

Media Information

Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI)

26 November 2012

Elite EU funding for Jena project on stem cell ageing

Prof. Karl Lenhard Rudolph, scientific director of the Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI), has been honoured with an Advanced Grant from the European Research Council (ERC). The grant will provide his new research project, StemCellGerontoGenes, with €2.5 million in funding. The ERC Advanced Grant awards the most money of any EU funding measure. The support goes to outstanding research leaders who are pursuing ground-breaking projects. Prof. Rudolph, who is based in Jena and is one of the world's leading age researchers, will spend the next five years investigating the genetic mechanisms of stem cell ageing.

Adult stem cells are essential to the regeneration and lifelong maintenance of various organs and tissues in the body. Experimental and clinical data show that adult stem cells lose their ability to function as we age. The older we get, therefore, the harder it is for our organs to regenerate themselves. Also, because stem cells live for a long time, they risk collecting molecular damage over the years. These mutations can cause stem cell dysfunctions that might lead to cancer. At the moment, almost nothing is known about which genetic factors affect stem cell ageing.

By contrast, an ever-increasing number of genetic mutations and sequence variations are coming to light that, as genetic risk factors, influence ageing or the development of age-related diseases – in either a positive or negative way. However, for most of these genetic factors, nothing is known about what accelerates or slows down the ageing process. “We’re assuming that some of the genetic factors that either speed up ageing or slow it down affect stem cell function,” says Prof. Rudolph, scientific director of the Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI). “These kinds of genetic variants could lead to early dysfunction or even cause the stem cells to transform into cancer cells. In other words, by changing the ways our stem cells function, the genes we inherit can decide how fast we age.”

Prof. Rudolph's project on adult stem cells has now received an ERC Advanced Grant, an EU funding measure that provides extensive financial support to researchers throughout Europe. ERC Advanced Grants are awarded to outstanding researchers who have been working for at least a decade at the highest international level, who have already produced important research findings, and who have submitted a proposal whose innovative approach opens up new directions for the research field in question. The ERC awards funding based solely on the excellence of the researcher and his or her project, which means that the Advanced Grant can also be regarded as a personal honour.

The main purpose of the new research project is to identify the genetic causes of stem cell ageing. Prof. Rudolph hopes the work will play a major role in discovering new molecular mechanisms of

ageing: “Those discoveries would give us a basis from which we could develop molecular therapies designed to extend people’s health spans.”

Prof. Rudolph is delighted with the ERC Grant and is keen to acknowledge that the honour extends beyond himself: “It also recognises the outstanding research that my team has been doing in this field over the past few years, and it underlines the importance of our research.” Prof. Rudolph has already pinpointed mechanisms that are fundamental to the loss of function in stem cells during ageing. He has also shown that shortening of the telomeres – protective caps at the end of each chromosome – is involved in adult stem cell decline.

The ERC project, which is entitled “Longevity and aging associated genes that control self-renewal and function of adult stem cells during aging” (StemCellGerontoGenes), begins in 2013. It will employ three postdocs and one technician, and will receive €2.5 million in funding over five years. The project aims to identify genes and molecular mechanisms that affect stem cell functions during ageing and make it harder for organs to maintain homeostasis and regenerate. The latter is the main cause of organ system dysfunction in older people.

Prof. Rudolph studied medicine at Georg-August-Universität in Göttingen and later went on to lead an Emmy Noether research group at Hannover Medical School. In 2006 he won a Heisenberg professorship, for which he was involved in researching the molecular mechanisms that underlie ageing and the development of diseases and cancer. In 2007 he was appointed director of the Institute of Molecular Medicine and the Max Planck Group for Stem Cell Research at the University of Ulm. He has been scientific director of the Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI) e.V. since February 2012, and a professor at Friedrich Schiller University in Jena since October 2012. Prof. Rudolph’s research has earned him numerous awards, including the Monika Kutzner award for cancer research, the Gottfried Wilhelm Leibniz Prize from the German Research Foundation (DFG), the René Schubert Award for Age Research, and the Wilhelm Vaillant Award in Molecular Medicine. He has been president of the German Association for Aging Research (DGfA) since 2009.

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Background information

The **European Research Council (ERC)** finances ground-breaking, visionary projects oriented towards basic research. It describes this type of research as frontier research. The ERC awards the following grants: a) Starting Grants, for young researchers with 2-7 years’ experience since earning their PhD; b) Consolidator Grants, for young researchers with 7-12 years’ experience since earning their PhD; c) Advanced Grants, for experienced researchers; d) Synergy Grants, for groups of 2-4 researchers.

The ERC accepts grant applications from all disciplines and topics in the fields of the physical sciences and engineering, the life sciences, and humanities and the social sciences. Projects must be visionary and ground-breaking and must substantially expand knowledge in the field in question. ERC funding is about supporting outstanding individuals. Scientific or scholarly excellence is the sole selection criteria, and the ERC rates this according to the applicants’ academic career and the relevance of their publications (track record), the principal investigator’s potential, the quality of the project and the degree to which it is innovative and ground-breaking. For more information, visit

<http://erc.europa.eu/>.

The **Leibniz Institute for Age Research – Fritz Lipmann Institute (FLI)** in Jena began its work in 2004 and is Germany's first research institute to be dedicated entirely to biomedical research into ageing. It employs more than 330 researchers from 25 countries to investigate the molecular mechanisms of ageing processes and age-related diseases. For more information, visit

www.fli-leibniz.de.

The **Leibniz Association** brings together 86 independent research institutions specialising in the natural sciences, the life sciences, environmental science, economics, spatial research, the social sciences and the humanities. Leibniz institutes address issues that are relevant to society, the economy and the environment. They do knowledge-oriented and application-oriented basic research, maintain scientific and scholarly infrastructures, and provide research-based services. The Leibniz Association places a great deal of importance on transferring knowledge to policymakers, researchers, business leaders and the public. Leibniz institutes maintain close partnerships with universities (e.g. through the ScienceCampus scheme), with industry, and with partners in Germany and abroad. The institutes are all subject to an exemplary transparent and independent review process. Since they are important to Germany as a whole, they receive both state and federal funding. Some 16,500 people, of which 7,700 are researchers, are employed across all the Leibniz institutes. The total budget comes to €1.4 billion. For more information, visit

www.leibniz-gemeinschaft.de.