OMB No. 0925-0001 and 0925-0002 (Rev. 09/17 Approved Through 03/31/2020)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: MacIver, M, Bruce

eRA COMMONS USER NAME (credential, e.g., agency login): MACIVER.BRUCE

POSITION TITLE: Professor of Neurophysiology

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Calgary, Alberta, Canada | BSc, MSc | 1981 | Pharmacology |
| University of Calgary, Alberta, Canada | PhD | 1987 | Neuroscience |
| Stanford University, Palo Alto, California | Postdoc | 1987 - 1989 | Neuropharmacology |
| Stanford University, Palo Alto, California | Postdoc | 1989 - 1991 | Pain Neurophysiology |
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A. Personal Statement

The long-term goal of our research is to provide physiological information needed to design safer and more effective anesthetics, and better measures of brain activity during anesthesia. Our current research investigates anesthetic actions on synaptic responses and EEG signals recorded from living brain slices, *in vitro*, as well as recordings from rats and human subjects. We use state-of-the-art electrophysiological recording techniques and sophisticated analytic approaches to determine circuit level effects produced by anesthetics and brain states associated with loss of consciousness. We target providing better and more science driven measures of anesthesia related neuronal activity, and better metrics to improve patient safety. In addition, by comparing whole animal and human recordings to synaptic effects seen in brain slices, we hope to better understand the physiologic basis of anesthetic effects on circuits in the nervous system. We have also studied the effects produced by temperature, hypoxia, hypoglycemia, ischemia, gamma radiation and G forces, on neuronal circuitry using our models; so we are well positioned to measure anesthetic effects in the proposed study, and to quantitatively monitor anesthetic concentrations.

**B. Positions and Honors:**

December 1991 to June 1998 Assistant Professor of Neurophysiology, Department of Anesthesia, Stanford University School of Medicine.

June 1998 to September 2010 Associate Professor of Neurophysiology, Department of Anesthesia, Stanford University School of Medicine.

September 2008 Founding Member: Bioengineering/Biodesign and the Stanford Bio-X Institute

October 2010 to present Professor of Neurophysiology, Department of Anesthesiology, Peri-operative and Pain Medicine, Stanford University School of Medicine

 **Honors, Awards and Other Professional Activities:**

1983 Mental Health Advisory Council of Alberta: Research Scholarship

1986 Alberta Heritage Foundation for Medical Research: Studentship

 1988 Pharmacological Society of Canada Award for Outstanding Research

 2000 Elected to Association of University Anesthesiologists

 2001 Appointed to the NIH, Special Emphasis Panel

 2004 Awarded the Allen V. Cox Medal, Stanford University

 2005 *Anesthesia and Analgesia* top 100 citations

1. Awarded the Faculty of 1000 – Medicine - Top 10 % Reviewer
2. *Anesthesiology* – Top 10 % Reviewer
3. *Neuropharmacology* – Top Reviewer in 2011

2013 Appointed Co-Chair of Stanford Medical School Research Committee, Faculty Senate

2013 Awarded the Faculty of 1000 – Top 5 % Reviewer

2014 Appointed to the NIH NIGMS SAT Study Section

2015 Reappointed Co-Chair of Stanford Medical School Research Committee, Faculty Senate

2017 Elemer Zsigmond Award, International Society for Anaesthetic Pharmacology, Boston MA

2020 Appointed Associate Editor *Journal of Neuophysiology*

**C. Contibutions to Science**

Publications – 69 peer reviewed papers: <https://www.ncbi.nlm.nih.gov/sites/myncbi/m..maciver.1/bibliography/43562341/public/?sort=date&direction=descending>

As a PhD student, I studied anesthetic effects on membrane electrical properties of neurons and, for the first time, described the ability of isolated brain slices to generate EEG-like oscillations when exposed to exogenous stimulants. Throughout my research career I have been interested in brain electrical activity, first from a mechanistic point of view by studying micro-EEG signals generated by large numbers of synchronized neurons in brain slices, and later as a tool to understand therapeutic effects in the human brain. The former includes papers on anesthetic mechanisms at a synaptic level and the latter includes awake behaving animal and human studies that have looked at hippocampal and cortical micro-EEG recordings and synaptic responses and how they are altered by anesthetics. Most recently our team has been studied the loss and recovery of consciousness in sleep and anesthesia.