

MICHAEL D. EHLERS

Address HHMI, Department of Neurobiology
Duke University Medical Center
317 Bryan Research Building
Research Dr.
Box 3209
Durham, NC 27710
USA
(919)684-1828
FAX (919)668-0631
e-mail: ehlers@neuro.duke.edu

Education

- 1998: *Doctor of Medicine*, **The Johns Hopkins University School of Medicine**,
Baltimore, MD.
1998: *Doctor of Philosophy*, **The Johns Hopkins University School of Medicine**,
Department of Neuroscience, Baltimore, MD.
1991: *Bachelor of Science with Honors*, Chemistry, **California Institute of Technology**,
Pasadena, CA

Professional Experience

2008-present *Professor*, **Duke University Medical Center**, Department of Neurobiology,
with joint appointments in the Department of Cell Biology, the Department of
Pharmacology and Cancer Biology, and the Department of Pathology

Current interests include understanding cell biological mechanisms that construct, shape, and maintain neuronal architecture and circuitry. Ongoing studies focus on identifying mechanisms underlying glutamate receptor trafficking at excitatory synapses, the secretory and endocytic machinery of dendrites and spines, and cellular mechanisms of circuit plasticity in the intact rodent nervous system.

2005-present *Investigator*, **Howard Hughes Medical Institute**

2004-2007 *Associate Professor*, **Duke University Medical Center**, Department of Neurobiology,
with joint appointments in the Department of Cell Biology, the Department of
Pharmacology and Cancer Biology, and the Department of Pathology

Revealed cellular mechanisms of protein trafficking and turnover in neuronal dendrites and their relationship to synapse formation and function.

2003-2005 *Director*, ***Neuroproteomics Laboratory***, **Duke University Medical Center**

Developed quantitative analysis of synaptic protein ensembles in plasticity and pathology. Assisted in identification and validation of biomarkers in neurologic and psychiatric disease, and fractionation methods for protein complexes from nervous tissue.

1998-2004 *Assistant Professor*, **Duke University Medical Center**, Department of Neurobiology,
with joint appointments in the Department of Cell Biology and the Department of
Pharmacology and Cancer Biology

1996-1998: Postdoctoral Fellow, Laboratory of Dr. Richard L. Huganir, **The Johns Hopkins University School of Medicine**, Department of Neuroscience.

Identified and characterized the association of NMDA-type glutamate receptors with neuronal intermediate filaments. Investigated structural features of NMDA receptors required for calcium/calmodulin-dependent inactivation. Investigated action of protein kinases and protein phosphatases on NMDA-type glutamate receptors. Identified cellular mechanisms involved in activity-dependent alterations in the number of postsynaptic AMPA-type glutamate receptors.

1994-1996: Doctoral Research, Laboratory of Dr. Richard L. Huganir, **The Johns Hopkins University School of Medicine**, Department of Neuroscience.

Identified novel mechanisms involved in regulating the subcellular localization of NMDA-type glutamate receptor subunits. Elucidated the primary molecular means by which NMDA receptor activity is controlled by intracellular calcium.

1992-1993: Graduate Research Assistant, Laboratory of Dr. Donald L. Price, **The Johns Hopkins University School of Medicine**, Department of Pathology.

Used in vivo animal models to describe the retrograde neuronal transport of neurotrophin receptors. Developed an in vitro primary neuronal culture system for the study of gene regulation during apoptosis.

1992: Graduate Research Assistant, Laboratories of Dr. J. James Frost and Dr. Ursula Scheffel, **The Johns Hopkins University School of Medicine**, Department of Radiology.

Examined the distribution of dopamine reuptake sites in mouse brain using high affinity radiolabeled cocaine analogs. Helped design clinical studies of dopamine reuptake site distribution in the living brains of patients recently diagnosed with Parkinson's Disease.

1990-1991: Undergraduate Research Assistant, Laboratory of Dr. Jesse L. Beauchamp, **California Institute of Technology**, Division of Chemistry and Chemical Engineering.

Examined the chemical reactivity and energy absorption properties of peptides in the gas phase using laser ablation and ion cyclotron resonance spectrometry.

1988-1990: Undergraduate Research Assistant, Laboratory of Dr. John H. Richards, **California Institute of Technology**, Division of Chemistry and Chemical Engineering.

