

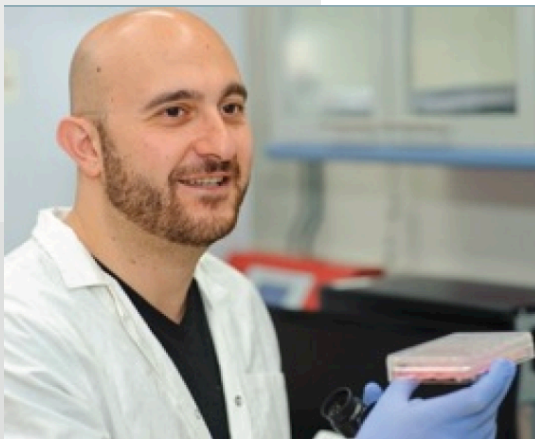
IMEG Seminar Series

The road to global science

Dr. Jacob H. Hanna Weizmann Institute of Science, Israel

From Stem Cells to Organized Embryos

September 27 th, 2021, 15:00~16:00



This seminar series is for students, postdocs, and all researchers at Kumamoto University. Check your email box and find the Zoom ID and passcode.



Establishment of the mammalian body plan occurs shortly after the embryo implants into the maternal uterus, and our understanding of post-implantation developmental processes remains limited. While methods for *in vitro* culture of pre- and peri-implantation mouse embryos are routinely utilized, approaches for robust culture of post-implantation embryos from egg cylinder stages until advanced organogenesis remain to be established. We develop herein highly stable *ex utero* post-implantation mouse embryo culture platforms, that enable appropriate development of embryos before gastrulation (E5.5) until the hind limb formation stage (E11). Late gastrulating embryos (E7.5) are grown in 3D rotating bottles settings, while extended culture from pre-gastrulation stages (E5.5 or E6.5) requires a combination of novel static and rotating bottle culture protocols. Histological, molecular, and single cell RNA-seq analyses validate that the *ex utero* developed embryos recapitulate precisely *in utero* development. This culture system is amenable to introducing a variety of embryonic perturbations and micro-manipulations that can be followed *ex utero* for up to 6 days. Establishment of a system to robustly grow normal mouse embryos *ex utero* from pre-gastrulation to advanced organogenesis represents a valuable tool to investigate post-implantation embryogenesis, eliminating the uterine barrier to mechanistically interrogate morphogenesis and tissue specification in mammals.

Reference

Aguilera-Castrejon et al., and Jacob H. Hanna. Ex utero mouse embryogenesis from pre-gastrulation to late organogenesis. *Nature* 593, 119-124 (2021)

You will be fascinated by...

Building techniques for growing mouse embryos in a glass vial.

The Hanna lab devised a method for growing mouse embryos outside a uterus for longer than ever before. This is a breakthrough finding!

Ex utero mouse development from pre-gastrulation to late organogenesis!

The roller culturing techniques allow better studies of crucial phases of mammalian development.

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