DIRECTORY 2013

GENOPOLE

INNOVATION TODAY, EVERY DAY

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MORE INFORMATION

Genopole®'s website

www.genopole.fr

Our website describes what's happening on the biocluster in words and pictures. It provides an accurate snap-shot of life on the campus and contains detailed information on the biocluster's activities and stakeholders.

You can view all the Genopole press releases, get the latest news from campus labs and companies and learn about events on the biocluster.

Genopole is active in social netwoks

A Facebook page called "Genopole Réussir en biotechnologies" provides regular news of website updates and, more broadly, the scientific discoveries and societal & ethical issues raised by new fields of investigation in the life sciences.

https://www.facebook.com/pages/Genopole-Réussir-en-biotechnologies/175395621643?ref=ts

Genopole also has a Facebook page called "Les Cafés du gène", dedicated to the public understanding of life science.

https://www.facebook.com/pages/Les-Cafés-du-Gène/172168977373

You can also view a series of videos on our website or at:
http://www.youtube.com/user/Genopole

Our presentations are available on SlideShare:
http://www.slideshare.net/genopole/

And you can keep up with our news on Twitter:
http://twitter.com/#!/Genopole

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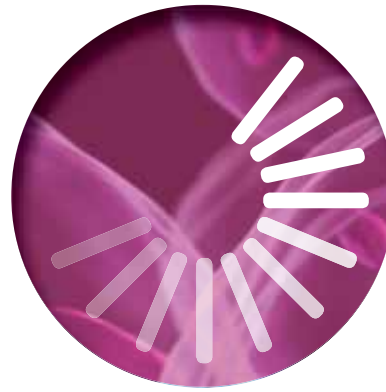

GENOPOLE
FRANCE'S LEADING BIOCLUSTER

Genopole is France's leading biocluster and has a special focus on life sciences. It is located just south of Paris (in the towns of Évry and Corbeil-Essonnes). Its mission is to give impetus today to innovations that will help us live better and healthier tomorrow.

Since the creation of Genopole in 1998 (under the impetus of the AFM-Téléthon and with support from the French government and local authorities), the goal was to build a research cluster around the Genethon lab, Genoscope (the French National Sequencing Center) and the French National Genotyping Center.

The biocluster has been growing steadily and is currently home to 21 academic labs, 71 biotech companies and 21 shared-use facilities.

Genopole has thus created a scientific eco-system to support the creation and develoment of biotech companies.

GENOPOLE'S MISSIONS

- Promoting the growth of the biotech industry by creating or attracting innovative companies and providing them with business support and real estate solutions.
- Building and coordinating a research cluster in genomics, post-genomics and related sciences.
- Reinforcing a life science teaching and training cluster, in collaboration with the University of Évry Val-d'Essonne (UEVE).
- Creating favorable conditions on campus for cross-fertilization between skills.
- Disseminating scientific and cultural information to the general public and contributing to societal debate on issues in genetics research.

GENOPOLE
INNOVATION TODAY, EVERY DAY

GENOPOLE: KEY FIGURES*

- **71** biotech companies
- **21** academic laboratories
- **21** shared-access technology platforms and facilities
- **€ 319.4M** in funds raised by Genopole portfolio companies
- **€ 153.6M** in turnover estimated for 2012 generated by 44 companies
- **4** companies listed on the stock market, **3** publicly traded companies
- **29** products from the regulatory preclinical phase through to market launch
- Genopole represents a total of **2,148** direct jobs. Real estate developments cover a total of **91,561** square meters
- Genopole is funded mainly by the Ile-de-France Regional Council **(30%)**, the Essonne Department Council **(26.5%)** and the French State **(15.7%)**.

*At 12.31.12

OPERATES WITHIN A HIGH-QUALITY SCIENTIFIC ENVIRONMENT

Genopole is located within a dense, high-quality scientific environment at the heart of the Essonne county, with universities (the University of Évry-Val-d'Essonne and the University of Paris Sud 11 in Orsay), research laboratories, elite haute école engineering schools (Polytechnique, Supélec, the Institut des hautes études scientifiques, etc.), government and not-for-profit research institutes (CEA, CNRS, Institut Curie, ONERA, etc.) and major scientific facilities (e.g. the Soleil Synchrotron and the NeuroSpin imaging facility). Genopole accounts for over a quarter of the Paris Ile-de-France region's public and private-sector research stakeholders.

This high density of research labs and hi-tech companies is set to grow still further, as a result of forthcoming development in the Saclay area. In fact, Genopole is located within a “biotech valley” south of Paris and works in synergy with the world-class Medicen Paris Region cluster (dedicated to innovative healthcare technologies and novel therapies). The Genopole biocluster also benefits from the general attractiveness of the Paris Ile-de-France region – Europe’s leading region for science, in terms of European patent filings. The Paris Ile-de-France region is home to no fewer than 300 public- and private sector research laboratories and about 200 biotech companies (accounting for 50% of the French total), ranking it third in Europe. Genopole benefits from one of the highest concentrations of biotech companies in France.

GENOPOLE IS AT THE HEART OF SCIENTIFIC RESEARCH

Genopole encompasses 21 research labs. Most specialize in genomics, post-genomics and biotherapies (71%) but there are also skills in biophysics/biochemistry (9,5%), bioinformatics/biomathematics (9,5%), the engineering sciences (5%) and clinical research (5%). The majority of these labs are administered or accredited by France’s national research institutes (CNRS, INRA, CEA and INSERM). This research firepower makes Genopole the leading French biocluster for genome sequencing, genotyping and human stem cell research, as well as for applications of this fundamental life science research, such as gene therapy of rare genetic diseases and functional genomics in crop species.

GENOPOLE IS AT THE FOREFRONT OF SYNTHETIC BIOLOGY

Genopole stands out among French research hubs for its commitment to synthetic biology, an emerging discipline at the interface between genetic engineering and engineering sciences that consists in designing and building new biological circuits with functions that are absent in nature.

The economic stakes are high and synthetic biology has many applications in the fields of healthcare (e.g. vaccines), the environment (remediation) and energy (biofuels).

In partnership with the CNRS, Genopole has created an Institute of Systems & Synthetic Biology (iSSB) and hosts five research groups (including biologists, computer scientists and physicists). The institute has a biological resource center (for DNA and cell samples), an automated molecular biology facility and a bioinformatics platform based essentially on novel software developed in-house.

The Institute currently operates 21 research contracts (including nine European Union collaborations).

GENOPOLE
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GENOPOLE SERVING BIOTECH COMPANIES

The Genopole biocluster is home to a range of start-ups (half of which were founded by public-sector researchers) seeking to turn scientific knowledge into a drug, a medical device or innovative products in the agricultural or environmental sectors. The Genopole Enterprises team (seven project managers) provides start-up and business development support to campus companies. This support can be managerial (strategy), logistic (premises and scientific facilities) or financial (business development and fundraising). To address its companies' accommodation needs, Genopole offers real estate solutions that range from an office (from 20 to 150 square meters – just right for recent start-ups), to much larger office/lab space (from 200 to 1,200 square meters) for more mature companies. Other plots around Évry (notably in the town of Lisses) are available. Genopole has also financed the construction and operation of 21 technical facilities (including a cell irradiator, a transmission electron microscope and a high-throughput screening platform), all of which are available for use by campus labs and companies.

In addition to its longstanding partners (such as the Essonne Chamber of Commerce and Industry [CCIE] and the Essonne Economic Development Agency [AEE]), Genopole Enterprises interfaces with the skills of the Ile-de-France Innovation Center (CFI). A CFI advisor holds a monthly clinic on campus.

Since its advent, 134 businesses have been incubated or accompanied by Genopole. Currently Genopole is home to 71 companies, 70% of which are active in the biomedical/healthcare sector and 30% in other sectors such as environmental technologies, agro-industry or scientific instruments to name just a few.

A RANGE OF SHARED SERVICES

Genopole offers even more help to portfolio companies by providing them with shared services. These notably include IT services: secure networks, website and e-mail hosting and management, update management and access to electronic business databases.

Furthermore, by joining the BioSupport employers group, biocluster companies can access an even wider range of services, including access to a part-time administrative and financial director, quality assurance and IT maintenance.

GENOPOLE – A KEY PARTNER FOR THE UNIVERSITY OF ÉVRY VAL-D'ESSONNE (UEVE)

Genopole supports the emergence of new academic sectors in life sciences and hosts a hundred or so PhD students in its labs. It has forged a close collaboration with UEVE – a Genopole founder member that has never ceased to reinforce its commitment to the bio-cluster's research activities. A dozen research groups (most of which are joint units with the CNRS, INSERM, INRA and CEA national research institutes) form the UEVE's Department of Biology (awarded a grade "A" ranking by the French Agency for the Evaluation of Research and Higher Education [AERES]). The research fields include biotherapy, stem cells, genomics, post-genomics, bioinformatics, biomaterials and synthetic biology. The UEVE created a Master's in Systems and Synthetic Biology, in collaboration with the iSSB. In order to reinforce the campus's attractiveness, the UEVE opened an Institute of Genetic Biology and Bioinformatics. The Institute will encompass all the university's existing biology research groups and some new ones. The Institute will also provide high-quality teaching and training in genomics and post-genomics as applied to healthcare, the environment, bioinformatics and complex systems engineering. It will host 500 students and 200 researchers and lecturers in bioinformatics and biomathematics (i.e. "dry biology").

GENOPOLE
FRANCE'S LEADING BIOCLUSTER

GENOPOLE – A STAKEHOLDER IN LOCAL AND SCIENTIFIC LIFE

Genopole is an active stakeholder in the Évry Center Essonne area's economy. Along with the UEVE and several local engineering and business schools, Genopole helped to found the Évry-Val-de-Seine Science & Education Cluster (PSEVS), which develops university teaching and research activities in and around Évry. The cluster also participates in civic debate *via* a year-round series of events, including the "Gene Café", French National Science Week, seminars, debates and the "DNA School" workshops in collaboration with Genethon. During these meetings, campus scientists explain their research, exchange points of view with the public. This is one of the biocluster's clear missions: to help disseminate scientific information, address controversial issues raised by scientific research and place life science in the context of the human and social sciences. In 2010, Genopole started to organize a five-year cycle of "Life Science and Society" seminars, in collaboration with the Ile-de-France Institute for Research, Innovation and Society. Researchers, sociologists, lecturers and journalists, for example), discuss the ethical problems raised by advances in science (synthetic biology, stem cells, GMOs, nanotechnology, biologics, etc.) and try to define ways of implementing constructive dialogue between the world of science and the general public so that people can form an educated opinion.

NEW DEVELOPMENTS ON THE BIOCLUSTER

Genopole has continually demonstrated its acknowledged expertise in the healthcare sector. Genopole is pursuing this strategy as the age of personal, genetic medicine dawns, with progress in cell therapy, gene therapy and nanotechnology. Genopole is fostering the development of personalized medicine. However, the biocluster is not limited to the medical field and Genopole members are variously working on yellow biotech (the environment), green biotech (agronomy) and white biotech (industry and bioenergy). In fact, Genopole has addressed the issue of sustainable development by launching a business plan competition for innovative greentech start-ups. Another development theme is its international dimension; the biocluster has committed to pro-actively prospecting for biotech companies worldwide.

GENOPOLE'S AMBITIONS

After 15 years of existence, France's leading biocluster is developing a dynamic strategy for 2020-2025 focused on the progression of personalized medicine and innovations in environmental protection. Thanks to the steadfast support of its partners and founding members, Genopole has become France's leading biocluster dedicated to research in genomics and genetics, and to the development of biotechnologies. Today, Genopole is finding new paths of development and identifying sectors with great promise for the future.

Four strategic orientations have been defined:

- For science: the Genopole model, which unites research labs, biotech companies, technical platforms and learning facilities, is evolving to include mini-clusters within the site. Genopole will thus be able to contribute to the creation of new activities in France in future-looking sectors such as human pluripotent stem cells, biomanufacturing, synthetic biology and telemedicine.
- For business creation: Genopole has implemented in France a unique process for accompanying creators of biotech startups. A team of project managers provides guidance and assistance to solidify the initial concept, mobilize the necessary competencies (legal, managerial, scientific, etc.) and raise capital (seed funds, angel and venture capital investors, government subventions, etc.). Today, Genopole wishes to extend the reach of its know-how to more mature companies with the objectives of maintaining their presence on the site and stimulating job creation.
- For the territory: Genopole's image contributes to those of the region and the nation. The biocluster is bringing new competencies aboard to increase its international visibility and renown, particularly in China, the United States and Canada, to favor the arrival of foreign businesses on the site.
- For society: to share knowledge with the public, in particular to address increasing concerns for ethical issues raised by scientific progress.

GENOPOLE'S DEVELOPMENT PROJECTS

A HOSPITAL- INTERFACED CLINICAL AND TRANSLATIONAL RESEARCH CENTER (CRCT)

The South Ile-de-France Medical Center (the CHSF, with 1,017 beds, 20 operating theaters and 130 consultation rooms) is located opposite the Genopole headquarters. The CHSF is the second largest hospital campus in the Paris Ile-de-France region. Genopole has seized this opportunity to create a Clinical and Translational Research Center (Centre de recherche clinique et translationnelle, CRCT) with the CHSF and the AFM-Téléthon. Construction began in 2013 and should be completed in 2014.

From the bench to the bedside and back, the CRCT will accelerate the transition from lab research to applications in the medical sector and help disseminate innovations in patient care. Researchers, companies, physicians and patient associations will interact and work together under the same roof, with a view to improving the entire healthcare chain. Without being too restrictive, the CRCT will give priority to locally developed gene and cell therapy research projects – particularly rare genetic diseases (in collaboration with the French Muscular Dystrophy Association AFM-Téléthon) and chronic diseases such as diabetes or cardiovascular and osteoarticular diseases.

The €16.5M required to fund the CRCT is provided by the Ile-de-France Regional Council (€10M), Essonne County Council (€5M) and the European Regional Development Fund (€1.5M).

BUILDING CYTOPOLIS – "STEM CELL CITY"

The development of stem cell research and its valorization *via* new therapies is a priority axis at Genopole. The purpose of the scientific, medical and industrial hub Cytopolis is to explore and develop the potential of stem cells for *in vitro* pathology modeling and regenerative medicine. The hub will benefit from the presence of other entities within the biocluster:

- European leader in human pluripotent stem cell research, the Center for Stem Cell Studies (CECS, AFM-Telethon), the Laboratory for the Genomics and Radiobiology of Keratinopoiesis (CEA) as well as the INSERM unit Stem Cells and Cardiogenesis, focused on heart disease;
- The Sud-Francilien Hospital Center located close to Genopole;
- The Clinical and Translational Research Center;
- The CellMill biomedical platform of EctyCell, an affiliate of Cellectis. CellMill will provide an iPS cell bank comprising numerous diseases. The objective of CellMill is to industrialize iPS cell cultures for the development of cellular models that represent the physiology, pathology and genetic diversity of human disease. The cells will serve as tools not only for fundamental research, but also for molecular screening in pharmaceuticals and cosmetics;
- The Translational Research & Development Institute (IRD-T), whose purpose is to attract academic laboratories and resolve challenges in the industrial and medical application of stem cell technologies.

BEYOND WORK: A BIOCLUSTER FOR LIVING, PLAYING AND INTERACTING

The success of scientific clusters such as Genopole depends on the synergies between the various laboratories, companies and platforms. With this in mind, the SEM Genopole is creating a life center on the campus. Situated along the N7 national roadway, the 20,000 m^2 site will offer food services, a gym, numerous businesses (newspaper stand, bar, pharmacy, bank, tailor, florist, etc.), a hotel, a residence for researchers and physicians and more. The life center is scheduled to open in late 2015.

DEVELOPING A BIOMANUFACTURING CLUSTER

Genopole is developing a dedicated biomanufacturing mini-cluster, comprising companies, laboratories and training programs. A 1,300 m^2 biomanufacturing center is located at the very heart of Genopole for the custom production of research, preclinical and ultimately clinical batches of recombinant proteins, and more particularly monoclonal antibodies.

Genopole has also invested €8M in the AFM's Genethon Bioprod vector biomanufacturing facility. This unit will make France one of the world leaders for the production of clinicalgrade gene therapy products.

Furthermore, Genopole in collaboration with the Quebec-based vaccine company Medicago has opened a research lab on the biocluster – the first step towards establishment of a commercial vaccine production facility.

OFFERING TRAINING IN BIOMANUFACTURING CAREERS

As part of the mini-cluster and to expand its biomanufacturing training offer, Genopole is making way for a branch of the Groupe IMT *(Institut des Métiers et des Technologies des produits de santé)*, an institute headquartered in Tours, France, with 35 years of experience in providing apprenticeship-based training for operational and technical careers in pharmaceutical production. The branch, scheduled to open in 2014 at the Genopole site, will focus on preparing people for the new and upcoming careers generated by biomanufacturing and biotechnology. Initially the branch will provide academically – and/or institutionally – recognized work-study or contract training programs for technicians or qualified technicians in industrial pharmacy and cosmetics, industrial biomanufacturing, and pharmaceutical and biotechnological equipment maintenance – www.groupe-imt.com.

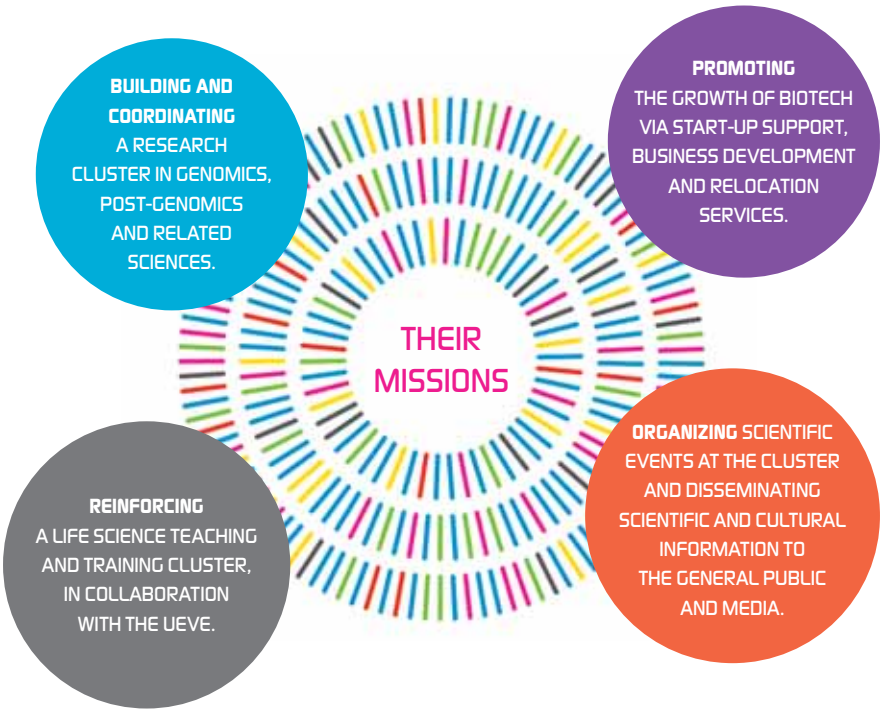
DEPLOYING A DNA ENCAPSULATION FACILITY

Cryopreservation, the most frequently employed stocking technique for large collections of DNA samples, results in large operating and maintenance costs and is vulnerable to equipment failures.

To address these issues, Genopole has acquired the DNAShell® preservation technology. This alternative storage method was developed by the Genopole company Imagene. DNAShell® provides very long-term DNA preservation at room temperature, at low costs, and for several years.

Scheduled for service start-up in 2013 by Genopole, the fully automated high-throughput DNA extraction and encapsulation facility will be able to process thousands of samples per day, thus responding to the needs of biobanks and other national biological resource centers.

THE GENOPOLE TEAMS



To provide researchers and entrepreneurs with a comprehensive range of on-site resources and support services, Genopole has five teams of expert staff: Research/Enterprises/Communication/ Global Infrastructure/International.

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GENOPOLE COMMUNICATION AND EVENTS [PAGES 18-19]
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RESEARCH

Genopole Research's mission is to (i) reinforce the biocluster's research strengths, (ii) structure and coordinate scientific life within the cluster and (iii) contribute to the development of new academic sectors.

The Genopole Research team provides research groups and individual researchers with opportunities for developing their research and exploiting their results: tools to enable researchers to move into functional, customized lab space. Genopole can provide support and funding for taking on staff and buying equipment, as well as access to a range of shared-access facilities and a high-quality program of scientific events.

- Genopole Research implements a pro-active policy for attracting top-class researchers and research groups to the biocluster.
- Genopole Research supports fast-expanding research programs on:
  - stem cells and biotherapies;
  - synthetic and systems biology;
  - proteomics and metabolomics;
  - biomaterials;
  - and many other topics.
- Genopole Research also fosters the emergence of new scientific leaders: Genopole created its ATIGE grants to enable young researchers to set up and grow a group within an academic laboratory on the Genopole biocluster. After a call for research proposals, the ATIGE recipients are selected by an independent review committee. Fellows receive a project grant of €76.500 per year for three years. Since 2001, a total of 23 ATIGE fellowships has been awarded.
- Genopole Research also promotes the "reverse brain drain" by helping French-trained researchers to move back after doing their postdoc work abroad. Candidates are selected on the basis of scientific excellence and, to date, 70 postdocs have thus received a grant-in-aid of €57.000 per year for two years, in order to undertake a research project on the Genopole campus. After these two years, all the recipients have found positions in an academic lab, a company or a teaching institution.
- Genopole Research coordinates scientific events with biocluster stakeholders and their off-campus partners by promoting interdisciplinarity and mutual knowledge of research activities (notably for PhD students and postdocs). Genopole Research helps to fund and organize a rich program of high-level scientific events and meetings: colloquia, international symposiums, workshops, joint clinical & fundamental research days, etc.
- Genopole Research contributes to the development of new academic fields, the constitution of joint national research institute/university units.
- In partnership with the association Arbre des Connaissances, Genopole Research organizes Apprentis Chercheurs, a program that gives students at the secondary education level a chance to conduct a program in one of the campus laboratories.

ENTERPRISES

Genopole Enterprises's mission is to promote the creation of hi-tech companies and provide business support from the first day (the genesis of the business idea) through to the successive funding rounds. The goal is to transform the results of life science research into drugs or industrial products, build a truly world-class biocluster and contribute to the emergence of French biotech.

PERSONALIZED PROJECT SUPPORT

The Genopole Enterprises team is made up of experienced project managers with complementary backgrounds. It covers all the operational phases in business creation and development. Genopole works closely with other business support organizations and the financial community to provide budding or experienced entrepreneurs with scientific, managerial, logistic and financial assistance. A committee of independent experts helps the Genopole Enterprises team to evaluate and refine business plans. Genopole portfolio companies and entrepreneurs are also eligible to receive pre-seed finance from the G1J Ile-de-France pre-seed fund.

GENOPOLE ENTERPRISES IS ACTIVE IN FOUR MAIN AREAS

- Helping entrepreneurs to transform their ideas into market-validated companies: fundraising, industrial alliances and turnover generation.
- Encouraging existing companies to move to the top-class Genopole campus.
- Promoting the development of Genopole portfolio companies: winning international business, in- and outlicensing operations, product and service commercialization, etc.
- On-site networking, with monthly business clubs for promoting dialogue on key corporate issues.

ACCREDITATION: A SIGN OF EXCELLENCE

Before receiving financial and project support from Genopole, each candidate for business incubation is evaluated by Genopole Enterprises and undergoes validation by a committee of independent experts in business, finance and science. Accredited companies obtain full access to Genopole services and a special network of business development partners. Established companies wishing to benefit from preferential access to the biocluster's environment and facilities can also apply to the Genopole Executive Board for accreditation.

THE G1J ILE-DE-FRANCE PRE-SEED FUND

PROVIDING BIOTECH COMPANIES WITH EARLY-STAGE FUNDING

G1J Ile-de-France is a biotech-dedicated pre-seed fund that was set up in collaboration with France's Caisse des Dépôts et Consignations state savings and investment bank. Over the period 2000-2012, the fund invested €3.2M in Genopole portfolio start-ups and has leveraged investment totaling €170.65M in 30 companies. Since mid-2008 (and an additional €5M round of fundraising), the G1J Ile-de-France has extended its activity to early-stage investment in innovative companies throughout the Paris Ile-de-France region.
Thus, G1J Ile-de-France works hand-in-hand with all the region's company incubators to promote the emergence of promising projects which, thanks to early-stage funding and support, will be able to attract investors at the various steps in corporate life. Since 2010, management of the portfolio was entrusted to CapDecisif Management.
G1J IdF can invest up to €300,000 per company (in equity and/or as share warrants).

G1J ILE-DE-FRANCE'S SHAREHOLDERS

- CDC Entreprises FPMEI & FFI-B
- Ile-de-France Regional Council
- MGEN
- Groupe Industriel Marcel Dassault (GIMD)
- Banque Populaire Rives de Paris
- Société Générale/Franpart
- The French Muscular Dystrophy Association (AFM-Téléthon)
- Merck Serono Biodevelopment
- Crédit Agricole Ile-de-France
- Investissement Québec
- Fonds des travailleurs québécois (FTQ)
- Essonne Chamber of Commerce & Industry
- Crédit Agricole Capital Investissement & Finance

- Biogemma
- Matignon Développement 3
- Laboratories Servier
- Accor
- IBM
- Safidi/Groupe EDF
- Agro Partenaires Participations 2

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GLOBAL INFRASTRUCTURE AND PLATFORMS

SHARING TECHNOLOGIES AND COMPETENCIES

With its Global Infrastructure and Platforms Department, Genopole supports the development of its companies and research laboratories by giving them access to research infrastructures, cutting-edge equipment and expertise that they would otherwise not be able to finance individually.

To assure this, the Infrastructure and Platforms Team:

- Identifies the needs of the biocluster companies and labs and then drives the creation of shared-access facilities and services to meet their research needs. A DNA encapsulation facility is on the way and the “L2A2” extension of the Center for Exploration and Experimental Functional Research (CERFE) is planned.
- Defines and monitors criteria in terms of accessibility, marketing and quality of the facilities and checks that the latter are self-financing.
- Provides shared access to semi-heavy equipment.
- Establishes a network between companies and laboratories, with a view to boosting competitiveness and increasing the efficiency of technology transfer.
- Coordinates measures for increasing use of the various platforms.
- Pilots marketing, communication and events related to the promotion of Genopole shared-use facilities.
- Assures site tech events by organizing demonstrations of innovative equipment and thematic seminars to explain newly available technologies.

INTERNATIONAL

Thanks to the quality of its research skills and infrastructure and the dynamism of its life science businesses, the French biotech industry is now ranked 3rd in Europe. As France's leading biocluster, Genopole has contributed significantly to this success. The biocluster was accredited by the Paris Region Economic Development Agency (ARD) and the Ile-de-France Regional Council as a "Paris Region International Business Location". Since the creation of the cluster in 1998, the Genopole team has acquired experience and expertise that are often requested by other bioclusters (mostly newly ones) around the world. Genopole International works in close collaboration with the Medicen Paris Region cluster, the Essonne Economic Development Agency regarding prospecting missions in the USA and Japan, the Essonne Chamber of Commerce and Industry and the Paris Region Economic Development Agency (ARD). It has three major objectives:

1. BUSINESS DEVELOPMENT

- Helping start-ups to grow their business internationally.
- Helping companies identify and implement international collaborations by attending the sector's major events: BIO, BioMed, BioSquare, BioVision, BioJapan, BioForum Shanghai, EU-MIT Career Fair (for French expats), etc.

2. MARKETING THE BIOCLUSTER

- Raising awareness of Genopole member labs and companies and the biocluster's economic and institutional partners with the international biopharmaceutical industry, foreign research organizations, investors and bioincubators.
- Consolidating existing relationships and collaborations.

3. BECOMING A KEY PLAYER IN THE EUROPEAN RESEARCH AREA

- Coordinating or participating in European projects: Natibs, BioLink and Bio-CT, a multicluster project which seeks to pool management tools and expertise for technical facilities, the "reverse brain drain" and the maturation of innovative life science start-ups.
- Encouraging French-trained expat researchers or entrepreneurs to return to France.

GENOPOLE DEVELOPING EXCHANGES WITH CHINA

As part of the twinning relations between the Essonne Department and the city of Wuhan, China (in the province of Hubei, west of Shanghai), Genopole has entered into a partnership with the Wuhan Biolake cluster, one of the three government-identified Chinese pilot sites for biotech development. Genopole's signature on the Sino-French framework agreement was the first of its kind with Wuhan. The partnership encompasses marketing and operational support (location, raising capital, establishing R&D units, etc.) for the establishment of Chinese biotech companies in France, and French biotech companies in China. In March 2012, Genopole had the pleasure of welcoming a delegation from Wuhan; its members had come to France to sign a collaboration agreement with UbiFrance, a French agency for international business development. Then, in April 2012, Genopole was present for the inauguration of the Sino-French biotechnology center created within the Biolake biopark.

GENOPOLE EVENTS

The Genopole biocluster brings together businesses, university laboratories, professors and students among others. Exchange among its members makes this ecosystem for innovation in biotech grow stronger. To encourage a biocluster spirit, Genopole organizes a number of recurrent events to favor encounters, the diffusion of scientific or business information and the sharing of experiences.

THE 9:15 CLUB is held the third Tuesday of each month from 9:15 to 10:15 a.m. and is open to all biocluster businesses. The attendees enjoy a breakfast while a facilitator leads a discussion on a chosen business strategy.

WORKSHOPS are held quarterly to provide company heads an opportunity to gain valuable insights on business issues from specialized consultants. Workshops are followed by a shared lunch to further encourage exchange.

WELCOME SESSIONS are held two or three times per year to hail new Genopole companies and give them an opportunity to present their activities to an audience of "Genopolians" and regional researchers.

EQUIPEMENT DEMOS are provided regularly to present and perfect the use of Genopole's cutting-edge technical equipement and show how it serves different fields of study, development or industrialization.

PLATFORM DAY will be held every two years to give the users and the managers of Genopole's 21 shared-use facilities the opportunity to meet. There, Genopole's state-of-the-art technologies and disciplines are presented, demonstrated and debated over stands and during round-tables and presentations.

THE WORLD CAFÉ, organized in conjunction with Évry-Val-d'Essonne University, gives students an opportunity to meet and explore chosen subjects, often concerning business creation.

GENOPOLE COMMUNICATION

Promoting the biocluster and its stakeholders and contributing to a better understanding of the ethical issues raised by progress in genetics.

THE COMMUNICATION TEAM'S MISSIONS ARE AS FOLLOWS:

RAISING GENOPOLE'S PROFILE

Reinforcing the attractiveness of the biocluster through:

- The organization of biocluster companies and labs attendance at major national and international events in healthcare and biotech (EuroBiO, BIO, etc.).
- The organization of a yearly competition for biotech startups in the environmental, agronomic and industrial sectors to attract new companies to the site.
- Media coverage: drafting and circulation of press releases, organization of press conferences.
- Genopole.mag, a magazine published in paper and web versions to inform a large audience of readers on what's new among the biocluster's companies and laboratories.
- Marketing material: brochures, annual reports, directories, corporate videos, the website, newsletters, etc.
- The organization of dedicated events on the biocluster: inaugurations, visits, seminars, colloquia, etc.

DEVELOPING A CAMPUS CULTURE

Creating and accentuating a sense of belonging to Genopole and promoting dialogue between campus stakeholders *via*: the Genopole web-site and extranet; organizing the "Génofolies" campus festival; the internal news magazine "Forum", available on paper or on the web, written collectively by a team of Genopole actors.

PROMOTING LIVELY, SOCIALLY RESPONSIBLE COMMUNICATION

Circulating scientific information to the general public by:

- Organizing an annual "Life Science in Society" colloquium, dedicated to the ethical questions raised by genetics research.
- Organizing the "Junior Gene Café" debates for the general public and researchers.
- Coordinating campus events as part of France's annual Science Festival: open days at labs and companies, events for the general public, etc.
- Involvement in civic activities and information provision, in partnership with a range of organizations: the "Knowledge Bank" with the Essonne County Council, the "Ethics Workshop" with Évry City Hall, etc.
- Support for educational initiatives, such as Genethon's "DNA School".

GENOPOLE REAL ESTATE

With nearly 92,000 square meters dedicated to research and biotech, Genopole offers diversified real estate solutions in an advantageous environment:

- the Gare de Lyon main train station in Paris is 35 min away (*via* the RER D light railway);
- Paris Orly international airport is 20 km away by car and Paris Roissy international airport is 70 km away;
- an intercompany restaurant;
- a convention center with a 700-seat plenary room;
- access to an ultra-high broadband IT network;
- a park and landscaped areas;
- shopping malls nearby.

Genopole can provide research providers and academic laboratories with operational, fitted-out premises.

GENOPOLE HAS DEVELOPED A COMPREHENSIVE REAL ESTATE OFFERING

- free office space for budding entrepreneurs;
- structured support with setting up a business, thanks to France's first biotech-dedicated ISO 9001-2000-certified incubator (run by the Essonne Chamber of Commerce and Industry). The incubator can also provide entrepreneurs with office space and equipped BSL1/BSL2 labs in modules ranging from 9 to 100 square meters, together with facilities management services (secretarial assistance, reception, maintenance, janitorial services and round-the-clock security services);
- office and lab accommodation for mature companies, organized by SEM Genopole.

The SEM Genopole real estate company leases 25,500 square meters of space in eight different buildings fitted-out for research or production activities. This modular real estate offering covers from 200 to 3,000 square meters. SEM Genopole also has 8,500 square meters of real estate reserves available for new-build projects.

FIVE REAL ESTATE PRODUCTS ARE AVAILABLE

- floor space only (unfitted);
- custom-fit floor space, equipped according to a company's business plan and needs;
- turn-key office space and BSL1 /BSL2 labs;
- technical facilities with shared access to equipment (glass wash rooms, cold rooms, meeting rooms, cafeteria, storage space, etc.);
- office space at the business center.

The custom-fit premises are specifically equipped for biotech activities and feature:

- lab space with different biological safety levels, as required;
- refrigeration and air treatment plants (from standard to HEPA levels).

SEM Genopole provides or arranges a number of facilities management services, notably for:

- on-site security (closed circuit TV);
- security staff (at night and weekends);
- access control;
- air conditioning maintenance.

Lastly, the nearby Leonardo de Vinci business park in the town of Lisses (developed by the Évry Center Essonne Metropolitan Area and the Paris Region Real Estate Authority) offers companies needing more space a range of plots (from 5,000 m^2 to 10 hectares) in a high-quality environment on the edge of a wooded area.

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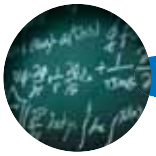
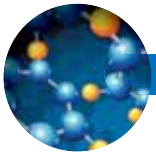
LABORATORIES



BIO-INFORMATICS MATHEMATICS



BIOPHYSICS / BIOCHEMISTRY

BIOTHERAPIES / VACCINOLOGY

GENOMICS / POSTGENOMICS

MEDICINE / TELEMEDICINE

ENGINEERING SCIENCES

Public research organisms and universities (supervisory bodies) of the academic laboratories

INSERM

- The Genethon Research Division
- Institute for Stem Cell Therapy and Exploration of Monogenic Diseases - I-Stem
- Molecular Immunology and Innovative Biotherapies
- Stem Cells and Cardiogenesis
- Structure and Activity of Normal and Pathological Biomolecules
- Unit for Integrated Biology in Adaptations to Exercise (UBIAE)

CNRS

- The Genethon Research Division
- Institute for Systems and Synthetic Biology (iSSB)
- Laboratory for Analysis and Modeling in Biology and the Environment (LAMBE)
- Metabolic Genomics
- Statistics and the Genome

INRA

- Plant Genome Polymorphism Research Unit
- Plant Genomics Research Unit (URGV)
- Statistics and the Genome

CEA

- Genoscope
- Laboratory for Analysis and Modeling in Biology and the Environment (LAMBE)
- Laboratory for the Genomics and Radiobiology of Keratinopoiesis
- Metabolic genomics
- The National Genotyping Center (CNG)
- Tumor Functional Genomics and Epigenetics

UNIVERSITY OF ÉVRY

- The Genethon Research Division
- GenHotel
- Institute for Stem Cell Therapy and Exploration of Monogenic Diseases - I-Stem
- Institute for Systems and Synthetic Biology (iSSB)
- IT for Integrated Biology and Complex Systems (IBISC)
- Laboratory for Analysis and Modeling in Biology and the Environment (LAMBE)
- Metabolic Genomics
- Molecular Immunology and Innovative Biotherapies
- Plant Genomics Research Unit (URGV)
- Statistics and the Genome
- Structure and Activity of Normal and Pathological Biomolecules
- Unit for Integrated Biology in Adaptations to Exercise (UBIAE)

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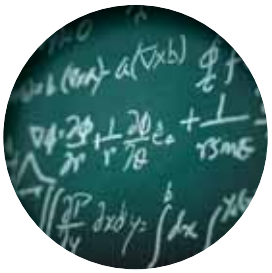

Bio-informatics / Mathematics / Systems biology

BioIntelligence Program

SUPERVISORY BODY
Genopole

DIRECTOR
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MAIN TOPIC
An integrated software environment for the life sciences industry.

