

# Physiological Maps Curation Guidelines:

enhancing knowledge integration and sharing through FAIR aligned structures

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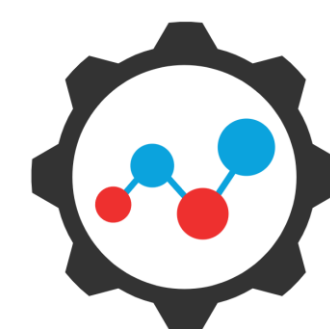
## Physiological Maps Curation Guidelines

The **Physiological Maps (PMs)** are a set of comprehensive representations of biological pathways and interactions in different organs, tissues, or cell types. They also allow storage and **graphical representation of mechanistic information** about organ physiology in a comprehensive and structured manner that is intended to be used and interpreted by **humans and computers** as two of the three data storage formats on the ONTOX project. The PMs are intrinsically linked to their respective **ontologies**, which occur with the integration of new domains of knowledge in the physiological layer. As a result, certain recommendations might be useful when building and upgrading these tools to ensure compliance with the machine-readable formats necessary for the use of those data in the project, while maintaining a human-friendly design.

To ensure the best use of these frameworks and the data they include, the PMs need to fulfill the **FAIR Guide Principles** (Findability, Accessibility, Interoperability, and Reusability). Consequently, we designed **ONTOX's Physiological Maps Curation Guidelines** to define the strategy for adhering to the FAIR principles in the construction and curation of PMs.

In the guidelines, you will find general guidance (with basic reading recommendations) to design, curate, and report updates of PMs in ONTOX. Additionally, information on data storage and management, a glossary, and a quality control checklist.

## PMs data storage



**Physiological Maps** can be found at the ONTOX dedicated **MINERVA platform** instance. You can find them at <https://ontox.elixir-luxembourg.org/minerva/>



**Modular pathways** are submitted to **WikiPathways** to allow interoperability with other ONTOX tasks and to accelerate pathway curation and improvement by community effort.



All PMs data and metadata are stored on **GitHub**. You can find everything there: <https://github.com/ontox-pms>



Stable versions go to **BioStudies** through the WP11 data management team to guarantee safe storage of the ONTOX legacy.

Planning Documents are reference documents for the map's development. It describes the scope, architecture and granularity of the map and limits the physiological processes that need to be included.

Table of Contents is a living document that lists the pathways on each map, the resources used to design the pathway, the current status for the pathway and links to a discussion thread for each specific pathway, it also indicates the last version file stored on GitHub.

### Documentation

Guidelines

Glossary

Planning Docs

Table of Contents

### Physiological Maps

References

Zotero

### Reports

Release Note Report

Issues Report

Pathway Discussion

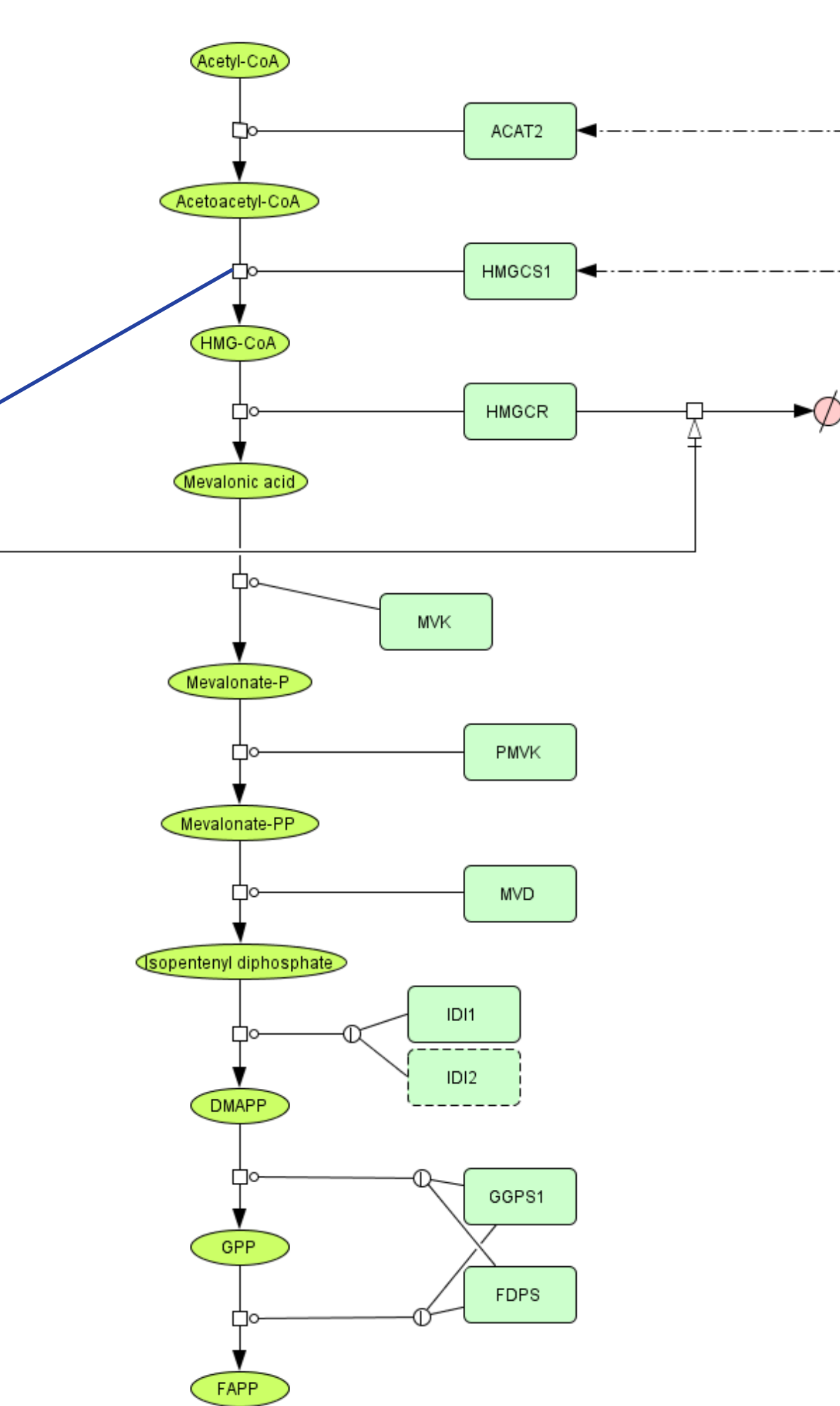
Release Notes are available with every new stable version of the PMs describing the modifications on the new versions.

