

Information for applicants – doctoral study program Life Sciences

1. Requirements

Field: Bio-omics

For doctoral studies of Bio-omics the graduates of the Master's Studies with knowledge in fields of biochemistry, molecular biology, physical chemistry, pharmacy and other related are eligible. It is assumed that the selected topic corresponds to the expertise of a particular candidate. The candidates are not required to have previous work experience. However, they should be able to demonstrate, using the thesis or their own publications, their capability for a creative work in the study field. The motivation and passion for science along with the assessment of the candidate's scientific patterns and awareness of the basic rules of scientific ethics will also be verified within the admission procedure. An essential requirement for the admission is a very good knowledge of English language in written form (translation of texts from Czech to English and vice versa, preparation of scientific reviews and critical analysis of professional scientific English texts), and particularly in spoken language i.e. the ability to discuss scientific topics with potential trainers.

The admission procedure is carried out in two rounds. Round 1 of the admission process is based on the application and background information. The threshold to pass Round 1 is 40/50 points.

The shortlisted candidates are invited for the Round 2 - a face-to-face interview with potential supervisors and members of the admission committee. For candidates living abroad, personal attendance is not necessary – the interview can be held in form of Skype conference.

The interview (in English) will cover the following topics:

- Field of study and summary of your Master thesis
- Motivation to do research, research interest
- Career plans, the dissertation thesis project
- General knowledge in the field of study
- Other related activities, communication in English

To be admitted, candidate has to achieve min. 45/50 points in the Round 2, in total 85/100 points in both rounds.

Electronic application on <https://is.muni.cz/prihlaska>.

Mandatory parts of the admission application:

- Curriculum Vitae
- Letter of interest (specified form)
- Copies of diplomas (BSc., MSc.) and diploma supplements / transcripts of records (in English or Czech language)
- Two Recommendations (one of them has to be provided by the Master thesis supervisor/advisor)
- Foreign language (English) certificate – optional, not compulsory
- Paid admission fee in the amount of 600 CZK

Field: Structural Biology

For doctoral studies of Structural Biology the graduates of the Master's Studies with knowledge in fields of biochemistry, molecular biology, physical chemistry, pharmacy and other related are eligible. It is assumed that the selected topic corresponds to the expertise of a particular candidate. The candidates are not required to have previous work experience. However, they should be able to demonstrate, using the thesis or their own publications, their capability for a creative work in the study field. The motivation and passion for science along with the assessment of the candidate's scientific patterns and awareness of the basic rules of scientific ethics will also be verified within the admission procedure. An essential requirement for the admission is a very good knowledge of English language in written form (translation of texts from Czech to English and vice versa, preparation of scientific reviews and critical analysis of professional scientific English texts), and particularly in spoken language i.e. the ability to discuss scientific topics with potential trainers.

The admission procedure is carried out in two rounds. Round 1 of the admission process is based on the application and background information. The threshold to pass Round 1 is 40/50 points.

The shortlisted candidates are invited for the Round 2 - a face-to-face interview with potential supervisors and members of the admission committee. For candidates living abroad, personal attendance is not necessary – the interview can be held in form of Skype conference.

The interview (in English) will cover the following topics:

- Field of study and summary of your Master thesis
- Motivation to do research, research interest
- Career plans, the dissertation thesis project
- General knowledge in the field of study
- Other related activities, communication in English

To be admitted, candidate has to achieve min. 45/50 points in the Round 2, in total 85/100 points in both rounds.

Electronic application on <https://is.muni.cz/prihlaska>.

Mandatory parts of the admission application:

- Curriculum Vitae
- Letter of interest (specified form)
- Copies of diplomas (BSc., MSc.) and diploma supplements / transcripts of records (in English or Czech language)
- Two Recommendations (one of them has to be provided by the Master thesis supervisor/advisor)
- Foreign language (English) certificate – optional, not compulsory
- Paid admission fee in the amount of 600 CZK

Detail information regarding doctoral study program Life Sciences is available at: <http://ls-phd.ceitec.cz/>

Contact person: Olga Křížová

phone.: +420 549 49 5252

e-mail: phd@ceitec.muni.cz

2. Topics announced for academic year 2020/2021
(submission of applications between 1 November 2019 and 29 February 2020)

