

He Who Dares Wins – Million Euro Funding for DKFZ Researcher

The European Research Council will provide funding of 2.4 million euro over the next four years to support a research project of Christof Niehrs at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ). Niehrs investigates the processes of reactivation of silenced genes in cells. Disruption of this mechanism can cause cancer and other diseases.

The Advanced Grants of the European Research Council (ERC) are intended to support research projects with a chance of yielding significant new findings while also involving taking high risks. After all, ambitious projects which contribute to answering important questions in science may sometimes involve huge efforts and still lead nowhere. Funded projects are required to be pioneering and be conducted by scientists who are leaders in their respective field of research. All these criteria are met by cell and evolutionary biologist Professor Dr. Christof Niehrs, whose scientific work at the German Cancer Research Center will now be funded by an ERC grant of € 2.4 million over a four-year period.

A living organism regulates many of its functions by switching off genes by attaching chemical labels. In this process called epigenetic regulation, labeling with methyl groups plays an important role. If something goes wrong here, then it is often the 'cancer brakes' which are silenced so that cell division gets out of control.

While the process of how methyl groups are attached has been well described, the reverse process, i.e. the removal of a methyl group, was not understood until recent discoveries by Christof Niehrs and his colleagues at DKFZ. The investigators identified a key player in what is called demethylation. This protein takes care that methylated gene building blocks are cut out and replaced by unlabeled building blocks. Once the labels are removed from a gene, it is reactivated and can fulfill its function in the cell.

This result has uncovered a link that was totally unknown until now. So far, biologists believed that DNA repair is responsible solely for repairing defects in the genetic material. However, the process of cutting out methylated gene building blocks shows that the cellular repair system plays a much more comprehensive role and is also decisive for the activity of individual genes.

Epigenetic gene regulation is crucial for the development of an organism: Regulation defects lead to the onset of many diseases. "We will now use the ERC funds to investigate possibilities of reactivating silenced genes and the role of the DNA repair system in this process. Interfering in epigenetic regulation is considered a promising approach for developing new therapies – this is a very hot topic, not only in cancer research," said Niehrs explaining the relevance of his research plans.

A picture of Christof Niehrs is available on the Internet at

http://www.dkfz.de/de/presse/pressemitteilungen/2010/images/Christof_Niehrs.jpg

Photography: Yan de Andres

The German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) is the largest biomedical research institute in Germany and is a member of the Helmholtz Association of National Research Centers. More than 2,000 staff members, including 850 scientists, are investigating the mechanisms of cancer and are working to identify cancer risk factors. They provide the foundations for developing novel approaches in the prevention,

diagnosis, and treatment of cancer. In addition, the staff of the Cancer Information Service (KID) offers information about the widespread disease of cancer for patients, their families, and the general public. The Center is funded by the German Federal Ministry of Education and Research (90%) and the State of Baden-Württemberg (10%).

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