



The Science Retraction Experience

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Deputy Editor
Science**

**with thanks to Andrew
Sugden and Monica Bradford**

	Correction	Expression of Concern	Retraction	No action / Self-correcting scientific process	Letter or Technical Comment exchange
Results unrepeatable	x	x	x	x	x
Data not available	x	x	x		
Fabrication/ plagiarism		x -> -> ->	X		
Interpretation/ conclusions questioned			x	x	x
(lack of) citation	(x)			x	

Balance notice to readers with a fair process.

Editorial Expressions of Concern help with this

Not always clear who are the “good guys”

Rapid online reactions can help and hinder

The retraction process can be long and complex.

Don't give in to demands for instant reaction

Every case is different.

Just when we think we've seen it all, there's a new twist

Whistleblowers

Corresponding author

Coauthors

Identified correspondent

Anonymous correspondent—motivations
may be honest or suspect

Institution

Referees

Retractions Accepted at *Science*

2000	2	2006	4
2001	1	2007	4
2002	6 (14)	2008	3
2003	4	2009	1
2004	3	2010	2
2005	5	2011	4
		2012	1

---of which 31% were in the physical sciences; 69% biology

Mean time to retraction ~2.8 years, max 8 years

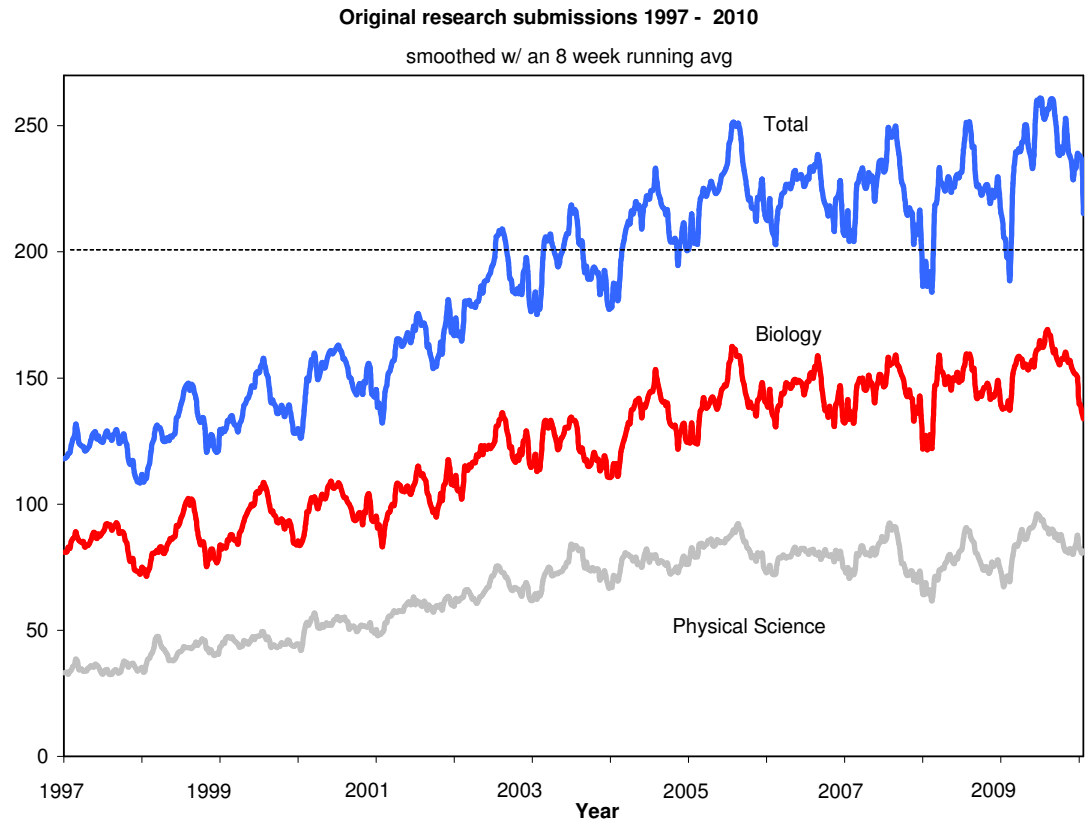
Reasons For Retractions as given to Science(2005-2012)

