IREM CULHA TASKIN, Ph.D.

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RESEARCH PROFILE

Neuroscience Ph.D. and postdoctoral researcher in preclinical and translational neuroscience, blood-brain barrier biology, and neural repair. Experience with in vivo mouse models, in vitro cell culture, molecular biology, immunostaining, and quantitative imaging. First-author publications in Stroke and Brain Hemorrhages.

EDUCATION

Ph.D., 2018 - 2023	Neuroscience, Istanbul Medipol University, Istanbul, Turkey
M.S., 2016 - 2018	Physiology, Yeditepe University, Istanbul, Turkey
B.S., 2012 - 2016	Physiotherapy and Rehabilitation, Yeditepe University, Istanbul, Turkey

RESEARCH EXPERIENCE

June 2024 - Present — **Postdoctoral Researcher**, **University of South Florida**, Morsani College of Medicine, Tampa, FL

- Design and conduct preclinical in vivo studies of blood-brain barrier (BBB) regulation, neurovascular injury, and neurodegenerative diseases using genetically modified mouse models.
- Perform rodent handling, stereotaxic surgery, intracranial injections, disease modeling, tissue collection, brain and spinal cord dissection, and neurological and behavioral assessments.
- Apply mammalian cell culture, PCR, genotyping, Western blotting, flow cytometry, RNA sequencing (RNA-seq), electrophysiology, and drug pharmacokinetic (PK) methods.
- Perform tissue processing, histology, immunohistochemistry (IHC), immunofluorescence (IF), and light, fluorescence, confocal, and transmission electron microscopy (TEM).
- Use quantitative microscopy, image analysis, and molecular and cellular assessments to evaluate tissue injury, protein expression, vascular integrity, and functional outcomes.
- Investigate pericyte, endothelial cell, astrocyte, and extracellular matrix interactions in BBB regulation, including pericytic integrin beta-1 signaling after intracerebral hemorrhage (ICH).
- Contribute to NIH/NIA-funded neurovascular research (R01AG065345), collaborating on experimental design, troubleshooting, data analysis, interpretation, and scientific presentations.
- Contribute to manuscript preparation and grant writing, including a submitted 2026 American Heart Association Postdoctoral Fellowship application. Published first-author papers in Stroke (2026) and Brain Hemorrhages (2025).

Jan. - June 2024 **Postdoctoral Associate**, **University of Miami - Miami Project to Cure Paralysis**, Miami, FL

- Contributed to Department of Defense-funded preclinical research on Schwann-cell-based tissue engineering and regenerative approaches to spinal cord injury (SCI) repair.
- Performed primary Schwann cell culture and supported in vitro cell-based experiments investigating neural tissue repair.
- Collaborated on experimental procedures and preparation of cellular models for tissue-engineering studies.

2018 - 2023 **Senior Research Assistant / Doctoral Researcher**, **Istanbul Medipol University - REMER**, Istanbul, Turkey

- Conducted preclinical central nervous system (CNS) research on spinal cord injury, neurodegeneration, neural plasticity, and neurological recovery at the Regenerative and Restorative Medicine Research Center (REMER).
- Used in vivo rodent spinal cord injury models, tissue collection, and neurological and motor function assessments to investigate injury and recovery.
- Applied histology, tissue sectioning, immunostaining, microscopy, and quantitative image analysis to assess neuronal survival, tissue remodeling, and axonal regeneration.
- Investigated BMAL1-related mechanisms in neural repair and contributed to published research on neurological recovery after spinal cord injury.

2016 - 2018 **Research Assistant**, **Yeditepe University**, Physiology / Nanobiotechnology and Molecular Engineering, Istanbul, Turkey

- Conducted in vitro research in physiology, nanobiotechnology, and molecular engineering, studying the biological effects of boron nitride nanomaterials.
- Used cell culture and experimental assays to evaluate cellular responses and oxidative stress associated with hexagonal boron nitride materials.
- Contributed to peer-reviewed publications on nanomaterial bioapplications and cellular oxidative stress.

