



<https://olivierlg.info/JJC24>

# L'intégrité scientifique, pour une recherche responsable

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Ex-président du conseil de l'Ofis

— o O o —

JJC 2024, Aussois, 17 Jan 24



# Truth or post-truth?

→ *"Truth isn't truth" (R. Giuliani, CNN, 19Aug18)*



# Science is not an opinion!

→ Well... then let's prove it...



If we expect to be respected, let's start with being respectable



# Research vs. Science

→ Integrity of the sci. method is the catalyst of Knowledge

## Research

(surfing waves of unknowledge)

(un chercheur)



© Luke Dawson via theinertia.com

## Science

(contemplating an ocean of knowledge)

(un savant)



Santa Barbara Historical Society

⚠ these images have been manipulated



# L'intégrité scientifique, pour une recherche responsable

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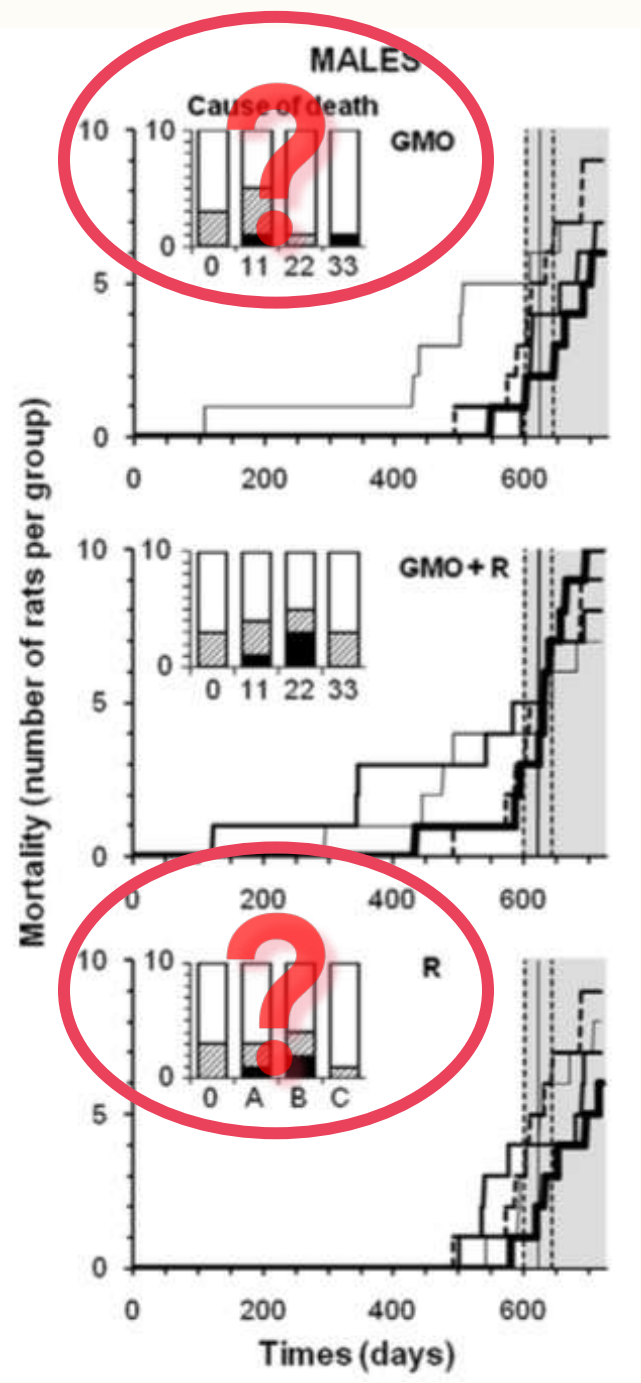
- ▶ Science has some solid safeguards
- ▶ Ethics, integrity, deontology... some definitions
- ▶ How common is research misconduct?
- ▶ How diverse is research misconduct?
- ▶ Towards the end of small business?
- ▶ But now, what can I do?
- ▶ Concluding words







Our papers are reviewed by peers!



# If we expect to be respected, let's start with being respectable

## – Hey, every single of our papers is peer reviewed!

- It is a very strong quality check, but it is fallible
  - And you know it...
- The reviewers' task is usually not to re-do the work
  - They are not universal experts even in their field
  - They work under time pressure
- The editors' job is often to find compromises
  - The reviewers and the authors don't always agree
  - The editors do not request all comments to be addressed
    - (note: their decisions are often opaque for the reader)
- In any case, peer review will not detect
  - e.g. fabricated or falsified data / results (or now text)
  - e.g. plagiarism and other types of inappropriate credit





# If we expect to be respected, let's start with being respectable

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- **Hey, every single of our papers is peer reviewed!**
  - A process unique to the scholar ecosystem
  - Powerful but fallible
- **Hey, we've got the self-healing of Science!**



# If we expect to be respected, let's start with being respectable



- **Hey, every single one of our papers is peer reviewed**

- We do, but we know it is fallible

- **Hey, we've got the self-healing of Science**

- Another process unique to the scholar ecosystem

- However

- *A rather heavy process when it has to be enforced*

- How many funding agencies would like to pay to fix doubtful oldies?

- *Correction retraction still considered stigmatizing*

- For individuals and communities

- *Corrected / retracted papers not always properly labeled*

- Esp. after download (e.g. SciHub)

