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The research group of Prof. Susanne Gebhard at the Institute of Molecular Physiology of the Johannes Gutenberg University Mainz is inviting applications for a

## **PhD position**

(Salary level TV-L E13, 65%, 36 months)

in a DFG-funded research project with the title

“The enigmatic LiaXYZ System of *Enterococcus faecalis* and its role in resistance to cell envelope-targeting antibiotics”

### **The project:**

Enterococci are responsible for about 10% of hospital acquired infections. Such infections are hard to treat, because the bacteria are resistant against many antibiotics, particularly those that target the cell envelope. One of the most promising antibiotics for treating drug-resistant enterococci is daptomycin, which targets both the cell wall and the membrane. But resistance against this compound is already on the rise, and a better understanding of how this resistance works is needed.

It has been found that resistance against daptomycin in enterococci often involves increased production of the three proteins LiaX, LiaY and LiaZ. This study aims to unravel how the LiaXYZ system works in *E. faecalis* and how it protects the bacterium from daptomycin and other antibiotics.

In this project, we will use genetic and protein biochemical techniques to understand exactly how much each of the three proteins contributes to daptomycin resistance. We will fuse the proteins to fluorescent markers to track them in the cell and see how their behaviour changes when the antibiotic is present. We will also investigate how LiaX interacts with membranes and with itself, and whether LiaY is involved in any of this. And finally, we will test how LiaZ's activity helps to protect the bacteria. Overall, this research could help develop better strategies to fight antibiotic-resistant bacteria.

### **Who you are:**

As the successful candidate, you hold, or are about to obtain, a master's degree in microbiology, biochemistry or a related subject area. You have a genuine passion and curiosity for bacteria and the molecular mechanisms by which they resist antibiotic action. This is paired with problem-solving, time management and excellent communication skills and an ability to work as part of a team. A theoretical and practical foundation in protein biochemistry, microscopy and/or membrane biology are of distinct advantage.

### **What we offer:**

You will be embedded in an interdisciplinary team of researchers and will receive state-of-the-art training in molecular microbiology, fluorescence microscopy and functional analysis of proteins and protein-membrane interactions. The Gebhard lab offers a stimulating and supportive research environment, and you will have the opportunity to gather international experience by visiting our collaborators in the UK.

**To apply**, please send a single pdf including a motivation letter, CV, contact details for two referees, and copies of your BSc and MSc transcript to [sugebhar@uni-mainz.de](mailto:sugebhar@uni-mainz.de) until **15<sup>th</sup> March 2026**. The start date is negotiable but would ideally be as soon as possible.