

Wake-up call for more research into cell metabolism

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More scientific research into the metabolism of stromal support cells and immune cells – and the role of the metabolism of these cell types in the development of diseases – could open new therapeutic avenues for diabetes, inflammatory conditions and cancer. That was the conclusion of a review article by scientists from VIB and KU Leuven in the leading journal *Nature*.

Prof. Peter Carmeliet: "Consider the review article a sort of wake-up call. The metabolism of cancer cells has been examined in minute detail for decades now in order to facilitate new oncology treatments, whilst the metabolic research into other important cells such as the stromal and [immune cells](#) has not received the scientific attention that it deserves. Metabolic studies into these cells could provide new targets for the treatment of, for example, [inflammatory diseases](#) and diabetes."

Cell metabolism

Stromal cells are the support cells of the body. One important type of support cell is the endothelial cell, which lines the inner wall of [blood vessels](#). Blood vessels transport oxygen and nutrients to cells. Immune cells attack harmful bacteria and viruses in order to remove them from the body. Each type of cell requires different types of "food" in order to convert this into the energy and nutrients required to allow the cells to do their work. This is called cell metabolism. We now know that – in the case of cancer, diabetes and inflammatory diseases – the supply and processing of this "food" to endothelial cells and other support cells is

abnormal. This allows endothelial cells to form new blood vessels (also called angiogenesis) in an excessive manner and causes tumors to grow aggressively due to the fact that the supply of cell nutrients is cranked up.

In the interests of the patients

Cancer research of the past 15 to 20 years has focused almost exclusively on the metabolism of cancer cells. However, the focus on [cancer cells](#) has placed efforts to study other important cells such as endothelial cells and immune cells on the back burner. This is a shortcoming according to Peter Carmeliet, Bart Ghesquière, Brian W. Wong and Anna Kuchnio in their review article that will be published in *Nature* on 10 July. All the evidence seems to indicate that thorough research into the [cell metabolism](#) of [stromal cells](#), [endothelial cells](#) and immune [cells](#) could result in new treatment options not only for cancer, but also for diabetes and inflammatory diseases.

This will also be necessary to improve the current cancer treatments. Indeed, angiogenesis inhibitors are being used to combat cancer, but their success is limited by the fact that cancer patients become resistant to these drugs. Strategies that will paralyze the blood vessels by taking away their energy and building blocks appear very promising. With their ardent plea in *Nature* they hope that – in the interests of the patients – the scientific focus over the coming years will shift to this sub-section of medical and pharmacological research.

More information: Bart Ghesquière et al., Metabolism of stromal and immune cells in health and disease, *Nature*, 2014.

Provided by VIB (the Flanders Institute for Biotechnology)

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