UNIVERSITÄT HOHENHEIM
Institut für Lebensmittelwissenschaft und Biotechnologie
FG Aromachemie

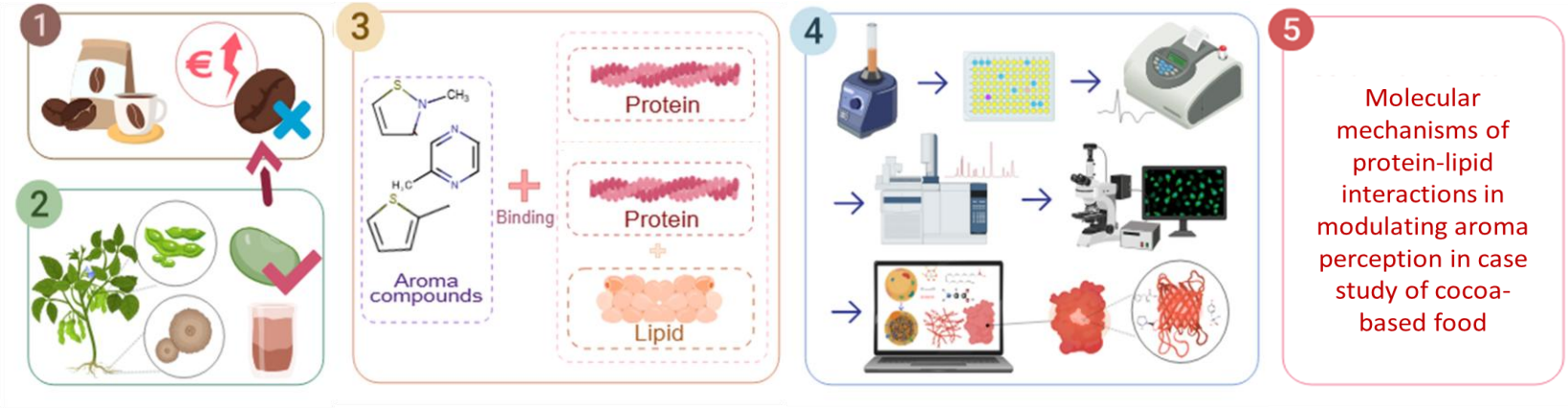
Bachelorarbeit – Projektarbeit – Masterarbeit

Molecular Mechanisms of Protein- Lipid Interactions in Modulating Aroma Perception (Case Study: Cocoa Alternatives)

Cocoa production is increasingly affected by climate change, deforestation, and rising costs, making sustainable cocoa alternatives more important than ever. Plant-based and microbial proteins—such as faba bean, carob, soy, pea and rice —show great potential, but current substitutes still lack the complex aroma profile of real cocoa. One major challenge is that the molecular mechanisms behind how proteins, lipids, and aroma compounds interact are not yet fully understood.

This project aims to uncover how protein–lipid complexes influence the retention and release of cocoa aroma compounds. By understanding these interactions at the molecular level, we hope to support the design of next-generation, sustainable cocoa alternatives with improved sensory quality.

Depending on your thesis level, you will work with a combination of analytical techniques (fluorescence spectroscopy, FTIR, SDS-PAGE), aroma analysis (HS-GC-MS), and computational tools such as molecular docking and molecular dynamics simulations. Together, these methods will help reveal how proteins and lipids bind and stabilize key cocoa flavor molecules.



Prof. Dr. Yanyan Zhang, Fachgebiet Aromachemie, Universität Hohenheim
Fruwirthstr. 12, 70599 Stuttgart, Tel. 0711-459 24870, Email: andrea.graf@uni-hohenheim.de

Kontakt
M.Sc. Ruotong Nie
ruotong.nie@uni-hohenheim.de
0711-459 24877