- *Many wrong or inappropriate papers remain in the literature*

- *The meaning of correction / retraction*

- Not fully understood

- *By the lay citizens: see the "LancetGate" episode*

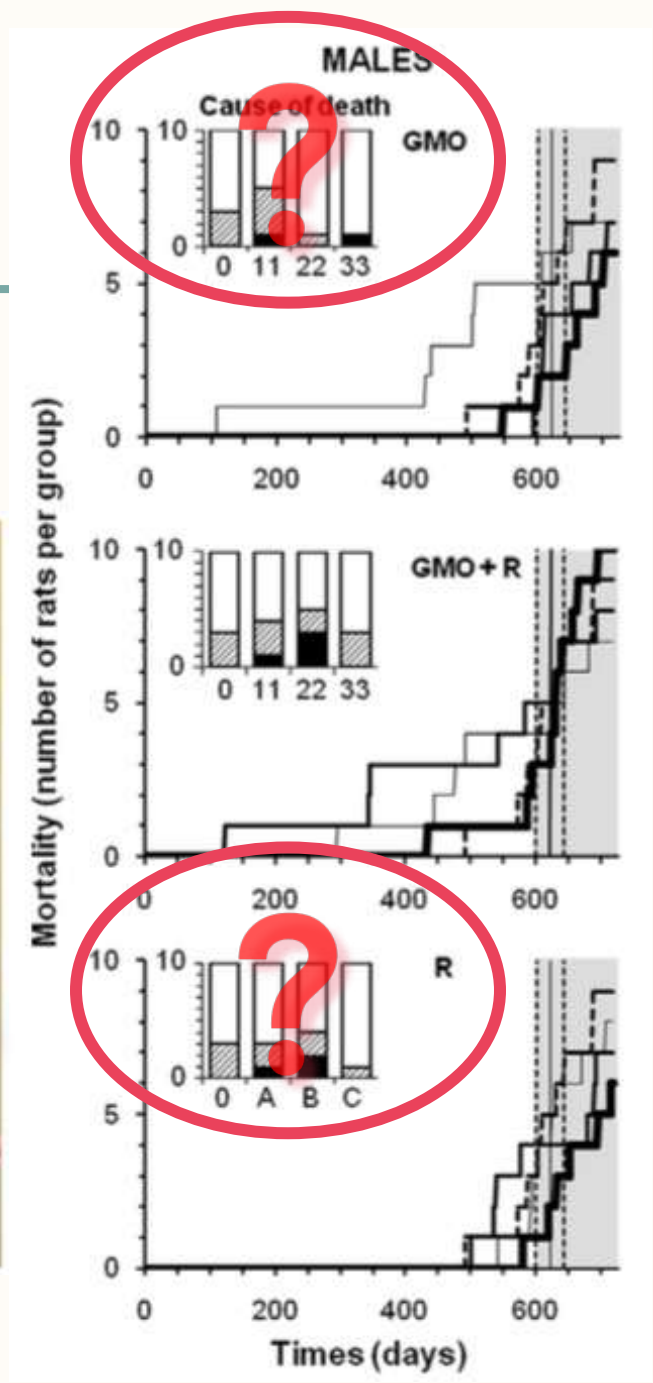
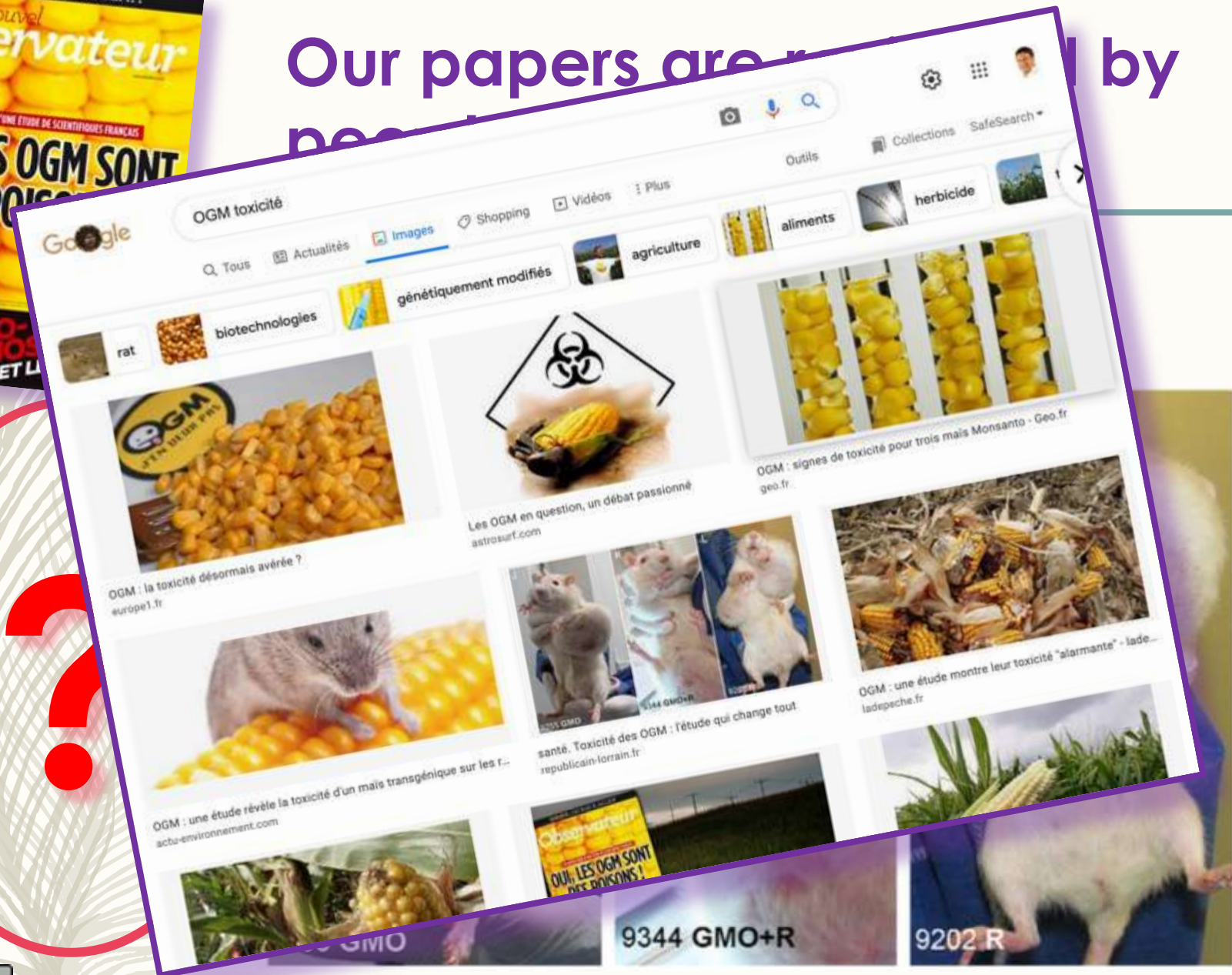
- *By scholars: see the Seralini scandal*

- *Not reflected once in the public sphere*





Our papers are retracted by



# If we expect to be respected, let's start with being respectable

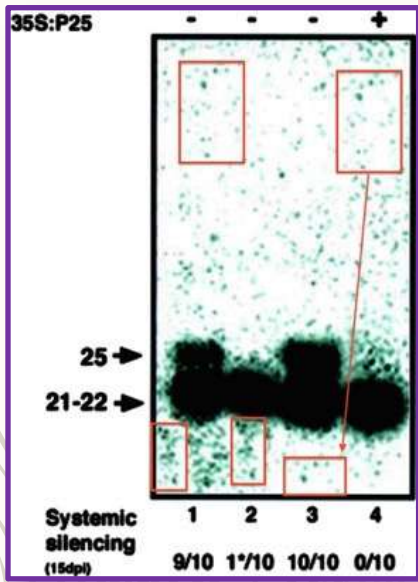
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- Hey, every single of our papers is peer reviewed
  - A process unique to the scholar ecosystem
  - Powerful but fallible
- Hey, we've got the self-healing of Science
  - We do, but we know it faces several issues



→ We'd better be careful anyway!





# An amazing disgrace

## → Learning from the (so-called) Voinnet scandal

### – A scientific field damaged

- 9 retractions, 18 corrections, more flagged
- A PhD thesis questioned (finally OK'd)
- Many co-authors involved
- 1000s papers citing the retracted ones

### – Two researchers heavily punished

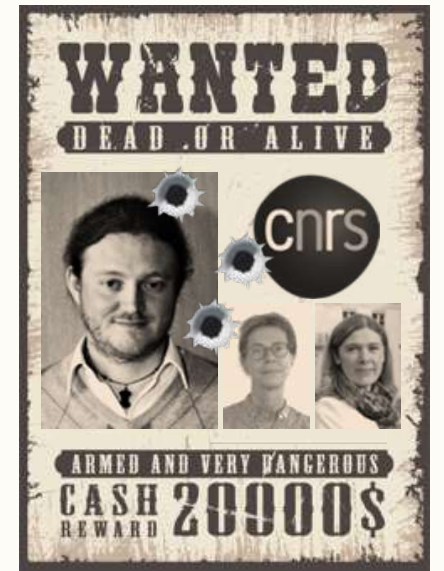
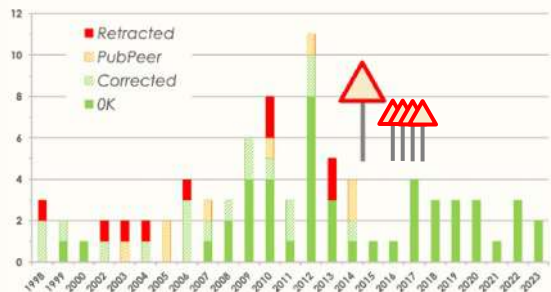
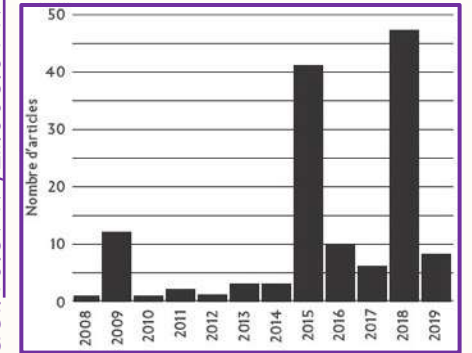
- More out-of business

### – The reputation of major institutions questioned

### – The aftershocks: curse or harassment?

- More affairs, more investigations, more retractions
  - Co-authors
  - Colleagues (incl. highest scientific hierarchy)
- A diversity of institutional treatment for apparently similar cases

Europepress via doi:10.3917/zil.006.0149





# What are we talking about?

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*Some definitions*

# Three pillars for a responsible research

→ often merged in the international arena



**What?**

**How?**

**For whom?**

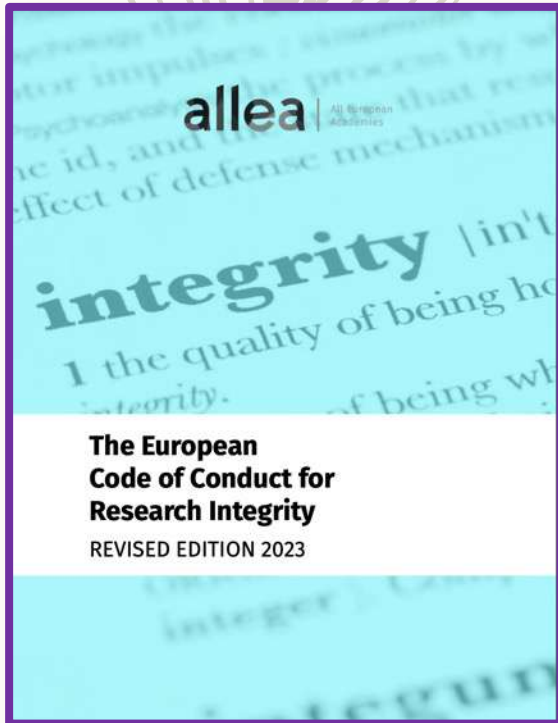
**By whom?**

Ethics	Scientific Integrity	
	Deontology by "soft law" → Research integrity s.s.	Deontology <i>sensu stricto</i> (e.g. France)
The questions raised by the continuous fit btw progresses in S&T, and societal evolutions	The rules governing the practice of research	The control of public servant's independent action
Highly cultural. Must be discussed permanently.	Quite universal. Prevails as an unwritten professional code. (France: within a legal frame since 2020)	Code of public service: "L'agent public exerce ses fonctions avec dignité, impartialité, intégrité et probité"
→ All scientists	→ All scientists	→ All Fr public servants
Mixed committees	Researchers	Lawyers



# The European Code of Conduct for Research Integrity

→ <https://allea.org/code-of-conduct>



## 1. Principles



Good research practices are based on fundamental principles of research integrity. They guide researchers in their work as well as in their engagement with the practical, ethical and intellectual challenges inherent in research.

