FUNDING:

The below table shows my direct (total) cost expenditures since being hired, indicating a steady increase >30% per year.

FY15: $113,761 ($168,924)
FY16: $360,123 ($524,225)
FY17: $459,523 ($709,019)
FY18: $550,011 ($887,186)
FY19: $850,836 ($1,366,308)

Current:

2019 – 22 **Accessible technologies for high-throughput, whole-brain reconstructions of molecularly characterized mammalian neurons**
NIH RO1
Role on project: Co-Investigator (PI: Muller, Miller)
Term: 01-Sept-2019 to 31-Aug-2022
Total budget: $753,974 (direct cost) $1,180,445 (total cost)
The overall goal of the proposal is to develop technologies for the brain wide reconstruction of axonal arbors of molecularly defined neurons. The proposal aims at overcoming barriers in neuronal labeling, imaging and computation to achieve this goal, and to develop a technology platform that can be scaled to all neurons of the brain

2019 – 20 **Reproducible imaging-based brain growth charts for psychiatry**
NIH R01 Research Grant
Role on project: Co-Investigator (PI: Saterthwaite)
Term: 01-Aug-2019 to 31-May-2020
Budget: $231,276 (direct cost) $362,861 (total cost)
Aggregate, harmonize, and analyze existing large-scale pediatric neuroimaging datasets to identify normative and clinical brain growth curves.

2019 - **Microsoft Research Award**
Mirco Soft Research Gift
Role on Project: Investigator
Term: Unrestricted Gift
Budget: 50,000 (total cost)
Research and development of neuroscience and connectomes around neuronal circuit and system modeling, application of time-series-of-graphs and dynamics to neuronal signaling analysis and connectomes, and in the abstractions of matter, math, machines that point toward complex systems composed of low-level components.

2018 – 20 **Lifelong Learning Forests**
Defense Advanced Research Projects Agency Research Grant FA8650-18-2-7834 (128567)
Role on Project: Investigator
Term: 01-Jul-2018 to 30-Jun-2020
Budget: $1,123,474 (direct); $1,839,308 (total)
Lifelong Learning Forests (L2Fs) will learn continuously, selectively adapting to new environments and circumstances utilizing top-down feedback to impact low-level processing, with provable statistical guarantees, while maintaining computational tractability at scale.

2018 – 21 **SemiSynBio: Collaborative Research: YeastOns: Neural Networks Implemented in Communication Yeast Cells**

National Science Foundation Research Grant (129439)
Role on project: Co-Investigator (PI: Schuman)
Term: 01-Jul-2018 to 30-Jun-2021
Budget: $172,971 (direct cost) $263,942 (total cost)
Provide neuroscience and machine learning expertise to guide the design of the computational learning capabilities of the system.

2018 – 19 **Connectome Coding at the Synaptic Scale**
Schmidt Science Foundation (128503)
Role on Project: Investigator
Term: 01-Jan-2018 to 31-Dec-2019
Budget: $250,000 (total)
Study learning and plasticity at an unprecedented scale, revealing the dynamics of large populations of synapses comprising an entire local cortical circuit. No previously conducted experiment could answer the questions about the dynamics of large populations of synapses, which is crucial to understanding the learning process.

2017 – 21 **Continual Learning Across Synapses, Circuits, and Brain Areas**
Defense Advanced Research Projects Agency Research Grant FA8650-18-2-7834 (129061)
Role on project: Co-Investigator (PI: Tolias)
Term: 01-Nov-2017 to 30-Oct-2021
Budget: $486,666 (direct) $796,715 (total)
Develop the pre-processing analysis pipeline for the imaging data collected in this project.

2017 – 20 **NeuroNex Innovation Award: Towards Automatic Analysis of Multi-Terabyte Cleared Brains**
National Science Foundation 1707298
Role on Project: Investigator
Term: 01-Sept-2017 to 31-Aug-2020 (No Cost Extension)
Budget: $588,758 (direct) $959,999 (total)
We propose to lower the barrier to connecting data to analyses and models by providing a coherent cloud computational ecosystem that minimizes current bottlenecks in the scientific process.

