room. 363

e-mail: m_traykovska@biofac.uni-sofia.bg

Work address: Dragan Tsankov №8, Sofia-1164, Bulgaria, room 363, office hours: Tuesday and Thursday: 4 - 6 p.m.

Position held: Chief 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; Graduate Guide; Scientific research, preparation and implementation of national and international scientific and educational courses.

Martina Traykovska, assistant professor, in the Laboratory of Synthetic Biology and Bioinformatics, Faculty of Biology, SU "St. Kliment Ohridski"

Teaching experience:

Courses:

Laboratory Exercises on **"Molecular Genetics"** (mandatory) for IV year students of the Molecular Biology major

Laboratory Exercises on **"Bioinformatics and Molecular Evolution"** (mandatory) for students of the 1st year of the Master's program Genetics and Genomics (in English and in Bulgarian) and Gene and Cell Engineering (in Bulgarian)

Laboratory Exercises on **"Synthetic Biology"** (mandatory) for students of the 1st year of the master's program Genetics and Genomics (in English and in Bulgarian) and Gene and Cell Engineering (in Bulgarian)

Laboratory Exercises on **"Genomics"** (mandatory) for students of the 1st year of the Master's program Genetics and Genomics (in English and in Bulgarian) and Gene and Cell Engineering (in Bulgarian)

Education and training:

2023 - Researcher in Synthetic Biology in the Laboratory of **"Synthetic Biology and Bioinformatics"**, in SU "St. Kliment Ohridski", Faculty of Biology, Sofia, Bulgaria

2014 - 2017 - Educational and scientific degree **"Doctor", specialty Genetics, direction 4.3 Biological Sciences, Dissertation on the topic "Engineering of functional nucleic acids and their application in the fields of Molecular Genetics and Synthetic Biology"** in SU "St. Kliment Ohridski", Faculty of Biology, Sofia, Bulgaria

2020 - 2021 - Master's degree in **"Management of Clinical Trials", Faculty of Public Health, "Prof. Dr. Tsekomir Vodenicharov"**, MU, Sofia, Bulgaria

2012 - 2014 - Master's degree in **"Genetic and cellular engineering",** SU "St. Kliment Ohridski", Faculty of Biology, Sofia, Bulgaria

2008 - 2012 Bachelor's degree in **"Molecular Biology",** SU "St. Kliment Ohridski", Faculty of Biology, Sofia, Bulgaria

Selected scientific publications:

1. Nikolet Pavlova, Martina Traykovska, Robert Penchovsky, **"Targeting FMN, TPP, SAM-I, and glmS Riboswitches with Chimeric Antisense Oligonucleotides for Completely Rational Antibacterial Drug Development",** Antibiotics, 2023.

   https://penchovsky.atwebpages.com/publications.php?page=3177

2. Robert Penchovsky, Georgi Miloshev, Nikolet Pavlova, Katya Popova, Lozena Otcheva, Aikaterini Valsamatzi, Martina Traykovska, **Book: New Frontiers and Applications of Synthetic Biology; chapter 8. Small RNA-based systems for sensing and therapeutic applications**, Elsevier, 2022, ISBN: 9780128244692

   https://penchovsky.atwebpages.com/publications.php?page=300

3. Martina Traykovska, Robert Penchovsky, **"Engineering antisense oligonucleotides as antibacterial agents that target FMN riboswitches and inhibit the growth of Staphylococcus aureus, Listeria monocytogenes, and**

Escherichia coli", ACS Synthetic Biology, 2022, ISSN: 2161-5063, doi: 10.1021/acssynbio.2c00013, Q1, IF 5

https://pubs.acs.org/doi/10.1021/acssynbio.2c00013

4. Martina Traykovska, Robert Penchovsky, "**Targeting SAM-I Riboswitch Using Antisense Oligonucleotide Technology for Inhibiting the Growth of Staphylococcus aureus and Listeria monocytogenes",** Antibiotics, 2022, IF 5.0 https://www.mdpi.com/2079-6382/11/11/1662/pdf
5. Martina Traykovska, Lozena A. Otcheva, Robert Penchovsky, **"Targeting TPP riboswitches using chimeric antisense oligonucleotide technology for antibacterial drug development"**, ACS Applied Bio Materials, 2022, Q1, IF 4.5, doi: 10.1021/acsabm.2c00628
6. Georgi Y. Miloshev,, Martina Traykovska, Dimitrios Kaloudas, Robert Penchovsky, **"ENGINEERING A PLASMID AS A REPORTER SYSTEMFOR QUANTIFYING GENE EXPRESSION IN ESCHERICHIA COLI"** Proceedings of the Bulgarian Academy of Sciences, 2022

