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Research suggests compound administered during some bone marrow transplants elevates risks

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Research conducted at Oregon Health & Science University's Vaccine and Gene Therapy Institute may spur debate about the risks associated with administering a specific compound in some forms of bone-marrow transplantation. The research is published in the current edition of *Cell Host and Microbe*.

The VGTI research team, led by institute director Jay Nelson, Ph.D., studies human cytomegalovirus, a virus that may infect up to 80 percent of the American population. The exact percentage of infected citizens is unknown due to the fact that the virus causes minor symptoms or no symptoms at all in most healthy people. However, the virus can pose a significant risk in people whose immune system has been compromised, such as those infected with HIV, or patients who have had their immune systems suppressed through chemotherapy or with anti-rejection medications during transplantation.

During this specific research project, Nelson, along with M. Shane Smith, Ph.D., a postdoctoral fellow in Nelson's lab and other colleagues focused on the impact of granulocyte-colony stimulating factor, or G-CSF, on the virus. G-CSF is a hormone frequently administered to bone marrow transplant donors to stimulate stem cell growth and localization of blood prior to harvesting blood-borne stem cells.

While G-CSF-induced stem cell localization to the blood does provide a

more comfortable means of stem cell donation compared to the previous method of harvesting cells directly from the bone marrow, previous studies have suggested that bone marrow transplantation performed with blood-borne stem cells places recipients at double the risk for HCMV and chronic graft-versus host disease.

The VGTI research team uncovered the mechanism behind this associated risk. Using a mouse model of the disease, the scientists determined that G-CSF causes HCMV, which is in a dormant or latent state in the bone marrow, to reactivate in stem cells, thereby placing stem cell recipients at elevated risk for HCMV transmission and disease.

"Because bone marrow recipients' immune systems are so significantly compromised, this risk is very significant," said Nelson. "We believe this research will generate discussion about the proper applications for G-CSF - which continues to provide benefits - but the risk associated must also be factored into patient care."

Provided by Oregon Health & Science University