

The Immunomodulatory Role of Alcohol on HIV-infected Monocyte-derived Dendritic Cells

by *Gianna Casteleiro* | *Madhavan Nair, Ph.D* | *Gloria Figueroa, B.S.* | *Marisela Agudelo, Ph.D*

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Abstract Details

Alcohol is known to induce inflammation in the presence of the human immunodeficiency virus (HIV). In our previous studies, we revealed that alcohol induces cannabinoid receptors which play a role in the regulation of inflammatory cytokine production in monocyte-derived dendritic cells (MDDC). However, the ability of alcohol to alter MDDC function during HIV infection has not been clearly elucidated yet. To study the potential impact of alcohol on HIV-infected MDDC (confirmed by p24 ELISA), monocytes were isolated from commercially available buffy coats and cultured for 7 days with GM-CSF and IL-4. MDDC were infected with HIV-1Ba-L and treated with different concentrations of alcohol (0.1% and 0.2%) for 4-7 days. MDDC phenotype, endocytosis, cytokine production, and ability to transmit HIV to T cells were analyzed. Uninfected CD4+ T cells were co-cultured for 7 days with either infected/treated MDDC or the supernatants from infected/treated MDDC. Inflammatory cytokine arrays were performed using supernatants from HIV-infected MDDC treated with alcohol. Results showed that HIV positive MDDC treated with alcohol had higher levels of infection compared to untreated HIV positive controls. CD4+ T cells exposed to HIV-infected MDDC acquired 100-fold higher levels of p24 compared to CD4+ T cells exposed to only supernatants. CD4+ T cells exposed to HIV-infected and alcohol-treated MDDC had higher levels of infection compared to controls. Cytokine array data show dysregulation of cytokine production by alcohol. In addition, MDDC phenotype and endocytic capacity were altered in the alcohol treated MDDC. Our results indicate a crucial role of MDDC in HIV transmission to T cells and provide insights into the inflammatory role alcohol exerts on dendritic cell function in the context of HIV infection. Supported by the National Institute on Alcohol Abuse and Alcoholism award R00AA021264, the National Institute on Drug Abuse award R01DA034547, and the Institute on NeuroImmune Pharmacology at FIU.

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Author Information

Author: *Gianna Casteleiro* | *Madhavan Nair, Ph.D* | *Gloria Figueroa, B.S.* | *Marisela Agudelo, Ph.D*

Email: gcast109@fiu.edu, madhavan.nair@fiu.edu, gfiguero@fiu.edu, magudelo@fiu.edu

Affiliation: FIU Herbert Wertheim College of Medicine Department of Immunology, FIU Herbert Wertheim College of Medicine Department of Immunology, FIU Herbert Wertheim College of Medicine Department of Immunology, FIU Herbert Wertheim College of Medicine Department of Immunology, FIU Herbert Wertheim College of Medicine Department of

Presenter Information

Presenter: *Gianna Casteleiro*

Email: gcast109@fiu.edu

Preference: Poster