How HIV hides itself

April 1 2008

Researchers have discovered how Human Immunodeficiency Virus (HIV), which causes AIDS, can hide itself in our cells and dodge the attention of our normal defences, scientists heard today at the Society for General Microbiology's 162nd meeting being held this week at the Edinburgh International Conference Centre.

When a normal virus such as the common cold infects people we develop an immune response and produce defence cells which can quickly get rid of the virus. But when HIV infects us it can last for our whole life. HIV does this by successfully hiding from our immune cells, which are seeking to identify and destroy the virus, fooling them into thinking that it is part of the normal trash in a cell rather than being clearly visible on the cell surface.

"HIV can make a protein called Nef, which helps the virus hide. Nef interferes with one important part of our defences which helps our immune system recognise infected cells by displaying pieces of the infecting virus or bacteria on the cell surface, forming a target for our bodies' killer cells. When HIV infects one of our cells, the protein Nef binds to this helper system and alters it in such a way that the cell believes it belongs in the cellular trash bin rather than on the surface where our main defences can see it," says Associate Professor Dr Kathleen Collins of the University of Michigan, USA.

The Nef protein made by HIV recruits other proteins which we naturally make within our cells to aid this subversion. The US scientists have identified these natural proteins and developed inhibitors which can

block their actions, reversing the activity of Nef and potentially allowing our immune system to function properly and clear the virus from our system.

“We are currently screening a whole range of substances looking for small molecule inhibitors which could be developed into drugs to provide better therapies for people with HIV and AIDS,” says Kathleen Collins. “We have discovered that Nef takes on notably different shapes and structural forms in different contexts, which allows it to reveal or obscure different traffic signals within the infected cell as needed. Once we have a better understanding of the surfaces and shapes involved in these interactions we will be in a better position to develop medicines which may someday help to combat AIDS.”

Source: Society for General Microbiology