NEDİM HACIOSMANOĞLU

PH.D.

CONTACT

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LANGUAGE PROFICIENCY

Turkish - Native

English - YDS 2024/11: 91.25 - A

Laz Language - Native

SKILLS

Biological Engineering

Modelling Biological Systems

Nanofabrication

Toxicity Assestment

Animal Experiments

3D Design & Printing

Biosensors & Diagnostics

Bio-Electronics

"I am an enthusiastic and inquisitive individual with a steadfast dedication to advancing science and generating innovative ideas. With over ten years of experience in project management and laboratory research as an undergraduate and graduate student, I am deeply driven to collaborate with others in pursuit of challenging objectives. Throughout my scientific endeavors, I have been honored with accolades from international projects, actively contributed to numerous grant proposals, and published extensively across diverse fields—from the de novo design of biological systems to bio-electronic interfaces."

EDUCATION

2006-2010

ÇAPA ANATOLIAN TEACHER TRAINING HIGH SCHOOL
High School - Istanbul - Türkiye

2011-2016

ISTANBUL TECHNICAL UNIVERSITY, B.SC.
Faculty of Science and Letters,
Department of Molecular Biology and Genetics
100% English Programme, GPA: 3.00

2016-2019

BILKENT UNIVERSITY, M.SC.
Institute of Material Science and Nanotechnology
National Nanotechnology Research Center (UNAM)
Ankara - Türkiye, GPA: 3.27

2019-2025

BILKENT UNIVERSITY, PH.D.
Institute of Material Science and Nanotechnology
National Nanotechnology Research Center (UNAM)
Ankara - Türkiye, GPA: 3.51, Completion Date: 03/09/2025

2020-Present

ISTANBUL UNIVERSITY, B.SC. STUDENT
Faculty of Open Education - Philosophy

CERTIFICATES & LICENSES & SCORES

KPSS - 2023 - A

KPSS1: 82.70, KPSS2: 82.36, KPSS3: 81.9

ALES-SAY

2024-2 - 74.2

CERTIFICATE OF ANIMAL USE IN EXPERIMENTAL RESEARCH

2021, Valid for mice, rabit and fish

DRIVERS LICENSE

M, B1, B, F

RADIO OPERATOR LICENSE

TB1HNH

DRONE OPERATOR

TR-IHA1H5267242

MEMBERSHIPS

ITU MBG STUDENT CLUB

Active Member and Administrator, 2011-2016

TURKISH SOCIETY FOR EXTRACELLULAR VESICLES (TURSEV)

Active Member, 2024 - Present

PUBLICATIONS & PATENTS

Please visit my Google Scholar or ORCID profile for a detailed list of my academic contributions, which include 10 research articles published (all in Q1 journals), 3 review articles (all in Q1 journals), 4 book chapters, 4 international patents, and 12 conference presentations. My work has accumulated over 110 citations, with an H-index of 5, reflecting sustained impact and recognition in the fields of synthetic biology, nanotechnology, and biosensing.

List of my patents from different cutting-edge subjects include bacterial protein release systems, medical diagnostic devices and new-generation of diagnostic techniques;

Self-Surface-Releasing Bacterial Treatment Method Based on Synthetic Circuit and Protein Engineering,.
WO Patent, WO/2023/128,983

Method of developing heat control platform for isothermal nucleic acid amplification techniques,
WO Patent WO2024144598A1

Determination of species, detection of disease and pathogenicity detection method in eukaryotic exosomes and bacterial outer membrane vesicles,
WO Patent WO2024144599A1

A Riboregulating Biosensor Detecting Sars-Cov-2 Pathogen and A Method of Obtaining Thereof,
WO Patent WO/2023/113,718

AWARDS, HONORS AND *GRANTS*

TUBITAK *2209 Project Fund*, **iGEM 2017 Bronze Medal Winner**, **2017 TUSIAD Sustainability Medalist**, 2017 **Quarry Life Awards National Winner**, *TUBITAK 1002 Project Fund*, Best Poster Presentation – EBAT 2023, NanoLetters Seed Grants Finalist Proposal, *TUBITAK 2211* ***National PhD Scholarship***

PROJECT & WORK EXPERIENCE

September 2012 – January 2016
Undergrad Researcher - ITU MOBGAM (Molecular Biology & Genetics Research Center)

- Archeal (*Sulfolobus solfataricus*) culture experiments, chromatography (Thin layer, FPLC), isolation of biomolecules (DNA, plasmid, protein), protein purification (His-tag, Tap-tag), protein analysis (SDS-PAGE), proteomic experiments (2-D Gel electrophoresis), site-directed mutagenesis.

