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Quantitative characterization of RNA fitness landscapes

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Experimental evolution of RNA (or DNA) is a powerful method to isolate sequences with useful function (e.g., catalytic RNA), discover fundamental features of the sequence-activity relationship (i.e., the fitness landscape), and map evolutionary pathways or functional optimization strategies. However, the limitations of current sequencing technology create a significant undersampling problem which impedes our ability to measure the true distribution of unique sequences. In addition, synthetic sequence pools contain a non-random distribution of nucleotides. We present and analyze simple models to approximate the true sequence distribution. We also provide tools that compensate for sequencing errors and other biases that occur during sample processing.

Speaker Biography

Ramon Xulvi-Brunet has completed his PhD in Theoretical Physics from Humboldt Universitaet zu Berlin, Post-doctoral Position in Applied Mathematics from University of Sydney, Post-doctoral Position in Biostatistics from University of Pennsylvania and Post-doctoral Position in Modelization of Biological Systems from Harvard University. He is a Research Scientist at University of California Santa Barbara and also serves as Physics Professor.

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