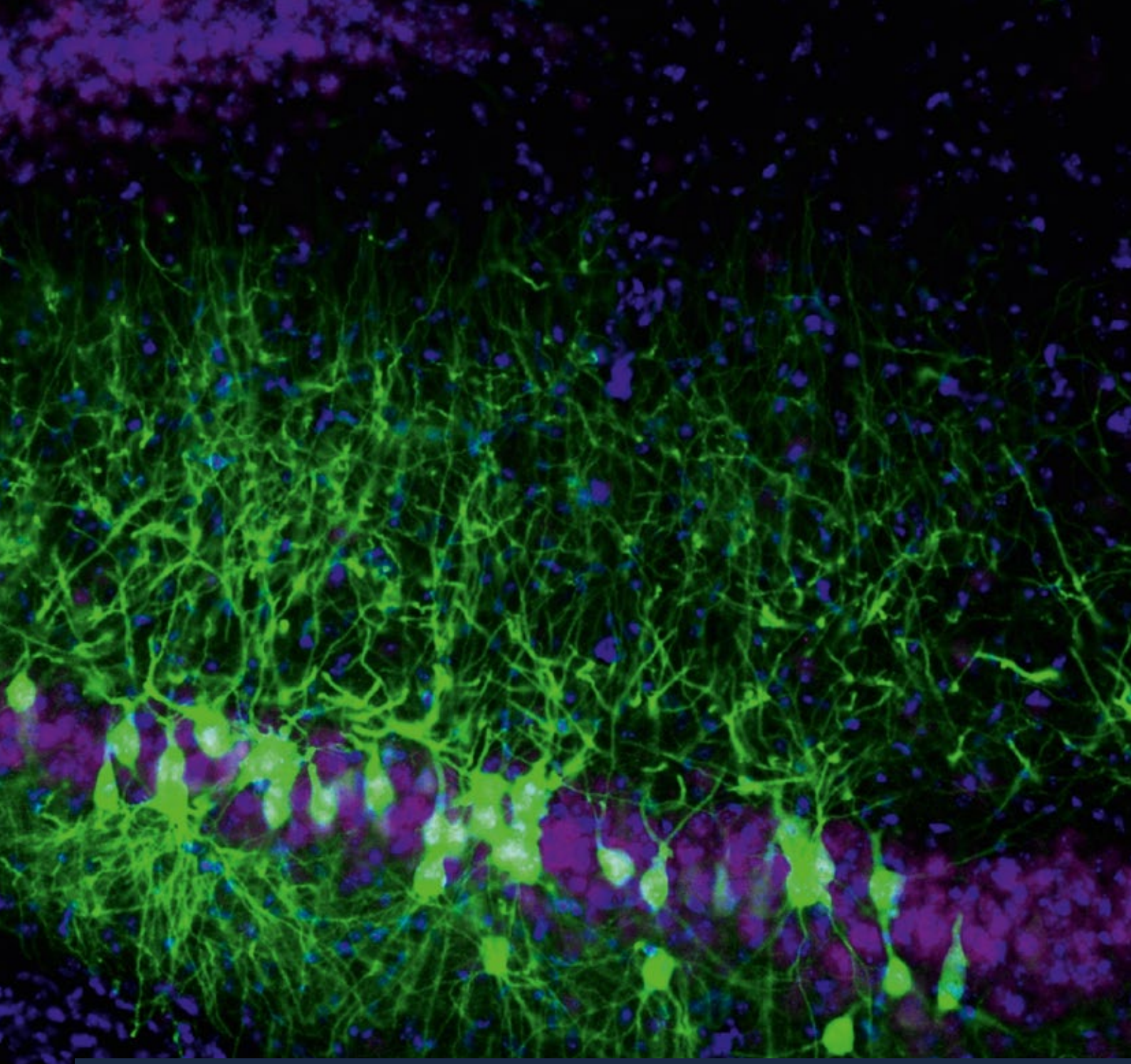

VIB

ANNUAL REPORT 2017

SCIENCE MEETS LIFE

Based on media coverage over recent months, it is safe to say that biotech is 'hot'. Major deals and investments are being announced. New companies are being founded as existing companies mature and products reach the market. Flanders has a vibrant life sciences ecosystem and is a fertile breeding ground for biotech companies. In addition to its position at the heart of Europe and its healthy economic climate, the proximity of knowledge centers such as VIB is a catalyst for a thriving biotech market. Access to innovations and talented people are important assets for start-ups and inward investors and for ensuring future investment.

In 2017, breakthrough VIB research contributed to products and technologies aimed at tackling rare and incurable diseases, enhancing crop yield and facilitating a bio-based society. It is our pleasure to share a few examples of some breakthroughs that are potential game changers:

- VIB scientists have managed to unravel the functioning of what is thought to be the 'master protein' that drives a range of common allergic diseases, such as asthma and eczema. Their insights into this protein, which is called TSLP, enabled the team to develop a new molecule that can block TSLP activity. This holds great promise for the development of new therapies to treat widespread allergic conditions.
- VIB scientists have discovered an essential mechanism in the spread of cancer. They found that reducing the glutamine levels of macrophages, a particular type of white blood cell often responsible for supporting tumor growth, changes the macrophages' behavior. Instead of supporting cancer, the macrophages change back into 'good' cells and fight the disease. These groundbreaking findings potentially offer new strategies for immunotherapy.
- Tau proteins are associated with more than twenty neurodegenerative diseases, including various forms of dementia. These proteins clump together in patients' brains to form neuronal tangles: protein aggregation that eventually coincides with the death of brain cells. VIB researchers have discovered how tau disrupts the functioning of nerve cells, even before it starts forming tangles. The researchers immediately suggested a way to intervene in this process.
- VIB researchers have discovered a gene that significantly increases plant growth and seed yield in maize. Research into crop yield is crucial because of the increasing incidence of extreme weather conditions affecting agriculture. The results from laboratory research were confirmed during two-year field trials conducted in Belgium and the United States which showed that this gene can increase seed yield in maize hybrids by 10 to 15%.

These disruptive findings only serve a purpose if they are developed further and transferred to the marketplace. This is the role of VIB's Innovation and Business unit, which had an extremely productive year in 2017. In addition to realizing a record industrial income of 28.7 million euro, the team concluded the establishment of a new start-up: Aelin Therapeutics, for which 27 million euro was raised in an 'A' round. Furthermore, VIB entered into multiple license agreements with industry to further develop VIB discoveries, including strategic partnerships with Galapagos and Denali Therapeutics. Through its Discovery Sciences team, VIB invests heavily in de-risking promising targets. In 2017, the team assessed nine small compounds, 11 biologics and two agro/microbiology projects.

To maintain our position as a global life sciences research institute, we must constantly fine-tune our strategy and respond to the latest challenges. For this reason, in 2017, we reorganized our research into eight thematic research centers which look for cross-pollination and interaction between groups within and across centers. We also introduced the VIB Grand Challenges program to stimulate cross-border and interdisciplinary translational research, with the ambition of increasing VIB's societal impact.

To strengthen VIB's brand recognition, we developed and implemented a strong and consistent institutional identity, which positions VIB as a world-class research institute engaged in breakthrough discoveries and translating these into value for society.

Overall, 2017 was a very successful and enriching year, further establishing VIB's position as one of the leading biotech research institutes in the world.

Ajit Shetty, Chairman of the Board of Directors
Jo Bury and Johan Cardoen, Managing Directors

Raising the bar in life sciences research

VIB is home to world-class researchers who are working across disciplines to tackle some of society's major challenges. In eight thematic research centers, we create opportunities for knowledge pooling which leads to inspiring collaborations between scientists within the centers and beyond.

Strong partnerships with the universities of Ghent, Leuven, Antwerp, Brussels and Hasselt allow us to build across strengths and to unite academic talents from a wide range of disciplines.

VIB's proactive approach to technology transfer does not stop at engaging our researchers to convert their research results into concrete, marketable 'products'. Our Innovation and Business team also actively promotes the translation of our discoveries and encourages potential industrial partners to further develop and commercialize them.

Mission and vision

It is VIB's mission to conduct pioneering biomolecular research in life sciences, to gain a better understanding of the mechanisms of life and to translate our research findings into products and solutions that benefit society.

We are convinced that breakthrough research in the molecular mechanisms of life will lead to a better quality of life, economic growth and sustainable societal well-being.

Remaining among world-class research institutes

Excellence Grants and Awards: competitive funding and increased visibility

In 2017, VIB decided to set up a central Grants Office. Its goals are to identify, and enable VIB scientists to apply for, the most suitable competitive funding, and to increase success rates. Together with a pilot team representing most of the centers, the central Grants Office is currently building a common grants support strategy to hunt for the most competitive funding for junior and senior scientists. These include MSCA, ERC, NIH and international foundations (e.g. the Bill & Melinda Gates Foundation, the Chan Zuckerberg Initiative and the Paul G. Allen Philanthropies), among others.

Besides research funding, the Grants Office scouts for international prizes and prestigious awards in order to nominate VIB scientists. Such recognition is of great importance to raise competitiveness and visibility at all levels of the institute. Junior and senior scientists are selected on a regular basis for various types of international recognition.

Monitoring and benchmarking: measuring the impact of VIB's science

VIB aims to belong to the top 10% in the life sciences disciplines it represents. This needs careful monitoring and impact analysis at an institutional and center level, as well as an international level. The Science & Technology team is developing carefully selected Tier lists, a balanced scorecard and international ranking tools to measure VIB's impact. In addition, access to international databases such as Scopus and Web of Science allows us to identify emerging fields in life sciences and promising junior scientists to join our institute.

