



two

**OPENING NEW
HORIZONS**



Flanders
State of the Art

Annual 2018



OPENING NEW HORIZONS



Annual 2018

HANS WILLEMS

SECRETARY-GENERAL FWO

FIVE CORE STRATEGIES OF THE FWO

After 2017, which brought many sweeping changes, in 2018 the FWO continued its established course of action with new procedures, processes and regulations. We also developed a new policy plan and memorandum. It's now time for a recap.

Hans Willems, Secretary-General of the FWO, looks back with satisfaction on the work and the changes made by the administration and directors in 2018. It was an intense year during which we achieved lots of positive things. We redesigned the evaluation procedure of all our fundamental channels from A to Z. In 2019, we will monitor the changes and make adjustments where necessary."

INVESTING IN A STRONG FLEMISH KNOWLEDGE REGION

The process of drafting the new 2019-2023 policy plan was also intense. The plan describes the areas in which the FWO will focus during the next policy period, and constitutes the basis of the memorandum, which the FWO will publish in the run-up to the Flemish and Federal elections. It is a tradition for us to clarify to political parties what the FWO and fundamental scientific research stand for just before important elections. We want to contextualise why it is necessary to continue investing in fundamental and strategic basic research in Flanders. We want to use the memorandum to call on the new government to jointly invest in a strong Flemish knowledge region with us. We require support for this project: in order to open European doors, take further steps in open science and build bridges to private partners, etc. In order to achieve the Lisbon norm – to invest 3% of gross domestic product in research and development – around €400 million needs to be invested during the coming policy period. Part of this will ideally be spent on fundamental and strategic basic research. In the memorandum we explain why these funds are good investments if they are allocated to the FWO.

FIVE STRATEGIES

The memorandum is divided into five strategies that define the FWO. Through the years we have adapted our operations, but our essence has remained the same: we have been striving for excellence for 90 years. It is linked to everything we do (Strategy 1). Efficient procedures are indispensable for achieving excellence. We must minimise the administrative overhead for our applicants (Strategy 2). Moreover, international collaboration is becoming increasingly important; we want to strengthen and boost these ties even more (Strategy 3). We carry out our mission with an open mind. The FWO wants to stand in the world and have a broad view of society. We support open science (Strategy 4) and we advise and support researchers in building bridges to society (Strategy 5). For example, we recommend that researchers engage in the debate with other research-

ers, as well as in the media and with industrial partners. That idea forms the basis of this yearbook. Leading researchers engaged in dialogue with experts in and outside the academic world. We are convinced that what we do is not only important for scientific research, but also for society at large."

GETTING STARTED ON THE OBJECTIVES

The memorandum was presented to all democratic factions before the elections of May 2019. In doing so the FWO hopes the different elements in the memorandum were included in the election programme. The reactions were positive. Nobody doubted the importance of fundamental and strategic basic research. Everyone agreed that it is important to invest in Flanders as a knowledge region. People were generally happy with the FWO's operations. Obviously, the various politicians place the emphasis on different aspects. Now we have to wait until the new Committee on Scientific Policy is convened in the Flemish Parliament, so we can issue an invitation to the members. Meanwhile, we are not resting on our laurels. Each of the strategic objectives in the memorandum is linked to our policy plan. We are currently still developing it. In 2019, we are already planning two colloquia that fall under the title 'Bridge Builders': one on interdisciplinarity and one on science communication."

Five strategies

- ✓ Creating a climate for excellent quality and major breakthroughs
- ✓ Developing clear and efficient procedures
- ✓ Seizing opportunities in Europe and the world
- ✓ Encouraging open science
- ✓ Building bridges in society

6 Willy Verstraete
& Christine Van Broeckhoven

14 Herman Van Goethem
& Veronique Van Speybroeck

27 Danielle Raspoet
& Bart Vermang

30 Jan Steyaert
& Johan Hanssens

38 Hans Maertens
& Sylvia Wenmackers



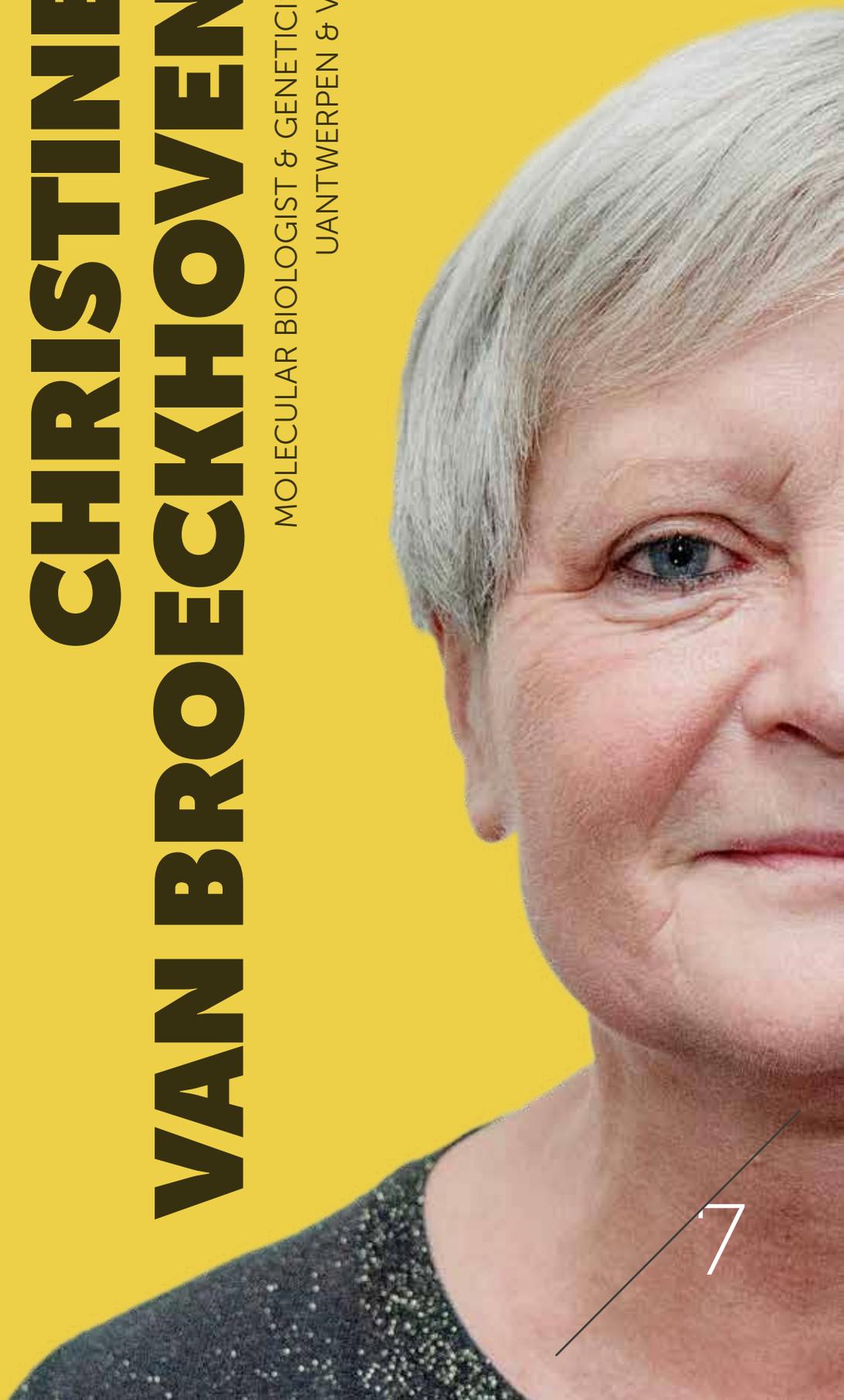
6

WILLY VERSTRAETE

FWO CHAIR

CHRISTINE VAN BROECKHOVEN

MOLECULAR BIOLOGIST & GENETICIST
UANTWERPEN & VIB



7



STRATEGY 1: CREATING A CLIMATE FOR EXCELLENT QUALITY AND MAJOR BREAKTHROUGHS

“EXCELLENCE REQUIRES FIRST-CLASS TALENT, INSPIRATION AND EXTREMELY HARD WORK, AS WELL AS STIMULATING POLICY”

Pioneering, excellent, brilliant. The FWO has plenty of superlatives at the ready to describe the quality of scientific research in Flanders. But how do you produce top-class scientists? And, being almost a centenarian, how does the FWO accurately respond in an increasingly complex landscape? A discussion with microbial biotechnologist and FWO chair Willy Verstraete and molecular biologist and geneticist Christine Van Broeckhoven, global authority in the field of research on dementia.

How do we make Flanders an excellent knowledge region?

Verstraete: “Excellence implies leadership. Someone that is excellent is a person to whom others apply a connotation: *according to*. An expert sets out the lines. To label Flemish science as excellent, researchers in Flanders must be given the opportunity to focus on their field with optimal inspiration over a long period

of time. The FWO jointly invests in this kind of framework with Flemish knowledge institutes.”

Van Broeckhoven: “The approach is simple: if you want to be one of the best, you must be bold enough to make choices. You must possess the knowledge, the resilience and the courage to continuously look ahead 5 to 10 years. In my

view the question of whether or not Flemish science policy is rated excellent depends on the mentality and the results of our researchers. If you want to be excellent you have to continuously focus on your field and your ideas. Unfortunately, however, excellence has become a dirty word. Excellence as a target has become considerably more difficult to achieve because each student or researcher at a university is stimulated to the same extent, based on a principle of equality. This is because excellence involves people that want to make a difference and thus, to a certain extent, who form an elite."

The FWO is keen to create a climate in which the best can excel. How do you approach something like that?

Van Broeckhoven: "Excellence is a wave movement: researchers walk in the footsteps of those who came before them and continue to build on previous insights. I did the same as a young researcher by relying on the insights of the Antwerp neurologist Ludo van Bogaert. In the meantime I have developed research groups at the University of Antwerp and the VIB (Flemish Institute for Biotechnology), in which I try and pass on my insights to talented young researchers. I help the students to not only perform excellent research, but also to coach researchers that come after them. Therefore, the role of supervisors is of great importance. They teach a young researcher where he or she can make a difference and that forms the basis for becoming a successful scientist."

Verstraete: "The international context counts too, in addition to the right coaching. At the FWO we set researchers on their international journey with travel grants and funds such as

Pegasus, Marie Curie or Odysseus. By measuring ourselves against and collaborating with brilliant colleagues from abroad our scientists systematically push their boundaries and become stronger. We do our utmost to develop this international fervour. We demonstrate to young scientists that the FWO is a platform with a solid network and a high quality reputation through our possibilities in the field of international exchange, as well as our collaboration with large European research institutes and our panels of leading experts."

What else do researchers need in order to deliver top quality research? And how can the FWO help?

Verstraete: "There are countless factors involved, but in my opinion the basis remains that researchers must be able to count on the best possible framework from a foundation like the FWO. And that is only possible if the Government of Flanders continues to increase the budgets for research and innovation. Since 2019 we can add €70 million annually to the FWO's global investment budget¹. This is a springboard that not only improves quality, but also the opportunities for a successful research application. Also consider the fact that the Government of Flanders is investing an extra €280 million in research and innovation this year. This means that in total an extra budget of €500 million was allocated to R&D during this period of government. Although we are still far from the European investment norm of 3%, which is considered the lower threshold for an excellent science climate. The more funding, the better a science fund can offer fundamental research and strategic basic research equal opportunities and the greater the chance of success of the research."

