

# Agro-Environmental and Food Research Group (AA1)

Facultade Ciencias  
Universidade de Vigo



**Who are we?**

**What do we do?**

**A CASE...**

**Where do we want to go?**

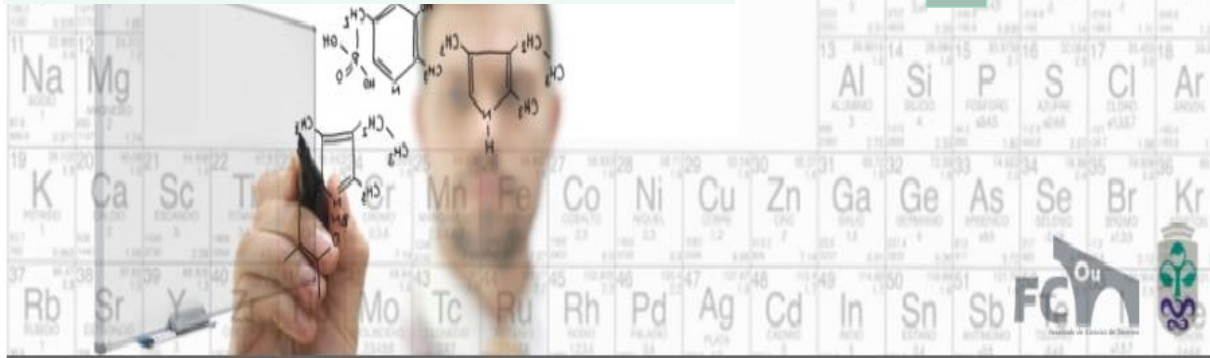
**By Jesus Simal-Gandara**  
**([jsimal@uvigo.es](mailto:jsimal@uvigo.es))**

**The Agro-Environmental and Food Research Group:  
research lines and a case for residual reference values in food**

# Who are we?

## AA1

Competitive Reference Research  
Group since 2007



## CIA<sup>3</sup>

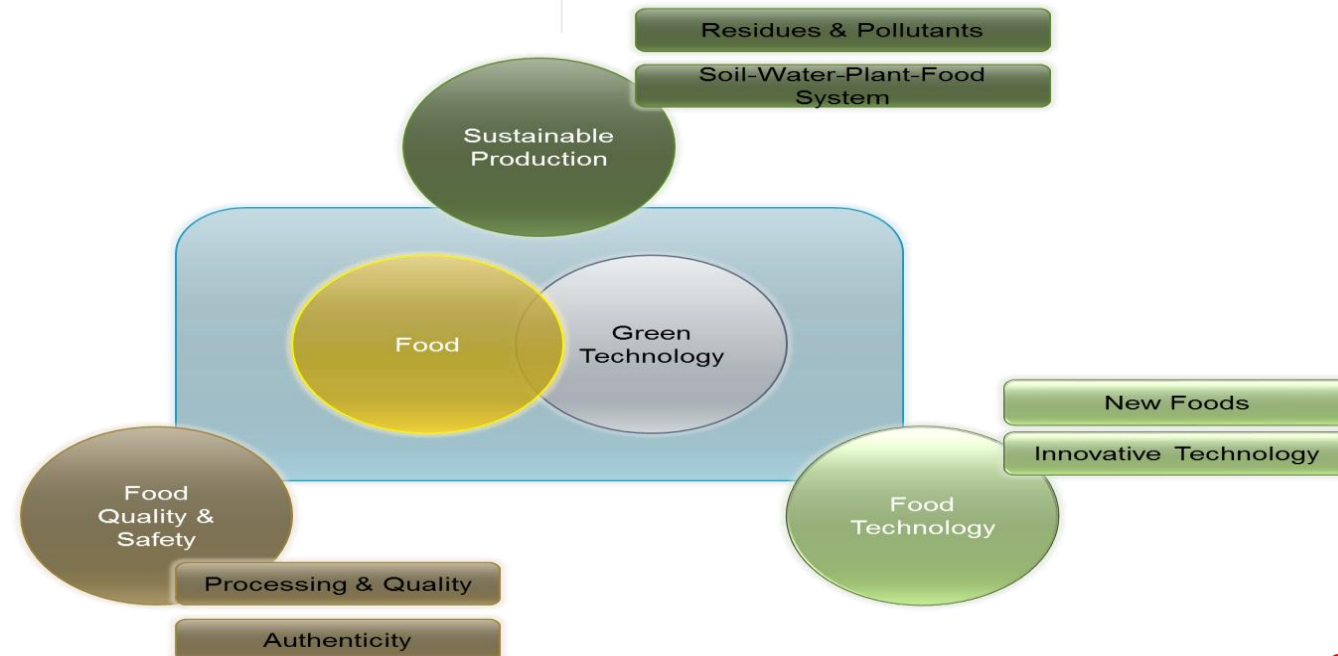
Strategic Research Grouping  
since 2009

