

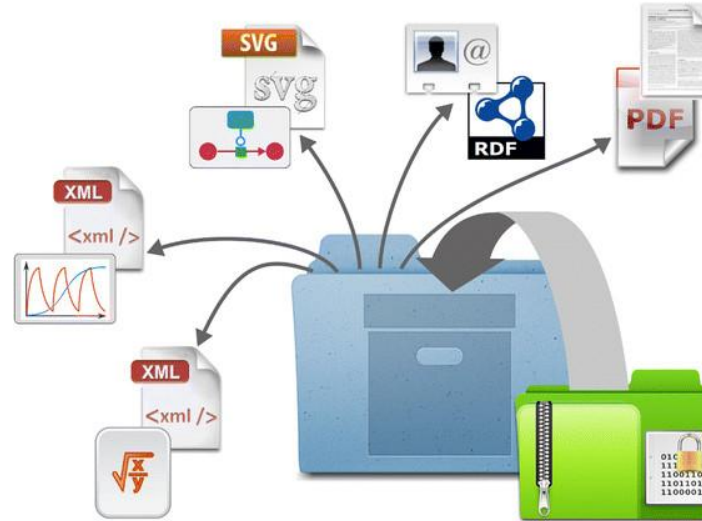
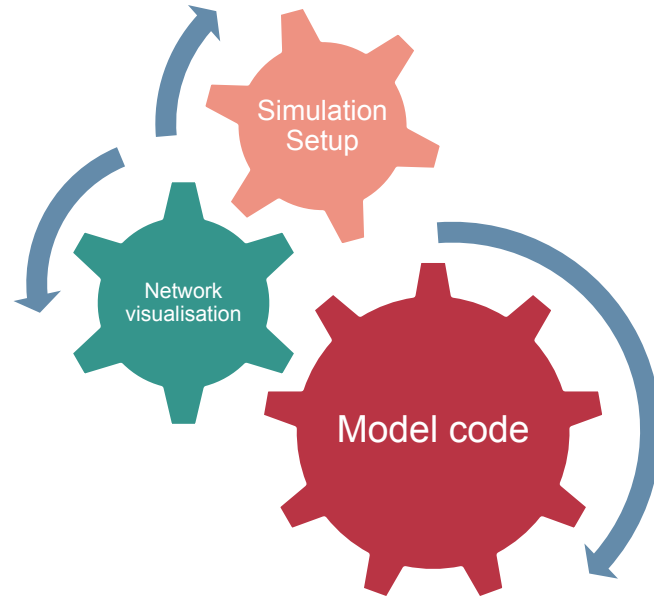


