DEUTSCHES KREBSFORSCHUNGSZENTRUM IN DER HELMHOLTZ-GEMEINSCHAFT

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Tracking Down the Causes of Fatty Liver – Obesity Research Award for DKFZ Scientist

Dr. Stephan Herzig, head of a junior research group at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) is awarded this year's Research Award of the German Obesity Society (Deutsche Adipositas-Gesellschaft). The prize comprises an award sum of 5,000 euros and is awarded annually to a young researcher aged up to 40 years, whose scientific work is a special contribution to the study of obesity. Herzig investigates the molecular causes of the development of fatty liver in overweight patients.

Stephan Herzig heads the Emmy Noether Junior Research Group "Molecular Metabolic Control" at DKFZ. Together with his team, he is studying the molecular causes of severe metabolic disorders such as diabetes. Among other things, the researchers are trying to find out which changes in the metabolism of obese persons lead to a condition called fatty liver. Massive fat accumulation in the liver is one reason why obese patients can develop insulin resistance and, as a result, diabetes. It is also responsible for the fact that overweight persons have an elevated risk of atherosclerosis and coronary heart disease.

Risk factors for the development of fatty liver include obesity and excessive alcohol consumption. An increased effect of cortisol may also cause fatty liver. Overweight persons are particularly at risk because the effect of cortisol is increased in several tissues in their bodies. Herzig and his team have now found out that cortisol, through the cortisol receptor, acts directly on a switch of the HES1 gene and, thus, turns it off completely. The HES1 gene normally produces a protein which activates a number of enzymes that break down fat and, thus, counteracts fat accumulation in the liver. If it is blocked by cortisol, fat levels rise correspondingly.

A tumor may also be responsible for uncontrolled fat deposition in the liver. Specific types of cancer cause severe weight loss in patients within a very short time – a condition called cachexia. Scientists suppose that the tumor releases messenger substances which encourage the body to break down its own fat and muscle tissue. Fat thus released accumulates in the liver. Herzig was able to prove that the level of the RIP 140 molecule is elevated in mice with cancer. The more RIP 140 the animals produced, the more fat accumulated in their livers. Herzig and his colleagues found out that RIP 140 inhibits the breaking down of fat in the liver. The researchers are hoping to use these findings to develop new approaches for the treatment of fatty liver, which might simultaneously counteract life-threatening cachexia.

Herzig studied biology and geography at the University of Göttingen and has been working at DKFZ for the past six years heading a junior research group. The award will be presented to him on November 5, 2009, on the occasion of the 25th Annual Meeting of the German Obesity Society in Berlin.

A picture of Stephan Herzig is available at:

www.dkfz.de/de/presse/pressemitteilungen/2009/images/Herzig.jpg

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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