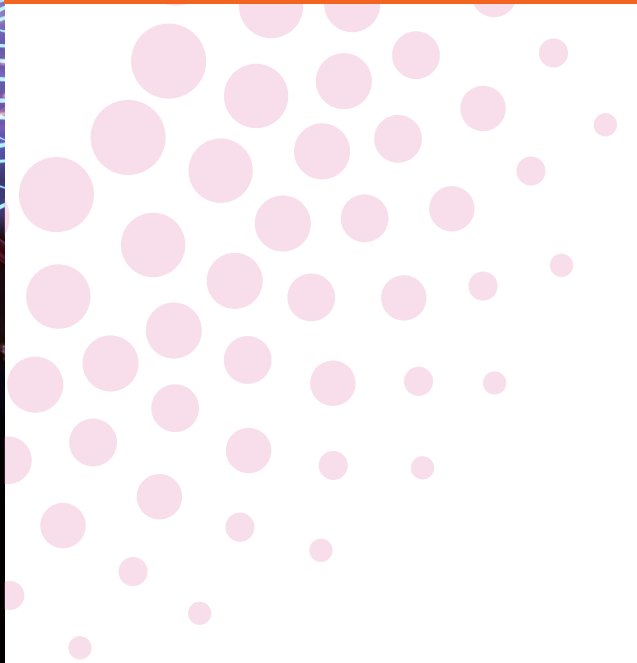




ERC projects to unlock mysteries of the human brain

European Month of the Brain
May 2013



European Research Council

Established by the European Commission

<http://erc.europa.eu>

Brain research

The brain is the most complex organ of the human body with about 100 billion neurons. The study of the development, organisation and processes of the nervous system during normal and pathological conditions is complex and highly multidisciplinary. Neuroscience is also a fast evolving field; research will bring prodigious benefits in the way we analyse, diagnose and treat human brain-related diseases as well as neurological and psychiatric disorders.

Massive efforts have been devoted worldwide to support brain research and the European Union has funded neuroscience research through several programmes. Since its creation in 2007, the European Research Council (ERC) has been supporting cutting-edge and innovative studies in neurosciences.

More than 200 research projects have been funded for a total budget of over € 250 million. About 15% of the projects funded in life sciences have a strong neuroscience component. Many of these projects address research and public health challenges and explore emerging areas in neurosciences. Questions addressed by some ERC projects deal for instance with memory and information coding in the brain, genesis and repair of the nervous system, empathy and emotion processes, cell and gene therapy for Parkinson's and Alzheimer's diseases, computation models for man-machine interaction or retinal degeneration and blindness.

Don't miss the ERC grantees European Month of the Brain 2013 Conference



**“European brain research:
successes and next challenges”
Brussels, 14 May 2013**

09:30 - 10:00

Key Note Lecture

“Neuroscience: Where we are, where we should go”

Richard G. Morris, University of Edinburgh (UK)

10:20 - 11:20

**Think smart! Understanding how the brain works to
live a better and healthier life**

“The empathic brain”

Christian Keysers, University Medical Center Groningen (The Netherlands)

“Basic research to fight paraplegia”

Martin Schwab, University of Zurich (Switzerland)

13:30 - 14:30

Think right! Brain research at the service of patients

“Sight recovery in patients with retinal diseases”

Robin Ali, University College London (UK)

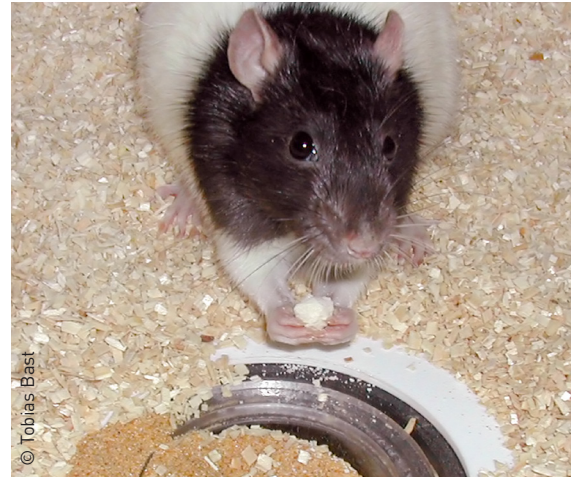
For more information:

http://ec.europa.eu/research/conferences/2013/brain-month/index_en.cfm?pg=conference&sub=general