Peer review and evaluation beyond numbers

Whilst the metrics in the balanced scorecard help VIB and the research centers to monitor and follow up on performance indicators, true appreciation of the quality of the research, technology transfer and research/service programs at VIB comes from peer review. The Science & Technology team manages the process of peer review in VIB by identifying field experts, coordinating the process of peer review and guarding the quality and guidelines of procedures. Current programs in scope for peer review are the five-yearly evaluation of VIB research centers and group leaders, the science advisory boards and the new translational initiative, the Grand Challenges program. The team also supports VIB's management and research centers in the strategic hiring of scientific directors and group leaders by identifying potential candidates in the field and strategic areas of research.

Staying at the forefront of life sciences research

In 2017, VIB introduced its Grand Challenges program to significantly increase its societal and economic impact. The objective is to select, fund and execute well-defined, transdisciplinary, cross-institutional, translational and/or disruptive research programs addressing a specific medical or agricultural need, starting from the clinic or field (reverse translation). The Grand Challenges program will allow VIB to take its scientific leadership to the next level of global visibility, while staying true to its success formula of a bottom-up, excellence-driven institute with significant scientific and societal impact.

A first call for projects was launched in the third quarter of 2017. The project proposals will be evaluated based on a peer review process. The proposals will be rated based on two criteria: a scientific review will be done by topic experts to judge the quality of the project relative to the specific field, and a societal impact review will be performed by people with a broader view on potential impact.

Influencing European policymakers

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721 PUBLICATIONS

SCIENCE

236 PUBLICATIONS IN TIER 5 JOURNALS

CORE FACILITIES 10

TECHNOLOGIES

TECH WATCH PROJECT APPLICATIONS APPROVED 32

5 PARTNER UNIVERSITIES → 75 RESEARCH GROUPS

1 INSTITUTE

66 NATIONALITIES ← 1,508 FTE

TOTAL INCOME

% 48 FLEMISH GOVERNMENT

% 52 OTHER INCOME

TECH TRANSFER

28.7 M € INDUSTRIAL INCOME

1 NEW START-UP COMPANY

INFORMING THE PUBLIC

4,350 VISITORS TO BIOTECH DAY

10,322 YOUNGSTERS IN EDUCATIONAL PROJECTS

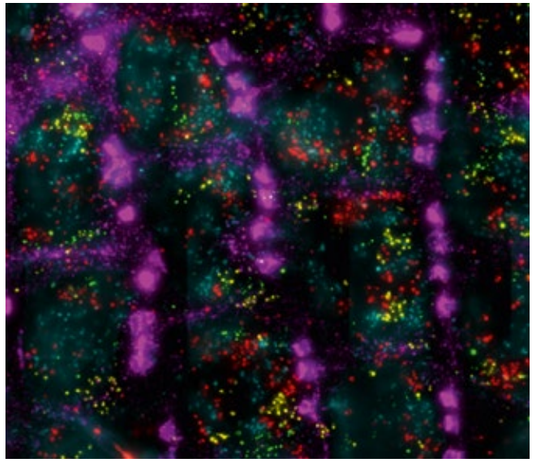
SCIENCE MEETS SCIENCE

BASIC SCIENCE GREAT IMPLICATIONS

Basic research, driven by curiosity, freedom and creativity, is the foundation of many revolutionary transformations. It contributes to a deeper understanding of the world and leads to new technologies and products that benefit society.

VIB's scientists are at the forefront of their discipline and are widely acclaimed for their pioneering research. The following summaries of a selection of 2017 publications will give you a flavor of the scope of VIB's research.

Cancer biology



New insights into the cellular origin of melanoma

Identification of the cancer cell of origin is a critical step toward earlier detection of malignancies, better prediction of tumor behavior, and development of preventive therapies.

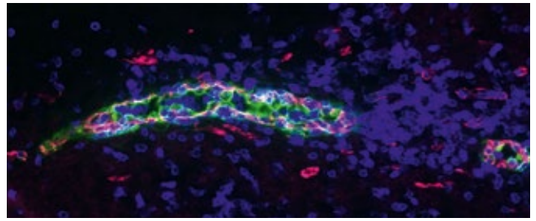
Recent research in the lab of Jean-Christophe Marine combined the up-and-coming single-cell RNA sequencing technique with *in vivo* time lapse imaging, which allowed the scientists to monitor both morphological and molecular changes in melanoma-initiating cells from the moment they entered their very first cell division.

Using a mouse model that recreates the early stages of melanoma development in humans, they observed mature melanocytes, or pigment-producing cells, in the top layer of the skin, expanding, changing their appearance and then losing their normal 'melanocyte' characteristics before becoming malignant cancer cells. This was in direct contrast with the activities of other types of skin cells, such as unpigmented or stemlike melanocytes.

These mouse models really set the study apart. By inducing cancer specifically on the tail skin of the mice, the researchers developed a refined model that faithfully mimics key features of the human disease.

The data from this research clearly show that mature, differentiated cells can serve as the cellular origin of a tumor. This contrasts with most – if not all – other *in vivo* tumor lineage-tracing studies to date, showing that stem or progenitor cells, such as those in intestinal adenoma and basal cell carcinoma, are cells of origin. The study also indicates that regional variation in tumor predisposition is dictated by microenvironmental cues rather than intrinsic differences in cellular origin. Critically, this work provides *in vivo* evidence that differentiated somatic cells can be reprogrammed into cancer initiating cells.

Kohler *et al*., Cell Stem Cell, 2017



Specialized blood vessels enhance tumor-fighting immunotherapy

Sustained angiogenesis, the growth of new blood vessels and the suppression of the immune system are hallmarks of cancer, with an increasing amount of evidence demonstrating that these two activities are interrelated. Therapies that prevent tumor blood vessel growth are often used in clinics to fight cancer, but they are only effective in a subset of patients. A minority of treated patients have responded well to these immunotherapies, emphasizing the need to identify strategies that will increase response rates in patients. An international team of scientists led by Elizabeth Allen and Gabriele Bergers has provided evidence that anti-PD-L1 therapy can sensitize and prolong the efficacy of anti-angiogenic therapy, and conversely, anti-angiogenic therapy can improve anti-PD-L1 treatment. This occurs particularly

when intra-tumoral specialized blood vessels; i.e. HEVs (high-endothelial venules), are generated that facilitate enhanced white blood cell infiltration, activity and tumor cell destruction.

To avoid being targeted by their hosts' immune systems, tumors maintain an immunosuppressive environment by manipulating the characteristics of the immune and vascular system. Increased blood supply and decreased immune activity are necessary for malignant cells to multiply.

The team showed that combining anti-angiogenic and immune-stimulating therapies in the treatment of tumors in mouse models resulted in better therapeutic outcomes, by providing white blood cell gates through which they can infiltrate cancers.

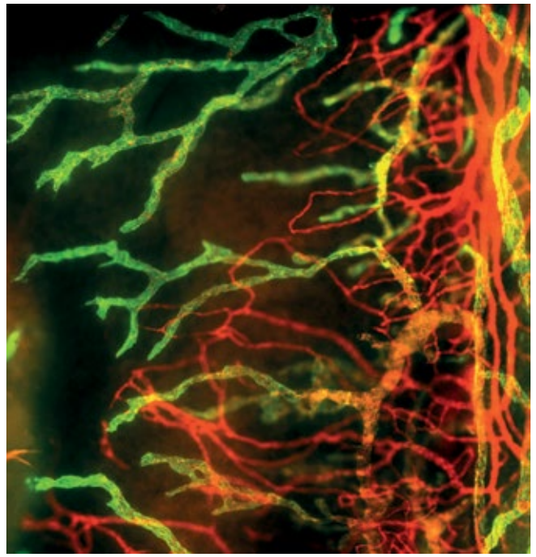
The results of the study indicate that the two therapies stimulated significant growth of HEVs in pancreatic and mammary tumors, leading to malignant cell death and tumor shrinkage. The next step in this research involves investigating how intra-tumoral HEVs are formed and maintained.

Allen *et al.*, Science Translational Medicine, 2017

Fat fuels the road to cancer cell spread

Metastasis is one of the most important and life-threatening complications of cancer today. It results in the majority of deaths associated with cancer. For cancer cells to spread, they must find or build a 'road' to travel on. Lymphatic vessels, a specialized kind of vessels transporting fluid rather than blood, are a primary route of cancer cell spread, and the formation of new lymphatic vessels, termed lymphangiogenesis, is a poorly understood process.

A team guided by Peter Carmeliet sought to investigate the metabolism of lymphatic vessels. The study began with a simple observation: lymphatics use more fat (fatty acids) compared to blood vessels. Using drugs to prevent fat utilization by lymphatics prevented lymphatic growth: an important step in inhibiting metastasis.

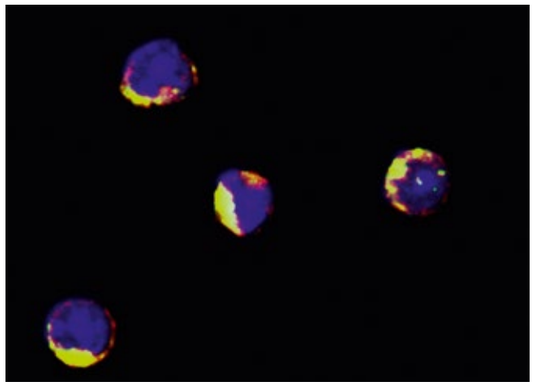


To understand why these cells are so reliant on fat, the researchers investigated how lymphatics develop. Lymphatics 'transform' from blood vessels during embryonic development, and this study showed that the signals that transform blood vessels to lymphatics also change their 'taste' to prefer eating fat. The novelty of this discovery is that this 'transformation' relies on an increase in fat utilization. The fat is used to generate molecules which can modify important factors that regulate the expression of the genetic code, termed epigenetic changes, which can ensure the function of lymphatics. The hardwiring of the genetic code (DNA) itself is not altered by fat, but the utilization of this code that defines the lymphatic gene signature is modulated. A key translational aspect to this finding was the proof that resupplying another (fat) nutrient source could restore the growth and function of lymphatics.

