

生化学セミナー

日時： 11月 16日(木) 17:00~18:00

場所： 共同研究棟 7 階セミナー室

演者： **Prof. Stefan Hoppler (Institute of Medical Sciences, University of Aberdeen, Scotland, United Kingdom)**

演題： **Tissue- and stage-specific Wnt signalling in embryonic development and heart muscle differentiation.**

The Wnt pathway is a conserved cell-to-cell signalling mechanism, which is important for embryonic development, stem cell-mediated regeneration and diseases, such as cancer. We study how the same Wnt pathway is used repeatedly in different cellular contexts to instruct different and specific cellular responses.

We have recently established hESC culture to study the role of Wnt signalling in human heart muscle (cardiomyocyte) differentiation. We have confirmed important stage-specific roles for Wnt signalling in regulating human cardiomyocyte differentiation; and additionally we have identified more precise roles for individual Wnt signal and Wnt receptor genes.

We use early *Xenopus* embryos as a model to investigate the molecular mechanisms of tissue- and stage-specific Wnt signalling. We use a high-throughput sequencing approach combining RNA-seq and ChIP-seq to identify tissue-specific direct Wnt target genes. The findings from our whole-genome analysis challenges the existing paradigm about Wnt target gene regulation.

Recent relevant research articles:

- Mazzotta S., Neves C., Bernardo AS, Docherty K, **Hoppler S** (in press). Distinctive Roles of Canonical and Noncanonical Wnt Signaling in Human Embryonic Cardiomyocyte Development, Stem Cell Reports (2016), doi:10.1016/j.stemcr.2016.08.008
- Nakamura Y., Alves E., Veenstra GJ, **Hoppler S** (2016). Tissue- and stage-specific cellular context regulates Wnt target gene expression subsequent to β -catenin recruitment to cis-regulatory modules. Development 143, 1914-1925. doi:10.1242/dev.131664
- Gibb N., Lavery D.L. and **Hoppler, S.** (2013). Sfrp1 promotes cardiomyocyte differentiation in *Xenopus*, via negative feedback regulation of Wnt signalling. Development, 140, 1537-1549. doi:10.1242/dev.088047

Stefan Hoppler博士は、発生生物学者として心臓を中心とした臓器の発生、分化に関わる研究を行ってこられました。本セミナーでは、ヒト胚性幹細胞を用いた心筋分化の仕組み、ならびにカエル初期胚における組織、時期特異的遺伝子発現を、Wntシグナルの視点で明らかにされた最近の知見を解説していただきます。