



# Effects of glial cell line-derived neurotrophic factor and leukemia-inhibitory factor on the behavior of two calf testis germline stem cell colony types

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**ABSTRACT.** Germline stem cells are the only such capable of transmitting genetic information *in vivo*. The isolation and culture of these cells *in vitro* provide a unique model to understand sperm differentiation and hence, spermatogenesis and male fertility. In this study, we isolated, purified, and cultured germline stem cells from the testes of newborn calves. Moreover, we investigated the effects of glial cell line-derived neurotrophic factor (GDNF) and leukemia-inhibitory factor (LIF) on their proliferation. Male calf germline stem cells were found to be pluripotent, and able to form grape-like and embryonic stem cell (ES)-like colonies when cultured. GDNF promoted proliferation of the former, whereas LIF induced growth of the latter. The grape-like colonies retained their germline stem cell characteristics, whereas

the ES-like colonies demonstrated more primitive attributes. This investigation established a male calf germline stem cell culture model that may serve as a foundation for further studies aiming to understand the properties of such cells.

**Key words:** Calf testis; Germline stem cells; Sperm differentiation; Glial cell line-derived neurotrophic factor; Leukemia-inhibitory factor; Proliferation