This work demonstrates the importance of the reliance of lymphatic cells on fat. It also provides essential steps towards developing effective drugs to prevent excessive lymphatic growth in cancer, and to treat incapacitating complications of lymphedema.

Wong *et al.*, Nature, 2017

Immunity and inflammation

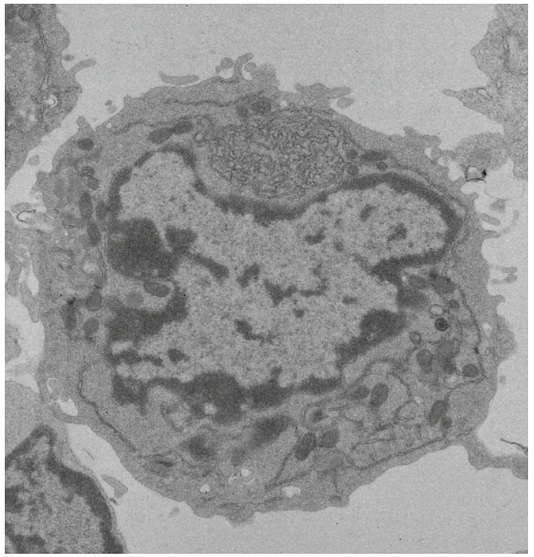


Surprise finding leads to new insights into splenic B cell differentiation

B cells are an important part of our immune system, as they are responsible for manufacturing antibodies that fight disease. The spleen produces two types of B cells: marginal zone B (MZB) cells and follicular B cells. However, scientists knew little about the mechanisms governing why early B cells develop into MZB cells versus follicular B cells. A research team headed by Bart Lambrecht and Hamida Hammad had a 'eureka!' moment after discovering that a little-known protein, Taok3, brings a certain proteinase, ADAM10, to the surface of the immature B cell and triggers its development into an MZB cell. Without that special event, immature B cells can only develop into follicular B cells. MZB cells generate antibodies against encapsulated bacteria such as pneumococcus, a major cause of respiratory illness, when they enter the bloodstream. In mouse strains, the team observed that, without Taok3, immature B cells never 'committed' to becoming MZB cells. As a result, they were susceptible to pneumococcus infection.

This research has generated insights that are very relevant to new therapies for a range of important diseases.

Hammad *et al.*, Nature Immunology, 2017



Crucial role for XBP1 in several aspects of DC functioning and homeostasis

Type 1 conventional dendritic cells (cDC1s) play a crucial role in orchestrating the balance between protective anti-viral or anti-tumor immunity and tolerance to self-antigens. What determines this balance remains poorly understood, but over the past few years, several signaling pathways have been unraveled that help DCs to perform their specialized cross-presentation function. In a previous study, Sophie Janssens and Bart Lambrecht found that loss of XBP1, a major transcription factor in the unfolded protein response, in cDC1s cripples their ability to cross-present dead-cell derived antigens.

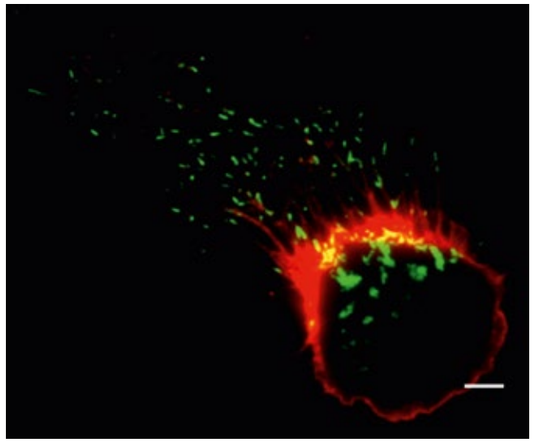
Simon Tavernier and colleagues from other labs have now discovered an additional role for XBP1 in the survival of lung, but not intestinal or splenic, cDC1s, showing a tissue-specific role for the IRE1/XBP1 branch in maintaining DC homeostasis. By exploring the mechanisms underlying this tissue-specific response, they found that lung and intestinal DCs mount different adaptive responses in the face of chronic ER stress, which is mimicked in a mouse model by the loss of XBP1.

Intestinal cDC1s show a highly increased IRE1 endonuclease activity compared to lung cDC1s. In the field of ER stress, the physiological role of RIDD is still highly debated, but the researchers have clearly established that, in dendritic cells, RIDD plays a protective role and helps the cells to survive the loss of XBP1.

Although the picture is not yet complete, this study shows that adaptive responses are hardwired differently in DCs across different tissues, and that the IRE1/XBP1 pathway appears to play a crucial role in several aspects of DC functioning and homeostasis. Considering the established role of DCs in cancer immunotherapy, understanding these stress-signaling networks will be crucial in developing the next generation of DC therapy.

Tavernier *et al.*, Nature Cell Biology, 2017

Medical Biotechnology



New antibodies to fight human respiratory syncytial virus

RSV causes nearly 34 million cases of illness every year in children under 5 years of age. It can result in serious illness in both very young children and elderly people, leading to hospitalization in up to 2% of cases. Despite intensive research and the virus's status as a major pathogen, current methods of treatment rely almost exclusively on supportive care. With the goal of developing a new therapy to fight disease caused by RSV, Xavier Saelens and his team developed Nanobodies® which target the protein that the virus needs to enter lung cells. The researchers showed that these Nanobodies® neutralized the virus in laboratory assays as well as in animals.

To obtain highly potent anti-viral molecules, the Ghent group collaborated closely with a team from the Geisel School of Medicine and the National Institutes of Health in the USA to select, produce and purify Nanobodies® that specifically target the active but highly unstable form of the RSV fusion protein. Detailed structural analysis revealed that these Nanobodies® tightly bind to a very conserved pocket of the viral fusion protein, and that they provide antiviral activity against clinical isolates of the two RSV types.

At present, there is no antiviral treatment available for patients (often infants) hospitalized with RSV. Therefore, there is high demand for an antiviral drug that can be applied therapeutically, i.e. after infection has occurred. The team's next steps will revolve around transforming the Nanobodies® so that they are developed into a format that can be used in clinical tests. The goal is to team up with an industrial partner to translate the findings into a therapeutic treatment that is useful for RSV patients.

Rossey *et al.*, Nature Communications, 2017

Microbiology

How gut bacteria count: quantitative microbiome profiling

How much bacteria you have in your gut matters, as Jeroen Raes and his team discovered. Using a new technique

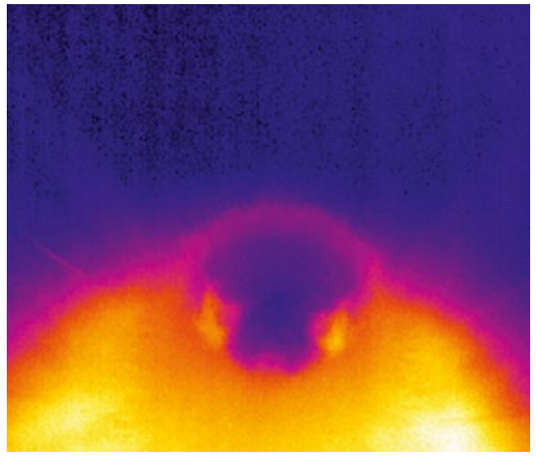
that allows the number of bacteria in a fecal sample to be determined quickly and accurately, they revealed that microbiota population sizes between healthy individuals differ up to tenfold. The total number of bacteria in a healthy individual fluctuates quite substantially over time, but people with Crohn's Disease (CD) have a lot less bacteria than healthy people.

Previously, scientists could only work with the relative amount (percentage) of bacteria in someone's gut. Now, using a combination of DNA sequencing and flow cytometry, they can work with the actual numbers. This Quantitative Microbiome Profiling means a world of difference in linking microbiome data to other quantitative data and health parameters.

The first results obtained with this new technique are already spectacular. Along with the information on bacterial loads, the team discovered a new type of gut microbiota, or 'enterotype'. It became clear that the B-enterotype actually holds two types: one with a high number of bacteria (B1) and another with a low number of bacteria (B2). Some species that are often linked to a healthy gut flora seem to be less numerous in the B2 enterotype. This B2 enterotype is commonly seen in patients with Crohn's disease, but also in some healthy volunteers. The aim now is to determine whether this gut flora type promotes the development of diseases, and if so, what can be done to prevent it.

Vandeputte *et al.*, Nature, 2017

Neuroscience



Researchers discover mechanism behind rapid smell source localization

Most mammals can swiftly pinpoint where a smell is coming from. However, the neural mechanism behind this seemingly straightforward task is still a big question in biology. To address this question, a research team at NERF, led by Sebastian Haesler, set up an experiment using mice.

To begin with, the team developed a novel method to measure respiration dynamics. Unlike current methods, this technique – using an infrared camera – is noninvasive. In this way, the NERF team discovered that mice presented with new smells spontaneously turned their nose towards the source in under 100 milliseconds.

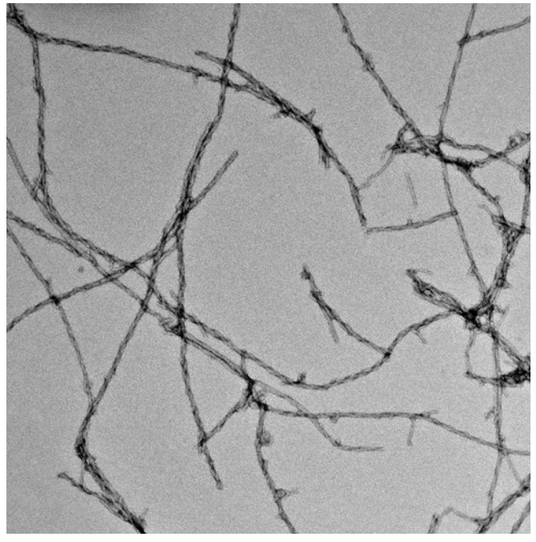
Building on this behavioral response, the team then performed experiments to explore the mechanistic principles behind odor source localization. The data from the research show that mice compare the strength of the smell obtained through the two nostrils in order to locate the direction of the odor source. This comparison involves information transfer between the two brain hemispheres. Scientists also identified the part of the brain, called the anterior olfactory cortex, that plays a key role in this process.

