

**International Master in**

# **Physical Biology of Cells and Cell Interactions**

**Application, Admission, Requirements and  
Procedures**

**Winter Term 2020-21**

**GOETHE UNIVERSITY, GERMANY**

**Institute of Cell Biology and Neuroscience**



## CONTENTS

COURSE CONTENT AND FOCUS AREA.....	3
BASIC KNOWLEDGE FOR THE START OF YOUR STUDIES IN PBioC.....	4
APPLICATION AND DEADLINES.....	7
ADMISSION REQUIREMENTS.....	8
CONDITIONS OF ADMISSION.....	10
DOCUMENTS TO SUBMIT.....	10
SEMESTER FEES.....	11
HOUSING AND COSTS FOR LIVING.....	12
SCHOLARSHIPS.....	13
HEALTH INSURANCE.....	15
APPLY FOR STUDY VISA.....	15
ENROLMENT AND SEMESTER FEES.....	16
ORIENTATION DAY.....	16
IMPORTANT ADDRESSES.....	17
CONTACT.....	18
HOW TO FIND US.....	19

## COURSE CONTENT AND FOCUS AREA

The two-year Master's programme Physical Biology of Cells and Cell Interactions (PBioC) takes place at an **international level** and promotes an in-depth **research-oriented** education in the fields of cell biology and physical biology.

The Master's programme provides students with an **understanding of fundamental life processes** from cell growth, cell-cell communication and differentiation to hormonal, inflammatory, angiogenic signalling and aging. These processes are studied in different animal and plant **model systems** in context of cells, tissues and entire model organisms. The experimental and conceptual approaches of the programme include cutting-edge methods in **cell and molecular biology, biochemistry, bioinformatics, immunology and genetics**, combined with various **advanced microscopy** techniques and applications, **data analysis** as well as **(neuro-)physiology** and **morphological analysis**.

The programme offers a combination of **theoretical courses** and **experimental activities** from the first semester on. In addition, students are introduced to the current state of international research and

acquire occupational skills that enable **interdisciplinary** research, independent **scientific thinking** and **responsible action**.

**Duration:** The standard length of the course is four semesters.

**Language of instruction:** English

Further information on the Master's program can be found here:

[www.goethe.link/msc-pbioc](http://www.goethe.link/msc-pbioc)

## **BASIC KNOWLEDGE FOR THE START OF YOUR STUDIES IN PBioC**

### **Biological Focus**

- 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, mono- and diploid organisms
- 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 Focus

- 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, knock-ins, 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
- Basic lab work: preparation of solutions, dilutions and calculation of molarities
- Understanding of scientific publications

## Recommended Literature

- Alberts, Molecular Biology of the Cell, Sixth Edition, 2014

- Meneely, Genetic Analysis, Second Edition, 2014
- Davis, Basic Methods In Molecular Biology, Second Edition, 1995
- Quinn, Experimental Design and Data Analysis for Biologists, 2002

## APPLICATION AND DEADLINES

### Start of the Program

The program starts at the beginning of the winter semester.

Prospective students are encouraged to apply as early as possible.

Applications are submitted via the online platform uni-assist.

The **application period** is from **1 April - 31 May** each year for the upcoming winter term.

Applications submitted after the deadline will not be considered.

International students have to submit a copy of their application documents to uni-assist:

**Goethe-Universität Frankfurt**  
**Master-Abteilung**  
**c/o uni-assist e.V.**  
**D-11507 Berlin**

Please see this link for more information on the central online application platform for Master's programs:

[www.uni-assist.de/online-application.html](http://www.uni-assist.de/online-application.html)

Applicants are strongly encouraged to apply before the May 31 deadline. This especially relates for applicants who need more time to prepare for enrolment in the program (i.e. non-EU applicants who need visa to enter Germany).

## **ADMISSION REQUIREMENTS**

1. **Bachelor degree** 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 (the letter of motivation should not exceed two pages in length. Font size should be 12 pt, 1.5 line spacing). It should focus on:



- What is your motivation for the Master's program Physical Biology of Cells and Cell Interactions?
  - In which topics, scientific fields of the program are you mainly interested?
  - What are your previous practical experiences in the lab (lab work) / professional experiences?
  - Which aims do you follow with the study program, what are your occupational career plans?
  - Title and summary of your Bachelor thesis.
  - Which experimental methods did you perform in 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 B2 level of the Common European Framework of Reference for Languages,
- TOEFL 87 or IELTS 5.5.
  - A certificate of proficiency, which has been issued by the relevant departments based on a written thesis in English language, is also suitable.

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

## CONDITIONS OF ADMISSION

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

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

## DOCUMENTS TO SUBMIT

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

- A university entrance qualification (e.g. A-Levels)
- Bachelor's degree certificate with a transcript of records

- 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 motivation
  - Declaration of examination claim (download in the online application portal)
  - Proof of English and German (optional) 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:

[goethe.link/msc-pbioc-application](https://goethe.link/msc-pbioc-application)

## 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 366 EUR per semester (732 EUR per year). This fee includes unlimited use of public transport in Frankfurt and the whole Federal State of Hessen.

