# Agenda

- **Functions of Peer Review**

- **Issues in Peer Review**

- **Evolution of Peer Review**

- **Peer Review for Open Science**

- **Concluding Remarks**

Functions of Peer Review
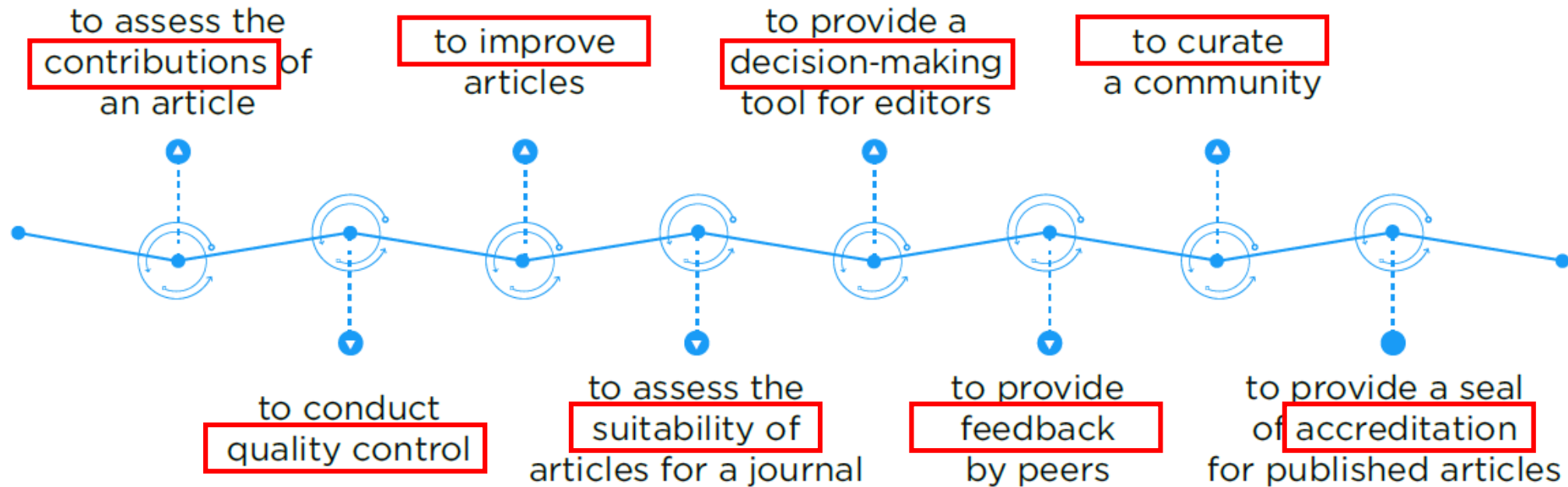
Challenges in Peer Review

Functions of Peer Review

- **Technical evaluation of the validity or soundness** of a work in its methodology, analysis and argumentation
  - is it good scholarship?

- Assisting editorial selection by **assessing the novelty or expected impact** of a work
  - is it exciting, innovative or important scholarship?
  - is it right for this journal, conference or funding call?
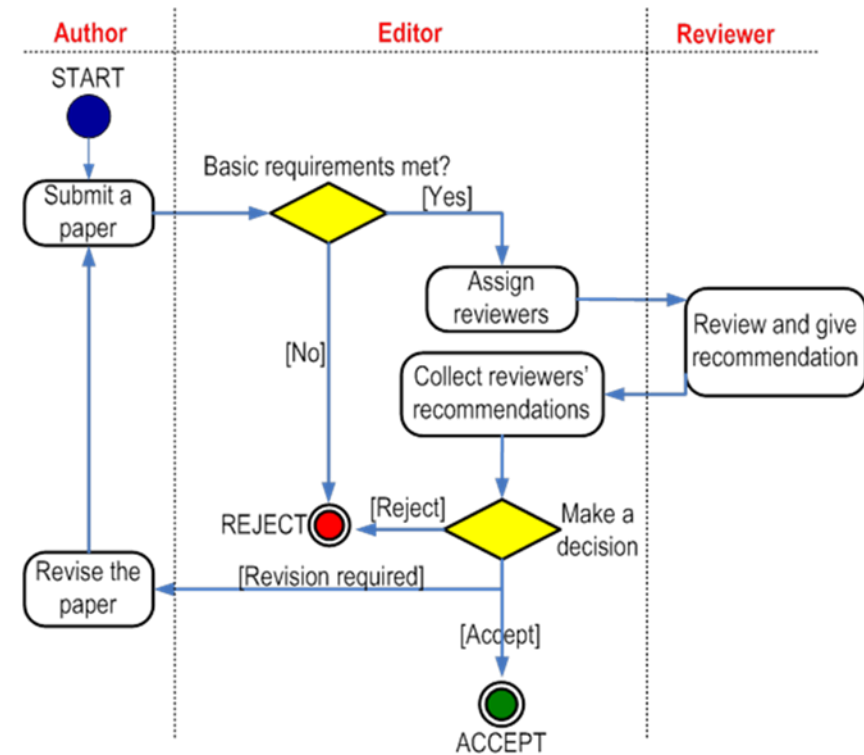
* Source: Ross-Hellauer T. What is open peer review? A systematic review [version 2; peer review: 4 approved]. F1000Research 2017, 6:588 (https://doi.org/10.12688/f1000research.11369.2)

