

# システムバイオロジー (Arthur Lander) Systems Biology of Development (Arthur Lander)



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## Design principles underlying robust biological systems

Systems biology fuses experimental biology with mathematics, physics, engineering and computer science, in a search for fundamental design principles that explain the complexity of life. We investigate how cells accurately know their locations in space; how tissues and organs stop growing at precisely-determined sizes; and how selection for control of these processes opens the door to combinatorial fragility, wherein combinations of small changes (e.g. in gene expression) can lead to catastrophic failures (e.g. birth defects). We work with mice, fruit flies, zebrafish, and frequently combine genetic experiments with mathematical modeling. We also study the influences of such control processes on how cancer arise and grow.