Technical Issues (with details) 13

Can't Reproduce 9

Misconduct 5

Papers per week



Kinds of Retractions

Good: the original authors initiate and/or agree to retract the paper

Bad: one or more authors refuse to sign retraction, or fail to agree among themselves

Ugly: authors refuse to retract despite institutional findings and/or try to inappropriately characterize the status of the work

“Good” retractions--

‘I have described (1) unmineralized fossil bacteria from two sources, widely separated in time and space

[...]. When two friends to whom I had sent parts of my sample of the Newark Canyon limestone failed to find the coccoid bacteria, I reexamined the sample and made the embarrassing discovery that the minute spheres were fluorite artifacts produced during the preparation of the material for microscopic examination.’
[...]

W. H. BRADLEY
U.S. Geological Survey,
Washington, D.C. 20242

1. W. H. Bradley, *Science* 141, 919 (1963).

Retraction of Zou and Buck, Science 311 (5766) 1477-1481. (2006)



In the Report “Combinatorial Effects of Odorant Mixes in Olfactory Cortex” ([1](#)), we described subcellular patterns of *Arc* (*arg3.1*) mRNA expression in anterior piriform cortex neurons after mice had been exposed to odorants. We reported that some cortical neurons express *Arc* in response to a mix of two odorants but not either odorant alone. My laboratory has been unable to reproduce this finding. I am therefore retracting the Report. I sincerely apologize for any confusion that its publication may have caused



In the course of carrying out experiments that were a direct extension of our recent *Science* paper “Stable RNA/DNA hybrids in the mammalian genome: inducible intermediates in immunoglobulin class switch recombination” ([1](#)), we discovered differences from those in the paper. The first author (R. B. Tracy) has admitted to data alteration such that the primary conclusions of the paper are in question. Because of this, the authors are retracting the entire paper on class switch recombination ([1](#)). We are deeply regretful for any scientific misconceptions that have resulted from these studies.

[Robert B. Tracy¹](#) [Chih-Lin Hsieh^{2,3}](#) [Michael R. Lieber^{1,2,4,5}](#)



Editorial Expression of Concern

-----frequently indicating that an investigation has been initiated

‘In the issue of 23 October 2009, Science published the Report “Detection of an infectious retrovirus, XMRV, in blood cells of patients with chronic fatigue syndrome,” a study by Lombardi et al. ---(1). Since then, at least 10 studies conducted by other investigators and published elsewhere have reported a failure to detect XMRV in independent populations of CFS patients. [...]

The study by Lombardi et al. (1) attracted considerable attention, and its publication in Science has had a far-reaching impact on the community of CFS patients and beyond. Because the validity of the study by Lombardi et al. is now seriously in question, we are publishing this Expression of Concern and attaching it to Science's 23 October 2009 publication by Lombardi et al.

The U.S. National Institutes of Health is sponsoring additional carefully designed studies to ascertain whether the association between XMRV and CFS can be confirmed. Science eagerly awaits the outcome of these further studies and will take appropriate action when their results are known. ‘

Bruce Alberts, Editor-in-Chief

Partial retractions (rare)

Retractions of interpretations

Preludes to complete retractions

How important were the data retracted
to Science's acceptance of the paper?

In our 23 October 2009 Report, “Detection of an Infectious Retrovirus, XMRV, in blood cells of patients with chronic fatigue syndrome” ([1](#)), two of the coauthors, Silverman and Das Gupta, analyzed DNA samples from chronic fatigue syndrome (CFS) patients and healthy controls. A reexamination by Silverman and Das Gupta of the samples they used shows that some of the CFS peripheral blood mononuclear cell (PBMC) DNA preparations are contaminated with XMRV plasmid DNA ([2](#)). The following figures and table were based on the contaminated data: Figure 1, [...] table S1, [...] and figure S2 [...]. Therefore, we are retracting those figures and table.

