Keynote speakers

Hélène AMIEVA, PhD | Bordeaux Neurocampus (Bordeaux, France)

More to come…

Adam ANTEBI, PhD | Max Planck Institute for Biology of Ageing (Cologne, Germany)

Dr. Antebi received his PhD in Biology from Massachusetts Institute of Technology in 1992, and performed his post-doctoral studies at the Johns Hopkins University Baltimore, MD. From 1997 he worked as a Max Planck Independent Group Leader at the Max Planck institute for Molecular Genetics, Berlin, and from 2004 as assistant and then associate professor with Baylor College of Medicine, Houston, Texas. Dr. Antebi is currently one of the founding directors of the Max Planck Institute for Biology of Ageing, Cologne, which he has helped lead to become a world-renowned center for ageing research. He is also an honorary Professor at the University of Cologne, Center of Excellence Cluster on Cellular Stress Response and Age-associated Disease. Dr. Antebi's work has focused on endocrine and metabolic regulation of longevity in the small roundworm, Caenorhabditis elegans, an important model system for ageing research. Among his findings, he has discovered that components of developmental clocks and nuclear receptor signaling can regulate animal life span and found that small nucleoli are a cellular hallmark of longevity. He has served as an editor in chief of the journal "Aging Cell" and has won various honors including the prestigious Ellison Medical Foundation Senior Scholar in Aging Award, the Paul Glenn/American Federation for Aging Research Breakthrough in Gerontology Award, the Runnstrom Lecture Award, the ADPS Longevity Award, the ERC Advanced Grant, and is an EMBO fellow.

Selected publications:

- *Gerisch, B., Tharyan, R.G., Mak, J., Denzel, S.I., Popkes-van Oepen, T., Henn, N., and Antebi, A. (2020) HLH-30/TFEB is a master regulator of reproductive quiescence. Dev Cell (accepted).*
- *Tiku, V., Jain, C., Raz, Y., Nakamura, S., Heestand, B., Liu, W., Späth, M., Suchiman, H., Eka, D., Müller, R.U., Slagboom, P.E., Partridge, L., and Antebi, A. (2017) Small nucleoli are a cellular hallmark of longevity. Nat Commun- 8: 16083.*
- *Nakamura, S., Karalay, Ö., Jäger, P.S., Horikawa, M., Klein, C., Nakamura, K., Latza, C., Templer, S.E., Dieterich, C., and Antebi, A. (2016) Mondo complexes regulate TFEB via TOR inhibition to promote longevity in response to gonadal signals. Nat Commun. 7: 10944.*
- *Denzel, M.S., Storm, N.J., Gutschmidt, A., Baddi, R., Hinze, Y., Jarosch, E., Sommer, T., Hoppe, T., and Antebi, A. (2014). Hexosamine pathway metabolites enhance protein quality control and prolong life. Cell 156, 1167-1178.*
- *Shen, Y., Wollam, J., Magner, D., Karalay, O., and Antebi, A. (2012). A steroid receptor-microRNA switch regulates life span in response to signals from the gonad. Science 338, 1472-1476.*

Carol A. Barnes, PhD | University of Arizona (Tucson, USA)

Dr. Carol Barnes is a Regents Professor in the Departments of Psychology, Neurology and Neuroscience, the Evelyn F. McKnight Endowed Chair for Learning and Memory in Aging, Director of the Evelyn F. McKnight Brain Institute, and Director of the Division of Neural Systems, Memory & Aging at the University of Arizona, Tucson, AZ. Dr. Barnes is past-president of the 38,000 member Society for Neuroscience, an elected member of the National Academy of Sciences, Fellow of the American Association for the Advancement of Science, and an Elected Foreign Member of the Royal Norwegian Society of Sciences and Letters. She is recipient of the 2013 Gerard Prize in Neuroscience and the 2014 American Psychological Association Award for Distinguished Scientific Contributions. She earned her B.A. in psychology from the University of California at Riverside, and her M.A. and Ph.D. from Carleton University in Ottawa, Canada. She did postdoctoral training in neuropsychology and neurophysiology in the Department of Psychology at Dalhousie University, The Institute of Neurophysiology, University of Oslo, and in the Cerebral Functions Group at University College London. The central goal of Dr. Barnes' research program is to understand how the brain changes during the aging process and what the functional consequences of these changes are on information processing and memory. Her research program involves behavioral, electrophysiological and molecular biological approaches to the study of young and aged rodents and non-human primates. This work provides a basis for understanding the basic mechanisms of normal aging in the brain and sets a background against which it is possible to assess the effects of pathological changes such as Alzheimer's disease. Some current work also includes an assessment of therapeutic agents that may be promising in the alleviation or delay of neural and cognitive changes that occur with age. Dr. Barnes has written 275 articles in the area of memory changes during normal aging and their possible neurobiological correlates.

