Assistant Prof. Nikolet Pavlova, Ph.D.

Office/room 363
Phone number: 02 8167 340
e-mail: n_pavlova@uni-sofia.bg

Business adress: Dragan Tsankov №8, Sofia-1164, Bulgaria, office 363
Reception time:
Monday – from 10 to 12 a.m.,
Friday from 15 to 17 p.m.

Position held: Assistant Professor, Ph.D., in the Laboratory of Synthetic Biology and Bioinformatics headed by Prof. Dr. Robert Penchovsky.

Main activities and responsibilities: Training and assessment of students; Guidance of graduates and doctoral students; Scientific research, preparation, and implementation of national and international scientific and educational projects. The discovery of new targets and the development of new drug candidates provide elegant methods to address the problem of antibiotic resistance.

Research Gate: https://www.researchgate.net/profile/Nikolet-Pavlova
ORCID: https://orcid.org/0000-0002-5405-9089
Scopus: ID: 57201255941

Teaching activity:

Bioinformatics and Introduction to Bioinformatics at the Faculty of Biology of Sofia University "St. Kliment Ohridski":
Bachelors - Agrobiotechnologies – 30 hours of exercises (fourth year, winter semester)

Masters:

Gene and Cell Engineering (first year, winter semester), Bulgarian language – 30 hours of exercises

Genetics and Genomics (first year, winter semester), Bulgarian language – 30 hours of exercises, English language – 30 hours of exercises

SDK - 30 hours of exercises

Scientific activity:

From 2024 Ch. assistant professor Dr. Pavlova has worked as a young scientist and R2 researcher under the guidance of Prof. Dr. Robert Penchovsky at the Faculty of Biology, SU "St. Kliment Ohridski". Her activity was financed by various projects of the Scientific Research Fund, such as: KP-06-H63/1/13.12.2022, DN13/14/20.12.2017 (completed with 20 publications, with a total impact factor of 84 points and 274 points from the districts Q1-Q4) and from two projects "Sofia University - Marker for Innovations and Technological Transfer (SUMMIT)", with numbers No.70-123-194/2.02.2024 and 70123-505./05.07.2023.

Education:

2019 **PhD in Biological Sciences - Genetics, Genomics and Bioinformatics, Sofia University "St. Kliment Ohridski".**

2014 - 2016 **Master's degree in "Genetics and Genomics" and award for excellence at the University of St. Kliment Ohridski**

2014 - 2016 Master's degree in "Project Management", International Business School, Bulgaria

2010 - 2014 Bachelor of Molecular Biology, Sofia University "St. Kliment Ohridski"

2010 – 2014 Bachelor of Business Administration, International Business School, Bulgaria

Work experience:

2024 Researcher R2 under the project "Sofia University - Marker for Innovation and Technology Transfer (SUMMIT)", with number No.70-123-194/2.02.2024, "Creation of software systems for computer design of fast allosteric ribozymes that sense the presence of well-defined sequence oligonucleotides and a database of clinically relevant human genetic variations to apply for two patents"

2023 – 2024 Researcher R2 under the project "Sofia University - Marker for Innovation and Technological Transfer (SUMMIT)", with number 70-123-505./05.07.2023, "Design of antisense oligonucleotides linked to cell-penetrating oligopeptides as new antibacterial agents against resistant pathogenic bacteria in humans to apply for a European patent"

2023 - 2024 Researcher (young scientist) in the laboratory of Synthetic Biology and Bioinformatics of Prof. Robert Penchovsky, Faculty of Biology, SU "St. Kliment Ohridski".

2019 - 2023 Researcher (young scientist) under the supervision of Prof. Robert Penchovsky, in the "Genetics" Department of the Faculty of Biology, SU "St. Kliment Ohridski".

2021 – 2022 Development of medicinal preparations with an antibacterial effect in partnership with an international private pharmaceutical company.

2020 - 2022 Honorary teacher - exercises in Bioinformatics and Introduction to Bioinformatics during the 2020/2021 and 2021/2022 academic years of bachelors, masters (in Bulgarian and English) and PhD students at the Faculty of Biology, SU "St. Kliment Ohridski".

