Scientists solve mystery about why HIV patients are more susceptible to TB infection

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A team of Harvard scientists has taken an important first step toward the development of new treatments to help people with HIV battle *Mycobacterium tuberculosis* (TB) infection. In their report, appearing in the July 2009 print issue of the *Journal of Leukocyte Biology* they describe how HIV interferes with the cellular and molecular mechanisms used by the lungs to fight TB infection. This information is crucial for researchers developing treatments to help people with HIV prevent or recover from TB infection.

"HIV/TB co-infection is a critical global health problem, especially in developing countries," said Naimish Patel, M.D., lead researcher on the study and Instructor of Medicine at Beth Israel Deaconess Medical Center and Harvard Medical School. "We hope that these findings will lead to further studies and possible new therapies for treating or preventing tuberculosis in HIV disease."

Patel and colleagues made their discovery by extracting immune cells called "alveolar macrophages" from the lungs of otherwise healthy, asymptomatic HIV-positive patients as well as from people who did not have HIV. In people who are HIV-positive, the macrophages have a decreased response to the TB bacterium when compared to people who did not have HIV. To learn why, the scientists examined lung specimens from the HIV-positive patients and found increased levels of a molecule called IL-10, which elevated the amount of a protein called "BCL-3" in alveolar macrophages and that reduced their ability to ward off TB infection.

"HIV and TB represent two of the most significant health challenges in human history and the combination of the two infections is particularly devastating because HIV dramatically increases the severity of TB infection," said John Wherry, Ph.D., Deputy Editor of the Journal of Leukocyte Biology, "There are still many unknowns about how HIV reduces the ability of the body to combat other infections. This study sheds light on co-infection with HIV and TB, which up to this point, has perplexed scientists and physicians alike."

More information: Naimish R. Patel, Katharine Swan, Xin Li, Souvenir D. Tachado, and Henry Koziel. Impaired M. tuberculosis-mediated apoptosis in alveolar macrophages from HIV+ persons: potential role of IL-10 and BCL-3. *J Leukoc Biol* 2009 86: 53. www.jleukbio.org/cgi/content/abstract/86/1/53

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