Selected publications:

- *Burke, S.N., Maurer, A.P., Nematollahi, S., Uprety, A., Wallace, J.L. and Barnes, C.A. (2014) Advanced age dissociates dual functions of the perirhinal cortex. Journal of Neuroscience, 34:467-480.*
- *Lester, A.W., Moffat, S.D., Wiener, J.M., Barnes, C.A. and Wolbers, T. (2017) The aging navigational system. Neuron, 9:1019-1035.*
- *Ryan, L., Hay, M., Huentelman, M.J., Duarte, A., Rundek, T., Levin, B., Soldan, A., Pettigrew, C., Mehl, M.R., Barnes, C.A. (2019) Precision Aging: Applying precision medicine to the field of cognitive aging. Frontiers in Aging Neuroscience, 11:128, doi: 10.3389/fnagi.2019.00128.*
- *Gray, D.T., Barnes, C.A. (2019) Experiments in macaque monkeys provide critical insights into age-associated changes in cognitive and sensory function. Proceedings of the National Academy of Sciences, 116:26247-26254.*
- *Huentelman, M.J., Talboom, J.S., Lewis, C.R., Chen, Z., Barnes, C.A. (2020) Reinventing neuroaging research in the digital age. Trends in Neuroscience, 43: 17–23.*

Luc BUEE, PhD | University of Lille - Inserm - CHU-Lille (Lille, France)

Luc Buée has worked on Alzheimer's disease and related disorders for more than thirty years. He started his work on the role of proteoglycans in Alzheimer's disease with a PhD training at Mount Sinai Medical Center, NY, USA. He made some pioneering neuropathological observations on microvasculature abnormalities in neurodegenerative disorders. However, his main inputs have been in the understanding of neurofibrillary degeneration and tau physiological functions. He was involved in the initial biochemical characterization of tau aggregates among neurodegenerative disorders (Tauopathies barcode). He has then developed experimental models to better understand the role of post-translational modifications in tau aggregation, tau secretion and the prion-like tau propagation. Such experimental models are now widely used to evaluate therapeutic strategies in tauopathies (immunotherapy, small molecules, non-drug therapy...). With his team, he has also discovered many of the non-microtubular tau functions (tau and nucleic acids, tau and insulin signaling…). He is currently working on the pathophysiological consequences of neurofibrillary degeneration and their links to the amyloid pathology and neuroinflammation in Alzheimer's disease. His group was/is also involved in different international consortia. Luc Buée is a French scientist (Directeur de Recherches au CNRS), Director of the Lille Neuroscience & Cognition Research Centre and Head of the Inserm laboratory « Alzheimer & Tauopathies » at the University of Lille, France. Located on the Lille hospital campus, his laboratory belongs to the Lille Centre of Excellence in Neurodegenerative disorders (LiCEND) and is also part of the LabEx DISTALZ (National consortium on Alzheimer's disease). He is also involved in different scientific advisory boards and operating committees (National committee of Universities, Neuroscience section (CNU69), Janssen Horizon, Rainwater Charitable Foundation). He is also the representative researcher elected by academia colleagues at the French Foundation Plan Alzheimer. He is the organizer of the Eurotau meetings. Since October 2019, he is the president of the French Society for Neuroscience (Société des Neurosciences).