Functions of Peer Review

to assess the contributions of an article

to improve articles

to provide a decision-making tool for editors

to curate a community

to conduct quality control

to assess the suitability of articles for a journal

to provide feedback by peers

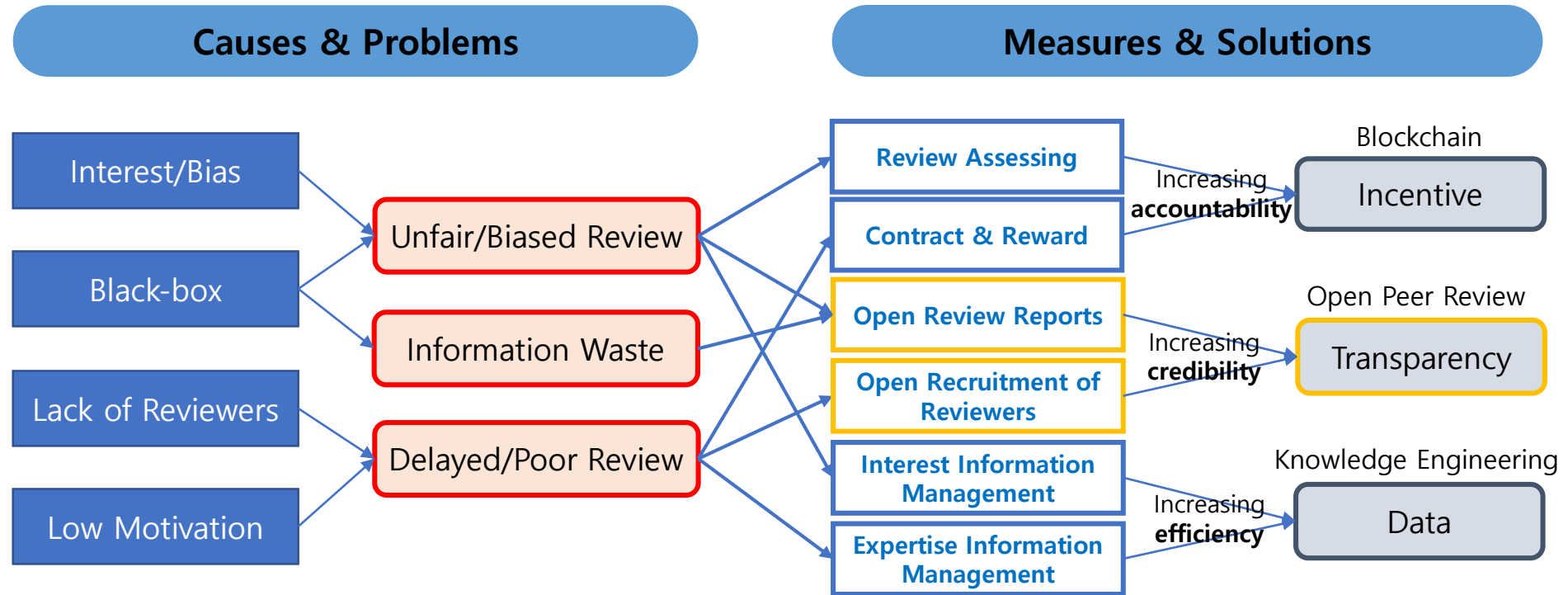to provide a seal of accreditation for published articles

Issues in Peer Review

Issues in Peer Review

- **Unreliability and inconsistency** : Decisions on rejection or acceptance are inconsistent.

