Pancreatic cancer fights off immune attack

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Scientists of the German Cancer Research Center (Deutsches Krebsforschungszentrum) and the Heidelberg University Hospitals have discovered that pancreatic cancer attracts regulatory T cells, which suppress the activity of immune cells. In this way, the tumor might escape its destruction by the immune system.

The ability to discriminate between friend and foe or between “self“ and “foreign” is vital for a functioning immune system. There are numerous protective mechanisms at work to save the body’s own tissue from attacks by misguided immune cells. A pivotal role is played by regulatory T cells (Treg cells), which prevent immune reactions against the body’s own structures by suppressing the aggressiveness of particular immune cells called T helper cells.

Malignant tumors actively attract Treg cells and, thus, slow down immune defense to protect themselves against elimination. This is suggested by results just published by Associate Professor Dr. Philipp Beckhove jointly with colleagues from the German Cancer Research Center in collaboration with Professor Jürgen Weitz, Dr. Hubertus Schmitz-Winnenthal and other colleagues from the Heidelberg University Hospitals.

In tissue samples of pancreatic cancer the researchers found a much higher number of Treg cells than in samples obtained from regions of the organ that were not affected by cancer. For other immune cells, such as T helper cells, they found no such differences.

Cells of the immune system, including regulatory T cells, are called to their site of action by specific “address molecules“ on the surface of blood vessel cells (endothelial cells). The presence of address molecules is the signal for immune cells patrolling in the bloodstream to squeeze through the vessel wall in order to enter the adjacent tissue. Beckhove and colleagues have shown that Treg cells easily pass through a layer of endothelial cells isolated from tumor tissue.

If, however, the endothelial cells originate from healthy tissue, then a significantly lower number of Treg cells make their way through the layer of cells. The researchers also discovered why this is so: Endothelial cells from tumor tissue carry significantly more address molecules on their surface than vessel cells from healthy regions of the pancreas. When the investigators made these adresses invisible using specific antibodies, the Treg accumulation in the tumor tissue was stopped.

“Treatment possibilities for pancreatic carcinoma, in particular, are still insufficient. Specific antibodies preventing the accumulation of Treg cells in the tumor and, thus, strengthening immune defense, might be a useful therapeutic option,” says Phillip Beckhove to explain the relevance of these results.

Source: Deutsches Krebsforschungszentrum