   http://www.proceedings.bas.bg/index.php/cr/article/view/7/7
7. Robert Penchovsky, Nikolet Pavlova, Georgi Miloshev, Antoniya Georgieva, Martina Traykovska, **"Versatile Tools of Synthetic Biology applied for Drug Discovery and Production",** Future Medicinal Chemistry, Q2, IF 4.75, 2022
8. Aikaterini Valsamatzi, Martina Traykovska, Robert Penchovsky, "**Coronavirus SARS-CoV-2: Where do we stand?"**, Acta Microbiologica Bulgarica, ISSN: 2603-3755, 2022, SJR 0.115, Q4
9. Martina Traykovska, Katya B. Popova, Robert Penchovsky, **"Targeting glmS Ribozyme with Chimeric Antisense Oligonucleotides for Antibacterial Drug Development"**, ACS Synthetic Biology, 2021, doi: https://pubs.acs.org/doi/10.1021/acssynbio.1c00443, SJR 5.5, Q1

   https://pubs.acs.org/doi/abs/10.1021/acssynbio.1c00443
10. Lozena A Otcheva, Nikolet Pavlova, Katya B Popova, Martina Traykovska, Robert Penchovsky, **"Why some Riboswitches are Suitable Targets for Antibacterial Drug Discovery",** EC Microbiology, 2020

    https://penchovsky.atwebpages.com/publications.php?page=293
11. Aikaterini Valsamatzi-Panagiotou, Martina Traykovska, Robert Penchovsky, "**Mechanisms of antibacterial drug resistance and**

approaches to overcome", Drug Discovery Targeting Drug-Resistant Bacteria, 2020, ISBN: B978-0-12-818480-6.00002-3

https://penchovsky.atwebpages.com/publications.php?page=290

12. Aikaterini Valsamatzi-Panagiotou, Martina Traykovska, Robert Penchovsky**,"Mechanisms of Drug resistance and Approaches to overcome it"**, Elsevier, 2019

13. Martina Traykovska, Sjoerd Miedema, Robert Penchovsky, **"Clinical Trials of Functional Nucleic Acids: Antisense Oligonucleotides and Aptamers"**, International Journal of Biomedical and Clinical Engineering (IJBCI), 2018, ISSN: 2161-1610, doi: 10.4018/IJBCE.2018070104

https://penchovsky.atwebpages.com/publications.php?page=224

14. Robert Penchovsky, Martina Traykovska, "**Synthetic Approaches to Biology: engineering gene control circuits, synthesizing, and editing genomes, Emerging Research on Bioinspired Materials Engineering"**, IGI Global, DOI: 10.4018/978-1-4666-9811-6, 2016
https://www.igi-global.com/chapter/synthetic-approaches-to-biology/146511

15. Katya B Popova, Lozena A Otcheva, Martina Traykovska, Robert Penchovsky, **"RNA as A Potent Target for Antibacterial Drug Discovery"**, Biomedical Journal of Scientific and Technical Research, 2018, ISSN: 2574-1241, doi: 10.26717/BJSTR.2018.10.001938

https://penchovsky.atwebpages.com/publications.php?page=226

16. 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",** 2018, 14th Congress of Microbiologists in Bulgaria with International Participation

17. Robert Penchovsky, Martina Traykovska, **"Designing drugs that overcome antibacterial resistance: where do we stand and what should we do?"** Expert opinion on drug discovery, doi: 10.1517/17460441.2015.1048219, 2015, IF 5.7

18. Robert Penchovsky, Martina Traykovska, **"Engineering Microfluidic and Nucleic acid-based Biosensoring Devices with versatile applications to modern biotechnology"**, International Conference Kliment's Days, 2013