- **Delay and expense** : It slows down the availability of results for further research. The same manuscript may be peer reviewed many times over as it is successively rejected and resubmitted.

- **Unaccountability and risks of subversion** : Editors can reject submissions by selecting reviewers based on their known preference. Reviewers may act unethically in their own interests.

- **Social and publication biases** : Reviewers may be subject to social biases on the grounds of gender, nationality, institutional affiliation, language and discipline..

- **Lack of incentives** : Peer review provides little in the way of incentives for reviewers.

- **Wastefulness** : Information such as behind-the-scenes discussions of reviewers and authors is wasted.

Issues in Peer Review

* Source: Dong-Hoon Choi, Tae-Sul Seo, Development of an open peer review system using blockchain and reviewer recommendation technologies, Science Editing, 8(1), 104-111, 2021. (https://doi.org/10.6087/kcse.237)

Evolution of Peer Review

Evolution of Peer Review

- 1665 : First scientific journal **without peer review**.

- 17c~19c : A **selected group** of experts evaluate manuscripts for publication

- 19c~20c : Peer Review (single & double-blind) is **commonplace**.

- 1967 : The **Nature** adopted peer review. (Generally in 1973), **Lancet**(1976)

- 1991 : **Preprint** (arXiv) with out peer review.

- 2007 : BMJ Open **opened reviewer identities and review reports**.

- 2012 : **Pre-submission** peer review (Rubriq), Publon **provided credit** to editors and reviewers.

- 2013 : F1000Research established **post-publication** Peer Review.

- :

Evolution of Peer Review

- Open/Masked peer review
  - Open peer review, Blinded/masked peer review
- Pre/Post publication peer review
  - Pre-peer review commenting, Pre-publication peer review, Post-publication peer review, Post-publication commenting, Registered reports
- Collaboration and decoupling
  - Collaborative peer review, Interactive peer review, Discussion during review, Cascading peer review, Peer review as a separate service, Recommendation service, Portable review, Independent peer review, Decoupled post-publication review, Review by third parties
- Focused and specialized review
  - Soundness only review, Result free review, Specialized review

* Source: Woods, Helen & Brumberg, Johanna & Kaltenbrunner, Wolfgang & Pinfield, Stephen & Waltman, Ludo. (2022). Innovations in peer review in scholarly publishing: a meta-summary. Wellcome Open Research. 7. 82. 10.12688/wellcomeopenres.17715.1.

Evolution of Peer Review

Quality & Reproducibility school

Focus: Evaluating and improving research quality and reproducibility

Key issues: Reviewer training, statistical peer review, reviewer reliability, registered reports, data/software peer review, integrity

Democracy & Transparency school

Focus: Making evaluation of research more democratic and transparent

Key issues: Reviewer accountability, soundness-only peer review, open peer review, post-publication peer review, preprint peer review

How to improve peer review

Equity & Inclusion school

Focus: Making evaluation of research more equitable and inclusive

Key issues: Reviewer diversity, editorial board diversity, gender bias, geographic bias, racial/ethnic bias, double-blind peer review

Efficiency & Incentives school

Focus: Improving efficiency of peer review and incentives for reviewers

Key issues: Pressure on review system, reviewer fatigue, portable peer review, journal-independent peer review, reviewer recognition

* Source: Waltman, Ludo, Wolfgang Kaltenbrunner, Stephen Pinfield, and Helen B. Woods. 2022. "How to Improve Scientific Peer Review: Four Schools of Thought." SocArXiv. March 9. doi:10.31235/osf.io/v8ghj.