To move this research domain ahead, the team is currently recording neural activity between the anterior olfactory cortices in the two hemispheres, to reveal the exact comparison mechanism for rapid odor localization. In addition, the team has started to build on these insights in the context of Alzheimer's disease. During the tests, the mice only responded to new smells, not familiar ones. However, in the case of Alzheimer's, it is expected that they will respond to familiar smells as well, because they might have forgotten them. Moreover, Alzheimer's is associated with a declining sense of smell. Hopefully these findings will contribute to a better understanding of diseases that affect the memory.

Esquivelzeta *et al.*, Current Biology, 2017

Novel perspectives on anti-amyloid treatment for the prevention of Alzheimer's disease

Alzheimer's disease is the most common cause of dementia and affects approximately 30 million people worldwide. The relatively rare hereditary form of the disease is caused by mutations in the γ-Secretase enzyme or the APP protein. γ-Secretase cuts APP several times in a progressive manner, with each cleavage generating a shorter fragment, called amyloid beta, that gets released into the brain. The labs of Lucia Chavez-Gutierrez and Bart De Strooper discovered that the disease-causing mutations disrupt this cutting process by weakening the interactions of γ-Secretase and APP during the progressive cleavages. In this way, they promote the premature release of longer, more toxic amyloid beta fragments. The more the γ-Secretase-APP interaction is undermined, the sooner Alzheimer's disease



develops. Importantly, the findings also suggest that changes in the cellular environment could modulate the interaction between γ-secretase and APP, and could therefore also affect someone's risk of developing the non-hereditary form of Alzheimer's disease.

This has important therapeutic implications, since the results suggest that stabilizing the interaction between γ-Secretase and APP might be sufficient to avoid the release of longer and toxic amyloid beta fragments, and thus prevent or delay the disease. The team is currently collaborating with academic drug discovery units to translate these findings into new therapeutic drug candidates.

Szaruga *et al.*, Cell, 2017

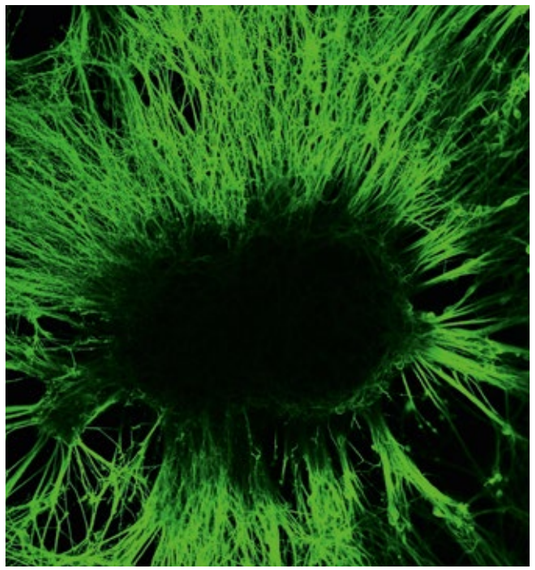
Human neurons in mouse brains are more susceptible to Alzheimer's pathology

While many features of the brain are conserved between different species such as humans and mice, the human brain displays a number of unique characteristics, which make us what we are, as a species and as individuals. Studying this human-specific aspect remains a big challenge in neuroscience. A team from the De Strooper lab collaborated with researchers from other universities to tackle this problem.

The scientists differentiated human pluripotent stem cells into neural cells in a dish, and then transplanted these human neurons into mouse brains containing amyloid plaques, one of the hallmarks of Alzheimer's disease. This novel human/mouse chimera model allows for a better characterization of the disease processes that actually take place in the brains of human patients. The study's results showed that, compared to mouse neurons, human neurons were much more sensitive to amyloid plaque pathology.

Moving forward, Bart De Strooper and his team are planning a screen to identify human genes that protect against cell death associated with Alzheimer's disease. The end goal of the screening is to identify new drug targets within human cells themselves, something that has never before been possible.

Espuny-Camacho *et al.*, Neuron, 2017



From droplets to clumps: phase separation and protein aggregation in neurodegenerative disease

Protein aggregation is a hallmark of many neurodegenerative diseases, including amyotrophic lateral sclerosis (ALS) and frontotemporal lobar degeneration (FTLD). So-called stress granules are the prime suspects for seeding pathological protein aggregation in these diseases. Stress granules are membraneless compartments in the cell, which arise through liquid-liquid phase separation. When this phase transition goes awry, it could cause the demixed liquids to solidify.

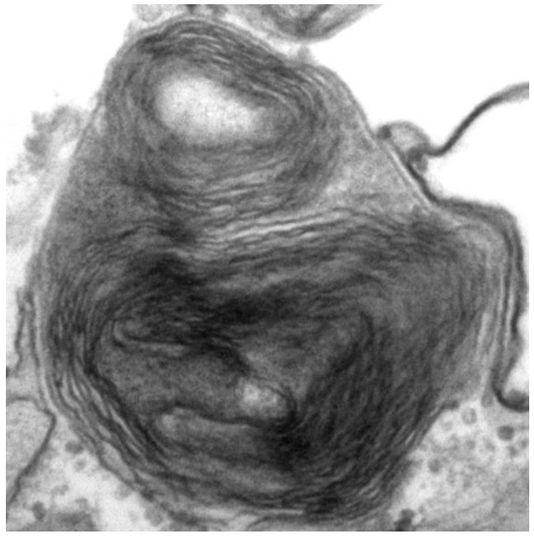
Researchers from the lab of Ludo Van Den Bosch (VIB-KU Leuven) set out to investigate whether dipeptide repeat proteins translated from genetic repeats linked to ALS and FTLD alter phase separation dynamics. They did so in collaboration with the labs of Peter Tompa (VIB-VUB) and Joost Schymkowitz and Frederic Rousseau (VIB-KU Leuven), as well as the proteomics expertise unit (VIB-UGent) and other colleagues outside of VIB. The team discovered that pathogenic dipeptide repeat proteins do not only undergo liquid-liquid phase separation themselves, but also induce phase separation of a large set of proteins involved in RNA

and stress granule metabolism. Moreover, arginine-rich regions seem to play an active role in these phase separation processes of other disease-related proteins.

These findings provide important molecular insights into the formation of protein clumps, uncovering a potential new toxic cellular pathway. From a therapeutic viewpoint, phase transitions are extremely relevant, as they represent an important tipping point: irreversible aggregation of proteins into solids could lead to permanent damage and subsequently cause neurodegeneration.

Boeynaems *et al.*, Molecular Cell, 2017

ATP13A2 also associated with hereditary spastic paraplegia



Hereditary spastic paraplegias (HSP) are heterogeneous neurodegenerative disorders characterized by progressive spasticity of the lower limbs due to degeneration of the corticospinal motor neurons. Mutations in over 60 genes are implicated in HSP, although these explain ~30–70% of cases, depending on the mode of inheritance. Recent gene discoveries have revealed a genetic overlap between HSP and a spectrum of neurodegenerative diseases, supporting their clinical similarity and common pathomechanistic background.

To understand more about HSP, an international team of researchers, under the leadership of Albena Jordanova and Primary Investigators from Germany, Belgium and Bulgaria, performed whole exome sequencing and homozygosity mapping in a Bulgarian family with three siblings affected by complicated HSP. They identified a homozygous mutation in the ATP13A2 gene. Screening of 795 HSP patients of various ethnicity revealed two additional families carrying truncating biallelic mutations in ATP13A2.

This gene was already associated with Kufor-Rakeb syndrome (KRS), a form of juvenile-onset parkinsonism, and with neuronal ceroid lipofuscinosis that clinically overlaps with KRS. It was also known that heterozygous ATP13A2 variants might represent risk factors for early- and late-onset parkinsonism. Reporting that mutations in ATP13A2 cause complicated HSP type SPG78, the VIB researchers expanded the clinical and genetic spectrum of ATP13A2-associated disorders. They suggested that loss of ATP13A2 autophosphorylation activity contributes to disease etiology. Via biochemical and immunocytochemical assays, they could demonstrate that loss of ATP13A2 function causes a combination of lysosomal and mitochondrial dysfunction that affects multiple neuronal populations.

Estrada-Cuzcano *et al.*, Brain, 2017

Deleterious ABCA7 mutations in early-onset Alzheimer's disease

Alzheimer's disease (AD) is the most common form of dementia. Genetic research to uncover genes involved in the onset of Alzheimer's is advancing at full speed. More than 20 genomic *loci* have been identified. Among those, the so-called ABCA7 gene is of particular interest, because both common and rare variants of this gene affect the risk of Alzheimer's.

A specific type of mutations in ABCA7, the so-called deleterious premature termination codon (PTC) mutations,

appear more often in people with Alzheimer's than in healthy individuals. It is also known that Alzheimer's patients carrying a PTC mutation mostly have a family history of Alzheimer's. The observation that ABCA7 PTC mutations exert a relatively strong effect on individual risk and familial occurrence of Alzheimer's makes it interesting to further explore their potential in individualized genetic diagnosis and risk prediction.

To address this on a clinical and molecular level, a team headed by Kristel Sleegers in the research group of Christine Van Broeckhoven examined the prevalence and characteristics of ABCA7 mutations in a large European cohort of early-onset patients (onset age ≤65). This subgroup of patients with Alzheimer's would strongly benefit from improved diagnosis and genetic counseling.