FIELD OF ACTIVITY
- Drug discovery.
- Systems biology.
- Product lifecycle management.
- Applications in oncology & toxicology.

KEYWORDS
Drug discovery / Oncology / Toxicology / Systems biology / Product lifecycle management / Digital Clinics

RESEARCH THEMES

The institute of Systems and Synthetic Biology is developing the Bio Intelligence Program (*cf.* page 33).

The goal of the BioIntelligence Project is to elaborate an integrated software environment for product and compound R&D in the life science industry, with emphasis on the pharmaceutical and crop protection industries. This innovative digital environment will:

- deliver a unified platform for collaborative biological synthesis and analysis;
- generate mathematical models for use in in silico digital simulation and comparison with experimental data;
- optimize life science R&D processes. ■

Engineering sciences

Center for Mechanical Engineering and Automation Studies and Research

[CERMA]
EDE-Innov

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EDE-innov

DIRECTOR - INSTRUMENTATION DEPARTMENT
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MAIN TOPIC
Engineering sciences.

FIELD OF ACTIVITY
- Development of new production methods, feasibility studies and specifications for products and machines requiring a multi-disciplinary approach.
- Applications in manufacturing, research and biology.

KEYWORDS
Mechanical engineering / Robotics / Automation / Instrumentation / Process: development and feasibility / Prototyping

RESEARCH THEMES

The Cerma stands out by its ability to provide total management of complex projects (from initial specification to commissioning) in fields including mechanical engineering, electronics, special sensors and industrial IT.

As a Technology Transfer Center of the University of Évry, it designs, builds and implements innovative machines, products and automated processes for a range of industrial sectors (notably in the field of biology).

The Cerma has particularly focused its work on the high-throughput automation of electrophoretic analysis and related techniques: sample preparation, dilution, PCR, UV luminescence imaging, etc.

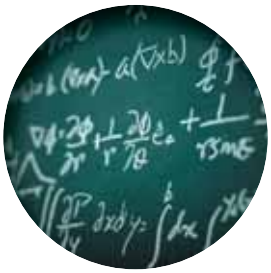
Since its creation, the Cerma has handled more than 250 projects in a variety of sectors: automated workstations in genetics, crash test beds in the automotive industry, industrial inkjet printers, medical electronics, etc.

COLLABORATIONS

The Cerma collaborates with other public-and private-sector establishments: Genoscope (*cf.* page 31), Genethon (*cf.* page 101), University of Évry (the IBISC lab *cf.* page 34), University of Paris 7, University of Paris 11, the Gustave Roussy Institute, INRETS (LIVIC), Danone Research, etc.

INDUSTRIAL COLLABORATIONS

- Several private-sector users: Oligo Express (oligonucleotide synthesis) in Montreuil, France; Metabolic Explorer (a green chemistry company developing and patenting industrial processes based on fermentation) in Saint-Beauzire, France.
- Equipment manufacturers and reagent producers: Genome Express (oligonucleotide synthesis) ; DNA agency.
- Other industrial collaborations: Danone Research, EDF, Traiteurs de Paris, Ces, Biobank, Alam Medical, CEA, Primadiag, Qualicyt, Herdegen, IRSN, Corning, Risoud Precision, Ehbio, Aegilops, Cornilleau, Fanuc, Genewave, Adres, Comelli, Thema Concept. ■



Bio-informatics / Mathematics / Systems biology

Epigenomics Program

SUPERVISORY BODY
Genopole

DIRECTOR
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MAIN TOPIC
A multidisciplinary modeling approach for systems biology and synthetic biology.

FIELD OF ACTIVITY
- Modeling and simulation of biological processes in a (post)genomics context.
- Epi-organization of genomes.

KEYWORDS
Modeling / Simulation / Engineering / Macromolecular networks / Epigenesis

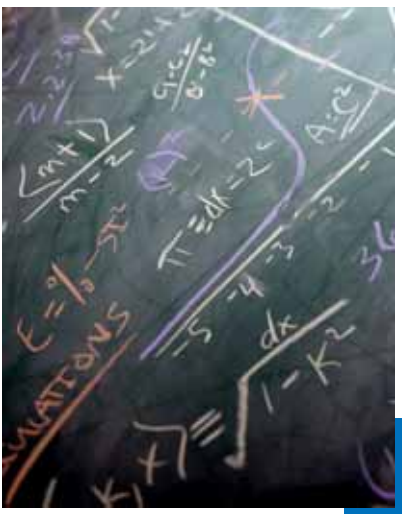
The Program simultaneously serves as:
- a vector for training researchers in disciplines other than their own,
- a visiting researcher program,
- a hotbed of pioneering science (stimulating the invention of new research subjects and supporting them through targeted, thematic activities),
- a collaborative program that federates Évry-based research efforts on modeling in biology.

All the activities funded by the Epigenomics Program are highly thematically targeted and are based around a small number of leading researchers. ■

RESEARCH THEMES

The Institute of Systems and Synthetic Biology is developing the Epigenomics Program (*cf.* page 33).

The Genopole Epigenomics Project (founded in 2002 and whose slogan is “modeling for understanding”) aims first and foremost to be a forum for dialogue in order to catalyze research on complex biological problems *via* contributions from a range of disciplines: biology, computing, mathematics, theoretical physics, artificial chemistry and so on.



Genomics / Postgenomics / Biotherapies

Euroas Genomic Bank

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MAIN TOPIC
Genomics and postgenomics of spondylarthropathies.

FIELD OF ACTIVITY
- Constitution of DNA banks and clinical/immunological databases.
- Physiopathology of spondylarthropathies.
- Characterization of genetic factors other than HLA B27.
- Function of HLA B27.
- Clinical epidemiology.

KEYWORDS
Genetics / Immunology / Ankylosing spondylitis / Spondylarthropathies

RESEARCH THEMES

Ankylosing spondylitis (AS) is the archetypal (and most frequent) spondylarthropathy.

The Euroas association (which consists of 10 rheumatology research labs and clinical centers from 9 European countries) has achieved one of its main objectives: building a European genomic bank (EGB) for cataloguing the genetic and clinical characteristics of patients suffering from SA or other spondylarthropathies and those of their families.

The bank's current collection of 7,000 samples (collected by the consortium members from 1,230 families) includes a large cohort of B27-negative subjects and some B27-positive subjects.

The EGB has enabled selection of a large research cohort and the launch of a high-resolution MHC and genome study. The goal is to screen for potential susceptibility and/or severity genes involved in the genesis of spondylarthropathies in general and SA in particular, thus elucidate the fundamental molecular mechanisms of these diseases and open up new opportunities for developing novel diagnostic techniques and treatments (including cell and gene therapies). ■

Genomics / Postgenomics / Biotherapies

The Genethon Research Division

SUPERVISORY BODIES
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MAIN TOPIC
Gene therapy for rare genetic diseases.

FIELD OF ACTIVITY
Design, preclinical and clinical development of innovative therapies for rare genetic diseases with a specific focus on neuromuscular disorders.

KEYWORDS
Rare diseases / Immunodeficiencies / Muscular dystrophy / Neuromuscular diseases / Gene therapy / Therapeutics based on genetic knowledge / Gene transfer vectors / Gene targeting / Process development and biomanufacturing / Gene transfer, Stem cells

RESEARCH THEMES

The Genethon Research Pole is active in four main research areas:

- Identification of new therapeutic approaches for monogenic neuromuscular diseases, including Duchenne Muscular Dystrophy, progressive limb-girdle muscular dystrophies, X-linked myotubular myopathy and spinal muscular atrophy. The research includes the investigation of physiopathological mechanisms, the search for new biomarkers, and the identification of new therapeutic strategies based on locoregional or systemic administration of adeno-associated viral vectors.

This research is carried out by the groups of Isabelle Richard, Ph.D. (DR1 CNRS, part of the joint unit UMR 8587), Anna Buj-Bello, Ph.D. (CR2 INSERM, ATIGE research group) Carole Masurier, Ph.D., and Fedor Svinartchouk, Ph.D.

- Gene therapy of primary immunodeficiencies, including Wiskott-Aldrich syndrome, chronic granulomatous disease, and X-linked and Artemis-deficient severe combined immunodeficiencies. The research includes the development of new lentiviral vectors for the genetic modification of hematopoietic stem cells, the analysis of stem cell differentiation, and the study of the genetic and epigenetic consequences of gene transfer in the human genome.

This work is performed in the INSERM Unit U951 led by Anne Galy PhD (DR1 INSERM) (*cf.* page 38), Director of the Gene Therapy of Blood Disease Program.

- Development of innovative approaches for gene and vector targeting, and vector biomanufacturing. The research addresses new approaches for targeted transgenesis and the development of innovative technologies for the production and large-scale manufacturing of lentiviral and adeno-associated viral vectors.

This work is performed by the groups of Otto Merten, Ph.D., Matthias Hebben, Ph.D. and Fulvio Mavilio, Ph.D.

- Characterization and control of immune response to gene transfer. The research is addressing the humoral and cell-mediated immune responses to *in vivo* administration of viral vectors in pre-clinical small and large animal models, and new methods to monitor and control immune responses in the context of gene therapy clinical trials.

This work is carried out by the groups of Carole Masurier, Ph.D., Federico Mingozzi, Ph.D. (Associate Professor, UPMC), and by researchers from the INSERM U951 led by Anne Galy Ph.D. (*cf.* page 38). ■

Genomics / Postgenomics / Biotherapies

GenHotel

European Research Laboratory for Rheumatoid Arthritis
EA 3886

SUPERVISORY BODY
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EA 3886

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MAIN TOPIC
Genomics - Genetic Statistics.

FIELD OF ACTIVITY
Research on the genetic susceptibility to complex diseases through genomic analyses with a focus on rheumatoid arthritis.

KEYWORDS
Human genetics / Multifactorial diseases / Genomic variants / Genetic statistics

RESEARCH THEMES

Rheumatoid arthritis, the most common autoimmune disease, is a painful chronic rhumatism which leads to progressive joint destruction. This multifactorial disease involves a large number of genetic factors, not all characterized by now.

GenHotel's goal is to determine the multifactorial determinism of rheumatoid arthritis by studying genetic and environmental factors in patients and their families. The final purpose is to contribute to new drug targets development, with a view to prevent and cure this disease. The research methodology will be extended to other diseases having a major impact on public health.

In this context, GenHotel's activity is focused on characterization of genomic variants for sequence, copy number and expression, in familial samples. Furthermore, combination studies are performed on clinical, genomic and environmental data. These analyses are essential for characterization of interactions between all the known risk factors of rheumatoid arthritis.

COLLABORATIONS

- GenHotel is involved in several collaborations on the Genopole campus, notably with Centre National de Génotypage (JF Deleuze, R Olaso, Genomics Institute/CEA), and with Statistics & Genome laboratory (C Ambroise, UEVE/CNRS/INRA).
- GenHotel is in close contact with several clinicians, notably F Cornélis (CHU Clermont-Ferrand), T Bardin (Hôpital Lariboisière, AP-HP, Paris) and P Hilliquin, P Quillet and I Lemaire (CHSF Corbeil).
- Through sharing activities, GenHotel develops several national and international collaborations which lead to research projects on rheumatoid arthritis or on other autoimmune or inflammatory/rheumatic diseases (P Quartier, Hôpital Necker – P Migliorini, Pisa University, Italy – L Michou, CHUL Quebec, Canada – A Boudjema, Oran University USTO, Algeria – A Maalej & H Ayadi, Sfax University, Tunisia – A Finck, CHU Geneva, Switzerland). ■

Biotherapies / Vaccinology

Genopole Plant Process Innovation

SUPERVISORY BODY
Genopole

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OPERATIONS MANAGER
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MAIN TOPIC
Development of vaccines and therapeutic proteins *via* plant molecular farming.

FIELD OF ACTIVITY
Research and development of vaccine and recombinant protein production systems using plant-based transient expression.

KEYWORDS
Virus-like particles (VLP) / Recombinant antibodies / Therapeutic proteins / Vaccines / Diagnostics / Transient expression / Plant molecular farming

COLLABORATIONS

- MEDICAGO.
- INRA-URGV (Plant Genomics Research Unit, *cf.* page 41).
- CEA. ■

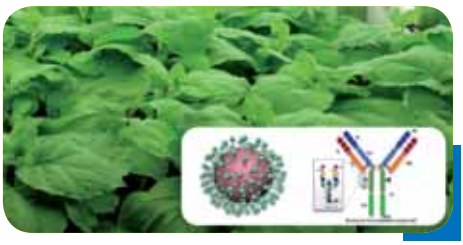
RESEARCH THEMES

The Genopole laboratory Plant Process Innovation (PPI) develops new and innovative processes for the production of recombinant proteins using genetically engineered plants. PPI is equipped with VLPExpress™, a high-throughput virus-like particle (VLP) testing platform developed by the Canadian biotechnology company Medicago. The platform speeds the identification of candidate VLPs and in turn the development of therapeutic or diagnostic vaccinal and recombinant antibody applications.

The laboratory thus benefits from:

- an alternative transient expression method in plants;
- rapid selection of the best expression strategies;
- a miniaturized and automated production process that can be directly extrapolated to pharmaceutical GMP.

This allows the laboratory to attain one objective: assure R&D in the transient expression of VLP's or recombinant antibodies.



Genomics / Post-genomics

Genoscope-CNS

CEA/Genomics Institute

SUPERVISORY BODY
CEA

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MAIN TOPIC
Genomics and post-genomics of biodiversity / metagenomics of microorganisms from the environment.

FIELD OF ACTIVITY
- High-throughput production of DNA sequences.
- Analysis of genomes and metagenomes.
- Functional genomics, metabolism.
- Applications: research on biological solutions for replacing chemical synthesis.

KEYWORDS
Sequencing / Genomics / Metagenomics / Bioinformatics / Comparative genomics / Biochemistry / Metabolism / Bioconversions / Metabolic engineering

RESEARCH THEMES

Since its inception in 1997, Genoscope's mission has been to participe in ambitious collaborative projects, selected upon criteria of scientific excellence, by providing the scientific community with cutting-edge expertise and large scale capacities for the production and analysis of genomic data. Genoscope has thus participated in the Human Genome Project (Chromosome 14), in plant genome projects (algae, grapevine, the banana tree, *Arabidopsis*, rice, cocoa tree, *medicago truncatule*…), animal genome projects (Tetraodon, Anopheles…) and fungi (truffle, fungal pathogens such as *Leptosphaeria maculans* and *Botrytis cinerea*). Genoscope has also sequenced more than fifty prokaryotic genomes.

Genoscope is part of the Genomics Institute of the CEA since 2007, and now carries out its mission of serving the scientific community within the framework of the « France Génomique » national infrastructure (www.france-genomique.org). The Genomics Institute of the CEA is the coordinator and one of the founding partners of France Génomique, which was created in 2011 thanks to a € 60M grant from the « Investissements d'Avenir ».

Since its creation, Genoscope has maintained its international competitiveness by incorporating the many technological leaps and developments produced worldwide in the field of genomic data production and analysis. Genoscope sequencing facility today includes six Illumina HiSeq2000 instruments, three Roche 454 GS Flx+, one Illumina MiSeq and three ABI 3730xl capillary Sanger sequencers. The facility will be progressively upgraded with third generation NGS instruments and technologies that are beginning to appear on the market. Genoscope activities also strongly rely on its informatics, bioinformatics and bioanalysis expertise and resources, that are also available to the community as an integral part of Genoscope platforms.

Genoscope is currently focusing its own research activity on the metagenomics of microorganisms from the environment, and more specifically marine protists (the « TARA Oceans » project), the bacterial flora of the human digestive tract, or those involved in effluent treatment. The exploitation of sequence data (now extended to the identification of biological functions, notably in the biocatalysis field) is opening up new possibilities for developments in industrial biotechnology. With a sustainable development perspective, Genoscope is searching for biological solutions in chemical synthesis, in order to reduce pollution and energy & fossil fuel consumption. To this end, Genoscope has developed a high-throughput enzyme activity screening platform and a metabolic engineering laboratory. This research is performed in close collaboration with the UMR 8030 Metabolic Genomics research unit (CEA/CNRS/UEVE, hosted by Genoscope, *cf.* page 37).

Including all these activities, Genoscope teams have co-authored more than 500 peer-reviewed publications since 1998.

INDUSTRIAL COLLABORATIONS

- Global Bioenergies (*cf.* page 106).
- Isthmus.
- Suez Environnement. ■

Genomics / Postgenomics / Biotherapies

Institute for Stem Cell Therapy and Exploration of Monogenic Diseases

[I-Stem]

SUPERVISORY BODIES
Inserm
Université d'Évry-Val-d'Essonne
AFM-Téléthon - CECS

DIRECTOR
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MAIN TOPIC
Postgenomics and cell therapy of monogenic diseases.

FIELD OF ACTIVITY
Evaluation of the full therapeutic potential of all types of human pluripotent stem cells (stem cells from all sources) in the treatment of monogenic diseases. Set against this background, the group is particularly exploring substitutive cell therapies for degenerative diseases on one hand and the use of stem cell lines carrying pathological mutations as drug screening targets on the other.

KEYWORDS
Cell therapy / Disease modeling / Stem cells / Monogenic diseases

RESEARCH THEMES

I-Stem is composed by two research entities: Inserm/UEVE and CECS.

I-Stem is developing 10 research themes:

- Neurodegenerative diseases (cell therapy, modeling of Huntington's disease).
- Motoneuron diseases (molecular and cell mechanisms involved in the development of motoneuron diseases such as myotonic dystrophy).
- Muscle diseases (disease modeling, repair).
- Neuroplasticity and therapeutics (study of molecular mechanisms involved in neural development).
- Retinopathies and neural development diseases (cell therapy, disease modeling).
- Genodermatoses (disease, cell therapy).
- Biotechnology of human stem cells (mass production of cells, genetic engineering).
- High-throughput screening.
- iPS disease modeling (use of induced pluripotent stem cells as disease models in drug screening).
- Functional genomics (development of dedicated technological tools for the study of monogenic diseases).

Participation in French National Research Agency programs, Medicen Paris Region cluster programs and several European Union projects.

INDUSTRIAL COLLABORATIONS

- Cellectis (Cellectis stem cells / Ectycell, *cf.* page 95).
- Texcell (*cf.* page 140).
- Covance.
- CiToxLAB.
- METAFORA biosystems (*cf.* page 119). ■

Genomics / Postgenomics / Biotherapies / Systems and synthetic biology

Institute of Systems and Synthetic Biology

[iSSB]
EA 4527 - CNRS UPS 3509

SUPERVISORY BODIES
Genopole - Université d'Évry-Val-d'Essonne - CNRS

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MAIN TOPIC
Systems and synthetic biology.

FIELD OF ACTIVITY
- Modeling, simulation and engineering of biological processes.
- Metabolic engineering.
- Molecular Biology.
- Bioinformatics.
- Microfluidics.
- Xenobiology.

KEYWORDS
Synthesis / Engineering / Modeling / Simulation / Macromolecular networks

RESEARCH THEMES

The Institute of Systems & Synthetic Biology (iSSB) is structured into 5 research teams. Systems Biology integrates experimental, theoretical, and computational studies to model living systems. In this research area, the MEGA and Metamorphosys teams study the structure, architecture, expression, and evolution of genomes.

Synthetic biology uses systems biology models to design, build, and test new biological circuits and devices (Xenome, Synth- Bio and Bio-RetroSynth teams). The overreaching goal of the iSSB projects is to design, construct and characterize biosafe spatio-temporal gene circuits in order to understand and control genetic expression.

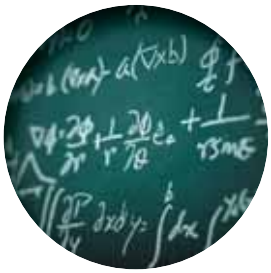
- The Mega research group analyses the topology of transcriptional networks in time and space. Its recent work has dealt with the functional organization and evolution of genomes, and with links between carbon metabolism and DNA replication. The group's theoretical work is prompting bench experiments that examine the cell's regulatory networks on the genome-wide scale.
- The Metamorphosys group studies three aspects of the genome of the African clawed frog Xenopus tropicalis: genome structure (DNA transposons and their use in genome engineering experiments), expression of the genome during ontogenesis, and genome evolution.
- The Synth-Bio research group is developing computational methods for designing biological and metabolic circuits within bacteria. These synthetic biological circuits are then characterized *in vivo.* Lastly, the bench data feed into established models and thus close the loop.
- The Bio-RetroSynth group's research interests cover the use of retrosynthetic methods for designing and building new metabolic networks. Retrosynthesis consists in choosing a set of exogenous enzymes which, when introduced in a host organism, produce the desired target compound. The method is being applied to the production of drug compounds in bacteria.
- The ultimate aim of the Xenome team is to design and engineer novel cellular components ("xeno"-nucleic acids, XNA) to elaborate safe GMOs whose *in vivo* generation and functionality can be strictly controlled, and which therefore allow the development of new and advanced applications in biotechnology.

ASSOCIATED "ATIGE" RESEARCH GROUP

- "Xenome". Leader: Piet Herdewijn.

INDUSTRIAL COLLABORATIONS

- WatchFrog (*cf.* page 148).
- Isthmus. ■



Bio-informatics / Mathematics / Systems biology

IT for Integrated Biology and Complex Systems
[IBISC]

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MAIN TOPIC
Computer science, bioinformatics, ICT and engineering science applied to biological systems.

FIELD OF ACTIVITY
- Bioinformatics, analysis, modeling.
- Identification and simulation of biological processes.
- Software engineering.
- Operational research.
- Communication & transport networks.
- Agent-based & communicative systems.
- Biomedicine & healthcare (signals, machine-assisted medical procedures, assistance robotics for people with loss of autonomy and their support providers).
- Assistance robotics for people with loss of autonomy and their support providers.
- Biometrics.
- Multimodal man-machine inter-facing.
- Road safety.
- Biology of the cellular micro-environment/ Modeling in physiology.

KEYWORDS
Bioinformatics / Postgenomics / Data integration and advanced databases / Formal methods / Algorithmics / Optimization / Learning / Complexity sciences / Data / Signal and image processing / Virtual reality / Augmented reality / Haptics interaction / Human-robot interactions / Intelligent vehicles / Cell migration / Cell environment / Experimental biology.

RESEARCH THEMES

The group's scientific activity is organized into three themes: biological systems, assistance robotics and airborne vehicles.

Within Genopole®, IBISC's specificity involves studying potential applications of computing science and automation to genomics and systems biology. Research in this area covers three main themes:

- The representation, analysis and comparison of DNA, RNA and protein sequences; the determination of functional motifs, annotation, etc.
- The organization and analysis of transcriptomic, proteomic and metabolomic data, together with statistical learning based on these data with a view to the development of systems biology tools.
- The representation, modeling, simulation and identification of biological processes, with a focus on the simulation of cellular and tissue processes; regulatory networks and cell / micro-environment interactions during metastatic spreading.

COLLABORATIONS

In addition to its participation in around 10 European Union projects and 20 or so French National Research Agency projects, IBISC collaborates directly with a number of industrial partners, including: Arevent - Cliris - Continental - Oktal. ■

Biophysics / Biochemistry / Nanotechnologies / Biomaterials

Laboratory for Analysis and Modeling in Biology and the Environment

[LAMBE]
UMR 8587

SUPERVISORY BODIES
CNRS - CEA - Université d'Évry-Val-d'Essonne - Université de Cergy-Pontoise

DIRECTOR
Jeanine Tortajada

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MAIN TOPIC
Chemistry, biology and physics applied to the analysis and modeling of biomolecules and materials.

FIELD OF ACTIVITY
- Mass spectrometry structural analysis of macromolecular synthetic systems of biological interest.
- Classical and *ab initio* modeling of the structure, dynamics and reactivity of biomolecules.
- Electrochemistry and activity of materials at interfaces in confined media (toxic radioactive elements), development of electrochemical sensors for trace analyses.
- Biophysics and macromolecular synthesis for therapeutics and the environment.

KEYWORDS
Mass spectrometry (MS) / Biomolecule modeling and simulation / Proteomic analyses / Development of new analytical strategies (MS / separation techniques coupling) / Electrochemistry / Corrosion / Electrochemical sensor development / Macromolecular chemistry / Supramolecular assemblies / Macro and supramolecular synthesis of biosourced materials / Membrane transport / Natural and synthetic nanopores / Gene therapy / Extracellular matrix and the cellular microenvironment

RESEARCH THEMES

- Proteomic studies (analysis of posttranslational modifications, immunopurified protein complexes, etc.) by using MALDI/TOF, electrospray/Q/TOF, capillary electrophoresis/ ion trap and LTQ orbitrap mass spectrometers.
- Development of new capillary electrophoresis/ surface plasmon resonance (SPR)/ mass spectrometry coupling.
- Study of the role of metal cations in the catalysis and activation of model biological compounds (amino acids, nucleotides, saccharides, etc.) in the gaseous phase.
- Multiscale modeling of the structure and function of biological assemblies.
- Development of course-grained force fields *via* protein-protein binding.
- Prediction and modeling of the long-term behavior of final electronuclear waste.
- Study of the transport (translocation) of single macromolecules through nanometer-scale protein-based pores and artificial biomimetic pores (nanolithography).
- Development of electrochemical sensors and biosensors for pollutant analyses.
- Synthesis of polymer gene therapy vectors and analysis of their *in vitro* and *in vivo* structure and function.
- Synthesis of biosourced polymers.

ASSOCIATED "ATIGE" RESEARCH GROUP

"Protein translocation and folding at the nanopore outlet: a comparison between natural and biomimetic systems; applications". Leader: Juan Pelta

INDUSTRIAL COLLABORATIONS

- EDF
- Areva
- Andra (French National Agency for the Management of Radioactive Waste)
- Arcelor
- Synchrotron Soleil
- Ceva (Centre for the Study and Exploitation of Algae)
- Global Bioenergies (*cf.* page 106)
- Horiba Jobin Yvon
- Onidol
- SNPE. ■

Genomics / Postgenomics / Biotherapies

Laboratory for the Genomics and Radiobiology of Keratinopoiesis

SUPERVISORY BODY
CEA (iRCM)

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MAIN TOPIC
Stem cells of the human epidermis.

FIELD OF ACTIVITY
- Stem cell biology.
- Radiobiology.
- Cancer.

KEYWORDS
Somatic stem cells / Human skin / Genomics / Transcription factors / Skin organogenesis / Regenerative medicine / Cancer / Hypersensitive patients / Ionizing and UV radiation / DNA damage and repair

Our group dissects the determinants of stemness and self-renewal in keratinocyte stem cells, notably those related to the TGF-ß1 network. We also aim at understanding the mechanisms that maintain genomic stability in the basal keratinocytes, which are the major target of skin carcinogenesis after ionizing or UV radiation. DNA damage and repair are characterized in normal and hypersensitive skin, derived from patients with rare genetic dermatologic diseases. ■

RESEARCH THEMES

Homeostasis, regenerative potential and radiosensitivity of human epidermal stem cells.

Human interfollicular epidermis is the multilayered epithelium that covers the human skin. This tissue is in perpetual renewal, a process named keratinopoiesis which is maintained through stem cells and their ability to self-renew.

Although potentialities of human epidermal stem cells have been exploited for clinical purposes for more than 20 years, they are still poorly known. Keratinocyte stem cells are located in the basal layer of epidermis. They are defined as undifferentiated and quiescent cells, capable of a large proliferative potential when stimulated. Their direct progeny, called keratinocyte progenitors, are responsible for the short-term maintenance of epidermis. Our laboratory aims at better characterizing these two basal cell populations, both in normal skin homeostasis and after genotoxic stress.

Genomics / Postgenomics

Metabolic Genomics

CEA/Genomics Institute - UMR 8030

SUPERVISORY BODIES
CNRS - CEA - Université d'Évry-Val-d'Essonne

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Marcel Salanoubat

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MAIN TOPIC
Study of the diversity of organisms and its chemistry.

FIELD OF ACTIVITY
- Genomics of eukaryotes, prokaryotes and metagenomes.
- Metabolism
- Biocatalysis.
- Bioremediation.
- Organic and analytical chemistry.
- Metabolic engineering, synthetic biology.

KEYWORDS
Sequencing / Biochemistry / Metabolism / Metabolomics / Comparative genomics / Functional genomics / Enzyme / Biocatalysis / Transcriptomics / Mass Spectrometry / Synthetic biology / Metabolic engineering

RESEARCH THEMES

The Metabolic Genomics Laboratory (UMR 8030) is the basic research structure of the Genoscope-National Sequencing Center (*cf.* page 31) which was integrated within the "Institute of genomics" of the CEA. Historically, the main theme of the Laboratory (UMR) was tightly linked to Genoscope's primary mission of furnishing large-scale sequencing to the French scientific community.

This mission continues with bioinformatics analysis of eukaryotic and prokaryotic genome sequences. In our various in-house, national and international collaborative projects, we explore organism biodiversity *via* genome analyses, thus participating significantly in the exploration of life on earth.

Over the last three years, new sequencing techniques have profoundly changed genomic research by making access to sequencing data commonplace and by extending sequencing knowledge to cover all biodiversity with, in particular, the ability to study metagenomes.

Two large projects fall within this focus:

- The exploration of the biodiversity of ocean life (Tara Oceans), a project involving the sequencing bioinformatics analysis team (P. Wincker);
- The analysis of the human intestinal microbiome over several European projects in partnership with the Metagenomics of Prokaryotes Laboratory (D. LePaslier).

This flood of *de novo* sequencing data has also accelerated growth in the number of identified genes whose purpose is currently a mystery. Genoscope and UMR have thus decided to extend our biodiversity focus to the study of the chemical reactions of organisms according to three major axes:

- The discovery of novel biochemical reactions to increase the knowledge of prokaryotic metabolism (Laboratory of Genomics and Metabolic Biochemistry, M. Salanoubat, Laboratory of Bioinformatics Analysis in Genomics and Metabolism, C. Médigue).
- The discovery of new biocatalysts to provide alternatives to synthetic chemistry (Biocatalytic Activity Screening Laboratory, V. De Berardinis*, Laboratory of Organic Chemistry and Biocatalysis, A. Zaparucha).
- The development, using metabolic engineering and synthetic biology, strains of potential interest for industrial biotechnology (laboratoire d'application (M.Bouzon Bloch)*.

This new focus is part of our actions for a sustainable chemistry that moves away from fossil-based sources, reduces pollution and uses less energy.

The development of this enzyme-based industrial biotechnology will contribute significantly to new methods of production that are of interest in the quest to meet the goals of the Kyoto Protocol.

* Genoscope Laboratories, currently not part of UMR ■

Genomics / Postgenomics / Biotherapies

Molecular Immunology and Innovative Biotherapies

INSERM U 951

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Université d'Évry-Val-d'Essonne
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MAIN TOPIC
Immunology and biotherapies for rare genetic diseases.

FIELD OF ACTIVITY
Treatment of genetic diseases of the blood and immune system. Gene therapy, immune responses and immune sanctuaries.

KEYWORDS
Gene therapy / Rare diseases / Clinical trials / Immune deficiencies / Wiskott Aldrich syndrome / Chronic Granulomatous Disease / Hematopoietic gene therapy / Stem cells / Lentiviral vectors / Adeno-associated vectors / Muscular dystrophies / Eye

RESEARCH THEMES

This Research Group is constituted of researchers from Genethon and from the public sector (INSERM, University of Évry- Val-d'Essonne, École Pratique des Hautes Etudes). The group is established within Genethon's facilities in Évry thereby facilitating the development of research projects into pluri-disciplinary therapeutic programs.

The research projects cover:

- The development of novel approaches in gene and cell therapies to treat inherited immunodeficiencies, including Wiskott-Aldrich syndrome, Chronic Granulomatous Disease and Arthemis-deficient severe combined immunodeficiency. These projects are integrated within preclinical and clinical programs at Genethon.
- The study of host/vector interactions such as interactions between lentiviral vectors and hematopoietic stem cells at the cellular, genomic and epigenetic levels: interactions between viral vectors and the immune system in particular in immune sanctuaries ; effects of the pathological context on the efficacy of gene therapy vectors particularly in muscular dystrophies. ■

Genomics / Postgenomics / Biotherapies

The National Genotyping Center

[CNG]
CEA/Genomics Institute

CNG CENTRE NATIONAL DE GENOTYPAGE

cea

SUPERVISORY BODY
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MAIN TOPIC
Genomics and postgenomics of human diseases.

FIELD OF ACTIVITY
The CNG is primarily devoted to the discovery and characterization of genes and biomarkers involved in human diseases.

KEYWORDS
Genotyping / Sequencing / Epigenomics / Functional genomics / Bioinformatics and related genomics technologies

RESEARCH THEMES

Being part of the Genomics Institute of the CEA since 2007, the CNG is one of the founding partners of the "France Génomique" national infrastructure, which was created in 2011 thanks to a € 60M grant from the "Investissements d'Avenir". As such,the CNG offers its cutting-edge genomics expertise as well as its high-throughput data production and analysis platforms available for collaborations on projects that will be submitted by the French scientific community and selected on the basis of their scientific excellence in the field of medical genomics. The CNG also develops its own technologies.

Since its creation, the CNG has maintained its international competitiveness by incorporating the many technological developments produced worldwide in the field of genomics. It has set up a whole range of integrated platforms for studying the genes responsible for diseases and utilized biomarkers in major epidemiological studies (diabetes, asthma), Alzheimer's, cardiovascular, psychiatric diseases, various forms of cancer (breast, liver, kidney), infectious diseases and rare diseases.

- A bank laboratory.
- High-throughput genomics platforms for performing whole-genome association studies and linkage analyses:
  - SNP genotyping: ultra high-density Illumina or Affymetrix chips
  - *Whole exome* or *whole genome* resequencing on Illumina HiSeq2000 instruments
- A SNP discovery and mutation detection platform.
- High-resolution genotyping and gene mapping (MALDI-TOF, KASPar, Taqman, Sequenom, GS Junior).
- High-throughput RNAseq and gene expression analysis platform.
- Epigenetics laboratory (ChiP-seq, MeDIP-seq, Bi-seq, DIP-seq, Bi-SeqMiRNA, chromatin conformation).
- A bioinformatics and computational biology laboratory.
- Functional genomics laboratory (gene expression and regulation).

The CNG participates in major European programs on both technological development and disease research. It is involved in major French national programs such as the "Alzheimer" project, funded by the Alzheimer foundation and coordinated by the INSERM, or the "Genomics and Cancer" national program in collaboration with other programs funded by the French National Cancer Institute. The CNG production infrastructure has been widely used by the French and European scientific communities. A scientific review highlighted that CNG groups have performed over 400 research projects submitted by scientists from about 300 French Research Institutes and 60 laboratories from outside France. Since its creation in 1999 the CNG has coauthored more than 600 reviewed publications.

The CNG also hosts training fellowships (over 110 researchers since 1999) and student projects (over 100 interns and 70 students since 1999). The CNG hosts a number of external research groups involved in collaborative projects including the French National Institute for Agricultural Research (INRA) University of Évry and INSERM. ■

Genomics / Postgenomics

Plant Genome Polymorphism Research Unit

[US_1279: EPGV]

SUPERVISORY BODIES
Inra

DIRECTOR
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MAIN TOPIC
Plant genomics.

FIELD OF ACTIVITY
Detection, analysis and management of plant species polymorphism.

KEYWORDS
Plant genomics / High throughput sequencing / Genotyping

COLLABORATIONS

The EPGV team is partner of many ANR, KBBE and Investments d'Avenir programs (BreedWheat, Amaizing, Sunrise) involving major French seed companies. ■

RESEARCH THEMES

The major challenges in plant breeding are the analysis of diversity and of the evolution of genes and genomes, the identification of genetic factors controlling traits of agronomic interest (QTL mapping, association studies) and marker-assisted selection.

Scientific projects with these core subjects require the application of high-throughput sequencing and genotyping.

In order to address this, the U.S. INRA_1279 (Étude du Polymorphisme des Génomes Végétaux EPGV) was founded in 2001 and is located at CEA/Institut de Génomique (IG) / National Genotyping Centre (CNG), Évry (*cf.* page 39).

The main activities include:

- Development of customized protocols based on the specificities of plant genomes (genome size, genetic variability, polyploidy…) and of the evolution of new techniques available at the technological platform of the Genomics Institute.
- Provide different teams (Inra, Cirad…) with tools for high-throughput sequencing and genotyping.
- Establish collaboration with bioinformaticians for the implementation of analytical tools and data management of polymorphisms.

The EPGV team is a partner of "France Génomique" program.

Genomics / Postgenomics/ Systems biology

Plant Genomics Research Unit

[URGV]
INRA UMR 1165

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DIRECTOR
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MAIN TOPIC
Genomics, transcriptomics and proteomics of model plants and crop plants.

FIELD OF ACTIVITY
Genomics and computing resources in plant biology.

KEYWORDS
Plant genomics / Plant models / Crop plants.

