Launched in 2013
The Neuroscience Initiative at the University of Utah represents a $10 million commitment, by Senior Vice President for Health Sciences Dr. Vivian Lee, to unify basic, translational, and clinical research efforts towards a better understanding of the brain in disease and health.

Vision:

*Deepen our understanding of function and disorders of the nervous system, and improve patient care through innovation and integration of basic, translational and clinical research efforts.*

Goals:

• Create a pipeline of innovation in neuroscience research
• Attract, develop and retain the brightest neuroscience faculty
• Increase competitiveness of faculty and programs for extramural funding and programmatic support
• Build a sustainable administrative structure to integrate and unify the neuroscience community campus-wide
The Neuroscience Initiative unites clinicians and scientists across campus and beyond in the study of neuroscience.

### Neuroscience-focused departments
- Neurobiology & Anatomy
- Neurology
- Neurosurgery
- Ophthalmology & Visual Sciences
- Psychiatry
- Psychology

### Additional departments performing neuroscience research
- Anesthesiology
- Biochemistry
- Bioengineering
- Chemistry
- Communication Sciences & Disorders
- Educational Psychology
- Human Genetics
- Orthopedics
- Pathology
- Pediatrics
- Pharmacology & Toxicology
- Philosophy
- Physical Medicine & Rehabilitation
- Radiology
- Surgery
The Initiative is organized around five disease pillars and five methodological platforms of particular relevance to the University of Utah.
Collaboration
Seed grants
Collaborative grant proposal support
Interest groups

Community
Symposia, seminars, and workshops
Partnership on recruitment
Outreach

Infrastructure
Integrated space
Administrative support

A central focus of the Neuroscience Initiative is to build an integrated academic environment which will develop and support collaborations across disciplines.
2015 Neuroscience Initiative Seed Grants:
Creating Connections

Development of TRPV4 Channel Antagonists To Treat Glaucoma
David Krizaj - Ophthalmology; Christopher Reilly - Pharmacology & Toxicology; Ryan Looper – Chemistry

Tracking Arc by Super-Resolution Microscopy in Living Synapses
Erik Jorgensen - Biology; Jason Shepherd - Neurobiology & Anatomy

Identifying Modifiers of Anticipation in Myotonic Dystrophy Type-1
Nicholas Johnson - Neurology; Robert Weiss - Human Genetics; Russell Butterfield - Neurology

Examination of Neurobehavioral and Neurophysiological Mechanisms Underlying Habitual Short Sleep Duration
Paula Williams - Psychology; Jeff Anderson - Radiology; Chris Jones – Neurology

Discovering Roles of Mitochondrial Movement and Distribution in Glia
Janet Shaw - Biochemistry; Karen Wilcox - Pharmacology & Toxicology

Understanding the Genetic and Neurobiological Basis of Pediatric Bipolar Disorder
Jeff Anderson - Radiology; Melissa Lopez-Larson - Psychiatry; Mark Yandell - Human Genetics; Alex Shcheglovitov - Neurobiology & Anatomy
A Prosthesis that Moves andFeels
This team aims to create and test hand and arm prostheses that can move and feel sensation nearly as well as their biological counterparts using the Utah electrode array, a U of U innovation.

Sensory-Motor Integration via Recording and Stimulating Arm Nerves
NSF Integrative Strategies for Understanding Neural & Cognitive Systems: Individuality and Variation

David Warren, PhD, Bioengineering
Douglas Hutchinson, MD, Orthopaedics
Greg Clark, PhD, Bioengineering

A New Model for Investigating Mechanisms of Behavior
The tiny tropical fish Danio
genella translucida is transparent throughout life, offering scientists a window into the brain. This project will adapt sophisticated techniques for use in this new model species.

Danio
genella translucida:
A New Fish Model for Systems Neuroscience
NSF BRAIN EAGER

Adam Douglass, PhD, Neurobiology and Anatomy

Cracking the Olfactory Code
The mammalian sense of smell is one of the most complex sensory systems. This interdisciplinary collaboration between six institutions aims to understand how the brain detects, encodes, and extract meaning from odors.

Analysis of the Mammalian Olfactory Code
NSF IDEAS Lab Cross-EF Activity

Matt Wachowiak, PhD, Neurobiology and Anatomy

Deep Brain Imaging to Understand Learning & Memory
This project aims to develop innovative, inexpensive technologies to visualize the inner workings of deep neural networks and their connections at high resolution in behaving animals.