Generated structural mutants of E. coli beta-lactamase for use in kinetic assays of enzymatic activity.

Teaching Experience

2003-present Neurobiology of Disease (NBI 361), **Duke University Medical Center**

Lectures on clinical features and pathogenesis of neurodegenerative disorders given as part of an upper level graduate course.

2001-2002 Cellular Signaling (CBI 417), **Duke University Medical Center**

Lectures on cellular mechanisms of learning and memory given as part of an advanced graduate course in Cell Biology.

1999-present: Basic Neurobiology (MBI 202), **Duke University Medical Center**

Lectures on neurotransmitters and neurotransmitter receptors given to first year medical students.

1999-present: Molecular Cell Biology (CBI 251), **Duke University Medical Center**

Lectures on signal transduction mechanisms given as part of the Cell & Molecular Biology Graduate Program curriculum.

1998-2000: **Neuronal Signaling (NBI 317), Duke University Medical Center.**

Lectures on ion channels, receptors, and synaptic plasticity given as part of the Neurobiology Graduate Program core curriculum.

1992-1994: ***Teaching Assistant*, Medical Neuroscience Course, The Johns Hopkins University School of Medicine, Department of Neuroscience..**

Conducted teaching sessions with sections of 20-25 medical students covering cellular neurobiology and neuroanatomy in both formal and small tutorial settings.

1990-1991: ***Senior Teaching Assistant*, Organic Synthesis Teaching Laboratories, California Institute of Technology, Division of Chemistry and Chemical Engineering.**

Responsible for designing and implementing laboratory exercises for the Organic Synthesis courses. Taught laboratory courses with sections of 10-12 undergraduates.

1989-1991: ***Tutor in Chemistry, Biology, and Mathematics*, California Institute of Technology, Office of the Dean of Students, Scientific Outreach Program.**

Tutored local high school students recognized for excellence in the natural sciences.

Awards and Fellowships

Breakthrough Research Award, North Carolina Biotechnology Center, 2008

awarded to a single North Carolina researcher for outstanding breakthrough research in the life sciences

Thomas Langford Lectureship Award, 2008

Society for Neuroscience Young Investigator Award, 2007

given to a young investigator within 10 years of his/her Ph.D. for outstanding research in neuroscience

John J. Abel Award in Pharmacology, 2007

awarded for original, outstanding research in the field of pharmacology by a young investigator under 40

Daniel X. Freedman Award for outstanding basic science research, NARSAD, 2006

Fulbright Scholar Award, 2006

Howard Hughes Medical Institute, Investigator, 2005

Thomas Langford Lectureship Award, 2004

Wakeman Scholar Award in Neurobiology, 2004

Raymond and Beverly Sackler Foundation Scholar Award, 2004

NINDS "Top Science Advances" Selectee, 2003

Eppendorf and *Science* Prize for Neurobiology, 2003

given to a single scientist under 35 for most outstanding research in neurobiology within the past 3 years.

Broad Scholar in the Neurosciences Award, 2003

Faculty of 1000 Exceptional Paper 2003, 2006, 2007(x2)

NARSAD Young Investigator Award, 2002

Winter Conference on Brain Research Fellowship, 2002

Ruth Salta Junior Investigator Achievement Award of the National Heart Foundation, 2001

Ellison Foundation New Scholar Award, 2001

Ruth Salta Junior Investigator Achievement Award of the National Heart Foundation, 2000

NARSAD Young Investigator Award, 2000

Alfred P. Sloan Research Fellow Award, 2000

George H. Hitchings New Investigator Award, 1999

McKnight Scholar Award, 1999

Klingenstein Fellowship in the Neurosciences Award 1999

Whitehead Scholar Award, 1998

Howard Hughes Postdoctoral Fellowship, 1998.

Alpha Omega Alpha, elected 1998.
 David Israel Macht Young Investigator Award, 1996.
 Medical Scientist Training Program Fellow, 1991-1998.
 Schaffer Cell Biology/Anatomy Award, 1992.
 Richard P. Schuster Memorial Prize for Excellence in Chemistry, 1991.
 American Chemical Society Award, 1990.
 Los Angeles Philanthropic Society Scholarship, 1989-1991.
 John Stauffer Merit Award, 1989-1991.
 Caltech Merit Scholar, 1989-1991.
 National Merit Scholar, 1987.
 William Randolph Hearst Foundation Award, 1987.