2017 – 22 **Sensorimotor processing, decision making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain**
NIH Research Grant 1U19NS104653-01 (127940)
Role on Project: Co-Investigator (PI: Engert)
Term: 01-Sept-2017 to 31-Aug-2022
Budget: $655,206 (direct); $1,050,000 (total) (JHU sub-award)
Generate a realistic multiscale circuit model of the larval zebrafish's brain – the multiscale virtual fish (MSVF). The model will span spatial ranges from the nanoscale at the synaptic level, to local microcircuits to inter-area connectivity - and its ultimate purpose is to explain and simulate the quantitative and qualitative nature of behavioral output across various timescales.

2017 – 20 **CRCNS US-German Res Prop: functional computational anatomy of the auditory cortex**
National Institutes of Health Research Grant 1R01DC016784-01 (126308)
Role on Project: Co-Investigator (PI: Ratnanather, J)
Term: 01-July-2017 to 30-June-2020
Budget: $458,519 (direct cost) $747,143 (total)
Create a robust computational framework for analyzing the cortical ribbon in a specific region: the auditory cortex.

2017 – 20 **Multiscale Generalized Correlation: A Unified Distance-Based Correlation Measure for Dependence Discovery**
National Science Foundation Research Grant (132031)
Role on project: Co-Investigator (PI: Cencheng, S)
Term: 01-May-2017 to 30-April-2020
Budget: $124,189 (direct) $200,000 (total)
Establish a unified methodology framework for statistical testing in high-dimensional, noisy, big data, through theoretical advancements, comprehensive simulations, and real data experiments.

2016 – 20 **D3M: What Would Tukey Do?**
Defense Advanced Research Projects Agency Research Grant FA8750-17-2-0112 (125863)
Role on project: Co-Investigator (PI: Priebe, C)
Term: 01-Oct-2016 to 30-Sep-2020
Budget: $2,746,050 (direct) $4,406,360 (total)
Develop theory & methods for generating a discoverable archive of data modeling primitives and for automatically selecting model primitives and for composing selected primitives into complex modeling pipelines based on user-specified data and outcome(s) of interest.

Pending:

2019 – 22 **High throughput mapping pipeline for incomplete and censored neuroimaging data**
NIH / MH-19-148
Role on Project: Co-Investigator (PI: Miller)
Term: 01-Dec-2019 to 30-Nov-2022
Budget: $1,107,698 (direct) $1,744,857 (total)
GOAL of Project

2020 – 25 **CAREER: Foundational Statistical Theory and Methods for Analysis of Populations of Attributed**
NSF 17-537
Role on project: Principal Investigator
Term: 01-Jan-2020 to 31-Dec-2025
Budget: $384,873 (direct) $630,230 (total)
The goal is to establish foundational theory and methods for analyzing populations of attributed connectomes.

2020 – 23 **Graspy: A python package for rigorous statistical analysis of populations of attributed connectomes**
NIH MN-19-147
Role on project: Principal Investigator
Term: 01-Jan-2020 to 30-June-2023
Budget: $861,240 (direct) $1,410,279 (total)
The goal of this project is to establish a state-of-the-art toolbox for analysis of connectomes, spanning taxa, scale, and complexity. More specifically, we will develop and extend implementations to enable neurobiologists to 1) estimate latent structure from attributed connectomes, (2) identify meaningful clusters among populations of connectomes, and (3) detect relationships between connectomes and multivariate phenotypes, such as behavior, genetics, and physiology.

2020 – 25 **NeuroNex: Enabling Identification and Impact of Synaptic Weight in Functional Networks**
NSF 19-563

Role on project: Co-Investigator (PI: Harris)
Term: 01-April 2020 to 31-March-2025
Budget: $609,294 (direct) $997,719 (total)
Develop the requisite technology to understand the impact of synaptic weight on functional networks.

2020 – 25 **Identifying Neurobehavioral Pathways for Cannabis Use Disorder: Multimodal MRI Investigations of Control and Reward Neural Networks**
NIH18-062 - National Institute on Drug Abuse
Role on project: Co-Investigator (PI: Hanson)
Term: 01-April-2020 to 31-March-2025
Budget: $234,338 (direct) $383,727 (total)
This project will connect strong behavioral markers of addiction risk, measures of drug use, and measures of brain network connectivity to aid in understanding what causes drug use, versus what is a consequence of it.

2020 – 23 **A Novel Framework for Mapping Brain Dynamics and Substrates of Human Cognition Across Species**

NIH MH-20-120
Role on project: Co-Investigator (PI: Milham)
Term: 01-July-2020 to 30-June-2023
Budget: $178,898 (direct) $292,945 (total)
Develop and apply modern alignment methods to compare and contrast human and non-human brain imaging.

