

PRESPHOTO – a project to improve the preservation of cyanobacteria and diatom cultures

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The availability of biological material of guaranteed identity and quality in Biological Resource Centers is considered fundamental for scientific research and R&D, but depends heavily on adequate preservation methods. We present a new BRAIN-BE project on improving the preservation of two groups of photosynthetic microorganisms, cyanobacteria and diatoms, in two collections of the Belgian Co-ordinated Collections of Micro-organisms (BCCM). First, we will improve the cultivation success of diatoms from different habitats by testing different culture media. For organisms that keep resisting cultivation, we will develop DNA extraction and amplification, as well as morphological investigation based on single cells. Secondly, we will design and validate improved cryopreservation protocols for both diatoms and cyanobacteria, since cryopreservation is now the preferred method for the long-term storage of microalgal cultures. For that, the two-step cryopreservation method will be tested using several cryoprotectants and strains in different growth stages. Moreover, this will be compared with the encapsulation/dehydration method. For cyanobacteria, viability tests will be performed with vital dyes whereas diatoms' survival will be assessed by PAM fluorometry. In addition, genome resequencing will be applied to determine the impact of the cryopreservation protocol(s) on genomic stability. Finally, a genomic DNA bank will be constructed and validated. This is highly complementary to preservation as living strains, given that some users require only genomic DNA and it may not be feasible to preserve the global microalgal species diversity as living cultures.