

# TELLING STORIES OF IMPACT: HOW UNIVERSITY RESEARCH AND INNOVATION MAKE A DIFFERENCE





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# INVEST IN KNOWLEDGE!

The Belgian universities jointly call on the Belgian representatives in or working with the European Institutions to support a considerable European budget for knowledge and innovation in the next Multi-annual Financial Framework (MFF). Furthermore, they urge regional and federal politicians to raise overall public R&I investment, in order to reach the 3% objective set by the Lisbon Strategy. The universities, represented in the Flemish Interuniversity Council (VLIR) and the Conseil des Recteurs (CRef) endorsed earlier the statement issued by the Netherlands house for Education and Research (Neth-ER) “Invest in Knowledge”, mentioned again below.

*“The EU27 leaders committed to a stronger, prosperous and social European Union in the Rome Declaration of March 2017. Thus, it is time to define Europe’s future ambitions. These ambitions must be based on Europe’s excellent knowledge base and infrastructure. To ensure we exploit all of Europe’s potential, the Belgian universities call for a coherent and ambitious European knowledge policy.*

*To realise Europe’s ambitions, investment in research, innovation and education should be at the heart of the next MFF, as the knowledge-based economy is at the heart of Europe’s future. In the same fashion, Europe’s excellent knowledge base will be at the heart of mission-driven research while solving our big societal challenges, and Europe’s innovation potential can help us become the most competitive region in the world.*

*The next MFF should reflect these ambitions and anticipate growth opportunities. Public investments in research and innovation have proven to create economic growth. Therefore, we call for a modern European budget, which is focused on knowledge and growth and in which the budget increase of the previous knowledge programmes is continued. Programmes such as Horizon 2020 and Erasmus+ create high European added value, contribute to growth and jobs and help closing the investment gap left behind by the financial and economic crisis. A coherent European knowledge policy will enhance their impact.*

***In light of implementing an effective and coherent knowledge policy, we welcome the suggestion by the European Parliament and the Lamy group for a budget of at least € 120 billion for a next framework programme for civil research and innovation.” We call on our own Member State to show similar ambitions in the Council. We call on our own Member State to show equal enthusiasm in the budget for the successor of Erasmus+. We call on them to prioritise knowledge and innovation in all European programmes, including the European Structural and Investment Funds and the Common Agricultural Policy, and to be serious about possible synergies and complementarity between different European programmes.***

*“Let’s invest in a hopeful future which was at the heart of the Rome Declaration. Let’s not only turn money into knowledge, but also knowledge into money. Let’s recognise knowledge and innovation as a core priority for inclusive and sustainable prosperity for all Europeans and let’s invest in a coherent European Research and Innovation Policy.”*

In this brochure the Belgian universities demonstrate how European research projects in which they were involved created impact. Impact on job creation and wellbeing of European citizens. Economic impact. Scientific impact. Impact on the career development of researchers, innovators and independent thinkers. Impact on our diverse society as a whole. Impact in all kinds of ways. For Belgium, Europe and beyond.

Herman Van Goethem and Vincent Blondel  
President VLIR President CRef





University of Liège

# SHARE UNDERSTANDING THE PROCESS OF AN AGEING SOCIETY

## AGEING: AN INSUFFICIENTLY DOCUMENTED PHENOMENON

Ageing is one of the principal challenges that citizens and governments face in the 21st century. One part of this challenge is a financial task, as the sustainability of the current pension systems in many European countries is under scrutiny. Societal and financial costs of ageing are steadily rising, and even intergenerational cohesion may be threatened.

But the process of population ageing is complex. Elder people live differently or are treated otherwise depending on the country they live in. The policy system and the social cohesion are both quite diverse in every country.

In short: the ageing of societies is a phenomenon that has been of interest to the scientific community before, but about which there was only partial knowledge up to now.

## UNDERSTANDING THE COMPLEXITY

Researchers want to analyse and comprehend in depth the complex process of population ageing. Because so little is known about it, the urge to know how it works and how it might be tackled is increasing every day.

However, ageing cannot be researched if not at least three basic requirements are met. First, the individuals should be observed in different stages of their ageing. Second, the topics on which the researchers discuss with these individuals should be chosen from multiple fields of study to be able to cover all the divergent challenges. Finally, in the current European and international context, this process should be observed in different countries, following the exact same study protocols. A study

### NAME OF PROJECT:

SHARE - Survey of Health, Ageing and Retirement in Europe

### WEBPAGE:

<http://www.share-project.org/>

### PROJECT BUDGET (TOTAL):

EUR 4.141.233,58

### BELGIAN UNIVERSITY:

University of Liège  
University of Antwerp

### RESEARCHERS:

Prof Sergio Perelman,  
Xavier Flawinne, Laurent Nisen  
Prof Dimitri Mortelmans,  
Prof Koen Decanck,  
Prof Tim Goedeme

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under INFRASTRUCTURES, Grant Agreement No. 227822.



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that is longitudinal, interdisciplinary and international is a *conditio sine qua non* for this subject.

#### A DATABASE OF 120.000 CITIZENS

This vast study started in 2004 and received support from the European Commission and national or regional funding agencies. Every two years, the various ways in which people aged over fifty live and age in no less than twenty-seven European countries plus Israel were examined. The *Survey of Health, Ageing and Retirement in Europe (SHARE)* led to a huge database containing the results with interviews from more than 120.000 citizens across Europe, covering the interplay between economic, health and social factors that are shaping elder people's lives.

#### LEARNING FROM INTERNATIONAL BEST PRACTICES

The research supports evidence-based policies and mutual learning on national as well as on European and international levels. This cross-national perspective could never have been reached by spending an equal amount of resources on local surveys only and in member countries separately. The cross-national panel structure allows both researchers and policymakers to compare policies on ageing between countries and to learn from the best practices throughout Europe.

The data are now used by nearly 7000 registered users and are linked to nearly 2000 publications including more than 800 in scientific journals. Apart from its academic impact, the project reaches out to a much wider audience. An innovative newsletter format, the *SHARE Findings Newsletter* makes the research results accessible to a non-academic readership of citizens, NGOs and the press. The newsletter is written in non-scientific English and presents summaries of the most relevant publications based on SHARE data from all over the world.



“The University of Liège believes that excellence in research is also reflected in the willingness to share knowledge and to make the results relevant and applicable at regional, European and international level. Through dissemination and use of outcomes in society, the SHARE project is a significant example of the contribution to more intense and active citizenship. We therefore support the European Commission's plans to make it easier to engage with citizens in the next Framework Programme.”

RUDI CLOOTS  
VICE RECTOR RESEARCH  
UNIVERSITY OF LIÈGE



Hasselt University

# DACOTA

## THE RELEVANCE OF ROAD SAFETY RESEARCH

### THE LARGE IMPACT OF TRAFFIC ACCIDENTS

Traffic accidents, particularly severe accidents, have a tragic impact on people's lives and immense consequences on our society. In 2008, over 38.000 people died in traffic accidents in Europe alone, a further 1.2 million people were injured. The costs of these traffic accidents were estimated to be as much as €160 billion for the fifteen European countries reviewed. Reducing road casualties is therefore a high priority for both the European Commission and the national governments.

### EUROPEAN RESEARCH ON BEST PRACTICES NEEDED

Analysis on countries achieving the best results on road safety shows that the most effective policies leverage scientific evidence-based knowledge. The goal of this pan-European research, in which UHasselt was partnering, was to share the benefits of this leading-edge research and the decision-making tools with the international Road Safety Community in an effort to reduce casualties worldwide through data and knowledge-based policy-making.

### STARTING THE PROJECT: DATA COLLECTION

The research team gathered and analysed data from all Member States on a wide range of road safety topics.

This research and collection included data on road accidents, exposure, safety performance, country specific characteristics, road safety programmes, road safety management, etc. The vast amount of data was gathered and stored in a relational database and subsequently subjected to a series of road safety analyses and syntheses.

