



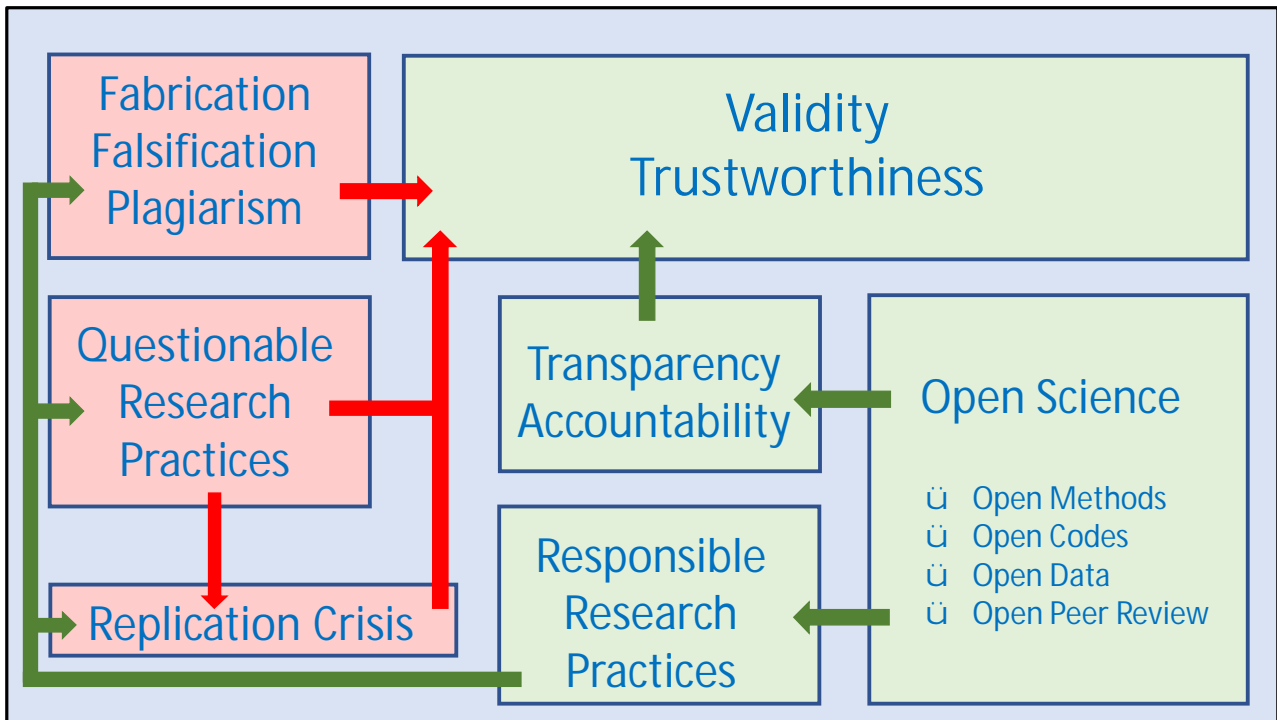
How can we foster research integrity

Lex Bouter

2022-07-07 How can we foster RI – Queen Mary University – London - UK – 45 minutes in total (20 presentation and 25 interaction).

Content

- § How research integrity and open science hang together
- § National Survey on Research Integrity
- § Drivers of research integrity
- § What can research institutes do?



During the last decade there has been a shift from detecting and sanctioning FFP via prevention of QRPs towards stimulating RRP. During that same decade open science gained momentum and it also became clear that the replication crisis is driven by QRPs (selective reporting first and foremost).

This slide shows how research integrity, the replication crisis and open science hang together. Red arrows indicate an undesirable impact, like lowering research quality, truth and trust or increasing the replication crisis. Green arrows depict effects we want to see: more transparency, more accountability, more truth, more more trust, higher research quality, less replication crisis, less FFP and less QRPs.

Open science modalities have the potential to strenghten the validity and trustworthiness of research.



