INTERNSHIP PROPOSAL

Institute and Group: IBS group HIV and persistent human viruses

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Research project title: Human monoclonal antibodies: a new therapeutic strategy against BK virus infection and associated diseases

5 Keywords to describe the project:

BK virus, monoclonal antibodies, therapy, immunogen, vaccine

Description of the project (aims, experimental techniques, recommended background):

BK virus (BKV) infection has a major negative impact on the transplant recipient community. It is estimated that up to 30% of the 60,000 kidney transplants performed annually worldwide are potentially compromised by BKV-associated nephropathy (BKVAN) or BKV replication. Recent data reveal a key role of the anti-BKV neutralizing Ab response in protecting against BKV infection and associated diseases, and strongly support the benefit of administering neutralizing Abs as a preventive strategy before transplantation or as a therapeutic strategy after transplantation. The main objective of the project is to isolate and characterize human mAbs that efficiently neutralize all the BKV genotypes and variants and may ultimately be used as a therapeutic strategy against BKV infection as well as tools for vaccine design.

Justification that the internship's subject fits with the general theme of GRAL:

This new project of our group fits the GRAL Host-Pathogen Interaction theme. Structural characterization of the isolated Abs and their epitopes will help Ab optimization and immunogen design.

Relevant publications of the team

1. Landais E, Murrell B, Briney B, Murrell S, Rantalainen K, Berndsen ZT, Ramos A, Wickramasinghe L, Smith ML, Eren K, de Val N, Wu M, Cappelletti A, Umotoy J, Lie Y, Wrin T, Algate P, Chan-Hui PY, Karita E; IAVI Protocol C Investigators; IAVI African HIV Research Network, Ward AB, Wilson IA, Burton DR, Smith D, Pond SLK, Poignard P. (2017) "HIV Envelope Glycoform Heterogeneity and Localized Diversity Govern the Initiation and Maturation of a V2 Apex Broadly Neutralizing Antibody Lineage." Immunity. Nov 21;47(5):990-1003.e9. doi: 10.1016/j.immuni.2017.11.002.
2. MacLeod DT, Choi NM, Briney B, Garces F, Ver LS, Landais E, Murrell B, Wrin T, Kilembe W, Liang CH, Ramos A, Bian CB, Wickramasinghe L, Kong L, Eren K, Wu CY, Wong CH; IAVI Protocol C Investigators & The IAVI African HIV Research Network, Kosakovsky Pond SL, Wilson IA, Burton DR, Poignard P. (2016) "Early Antibody Lineage Diversification and Independent Limb Maturation Lead to Broad HIV-1 Neutralization Targeting the Env High-Mannose Patch." Immunity. May 17;44(5):1215-26. doi: 10.1016/j.immuni.2016.04.016.
3. Walker, L. M., M. Huber, K. J. Doores, E. Falkowska, R. Pejchal, J. P. Julien, S. K. Wang, A. Ramos, P. Y. Chan-Hui, M. Moyle, J. L. Mitcham, P. W. Hammond, O. A. Olsen, P. Phung, S. Fling, C. H. Wong, S. Phogat, T. Wrin, M. D. Simek, G. P. I. Protocol, W. C. Koff, I. A. Wilson, D. R. Burton and P. Poignard (2011). "Broad neutralization coverage of HIV by multiple highly potent antibodies." Nature 477(7365): 466-470.