**PhD:** Food Science

**Title:** Innovative technologies for the development of functional foods from by-products from various food chains

**Proposing supervisor:** Teresa Cirillo (MED/42)

**Objectives of the research project and interdisciplinary collaborations:**

Every year, the food industry generates tons of by-products that involve non-negligible disposal costs. Among them, the “skins” of products such as coffee, pine nuts and almonds represent about 4% of the weight of the processed product. A huge number of studies highlighted the possibility of alternative reuse of these waste products thanks to their chemical characteristics and nutritional profile. In addition to the high fiber content, these by-products show an excellent concentration of polyphenols, with documented bioactivity also modulating the oxidative stress in vivo. These characteristics make these by-products a valid alternative for developing functional products for the food, nutraceutical and industrial sectors. This project aims to transform waste into a viable resource.

**Innovation and originality of the project in relation to the state of the art**:

The main innovation of this project is related to the development of products from industrial wastes that are not currently on the market. The aspects related to the reuse of the skin of coffee, pine nuts and almonds represent a great added value because these products currently generate non-negligible disposal costs. Therefore, the first phase of the project will focus on enhancing these by-products and provide in-depth knowledge of these matrices, which are still not well known so far, exploiting their positive characteristics for human health and the development of functional products. The results, starting from the enhancement of industrial wastes from specific supply chains, will also have a positive impact on other production sectors such as bakery and products thereof, as well as coffee roasting companies, providing them with formulations for the production of innovative functional products to be placed on the market.

**Grant availability** (funds to support the research activities): Research agreement with companies following a MISE project for a total of approximately 100,000 euros

**Collaborations with foreign institutions**:

Part of the doctoral project (approximately 6 to 9 months) will be carried out at the Pharmacology and Therapeutics, Phytochemistry and Food Sciences, of the Universidade Lusófona de Humanidades e Tecnologias (Lisbon - Portugal).