



# BIO PARK

CHARLEROI BRUSSELS SOUTH

# news

## The Biopark Charleroi Brussels South Newsletter

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**ULB**

**UMONS**  
Université de Mons



## Ph.D students past and present: what a Ph.D means to them

The various academic laboratories located on the Biopark mean that it also plays a role in education, and almost 80 Ph.D theses are currently being written on the campus. The Ph.D students come from the ULB and from around the world – China, Portugal, Serbia... to name but a few of their home countries – and this year over 15 of them began working on their thesis at the IBMM and IMI. You can meet a few of them here... Throughout the following pages you will meet others who have sat their viva on the Biopark before heading abroad to carry out post-doctoral research, working in industry, or staying in the Biopark's research laboratories. *Ph.D students past and present: what a Ph.D means to them?* is the theme of this special report.

## The new batch of Ph.D students is here!

### **EMMANUELLE ALALUF, 29**

I see research at the IMI and medicine in the hospital as being complementary activities. Immunology is a fascinating area of study with applications in a range of fields, and in nephrology and transplants in particular: two fields that I plan to specialise in later.

I'm working on the enzyme heme oxygenase-1 in myeloid cells that play a key role in how tumour cells escape attacks from our own immune system. The aim is to help develop new drugs and vaccines against cancer.

### **SIMON VERMEIREN, 23**

My Ph.D thesis studies the role of the gene Prdm12 in spinal ganglions during embryonic development.

I decided to write a thesis to delve deeper into the subject of my master's dissertation, but also because I like working in a lab and setting up new experiments. I chose to stay at the IBMM because of the suggested subject, the supervision, and the workplace atmosphere.

### **MAELLE ANCIAUX, 24**

I'm studying the genetic expression programme of a population of T lymphocytes involved in the production of antibodies, and which therefore have an impact on the effectiveness of a vaccine.

Why the Biopark? Because I did my master's at the IBMM and I like the ULB spirit!

### **LAURA WEICHSELBAUM, 30**

Bacterial infections are one of the main causes of mortality in cirrhotic patients, which affect them more often and more severely. This increased susceptibility to infections is explained, in part, by a dysfunctional immune system. My research project sets out to characterise the cellular agents of innate immunity in cirrhotic patients to better understand the mechanisms behind the disorder.

My thesis helps me to see pathologies from another angle, which is a precious asset as a doctor. And the IMI is the perfect setting for starting a Ph.D thesis both for the supervision provided and the professional and personal qualities of the people who work there.

### LINE DE GRANDE, 24

My thesis looks at the molecular and cellular aspects of the formation of blood vessels in the brain.

When working on my dissertation, I found out exactly what was involved in research and it made me want to take it further with a thesis. It fascinates me: gradually answering the questions that we ask every day to make advances in research, taking ownership of your project and growing alongside it.

### MARIJA DRAGOJEVIC, 24

I'm from Serbia, and a graduate of the University of Belgrade.

The Biopark is a good place to do your Ph.D because you can learn a wide variety of innovative techniques. The seminars held on the Biopark are also a great opportunity to learn and swap ideas. By coming here, to an international environment, I am broadening my horizons and working with researchers who are renowned in their fields.

### NICOLAS ISTACES, 28

My research project sets out to understand the molecular mechanisms by which CD8 ("cytotoxic") T lymphocytes acquire immune memory.

The Biopark is an attractive research environment for immunology. Supervisors work with Ph.D students in a spirit of creativity and advancement of understanding.

### RAPHAËL DUTOIT, 34

The Ph.D will allow me to continue my education and pick up new skills. Furthermore, it's an opportunity to throw myself into a research project while leaving plenty of room for creativity.

The IBMM was the natural choice because my thesis was about the structural characterisation, biochemistry, and physiology of bacterial enzymes.

### YIWEI JIANG, 26

My thesis is based on the interactions between antibodies and cells in mothers and newborns.

I'm drawn to the mystery of immunology: it's why I wanted to go into research. Through my Ph.D thesis I can expand my skillset, which is an investment in my career.

I'm from China (China Pharmaceutical University, in Nanjing) and I've really been made to feel at home here: the people are friendly on the Biopark!

