Приложение 6 к Листу заочного голосования

Структура научного профиля (портфолио) потенциальных научных руководителей участников трека аспирантуры Международной олимпиады Ассоциации «Глобальные университеты» для абитуриентов магистратуры и аспирантуры.

На русском языке:

Университет	ФГАОУ ВО Казанский федеральный университет
Уровень владения английским языком	Свободно
Направление подготовки и профиль образовательной программы, на которую будет приниматься аспирант	1.5.7 – Генетика
Перечень исследовательских проектов потенциального научного руководителя (участие/руководство)	1. РФФИ 19-34-90061 Аспиранты Разработка мультиферментных комплексов для повышения эффективности антибактериальной терапии и ускорения ранозаживления при смешанных кожных инфекциях ассоицированных с образованием биопленок 2. РФФИ 20-04-00247а (2020-2022) Межбактериальные взаимодействия как ключевой фактор лекарственной устойчивости в смешанных биопленках: разработка новых подходов к терапии полимикробных инфекций 3. РНФ 20-64-47014 (2020-2023) Новые подходы к снижению устойчивости микроорганизмов к антибиотикам при смешанных инфекциях: поиск новых антимикробных субстанций на основе полусинтетических тиотерпеноидов, характеристика молекулярных мишеней и механизмов действия, разработка эффективной системы доставки антимикробных агентов и ее визуализация с помощью конъюгатов с BODIPY-люминофорами 4. Грант Президента российской федерации для государственной поддержки молодых российских ученых докторов наук. МД-572.2020.4 (2020-2021). «Мультифункциональная роль PII-подобных регуляторных белков в клетках бактерий класса Bacilli» 5. РФФИ 20-34-90066 Аспиранты «Адаптация микоплазмы Acholeplasma laidlawii к тепловому стрессу: молекулярные механизмы функционирования систем белков теплового шока БТШ20-БТШ70-БТШ100»
Перечень возможных тем для исследования	Микробиом кожи в норме и патологии: пересмотр состава через РНК-профилирование и исследование модуляции чувствительности микробиоты к антимикробным препаратам

Научный руководитель:

Айрат Рашитович Каюмов,

доктор биологических наук

Казанский федеральный университет

Микробиология/генетика

Бактериальные биопленки, антибиотикорезистентность, межбактериальное взаимодействие, молочнокислые бактерии, пробиотики

Особенности исследования *(при наличии)*
Работа с NGS

Требования потенциального научного руководителя

Основные публикации

1. Sharafutdinov, I.S., Pavlova, A.S., Akhatova, F.S., Khabibrakhmanova, A.M., Rozhina, E.V., Romanova, Y.J., Fakhrullin, R., Lodochnikova, O.A., Kurbangalieva, A.R., Bogachev, M.I., Unraveling the molecular mechanism of selective antimicrobial activity of 2(5H)-furanone derivative against Staphylococcus aureus (2019) International Journal of Molecular Sciences, 20 (3), paper № 694
2. Sharafutdinov, I.S., Pavlova, A.S., Khabibrakhmanova, A.M., Faizova, R.G., Kurbangalieva, A.R., Tanaka, K., Trizna, E.Y., Baidamshina, D.R., Bogachev, M.I. Targeting Bacillus cereus cells: Increasing efficiency of antimicrobials by the bornyl-possessing 2(5H)-furanone derivative (2019) New Microbiologica, 42 (1), pp. 29-36.
3. Gavrilova, E., Anisimova, E., Gabdelkhadieva, A., Nikitina, E., Vafina, A., Yarullina, D., Bogachev, M., Kayumov, A. Newly isolated lactic acid bacteria from silage targeting biofilms of foodborne pathogens during milk fermentation (2019) BMC Microbiology, 19 (1), paper № 248.
4. Pavlova, A.S., Ozhegov, G.D., Arapidi, G.P., Butenko, I.O., Fomin, E.S., Alemasov, N.A., Afonnikov, D.A., Yarullina, D.R., Ivanov, V.T., Govorun, V.M., Kayumov, A.R. Identification of Antimicrobial Peptides from Novel Lactobacillus fermentum Strain (2020) Protein Journal, 39 (1), pp. 73-84.
5. Sharafutdinov, I.S., Ozhegov, G.D., Sabirova, A.E., Novikova, V.V., Lisovskaya, S.A., Khabibrakhmanova, A.M., Kurbangalieva, A.R., Bogachev, M.I., Kayumov, A.R. Increasing Susceptibility of Drug-Resistant Candida albicans to Fluconazole and Terbinafine by 2(5H)-Furanone Derivative (2020) Molecules, 25 (3), paper № 642.
6. Chernova, L.S., Bogachev, M.I., Chasov, V.V., Vishnyakov, I.E., Kayumov, A.R. N- And C-terminal regions of the small heat shock protein IbpA from: Acholeplasma laidlawii competitively govern its oligomerization pattern and chaperone-like activity (2020) RSC Advances, 10 (14), pp. 8364-8376.
7. Shtyrlin, N.V., Pugachev, M.V., Sapozhnikov, S.V., Garipov, M.R., Vafina, R.M., Grishaev, D.Y., Pavelyev, R.S., Kazakova, R.R., Agafonova, M.N., Iksanova, A.G., Lisovskaya, S.A., Zeldi, M.I., Krylova, E.S., Nikitina, E.V., Sabirova, A.E., Kayumov, A.R., Shtyrlin, Y.G. Novel bis-ammonium salts of

