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Theory of bacterial genome evolution

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Abstract:

The rapid accumulation of genome sequences from diverse organisms presents an opportunity and a challenge for theoretical research: is it possible to derive quantitative laws of genome evolution and an underlying theory? Analyses of extensive data from multiple genome comparisons reveal universal trends in bacterial genome evolution. To identify the underlying factors that govern the evolutionary trajectories, we developed a mathematical model for microbial genome evolution within the framework of population genetics and tested it against extensive genomic data. Specifically, we addressed three fundamental aspects of genome evolution: i) the evolution of genome size, ii) the evolution of genome composition, and iii) genome divergence and speciation across the course of evolution. Our findings demonstrate that key aspects of genome evolution can be captured by general population genetics models, and pave the way for further theoretical analyses of fundamental evolutionary mechanisms.

https://zoom.us/j/97870659786?pwd=RjhCRDJFdDhpaG8xSlJnMzdoMklTQT09

Date & Location:

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Zoom Lecture