Review of: "Critical Review on Carbon Nanomaterial Based Electrochemical Sensing of Dopamine the Vital Neurotransmitter"

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Potential competing interests: No potential competing interests to declare.

The review *„Critical Review on Carbon Nanomaterial Based Electrochemical Sensing of Dopamine the Vital Neurotransmitter*“ summarizes the recent advances in non-enzymatic electrochemical sensing of dopamine utilizing carbonaceous nanomaterials in the design of electrodes. My major concern within this submission is the absence of critical analysis of the advanced electroanalytical properties (*e.g.,* LOD, sensitivity, selectivity, etc.) of certain carbon-based materials (*viz*. graphene oxide (GO) *vs* r-GO, GO *vs* single or multi-carbon nanotubes, etc.) used for the detection of dopamine. Furthermore,

2. The lack of schemes and images is obvious. The first image comes on p.7, before section 4.

3. p. 5 „Under physiological conditions, dopamine undergoes electrochemical oxidation to form dopamine-quinone..“ No reactions or schemes were given to support this statement. In fact, this irreversible two-electron process accompanied by the transfer of two protons underlies the main concept of this submission. At the same time, no scheme of dopamine conversion utilizing enzymatic (using Tyrosinase, laccase, etc.) in contrast to non-enzymatic sensing was present.

4. The authors should avoid the use of misleading terminology. For example, in section 2, p. 4 „non-enzymatic-based electrochemical biosensors“. In the absence of an enzyme, the electrochemical sensor cannot be called „biosensors“.

5. In section 4 „4.1. Graphene & CNTs based electrochemical sensors for dopamine“, why were the aptamer-based biosensors specific to dopamine detection mentioned in this section? The same question applies to the use of DNA in the design of sensors used for dopamine (DA) detection.

6. The reason for the advanced sensing properties of dopamine by polymer-doped carbon electrodes should be stressed.