#### NAME OF PROJECT:

DaCoTA - Road safety Data Collection, Transfer and Analysis

#### WEBPAGE:

<http://www.dacota-project.eu>

#### PROJECT BUDGET (TOTAL):

EUR 7.310.655,22

#### BELGIAN UNIVERSITY:

Hasselt University

#### RESEARCHERS:

Prof Elke Hermans

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under Transport, Grant Agreement No. 233659.



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The data were used in particular to develop Annual Statistical Reports, a Road Safety Management Profile for each country and Basic Factsheets covering for example the road safety of children, pedestrians, highways and single vehicle accidents.

#### TOOLS FOR MORE ROAD SAFETY IN EUROPE PROVIDED

As a result of analysing the data and applying statistical methods, the researchers were able to identify trends and make projections about key indicators of road safety. Projections were established for traffic fatalities for each Member State for the period up to 2020 based on advanced statistical procedures. Subject matter experts on road safety topics such as novice drivers, powered two-wheelers and post-impact care were empaneled to make state of the art reviews, later made available through web texts.

Furthermore, the researchers established country specific overviews as well. These overviews include the scoring values on key characteristics in all Member States with respect to road safety. These country overviews provide additional insight in their structure and culture, safety measures and programmes, safety performance indicators, final outcomes and social costs. To enable benchmarking, a single composite road safety index score was computed for Member States.

The consortium has received an international award for the development of the 'European Road Safety Observatory'. Road safety institutes and universities from several European countries joined forces to centralise the wealth of scattered road safety information in one overall knowledge system and developed a number of policy-supporting tools (such as factsheets and country overviews). Prince Michael of Kent, head of the 'Commission for Global Road Safety' granted the award as a recognition for the societal impact of this project.



"By bringing together experts in their respective research fields, European Framework Programmes have supported the venue of more evidence-based approaches to socially relevant challenges. The DaCoTa project brought a knowledge-based policy making approach to help reducing road casualties. Tackling upcoming challenges will require Europe to invest even more in fundamental and applied research."

JEAN-MICHEL RIGO  
VICE RECTOR RESEARCH  
HASSELT UNIVERSITY



Université catholique  
de Louvain

# APIDIS OFFERING PERSONALISED MULTIMEDIA CONTENT

## FROM MASS PRODUCTION OF MULTIMEDIA CONTENT

In today's society, content production and content consumption are confronted with a fundamental mutation. Two complementary trends have appeared with the emergence of the Internet and smartphones.

On the one hand, individuals and organizations become more and more heterogeneous in the way they access content. They want to access dedicated content through a personalised service, able to provide what they are interested in, when they want it and through the distribution channel of their choice.

On the other hand, technological advances in sensor development and image interpretation have become mature enough to support and facilitate the creation and distribution of content.

## TO PERSONALISED PRODUCTION

Given the increased diversity in content consumption profiles, providers are looking for a more democratic and personalised production of multimedia content.

This research project has been defined to anticipate this trend, and to prepare future evolutions of the content production industry towards automated infrastructures allowing content to be produced, stored and accessed at low cost and in a personalised and dedicated way.

## MAKING ALGORITHMS

A consortium including multiple and complementary expertise addressed the multiple scientific and industrial challenges involved in the project. The researchers proposed a framework to automate the collection and distribution of digital content.

### NAME OF PROJECT:

APIDIS, Autonomous Production of Images based on Distributed and Intelligent Sensing

### WEBPAGE:

[https://cordis.europa.eu/project/rcn/85433\\_en.html](https://cordis.europa.eu/project/rcn/85433_en.html)

### WEBPAGE SPIN-OFF:

[www.keemotion.com](http://www.keemotion.com)

### PROJECT BUDGET (TOTAL):

EUR 2.615.541

### BELGIAN UNIVERSITY:

Université catholique de Louvain  
- coordinator

### RESEARCHER:

Prof Christophe  
De Vleeschouwer

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under ICT, Grant Agreement No. 216023.



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They collected raw and high-resolution content from networks of multi-modal sensors. Then they built on distributed scene analysis algorithms to identify salient segments within this content. Eventually, they exploited that knowledge to automate the production of video reports for specific scenarios, most notably sports events.

#### AUDIENCE DEDICATED CONTENT

The potential applications of the integrated technology and methodologies developed within this project are numerous. They range from personalised access to local sport events through a web portal or a mobile handset to cost-effective and fully automated production of content dedicated to a small audience, like DVD-souvenirs, university lectures, etc.

Commercial exploitation opportunities have been outlined by broadcasters, sports- and TV- professionals during IBC and NAB shows, leading to the creation of the spin-off company Keemotion.

In short, the project has increased industrial and academic interactions worldwide. The main impact has been economical, through the creation of a topmost company in the area of autonomous production. Keemotion products are now deployed in more than a hundred sites in Europe, the US and Canada.

The object and tracking-technology developed in the project had impact on other scientific fields than sports analysis as well: material engineering for instance, and even life sciences, through cell tracking algorithms.

“Cross-fertilization between different fields and research teams definitively represents the hallmark of Framework projects at our university. Such projects provide our researchers with the opportunity to confront their novel research ideas with their colleagues worldwide and foster the innovation process leading to the development of new technologies, services and the creation of spinoffs. The APIDIS project illustrates, by the set-up of the company Keemotion, leader in autonomous audiovisual content production, how EU funding can have real impact on innovation.”

JEAN-CHRISTOPHE RENAULD  
PRO RECTOR FOR RESEARCH  
UNIVERSITÉ CATHOLIQUE DE LOUVAIN



University of Antwerp

# GRACE

## HOW TO SAVE THE WORLD FROM ANTIBIOTIC RESISTANCE

### INCREASING RESISTANCE TO TREATMENT WITH ANTIBIOTICS

Since Alexander Fleming discovered penicillin in 1928 (by accident), antibiotics have become one of the main medications and were called the miracle drugs of the twentieth century. Antibiotics are used for treating bacterial infections and have saved millions of lives. The benefits of antibiotics can hardly be overestimated.

As antibiotics are crucial in treating patients, it is problematic that the standard treatments for bacterial infections are now less effective than before, and sometimes don't even work at all. When antibiotics no longer affect certain bacteria, those bacteria are said to be antibiotic resistant. And this is one of the world's most pressing health problems.

The overuse and misuse of antibiotics are key factors in the increasing antibiotic resistance. Both doctors and patients bear responsibility in ensuring a proper use of antibiotics and minimising the development of antibiotic resistance. But to be able to inform doctors and patients about proper use, scientific evidence is needed about the use, behaviour and consequences of misuse of antibiotics.

### MORE EVIDENCE AND BETTER PRESCRIPTION NEEDED

The research group of the University of Antwerp searched for more evidence for the causes of antibiotic resistance, and better tools for correct prescribing of antibiotics. With EU funding and in collaboration with a consortium of academic and non-academic partners, the University of Antwerp coordinated the GRACE project studying patients suffering from acute lower respiratory tract infections (LRTI) acquired in the community. LRTI are one of the most common reasons for consulting general practitioners and account for considerable antibiotics use and health care costs:

#### NAME OF PROJECT:

GRACE - Genomics to combat Resistance against Antibiotics in Community-acquired Lower Respiratory Tract Infections (LRTI) in Europe (GRACE)

#### WEBPAGE:

[http://www.cordis.europa.eu/project/rcn/78765\\_en.html](http://www.cordis.europa.eu/project/rcn/78765_en.html)

#### PROJECT BUDGET (TOTAL):

EUR 12.838.345

#### BELGIAN UNIVERSITY:

University of Antwerp - coordinator

#### RESEARCHERS:

Prof Herman Goossens,  
Prof Samuel Coenen,  
Em. Prof Greet Ieven

This project has received funding from the European Union's FP6 Research and Technological Development Programme under LIFESCIHEALTH, Grant Agreement No. 518226.



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more than half of the patients with LRTI in Europe are prescribed antibiotics.

### THE EVIDENCE: THE LARGEST STUDY EVER

In the largest prospective study ever, in sixteen primary care networks, in twelve European countries, the scientists enrolled no less than 3.104 adult patients with LRTI and compared the aetiology of these patients with 2.985 matched controls without respiratory infection.

