

COMMUNICATION SKILLS

Prof. Sameer Khandekar
 Department of Mechanical Engineering
 Indian Institute of Technology Kanpur
 SL-109 | samkhan@ | 7038
 home.iitk.ac.in/~samkhan

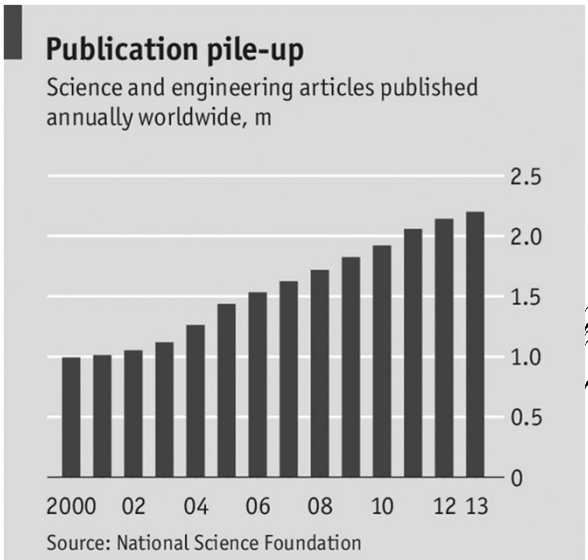
Research and Publishing Ethics

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- ▶ **Research is generally defined as** “Studious inquiry or examination aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws.”
- ▶ **Publication is the dissemination of your findings to the scientific community; in general, scientific publications are subject to peer review**

S&T PUBLICATIONS



Publication pile-up
 Science and engineering articles published annually worldwide, m

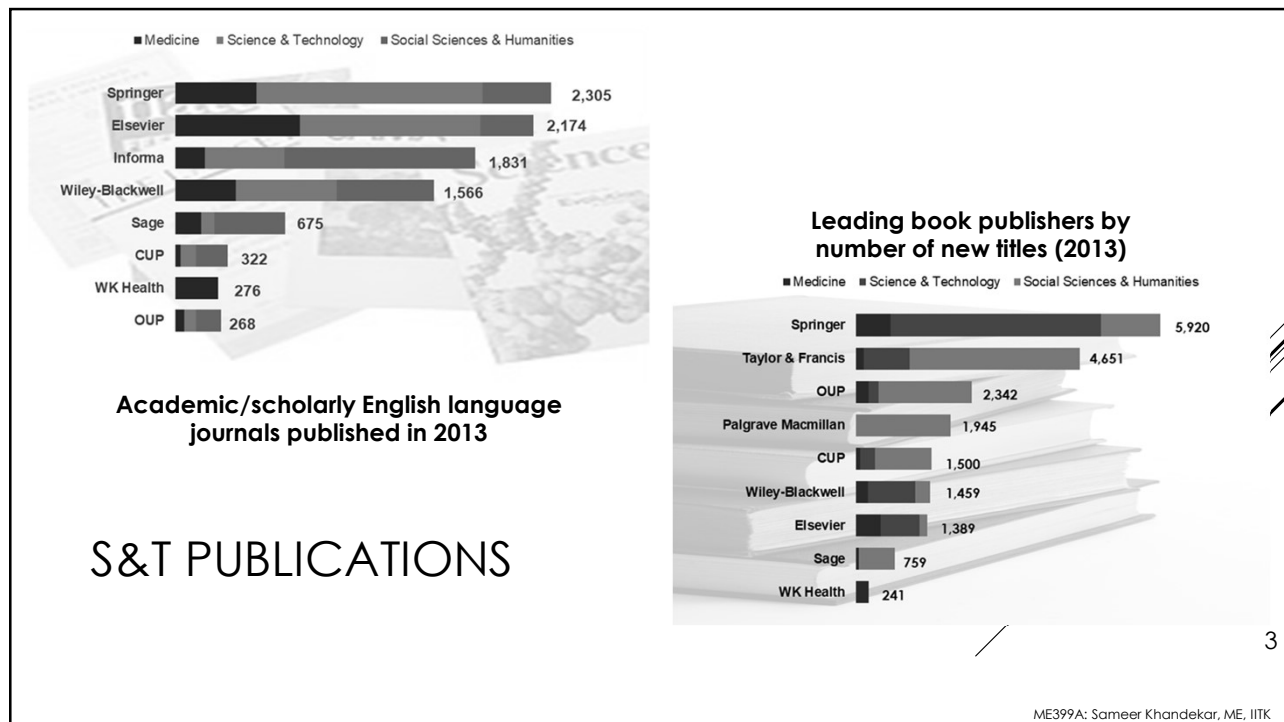
Year	Articles (m)
2000	1.0
2001	1.0
2002	1.0
2003	1.1
2004	1.2
2005	1.3
2006	1.4
2007	1.5
2008	1.6
2009	1.7
2010	1.8
2011	1.9
2012	2.0
2013	2.1