	pyridoxine: Synthesis and antimicrobial properties (2020) Molecules, 25 (18), paper № 4341. 8. Guseva, G.B., Antina, E.V., Berezin, M.B., Pavelyev, R.S., Kayumov, A.R., Sharafutdinov, I.S., Lisovskaya, S.A., Lodochnikova, O.A., Islamov, D.R., Usachev, K.S., Boichuk, S.V., Nikitina, L.E. Meso-substituted-BODIPY based fluorescent biomarker: Spectral characteristics, photostability and possibilities for practical application (2020) Journal of Photochemistry and Photobiology A: Chemistry, 401, paper № 112783. 9. Guseva, G., Antina, E., Berezin, M., Lisovskaya, S., Pavelyev, R., Kayumov, A., Lodochnikova, O., Islamov, D., Usachev, K., Boichuk, S., Nikitina, L. Spectroscopic and in vitro investigations of boron(III) complex with meso-4-methoxycarbonylpropylsubstituted dipyrromethene for fluorescence bioimaging applications (2020) Molecules, 25 (19), paper № 4541 10. Garipov, M.R., Sabirova, A.E., Pavelyev, R.S., Shtyrlin, N.V., Lisovskaya, S.A., Bondar, O.V., Laikov, A.V., Romanova, J.G., Bogachev, M.I., Kayumov, A.R., Shtyrlin, Y.G. Targeting pathogenic fungi, bacteria and fungal-bacterial biofilms by newly synthesized quaternary ammonium derivative of pyridoxine and terbinafine with dual action profile (2020) Bioorganic Chemistry, 104, paper № 104306 11. Zhuravleva, D.E., Iskhakova, Z.I., Ozhegov, G.D., Gogoleva, N.E., Khusnutdinova, D.R., Shagimardanova, E.I., Forchhammer, K., Kayumov, A.R. Complete Genome Sequence of Lactobacillus hilgardii LMG 7934, Carrying the Gene Encoding for the Novel PII-Like Protein PotN (2020) Current Microbiology, 77 (11), pp. 3538-3545. 12. Baidamshina, D.R., Koroleva, V.A., Trizna, E.Y., Pankova, S.M., Agafonova, M.N., Chirkova, M.N., Vasileva, O.S., Akhmetov, N., Shubina, V.V., Porfiryev, A.G., Semenova, E.V., Sachenkov, O.A., Bogachev, M.I., Artyukhov, V.G., Baltina, T.V., Holyavka, M.G., Kayumov, A.R. Anti-biofilm and wound-healing activity of chitosan-immobilized Ficin (2020) International Journal of Biological Macromolecules, 164, pp. 4205-4217. 13. Trizna, E.Y., Yarullina, M.N., Baidamshina, D.R., Mironova, A.V., Akhatova, F.S., Rozhina, E.V., Fakhrullin, R.F., Khabibrakhmanova, A.M., Kurbangalieva, A.R., Bogachev, M.I., Kayumov, A.R. Bidirectional alterations in antibiotics susceptibility in Staphylococcus aureus—Pseudomonas aeruginosa dual-species biofilm (2020) Scientific Reports, 10 (1), paper № 14849 14. Baidamshina, D.R., Koroleva, V.A., Olshannikova, S.S., Trizna, E.Y., Bogachev, M.I., Artyukhov, V.G., Holyavka, M.G., Kayumov, A.R. Biochemical Properties and Anti-Biofilm Activity of Chitosan-Immobilized Papain (2021) Marine drugs, 19 (4), paper №197 15. Sokolova, A., Uljanitski, Y., Kayumov, A.R., Bogachev, M.I. Improved online event detection and differentiation by a simple gradient-based nonlinear transformation: Implications for

