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Peer Reviewing Reproducibility: The Physiome Journal: motivations, challenges and implementation

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ABSTRACT

Physiome is a journal committed to reproducibility and reusability of mathematical models of physiological processes. Every article published in *Physiome* is connected to a curated and permanent version of the model code with a persistent identifier. Through the *Physiome* paper, the code necessary to run the model is easily accessible by just clicking a link, to be reused as it is or as a module in a bigger model. It is also connected to a primary paper published in a field specific journal, where the validation and scientific value of the model is discussed. A *Physiome* publication is a complement to your primary article that ensures reproducibility, reusability and discoverability of you model. The format encourages modularity that facilitates combination of different models to develop the next level of systems understanding. And all the models are in one place, easy to find and accessible.

Reproducibility and confirmation of results is crucial for useful science and should be one of the supporting pillars of good research. Yet, publication of it is rarely incentivised, often treated as a secondary result at best, which undermines the quality of our work. With the strict formulation of equations and easily shared code, it seems like mathematical models should be reproducible by default, but in fact less than 10% of the models published in scientific journals work when implemented by another group. The Physiome Journal aims to tackle these problems directly. To get the Physiome journal up and running, the Physiome project have collaborated with Digital Science to build an open source peer review system (coko), with journal article published in figshare.

This presentation will cover:

- An overview of the mathematical models used in physiome research
- The technical implementation of reproducibility peer review using an implementation of the open source journal submission system from the collaborative knowledge foundation and figshare
- How we can reduce the effort in demonstrating reproducibility by building reproducibility into scientific workflows from the beginning through the use of technologies such as gigantum

For more information visit: https://journal.physiomeproject.org