Job Title: Postdoctoral Fellow or Phd student in **fabrication of Capacitive Micromachined Ultrasonic Transducers (CMUT)**
Posting Date: April 25, 2018
Position Start Date: Summer/Fall, 2018
Duration: 2 years with possible extension
Supervisor: Dr Guy Cloutier (guy.cloutier@umontreal.ca)
Team: Laboratory of Biorheology and Medical Ultrasonics
Affiliation: University of Montreal, Montréal, Québec, Canada
Working site: Centre de recherche du CHUM, 900 St-Denis, Montréal.
Scholarship: $37 850 CAD/year (with bonus if external scholarship is obtained)

Position Description:

A postdoctoral position is available for a highly trained and motivated person to work in **fabrication of Capacitive Micromachined Ultrasonic Transducers (CMUT)**. Red blood cell (RBC) aggregation is a strong marker of inflammation and has the unique advantage of offering continuous monitoring capability through ultrasound imaging. The LBUM is currently developing and integrating a technology to provide point-of-care patient monitoring based on the analysis of high-frequency ultrasound spectral data to measure the time-varying clustering of RBCs flowing within a new medical device. Further works are needed to design and fabricate CMUT transducers. The postdoctoral fellow will perform the simulation study on COMSOL to gather preliminary data supporting this. After having fabricating the transducer prototype based on simulations, he (she) will pursue on optimizing CMUT designs. He (she) will then be involved in a clinical study to evaluate the efficacy of the proposed CMUT design to be embedded in the new medical device prototype. The requested candidate will be responsible for statistical analyses and writing of manuscripts. This project is done in collaboration with Dr Frédéric Lesage of the École Polytechnique of Montréal.

Essential requirements:

- PhD in engineering physics, mechanical engineering, electrical engineering, biomedical engineering, medical physics or related fields;
- A track record of first author publications in peer-reviewed scientific journals;
- A strong background in one or some of the followings: ultrasound transducer design, microfabrication, ultrasound beamforming, acoustic physics, modelling of physical phenomena (such as acoustics, wave propagation, solid and fluid mechanics), ultrasound experimentation and data acquisition, signal and image processing;
- Programming skills in COMSOL, MATLAB, C, C++;
- Knowledge of programming interfaces of Verasonics and Ultrasonix research scanners;
- Proven technical writing skills for the preparation of research proposals and scientific articles;
- Proven track record in oral presentation of scientific results.

Eligibility:

The Postdoctoral Fellowship is open to scholars who have completed their doctoral degree no earlier than March, 2017.

Application process:

Applicants should send 1 PDF file containing the following (in this order) items to Dr Cloutier (guy.cloutier@umontreal.ca):

1. Presentation letter (maximum 2 pages) stating their motivations to work with Dr Cloutier's team
2. Complete CV including at least 3 references
3. Academic records at the B.Sc. or Engineering degree, Master and Ph.D. degrees
4. Two reference letters

The PDF file containing all documents must be sent to the director of LBUM (guy.cloutier@umontreal.ca). Only selected candidates will be notified to begin interview process.

The LBUM (www.lbum-crchum.com):

The Laboratory of Biorheology and Medical Ultrasonics (LBUM) pursues researches in medical imaging and blood rheology. Our research programs intend to improve the diagnostic and follow-up of hyper-erythrocyte aggregation, a pathological state promoting the hyper-viscosity of blood and thrombotic side effects, arterial atherosclerosis, vascular aneurysms, deep vein thrombosis, breast tumors, liver steatosis and tendon pathologies with new imaging methods. The LBUM is also developing new methods to characterize the biomechanical properties of the vascular wall and cardiac myocardium with ultrasound elastography. These research projects are realized in collaboration with clinical scientists, radiologists and cardiologists, fundamental scientists specialized in cardiovascular pathologies, biomedical engineers, and medical physicists. The LBUM is a Laboratory located in the Research Center of the University of Montreal Hospital. It is part of the Imaging and Bioengineering research axis of the University of Montreal Hospital Research Center. The LBUM is directed by Dr Guy Cloutier, who is also Professor in the Department of Radiology, Radio-oncology and Nuclear Medicine at the University of Montreal, and Member of the Institute of Biomedical Engineering (IGB) at the same university.

The CRCHUM (http://crchum.chumontreal.qc.ca/):

The CRCHUM enjoys an enviable position as a leading research institution both in North America and the French-speaking world. Our researchers work under seven research priorities: cancer; cardio-metabolic; tissue injury; immunity; infection and inflammation; neuroscience; imaging and engineering; risk to health and evaluation care systems and services. The priorities that were retained help the links between basic, clinical and populational health research activities, which provide a unique and high-performance framework that fosters interdisciplinary collaborations. Our new building is a 48,000 m² research area including an ultramodern animal facility, 75 laboratories, 33 clinical examination rooms, 15 beds for early-phase clinical research, a specialized pharmacy, 9 core scientific facilities (1-animal facility (for large and small animals), 2-biobanks, 3-cytometry, cell imaging and molecular pathology, 4-experimental imaging (which includes a cyclotron), 5-biosafety level 3 (BSL3), 6-rodent phenotyping, 7-mass spectrometry and surface plasma resonance, 8-gene targeting, 9-animal modelling and genotyping). It is located beside the new University of Montreal Hospital (http://www.chumontreal.qc.ca/).