VIB TIMES

QUARTERLY
NEWSLETTER
OF VIB.
APRIL 2016

VIB

Science meets Science

Women in Science at VIB

Four ERC Consolidator Grants for VIB

Crispr-ing VIB

Katrina Wright

2016: a strategic year for VIB

VIB has an interesting and challenging year ahead, with many important and exciting things happening.

Whereas the individual departments had their evaluations last year, VIB as a whole will be evaluated in the coming months. This evaluation – commissioned by the government of Flanders – will look into the overall results of VIB as an institute over the past five-year period. In addition, the team of consultants will also analyze the strategic plan for the coming five years. We have a lot riding on this evaluation, as the outcome will be the basis for government support for VIB in the coming period.

2016 will also be a transition period for VIB as an organization working towards the implementation of the strategic plan, which was developed by a team from headquarters and the departmental directors. This implies a lot of changes, one of them being a thematic re-clustering of VIB's research. We will tell you more about this reorganization in one of the following editions.

We also believe that the time was ripe to launch a brand new external newsletter to keep you posted on what's happening at VIB and we proudly present "VIBtimes". This first issue has a clear focus on science.

In the beginning, you will receive VIBtimes as a printed newsletter, however, after the first hard copy editions, it will only be distributed as an electronic newsletter. We are convinced that this way, we will be able to serve you even better with more background info on VIB.

Would you be so kind to provide us your email address via www.vib.be/VIBtimes? So you definitely don't miss out on VIBtimes. Feel free to distribute this link to your contacts that might be interested in receiving updates from VIB.

We look forward to staying in touch with you!

Katrina Wright
Communications Manager VIB

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TURNING PLANT SEEDS INTO MEDICINE FACTORIES

Thanks to a collaboration between two VIB/UGent research groups, Ann Depicker and Nico Callewaert have achieved a biotechnology breakthrough. The GlycoDelete technology, which simplifies the production process for biotech medicines, was originally developed in mammalian cells by Nico Callewaert. By jointly applying this technology to plant seeds, the researchers have demonstrated that plant seeds can serve as a medium for the inexpensive and large-scale production of biotech medicines. The results of their research were published in Nature Biotechnology.

Why is plant-based production of medicines such an important milestone?
Nico: "Because of the major advantages. First of all, plants don't need expensive fermenters and control systems, so it is much easier and cheaper to grow them. Second, you can store the dried plant seeds containing the protein of interest for years at room temperature. When you need the protein, all you have to do is isolate it from the seeds. This is a huge advantage, as it enables stockpiling of pharmaceutical proteins that could treat epidemic or rapidly spreading infections such as the recent Ebola outbreak. In those cases, production capacity is often a bottleneck."

A crucial hurdle were the sugar chains attached to plant-produced proteins.
Ann: "Yes. Plants produce different sugar structures than human cells do. When eating plants, this usually does not pose a problem, since the sugars are digested. However, if we inject plant-based biotech medicines into the bloodstream, those plant-specific sugars will be identified as foreign by 25 to 50% of the population, resulting in a severe allergic reaction. This problem has long hampered the wider use of plants to manufacture biotech medicines."

Nico, how did your team come up with a solution?
Nico: "In 2014, we developed GlycoDelete technology, which shortens the undesirable sugar structures. This solves the issue completely, by making the sugar chains homogeneous and removing the plant-specific immunogenic epitopes."

