Estudo Orientado em Biologia Celular e Biotecnologia

Estudo Orientado em Biologia Molecular e Genética

**Título:** Laboratory research with diatoms: Sentinel species for aquatic ecosystems

**Enquadramento:** This work will delve into the critical role of the diatom *Phaeodactylum tricornutum* as a potential sentinel for the health of our aquatic ecosystems. Against a backdrop of escalating environmental pollution, this hands-on study aims to harness the unique characteristics of this diatom species to develop innovative biomonitoring tools. By examining the physiological and biochemical responses of *P. tricornutum* to environmental pollution, the discussion of this work will allow to uncover the potential of this diatom species for monitoring ecosystem health, and its implications for environmental management, allowing for more targeted and effective conservation strategies to protect the delicate balance of our aquatic environments.

**Plano e Métodos:** After two days of growth, diatom cultures will be exposed to a pollutant at different concentrations for two days. Photosynthetic physiology will be monitored periodically through cutting-edge non-invasive fluorescence of chlorophyll *a* techniques like Pulse Amplitude Modulated (PAM) fluorescence. Furthermore, oxidative stress will be evaluated by lipidic peroxidation (TBARs methodology), and pigment composition will be assessed. Students will gain hands-on experience assessing the physiological and biochemical responses of this species to environmental stress (e.g. exposure to pollutants). Through experiment design and data analysis, students will evaluate the potential of *P. tricornutum* as an early warning system for aquatic contamination, offering them a unique opportunity to:

* Conduct laboratory research into the effects of pollutants on *P. tricornutum*.
* Master advanced techniques in physiological and biochemical analysis.
* Critically interpret experimental data and draw meaningful conclusions.
* Evaluate the efficacy of *P. tricornutum* as a biomonitor for aquatic ecosystems.
* Understand the broader implications of their findings for environmental conservation and pollution mitigation strategies.

By the end of this guided research, students will have developed essential laboratory skills and critical thinking, and a deep understanding of microalgal responses to environmental stress.

**Nº de alunos:** 2

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