

Research of excellence

The programme of excellence, CIBLES, presented in this Biopark News is, without a doubt, a formidable initiative.

First of all, from a scientific point of view, since it is coordinated by two institutes, the Institut de Biologie et de Médecine Moléculaires in the Biopark, run by Muriel Moser and Etienne Pays, winner of (among others) the two most prestigious prizes in Belgium: the Prix Francqui and the FNRS Quinquennial Prize, and the Institut de Recherche Interdisciplinaire en Biologie Humaine et Moléculaire on the Erasmus campus, CIBLES has put together teams of international renown. Researchers are working to identify and validate targets and innovative therapeutic strategies centered on pathologies linked to chronic inflammatory reactions and the nervous system. The perspective is clearly to find new generations of medicines.

CIBLES is also a formidable political initiative. It consists of an investment of 25 million euros over a period of 5 years on a research project of quality, with the intention of, and the means for, producing high quality scientific results : the CIBLES programme associates the laboratories of the Université Libre de Bruxelles (ULB), the Université Catholique de Louvain (UCL) and the Université de Liège (ULg) and is sponsored by three Walloon companies - UCB, GSK and Euroscreen, a ULB spin-off in the Biopark.

Research of excellence, ambitious industrial partners, close dialogue among all the players, the ingredients have been put together to make this programme a success for both the science and the economy of the region.

WILL, the Walloon Institute for Life science Lead, created during the previous legislature, should also help our Region and Community to position themselves as leaders in life sciences and biotechnology : an inter-university «without walls», WILL will be an institute of pre-translational research of excellence, brought to support high level research projects, selected by an international scientific council. ULB researchers, including those who work in the Biopark Charleroi Brussels South, are ready to take up the challenge.



Philippe Vincke

Rector

Université Libre de Bruxelles

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Programme of excellence

Promising CIBLES

The programme of excellence CIBLES aims to validate new pharmacological targets. At the helm and among the partners of this programme of around 25 million euros, the teams of the Biopark Charleroi Brussels South.

The human genome has been known since 2000 but the pace of development of new drugs has not accelerated. The reason for this, of course, is the time needed to develop new medicinal products and also the huge gap between the knowledge of the existence of a gene and the understanding of its physiological and pathological roles. The programme of excellence, CIBLES, is working to close this gap: its objective is to identify and validate new therapeutic targets in domains important for human health and for pharmaceutical and biotechnology activities in Wallonia. In the context of the Marshall plan, 25 million euros have been dedicated over five years to this research programme financed by the Walloon Region and on which work almost 120 researchers and technicians.

the Institut de Biologie et de Médecine Moléculaires, IBMM, (Biopark Charleroi Brussels South) and the Institut de Recherche Interdisciplinaire en Biologie Humaine et Moléculaire, IRIBHM (Campus Erasme). CIBLES focuses its therapeutic interest on the central nervous system, inflammation and cancer, hence the three areas of research: receptors coupled to G proteins, promising intracellular targets and stem cells.

The first area studies receptors coupled to G proteins. These GPCRs regulate almost all human physiological systems and are involved in over 30% of present medicinal products : IR-IBHM has played a pioneering role in their cloning, the spin-off Euroscreen is a specialist in this area (see page 4).

Second subject of the programme : promising intracellular targets. IBMM researchers are studying two molecules which are serious candidates for the title of anti-inflammatory therapeutics : firstly, a new family of proteins, apolipoprotein L; secondly, IDO (explanations on page 3).

Stem cells

Finally, the third subject of CIBLES concerns therapeutic applications of stem cells in diseases of the central nervous system and cancer. Embryonic stem cells (ESC) are capable of generating all types of cell, they are auto-renewing and can be used in many applications, such as cell therapy or the search for new drugs. For several years, IRIBHM researchers have been developing novel methods to transform stem cells into nerve cells, in a controlled specific way, in other words, « à la carte ». Their work, supported by the CIBLES programme, is promising, especially for the treatment of epilepsy and Alzheimer's. Furthermore, it seems that certain stem cells might participate in the development or recurrence of certain cancers : the researchers are investigating if cancerous stem cells exist in epithelial cells, characteristic of skin, breast and intestinal cancers, with a view to identifying appropriate markers.

