ACTIVATED MATURE B CELLS ARE ENRICHED IN THE LUNG OF HEALTHY MALAWIAN ADULTS

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Background
B cells play an important role in defence against pathogens, mainly through antibody production, cytokine release and antigen presentation. A lot of studies have defined the phenotype and proportions of the different B cell subsets in peripheral blood. However, there is not much that is known about the phenotype and proportions of B cell subsets in the lung. As such, we aimed to identify the phenotype and proportions of B cell subsets in the lung of healthy adults and how they compare to those in the systemic compartment.

Methods
We recruited 17 study participants from Queen Elizabeth Central Hospital VCT clinic in Blantyre, Malawi. All participants were healthy, asymptomatic adults (≥18 years old) who were HIV-1-uninfected with no clinical evidence of active disease. The participants underwent a bronchoscopy through which bronchoalveolar lavage (BAL) fluid was obtained. Peripheral blood was also obtained from the participants. BAL cells and PBMCs were isolated from the BAL fluid and peripheral blood, respectively. Flow cytometry-based immunophenotyping was performed on the BAL cells and PBMCS to identify the following B cell subsets: Immature transitional B cells (CD19+CD10+), naïve mature B cells (CD19+CD10-CD27-CD21+), resting memory B cells (CD19+CD10-CD27+CDC1+), tissue-like B cells (CD19+CD10-CD27-CD21-), activated mature B cells (CD19+CD10-CD27+CD21-) and plasmablasts (CD19+CD27++CD38+++).

Results
We found that activated mature B cells (36%) and resting memory B cells (39%) were the predominant subsets in BAL fluid, while naïve mature B cells (31%) and resting memory B cells (38%) were the predominant subsets in peripheral blood. The proportion of activated mature B cells was higher in BAL cells than in PBMCs (36% vs. 16%; $p<0.0001$). The proportions of naïve mature B cells (6% vs. 31%; $p<0.0001$), plasmablasts (0.7% vs. 2%; $p=0.0069$) and immature transitional B cells (0.1% vs. 1%; $p=0.0312$) were lower in BAL cells compared to PBMCs. The proportions of resting memory B cells (39% vs. 38%; $p=0.5861$) and tissue-like B cells (6% vs. 5%; $p=0.6033$) were similar between BAL cells and PBMCs.

Conclusion
Our findings show B cell subsets are distributed differentially between the lung and peripheral blood compartments, with activated mature B cells being enriched in the alveolar space, a portal of entry for antigens. The higher proportion of activated mature B cells in the lung likely reflects the high exposure to multiple antigens in the respiratory tract.