



INTEGRATION OF MICROFLUIDIC DYNAMIC CULTURE, HYDROGELS AND BIO-STABLE AND OXIDANTS TO IMPROVE HUMAN GAMETE, EMBRYO AND STEM CELL CULTURE FOR ENHANCED FERTILITY TREATMENTS, RESTORATIVE MEDICINE, PHARMACEUTICAL SCREENING AND PERSONALIZED MEDICINE

Abstract

Human oocyte in vitro maturation has foreseeable importance for fertility preservation, infertility treatment, and significantly reducing the cost (democratizing treatments) and medical risks (improved safety) of family building. Decades of scientific/clinical efforts have been expended with little improvement in efficiency or efficacy of IVM technologies, blocking its clinical use. Recent advancements in bioengineering, biomaterials, and bio-stable molecules provide bio-inspired opportunities to advance human oocyte IVM to an acceptable level of success and facilitate clinical application.

This conference will enable realization and prioritization of project designs by international discipline-leads to support future basic, translational, and clinical studies and grant applications. The integration of advanced and novel bioengineering, biomaterial, biomolecule tools promise to address above mentioned knowledge gaps, technical shortcomings, and support clinical solutions to provide new medical treatment strategies and improve existing technologies in preserving fertility, treating infertility, and advancing stem cell use in pharmaceutical discoveries and restorative/regenerative medicine.



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Dr. Smith is a professor of Obstetrics & Gynecology, Physiology and Urology at the University of Michigan Medical School, Ann Arbor, USA.

He has served as director of MStem Cell Laboratories since the lab was founded in 2011.

Dr. Smith's spans and links several areas, including:

- I. Regulation of oocyte meiosis and chromatic remodeling
- II. Basic and applied studies of oocyte cryopreservation.
- III. Interdisciplinary collaborations to investigate utility of microfluidics and contemporary/developing microscopy for gamete/embryo isolation, manipulation, culture, and bioanalysis.
- IV. Basic, translational, and applied studies to improve semen cryopreservation, semen/sperm analysis, and inhibition of sperm function.
- V. Deriving and using human embryonic stem cells (hESCs).



10th December, 2024

h 12:00 – AULA C

Dept. of Chemistry, Biology and Biotechnologies – Via Elce di Sotto, 8

