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Brain dendritic cell recruitment subsequent to *Mycobacterium bovis* bacillus Calmette-Guerin intracerebral infection contributes to CNS protective immunity

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Mycobacterium bovis BCG causes inflammation of the CNS referred to as central nervous system tuberculosis (CNS-TB). CNS-TB is a lethal form of tuberculosis that constitutes approximately 5-10% of extra-pulmonary tuberculosis cases. Pathogenesis of CNS-TB is initiated as a secondary infection during haematogenous dissemination of pulmonary infection to the brain parenchyma. CNS-TB is associated with high morbidity and 50% mortality. The mechanisms associated with CNS-TB infection and cells targeted for invasion is mostly unknown. The regulatory role of dendritic cells (DCs) in CNS-TB has been neglected because of their absence during homeostasis. This study investigated DC recruitment kinetics and phenotype in context to CNS-TB. C57BL/6 mice were intracerebrally infected with BCG and sacrificed at different time intervals. Bacterial loads of samples were determined by plating homogenates of organs and counting colony-forming units. Brain DCs were quantified and their phenotype determined using flow cytometry. Bacterial loads showed dissemination of BCG from the brain to the spleen and to a lesser extent to the lungs. A significant increase was observed in the amount of dendritic cells recruited to the brain at week 4 post BCG infections. At week 6, there was a significant drop in the amount of BCG present in the brain. Recruitment of T cells to the brain following BCG infection shows that DCs are successful in presenting antigens to T cells and eliciting an adaptive immune response in CNS-TB. This shows that the CNS is not immune privileged but CNS inflammation caused by mycobacteria is a highly regulated process that limits potential pathology damage.

Biography

Khanyisile Kgoadi is a Clinical Science and Immunology PhD student at the University of Cape Town, South Africa. She has completed her BSc in Biochemistry at the University of Johannesburg and MSc studies in Biochemistry at the University of Pretoria, South Africa. She has published a joint first authorship paper in the current metabolomics journal. She has won the South African Women in Science Award in 2015. She was awarded the Margaret McNamara Education Grant for her strong leadership qualities and empowerment of children and women through education.

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