STUDY OF ANTIMICROBIAL RESISTANCE MECHANISMS AND BIOMARKERS OF INFLAMMATION AND THE DEVELOPMENT OF MOLECULAR ASSAYS FOR INFECTIOUS DISEASES AND PATHOLOGY

Moscow Institute of Physics and Technology (National Research University)

Degree or qualification is awarded: **PhD (Candidate of Science)**

Language of study: **English**
Mode of study: **full-time**
Duration: **4 years**
Availability of free education: **yes**
Price: **375 000 RUB**

Programme webpage at the university website:
https://eng.mipt.ru/programs/study-of-antimicrobial-resistance-mechanisms-and-biomarkers-of-inflammation-and-the-development/

Programme curator: **Denis Ustyuzhaninov**
Tel.: **+7 (498) 713 91 70**
E-mail: interadmission@phystech.edu

Research supervisor:
Dmitry Gryadunov
PhD, DSc

Supervisor's research interests:
Study of molecular mechanisms of drug resistance in bacteria and viruses, design of specialized DNA and protein microarrays, development of nucleic acids amplification and hybridization techniques, stateof-the-art technologies in molecular biology and molecular diagnostics, genomics of socially significant and biowarfare infectious agents, complete integrated microfluidic device design, engineering of portable systems for real-time clinical and forensic diagnostics

Research highlights:
We developed, patented and implemented in clinical practice an original technology of hydrogel microarrays. This platform serves as a basis for a number of state-of-the-art approaches for a multiplex analysis of DNA and the protein biomarkers of socially significant diseases, including the molecular genetics, immunological, and epidemiological aspects of pathogenesis.

Supervisor's specific requirements:

- Nucleic acids amplification methods.
- Nucleic acids isolations methods.
- NGS and Sanger sequencing.
- Genetic engineering/ cloning methods.
- Bioinformatics tools (knowledge of Python/R/etc. languages is welcome).
- Statistical methods of analysis.

Main publications:

- Shaskolskiy B, Dementieva E, Kandinov I, Chestkov A, Kubanov A, Deryabin D, et al. Genetic diversity of Neisseria gonorrhoeae multi-antigen sequence types in Russia and Europe. International Journal of Infectious Diseases 2020;93:1-8. https://doi.org/10.1016/j.ijid.2020.01.020

- Savvateeva EN, Rubina AY, Gryadunov DA. Biomarkers of Community-Acquired Pneumonia: A Key to Disease Diagnosis and Management. Biomed Res Int 2019;1701276. https://doi.org/10.1155/2019/1701276
- Kubanov A, Solomka V, Plakhova X, Chestkov A, Petrova N, Shaskolskiy B, et al. Summary and Trends of the Russian Gonococcal Antimicrobial Surveillance Programme, 2005-2016. Journal of Clinical Microbiology 2019;57:e02024-18. https://doi.org/10.1128/JCM.02024-18
- Gryadunov DA, Shaskolskiy BL, Nasedkina TV, Rubina AY, Zasedatelev AS. The EIMB hydrogel microarrays technology: thirty years later. Acta Naturae 2018;10(4):4-18. https://doi.org/10.32607/20758251-2018-10-4-4-18
- Zimenkov DV, Nosova EY, Kulagina EV, Antonova OV, Arslanbaeva LR, Isakova AI, et al. Examination of bedaquiline- and linezolid-resistant Mycobacterium tuberculosis isolates from the Moscow region. J Antimicrob Chemother 2017;72:1901-6. https://doi.org/10.1093/jac/dkx094

Specializations within this programme