10

(1) In June 2017, the FWO received €30.3 million extra in recurring funds from the Government of Flanders. In the context of the Flemish growth track for Research and Development this budget will be increased pro rata once more by €40 million in 2019.



"We have succeeded in enabling pioneering research to be performed independently, without any interference from above. The bottom-up model is the great strength of the FWO"

**WILLY
VERSTRAETE**

Are the right people benefiting from the increasing budgets? And should the distribution policy that applies to FWO funds be even more transparent?

Van Broeckhoven: "When assessing applications, the FWO works with thematic panels, which often operate too strictly in a certain box. There is a panel that examines applications for cancer research and another that covers pharmaceutical sciences. Imagine that you want to perform research into a cancer drug, well you'll find you fall between two. There is also a proliferation of panels. This must change urgently because lots of multidisciplinary, valuable studies miss out on much-needed support. Young scientists in particular are the victims of the outdated panel system."

Verstraete: "In the coming years our aim is to respond to this dissatisfaction by drastically changing the composition of the panels. We want to complete our plan by 2020. One shining example is the European Research Council² (ERC),

which deliberately works with a limited number of panels and takes a multidisciplinary approach when compiling them. Moreover, we want to eliminate any possible conflicts of interest and any form of 'it all boils down to who you know' as well as any perception of this. From now on you can no longer sit on a panel to which you have personally submitted an application, or to which one of the pre- or post-doctoral researchers you are supervising, submits his or her candidacy. Each of the new panels will get an international chair, supported by an expert from the FWO, who will monitor and advise several panels objectively."

Van Broeckhoven: "Shouldn't the FWO go even further? Since 2019, the FWO differentiates between applications from junior and senior researchers, which means the funds are distrib-

11

(2) The European Research Council (ERC) awards grants to excellent researchers and thus encourages groundbreaking research in Europe.

uted much more equally and talented young researchers have more opportunities. It is fantastic that researchers at the beginning of their career can now compete with their peers, rather than having to contend with academic heavyweights. In fact, age and reputation shouldn't be allowed to play a role. Why don't we use an anonymous submission system, in which the content alone is key? The ERC has understood that: in its review it places the emphasis on the substantive strength of a case and the chance of a potential breakthrough."

In their applications researchers should point to the social importance of their research. Was this a necessary addition?

Van Broeckhoven: "It firmly embeds the researcher in society, which has been a must for a long time. You are performing research with grants, so it is obvious that you can prove its added value, isn't it?"

"I do think that a supplement to the FWO's bottom-up system is needed, in which research is provided by the actual researchers. With a view to social importance some top-down funding would not be a bad thing. I am thinking of major problems such as behavioural or brain diseases, on which the FWO should encourage specific solution-oriented research. This dimension is lacking. The European Commission actually does this via the FET Flagship projects³ involving the human brain, graphene⁴ or quantum technology. It takes place in our neighbouring countries too."



"Excellence is a wave movement: researchers walk in the footsteps of those who came before them and continue to build on previous insights. The role of supervisors is of great importance in that process"

**CHRISTINE
VAN BROECKHOVEN**

12

Verstraete: "We definitely want to encourage the social relevance of research. Within the FWO it is not currently possible to conduct strategic basic research on a topic with 'social' finality with a PhD grant. By making these types of studies more explicitly available to strategic basic research applicants⁵ we hope to offer these developments more conscious support."

"It is good to examine the FWO's role and position in recent decades. Over the past 90 years, we have succeeded in enabling pioneering research to be performed independently, without any interference from above. The bottom-up model is the great strength of the FWO, we cannot touch that. When it comes to important research themes the Flemish Government has established strategic research centres (SOCs) such as the VIB, to supplement the FWO. The need for social linkage is thus felt and satisfied on several levels."

Van Broeckhoven: "If I look at my field, I see a great many opportunities for responding to evolving social needs. We should approach all behavioural disorders in this way. Take, for example, autism and psychoses, as well as all kinds of solutions for elderly care needs. We should take a much more practical approach in these domains. We live in a society in which everyone is living longer, thanks to science, which has the disadvantage that psychological disorders are becoming increasingly common among people aged over 65. Science has to find solutions for these too."

Does the social aspect also play a role when evaluating a study?

Verstraete: "We are convinced that this is the only way. Therefore, we are examining whether we could rely more on the English reference framework, which takes a broader view than just a researcher's citation index of publications. The aim is to introduce a second 'axis' around social service provision focusing on communication. This is a strong belief in the United Kingdom, as well as in the United States, where researchers are not only judged on their publications in scientific journals, but also on their communication skills. This does not at all mean we want to force researchers to communicate about their research in an accessible manner. But it could be a useful addition."

Van Broeckhoven: "It is much easier to engage in a debate with your colleagues or at a symposium than explaining your insights to an audience that is far removed from your research. I speak from years of experience: people may be genuinely interested in highly complex themes, if you can find the right tone. If you succeed, it can certainly help to strengthen the ties between science and the citizen."

(3) FET Flagships are European research initiatives that tackle scientific and technological challenges. They run for 10 years and are funded by Horizon 2020, Europe's highest investment programme for research and innovation.
(4) Graphene is a two-dimensional plane based on carbon atoms. It is considered to be a material for the future in nanoscience.
(5) Research that could (in the long term) result in innovative applications (products, processes, services) with added economic value. The FWO differentiates between fundamental research and strategic basic research.

13



HERMAN VAN GOETHEM

RECTOR UANTWERPEN
& VLIR CHAIRMAN

14

VERONIQUE VAN SPEYBROECK

HEAD CENTER FOR MOLECULAR
MODELING UGENT



15

THEME 2: DEVELOPING CLEAR AND EFFICIENT PROCEDURES

“A RESEARCHER NEEDS TO BE NURTURED AND ALLOWED ROOM TO GROW”

Serving as a lifeline for research funding, the FWO funds and mandates are vital for the Flemish scientific community. Clear and efficient procedures make or break the success of the FWO. How do Herman Van Goethem and Veronique Van Speybroeck, respectively VLIR chairman and researcher, view the position of researchers?

On one side of the table we have a great thinker who has acquired years of experience. Opposite him a passionate, spirited, civil engineer. Herman Van Goethem is rector of the University of Antwerp and chairman of the VLIR⁽¹⁾, Veronique Van Speybroeck heads Ghent University's Centre for Molecular Modelling. Two pure bred academics that consider one conviction to be extremely important: fundamental research deserves more respect and more funding.

"In recent years I have collaborated on a petition and an open letter to the Flemish Government from various Flemish universities. The message was clear: fundamental research needs more resources. We have raised the alarm several times because success rates were exceptionally low, around 15%. The Flemish Government is allocating an additional €70 million to the FWO this year in response to these concerns. Hopefully

(1) The Flemish Interuniversity Council, the consultative body of Flemish universities.

fundamental research will receive a generous piece of the cake,” exclaims Van Speybroeck.

“Our society benefits from fundamental ‘blue sky’ research, the outcome of which is not established at the outset. We need to abandon the focus on usefulness, in which anything that does not provide an immediate return or use, is pushed aside. All our knowledge and ability rests on fundamental insights,” adds Van Goethem. Both the rector and the professor are of the opinion that the Flemish Government’s wave of investment is a symbolic affair. “Since 1990, the number of students attending Flemish universities has doubled. However, funding has not increased accordingly. This also has consequences for research. It was time for it to catch up.”

The FWO also advocates a further increase in funding. One of the irons in the fire: to create optimal circumstances for research. What aspects could be improved?

Van Speybroeck: “Although we have come a long way, and a lot has changed for the better in recent years, in terms of administration and ICT things could and must be improved. I am talking about the extremely diverse application procedures, the request to repeatedly submit new CVs and portfolios, etc. We lose a great deal of time as a result. Even to the extent that departments have to supply staff on deadline days to help researchers submit their files. There is a great need for standardisation with regard to applications for research budgets. Ideally to achieve this there would be extensive collaboration between the different universities and funding bodies.”

Van Goethem: “Of course, ad hoc submissions would be much easier for researchers, without all the documents needing to be in a standard format. Standardised administration would facilitate processing of the applications on the FWO side and may also be cheaper. This trend is inevitable. Nevertheless, we still need to ask ourselves whether we are going too far in terms of standardisation. Applicants currently invest a great deal of time in design and procedure, and often get bogged down in administrative confusion or ICT issues.”

The FWO places the welfare of researchers at the forefront. Is the psychological context becoming increasingly important?

Van Goethem: “The number of researchers in Flanders has risen dramatically in recent years. However, the psychosocial issue is increasing proportionally: burn-out, absence due to illness, depression, stress at work. A research mandate is an immense privilege, an unrestricted setting within which you can independently develop intellectually. Students at our universities are seduced by the benefits of a job as a researcher. It’s just that opting for research also involves a certain form of loneliness. Building a career as a researcher is back-breaking. Publishing is the motto, but the energy and mental stress it requires can suck the life out of you after a while. If you are the kind of person that finds this type of pressure difficult to cope with, you’d better not choose research. If you can cope with it, then the benefits are endless.”

Van Speybroeck: “I always try and impress these extraordinary benefits on young researchers. The academic freedom of thought, autonomy, which you will not get from any other employer. There’s nowhere else you can develop your own vision and skill to



“My advice to the academic community as a whole: make an effort to give positive feedback. Try and provide people with an insight into what could be improved in a positive manner”

**HERMAN
VAN GOETHEM**



this extent. Research is an occupation that is extremely demanding, but also provides great satisfaction. In order to positively maintain this balance, it is important to offer researchers the right environment.”

What are the decisive factors for the ideal research context?

Van Speybroeck: “Researchers need an environment in which they can do their own thing. Many of them start out with an open mind. We must stimulate this curiosity for as long as possible. This can only be done if you can perform research undisturbed. And are given the space to try, fail and learn.”

“With the current way of working it is difficult to afford fundamental research sufficient opportunities. FWO grants are distributed as widely as possible,

which results in fundamental researchers sometimes lacking the time and resources to achieve a breakthrough. Why doesn’t the FWO reserve larger funds following the example of the ERC grants², which offer a researcher the comfort to focus on a study for five years with a large grant? This could offer interdisciplinary research added value too. After all, it requires time for experts from different disciplines to successfully work together. In the Netherlands these kinds of projects sometimes run for 10 years, this notion is still alien to us here.”

Van Goethem: “In this debate we are sometimes a little envious of American universities, like Harvard, where researchers are able to do their thing unhindered for years. However, they operate much more with private funding there. In Europe we have a model

(2) The European Research Council (ERC) awards grants to excellent researchers and thus encourages ground-breaking research in Europe.

steered by the government and so a lot of money is spent on procedures. There will only be a margin for such mega-grants if Flemish funding for research and development increases further."

The right funding provides a long-term framework, but a researcher also needs daily guidance. What is the supervisor's role?

Van Goethem: "The interaction with a supervisor is the most important dynamic for a young researcher. This is why I believe universities should speed up efforts related to training supervisors. It's a question of good HR policy. In the past it was non-existent, nowadays coaching researchers and supervisors is making ever greater progress. How do you support research? We have to actively assist new teachers with the challenge."