RESEARCH THEMES

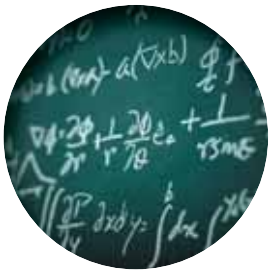
The URGV's goal is to develop plant genome analysis tools and use them to identify genes which impact on agriculture (crop growth and seed production), the environment (disease resistance genes) and/or the agrifood industry (genes influencing the quality of crop-derived products).

The unit's research themes fall into three main categories:

- Functional analysis of the Arabidopsis model genome
  - Development of transcriptome analysis tools and of RNAseq.
  - Development of pan-genome microarray chips.
  - Post-transcriptional studies/protein modifications.
  - Analysis of the PPR (pentatricopeptide repeat) family involved in organelle function.
  - Analysis of MAP kinases and their role in adaptation to biotic and abiotic stress.
- Analysis of crop genomes
  - Comparative analysis of plant genome structure (wheat, canola, grapevine and forest trees).
  - Positional cloning of agriculturally important genes.
  - Development of reverse genetic tools (gene tilling).
  - Studies of polyploidy, gender determinism and viral resistance.
  - Grapevine genome transcript analysis.
- Bioinformatics
  - Development of a database (FLAGdb) on the Arabidopsis model genome and bioinformatics tools for managing and analyzing the data outputs.
  - Creation of new analysis tools for facilitating genome synteny conservation studies and work on plant improvement.
  - Development of analytical tools for gene regulation sequences.
  - Collaboration with the Genoscope and URGI on the annotation of the grapevine and canola genome.

INDUSTRIAL COLLABORATIONS

- Biogemma
- Genewave (*cf.* page 98)
- Serial Genetics
- Partnerchip (*cf.* page 125)
- BASF
- Bayer
- Semillas Fyto
- Medicago. ■



Bio-informatics / Mathematics

Statistics and the Genome

CNRS UMR 8071 - INRA

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MAIN TOPIC
Mathematics and bioinformatics applied to the analysis of genomic and post-genomic data.

FIELD OF ACTIVITY
Development of mathematical models and tools for the analysis of biological sequences and networks (Gene expression, Data analysis).

KEYWORDS
Statistical analyses / Bayesian / Modeling / Sequence evolution / Large-scale comparisons / Genetics

RESEARCH THEMES

Design of statistical methods for the analysis of DNA/protein sequence & expression data.

Making these methods available to the community of biologists *via* the internet.

Our research axes notably include:

- Sequence analysis using Markov chains or hidden Markov chains.
- Statistical inference of biological networks (interaction, regulation, metabolic pathways) from statistical or dynamical data.
- Analysis of genomic data for the identification of genes involved in the etiology of diseases (SNP analysis); time-domain analysis of gene expression mechanisms (Markovian modeling or otherwise).
- Study of inter-gene relationships, support for automatic annotation *via* large-scale sequence comparisons. Transposable elements.
- Study of protein sequence evolution.
- Analysis of transcriptome/proteome data. ■

Genomics / Postgenomics / Biotherapies

Stem Cells and Cardiogenesis

Inserm UMR 633 - FRM* Label team

SUPERVISORY BODY
Inserm

DIRECTOR
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MAIN TOPIC
The genetic and epigenetic mechanisms underlying the cardiac specification of embryonic stem cells (ESCs): early cardiogenesis.

FIELD OF ACTIVITY
- Genetic and epigenetic regulation of cardiogenesis, using embryonic cells and early mouse embryos.
- Modeling of genetic heart diseases using reprogrammed somatic cells from patients (laminopathies, cohesinopathies and cardiomyopathies, filamin A mutations and valve diseases).
- Preclinical studies of cell therapies for ischemic and congenital heart diseases.

KEYWORDS
Early cardiac development / Cell therapy / Disease modeling / Stem cells / Reprogrammed cells

RESEARCH THEMES

The group is working on 4 topics:

- Understanding the dual role of the transcription factor Oct-4 in the pluripotency and mesendodermal & cardiac specification of human ESCs and mouse embryos. This program also aims at discovering new transcriptional and epigenetic (chromatin 3D structure) cardiogenesis pathways.
- Establishing heart valve progenitors for use in research on the embryonic development of heart valves; modeling genetic diseases (filamin A mutations) that affect the valves; cell therapy for valve degeneration.
- Modeling of laminopathies and cohesinopathies by using a mutated ESC model and reprogrammed somatic cells from patients: the study of structural and transcriptional hypotheses (including chromatin modifications) in this disease context.
- The use of cardiomyocyte progenitors for regenerative medicine in patients suffering from ischemic or congenital cardiomyopathies: preclinical and clinical studies.

COLLABORATIONS

- Professor Philippe Ménasché: HEGP, INSERM U633 (Paris, France): cell therapy of ischemic cardiomyopathies (a clinical project).
- Dr Mark Mercola, Burnham Institute, La Jolla, CA, USA: high-throughput screening of molecules and miRNA, inducing early and late cardiac specification in ESCs and cardiac progenitor cells.
- Dr Stéphane Zaffran, INSERM UMR 910 (Marseilles, France): valve progenitors in the embryo. Novel cardiogenic pathway.
- Dr Viginie Lambert and the group led by J.-F. Renaud (Marie Lannelongue Hospital and the CNRS unit at Le Plessis Robinson); cell therapy of congenital cardiomyopathies in a porcine model.
- Dr S Evans, UCSD, La Jolla, CA, USA: lineage tracing of cardiac progenitors *in vivo*.
- Dr R Markwald, Charleston University, USA, valve project).
- Dr Jose Luis de la Pompa CNIC Madrid, Spain, valve project.
- Dr Valérie Cormier-Daire, Hôpital Necker, Paris; Shapeheart Transatlantic Research Network Coordinator (http://shapeheart.org)/Fondation Leducq012-17.

* Foundation for the medical research ■

Biophysics / Biochemistry / Nanotechnologies

Structure and Activity of Normal and Pathological Biomolecules

INSERM - UEVE U829

SUPERVISORY BODIES
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MAIN TOPIC
Dynamics of the Cytoskeleton.

FIELD OF ACTIVITY
- Cell biology.
- Cancer.
- Neuroscience.
- Medicine.
- « Drug design ».

KEYWORDS
Structure / Proteins / NMR / Tubulin / Cancers / Nervous system / Mutations / AIDS

RESEARCH THEMES

- Physiopathology of the cytoskeleton, impacts on the cell cycle and neuronal function.
- Structure, folding, stability & dynamics of proteins in solution, impact of mutation.
- Protein/protein, ligand/protein and protein/nucleic acid interactions.
- Development of a multifunctional biomolecule fluorescent marker based on nanodiamonds.

ASSOCIATED CHAIR OF EXCELLENCE

"Cellular neurobiology and the cytoskeleton". ■

Medicine / Telemedicine / Clinical research

Study and Research Center for the Intensification of Diabetes Treatment [CERITD]

SUPERVISORY BODIES
Ceritd Association loi 1901

CEO
Guillaume Charpentier

DIRECTOR
Lydie Canipel

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Mail dir@ceritd.fr
Site www.ceritd.fr

MAIN TOPIC
Study, research and provision of care for the intensification of diabetes treatment.

FIELD OF ACTIVITY
- Ambulatory healthcare center for diabetic patients treated with external insulin pumps.
- Translational clinical research center.

KEYWORDS
Type 1 diabetes, Type 2 diabetes / Genetics / Insulin pump / Clinical research / Telemedicine / Innovative technologies / Cooperation protocol / Therapeutic education / Evaluation

RESEARCH THEMES

Genetics and prediction of type 2 diabetes:

- Establishment of a computerized database (clinical, medical history, social-economic and biological data) and a DNA bank (6,000 patients) under the management of Prof. Froguel's team in Lille, France.
- Sponsor of the Descendants program aimed at validating a method for detecting glycemic abnormalities at different ages in the children of people with type 2 diabetes.

Innovative technologies:

- Sponsor of clinical studies
- Founding member of a French consortium for the development of a semi-closed loop glycemia control system in diabetic patients.
- Modeling of postprandial glycemia in type 2 diabetes patients.
- Modeling of glycemia during different levels of physical activity.

Epidemiological cohort monitoring:

- Prospective monitoring of patients treated by insulin pumps in the southern Greater Paris area.
- European collaborative study to assess the quality of type 2 diabetes management and its coherence with existing recommendations in 8 European countries.

Telemedicine:

- Development of algorithms to automatically calculate insulin doses; decision-making support and patient coaching *via* electronic blood glucose journals for type 1 and type 2 diabetes patients.
- Development of a shared information system for health professionals (ePEP software) permitting telemedical monitoring of patients using electronic blood glucose journals.

COLLABORATIONS

Numerous collaborations over many projects in the fields of type 2 diabetes genetics and maturity onset diabetes of the young (MODY): development of innovative technologies, scientific, industrial, pharmacological and institutional collaborations, reorganization of care provision. ■

Genomics / Postgenomics / Biotherapies

Tumor Functional Genomics and Epigenetics

an ATIGE research Group

SUPERVISORY BODY
CEA (iRCM)

MANAGER
Claude Gazin

CONTACT DETAILS
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MAIN TOPIC
Tumor genomics, postgenomics and biotherapies.

FIELD OF ACTIVITY
- Functional genomics for translational research.
- Regulatory networks.
- Epigenetics.

KEYWORDS
RNA interference / Synthetic lethality / Gene regulation / Epistasis / Cancer in humans / Cell models / Drug targets / prognostic markers

RESEARCH THEMES

- Genome-wide identification of synthetic lethal genetic interactions with recurrent oncogenic mutations (TP53, BRCA1, RAS and Fanconi pathways…).

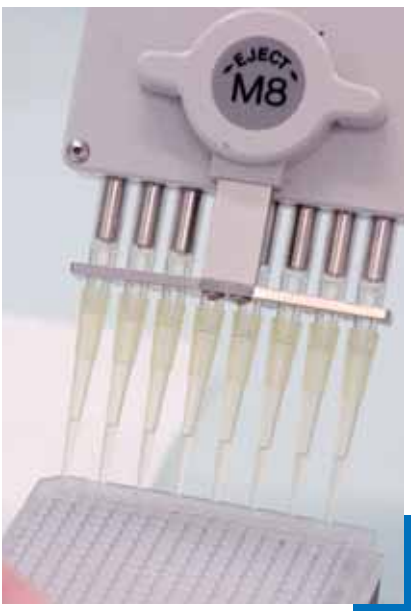
  By using isogenic human cell pairs to model critical steps of cancer progression and by exploiting genome–wide short hairpin RNA libraries, we assess the vulnerabilities induced by defined oncogenic alterations.

  We are especially seeking to identify interfering RNAs that are synthetic lethal with oncogenic mutations in our model system and then evaluate their significance in relevant clinical situations.

  This uncovers the genetic and epigenetic reprogramming of human cells by oncogenic events and provides new therapeutic leads for translational research.

- Identification of genes involved in therapeutic resistance.

  We are currently investigating genes involved in Olaparib resistance in BRCA 1 deficient cancers and in Vemurafenib or Selumetinib resistance in melanoma. ■



Genomics / Postgenomics / Telemedicine

Unit for Integrated Biology in Adaptations to Exercise

[UBIAE]
INSERM U902

SUPERVISORY BODIES
Genopole - Université d'Évry-Val-d'Essonne - Inserm

DIRECTOR
Véronique Billat

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Université d'Évry-Val-d'Essonne
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F-91125 ÉVRY Cedex
Tel. +33 1 60 78 94 86
Fax +33 1 69 36 42 65
Mail veronique.billat@wanadoo.fr
Site www.billat.net

MAIN TOPIC
Physiology, genomics and post-genomics for the implementation of physical exercise protocols.

FIELD OF ACTIVITY
- Genomics and bioenergetics of muscle activity in healthy subjects and patients.
- Analysis of the physiological responses to acute and chronic exercise (training) in the mammal (the human, the mouse and the horse in particular).
- E-learning for health by exercise by electronic and GPRS data transmission.
- Analysis of physiological and perceptive response to exercise.

KEYWORDS
Cardiovascular and muscular capacity / Exercise / Heart / Mitochondrion / Muscle / Oxygen uptake and deficit / VO2max

RESEARCH THEMES

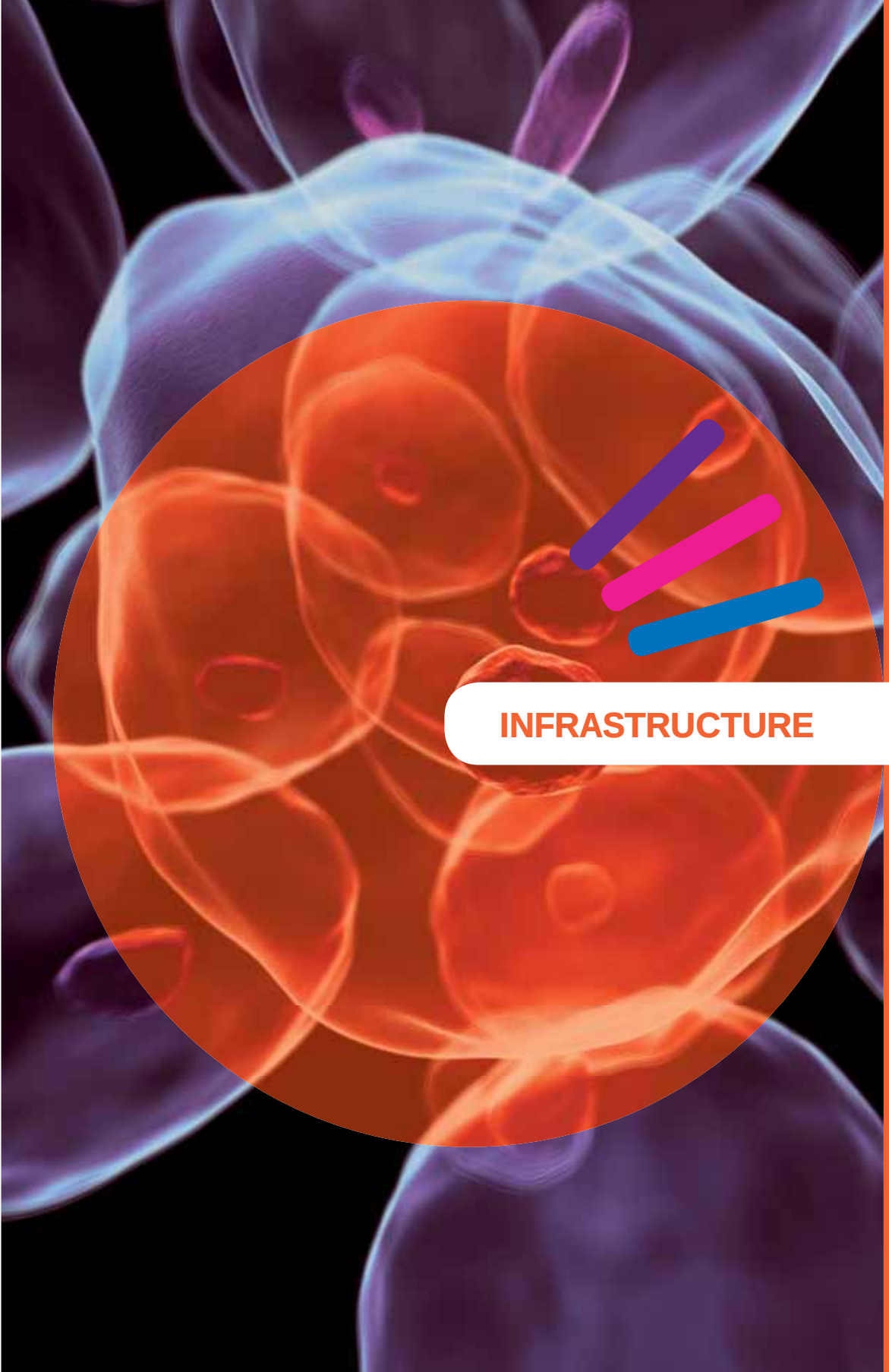
The laboratory's work is set against a public health context, with the objective of optimizing motor performance. Our group analyzes the bioenergetic responses to muscle exercise (from physiology to molecular biology) in humans and animals (with murine and equine models). Our expertise in the field of effort training and re-training enables improvements in motor performance in both patients and experienced athletes. In fact, we develop physical training methods, which are specifically adapted to an individual's physiological profile, in order to reconcile performance and health.

- Unit 902 performs research in physiology and integrative biology. One particular novel feature relates to the Unit's integrative approach on four different levels.
- In terms of experimental models, we study the mouse and the horse, as well as humans.
- In terms of methodological approaches, we study the biological reactions to physical exercise on the physiological, cellular and molecular (genetic) levels.
- Our approach is based on human exercise performed in the laboratory but also in the field, so as not to interfere with spontaneous regulation of the speed of movement (notably during competitive sport).
- Our goal is to contribute to health by prevention thanks to the education for health by exercise with the e-learning and telemedicine and physiological measurement.

In summary, our laboratory is at the cutting edge of efforts to develop new methods for analyzing bioenergetic responses to exercise (from physiology through to molecular biology) in healthy or diseased humans and animals. This involves a wide range of techniques, from the validation of DNA chips to the use of telemedicine. ■

FIELD OF ACTIVITY OF THE LABORATORIES

	Bio-informatics / Mathematics	Systems biology	Synthetic biology	Biophysics / Biochemistry	Nanotechnologies	Biomaterials	Genomics / Postgenomics	Biotherapies	Vaccinology	Medicine	Telemedicine	Clinical research	Engineering sciences
Biointelligence Program	●	●											
Center for Mechanical Engineering and Automation Studies and Research [CERMA)													●
Epigenomics Program	●	●											
Euroas Genomic Bank							●	●					
The Genethon Research Division							●	●					
GenHotel European Research Laboratory for Rheumatoid Arthritis							●	●					
Genopole Plant Process Innovation								●	●				
Genoscope-CNS CEA /Genomics Institute							●						
Institute for Stem cell Therapy and Exploration of Monogenic diseases							●	●					
Institute of Systems and Synthetic Biology [iSSB]		●	●				●	●					
IT for Integrated Biology and Complex Systems	●	●											
Laboratory for Analysis and Modeling in Biology and the Environment				●	●	●							
Laboratory for the Genomics and Radiobiology of Keratinopoiesis							●	●					
Metabolic Genomics							●						
Molecular immunology and Innovative biotherapies							●	●					
The National Genotyping Center [CNG] CEA /Genomics Institute							●	●					
Plant Genome Polymorphism Research Unit							●						
Plant Genomics Research Unit [URGV]		●					●						
Statistics and the Genome	●												
Stem cells and cardiogenesis							●	●					
Structure and Activity of Normal and Pathological Biomolecules				●	●								
Study and Research Center for the Intensification of Diabetes Treatment										●	●	●	
Tumor Functional Genomics and Epigenetics							●	●					
Unit for Integrated Biology in Adaptations to Exercise							●				●		



INFRASTRUCTURE

FIELD OF ACTIVITY

CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Genopole Infrastructure provides Genopole entities with access to 18 technical platforms and a technical facility (Genopole Enterprises / Chamber of Commerce and Industry of Essonne business incubator technical facility, p.56). These tools provide real solutions to the biocluster's companies and laboratories in eight fields of research in life sciences (see below). An international conference center (Genocentre, p.64) and a municipal very high-speed communications network (REVE, p.63) complete this offer.

CELL BIOLOGY - MICROSCOPY

These platforms provide access to a range of competencies serving functional exploration, flow cytometry and high-throughput screening, as well as a range of microscopy equipment including two-photon microscopy, transmission electron microscopy, spectral microscopy and evanescent wave microscopy.

MOLECULAR BIOLOGY

These platforms provide expertise in DNA cloning, transcriptomic analyses, construction of complex biological systems for synthetic biology, etc. and access to a large range of instruments: gel documentation system, PCR and qPCR systems, slide scanner, etc.

STRUCTURAL BIOLOGY – CHEMICAL ANALYSIS

These platforms offer a range of technologies for the study of molecular structures and interactions of ligands, proteins and nucleic acids, as well as a variety of separation techniques. In particular, equipment for nuclear magnetic resonance (NMR), atomic force microscopy (AFM), spectrofluorometry and mass spectrometry are also available *via* these platforms.

BIOMANUFACTURING

Genopole benefits from eukaryotic cell and plant system biomanufacturing platforms. The Genopole biomanufacturing center focuses on custom production of therapeutic monoclonal antibodies and recombinant proteins using eukaryotic cells. Alternatively, the Genopole Plant Process Innovation platform uses plant-based transient expression – thus GMO-free to produce monoclonal antibodies or virus-like particles.

BIOLOGICAL RESOURCES CENTER

These platforms provide access to collections of biological samples as well as an innovative technology capable of storing DNA at room temperature.

FUNCTIONAL EXPLORATION

These platforms provide animal housing, experimentation units and shared equipment for exploratory and characterization work in cellular, piscine, amphibian and murine models. They provide optimal conditions for research while insuring the total respect of health and ethical standards.

IT AND BIOINFORMATICS

These platforms provide a complete environment for IT and its application in bioinformatics. This includes calculation resources and high-performance software to enable applications in systems biology, synthetic biology, genomics, image analyses and virtual and augmented reality.

ROBOTIZATION - AUTOMATION

These platforms benefit from technologies for robotization and automation, enabling applications in imaging, high throughput screening, microinjection and agroinfiltration.

AFM-TÉLÉTHON | French Muscular Dystrophy Association

CAECE | Évry Centre-Essonne Metropolitan Area

CCI ESSONNE | Essonne Chamber of Commerce and Industry

CG91 | Essonne Department Council

CRIF | Ile-de-France Regional Council

DRIRE | Regional Delegation of Industry, Research & Environment

ENSMP | National School of the Mines de Paris

FRM | Foundation for Medical Research

FUI | Single inter-ministerial fund

IBISA | Biology, Healthcare and Agronomy Infrastructure

MESR | Ministry of Education and Research

UCP | University Cergy-Pontoise

UEVE | University Évry-Val-d'Essonne

IBISA ACCREDITATION ("INFRASTRUCTURE IN BIOLOGY, HEALTHCARE AND AGRONOMY")

Is awarded to platforms which provide open access to academic and private-sector researchers on the regional and national levels. These platforms have to meet a strict set of operating specifications which guarantee the quality of the service offering and the long-term technological performance.

SHARED-USE TECHNICAL FACILITY

A set of technical resources brought together on a single site, with a view to offering high-level technological services and resources to a user community.

SHARED-USE PLATFORM

A set of technical and human resources brought together on a single site, with a view to offering high-level technological services and resources to a user community.

COLLABORATIVE PLATFORM

A facility whose use requires the elaboration of a joint scientific program.

SERVICE PLATFORM

A service-based facility whose use does not require scientific collaboration.

COLLABORATIVE/SERVICE PLATFORM

A facility which operates in both service-based and collaborative modes.

INFRASTRUCTURE

Major technology platforms within the Genopole biocluster.

CONTACT
Emmanuel Dequier
Director
emmanuel.dequier@genopole.fr

Collaborative / service platform

The abSYNTH Facility

HOST LABORATORY
Institut de Biologie Systémique et Synthétique [iSSB]

SUPERVISORY BODY
Université d'Évry-Val-d'Essonne

FUNDING BODIES
UEVE - CNRS - CG91 - Genopole

DIRECTOR
Jean-Loup Faulon

TECHNICAL FACILITY MANAGERS
Nicolas Pollet, Joan Hérisson

CONTACT DETAILS
iSSB - Genopole Campus 1
Bât. 6 - 5 rue Henri-Desbruères
F-91030 ÉVRY Cedex
Sites www.issb.genopole.fr/Platform
www.issb.genopole.fr/abSYNTH

FIELD OF ACTIVITY

- The design, construction and characterization of complex biological systems based on or inspired by living organisms but with functions that are not found in nature.
- Automated conception of genetic circuits.

KEYWORDS
Synthetic biology / Cellular imaging / Metabolic Engineering / Bioinformatics

EQUIPMENTS

Design

- An intensive calculation service (2.7 TFlops).
- A scientific software portal:
  1. sequence bank (Xenopus),
  2. BLAST server (specialized for Xenopus),
  3. prediction of promiscuity,
  4. calculation of molecular signatures,
  5. periodicities of co-regulated genes.

Construction

- Molecular biology equipment for producing DNA clones.
- High-performance centrifuge.

Characterization

- Microfluidics for:
  1. single-cell microscopic observation of prokaryotes,
  2. the development of custom-made chips (cell sorting, directed evolution).
- Fluorescence plate readers.
- Quantitative PCR systems.

ACCESS PROCEDURE

The facility can be accessed after prior submission of projects to a steering committee.

Please contact:

Joan Hérisson

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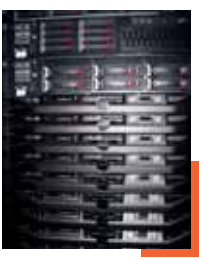
joan.herisson@issb.genopole.fr



CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Service platform

The Biomanufacturing Center Genopole

HOST STRUCTURE
Genopole

SUPERVISORY BODY
GIP Genopole

FUNDING BODIES
CRIF - CG91 - MESR

CONTACT DETAILS
Genopole Campus 1
Bât. 8 - Porte 865
5 rue Henri-Desbruères
F-91030 ÉVRY Cedex
Site www.genopole.fr/Centre-de-Bioproduction-Genopole.html

FIELD OF ACTIVITY
Custom production of monoclonal antibodies and recombinant proteins:

- Creation of cell banks.
- Development and optimization of biomanufacturing processes.
- Production of research and preclinical batches today and clinical batches by 2014.

KEYWORDS
Biomanufacturing / Cell culture / Monoclonal antibodies / Therapeutic proteins

EQUIPMENTS

- Stainless steel (200-1250 liters) and disposable (20-200 liters) bioreactors.
- Purification equipment: clarification – ultrafiltration – column chromatography – nanofiltration.
- BSL2 production suites, EU grade C and D cleanrooms.
- Autonomous cleanrooms (separate air treatment, effluent collection and treatment, controlled-temperature storage zones, etc.).
- Pharmaceutical materials (purified water, clean steam, medical gases).

At its Évry campus, Genopole has created a center for the biomanufacturing of recombinant proteins, in particular monoclonal antibodies, in mammalian cell cultures.

The center is already custom producing research and preclinical batches and will start producing clinical batches by 2014. It furnishes public-sector research labs, biotech companies and the pharmaceutical industry, among others. The center's operations will ultimately by submitted to the ANSM* for GMP certification.

The center benefits from two completely independent cell culture suites and can thus produce two different biomolecules simultaneously. It is equipped with stainless steel bioreactors, the largest of which attains 1,250 liters, as well as cutting edge technologies in disposable systems (20-200 L).

Beyond biomanufacturing, the center's commercial offering also includes processes development and optimization, and the creation of cell banks.

* Agence nationale de sécurité du médicament et des produits de santé, France's drug regulatory agency.

ACCESS PROCEDURE

Please contact:

Naceur Tounekti
Tel.: +33 1 60 87 83 00
bd.cgb@genopole.fr

Shared-use Technical Facility

Business Incubator Technical Facility

Certified ISO 9001v2008

HOST STRUCTURE
Genopole Entreprises Incubator
CCI Essonne

SUPERVISORY BODIES
CCI Essonne - Genopole

FUNDING BODIES
CRIF - CG91 - CCI Essonne - Genopole

MANAGER
Marie-Noëlle Decarreaux

TECHNICAL FACILITY MANAGER
Erwann Guellaen

CONTACT DETAILS
4 rue Pierre-Fontaine
F-91058 ÉVRY Cedex
Site www.essonne.cci.fr

FIELD OF ACTIVITY
Support for biotech start-ups *via* the provision of a comprehensive range of specific services and biomedical/healthcare research equipment.

KEYWORDS
Accommodation / Equipment and mutualization management / P2 labs / Business crossroads

EQUIPMENTS

The technical facility features both private and shared-access premises and research equipment:

Shared-access scientific and technical facilities:

- Central wash room, 250-liter autoclave, washing machine, oven.
- A 4°C cold room and a 37°C warm room.
- A suite with -150°C, -80°C and -20°C freezers.
- Sample preparation room: stirrers, centrifuges, freeze dryer, incubator, ultra pure water production, deionized water production, ice machine, microtome, growth chamber, sonicator
- Sample analyses room: GeneQuant spectrophotometer, SpeedVac concentrator, DNA amplifier, HPLC system, Q-PCR Light Cycler 480 II v. 96, plate reader, bioanalyzer, luminescence bioimaging.
- Platform comprising five P2 laboratories (each approximately 20 m^2): temperature-controlled negative pressure airlock, shared management of CO_2 supply and alarm.

ACCESS PROCEDURE

Please contact:

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mn.decarreaux@essonne.cci.fr

CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Collaborative platform

Cell Sorting Workstation

HOST LABORATORY
Laboratory for the Genomics and radiobiology of keratinopoïesis

SUPERVISORY BODY
CEA

FUNDING BODIES
CEA - CRIF - Genopole

DIRECTOR
Michèle Martin

PLATFORM MANAGER
Pierre Vaigot

CONTACT DETAILS
Laboratoire de Génomique et Radiobiologie de la Kératinopoïèse
Genopole Campus 2
2 rue Gaston-Crémieux - CP 5722 - F-91057 ÉVRY Cedex

FIELD OF ACTIVITY
- Flow cytometry.
- High-speed cell sorting.

KEYWORDS
Cell sorting / Cell cloning / Stem cells / Keratinocyte / Cell cycle / Multiparametric analysis

ACCESS PROCEDURE

The platform may be accessed by all members of the Genopole's public- and private-sector scientific community, subject to specific arrangements with the CEA.

Please contact:

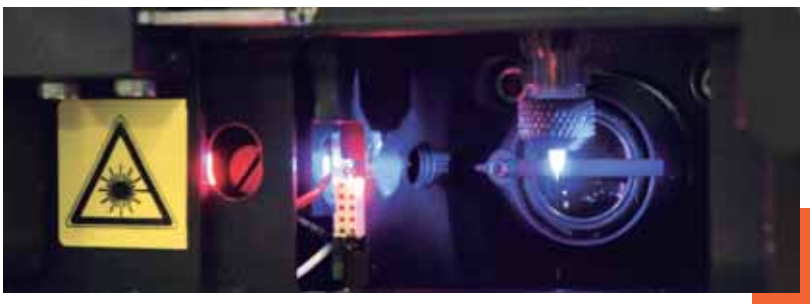
Pierre Vaigot

Tel.: +33 1 60 87 34 96

pierre.vaigot@cea.fr

EQUIPMENTS

- MoFlo Mls cell sorter / cloner (Beckman/ Cytomation).
  3 lasers (uV, red, blue); 7 colors



Collaborative platform

CellMill

A platform for technological and biomedical innovation

HOST STRUCTURE
Ectycell, subsidiary of the Cellectis Group

FUNDING BODIES
FUI - IDF - CG91 - CAECE - Genopole

INVESTISSEURS
Cellectis - Caisse des dépôts et consignations

CEO
Mathieu Simon

PLATFORM MANAGER
Stephan Reynier

CONTACT DETAILS
Genopole Campus 1
5 rue Henri-Desbruères - F-91000 ÉVRY

FIELD OF ACTIVITY

Creation of tools based on genomic engineering, cell models and *in vitro* studies.

The purpose of the CellMill platform is to create, produce and market biological tools and novel, potent, *in vitro* models for research in disease mechanisms and treatments. Aiming to serve the pharma, biotech and cosmetic industries, the launch of this unique platform will aid in the creation of a new innovative sector in France.

KEYWORDS
iPS hub / Genetically modified cell lines / Cellular models / Regenerative medicine

COLLABORATIONS

I-Stem's scientific competencies in the field of stem cells and Cellectis' technological and industrial strengths in genomic engineering are complementary.

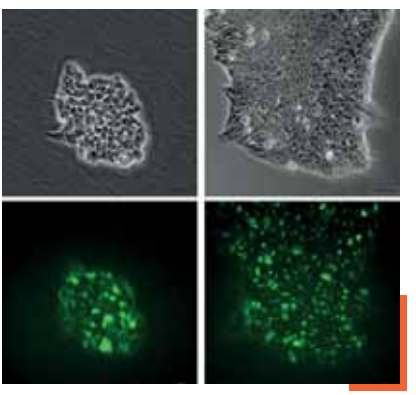
With the support of the AFM-Téléthon, the deployment of the CellMill platform will call upon the strengths and natural excellence of the reference centers for rare diseases.

ACCESS PROCEDURE

For any further information contact:
Tél.: +33 1 81 69 16 03

CellMill unites all the elements needed to respect the highest industrial standards:

- Tissue sample collection (skin samples).
- Genomic reprogramming and engineering to create iPS and modified iPS cell banks.
- Preservation, maintenance and expansion of an iPS cell bank offering the largest possible choice of the most pertinent and genetically diverse human cells.
- Use of the iPS cell bank to create modified cells and tissues for use in industry and research.



CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING
BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Service platform

Center for Exploration and Experimental Functional Research

[Cerfe]
Certified ISO 9001v2008

HOST STRUCTURE
Genopole

SUPERVISORY BODY
GIP Genopole

FUNDING BODIES
CRIF - CG91 - MESR

Site www.genopole.fr

FIELD OF ACTIVITY

- Small animal functional exploration and breeding (rodents and lagomorphs):
  - Production and distribution of mouse genetic models.
  - Functional exploration and phenotyping.
- Creation of experimental models.

KEYWORDS

Rearing / Functional exploration / Small animal models / *In vivo* evaluation / Ethics commitee

ACCESS PROCEDURE

The CERFE may be accessed upon authorization from the Minister for Higher Education and Research following a favorable opinion from the CERFE ethics committee (no. 51).

To request use of the installations and services and for all quotes and contractual matters:

Please contact:

cerfe@genopole.fr

EQUIPMENTS

- Housing units: ventilated racks, isolators.
- Handling units: flow hoods.
- Automated washing, autoclaving and sterilization equipment.
- Shared *in vitro* and *ex vivo* cell culturing equipment: BSC, incubators, microscope, centrifuge.
- Shared laboratory equipment (refrigerators, incubators, weight scales, BSCs, Nikon TE2000 inverted microscope, infusion and anesthesia equipment, etc.).
- Shared functional equipment: Caloric and cardiac measurement system for treadmill tests, actimetry platform, IVIS Xenogen fluorescence / bioluminescence imaging systems, MS9-5 cells counting system.

Collaborative / service platform

The Center for Functional Investigation and Experimental Research in Amphibians and Fish [Cerfap]

HOST STRUCTURE
Institute for Systems and Synthetic Biology (experimentation area)
WatchFrog S.A.
(animal housing area).

SUPERVISORY BODIES
Université d'Évry-Val-d'Essonne
CNRS

FUNDING BODIES
UEVE - Genopole - CG91

FIELD OF ACTIVITY

- Creation and development of small aquatic model organisms:
  - Production of eggs and aquatic larvae.
  - Molecular genetics.
  - Functional genomics.
  - Creation of disease models.
  - Evaluation of environmental risks.
- Development and implementation of routine testing within the framework of a quality management system.
- Testing platform for API toxicity on embryonic development (FETAX, ASTM Guidelines).
- Production and distribution of a cell line *(Xenopus tropicalis)*.

KEYWORDS
Xenopus / Japanese rice fish / Animal model / Environmental risk / Molecular genetics

ACCESS PROCEDURE

Access to the CERFAP is subject to prior approval by the platform management committee.

The WatchFrog company is responsible for the animal housing activities.

Please contact:
cerfap@genopole.fr

EQUIPMENTS

- Automated animal housing units.
- Confined environments (Biosafety Level 2 and above) with controlled temperature, pressure, light and water quality.
- Shared laboratory equipment: refrigerators, -20° and -80° freezers, incubators, microbiological safety cabinets, fluorescence microscopes, magnifiers, scales, experimental workstations.
- Automated imaging systems and imaging-in-flow devices for use in aquatic environments.
- Automated microinjector.

CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING
BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Service platform

DNA and Cell Bank

Certified IBiSA and AFNOR NF-96-900 National Facility

HOST STRUCTURE
Genethon Association loi 1901

FUNDING BODIES
AFM-Telethon - Genethon - Genopole

CEO
Frédéric Revah

CSO
Fulvio Mavilio

PLATFORM MANAGER
Safaa Saker-Delye

CONTACT DETAILS
Genethon
1 bis rue de l'Internationale
BP 60 - F-91002 ÉVRY Cedex
Site www.genethon.fr

FIELD OF ACTIVITY
Processing and storage of human blood samples (serum, DNA, lymphocytes and lymphoblastoid B cell lines) and biopsy samples (primary cultures – mainly myoblasts and fibroblasts).

KEYWORDS
DNA / Lymphoblastoid cell lines / Fibroblasts / Myoblasts / Cell cultures

EQUIPMENTS

- DNA Extractor AutoGene.
- 5 microbial safety cabinets.
- 6 CO_2 incubators.
- 6 -80°C freezers.
- 10 -20°C freezers.
- 13 nitrogen tanks (660L).
- Documentation system for electrophoresis gels.
- DropSense96 UV/VIS spectrophotometer.
- Pulsed field gel electrophoresis system for DNA.

