

PROGRESS IN NEUROSCIENCE PINS

Seminar Series of the Brain & Mind Research Institute Weill Cornell Medical College (WCMC) &



The Graduate Program in Neuroscience of WCMC and Sloan Kettering Institute

Thursday, 1/28/16, 4 PM, coffee at 3:45 PM Weil Auditorium

"Insights from genomics, stem cells and artificial intelligence into neurodegenerative diseases and strategies to treat them"

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Abstract:



Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD), amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) are all devastating fatal neurodegenerative diseases. Despite years of effort, no therapeutic strategy has succeeded in significantly slowing the progression of any of these diseases, suggesting that the critical mechanisms of disease have not vet been targeted effectively. We have focused on using family-based whole genome analysis of patients, human neuron models of disease developed from patient stem cells, deep learning, and single cell analysis methods to understand the predictive value of specific molecules for neurodegeneration. Protein pathways and dyshomeostasis in general and autophagy in particular has emerged as an important pathway, and efforts to target it with small molecules show promise.

Recent relevant publications:

- 1) Barmada SJ, Serio A, Arjun A, Bilican B, Daub A, Ando DM, Tsvetkov A, Pleiss M, Shaw C, Chandran S, Finkbeiner S. (2014) Neuronal autophagy induction improves survival in ALS models by enhancing TDP43 clearance. *Nat. Chem. Biol.*, 10: 677–685.
- 2) Finkbeiner S, Kassner P, Frumkin M. (2015) Cell-based screening: Extracting meaning from complex data. *Neuron*, 86:160–174.
- 3) Haston KM, Finkbeiner S. (2015) Clinical Trials in a Dish: The potential of pluripotent stem cells for the development of therapies for neurodegenerative diseases. *Ann. Rev. Pharmacol. Toxicol., in the press.*
- 4) Possin KL, Sanchez PE, Fernandez R, Finucane M, Kerchner GA, Johnson ET, Davis A, Lo I, Bott N, Kiely T, Fenesy MC, Miller BL, Kramer JH, Finkbeiner S. (2016) Cross-species translation of the Morris maze for Alzheimer's disease. *JCI, in press.*



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