

PhD position (m/f/d)

Coupling between water availability, carbon supply, and wood formation in trees – STEMCELL WP1

The Technical University of Munich (TUM) is one of the world's leading universities. At the TUM School of Life Sciences, one focus is on forest ecosystems, aiming to better understand their dynamics and contribute to their sustainable management. Funded by the European Research Council (ERC), the STEMCELL project has been established to enhance our understanding of tree growth and wood formation under drought conditions at the TUM School of Life Sciences. The goal of the STEMCELL project is to uncover the relationship between whole-tree water use and wood cell formation in trees, using advanced growth models to predict the future of wood formation and carbon allocation in forests facing drier conditions. Within WP1, a PhD researcher will perform controlled experiments on juvenile trees, which will be scaled up to mature trees at unique, whole-ecosystem rainfall-exclusion experiments, carefully monitoring wood formation. The PhD will be part of the STEMCELL team led by Prof. Richard Peters and a postdoc who will integrate the findings into a new numerical model simulating wood-formation. Specifically, we are looking to fill the position of a

PhD student (m/f/d) in the field of tree growth and wood physiology, 75%, available from February 2026

Your profile

- Completed master studies in the field of ecophysiology, plant biology, forest growth sciences or related fields
- Interested in tree growth, experimentation, and plant functioning
- Good quantitative skills (e.g., statistical analysis, coding in R, data management)
- Good communication skills
- Ability to work in a team
- Driving license category B desirable (access to field sites)

Your tasks

You will investigate how water and carbon availability jointly control tree growth at the cell level, with a focus on wood formation and its hormonal regulation. Using innovative factorial experiments with juvenile trees in climate chambers, you will manipulate drought and carbohydrate supply to tease apart their roles in controlling cambial activity, cell enlargement, and wall thickening. You will combine high-resolution dendrometer records with analyses of wood anatomy, carbohydrate pools, hydraulic traits, and hormonal profiles to uncover the mechanisms by which drought limits growth. Building on these experiments, you will extend the framework to mature trees using a unique canopy crane facility. Your findings will provide the empirical foundation for mechanistic modelling of tree growth under climate change and directly inform the other work packages of the project.

Specifically, tasks include:

- Designing and conducting climate-chamber experiments with juvenile *Fagus sylvatica*, *Picea abies*, and *Quercus petraea* to test combined water and carbon limitations of growth
- Applying innovative techniques such as stem chilling, controlled drought, and CO₂ labelling to manipulate and track growth processes
- Measuring high-resolution stem growth with dendrometers and stomatal conductance to establish the water-growth link in both a state-of-the-art growing chambers and in a mature forest
- Interactive collaboration and exchange within the STEMCELL team
- Publication of peer-reviewed scientific papers in international journals

- Communication of research findings at scientific conferences and stakeholder meetings

Our offer

- Work in a highly dynamic and international research group at the forefront of the field
- Embedded into a newly established, interdisciplinary research team with focus on tree growth and drought
- Interact with a wide network of peers, scientists and stakeholders both nationally and internationally
- 75% position (30h employment per week) in remuneration group TV-L E13, for a period of 3 years with the possibility for an extension to 4 years.
- The place of employment is the TUM School of Life Science in Freising, Germany
- Severely handicapped persons will be given preference in case of essentially equal qualification
- The TUM aims to increase the proportion of women in its staff; applications from women are therefore expressly welcomed

Contact

Please send your application, consisting of a complete CV and a concise motivation letter, by October 25, 2025, at the latest to:

Technical University of Munich
Chair of Tree Growth and Wood Physiology
attn. Barbara Bauer
Hans-Carl-von-Carlowitz-Platz 2
85354 Freising, Germany
Email: bbauer@tum.de

For questions about the position, please contact Prof. Richard Peters, richard.peters@tum.de.

In case of an online application (preferred) we ask you to send the documents collected in a single pdf file.

In case of a written application, we ask you to send us copies only, as we are unfortunately unable to return your application documents once the procedure has been completed.

As part of your application for a position at the Technical University of Munich (TUM), you will be submitting personal data. Please refer to our data protection information in accordance with Art. 13 of the General Data Protection Regulation (DSGVO) <https://portal.mytum.de/kompass/datenschutz/Bewerbung/> regarding the collection and processing of personal data as part of your application. By submitting your application, you confirm that you have taken note of TUM's data protection information.

Find out more about us at <https://www.lss.ls.tum.de/tgw/home/>