

HIV-1's 'hijacking mechanism' pinpointed by researchers

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Researchers at McGill University and the affiliated Lady Davis Institute for Medical Research at Montreal's Jewish General Hospital - along with colleagues at the University of Manitoba and the University of British Columbia - may have found a chink in the armour of the human immunodeficiency virus type 1 (HIV-1), the microorganism which causes AIDS. They have pinpointed the key cellular machinery co-opted by HIV-1 to hijack the human cell for its own benefit. Their study was published in May in the *Journal of Biological Chemistry*.

Once a cell is infected with HIV-1, activation of the virus's gene generates a large HIV-1 RNA molecule known as the RNA [genome](#). This is then transported from the cell nucleus to the inner surface of the [plasma membrane](#). The RNA genome can produce both structural proteins and enzymes, but once it arrives at the plasma membrane it can also assemble into new copies of the virus that actually bud out of the cell. Dr. Andrew J. Mouland and his colleagues have discovered how the RNA genome gets transported - or trafficked - from the nucleus to the plasma membrane.

"There is a highway inside the human cell," explained Dr. Mouland, Associate Professor at McGill's Departments of Medicine and Microbiology and Immunology and head of the HIV-1 RNA Trafficking Laboratory at the Lady Davis Institute. "When you drive your car to Toronto you're 'trafficking' the items in your trunk. Similarly, what we have shown is that HIV-1 commandeers the host cell's endosomal machinery to traffic its structural proteins and RNA genome. Imagine

that it's essentially jumping on board for the ride and directing it to where it needs to go. This trafficking can occur very fast in cells; so this is how these key components of HIV-1 so efficiently get to the plasma membrane, where the virus can begin to assemble.

"The RNA genome is critical, because if it doesn't get trafficked to the right place at the plasma membrane, the virus will not be infectious," he explained.

This discovery is extremely exciting, Dr. Mouland said, because now that researchers understand a little more about how the cell's transport machinery is hijacked by HIV-1, they have hopes that they can now begin to devise strategies to block the process.

Source: McGill University ([news](#) : [web](#))

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