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Rethinking research misconduct in an Open Science environment

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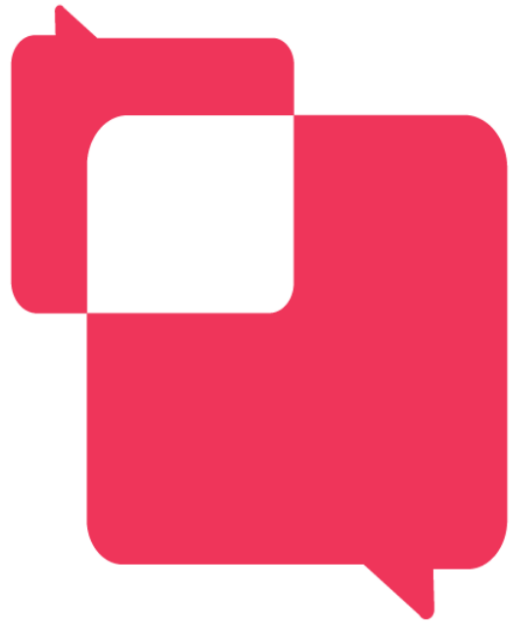

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Objectives

Explore how Research Misconduct evolves with Open Science, thereby redefining Research Integrity (and Research Ethics)

Emphasize the need for updated governance, accountability, and collaboration practices, specifically through a research ecosystem mindset.

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What is Open Science?

Nature of Open Science:
an **inclusive construct** that combines various movements and practices.

Goals:
- make multilingual **scientific knowledge** openly available, accessible, and reusable for everyone.
- increase **scientific collaborations and sharing of information** for the benefits of science and society.
- **open the processes of scientific knowledge creation, evaluation, and communication** to societal actors beyond the traditional scientific community.

Scope:
It comprises **all scientific disciplines and aspects of scholarly practices**, including basic and applied sciences, natural and social sciences, and the humanities.

Key Pillars:
- Open scientific knowledge.
- Open science infrastructures.
- Science communication.
- Open engagement of societal actors.
- Open dialogue with other knowledge systems.

UNESCO Recommendation on Open Science

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What is open science? Open science is an approach to research based on open cooperative work that emphasizes the sharing of knowledge, results and tools as early and widely as possible. It is mandatory under Horizon Europe, and it operates on the principle of being 'as open as possible, as closed as necessary'.

https://rea.ec.europa.eu/open-science_en

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RELEVANCE TO THE THEME?

