

Peer Review

Review of: "Reduced Blood to Brain Glucose Transport as the Cause for Hyperglycemia: A Model That Resolves Multiple Anomalies in Type 2 Diabetes"

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This manuscript presents an innovative and thought-provoking brain-centered model of glucose homeostasis, proposing that impaired blood-to-brain glucose transport may represent a primary driver of hyperglycemia in type 2 diabetes mellitus rather than classical insulin resistance mechanisms. The study is conceptually strong and integrates physiological, epidemiological, and mathematical modeling evidence to address several anomalies unexplained by traditional models, which significantly enhances its theoretical novelty and interdisciplinary relevance. The authors provide a comprehensive synthesis of empirical observations and successfully demonstrate how their model qualitatively reproduces multiple clinical and experimental patterns associated with T2DM. However, the manuscript remains largely theoretical and would benefit from stronger validation through experimental, clinical, or population-based datasets to support model assumptions and improve translational applicability. Additionally, clarification of parameter justification, sensitivity analyses, and clearer delineation of limitations would strengthen scientific rigor. Overall, this work offers a compelling alternative framework that may stimulate further research into neurovascular contributions to diabetes pathophysiology, although additional empirical validation is necessary before broad clinical implications can be established.

Declarations

Potential competing interests: No potential competing interests to declare.