Selected publications:

- *Colin M, Dujardin S, Schraen-Maschke S, Meno-Tetang G, Duyckaerts C, Courade JP, Buée L (2020) Exploring anti-tau immunotherapy within the hypothesis of the prion-like propagation. Acta Neuropathol, 139: 3-25*
- *Albert M, Mairet-Coello G, Danis C, Lieger S, Caillierez R, Carrier S, Skrobala E, Landrieu I, Michel A, Schmitt M, Citron M, Downey P, Courade JP, Buée L*, Colin M* (2019) Prevention of tau seeding and propagation by immunotherapy with a central tau epitope antibody. Brain, 142(6):1736-1750*
- *Ising C, Venegas C, Zhang S, Scheiblich H, Schmidt SV, Vieira-Saecker A, Schwartz S, Albasset S, McManus R, Tejera D, Griep A, Santarelli F, Brosseron F, Opitz S, Stunden J, Merten M, Kayed R, Golenbock D, Blum D, Latz E, Buee L, Heneka M (2019) NLRP3 inflammasome activation drives tau pathology. Nature, 575(7784): 669-673*
- *Laurent C, Dorothée G, Hunot S, Martin E, Monnet Y, Duchamp M, Duong Y, Légeron FP, Leboucher A, Burnouf S, Faivre E, Carvalho K, Caillierez R, Zommer N, Demeyer D, Jouy N, Sazdovitch V, Schraen-Maschke S, Delarasse C, Buée L*, Blum D* (2017) Hippocampal T cell infiltration promotes neuroinflammation and cognitive decline in a mouse model of Tauopathy. Brain, 140(Pt 1):184-200.*

- *Marciniak E, Leboucher A, Caron E, Ahmed T, Tailleux A, Dumont J, Issad T, Gerhardt E, Pagesy P, Vileno M, Bournonville C, Hamdane M, Bantubungi K, Lancel S, Demeyer D, Eddarkaoui S, Vallez E, Vieau D, Humez S, Faivre E, Grenier-Boley B, Outeiro TF, Staels B, Amouyel P, Balschun D, Buee L*, Blum D* (2017) Tau deletion promotes brain insulin resistance. J Exp Med, 214(8):2257-2269.*
- *Sotiropoulos I, Galas MC, Silva JM, Skoulakis E, Wegmann S, Maina MB, Blum D, Sayas CL, Mandelkow EM, Mandelkow E, Spillantini MG, Sousa N, Avila J, Medina M, Mudher A, Buee L (2017) Atypical, non-standard functions of the microtubule-associated Tau protein. Acta Neuropathol Comm, 5: 91*

Gwenaelle Catheline | Bordeaux Neurocampus (Bordeaux, France)

Gwenaelle Catheline is an associate professor of the Ecole Pratique des Hautes Etudes working in the Aquitaine Institute of Integrative and Cognitive Neurosciences. She obtained her PhD in Neuroscience at the Pierre and Marie Curie University in Paris under the supervision of Jean-Marie Besson. In the first part of her scientific career, she investigated functional consequence of morphological adaptation of the nervous system to various pathophysiological conditions in rodents (neuropathic pain, lactation, parturition). Her research on animal studies indicated that the anatomical plasticity of the nervous system can be maladaptative. Now, she focussed her research program on the screening of the emergence of imaging abnormalities and associated cognitive-behavioral impairments in aging population. With this aim, she has applied advanced neuroimaging techniques in order to understand the etiology and pathophysiology of CNS disorders as well as the conditions associated with their expression. She has implemented the multimodal imaging approach coupling structural and functional MRI techniques for large cohorts with several hundred of subjects. Her research program is based on an extended multidisciplinary network of collaborators including epidemiologists, psychologists, computer scientists and clinicians. Using voxel-based morphometry analysis, she has shown that subjects who will develop Alzheimer's disease present hippocampal atrophy at least 7 years before the diagnosis. On elderly subjects presenting episodic memory decline she described morphological modifications of the hippocampus but also of microstructure of the fornix and the cingulum tract. More recently, she demonstrated an increase of functional connectivity recorded at rest in a network centered on the posterior cingulate cortex associated to a decrease of structural connectivity in episodic memory decliners. This observation is in accordance with a new story emerging from the recent neuroimaging literature considering the increase of rest connectivity as a maladaptive response of the brain to the age-related structural disconnection process. With her team collaborators, she has also developed a research program on the sleep/wake cycle disturbances and the cognitive decline in aging subjects using daily-life assessment (actigraphy).

