

Laboratory of Interdisciplinary Biology

Graduate School of Science



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(Theoretical Biology)

We conduct computer simulations on mathematical models based on physics and mathematics. We explore the functions of gene networks, and the logic linking the development and evolution of living organisms. We study from microorganisms to animals and plants.



Communication in multicellular systems

We predict chemical and mechanical cell-cell interactions that control cell differentiation and organ shape in microbial populations and animal and plant tissues through quantitative simulations and verify these predictions experimentally through collaborative research.

Number and symmetry of organs

We quantify the positioning of animal and plant organs (e.g., tentacles and petals) by computer simulations and field studies to identify principles by which number and symmetry are determined during development and diversified through evolution.

Let's actively incorporate physics and mathematics to unravel life together. No experience in computer programming required.

Gene Network Evolution for Shaping

We investigate how developmental processes and organ shape are diversified by modeling the spatiotemporal patterns of gene expression during development and evolving a gene regulatory networks on computers.

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Scan here for the lab's website >>

