



BIO PARK

CHARLEROI BRUSSELS SOUTH

news

The Biopark Charleroi Brussels South Newsletter

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ULB

UMONS
Université de Mons



Mood

THE LIFEBLOOD OF RESEARCH

Used to working with living organisms and interpreting the smallest “signals”, our academic research institutes definitely have one thing in common with the subjects of their research: like all living things, they need a constant supply of energy.

For them, this energy takes the form of the many doctoral and postdoctoral researchers that come to our laboratories for training. It also takes the form of experienced researchers who, particularly following postdoctoral research abroad, return brimming with original ideas, innovative projects, and enthusiastic partnerships. You will see proof of this in this edition of Biopark News.

Nevertheless, too few of those researchers who travel abroad actually do come back. The root causes include the lack of employment opportunities, job insecurity, and slashed laboratory budgets in the face of increasing international competition with other universities... And as we know, all living things need a suitable environment if they are to survive.

The Biopark is fighting to meet this challenge, and each new talent discovered is a fresh lease of life.

Véronique Kruids

Chair of the Department of Molecular Biology, ULB



Broadening horizons



Spending time abroad is an important, if not vital, experience for young researchers. Working in a foreign laboratory exposes researchers to new ways of doing things and new research techniques, and once learned, why not bring these new ideas back to Belgium? Two researchers who left to carry out postdoctoral research in the USA and are now back on the Biopark share their experience with us.

Just back in Belgium after spending three and a half years at the University of California, San Francisco (UCSF), Benoît Vanhollebeke hasn't quite settled down, “Even though I have now been back at the Biopark for a month, I still go back and forth to Germany, where my postdoctoral laboratory has been delocalized. I still need to tie up a few loose ends before my research will be complete”. The researcher splits his time between Germany and the IBMM, where he is involved in setting up a new research unit that will study the development of the vascular system and the blood-brain barrier with support from *Fondation ULB* and *Fonds Brachet*. It was during his time in the USA that Benoît Vanhollebeke furthered his knowledge in this field: “After by PhD at the Parasitology Laboratory, my main goal was to try something different”, he explains, “and I was particularly interested in the vascular system. I began looking for an innovative research project in that field, in any laboratory I could find”. His search ended at Didier Stainier's laboratory at UCSF, where they were researching embryonic development,

especially in the zebrafish: “The zebrafish is an interesting model for research into the vascular system's development”, he goes on, “especially due to the transparency of the embryos”. He has now introduced this technique on the Biopark: “the infrastructure

After three and a half years in San Francisco, Benoît Vanhollebeke will create a new research unit at the Biopark to study vascular development and the blood-brain barrier.



is in place!”. Now they just have to form a team that should begin work within the next few months.

CHANGING THE WAY WE SEE RESEARCH

One of the major benefits of spending time abroad is the acquisition of new scientific techniques. But that is not all. “Working abroad can change the way you see things”, Benoît explains, “It’s important to break away from how you carried out your doctoral research so that you can develop new ideas. This is how you become independent, creative, and build future expertise”. This opinion is shared by Guillaume Oldenhove who returned to the IBMM in 2011 after carrying a postdoctoral research on immunity of the digestive tract at the Bethesda National Institute for Health in Washington DC: “What struck me most was the international make-up of the research team”, he explains, “American laboratories have so much appeal that you meet researchers from all over the world. It shows you that you are not the only ones working in a particular field and changes how you look at research”. Guillaume continues to work with

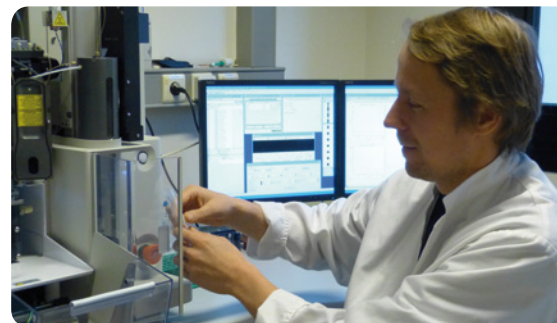
his host laboratory, sharing resources, ideas, and techniques: “PhD students can go from one to another to learn techniques before taking that knowledge home with them. This is definitely a good thing for developing research”, he concludes.

MORE EXCHANGES AND INTEGRATION

Another benefit of experience abroad is the opportunity to see how research works elsewhere. “American teams are often structured around research centres”, Guillaume Oldenhove explains, “In these research centres, cutting edge equipment is available for all researchers to share. This is great for fostering cooperation and sharing ideas”. He believes that this model should carry more currency here, too: “I don’t think we are doing too badly in Belgium,” he continues, “but small research teams can still have a hard time. What we lack is an international outlook and cohesion. Fortunately, things are starting to pick up”, he continues, citing the CMMI as setting a good example in pooling resources.