In 928 patients and 980 matched control individuals, the VIB researchers found a fivefold enrichment of PTC mutations in patients versus controls. The team gained further insight into the mode of action of these mutations via targeted transcript analysis with third-generation (long-read) sequencing. This revealed many novel ABCA7 isoforms, several of which could rescue the deleterious effect of a PTC mutation through exon skipping or alternative splicing. Their work shows that genetic screening for ABCA7 PTC mutations is warranted in genetically unexplained early-onset Alzheimer's disease patients. Moreover, the novel transcript modifying events, which may influence ABCA7 dosage and disease severity, may direct opportunities for therapeutic interventions in AD.

De Roeck *et al.*, Acta Neuropathologica, 2017

Plant Systems Biology

The Apostasia genome and the evolution of orchids

Orchids are amazing flowering plants which are immensely popular, not only among florists, but also among evolutionary biologists and bioinformaticians. This comes as no surprise, given the range of remarkable characteristics these plants display. Have you ever wondered what makes the orchid flower morphology so unique and diverse? Why do their petals bear a striking resemblance to insects? How is it possible that so many orchid subfamilies grow practically everywhere in the world? How can some of them grow on trees or rocks, while others have roots grounded in soil? How can their tiny seeds sprout without the nutritional layer which is required for germination in other plant species?

The joint efforts of a cross-border team of scientists, under the leadership of Yves Van de Peer, yielded an interesting report, revealing the evolutionary basis of these marvels of the orchid. The researchers sequenced the genome of one of the primitive terrestrial orchids, *Apostasia shenzhenica*, and compared its content and structure to two epiphytic

orchids, *Phalaenopsis equestris* and *Dendrobium catenatum*, as well as to the genome and gene expression patterns of other plants. One of their compelling discoveries was the occurrence of at least one whole genome duplication event shared by all orchids. This genome duplication likely laid the groundwork for the subsequent orchid divergence, enabling the acquisition of new traits, through either gene duplication or gene loss (the latter leading to the reversion to ancestral state). The researchers shed light on the genetic basis of the flower and root morphology of various orchid subfamilies, as illustrations of this differential gene retention and, consequently, the generation of the whole spectrum of orchids.

Zhang *et al*., Nature, 2017

Discovery of a new gene that significantly increases seed yield in maize

Worldwide, 180 million hectares of maize are planted, with production of approximately one billion tons a year making it the world's most cultivated crop. Maize is primarily cultivated as animal feed, but also for human consumption and, to a lesser extent, as a source of biofuels. Research into new maize varieties is of great importance to maintain sufficient maize production; by selecting growth-enhancing genes, breeders can develop improved agricultural crops, which offer harvest security even in a changing climate.

A team of researchers headed by Dirk Inzé and Hilde Nelissen is conducting research into the molecular mechanisms behind leaf growth in maize. Leaf development is a blueprint for the plant's growth processes. The researchers discovered a gene in maize, named PLA1, which regulates plant growth and the size of plant organs such as the leaves, but also the cob. They succeeded in significantly boosting biomass and seed production by increasing PLA1 expression in the plant, which leads to a yield increase of 10 to 15% on the same agricultural area.

In the greenhouse, the researchers discovered that PLA1 plays a role in how plants cope with drought stress. The growth-enhancing PLA1 trait appeared to partly compensate for the growth reduction that normally occurs because of long periods of water shortage. Therefore, these findings also offer potential for developing agricultural crops that guarantee stable yields even when weather conditions are less favorable. In this way, new varieties of crops can help to cope with the effects of climate change.

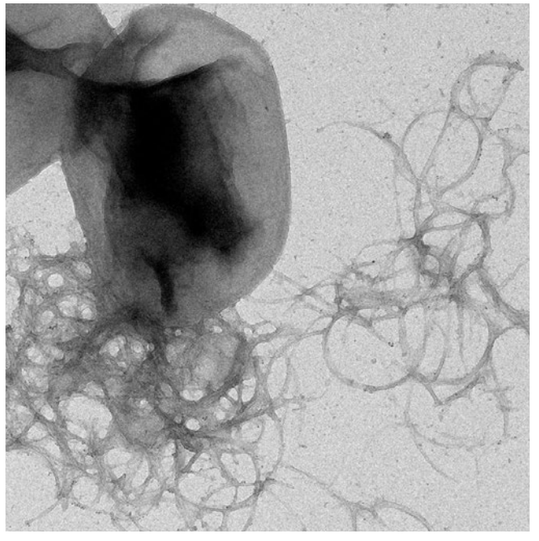
Further research is now focusing on finding the molecular mechanisms that lie at the basis of the increased yield.

Sun *et al*., Nature Communications, 2017

Structural Biology

Researchers gain new insights into the formation of non-pathological amyloids

In humans, amyloids are associated with neurodegenerative illnesses such as Alzheimer's, Parkinson's and Huntington's disease, and prion diseases like BSE and Creutzfeldt-Jakob disease. In these pathological amyloids, proteins misfold into toxic forms that can cause cell death and may lead to brain and organ damage.



Scientists from VIB and different Belgian universities collaborated on a study of functional amyloids – protein aggregates with the typical amyloid structure – that do not lead to disease but rather serve a dedicated biological function. Led by Mike Sleutel and Han Remaut, the team used a novel microscopy method to examine the real-time formation of functional amyloids by bacteria, observing key growth and regulatory characteristics.

The goal of this research was to learn more about the process by which bacteria can circumvent the development of harmful toxic intermediates. To do so, the researchers relied on high-speed atomic force microscopy to observe the growth of individual amyloid fibers 100 times faster than with conventional atomic force microscopes.

The scientists found that curli, a type of functional amyloids produced by *E. coli* and other bacteria to form biofilms, follow a different developmental process than pathological amyloids. As they watched curli fibers spawn and grow, it emerged that, during amyloid nucleation, curli subunits directly collect into minimally-sized fibers that have the same properties as mature curli, thereby avoiding the formation of toxic intermediates seen in amyloid pathologies. The bacteria also use an additional safeguard, a protein that blocks the growth fibers when they form in the wrong cell compartment.

Curli are an ideal model system for uncovering the fundamental principles of amyloid assembly, both functional and pathological. This study helps us understand how bacteria form amyloids without self-inflicting toxicity. Even more importantly, functional amyloids have great potential as the future building blocks of new biomaterials.

Sleutel *et al*., Nature Chemical Biology, 2017

SCIENCE MEETS TECHNOLOGY

TECHNOLOGICAL ADVANCES SET THE PACE FOR RESEARCH

As technologies continue to evolve, research methods follow suit. New technological solutions often require expertise and skills far beyond what one center, let alone one research group, can provide. This is exactly why VIB invests heavily in its Tech Watch program and in state-of-the-art Core Facilities.

Tech Watch: scouting for new technologies

Staying abreast of the latest tools and technologies is a challenge itself. VIB's Tech Watch team continually explores the market for emerging technologies that could impact our scientists' research and that will advance research results.

The team has a unique screening system that allows it to discover emerging technologies even before they are commercially available. It assesses the latest technological developments and determines the impact these technologies might have on the scientific output of VIB. Based on its findings, new tools and instruments are introduced to VIB scientists. As such, our researchers have privileged early access to stealth technologies in their prototype phase, as well as recently commercialized technologies. In addition, the Tech Watch team takes care of the contractual agreements with these companies.

Technology Innovation Lab: accelerating technology implementation

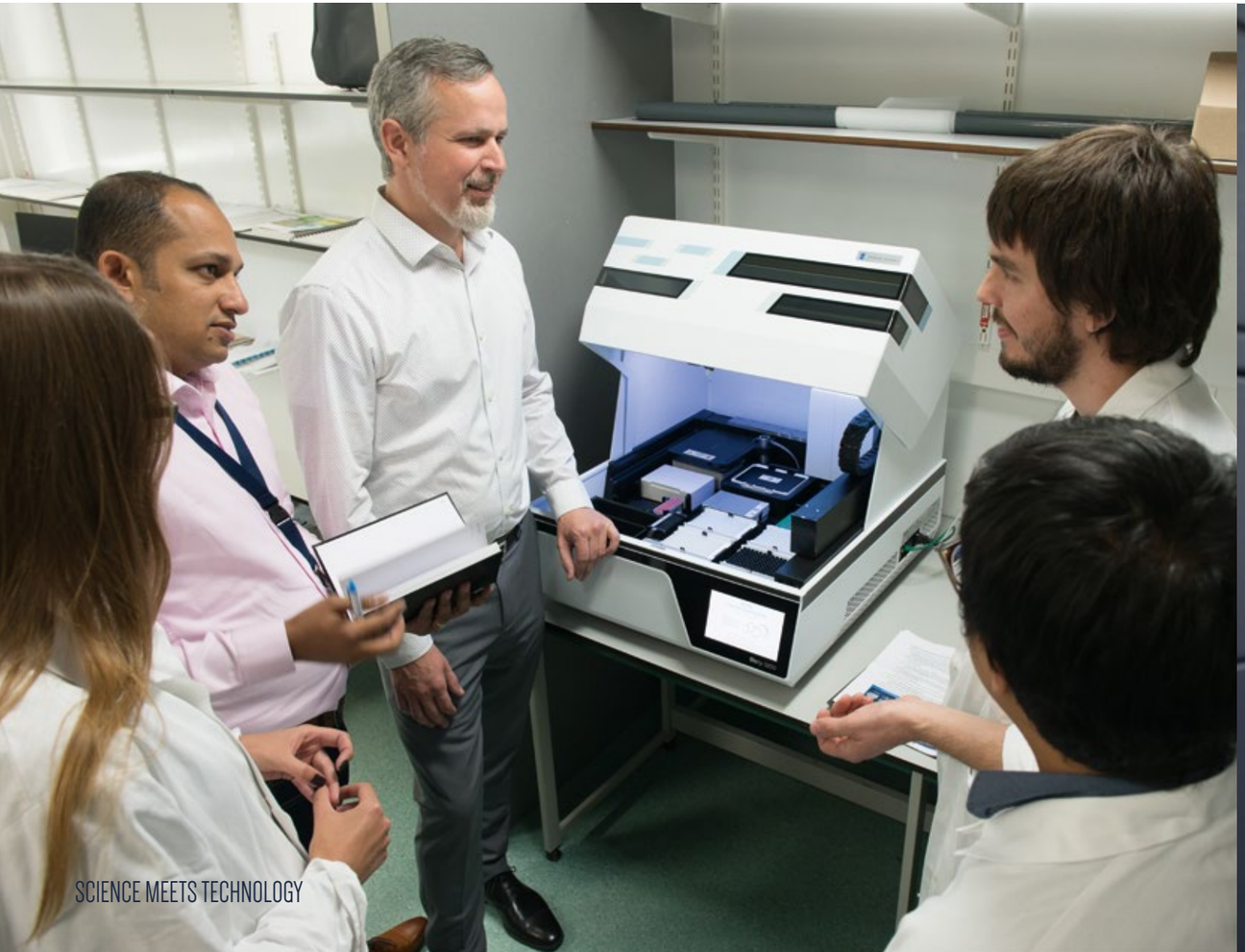
In 2017, VIB created the 'Technology Innovation Lab' to increase the uptake of innovative breakthrough technologies within the research centers. Two dedicated life sciences specialists provide hands-on support in the lab to lower the threshold for scientists to implement these technologies in