Imaging synaptic activity deep in the brain using super-resolution cannula microscopy
NSF Integrative Strategies for Understanding Neural & Cognitive Systems: Neuroengineering & brain-inspired concepts & design

Rajesh Menon, PhD, Electrical and Computer Eng.
Erik Jorgensen, PhD, Biology
Jason Shepherd, PhD, Neurobiology and Anatomy

Advancing the White House BRAIN Initiative
Forging a synergistic partnership with the University of Utah, the BRAIN Initiative invested $2.77 million in University of Utah neuroscience efforts in 2015 through the National Science Foundation. U of U investigators successfully competed for all four 2015 NSF BRAIN opportunities.
Demystifying the Teen Brain

In what is destined to become a landmark study, the University of Utah was selected as one of eleven sites from across the nation to collectively follow 10,000 children starting at age 9 or 10. These children will be monitored for five to ten years, throughout the period of highest risk for substance use. This groundbreaking research will inform prevention and treatment planning, public health strategies, and policy decisions.

Adolescent Brain Cognitive Development (ABCD) Study Research Project Site

National Institutes of Health

Deborah Yurgelun-Todd, PhD, Psychiatry
Perry Renshaw, PhD, Psychiatry

The Genetics of Autism

Autism Spectrum Disorder (ASD) affects at least 1 child in 68, imposing a considerable psychological and economic burden on affected individuals, their families, and society. This project will assess whole genome sequencing data from over 500 families to identify genetic changes that contribute to specific aspects of ASD such as cognitive delay and late language onset. The study design may also allow for discovery of factors that protect against development of ASD.

Whole Genome Analysis for Autism Risk Variants: Combining WGS from Utah high-risk pedigrees and SSC families

Simons Foundation Autism Research Initiative

Hilary Coon, PhD, Psychiatry
Gabor Marth, DSc, Human Genetics

Understanding the Brain in Health and Disease

A startling one in three of us will suffer from a brain disorder within our lifetime, placing an estimated $200 billion strain on our nation’s health care system each year. Two grants awarded to University of Utah neuroscience faculty in 2015 exemplify the outstanding work that will bring us closer to alleviating this strain.
Through interdisciplinary events, the Neuroscience Initiative linked basic, translational, and clinical researchers to collaborators and resources.

Symposia, Seminars, and Workshops


Demyelinating & Neuroinflammatory Diseases Symposium (June 11, 2015): Internal symposium featuring speakers from 8 departments.

Visit by Dr. Kevin Guskiewicz (March 13, 2015): Renowned concussion expert.

Visit by Dr. Benjamin Segal (June 11, 2015): Leading researcher in immunopathology of multiple sclerosis.

Allen Brain Institute Workshop @ Snowbird (October 31, 2015): Hands on tutorial on the Allen Brain Atlases.

Dr. Terri Gilbert of the Allen Institute for Brain Science demonstrates the functionality of the Allen Brain Atlases. Photo courtesy of Dr. Bryan Jones (http://prometheus.med.utah.edu/~bwjones/)
Outreach

Thanks to our generous benefactors, partners, and tireless volunteers, thousands of Utahns were reached with messages of brain health, safety, and the importance of neuroscience research.

Brain Awareness Week 2015 (March 16-22): In partnership with the Dana Alliance, student leaders Sarah Redmon and Tiffanie Dahl coordinated 11 site visits.

Team Brain (June 27): Team captains Rachel Taylor, Safia Keller, and Andrea White, with the support of the Neuroscience Initiative and Clinical Neurosciences Center, raised tens of thousands of dollars for the National MS Society through bikeMS.

Lending Library: Our publicly-available collection of outreach materials was used in over 30 events.
The new “Neuroscience Hub”, featuring collaborative laboratory space, meeting space, a seminar room, and offices, opened in August 2015 – providing more opportunities than ever to spark new interactions and cross-pollinated ideas.
Looking Forward to 2016

Collaboration
2016 Seed Grants, continued sponsorship of interest groups

Community
Symposia, seminars, and partner events
Brain Awareness 2016 and other outreach

Infrastructure
Ongoing administrative support, communications & hiring

The Neuroscience Initiative at the University of Utah will continue to further neuroscience research. Together, we will achieve a better understanding of the brain in health and disease, and create the next generation of innovative solutions for patient care.