GERMAN CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

Research for a Life without Cancer

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Skin from the Petri dish helps cancer research

How does skin cancer develop? This is the central question around which Petra Boukamp's research revolves. Boukamp, who led a research department at the German Cancer Research Center (DKFZ) for many years, studied the role of genetic alterations in the development of skin cancer. In addition, she developed organ models that closely resemble human skin and enable researchers to track the development of skin cancer in culture. For this research, the scientist has now been honored with the experimental part of the German Cancer Award (Deutscher Krebspreis).

In order to understand how normal human skin develops and what mistakes during this process can lead to skin cancer, Petra Boukamp developed three-dimensional models of human organs. Boukamp succeeded in getting the cells to organize themselves independently into layers in the Petri dish. These organ models are reproducible; they imitate conditions in human skin very closely and have a lifetime of up to six months.

Scientists are using these 3D organ models to examine how epidermal stem cells secure the skin's life-long capacity to regenerate and whether and how UV radiation and other environmental factors cause the skin to age.

When skin cancer cells in different stages of malignancy are added to this culture model, the researchers can study the interactions of the cancer cells with their environment or examine mechanisms that account for the invasive capacity of tumor cells. From these 3D-models, scientists have also developed a model for studying the effectiveness of modern anticancer drugs as well as side effects and resistance mechanisms.

In addition, Boukamp's research has also made seminal contributions to unraveling the role of chromosome ends (telomeres) and the so-called "immortality enzyme" telomerase in normal cells as well as in skin cells that have turned cancerous.

Petra Boukamp studied biology at Heidelberg University. She earned a PhD at the University of Kaiserslautern and attained her qualification to give lectures ('Habilitation') at the University of Heidelberg. Since 1972, she has worked at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) in Heidelberg, first as a technical assistant and subsequently as a research assistant. Following several research experiences at the University of Irvine, California, she first became a research group leader and then, from 2001 until 2015, head of DKFZ's Division of Genetics of Skin Carcinogenesis. Presently she is finalizing work at the DKFZ and at the same time working as a team leader at the Leibniz Institute for Environmental Medicine in Düsseldorf.

The German Cancer Award, sponsored by the German Cancer Society (Deutsche Krebsgesellschaft), is one of the most prestigious distinctions in cancer medicine in Germany. The award is presented annually in equal parts for excellent research in experimental basic research, in translational research and in tumor diagnostics and treatment. Each category comprises €7.500.

Along with Petra Boukamp, the second award-winner in the category "Experimental Cancer Research" was Martin Lipp from the Max Delbrück Center in Berlin. This year's award in the

category “Clinical Cancer Research” went to Michael Hallek, University of Cologne. The award-winner in the category “Translational Cancer Research” was Guido Reifenberger from Düsseldorf University and the German Center Consortium (DKTK).

The awards were presented on March 1 during the 19th AEK Cancer Congress of the German Cancer Society.

An image of the award-winner is available for download at:
http://www.dkfz.de/de/presse/pressemitteilungen/2017/bilder/Boukamp.jpg

The German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) with its more than 3,000 employees is the largest biomedical research institute in Germany. At DKFZ, more than 1,000 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. The staff of the Cancer Information Service (KID) offers information about the widespread disease of cancer for patients, their families, and the general public. Jointly with Heidelberg University Hospital, DKFZ has established the National Center for Tumor Diseases (NCT) Heidelberg, where promising approaches from cancer research are translated into the clinic. In the German Consortium for Translational Cancer Research (DKTK), one of six German Centers for Health Research, DKFZ maintains translational centers at seven university partnering sites. Combining excellent university hospitals with high-profile research at a Helmholtz Center is an important contribution to improving the chances of cancer patients. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg.

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