

Review of: "Provisional Definition of the Living State: Delineation of an Empirical Criterion that Defines a System as Alive"

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Potential competing interests: No potential competing interests to declare.

I was rather confused by this pre-print. It reads like a review - as in it doesn't really present new ideas - but it is not at all well referenced (only three references are provided), to indicate sources of those ideas. None of the provided references really cover the thermodynamic principles which are boxed within the text.

On the definition of living systems, for example, there are, as the author suggests, various models based on thermodynamic systems: the idea of "far from equilibrium" models. However, there are no references presented for the statements relating to these ideas, which was more than a little peculiar. There is a wealth of material available which would help the author flesh out his ideas.

The pre-print also jumps from a model of life to a model of consciousness, which is a significant logical jump and is not mentioned in the title of the article. If I was authoring this work, either as a review or as a novel idea, I would limit it to trying to define life, rather than making the big leap to what constitutes intelligent and self-aware life.

I would suggest that the author do a large literature search on the topic: there are lots of ideas on what constitutes a living system. When re-modelling this work, I would aim to provide a thorough literature review on the subject then, if I had a novel take on it, relate that idea to the work reviewed.

The figure, at the end of the article, could be the basis for a model, but no real model is provided, nor is there a way in which the suggestions could be tested. Moreover, the idea of "goal-orientation" for life seems like another leap. Can we really say there is a goal in mind when organisms, such as Bacteria or Archaea, are just existing and reproducing? A goal suggests the organisms are directed towards a definable end. Is that true of life, and is it suggesting evolutionary processes have an end in mind? Therefore, I wasn't really convinced by that suggestion. However, better referencing might do the trick.

I was also unsure of the author's institutional credentials: There doesn't appear to be an "International Space Federation" in Geneva. However, that's a minor point.

If, as I presume, the author is aiming to publish the manuscript in a peer-reviewed journal, he will need to reference all of the underlying statements, and develop the ideas in figure 1 so that they are testable, at least in a qualitative manner.

I hope that these comments are helpful.