### ANA SOFIA DA COSTA BRITO, 26

I'm Portuguese and I decided to come and study my Ph.D at the Biopark because it is a place where universities, technical colleges, and private enterprise work as partners, and because the labs are known for their research into fundamental molecular mechanisms. A Ph.D is a great opportunity to continue my initial training from the University of Minho (Braga) and build my future career.

### ALICE HOYOIS, 29

Biliary atresia is an inflammatory disease that develops after birth and progressively blocks the biliary vessels. The disease quickly evolves into cirrhosis of the liver, and a premature death. It is not understood what causes the disease. A number of hypotheses have been put forward, including an immune response targeting the tissue. And this is the hypothesis that I am researching.

A doctor by trade, I wanted to learn about another aspect of the disease through research: to look beyond symptoms and understand the mechanisms.

### LAURA KOSTOV, 25

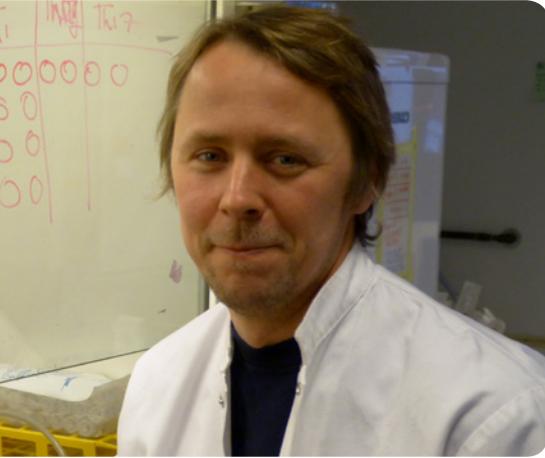
My research project is looking at the molecular mechanisms governing intercellular communications between adipose tissue (fat) stem cells and macrophages (immune system cells that *eat* pathogenic agents).

I find research stimulating, so I decided to pursue a Ph.D. I didn't choose to stay on at the Biopark *per se*, but rather to stay in a lab where I felt at home, and where I have great respect for the scientific rigour that it extols.

## International experience is a necessary step in an academic researcher's career



A position as an academic researcher is often the *Holy Grail* of Ph.D. students at the beginning of their thesis. With a career that began at almost exactly the same time as the Biopark was formed, Guillaume Oldenhove now works here on a daily basis. The result of luck and a good CV, he'll say.



Guillaume Oldenhove (Immunobiology Laboratory, Immunology Cluster, IBMM) is one of the very first to have completed a dissertation on the Gosselies Campus. He first learned of the Biopark in the early 2000s: "A beetroot field!", he remembers, smiling, "There wasn't much here apart from the IBMM building. The IMI building was just the foundations". Is this an obstacle when you're a student? "There were a few disadvantages to being away from Brussels, yes, but my main motivation was always the research".

### POST-DOCTORAL STUDIES ABROAD

Having completed his dissertation at the old Animal Physiology laboratory, he decided to continue in the same lab with a Ph.D. thesis

on the regulatory mechanisms of the immune response. By the end of his thesis, he had developed a great interest in the immunology of intestinal mucus, and had the opportunity to specialise in this subject over three years spent at the National Institute of Health (NIH) in Washington: "International experience is a must for researchers looking to establish a career in academia", he explains, "Learning how research is carried out opens your eyes as to how fundamental research works today: the techniques used, new theories around a particular problem, a different dynamic, etc. It's extremely rewarding!". Armed with this post-doctoral experience, Guillaume Oldenhove returned to the IBMM in 2011, first as a postdoctoral researcher in the Immunobiology lab, before securing the coveted role of academic researcher. "I applied to the ULB when a chair became vacant in the molecular biology department. I was in the right place at the right time", he admits, "Experience abroad and number of publications play a key role in deciding who occupies these posts, but there is also an element of luck that can't be controlled for".

### STRONGER TOGETHER

Over the years, Guillaume Oldenhove has witnessed the Biopark's rapid evolution: "The number of buildings that have sprung up around

the IBMM over the years prove that the Biopark is a concept that works, it all points to success, to a certain dynamism". With one drawback: "I think that we are becoming less of a university campus and more of an entrepreneurial environment. This sometimes makes it difficult to recruit foreign students, who prefer to go to the KUL, for example". However, he believes that the development of multimodal platforms in the image of the CMMI will boost the Biopark's appeal among researchers: "The platforms are home to all of the tools and devices needed to study a particular theme, easily accessible to all, both academic and private researchers. This represents a huge asset. The development of other platforms using the same model as the CMMI but focusing on different themes like sequencing, for example, would provide an additional draw for the Biopark". The researcher also cites collaboration with other laboratories and businesses: "Our laboratory, for example, works in partnership with researchers at the IMI and Paul Delrée, a doctor at the IPG, who regularly carries out anatomopathological analysis for us. Because the IPG is just a few metres away, the collaboration was easy to set up".

