



אוניברסיטת בן-גוריון בנגב
Ben-Gurion University of the Negev
Avram and Stella Goldstein-Goren Department
of Biotechnology Engineering
SEMINAR



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July 7th, 14:10, Building 51 – Auditorium Nano

Synthetic Ex Utero Embryogenesis: from Naive Stem Cells to Complete Embryo Models

The identity of somatic and pluripotent cells can be epigenetically reprogrammed and forced to adapt a new functional cell state by different methods and distinct combinations of exogenous factors. The aspiration to utilize such in vitro reprogrammed pluripotent and somatic cells for therapeutic purposes necessitates understanding of the mechanisms of reprogramming and differentiation and elucidating the extent of equivalence of the in vitro derived cells to their in vivo counterparts. In my presentation, I will present my group's recent advances toward understanding these fundamental questions and further detail our ongoing efforts to generate developmentally unrestricted human naive pluripotent cells with embryonic and extra-embryonic developmental potential. I will expand on new avenues for utilizing custom made electronically controlled ex utero platforms and optimized conditions for growing natural mammalian embryos ex utero for extended periods capturing development from pre-gastrulation until advanced organogenesis, for better studying of stem cell transitions during embryogenesis and organogenesis. I will detail how the latter platforms offered an exclusive technical platform to demonstrate and unleash the self-organizing capacity of mouse naïve PSCs to generate post-gastrulation synthetic Bona Fide and organ-filled, synthetic embryo models with both embryonic and extraembryonic compartment ex utero, as well as our ability to extend these findings with naïve human PSCs and generate complete structured day 14 human embryo models. Collectively, I will be highlighting prospects for new platforms for advancing human disease and developmental modelling.

Host:

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