ELOISE HUDRY, PHD

Current positions	Term lecturer – MGH institute of Health Professions
	Assistant Professor in Neurology – MGH – Harvard Medical School
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Place of Birth:	Annecy (FRANCE)

SUMMARY

I completed my PhD in the lab of Pr. Aubourg (Paris 5, France), a renowned scientist working on gene therapy approaches to treat genetic neurodegenerative disorders, before pursuing my academic career in the lab of Pr. Hyman at Harvard Medical School in the MassGeneral Institute for Neurodegenerative Disease (MIND). My research generally takes advantage of advanced microscopy techniques and newly developed viral vectors to unravel the pathological processes at play in Alzheimer's disease (AD), with a particular focus on intracerebral cholesterol metabolism changes and the role of Apolipoprotein E, the main genetic risk factor associated with the disease. I was promoted to an Assistant Professor in Neurology at MGH-Harvard in 2017.

Outside of my research activities, I am a term lecturer of "Biochemistry" and "Introduction to Chemistry" online prerequisites at the MGH Institute for the Health Professions since 2014, and I participate every other year in an HMS quarter course entitled "Gene therapy and imaging for nervous system disorders." Additionally, I organize the weekly Journal Club at Massachusetts Institute for Neurodegenerative Disease and continue to train technicians, PhD students, as well as post-doctoral fellows in the lab.

EDUCATION

1998	Baccalaureate (with honors)	Physics and Chemistry	Lycee Saint-Michel, Annecy, FRANCE
2003	B.Sc. (with honors)	Cell Biology and Physiology	Ecole normale Superieure, Lyon, FRANCE
2004	M.Sc (with honors)	Molecular and Cellular Genetics	Ecole normale Superieure, Lyon, FRANCE
2008	Ph.D (with honors)	Neurosciences	University of Rene Descartes, Paris 5, FRANCE

FACULTY APPOINTMENTS AND TEACHING ACTIVITIES

4/2013 – 3/2017	Instructor	Department of Neurology; Alzheimer's Disease research unit	Massachusetts General Hospital – Harvard Medical School
3/2017 - present	Assistant Professor	Department of Neurology; Alzheimer's Disease research unit	Massachusetts General Hospital – Harvard Medical School
9/2014 - present	Term lecturer	Intro to Chemistry for Health Professionals - HCHEM-452	MGH - IHP

EDITORIAL AND GRANT REVIEW ACTIVITIES

2013	Ad-hoc reviewer for National Medical Research Council (NMRC), the Ministry of Health, Singapore.
2013 – present	Ad hoc reviewer for the journal Molecular Therapy, The Journal of Neurinflammation, Nature Communications, Nature Neuroscience
10/2015 – present	Permanent member of the NIA-N K-series, R13 and R36 Study Section
2018	Interim reviewer of the Horizon 2020 research framework program of the European Commission

NATIONAL AND INTERNATIONAL INVITED PRESENTATIONS

National lectures

2009 Exploring Alzheimer's disease mechanisms and testing novel therapeutic approaches using mouse models / Plenary Talk
Society for Gerontology and Geriatry annual meeting, Paris, France

2012 Changes in the progression of amyloid deposition in APP/PS mice after overexpression of different apoe isoforms through intraventricular injection of an adeno-associated virus serotype 4 / Nanosymposium Talk
Society for Neuroscience annual meeting, New Orleans (LA), U.S.A.

2013 Gene Transfer of Human APOE epsilon 2 alleviates the progression of Amyloid deposition in vivo / Symposium talk
American Society of Gene and Cell Therapy annual meeting, Salt Lake City (UT), U.S.A

2013 Gene therapy approaches to alleviate Alzheimer's disease neuropathological changes / Plenary Talk at the Appel Alzheimer's Disease Research Institute, invited by Dr Steven Paul
Brain and Mind Research Institute - Weill Cornell Medical College of Cornell University - NYC

2014 Unraveling the role of APOE in Alzheimer's disease-related neurotoxicity and neuronal dysfunction / Plenary Talk at the SPINES seminar
SPINES seminar (Seminars from Postdocs In Neuroscience: Extramural Series) - NYU Neuroscience Institute Skirball Institute of Biomolecular Medicine Medical

2015 APOE2-Based Gene Therapy Approaches to Alleviate Alzheimer's Disease Neuropathological Hallmarks / Plenary Talk
Alzheimer's Drug Discovery Foundation, Jersey City (NJ), U.S.A.

