



**European Research Council**  
Established by the European Commission

**12 February 2016**  
**ERC Consolidator grants 2015**  
**Examples of projects**

**Environmentally-friendly alternatives to fight insects invasions**

Dr Jérémy Bouyer proposes to develop biological technologies to control three types of pest insects (mosquitoes, tse-tse flies and Mediterranean fruit flies), two of which are presently invading Europe. If successful, his approach would be well placed as an environmentally-friendly alternative to fight insects transmitting human, animal and plant diseases, including Zika virus, without insecticides that raise concern for their toxicity for health and environment.

His team will work to improve the « sterile insect technique » which consists in mass rearing male insects, sterilizing them by radiation and releasing them into the environment, where they compete with their wild, non-sterile counterparts to reproduce. The objective is to reduce the fertility of the overall population and eventually cause its collapse. Their « boosted sterile insect technique » consists in ensuring that the males also transmit substances to the females that kill them or their progeny.

Researcher: Jérémy Bouyer

Host Institution: Centre de Cooperation International en Recherche Agronomique pour le Developpement (CIRAD)

ERC project: Revolutionizing Insect Control (REVOLINC)

ERC funding: €1.99 million over five years

**When states say sorry - political apologies across cultures**

In the past decades, there has been a rise in the number of apologies offered by states for injustices and human rights violations. But how well do political apologies fit in different cultures? Do they have a universal potential to redress injustice or restore harmony? Dr Juliette Schaafsma from Tilburg University will bring scholarship on transitional justice and reconciliation together with cross-cultural psychology and anthropology, to investigate how political apologies are viewed across cultures and. She aims to build a theoretical framework regarding the potential value and role of political apologies. It is the first time these questions will be systematically addressed. Dr Schaafsma aims to lay the foundations for new research and theorizing on ways to restore justice and promote reconciliation in the aftermath of wrongdoings.

Researcher: Juliette Schaafsma

Host Institution: Tilburg University (Netherlands)

Project: Political Apologies across Cultures (APOLOGY)

ERC funding: €1.9 million over five years



**European Research Council**

Established by the European Commission

### **Osteoporosis: teaching old bones new tricks**

One out of five people in their fifties will experience a bone fracture due to osteoporosis. Millions have fragile bones and this imposes a dramatic socio-economic burden, ever larger in aging societies. Prof. Chiara Vitale-Brovarone from Politecnico di Torino aims to revolutionize the current osteoporosis treatment by bringing in the contribution of biomaterial scientists. Bone remodelling, is a natural process in which mature bone tissue is removed by osteoclasts followed by the production of new bone by osteoblasts. As people age the balance becomes negative. By using smart synthetic bone and other novel techniques, Prof. Vitale-Brovarone will locally “trick” aged bone cells to act as healthy ones and treat osteoporosis fractures. Her research is opening a new approach with smart, biomimetic strategies to treat aged, unbalanced bone tissues.

Researcher: Chiara Vitale-Brovarone

Host Institution: Politecnico di Torino (Italy)

Project: Biomimetic trick to re-balance osteoblast-osteoclast loop in osteoporosis treatment: a topological and materials driven approach (BOOST)

ERC funding: €1.97 million over five years

### **Vision restoration – a step closer**

Healing the blind has required miracles since biblical times. Dr Balázs Rózsa's research could bring us closer to sight restoration without the help from supernatural. Working at the Institute of Experimental Medicine of the Hungarian Academy of Sciences, he will assess the feasibility of creating an “artificial sense” and, thereby, a possible visual prosthetic.

Dr Rózsa will investigate how neural activity relates to subjective perceptions. Finding and understanding these processes will make it possible to reactivate them to provoke cortical activation similar to visual stimulation. The project includes, among others, development of high-definition three dimensional imaging for functional mapping large cell assemblies and photo activation in brain areas associated with visual perception. To test these new tools and methods, Dr Rózsa would like to restore visual perception in living mice.

Researcher: Balázs Rózsa

Host Institution: Institute of Experimental Medicine of the Hungarian Academy of Sciences (Hungary)

Project: Restoration of visual perception by artificial stimulation performed by 3D EAO microscopy (VISONby3DSTIM)

ERC funding: €2 million over five years



**European Research Council**

Established by the European Commission

### **Change in portable power generation**

Whether it is smartphones and tablets or electric cars, battery life is probably one of the main technological problems of our time. Dr Albert Tarancón from Catalonia Institute for Energy Research is taking up this challenge. His aim is to develop micro solid oxide fuel cells, as small as one euro cent, which could efficiently power portable devices.

Solid oxide fuel cells are one of the most efficient and flexible power generators, but currently they can't work at room temperature. Dr Tarancón hopes to change it. His research project combines advanced material science, nanotechnology and microelectronics to create fuel cells with higher energy densities and lower costs. If he is successful, Dr Tarancón will revolutionize portable power generation.

Researcher: Albert Tarancón

Host Institution: Catalonia Institute for Energy Research (Spain)

Project: Breaking the temperature limits of Solid Oxide Fuel Cells: Towards a new family of ultra-thin portable power sources (ULTRASOFC)

ERC funding: €1.9 million over five years

### **Why are "poor" schools underperforming?**

Traditionally, schools in low-income areas generally perform worse than schools in richer neighbourhoods. However, the factors behind this phenomenon are still unclear. Prof. Pedro Carneiro, from University College London, has just received an ERC Consolidator Grant to fully understand what drives this inequality, and how this can be tackled by policymakers.

According to Prof. Carneiro, the roots of the problem are not only economic, but they also reflect ineffective teaching, the family's role in child development and misinformation or stigma. With his team, he hopes to uncouple all these factors and understand what impact social interactions have in determining the success of welfare programmes aimed at improving the competitiveness of schools in low-income areas.

Researcher: Pedro Carneiro

Host Institution: University College London (UK)

Project: Skills and Poverty (SKILLPOV)

ERC funding: €1.9 million over five years



**European Research Council**

Established by the European Commission

### **whyBOther – Why do bacteria produce botulin?**

As well as a renowned product for cosmetic surgery, botulin is also the most acutely lethal toxin known to man. Produced by a bacterium commonly found in soil and in poorly preserved foods, botulin is known to cause tetraplegia and death in both humans and animals. Prof. Miia Lindström, from the University of Helsinki, has received an ERC Consolidator Grant to study why and how bacteria produce botulin and – importantly – how toxin production could be discouraged.

By focusing on the evolutionary strategies leading to the development of bacterial sub-populations and that don't produce the toxin, she aims to expand the current fragmented knowledge from single toxin regulators to global cellular decisions that govern the production of the toxin. Because of the vast impact of the botulinum neurotoxin, her research could have repercussions for the food, feed, medical, and agricultural sectors.

Researcher: Miia Lindström

Host Institution: University of Helsinki (Finland)

Project: Why does *Clostridium botulinum* kill? In search for botulinum neurotoxin regulators – whyBOther

ERC funding: €2 million over five years

### **More information**

[ERC website](#)