



MIT-Germany & University of Regensburg: Summer 2022 Special Combined Research Internship & GTL Program

University of Regensburg (UR): A partner of the MIT-Germany program since 2015, the University of Regensburg is a renowned international center of research and teaching in Germany. The modern campus is located at the southern edge of a historic city dating back to the Middle Ages, and a designated UNESCO world heritage site. UR was the MIT-Germany's program's first university host for the Global Teaching Labs program, and has hosted dozens of MIT students for GTL programs and research internships.

Global Teaching Lab (GTL): Learn through teaching! GTL challenges MIT students to synthesize and present what they know, work in a team, and communicate with peers of a different cultural background, all while sharing MIT's unique approach to science and engineering education with high school students in Germany.

Program Dates:

- June 1—August 19, 2022

Program Applicants:

- Open to students of Chemistry, Biology, and related subjects

Program Details:

- Conduct full-time UROP-like research for the whole summer! You're matched with a UR PhD student or post-doc (see areas below), along with a UR faculty advisor. Research project is tailored to your interests and the host's work.
- Get a taste of GTL! Participate in 5-10 days of GTL programming in June and July, while matched with a UR student "buddy" who is preparing to be a HS science teacher in Germany
- Attend short classes! Option to participate in a short lab course with the UR chemistry department and/or a bilingual (English & German) scientific communication class (note: both activities not for MIT credit)
- Be a student in Germany! You'll be enrolled officially as a student at UR, living in student dormitories, and be able to participate in the great summer activities of the university

Interested? Please apply!

- Please send us: your summer availability (dates; should be roughly June 1—August 19), your updated resume, and which research projects/PIs below interest you.
- Students must have a passport valid until at least Nov 30, 2022 (three months after program completion)
- For more information and to apply, please contact the MIT-Germany Program Assistant Amanda Tragert (atragert@mit.edu)

Research Opportunities

1. Analytical chemistry

Prof. Antje Bäumner:

Research projects will investigate the development of nanomaterials for rapid, medical diagnostics and will focus either on the determination of the immune status against Covid-19 or diseases related to inflammation.

<https://www.uni-regensburg.de/chemistry-pharmacy/analytical-chemistry/baemner/homepage/index.html>

2. Inorganic chemistry

Dr. Florian Wisser:

“Porous Nanomaterials for Solar Fuels”

During the internship the student will work on the synthesis of organometallic catalysts for solar fuel production, and their integration into porous materials (metal-organic frameworks and porous organic polymers). The organometallic catalysts will be studied in photochemical CO₂ activation or photochemical water splitting. Beside the synthesis and testing of catalysts, the student will be engaged in the structure elucidation of the active site combining advanced spectroscopy (NMR, IR, RAMAN) and X-ray scattering techniques, the optical properties using fluorescence spectroscopy or the elucidation of the reaction mechanism using in situ EPR spectroscopy.

<https://www.uni-regensburg.de/chemie-pharmazie/anorganische-chemie-wisser/startseite/standard-titel/index.html>

3. Organic chemistry

The department of organic chemistry focuses on synthesis and catalysis, with a special focus on photocatalysis towards natural products and pharmaceutically relevant compounds. In this context, internships can be offered in the groups of:

Prof. Oliver Reiser:

Catalytic Conversion of Renewable Resources, Photocatalysis with earth-abundant metals

http://www-oc.chemie.uni-regensburg.de/reiser/index_e.html

Prof. Burkhard Koenig:

Synthetic methodology, Physical Organic Chemistry, Photocatalysis with organic dyes.

<https://www.uni-regensburg.de/chemie-pharmazie/organische-chemie-koenig/startseite/index.html>

Prof. Alexander Breder:



Synthetic methodology and organic catalysis using selenium catalysts

<http://www-oc.chemie.uni-regensburg.de/breder/index.php>

Prof. Julia Rehbein:

Spectroscopy and Computational Chemistry

www.reaction-dynamics.com

4. Institute of Plant Sciences, Cell Biology and Plant Biochemistry

Prof. Thomas Dresselhaus:

Our labs are integrated in the department **Cell Biology and Plant Biochemistry**, which represents one of the two plant sciences departments at the University of Regensburg. The working groups (AGs) of the department (see names on the left panel) focus their research activities on the understanding of various molecular mechanisms related to **plant reproduction and development** as well as the **interaction with the biotic and abiotic environment**. The research objectives are the most important crop plants maize and wheat as well as *Tripsacum dactyloides* and *Arabidopsis thaliana* as model systems. Applied research relates to overcoming hybridization barriers, to engineer parthenogenesis as a component of apomixis (asexual reproduction through seeds), to developing disease resistance, to plants better adapted to environmental stress, and to increasing biomass and bioenergy yield potentials in cereals.

<https://www.uni-regensburg.de/biologie-vorklinische-medizin/cell-biology-and-plant-biochemistry/dresselhaus/research/index.html>

5. Additional Opportunity: Chemistry Education

Prof. Oliver Tepner:

Before the research internships, there is the possibility to prepare experiments on the topic of plastics in a seminar on bilingual chemistry teaching. Together with students from the University of Regensburg, lessons are planned and an experiment day is designed for high school students.