Some ERC grantees at the European Month of the Brain

Unravelling the processes of knowledge acquisition

Knowledge has a central role in our society. To understand more about the acquisition of knowledge and the brain mechanisms underlying it, Professor Richard Morris (University of Edinburgh, UK) is determining the neurobiological basis of 'schemas' in collaboration with Professor Guillén Fernández (Radboud University, The Netherlands). Schemas are the cognitive frameworks that help to organise and interpret information around us. The researchers are conducting an interdisciplinary experimental analysis of the mechanisms of acquiring knowledge, with a focus on the rapid acquisition and assimilation of new information into existing neural schemas. The researchers test how this rapid learning depends upon two components: novelty and prior knowledge. The study integrates animal experimentation with studies on humans, combining methods ranging from optogenetics to cognitive testing. In the long-term, the project aims to contribute to newer, more effective learning strategies.



Rat eating in arena

Principal Investigator: Prof. Richard Morris

Host Institution: University of Edinburgh, UK

ERC Project: The neurobiology of schemas: knowledge acquisition and consolidation (NEUROSCHEMA)

ERC Call: Advanced Grant 2010

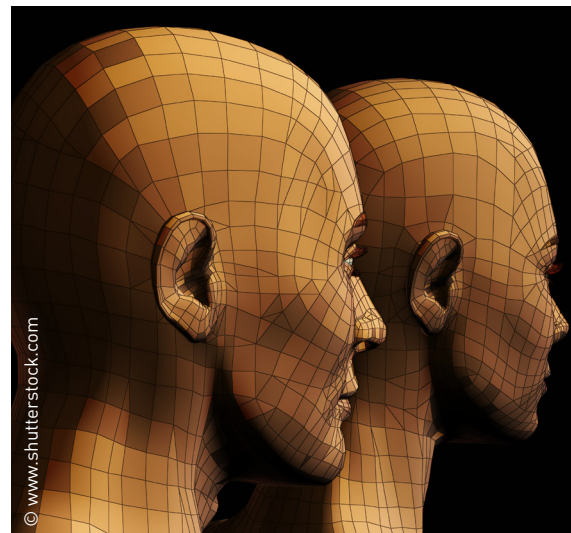
ERC Funding: €3 million for five years

Researcher's webpage:

<http://neuroschema.org/research/>

In search of how our brain feels

Humans have the capacity to slip into the skins of other people, to vicariously experience their actions and emotions. Professor Christian Keysers seeks to understand the processes of empathy within our neurons. His project consists of two complementary analyses. Along with his team, he will first examine how the network of regions involved in action observation in the brain - the "vicarious motor network" - integrate information. Challenging traditional models of action observation, the study will focus on directions of information flow between the vicarious motor nodes. The second analysis explores emotions; how neurons in brain regions associated with empathy respond to witnessing and experiencing emotions. This study will benefit life sciences, particularly genetics, and will inspire better therapies for psychiatric disorders of empathy such as autism. For robotics, it will concretise a biological example of how brain processes and predicts actions of others as well as read their feelings.



Principal Investigator: Prof. Christian Keysers

Host Institution: Royal Netherlands Academy of Arts and Sciences (KNAW), The Netherlands

ERC Project: Cracking the code and flow of empathy (VICARIOUSBRAIN)

ERC Call: Starting Grant 2012

ERC Funding: €1.7 million for five years

Researcher's webpage:

<http://www.herseninstituut.knaw.nl/ResearchGroups/KeysersGroup/tabid/413/Default.aspx>

Towards repair and regeneration of nerves after injury

Professor Martin Schwab aims to better understand nerve-regeneration and functional recovery after injury to the body's central nervous system (CNS). For these processes of repair, the inactivation of the membrane protein Nogo-A has been increasingly recognised. Along with his team, the researcher has found a member of a specific family of receptor proteins, to bind with high affinity Nogo-A, facilitating nerve fibre growth and plasticity. In particular, the group of Prof. Schwab plans to further understand the functional receptor complex that mediate Nogo-A signalling cascade and its regulatory role for synaptic plasticity and nerve fiber regeneration. The results will contribute to improve molecular and physiological understanding of Nogo-A, as well as strengthen the rationale for extending the indication of clinical anti-Nogo-A therapies from spinal cord injury to stroke.