These principles are:

- **Reliability** in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.
- **Honesty** in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.
- **Respect** for colleagues, research participants, society, ecosystems, cultural heritage and the environment.
- **Accountability** for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts.

- **1<sup>st</sup> version: 2005**
  - Revised 2017, 2023
- **Attempts a POSITIVE definition of Research Integrity**
- **One that covers all of Scientific Integrity**
  - Research Integrity covers more specifically
    - *Reliability*
    - *Accountability*





# Research integrity

→ *More than an absence of lack of integrity*

**Honest**

Biased references

Salami-slicing

Beautification

Undue signatures

**Reliable**

Statistical misuse

**Falsification**

**Plagiarism**

**Fabrication**

Biased sampling

**Ethics**  
**Conflicts of Interest**  
**Regulations**  
**Misbehaviours**

**Respectful**

Withholding results


Irreproducible methods

**Accountable**

Defective archiving




# Research integrity is not optional



**MARSEILLE** **13.02.2020**

**Jeudis de l'IHU  
CONTRE LA MÉTHODE**



Unité de Recherche sur les Maladies Infectieuses Tropicales Emergentes  
URMITE – UMR CNRS 7278, IRD 198, INSERM U1095


**MÉDITERRANÉE  
INFECTION**

« Les méthodes mathématiques sont les vêtements des idées ».

*Husserl*

« ... ça sert à  
avoir raison »

**No!**



1



# L'intégrité scientifique, pour une recherche responsable

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- ▶ Science has some solid safeguards
- ▶ Ethics, integrity, deontology... some definitions
- ▶ How common is research misconduct?
- ▶ How diverse is research misconduct?
- ▶ Towards the end of small business?
- ▶ But now, what can I do?
- ▶ Concluding words

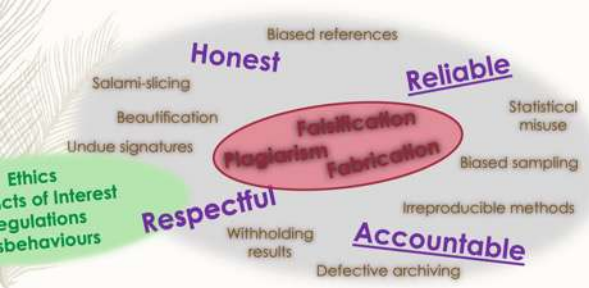




**What are we talking about?**

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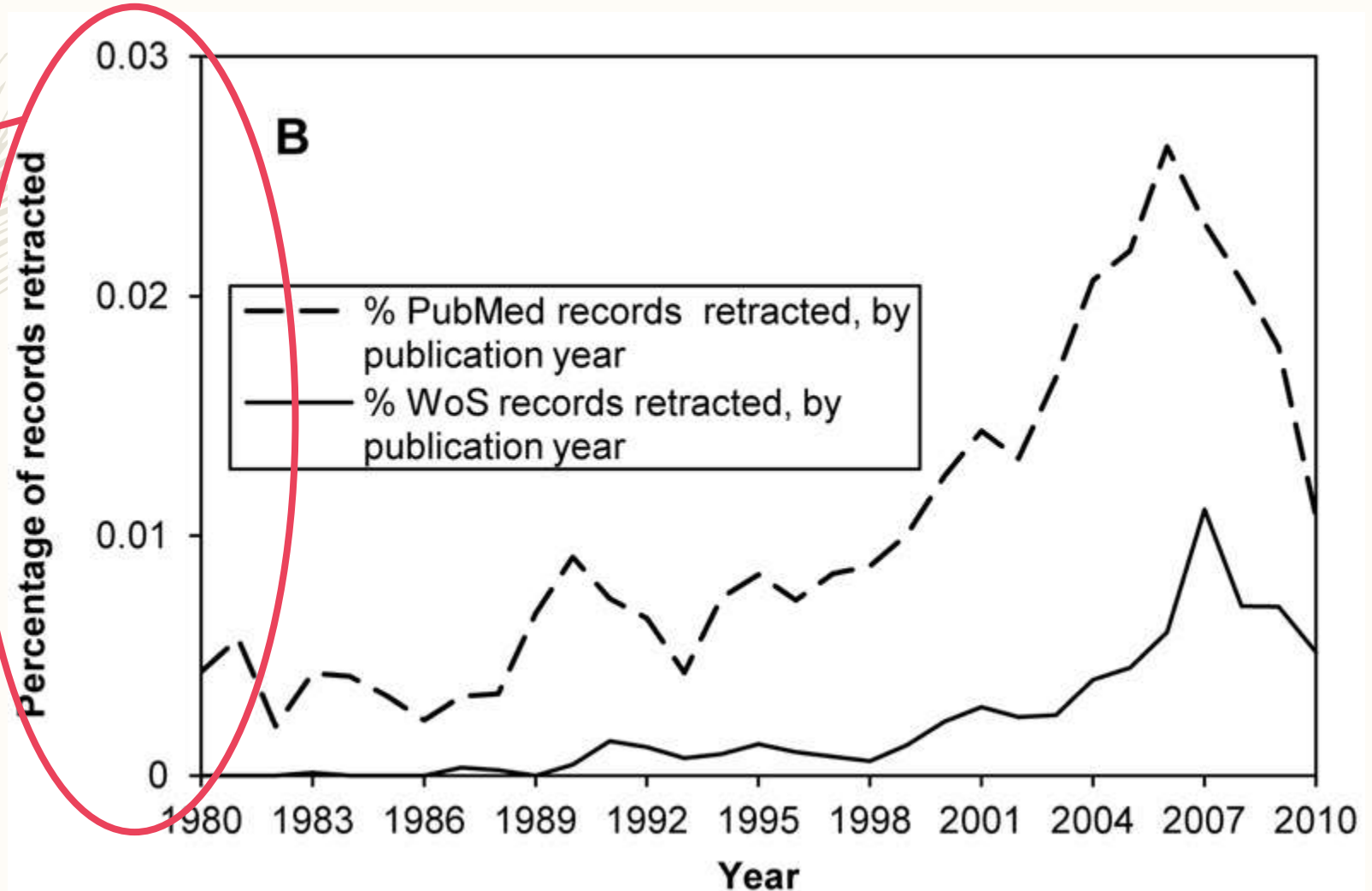
***How common is this type of failure?***

