THE MIND OF THE SCIENTIST

With this sculpture I have tried to express the creative energy of scientists. The whole development emerges from a human head, half of which is represented anatomically. I allude to a strong contrast between the tight static form of the head and the open side of the mind where everything is in constant movement, symbolizing the constant evolution of science.

At the top, two people push a question mark out of the brain. One of them leans on the DNA ladder. A symbol triangle that represents mathematics appears from the top of the skull. The triangle is positioned in such a way that it can be interpreted as a small hat, giving a playful touch to an otherwise serious subject. From the centre of the brain a space telescope (Hubble) is focused on the infinite. Underneath a microscope makes the inverse movement, focused on the infinitesimal. Still lower, a computer and a book symbolize the various sciences, the arts and the humanities. Both the syringe (medicine) and the compass make an upward move like ±-x, thus making sure that the fetus (biology) floats. At the top edge of the dark hollow skull space, an atom (physics) moves just underneath a planet. The darkness in the background creates a sense of mystery. This reminds us of the dark infinity of the cosmos, where so much still remains to be discovered.

Tom Frantzen
The Research Foundation - Flanders (FWO) has a long tradition of awarding science prizes, often in collaboration with the private sector. These prizes vary in size, but winning one represents a major recognition for researchers in various disciplines.

The FWO’s ‘prize of prizes’ has been awarded every five years since 1960 and goes by the somewhat prosaic name of ‘Five-yearly Prizes’.

For 2010, we have chosen a more attractive name, a name that makes a clear statement about the value that lies behind the prize. It is now generally known that the FWO feels very strongly about scientific excellence. For that reason, and in consultation with our colleagues of F.R.S. - FNRS, we decided on the name ‘FWO Excellence Prizes’. This name accurately reflects the fact that this prize is intended for researchers who truly excel, who rise above the scientific community in Flanders, which is already quite performing anyhow.

The laureates who are receiving these prizes today are at the absolute top of their fields. They add even more lustre to the reputation that the prizes already have. These researchers have made significant contributions to extending the frontiers of human knowledge in their respective fields – fundamental researchers with strong reputations, both within their areas of research and in terms of social relevance, and who also guide and mentor many promising young researchers.

To say that we select excellent researchers sounds deceptively easy. Many leading researchers were eligible but did not make it this time. One may well ask: what is ‘excellence’ precisely? To answer that question, a plethora of factors and criteria had to be taken into consideration, for which no better procedure has yet been found than the one that has already proven its value repeatedly, namely peer review by colleagues and fellow researchers. We have made sure that a strict, objective and transparent procedure, worthy of FWO standards, was followed.

We therefore present in this publication, with due pride, the prize winners who may rightly be considered to be ambassadors of Flemish science. We congratulate them sincerely on their accomplishments and hope that all of them will keep contributing to the ground-breaking research that is so essential for society, and that sets an inspiring example for young research talent.

dr.ir. Elisabeth Monard
secretary general FWO
THE LEGACY OF DR. ALPHONSE DE LEEUW

Dr. Alphonse De Leeuw, curator of the clinical collections of the Faculty of Medicine and Pharmacy of the Université Libre de Bruxelles, died on August 24, 1953. On October 16 of that year, the Board of Directors of the NFWO accepted his legacy worth four million Belgian francs. His will determined that this legacy should be used to create a prize of 750,000 Belgian francs to be awarded once every five years. The prize, apart from his name, also bears the names of his wife Marie Damry and her former husband Leon Charles Bourlart, a cousin of Dr. De Leeuw.

The prize was awarded for the first time in 1960 and the winner was chosen from a list of winners of state-awarded five-year and ten-year scientific prizes (literature, mathematics, medical sciences, ...) and winners of the Francqui prize. Three juries, with ten prominent scientists drawn from the natural sciences and medicine, mathematics, physics and chemistry, and the humanities, were responsible for the selection of candidates.

Each jury nominated one candidate. From this shortlist the Board chose the final winner. For example, the first Dr. Damry-Bourlart Prize was awarded to Prof. Albert Dalcq, permanent secretary of the “Académie Royale de Médecine de Belgique”. The prize was presented on Friday, the 27th of May, 1960.

FIRST REVISION

For the presentation of the second Dr. Damry-Bourlart prize, a call for prominent researchers was launched. Unlike the first prize, fellow researchers nominated the candidates. The procedure has remained unchanged to the present day. For the 1965 edition no less than 13 applications were submitted in both the Humanities and in the Physical and Natural Sciences. Once again, it was up to the Board to choose a single winner, which proved to be a particularly difficult task. Therefore, they called upon the assistance of the Francqui Fund, which had successfully awarded the Francqui prize every year since 1933, and had developed a lot of expertise on this matter. The Francqui Fund suggested the creation of two additional prizes. The following categories were therefore created:

- A prize for the Natural and Medical Sciences
- A prize for the Mathematical, Physical and Chemical Sciences
- A prize for the Humanities

To be able to award these three prizes, an additional sum of 1,500,000 Belgian francs was needed. At the request of the National Fund for Scientific Research (NFWO), the Board of Directors of the Francqui Fund decided on 22 January 1965 to invest this amount in the creation of two new scientific awards: the Baron Holvoet Scientific Prize and the Ernest-John Solvay Scientific Prize. With this donation, the Francqui Fund simultaneously paid tribute to two former Presidents of the NFWO, who also were leading figures in building the necessary funding channels for fundamental scientific research in Belgium.
THE WINNERS FOR 1965 WERE:

Prof. Jean Dabin for the Damry-Bourlart Scientific Prize;
Prof. Ilya Prigogine for the Ernest-John Solvay Scientific Prize;
Prof. Albert Claude for the Baron Holvoet Scientific Prize

Both Ilya Prigogine and Albert Claude would later receive a Nobel Prize.

