



Society for Brain Mapping and Therapeutics (SBMT)
Alzheimer's Disease Conference 2018:

**A Primer on Recent Advances in Alzheimer's Disease Research:
Pathogenic Mechanisms, Early Diagnosis, Prevention & Treatment**

Organized by Konrad Talbot, J. Wes Ashford,
Maya Koronyo-Hamaoui, & Margaret Fahnestock

Final Program

Friday, April 13th 10:00 - 11:30 am

A3: AD Mechanisms I: New Perspectives on A β and Tau

Chairs: Konrad Talbot and Margaret Fahnestock

10:00-10:15 Konrad Talbot (UCLA & VA West Los Angeles HCS): A welcoming introduction to the Alzheimer's Disease Conference 2018

Key background paper: Scheltens, P. et al. (2016) Alzheimer's disease. *Lancet* 100043: 505

10:15-10:30 Salvador Soriano (Loma Linda Univ.): Amyloid beta (A β) is neither necessary nor sufficient to initiate late-onset Alzheimer's disease

Key background papers: Castello, M.A. et al. (2014) Moving beyond anti-amyloid therapy for prevention and treatment of Alzheimer's disease. *BMC Neurology* 14: 169; Herrup, K. (2015) The case for rejecting the amyloid cascade hypothesis. *Nature Neuroscience* 18: 794-799

10:30-10:45 Duygu-Tosun-Turgut (UCSF): Association between A β accumulation and later tau deposition in cognitive and clinical symptoms of normal and early AD cases

Key background paper: Tosun, D. et al. (2017) Association between tau deposition and antecedent amyloid- β accumulation rates in normal and early symptomatic individuals. *Brain* 140: 1499-1512

10:45-11:00 Margaret Fahnestock (McMaster Univ.): A β -tau interactions influence cognition by down-regulating BDNF

Key background paper: Rosa, E. et al. (2016) Tau modulates BDNF expression and mediates A β -induced BDNF downregulation in animal and cellular models of Alzheimer's disease. *Neurobiology of Aging* 48:135-142

11:00-11:15 Carol A. Miller (USC): Tau pathology in AD: Mapping brain connectivity from millimeters to microns

Key background paper: Miller, C.A. et al. (2016) ZO om³: A three-dimensional super-resolution technique to map brain connectivity from millimeters to molecules. *Journal of Neuropathology & Experimental Neurology* 75, Issue 6: abstract 36

11:15-11:30 Session Discussion

Friday, April 13th 1:30 - 3:00 pm

A10: AD Mechanisms II: ApoE4

Chairs: J. Wes Ashford and Carr Smith

1:30-1:45 J. Wes Ashford (Stanford Univ. & VA Palo Alto HCS): The triad of AD risk: age, sex and ApoE4

Key background papers: Riedel, B.C. et al. (2016) Age, APOE and sex: Triad of risk of Alzheimer's disease. *Journal of Steroid Biochemistry and Molecular Biology* 160: 134-147; Mosconi, L. et al. (2017) Sex differences in Alzheimer risk: brain imaging of endocrine vs chronologic aging. *Neurology* 89: 1382-1390; Neu, S.C. et al. (2017) Apolipoprotein E genotype and sex risk factors for Alzheimer disease: a meta-analysis. *JAMA Neurology* 74: 1178-1189

1:45-2:00 Carr J. Smith (Florida State Univ.): AD risk posed by the APOE ϵ 4 allele may be related to increased lifetime exposure to a neurotoxic process

Key background paper: Smith, C. & Ashford, J.W. (2017) APOE ϵ 4 allele-associated Alzheimer's disease risk is consistent with increased lifetime exposure to a neurotoxic process. *Journal of Systems and Integrative Neuroscience* 3: 1-4.

2:00-2:15 Iliya Lefterov (Univ. of Pittsburgh): Multi-omic profiling identifies ApoE allele-dependent lipid and gene expression patterns in AD

Key background paper: Carter, A.Y. et al. (2017) Liver X receptor agonist treatment significantly affects phenotype and transcriptome of APOE3 and APOE4 Abca1 haplo-deficient mice. *PLoS One* 12(2): e0172161

2:15-2:30 Thalia E. Arpawong (USC): Genetic variants in APOE ϵ 4 and TOMM40 associated with AD risk and age-related verbal memory