University Service

Cell and Molecular Biology Graduate Program Executive Committee (2009-present)
 Pediatrics Faculty Mentoring Committee (2008-present)
 Neurobiology Faculty Search Committee (2008-2009)
 Biochemistry Chair Search Committee (2008-2009)
 Department of Biology Faculty Search Committee (2008-2009)
 Duke Institute for Brain Sciences Executive Board (2008 – present)
 Ophthalmology Faculty Search Committee (2008-2009)
 Selection Committee, Lawrence C. Katz Prize for Innovative Research in Neuroscience (2007-present)
 Institute of Genome Science and Policy Director Review Committee (2007-2008)
 Neurobiology Faculty Search Committee (2007-2008)
 Director of Admissions, Neurobiology Graduate Program (2007 – present)
 Duke Medicine Science Advisory Council (2006 – present)
 MSTP Steering Committee (2006 – present)
 Neurobiology Faculty Search Committee (2006-2007)
 Duke University Medical Center Strategic Plan Implementation Committee (2006 – 2007)
 Duke University Science Retreat Planning Committee (2005)
 Medical Scientist Training Program Executive Committee (2005 – 2006)
 Neurogenomics Faculty Search Committee (2004)
 Computational Neurobiology Faculty Search Committee (2003)
 Pharmacological Sciences Training Program Executive Committee (2003 – present)
 Duke University Proteomics Advisory Committee (2003 – present)
 Center for Translational Neuroscience Faculty Search Committee (2003)
 Neurobiology Faculty Search Committee (2003)
 Alpha Omega Alpha Research Presentations Committee (2001 – 2007)
 Institutional Animal Care and Use Committee (2001 – 2005)
 Medical Scientist Training Program Admissions Advisory Committee (2000 – 2005)
 Neurobiology Molecular Core Facility Committee (2000 – present)
 Neurobiology Faculty Search Committee (1999)
 Neurobiology Steering Committee (1999-present)
 Medical Student 3rd Year Research Director, Neurosciences (2000-2001)
 M.D./Ph.D. Coordinator, Neurobiology (1999-present)
 Neurobiology Graduate Admissions Committee (1999-present)

Professional Activities

National and International Service

Member, Eppendorf & *Science* Prize Selection Committee (2007 – 2009)
 Scientific Advisory Board, European Consortium on Synaptic Protein Networks (2008 – present)

Professional Societies

Member, International Society for Neurochemistry (2005 – present)
Member, American Society for Biochemistry and Molecular Biology (2003 – present)
Member, American Society for Cell Biology (1999 – present)
Member, Society for Neuroscience (1992 – present)

Grant Reviewer

Simons Foundation Review Board, 2009
Autism Speaks
Thomas F. and Kate Miller Jeffress Memorial Trust
Neurological Foundation of New Zealand
AAAS Women's International Science Collaboration Program
The Wellcome Trust, United Kingdom
Alzheimer's Association
Department of Defense Experimental Program to Stimulate Competitive Research (DEPSCoR)
Medical Research Council, United Kingdom
U.S.-Israel Binational Science Foundation
Volkswagen Foundation, Germany

NIH Service

Molecular, Developmental, and Cellular Neuroscience Study Section (MDCN1), Ad hoc member
Synapses, Cytoskeleton and Trafficking Study Section (SYN), Ad hoc member
Neurodifferentiation, Plasticity, and Regeneration Study Section (NDPR), Ad hoc member

Editorial Boards

Journal of Biological Chemistry, Editorial Board Member (2003 – present)
Journal of Neuroscience, Associate Editor (2003 – 2008)
Faculty of 1000, Neurobiology of Disease Section (2004 – present)
Molecular and Cellular Neuroscience, Associate Editor (2005 – present)
Brain Cell Biology, Editorial Board Member (2006 – 2008)
Debates in Neuroscience, Editorial Board Member (2006 – 2007)
Ubiquitin-Proteasome Section, Targeted Protein Database, Current BioData Ltd (2006 – 2008)
Journal of Experimental Neuroscience, Editorial Board Member (2008 – present)
Section Editor, Cell Signaling, Current Opinion in Neurobiology (2009)
Associate Editor, Frontiers in Synaptic Neuroscience (2008 – present)

Commerical and Industry Activities

2006 Frontiers of Neuroscience Drug Discovery Summit, Merck & Co., Inc.
2008-present Neuroscience Therapeutic Area Scientific Advisory Panel, Pfizer, Inc.