Selected publications:

- *Coupé, P., Manjón, J. V., Lanuza, E., & Catheline, G. (2019). Lifespan Changes of the Human Brain In Alzheimer's Disease. Scientific Reports, 9(1).*
- *Planche, V., Coupé, P., Helmer, C., Le Goff, M., Amieva, H., Tison, F., Dartigues, J.-F., & Catheline, G. (2019). Evolution of brain atrophy subtypes during aging predicts long-term cognitive decline and future Alzheimer's clinical syndrome. Neurobiology of Aging, 79, 22–29.*

- *Baillet M., Dilharreguy B., Pérès K., Dartigues J.-F., Mayo W., Catheline G. (2017) Activity/rest cycle and disturbances of structural backbone of cerebral networks in aging. Neuroimage 146:814–820.*
- *Bernard, C., Dilharreguy, B., Helmer, C., Chanraud, S., Amieva, H., Dartigues, J.-F., Allard, M., Catheline, G., (2015). PCC characteristics at rest in 10-year memory decliners. Neurobiology of Aging 36, 2812–2820.*
- *Bernard C, Helmer C, Dilharreguy B, Amieva H, Auriacombe S, Dartigues JF, Allard M, Catheline G. (2014) Time course of brain volume changes in the preclinical phase of Alzheimer's disease. Alzheimer's § Dementia Mar;10(2):143-151.*

Maria Llorens-Martin | Centro de Biologia Molecular Severo Ochoa (Madrid, Spain)

I received my Ph.D. from the Universidad Complutense de Madrid (Spain) in 2009 for my research on the effects of physical exercise on adult hippocampal neurogenesis (AHN), which was conducted under Dr. José Luis Trejo's supervision at the Instituto Cajal (Madrid). In 2010, I joined Prof. Jesús Ávila's lab at the Center for Molecular Biology "Severo Ochoa" (CBMSO) as a postdoctoral fellow. During that period, I investigated AHN alterations in the brains of murine models of Alzheimer's disease (AD). In 2015, I was awarded a "JSPS Postdoctoral fellowship for foreign researchers" to undertake a postdoctoral research period in the University of Tsukuba (Japan) under the supervision of Dr. Hideaki Soya, where I developed novel molecular tools for the study of AHN in AD animal models. In 2016, I established my independent laboratory, combining the expertise I had acquired in neurodegenerative disorders with my background in AHN and neuroprotection. Since 2017, I hold Assistant Professor and Senior Researcher tenure-track positions at the Universidad Autónoma de Madrid under the Ramón y Cajal Program. The focus of my research group at the CBMSO is the basic biology of newborn granule neurons and AHN's neuroprotective potential for the treatment of various diseases. We focus on determining AHN's potential as a general form of neuronal plasticity in the adult brain. One of our main research goals is to untangle the function that newly generated neurons play in adult mammalian brain circuits.

Selected publications:

- *Unraveling human adult hippocampal neurogenesis. Flor-García M; Terreros-Roncal J; Moreno-Jiménez E.P; Ávila J; Rábano A; Llorens-Martín M. Nature Protocols. In press (Accepted 2019 Oct 30).*
- *Adult hippocampal neurogenesis is abundant in neurologically healthy subjects and drops sharply in Alzheimer´s disease patients. Moreno-Jiménez E.P; Flor-García M; Terreros-Roncal J; Rábano A, Cafini F, Pallas-Bazarra N, Ávila J, Llorens-Martín M. Nature Medicine. 2019 Apr; 25(4): 554-60. PMID: 30911133.*
- *Activity-dependent reconnection of adult-born dentate granule cells in a mouse model of frontotemporal dementia. Terreros-Roncal J; Flor-García M*; Moreno-Jiménez EP*; Pallas-Bazarra N*; Rábano A; Sah N; van Praag H; Giacomini D; Schinder AF; Ávila J; Llorens-Martín M. The Journal of Neuroscience. 2019 Jul 17; 39(29): 5794-5815. PMID: 31133559.*
- *Novel function of Tau in regulating the effects of external stimuli on adult hippocampal neurogenesis. Pallas-Bazarra N, Jurado-Arjona J, Navarrete M, Esteban JA, Hernández F, Ávila J, Llorens-Martín M. The EMBO Journal. 2016 Jul 1; 35 (13): 1417-36. PMID: 27198172.*

