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**Evolution and development: what can physics contribute**

ERIC SIGGIA, Rockefeller University

The genome contains both the 'parts list' for an organism, the genes, as well as the instructions about how to assemble it. Many of the current genome sequencing projects have been motivated by the desire to compare sufficiently similar organism, to discover what parts of the genome are functional, and how they define the differences between the organisms. A particularly fruitful place to study gene regulation (the 'assembly manual') is development from egg to adult. Current progress in deducing developmental regulatory networks from the genome will be illustrated with the early, head-tail patterning in the fly embryo. The recent sequencing of a second species of fly, has allowed us to computationally screen for interesting differences in the early embryonic patterning and test these experimentally. This provides a first glimpse of how regulation evolves.