Technology from Kyoto University

Method for Inducing Pro-spermatogonia or Oogonia from Human iPS Cells

We are looking to out-license the technology for its commercialization.

Novel method to produce oogonia and pro-spermatogonia using human primordial germ-like cells (PGCLCs) or primordial germ cells (PGCs)

◆ Background

Conventional methods for differentiating human PGCLCs or PGCs into oogonia or pro-spermatogonia relied on co-culture with ovarian or testicular cells from other species or individuals to provide an external differentiation environment. This produced mixed, impure cell populations. Therefore, a simpler and more efficient method that induces differentiation without an external environment is needed.

◆ Description

Researchers at Kyoto University successfully established a method to induce pro-spermatogonia and oogonia from human iPS cells.

They first generated PGCLCs and PGCs from pluripotent stem cells, including embryonic stem (ES) cells and iPS cells. By culturing these cells in a medium with specific signaling molecules, they efficiently induced differentiation into oogonia and pro-spermatogonia without relying on ovarian or testicular cells from other species or individuals.

This method allowed them to elucidate the molecular mechanisms of epigenetic reprogramming involved in the differentiation of pre-spermatogonia and oogonia.

The work marks a significant milestone in understanding human germ cell development and advancing in vitro generation of human germ cells, with potential applications in studying infertility and developing new treatment strategies.

◆Development Status

Confirmed the differentiation of prespermatogonia and oogonia *in vitro*

◆Potential Application

Development of infertility treatments

◆Intellectual Property

PCT/JP2024/029671

◆Offers

- Patent License
- Collaborative Research

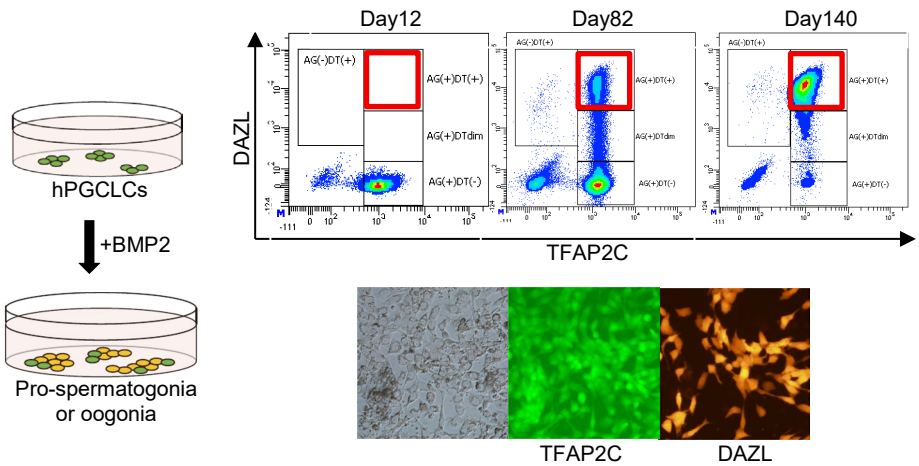

Figure. Specific signalling promotes hPGCLC differentiation

(Left) Human PGCLCs proliferate and differentiate into pro-spermatogonia or oogonia in the presence of BMP signaling molecules, coupled with their extensive amplification (about >10^{10}-fold).

(Upper Right) Flow cytometric analysis of the expression of PGC marker TFAP2C and pro-spermatogonia/oogonia marker DAZL. The number of pro-spermatogonia and oogonia (red frame) increases in proportion to the culture period.

(Bottom Right) Typical morphology of cultured human PGCLCs. EGFP fluorescence (center) indicates TFAP2C expression, and tdTomato fluorescence (right) indicates DAZL expression.

◆Contact

TLO-KYOTO Co., Ltd.
Mail: licensing_ku@tlo-kyoto.co.jp
Phone: +81-75-753-9150

Level 3, International Science Innovation Bldg., Kyoto Univ.,
Yoshidahonmachi, Sakyo-ku,
Kyoto 606-8501, Japan

IAC Institutional Advancement and Communications

TLO-KYOTO