- *GSK-3β overexpression causes reversible alterations on postsynaptic densities and dendritic morphology of hippocampal granule neurons in vivo. Llorens-Martín M, Fuster-Matanzo A, Teixeira CM, Jurado-Arjona J, Ulloa F, DeFelipe J, Rábano A, Hernández F, Soriano E, Ávila J. Molecular Psychiatry. 2013 Apr; 18(4): 451-60. PMID: 23399915.*

Aline Marighetto | Bordeaux Neurocampus (Bordeaux, France)

Aline Marighetto is a research director at CNRS, leading the "Physiopathology of Declarative Memory" team at the Neurocentre Magendie since 2011. After obtaining a Master in Social Psychology, she did a second master in Neuroscience during which she met her mentor Pr. R. Jaffard. Since then, she has always been working on the neurobiology of memory with a top-down approach, from behavior to systems and molecules, and a focus on hippocampal function. She obtained a PhD grant to study the role of the septo-hippocampal cholinergic path, major subcortical input to the hippocampus, in a period which was the golden age for the cholinergic hypothesis of memory. This hypothesis was mainly based on the effects of cholinergic drugs and unselective cholinergic lesions. During her PhD, she combined thorough analyses of behavior in the radial-maze i) to biochemical analyses of the dynamical marker of cholinergic activity available at that time (choline uptake), and ii) to manipulations of cholinergic activity through intra-septal drug injections in mice. Her work provided challenging findings, and led her to propose a new cholinergic hypothesis. Having found that memory testing induces bi-directional changes, activation and diminution of cholinergic activity depending on the form of memory involved and on the phase of memory considered, she made the hypothesis of biphasic cholinergic modulation of memory formation. Thus, an increase of hippocampal acetylcholine (ACh) release during learning would promote memory encoding (especially of complex/relational representations), while a reduction of the release after learning to below pre-learning levels would sustain memory consolidation (PhD thesis, 1991). This hypothesis was insufficiently developed in the articles made of her PhD work in order to be attributable to AM. Nevertheless, the idea of antagonistic modulation by ACh for encoding vs consolidation processes turned out to be pioneer. It was echoing with a literature emerging at that time, according to which (now) selective cholinergic lesions had almost no effect on memory, and it was basically confirmed during following years (cf for example Hasselmo, Trens Cogn Sci,1999; Rasch BH, Born J, Gais S, J. Cognitive Neurosci, 2006). After two post-docs, first in Dr. Rawlins's laboratory (Dept of Experimental Psychology Oxford, England) to study the effects of lesioning a major source of cortical inputs to the hippocampus, the entorhinal cortex, and second in a pharmaceutical company (Servier-Paris), AM went back to Pr Jaffard's lab in Bordeaux as a CNRS researcher in 1996 to start her project on aging, and took over the leading of the team in 2006, before moving to the Neurocentre Magendie. She has developed with her team specific behavioral tasks in the radial maze to study the preferential degradation of declarative memory occurring during aging in mice. The tasks are conceptually based on the relational theory, and they have been successfully translated to humans using a virtual equivalent of the radial-maze. Thanks to these behavioral models, the team made some significant contributions to the field of mnemonic aging, including collaboration to a pioneer work on the role of the retinoid signaling pathway (Etchamendy et al, J. Neurosci., 2001; Mingaud et al, J.Neurosci., 2008) and recent identification of CA1-dependent temporal

binding as a critical component of declarative memory formation altered in aging (Sellami et al, PNAS, 2017).

