The Future of Research Integrity

Elliott Lumb
Co-Founder, Signals

Nicko Goncharoff
Commercial Lead and Co-Founder, Signals

The Past

William Summerlin

Dermatologist and researcher at Sloan-Kettering Institute in New York

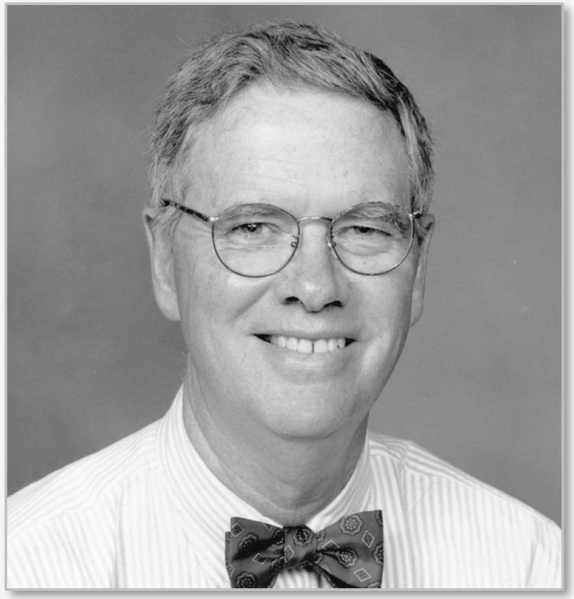
Reported successfully transplanting skin between genetically unrelated animals


Fraud Is Charged at Cancer Center

Inquiry at Cancer Center Finds Fraud in Research

New York Times, May 25, 1974

John Darsee & Robert Slutsky



John Darsee
"Rising star" at Harvard Medical School **published over 100 articles** in a short career

Robert Slutsky published **1 article every 13 days**

Both added co-authors to their articles to influence journal editors

"Slutsky did not attempt to hide his dishonesty. He told me that he had always known that the work of John Darsee was suspect, because Darsee was the only person who had published more than him"

Andrew Wakefield

EARLY REPORT

Early report

Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

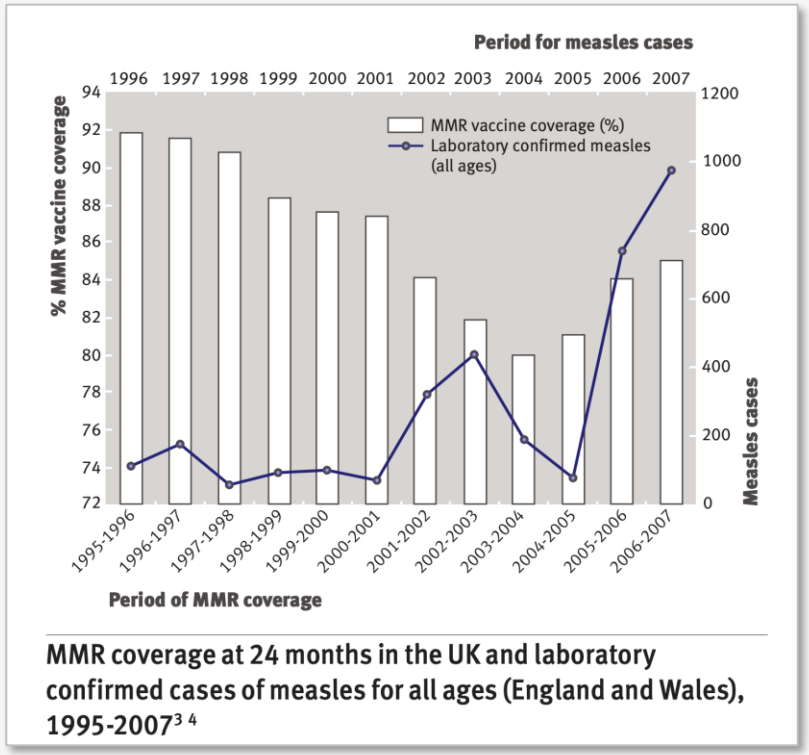
Findings Onset of behavioural symptoms was associated by the parents, with measles, mumps, and rubella vaccination in eight of the 12 children, with measles infection in one child, and otitis media in another. All 12 children had intestinal abnormalities ranging from lymphoid nodular hyperplasia to aphthoid ulceration. Histology showed patchy chronic inflammation in 11 children and reactive ileal lymphoid hyperplasia in seven, but no granulomas. Behavioural disorders included autism (nine), disintegrative psychosis (one), and possible postviral or vaccinal encephalitis (two). There were no focal neurological abnormalities and MRI and EEG tests were normal. Abnormal laboratory results were significantly raised urinary methylmalonic acid compared with age-matched controls (p<0·003), low haemoglobin in four children, and low serum IgA in four children.

