

New reporter system to study bone-related regenerative medicine generated by UMN labs

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A new reporter system used to study the bone regeneration potential of human embryonic stem cells has been generated in research led by the University of Minnesota. The new reporter system is the first of its kind for human pluripotent stem cells and is important for identifying certain agents and pathways that mediate early stages of human bone development.

The research is published today in the journal *Stem Cell Reports*.

The RUNX2-yellow fluorescent protein reporter system allows researchers to learn whether a human pluripotent stem cell-derived cell tests positive (or negative) for certain properties. Cells testing positive have been shown previously to repair bone in the skulls of immunodeficient mice. An improved understanding of whether a cell tests positive or negative through the RUNX2-yellow fluorescent protein reporter system will allow researchers to better monitor which types of cells produced from human pluripotent stem cells might be best suited to regenerating bone.

The *Stem Cell Reports* publication comes on the heels of a complementary finding led by the same group of University of Minnesota researchers published in December in the journal *Stem Cells*. The *Stem Cells* publication specified a new reporter system to identify and isolate a unique group of progenitor blood cells from human

pluripotent [stem cells](#). The ability to isolate this unique group of cells will likely impact the scientific community's potential to generate human blood cells from human [pluripotent stem cells](#), with the potential to produce new therapies for patients to better treat diseases such as leukemia or genetic blood disorders.

The bone-related reporter system will now be used to test potential new therapeutic compounds at the University's Institute for Therapeutics Discovery & Development. Mayo Clinic and the University of Minnesota School of Dentistry contributed to the finding supported by National Institutes of Health and National Institute of Dental and Craniofacial Research grants DE022556 and R90 DE023058.

"While we've developed these reporters in other systems including animals in the past, we haven't previously done this in human-specific cells," said Dan Kaufman, M.D., Ph.D., corresponding author of the publication, professor of medicine at the University of Minnesota Medical School, and Stem Cell Institute and Masonic Cancer Center member. "Human cells allow us to better translate new therapies from the lab to humans, and learn more about how early bone and [blood cells](#) are made."

More information: *Stem Cell Reports*, www.cell.com/stem-cell-reports ... [2213-6711\(15\)00029-6](tel:2213-6711(15)00029-6)

Provided by University of Minnesota

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