

A new weapon in the war against HIV-AIDS: Combined antiviral and targeted chemotherapy

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A discovery by a team of Canadian and American researchers could provide new ways to fight HIV-AIDS. According to a new study published in *Nature Medicine*, HIV-AIDS could be treated through a combination of targeted chemotherapy and current Highly Active Retroviral (HAART) treatments. This radical new therapy would make it possible to destroy both the viruses circulating in the body as well as those playing hide-and-seek in immune system cells.

The study was led by Dr. Rafick-Pierre Sékaly, of the Université de Montréal. Dr. Jean-Pierre Routy of the Research Institute of the McGill University Health Centre (RI-MUHC) and scientists from the National Institutes of Health (NIH) and the University of Minnesota in the United States also collaborated on the investigation.

To date, anti-AIDS treatments have been stymied by "HIV reservoirs" - [immune system](#) cells where the [virus](#) hides and where existing HAART treatments cannot reach. The researchers successfully identified the cells where HIV hides and the "stealth" mechanisms that allow the virus to escape existing treatments. This breakthrough opens the way towards innovative therapies that are completely different from current approaches.

"Our results argue in favour of a strategy similar to the one used against leukemia, which is targeted [chemotherapy](#), associated with a targeted

immune treatment. This would make it possible to destroy the cells containing a virus, while giving the immune system time to regenerate with healthy cells," says Dr. Rafick-Pierre Sékaly, a professor at the Université de Montréal, researcher at the Centre Hospitalier de Université de Montréal (CHUM), director of INSERM 743 and scientific director of the Vaccine and Gene Therapy Institute of Florida.

"For the first time, this study proves that the HIV reservoirs are not due to a lack of potency of the antiretroviral drugs, but to the virus hiding inside two different types of long life CD4 memory immune cells," explains Dr. Jean-Pierre Routy, a hematologist with the MUHC, researcher in infection and immunity at the RI-MUHC and professor of hematology at McGill University. "There are several types of HIV reservoirs, each necessitating a different treatment to eliminate them."

Indeed, once the virus is hidden in these reservoir cells, it becomes dependent on them: if the cell lives, the virus lives, but if the cell dies, so does the virus. As such, destroying these immune cells will allow for the elimination of the resilient or hidden parts of the virus. Existing HAART treatments destroy the viruses circulating in the body, yet cannot reach those hidden in reservoir cells.

"We now have brand-new options to fight [HIV](#)," concludes Nicolas Chomont, a postdoctoral intern at the Université de Montréal's Department of Microbiology and Immunology and one of the co-authors of this study. "The combination of fundamental and clinical approaches led to amazing results that allow us to elucidate another mystery of this virus of a thousand faces."

These new therapeutic options will require many more years of research before they are validated and become a reality for patients. However, this study represents an invaluable work plan that will provide a map for many laboratories around the world.

Source: University of Montreal ([news](#) : [web](#))

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