Conferences and Meetings

Session Co-Chair, Molecular and Genetic Techniques, Society for Neuroscience Meeting, 2008
Session Chair, NMDA Receptors, Society for Neuroscience Meeting, 2008
Mini-Symposium Organizer, Cell Biology of the Neuron, Amer Soc for Cell Biology Meeting, 2008
Conference Organizer, Structural & Functional Organization of the Synapse, Iowa City, 2007
Session Chair, Cold Spring Harbor Meeting on Synapses: from Molecules to Behavior, 2007
Session Organizer, Gordon Research Conference on Cell Biology of the Neuron, 2004

Invited Lectures

2008: McGill University Pharmacology and Therapeutics Seminar, University of Pennsylvania Cell and Developmental Biology Seminar, University of Arizona Neuroscience Seminar, Salk Institute Biological Sciences Seminar, Stanford University Neuroscience Lecture, Harvard Medical School Neurobiology Seminar, Vollum Institute Invited Seminar, Eli Lilly & Company Invited Seminar, University of California Davis Neuroscience Seminar, Cell Biology of the Neuron Gordon Research Conference, Synaptic Basis of Disease Invited Speaker, FENS Minisymposium on NMDA Receptor Regulation, Golgi Meeting Invited Speaker, Philip Godfrey Memorial Lecture of the Biochemical Society of the United Kingdom, European

- Summer Synapse School Research Seminar, Frontiers in Neurophotonics Meeting Bordeaux, University of Michigan Pharmacology Seminar, Rosalind Franklin University Molecular and Cellular Sciences Seminar
- 2007: Academia Sinica Taiwan Institute of Molecular Biology Seminar, National Yang-Ming University Taiwan Neuroscience Seminar, University of Massachusetts Medical School Neuroscience Seminar, Vanderbilt Neuroscience Seminar, University of Alabama Birmingham Neurobiology Seminar, British Neuroscience Association Symposium on Ubiquitin and Synaptic Function, University College London Physiology Seminar, Cold Spring Harbor Meeting on Synapses from Molecules to Behavior, NIMH Neuroscience Lecture, NIEHS Frontiers in Environmental Science Seminar, Emory University Human Genetics Seminar, University of Iowa Symposium on Structural and Functional Organization of the Synapse, University of Iowa Obermann Conference on Synapses, European Synapse Summer School Research Seminar, Johns Hopkins Neuroscience Retreat Keynote Lecture, University of Miami Biology Seminar, University of Miami Cell Biology and Anatomy Seminar, Columbia University Neuroscience Seminar, Skirball Institute of New York University Neuroscience Seminar, University of California Irvine Neurobiology and Behavior Colloquium, University of North Carolina Cell and Molecular Physiology Seminar, Duke University Pathology Grand Rounds
- 2006: Case Western Reserve Neuroscience Seminar, NIH Porter Neuroscience Lecture, Cornell-Weill Medical School Biochemistry Seminar, Club Exocytose-Endocytose Conference of the Société de Biologie Cellulaire de France, Cell Biology of the Neuron Gordon Research Conference, Centro de Investigación Médica Aplicada Universidad de Navarra Neuroscience Seminar, Gordon Research Conference on Synaptic Transmission, INSERM Grenoble Neuroscience Seminar, European Summer Synapse School Research Seminar, University of Pittsburgh Neurobiology Seminar
- 2005: Institut François Magendie-Université de Bordeaux Neuroscience Seminar, Montreal Neurological Institute Killam Lecture, Duke University's Thomas Langford Lecture, Medical College of George Neuroscience Seminar, University of North Carolina Chapel Hill Synapse Club Seminar, Neural Circuits and Plasticity Gordon Research Conference, National MD/PhD Student Symposium Featured Speaker, Universität Kaiserslautern Invited Lecture, International Society for Neurochemistry Symposium Speaker, Gordon Research Conference on Excitatory Amino Acids and Brain Function, École Normale Supérieure Biology Seminar, Yale University Biology Seminar, University of Washington Physiology & Biophysics Seminar, University of British Columbia Neuroscience Seminar
- 2004: Washington University-St. Louis Neurobiology Seminar, Northwestern University Neurobiology & Physiology Seminar, University of Chicago Neurobiology Seminar, Harvard Children's Hospital Neuroscience Seminar, Harvard Medical School Molecular Biology & Genetics Seminar, Caltech Biology Seminar, University of Virginia Neuroscience Seminar, Stanford University Neuroscience Seminar, Brandeis University Biology Seminar, Gordon Research Conference on Cell Biology of the Neuron, FASEB Conference on Ubiquitin and Cellular Regulation, Eppendorf AG Special Lecture, Harden Conference on the Ubiquitin Proteasome System in Health and Disease, Colorado State University Molecular Cellular and Integrative Neuroscience Seminar, University of Colorado Health Sciences Center Neuroscience Seminar
- 2003: University of North Carolina-Chapel Hill Cell and Molecular Physiology Seminar, University of Texas-Houston Medical Center Neurobiology Seminar, University of Southern California Biology Seminar, Johns Hopkins University Special Lecture in Neurology, University of Tennessee Health Sciences Center Pharmacology Seminar, Stanford University Neurobiology Seminar, Mount Sinai School of Medicine Translational Neuroscience Seminar, Gladstone Institute of Neurological Disease Neuroscience Seminar, Gordon Research Conference on Excitatory Amino Acids and Brain Function, Duke University Neurobiology Seminar, Baylor College of Medicine Brain and Behavior Seminar
- 2002: Baylor College of Medicine Neuroscience Seminar, Winter Conference on Brain Research Symposium on AMPA and NMDA Receptor Targeting and Trafficking, NIH-NIEHS Signal Transduction Seminar, Brown University Neuroscience Seminar, University of North Carolina Synapse Club Seminar, SUNY Stony Brook Neurobiology and Behavior Seminar, McKnight

