

Project Title:

Temporal Control of Mesoderm Specification

Supervisor:

Raquel P. Andrade, PhD
CBMR, University of Algarve, Faro
<http://cbmr.ualg.pt/research/stemcelldevelop/temporal-control-laboratory/>
Email: rgandrade@ualg.pt; Tel. +351289244490/81

Location of research lab/research center:

Centre for Biomedical Research, CBMR
University of Algarve
Campus de Gambelas
Ed8, Lab 1.14
8005-139 Faro

Summary: (1000 characters)

Gastrulation is a fundamental process in development, when the three embryonic germ layers are formed. Gastrulation occurs over time; yet, it is not known how temporal control of cell ingression through the primitive streak is achieved. An embryonic clock was first described as cycles of *hairy1* expression in temporal control of chick somitogenesis [1-2]. We now know that Hes1 oscillations also dictate cell fate specification in embryonic stem cells [3] and that *hairy1* oscillates in the stem cell-rich epiblast of gastrulating embryos (unpublished).

This proposal intends to address how Temporal Control of Mesoderm Specification is achieved by characterizing the gene regulatory network under the control of Hairy1 during gastrulation. Genome-wide approaches will be employed to identify Hairy1 target genes over time and how their expression depends on *hairy1* dynamics. Live-imaging of chick gastrulation will also be performed to assess Hairy1 impact at the tissue and single-cell level.

Bibliographic references:

1. Palmeirim, I., et al., *Avian hairy gene expression identifies a molecular clock linked to vertebrate segmentation and somitogenesis*. Cell, 1997. 91(5): p. 639-648.
2. Skipper, M., *Time for segmentation*. Nature Milestones Development 2004. Milestone 24.
3. Kobayashi, T. and R. Kageyama, *Expression dynamics and functions of Hes factors in development and diseases*. Curr Top Dev Biol, 2014. 110: p. 263-83.