

# A vaccine directed against tumor blood vessels suppress tumor growth and metastasis

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In a new study published in the scientific journal *Oncotarget* researchers from Uppsala University show that a therapeutic vaccine directed against tumor vessels can reduce tumor burden and suppress formation of spontaneous lung metastases in a mouse model for metastatic breast cancer.

The [target molecule](#) of the immunization strategy is the extra domain-A (ED-A) of fibronectin, a protein domain which is highly selective for the tumor vasculature in the adult.

"The vaccination approach we have employed is not prophylactic but therapeutic, meaning that immunity was induced after the onset of tumorigenesis - a scenario that resembles the clinical conditions much more closely than prophylactic immunization studies, says Anna-Karin Olsson, researcher at the Department of Medical Biochemistry and Microbiology at Uppsala University", who has led the study.

The therapeutic effect was significant, despite the aggressive nature of the tumor model. Moreover, the vaccine induced an 80 percent reduction metastasis, which is an important finding considering that a majority of all deaths by [cancer](#) are caused by cancer that has spread in the body.

A major advantage of the approach is that the target molecule ED-A is present in the majority of solid tumors. Vaccination against ED-A could

therefore provide a treatment strategy with broad applications in [cancer therapy](#). Furthermore, the researchers show that their strategy for immunization against a self-molecule is highly efficient and can be achieved with an adjuvant (immunostimulatory compound included in vaccines) that is acceptable for use in the clinic. The lack of potent, but at the same time non-toxic and biodegradable adjuvants has been a major limitation in the development of therapeutic vaccines.

Another important aspect is that therapeutic vaccination (endogenous production of the target antibodies) can provide a cost-efficient alternative to administration of large amounts of monoclonal antibodies, currently in clinical use for cancer and other diseases. The high costs associated with monoclonal antibody-based therapies puts a significant strain on the health-care economy, which may limit accessibility for patients.

"In conclusion, we believe therapeutic vaccination could provide a new, potent and cost-efficient treatment strategy for [solid tumors](#) and metastasizing cancer", says Anna-Karin Olsson.

**More information:** "Therapeutic vaccination against fibronectin ED-A attenuates progression of metastatic breast cancer", Julia Femel, Elisabeth JM Huijbers, Falk Saupe, Jessica Cedervall, Lei Zhang, Pernilla Roswall, Erik Larsson, Helena Olofsson, Kristian Pietras, Anna Dimberg, Lars Hellman and Anna-Karin Olsson, *Oncotarget*, 2014.

Provided by Uppsala University

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