- Conference on Neuroscience, Japanese Neuroscience Society Conference Symposium on Synaptic Targeting of Glutamate Receptors, Penn State Life Science Consortium Seminar, Emory University Cell Biology Seminar, Neurobiology of Aging Symposium on the Molecular and Cellular Basis of Synaptic Dysfunction and Loss in Alzheimer's Disease
- 2001: Duke University Pharmacology Seminar; University of North Carolina-Chapel Hill Cell Biology Seminar, Society for Neuroscience Symposium on Hebb and Homeostasis in Synaptic Plasticity; NIH-NINDS Neurosciences Seminar, Johns Hopkins University Neuroscience Seminar, Albert Einstein College of Medicine Neuroscience Seminar
- 2000: Duke University Neurobiology Symposium, Duke University Cell Biology Seminar
- 1998: Duke University Neurobiology Symposium

Miscellaneous

Participant, Duke University Summer Research Opportunities Program for Minority Undergraduates

Contributor, Alzheimer's Research Forum

Contributor, Neuroscience, Second Edition, eds. Purves et al, Sinauer Press (Sunderland, MA)

Contributor, Alliance for Cellular Signaling, subfield: NMDA receptor signaling

Reviewer for the following journals: *Science, Nature, Cell, Neuron, Nature Neuroscience, Nature Cell Biology, PLoS Biology, Nature Reviews Neuroscience, Journal of Cell Biology, Journal of Neuroscience, Genes & Development, Trends in Neurosciences, Journal of Biological Chemistry, Journal of Neurophysiology, Journal of Cell Science, EMBO Journal, EMBO Reports, FASEB Journal, Molecular and Cellular Neuroscience, Molecular and Cellular Biology, Neuroscience, European Journal of Neuroscience, Neuroscience Letters, Journal of Neurochemistry, Neuroscience Research, Neurobiology of Aging, Chemistry and Biology, Molecular Interventions, Archives of General Psychiatry, Journal of Neuroscience Methods, Archives of Neurology, Brain Research, Journal of Neuroscience Methods*

NIH Research Grants (current support only – Ehlers as PI)

- | | |
|----------------|--|
| 2000 – present | Synaptic Targeting of NMDA Receptors (R01 NS39402) |
| 2002 – 2007 | Intracellular Trafficking of AMPA Receptors (R01 MH64748) |
| 2004 – present | Molecular Targets of A-beta-Induced Synaptic Dysfunction (R01 AG24492) |
| 2005 – present | The Endocytic Machinery of Dendritic Spines (R01 NS047574) |

