Review of: "Is gastrulation the most important time in your life?"

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Potential competing interests: No potential competing interests to declare.

Comments on the article "Is gastrulation the most important time in your life?" By Marta Linde-Medina

The article posted by Marta Linde-Medina presents a good and brief historical perspective on gastrulation. In my opinion, based on the general definitions made by Haeckel, it remains valid to view gastrulation as a critical stage in which most of the key processes related to early morphogenesis and cell differentiation take place. However, as with many other examples in biology, when we zoom in to look at the molecular and cellular details, differences and variability emerge between gastrulation in different organisms. The article focuses on these differences rather than gastrulation, as a global process, *per se*. The author brings new evidence regarding the discovery of a set of neuromesodermal progenitors (NMP), which challenges the common view that germ layer formation is complete by the end of gastrulation. Here are some suggestions for improving this manuscript:

1. The title and focus of the article: The title should reflect the main points and arguments presented in the article. Though it is clear that the article is related to the famous claim of *Lewis Wolpert*, the main issue relates to the findings of NMP, a group of cells that remain undifferentiated even after gastrulation is completed. In this sense, I could suggest changing the title to a more specific one, something like "*Reevaluating the Significance of Gastrulation: Insights into Neuromesodermal Progenitors in Animal Development".* I think that this change could better align with the main topic that is presented. Also, this new scenario, could serve as a platform to better discuss and clarify the impact of NMP on gastrulation. Based on what is presented, it remains unclear, above the spatiotemporal shift in cell differentiation, which other aspects of gastrulation are being challenged by the discovery of NMP. In line with this, it will be helpful to discuss whether, in any sense, NMP requires gastrulation. Finally, I think this shift could be better aligned with the abstract, which states: "*It is commonly thought that gastrulation establishes the entire body axis. The discovery of neuromesodermal progenitors is challenging this view*."

2. Terminology: Since life is a unique property of the living as a whole, it is highly recommended to avoid using the term "life" to denote "life of organs or body parts." Additionally, as NMP are capable of contributing only to ecto- or mesodermal derivatives, it is recommended to eliminate the term "pluripotent cells" when referring to these cells.

Overall, the article provides valuable insights into the role of gastrulation and the discovery of NMP. Addressing the

suggested improvements would enhance the clarity and impact of the manuscript.