Van Speybroeck: "A good research group considers supervision to be extremely important. I note that we are attaching increasing importance to a researcher's independence, which is greatly influenced by prestigious European research funds, but I think this pendulum regularly swings back. It is not bad at all for a young researcher to be nurtured. An academic needs continuous mentoring - not only as a PhD student, but also later on as a postdoctoral student and even a professor. A sympathetic ear and a sounding board can work wonders. We should continue to foster the warmth and teamwork a research group provides."

Van Goethem: "The informal research culture is just as important as the procedures. It is something I have always strived to invest in, and I can recommend it to any supervisor. It can be useful to regularly sit down with your researchers and have them comment on each other's papers. It is a challenge to engage in a discussion that is substantiated and respectful. Learning to

cope with each other's strengths and weaknesses makes them better people and better researchers."

Is the importance of giving and receiving feedback underestimated at times?

Van Goethem: "My advice to the academic community as a whole: make an effort to give positive feedback. Try and provide people with an insight into what could be improved in a positive manner. Beware: you have to mention the weaknesses, but you can also do so without a flashing red light. Five out of six FWO applications are rejected. It is obvious to me that one should communicate about this in a constructive manner."

"Evaluations are the most painful moments in an academic career, whether it concerns a research application or a potential promotion to professor. This is because someone is always disappointed. And it has to be done without breaking them. Just as researchers assess each other's study in a peer review, we have to work on peer assistance, in which scientists coach each other and research managers, such as a dean or department head, approach an evaluation as an opportunity to learn."

Finally: in recent years, the FWO has implemented a lot of changes. Are they improving working conditions for researchers?

Van Speybroeck: "It's rather too soon to answer that question. At the moment, for large numbers of scientists it's still more a matter of adjusting. We first have to experience the changes to be able to gauge whether or not they

are positive. The fact that the FWO is making an effort to communicate about the situation does help. I hope that the FWO will quickly make amendments together with researchers if it proves that some work still needs to be done."

"There are certainly still focal points for the future. For example, the panels that assess applications could take a more streamlined approach. This is because panels often have so many files to handle, in addition to their composition. It means that interdisciplinary research often falls by the wayside since the panels only have domain-specific experts around the table. The lead time is also very lengthy. There are postdocs that submit an application for funding in December and only hear at the end of June whether or not they are entitled to a grant as of October. This often happens to 30-year-olds just embarking on their career; the application procedure is unnecessarily long and gruelling for them. Perhaps one solution could be to work with shorter abstracts. The panel could carry out a faster screening based on a concise 'statement of intent'. In a subsequent step the applicant could still be interviewed, but it would enable us to provide clarity sooner."



"Researchers need an environment in which they can do their own thing, and are given the space to try, fail and learn"

**VERONIQUE
VAN SPEYBROECK**



DANIELLE RASPOET

DIRECTOR ADVISORY
COUNCIL VARIO



BART VERMANG

INDUSTRIAL ENGINEER
UHASSELT & IMEC



**STRATEGY 3: SEIZING OPPORTUNITIES
IN EUROPE AND THE WORLD**

“INTERNATIONAL- ISATION BEGINS AND ENDS AT HOME”

Sending out researchers, attracting the best foreign talent and cross-border collaboration. The context in which the FWO operates has never been as international. Meanwhile, the academic landscape is constantly expanding worldwide. How does Flemish research position itself on this playing field? Danielle Raspoet, director of the advisory council VARIO, and professor Bart Vermang from Hasselt University/Imec, take stock.

During a conference in December 2017, VARIO, the Flemish Advisory Council for Innovation and Enterprise left us in no doubt whatsoever: Flanders has the potential to be one of the five most innovative knowledge regions in Europe. On the condition, explains director Danielle Raspoet, that Flemish knowledge institutes become more international. Internationalisation is thus a common theme in VARIO’s recommendations for Flemish policy, as Raspoet makes clear: “Building a

knowledge region begins by attracting and anchoring the best international talent. If we want to be excellent, our researchers must be able to work with the best experts worldwide. At the same time, we have to send our PhD students, post-doctoral researchers and professors to the best institutes. This interaction operates like a springboard for making Flanders more appealing for research and investment.”

One of these 'missionaries' is the young professor Bart Vermang, an expert in energy technology, who works at Hasselt University as well as Imec. At Imec, where he completed his PhD, Vermang rapidly built up an international career. Following PhD research at Imec, a Marie Skłodowska-Curie project in Sweden and a postdoc scholarship from the FWO at home, in 2016, he was awarded a prestigious ERC grant¹ and was able to start work as a professor at Hasselt University. His job is very international. "Each of the projects I work on has at least one European dimension. In Hasselt we develop different projects within Horizon 2020. The programme operates in a European context, but recently began encouraging researchers to also collaborate with partners outside Europe. For example, we recently enlisted the help of Australian and American scientists."

What do we gain from pursuing an international course in Flanders?

Vermang: "Immersing yourself in a different language and culture offers you a different perspective of the world. I think that's a must for any researcher. This added value really stands out for me in my research team, which is becoming increasingly diverse: there are researchers from Iran, Turkey, India, Portugal and Hungary. Flemish universities and colleges of higher education must encourage students, PhD students and postdocs as much as possible to work or collaborate internationally. Submitting international research proposals for a Horizon 2020 project, an ERA-NET collaboration² or an ERC grant in itself is worth the experience. Even if you don't get the funds. You

compete with your idea alongside the best in European research. That alone makes the process valuable for the development of young researchers."

"But there is a downside too. It's a good idea to attract first-class talent from abroad. However, it is often difficult for them to integrate. Unfortunately we mainly speak Dutch at Flemish universities. This makes it tricky to involve foreign researchers in teaching or other tasks at the university. And this puts more pressure on Flemish professors to assume those activities. Their research does provide added value, but apart from that the foreign experts do not contribute to the Flemish institute at which they perform their research. I think that Anglicisation of the range of study programmes would considerably improve their integration."

Raspoet: "VARIO also urges relaxation of the linguistic regulations, which still adhere too strictly to Dutch. We can't continue to expect international experts to learn Dutch specially for us, can we? It means we are making ourselves irrelevant."

"With the view of a return on the resources we invest in them, VARIO advocates keeping first-rate foreign researchers here for a while, at a university, or allowing them to move into our businesses and society more easily. To this end, Flemish Minister for Innovation, Philippe Muyters, is currently examining the possibility of creating a 'search year'. Foreign researchers could spend this period exploring the labour market. Moreover, there is a far greater need for exchange with the business community and internships, to at least bind them to us for a while."



"The internationalisation of education and research is a shared agenda. Because ministers do not often look beyond their particular field of competence, we are advocating for a liaison officer to help"

DANIELLE RASPOET

Does internationalisation mean that Flemish researchers have fewer opportunities here?

Vermang: "Flemish students are less eager to begin a PhD than their foreign counterparts that settle here. It is a challenge that takes years and the economy is now particularly buoyant, which means the salary is not markedly higher than in the private sector. It all depends on the field. Should we regret this? Yes and no. A knowledge region needs researchers that are passionately committed to their field, whether they are Flemish or foreigners."

Raspoet: "Over the past 15 years, FWO funds have increased significantly and the number of postdocs is on the rise.

Nevertheless, at a certain point we will reach a limit. The increase in recent years is mainly attributable to the increase in foreign postdocs. At the same time we note that the foreign postdocs hardly ever move on to a professorship or the regular labour market. That's something we need to work on. Although some improvement can be observed: the latest professorships awarded are very international with foreign experts making up 33% of the total."

Vermang: "The fact that since a couple of years foreign professors make up over half of the expert panels that assess FWO applications acts as a counterweight against the 'protectionism' of some Flemish panel experts."

(1) The Marie Skłodowska-Curie programme originates from the European Commission, which promotes interdisciplinary and multilateral research in Europe through individual and joint grants.
(2) The European Research Council (ERC) awards grants to excellent researchers and thus encourages ground-breaking research in Europe.
(3) ERA-NET (European Research Area Networks) promotes the collaboration of researchers from different countries in and outside of Europe.

How can we be more successful at attracting and sending out excellent researchers?

Raspoet: "The internationalisation of education and research is an agenda in which the competences of both Flemish and federal ministers come together: employment, admissions policy, education, foreign policy etc. Because ministers do not often look beyond their particular field of competence, we are advocating for a liaison officer. This liaison officer, in association with knowledge institutes, could help the different competent authorities and businesses draft a comprehensive policy."

"In Flanders we already succeed in attracting many PhD students and post-docs, respectively 30% and over 40% of all researchers. But barely 8% of students and 10% of professors come from elsewhere - although for the most recent professors appointed, the figure is 33%. In order to maintain and improve these figures where possible, we hope for an improved welcome policy. There is still the issue of scientists finding it difficult to bring their family with them while they work on a project in Flanders, due to problems involving visas and work permits."

"By using our branding more effectively we can enhance our appeal and improve our resonance internationally. Look at what the Netherlands is accomplishing with Brainport Eindhoven, which is successfully promoting itself as an innovative knowledge region. In Leuven, Mindgate provides an outstanding example, but we have to im-

prove our marketing activities for our knowledge institutes, strategic research centres and leading clusters as a whole. "Internationalisation begins at home."

Vermang: "In recent years, the FWO has made efforts to pick up promising researchers that just missed out on a European grant. The calls for Marie Skłodowska-Curie³ or ERC include a large 'grey zone' that scores well, but is not successful. By taking them on board we can enable even more Flemish scientists in Europe to spread their wings. For example, the European Commission awards a Seal of Excellence, a quality label for project proposals that are not retained by Horizon 2020. However, additional budget is required for these umbrella grants, to effectively provide such a label with financial support. Larger universities have already developed a number of channels for this purpose. The FWO can and must operate in a complementary fashion with regard to the international landscape."

What accents should the FWO establish or broaden?

Raspoet: "We support a balance: between junior and senior, domestic and foreign talent. And critical evaluation and adjustments. The researchers' mobility and drive to work internationally carries insufficient weight in the review procedure. Anyone studying on an Erasmus programme, or completing a PhD or research project abroad, should have an advantage. It's something we have to encourage as early as possible. This is because it's precisely the direction in which the research landscape is evolving."

Vermang: "I agree with that. Internationalisation must be encouraged much earlier in the process. If you only start stimulating it when a researcher starts a professorship, it is in fact too late."

Raspoet: "Moreover, by reserving a fixed share of FWO funds for international collaboration, with a target and a ceiling, instead of separate budgets for national and international programmes, we believe it would be easier to connect excellent researchers to the right funds and encourage them to work internationally."

Vermang: "If there's one project that is never finished, it is promoting international research and mobility. That is the most powerful way of changing the Flemish mentality. The number of Flemish students that opt for Erasmus is extremely low compared with other European countries.⁴ At the same time there are many young researchers that would prefer to spend their entire career at the same university. This attitude must be gradually phased out."

"Mind you, I don't want to restrict internationalisation to mobility beyond our borders: we are also removing the blinkers through the EOS programme, which promotes collaboration between Flemish and Walloon researchers. And international collaboration is also important. The point is, we don't do very well in Flanders in that regard. What's more, with open science we introduce the world to Flanders, and vice versa. International mobility is crucial for keeping our bar high as a knowledge region. This must be the ultimate goal in the coming years."