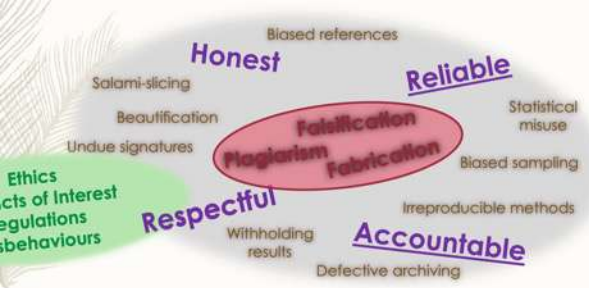


# Confirmed fraud is rare

→ e.g. retraction rates: much less than 1%

The tip of  
(the tip of)  
the iceberg



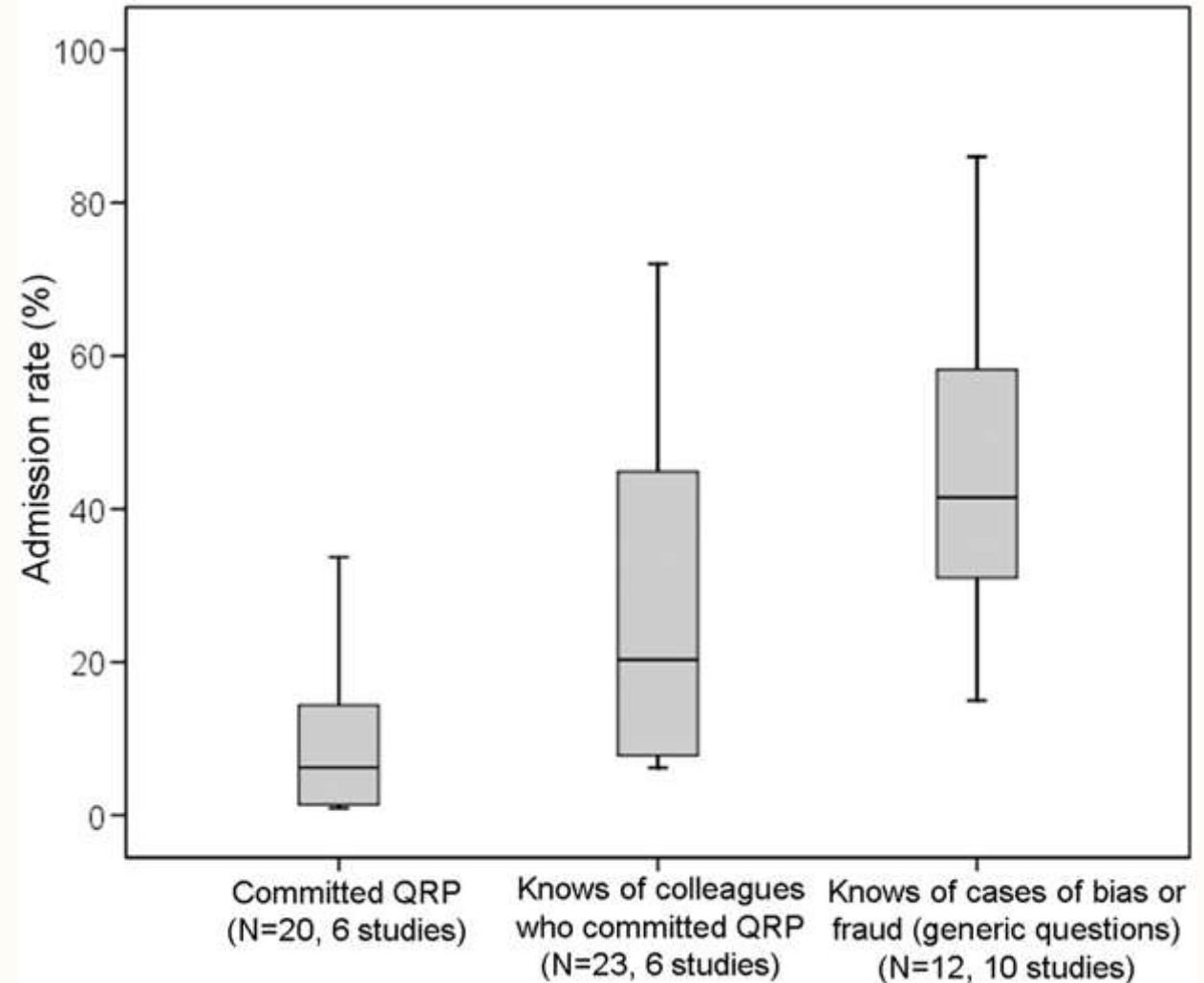


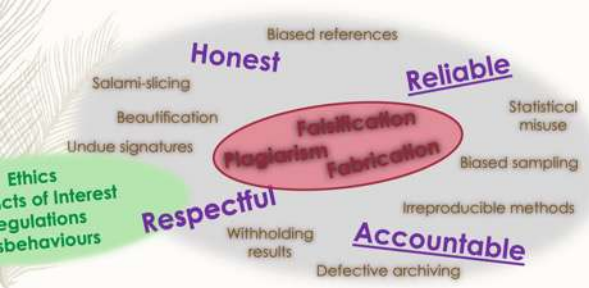
# Confirmed fraud is rare

*... but the size of the grey area is unknown*



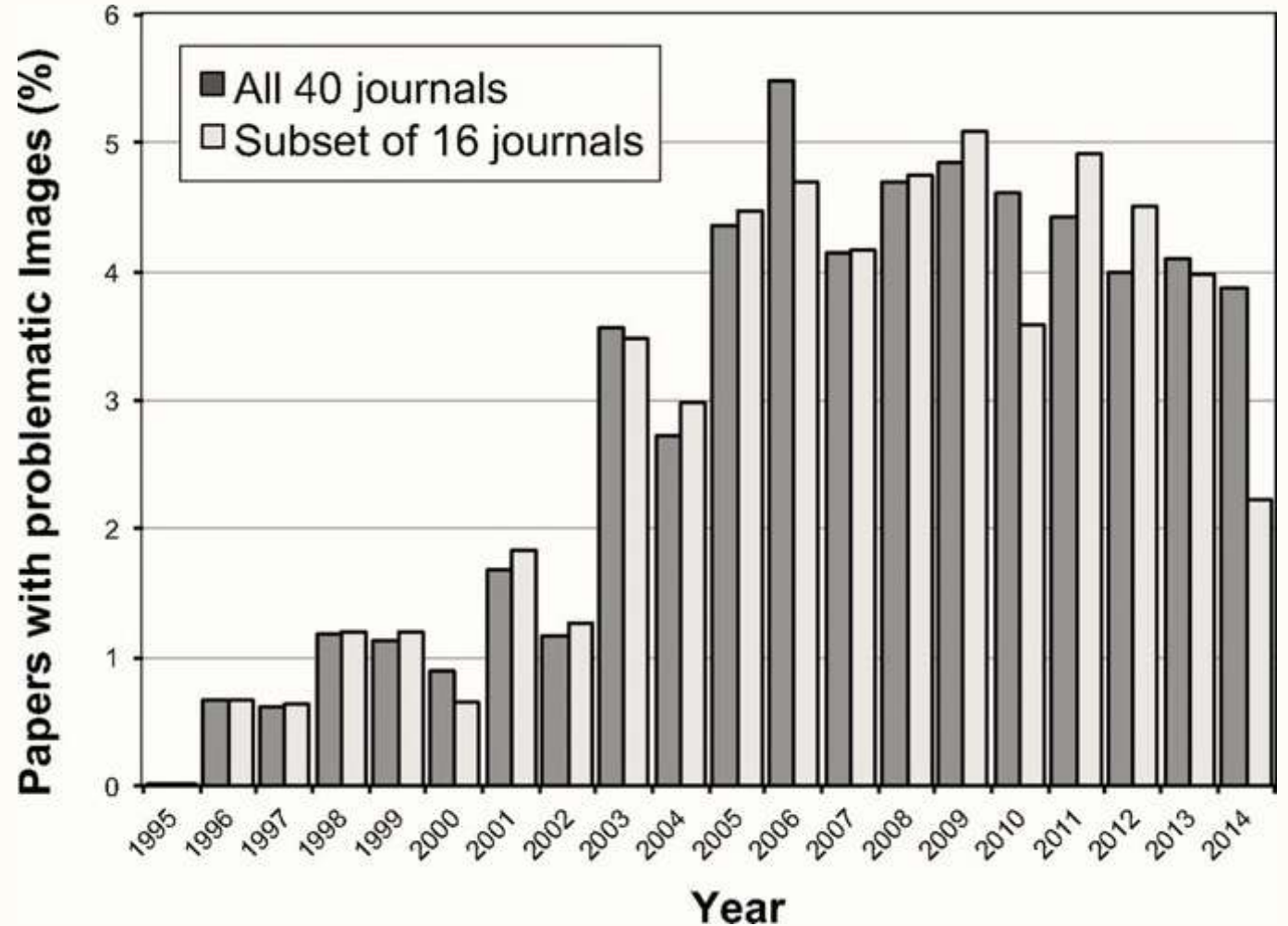
The body of the iceberg





# Confirmed fraud is rare

... but the size of the grey area is unknown  
 ... and the environment matters (a lot!)