Evidence was given that almost half of these infections were caused by viruses. And only approximately one in five patients had a bacterial pathogen isolated. Therefore: only one in five could indeed conceivably benefit from antibiotic treatment, even though it was prescribed to many more!

Another part of the project studied the benefit of antibiotics in patients with LRTI where pneumonia is not suspected, because the fear of pneumonia is another reason for massive abuse of antibiotics. The study showed that when pneumonia is not clinically suspected, antibiotics provide no meaningful benefit and even cause slight harms. It clearly demonstrated that unless pneumonia is suspected, antibiotics should not be prescribed for these patients.

### BETTER PRESCRIPTION: AN ONLINE COMMUNICATION SKILLS TRAINING

The new evidence supports a cautious approach to antibiotic prescribing. Nevertheless, sometimes antibiotics are in fact needed, and then doctors should know which ones should be prescribed.

Further study on the consequences of the use of different antibiotics shows that the resistance to amoxicillin is only modest and short-lived. Therefore, the study supports European countries that recommend amoxicillin when an antibiotic is indicated, and provides compelling evidence for other countries to promote amoxicillin (rather than new, broad-spectrum, expensive antibiotics).

However, antibiotics often are not needed at all. How can doctors and their patients with acute lower or upper respiratory tract infections be convinced not to use them? This is challenging and requires effective communication skills of doctors. For this purpose, in the GRACE project, an internet tool for training communication skills and an interactive patient information booklet were developed. The study also demonstrated that the use of the training tool for doctors and the booklet for patients induced important reductions in antibiotic prescribing.

The results of the GRACE project are expected to have an important impact on antibiotic policies at European and national level, and will pave the way for novel interventions, including diagnostics, to better target patients with LRTI who need antibiotics.



© GRACE



“Antwerp University fully engages in creating impact with its research, on regional, national and European level. The EU Framework Program has always provided an important leverage effect in that respect. Our research on antibiotic resistance has been generously supported by European funding. The collaboration set up in the context of these projects, connecting academics to a wide variety of societal actors, fed into the development of new national and European health policies and made a difference for hospitals, the medical profession and patients all over Europe. Academic research deserves full support of the next Framework programme, which is a wise investment considering the impact it generates.”

RONNY BLUST  
VICE RECTOR RESEARCH  
UNIVERSITY OF ANTWERP





Université Saint-Louis  
- Bruxelles

# GREPEC COMING TO TERMS WITH OVERCROWDED PRISONS AND ALTERNATIVE SANCTIONS

## INCLINATION TOWARDS IMPRISONING

When studying justice in Europe, a disproportionate resort to incarceration is detected. Both legislators and judicial authorities seem inclined to imprison convicts rather than implement so-called alternative sanctions.

However, for many reasons, incarceration is not the most desirable option. To start with, it leads to huge overcrowding in prisons across Europe, violating fundamental rights of individuals and compromising the mutual trust necessary to support judicial cooperation in Europe.

Moreover, incarceration proves to be dysfunctional both in rehabilitating the offenders and in preventing the individuals from recidivism.

## ANALYSING AND CHANGING THE INCLINATION TOWARDS INCARCERATION

The research, conducted under the coordination of the University of Ferrara (Italy), had primarily a scientific objective: to draw up a comparative and analytical table of the existence and implementation of 'alternative sanctions' in six European countries and of their conformity with the law of the Council of Europe and the European Union. But as the analytical table started to unfold the reality of the disproportionate resort to incarceration, the researchers added a second, far-reaching goal: to help criminal operators and policy-makers with the objective of improving their ability to appropriately implement the alternative strategies of detention.

## SETTING UP A SERIES OF TRAINING

After having thoroughly drawn up the comparative and analytical table, the researchers set up a long series of various valorisation activities with the intention to promote the dissemination and the discussion of the results. The activities consisted of

### NAME OF PROJECT:

Prison overcrowding and  
alternatives to detention

### WEBPAGE:

<http://www.prisonovercrowding.eu/>

### PROJECT BUDGET (TOTAL):

EUR 312.249,61

### BELGIAN UNIVERSITY:

Université Saint-Louis -  
Bruxelles

### RESEARCHERS:

Yves Cartuyvels,  
Christine Guillain

This project has received  
funding from the Criminal  
Justice Programme under an  
Action Grant for specific  
transnational and national  
projects, Just/2013/JPEN/AG.





communication and training sessions with both professionals of the criminal justice system (judges, offender supervision workers), researchers and students.

#### INCREASING KNOWLEDGE FOR RESEARCHERS, PROFESSIONALS AND THE GENERAL PUBLIC

When having training sessions with students, the researchers were able to enhance their knowledge about detention and alternatives to prison. When working with judges and workers of the offender supervision, it was an opportunity to learn from experiences in other countries.

The researchers were influential in the heart of justice as well: they were heard at the Justice Committee of the House of Representatives on the draft law amending criminal law and criminal procedure. It gave the researchers the opportunity to discuss the Council of Europe's recommendations to promote alternatives to imprisonment. Later, they were invited for a meeting with Belgian magistrates to discuss the recommendations that the research panel proposed at the end of the research. It gave them the opportunity to make the magistrates sensitive to the importance of the recourse to alternative sanctions and thus to influence their practices.

The general public was not forgotten either. Since 2015, the researchers participated in the National Days of Prison. The aim is to organize events intended for a wide audience in order to raise awareness, inform and make proposals concerning detention and alternative sanctions.

In general, drawing on the legal analysis they made, the researchers are able to propose a set of guidelines on the alternatives to detention. The purpose of these guidelines is twofold. On the one hand, they promote the adoption and the implementation of alternatives to incarceration in accordance to the Council of Europe standards and rules. On the other hand, they encourage the circulation of best practices on a European level with the aim of fostering mutual recognition and mutual trust in cross-border judicial cooperation.

"Prison overcrowding is a key societal issue. It entails deplorable living conditions inside prisons and has damaging effects both for the prisoner's relatives and for society as a whole. To ensure that prisoners benefit from a real rehabilitation both during and at the end of their sentence, there is an urgent need to address alternatives to detention. This reflection must take place in a broader context than the narrow space of the Belgian borders. This is precisely what this European interdisciplinary research permitted. Therefore, we definitely need a strong and ambitious new Framework Programme to continue to fund this kind of projects that definitively have a strong societal impact in the longer run."

HUGUES DUMONT  
VICE RECTOR RESEARCH  
UNIVERSITÉ SAINT-LOUIS – BRUXELLES





Ghent University

# KILL\*SPILL SAVING OCEANS FROM PERMANENT OIL POLLUTION

## MINIMAL RECOVERY OF OIL SPILLS

Every year more than 2500 million liters of oil are wasted or spilled in our oceans. Some of this oil comes from accidental spills or leaks, but just as much oil spill is caused by the careless habits of humans.

The effect of these oil spills on nature cannot be underestimated. Some of the oil will disperse, but most of it will drift, and possibly reach the shoreline. When it does, the oil threatens both animal life and coastal vegetation, causing death and toxicity. In case of large oil spills, mass mortality and contamination both in the ocean and at the shoreline are inevitable.

As awareness of the dangers of the impact of oil pollution rises, spill incidents have been steadily decreasing over the last five decades. Nevertheless, the amount of oil spilled remains enormous. There are some existing technologies that can be used in emergency response to these spills, but they hardly ever recover more than ten percent of the wasted oil. Consequently, there are still over 2000 million liters of oil every year that are not recovered and that threaten to contaminate our environment.

## EXISTING SOLUTIONS COME UP SHORT

Current technologies most often use booms and skimmers. Booms are a type of floating barriers that aim at stopping the oil from drifting around, fixing it between the barriers. Skimmers are more designed for recovery: they are used to remove floating oil from the surface of the water. The effect of both is rather small.

There is another method as well: dispersants. This is the classic remediation approach for open seas where the spilled oil is converted into billions of micron-sized droplets that are then easier to be biodegraded by microbes.

