GURUGUHAN MEENAKSHISUNDARAM
484 STINCHCOMB DR APT 9, COLUMBUS, OH 43202
PHONE: (614) 599-0989 *EMAIL:* guruguhan.meenakshisundaram@osumc.edu

EDUCATION

Doctor of Philosophy, Biomedical Engineering **Aug 2008**
The Ohio State University (OSU), Columbus, OH

Master of Science, Chemical Engineering **Dec 2004**
Arizona State University (ASU), Tempe, AZ

Bachelor of Engineering (Hons), Chemical Engineering **June 2001**
Birla Institute of Technology and Science (BITS), Pilani, INDIA

RESEARCH EXPERIENCE

Research Associate **Oct 2009 – Present**
Davis Heart and Lung Research Institute (DHLRI), OSU

- Development of novel oxygen monitoring devices to aid diagnosis and treatment of oxygen-level dependent medical conditions
- Development of a novel device for the measurement of skin surface oxygenation

Postdoctoral Training **Oct 2008 – Oct 2009**
Davis Heart and Lung Research Institute (DHLRI), OSU

- Evaluation and implementation of new strategies for the development and improvement of oximetry devices
- Preparation and publishing of manuscripts based on PhD dissertation work

Doctoral Research, Biomedical Engineering, OSU **Sept 2004 – Aug 2008**

- Development of novel implantable sensors for measurement of oxygen
  - Designed & tested biomedical devices for measuring and monitoring oxygen levels *in vitro* and *in vivo*
  - Improved fabrication protocols using novel material choices, and devised innovative testing methods
  - Conducted independent studies to characterize and validate devices, based on established project specifications
  - Contributed individually as an engineer, in a cross-functional team of chemists, physiologists & clinicians
- Investigation of the effect of fluid (blood) flow on the development of cardiovascular disease
  - Researched the role of fluid dynamics (shear stress) in heart disease, using a novel *in vitro* circulation system

Masters Research, Chemical Engineering **Aug 2002 – July 2004**
Arizona State University and Purdue University

- Minimization of blood-induced biofouling of bedside, point-of-care devices for detecting heart attack
  - Developed anti-fouling strategies for analysis of patient blood samples for the detection of heart attack
  - Tested and validated functionality of devices using model solutions; Modeled transport across these barriers

PEER-REVIEWED PUBLICATIONS

- **Meenakshisundaram G**, Eteshola E, Blank A, Lee SC, Kuppusamy P. A molecular paramagnetic spin-doped biopolymeric oxygen sensor. *Biosens. Bioelectron.* **2010** (In press)
- Pandian RP, **Meenakshisundaram G**, Bratasz A, Eteshola E, Lee SC, Kuppusamy P. An implantable Teflon chip holding lithium naphthalocyanine microcrystals for secure, safe, and repeated measurements of pO_2 in tissues. *Biomed. Microdevices* **2010** (In Press)
- **Meenakshisundaram G**, Pandian RP, Eteshola E, Lee SC, Kuppusamy P. A paramagnetic implant containing lithium naphthalocyanine microcrystals for high-resolution biological oximetry. *J. Magn. Reson.* **2010**, 203(1): 185-9

- **Meenakshisundaram G**, Eteshola E, Pandian RP, Bratasz A, Karuppaiyah S, Lee SC, Krishna MC, Swartz HM, Kuppusamy P. Oxygen sensitivity and biocompatibility of an implantable paramagnetic probe for repeated measurements of tissue oxygenation. *Biomed. Microdevices* **2009**, 11(4): 817-26
- **Meenakshisundaram G**, Eteshola E, Pandian RP, Bratasz A, Lee SC, Kuppusamy P. Fabrication and physical evaluation of a polymer-encapsulated paramagnetic probe for biomedical oximetry. *Biomed. Microdevices* **2009**, 11(4): 773-82
- Han Z, Chen YR, Jones CI, **Meenakshisundaram G**, Zweier JL, Alevriadou BR. Shear induced reactive nitrogen species inhibit mitochondrial respiratory complex activation in cultured vascular endothelial cells. *Am. J. Physiol.: Cell Physiol*. **2007**, 292(3): C1103-12

PATENT APPLICATIONS

- Kuppusamy P, **Meenakshisundaram G**, Eteshola E, Rivera BK. Biocompatible polymer coatings for the development of implantable oxygen sensors **2007** (Invention disclosure filed, pending processing)

CONFERENCES / PRESENTATIONS

- **Meenakshisundaram G**, Eteshola E, Bratasz A, Pandian RP, Lee SC, Kuppusamy P. OxyChip – a novel biopolymer-based oxygen-sensing implant for *in vivo* oximetry. *Biomedical Engineering Society (BMES) Annual Fall Meeting*, St. Louis, MO, Oct **2008**
- **Meenakshisundaram G**, Eteshola E, Bratasz A, Pandian RP, Lee SC, Kuppusamy P. Fabrication & characterization of a novel oxygen-sensing implants for *in vivo* oximetry. *DHLRI Research Retreat, OSU*, Columbus, OH, Apr **2007**

AWARDS & RECOGNITIONS

- Bioscience Technology Researcher of the Year 2009 – Honorable Mention
- Poster Winner - DHLRI Research Retreat Poster Competition, OSU, Apr 2007

MEMBERSHIPS & EXTRA-CURRICULAR ACTIVITIES

- Member of the Biomedical Engineering Society (BMES)
- Volunteer for the Association of India's Development (AID), OSU Chapter, Columbus, OH

REFERENCES

1) **Periannan Kuppusamy, PhD**
Professor, Internal Medicine and Biomedical Engineering
420 West 12th Avenue, TMRF, Rm. 114
Columbus, OH 43210
Ph: (614) 292-8998
Email: periannan.kuppusamy@osumc.edu

2) **Stephen C. Lee, PhD**
Associate Professor, Biomedical Engineering
473 West 12th Avenue, DHLRI, Rm. 305C
Columbus, OH 43210
Ph: (614) 292-2833
Email: stephen.lee@osumc.edu

3) **Mark A. Ruegsegger, PhD**
Assistant Professor of Practice, Biomedical Engineering
1080 Carmack Rd, Bevis Hall, Rm. 270b
Columbus, OH 43210
Ph: (614) 247-6890
Email: ruegsegger.1@osu.edu