

Surprises of the measles virus structure with new 3d model

October 24 2011

Professor Sarah Butcher's research group from Helsinki University's Institute of Biotechnology report in the 24th October online issue of the journal *Proceedings of the National Academy of Sciences* a three-dimensional model of measles virus. The new model helps to explain many previous, unaccounted for observations in the life cycle of the virus.

Measles is an important disease worldwide that is highly infectious, causing the deaths of over 100000 people annually. According to the latest figures from the World Health Organisation, 33 countries in Europe have reported cases in 2011. As there is an effective vaccine against [measles](#) given to children, most of the infections detected in Finland are the result of exposure abroad.

Measles virus belongs to a family of viruses whose members are all pleomorphic enveloped viruses. All the members of this family contain a so called "matrix" protein which has previously been thought to line the inside of the envelope and play a major role in the budding of the virus from the cell.

The group's research shows that matrix actually forms helical tubes inside the virus that are wrapped around the [viral genome](#) and nucleocapsid. So matrix helps to compact the genome to fit it into the virus. Thus the researchers believe that matrix will regulate both the start of [virus replication](#) in the cell, and also the movement of the genome within the cell as the virus assembles. The research used modern electron

cryo-tomography and image processing to solve the structure, a method analogous to X-ray tomography of the human body.

Lassi Liljeroos, M.Sc. a Ph.D. student in the Butcher group will now follow up on these results by looking at related viruses to see if they are similar. Structurally, measles virus may be similar to other viruses causing [respiratory tract infections](#) like influenza and RS-virus.

The understanding of [virus structure](#) at the molecular level can help in the design and development of new antiviral drugs. The measles virus research was carried out as collaboration with researchers from Oxford and Turku Universities.

More information: Electron cryotomography of measles virus reveals how matrix protein coats the ribonucleocapsid within intact virions, *PNAS*, 2011.

Provided by University of Helsinki

Citation: Surprises of the measles virus structure with new 3d model (2011, October 24)
retrieved 26 June 2024 from <https://phys.org/news/2011-10-measles-virus-3d.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--