

GÖRKEM AKGÜL

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EDUCATION

USKUDAR UNIVERSITY

Bachelor of Science in Molecular Biology and Genetics (2019 - 2023)

GPA: 3.79

Graduated with **high honors** and **ranked 1st** in the department.

Thesis Title: Design Of Neuron-Specific Lentiviral Vectors And Investigation Of Gene Therapy Applications In Spinal Muscular Atrophy Disease - Supervisor: [Cihan TASTAN](#) - Thesis Poster: [DOI](#)

Bachelor of Engineering in Software Engineering - Double Major (2020 - 2024)

GPA: 3.88

Ongoing Graduation Project: Investigation of Deep Learning Approaches for MRI-based Brain Parcellation - Co-Supervisors: [Nico SCHERF](#) and [Kristin SURPUHI BENLİ](#)

RESEARCH EXPERIENCE

Summer Research Intern at the [Centre for Medical Image Computing at the University of College London](#) *July 2023 - November 2023*

Progression Of Neurodegenerative Disease (POND) Group

- Developed predictive models for Alzheimer's Disease (AD) using diverse biomarkers, including MRI, PET, DTI, genetics, and cognitive tests. Employed ensemble methods with tree-based algorithms to forecast critical AD biomarkers: ADAS-Cog13 score, ventricle volume, and clinical status
- Analyzed the significance of predictors to evaluate their impact on the application of predictive modeling in the onset of AD within clinical trials.

Supervisor: [Neil OXTOBY](#) and [Maitrei KOHLI](#)

Intern/Guest Researcher at [Max Planck Institute for Human Cognitive and Brain Sciences Germany](#) *July 2022 - October 2022 (via Erasmus+) / October 2022 - Present (Remote)*

Neural Data Science and Statistical Computing Group

- Applied several dimensionality reduction techniques (PCA, Laplacian Eigenmaps, UMAP) to connectome data and visualized the gradients with Brainspace for biomarker search.
- Created ground truth labels of pyramidal neurons using QuPath. Implemented CNN-based (for instance: U-net, MASK R-CNN, Stardist, Cellpose) and Vision Transformer-based (Swin-Net, Swin U-Net, Trans U-Net, etc) Neural Networks for pyramidal neuron segmentation.

Supervisor: [Nico SCHERF](#)

Guest Researcher at [Transgenic Cell Technologies and Epigenetics Application and Research Center](#) *January 2021 - June 2023*

- Played a significant role in the preparation of project proposals for funding from prestigious institutions such as [TUBITAK](#) and [TUSEB](#). This effort resulted in the full funding of the project titled *"In Vitro and Ex Vitro Study of New Generation CRISPR-Prime Editing that targets Exon 7/Intron 7 of SMN2 Gene Regulation in Spinal Muscular Atrophy (SMA) and Approaches in SMN1 Encoding Motor Neuron Cell Specific Neural Lentivirus"* by TUSEB.
- Contributed to the development of neuron-specific lentiviral vectors for CRISPR-based therapies, focusing on neurological rare diseases, particularly Spinal Muscular Atrophy (SMA).
- Helped development of innovative therapeutic approaches for treating Retinitis Pigmentosa, utilizing XNA-based antisense oligonucleotides and lentiviral vectors.

Supervisor: [Cihan TASTAN](#)

INDUSTRY EXPERIENCE

Junior Intern Developer at [OPTIIM](#)

September 2016 – June 2017

- As a high school student, worked part-time as a web developer, proficiently utilizing HTML, JavaScript, jQuery, and CSS to create websites for Project Portfolio Planning and Resource Management.
- Collaborated with test engineers to perform load testing and service virtualization, gaining valuable experience in quality assurance and software testing methodologies.

PUBLICATIONS

PATENTS

- CRISPR-PE System For Retinol Dehydrogenase 12 (Rdh12) Gene Mutations For Use In The Treatment Of Retinitis Pigmentosa (RP) Disease (TR/EU, pending, No: TR2021022284A2 / WO2023129095A1)
- Exon 13 Skipping Xeno Nucleic Acid Antisense-Oligonucleotide (XNA-ASO) Sequences For Genetic Therapy Of USH2A-Induced Retinitis Pigmentosa (TR/EU, pending, No: TR2022001648A2 / WO2023154026A1)
- Neural Lentiviral Vector Containing The Functional Abca4 Gene For Use In The Treatment Of Retinitis Pigmentosa (RP) Disease (TR, pending, No: TR2022000448A2)
- Methods for the Treatment of Spinal Muscular Atrop (TR, pending, No: 2021/018884)
- Neurotrophic Factor And Optogenetic System-Based Lentiviral System For Use In Retinal Diseases (TR, pending, No: TR2022021763A2)

AWARDS AND SCHOLARSHIPS

Department Ranking Award

June 2023

I achieved 1st place in the Molecular Biology and Genetics class of 2023 at graduation.

