University	Peter the Great St.Petersburg Polytechnic University (SPbPU)
Level of English proficiency	“Upper Intermediate”
Courses and fields of studies offered for applicants	*03.06.01 «Physics and Astronomy»* *03.06.01_12 «Biophysics»* *06.06.01 «Biological Sciences»* *06.06.01_03 «Molecular Biology»*
Projects for potential academic supervision	Study of molecular mechanisms of bacteria defense systems against viruses. Development of diagnostic systems based on CRISPR-Cas technologies. Study of mechanisms of repair and recombination; SMC proteins.
Topics offered for prospective researches	Interaction of RecA and RecN proteins in bacterial cells during the SOS response. Development of a diagnostic system for detecting infectious diseases. Molecular mechanism of the CfrBI restriction-modification system. Strategies for using bacteriophages to create effective antibacterial drugs. Study of SMC proteins.
 Research supervisor: Morozova Natalia, Candidate of Science/PhD in Life Sciences (Institute of Cytology of the Russian Academy of Sciences)	*Biology*
	Supervisor’s research interests Study of molecular mechanisms of functioning of various bacterial defense systems against viruses, such as restriction-modification systems, CRISPR-Cas, BREX, PARIS and others. Study of molecular mechanisms of development of bacteriophages and new viral enzymes. Development of approaches for simple editing of bacteriophage genomes to create effective antibacterial phage drugs of a new type. Study of molecular mechanisms of action of proteins involved in the SOS response of bacteria, including the SMC-like protein RecN.
	Study program highlights *(при наличии)* Research is carried out at a high world level, including using the unique "Laser Tweezers" installation. As part of the work, active cooperation is conducted with leading world scientists working in these areas. If possible and financed, postgraduate students are provided with financial support.
	Supervisor’s specific requirements: High motivation, desire to work in science, willingness to spend a large amount of time on scientific research, basic knowledge in the field of molecular biology and genetic engineering is desirable.
	Supervisor’s publications over the last 5 years: 16 publications, including 14 publications in journals indexed in Web of Science Core Collection, Scopus; 3 publications in journals indexed in Russian Science Citation Index; 7 publications in journals included in the first quartile (Q1) of the

	impact factor of JCR Science Edition or JCR Social Sciences Edition, according to SJR. List of 5 most significant publications: *1. Kirillov A, Morozova N, Kozlova S, Polinovskaya V, Smirnov S, Khodorkovskii M, Zeng L, Ispolatov Y, Severinov K. Cells with stochastically increased methyltransferase to restriction endonuclease ratio provide an entry for bacteriophage into protected cell population. Nucleic Acids Res. 2022 Dec 8;50(21):12355–68. doi: 10.1093/nar/gkac1124. (Scopus, WOS, Q1)* *2. Mamontov V, Martynov A, Morozova N, Bukatin A, Staroverov DB, Lukyanov KA, Ispolatov Y, Semenova E, Severinov K. Persistence of plasmids targeted by CRISPR interference in bacterial populations. Proc Natl Acad Sci U S A. 2022 Apr 12;119(15):e2114905119. doi: 10.1073/pnas.2114905119. (Scopus, WOS, Q1)* *3. Kozlova S, Morozova N, Ispolatov Y, Severinov K. Dependence of post-segregational killing mediated by Type II restriction–modification systems on the lifetime of restriction endonuclease effective activity. mBio 0:e01408-24. https://doi.org/10.1128/mbio.01408-24 (Scopus, WOS, Q1)* *4. Burman, N., Belukhina, S., Depardieu, F. et al. A virally-encoded tRNA neutralizes the PARIS antiviral defence system. Nature (2024). https://doi.org/10.1038/s41586-024-07874-3 (Scopus, WOS, Q1)* *5. Ishita Jain; Matvey Kolesnik; Konstantin Kuznedelov; Leonid Minakhin; Natalia Morozova; Anna Shiriaeva; Alexandr Kirillov; Sofia Medvedeva; Alexei Livenskyi; Laura Kazieva; Kira Makarova; Evgene Koonin; Sergei Borukhov; Konstantin Severinov; Ekaterina Semenova, tRNA anticodon cleavage by target-activated CRISPR-Cas13a effector.Sci. Adv. 10,eadl0164(2024). DOI:10.1126/sciadv.adl0164 (Scopus, WOS, Q1)*
	Impacts of Supervisor's research *(при наличии)* 1. Patent for invention No. 2808699 "Non-contact method for measuring temperature using fluorescent probes" 2. Patent for utility model No. 225970 "Device for visual assessment of the presence of pathogens in the field using CRISPR-Cas technologies" 3. Patent for utility model No. 231780 "Device for determining the presence of pathogens in the field using CRISPR-Cas technologies"