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Review on Transducing Mechanism of Biosensors for POC Diagnosis

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Abstract—Timely disease treatment is an important aspect of medical care; however, the lack of healthcare facilities, e.g., diagnostic systems, outpatient care, etc., in low-socioeconomic regions, coupled with growing global populations, mean that many people, world-wide, are vulnerable to otherwise treatable diseases. The reasons are numerous such as setting up advanced health facilities in every rural area requires enormous financial resources. Similarly, it is impossible to provide easy access to all such places which are detached from big cities. Furthermore, if somehow the setup is built in such areas, the availability of trained human resource is uncertain. In such conditions where facilities cannot be decentralized and patients' access is not easy, the need of the hour is to work on point of care system for rapid diagnosis. Such systems are expected to have an entire lab on a chip. There is a lot of research going in this area, but still the usage of such devices at patient level is not materialized. The challenges are many like the diagnosis system should be cost effective and affordable by the target population. It must be user friendly and does not require special training to handle it. It can also be easily carried from one point of care to another. This review focuses on different CMOS biosensors designed and primarily used in POC diagnosis including assay proteins, Deoxyribonucleic Acid (DNA) and cells. In first part we present the research work done in the field of biosensor for achieving rapid, cost effective and reliable POC system. The different transducing mechanisms available in literature are discussed in detail.

Keywords—POC Diagnosis, Biosensors, Transducing Mechanism, Optic Based Biosensors