*Natacha Jordens*



## Seek out all the experience you can

A new addition to the MaSTherCell team, Nicolas Preyat used his years as a researcher to broaden his knowledge and diversify his skills. This endowed him with a lasting curiosity and a taste for interaction that he is now bringing to his new employer: MaSTherCell.



Hired by MaSTherCell in mid-January, Nicolas Preyat is discovering the business world. “From the very first day, the differences from the academic environment leap out at you”, explains the former IBMM researcher, “For example here,

all of our protocols have to be approved in advance, right down to the smallest reagent used, and every detail is discussed in total transparency with the client”. As a project manager, he acts as the point of contact between MaSTherCell’s clients, seeking to enter production of a cell therapy product, and the company’s operational teams: “The work is different: I’m no longer wearing a white coat but I’m faced with fresh scientific questions every day. It’s stimulating”.

Another difference? The profiles of his colleagues. “There are experienced researchers working in cellular biology and immunology, of course, but there are also industrial engineers, sales engineers, and quality assurance specialists, to name but a few. They all apply themselves individually within their area of expertise, but we regularly come into contact on the various aspects of a project that require a range of expertise. It helps us move forwards quicker and more effectively, all while adhering

stringently to current pharmaceuticals sector quality standards. There is a real feeling of commitment to a shared goal and a sense of belonging to a single innovative company. That’s the thing I like best about companies of an accessible size like MaSTherCell”.

### WHAT GOES ON NEXT DOOR

Interaction and discussion stood out in his career as a researcher, too. Nicolas Preyat began working on his thesis in 2008, supervised by Oberdan Leo who would become the Director of the IMI a few months later. Because his supervisor had less time to spend with him, he sought out information and advice from others in the lab... as well as in surrounding labs: “I’m curious by nature and had a lot of freedom”, he goes on, “It became a real advantage: it’s when you *go across the corridor* and speak face-to-face with people in other teams that synergies and partnerships fall into place. I was therefore able to work on some very different projects and pad out my range of scientific expertise. And I give this advice to every young researcher: go and see what’s happening next door”.

Upon completing his Ph.D in 2013, he had definite plans to make the transition into the private sector: “In addition to personal dispositions, I was all too aware that the chances of securing a stable position in academia were slim, even with an excellent

international education”, he explains. So he decided to stay in Belgium and began post-doctoral research in Muriel Moser’s team, where he developed an interest in immunotherapy and the development of monoclonal antibodies. “I knew that it was really just a stepping stone, and that I had to be ready to look for work in the private sector”. The researcher therefore set about developing his transferable skills: “English classes, courses at Biopark Training, etc. These are the kinds of assets that can make a difference in getting a job”.

### STAY IN TOUCH

When he moved to the i-Tech Incubator 2, Nicolas Preyat stayed in touch with his former colleagues, “I sometimes call on one of them when I need to quickly find a solution to a technical issue, for example”. He also told a colleague about the devices available at the IBMM: “That’s the Biopark’s main advantage: everyone is so close at hand. It makes it easier to forge partnerships and move forwards if everyone involved is within walking distance”, the young man concludes, recalling the forests of cranes that dotted the fields around the IBMM while he was studying in the lab back in 2005.

*Natacha Jordens*



## From Biopark to the USA

Studying at the Biopark can be a launch pad for an international career. Here we see exactly how with Maxime Dhainaut and Long Vo Ngoc, erstwhile students at the IBMM and now *postdocs* in prestigious American laboratories.



One is now a researcher at the University of California San Diego, while the other chose the Icahn School of Medicine at Mount Sinai in New York. Maxime Dhainaut and Long Vo Ngoc both studied molecular biology at the ULB, and worked on their thesis at the IBMM.

For Maxime Dhainaut, who completed his Ph.D under Muriel Moser at the Immunobiology laboratory, “Heading abroad is an important step in a researcher’s career. This kind of experience familiarises you with other ways of carrying out research, as well as bringing you into contact with numerous foreign researchers who also decided to move abroad”. Maxime is currently studying anti-tumour immune responses alongside Professors Merad and Brown in New York.



