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# Label-free optical biosensing as an alternative for HIV-1 drug resistant mutation detection

Collectively, conventional technologies for HIV-1 drug-resistant mutation detection have established the basis for understanding the mechanisms involved in drug-resistant mutations and have thus led to the development of antiretroviral therapy (ART) regimes that target and suppress drug-resistant variants. Technologies like Sanger sequencing, Next Generation Sequencing (NGS), and Polymerase Chain Reaction (PCR) are considered gold standards for HIV-1 drug-resistant mutation detection and have since been used to inform global guidelines, particularly the World Health Organization (WHO) resistance monitoring protocols. However, their significant impact has been hindered by high costs, turnaround time, speed, accessibility, complexity, and multiplexing. This study uses optical biosensor based on localized surface plasmon resonance spectroscopy as an alternative drug-resistant detection technique. Optical biosensors offer cost effectiveness, simple and potential for point-of-care development alternative, which is important particularly in resource-limited settings. Localized surface plasmon was successfully optimized for HIV-1 drug-resistant mutation detection, moreover, the achieved wavelength shifts are comparable with our simulation results for nanoparticle response to refractive index changes.

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Yes, I ACCEPT

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