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Smartphone biosensing for point of care diagnostics

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Abstract

A lot of individuals residing in resource limited settings where timely access to medical care is a challenge and healthcare infrastructure is usually poor have no access to laboratory facilities. Disease diagnosis in such sites is dependent on the presence of point-of-care (POC) devices. These POC diagnostics play a key role in ensuring rapid patient care because they are simple to use, inexpensive, portable, instrument independent and do not require a trained technician to operate. In this study, we used a smartphone camera as a spectrometer for measurement of rhodamine at different concentrations. Rhodamine was used as the analyte of choice for proof of concept purposes. The smartphone platform was able to detect the absorption within the visible spectral range from 400 to 700 nm. The results obtained showed that the performance of the smartphone based platform correlates with the conventional microplate reader. From this study, we therefore envision an inexpensive and portable smartphone based device with connectivity to the internet for POC diagnostics in resource limited settings.