ACCESS PROCEDURE

All requests for collaboration with the DNA and Cell Bank should be made in writing and sent to Dr Safaa Saker-Delye.

After approval of the application, a partnership agreement (specifying the parties' rights and obligations) will be drawn up.

Please contact:

Safaa Saker-Delye

Tel.: +33 1 69 47 29 77

saker@genethon.fr

Collaborative platform

Evr@ Platform:
Virtual Environment and @ugmented Reality

HOST LABORATORY
IT for Integrated Biology and Complex Systems

SUPERVISORY BODY
Université d'Évry-Val-d'Essonne

FUNDING BODIES
UEVE - CNRS - CG91 - MESR - Genopole

DIRECTOR
Saïd Mammar

SCIENTIFIC MANAGER
Malik Mallem, Samir Otmane

TECHNICAL FACILITY MANAGER
Frédéric Davesne

CONTACT DETAILS
Ibisc - Université d'Évry-Val-d'Essonne
CE 1455 Courcouronnes
40 rue du Pelvoux - F-91020 ÉVRY Cedex
Site http://evra.ibisc.univ-evry.fr

FIELD OF ACTIVITY

- Augmented reality and virtual reality.
- Collaborative teleworking.
- Visualization and exploration of massive data sets in biology.
- User-centered immersive interfaces for molecular Interactions.

KEYWORDS
Personal multimodal digital assistance / Human motion capture and analysis / Precise robotics teleoperation via natural movements / Collaborative telework / Assistance with structural hypothesis experimentation in biology

EQUIPMENTS

Two virtual reality platforms (VR)

- A semi-large-scale platform for user semi-immersion:

Visualization system

- 3D visualization screen (3.2 m x 2.4 m).
- 3-DLP projector for active stereoscopy with high ambient light levels.
- High-performance graphics and video server.

- A lightweight, portable platform:

Visualization system

- 3D visualization screen (1.5 m x 1.5 m).
- Projector for active stereoscopy.
- High-performance graphics and video server.

System permitting interactivity between the two platforms

- Front-positioned user motion tracking (infrared cameras, Flystick, markers).
- Spidar-type force feedback systems.

Augmented reality equipment (AR)

Visualization system

- Ultralight augmented reality monocle with minicamera, VR/AR headpiece.

Localization sensors

- High precision cameras, GPS, inertial unit.

A robotic platform

- Two 6-axis industrial robots, 1 ROV (underwater robot) with 2 cameras and one 25-axis humanoid robot.

  The four robots can be maneuvered *via* the Internet.

Mutualized equipment/software

- One 40-inch multi-touch 3D screen.
- One 3D printer.
- Two software development platforms: VR (3DVIA Virtools) and AR (ARCS, developed by Ibisc).

ACCESS PROCEDURE

For collaborations as part of French or EU-funded research projects.

Please contact:

Malik Mallem - Tel.: +33 1 69 47 75 15
malik.mallem@ibisc.univ-evry.fr

Samir Otmane - Tel.: +33 1 69 47 75 92
samir.otmane@ibisc.univ-evry.fr

Frédéric Davesne - Tel.: +33 1 69 47 75 63
frederic.davesne@ibisc.univ-evry.fr

Infrastructure

The Évry-Val-d'Essonne REVE high-speed network

The GIE private-public joint venture

HOST STRUCTURE
Université d'Évry-Val-d'Essonne

FUNDING BODIES
CRIF - Initially the Évry Centre Essonne Metropolitan Area, than the GIE REVE members

PRESIDENT OF THE BOARD
Pierre Tambourin

GIE REVE MEMBERS
UEVE - Genopole - Télécom SudParis et Télécom École de Management - École nationale des Mines de Paris (Centre des matériaux) - Généthon - École nationale supérieure d'informatique pour l'industrie et l'entreprise - Institut de Génomique du CEA - CROUS

CONTACT DETAILS
Genopole Campus 1
5 rue Henri-Desbruères
F-91030 ÉVRY Cedex
Site www.reve.fr

FIELD OF ACTIVITY
A private telecom network in Évry.

KEYWORDS
Network / High-speed IP / Internet / Information and communication technology (ICT)

OBJECTIVES

REVE links 14 scientific sites in the Évry Centre Essonne Metropolitan Area and is available to companies based on the Évry-Corbeil biocluster. It provides rapid access to genetics and genomics data. REVE enables deployment of the technologies needed to build a cross-disciplinary, virtual campus.

For academic stakeholders, it provides infrastructure that is essential for developing and leveraging information and communication technologies.

For business stakeholders, it provides an attractive, validated platform for reinforcing the area's hi-tech industrial fabric–particularly in the field of genomics.

TECHNICAL CHARACTERISTICS

14 connection points with a dual redundant loop configuration.

- High-speed IP network.
- Capable of interconnection with long-distance broadband networks (Internet), the Renater higher education network and the private operator FrontierOnline (with user selection of the end operator).
- Support for IP multicasting.
- Traffic compatibility and skimming functions.
- Support for IPv4 and IPv6.

ACCESS PROCEDURE

Please contact the technical service:

admin-contact-reve@reve.fr

Infrastructure

The Genocentre

International Convention Center

A forum for dialogue and knowledgesharing at the heart of Genopole

FUNDING BODIES
CRIF - CG91 - AFM-Téléthon

AFM SECRETARY
Jean-Pierre Gaspard

OPERATIONS DIRECTOR
Laurence Rimac

CONTACT DETAILS
1 rue de l'Internationale
BP 59 - F-91002 ÉVRY Cedex
Site www.genocentre.fr

FIELD OF ACTIVITY
Venue for the organization of conventions, colloquia and meetings.

KEYWORDS
Seminars / Conferences / Symposiums / Conventions / Plenary meetings

EQUIPMENTS

Cutting-edge facilities:

- A 5,700 m² convention center comprising a divisible, indoor amphitheater (from 270 to 700 seats) with a 100-300 m² stage area, a television studio, 7 modular meeting rooms (from 12 to 400 m²), a 400 m² multipurpose area and a versatile 700 m² plaza. Parking lots nearby.
- Easy access for visitors with reduced mobility - Genocentre was the first convention center in the Paris Ile-de-France region to receive the "Tourism and Handicap" label of excellence awarded by the French government.
- A building which is fully equipped with video, data and telephone networks for flexible use and interactive links between rooms and with the outside world.
- Top-class audiovisual equipment: video projection, conference translation and video conferencing.
- Furniture and fittings designed for optimal comfort of use, plus high-performance acoustic treatments in all areas.
- Personalized "à la carte" services delivered by a team of professionals who will help you organize your event.

In addition to reserving the appropriate room and the related audiovisual services for you, the Genocentre team will advise you and, if necessary, contact external providers for additional services (catering, transport, accommodation, decoration, fitting out, etc.).

ACCESS PROCEDURE

Genocentre is open to scientific, charitable or commercial organizations based in France or abroad.

For any further information contact:

Tel.: +33 1 69 47 34 89

genocentre@afm.genethon.fr

Collaborative platform

Genopole Plant Process Innovation Platform [GPPi]

HOST LABORATORY
Laboratoire Genopole Plant Process Innovation

SUPERVISORY BODIES
Genopole - Medicago

FUNDING BODIES
Genopole - Medicago

CSO
Heribert Hirt

TECHNICAL FACILITY MANAGER
Andéol Falcon de Longevialle

CONTACT DETAILS
Laboratoire Genopole Plant Process Innovation - Genopole Campus 2
2 rue Gaston-Crémieux
CP 5708 - F-91057 ÉVRY
Site www.genopole.fr

FIELD OF ACTIVITY

- VLPExpress™ high throughput discovery platform.
- Transient expression of recombinant proteins in plant systems.
- Targets: virus-like particles; recombinant antibodies.

KEYWORDS

Biomanufacturing / Virus-like particles / Monoclonal antibodies / Molecular farming

ACCESS PROCEDURE

The facility can be accessed after prior submission of projects to a steering committee.

Please contact:

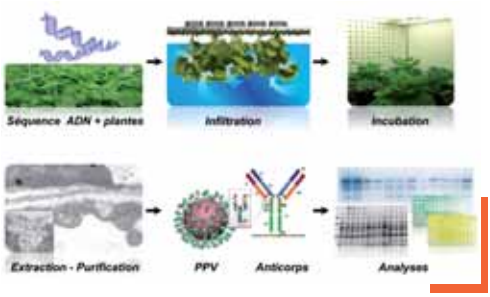
Andéol Falcon de Longevialle

Tel.: +33 6 76 89 95 73

andeol.falcon@genopole.fr

EQUIPMENTS

- 1 automated agro-infiltration system (SNC Lavalin).
- 2 growth chambers: 1 GroBank BB XXL3+ (CLF Plant Climatics); 1 Percival AR41L2 (Percival).
- 1 IKA T-25 (Ultra Turrax) disperser (homogenization).
- 1 Nanosight NS200 (Nanosight) nanoparticle analyzer.
- 1 Gel Doc EZ imager (Bio-Rad).
- 1 trans-blot turbo system (Bio-Rad).



CELL BIOLOGY - MICROSCOPY | **MOLECULAR BIOLOGY** | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | **BIOMANUFACTURING**

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | **ROBOTIZATION - AUTOMATION**

Collaborative platform

HTS Platform

HOST STRUCTURE
CECS/I-Stem - Institute for Stem Cells in the Treatment and Study of Monogenic Diseases

SUPERVISORY BODIES
Université d'Évry-Val-d'Essonne - Inserm

FUNDING BODIES
CRIF - AFM-Téléthon - Inserm - Genopole

DIRECTOR
Raymond Zakhia

PLATFORM MANAGER
Delphine Laustriat

CONTACT DETAILS
CECS/I-Stem - Genopole Campus 1
5 rue Henri-Desbruères
F-91030 ÉVRY Cedex
Site www.istem.eu

FIELD OF ACTIVITY
High-throughput molecular screening for drug discovery.

KEYWORDS
Automation / High throughput screening / High content imaging / Functional genomics / Compound library / Pluripotent stem cells / Test development

ACCESS PROCEDURE

Please contact:
Raymond Zakhia
Tel.: +33 6 84 03 81 28
rzakhia@istem.fr

EQUIPMENTS

- Biocell 1800 - Agilent Technologies.
- Bravo - Agilent Technologies.
- Analyst GT - Molecular Devices.
- Arrayscan - Cellomics.
- 7900 HT(qPCR) - Applied Biosystems.

CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING
BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Collaborative / service platform

Imaging & Cytometry Platform

Functional *in vivo* Imaging

HOST STRUCTURE
Genethon - Association loi 1901

FUNDING BODIES
AFM-Telethon - Genethon - Genopole - CRIF - CG91 - MESR - FRM - UEVE

CEO
Frédéric Revah

CSO
Fulvio Mavilio

PLATFORM MANAGER
Daniel Stockholm

CONTACT DETAILS
Genethon - 1 bis rue de l'Internationale
BP 60 - F-91002 ÉVRY Cedex
Site www.genethon.fr

FIELD OF ACTIVITY
Expertise and tools for molecular and physiopathological exploration, from the single cell to the living whole organism *via* Imaging and Flow Cytometry technics.

- Imaging: morphometric analyses, macroscopy, confocal microscopy, spectral microscopy, multiphoton microscopy, long-term time-lapse microscopy, morphological & functional echography.
- Flow Cytometry: cellular and molecular analyses, cell sorting & cloning.

KEYWORDS
Imaging / Cytometry / Photonics / Cells / Animal

EQUIPMENTS

Photonic imaging

- BioRad Radiance 2000MP multiphoton inverted microscope (Zeiss).
- Leica TCS SP2 upright/inverted spectral confocal microscope.
- Zeiss LSM 510 Meta inverted spectral confocal microscope.
- Leica macroscope.
- Microvision morphometry workstation on a Nikon E600 microscope.
- Microvision fluorescence-mode morphometric workstation with a Leica inverted microscope.
- Microvision fluorescence-mode morphometric workstation with an upright Leica microscope.
- Biostation IM Nikon.

Flow Cytometry - Cell sorting

- MoFlo sorter (Beckman Coulter).
- LSR II analyzer (Becton Dickinson).
- FACSCalibur analyzer (Becton Dickinson).
- FC 500 MCL analyzer (Beckman Coulter).

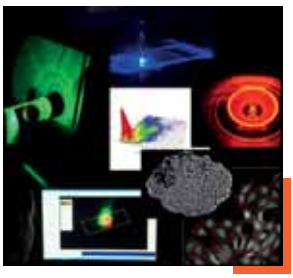
Echography

- Vevo 770 Echograph (Visual Sonic).

ACCESS PROCEDURE

For service provision, training, advice and quotes.

Please contact:
info-imagerie-cytometrie@genethon.fr



CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Service platform

Irradiation Research Platform

HOST LABORATORY
Laboratory for the genomics and radiobiology of keratinopoïesis

SUPERVISORY BODIES
CEA - Genopole

FUNDING BODIES
Genopole - CEA - CRIF

DIRECTOR
Michèle Martin

TECHNICAL FACILITY MANAGERS
Michèle Martin, Richard Launay, Sandra Moratille

CONTACT DETAILS
CEA - Institut de Radiobiologie Cellulaire et Moléculaire
Genopole Campus 2
2 rue Gaston-Crémieux
CP 5722 - F-91057 ÉVRY Cedex
Site www-dsv.cea.fr

FIELD OF ACTIVITY

- Irradiation of biological material.
  - Evaluation of the use of stem cells in cell therapy.
  - Preparation of feeder cell layers for stem cell culture.
  - Fundamental studies of the damage caused by gamma radiation.
  - Identification of mechanisms in radiation-induced cancer.
- Irradiation of non-biological material.

KEYWORDS
Skin / Stem Cells / Cell therapy / Radiobiology / Cancer

ACCESS PROCEDURE

The irradiator may be accessed by all members of the Genopole's public- and private-sector scientific community.

Please contact:

Sandra Moratille
Tel.: +33 1 60 87 34 85
sandra.moratille@cea.fr

Or, if the latter is absent:

Michèle Martin
Tel.: +33 1 60 87 34 91
michele.martin@cea.fr

EQUIPMENTS

- One irradiation room with an IBL 637 medical gamma-ray irradiator (caesium-137 source), doses: 1 to 50 Gy/min.
- One L2 preparation room (CO2 incubator, PSM, centrifuge, microscope, water bath, refrigerator and freezer).
- One microscope with Comet software to characterize radiation-induced lesions.
- A highly-trained staff to respond to your needs.

Collaborative / service platform

Mass Spectrometry Platform

HOST LABORATORY
Laboratory for Analysis and Modeling in Biology and the Environment (Lambe)

SUPERVISORY BODIES
Université d'Évry-Val-d'Essonne
CNRS - CEA

FUNDING BODIES
UEVE - CNRS - CEA - UCP
CRIF - CG91 - MESR - Genopole

DIRECTOR
Pr Jeanine Tortajada

TECHNICAL FACILITY MANAGERS
Florence Gonnet, Régis Daniel

CONTACT DETAILS
Lambe - Université d'Évry-Val-d'Essonne - Bâtiment Maupertuis
Bd François-Mitterrand
F-91025 ÉVRY Cedex
Site www.lambe.univ-evry.fr

FIELD OF ACTIVITY

- Development of analysis methods *via* mass spectrometry and liquid chromatography-mass spectrometry (LC-MS).
- Development of mass spectrometry and coupled liquid chromatography-mass spectrometry analytical techniques.
- Analysis of synthetic polymers and biological macromolecules using mass spectrometry.
- Proteomic analyses (identification of proteins by peptide mass mapping or MS/MS sequencing, screening for mutations/post-translational modifications, semi-quantitative protein analyses).
- Characterization of immuno-purified protein complexes: identification of interacting partners.
- Study of non-covalent interactions (protein-protein, polysaccharide-protein, DNA-ligand, protein-peptide and biomolecule- metal cation interactions).

KEYWORDS
Mass spectrometry / NanoLC-MS/MS / Proteomics / Analysis of complexes / Glycomics / Small molecule assay

EQUIPMENTS

Mass spectrometry

- Ion traps: SATURN 3 (Varian) and Esquire 3000 (Bruker).
- Triple quadrupole: API 2000 (Applied Biosystems).
- Q-TOF: QSTAR PULSAR i (Applied Biosystems).
- MALDI-TOF: Voyager DE STR (Applied Biosystems).
- Orbitrap: LTQ Orbitrap XL (Thermo Fisher Scientific) (*cf.* photo).
- Source DESI, AP-MALDI.

Separation techniques

- HP3D capillary electrophoresis (Agilent).
- GC: Varian 3900.
- HPLC: Watters, Perkin Elmer, Merck.
- NanoLC: Ultimate 3000 and LC-Packings (Dionex).

Spectrophotometer

- UV-visible spectrophotometer (Varian) and NanoDrop 1000 (Thermi Fisher Scientific).

ACCESS PROCEDURE

Please contact:

Dr Véronique Legros

Tel.: +33 1 69 47 76 52 / 76 61

veronique.legros@univ-evry.fr

Collaborative / service platform

MicroScope Platform

Certified IBiSA National Platform - Certified ISO 9001v2008

HOST LABORATORY
Genomics Institute

SUPERVISORY BODIES
CNRS - CEA

FUNDING BODIES
CNRS - CRIF - CG91 - MESR
Genopole - GIS IBiSA

DIRECTOR
Jean Weissenbach

TECHNICAL FACILITY MANAGERS
Claudine Médigue, David Vallenet

CONTACT DETAILS
Genoscope CNRS/UMR8030
Atelier de Génomique Comparative
Genopole Campus 2
2 rue Gaston-Crémieux - F-91000 ÉVRY
Site www.genoscope.cns.fr/agc/microscope/

FIELD OF ACTIVITY

- Development of tools for the annotation of bacterial genomes and for comparative genomics and metabolic studies.
- Organization and management of genomic and metabolic data in database structures.
- Development of web interfaces for these tools and the MaGe ("Magnifying Genomes") annotation platform.
- Training in the annotation and comparative analysis of bacterial genomes using the MaGe graphic interface.
- Annotation of newly-sequenced genomes and re-annotation of published bacterial genomes.
- NGS data analysis: projects in evolution (polymorphisms) and transcriptomics (rna-seq).

KEYWORDS

Bioinformatics platform / Bacterial genome annotation / Functional annotation / Comparative analysis of bacterial genomes / Bacterial metabolism / Metabolic networks

EQUIPMENTS

The platform has joined national life sciences structures, *France Génomique* (https://www.france-genomique.org/) and the *Institut Français de bio-informatique* (iFb).

- Automated syntaxic, functional and relational annotation pipeline.
- Calculation of groups of conserved genes (syntenies) for all published bacterial proteomes.
- Genomic relational database containing the sequences and results of the methods and metabolic databases.
- The MaGe graphic web interface for expert annotation and the exploration and analysis of genomic and metabolic data.

In January 2012 the Bioinformatics Analysis Laboratory for Genomics and Metabolism (LABGeM) received ISO9011:2008 certification for its R&D and services activities *via* the MicroScope platform.

ACCESS PROCEDURE

Please contact:

Claudine Médigue

Tel.: +33 1 60 87 84 59

cmedigue@genoscope.cns.fr

Access to databases
and current projects *via* the Web site:

www.genoscope.cns.fr/agc/microscope/

Service platform

PBPK Modeling Platform

HOST STRUCTURE
PhinC Development

SUPERVISORY BODIES
Genopole, PhinC Development

FUNDING BODIES
Genopole, PhinC Development

DIRECTOR
Bernard Orlandini

PLATFORM MANAGER
Virginie Gualano

CONTACT DETAILS
PhinC Development
Campus 1 - Porte 861
5 rue Henri-Desbruères
F-91000 ÉVRY
Site plates-formes.genopole.fr
ou www.phinc.fr

FIELD OF ACTIVITY
Computerized pharmacokinetic-pharmacodynamic modeling and simulation platform for the optimization of drug development during lead identification, preclinical testing and phase I and IIa trials.

KEYWORDS
Modeling and simulation / PBPK / Lead / Drugs / Preclinical and clinical development

GastroPlus is a simulation software package that permits the construction of specific biomathematical models for therapeutic compounds in accordance with current knowledge in physiology, anatomy, physics and chemistry. Its modeling capacities evolve as new data is obtained (physico-chemical, *in vivo*, animal model, clinical, etc.). With its multidisciplinary and iterative approach, GastroPlus brings vital added value to:

- lead selection or development;
- preclinical interspecies extrapolation;
- the move from preclinical studies to clinical trials: human ADME prediction, selection of first-in-man dose, regimen and route of administration;
- the evaluation of drug or food interactions.

The GastroPlus approach thus optimizes the drug development research path.

EQUIPMENTS

GastroPlus software and modules:

- PBPK Plus
- ADMET Predictor
- Additional Dosage Routes
- Drug Drug Interaction
- Metabolism and Transporter Module
- Ocular Module

ACCESS PROCEDURE

Please contact:

Genopole Grandes Installations et plates-formes

Tel.: +33 1 60 87 83 16

esl@genopole.fr

plates-formes@genopole.fr

Collaborative platform

Structural Biology Platform

HOST LABORATORY
Structure and Activity of Normal and Pathological Biomolecules

SUPERVISORY BODIES
Université d'Évry-Val-d'Essonne - Inserm

FUNDING BODIES
UEVE - CRIF - CG91 - AFM-Téléthon - CEA - MESR - Inserm - Genopole

DIRECTOR
Patrick Curmi

PLATFORM MANAGER
Patrick Curmi

CONTACT DETAILS
Bâtiment Maupertuis
Université d'Évry-Val-d'Essonne
Rue du Père-Jarlan - F-91025 ÉVRY

FIELD OF ACTIVITY

- NMR & spectrofluorimetry:
  - Structure, folding, stability and dynamics of proteins in solution.
  - Ligand/protein, protein/protein, protein/nucleic acid interactions.
  - Physiopathology of the microtubule cytoskeleton, cell cycle and neuron function.
- Molecular modeling and dynamics.
- AFM (atomic force microscopy):
  - Nanometer-scale characterization of biomolecules and complexes.
  - Air or liquid media observations of single molecules (DNA or proteins).
  - DNA-ligand / protein-protein complexes and partner microtubules.

KEYWORDS

NMR / 3D structures in solution / Modelization / Molecular dynamics / Drugs / Protein Moieties / AFM / Molecular imaging

EQUIPMENTS

- 600 MHz NMR spectrometer equipped with a cryoprobe.
- Molecular modeling and molecular dynamics software.
- Spectrofluorimeter with fluorescence polarization and temperature control (MD-5020, PTI).
- 2 Nanoscope III atomic force microscopes (Digital Instruments).
- Total internal reflection fluorescence microscope (TIRFM, Nikon).

ACCESS PROCEDURE

Please contact:

For NMR and spectrofluorimetry

Marie-Jeanne Clément
Tel.: +33 1 69 47 76 36
mclement@univ-evry.fr

Atomic force microscopy

David Pastré
Tel.: +33 1 69 47 01 79
david.pastre@univ-evry.fr

Atomic force microscopy

CELL BIOLOGY - MICROSCOPY | MOLECULAR BIOLOGY | STRUCTURAL BIOLOGY - CHEMICAL ANALYSIS | BIOMANUFACTURING

BIOLOGICAL RESOURCES CENTER | FUNCTIONAL EXPLORATION | IT AND BIOINFORMATICS | ROBOTIZATION - AUTOMATION

Collaborative platform

Transcriptomics Platform

Certified IBiSA National facility and INRA Strategic platform

Certified ISO 9001v2008

HOST LABORATORY
Plant Genomics Research Unit (URGV)

SUPERVISORY BODIES
INRA - CNRS - Université d'Évry-Val-d'Essonne

FUNDING BODIES
INRA - CNRS - UEVE - CRIF - CG91 - MESR - Genopole

DIRECTOR
Heribert Hirt

PLATFORM MANAGER
Sandrine Balzergue

CONTACT DETAILS
Unité de Recherche en Génomique Végétale - Genopole Campus 2
2 rue Gaston-Crémieux - CP 5708 - F-91057 ÉVRY
Site http://www.versailles.inra.fr/urgv/microarray.htm

FIELD OF ACTIVITY
Transciptomic analyses in plants:

- mRNA-seq and Small RNA-seq.
- Conception, hybridization and analysis of Agilent high-density microarrays:
  1) Catma: complete Arabidopsis thaliana genome microarray.
  2) "Cultivated plants" microarrays.
- Affymetrix system for cultivated plants: custom or commercial.

KEYWORDS
Plant transcriptome / High throughput sequencing / Microarrays / Statistical analyses

EQUIPMENTS

- Ion Proton™ sequencing system (Ion Torrent, Life Technologies).
- 1 Affymetrix workstation: 1 semiconfocal scanner (Command Console software), FS 400 automatic sample handling system, 640 hybridization oven.
- Agilent Hybridization system (hybridization oven + hybridization chamber and backing slides).
- 2 Roche-NimbleGen hybridization system (4-bay model).
- 1 Nano-spectrophotometer, BMG, Labtech Nanodrop.
- 1 Real-Time PCR, Applera, ABI prism 7 900.
- 1 Real-Time PCR, BioRad CFX384.
- 1 scanner Genepix 4200A (Axon).
- 1 scanner 3µ InnoScan 700 (Innopsys).
- 1 scanner 1µ InnoScan 900 (Innopsys).
- 2 Agilent bioanalyzer.
- Qubit© 2.0 Fluorometer (Life Technologies).

ACCESS PROCEDURE

To use the plant DNA microarray and RNA-seq platform and benefit from the expertise of the Plant Genomics research unit:

Please contact:

Sandrine Balzergue
Tel.: +33 1 60 87 45 28
balzerg@evry.inra.fr


Ion Proton sequencing system

Collaborative / service platform

Transmission Electron Microscopy

HOST LABORATORY
Pierre-Marie Fourt Materials Center
at the École des Mines de Paris

SUPERVISORY BODY
Mines ParisTech

FUNDING BODIES
Mines ParisTech - CRIF - Inserm
ARMINES - Genopole

DIRECTOR
Jacques Besson

PLATFORM MANAGER
Mohamed Sennour

CONTACT DETAILS
École des Mines de Paris
Centre des matériaux - BP 87
F-91003 ÉVRY Cedex
Site www.ensmp.fr

FIELD OF ACTIVITY

- Biology:
  - Ultrastructural morphology.
  - Ultrastructural immunocytochemistry.
  - Nanoparticles for protein targeting.
- Material physics:
  - Nanomaterials and new alloys.
  - Interfaces: structural, damage and properties.
  - Protection of materials, multimaterials.

KEYWORDS
Electron microscopy / Imaging / Tomography / Ultramicrotomy / Ultrastructure / Cellular biology

EQUIPMENTS

Transmission Electron Microscopy

- Field emission gun;
  acceleration voltage: 80–200 kV;
  resolution: 0.24 nm;
  specimen stage angle: ±80°.
- Imaging in conventional and high-resolution modes with a magnification ranging from x50 to x1,000,000 (20 million on the CCD camera).
- Scanning transmission electron microscopy (STEM) with bright-field detector (BF), annular dark field (ADF) and high-angle annular dark field (HAADF) modes.
- Local chemical analysis with an energy-dispersive X-ray spectrometer coupled to a nanometer probe.
- Energy-filtered imaging system (GIF) coupled to an electron energy loss spectrometer (PEELS).
- Slow scan CCD camera (1k x 1k) wide-angle CCD cameras (14 million pixels).
- A nanotomography system (in TEM and energy filtered TEM modes).

Samples préparation

- Ultramicrotomy: LEICA EMTRIM and LEICA ULTRACUTR.
- Tint: Lynx and Microscopy Tissue Process.

ACCESS PROCEDURE

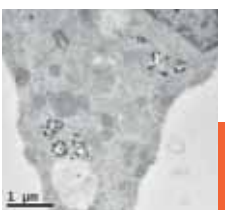
Please contact:

Material physics

Mohamed Sennour (École des Mines)
Tel.: +33 1 60 76 31 73
mohamed.sennour@mat.ensmp.fr

Biology

Patrick Curmi (Inserm U829)
Tel.: +33 1 69 47 03 23
pcurmi@univ-evry.fr



TEM Mode

FIELD OF ACTIVITY OF THE PLATFORMS AND INFRASTRUCTURES

	Cell biology - Microscopy	Molecular biology	Structural biology - Chemical analysis	Biomanufacturing	Biological resources center	Functional exploration	IT and bioinformatics	Robotization - Automation
The abSYNTH Facility	●	●					●	
The Biomanufacturing Center Genopole				●				
Business Incubator Technical Facility	●	●						
Cell Sorting Workstation	●							
CellMill	●	●			●	●		
Center for Exploration and Experimental Functional Research [Cerfe]	●					●		
The Center for Functional Investigation and Experimental Research in Amphibians and Fish [Cerfap]	●	●			●	●		
DNA and Cell Bank					●			
Evr@ Platform							●	●
The Évry-Val-d'Essonne REVE high-speed network							●	
The Genocentre International Convention Center								
Genopole Plant Process Innovation Platform [GPPi]		●		●				●
HTS Platform	●	●				●		●
Imaging & Cytometry Platform	●	●				●	●	●
Irradiation Research Platform	●							
Mass Spectrometry Platform			●					
MicroScope Platform							●	
PBPK Modeling Platform							●	
Structural Biology Platform	●		●					
Transcriptomics Platform		●						
Transmission Electron Microscopy	●							

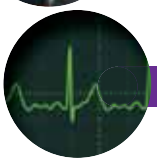
NOTES

COMPANIES

AGRICULTURE / ENVIRONMENT

BIOMANUFACTURING / PHARMACEUTICAL SERVICES

CONSULTANCY



DIAGNOSTICS

MEDICAL DEVICES

R&D SERVICES AND PRODUCTS

SCIENTIFIC INSTRUMENTATION

THERAPEUTICS

CONTACT
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Director Genopole Entreprises
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Agriculture / Environment

Aelred

PRESIDENT
Pierre Malvoisin

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Site www.aelred.fr
Date of founding 02/2009

FIELD OF ACTIVITY
Custom gene mutation services for the generation, characterization and use of new alleles in any plant species (non-GMO technology).

Development and supply of improved varieties (medicinal and fiber/bioenergy plants, in particular).

KEYWORDS
Reverse genetics / Plant biotechnology / Biomass / Plant-based ingredients / Green chemistry and energy

Aelred offers its services to companies and public research laboratories wishing to obtain new alleles for a specific gene or confirm the function of a previously uncharacterized gene through reverse genetic tools.

Starting from a collection of mutants (induced mutation), Aelred's technology enables the screening and characterization by reverse genetics of plants mutated on a given gene (the candidate gene) in a relatively short time (one to two years, for an annual plant). These plants can be introduced thereafter in a conventional breeding program. This targeted plant breeding technology allows to speed the breeding of new varieties, better adapted to their environment or better suited for particular industrial uses.

Capitalizing on its targeted plant breeding technology, Aelred is also carrying out two in-house R&D programs:

- One to improve a medicinal plant, the objective being to commercialize safer, health-promoting ingredients extracted from this plant.
- The other one, to test and develop new varieties of miscanthus, a promising non-food plant dedicated to produce raw biomass and to be used as renewable resources for energy and material, in a sustainable way. ■

ANNUAL TURNOVER: €150K (ESTIMATED 2012)

3 STAFF MEMBERS

STRENGTHS: in-depth knowledge of an innovative plant genomics technology.

Close collaboration with INRA-URGV which develops and improves reverse genetic technologies.

INNOVATION ASSETS: IP/patent protection possible for a mutated gene and the new character confered to the plant.

Agriculture / Environment

Agdia Biofords

MANAGING DIRECTOR
Dr Marcos Amato

INTERNATIONAL SALES & MARKETING MANAGER
Salima Berkani

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Date of founding 28/11/1988

FIELD OF ACTIVITY

Leading the way to healthy crops Agdia-Biofords provides diagnostic solutions based on immunological and molecular technologies for plant pathogens and GMO. Our mission is to help the different players of the agricultural industry to obtain high quality productions by providing them reliable diagnostic tools and high level services.

KEYWORDS
Plant pathogen detection / GMO detection / ELISA tests / Quick diagnostic test (lateral flow device) / DNA isothermal amplification kit (RPA). Seed companies / Growers / Plant Research and Diagnostic laboratories

BACKGROUND

Created in 1988 as a consulting company to serve the agro-industry, Biofords became in 2006 the exclusive distributor of the American company Agdia Inc. for Europe, Africa and Middle East. Following a commercial success Biofords became Agdia-Biofords in 2009.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Development and commercialization of detection kits for:

- Plant pathogens (viruses, bacteria, fungi, viroids and phytoplasma).
- Genetically modified organisms (GMOs: corn, coton, soya, canola, etc.).
- Plant growth hormones (auxins, abscissic acid, etc.).

We provide also testing services for different crops in United States.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- The national French federation of potato plant producers.
- Inra, Cirad.
- Winner of the Responsible Innovation Price (2011).

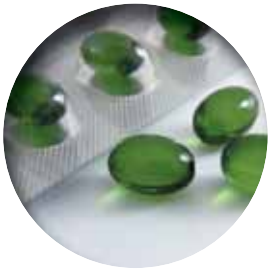
COLLABORATIONS SOUGHT

We offer customized solutions to agricultural industry players asseed companies, growers, plant research and diagnostic laboratories. ■

ANNUAL TURNOVER 2011/2012: €1M

STRENGTHS: Expertise in agricultural industry. Plant diseases and plant genetics (traits).

Follow us on twitter: https://twitter.com/AgdiaBiofords



Therapeutics

AISA Therapeutics

CEO
Patrizia d'Alessio

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Date of founding 19/10/2005

FIELD OF ACTIVITY

AISA Therapeutics develops inflammation modulators. Applications concern (i) therapeutics for inflammatory and auto-immune diseases and (ii) anti-stress and anti-ageing nutraceuticals.

KEYWORDS

Anti-inflammatory / Anti-ageing / Anti-stress / Vascular endothelium / Nutraceuticals / Plant compounds

BACKGROUND

AISA Therapeutics was spun out of a fundamental research program on novel anti-inflammatories at the René Descartes University of Paris Necker-Children's Hospital. Since moving to the University of Paris Sud 11 in 2002, Patrizia d'Alessio has identified and patented four plant molecules by using its *in vitro* and *in vivo* screening platforms. In 2007, one of these molecules (AISA 5203-L) gave rise, following preclinical evaluation of oral or topic administration, to two new patents covering tissue repair and the treatment of stress in the skin and the colon.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The company is developing its hit AISA 5203-L and has filed three patents, the third one being granted in Europe and China. Preclinical studies have revealed that AISA 5203-L has anti-inflammatory effects on the skin and the digestive system, as well as anti-stress properties. AISA active targets the adhesion molecules of the vascular endothelium *via* a rhoA- dependent mechanism.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

AISA Therapeutics is a partner of the European FP7 consortium RISTOMED, which aims at preventing ageing-related diseases by monitoring and managing healthy food and nutraceutical intakes in an elderly population (65 to 85 years of age). The expected impact of AISA 5203-L to lower circulating levels of the inflammatory markers has been validated.

AISA forecasts several clinical studies oriented toward the demonstration of its active efficacy in similar populations, such as nurseries and pre-Alzheimer.

COLLABORATIONS SOUGHT

In 2013, AISA Therapeutics is focusing on the development and commercialization of an anti-stress and anti-inflammatory nutraceutical in the category: "For special medical purposes". ■

3 PATENTS

2 SALARIED STAFF

STRENGTHS: a compound that can be exploited in the nutraceutical and pharmaceutical sectors.

INNOVATION ASSETS: non-toxic anti-inflammatory compound, candidate for long-term treatments.

Agriculture / Environment

Algentech

PRESIDENT
Alexander Sorokin

CSO
Isabelle Malcuit

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Date of founding 18/03/2009

FIELD OF ACTIVITY

Development of innovative technologies for gene targeting and whole-genome transformation in plants.

KEYWORDS
Gene targeting / Organelle Transformation / Genomics / Plant biotechnology

BACKGROUND

Algentech SAS has benefited from four years of research and development in the United Kingdom. The company has deposited four patents in 31 countries and has already signed two industrial contracts with two leaders in the agro-biotech sector.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Algentech develops three innovative technologies for the agro-biotech sector, the tobacco industry, biofuel production, the pharmaceutical industry and plant research applications.

Our technologies enable precise targeting of genes in the plant nuclear and organellar genomes.

The nuclear gene targeting technology allows the rapid identification of genes associated with important agronomic traits, the modification of genes for example to improve the nutritional quality of crops. Targeted gene knock-out is also used in tobacco harm reduction programs and to reduce the cost of production of plant-made proteins.

Chloroplast transformation is mainly applied to the production of high value compounds in plants such as enzymes used in biofuel production, proteins and secondary metabolites for the pharmaceutical industry.

