Transforming Patient Lives Through Neuromodulation: Developing Transformative Therapies to Understand and Develop the Next Generation of Therapies for Neurological and Neuropsychiatric Disease

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Neurological and neuropsychiatric disorders such as Parkinson’s disease, epilepsy, obsessive-compulsive disorder, depression, and addiction, are increasingly understood to arise from disordered brain circuitry. Mounting evidence for this concept arises from more than a decade of research into mechanisms and benefits of deep brain stimulation for the treatment of movement disorders—advances routed in multidisciplinary collaborative work requiring expertise in neuroscience, neuroradiology, neurophysiology, bioengineering, psychiatry, neurology, and neurosurgery. DARPA’s recent SUBNETS Program and the Obama Administration’s BRAIN Initiative through the NIH, have both articulated the compelling need to develop the next-generation tools to advance our understanding of the nervous system and treat the complex brain circuit disorders listed above. Recent, cutting-edge clinical work on Anschutz Campus, combined with strong translational efforts in Neurosurgery, Neurology, Psychiatry, Neuroradiology and Bioengineering, position our campus at the forefront of efforts underway to develop transformative solutions to fundamental questions regarding brain development and function in health and disease. We have forged a robust collaboration, aimed at elucidating these neural circuit disorders, that pulls together clinical and translational investigators from multiple disciplines, departments, and campuses—including CU-SOM, University of Colorado Hospital, and Children’s Hospital Colorado. This collaborative effort is aimed at furthering our understanding of, and developing novel therapies for, brain disorders such as pediatric secondary dystonia, obsessive-compulsive disorder, Parkinson’s disease, schizophrenia, and Alzheimer’s disease. This novel and robust collaboration has already garnered significant regional attention (for example, http://www.denverpost.com/news/ci_28726603/), leading directly to local community and international industry interest and collaborations. Efforts are underway to secure the extramural funding that will achieve national prominence for this work. Our group requires and involves faculty and trainees at all levels of professional development. This transformative approach to understanding the brain will result in novel therapies for neurologic and psychiatric disease—but the effort will be aided by the acquisition and support of key translational research faculty, and crucial equipment. Through our collective efforts, the University of Colorado School of Medicine has already become a regional leader in this area. The support requested here for interdisciplinary collaborative cutting-edge research, by continuing to catalyze ongoing innovative scholarship, allowing us to attract and support new faculty with expertise in areas not currently covered, and providing opportunities for research and clinical trainees in this same area, will launch CU-SOM to national prominence, make us competitive for federal funding in this arena, and secure our position as a national and international leader in this arena.

Faculty Applicants:
- Neurosurgery—Aviva Abosch, M.D., Ph.D.
- Neuroradiology—Jody Tanabe, M.D.
- Neuroscience—John Thompson, Ph.D., Gidon Felsen, Ph.D., Diego Restrepo, Ph.D.
- Biomedical Engineering—Emily Gibson, Ph.D., Cristin Welle, Ph.D.
- Neurology—Drew Kern, M.D., Cornelia Drees, M.D.
- Neuropsychology—Brianne Bettcher, Ph.D., Huntington Potter, Ph.D.
- Psychiatry—Rachel Davis, M.D., Robert Freedman, M.D.