IUTA — Institut für Umwelt & Energie, Technik & Analytik e.V.

Bliersheimer Str. 58-60
47229 Duisburg
www.iuta.de

Internship, Bachelor & Master Thesis Opportunities

PHARMACEUTICAL AND BIOPHARMACEUTICAL ANALYSIS — ADVANCING SAFETY AND SUSTAINABILITY

Are you interested in pharmaceutical monitoring, biopharmaceutical characterization, workplace safety, instrumental analytics and analytical instrument development? At IUTA, we offer motivated students the opportunity to work on innovative projects focusing on the application and optimization of analytical methods in biopharmaceutical research and pharmaceutical monitoring. You will take a deep dive into topics such as:

Pharma Monitoring — Assessing occupational exposure risk of pharmaceutical staff handling and preparing highly potent pharmaceuticals, focusing on the impact of various parameters on safety. This includes the development of new monitoring methods based on liquid chromatography (LC) coupled to mass spectrometry (MS) analysis as well as removal techniques for effective safety management.

Stability Testing and Quality Control — Develop and validate methods to assess the stability of biopharmaceutical drug products. Stability testing includes a diverse range of methods such as chromatographic techniques as well as coupling of LC and high-resolution mass spectrometry to analyze enzymatic digests or the intact therapeutic proteins.

Medical product testing — Develop and validate methods to assess the safe use of different medical products. This includes evaluating extractables/ leachables, assessing permeability or adsorption effects on different materials. Various chromatographic techniques and mass spectrometry will be used to assess product characteristics.

In addition, you will have the opportunity to connect with a wide network of research institutions and industry partners involved in our projects and commercial activities, providing avenues for professional exchange, collaboration and future career opportunities in academia or industry.

WE ARE LOOKING FOR STUDENTS WHO:

- Are studying instrumental analytics, industrial pharmacy, chemistry, water science or related fields
- Have a passion for laboratory work and a hands-on mentality
- Are curious about collaborative research in environment and water related topics
- Want to work on projects with both scientific depth and industrial relevance

For further questions and application, contact **Michelle Klein (klein@iuta.de), Jana Thissen (thissen@iuta.de) or Mischa Jütte (juette@iuta.de)**

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WE CAN OFFER:

- Internships, Bachelor- and Master-Theses related to the mentioned topics
- Opportunities for hands-on experience with state-of-the-art analytical equipment
- Interdisciplinary research and collaboration with industry and/or project partners
- Mentorship from a young and dynamic research team
- Open-minded, motivated and supporting work environment

AVAILABLE PROJECTS

Stability analysis of anti-tumor biosimilars during preparation
To ensure high-quality stability data, standardized protocols will be developed and validated to reliably detect structural and chemical changes in biopharmaceuticals. Analytical capabilities are expanded to include chemical, physical and biological methods in order to assess the stability of a wide range of biologics such as antibodies, antibody-drug conjugates or enzymes. The goal is to develop procedures for the simultaneous acquisition of multiple data types using two-dimensional, orthogonal analytical techniques.

Method development to detect protein contamination in occupational healthcare settings
Considering the contamination control strategy outlined in GMP Annex I, pharmacies are required to develop efficient cleaning protocols for their sterile production facilities. To evaluate the effectiveness of cleaning routines a method needs to be developed that enables the sensitive detection of proteins. This includes the optimization of the sample preparation (e.g., focus on different enrichment techniques for proteins) and the development of an LC-MS/MS method to analyze the content of proteins at peptide level in wipe samples.

Method development LC-MS/MS
We frequently offer different analytical topics e.g., method development with LC-UV, LC-MS/MS targeted on cytostatic drugs or transformation products. In our research, we employ various chromatographic techniques, including reversed phase, HILIC, SEC and IEX to provide comprehensive analysis and results.

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