

**Frontiers of Knowledge Award in Development Cooperation**

## **The BBVA Foundation distinguishes Pedro Alonso and Peter Myler for their part in major advances against infectious diseases afflicting the world's poorest countries**

- Alonso has fought to turn the tide against malaria through the use of insecticide treated bednets, which have cut mortality rates by 60%, and the trials of the first ever vaccine to achieve partial effectiveness against the disease
- Myler led the genetic sequencing of the parasites causing leishmaniasis and Chagas disease, a milestone in basic research that has allowed to identify dozens of therapeutic targets for future vaccines and treatments
- The award recognizes the importance of multi-pronged, complementary strategies, like those deployed by the laureates, in addressing the complex challenges posed by these conditions
- "The innovations behind the approaches pioneered by the two winners are poised to become critical parts of a more successful strategy to reduce infectious disease burdens in developing countries," in the words of the jury's citation.

**Madrid, February 28, 2017.-** The BBVA Foundation Frontiers of Knowledge Award in the Development Cooperation category goes, in this ninth edition, to researchers Pedro Alonso and Peter Myler, for their pivotal role in the fight against infectious diseases that affect millions of people throughout the developing world, and claim hundreds of thousands of lives, with children among the most vulnerable. Alonso's work has been crucial to the latest advances against malaria, which have delivered a 60% reduction in mortality rates over the past 15 years. Myler's research is opening vital avenues for the development of future drugs or vaccines against what are widely referred to as poverty-related or neglected diseases.

"We do not believe there is a magic bullet against these conditions," reflects jury chairman Joachim von Braun. "That is why we have chosen to recognize achievements that start from distinct angles, in this case clinical practice and research of the most basic nature." The former, represented by Alonso's contributions, is about concrete outcomes in the here and now, while the latter about laying the fundamental groundwork for future advances.

In the case of Pedro Alonso (Madrid, Spain, 1959) the jury singled out two achievements: his demonstration in the 1980s that insecticide treated bednets protect against malaria, and his successful testing in the 2000s of vaccines against the disease. These contributions, the citation points out, "have emerged as the two main pillars of malaria control." Alonso, Professor of International Health at the University of Barcelona, also heads the Global Malaria Program of the World Health Organization in Geneva (Switzerland).

Peter Myler (Rockhampton, Australia, 1956) has pioneered the application of the latest genomic technology to the endemic diseases that afflict developing countries. In 2005, he managed to sequence the genome of the parasites responsible for two of these conditions, leishmaniasis and Chagas disease: an advance described by the jury as "opening a route to develop new drugs to fight these and potentially other infectious diseases." Myler is Director and Principal Investigator at the Seattle Structural Genomics Center for Infectious Disease (United States).

"The innovations behind the approaches pioneered by the two award winners," the citation continues, "are poised to become critical parts of a more successful strategy to reduce infectious disease burdens in developing countries."

### **Six million deaths averted**

Pedro Alonso welcomed the award's endorsement of "multidisciplinarity and complementary strategies as the best way to tackle complex problems like the fight against infectious diseases. The key to success is a multidisciplinary approach, with one of the fundamental strands being basic biology and new genomic tools."

Malaria is a parasitic infection contracted each year by some 200 million people. Of this number, 400,000 will not survive, the great majority of them African children. It is in fact the fourth cause of childhood death worldwide. The disease also imposes an immense economic burden that holds back the development of countries where it is endemic. It is transmitted by bites from *Anopheles* mosquitos infected in turn by the *Plasmodium* parasite, and there is as yet no vaccine that can stop contagion. Yet in the last 15 years, mortality rates have come down by as much as 60%, equating to six million deaths averted, mostly among children under five. This statistic is largely due to the preventive measure in widest use: bednets impregnated with long-lasting insecticide.

It is here that Pedro Alonso's work has proved game-changing: "I had the honor of leading the first study which proved, against all expectations, that the use of insecticide treated bednets was highly effective," the new laureate explains. "It has since become a first line of control in the fight against malaria. A technology that costs little but is hugely beneficial."

The results of the study he led in The Gambia on the effectiveness of bednets appeared in *The Lancet* in 1991. This approach was at the time viewed with skepticism. The few studies conducted had come up with sparse and

inconclusive evidence in favor of bednets, to the extent that their use was about to be discontinued. Alonso's team laid the controversy to rest, showing that children who slept under insecticide treated bednets were less likely to catch malaria.

