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The role of cervical mucus and mucins in HIV/AIDS

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Introduction: Sexual intercourse is the major route of human immunodeficiency virus (HIV) transmission. Our laboratory reported that purified cervical mucins from HIV negative women inhibited HIV-1, whilst the crude cervical mucus did not. The anti-HIV-1 activity of crude cervical mucus and purified mucins from HIV positive women is unknown. We aimed to compare the anti- HIV-1 activities of the crude cervical mucus and purified mucins from HIV negative and HIV positive women in a large cohort.

Methods: We collected cervical mucus plugs in guanidinium hydrochloride from fifteen HIV negative and eight HIV positive pregnant women, and stirred them overnight to solubilise. We subjected the samples to a low speed centrifugation to remove insoluble material and prepare crude cervical mucus. To purify mucins, we centrifuged samples twice by caesium chloride density gradient ultra-centrifugation, dialyzed against distilled water to desalt and freeze-dried to remove water. We confirmed the purity of mucins by SDS-PAGE and detected mucins by Western blot. We incubated separately the crude cervical mucus and purified mucins with HIV-1 for 48 hours, transferred each mixture to TZM-bl cells and detected the HIV-1 neutralization by illuminometer.

Results: The mucin purification profiles showed that caesium chloride density gradient ultra-centrifugation removed protein contaminants from the mucins, as confirmed by the faint protein background on the SDS-PAGE. We detected MUC5AC and MUC5B in all samples using Western blot. We found that the crude cervical mucus and purified mucins from HIV negative and HIV positive women inhibited HIV-1 in an *in vitro* assay, with inter-individual variation among patients from both groups.

Conclusion: Our findings suggest that HIV infection does not compromise the expression of the cervical mucins, and both crude cervical mucus and purified mucins can neutralize HIV-1 in an *in vitro* assay regardless the HIV status of the participants.

Biography

Baxolele Mhlekele has completed his BSc (Med) (Hons) by 2012 from the University of Cape Town, specializing in Medical Biochemistry and is now completing his MSc (Med) in the same institution and field. His MSc research is based on the anti-HIV-1 activities of the human cervical mucins and their ability to protect the growing foetus in the cervix during pregnancy against infectious agents, which usually ascend from the bacterial rich vaginal environment.

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