

NEW TUMOR TREATMENTS MAY REDUCE RISK OF RECURRENCE

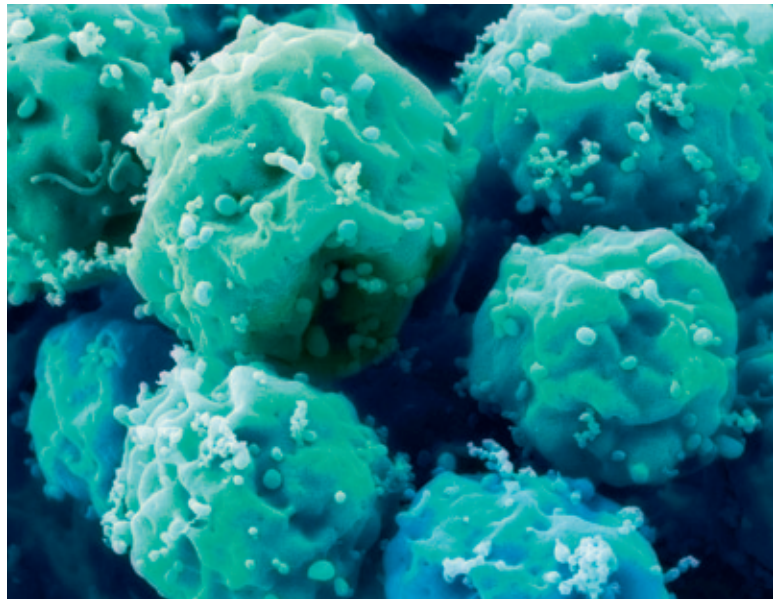
Cancer, master of the art of survival

Cancer stem cells constantly generate new tumor cells. Researchers at Bayer HealthCare are working in partnership to identify active substances that strip these robust cancer cells of their vitality, with the aim of reducing cancer patients' risk of a recurrence.

Eternal life – what some people wish for has long been a reality for a few of the cells in our bodies. For as long as they are supplied with the necessary nutrients, they are able to divide indefinitely, generating new material for our tissues and organs. Red blood cells, for example, are continuously renewed from a pool of stem cells in the bone marrow. It has been known for some years now that cancer tissue may likewise have a reserve of stem cells. "Unlike ordinary tumor cells, these robust cancer stem cells can withstand even intensive chemotherapy and radiotherapy unharmed – and may consequently give rise to a recurrence after apparently successful treatment," explains Dr. Karl Ziegelbauer, Head of the Oncology Therapeutic Research Group at Bayer HealthCare.

Targets are signal pathways that may keep the cancer stem cells alive

Bayer researchers are therefore seeking treatments that are able to specifically target cancer stem cells. Together with scientists at the Californian company OncoMed Pharmaceuticals, they have identified target molecules that may be the source of the cancer stem cells' eternal life. "We are focusing on molecules in what is known as the Wnt signaling pathway," says Dr. Peter Nell, Business Development and Alliance Manager at Bayer HealthCare in San Francisco, USA. This signal transduction pathway is one of many regulatory mechanisms that are able to control multiple vital processes – for example, the development from an embryo to a healthy living being. "Molecule cascades such as the Wnt signaling pathway transmit a signal from a cell's surroundings through its surface to the control center in the cell nucleus," explains Nell. If the flow of information is misregulated, this may lead to the formation of malignant tumors but also to the development of heart disease, brain disorders or other illnesses.



The Wnt signaling pathway may also play a key role in the control of stem cells. Two potential active substances that are currently in Phase I clinical trials block this signaling pathway and might therefore help to deprive cancer stem cells of their eternal life. In an initial study, an antibody called vantictumab was well tolerated and will be further explored in combination with standard chemotherapy. "In preclinical experiments, the number of cancer stem cells in the tumor tissue was markedly reduced," says Nell. A second molecule known as FZD8-Fc has also demonstrated in preclinical tests that it can successfully stop signal transmission in the Wnt signaling pathway.

Versatile: the scanning electron microscope image shows human stem cells, the precursors for all cells in the body. But if their signal pathways are disrupted, they can form malignant tumors.



Cancer treatment video
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