Though theoretically the case, this method does not work in the deep sea, where there is insufficient oxygen, and therefore an insufficient number of or energy for

### NAME OF PROJECT:

KILL\*SPILL - Integrated  
Biotechnological Solutions for  
Combating Marine Oil Spills

### WEBPAGE:

<http://www.killspill.eu/>

### PROJECT BUDGET (TOTAL):

EUR 12.442.645,02

### BELGIAN UNIVERSITY:

Ghent University

### RESEARCHERS:

Nico Boon, Korneel Rabaey

This project has received  
funding from the European  
Union's Seventh Framework  
Programme (FP7/2007-2013)  
under KBBE, Grant Agreement  
No. 312139.



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microbes. So the oil is still dispersed in the sea, invisible, unrecoverable, making it even more dangerous for marine life. This side-effect is often overlooked by clean-up teams and policy makers.

From time to time burning the oil is used as a solution, but this causes chunks of tar, that consequently sink to the bottom of the ocean, causing an even more toxic situation than before.

Is there really not a more nature-friendly and effective method to save our oceans and wildlife from oil pollution?



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## PROTECTING THE ENVIRONMENT WITH ECO-FRIENDLY METHODS

A multidisciplinary team at Ghent University embarked on a mission to find a solution with a more full-fledged outcome, overcoming the disadvantages of the traditional methods. Their focus was on biodegrading, a method which uses nature itself, and has no additional negative consequences.

The researchers were able to study the effect that depth in the ocean has on oil degradation. Remarkably, despite the tremendous pressures and colder temperatures, bacteria keep on degrading organics, albeit more slowly. The project mapped out the microbial potential along these depths, not just for oil spill clean-up, but for other processes such as bioproduction as well.

## MICROBES TO THE RESCUE

Apart from creating the very first overview of the results from and gaps in existing technologies, the scientists also came up with a variety of new nature-friendly technologies. One of their main concerns was the remaining sediment that drops to the bottom of the ocean – a place much like a desert with practically no life, no activity, and hardly any oxygen. One of the more successful methods was using electricity at the bottom of the ocean. By adding electricity, the microbial activity rises and the oil is biodegraded in larger amounts. To be even more effective, the research group came up with a small mobile machine that wanders around the bottom of the ocean like a vacuum cleaner going wherever needed to add electricity and thus stimulating the microbial activity that can biodegrade the oil.

## BLUE GROWTH AS A RESEARCH STRATEGY

Kill Spill is not a stand-alone project but testament to Ghent University's commitment to blue growth, i.e. caring for our oceans and seas while sustainably tapping into the resource potential they offer. EU research funding allowed its marine/maritime scientific community to contribute to knowledge development through high-impact projects. Seas and oceans are being investigated as sources to overcome impending shortages in food, energy, and minerals. Also crucial challenges such as marine litter and microplastics, coastal defence, and reduction of CO<sub>2</sub> emission are addressed. All scientific endeavours ranging from fundamental to applied research but also using the whole spectrum of disciplines which Ghent University has to offer (e.g. collaborative projects with social scientists looking into the physical and psychological effects of oceans on human health). Because caring about our blue planet is caring about the entire planet.

“Caring for our seas and oceans is absolutely essential to mankind. Universities have a key role to play here, given our proven experience in increasing scientific knowledge about the conservation of oceans and seas and the sustainable use of marine resources, in developing the corresponding research capacity and in transferring marine technology. But we will only be able to keep on fulfilling this role if governments and public authorities care enough to further invest in our scientific communities. Europe should show the way in this investment and put research and innovation at the heart of its financial priorities.”

RIK VAN DE WALLE  
RECTOR  
GHENT UNIVERSITY



Université libre  
de Bruxelles

# ON TUBERCULOSIS HOW TO FINALLY CHALLENGE THE INFECTIOUS DISEASE

## A MAJOR HEALTH PROBLEM

Tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. The only currently available vaccine against tuberculosis is the Bacille Calmette Guérin-vaccine. This vaccine has a high efficacy to protect infants against the most severe forms of tuberculosis, but its efficacy against pulmonary tuberculosis both in children and in adults is unfortunately very limited.

Therefore, tuberculosis remains a global health problem with one person dying from tuberculosis every eighteen seconds and more than ten million new cases of tuberculosis declared in 2016.

## FINDING MORE EFFECTIVE VACCINES

As tuberculosis is still causing so many deaths, new vaccines are urgently needed. They are expected to protect all age groups more profoundly and to help to reach the objectives fixed by the World Health Organization of a world without tuberculosis in 2050.

## THE CLINICAL PORTFOLIO MANAGEMENT APPROACH

Building on a sequence of projects on tuberculosis vaccine development financed by the European Commission with the active participation of ULB, the TuBerculosis Vaccine Initiative (TBVI) was created to coordinate the participation of more than fifty partners from academia, research institutes and private industries in new projects, the latest of which is TBVAC2020.

Through a clinical portfolio management approach, TBVI has led to a substantial contribution in the global tuberculosis vaccine pipeline. To test new vaccine candidates in clinical trials and finally succeed in developing new vaccines against tuberculosis, identification of biomarkers of protection (i.e. indicators showing that a person is protected against the disease) is indispensable.

In TBVAC2020, more than forty partners are working on the detection of such biomarkers, the development of standardised assays for measuring them and their evaluation in samples from well-defined clinical cohorts of patients. As the animal models imperfectly reproduce the consequence of *M. tuberculosis* infections in humans, these studies on biomarker discovery are best performed on human samples.

## NEW TOOLS TO FIGHT TUBERCULOSIS

Even if it's estimated that one third of the world's population is infected with *M. tuberculosis*, most of the infected people do not develop tuberculosis as they are able to mount protective immune responses against the disease. Biomarkers of protection may therefore be identified by comparing the immune responses from infected people who remain healthy to those of the patients with active tuberculosis.

By doing so, ULB has identified different biomarkers of protection in both children and adults, these biomarkers being recorded in a TBVI database that may be used for the evaluation of new vaccine candidates.

### NAME OF PROJECT:

TBVAC2020 - Advancing novel and promising TB vaccine candidates from discovery to preclinical and early clinical development

### WEBPAGE:

<http://www.tbvi.eu/for-partners/tbvac2020/>

### PROJECT BUDGET (TOTAL):

EUR 25.056.507,33

### BELGIAN UNIVERSITY:

Université libre de Bruxelles

### RESEARCHER:

Prof Françoise Mascart

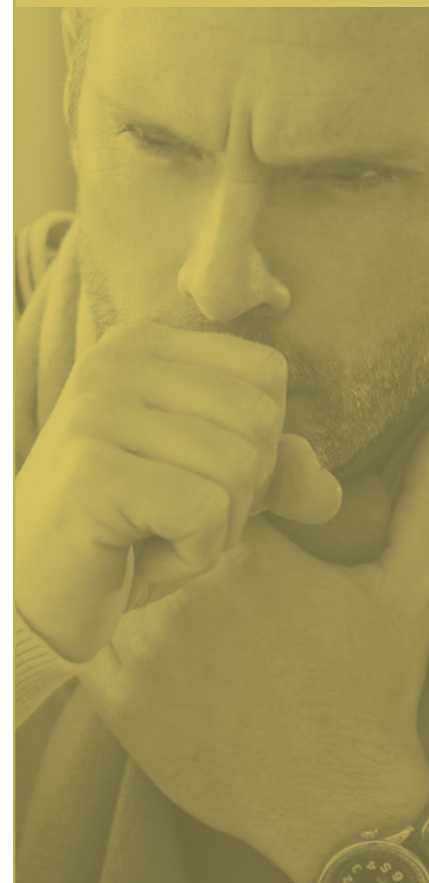
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Societal Challenge Health, Grant Agreement No. 643381 and the Brussels Capital Region.