Interpretation We identified associated gastrointestinal disease and developmental regression in a group of previously normal children, which was generally associated in time with possible environmental triggers.

Lancet 1998; **351**: 637–41
See Commentary page

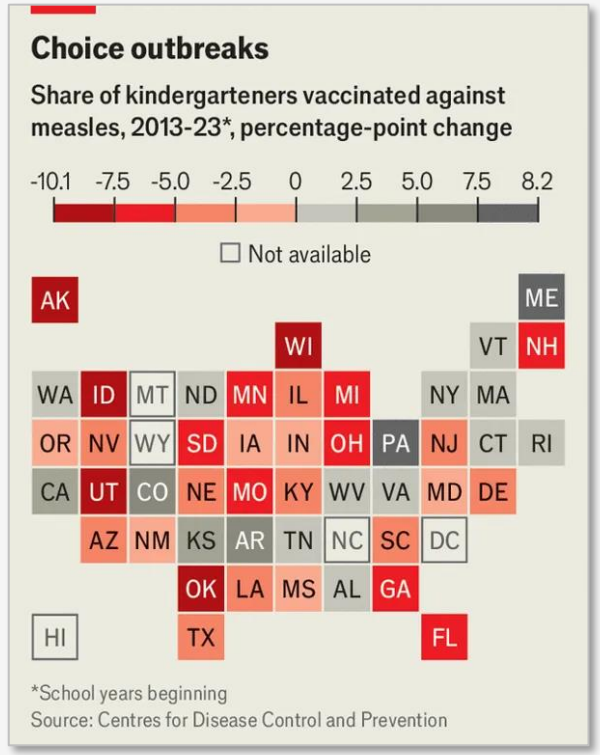
Inflammatory Bowel Disease Study Group, University Departments of Medicine and Histopathology (A J Wakefield FRCS, A Anthony MB, J Linnell FRCS, A P Dhillon MRCPath, S E Davies MRCPath) **and the University Departments of Paediatric Gastroenterology** (S H Murch MB, D M Casson MRCP, M Malik MRCP, M A Thomson FRCP, J A Walker-Smith FRCP), **Child and Adolescent Psychiatry** (M Berelowitz FRCPsych), **Neurology** (P Harvey FRCP), **and Radiology** (A Valentine FRCR), **Royal Free Hospital and School of Medicine, London NW3 2QG, UK**
Correspondence to: Dr A J Wakefield

a link between MMR vaccination and autism were quickly refuted



MMR coverage at 24 months in the UK and laboratory confirmed cases of measles for all ages (England and Wales), 1995-2007[3 4]

Decrease in MMR vaccinations, increase in measles cases

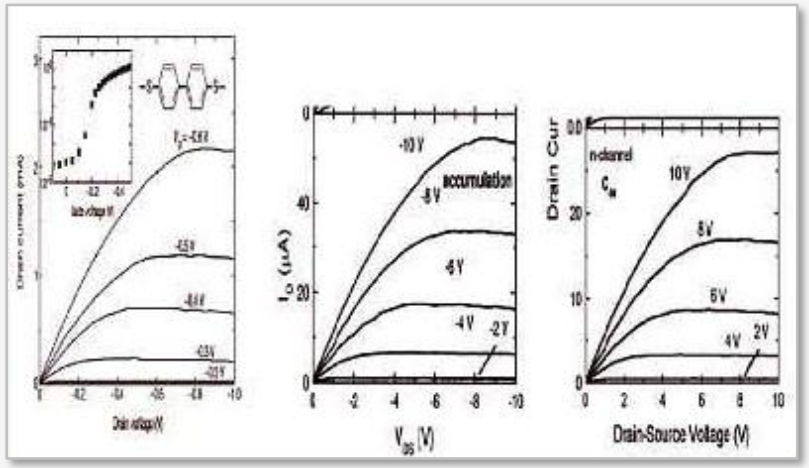


Anti-vaccine sentiment on the rise today

Jan Hendrik Schön

Breakthroughs in:

- organic electronics
- superconductivity
- nanotechnology



"The data were too perfect, different experiments had identical noise"

Kept no lab notebooks, deleted raw data files, and destroyed original samples


COMMENT

118: a case of misconduct

Reputations at risk

NEWS AND ANALYSIS

Misconduct claim hits Bell Labs

Bell Labs in the spotlight

Retractions

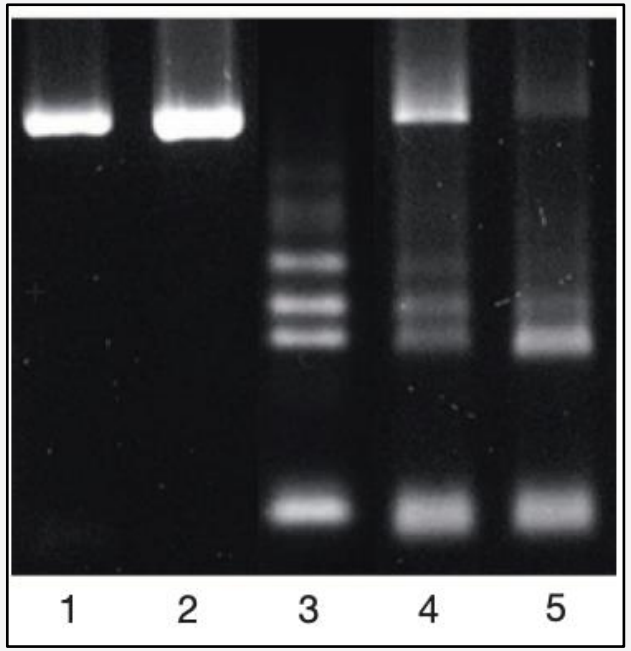
- Nature: 7
- Science: 8

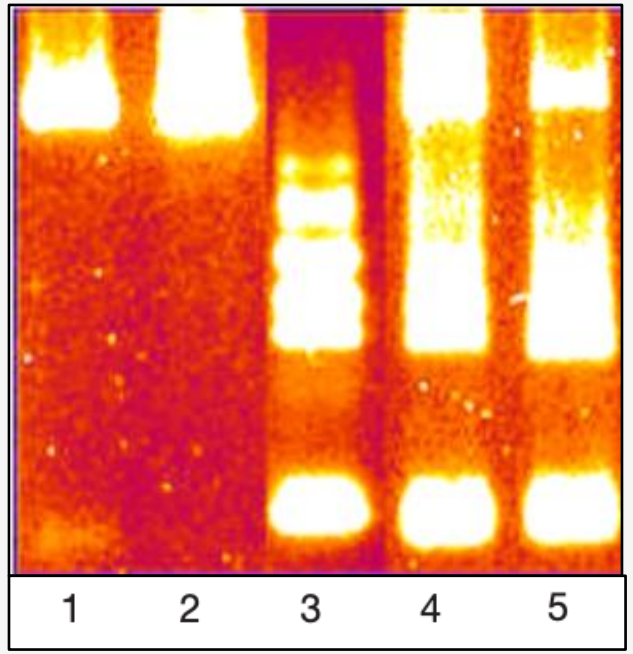
00s

Haruko Obokata

Reported STAP in Nature

A simple method to create pluripotent stem cells





Allegations of misconduct within two days

Research fraud isn’t new

Publish or perish

Competition for grants

Desire for recognition

Career advancement

Financial incentives

