

CURRICULUM VITAE

MURAT S. DURAKOGLUGIL, MD, PhD

Assistant Professor | Molecular Genetics | Translational Neuroscience

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ACADEMIC PROFILE

Physician-scientist and translational neuroscientist with an established research program in synaptic physiology, ApoE/Reelin signaling, Alzheimer's disease, neurodevelopmental biology, and mechanisms of synaptic homeostasis. Research integrates electrophysiology, molecular and biochemical approaches, imaging, mouse genetics, pharmacology, and quantitative data analysis. Experienced in research leadership, collaborative grant-supported science, mentoring, core-facility leadership, manuscript and grant development, and multidisciplinary neuroscience.

EDUCATION

1998–2003 PhD, Medical / Clinical Pharmacology and Neuroscience

Hacettepe University Medical School, Ankara, Turkey

1990–1996 Doctor of Medicine (MD)

Hacettepe University Medical School, Ankara, Turkey

POSTGRADUATE TRAINING

2006–2009 Postdoctoral Research Fellow

Department of Molecular Genetics, UT Southwestern Medical Center

2003–2006 Postdoctoral Research Fellow

Department of Pharmacology & Neuroscience, University of Dundee, Scotland, UK

2002–2003 Postgraduate Research Student / British Council Scholar

University of Dundee, Scotland, UK

1996–2003 Postgraduate medical training

Clinical Pharmacology; Pediatrics; Hacettepe University, Ankara, Turkey

ACADEMIC APPOINTMENTS

2011–Present Assistant Professor

Department of Molecular Genetics / Center for Translational Neurodegeneration Research, UT Southwestern Medical Center

2009–2011 Assistant Instructor

Department of Molecular Genetics, UT Southwestern Medical Center

RESEARCH LEADERSHIP AND SCIENTIFIC CONTRIBUTIONS

- Reelin signaling and synaptic homeostasis — defined mechanisms linking Reelin to neuronal excitability, receptor trafficking, STEP61 signaling, AMPAR/NMDAR function, protein translation, and homeostatic plasticity.
- ApoE/ApoER2 biology in Alzheimer's disease — contributed to mechanistic studies of ApoE4-associated receptor recycling, synaptic dysfunction, endosomal biology, ApoER2 signaling, and amyloid-related pathobiology.

- Synaptic physiology and plasticity — extensive expertise in field electrophysiology, whole-cell patch clamp, LTP/LTD, mGluR-LTD, NMDA/AMPA receptor function, and pharmacologic modulation.
- Reelin–FMRP translational axis — developed a framework linking extracellular Reelin signaling to FMRP-dependent translational control, synaptic protein homeostasis, and convergence of neurodevelopmental and neurodegenerative mechanisms.
- Translational target validation — designed preclinical studies involving ApoE/Reelin biology, endosomal trafficking, gamma-secretase modulation, lithium/GSK3 pathways, and disease-relevant models.
- Electrophysiology Core leadership — responsible for experimental strategy, execution, analysis, equipment oversight, collaborative studies, grant support, and trainee/staff mentorship.

RESEARCH SUPPORT

- NIH/NINDS R01 NS093382, Molecular Basis of Synaptic Suppression by ApoE (Herz), 2016–2020. Role: Faculty Investigator / collaborative contributor.
- NIH/NIA RF1 AG053391, Physiology and Pathophysiology of ApoER2 Splicing in Alzheimer's Disease (Herz), 2016–2021. Role: Faculty Investigator / collaborative contributor.
- Darrell K. Royal Research Fund for Alzheimer's Disease, NMDA Receptor Regulation in Alzheimer's Disease and Memory Enhancement, 2014–2017. Role: Principal Investigator.
- BrightFocus Alzheimer's Disease Research Award, Targeting the Endosome for Alzheimer's Drug Discovery, 2016–2019. Role: Faculty contributor.
- NIH P30 AG012300 Pilot Project, Reelin in Tau Phosphorylation and Synaptic Dysfunction in Alzheimer's Disease, 2011–2012. Role: Principal Investigator.

