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Dr. Rafick-Pierre Sékaly, Department
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Protein Found That Strengthens Immune System

Research discovers how some HIV-infected patients can naturally resist the disease

By: Matthew DiCicco

HIV is characterized by diminishing central memory T-cells, a specific type of infection-fighting cell that recognizes foreign invaders and recalls how to fight them. Now, a Canadian-American research team is looking at how the T-cells persist in people who are able to control the HIV disease naturally -- called 'elite controllers' -- without strong pharmaceutical cocktails.

Lead scientist Prof. Rafick-Pierre Sékaly, Université de Montréal, and his colleagues have found how elite controllers hold a specific protein in their DNA that regulates the central memory T-cells, keeping them alive and fighting. They are studying how the protein could be altered to limit central memory T-cell deterioration in other patients.

"We showed that in HIV infection the central memory T-cells re-seed the immune system to fight back," says Sékaly.

People vaccinated to ward off disease have central memory T-cells active even after 30-40 years. The cells regenerate themselves inside the body, to keep up the recipient's immunity.

Sékaly has found a key protein called FOX03a that preserves these central memory T-cells in elite controllers, allowing them higher immune memory and function. The protein is defective in other HIV-infected individuals that need treatment to curb the disease.

In his study, he looked at three different groups infected with HIV: ones that were treated and benefited from strong HIV drug cocktails, ones that were treated and did not benefit, and one group not

showing symptoms. The improved central memory T-cells have such an effect that those that were infected and treated were not healthier than those that were infected but contained the natural protection of the T-cells.

FOX03a is able to force the HIV virus into a permanent defensive state in the body. So, further research could contribute towards a vaccine or at least stronger suppressants for the HIV virus. The researchers are now trying to purify FOX03a and find molecules that induce its protective form.

"This is a major step forward in the understanding of how our immune system responds to life-threatening infections such as Hepatitis C," says Sékaly.

Along with HIV treatment, the discovery could lead to therapies for other diseases that weaken the immune system, such as rheumatoid arthritis, bone marrow and organ transplant rejections and some cancers.

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Also involved on this research project are colleagues from the Centre Hospitalier de l'Université de Montréal and Inserm, Dr. Elias El Haddad and Dr. Julien van Grevenynghe, Prof. Jean-Pierre Routy, McGill University, and Robert S. Balderas, BD Biosciences Institute of San Diego.

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