174. Illumination of Photosynthetic Trans-Kingdom Consortia

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Project Goals: We are interested in engineering and studying photosynthetic consortia. Monocultures provide insights into microbiology and have been compelled to make many a product, but they are inherently limited in both capacity to manufacture goods and how honestly such growth represents the natural world. Out in the wildernesses of the world (be they in far off countries or just on the surface of your skin) microbes are fighting and struggling, helping or hindering, and simply coexisting with a slew of partners. In an effort to better understand these complex populations, we seek to engineer interactions between microbes such that they are more involved but not as convoluted as natural systems. Focusing on photosynthetic co-cultures allows us to develop knowledge of these fundamental interactions and demonstrate proof-of-principle examples for downstream biotechnology applications, while probing the limits of photosynthetic efficiencies.

The components of the co-cultures are Synechococcus elongatus, Saccharomyces cerevisiae, Bacillus subtilis, and Escherichia coli and their interactions range from natural to engineered. Growth is demonstrated while culture dynamics illuminate complicated relationships.

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