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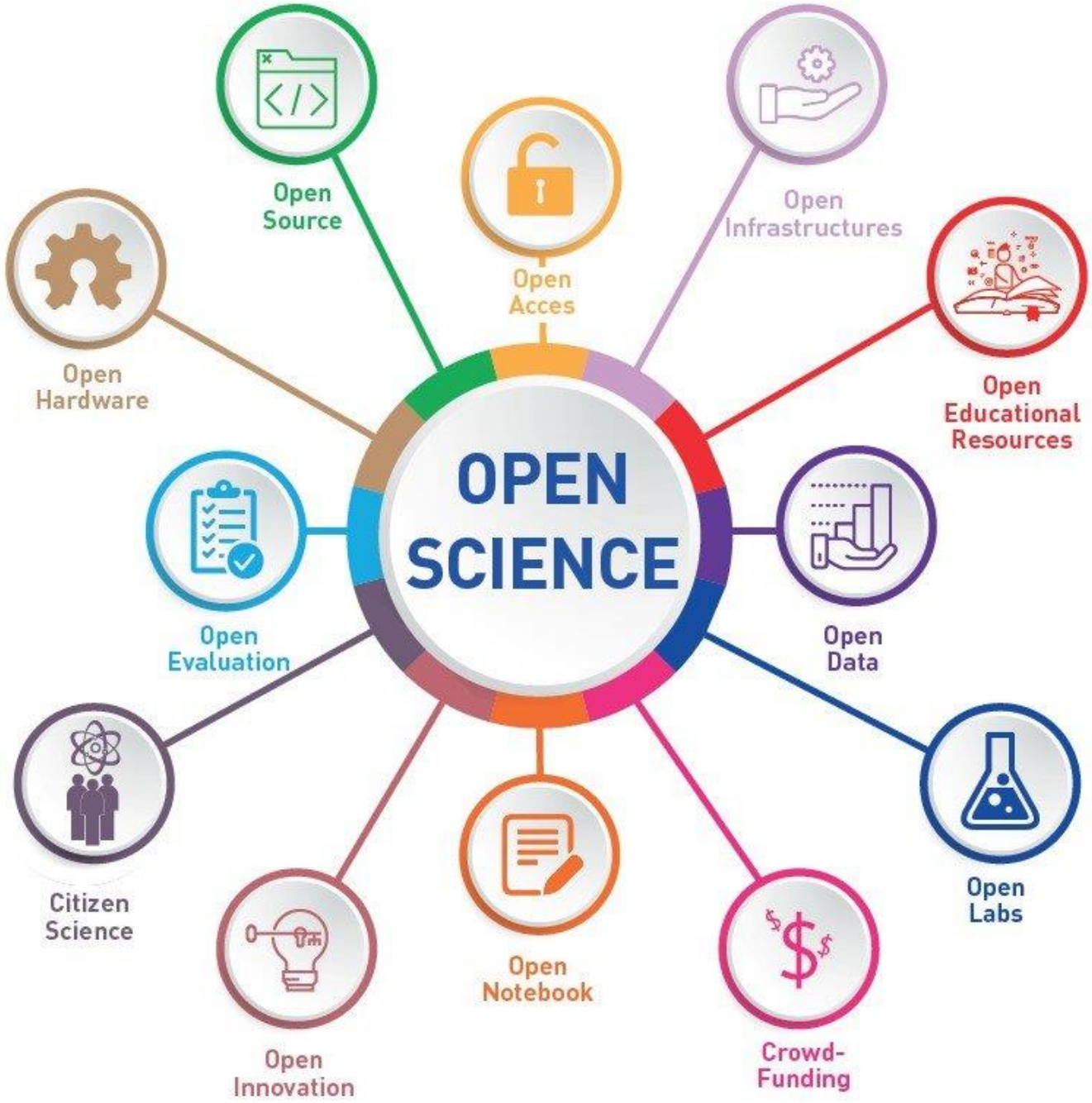

Elements of Open Science
-*UNESCO Recommendation on Open Science*

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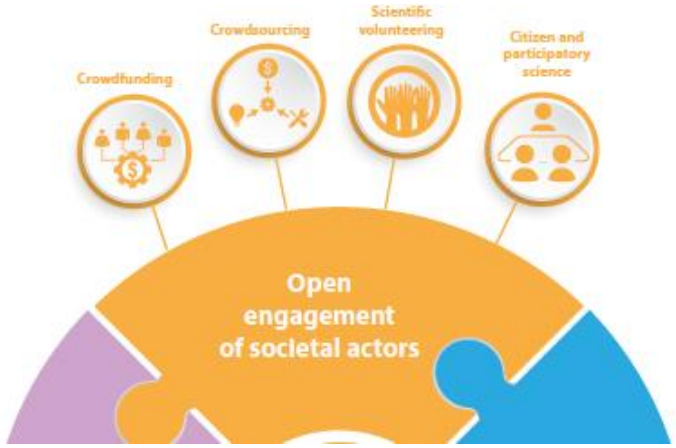

