

Simplified Generation and Purification of Human Primordial Germ-Like Cells

Researchers at Stanford have developed a simplified 2-D in vitro platform to generate human primordial germ cells (PGCs) from pluripotent stem cells. This work seeks to better elucidate germ cell development and to simplify the production of human PGCs for future drug discovery, disease modeling and potentially infertility treatments. In mammalian embryos, PGCs are the harbinger to eggs and sperm, and thus key to the act of reproduction itself and the transmission of genetic and epigenetic information. Current methods of generating PGCs from human pluripotent stem cells entail complex 3-D aggregates and high variability. The researchers have shown that their simplified, monolayer method can differentiate hPSCs into PGCs within 3.5 days, with higher efficiencies and improved consistency across multiple hPSC lines.

Stage of Development

The researchers are implementing this platform to create fully mature sperm and oocytes from human pluripotent stem cells.

Applications

- In vitro generation of human primordial germ cells
- Modeling and treatment of male and female infertility
- Production of autologous sperm and oocytes
- Drug development

Advantages

- Simplified 2-D generation of human PGCs with improved efficiency and reproducibility
- Robust and consistent

Patents

- Published Application: [WO2021243252](#)
- Published Application: [20230242871](#)

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