Peer Review for Open Science

Peer Review for Open Science

Statement on peer reviewed publications

06/07/2022

The key principle of Plan S states that *"from 2021, scientific publications... compliant Open Access journals or platforms."* The Guidance document defines "scientific publications" further as "peer-reviewed scholarly publications". These are generally interpreted as peer-reviewed articles published in scholarly journals or on platforms (see FAQs for the current description of a platform). As a result, particular prominence is given to journals and platforms as privileged venues for research outputs.

Scientific publishing is evolving rapidly. A number of initiatives have moved away from the notion that peer-reviewed articles must be published in traditional Open Access journals or platforms. They provide peer review services that are entirely independent from such journals or platforms. These include Peer Community in (PCI), Sciety, Next Generation Repositories, Notify Project, PREreview, and Review Commons, to name a few. These initiatives give the author the freedom to decide how and when to disseminate their peer-reviewed article.

In light of the accelerating development of these journal-independent peer-review services, cOAlition S would like to explicitly state that 'peer reviewed publications' – defined here as scholarly papers that have been subject to a journal-independent standard peer review process with an implicit or explicit validation[1]– are considered by most cOAlition S organisations to be of equivalent merit and status as peer-reviewed publications that are published in a recognised journal or on a platform.

These innovative developments turn attention away from the prestige of the journal or platform to focus on the intrinsic value of the peer-reviewed article itself, in line with Plan S Principle 10. High-quality peer review services that are separate and distinct from publication services provide independence from the traditional journal format. They allow authors to meet their obligation to Plan S funders by finding a solution to openness for all researchers. cOAlition S therefore explicitly endorses such innovations.

scientific publications that result from research funded by public grants must be published in compliant Open Access journals or platforms.

High-quality peer review services that are separate and distinct from publication services provide independence from the traditional journal format.
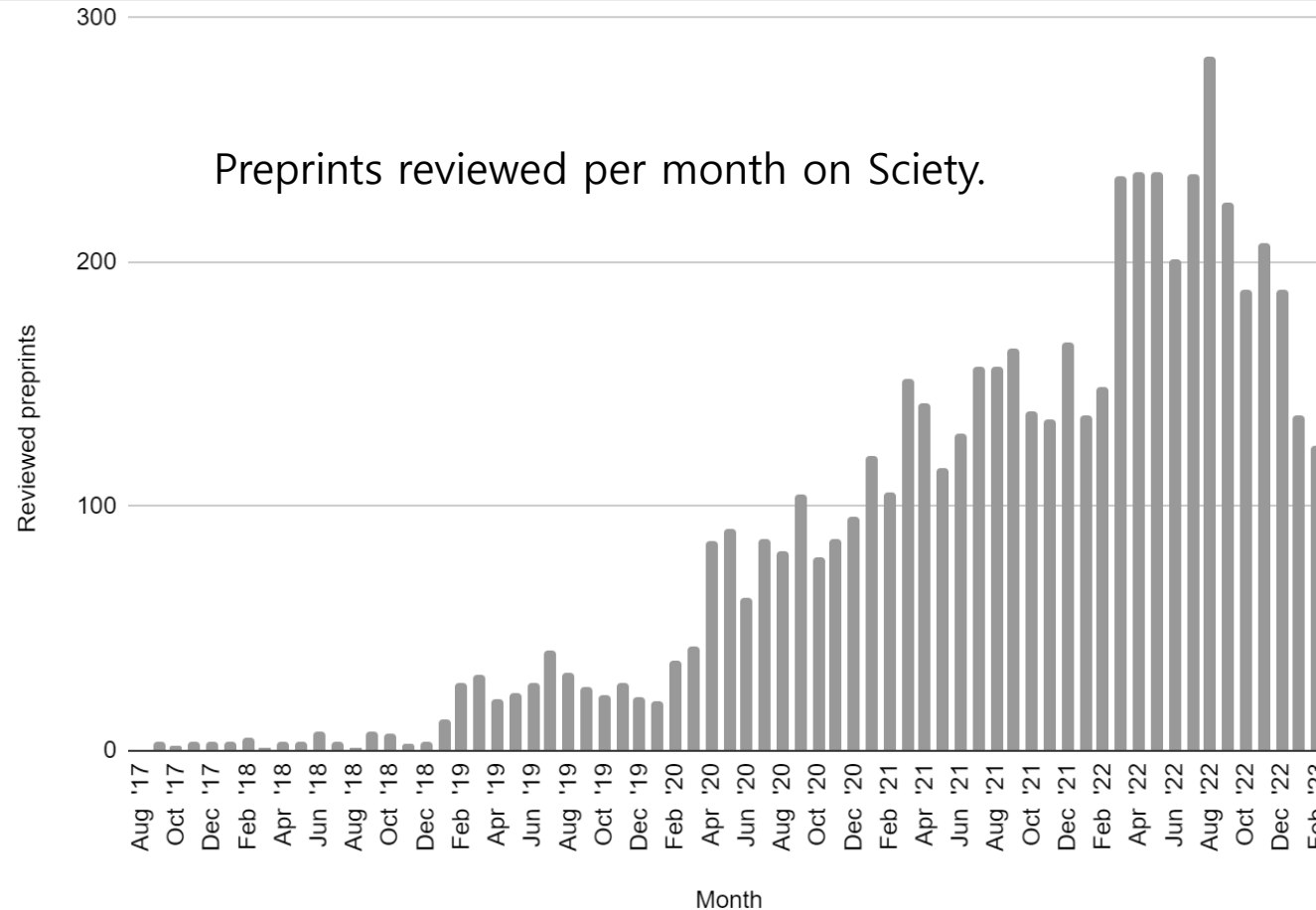
Peer Review for Open Science