3 subjects

Driving the programme launched in January 2009, the Université libre de Bruxelles, ULB, and especially two of its institutes recognised as being at the forefront of functional genomics :



Driven by ULB, the programme of excellence, CIBLES, brings together the competences of teams from the Université catholique de Louvain (UCL) and the Université de Liège (ULg). Research of excellence combined with a desire for innovation in collaboration with the companies UCB, GSK and Euroscreen who are sponsors of the programme, CIBLES should enable the validation of new targets centered on pathologies linked to inflammation, the central nervous system and cancer, which will then allow the development of new generations of medicines. We can see that the ambition is both scientific and economic.

Inflammation

ApoL and IDO the answer ?

Attached to the study of a selection of particularly promising targets in the area of inflammation, part 2 of the CIBLES programme is led by Professor Etienne Pays, of the Institut de Biologie et de Médecine Moléculaires (IBMM).

The first response of the immune system to an infection, inflammation is a useful but dangerous reaction. Useful because it enables us to eliminate the pathogenic agent and to repair tissue lesions. Dangerous because it's involved in numerous degenerative pathologies such as atherosclerosis, asthma and Crohn's disease. In the context of the programme of excellence CIBLES, researchers are studying two types of molecule which are serious candidates for the title of anti-inflammatory therapeutic targets : the apoLs and IDO.



Muriel Moser

The same scientific interest

Director of research at IBMM, Muriel Moser coordinates the CIBLES programme, in cooperation with the academics responsible for each part, Marc Parmentier (part 1), Etienne Pays (part 2) and Pierre Vanderhaeghen (part 3).

> The programme of excellence is ambitious. Just over a year after its launch, how do you feel about it?

Muriel Moser : Very positive. When the theme was defined and accepted by the Walloon Region, collaborations were set up spontaneously between academic researchers from the two ULB institutes and with our colleagues from UCL and ULg, simply because the scientific interest was the same. Contacts with the sponsors are frequent, interesting and very cordial. The programme of excellence has the particularity of supporting both innovative research and its application, and therefore federates academic researchers and the industrial world. It's a win-win situation.

> You're directly involved in the research on IDO in part 2.

How far have you got ? Have the first months been promising ?

Muriel Moser : We've already obtained promising results which show that this enzyme is involved in the control of a mouse colitis model. In collaboration with our colleagues in UCL, we're trying to identify the cells expressing the enzyme in inflammatory responses and to understand its mechanism of action. IDO is an interesting target because it plays a role in inflammation, tolerance and cancer. However, little is known of its function and importance, a controversial subject in the literature...

ApoL

The apolipoproteins L or apoLs, the IBMM Laboratory of Molecular Parasitology know very well. In 2003 the laboratory, run by Etienne Pays, identified a human blood protein capable of killing the trypanosome, the parasite responsible for sleeping sickness – which was none other than the apolipoprotein L-1 or apoL-1. Two years later, the laboratory elucidated the function of apoL-1, detailing its mechanism of action to kill trypanosomes. In 2007, it demonstrated the essential role of this protein in our immunity to the parasite. Today, the researchers have shown that apoL-1 is over-expressed in inflammatory pathologies and intervenes in programmed cell death. A new field of research has opened – how a protein, identified by studying the capacity of adaptation of the trypanosome to its host, could help us understand the inflammatory mechanisms involved in numerous chronic degenerative pathologies.

IDO

Via the CIBLES programme, researchers are studying the role of apoLs (pro-inflammatory) in inflammatory type immune response and their potential to target and destroy cancerous cells.

The other molecule studied in this part of the CIBLES programme is the enzyme, indoleamine 2, 3-dioxygenase or IDO. This enzyme is involved in the inhibition of the immune response. It can be synthesized by dendritic cells, the sentinels which trigger our immune response. The IBMM Laboratory of Animal Physiology has made several discoveries about IDO, an enzyme with recognised anti-inflammatory properties, in particular in the case of inflammation of the colon (colitis): it has demonstrated that the anti-inflammatory response leading to improvement of the colitis plainly depends on IDO and has observed that the enzyme indoleamine is synthesised in the colon of mice protected against this inflammation. Today, in the context of CIBLES, researchers are trying to zero in on the role of the IDO produced by tumours or inflammatory cells in anti-tumour resistance. They're also investigating the potential of activation of IDO in the control of inflammatory diseases.

The GPCR sentinels

Specialised in the area of receptors coupled to G proteins G (GPCRs), Euroscreen SA is a logical sponsor of part 1 of the CIBLES programme consecrated to the study of these receptors.