The mitochondria transformation tool is a breakthrough technology used for induction of cytoplasmic-male sterility for production of high yield hybrid varieties.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

The company has deposited four patents in 31 countries and has already signed two industrial contracts with two leaders in the agro-biotech sector.

Two collaborative projects are in progress with a UK-based company for a gene targeting study in algae and with a company specialized in allergy treatments for reduction of the production costs of plant-made proteins.

COLLABORATIONS SOUGHT

Algentech is seeking partnerships with major agro-biotech companies, tobacco industry, biofuel industry, pharmaceutical companies, seed companies and international research organizations. ■

R&D services and products

Alkion Biopharma

PRESIDENT & CSO
Dr Franck Michoux

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Date of founding 27/12/2011

FIELD OF ACTIVITY

Provide cosmetic and pharmaceutical companies with a secured and sustainable supply of high quality plant biomass and active biotechnological ingredients.

KEYWORDS
API / Bioreactors / Medicinal plants / Plant biotechnology / Plant stem cells / Recombinant proteins

BACKGROUND

Alkion Biopharma develops an exclusive technology generated at the Imperial College London. The company was incorporated in December 2011.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Continuous and stable production of high yield biomass in bioreactors. This production is independent from the seasons, from the production location and from the plant growth characteristics.

Production and purification plant-based active biotechnological ingredients, such as Plant Stem Cells or its HyperActive extracts designed for cosmetic and pharmaceutical companies.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Agreement with Kew Gardens (UK) for the supply of medicinal plants with anticancer activities.
- Partnership with the Sanger Institute (UK) for the screening of complex anticancer active ingredients.

COLLABORATIONS SOUGHT

Alkion Biopharma is targeting cosmetic and pharmaceutical companies which are looking for a secure and stable supply of plant raw materials and/or plant active biotechnological ingredients. ■

3 PATENTS

4 STAFF MEMBERS

STRENGTHS: High yield production of complex active ingredients in a controlled environment.

Technology able to respond to industrial scales and requirements.

INNOVATION ASSETS: Unique differentiated biomass production technology in bioreactors. This technology can participate in the preservation and propagation of endemic or endangered plant species, as well as the production of recombinant proteins.

Scientific Instrumentation

AlyXan

PRESIDENT
Laurent Courthaudon

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Date of founding 10/2005

FIELD OF ACTIVITY

AlyXan develops, manufactures and commercializes instruments for continuous and/or onsite analysis of trace elements such as volatile organic compounds.

KEYWORDS
Mass spectrometry / Real-time / Thermal desorption / VOC / Continuous measurement

BACKGROUND

Founded in 2005, AlyXan is now entering the commercial launch phase for its first two products: BTrap, a solution for continuous and/or real-time analysis of volatile organic compounds based on high-resolution mass spectrometry, and TD Flash, an analytical thermal desorption device.

Two BTraps and four TD Flashes have already been sold. An initial distribution agreement was signed in 2013 for TD Flash.

Also, as part of its service provider activities, AlyXan has developed strong relations with prestigious clients including DGA, DCNS, EADS, ENSAM, l'Oréal, Veolia, Michelin, Arcelor, Saint-Gobain and SIAAP among others.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

AlyXan conceives, manufactures and commercializes instruments for the analysis of water and/or gases used at worksites or in laboratories. The company specializes in the analysis of trace elements, particularly to detect and quantify chemical pollutants, aromas, odors, etc.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

The BTrap mass spectrometer was conceived and optimized for onsite real-time measurement of trace elements in complex mixes. The portable system is designed for the analysis of small molecules, for example volatile organic compounds. Two aspects of BTrap are particularly innovative: on one hand the instrument provides particularly precise mass analysis, thus permitting the differentiation of compounds with closely neighboring masses, and on the other it deploys chemical ionization techniques to selectively detect target molecules. Another strong point of the system is its ability to simultaneously detect all components in a sample, whatever their number. BTrap permits continuous, qualitative and quantitative analysis of complex samples with no need for preliminary preparations, over seconds or minutes according to the desired concentration. The instrument is doubly patent-protected: CNRS, Université Paris Sud and UPMC.

The analytical thermic desorber TD Flash is an accessory used in gas chromatography. It allows for the desorption of field sample compounds into a tube before they are injected in a chromatography column. The desorption necessitates a refocalization step that the TD Flash does *via* cryogenic trapping, the instrument's strong point, as cryogenic trapping enables the analysis of the gamut of elements in a sample, whatever their weight or volatility.

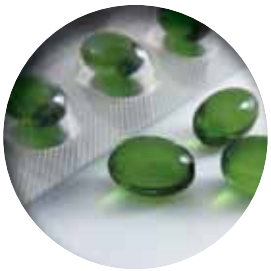
COLLABORATIONS SOUGHT

Industrial entities interested by onsite or deferred dynamic analysis of volatile organic compounds present at very low concentrations in complex mixes. ■

STRENGTHS: reliable, robust and portable, BTrap stands out in mass spectrometry thanks to its high selectivity, soft ionization permitting improved identification, and quantitative measurement without preliminary preparations.

Renowned expertise in the development of analytical instruments.

INNOVATION ASSETS: BTrap is a multi-element analyzer capable of discriminating between an oxygen atom and a methane molecule in a sample, despite their difference of only 0.036 mass units.



Therapeutics

AMAbiotics

PRESIDENT
Antoine Danchin

CSO
François Gendre

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Date of founding 01/02/2010

FIELD OF ACTIVITY

A partnering research organization (PRO) focused on understanding and exploiting interactions between microbial metabolism, food and health.

KEYWORDS
Bioremediation / Metabolism / Genomics / Bioinformatics / Aging / Reactive oxygen species

BACKGROUND

AMAbiotics SAS was incorporated to pursue the commercial development of metabolic bioremediation solutions based on (i) internationally acknowledged expertise developed over the years by Antoine Danchin and (ii) François Gendre's experience as Head of Research in a major food industry group.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

AMAbiotics SAS identifies metabolic interactions between communities of living organisms (including humans) in which each organism has a specific role from indifference or collaboration through to competition or even aggression.

The community's overall equilibrium results from the exchange of chemical compounds (referred to as cenobiotics) that come either from food supplies or from the synthesis and degradation of compounds produced by the various species.

Understanding these metabolic cascades in specific situations (such as those created by long-term drug treatments, an unbalanced diet or the inevitable consequences of aging) has enabled AMAbiotics to develop solutions for helping individual organisms to stay at or return to equilibrium.

AMAbiotics SAS develops proprietary or third-party products on the basis of a portfolio of know-how, patents and applications.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- A member of the European Microme consortium (FP7).
- Creation (with the Foundation Fourmentin-Guilbert) of the journal *Symplectic Biology* – rapid research notes in systems and synthetic biology.
- Patents being filed and 23 high-level scientific publications since the creation of the company.

COLLABORATIONS SOUGHT

AMAbiotics is looking for industrial alliances in the application of metabolic bioremediation (i.e. the correction of metabolic deficiencies in humans, animals and plants) in the fight against the negative effects of chemicals, chronic drug treatments and aging. ■

5 STAFF MEMBERS

STRENGTHS: established expertise in the analysis of bacterial metabolism and the discovery of novel metabolic pathways.

Close relationships with acknowledged partners worldwide – especially in Europe and Asia and in the field of genomics and its applications.

INNOVATION ASSETS: a multidisciplinary approach to the overall metabolism of communities of organisms, combining *in silico* approaches (bioinformatics) and *in vivo* experimentation.

Agriculture / Environment

Anova-Plus

CEO
Dr Marc Masson

BUSINESS & DEVELOPMENT
Guy Blache

VICE-PRESIDENT & NAFTA OPERATIONS
Dr Mark Walton

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Date of founding 03/2012

FIELD OF ACTIVITY

Anova-Plus will develop for agriculture, food production and environment, quick, reliable and quantitative diagnostic kits, to detect on site microorganisms such as plant pathogens (grape Phytoplasma), marine toxic micro-alguea *(Alexandrium minutum)*.

KEYWORDS

Diagnostic kits / Plant pathology / Fungal diseases / Immunology / Isothermal DNA/RNA amplification / PCR

BACKGROUND

Founders are convinced that diagnostic kits will allow to improve the efficiency of plants, animals, food production diseases detection contributing to a better production cycle management, safer health and better environment.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Anova-Plus is a contracting R&D platform for developing new decision tools. Those new and on-site tools will be based on immunology and/or isotherm DNA/RNA amplification techniques.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Anova-Plus is focused on BtoB partnerships with the main actors of Agriculture and distributors seeking for QC's or/and traceability reliable tools.

COLLABORATIONS SOUGHT

For developing those kits, Anova-Plus will favour partnerships with technology suppliers in immunology and isotherm PCR techniques. In the downstream direction, all crop specialists and institutions will be welcomed to help integrating kits into end user practices. ■

8 STAFF MEMBERS within the next 18 months.

STRENGTHS: integrated knowledge of the agricultural sectors, animals, field and specialized crops, molecular biology and diagnostic methods. A BtoB innovative and collaborative scheme to secure market access.

Synergies within the Genopole campus will allow faster access to innovative techniques and laboratory platforms.

INNOVATION ASSETS: synergic use of immunology and PCR for plant health. North America Subsidiary.

Scientific Instrumentation

Archimej Technology

CEO
Mejdi Nciri

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Date of founding 2012

FIELD OF ACTIVITY

Archimej Technology is focused on the development of its proprietary technology: SPECTROSCOPY 2.0®.

SPECTROSCOPY 2.0® technology brings unprecedented features to absorption spectroscopy, specifically in terms of measurement sensibility, miniaturization and production costs.

KEYWORDS
Absorption spectroscopy / Clinical chemistry / Diagnostics / Medical device / Point of care (POC) / Telemedicine

BACKGROUND

Created in August 2012, Archimej Technology builds upon three optic innovations that radically change the absorption spectroscopy paradigm. The company functions on a licensing business model segmented by per-application markets.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

SPECTROSCOPY 2.0® is a diffusion-based technology pertinent for a large range of industries or for specific market applications, including biomedical or environmental sciences, the food industry or even the aerospace industry and defense.

Today, Archimej Technology is leading two complementary projects in biochemical analysis, its current focus: α-BioLED (OEM spectrometers for analyzer robots) and ß-BioLED (clinical chemistry for POC and telemedicine).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Co-development partnership with a Chinese/ Taiwanese industrial chip producer.
- Winner of the 2012 Altran Foundation for Innovation Prize (France) for its ß-BioLED project; selected for the Altran Foundation International Prize (ongoing).
- Winner of the 2013 Scientipôle Initiative Prize for its α-BioLED project.

COLLABORATIONS SOUGHT

- Laboratory, medical research center (private or public) and/or medical research hospital specialized in clinical chemistry analysis.
- Stakeholders in industrial information and communication technologies.
- Leaders in *in vitro* diagnostics and/or medical devices for diagnostics. ■

5 PATENTS

STRENGTHS: diffusion-based plug and play technology with a large range of market applications.

Strong miniaturization potential for higher measurement sensitivity.

INNOVATION ASSETS: a technological breakthrough that changes the paradigm in absorption spectroscopy.

Medical devices

Arterial Remodeling Technologies (ART)

CSO
Machiel Van Der Leest

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Date of founding 21/11/2001

FIELD OF ACTIVITY

Arterial Remodeling Technologies ("ART") is developing bioresorbable peripheral and coronary artery stents that promote the natural post- angioplasty remodeling of an injured artery. In the mid- to long term, the company is seeking to diversify into the peripheral stent market. The company will remain flexible enough to produce custom stents according to the customer's blueprints.

KEYWORDS

Stent / Biocompatible / Bioresorbable / Polymer / Cardiovascular system

BACKGROUND

The ART technology is based on IP generated at René Descartes University of Paris V (Professor Antoine Lafont), the Cleveland Clinic Foundation and CNRS Montpellier (Professor Michel Vert).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

ART is developing a new generation of bioresorbable stents for the treatment of coronary disease.

In addition to having optimal mechanical properties, this stent dismantles itself gradually and degrades fully over time. This helps the artery to remodel itself and heal naturally by recovering its initial luminal profile. The goal is to replace permanently indwelling stents with bioresorbable, transient devices.

The polylactide stent has several advantages: it is non-inflammatory, biocompatible, hemocompatible and mechanically resilient. Furthermore, ART's stents are (i) compatible with MRI, (ii) visible during angioplasty and (iii) do not require surgeons to change their surgical techniques and habits.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- University of Montpellier 1.
- CNRS.
- University René Descartes Paris V. ■

1 GRANTED PATENT + 9 PATENT APPLICATIONS
6 STAFF MEMBERS

Medical devices

AssistMov

PRESIDENT
Mourad Bouzit

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Date of founding 01/10/2009

FIELD OF ACTIVITY

AssistMov designs innovative solutions for human rehabilitation, using robotics and virtual reality technology.

KEYWORDS
Rehabilitation / Physiotherapy / Robotics / Virtual reality / Mobility

BACKGROUND

At the crossroad of physiotherapy, robotics and virtual reality, Assistmov products and services re-invent the rehabilitation process, offering to physiotherapists highly innovative solutions, based on more than 18 years of research in France and US university labs.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Assistmov's first strategic orientation is set on lower limbs rehabilitation. Two products are currently being developed: a balance rehabilitation system and a walk rehabilitation system.

Prototypes already exist. A market authorization was attained in late 2012.

COLLABORATIONS / HIGHLIGHTS

- A prizewinner in the French Ministry of Research's 2008 business plan competition for innovative companies.
- Company setup in Oct. 2009.
- A prizewinner of Scientipole Initiative in 2010.
- Two doctoral students in medical robotics join AssistMov team in October 2010.
- Collaboration Assistmov-ISIR (UPMC-Paris VI robotics lab).
- Collaboration with various Physical Therapy and Functional Rehabilitation departments around Paris (Pr Thoumie at Rotschild hospital; Pr Bussel at Garches Hospital).
- Partnership with RMI, the French leader in the computerization of the health system.

COLLABORATIONS SOUGHT

- Industrial partnerships, to manufacture the devices (mechanics, electronics).
- Commercial partnership, to supply our products in Western Europe.
- Scientific collaborations in rehabilitation field. ■

3 PATENTS + 2 IN PROGRESS

STRENGTHS: strong ability to design integrated solutions, using robotics and virtual reality.

Close daily relations with scientific research in physical therapy and robotics.

INNOVATION ASSETS: a multidisciplinary approach in robotics (mechanical, electronics and software engineering) along with a genuine industrial view.

Consultancy

Aurgalys

CSO
Dr Philippe Berthon

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Date of founding 03/2008

FIELD OF ACTIVITY

Aurgalys provides operational and/or strategic support to life science and healthcare entrepreneurs and investors.

KEYWORDS

Corporate finance / Equity Research / Business development / Transition management / Support / Consulting

BACKGROUND

Founded by Dr Philippe Berthon in 2008, Aurgalys leverages its know-how and network through its partners and business, all experienced managers and entrepreneurs. In 2010, Aurgalys launched specific Equity Research services with its own fully dedicated analyst, covering listed companies and valuating private companies upon request.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Interim management: CEO, CSO, regulatory affairs, CMO, marketing.
- Business development: in/out licensing, joint ventures, distributions.
- Corporate finance: fund raising, mergers & acquisitions, PIPE, alliances, investor relations.
- Support/consulting: strategy, due diligence, marketing.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Cellectis, BioAlliance, Diaxonhit, Evolva/Arpida, NonLinear Tech, Medicen, Nanopowers, DNA Therapeutics, etc.
- Aurgalys is an active member of SFAF (French Society of Financial Analysts), France Biotech, AEE, AACR, Genopole. ■

STRENGTHS: corporate finance and consulting: entrepreneurs serving entrepreneurs.

Consultancy

Bio Support

PRESIDENT
Bernard Orlandini

CEO
Agnès Boulanger

DIRECTOR
Noëlle Couget

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Date of founding 01/2006

FIELD OF ACTIVITY
A not-for-profit organization for sharing personnel between several companies.

KEYWORDS
Human resources / Sharing

10 STAFF MEMBERS

BACKGROUND

A not-for-profit organization founded in 2006 on the initiative of six Genopole® companies, with a view to sharing key employees whom individual members could not afford to recruit on a full-time basis.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Shared human resources in finance, accountancy, quality management, IT and legal affairs and contract management.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

30 member companies. ■

Agriculture / Environment

Biométhodes

CEO
Gilles Amsallem

CTO BIOTECH
Stéphane Blesa

CTO PROCESS
Niels Langvad

VP OPERATIONS
Romain Fouache

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Date of founding 06/11/1997

FIELD OF ACTIVITY
Genetic engineering applied to bioenergy, green chemistry and industrial biotech.

KEYWORDS
Biomass / Biofuels / Biorefinery / Specialty enzymes

BACKGROUND

1998-2000: Development of the company's technology platform.

2000-2005: R&D collaboration with several major chemicals and pharmaceutical companies (ABEnzymes, GSK, Roquette, Sanofi-Aventis…).

2005-2007: Development of biocatalysis and bioenergy applications.

2008-2012: Collaboration between Biométhodes and Virginia Technology/Oak Ridge National Laboratory (US Department of Energy) on the development of the bio refinery platform.

2012-2013: Building of a pilot plant in Virginia and start of biorefinery activities for green chemistry.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Bio manufacturing system applied to industrial biotech. Genetic, protein and enzyme optimization. The company has developed and exploited novel technologies (MM® and THR®) for improving industrial enzymes. These technologies are protected by three patent families owned by the company and parts of the work have been published in top-rank scientific journals.

Biométhodes owns patent pertaining to delignification and decrystallization of cellulose for which it has an exclusive and worldwide license from Virginia Tech.

In order to achieve a full exploitation of any kind of ligno-cellulosic residues, the company has developed a technological platform, which successfully integrates two crucial steps, the chemical pre-treatment and the biological hydrolysis.

This process allows for the first time an optimal separation of the ligno-cellulosic biomass in its three various constituents, the lignin, amorphous cellulose and the hemicelluloses.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Development of the first process for transformation of lignocellulosic biomass into cellulose, hemicellulose, lignin, acetic acid.
- Implementation of production of enzymes systems for the hydrolysis of biomass.
- Biométhodes signed a research contract with the Fraunhofer ICT (Germany) to scale-up the pre-treatment process.
- Biométhodes received a public grant (USA) to develop a cellulosic ethanol biorefinery plant in South Virginia. The total value of this three-year project is $24M.
- Biométhodes obtained the Chemstart'up award 2011. The company was the global Ideas Winner for France in the CleanTech open competition 2011, and was finalist in the global CleanTeach open Ideas competition.

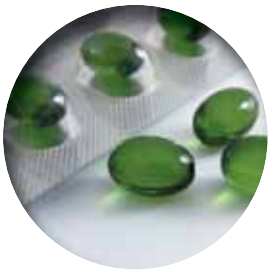
COLLABORATIONS SOUGHT

Joint ventures in industrial chemistry, energy and the environment. ■

12 PATENTS

11 STAFF MEMBERS

STRENGTHS: intellectual property - industrial feasibility - well positioned in the USA and Europe.



Therapeutics

CECS / I-Stem The Center for Stem Cell Studies

PRESIDENT
Karl-Stéphane Robert

CSO
Raymond Zakhia

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Date of founding 01/10/2009

FIELD OF ACTIVITY

Evaluation of the full technological and therapeutic potential of pluripotent stem cells (from all sources) for treating monogenic diseases. The CECS is notably developing substitutive cell therapies for degenerative pathologies and stem cells for use as targets in drug screening.

BACKGROUND

CECS (founded in 2009) is a not-for-profit R&D organization dedicated to the development and application of stem-cell-based technologies and treatments in the field of rare genetic diseases. The CECS is partly funded by the French Muscular Dystrophy Association (AFM) as part of the I-STEM Institute (*cf.* page 32).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The CECS has developed several therapeutic research themes in the field of muscle diseases as part of I-STEM's activities, together with four technological research programs:

- Stem cell biotechnology (large-scale cell production, genetic engineering and medium-throughput screening).
- High-throughput screening.
- Functional genomics (development of gene product based technological tools for studying monogenic diseases).
- iPS disease modeling (the use of induced pluripotent stem cells as a new tool in drug screening).

With five technological research and development programs:

- Drug Discovery (high-throughput screening).
- iPs Pathological disease modeling (the use of induced pluripotent stem cells as a new tool in drug screening).
- Stem Cell Biotechnology & Bio-Banking.
- Muscular diseases.
- Neuroplasticity and therapeutics.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- A collaborative research and development program funded by Oseo.
- A collaborative research contract with Roche.

COLLABORATIONS SOUGHT

Industrial collaborations. ■

OPERATING BUDGET: €4.8M/YEAR
8 PATENTS
9 PUBLICATIONS
44 STAFF MEMBERS

R&D services and products

Cellectis stem cells / Ectycell

CEO
Mathieu Simon, Ph.D.

SITE MANAGER
Stephan Reynier

CSO
Philippe Duchateau, Ph.D.

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Date of founding 10/2011

FIELD OF ACTIVITY

Cellectis stem cells is responsible for spreading Cellectis' genome engineering technologies into the stem cell field in order to transform these cells for use in *in vitro* testing and regenerative medicine applications.

KEYWORDS

Pluripotent stem cells / Cardiomyocytes / Hepatocytes / iPS Hub / Genome engineering / Meganucleases / TALEN™

BACKGROUND

The Cellectis stem cells Business Unit combines two Cellectis Group companies dedicated to stem cell technology: Ectycell, based at the Evry Genopole (France), and Cellartis, based in Gothenburg (Sweden), which was acquired by Cellectis in October 2011.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Products

Cardiomyocyte monolayers, cardiomyocyte clusters, hepatocyte-like cells, DEF-CS feeder free culturing system, mesenchymal progenitor cells, human stem cell lines, stem cell antibodies.

- Projects

- Creation of a large biobank of pluripotent stem cells representing human genetic diversity.
- Differentiation of pluripotent stem cells into cardiomyocytes, hepatocytes, neurons and keratinocytes.
- Clinical grade iPS manufacturing and banking, Clinical development of red blood cells and pancreatic beta cells from pluripotent cells.

- Services and Technologies

iPS Hub: Production of iPS cells and genome engineering of pluripotent stem cells.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Cellectis stem cells has obtained funding from Oséo – the French industrial funding agency –, local and regional government and the *Fonds Stratégique d'Investissement (FSI)* to pursue its activities in France; in addition to a number of European Union funded projects. Cellectis stem cells has a number of research collaborations with both academic and industrial partners.

COLLABORATIONS SOUGHT

Partners interested in industrializing pluripotent stem cells to develop industrial *in vitro* tools predictive of human physiology and genetic diversity.

To develop major partnerships, particularly in the field of regenerative medicine. ■

18 STAFF MEMBERS IN ÉVRY (63 IN GOTHENBURG)

STRENGTHS: Stem cell culturing and differentiation expertise. Meganuclease and TALEN™ based genome engineering expertise.

CellMill Platform for production and differentiation of pluripotent stem cells.

Medical devices

Centaure Metrix

CEO
Dr Bernard Auvinet

CSO
Dr Éric Barrey

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Date of founding 18/10/2001

FIELD OF ACTIVITY

Centaure Metrix produces and sells diagnostic and therapeutic devices for gait disorders, with applications in medicine (rehabilitation, physical medicine, neurology, myology, geriatrics, rheumatology, etc.) and sports training.

KEYWORDS
Medical equipment / Gait / Rehabilitation / Sport / Running

BACKGROUND

Founded in 2001 by a scientist and a rheumatologist. A prizewinner in the French Ministry of Research's business plan competition for innovative companies and a member of the Entreprendre network and the Medicen Paris Region cluster.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- LOCOMETRIX Diagnostics: solutions for evaluating and quantifying gait disorders and running style and performance; assessment of the risk of falls in the elderly.
- LOCOMETRIX Feedback Training: a treadmill-based, active rehabilitation method.
- LOCOMETRIX Running: application to assess joint health, comfort and walking or running style using the iPhone as a recorder.
- LOCOMETRIX Podology: a solution for evaluating the comfort of soles.
- EQUIMETRIX: a solution for quantifying locomotor parameters in four-legged animals: limps and fitness for racing.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Centaure Metrix is actively involved in clinical studies with the Pierre Fabre Group (fibromyalgia, hyaluronic acid), the Institut de Myologie (human, canine and feline muscular dystrophies), Liege University Medical Center (Alzheimer's disease) and the Pays de la Loire University Medical Center (the PREPA study on prediction of the risk of falls in the elderly).

Locometrix is also used in sports evaluation at INSEP and the National Center of Rugby in Marcoussis.

Equimetrix is used in the research project GenEndurance in Arabian horses and also in the Olympic training center in Warendorf (Germany).

COLLABORATIONS SOUGHT

Research partners: evaluation of fall risks in the elderly, early detection of Alzheimer's disease, clinical evaluation of fibromyalgia.

Commercial partners: healthcare companies, mutual health insurers, distributors. ■

ANNUAL TURNOVER: €100K

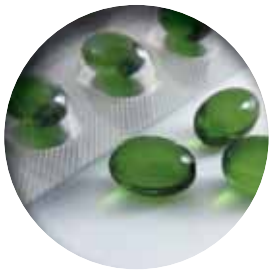
1 PATENT

3 STAFF MEMBERS

STRENGTHS: European leader in accelerometry based gait analysis

Solid scientific and clinical methodological validations and market experience.

INNOVATION ASSETS: rapid results, portable equipment applicable in routine practice.



Therapeutics

DNA Therapeutics

CEO
Jian-Sheng Sun

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Date of founding 08/06/2006

FIELD OF ACTIVITY

DNA Therapeutics develops targeted drups against resistant cancer with a lead IMP demonstrating good safety & antitumor activity in patients.

KEYWORDS

Cancer / Treatment-related resistance / DNA repair / Signal interference of DNA repair

BACKGROUND

DNA Therapeutics is a clinical stage biopharmaceutical company that was spun out of four French public research institutions (the Institut Curie, CNRS, INSERM and the National Museum of Natural History).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

DNA Therapeutics develops first-in-class targeted drugs against resistant cancer based on a novel concept that inhibits efficiently DNA repair activity responsible of resistance by acting at DNA damage sensing and signaling, the common upstream steps of all DNA repair pathways.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

As evidenced by preclinical and early clinical data, the ability of Dbait/DT01 to improve the efficacy of existing cancer therapies without additional toxicity makes it a promising targeted drug benefiting many patients, and extending the market of radiotherapy, chemotherapy and other cancer therapies.

COLLABORATIONS SOUGHT

DNA Therapeutics' mission is to fill the gap between the translational research of a new class of DNA repair inhibitors and their late stage drug development. Convinced of the large potential of its technology platform, early stage partnering is part of its business model and strategy for risk sharing, leveraging resources and competences to achieve full market value, as well as shortening time-to-market. ■

5 PATENTS

8 STAFF MEMBERS

STRENGTHS: a new class of target therapeutics for advanced stage cancer, efficiency and absence of toxicity in health tissues.

INNOVATION ASSETS: unique, patented, breakthrough technology that has been validated in animals and now in patients.

Diagnostics

Endodiag

PRESIDENT
Cécile Real

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Date of founding 01/2011

FIELD OF ACTIVITY

The design, development and marketing of medical devices and services for the diagnosis of endometriosis.

KEYWORDS
Diagnostics / Endometriosis / Medical Device / Biomarker / Pharmacotesting

BACKGROUND

Endodiag is the result of over 20 years of endometriosis research by Drs Bouquet de Jolinière and Gogusev (INSERM unit U1016) and underpinned by several international publications, together with extensive knowledge of medical device and gynecology markets from the two other company founders.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

A specialist in endometriosis diagnosis. The company notably develops medical devices for the biopsy of endometriosis lesions and provides an associated sample analysis service. ■

1 PATENT

3 STAFF MEMBERS

STRENGTHS: 20 years of research, a complementary management team and a target market with unmet needs.

INNOVATION ASSETS: a unique sampling device, novel cell lines and genotypic and phenotypic markers.

R&D services and products

Eukarÿs

PRESIDENT
Benjamin Bertrand

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Date of founding 06/2010

FIELD OF ACTIVITY

Development and sales of high-yield high performance expression systems for mature eukaryotic mRNA synthesis, recombinant proteins production, and cell-based assays.

KEYWORDS
mRNA / Recombinant proteins / *In vitro* and cell-based expression systems / Cell-based assays / Functional genomics / Vaccine

BACKGROUND

Eukarÿs was created in June 2010 following the filing of the EP10305400.3 European patent application, which protects a unique and innovative non-viral expression technology named C3P3®. Eukarÿs has been Prize-winner of the French National Contest for Innovative Technologies Companies in 2009 and 2011.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Eukarÿs develops and sells high performance mature mRNA production kits, based on its C3P3® proprietary technology. Eukarÿs also develops cellular expression systems for high yield production of recombinant proteins and cell-based assays. The company will out-license its technology in 2014.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

The first C3P3® expression system developed by Eukarÿs is a transient gene expression system in CHO-K1 and HEK293 cells for the production of recombinant proteins with producing yields up to 10 times greater than traditional systems.

COLLABORATIONS SOUGHT

Academic and industrial research partners to conduct new assays and head to head comparison studies, and evaluate the C3P3® technology, to co-develop new eukaryotic expression systems (mammalian cell line, plant, yeast…) and new applications such as cell-based assays based on the C3P3® technology.. ■

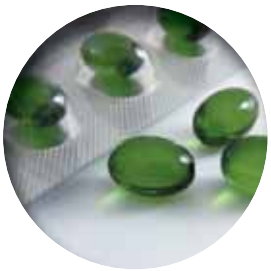
2 PATENTS

3 STAFF MEMBERS

STRENGTHS: a proprietary, patented and disruptive technology with key competitive advantages offering many co-development opportunities.

Proven and anticipated competitive advantages of C3P3® expression systems are: non-viral, very high expression yields, multigene expression, and host independent - adaptable to a wide range of cell types.

INNOVATION ASSETS: C3P3® is a flexible technology to express or inhibit the expression of any gene, in any eukaryotic species (i.e. from yeast to humans), in any biological system (from acellular reaction mix to living organisms) and any targeted tissue at high performance.



Therapeutics

GeneSignal

CSO
Salman Al-Mahmood

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Date of founding 11/02/2000

FIELD OF ACTIVITY

Based on its portfolio of over 90 genes specifically involved in angiogenesis, Gene Signal designs, validates and develops innovative therapeutic solutions for pathologies related to angiogenesis regulation.

KEYWORDS

Rejection of corneal grafts / Anti-angiogenics / Antisense oligonucleotide / Retinopathy / Oncology

BACKGROUND

GeneSignal was founded in 2000 at Genopole. Although GeneSignal International is now based in Switzerland, the company is pursuing its research program in Évry and its development activity in Canada.

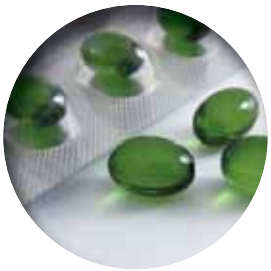
DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

GeneSignal is focusing its development on niche markets. Its first drug candidate (for the prevention of corneal graft rejection) is in Phase III clinical development.

The company is evaluating three other drug candidates with applications in dermatology and ophthalmology and is also working on four promising molecules in the field of vascular disease.

COLLABORATIONS SOUGHT

In order to focus on research, GeneSignal is currently seeking potential licensees for commercializing or co-developing its therapeutic portfolio. ■



Therapeutics

Genethon

PRESIDENT
Laurence Tiennot-Herment

CEO
Frédéric Revah

CSO
Fulvio Mavilio

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Date of founding 1990

FIELD OF ACTIVITY

Discovery, development and production of innovative therapies for rare genetic diseases notably neuromuscular diseases.

KEYWORDS
Rare diseases / Biotherapies / Neuromuscular diseases / Gene therapy / Gene-based therapeutics / Vector technology, gene transfer / Pharmaceutical development / Regulatory affairs / Preclinical and clinical development / GMP production of gene transfer vectors

Genethon, a non-profit biotechnology company is financed more than 75% by the AFM-Telethon through donations from the French Telethon.

Its mission is to develop and provide gene therapy treatments to patients suffering from rare genetic diseases.

Genethon is developing therapies for rare neuromuscular diseases, immune system or blood disorders, eye disorders and liver diseases.

Genethon is a global leader in the research and development of innovative treatments for rare diseases and biotherapies and was awarded the prestigious 2012 Prix Galien France for pharmaceutical research.

With financial contributions from AFM-Telethon, Genopole and local governmental authorities (Région Ile de France and Département de l'Essonne), Genethon built its "BioProd" biomanufacturing centre, one of the world's largest facilities for the GMP production of gene therapy vectors (*cf.* page102).

Genethon's capabilities encompass all the expertise and skills involved in the discovery, preclinical, clinical and technological development, and biomanufacturing of gene therapy vectors:

- Therapeutic Research departments, Design gene therapy approaches for several diseases (*cf.* page 28 et page 38).
- Preclinical development:
  An *in vitro* and *in vivo* drug testing platform, which includes:
  - A vivarium hosting up to 4,000 rodents.
  - A functional investigation facility.
  - An imaging and cytometry platform, with tools and skills for molecular and physiopathological investigation, from the single cell to the whole animal level (*cf.* page 67).
  - A histology service.
- Technological development for gene therapy products:
  - A Bioprocess R&D group.
  - A group working on immunological aspects.
  - A group working on identification and development of biological markers and theranostics for monitoring neuromuscular diseases (Duchenne muscular dystrophy, in particular).
- GMP biomanufacturing department (Genethon BioProd):
  - Capable of producing clinical batches of drug candidates for gene therapy trials (*cf.* page 102).
  - Including a Quality group (Quality Control and Quality Assurance).
- Clinical Development, including a Regulatory Affairs department, which manages the design, implementation and management of clinical trials.
- DNA and cell bank, a national platform for the preparation and conservation of human biological samples.

Genethon is one of the four main participants in the "*Advanced Diagnostics for Novel Approaches Therapeutics*" (ADNA) program, a strategic industrial collaboration partly-funded by Oséo (the French state innovation agency) and coordinated by the Mérieux Alliance. The project is designed to advance development of personalized medicine by making novel biodiagnostics and new therapies available to healthcare stakeholders.

Genethon also is the coordinator of the Consortium preindustrial PGT, which develops bioproduction processes at pilot scale.

Thanks to its "DNA School", Genethon also provides training throughout the year on methods and issues in Genomics and DNA science. ■

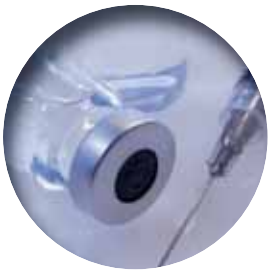
2 NEW PATENTS FILED IN 2012

15 SCIENTIFIC PUBLICATIONS IN 2012

230 STAFF MEMBERS

2 INTERNATIONAL GENE THERAPY CLINICAL TRIALS UNDERWAY AND A PORTFOLIO OF DRUG CANDIDATES AT VARIOUS STAGES OF PRECLINICAL DEVELOPMENT

AWARDED THE 2012 PRIX GALIEN FRANCE FOR PHARMACEUTICAL RESEARCH



Biomanufacturing / pharmaceutical services

Genethon BioProd

PRESIDENT
Laurence Tiennot-Herment

CEO
Frédéric Revah

HEAD OF THE GMP BIOMANUFACTURING FACILITY
Alain Schwenck

QUALITY DIRECTOR AND QUALIFIED PERSON
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FIELD OF ACTIVITY
GMP production of gene therapy products for clinical trials.

KEYWORDS
GMP production of products for gene transfer / Biomanufacturing / Clinical trials

Genethon Bioprod is the new production center of GMP-grade gene therapy products for clinical trials of Genethon (*cf.* page 101). Located on Genopole's campus in Évry, it was constructed with the co-financing by AFM-Telethon (€5.5M), Genopole (€8M), Ile-de-France Local Council (€8M) and the General Council of the Department of Essonne (€7M) for a global building budget of €28.5M.

Thanks to its operational area and production scales, Genethon BioProd is one of the largest biomanufacturing centres worldwide for clinical grade gene therapy products.

Genethon will have a production capacity of close to thirty clinical batches produced yearly for trials conducted in France and abroad. Each batch will allow the treatment of several to few hundreds of patients depending on the pathology targeted and on the specific product manufactured.

KEY DATA

- 5,000 m² dedicated to the biomanufacturing and quality control of gene therapy products.
- Approximately 2,500 m² classified and confined laboratories (L3 confinement adapted to viral products and GMO handling).
- 4 production suites of 500 m².
- Production of 30 clinical grade batches of gene therapy product per year at full capacity.
- 2 suites for aseptic filling in Class A isolators.
- Up to 1000 l of bioreactor cultures for AAV (4 bioreactors of 200 l each) by suite.
- Up to 100 l of culture for lentiviral vectors by suite.
- 120 m² pilot laboratory dedicated to process industrialization.
- 500 m² of quality control laboratories in accordance with Quality regulations.
- 15 different HVAC engines to provide clean air to the various production zones.
- Green standards: Genethon BioProd fulfills HEQ® (High Environmental Quality) requirements.
- Annual operating cost: Approximately 10M€ funded by AFM-Telethon thanks to the donations of Téléthon. ■

Scientific Instrumentation

Genomic

CEO
Michel Gazeau

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Date of founding 04/1989

FIELD OF ACTIVITY

Development, production and marketing of high throughput automates for biological sample preparation and for genetic and biochemical analyses.

