



Bio-X NeuroVentures program aims to unlock the secrets of the brain

What if you could excite brain cells at will? The implications are astounding, but that's exactly what Bio-X faculty member and Professor of Bioengineering and Psychiatry, Karl Deisseroth, is doing. Deisseroth's new technology, called optogenetics, combines use of light and genetics to turn specific cells on or off. This approach has the potential not only to identify and map the neural networks underlying cognition and intelligence, but also to repair the devastating effects of neurological and psychiatric disease. As part of the newly launched Bio-X NeuroVentures program, Deisseroth is establishing an Optogenetics Innovation Laboratory to advance and share this new field.

"Bio-X NeuroVentures is designed to rapidly incubate exceptional research initiatives," says Bio-X Director Carla Shatz, "and the Optogenetics Innovation Lab will drive a critical technology forward, providing research and teaching resources that will benefit students and scientists at Stanford and around the world."

Bio-X is already a catalyst for imaginative thinking and novel approaches. This new program will make it possible for unusually creative and promising ideas to be explored and transformed into more permanent resources for researchers at Stanford and around the world. A generous gift from the Louise and Claude Rosenberg, Jr. Family Foundation is helping to launch Bio-X NeuroVentures.

Under the direction of William T. Newsome, Bio-X faculty member and Professor of Neurobiology, Bio-X NeuroVentures will promote collaborations that transcend the field of neuroscience, with the ultimate goal of unlocking secrets of the brain and intelligence. He envisions facilitating completely new kinds of neuroscience, pioneering new fields and developing sophisticated new technologies to fundamentally change the way the brain is studied and treated.

Bio-X NeuroVentures will bring together the powerful new ways of exciting and suppressing nerve cells and neural circuits with advances made in cognitive and behavioral sciences. Optogenetics calls on the multidisciplinary strengths and expertise at Stanford in molecular biology, engineering, physics, computation and psychology. Scientists pursuing technology development will work in a highly collaborative and interactive way with discovery scientists, allowing them to more easily identify and solve real, over-the-horizon problems.

"The optogenetics approach may be the most powerful set of tools in the history of neuroscience," said Newsome.

The initial focus of the Optogenetics Innovation Lab will be on understanding previously uncharted areas of the brain and the mechanisms of learning, memory, motivation, decision-making and sleep. The lab will also apply its technologies to understanding and treating diseases of the nervous system such as depression and Parkinson's. In addition to neuroscience applications, optogenetics technology can be extended to other types of cells in the heart, muscles, and pancreas, potentially creating better ways to treat arrhythmias and diabetes.

Ann Arvin, Lucile Salter Packard Professor in Pediatrics and Microbiology & Immunology, Vice Provost and Dean of Research, believes the start of Bio-X NeuroVentures brings Bio-X into an exciting new phase that will further enhance interdisciplinary research and teaching within Bio-X and the broader academic community.