2016 - 2017 **Teaching Assistant**, **Yeditepe University School of Medicine**, Istanbul, Turkey

- Assisted with medical physiology laboratory courses and practical teaching sessions for medical students.
- Supported hands-on laboratory activities and student learning in fundamental physiology.

2014 - 2016 **Physiotherapy and Rehabilitation Intern**, **hospitals and rehabilitation centers**, Istanbul, Turkey

- Completed supervised clinical training in physiotherapy and rehabilitation across hospitals and rehabilitation centers.
- Gained practical exposure to adult and pediatric rehabilitation services in clinical settings.

PUBLICATIONS

1. Culha-Taskin I, Nasrollahi A, Yao Y. Loss of pericytic integrin-β1 exacerbates blood-brain barrier damage and hemorrhagic brain injury. Stroke. 2026;57(9):2839-2852. DOI
2. Culha Taskin I, Yao Y. Immune cells in intracerebral hemorrhage. Brain Hemorrhages. 2025;6(2):86-94. DOI
3. Balçıkanlı Z, Çulha İ, Dilsiz P, et al. Lithium promotes long-term neurological recovery after spinal cord injury in mice by enhancing neuronal survival, gray and white matter remodeling, and long-distance axonal regeneration. Front Cell Neurosci. 2022;16:1012523. DOI
4. Yılmaz H, Yılmaz D, Çulha Taşkın İ, Çulha M. Pharmaceutical applications of a nanospectroscopic technique: Surface-enhanced Raman spectroscopy. Adv Drug Deliv Rev. 2022;184:114184. DOI
5. Çulha Taşkın İ, Şen Ö, Emanet M, Çulha M, Yılmaz B. Hexagonal boron nitrides reduce the oxidative stress on cells. Nanotechnology. 2020;31(21):215101. DOI
6. Emanet M, Şen Ö, Çulha Taşkın İ, Çulha M. Synthesis, functionalization, and bioapplications of two-dimensional boron nitride nanomaterials. Front Bioeng Biotechnol. 2019;7:363. DOI

TECHNICAL SKILLS

Animal models and surgery: In vivo rodent models; collagenase-induced ICH and spinal cord injury models; stereotaxic surgery; intracranial and intraspinal injections; tissue collection; brain and spinal cord dissection.

Mouse genetics and molecular biology: Conditional Cre-loxP mouse models; pericyte-specific Itgb1 knockout; polymerase chain reaction (PCR); genotyping; Western blotting; RNA-seq.

Neurological and behavioral testing: Neurological deficit scoring; corner test; beam walk; wire hang; motor function assessments.

Blood-brain barrier and neurovascular analysis: BBB leakage; hemoglobin extravasation; hematoma volume; Claudin-5, ZO-1, Caveolin-1, Mfsd2a, PDGFRβ, and AQP4 analysis.

Histology and immunostaining: Brain and spinal cord sectioning; cresyl violet staining; IHC and IF of vascular, glial, and neuronal markers.

Microscopy and image analysis: Confocal, fluorescence, bright-field, and transmission electron microscopy (TEM); ImageJ/Fiji; ZEN; quantitative image analysis.

Cell culture and cellular assays: Primary Schwann cell culture; mammalian cell culture; in vitro oxidative stress studies.

Additional methods: Flow cytometry; electrophysiology; drug pharmacokinetic methods.

Data analysis and programming: Quantitative experimental data analysis; data interpretation; scientific figure preparation; Python; MATLAB.

ACADEMIC PEER REVIEW

Frontiers in Aging Neuroscience | 2026
Frontiers in Immunology | 2026 (two reviews)
Frontiers in Neurology | 2025

SOCIETY MEMBERSHIPS

2025 - Present American Heart Association (AHA) - Stroke Council, Professional Member

CERTIFICATES

Certificate of Animal Use in Experimental Research, Yeditepe University Faculty of Medicine, Experimental Research Center (January 12-21, 2017).