Source: National Science Foundation

Economist.com

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- ▶ Publication is the final stage of research → a responsibility for all involved.
- ▶ They are expected to provide a detailed and permanent record of research.
- ▶ Publications for the basis of → (i) New research (ii) New application
- ▶ Hence they affect not only the research community but society at large
- ▶ Researchers therefore have a responsibility to ensure that their publications are honest, clear, accurate, complete and balanced, and should avoid misleading, selective or ambiguous reporting.
- ▶ Journal editors/ publications managers also have responsibilities for ensuring the integrity of the research literature.

IMPORTANCE OF PUBLICATIONS

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Journals like to publish papers that are going to be widely read and useful to the readers

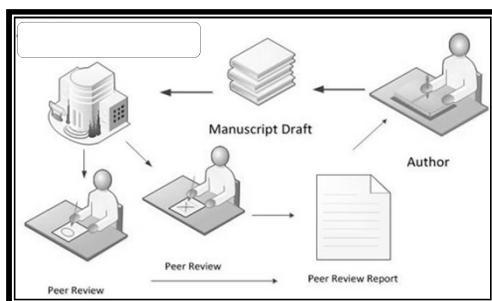
- Papers that report '**original and significant**' findings that are likely to be of interest to a broad spectrum of its readers
- Papers that are **well organized and well written**, with clear statements regarding how the findings relate to and advance the understanding/development of the subject
- Papers that are **concise and yet complete** in their presentation of the findings

WHAT IS PUBLISHABLE....

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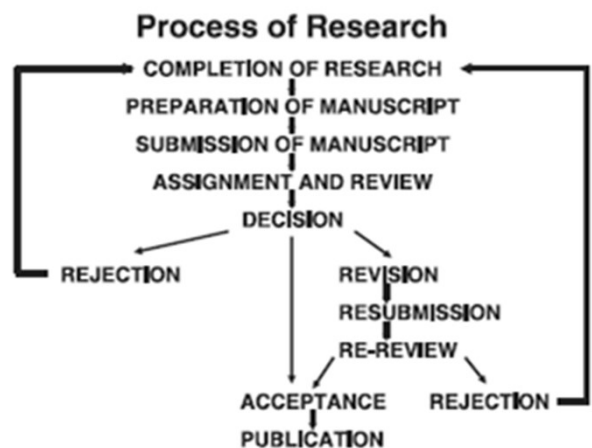
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Publication of results is an integral and essential component of research



PUBLICATION PROCESS

Publication Process: Flow diagram



Dale J. Benos, Jorge Fabres, John Farmer, et al Ethics and scientific publication// *Adv Physiol Educ* 29: 59–74, 2005 6

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- ▶ Research misconduct and publishing misconduct are two faces of the same coin
- ▶ Most research misconduct begins before the paper.
- ▶ It is only caught when it is published, which puts more attention on publication misconduct
- ▶ In recent times, technology is helping in detecting cases of fraud
- ▶ With increased number of dubious journals and publications, ethical value system is also fast eroding.