Trainees

Predoctoral

Rui Peixoto (2004 – present)

Kathryn Condon (2004 – present)

Tingting Wang (2004 – present)

Ming-Chia Lee (2004 – present)

Jason Yi (2004 – present)

Zhiping Wang (2003 – 2008, currently postdoctoral fellow with Dr. Yishi Jin, UCSD)

Mikyong Park (2001 – 2006, currently postdoctoral fellow with Dr. Kang Shen, Stanford)

April C. Horton (1999 – 2005, currently resident in Anesthesiology, U Penn)

Derek B. Scott (1999 – 2004, currently patent agent, Human Genome Sciences)

Postdoctoral

Angela Mabb, Ph.D. (2007 – present)

Hyun-Soo Je, Ph.D. (2006 – present)

Thomas Newpher, Ph.D. (2006 – present)

David Cao, Ph.D., (2006 – 2007)
currently Research Scientist, University of Alabama, Tuscaloosa, AL

Cyril Hanus, Ph.D. (2006 – present)

Ian Davison, Ph.D. (2005 – present)

Benjamin Arenkiel, Ph.D. (2005 – present)
 Matthew Kennedy, Ph.D. (2005 – present)
 Thomas Helton, Ph.D. (2004 – 2008)
 currently research fellow with Dr. Diane Lipscombe, Brown University, Providence, RI
 Jiuyi Lu, Ph.D. (2002 – 2008)
 currently research fellow with Dr. Wei Chen, Duke University, Durham, NC
 Takeshi Otsuka, Ph.D. (2002 – 2004)
 currently Assistant Professor, National Institute of Physiological Sciences, Okazaki, Japan)
 Goang-Won Cho, Ph.D. (2002 – 2003)
 currently Research Professor, The Catholic University of Korea, Seoul, South Korea
 Isabel Perez-Otano (2000 – 2004)
 currently Assistant Professor, CIMA, Universidad de Navarra, Pamplona, Spain
 M. McLean Bolton, Ph.D. (2000 – 2001)
 currently research fellow with Dr. Donald Lo, Duke University, Durham, NC
 Yuanyue Mu, Ph.D. (2000 – 2006)
 currently research fellow with Dr. Jonathan Stamler, Duke University, Durham, NC
 Thomas A. Blanpied, Ph.D. (2000 – 2005)
 currently Assistant Professor, University of Maryland, Baltimore, MD

Peer-Reviewed Publications

H.-S. Hoe, Z. Fu, A. Makarova, J.-Y. Lee, C. Lu, L. Feng, A. Pajooesh-Ganji, Y. Matsuoka, B. T. Hyman, **M. D. Ehlers**, S. Vicini, D. T. S. Pak, and G. W. Rebeck (2009). The effects of amyloid precursor protein on post-synaptic composition and activity. *J. Bio. Chem.* (in press).

T. D. Helton, T. Otsuka, M.-C. Lee, Y. Mu, and **M. D. Ehlers** (2008). Pruning and loss of excitatory synapses by the parkin ubiquitin ligase. *Proc. Natl. Acad. Sci. U.S.A.* 105:19492-7.

Z. Wang, J. G. Edwards, N. Riley, D. W. Provance Jr., R. Karcher, X.-d. Li, I. G. Davison, M. Ikebe, J. A. Mercer, J. A. Kauer, and **M. D. Ehlers** (2008). Myosin Vb mobilizes recycling endosomes and AMPA receptors for postsynaptic plasticity. *Cell* 135:535-548..

D. M. Tiruchinapalli, **M. D. Ehlers**, and J. D. Keene (2008). Activity-dependent expression of RNA binding protein HuD and its association with mRNAs in neurons. *RNA Biol.* (in press)

T. A. Blanpied, J. M. Kerr, and **M. D. Ehlers** (2008). Structural plasticity with preserved topology in the postsynaptic protein network. *Proc. Natl. Acad. Sci. U.S.A.* 105:12587-92

B. R. Arenkiel, M. E. Klein, I. G. Davison, L. C. Katz, and **M. D. Ehlers** (2008). Targeted genetic control of neuronal activity in mice conditionally expressing TRPV1. *Nature Methods.* 5:299-302

J. Lu, T. D. Helton, T. A. Blanpied, B. Racz, T. M. Newpher, R. J. Weinberg, and **M. D. Ehlers** (2007). Postsynaptic positioning of endocytic zones and AMPA receptor cycling by physical coupling of dynamin-3 to homer. *Neuron* 55:874-889.

