Evaluation of the anti-biofouling potential of novel biocidal nano-agents in a biological model system

Place of work: BioISI, Lab Microbiology & Biotechnology Edificio Teclabs

Supervisors: Lisete Fernandes (lcfernandes@ciencias.ulisboa.pt); Elisabete Silva (ersilva@ciencias.ulisboa.pt)

The spontaneous colonization of microorganisms on surfaces, which promotes biofouling formation, is a global concern for all societal infrastructures, ranging from water service management systems (e.g., water distribution and treatment) to marine operations (e.g. transportation, offshore renewable energy systems).
Biofouling has serious consequences, including premature biocorrosion and waterborne biocontamination, which endangers industrial sustainability and public health.
Controlling biofouling through disinfection or prevention strategies is a critical process.
The most effective bio-decontamination strategies include the controlled release of bioactive compounds. However, these are frequently toxic and cumulative in the environment, resulting in a limited life cycle and ecological issues that entail new strategies, as well as a better understanding on the agent's bioactivity effects towards bio-foulants.
E. R. Silva's work develops new nanocomposite agents containing immobilized biocidal compounds, aiming to amplify their original bioactivity, and minimize the release of chemical compounds into aquatic systems when employed.
Exposure to environmental aggressions, stresses, is a universal phenomenon constantly affecting all living cells within a multicellular or unicellular organism context. Due to the knowledge built from extensive studies which includes 'omics as well as genetics manipulations, yeast *Sacharomyces cerevisiae* remains a reliable biological system to easy assess cellular impact of biocidal nano-agents.
Assess if nano-agents have biological impact on yeast will allow to ascertain nonspecific or side effects of the agents, as well as will better define/characterize its biological target activity.