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Focus: Stem Cells and Cancer

Stem cells have two abilities that make them special: They can divide indefinitely and they can differentiate into any cell type of the body. Day by day, millions of cells in the human body perish because they are “weak from old age”, diseased or transformed. Stem cells replenish the supply.

Doctors make use of the special properties of stem cells when treating cancer. Chemotherapy or radiation therapy of blood cancer, for example, kills not only transformed blood cells, but healthy ones, too. Doctors can compensate for this loss by transplanting new hematopoietic stem cells – a medical intervention that requires a great deal of skill, as you can read in *einblick*.

However, stem cells are not only able to save lives; they can also turn into a deadly danger. If their hereditary material changes, they can develop into what are called cancer stem cells, which produce ever new, transformed daughter cells. These cancer stem cells seem to be responsible when some tumors return after initial success of treatment and then often form secondary tumors. Although conventional therapies eradicate “normal” cancer cells, they are rather ineffective against cancer stem cells. Therefore, researchers are looking for ways to make cancer stem cells vulnerable to attack – and they report first good results.

Whether a bee larva develops into a queen or a worker bee depends solely on its food. Particular substances in the food have an influence on the genes that are switched on or off in their body cells. Scientists of the German Cancer Research Center are taking a closer look at these substances, because they might slow down the uncontrolled growth of cancer cells.

Other topics in the current issue:
- Pin-sharp images from the new seven-Tesla MRT at DKFZ
- Using iron against tumor cells
- Cellular secret service: microRNAs watch the activity of our genes
- 400 million euros for cancer research network: An interview with Professor Otmar Wiestler
- “Now that it’s behind me, I am overwhelmed with thankfulness.” Birgit Schäfer has been cured of cancer for twenty years.
- Portrait of the Helmholtz Research Centers: The Max Delbrück Center for Molecular Medicine in Berlin

The issue is available on the Internet at www.dkfz.de/einblick

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