[Robert H. Silverman1](#),* [+ 11 more]

Science 14 October 2011

Editorial Retraction

***Science* is fully retracting the report “detection of an infectious retrovirus, XMRV, in blood cells of patients with chronic fatigue syndrome” ([1](#)). Multiple laboratories, including those of the original authors ([2](#)), have failed to reliably detect xenotropic murine leukemia virus–related virus (XMRV) or other murine leukemia virus (MLV)–related viruses in chronic fatigue syndrome (CFS) patients. In addition, there is evidence of poor quality control in a number of specific experiments in the Report. [...]**

Given all of these issues, *Science* has lost confidence in the Report and the validity of its conclusions. We note that the majority of the authors have agreed in principle to retract the Report but they have been unable to agree on the wording of their statement. It is *Science's* opinion that a retraction signed by all the authors is unlikely to be forthcoming. We are therefore editorially retracting the Report. [...]

[Bruce Alberts](#), Editor-in-Chief



Editorial Retraction

[A Single Molecular Spin Valve](#) J. H. Schön, *et al.*

Science Published online 18 April 2002

Recently, as a result of the report of the Beasley Committee to Bell Laboratories, Lucent Technologies, several papers on which J. H. Schön was the lead author have been retracted. Another paper ([1](#)) that was published by *Science* was not formally analyzed by the Beasley Committee. Although we recognize that some parts of this paper may remain valid, we note that key parts depend on and cite results or methods derived from two of the already retracted papers ([2](#), [3](#)). We therefore advise the scientific community that the validity of all of the results in this paper cannot be established.

[Donald Kennedy](#), Editor-in-Chief

Science 2 May 2003

1) Evidence of a Pluripotent Human Embryonic Stem Cell Line Derived from a Cloned Blastocyst

Woo Suk Hwang, Young June Ryu, Jong Hyuk Park, Eul Soon Park, Eu Gene Lee, Ja Min Koo, Hyun Yong Jeon, Byeong Chun Lee, Sung Keun Kang, Sun Jong Kim, Curie Ahn, Jung Hye Hwang, Ky Young Park, Jose B. Cibelli, and Shin Yong Moon

Science 12 March 2004: 1669-1674. Published online 12 February 2004

2) Patient-Specific Embryonic Stem Cells Derived from Human SCNT Blastocysts

Woo Suk Hwang, Sung Il Roh, Byeong Chun Lee, Sung Keun Kang, Dae Kee Kwon, Sue Kim, Sun Jong Kim, Sun Woo Park, Hee Sun Kwon, Chang Kyu Lee, Jung Bok Lee, Jin Mee Kim, Curie Ahn, Sun Ha Paek, Sang Sik Chang, Jung Jin Koo, Hyun Soo Yoon, Jung Hye Hwang, Youn Young Hwang, Ye Soo Park, Sun Kyung Oh, Hee Sun Kim, Jong Hyuk Park, Shin Yong Moon, and Gerald Schatten

Science 17 June 2005: 1777-1783. Published online 19 May 2005

**Special Online Collection: Hwang *et al.* Controversy --
Committee Report, Response, and Background**

Jump to features in special collection:

[Committee Report](#)

[Science Statements](#)

[The Papers](#)

[News Coverage](#)

[Letters/](#)

[Policy Forum](#)

On December 1, 2006, *Science* published, on this Web site, the report of a committee commissioned by the journal to review its practices in the period leading up to the publication of the 2004 and 2005 stem cell papers by Hwang *et al.*, which were subsequently retracted. On this page, we are making available direct links to [the report, Science's response, and an accompanying editorial.](#)

Impact of Hwang Paper on our Policies

- **All co-authors notified upon manuscript submission, to check authorship.**
- **Detailed authorship and conflict-of-interest disclosure before acceptance by all authors.**
- **All figures checked at revision for inappropriate adjustments**
- **Restrictions on data/materials access minimized.**
- **No unpublished data allowed. All references/data must be available at the time of publication.**

Before Acceptance of the Paper:

Authorship: The authorship policies of *Science* follow those recommended by the report "On Being a Scientist", 3rd Edition, published by the US National Academy of Sciences (<http://www.nap.edu/catalog/12192.html>).

