Review of: "Quantum Evolution and Genetic Mutations"

Chenyu Huang[1]

1 University of California, Irvine

Potential competing interests: No potential competing interests to declare.

The paper "Quantum Evolution and Genetic Mutations" by Hossien Hossieni offers an intriguing exploration into the intersection of quantum mechanics and biology, specifically in the context of genetic mutations and evolution. However, like all scientific works, it has its potential disadvantages and areas for further scrutiny. Here are some of the main points that could be considered as disadvantages or areas for further exploration:

Complexity and Accessibility: The paper delves into complex quantum mechanical concepts such as quantum tunnelling and its potential role in genetic mutations. While intellectually stimulating, the complexity of the subject matter may make it less accessible to readers who are not well-versed in both quantum physics and molecular biology. Simplifying these concepts or providing more background information could help make the paper more accessible to a broader audience.

Experimental Evidence: The paper discusses the theoretical underpinning of quantum mechanics in genetic mutations, particularly focusing on quantum tunnelling. However, one potential disadvantage is the current lack of direct experimental evidence to conclusively prove that quantum tunnelling plays a significant role in genetic mutations. The paper acknowledges this gap, highlighting the need for more research. Enhancing the paper with more empirical evidence, if available, or discussing ongoing experiments could strengthen its arguments.

Comparison with Classical Mechanics: The paper argues for the significance of quantum mechanics in explaining mutations that classical mechanics cannot. However, a more detailed comparison between the predictions of classical and quantum mechanics regarding specific mutation events could offer a clearer picture of why quantum mechanics is superior in this context. Including more specific examples or case studies where quantum mechanics provides a better explanation than classical theories could enhance the argument.

Potential Overemphasis on Quantum Mechanics: While quantum mechanics undoubtedly offers exciting new perspectives on genetic mutations, there's a risk of overemphasizing its role at the expense of other factors. Genetic mutations are influenced by a myriad of factors, including environmental stressors, chemical exposure, and more. Balancing the discussion with how quantum mechanics interacts with these other factors would provide a more holistic view of the mutation process.

Methodological Challenges: The paper mentions the difficulty of experimentally observing quantum tunnelling in DNA due to the inability to easily control and observe the process. Discussing potential methodological advancements or innovative experimental designs that could overcome these challenges in the future would be beneficial. This would not

only highlight the current limitations but also point towards future directions for research.

Implications for Evolutionary Theory: The paper briefly touches on the implications of quantum mechanics for evolutionary theory but could expand on this further. Discussing how quantum-induced mutations might affect long-term evolutionary trends, speciation, and adaptation could offer fascinating insights into the dynamics of evolution beyond the molecular level.

Interdisciplinary Bridging: Finally, given the interdisciplinary nature of the topic, bridging the gap between quantum physics and biology is both a strength and a challenge. Further discussion on interdisciplinary methodologies, collaboration, and education could help in advancing this field of study, making it more robust and integrated.