"A knowledge region needs researchers that are passionately committed to their field, whether they are Flemish or foreigners"

BART VERMANG

(4) During the 2017-2018 academic year, 5 789 Flemish students went abroad for part of their studies. VLARIO aims to triple this number by 2023.



JAN

STEYAERT

STRUCTURAL BIOLOGIST
VUB & VIB

30



**JOHANN
HANSENS**

SECRETARY-GENERAL
DEPARTMENT OF ECONOMY,
SCIENCE AND INNOVATION

31



THEME 4: ENCOURAGING OPEN SCIENCE

“THE WIDER YOU SHARE KNOWLEDGE, THE GREATER IT BECOMES”

Freely-available data, open access to databases, transparency for research results. For many scientists these all make perfect sense, and yet they are still not always structurally embedded. Therefore, it is logical that the FWO is making open science a focal point. Jan Steyaert, structural biologist at the VUB and the VIB, and Johan Hanssens, Secretary-General of the Department of Economy, Science and Innovation, share their insights.

Many elements contribute to greater openness in the science community: open methodology, open access, open data, open learning and open education, etc. But are we still a long way from ‘open’ science?

Steyaert: “We are on the right track. I don’t think a single scientist still needs to be convinced of the benefits. Everyone is a fan in advance. On the one hand because we gain by making our research more transpar-

ent, on the other because we owe it to society to demonstrate the results of public investment in science.”

“In structural biology we are already very far in terms of open science. For example, we use the Protein Database for Structural Biology as a touchstone. In our discipline we cannot publish any developments without first submitting our results to this database. There is a similar database for genome research

too. Open science is a fantastic principle, from which we can all benefit if it is also applied worldwide. If we work at different speeds, it creates unfair competition. And researchers cannot solve that problem alone.”

Hanssens: “Scientists are actually great supporters of the principle, but there are many obstacles between the dream and the deed. In Europe, barely a quarter of all publications are openly accessible; this figure is considerably lower worldwide. From the policy perspective in Flanders, backed by Europe, we are pushing to speed up the evolution towards open science. In the first place because knowledge will only increase if you make your insights widely accessible. Apart from that, open science also offers economic added value. Think about it like a positive spiral. It helps scientists validate their results and companies to become more innovative. It increases citizens’ trust in science. And that invites politicians to continue to invest in science.”

What are the main stumbling blocks for open science?

Steyaert: “The greatest conflict lurks in open access, free access to publications and articles. From an intellectual perspective this is a must, but it does clash with the way in which the major academic journals operate. Take the examples of *Nature* and *Science*, and the Dutch scientific publisher Elsevier. A scientist strives to make an impact by publishing in ‘A’ journals. But to them your insights irrevocably vanish behind a profitable paywall. It still costs researchers a handsome sum to make an article openly accessible in a first-class journal such as *Nature* or *Science*. You

may have to pay the journal €2 000 to €3 000 extra, on top of the standard cost of publication. We are happy to pay that sum to disseminate our insights worldwide. However, with our lab at the VIB we publish a hundred or so publications a year. Calculate how much more it would cost to make them openly accessible. It’s not a problem for large institutes, but it’s different for smaller players.”

Hanssens: “We have to turn this situation around: grants for scientists should be spent on research, not be handed over to publishers.”

Steyaert: “The FWO briefly considered joining Coalition S, an international group of research funding bodies that, for example, agree to ban their researchers from publishing in journals without open access. Even if that meant first-rate journals like *Nature* and *Science*. As a result, scientists would lose the most prestigious channels for sharing their insights. Publication in these journals also increases the chance of funding for research projects. It would unintentionally create a competitive disadvantage. The debate demonstrates how difficult it is to impose open access. Therefore the key question is: how do we gradually implement the practice? When, with whom and on what scale? The European Commission, which is making open science a priority, should engage in dialogue with the monopoly firms, to establish how we could link their revenue models to open access, before imposing conditions on researchers.”

Hanssens: “Europe is attempting to get Member States on the same page using Plan S, an action plan related to open science that the European Commission proposed in 2018. Fifteen funding agencies already support the plan. The FWO does not officially support it yet, because it has reasonable questions regarding the plan’s practical



“Open data is still in the experimental phase. Us scientists are learning a lot from it. We need to take the time to establish feasible boundaries”

JAN STEYAERT

roll-out. Plan S would impose a ban on scientists publishing in journals that do not operate according to open access. However, European scientists would consequently be in a weaker position than their colleagues in China or the US, where open access is far less of an issue. The only right approach is one that is coordinated internationally, in which Europe as the driver engages in consultation with scientists, publishers and governments worldwide.”

Is the research community involved in this dialogue?

Steyaert: “Barely, in my view. The problem is tackled strictly from the top down, without us being heard. It is not straightforward for scientists to stand up together, but we do have the resources to apply pressure. Top-quality journals would not exist without

our publications and our peer reviews, which we even perform free of charge. If we were to pull together, it would have a major impact. However, that remains in the conditional.”

Hanssens: “People also realise this at the European level. It’s the reason why, for example, Plan S recently conducted a round of questions involving 500 or so respondents at European knowledge institutes. The results are currently being processed. The European Commission’s plan of action regarding Plan S will focus on the outcome.”

How do scientists view open data, in which research data is freely available under certain conditions?

Steyaert: "Open data is still in the experimental phase. Us scientists are learning a lot from it. It is a principle we must strive for. However, we need to take the time to establish feasible boundaries, so that everyone can be involved. The Protein Database for Structural Biology is a good example. Given that it is compulsory for all structural biologists to submit their data to it, after 20 years we possess a database with the plans of over 100 000 proteins, which is also openly accessible. Although the intention cannot be for the logbooks related to the research

I am performing today to be digitally available tomorrow for everyone to consult. Open data cannot be allowed to upset the balance of the system of intellectual property."

"Another problem springs to mind. The new electron microscope that we use in our research group generates four terabytes of data every day. Imagine if we had to store this mountain of data and make it accessible for 10 years? We'd face a logistical limit. Moreover, 99% of this data will never be used again, neither internally nor externally. Therefore, it's an exercise delineating how, when and where we want to apply open data."



"Scientists are actually great supporters of open science, but there are many obstacles between the dream and the deed. In Europe, barely a quarter of all publications are openly accessible. This figure is even considerably lower worldwide"

JOHAN HANSENS

36

Hanssens: "The storage infrastructure is the one basic condition for establishing open data. The other is data management. If so much data becomes available, careful management is also required. In the coming years Flanders is allocating €5 million a year to establish a balanced framework for open data. In this context we are collaborating on a European Open Science Cloud and drafting a Skills Agenda, in which, in consultation with the VLIR¹ we will identify the best way to coordinate open data management."

"As open as possible, as closed as necessary, is the balance we are aiming for. However, there are currently lots of questions that need answering: who will be the arbitrator in this matter? What is a reasonable storage period? There is a need for unambiguous agreements at the European level, so that we can create a level playing field, with clearly designated exceptions related to privacy, intellectual property rights and geopolitical considerations. Open data is the future, all the more because a lot of data-driven technology is starting to take off. Examples include artificial intelligence or machine learning. However, data is a very sensitive matter that we would do best to treat with the utmost care."

What role does the FWO play with regard to open data?

Steyaert: "The FWO plays a crucial role in this matter, because it can impose conditions on a researcher in exchange for funding. And it does so with great verve. Nowadays, each FWO application includes a binding clause, in which the applicant must write a few lines to explain his/her data management plan. It's an eye-opener for many young researchers. Today we have no comprehensive solutions to all the implications of open data, but you can already achieve a lot through shared awareness."

37

⁽¹⁾ The Flemish Interuniversity Council, the consultative body of Flemish universities.



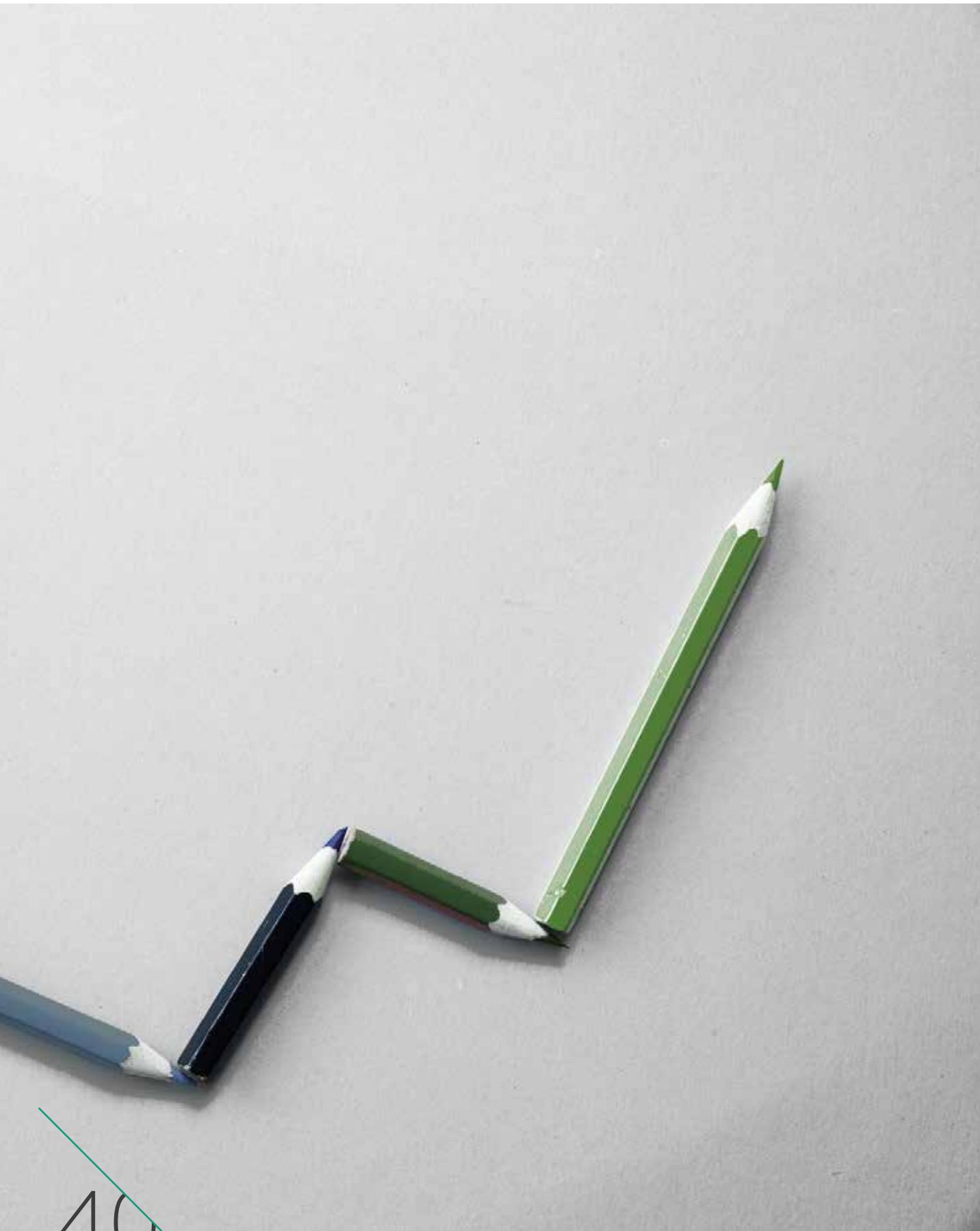
HANS MAERTENS

MANAGING DIRECTOR VOKA

SYLVIA WENMACCKERS

PHILOSOPHER OF SCIENCE KU LEUVEN
& CO-CHAIR DE JONGE ACADEMIE





THEME 5: BUILDING BRIDGES IN SOCIETY

“MUCH CAN BE GAINED BY BETTER INFORMING PHD STUDENTS AND BUSINESS LEADERS”

Giving young researchers every opportunity also means enabling talented individuals to flow seamlessly on to the labour market. A challenge that the FWO takes to heart. Does the black hole loom after completing a PhD or postdoc? And how efficiently do knowledge institutes and businesses share their insights? Plenty to talk about with Voka top man Hans Maertens and co-chair of the Jonge Academie, Sylvia Wenmackers.

