



Московский семинар по биоинформатике

Заседание 326

25 октября 2018, **четверг**, 19.00

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WHAT'S LOVE GOT TO DO WITH IT? STABLE MARRIAGE IN MICROBIAL ECOSYSTEMS

Microbial communities routinely have several alternative stable states observed for the same environmental parameters. A possibility of sudden and irreversible transitions between these states (regime shifts) complicates external manipulation of these systems. Can we predict which specific perturbations may induce such regime shifts and which would have only a transient effect? Here I will describe several new conceptual models that exhibit these emergent phenomena. Two of our models [2,3] were inspired by a decades-old economics work: the stable marriage or stable allocation problem, developed by Gale and Shapley in the 1960s and awarded the Nobel prize in economics in 2012. Using only the ranked tables of nutrient preferences and competitive abilities of microbes, we can determine all stable states and specific perturbations driving the system from one state to another.

[1] Goyal A, Maslov S. Diversity, stability, and reproducibility in stochastically assembled microbial ecosystems. Phys. Rev. Lett., 120, 158102. <https://doi.org/10.1103/PhysRevLett.120.158102>

[2] Goyal A, Dubinkina V, Maslov S (2018) Microbial community structure predicted by the stable marriage problem. ISME Journal. <https://doi.org/10.1038/s41396-018-0222-x>

[3] Dubinkina V, Fridman Y, Pandey PP, Maslov S (2018) Alternative stable states in a model of microbial community limited by multiple essential nutrients. BioRxiv 439547 [Preprint]. October 11, 2018. <https://doi.org/10.1101/439547>

Рабочий язык семинара – русский

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