Goethe University, Frankfurt
Faculty of Biosciences (FB15)

Master
Physical Biology of Cells and Cell Interactions (PBioC)

Master of Science (M.Sc.)
Information: Application, Admission Requirements and Procedures
WS 2016-17
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Master Co-ordination | Course Guidance

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1. COURSE CONTENT AND FOCUS AREA

The two-year Master's program Physical Biology of Cells and Cell Interactions is research-oriented and educates students in modern concepts and methods of cell biology and physical biology. Scientific questions in the fields of cell biology and physical biology will be combined with developmental biology, cellular structure biology, bioinformatics, biochemistry, immunology, neuro-and plant physiology.

The Master's program provides students with an understanding of fundamental life processes from cell growth, cell-cell communication and differentiation to hormonal, inflammatory, angiogenic signaling and aging. These processes are studied in context of cells, individual tissues and model organisms. The experimental and conceptual approaches of the program include modern cell biological, molecular, biochemical, bioinformatical, immunological and genetic methods, combined with various microscopical techniques and applications, molecular imaging, data analysis as well as morphological and physiological technologies.

Duration: The standard length of study for the Master of Science is 4 semesters.

Languages of instruction: English

More information to the Master Program can be found at:

http://www.bio.uni-frankfurt.de/42272505/MSc-PBioC?
2. BASIC KNOWLEDGE FOR THE START OF YOUR STUDIES IN PBioC

Biological Part

- Eukaryotic cells and their organelles: structure and function, difference to prokaryotes
- Cell cycle and cell division: principles and differences of mitosis and meiosis
- Biomechanical organization of eukaryotic cells: cytoskeleton, cell adhesion, cell communication and extracellular matrix
- Cell membranes: structure and function, electrical properties and membrane transport of small molecules
- Eukaryotic phylogeny: animals vs plants, vertebrates vs invertebrates, mammals vs non-mammals
- Established animal model organisms: mouse, zebrafish and fruit fly
- Developmental biology: embryogenesis of mouse, zebrafish and fruit fly, cell differentiation
- Stem cells: function, induction, biomedical relevance
- Degradation of cellular components and cell death: autophagy, apoptosis, necrosis
- Energy conversion: function of mitochondria and chloroplasts
- Antibodies: structure and biological function, antibodies as tools in cellular biology
- Eukaryotic genomes: structure and function, chromosomes
- DNA: structure and function, replication, repair, recombination
- Gene expression: mechanisms, expression control, transcription factors, enhancers, silencers
- Protein biosynthesis: from DNA to proteins, ribosomes, regulation

Methodical Part

- Microscopy: light microscopy, fluorescence microscopy, confocal fluorescence microscopy
- Molecular biology: structure and function of plasmids, molecular cloning, polymerase chain reaction (PCR), restriction enzymes, transformation of bacteria
- Transgenic animals: creation of transgenic animals, knockdowns, knockins, knockouts, conditional knockouts, genome editing
- Protein biochemistry: immunological detection techniques, SDS-PAGE, Western blot
- Cell culture: sterile working with mammalian cell lines, transfection and expression of recombinant proteins, knockdown
- Statistics: descriptive statistics, hypothesis testing, regression analysis
- Calculus: matrix-vector calculations, curve sketching
- In addition you should know how to prepare solutions, dilutions and calculating with molarities for your experiments.
- You should be familiar with reading and understanding of international scientific English publications.

As a reference we recommend:

- Quinn, Experimental Design and Data Analysis for Biologists, 2002
3. APPLICATION AND DEADLINES

Start of study program: The study program starts at the beginning of the winter semester. Prospective students are encouraged to apply as early as possible.

Applications are handed in through the online portal of uni-assist.

The application deadline is July 15 each year for the upcoming winter term.

Please see this link for more information on the application process, central on-line portal for Master's programs: [http://www.uni-frankfurt.de/54273394](http://www.uni-frankfurt.de/54273394)

The application system (uni-assist) will open on April 1st for the winter term 2016/17.

Applications submitted after the July 15 deadline will not be considered.

At the time of application, applicants need to have valid TOEFL (or IELTS) results which satisfy the minimum requirements below.
4. ADMISSION REQUIREMENTS

1. B. A. in the same or a related subject, or at least an equivalent degree from another university of applied sciences in the same or similar subject, or a Master’s degree at another university that has not been passed and the examination claim has not been forfeited.

2. Letter of motivation in English language + grade of Bachelor's degree (The letter of motivation should not exceed two pages in length. Font size should be 12pt, 1.5 line spacing). It should contain:

   1. What is your motivation to study in the Master program Physical Biology of Cells and Cell Interactions?

   2. In which topics, scientific fields of the program are you mainly interested in?

   3. What are your previous practical / professional experiences?

   4. Which aims do you follow with the study program, what are your occupational career plans?

   5. Title and summary of your bachelor thesis.

3. **Proof of English language skills**: If you are not a native speaker you have to provide a proof of sufficient knowledge of the English language on C1 level (the Common European Framework of Reference for Languages), but at least a score of TOEFL 82 or IELTS 5.5.

   A certificate of proficiency issued by the relevant examinations office on the basis of a written in English thesis is also suitable.

   Applicants with a minimum one-year study or work stay in an English speaking country within the last three years before application are accepted.