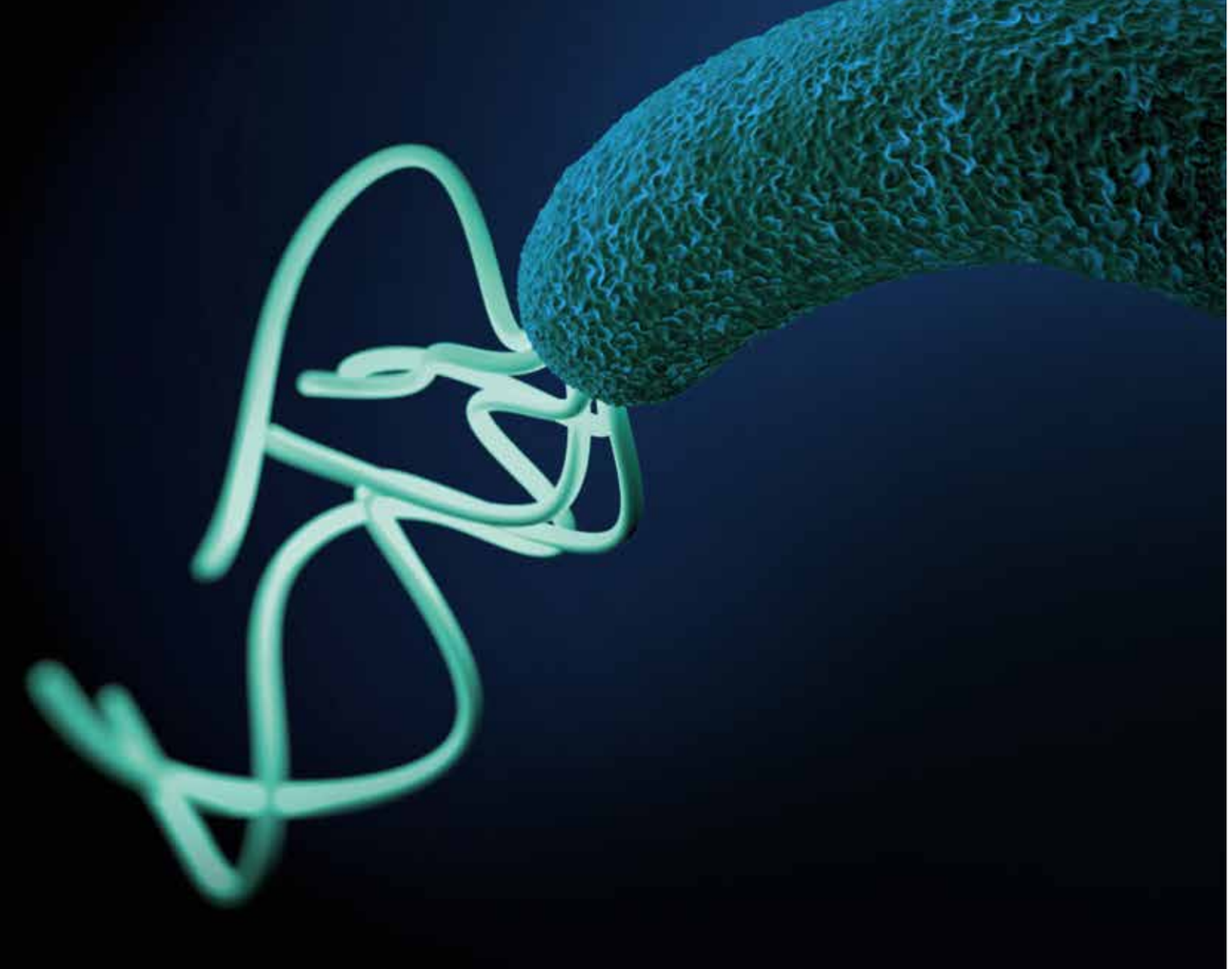
How was the technology tested and what are the next steps?
Ann: "We let unmodified Arabidopsis seeds and seeds with the GlycoDelete mutation both produce a specific test protein. Rabbits that were injected with the proteins containing plant-specific sugar structures displayed an undesirable immune response, but that response was absent upon injection with the truncated proteins from the GlycoDelete seeds. What's more, the GlycoDelete modification did not hinder the seeds' growth.

"The simplicity of the modification makes an industrial approach possible and could lead to the inexpensive large-scale 'pharming' of medicines using plants."

Ann Depicker

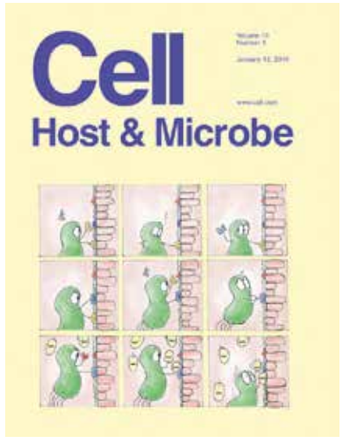
The application of GlycoDelete to plants opens the door to many promising advances. Now we're working on transferring a next-generation version of our joint technology to plant species that produce protein-rich seeds in large quantities. The simplicity of the modification makes an industrial approach possible and could lead to the inexpensive large-scale 'pharming' of medicines using plants."

Piron et al., Nature Biotechnology 2015



NEW INSIGHTS INTO H. PYLORI UNMASK A ‘MOLECULAR CHAMELEON’

The bacterium ‘Helicobacter pylori’ *is highly adapted to survival in the human stomach and is responsible for the majority of gastric ulcer and cancer cases worldwide. Scientists at the lab of Han Remaut (VIB/VUB) present new insights into BabA – a protein that plays a crucial role in* H. pylori’s *s survival strategy. We asked Kristof Moonens (postdoc) and Ayla Debraekleer (PhD student) about their research that made the cover of Cell Host & Microbe.*



The results inspired Ayla to draw the cartoon that features on the cover of Cell Host & Microbe.

First of all, what can you tell us about *Helicobacter pylori*?
Kristof: “This bacterium has been associated with mankind since ancient migrations and is still present in about half of the world population. It is responsible for the majority of gastric ulcer and cancer cases. Fighting it has become difficult, because of bacterial pathogens’ growing resistance to antibiotics. Nowadays, *H. pylori* eradication therapy requires sustained treatment with a cocktail of two or three different antibiotics. The quest for new treatment options or a vaccine is on.”

How does *H. pylori* manage to survive in noxious gastric juices?
Ayla: “An important survival strategy of the bacterium involves binding to the stomach mucosa, which keeps it out of the reach of gastric juices. *H. pylori* achieves this binding by adhering to blood group sugars found on gastric mucus and underlying cells. This interaction is made possible by the protein BabA. Our research provides new detailed structural and functional insights into that protein.”

What new information did you uncover?
Kristof: “This BabA protein proves to be a true ‘molecular chameleon’. It adapts its binding properties and preference for different ABO blood group sugars according to their prevalence in different human populations.
By determining the X-ray structures of different BabA proteins, we managed to establish a general framework for ABO blood group binding by the adhesin. Thomas Borén, a researcher from Umeå University in Sweden, had previously shown that ‘specialist’ *H. pylori* strains only bind to gastric tissue of blood group O individuals, whereas ‘generalist’ strains interact with all types of blood group individuals. Now we can show that a select network of residues in the protein steer the differences in binding preferences.”

How does this research provide clinical perspectives?
Ayla: “Our study also uncovered BabA’s Achilles heel. We have now shown that treatment with the redoxactive pharmaceutic N-acetylcysteine annihilates BabA function and, furthermore, that N-acetylcysteine lowers stomach inflammation in *H. pylori*-infected mice.
While the additive effect of N-acetylcysteine on antibiotic eradication therapies had already been reported, we have now found a molecular basis and explanation for this effect. This creates the basis for the rational design of novel, anti-adhesive drugs that will, hopefully, reduce bacterial attachment, stomach inflammation and hence lower the risk for overt disease development.”

Moonens et al.,
Cell Host Microbe. 2016

HOW FLOWERING PLANTS COLONIZED THE SEA

A recent genome study of the seagrass Zostera marina*, published by an international team of 35 researchers in early 2016, may prove to lay the foundations for a range of functional ecological studies. Why this is? Associated with VIB and Ghent University, Yves Van de Peer is happy to give a full account.*

Seagrasses are the only angiosperms or 'flowering plants' that have ever colonized the sea. In doing so, they became the bedrock for one of our planet's most productive coastal ecosystems. Notably, their shift to a marine lifestyle required impressive structural and physiological adaptations: an interesting research topic for both evolutionary life sciences and plant biology, to say the least.

Yves, what was the focus of your team's research?
"We focused on *Zostera marina* or 'marine eelgrass', one of the most wide-spread seagrass species in the temperate northern hemisphere. In 2010, a genotype of *Zostera marina* was harvested from the northern Baltic Sea. After its DNA was extracted, it was sequenced and analyzed, revealing its complete genetic material. This is a world first: no other marine angiosperm was ever fully sequenced up until now."

In a nutshell, what did the research reveal?
"By sequencing *Zostera marina*, we gathered unique insights into the genomic gains and losses that helped it achieve the necessary adaptations for a marine lifestyle. For starters, the seagrass species lost the entire repertoire of stomatal genes. Inhabiting a light-attenuated, submarine environment, *Zostera marina* also lost ultraviolet resistance genes — used to sense and respond to UV damage — along with the phytochromes related to light detection."

"What is more, we also noticed how eelgrass (re)developed specific structural traits to adjust to the salinity of full marine seawater. For instance, its cell walls contain *polysaccharides*. Typical of land plants, these help *Zostera marina* cope with dehydration and osmotic stress at low tide. Another example: the plant's cell walls share features with those of macroalgae, crucial for taking up nutrients, regulating the exchange of oxygen and carbon dioxide, and stabilizing the number and charges of ions in the plant's cells."

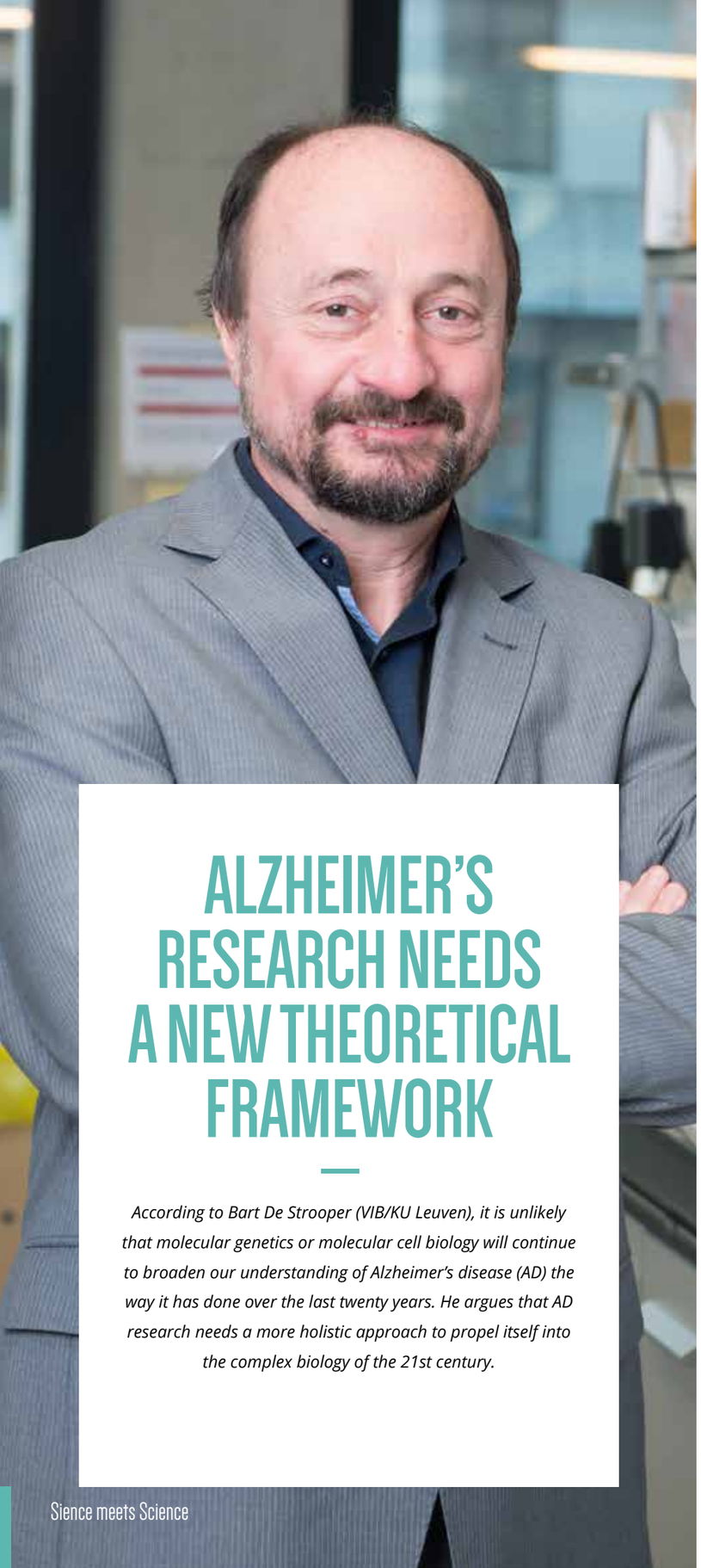
How is this research relevant to ecological research in general?
"Nowadays, more and more people are inhabiting our planet's coastal areas. Consequently, many ecosystems are under pressure, including seagrass beds. As a result, other ecosystems may be at risk, too. Seagrasses not only sustain harvestable fish and invertebrates like lobsters, shrimp and crabs; they also play a part in controlling erosion effects and capturing carbon dioxide. Having unraveled the genomic basis of *Zostera marina*'s complex adaptations to life in ocean waters, this study can advance ecological studies on how marine ecosystems might adapt to global warming."

Olsen et al., Nature 2016

EVIDENCE FOR A WHOLE GENOME DUPLICATION EVENT

By studying *Zostera marina*, Yves Van de Peer and his team also found evidence for a whole genome duplication (WDG) event that seems to have coincided with the Cretaceous–Paleogene (K–Pg) extinction event, 66 million years ago.

Yves: "In another recent study, we discovered that gene duplicability of core genes is highly consistent across all angiosperms. As this will also apply to *Zostera marina*, the seagrass species is providing further evidence for a correlation between WGD events and the K-Pg extinction event."



ALZHEIMER'S RESEARCH NEEDS A NEW THEORETICAL FRAMEWORK

According to Bart De Strooper (VIB/KU Leuven), it is unlikely that molecular genetics or molecular cell biology will continue to broaden our understanding of Alzheimer's disease (AD) the way it has done over the last twenty years. He argues that AD research needs a more holistic approach to propel itself into the complex biology of the 21st century.

You state that the neuron-centric view of contemporary AD research needs to be expanded. Why is that?
Bart: "For over 20 years now, the 'amyloid cascade hypothesis' has been the main theoretical construct for AD. It proposes amyloid plaques – or their major constituents, the Aβ-peptides – as the direct cause of progressive neurodegeneration. Although this biochemical approach has led to a tremendous increase in knowledge of the molecular biology, pathophysiology and diagnosis of AD, we need to go beyond *in vitro* research that is limited to evolved stages of the disease. The brain harbors an incredible variety of cell types, so in order to really understand AD, biochemical findings need to be integrated into the brain's complex cellular context."

