POSTDOCTORAL POSITION
Microbiology of Food Spoilage and Innovative Molecular Tools
(Design of the SpoiLog Database)

Project Description

Food spoilage microbiota are responsible for manufacturing incidents (changes in food color, odor, taste, texture, package swelling, etc.), rendering products unfit for consumption and constituting a major limiting factor for the commercial shelf life of food products.

Since early 2023, this concept of unfit food has been reinforced in France by the Food Alert Management Guide, which now requires notification of products unfit for consumption. By developing on food products, spoilage microflora therefore cause considerable losses in the agri-food industry (food waste, economic impact, environmental impact, loss of competitiveness). In Europe, it is estimated that 30% of food production is wasted, of which 25% is attributed to microbiological spoilage. This phenomenon is exacerbated by the "Clean Label – Greener Biocide" trend, packaging reduction and recyclability, and salt reduction.

Currently, there are very few standardized methods to identify the organisms responsible for spoilage and to monitor processes. There is also no offer adapted to each level of need and little or no support for agri-food industries: problem qualification, identification of spoilage organisms, and support through to the implementation of appropriate control measures (challenge tests, process validation).

The SpoiLog project aims to develop a digital, ergonomic, multi-sector database to guide manufacturers in controlling issues related to spoilage microflora, to generate new experimental data, to identify the sequencing techniques most appropriate to the challenges of spoilage, and to develop an agile investigation method for agri-food industries to control issues related to spoilage microbial flora in both conventional and innovative foods (based on plant proteins).

As part of the SpoiLog project, we are recruiting a postdoctoral researcher within the UMR SecAlim 1014 INRAE-Oniris unit. The mission will be to generate new experimental data on the characterization of spoilage microflora for currently under-documented matrices (conventional and plant-based alternatives). These new data will feed and strengthen the newly created SpoiLog database. To achieve this, the postdoc will implement classical microbiology tools and also develop innovative molecular microbiology tools (full-length 16S / ITS metabarcoding) as well as methods for quantifying spoilage bacterial and fungal populations (qPCR / PMA-qPCR). The postdoctoral researcher will play a key role in structuring an unprecedented tool in France for the prevention of microbiological spoilage and will contribute to the production of publishable data in international scientific journals.

The postdoctoral contract, with a duration of 18 months (renewable), will start in February 2026.

Funding

INRAE contract: between 3 135€ and 3 559€ gross per month, depending on experience (INRAE salary grid).

Host Laboratory

SECALIM (Food Safety and Microbiology) is a Joint Research Unit (UMR1014) INRAE/Oniris that conducts research in the field of food microbiological safety. The mission of SECALIM is to produce and disseminate scientific knowledge and methods in food microbiological safety to respond to societal demands in public health and the control of food losses. Its research activities aim to characterize and control microbial risks (pathogenic and spoilage) in foods. The expertise implemented within the unit combines classical and molecular microbiology, predictive microbiology, and quantitative risk assessment. One of the objectives of this work is to contribute to the development of innovative control measures for professionals and regulatory authorities to ensure the microbiological safety of foods.

Candidate Profile

Holders of a PhD in food microbiology, microbial ecology, or equivalent must demonstrate strong skills in microbiology and food microbial ecology, as well as in genomics, microbial genetics, and bioinformatics, and possibly statistical methods applied to community analysis and interactions. Knowledge of food production chains and processing methods, as well as issues related to microbiological food spoilage, will be appreciated. The candidate must also have transversal skills (project management, communication, teamwork, collaboration, proficiency in English, writing and organizational skills). Their academic background (doctoral, postdoctoral) should demonstrate their interest in applied research, autonomy, adaptability, and versatility, as well as their ability to develop a network of national and international collaborations.

Application Deadline

15th of January 2026

Documents Required for Application

It is mandatory to provide the following as part of the application:

- A complete and detailed CV, particularly highlighting the level of experience related to the required prerequisites
- A cover letter
- PhD dissertation (if non-confidential)
- References or contact details of people who can provide recommendations
- PhD diploma and, if applicable, certificates of postdoctoral internships/fellowships

Contacts

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