



Deutscher Akademischer Austauschdienst
German Academic Exchange Service



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Doctorate



Graduate School of Quantitative and Molecular Biosciences Munich

Ludwig-Maximilians-Universität München • München

Overview

Degree	Doctoral degree, Dr rer nat
Course location	München
In cooperation with	Technical University Munich, Helmholtz Center Munich, Max-Planck Institute for Biochemistry Munich
Teaching language	<ul style="list-style-type: none">English
Languages	Courses are held in English (100%).
Full-time / part-time	<ul style="list-style-type: none">full-time
Mode of study	Fully on-site with voluntary online elements
Programme duration	9 semesters or more
Beginning	Only for doctoral programmes: any time
Additional information on beginning, duration and mode of study	The courses always start in spring. Depending on the topic, courses will either be held in person or online (only sometimes). Compulsory "primer" (foundational) courses (programming, statistics, bioinformatics, biophysics) are planned as intensive courses in the period March to July. Soft skill courses (Good Scientific Practice, Presentation Skills, Scientific Writing), lecture series talks / journal clubs, and bonus lectures will be scheduled individually throughout the year.
Application deadline	For current information, please visit: https://qbm.genzentrum.lmu.de/application/
Tuition fees per semester in EUR	None
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	The molecular biosciences are undergoing a major paradigm shift – away from analysing individual genes and proteins to studying large molecular machines and cellular pathways, with the ultimate

goal of understanding biological systems in their entirety. The study of biomolecular systems poses major methodological and conceptual challenges, centred around the need for quantitative approaches. This includes the development of sensitive quantitative assays for in vitro and in vivo approaches; improved measurement techniques that ideally push resolution limits to the single molecule level; statistical methods to deal with high-dimensional, often noisy, data sets; and mathematical modelling approaches that reduce the dimensionality of parameter spaces and produce mechanistically realistic, experimentally testable predictions. As a result, systems-oriented biological research is inherently an interdisciplinary undertaking, involving biochemistry/structural biology, molecular and organismal genetics, biophysics, biostatistics, bioinformatics, and theoretical physics. Recently, AI (AlphaFold, computer vision, etc.) has had a huge impact on life science, proving that this field is constantly changing.

The mission of QMB is to provide young scientists with the skills and resources to excel in this new multi-disciplinary environment. We seek to train a cohort of young scientists who, while firmly anchored in their primary disciplines, are well versed in multiple approaches and styles of thought. The goal is for the students to be comfortable communicating across traditional boundaries, especially across the divide between experiment and quantitative theory – to become, in effect, scientifically bilingual or multilingual. To this end, the school offers a structured PhD programme consisting of three components: an interdisciplinary research project jointly supervised by two PIs from different fields, a substantial programme of formal course work centred around an interdisciplinary core course that covers key problems in bioscience from multiple perspectives, and activities designed to enhance students' communication skills and their ability to succeed in the competitive profession of science. Additional support is offered by the [GraduateCenter](#).

Course Details

Course organisation

QMB offers an integrated interdisciplinary PhD programme that consists of three main components:

1. An interdisciplinary research project that combines concepts and methods from different fields.
2. A substantial programme of formal course work with a general and an individual component:

- First year:
 - **Primer courses:** To support the work in their projects and build a stronger foundation in the disciplines outside a student's primary field of training, we offer targeted feeder courses that are specifically designed to teach relevant basics to non-specialists. Depending on their background, life science students can take primers in biophysics and statistics/bioinformatics, maths/physics students can take primers in life sciences and bioinformatics, and bioinformatics students can take primers in biophysics and statistics.
 - **Bonus lectures** can be picked by the students depending on their interests and project-specific requirements. Students can deepen their knowledge about selected topics (e.g. Bayesian Statistics, HMMs, AI, advanced programming in Python) in small classes of max. 10 participants.
 - **Lecture series:** QMB students suggest, invite, and host external speakers at this event. The lectures on QMB-relevant topics are complemented with a journal club with the guest speaker.
- Subsequent years:
 - **QMB retreat:** This annual event brings all QMB students together in an informal scientific environment where they present their research in brief talks and posters, and attend lectures of invited speakers.
 - **Elective advanced courses:** These are based on the background and the needs of the respective thesis project, with the goal to develop skills to support the students' interdisciplinary research.

3. Further activities to enhance students' communication and other transferable skills: Workshops on scientific writing and scientific presentation as well as writing fellowship applications are offered, as are additional workshops on topics such as optimising communication, team, and leadership skills, project management, intercultural and gender awareness, and applying for jobs. These are offered as electives.

Certificates for specific modules are awarded	Yes
International elements	<ul style="list-style-type: none"> International guest lecturers
Special promotion / funding of the programme	<ul style="list-style-type: none"> Other (e.g. state level)
Course-specific, integrated German language courses	No
Course-specific, integrated English language courses	No

Costs / Funding

Tuition fees per semester in EUR	None
Semester contribution	<p>Basic fee of 85 EUR + additional fee for the "Deutschlandticket" (currently 49 EUR per month)</p> <p>https://www.lmu.de/en/workspace-for-students/abc-study-guide/semester-ticket/index.html</p>
Costs of living	Living costs (including accommodation and health insurance) in Munich range from 1,000 to 1,200 EUR per month.
Funding opportunities within the university	Yes
Description of the above-mentioned funding opportunities within the university	<p>Funding opportunities include the regular PhD position (65% E13).</p> <p>LMU Travel Grant, LMU Completion Grant</p>

Requirements / Registration

Academic admission requirements	Master's degree in any relevant discipline: biochemistry, biophysics, biomedical sciences, bioinformatics, experimental and theoretical biophysics, (physical) chemistry, and applied mathematics; two letters of recommendation and a proof of English proficiency. See this link for more details: https://qbm.genzentrum.lmu.de/application/requirements/ .
Language requirements	Applicants must provide proof of English proficiency (IELTS, TOEFL, comparable certificates, confirmation from previous academic institution, etc.).
Application deadline	For current information, please visit: https://qbm.genzentrum.lmu.de/application/

Submit application to <https://qbm.genzentrum.lmu.de/application/>

Services

Accommodation

The International Office helps visiting academics, PhD students, and postdocs who are travelling to Munich for a set period of time to find accommodation.

For further information, please visit the following link:

<https://www.lmu.de/en/study/important-contacts/international-office/index.html>.

Rooms in shared flats are popular on the private market and reasonably priced at 400 to 800 EUR per month if located in central parts of Munich.

<https://www.lmu.de/en/about-lmu/working-at-lmu/additional-services/lmu-gateway/new-international-doctoral-candidates/phase-1-preparing-your-move-to-munich/index.html>

Structured research and supervision

Yes

Research training / discussion

Yes

Support for international students and doctoral candidates

- Visa matters

Contact

Ludwig-Maximilians-Universität München

QMB - Gene Center Munich
Department of Biochemistry

Dr Beate Hafner

Feodor-Lynen-Straße 25
81377 München

✉ office-qbm@genzentrum.lmu.de

🌐 Course website: <https://qbm.genzentrum.lmu.de/phd-program/>

📘 <https://de-de.facebook.com/lmu.muenchen/>

🐦 <https://twitter.com/munichqbm?lang=de>

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DAAD - Deutscher Akademischer Austauschdienst e.V.
German Academic Exchange Service
Section K23 – Information on Studying in Germany
Kennedyallee 50
D-53175 Bonn
www.daad.de

GATE-Germany

Consortium for International Higher Education Marketing
www.gate-germany.de

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