National Survey on **Research Integrity**

www.nsri2020.nl

@SurveyIntegrity



Gowri Gopalakrishna



Towards a Responsible Research Climate
Findings from academic researchers in Amsterdam

Tamarinde Haven

www.amsterdamresearchclimate.nl


<https://www.nrin.nl/docman/theses/41-phd-thesis-tamarinde-haven/file>

- § Haven TL, Tijdkink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (<https://doi.org/10.1371/journal.pone.0210599>).
- § Haven TL, de Goede MEE, Oort FJ. Personally perceived publication pressure: revising the Publication Pressure Questionnaire (PPQ) by using work stress models. Research Integrity and Peer Review (2019) 4:7 (<https://doi.org/10.1186/s41073-019-0066-6>)
- § Haven TL, Bouter LM, Smulders YM, Tijdkink JK. Perceived publication pressure in Amsterdam: survey of all disciplinary fields and academic ranks. PLoS ONE 2019; 14: e0217931. (<https://doi.org/10.1371/journal.pone.0217931>)
- § Haven T, Tijdkink J, Pasman HJ, Widdershoven G, ter Riet G, Bouter L. Do research misbehaviours differ between disciplinary fields? A mixed methods study among academic researchers in Amsterdam. Research Integrity and Peer Review 2019; 4:25. <https://doi.org/10.1186/s41073-019-0081-7>
- § Haven T, Tijdkink T, Martinson B, Bouter L, Oort F. Explaining variance in perceived

research misbehavior: results from a survey among academic researchers in Amsterdam. Research Integrity and Peer Review 2021; 6: 7. <https://rdcu.be/cjUlq>

www.nsri2020.nl


- § Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023>
- § Gopalakrishna G, Wicherts JM, Vink G, Stoop I, van den Akker O, ter Riet G, Bouter L. Prevalence of responsible research practices and their potential explanatory factors: a survey among academic researchers in The Netherlands. MetaArXiv (6 July 2021). (<https://doi.org/10.31222/osf.io/xsn94>)

Most prevalent (5/11) QRPs (score 5,6,7)	Prevalence (%)	 National Survey on Research Integrity
Not submitting or resubmitting a valid negative publication	17.5	
Insufficient mentioning of study flaws and limitations in publications	17.0	
Insufficiently supervised or mentored junior co-workers	15.0	
Insufficient attention to equipment, skills or expertise	14.7	
Inadequate notes of research proces	14.5	

11 QRPs were assessed on a 7-pointscale raging from 1 (never) to 7 (always) referring to the last 3 years.

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023>

QRP/FF	Prevalence (%)	 National Survey on Research Integrity
Any Frequent QRP (at least 1/11 QRPs with a score of 5,6,7)	51.3	
Fabrication (making up data or results)	4.3	
Falsification (manipulating research materials, data or results)	4.2	
Any FF (either fabrication or falsification or both)	8.3	

11 QRPs were assessed on a 7-pointscale ranging from 1 (never) to 7 (always) referring to the last 3 years.

Fabrication and Falsification was assessed by a dichotomous question (yes/no) referring to the last 3 years.

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023.

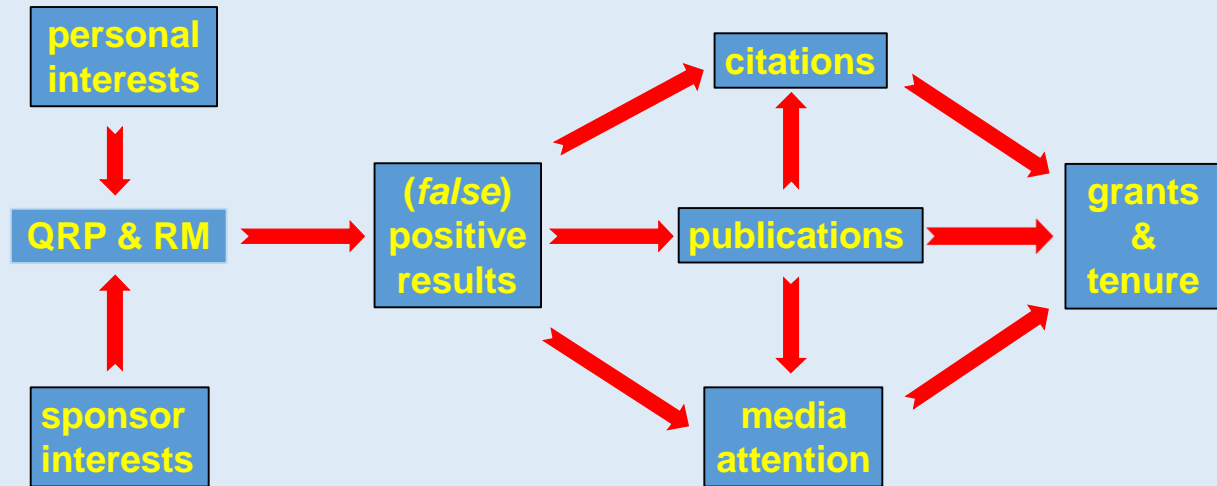
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023>