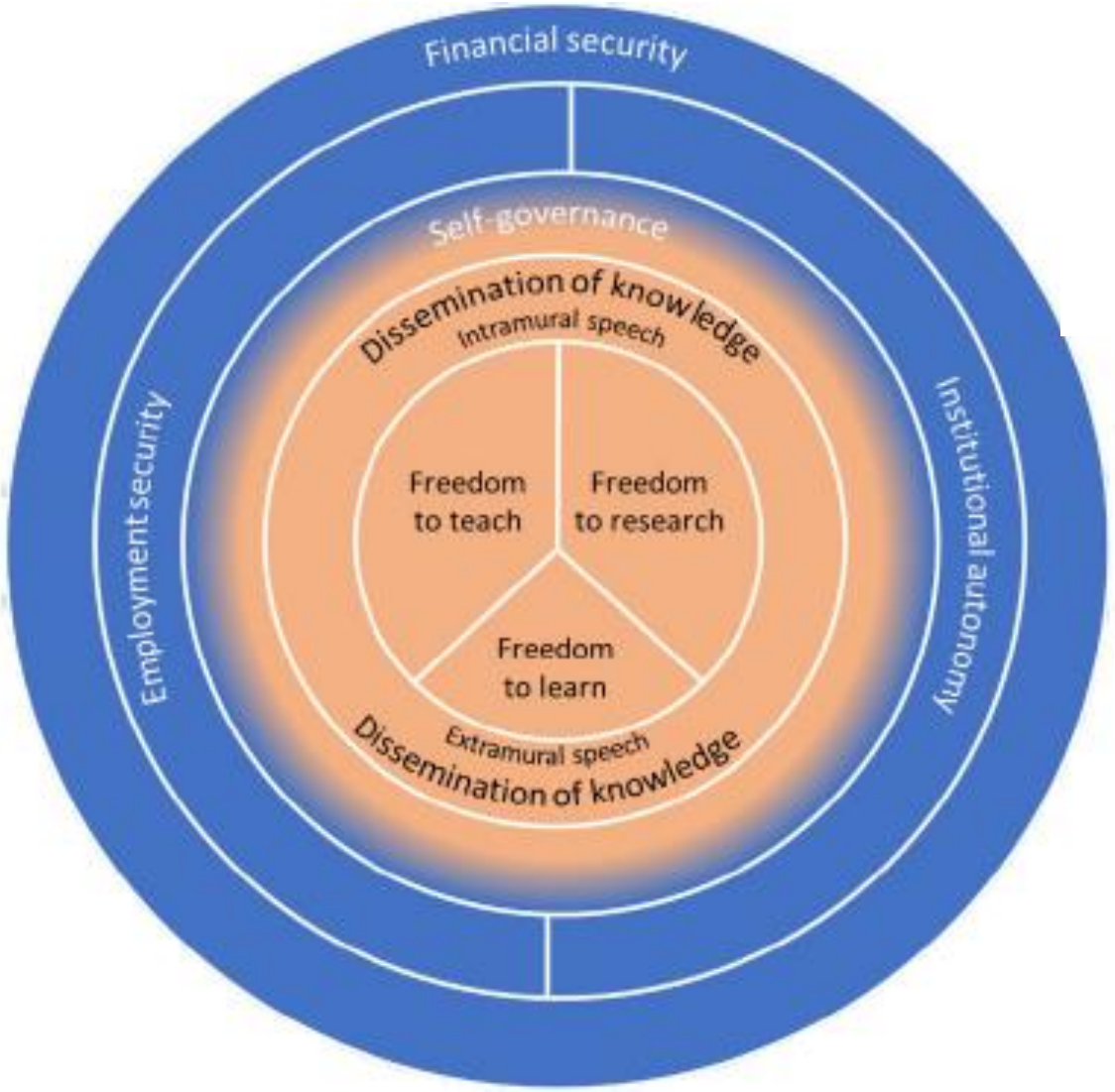

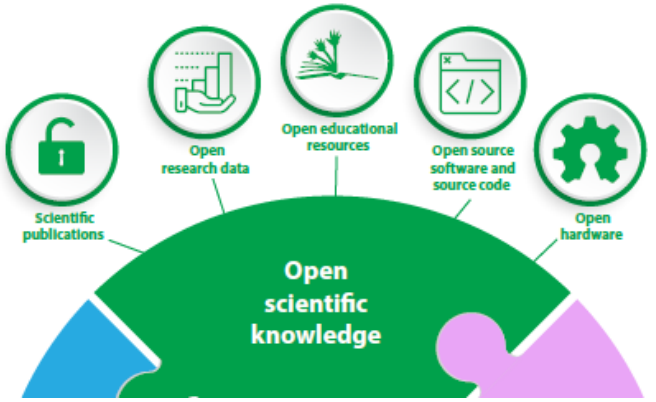

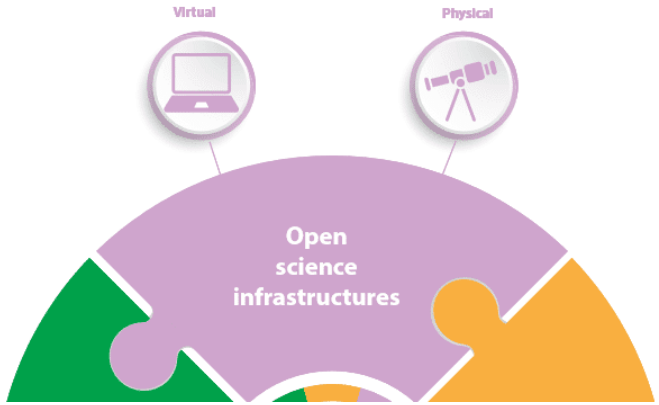

Elements of Academic Freedom
-- *How Academic Freedom is Monitored*, STOA 2023

Elements of Open Science
-*UNESCO Recommendation on Open Science*, 2021

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Responsible Open Science is an essential foundation in the practice and governance of Academic Freedom

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Now, GOING BACK TO THE TOPIC

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Open Science (partially) addresses traditional Research Misconduct issues