## 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 600 - 1000 EUR 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. 900 EUR per month. This calculation is based on the following items:

- 750 EUR for rent, food, clothes, communication and study materials,
- 87 EUR for compulsory but almost comprehensive health insurance
- 61 EUR for the administrative fee, semester contribution, including free public transport (ca. 366 EUR per semester).

Further information can be found here:

[www.goethe-university-frankfurt.de/65204616/050-Cost-of-living](http://www.goethe-university-frankfurt.de/65204616/050-Cost-of-living)

### Finding a Place to Live

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/en/](http://www.wg-gesucht.de/en/)

[www.goethe-university-](http://www.goethe-university-frankfurt.de/62938176/300_Living)

[frankfurt.de/62938176/300\\_Living](http://www.goethe-university-frankfurt.de/62938176/300_Living)

[www.studentenwerkfrankfurt.de/en/accommodation/general-information/](http://www.studentenwerkfrankfurt.de/en/accommodation/general-information/)

[www.immobilienscout24.de/](http://www.immobilienscout24.de/)

## 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 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.

### **DAAD Scholarships**

The most extensive scholarship program is that offered by the DAAD (German Academic Exchange Service). Advanced students may apply for DAAD scholarships. Depending on their country of origin and subject, in some cases only graduates may apply.  
[www.daad.de/en/](http://www.daad.de/en/)

### **Goethe Goes Global - Master Scholarships**

Goethe Goes Global Master's scholarships, funded by the Johanna-Quandt-Foundation Frankfurt:  
[www.goethe-university-frankfurt.de/58572942/Goethe-Goes-Global-Master-Scholarships](http://www.goethe-university-frankfurt.de/58572942/Goethe-Goes-Global-Master-Scholarships)

### **Deutschlandstipendium**

The Deutschlandstipendium is provided by the Goethe University. Students with very good academic record and strong interest in social commitment are funded. The yearly application period is during the summer months.

[www.deutschland-stipendium.uni-frankfurt.de](http://www.deutschland-stipendium.uni-frankfurt.de)

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 the DAAD. More details are available at the database of the DAAD:

[www.daad.de/deutschland/stipendium/en/](http://www.daad.de/deutschland/stipendium/en/)

Further information can be found here:

[www.goethe-university-frankfurt.de/62902584/200\\_Scholarships](http://www.goethe-university-frankfurt.de/62902584/200_Scholarships)  
[www.stipendien.uni-frankfurt.de](http://www.stipendien.uni-frankfurt.de)

## 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.

[www.goethe-university-frankfurt.de/62971723/300\\_HealthInsurance](http://www.goethe-university-frankfurt.de/62971723/300_HealthInsurance)

## 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 a travel health insurance.

## **ENROLMENT AND SEMESTER FEES**

### **Enrolment**

You can enrol as a student by mail or in person. Make sure that you have included all the necessary papers (see letter of admission).

Please note the deadline for enrolment on the letter of admission.

### **Semester fees**

Please note that the semester fees have to be paid every semester. For winter terms, the deadline is 31th July, for summer terms, the deadline is 31th January.

Further information can be found here:

[www.uni-frankfurt.de/35793995/rueckmeldung](http://www.uni-frankfurt.de/35793995/rueckmeldung)

## **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.

Further information can be found here:

[www.goethe-university-frankfurt.de/62987419/100\\_OrientationPrograms](http://www.goethe-university-frankfurt.de/62987419/100_OrientationPrograms)

## **IMPORTANT ADDRESSES**

### **International Office**

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

T + 49 69 798-3838

Office hours application advisory  
Tue, Thu 9.00 -12.00 h  
Mo, Wed 13.00 – 16.00 h

### **Study Service Center, SSC**

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

T + 49 69 798-3838

F + 49 69 798-763-17983

E-Mail: [ssc@uni-frankfurt.de](mailto:ssc@uni-frankfurt.de)

## Examinations Office

**Monika Goltz**

Campus Riedberg | Biozentrum  
Section N101, Room 1.02  
Max-von-Laue-Str. 9  
60438 Frankfurt am Main

T +49 69 798-46475

F +49 69 798-46470

E-Mail: [goltz@bio.uni-frankfurt.de](mailto:goltz@bio.uni-frankfurt.de)

Office hours

Tue + Wed      09.30 - 11.30 h

Thu              14.00 - 16.00 h

## CONTACT

**Program Director**

**Prof. Dr. Stefan Eimer**

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## Master Coordination | Course Guidance

### Dr. Isabell Smyrek

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60438 Frankfurt am Main



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E-Mail: [Info-MasterPBIOC@bio.uni-frankfurt.de](mailto:Info-MasterPBIOC@bio.uni-frankfurt.de)

## HOW TO FIND US

### Arriving by public transport

From central station take the underground line U4 to »Willy-Brandt-Platz«. Take the underground line U8 to »Uni Campus Riedberg«

From »Hauptwache« take the underground line U8 to »Uni Campus Riedberg«.



# Scientific Campus Riedberg Plan