Many rewards in academia are linked to having positive and spectacular results as these are published more easily in high impact journals and will be cited more often.

The various Questionable Research Practices (QRPs) have in common that they can effectively help to get these positive and spectacular results.

How things can go wrong



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This slide shows – in a simplified way – how things can go wrong.

In most disciplines the proportion of papers reporting positive results increases over time. Positive results are published and cited more often, and also get more media attention. This will probably increase the likelihood of getting grants and tenure. We have also some evidence that conflicts of interest and sponsor interests may lead to sloppy science or worse. QRP and RM can effectively help to get (false) positive results.

Negative findings are so unpopular that often these are not reported at all. This mechanism will lead to publication bias, selective reporting and selective citation. Especially small studies with positive outcomes will predominantly be chance findings. These phenomena will distort the published record and can explain the large replication difficulties some fields (e.g. preclinical research) experience.

Personal interests and sponsor interests can lead to QRP and RM also if researchers are not aware of it. Many of us want to please our sponsor with a view to motivate them to keep funding our work. That could lead for instance to subtle flaws in the study design, to selective reporting and to spin in the report of the results of the

study.

There is evidence for some of the relations suggested in this slide, but no or only little evidence for most of them. We really need more solid empirical research to clarify how these things work. Gaining this knowledge is important for effectively fostering RCR and preventing QRP and RM.

Functioning of moral compass depends on:

§ Individual factors:

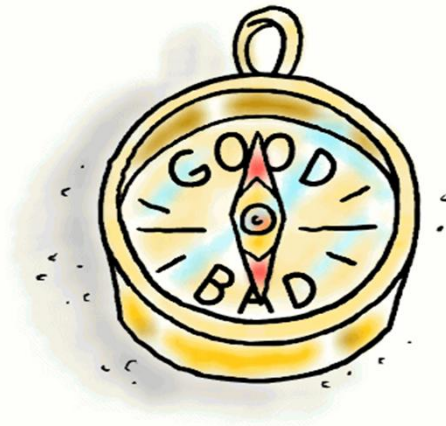
virtuousness of the individual

§ Institutional factors:

research climate in the lab

§ Systemic factors:

adequate incentives




Researchers navigate the dilemmas in their work with their moral compass. The quality of this compass depends on how virtuous the researcher at issue is.

But there are also strong other drivers of their behaviour in the direct professional environment and the system of science at large.

That doesn't diminish the personal responsibility to behave well in research. In fact it makes personal responsibility larger: individual researchers also have to help to improve the research climate and to remove perverse incentives.

Explanatory Factors	ORP	RM	RRP
Likelihood of detection (reviewers)		↓	
Publication pressure	↑		↓
Following academic norms	↓	↓	↑
Organizational justice	↓		
Mentoring (survival)	↑		
Mentoring (responsible)	↓		↑
Competitiveness	↑		
Work pressure	↑		↑
Funding pressure			↑



Arrows refer indicate the association of the explanatory at issue with the outcome listed. Green arrows indicated associations with better research integrity, red arrows indicate association with worse research integrity. These effects were derived from a multivariable regression model containing five background variables and all explanatory factors.

Please remember that the data come from a cross-sectional study and by no means 'prove' causality.

