Innovative research practices and tools

Research integrity as catalyst and outcome

https://doi.org/10.6084/m9.figshare.5047705

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Good and open research practices

- involve public / patients in drafting research proposals
- openly share project proposals
- share hypothesis before starting research
- search for OA literature
- extensively search for existing data before generating your own
- use easily attainable software to allow anyone to reproduce your results
Good and open research practices

- Store data in the most open format possible
- Executable, forkable publications, including text, code & data
- Cite OA versions of literature & provide data and code citations
- Acknowledge contributor roles in a publication
- Translate research objects in world languages
- Publish preprints, encourage feedback / open peer review
Good and open research practices

- publish pre-publication history (version + reviews)
- make re-use and licensing guidelines explicit
- communicate analyzed data with: experts, non-expert scientists, lay-public
- refuse to be part of all male of all white panels
- assessment of scientists based on a variety of contributions, not just H-index
- use metrics of commercial/social applications to assess research
Three goals for science & scholarship (G-E-O)

- declaring competing interests
- replication & reproducibility
- meaningful assessment
- effective quality checks
- credit where it is due
- no fraud, plagiarism

- connected tools & platforms
- no publ. size restrictions
- null result publishing
- speed of publication
- (web)standards, IDs
- semantic discovery
- re-useability
- versioning

- good = reproducible & transparent
- efficient
- open

- researcher
- publisher
- funder
- public
- government
- library

- open peer review
- open (lab)notes
- plain language
- open drafting
- open access
- CC-0/BY

- research governance changes
- technical changes & standards
- economic & copyright changes
Registered Reports: Peer review before results are known to align scientific values and practices.
Explore protocols.io

Discover free, up-to-date research protocols and useful content in your field of interest

Version, modify, and discuss existing protocols

You can "clone" protocols in order to be able to modify existing protocols from other scientists. You can also ask questions and comment on step-level or on the entire protocols.

Getting Started

The Resource Identification Portal was created in support of the Resource Identification Initiative, which aims to promote research resource identification, discovery, and reuse. The portal offers a central location for obtaining and exploring Research Resource Identifiers (RRIDs) - persistent and unique identifiers for referencing a research resource. A critical goal of the RII is the widespread adoption of RRIDs to cite resources in the biomedical literature and other places that reference their generation or use. RRIDs use established community identifiers where they exist, and are cross-referenced in our system where more than one identifier exists for a single resource. Some examples are shown below, which are linked to metadata about each resource.

- Antibody: RRID: AB_007565
- Organism: RRID: RGD_4158685
- Cell Line: RRID: CVCL_0033
- Tool: RRID: SCR_007568
Contributor Roles

A high-level classification of the diverse roles performed in the work leading to a published research output in the sciences. Its purpose to provide transparency in contributions to scholarly published work, to enable improved systems of attribution, credit, and accountability.
F1000Research publishes pioneering ‘living article’

**Scientists published article is the first to be updated live online**

DOI: 10.12688/f1000research.4263.2
Cooperation And Liaison Between Universities And Editors (CLUE): Recommendations On Best Practice

Elizabeth Wager, Sabine Kleinert, Michele Garfinkel, Volker Bähr, Ksenija Baždarić, Michael Farrington, Chris Graf, Zoë Hammatt, Lyn Horn, Susan King, Debra Parrish, Bernd Pulverer, Paul Taylor, Gerrit van Meer

doi: https://doi.org/10.1101/139170

This article is a preprint and has not been peer-reviewed [what does this mean?].
Peer review models – dimensions of change

- Timing
- Criteria
- Journal-independent
- Recruitment
- Credit
- Names published
- Reports published
- Blindness
A life cycle model of peer review - limited

- pre-pub peer review
- formal peer review
- post-pub peer review (PPPR)

- no open availability of draft & “pre-prints”
- weak PPPR & commenting culture
A life cycle model of peer review - enhanced

- Pre-pub peer review
- Formal peer review
- Post-pub peer review (PPPR)

- Pre-prints, overlay journals etc.
- PPPR, extended commenting etc.

Tools:
- Jupyter
- Statcheck
- THE PRO INITIATIVE for open science
A life cycle model of peer review - quality

Pre-pub peer review

Formal peer review

Post-pub peer review (PPPR)

Pre-prints, overlay journals etc.

PPPR, extended commenting etc.

Jupyter

Statchek

The PRO Initiative for open science
**Scenario C:**

- **Closed connection**

  - **High open research practices acceptance**
    - Sharing system optimised for communication
    - Repositories /preprints part of basic infrastructure
    - Form research is disseminated in is determined by needs of research
    - Broad acceptance of granular review / curation
    - Less hierarchical academic publishing system

  - **Low open research practices acceptance**
    - Mainstream of content remains paywalled
    - Strong focus on non-granular status metrics
    - Peer review remains publisher-based & closed
    - Concentration of publisher market

- **Low implementation of distributed technologies**

  - **High implementation of distributed technologies**
Enabling and constraining contexts of open and reproducible workflows

- political support at (inter)national level
- pressure from funders
- user-friendly and powerful tools
- interoperability
- role models
- attention for positive effects

- assessment criteria
- publication culture
- learning curves
- agreements with collaborators
- uncertainty over effects & legitimacy
Developments towards good, open and efficient research

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<th>Slow, difficult</th>
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<tr>
<td>Debunking impact factor thinking</td>
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<td>Debunking data scooping myth</td>
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<td>Changing version of record thinking</td>
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<th>Fast, smooth, easy</th>
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<td>Preprint adoption by publishers &amp; researchers</td>
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<td>Data management policies at funders</td>
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<td>ORCID adoption</td>
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.@ryhertzberger at npos17 OR npos2017: peer review is the silver standard, scooping should be the gold standard. I like that. #opencode