

EDUCATION & OUTREACH

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Summer Course: **Systems Biology of Disease**

Systems Biology is a holistic approach to deciphering complexity and emergent properties of biological systems. Embracing systems-biology practices helps us to reveal molecular and cellular networks that relay information and ultimately, design predictive, multi-scale models for spatiotemporal patterns of biological systems. During this process, systems biology drives innovation through iterative biology-driven advancements in technology and computation. One of the current challenges in the field is how we phrase questions and design studies that will help us to understand the complexity in “larger” systems, including organisms of greater medical relevance, such as mice and humans.

This course aims to disseminate systems approaches and analysis tools to study human biology in health and disease. This course will also introduce systems biomedicine, which is the application of a systems view to disease. We will demonstrate the state of the art of systems biology for medical applications (i.e. how to stratify diseases, and identify biomarkers and drug targets) and discuss key opportunities and challenges for the application of systems biology approaches to medicine. This course is designed as an introduction to systems biomedicine with lectures, hands on interactive sessions, and panel discussions. As such, it is aimed at graduate students, post-doctoral fellows and principal investigators with an interest in systems biomedicine.

Upon completing this course, trainees will have learned: **1)** core concepts of systems biology, **2)** applications to systems biomedicine, **3)** how to construct classifiers that stratify diseases, **4)** how to discover biomarkers, and **5)** how to discover drug targets. The final day will be devoted to the application of systems biomedicine approaches to data brought by trainees or public datasets.

This 5-day course will take place at ISB from July 28-August 1.

[Learn more at the site](#)

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