NOVARTIS

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In the synthetic biology group at NIBR, we develop microbial tools that we can use to study mechanisms involved in human disease. One important application of these tools is the modulation of transcription factors; specifically, what are the key surfaces involved in transcription factor function and how can we change the function of the transcription factors by binding small molecules or peptides to these surfaces? To address these questions, we will (1) invent technologies to investigate the modulation of transcription factors using synthetic biology and evolution in budding yeast, and (2) collaborate with disease biologists and structural biologists at Novartis to characterize the transcription factors using cell biology and structural biology. Controlling transcription factors could be a key factor in the treatment of cancer and other human diseases, and synthetic biology can provide us a means to investigate their modulation.

Selected Publications

Improved use of a public good selects for the evolution of undifferentiated multicellularity
Koschwanez JH, Foster KR, Murray AW
Elife. 2013 Apr 2;2:e00367.

Sucrose utilization in budding yeast as a model for the origin of undifferentiated multicellularity
Koschwanez JH, Foster KR, Murray AW
PLoS Biol. 2011 Aug;9(8):e1001122.

Easily fabricated magnetic traps for single-cell applications
Koschwanez JH, Carlson RH, Meldrum DR
Rev Sci Instrum. 2007 Apr;78(4):044301.

Click here for additional publications.

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