Study programme: MOLECULAR AND TRANSLATIONAL MEDICINE

ANOTATION

The doctoral study programme „Molecular and Translational Medicine“ is focused on understanding the molecular basis of human diseases, diagnostics and therapy. It focuses on the identification and validation of new molecular targets, biomarkers of diseases, innovative therapeutic approaches, health informatics, data analysis and personalized medicine. The field emphasizes the development of scientific and critical thinking of postgraduate students and deepens their theoretical and practical knowledge.

ADMISSION PROCEDURE 2023/2024

Dissertation topic/s of the training department:

Institute of Molecular and Translational Medicine, Faculty of Medicine and Dentistry, Palacký University Olomouc, Hněvotínská 5, Olomouc, phone: +420 585 632 081

1. Cellular fluxomic analysis for research of pathobiochemical processes
1 position in full-time or part-time form of study
Supervisor: prof. RNDr. Tomáš Adam, Ph.D.

2. New prognostic and predictive factors in solid tumors
3 positions in full-time or part-time form of study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., MUDr. Josef Srovnal, Ph.D., Mgr. Vladimíra Koudeláková, Ph.D.

3. Genetic and epigenetic biomarkers in health and disease
5 positions in full-time or part-time form of study
Supervisors: Ing. Rastislav Slavkovský, Ph.D., MUDr. Petr Džubák, Ph.D., doc. MUDr. Marián Hajdúch, Ph.D., prof. Mgr. Jiří Drábek, Ph.D., Mgr. Vladimíra Koudeláková, Ph.D.

4. Identification of molecular targets and resistance mechanisms of anticancer drugs by cell biology and proteomics methods
2 positions in full-time study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., MUDr. Petr Džubák, Ph.D.

5. Development of 3D pharmacophore signatures and their application in anticancer drug design
1 position in full-time study
Supervisor: Pavlo Polishchuk, M.Sc., PhD.

6. The role of tumor hypoxia in the development of acquired resistance to microtubule-targeted drugs
1 position in full-time study
Supervisor: Viswanath Das, M.Sc., Ph.D.

7. Identification of proteomic biomarkers in exhaled breath condensate patients with systemic or pulmonary disease
2 positions in full-time study
Supervisors: MUDr. Petr Džubák, Ph.D., doc. MUDr. Marián Hajdúch, Ph.D.

8. Anticancer drugs targeting nucleic acid metabolism
2 positions in full-time study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., MUDr. Petr Džubák, Ph.D.

9. Bioinformatics processing of big data in clinical and preclinical studies
3 positions in full-time or part-time form of study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., RNDr. Petr Pavliš, Ph.D., Mgr. Jana Vrbková, Ph.D.

10. Search and characterization of compounds for the therapy of congenital or acquired diseases caused by aberrant pre-mRNA editing
1 position in full-time study
Supervisor: Mgr. Jiří Voller, Ph.D.

11. DNA damage signaling in the cellular response to stress
2 positions in full-time study
Supervisor: Mgr. Martin Mistrík, Ph.D.

12. Cellular stress in health and disease
3 positions in full-time study
Supervisors: Mgr. Martin Mistrík, Ph.D., Mgr. Pavel Moudrý, Ph.D., Mgr. Zdeněk Škrott, Ph.D.

13. Physiology and pathophysiology of ageing
2 positions in full-time study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., Mgr. Jiří Voller, Ph.D.

14. Drug repurposing for treatment and prevention of diseases
2 positions in full-time study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., Ing. Soňa Gurská, Ph.D.

15. Biologically active molecules and their therapeutic combinations
2 positions in full-time study
Supervisor: doc. MUDr. Marián Hajdúch, Ph.D.

16. Modifications of biologically active molecules leading to improvement of their pharmacological properties
3 positions in full-time study
Supervisors: doc. RNDr. Milan Urban, Ph.D., doc. RNDr. Václav Ranc, Ph.D., Pavlo Polishchuk, M.Sc., Ph.D.

17. Diagnosis and treatment of rare diseases
2 positions in full-time study
Supervisors: doc. MUDr. Marián Hajdúch, Ph.D., MUDr. Josef Srovnal, Ph.D.

18. Multimodal imaging methods for preclinical testing of new bioactive molecules
2 positions in full-time study
Supervisors: PharmDr. Zbyněk Nový, PharmDr. Miloš Petřík, Ph.D.

19. Ligand- and structure-based modeling of biologically active compounds
1 position in full-time study
Supervisor: Pavlo Polishchuk, M.Sc., Ph.D.

20. Omics Approaches in Reproductive Medicine
2 positions in full-time study
Supervisors: Mgr. Tomáš Oždian, Ph.D., doc. MUDr. Jiří Dostál, CSc.