Guillaume Oldenhove and Benoît Vanhollebeke both agree: they are both lucky that in their current institute they have a *carte blanche* concerning areas to explore. Helping young researchers abroad to return home, and promoting innovation and creativity, remain among the major challenges facing research campuses today.

Natacha Jordens



National Institutes of Health/Department of Health and Human Services

In 2011, Guillaume Oldenhove returned to the Biopark after completing postdoctoral research at the NIH in Washington, where he developed his knowledge of digestive system immunity.





Crossing borders... Melbourne, Australia

One year ago, Pierre Smeesters left Belgium for Australia. The IBMM researcher joined the Murdoch Children's Research Institute at the University of Melbourne where he continued his research into streptococcus A before returning to the Biopark.

Streptococcus A infection remains an enigma for scientists, and is a major public health issue. A benign infection in the Western world – causing angina, for example – it has nevertheless become increasingly common over the past twenty years, and in developing countries streptococcus A is a killer, causing the deaths of over 500,000 people every year. Only a vaccine could counter the germ, but there is currently no vaccine in existence that proves effective against the diverse strains of the bacteria.

As a paediatrician, Pierre Smeesters has spent several years studying this infection, first in

Brazil, then in the IBMM's Bacterial Physiology and Genetics, and now at the Murdoch Children's Research Institute in Melbourne which he joined in 2011, thanks in no small measure to the *Rayonnement International (International Profile)* award at the ULB. Pierre Smeesters should spend a further two years working at the Australian university before returning to the Biopark with solid experience in immunology and an active international network.

31 COUNTRIES

The researcher launched and currently coordinates a research project with a wide scope of inquiry. Its aim? To gain a comprehensive understanding of streptococcal infections wherever they develop. No fewer than 46 researchers and doctors from 31 different countries are participating in the initiative, and together they have compiled over 1000 bacterial strains. Their analysis has resulted in a new description of the pathogen, and a new “common ground” shared by its different forms that should enable a single, effective vaccine to be developed that works against most of the strains encountered around the world.

The first findings were published at the end of 2012 in the review *Clinical Microbiology and Infection* and submitted to the website of

the American CDC that is home to the world's leading research laboratory for this bacteria. The finishing touches are being made to the complete classification of the bacteria, the new international streptococcus A vaccination strategy is currently being assessed in the lab, and contact has been made with the University of Tennessee (USA), responsible for the worldwide vaccination programme. Things are quickly picking up pace.

FIJI

“At the IBMM I carried out the theoretical groundwork and developed the bioinformatic models for this new approach, but I had insufficient biological material to be able to put it to the test. In Melbourne, I have access to a blood bank of samples from infected children in Fiji. Working at the Murdoch Children's Research Institute also means that I can attend seminars, communicate, and embark on rewarding partnerships with colleagues within the children's hospital, as well as those at the maternity ward, the cancer hospital, the general hospital, or even the research labs at the University of Melbourne: we are all present within an area or around 1.5 square miles”, Pierre Smeesters explains.

Nathalie Gobbe



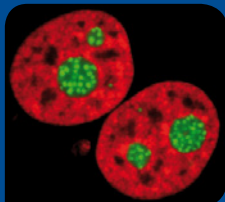
Melbourne

A ULB RESEARCHER INVOLVED IN A EUROPEAN MASTERS ON RNA

For over 30 years, the *Université de Lorraine* has been an expert on RNA, and next September will see the launch of an International Masters in this field (“RNA/Enzyme Sciences”). **Denis Lafontaine**, the head of the **RNA Metabolism Laboratory at the IBMM**, will be teaching on the course together with other French and German professors.

“It was very important for our lab to be involved with this programme”, Denis Lafontaine confirms. “It is an innovative Master’s programme, in that the specialist skills of several European laboratories are all included in a single course. It is a comprehensive course that combines molecular and cellular disciplines.” Student exchanges between the participating institutions are planned. Denis Lafontaine will give classes on research into the nucleolus and ribosome biogenesis.

D.D.S.



CYCLOSPORINE UNABLE TO CONTROL CERTAIN KINDS OF TRANSPLANT REJECTION

The immunosuppressive treatment provided during trachea transplants seems to be unable to prevent the appearance of bronchiolitis obliterans. This is a brief summary of the results obtained by **Dr Philippe Lemaître** and **Dr Alain Lemoine’s (IMI)** team, published in the *American Journal of Transplantation* in February. Bronchiolitis obliterans is a reduction in the diameter of the windpipe that is typical of chronic rejections of lung transplants, and is the main cause of failed transplants.