I. E. Michailidis, T. D. Helton, V. I. Petrou, T. Mirshahi, **M. D. Ehlers**, and D. E. Logothetis (2007). PIP₂ regulates NMDA receptor activity through alpha-actinin. *J. Neurosci.* 27:5523-32.

****M. D. Ehlers**, M. Heine, L. Groc, M.-C. Lee, and D. Choquet (2007). Diffusional trapping of GluR1 AMPA receptors by input-specific synaptic activity. *Neuron* 54:447-460.

** Corresponding author

B. R. Arenkiel, J. Peca, I. G. Davison, C. Feliciano, K. Deisseroth, G. J. Augustine, ****M. D. Ehlers**, and G. Feng (2007). In vivo light-induced activation of neural circuitry in transgenic mice expressing channelrhodopsin-2. *Neuron* 54:205-218.

** Corresponding author

A. C. Horton, J. J. Yi, and **M. D. Ehlers** (2006). Cell type-specific dendritic polarity in the absence of spatially organized external cues. *Brain Cell Biol.* 1:29-38

M. Park, J. M. Salgado, L. Ostroff, T. D. Helton, C. G. Robinson, K. M. Harris, and **M. D. Ehlers** (2006). Plasticity-induced growth of dendritic spines by exocytic trafficking from recycling endosomes. *Neuron* 52:817-830.

I. Pérez-Otaño, R. Lujan, S. J. Tavalin, M. Plomann, J. Modregger, X.-B. Liu, E. G. Jones, S. F. Heinemann, D. C. Lo, and **M. D. Ehlers** (2006). Endocytosis and synaptic removal of NR3A-containing NMDA receptors by PACSIN1/Syndapin1. *Nature Neurosci.* 9:611-621.

H.-S. Hoe, A. Pocivavsek, G. Chakraborty, Z. Fu, S. Vicini, **M. D. Ehlers**, and G. W. Rebeck (2006). Apolipoprotein E receptor 2 interactions with the NMDA receptor. *J. Biol. Chem.* 281:3425-3431.

A. C. Horton, B. Racz, E. E. Monson, A. L. Lin, R. J. Weinberg, and **M. D. Ehlers** (2005). Polarized secretory trafficking directs cargo for asymmetric dendrite growth and morphogenesis. *Neuron* 48:757-771.

I. K. Svenson, M. T. Kloos, A. Jacon, C. Gallione, A. C. Horton, M. A. Pericak-Vance, **M. D. Ehlers**, D. A. Marchuk (2005). Subcellular localization of spastin: implications for the pathogenesis of hereditary spastic paraplegia. *Neurogenetics* 6: 135-41.

R. T. Terry-Lorenzo, D. W. Roadcap, T. Otsuka, T. A. Blanpied, P. Zamorano, C. C. Garner, S. Shenolikar, and **M. D. Ehlers** (2005). Neurabin/protein phosphatase-1 complex regulates dendritic spine morphogenesis and maturation. *Mol. Biol. Cell* 16:2349-2362.

M. Park, E. C. Penick, J. G. Edwards, J. A. Kauer, and **M. D. Ehlers** (2004). Recycling endosomes supply AMPA receptors for LTP. *Science* 305:1972-1975.

B. Racz, T. A. Blanpied, ****M.D. Ehlers**, and R. J. Weinberg (2004). Lateral organization of endocytic machinery in dendritic spines. *Nature Neurosci.* 7:917-918.

** Corresponding author

D. B. Scott, I. Michailidis, Y. Mu, D. Logothetis, and **M. D. Ehlers** (2004). Endocytosis and degradative sorting of NMDA receptors by conserved membrane-proximal signals. *J. Neurosci.* 24: 7096-7109.

T. A. Blanpied, D. B. Scott, and **M. D. Ehlers** (2003). Age-related regulation of dendritic endocytosis associated with altered clathrin dynamics. *Neurobiol. Aging* 24:1095-1104.

Y. Mu, T. Otsuka, A. C. Horton, D. B. Scott, and **M. D. Ehlers** (2003). Activity-dependent mRNA splicing controls ER export and synaptic delivery of NMDA receptors. *Neuron* 40:581-594.

