Blood vessel cells help tumours evade the immune system

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A study by researchers at Sweden's Karolinska Institutet is the first to suggest that cells in the tumour blood vessels contribute to a local environment that protects the cancer cells from tumour-killing immune cells. The results, which are being published in the *Journal of the National Cancer Institute*, can contribute to the development of better immune-based cancer therapies.

Immune-based antitumour therapies, that strengthen the body's own ability to fightcancer, have attracted great attention in recent years and achieved interesting success rates, especially in malignant melanoma. However, many patients still do not respond to immune-based therapies.

The results from the current study imply that tumour pericytes, a cell that is part of the tumour blood vessels, critically manipulate the tumour environment, helping the cancer cells escape immune surveillance.

"Understanding the interplay between tumour pericytes, malignant cells, and the immune system might help in designing more personalised and effective therapeutic approaches", says Principal Investigator Guillem Genové at the Department of Medical Biochemistry and Biophysics at Karolinska Institutet.

Tumours evade the immune system by a variety of mechanisms, one of them being the recruitment of so called 'myeloid-derived suppressor cells' (MDSC). MDSCs suppress the ability of killer T-cells to destroy cancer cells. It is known that the more MDSCs present, the worse the prognosis or therapy response of the patient. Tumours secrete signal molecules such as interleukin-6 (IL-6) that help in recruiting MDSCs, but the mechanisms behind IL-6 tumour secretion are quite unknown.

The researchers found that the higher the number of pericytes, the more "normal" the tumour environment looked like. On the contrary, diminished pericyte numbers altered the microenvironment and correlated to higher IL-6 expression from the malignant cells and more MDSCs. They also identified a subset of breast cancer patients who had fewer pericytes and increased MDSCs, correlating to a worse prognosis and more aggressive characteristics of the tumour.

"Our work suggests that ways to increase the numbers of pericytes could potentially decrease IL-6 expression. This could improve cytotoxic T-cell activity and result in better antitumour effect", says Dr Genové.

More information: "Role of Tumor Pericytes in the Recruitment of Myeloid-Derived Suppressor Cells" *J Natl Cancer Inst* (2015) 107 (10): djv209 DOI: 10.1093/jnci/djv209

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