Jerome Mertens, PhD

Associate Professor
Riford Chair for Neurodegenerative Disease and Dementia
University of California San Diego
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OTHER AFFILIATIONS

Adjunct Assistant Professor
Laboratory of Genetics
Salk Institute for Biological Studies
10010 N Torrey Pines Rd

Adjunct Professor
Institute of Molecular Biology
University of Innsbruck
6020 Innsbruck, Austria

EDUCATION

2012 PhD in Molecular Biomedicine (Dr. rer. nat), *'Human iPSC-derived neurons for modeling Alzheimer's Disease and Drug Validation.'* (honored 'summa cum laude'), Institute for Reconstructive Neurobiology, University of Bonn, Germany, Supervisor: Dr. Oliver Brüstle

2008 Diploma in Molecular Biomedicine, *'Gap junction-mediated cell-to-cell transfer of short interfering RNA between astrocytes.'* (grade 1.1, *very good*), University of Bonn, Germany

CURRENT POSITIONS

2023 – now Associate Professor (tenured)
Riford Chair for Neurodegenerative Disease and Dementia
Department of Neurosciences
UCSD School of Medicine
University of California San Diego

2023 – now Adjunct Professor
Institute of Molecular Biology, University of Innsbruck, Austria

2020 – now Assistant Adjunct Professor
The Salk Institute for Biological Studies, La Jolla, CA, USA

EDUCATION

2012 PhD in Molecular Biomedicine (Dr. rer. nat), *'Human iPSC-derived neurons for modeling Alzheimer's Disease and Drug Validation.'* (honored 'summa cum laude'), Institute for Reconstructive Neurobiology, University of Bonn, Germany, Supervisor: Dr. Oliver Brüstle

2008 Diploma in Molecular Biomedicine, *'Gap junction-mediated cell-to-cell transfer of short interfering RNA between astrocytes.'* (grade 1.1, *very good*), University of Bonn, Germany

PREVIOUS POSITIONS

2017 – 2023	Assistant Professor (tenure track) Institute of Molecular Biology, University of Innsbruck, Austria
2017 – 2020	Staff Scientist, The Salk Institute for Biological Studies, La Jolla, CA, USA supported by a Pathway to Independence Award NIH K99
2013 – 2017	Research Associate, Laboratory of Genetics - Gage, The Salk Institute for Biological Studies, La Jolla, CA, USA, Mentor: Fred H. Gage
2011 - 2012	Research Fellow, Institute of Reconstructive Neurobiology, University of Bonn, Germany
2008 - 2011	Graduate Student, Institute of Reconstructive Neurobiology, University of Bonn, Germany,

CURRENT AND SELECTED PAST RESEARCH SUPPORT

NIA P30 - Alzheimer's Disease Research Centers, P30-AG062429, 'UCSD Shiley-Marcos Alzheimer's Disease Research Center', PI: J. Brewer, UCSD ADRC iPSC Core leader: J. Mertens

NIA R01 - National Institute on Aging, R01-AG056306, 'Assessing cellular aging in old and rejuvenated neurons from Alzheimer patients', PI: Fred H. Gage (Salk Institute for Biological Studies), Co-I: J. Mertens

Alzheimer's Association Research Grant (AARG), AARG-22-972303, 'Physiological facilitators of phospho-Tau solubility in neurons', PI: Susanne Wegmann (DZNE Berlin), Co-I: J. Mertens

BrightFocus Postdoctoral Fellowship, BrightFocus Foundation, 'Assessment of the pyruvate kinase isoform imbalance in the loss of cell identity in Alzheimer's disease neurons and neuroinflammation', Grantee: L. Traxler; Supervisor: J. Mertens

ERC Starting Grant (past), European Commission, 'Age-dependent mechanisms of sporadic Alzheimer's Disease in patient-derived neurons', PI: J. Mertens

BrightFocus Research Grant (past), BrightFocus Foundation, 'Age-dependent Neuronal De-Differentiation in Alzheimer's Patient-Derived Induced Neurons', PI: J. Mertens

Marie Curie Fellowship (past), European Commission, 'Assessing transcriptional and nuclear pore aging in age-equivalent and rejuvenated induced neurons from Alzheimer patients', PI: J. Mertens

NIH NIA K99-AG056679 (past), Pathway to Independence Award 'Assessing cellular aging in old and rejuvenated neurons from Alzheimer patients', PI: J. Mertens

