Biophysical Tools for the Study of Breast Cancer Cell Migration and Invasion

Overview:
Applications are invited for a Postdoctoral Fellow in the Life Sciences Complex at McGill University in Montreal, Canada. Candidates should have a Ph.D. degree in the areas of Biophysics, Cell Biology, Cancer Biology, Bioengineering or a related field with an excellent track record for innovative research.

With a strong focus on interdisciplinary work the project will involve a collaboration between labs in cancer biology, biophysics and cellular biomechanics. McGill is ranked among the finest research-intensive universities in the world. The trainee will have access to the Advanced BioImaging Facility, Cell Imaging and Analysis Network and extensive light microscopy workshops and courses. They will have opportunities to attend seminars from world-renowned scientists speaking in Physiology, Biochemistry, Bioengineering and the Goodman Cancer Research Centre. There will also be links to the private sector for the development of custom acquisition and analysis software tools.

Project Summary:
The candidate will join a multidisciplinary team to develop a biophysical toolbox to measure forces in migrating cells, while simultaneously quantifying focal adhesion protein dynamics and interactions. This toolbox will be applied to investigate the role that the mechano-sensitive protein called lipoma preferred partner (LPP) plays in regulating breast cancer cell migration, invasion and metastasis using 1D, 2D and 3D cell model systems, tunable viscoelastic substrates, traction force microscopy (TFM), and image correlation microscopy (ICM). These tools will be used to decipher the complex molecular mechanisms controlling cell-matrix adhesion, cell migration, invasion and metastasis, and will be broadly applicable to researchers in diverse physical, life and health sciences fields.

Education and Experience:
PhD in preferred areas including Biophysics, Cell Biology, Cancer Biology, Bioengineering

Compensation:
The initial appointment is 1-year with potential for 2 additional years. Starting salary depends on experience.
Major Duties and Responsibilities:

1. Determine the mechanisms used by LPP – a zyxin family member – in regulating breast cancer cell migration and invasion.
2. Development of TFM in 1D, 2D and 3D model systems.
3. Development of ICM for measuring protein dynamics and interactions in focal adhesions in 1D, 2D and 3D model systems.
4. Develop a software interface in MatLab and then extend that to MetaMorph for TFM and ICM.
5. Oversight and mentorship of graduate students working on the project.
6. Keep abreast of the literature in the area.
7. Take a lead role in manuscript writing.
8. Present the work at national and international meetings.
9. Tissue culture, transfections, live cell imaging, basic microbiology.

Experience In Any of These Areas is Desired:

1. TFM or ICM an asset.
2. MatLab and/or MetaMorph. Basic programming for image processing and analysis.
3. Live cell imaging.
4. Working with 3D cultures.
5. Micropatterning.
6. TIRF, confocal microscopy, spinning disk microscopy.
7. Ability to work independently and efficiently but also work well as a part of a team.
8. Strong verbal and written communication in English.

The list of duties and responsibilities outlined above is representative and not a complete and detailed list of tasks, which may be performed by an employee whose position has been matched to this description.

How To Apply:

Candidates should send a cover letter indicating their area of scientific expertise, their curriculum vitae, a one-page statement of past and future research interests, and the names and contact information of three references to:

Dr. Claire Brown  
Associate Professor, Physiology  
McGill University  
claire.brown@mcgill.ca