

Proposed submission and curation workflows for publishing discoverable, reproducible, and reusable PHYSIOME models

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Introduction

The VPH/Physiome Portal (PHYSIOME) aims to encourage the creation and public archiving of discoverable, reproducible, and reusable computational models throughout the biomedical modelling community.

Achieving this will be aided by providing an incentive for scientists to adopt modelling practices which support this aim and through the provision of support infrastructure to assist scientists in migrating their work.

We propose here some example workflows that could be implemented as part of PHYSIOME submission and curation infrastructure.

Curation

We define curation in PHYSIOME as the process by which modelling studies are evaluated against the following criteria.

1. Models and simulation experiments are encoded in accepted community standard formats and simulation results are reproducible.
2. Relevant models are reused and new models are modular.
3. The underlying biology is described in a computable form (semantic annotation of the models and experiments).

A proposed basic curation workflow is shown in Figure 1. This simply evaluates a received submission. In the comprehensive curation workflow shown in Figure 2, the curation team work with the submission authors to address issues that arise during the curation.

The curation report is the combination of the curator's reproducibility evaluation (Figure 1 or 2, criteria 1) and their evaluation of the reusability and annotation of the submission (criteria 2 and 3).

PHYSIOME + journal submission

A key goal of the VPH/Physiome Portal is to work in partnership with scientific journals. Curation of the PHYSIOME model is but one part of the review process that any modelling study must be subjected to prior to its acceptance by the scientific community. In Figure 3 we illustrate an example workflow of a journal utilizing PHYSIOME curation as part of their traditional review process.

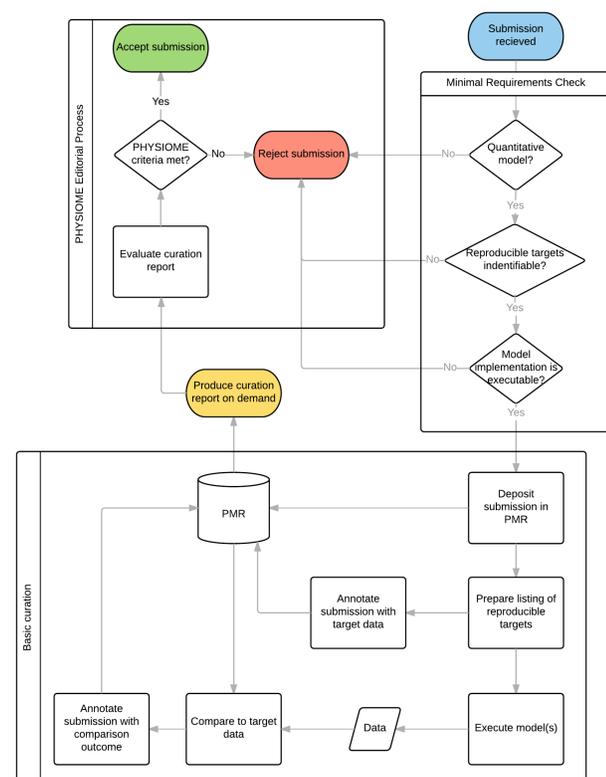


Figure 1: Proposed basic curation workflow for reproducibility. Not shown are the steps for curating modularity, reuse and composition, etc.

