

Review of: "Morphomechanics: An Extended View"

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Potential competing interests: No potential competing interests to declare.

This paper argues that mechanical mechanisms can play an important role in morphogenesis. Amid many examples, recent developments in the theory of active matter are discussed along with potential roles of mechanosensitive ion channels. The text is thoroughly documented and well structured, and it could be further improved along the following lines:

1. The Introduction might be extended with background information for a wider audience. For example, the term "active matter" is more general than "entities capable of transforming chemical energy into mechanical work" (page 1, 1st paragraph). Please give a complete definition of active matter and provide a reference for it. In my opinion, a good option is the review paper (Doostmohammadi A et al., 2018) <https://doi.org/10.1038/s41467-018-05666-8> cited on page 1, 4th paragraph. Also, the motivation of the present study could be explained in more detail. Indeed, contributing to a general theory of embryogenesis is an important endeavor (page 1, 3rd paragraph), but the reader would like to know what specific knowledge gap is addressed by this article.
2. The second section contains a nice overview of similarities observed between liquid crystals and cell monolayers. While some of the examples are truly inspiring, the discussion of the hyper-restoration hypothesis seems confusing to me (page 5). In particular, the relationship between this hypothesis and growth response and stretch activation could be explained in more detail, pointing out the importance of the stimulus magnitude and duration (Taber, 2009).
3. Please check the list of references for inaccuracies generated by the reference manager software. For example, the last reference is incomplete (the paper is written by two authors: van den Brink SC, van Oudenaarden A). The corresponding citation on page 9 should read "(van den Brink and van Oudenaarden, 2021)". Also, the headquarters of World Scientific Publishing Company are located in Singapore, not "Singapur" as listed in the reference items (Gordon and Gordon, 2016) and (Gordon, 1999) - see, e.g., <https://www.worldscientific.com/page/about/corporate-profile>.
4. In the entire text, the excessive use of passive voice makes the article a bit monotonous. Please consider switching to active voice whenever possible. For example, instead of "Several ways of harnessing active turbulence have been proposed (Balasubramaniam et al. 2021)," please write "Balasubramaniam et al. (2021) proposed several ways of harnessing active turbulence".

Minor comments and revisions

Page 5, 2nd paragraph: A space is needed between "of" and "mechanically". Also, instead of "can originate" I would prefer "can generate" or "can bring about".

Page 5, 6th paragraph: Instead of "variety of cells behaviors" please write "variety of cell behaviors". Also, "will be, for example:" could be replaced by "include". Then, I would start another sentence on behaviors that boost stress under tension.

Page 5, 1st paragraph: Instead of "annihilate to each other", I would write "annihilate each other". Also, a comma is needed after "defects".

Page 6, 2nd paragraph: Please replace "studies on liquid crystals has been" with "studies on liquid crystals have been".

Page 7, 2nd paragraph: I'm not sure what is meant by "could compute these measurements".

Page 7, 3rd paragraph: Instead of "double lipid bilayer" I would write "lipid bilayer".

Page 8, 1st paragraph: Here, "non-selective cation channel" should be replaced by "non-selective cation channels".

Page 9, 1st paragraph: Instead of "Cells expressing somite markers appears" please write "Cells expressing somite markers appear".

Page 10, 1st paragraph: I would replace "may be: 1) a side" by "may: 1) be a side".

Page 10, 2nd paragraph: "mechanically activable site" might be "mechanically activated site"

Page 10, 3rd paragraph: Instead of "gut. i.e., they", please consider "gut - i.e., they"

Page 10, last paragraph: "This defects" should be replaced by "These defects".

Page 11, last paragraph: "denaturalization" should be "denaturation"

Page 12, 3rd paragraph: Instead of "all them are features" I would prefer "all of these are features".