It is one of the strategic recommendations that employer organisation Voka hammers home to Flemish companies: seek collaboration with universities and colleges of higher education. “It is important that we encourage them to look further than their own four walls. To work together and engage in dialogue with sectoral organisations, as well as to discover the innovative insights of the academic world,” explains managing director Hans Maertens. His organisation boasts 18 000 members, responsible for 70% of employment in Flanders.

Sylvia Wenmackers does not think it is a pressing issue yet just because both the FWO and Voka consider support between a university and the business community to be a point of concern. Wenmackers is a philosopher of science at KU Leuven and co-chair of the Jonge Academie, a group of young scientists from very diverse fields. “We prefer to take a positive stance because a lot is going on in this field.”

The FWO aims to build bridges in society, and to and from the academic world. Do you notice an increasing rapprochement between academics and business?

Maertens: "My impression is that collaboration between knowledge institutes and businesses has increased dramatically in recent years. You can tell from the many cooperation partnerships, as well as the high success rates in applied research. Moreover, Flanders possesses a fertile spin-off culture, in which scientists translate fundamental research insights into useful, innovative products and breakthrough technology. A successful spin-off is one of the finest examples of collaboration between the two sectors."

Wenmackers: "You are talking about a certain part of the academic community. Not every type of study lends itself to spin-offs or immediate application, while the knowledge gathered is crucial nevertheless. Where should researchers end up? In the business community, as well as in education, to cite just one missing link. It is striking that no model pathway exists for researchers to prepare them to work as teachers. Few people take that option currently, even though many young academics possess the competences for it."

Maertens: "In this theoretical exercise you could also replace businesses with public authorities, educational institutes, non-profit organisations and hospitals too. It is a university's mission to be as open as possible to society. It's the only way it can interact with businesses to enable knowledge workers to seamlessly flow into the corporate world. It seems obvious to me that

this interaction should take place as early as possible. Academics should already be reflecting on the added value they could offer these sectors as a person or with their research, during a PhD or postdoc project. If the link is not there, you should question the usefulness of the study concerned."

Wenmackers: "History teaches us that research may appear useless in the short term, but that it is indispensable for genuine innovation in the long term. Independent research is actually the best guarantee for future insights and applications. Take the example of the MRI scanner, now used in countless hospitals, which was only developed after 1970 and only possible because the American physicist Erwin Hahn had studied 'spin echoes' out of scientific curiosity 20 years earlier. There are hundreds of similar examples involving crucial breakthroughs. It would be dumb to force all researchers to solve real issues."

Why do academics find it so difficult to move on to other fields of employment?

Wenmackers: "It seems to me that we need time to find each other. We are in a transition phase: more and more people are performing research and this means an increasing number of people are moving on to other employment options. This is a luxury problem: the number of highly educated people is on the rise. For now there is no tradition or experienced body yet that helps them take the step to corporate life or the public sector. Support still has to grow on both sides. Companies are also insufficiently aware of the advantages a candidate with an academic profile could offer."



"Academics should already be reflecting on the added value they could offer these sectors as a person or with their research, during a PhD or postdoc project"

HANS MAERTENS



Maertens: "In the past 10 years, the number of PhDs in Flanders has doubled. This is a trend that has an impact. It's a good thing, with the view to research and development, but at the same time us researchers must help them plan the next step of their career. Only the best 10-20% are able to build an academic career, we have to help the others connect through career guidance. These are smart young people that could jointly shape Flanders' future, if we are able to assist them find a suitable workplace."

"Moreover, we need to be bold enough to hold the typical PhD pathway in Flanders up to the light. How could we ensure that young people are not alienated because they have spent

years performing research on a specific theme? We at least have to consider shorter PhDs or pathways that are more in line with the business community, such as the Flanders Innovation & Entrepreneurship agency's Baekeland mandates. And what's more: aren't too many PhD mandates being awarded at the moment? If we only want the best people to perform research shouldn't we reduce the number of researchers in Flanders again?

Wenmackers: "You are a supporter of PhDs that have a technical, applied character, but this is not always straightforward. Fundamental research and research with long-term insights are essential. Besides, these types of research can only be performed at

university. A shorter pathway would result once more in a decline because the research years not only serve to provide scientific results. You have to give young researchers the time to develop as scientists, learn how to work independently, develop and acquire expertise, take initiatives related to collaboration and so on. These human qualities suffer with a shorter track. The value offered by a PhD involves more than general knowledge and technical skills."

The FWO points out obstacles doctors encounter as soon as they exchange the academic workplace for a different environment. How could we ease the transition?



"Many students follow the same study programme, many researchers collaborate on a certain theme. This group lacks awareness of the contribution they could make in a personal or other context"

**SYLVIA
WENMACKERS**

Wenmackers: "There is a lot to be gained from improved information provision for PhD students as well as business leaders. The misconceptions are mutual, something I see during info evenings and debates: we have a cartoonish idea of one another. This creates hurdles, which we can only eliminate through consultation. The government must also provide a good example by opening up vacancies to PhD students."

Maertens: "Voka is keen to help researchers broaden their perspective. Why not by starting a business, for example? Therefore, we have launched a pilot project in a joint venture with Ghent University, called 'From PhD to SME'⁽¹⁾. Young researchers generally have very valuable skills. They are often able to think in a highly innovative manner. They are team-oriented and have a learning attitude; in fact they are designed for lifelong learning. Making them aware of the value they offer is

the task at hand. Top sportsmen and women are coached from all sides every day, but do we provide our 'top thinkers' with enough support?"

Wenmackers: "Universities must increase young researchers' awareness of their specific capacities. Many students follow the same study programme, many researchers collaborate on a certain theme. This group lacks awareness of the contribution they could make in a personal or other context: I am talking about certain skills, independent of their intellectual knowledge. You also have different roles and functions in a research team, as you do in other sectors. We want them to make this connection. Courses such as service learning are very interesting for a lot of students in this regard. It involves a company or non-profit organisation presenting a specific question to the students, who develop a specific solution. Such cases could also be interesting during a research project."

You both talk of a lack of information, among researchers and employers alike. Can science communication increase support?

Maertens: "Science communication makes a difference. If researchers communicate about the progress of their research, they unite different worlds. Personally, I think they are even obliged to do so, because we support them using public funds. I am just saying that today, universities and professors do not participate enough in the public debate."

Wenmackers: "We often reflect on this at the Jonge Academie. We agree that there are too few channels for researchers to engage in qualitative science communication. In the current media landscape people expect news to be fast and free, which closes the door on exploring scientific themes in more substantive depth. News and press releases from knowledge institutes are sometimes picked up, but we lack support for research journalists who can also view the reports from a critical angle. While there is definitely a market for it."

Maertens: "In my opinion there are lots of insights and achievements that never leave the four walls of the research lab. For me the fundamental question is: how do you transfer knowledge to those who can go on to use it? To entrepreneurs, for example, who could add an extra dimension to it. A researcher cannot say: what's next? But an entrepreneur can. We could stimulate this interaction much more through far-reaching science communication. As well as by encouraging universities to open their doors wider: by participating in business open days, STEM academies and lifelong learning, etc. Voka encourages cross-pollination through clubs, networks, info and debate evenings. Our aim is to elevate the interaction between researchers and entrepreneurs to a higher level."

(1) SME = Small to Medium-sized Enterprise.

48 The FWO supports
fundamental and strategic
research

52 What can FWO do for me?

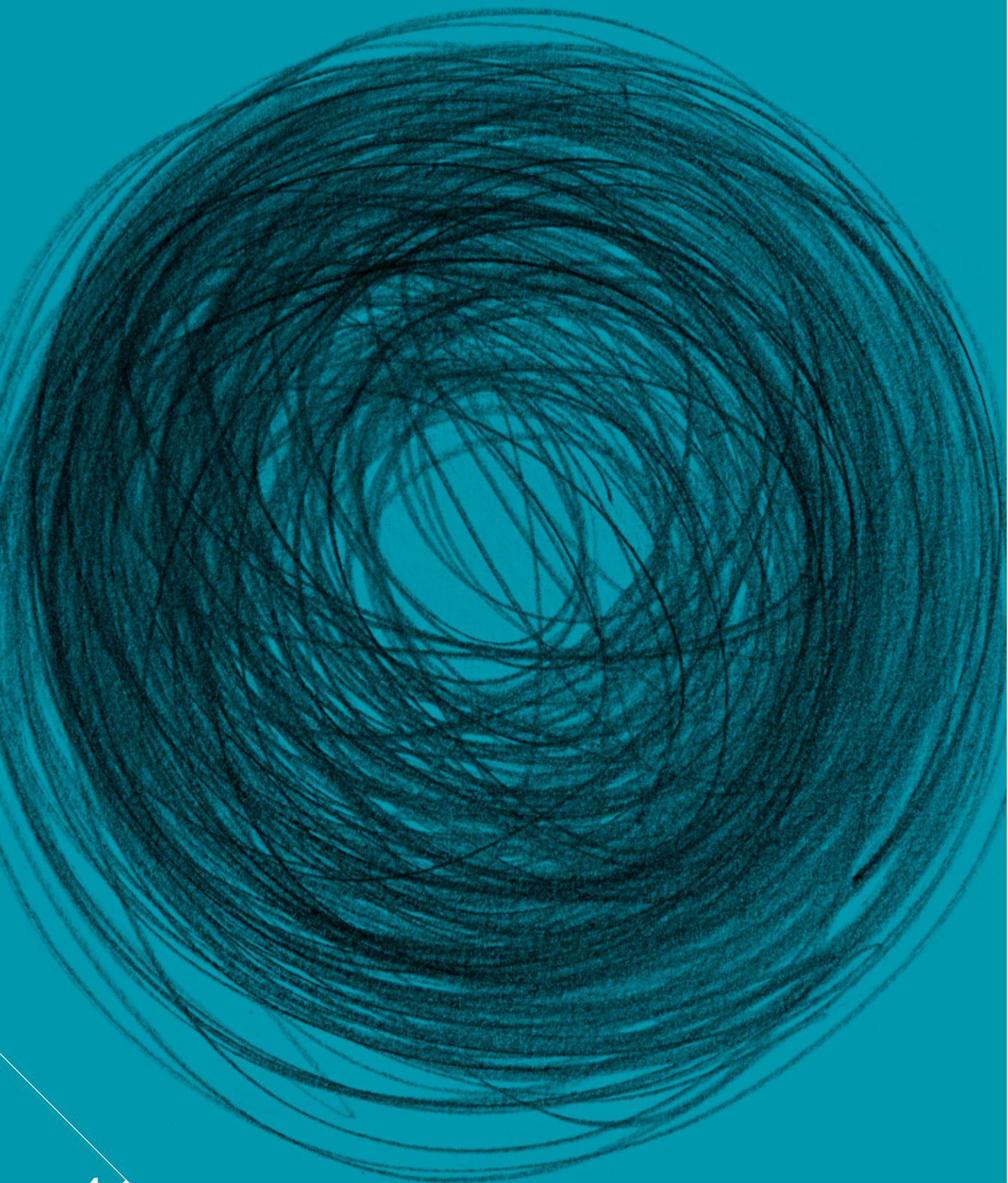
54 Scientific prizes

56 Graphs

60 Financing of the FWO

64 Organization

72 Support the FWO



THE FWO SUPPORTS FUNDAMENTAL AND STRATEGIC RESEARCH

- ／ SCIENCE OPENS NEW HORIZONS
- ／ SCIENCE CREATES OPPORTUNITIES
- ／ SCIENCE IS ESSENTIAL FOR OUR WELL-BEING
- ／ SCIENCE IS THE DRIVER OF INNOVATION
- ／ THE FWO AND EUROPE
- ／ FWO SUPPORTS THE FLEMISH SUPERCOMPUTER CENTRE (VSC)

