Innovative method to starve tumors

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The development of cancerous tumours is highly dependent on the nutrients the tumours receive through the blood. The team of Dr. Janusz Rak, of the Research Institute of the McGill University Health Centre (MUHC) at the Montreal Children's Hospital, including Dr. Khalid Al-Nedawi and Brian Meehan, has just discovered a new mechanism that tumours use to stimulate the growth of the blood vessels that feed them.

The researchers have also proposed a new way to control this process, which may translate into future therapies. These findings were published this week in the *Proceedings of the National Academy of Sciences* (*PNAS*).

An innovative method…

According to the researchers, tumour cells can release "bubbles" called microvesicles, which allow the tumours to communicate with the endothelial cells of blood vessels and stimulate changes in their behaviour. The microvesicles are armed with specific cancer proteins as they leave the tumour. When they are taken up by endothelial cells, the specific cancer proteins that they carry can trigger mechanisms that promote the abnormal formation of new blood vessels. The vessels then grow towards the tumour and supply it with the nutrients it requires to grow.

"We had already demonstrated the existence of these vesicles as well as their importance in the communication process between cancer cells and their environment. But this new discovery is much more targeted and

represents a new direction in terms of therapy," said a delighted Dr. Rak.

… to starve tumors

In fact, a family of molecules derived from annexin V seems to effectively fight this process and ultimately may help "starve" the tumour. "The molecule we used is effective both in vitro and in vivo. It prevents the formation of new blood vessels in mice with cancer and therefore strongly inhibits tumour growth," explained Dr. Rak.

Called Diannexin, this molecule acts to block the in vitro fusion of vesicles and endothelial cells. In mice with cancer, Diannexin works to slow blood vessel growth towards the tumour, resulting in anti-cancer effects. This finding is particularly important considering the treatment was applied in isolation without additional chemotherapy. If combined with other agents, this new way of treating cancer may be even more potent.

Diannexin is currently being developed as an antithrombotic medication. It would therefore be possible to use it safely for different types of pathologies.

Source: McGill University Health Centre