The BfR independently prepares expert opinions and statements on issues of food, feed and chemical safety and consumer health protection in Germany on the basis of internationally recognised scientific evaluation criteria. It advises the Federal Government and other institutions and interest groups in these areas. The BfR thus makes an important contribution to the protection of human health. You can find information on the remit of the Division here on our homepage.

The following position is available (in cooperation with PD Dr. Bankoglu) at the Unit Junior Research Group Skin microbiome of the Federal Institute for Risk Assessment (BfR) from 02.03.2026:

Master Thesis

Overarching Research Theme:

"Genotoxic Risks of Bacterial Pesticide Metabolites: *In vitro* insights"

Institution of

Federal Ministry of Agriculture, Food and Regional Identity

BfR

German Federal Institute for Risk Assessment

Project Description:

The human microbiome possesses a significant metabolic capacity that far exceeds the human metagenome and its associated biochemical pathways. However, the microbiome is not yet considered in xenobiotics risk assessments, although previous studies suggest that the microbiome may modulate genotoxicity by metabolization of a xenobiotic parent compound.

To gain a better understanding of the complex xenobiotic-microbiome interactions, the genotoxicity of bacterial metabolites will first be examined in simplified in vitro systems.

Therefore, the successful student will cultivate pure bacterial strains individually and in a defined community within the junior research group “Skin microbiome”. This approach provides a controlled environment, in which the microbial metabolism of test substances can be studied without external interference. To investigate the cytotoxic potential of the microbial culture supernatants different cytotoxicity biomarkers will be performed on human skin cells.

In cooperation with PD Dr. Bankoglu (Unit Safety of Food Contact Materials), the genotoxic potential of these bacterial culture supernatants will be characterized.

By isolating the direct genotoxic effects of bacterial metabolites formed during incubation, we can obtain preliminary data that will serve as a foundation for more complex *in vitro* models, such as a commensal 3D skin model, where both microbial communities and host interactions will be considered.

This project aims to assess the genotoxicity of bacterial pesticide metabolites produced during the incubation of test substances in skin models. It will also optimize *in vitro* test methods for analyzing complex microbial metabolite mixtures and study the matrix effects of the bacterial cultivation environment. Additionally, the project seeks to improve our understanding of the potential differences in genotoxic activity between bacterial metabolites and their parent compounds, comparing these findings with literature data and predictions from *in silico* models.

The project includes the following focus areas, which can be addressed separately by different students:

- Establishment and optimization of in vitro genotoxicity tests for the assessment of bacterial pesticide metabolites in skin models
- Evaluating the compatibility of bacterial cultivation systems with in vitro genotoxicity testing, including the matrix effects of the bacterial environment during incubation
- Understanding the genotoxic interactions of bacterial metabolites and parent compounds, with an emphasis on potential differences in genotoxic activity

Your profile

- Completed Bachelor's degree in life sciences (biology, biochemistry, biotechnology, molecular life sciences, food chemistry or a comparable field) and currently enrolled in a Master's programme in a similar field
- Experience with cell culture or other relevant methods to the project is advantageous but not mandatory
- Basic knowledge in cell biology
- Very good knowledge of written and spoken English
- Flexible, motivated and self-organized working style

We offer a modern, well-equipped laboratory, collaborative research work in an interdisciplinary environment and comprehensive support directly within the team.

Application process

Have we piqued your interest and would you like to delve deeper into the fascinating world of food contact materials?

Then please apply by e-mail **(lisa.lemoine@bfr.bund.de)** with the subject line **Application for thesis: Genotoxic Risks of Bacterial Pesticide Metabolites**. Please attach a short letter of motivation, CV, certificates and transcripts and contact details of at least one reference.

Please address any questions about the area of responsibility to:
Dr. Lisa Lemoine: T +49 30 18412-56501
E-Mail: lisa.lemoine@bfr.bund.de

You will find more information on our homepage:
bfr.bund.de/de/en/working_at_the_bfr

The BfR welcomes applications from people of all nationalities.

Zertifikat seit 2009
audit berufundfamilie

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BfR | Identifying Risks – Protecting Health

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