Scientific awards:

2023 Award of the Stefan Angelov Foundation for the best work of a young Bulgarian microbiologist in 2022. - II place – Nicolet Pavlova, for her work: Bioinformatics and Genomic Analyses of the Suitability of Eight Riboswitches for Antibacterial Drug Targets, Nikolet Pavlova and Robert Penchovsky, Antibiotics, 2022, DOI:10.3390/antibiotics11091177, IF: 5.22, SJR=0,785,Q1https://www.bas.bg/?p=43141, https://penchovsky.atwebpages.com/research.php?page=22

2018

- Two awards for the best poster presented at the 14th Congress of Microbiology in Hisarya, Bulgaria, with international participation 2018: Bioinformatics Web-Based server for bacterial genome analysis
- Control of gene expression by bacterial riboswitches and their application as drug targets

2016 Full honors at Sofia University "St. Kliment Ohridski", for excellent success during exams and master's defense within the framework of the master's program in "Genetics and Genomics".

Scientific publications:

At the moment, my results have been published in 17 scientific articles and book chapters with a total Impact Factor of 51.64 and over 270 citations, presented at 3 international scientific conferences with prizes for the best poster and an award for the best work of young Bulgarian microbiologist. H-index: 6.

1. Computational Design of Allosteric Ribozymes via Genetic Algorithms, RNA Amplification and Analysis. Methods in Molecular Biology, vol 2822, Dimitrios Kaloudas, **Nikolet Pavlova,** Robert Penchovsky, Springer, https://doi.org/10.1007/978-1-0716-3918-4_28, RNA AMplifaciation and Analysis

2. Antisense and Functional Nucleic Acids in Rational Drug Development, Antibiotics, 2024, Robert Penchovsky, Antoniya V. Georgieva, Vanya Dyakova, Martina Traykovska, **Nikolet Pavlova,** Antibiotics, 2024, https://www.mdpi.com/2079-6382/13/3/221, SJR:5.5 , Q1, **IF: 4.8**, https://penchovsky.atwebpages.com/publications.php?page=3199.

3. Targeting FMN, TPP, SAM-I, and glmS Riboswitches with Chimeric Antisense Oligonucleotides for Completely Rational Antibacterial Drug Development, **Nikolet Pavlova,** Martina Traykovska, Robert Penchovsky, Antibiotics, 2023, https://www.mdpi.com/2079-6382/12/11/1607, 10.3390/antibiotics12111607, SJR=5.5, Q1, **IF: 4.8**

4. Bioinformatics and Genomic Analyses of Eight Riboswitches and their Suitability for Antibacterial Drug Targets, **Nikolet Pavlova**, Allied Academies, CPD accredited Hybrid Event 7th International Conference on Pharmaceutics ans Advanced Drug Delivery Systems, London, UK, March 2023, Q3.

5. GHOST-NOT and GHOST-YES: Two Programs for Generating High-Speed Biosensors with Randomized Oligonucleotide Binding Sites with NOT or YES Boolean Logic Functions Based on Experimentally Validated Algorithms, Dimitrios Kaloudas, **Nikolet Pavlova**, Robert Penchovsky, 2022-2023, SSRN.

6. Bioinformatics and Genomic Analyses of the Suitability of Eight Riboswitches for Antibacterial Drug Targets, **Nikolet Pavlova** and Robert Penchovsky, Antibiotics, 2022, DOI:10.3390/antibiotics11091177, IF: 5.22, SJR=0,785, Q1

7. Versatile tools of synthetic biology applied to drug discovery and production, **Nikolet Pavlova**, Georgi Y Miloshev, Antoniya V Georgieva, Martina Traykovska & Robert Penchovsky, Future Medicinal Chemistry, 2022, DOI:10.4155/fmc-2022-0063, IF: 4,7, SJR=0,649, Q2