The organism, constantly challenged by its environment, has to analyse simultaneously thousands of pieces of different kinds of information from simple photons to odorants, passing by hormones, amino acids and nucleotides. The reception of this information and its decoding by cells requiring the presence of specific receptors at the interface between extra- and intra-cellular milieu. Of these, the GPCRs make up the largest family of membrane receptors in mammals. They owe their name to their capacity to couple, once activated, to heterotrimeric proteins bonding GTP (guanosine triphosphate), also called G proteins. These proteins transmit the signal from the receptor to different intracellular effectors, enabling the generation of an appropriate cell response. A great number of GPCRs therefore constitute real sentinels and have always been of great interest to the pharmaceutical industry. GPCRs are, in fact, the biological targets of over 30% of today's medicines.

New receptors

Part 1 of the programme of excellence CIBLES run by the university has, amongst others, the objective to study already deorphanised GPCRs, in order to validate them as targets for the treatment of human pathologies, especially chronic inflammatory and central nervous system diseases. The university researchers also hope to identify new promising receptors.

This project is of great interest to Euroscreen SA, a ULB spin-off with around fifty employees, which concentrates its expertise on GPCRs : Euroscreen has a Drug Discov-

ery activity and, via its structure Euroscreen Fast, provides services « à la carte » screening and profiling based on RCPGs.

Coordinated by Prof. Marc Parmentier of the Institut de Recherche Interdisciplinaire en Biologie Humaine et Moléculaire - IRIBHM (ULB), in collaboration with the team of Prof. Michel Georges at ULg and with sponsors UCB and Euroscreen, part 1 of the CIBLES project aims to deorphanise different GPCRs, that is to identify their natural ligand, a first step towards understanding the physiological function of the receptor. The university researchers are doing distribution studies in order to identify where the receptor is expressed and, at the final step, they'll study the receptors identified on animal models in order to determine their potential interest for certain pathologies.

Priorities

« As an industrial sponsor, in the project we play a guidance role which depends on the therapeutic and industrial interests. We interact with research laboratories in order to measure the advances, detect the most promising paths, suggest possible reorientations, make certain receptors a priority, etc. », states Vincent Lannoy, Intellectual Property and Licensing Manager of Euroscreen SA. And he explains: « CIBLES should enable Euroscreen to detect and validate new receptors. Once these targets have been patented, it's up to us to bring them into our drug discovery programme and, if they have real potential, take them to pre-clinical validation.



Close collaboration

Whether it's the programme of excellence, CIBLES, or research projects developed in the competitiveness cluster BioWin, close collaboration between academic and industrial laboratories is essential. This is the opinion of Vincent Lannoy of Euroscreen SA.

The objectives of university and industrial laboratories are different. The academic researcher wants, for example, to publish as soon as possible while a company wants to wait until the patents are in the public domain. The notion of patent rights is also prickly: Who's the inventor? Who's the owner? These definitions are indispensable if we discuss the development of research. A dialogue has to be established between universities and enterprises, and also between enterprises themselves: the objectives of an SME are not necessarily those of a multinational. It's therefore necessary to have long discussions reconcile the objectives, make concessions. The CIBLES programme has an advantage: the number of partners is small, which means the management can be more supple.



Anna Maria Marini

« Research, it's a huge Game of the Goose without an end »

A new laboratory has been set up in the Institut de Biologie et de Médecine Moléculaires, IBMM: the Laboratoire de Biologie du Transport Membranaire with, at its head, Anna Maria Marini.

«I received my first microscope when I was 8. At 10, I saved up to buy a chemistry set !» smiles Anna Maria Marini. In 2009 she set up her laboratory in the Institut de Biologie et de Médecine Moléculaires and she was, of course, a million miles away from imagining that one day she would be a researcher. She studied «maths-sciences» at the Athénée Charles Janssens, Ixelles, in Brussels where she remembers having a fantastic chemistry teacher. This encounter marked her and she decided to do a chemistry degree at ULB. Four years later, she did her final project on yeasts at the Laboratoire de Physiologie Cellulaire et de Génétique in the Faculty of Science. Her supervisor, Bruno André, persuaded her to do a doctorate. «I hadn't really thought about it before. At the time, I wanted to take a break, to travel. Bruno André suggested I do a PhD; I presented a project to the FRIA (FNRS) and obtained a grant; that was the beginning», remembers Anna Maria Marini.