Key background papers: Yu, L. et al. (2017) APOE ϵ 4-TOMM40 ϵ 523 haplotypes and the risk of Alzheimer's disease in older Caucasian and African Americans. *PLoS One* 12(7): e0180356; Arpawong, T.E. et al. (2017) Genetic variants specific to aging-related verbal memory: insights from GWASs in a population-based cohort. *PLoS One* 12(8): e0182448

2:30-2:45 Therese S. Salameh (Univ. of Washington & VA Puget Sound HCS): Interaction of ApoE, insulin resistance, and dyslipidemia in AD cognitive impairment

Key background paper: Salameh, T.S. et al. (2016) Insulin resistance, dyslipidemia, and apolipoprotein E interactions as mechanisms in cognitive impairment and Alzheimer's disease. *Experimental Medicine and Biology* 241: 1676-1683

2:45-3:00 Session Discussion

Friday, April 13th 3:30 - 5:00 pm

A17: AD Mechanisms III: Brain-Immune Interactions

Chairs: Maya Koronyo-Hamaoui and Jonathan Kipnis

3:30-3:45 Maya Koronyo-Hamaoui (Cedars-Sinai Med. Ctr.): Retinal amyloid-associated inflammation in Alzheimer's Disease

Key background papers: Koronyo, Y. et al. (2017) Retinal amyloid pathology and proof-of-concept imaging trial in Alzheimer's disease. *Journal of Clinical Investigation* 127: e93621; Rentsendorj, A. et al. (2018). A novel role for osteopontin in macrophage-mediated amyloid- β clearance in Alzheimer's models. *Brain Behavioral Immunology* 67:163-180

3:45-4:00 Jorge I. Alvarez (Univ. of Pennsylvania): Neurovascular regulation of inflammatory responses

Key background papers: Alvarez, J.I. et al., (2015) Focal disturbances in the blood-brain barrier are associated with formation of neuroinflammatory lesions. *Neurobiology of Disease* 74:14-24; Alvarez, J.I. et al. (2011) The Hedgehog pathway promotes blood-brain barrier integrity and CNS immune quiescence. *Science* 334: 1727-31

4:00-4:15 Maj-Linda Selenica (Univ. of South Florida): The implications of CCL2 in modulation of inflammatory profile, amyloid beta and tau pathology in AD-transgenic mouse model

Key background papers: Selenica, M.L. et al. (2014) Epitope analysis following active immunization with tau proteins reveals immunogens implicated in tau pathogenesis. *Journal of Neuroinflammation* 11: 152; Leyns, C. et al. (2017) TREM2 deficiency attenuates neuroinflammation and protects against neurodegeneration in a mouse model of tauopathy. *Proceedings of the National Academy of Sciences (U.S.A.)* 114:11524-11529

4:15-4:30 Radosveta Koldamova (Univ. of Pittsburgh): Diet, APOE genotype, and sex affect immune response in APP mice.

Key background paper: Nam, K.N. et al. (2018) Integrated approach reveals diet, APOE genotype and sex affect immune response in APP mice. *Biochimica & Biophysica Acta* 1864: 152-161

4:30-4:45 Jonathan Kipnis (Univ. of Virginia): The role of CNS-draining lymphatics in aging and AD

Key background papers: Louveau, A. et al. (2016) Lymphatics in neurological disorders: a neuro-lympho-vascular component of multiple sclerosis and Alzheimer's disease? *Neuron* 91: 957-973; Louveau, A. et al. (2017) Understanding the functions and relationships of the glymphatic system and meningeal lymphatics. *Journal of Clinical Investigation* 127: 3210-3219

4:45-5:00 Session Discussion

Saturday, April 14th 10:00 – 11:30 am

B24: AD Mechanisms IV: Brain & Systemic Insulin Resistance & Glucose Metabolism

Chairs: Konrad Talbot and Auriel A. Willette

10:00-10:15 Konrad Talbot (UCLA & VA West Los Angeles HCS): The nature of brain insulin resistance in AD and its association with systemic insulin resistance and cognitive decline

Key background papers: Talbot, K. et al. (2012) Demonstrated brain insulin resistance in Alzheimer's disease patients is associated with IGF-1 resistance, dysregulated IRS-1, and cognitive decline. *Journal of Clinical Investigation* 122: 1316-1338; Talbot, K. and Wang, H.-Y. (2014) The nature, significance, and GLP-1 analogue treatment of brain insulin resistance in Alzheimer's disease. *Alzheimer's & Dementia* 10: S12-S25

10:15-10:30 Roger J. Mullins (NIA): Brain insulin resistance links A β & tau pathologies in late-onset AD

Key background paper: Mullins, R.J. et al. (2017) Insulin resistance as a link between amyloid-beta and tau pathologies in Alzheimer's disease. *Frontiers in Aging Neuroscience* 9: 118.

