Oncolytic virotherapy is a novel targeted therapeutic approach that harnesses viral tumour lysis and generation of secondary anti-tumour immune responses. "Coxsackievirus A21 (CAVATAK™) is a naturally occurring "common cold" virus that elicits pre-clinical models displaying both in vivo and in vitro oncolytic activity across a wide spectrum of cancers.\(^\text{1}\)" Natural infection by CAV21 is usually self-limiting within the upper respiratory tract.\(^\text{2}\) CAV21 targets human cancerous cells by binding to the \(\alpha\)-N-terminal domain of surface expressed human integrin receptor molecule-1 (ICAM-1).\(^\text{3}\) Subsequent infection, viral replication and rapid cytolysis of the targeted cells results in systemic release of progeny virus. CAV1 is highly expressed on the surface of numerous human cancers including lung, pancreas, breast, prostate, head/neck cancer and melanoma.\(^\text{4}\) ICAM-1 expression often correlates with the degree of malignant spread of the (unvacuumed).\(^\text{5}\) CAVATAK™ is the name of a proprietary formulation of Coxsackievirus A21 and it is currently being evaluated in Phase I trials in patients with late stage lesions ("treatment-naive"; breast cancer) and recurrent head neck cancer.

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## Results

### #1 Immunohistochemical staining of ICAM-1 receptor levels in biopsy samples from lung cancer patients compared to normal lung tissues

(Images and data not provided in text)

### #2 ICAM-1 surface expression on a panel of lung cancer cells

(Images and data not provided in text)

### #3 Cell morphology of a panel of lung cells post-CAVATAK™ infection

(Images and data not provided in text)

### #4 ICAM-1 activity of CAVATAK™ on a panel of human lung cancer cell lines

(Images and data not provided in text)

### #5 Evaluation of viral replication yield of CAVATAK™ in normal lung and lung cancer cells

(Images and data not provided in text)

### References


### Conclusion

Immunohistochemical staining showed low or no detection of ICAM1-1 expression in biopsies of normal lung tissues, while significant levels of ICAM1-1 were detected in tumorous human cancers from varying stages of disease.\(^\text{1}\)

Moderate to high levels of cell surface ICAM1-1 expression were observed following flow cytometric analysis of a panel of both human NSCLC and SCLC in vitro cultures.\(^\text{2}\)

High CAV1 expressing NSCLC and SCLC cells displayed significant susceptibility to rapid multi-cycle replication and cell cytolysis following in vitro challenge with CAVATAK™. NSCLC H157 lung cells found to be the most sensitive lung cell line.\(^\text{3}\)

Intratumoral injection of a single dose of CAVATAK™ via subcutaneous needle resulted in significant reduction in tumour burden.\(^\text{4}\)

Viral-mediated oncolysis of the H157 xenografts was accompanied by the release of progeny virus as observed by increase in the systemic load of infection (CAVATAK™).

Coxsackievirus A21 displays significant pre-clinical oncolytic activity against human lung cancer cells both in vitro and in vivo environments. The present pre-clinical findings establish proof of concept for the potential application of oncolytic virotherapy with CAVATAK™ as a novel targeted anti-cancer therapeutic within the clinical environment.

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