In order to preserve the three prizes, the Francqui Fund decided in 1970 to once again donate 1.5 million Belgian francs for the Baron Holvoet and Ernest-John Solvay Scientific Prizes. On June 26, 1970, the prizes were awarded to Pieter De Somer (Dr. Damry-Bourlart Prize), Pol Swings (Ernest-John Solvay Scientific Prize) and Maurits Gysseling (Baron Holvoet Scientific Prize).

SECOND REVISION

On the 6th of June 1971, Joseph Maisin, professor at the Université Catholique de Louvain, died in a car accident. In memory of this great scholar, the Board of Directors of the NFWO on 19th November of that year decided to create the Joseph Maisin Scientific Prize.

At the request of the family and friends of Professor Maisin, this prize will be awarded to scientists in the Natural and Medical Sciences. The Maisin family and the cancer institute of the Université Catholique de Louvain jointly took the initiative to establish a steering committee to ensure the necessary fundraising. The Joseph Maisin Scientific Prize will be awarded, according to the wishes of the Maisin family, by the Fund for Scientific Medical Research (FGW0).

Further support from the Francqui Fund was no longer necessary thanks to this patronage and thus the Baron Holvoet Scientific Prize ceased to exist. The Ernest-John Solvay Scientific Prize was continued due to a donation from the Solvay family. This led in 1975 to the following arrangement:

- Joseph Maisin Scientific Prize for Natural and Medical Sciences:
- Dr. Damry-Bourlart Scientific Prize for Mathematical, Physical and Chemical Sciences
- Ernest-John Solvay Scientific Prize for the Humanities.

FINAL FORM

For the period 1971-1975, the prizes were awarded in duplicate. Each prize had a Dutch and a French winner. This duplication was motivated by the great scientific potential in Belgium and it avoided some difficult community problems that threatened to overshadow the Prizes.
On June 23, 1975, the then Belgian Parliament passed the amendment by which prizes and grants awarded to scholars would be exempted from income tax. As a result, the five-yearly prizes of the NFWO acquired their final structure in 1975.

This system of six academic prizes, for three Dutch- and three French-speaking researchers, continued to be implemented until the end of the century. The sums involved were the only item to be changed. In 1980, each prize was increased to 1,250,000 Belgian francs and in 1985 to 2,000,000 Belgian francs. By 1995 this figure had already risen to 3 million Belgian francs. In 1995, Christine Van Broeckhoven (Antwerp University) was the first woman to win a five-yearly NFWO prize.

RISING REPUTATION
Fame of the five-yearly NFWO prizes increased and more candidates were being nominated each year. For the period 1996-2000, there were no less than 33 nominees. Due to the large number of candidates, the decision to split the Dr. Damry-Bourlart Scientific Prize and Joseph Maisin Scientific Prize was made during the meeting of the Federal Agency and the Federal Council of December 5th, 1999. This gave rise to two sets of five prizes, each worth 3,000,000 Belgian francs:

**The Dr. Damry-Bourlart Scientific Prize**
- Physical Sciences
- Applied Sciences

**The Joseph Maisin Scientific Prize**
- Biomedical Sciences
- Clinical Biomedical Sciences,

**The Ernest-John Solvay Scientific Prize**
- Language, Cultural, Social and Behavioural Sciences

For the period 2001-2005 each prize amounted to €100,000. The prizes were formally presented at an academic session at the Palais des Académies by HM King Albert II.

In 2010, it has been 50 years since the first prizes were awarded. The Research Foundation - Flanders (FWO) is also proud to present the winners of this anniversary edition:

- **The Dr. De Leeuw-Damry-Bourlart Prize for Physical Sciences**
  Prof. Dirk Inzé (Universiteit Gent)

- **The Dr. De Leeuw-Damry-Bourlart Prize for Applied Sciences**
  Prof. Bart De Moor (Katholieke Universiteit Leuven)

- **The Joseph Maisin Prize for Fundamental Biomedical Sciences**
  Prof. Peter Carmeliet (Katholieke Universiteit Leuven)

- **The Joseph Maisin Prize for Clinical Biomedical Sciences**
  Prof. Paul Rutgeerts (Katholieke Universiteit Leuven)

- **The Ernest-John Solvay Prize for the Humanities**
  Prof. Sonja Snacken (Vrije Universiteit Brussel)

To mark the anniversary of these important science prizes in a special way, they were given a new name. Henceforth, the five-yearly prizes will be known as the "FWO Excellence Prizes". After all, the awarding of scientific excellence is where it all started 50 years ago. The FWO had a special souvenir created by artist Tom Franzen for all the winners. He succeeded in portraying the awarding of "scientific excellence in fundamental ground-breaking research" in a masterly way.
An overview of 50 years of awarding excellence.