Selected publications:

- *Temporal binding function of dorsal CA1 is critical for declarative memory formation. Sellami A, Al Abed AS, Brayda-Bruno L, Etchamendy N, Valério S, Oulé M, Pantaléon L, Lamothe V, Potier M, Bernard K, Jabourian M, Herry C, Mons N, Piazza PV, Eichenbaum H, Marighetto A. Proc Natl Acad Sci U S A. 2017 Sep 19;114(38):10262-10267*
- *Temporal Memory and Its Enhancement by Estradiol Requires Surface Dynamics of Hippocampal CA1 N-Methyl-D-Aspartate Receptors. Potier M, Georges F, Brayda-Bruno L, Ladépêche L, Lamothe V, Al Abed AS, Groc L, Marighetto A. Biol Psychiatry. 2016 May 1;79(9):735-45*
- *Partial loss in septo-hippocampal cholinergic neurons alters memory-dependent measures of brain connectivity without overt memory deficits. Brayda-Bruno L, Mons N, Yee BK, Micheau J, Abrous DN, Nogues X, Marighetto A. Neurobiol Dis. 2013 Jun;54:372-81.*
- *Retinoid hyposignaling contributes to aging-related decline in hippocampal function in short-term/working memory organization and long-term declarative memory encoding in mice. Mingaud F, Mormede C, Etchamendy N, Mons N, Niedergang B, Wietrzych M, Pallet V, Jaffard R, Krezel W, Higueret P, Marighetto A. J Neurosci. 2008 Jan 2;28(1):279-91*
- *Alleviation of a selective age-related relational memory deficit in mice by pharmacologically induced normalization of brain retinoid signaling. Etchamendy N, Enderlin V, Marighetto A, Vouimba RM, Pallet V, Jaffard R, Higueret P. J Neurosci. 2001 Aug 15;21(16):6423-9.*

Lars Nyberg | Umeå University (Umeå, Sweden)

Lars Nyberg serves as Professor of Psychology and Neurosciences at Umeå University, Sweden. He has been active in the field of functional neuroimaging of memory since 1994. He is the director of Umeå Center for Functional Brain Imaging (UFBI), and a principal investigator of the Betula longitudinal project on aging, memory and dementia. Since 2008 he is a member of the Royal Swedish Academy of Sciences. Nyberg's research is focused on the identification of genetic, brain, and life-style predictors of heterogeneity in cognitive-aging profiles.

Selected publications:

- *Nyberg, L., Karalija, N., Salami, A., Andersson, M., Wåhlin, A., Kabovaand, N., Köhncke, Y., Axelsson, J., Rieckmann, A., Papenberg, G., Garrett, DD., Riklund, K., Lövdén, M., Lindenberger, U., & Bäckman, L. (2016). Dopamine D2 receptor availability is linked to hippocampal-caudate functional connectivity and episodic memory. Proceedings of the National Academy of Sciences, USA, 113, 7918-23.*
- *Salami, A., Pudas, S., & Nyberg, L. (2014). When More Becomes Less: Elevated Hippocampal Resting-State Connectivity Underlies Deficient Neurocognitive Function in Aging. Proceedings of the National Academy of Sciences, USA, 111, 17654-17659.*
- *Dahlin, E., Stigsdotter Neely, A., Larsson, A., Bäckman, L., & Nyberg, L. (2008). Transfer of learning after updating training mediated by the striatum. Science, 320, 1510-1512.*
- *Eriksson, J., Vogel, E. K., Lansner, A., Bergström, F., & Nyberg, L. (2015). Neurocognitive architecture of working memory. Neuron, 88, 33-46.*
- *Nyberg, L., Lövdén, M., Riklund, K, Lindenberger, U., & Bäckman, L. (2012). Memory aging and brain maintenance. Trends in Cognitive Science, 16, 292-305.*

Laure Rondi-Reig | Sorbonne University (Paris, France)