5. CONDITIONS OF ADMISSION

Provisional admission is possible if the Bachelor's program has not yet been completed; this requires a transcript of records stating at least 80% of the required for the bachelor's degree CP. In case the required degree has not been awarded by the time of application, you can still apply if you provide: Proof of matriculation

A detailed certificate of the present status of your studies and the anticipated date of completion of the Bachelor's program.
6. DOCUMENTS TO SUBMIT

If you are not already enrolled at Goethe-University Frankfurt:

- A university entrance qualification (e.g. A-Levels)
- Bachelor's degree certificate
- If the Bachelor's degree has not yet been completed: A transcript of records or equivalent document listing the content of the study program and average grade
- Letter of recommendation from your supervisor (Download in the online application portal)
- Letter of motivation
- Declaration of examination claim (Download in the online application portal)
- Proof of English and German language skills

You may need to submit other documents depending on your country of origin and your previous education; please see the general information about applying for a Master's degree.

Conditions of admission and application can also be found at:

http://www.uni-frankfurt.de/54273394?
7. SEMESTER FEES

There are no tuition fees for students of the PBioC program. However, students are obliged to pay an administrative fee to Goethe University which currently amounts to about 350 EUR per semester. This fee includes unlimited use of public transport in Frankfurt and the whole Federal State of Hessen.

8. HOUSING AND COSTS FOR LIVING

Students will need to organize their own accommodation. Limited space in Student Housings is available. In case of difficulties, the coordinator is willing to advise you. Living costs in Frankfurt may range from about 800-1000 Euros per month per person.

The cost of living in Frankfurt depends on personal requirements and lifestyle.

COSTS FOR LIVING

However, students should expect minimum expenses of approx. 741 EUR per month. This calculation is based on the following items: 600 EUR for rent, food, clothing, and study materials, around 82 EUR for compulsory but almost comprehensive health insurance, and approx. 60 EUR for the administrative fee, semester contribution (ca. 354,69 € per semester, 60 € per month) (including free public transport).

For more information see:
http://www.goethe-university-frankfurt.de/44657419/funding?#scholarships

Look for a place to live in Frankfurt or surrounding area:

It is very difficult to find a room or apartment in Frankfurt. We recommend to come to Germany several weeks before their Master course starts and in stay temporary accommodation (e.g. youth hostel) and then to look for an accommodation.

These addresses are useful to find a room or apartment in and around Frankfurt.
www.wg-gesucht.de
www.uni-frankfurt.de/44656772/living
www.studentenwerkfrankfurt.de/wohnen.html
http://www.immobilienScout24.de/

9. SCHOLARSHIPS

The MSc program PBioC does not offer scholarships.

In general, German institutions of higher education do not award scholarships themselves. Students may apply for German funding sources. There are, however, several scholarship-awarding organizations. Funding organizations aim at diverse objectives and use different selection criteria, but most institutions expect superior academic performance and distinct social commitment from their candidates.

Please keep in mind: For most of the scholarships you have to apply in your home country before the Master course starts.
The most extensive scholarship program is that offered by DAAD (German Academic Exchange Service). Advanced students may apply for DAAD scholarships, or depending on their country of origin and subject, in some cases only graduates may apply.

Other scholarship-awarding institutions have varying conditions, for example, regarding country of origin, subject, previous study achievements, duration of support, etc. A very quick and efficient way of finding out about the appropriate scholarship is through using the scholarship database of DAAD.

More details are available at the database of the DAAD: http://www.daad.de/deutschland/stipendium/en/

For more information see: http://www.goethe-university-frankfurt.de/44657419/funding?#scholarships

Goethe Goes Global - Master Scholarships

Goethe Goes Global Master’s scholarships, funded by the Johanna-Quandt-Foundation Frankfurt!

For more information: www.uni-frankfurt.de/masterstip.

10. HEALTH INSURANCE

All students who are not European Union citizens will require a German health insurance. Such insurance will cover the costs of most medical treatments (including dental care) in Germany.

11. APPLY FOR STUDY VISA

Before you travel to Germany you need to apply to the German embassy in your country for a study visa. Please visit the embassy website to find out which documents you will need to bring. As a general rule, you will need your passport, proof of finance, letter of acceptance and travel health insurance.

12. TRANSFER OF SEMESTER FEES

You can register in writing or in person. Make sure that you have included all the necessary papers (see letter of acceptance). Please note the deadline of acceptance for registration on the letter of acceptance. Otherwise your letter of acceptance will not be valid.

13. ORIENTATION DAY

The Orientation Day for international master students will be in the first week of October. With the Orientation Day the International Office wants to help the students for a good study start and life in Germany. The program is specifically designed for international students who have never lived or studied in Germany before. You will get an invitation along with your letter of admission.
14. IMPORTANT ADDRESSES

International Office

Johann Wolfgang Goethe-University
Campus Westend
(PEG-Building, Information Center, ground floor)
Theodor-W.-Adorno-Platz 6
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Office hours application advisory:
Tue, Thu 9-12 hrs
Mo, Wed 13-16 hrs
Tel.: +49-(0)69-798-3838

Examinations Office

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Office hours
Tue + Wed 9.30 - 12.00 h
Thurs 14.00 - 16.00 h

Study Service Center, SSC

Campus Westend - PEG-Gebäude,
Theodor-W.-Adorno-Platz 6, 60323 Frankfurt am Main,

Tel. 069/798-3838, Fax 069/798-763-17983

E-Mail: ssc@uni-frankfurt.de