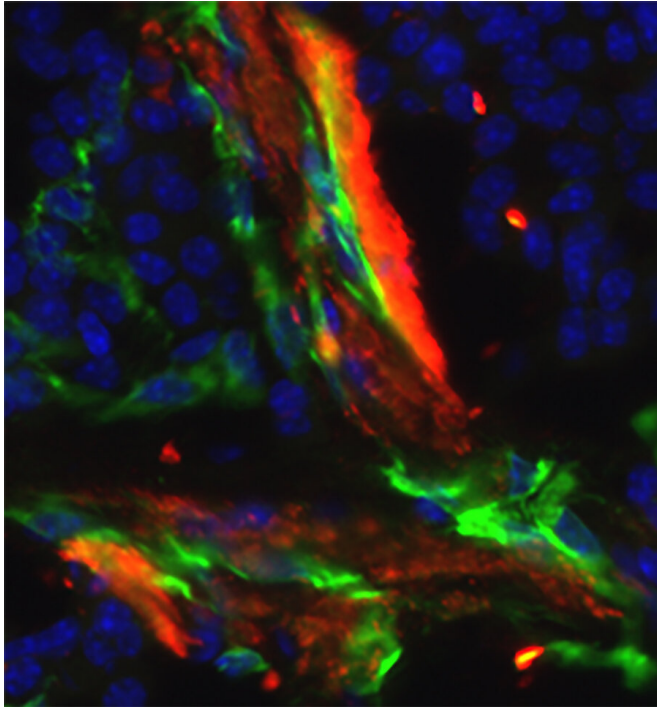


Novel function of platelets in tumor blood vessels found

25 June 2020



Platelets (red) in close contact with tumour vessels (green). Platelets are activated in the tumour microenvironment and secrete a large number of growth factors. Conditional knockout of PDGFB in platelets demonstrates its previously unknown role in pericyte recruitment, maintenance of tumour vascular integrity and host protection against metastasis. Credit: Yanyu Zhang

Scientists at Uppsala University have discovered a hitherto unknown function of blood platelets in cancer. In mouse models, these platelets have proved to help preserve the vascular barrier which makes blood-vessel walls selectively impermeable, thereby reducing the spread of tumor cells to other parts of the body. The study is published in the journal *Cancer Research*.

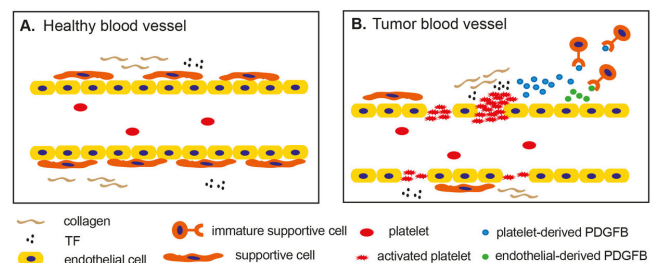
Platelets, or thrombocytes, as they are also termed, are tiny cell fragments that form in the

bone marrow and circulate in the blood. If we are injured and start bleeding, they clump together, sealing off the wound while also helping the blood to coagulate.

When the platelets are activated—which occurs not only in wounds but also in tumors—the substances known as [growth factors](#) contained in the platelets are released into their immediate surroundings. One is [platelet-derived growth factor B \(PDGFB\)](#).

In the study, the researchers investigated what happens when the PDGFB in platelets, but not in other [cell types](#), is deleted in individuals with cancer. PDGFB from platelets was found to be essential, to attract supporting [cells](#) to the tumor blood vessels. In healthy tissue, on the other hand, the platelets did not to perform this function. If PDGFB was lacking in platelets, the quantity of circulating tumor cells increased and they spread to other parts of the body to a much higher degree.

Previous studies have shown that PDGFB from cells of another kind, endothelial cells that line the inside of blood vessels, is necessary to attract supporting cells to the vessels when they form. According to the new study, this function in tumors also requires PDGFB from platelets, which distinguishes them from healthy tissue.



Platelets are activated in blood vessels in wounds but also in tumour blood vessels. The study proves that PDGFB released from platelets, when activated, plays an essential role in attracting supporting cells to the blood

vessels and in preventing tumour cells from spreading.
Credit: Yanyu Zhang

From a medical point of view, it may be advantageous, in some situations, to reduce platelet activity in order to prevent [blood](#) clots, for example. Moreover, previous research shows that platelets can promote spread of tumor cells.

"Our data show that platelet activation in cancer is not altogether harmful. Instead, the PDGFB released when the platelets are activated can help to maintain the vascular barrier in tumors, thereby counteracting the spread of tumor cells. That makes it important for the specific functions of the various platelet-derived molecules to be taken into consideration when new therapies are developed," says Anna-Karin Olsson, who leads a research group at the Department of Medical Biochemistry and Microbiology at Uppsala University.

More information: Zhang et al., Platelet-specific PDGFB ablation impairs tumor vessel integrity and promotes metastasis, *Cancer Research* (2020).
[DOI: 10.1158/0008-5472.CAN-19-3533](https://doi.org/10.1158/0008-5472.CAN-19-3533)

Provided by Uppsala University

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