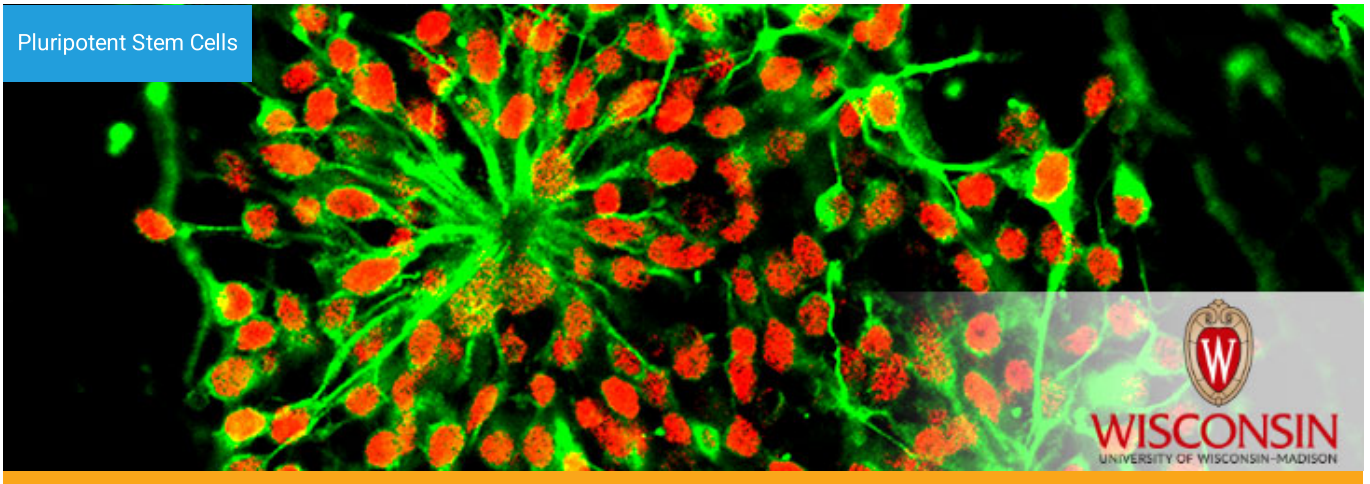




Generating Endothelial Cells from Human Pluripotent Stem Cells

[View U.S. Patent No. 9,290,741 in PDF format.](#)

WARF: P130110US02

Inventors: Sean Palecek, Xiaojun Lian, Xiaoping Bao

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a simplified method for differentiating human pluripotent stem cells into endothelial cells without expensive growth factors.

Overview

Endothelial cells derived from human pluripotent stem cells (hPSCs) hold incredible potential for human health, for example, in the engineering of new blood vessels, heart regeneration and screening for cancer-slowing drugs.

To realize this potential, scalable and cost-effective methods must be found for generating endothelial cells from hPSCs. Current methods are inefficient and require expensive growth factors.

The Invention

UW–Madison researchers have developed a new method for differentiating hPSCs into endothelial cells under chemically defined, growth factor-free conditions. Their method works by activating the Wnt/ β signaling pathway for a defined period, e.g., using a Gsk3 inhibitor.

In the new process, hPSCs are contacted with the Wnt/ β signaling activator for about two days in suitable culture medium. The cells are cultured in the absence of the activator for up to another 10 days, and undergo at least 14 population doublings. The culture medium is substantially free of exogenous growth factors like VEGF.

The entire process can be embodied in a kit containing (i) a Gsk3 inhibitor, (ii) suitable culture medium and (iii) appropriate instructions.

Applications

- Efficiently generating endothelial cells from hPSCs

Key Benefits

- Steps are simplified and reproducible.
- No costly growth factors
- Faster – cells expand more than 16,000 fold within a month
- More pure – can generate populations of 99 percent endothelial cells

Stage of Development

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The researchers have generated endothelial cells from pluripotent stem cells in a simplified, growth factor-free method. The cells are purified to 99 percent after purification.

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Additional Information

For More Information About the Inventors

- [Sean Palecek](#)

Related Technologies

- [WARF reference number P100219US02 describes a protocol for producing highly pure populations of brain microvascular endothelial cells \(BMECs\), which comprise the blood-brain barrier.](#)

Tech Fields

- [Pluripotent Stem Cells : Differentiation](#)

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