10:30-10:45 Siobhan M. Hoscheidt (Wake Forest Med. Sch.): Insulin resistance is associated with lower arterial blood flow and reduced cortical perfusion in cognitively asymptomatic middle-aged adults

Key background paper: Hoscheidt, S.M. et al. (2017) Insulin resistance is associated with lower arterial blood flow and reduced cortical perfusion in cognitively asymptomatic middle-aged adults. *Journal of Cerebral Blood Flow & Metabolism* 376: 2249-2261

10:45-11:00 Peter R. Patrylo (Southern Illinois Univ.): Systemic insulin resistance precedes A β plaque deposition and cognitive decline in an animal model of AD

Key background paper: Maclin, L. et al. (2017) Glucose tolerance and insulin sensitivity are impaired in APP/PS1 transgenic mice prior to amyloid plaque pathogenesis and cognitive decline. *Experimental Gerontology* 88: 9-18

11:00-11:15 Auriel A. Willette (Iowa State U): Systemic insulin resistance is a risk factor for reduced cerebral glucose uptake, increased cerebral A β accumulation, and MCI conversion to AD dementia

Key background papers: Willette, A.A. et al. (2015) Association of insulin resistance with cerebral glucose uptake in late middle-aged adults at risk for Alzheimer disease. *JAMA Neurology* 72: 1013-1020; Willette, A. et al. Insulin resistance predicts medial temporal hypermetabolism in mild cognitive impairment conversion to Alzheimer disease. *Diabetes* 64: 1933-1940; Willette, A.A. (2015) Insulin resistance predicts brain amyloid deposition in late middle-aged adults. *Alzheimer's & Dementia* 11: 504-510

11:15-11:30 Session Discussion

Saturday, April 14th 1:00 – 2:30 pm

B31: Early AD Diagnosis I: Brain & Retinal Imaging

Chair: J. Wes Ashford and Maya Koronyo-Hamaoui

1:00-1:15 Ansgar Furst (Stanford Univ. & VA Palo Alto HCS): Advancing brain imaging for AD integrating anatomic and physiologic measures for early diagnosis

Key background paper: Ashford, J.W. and Furst, A.J. (2014) Advancing brain imaging for Alzheimer's disease: integrating anatomic and physiologic measures. *Journal of Alzheimer's Disease* 41: 759-763.

1:15-1:30 Yu Zhang (UCSF and VA Palo Alto HCS): Impact of the Alzheimer's Disease Neuroimaging Initiative (ADNI) Brain Health Registry on diagnosing AD using A β imaging

Key background papers: Weiner, W.M. & Veitch, D.P. (2015) Overview of Alzheimer's Disease Neuroimaging Initiative. *Alzheimer's & Dementia* 11: 730-733 and Weiner, N.W., et al. (2015) Impact of the Alzheimer's Disease Neuroimaging Initiative (ADNI) 2004-2014. *Alzheimer's & Dementia* 11: 865-884

1:30-1:45 Axel Montagne (USC): Imaging of neurovascular dysfunction in Alzheimer's disease

Key background papers: Montagne, A. et al. (2016) Brain imaging of neurovascular dysfunction in Alzheimer's disease. *Acta Neuropathologica* 131: 687-707; Montagne, A. et al. (2017) Alzheimer's disease: A matter of blood-brain barrier dysfunction? *Journal of Experimental Medicine* 214: 3151-3169; Kisler, K. et al. (2017) Cerebral blood flow regulation and neurovascular dysfunction in Alzheimer disease. *Nature Reviews Neuroscience* 18: 419-434

1:45-2:00 Duygu Tosun-Turgut (UCSF): Cerebral blood flow and glucose utilization in diagnosis of AD stages

Key background paper: Tosun, D. et al. (2016) Discriminative power of arterial spin labeling magnetic resonance imaging and ¹⁸F-fluorodeoxyglucose positron emission tomography changes for amyloid- β -positive subjects in the Alzheimer's disease continuum. *Neurodegenerative Diseases* 16: 87-94

2:00-2:15 Maya Koronyo-Hamaoui (Cedars-Sinai Med. Ctr.): Retinal imaging of A β plaques for diagnosis of AD

Key background papers: Koronyo, Y. et al. (2012) Alzheimer's disease in the retina: imaging retinal A β plaques for early diagnosis and therapy assessment. *Neurodegenerative Diseases* 10: 285-293, 2012; Hart, N.J. et al. (2016) Ocular indicators of Alzheimer's: exploring disease in the retina. *Acta Neuropathologica* 132: 767-787.