21. Liquid biopsies in experimental and clinical oncology
2 positions in full-time or part-time form of study
Supervisors: MUDr. Josef Srovnal, Ph.D., Mgr. Vladimíra Koudeláková, Ph.D.

22. Synthesis and characterization of 2D nanoplatforms as active drug carriers
3 positions in full-time or part-time form of study
Supervisors: doc. RNDr. Vaclav Ranc, Ph.D., doc. MUDr. Marián Hajdúch, Ph.D.

23. Plasmonic nanomaterials in cancer theranostics
2 positions in full-time or part-time form of study
Supervisors: doc. RNDr. Vaclav Ranc, Ph.D., PharmDr. Miloš Petřík, Ph.D.

24. Preclinical development of molecular imaging agents
2 positions in full-time study
Supervisors: PharmDr. Miloš Petřík, Ph.D.

25. Identification of proteomic biomarkers in proximal fluids and tissues
2 positions in full-time study
Supervisors: MUDr. Petr Džubák, Ph.D., doc. MUDr. Marián Hajdúch, Ph.D.

26. Study of basic pharmacokinetic properties (ADME) of new drugs in preclinical development
1 position in full-time study
Supervisor: Mgr. Barbora Lišková, Ph.D.

27. Search and study of the mechanism of action of new circadian rhythm modulators for the therapy of civilization diseases
1 position in full-time study
Supervisor: Mgr. Jiří Voller, Ph.D.

28. Search and study of the mechanism of action of substances affecting the viability and motility of human spermatozoa
1 position in full-time study
Supervisor: Mgr. Jiří Voller, Ph.D.

29. Use of open-source software approaches for analysis of metabolomic and lipidomic clinical data
1 position in full-time study
Supervisor: Mgr. Lukáš Najdekr, Ph.D.

30. Isolation and analysis of membrane lipid rafts using a non-targeted metabolomics and lipidomics approach
1 position in full-time study
Supervisor: Mgr. Lukáš Najdekr, Ph.D.

31. New methods in protein degradation
2 positions in full-time study
Supervisors: Mgr. Dušan Holub, Ph.D., doc. MUDr. Marián Hajdúch, Ph.D.

32. Innovative approaches to protein interaction modifiers
1 position in full-time study
Supervisors: MUDr. Petr Džubák, Ph.D., Mgr. Jana Václavková, Ph.D.

33. Utilization of the space of unprecedented covalent inhibitors
1 position in full-time study
Supervisor: MUDr. Petr Džubák, Ph.D.

34. Research and development of agents for cancer, neurodegenerative and infectious diseases
5 positions in full-time study
Supervisors: prof. Juan DeSanctis, PhD., doc. MUDr. Marián Hajdúch, Ph.D., MUDr. Petr Džubák, doc. RNDr. Milan Urban, Ph.D., Viswanath Das, M.Sc., Ph.D.

35. New chemoinformatics approaches to fragment-based drug discovery
1 position in full-time study
Supervisor: Pavlo Polishchuk, M.Sc., Ph.D.

36. Role of axonal transport and pathology in neurodegeneration
2 positions in full-time study
Supervisor: Viswanath Das, M.Sc., Ph.D.

37. Systems approaches to understanding aging and neurodegeneration
2 positions in full-time study
Supervisor: Viswanath Das, M.Sc., Ph.D.

Notice
The applicant selects from the listed topics and, in addition to the chosen doctoral study programme he/she also indicates the topic of the dissertation thesis in the application.

Application deadline:	**June 9, 2023**
Date and location of the entrance examination:	**June 21, 2023** – start at 10:00 a.m., Institute of Molecular and Translational Medicine, Faculty of Medicine and Dentistry, Palacký Univesity Olomouc, Hněvotínská 5, Olomouc, Czech Republic, alternatively online.

Anticipated maximum number of admitted students:

Full-time form:	**66** students
Part-time form:	**5** students

Examination format: oral (onsite or online)

Contents of entrance exam:
- basics of individual fields - molecular and translational medicine
- knowledge of the topic on which the candidate is applying
- language skills (especially English)

Evaluation criteria:

The level of general professional knowledge will be evaluated according to the result of the admission procedure and interview, the applicant's aptitude for scientific work, the applicant's previous experience with scientific and professional work (diploma thesis, professional lectures and publications, applicant’s scientific activities, motivation, etc.), language skills, preconditions for graduation. Students will be admitted to the study based on the above criteria, capacity of the supervisors and the training facility.

The annual tuition fee for the post-graduate study programme conducted in English is set at EUR 100.