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.

After reviewing the document titled *"Critical Review on Carbon Nanomaterial-Based Electrochemical Sensing of Dopamine the Vital Neurotransmitter,"* here's an analysis of its novelty, importance, language, style, figures, resolution, and references:

· The review summarizes recent advances in the use of carbon nanomaterials for dopamine sensing via electrochemical methods. While the subject of dopamine sensing has been well-studied, the novelty here lies in the critical evaluation of non-enzymatic, carbon-based approaches, specifically focusing on recent developments in carbonaceous nanomaterials. However, many studies included in the review are previously established methods, with some innovations such as enhanced selectivity and sensitivity using graphene-based sensors. The review could emphasize more novel or unexplored aspects of these materials to strengthen its innovative contribution.

· The review is important in the context of healthcare diagnostics and personalized medicine, as it addresses the need for reliable dopamine detection methods. The clinical significance of dopamine in diagnosing neurological disorders, such as Parkinson's disease, underscores the relevance of this work. Additionally, the focus on potential commercialization and integration of these sensing methods into real-world applications adds practical value.

· The language is formal and appropriate for a scientific review. However, certain sections could benefit from more precise wording. Some technical descriptions feel slightly repetitive, particularly in the introduction and general discussion on carbon nanomaterials.

· The style is clear and structured, with a logical progression from the importance of dopamine detection, through the evaluation of carbon nanomaterials, to future perspectives. However, some sections, especially in the introduction, could be condensed to avoid redundancy. The article is well-referenced, but certain parts could use more critical analysis rather than merely summarizing existing literature.

· The figures included are functional but lack simplicity. For instance, some chemical structure figures are dense and might overwhelm readers unfamiliar with the specific material science being discussed. It would help to simplify or break down complex figures to make them more accessible.

· The resolution of the figures is acceptable, but improvements could be made, particularly in clarity. For example, images

showing graphene structures or electrochemical data could be clearer, with better contrast between key components. Enhancing these visuals would aid comprehension.

· The references are appropriate to the subject, covering a range of foundational studies and recent innovations in electrochemical dopamine sensing. However, more emphasis on contemporary commercialization efforts and practical applications could strengthen the relevance to current trends in the field.

· The review could benefit from a more critical analysis of recent innovations, emphasizing what sets current research apart from established methods. Additionally, simplifying the figures and enhancing the focus on practical applications or real-world testing would make the article more impactful.