2018 Selected participant at the Charleston Conference on Alzheimer's Disease (Charleston, SC)

International lectures

2008 AAV gene therapy with cholesterol 24-hydroxylase attenuates Alzheimer phenotype in APP23 mice / Nanosymposium Talk

European Society of Gene and Cell Therapy annual meeting, Bruges, Belgium

2012 Changes in the progression of amyloid deposition in APP/PS mice after overexpression of different apoe isoforms through intraventricular injection of an adeno-associated virus serotype 4 / Nanosymposium Talk

European Society of Gene and Cell Therapy annual meeting, Paris, France

2013 Oligomeric soluble Amyloid-beta species induce calcium dyshomeostasis in the healthy living mouse brain / Symposium talk
Alzheimer's Association International Conference, Boston (MA), U.S.A.

2014 Unraveling the role of apolipoprotein E in age- and Abeta-related neuronal dysfunction / Symposium talk
Alzheimer's Association International Conference, Copenhagen, Denmark

2014 Unraveling the Role of APOE in Alzheimer's disease-related Neurotoxicity and Neuronal Dysfunction using in vivo multiphoton imaging / Plenary Talk at the ICM weekly seminar, Invitation by Dr. Delatour.
Institute of the Brain and Spinal Cord (ICM). Paris, France

2017 Apolipoprotein E: a complex modulator of neuronal network integrity in physiological and pathological contexts, Alzheimer's and Parkinson's Diseases Congress, Vienna, Austria

2017 Apolipoprotein E and Amyloid beta: Old dogs, New Tricks - Centre for Discovery Brain Sciences Seminar, Edinburgh, Scotland, UK (Invitation by Dr. Spires-Jones)

2017 Gene therapy approach for the treatment of Alzheimer's disease: Targeting apolipoprotein E with novel AAV vectors delivered systemically - Invited speaker. – European Society of Gene and Cell Therapy annual meeting, Berlin, Germany

PEER-REVIEWED PUBLICATIONS OF ORIGINAL RESEARCH ARTICLES

1. **Hudry E**, Van Dam D, Kulik W, De Deyn PP, Stet FS, Ahouansou O, Benraiss A, Delacourte A, Bougnères P, Aubourg P, Cartier N. Adeno associated vector gene therapy with cholesterol 24-hydroxylase reduces the amyloid pathology before or after the onset of amyloid plaques in mouse models of alzheimer disease. *Molecular Therapy*. 2010 Jan;18(1):44-53
2. Wu HY, **Hudry E**, Hashimoto T, Kuchibhotla K, Rozkalne A, Fan Z, Spires-Jones T, Xie H, Arbel-Ornath M, Grosskreutz CL, Bacskai BJ, Hyman BT. Amyloid beta induces the morphological neurodegenerative triad of spine loss, dendritic simplification, and neuritic dystrophies through calcineurin activation. *J Neurosci*. 2010 Feb 17;30(7):2636-49.
3. DaRocha-Souto B, Coma M, Gomez Perez-Nievas B, Scotton TC, Siao M, Sanchez-Ferrer P, Hashimoto T, Fan Z, **Hudry E**, Barroeta I, Serenó L, Rodríguez M, Sánchez MB, Hyman BT, Gómez-Isla T. Activation of Glycogen Synthase Kinase 3 Beta mediates beta-amyloid induced neuritic damage in Alzheimer disease. *Neurobiol Dis*. 2011 Sep 13
4. **Hudry E**, Wu HY, Arbel-Ornath M, Hashimoto T, Matsouaka R, Fan Z, Spires-Jones T, Betensky R, Bacskai BJ, and Hyman BT. Inhibition of the NFAT pathway alleviates Amyloid Beta neurotoxicity in a mouse model of Alzheimer disease. *J Neurosci*. 2012 Feb 29;32(9):3176-92.
5. Wu HY, **Hudry E**, Hashimoto T, Uemura K, Fan Z, Berezovska O, Grosskreutz CL, Bacskai BJ and Hyman BT. Distinct dendritic spine and nuclear phases of Calcineurin activation after exposal to Amyloid β revealed by a novel FRET assay. *J Neurosci*. 2012 Apr 11; 32(15): 5298-309.
6. Arbel-Ornath M, **Hudry E**, Eikermann-Haerter K, Hou S, Gregory JL, Zhao L, Betensky RA, Frosch MP, Greenberg SM and Bacskai BJ. Interstitial fluid drainage is impaired in ischemic stroke and Alzheimer's disease mouse models. *Acta Neuropathologica* 2013. Sep;126(3):353-64
7. Maguire CA, Crommentuijn MHW, Mu D, **Hudry E**, Serrano-Pozo A, Hyman BT and Tannous BA. Mouse gender

