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Aptameric sensors for early detection of preeclampsia

Sonu Gandhi[1] and **Pankaj Suman**[2]
[1]Amity Institute of Biotechnology, Amity University, Sec-125, Noida-201313, India.
[2]National Institute of Animal Biotechnology, Hyderabad, Telangana-500049, Indai

Preeclampsia is a critical stage caused by vascular multisystem disorder and responsible for high degree of mortality in case of pregnant mother. The diagnosis can be done at 18-20 weeks of gestation period, provided with some early detection techniques to prevent preeclampsia. Extensive research has been carried out on biomarker discovery and variety of assays have been developed based on antigen-antibody interaction with sensitivity in the range of nanograms. During preeclampsia stage there are multiple markers that expressed at higher level. Expression of multiple markers require the detection and at the same time point to diagnose the disease with precision. Antibody based sensors are routinely used in the laboratory that has the potential for sensitive detection of expressed marker at picomolar concentration. Aptamer based sensors are more robust that can replace antibodies for ultrasensitive detection. The signal generated in apatameric sensors is based on the change of the conformation due to binding with its specific target and detection can be done up to femto molar rang with very high specificity. Coupling of aptamers on to the membrane for the development of lateral flow dipstick assay make it feasible for on-site detection. Therefore, aptamers can be used as the potential preeclampsia biomarkers to overcome the limitations of existing immunodiagnostic methods and can act as promising tool to develop aptasensors for early diagnosis of preeclampsia.

sonugandhi@gmail.com

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