their research projects. They give practical training on the instrument, provide support during the initial experiments, help with troubleshooting, transfer best practices and explore new technological avenues with VIB scientists to boost research output. One example of such an introduction is the BioXp™ 3200 System from Synthetic Genomics Inc. The BioXp™ 3200 System, the world's first DNA printer, was evaluated in the VIB-UGent Center for Plant Systems Biology (PSB). A weekly DNA synthesis service was set up, with significant interest from multiple PSB groups and across the centers. After a positive evaluation in the first five months, the decision was made to purchase the system and the DNA printer was integrated in PSB. In addition, a weekly DNA synthesis service will be rolled out from PSB to the whole institute.

VIB Core Facilities: access to cutting-edge equipment

Since its inception, research at VIB has been of a highly innovative nature and, as a result, enabling technologies have always been high on the radar. To conduct frontier basic research, access to the latest state-of-the-art equipment is a prerequisite in today's life sciences environment. Core Facilities are important research resources, providing access to advanced instrumentation and technologies operated by experts. VIB's cores are hubs of innovation, connecting our scientists with the tools and expertise that can take their research projects to the next level. In addition to routine servicing, the Core Facilities are an indispensable partner for user-driven method and application development.

As life sciences sub-disciplines evolve at an unprecedented speed, the Core Facilities constantly scan the possible impact of emerging fields and pick up relevant trends. In this way, we soon realized that, with the emergence of single cell and/or CRISPR/Cas9 approaches, the field of flow cytometry and FACS (*fluorescence-activated cell sorting*) would be revolutionized, and that, due to the high degree of expertise required, inexperienced users would risk missing out on the benefits of this technology. To avoid this, VIB set up a multi-platform Flow Cytometry Core in 2017, offering mass flow cytometry or imaging flow cytometry services to all VIB research groups.



SCIENCE MEETS BUSINESS

TECHNOLOGY TRANSFER SPURRING ECONOMIC DEVELOPMENT

The translation of research results from the bench to the bedside or the field is not only a risky process; it is also expensive and lengthy. The ability to de-risk innovation is a prerequisite for successfully attracting business partners and investors. VIB's Innovation and Business team meticulously manages all the steps in this process, often from the beginning of an invention all the way to concluding a business deal or creating a new start-up. In terms of technology transfer, 2017 was a huge success with the best results in industrial income since VIB's inception.

Protecting VIB's findings

With a view to commercializing research results and considering major downstream investments, it is important to safeguard VIB assets with Intellectual Property Rights. In 2017, VIB's IP team filed 35 new patent applications and 26 patent applications became public from earlier filings. VIB currently manages a patent estate of 253 patent families.

Teaming up with companies

The invention and development of a commercial biotech product is carried out in consecutive steps, starting with years of basic research and ending with a market introduction. Collaborating with industry is one way of advancing research and bringing innovation and technological development to patients and farmers. Since the start, VIB has forged long-term strategic alliances focused on specific areas of research. Such partnerships allow the pooling of resources and help to streamline the process of commercializing research results. In 2017, 76 FTEs were funded by such contracts.

We realized a record 28.7 million euro in industrial income in 2017, and concluded a total of 135 collaborations with industrial partners in the form of R&D agreements, licensing and/or service agreements. One particularly outstanding licensing agreement is the therapeutic license deal for the development of MALT1 inhibitors towards clinical application in several therapeutic indications with Galapagos (BE). Another is the therapeutic license deal concluded with Denali Therapeutics (US), which grants Denali exclusive rights to develop monoclonal antibodies previously developed by Bart De Strooper's team and validated against BACE1, an important target in Alzheimer research.

Leveraging innovation

Having a meaningful impact on society is what drives many scientists. However, research institutes and universities are not equipped to fully translate discoveries into the market. Developing an academic finding into a commercial product requires a different set of skills and can potentially offer opportunities to create employment by setting up a start-up company.

In 2017, VIB added another start-up, Aelin Therapeutics, to its impressive track record, bringing the total number of spin-offs to 20. Aelin Therapeutics secured 27 million euro of Series A financing from a strong international investor syndicate to pioneer a new modality of drug development based on a technology branded 'Pept-ins™'. The company will initially focus on antibacterial drugs as an alternative against antibiotic-resistant pathogens and in anti-cancer therapies.

Furthermore, after the completion of seed financing in 2016, Aphea.Bio secured a successful series A round of 7.7 million euro in 2017. The company is focusing on the exploitation of microbial diversity in soil and crops for biocontrol and biostimulant applications.

In 2015, in partnership with Thrombogenics, VIB created a start-up company, Oncurious, to develop a VIB-originated monoclonal antibody in a rare form of pediatric brain cancer. In 2017, VIB engaged further with Oncurious by licensing a portfolio of promising immune-oncology projects and by co-developing these through the VIB Discovery Sciences team. This positions Oncurious as a promising next-generation oncology company.

VIB's start-ups represent a total capital investment of 1.17 billion euro and a total of 823 people in direct employment.

Acquisitions

In January 2017, Agilent Technologies, Inc. (US) completed the acquisition of Multiplicom, a VIB-UAntwerp spin-off. Multiplicom develops, manufactures and commercializes molecular diagnostic kits which enable personalized medicine. This acquisition significantly strengthens Agilent's presence in the genomics market and creates opportunities to offer Multiplicom's products and technology to a much bigger market.

Driving an innovative life sciences hub

An open and collaborative culture is conducive to innovation and creates important leverage for value and investments. To drive the international competitiveness of the life sciences ecosystem in Flanders, the most important factors are: leading-edge science and access to knowledge, availability of talent and skills, and affordable state-of-the-art lab and office space.

Knowledge and expertise from a research institute such as VIB is inspiring and forms the ideal breeding ground for innovation projects. Both young start-ups and international pharmaceutical companies find their way to the biotech clusters and to important partners to develop collaborations. At the same time, they can tap into the available talent and know-how. Over the years, several foreign biotech companies have set up businesses in Flanders, collectively investing 900 million euro in the region and creating direct employment for 600 people.

In 2017, VIB was instrumental in attracting two companies to establish bases in Flanders. Talix Therapeutics was founded in Leuven in the middle of 2017, as a spin-off of the French company BliNK Biomedical (Lyon). Talix Therapeutics will focus on the development of an antibody to be used for cancer immunotherapy. In December 2017, the Dutch firm Innoser set up operations in Diepenbeek, Belgium, in the Bioville incubator. Innoser is a Contract Research Organization and offers preclinical research expertise and infrastructure.

De-risking discoveries for smoother translation

VIB's Discovery Sciences unit is the translational research lab and is part of VIB's Innovation and Business unit. A dedicated team of industry-experienced scientists aims to build a portfolio of valuable projects that deliver validated starting points for the development of small molecules, biologicals and agrochemicals. The early discovery activities in VIB Discovery Sciences focus on creating value by de-risking innovative targets, thereby demonstrating reproducibility and proof-of-concept for further development. This increases the value of these new targets for industrial collaborations.

In 2017, the VIB Discovery Sciences team worked on a portfolio of nine 'small compound' projects, 11 'biologics' projects and two agro/microbiology projects.

VIB Discovery Sciences projects have created a lot of interest among business partners and investment funds and could potentially lead to new start-ups as well as high-value license deals. As a good illustration of this, VIB Discovery Sciences recently leveraged the pipeline of Oncurious through its activities.