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On FFP and Open Science

Open Science creates an ecosystem where fabrication, falsification, and plagiarism are more difficult to commit and much easier to detect.

By promoting the sharing of data, methods, and research outputs, OS fosters an environment where transparency is the default, and research is continuously subjected to the scrutiny of peers and the public.

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Fabrication, Falsification

OSF REGISTRIES

PREREGISTRATION CHALLENGE

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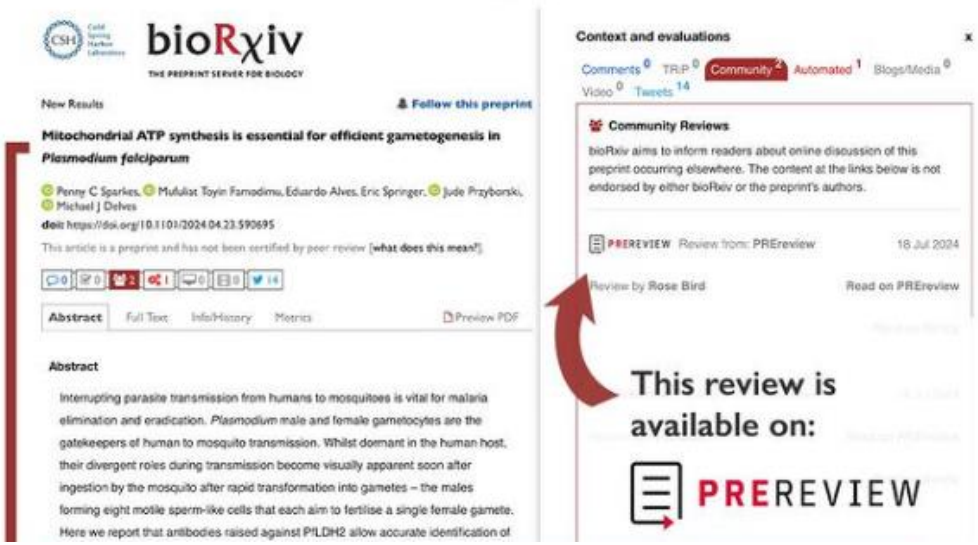
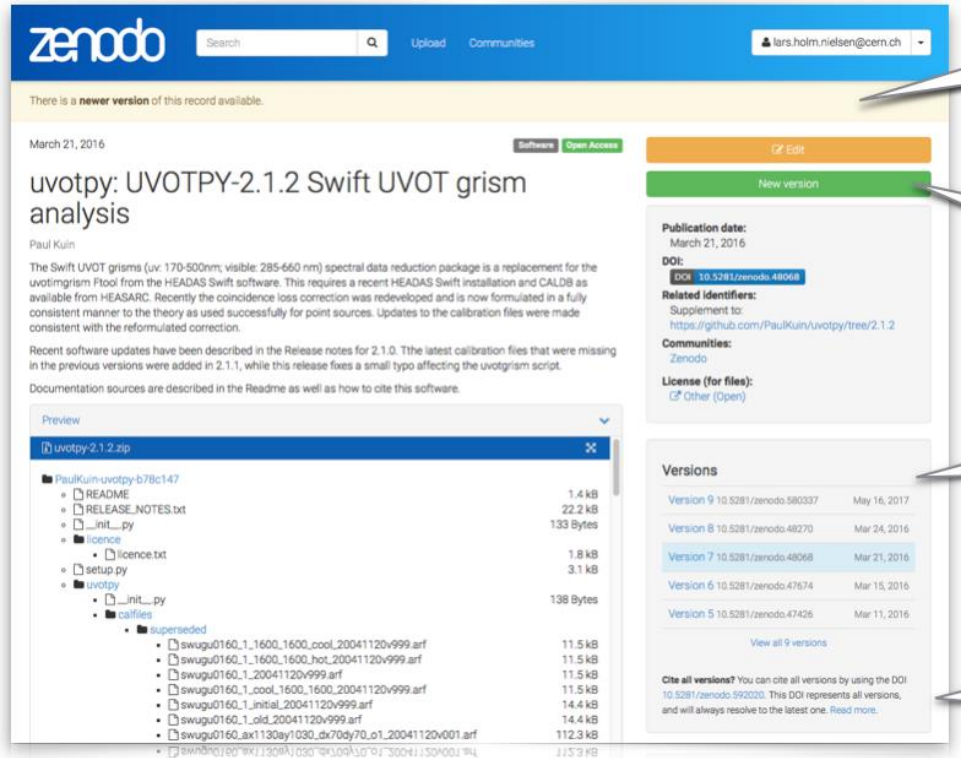
Plagiarism