• THE DR. DE LEEUW-DAMRY-BOURLART PRIZE
  1960: Prof. Albert Dalcq († 29/10/1973) (Académie Royale de Médecine de Belgique)
  1965: Prof. Jean Dabin († 13/08/1972) (Université Catholique de Louvain)
  1970: Prof. Pieter De Somer († 17/06/1985) (Katholieke Universiteit Leuven)
  1975: Prof. Walter Fiers (Rijksuniversiteit Gent)
  1980: Prof. Severin Amelinckx († 22/02/2007) (Universiteit Antwerpen)
  1985: Prof. Jean Bourgain (Vrije Universiteit Brussel)
  1990: Prof. Marc Van Montagu (Universiteit Gent)
  1995: Prof. Romain Coussement (Katholieke Universiteit Leuven)

• Exact Sciences
  2000: Prof. Arnold De Loof (Katholieke Universiteit Leuven)
  2005: Prof. Victor Moshchalkov (Katholieke Universiteit Leuven)
  2010: Prof. Dirk Inzé (Universiteit Gent)

• Applied Sciences
  2000: Prof. Paul Van Houtte (Katholieke Universiteit Leuven)
  2005: Prof. Willy Verstraete (Universiteit Gent)
  2010: Prof. Bart De Moor (Katholieke Universiteit Leuven)

• THE JOSEPH MAISIN PRIZE
  1975: Prof. Georges Peeters (Rijksuniversiteit Gent)
  1980: Prof. Marc Verstraete (Katholieke Universiteit Leuven)
  1985: Prof. Herman van den Berghe (Katholieke Universiteit Leuven)
  1990: Prof. Alfons Billiau (Katholieke Universiteit Leuven)
  1995: Prof. Christine Van Broeckhoven (Universiteit Antwerpen)

• Fundamental Biomedical Sciences
  2000: Prof. Erik De Clercq (Katholieke Universiteit Leuven)
  2005: Prof. Bart De Strooper (Katholieke Universiteit Leuven)
  2010: Prof. Peter Carmeliet (Katholieke Universiteit Leuven)

• Clinical Biomedical Sciences
  2000: Prof. Daniel Pipeleers (Vrije Universiteit Brussel)
  2005: Prof. Frans Van de Werf (Katholieke Universiteit Leuven)
  2010: Prof. Paul Rutgeerts (Katholieke Universiteit Leuven)

• THE ERNEST-JOHN SOLVAY PRIZE
  1965: Prof. Ilya Prigogine († 28/05/2003) (Université Libre de Bruxelles)
  1970: Prof. Pol Swings († 28/10/1983) (Université de Liège)
  1980: Prof. Herman Van der Wee (Katholieke Universiteit Leuven)
1985: Prof. Leo Apostel († 10/08/1995) (Vrije Universiteit Brussel)
1990: Prof. Raoul Van Caenegem (Universiteit Gent)
2000: Prof. Marc Waelkens (Katholieke Universiteit Leuven)
2005: Prof. Ronny Lesthaeghe (Vrije Universiteit Brussel)
2010: Prof. Sonja Snacken (Vrije Universiteit Brussel)

• THE BARON HOLVOET SCIENTIFIC PRIZE
1965: Prof. Albert Claude († 22/05/1983) (Université Libre de Bruxelles)
THE DR. DE LEEUW-DAMRY-BOURLART PRIZE

This prestigious prize has been awarded since 1960 to outstanding researchers active in Flanders. The prize is named after an important sponsor of the FWO, dr. Adolphe De Leeuw (1880-1953), MD, University of Brussels, who donated 4 million BEF to set up this five-yearly prize (at that time equalling 750,000 BEF). The prize is also named after his wife, Marie Damry, and her first husband, Leon Charles Bourlart.
Prof. Dirk Inzé

Born on 19 October 1957 in Hamme
Current positions: Professor of Plant Physiology and Molecular Biology, Ghent University (since 2002) and Head of Department, Plant Systems Biology, VIB, Ghent (since 2002).

QUALIFICATIONS:
• Biologie, Universiteit Gent (1979)
• PhD Biologie, Universiteit Gent (1984)

EXPERTISE/INTERESTS:
Cellular defence mechanisms, cell division, food production, plant system biology / cell cycle regulation and growth control in higher plants.
How do plants grow? What determines their size and growth rate? Why are sequoia trees so large and why do bonsai trees stay so small? These are questions Dirk Inzé has been asking for more than thirty years. He caught the molecular plant research bug from two illustrious predecessors: Marc Van Montagu and the late Jef Schell. They brought him into the wonderful world of biotechnology. It was not merely biotechnological research that fascinated him, but he also found its social relevance endlessly absorbing. These two elements formed the basis for his real passion: contributing to building a sustainable world. You could call it Inzé’s personal mission. Naïve? Not at all! The latest figures on demographic trends speak for themselves: 9.1 billion people by 2050!

Who will feed those mouths and how? “Experts estimate that world food production will need to grow by at least 70% by 2050,” stresses Inzé. “Because the potential to extend the amount of land dedicated to agriculture extremely limited, the only solution is to develop more productive crops, especially rice, wheat, maize and sorghum. An additional problem, global warming, will only further exacerbate the existing problems for agriculture, especially that of drought. The recent drought in Russia and the impact on wheat production is a striking example. To increase the productivity and drought tolerance of crops you must understand the mechanisms that regulate growth and yield of plants and the way you can control those processes.”

