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High performance electrochemical transistor for adrenaline detection

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Epinephrine also known as Adrenaline is an excitatory neurotransmitter which plays an important role in fight and flight response. The abnormalities in the level of epinephrine are the direct symptoms of some diseases such as cardiomyopathy, orthostatic hypertension, stress and other heart related diseases. The detection of epinephrine has been done using various methods but all these methods exhibit low detection limit, require skilled labor and show interference from alike molecules. In the present study, a PEDOT: PSS based organic electrochemical transistors (OECT) has been developed to detect the presence of epinephrine. The device uses aptamers as biorecognition

molecule which specifically binds to epinephrine and causes change in the transfer characteristics. A range of common interfering agents were also tested against the device and no change in current was observed, indicating high specificity of the present approach. The present approach not only provides a simple and novel testing tool but also demonstrates low detection limit of 90 pM which is by far the lowest that has been achieved using any technique. The current approach can be further used for the detection of various biomolecules by designing the aptamer for the specific molecule.

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