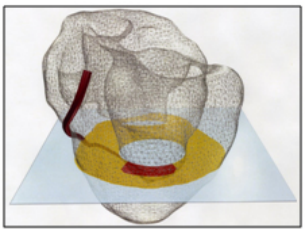
Université de Montréal






POSITION FOR A M.SC. STUDENT

Site: CRCHUM - Centre de recherche du Centre hospitalier de l'Université de Montréal, 900, rue St-Denis, Montréal, Qc

Laboratory /Group: Dr. Simon Turcotte - Cancer immunology research group

Web Site: https://www.chumontreal.qc.ca/crchum/chercheurs/simon-turcotte; http://icm.qc.ca/fr/recherche-scientifique/chercheurs/dr-simon-turcotte.html; https://chirurgie.umontreal.ca/turcotte-simon/

Title: Improving adoptive cell transfer immunotherapy with clinical-grade cell sorting of tumor-reactive T cells infiltrating solid tumors.

Project description: The objective of the project is to determine the efficacy of immunotherapy in the treatment of patients with refractory melanoma or metastatic colorectal cancer (CRC). Tumor-infiltrating T lymphocytes adoptive cell transfer (TIL ACT) immunotherapy is associated with high rates of sustained responses, and consists of surgically harvesting metastases, expanding TILs ex vivo in an incubator, and transfusing these autologous TILs to the lymphodepleted patient. However, the effectiveness of such a treatment is limited, as i) only a small percentage of TILs recognize tumor antigens; and ii) the standard ex-vivo expansion method of TILs does not promote efficiently the expansion of anti-tumor TILs, which are often embedded in tumor-non responsive T cells. To overcome these barriers, we have developed a technique that uses cell surface molecules to select and enrich tumor-reactive TILs, indicating that a lymphocyte has repeatedly encountered a known antigen. Such a technique allows to retrieve anti-tumor T lymphocytes more in selected TILs than those produced by standard method without selection. To reach the end of the project, patients with CRC liver metastases or metastatic melanoma will be recruited and their tumors will be resected. The TILs will be sorted, selected by their surface molecules using flow cytometry (FACS), and expanded ex-vivo. In parallel, tumor DNA and RNA will be extracted and sequenced to identify the mutated tumor antigens. Peptides encoding these tumor-expressed antigens will be synthesized and tested for recognition by TILs in a recognition assay, consisting of a cell co-culture (TILs, antigen presenting cells and peptides encoding antigens), ELISPOT and FACS.

References:

- Turcotte S et al. Tumor MHC class I expression improves the prognostic value of T-cell density in resected colorectal liver metastases. Cancer Immunol Res. 2014 Jun;2(6):530-7.
- Tran E, Turcotte S et al. Cancer immunotherapy based on mutation-specific CD4+ T cells in a patient with epithelial cancer. Science. 2014 May 9;344(6184):641-5
- Turcotte S et al. Tumor-reactive CD8+ T cells in metastatic gastrointestinal cancer refractory to chemotherapy. Clin Cancer Res. 2014 Jan 15;20(2):331-43.
- Turcotte S et al. Phenotype and function of T cells infiltrating visceral metastases from gastrointestinal cancers and melanoma: implications for adoptive cell transfer therapy. J Immunol. 2013 Sep 1;191(5):2217-25.

Mains themes /disciplines: Immunology

Program of formation: Biomedical Sciences

Qualifications: Bachelor's degree in biology or other related field. Having completed an internship in a research laboratory is an asset.

Available: From January 2019

Support: Successful candidates will be supported by research grants (salary based on CIHR guidelines) and will have the opportunities to apply at various competitions for studentship.

Contact info: Applicants should send a resume to Sandy Pelletier at sandy.pelletier@umontreal.ca, including a list of publications, university records and the names, with contact information, of two references that could comment on your achievements