# FAIR assessment of biosimulation models – a cross-community project

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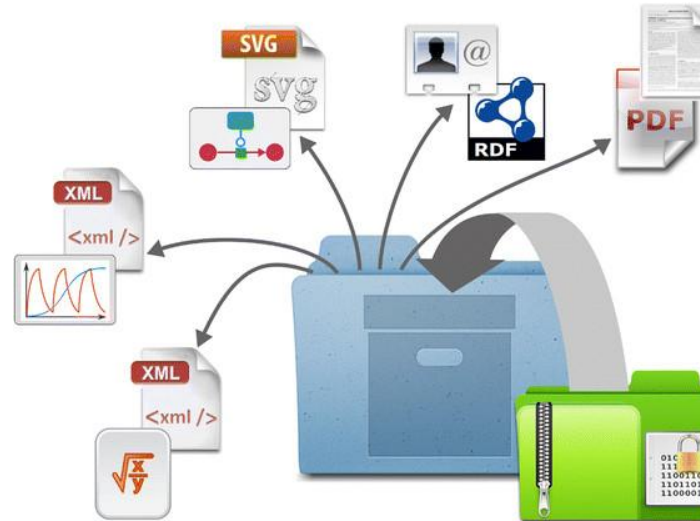
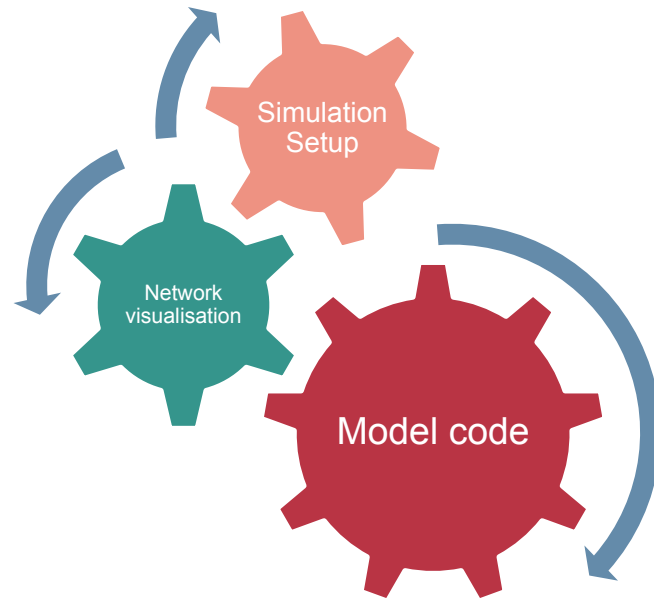
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# Use of standards for the encoding of biosimulation models enhances reproducibility of scientific results

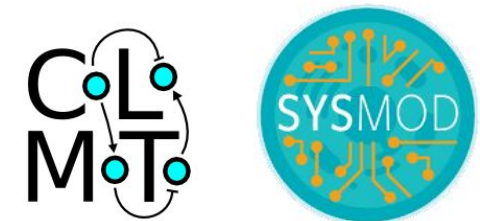


The logo for COMBINE (The Computational Modeling in Biology Network). It features a stylized 'c' made of four colored circles (teal, green, grey, yellow) connected by lines, followed by the word 'mbine' in a lowercase, sans-serif font. The 'm' is grey, and 'bine' is green.

# Adherence to the FAIR data principles fosters reuse and interoperability of biosimulation models



Comprehensiveness	<ul style="list-style-type: none"><li>✓ Brief description</li><li>✓ List of components</li><li>✓ Use of standard identifiers</li></ul>
Accessibility	<ul style="list-style-type: none"><li>✓ Use of shared model repositories</li><li>✓ Use of a dedicated website</li></ul>
Reusability	<ul style="list-style-type: none"><li>✓ Annotations for model entities and interactions</li><li>✓ Proper justification of choices when inferring rules or estimating parameters</li><li>✓ Proper credits to the original version of the model</li></ul>
Interoperability	<ul style="list-style-type: none"><li>✓ Use of Systems Biology standards for model files</li><li>✓ Compatible software for nonstandard model files</li></ul>
Reproducibility	<ul style="list-style-type: none"><li>✓ Comprehensive description of experiments and initial conditions</li><li>✓ Explicit mention of the parameter values</li><li>✓ Available code for model experiments</li></ul>

