

Cancer as system error – International conference at the German Cancer Research Center

Inflammation, blood supply, or metabolism: Many body functions influence cancer development or spread. From September 28th to 30th, scientists from around the globe met at the German Cancer Research Center (DKFZ) in Heidelberg to exchange information about the interplay between body and cancer. The German Cancer Research Center and the Center for Molecular Biology of Heidelberg University (ZMBH) are jointly hosting the conference “Forum 2015: Tumor Microenvironment, Metabolism & Metastasis” as part of the DKFZ-ZMBH Alliance Forum series.

In the past, malignant tumors were often regarded as diseases that are restricted to a specific part of the body. Today, however, scientists understand that in most cases cancer is a systemic disease, i.e., it affects the whole organism.

Cancer cells constantly exchange signals with their microenvironment: They send out signals to healthy cells of the body and receive messages from the organism in return. By this means, cancer cells make sure that blood vessels grow into the tumor. On the one hand, these blood vessels supply the tumor with nutrients and facilitate its metastatic spread. On the other hand, these vessels also allow immune cells to enter and attack the tumor – or, reversely, to support its growth.

However, not only a tumor’s immediate environment but also more distant parts of the body may influence the development, growth and spread of tumors. Changes in metabolism and disorders of the immune system, for example, have a major impact on the progression of cancer.

“We have invited the world’s leading scientists in this exciting research field to Heidelberg,” says Hellmut Augustin, who is one of the conference’s organizers.

Douglas Hanahan, director of the Swiss Institute for Experimental Cancer Research in Lausanne, gave a talk at the conference. Hanahan, who is the author of the most cited cancer research publication ever (“Hallmarks of Cancer”), reported on the influence of inflammation on the effectiveness of immunotherapies against cancer.

Inflammation was also the topic of Mathias Heikenwalder’s talk, who has been recruited to the DKFZ most recently. Heikenwalder has investigated at the molecular level how inflammatory changes in the liver (such as hepatitis) cause liver cancer.

Celeste Simon, Scientific Director of the Abramson Family Cancer Research Institute at the University of Pennsylvania in Philadelphia, explained how cancer cells adapt to the low level of oxygen inside a tumor and, thus, additionally promote cancer growth.

More than 300 participants attended the conference entitled “Forum 2015: *Tumor Microenvironment, Metabolism & Metastasis*”. The conference was part of a forum series that is organized by the strategic alliance of the DKFZ and the Center for Molecular Biology of Heidelberg University (ZMBH).

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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