- Articles
- **Preprints**
- Review reports
- **Data**
- Codes
- Protocols
- Reports
- :
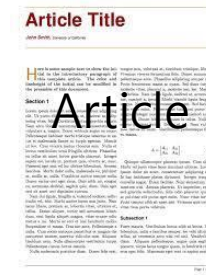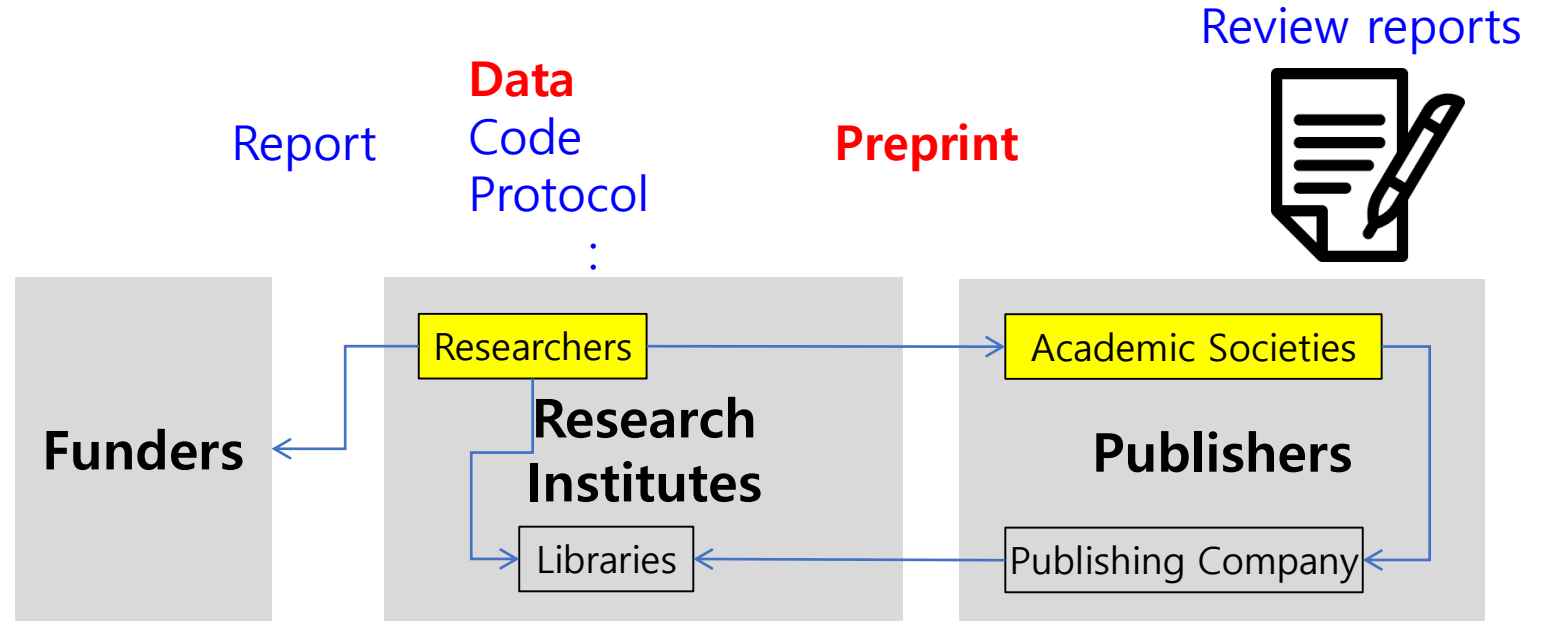
Peer Review for Open Science