November 2014 – December 2015
Project Manager - TUBITAK 2209A University Students Research Projects Support Fund

- *Project Title and Number:* '' Investigation of the amino acids responsible for the pH-dependent activity of DNAK molecular chaperone'', (Project Number: 1919B011403057). Performed production, purification, and characterization studies for recombinant DnaK. Budget: 2500 TL (~ 1000 $)

May 2015 – September 2016
Vice Team Leader – ITU iGEM TEAM / Bronze Medal Winner

- Designed and produced a FRET-based protein biosensor for methamphetamine detection.

For more information: http://igem.org/About, http://igem.itu.edu.tr, http://2016.igem.org/Team:Istanbul_Tech

June 2015 – August 2015
Summer Intern – Bilkent University - UNAM (National Nanotechnology Research Center)

- Performed and gained hands-on experience in the isolation and characterization of bacterial biofilm proteins, SEM (Scanning Electron Microscopy), TEM (Transmission Electron Microscopy), and Gibson Assembly molecular cloning.

September 2015 – September 2016
Undergrad Researcher – UHEM (National Center for High-Performance Computing)

- Project title and Number: Molecular Dynamic Simulations of LacI family transcriptional repressor, PurR for the design of a novel biosensor", (Project Number: 1003702015). Performed 250 ns simulation of six different PurR-LacI models to understand the recognition mechanism. I used and wrote NAMD-CHARMM scripts, and used the supercomputer as a project manager.

January 2016 – July 2016
Graduation Project – ITU MOBGAM - UHEM

- Project title: Molecular Dynamic Simulations of HSP70 ATPase Domain with His226 Mutation. Computationally modeled two truncated versions of the DnaK, and the effect of the mutations on phosphate release was investigated by molecular dynamics simulations. Again used and wrote NAMD-CHARMM scripts, and used the supercomputer as a project manager

September 2015 – January 2017
Quarry Life Awards – Heidelberg Cement / National Winner & Sür 2016 Medal Winner

- Quarry Life Award is an international research competition organized in 21 countries with the aim of raising awareness of biodiversity in quarries. Our team, MossBusters, received the National Winner & Sür2016 Medal Winner awards with our project titled "NAKED ROCK FIELD REHABILITATION BY USING MUTUALISTIC LIFE SYSTEMS". Developed novel bioremediation techniques with heat and drought-resistant plants to remediate minefields.

September 2016 – Present
M. Sc. & Ph.D. Candidate – Bilkent University – UNAM (National Nanotechnology Research Center)

- Completed synthetic biology projects with advanced cloning (Gibson & Golden Gate Assembly) and biological or chemical characterization (Western Blot, SDS-PAGE, NGS, SEM, XPS, Raman, AFM) experiments.
- Served as Molecular Genetics Lab Assistant in Spring 2017 and organized an Advanced Molecular Cloning Workshop in January 2018.
- Completed M.Sc. in 2019 with a thesis on a theranostic bio-device for biomedical applications; thesis focused on a next-gen glucose biosensor.
- Collaborated on engineering *E. coli* for nanotoxicity assessment of new materials. Also worked at Boğaziçi University - Department of Electrical & Electronics Engineering for the development of a living antenna system with engineered bacteria (ANTENNALIVE).
- During COVID-19, **contributed to SARS-CoV-2 detection and prevention projects with TUBITAK COVID Consortium**, developing PCR kits, LAMP reactions, and RNA-based detection systems.
    - Worked with viral cultures and developed commercial SARS-CoV-2 test kits.
- Published research and contributed to an international patent during the pandemic.
- Received Animal Experiment Training and Clean Room Training post-2022, certified for animal use in experiments.
- Experienced in microfabrication, including Magnetron Sputtering and E-beam Evaporation, for nano-coatings and metasurface production.
- Ph.D. thesis focuses on 3D printed systems for detecting extracellular vesicles, pathogens, and biomolecule production with engineered bacteria.
- Developing 3D-printed microbioreactors for optimized vesicle production with optical, heating, and mixing functions.
- **Leading the YUVA project** and **collaborating on the ALGALSPACE project** for the **Turkish Space Agency's first space mission**.
    - Prepared space-kit for the project, designed **the first 3D printed object from our country** that travelled to space.
- Committee member for EBAT 2023 and TURSEV 2024
- Prestigious TUBITAK 2211 National PhD scholarship
- Received TUBITAK 1002 funding of 60,000 TL (~$3000).
- Completed Ph.D. in September 2025.