This approach also accelerates the development of new diagnostic tests based on the demonstration of specific immune responses. Early diagnosis of tuberculosis is crucial for early treatment to avoid severe illness and dissemination of the disease. It is a priority to identify among *M. tuberculosis*-infected individuals those who present the highest risk of developing the disease. Only by doing so, we can efficiently target the population with the highest need for prophylactic treatment and thus avoid new cases of tuberculosis as well as unnecessary treatment.

ULB has developed a new diagnostic test, and research is on track to accurately identify risk factors of tuberculosis with standardised blood tests. It is very important that this research can be continued to identify the combination of biomarkers that best predict protection after infection or vaccination as well as the duration of this protection.

Operationalising the research strategy of TBVI in the coming years is expected to result in support for twenty new discovery approaches, up to six candidate vaccines at preclinical stages and up to six candidates at early clinical stages. In addition, it will identify, optimise and evaluate fifteen innovative approaches on biomarkers. The development of a new vaccine by means of a preclinical and clinical portfolio management approach is estimated to cost approximately €600 million over the next ten years. This investment seems relatively small when compared to the estimated costs of the disease in Europe and globally over this period, which are estimated to be €5.9 and €58 billion, respectively. The TBVI approach, aiming at the development of a vaccine affordable for all, will significantly contribute to the fight against a disease that is projected to be responsible for 1 to 2 million deaths each year until 2030, and ULB has been actively involved in this fight thanks to the financial support from the European Commission.



“Europe has always been in the forefront of the fight against infectious diseases like tuberculosis, through collaborative fundamental and applied research of the highest quality. Stable and long-term funding through European Framework Programmes for Research and Innovation is indispensable to keep providing concrete and accessible solutions to health challenges worldwide.”

SERGE SCHIFFMANN  
VICE RECTOR RESEARCH AND VALORISATION  
UNIVERSITÉ LIBRE DE BRUXELLES





KU Leuven

# REVEAL FILTERING INFORMATION FROM THE NOISE

## NOISE IS DISTURBING THE ACCESS TO INFORMATION

The world of media and communication is currently experiencing enormous disruptions that are profoundly changing our daily lives and society at large. With the digital revolution, the Internet and social media, communication has rapidly moved from single to multidirectional patterns. On the one hand, for media organisations it has become very difficult, or even impossible, to act as a gatekeeper, deciding what is communicated to whom and what not, because every single individual now has the opportunity to access information directly, anywhere and anyhow, through social media. On the other hand, a handful of companies such as Google and Facebook use algorithms that have a profound influence on the media content individuals consume. Both trends lead to a new, significant problem: it has become very difficult for media professionals and media consumers to distinguish meaningful information from useless or even misleading information, called 'noise'. Recent events, such as Brexit and the US elections, demonstrated that this noise can be particularly worrisome as misinformation, or what became the latest 'hot topic' – fake news – may distort people's perceptions, ideas, and behaviour.

## REDUCING THE NOISE

Many relevant research communities and several recent initiatives have already acknowledged the need to be able to expose this noise. They focus on the automatic discovery of information by adopting semantic search and retrieval technologies, adapting this to the particularities of social media. However, there's more to it than that: news-gathering on social media is not only about semantic search and technology, but also about hidden social values. There is no such thing as bare content:

### NAME OF PROJECT:

REVEAL - REVEALing hidden concepts in Social Media

### WEBPAGE:

<https://revealproject.eu>

### PROJECT BUDGET (TOTAL):

EUR 6.925.004

### BELGIAN UNIVERSITY:

KU Leuven

### RESEARCHER:

Prof Peggy Valcke

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under ICT, Grant Agreement No. 293605.



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all content has interconnected and interacting sources. If science can manage to decipher these interactions, we will be able to reveal much more than the direct meaning, or what is evident 'on the surface'.

### ADVANCING THE TECHNOLOGY

Complete models of small and large societies, interacting vividly in real time, are engraved in the content that is residing in social networks. Along these lines, companies, software developers, research centres, universities, and an international public broadcaster joined forces in the REVEAL project funded under the Framework Programme. They started the project to advance the necessary technologies for making a higher-level analysis of social media possible, thus enabling users to reveal hidden information.

### EXPOSING THE NOISE: VERIFICATION TOOLS FOR INFORMATION ON SOCIAL MEDIA

By discovering higher-level concepts hidden within content produced by users of social media, the researchers were able to create (and integrate) content verification tools for social media. These tools and metrics help to tackle the problem of online fake news by addressing the trustworthiness of information and revealing the 'hidden modalities' of a story. For example, the image forensics tools help spotting manipulated content, while Truthnest allows for the assessment of the reputation of the author or truthfulness of a particular post, thereby facilitating the discovery of newly generated fake content. With the help of science we are entering a stage that allows us to automatically judge the quality and trustworthiness of content, and even predict future trends.

Although the project only recently ended, the uptake of the results has been significant. The results and tools developed within REVEAL are used by fact checkers, journalists and organisations around the world, including Deutsche Welle and Amnesty International.

"We need an ambitious European research & innovation framework that funds the best scientists (ERC), educates the next generation of critical thinkers (MSCA), and enables interdisciplinary research to help society at large distinguish fact from fiction."

LUC SELS  
RECTOR  
KU LEUVEN



University of Mons

# PROSPER

## BIOMOLECULAR SENSORS TO IMPROVE YOUR HEALTH AND SAFETY

### TRYING TO TACKLE HEALTH AND SAFETY PROBLEMS

To reduce the effects of certain threats to our health and safety, several efforts can be taken. For instance: when being ill, we can resort to medicine. If we are injured, surgery is possible. And fearing a threatening disease, several tests can be applied.

But of course, many of these threats could be tackled far more accurately. Something we wish we had known about a disease before, so medicine could have been taken from the start and could have been more effective. And if a patient needs surgery, it would improve his recovery if the surgery was not that invasive.

### COLLABORATING TO IMPROVE EXISTING SENSORS

Scientists from fields such as photonics, bio-chemistry and endoscopy decided to collaborate with the aim of contributing to the development of a new class of biochemical optical sensors that could significantly improve the healthcare of the future. They wanted to help patients in earlier stage, with less invasive techniques, or with better chances of monitoring and prediction.

### SENSORS FOR NON-INVASIVE AND EARLY DETECTION

The PROSPER research group based this new class of biosensors on a functionalised polymer optical fibre. In this fibre, specially designed refractive-index gratings have been written. On this surface of grafted fibre, immobilised biomolecular receptors are then placed. By the monitoring of wavelength shifts in these receptors, the sensors are able to make a label-free detection.

Such biosensors exhibit a limit of detection of  $\sim 1$  pM in real time, which is classical for biodetection.

Although generic and able to work in various areas such as environmental monitoring, food analysis, agriculture or security, the proposed biosensors have been targeted for non-invasive medical diagnostics where they present the most ground-breaking nature. Indeed, unlike bulk structures, they require reduced reaction volumes for

#### NAME OF PROJECT:

PROSPER - Development of Polymer Optical Fibre Gratings for Endoscopic Biosensing Purpose

#### WEBPAGE:

<https://hosting.umons.ac.be/aspnet/erc-prosper/index.html>

#### PROJECT BUDGET (TOTAL):

EUR 1.438.368

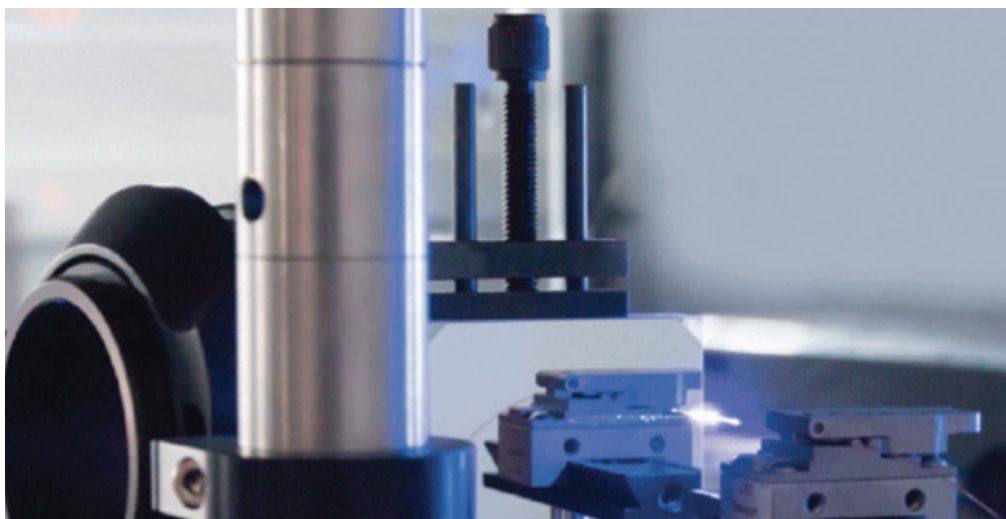
#### BELGIAN UNIVERSITY:

University of Mons

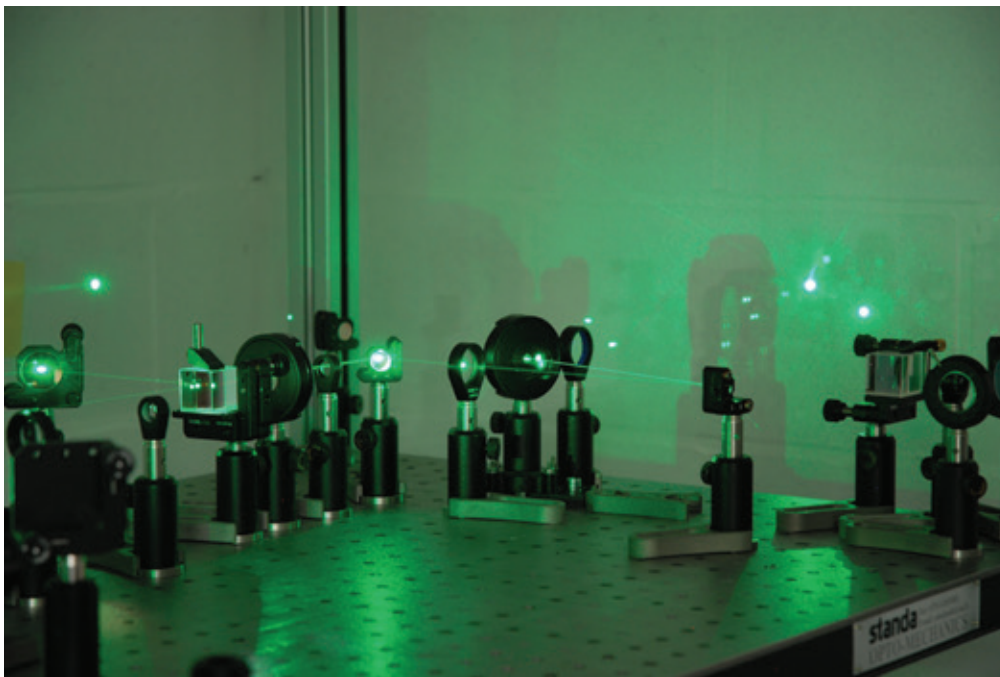
#### RESEARCHER:

Christophe Caucheteur

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) IDEAS/ERC, Grant Agreement No. 280161.







ex vivo measurements and present the advantageous possibility of assaying several parameters simultaneously (e.g. several cancer-associated antigens in one sample). As a result, statistical analysis of these parameters can potentially increase the reliability and reduce the measurement uncertainty of a diagnosis over single-parameter assays. More importantly, the proposed biosensors have the unique potential to be used in vivo in an endoscope, which would considerably improve the diagnosis.

#### TOWARDS SEVERAL APPLICATIONS

Thanks to the outcomes of the PROSPER project and other technologies developed at UMONS, a spin-off has been created created B-SENS, a Belgian company specialised in the development of OEM sensors based on the fiber Bragg grating technology. Its unique expertise lies in the design, realisation and implementation of physical and (bio) chemical sensors. These sensors are provided to customers to ensure the safety of goods and people.

Optical fiber gratings yield miniaturised sensors that can be distributed, remotely monitored or inserted into small spaces, allowing their use in numerous fields. Their association with a specific sensitive layer reveals their most ground-breaking nature, opening the way to in situ (bio)chemical and physical sensing and offering great, perhaps even revolutionary, new capabilities of sensors deployment. In this configuration, the grating is a generic and adaptive device while the sensitive layer brings the specificity.

The B-SENS team possesses an exclusive know-how in physical and (bio)chemical sensors. Based on the clients' specifications, B-SENS is the right partner for advanced sensors development in various applications such as early fire detection, hydrogen leak detection, pollution monitoring, strain monitoring inside composite materials, railway traffic monitoring, concrete drying process monitoring, structural health monitoring of windturbine blades, smart needles for use in clinical endoscopy, minimally-invasive cancer diagnosis.

"New materials, sensors and health are some of the key sectors of research for our university. The PROSPER project, through financing from Europe, allowed UMONS to put in place a multidisciplinary team aiming at contributing to the development of a new class of biochemical optical fiber sensors that can significantly improve the healthcare of the future. This team is still active in our laboratories and pursues its work towards minimally-invasive cancer diagnosis. The support of the European Commission in funding research and innovation projects is crucial for creating unique opportunities to share and transfer knowledge in Europe and in the world."

RUDDY WATTIEZ  
VICE RECTOR FOR RESEARCH  
UNIVERSITY OF MONS



Vrije Universiteit  
Brussel

# CYBERLEGS FOR A CLOSE ENCOUNTER WITH REAL LIMBS

## THE PROSTHESES AS A WOULD-BE LIMB

Amputation surgery is one of the most traumatic experiences a person can go through. Losing a limb is not only a huge psychological burden, but it brings along a whole range of daily, more physical inconveniences as well.

Most amputees will call for the help of a prosthesis. This new limb will help them to partially retrieve some part of their former mobility. The prosthesis will enable the amputee to walk, to hold his child, or to show someone around again.

Nevertheless, despite the evident added value of a prosthesis, the patient will experience many shortcomings as well. For instance, current prostheses are heavy. They don't have the perfect shape to go with your specific body either. And they can't be moved as easily as real limbs, limiting the patient in many of its movements and causing back and muscle pain in the long run.

In short, a prosthesis is not an exact copy of the limb at all. It falls short in mimicking the large variety of the natural functions of the former limb and can be no more than a half-hearted substitute. Because of that, the relation of a patient to its prosthesis is often only half-hearted as well.

## A LIMB-LIKE PROSTHESES

Scientists wanted to do more for these people. What if it were possible to make a prosthesis that does not simply look like a new arm or leg, but also functionally replaces the amputees' lost limb? What if science were able to make an ortho-prosthesis that not only enables the patient to walk again, but also restores its mobility in much more detail, so the patient can reconsider walking on slopes and mounting stairs?