FORMAL TEACHING ACTIVITIES

since 2019	Lecture series '*Epigenetics*', BSc Biology Lecture series '*Disease Mechanisms*', MSc Molecular and Cell Biology Seminar '*Genomics*', MSc Molecular and Cell Biology
since 2018	Lectures and Practical Course, '*Genomics*', BSc Biology
since 2017	Lecture series *'Selected Topics in Cell Biology',* MSc Molecular and Cell Biology Lectures, Seminar, Practical Course *'Stem Cell Biology'*, MSc Molecular and Cell Biology
2019 - 2022	Supervision of 13 BSc and MSc theses
2019 - 2022	Supervision of 6 graduate students

RECENT PRESENTATIONS

Neuroscience Grad. Program retreat	Lake Arrowhead, CA	Apr 28, 2023	invited speaker
UCSD Neurodegeneration seminar	San Diego, CA	Apr 18, 2023	invited speaker
USC ADRC-REC seminar	Los Angeles, *virtual*	Apr 14, 2023	invited speaker
Gordon GRC Functional Genomics	Ventura, CA	Apr 6, 2023	invited speaker
NIH/NIA Cancer-AD Nexus workshop	Bethesda, *virtual*	Oct 19, 2022	invited speaker
LMU München ISD seminar	Munich, DE	Oct 17, 2022	invited speaker
CeMM seminar	Vienna, AT	Aug 4, 2022	invited speaker
Haifa IBBRC annual meeting	Haifa, IL	June 14-16, 2022	invited speaker
Helmholtz Stem Cells Seminar	Munich, DE *virtual*	Nov 18, 2021	invited speaker
New Horizons in Alzheimer's Disease	VIB Leuven, BE	Oct 28, 2021	invited speaker
Hebrew University Medical seminar	Jerusalem, IL *virtual*	Oct 20, 2021	invited speaker
17th Austrian Neuro Meeting (ANA)	Salzburg, AT	Sep 28, 2021	invited speaker
DFG GRK2162 Seminar	Erlangen, DE	Jul 08, 2021	invited speaker

PEER-REVIEWED PUBLICATIONS

L. Traxler, R. Lucciola , J.R. Herdy, J. Jones, **J. Mertens#**, and F.H. Gage#. 'Neural cell state shifts and fate loss in aging and age-related diseases', Nature Reviews Neurology, *in press*

A.G. de la Fuente, S. Pelucchi, **J. Mertens**, M. Di Luca, D. Mauceri, and E. Marcello. 'Novel therapeutic approaches to target neurodegeneration', British Journal of Pharmacology, doi: 10.1111/bph.16078, Mar 2023

J. R. Herdy, L. Traxler, R.K. Agarwal, L. Karbacher, J.C.M. Schlachetzki, L. Boehnke, D. Zangwill, D. Galasko, C.K. Glass, **J. Mertens#**, and F.H. Gage#. 'Increased Post-Mitotic Senescence in Aged Human Neurons is a Pathological Feature of Alzheimer's Disease', Cell Stem Cell, doi: 10.1016/j.stem.2022.11.010, Dec 2022

M. van den Hurk, S. Lau, M.C. Marchetto, J. Mertens, S. Stern, O. Corti, A. Brice, B. Winner, J. Winkler, F.H. Gage, and C. Bardy. 'Druggable transcriptomic pathways revealed in Parkinson's patient-derived midbrain neurons', npj Parkinson's Disease, doi: 10.1038/s41531-022-00400-0, Oct 2022

L. Böhnke, L. Zhou-Yang, S. Pelucchi, F. Kogler, D. Frantal, F. Schön, S. Lagerström, O. Borgogno, J. Baltazar, J.R. Herdy, S. Kittel-Schneider, M. Defrancesco, and **J. Mertens#.** 'Chemical Replacement of Noggin with Dorsomorphin Homolog 1 for Cost-Effective Direct Neuronal Conversion', Cellular Reprogramming, doi: 10.1089/cell.2021.0200, Jul 2022.

L. Traxler, J.R. Herdy, D. Stefanoni, S. Eichhorner, S. Pelucchi, A. Szücs, A. Santagostino, Y. Kim, R.K. Agarwal, J.C.M. Schlachetzki, C.K. Glass, J. Lagerwall, D. Galasko, F.H. Gage, A. D'Alessandro, and **J. Mertens#.** 'Warburg-like metabolic transformation underlies neuronal degeneration in sporadic Alzheimer's disease'. Cell Metabolism, doi: 10.1016/j.cmet.2022.07.014, Sep 2022.