Principal Investigator: Prof. Martin Schwab

Host Institution: University of Zurich, Switzerland

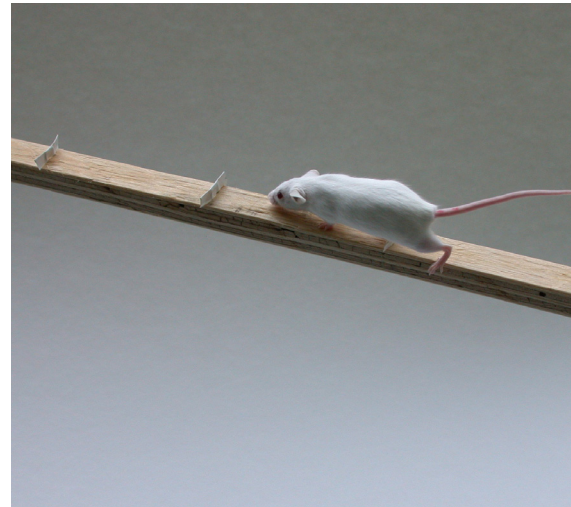
ERC Project: The Nogo-A receptor complex after CNS injury and its role in the developing and adult nervous system (NOGORISE)

ERC Call: Advanced Grant 2011

ERC Funding: €2.5 million for five years

Researcher's webpage:

<http://www.hifo.uzh.ch/research/schwab.html>



Obstacle run

Cell therapy for treating blindness

Retinal degeneration, leading to the loss of photoreceptors, the light sensing cells of the retina required for vision, is a major cause of untreatable blindness. Professor Robin Ali seeks to develop stem cell therapy for such diseases. He will determine whether embryonic stem (ES) cells can be used to repair degenerate retina and to model photoreceptor disorders. The project plans to establish new protocols for differentiating mouse and human ES cells into photoreceptors and to transplant these into degenerate retinas to test their ability to restore vision. The study also aims to use induced pluripotent stem cell technology to generate photoreceptors from patients with retinal disorders in order to study disease processes that might be corrected using drugs or other innovative technologies such as gene therapy.

Principal Investigator: Prof. Robin Ali

Host institution: University College London, UK

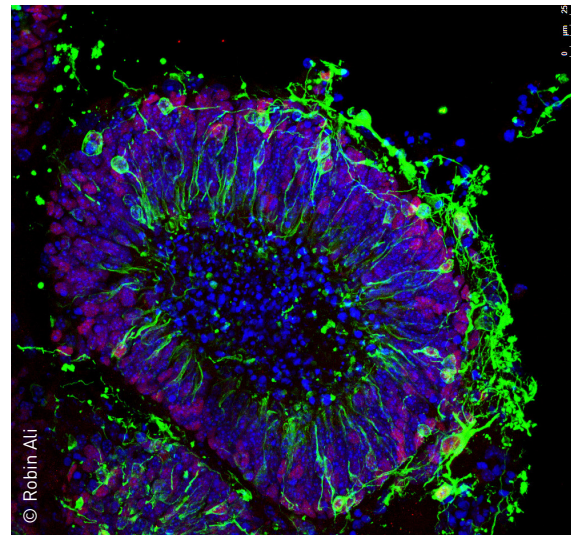
ERC Project: Generation of stem cell derived photoreceptors for the treatment and modeling of retinal degeneration (STEMRD)

ERC Call: Advanced Grant 2012

ERC funding: €2.4 million for five years

Researcher's webpage:

<http://www.ucl.ac.uk/ioo/genetics/gene-and-cell-therapy/research-team>



Growing retina in a dish

European Month of the Brain conference

“Healthy brain: healthy Europe - A new horizon for brain research and healthcare” organised by DG Research and Innovation and the Irish Presidency of the Council of the EU

Dublin, 27 and 28 May 2013

This event is a chance to bring together renowned experts in neuroscience in order to refine national strategies on brain research and healthcare. Amongst the speakers is Adriana Maggi, holder of an ERC Advanced grant 2012.