Gopalakrishna G, ter Riet G, Vink G, Stoop I, Wicherts J M, Bouter L. Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. PLoS One 2022; 17: e0263023.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263023>

Gopalakrishna G, Wicherts J M, Vink G, Stoop I, van den Akker O, ter Riet G, Bouter L. Prevalence of responsible research practices among academics in The Netherlands [version 1; peer review: awaiting peer review]. F1000Research 2022; 11: 471.

<https://doi.org/10.12688/f1000research.110664.1>

Mertonian norms



Communism (scientific knowledge is not private property. Scientists must share it with the scientific community, otherwise knowledge cannot grow.)

Universalism (whether scientific knowledge is judged as true or false is judged by universal, objective criteria)

Disinterestedness (being committed to discovering knowledge for its own sake)

Organised scepticism (no knowledge claim is regarded as 'sacred'. Every idea open to questioning, criticism and objective investigation.)

https://en.wikipedia.org/wiki/Mertonian_norms

Originally published as: Merton RK. Science and technology in a democratic order. *Journal of Legal and Political Sociology*. 1942; 1: 115-26.

Reproduced as Chapter 13 (p. 267 – 78) of Merton RK. *The sociology of science: theoretical and empirical investigations*. Chicago, University of Chicago Press, 1973.

Aspiring to greater intellectual humility in science

Rink Hoekstra^{1,4} and Simine Vazire^{2,3,4}

0. Title and abstract	0.1. The abstract should describe the limitations of the study and boundary conditions of the conclusion(s)
	0.2. Titles should not state or imply stronger claims than are justified (for example, causal claims without strong evidence)
1. Introduction	1.1. The novelty of research should not be exaggerated
	1.2. Selective citation should not be used to create a false sense of consistency or conflict in the literature
2. Methods	2.1. The methods section should provide all the details that a reader would need to evaluate the soundness of the methods and to conduct a direct replication
	2.2. The timing of decisions about data collection, transformations, exclusions and analyses should be documented and shared
3. Results	3.1. Detailed information about the data and results (including informative plots and information about uncertainty) should be provided
	3.2. It should be transparent which analyses were planned and where those plans were documented; weaker conclusions should be drawn to the extent that analyses were susceptible to data-dependent decision-making

<https://doi.org/10.1038/s41562-021-01203-8>

Aspiring to greater intellectual humility in science

Rink Hoekstra^{1,4} and Simine Vazire^{2,3,4}

4. Discussion	4.1. The statistical uncertainty of results should be incorporated into the narrative conclusions drawn from the results
	4.2. The research summary should capture the full range of results (for example, include our 'most damning result')
	4.3. Causal claims should be only as strong as the internal validity of the study allows
	4.4. Claims about generalizability should be only as strong as the sampling of participants, stimuli and settings allows
	4.5. All conclusions should be calibrated to the confidence in the construct validity of the measures and manipulations
	4.6. Alternative interpretations should be presented in their strongest possible form ('steelmanned')
	4.7. A discussion of the limitations should be incorporated throughout the discussion section, rather than bracketed off in a subsection
5. Post publication guidance for authors	5.1. Insist that press releases and reporters capture the limitations of the work, and correct outlets that exaggerate or misrepresent
	5.2. Encourage criticism, correction and replication of the work, and respond non-defensively when errors or contradictory evidence are brought to light
	5.3. When appropriate, retract papers, issue corrections or publish 'loss of confidence' statements

<https://doi.org/10.1038/s41562-021-01203-8>



<https://wellcome.org/reports/what-researchers-think-about-research-culture>

https://russellgroup.ac.uk/media/5925/realising-our-potential-report_4-compressed.pdf?=section2

<https://russellgroup.ac.uk/media/5924/rce-toolkit-final-compressed.pdf?=section2>

https://russellgroup.ac.uk/media/5923/realising-our-potential-case-studies_3-compressed.pdf?=dl1

RESEARCH ARTICLE

Perceptions of **research integrity climate** differ between academic ranks and disciplinary fields: Results from a survey among academic researchers in Amsterdam