THE SYSTEMS BIOLOGY OF AIRPORTS

Inzé estimates that with the current state of science, we understand about 20 to 30% of the mechanisms that make them grow. “We know the main players. These are proteins that control cell growth and cell division. But how these proteins are interconnected, how they influence each other, is still not understood. Compare it with…"
the complex network of airports in Europe, for example, that are permanently interconnected by control towers. If an airport is down, then an alternate routing system is immediately initiated that allows passengers to reach their destination by bypassing it and using various shortcuts and loopholes. In plant growth it is just the same: we know the airports, the proteins, we know where they are, but we do not know exactly how they work together, interact and communicate with each other.

A new discipline has grown from all the knowledge and awareness of the lack thereof acquired during the past decades: systems biology. For a biotechnologist like Inzé the biggest challenge for the future is further elucidating and understanding the complex system that makes plants grow. “As we make progress, we will have a better understanding of the processes that control growth and we can use that knowledge to improve and optimize crops.”

**POLITICAL RESPONSIBILITY**

Barely 5% of all global research funding goes into agricultural research to improve the productivity of crops. Inzé considers this woefully low. “Especially when you know that at present nearly 1 billion people are malnourished. A solution will not just fall out of the sky. It takes years of research and long-term investment to bring improved crops to market. The development costs for an improved version easily add up to around 80 million Euros. Research institutions cannot carry those costs on their own and poor countries certainly cannot. Good cooperation with major biotechnology companies is therefore a necessity. Public-Private Partnership (PPP) offers a solution.”

According to Inzé, one will certainly have to join forces in the short term. That means global coordination of scientific research, but also creating the financial support required. Inzé remarks, “It’s a matter of political will.

The budget for the new experimental fusion reactor in Cadarache (southern France) is 10 billion Euros. Why can’t that be done for the food problem? We as scientists can only raise the alarm. And we do so constantly. We are being invited to international conferences and publish in top journals. We work with renowned institutions such as the Riken Institute in Yokohama, Japan, and the Max Planck Institute in Germany. Our voice is heard. Our research is respectable, although we must compete with countries like China who invest huge sums in research and development. Flanders has delivered significant efforts in recent years. As a funding body, the FWO plays a key role. “But vigilance and hard work remain the watchwords.”
Prof. Bart De Moor

Born on July 12, 1960 in Halle

QUALIFICATIONS:
• Civil Control Engineering, K.U.Leuven (1983)

CURRENT POSITIONS:
Professor of Electrical Engineering (since 1998) and Vice-Rector International Policy, K.U.Leuven (since 2009).

EXPERTISE:
Numerical algebra, numerical data mining, system control and identification, bioinformatics, systems biology.
Whether it is cars, planes, missiles or chemical production processes, econometric models of a country or a region, climate studies, the unraveling of the genetic code of living organisms or of entire habitats, these dynamic systems are currently modelled using mathematical models. With these models, their behaviour can be simulated or optimized with advanced computer methods, without the need for experiments. This combination of theoretical-mathematical and practical challenges and concrete applications in technology and society is the domain of systems theory. It is Bart De Moor’s favourite testing ground. "At the beginning of my doctorate in 1984, there was very little data for all those dynamical systems. Today, hundreds of sensors in each application generate gigabytes of data," said De Moor. "We store it in numerical databases and use it to develop dynamic models. But our research is also bringing about a colossal evolution in mathematical techniques, so our models are becoming more and more refined."

**SPIN-OFFS**

De Moor has published hundreds of articles in reputable journals, but also applied the insights gained from real-world applications. He was at the basis of six spin-offs. Ipcos was the first. A company with about 50 employees and several offices worldwide that develops technology to model and automatically control chemical processes and integrated power plants. Data4S (now sold to the Irish Norkom) was De Moor’s second brainchild. For each mobile phone call, 20 to 30 parameters are monitored such as duration, frequency, time point, recipient, etc. This produces millions of data every day. Using data mining algorithms, Data4S maps the calling behaviour of its clients. These models can then be used for marketing purposes or to detect fraud. "The basic idea is very simple," says De Moor. "In those sectors or market niches where a lot of data is available, we develop models to maximize added value." That is how TML (data mining in traffic engineering), Silicosis (biochemical data mining for drug development), Dsquare (data mining in the process industry) and Carte Genia (genetic data mining) were established.

**BIOINFORMATICS**

Ten years ago, Bart De Moor together with his employees tumbled into the bioinformatics field. De Moor notes: "Through the enormous developments in technology and the billions of data generated daily, biology and, above all, genetics have become an information science." Geneticists are confronted every day with millions of data: three billion characters (A, C, T and G) for a human genome (genomics) - a full 750 MB CD-ROM, a mere 25,000 numbers for a relatively simple genetic measurement (transcriptomics) or even hundreds of thousands of numbers for measuring the concentration of...
of proteins in biological samples (proteomics). Every day new biological mechanisms are discovered that we are trying to understand better with our data mining algorithms. For example, we can create a fingerprint of cancer tumours for a quick and accurate medical diagnosis. This will lead to Health Decision Support systems that support the physician when he is confronted with gigabytes of patient data.

System biology grew from the symbiosis of biology and system theory: a research field with an enormous potential. De Moor comments: “In the future we will design new biological systems with the same design techniques currently used for designing silicon chips. We will be able to create new organisms with features that do not occur in nature.” Synthetic bacteria programmed to detect heavy metals in polluted water that light up blue to signal their presence, for example.

Or bacteria to detect cancer in patients long before you can see the tumour in a scanner, and that then destroy it. All these are developments involving numerous mathematical and system theoretical issues, as well as requiring sound biological knowledge and a lot of creativity. But they also raise a lot of ethical questions. “It’s no longer the question of how we should do something, but whether we should and why. That will be the crucial question for the future,” added De Moor.

ANTICYCLICAL INVESTING
Bart De Moor prefers to work with a large research group. To him, science also has an important social dimension. This creative mix of scientists creates a situation where new ideas bubble up, new developments arise, as well as spin-offs, international networks, promising research careers and thus employment and prosperity. “But since the big catch-up movement back in 1995, which I helped to shape as a cabinet advisor, this is the first time I’ve experienced a drop in funding. That is unfortunate,” says De Moor. “Because times of crisis are the moment you have to invest contrary to the cycle in science and technology. I also miss the incorporation of Flemish science policy in a European context. If Flanders wants to belong to the European top, then it is essential to continue investing in people, projects and infrastructure.”
Jury for the Dr. De Leeuw-Damry-Bourlart Prize

PROF. TORD CLAESON
chairman of the jury
Professor of Microtechnology and Nanoscience, Chalmers University of Technology, Göteborg (Sweden).

EXPERTISE:
Electron tunnelling, superconductivity, condensed matter, sensors.

PROF. MANFRED RÜHLE
Acting Director at the Max-Planck-Institute for Metals Research (Germany) and Scientific Member of the Max Planck Society.

EXPERTISE:
Materials science, internal interfaces, characterisation of materials, transmission electron microscopy.

PROF. CLIVIA SOTOMAYOR-TORRES
ICREA Research Professor and Group Leader, Catalan Institute for Research and Advanced Studies (ICREA) and Catalan Institute of Nanotechnology, Barcelona (Spain).

EXPERTISE:
Nanophotonics, nanoelectronics, phononics, nanofabrication, condensed matter physics.

PROF. KRISTIAN STUBKJAER
Head of Department, Electrical Engineering, Technical University of Denmark (Denmark).

EXPERTISE:
Optoelectronics, networks, optical signal processing.
PROF. GERARD VAN KOTEN

Distinguished University Professor, Organic Chemistry and Catalysis, Faculty of Science, Utrecht University (The Netherlands) and Distinguished Research Professor at Cardiff University (UK).

EXPERTISE:
Homogeneous catalysis, organometallic chemistry, organic synthesis.

PROF. CHIARA TONELLI

Professor of Genetics, Dipartimento di Scienze Biomolecolari e Biotecnologie, Università degli Studi di Milano (Italy).

EXPERTISE:
Genetics, Molecular Biology, Functional Genomics, Gene Regulation, Plant transcription factors.

PROF. ADRIAN BOWMAN

Professor of Statistics, School of Mathematics and Statistics, University of Glasgow (UK).

EXPERTISE:
Statistical and nonparametric modelling, environmental applications, shape and image analysis.
The Ernest-John Solvay Prize

This prestigious prize has been awarded since 1965 to outstanding researchers active in Flanders. The prize is named after Ernest-John Solvay (1838-1922). He was a Belgian industrialist and chemist who developed a process to produce soda ash on large scale. The process was patented and the exploitation of his patents brought Solvay considerable wealth, which he used for philanthropic purposes, including the establishment in 1894 of the “Institut des Sciences Sociales” (ISS) at the Free University of Brussels (now the ULB and VUB) as well as International Institutes for Physics and Chemistry.

In 1903, he founded the Solvay Business School. In 1911, he began a series of important conferences in physics, known as the Solvay Conferences, whose participants included luminaries such as Max Planck, Marie Curie, Henri Poincaré, and Albert Einstein. The Family Solvay has provided an important contribution to the start capital for the NFWO (25 million BEF). Their contribution started off a national fundraising campaign, which eventually led to the establishment of the NFWO in 1928.
Laureate
for the Ernest-John Solvay Prize
in Humanities and Social Sciences

Prof. Sonja Snacken

Born on November 13, 1955 in Ghent

QUALIFICATIONS:
• Law, VUB (1978)
• Criminology, VUB (1980)
• PhD Criminology, VUB (1985)

CURRENT POSITIONS:
Professor of Criminology and Law, VUB
(since 1991).

EXPERTISE:
Application and execution of prison sentences.
Sonja Snacken is a human rights activist and researcher. This combination is a direct result of a visit to a psychiatric institution where both psychiatric patients and psychiatric offenders were housed together. The year is 1975. Snacken is a law student. At that time, the institution was nicknamed “the Hell of Tournai”. The images they were confronted with were shocking. People who were tied to their beds, banging their heads against the wall until they bled. Two part-time psychiatrists and staff only could stand by and watch this happen, incapable of intervening due to a lack of resources. Kafkaesque, medieval, and that was taking place in Belgium! Snacken’s decided that she should use her scientific interest to do something about such inhumane conditions. That is how her research career started.

Snacken is a lawyer and criminologist. Because she found that the social dimension of science is equally important, she also studied Sociology of Law. A symbiosis that is the result of years of passionate work on the importance and scope of criminal law in our modern society. “All of my work,” says Snacken, “is an attempt to link social science research on punishment to the standards in the field of human rights. An unusual interdisciplinary research field. Because sub-disciplines such as human rights, criminology, penology, etc. each have their own expertise which is extensively published. Bringing two or more of them together does not happen often.”

DEPRIVATION OF LIBERTY
Why are people punished? In what way? What criteria do judges use when making their choices? Why are people sometimes treated differently for the same crime? How are prisoners treated? What effects does this have? Is detention really the best solution for society and the victims? For several years, Snacken and her co-workers have been looking day-in-day-out for clear answers to these questions. How? Through in-depth and qualitative research in prisons, police offices and investigating judges, juvenile institutions, psychiatric institutions, detention centres and remand centres. “Thus it turns out that foreigners and criminals of Maghreb origin are much more likely to end up in prison than native Belgians. And where do they end up? Into cells with two or three prisoners that were originally designed for one person. How does that affect the relations with fellow prisoners and staff? A comparative study of eight jails on the quality of internal relations and the presence of violence showed a lot of differences. These included the fact that the
violence is much lower when the management provides training, work or other activities so that the detainees are not permanently locked in their cells. But the staff sometimes has a different view: staying in the cell seems safer. And yet, if the relationship between staff and inmates is poor or limited, how can you find out if they are depressed, having suicidal thought, wanting to escape, or whether there are conflicts or threats of riots? And what about the reintegration into society after release, which is also in the interests of society and the victims? Based on all that scientific research we were able to demonstrate that in Belgium and Europe a much broader concept of security is needed that goes far beyond merely bars, reinforced doors and locks. Deprivation of liberty is a very delicate and complex matter.”

A YET UNDEVELOPED TERRITORY
The legitimacy and credibility of other forms of punishment is an area that Snacken wants to work on in the coming years. Why is imprisonment still the most symbolic punishment? Why do other forms such as community service or perpetrator treatment programmes have such a hard time in becoming accepted by society? "However, people are open to alternative punishment forms if the offender gives something back to the victim or society," emphasizes Snacken. "One will need to consider this. Because due to population growth and migration, the overcrowding of our prisons really is a problem."

Another unexplored area is the law. Snacken has always ensured that the results of her research trickled down to politicians, judges and other professional workers in the field, in Belgium and at the European level. With her research, she wants to hold a mirror in front of them and the wider public to demonstrate how complex the whole penal system is, how they can gain a better and broader view, and what can be changed. On the basis of her expertise, Snacken was involved in the recent legislation on the internal and external legal status of detainees. "With regard to the law, Belgium is somewhere in the middle bracket. There are still initiatives that are being taken on the basis of a long-term vision. But politicians are increasingly under pressure to find quick, simplistic and conciliatory solutions whenever there incidents occur. But those are usually the tip of an iceberg. I think it is fundamentally wrong that the FWO is receiving less money. Scientific research is needed to seek scientifically based rather than simplistic answers to the problem of the complexity of crime and punishment.”
PROF. CHRISTOPHER DYER  
Chairman of the Jury  
Director of the Centre for English Local History, University of Leicester (UK).  

EXPERTISE:  
Social history, economic history, landscape history.

PROF. WILLEM LEVELT  
Director Emeritus Max-Planck-Institut für Psycholinguistik, Nijmegen (The Netherlands).  

EXPERTISE:  
Psycholinguistics, experimental psychology.

PROF. PETER NIJKAMP  
Honorary University Professor, VU University, Amsterdam (The Netherlands).  

EXPERTISE:  
Regional, urban and environmental economics.
**PROF. ANDREU MAS-COLELL**
Professor of Economics, Universitat Pompeu Fabra, Barcelona, and President of the Barcelona Graduate School of Economics (Spain).

**EXPERTISE:**
Microeconomics, general equilibrium theory, demand theory, game theory.

**PROF. PATRICE POGNAN**
Full Professor of Czech Language and Linguistics, Institut National des Langues et Civilisations Orientales (INALCO), Paris and External Lecturer and Senior Scientist at STIH-LALIC-Certal, Paris-Sorbonne University and INALCO (France).

**EXPERTISE:**
Czech and Slavic linguistics, natural language processing, databases, Berber lexicography, writing systems.

**PROF. WIM BLOCKMANS**
Rector of the NIAS (Netherlands Institute for Advanced Study), Wassenaar (the Netherlands).

**EXPERTISE:**
Medieval history, social-political change.

**PROF. HILARY FRASER**
Executive Dean, School of Arts, Birkbeck College, University of London (UK).

**EXPERTISE:**
Nineteenth-century literature, visual arts, cultural history.
The Joseph Maisin Prize

This prestigious prize has been awarded since 1975 to outstanding researchers active in Flanders. The prize is named after a great scientist and physician, Prof. Joseph Maisin (1893-1971), on demand of the Maisin family. Prof. Maisin was a renowned oncologist who made significant contributions to cancer research. He was professor at the Catholic University of Louvain (from 1924) and founded a Cancer Institute at that university in 1925.
Laureate
for the Joseph Maisin Prize
in Fundamental Biomedical Sciences

Prof. Peter Carmeliet
Born on December 8, 1959 in Leuven.