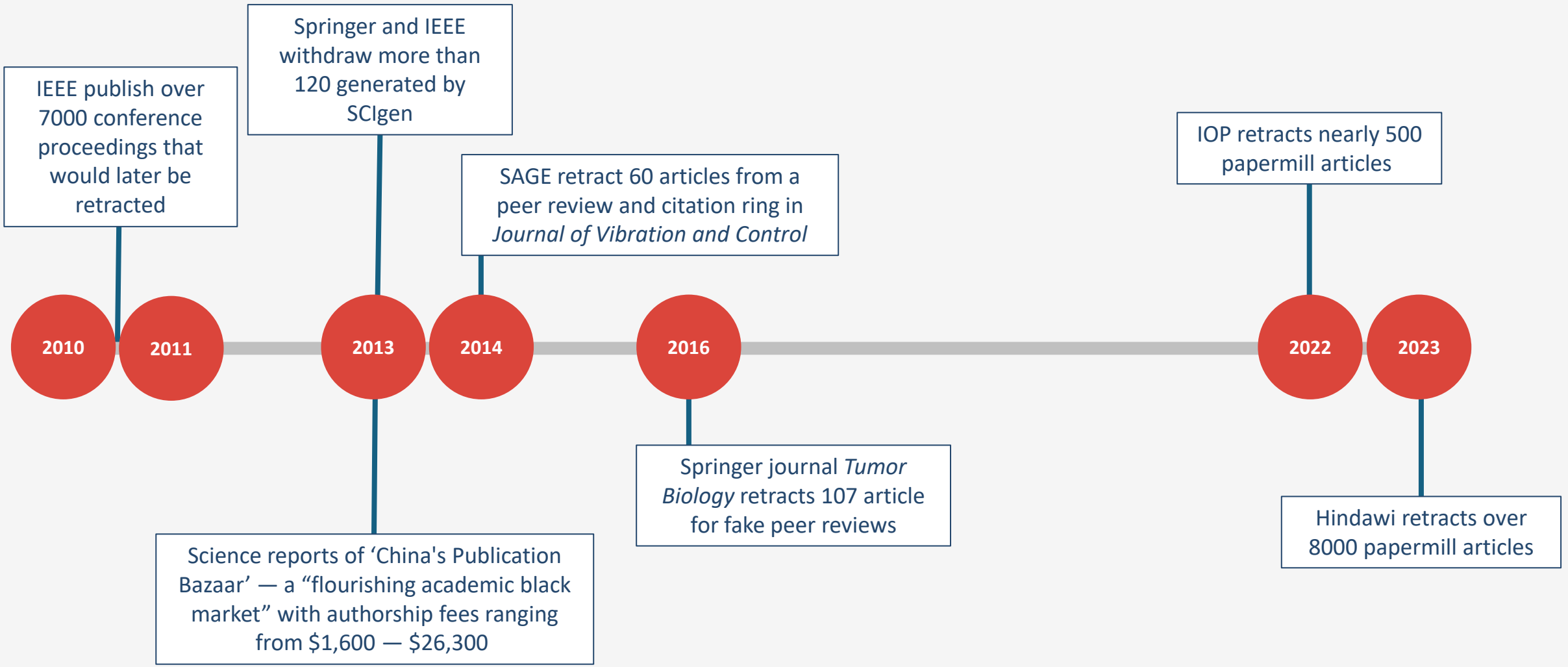
Pressure on researchers is increasing

“most large hospitals in China have considered articles listed in the Science Citation Index (SCI) as a must or priority for candidates … **As young doctors, we feel under great pressure to publish**.”

Since the introduction of Academic Performance Indicator system: "**Publication has become the mantra and motto for academics**, resulting in the rise of predatory publishing."

A national survey in the Netherlands found that “**Publication pressure** was associated with more often engaging in one or more **questionable research practices** frequently”

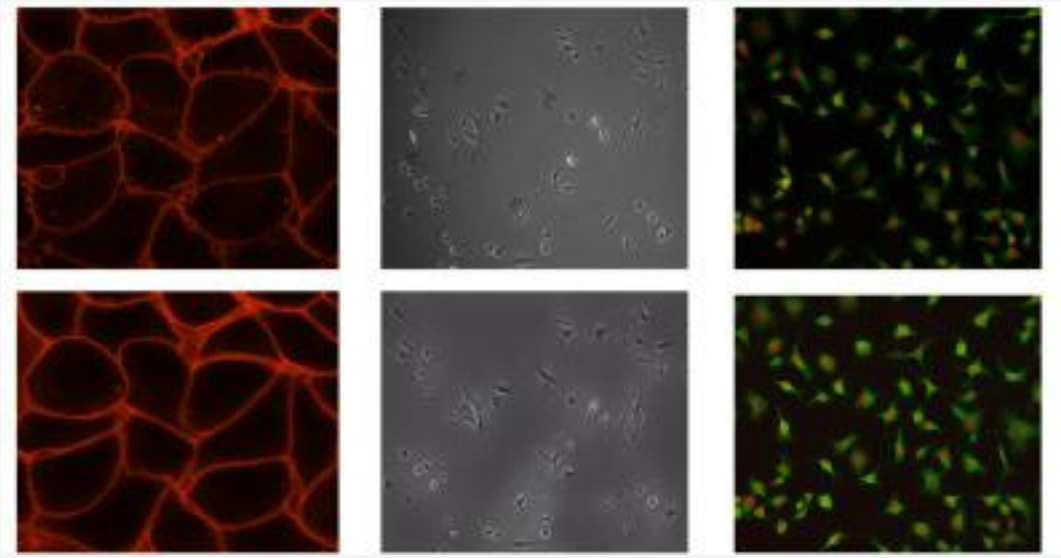
The scale of research integrity issues is increasing