	the biomedical signal and image analysis (2021) Biomedical Signal Processing and Control, 66, paper № 102470 16. Chernova, L. S., Vedyaykin, A. D., Bogachev, M. I., Fedorova, M. S., Ivanov, V. A., Vishnyakov, I. E., & Kayumov, A. R. (2022). The division protein FtsZ interacts with the small heat shock protein IbpA in Acholeplasma laidlawii. Biochimica et Biophysica Acta (BBA)-General Subjects, 1866(12), 130220. 17. Mahmoud, R. Y., Trizna, E. Y., Sulaiman, R. K., Pavelyev, R. S., Gilfanov, I. R., Lisovskaya, S. A., ... & Kayumov, A. R. (2022). Increasing the Efficacy of Treatment of Staphylococcus aureus–Candida albicans Mixed Infections with Myrtenol. Antibiotics, 11(12), 1743. 18. Mironova, A. V., Karimova, A. V., Bogachev, M. I., Kayumov, A. R., & Trizna, E. Y. (2023). Alterations in Antibiotic Susceptibility of Staphylococcus aureus and Klebsiella pneumoniae in Dual Species Biofilms. International Journal of Molecular Sciences, 24(10), 8475. 19. Gavrilova, E., Kostenko, V., Zadorina, I., Khusnutdinova, D., Yarullina, D., Ezhkova, A., ... & Nikitina, E. (2023). Repression of Staphylococcus aureus and Escherichia coli by Lactiplantibacillus plantarum Strain AG10 in Drosophila melanogaster In Vivo Model. Microorganisms, 11(5), 1297.

На английском языке:

University	Kazan Federal University
Level of English proficiency	Intermediate
Educational program and field of the educational program for which the applicant will be accepted	*1.5.7 Genetics*
List of research projects of the potential supervisor (participation/leadership)	1. RFBR 19-34-90061 Graduate students Development of multienzyme complexes to increase the effectiveness of antibacterial therapy and accelerate wound healing in mixed skin infections associated with the formation of biofilms 2. RFBR 20-04-00247a (2020-2022) Interbacterial interactions as a key factor of drug resistance in mixed biofilms: development of new approaches to the treatment of polymicrobial infections 3. RSF 20-64-47014 (2020-2023) New approaches to reducing the resistance of microorganisms to antibiotics in mixed infections: search for new antimicrobial substances based on semisynthetic thioterpenoids, characterization of molecular targets and mechanisms of action, development of an effective delivery system for antimicrobial agents and its visualization using conjugates with BODIPY phosphors 4. Grant from the President of the Russian Federation for state support of young Russian scientists, doctors of science. MD-572.2020.4 (2020-2021). "Multifunctional role of PII-like regulatory proteins in Bacilli class bacterial cells" 5. RFBR 20-34-90066 Postgraduate students “Adaptation of the mycoplasma Acholeplasma laidlawii to heat stress: molecular mechanisms of functioning of the heat shock protein systems HSP20-HSP70-HSP100”
List of the topics offered for the prospective scientific research	Skin microbiome normal and its structure: revision of composition through RNA profiling and study of modulation of microbiota sensitivity to antimicrobial drugs
 Research supervisor: Airat R Kayumov, Doctor of Science Kazan Federal University	*Microbiology*
	Supervisor's research interests Bacterial biofilms, antibiotic resistance, inter-bacterial interaction, Lactic acid bacteria, probiotics
	Research highlights *(при наличии)* *Work with NGS data*
	Supervisor’s specific requirements:
	Supervisor’s main publications 1. Sharafutdinov, I.S., Pavlova, A.S., Akhatova, F.S., Khabibrakhmanova, A.M., Rozhina, E.V., Romanova, Y.J., Fakhrullin, R., Lodochnikova, O.A., Kurbangalieva, A.R., Bogachev, M.I., Unraveling the molecular mechanism of selective antimicrobial activity of 2(5H)-furanone derivative against

