



[Position for a PhD student or MSc-PhD student](#)

Laboratory : **Biomaterials and Cartilage Laboratory** <http://www.groupe.polymtl.ca/tissue/>
Dr. Caroline Hoemann, Ph.D., Professeure Agrégée
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Research Group : **Groupe de Recherche en Sciences et Technologies (FRQ)**

Web site: <http://www.groupe.polymtl.ca/grstb/>

Project description:

The project aims to evaluate and develop novel biomaterial implants that stimulate therapeutic responses. Our experiments concentrate on the biophysical interactions between biopolymers and blood that lead to a guided or organized tissue regeneration response. In particular, we are associating structural features of chitosan, a naturally-derived biodegradable polysaccharide, to several biophysical properties, polymer biodegradation, and cell chemotactic properties towards innate immune cells and stem cells. A specific approach has used fluorescent chitosan derivatives to track chitosan-cell interactions in vitro with cultures cells and in vivo in repairing bone and cartilage lesions. The overall aim of the research program is to develop novel therapies for damaged bone and cartilage.

Recent publications from the laboratory:

- ✦ Hoemann CD, Chen G, Marchand C, Sun J, Tran-Khanh N, Chevrier A, Thibault M, Fernandes MGJ, Poubelle PE, Shive MS, Centola M, and El-Gabalawy H. Scaffold-guided subchondral bone repair: implication of neutrophils and alternatively activated arginase-1+ macrophages. *Am. J. Sports Med.* 2010;38(9): 1845-56
- ✦ Chen G, Sun J, Lascau-Coman V, Chevrier A, Marchand C, Hoemann CD. Acute osteoclast activity following subchondral drilling is promoted by chitosan and associated with improved cartilage repair tissue integration. *Cartilage*, 2011: 2: 173-185
- ✦ Marchand C, Bachand J, Périnet J, Baraghis E, Lamarre M, Rivard GE, DeCrescenzo G, Hoemann CD. C3, C5 and factor B bind to chitosan without complement activation. *J Biomed Mater Research Pt A.* 2010: 93A(4):1429-1441

Discipline: biomaterials.

Candidate background : biomedical sciences, biochemistry, pharmacology, biomedical engineering

Qualifications:

- ✦ We are seeking a highly motivated graduate student with a strong background in health sciences, capable of independent research, and interested in higher education in *Génie Biomédical at the École Polytechnique* with competitive grade point average.
- ✦ Prior laboratory research experience and knowledge of French and English is an asset.
- ✦ The student should hold a baccalaureate or M.Sc. in health sciences, biochemistry, biology, biomedical sciences, pharmacology, or physics with a biophysics option.

Scholarship: The graduate student position is open to candidates until filled, or by Fall 2012. Successful candidates will be supported by a student scholarship stipend that covers tuition and living expenses, with up to 1,500 \$CDN to purchase their own lap top. Additional salary can be derived from teaching assistantships.

Contact:

Applicants should submit by e-mail their CV, a list of publications, university transcripts and the names, with contact information, of two references that could comment on your academic and scientific achievements if possible in one .pdf document, to :

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