Tamarinde L. Haven^{1*}, Joeri K. Tijdkink^{1,2}, Brian C. Martinson³, Lex M. Bouter^{1,2}

RESEARCH ARTICLE


Perceived **publication pressure** in Amsterdam: Survey of all disciplinary fields and academic ranks


Tamarinde L. Haven^{1*}, Lex M. Bouter^{1,2}, Yvo M. Smulders³, Joeri K. Tijdkink^{1,4}

RESEARCH

Explaining variance in perceived research misbehavior: results from a survey among academic researchers in Amsterdam

Tamarinde Haven^{1*}, Joeri Tijdkink^{1,2}, Brian Martinson^{3,4,5}, Lex Bouter^{1,6} and Frans Oort⁷

Open Access 



Research Integrity and Peer Review

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The Academic Research Climate Amsterdam study among UvA, VU and Amsterdam UMC explored Dutch research culture: www.amsterdamresearchclimate.nl

Preregistration of study protocol and data analysis plan: <https://osf.io/x6t2q/>

Publications:

- § Haven TL, Tijdkink JK, Martinson BC, Bouter LM. Perceptions of research integrity climate differ between academic ranks and disciplinary fields: results from a survey among academic researchers in Amsterdam. PLoS ONE 2019; 14: e0210599 (<https://doi.org/10.1371/journal.pone.0210599>).
- § Haven TL, de Goede MEE, Oort FJ. Personally perceived publication pressure: revising the Publication Pressure Questionnaire (PPQ) by using work stress models. Research Integrity and Peer Review (2019) 4:7 (<https://doi.org/10.1186/s41073-019-0066-6>)
- § Haven TL, Bouter LM, Smulders YM, Tijdkink JK. Perceived publication pressure in Amsterdam: survey of all disciplinary fields and academic ranks. PLoS ONE 2019;

14: e0217931. (<https://doi.org/10.1371/journal.pone.0217931>)

- § Haven T, Tijdkink J, Pasma HJ, Widdershoven G, ter Riet G, Bouter L. Do research misbehaviours differ between disciplinary fields? A mixed methods study among academic researchers in Amsterdam. *Research Integrity and Peer Review* 2019; 4:25. (<https://doi.org/10.1186/s41073-019-0081-7>)
- § Haven T, Tijdkink T, Martinson B, Bouter L, Oort F. Explaining variance in perceived research misbehavior: results from a survey among academic researchers in Amsterdam. *Research Integrity and Peer Review* 2021; 6: 7. <https://rdcu.be/cjUlq>