### LINKS WITH BELGIUM

As for Long Vo Ngoc, he is currently a postdoc under Professor Kadonaga in San Diego. He cut his teeth in Véronique Kruys’ lab, and stays in regular contact with Belgium. And with good reason: the findings of research into the TET enzyme which can modify RNA were recently published in *Science* journal.

“It is the result of collaboration between a number of research groups, including François Fuks on the Erasme campus, the principal site for the study and where it was launched, and Véronique Kruys’ laboratory at the IBMM, which worked on certain parts of the project”, Long explains. “I worked on the project remotely for a year! I wouldn’t mind returning to Belgium in a few years, and why not to the ULB”.

### A FUTURE IN RESEARCH

Maxime Dhainaut believes that his immediate future is in research. “I already had the opportunity to spend two short periods abroad during my studies: it’s always a highly rewarding life experience and the decision to go abroad was the right one. I currently have a two-year contract and I’ve applied for funding to extend my stay here, with a view to continuing as a postdoc in New York for 5 years”.

“I think that in general we are appreciated abroad”, Long reports. “Our experience at the IBMM was really positive, that’s a fact. I can tell when I talk to foreign researchers or when I’m in lab meetings: we quickly realise that we have received excellent training, in particular with regard to critical enquiry and experiment design”.

*Damiano Di Stazio*

## Combining research and training



A former student and postdoc researcher at the IBMM, Erika Baus became the first trainer at Biopark Training in 2009. She is perfectly at home there, finding the happy medium between the world of research and her passion for teaching.



“I have always been fascinated by zoology and anything to do with animals”, recalls Erika Baus, now a training engineer at Biopark Training. “It was before I discovered biology, and more specifically molecular biology at the ULB. It wasn’t long before I found this subject far more fascinating and up to date than zoology!”.

At the ULB, Erika Baus cut her teeth during her Ph.D and first postdoc role at the Animal Physiology Laboratory (now the Immunobiology lab), both alongside Oberdan Leo - “It was he who, years later, would talk to me about opening a training centre on the Biopark”. But despite her passion for research and interesting findings, the erstwhile researcher wanted to try something else.

“I have a very logical mind”, admits Erika Baus. “And never being able to obtain a black or white answer in research made me very frustrated. I nevertheless gave research one last shot, but this time on a subject closer to zoology, and one of my first areas of interest (the study of genetic flows between starfish populations). That was how I got my Marie Curie grant to join the Biodiversity and Ecological Processes Research Group, at Cardiff University”.

It was an experience rich in scientific encounters and discoveries - “I was fortunate to be working with people from all over the world, studying species each more exotic than the last. But that still failed to rekindle an interest in research”, explains the trainer who admits that she always preferred organising findings for a paper rather than doing the research needed to get them.

And after three years working on science policy for the Belgian biodiversity platform, Erika Baus found her dream job at the Biopark’s new training centre.

“In addition to constant contact with the world of research, I find teaching a class of *deluxe* students made up of highly motivated individuals to be really rewarding. I can get training in new techniques and complex

themes in life sciences, and then think about how best to make the subject more straightforward, more logical, and more accessible”, the trainer goes on.

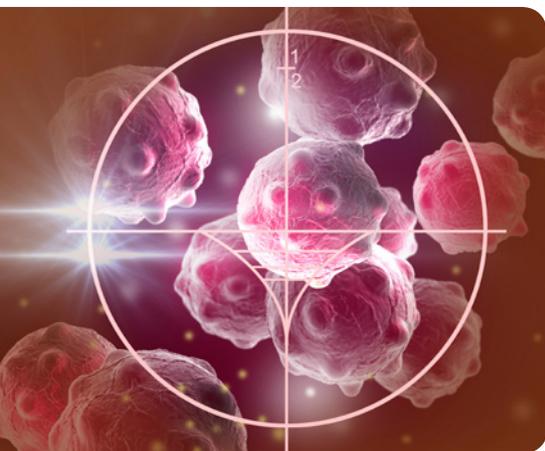
“What’s even better is that since 2009, the course of the Biopark Training has been amazing!”, Erika beams. “Our dynamic little team is made up of personalities and profiles that go together nicely. I love the environment and opportunities available to me at Biopark Training. And as for my passion for zoology, that’s what my holidays in exotic destinations are for!”.