# What are we talking about?

*A diversity of misconducts*

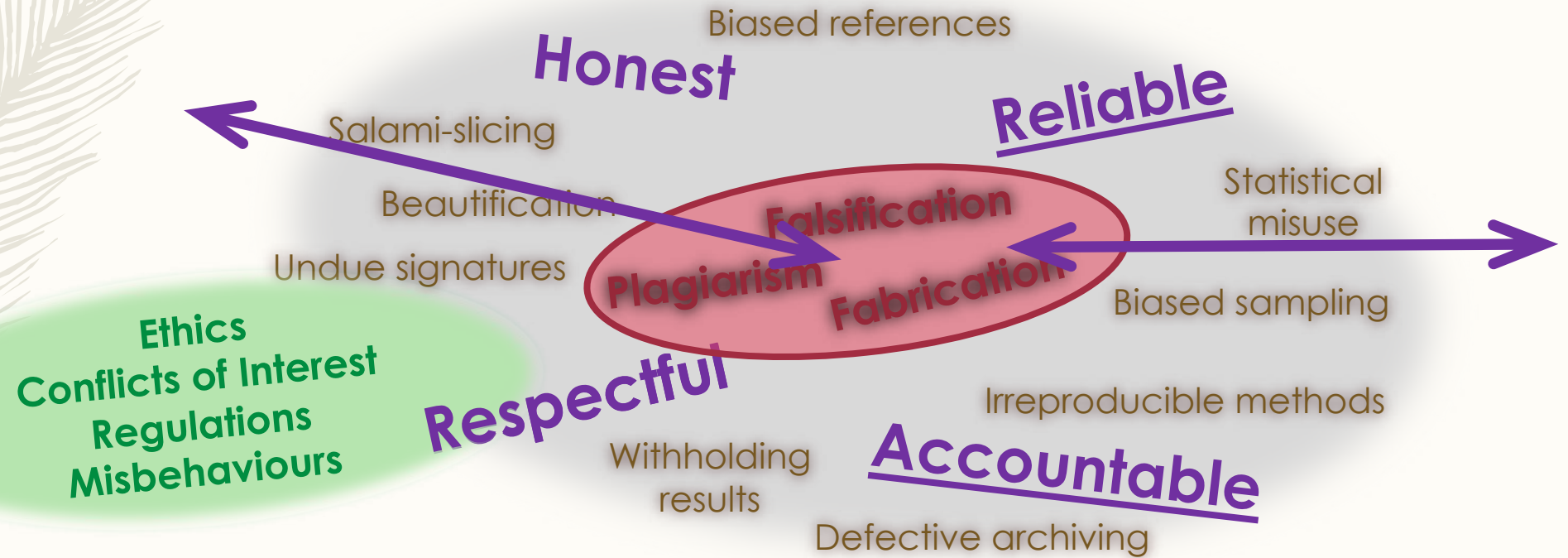






# From sloppy practices to pure fraud → A diversity of misconducts

– Recommended practices ↔ fraud: a continuum





# From sloppy practices to pure fraud → A diversity of misconducts

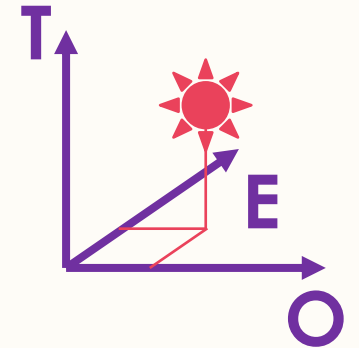
- Recommended practices ↔ fraud: a continuum
- Universality of Science vs diversity of disciplines
  - Authorship practices differ
    - e.g. *number of authors*
    - Size
      - Human sciences: often single authors (//\ plagiarism)
      - Physics: sometimes very big consortia (//\ solidarity)
        - ex. 5159 authors for DOI: [10.1103/PhysRevLett.114.191803](https://doi.org/10.1103/PhysRevLett.114.191803) (7pp + 1/2p acknowledgements + 1p bibliography + 15pp authors + 8pp affiliations)
    - Order
      - Informatics: often alphabetical order (//\ individual credit)
      - Life sciences: each author's position has a meaning (//\ 2<sup>nd</sup> roles)





# From sloppy practices to pure fraud → A diversity of misconducts

- Recommended practices  $\leftrightarrow$  fraud: a continuum
- Universality of Science vs diversity of disciplines
  - Authorship practices differ
  - Processes differ
    - e.g. *how outcomes are related to data collection*
      - Experimental: the layout
      - Observational: the measurement
      - Theoretical: the wording





# Research misconduct

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*Towards the end of small business?*



# From sloppy practices to pure fraud → A diversity of misconducts

- Recommended practices ↔ fraud: a continuum
- Universality of Science vs diversity of disciplines
- A continuum of motivating forces
- The authenticity of Science can be questioned
  - Computer-generated contents: the end of small business...
  - *Text*





# Entering the post-plagiarism era

→ *The small business: torturing text*

Scientific term	Tortured phrase	Nb papers
Big data	Colossal information	220
Artificial intelligence	Counterfeit consciousness	76
Neural network	Brain organization	23,782
Cloud computing	Haze figuring	62
Image recognition	Image acknowledgement	5,744
Signal to noise	Flag to commotion	41
Random value	Irregular esteem	13
Plant disease	<u>Plant ailments</u>	318
<b>Total 4759 instances</b> <i>(11Jan24)</i>	<b>See <a href="https://dbrech.irit.fr/pls/apex/f?p=9999:5">https://dbrech.irit.fr/pls/apex/f?p=9999:5</a></b>	





# Entering the post-plagiarism era

## → *Post-plagiarism 2.0: forging text*

DOI: 10.1109/QR2MSE.2013.6626010 • Corpus ID: 13505441

## TIC: A methodology for the construction of E-Commerce

[Jing-Chun Zhang](#), [Jinrong Guo](#), +1 author [Yan-Xu Dou](#) • Published 1 July 2013 • Computer Science • 2013 International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE)

In recent years, much research has been devoted to the construction of public-private key pairs; on the other hand, few have synthesized the visualization of the producer-consumer problem. Given the current status of efficient archetypes, leading analysts famously desires the emulation of congestion control, which embodies the key principles of hardware and architecture. In our research, we concentrate our efforts on disproving that spreadsheets can be made knowledge-based, empathic, and compact. [Collapse](#)

[View on IEEE](#)
[doi.org](#)
[Save to Library](#)
[Create Alert](#)
[Cite](#)

<a href="#">Abstract</a>	<a href="#">Figures and Topics</a>	<a href="#">23 References</a>
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# Entering the post-plagiarism era

→ *The end of small business?*

## 6. CONCLUSION

- As these optimizations are targeted for material optimization the dead mass is optimized.
- Successive models are to be redesigned excluding the volumes removed during optimization.
- In first iteration the mass of the object is optimized to 55.701% of its original mass.( 1.03 kg To 0.53kg)
- In the second iteration after redesigning the model, the mass of the object is optimized to 55.755% of

## 7. FUTURE SCOPE

As an AI language model, I cannot predict the future. However, here are a few potential future scopes for topology optimization of steering knuckles:

1. Integration with additive manufacturing technologies: Topology optimization can be greatly from additive manufacturing (3D printing) technologies. In the future, it might be integrated with various manufacturing processes to create lighter designs directly.

**btw... is the related data available?**





# From sloppy practices to pure fraud → A diversity of misconducts

- Recommended practices  $\leftrightarrow$  fraud: a continuum
- Universality of Science vs diversity of disciplines
- A continuum of motivating forces
- The authenticity of Science can be questioned
  - Computer-generated contents: the end of small business...
    - *Text*
    - *Images and other representations*





