

Ph.D. Project Offer

Research director:

Dr. Andrés Finzi

Research Assistant Professor
Department of Microbiology and Immunology
Faculty of Medicine, Université de Montréal
Centre de recherche du CHUM – St-Luc Hospital
Interest of the lab: HIV, viral fusion, gp120-gp41

Project :

In the absence of no effective vaccines against HIV and with therapies aimed at HIV eradication remaining a far fetched goal, it is urgent to develop new methods to neutralize this virus. The best way to block HIV infection is to inactivate the virus before it can infect cells. This is why it is important to better understand the conformational transitions that the HIV-1 envelope glycoproteins undergo during the process of virus entry as they represent attractive targets for intervention. A major goal of my research is to better understand the conformational changes in the HIV-1 envelope glycoproteins triggered by CD4 binding as they represent attractive targets for intervention. Another important goal of my research is to understand how the conformational flexibility of the HIV envelope and its modulation by the inner domain Layers 1-3, that we have recently identified (Finzi et al., Mol Cell 2010), and by the variable loops, contribute to viral progression and pathogenesis. My laboratory will also study the structural and functional interaction between HIV-1 gp120 and gp41. This work has the potential to generate stable complexes suitable for crystallization. Such a realization will likely assist in the development of any small molecule trying to block HIV fusion.

Requirements :

Candidates should have a formal training in biomedical sciences (microbiology, biochemistry, immunology, virology) and excellent organizational, interpersonal, and communication skills. Candidates must aim to acquire a Ph.D. in Virology and Immunology.



CENTRE DE RECHERCHE DU CENTRE HOSPITALIER DE L'UNIVERSITÉ DE MONTRÉAL

■ Hôtel-Dieu
3850, rue Saint-Urbain
Montréal (Québec) H2W 1T7

■ Hôpital Notre-Dame
2099, rue Alexandre-de-Sève
Montréal (Québec) H2L 2W5

■ Hôpital Saint-Luc
264, boul. René-Lévesque Est
Montréal (Québec) H2X 1P1

■ Technopôle Angus
2901, rue Rachel Est
Montréal (Québec) H1W 4A4

To apply:

Applicants should submit a resume, university records, a short statement of research interests and at least the name of three references.

Please apply by email at: **andres.finzi@umontreal.ca**

References

1-Finzi A, Xiang SH, Pacheco B, Wang L, Haight J, Kassa A, Danek B, Pancera M, Kwong PD and Sodroski J. Topological layers in the HIV-1 gp120 inner domain regulate gp41 interaction and CD4-triggered conformational transitions. *Molecular Cell*. 2010; 37:656-67.

2-Finzi A, Pacheco B, Zeng X, Kwon YD, Kwong PD and Sodroski J. Conformational characterization of aberrant disulfide linked HIV-1 gp120 dimers secreted from overexpressing cells. *J Virol Methods*. 2010; 168:155-61.

3-Zhou T, Georgiev I, Wu X, Yang Z-Y, Dai K, Finzi A, Kwon YD, Scheid J, Shi W, Xu L, Yang Y, Zhu J, Nussenzweig M, Sodroski J, Shapiro L, Nabel GJ, Mascola JR and Kwong PD. Structural basis for broad and potent neutralization of HIV-1 by antibody VRC01. *Science*. 2010; 329(5993):811-7.

4- Zhuang K., Finzi A., Tasca S., Shakirzyanova M., Knight H., Westmoreland., Sodroski J, Cheng-Mayer C. Adoption of an "open" envelope conformation to facilitate CD4 binding and structural remodeling precedes coreceptor switch in infected macaques. *PlosOne*. 2011. 6(7):e21350.doi:10.1371/journal.pone.0021350