Ammonium

The young chemist wanted to answer a basic question: Are there proteins involved in the transport of ammonium, source of nitrogen for microbes and plants, but also known for its toxicity and involvement in the regulation of acidity (pH) in blood in mammals?

She progresses and, above all, her curiosity always excites her a bit more... «I didn't want to abandon my subject as I had just established an unexpected link between the ammonium transporters in yeast and the human Rhesus factors», she confesses, «I decided to continue my work for a post-doctorate in the same laboratory». Her entry straight into the world of research coincided with the installation of the IBMM in Charleroi.

In 2000, she published a paper in the journal *Nature Genetics*: Using the yeast model, Anna Maria Marini showed that Rhesus factors, the function of which was then totally un-

known, played a role in ammonium transport.

Having become a qualified FNRS researcher, she set up a collaboration with another IBMM laboratory, Josiane and Claude Szpirer's Laboratoire de Biologie du Développement.

In 2008 this collaboration resulted in another prestigious publication in *Nature*, with her direct colleague, Sophie Biver. They demonstrated in the mouse model what she had sensed in the yeast model: she observed that mice without the RHCG gene (linked to the Rhesus factor) showed anomalies connected to defective ammonium transport and especially a defect in ammonium excretion in the urine, which caused increased acidity of the blood and significant weight loss. She also observed that male mice without the gene fathered smaller litters than usual.

Renal Pathology

This discovery on ammonium transport challenged the concept taught from the 1940s that renal excretion of ammonium happened only by passive diffusion, without the intervention of a protein. She also opened perspectives in human medicine: observations suggested that, in man, mutations affecting the gene coding for RHCG protein could cause certain forms of renal pathology or a loss of masculine fertility.

«I arrived in research by chance and I found I liked it. Today, what is fascinating about research is the satisfaction of my curiosity. And I try to transmit this passion to PhD students: to see in their eyes this little light. The first step – understanding – is egoist; but, at the same time, by advancing our knowledge, we hope that one day we'll perhaps be able to help to resolve different pathologies and this perspective of medical application is also really stimulating », explains Anna Maria Marini, « Research is a huge Game of the Goose without an end: the researcher plays, advances, sometimes has to go back, take an-

other way, he progresses but the end is, and always will be, elusive. New challenges always appear, that's also the magic of research».

New laboratory

In May 2009, she took the plunge and created her laboratory in IBMM, the Laboratoire de Biologie du Transport Membranaire, where she continues her studies on ammonium transport. «The door of my office is always open; when someone wants to show me a Petri dish or ask me about an experiment, I love this contact with the practical side and I rush to the laboratory. I need to watch, feel, experiment; it would be difficult for me just to analyse a table of data. Discoveries, advances are often the fruit of rigorous observation without reason», she explains.

And when she isn't splitting hairs (she confesses) to try to understand the molecular mechanisms of ammonium transport, what does she do? «I love African dance», she says, half amused, «I'm fascinated by this way of corporal expression». She dances, listens to jazz, plays the saxophone, goes to the cinema, does some gardening, «I'm never bored», she says.



Jean-Pol Detiffe



About DNAVision

In April 2009, DNAVision received a double quality certification : CAP and GMP. Interview with the CEO of a spin-off which is taking off, Jean-Pol Detiffe.

> Tell us about DNAVision in a few words.

Jean-Pol Detiffe : DNAVision is a spin-off of ULB set up in 2004 based on expertise in research into genetic markers developed in BioVallée (today Immune Health). We employ 18 people in Charleroi and have a turnover of 1.6 million euros. We provide DNA analyses for different applications, principally to the industrial and medical world. Our clientèle is international, mainly European, and we have around seventy customers, including seven of the world top 10 pharmaceutical groups. In 2008, the spin-off created a spin-out : DNAVision Agrifood, based in Liège with 6 employees, and specialised in the food and animal feed industries.

> Your « business card » is the analysis of DNA, which means what, exactly?

Jean-Pol Detiffe : We do DNA analyses in the context of clinical trails for pharmaceutical companies and personalised medicine tests intended for professionals in the medical world. Our expertise is in pharmacogenetics, the detection of genetic variations, and pharmacogenomics, tests on gene expression. We develop our own pharmacogenetics tests associated to genetic mutations which bring about changes in response to drugs. In 2005 DNAVision became the first European genetic analysis laboratory to be accredited ISO17025. We also provide services to third parties, for example, for the diagnostic signa-

ture of breast cancer with the French company, Ipsogen, and the predictive signature of Alzheimer's with the Norwegian company, Diagenic.