### AA1: Agro-Environmental and Food Research Group

- Nutrition and Food Science
- Biochemistry and Molecular Biology
- Soil Science and Agricultural Chemistry
- Physical-Chemistry

### CIA<sup>3</sup>: Agro-Food Research Centre

- AA1
- 5 groups at Ourense: Chemical Engineering, Biotechnology, Food Technology, Food Rheology, and Botany
- 1 Group at Vigo: Plant Physiology



## LABs FACILITIES

### **1.-Sample Preparation Lab**

### **2.-Gas Chromatography Lab:**

GC-MS (quadrupole): 1

GC-MS (triple quad): 1

GC-MS (ionic trap): 2

### **3.-Liquid Chromatography Lab:**

HPLC (different detectors): 2 (UV-Vis, and fluorescence, mainly)

HPLC-MS/MS (triple quad): 1

# What do we do?

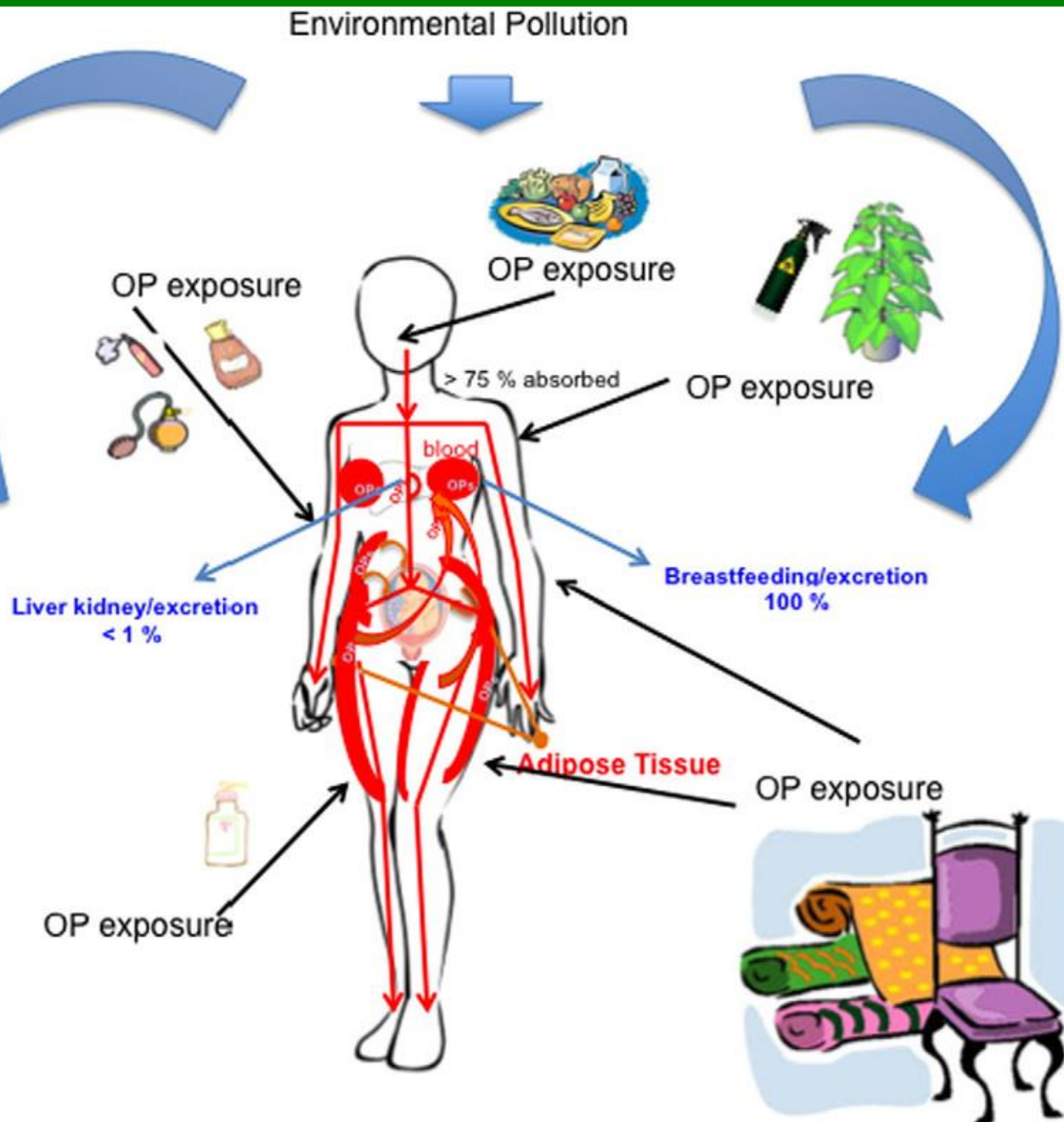
## SPECIALIZATION

The research group is specialized in chromatographic separations (GC-MS and LC-MS), but also is now **starting to work on molecular biology and proteomics**.