Preprint Review

* Source: Avissar-Whiting, Michele, Frederique Belliard, Stefano M. Bertozzi, Amy Brand, Katherine Brown, Géraldine Clément-Stoneham, Stephanie Dawson, et al. 2023. "Advancing the Culture of Peer Review with Preprints." OSF Preprints. April 3. doi:10.31219/osf.io/cht8p.

Preprints reviewed per month on Sciety.

Peer Review for Open Science

Preprint Review

Open Post-publication Peer Review

Journal-independent Peer Review

Peer Review for Open Science

## Preprint Review – Open Post-publication Peer Review

Article Submission

Publication & Data Deposition

Open Peer Review & User Commenting

Article Revision

Basic check on each submission to ensure that all policies are adhered to.

Article (with its source data) is **published within a week**, enabling **immediate viewing and citation**.

Expert **referees are** selected and **invited**.
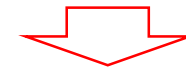
Their **reports and names are published** alongside the article.

Together with the **authors' responses and comments** from registered users.

Authors could publish revised versions. **All versions of an article are linked** and independently citable.

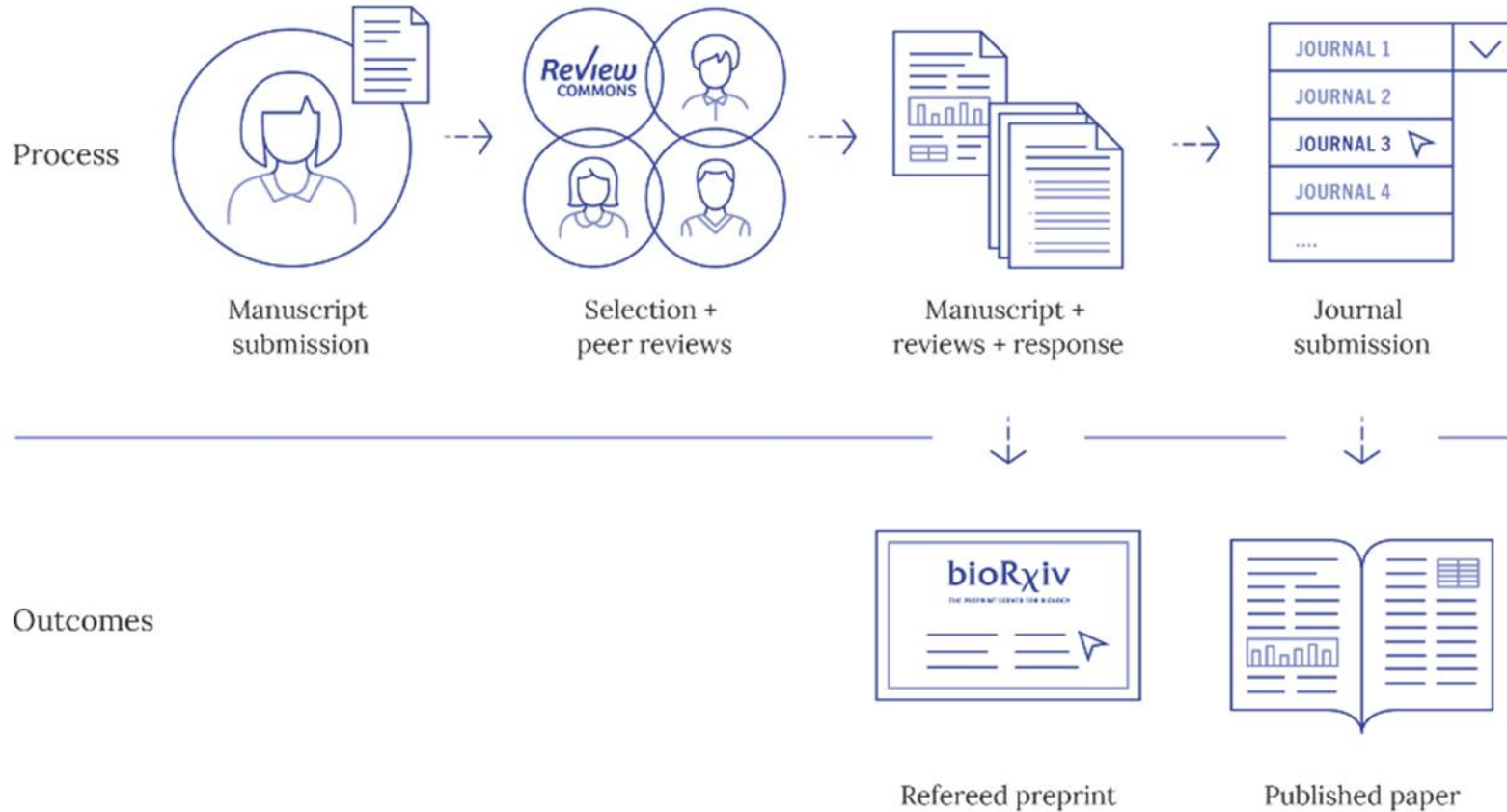Articles that pass peer review are indexed in external databases such as **PubMed**, **Scopus** and **Google Scholar**.