> You don't provide predictive tests to the general public?

Jean-Pol Detiffe : No, our aim isn't to evaluate the your probability of developing a certain genetic disease but to define your receptivity to treatment. This information is useful for health professionals who can choose the drug treatment, adapt the posology, predict certain side effects, etc. The medical world is eager for personalised medicine which reduces the costs of inefficacy and side effects of a medicinal product. At the moment we're developing a web site « www.persomedicine.com » which allows doctors to order analyses, access up-to-date literature, blogs, etc. on-line.

> DNAVision obtained in April the « CAP Accreditation ». What does this change ?

Jean-Pol Detiffe : The CAP accreditation means that we are recognised by the American authorities and our tests are reimbursed by American insurance companies. It's the outcome of two years' evaluation. We started by participating in blind tests with American laboratories which evaluated our capacity to generate reliable results and to interpret them correctly. The American auditors then visited our laboratories in Charleroi and finally we obtained the CAP certificate.

We're the only company in Europe to be CAP accredited in pharmacogenomics. At the same time, the Federal Agency for Medicines certified our new laboratories GMP.

> You are one of the players on the business side of the Biopark Charleroi Brussels South. What sort of relationship do you have with your neighbours?

Jean-Pol Detiffe : We work with Immune Health and other companies in the Biopark : Henogen, Delphi Genetics, BV Transgenic Services, Euroscreen... We're also involved in a research project with the Institut d'Immunologie Médicale : DNAVision, in close collaboration with IMI, has developed a test which allows the prediction of the resistance to treatment with interferon in cases of multiple sclerosis and hepatitis C. The test measures the level of expression of the gene Mxa as a marker of the activity of interferon. Validated analytically, it's being validated clinically and will result in a new ULB spin-off.

IMI gives us access to its medical expertise and samples ; we develop the tests, they do the analyses. Evolving in a Biopark encourages collaboration with our close neighbours.

<http://www.dnavision.be>

Human Frontier: IBMM prizewinner

A researcher in the IBMM Molecular Parasitology Laboratory, Benoit Vanhollebeke is the only Belgian to have received a post-doctorate grant from the prestigious Human Frontier Science Program. Even better, he came 1st out of 672 candidates!

The young researcher has just gone off to the University of California in San Francisco where he'll do a post-doc financed by EMBO (European Molecular Biology Organization) before following on with a new research project funded by the prestigious «Human Frontier Science Program». Bio-engineer by training, in 2003 Benoit Vanhollebeke joined the IBMM (Institut de Biologie et de Médecine Moléculaires) Molecular Parasitology Laboratory to do, under the supervision of Etienne Pays, a thesis on the model of the trypanosome, this astonishing parasite which manages to outsmart immune defenses by continuously changing and which wreaks appalling damage in Africa, causing sleeping sickness in man and nagana in livestock. His project «Human FrontierScience» means he'll leave the trypanosome behind and work on another model, the zebrafish. He'll study vascular biology in this promising model, especially the permeability properties of blood vessels.

Incorrect sorting

The IBMM Molecular Parasitology Laboratory - Elsa Lauwers (in charge of research at the FNRS), Christophe Jacob and Bruno André – published in the *Journal of Cell Biology* a study which showed that the signal which targets the membrane proteins inside lysosomes (where they're degraded) correspond to a specific short chain of ubiquitins, small proteins acting as chemical markers in many cell regulation mechanisms. Several years ago, the same ULB laboratory had shown that the key role played by ubiquitin in the address of targeting proteins towards internal compartments of the cell: ubiquitin is the signal which triggers internalisation by endocytosis of surface membrane proteins.

Everything leads us to believe that the conclusions of the IBMM researchers drawn from the experiments done on yeast can be extrapolated to very many membrane proteins (receptors, channels,..) of human cells. By better understanding the malfunctioning of sorting systems, the researchers are helping to understand better the mechanisms of different illnesses.

See the *Journal of Cell Biology* of 4 May 2009.

