Research & Services | Strategies for Studying Normal and Perturbed Embryonic Development (Yissum)
code: 34-2010-2415
Dalit Sela-Donenfeld, HUJI, Faculty of Agricultural, Food and Environmental Quality Sciences, The Koret School of Veterinary Medicine

Specializing in developmental biology, including embryonic development of the central nervous system, migration mechanisms of cells in embryos, genetic manipulations in chick embryos for the production of transgenic chickens

Categories	Life Sciences and Biotechnology, Medicine

Dalit Sela-Donenfeld's Laboratory, The Koret School of Veterinary Medicine, The Robert H. Smith Faculty of Agriculture, Food and Environment

Research Capabilities

- The lab has expertise and knowledge in growing chick embryos in vivo and ex vivo and a full battery of tools to investigate and manipulate embryonic development, including state-of-the art genetic, molecular, cellular, microsurgical, histological and microscopic strategies to study normal and perturbed embryonic development.
- The chick embryo serves as an excellent in-vivo model due to its easy accessibility and resistance, the ability to perform molecular, cellular or surgical micro-manipulations on it, its low cost, and high similarity to mammalian embryos. It can serve as a model to test the effects of various compounds in an in-vivo environment.
- A long-term application depends on an ongoing research project to generate a novel approach to producing transgenic chickens.
- Advantages
- The chick embryo serves as a central model in the field of developmental biology and has been approved as a model organism for biomedical research by the NIH. As an easily-accessible and low-cost in vivo model for testing the impact of compounds, toxins, contaminants, irritants, etc., it is of great value to research projects in industry. The lab's knowledge of affecting, treating, and growing chick embryos both in vivo and ex vivo, together with the team's in-depth knowledge of the most advanced molecular, cellular, histological, and microscopy technologies, provide a unique research capability for multiple research avenues.

Research Background

One of the lab's basic aims is to increase understanding of developmental processes that occur during early embryonic development of the hindbrain (the precursor of the brain stem). Another goal is to unravel how a unique population of embryonic cells, the neural crest cells, are engaged in migration and how they detach from the central nervous system to settle in the periphery. A third project in the lab utilizes knowledge of early embryonic development to transform the germ cell precursors in the embryo in order to generate transgenic chicken lines.

Researcher and Research Interests

Dalit Sela-Donenfeld, Ph.D., Head of Laboratory, is a developmental biologist who trained as a post-doc at the Hebrew University's Hadassah Medical School and at the National Institute for Medical Research in London in the embryonic development of the CNS. Her expertise combines advanced genetic and molecular manipulations with cellular and surgical approaches, using chick embryos as a model system for understanding vertebrate development. Her findings filled a critical gap in understanding how neural crest cells are developed and suggested a novel role for hindbrain cells and signals.

Available Resources

- The research group consist of seven students – four Ph.D. and two M.Sc. student, and one part-time technician. All are very well acquainted with the research and tools required for studying embryonic development in the lab's in vivo and ex vivo systems. Several manuscripts have been published as a result of studies conducted in the lab and several other papers are about to be published or submitted in the near future.
- The lab is fully equipped with several stereo-microscopes, egg incubators, micro-surgery tools, epi-fluorescent upright microscope/stereo-microscope with imaging systems, and a confocal system with four lasers. The lab also possesses equipment for histology (microtome and cryostat).

Laboratory Contact

Dr. Dalit Sela-Donenfeld, seladon@agri.huji.ac.il, +972-8-948-9533

Contact for more information:

Itzik Goldwaser ✉, VP, Head of Research Collaborations , +972-2-6586685

Yissum Research Development Company of the Hebrew University of Jerusalem
Hi-Tech Park, Edmond J. Safra Campus, Givat-Ram, Jerusalem P.O. Box 39135, Jerusalem 91390
Israel Telephone: 972-2-658-6688, Fax: 972-2-658-6689