

Dear Editor,

I submit "Distinguishing Protocomputational Substrates in Mycelial Networks: Syntactic Coupling Predicts Nonlocal Correlation" for consideration in *BioSystems*.

This computational study provides the first empirical test distinguishing Langan's Cognitive-Theoretic Model of the Universe (CTMU) from Wolfram's ruliad framework in biological systems. Using agent-based models of mycelial growth, I demonstrate that only CTMU's syntactic coupling predicts strong nonlocal correlation ($r = 0.955$) between physically isolated colonies, matching empirical observations in *Physarum polycephalum* networks.

The manuscript presents:

- Three pre-registered computational models (classical, syntactic, ruliad)
- Quantitative signatures distinguishing each framework
- Testable experimental predictions for laboratory validation
- Open-source code and complete data availability

This work bridges theoretical physics, computational biology, and consciousness studies, offering a novel approach to testing protocomputational theories empirically.

The manuscript is original, not under consideration elsewhere, and I approve submission. All code and data will be made publicly available upon acceptance.

Suggested reviewers:

- Prof. Andrew Adamatzky, University of the West of England (andrew.adamatzky@uwe.ac.uk) – *Physarum* computation expert
- Dr. Michael Levin, Tufts University (michael.levin@tufts.edu) – Bioelectricity and morphogenesis
- Dr. Melanie Moses, University of New Mexico (melaniem@cs.unm.edu) – Collective behavior modeling

Thank you for your consideration.

Sincerely,

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