CURRENT POSITIONS:
Professor of Medicine, K.U.Leuven (since 2000) and Director of the Vesalius Research Center, VIB (since 2008).

QUALIFICATIONS:
• Medicine, K.U.Leuven (1984)
• PhD Medicine, K.U.Leuven (1989)

EXPERTISE:
Blood vessel formation (angiogenesis), growth factors, cardiovascular disease, neurodegeneration, gene technology.
If you look at Peter Carmeliet’s curriculum, you can clearly say that his research career has followed a theme of creativity, vision and courage and, yes, sometimes also luck was on his side. After his postdoctoral training at Harvard and MIT, Boston, United States, he returned to the K.U.Leuven, where he created a transgenic knockout mouse lacking the VEGF molecule (vascular endothelial growth factor), one of the most dangerous growth factors for blood vessel formation in cancer. A few years later he had luck on his side once again, and he unexpectedly made a spectacular discovery. By making a small change to the genome of the VEGF protein in the mouse, he discovered the relationship between angiogenesis and a specific type of muscle paralysis in humans known as ALS (amyotrophic lateral sclerosis).

FROM MOUSE TO CLINIC

Peter Carmeliet inherited the passion for medical research from his father, Professor Edward Carmeliet. But it was only after his doctoral thesis that he chose the field of angiogenesis. “The discovery of the role of the VEGF molecule in blood vessel growth was really a direct hit,” recalls Carmeliet. “Cells grow because they get oxygen through blood vessels. So if you can inhibit blood vessel growth, you can also get cancer and other inflammatory diseases (such as eye diseases, arthritis, liver cirrhosis, etc.) where blood vessels are necessary for cell growth, to slow down or stop. Thanks to the VEGF molecule, we ended up at the PLGF protein (Placental growth factor), a sister protein of the VEGF family. We discovered that if you suppress this protein in diseased mice, you only slow blood vessel growth in diseased tissues, but not in healthy tissues. In collaboration with ThromboGenics, Professor Désiré Collen’s company, we developed PLGF inhibitors. Pharmaceutical giant Roche took the lead and is clinically testing the drug now. It is fascinating to see how basic research can lead to such a result ten years later. If everything goes well, we have the prospect of hopefully having a new cancer drug.”
Carmeliet’s second discovery is also heading in the same direction. The relationship between VEGF and the muscular paralysis ALS turned out to consist principally of a neurological component. A massive challenge for Carmeliet and his research team because neurological examination was unknown territory for them. “We accepted the challenge, and deliberately invested to unravel that new area between angiogenesis and

Without serious effort and a well thought policy vision, excellence in research is out of the question
neurology and restructured our laboratory accordingly. Currently, fifteen to twenty doctoral students and/or postdoctoral researchers work there. We have demonstrated that patients are at increased risk for ALS if they have a VEGF protein deficiency. If you treat the mutated animals with the protein, then their health improves and they survive longer. We are now ready to clinically test the treatment on ALS patients.”

COMPETITIVE FIELD
But Carmeliet and his colleagues are taking it one step further. Tumour cells always ensure that they create other molecules so that the patient could relapse. “It is therefore important to make the angiogenesis treatment more efficient, better and especially safer. That is why we are currently focusing on the metabolism of blood vessel cells. We are investigating how we can remove the energy from blood vessels so that they can no longer grow. A completely new strategy that hopefully will yield results,” said Carmeliet.

Angiogenesis is a competitive research area nowadays. Europe has a number of leading groups, including Peter Carmeliet’s group. But it takes more than courage, vision and luck alone to climb to such a level. A consistent output of creative, leading edge, quality articles in top journals is a prerequisite. Then the outside world gets to know what you’re doing and the quality you deliver. Another condition is funding. With additional funding, different risks can be taken and opportunities can be exploited to make the research even more innovative. Carmeliet points out, “I had the great good fortune that Professor Collen invested a portion of the royalties from the blood clotting agent tPA into his department. Also the FWO, K.U.Leuven and VIB are an important source of funding, already since the beginning, 15 years ago. But I also want to emphasize the synergy with the university, because without serious effort and a well thought-out policy vision, excellence in research is out of the question. This synergy is an unconditional basis for a healthy, successful and internationally competitive research environment.”
Prof. Paul Rutgeerts

Born on September 29, 1948 in Brussels.

JOB TITLE:
Professor of Medicine, K.U.Leuven (since 1990).