F1000 Research

* Source: Cheol-Heui Yun, Professor, SNU

Peer Review for Open Science

Peer Review for Open Science

Data Paper Peer Review

Characteristics	Journal Articles	Data Papers
Purpose of Publishing	Sharing credible **knowledge**	Sharing credible **dataset**
Aims of Peer Review	To check quality, novelty and validity of the **theories, experiments and observation**	To check completeness and collecting method of the **dataset**
Core Article Type	Original paper Review paper	Data paper
Composition of Manuscript	Methods Results Discussion Conclusions	Data description Metadata Dataset
Data Sharing Policy	Data sharing	Data sharing & Peer review
Deposition of data	No limitation	Repositories
DOI	Article	Article & Data

Peer Review for Open Science

Data Paper Peer Review

Review I – *Data description document*
1. Is the method used to create the data of a high scientific standard?
2. Is enough information provided to enable the data to be re-used?
3. Comprehensive description of all the data
4. Does the data make an important and unique contribution to the geosciences?
5. Range of applications to geosciences
6. Are all contributors and existing work acknowledged?
7. Sufficient citation information of the dataset, eg dataset DOI, name of data centre etc.

Review II - *metadata*
8. Does the metadata establish the ownership of the data fairly?
9. Is enough information provided to enable the data to be re-used?
10. Are the data present as described, and accessible from a registered repository using the software provided?
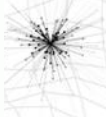
Review III – *the data themselves*
11. Readability, E.g. do they use standard or community formats?
12. Quality e.g. are error limits and quality statements adequate to assess fitness for purpose, is spatial or temporal coverage good enough to make the data useable?
13. Are the data values physically possible and plausible?
14. Are there missing data that might compromise its usefulness?

Concluding Remarks

Concluding Remarks

- Peer review in scholarly publishing has many problems to be resolved.

- First of all, publication ethics should be aware and kept by authors, reviewers, editors, and other stakeholders in the scholarly publishing industry.

- At the same time, the current peer review process should be changed to be more objective and efficient.
  - Open/Transparent peer review, preprint review, and data paper peer review are considered the most desirable peer review approaches in the open science era.

- A call to action for Journals: Implement a written policy encouraging preprints and data papers as well as preprint reviews and data paper reviews.