2016 Weill Awardees

Weill Finalist Project Summaries

Innovation Awards

1. Robert Edwards
   - **Title:** The Dual Role of a-Synuclein in Neurodegeneration
   - **Project Summary:**The protein ?-synuclein has a central role in Parkinson?s disease (PD); however, there is evidence that synuclein can both protect against neural degeneration and cause PD. The long-term objective of this project is to understand this apparent functional contradiction. We hypothesize that these two functions are distinct but related. The strategy is to use the function of synuclein in intracellular trafficking and exocytosis as an entry-point to elucidate its role in degeneration.
2. Mark von Zastrow, Brian Shoichet, Nevan Krogan
   - **Title:** Probing the pathways of pain and addiction with a new therapeutic lead
   - **Project Summary:**The development of effective drugs to treat pain launched the modern pharmaceutical era. Opioid analgesics, which is a category of drugs containing morphine and codeine, has enabled surgical interventions and brought relief to hundreds of millions of patients; however, most are fraught which adverse side-effects and have profound addictive liabilities. This project will use an innovative multi-faceted approach to explore potential new analgesics with fewer adverse side effects.
3. Peter Walter, Susanna Rosi
   - **Title:** Deciphering the Molecular Basis of Brain Injury-Induced Dementia
   - **Project Summary:**Traumatic brain injury (TBI), resulting from blunt trauma to the head, is a major mental health problem with debilitating consequences, including memory loss and cognitive decline. In a recent study we conducted in mice, we found that traumatic brain injury (TBI) activates the integrated stress response (ISR) in the hippocampus, the brain?s center for memory formation. For this project, we will evaluate a drug-like small-molecule that has been shown to inhibit the ISR and its applicability towards treating traumatic brain injury (TBI).
4. Yin Shen, Arnold Kriegstein
   - **Title:** Investigating individual susceptibility to complex neurodevelopment diseases via functional genomics.
   - **Project Summary:**The role of genetics in complex neurodevelopmental disorders, including autism spectrum disorders (ASD), attention deficit hyperactivity disorder (ADHD), and schizophrenia, remains largely unknown. Our preliminary analyses show there are tens of thousands of small genetic variations are found more often in patients with these disorders, but it is unclear how many of the variations contribute to these neurological diseases and how. For this study, we will utilize novel functional genomics tools to identify important yet subtle genetic variations that contribute to neurological diseases.

5. Amy Gelfand, Steve Cummings, John Boscardin, Andrew Charles
   ○ **Title:** Melatonin for Adolescent Migraine Prevention-An Innovative ?Remote Trial? to Accelerate Clinical Research in Child Neurology
   ○ **Project Summary:**A safe, effective, and well-tolerated treatment for migraines adolescents, which affects 5-8% of the population, is urgently needed. Melatonin is a natural supplement that is available over counter to improve sleep in children and adolescents. In addition, recent studies have shown it also has the potential to be used as a migraine preventive. This project will use an innovative ?remote trial? approach and perform a randomized placebo-controlled trial that evaluates the efficacy of melatonin for migraine prevention in adolescents.
6. Stephan Sanders, Riley Bove, Kate Rankin
   ○ **Title:** Developing the Neuropsychiatry Clinics of the Future
   ○ **Project Summary:**Access to relevant, up-to-date, and accurate clinical information is vital to treating patients and advancing research. To accomplish this, the project will develop a state of the art neuropsychiatric clinic. The clinic will include an informatics system that simplifies data input, integrates pre-existing databases, and develops easy-to-use dashboards customized for clinical and research use. By doing so, the new clinic will give patients, clinicians, and researchers access to a diverse set of information on which to base clinical decisions.
7. Daniel Lim, Geoffrey Manley
   ○ **Title:** Long noncoding RNAs (lncRNAs) as highly specific biomarkers of brain injury
   ○ **Project Summary:**The goal of this project is to develop a highly specific and sensitive diagnostic blood test for mild traumatic brain injury (mTBI) via the detection of long non-coding RNAs. Since many long noncoding RNAs are expressed specifically and abundantly in the brain, they have great potential to serve as a biomarker of brain injury. If successful, the proposed diagnostic technology could directly improve the care of millions of patients with mTBI by providing a more accurate, less subjective test for the management of those with brain injury.
8. Michael Wilson, Samuel Pleasure, Joseph DeRisi
   ○ **Title**: Generating Patient-Derived Monoclonal Antibodies to Probe the Underlying Basis of Neuroinflammatory Diseases: A Single Cell Approach
   ○ **Project Summary:**While antibodies play a critical role in our body?s ability to fight infections, they have also been implicated in some neuroinflammatory diseases like multiple sclerosis (MS). However, a major obstacle to studying these antibodies, and their targets (called antigens), is the limited supply of biological samples. This project will use new, innovative tools to examine samples at the single-cell resolution, and therefore greatly accelerating UCSF?s antibody-antigen discovery and neurobiology research programs.
9. Lisa Gunaydin
   ○ **Title:** Biomarkers for susceptibility and resilience in anxiety and compulsive behaviors
   ○ **Project Summary:**Using a mouse model of obsessive-compulsive disorder (OCD), the team will take an interdisciplinary approach to discover new biological clues, or biomarkers, for anxiety and compulsive behavior. This work has the potential to not only uncover why some individuals appear to be more susceptible, or resilient, to developing anxiety disorders, but also provide a rich set of targets upon which to develop novel drugs and treatments.

Scholar Awards

1. Mazen Kheirbek
   - **Title:** Illuminating novel targets for the treatment of mood and anxiety disorders
   - **Project Summary:**Dr. Kheirbek?s primary research goal has been to delineate the circuit mechanisms that underlie psychiatric diseases in order to develop better therapies. For this project, he seeks to identify the cell types and neurological circuit that links mood and anxiety disorders to the reduction in the volume of the hippocampus, a region of the brain.
2. Michael Oldham
   - **Title:** Spatial Transcriptomics of the Human Brain
   - **Project Summary:**This study will integrate gene expression data and their spatial distribution in tissue sections to develop mathematical models that can accurately predict the cellular composition of human brain samples.
3. Alexandra Nelson
   - **Title:** Role of Striosomes in Parkinson?s Disease and Levodopa-Induced Dyskinesia
   - **Project Summary:**Dr. Nelson?s research focuses on pathological patterns of striosomes, a chemical compartment in the portion of the brain, whose activity is thought to be related to neurological diseases affecting both movement and cognition.
4. Raquel C. Gardner
   - **Title:** Defining Clinical Trajectories after Traumatic Brain Injury
   - **Project Summary:**Utilize two very large traumatic brain injury (TBI) databases to discover novel predictors of poor outcomes after a TBI. Ultimately, this work will allow clinicians to better identify highly vulnerable patients who should be targeted for treatment like intensive rehabilitation and/or drug trials, directly leading to improved patient care.
5. Louis Ptá?ek
   - **Title:** Characterization of PNKD enzymatic function and it role in synaptic regulation
   - **Project Summary:**Characterization of an novel protein produced by individuals with paroxysmal non-kinesigenic dyskinesia, or PNKD, which is a genetically-inherited disorder of the nervous system that causes periods of involuntary movement.
6. Maggie Waung
   - **Title:** Dissecting Migraine with Optogenetics
   - **Project Summary:**Use a diverse tool kit to elucidate the brain circuits underlying chronic headache pain and discover the basis for migraine?s prevalence among females.

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