*Damiano Di Stazio*



## Specialist courses in cancerology

This April a new training cycle will be launched, entitled *Next-Generation Sequencing – Focus on oncology*. It is the result of a partnership between Biopark Training – the continuing education centre for the healthcare sector – the ULB Cancer Research Center, OncoDNA, and TATAA Biocenter.



In late 2014, Biopark Training launched a training programme designed to provide an overview of *Next-Generation Sequencing* (NGS) techniques and capture a snapshot of their applications.

So positive were the results of this course that in late April, a new course will cover the subject in greater depth... and in English (see inset on this page). The course will focus primarily on the preparation of samples and Quality Control for sample libraries, both crucial stages in the sequencing process. “We are working with the Swedish training centre TATAA Biocenter on the first part of the course, because the earlier partnership was

so successful”, highlights Valérie Herveldt, a trainer at Biopark Training.

This time, oncology will be in the spotlight. A new course, entitled “*Next-Generation Sequencing – Focus on oncology*”, will run from 26-27 April on the ULB’s Erasme campus. It is the result of close collaboration between Biopark Training, the continuing education centre for the healthcare sector (ULB – Pôle Santé), the ULB Cancer research Center (U-CRC) and OncoDNA. Genomic, transcriptomic, and epigenomic aspects will be examined and, in addition to presentations combining theory and bioinformatic analysis, the course will include a tour and demonstration of the ULB’s dedicated epigenomic platform: EPICS (see inset next page).

### AN ONCOLOGY ECOSYSTEM

“We would like to pad out the NGS course to best meet the needs and expectations of the various stakeholders”, explains Arnaud Termonia, Director of Biopark Training.

“The continuing education centre for the health sector will develop an oncology training platform which will, thanks to ERDF support, constitute the foundations of a specialist cancer research cluster (*Cancéropôle*). The U-CRC is the ideal academic partner for oncology and we can also count on the cutting

### A DEFINITIVE COURSE IN NGS FORMATIONS

- Module 1 (2 days):  
*An Introduction to NGS – Library construction and quality control*
- Module 2 (1 day):  
*Successful NGS analysis*
- Module 3 (2 half-days):  
*Next-Generation Sequencing applied to oncology*

**Learn more: <http://www.biopark.be/bioparkformation>**

edge expertise of OncoDNA. We will draw on this auspicious partnership to describe NGS techniques and illustrate its applications in oncology”, Arnaud Termonia specifies.

### TRAINING BASED ON RESEARCH

“It isn’t the first time that we have been involved in a Biopark Training project”, reveals François Fuks, Director of the U-CRC and the Cancer Epigenetics Laboratory at the ULB Faculty of Medicine. “The partnership

also forms part of the ULB's strategy to boost its visibility so we can concentrate talents and skills around a single theme, as has been done with the Institute of Neurosciences (UNI) or the Diabetes Research Centre (ULB CDR)".

"The strategy is and always has been to support our partners in their fields of research", Valérie Hertveldt continues. "It was therefore an obvious step to bring these partners together and offer cutting edge expertise in oncology".

"Cancerology is rapidly evolving in terms of technology and skills", François Fuks explains. "In epigenomics, the use of NGS is a revolution in medicine. Sequencing the

epigenome provides information that can be used to better understand, diagnose, and treat cancers, with advances in the treatment of breast cancer in particular".

In time, other courses may be organised following the same model. "We can use this experiment to create and/or adapt other courses in oncology as well as the competences of the Biopark and Healthcare Cluster such as imaging, bioinformatics, and immunotherapy", François Fuks concludes.



## EPICS: A PLATFORM UNIQUE IN BELGIUM

François Fuks, Director of the ULB Cancer Research Center (U-CRC) tells Biopark News that, "The aim of our dedicated epigenomics sequencing platform, EPICS, is to offer a comprehensive cutting edge epigenomics and bioinformatic analysis service".