influences brain transduction by intravascularly-administered AAV9. *Molecular Therapy* 2013. Aug 21(8):1470-1
8. Farrar CT, William CM, **Hudry E**, Hashimoto T, Hyman BT. A Novel RNA Aptamer Probe as an Optical Imaging Agent for the In Vivo Detection of Oligomeric Aβ and Amyloid Plaques. *PlosOne*. 2013. *PlosOne*. 2014 Feb 26;9(2)
9. **Hudry E**, Dashkoff J, Roe AD, Takeda S, Koffie RM, Hashimoto T, Scheel M, Spires-Jones T, Arbel-Ornath M, Betensky R, Davidson BL, Hyman BT. Gene transfer of human ApoE isoforms differentially modulates Amyloid deposition and neurotoxicity. *Sci Transl Med*. 2013 Nov 20;5(212):212
10. Liao F, Hori Y, **Hudry E**, Adam Q. Bauere AQ, Jianga H, Mahan TE, Lefton KB, Zhang TJ, Dearbornf JT, Kimh J, Culvere JP, Betenskyi R, Wozniak DF, Hyman BT, Holtzman DM. Anti-ApoE antibody given after plaque onset decreases Aβ accumulation and improves brain function in a mouse model of Aβ amyloidosis. *J Neurosci*. 2014. May 21;34(21):7281-92
11. Galea E, Morrison W, **Hudry E**, Arbel-Ornath M, Bacskai BJ, Gómez-Isla T, Stanley EH, Hyman BT. Topological analyses in APP/PS1 mice reveal that astrocytes do not migrate to amyloid β plaques. *PNAS*. 2015. Dec 22;112(51):15556-15561
12. Eikermann-Haerter K, Arbel M, Yu ES, Kuchibhotla KK, Yuzawa I, **Hudry E**, Lattarulo CR, Thyssen D, Climov M, Keles F, Belcher A, Sengul B, Negro A, Yalcin N, Rosen I, Arreguin A, Charles AC, Ferrari MD, Van den Maagdenberg A, Bacskai BJ, Ayata C. Abnormal synaptic Ca(2+) homeostasis and morphology in cortical neurons of familial hemiplegic migraine type 1 mutant mice. *Ann Neurol*. 2015 Aug;78(2):193-210
13. Hori Y, Elmaleh DR, Shoup TM, Takahashi K, Takeda S, Cho H, Irimia D, Hyman BT, and **Hudry E**. FDA approved asthma therapeutic agent impacts amyloid β in the brain in a transgenic model of Alzheimer's disease. *J Biol Chem*. 2015 Jan 23; 290(4):1966-78
14. Djelti F, Braudeau J, **Hudry E**, Dhenain M, Varin J, Bièche I, Marquer C, Chali F, Ayciriex S, Auzeil N, Alves S, Langui D, Potier MC, Laprevote O, Vidaud M, Duyckaerts C, Miles R, Aubourg P, Cartier N. CYP46A1 inhibition, brain cholesterol accumulation and neurodegeneration pave the way for Alzheimer's disease. *Brain*. 2015 Aug;138(Pt 8):2383-98.
15. HYMAN BT, GROWDON JH, ALBERS MW, BUCKNER RL, CHHATWAL J, GOMEZ-ISLA MT, HAASS C, **HUDRY E**, JACK CR JR, JOHNSON KA, KHACHATURIAN ZS, KIM DY, MARTIN JB, NITSCH RM, ROSEN BR, SELKOE DJ, SPERLING RA, ST GEORGE-HYSLOP P, TANZI RE, YAP L, YOUNG AB, PHELPS CH, MCCAFFREY PM. MASSACHUSETTS ALZHEIMER'S DISEASE RESEARCH CENTER: PROGRESS AND CHALLENGES. *ALZHEIMERS DEMENT*. 2015 AUG 19
16. **Hudry E**, Martin C, Gandhi S, György B, Scheffer DI, Mu D, Merkel SF, Mingozzi F, Fitzpatrick Z, Dimant H, Masek M, Ragan T, Brisson AR, Ramirez SH, Hyman BT, Maguire CA. Exosome-associated AAV vector as a robust and convenient neuroscience tool. 2016. *Gene Ther*. 2016 Apr;23(4):380-92.
