



**University of Naples Federico II**

**Department of Pharmacy**

*PhD course*

*Nutraceuticals, Functional Foods and Human Health*

DIPARTIMENTO di FARMACIA



## *XXXLX cycle*

Tutor: Prof. Stefania Albrizio; co-Tutor Prof. Ferdinando Fiorino

### **Assessment of the public health risk associated with the consumption of xenobiotic-contaminated food.**

In recent years, food is taking on a leading role as a source of substances that can contribute to the maintenance of good health as well as optimal mental and physical well-being.

The idea of food 'as medicine' cannot, however, disregard the fact that the composition of food now includes xenobiotics of various kinds that are either intentionally added to the food or result from contamination that may occur throughout the production chain or by transfer from the environment. Numerous studies over the years have shown the relationship between the presence of chemical contaminants ingested through food with pathologies as diverse as cancer, inflammatory-based diseases, endocrine dysfunction, and alterations in the gut microbiota and immune system functioning.

Numerous authorities around the world (among the most important: Food and Drug Administration, FDA and European Food Safety Authority, EFSA) publish opinions on current and emerging food risks, which are useful for updating legislation on food safety and public health protection, supported by scientific studies not only on toxicological aspects but also on monitoring the presence of contaminants in food.

The search for contaminants in food matrices (and environmental matrices, due to the close relationship between the environment and food quality) requires the development of analytical procedures that are adapted to the complexity of these matrices, allowing the extraction and quantitative determination even of concentrations in the ppb range. Each procedure has to be validated by referring to the main official guidelines on the validation of analytical methods. Finally, different approaches can be used for risk assessment of contaminant exposure through food starting from the determined concentrations. Examples are the recent tools developed by EFSA such as RACE (Rapid Assessment of Contaminant Exposure) for the rapid assessment of exposure to different types of contaminants or PRIMo (Pesticide Residue Intake Model) for assessing the risk associated with the intake of pesticides through food.