2:15-2:30 Session Discussion

Saturday, April 14th 3:00 – 4:30 pm

B38: Early AD Diagnosis II: CSF & Blood Biomarkers

Chairs: Howard J. Federoff and Konrad Talbot

3:00-3:15 J. Wes Ashford (Stanford Univ. & VA Palo Alto HCS): CSF biomarkers and cognitive changes across AD spectrum

Key background papers: Ashford, J.W. et al. (2011) Imaging the Alzheimer brain. *Journal of Alzheimer's disease* 26: 1-27; Ashford, J.W. (2011) Measuring memory in large group settings using a continuous recognition test. *Journal of Alzheimer's Disease* 27: 885-895

3:15-3:30 George Perry (U Texas): CSF markers of metabolic and synaptic dysfunction hypotheses in AD

Key background paper: Manyevitch, R. et al. (2018) Evaluation of metabolic and synaptic dysfunction hypotheses of Alzheimer's disease (AD): a meta-analysis of CSF markers. *Current Alzheimer Research* 15: 1-21

3:30-3:45 Gregory M. Cole (UCLA & VA West Los Angeles HCS): Preclinical AD identified by pathogenic proteins in neurally derived blood exosomes

Key background paper: Fiandaca, M.S. et al. (2015) Identification of preclinical Alzheimer's disease by a profile of pathogenic proteins in neurally derived blood exosomes: a case-control study. *Alzheimer's & Dementia* 11: 600-607

3:45-4:00 Scott E. Counts (Michigan State): ProNGF in cerebrospinal fluid as a putative biomarker for Alzheimer's disease

Key background papers: Janel, N. et al. (2017) Combined assessment of DYRK1A, BDNF and homocysteine levels as diagnostic marker for Alzheimer's disease. *Translational Psychiatry* 7: e1154; Counts, S.E. et al. (2016) Cerebrospinal fluid proNGF: a putative biomarker for early Alzheimer's disease. *Current Alzheimer Research* 13:800-808; Forlenza, O.V. et al. (2015) Lower cerebrospinal fluid concentration of brain-derived neurotrophic factor predicts progression from mild cognitive impairment to Alzheimer's disease. *Neuromolecular Medicine* 17: 326-332

4:00-4:15 Howard J. Federoff (UCI): Plasma metabolome, cognitive function and Alzheimer's disease

Key background papers: Mapstone, M., et al. (2017) What success can teach us about failure: the plasma metabolome of older adults with superior memory and lessons for Alzheimer's disease. *Neurobiology of Aging*. 51:148-155; Fiandaca, M.S. (2015) Plasma 24-metabolite panel predicts preclinical transition to clinical stages of Alzheimer's disease *Frontiers in Neurology* 6: 237; Mapstone, M. et al. (2014) Plasma phospholipids identify antecedent memory impairment in older adults. *Nature Medicine* 20(4):415-8

4:15-4:30 Session Discussion

Sunday, April 15th 10:00 – 11:30 am

C45: AD Prevention Focusing on Lifestyle

Chairs: J. Wes Ashford and Carr J. Smith

10:00-10:15 Jennifer Kaci Fairchild (Stanford Univ. & VA Palo Alto HCS): Neurocognitive detection of early cognitive decline

Key background paper: Baerresen, K.M. et al. (2015) Neuropsychological tests for predicting cognitive decline in older adults. *Neurodegenerative Disease Management* 5: 191-201

10:15-10:30 Deborah E. Barnes (UCSF): Potential for primary prevention of Alzheimer's disease

Key background papers: Barnes, D.E. and Yaffe, K. (2011) The projected effect of risk factor reduction on Alzheimer's disease prevalence. *Lancet Neurology* 10: 819-828; Livingston, G. et al. (2017) Dementia prevention, intervention, and care. *Lancet* 390: 2673-2734

10:30-10:45 Hussein Yassine (USC): High dose DHA supplementation in APOE4 carriers may decrease AD incidence

Key background paper: Yassine, H.N. (2017) Association of docosahexaenoic acid supplementation with Alzheimer disease stage in Apolipoprotein E ϵ 4 carriers, a review. *JAMA Neurology* 74: 339-347

10:45-11:00 Fernando Gomez-Pinilla (UCLA): Diet and exercise together helps prevent neurological and cognitive disorders