We investigate the distribution of **agricultural and environmental organic chemical contaminants in the food production chain**, and **how improving the sensory and functional quality of food**, with an eye on the food chain globally, integrating environment, agriculture and food with nutrition and public health issues.

Our focus today is on the study of **persistent organic pollutants (POPs) from the point of view of public health** (epidemiology, toxicity of mixtures, metabolites...), and on the study of **secondary metabolites in plant foods**, exploring the molecular mechanisms that explain their activity.

# What do we do?





# A CASE... for residual reference values in food

## BACKGROUND

In the extraction of the crude mineral composed of sodium chloride and potassium chloride, together with other **impurities, these were eliminated by a flotation process with amine-based collectors.**

The salt obtained by this procedure **was deposited** without exploitation **and, later, commercial exploitation of the deposit as edible salt begins.**

Since the type of amine used as a collector is unknown, it is considered **necessary to evaluate two groups of amines based on their toxicity:** aliphatic amines and alcohol amines on the one hand, and aromatic amines on the other.

# A CASE... for residual reference values in food

## Reference values for aliphatic amines and alcohol amines

**Octadecylamine (ODA)** is representative in terms of toxicity.

**Based on the lowest NOAEL established** (3 mg/kg body weight per day), a **Tolerable Daily Intake (TDI)** for octadecylamine of 3  $\mu\text{g}/\text{kg}$  body weight/day can be estimated **by applying a safety factor of 1000**, given the limitation of existing data.

The European Commission has indicated that **actual consumption of salt in Europe is high** (from 8 to 12 g/person per day).

$$\text{Valor de referencia} = \frac{3 \mu\text{g}}{\text{kg} \times \text{día}} \times 60 \text{ kg} \times \frac{1 \text{ día}}{12 \text{ g sal}} = 15 \mu\text{g/g} = 15 \text{ mg ODA/kg sal}$$

# A CASE... for residual reference values in food

## Reference values for aromatic amines

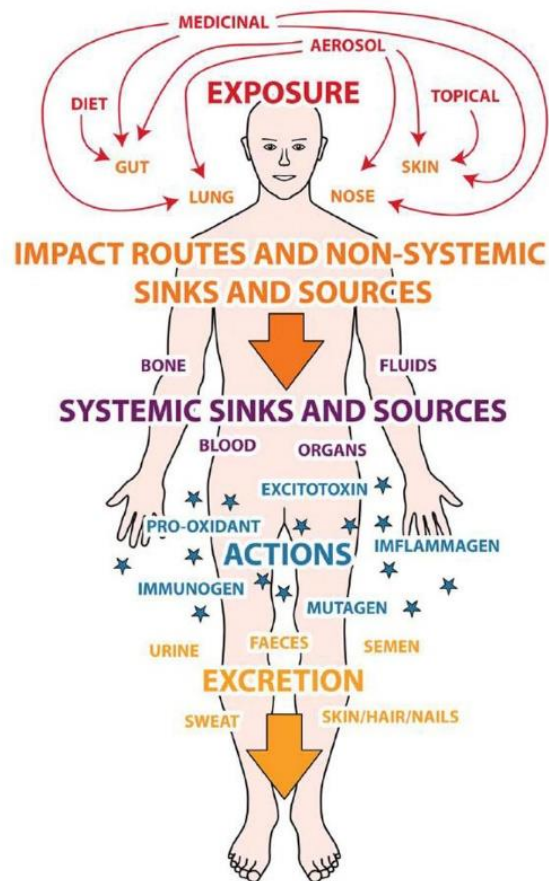
Within this type of amines, **the OEHHA** (Office of Environmental Health Hazard Assessment) **has established for the 2-naphthylamine an NSRL** (No Significant Risk Level for Carcinogens) of 0.4 µg/day.

Taking into account also a **daily salt intake of 12 g/day**, a **reference value could be established** for the detection of the 2-naphthylamine residues of 0.033 mg/kg salt.

From the point of view of the possible presence of aromatic amines, **the total sum of the aromatic amines present should be less than 30 µg/kg salt.**



# Where do we want to go?



Environment

Food

Exposome

<https://ec.europa.eu/programmes/horizon2020/>

## **NEW METHODS in "Health Science"**

- 1.-Exposure biomarkers**
- 2.-Epidemiological and clinical assays**
- 3.-Proteomic and transcriptomic tools**

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