

Regulation of Gene Expression

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Regulation of gene expression determines cellular form and function. Differential activation and repression of genes in different cells and at different times underlies developmental self-organisation, and species evolution.

The sea urchin embryo offers unique opportunities for the analysis of developmental genetic regulatory networks. We are currently engaged in modelling the network of gene interactions responsible for a robust, stereotyped differentiation of cells along the animal-vegetal axis of early sea urchin embryos. The modelling framework developed for the above regulatory network can be generalised to provide insights into developmental self organisation and the evolution of genetic regulatory networks underlying body plans.

We are currently applying these theoretical insights to the evolution of self-organising sensory systems.