KEYWORDS

DNA extraction / laboratory grinders / molecular diagnostics / agro-food laboratories

BACKGROUND

Founded in 1989. Plus €273,000 in capital in 2005. Won a public tender (Hôpitaux de Paris) for at least 7 ExtraGene DNA extractors. 28 MGS grinders purchased by foreign laboratories.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- ExtraGene, a DNA extractor for large volume samples; multi-protocol, open automate Range of 6 laboratories grinders/homogenizers for food control, GMO and mycotoxin detection, varietal selection by molecular markers, grinding biopsies at ultra low temperature.
- A multi sampler for powder products.
- A range of standardized kits for biological and medical sample transportation.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Development of a new version of the DNA extractor (ExtraGene II), a multigrinder and a multisampler in microplates. Two French patent applications filed.
- Development of an export plan with the Haute-Savoie Chamber of Commerce and Industry. Looking to recruit a sales manager in France and a student in international trade for a contract training program.
- A team of ESSEC students studying entry strategies for the U.S. market. Genomic granted Genopole accreditation; opening an office in the biocluster.

COLLABORATIONS SOUGHT

- Laboratories with expertise in biochemistry.
- Well established companies in bio-bank markets, food control laboratories, seed developers and seed breeders the world-over. ■

ANNUAL TURNOVER: €290,000

8 PATENTS

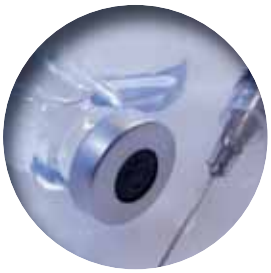
5 STAFF MEMBERS

STRENGTHS: original, patented products responding to needs in analysis speed.

Collaboration with leading laboratories - Focus on products that are not very sensitive to technical developments; sample preparation; stability and expertise of the technical staff.

INNOVATION ASSETS: anticipating the needs of applied research laboratories and laboratories employing the latest advances in genetics and molecular biology.

Although product development remains a focus, it is now time to develop sales abroad.



Biomanufacturing / pharmaceutical services

GenoSafe

PRESIDENT
Dr Serge Braun

BUSINESS DEVELOPMENT DIRECTOR
Vincent Zuliani

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Date of founding 03/09/2003

FIELD OF ACTIVITY

GenoSafe is a Contract Services Organization which specializes in evaluating the efficacy, quality and safety of innovative biotherapeutic products. We meet our clients' specific needs by performing custom studies in strict compliance with regulatory requirements.

KEYWORDS
Gene transfer / Gene therapy / Cell therapy / Vaccination

BACKGROUND

GenoSafe was incorporated in 2003 and became operational in 2004. Its two shareholders are Genethon (*cf.* page 101) and the French Muscular Dystrophy Association (AFM-Telethon).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

From the research phase through to the clinic, GenoSafe offers true project support in study design, methodological development & validation and product testing in four main fields:

- Molecular analysis (including biodistribution studies for gene transfer products).
- Evaluation of immune responses.
- Quality control of gene and cell therapy products for preclinical and clinical use.
- Follow-up of patients included in clinical trials.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- GenoSafe's European clientele is composed of biotech firms, pharmaceutical companies and academic labs.
- GenoSafe is a partner in various French and European collaborative projects.
- GLP compliance certificate.

COLLABORATIONS SOUGHT

Clients seeking a CSO to assess the safety, quality and efficacy of their biotherapeutic products, responding to their expectations in terms of Quality of Services (scientific and regulatory) and meeting the timelines. ■

15 STAFF MEMBERS

STRENGTHS: scientific expertise in complementary fields, customized services, flexibility, ability to meet timelines, GLP compliance, facilities: BSL1, BSL2 and BSL3 labs.

INNOVATION ASSETS: customer support from the research phases through to the clinic.

Diagnostics

GenoSplice Technology

CO-MANAGERS
Pierre de la Grange, Marc Rajaud

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Date of founding 12/11/2008

FIELD OF ACTIVITY
Bioinformatics service provider (gene expression, splicing, SNP, CNV, epigenetics, data integration).

KEYWORDS
Bioinformatics / DNA chips / Expression / High-throughput sequencing / RNA-Seq / Splicing

BACKGROUND

The company has been spun out of the European Alternative Splicing Network of Excellence (EURASNET).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

GenoSplice, with its unique expertise in bioinformatics, is a leader in the analysis of expression data.

It develops and markets high value-added services internationally in the analysis of genomic data gathered through high-speed sequencing and/or DNA microarrays. The company uses proprietary tools to provide its innovative services and maintains long-term collaborative relationships. Each client is unique, just as each analysis process is unique.

GenoSplice's services primarily concern data analysis: gene expression, alternative splicing, microRNA, fusion transcripts, epigenetics, SNP, CNV, translocation, and proteomics.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Prizewinner in the French Ministry of Research's 2008 and 2011 business plan competition for innovative companies.
- Funding from BIOCRITT and Oséo.
- A member of the Medicen Paris Region cluster.
- Collaborations: INSERM, IGR, Pasteur Institute, CNRS, Curie Institute, University of Taiwan, University of Kentucky, University of Cambridge, University of Newcastle, Howard Hughes Institute, St-Jude Hospital.

COLLABORATIONS SOUGHT

Gene expression, in particular at the exon-scale. ■

Agriculture / Environment

Global Bioenergies

CHAIRMAN AND CEO
Marc Delcourt

PROCESS DESIGNER AND CHAIRMAN OF THE SCIENTIFIC ADVISORY
Philippe Marlière

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Date of founding 17/10/2008

FIELD OF ACTIVITY

Global Bioenergies is developing a bioprocess for converting renewable resources into gaseous hydrocarbons (light olefins: isobutene, butadiene, isoprene, propylene).

KEYWORDS

Biofuels / Bioenergy / Renewable Resources / Biochemicals, Isobutene / Butadiene / Isoprene, Propylene / Synthetic Biology

BACKGROUND

Global Bioenergies was incorporated in 2008 by Marc Delcourt and Philippe Marlière. It is one of the few companies worldwide (and the only one in Europe) working on biological processes for gaseous hydro-carbon production.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The process is based on setting up an artificial metabolic pathway (designed by the company) in various micro-organisms and using renewable resources (sugars from sugar cane, sugar beet, starch or agricultural and forestry waste).

Since the hydrocarbon products are gaseous, no purification steps (such as distillation, in the case of ethanol) are required. This should lead to significantly improved environmental and economic parameters as compared to those of today's existing biofuel production approaches.

By using proven, cheap, chemical processes, these gaseous alkenes can then be easily converted into liquid hydrocarbons (petrol, kerosene, diesel, ETBE, etc.) and various polymers (for use in tires, organic glasses and plastics).

The company has reached the first development milestones in its isobutene production process ahead of schedule: proof of concept, strain design and a lab-scale prototype.

Global Bioenergies is continuing to improve its process yield and is getting ready to perform tests in a pilot plant. In parallel, the company is seeking to repeat this success with other gaseous alkenes (propylene, butadiene, ethylene, n-butene, etc. – all pivotal molecules in petrochemistry that are currently only derived from crude oil).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Global Bioenergies performed its first round of financing in early 2009 (raising € 4M with Masseran Gestion, the venture capital of Natixis - subsidiary of BPCE bank) and a 2,9 fold oversubscribed IPO in June 2011. It has created a top-level Scientific Advisory Board, built a team of 25 researchers and obtained proof of concept for its process.

In late 2010, the company opened an office in Munich and signed its first contract (with an American company) on a particular application of its process in a billion-dollar market. In July 2011, Global Bioenergies entered into a strategic bio-butadiene partnership with Synthos, a leading East-European chemicals company.

In late 2011, Global Bioenergies announced the beginning of a feasibility study with LanzaTech to examine whether its pathway can be functionally transferred into LanzaTech's carbon monoxide using organism and signed also an agreement with a major German car manufacturer. The company works in close collaboration with the Genoscope lab (the CEA Genomics Institute) and thus has access to unique facilities and expertise for sequencing, metagenomic cloning and synthetic biology. Global Bioenergies also collaborates with the joint UEVE/CEA/CNRS LAMBE laboratory.

In late 2012, Global Bioenergies received the Europabio award "most innovative European biotech SME".

The company received more than € 2,6M from Synthos since the discovery of the metabolic pathway to the butadiene. GBE launched a € 3M capital increase.

COLLABORATIONS SOUGHT

Global Bioenergies is seeking to establish industrial collaborations and grant options on future, application-specific, exclusive licenses on its technology. ■

38 STAFF MEMBERS

STRENGTHS: a bioprocess based on the creation of a new, artificial metabolic pathway; major environmental and economic value.

INNOVATION ASSETS: biomanufacturing of gaseous hydrocarbons.

Scientific Instrumentation

HORIBA Jobin Yvon

CEO
Michel Mariton

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FIELD OF ACTIVITY

Designer and manufacturer of scientific instruments in the field of biophotonics. The acquisition of GenOptics in 2009 expands the technological portfolio of HORIBA Scientific by integrating surface plasmon resonance imaging (SPRi) for the label-free analysis of biomolecular interactions.

KEYWORDS

Biophotonics / SPRi / Labelled or label-free analysis / Bio-interaction / Multiplexing / Biomolecular analysis / Cellular analysis / Molecular characterization

BACKGROUND

HORIBA Jobin Yvon, founded in 1819 in Paris, is a historic actor in French optics. The development of the company is based on the acquisition of several innovative companies, experts in different sectors of optical instrumentation, such as: IBH, SPEX, Instruments SA, ISA, Dilor, Sofie, SLM, Beta Scientific and more recently GenOptics.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

HORIBA Scientific is a world leader in scientific instrumentation, and particularly for Life Sciences. World-expert in SPRi for the high-throughput analysis of molecular interactions in real-time, HORIBA Scientific product portfolio (SPRi sytems, Raman spectrometers, Fluorescence spectrometers, particle size analyzers…) allows the detailed characterization of biological samples (molecules, cells, tissues) in the academic or industrial sectors.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

HORIBA Scientific is a key partner of several prestigious entities such as the French military procurement agency, CEA, IOGS, INSERM and big pharma companies. Its implementation in the Paris-Saclay campus will foster new cooperations with neighbouring academic research laboratories or private R&D centers.

Regarding Life Sciences applications, HORIBA Scientific collaborates with several universities. A patent was filed recently for the coupling of SPRi with MALDI-TOF mass spectrometry, allowing a better access to the identification and quantification of new clinical biomarkers. ■

ANNUAL TURNOVER: €70M

MORE THAN 10 PATENTS FILED ANNUALLY

300 PEOPLE IN FRANCE

STRENGTHS: large product portfolio.

Expertise and methodology in instrumentation for the study of biomolecular interactions or chemical characterization. Multidisciplinary team of PhD scientists and engineers. International distribution network.

INNOVATION ASSETS: SPRi-mass spectrometry coupling.

R&D services and products

Imagene

CEO
Sophie Tuffet

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Site www.imagene.fr
Date of founding 01/12/1998

FIELD OF ACTIVITY

- Services and products for DNA and RNA storage at room temperature through encapsulation.
- DNA and RNA extraction services.
- Sale of platforms for preparation and encapsulation of DNA.
- R&D on the preservation of biological material at room temperature.

KEYWORDS
DNA and RNA storage / Room temperature / Long-term / Industrial process / Gene library

BACKGROUND

Imagene has developed a worldwide patented, novel technology for the preservation of nucleic acids at room temperature based on encapsulation.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The Imagene technology is based on encapsulation of purified and desiccated nucleic acids under a controlled atmosphere that protects them from degradation factors in compact, sealed, corrosion-proof metal capsules. The minicapsules are marketed DNAshell® and RNAshell®. It is thus possible to store nucleic acids of any species in a form compatible with any type of current or subsequent analysis at room temperature. Our breakthrough innovation has many advantages over conventional methods (ie cryostorage), particularly in terms of stability, safety, operating & maintenance costs, transport and distribution.

Imagene markets services and products for long-term preservation of nucleic acids at room temperature as well as complementary services of nucleic acids extraction and QC analysis. Imagene offers a global solution for nucleic acids preservation and use. Imagene has successfully achieved a R&D program to apply its technology to the preservation of RNA samples at room temperature. For key customers in need of processing large numbers of samples, Imagene is amenable to sell and install complete platforms.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- An industrialized, automated platform for the handling of genetic materials at large-scale (2,500 DNA capsules a day, i.e. 500,000 a year).
- Ensures complete and lasting traceability of each biological sample and meets quality standards (ISO 9001: 2000, ISO 17025).
- Many scientific collaborations, including the Pasteur Institute, the French National Museum of Natural History and the French National Crime Research Institute (IRCGN), University of Marseille, The Bergonié Institute.

COLLABORATIONS SOUGHT

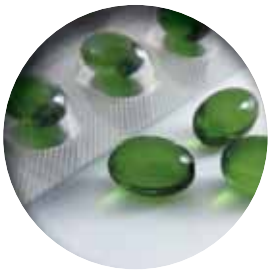
With its encapsulation facility, Imagene is seeking industrial partners and customers (academic labs, biotech firms and pharmaceutical laboratories) interested in taking advantage of room temperature storage for their nucleic acids samples. ■

4 PATENT FAMILIES, 3 OF WHICH WERE FILED IN 2008

12 STAFF MEMBERS

STRENGTHS: the only technology allowing stable and lasting nucleic acids storage at ambient temperature with nearly no maintenance and operating costs.

INNOVATION ASSETS: the minicapsules are traceable and tamper-proof and allow the storage of variable quantities of nucleic acids (ie from DNA traces to several µgs).



Therapeutics

Immune Pharma

PRESIDENT
Jean Kadouche

CSO
Daniel Teper

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Date of founding 18/12/2010

FIELD OF ACTIVITY

The biotech company Immune Pharma SAS is developing therapeutic monoclonal antibodies (mAbs) with applications in the fields of cancer, autoimmune and inflammatory diseases and transplantation.

KEYWORDS
Monoclonal Antibodies / mAbs, Fully human, Cancer / Autoimmunity / Transplantation

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Anti-eotaxin 1, licensed from ICO Therapeutics Inc.
- Partnering with the Hebrew University of Jerusalem (Yissum): INPs-mAb, Professor Simon Benita.
- Partnering with the Weizmann Institute (Yeda): dual-epitope mAbs against EGFR receptors, Professor Yossi Yarden.
- A technology for generating fully human mAbs: HuCell®, IP.

BACKGROUND

The biotech company Immune Pharma SAS is developing therapeutic mAbs. It was incorporated in order to leverage the in-depth expertise of its two founders (Daniel Teper, CEO, and Jean Kadouche, President and CSO) in this field.

COLLABORATIONS SOUGHT

mAbor technology licensing (fusion proteins, expression systems, drug delivery, cytotoxicity and labeling) with intellectual property, freedom to operate and proof of concept. ■

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- A fully human anti-eotaxin 1 mAb in Phase 2a clinical trials in Crohn's disease (licensed from ICO Therapeutics Inc.), severe asthma (phases 2a), phase 2 for severe Ulcerative Colitis, in phase 1 for ophthalmology and Bullous Pemphigoid.
- A technology for generating fully human mAbs: HuCell®.
- Immunonanoparticles (INPs-mAb) in the treatment of solid tumors, leukemias and lymphomas.
- Dual-epitope mAbs against EGFR receptors.
- AmiKet (chemo-induced neuropathic) in phase 3.
- Azixa (solid tumors) in phase 2, Crolibulin (solid tumors) in phase 1.
- NanomAbs (cancer, multiple) in preclinical.

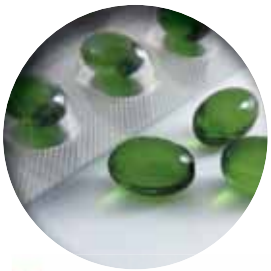
9 PATENTS

3 STAFF MEMBERS

STRENGTHS: mAbs and drug development experience. Management team, know-how and new targets.

INNOVATION ASSETS: HuCell® fully human technology.

OTHER FACTS: the company's business model and selected targets.



Therapeutics

Inatherys

CEO
Coralie Belanger

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4 rue Pierre-Fontaine - F-91058 ÉVRY Cedex
Tel. +33 6 01 13 58 59
Date of founding 04/06/2009

FIELD OF ACTIVITY

Development of therapeutic monoclonal antibodies for clinical applications in the field of inflammation and oncology.

KEYWORDS

Monoclonal antibodies / Antibody fragments / Inflammation / Orphan disease / Innovative mechanism of action

BACKGROUND

Inatherys is a “spin-off” of two research units: INSERM U699 in Bichat hospital (Renal immunopathology, receptors and inflammation) and CNRS (UMR 8147– cytokines, immune response and hematopoiesis, that is associated with the onco-hematology department of Necker hospital). Inatherys’ founders have produced, characterized, and patented a portfolio of monoclonal antibodies against innovative targets with unique mode of action: a drug candidate (INA01) first for incurable leukemia/ lymphoma and subsequently for more frequent cancers, and a second drug candidate (INA02) for severe inflammatory diseases refractory to standard therapies.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Inatherys’ portfolio currently includes two drug candidates:

- INA01 is an anti-transferrin receptor (CD71) monoclonal antibody. CD71 regulates cell activation and proliferation. Pre-clinical studies demonstrate that malignant cells (adult T cell leukemia caused by HTLV-1, mantle cell lymphoma and acute myeloblastic leukemia) with high proliferative activity express high density of CD71 and INA01 binding blocks its biological activity inducing a dramatic iron deprivation of the target cells leading to inhibition of cell proliferation and to apoptosis.
- INA02 is a monoclonal antibody targeting the D2 domain of the CD89, which is expressed on many cells involved inflammation. Monovalent binding of CD89 with INA02 induces durable inhibition of inflammatory disorders.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Very promising preliminary results on efficacy have been obtained with both monoclonal antibodies *ex vivo* on fresh malignant cells from patients with blood cancers or inflammatory diseases, but also on murine models injected with or reproducing human diseases. First administration of INA01 in monkeys showed good safety profile.

Inatherys’ first strategy is to develop INA01 in orphan diseases like leukemia or lymphoma in advanced phase, refractory to treatments without therapeutic option, and INA02 in severe and resistant asthma (in partnership with industrial). The phase I clinical trial of INA01 is scheduled for 2016.

Subsequently, Inatherys objective is to extend INA01 indications to more frequent cancers and INA02 indications to others frequent severe inflammatory diseases like arthritis and nephritis, resistant to conventional therapies.

In 2011 Inatherys has received subsidies from Oséo as laureat “création - développement” (€ 290K).

2012: Scientipole Academy award.

COLLABORATIONS SOUGHT

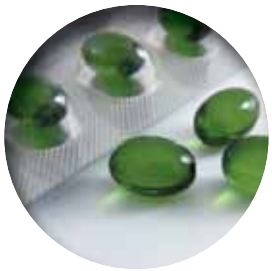
Inatherys is raising funds to start the regulatory development of INA01 up to the phase 1 in Human and to continue the preclinical development of INA02 with subsequent potential partnerships with pharmaceutical industries. ■

2 PATENTS WITH EXCLUSIVE LICENSING

2 STAFF MEMBERS

STRENGTHS: very promising results of both candidate drugs in development. Highly experienced team with complementary skills (Clinical development, scientific, management, business and law).

INNOVATION ASSETS: handling of animal models relevant in cancer and inflammatory diseases. Expertise *in vivo / ex vivo* validation and development of monoclonal antibodies.



Therapeutics

InnaVirVax

CEO
Joël Crouzet, Ph.D., HDR

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Date of founding 03/2008

FIELD OF ACTIVITY

InnaVirVax is developing (i) innovative biotherapies for the treatment of infectious diseases, HIV infections and cancer and (ii) a prognostic test for the onset of AIDS in seropositive patients.

KEYWORDS
HIV / AIDS / Cancer therapy / Biotherapies / Prognosis

BACKGROUND

InnaVirVax is a clinical stage biotech company that has spun out of the UMR-S 945 Immunity and Infection Laboratory (a joint INSERM - Pierre & Marie Curie Université of Paris research unit) at the Pitié Salpêtrière Medical Center in Paris.

InnaVirVax was founded by Professor Patrice Debré, Dr Vincent Vieillard and Dr Joël Crouzet in order to develop new anti-HIV therapies on the basis of a breakthrough discovery.

InnaVirVax is also developing a novel biotherapy in the field of cancer.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- An innovative immunotherapy for HIV-1 infected patients, protecting the immune system from the CD4 + T lymphocyte depletion, that would act in synergy to antiretrovirals.
- A prognostic test for the prediction of immunodepression and the monitoring of HIV patients.
- A biotherapy for immunodeficiency in treatment-failure HIV-1 patients.
- An innovative cancer biotherapy.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- InnaVirVax was an award winner of the French Ministry of Research's 2008 business plan competition for innovative companies. Moreover InnaVirVax has been an award winner of the "Tremplin Entreprises" from the French Senate in 2011.
- Furthermore, InnaVirVax has obtained a grant- in-aid from the French National Research Agency as part of the BiotecS program on therapeutic HIV vaccines.
- InnaVirVax has completed a series A round of funding of €1.1M in mid 2009.
- InnaVirVax completed early 2012 a series B round of funding of €3.7M.
- The lead therapeutic candidate of InnaVirVax (VAC-3S) has met Phase I/IIa primary endpoint in 2012. The beginning of a Phase II clinical trial is scheduled in 2013.

COLLABORATIONS SOUGHT

InnaVirVax is seeking industrial partners (in the therapeutic and diagnostics sectors) with the ability to co-develop and to pursue the development of InnaVirVax's projects. ■

2 PATENTS FAMILIES from the INSERM and the Paris Public Hospitals Group (AP-HP) and 3 patent families filed since the incorporation of InnaVirVax.

9 STAFF MEMBERS

STRENGTHS: developing the applications of a breakthrough innovation with "first in class" products.

INNOVATION ASSETS: the company's development products address unmet needs.

Diagnostics

IntegraGen

CEO
Bernard Courtieu

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Date of founding 2000

FIELD OF ACTIVITY

Develop innovative molecular diagnostic tests, responding to major unmet medical needs, based on the company's unique expertise in clinical genomics. IntegraGen's vocation is firstly to establish the link between innovations derived from molecular research and medical practise, by developing biomarkers for autism and oncology specifically intended for clinical use, and subsequently to make its genomics services available to practitioners and researchers thanks to its exceptional technological and scientific know-how.

KEYWORDS
Autism / Oncology / Metabolism / Diagnostics / Genetics

BACKGROUND

IntegraGen was founded in 2000 on the basis of a locus identification technology for familial, polygenic diseases. The company rapidly built a portfolio of patents protecting its discoveries in the field of genetic predispositions.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Unique personalized sequencing services.
- First French Services Lab equipped with an Illumina MiSeq.
- IntegraGen offers pharmacogenomics services (sequencing and genotyping) to research organizations on a CRO basis.
- Diagnostics: Integragen is developing panels of biomarkers likely to indicate an increased risk of disease onset (in autism and oncology), contributing to early molecular diagnosis and treatment.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- June-2012: IntegraGen launched the ARISk® Test, a risk assessment test for autism for siblings of an affected proband, during the summer of 2012. Initial physician orders have demonstrated the validity of IntegraGen's organization centered around its contracted CLIA laboratory and expanded its interaction with the clinicians dealing with autism. These first sales have enabled IntegraGen to initiate a collaborative dynamic with pediatricians, child psychiatrists and child neurologists.
- Feb-2012: In partnership with IntegraGen, Cleveland Clinic Children's Hospital has launched a study to determine whether genetic markers can be used to help identify children who are at risk of developing autism.
- April 2011: IntegraGen entered into an exclusive licensing agreement with The Johns Hopkins University and Massachusetts General Hospital to commercialize genetic tests that identify children at risk for autism.
- Service contracts with Servier.
- Industrial and academic collaboration agreement for biomarkers validation in the field of oncology.

COLLABORATIONS SOUGHT

In order to develop innovative and clinically useful diagnostic tools, IntegraGen controls the entire Genomic Diagnostics Services development chain:

- Technological leadership and command of state-of-the-art genomics, particularly command of technologies such as high bit-rate sequencing and genotyping and, in more general terms, all technologies relative to analysis of DNA and genetic cell material.
- Integration of academic or private research into the networks as partner or service provider.
- Establishment of networks of clinical practitioners specialised in targeted pathologies where the tools developed serve to improve patient care.
- Control of the biostatistics and bioinformatics validation aspects.
- Perfect knowledge of regulatory aspects.
- Access to reference laboratory markets in Europe and North America.

IntegraGen's vocation is to be number 1 in the genetic test field, thus contributing to diagnostics and improving care for targeted pathologies such as autism and certain forms of cancer. ■

ANNUAL TURNOVER IN 2011: €4.7M

11 PATENTS

30 STAFF MEMBERS

STRENGTHS: a full range of genetics platforms.

Validated diagnostic tools.

INNOVATION ASSETS: launch of a new personalized sequencing service, the first offering of this type in France. IntegraGen is the first French Services Lab equipped with an Illumina MiSeq.

Biomanufacturing / pharmaceutical services

Keyrus Biopharma

CEO
Kemal Mebarki

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Date of founding 1998

FIELD OF ACTIVITY

Clinical Research Organization, full service in clinical development with management of your projects from the regulatory needs to the follow-up of your product in Pharmacovigilance.

KEYWORDS

CRO / Clinical research / Regulatory affairs / Pharmacovigilance / Innovation

BACKGROUND

Created in 1998, Keyrus Biopharma is a full service CRO, covering Europe, the Middle East and the Maghreb, with the ability of supporting health industries (pharmaceuticals, biotechnology, medical device, nutrition and cosmetics) with our advices and expertise.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Provides comprehensive or on-demand services offer in clinical development (regulatory affairs, medical writing, project management, monitoring, biometry, pharmacovigilance...).
- Combines use of tools (Oracle® Clinical and RDC, BusinessObjects®, SAS®, Oracle® Argus, Qlickview®).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- A real adapted expertise in project management (many references in biotechnology areas and medical device).
- We are certified ISO 9001.
- Achievements in areas of advanced research, such as cell therapy.

COLLABORATIONS SOUGHT

Ability to take risks towards companies involved in the launch of their first product. ■

ANNUAL TURNOVER: €18.5M

230 STAFF MEMBERS

STRENGTHS: innovative, responsive and flexible company.

Reference of quality, competitive pricing, experience

INNOVATION ASSETS: innovation team since 2 years.

R&D services and products

LPS-BioSciences

CEO
Frédéric Caroff

CSO
Asmaa El Hamidi-Jobic

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Date of founding 11/2011

FIELD OF ACTIVITY

Bacterial endotoxin production, analysis and removal. R&D in vaccines and adjuvants. Detection of bacterial pathogens.

KEYWORDS

Endotoxin / Lipopolysaccharide / LPS - Antigen / Structure / Extraction / Removal / Adjuvant / Vaccine

BACKGROUND

LPS-BioSciences is specialized in bacterial endotoxins. It combines an exclusive proprietary technology for endotoxin production and characterization with the know-how originating from Paris-Sud Université and CNRS and acknowledged international expertise of its founder Martine Caroff, D. Sc. (Director of Research at CNRS).

The company runs an innovative R&D project of a vaccine adjuvant which was granted and supported by OSEO.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

LPS-BioSciences is specialized in bacterial endotoxins (lipopolysaccharides) and offers services of extraction and analysis to use and study LPS, but also elimination to remove them. The company provides its services to industrial and academic partners from the human and animal health domain but also from cosmetics.

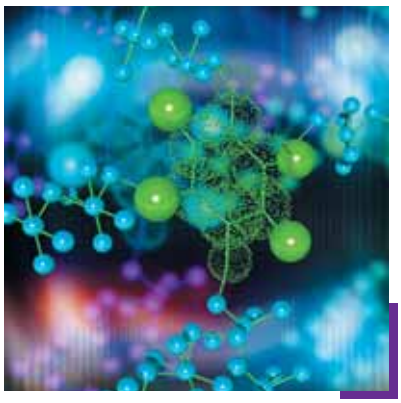
New concepts in the vaccine field are under preclinical development to provide next generation of adjuvant.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Participation in the Infect ERA European program for 2013 and 2014.
- 2 Long term collaboration contracts in 2012 and 2013 with CEVA animal health.
- Contract in 2012 with the first global company from the cosmetic industry.
- A prize winner in the 2012 Scientipôle cluster competition.
- A prize winner in the 2011 French national business plan competition for high-tech start-ups.
- A prize winner in the 2008 French national business plan competition for high-tech start-ups.
- Winner of the 2006 research exploitation prize awarded by the Essonne County Council and Paris-Sud Université.

COLLABORATIONS SOUGHT

- Academic research laboratories and private companies involved in R&D for diagnostic, vaccines and adjuvants.
- Biotech, diagnostic, food processing, and cosmetology companies. ■

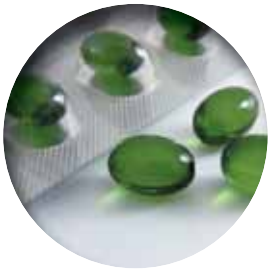


1 PATENT (exclusive licence agreement).

STRENGTHS: on-demand, large-scale and highly purified LPS production.

Acknowledged expertise for LPS characterization, analytical device, innovative methods.

Innovation assets: methods for endotoxin extraction and purification (without use of toxic solvents).



Therapeutics

LTKfarma

PRESIDENT
André Ulmann

CSO
Dorothée Carvallo

PHARMACEUTICAL DEVELOPMENT AND REGULATORY SCIENTIFIC FOUNDERS
Pr David Klatzmann
François Lemoine
Dr José Cohen

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Date of founding 03/2006

FIELD OF ACTIVITY

Development and marketing of cell therapy products (derived from modified T-cells) for the treatment of leukemia and of certain auto-immune diseases and solid tumors.

KEYWORDS

Cell Therapy / T lymphocyte / T regulatory cell / Suicide gene / GvHD / Allograft

BACKGROUND

LTKfarma is a biotech company that was spun out of research performed at the "Biology and Therapy of Immune Diseases" laboratory (a joint CNRS/Pierre & Marie Curie University of Paris research unit) and the Biotherapy Division at the Pitié-Salpêtrière Hospital.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

LTKfarma develops two products (TK-1 and TK-54) by modifying *in vitro* the donor's T lymphocytes *via* the introduction of a "suicide gene" for TK-1 and *via* T regulatory cells depletion to improve anti tumor effect and suicide gene introduction for TK-54. Suicide gene introduction enables post-graft cell selection. The objective is to:

- Drastically reduce mortality from graft-versus- host disease (GVHD), the main complication of allogeneic, hematopoietic stem cell transplantation (HSCT), i.e. a target figure of 5% instead of today's 20%-60%.
- Offer HSCT as a therapeutic alternative with an enhanced risk/benefit ratio for patients suffering from solid tumors and severe forms of autoimmune diseases such as scleroderma, multiple sclerosis and rheumatoid arthritis.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

To date, TK-1 has been tested in Phase I/II clinical trials for the treatment of hematological cancers, with funding from the company's partners, the Paris Public Hospitals Group (AP-HP) and the French Muscular Dystrophy Association (AFM).

In parallel, LTKfarma is developing a new product TK-54 (derived from TK-1) and will start new Phase I/II clinical trials for leukemia within 2 years.

LTKfarma obtained from EMA (European Medicines Agency) for TK54 product an ATMP classification (Advances Therapy medicinal Product) in March 2010 and an orphan drug designation in acute myeloid leukemia application and in acute lymphoblastic leukemia respectively, in September 2010 and June 2011.

LTKfarma was a top prizewinner in the French Ministry of Research's 2005 business plan competition for innovative companies, obtaining a €450,000 grant-in-aid.

COLLABORATIONS SOUGHT

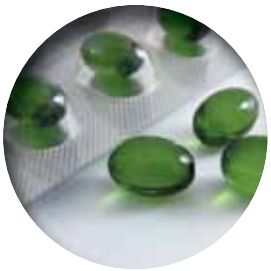
The company is currently seeking academic, industrial and commercial partnerships for the development and commercialization of its TK-1 and TK54 products.

In parallel, the company has committed to finding financial partners which will enable it to pursue its regulatory and clinical efforts, with the goal of obtaining its first product marketing approval the coming 10 years. ■

4 PATENTS

STRENGTHS: Recent IP on a technology with a clinical proof of concept.

INNOVATION ASSETS: 4 life-saving procedure.



Therapeutics

MABLife

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François Vallet

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Date of founding 15/02/2000

FIELD OF ACTIVITY

MABLife is specialized in research and development of monoclonal antibodies for therapeutic and diagnostic use.

KEYWORDS
Monoclonal antibodies / Therapeutic products / Diagnostic products / Services provider / Preclinical and clinal development

BACKGROUND

Four products in preclinical development:

- Ophthalmology: anti-CD160 antibody, angiogenesis inhibitor for the treatment of ocular diseases (AMD, neovascular glaucoma, retinal vein occlusion, diabetic retinopathy, retinopathy of prematurity, corneal neovascularization due to inflammation, trauma, burns and transplants).
- Hematology-oncology and autoimmune/inflammatory diseases:
  - Antibody targeting the transmembrane isoform of the CD160 receptor.
  - Anti-CD5 / anti-HLA-DR combination.
- Infectious/nosocomial disease: anti-*aspergillus fumigatus* for diagnostic use and treatment of invasive *Aspergillums* infections.

Clinical development:

- MABLife is developing an Yttrium-90 coupled polyclonal antiferritin antibody (Ferritarg-P) for the radioimmunotherapy of refractory Hodgkin's disease. Ferritarg-P obtained "Orphan Medicinal Product" status for this indication from EMA in 2004 and from FDA in 2006; it has successfully completed a Phase I clinical trial.

Services provider
(MAB'Solut, www.mabsolut.com):

- With its MAB'Solut division, MABLife offers a complete range of services covering the full spectrum of antibody development:
  - Antigen preparation (hapten conjugation, fragmentation, etc.).
  - Immunizations, fusion, screening, selection and production of hybridomas.
  - Production and purification of monoclonal and polyclonal antibodies.
  - *In vitro* antibody characterization and validation (functional and analytical tests).
  - Design of bioassays to study antibody activity mechanisms.
  - Molecular biology to optimize antibodies: chimerization, fragment construction (ScFV, ScFV2, dAb), bispecific antibodies, humanization.
  - Chemical fragmentation (Fab, Fab'2) and antibody coupling (biotin, enzymes, fluorochromes, cytotoxic molecules, etc.).
  - *In vivo* efficacy studies in rodents, particularly in the field of oncology (syngeneic, metastatic and xenograft models).
  - Development of specific *in vivo* models upon request.

COLLABORATIONS SOUGHT

MABLife proposes co-development partnerships to industrial partners for its therapeutical products as well as for the development of biomarkers and theranostic tests. ■

6 PATENTS
9 STAFF MEMBERS

Agriculture / Environment

Magpie Polymers

PRESIDENT
Steve van Zutphen

CSO
Étienne Almoric

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Date of founding 14/02/2011

FIELD OF ACTIVITY

Magpie Polymers is a proprietary and disruptive filtration technology to recover precious metal from industrial waste and process water and also to treat highly polluted industrial water. With a technology based on coordination chemistry, Magpie selectively and efficiently recovers dissolved metals while cleaning the water.

Magpie commercializes its polymers beads and its water treatment systems mainly in the fields of precious metal refining, surface treatment and micro-electronics.

KEYWORDS
Water treatment / Precious metals / Recycling / Pollution / Recover / Toxic metals

BACKGROUND

There is an increasing need to recover and recycle rare and precious metals. At the same time, industry struggles to reduce metal content in its waste-water and stay in line with ever stricter regulation. Magpie Polymers develops filtration material for difficult to treat industrial waste-water and selectively recover precious metals. The company is based on research carried out by Steve van Zutphen at the Ecole Polytechnique in 2006 and was founded in 2011 together with Etienne Almoric.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Magpie produces high-performance filtration resins. When water is filtered through a cartridge of Magpie, the metals, such as palladium, platinum, gold, indium or uranium, are selectively retained. The metal concentration after treatment is close to the detection limit of modern analysis equipment. The metals captured onto the polymer can easily be recovered.

Magpie Polymers has an application and analysis laboratory able to develop custom solutions for difficult to treat water to answer specific customer needs.

Magpie design and build filtration systems for the recovery of precious metal and also for the abatement of toxic metals.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

In 2012 Magpie has sold its technology to several precious metal refining companies across Europe for the recovery of PGM (Platinum Group Metal) in strong acidic solution.

Magpie also set up a filtration equipment for indium and gallium for a photovoltaic company that allow them to comply with environmental regulation and to recover those metals.