After studying Biology and Neurosciences at Sorbonne University in Paris, Laure Rondi-Reig obtained her PhD degree on the "Role of the cerebellum in motor and spatial learning". She was trained in behavioral genetics and neuropsychology of memory during her postdoctoral stay at the Massachusetts Institute of Technology (MIT) in the laboratory of S. Tonegawa and her collaboration with H. Eichenbaum at Boston University. She was then recruited by the French institution for research, the CNRS, and worked at the Collège de France in the laboratory of A. Berthoz. She currently leads her own lab entitled "Cerebellum, Navigation and Memory" (CeZaMe) at the Neuroscience department of the Biology Paris Seine Institute and is co-President of the scientific council of the life sciences department at Sorbonne University. Laure Rondi-Reig is a recognized expert in the Navigation field. Her work established the functional link between the cerebellum and the hippocampus during spatial cognition by emphasizing the crucial role of self-motion calibration by the cerebellum for navigation and spatial memory. She is the inventor of the Starmaze, which evaluates spatio-temporal memory and navigation strategies in rodents and humans. She has been awarded the CNRS bronze medal in 2010, the FRM Iagonitzer prize in 2012 and the SATT Lutech innovation prize in 2019 for her invention and its application on the diagnosis of memory disorders in humans and rodents models.

Selected publications:

- *Watson TC*, Obiang P*, Torres-Herraez* A, Watilliaux A, Coulon P, Rochefort C, Rondi-Reig L. Anatomical and physiological foundations of cerebello-hippocampal interaction. Elife. 17;8, 2019*
- *Babayan, Watilliaux, Viejo, Paradis, Girard, Rondi-Reig, A hippocampo-cerebellar centred network for the learning and execution of sequence-based navigation. Scientific Reports 7:17812, 2017.*
- *Iglói K., Doeller C.F., Paradis A.L., Benchenane K., Berthoz A., Burgess N. and Rondi-Reig L. Interaction between hippocampus and cerebellum Crus I in sequence-based but not place-based navigation. Cerebral cortex, 25(11):4146-54, 2015*
- *Rochefort C., Arabo A., André M., Poucet B., Save E. and Rondi-Reig L. IF:31.4 Cerebellum Shapes Hippocampal Spatial Code. Science, 334, 385-389 (2011)*
- *Rondi-Reig L., Petit G., Arleo A., Burguière E. The Starmaze: a new paradigm to characterize multiple spatial navigation strategies. Measuring behavior, Wageningen, The Netherlands, 2005*

Yaakov Stern | Columbia University (New York, USA)

Yaakov Stern is Professor of Neuropsychology in the Departments of Neurology and Psychiatry, as well as the Taub Institute for the Research on Alzheimer's Disease and the Aging Brain, at Columbia University Irving College of Physicians and Surgeons. He is chief of the Cognitive Neuroscience Division in the Department of Neurology. Dr. Stern's research focuses on cognition in normal aging and in diseases of aging, particularly Alzheimer's disease. One strong focus of his current research program is investigating the neural basis of cognitive reserve. Dr. Stern's work was crucial to identifying and clarifying the nature of cognitive reserve, which is a theory that explains

individual differences in the susceptibility to age-and disease-related brain changes. In 1992 he demonstrated that when patients with Alzheimer's disease are matched for clinical severity, those with higher education had more extensive neurodegeneration, indicating that they could cope more successfully with the underlying pathology. He was one of the first to use prospective incidence studies to demonstrate that individuals with higher educational or occupational attainment, or who engage in more late life leisure activities have a reduced risk of developing Alzheimer's. He was the first to observe that patients with higher reserve had a more rapid rate of decline. Much of his later work has focused on the potential neural basis of cognitive reserve using imaging studies, as well as promoting consensus on terminology surrounding reserve and resilience concepts. Dr. Stern also leads a large scale imaging study to identify unique neural networks underlying the major cognitive abilities affected by aging, and another long-term study that models the natural history of Alzheimer's disease. Dr. Stern's research approach includes classic neuropsychological and cognitive experimental techniques, with a strong focus on functional imaging. He has published over 600 peer-reviewed papers, numerous chapters, and edited a book on cognitive reserve.

