

Press Release

Sweeping success with ERC Advanced Grants

Seven ETH researchers awarded grants

Zurich, 1 June 2015

Seven ETH Zurich professors have applied successfully for an ERC Advanced Grant, which is worth about CHF 2.5 million. Two of the seven received the coveted award for the second time.

ERC Advanced Grants are very popular among researchers throughout Europe, as only top researchers' projects are supported by the European Research Council (ERC). The grants are therefore considered a special distinction. In addition, researchers welcome the significant funds: the approved projects receive from CHF 2.5 million to CHF 3.5 million over a period of five years.

The success rate of ETH researchers is an impressive 33%: seven of the 21 projects submitted were approved for an ERC Advanced Grant. Professor Ruedi Aebersold, head of the Institute of Molecular Systems Biology, and Professor Atac Imamoglu, head of the Institute of Quantum Electronics, were successful for a second time. In total, ETH researchers received the amount of 16.6 mio swiss francs.

Building on past success

ETH Zurich is one of the most successful European universities in recent years in terms of winning ERC Advanced Grants. In 2013, 12 of these grants were awarded to ETH researchers, and in 2012 they received seven grants. "The fact that ETH has seamlessly built on the success of ERC grants in recent years is a sign of how highly it is regarded within the European research environment, and it also shows the quality of our researchers," says Detlef Günther, Vice President of Research and Corporate Relations at ETH Zurich.

"These grants are of course a wonderful thing for us researchers, but they are also increasingly an important indicator of a university's performance. ETH Zurich has fared well up to now," adds Aebersold.

Full association remains the goal

The European Union put the participation of Swiss-based researchers on ice after Swiss citizens voted in favour of the mass immigration initiative in February 2014. But an agreement signed by the Swiss Federal Council last autumn allowed Swiss researchers to at least partially participate in the EU research programme Horizon 2020, opening the door again to EU research funding and ERC grants. However, it is not yet clear whether researchers in Switzerland will be able to participate in Horizon 2020 beyond the end of 2016. The EU has made this dependent on whether a solution is found to the free movement of persons. Günther explains: "It will continue to be of central importance to the Swiss academic landscape that researchers can apply for the prestigious ERC Grants. But this will be possible only if Switzerland can participate fully in the Horizon 2020 research programme over the long term."

ERC Advanced Grants have been awarded to the following researchers (in alphabetical order):

Ruedi Aebersold is a professor of molecular systems biology. His research examines all issues relating to how proteins control and catalyse the complex biochemical processes of living cells. In his European Research Council (ERC) project, he aims to map protein networks and classify the relationship between the structure of such networks and profiles of observable characteristics (phenotypes), such as certain diseases. The project's importance lies in determining the basic mechanisms for how genetic differences are expressed in phenotypes via changes in protein networks. This is Aebersold's second ERC Advanced Grant; he was awarded his first in 2008.

Atac Imamoglu, Professor of Quantum Electronics, investigates semiconductor nanostructures in which electrons interact with single photons (particles of light). The first goal of his ERC funded project is to use coherent laser excitation to convert the state of the electronic system from a semiconductor into a superconductor, in a controlled and reversible manner. The second goal aims to make use of electron-light coupling to ensure that photons in these systems interact strongly with each other – in stark contrast to light beams in free space which have no influence on each other. Scientists ascribe great potential to these advances for the realization of devices with novel functionalities.

Juerg Leuthold is a professor at the Institute of Electromagnetic Fields, where he researches new high-speed communication systems. Currently, he and his team are developing new integrated chips that can process signals at the highest data rates. The ERC Advanced Grant will support them as they work on computer chips for the next generation of mobile communications, which are expected to facilitate transmission rates of 10 to 100 gigabits per second. The project is supposed to impact the mobile data communications field as it addresses the ever growing data communications demand.

Dario Neri is professor of Biomacromolecules at the Department of Chemistry and Applied Biosciences of ETH Zürich. The main research activities of his group focus on the development of novel "targeted" therapeutics, for the treatment of cancer and of chronic inflammation. The goal of the ERC Project is the development of novel classes of therapeutic agents, with "activity on demand" (e.g., selective activation of the drug at the site of disease, thus limiting toxicity to normal tissues). The project focuses on certain aggressive cancer types and chronic inflammatory conditions (e.g., rheumatoid arthritis), which at present cannot be cured by conventional drugs.

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Thermodynamics professor **Dimos Poulidakos** plans to use the EU funds to continue his research into ice formation and efficient methods for treating icy surfaces. His interdisciplinary work covers aspects of thermodynamics, fluid dynamics and materials science. In addition, he will investigate phenomena with resolutions ranging from one nanometre to several hundred micrometres that affect the behaviour of water as it freezes on a surface. The goal of the project is to find new ways to design and produce supericephobic materials, which would open up a broad range of applications.

Imitating cartilage is the central challenge in the newly funded ERC project of **Nicholas D. Spencer**, Professor of Surface Science and Technology. By using known polymer-synthesis methods in a new way, Spencer aims to build up structures that resemble those of cartilage. This will enable the behaviour of these individual structures to be studied in more detail, thereby providing a clearer idea of how cartilage functions. Further, it is expected that cartilage-inspired lubrication systems for industrial applications will be developed. Finally, it is hoped that the project will set the stage for future biocompatible, wear-resistant sliding surfaces that can be used for cartilage repair in the human body, e.g. as more effective treatments for cartilage disorders and/or cartilage-replacement strategies.

Julia Vorholt is a professor of microbiology at ETH Zurich's Institute of Microbiology who has done pioneering work in understanding the metabolism of bacteria and how they adapt to plants. In her ERC project she is aiming at identifying causal relationships, both among plant-associated bacteria (the plant microbiota) as well as between bacteria and plants. Her findings will aid efforts to encourage sustainable plant growth and diminish plant diseases.

Further Information

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