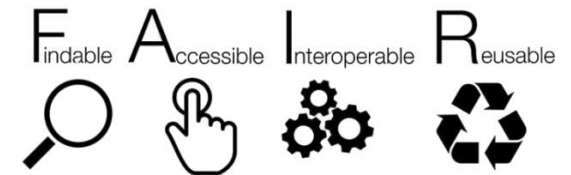
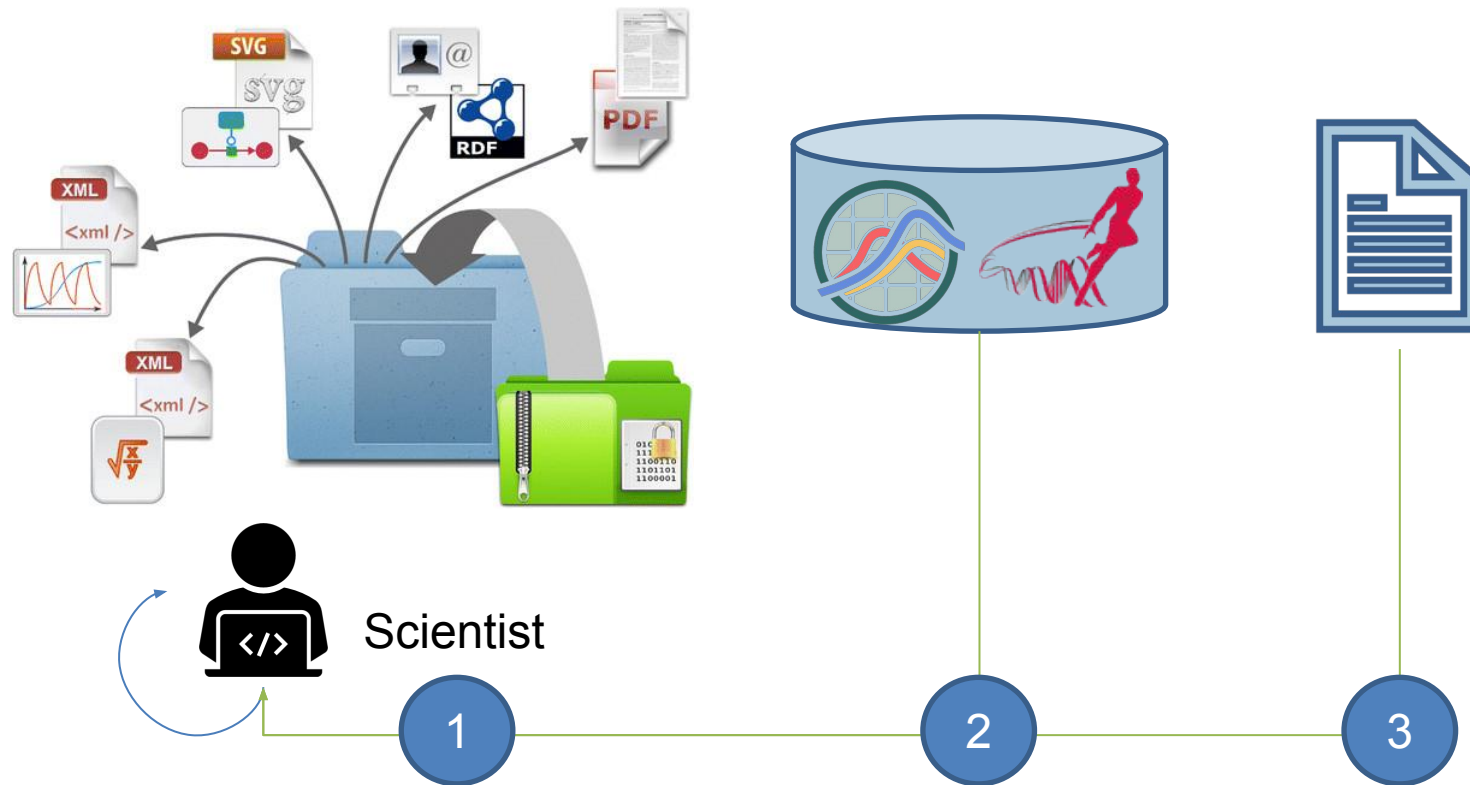


**COMBINE:** Waltemath et al. (2019). DOI: 10.1515/jib-2020-0005 or **TALK@ICSB** The Computational MOdeling in Biology NEtwork in 2022. David Nickerson, Session 17B: WILDCARDS \*\*. [Part II]