SCIENCE OPENS NEW HORIZONS

Science pushes the boundaries of our knowledge. The Research Foundation - Flanders (FWO) is the agency that supports ground-breaking fundamental, and strategic research at the universities of the Flemish Community. The FWO also stimulates cooperation between the Flemish universities and other research institutes.

SCIENCE CREATES OPPORTUNITIES

Fundamental scientific research is focused on expanding knowledge about human beings and their environment. As the level of knowledge of our society grows, so does the quality of life in general and the quality of training in particular. Young people are thus given every opportunity to deploy their talents in a broad array of disciplines.

Research financed by FWO, especially strategic basic research, also contributes to the valorisation of scientific breakthroughs.

SCIENCE IS ESSENTIAL FOR OUR WELL-BEING

In the long term, such a high level of knowledge in combination with the resulting human capital paves the way for targeted and applied research that can also support policy. Decisions in economic or social domains can then also be influenced by the work of excellent research groups. This is not surprising, as ground-breaking research may lie at the heart of solutions to the key challenges facing our society today (environment, mobility, health, etc.).

SCIENCE IS THE DRIVER OF INNOVATION

Fundamental research seldom adds economic or social value in the short term. It is, however, essential for ensuring our welfare and well-being in the long term. That is why the FWO is dependent on government funding. A balanced distribution of resources between targeted and non-targeted research is required.

With the financing of strategic research in the broadest sense, the FWO takes an important step to valorisation.

THE FWO AND EUROPE

Non-governmental 'research councils' are a tradition in Europe. The FWO, too, is a member of the European Research Council (ERC) and involved in various European research initiatives (ERA-NET, JPI, ESFRI, etc.).

FWO SUPPORTS THE FLEMISH SUPERCOMPUTER CENTRE (VSC)

The Flemish Supercomputer Centre (VSC) is a virtual centre making supercomputer infrastructure available for both the academic and industrial world. This centre is managed by the Research Foundation - Flanders (FWO) in partnership with the five Flemish university associations.

WHAT CAN FWO DO FOR ME?

THE FWO INVESTS IN YOUNG TALENTS

- ✓ Fellowships for young researchers (PhD Fellowships in fundamental research and strategic basic research): 2 x 2 years
- ✓ Special PhD Fellowships: 1 year
- ✓ Clinical PhD Fellowships: 2 years, part-time
- ✓ EUI Fellowships: 4 years
- ✓ Postdoctoral Fellowships (junior and senior): 3 years
- ✓ Senior clinical investigators: 3 x 5 years, part-time

THE FWO SUPPORTS RESEARCH TEAMS

- ✓ Research projects in Fundamental Research: 4 years
- ✓ Research projects in Strategic Basic Research: 2-4 years
- ✓ Research projects in Applied Biomedical Research with a Primary Social finality: 2-4 years
- ✓ Excellence of Science projects: in support of joint fundamental research between researchers in the Flemish and French Communities of Belgium
- ✓ Odysseus: providing start-up funding for researchers who have built up a career outside Flanders
- ✓ Medium-scale and Large-scale research infrastructure
- ✓ International research infrastructure
- ✓ VSC: Support and financing of Flemish SuperComputing (Tier1 and Tier2)

THE FWO REWARDS EXCELLENT RESEARCH

- ✓ FWO-Excellence Prizes: five prizes of €100 000 each awarded every five years
- ✓ FWO-scientific prizes: prizes sponsored by private companies or non-profit organisations that reward both young and experienced researchers

FWO PUSHES BOUNDARIES

- ✓ Participation in conferences inside and outside Europe
- ✓ Participation in a course or workshop inside and outside Europe
- ✓ Short and long stays abroad in and outside Europe
- ✓ [PEGASUS]² Marie Skłodowska-Curie incoming and outgoing Fellowships
- ✓ Scientific research networks
- ✓ Organisation of scientific meetings
- ✓ Funds for coordination activities of international collaborative associations
- ✓ Bilateral research networks (Brazil, China, Québec, Russia, Vietnam, South Africa)
- ✓ Lead Agency Procedures (Luxemburg, Austria, Slovenia, Switzerland)
- ✓ Exchange agreements
- ✓ Scientific cooperations
- ✓ European programmes (Horizon 2020, COST, ERA-NET and JPI)

[More information and lists of beneficiaries can be found on www.fwo.be](http://www.fwo.be)

SCIENTIFIC PRIZES

Every year the FWO awards scientific prizes. Our aim is to reward excellent fundamental scientific research. However, the prizes also serve as an important indicator: they underline the social relevance of scientific research. Moreover, the contributions are sponsored by private companies or non-profit organisations. This helps create close ties between the business and research communities.

THE FOLLOWING PRIZES WERE AWARDED IN 2018:

Scientific prize Foundation AstraZeneca - Mental Disorders

€25 000

Filip Raes (KU Leuven)

Scientific prize Foundation AstraZeneca - Primary Care

€25 000

Pauline Boeckstaens (UGent)

Scientific prize Foundation AstraZeneca - Asthma

€25 000

Thomas Marichal (ULiège)

Scientific prize Foundation AstraZeneca - Oncology

€25 000

Piet Ost (UGent)

Baillet Latour Health Prize

€250 000

Laurence Zitvogel
(Univ. Paris Sud Centre Gustave
Roussy)
Guido Kroemer
(Univ. Paris Sud Centre Gustave
Roussy)

Baillet Latour Grant for Medical Research

€150 000

Pieter Van Vlierberghe (UGent)

BiR&D Multi-Disciplinary PhD Award - Science & Technology

€10 000

Lien Smeesters (VUB)

BiR&D Multi-Disciplinary PhD Award - Life Sciences

€10 000

Ranhua Xiong (UGent)

Scientific prize Gustave Boël - Sofina Fellowships

Mariska Bauwelinck (VUB)
Jonathan Goldenberg (UGent)
Federica Perrone (UAntwerpen)
Yana Van Den Herrewegen (VUB)
Jeroen Vrijssen (UHasselt)
Yulin Wang (VUB)

IBM Innovation Award

€5 000

Sujoy Sinha Roy (KU Leuven)

Scientific prize McKinsey & Company

€5 000

Nik Stoop (KU Leuven)

Umicore Materials Technology PhD Award

€10 000

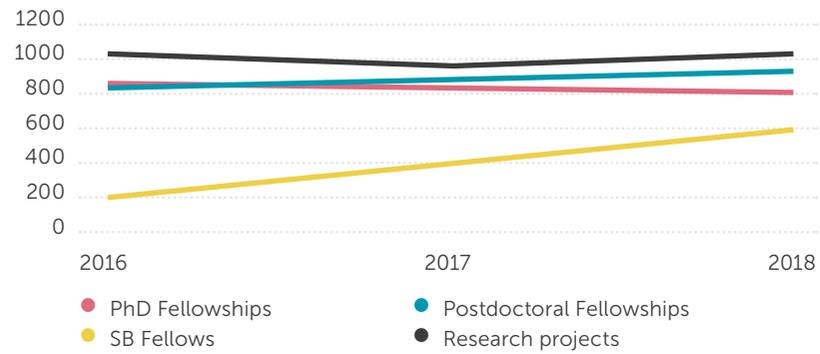
Donal Finegan (US DoE National
Renewable Energy Laboratory)



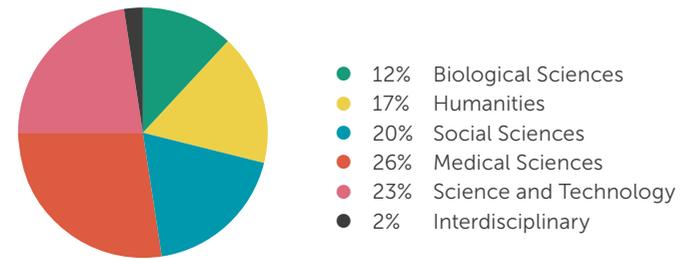
GRAPHS

- / EVOLUTION RESEARCHERS IN FUNCTION
- / EVOLUTION SUCCES RATE FELLOWSHIPS
- / EVOLUTION SUCCES RATE RESEARCH PROJECTS
- / PHD FELLOWSHIPS PER SCIENTIFIC DISCIPLINE
- / POSTDOCTORAL FELLOWSHIPS PER SCIENTIFIC DISCIPLINE
- / RESEARCH PROJECTS PER SCIENTIFIC DISCIPLINE
- / RATIO MALE:FEMALE

**EVOLUTION RESEARCHERS IN FUNCTION
(ON 31-12-2018)**



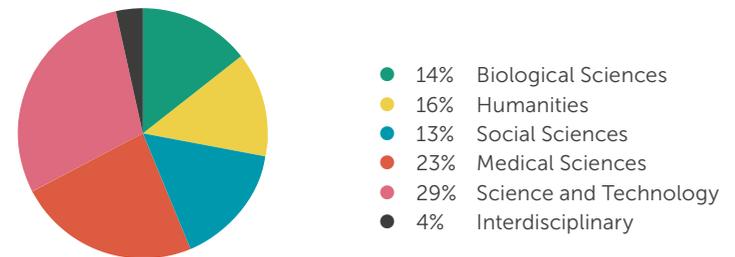
**PHD FELLOWSHIPS PER SCIENTIFIC DISCIPLINE
(ON 31-12-2018)**



