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Evaluation and Design of Affordable and Novel HIV-1 Drug Resistance Assays:

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2006-11-17T11:41:08Z
http://hdl.handle.net/10539/1865

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ABSTRACT

Approximately 5 million individuals are infected with HIV/AIDS in South Africa. The South African government has initiated a National Anti-retroviral therapy (ARV) Program to manage this disease. The emergence of drug resistance to ARV therapy is of great concern. Commercial gold standard sequence-based genotyping assays for monitoring resistance are unaffordable.

This project aimed at developing affordable methods to detect specific point mutations relevant to HIV-1 subtype C. The Oligonucleotide Ligation assay (OLA), a real-time PCR assay and a Restriction Fragment Length Polymorphism (RFLP) assay were explored. Results were compared to the Viroseq genotyping assay. OLA performed poorly on HIV-1 subtype C samples and needs modification. The real-time PCR assay using short Minor Groove Binding probes, accurately detected the K65R mutation. The *Mae III* RFLP assay detected all V106M mutations accurately. Longitudinal cohort studies are required to confirm relevant mutations, appropriate assays and algorithms for resistance monitoring in HIV-1 subtype C.