**COMBINE Archive:** Bergmann et al. (2014). DOI: 10.1186/s12859-014-0369-z

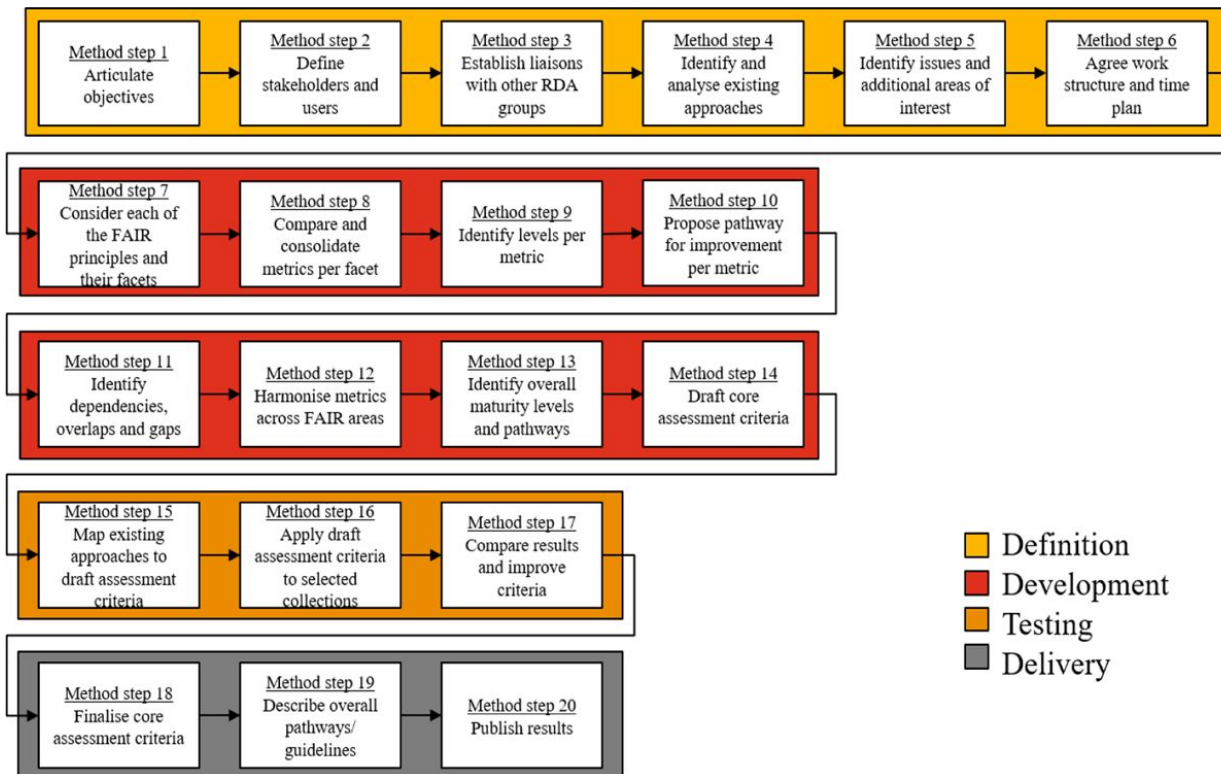
**Main challenges to increase the impact of computational:** Niarakis et al. (2022). DOI: 10.1093/bib/bbac212

# How FAIR are biosimulation studies during development, curation and publication?



1. during modeling
2. during model curation
3. during publication

# A method for semi-automated FAIR assessment



- FAIR evaluation as a standard procedure
- FAIR model indicators
- FAIR evaluation tool

FAIR principle	COMBINE indicator	Description	Score
F1	CA-F1.2	Each version of the COMBINE archive has a persistent and globally unique identifier or DOI.	✗
I1	CA-I1.1	The COMBINE archive is valid.	✓

Fig. (left): Bahim, C., Casorrán-Amilburu, C., Dekkers, M., Herczog, E., Loozen, N., Repanas, K., Russell, K. and Stall, S., 2020. The FAIR Data Maturity Model: An Approach to Harmonise FAIR Assessments. *Data Science Journal*, 19(1), p.41. DOI: <http://doi.org/10.5334/dsj-2020-041>



# Interested? Join us!



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Check out our GitHub project:  
<https://github.com/FAIR-CA-indicators>