In other words: AD research needs to 'zoom out' and take a wider scope?
"Yes, and not just in one way. First of all, many different cell types – and their interactions with one another – all contribute to the gradual evolution of AD. Microglia, astroglia and oligodendrocytes, for instance, all contribute to a complex cellular phase of the disease. Hence, all of these cell types need to be taken into account.

Secondly, this cellular phase evolves over decades, so we also need to widen the temporal scope. AD starts insidiously many years before full dementia becomes apparent, but the amyloid cascade hypothesis provides no explanation for this silent incubation period.

And, lastly, advances in the field of single-cell biology have demonstrated the startling heterogeneity of the brain. This means we can't just study random pieces of brain tissue. We need to widen the 'spatial scope' as well and add cellular resolution to the analysis instead of the bulk approach which is typical of the systems biology approaches at the moment."

Taking the cellular, temporal and spatial aspects of the disease process into account seems like a daunting task.
"The brain is the most complex structure of the human body, so it's definitely not an easy feat. Still, the enormous complexity can only be understood if the many separate findings of exploratory science are integrated into a broader conceptual framework than provided by the amyloid hypothesis. AD research clearly needs an 'atlas', so to speak, that encompasses the many parallel processes that go astray in the brains of AD patients."

How would such an atlas be constructed?
"It could be generated by measuring all changes in the different cell types over different stages in a few relevant brain areas. The incredible progress in genome wide approaches at the single cell level of the last three years starts to make this a feasible aim."

What do you hope to achieve with this review article?
"I mainly hope that it stirs up the debate. I am convinced that a new integrated conceptual framework could transform the field, as it would be easier for AD researchers to appreciate and cross-pollinate each other's work.

Such a framework would also provide a scientifically coherent basis for targeted therapeutics that address the different elements of the disease in a stage-dependent manner. If the AD research community agrees on that, we can start looking for a systematic way to realize the framework."

You recently showed the relevance of G protein-coupled receptor 3 (GPR3) for AD. Can you elaborate?
"Indeed, together with Amantha Thathiah, we recently identified GPR3 as a therapeutic target for AD. The loss of GPR3 reduced amyloid burden and improved cognition in four AD mouse models. We also evaluated the GPR3 expression in post-mortem brain tissue from two cohorts of AD patients. These studies revealed that GPR3 expression is elevated in a subset of AD patients and is associated with disease progression. Given the vast resources required to develop and evaluate a new therapy, demonstrating the relevance of research findings in multiple disease-relevant models is crucial. Our research provides exactly this level of validation."

Huang et al., Science Translational Medicine 2015
De Strooper and Karan, Cell 2016

QUICKSCAN

1

#antimicrobials #protein aggregation

Joost Schymkowitz and Frederic Rousseau (SWITCH lab – VIB/KU Leuven) have shown that toxicity resulting from protein aggregation can be turned against bacteria to treat bacterial infections without affecting their murine host. To that effect, they have designed short peptides containing aggregation-prone sequences derived from bacterial proteins. These peptides are efficiently absorbed by bacteria thereby inducing intracellular bacterial protein aggregation.

Bednarska et al., Mol Microbiol 2015

2

#carbon export #ocean microbiome

The biological carbon pump is the process by which CO^2 is transformed into organic carbon through photosynthesis, exported through sinking particles, and finally sequestered in the deep ocean. Samuel Chaffron of the Jeroen Raes lab (VIB/KU Leuven) and his colleagues used Tara Oceans datasets to show that specific plankton community networks correlate with carbon export in the subtropical oligotrophic ocean. Additionally, they showed that the relative abundance of a few genes could predict a significant fraction of the variability in carbon export in these regions.

Guidi et al., Nature 2015

3

#protein ubiquitination #arabidopsis

Plants employ protein ubiquitination as a key mechanism to respond quickly to a changing environment and to control growth and development. For the first time in *Arabidopsis*, the Kris Gevaert and Sofie Goormachtig labs (VIB/UGent) have reported a proteome-wide mapping of ubiquitination sites via enrichment at the peptide level. Profiling exact ubiquitin conjugation sites on proteins breaks ground for better appreciation of ubiquitin-governed processes in plants.

Walton, Stes et al., Plant Cell 2016

4

#brain size #genetic basis

The Patrick Callaerts lab (VIB/KU Leuven) has characterized natural variation in mushroom body morphology in the fruit fly *Drosophila melanogaster* to identify gene networks that act in brain development and plasticity and to find correlations with behavior. This work provides insight into the genetic basis of brain size and it opens perspectives for study of how the environment and gene networks interact and how brains and complex behaviors evolve.