	Staphylococcus aureus (2019) International Journal of Molecular Sciences, 20 (3), paper № 694 2. Sharafutdinov, I.S., Pavlova, A.S., Khabibrakhmanova, A.M., Faizova, R.G., Kurbangalieva, A.R., Tanaka, K., Trizna, E.Y., Baidamshina, D.R., Bogachev, M.I. Targeting Bacillus cereus cells: Increasing efficiency of antimicrobials by the bornyl-possessing 2(5H)-furanone derivative (2019) New Microbiologica, 42 (1), pp. 29-36. 3. Gavrilova, E., Anisimova, E., Gabdelkhadieva, A., Nikitina, E., Vafina, A., Yarullina, D., Bogachev, M., Kayumov, A. Newly isolated lactic acid bacteria from silage targeting biofilms of foodborne pathogens during milk fermentation (2019) BMC Microbiology, 19 (1), paper № 248. 4. Pavlova, A.S., Ozhegov, G.D., Arapidi, G.P., Butenko, I.O., Fomin, E.S., Alemasov, N.A., Afonnikov, D.A., Yarullina, D.R., Ivanov, V.T., Govorun, V.M., Kayumov, A.R. Identification of Antimicrobial Peptides from Novel Lactobacillus fermentum Strain (2020) Protein Journal, 39 (1), pp. 73-84. 5. Sharafutdinov, I.S., Ozhegov, G.D., Sabirova, A.E., Novikova, V.V., Lisovskaya, S.A., Khabibrakhmanova, A.M., Kurbangalieva, A.R., Bogachev, M.I., Kayumov, A.R. Increasing Susceptibility of Drug-Resistant Candida albicans to Fluconazole and Terbinafine by 2(5H)-Furanone Derivative (2020) Molecules, 25 (3), paper № 642. 6. Chernova, L.S., Bogachev, M.I., Chasov, V.V., Vishnyakov, I.E., Kayumov, A.R. N- And C-terminal regions of the small heat shock protein IbpA from: Acholeplasma laidlawii competitively govern its oligomerization pattern and chaperone-like activity (2020) RSC Advances, 10 (14), pp. 8364-8376. 7. Shtyrlin, N.V., Pugachev, M.V., Sapozhnikov, S.V., Garipov, M.R., Vafina, R.M., Grishaev, D.Y., Pavelyev, R.S., Kazakova, R.R., Agafonova, M.N., Iksanova, A.G., Lisovskaya, S.A., Zeldi, M.I., Krylova, E.S., Nikitina, E.V., Sabirova, A.E., Kayumov, A.R., Shtyrlin, Y.G. Novel bis-ammonium salts of pyridoxine: Synthesis and antimicrobial properties (2020) Molecules, 25 (18), paper № 4341. 8. Guseva, G.B., Antina, E.V., Berezin, M.B., Pavelyev, R.S., Kayumov, A.R., Sharafutdinov, I.S., Lisovskaya, S.A., Lodochnikova, O.A., Islamov, D.R., Usachev, K.S., Boichuk, S.V., Nikitina, L.E. Meso-substituted-BODIPY based fluorescent biomarker: Spectral characteristics, photostability and possibilities for practical application (2020) Journal of Photochemistry and Photobiology A: Chemistry, 401, paper № 112783. 9. Guseva, G., Antina, E., Berezin, M., Lisovskaya, S., Pavelyev, R., Kayumov, A., Lodochnikova, O., Islamov, D., Usachev, K., Boichuk, S., Nikitina, L. Spectroscopic and in vitro investigations of boron(III) complex with meso-4-methoxycarbonylpropylsubstituted dipyrromethene for fluorescence bioimaging applications (2020) Molecules, 25 (19), paper № 4541 10. Garipov, M.R., Sabirova, A.E., Pavelyev, R.S., Shtyrlin, N.V., Lisovskaya, S.A., Bondar, O.V., Laikov, A.V., Romanova, J.G., Bogachev, M.I., Kayumov, A.R., Shtyrlin, Y.G. Targeting pathogenic fungi, bacteria and fungal-bacterial biofilms by newly

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