L. Traxler, J. Lagerwall, S. Eichhorner, D. Stefanoni, Angelo D'Alessandro, and **J. Mertens#**. 'Metabolism navigates neural cell fate in development, aging and neurodegeneration', Disease Models and Mechanisms, doi: 10.1242/dmm.048993, Aug 2021

A. Soni, D. Klütsch, X. Hu, J. Houtman, N. Rund, A. McCloskey, **J. Mertens**, S.T. Schafer, H. Amin, and T. Toda. 'Improved Method for Efficient Generation of Functional Neurons from Murine Neural Progenitor Cells', Cells, doi: 10.3390/cells10081894, Jul 2021

J. Mertens#, J.R. Herdy, L. Traxler, S.T. Schafer, J.C.M. Schlachetzki, L. Böhnke, D.A. Reid, H. Lee, D. Zangwill, D.P. Fernandes, R.K. Agarwal1, R. Lucciola, L. Zhou-Yang, L. Karbacher, F. Edenhofer, S. Stern, S. Horvath, A.C.M. Paquola, C.K. Glass, S.H. Yuan, M. Ku, A. Szücs, L.S.B. Goldstein, D. Galasko, and F.H. Gage#. 'Age-dependent instability of mature neuronal fate in induced neurons from Alzheimer's patients', Cell Stem Cell, doi: 10.1016/j.stem.2021.04.004, Apr 2021

J.R. Herdy, L. Karbacher, and **J. Mertens#**. 'One Big Step to a Neuron, Two Small Steps for miRNAs', Cell Stem Cell, 28 (1), doi:10.1016/j.stem.2020.12.007, Jan 2021

J.C.M. Schlachetzki, T. Toda, and **J. Mertens#**. 'When function follows form: Nuclear compartment structure and the epigenetic landscape of the aging neuron', Exp Gerontology, doi: 10.1016/j.exger.2020.110876, Feb 2020

L. Traxler, F. Edenhofer, and **J. Mertens#**. 'Next-generation disease modeling with direct conversion: a new path to old neurons', FEBS letters, 593 (23), 3316-3337, Dec 2019

A. Erharter, S. Rizzi, **J. Mertens**, and F. Edenhofer. 'Take the shortcut–direct conversion of somatic cells into induced neural stem cells and their biomedical applications', FEBS letters, 593 (23), 3353-3369, Dec 2019

J. R. Herdy, S.T. Schafer, Y. Kim, Z. Ansari, D. Zangwill, M. Ku, A.C.M. Paquola, H. Lee, **J. Mertens#**, and F.H. Gage#. 'Chemical modulation of transcriptionally enriched signaling pathways to optimize the conversion of fibroblasts into neurons', eLife 8, e41356, May 2019

L. Böhnke, L. Traxler, J. R. Herdy, and **J. Mertens#**. 'Human neurons to model aging: A dish best served old', Drug Discovery Today: Disease Models, doi: 10.1016/j.ddmod.2019.01.001, Feb 2019

S.T. Schafer, A.C.M. Paquola, S. Stern, D. Gosselin, M. Ku, M. Pena, T.J.M. Kuret, M. Liyanage, A.A. Mansour, B.N. Jaeger, M.C. Marchetto, C.K. Glass, **J. Mertens**, and F.H. Gage. 'Pathological priming causes developmental gene network heterochronicity in autistic subject-derived neurons', Nature Neuroscience, doi: 10.1038/s41593-018-0295-x. Jan 2019

B. Eftekharzadeh, J. G. Daigle, L. E. Kapinos, S. Dujardin, A. Coyne, Sean J Miller, C. Cook, J. C. Grima, R. E. Bennett, J. Schiantarelli, Y. Carlomagno, K. Tepper, A. C. Amaral, S. L. DeVos, C. R. Vanderburgh, M. Maesako, C. Commins, B. T. Corjuc, J. A. Gonzalez, **J. Mertens**, D. Mackenzie, S. Vidensky, N. J. Valle, U. Hussain, F. H. Gage, J. Troncoso, X. Salvatella, R. Y. H. Lim, E. Mandelkow, S. Wegmann, L. Petrucelli, J. D. Rothstein, and B. T. Hyman. 'Tau Protein Disrupts Nucleocytoplasmic Transport in Alzheimer's Disease'. Neuron, doi: 10.1016/j.neuron. 2018.12.031, Jan 2019

J. Mertens, D. Reid, S. Lau, Y. Kim, and F. H. Gage. 'Aging in a dish: iPSC-derived and directly induced neurons for studying brain aging and age-related neuro-degenerative diseases', Annual Reviews Genetics, doi: 10.1146/annurev-genet-120417-031534 , Sep 2018