Zwarts et al., Nat Commun 2015

5

#frontotemporal dementia #amyotrophic lateral sclerosis

The Christine Van Broeckhoven lab (VIB/Antwerp University) has identified mutations in TBK1 in Belgian FTD and ALS patients. This is the third gene linking both clinical diseases entities to the same biological pathway characterized by TDP-43 neuropathology. Mutations reduce TBK1 expression and were identified in autosomal dominant and sporadic patients. TBK1 mutations are frequent in FTD patients and most carriers present at later age with the behavioral variant of FTD, early memory loss and Parkinsonism.

Christine Van Broeckhoven explains: "The identification of TBK1 again demonstrates the power of the Flanders-Belgian FTD patient population which is collected within the Belgian Neurology (BELNEU) consortium, a national network of participating neurology expertise centers associated with university and general hospitals across Flanders."

Van Mossevelde et al., Brain 2015
Gijselinck et al., Neurology 2015

6

#synapse robustness #protein turnover #microautophagy

The synaptic contacts that neurons in our brain make with one another are usually far from the cell body. Damaged components at synapses need to be recognized and removed to avoid synaptic depression. The Patrik Verstreken lab (VIB/KU Leuven) has identified a novel mechanism by which proteins are turned over at synapses, termed endosomal microautophagy. The chaperone Hsc70-4 is critical in this process and decides whether to refold a protein or to send it the endosome for degradation. By rejuvenating synaptic protein pools, endosomal microautophagy promotes neurotransmitter release, regulating synaptic strength.

Uytterhoeven et al., Neuron. 2015

7

#poplar trees #microbiome

In 2009, the Wout Boerjan lab (VIB/UGent) established a field trial with low lignin poplars to improve the processing of wood into liquid biofuels. A partnership with the Jaco Vangronsveld lab (UHasselt) has now revealed that engineering the lignin biosynthesis pathway also substantially influences the microbiota of the plant endosphere. These interactions need to be taken into account, and can potentially even be exploited when tailoring metabolic pathways.

Beckers et al., Proc Natl Acad Sci USA 2016

8

#EMT #NK cell maturation

Using an unprecedented panel of mouse models, the Geert Berx and Bart Lambrecht labs (VIB/UGent) have demonstrated that the timely induction of Zeb2 by T-bet is an important event during NK cell terminal maturation that regulates NK cell differentiation, trafficking, responsiveness to chemokines, proliferation and survival.

van Helden et al., J Exp Med. 2015

9

#ischemic stroke #neuronal metabolism

How neuronal metabolism can be targeted to provide protection in brain disease remains poorly understood. The Peter Carmeliet lab (VIB/KU Leuven) shows that loss or inhibition of the oxygen sensor PHD1 protects against brain ischemia via reprogramming of neuronal metabolism. By shunting more glucose into the oxidative pentose phosphate pathway, PHD1 deficient neurons enhance their capacity to scavenge oxygen radicals, thereby securing redox homeostasis in ischemia.

Quaegebeur et al., Cell Metabolism 2016

CRISPR-ING VIB: HOW CAS9 IS SLICING UP VIB'S FAVORITE GENES

CRISPR Genome Editing technology is being hailed as the biggest breakthrough life science technology of the century. When combined with access to cheap, synthetic DNA, it is taking us into a new era of biotechnology. VIB's Tech Watch has boosted many Genome Engineering projects. In this article, we will highlight examples that show how VIB scientists have adopted these technologies.

Genome editing of mammalian cells is made easy with CRISPR. Custom KO/KI cell lines can be generated rapidly, helping to speed up the functional analysis of favorite genes. Wenting Guo of the Ludo Van Den Bosch and Wim Robberecht Lab (VIB/KU Leuven) has used CRISPR to make custom, genome-edited cell lines. As they explain, "with the custom iPS cell lines, I could spend more time focusing on phenotype investigation in the cell lines. Since ALS is a complex genetic disease, correcting the point mutation in ALS-patient derived iPS cells gives us perfect control with the same genetic background to test how the mutation causes cellular defects. It is a powerful technology to model ALS in a dish".

Petra Van Damme of the Kris Gevaert Lab (VIB/UGent) is working with HAP1 haploid cell lines, in which genes can be rapidly inactivated by CRISPR: "Our studies focus on protein N-terminal modifications and typically used to rely on knockdown studies. However, only suboptimal substrates were identified, likely resulting from the high efficiency of the modification reactions and incomplete enzyme knockdown. HAP1 KO cells will allow us to obtain proteome-wide views of the N-terminal modification landscape".