Selected publications:

- *Stern Y. Cognitive reserve. Neuropsychologia. 2009;47(10):2015-28.*
- *Steffener J, Stern Y. Exploring the neural basis of cognitive reserve in aging. Biochim Biophys Acta. 2012;1822(3):467-73.*
- *Stern Y, Gazes Y, Razlighi Q, Steffener J, Habeck C. A task-invariant cognitive reserve network. Neuroimage 2018;176:36-45.*
- *Stern Y, Arenaza-Urquijo EM, Bartres-Faz D, et al. Whitepaper: Defining and investigating cognitive reserve, brain reserve, and brain maintenance. Alzheimers Dement. 2018. Epub 2018/09/18. doi: 10.1016/j.jalz.2018.07.219.*
- *Habeck C, Eich T, Razlighi R, Gazes Y, Stern Y. Reference ability neural networks and behavioral performance across the adult life span. Neuroimage. 2018;172:51-63.*

Tony Wyss-Coray | Stanford University (Stanford, USA)

Tony Wyss-Coray, D.H. Chen Distinguished Professor of Neurology and Neurological Sciences at Stanford University, is the Co-Director of the Stanford Alzheimer's Disease Research Center, and Senior Research Career Scientist at the Palo Alto VA. His lab studies brain aging and neurodegeneration with a focus on age-related cognitive decline and Alzheimer's disease. The Wyss-Coray research team discovered that circulatory blood factors can modulate brain structure and function and factors from young organisms can rejuvenate old brains. These findings were voted 2nd place Breakthrough of the Year in 2014 by Science Magazine and presented in talks at Global TED, the World Economic Forum, and Google Zeitgeist. Current studies focus on the molecular basis of the systemic communication with the brain by employing a combination of genetic, cell biology, and –omics approaches in killifish, mice, and humans and through the development of bio-orthogonal tools for the in vivo labeling of proteins. Wyss-Coray is the co-founder of Alkahest, a company developing plasma-based therapies to counter age-related diseases such as Alzheimer's; he is also the recipient of an NIH Director's Pioneer Award, a Zenith Award from the Alzheimer's Association, a NOMIS Foundation Award, an inventor on multiple patents,

and was selected by TIME Magazine to "The Health Care 50" as one of the most influential people transforming healthcare in 2018.

Selected publications:

- *Villeda SA, Plambeck K, Middledorp J, Castellano JM, Mosher KI, Luo J, Smith LK, Bieri G, Lin K, Berdnik D, Wabl R, Udeochu J, Wheatley EG, Zou B, Simmons DA, Xie XS, Longo F, and Wyss-Coray T (2014) Young blood reverses age-related impairments in cognitive function and synaptic plasticity in mice. Nature Med. 20:659–63. [PMC4224436]*
- *Yousef H, Czupallla CJ, Lee D, Chen MB, Burke AN, Zera KA, Zandstra J, Berber E, Lehallier B, Mathur V, Nair RV, Bonanno LN, Yang AC, Peterson T, Hadeiba H, Merkel T, Körbelin J, Schwaninger M, Buckwalter MS, Quake SR, Butcher EC, Wyss-Coray T. (2019) Aged blood impairs hippocampal neural precursor activity and activates microglia via brain endothelial cell VCAM1. Nature Med. 25:988-1000 [PMC pending]*
- *Lehallier B, Gate D, Schaum N, Nanasi T, Lee SE, Yousef H, Moran Losada P, Berdnik D, Keller A, Verghese J, Sathyan S, Franceschi C, Milman S, Barzilai N, Wyss-Coray T. (2019) Undulating changes in human plasma proteome profiles across the lifespan. Nature Med. 25: 1843-1850 [PMC pending]*
- *Gate D, Saligrama N, Leventhal O, Yang AC, Unger MS, Middeldorp J, Chen K, Lehallier B, Channappa D, De Los Santos MB, McBride A, Pluvinage J, Elahi F, Tam GK, Kim Y, Greicius M, Wagner AD, Aigner L, Galasko DR, Davis MM Wyss-Coray T. (2020) Clonally expanded CD8 T cells patrol the cerebrospinal fluid in Alzheimer's disease. Nature 577: 399-404 [PMC pending]*
- *Marschallinger J, Iram T, Zardeneta ME, Lee SE, Lehallier B, Haney MS, Pluvinage JV, Mathur V, Hahn O, Morgens DW, Kim J, Tevini J, Felder TK, Wolinski H, Bertozzi CR, Bassik MC, Aigner L, Wyss-Coray T. (2020) Lipid-droplet-accumulating microglia represent a dysfunctional and proinflammatory state in the aging brain. Nat Neurosci 23:194–208 [PMC pending]*