Researchers discover gene that blocks HIV

by Richard Cairney

February 28, 2008 - Edmonton - A team of researchers at the University of Alberta has discovered a gene that is able to block HIV, and in turn prevent the onset of AIDS.

Stephen Barr, a molecular virologist in the Department of Medical Microbiology and Immunology, says his team has identified a gene called TRIM22 that can block HIV infection in a cell culture by preventing the assembly of the virus.

"When we put this gene in cells, it prevents the assembly of the HIV virus," said Barr, a postdoctoral fellow. "This means the virus cannot get out of the cells to infect other cells, thereby blocking the spread of the virus."

Barr and his team also prevented cells from turning on the TRIM22 gene - provoking an interesting phenomenon: the normal response of interferon, a protein that co-ordinates attacks by genes like TRIM22 against viral infections, became useless at blocking HIV infection.

"This means that TRIM22 is an essential part of our body's ability to fight off HIV. The results are very exciting because they show that our bodies have a gene that is capable of stopping the spread of HIV."

One of the greatest challenges in battling HIV is the virus' ability to mutate and evade medications. Antiretroviral drugs introduced during the late 1990s interfere with HIV's ability to produce new copies of itself - and though beneficial, the drugs are unable to eradicate the virus. Barr and his team have discovered a gene that could potentially do the job naturally.

"There are always newly emerging drug-resistant strains of HIV so the push has been to develop more natural means of blocking the virus. The discovery of this gene, which is natural in our cells, might provide a different avenue," said Barr. "The gene prevents the assembly of the virus so in the future the idea would be to develop drugs or vaccines that can mimic the effects of this gene."

"We are currently trying to figure out why this gene does not work in people infected with HIV and if there is a way to turn this gene on in those individuals," he added. "We hope that our research will lead to the design of new drugs, or vaccines that can halt the person-to-person transmission of HIV and the spread of the virus in the body, thereby blocking the onset of AIDS."

The researchers are now investigating the gene's ability to battle other viruses.

Barr's research is funded by the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council and the Alberta Heritage Foundation for Medical Research. The findings are published in the *Public Library of Science Pathogens.*