innovations
from the University of Vermont

TITLE: MAINTAINING SELF-RENEWING, PLURIPOTENT EMBRYONIC STEM CELLS

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DESCRIPTION: Embryonic stem (ES) cells are derived from the inner cell mass (ICM) of the pre-implantation embryo and are capable of self-renewal (proliferation without differentiation) and pluripotency (the capability to differentiate into all three of the embryonic germ layers). With these capabilities, ES cells hold the promise to serve as a source of cells in transplantation medicine, provided that growth of these cells is done in a way that reduces opportunity for contamination by infectious agents from feeder cells or other animal sourced contamination. This invention identifies wnt3a as another factor involved in keeping ES cells capable of self-renewal and pluripotency and provides methods for use of media conditioned by wnt3a expressing cells or media containing wnt3a as one of multiple supporting factors as alternatives for feeder cell and LIF maintained ES cells.

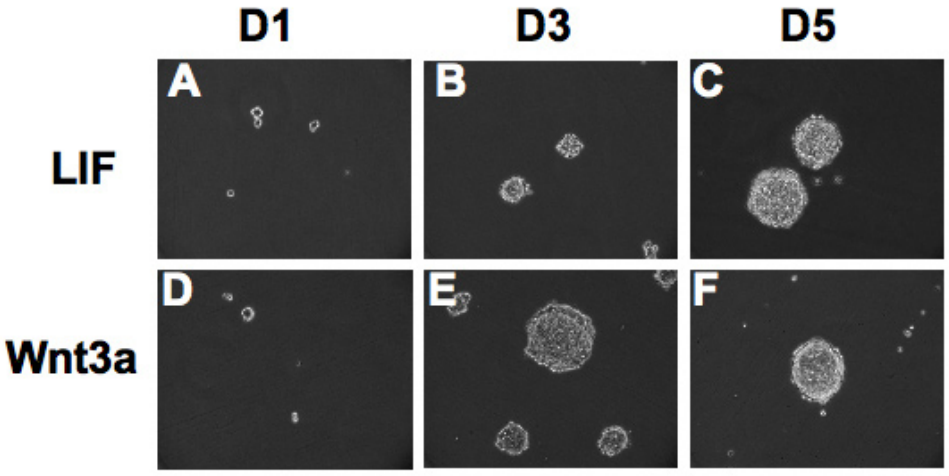

Fig. 1. Effects of 50% v/v conditioned medium from wnt3a cell line on ES cell self-renewal compared with LIF medium. Phase contrast photomicrographs of compact ES cell colonies (small to large) in self-renewal in LIF containing medium at D1-D5 (A-C) and in conditioned medium from wnt3a cells at D1-D5 (D-F). Original magnification, x100

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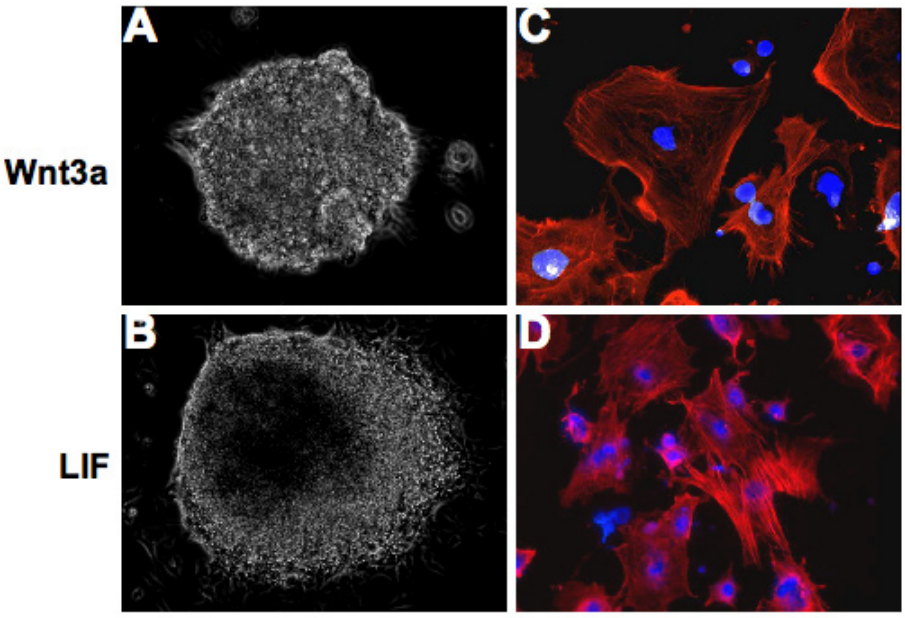

Fig. 2. Phase contrast photomicrographs of embryoid bodies (EBs) generated from CGR8 ES cells maintained in 50% wnt3a conditioned medium (A) or LIF containing medium (B). EB immunostaining for cardiac specific sarcomeric ∝–actin (red) from wnt3a conditioned media maintained ES cells (C) and from LIF maintained ES cells (D), C&D, show nuclei stained blue with Hoeschst 33258. Original magnification, x100.

ADVANTAGES: Identification of the role of wnt3a in ES cell self-renewal and pluripotency offers another option in the arsenal of feeder free culture methods for growth of and future therapeutic use of ES cells.

PATENT STATUS: Patent pending

LICENSING STATUS: Worldwide rights available

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