PEER-REVIEW REPORT 1

Name of journal: Neural Regeneration Research
Manuscript NO: NRR-D-18-00342
Title: Neural plasticity and adult neurogenesis: the Deep Biology perspective
Reviewer's Name: Ye Zhou
Reviewer's country: USA
Date sent for review: 2018-05-21
Date reviewed: 2018-05-27
Review time: 6 Days

1. Do you consider this paper is hotspots or important areas in the research field related to neural regeneration?
Yes, but the context doesn't focus on the interesting "modeling" topic as the title implies
2. Which area do you think this paper falls into? Neurorepair, neuroprotection, neuroregeneration or neuroplasticity.
Neuroregeneration
3. Is the manuscript technically sound, and do the data support the conclusions?
This is a review paper
4. Has the statistical analysis been performed appropriately and rigorously?
This is a review paper
5. Is the manuscript presented in an intelligible fashion and written in Standard English?
yes, but need deeper insights and language polishing
6. Your peer review comments will be published as an open peer review report. Do you agree to have your name included with the published article?
yes

Manuscript Rating Question(s):	Scale	Rating
The subject addressed in this article is worthy of investigation. (3 as the best score)	[1-3]	2
The information presented was new. (5 as the best score)	[1-5]	3

COMMENTS TO AUTHORS

This review paper by Giovanni Cirillo focuses on mechanisms of adult neurogenesis, especially the role of NGF in cellular changes during neurogenesis. The paper also proposes a "deep biology" concept related to modelling and machine learning in the end.

Strengths
-Clear and comprehensive statements of NGF-induced neuronal differentiation.
-The concept map of NGF-induced differentiation (figure 1) is concise and informative.
-Interesting prospective on "deep biology": getting help from algorithms and computer programming.

Weaknesses:

-The tile implies this review paper is focusing on "precise neural differentiation through modelling". However, 80% of the main context talks about molecular events related to adult neurogenesis, not modeling.

-The authors proposed a concept of "deep biology" via the assistance from algorithms and computer programming. This concept is not novel. For example, Nature Methods in 2016 and Nature Commun in 2017 have published papers by Pirhaji et al. from MIT in screening biological mechanisms and drug targets through database and machine learning.

In addition, to make this "deep biology" idea more convincing, the authors should add supportive evidences or applications.

- As a review paper, the citation of this paper is unpleasant. Many sentences with specific scientific findings miss citations, i.e. Line 50-53, line 57-62, line 67-71, line 62-64, line 82-85, line 121-125.

In addition, the authors missed a couple of citations in the references, such as Zhao et al., 2008; Chao 2003; Groen et al., 1982; Hornberg et al., 2006

Minor weakness

- The first two titles mentioned "neurogenesis", but this paper only talks adult neurogenesis. Suggest adding "adult" before neurogenesis to avoid misunderstanding.

-The first title mentioned "synaptic plasticity", but the text is not related to synaptic plasticity at all. Suggest replacing to "neural plasticity".

-In line 105, please explain PC12 cells.

-In line 124, Mitochondrial fusion is not only regulated by mitofusin 2 but also Mfn-1.

-Figure1, the unit and description of Y axis need to be defined.

-This paper needs grammar check and language polishing.

It is suggested to add a 250 unstructured abstract and cited the mentioned reference to enlarge the article as an full review.