Generative AI makes it easier for papermills

Real

AI generated



Research Integrity in the Era of Fake Articles: Challenges and Solutions

Authors: Elliott Lumb, Nicko Goncharoff

Affiliation: Research Signals

Abstract

The proliferation of fake and fraudulent research articles presents a growing challenge to research integrity. These articles threaten the reliability of the scholarly record, mislead the scientific community, and undermine public trust in science. This paper explores the scope of the problem, the mechanisms enabling the spread of fake articles, and the critical role of research evaluation tools in addressing these challenges. Drawing on insights from Research Signals, we present strategies to detect, prevent, and mitigate the impact of fake articles while fostering a culture of integrity in scholarly publishing.

1. Introduction

The scientific enterprise relies on the credibility of its scholarly outputs. Research articles serve as the foundation of scientific progress, guiding decisions in policy, industry, and healthcare. However, the rise of fraudulent and fabricated research articles-often propagated through predatory journals, paper mills, and unethical publishing practices-poses a serious threat to research integrity. This paper investigates the challenges posed by fake articles and offers solutions grounded in the latest advancements in research evaluation and monitoring.

2. The Growing Threat of Fake Articles

Fake articles are characterized by fabricated data, plagiarism, or authorship misrepresentation. These articles are often created with the intent to:

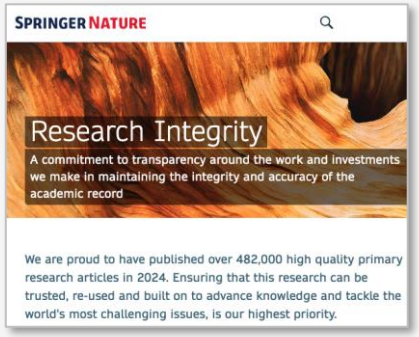
- Inflate academic credentials or satisfy institutional publication requirements.
- Support pseudoscientific claims or unethical agendas.

A fake article about fake articles by ChatGPT

Today

Publishers are investing more in research integrity to prevent problematic publications

Hiring and expanding RI teams



Industry collaboration

UNITED2ACT AGAINST PAPER MILLS

COPE

STM INTEGRITY HUB

Working with startups

imagetwin

Signals.

Clear Skies

A community of researchers are pioneering the detection of problematic publications

Researchers building tools:

- SCIgen detector (2012)
- Seekn Blastn (2019)
- Tortured phrase detection (2021)

Cyril Labbé

Jennifer Byrne

Guillaume Cabanac

A community of 'sleuths' comb the literature for issues:

Elisabeth Bik
Flagged >7000 article

Sholto David
Flagged >3000 articles

Nick Wise
1000 retractions

René Aquarius
Identifies an issue every day

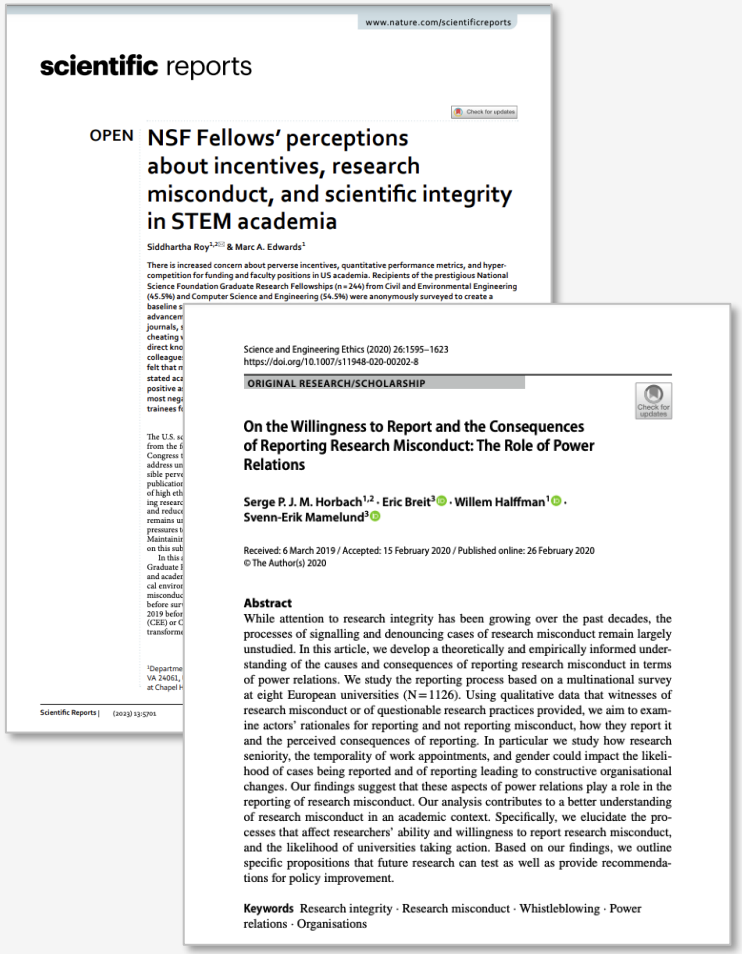
The research sleuth community is small

Not enough experts identifying issues in the literature

Only **31%** of NSF follows would report misconduct if they suspected it

55% of fellows felt that ethics trainings did not prepare them for dealing with ethical issues

A study found that a primary reason for not reporting misconduct was the **“fear of negative consequences”**



www.nature.com/scientificreports

scientific reports

OPEN

NSF Fellows' perceptions about incentives, research misconduct, and scientific integrity in STEM academia

Siddhartha Roy[1,2]✉ & Marc A. Edwards[1]

There is increased concern about perverse incentives, quantitative performance metrics, and hyper-competition for funding and faculty positions in US academia. Recipients of the prestigious National Science Foundation Graduate Research Fellowships (n = 244) from Civil and Environmental Engineering (45.5%) and Computer Science and Engineering (54.5%) were anonymously surveyed to create a

Scientific Reports | (2023) 13:5701

Science and Engineering Ethics (2020) 26:1595–1623
https://doi.org/10.1007/s11948-020-00202-8

ORIGINAL RESEARCH/SCHOLARSHIP

On the Willingness to Report and the Consequences of Reporting Research Misconduct: The Role of Power Relations

Serge P. J. M. Horbach[1,2] · Eric Breit[3] · Willem Halffman[1] · Svenn-Erik Mamelund[3]

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Abstract

While attention to research integrity has been growing over the past decades, the processes of signalling and denouncing cases of research misconduct remain largely unstudied. In this article, we develop a theoretically and empirically informed understanding of the causes and consequences of reporting research misconduct in terms of power relations. We study the reporting process based on a multinational survey at eight European universities (N = 1126). Using qualitative data that witnesses of research misconduct or of questionable research practices provided, we aim to examine actors' rationales for reporting and not reporting misconduct, how they report it and the perceived consequences of reporting. In particular we study how research seniority, the temporality of work appointments, and gender could impact the likelihood of cases being reported and of reporting leading to constructive organisational changes. Our findings suggest that these aspects of power relations play a role in the reporting of research misconduct. Our analysis contributes to a better understanding of research misconduct in an academic context. Specifically, we elucidate the processes that affect researchers' ability and willingness to report research misconduct, and the likelihood of universities taking action. Based on our findings, we outline specific propositions that future research can test as well as provide recommendations for policy improvement.

Keywords Research integrity · Research misconduct · Whistleblowing · Power relations · Organisations

Correcting the scholarly record can take years

Retraction Watch

‘We badly need to change processes’: How ‘slow, opaque and inconsistent’ journals’ responses to misconduct can be

HighWire Powered by MPS Solutions Se

Research Integrity and the Challenges of Mass Retractions

;enago academy 15 YEARS OF TRUST Learn. Share. Discuss. Publish.

Why Are Journals So Slow to Retract Papers?

Retraction Watch

A two-year drama: The anatomy of a retraction request

The Future

Should sleuths receive more recognition or rewards? If so, what form could that take?