### NAME OF PROJECT:

CYBERLEGS – The CYBERnetic LowEr-Limb CoGnitive Ortho-prothesis

### WEBPAGE:

[www.cyberlegs.eu](http://www.cyberlegs.eu)

### PROJECT BUDGET (TOTAL):

EUR 3.460.630

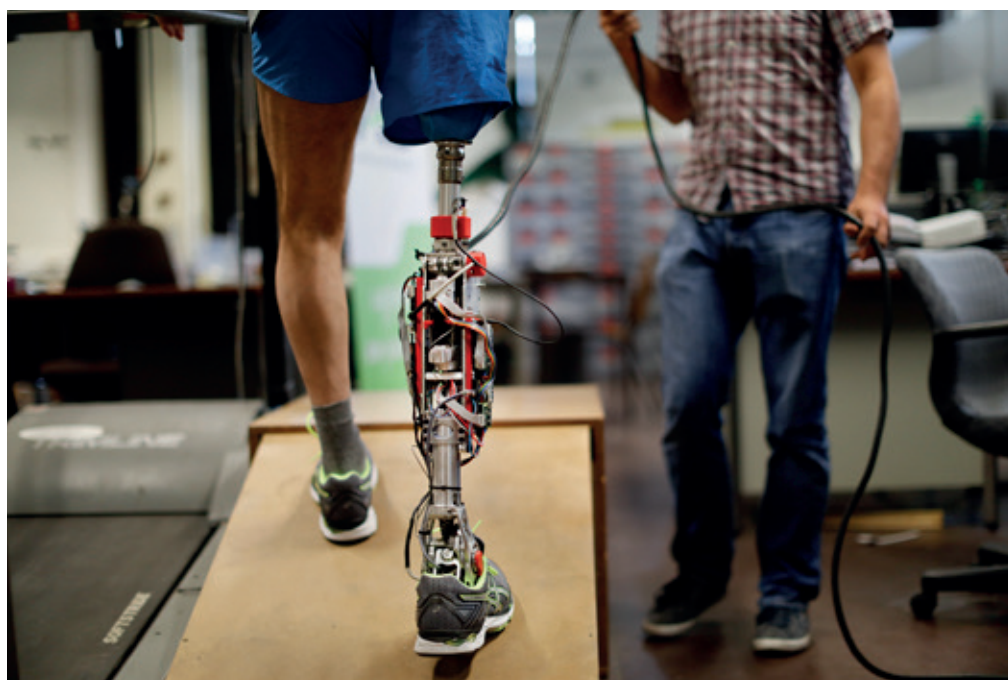
### BELGIAN UNIVERSITY:

Vrije Universiteit Brussel

### RESEARCHER:

Dirk Lefebvre

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under ICT, Grant Agreement No. 287894.



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In short: the researchers wanted to combine robotic technologies and the inspiration of the human body to develop innovative prosthetic legs and to improve amputees' quality of life.

### ABOUT MECHANISMS AND INTENTIONS

With the financial support of the Framework Programme, an interdisciplinary research group was established. The scientists made an active ankle-knee prosthesis consisting of two compliant and active joints, mimicking the bone structure of an ankle. Motors and elasticity were added to replace the lost muscles and Achilles tendon. Finally, a locking mechanism made it possible to include or exclude a parallel spring in the knee.

The CYBERLEG-prosthesis, as it was called, combines two benefits: on the one hand, it gives the patient all the assistance that normal gait gives, but on top of that it adds energy whenever necessary, by use of the motors.

The most innovative feature of the CYBERLEG, however, is that it also 'understands' the intentions of the user: it will follow the user's goal, allowing for movements that are much closer to what a real ankle does. The CYBERLEG thus provides natural adaptability of the prosthesis to different terrains and slopes. In doing so, it will moreover prevent the amputee from falling, using a multi-sensory fusion algorithm based on the observation of the motion of the amputee's body, the interaction force between the CYBERLEG and the amputee, and their forces interaction with the ground. Finally, the amputee will receive efferent feedback from the CYBERLEG as well, creating a loop of information on movement and intentions that make the CYBERLEG feel like a part of his or her own body.

### BENEFITS FAR BEYOND MOBILITY

The prototypes of CYBERLEG were already proven to work both in and outside the lab environment. At the University of Brussels (VUB), a 59-year old amputee was invited to come and test the new type of prosthesis at Cybathlon, an international championship for people with disabilities competing in six disciplines, using advanced assistive devices including robotic technologies.

The man with the CYBERLEG was able to successfully complete the obstacle course. He proved that wearing this prosthesis, he could get up from a chair, mount stairs or walk up a slope much better than someone with a classical prosthesis.

The results are just as promising on the psychological level, with which we started this article: CYBERLEG-patients find it much easier to integrate in society again, restore their self-image, and take up the life, love and job they had before their limb was amputated.

Moreover, these successful real-life demonstrations are very promising for commercial uptake in the very near future. At the Vrije Universiteit Brussel (VUB) itself, a company called Axiles Bionics was founded, and no less than eight patents have already been applied for by the consortium. The possibilities of this new type of prosthesis are enormous. Amputees have never been closer to leading a normal life.



"CYBERLEGs is a beautiful example of how amputees can regain their mobility with robotics. In this kind of multidisciplinary projects, where humans and robotics take centre stage, we can only make the difference with European support."

KARIN VANDERKERKEN  
VICE RECTOR RESEARCH POLICY  
VRIJE UNIVERSITEIT BRUSSEL





University of Namur

## CAPCAN

# UNDERSTANDING HOW DOGS CAN CAUSE SEPTICEMIA TO HUMANS

### AN EMERGING DISEASE

*Capnocytophaga canimorsus* are normal bacteria of the oral microbiota of dogs, together with bacteria belonging to hundreds of different species. Although it is not a pathogen for dogs, *C. canimorsus* can cause septicemia to humans that have been in contact with a dog. The disease often evolves to a septic shock with peripheral gangrene. Despite amputations and adequate antibiotic treatment, the mortality ranges between 18 and 40 percent. The number of cases where septicemia is observed is about four cases per million inhabitants per year. Since the first record of a *C. canimorsus* infection in 1961, many and increasing case reports have been published in the clinical literature. However, few scientists address the question of why this bacterium is so dangerous to humans.

### DEVELOPING WAYS OF PREVENTION

The ERC project CAPCAN consisted of an in-depth study of *Capnocytophaga canimorsus* aiming at understanding why *C. canimorsus* bacteria are so virulent for humans. In particular, the research group tested the hypothesis that not every strain of *C. canimorsus* is equally dangerous to humans, an hypothesis that springs from the fact that the disease is very rare with regard to the high number of dogs in close contact with humans.

### LEARNING ALL THERE IS TO KNOW ABOUT *C. CANIMORSUS*

The European project, led by the University of Namur, unravelled different basic mechanisms of pathogenesis that are specific to this pathogen. In particular, the scientists dissected the molecular surface structures of *C. canimorsus*, they described a polysaccharidic capsule playing an important role in the infection and they characterized the genes involved in its assembly pathway. Taking advantage of a collection of strains isolated worldwide from patients or from healthy dogs, they compared the capsules by antigenic and genetic means.

#### NAME OF PROJECT:

CAPCAN - Molecular and Genetic Study of the human infections by *Capnocytophaga canimorsus*

#### WEBPAGE:

[https://cordis.europa.eu/project/rcn/103906\\_en.html](https://cordis.europa.eu/project/rcn/103906_en.html)

#### PROJECT BUDGET (TOTAL):

EUR 1.473.338

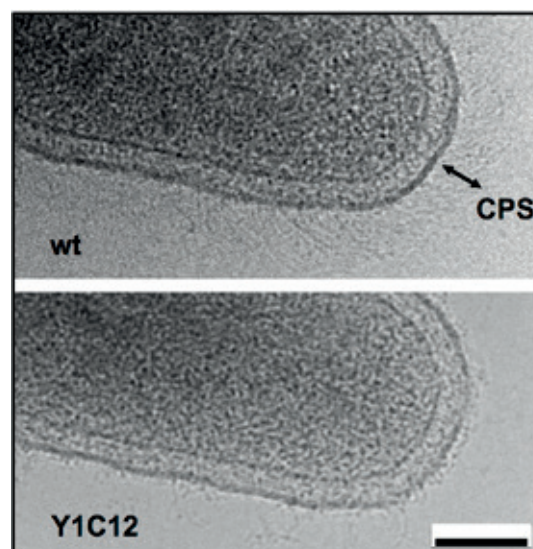
#### BELGIAN UNIVERSITY:

University of Namur

#### RESEARCHER:

Prof Guy Richard Cornelis

This project has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under the ERC, Grant Agreement No. 293605.



The capsular polysaccharide (CPS) of *C. canimorsus*

Cryo-Electron microscopy images of wild type (wt) and capsular deficient (Y1C12) mutant bacteria.

Taken from reference Renzi, F, et al. (2016) *Sci Rep* 6: p. 38914.