QUALIFICATIONS:
• Medicine, K.U.Leuven (1973)
• Internal Medicine, Universitair Ziekenhuis Leuven (1978)
• PhD Medicine, K.U.Leuven (1981)

EXPERTISE:
Intestinal disorders and inflammation, Crohn’s disease, colitis.
An estimated one in two hundred or some 50,000 Belgians suffers from a chronic intestinal inflammation. In technical jargon inflammatory bowel diseases, IBD for short. Two of the most common disorders are ulcerative colitis and Crohn’s disease. In the first, only the lining of the colon is affected. In Crohn’s disease, the entire gastrointestinal tract can be affected, through several layers. Both diseases are not curable, but can be managed with appropriate medication. Alarmingly, the number of patients is increasing, especially in the 15 to 30 years age group. Paul Rutgeerts’ ultimate motivation as leader of the Leuven IBD research group is to be able to treat this increasing number of patients in an effective and efficient way through clinical research. Paul Rutgeerts got a taste of medicine from his father who was a doctor. Once he became a physician, he decided to specialise in internal medicine. Through hard work, a critical attitude and remaining focused on his research field, he developed the IBD research group to become a leading laboratory that can compete with other European and American groups. The link between research and clinical practice, in particular, typifies the approach Rutgeerts applies. “Properly observing patients, involving them in your research and at the same time gaining the greatest possible knowledge of the disease are essential. In addition, a researcher has to be creative, thinking up all sorts of ideas; even those that seem to go against the existing paradigms. Thanks to this approach, I can safely say that the domain of bowel disease is a model for translational research in our research group: the synthesis of insights from clinical and lab research, leading to better therapies.”

CIVILIZATION DISEASES
Chronic inflammatory bowel diseases are diseases of civilization according to Rutgeerts, in which genetic predisposition, but perhaps food and even climate and environmental factors play a role. “But the cause,” he says, “is still completely unknown. However, in recent years our understanding of the pathophysiology has grown. Thus, we can show that Crohn’s disease in its early stage is triggered by the bacteria in the contents of the intestines, and these in turn respond to it and become inflamed. Apparently it involves an imbalance between inflammatory proteins and anti-inflammatory substances, which causes intestinal injuries to occur. Because the current drugs are not very effective and have serious side effects, we went looking for more efficient substances. In particular we invested consider-
ably into research into the blocking of Tumour necrosis factor (TNF), the main inflammatory protein. An antibody against this protein has been developed by several pharmaceutical companies, which we tested at an early stage and to which we made an important contribution in terms of the strategy to achieve optimal success with the patient. Currently, other targets in the inflammatory cascade are being addressed such as interleukin-12 and the migration of inflammatory cells.

COMPETITIVE
Searching for the ultimate cause of IBD is a multidisciplinary challenge. It is Rutgeerts’ ambition to unravel most of the early changes that lead to Crohn’s disease at the molecular level. Rutgeerts notes: “To achieve this we work closely with scientists from a broad set of disciplines, including genetics, biochemistry and bacteriology. Using molecular techniques, we not only want to study the expression of all the genes in the intestinal mucosa and the composition of the bacterial flora in the gut and determine which component provokes the lesions, but also how these are affected under the influence of our therapy.”
In order to finance it all, Rutgeerts is drawing upon several sources: the university, EU projects and funding from contract research. The FWO provides about one third of his budget. Rutgeerts comments, “Personally I was never a trainee researcher with the FWO, but for many of the researchers in my group the FWO was a springboard to a productive research career. The favourable research environment thus created by the FWO is very important. But the competition is fierce. Especially when you know that only 14% of the resources requested are funded by the FWO. Therefore the government should always be seeking to invest more in research and innovation. Flanders is among the best in Europe for clinical research. That has to continue be so and, where necessary, be improved. If we want to remain competitive, the overabundance of rules and regulations at policy level and at the universities must be avoided wherever possible and we must apply the European rules as flexibly as possible.”
Emeritus Professor of Reproductive Endocrinology, University of Edinburgh (UK).

EXPERTISE:
Reproductive endocrinology, contraception, infertility, abortion.

PROF. DAVID BAIRD
chairman of the jury

Head of Department, Genetics, Hospital Necker Enfants Malades, Paris (France).

EXPERTISE:
Medical molecular genetics development

PROF. ARNOLD MUNNICH

Professor, Interfaculty Institute for Biochemistry, University of Tübingen, Head of Department, Molecular Medicine, and Scientific Director of the Comprehensive Cancer Center Tübingen (Germany).

EXPERTISE:
Cell death, senescence, signal transduction, tumor biology, liver damage.

PROF. KLAUS SCHULZE-OSTHOFF

Professor of Clinical Biochemistry and Head of the Institute for Clinical Biochemistry, Hannover Medical School (Germany).

EXPERTISE:
Experimental diabetes, metabolic research, pancreatic beta-cells.

PROF. SIGURD LENZEN
PROF. CHRISTOPHER BUTLER
Dean of Research, Head of Department and Professor of Primary Care Medicine, School of Medicine, Cardiff University (UK).

EXPERTISE:
Health behaviour change, antibiotic use and resistance, primary care, clinical epidemiology.

PROF. WOUTER H. MOOLENAAR
Senior group leader, Netherlands Cancer Institute, Amsterdam and Professor of Molecular Cell Biology at Leiden University (the Netherlands).

EXPERTISE:
Growth factors, lipid mediators, membrane receptors, signal transduction, cancer.

PROF. ANGELA VINCENT
Emeritus Professor of Neuroimmunology, Clinical Neurology, University of Oxford, and Honorary Professor, Institute of Neurology, University College London (UK).

EXPERTISE:
Neuroimmunology, autoimmunity, neuroscience, immunology.