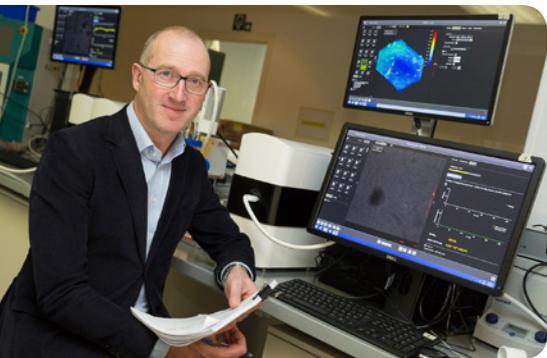
*Next-Generation Sequencing* is constantly evolving, and it is essential that we are able to adapt to and predict advances and changes: a challenge deftly handled by the ULB in the epigenomics field.

"Unlike other platforms, a few years ago we took the gamble of refocusing, of specialising in order to perform better and more effectively: we are the only platform in Belgium entirely dedicated to epigenomics. Our expertise and resources will enable us to become one of the leading players in epigenomics in Europe".

## A growth spurt for Ovizio in 2016



Following an €8m fundraising round, the company was looking to bolster its R&D team by recruiting five new staff in Uccle and Gosselies.



Philip Mathius, CEO and co-founder of Ovizio Imaging Systems

Over the course of 2015, Ovizio Imaging Systems saw its business and products received positively by both the market and investors. After launching their *iLineF* microscope in partnership with Applikon (May 2015) and its *iLineS* range in partnership with Pall Life Sciences (October 2015), the young company has persuaded American and Belgian investors to back its growth. “This support means that we are able to push ahead with the development of a technological platform and a worldwide sales structure in order to meet needs in our markets that are as

yet unfulfilled (...)”, explains Philip Mathius, CEO and co-founder of Ovizio. Indeed, the funding will enable Ovizio to accelerate its sales strategy for the bioproduction and cell culture verification markets. Key recruitments include a Business Developer in the USA to analyse market opportunities across the pond. Some of the funds will be dedicated to expanding the product range to include bespoke tools, and launching the company's next-gen technology on the *in vitro* diagnostics market.

### HOLOCANCER PROJECT

With the BLOWIN project *HoloCancer*, Ovizio is making a commitment to developing a cancer diagnostic instrument and consumables within three years, one that will be used to diagnose cervical cancer in particular. To fulfil this commitment, the spin-off will be counting on its holographic imaging platform and working in partnership with laboratories at the ULB (MRC, Institute of Molecular Biology and Medicine, CMMI-RNA), UMONS (general, organic, and biomedical chemistry department) and BIO.be. The challenge facing the consortium lies in identifying confirmed label-free biomarkers, and delivering an instrument ready for clinical approval and certification.

The instrument in question should be able to analyse samples directly in their media: no more need to take samples or use markers that are toxic to the operators. The process will therefore eliminate all risk linked to human interpretation, and the instrument's software will use the holographic signature of each cell to determine whether it is abnormal or not.

Ovizio has already appointed a *VP Diagnostics* tasked with forming a team of engineers, researchers, and process developers to tackle the project. Four further staff will be recruited in 2016 to form the new diagnostics division that will work on the HoloCancer project. Once the device has been tested and approved, Ovizio will be looking to create other versions for different kinds of cancer, and plans to recruit over 20 additional staff to do so in the next two or three years.

Sibylle Rocher-Barrat



## In brief

The Director of the Biopark, **Dominique Demonté**, is now also the new chairman of the Strategic Development Committee for Charleroi-Sud Hainaut for a two-year tenure. The Committee is composed of figures from the business, political, and trade union fabric of the region, and is a forum for sharing information, contemplating trending issues, taking action, and promoting the strategic development of the region, with the aim of driving development across all of the region's towns.

On 9 December, a meeting was held at the Point Centre attended by project developers and investors operating in the biotech sector. On the agenda was a presentation of three investment funds specialised in funding innovation in biotechnology, life and health sciences, followed by a pitching session for three companies each at different stages of development: Antigone (a ULB spin-off project), **Univercells**, and **OncoDNA**. Organised jointly by the **Biopark**, **i-Tech Incubator** and BNP Paribas Fortis, the event was attended by some 120 people.

### PRDM12: A POSSIBLE TARGET IN THE TREATMENT OF PAIN?

The treatment of chronic or neuropathic pain presents a real challenge for public health, as current methods are not sufficiently effective. A better understanding of the molecular mechanisms behind pain is needed if new treatment strategies are to be developed.