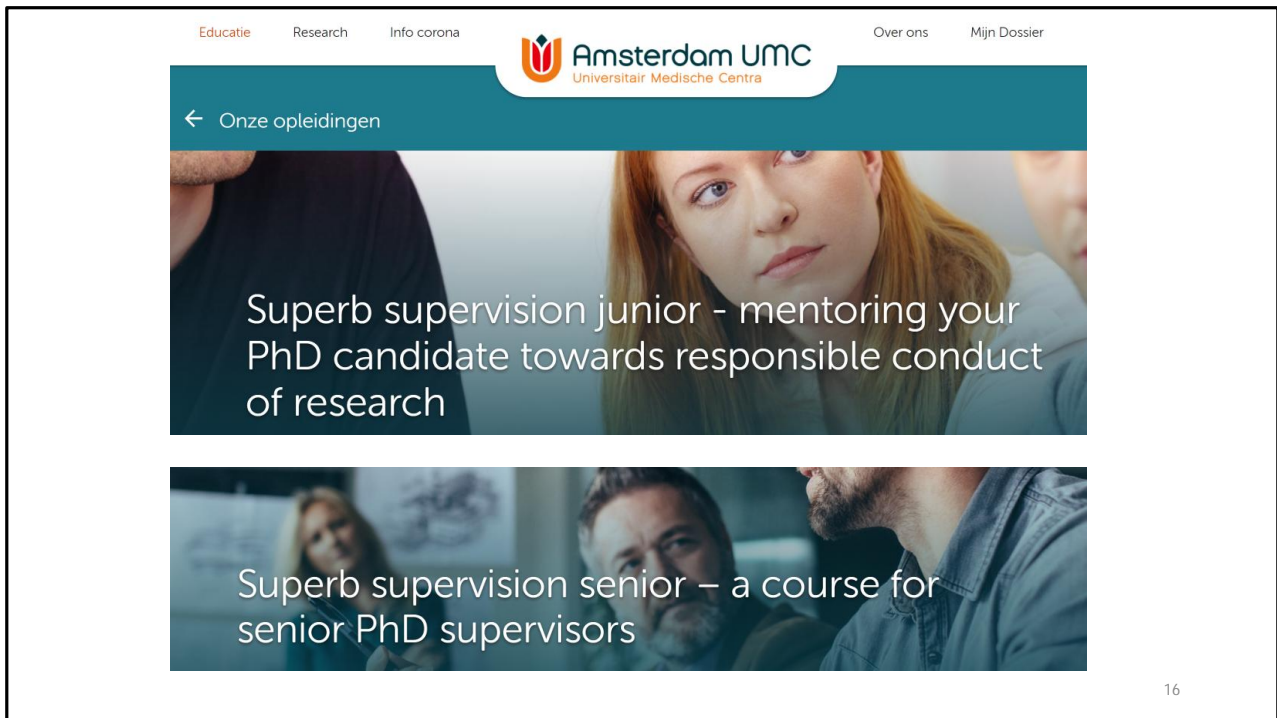
The Wellcome Trust published in 2020 a very informative survey results on how researchers perceive their culture: <https://wellcome.ac.uk/sites/default/files/what-researchers-think-about-the-culture-they-work-in.pdf>.

The UK Russell Group of research universities offer great materials to change research culture in the desired direction:

https://russellgroup.ac.uk/media/5925/realising-our-potential-report_4-compressed.pdf?section2

<https://russellgroup.ac.uk/media/5924/rce-toolkit-final-compressed.pdf?section2>

https://russellgroup.ac.uk/media/5923/realising-our-potential-case-studies_3-compressed.pdf?dl1



<https://www.vumc.nl/educatie/onze-opleidingen/opleidingsdetail/superb-supervision-junior-mentoring-your-phd-candidate-towards-responsible-conduct-of-research.htm>

<https://www.vumc.nl/educatie/onze-opleidingen/opleidingsdetail/superb-supervision-senior-a-course-for-senior-phd-supervisors.htm>

Haven T, Bouter L, Mennen L, Tijdink J. Superb Supervision: a pilot study on training supervisors to convey responsible research practices onto their PhD students. MetaArXiv (15 November 2021) <https://osf.io/preprints/metaarxiv/dxyng/>



Early career researchers can drive reform and make the difference. Here are some examples of networks that accelerate local change.

<https://www.ukrn.org/>

<https://reproducibilitea.org/>

<https://inosc-starter-kit.netlify.app/>



Assessment of researchers

- § Grant applications
- § Vacancies
- § Promotion
- § Tenure
- § Awards

Incentives works well

For *intended* effects:

- § More publications and citations

But also for *unintended* effects:

- § Focus on quantity, not quality
- § More plagiarism and duplicate publication
- § More 'salami slicing', gift authorship and use of predatory OA journals
- § Citation cartels and fake papers and fake peer reviewers
- § Stronger 'Matthew effect', less equity
- § Less time-consuming responsible research practices

All incentives can and will be gamed if stakes are high¹⁹

Both the upside and the downside of incentives is that they work so well. That means that if not carefully chosen they can do a lot of damage.

ESSAY

The Hong Kong Principles for assessing researchers: Fostering research integrity

PLoS Biology 2020; 18: e3000737



Research assessments should recognize responsible research practices

Narrative review of a lively debate and promising developments



Noémie AUBERT BONN¹ and Lex BOUTER²

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How to realize fair assessment procedures of researchers is outlined in the Hong Kong Principles.

The name Hong Kong refers to the city where the 6th WCRI was held in 2019. Before and during the conference we discussed the HKPs and after the conference they were endorsed by its participants.