In murine subjects, the researchers looked at the reactions of different populations of T lymphocytes and the appearance of bronchiolitis lesions when treated with cyclosporine, an immunosuppressive agent used in clinical treatment. They witnessed an increase in interleukins 17 and 6 (IL-17 and IL-6), the molecules produced by certain lymphocytes and linked with bronchiolitis obliterans. The cyclosporine failed to prevent the appearance of the lymphocytes that cause this disease. Worse still, it may even indirectly promote them by inhibiting other lymphocytes such as T CD8 lymphocytes that are also involved in rejected transplants. The results were confirmed in mice genetically deprived of IL-17, protected from bronchiolitis obliterans by cyclosporine.

The cyclosporine may, paradoxically, provide a “favourable” environment for these lesions to appear and, as a consequence, cause the transplant to be rejected. In short, by inhibiting one cause of rejection, cyclosporine may promote another.

N.J.

WELBIO: a new Biopark project



Walloon Excellence Life Sciences and Biotechnology (WELBIO) is backing eight new research projects. They include Stanislas Goriely's project at the Institute for Medical Immunology (IMI).

During an infection, a certain type of white blood cell – cytotoxic T lymphocytes – multiply rapidly. These lymphocytes differentiate into “effector” cells that then destroy the infected cells. Once this stage is complete, most of the

T lymphocytes die, as they no longer serve any purpose. However, some of them remain within the organism: they act as a type of memory, and enable the body to respond more rapidly, vigorously, and effectively to next time it is infected with the same pathogen.

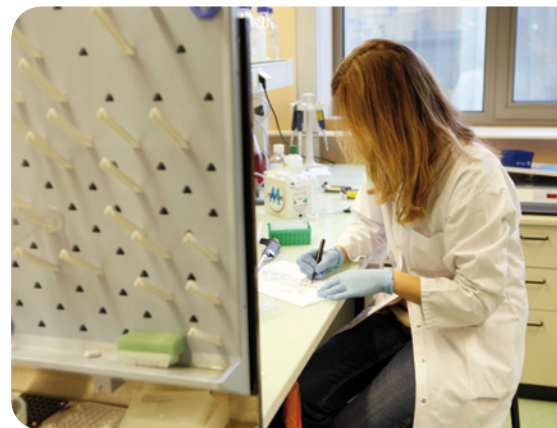
These “memory” T lymphocytes also form the basis for preventative vaccination.

MEMORY CELLS

Thanks to WELBIO, Stanislas Goriely is able to study both of these aspects of immunity: the innate immune response and the adaptive response initiated by a vaccine. Together with his team at the Institute for Medical Immunology (IMI), Stanislas Goriely will study the molecular mechanisms that form and maintain these “memory” cells.

“We want to understand how the different transcription factors control the long-term differentiation of these “memory” cells. We hope to be able to regulate certain transcription factors and to pave the way to develop new vaccination strategies for tuberculosis, malaria, or AIDS, for example”, Stanislas Goriely reports.

He goes further, “WELBIO emphasises support for ‘promising’ young researchers working on innovative fundamental research projects that are high risk but could potentially provide high



added value: ‘high risk, high gain’ projects. It is a great form of motivation”. The budget of €400,000 over two years will allow Stanislas Goriely to fund two positions (a technician and a postdoctoral researcher) as well as covering various operating costs.

Nathalie Gobbe



CV IN BRIEF: STANISLAS GORIELY

Trained as a doctor, Stanislas Goriely intended to specialise in paediatrics. However, when working on his dissertation in immunology under Professor Michel Goldman, he decided to go into research – two of his brothers and his sister are

already researchers themselves! – and began working on his doctoral thesis at the ULB, studying the neonatal immune system.

He completed his PhD at the Biopark, working at both the IMI and the IBMM (in Carine Van Lint's Molecular Virology Laboratory). He completed his thesis in 2004.

Three years later, he was appointed a qualified FNRS researcher at the IMI, where he continues his work on dendritic cells and the role they play in the immune response. Recently, he has also developed an interest in gene regulation within cytotoxic T lymphocytes.

In 2013, WELBIO awarded him a “starting grant” for his project “Mechanisms involved in the differentiation of cytotoxic T lymphocytes in memory cells”.

N.G.

