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Wearable biosensor prototype for the detection and surveillance of Lassa fever infection in low-resource settings

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Viral diseases which are new and reoccurring present on going issues to global health, in which Africa is the primary area for these outbreaks due to issues like poor health care structure, delayed detection, and weak surveillance. Also, in West Africa we see Lassa fever which is an acute viral hemorrhage disease that is endemically present and which also causes great morbidity and mortality. Early detection and continuous tracking of these viral diseases is key to better outbreak control and timely intervention. But we see that in low resource settings access to high technology diagnostic tools is limited. Thus, I put forth the idea of a wearable biosensor which will detect Lassa fever virus markers and at the same time which will do continuous monitoring. The wearable biosensor which will be coated with antibodies will use an electrochemical transducer which transforms the bio interaction between the viral marker which includes glycoproteins (GP1) in blood and the sensor into a measurable electrical signal. This signal will be processed by an integrated circuit and sent wirelessly to a mobile device or cloud server for real time results, monitoring and alert. This prototype is to fill in diagnostic gaps which in turn will provide continuous non-invasive surveillance of viral diseases in at risk communities which are prone to Lassa fever out breaks. If this is developed and put to use it may improve outbreak preparedness, support early intervention and in turn improve community health in West Africa and similar endemic areas.

Keywords: Lassa fever, wearable biosensor, electrochemical detection, viral surveillance, early diagnosis.