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5 Reprogramming of germ cells into pluripotency

Yoichi Sekita, Toshinobu Nakamura, and Tohru Kimura

Abstract

17 Primordial germ cells (PGCs) are precursors of all gametes, and represent the founder
 10 cells of the germline. Although developmental potency is restricted to germ-lineage
 cells, 24 PGCs can be reprogrammed into a pluripotent state. Specifically, PGCs give rise to
 germ cell tumors, such as testicular teratomas, 2 in vivo, and to pluripotent stem cells
 known as embryonic germ cells (EGCs) 22 in vitro. In this review, we highlight the current
 15 knowledge on signaling pathways, transcriptional controls, and post-transcriptional
 controls that govern germ cell differentiation and de-differentiation. These regulatory
 processes are common in the reprogramming of germ cells and somatic cells, and play a
 23 role in the pathogenesis of human germ cell tumors.

20 **Keywords:** Primordial germ cell; Reprogramming; EG cell; Germ cell tumor; iPS cell;
 Signal; Small molecule compound; Transcription factor; Gene.

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