EuroSciCon

4th European Congress on

VACCINES AND IMMUNOLOGY

October 04-05, 2021
Webinar

Yehia Mohamed, Immunological Disorders and Immunotherapy, Volume 05, Issue 4
ISSN: 2593-8509

Specificity of CD8+ T-Cell Responses to HIV-1 vaccines, lessons for COVID-19

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Sub-Saharan Africa carries the biggest burden of the human immunodeficiency virus type 1 (HIV-1)/AIDS epidemic and is in an urgent need of an effective vaccine. CD8+ T cells are an important component of the host immune response to HIV-1 and may need to be harnessed if a vaccine is to be effective. CD8+ T cells recognize human leukocyte antigen (HLA)-associated viral epitopes and the HLA alleles vary significantly among different ethnic groups. It follows that definition of HIV-1-derived peptides recognized by CD8+ T cells in the geographically relevant regions will critically guide vaccine development. Here, we study fine details of CD8+ T-cell responses elicited in HIV-1/2-uninfected individuals in Nairobi, Kenya, who received a candidate vaccine delivering conserved regions of HIV-1 proteins called HIVconsv. Using 10-day cell lines established by in vitro peptide restimulation of cryopreserved PBMC and stably HLA-transfected 721.221/C1R cell lines, we confirm experimentally many already defined epitopes, for a number of epitopes we define the restricting HLA molecule's and describe four novel HLA-epitope pairs. We also identify specific dominance patterns, a promiscuous T-cell epitope and a rescue of suboptimal T-cell epitope induction in vivo by its functional variant, which all together inform vaccine design.

Biography

Yehia Mohamed currently working as an Assistant Professor in the Department of Immunology at Ajman University, UAE. He received his undergraduate degree from Al-Azhar University in Cairo, Egypt. His phd was awarded in the Department of Infection, Immunity, and Inflammation, College of Medicine and Biological Sciences at Leicester University, UK. Yehia Mohamed has a variety of research interests including immunotherapeutic management of malignant tumors, especially hematologic malignancies, vaccine development for chronic viral infections and immunomodulatory effects of the newly introduced therapeutic medications.

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