Laboratory of Transcriptional Regulation

Development and evolution, Pax genes, Wnt/β-catenin signalling, Tcf/Lef

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We are interested in development and evolution of development (evo-devo). Our focus is on the role of transcription factors and signalling cascades, especially on the role of the Wnt/β-catenin signalling pathway and transcription factors of Pax and Tcf/Lef families. A combination of gain-of-function (transgenic) and loss-of-function (conditional knock-outs) approaches is used to study mammalian development using laboratory mouse as a model organism. In addition, cell culture approaches are used to study the role of the Tcf/Lef family during induced pluripotency. Our second main interest in the Laboratory is evolution of animal development. Several model systems including amphioxus, platynereis, fish and cnidarians are used in the laboratory to study various aspects of evo-devo.

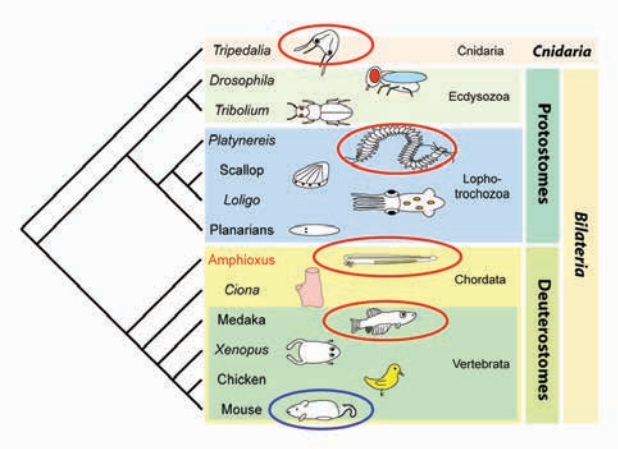

Fig. 1. Main model organisms used in the Laboratory of Transcriptional Regulation.

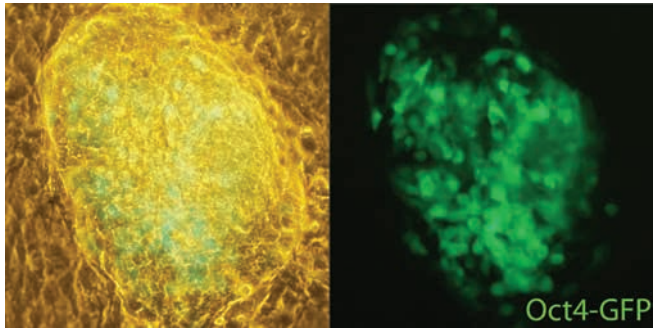

Fig. 2. Induction of pluripotent cells using PiggyBac-OSKM transposon. Activation of endogenous Oct4 is visualized by Oct4-GFP reporter.

- GA CR, GD204/09/H058 - Intercellular signalling in development and disease, 2009-2012, Z. Kozmik
- AS CR, IAA500520908 - The role of Pax genes in eye evolution, 2009-2013, Z. Kozmik
- GA CR, GCP305/10/J064 - Reconstructing urbilaterian photoreceptors: comparative study between Branchiostoma (Chordata) and Platynereis (Annelida), 2010-2013, Z. Kozmik
- GA CR, GAP305/11/2198 - Genetics of mammalian eye development, 2011-2014, Z. Kozmik
- Ministry of Education, Youth and Sports of the Czech Republic, LK11214 LK-NÁVRAT - Genetic regulation of embryonic development of the brain and the eye, 2012-2016, O. Machoň
- Ministry of Education, Youth and Sports of the Czech Republic, LH12047 LH-KONTAKT II - The role of alternative splicing in evolution of vertebrate body plan, 2012-2015, Z. Kozmik
- GA CR, GAP305/12/2042 – The role of transcription factors Tcf in the induced pluripotency and during neurogenesis , 2012-2015, O. Machoň

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From the left:
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Ondřej Machoň, PhD / Research Fellow · Michal Koc, PhD / Postdoctoral Fellow (until 2012) · Jana Smolíková, PhD / Postdoctoral Fellow (until 2012) · Daniela Gurská, MSc / PhD Student (until 2012)