

**PhD position**  
**Project DRIFT “Determination of Residues in Food Testing”**

**1- CONTEXT**

**LABERCA** is a research unit of Ecole Nationale Vétérinaire, Agroalimentaire et de l’Alimentation Nantes Atlantique (Oniris) and belongs to the Ministry of Agriculture and Fishing. It is under the supervision of the Direction Générale de l’Enseignement et de la Recherche (DGER) and the Institut National de la Recherche Agronomique (INRA) (Alim H Department) for its research activities in the field of chemical food safety. It is the National Reference Laboratory for dioxins, Polycyclic Aromatic Hydrocarbons (PAH) and growth promoters in breeding animals (Direction Générale de l’Alimentation – DGAI and DG SANCO - EU); activities conducted in this context are accredited against ISO 17025 standard. Research activities conducted in LABERCA are focused on the study of the chemical risk in Food in an integrated risk assessment approach from feed to mankind and its descendants. In this respect, two main categories of compounds can be identified, i.e. on the one hand residues of forbidden veterinary drugs and on the other hand contaminants. Residues include substances of natural origin (among which gonadic steroid hormones, proteic hormones of somatotropin-type) and xenobiotic substances (among which anabolic steroids, corticosteroids, beta-agonists and thyreostats). Environmental contaminants comprise dioxins, PCBs, RFBs, PFCs, PAHs or organochlorine substances (phytosanitaires). In these two groups, certain substances are known – or suspected - to exhibit a disrupting activity on the endocrine system, which has been drawn the scientific community’s attention for several years now, considering the direct consequences on consumers. The analysis of these molecules, most of the time present at trace level within complex biological matrices requires the use of ever more sensitive and specific identification techniques. Mass spectrometry under all its forms is the laboratory’s preference analytical tool when it comes to research projects in this general context. A large range of mass spectrometric facilities are available on LABERCA’s analytical platform. In parallel of these targeted approaches, the crucial issue related to illegal anabolic practices detection in cattle has been recently tackled through global and untargeted strategies development such as metabolomics. Mainly based on comparative and differential approaches, such strategy aims at highlighting biomarkers evidencing anabolic practices. A global workflow has been developed and implemented within LABERCA, this protocol has already proven its relevance and efficiency in various applications dedicated to the screening of anabolic practices in cattle. Research activities as a whole are being run according to a quality management system, which is certified according to the ISO9001:2008 standard. Generally 4 PhD students, 3 post-docs, 4 MSc students and several researchers are being supervised annually.

Since the late 1950s, **Waters Corporation** has been in the business of designing and producing innovative analytical instruments that assist scientists in achieving their scientific goals by increasing productivity and earning laboratory-based organizations a higher return on their investments in research, development and quality control. Liquid chromatography (LC) and mass spectrometry (MS) products are used worldwide in many fields including, pharmaceutical discovery, pollution monitoring and food safety analysis. Amongst the latest innovations, the SYNAPT G2 HDMS is a high resolution exact mass MS/MS platform combining a breakthrough quantitative Time of Flight (TOF) technology and enhanced High Definition MS™ (incorporating ion mobility) technologies to provide researchers with application flexibility and a new level of performance for a wide range of applications. By enabling analyte differentiation by size, shape, charge in addition to mass, this unique functionality allows complex research challenges to be addressed.

## 2- RESEARCH TOPIC

**Title:** Determination of Residues In Food Testing

**Acronym:** *DRIFT*

**Objectives:** A joint research programme was set up between Waters and LABERCA to both increase performances and improve efficiency of chemical food safety strategies. The research programme, conducted in the scope of a PhD, will investigate the technological advances implemented in the SYNAPT G2 HDMS instrument (including, APGC, Atmospheric pressure ionisation (DESI, DART), TRIZAIC, ion mobility), to address , using both targeted and untargeted (metabolomics) strategies, issues related to the chemical safety of food products from animal origin. Steroids, b-adrenergic drugs and growth hormone (somatotropin) will be considered as the main compounds of interest together with their biomarkers revealing anabolic practices in breeding animals.

## 3- PRACTICALS

**Duration:** 3 years (March 2012 – February 2015)

**Salary :** 1400 euros net / month

**Location:** LABERCA, Nantes, France – Missions at Waters, Manchester, UK

## 4- EXPECTED SKILLS

Master in analytical chemistry, Mass spectrometry

English fluent

## 5- APPLICATION

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**Dr Gaud DERVILLY-PINEL** – Responsable scientifique adjoint

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