28 May 2013

9:30 – 11:00 - The innovative brain: new policy approaches

“Coordinating approaches to research across Europe – Joint Programming in Neurodegenerative Disease research”

Adriana Maggi, Director of the Centre of Excellence on Neurodegenerative Diseases, University of Milan (Italy).

For more information:

http://ec.europa.eu/research/conferences/2013/brain-month/index_en.cfm?pg=conference-dublin&sub=general

Novel ways to address female health concerns

Addressing women’s health issues are of crucial importance. Professor Adriana Maggi examines the ways the liver uses information from hormones to integrate the metabolic, reproductive and hormonal status of women. She seeks to understand how the liver works in tandem with reproductive organs to regulate metabolism in response to reproductive needs and stages. The research proposes that the estrogen hormonal receptor ‘ER’ in the liver is a sensor of the body’s metabolic state with consequences for female reproductive functions. To demonstrate this, the study will identify molecular pathways by which endocrine and nutritional inputs are recognised and integrated by the ER in the liver and discover the ways in which it aligns energy metabolism to meet requirements of the reproductive functions. The project will lead to better understanding female metabolic and reproductive disorders, particularly those related to menopause and ovarian malfunction, thereby resulting in the design of novel and more effective treatments.

Principal Investigator: Prof. Adriana Maggi

Host institution: University of Milan, Italy

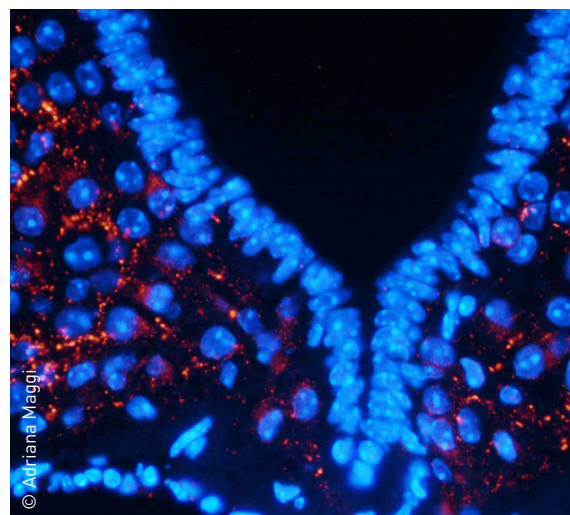
ERC Project: Role of Liver Estrogen Receptor in female Energy Metabolism, Reproduction and Aging: What About Your Liver Sexual Functions? (WAYS)

ERC Call: Advanced Grant 2012

ERC funding: €1.4 million for five years

Researcher’s webpage:

<http://users.unimi.it/DPS/person.php?id=21>



Agouti-related Protein (AgRP) staining in mouse arcuate nucleus of the hypothalamus.

“The Scientific Council is committed to continuously work hard to fulfil the ERC’s unique mission. ERC will continue to make fundamental contributions to the transformation of Europe into a world-leading knowledge area, where frontier research can be the hotbed for innovation and the well being of its citizens.”

Prof Helga Nowotny
ERC President and Chair of its Scientific Council



European Research Council

Established by the European Commission

More ERC projects in neurosciences

<http://erc.europa.eu/sites/default/files/publication/files/NEUROSCIENCES-WEB.pdf>

All on-going projects funded by the ERC

http://cordis.europa.eu/projects/home_en.html

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Publications Office

DOI: 10.2828/18873 • ISBN: 978-92-9215-013-6

ISBN 978-92-9215-013-6



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