Field: Bio-omics

1. ADAR2 RNA editing in CNS
Supervisor: Liam Keegan, Ph.D.
2. Characterization of cyclin-dependent kinase 12 (CDK12) substrates and their roles in regulation of transcription and tumorigenesis
Supervisor: Dalibor Blažek, Ph.D.
3. Development of bioinformatics methods for data integration from various diagnostic types in clinical oncology
Supervisor: Vojtěch Bystrý, Ph.D.
4. Dynamics of the Structure Maintenance of Chromosome (SMC) complexes
Supervisor: assoc. prof. Jan Paleček
5. Elucidation of novel therapy targets for B-cell malignancies
Supervisor: Michal Šmída, Ph.D.
6. Functions of cyclin-dependent kinase 11 (CDK11) in regulation of gene expression
Supervisor: Dalibor Blažek, Ph.D.
7. Genomic changes during post-polyploid diploidization in plants
Supervisor: assoc. prof. Martin Lysák
8. Investigating the regulation of the RNA modifying enzyme ADAR1 and how it regulates other biological pathways and diseases
Supervisor: prof. Mary O'Connell
9. Long non-coding RNAs (lncRNAs) in the pathogenesis of B cell lymphomas
Supervisor: assoc. prof. Marek Mráz
10. Mass spectrometric imaging of biological tissues
Supervisor: prof. Jan Preisler
11. Migration of malignant B cells and their adaptive response to BCR inhibitor therapy
Supervisor: assoc. prof. Marek Mráz
12. Non-coding RNAs (microRNAs/lncRNAs) and microenvironmental interactions of malignant B-cells
Supervisor: assoc. prof. Marek Mráz
13. Regulation of BCR signalling by DNA damage response and P53 protein
Supervisor: assoc. prof. Marek Mráz
14. Role of phosphorylated 14-3-3 proteins
Supervisor: Jozef Hritz, Ph.D.

15. Structure, function and evolution of plant telomere components
Supervisor: prof. Jiří Fajkus
16. The role of hormonal regulations in epigenetic reprogramming of plant development
Supervisor: assoc. prof. Jan Hejátko
17. The role of posttranscriptional RNA modifications in cell differentiation
Supervisor: assoc. prof. Štěpánka Vaňáčková
18. The role of protein-protein interactions in the dynamics of m6A RNA modification
Supervisor: assoc. prof. Štěpánka Vaňáčková

Field: Structural Biology

1. A structural basis for the cross-talk between histones and RNA Polymerase II
Supervisor: assoc. prof. Richard Štefl
2. Are Tau fibrils induced by phosphorylation and the interaction with 14-3-3 proteins relevant for Alzheimer disease?
Supervisor: Jozef Hritz, Ph.D.
3. Cracking the CTD code
Supervisor: assoc. prof. Richard Štefl
4. Designing modified DNA fragments
Supervisor: prof. Radek Marek
5. Experimental and Theoretical Studies of the Origin of Life on the Earth
Supervisor: prof. Jiří Šponer
6. Integrative structural biology of 3'UTRs
Supervisor: Peter Lukavsky, Dr. rer. nat.
7. Interactions underlying physiological function of Microtubule Associated Protein 2c
Supervisor: prof. Lukáš Žídek
8. Multiscale Modeling of Nucleic Acids
Supervisor: prof. Jiří Šponer
9. Protein motif for bacterial affinity
Supervisor: assoc. prof. Robert Vácha
10. Protein sensitivity of membrane curvature
Supervisor: assoc. prof. Robert Vácha
11. Regulation of protein-protein interactions
Supervisor: assoc. prof. Robert Vácha

12. RNA as a drug target
Supervisor: Peter Lukavsky, Dr. rer. nat.
13. Structural and time-resolved studies of phage replication in bacterial biofilm
Supervisor: Pavel Plevka, Ph.D.
14. Structural study of enterovirus replication in vivo
Supervisor: Pavel Plevka, Ph.D.
15. Structural studies of the TPLATE complex
Supervisor: Konstantinos Tripsianes, Ph.D.
16. Structure of parallel forms of nucleic acids studied by NMR spectroscopy and molecular modelling
Supervisor: prof. Radek Marek
17. Structure, dynamics and interactions of bacterial RNA polymerase subunits and sigma factors
Supervisor: prof. Lukáš Žídek
18. Structure-functional study of proteins involved in host cell recognition
Supervisor: prof. Michaela Wimmerová
19. Tau conformational changes induced by phosphorylation and 14-3-3 proteins relevant in neurodegenerative diseases
Supervisor: Jozef Hritz, Ph.D.