Key background papers: Gomez-Pinilla, F. (2011) The combined effects of exercise and foods in preventing neurological and cognitive disorders. *Preventive Medicine* 52 (suppl. 1): S75-80; Gomez-Pinilla, F. and Hillman, C. (2013) The influence of exercise on cognitive abilities. *Comprehensive Physiology* 3: 403-428; Carlin, J.L. et al. (2016) Voluntary exercise blocks Western diet-induced gene expression of the chemokines CXCL10 and CCL2 in the prefrontal cortex. *Brain, Behavior, and Immunity* 58: 82-90

11:00-11:15 Margaret Fahnstock (McMaster Univ.): Diet and exercise interact to raise BDNF levels and improve cognition in animal models and human subjects

Key background papers: Hutton, C.P. et al. (2015) Synergistic effects of diet and exercise on hippocampal function in chronically stressed mice. *Neuroscience* 308: 180-193; Heisz, J.J. et al. (2017) The effects of physical exercise and cognitive training on memory and neurotrophic factors. *Journal of Cognitive Neuroscience* 29: 1895-1907

11:15-11:30 Session Discussion

Sunday, April 15th 1:00 – 2:30 pm

C52: AD Treatment I: Targeting A β and/or Tau

Chairs: J. Wes Ashford and Steven L. Wagner

1:00-1:15 Steven L. Wagner (UCSD): Development of potent gamma-secretase modulators for Alzheimer's disease

Key background papers: Wagner, S.L. et al. (2017) Pharmacological and toxicological properties of the potent oral γ -secretase modulator BPN-15606. *Journal of Pharmacology and Experimental Therapeutics* 362: 31-44; Raven, F. et al. (2017) Soluble gamma-secretase modulators attenuate Alzheimer's β -amyloid pathology and induce conformational changes in presenilin 1. *EBioMedicine* 24: 93-101

1:15-1:30 Gal Bitan (UCLA): Molecular tweezers for lysine and arginine - powerful inhibitors of A β and tau aggregation

Key background paper: Schrader, T. et al. (2016) Molecular tweezers for lysine and arginine – powerful inhibitors of pathologic protein aggregation. *Chemical Communications* 52: 11318

1:30-1:45 Hoau-Yan Wang (CUNY): Reducing AD-related pathogenesis with a small molecule targeting filamin A

Key background papers: Wang, H.-Y. et al. (2012) Reducing amyloid-related Alzheimer's disease pathogenesis by a small molecule targeting filamin A. *Journal of Neuroscience* 32: 9773-9784; Wang, H.-Y. et al. (2017) PTI-125 binds and reverses an altered conformation of filamin A to reduce Alzheimer's disease pathogenesis. *Neurobiology of Aging* 55: 99-114

1:45-2:00 Jayakumar Rajadas (Stanford Univ.): Methylene blue as AD therapeutic reducing synaptic toxicity and tau phosphorylation

Key background paper: Sun, W. et al. (2016) Attenuation of synaptic toxicity and MARK4/PAR1-mediated tau phosphorylation by methylene blue for Alzheimer's disease treatment. *Scientific Reports* 6: 34784

2:00-2:15 Anahit Ghochikyan (Inst. of Molecular Med., Huntington Beach, CA): The potential of tau antibodies and vaccines in treating Alzheimer's disease

Key background papers: Agadjanyan, M.G. et al. (2017) Humanized monoclonal antibody armanezumab specific to N-terminus of pathological tau: characterization and therapeutic potency. *Molecular Neurodegeneration* 12: 33; Davtyan, H. et al. (2017) MultiTEP platform-based DNA epitope vaccine targeting N-terminus of tau induces strong immune responses and reduces tau pathology in THY-Tau22 mice, *Vaccine* 35: 2015-2024

2:15-2:30 Session Discussion

Sunday, April 15th 3:00 – 4:30 pm

3:00 – 4:30 pm

C59: AD Treatment II: Targeting β 1 Adrenergic Receptors, Insulin Resistance, Inflammation, and/or Energy Metabolism

Chair: Konrad Talbot and Gregory J. Brewer

3:00-3:15 Mehrdad Shamloo (Stanford Univ.): β 1 adrenergic receptor partial agonists for treatment of neurocognitive disorders

Key background paper: Yi, B. et al. (2017) Discovery of novel brain permeable and G protein-biased beta-1 adrenergic receptor partial agonists for the treatment of neurocognitive disorders. *PLoS One* 12(7): e0180319

