

Researchers find molecular 'key' to successful blood stem cell transplants

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University of British Columbia researchers have discovered a "molecular key" that could help increase the success of blood stem cell transplants, a procedure currently used to treat diseases such as leukemia, Hodgkin's lymphoma and aplastic anemia.

During a blood stem cell transplant, donor blood stem cells - which can produce red and [white blood cells](#) and platelets - are injected into the recipient to produce new blood. The stem cells then need to travel to the thymus - an organ near the heart - and produce T-cells, a type of white blood cell that orchestrates the body's immune system.

A common problem with blood stem cell transplants is the failure of stem cells to repopulate the thymus and generate T-cells. Without T-cells the patient is unable to fight infection and post-transplant prognosis is poor.

Now Prof. Hermann Ziltener and his research team at UBC's Biomedical Research Centre have identified a molecule called S1P that can tell the thymus to "open the gates" and accept more stem cells.

"This discovery gives us a handle on determining whether the thymus will be receptive to migrating stem cells," says Ziltener, a professor in the Dept. of Pathology and Laboratory Medicine. "By treating patients with drugs that control S1P, scientists can now manipulate the thymic gates to either open or close."

The same team had previously identified a number of molecules that function as the thymic gates for migrating [stem cells](#). The new study, published in the April issue of The [Journal of Experimental Medicine](#), is the first to hone in on the "key" molecule that can open the thymic gate.

Next steps in the research include finding the mechanism T-cells in blood use to control S1P formation. Researchers estimate that it would be at least five years before the discovery can be translated into a clinical test.

Source: University of British Columbia ([news](#) : [web](#))

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