

New stem cell method may eliminate need for blood donations to maintain platelet supply

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Platelets, whose primary function is to prevent bleeding, are vital for treating various forms of trauma and blood diseases. However, they can only be obtained through blood donations at present. Researchers reporting online February 13 in the Cell Press journal *Cell Stem Cell* recently found a way to create platelets without the need for donated blood, an advance that could possibly erase supply shortages and ensure platelet treatments for all who need them.

The supply of donated [platelets](#), which have a short shelf life and must be kept at room temperature, is often insufficient to meet clinical needs. In addition, while transfused platelets do not typically need to be immune-matched to patients, repeated transfusion of unmatched platelets leads to an immune reaction that eventually renders patients unresponsive to platelet [transfusion therapy](#).

To address these limitations, investigators from Japan developed a strategy to derive functional platelets from human induced [pluripotent stem cells](#). Induced pluripotent stem cells can be generated from various types of cells in the body, and they can in turn be coaxed to develop into nearly any other cell type. In the current study, the approach involved genetically manipulating such [stem cells](#) to become stable immortalized lines of platelet-producing cells called megakaryocyte progenitors.

The megakaryocyte progenitors could produce large quantities of platelets with clotting capabilities that were similar to those of donated platelets. Unlike freshly donated platelets, though, the immortalized

megakaryocyte progenitors could be expanded and frozen for long-term storage.

"Here we established a method to achieve the long-term self-replication of megakaryocyte progenitors as an immortalized cell line, which could eventually contribute to large-scale cultivation and production of platelets," says senior author Dr. Koji Eto of Kyoto University and the University of Tokyo.

More information: *Cell Stem Cell*, Nakamura et al.: "Expandable megakaryocyte cell lines enable clinically-applicable generation of platelets from human induced pluripotent stem cells."

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