

## **MSc Pharmaceutical Sciences: Master Research Project in the field of Clinical Pharmacy**

### **Announcement of topics:**

- Topics will be announced here: [http://www.bcp.fu-berlin.de/pharmazie/klinische\\_pharmazie/arbeitsgruppe\\_kloft/lehre/MSc\\_Pharmaceutical\\_Sciences/index.html](http://www.bcp.fu-berlin.de/pharmazie/klinische_pharmazie/arbeitsgruppe_kloft/lehre/MSc_Pharmaceutical_Sciences/index.html)
- Next availabilities: SoSe 2023 (See below)

# Research Project SoSe2023

## Clinical Pharmacy & Biochemistry

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### **RELATIONSHIP BETWEEN TURBIDITY AND BACTERIAL CONCENTRATION OF *ESCHERICHIA COLI* STRAINS**

#### Description, tasks:

The turbidity of a bacterial suspension is widely used to standardise bacterial inocula in experimental set-ups. However, the relationship between the turbidity in McFarland (McF) and the bacterial concentration in colony-forming units per milliliter (CFU/mL) is strain-dependent. Thus, this relationship should be investigated for two clinical *Escherichia coli* isolates and one reference strain using a McFarland densitometer and a plate-counting assay. Additionally, the variability of the turbidimetric measurement can be assessed. The understanding of the relationship between the turbidimetric data and the bacterial concentration for these strains should be used for the optimisation of a heteroresistance assay, requiring different inocula.

#### Learning objectives:

- Independent working in the infection lab
- Carrying out of a plate-counting assay and turbidimetric measurements
- Data analysis with R and summary of results
- Preparation of a report on the research project and optionally presentation of the experimental results

#### Requirements:

- Interest and enthusiasm in scientific-experimental work and eagerness to learn and acquire new expertise
- Ability to work independently with the help and advice of the supervisors
- Reliability and responsible work in the laboratory
- Very good oral and written English skill

This project is a full-time research project with mandatory presence at the research site.

Beginn/Start

Individual arrangement

**1 Student**

Student of the Pharmaceutical research master program

Application

Until 28.02.2023 via e-mail to Nicole Zimmermann ([nicole.zimmermann@fu-berlin.de](mailto:nicole.zimmermann@fu-berlin.de)) and CC to Prof. Dr. Kloft ([charlotte.kloft@fu-berlin.de](mailto:charlotte.kloft@fu-berlin.de)) with a short application including your **motivation** for the topic and a **CV**.

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**DOES THE CYTOKINE ADSORBER CYTOSORB® REDUCE MEROPENEM EXPOSURE IN CRITICALLY ILL PATIENTS WITH SEPSIS OR SEPTIC SHOCK?**

Description, tasks:

Sepsis and septic shock are life-threatening organ dysfunctions caused by a dysregulated host response against severe infection. Inflammatory cytokines play a central role in the progression of sepsis and dysregulation of vital organ functions that can lead to organ failure and death. To remove relevant cytokines in septic patients, the cytokine adsorber CytoSorb® is increasingly used in combination with conventional haemodialysis or haemofiltration machines in intensive care units. In this context, concerns have been raised that CytoSorb® unintentionally also adsorbs antibiotics such as the commonly used broad-spectrum beta-lactam antibiotic meropenem. This could potentially lead to undesirable and dangerous antibiotic underexposure, which should be avoided in this vulnerable patient population.

The proposed Master's project aims to investigate whether and, if so, to which extent CytoSorb® decreases meropenem exposure in critically ill patients. In a first step, an available dataset from Charité - Universitätsmedizin Berlin with retrospectively collected clinical data will be graphically and statistically analysed and evaluated. Finally, nonlinear mixed-effect modelling methods will be applied to describe the underlying pharmacokinetic data.

Learning objectives:

- Literature research strategies
- Dataset preparation, exploratory data and graphical analysis in the software R
- Nonlinear mixed-effect modelling in NONMEM
- Preparation of a report on the research project and optionally presentation of the scientific results

Requirements:

- Interest in clinically relevant research
- Prior experience with R is an advantage
- Ability to work independently with the help and advice of the supervisor
- Very good oral and written English skills

-This project is a full-time 6-week research project with regular presence at the research site.-

**1 Student**

Student of the Pharmaceutical research master program

Application

Until 15.03.2023 via e-mail to Franz Weber (franz.weber@fu-berlin.de) and CC to Prof. Dr. Kloft ([charlotte.kloft@fu-berlin.de](mailto:charlotte.kloft@fu-berlin.de)) with a short application on the **motivation** for the topic and a **CV**.