

Fighting cancer before tumor grows

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Researchers in Heidelberg have discovered a new strategy for an immunization against certain forms of cancer. They have determined that immune cells react strongly to the modified proteins in tumor cells in which a DNA repair defect has occurred. It is estimated that this repair defect is present in some 15 percent of all tumours.

The researchers, led by Professor Dr. Magnus von Knebel Doeberitz, Medical Director of the Department of Applied Tumor Biology at the Heidelberg University Hospital, studied the most frequent form of hereditary colon cancer, the HNPCC syndrome (Hereditary Non-Polyposis Colorectal Cancer Syndrome)

. The results of their research, which was conducted in co-operation with the German Cancer Research Center and the European Molecular Biology Laboratory (EMBL) and was funded with € 380,000 by the Deutsche Krebshilfe (German Cancer Aid) have been published in the April edition of the renowned American professional journal "Gastroenterology".

In Germany, colon cancer, with about 65,000 new cases per year, is the third most common form of cancer. In about 15 percent of these tumors, there is a defect in certain repair mechanisms of the DNA that leads mainly to changes in the so-called microsatellites. As the researchers in Heidelberg have now discovered, these changes in microsatellites cause the tumour cells to begin forming foreign proteins, which can be recognized and attacked by the immune system. But why are tumours formed despite the immune reaction" "There are two reasons for this,"

says Professor von Knebel Doeberitz. “The immune system often reacts too slowly – and some tumor cells are able to hide because they lose the ability to express the foreign proteins on their surface.”

The results of the Heidelberg research team suggest that the growth of tumours with microsatellite changes can be prevented if the immune system can be activated against the foreign proteins in time. The researchers’ next goal is thus to develop a vaccine against these types of cancer from the new foreign proteins that are created from mutations. If the immune system is sensitized against the “enemy” by immunization, it could react rapidly and strongly when cancer cells or their early stages appear.

The new immunization strategy could be effective against 10 to 15 percent of all cancers. The new results are especially significant for patients who suffer from the most frequent form of hereditary colon cancer, the HNPCC syndrome (Hereditary Non-Polyposis Colorectal Cancer Syndrome). Almost all tumours of this form are affected by the changes in microsatellites.

Source: University Hospital Heidelberg

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