This finding was corroborated by further studies under the umbrella of the World Health Organization (WHO), resulting in over one billion bednets being distributed in the last decade alone.

Alonso was also actively engaged in the search for a vaccine, and in the 2000s led the first studies which proved that vaccine-induced immunity could reduce the risk of malaria, a concept widely doubted at the time.

He did not stop there but went on to head trials of what is now considered the most advanced vaccine available, the first to receive a positive recommendation from the European Medicines Agency. At the end of 2016, the WHO announced that the RTS,S vaccine – trade name Mosquirix – would be implemented in pilot schemes in three Sub-Saharan countries starting in 2018.

“The vaccine we have is not perfect,” Alonso admits, “in fact it is far from being so. But it is still good enough for the WHO to authorize the launch of a trial program involving hundreds of thousands of children in three African countries.”

### **Genomics against neglected diseases**

Peter Myler is aware that the work being done by himself and his colleagues “is vital for the development of future drugs or even vaccines against these diseases.” He is also confident of their success, while aware that the parasites they face are sophisticated enemies. “The genome is like an organism's instruction manual. It tells us about its internal mechanisms so we can find new tools to combat it effectively.”

Myler began his career in his native Australia working with malaria, before moving to the United States to take up a postdoc place at the center where he now works, heading a program that applies the latest genomic and computational biology techniques to elucidate “how parasites function at the molecular level.” The basic knowledge generated in his work has enabled the identification of dozens of new pharmacological targets and “has proved indispensable for the hundreds of research groups worldwide” investigating in the area.

A number of drugs now at the trial stage are a product of Myler's contributions, though he is quick to warn that none of them will provide a definitive solution for these diseases: “The problem is that parasites are continually turning resistant, so we will need to keep on developing new drugs.”

The parasites he has battled with most, *Leishmania* and *Trypanosoma cruzi*, cause the deaths of tens of thousands of people each year. The incidence of cutaneous leishmaniasis, the most common form in humans, is reckoned at

around one and a half million cases annually, mainly in North Africa, the Middle East, North West India and China. *Trypanosoma* is responsible for Chagas disease, which affects from six to seven million people, primarily in Latin America. Another of its variants causes sleeping sickness in Africa.

Both Myler and Alonso see a clear and urgent need for more research to combat these conditions. For Alonso, "it is the duty of advanced societies like Spain to aid in the fight against diseases that afflict poor countries. The solutions are there, but only if we put the resources in place to unlock new knowledge." Myler, meantime, bemoans the fact that conditions like leishmaniasis are "barely known," and calls for society to "wake up to their importance so we can raise the funds needed to deal with them effectively."

### Bio notes

**Pedro Alonso** (Madrid, Spain, 1959) graduated in medicine from the Universidad Autónoma de Madrid in 1984. He then went on to complete an MSc at the London School of Hygiene and Tropical Medicine, and later a PhD in the University of Barcelona. From 1992 to 2000 he headed the Epidemiology and Biostatistics Unit at Hospital Clínic in Barcelona. In 1996, he founded the Manhica Health Research Centre, CISM (Mozambique) where he served as Scientific Director until 2008. Other former posts include that of Head of the Center for International Health at Hospital Clínic de Barcelona (2001-2014), Director of the Barcelona Centre for International Health Research (CRESIB) (2006-2014) and Director of the Barcelona Institute for Global Health, ISGlobal (2010-2014), which he also founded. He is currently Director of the WHO's Global Malaria Program in Geneva (Switzerland).

**Peter Myler** (Rockhampton, Australia, 1956) is Professor and Director of Core Services at the Center for Infectious Disease Research (Seattle, United States). In 1982, he earned a PhD in Biochemistry from the University of Queensland (Australia). After conducting post-doctoral research on antigenic variation in African trypanosomes at the Issaquah Health Research Institute and Washington State University, he was one of the forces behind the development of Seattle Biomed, forerunner of today's Center for Infectious Disease Research. In 1993, he became Assistant Professor in Pathobiology at the University of Washington, where he is currently Affiliate Professor in the departments of Global Health and of Biomedical Informatics & Medical Education, and a member of the Molecular and Cellular Biology program. In the last 15 years, Myler has been at the forefront of applying genomic technologies to increase understanding of the molecular mechanisms governing gene expression during *Leishmania* differentiation. He is Director and Principal Investigator at the Seattle Structural Genomics Center for Infectious Disease (SSGCID).

