Review of: "Rhythmic Oscillations and Resonant Information Transfer in Biological Macromolecules"

Joana Cabral[1]

1 Universidade do Minho

Potential competing interests: No potential competing interests to declare.

In this work, Dr. Brown and Dr. Meijer comment on the fundamental role of resonance in orchestrating the dynamics of biological systems, mediating field interactions between molecules and cellular structures, which may ultimately be at the core of still unexplained phenomena such as sentience and consciousness. It briefly overviews existing theories proposing the fundamental role of resonance across fields and scales. The article would benefit to link to experimental evidence indicating the role of oscillations in maintaining life processes not only at the microscale, but also at the macroscale, such as the nervous system or the entire organism, which may support the fundamental role of oscillations for sentience and consciousness.

Buzsaki, G. (2006). *Rhythms of the Brain*. Oxford university press.

Hanson, A. (2021). Spontaneous electrical low-frequency oscillations: a possible role in Hydra and all living systems. *Philosophical Transactions of the Royal Society B*, *376*(1820), 20190763. https://royalsocietypublishing.org/doi/full/10.1098/rstb.2019.0763

Hutcheon, B., & Yarom, Y. (2000). Resonance, oscillation and the intrinsic frequency preferences of neurons.*Trends in neurosciences*, *23*(5), 216-222.

Cabral, J., Fernandes, F. F., & Shemesh, N. (2023). Intrinsic macroscale oscillatory modes driving long range functional connectivity in female rat brains detected by ultrafast fMRI. *Nature Communications*, *14*(1), 375. https://www.nature.com/articles/s41467-023-36025-x

Small typos:

- Some sentences are split into two paragraphs and could be corrected to facilitate reading: “….which describes (remove paragraph change) mechanisms of consciousness…” and “…spanning from Hameroff and (remove paragraph change) Penrose’s model”…
- In the legend of Figure 1, the same letters (a and b) are used to refer to the panel or to the radius. This could be easily solved by referring to the pannels as (a) and (b), to differentiate from a and b as radius.