Cologne Evolution Colloquium

SFB 680 Molecular Basis of Evolutionary Innovations

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Comparative analyses of neuromesodermal progenitor dynamics in vivo

A major question in developmental biology is to understand how cellular fate decisions are regulated precisely in space and time. During early development of vertebrate embryos, this is massively complicated by the large numbers of cells whose fate decisions must be precisely orchestrated. Furthermore, this patterning occurs together with huge tissue rearrangements that form the stereotypical body plans that we can recognise. Fortunately, we can now begin to watch how these processes occur with the use of modern imaging approaches that allow for the following of cell fate decision events and cellular rearrangements by live 3D time-lapse microscopy. This is allowing for a shift in our understanding of pattern formation away from static models towards models that are based on the principles of dynamical systems and statistical mechanics. By employing single cell techniques to zebrafish embryos in vivo, we are currently focussing on applying these approaches towards a dynamical understanding of how neuronal and mesodermal fates are allocated correctly during posterior axis elongation and somitogenesis. While zebrafish perform this with little overall growth in embryo size, vertebrates like mammals undergo a large degree of growth. I will discuss how such fundamental differences in energy supply have influenced the interpretation of conserved regulatory networks and patterning mechanisms by neuromesodermal progenitors during axial elongation across chordates.

Wednesday, October 4, 2017, 17:00
University of Cologne, Institute for Genetics
Seminar Room 0.46

Hosted by Matt Benton