Erasmus Scholarship

June 2022

Successfully earned the Erasmus Scholarship during my internship at MPI CBS through being ranked 5th in Erasmus score based on GPA and English Exam among Bachelor's and Master's applicants.

SKILLS

Programming/Computing Skills: C, Java, Python, MATLAB, HTML, CSS, Machine Learning, Deep Learning, Digital Signal Processing, OpenCV, ImageJ/Fiji

Biological/Research Techniques: PCR, Western Blot, Immunohistochemistry, NGS, Sanger, NCBI BLAST, Viral Vector Design (Lentiviral), Apoptosis Quantitation with Annexin V, Primer Design (Benchling), CRISPR System Design

ADDITIONAL COURSES AND CERTIFICATIONS

- “**BrainX: Cellular Mechanisms of Brain Function**”, Duration: 8 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- “**Multi-BrainX: The Multi-scale brain**”, Duration: 7 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- “**Optimization: principles and algorithms - Linear optimization**”, Duration: 5 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- “**Optimization: principles and algorithms – Network and discrete optimization**”, Duration: 5 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- “**Optimization: principles and algorithms – Unconstrained nonlinear optimization**”, Duration: 6 weeks, [EPFL](#), Platform: Edx, [Certificate](#).

- **“Fundamentals of Biomedical Imaging: Magnetic Resonance Imaging (MRI)”**, Duration: 6 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- **“Image Processing and Analysis for Life Scientists”**, Duration: 7 weeks, [EPFL](#), Platform: Edx, [Certificate](#).
- **“Probability - The Science of Uncertainty and Data”**, Duration: 16 weeks, [MIT](#), Platform: Edx, [Certificate](#).
- **“Digital Signal Processing Specialization”**, Duration: 14 weeks, [EPFL](#), Platform: Coursera, [Certificate](#).
- **“Practical Data Science with MATLAB Specialization”**, Duration: 18 weeks, [Mathworks](#), Platform: Coursera, [Certificate](#).
- **“Machine Learning”**, Duration: 11 weeks, [Stanford University](#), Platform: Coursera, [Certificate](#).
- **“IBM Machine Learning Specialization”**, Duration: 22 weeks, [IBM](#), Platform: Coursera, [Certificate](#).
- **“Deep Learning Specialization”**, Duration: 17 weeks, [DeepLearning.AI](#), Platform: Coursera, [Certificate](#).
- **“DeepLearning.AI TensorFlow Developer Specialization”**, Duration: 16 weeks, [DeepLearning.AI](#), Platform: Coursera, [Certificate](#).
- **“TensorFlow: Advanced Techniques Specialization”**, Duration: 16 weeks, [DeepLearning.AI](#), Platform: Coursera, [Certificate](#).
- **“Probabilistic Deep Learning with TensorFlow 2”**, Duration: 5 weeks, [Imperial College London](#), Platform: Coursera, [Certificate](#).
- **“Neuroscience and Neuroimaging Specialization”**, Duration: 16 weeks, [Johns Hopkins University](#), Platform: Coursera, [Certificate](#).
- **“Brain Science and Neuroscience: The Science of the Future”**, Summer School for High School Students, [Kadir Has University](#), [Certificate](#).
- **“Synapses, Neurons and Brains”**, Duration: 10 weeks, [The Hebrew University of Jerusalem](#), Platform: Coursera, [Certificate](#).
- **“Medical Neuroscience”**, Duration: 13 weeks, [Duke University](#), Platform: Coursera, [Certificate](#).
- **“Anatomy: Human Neuroanatomy”**, Duration: 7 weeks, [Michigan University](#), Platform: Coursera, [Certificate](#).
- **“Circadian clocks: how rhythms structure life”**, Duration: 6 weeks, [LMU Munich](#), Platform: Coursera, [Certificate](#).
- **“Computational Neuroscience”**, Duration: 8 weeks, [University of Washington](#), Platform: Coursera, [Certificate](#).
- **“Sleep: Neurobiology, Medicine, and Society”**, Duration: 12 weeks, [University of Michigan](#), Platform: Coursera, [Certificate](#).
- **“Visual Perception and Brain”**, Duration: 5 weeks, [Duke University](#), Platform: Coursera, [Certificate](#).
- **“Music as Biology: What We Like to Hear and Why”**, Duration: 6 weeks, [Duke University](#), Platform: Coursera, [Certificate](#).