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## **CU SCIENTISTS' DISCOVERY COULD LEAD TO NEW CANCER TREATMENT** *Researchers find method to expand blood stem cells*

AURORA, Colo. (Sept. 2, 2014) – A team of scientists from the University of Colorado School of Medicine has reported the breakthrough discovery of a process to expand production of stem cells used to treat cancer patients. These findings could have implications that extend beyond cancer, including treatments for inborn immunodeficiency and metabolic conditions and autoimmune diseases.

In an [article](#) published Aug. 29 in PLOS ONE, researchers from the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology and Taiga Biotechnologies, Inc. said they have uncovered the keys to the molecular code that appear to regulate the ability of blood stem cells to reproduce and retain their stem-like characteristics.

The team developed protein products that can be directly administered to blood stem cells to encourage them to multiply without permanent genetic modifications.

“Use of stem cells to treat cancer patients who face bone marrow transplants has been a common practice for four decades,” said Yosef Refaeli, Ph.D., an associate dermatology professor and one of the study’s lead scientists. “The biggest challenge, however, has been finding adequate supplies of stem cells that help patients fight infection after the procedure.”

Gates Stem Cell Center Director Dennis Roop, Ph.D., recognized the magnitude of the team’s work.

“Researchers have long attempted to increase the number of blood stem cells in a lab,” Roop said. “Most of those approaches have been limited by the nature of the resulting cells or the inadequate number of cells produced.”

The technology described in the PLOS ONE article has worked with blood stem cells obtained from cord blood, adult bone marrow or peripheral blood from adults.

“The ability to multiply blood stem cells from any source in a dish will be critical for adoption of this new technology in clinics,” said Brian Turner, Ph.D., MHS, Taiga Biotechnologies’ chief scientific officer. Dr. Turner is also one of the paper’s lead authors.

The goal now is to move the technology from the lab into clinical trials. Taiga Biotechnologies is in the process of setting up first-in-human clinical trials with the blood stem cell expansion approaches described in the article. The clinical applications for expanded human blood stem cells vary from inborn immunodeficiency conditions, like SCID and sickle cell anemia, to metabolic conditions, like Hurler's disease or Gaucher syndrome. Autoimmune diseases that could be affected include severe multiple sclerosis and lupus. And the types of cancer that could be treated as a result of this research include leukemia, lymphoma, myeloma and other types of solid tumors.

LINK TO ARTICLE: <http://dx.plos.org/10.1371/journal.pone.0105525>

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### **About the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology**

The Charles C. Gates Regenerative Medicine and Stem Cell Center was established in 2006 with a gift in memory of Denver industrialist and philanthropist, Charles C. Gates, who was captivated by the hope and benefit stem cell research promised for so many people in the world. The Gates Center aspires to honor what he envisioned—by doing everything possible to support the collaboration between basic scientific researchers and clinical faculty to transition scientific breakthroughs into clinical practice as quickly as possible.

Led by Founding Director Dennis Roop, Ph.D., the Gates Center is located at the University of Colorado's Anschutz Medical Campus, the largest new biomedical and clinical campus in the United States. Operating as the only comprehensive Stem Cell Center within a 500-mile radius, the Gates Center shares its services and resources with an ever-enlarging membership of researchers and clinicians at the Anschutz Medical Campus, which includes University of Colorado Hospital, Children's Hospital Colorado and the future Veterans Administration Medical Center, as well as the Boulder campus, Colorado State University, the Colorado School of Mines, and business startups. This collaboration is designed to draw on the widest possible array of scientific exploration relevant to stem cell technology focused on the delivery of innovative therapies in Colorado and beyond.

### **About Taiga Biotechnologies, Inc.**

Taiga Biotechnologies, Inc. is a biotechnology company based in Aurora, Colo. Taiga Biotechnologies' mission is to develop novel approaches to treat complex diseases, including cancers, immunodeficiencies and infectious agents such as Influenza and HIV. The company is currently developing six core programs, all enabled by the company's proprietary stem cell technologies: the development of laboratory expanded donor blood stem cells for indications that include congenic or acquired immunodeficiency and cancer; a novel immunotherapeutic for improvement of outcomes following vaccination for infectious diseases or cancer; a novel biological that may expedite recovery from bone marrow stem cell transplantation; a novel approach for the expansion of human T-cells in a dish without genetic modification, to be used for passive immunotherapy for cancer or infectious disease; red blood cell pharming from blood

stem cell lines for clinical use in civilian and military applications; therapeutic antibodies based on a novel approach for development of antibody specificities for difficult protein targets.

### **About the University of Colorado School of Medicine**

Faculty at the University of Colorado School of Medicine work to advance science and improve care. These faculty members include physicians, educators and scientists at University of Colorado Hospital, Children's Hospital Colorado, Denver Health, National Jewish Health, and the Denver Veterans Affairs Medical Center. The school is located on the [Anschutz Medical Campus](#), one of four campuses in the University of Colorado system. To learn more about the medical school's care, education, research and community engagement, visit its [web site](#).