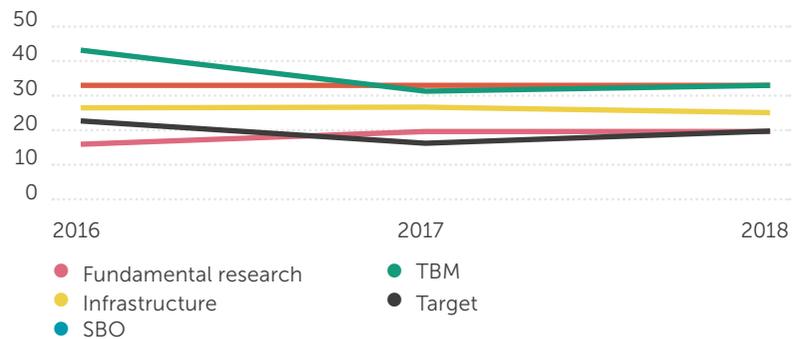
**EVOLUTION SUCCES RATE FELLOWSHIPS
(ON 31-12-2018)**



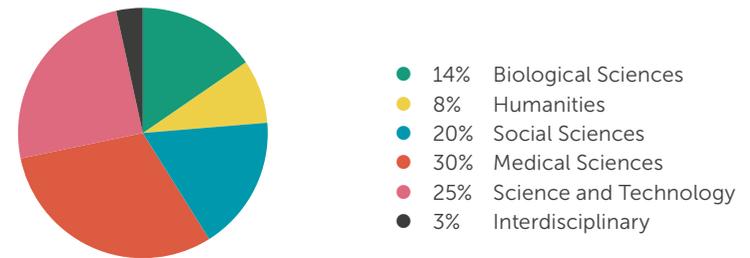
**POSTDOCTORAL FELLOWSHIPS PER SCIENTIFIC DISCIPLINE
(ON 31-12-2018)**



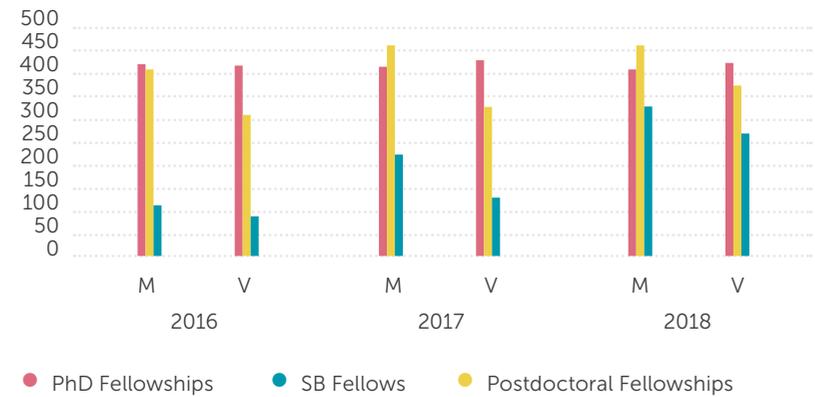
**EVOLUTION SUCCES RATE RESEARCH PROJECTS
(ON 31-12-2018)**

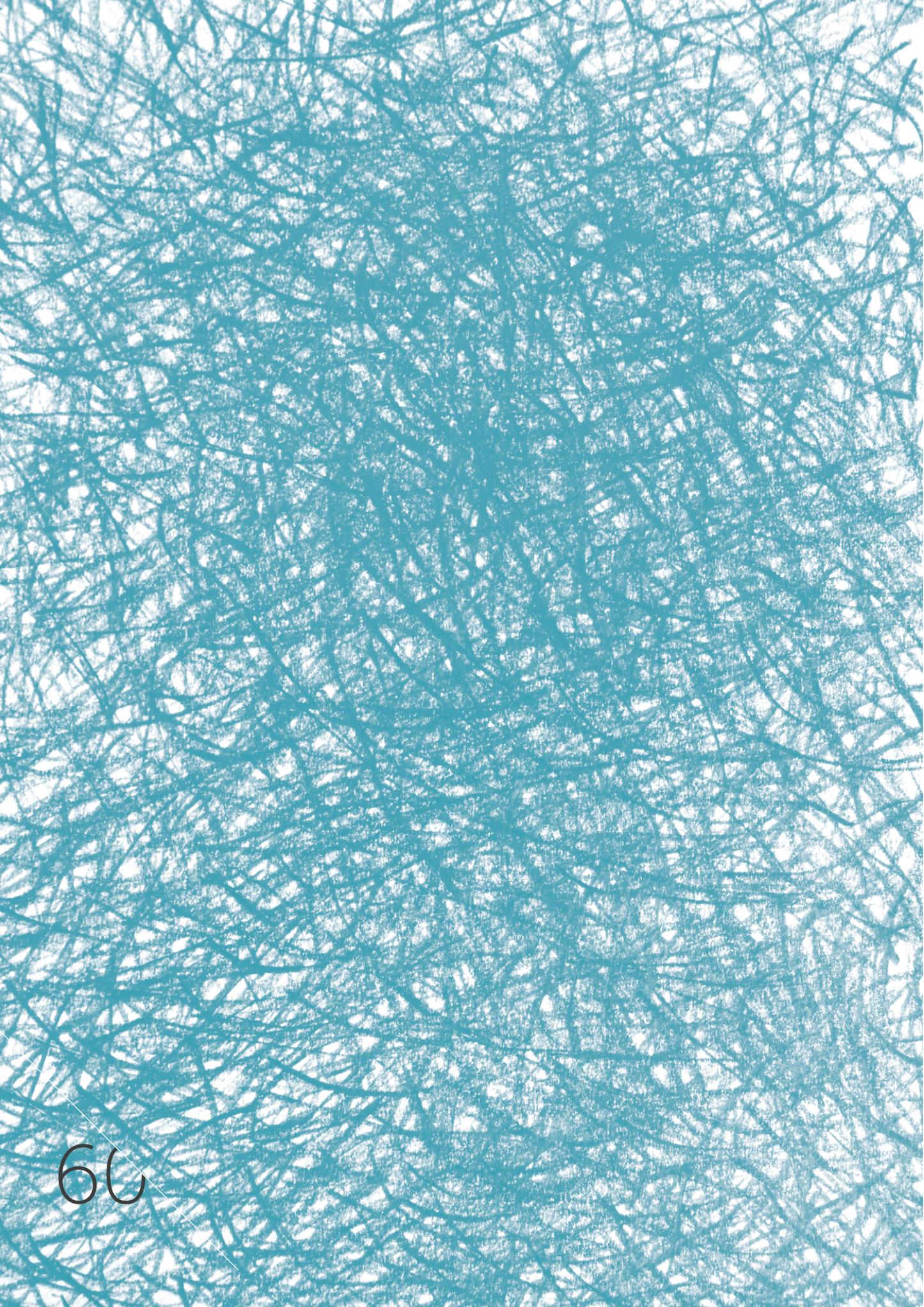


**RESEARCH PROJECTS PER SCIENTIFIC DISCIPLINE
(ON 31-12-2018)**



**RATIO MALE:FEMALE
(ON 31-12-2018)**





FINANCING OF THE FWO

EVOLUTION OF GRANTS
2016-2018

SUBSIDY DISTRIBUTION

Since 2016, the FWO possesses operational appropriations – used to finance our internal operations – and support appropriations – used to support individual and project-based researchers. The 2019 budget allocates €12.9 million for operational appropriations and €341.4 million for support appropriations. The support appropriations are comprised as follows:

Flemish Government

- ✓ Grant for fundamental research, clinical research, fundamental basic research and research infrastructure: €281.6 million
- ✓ Grant from the National Lottery: €11.5 million
- ✓ Funds through the Hermes Fund: €3.7 million

Federal Government

- ✓ Grant for additional researchers (Federal Science Policy): €0.5 million
- ✓ FGWO grant: Fund for Medical Scientific Research (Federal Public Service Health, Food Chain safety and Environment): €1.4 million
- ✓ IIKW grant: Inter-University Institute for Nuclear Science (Federal Public Service Economy, SMEs, Self-employed and Energy): €2.1 million

Fiscal and parafiscal measures

For our postdoctoral fellowships we are granted an 80% income tax exemption, which results in an estimated extra budget of €11 million. Moreover, we are exempt from employers' social security contributions for Postdoctoral Researchers, which have been added to the reference list dated 31 December 1995. That gives us an estimated extra €7.7 million to spend. FWO can also rely on the employment programme for fundamental research, the Scientific Maribel Plan, which brings in €18 million.

European Union

The (Pegasus)² Marie Skłodowska-Curie Fellowship programme wants to attract excellent postdoctoral researchers to Flanders for the advancement of Flemish research. The Fellowship gives the selected researchers optimal conditions to help them build a scientific career in Flanders. The programme also offers postdoctoral researchers in the Flemish Community the possibility to boost their research career by gaining international research experience. The subsidy for 2019 will amount to approximately €1.8 million. Moreover the European Union also provides €0.5 million of supports for some ERA projects.

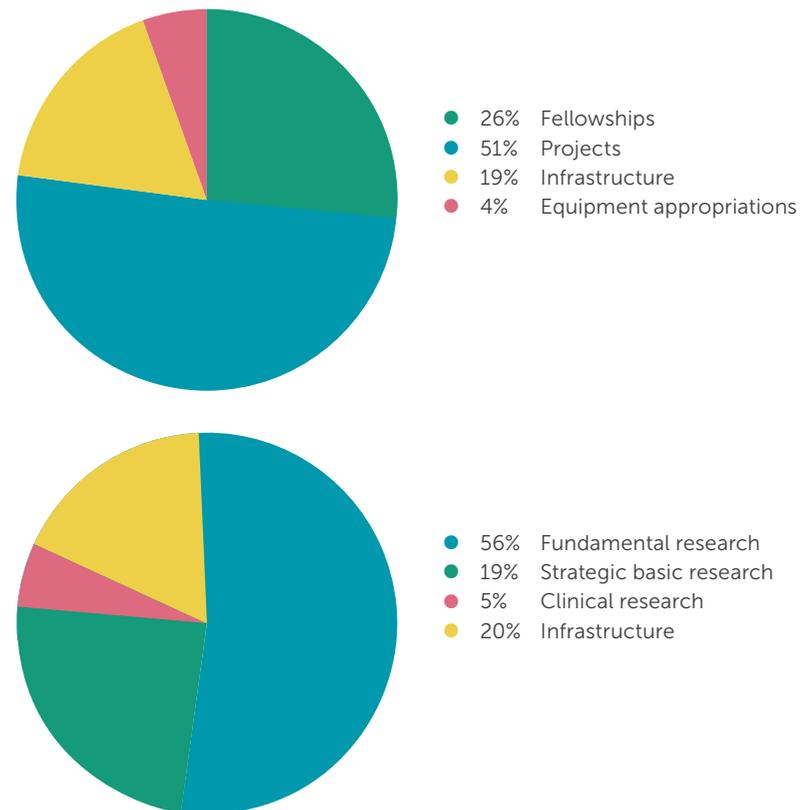
Funds are raised not only through subsidies, but also via benefactors:

- ✓ Prizes: various companies and institutions support fundamental research in their fields with their own prizes (€0.3 million)
- ✓ Donations and legacies (€0.9 million)
- ✓ Reimbursement of (2) permanent researchers by the recipient institutions (€0.4 million)

EVOLUTION OF GRANTS 2016-2018



SUBSIDY DISTRIBUTION



ORGANIZATION

BOARD OF TRUSTEES

The Board of Trustees makes decision on the recommendations of expert panels and scientific committees, as well as the activities, budget and accounts of the FWO.