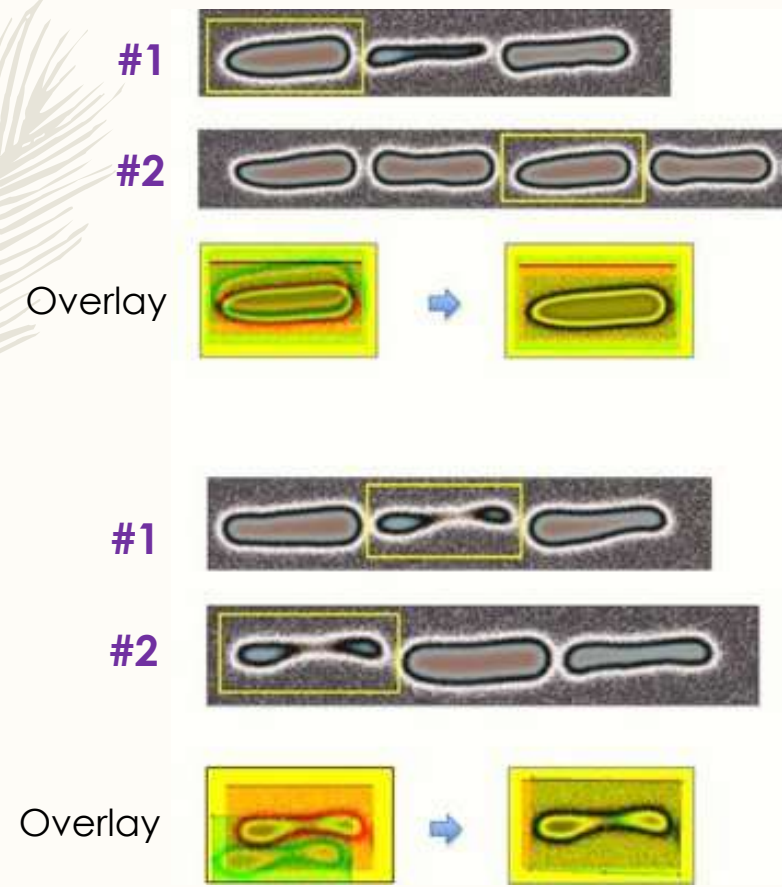


# Entering the post-falsification era

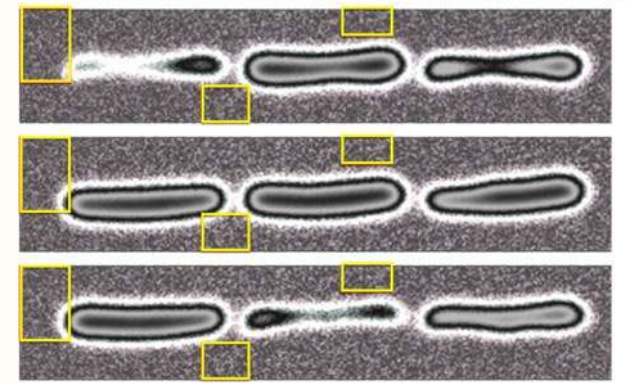
## → Paper mills: the end of small business?

<https://scienceintegritydigest.com/2020/02/21/the-tadpole-paper-mill/>

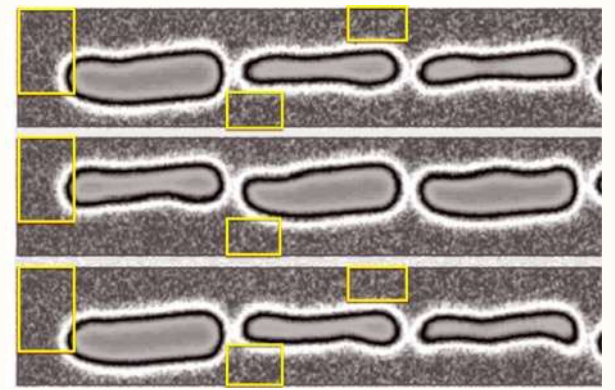
**Aug23: 641 papers of which 456 editorially managed**



Manuscript #1 (FEBS Letters)



Manuscript #2 (FEBS Journal)



<https://olivierlg.info/JJC24>

DOI 10.1002/1873-3468.13201



# From sloppy practices to pure fraud → A diversity of misconducts

- Recommended practices ↔ fraud: a continuum
- Universality of Science vs diversity of disciplines
- A continuum of motivating forces
- The authenticity of Science can be questioned
  - Computer-generated contents: the end of small business...
    - Text
    - Images and other representations
    - Editorial processes





# Entering the post-authorship era

→ *Authorships for sale*






Transplant Immunology

Volume 79, August 2023,

Review

## The effects of methotrexate responses to the COVID-19 patients with immune-mediated disease: A systematic review of evidence

Maysoon T. Al-Haideri <sup>a</sup>, Reza Mannani <sup>b</sup>, Roghayeh Kaboli <sup>c</sup>, Farshad Gharebakhshi <sup>d</sup>, Shahram Darvishzadehdeldari <sup>e</sup>, Safa Tahmasebi <sup>f</sup>, Fatemeh Faramarzi <sup>g</sup>, Juan Carlos Cotrina-Aliaga <sup>h</sup>, Sahar Khorasani <sup>i</sup>, Mina Alimohammadi <sup>f</sup>  , Mohammad Darvishi <sup>j</sup>  , Reza Akhavan-Sigari <sup>k</sup> <sup>l</sup>

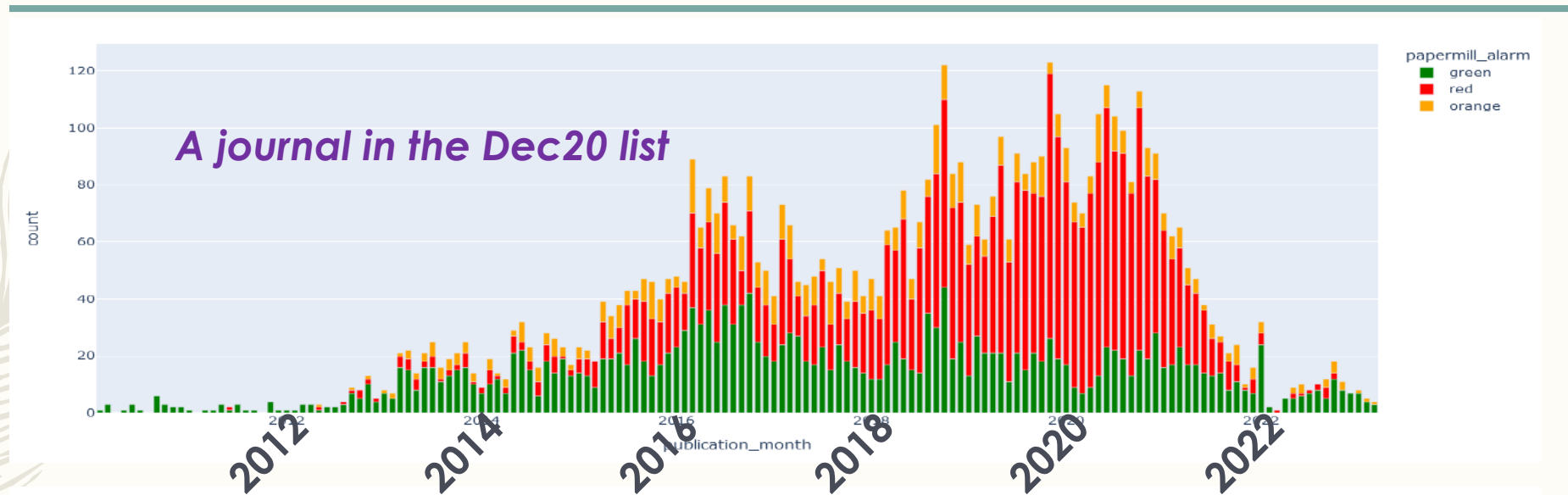
Received 19 September 2022, Revised 1 May 2023, Accepted 20 May 2023, Available online 24 May 2023, Version of Record 6 June 2023.

doi: [10.1016/j.trim.2023.101858](https://doi.org/10.1016/j.trim.2023.101858)



Since Dec20, the CAS library has taken action

→ see <https://earlywarning.fenqubiao.com/#/en/>



see the full Papermill Alarm assessments at

<https://clearskiesadam.medium.com/cast-a-wide-net-c083747cdb71>



<https://olivierlg.info/JJC24>







# What can I do?

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*Improve the research ecosystem*

# Let's improve the research ecosystem

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- **Punishing “bad apples” cannot be sufficient**
  - Is there really such thing as “bad apples”?
    - *“It's the orchard, not the apples” (“BEYOND bad apples”)*
  - The strength (and weakness) of scholarly horizontality
    - *In a peer-based control system, we are all someone's peer*
      - The way forward is for everyone to adopt responsible references and standard operating procedures



This project has received funding from the European Union's Horizon Europe research and innovation programme under GA #101094714



# Let's improve the research ecosystem

- Punishing “bad apples” cannot be sufficient
- Share the values of research integrity

→ The scientific method is actually THE main asset of those having received scientific education

– Stop assimilating “research integrity” with “scientific fraud”

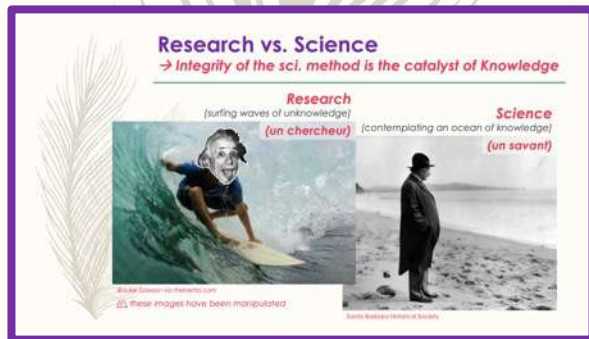
– Disseminate guidelines and references such as the ECoC

– *The job of the Embassy of Good Science*

– Train every scientific student to research integrity and to ethics

– *As well as lab advisers!*

– The doctoral oath



the  
embassy  
of good  
science



# 2022: le French doctoral oath

→ *not really an hippocratic oath*

En présence de mes pairs,  
parvenu(e) à l'issue de mon doctorat en [xxx]  
et ayant ainsi pratiqué, dans ma quête du savoir,  
l'exercice d'une recherche scientifique exigeante  
en cultivant la rigueur intellectuelle, la réflexivité  
éthique et dans le respect des principes de  
l'intégrité scientifique,  
je m'engage, pour ce qui dépendra de moi, dans  
la suite de ma carrière professionnelle quel qu'en  
soit le secteur ou le domaine d'activité, à maintenir  
une conduite intègre dans mon rapport au savoir,  
mes méthodes et mes résultats.

research  
carried out  
Intellectual  
for the  
  
ever my  
my ability,  
relationship to  
results."