2020 – 23 **MBAc: Mouse Brain Atlasing in the Cloud**
NIH MN-19-147
Role on project: Co-Investigator (PI: Osten)
Term: 01-July-2020 to 30-June-2023
Budget: $1,520,570 (direct) $2,489,933 (total)
Develop and disseminate CloudReg, a cloud brain atlasing tool for microscale whole mouse brains.

2020 – 24 **Exploiting latent structure for efficient and robust inference**
Role on project: Co-Investigatror (PI: Priebe)
Term: 01-July-2020 to 30-June-2024
Budget: $999,330 (direct) $1,504,662 (total)
Develop theory and methods for analysis of networks and populations thereof.

2020 – 24 **Distributed ensemble neural representations of anxiety states**
NIH 0 NS 18-303 BrainInitiative RO1
Role on project: Co-Investigator (PI: Adwanikar)
Term: 01-July-2020 to 30-June-2024
Budget: $2,672,969 (total)
Imaging the coordinated, multi-area, ensemble neural signaling of anxiety and attention states at cellular-resolution in freely behaving mice.

2020 – 25 **The NKI-Rockland Sample II: An open resource of multimodal brain, physiology, and behavior data from a community lifespan sample**
NIH 19-056
Role on project: Co-Investigator (PI: Milham)
Term: 01-July-2020 to 30-June-2025
Budget: $30,713 (direct) $ 78,891 (total)
We will continue collecting, organizing, and analyzing another cohort of the NKI-Rockland Sample.

Previous:

2017 – 18 **The Brain Ark**
Defense Advance Research Project Agency Grant 90076467
Role of the Project: Principal Investigator
Characterize the statistical properties of the individual graphs, to identify circuit motifs, both that specialize in a species specific fashion, and that are preserved across species. As a test, will compare the connectomes of sea lions and coyotes.

2017 – 18 **The International Brain Station**
The Kavli Foundation 90071826
Role of the Project: Principal Investigator
Take the first few steps towards building the international brain station.

2017 – 18 **Brain Comp Infra: EAGER: BrainLab CI: Collaborative, Community Experiments with**
National Science Foundation ACI-1649880
Role of Project: Co-Investigator (PI: Miller, Burns)
The BrainLab CI prototype system will deploy an experimental-management infrastructure that allows users to construct community-wide experiments that implement data and metadata controls on the inclusion and exclusion of data.

2016 – 19 **A Scientific Planning Workshop for Coordinating Brain Research Around the Globe**
National Science Foundation 1637376 Part 1 of 2
Role of the Project: Principal Investigator
This travel grant is for the expressed purposes of gathering researchers from around the globe to discuss the new way to further brain research during part one of a two day conference.

2016 – 19 **A Scientific Planning Workshop for Coordinating Brain Research Around the Globe**
National Science Foundation 1637376 Part 2 of 2
Role of the Project: Principal Investigator
This travel grant is for the expressed purposes of gathering researchers from around the globe to further discuss advancements in brain research during the second part of a two day conference.

2015 – 18 **From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from**
Defense Advance Research Project Agency Grant N66001-15-C-40401
Role on Project: Principal Investigator
Multiple, large, multifarious brain imaging datasets are rapidly becoming standards in neuroscience. Yet, we lack the tools to analyze individual datasets, much less populations thereof. Therefore, we will develop theory and methods to analyze and otherwise make such data available.

2014 – 16 **Scalable Grain Graph Analyses Using Big-Memory, High-IPS Compute Architectures**
Defense Advance Research Project Agency Grant N66001-14-1-4028
Role on Project: Co-Investigator (PI: Burns)
Build software infrastructure to enable analytics on billion node, terabyte sized networks using commodity hardware.

2014 - 19 **Synaptomes of Mouse and Man**
R01NS092474
Role on project: Co-Investigator (PI: Smith)

The major goals of this project are to discover the synaptic diversity and complexity in mammalian brains, specifically comparing and contrasting humans with mice, the leading experimental animal.

2012 – 15 **CRCNS: Data Sharing: The EM open Connectome Project**
National Institute of Biomedical Imaging and Bioengineergng RO1EB16411
Role of Project: Co-Investigator (PI: Burns)
Develop cyberinfrastructure to support management, visualization, storage, and analysis of large-scale electron microscopy data.