8. Book: New Frontiers and Applications of Synthetic Biology; chapter 8. Small RNA-based systems for sensing and therapeutic applications, Robert Penchovsky, Georgi Miloshev, **Nikolet Pavlova**, Katya Popova, Lozena Otcheva, Martina Traykovska,Elsevier, 2022, https://doi.org/10.1016/B978-0-12-824469-2.00004-X, Q3

9. Robert Penchovsky, **Nikolet Pavlova** and Dimitrios Kaloudas, ExBWS: Extended Bioinformatics Web Services for Sequence Analyses, International Journal of Bioinformatics Research and Applications, 2021, IF; 0.85, (Q4, Scopus)

10. Dimitrios Kaloudas, **Nikolet Pavlova** and Robert Penchovsky, Phycoremediation of wastewater by microalgae: a review - Environmental Chemistry Letters 2021, IF:9, (Q1, Scopus)

11. Dimitrios Kaloudas, **Nikolet Pavlova** and Robert Penchovsky, Lignocellulose, algal biomass, biofuels and biohydrogen: a review - Environmental Chemistry Letters 2021, IF:9, (Q1, Scopus)

12. Lozena A Otcheva, **Nikolet Pavlova**, Katya B Popova, Martina Traykovska and Robert Penchovsky, Why Some Riboswitches are Suitable Targets for Antibacterial Drug Discovery? - EC Microbiology 2020, IF:1.73

13. Robert Penchovsky, **Nikolet Pavlova** and Dimitrios Kaloudas, RSwitch: a novel bioinformatics database on riboswitches as antibacterial drug targets - IEEE Transactions on Computational Biology and Bioinformatics (2020), IF:2.8, (Q1, Web of Science)

14. Genome-wide bioinformatics analysis of FMN, SAM-I, glmS, TPP, Lysine, Purine, Cobalamin, and SAH riboswitches for their applications as allosteric antibacterial drug targets in human pathogenic bacteria, **Nikolet Pavlova**, Robert Penchovsky, 2019, Expert Opinion on Therapeutic targets, IF:4,598,

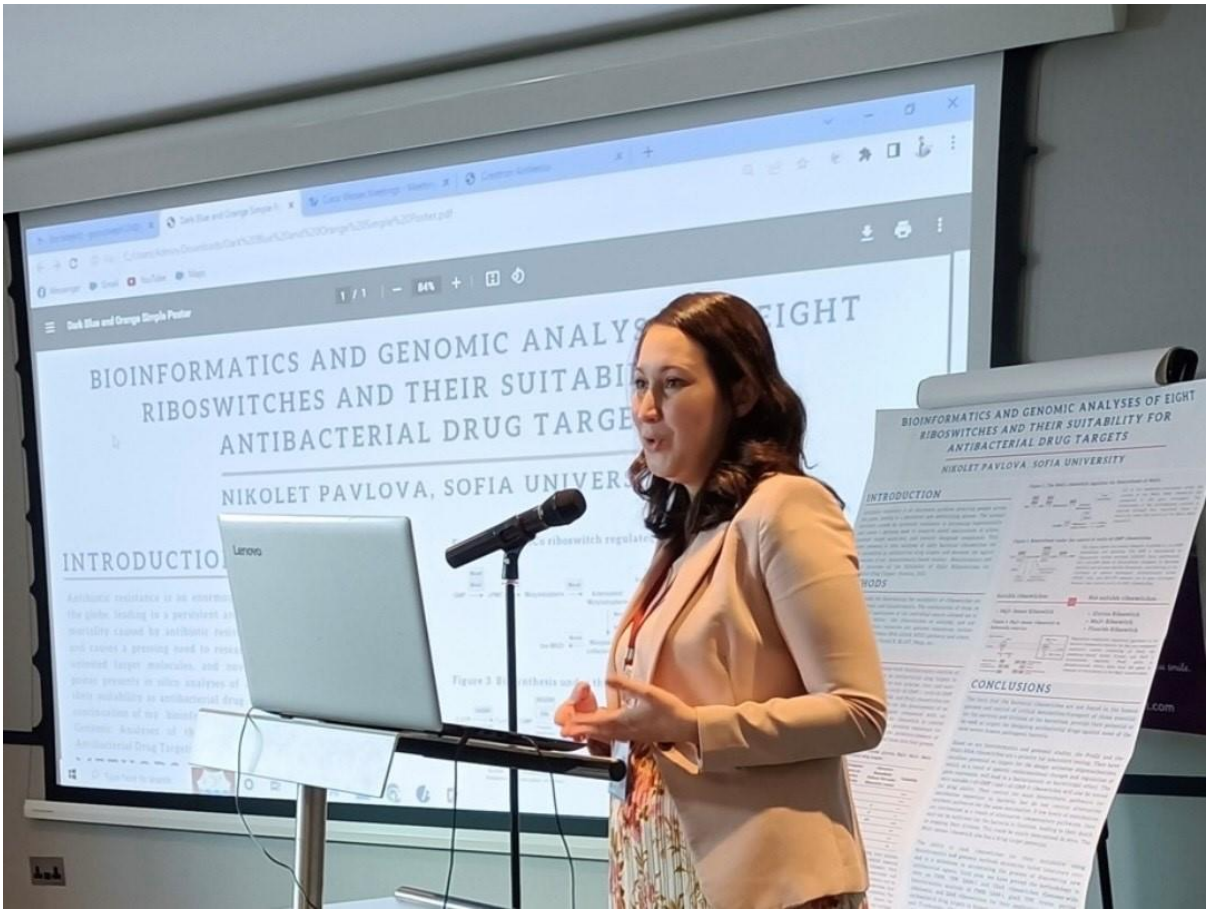
15. Riboswitch distribution, structure, and function in bacteria, **Nikolet Pavlova**, Dimitrios Kaloudas, Robert Penchovsky, 2019, Gene. IF: 2,498,