OPEN ACCESS

Community Reviews on bioRxiv





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Cite **specific version** or **the concept** representing all versions

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But not only against FFP…

1. *Allowing funders or sponsors to jeopardize independence*

✓ Transparency via conflict of interest disclosures, open methodology and data, open peer review, pre-registration of studies…

✓ Through crowd-funding

✓ Through the inclusion of citizen scientists and use of citizen science practices

2. *Misusing Seniority to Encourage Violations/ manipulating authorship*

✓ Transparency in authorship and contributions

✓ Open Collaboration

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3. Withholding Research Data or Results without Justification

✓ Mandatory Data Sharing (after a reasonable embargo period)

✓ FAIR Principles

4. Salami Slicing Publications

✓ Open Data and Methodologies

✓ Preprints and OA Publishing

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6. Self-Plagiarism

- ✓ Transparency in Preprints with time-stamped versions
- ✓ Author contribution statements
- ✓ OA publishing
- ✓ Open data and methodologies

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However,
Open Science can also exacerbate research misconduct or create new ones

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1. *Misuse of Open Data*

Researchers may reanalyze data without fully understanding its limitations or ethical constraints. Risks of dual use.

2. *Preprint Misrepresentation*

Can lead to misrepresentation of preliminary findings as final, validated results, especially in the media or public discourse.

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3. *Insufficient Data Anonymization*

The demand for open data can lead to hasty data sharing, sometimes without ensuring that personal or sensitive data is sufficiently anonymized. This increases the risk of re-identification

4. Pressure to Publish Open Access

Researchers may engage with low-quality, non-peer-reviewed, or predatory journals to satisfy institutional demands for open access publishing, leading to the dissemination of unreliable research

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5. Collaborator Exploitation in Citizen Science

The lack of clear crediting mechanisms or ethical guidelines can lead to the exploitation of non-professional contributors.

6. Gaming the research evaluation system

7. Uploading (almost) unusable datasets…

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Considering that Open Science is now the “standard” in doing science, these emerging unacceptable practices MUST be included in the roster of research misconduct.

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When thinking of research misconduct, we KNOW that this is never just about the individual researcher. It is also about the research ecosystem.

It's not just about the Bad Apples. It is also the orchard.

