University of Toronto
Faculty of Applied Science and Engineering
Department of Mechanical & Industrial Engineering

Posting: November 3, 2023

Postdoctoral Fellow

Areas of Research:

This project will focus on computational research of fluid flow and cells transport within artificial and natural scaffolds for optimal design of bioreactors and protocols for tissue engineering.

Description of Duties:

The University of Toronto (U of T)'s Advanced Thermofluids Optimization, Modelling and Simulation (ATOMS) Laboratory is looking for a postdoctoral fellow in the areas of computational fluid dynamics, biomedical microfluidics, computational biology, tissue engineering or regenerative medicine with experience in CFD simulation of fluid flow in porous media, including standard CFD methods and/or Lattice-Boltzmann Methods for fluid flow. The postdoctoral fellow will work on *in silico tissue engineering*, i.e., simulation, design and optimization of fluid flow and particle transport within perfusion bioreactors and tissue scaffolds to support production and self-organization of endothelial cells into micro-vessels.

The Postdoctoral Fellow will work under the supervision of Professor Cristina Amon (Mechanical & Industrial Engineering) and Dr. Sara Vasconcelos (Institute of Biomedical Engineering & UHN) and senior research associates in the ATOMS lab to conduct bioreactor design and tissue engineering research and training activities, work collaboratively with industrial and academic partners, author scientific publications and conference talks, prepare progress reports and technical presentations, develop research proposals and funding applications, and help supervise students on a day-to-day basis. The candidate will be expected to work independently, provide leadership to an interdisciplinary team of graduate students, produce publishable results, and publish frequently.

This Postdoctoral Fellow position offers a unique opportunity to conduct *in silico tissue engineering* research in collaboration with a multidisciplinary team of world-renowned medical researchers and engineers that are part of a broader initiative on regenerative medicine.

Requirements:

Education

- Doctoral degree, obtained within the past 5 years, in Mechanical Engineering, Biomedical Engineering, Bioengineering, Aerospace Engineering or related fields with a focus on CFD simulation of perfusion bioreactors, microfluidics transport phenomena and/or tissue scaffolds.

Experience/Skills

Required

- Theoretical and practical knowledge of computational methods for fluid flow (CFD), solid mechanics (CSM/FEA), and fluid-structure interaction (FSI), including flow in porous media.
- In-depth understanding of momentum and mass transport phenomena, specially in porous media and microfluidics.
- Ability to conduct research at the highest level, as demonstrated by research publications in scientific journals.
- Proficiency in computer programming on languages commonly used for engineering and science, e.g., Python, Matlab, Julia, C/C++.
- Proficiency in using common packages for simulation (e.g., COMSOL, ANSYS/Fluent, OpenFOAM) and solid modelling (e.g., SolidWorks, MeshMixer).

Desired

- Project-based experience in microfluidics simulation.
- Project-based experience or familiarity with experimental methods for cell culture.

Other Skills

- Well-developed interpersonal, communication and analytical skills.
- Demonstrated initiative and technical ability.
- Ability to work independently, with minimal supervision.

Salary: $55,000
Expect start date: as soon as possible
Schedule: 100%FTE.
Appointment Type: One-Year term with a possible renewal.

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Closing Date: December 13th, 2023.

To Apply: Application package should include a cover letter, CV (including a list of 3 professional references), and copies of selected journal papers the candidate considers most relevant. Please email your application as a single PDF file, named as "*LastName_FirstName_Postdoc_Bioengineering.pdf*", to David Romero at d.romero@utoronto.ca. Use "*Bioengineering Postdoc Application – YOUR NAME*" as the subject line in the email.

The normal hours of work are 40 hours per week for a full-time postdoctoral fellow recognizing that the needs of the employees' research and training and the needs of the supervisor's research program may require flexibility in the performance of the employees' duties and hours of work.

Employment as a Postdoctoral Fellow at the University of Toronto is covered by the terms of the CUPE 3902 Unit 5 Collective Agreement. This job is posted in accordance with the CUPE 3902 Unit 5 Collective Agreement.

The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from racialized persons/ persons of colours, women, Indigenous/Aboriginal, People of North America, persons with disabilities, LGBTQ persons, and others who may contribute the further diversification of ideas.