ECONOMIC IMPACT

START-UPS

1.17 B € CAPITAL INVESTMENT

823 DIRECT EMPLOYMENT

INFRASTRUCTURE

BIO-INCUBATOR LEUVEN

9,000 M²

15 COMPANIES/TENANTS

280 EMPLOYEES

BIO-INCUBATOR GHENT

6,500 M²

10 COMPANIES/TENANTS

225 EMPLOYEES

BIO-ACCELERATOR GHENT

18,000 M²

4 COMPANIES/TENANTS

550 EMPLOYEES

INTELLECTUAL PROPERTY

588 TOTAL NUMBER OF PATENT APPLICATIONS

253 TOTAL NUMBER OF ACTIVE PATENT FAMILIES

VIB

SUPPORT BIOTECH ECOSYSTEM

INTERNATIONAL SCHOOLS

92 GHENT PUPILS

70 LEUVEN PUPILS

FLANDERS.BIO / VIB MBI LIFE SCIENCES & HEALTH

20 GRADUATIONS / YEAR

ACCESS TO TALENT

5 UNIVERSITIES

4 STRATEGIC RESEARCH CENTERS

INDUSTRIAL INCOME

89.4M € TOTAL OVER LAST 5 YEARS

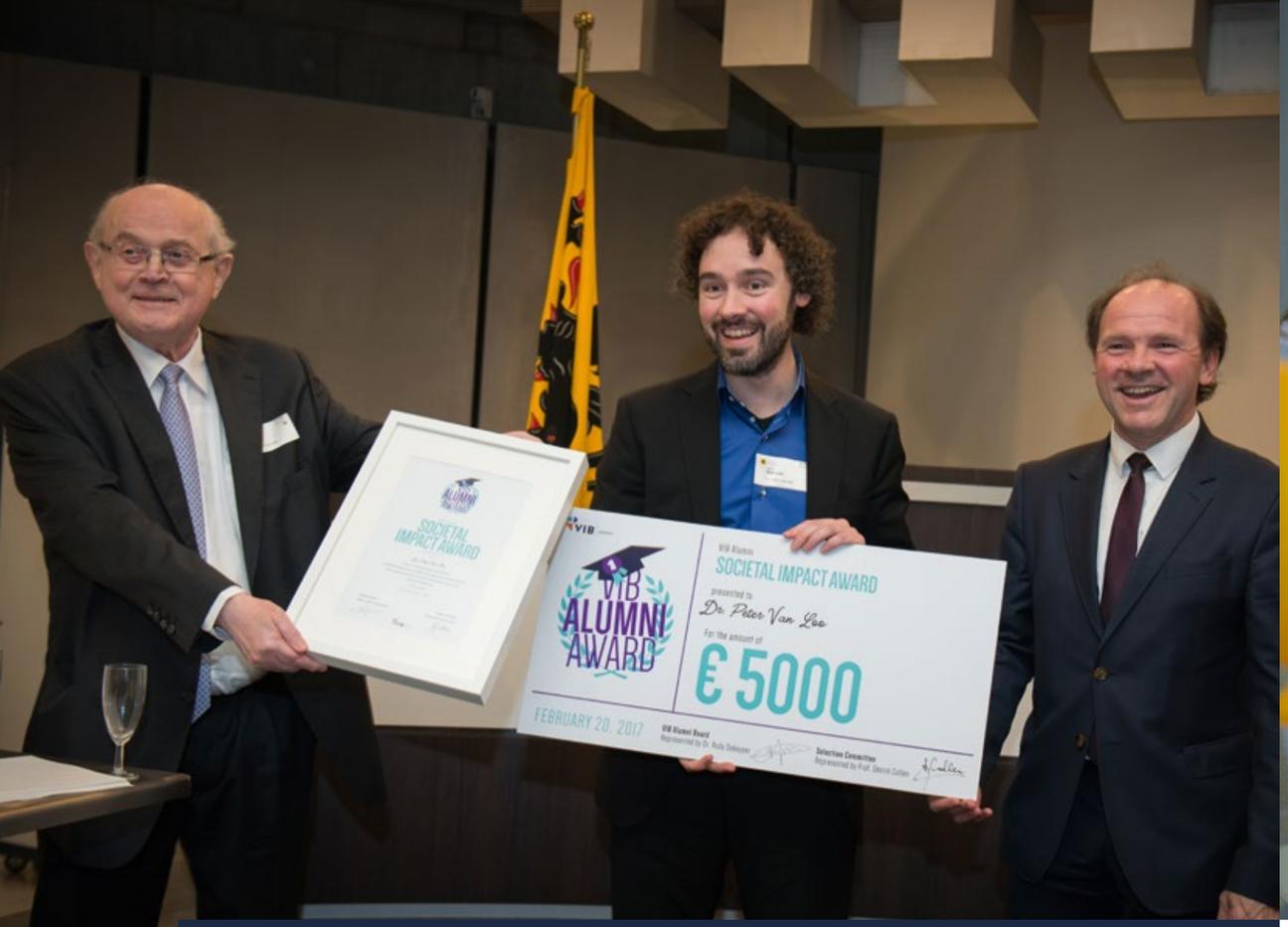
INWARD INVESTMENTS

900M € CAPITAL INVESTMENT

650 DIRECT EMPLOYMENT

AGREEMENTS WITH INDUSTRY

+ 100/YEAR



SCIENCE MEETS PEOPLE

PUBLIC OUTREACH

Communicating effectively about VIB's research to broader, non-scientist audiences helps to build support for science. It promotes understanding of its wider relevance to society and encourages more informed decision-making at all levels, from policymakers to communities and individuals. In addition to assisting researchers in getting media attention for their breakthrough research, VIB's communication team creates various opportunities for scientists to engage with the public, whether by teaching schoolchildren, giving lectures to various audiences, using social media or actively recruiting the public to participate in research.

VIB Matinee

The Biotech Tour, which toured throughout Flanders in 2016, had its apotheosis in February 2017 at a VIB Matinee in the Flemish Parliament. During the afternoon, Jo Bury and Johan Cardoen outlined the importance of basic research for society and the eight Science Directors of VIB's research centers highlighted their research. In his speech, Minister Muyters emphasized the social and economic impact of VIB's research. After the speeches, the new management agreement for 2017 - 2021 was officially signed.

During the Matinee, Peter Van Loo (Francis Crick Institute, UK) was honored with the first 'VIB Alumni Award' for his research on diagnosing Myeloproliferative disorders.

Biotech day

VIB's Biotech day has become a tradition on the third Sunday of October every year. The 2017 edition focused on food. The UGent-VIB Research Building FSVM I and many biotech companies at the TechLane Ghent Science Park opened their doors for 4,350 visitors and showcased their research. People were taken on guided tours through the labs, children could test their skills in the lab and adults could join lectures and biotech talks. .

Science day

The annual Science day, an initiative of the Government of Flanders, demonstrates how science and technology influence our daily lives. Several VIB centers and labs participated and showed their research to visitors. In Brussels, people could watch the play 'I, Raymond Haemers', which tells the story of how an accidental discovery led to the creation of the successful biotech company Ablynx. In Antwerp, visitors could test their memories with an interactive memory game.

Bringing people and technologies together

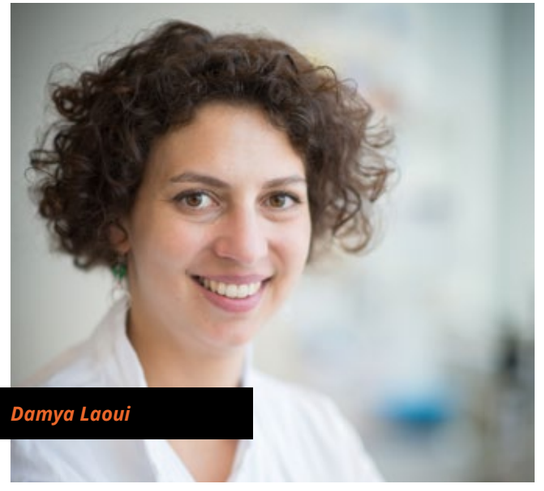
The primary goal of VIB's Conference Series is visibility for both new and established scientists and technologies. A second goal is to create opportunities for VIB and guest scientists to present their research and strike up groundbreaking collaborations.

In addition to the presence of leading names in a variety of fields, VIB conferences also bring camaraderie and a spirit of welcome. As one of the participants put it: "'At the Forefront of Plant Research' was a fully immersive experience, and a rare occasion to find top-level research in a friendly environment."

Thanks to an impressive lineup of speakers, VIB conferences attracted 1,543 participants in 2017. The quality of the lectures and attendees is also appreciated by companies, who value the opportunity to take part as sponsors or exhibitors.

Stronger through diversity

Scientists at VIB come from all over the world. With 66 nationalities we can affirm that we are a truly international research institute. We are fully aware that inclusion and diversity are key enablers for growth and breakthrough science. Great efforts are being made to promote variety in gender, race and ethnicity at all levels, as we strongly believe that this boosts creativity and innovation. For the years to come, diversity and inclusion will remain a focal point.



Damya Laoui

Faces of VIB

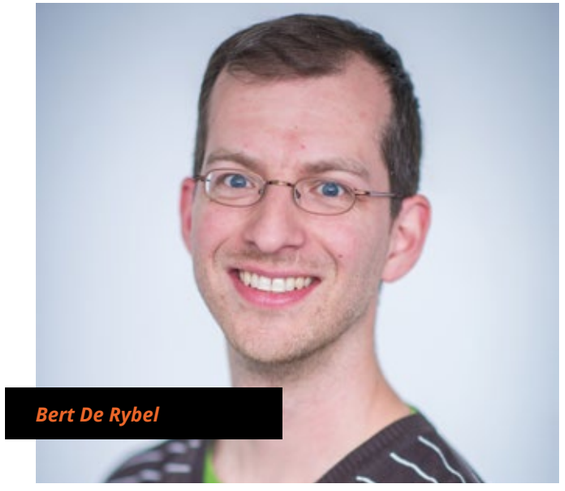
Damya Laoui, Postdoctoral scientist, VIB Center for Inflammation Research, VUB

VIB is an excellent research environment. Due to its multidisciplinary nature, nearly all the specialized equipment and state-of-the-art techniques you can think of are available in the network or in the Core Facilities, making it much easier to push scientific boundaries.

The coaching sessions offered by VIB under the titles of 'Self-leadership for Woman Scientists' and 'Individual Career Counseling', as well as the freedom that I get from my group leader Jo Van Ginderachter, helped me to develop my scientific independence and become a team leader. As a woman, my goal is to prove to young researchers that combining a scientific career with a family is feasible, with a bit of creativity.

