

# Scientists shed light on a tumor-suppressive protein in metastases

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A new study conducted at the VIB-KU Leuven Center for Cancer Biology in Belgium has labeled the protein Caveolin-1 as a high-potential target in the fight against cancer. Many research projects have already implicated this protein in both tumor-promotive and suppressive functions, but its exact role remained elusive. By examining macrophages at the sites of metastases, the scientists have now described the anti-metastatic surveillance role of Caveolin-1 for the first time.

The new paper, published in *Cell Reports*, was conducted by a team led by prof. Massimiliano Mazzone (VIB-KU Leuven). His lab has been focusing on the tumor microenvironment for some time now, gradually disentangling topics such as tumor oxygen shortage, angiogenesis (the formation of blood vessels) and [macrophages](#) (a type of white blood cell) and anti-[cancer](#) immunity.

While the role of tumor-associated macrophages at each step of [cancer progression](#) is already well established, the biology of metastasis-associated macrophages, their counterparts at the sites of cancer metastases, has been neglected. Understanding this field, however, is of the utmost relevance, as metastases cause no less than 90 percent of human cancer deaths.

In this research, the team describes for the first time the mechanism of Caveolin-1 in metastatic macrophages. They saw that upregulation of this protein in the lung environment clearly hinders metastatic growth.

Prof. Mazzone of VIB-KU Leuven says, "A surprising outcome, since macrophages are traditionally associated with cancer progression. But at the same time, the anti-metastatic, patrolling function of Caveolin-1 makes sense when one considers the relevance of the immune system in the lungs as the first barrier against (inhaled) pathogens and external bodies. You could say Caveolin-1 is a gatekeeper: high expression can

protect the body against foreign bodies and diseases, while downregulation is prometastatic."

Previous studies associated the loss of Caveolin-1 with more aggressive proliferation and worse patient outcomes in several types of cancer. Prof. Mazzone's findings directly confirm the suggestion that this protein may yield promising therapeutic perspectives.

Prof. Mazzone (VIB-KU Leuven): "We have now learned that there is a huge difference in immunity at the metastasis compared to the primary tumor. And since metastasis is what kills most cancer patients, this research avenue deserves much more attention."

**More information:** Loss of Caveolin-1 in metastasis-associated macrophages drives lung metastatic growth through increased angiogenesis, Celus et al., *Cell Reports* 2017.

Provided by VIB (the Flanders Institute for Biotechnology)

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