17. Merkel SF, Andrews AM, Lutton EM, Mu D, **Hudry E**, Hyman BT, Maguire CA, Ramirez SH*. Trafficking of AAV vectors across a model of the blood-brain barrier; a comparative study of transcytosis and transduction using primary human brain endothelial cells. *Journal of Neurochemistry*. 2017 Jan;140(2):216-230
18. Dashkoff J, Lerner EP, Truong N, Klickstein JA, Fan Z, Mu D, Maguire CA, Hyman BT, **Hudry E**. Tailored transgene expression to specific cell types in the central nervous system after peripheral injection with AAV9. *Mol Ther Methods Clin Dev*. 2016 Dec 7;3:16081.
19. Arbel-Ornath M*, **Hudry E*,** Boivin JR, Hashimoto T, Kuchibhotla KV, Hou S, Lattarulo CR, Belcher AM, Shakerdge N, Trujillo PB, Hyman BT and Bacskai BJ. Soluble oligomeric amyloid-β species, in the presence of apolipoprotein E, induce calcium dyshomeostasis in the healthy living mouse brain. *equal contribution between Dr. Arbel-Ornath and Dr. Hudry. Mol Neurodegener. 2017 Mar 21;12(1):27.
20. Kara E, Marks JD, Fan Z, Klickstein JA, Roe AD, Krogh KA, Wegmann S, Maesako M, Luo CC, Mylvaganam R, Berezovska O, **Hudry E**, Hyman BT. Isoform and cell type-specific structure of Apolipoprotein E lipoparticles as revealed by a novel Forster Resonance Energy Transfer assay. J Biol Chem. 2017 Jul 6. pii: jbc.M117.784264.
21. Ayciriex S, Djelti F, Alves S, Regazzetti A, Gaudin M, Varin J, Langui D, Bièche I, **Hudry E**, Dargère D, Aubourg P, Auzeil N, Laprévote O, Cartier N. Neuronal Cholesterol Accumulation Induced by Cyp46a1 Down-Regulation in Mouse Hippocampus Disrupts Brain Lipid Homeostasis. Front Mol Neurosci. 2017 Jul 11;10:211.
22. Zhang C, Griciuc A, **Hudry E**, Wan Y, Quinti L, Ward J, Forte AM, Shen X, Ran C, Elmaleh DR, Tanzi RE. Cromolyn Reduces Levels of the Alzheimer's Disease-Associated Amyloid β-Protein by Promoting Microglial Phagocytosis. Sci Rep. 2018 Jan 18;8(1):1144
23. Liao F, Li A, Xiong M, Bien-Ly N, Jiang H, Zhang Y, Finn MB, Hoyle R, Keyser J, Lefton KB, Robinson GO, Serrano JR, Silverman AP, Guo JL, Getz J, Henne K, Leyns CE, Gallardo G, Ulrich JD, Sullivan PM, Lerner EP, **Hudry E**, Sweeney ZK,

Dennis MS, Hyman BT, Watts RJ, Holtzman DM. Targeting of nonlipidated, aggregated apoE with antibodies inhibits amyloid accumulation. J Clin Invest. 2018 Mar 30. pii: 96429. doi: 10.1172/JCI96429. [Epub ahead of print]

OTHER PEER-REVIEWED PUBLICATIONS

1. Choudhury SR, **Hudry E**, Maguire CA, Sena-Esteves M, Breakefield XO, Grandi P. Viral vectors for therapy of neurologic diseases (review). *Neuropharmacology*. 2016 Feb 21
2. **Hudry E**. New Therapeutic Avenue for ALS: Avoiding a Fatal Encounter of TDP-43 at the Mitochondria (commentary). *Mol Ther*. 2017 Jan 4;25(1):10-11.