

# Res. Asst. Halis Batuhan ÜNAL



## Personal Information

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## Education

**Master of Science (MSc):** Başkent University / Institute of Science / Department of Molecular Biology and Genetics  
**GPA:** 3.83/4.00  
**Bachelor's Degree (BSc):** Başkent University / Faculty of Science and Literature / Department of Molecular Biology and Genetics  
**GPA:** 3.40/4.00

## Experiences

**2023 -** **Research Assistant**, Başkent University Department of Molecular Biology and Genetics  
**2022 - 2023** **Part-Time Intern**, Başkent University Institute of Food, Agriculture and Livestock Development  
**2020 - 2021** **Part-Time Molecular Biologist**, Genoks Genetic Diseases and Diagnostic Center  
**2020 Jun – 2020 Aug** **Summer Intern**, Asthma and Allergy Pathogenesis Laboratory, at Prof. Dr. İ. Çağatay KARAASLAN's lab in Hacettepe University, Department of Molecular Biology  
**2019 Aug – 2019 Sep** **Voluntary Intern**, Estrogen Receptor & Breast Cancer Laboratory, at Prof. Dr. Mesut MUYAN's lab in Middle East Technical University, Department of Biological Sciences  
**2019 Jun – 2019 Jul** **Voluntary Intern**, Cell Culture Lab, at Prof. Dr. Erkan YURTCU's lab in Başkent University, Department of Medical Biology  
**2018 Jan – 2019 Feb** **Voluntary Intern**, Estrogen Receptor & Breast Cancer Laboratory, at Prof. Dr. Mesut MUYAN's lab in Middle East Technical University, Department of Biological Sciences

## Scholarships

**2021 – 2022 (2 years)** **Master's Student Scholarship**, TÜBİTAK 3501 'Single-Cell RNA Sequencing in *Arabidopsis thaliana* Root Exposed to Boron Toxicity at the Seed and Seedling Stages'  
**2021 – 2023 (2 years)** **BİDEB 2210-A**, TÜBİTAK Domestic Graduate Scholarship Program  
**2021 – 2023 (2 years)** Başkent University Fully Funded Scholarship

## Research Interests

Molecular Biology, Molecular Farming, Virus-Like Particle (VLP), Plant Biotechnology, Transgenic Plant Technologies, Plant Tissue Culture, Bulk RNA Sequencing, Omics Technologies, Single-cell RNA Sequencing, Recombinant DNA Technologies, *Nicotiana benthamiana*, *Arabidopsis thaliana*, *Agrobacterium*-mediated gene transfer

## Experimental Skills

Conventional Molecular Cloning, CRISPR/cas9, DNA/RNA Isolation, PCR, RT-PCR, qRT-PCR, Electrophoresis, Agro-infiltration, Protein isolation from plant, SDS-PAGE, Western Blot, ELISA, RNA-sequencing analysis by using informatic tools (GO, KEGG, PCA etc.), Biochemical analysis (MDA, H<sub>2</sub>O<sub>2</sub>, Proline, Content of Anthocyanin and Flavonoids, Photosynthetic activity, Catalase), Protoplast Isolation, Plant tissue culture.

## Projects

Conservation of critically endangered endemic plant *Prangos denticulata* through in vitro propagation and its genetic characterization (**Başkent University - BAP**) (**Researcher**)

Development of a second-generation multi-epitope homologous virus-like particle (VLP)-based vaccine against SARS-CoV-2 virus on a plant platform (**TÜBİTAK 3501**) (**Thesis Project**)

Single-Cell RNA Sequencing in *Arabidopsis thaliana* Root Exposed to Boron Toxicity at the Seed and Seedling Stages (**TÜBİTAK 3501**) (**Scholarship Recipient**)

## Publications

Yılmaz, H., Kayihan, C., **Ünal, H. B.**, Yaprak, O., & Aksoy, E. (2023), Single-cell transcriptional profiling in Arabidopsis root exposed to B toxicity at seedling stages, bioRxiv, 2023-03

Kayihan C, **Ünal H**, Yaprak O, Mutlu S, Tunç M, Yılmaz I. Finding New Putative Genes Having Role in Excess Boron Responsive Mechanism from Probesets Identified as Unknown in Wheat Cultivars. F1000Research, 2022; :19-19. (SCOPUS)

## Presentations in Congress

Kayihan D, **Ünal B**, Kayihan C, Öztop S, Hanifehnezhad A, Özkul A; Production of a plant-based vaccine candidate against COVID-19 through molecular pharming, European Congress on Biotechnology, June 30 – July 03 2024, Rotterdam / The Netherlands, Pg: 52. (ORAL PRESENTATION) (INTERNATIONAL CONGRESS)

**Halis Batuhan Ünal**, Doğa Selin Kayihan, Ceyhun Kayihan; Cloning the SARS-CoV-2 structural proteins for transient expression of a VLP-based vaccine candidate in *Nicotiana benthamiana*, International Congress on Biotech Solution and Sustainability, May 07-10 2024, Gebze / Turkey, Pg: 27, ISBN: 978-625-94974-0-2. (ORAL PRESENTATION) (INTERNATIONAL CONGRESS)

Hikmet YILMAZ, Ceyhun KAYIHAN, **Halis Batuhan ÜNAL**, Oğuzhan YAPRAK, Emre AKSOY, Buğra CAN; Single-Cell Transcriptional Profiling in Root Tissues of Arabidopsis thaliana Exposed to Boron Toxicity at at Seedling Stages, International Congress on Biotech Solution and Sustainability, May 07-10 2024, Gebze / Turkey, Pg: 21, ISBN: 978-625-94974-0-2. (ORAL PRESENTATION) (INTERNATIONAL CONGRESS)

Ceyhun Kayihan, Emre Aksoy, Doğa Selin Kayihan, Ümit Barış Kutman, **Halis Batuhan Ünal**, Oğuzhan Yaprak, Neslihan Yaşar; Physiological and biochemical analyzes in nla mutant *Arabidopsis thaliana* plant under boron toxicity, 25. Ulusal Biyoloji Kongresi, 14 July .2023 İzmir / TURKEY. (ORAL PRESENTATION) (NATIONAL CONGRESS)

Tunc Melis V., **Unal H. Batuhan** & Gokdemir F. Seyma; Genome-wide analysis of GATA Transcription factor family in *Amborella trichopoda*, International Congress of Engineering and Natural Sciences Studies (ICENSS2021), May 07-09 2021, Ankara / TURKEY, Pg:291-302. (ORAL PRESENTATION) (INTERNATIONAL CONGRESS)

## References

### **Prof. Dr. Füsün EYİDOĞAN**

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### **Assoc. Prof. Ceyhun KAYIHAN (Supervisor)**

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### **Asst. Prof. Doğa Selin KAYIHAN (Co-Supervisor)**

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