Scientific misconduct means fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting or reporting research

RESEARCH VS PUBLISHING MISCONDUCT

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The New York Times
nytimes.com

December 20, 2008

Global Trend: More Science, More Fraud
By LAWRENCE K. ALTMAN and WILLIAM J. BROAD

The South Korean scandal that shook the world of science last week is just one sign of a global explosion in research to guard against error and fraud.

Experts say the problem is only getting worse, as research projects, and the journals that publish the findings, soar.

Science is often said to be self-correcting and had research with a triple safety net. The first is peer review, in which research is fact-checked. The second is the referee system, which has journals ask reviewers to judge if manuscripts in science's independent scientists can if the work holds up.

The Economist
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World politics | Business & finance | Economics | Science & technology | Culture | The World in 2

Scientific misconduct
Monkey business?
Allegations of scientific misconduct at Harvard have academics up in arms
Aug 26th 2010 | From the print edition

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Science
SPECIAL SECTION

Breakdown of the Year: Scientific Fraud

One year ago, as Science was assembling its 2005 Breakthrough of the Year issue, the need for a last-minute change became uncomfortably clear. A shadow was creeping across one of this journal's landmark papers, in which a team of South Korean and American researchers, led by Woo Suk Hwang at Seoul National University, claimed to have created the first-ever human embryonic stem cell lines that matched the DNA of patients. After anonymous allegations of irregularities in that paper appeared on a Korean Web site, South Korean authorities launched an investigation. As the story unfolded, Science's new editors hastily pulled an item about the Hwang achievements from the issue's roster of runners-up.

Today, the fallout from the Hwang case is plain. Multiple inquiries discredited two papers Hwang published in Science in 2004 and 2005, which claimed some of the greatest accomplishments to date with human embryonic stem cells. The papers were retracted. But the scientific fraud, one of the most audacious ever committed, shattered the trust of many researchers and members of the public in scientific journals' ability to catch instances of deliberate deception.

As it turned out, the Hwang debacle marked the beginning of a bad year for honest science. Incidents of publication fraud, if not on the rise, are garnering more attention, and the review process is under scrutiny. In June, European investigators reported that the bulk of papers by Jon Sjöberg, formerly a cancer researcher at the Norwegian Radium Hospital in

on September 21, 2009

NewScientist Science in Society

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MIT professor sacked for fabricating data
15:52 28 October 2005 by Eugenie Samuel Reich, Boston

Read full article | Continue reading page | 1 | 2

A high-flying researcher has been fired from the prestigious Massachusetts Institute of Technology in Boston for fabricating data. A New Scientist investigation can, however, reveal that serious doubts are also being expressed over the accuracy of data published by the same researcher much earlier in his career.

Luk Van Parijs, 35, was an associate professor of biology at MIT. On Wednesday, he was sacked by the institute after admitting to fabricating and falsifying research data in a published scientific paper and several manuscripts and grant applications.

Graphs in (mainly) represents different in outliers, or (Enlarge)

The New York Times
Science Home | Environment | Space & Cosmos | Columns

Researcher Faked Evidence of Human Cloning, Koreans Report
By NICHOLAS WADE and CHOE SANG-HUN
Published: January 10, 2008

Dr. Hwang Woo-Suk, the South Korean researcher who claimed to have cloned human cells, fabricated evidence for all of that research, according to a report released today by a Seoul National University panel investigating his work.

The finding strips any possibility of legitimate achievement in human cell cloning from a researcher who had been propelled to international celebrity and whose previous to make paralyzed people walk had been engraved on a Korean postage stamp.

