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**Vitamin D for combating HIV/TB****Anna K Coussens**

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**T**uberculosis (TB) susceptibility is influenced by immunosuppression during *Mycobacterium tuberculosis* (*Mtb*) infection. Amongst the greatest risk factors for TB are HIV-1 infection and vitamin D deficiency. These risk factors are not mutually exclusive and exacerbate each other. However, the phenotype of immunodeficiency induced by each is different, therefore their interrelationship on susceptibility is complex. Co-infection with HIV is thought to increase susceptibility to TB via a number of mechanisms; primarily through dysfunctional and decreased CD4<sup>+</sup> T cells and impaired T cell activation. However, the impact on innate immunity which may influence the primary response to *Mtb* is less clear. Vitamin D deficiency not only associates with TB risk, but it is greater in HIV-co-infected patients. The effects of vitamin D on the immune system are pleiotropic, being both anti-inflammatory and anti-microbial. Consequently, the exact mechanisms by which vitamin D may help prevent and treat TB-HIV remain contentious. Evidence suggests that vitamin D may not only reduce risk of TB by increasing anti-mycobacterial immunity and reducing inflammation, but it may also reduce HIV replication and the associated effects on innate and adaptive immunity; thus concomitantly reducing the associated risk of HIV on TB. I will summarise our *in vitro* and *ex vivo* findings in various populations on the effect of vitamin D supplementation on the response of innate and adaptive immunity to HIV-*Mtb* infection, and demonstrate the effects of local inflammation on the cellular response to co-infection. Vitamin D may prove to be a cheap, effective, tool for preventing TB-HIV disease progression.

**Biography**

Anna Coussens obtained her PhD in Australia at the Queensland University of Technology, in Cellular and Molecular biology. After completing a postdoc at the National Institute of Medical Research in the UK, she moved to the University of Cape Town in 2012, to develop a research program in clinical TB-HIV immunology. She is a Senior Lecturer in the Division of Medical Microbiology, within the Institute of Infectious Disease and Molecular Medicine. She recently began her own research group focusing on host directed therapies and biomarkers of subclinical infection. She is currently an executive committee member of the Global Young Academy.

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