

## **Insulin Resistance Related to Wide-Spread Diseases: Heart Attack, Diabetes, Cancer**

Stephan Herzig receives Novartis Foundation award for arteriosclerosis research

Dr. Stephan Herzig and his working group "Molecular Metabolic Control" at the German Cancer Research Center (DKFZ) is one of four research teams that have been awarded research grants from the Novartis Foundation for Therapeutic Research in 2005. The Heidelberg molecular biologists will receive funds of 150,000 euros in the next three years for their planned project on arteriosclerosis research.

Future research work will be focused on malfunctions of the insulin-dependent metabolism. Insulin is a hormone which induces the uptake of sugar (glucose) in muscle cells, fat cells and liver cells. It also plays an important role in the transmission of signals to cells of the immune system called macrophages or scavenger cells. In his research work, Herzig is investigating indications suggesting that these macrophages can become resistant to insulin. As a result, the cells take up increased levels of cholesterol. Their accumulation in the blood vessels can lead to the formation of dangerous plaques in the arteries, a process known as arteriosclerosis. If these plaques start traveling, they can block the coronary vessels or vessels of the brain, which may lead to a myocardial infarction (commonly known as heart attack) or stroke.

Stephan Herzig is studying a protein named RIP140. As he found out, this molecule is found both in insulin-resistant liver and muscle cells and in macrophages. "We believe that RIP140 controls the fatal cholesterol uptake and the release of signaling substances." Herzig will conduct new studies to verify this assumption. His long-term goal is to develop new drugs to slow down RIP140 and, thus, the development of arteriosclerosis, thereby checking the scavenger cells.

These findings may also be useful for cancer treatment. In tumor cachexia, a frequent condition associated with advanced cancer, the insulin metabolism also malfunctions. Cachexia causes wasting and loss of strength. At least 50 percent of cancer patients suffer from this symptom. Due to an overall weakening of the body's defensive force, the chances of success of a treatment like chemotherapy are much smaller. Herzig hopes to pin down the disease-causing defects in the glucose and lipid metabolisms. Together with his team, he will identify genes and gene products which increase susceptibility to metabolic diseases. In a second step, they will examine whether these may be suitable as drug targets. So far, the researchers have found three genes qualifying as candidates.

The task of the Deutsches Krebsforschungszentrum in Heidelberg (German Cancer Research Center, DKFZ) is to systematically investigate the mechanisms of cancer development and to identify cancer risk factors. The results of this basic research are expected to lead to new approaches in the prevention, diagnosis and treatment of cancer. The Center is financed to 90 percent by the Federal Ministry of Education and Research and to 10 percent by the State of Baden-Wuerttemberg. It is a member of the Helmholtz Association of National Research Centers (Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V.).

This press release is available at [www.dkfz.de/pressemitteilungen](http://www.dkfz.de/pressemitteilungen)

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