The **Developmental Genetics Laboratory** (IBMM Cellular and Developmental Biology Cluster) recently identified a new agent in the process through which pain is perceived: Prdm12, an epigenetic regulator of gene expression. In an article published in *Development* last October, Eric Bellefroid's team demonstrated that this factor plays a crucial role in the specification of a particular population of interneurons in the spine that are involved in locomotion. The team's recent work, published in *Cell Cycle* in late 2015, shows that this gene, which is mutated in patients afflicted with a congenital insensitivity to pain, is also crucial for the development of sensory neurons in pipidae. They also showed that this gene's counterpart plays a role in the perception of nociceptive signals in fruit flies.

This makes Prdm12 a key regulator in the development of neurons specialising in the perception of pain, and one that has been retained throughout evolution. Because its expression in human sensory neurons has been retained, Prdm12 may constitute a new target in the development of new treatments for pain.

### REGULATING THE TRANSPORTATION OF AMMONIUM IN YEAST

TORC1 (Target Of Rapamycin Complex 1) is a protein complex involved in the growth of eukaryotic cells. Retained throughout evolution, it adapts the metabolism in line with signals received from the external environment, such as the availability of nutrients.

In an article published in *PLoS Genetics*, the team at the **Biology of Membrane Transport Laboratory** (Anna Maria Marini, IBMM, Cellular and Developmental Biology Cluster) sheds light on the diverse range of regulatory mechanisms mediated by TORC1, in particular in controlling ammonium's entry into *Saccharomyces cerevisiae* yeast. The scientists discovered a new regulatory mechanism involving the protein Amu1/Par32: when nutrients with high nitrogen content are detected, the TORC1 cascade triggers the dephosphorylation of Amu1/Par32, causing it to migrate to the surface of the cell where it inhibits a type of ammonium transporter without triggering endocytosis. This mechanism may enable the yeast to control the absorption of ammonium, as well as reacting to changes in external conditions more quickly than when transporters degrade.

Yeast's preferred source of nitrogen, ammonium may be neurotoxic in humans, although it does play a role in controlling the homeostasis of blood pH. Because of this, it is disposed of in the urine in a controlled fashion. In time, an understanding of the mechanisms regulating the transportation of ammonium and its role in cellular physiology should shed light on pH regulation and how it can go wrong in humans.



## In brief

### THE RNA ALPHABET

DNA is not the only one with its own *alphabet*. For the first time, a study by researchers at the ULB lifts the veil on the role played by one of the *letters* that make up our RNA: hmC or hydroxymethylation.

Researchers in the **Molecular Biology of the Gene** (IBMM, Immunology Cluster) laboratory and the Laboratory of Cancer Epigenetics (ULB Cancer Research Center and Faculty of Medicine, U-CRC) discovered that hmC promotes the translation of RNA into protein. They also showed that hmC is essential to development, with fruit flies dying when it was not present, and drafted a full epigenetic mapping of the hmC marker. This research was carried out on a fruit fly cellular model developed by the Gosselies lab.

Published in the prestigious *Science* journal in January, the study forms part of a flourishing field of research: epigenetic modifications of RNA may provide an explanation for a number of great mysteries in the research of living organisms, as well as improving our understanding of diseases like cancer.

### HIV: PHARMACEUTICAL MOLECULES REACTIVATING THE VIRUS

Despite undergoing prolonged and highly effective combination therapy for HIV, patients retain cells infected with the latent virus, ready to reactivate when treatment stops. One of the biggest challenges currently facing research in the fight against AIDS is therefore how to eliminate these cellular reservoirs, in particular by forcing these latent stores of the virus to become active.

Working in partnership with Paris-Descartes and Strasbourg universities, and the Infectious Diseases Department at the ULB, researchers at the **Molecular Virology Laboratory** (IBMM - Molecular Microbiology Cluster) have shown that a combination of pharmaceutical molecules is able to “awaken” the dormant virus. The combination of a DNA methylation inhibitor and a deacetylase inhibitor (already approved for the treatment of humans for other diseases) triggers viral production at a greater rate than that obtained by the two molecules when used separately, and at lower dosages than the concentrations usually used in the treatment of humans.

Published in *EMBO Molecular Medicine* last December, the study paves the way for major new prospects in the development, delivery, and planning of clinical trials seeking to shrink these latent reservoirs and may, in combination with other antiretroviral strategies, form another step towards remission of the disease.