STUDY OF THE ANTIMICROBIAL ACTIVITY OF THE FAT OF THE FLY LARVA HERMETIA ILLUCENS IN MEDICINE, VETERINARY MEDICINE AND AGROBIOTECHNOLOGY

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-the-antimicrobial-activity-of-the-fat-of-the-larva-of-the-fly-hermetia-illucens-in-medicine/

Programme curator: **Denis Ustyuzhaninov**
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Research supervisor:
Elena Marusich
PhD

Supervisor's research interests:

- Discovery of new modulators of plants growth and development
- Neurotoxicity of human Aβ1-42 amyloid on Caenorhabditis elegans model
- Search for alternative to antibiotic compounds of natural origin able to fight against pathogenic microorganisms
- In vivo aging and neurodegeneration model on Caenorhabditis elegans
- State-of-the-art technologies in Molecular and Cell biology

Research highlights:
My main research interests is in the field of new drugs development and assessment of their efficacy. Specifically, we study the antimicrobial activity of the extract from Hermetia illucens fly larva fat against pathogens in agriculture, veterinary and medicine. As a participant of Roscosmos project, we investigate the combined effect of low radiation and galactic cosmic rays on living nematodes organism Caenorhabditis legans. Another project focus of the geroprotective activity study of Vitaferin-A derivatives based on Caenorhabditis elegans model with application of innovative computer technologies and devices.We collaborate with international groups in USA, Germany, Luxemburg, Japan. The laboratory is well-equipped by all necessary to perform innovative scientific research. The work team of friendly, young and v-creative people.

Supervisor's specific requirements:

- Good knowledge of Molecular biology, Microbiology, Medicine
- Practical skills in basic Molecular and Cell biology methods
- Ability to work with little or no supervision
- Great self-organized, focused on the details, to be responsive and get results in time
- Excellent communication and text writing skills.
- Enthusiastic and creative in problem solving

Main publications:

- Louboutin JP, Chekmasova AA, Marusich E, Chowdhury JR, Strayer DS. Efficient CNS gene delivery by intravenous injection. Nat Methods 2010;7(11):905-7. https://doi.org/10.1038/nmeth.1518.
- Louboutin JP, Marusich E, Fisher-Perkins J, Dufour JP, Bunnell BA, Strayer DS. Gene transfer to the rhesus monkey brain using SV40-derived vectors is durable and safe. Gene Ther 2011;18(7):682-91. https://doi.org/10.1038/gt.2011.13
- Agrawal L, Louboutin JP, Marusich E, Reyes BA, Van Bockstaele EJ, Strayer DS. Dopaminergic neurotoxicity of HIV-1 gp120: reactive oxygen species as signaling intermediates. Brain Res 2010;1306:116-30. http://doi: 10.1016/j.brainres.2009.09.113
- Chuprov-Netochin R, Neskorodov Y, Marusich E, Mishutkina Y, Volynchuk P, Leonov S, Skryabin K, Ivashenko A, Palme K, Touraev A. Novel small molecule modulators of plant growth and development identified by high-content screening with plant pollen. BMC Plant Biol 2016;6;16(1):192. https://doi.org/10.1186/s12870-016-0875-4
- Lashmanova E, Zemzkaya N, Proshkina E, Kudryavtzeva A, Voloshkina M, Marusich E, et al. The evaluation of geroprotective effects of selected flavonoids in Drosophila melanogaster and Caenorhabditis elegans. Front. Pharmacol 2017, 8:884. http://doi:10.3389/fphar.2017.00884
- Marusich E, Mohamed H, Afanasev Y, Leonov S. Fatty Acids from Hermetia illucens Larvae Fat Inhibit the Proliferation and Growth of Actual Phytopathogens. Microorganisms 2020; 8, 1423. https://doi.org/10.3390/microorganisms8091423

Specializations within this programme