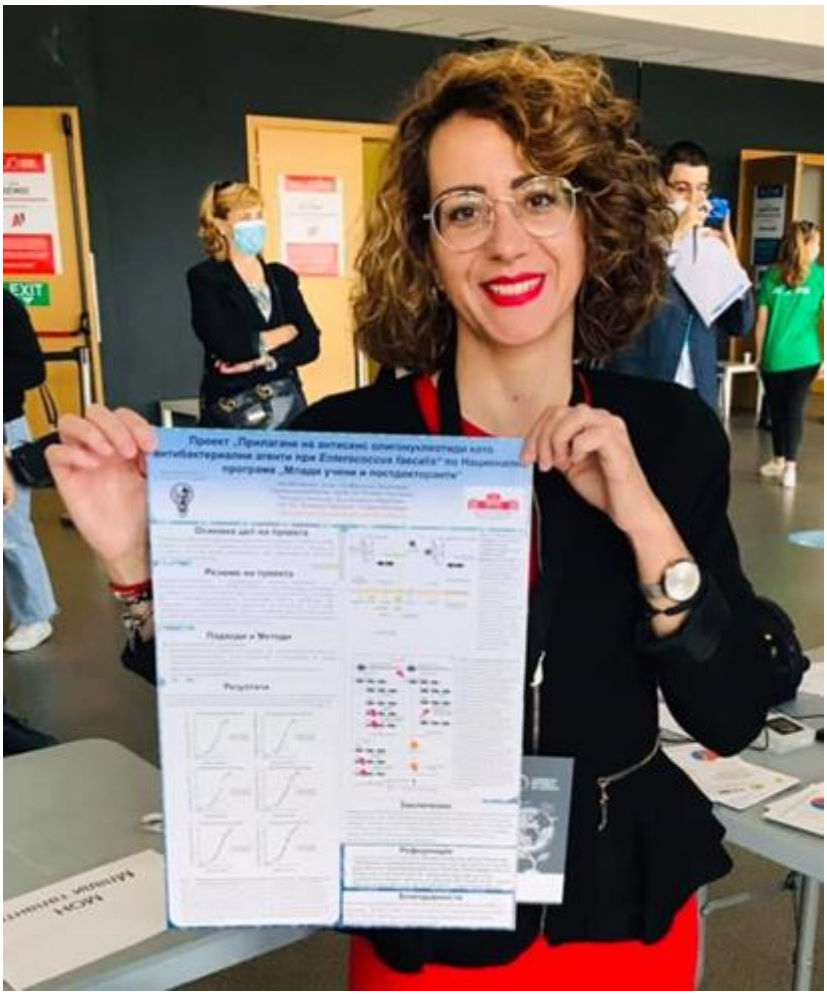
Link: https://penchovsky.atwebpages.com/publications.php

H index: 5
Citations: 152
Impact Factor (IF): 35

Awards:

- **First prize for the most successful project in the field of Biological Sciences for 2021, presented at the Sofia Science Festival, May 15-16, 2021 - awarded project: "Application of antisense oligonucleotides as antibacterial agents in *Enterococcus faecalis*", Funding Institution , Sofia University, 2020 to 2020**

  https://penchovsky.atwebpages.com/conferences.php?page=28



The most successful project under the National Program "Young scientists and postdoctoral fellows" in the field of Biological Sciences is awarded to Martina Traykovska, May, 2021.

- **First prize for the best scientific work of a young microbiologist in the country by the Foundation "Acad. Prof. Dr. Stefan Angelov" - awarded article - "Engineering antisense oligonucleotides as antibacterial agents that target FMN riboswitches and inhibit bacterial growth of Staphylococcus aureus, Listeria monocytogenes and Escherichia coli". March 2023.**
  https://penchovsky.atwebpages.com/research.php?page=21

Awarding of Asst. Prof. Dr. Martina Traykovska with the First Prize for the best scientific work of a young microbiologist in the country from the Foundation "Acad. Prof. Dr. Stefan Angelov", March 7, 2023, Sofia, Bulgaria

Media appearances of the research team led by Prof. Dr. Robert Penchovsky

https://penchovsky.atwebpages.com/research.php

1. Four young scientists from the Faculty of Biology received prizes from competitions, https://www.uni-sofia.bg/index.php/novini/novini_i_s_bitiya/chetirima_mladi_ucheni_ot_biologicheskiya_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. "Ch. Dr. Martina Trajkovska and her work as a geneticist at SU" in an interview with BG Nauka: https://www.youtube.com/watch?v=02douKt1Zmc

4. "A microbiologist replaces antibiotics when they don't work" - interview in Business Global magazine, no. 6 (34) https://bglobal.bg/108954-%D0%9C%D0%B8%D0%BA%D1%80%D0%BE%D0%B1%D0%B8%D0%BE%D0%BB%D0%BE%D0%B3-%D0%B7%D0%B0%D0%BC%D0%B5%D1%81%D1%82%D0%B2%D0%B0-

