Periodontal pathogens enhance HIV-1 promoter activation in T cells

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Today, during the 39th Annual Meeting of the American Association for Dental Research, convening at the Walter E. Washington Convention Center in Washington, DC, lead researcher O.A. Gonzalez (University of Kentucky, Lexington) will present a poster of a study titled "TLR2 and TLR9 Activation by Periodontal Pathogens induce HIV-1 Reactivation."

Although oral co-infections (e.g. periodontal disease) are highly prevalent in HIV-1 patients and appear to positively correlate with viral load levels, the potential for oral bacteria to induce HIV-1 reactivation in latently infected cells has received little attention. The researchers involved in this study have proved that periodontal pathogens enhanced HIV-1 promoter activation in T-cells, monocytes/macrophages and dendritic cells; however the mechanisms involved in this response remain undetermined.

The objective of this study was to determine the role of Toll-like receptors (TLR) in HIV-1 reactivation induced by periodontal pathogens. The oral Gram-negative but not Gram-positive bacteria enhanced HIV-1LTR activation in BF24 cells. TLR9 activation by F. nucleatum and TLR2 by both Gram-negative bacteria were involved in this response, however TLR4 activation had no effect. Use of NFkB or Sp1 specific chemical inhibitors suggested that these transcription factors are positive and negative regulators of bacterially-induced HIV-1LTR activation, respectively. HIV-1LTR activation and viral replication were similarly induced in THP89GFP cells.

Finally, production of TNFa was enhanced by Gram-negative bacteria and its neutralization reduced HIV-1 reactivation. These results suggest that TLR2 and TLR9 activation by P. gingivalis and F. nucleatum, as well as TNFa produced in response to challenge enhance HIV-1 reactivation in monocytes/macrophages. Increased bacterial growth and emergence of periodontopathogens or their products accompanying chronic oral inflammatory diseases could be risk modifiers for viral replication and transmission, systemic immune activation and AIDS progression in HIV-1 patients.

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