

## **DIETARY POLYPHENOLS ENHANCE OPTOGENETIC RECALL OF FEAR MEMORY IN HIPPOCAMPAL DENTATE GYRUS GRANULE NEURON SUBPOPULATIONS**

**J Brathwaite, C Smith, T Frolinger, J Wang and G M Pasinetti**

Icahn School of Medicine at Mount Sinai, USA

**C**enters for Advancing Research on Botanicals and Other Natural Products (CARBON) Icahn School of Medicine at Mount Sinai, Supported by P50 AT008661 Center Grant by NCCIH and ODS Dietary polyphenols have been investigated for their role in promoting memory in model systems of stress, but little is known about select subpopulations of neurons that are influenced by polyphenols to improve memory performance. Granule neurons in the hippocampal dentate gyrus are vulnerable to stressors that impair the functioning of contextual memory and can be influenced by dietary polyphenols. We utilized a c-fos-tTA/TRE-ChR2 optogenetics model in which neurons activated during fear learning are labelled with ChR2-mCherry and can be optically reactivated in a different context to recapitulate the behavioural output of a related memory. Treatment with dietary polyphenols increased fear memory recall and ChR2-mCherry expression in dentate gyrus neurons in the same animal, suggesting that dietary polyphenols promote recruitment of neurons to a fear memory engram. We show that dietary polyphenols promote memory function and offer a general method to map cellular subpopulations influenced by dietary polyphenols, in part through the mechanism of c-Fos expression enhancement.

### **Biography**

Justin Brathwaite has graduated from Columbia University in 2014 with a Bachelors of Arts, BA in Chemistry. Since graduation, he has been working full time as an Associate Researcher at the Icahn School of Medicine, Center of Molecular and Integrative Neuro-resilience directed by Dr. Giulio Pasinetti MD/PhD, under a Research Supplement to promote diversity in health related research awarded by the National Institute of health (NIH).

Jbrath812@gmail.com