Acknowledgment on retraction notices

Change perceptions to recognise sleuths for their positive contributions

Broader recognition through Awards or counting toward **promotion & grants**

Professionalise the role or pay for consulting work

Avoid “cash per paper reported or retracted”

"I would like to get confirmation of receipt if I flag papers with the research integrity departments of the publishers. I think this does not happen half of the time."

— René Aquarius, Radboud University

Looking ahead to the next three years, what threats to research integrity worry you most?

AI

*"The strategies we previously used to detect false content may no longer be effective. We can no longer simply rely on examining the data as AI fabrications become more sophisticated." — **Wu Guangheng, 5GH Foundation***

Retractions should be part of a self-correcting scholarly record.
The high volume of retractions could further **undermine trust in science** and institutions

*"Some nations/institutions are becoming so synonymous with misconduct that I also worry about bias and impact on DEI." — **Kim Eggleton, IOP***

Collateral reputational damage to honest researchers

How do you see research integrity evolving in the next few years?

"We will see continued efforts towards a more collaborative approach in tackling Research Integrity threats — ***Wei Mun Chan, eLife***

RI will continue to be a **critical issue**

Increasing **positive collaboration** between publishers and sleuths

Technology will play a much larger role in increasing efficiency and reducing fraud

More checks from publishers and **greater responsibility for institutions** to verify integrity of research

"Unless we are much more proactive and take the many challenges that face us seriously, then I really worry for the scientific archive, which has taken 350 years to develop and could be ruined in a few years as we can no longer rely on the material that it contains."
— Graham Kendall, MILA University

What steps do you think researchers, institutions, and publishers need to take to improve research integrity?

*"Collaboration between Research Integrity teams in publishers and institutions on educating and guiding the actions of researchers is key." — **Elena Vicario, Frontiers***

Less talk, more action:

- streamlined guidelines
- action against bad actors
- support and protection for whistleblowers

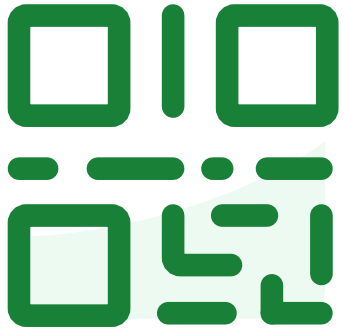
Increased **awareness** and **education** about research integrity and its challenges

Increased **transparency** in publishing and **data provenance**

*"The root problem is the very toxic and harmful "Publish or Perish" culture that scientists have been indoctrinated with for decades. We need to reevaluate how we evaluate science and scientists, and reduce the toxic pressures as much as possible." — **Mu Yang, Columbia University***

Publish or perish

What does the audience think?



Join at slido.com
#3944490

In the next 3 years do you think research integrity issues will

1. Get worse
2. Improve
3. Stay the same

In the next 3 years do you think research integrity issues will:

ⓘ Start presenting to display the poll results on this slide.

In the next 5 years do you think incentive structures will change to address the issues of 'publish or perish’?

Yes

No

slido

Please download and install the Slido app on all computers you use

In the next 5 years do you think incentive structures will change to address the issues of 'publish or perish’?

ⓘ Start presenting to display the poll results on this slide.

What worries you most about research integrity in the next 3 years?