TECHNICAL SKILLS

Molecular Biology Techniques:

- Bacteria, Archea, and Mammalian cell culture aseptic work, hands-on experience
- Biosecurity Level-2 to -3 (contagious organisms) laboratories, hands-on experience
- Advanced DNA cloning, purification, and sequencing, hands-on experience
- RNA sensor design, production and characterization, hands-on experience
- Design experience for multiplex genetic circuits for biosensors, protein production, and nanotoxicity assays
- Protein purification, enzyme production, and characterization, hands-on experience
- Sequencing (DNA, RNA) and sequence characterization, mutation detection, and lineage analysis from organismal data

Nano-structure and Nano-particle Analysis:

- Advanced microscopy (SEM, TEM, Raman, AFM) for characterization, hands-on experience
- Analysis techniques (NTA, Zeta-Size, and FT-IR), hands-on experience

Micro-Nano Fabrication:

- Clean Room training and 3-year experience on clean-room procedures
- Subtractive Manufacturing-Patterning and characterization (E-Beam Evaporator, Magnetron Sputter, Stylus Profilometer, micro-dicer) hands-on experience
- Nanomaterial Chemical Synthesis hands-on experience

Electronic & Mechanical System Design

- Heater, Absorbance Reader and Mixer design with development cards (Arduino, Raspberry Pi)
- Advanced 3D -design (microfluidic, microneedle, microwell, microbioreactor systems) and production with PLA and SLA printers hands-on experience

Computer Skills:

- **Operating Systems:** Windows, IOS, Linux (various distributions including Bio-Linux), TRUBA and UHEM supercomputer user experience
- **Programming Languages:** Python (intermediate), R (intermediate)
- **Bioinformatics Softwares:** VMD, NAMD, CHARMM, PyMol, Autodock Vina, Benchling, Alphafold, Robetta, Chimera
- **Design Softwares:** Adobe Illustrator, Blender, Biorender
- **Engineering Softwares:** SHAPR3D, Fritzing

DEVICE TRAININGS & SETUP

- ESEM Electron Microscope (FEI) Training and Master user (2016-Present)
- Atomic Force Microscope (AFM, Asylum) Training and Master user (2024-Present)
- SNOM + Raman Microscope Training and Master user (2025-Present)
- FTIR Spectrometer (Tensor 37) Training and Master user (2023Present)
- Plasma Enhanced Chemical Vapor Deposition (PECVD, Vaksis) Training and Master user (2022-Present)
- Dicing Saw (Clean Room) Training and Master user (2022-Present)
- Xe, Halogen, Deuterium Light Sources Training and Master user (2022-Present)
- Zeta Potential (Zeta Sizer) Training and Master user (2018-Present)
- Keyence Microscope Training and Master user (2023-Present)
- UV-VIS Spectrophotometer Training and Master user (2016-Present)
- UV-VIS-NIR Spectrophotometer Training and Master user (2016-Present)
- 3D Printer Markerbot, HalotONE, Formlabs Training and Master user (2022-Present)
- Fluorescent and DIC Equipped Upright Microscope Training and Master user (2016-Present)
- Fluorescent and DIC Equipped Inverted Microscope Training and Master user (2016-Present)
- Bioreactors (Sartorius, 2 L / 5 L / 30 L) Training and Master user (2016-Present)
- Centrigures / Microfuges / Ultracentrifuges (Various brands) Training and Master user (2016-Present)
- Gel Imaging and Documentation System (Biorad) Training and Master user (2016-Present)
- Gradient PCR (Biorad) Training and Master user (2016-Present)
- Gradient Real-Time PCR (Biorad) Training and Master user (2016-Present)
- Laminar Flow Cabinets Training and Master user (2016-Present)
- Microplate Reader (M5 Spectramax) Training and Master user (2016-Present)
- Microtomes (Thermo Fisher) Training and Master user (2016-Present)
- Autoclave (Various brands) Training and Master user (2016-Present)

REFERENCES

Asst. Prof. Dr. Fatih İnci
(Bilkent University - National Nanotechnology Research Center) - finci@unam.bilkent.edu.tr

Assoc. Prof. Dr. Ahmet Çağkan İnkaya
(Hacettepe University - Department of Medicine) - inkayaac@yahoo.com