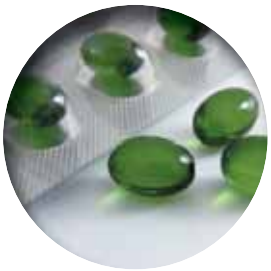
In 2013 Magpie will be able to grow further in these markets and start developing an offer for international mining operations. ■

3 PATENTS

9 STAFF MEMBERS

STRENGTHS: simple application: Magpie's technology is used in standard filtration hardware. Removal of toxic and recovery of highly valuable metals is optimized according to the client's requirements: Custom made solution.

INNOVATION ASSETS: an innovative technology that is more selective and efficient than all competing materials for the recovery of precious metal in industrial waste and process water.



Therapeutics

Metabrain Research

PRESIDENT
Valérie Autier

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Date of founding 03/2009

FIELD OF ACTIVITY

Metabrain is a Partnering Research Organization (PRO) that enriches and leverages early-stage pipelines in the field of metabolic and neurodegenerative diseases. Its customers include pharmaceutical, biotech and food industry companies and academic labs.

KEYWORDS

Drug and nutraceutic discovery / Lead Optimization / Metabolism / Diabetes / Obesity / Alzheimer / Collaborative innovation

BACKGROUND

A group of 30 scientists – all experts in diabetes and metabolic disorders – joined Metabrain Research on the basis of their know-how in drug discovery developed at Merck Serono.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Metabrain runs collaborative research projects and contract research programs that focus on the links between metabolic and neurodegenerative diseases. We are investigating both therapeutic (drug-based) and preventive (nutraceutical) approaches in the treatment of diabetes, obesity and Alzheimer's disease.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Customers and partners: more than 15 partners from biotech, pharma and academia.
- Biophytis' Partner for SARCOB (Budget of €2.4M), a leading project in obesity and sarcopenia supported by the Department Council of Essonne.
- Several national and European Union collaborative programs are ongoing or under review.
- Work on NCEs, NBEs, natural products and food supplements.

COLLABORATIONS SOUGHT

- Research alliances on first-in-class antidiabetic drugs.
- Contract research: medicinal chemistry and *in vitro* and *in vivo* biological profiling.
- Research collaborations for validating novel targets and discovering new drugs on the basis of connections between metabolic and CNS disorders. ■

ANNUAL TURNOVER: €3M

30 STAFF MEMBERS

STRENGTHS: turnkey collaborative research programs.

Standard drug discovery platform that specializes in metabolic disorders.

INNOVATION ASSETS: common molecular targets for treating both metabolic and neurodegenerative disorders.

R&D services and products

METAFORA biosystems

PRESIDENT
Luc d'Auriol

CSO
Vincent Petit

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Date of founding 03/2011

FIELD OF ACTIVITY

METAFORA biosystems develops innovative biomarkers of cell metabolism based on nutrient transporters profiling at the cell surface, using unique ligands specific for these metabolic key players.

KEYWORDS
Biomarker / Metabolism / Transporters / Toxicology / Stem cells

BACKGROUND

METAFORA biosystems has its headquarters in Montpellier, and has opened its wet lab at Genopole Entreprises Incubator.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The science and technologies behind METAFORA biosystems are focused on cell physiology and metabolism. The expertise of the company stems from its capacity to generate and commercialize expression profiles of nutrient transporters at the cell surface, for different application areas, notably in drug development either during R&D or during the course of clinical trials. They also participate in cost saving by allowing an earlier attrition of toxic molecules as well as by refining diagnostics and helping in the definition of new personalized medicine.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

METAFORA biosystems is one of the industrial partners of StemSAFE, a FUI funded project aiming to develop new tools for ATMP (Advanced Therapeutical Medical Products) securitization. The company won the National Competition for the Creation of Innovative Companies, organized by the French Ministry of Research, in July 2012.

COLLABORATIONS SOUGHT

METAFORA biosystems seeks for industrial and academic partnerships for drug response and drug toxicity biomarkers discovery and development, both in preclinical and clinical settings. ■

INTELLECTUAL PROPERTY: contract license agreement on 2 patents (CNRS)

8 STAFF MEMBERS

STRENGTHS: the sole industrial to exploit nutrient transporters as metabolic biomarkers of cell physiology. A biomarker easy to use / a high transferability of the technology / established collaborations with leading academic groups.

R&D services and products

New England Biolabs France

GENERAL MANAGER FRANCE
Éric Beguec

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Date of founding 02/03/2011

FIELD OF ACTIVITY

New England Biolabs is a private company manufacturing reagents for the life science industry particularly focused on products for genomic research.

KEYWORDS

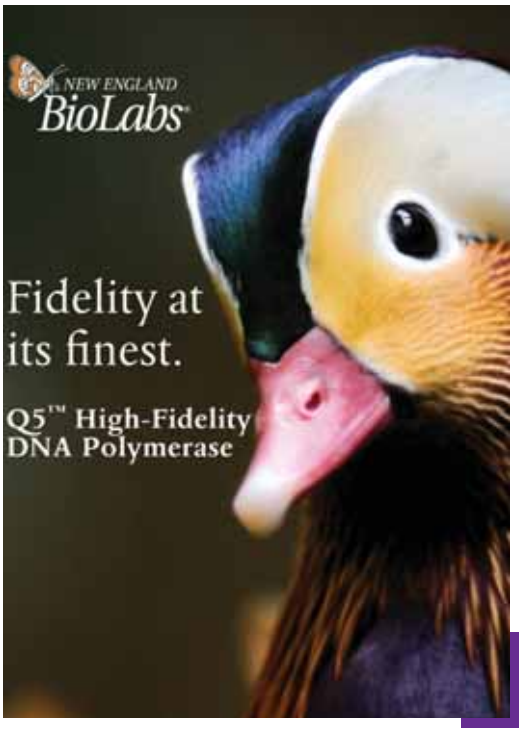
Enzymes / Molecular Biology / Next Gen sequencing kits / Molecular weight ladders / Epigenetic / Genomic Research

BACKGROUND

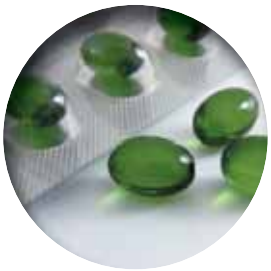
Established in the mid-1970s as a co-operative laboratory of experienced scientists, New England Biolabs (NEB) is a world leader in the production and supply of reagents for the life science industry. NEB is headquartered in Ipswich, Massachusetts, USA and has seven subsidiary offices including NEB France which opened in 2011.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

NEB now offers the largest selection of recombinant and native enzymes for genomic research and continues to expand its product offerings into areas related to Next Gen Sequencing, nucleic acid manipulation, protein expression, glycobiology and epigenetics. NEB serves the academic and industrial research market in addition to customised products for drug discovery and molecular diagnostics. ■



STRENGTHS: NEB is vigorously committed to servicing our customers with best-in-class products, unparalleled technical support and an R&D depth unmatched by organisations many times our size.



Therapeutics

Nokad

CEO
Amine M. Abina

VICE-PRESIDENT
François Erard

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Date of founding 21/01/2004

FIELD OF ACTIVITY

Validation of *in vivo* targets.

KEYWORDS

Thrombosis biomarkers / Therapeutic and preventive vaccines / Functional protein knock-out (KO) / Treatment of thrombopenia / Bioinformatics platform / Rapid validation of *in vivo* targets in various species

BACKGROUND

Nokad was founded in 2004 with the objective of developing an innovative technology platform for the *in vivo* validation of drug targets. This development work prompted Nokad to explore a newly discovered biological pathway in hematopoiesis and, in parallel, validate its vaccine approach in several in-house and external collaborative programs.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Viable adult Erythropoietin-functional Knock-Out mice and rats.
- New strategies in therapeutic and prophylactic vaccination using the cross-reactivity approach.
- Functional protein KO in various mammalian species.
  - *In vivo* validation of hepatic or local targets *via* RNAi or shRNA delivered by a recombinant virus.
  - *In vivo* overexpression of target genes using recombinant adenoviruses or adeno-associated viruses.
- Generation of antibodies against non-antigenic or conserved proteins using the cross-reactivity strategy 3.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Creation of the first viable EPO-KO models in several animal species.
- Discovery of a new biological pathway in hematopoiesis, in collaboration with the INSERM.

In vivo target validation programs performed for pharmaceutical companies.

- Receipt of a major grant from the French National Research Agency in 2009.

COLLABORATIONS SOUGHT

We are looking for partners involved in the development of biomarkers of venous and arterial thrombosis and the treatment of thrombocytopenia.

Collaborations are also sought for the evaluation of new strategies in therapeutic and prophylactic vaccination in human and veterinary medicine.

Nokad is also looking for a partner to distribute some of the animal models developed in-house.

Innovative therapeutics applied to various types of cancer; therapeutic vaccination. ■

5 PATENTS

6 STAFF MEMBERS

STRENGTHS: an innovative strategy for target validation and for vaccination.

Rapidly available, high-quality information on validation.

INNOVATION ASSETS: an integrated platform for *in vivo* target validation; a novel vaccine strategy.

Medical devices

Novacyt

CEO
Éric Peltier

CHIEF OPERATING OFFICER
Jean-Pierre Crinelli

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Date of founding 11/07/2006

FIELD OF ACTIVITY

Novacyt develops innovative medical cytology solutions (notably an entirely automated, liquid-based cytology system) which are sold worldwide.

KEYWORDS

In vitro diagnostics / Automation / Liquid-based cytology

BACKGROUND

Novacyt was founded with the goal of becoming a major player in cytology diagnostics. The company's expertise know-how is based on its knowledge of medical cytology and the development, industrialization and commercialization of *in vitro* diagnostic devices.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Novacyt commercializes a complete thin-layer cytology range. The NOVAPREP® *Via*l Test Gyn and Non Gyn consumables and the NOVAPREP® Decantation System are dedicated for use with the NOVAPREP® NPS25 and NPS50 processing systems.

Novacyt sells its automated cytology solutions in France and has a worldwide distribution network.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

In just two years, Novacyt has developed and commercialized a fully automated solution for liquid-based cytology, which has already been adopted in over 15 countries. Thanks to its standardization and high quality, this innovative system is improving diagnostic performance levels in medical cytology.

COLLABORATIONS SOUGHT

Novacyt is looking for commercial partners in Brazil, China and India. ■

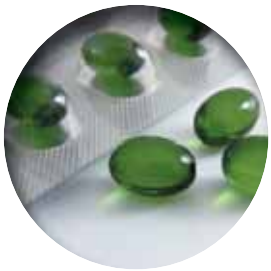
ANNUAL TURNOVER: €1.5M

19 PATENTS

8 STAFF MEMBERS

STRENGTHS: innovation, industrial processes, marketing & sales, regulatory issues.

Market knowledge, product-market matching and a multidisciplinary team.



Therapeutics

Novagali Pharma (Santen SAS)

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Jérôme Martinez

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Date of founding 08/08/2000

FIELD OF ACTIVITY

Novagali Pharma is an ophthalmic pharmaceutical company that develops and markets innovative ophthalmic products for all segments of the eye. Thanks to its three proprietary technology platforms, the company has a portfolio of innovative products from which one is already commercialized and two are in phase III clinical trials.

KEYWORDS
Ophthalmology / Technologies / Cationorm®

BACKGROUND

Novagali Pharma was created in August 2000 by Simon Benita. The company then set up its labs and corporate offices at Évry Genopole. In 2003, the company started to focus on ophthalmology and launched its first product Cationorm® in France in 2008.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Based on its three patented technology platforms, Novasorb®, Eyeject® and Li-prodrug®, Novagali has developed a portfolio of diversified products in late-stage development. Cationorm®, indicated to treat dry eye symptoms, is the first product marketed in Europe, South East Asia, MENA and in the USA.

Products under development include Cyclokat® (phase III) for the treatment of severe dry eye syndrome, Vekacia® (phase III) for treatment of vernal keratoconjunctivitis, Catioprost® (phase II) indicated for the treatment of glaucoma and Cortiject® (Phase I) for the treatment of diabetic retinopathies.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Since its incorporation, Novagali Pharma has raised a total of around € 59M in four rounds of fundraising.

In 2008, Novagali Pharma launched the first product to come out of its pipeline: Cationorm®, an innovative cationic emulsion for treating the symptoms of dry eye syndrome.

In April 2010, Novagali Pharma and its partners in the Vitrena project obtained € 9.4M in funding from Oséo for this diabetic retinopathy project. In July, Novagali Pharma successfully achieved an IPO raising € 22M and is listed on NYSE Euronext Paris. Late 2011, the company was acquired by the Japanese Santen group, a global leader in ophthalmology. ■

28 PATENTS

48 STAFF MEMBERS

STRENGTHS: Cationorm®, its first product on the market; 3 innovative technology platforms, with Novasorb® for the eye surface and the anterior segment, Eyeject® for administering drugs to the back of the eye and Li-Prodrug® based on prodrug administration to the eye; a late stage pipeline with two products in Phase III; a pilot production unit for industrial-scale transfers. Novagali Pharma is an integrated company combining experience in and knowledge of formulation, analysis, preclinical testing, manufacturing, clinical trials, regulatory affairs and marketing.

INNOVATION ASSETS: development of innovative drugs for all segments of the eye; patented technologies to increase the bioavailability of drugs while improving tolerance.

Medical devices

Novian Health

PRESIDENT
Julian Itzcovitz, Ph.D.

CSO
Eugene Bajorinas

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Date of founding 20/12/2011

FIELD OF ACTIVITY

Novian Health is developing image-guided minimally invasive tumor treatments by using interstitial laser therapy techniques.

Launching an European multi-center trial to demonstrate effectiveness of Novilase® to ablate small breast cancers and further on partnering with French luminary institutions for extending the clinical applicability of the Novilase® device.

KEYWORDS
Interstitial Laser Therapy (ILT) / Novilase® / Breast Cancer / Minimally Invasive & Ambulatory Treatment

BACKGROUND

Novian Health SAS is a wholly owned subsidiary of Novian Health Inc. which was founded by internationally renowned breast surgeon Kambiz Dowlat, M.D. The Company is developing proprietary technology for the treatment of tumors by using Interstitial Laser Therapy (ILT). The Institut Gustave Roussy is leading a multi-center European clinical trial to demonstrate the safety and effectiveness of Novilase® to ablate small breast cancers. Other research and development activities are planned involving partnerships with French public & private institutions.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Novilase® is the company's first device that uses controlled heating with a laser to ablate breast tumors in a minimally invasively procedure which is an alternative to surgery (e.g. lumpectomy). Ultrasound, or stereotactic x-ray imaging guidance is used to position the two small probes within the ablation zone. One probe contains the laser fiber to heat the tumor and the other measures temperature at the periphery of the ablation zone. This patented approach provides precise, real-time monitoring and control of the ablation. Novilase® has a proven feasibility based on a 65-patient study done at Rush University Medical Center in Chicago.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

The Company has received U.S. FDA 510(k) clearance for the treatment of benign breast tumors and ablation of soft tissue. In addition, FDA IDE and MHRA (U.K.) approvals have been received to begin a multi-center clinical trial to assess the effectiveness of Novilase® to ablate malignant breast tumors. Through a research collaboration agreement with the IGR and a comparable multi-center clinical trial has been initiated in France at the end of 2012. Other research and development projects are planned with luminary French public & private institutions to extend the clinical applicability of the Novilase® device.

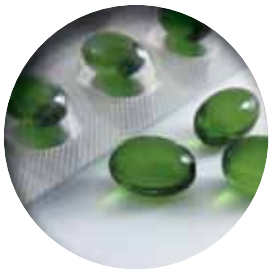
COLLABORATIONS SOUGHT

The company is seeking financial partners to complete european fundraising and will enable it to reach key milestones: EU regulatory approval, EU first sales and a robust data set for U.S. regulatory filing. The company is also seeking strategic partners to co-develop image-guided laser therapies and accelerate European and/or global commercialization post regulatory approvals. ■

32 ISSUED PATENTS, REGISTERED DESIGN AND REGISTERED UTILITY MODELS (16 EU, 9 U.S., AND 7 INTERNATIONAL) AND MULTIPLE PENDING APPLICATIONS

STRENGTHS: significant market size ($2 billion EU & US; $1 billion annual procedures). Robust IP portfolio. Scaleable business model based on recurring revenue from sale of disposables. Potential applicability of platform technology to other tumor indications and markets.

INNOVATION ASSETS: the opportunity to be the first minimally invasive treatment option for women with breast tumors. The Novilase® proposed treatment has a better patient comfort & recovery, a high efficacy and lower cost compared to surgery.



Therapeutics

Nutrivercell

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Loïc Renard

CSO
Aymen Jabrane

INTERNATIONAL PROJECT MANAGER
Cynthia Renard

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Date of founding 31/03/2009

FIELD OF ACTIVITY

Nutrivercell designs, formulates, develops, manufactures and markets nutraceuticals with medical added value.

KEYWORDS
Nutritional ingredients / Polyphenols / Combination with medicines / Infectious diseases / Inflammation

BACKGROUND

Nutrivercell was founded in March 2009 by a pharmacist with the objective to reinforce conventional medicines efficiently with high quality nutritional ingredients.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Nutrivercell has focused its development on infectious disease and inflammation.

DUAB®, an antibacterial product, is used in combination with antibiotics to strengthen their efficacy by reducing the virulence and the resistance of the main bacterial strains met in the urinary tract infections. DUAB® was launched in French pharmacies in late 2010 and is being promoted *via* medical visits to physicians and a direct sales network in pharmacies.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

By December 2012, over 3,500 pharmacies were selling DUAB® over the counter in France.

Mid 2013: market launch of the anti-inflammatory. Product NEOGIL® developed in partnership with the University of Bordeaux.

March 2013: start of patients' inclusion in a clinical study to obtain a claim as "reducing disease risk" article 14 of EFSA (European Food Security Agency) DUAB®.

February 2013 first international distribution agreement.

COLLABORATIONS SOUGHT

Partner with OTC Nutritional & Pharmaceutical Products specialized in urology/gynecology and/or inflammation, with a view to access international markets. ■

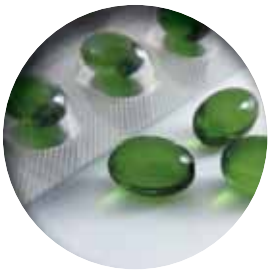
3 PATENTS

3 STAFF MEMBERS

STRENGTHS: innovative strategy focused on combination with drugs.

Strong scientific, medical and supply chain expertise.

INNOVATION ASSETS: synergistic nutraceutical-drug combinations.



Therapeutics

ObeTherapy Biotechnology

CEO
Itzik Harosh

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Date of founding 19/01/2000

FIELD OF ACTIVITY

Drug discovery for the treatment of obesity and metabolic diseases.

KEYWORDS

Obesity / Type II diabetes / Lean or starvation phenotype

BACKGROUND

ObeTherapy Biotechnology's business is based on its innovative approach to identifying novel genes that can be used as therapeutic targets in obesity. The paradigm is diametrically opposed to conventional ethos in this field: instead of looking at what genetically characterizes the obese phenotype, ObeTherapy Biotechnology is focusing on the lean or starvation phenotype.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

ObeTherapy Biotechnology's main goals are to:

- identify new target genes for the treatment of obesity and related pathologies,
- validate these targets by establishing transgenic animal models,
- identify new chemical entities which can modulate the products of these target genes,
- develop these NCEs up to the preclinical phase.

This has enabled it to identify, validate and patent a family of genes involved in energy supply. These genes are high potential therapeutic targets, since they are non-redundant and are very specific. Drugs that bind to these targets are identified by using a high-throughput screening method patented by ObeTherapy.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

The discovery of new therapeutic molecules and their development up to market launch are performed in close collaboration with the Zambon group (Milan, Italy). In parallel, a new gene candidate and inhibitors have also been recently identified. The establishment of an alliance for this second target is currently under discussion.

COLLABORATIONS SOUGHT

ObeTherapy Biotechnology is currently seeking industrial and financial alliances, in order to finalize the preclinical trials on two lead targets. ■

7 PATENTS
4 patents on novel molecules.
2 patents on new target molecules for type 2 diabetes treatment.
1 patent for a high-throughput screening method.

2 STAFF MEMBERS

STRENGTHS: one molecule in the preclinical phase and another in "lead optimization".

INNOVATION ASSETS: ObeTherapy looks at targets produced in a lean phenotype.

Medical devices

OsseoMatrix

CHAIRMAN & CEO
Dr Didier Nimal

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Date of founding 24/03/2009

FIELD OF ACTIVITY

OsseoMatrix designs, manufactures and markets customized bioceramic implants to compensate for critical size bone defects on cranio-maxillofacial and orthopedic area.

KEYWORDS
Implant / Bioceramics / Customized / Rapid prototyping / Porosity programmed

BACKGROUND

After twenty years with leading international companies on the market for implantable medical devices, Dr Nimal Didier has developed a manufacturing technology of implants by laser process from calcium phosphate powders.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Combining its expertise in the shaping of materials and the processing of digital scanners OsseoMatrix offers a set of innovative solutions for the surgical treatment of bone loss: study models, substrates, surgical guides, customized bioceramic implants with programmed porosity.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Winner of National Contest of creating innovative technology companies of the Ministry of Research into Emerging category (2008) and Creative development (2010), OsseoMatrix was awarded the Grand Prix Siemens Innovation in September 2011. In 2012 OsseoMatrix is coordinator of the project of the National Agency of Research (ANR) OrthoFlase (partners CEA, Ecole Mines, CNRS, SISNCOM).

COLLABORATIONS SOUGHT

International distributors. ■

ANNUAL TURNOVER: €120K

2 INTERNATIONAL PATENTS PUBLISHED

5 STAFF MEMBERS

STRENGTHS: innovative technology with high potential: customized implants, same chemical composition as bone.

INNOVATION ASSETS: programmed porosity.

R&D services and products

PartnerChip

CEO
Pascal Soularue

DIRECTOR
Nadia Billault

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FIELD OF ACTIVITY

PartnerChip offers its customers a panel of tools for genomics, high-density microarray analysis, diagnostics and bioinformatics.

KEYWORDS
Biomedicine / Microarray / Diagnostics / Genomics / Bioinformatics

BACKGROUND

PartnerChip was incorporated in January 2005 and is an accredited “Affymetrix Official Service Provider”. Since 2007, PartnerChip has been developing its own diagnostic microarrays. In 2010, PartnerChip became official service provider for Roche-Nimblegen. In 2012 PartnerChip became Official Service Provider for Toray, a Japanese firm providing miRNA facilities.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

PartnerChip offers services such as array design, spotting quality control, targeted on-chip hybridization on chips (gene expression, exon jumping analysis, genotyping, resequencing, comparative genomic hybridization, microRNAs, methylation, epigenetic variations, etc.), array preparation and reading, generation and analysis of raw data (normalization, comparison, statistical analysis, clus- tering, pathway involvement and data mining).

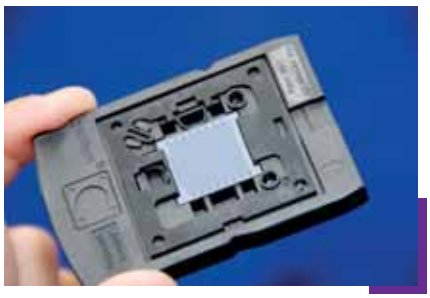
PartnerChip also develops resequencing chips for diagnostics and antibodies arrays.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- PartnerChip was involved in the Medicen Paris Region cluster’s Biotype project and in five European Union projects (EuroIron, ProteinStorage, PrediCancer, NMD-Chip, CaroMaize).

COLLABORATIONS SOUGHT

PartnerChip is seeking to establish collaborations with all types of biotech firms (red, green and white), pharmaceutical companies and CROs. ■



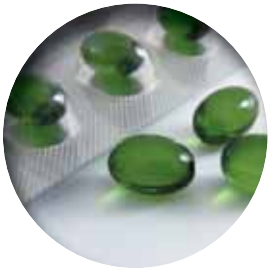
ANNUAL TURNOVER: €320K

2 PATENTS

4 STAFF MEMBERS

STRENGTHS: responsiveness, creativity, 20 years of experience in genomics.

INNOVATION ASSETS: the development of new tools in the field of diagnostics.



Therapeutics

PEP-Pharma

PROJECT LEADERS
Angelita Rebollo, Fariba Némati, Didier Decaudin

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Date of founding 2013

FIELD OF ACTIVITY

Development of innovative Cell Penetrating Peptides (CPP) as targeted therapies for the treatment of severe diseases.

PEP-Pharma develops and exploits a proprietary technology Platform of CPP (DPT) for the intracellular delivery of active molecules. These innovative molecules modulate protein-protein interactions and, thereby, inhibit key cellular mechanisms of diseases.

KEYWORDS

Cell Penetrating peptide / Targeted therapy / Caspases / Phosphatases / Cancer / Biomarker

BACKGROUND

PEP-Pharma spun out of Inserm (French national institute of health and medical research), UPMC (Leading French Scientific and Medical University) and Institut Curie (Largest French Research and Hospital Center dedicated to cancer research). The project benefits from their internationally known scientific expertise, their unique pre-clinical models and their clinical and translational research capacity.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The first product (DPT-PEP1), based on DPT technology, is a new anti-cancer targeted therapy. It specifically blocks an innovative protein/protein interaction:

- triggering apoptosis of tumour cells, without harming healthy cells,
- without affecting the rest of signalling pathways.

DPT-PEP1 (CPP of 30 amino acids) combines 2 peptide sequences:

- Optimized Penetrating « Shuttle » (DPT),
- Active Peptide (PEP1) modulating Caspase-9/PP2A interaction.

The mechanism of action is based on a caspase activation, with a cytochrome c release. It has no effect on cell cycle.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

DPT-PEP1 has already achieved the proof-of-concept *(Arrouss et al., 2012):*

- *in vitro:* DPT-PEP1 induces apoptosis in tumoral B cells from chronic lymphocytic leukemia (CLL) without affecting healthy cells (T , NK cells, monocytes), showing tumoral specificity.
- *in vivo:* DPT-PEP1 inhibits tumor growth in primary human uveal melanoma, breast, ovarian and lung and cancer xenograft models.

Neither toxicity nor immunogenicity has been detected upon prolonged *in vivo* treatment.

DPT-PEP1 constitutes a new therapeutic approach for human cancer treatment, alone or in combination with other treatments.

Based on the same DPT technology, PEP-Pharma is also developing drug candidates on other promising molecular targets, known to be involved in various cancers. Two new leads are currently under development.

In 2012, PEP-Pharma won the National Competition for innovative businesses from the French Ministry of Research.

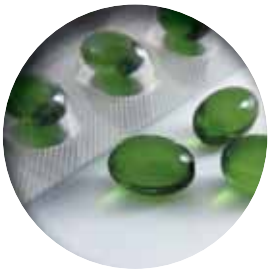
COLLABORATIONS SOUGHT

Inserm, Institut Curie, UPMC, IBV, CNIO, CEA, CSIC. ■

PATENTS: portfolio of 6 patent families covering the Cell Penetrating Peptide Technology and the first therapeutic products.

STRENGTHS: optimized Cell Penetrating Peptide Technology; *in vivo* Proof of concept on the first product; predictive biomarkers.

INNOVATION ASSETS: new targeted approach for the treatment of severe diseases.



Therapeutics

Pharnext

CEO
Pr Daniel Cohen

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Date of founding 04/2007

FIELD OF ACTIVITY

Research and development of Pleotreatments® and biomarkers based on systems biology by using a proprietary "discovery platform". Pharnext is currently focused on CNS (CMT disease, Alzheimer, Parkinson) and metabolic disorders (diabetes type 2).

KEYWORDS
Genomics / Network pharmacology / Drug repurposing / Molecule combination / Biomarkers

BACKGROUND

Pharnext was founded in April 2007 by Pr Daniel Cohen, expert in pharmacogenomics, and Philippe Pouletty, co-founder of Truffle Capital. Its core expertise is to reconstitute complex biological networks associated to one disease and identify the best combination of active molecules for targeting the molecular nodes being perturbed.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The approach is applicable to virtually any disorder and particularly suited to multifactorial diseases. Pharnext is currently focused on neurodegenerative diseases and metabolic diseases:

- CMT disease: successful phase 2 trial completed.
- Alzheimer: phase 1/2a trial in progress.
- Diabetes: leads selections
- 5 other R&D therapeutic programs in progress.
- Biomarkers validated for Alzheimer's disease.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Fund raising of €31.75M in equity from foundation.
- Partnership with pharmaceutical company Ipsen on lead program for the treatment of CMT disease (June 2009).
- Coordination of ISI project "DIPPAL" which aims at developing early diagnostic test and therapeutic approach for Alzheimer disease (November 2010).
- Proof of concept obtained in man through successful Phase 2 study of CMT (January 2013).
- Alzheimer's disease program entered Phase 1/2a study (February 2013).

COLLABORATIONS SOUGHT

- Industrial partnerships in pharmaceutical and diagnostic sectors on drug candidate and biomarkers programs.
- R&D collaborations with academic and industrial partners on early programs. ■

27 PATENT FAMILIES

35 STAFF MEMBERS

STRENGTHS: new paradigm in R&D for faster pharmaceutical developments, particularly in multifactorial diseases.

Eminent scientists and breakthrough approach in pharmaco-genomics.

INNOVATION ASSETS: active molecules combinations, repurposing of already approved drugs.

R&D services and products

Phenocell

CEO
Brigitte Onteniente

ASSOCIATE
Laure Ory-Lavollée

R&D
Xavier Nissan

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Date of founding 2013

FIELD OF ACTIVITY

Phenocell will produce and commercialize induced pluripotent stem cell lines (iPSC) from patients with rare diseases (RD-iPSC), and corresponding differentiated cells.

In addition to cells, Phenocell will provide access to state-of-the-art technologies through cell culture training, know-how and technology transfer.

KEYWORDS

Monogenic diseases / Pathological modeling / Pluripotent stem cells / Drug screening

BACKGROUND

Phenocell is a spin-off of the I-Stem Institute, conceived as an innovative technology platform for manufacturing biological tools that aim at accelerating research and drug development in the field of R&D.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Phenocell will serve academic and industrial research teams with iPSC lines and differentiated cells and tissues.
- Services will include full expertise and facilities to implement HTS and HCS projects, and a School for reprogramming and differentiation.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Brigitte Onteniente and Xavier Nissan have been selected to follow the prestigious HEC Challenge+ business education program.
- A strong partnership with I-Stem, the Genethon and the Fondation Maladies Rares, will result in a quick development of the biobank and company's assets.

COLLABORATIONS SOUGHT

Phenocell is targeting the Pharmaceutical industry, academic laboratories and SME for the production and use of disease-specific iPSC and Phenocopies in research and development programs. ■

STRENGTHS: a unique environment to develop the largest RD-iPSC and Phenocopies biobank.

A unique expertise in the field of RD and the use of RD-iPSC for research programs.

INNOVATION ASSETS: perfectly qualified and anotated RD cellular models for R&D.

R&D services and products

PhinC Development

CO-FOUNDERS
Bernard Orlandini, Éric Evène, Mathieu Felices, Virginie Gualano

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Date of founding 23/10/2008

FIELD OF ACTIVITY

Drug development support to biotech and small pharma companies in early phases from preclinical studies to phase IIa trials.

KEYWORDS

Early drug development (preclinical, I and IIa phases) - Modeling & Simulation - Pharmacometrics - Pharmacokinetics/Pharmacodynamics (PK/PD)

BACKGROUND

PhinC was founded at the Genopole biocluster in 2008 by four experienced CRO/pharmaceutical professionals with complementary competencies (pharmacology, biostatistics, pharmacokinetics, biomedical R&D).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

PhinC uses an integrated and multidisciplinary approach to provide custom-tailored scientific and operational support for companies developing drug candidates. According to your needs, we can provide partial or all-inclusive services in the following fields of activity:

- Scientific and methodological support: by furnishing supplementary expertise, PhinC provides support to the client's R&D team thus allowing this latter to first conceptualize and then pilot the development of its product. We provide pertinent counseling for fast decision-making and concrete assistance for effective deployment. Our services include the conceptualization and monitoring of preclinical and clinical trials, the development of rationale for first-in-human trials, the assistance for appropriate subcontractor selection (CRO and academic) and the constitution of associated regulatory and scientific dossiers.
- Pharmacometrics analyses: PhinC provides to its clients its multidisciplinary skills in pharmacokinetics (PK), pharmacodynamics (PD), PK/PD, toxicology, physiological based pharmacokinetics (PBPK), PK/QT (cardiac safety), PK population and all related statistics analyses. Thanks to Modeling and Simulation techniques, PhinC builds predictive pharmacological models allowing the optimization of drug development plan: MBDD approach (Model-Based Drug Development).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Deployment of predictive modeling tools at the non-regulatory, preclinical level *via* the GastroPlus software package (PBPK studies).
- 2012: Acquisition of the pioneer Modeling & Simulation company, EMF Consulting. Set up of the collaboration between Eliane Fuseau, EMF founder and PhinC team.

COLLABORATIONS SOUGHT

- Partnership to use and assess innovative Modeling & Simulation tools and algorithms.
- Partnership for the implementation of an integrated drug discovery platform to strengthen our drug candidate optimization activity. ■

7 STAFF MEMBERS

STRENGTHS: we offer an integrated, custom-tailored approach to optimize early-phase costs and timelines so that our clients can successfully manage their development. With our innovative PK/PD, biostatistics and modeling and simulation applications, we can provide support at the earliest research phases to adapt and valorize drug development.

Scientific Instrumentation

Physikron

CEO
David Znaty

VICE-PRESIDENT
Patrick Vayn

CSO
David Scigocki

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Date of founding 21/06/2005

FIELD OF ACTIVITY

Development of new mass spectrometry solutions.

KEYWORDS
Tandem mass spectrometry / High-throughput / Low sample requirement / Proteomics

BACKGROUND

Physikron has developed analytical processes for tandem mass spectrometry (MS-MS) based on concepts from particle physics.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

These processes simultaneously produce several well-separated MS-MS spectra (with no selection of the individual primary mass) from a single MS-MS spectrum containing all the fragments of several different primary masses.

Machines equipped with the Physikron technology can increase by up to 80% the number of proteins identified in a LC run, increase significantly their acquisition throughput and decrease their sample requirement in MS-MS mode without hardware modification.

A higher acquisition throughput is particularly significant for liquid chromatography-coupled systems (LC MS-MS) because existing machines are only able to produce a part of the MS-MS spectra for the different primary masses going through the chromatography line. The system has notable uses in proteomics and medical diagnostics.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Collaboration with an academic laboratory. The technology has been acquired by a big pharma.

COLLABORATIONS SOUGHT

Physikron is looking for co-development and/or licensing partners (mass spectrometers manufacturers, players in medical diagnostics). ■

3 PATENTS

1 STAFF MEMBER

STRENGTHS: performances, rapidity, analysis of complex mixtures and sample consumption strongly reduced.

Scientific Instrumentation

PlasmaBiotics

PRESIDENT
Daniel Vinteler

R&D
Caroline Levy

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Date of founding 17/03/2011

FIELD OF ACTIVITY

PlasmaBiotics is centered on the design, the development and the marketing of cold plasma equipment for thermo sensitive medical devices disinfection.

KEYWORDS
Disinfection / cold plasma / atomic nitrogen / thermosensitive medical device.

BACKGROUND

PlasmaBiotics masters a unique process patented by the CNRS (National Center for Scientific Research) and Université Paris SUD. The company focuses her research on the evaluation and the optimization of the biological efficiency of the nitrogen cold plasma on various materials and for different pathogens.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

PlasmaBiotics develops and markets a range of nitrogen cold plasma generators at ambient temperature and pressure. The technology is patented by the CNRS (National Center for Scientific Research) and the Université Paris-Sud. In first intention, the company targets the market of storage and the disinfection of the thermosensitive medical devices.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Since end of 2009, PlasmaBiotics optimized this technology and developed a prototype in partnership with the LPGP laboratory. A validation of the microbiological efficiency of the cold plasma has been done on several pathogens at Antoine Béclère hospital, at INRA Avignon as well as in the privet laboratory BIO-CLIN.

COLLABORATIONS SOUGHT

PlasmaBiotics is looking for partners for co-developments for different applications: endoscopes storage and disinfection, wound healind, applications in the food-processing industry, the bio defense, etc. ■

ONE EXCLUSIVE PATENT LICENSE FROM CNRS

3 STAFF MEMBERS

STRENGTHS: high efficiency, fast and simple to use, respectful of all materials, absence of any waste, no toxicity, consumable (nitrogen) extracted from air.

MULTIDISCIPLINARY TEAM: in design, sciences, management and innovation financing.

INNOVATION ASSETS: a unique physical-chemical method compatible with termosensitive materials.

COMPANY VISION: make the world of the health safer by using cold plasmas.

R&D services and products

Polytheragene

CEO
Pr Hervé Cheradame

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Date of founding 10/2011

FIELD OF ACTIVITY

Manufacture and sale of new high performance transfecting agents for gene therapy, high-throughput screening and biomanufacturing.