TWO MORE YEARS

WELBIO has extended its support for Etienne Pays' project at the Institute of Molecular Biology and Medicine (IBMM) for a further two years. The project is studying apolipoproteins.



Etienne Pays' Molecular Parasitology Laboratory at the IBMM has spent several years studying a specific protein family: apolipoprotein L. Backed by WELBIO, his laboratory is following two particular avenues of investigation.

Firstly, his team is analysing the biological processes controlled by apolipoprotein L, focusing on the role played by apolipoprotein L1 in renal function. They hope to make advances in the treatment of terminal renal failure. The second field of research has generated mutated apolipoprotein L1 that can effectively kill *Trypanosoma gambiense* and *T. rhodesiense* that cause sleeping sickness in humans and nagana in cattle. Etienne Pays and his team are studying the potential applications of this breakthrough in order to both understand how *T. gambiense* is able to resist human serum and to combat the human and animal diseases caused by these parasites.

N.G.



IPG joins the Biopark

Present on the Aéroport de Gosselies since 2006, the Institute of Pathology and Genetics has recently joined the Biopark. Pierre Lefesvre, the molecular pathology manager at IPG, tells us more.

INTRODUCE THE IPG IN JUST A FEW WORDS...

Pierre Lefesvre: IPG's history goes back 60 years. The Institute is a non-profit association specialised in medical diagnosis and that has expanded its activities in fields such as pathology, human genetics and molecular biology. In earlier days, pathology and clinical genetics – researching the genetic causes of a disease – were completely unrelated fields, and what is unique about the IPG is that these two departments work closely together. For example, in oncology this close cooperation lets us form diagnostics and to develop medical interpretations. In medical and technological terms there is a greater synergy.

HOW MANY PEOPLE WORK AT THE IPG?

P. Lefesvre: The IPG is staffed by over 200 employees (pathologists, technicians, etc.). Our role is basically to carry out cutting edge diagnostics for patients. We work hand in hand with a number of Belgian hospitals and every year we provide them with about 250,000 analyses.

WHAT IS YOUR NEXT CHALLENGE?

P. Lefesvre: Physically, we are already mature, and our staff has also grown. Our greatest challenge now is to stay up to date in three areas: quality standards, technological standards (molecular biology, high speed sequencing, etc.), and care services. Given the pace at which technology advances, this is no mean feat.

YOU RECENTLY JOINED TO THE BIOPARK. WHY?

P. Lefesvre: We had already been present on the Aéroport for several years, and we needed to share our services. Our goal is to work more closely with local partners and foster collaboration with various players on the Biopark.

TELL US MORE ABOUT THIS COLLABORATION.

P. Lefesvre: For example, we are already working with the IMI and CMMI on joint scientific projects. We are also working closely with Biopark Training: we provide the training centre with access to our cutting edge equipment, and in return our teams have access to training. These examples

show that “in practice” we are becoming an increasingly integrated part of the Biopark. The logical next step was to join the Biopark “on paper” too.

Damiano Di Stazio

www.ipg.be



Wallonia Biotech Coaching: serving biotech spin-offs



Wallonia Biotech Coaching has worked with companies on the Biopark since 2006. However, the “virtual incubator’s” role is little understood. Serge Pampfer, the WBC Chief Executive, sheds some light on their work.



CAN YOU BRIEFLY EXPLAIN THE MISSIONS OF WALLONIA BIOTECH COACHING?

Serge Pampfer: The WBC virtual incubator was founded in 2006 in order to provide additional support to emerging life sciences companies in Wallonia. We work in partnership with the Technology Transfert Offices, incubators, and investors in each university environment to

develop and execute long-term support programmes with financial contributions. The unique multi-region positioning of the WBC – it works throughout Wallonia – means that is able to act as a platform for sharing and consolidating information between the various bio-entrepreneurship stakeholders in Wallonia, one of which is the Biopark.

HOW INVOLVED IN THE BIOPARK IS WBC?

SP: To put a figure on it, WBC has already injected €890,000 into biotech companies in Gosselies, particularly in the spin-offs Bone

Therapeutics, Endotools Therapeutics, and the recently created OncoDNA. In 2010, WBC began its support of the Biopark Incubator management team which is worth €150,000 per year. In total, our work with the ULB forms a considerable part of our current and future business.

AND THE COOPERATION IS SET TO EXPAND IN THE FUTURE...

