

Virus-like particles provide vital clues about brain tumors

17 April 2013

Exosomes are small, virus-like particles that can transport genetic material and signal substances between cells. Researchers at Lund University, Sweden, have made new findings about exosomes released from aggressive brain tumors, gliomas. These exosomes are shown to have an important function in brain tumor development, and could be utilized as biomarkers to assess tumor aggressiveness through a blood test.

"Current wisdom says that cells are closed entities that communicate through the secretion of soluble signalling molecules. Recent findings indicate that cells can exchange more complex information – whole packages of genetic material and signalling proteins. This is an entirely new conception of how cells communicate", says Dr Mattias Belting, Professor of Oncology at Lund University and senior consultant in oncology at Skåne University Hospital, Lund, Sweden.

Exosomes are small vesicles of only 30 nm. They are produced inside cells and act as "transport vehicles" of genetic material that can be transferred to surrounding cells. Since their first discovery, exosomes have been found in blood, saliva, urine, [breast milk](#) and other body fluids.

Mattias Belting's research group has investigated exosomes released from [tumour cells](#) of patients with gliomas.

The tiny exosome particles are delivered from the tumour to healthy cells of the brain and may prime normal tissue for efficient spreading of the tumour. The researchers in Lund have now shown that the aggressiveness of the tumour is reflected in the exosome [molecular profile](#).

"We have succeeded in developing a method for the isolation of exosomes from brain tumour patients through a relatively simple blood test. Our analyses indicate that the content of exosomes mirrors the aggressiveness of the tumour in a

unique manner", says postdoctoral researcher Paulina Kucharzewska.

Exosomes could thus be utilised as [biomarkers](#), i.e. to provide guidance on how the patient should be treated and to monitor treatment response. This possibility is particularly attractive with brain tumours that are not readily accessible for tissue biopsy. However, analysis of exosomes from the blood may also prove important with other tumour types. The value of conventional tumour biopsies is limited by the heterogeneity of tumour tissue, i.e. the tissue specimen may not be fully representative of the biological characteristics of a particular tumour. Exosomes, however, may offer more comprehensive information, according to the researchers.

The second international meeting on exosomes has just opened in Boston, and Mattias Belting and members of his team are there.

"It is very exciting to be part of the emergence of a novel research field. It can be anticipated that the most influential researchers in this area may one day be awarded the Nobel Prize", says Dr Belting.

The results are published in *Proceedings of the National Academy of Sciences (PNAS)*.

Provided by Lund University

APA citation: Virus-like particles provide vital clues about brain tumors (2013, April 17) retrieved 16 July 2022 from <https://medicalxpress.com/news/2013-04-virus-like-particles-vital-clues-brain.html>

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