

Researchers discover Ebola's deadly secret

January 19 2010

(PhysOrg.com) -- Research at Iowa State University has led scientists to uncover how the deadly Zaire Ebola virus decoys cells and eventually kills them.

A research team led by Gaya Amarasinghe, an assistant professor of biochemistry, biophysics and molecular biology, had previously solved the structure of a critical part of an Ebola protein known as VP35, which is involved in host immune suppression.

Amarasinghe and his research team now know how VP35 is able to do it.

When most viruses invade a cell, they start to make RNA in order to replicate.

When the healthy host cell senses the replicating RNA, the host cell starts to activate anti-viral defenses that halt replication and eventually help clear the <u>viral infections</u>.

What Amarasinghe and his group have discovered is that Ebola virus encoded VP35 protein actually masks the replicating viral <u>ribonucleic</u> <u>acid</u> (RNA), so the cell doesn't recognize that there is an invading virus.

One of the reasons Ebola, in particular the strain isolated from Zaire, is so deadly is that the host cells don't have any immune response when the virus enters the cell, said Amarasinghe.

"The question with Ebola has always been 'Why can't host cells mount an



<u>immune response</u> against the Ebola virus, like they do against other viruses?'" he said.

"The answer is, 'If the cell doesn't know that there's an infection, it cannot build up any response.' So our work really gets at the mechanism Ebola infection and immune evasion."

The collaborative approach taken by Amarasinghe enabled him to team up with virologist Christopher Basler at the Mt. Sinai School of Medicine, New York City, to investigate how the structural findings match up with how these proteins function inside the cell.

"Our initial structure that we solved in 2008 was key to expanding our knowledge, but the structure was just part of the equation, and when we put it together with the functional studies, everything made sense," Amarasinghe said.

The current research describing the protein-RNA complex structure, which was solved by using non-infectious VP35 protein, and associated functional studies is published in the current issue of the journal *Nature Structural and* Molecular Biology and is available as an advanced online publication.

These findings build on Amarasinghe's research published in the journal *Proceedings of the National Academy of Sciences* of the United States of America last January.

In his current research, Amarasinghe focused on a specific part of the Zaire Ebola VP35 protein that he thought looked unusual.

As testing results came in, he found that the suspect region of the protein was binding with, or neutralizing, the part of the host cell that triggers the immune system in the cell.



"The interesting thing about the <u>Ebola virus</u> is that it doesn't let cells even get started to defend themselves," he said. "This hides the (viral) RNA from being recognized by the <u>host cell</u>. This is a powerful immune evasion mechanism."

More information: <u>www.nature.com/nsmb/journal/va ...</u> <u>t/abs/nsmb.1765.html</u>

Provided by Iowa State University

Citation: Researchers discover Ebola's deadly secret (2010, January 19) retrieved 10 May 2024 from <u>https://phys.org/news/2010-01-ebola-deadly-secret.html</u>

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.