SP: Yes. 17 of the 54 projects that we are currently involved in as part of the pre-incubation initiative launched in 2010 come from the ULB. This represents 31% of our future portfolio, compared to 12% as of now. For 2013, we have budgeted around €380,000 funding for new projects on the site. Our role in funding Biopark Incubator is also soon set to expand in order to emphasize our commitment to the team and their work. The partnership between WBC and Biopark stakeholders is therefore set to become stronger as time goes on, and will benefit all of the site’s new businesses.





Surprising picture

This image taken by **David Pérez-Morga** from the **CMMI** is entitled **“War in Our Human Trenches”**, and depicts the battle between an immune cell and a trypanosome, as seen through an electronic microscope. The image was chosen to enter the “National Geographic-FEI” competition and will perhaps soon feature in a National Geographic film called “Mysteries of the Unseen World”.

Before entering the final contest, the image was already earmarked for inclusion in June last year. The CMMI also featured on the cover of *Science* with a similar image illustrating the latest discoveries made by the IBMM’s Molecular Parasitology Laboratory on the mechanisms used by the parasite to inhibit the immune response of the host.

N.J.

Trained to succeed



Biopark Training goes from strength to strength: in 2012 its courses were all full, its students worked diligently, and an impressive number of jobseekers successfully found work...



Biopoly's 2011 class

100 % of the jobseekers went on to find work following the 2011 Biopoly programme, the biotechnology course organised by Biopark Training in partnership with Forem. This impressive statistic affirms the successes achieved since the programme was launched in 2009 when over 80% of participants quickly found stable employment after completing the course.

"These figures are explained by the quality of the training on offer and our awareness of employer needs", reports Arnaud Termonia, the Biopark Training manager. "The team's primary concern is to match the qualifications of our participants as closely as possible to industry needs. Biopoly's aim is clearly to get people into work, and these intensive courses help those who enrol to find or return to work".

STRATEGIO, OR HOW TO BECOME A MANAGER

Biopark Training also offers a range of courses for biotechnology professionals. These include Strategio, a course designed to train biomedical staff in management. The first course was attended by 18 students, and was a definite success.

"Firstly, Strategio is a short, intensive, yet comprehensive course (like a "mini-MBA") designed especially for managers in the biomedical sector. The interactive teaching style involves renowned academic and industrial experts who work in pairs on specific themes. The participants then carry out a group project that covers all aspects of the course. This all combines to make the course highly dynamic and relevantly applicable", highlights Arnaud Termonia.

In light of the course's success in 2012, organised in partnership with the Biowin competition cluster and the Solvay Brussels School Economics & Management (ULB), it has already been earmarked to run again in September 2013.

IMMUNOLOGY FOR ALL

In 2012, Biopark Training also launched an immunology training programme. "Immunology is a complex field that can be difficult to enter for non-immunologists", states the head of Biopark Training. "We wanted to design a course for non-specialists who often have to deal with immunological issues in their work."

Here too, the curriculum (a general introduction followed by intensive modules in areas such as vaccinology, cancer research,

> continued on next page



infection, allergies, and allogenic reactions) calls upon academics, industrial experts, and clinicians. Over 300 participants signed up for this opportunity to refresh their knowledge of immunology.

Biopark Training is determined that it should not end there, and new courses have already appeared in the 2013 prospectus. In other good news, the team will soon welcome its 2000th trainee!

Damiano Di Stazio

Visit <http://biopark.be/training.html> for a look at the prospectus.



STRATEGIO

In brief



ADDITIONAL FUNDING FOR BONE THERAPEUTICS

Bone Therapeutics, the specialist in researching new treatments for bone diseases, secured €7.7m in additional funding from its investors and the *Région Wallonne*. These funds will enable Bone Therapeutics to accelerate the development of its infrastructure, and to support the clinical trials for PREOB[®], launched last October. The candidate-drug is designed to treat osteonecrosis of the hip, a rare disease that destroys the joint, and non-union, when fractures fail to heal. PREOB[®] is currently undergoing Phase III clinical trials on 130 patients suffering from osteonecrosis in over 20 sites around Europe.

N.J.

OECD: BIOPARK SHOWS THE WAY

The Biopark is a “good example of a successful university initiative”, made possible with the support of European Structural Funds, and that fulfils the training, research, and civil service roles expected of universities. These are the words used by the Organisation for Economic Co-operation and Development when describing Wallonia’s regional innovation policy in February. The OECD draws attention to the value chain and mutual suitability of the various stakeholders at the heart of the campus’ operations and structure, as well as the “significant achievements” (patents, partnerships, etc.) made by the site.

The OECD’s study was launched in 2011 in partnership with the Walloon government. The aim was to better understand Wallonia’s regional innovation system in order to improve future performance.

N.J.