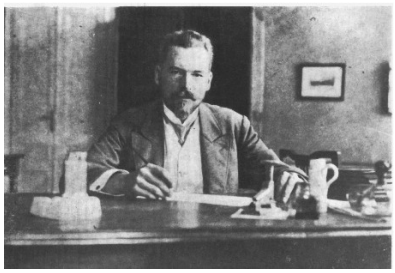

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# How is information decoded in developmental systems?

*Friday, 20 September 2019 09:30 (30 minutes)*

The development of multicellular organisms is a dynamic process in which cells divide, rearrange, and interpret molecular signals to adopt specific cell fates. Despite the intrinsic stochasticity of cellular events, the cells identify their position within the tissue with striking precision of one cell diameter in fruit fly or three cell diameters in vertebrate spinal cord. How do cells acquire this positional information? Where is this information encoded and how do cells decode it to achieve the observed level of cell fate reproducibility? These are fundamental questions in biology that are still poorly understood. In this talk, I will combine both information theory methods and mechanistic models to address these questions. I will investigate to what extent the level of noise in the input signals affects precision of the resulting gene expression pattern. I will present data-driven analysis of gene regulatory network that interprets two positional cues in the developing spinal cord. Interestingly, the observed precision of gene expression pattern is close to the theoretical limit of precision of decoding of noisy signals.

## Summary

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