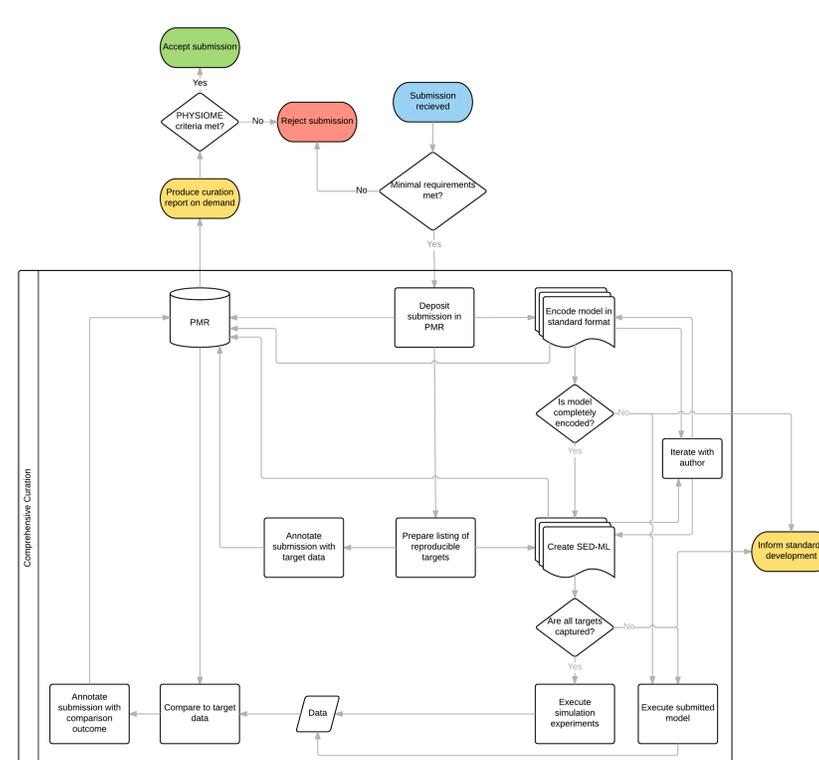


Figure 2: The proposed comprehensive curation workflow, extending the basic workflow via interaction with submission authors. Minimal requirements are the same as shown in Figure 1.

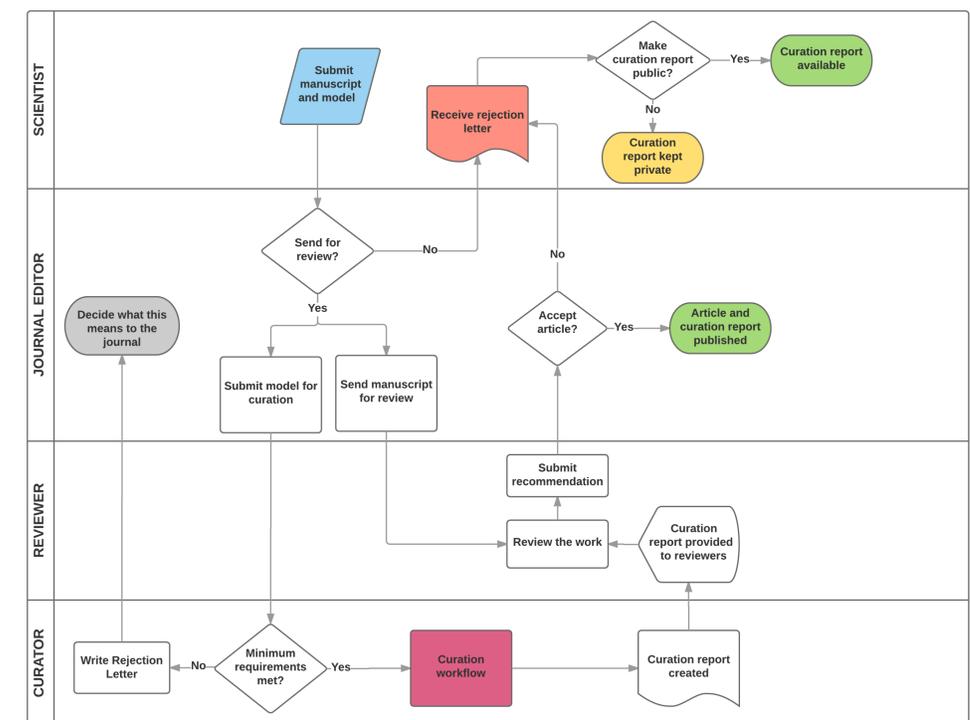


Figure 3: Proposed submission workflow via a partner journal. Not shown is the curation workflow (Figures 1 & 2) which may result in the publication of the model in PHYSIOME in addition to the journal.

Summary

We present here curation workflows (Figures 1 & 2) in which submissions to the VPH/Physiome Portal are subjected to an unbiased evaluation of their reproducibility, reusability, and discoverability. The outcome of these workflows is a detailed curation report which PHYSIOME editors would use to make informed decisions on the acceptance of a given submission.

Journal editors are able to utilize the curation workflows as part of the peer review process (Figure 3) to help inform journal reviewers as to the quality of computational models that are part of a submitted study.

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