### NOT EVERY STRAIN OF *C. CANIMORSUS* IS EQUALLY DANGEROUS

While there was a great diversity in the capsules from bacteria isolated from dogs, there was very little diversity among the capsules from bacteria isolated from human infections. These results prove the hypothesis that a small minority of dog-hosted *C. canimorsus* is more virulent for humans than the others and hence that the dogs carrying these *C. canimorsus* strains are more dangerous to humans. This finding is of the utmost importance because it paves the way for prevention.

A polymerase chain reaction test allowing the identification of the dogs carrying the more virulent strains of *C. canimorsus* was developed and patented. Furthermore, to complete the last proof-of-concept stages to bring the test towards the market, the prevalence of the dangerous strains isolated from human infections and from dog mouths has been strengthened on a higher number of strains. In addition, the transmission of the dangerous strains between dogs is currently studied.

The basic research of this project has brought major insights into the biology and pathogenesis of *C. canimorsus* microorganisms. In addition, the research opened the door to the prevention of these life-threatening infections. Both societal and economic impacts are foreseen. The identification of the dogs carrying the pathogenic strains will allow prevention measures and awareness of the risks that these dogs represent. This could lead to the saving of human lives and spare the heavy and costly management of these severe infections that frequently lead to amputation of limbs.

In addition, the identification of the dogs carrying the more virulent strains could lead to a “Pathogenic *C. canimorsus* free status” useful for professional dogs such as assistance dogs, police dogs or rescue dogs. One could then decide to invest the costs associated to the training of these dogs only into examined and negative dogs. Finally, the *C. canimorsus* condition is a parameter that could also be added to the sanitary status of dog breeding facilities. In a long term perspective, the CAPCAN project provided the basis for the elaboration of an anti-carriage vaccine for dogs.



“The mission of every university is, not only to diffuse knowledge, but also to produce new knowledge, which requires providing an essential place for fundamental research. The support of research and innovation is crucial for next-generation applications. CAP-CAN, a research project funded under the ERC is a nice example of how fundamental research on the biology and pathogenesis of a microorganism can lead to a potential and valuable design for the prevention of a life-threatening infection in humans.”

CARINE MICHIELS  
VICE RECTOR FOR RESEARCH AND  
INTERNATIONAL RELATIONS  
UNIVERSITY OF NAMUR





# TRAINING THINKERS AND DOERS

Universities bring about a direct connection between research and education. They are hubs for knowledge production, knowledge exchange and knowledge transfer to society. Therefore, they are key players in training the next generation of researchers, innovators, independent thinkers and high-performing staff. With the Marie Skłodowska-Curie Actions (MSCA), the European Framework Programme for Research and Innovation supports universities in training the next generation knowledge workers.

MSCA grants allow fellows to prepare for the international job market, by helping them to develop their language, writing, leadership, organizational, management and entrepreneurial skills. For young researchers, whether they aspire a career in the public or private sector, MSCA grants create opportunities for having a first experience with European funding, facilitate building up an international network, provide the basis for setting up new collaborative research projects in the future, or provide the necessary means for researchers to obtain their PhD. The MSCA program therefore not only supports excellent science, but at the same time trains young people to find a challenging position on the international job market, as the following cases illustrate.

“The Poder network is great community of early-career researchers in development economics. I have and still benefit from the discussions and exchange with my fellow members. At the same time, the fellowship also opened up a vast network and interactions with leading thinkers and academics in the field. The summer schools and targeted skill training offered by the programme greatly helped in advancing my technical skills as well as general writing skills, writing proposals for funding and handling the interaction with and on different media outlets. Thus, following my fellowship I could secure a number of collaborations and funding for my current research projects.”

DR RENATE HARTWIG



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“The fellowship is highly competitive and requires a lot of preparation work. Nevertheless, the material conditions that it offers and its radiance have definitely opened doors for me. It allowed me to enter a scientific field and to make lasting contacts with its best players. Moreover, this experience also played an important role in my nomination in a permanent academic position.”

DR NICOLAS MARQUIS

These projects have received funding from the European Union's FP7 or Horizon 2020 research and innovation programmes under the Marie Skłodowska-Curie grant agreements No. 608109, 624697, 251211, 722416, 299554, 264694 and 213543.



"Thanks to a double experience in MSCA Networks as Early Stage Researcher and as Experienced Researcher I was able to develop myself as an independent researcher with an International profile. The technical and transversal skills gathered at my university and Siemens PLM Software allowed me to obtain further personal grants and participate in the writing of several MSCA proposals. My current position as a Research Engineering Manager within Siemens PLM Software is a perfect spot to work with young talented researchers and transfer my academic skills to an industrial environment. On top of it all, I got many new colleagues and friends thanks to the network!"

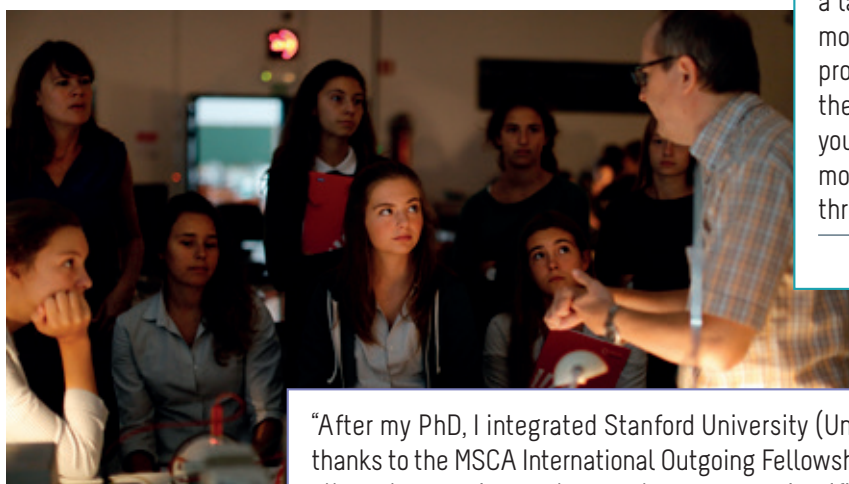
DR TOMMASO TAMAROZZI



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"Doing my PhD studies within an MSCA Innovative Training Networks project has provided me with the valuable opportunity to take part in ongoing discussions in my research field and to receive feedback from a large group of international scholars. The mobility and interactivity aspect of the program has allowed me to gain insight in the current work and struggles of fellow young researchers, as well as to engage more profoundly with the local context through the secondment organised."

MS MELA ZULJEVIC



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"After my PhD, I integrated Stanford University (United States) to perform my postdoctoral studies thanks to the MSCA International Outgoing Fellowships for Career Development grant. The fellowship allowed me to rigorously complement my scientific training in Immunology, gain a lot of scientific independency and acquire additional writing, networking, leadership, mentoring and financial skills. The one-year return phase is also highly appreciable, as it gave me some time to establish myself in a host lab in Europe, and to prepare the ground to apply for a tenured or tenure-track position in the Institute of my choice. I recommend any young researcher to apply to MSCA fellowships!"

DR THOMAS MARICHAL



© Christophe Vander Eecken

"The MSCA grant has had an important impact on my career. Managing my own project gave me the opportunity to act as an independent researcher, and be considered as such by my peers. Attending conferences enlarged my scientific network, and training extended my scientific skills. MSCA is an excellent step towards an independent scientific career."

DR ALICE FOUCART

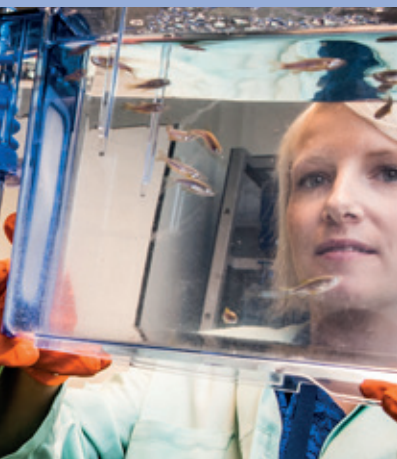


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That is why the Belgian Universities, once again, stress the importance of giving priority in the next Multi-Annual Financial Framework to the 9th EU Framework Programme for Research and Innovation (FP9).



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