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Mentor-Postdoc Spotlights Series 2019

Todd Evans, Ph.D.
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With over 35 years of research experience, Dr. Evans received his PhD in 1987 in Molecular Biology from Columbia University under the guidance of Dr. Argiris Efstratiadis. He is now a tenured Professor of Surgery in Cell and Departmental Biology. Dr. Evan's PhD work was focused on Alternate DNA Structures in Eukaryotic Promoter Regions. He obtained his BA degree from Northwestern University in 1982.

After completing his PhD at Columbia, Dr. Evans moved to the National Institutes of Health, NIH, on a Postdoctoral Fellowship to work under the tutelage of Gary Felsenfeld. The work mainly involved Transcriptional regulation in erythroid cells.

Dr. Evans's team at Cornell now studies the molecular regulation of organogenesis, with projects focused on stem cell biology, lineage commitment, differentiation, growth, and morphogenesis. His lab currently uses two primary model systems, pluripotent stem cells and the zebrafish, to probe genetic regulatory networks that are implicated in normal development and human congenital and acquired disease. Regarding hematopoiesis and cardiovascular development, Dr. Evans are studying the functions of BMP and S1P signaling for regulating stem and progenitor cell biology and have described functions for three related regulatory genes (Gata4, Gata5, and Gata6) during embryogenesis and in maintaining homeostasis of the adult cardiovascular system. A third major area of research is the epigenetic control of development and cellular memory by DNA methylation (by AID and TET proteins). They are developing novel animal and stem cell models to manipulate components of GATA and other key regulatory pathways, and to define specificity for component functions. Having first "built" organs, he believes these molecular pathways can be reemployed to enhance regeneration of injured or diseased organs. A major goal of this work is to define potential targets for treating debilitating human diseases including cancer, heart disease, liver disease, diabetes, and asthma.

Dr. Evans is currently Vice Chair for Research in the Department of Surgery, with cross- appointments in Cell and Developmental Biology and (adjunct) Biomedical Sciences of the Cornell Veterinary School of Cornell University. He also helps mentor junior faculty and the surgical residents during their research years. He is co-PI of a training program funded by the state (NYSTEM) to support students and postdoctoral fellows in stem cell biology, and PI of a shared facility grant (NYSTEM) for gene engineering and disease modeling using stem cells.

In spite of publishing almost 160 manuscripts, Dr. Evans humbly says he's still working on that 'most important publication' to make an impact. He currently focuses on:

- The development of new models in zebrafish for heart and liver regeneration to understand how these processes might be enhanced in mammals including humans.
- Chemical biology projects that use defined screens to find new small molecules that impact organ development and might be used as drug leads for research and therapy.
- New mouse and human ES and iPS cell models to study aging, neuro-endocrine tumors (carcinoids), asthma, stem cell niches, and other developmental programs.

Notable publications from Dr. Evans's lab include:

Evans, T. and Felsenfeld, G. (1989). The Erythroid-Specific Transcription Factor Eryf1: A New Finger Protein. ***Cell*** 58:877-885.

Kikuchi, K., Holdway, J.E., Werdich, A.A., Anderson, R.M., Fang, Y., Egnaczyk, G.F., Evans**,** T., MacRae, C.A., Stainier, D.Y.R., and Poss, K.D. (2010). Primary Contribution to Zebrafish Heart Regeneration by *gata4+* Cardiomyocytes. ***Nature***. 464: 601-605. PMCID: PMC3040215

Polo, J.M., Liu, S., Figueroa, M.E., Kulalert, W., Eminli, S., Tan, K.Y., Apostolou, E., Stadtfeld, M., Li, Y., Natesan, S., Wagers, A., Melnick, A., Evans, T., and Hochedlinger, K. (2010). Cell of Origin Influences Molecular and Functional Properties of Murine Induced Pluripotent Stem Cells. ***Nature Biotechnol.*** 8: 848-855. PMCID: PMC3148605

Kumar, R., DiMenna, L., Schrode, N., Liu, T.-C., Franck, P., Munoz-Descalzo, S., Hadjantonakis, A.-K, Zarrin, A.A., Chaudhuri, J., Elemento, O., and Evans, T. (2013). AID Stabilizes Stem Cell Phenotype by Removing Epigenetic Memory of Pluripotency Genes. ***Nature***. 500: 89-92. PMCID: PMC3762466.

Dr. Evan's key advice to current and future postdocs ***"Focus your effort on something that is difficult but will generate a high impact first author paper. Have something going on in your "spare" time that is distinct from the PI's interest."***

Check out the lab's webpage: http://vivo.med.cornell.edu/display/cwid-tre2003

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Dr. Yahui Lan obtained her PhD from The Hong Kong University of Science and Technology under the mentorship of Dr. Zilong Wen. Her doctoral thesis focused on the topic "*Distinct functions of different scl isoforms in zebrafish definitive hematopoietic stem cell initiation and maintenance*". After her Ph.D., Dr. Lan joined the Evans lab at Weill Cornell Medicine.

With more than a decade worth of research experience, Dr. Lan has 6 publications in renowned journals to her credit.

Please read the Lan and Evans manuscript titled "***Epigenetic Regulation of Cardiac Development and Disease through DNA Methylation***" published in the second issue of *JoLS, Journal of Life Sciences*.