Moher D, Bouter L, Kleinert S, Glasziou P, Sham MH, Barbour V, Coriat AM, Foeger N, Dirnagl U. The Hong Kong principles for assessing researchers: fostering research integrity. PLoS Biology 2020; 18: e3000737

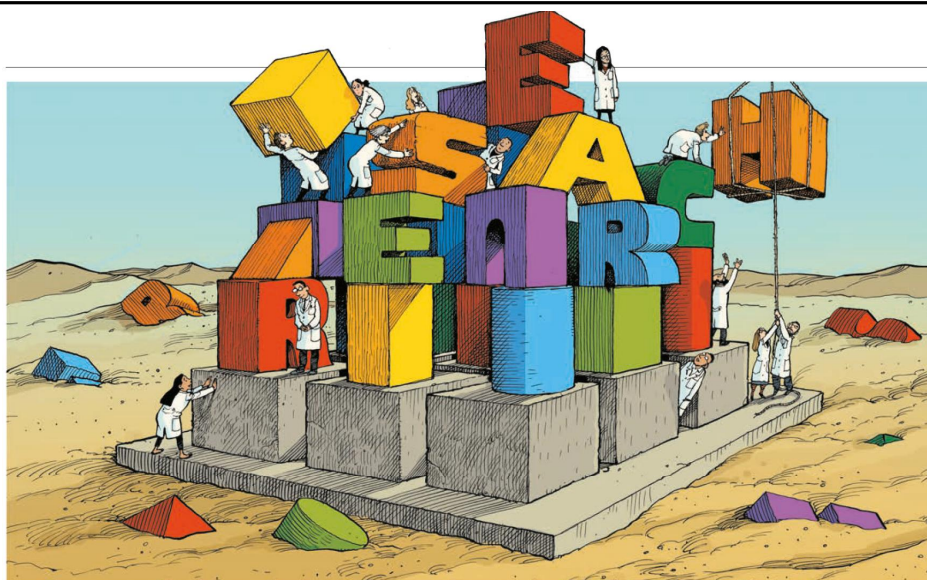
<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000737>

Please endorse the HKPs at www.wcrif.org/guidance/hong-kong-principles

On this webpage you can also find best practices, PP slides and a video on the HKPs.

More initiatives to improve the assessment of researchers are reviewed in:
Aubert Bonn N, Bouter L. Research assessments should recognize responsible research practices: narrative review of a lively debate and promising developments. MetaArXiv (19 July 2021).

<https://osf.io/preprints/metaarxiv/82rmj>



SOPs4RI

105 tools



Research integrity: nine ways to move from talk to walk

Nature 2020; 586: 358-60

21

Researchers need help from their institutions in avoiding questionable research practices.

In 2020 we published in Nature what these institutions should do specifically, based on research from a large EU consortium: <https://sops4ri.eu/>

Mejlgaard N, Bouter LM, Gaskell G, Kavouras P, Allum N, Bendtsen AK, Charitidis CA, Claesen N, Dierickx K, Domaradzka A, Reyes Elizondo A, Foeger N, Hiney M, Kaltenbrunner W, Labib K, Marušić A, Sørensen MP, Ravn T, Rea Ščepanović R, Tjeldink JK, Veltri GA. Research integrity: nine ways to move from talk to walk. Nature 2020; 586: 358-60. <https://www.nature.com/articles/d41586-020-02847-8>

The European Code of Conduct for Research Integrity (<http://www.allea.org/wp-content/uploads/2017/03/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf>) was

published in 2017 and made mandatory for research sponsored by the EU (Horizon 2020 and Horizon Europe). See page 6 of Horizon Europe Programme Standard Application Form (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf)

states:

We declare that the proposal complies with ethical principles (including the highest standards of research integrity as set out in the ALLEA European Code of Conduct for Research Integrity, as well as applicable international and national law, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. Appropriate procedures, policies and structures are in place to foster responsible research practices, to prevent questionable research practices and research misconduct, and to handle allegations of breaches of the principles and standards in the Code of Conduct.

