

Assoc. Prof. Martina Traykovska, PhD

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Research interests: Synthetic biology, synthetic control of gene expression, development of novel antibacterial and anticancer drugs, riboswitches, aptamers and ribozymes.

Profiles in major databases

ORCID: https://orcid.org/0000-0002-4714-9908

NACID: https://ras.nacid.bg/dissertation-preview/46647

SCOPUS: https://www.scopus.com/authid/detail.uri?authorId=56656488000

Web of Science: https://www.webofscience.com/wos/author/record/AAL-2541-2021

Google Scholar: https://scholar.google.com/citations?hl=en&user=OzgEAzQAAAAJ

Sofia University Authors: https://authors.uni-sofia.bg/AuthorPublications.aspx?id=8ceb767c-8d74-43d9-951b-05bfffab0fba

Education

2017: PhD, professional field 4.3 Biological Sciences, Department of Genetics, Faculty of Biology, Sofia University “St. Kliment Ohridski”

2014 – 2017: Full-time doctoral student, Department of Genetics

2020 – 2022: Master’s degree in Clinical Trials Management, Medical University of Sofia, Faculty of Public Health “Prof. Tsekomir Vodenicharov”

2012 – 2014: Master’s degree in Genetic and Cellular Engineering, Biotechnology program, Faculty of Biology, Sofia University “St. Kliment Ohridski”

2008 – 2012: Bachelor’s degree in Molecular Biology, Faculty of Biology, Sofia University “St. Kliment Ohridski”

Professional experience

Academic positions:

2026 – present: Associate Professor, Laboratory of Synthetic Biology and Bioinformatics, Faculty of Biology, Sofia University "St. Kliment Ohridski"

2023 – 2026: Chief Assistant Professor, PhD, Laboratory of Synthetic Biology and Bioinformatics, Faculty of Biology, Sofia University "St. Kliment Ohridski"

2018 – 2023: Chief Assistant Professor, PhD, Department of Genetics, Faculty of Biology, Sofia University "St. Kliment Ohridski"

Research experience:

2023 – present: Researcher, Laboratory of Synthetic Biology and Bioinformatics, Faculty of Biology, Sofia University "St. Kliment Ohridski".

2018 – 2023: Researcher, Department of Genetics, Faculty of Biology, Sofia University "St. Kliment Ohridski"

Scientific awards and distinctions

1. First prize for the best research by a young Bulgarian microbiologist in 2022, awarded by the "Academician Prof. Dr. Stefan Angelov" Foundation



ФОНДАЦИЯ "АКАД. ПРОФ. Д-Р СТЕФАН АНГЕЛОВ"

ДИПЛОМА

НАГРАДА ЗА НАЙ-ДОБРА РАБОТА
НА МЛАД БЪЛГАРСКИ МИКРОБИОЛОГ ПРЕЗ 2022 г.

I МЯСТО

МАРТИНА ТРАЙКОВСКА

Катедра „Генетика", Биологически факултет, СУ „Климент Охридски"

за

"Engineering Antisense Oligonucleotides as Antibacterial Agents That Target FMN Riboswitches and Inhibit the Growth of Staphylococcus aureus, Listeria monocytogenes, and Escherichia coli"

„Конструиране на антисенс олигонуклеотиди като антибактериални агенти, насочени към FMN рибосвичове и инхибиращи растежа на Staphylococcus aureus, Listeria monocytogenes и Escherichia coli"

Почетен председател на фондацията: Председател на фондацията:

Хелма Ангелов Акад. Ангел С. Гълъбов, д.м.н.

София, 07 март 2023 г.

2. Most successful project in biological sciences, presented at the Sofia Science Festival, 15–16 May 2021



Scientometric data

As of 1 October 2026, Assoc. Prof. Martina Traykovska, PhD, has authored 6 book chapters, 22 scientific journal articles, 4 proceedings articles, and 1 monograph. **Google Scholar records** 342 citations of her work, including 286 in the last 5 years: *https://scholar.google.com/citations?hl=en&user=OzgEAzQAAAAJ*. According to Scopus, Dr. Traykovska has 245 citations for 20 publications and an h-index of 9: *https://www.scopus.com/authid/detail.uri?authorId=56656488000*. According to **Web of Science,** 14 of her publications have been cited 203 times, with an h-index of 8: *https://www.webofscience.com/wos/author/record/AAL-2541-2021.*