Y. Kim, X. Zheng, Z. Ansari, M.C. Bunnell, J.R. Herdy, L. Traxler, H. Lee, A.C.M. Paquola, C. Blithikioti, M. Ku, J.C.M. Schlachetzki, J. Winkler, F. Edenhofer, C.K. Glass, A.A. Paucar, B.N. Jaeger, S. Pham, L. Boyer, B.C. Campbell, T. Hunter, **J. Mertens#**, F.H. Gage#. 'Mitochondrial aging defects emerge in directly reprogrammed human neurons due to their metabolic profile ', Cell Reports, doi: 10.1016/j.celrep.2018.04.105, May 2018

T. Toda, J. Y. Hsu, S. B. Linker, L. Hu, S. T. Schäfer, **J. Mertens**, F. V. Jacinto, M. W. Hetzer, and F. H. Gage. 'Nup153 Interacts with Sox2 to Enable Bimodal Gene Regulation and Maintenance of Neural Progenitor Cells', Cell Stem Cell, doi: 10.1016/j.stem.2017.08.012, Nov 2017

K. C. Vadodaria, **J. Mertens**, M. C. Marchetto, and F. H. Gage. 'Generating human serotonergic neurons in vitro: Methodological advances', Bioessays, 10.1002/bies.201600127, Nov 2016

X. Zheng, L. Boyer, M. Jin, **J. Mertens**, Y. Kim, L. Ma, L. Ma, M. Hamm, F. H. Gage and T. Hunter. 'Metabolic reprogramming during neuronal differentiation from aerobic glycolysis to neuronal oxidative phosphorylation', Elife, doi: 10.7554/eLife.13374, Jun 2016

K. J. Oedegaard, M. Alda, A. Anand, O. A. Andreassen, Y. Balaraman, W. H. Berrettini, A. Bhattacharjee, K. K. Brennand, K. E. Burdick, J. R. Calabrese, C. V. Calkin, A. Claasen, W.H. Coryell, D. Craig, A. M. DeModena, M. Frye, F. H. Gage, K. Gao, J. Garnham, E. Gershon, P. Jakobsen , Leckband SG, McCarthy MJ, McInnis MG, A. X. Maihofer, **J. Mertens**, G. Morken, C. M. Nievergelt, J. Nurnberger, S. Pham, H. Schoeyen, T. Shekhtman, P. D. Shilling, S. Szelinger, B. Tarwater, J.Yao, P. P. Zandi and J. R. Kelsoe. 'The Pharmacogenomics of Bipolar Disorder study (PGBD): identification of genes for lithium response in a prospective sample', BMC Psychiatry, doi: 10.1186/s12888-016-0732, May 2016

J. Mertens, M. C. Marchetto, C. Bardy and F. H. Gage. 'Evaluating cell reprogramming, differentiation and conversion technologies in neuroscience', Nature Rev Neuroscience, doi: 10.1038/nrn.2016.46, May 2016

K. C. Vadodaria*, **J. Mertens***, A. P. C. Paquola, C. Bardy, R. Jappelli, L. Fung, M. C. Marchetto, M. Hamm, M. Gorris, P. Koch and F. H. Gage. 'Generation of functional human serotonergic neurons from fibroblasts,' Molecular Psychiatry, 10.1038/mp.2015.161, Jan. 2016

J. Mertens, A. C. M. Paquola, M. Ku, E. Hatch, L. Böhnke, S. Ladjevardi, S. McGrath, B. Campbell, H. Lee, J. R. Herdy, J. T. Gonçalves, T. Toda, Y. Kim, J. Winkler, J. Yao, M. Hetzer and F. H. Gage. 'Directly reprogrammed human neurons retain aging-associated transcriptomic signatures and reveal age-related nucleo-cytoplasmic defects,' Cell Stem Cell, doi.org/10.1016/j.stem.2015.09.001, Oct. 2015

J. Mertens*, Q. Wang*, Y. Kim, D. X. Yu, S. Pham, B. Yang, Q. Wang, Y. Zheng, K. E. Diffenderfer, J. Zhang, S. Soltani, T. J Eames, S. T. Schafer, L. Boyer, M. C. Marchetto, J. I. Nurnberger, J. R. Calabrese, K. J. Ødegaard, M. J. McCarthy, P. P. Zandi, M. Alba, C. M. Nievergelt, The Pharmacogenomics of Bipolar Disorder Study, S. Mi, K. J. Brennand, J. R. Kelsoe#, F. H. Gage# and J. Yao#. 'Differential Responses to Lithium in Hyperexcitable Neurons from Bipolar Patients,' Nature, doi.org/10.1038/nature15526, Oct. 2015

A. Jovicic, **J. Mertens**, S. Boeynaems, E. Bogaert, N. Chai, S. Yamada, J. Paul, S. Sun, J. R. Herdy, G. Bieri, N. Kramer, F. H. Gage, L. Van Den Bosch, W. Robberecht and A. Gitler. 'Modifiers of C9orf72 DPR toxicity implicate nucleocytoplasmic transport impairments in c9FTD/ALS', Nature Neuroscience, doi:10.1038/nn.4085, Aug 2015

S. Mitschka, T. Ulas, T. Goller , K. Schneider, A. Egert, **J. Mertens**, O. Brüstle, H. Schorle, M. Beyer, K. Klee, J. Xue, P. Günther, K. Bassler, J. Schultze and W. Kolanus. 'Co-existence of intact stemness and priming of neural differentiation programs in mES cells lacking Trim71', Scientific Reports, 5, Jun 2015.