The hyperlink of Appropriate procedures, policies and structures opens the Guideline for Promoting Research Integrity in Research Performing Organisations (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/guideline-for-promoting-research-integrity-in-research-performing-organisations_horizon_en.pdf) by the SOPs4RI (<https://sops4ri.eu/>).

Area	Topic	Action*
Support	Research environment	Ensure fair assessment procedures and prevent hypercompetition and excessive publication pressure.
	Supervision and mentoring	Create clear guidelines for PhD supervision (such as on meeting frequency); set up skills training and mentoring.
	Integrity training	Establish training and confidential counselling for all researchers.
Organization	Ethics structures	Establish review procedures that accommodate different types of research and disciplines.
	Integrity breaches	Formalize procedures that protect both whistle-blowers and those accused of misconduct.
	Data practices and management	Provide training, incentives and infrastructure to curate and share data according to FAIR principles.
Communication	Research collaboration	Establish sound rules for transparent working with industry and international partners.
	Declaration of interests	State conflicts (financial and personal) in research, review and other professional activities.
	Publication and communication	Respect guidelines for authorship and ensure openness and clarity in public engagement.

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The SOPs4RI toolbox for research institutions covers 9 topics. I will provide some examples of the first three of these.

Mejlgaard N, Bouter LM, Gaskell G, Kavouras P, Allum N, Bendtsen AK, Charitidis CA, Claesen N, Dierickx K, Domaradzka A, Reyes Elizondo A, Foeger N, Hiney M, Kaltenbrunner W, Labib K, Marušić A, Sørensen MP, Ravn T, Rea Ščepanović R, Tijdink JK, Veltri GA. Research integrity: nine ways to move from talk to walk. *Nature* 2020; 586: 358-60. <https://www.nature.com/articles/d41586-020-02847-8>

Guidelines for research institutions on the **research integrity education of bachelor, master and PhD students**



Guidelines for research institutions on the **research integrity education of institutional research integrity stakeholders**

Guidelines for research institutions on the **research integrity education of post-doctorate and senior researchers**

Guidelines for research institutions on **continuous research integrity education**

www.sops4ri.eu

Labib K, Evans N, Pizzolato D, Aubert Bonn N, Widdershoven G, Bouter L, Konach T, Langendam M, Kris Dierickx K, Tjeldink JK. Co-creating research integrity education guidelines for research institutions. MetaArXiv (3 March 2022).
<https://osf.io/preprints/metaarxiv/gh4cn/>

Preliminary version of the guidelines (pilots ongoing):

<https://osf.io/z7m3v/>

<https://osf.io/6d9ta/>

<https://osf.io/ya3qj/>

<https://osf.io/ambg3/>



Malcolm Macleod
Academic Lead for
Research Integrity
and Improvement



Radboudumc



Maurice Zeegers
UM Platform for
Research Ethics
and Integrity



<https://www.radboudumc.nl/en/education/events/2022-research-integrity-round>

<https://www.ed.ac.uk/research-office/research-talent-and-culture/research-improvement#:~:text=In%20January%202020%2C%20the%20University,Centre%20for%20Clinical%20Brain%20Sciences.&text=The%20University%20is%20part%20of,is%20a%20peer%2Dled%20consortium.>

<https://www.maastrichtuniversity.nl/research/integrity-ethics/um-platform-research-ethics-and-integrity>

Macleod M. Want research integrity? Stop the blame game. Nature 2021; 500: 533.
<https://www.nature.com/articles/d41586-021-03493-4?s=09>

How research institutes can foster Research Integrity better

- § Learn from neighbours on the campus and (inter)nationally
- § Get inspiration from available guidelines and materials
- § Make a Research Integrity Promotion Plan
- § Have an active and diverse Research Integrity Committee
- § Ensure coherence and continuity of efforts



WORLD CONFERENCES ON RESEARCH INTEGRITY

Website: www.wcrif.org

Twitter: [@WCRIFoundation](https://twitter.com/WCRIFoundation)

Vimeo: <https://vimeo.com/user175668074>

Website: www.wcrif.org

Twitter: [@WCRIFoundation](https://twitter.com/WCRIFoundation)

Vimeo: <https://vimeo.com/user175668074>