

Senior/Postdoctoral Associate (Ref:
IRG_CAMP_2021_016)
Singapore-MIT Alliance for Research and Technology
(SMART) Centre

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Posted Sep. 30, 2021, set to expire Jan. 29, 2022

Job Title	Senior/Postdoctoral Associate (Ref: IRG_CAMP_2021_016)
Department	(Critical Analytics for Manufacturing Personalized- medicine) Inter Disciplinary Research Group
Institution	Singapore-MIT Alliance for Research and Technology (SMART) Centre Singapore, Singapore, Singapore
Date Posted	Sep. 30, 2021
Application Deadline	Oct. 30, 2021
Position Start Date	Sep. 30, 2022
Job Categories	Post-Doc
Academic Field(s)	Mechanical Engineering Electrical and/or Electronics Bioengineering (all Bio-related fields)
Job Website	http://smart.mit.edu/careers/career-opportunities
Apply Online Here	https://smart.mit.edu/careers/career-opportunities/job-application?job=443&job_cat=Job
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Job Description	

Overview

SMART CAMP (Critical Analytics for Manufacturing Personalized-Medicine) is a new interdisciplinary research programme in Singapore (CREATE international research campus and innovation hub) and at the Massachusetts Institute of Technology (MIT). SMART CAMP addresses key technology

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bottlenecks in cell therapy manufacturing: (i) critical quality attributes of safe, effective cell therapy products; and (ii) integrated process analytics to monitor and modulate those attributes. While cell therapies are poised to transform healthcare for both the industry and the patient, there remain many outstanding scientific and technical challenges to significant global impact that this R&D programme addresses. This high-impact focus includes measurement and feedback control of processing parameters (process analytic technologies, or PAT) that contribute to cell viability and function during cell proliferation, and the measurement at intermediate and final steps of the cell product properties correlated with positive therapeutic outcomes (critical quality attributes, or CQA).

This interdisciplinary team comprises engineers, biologists, clinicians, manufacturing, and data analytics experts from multiple MIT academic units, and multiple Singapore-based universities, research centres of excellence, and hospitals who are experienced at translational demonstrations of technologies in safety-regulated industries such as cell therapies. As with all postdoctoral associates (PDAs) in SMART CAMP based in Singapore, the PDA will work in a diverse team of experts including several principal investigators (PIs) and PDAs, and receive direct mentorship regarding career development from a pair of who are based in Singapore and at MIT, respectively.

CAMP's unique, enabling and cross-cutting capabilities include cell and clinical biology, microfluidics, real-time optics and spectroscopies, 3D-printed devices, process analytics, data analytics, and bioinformatics. This programme will demonstrate these approaches required of cell-based personalized medicine through three translational testbeds (three Flagship Projects), ultimately facilitating access for more patients to life-saving, approved cell therapies for currently intractable health challenges. These flagship projects will address allogeneic and autologous cell therapy products, including but not limited to cell sources including adult stem/progenitor cells and immune cells for treatment of specific cancers, tissue degeneration, and autoimmune diseases. This PDA is part of the core postdoctoral research team of CAMP, and will contribute his/her/their expertise to all three flagship projects as appropriate:

Flagship Project 1: Label-free critical quality attributes (CQA) for personalized efficacy of cell therapies, including multivariate analysis of biological and biophysical attributes

Flagship Project 2: Rapid critical quality attributes (CQA) for safety of cell sources & cell therapy products, including process analytic technologies (PAT)

Flagship Project 3: Integrated process analytic technologies (PAT) for cell proliferation and recovery, including in-line and intermittent monitoring to promote efficacy and safety CQA

Job Responsibilities

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The work scope for this position will focus on the therapeutic applications of MSCs & T-cells, by working on the means for improving their efficacy through novel biophysical profiling strategies. During the production process of both MSCs and T-cells, cells often undergo phenotype changes that are not readily predictable from their donor profiles and culture protocols. The detailed mechanisms of such transitions are not fully understood and careful monitoring is of critical importance in cell therapy engineering. Additionally, further development of assay that monitor cell state will serve as a valuable tool for validating cell product quality at or near the release point.

The main responsibilities of the PDA will be to maintain and support our ongoing microfluidic cell sorting technology platform for various cell separation applications and to further develop (both in terms of instrumentation and scientific validation) our novel magnetic resonance (MR) spectroscopy (MRR) based cell phenotyping technology in collaboration with other researchers in CAMP and collaborating research teams in Singapore. The PDA will also interface with the greater cell therapy community in Singapore, including other researchers, clinicians, GMP manufacturers and regulators to help translate the findings of this work toward the goal of improving cell therapy products for patients.

Job Requirements

- A PhD degree in bioengineering, electrical engineering, mechanical engineering, chemical engineering, physics, or a related field is required. An interdisciplinary research background in cell culture, translational science, and biophysics/instrumentation will be an added advantage.
- Knowledge and demonstrated skill set in some of the following; instrumentation, magnetic resonance spectroscopy, microfluidics engineering, BioMEMS, cell sorting, circuit design.
- Self-motivated and able to work independently as well as in collaboration with a multidisciplinary team.
- Must be able to communicate ideas and results to researchers with different training backgrounds.
- Good track record of publications and scientific output.
- Able and committed to work in Singapore.

To apply, please visit our website at: <http://smart.mit.edu/careers/career-opportunities>. Interested applicants are invited to send in their full CV/resume, cover letter and list of three references (to include reference names and contact information). We regret that only shortlisted candidates will be notified.

Contact Information

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