The speed, ease and low cost with which CRISPR allows the generation of KO/KI mouse models is also accelerating the study of gene function *in vivo*. Tech Watch has supported a spectacular uptake of CRISPR in the generation of new mouse models. Jens Staal of the Rudi Beyaert Lab (VIB/UGent) has used CRISPR to make many mouse KI models: "The genome editing revolution is here. We can now rapidly generate mutant mice to study the physiological role of a single amino acid residue on a protein expressed from the endogenous gene, an endeavor that was much more difficult and time-consuming with homologous recombination".

In plants, CRISPR is being used to knock out genes and for functional genomics. Geert De Jaeger (VIB/UGent) has used Tech Development funding to tinker with CRISPR so that it can be used as a novel tool to study protein-DNA interactions. Geert comments: "For plant research, I see two milestones thanks to CRISPR technology. First, after decades of fruitless attempts in plants we finally have a tool at hand for targeted knock-out or knock-in. Second, the efficiency of CRISPR in crop plants will boost translational research in Ag-Biotech."

FOUR VIB SCIENTISTS RECEIVE ERC CONSOLIDATOR GRANTS

Kevin Verstrepen, Adrian Liston, Mohamed Lamkanfi and Daniël Van Damme: each of these four promising VIB scientists has received a 'Consolidator Grant' worth nearly 2 million euros from the European Research Council (ERC).

With these Consolidator Grants the ERC aims to support researchers who wish to pursue 'frontier research'. Excellence serves as the only selection criterion. Apart from offering the scientist the means to engage in high-risk/high-gain projects, the grant also strengthens the VIB's position as a leading research center in life sciences. The total number of ERC grants won by VIB now stands at 34.
Boosting research.

For Adrian Liston (VIB/KU Leuven), who specializes in neurodegenerative diseases, the grant provides the opportunity to start a major initiative that will lay bare how the brain interacts with its immune system. Kevin Verstrepen (VIB/KU Leuven), who is investigating the basic memory of simple as well as complex cells, will recruit a whole team of scientists to pursue a new line of research.

Mohamed Lamkanfi (VIB/UGent), aims to map the interaction between inflammasomes and cell death mechanisms in immune cells: "This will help us to find new treatments for autoinflammatory and –immune diseases." And last but not least, Daniël Van Damme (VIB/UGent) is committed to discover how and why endocytosis evolved differently in plants compared to animal and yeast cells.

"ERC Grants are extremely important for science in Europe. It's the best example that investing in bottom up excellent science pays off on a European level. VIB actively promotes ERC grant applications within the institute, as it perfectly matches with VIB's business model of promoting bottom up groundbreaking research with long term perspectives. In addition, the ERC 'label' is a quality recognition for our PIs at the European level. VIB has been applying since the start under FP7 and obtained 34 ERC grants till now. Currently I out of 3 PIs are involved in ERC research, which is a very high number within the European research landscape. With ongoing efforts to further increase this number of ERC grants VIB wants to stay in the top league of ERC funded research institutes."

Lieve Ongena
Science Policy Manager VIB

NILS-ILJA-RICHTER AWARD 2015 GOES TO MARKUS KLEINEWIETFELD

The German Society for Autoimmune Diseases (Deutsche Gesellschaft für Autoimmunerkrankungen e.V., DGfAE) has presented the 2015 Nils-Ilja-Richter Award to Markus Kleinewietfeld (VIB/UHasselt). The award, which comes with prize money of EUR 5,000, recognizes outstanding achievements in the research of pathophysiological mechanisms involved in the development of autoimmune diseases or the development/testing of new therapeutic concepts.

Markus Kleinewietfeld – since recently the Group Leader at the VIB and Hasselt University – conducted in the framework of an interdisciplinary and international team ground-breaking work on the impact of environmental factors on autoimmunity. The team discovered that dietary salt could impact adaptive immunity and in particular Th17 cell responses in an experimental model system for Multiple Sclerosis. Th17 cells play a fundamental role in the development of autoimmune diseases. The findings could also present essentially new routes towards therapeutic approaches to autoimmune diseases.

Vanessa Morais worked in Bart De Strooper's lab (VIB/KU Leuven) for nearly 10 years. In August 2015 she returned to her home country, Portugal, to become group leader at the Instituto de Medicina Molecular in Lisbon. Only weeks later she received an ERC starting grant and an EMBO installation grant. Double bingo, what an entrance!

VIB ALUMNI

VANESSA MORAIS KNOWS HOW TO MAKE AN ENTRANCE AS A NEW GROUP LEADER

Congratulations, Vanessa. How important are these grants for you and your research group?
Vanessa: "They mean everything: recognition, flexibility and security in terms of budgeting, independence, scientific freedom … Now I can buy the necessary equipment and reagents to pursue the research questions that really matter to me. At the same time, the grants come with a certain pressure because they give you every reason to obtain results in the years to come."

