



The effect of photosynthetic efficiency on biofuel production in cyanobacteria
Master degree project / Research training / Internship

We are looking for an ambitious student with an interest in molecular biology, synthetic biology, carbon fixation or biofuel production efficiency for a project to determine under what conditions, and to what extent, carbon fixation efficiency limits end product (e.g. biofuel) formation in cyanobacteria.

Cyanobacteria are photosynthetic organisms that are suitable for sustainable production of compounds of biotechnological, biomedical and industrial importance, including biofuel production. Metabolic engineering in cyanobacteria has greatly increased the production of these end products, but what factors limit yield? It is known that the efficiency of photosynthetic carbon fixation often limits the growth rate of photosynthetic organisms, but to what extent the activity of carbon-fixing enzymes limits the yield of end products in cyanobacteria (e.g. ethanol) has not been investigated.

In this project you will (i) replace cyanobacterial carbon-fixing enzymes with those from other organisms (with different kinetic properties), (ii) evaluate the subunit production and assembly capacity of introduced enzymes, (iii) monitor the effects of this transplantation on organism growth rate and biomass and (iv) monitor the end product (e.g. ethanol) yield under differing CO₂ concentrations. This information will be used to model under which conditions Rubisco activity could be altered to increase end product yield in cyanobacteria.

If you find this project interesting, please contact Pia Lindberg or Laura Gunn:

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