Delphi Genetics : grants licence

Delphi Genetics, ULB's spin-off has entered into an agreement with Sanofi Pasteur, the vaccines division of Sanofi-Aventis Group, for the manufacture of biological pharmaceuticals using Delphi's patented StabyExpress™ technology. StabyExpress is a new approach to stabilizing the genetic machinery required to manufacture proteins, the raw material at the heart of many modern biopharmaceuticals including vaccines, monoclonal antibodies and therapeutic proteins. Delphi's StabyExpress technology improves the efficiency of protein manufacture and at a higher quality than alternative approaches. Moreover, the technology avoids use of antibiotic resistance genes and is therefore in line with recent FDA and EMEA recommendations against the use of antibiotics in manufacturing of proteins for human and veterinary use. StabyExpress is a technology which is covered by ULB patents and developed under license by Delphi Genetics : it improves the efficiency of protein manufacture and at a higher quality than alternative approaches.

Biopark Training/Formation : 1st success...

A few weeks after its creation, Biopark Training/Formation launched its first training sessions with great success as they were all full ! Combining theoretical and practical knowledge, technical and interpersonal skills, seven short modules (1/2 to 2 days) in genomics (biomedical applications of PCR) and flow cytometry were programmed. Biopark Training/Formation had 81 registrations from biotechnology industries and the Hautes Ecoles (teachers) and research institutes (academic and technology researchers). To meet the demand, Biopark Training/Formation will soon provide a new cycle. Starting in the autumn, new subjects will also be programmed, based on discussion with professionals in the sector : at the end of the summer, see the programme on <http://www.biopark.be/formations>.

...and new support

Launched as a pilot project during the 1st call for Convergences (ESF, European Union and Walloon Region), the training project intended for teachers in the Hautes Ecoles was approved in the 2nd call : thanks to the European Social Fund, it has now been extended to all Hautes Ecoles of the Communauté française, and this up to 2013. Driven by Biopark Training/Formation, the objective of this project is to ensure better cohesion between the initial training given by the teachers and the requirements of enterprises in constant evolution. Intended for teachers in HE which train mainly for the professions of laboratory technician and engineer in biotechnology linked to life sciences, it deals with three areas : theoretical modules describing the state of the art, giving up-to-date information on a specific discipline, demonstrations of certain recent techniques and help with setting up specific practical projects.

Imaging expands

Thanks to support from Europe and the Walloon Region (FEDER, 2nd call), the multimodal imaging centre is being completed. We remember that during the 1st call Convergences (FEDER, European Union and Walloon Region), a budget of around 10 million euros had been assigned for the creation of a multimodal imaging centre in the Biopark Charleroi Brussels South. This centre will provide industry and academic laboratories with a unique interface integrating advanced microscopy technologies and methods, and in vivo imaging by magnetic resonance (IRM) and PET Scan. In the context of the 2nd call, the Imaging Centre obtained a budget of some 4.7 million euros, for the acquisition of new equipment to extend the range of skills and services available, and to install the imaging centre in purpose-built premises on the Aéropole of Charleroi. An immuno-histochemistry platform (team of Isabelle Salmon at ULB Erasme) will be formed at this centre.

IES Symposium

Every two years the International Eosinophil Society (IES) organises a scientific congress dedicated to the biology of eosinophil and related diseases, including allergic and infectious disorders. The symposium traditionally brings together 150 to 200 scientists and medical researchers from all over the world. This year the 6th edition of this congress is in Belgium : it will take place in Bruges, from 7 to 12 July. This edition is co-organised by the Institut d'Immunologie Médicale (IMI) of the Charleroi Brussels South Biopark and the University of Lille II.

Information at
<http://www.eosinophil-society.org/EOSINOPHILS-2009>

Waleo : bacterial proliferation

The results of the Waleo3 programme – technologies to serve medicine and health – of the Walloon Region were announced in May. Among the 12 projects supported (four with ULB) is one led by Laurence Van Melderens of the IBBM Laboratoire de Génétique et Physiologie Bactérienne, entitled HYPRO2COM, a project concerning bacterial proliferation.

Production on a large scale and at reduced costs of medically relevant components is often done in bacteria which are real production plants. As production depends directly on the number of bacteria, different techniques have been developed to increase this number. The objective of project HYPRO2COM is to develop the hyper-proliferative strain and optimised culture conditions for both large scale production and smaller scale laboratory production. In parallel, the researchers want to understand the role of mutated genes in bacterial physiology, especially in metabolism. Coordinated by the ULB Laboratoire de Génétique et Physiologie Bactérienne, the project involves a team from the BioSys research group of the Faculté Polytechnique of Mons and is sponsored by GlaxoSmithKline Biologicals and Delphi Genetics, a spin-off of ULB in the Biopark Charleroi Brussels South.