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

Farshid Gheisari[1]

1 Shiraz University of Medical Sciences, Iran, Islamic Republic of

Potential competing interests: No potential competing interests to declare.

The article provides a comprehensive review of carbon nanomaterial-based electrochemical sensing of dopamine, outlining recent advances and future challenges in this field. Here's a detailed critique focusing on its strengths and weaknesses:

Strengths:

1. The article reviews different carbon nanomaterials, such as graphene and carbon nanotubes, and their applications in dopamine sensing, highlighting improvements in electrode modification techniques. This thoroughness adds depth, making it valuable for readers seeking an understanding of state-of-the-art materials and methods.
2. Technical Depth: Detailed descriptions of electrochemical sensing mechanisms and challenges with interferents (such as ascorbic acid and uric acid) are well-explained. The focus on non-enzymatic sensing provides insights into overcoming common limitations in enzymatic sensors.
3. Future Perspective: The discussion on emerging technologies, like wearable sensors and organ-on-chip devices, offers a forward-looking view, which is valuable for setting future research directions.

Weaknesses:

1. Repetition and Overly Long Descriptions: The paper contains redundant descriptions of certain concepts, such as the properties of dopamine and the characteristics of carbon nanomaterials. This repetition can detract from the flow and readability of the article.
2. Lack of Original Data or Analysis: As a review, the article does not present any new experimental data. It could benefit from a meta-analysis or statistical comparison of various sensor performance data from the literature to provide a clearer evaluation of which materials or methods perform best under specific conditions.
3. Limited Practical Implementation Discussion: Although commercialization is mentioned, there is little detail on real-world limitations such as cost, durability, and ease of manufacturing, which would be critical for translating laboratory research into clinical applications.
4. Table and Figure Usage: The tables in the article are information-dense but lack summarization. A more streamlined presentation (e.g., emphasizing specific advances or providing a ranking of materials' effectiveness) could enhance their utility.

Recommendation:

Minor Revision: The article is well-researched and comprehensive but would benefit from condensation and slight restructuring. Focusing more on unique comparisons or challenges for real-world application would strengthen its relevance to both researchers and practitioners.