PEER-REVIEWED PUBLICATIONS

1. Durakoglulil MS. Reelin signaling as a translational rheostat: linking synaptic homeostasis to neurodevelopment and neurodegeneration. *Front Mol Neurosci*. 2025;18:1731914.
2. Calvier L, Alexander A, Marckx AT, Kounnas MZ, Durakoglulil M, Herz J. Safety of Anti-Reelin Therapeutic Approaches for Chronic Inflammatory Diseases. *Cells*. 2024;13(7):583.
3. Wasser CR, Werthmann GC, Hall EM, Kuhbandner K, Wong CH, Durakoglulil MS, Herz J. Regulation of the hippocampal transcriptome by Apoer2-ICD release. *Mol Neurodegener*. 2023;18:62.
4. Durakoglulil MS, Wasser CR, Wong CH, Pohlkamp T, Xian X, Lane-Donovan C, Fritschle K, Naestle L, Herz J. Reelin Regulates Neuronal Excitability through STEP61 and Calcium Permeable AMPARs in an NMDAR-Dependent Manner. *J Neurosci*. 2021;41:7340-7349.
5. Pohlkamp T, Xian X, Wong CH, Durakoglulil MS, Werthmann GC, Saido TC, Evers BM, White CL 3rd, Connor J, Hammer RE, Herz J. NHE6 depletion corrects ApoE4-mediated synaptic impairments and reduces amyloid plaque load. *eLife*. 2021;10:e72034.
6. Kounnas MZ, Durakoglulil MS, Herz J, Comer WT. NGP 555, a gamma-secretase modulator, shows a beneficial shift in the ratio of amyloid biomarkers in human cerebrospinal fluid at safe doses. *Alzheimers Dement (N Y)*. 2019.

7. Xian X, Pohlkamp T, Durakoglulugil MS, Wong CH, Beck JK, Lane-Donovan C, Plattner F, Herz J. Reversal of ApoE4-induced recycling block as a novel prevention approach for Alzheimer's disease. *eLife*. 2018;7:e40048.
8. Lane-Donovan C, Wong WM, Durakoglulugil MS, Wasser CR, Jiang S, Xian X, Herz J. Genetic Restoration of Plasma ApoE Improves Cognition and Partially Restores Synaptic Defects in ApoE-Deficient Mice. *J Neurosci*. 2016;36:10141-10150.
9. Lane-Donovan C, Philips GT, Wasser CR, Durakoglulugil MS, Masiulis I, Upadhaya A, et al. Reelin protects against amyloid beta toxicity in vivo. *Sci Signal*. 2015;8:ra67.
10. Pohlkamp T, Durakoglulugil M, Lane-Donovan C, Xian X, Johnson EB, Hammer RE, Herz J. Lrp4 domains differentially regulate limb/brain development and synaptic plasticity. *PLoS One*. 2015;10(2).
11. Wasser CR, Masiulis I, Durakoglulugil MS, Lane-Donovan C, Xian X, Beffert U, et al. Differential splicing and glycosylation of Apoer2 alters synaptic plasticity and fear learning. *Sci Signal*. 2014;7:ra113.
12. Bal M, Leitz J, Reese AL, Ramirez D-O, Durakoglulugil M, Herz J, Monteggia LM, Kavalali ET. Reelin mobilizes a VAMP7-dependent synaptic vesicle pool and selectively augments spontaneous neurotransmission. *Neuron*. 2013;80:934-946.
13. Chen Y, Durakoglulugil MS, Xian X, Herz J. ApoE4 reduces glutamate receptor function and synaptic plasticity by selectively impairing ApoE receptor recycling. *Proc Natl Acad Sci U S A*. 2010;107:12011-12016. *Equal contribution.
14. Durakoglulugil MS, Chen Y, White CL, Kavalali ET, Herz J. Reelin signaling antagonizes beta-amyloid at the synapse. *Proc Natl Acad Sci U S A*. 2009;106:15938-15943.
15. Durakoglulugil MS, Orer HS. Cannabinoid Receptor Activation in the Nucleus Tractus Solitarius Produces Baroreflex-Like Responses in the Rat. *Int J Biomed Sci*. 2008;4:229-237.
16. Peden DR, Petitjean CM, Herd MB, Durakoglulugil MS, Rosahl TW, Wafford K, Homanics GE, Belelli D, Fritschy JM, Lambert JJ. Developmental maturation of synaptic and extrasynaptic GABAA receptors in mouse thalamic ventrobasal neurones. *J Physiol*. 2008;586:965-987.
17. Durakoglulugil M, Irving AJ, Harvey J. Leptin induces a novel form of NMDA receptor-dependent long-term depression. *J Neurochem*. 2005;95:396-405.
18. Tombakoglu M, Durakoglulugil M, Kale G, Orer HS, Bulun A, Anlar B. Transient intrauterine hypotension causes apoptosis in fetal rat brain and affects learning. *Pediatr Res*. 2003;53:977-982.
19. Otçu S, Durakoğulugil M, Orer HS, Tanyel FC. Contralateral genitofemoral sympathetic nerve discharge increases following ipsilateral testicular torsion. *Urol Res*. 2002;30:324-328.