Was it an obvious choice to return to Lisbon? How well is research funded in Portugal these days?
Vanessa: "It has always been my intention to return to my home country. Although, I must agree, the financial situation for researchers in Portugal is not ideal. But one can do excellent science anywhere. Much depends on the facilities and resources at the host institute. The Instituto de Medicine Molecular (iMM) is part of the Faculty of Medicine at the University of Lisbon and is absolutely capable of providing the support I need. It is a unique institute, with many young group leaders, a pleasant meeting of brilliant scientific minds, I would say. The institute can compete with any other top-notch research institute in Europe. To give one example: nine researchers from iMM have already obtained ERC grants in the past; many others are EMBO grantees. That says it all."

Which research themes will you pursue in the coming years?
Vanessa: "I will further build on my VIB work. The focus will be on the pivotal role of mitochondria at the synapse. Synaptic mitochondria have acquired specific mechanisms to manage local stress. Disruption of these mechanisms contributes to neuronal degeneration. Only very little is known about mitochondria at the synapse and their role in neurotransmitter release. There are plenty of questions to investigate."

What has been the contribution of VIB to your career?
Vanessa: "Being part of VIB and KU Leuven for ten years has exposed me to a unique and challenging line of thinking. It has made me much more critical towards my own research. With Bart De Strooper as a lifelong mentor and Patrik Verstreeken as a great collaborator and coach, I have become a much better scientist. We tackled questions of fundamental scientific importance but also generated results with may have a significant impact on the lives of patients with Parkinson's disease or other neurodegenerative disorders."

You decided to become a group leader. Not an obvious choice for many women.
Vanessa: "I find it very odd that women are a minority in leadership positions. Females have the same potential as males. No doubt about that. Combining a scientific career with family life? Why should it be more difficult for women? It is a matter of good planning, focus, finding a balance in what you do and sharing responsibilities between partners. I do not find it difficult to be a good mother and a good scientist at the same time. Even if neither of these is a '9 to 5' job. It is possible to juggle with more than one ball at a time, you know.

Additionally, the VIB training programs 'Women in Science' and 'Leadership' were very helpful to prepare me for my new job. The leadership course teaches you how to deal with issues in your team. 'Women in Science' helps you find smart solutions to difficult situations."
(See article on page 39)

All VIB Alumni are invited to join the VIB Alumni group on LinkedIn.

WOMEN IN SCIENCE AT VIB

Women make up over 50% of all PhD students and postdocs at VIB. But when it comes to group leaders, female representation drops to 13%. Time for action! We spoke to Marijke Lein, the Director of Human Resources.

How does VIB try to rectify the gender imbalance in leadership positions? By setting gender quotas?
Marijke: "We do not think quota are the way to go. In particular, current female group leaders reject them because quota signify a devaluation of their own position and a disavowal of their achievements. Therefore scientific excellence will remain the criterion in recruitment processes, regardless of gender, nationality, religion, age, etc. However, VIB looks into ways to shatter the glass ceiling by enabling the internal promotion of women and by putting less emphasis on mobility requirements. "

So what is the VIB recipe for tackling this problem?
Marijke: "First of all, we do our best to improve the career prospects for female researchers by taking away obstacles that prevent women from taking positions as group leaders: helping to find a job for their partner, for example, or expanding childcare facilities. But obviously that is not enough. Recent studies show other reasons for women to hold back on going all the way in their careers. Although men and women recognize the advantages of a promotion equally, females anticipate more of the negative consequences that go with a higher position. And then there is their dislike of the 'political game-playing' at the top. In the perception of most women, it is still a male game. They feel reluctant to claim their space in this world. "

Gender imbalance at leadership positions is not a unique VIB issue, is it?
Marijke: "No, not at all. Recently, VIB joined forces with 12 leading European research institutes, all of them partners in the EU-LIFE alliance, to launch the LIBRA project. Supported by the gender expert organization ASDO, this project will evaluate the current status of gender equality in the different institutes. In a second phase, the institutes will implement innovative and efficient actions to increase representation and participation of women in leadership positions.
Soon, a survey on gender will be carried out in all EU-life institutes. We hope that everyone at VIB will take part in this survey!"

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VIB's General Assembly 2016
April 13, 2016 - Ghent

The Brain Mosaic: cellular heterogeneity in the CNS
September 22-23, 2016 - Leuven

VIB's 20th anniversary
October 5, 2016 - Brussels

Advances in Cell Engineering, Imaging and Screening
November 17-18, 2016 - Ghent

Hallmarks of Cancer, Cell-VIB Symposium
December 11-13, 2016 - Ghent