In order to meet our requirements for authorship of a paper, you must have participated significantly in the reported research or writing of the paper. Please affirm that you meet these criteria by indicating your contribution to all of the following descriptions (circle from 0% responsible to 100% responsible): I...

Authorship Activity	Level of participation
Participated in the design and/or interpretation of the reported experiments or results.	0 20 40 60 80 100%
Participated in the acquisition and/or analysis of data. State Which data: _____	0 20 40 60 80 100%
Participated in drafting and/or revising the manuscript.	0 20 40 60 80 100%
Was primarily responsible for a particular, specialized role in the research, e.g. statistical analysis, crystallography, preparation of cell lines; please briefly state which: _____ _____	0 20 40 60 80 100%
Provided administrative, technical or supervisory support.	0 20 40 60 80 100%

Data must be checked by senior author:

The senior author from each lab or group must answer this question: I have personally checked all the original data that was generated by my lab or group:

Yes Not applicable; I am not the senior author or lab head.

If yes, these data are presented in these figures and tables (including the Supporting Online Material):

_____.

***Science* policy: Data Must Be Available—in SM or archived.**

“Data and materials availability: All data necessary to understand, assess, and extend the conclusions of the manuscript must be available to any reader of Science. After publication, all reasonable requests for materials must be fulfilled. Any restrictions on the availability of data or materials, including fees and original data obtained from other sources (Materials Transfer Agreements), must be disclosed to the editors upon submission. “

There are still some exceptions-----

“... a lamentable element of the culture [in social psychology and psychology research] is for everyone to keep their own data and not make them available to a public archive. This is a problem on a much larger scale...

Archiving and public access to research data not only makes ... data fabrication more visible, it is also a condition for worthwhile replication and meta-analysis....”

(Tilburg report on the Stapel case, Oct 2011)

Contributing Factors

Data increase

Supplemental Material should be subject to the same editorial standards and peer-review procedures as the print publication.

Interdisciplinary papers-
multiple authors, institutions,
countries-different languages,
standards –miscommunication
potential

Money, prestige,
Public (and media) attention



“Risk Factors” that can help identify papers that should receive an even higher level of scrutiny

Multi-disciplinary

Result that was “hoped for” or too good to be believed

Multiple labs and multiple countries

Fast turn around on additional experiments/data

‘Although [journals] cannot create deception-proof peer review, they can treat retractions honestly and forthrightly. They can express the community's interest in the trustworthiness of results and close their pages to transgressors. They should also praise responsible actions, especially when those carry personal costs.’

Donald Kennedy

InterAcademy Council Report Oct 17 2012

Responsible Conduct in the Global Research Enterprise



- **Researchers** have the primary responsibility for upholding standards of responsible conduct in research.

Researchers have an **obligation** to themselves, their colleagues, and society **to avoid -- falsification, fabrication, and plagiarism and the other forms of irresponsible conduct that can undermine the research enterprise.**

Guidelines for responsible conduct and procedures to address irresponsible research practices need to be **established in the initial stages of international collaborations.**

- **Peer reviewers** need to assess proposed publications fairly and promptly, with full disclosure of conflicts of interest or bias.
- **Journals** should use technological means to protect the integrity of the research literature. They should make retractions visible so that retracted papers are not used or cited. **Both authors and journals** should take steps to avoid duplicated publications that readers expect to be original and should refrain from citations designed only to boost the journal's impact factor.

Still need to look closely at the pressures contributing to retractions.



Cannot overemphasize the importance of proper mentoring

Scientists are human and this means we will always be confronted with new challenges.

Problems are still an exception