IDA Highlight: CD4 T cells in HIV infection

CD4 T cells are well known as the main target for HIV infection, however, their T cell antiviral activity during His infection is not as well known. This year the IDA invited Dr Zaza Ndhlovu from the African Health Research Initiative, to be one of the faculty members of the HIV themed session, where he presented a talk titled: ***"The role of HIV-specific CD4 T cell responses in HIV cure strategies: Friend or foe?"***. During his talk he outlined the importance of initiating people very early on antiretroviral (ARV) therapy (ART), further showing that early ART initiation augments HIV-specific CD4+ T cell responses. The speaker also highlighted that ART does not cure people of HIV infection, because after individuals stop taking their ARVs, the viral reservoir in the lymph node [major site of HIV replication during ART] rapidly replicates. Overall, his talk highlighted the importance of CD4+ T-cells and how they are important in HIV pathogenesis. Most research on T cell immunity has focused on CD8 T cell immunity, this year we were fortunate to have 2 talks from student participants that focused on CD4 mediated T cell immunity during HIV infection.

Bongiwe Mahlobo, PhD Student from the African Health Research Institute (South Africa), presented an oral talk titled ***"Single-cell transcriptional profiling of T follicular regulatory (TFR) and T follicular helper (TFH) cells".***These two cell subsets are known to play an important but contrasting role in shaping humoral anti-HIV immune responses. Her research specifically aimed at defining the

transcriptional functional signatures of TFR and TFH cells, that could inform HIV vaccine or cure strategies. She identified transcriptional profiles that included differential expression of Hap1, NINJ1 among other transcripts, that could distinguish these two cell population.

Gisele Umviligihozo, SANTHE Fellow from Rwanda, presented her research on the ***"Analysis of Vpu-mediated CD4 and tethering down-regulation across major HIV-1 group M subtypes"***. HIV-1 viral protein U (VpU) down-regulates CD4 and tetherin, allowing virus-infected cells to evade host immunity and promote viral egress. However, little is known about the functional diversity of VpU among HIV-1 subtypes. Gisele aimed to investigate this by cloning a genetically diverse panel of 332 VpU sequences from chronically infected patients from Rwanda, Uganda, South Africa and Canada. Her findings showed that VpU from subtype D clones had the highest CD4 and tetherin downregulation function, while (VpU) subtype C had the lowest downregulation of these molecules. She concluded that global HIV-1 sequence diversity may have an impact on VpU functions, and would be critical to understanding HIV pathogenicity (of CD4 T cells) in Humans.

In summary, the CD4 anti-HIV immunity session highlighted key aspects of CD4 mediated immunity that many students were not aware of.

Article by Yanga Mdleleni, Abel Lissom and Tsegaye Yosef