Bert De Rybel, Group leader, VIB-UGent Center for Plant Systems Biology

It is fair to say that VIB has played a major role in my scientific career. Although I lived abroad for five years during my post-doc, I started at VIB in 2004 as an MSc and later PhD student. The opportunity to start my own research group at VIB in 2017 therefore felt very much like returning to my roots. Offering world-class research, excellent support facilities, training courses and technology transfer possibilities, VIB is without any doubt a very desirable place to do research.



Bert De Rybel

I feel proud to be writing a small part of the VIB story with our research on vascular proliferation in plants.

Jeroen Cortebeeck, Lab technician, VIB-KU Leuven Center for Microbiology

I have been working for VIB for nine months and it has been quite an experience for me. The first thing I noticed is the atmosphere: a true passion for high science and an overall positive mindset. The opportunity to take interesting courses and receive proper funding enables you to learn, grow and improve not only your own qualities but also your research. I will enjoy working for VIB for many years to come.

Jeroen Cortebeeck

Rita Cacace

Rita Cacace, Postdoctoral researcher, VIB-UAntwerp Center for Molecular Neurology

Working at VIB means being part of an outstanding and dynamic research environment. We work towards a common goal: to translate our scientific findings into applications. Many kinds of expertise are within easy reach and courses and workshops are organized to learn about the most advanced technologies in different fields, and also to improve personal skills. A lot depends on how much you, personally, are willing to embrace your 'VIB-ness' – the opportunities are just behind the corner. Since I started my experience here a few years back, I felt and still feel in a privileged position. I can carry on a career in science in a place where I can constantly improve myself and embrace novel challenges with the mission to help patients with dementia and their caregivers.

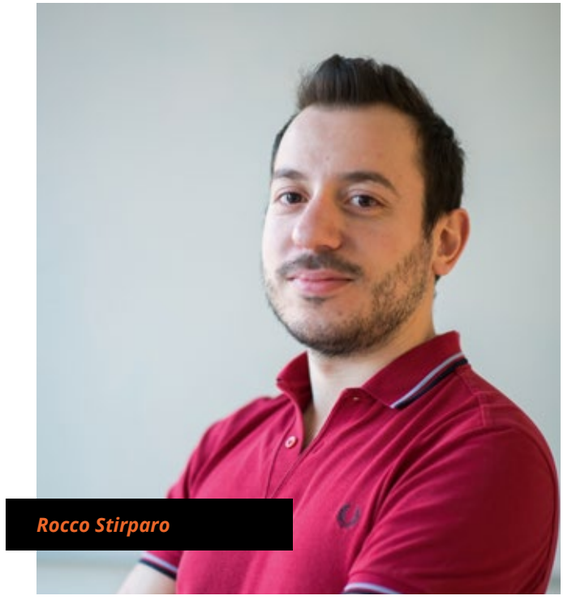
Kris Gevaert

Kris Gevaert, Group leader, VIB-UGent Center for Medical Biotechnology

I grew up with VIB, starting as a PhD student in late 1994. I vividly remember defending my own small proteomics projects to an evaluation board some years later. Actually, that direct confrontation with peers was fun at that time, although it is a little bit more stressful nowadays. The things I like most about working at VIB are the inspiring scientists you get to meet and team up with, the challenging and often cross-disciplinary research, the great support when valorizing your methods, results and ideas, and the VIB badge, which helps to open doors for new research.

Wolfgang Fecke, Expert in Discovery Biology, VIB Discovery Sciences

After working for nearly 20 years in different pharma and biotech companies in Germany, the UK and Italy, I had the chance in 2015 to join the newly-established 'VIB Discovery Sciences' labs in Leuven. My main motivation for going back to academia after all those years in industry was the chance to work directly with world-class academic scientists on basic research questions – something which is very difficult to do in the pharmaceutical industry. At the same time, I am able to continue what I was doing in pharma before, namely trying to figure out if and how we can make an innovative therapeutic which is clearly beneficial for patients out of cutting-edge research.



Rocco Stirparo

Rocco Stirparo, PhD student, VIB-KU Leuven Center for Cancer Biology

For me, working at VIB means having the possibility to make your ideas come true. The only limit is your imagination.

Wolfgang Fecke

Joke Baute

Joke Baute, Learning & Development Specialist, VIB HQ

Being able to create opportunities for my colleagues at VIB to develop their skills to the maximum is what motivates me. Nowadays, in addition to being an excellent scientist, you need to be a great people and project manager and have clear communication, presentation and many other soft skills, which are often just as important in a career. With 'Training at VIB' we offer the possibility to put together a personal training program tailored to everyone's own career path and ambitions. I'm always happy to see how much positive and constructive feedback we receive after our training events. And of course, we are always open to change and improvement!

GOOD GOVERNANCE

VIB has established a 'Good Governance Charter'. The full text of the charter is public and can be consulted on our website (vib.be).

Our principles of good governance are regularly tested and adjusted. This means that we are able to capitalize on local and international developments in this context and meet the needs of all our stakeholders.

BALANCE SHEET

(€ THOUSANDS)

ASSETS	31.12.2017	31.12.2016
Intangible fixed assets	968	1.151
Tangible fixed assets	31.699	32.970
Financial fixed assets	25.191	22.797
Contracts in progress	8.646	7.169
Amounts receivable within one year	16.587	12.963
Investments	68.625	53.422
Cash at bank and in hand	31.010	16.942
Deferred charges	14.348	12.106
TOTAL ASSETS	197.074	159.520

LIABILITIES		
Allocated funds	87.452	71.660
Investment grants	29.462	30.334
Amounts payable after one year	5.360	6.045
Amounts payable within one year	54.205	43.101
Accrued charges and deferred income	20.595	8.380
TOTAL LIABILITIES	197.074	159.520

PROFIT AND LOSS STATEMENT

(€ THOUSANDS)

	31.12.2017	31.12.2016
OPERATING INCOME	99.612	84.853
Turnover (from contract research)	25.382	23.634
Contracts in progress (+/-)	1.476	-1.516
Grants and subsidies	69.987	60.401
Other income	2.767	2.334
OPERATING EXPENSES	-94.107	-84.723
Raw materials and consumables	-9.478	-7.431
Services and other goods	-23.393	-21.124
Remuneration, social security costs and pensions	-51.425	-47.133
Depreciation	-8.866	-8.070
Other operating expenditures	-945	-965
FINANCIAL INCOME	688	1.152
FINANCIAL CHARGES	-633	-447
EXTRAORDINARY INCOME	18.557	926
EXTRAORDINARY EXPENDITURE	-8.325	-245
PROFIT/LOSS FOR THE FINANCIAL YEAR	15.792	1.516

VIB

Basic research in life sciences is VIB's raison d'être. VIB is an independent research institute where some 1,500 top scientists from Belgium and abroad conduct pioneering basic research. As such, they are pushing the boundaries of what we know about molecular mechanisms and how they rule living organisms such as human beings, animals, plants and microorganisms.

Based on a close partnership with five Flemish universities – Ghent University, KU Leuven, University of Antwerp, Vrije Universiteit Brussel and Hasselt University – and supported by a solid funding program, VIB unites the expertise of all its collaborators and research groups in a single institute.

VIB's technology transfer activities translate research results into concrete benefits for society, such as new diagnostics and therapies and agricultural innovations. These applications are often developed by young start-ups from VIB or through collaborations with other companies. This also leads to additional employment and bridges the gap between scientific research and entrepreneurship.

VIB also engages actively in the public debate on biotechnology by developing and disseminating a wide range of science-based information. More information can be found at www.vib.be

VIB

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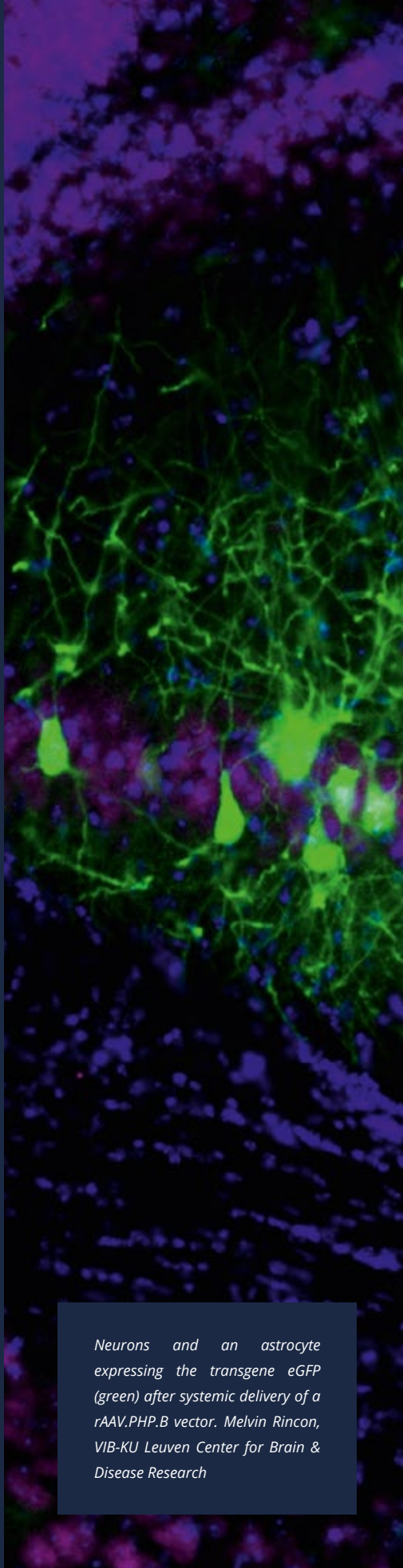

Neurons and an astrocyte expressing the transgene eGFP (green) after systemic delivery of a rAAV.PHP.B vector. Melvin Rincon, VIB-KU Leuven Center for Brain & Disease Research