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1. *Misuse of Open Data*


Researcher


Research institutions: ethics training, oversight and governance


Data repositories: curation and restrictions


Policymakers, RFOs: regulations on dual-use research, data sharing policies


Journal editors and reviewers: ethical review before publication

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2. Preprint Misrepresentation

- Researchers
- Preprint platforms: clear labelling, policies for public dissemination
- Journalists and media outlets: responsible and contextual reporting
- Research institutions: media training, support for responsible dissemination
- Funding agencies: funding conditions on prepublishing and peer-reviewed publications
- Scientific community: post-publication review, cultural norms

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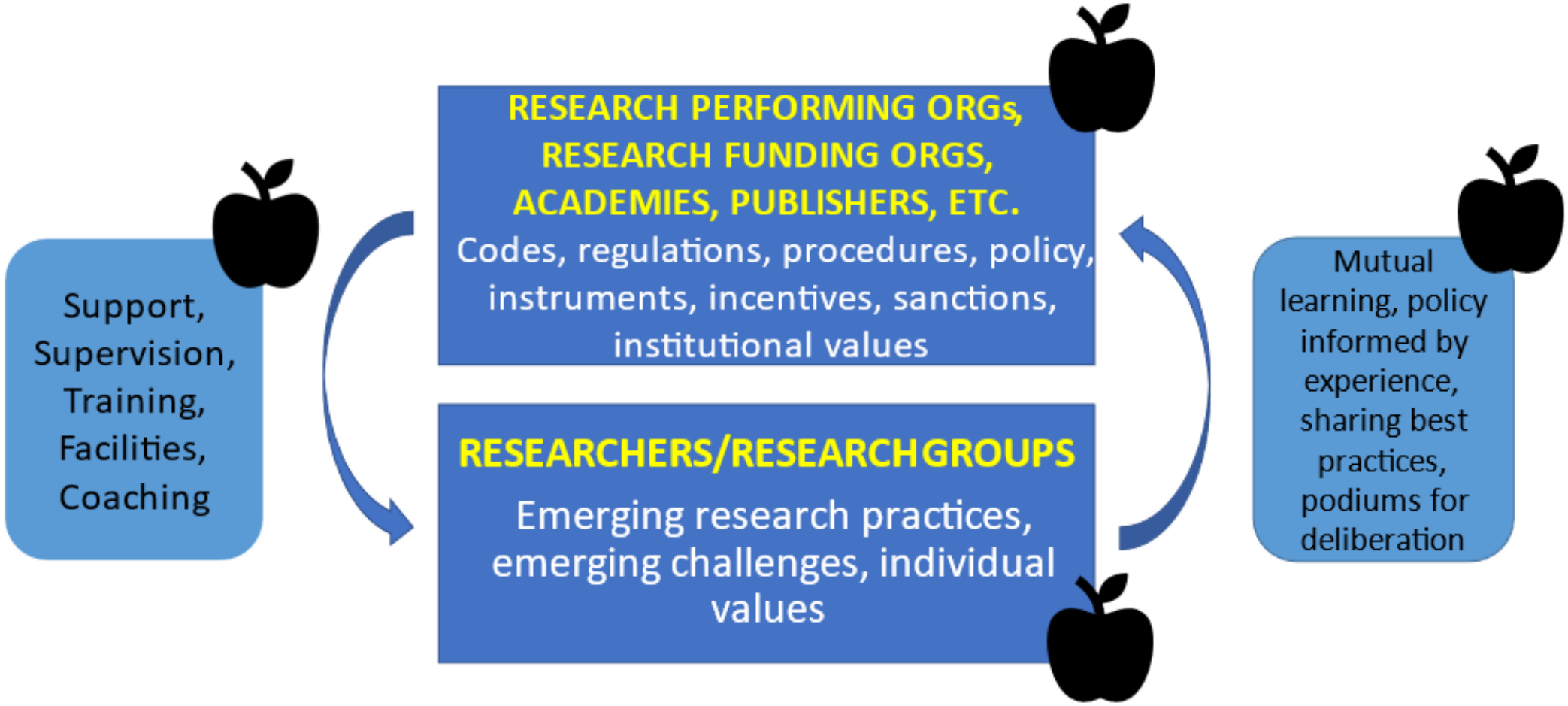

