New cancer vaccine platform a potential tool for tailored and efficacious targeted cancer therapy

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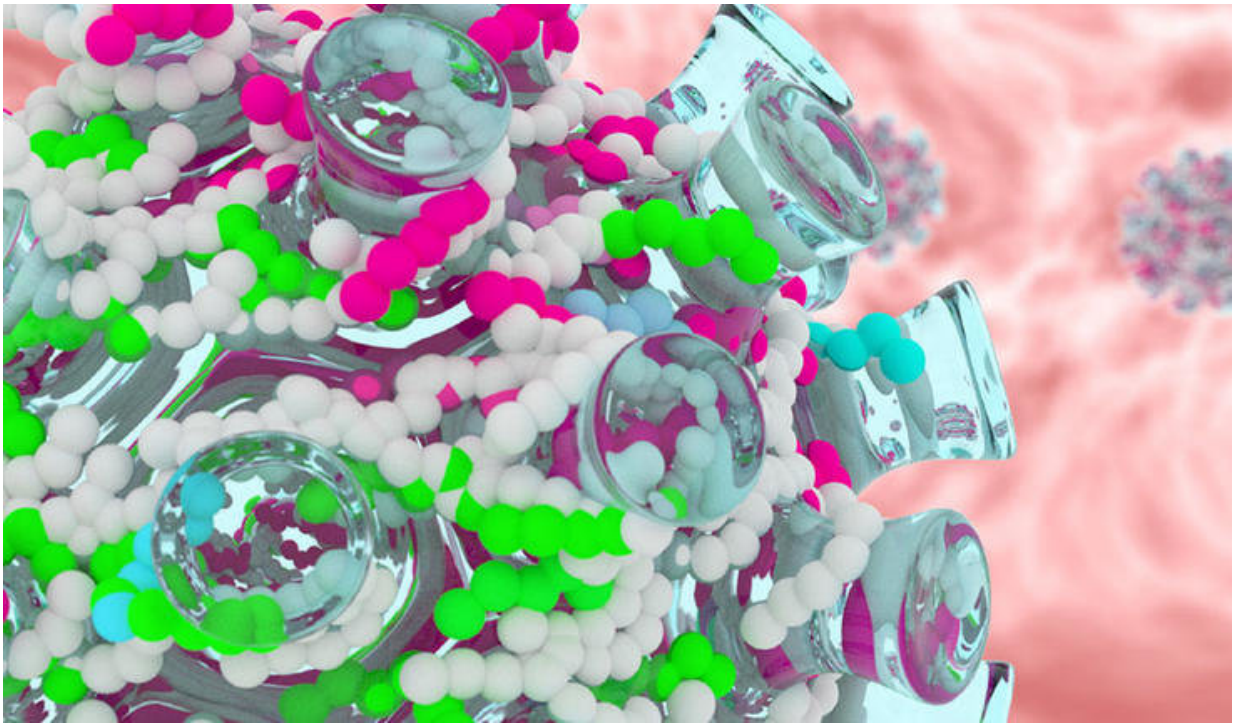

Cancer vaccine platform consists of silver colored enveloped virus onto which a patient's cancer peptides have been tied. Credit: University of Helsinki

Researchers at the University of Helsinki have reported PeptiENV, a cancer vaccine platform that can be used to improve the therapeutic efficacy of oncolytic enveloped viruses currently in clinical use. With

the help of this new cancer vaccine platform, the activation of the human immune response against cancer cells becomes significantly more effective.

"What is actually the most remarkable insight concerning the PeptiENV cancer vaccine platform is that we are able to envelop oncolytic viruses with the patient's own cancer peptides, enabling tailored, targeted treatment," says Erkko Ylösmäki, an Academy of Finland postdoctoral researcher working in the ImmunoViroTherapy Lab of the Faculty of Pharmacy, University of Helsinki.

Oncolytic viruses are naturally occurring viruses that have been modified to restrict their division into cancer cells only. Virotherapy is usually administered as an injection to the tumour or the abdominal cavity, or intravenously.

A virus enveloped with peptides through the PeptiENV platform can effectively "train" the patient's own, locally active T cells to identify tumour cells. Thus, the number of T cells able to identify tumour cells increases in the cancerous tissue, improving the efficacy of the cancer therapy.

The study demonstrated the functionality of the PeptiENV cancer vaccine platform in conjunction with oncolytic-enveloped herpes simplex virus 1, already used in the treatment of metastatic melanoma. Oncolytic vaccinia viruses, among others currently under investigation in clinical trials, are also compatible with the cancer vaccine platform.

Additionally, the number of T cells in the cancerous tissue that are able to identify cancer cells strongly correlates with the therapeutic effect of new immune checkpoint inhibitors.

"We aim to expand the pool of patients that could potentially benefit

from the unparalleled efficacy of immune checkpoint inhibitors," Ylösmäki explains.

More information: Erkko Ylösmäki et al. Personalized Cancer Vaccine Platform for Clinically Relevant Oncolytic Enveloped Viruses, *Molecular Therapy* (2018). DOI: 10.1016/j.ymthe.2018.06.008