

Post-doctoral position (18 months)

Title: Cancer, Environment and Metabolomic: Dog as Sentinel Species

Research Unit:

Laboratoire d'Étude des Résidus et Contaminants dans les Aliments (LABERCA), <http://www.laberca.org>
Ecole Nationale Vétérinaire, Agroalimentaire et de l'Alimentation Nantes Atlantique (Oniris)

Scientific guidance team:

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Context and objectives

LABERCA, the Laboratoire d'Étude des Résidus et Contaminants dans les Aliments, is a research unit of the Nantes Atlantique College of Veterinary Medicine, Food Science and Engineering (Oniris). The general field of activity of LABERCA fits within a global and integrated approach of risk assessment, from agricultural supply to human and its mankind. LABERCA generates knowledge and data related to the sources, transport and metabolism of chemical substances, in order to simultaneously characterise both exposure of consumers to chemical pollutants (occurrence of these parameters in foodstuffs) and their internal dose (occurrence of the same parameters, their metabolites or their degradation products in biological fluids and human tissue).

Besides conventional and historical targeted approaches based on liquid/gas chromatography – mass spectrometry developed by the unit to monitor and quantify these compounds, LABERCA has become involved in developing and exploiting new methodological approaches that are more open-ended, notably metabolic or metabolomic-type profiling. Overall, the unit aim at characterising the biological changes that occur following exposure to a chemical (particularly when this relates to endocrine disruption) or revealing new biomarkers of exposure and/or effects associated with these pollutants (with the ultimate aim of diagnosis, if possible predictively). A general framework has been built to conduct such studies, taking into account the procedures for the preparation of samples (biological fluids, animal tissues, food products), the generation of metabolic profiles (LC-HRMS GC-MS, GCxGC-MS), processing of raw data and statistical analysis by multivariate techniques (PCA and OPLS).

This post-doctoral contract falls within this context and is part of the project Canem ("Cancer, Environment and Metabolomics, Dog as sentinel species"), regional project funded by the Pays de la Loire region, and conducted in collaboration with AMAROC Unit ("Cancer animaux: modèles pour la recherche en oncologie comparée") of Oniris (Coordinator). Indeed, cancer is now in France the leading cause of death among both humans and pets. Dogs generally sharing the same environment as its owners, the hypothesis made in this project is that the question of the influence of environmental factors (particularly chemical exposure) on the incidence of cancer could be studied in the dog as a model of the same potential link in humans. This project therefore aims to use the spontaneous cancer of the dog as a model: i) to monitor a targeted set of chemical contaminants in biological samples (including fat) in order to characterize the body burden the studied individuals, and ii) to characterize the biological signatures (serum metabolic profiles) associated with tumor development.

During the post-doctoral contract, the recruited person will support the second part (metabolomics) of the project, including analysis of blood samples collected from healthy dogs or dogs with spontaneous cancer. Two types of canine cancers will be studied: breast tumors and non-Hodgkin's lymphoma, due to their clinicopathological characteristics very similar to their human equivalents and their suspected links with environmental contaminants. The final purpose will be to highlight blood biomarkers correlated with an imprint of environmental and physiological disturbances associated with cancer development.

Candidate profile:

PhD in analytical chemistry and/or chemistry with a good knowledge in mass spectrometry. Experience in metabolomics (data processing, data analysis) will be greatly appreciated. This position is open for an 18 month period (from March 2012). Salary: 2000€ / month