D. B. Scott, T. A. Blanpied, and **M. D. Ehlers** (2003). Coordinated PKA and PKC phosphorylation suppresses RXR-mediated ER retention and regulates the surface delivery of NMDA receptors. *Neuropharm.* 45:755-767.

A. C. Horton and **M. D. Ehlers** (2003). Dual modes of endoplasmic reticulum-to-Golgi transport in dendrites revealed by live-cell imaging. *J. Neurosci.* 23: 6188-6199.

M.D. Ehlers (2003). Activity level controls postsynaptic composition and signaling via the ubiquitin-proteasome system. *Nature Neurosci.* 6:231-242.

T.A. Blanpied, D.B. Scott, and **M.D. Ehlers** (2002). Dynamics and regulation of clathrin coats at specialized endocytic zones of dendrites and spines. *Neuron* 36:435-449.

K. W. Roche, S. Standley, J. McCallum, C. D. Ly, **M. D. Ehlers**, and R. J. Wenthold (2001). Molecular determinants of NMDA receptor internalization. *Nature Neurosci.* 4:794-802

D. B. Scott, T. A. Blanpied, G. T. Swanson, C. Zhang, and **M. D. Ehlers** (2001). An NMDA receptor ER retention signal regulated by phosphorylation and alternative splicing. *J. Neurosci.* 21:3063-3072.

M. D. Ehlers (2000). Reinsertion or degradation of AMPA receptors determined by activity-dependent endocytic sorting. *Neuron* 28:511-525.

D. Liao, X. Zhang, R. J. O'Brien, **M. D. Ehlers**, and R. L. Huganir (1999). Regulation of morphological postsynaptic silent synapses in developing hippocampal neurons. *Nature Neurosci.* 2:37-43.

M. D. Ehlers, E. T. Fung, R. J. O'Brien, and R. L. Huganir (1998). Splice variant-specific interaction of the NMDA receptor subunit NR1 with neuronal intermediate filaments. *J. Neurosci.* 18(2):720-730.

S. Zhang, **M. D. Ehlers**, J. P. Bernhardt, and R. L. Huganir (1998). Calmodulin mediates calcium-dependent desensitization of NMDA receptors. *Neuron* 21:443-453.

** Equally contributing authors.

R. J. O'Brien, S. Kamboj, **M. D. Ehlers**, D. Liao, K. R. Rosen, G. D. Fischbach, and R. L. Huganir (1998). Activity-dependent modulation of synaptic AMPA receptor accumulation. *Neuron* 21:1067-1078.

R. J. O'Brien, A. L. Mammen, S. Blackshaw, **M. D. Ehlers**, J. D. Rothstein, and R. L. Huganir (1997). The development of excitatory synapses in cultured rat spinal neurons. *J. Neurosci.* 17(19):7339-7350.

W. G. Tingley, **M. D. Ehlers**, K. Kameyama, C. Doherty, J. B. Ptak, C. T. Riley, and R. L. Huganir (1997). Characterization of protein kinase A and protein kinase C phosphorylation of the N-methyl-D-aspartate receptor NR1 subunit using phosphorylation site-specific antibodies. *J. Biol. Chem.* 272:5157-5166.

M. D. Ehlers, S. Zhang, J. P. Bernhardt, and R. L. Huganir (1996). Inactivation of NMDA receptors by direct interaction of calmodulin with the NR1 subunit. *Cell* 84:745-755.

L.-F. Lau, A. L. Mammen, **M. D. Ehlers**, S. Kindler, W. J. Chung, C. C. Garner, and R. L. Huganir (1996). Interaction of the N-methyl-D-aspartate receptor complex with a novel synapse-associated protein, SAP102. *J. Biol. Chem.* 271:21622-21628.

U. Scheffel, C. Steinert, S. E. Kim, **M. D. Ehlers**, J. W. Boja, and M. J. Kuhar (1996). Effect of dopaminergic drugs on the in vivo binding of [³H]WIN 35,428 to central dopamine transporters. *Synapse* 23:61-69.

M. D. Ehlers, W. G. Tingley, and R. L. Huganir (1995). Regulated subcellular distribution of the NR1 subunit of the NMDA receptor. *Science* 269:1734-1737.

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