The Board of Trustees is made up of the following members:

PRESIDENT

Willy Verstraete

Emeritus professor - UGent

VICE-PRESIDENT

An Van de Vel

Senior manager external research - Umicore

MEMBERS

Conny Aerts

Professor - KU Leuven

Bruno Blondé

Professor - Universiteit Antwerpen

Jo Bury

Managing director - VIB

Paul De Knop

Prorector - Vrije Universiteit Brussel

Anne De Paepe

Prorector - Universiteit Gent

Katrien Even

Partner PowerPulse BVBA

Ludo Lauwers

Thomas More Hogeschool

Rik Torfs

Prorector KU Leuven

Marlies Van Bael

Professor Universiteit Hasselt

Jos van Sas

Director External Affairs Nokia Bell Labs

MEMBER WITH ADVISORY VOTE

Mark Andries

Secretary-General of the Flemish Agency on Innovation & Entrepreneurship

Johan Hanssens

Secretary-General of the Department of Economy, Science and Innovation of the Flemish Government

SECRETARY-GENERAL

Hans Willems

Secretary-General - FWO

GOVERNEMENT DEPUTIES

Gert Bergen

Deputy head of cabinet Economy and Innovation of Philippe Muyters, Flemish minister for Work, Economy, Innovation and Sport

Simon Van Damme

Managing Director – LUCA School of Arts

FWO IN ITS NATIONAL CONTEXT – THE FFWO

The Board of Trustees of the FWO is responsible for the allocation of the funds which mainly come from the Flemish Government, and to a lesser extent from the Federal Government. The French Community has a fund analogous to the FWO: the "Fonds de la Recherche Scientifique F.R.S.- FNRS". The Boards of Trustees of both institutions manage the Federal Fund for Scientific Research (FFWO). The FFWO decides on non-divisible resources and a number of well-defined responsibilities (decisions on common rooms of buildings or certain prizes, donations and legacies).

FWO EXPERT PANELS

Fundamental research

For the fundamental channels there are 30 subject-specific panels and one interdisciplinary panel. Each panel is subdivided into a panel for applicants of fundamental research, postdoctoral researchers and fundamental research projects.

The 30 expert panels are divided into five scientific domains:

- ✓ Biological Sciences
- ✓ Humanities
- ✓ Social Sciences
- ✓ Medical Sciences
- ✓ Science and Technology

International collaboration

The Cross-Domain Panel (CDP) assesses applications submitted for various scientific fields, which may or may not have an international dimension.

The International Collaboration Committee (CIWC) gives its advice on applications for grants concerning the international mobility of researchers, the organisation of scientific meetings in Belgium, sabbaticals, international exchange agreements and scientific cooperation projects.

Strategic basic research

In 2018, 56 internationally-diverse panels, each consisting of five to seven members, evaluated the strategic basic research grants. These panels accompanied colleagues from the Flemish Agency for Innovation and Enterprise.

The SBR evaluation procedure includes a two-step internal evaluation, conducted respectively by different SBR expert panels and two umbrella committees.

SBR expert panels are generalist panels, in which thematically-linked economic and social projects are evaluated, and in which the advisers that sit on them work at the Flemish Agency for Innovation and Enterprise. The main role of the SBR expert panels is to allocate consensus scores for the different scientific and usage (sub)criteria, based on the comments issued by external experts, the applicants' response and the knowledge and expertise of the field.

This phase is followed by a meta-evaluation handled by two 'umbrella committees', one to evaluate the project application for economic feasibility and one for those that aim to create social value. The main task of these committees is to put the assessment made by the individual SBR expert panels in perspective in relation to the entire economic or social project portfolio, and to arrive at a final ranking.

Biomedical and clinical research

For the Applied Biomedical research programme with a primary social focus (ABS) the submitted project proposals are divided into thematic groups based on their subject when the call is closed. For each thematic group a specific expert panel is compiled, primarily composed of scientists and clinicians.

For the Fundamental Clinical Mandates (FCM, as of the 2020 call renamed as: Translational Clinical Mandates) the evaluation procedure takes place via an international expert panel consisting of researchers and clinicians from a wide range of medical disciplines.

Research infrastructure

Evaluation of applications for mid-scale research infrastructure takes place at the university level. The FWO assesses, per university, the nominated lists in relation to the selection criteria, which also takes into account the results of the consultation between universities.

For the evaluation of biennial applications for large-scale research infrastructure the FWO enlists the help of the Science Commission, which consists of international experts, for the scientific evaluation. In addition the Invest Commission was founded to evaluate the financial feasibility of the submitted proposals. The latter consists of Flemish experts in this field.

For biennial applications for international research infrastructure the scientific evaluation is also performed by the international experts in the Science Commission. For applications that are catalogued as scientifically excellent or extremely good, the Strategy Commission subsequently examines the structure, quality and feasibility of the operational and financial plan and the strategic importance for Flanders of these applications.

The international Tier 1 evaluation panel assesses the technical quality of the Tier 1 computing time requests and decides whether or not the requested computing time is allocated, and if so, in part or whole, depending on the available capacity.

An overview can be found on our website: <http://www.fwo.be/en/the-fwo/organisation/fwo-expert-panels/>

RESEARCH INTEGRITY

In 2013, a taskforce at FWO set out to propose measures to ensure research integrity. The taskforce was made up of academics from the Flemish universities and from various research areas. It was chaired by Professor Jacob Fokkema, Honorary Rector of TU Delft. The conclusions of the taskforce have been the subject of intensive consultation between the FWO and the Flemish universities.

The Board of Trustees approved the proposals in June 2015. Attention was directed to both prevention and awareness raising, detection and monitoring, corrective action and sanctioning.

The following measures were approved:

- ✓ incorporation of a clause in calls, application forms and agreements;
- ✓ profiles for researchers, supervisors and institutions, with rights and duties;
- ✓ amendments to the regulations; and
- ✓ further development of the procedures used by the FWO and the host institutions of the researchers to deal with infringements.

These recommendations are incorporated in the FWO's regulations. Applicants, assessors and other researchers at the FWO are informed of the details. Furthermore, the FWO has clear agreements with all its partner institutes to monitor how the practical implementation of these measures. Research integrity is fully embedded in the FWO's policy.

ETHICAL RECOMMENDATIONS

The FWO carries out monitoring to ensure that research supported by its funds is conducted in accordance with ethical standards. Some are imposed by law, others are generally accepted in (international) scientific practice. The FWO monitors these in the national and international context, especially at the EU level.

Researchers supported by the FWO must indicate the ethical aspects in their research by means of a questionnaire that is included in the application form. This may involve a legal obligation to present the file to an ethics committee and this is also specified in the questionnaire. Other

aspects at least form focal points for the applicants and the assessors of the application. Even if the study does not require any ethical recommendation, it may apply if the data is published at a later date. This means that the obligation in the questionnaire related to requesting advice, is sometimes applied more broadly than strictly required by law for the actual study, in order to avoid any problems later on.

The FWO's evaluation panels are tasked with issuing instructions regarding these kinds of ethical aspects in the applications they assess. The FWO also works closely with its partner institutes on this matter.

CONTACT THE FWO

Biological Sciences

+32 2 550 15 82
bio@fwo.be

Humanities

+32 2 550 15 84
cult@fwo.be

Social Sciences

+32 2 550 15 86
gm@fwo.be

Medical Sciences

+32 2 550 15 90
med@fwo.be

Science and Technology

+32 2 550 15 88
wt@fwo.be

Interdisciplinary research

+32 2 550 15 13
interdisciplinair@fwo.be

International mobility

+32 2 550 15 92
interprog@fwo.be

SB-Fellowships

+32 2 550 15 89
sb@fwo.be

SBO-projects

+32 2 550 15 91
sbo@fwo.be

TBM-projects

+32 2 550 15 93
tbn@fwo.be

Research infrastructure

+32 2 550 15 42
infrastructuur@fwo.be

National Contact Point

+32 2 550 15 76
ncp_fwo@fwo.be

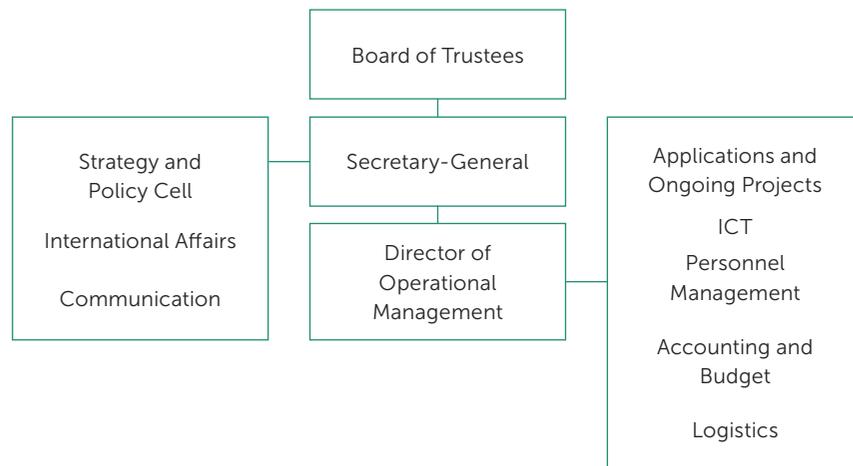
ERA-NET and JPI

+32 2 550 15 70
eranet@fwo.be and jpi@fwo.be

Expertpanels

+32 2 550 15 35
expert@fwo.be

ORGANIGRAM IN 2018



SUPPORT THE FWO

WHY SUPPORT THE FWO?

Fundamental research, or the search to push the boundaries of our knowledge, is a necessity in our society. Without this search there would be no penicillin, velcro or post-it notes.

But the search for new foundations of science is not always readily visible. It is only after many years of searching, testing and double-checking that scientists reveal their results. And many years can go by before fundamental scientific research finds a practical application. This long search makes today's researchers tomorrow's inventors. And they need your support!

By supporting scientific research you are making a choice for the future. With your donation or legacy you help to build the future of your children and grandchildren. And your great-grandchildren.

HOW TO SUPPORT THE FWO?

The Fund fulfils its mission partly thanks to financial donations from benefactors and testators. The desired goal and type of scientific research can be set out in the conditions of the act of donation or will, as long as the research topic is sufficiently generic. The government has ensured that the tax levied on these donations is very limited, so that the money goes almost entirely to scientific research through the following instruments:

- ✓ As a Public Utility Foundation, FWO enjoys lower inheritance taxes under Art. 59 of the Inheritance Tax Act.
- ✓ Monetary donations are tax deductible under Art. 104, 3 b of the 1992 Income Tax Act, provided the sum donated is at least €40 (Art. 107) and lower than €250 000 (to be indexed); moreover, the sum donated cannot amount to more than 10% of the net taxable income (Art. 109), or, in the case of companies, €500 000 and not more than 5% of the net taxable income (Art. 200).

More information:

<http://www.fwo.be/en/support-the-fwo/>

Research Foundation-Flanders (FWO)
Egmontstraat 5
1000 Brussels, Belgium
T 02 512 91 10
F 02 512 58 90
E post@fwo.be
www.fwo.be

Editor-in-Chief

Dr. Hans Willems
Secretary-General FWO

Copyright

Research Foundation - Flanders

Editing and graphic design

Pantarein Publishing

Fotografie

ID/ photo agency

Published in 2019

