**PhD: Food Science**

**Title:** Development of innovative 3D models to study the regulation of Piezo1 and Piezo 2.

**Proposing supervisor:** Paola Vitaglione

**Co-supervisor:** Annalisa Tito

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

The goal of the project is to develop innovative 3D systems to study Piezo1 and Piezo2 receptors in human cells and plant and to identify their natural agonists and/or antagonists. Piezo1 and Piezo2 receptors are two important mechanoreceptors that convert different mechanical stimuli, into electrochemical signals activating a specific response in human body. In the human system they are activated by signals such as increased pressure, gentle touch or pain, while in plants Piezo receptors seem to facilitate the roots in penetrating hard soils. The developed systems will involve multidisciplinary skills and will be based on skin and intestine cells or more complex systems such as innervated models of skin and intestine, but also plant models such as wild type Arabidopsis lines and mutants of the Piezo genes.

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

Piezo1 and Piezo2 receptors were identified about 10 years ago for their key role in mechanotransduction but their specific roles in various systems still need to be fully elucidated. Developing in vitro systems based on different platforms will allow us to study these receptors by a multidisciplinary approach and identify natural compounds that can regulate them permitting their utilization in various industrial applications. Arterra Bioscience, the company involved in the proposed project, has a great experience in the research and development of new active ingredients for applications in different industrial sectors and it holds a collection of plant and algal extracts that can be used to obtain high-value active ingredients. The proposed project aims to identify innovative products that fulfil the requirements of safety, standardization, and eco-sustainability acting on unknow and still unused targets.

**Grant availability**: Arterra Bioscience

**Collaborations with foreign institutions**:

Within the project, a collaboration with Professor Vincenzo Fogliano of the "Department of Agrotechnology and Food Sciences" of the University of Wageningen, is included.

The research group of Professor Fogliano is focused on the identification and characterization of innovative active ingredients for nutraceuticals and functional foods.