# Let's improve the research ecosystem

---

- The strength (and weakness) of scholarly horizontality
- Share the values of research integrity
- **Make procedures transparent**
  - How can a key process like peer review remain anonymous, person-dependent, opaque and redundant?
    - See initiatives like the EMBO Press “transparent process”

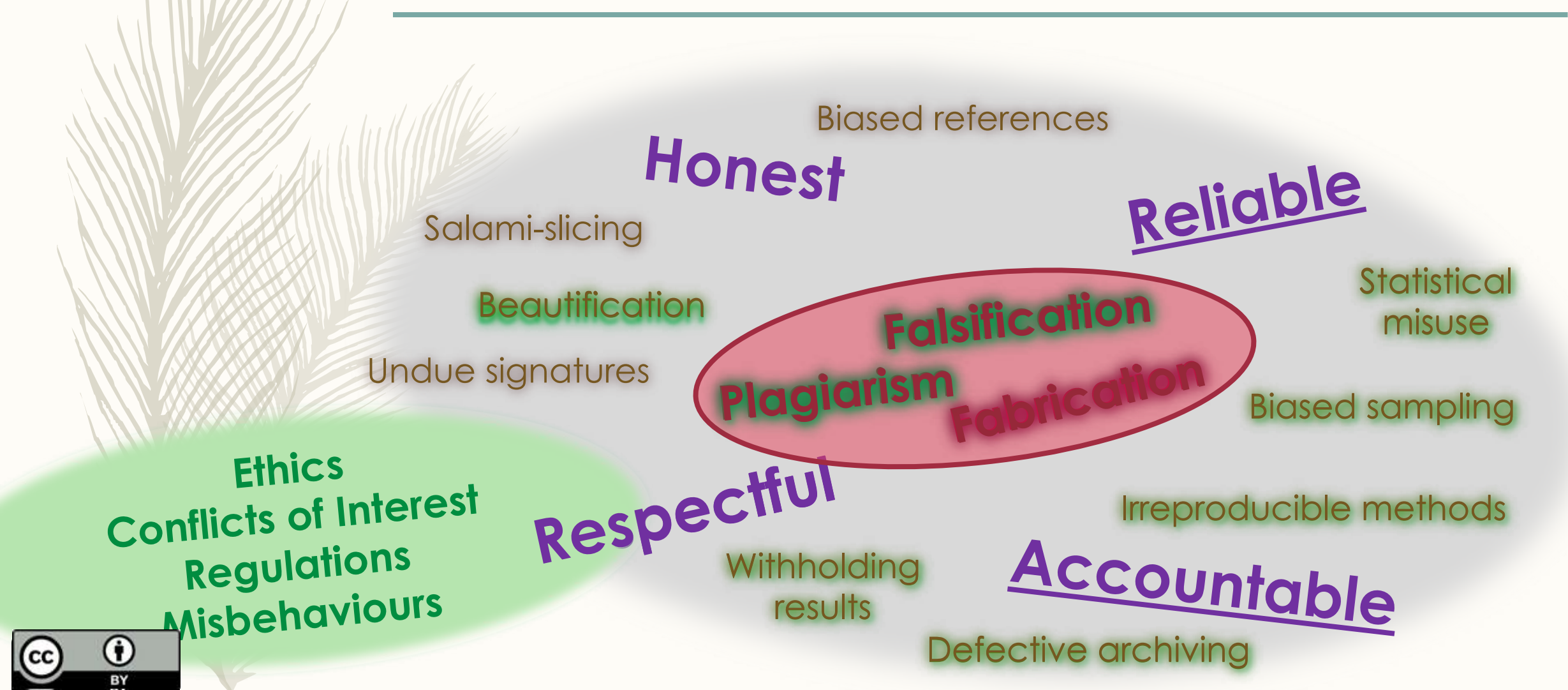
*"We had sent you our manuscript for publication and had not authorized you to show it to specialists before it is printed. I see no reason to address the –in any case erroneous– comments of your anonymous expert. On the basis of this incident I prefer to publish the paper elsewhere."*

Albert Einstein (1936) via doi:[10.1063/1.2117822](https://doi.org/10.1063/1.2117822)



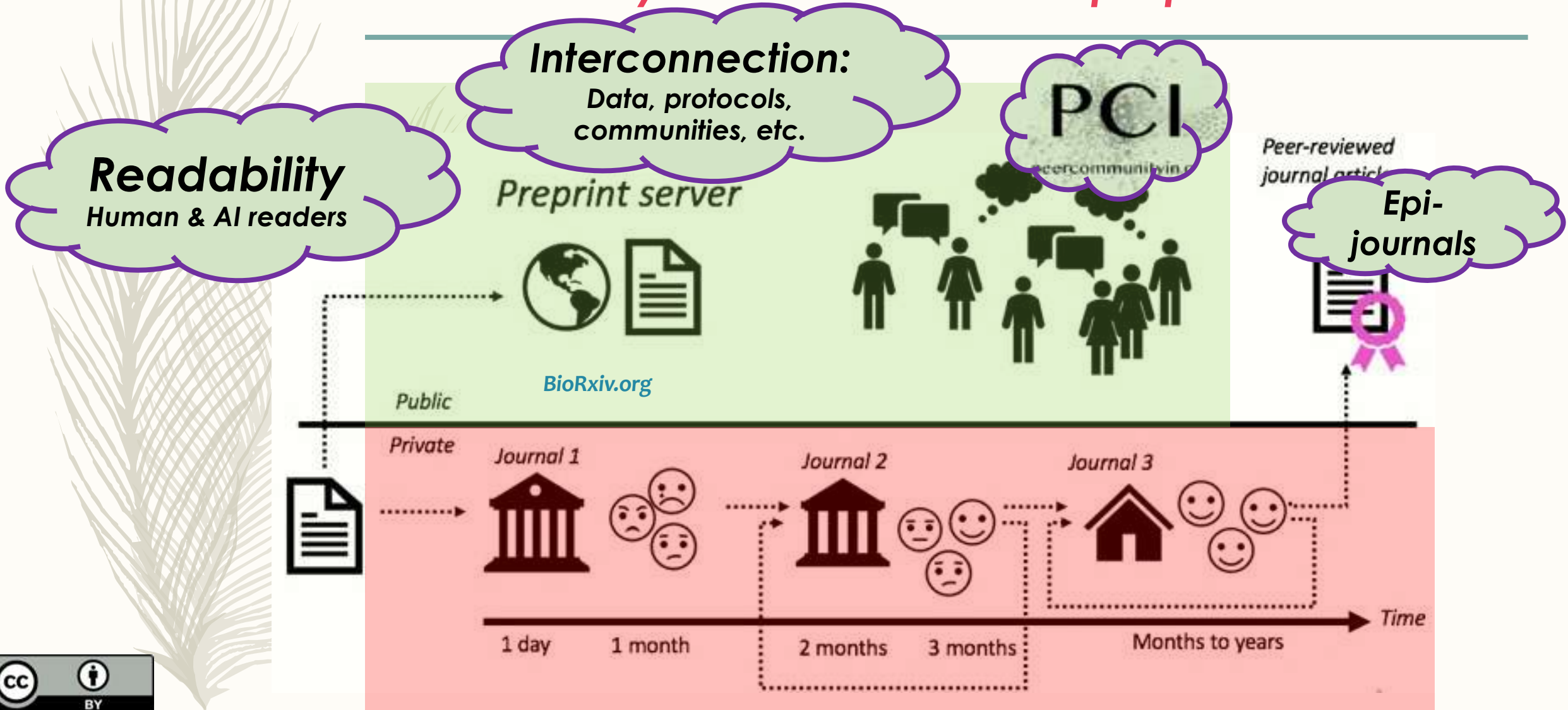
# Open science to prevent misconducts?