16. EBWS: Essential Bioinformatics Web Services for Sequence Analysis, Dimitrios Kaloudas, **Nikolet Pavlova**, Robert Penchovsky, IEEE/ACM Transactions on Computational Biology and Bioinformatics (IEEE ACM T COMPUT BI), 2018, IF: 1,64

17. EBWS: Essential Bioinformatics Web Services for Sequence Analyses, **Nikolet Pavlova**, Dimitrios Kaludas, Robert Penchovsky, German Conference on Bioinformatics, Vienna, Austria, 2018, Q4

Participation in scientific conferences:

2023 Participation by invitation in the 7th International Conference on Pharmaceutics and Advanced Drug Delivery Systems, Allied Academies, CPD accredited Hybrid Event**, London, UK, March 27-28 2023 с презентация и постер на тема:** Bioinformatics and Genomic Analyses of Eight Riboswitches and their Suitability for Antibacterial Drug Targets, **Nikolet Pavlova** https://alliedacademies.com/pharmaceutical-science-2023/2023/about https://alliedacademies.com/pharmaceutical-science-2023/2023/scientific-program-pdfs



2018 Participation in the 14th Congress of Microbiology in Bulgaria with international participation, the city of Hisarya, Bulgaria with two posters, each of which was awarded "Best Poster".

1. Nikolet Pavlova, Robert Penchovsky, Bioinformatics Web-Based server for bacterial genome analysis, 14th Congress of Microbiologists in Bulgaria with International Participation, 2018, PhD

2. Lozena A. Otcheva, Katya B. Popova, Nikolet Pavlova, Martina Traykovska, Robert Penchovsky, Control of gene expression by bacterial riboswitches and their application as drug targets, 14th Congress of Microbiologists in Bulgaria with International Participation, 2018, PhD https: //penchovsky.atwebpages.com/conferences.php?page=23

2018 Participation in the German Bioinformatics Conference held exclusively in Vienna, Austria with a poster.

1. **Nikolet Pavlova**, Dimitrios Kaloudas, Robert Penchovsky, Essential Bioinformatics Web Services for Sequence Analyses., German Conference on Bioinformatics, Vienna, Austria, 2018, Ref, SCOPUS Quartile: Q4 (SCOPUS), в сътрудничество с чуждестранни учени, PhD
https://penchovsky.atwebpages.com/conferences.php?page=22

Participation in scientific projects:

1. Project "Sofia University - Marker for Innovation and Technology Transfer (SUMMIT)", with number No.70-123-194/2.02.2024, "Creation of software systems for computer design of fast allosteric ribozymes that sense the presence of oligonucleotides with a precisely defined sequence and a database of clinically significant genetic variations in humans to apply for two patents", Budget BGN 200,000, duration 2 years.