## About the BBVA Foundation Frontiers of Knowledge Awards

The BBVA Foundation has as its core objectives the promotion of scientific knowledge, the transmission to society of scientific and technological culture, and the recognition of talent and excellence across a broad spectrum of disciplines, from science to the arts and humanities.

The **BBVA Foundation Frontiers of Knowledge Awards** were established in 2008 to recognize outstanding contributions in a range of scientific, technological and artistic areas, along with knowledge-based responses to the central challenges of our times. The areas covered by the Frontiers Awards are congruent with the knowledge map of the 21st century, in terms of the disciplines they address and their assertion of the value of cross-disciplinary interaction.

Their **eight categories** include classical areas like Basic Sciences and Biomedicine, and other, more recent areas characteristic of our time, ranging from Information and Communication Technologies, Ecology and Conservation Biology, Climate Change and Economics, Finance and Management to Development Cooperation and the innovative artistic realm that is Contemporary Music.

The BBVA Foundation is aided in the organization of the awards by the **Spanish National Research Council (CSIC)**, the country's premier public research agency. As well as designating each jury chair, the CSIC is responsible for appointing the technical evaluation committees that undertake an initial assessment of the candidates put forward by numerous institutions across the world, and draw up a reasoned shortlist for the consideration of the juries.

### Development Cooperation jury and technical committee

The jury in this category was chaired by **Joachim von Braun**, Professor and Director of the Department for Economic and Technological Change at the Center for Development Research (ZEF) of the University of Bonn (Switzerland). The jury secretary was **José García Montalvo**, Professor of Economics and Chairman of the Department of Economics and Business at Pompeu Fabra University (Spain). Remaining members were **Antonio Ciccone**, Chair of Macroeconomics and Finance in the Department of Economics at the University of Mannheim (Germany), **Vicente Larraga**, Research Professor and Head of the Molecular Parasitology Laboratory at the Center for Biological Research of the Spanish National Research Council (CSIC), **Norman Loayza**, Lead Economist in the Development Research Group of the World Bank (United States), and **Francisco Pérez**, Professor of Economic Analysis at the University of Valencia (Spain), and Research Director of the Valencian Institute of Economic Research (Ivie).

The CSIC technical committee was coordinated by **Ana Guerrero**, the Council's Deputy Vice President for Scientific and Technical Areas, and formed by: **Francisco Tomás**, Coordinator of the Food Sciences and Technology Area and

Research Professor in the Centro de Edafología y Biología Aplicada del Segura (CEBAS); **Ramón González**, Research Professor at the Institute of Grapevine and Wine Sciences (ICVV); **Enrique Playán**, Coordinator of the Agricultural Sciences Area and Research Professor at Aula Dei Experimental Station (EEAD); and **José Antonio Berenguer**, Coordinator of the Humanities and Social Sciences Area and Research Scientist at the Institute of Languages and Cultures of the Mediterranean and the Middle East (ILC).

### Previous awardee in this category

The **Development Cooperation** award in last year's edition went to economist **Martin Ravallion**, who by quantifying the threshold of extreme poverty enabled the setting of specific development cooperation goals and the design of plans and strategies for its alleviation.

**Five of the 79 winners in earlier editions of the BBVA Foundation Frontiers of Knowledge Awards have gone on to win the Nobel Prize.** **Shinya Yamanaka**, the 2010 Biomedicine laureate, won the Nobel Prize in Medicine in 2012; **Robert J. Lefkowitz**, awardee in the same Frontiers category in 2009, won the Chemistry Nobel in 2012. In Economics, Finance and Management, three Frontiers laureates were later honored with the Nobel: **Lars Peter Hansen**, winner of the Frontiers Award in 2010 and the Nobel Prize in 2013; **Jean Tirole**, Frontiers laureate in 2008 and Nobel laureate in 2014; and **Angus Deaton**, 2011 Frontiers laureate and Nobel laureate in 2015.

#### LAUREATE'S FIRST DECLARATIONS AND IMAGES

A video recording of the new laureate's first interview on receiving news of the award is available from the Atlas FTP with the following coordinates:

Server: **5.40.40.61**

Username: **agenciaatlas5**

Password: **premios**

The name of the video is:

**"PREMIO COOPERACIÓN"**

In the event of connection difficulties, please contact Alejandro Martín at Atlas:

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