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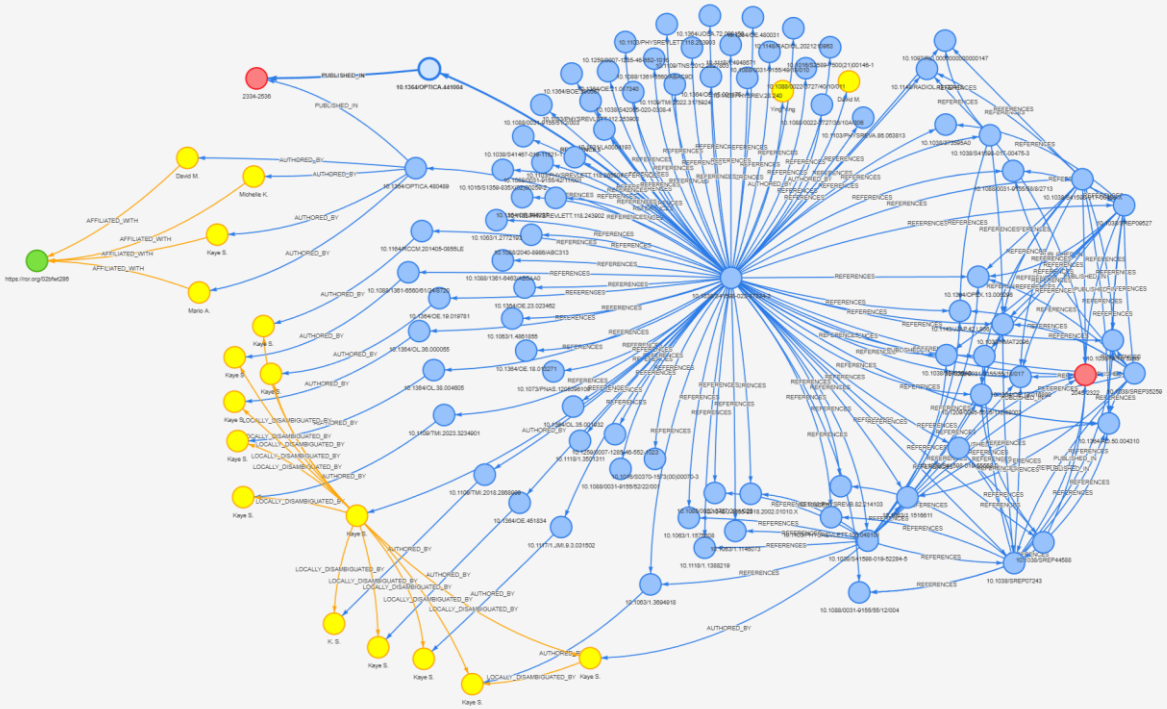
Please download and install the Slido app on all computers you use

What worries you most about research integrity in the next 3 years?

ⓘ Start presenting to display the poll results on this slide.

Our thoughts on the future

Technology



Easier and cheaper to:

- create fake papers
- fabricate data
- write peer reviews
- automate the manipulation of the publishing process

A need to look beyond the manuscript:

- author credibility and behaviour
- data provenance
- data and best practice sharing between publishers

Broader involvement from organisations in the scholarly industry

Publishers

Institutions

Funders

Connected through streamlined, standardized processes for handling integrity issues

People

Protection & support for researchers that report issues

Fair processes for researchers accused of and responsible for misconduct

Education & incentives to create a culture of improved research integrity

Conclusion

Research fraud and underlying incentive structures have existed for decades

Research integrity is becoming increasingly embedded in publisher workflows

Large-scale fraud and new technologies present emerging threats and uncertainties

As an industry, we must take collective action to safeguard the trustworthiness of the scholarly record

Acknowledgements

- René Aquarius
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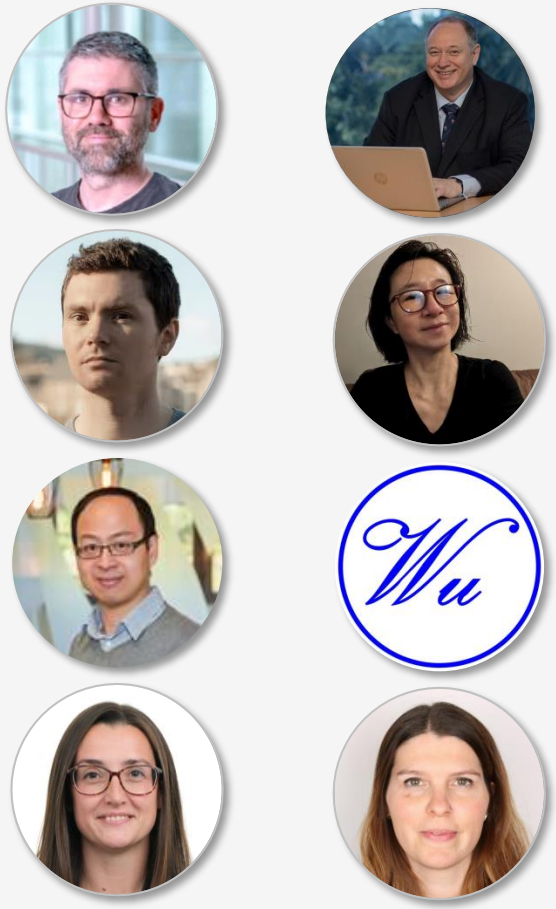
- Sholto David
- Mu Yang
- Kim Eggelton
- Wu Guangheng (www.5gh.org.cn/)
- Wei Mun Chan
- Elena Vicario



Thank you!

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