C. Bardy, M. Van Den Hurk, T. Eames, C. Marchand, R. Hernandez, M. Kellogg, M. Gorris B. Galet, V. Palomares, J. Brown, A. Bang, **J. Mertens**, L. Böhnke, L. Boyer, S. Simon and F. H. Gage. 'Neuronal medium that supports basic synaptic functions and activity of human neurons in vitro,' PNAS, pii: 201504393, Apr 2015.

D.H. Adamowicz, **J. Mertens** and F.H. Gage. 'Alzheimer's disease: distinct stages in neurogenic decline?' Biol Psychiatry, vol. 77:680-2, Apr 2015.

J. Mertens, K. Stüber, D. Poppe, J. Doerr, J. Ladewig, O. Brüstle#, and P. Koch#. 'Embryonic Stem Cell-Based Modeling of Tau Pathology in Human Neurons,' The American Journal of Pathology, vol. 182, no. 5, pp. 1769–1779, May 2013.

M. Glas, C. Coch, D. Trageser, J. Daßler, M. Simon, P. Koch, **J. Mertens**, T. Quandel, R. Gorris, R. Reinartz, A. Wieland, M. Von Lehe, A. Pusch, K. Roy, M. Schlee, H. Neumann, R. Fimmers, U. Herrlinger, O. Brüstle, G. Hartmann, R. Besch, and B. Scheffler.'Targeting the Cytosolic Innate Immune Receptors RIG-I and MDA5 Effectively Counteracts Cancer Cell Heterogeneity in Glioblastoma,' Stem Cells, vol. 31, no. 6, pp. 1064–1074, May 2013.

J. Mertens, K. Stüber, P. Wunderlich, J. Ladewig, J. C. Kesavan, R. Vandenberghe, M. Vandenbulcke, P. van Damme, J. Walter, O. Brüstle#, and P. Koch#. 'APP processing in human pluripotent stem cell-derived neurons is resistant to NSAID-based y-secretase modulation,' Stem Cell Reports, vol. 1, pp. 1–8, Dec. 2013.

J. Ladewig, **J. Mertens***, J. Kesavan*, J. Doerr, D. Poppe, F. Glaue, S. Herms, P. Wernet, G. Kogler, F.-J. Müller, P. Koch, and O. Brüstle, 'Small molecules enable highly efficient neuronal conversion of human fibroblasts,' Nature Methods, pp. 1–6, Apr. 2012.

P. Koch*, I. Y. Tamboli*, **J. Mertens***, P. Wunderlich, J. Ladewig, K. Stüber, H. Esselmann, J. Wiltfang, O. Brüstle#, and J. Walter#. 'Presenilin-1 L166P Mutant Human Pluripotent Stem Cell–Derived Neurons Exhibit Partial Loss of gamma-secretase activity in endogenous amyloid-beta generation,' The American Journal of Pathology, vol. 180, no. 6, pp. 2404–2416, Jun. 2012.

P. Koch*, P. Breuer*, M. Peitz*, J. Jungverdorben*, J. Kesavan, D. Poppe, J. Doerr, J. Ladewig, **J. Mertens**, T. Tüting, P. Hoffmann, T. Klockgether, B. O. Evert, U. Wüllner, and O. Brüstle. 'Excitation-induced ataxin-3 aggregation in neurons from patients with Machado–Joseph disease,' Nature, 480(7378):543-6, Nov. 2011.

BOOK CHAPTERS

J. Mertens, P. Koch#, O. Brüstle#. 'Human Pluripotent and Multipotent Stem Cells as Tools for Modeling Neurodegeneration', Book Chapter in Programmed Cells from Basic Neuroscience to Therapy, Spinger, 57-66, 2013

L. Zhou-Yang, S. Eichhorner, L. Karbacher, L. Böhnke, L. Traxler, and J**. Mertens#.** 'Direct conversion of human fibroblasts to induced neurons', Book Chapter in Neural Reprogramming, Springer, 2021, in press

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