Mammalian Neural Interfaces

What?
We’re begun developing mammalian neural interfaces for Brain-Machine Interfaces (BMI), neuroprosthetics and neuroscience. We have an interest in multiple recording modalities and technologies, including electrocorticography, implantable electrode / optode systems, insertion mechanisms, and wireless systems. We are exploring applications ranging from imaging to BMI.

Commercial Relevance
California and the Bay Area are poised perfectly to lead the emerging revolution in neural interfaces to the human brain. The coming wave will require world-class expertise, facilities and a workforce at the intersection of five areas: micro/nanofabrication, integrated circuit design, information technology / big data, neuroscience, and clinical neurosurgery. We are well-positioned –right now– to catalyze the creation of an industry.

Why?
A seamless, high density, long term clinically-viable interface to the human brain is one of the grand challenges of the 21st century. Half a century of scientific and engineering effort has yielded a vast body of neural interface knowledge and a closely related set of tools for stimulating and recording from neurons inside the mammalian brain for basic science, neural engineering and clinical applications.

Funding
- National Science Foundation IDBR: A modular system for high-density, multi-scale electrophysiology
- Bakar Fellowship
- Center for Neural Engineering and Prostheses (CNEP)
- high density electrical and optical interfaces
- wireless μECoG for BMI
- μECoG for speech prostheses
- parylene bonding and lifetime testing of interfaces
- ITO μECoG for signal reconstruction
- Neural dust

Who
- Maysamreza Chamanzar
- Peter Ledochowitsch
- Brian Pepin
- DJ Seo

Sub-Projects
- high density electrical and optical interfaces
- wireless μECoG for BMI
- μECoG for speech prostheses
- parylene bonding and lifetime testing of interfaces
- ITO μECoG for signal reconstruction
- Neural dust

Collaborators
- Tim Blanche (co-PI), Redwood Center for Theor. Neuroscience
- Jose Carmena, EECS, Helen Wills Neuroscience
- Jan Radney, EECS, SWIRC
- Pip Staba, UCSF
- Edward Chang, UCSF
- Viviana Gradinaru, Caltech

Maharbiz Group, Fall 2012