Issues Report is a list with all the domain-related issues for which the help of experts is needed. It can be sent to the expert teams any time when necessary.

Pathway Discussion is a dedicated document for each pathway, describing the history of changes and the rationale for certain decisions on the pathway design.

Data use a formal, accessible, shared, and broadly applicable language for knowledge representation. ONTOX PMs are designed using Process Description and Activity Flow **Systems Biology Graphical Notation (SBGN)**.

Standardized entities names allows automatic annotation with persistent identifiers for multiple databases using the MINERVA platform.



Tracking back data using persistent identifiers for the sources.

**Protein: HMGR**

**Compartment:** Hepatocyte

**Full name:** 3-hydroxy-3-methylglutaryl-CoA reductase

**Symbol:** HMGR

**Annotations:**

Source: HGNC

[1] [Ensembl \(ENSG00000113161\)](#)

[2] [Entrez Gene \(3156\)](#)

[3] [HGNC \(5006\)](#)

[4] [HGNC Symbol \(HMGR\)](#)

[5] [RefSeq \(NM\\_000859\)](#)

[6] [Uniprot \(P04035\)](#)

**Reaction: re23**

**Type:** State transition

**Annotations:**

Source: Annotated by curator

[1] [Digital Object Identifier \(10.1016/B978-0-12-824048-9.00005-5\)](#)

[2] [WikiPathways \(WP4718\)](#)

## Quality Control Checklist

### Maps and pathways (submaps) components

Do **Genes, RNAs and Proteins** have HGNC approved names?

Do **Compounds / metabolites** have ChEBI / PubChem annotations?

Do **Drugs** have ChEBI / PubChem annotations?

Do **Complexes** have ComplexPortal annotations?

Do **Compartments** have appropriate term from Cell Ontology, BRENDA, Cellosaurus, or a specific name from literature?

Do **Phenotypes** have GO-BF annotation term if available?

Arrows have at least 1 **PMID** or **DOI** or a database identifier?

Is the model a **Process Description** model?

Are all the nodes curated for cell specificity?

Are the names clear?

### Documentation & others

Is the **Release Note Report** complete and comprehensive?

Did you listed all the unsolved issues in the **Issues Report**?

Is the model annotated with a description (Model Notes)?

Is the model based on another model from a database?

Is the model annotated with the creator identity, affiliation and contact (Model Notes)?

Does the map have a top-level overview?

Are all the references organized on the **ZOTERO** group?

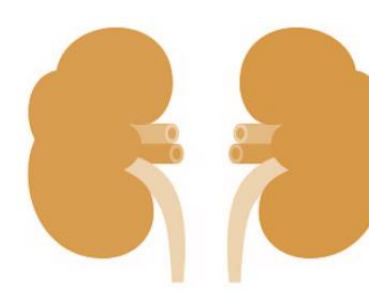
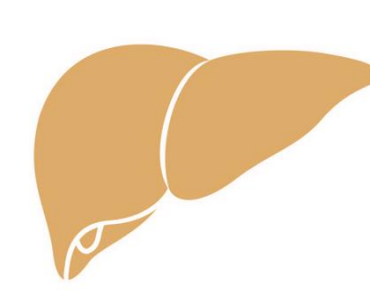
Are all the files organized and zipped in a .ZIP format?

Is the BioStudies metadata file completed?

Keep the authorship annotation on the model and add yourself as contributor and a description of what was modified.

Is the overview clickable?

Does it contains a coordinate .txt file?



This project received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 963845.

Download the Physiological Maps Resources [Booklet](#) and check all the links from the ONTOX PMs:

