Multi scale dynamics in retinal waves

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Résumé

Spontaneous waves of spiking activity are observed in the retina during development. This activity is thought to play a central role in shaping the visual system and retinal circuitry. Waves first occur at early embryonic stages of development and gradually disappear upon maturation. This process involves several time and space scales from molecular level (neurotransmitters), to single neurons and neural populations in the retina. I will present a model describing these different spatiotemporal scales, accurate enough to reproduce experimental observations as well as to provide testable experimental predictions. This model can be studied using tools from dynamical systems theory and bifurcations analysis. In my talk I will present part of this analysis linking it to biophysics and experiments.

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