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Cyanobacteria and microalgae culture collections and circular economy: the example of Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC)

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The European Green Deal and the Recovery Plan for Europe will define the European economy for many years, or even decades. This has several important implications as the blue economy contributes to climate change mitigation by developing offshore renewable energy, decarbonizing maritime transport and greening ports making the economy more circular by renewing the standards for fishing gear design, for ship recycling and for the decommissioning of offshore platforms and contribute for the developing of green infrastructures in coastal areas will help preserve biodiversity and landscapes, while benefitting tourism and the coastal economy. New products such as pharmaceuticals, nutraceuticals, food and feed items as well as molecules for industrial processes may come from the aquatic environment helping this actions. Microorganisms play an important role in this process since they can be produced in a sustainable way in controlled environments using a biorefinery approach. Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC, https://lege.ciimar.up.pt/), is a biological resource centre located at Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), Matosinhos, Portugal, that comprises more than 1100 different cyanobacterial and microalgae strains. LEGE-CC strains are mostly obtained from Portuguese ecosystems, including the Azores and Madeira archipelagos, which gives the collection a unique richness from a geographical and phylogenetic point of view. We have been using microorganisms from this culture collection to produce a wide array of new molecules with applications such as pigments, antiobesity, anticancer, antibiotic, antifouling to name a few. The possibility of sequential extractions allow us to take advantage of the whole biomass, with the final residues with applications ion feed for agriculture as biofertilizers. In this talk, we will provide few examples of these applications and the way the concept of circular bioeconomy can be applied.