

## Staff Exchange 1

In the period 21.11.-25.11.2021, the employee of the Institute of Microbiology, Romana Beloš, took part in a staff exchange of employees at project partner 3 (TU Wien), to learn the methodology for the extraction of polyhydroxybutyrate (PHB) from cyanobacteria biomass. As part of this short internship, R. Beloša learned to analyze PHB using high-performance liquid chromatography (HPLC). HPLC is used to separate sample components and determine their presence and concentration. The employee brought samples of lyophilized biomass of cyanobacteria grown in wastewater from the municipal wastewater treatment plant in Třeboň. Mainly samples after different treatments of wastewater (unsterilized wastewater, UV sterilization, and heat sterilization compared with BG-11 growth medium) and samples from pilot cultivation were tested. TU Wien has modern equipment for the analytical determination of the content of various substances, and the decision of the PHB content is one of the standardized methods here. Doctoral students Ricarda Kriechbaum and Julian Kopp introduced to Roman Beloša in detail the processing and analysis of samples. Before the analysis, the samples were hydrolyzed with acid (or base), and then PHB in the form of trans-crotonic acid was detected on HPLC. Subsequent analysis, comparison of values with the standard, and calculation of the PHB concentration were performed using the Chromeleon analytical program. At the same time, the results of these measurements helped to optimize the processing of the substrate (wastewater) from the municipal wastewater treatment plant before its use (Tab. 1). The purpose of this stay was to deepen cooperation, perform necessary analyzes within the project and transfer know-how for determining PHB content using HPLC to Czech workplace. This exchange stay benefited the CZ partner in implementing a new methodology in the workplace. Based on the transfer of know-how, the MBU workplace was subsequently able to purchase the necessary equipment (PHB standard, column for HPLC) so that the analyzes from further tests for the optimization of PHB production by cyanobacteria in wastewater could take place at the MBU workplace. The methodology was successfully introduced at the Institute of Microbiology in Třeboň.

**Tab. 1:** PHB analysis of samples of the cyanobacterium *Synechocystis* sp. Mt\_a24 was growing for 10 days in wastewater after various treatments.

sample	PHB content [% per dry biomass]
Heat treatment	9.2
Non-treated WW	5.8
UV treatment	8.4
BG-11	5.1

