Postdoctoral Researcher Positions

The **Karaman Research Group** invites applications from highly motivated postdoctoral researchers to join our interdisciplinary research program focusing on **cancer biology, genome stability, and translational drug discovery**.

Our laboratory integrates approaches from **molecular biology, cancer metabolism, proteomics, metabolomics, and computer-aided drug design** to elucidate disease mechanisms and translate these discoveries into novel therapeutic strategies.

These positions will be conducted as **full-time research fellowship positions**, contingent upon successful applications to **national and international postdoctoral funding programs**.

Funding Opportunities

Our research group will provide **scientific mentorship and proposal development support** for the following funding schemes:

- TÜBİTAK 2218 – National Postdoctoral Research Fellowship Program
- **International researcher exchange programs** (Marie Skłodowska-Curie Staff Exchange, TÜBİTAK 2221 – Fellowships for Visiting Scientists and Scientists on Sabbatical Leave)
- **Other national and international research funding programs**

Research proposals will be developed jointly with selected candidates, and **successful grant applications will provide funding for the researchers' fellowships and research expenses**.

Selection Process

Applications will undergo an **initial screening process**.

Candidates who successfully pass the preliminary evaluation will be **invited to an online interview**, after which the **final selection will be made**.

1. DNA Repair Mechanisms and Genome Stability

This research axis focuses on the molecular mechanisms of **DNA repair**, with particular emphasis on the **nucleotide excision repair (NER) pathway**.

Research topics include:

- Molecular architecture and regulation of **global genome repair (GG-NER)** and **transcription-coupled repair (TC-NER)**
- The role of defective DNA repair in **cancer development, premature aging, and genome instability disorders**
- **Proteomic and metabolomic alterations** associated with DNA repair activity
- Identification of **repair-associated biomarkers and therapeutic vulnerabilities**

Required Technical Expertise:

Applicants are expected to have demonstrated hands-on experience in the following experimental techniques:

- **Mammalian cell culture techniques** and cellular experimental models
- **Isolation and characterization of nucleic acids and proteins**, including DNA, RNA, and protein extraction methods
- **Electrophoresis-based analytical methods**, such as agarose gel electrophoresis and SDS-PAGE
- **Blotting techniques**, including Western blotting and related protein detection methods
- **Immunoprecipitation-based approaches**, including co-immunoprecipitation and protein–protein interaction analysis

Experience in additional molecular biology, proteomics, or metabolomics methodologies will be considered an advantage.

2. Molecular Metabolism of Cancer

This research program explores the **interplay between DNA damage responses and cancer metabolism**, particularly focusing on **glucose metabolism, the pentose phosphate pathway, and redox homeostasis**.

Research topics include:

- Metabolic rewiring during **DNA damage and repair processes**
- The role of **NADPH metabolism and the pentose phosphate pathway in genome stability**
- **Proteomic and metabolomic responses** to genotoxic stress
- Identification of **metabolic vulnerabilities** for therapeutic targeting

Required Technical Expertise:

Applicants must demonstrate **strong expertise in high-resolution mass spectrometry–based metabolomics and/or proteomics**, particularly using **Orbitrap mass spectrometry platforms**.

The successful candidate is expected to have **hands-on experience and technical proficiency** in the following areas:

- **Operation and methodological development using Orbitrap mass spectrometers** for metabolomic and/or proteomic analysis
- **Sample preparation workflows** for metabolomics and proteomics, including protein digestion, metabolite extraction, and sample cleanup procedures
- **LC–MS/MS experimental design and optimization**, including chromatographic separation and mass spectrometry acquisition parameters
- **Data acquisition strategies**, including DDA (Data Dependent Acquisition) and DIA (Data Independent Acquisition) approaches
- **Processing and interpretation of large-scale omics datasets**, including metabolomics and proteomics data analysis
- Experience with **bioinformatics tools and software** for MS data analysis (e.g., Proteome Discoverer, MaxQuant, Skyline, MetaboAnalyst, or similar platforms)
- Ability to **integrate proteomic and metabolomic datasets with biological pathway analysis**

Demonstrated expertise in Orbitrap-based mass spectrometry workflows will be considered a critical qualification for this position.

3. Translational Drug Discovery and Development

This axis aims to develop **novel therapeutic strategies for cancer** through an integrated translational research pipeline.

Research activities include:

- **Computer-aided drug design (CADD)** and structure-based modeling
- **Chemical synthesis and optimization** of small-molecule candidates
- Evaluation of biological activity using **in vitro, ex vivo, and in vivo models**
- **Proteomic and metabolomic profiling** to elucidate drug mechanisms of action

Required Technical Expertise:

Applicants must demonstrate **strong expertise in computer-aided drug design (CADD)** and **AI-assisted drug discovery approaches** for the identification and optimization of small-molecule therapeutics.

The successful candidate is expected to have **hands-on experience and technical proficiency** in the following areas:

- **Structure-based drug design (SBDD)** and **ligand-based drug design (LBDD)** methodologies
- **Molecular docking and virtual screening** workflows for target identification and lead optimization
- **Molecular dynamics simulations** and protein–ligand interaction analysis
- **Pharmacophore modeling, QSAR analysis, and binding affinity prediction**
- Experience with **AI-driven drug discovery approaches**, including machine learning or deep learning applications for compound screening and optimization
- Practical experience with **public drug design platforms and computational resources**, such as AutoDock, Schrödinger tools, MOE, OpenEye, or comparable software environments
- Familiarity with **large-scale compound libraries and virtual screening pipelines**, including the use of public chemical databases (e.g., PubChem, ChEMBL, ZINC)
- Ability to integrate **computational predictions with experimental validation workflows**

Demonstrated expertise in AI-assisted drug design and public computational drug discovery tools will be considered a critical qualification for this position.