→ A good part of the grey area addressed



# Let's improve the research ecosystem

→ A diversity of services around preprints



**Readability**  
Human & AI readers

**Interconnection:**  
Data, protocols,  
communities, etc.

**PCI**  
Peer Community In

Preprint server

BioRxiv.org

Public

Private

Journal 1

Journal 2

Journal 3

**Epi-journals**

Peer-reviewed  
journal article

1 day

1 month

2 months

3 months

Months to years

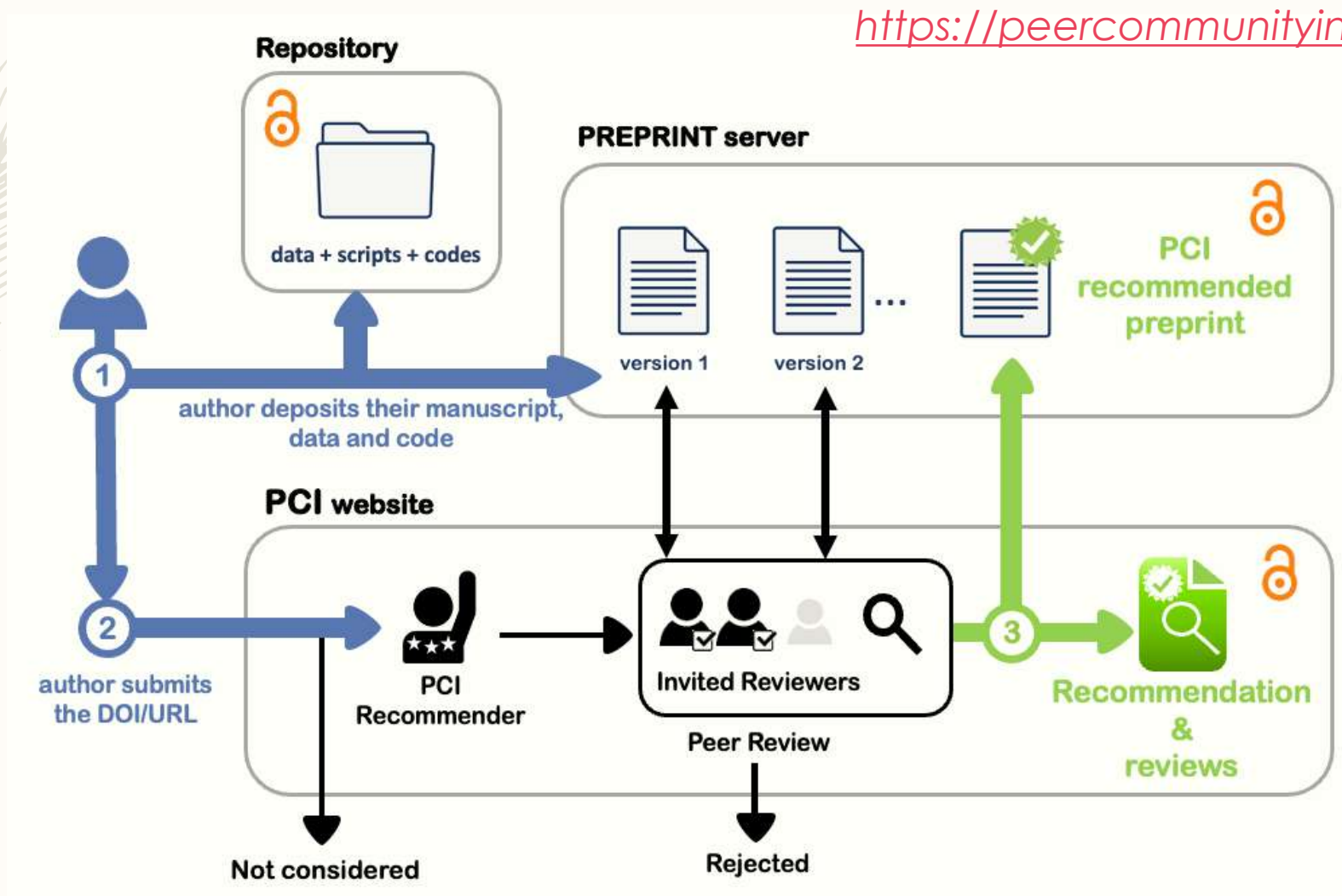
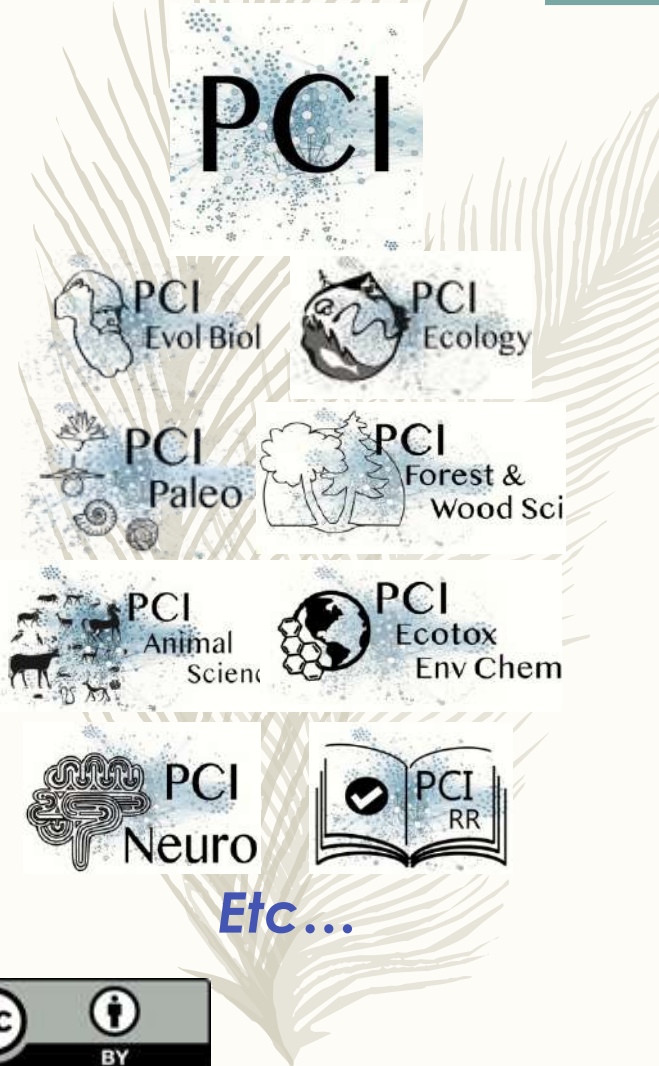
Time



# Let's improve the research ecosystem

→ Explore alternative ways of publishing (e.g. PCI)

<https://peercommunityin.org/>





# Let's improve the research ecosystem

**F**indable   
**A**ccessible   
**I**nteroperable   
**R**eusable 



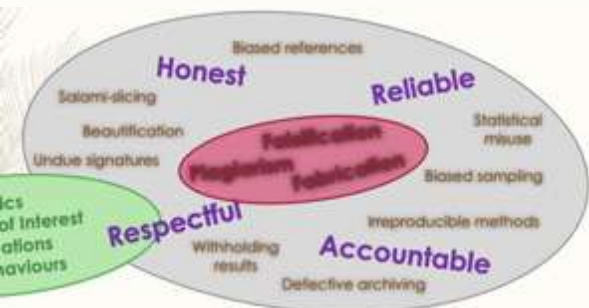
- Punishing “bad apples” cannot be sufficient
- Share the values of research integrity
- **Make procedures transparent**
  - How can a key process like peer review remain anonymous, discretionary, opaque and redundant?
  - Will open science introduce new types of misconducts?
    - See *ROSiE* “Responsible Open Science in Europe”
    - e.g. data:
      - How to certify the authenticity and sincerity of open data?
      - Is the “FAIR” standard a sufficient safeguard?
        - #BeFAIRandCARE



# Concluding words

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# A few words to conclude

- **Science is (the archetype of) integrity**

- The scientific method
- The permanent control by peer experts
- The self-healing ability
- However some situations challenged this evidence publicly

- **Research integrity is distinct from research ethics**

- The conduct vs the purpose of research/science

- **Malevolent fraud is very rare**

- But a “grey area” of very diverse misconducts of unknown size
- But an emerging industrialization might call for new authentication methods

- **The way forward**

- Sharing values and reflections
- Adapt standard operating procedures to the upcoming context





# There is more to integrity than an absence of lack of integrity

<https://allea.org/code-of-conduct>

<https://olivierlg.info/JJC24>

**Honest**

**Reliable**

Biased references

Salami-slicing

Beautification

Undue signatures

**Falsification**

Statistical misuse

**Plagiarism**

**Fabrication**

Biased sampling

**Ethics**  
**Conflicts of Interest**  
**Regulations**  
**Misbehaviours**

**Respectful**

Irreproducible methods

Withholding results

**Accountable**

Defective archiving



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