KEYWORDS
Transfection / Gene therapy / Biomanufacturing / Therapeutic proteins / Vaccine

BACKGROUND

The association of two complementary teams from the MPI/LAMBE laboratories at the University of Évry and the "Centre de biophysique moléculaire" at Orléans led to the development of two patented polymer families for nucleic acid transfection.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Two families of synthetic agents have been developed. The first is derived from polyethyle-nimine and the second is formed by amphiphilic tribloc copolymers for *in vitro* and *in vivo* applications. These compounds offer better efficacy and lower toxicity than market references.

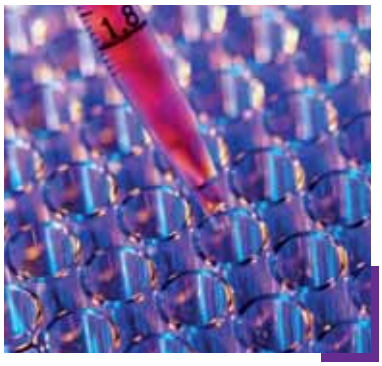
CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

New formulas are currently under development at the MPI lab (UEVE).

Common research with biomanufacturers showed the high performances (high efficacy, low toxicity) of these vectors for bioproduction in large volume (GMP quality available).

COLLABORATIONS SOUGHT

We are looking for partnerships and co-development opportunities with biomanufacturers, companies offering high throughput cell screening and biotechnology laboratories developing DNA or RNA vaccines. ■



1 EXCLUSIVE LICENCE FROM THE UNIVERSITY OF ÉVRY-VAL D'ESSONNE (UEVE)

STRENGTHS: high performance synthetic vectors.

Complementary teams in chemistry and biochemistry.

INNOVATION ASSETS: ability to develop high efficacy transfecting agents for specific applications (stem cells and cell suspension cultures).

Diagnostics

Prestodiag

CEO
Thibaut Mercey

CSO
Félix Piat

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Date of founding 19/03/2012

FIELD OF ACTIVITY

Prestodiag develops and markets kits for rapid detection of multiple bacteria in complex samples, for food testing, medical and environmental applications.

KEYWORDS

Microbiology / Bacteria / Diagnostics / Biophotonics / Surface Plasmon Resonance imaging (SPRi)

BACKGROUND

Prestodiag is an early-stage start-up that has developed an innovative technology of simple and rapid detection of pathogenic bacteria in complex matrices, co-developed with the CREAB research team led by Thierry Livache (UMR 5819, CEA-CNRS-UJF, Grenoble).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Prestodiag has developed an instrumental platform composed of a cost-effective label-free optical reader based on Surface Plasmon Resonance imaging (SPRi) and dedicated single-use kits / antibody biochips to monitor micro-organisms' growth in real-time, within complex samples.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Prestodiag has won various awards and prizes so far: Laureate of the Concours OSEO-Ministry of Research ("Emergence" category, 2011), Grand Prize Life Sciences at the Tremplin Entreprises French Senate-ESSEC (2012) and winner of the Concours Genopole 2012.

A strong collaboration has been set up with the CREAB team at CEA Grenoble (CEA/INAC/SPrAM), to improve our biosensing technology for microbiology.

COLLABORATIONS SOUGHT

Prestodiag is looking for some more partnerships for applications requiring rapid detection and identification of micro-organisms in complex matrices and for various fields: food testing, clinical applications, environment, cosmetics and pharmaceutical industry. ■

3 PATENTS

5 STAFF MEMBERS

STRENGTHS: label-free technology / « cost-effective » optical device and kits.

Pluridisciplinary team / microbiological results validated by food testing industy partners.

INNOVATION ASSETS: label-free and cost-effective technology, providing a microbiological result in hours instead of days.

Scientific Instrumentation

Sebia

CEO
Benoît Adelus

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Date of founding 10/1967

FIELD OF ACTIVITY

Design, production and commercialization of *in vitro* diagnostic systems (instruments and reagents) for medical biology laboratories.

KEYWORDS

In vitro diagnostics / Clinical biochemistry / Electrophoresis / Instruments / Reagents / Monoclonal gammopathies / Hemoglobinopathies / Diabetes / Chronic Alcohol abuse

BACKGROUND

Since its incorporation 40 years ago, SEBIA has become a global leader of innovative electrophoretic *in vitro* diagnostic systems and particular in capillary electrophoresis.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Electrophoresis consists in the use of an electrical field to separate the proteins contained in biological samples. The most recent capillary electrophoresis technique is applied in the dedicated automated systems: CAPILLARYS range (CAPILLARYS 2, CAPILLARYS 2 Flex Piercing and CAPILLARYS 2 Neonat Fast) and MINICAP range (MINICAP and MINICAP Flex Piercing).

The HYDRASYS range (ASSIST, HYDRASYS 2 SCAN, HYDRASYS 2 SCAN FOCUSING) utilizes an agarose gel as support. The electrophoresis technique is a leading technology in the diagnosis of immune system diseases, myeloma, hemoglobin abnormalities, HbA1c and the detection of other protein markers.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

SEBIA's R&D efforts are delivering results in two fields:

- The development of semi-automated or fully automated high-throughput systems with networking capabilities owing the PHORESIS Core powerful software, plus a full range of applications: proteins, lipoproteins, hemoglobin, HbA1c. SEBIA has recently launched three new automated instruments designed to the screening of Hemoglobinopathies (CAPILLARYS 2 Flex Piercing, CAPILLARYS 2 Neonat Fast and MINICAP Flex Piercing) as well as a new sampler for its agarose range (ASSIST) offering full traceability of the samples.
- *Via* its eight subsidiaries, its two representative offices and a network of 80 distributors, SEBIA offers an incomparable level of service worldwide.

COLLABORATIONS SOUGHT

Sebia maintains close links with the medical community, including university labs associated with its research work and disease specialists developing applications. Sebia has also started acollaboration with the IMF (International Myeloma Foundation) who supports research projects and offers information and support to the patients suffering from myeloma and to their family. ■

ANNUAL TURNOVER: €150M

400 STAFF MEMBERS

STRENGTHS: the world number 1 in electrophoresis technology. Strong innovation capacity.
A leader in the diagnosis of monoclonal gammopathies. Major player in the field of hemoglobinopathies and diabetes. High-level scientific and technical support.

Diagnostics

Statlife

CEO
Stéphane Ragusa

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Date of founding 22/04/2004

FIELD OF ACTIVITY

Statlife develops software for quantified evaluation of the benefits and risks associated with changes in drug regimens or in behavior (food habits, smoking, etc.), with a view to better prevention of today's major diseases.

KEYWORDS

Prevention / Prediction / Patient medical records / Risk scores / Epidemiological statistics

BACKGROUND

Statlife was spun out from research work on disease risk prediction carried out at the Pierre & Marie Curie University of Paris and INSERM. The company mines epidemiological data from the INSERM's prospective cohorts.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Statlife's various products and services are provided (i) by health insurers to their members, (ii) by companies to their employees or (iii) directly to pharmaceutical companies.

Statlife notably develops medical software packages for risk evaluation in diseases that depend on behavioral parameters (food habits, smoking, etc.), biological parameters and the administration of drug treatments. This personalized evaluation enables a better-informed therapeutic choice by the patient and his/her physician. Statlife also develops tools for nutritional prevention and the identification of nutritional deficits, with suggestions for possible modifications.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Statlife collaborates with several international pharmaceutical laboratories as part of Phase IV clinical trials to improve the prescription criteria for several marketed drugs. The company has notably developed a software package for justifying the prescription of hormone substitution treatments (delimitation of the population to be screened as part of preventive treatment) by quantifying a woman's risk of breast/ovary/endometrial cancer and osteoporosis.

COLLABORATIONS SOUGHT

Statlife wishes to offer its expertise to pharmaceutical companies keen to better qualify their drugs' target populations. ■

ANNUAL TURNOVER: €200K

2 PATENTS

4 STAFF MEMBERS

STRENGTHS: collaborations involving large, prospective cohorts.

The potential to optimize drug prescription criteria during the registration or post-marketing phases.

Medical devices

Tech Innovation

MANAGING DIRECTOR
Emmanuel Artigue

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Date of founding 05/2000

FIELD OF ACTIVITY

Outsourcing and software development. Installation of complete IT-Solution.

KEYWORDS

Orthopedics / Prostheses / Myoelectric devices / Arms

BACKGROUND

Tech Innovation was created in order to help people who are unable to use one or both arms normally. Previous, in-depth experience in robotics has enabled the company founders to design novel products.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The company's first challenges involved designing a myoelectric prosthesis for the elbow and then for the hand, as well as a new generation of myoelectric sensors.

Tech Innovation addresses even the apparently simplest problems, such as an assistive device for helping arthritis sufferers to open a bottle.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Collaboration with AFM, Thales, CEA, LISV and the Raymond Poincaré Hospital (Garches) in the study and design of an orthosis for people with muscular dystrophy. This device must enable the person to use his/her arm normally again.

COLLABORATIONS SOUGHT

Financial partners, as well as distributors to market our various products.

Technical collaborations to develop new products. ■

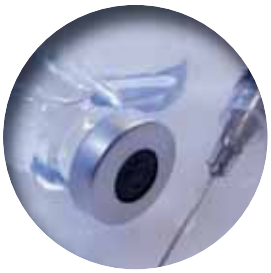
ANNUAL TURNOVER: €300K

4 PATENTS

4 STAFF MEMBERS

STRENGTHS: dynamism, responsiveness.

Understanding and analysis of the issues.



Biomanufacturing / pharmaceutical services

Texcell

CEO
Bernard Plichon

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Site www.texcell.fr
Date of founding 28/01/2003

FIELD OF ACTIVITY

Texcell offers fully GLP- and GMP-compliant viral safety testing and immunomonitoring services.

KEYWORDS
Viral safety testing / Viral and prion validation / Immunomonitoring / Immunoprofiling / Healthcare

BACKGROUND

Texcell is a service company offering GLP- and GMP-compliant viral safety testing and immunology services. Thanks to over 20 years' experience in the performance of biosafety and viral validation tests, Texcell has evaluated a large number of products – including some that have received marketing approval from the FDA, the EMEA and the MHW. The company's expertise is acknowledged worldwide and (since 2006) has developed commercial relationships with representatives based in Japan, India and South Korea. In 2010, Texcell has taken the majority in a company based in Middletown (Maryland) renamed Texcell North America.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Texcell offers a full catalogue of assays for the characterization of cell banks, the batch release of cell-derived biotechnological products and viral validation studies for evaluating the ability of industrial process steps to eliminate and/or inactivate viruses (over 30 relevant or model viruses are available) and prions.
- Texcell acts both as a contract research organization and a central lab for preclinical and clinical trials. Texcell offers an immunology- dedicated technology platform with an exhaustive range of GLP assay development services (optimization and validation) for analyzing the immune response to humoral and/or cell-based mediation.
- Today's compound development timelines have to be as short as possible. Viral safety testing, viral validation studies and clinical studies must be continually improved, in order to optimize the therapeutic strategy. The company acts as a true partner for its customers and the staff is committed to offering the right experimental protocols and tools. ■

45 STAFF MEMBERS

STRENGTHS: an international service company that is responsive and has a close relationship with its customers.

Expertise in virology and immunology.

INNOVATION ASSETS: a specialist in viral and prion safety.

OTHER FACTS: as an expert provider in virology, Texcell evaluates the viral safety of recombinant proteins, monoclonal antibodies, medical devices and other products of animal or human origin (such as blood-derived products, heparins, hyaluronic acid and collagens). The company also has expertise in immunomonitoring. Texcell develops and validates assays that monitor the immune response to cell-based and/ or humoral mediation in clinical trials (ELISA, cytometry, neutralizing serums, hemagglutination inhibition assays, bioassays, Luminex).

Medical devices

Theraclion

CEO
Jean-Yves Burel

CSO
François Lacoste

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Date of founding 05/08/2004

FIELD OF ACTIVITY

The development, manufacture and commercialization of medical devices for the non-invasive treatment of tissues with high-intensity, focused ultrasound (HIFU).

KEYWORDS
Ultrasound / Parathyroid / Breast tumors / Medical instrumentation / Therapy

BACKGROUND

August 2004: Theraclion is founded on the basis of INSERM research and EDAP technology.

April 2005: Truffle Venture becomes a shareholder, enabling continuation of Theraclion's technical and clinical development.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The Th-One is a HIFU-based system for the non-invasive, ambulatory treatment of tissues. It is used to treat certain disease conditions (notably thyroid nodules, hyper-parathyroidism and breast fibroadenoma).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- November 2007: Th-One obtains the CE mark.
- December 2008: Oséo awards an €8.5M toward Theraclion's development.
- December 2012: TH-One obtains the CE Mark for the breast Fibroadenoma indication.

COLLABORATIONS SOUGHT

Industrial partners. ■

27 PATENT FAMILIES

10 STAFF MEMBERS

STRENGTHS: innovative, well-characterized technology.

A significant market of non-surgical ablations with unmet needs; a strong financial partner.

INNOVATION ASSETS: non-invasive tissue treatment.

R&D services and products

Univercell Biosolutions

CEO
Guillaume Costecalde

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Date of founding 07/010

FIELD OF ACTIVITY

Univercell-Biosolutions sells human cardiac cells produced from induced pluripotent stem cells. Univercell-Biosolutions proposes a technological breakthrough in the provision of large quantities of formerly unattainable human cardiac and endothelial cells.

KEYWORDS
hiPSc / Cardiomyocytes / Endothelial cells / ED-ONE® / CM-ONE®

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Member of the IMI StemBancc Consortium (78M$).

COLLABORATIONS SOUGHT

The company is looking for partners to scale up cardiomyocyte production, as well as partners looking to use and validate Univercell-Biosolutions cells. ■

BACKGROUND

Univercell-Biosolutions was created in July 2010 by Michel Puceat and Guillaume Costecalde. The company then set up its labs and corporate offices at Évry Genopole. In 2013, the company launched its first product ED-ONE®, an endothelial cell produced from inducted pluripotent stem cells.

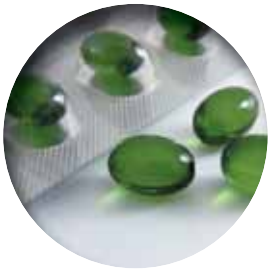
4 PATENTS

5 STAFF MEMBERS

STRENGTHS: cardiomyocyte maturation ; cell sorting.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Today, the stem cell-based technologies are unique tools for large scale production of human cardiomyocytes. Univercell-Biosolutions owns a proprietary technique of cell differentiation and sorting. This provides the company with a unique approach for producing pure (>99%) human pre-cardiomyocytes. These latter are then matured into cardiomyocytes using a robust and reproducible protocol.



Therapeutics

Vaxeal Research

PRESIDENT
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Date of founding 2012

FIELD OF ACTIVITY

Vaxeal is developing a novel generation of long synthetic peptide-based therapeutic vaccines for the treatment of patients with cancer and hepatitis C.

KEYWORDS

Therapeutic vaccines / Peptides / Cancer / Hepatitis C / Immunomodulators

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Products:
  - Oncology: Therapeutic vaccines derived from the relevant broadly expressed tumor antigens survivin, midkine and a third undisclosed antigen, and indicated for several human malignancies.
  - Hepatitis C: Therapeutic vaccines for both genotype 1 and 6 of hepatitis C virus.
- Technical Platforms:

Vaxeal and its partners (CEA, Inserm, HEGP) have combined their expertise to develop 4 innovative technical platforms to rapidly design, produce, formulate and validate new vaccine candidates. Our approach comprises thorough assessment immunogenicity and anti-tumoral activity in humans and in pertinent animal models.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

All of our vaccines have reached the proof-of-concept stage.

Our first vaccine targeting the protein survivin is in formal pharmaceutical development and its immunogenicity will be evaluated in a Phase I/II clinical trial on patients with advanced cancer in the first quarter of 2014.

Our HCV program is co-developed with the China Medical City of Taizhou for the Asian market.

COLLABORATIONS SOUGHT

Vaxeal is looking for co-development partnerships with both academic and industrial partners developing innovative adjuvants or immunomodulatory drugs. ■

ANNUAL TURNOVER: €500K

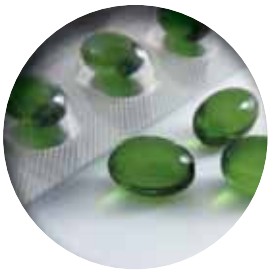
5 PATENTS

2 STAFF MEMBERS

STRENGTHS: strong IP positions ensuring our freedom to operate ; cutting edge scientific and technical strategies.

Strong scientific and pre-clinical validation of our products ; preeminent scientific and medical team.

INNOVATION ASSETS: restoration of appropriate, specific and intense immune T cell responses in the majority of the patients irrespective of their HLA type ; innovative combinatory vaccine strategy overcomes limitations to traditional approaches.



Therapeutics

Vaxon Biotech

PRESIDENT
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CSO
François Vallet

CSO
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Date of founding 08/01/2004

FIELD OF ACTIVITY

A biopharmaceutical company developing innovative cancer vaccines (notably for lung, prostate gastric, breast, renal, liver and colorectal cancers).

KEYWORDS
Optimized cryptic peptides / Immunotherapy / Vaccine / Oncology

BACKGROUND

The company's technology is based on an invention originally patented by Dr Kostas Kosmatopoulos and his research group at Institut Gustave Roussy/Inserm: optimized cryptic peptides, which stimulate the immune system so that it specifically destroys tumor cells.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

The vaccines developed by Vaxon target antigens that are over-expressed in tumor cells and very weakly expressed in normal tissues. The company's two lead products are Vx-001 (monopeptide) and Vx-006 (polypeptide):

- Vx-001 has obtained orphan drug status for small cell lung cancer (NSCLC) from the EMA (in 2007) and from the FDA (in 2009). It has entered in 2012 a phase IIb clinical trial in NSCLC, in 5 countries in Europe.
- Vx-006, which is currently completing its regulatory preclinical studies, is due to start a Phase I/II clinical trial in 2013.

In parallel, Vaxon is developing a portfolio of cancer therapeutic vaccines for all the main HLA alleles.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Vx-001 has completed a phase I/II clinical trial (116 patients), it demonstrated an excellent safety profile, a high immune response rate (70% of patients are responders) and a first proof of clinical activity. ■

8 PATENT FAMILIES

7 PATENTS GRANTED IN EUROPE AND IN U.S.

5 STAFF MEMBERS

STRENGTHS: a vaccine in advanced clinical development (Phase II b).

INNOVATION ASSETS: optimized cryptic peptides.

Medical devices

Vigilio

PRESIDENT
Dr Jean-Éric Lundy

CSO
Karim Aksas

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Date of founding 04/08/2005

FIELD OF ACTIVITY

Vigilio conceives, develops and markets miniaturized wireless biosensors, doubt-removal software and telemedical devices for domestic and medical-professions use.

KEYWORDS

Biosensors / Doubt-removal

BACKGROUND

Vigilio was created in 2005 by an emergency physician with the support of the medical business incubator Paris-Biotech Santé and the Assistance publique-Hôpitaux de Paris (AP-HP) university hospital center. It has partnerships with public and private laboratories for collaborative national and international research programs.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Vigi'Fall®: home fall detector. Vigi'Fall® analyzes a combination of accelerometric and posturometric data. Several commercial versions are available for use in homes, in assisted living facilities for seniors, or by isolated workers. May be linked to a 24/7 call center.
- Vigi'Therm®: wireless communicating thermometer (in development).
- Vigi'Coro®: asymptomatic heart disease detection (in development).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Vigilio was the coordinator for the European R&D program Fallwatch (FP7_Capacities_SME). Also, in collaboration with AP-HP and the private geriatrics hospital Les Magnolias (Ballainvilliers, France), and with the support of the Essonne Department, Vigilio implemented Vigi91, a prospective interventional clinical trial focused on evaluating falls in the home in people over 75 years old with or without early detection devices.

COLLABORATIONS SOUGHT

R&D partnerships: UJF Grenoble, CNRS Bordeaux, Insa Lyon, CEA Leti, QinetiQ (United Kingdom), etc.

- Commercial partners: Intervox-Legrand, IBM, Europ Assistance, etc. ■

ANNUAL TURNOVER: €41K

4 PATENTS

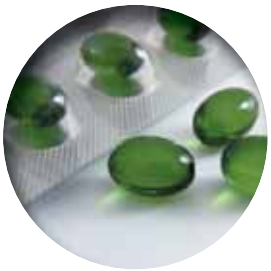
5 STAFF MEMBERS

STRENGTHS: Vigilio's goal is to become a national and world leader in fall detection in the elderly.

The company benefits from international partnerships and robust clinical validations of its technologies.

INNOVATION ASSETS: patch-style biosensors, doubt-removal, automated alerts.

Member of the Minalogic competitiveness cluster.



Therapeutics

Viroxis

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CHAIRMAN OF THE SCIENTIFIC BOARD
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Date of founding 25/11/2005

FIELD OF ACTIVITY

Viroxis designs and develops vaccines and drugs against human (e.g. HIV, HTLV) or animal (e.g. FeLV, FIV) retroviral pathogens.

KEYWORDS

Retrovirus / Prophylactic and therapeutic vaccines / Antiviral compounds

BACKGROUND

Work at the CNRS UMR8122 research unit (headed by Thierry Heidmann) at the Gustave Roussy Institute has identified retroviral protein domains that have immunosuppressive activity. Targeted mutations have been introduced which increase very significantly the immunogenicity of the corresponding viral proteins and, as a consequence, the efficiency of the vaccines prepared with the modified antigens.

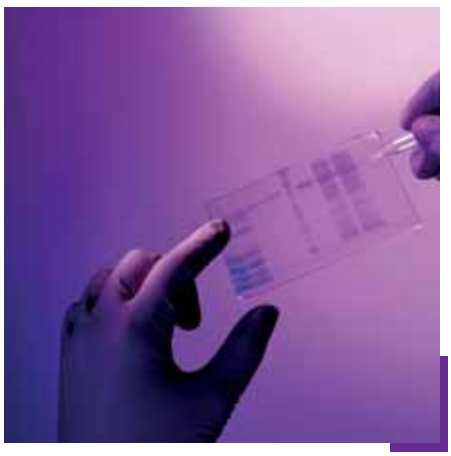
DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

On the basis of UMR8122's work, Viroxis is developing (i) antigens and optimizing vaccines against human or animal retroviruses and (ii) antiviral agent candidates that neutralize the identified domains.

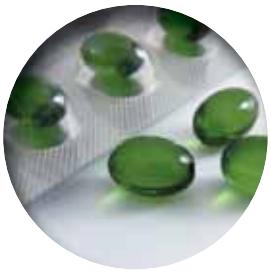
CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Viroxis' development work and future products are protected by 5 proprietary or exclusively licensed patent families.

A license signed end 2010 with an international animal health company, leader in the field, has brought a new animal vaccine to market in March 2012 (US market authorization has been delivered at the end of 2011). Another collaboration agreement for development of another animal vaccine has been finalized with the same partner company end of 2012. ■



5 PATENT FAMILIES
3 STAFF MEMBERS



Therapeutics

VitamFero

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HEAD OF RESEARCH
Dr Édouard Sèche

HEAD OF DEVELOPMENT
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Date of founding 27/10/2005

FIELD OF ACTIVITY

Design and development of new vaccines *via* exploitation of a patented technology platform based on the live and attenuated strains of *Toxoplasma gondii* (i.e. Toxo KO) and *Neospora caninum* (i.e. Neo KO).

KEYWORDS
Attenuated live vaccines / Toxoplasmosis / Neosporosis / Cryptosporidiosis / Coccidiosis / Leishmaniasis / Malaria / Apicomplexa

BACKGROUND

VitamFero was spun out of academic work performed at the UMR 483 research unit (François-Rabelais University of Tours/INRA), in collaboration with the CNRS. The company's founders are committed to exploiting the live attenuated and proprietary Toxo KO and Neo KO vaccine strains of *Toxoplasma gondii* and *Neospora caninum,* respectively.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Toxo KO and Neo KO live and attenuated strains result from the complete elimination of two genes of virulence from *T. gondii* and *N. canimum*, respectively. It remains strongly immunogenic but lacks any pathogenic properties. These characteristics make Toxo KO and Neo KO perfect tools for developing veterinary and human vaccines against congenital toxoplasmosis and bovine neosporosis. Toxo KO and Neo KO also serve as gene expression vectors that enable other parasitic pathogens to be targeted.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

VitamFero was founded on the basis of its success at the French Ministry of Research's 2005 Business Plan Competition for Innovative Companies. In 2008, the signature of an exclusive and worldwide license agreement with the François-Rabelais University of Tours, INRA and CNRS and the successful completion of its Rounds A and B of financing represented key milestones in the company's development. Beyond an aggregate of over €2.2M in grants and uncovered advances, in 2011, VitamFero secured the support of venture capital funds CapDecisif Management and G1J Ile-de-France in a capital increase of €1.5M in the framework of Round B of financing of the company. VitamFero is currently working on closing its Round C of financing.

COLLABORATIONS SOUGHT

In addition to upstream, academic and industrial collaborative R&D partners, beyond the business agreement it executed with Merial (Sanofi's veterinary healthcare division), world N°3 of animal health, VitamFero is seeking other licensees for the promotion, the commercialization, the distribution and sales of its vaccines. ■

2012 TURNOVER: €64,000

22 PATENTS

9 STAFF MEMBERS

STRENGTHS: a technology platform which provides many opportunities for designing and developing novel live attenuated vaccines.

A business model which uses the veterinary market as a "springboard" for the development of vaccines for human healthcare. A business agreement with Merial.

INNOVATION ASSETS: a safe and effective approach which is being strongly encouraged by the Innovation Task Force of EMEA.

OTHER FACTS: perfectly identified and validated markets in both the veterinary and human healthcare sectors.

Agriculture / Environment

WatchFrog

CEO
Gregory Lemkine

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Date of founding 11/2005

FIELD OF ACTIVITY

WatchFrog markets *in vivo* biotechnological solutions for the environmental risk assessment and the evaluation of the therapeutic, toxic or pollutant potential of all types of chemical, cosmetic or pharmaceutical compounds.

KEYWORDS

In vivo / Toxicity / Environment / Endocrine / Nervous system

BACKGROUND

WatchFrog is a service and contract testing provider for major industrial customers, all of whom are world leaders in their respective fields: water, energy, consumer goods, fine chemicals and pharmaceuticals. WatchFrog has a routine screening platform that meets the quality standards required by its industrial customers.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- In the environmental sector, WatchFrog offers modular systems for the real-time monitoring of the presence of pollutants in industrial effluent.
- For the environmental, chemicals and pharmaceutical sectors, WatchFrog has its own automated screening platform (with a throughput of several hundred samples over a few hours). Moreover, WatchFrog sells routine tests for screening for the endocrine-disrupting properties of chemical compounds under the European Union's REACH legislation and Water Framework Directive.
- WatchFrog can also create dedicated disease models for the pharmaceutical industry.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Collaboration agreement with the Environmental Protection Agency (USA EPA) as part of the TOXCAST program for prioritizing the toxicity testing of large numbers of chemicals.
- Participation to two projects of the French National Research Program on Endocrine Disruptors (PNPRE).
- Coordination of Hospital effluent monitoring station. This project is accredited by the Medicen and DREAM clusters; the goal is to develop a tool for the on-site monitoring of toxicants in hospital effluents.

COLLABORATIONS SOUGHT

In view of the flexibility of WatchFrog's technology, we are looking for new industrial partners to take up new challenges in lead optimization or environmental risk evaluation. ■

ANNUAL TURNOVER: €950K

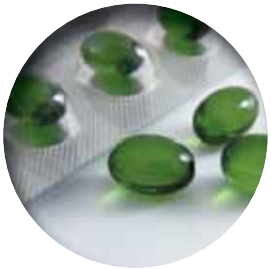
14 STAFF MEMBERS

STRENGTHS: miniature, industrializable vertebrate models.

A technology platform that complies with international quality standards for the production of aquatic material and molecular screening.

INNOVATION ASSETS: real-time monitoring of environmental risks on industrial sites.

OTHER FACTS: the creation of custom disease models.



Therapeutics

Wittycell

PRESIDENT
Miguel Sieler

CEO & CSO
Vincent Serra

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Date of founding 08/2005

FIELD OF ACTIVITY
Development of vaccine adjuvants.

KEYWORDS
Adjuvant / Vaccine / NKT cells / Healthcare

BACKGROUND

Wittycell uses a proprietary technology based on the stimulation of NKTi cells to develop novel therapeutics and prophylotic vaccine.

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

Wittycell developed Immunomodulator adjuvants based on NKT agonist glycolipids, for therapeutic and prophylactic vaccines against infectious diseases and cancer.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

Wittycell SAS has strong intellectual property position with major partnerships including the Jean Godinot Institute (France), the Institute for Medical Immunology (Belgium), the Scripps Research Institute (USA), the University of Chicago (USA) and the Brigham Young University (USA), and several private pharmaceutical companies (undisclosed information).

The first three immunomodulators leads are in preclinical development. The manufacturing process has been scaled up for million doses. The first GMP batch has been released. The first vaccine using new adjuvant is ongoing under a Phase I/II a clinical trial.

COLLABORATIONS SOUGHT

Pharma/vaccine companies looking for novel adjuvants. ■

28 PATENTS

10 STAFF MEMBERS

STRENGTHS: a network of international experts in biotechnology, molecular modeling, cell biology, clinical trials and virology. Proof of concept (*in vivo* efficacy) in many indications. GMP adjuvant ready to use for vaccine clinical development.

R&D services and products

XenTech

PRESIDENT & CSO
Jean-Gabriel Judde

CSO
Bertrand Coulomb

COO
Pascal Leuraud

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Date of founding 04/2006

FIELD OF ACTIVITY

XenTech is an innovative biotech company which specializes in the preclinical evaluation of cancer drugs and the identification of biomarkers and therapeutic targets.

KEYWORDS
Oncology / Preclinical expertise / Predictive models / Biomarkers / Companion tests / New therapeutic targets

BACKGROUND

XenTech was founded in 2006 by researchers from Institut Curie having over 15 years of experience in preclinical pharmacology in oncology. This spin-off company dedicated to biomarker discovery and preclinical evaluation of anticancer therapies is known worldwide for its expertise in the field of tumor xenografts. Located on Genopole® Campus, its experimental models are housed in the CERFE (*cf.* page 59).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

XenTech has an innovative experimental platform: one of the world's largest collections of patient-derived tumors xenografts (PDX). The collection is representative of the major types of cancer (breast, lung, colon, prostate) but also includes less common tumors (melanoma, ovarian cancer, renal cancer, pancreatic cancer, glioma, hepatoblastoma).

XenTech's platform is of considerable value for translational research in oncology, notably for drug screening and the molecular characterization of sensitive tumors.

XenTech participates in the development of novel cancer therapies by offering its services, models and expertise in preclinical oncology to stakeholders in oncology research.

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- Partnership with the world's biggest pharmaceutical companies involved in oncology.
- Partnerships with major French Cancer Centers.
- Member of the Oséo's Strategic Industrial Innovation Program "Cancer Anti-invasive Program" (CAP) which aims at developing a new therapeutic approach for invasive cancers.

In 2012, and for the second consecutive year, XenTech has been elected in the Deloitte Technology Fast 500, which is a ranking of the 500 fastest growing technology companies in Europe.

COLLABORATIONS SOUGHT

- Collaborative partnership with pharmaceutical industry on drug response biomarkers and new therapeutic targets discovery programs.
- Collaborative partnership with hospital structures to pursue development of the preclinical platform.
- Research fee-for-service contracts with pharmaceutical companies, biotechs and academic groups for evaluating antitumor efficacy of their drug candidates. ■

ANNUAL TURNOVER (2012): €3.0M

34 STAFF MEMBERS

STRENGTHS: a unique panel of breast cancers.

World-renowned experimental platform and scientific expertise.

R&D services and products

Xpertech

MANAGING DIRECTOR
Gilles Morvan

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Date of founding 01/ 2013

FIELD OF ACTIVITY

Engineering services for laboratories and sterile production units. Xpertech assists its customers with the management and efficient use of technical equipment.

KEYWORDS
Services / Studies / Calibration / Qualification / Maintenance

BACKGROUND

With its expertise, methodological arsenal and many years of experience in technical engineering for laboratories and the pharmaceutical industry, the Xpertech team helps its customers with the deployment and efficient use of tools and equipment in compliance with national and international regulations (GMP, GLP, FDA, etc.).

DESCRIPTION OF THE PRODUCTS / SERVICES / TECHNOLOGY

- Assistance with specifications documents for high technology equipment calls for tender.
- Production of reception, calibration, metrology, qualification and maintenance tests.
- Assistance for specific machines, clean room robots and aseptic filling devices.
- Implementation studies for single-use industrial production.
- Expertise for BSL2 & BSL3 laboratories (design, manufacturing, SOP, fluids, wastes).

CUSTOMER REFERENCES / COLLABORATIONS / HIGHLIGHTS

- In 2013, Xpertech finalized the development of XSED®, a computer program that enables complete and permanent monitoring of onsite equipment: technical aspects, documentation, regulatory calendars, management of tools and supplies.
- Xpertech offers its costumers a Vigilance contract, which gives them access to a timeshared technical equipment maintenance manager.

COLLABORATIONS SOUGHT

- Laboratories and industrials looking to upgrade equipment.
- Service companies who wish to associate for opening foreign offices. ■

TURNOVER: €100K, contracted in February 2013, previsional 2013: € 130K, 50% in exports.

NUMBER OF STAFF MEMBERS: 1 permanent staff member plus hiring scheduled for 2013.

STRENGTHS: extensive technical experience in laboratory equipment and BSL3 regulations.

Proven experience and methods.

INNOVATION ASSETS: XSED® expert system for equipment diagnostics.

Network of 4 experienced external consultants available for Xpertech missions.

INDEX OF CONTACTS

INDEX OF LABORATORIES, INFRASTRUCTURE AND COMPANIES

FIELD OF ACTIVITY OF THE COMPANIES

FIELD OF ACTIVITY OF THE COMPANIES

FIELD OF ACTIVITY OF THE COMPANIES

Biopharmaceuticals

	VALUE CHAIN IN DRUG DISCOVERY				THERAPEUTICS DOMAIN											
	Target discovery / validation	Drug discovery	Drug delivery	Diagnostics	Autoimmune	Cancer	Infectious	Metabolic disorders	Ophthalmology	Nutraceuticals	Other or unspecified	Agro biotech	Environment	Biomanufacturing / Green chemistry	Bioinformatics & informatics	Material / Medical devices
Aelred												●	●			
Agdia Biofords												●	●			
AISA Therapeutics		●			●					●						
Algentech												●				
Alkion BioPharma												●		●		
AlyXan													●			●
AMAbiotics										●						
Anova-Plus												●	●			
Archimej Technology				●							●					●
Arterial Remodeling Technologies											●					●
Assistmov																●
Aurgalys											●					
Biométhodes												●		●		
CECS I-Stem	●	●			●	●		●	●							
Cellectis Stem Cells / Ectycell	●															
Centaure Metrix																●
DNA Therapeutics		●				●										
Endodiag				●							●					●
Eukarÿs														●		
GeneSignal	●	●				●			●		●					
Généthon	●	●			●	●		●	●							
Généthon BioProd					●	●	●	●	●							
Genomic											●	●				●
GenoSafe	●	●			●	●	●	●			●					
GenoSplice Technology	●					●									●	
Global Bioenergies												●		●		
HORIBA Jobin Yvon	●			●												●
Imagene																●
Immune Pharma		●			●	●										
Inatherys		●				●					●					
InnaVirVax		●		●		●	●									
Integragen	●			●		●		●			●					
Keyrus Biopharma					●	●	●	●			●				●	
LPS-BioSciences		●		●			●				●					
LTKfarma		●			●	●										
MABLife		●			●	●			●		●					
Magpie Polymers													●			
Metabrain Research		●						●		●						
METAFORA biosystems	●	●		●												
New England Biolabs France	●															
Nokad	●			●	●	●	●	●			●					
Novacyt				●		●										●
Novian Health						●										●
Nutrivercell										●						
ObeTherapy Biotechnology	●	●						●								
OsseoMatrix											●					●
PartnerChip				●							●				●	
PEP Pharma	●	●				●					●					
Pharnext		●			●	●										
Phenocell	●	●														
PhinC Development		●			●	●	●	●	●		●					
Physikron	●	●		●											●	●
PlasmaBiotics																●
Polytheragene														●		
Prestodiag				●			●					●	●			●
Santen		●	●						●							
Sebia				●												●
Statlife						●									●	
Tech Innovation																●
Texcell		●	●		●	●	●	●	●		●					
Theraclion						●					●					●
Univercell-Biosolutions			●								●					
Vaxeal Research																
Vaxon Biotech		●				●	●									
Vigilio											●					●
Viroxis		●					●									
VitamFero		●					●									
WatchFrog	●										●		●			
Wittycell		●				●	●				●					
XenTech	●	●				●										
Xpertech											●			●		

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INNOVATION TODAY, EVERY DAY

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