Sofia University Authors: https://authors.uni-sofia.bg/AuthorPublications.aspx?id=8ceb767c-8d74-43d9-951b-05bfffab0fba **Impact factor = 60,08.**

Scientific publications

1. Dimitrios Kaloudas, **Martina Traykovska,** Nikolet Pavlova, Robert Penchovsky, Design and Applications of Riboregulators, ISBN: 978-981-95-3956-7, Springer, book chapter, 2026 *https://books.google.bg/books/about/Handbook_of_Synthetic_Biology.html?id=KJma0QEACAAJ&redir_esc=y*

2. Dimitrios Kaloudas, Nikolet Pavlova, **Martina Traykovska,** Robert Penchovsky, Targeting bacterial TPP riboswitches using pVEC-conjugated chimeric antisense oligonucleotides, Methods in Enzymology, doi: 10.1016/bs.mie.2026.06.015, Elsevier, . 2026

3. **Martina Traykovska,** Nikolet Pavlova, Dimitrios Kaloudas, Robert Penchovsky, Design and applications of chimeric antisense oligonucleotides that bind TPP mRNAs as antibacterial agents, Journal of Microbiological Methods, 2026, ISSN (print): 0167-7012, ISSN (online): 1872-8359, doi: 10.1016/j.mimet.2026.107700, , IF (2.5 – 2025), Web of Science Quartile: Q3 (2026), SCOPUS, SJR (0.524 - 2025), SJR Quartile: Q3 (2025)

4. Dimitrios Kaloudas, Nikolet Pavlova, **Martina Traykovska,** Robert Penchovsky, Molecular phylogenetics, distribution and evolution of the TPP riboswitch, Genetica, vol: 154, article: 43, 2026, ISSN (print): 0016-6707, ISSN (online): 1573-6857, doi: 10.1007/s10709-026-00292-5, , IF (2 - 2025), Web of Science Quartile: Q2 (2026), SCOPUS, SJR (0.5 - 2025), SCOPUS Quartile: Q2 (2026)

5. Nikolet Pavlova, Dimitrios Kaloudas, **Martina Traykovska,** Robert Penchovsky, Pharmacogenetics and Pharmacogenomics as Enabling Technologies for Precision Drug Development and Personalized Therapy, Current Drug Discovery Technologies, 2026, ISSN (print): 1570-1638, ISSN (online): 1875-6220, doi: 10.2174/0115701638494182260723063335, , SCOPUS, SJR (0.353 - 2025), SJR Quartile: Q3 (2025)

6. Vanya N. Dyakova, **Martina Traykovska,** Nikolet Pavlova, Dimitrios Kaloudas, Robert Penchovsky, Rational Design of Chimeric Antisense Oligonucleotides that Target FMN Riboswitch mRNAs and Inhibit the Growth of Methicillin-Resistant Staphylococcus

aureus, ACS Infectious Diseases, 2026 (online: 2025), ISSN (print): 2373-8227, doi: 10.1021/acsinfecdis.5c00779, ., Web of Science, IF (4.5 – 2025), Web of Science Quartile: Q1 (2025), SCOPUS, SJR (1.241 - 2025), SCOPUS Quartile: Q1 (2025)
https://pubs.acs.org/doi/10.1021/acsinfecdis.5c00779

7. Lozena A. Otcheva, **Martina Traykovska,** Robert Penchovsky, Targeting Bacterial Adenylate Kinase mRNA with a Chimeric Antisense Oligonucleotide for Rational Antibacterial Drug Development, Molecules, vol: 30, 2025, ISSN (online): 1420-3049, doi: 10.3390/molecules30163425, , IF (5.1 – 2025), JCR Quartile: Q2 (2025; Biochemistry & Molecular Biology), SCOPUS, SJR (0.865 – 2024), SCOPUS Quartile: Q1 (2025)
https://www.mdpi.com/1420-3049/30/16/3425

8. Nikolet Pavlova, Vanya Dyakova, **Martina Traykovska,** Dimitrios Kaloudas, Robert Penchovsky, The Application of Aptamers in Pharmacological Drug Development and Therapeutic, ChemistrySelect, vol. 10, issue 28, 2025, ISSN (print): 2365-6549, ISSN (online): 2365-6549, doi: 10.1002/slct.202502954, ., Web of Science, IF (2.3 – 2025), SCOPUS, SJR (0.366 - 2024), SCOPUS Quartile: Q3 (2025)
https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.202502954

