Roman Sobotka's group:

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Project name: Photosystem II biogenesis in the model organism cyanobacterium *Synechocystis* PCC 6803

Oxygenic photosynthesis fuels energy to the ecosystem and is responsible for the oxygenation of our atmosphere. The oxygen-evolving enzyme complex Photosystem II converts light energy to chemical energy and performs water splitting, the strongest catalytic reaction in biological systems. Amongst all known Reaction Centers Photosystem II needs the most subunits and cofactors. It binds 35 chlorophyll *a* molecules, the primary pigment of oxygenic phototrophs. The synthesis of this tetrapyrrole pigment shares the same biosynthetic pathway with the production of heme, which is the most abundant tetrapyrrole molecule in living organisms. Our group studies the interrelation of the two highly conserved processes of tetrapyrrole biosynthesis and Photosystem II biogenesis. Our model organism is the cyanobacterium *Synechocystis* PCC 6803. We mainly use molecular, genetic, and biochemical approaches as well as various biophysical methods for characterizing different *Synechocystis* strains.

The exact tasks of the student are going to depend on current progress in the large project. It will likely involve cultivation of cyanobacteria, chlorophyll and other pigment content measurement, determination of protein composition on thylakoid membrane.