RESEARCH ECOSYSTEM

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BEYOND

D1.1 Insights from the literature review on behavioural ethics, moral psychology & case-based methodologies and review of real-life case studies of research misconduct

BEYOND

D2.1. Consultation paper and plan to engage the public and expert stakeholders

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https://zenodo.org/records/10618735

https://zenodo.org/records/13861343

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A Multifaceted Landscape: Individual and Organizational Factors Influencing Research Misconduct

Individual Factors

- Moral psychology: cognitive biases, emotions on choices, ethical orientation
- Personal values and beliefs about integrity, honesty, accountability
- Career stage

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Organizational Factors:

- Research Culture
- (Institutional) Policies and Practices
- Research Assessment and Incentives
- Funding Pressures and Conflicts of Interest
- Power Dynamics
- Training and Mentorship

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Thus…

- ✓ In OS, as in traditional science, misconduct is shaped by environments (institutional culture, global inequalities).
- ✓ Failures in infrastructure, policies, and collaboration practices result to misconduct and thus, depending on definitions of culpability, several other research stakeholders could share the responsibility as well.

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ROSiE

Responsible Open Science in Europe

The ROSiE General Guidelines on Responsible Open Science

- ✓ Context-sensitivity
- ✓ Considers the responsibilities of the various players in the research ecosystem

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Context-sensitivity

Balancing Openness with other values

1.5. While OS is an essential component of responsible research practice, it should be balanced with other values, and additional safeguards should be created to prevent misuse and abuse.

Recognition of disciplinary differences

2.2. To promote good OS practices, RPOs should facilitate effective communication and establish clear collaboration guidelines that account for diverse research practices and promote coherence among different conceptions of openness. It is also important to consider scientific discipline-related challenges when implementing OS practices.

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Sensitivity to Global Inequities

8.2. RPOs should recognise potential global inequities in access to OS infrastructure and act to promote global justice and support the needs of researchers in low- and middle-income countries (LMICs). There is a great need for policymakers, RFOs, RPOs, and researchers from high-income countries to provide support to institutions from LMICs in building their capacities, exchanging good practices, and establishing infrastructure conducive to OS.

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Stakeholder-specific

Policy makers

1.6. National and European policies conducive to responsible OS are instrumental in signalling to researchers and research performing organizations (RPOs) the political commitments to support and promote OS.

6.5. Policymakers in collaboration with the scientific community should develop targeted strategies on how to involve diverse societal actors in citizen science and other public engagement activities to avoid situations where inequalities existing in society are replicated in activities of public engagement.

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Research Funding Organizations

2.5. RFOs should be aware and sensitive to the fact that OS practices and regulations in different countries are diverse. The baseline for openness requirements should be clear and attainable to all European countries.

Publishers

4.4.4. Publishers and researchers are encouraged to use Creative Commons (CC) licenses, meaning authors retain their rights under predefined conditions.

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Research Performing Organizations

2.9. RPOs should provide researchers with the necessary resources and infrastructure to support, promote, and incentivize responsible OS practices. These resources and infrastructure should be accessible and affordable to all researchers, regardless of their location or institutional affiliation.

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Researchers

4.3.1. Researchers should be open and honest about the methodological techniques or study design used in their research. This includes documenting these methods in study protocols, logs, laboratory journals, readme files, or reports. The research lifecycle steps should be verified, and the line of reasoning should be clear. This means the description of research should be detailed enough for the data collection and analysis to be replicated.

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Research Community

5.4. The research community should acknowledge the merit of data collection in the context of research evaluation. The promotion of publishing peer-reviewed data papers might help in this endeavour.

6.6. The research community should ensure that existing knowledge about citizen science approaches is shared so that researchers and citizen scientists learn from each other.

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Parting Words

1. OS requires solidarity, much more than traditional science ever did. We cannot leave others behind, otherwise we strengthen the very hegemony we are reacting against.
2. When thinking (and rethinking) of research misconduct in an OS environment, we need to take seriously what it means to hold various stakeholders accountable.
3. OS creates more overlap between research ethics and research integrity.

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