9. **Martina Traykovska,** Robert Penchovsky, Design of Antisense Oligonucleotides and Their Application as Antibacterial Agents: Principles, Mechanisms of Action and Challenges, monograph, ISBN: 978-954-07-6132-9, St. Kliment Ohridski University Press, Sofia, 2025
https://penchovsky.atwebpages.com/publications.php?page=3220
Publisher's page: https://unipress.bg/dizayn-na-antisens-oligonukleotidi-i-prilozhenieto-im-kato-antibakterialni-agenti-printsipi-mehanizmi-na-deystvie-i-predizvikatelstva

10. Robert Penchovsky, Antoniya V. Georgieva, Vanya Dyakova, **Martina Traykovska** and Nikolet Pavlova, Antisense and Functional Nucleic Acids in Rational Drug Development, Antibiotics 2024, IF (5.5 – 2025), *https://doi.org/10.3390/antibiotics13030221*, *https://penchovsky.atwebpages.com/publications.php?page=3199*

11. 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, IF (5.5 – 2025).

https://pubmed.ncbi.nlm.nih.gov/37998809/

12. **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 (4.5 – 2025) *https://pubmed.ncbi.nlm.nih.gov/35440139/*

13. **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 (5.5 – 2025) *https://doi.org/10.3390/antibiotics11111662*

14. **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 (5.6 – 2025), doi: 10.1021/acsabm.2c00628 *https://pubmed.ncbi.nlm.nih.gov/36170638/*

15. Nikolet Pavlova, Georgi Y. Miloshev, Antoniya V. Georgieva, **Martina Traykovska,** Robert Penchovsky, "Versatile tools of synthetic biology applied to drug discovery and production", Future Medicinal Chemistry, Q2, IF (3.3 – 2025), 2022 *https://pubmed.ncbi.nlm.nih.gov/35975897/*

16. Georgi Y. Miloshev, **Martina Traykovska,** Dimitrios Kaloudas, Robert Penchovsky, "ENGINEERING A PLASMID AS A REPORTER SYSTEM FOR QUANTIFYING GENE EXPRESSION IN ESCHERICHIA COLI", Proceedings of the Bulgarian Academy of Sciences, 2022, IF (0.4 – 2025) *https://www.proceedings.bas.bg/index.php/cr/article/view/7/7*

17. Aikaterini Valsamatzi-Panagiotou, **Martina Traykovska**, Robert Penchovsky, "Coronavirus SARS-CoV-2: Where do we stand?", Acta Microbiologica Bulgarica, ISSN (online): 2603-3755, 2022, SJR 0.115, Q4 *https://penchovsky.atwebpages.com/publications.php?page=3155*

18. 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://www.sciencedirect.com/book/edited-volume/9780128244692/new-frontiers-and-applications-of-synthetic-biology*

19. **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, IF (4.5 – 2025), Q1 *https://pubmed.ncbi.nlm.nih.gov/34734706/*

20. 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://www.researchgate.net/publication/349699835_EC_MICROBIOLOGY_EC_MICROBIOLOGY_Mini_Review_Why_Some_Riboswitches_are_Suitable_Targets_for_Antibacterial_Drug_Discovery*

21. Aikaterini Valsamatzi-Panagiotou, **Martina Traykovska**, Robert Penchovsky, "Mechanisms of antibacterial drug resistance and approaches to overcome", Drug Discovery Targeting Drug-Resistant Bacteria, 2020, ISBN: 978-0-12-818480-6, DOI: 10.1016/B978-0-12-818480-6.00002-3 *https://www.sciencedirect.com/science/chapter/edited-volume/abs/pii/B9780128184806000023*
22. 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.ch012, *2016 https://doi.org/10.4018/978-1-4666-9811-6.ch012*

23. 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://biomedres.us/fulltexts/BJSTR.MS.ID.001938.php*

24. 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 (7.3 – 2025) *https://pubmed.ncbi.nlm.nih.gov/25981754/*

Participation in and leadership of research projects

Principal investigator:

1. "Development of novel antibacterial agents against resistant strains of *Staphylococcus aureus* and *Enterococcus faecalis*", Bulgarian National Science Fund, Ministry of Education and Science, 2022 – 2024
2. "Development of antisense oligonucleotides that specifically inhibit the bacterial growth of *Porphyromonas gingivalis* and *Helicobacter pylori"*, Funding institution: Bulgarian National Science Fund, Ministry of Education and Science, 2019 – 2022

Participant:

1. "Bioinformatic and genomic analysis of mRNAs (riboswitches and others) found in the genomes of macrolide-resistant *Streptococcus pneumoniae* strains infecting humans", КП-06-М93/1 dated 08.12.2025, No. 2995, Funding institution: Bulgarian National Science Fund, Ministry of Education and Science, 2025 – 2027, Principal investigator: Chief Assistant Professor Nikolet Pavlova, PhD
2. "Development of software systems for the computational design of fast allosteric ribozymes that sense oligonucleotides with precisely defined sequences and a database of clinically significant human genetic variations for two patent applications", European Union, European Commission, 2024 – 2026, Contract No. 70-123-194/02.02.2024, Principal investigator: Prof. Robert Penchovsky, PhD
3. "Design of antisense oligonucleotides conjugated to cell-penetrating oligopeptides as novel antibacterial agents against resistant human pathogenic bacteria for a European patent application", European Union, European Commission, 2023 – 2025, Contract No. 70-123-505/05.07.2023, Principal investigator: Prof. Robert Penchovsky, PhD
4. "Comparative analysis of the efficacy of novel antibacterial agents based on different antisense oligonucleotides using different molecular mechanisms of RNA inhibition", Funding institution: Bulgarian National Science Fund, Ministry of Education and Science, 2022 – 2025

5. “Design of functional nucleic acids for synthetic regulation of gene expression in prokaryotes and eukaryotes”, Funding institution: Bulgarian National Science Fund, Ministry of Education and Science, 2019 – 2022
6. “Design and experimental testing of chimeric antisense oligonucleotides as antibacterial agents”, Funding institution: Bulgarian National Science Fund, Ministry of Education and Science, 2017 – 2020
7. “Application of antisense oligonucleotides as antibacterial agents against *Enterococcus faecalis”*, Funding institution: Sofia University Research Fund, 2020
8. “Antisense oligonucleotides that specifically bind to FMN and SAM riboswitches in human pathogenic bacteria”, Funding institution: Sofia University Research Fund, 2019
9. “Application of antisense oligonucleotides as antibacterial agents against *Staphylococcus aureus”*, Funding institution: Sofia University Research Fund, 2019
10. “Novel methods for developing antibacterial agents against *Listeria monocytogenes* using antisense oligonucleotides”, Funding institution: Sofia University Research Fund, 2018
11. “Novel methods for developing antibiotics against resistant *Escherichia coli* strains using antisense oligonucleotides that inhibit biochemical pathways controlled by riboswitches”, Funding institution: Sofia University Research Fund, 2017
12. “Novel methods for discovering antibiotic agents against resistant *Staphylococcus aureus* strains using antisense oligonucleotides”, Funding institution: Sofia University Research Fund, 2016
13. “Application of antisense oligonucleotides for specific inhibition of bacterial RNAs as a novel method for developing antibiotics”, Funding institution: Sofia University Research Fund, 2015

Participation in scientific conferences

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

Poster presentations:

1. **Martina Traykovska,** Application of antisense oligonucleotides as antibacterial agents against *Enterococcus faecalis*, Sofia Science Festival, 15–16 May 2021, project РД-22-838/2020 (selected as the most successful project in biology)
2. 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, 10–13.10.2018
3. Katya B. Popova, Lozena A. Otcheva, **Martina Traykovska** and Robert Penchovsky, „Probing general toxicity of antisense oligonucleotides to bacterial and mammalian cells“, Conference: 14th Congress of Microbiologists in Bulgaria with International Participation, 10–13.10.2018

Session or plenary presentations:

1. **Martina Traykovska**, Biological function of circular RNA molecules and their role in gynecological diseases, Borovets, Bulgaria, 2026
2. **Martina Traykovska**, Robert Penchovsky, "Engineering microfluidic and nucleic acid-based biosensing devices with versatile applications to modern biotechnology", International Conference on Bio Science, Development and New Opportunities, 20–22 November 2013