%D0%B0%D0%BD%D1%82%D0%B8%D0%B1%D0%B8%D0%BE%D1%82%D0%B8%D1%86%D0%B8%D1%82%D0%B5-%D0%BA%D0%BE%D0%B3%D0%B0%D1%82%D0%BE-%D0%BD%D0%B5-%D1%80%D0%B0%D0%B1%D0%BE%D1%82%D1%8F%D1%82

5. 4th award of the Stefan Angelov Foundation for the best work of a young Bulgarian microbiologist in 2022: https://microbio.bas.bg/en/pages-410-76th-anniversary-of-the-stephan-angeloff-institute-of-microbiology-bas-member-of-the-pasteur-international-network

6. 1st prize of the Stefan Angelov Foundation for the best work of a young Bulgarian microbiologist in 2022: https://www.bas.bg/?p=43141

7. 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-nauchnoto -rakovodstvo/

8. 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 -prof-d-r-robert-penchovski-poluchiha-pet-nagradi-v-ramkite-na-perioda-2021-2023-g/

9. Interview in "Bulgarian Science" magazine, no. 111: https://kupinauka.com/product/balgarska-nauka-broy-111-v-pdf

Participation in research projects:

1. **“Creation of new antibacterial agents against resistant strains of Staphylococcus and aureus Enterococcus faecalis"**, Funding institution Scientific Research Fund, Ministry of Education, from 2022 to 2024.
2. **"Creation of antisense oligonucleotides that specifically inhibit the bacterial growth of Porphyromonas gingivalis and Helicobacter pylori",** Funding institution Scientific Research Fund, Ministry of Education, from 2019 to 2022.
3. **"Comparative analysis of the effectiveness of new antibacterial agents based on different antisense oligonucleotides using different molecular mechanisms of RNA inhibition"**, Funding institution Scientific Research Fund, Ministry of Education, from 2022 to 2024.
4. **"Design of Functional Nucleic Acids for Synthetic Reflation of Gene Expression in Prokaryotes and Eukaryotes",** Funding Institution Scientific Research Fund, Ministry of Education, from 2019 to 2022.
5. **"Design and experimental testing of chimeric antisense oligonucleotides as antibacterial agents"**, Funding institution Scientific Research Fund, Ministry of Education, from 2017 to 2020.
6. **"Application of antisense oligonucleotides as antibacterial agents in Enterococcus faecalis"**, Funding institution institution Scientific Research Fund, Sofia University, 2020 to 2020
7. **"Antisense oligonucleotides that specifically bind to FMN and CAM riboswitches in human pathogenic bacteria"**, Funding institution Scientific Research Fund, Sofia University, from 2019 to 2019.
8. **"Application of antisense oligonucleotides as antibacterial agents in Staphylococcus aureus"**, Funding institution Scientific Research Fund, Sofia University, from 2018 to 2018.
9. "**New methods for creating antibacterial agents against Listeria monocytogenes", by using antisense oligonucleotides",** Funding institution Scientific Research Fund, Sofia University , 2018 to 2018.
10. "**New methods for creating antibiotics against resistant strains of Escherichia coli by using antisense oligonucleotides that inhibit biochemical pathways controlled by riboswitches"**, Funding institution Scientific Research Fund, Sofia University, from 2017 to 2017.

11. "**New methods for the detection of antibiotic agents against resistant strains of Staphylococcus aureus, by applying antisense oligonucleotides**", Funding institution Scientific Research Fund, Sofia University, from 2016 to 2016
12. **"Application of antisense oligonucleotides for specific inhibition of bacterial RNAs, as a new method for creating antibiotics",** Funding institution Scientific Research Fund, Sofia University, from 2015 to 2015.

List of conferences:

Poster participation:

1. **Lozena A. Otcheva, Katya B. Popova, Martina Traykovska and Robert Penchovsky, „Control of gene expression by bacterial riboswitches and their application as drug targets“, 14th Congress of Microbiologists in Bulgaria with International Participation, 10/10-13/10 2018**
2. **Katya B. Popova, Lozena A. Otcheva, Martina Traykovska and Robert Penchovsky, „Probing general toxicity of antisense oligonucleotides to bacterial and mammalian cells“, Конференция: 14th Congress of Microbiologists in Bulgaria with International Participation, 10/10-13/10 2018**