MANUSCRIPT IN REVIEW

Durakoglulugil MS, Kuhbandner K, Alexander AE, Wasser CR, Terrones T, Wong CH, Naestle L, Herz J. Reelin Conditional Knockdown Causes FMRP Overexpression And Synaptic Regression. In review (PNAS).

SELECTED PRESENTATIONS AND ABSTRACTS

- Kuhbandner K, Alexander AE, Wasser CR, Terrones T, Naestle L, Wong CH, Herz J, Durakoglulugil MS. Reelin's role in local synaptic protein synthesis and synaptic maturation. UTSW SURF Program, 2022.

- Ji J, Wasser C, Kuhbandner K, Herz J, Durakogluligil MS. Reelin Deficiency Disrupts Maturation of GABAergic Synapses. UTSW SURF Program, 2021.
- Durakogluligil MS, Wasser C, Lane C, Xian D, Herz J. ApoE isoform-dependent redistribution of AMPA receptors regulates DHPG-induced long-term depression. UTSW Neuroscience Retreat, 2013.
- Herz J, Durakogluligil M, Yang Y, Jiang S, Philips G, Wasser K, Lane C, Xian X. Molecular Basis for the Role of ApoE4 in Alzheimer's Disease. Keystone Symposium, 2012.

TEACHING AND MENTORING

- Research mentoring of graduate students, postdoctoral fellows, research technicians, summer research trainees, and physician-scientists.
- Mentored UTSW SURF/AMGEN and STARS trainees; research training includes electrophysiology, experimental design, data analysis, figure preparation, and scientific communication.
- Recent trainees include Axel Villalba (STARS Summer Research Program, 2024), Magalie Lambert (postdoctoral researcher), and Sharon Wu (graduate student).

PROFESSIONAL AND ACADEMIC SERVICE

- Guest Editorial Board Member, Frontiers in Molecular Neuroscience.
- Reviewer, Biological Psychiatry.
- Head of electrophysiology core activities, Center for Translational Neurodegeneration Research, UT Southwestern.

HONORS AND AWARDS

- British Council Scholarship, University of Dundee.
- Darrell K. Royal Alzheimer's Research Award.
- Turkish Pharmacological Society, 2nd Prize, Poster Contest.
- Eczacibasi Scientific Research Project Grant.

TECHNICAL EXPERTISE

Electrophysiology: fEPSP, LTP/LTD, whole-cell patch clamp, miniature synaptic currents, pCLAMP/Clampfit. Molecular/biochemical: Western blotting, synaptosomes, co-IP, surface biotinylation, RT-qPCR, ELISA/immunoassays. Imaging/histology: immunohistochemistry, immunofluorescence, confocal/widefield microscopy, ImageJ/Fiji. Models/data: transgenic mouse models, pharmacologic interventions, GraphPad Prism, Excel, Python workflows, scientific visualization and statistical analysis.