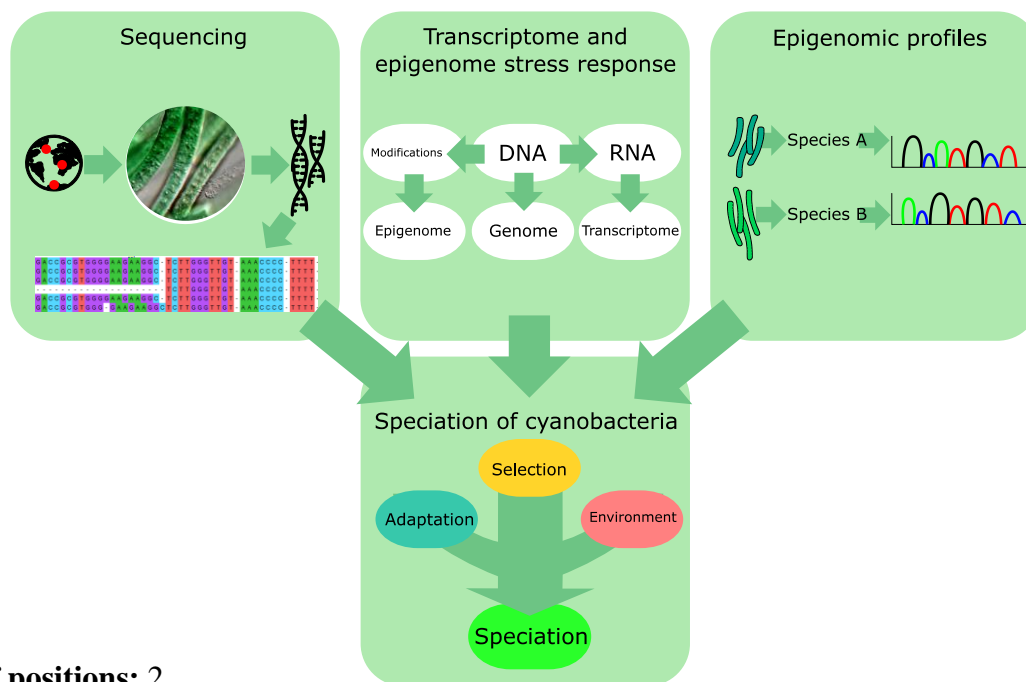


## PhD thesis topic:

### Species emergence and adaptation to the extreme environments in cyanobacteria

*Genome, epigenome, transcriptome, and phenotype*

Earth is inhabited by billions of prokaryotic species. However, the drivers of this incredible diversity remain enigmatic. Cyanobacteria belong to the most important primary producers thriving in all environments with sufficient light intensity for billions of years. They inhabit extreme environments such as desert soils, therefore, they are adapted to broad temperature fluctuation, high UV radiation, and water stress. With climate change, the drylands and deserts are expanding, and the importance of cyanobacteria is rising. The PhD project will be focused on the investigation of the transcriptome and epigenome response to these stresses (e.g. drought stress) in several species of cyanobacteria. The transcriptome of the strains will be sequenced by short reads using Illumina. Furthermore, the PhD student will use third-generation sequencing (PacBio or Oxford Nanopore) to reconstruct epigenomic profiles in several related species of cyanobacteria. The epigenomic profiles will be investigated at the population and species levels. The expression profiles will be connected with phenotype, epigenome, and genome diversity. Altogether, the result will provide evidence for the role of adaptation, selection, and environment in the speciation of cyanobacteria.



**Number of positions:** 2

**Place:** Algological Laboratory, Department of Botany, Palacký University Olomouc. The laboratory is focused on the evolution and taxonomy of cyanobacteria and algae. We established a wide network of collaborations in Europe and the USA (University of North Florida, USA; University of Florida, USA; Uppsala University, Sweden; Natural History Museum London, UK etc.).

**Supervisor:** doc. Mgr. Petr Dvořák, Ph.D., Department of Botany, Palacký University Olomouc

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**Start:** September 2023 or as negotiated

**Grant resource:** GAČR (Factors driving the global diversification of cosmopolitan cyanobacterium *Microcoleus*; principal investigator P. Dvořák)