**Implanteus Graduate School:** M1 or M2 internship

**TITLE**: Phytochemical characterization of underexplored Mediterranean crops: Unlocking the Potential Benefits for Human Health

According to the FAO and WHO, a healthy diet should be predominantly plant-based, with moderate inclusion of animal-derived products. In this context, the growing demand for plant-based products has been driven not only by recognizing the relationship between diet and health but also by ethical reasons, lifestyle choices, and environmental concerns.

Polyphenolic compounds are phytochemicals present in plants, playing roles related to protection against biotic and abiotic agents. These compounds are associated with numerous health benefits in the human diet due to their antioxidant, anti-inflammatory, or neuroprotective activity.

This internship aims to carry out the physicochemical characterization of crops that are currently underexplored in the Portuguese territory: lentil (*Lens culinaris Medikus*), white lupin (*Lupinus albus* L.), and buckwheat (*Fagopyrum esculentum Moench*), focusing on their phytochemical profile. It is also intended to assess the potential impact of these crops on human health, focusing on their inhibition activity on digestive enzymes (*e.g.* amylase, glucosidase, lipase) and metabolic enzymes (*e.g.* 3-hidroxi-3-methyl-glutaril-CoA reductase and Angiotensin-converting enzyme)

Relevant techniques:

Experimentally, the phytochemical (polyphenol) profile of the different crops will be evaluated using UV-Vis spectroscopy, high-performance liquid chromatography (HPLC), and mass spectrometry (ESI-MS). This evaluation will be carried out after the extraction and purification of polyphenolic compounds using Ultra-Turrax and solid-phase extraction (SPE).
The bioactive compounds' antioxidant activity in the different crops will be assessed using spectrophotometric methodologies, while the inhibition of relevant enzymes’ activity will be measured using colorimetric assay kits.

**Location of the internship**: LAQV-REQUIMTE, Chemistry and Biochemistry Department, Science Faculty, Porto University. Rua do Campo Alegre, s/n, 4169-007, Porto, Portugal.

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