2. "Sofia University - Marker for Innovation and Technology Transfer (SUMMIT)" project, with number 70-123-505./07.05.2023, "Design of antisense oligonucleotides linked to cell-penetrating oligopeptides as new antibacterial agents against resistant pathogenic bacteria in person to apply for a European patent", Budget BGN 200,000, duration 2 years.

3. Comparative analysis of the effectiveness of new antibacterial agents based on different types of antisense oligonucleotides using different molecular mechanisms of RNA inhibition, KP-06-H63/1/13.12.2022, BGN 200,000.

4. Creation of new antibacterial agents against resistant strains of Staphylococcus aureus and Enterococcus faecalis, by using antisense oligonucleotides, KP-06 ПМ63/8, BG-175467353-2022-03-0063, BGN 40,000.

Finished projects:

1. Design and experimental testing of chimeric antisense oligonucleotides as antibacterial agents, МОН, ДН/13/14/20.12.2017, 2017-2020 - "Most successful project". Results: 20 publications (IF: 68 points and 274 points by Q1-Q4, 86 citations, participation in 3 conferences with 2 presentations and 4 posters, developed 16 pieces of software, defended 4 PhDs, in collaboration with foreign scientists

2. Antisense oligonucleotides that specifically bind to FMN and CAM riboswitches in human pathogenic bacteria, 80-10-45/10.04.2019, 2019, successfully defended doctoral dissertation, participation in international conferences

3. Building and developing young highly qualified researchers and teachers for innovative interdisciplinary research beneficial to biomedicine, MES, BG05M2OP001-2.009-0019-C01/02.06.2017, 2017-2018

4. New methods of creating antibiotics against resistant strains of Escherichia coli, by using antisense oligonucleotides that inhibit biochemical pathways controlled by riboswitches, FNI of the SU, BG05M2OP001-2.009-0019C01/02.06.2017, 2017-2018

5. New methods for the discovery of antibiotic agents against resistant strains of

Staphylococcus aureus by application of antisense oligonucleotides, FNI of SU, 179/ 13.04.2016, 2016-2017

6. Application of antisense oligonucleotides for specific inhibition of bacterial RNAs, as a new method for creating antibiotics, 12/27.03.2015, 2015

Media participation:

1. Four young scientists from the Faculty of Biology received awards from competitions, https://www.unisofia.bg/index.php/novini/novini_i_s_bitiya/chetirima_mladi_ucheni_ot_biologichesk iya_fakultet_poluchiha_nagradi_ot_konkursi

2. "How Prof. R. Penchovski and his team fight antibiotic resistance", BG Nauka podcast: https://www.youtube.com/watch?v=xNdp04OiF9o

3. II award of the Stefan Angelov Foundation for the best work of a young Bulgarian microbiologist in 2022: https://microbio.bas.bg/pages-409-76-godini-ot-osnovavaneto-na-institutpo-mikrobiologiia-stefan-angelov-kam-ban-chlen-na-mrejata-pastior6.

4. II award of the "Stefan Angelov" Foundation for the best work of a young Bulgarian microbiologist in 2022: https://www.bas.bg/?p=43141

5. Four young scientists under the scientific guidance of Prof. Dr. Robert Penchovski received five awards within the period 2021-2023: https://nauka.bg/chetirima-mladi-ucheni-poluchiha-pet-nagradi-nauchnotorakovodstvo /

6. Four young scientists under the scientific guidance of Prof. Dr. Robert Penchovski received five awards within the period 2021-2023: https://naukamon.eu/chetirima-mladi-ucheni-pod-nauchnoto-rakovodstvo-na -profd-r-robert-penchovski-poluchiha-pet-nagradi-v-ramkite-na-perioda-2021-2023-g/