3:15-3:30 Konrad Talbot (UCLA & VA West Los Angeles HCS): Antidiabetic incretin receptor agonists as AD therapeutics

Key background papers: McClean, P.L. et al. (2015) Prophylactic liraglutide treatment prevents amyloid plaque deposition, chronic inflammation and memory impairment in APP/PS1 mice. *Behavioral Brain Research* 293: 86-106; Batista, A.F. et al. (2018) The diabetes drug liraglutide reverses cognitive impairment in mice and attenuates insulin receptor and synaptic pathology in a non-human primate model of Alzheimer's disease. *Journal of Pathology* (in press)

3:30-3:45 Sally A. Frautschy (UCLA & VA West Los Angeles HCS): Curcumin as an AD therapeutic

Key background papers: Hu, S. et al. (2015) Clinical development of curcumin in neurodegenerative disease. *Expert Review of Neurotherapeutics*. 15: 629-637; Ringman, J.M. et al. (2012) Oral curcumin for Alzheimer's disease: tolerability and efficacy in a 24-week randomized, double blind, placebo-controlled study. *Alzheimer's Research & Therapy* 4: 43

3:45-4:00 Geoffrey Joyce (USC): Statins as potential AD therapeutics

Key background paper: Zissimopoulos, J.M. et al. (2017) Sex and race differences in the association between statin use and the incidence of Alzheimer disease. *JAMA Neurology* 74: 225-232

4:00-4:15 Gregory J. Brewer (UCI): Targeting a higher power than $A\beta$ and tau in treating Alzheimer's disease: oxidative stress and energy metabolism

Key background papers: Brewer, G.J. (2010) Epigenetic oxidative redox shift (EORS) theory of aging unifies the free radical and insulin signaling theories. *Experimental Gerontology* 45:173-179; LeVault, K.R. et al. (2016) Circadian disruption reveals a correlation of an oxidative GSH/GSSG redox shift with learning and impaired memory in an Alzheimer's disease mouse model. *Journal of Alzheimer's Disease* 49:301-316

4:15-4:30 Session Discussion

Sunday, April 15th 5:00 – 6:30 pm

C66: AD Treatment III: Using Regenerative Medicine, Low Dose Ionizing Radiation, Cyclic AMP/GMP Modulators, or Repetitive Transcranial Magnetic Stimulation

Chair: Margaret Fahnstock and Mathew Blurton-Jones

5:00-5:15 Mathew Blurton-Jones (UCI): The potential and challenges in neuronal stem cell therapy for Alzheimer's disease

Key background paper: Marsh, S.E. and Blurton-Jones, M. (2017) Neural stem cell therapy for neurodegenerative disorders: the role of neurotrophic support. *Neurochemistry International* 106: 94-100

5:15-5:30 James S. Welsh (Loyola U): Low dose ionizing radiation as an Alzheimer's disease therapeutic

Key background papers: Betlazar, C. et al. (2016) The impact of high and low dose ionizing radiation on the central nervous system. *Redox Biology* 9: 144-156; Cutler, J.M. et al. (2016) Treatment of Alzheimer disease with CT scans: a case report. *Dose Response* 14: 1-7; Cutler, J.M. et al. (2017) Update on a patient with Alzheimer disease treated with CT scans. *Dose Response* 15: 1-2

5:30-5:45 G. Aleph Prieto (UCI): Modulators of cAMP and cGMP as AD therapeutics

Key background paper: Prieto, G.A. et al. (2017) Pharmacological rescue of long-term potentiation in Alzheimer diseased synapses. *Journal of Neuroscience* 37: 1197-1212

5:45-6:00 Joel L. Voss (Northwestern Univ.): Long-lasting enhancement of hippocampal-cortical networks and episodic memory in older adults via targeted non-invasive stimulation

Key background paper: Nilakantan, A.S. et al. (2017) Stimulation of the posterior cortical-hippocampal network enhances precision of memory recollection. *Current Biology* 27: 465-470

6:00-6:15 Jauhtai J. Cheng (Stanford Univ. & VA Palo Alto HCS): Using repetitive transcranial magnetic stimulation (rTMS) to treat cognitive impairment in Alzheimer's disease

Key background paper: Cheng, C.P.W. et al. (2018) Effects of repetitive transcranial magnetic stimulation on improvement of cognition in elderly patients with cognitive impairment: a systematic review and meta-analysis. *International Journal of Geriatric Psychiatry* 33: e1-e13

6:15-6:30 Session Discussion