In his string of splashy papers, his one legitimate claim was to have

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PUBLICATION ETHICS

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- ▶ A surprising upsurge in the number of scientific papers that have had to be retracted because they were **wrong or even fraudulent** has journal editors and ethicists wringing their hands."
- ▶ The retracted papers are a small fraction of the vast flood of research published each year, but they offer a revealing glimpse of the pressures driving many scientists to improper conduct."
- ▶ There are many theories for why retractions and fraud have increased.
 - ▶ A benign view suggests that because journals are now published online and more accessible to a wider audience it's easier for experts to spot frauds.
 - ▶ A darker view suggests that publish-or-perish pressures in the race to be first with a finding and to place it in a prestigious journal has driven scientists to make sloppy mistakes or even falsify data. The solutions are not obvious, but clearly greater vigilance is needed."

INCREASING DETECTION

EDITORIAL
Fraud in the Scientific Literature
 Published: October 5, 2012

HOME PAGE | TODAY'S PAPER | VIDEO | MOST POPULAR | U.S. EDITION
 The New York Times
 The Opinion Pages
 WORLD | U.S. | N.Y. | REGION | BUSINESS | TECHNOLOGY | SCIENCE | HEALTH | SPORTS | OPINION | 7

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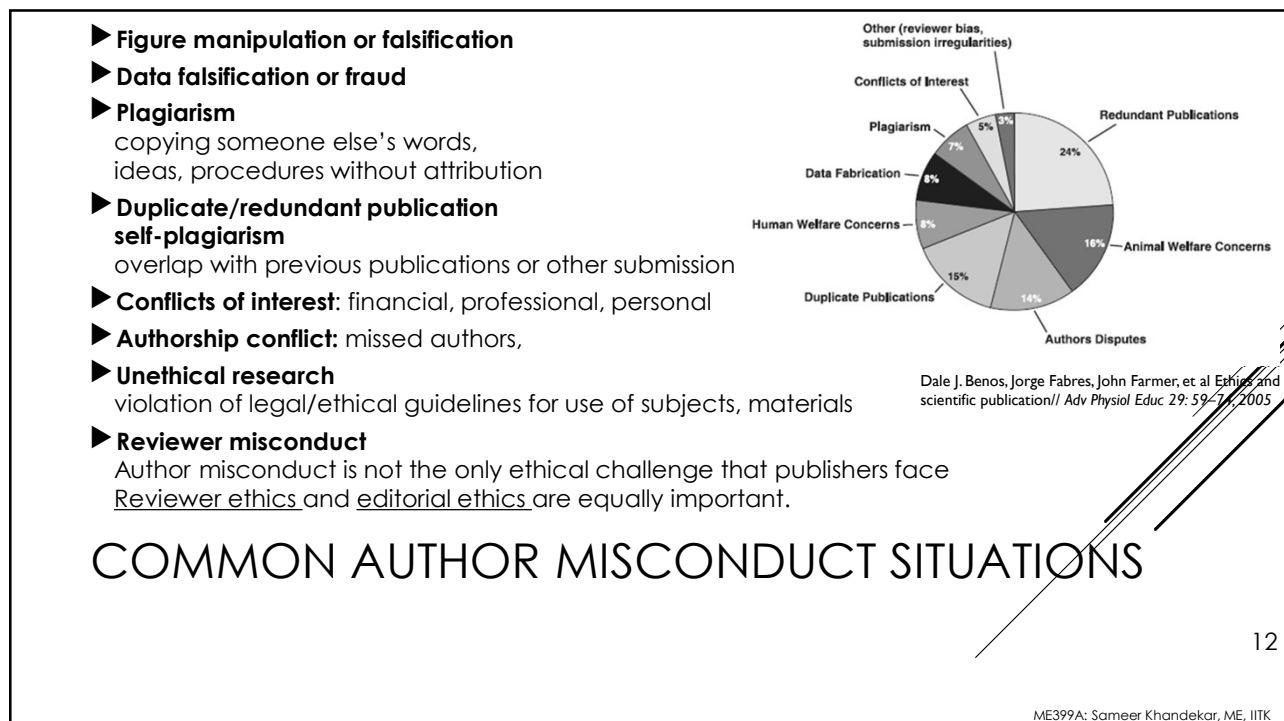
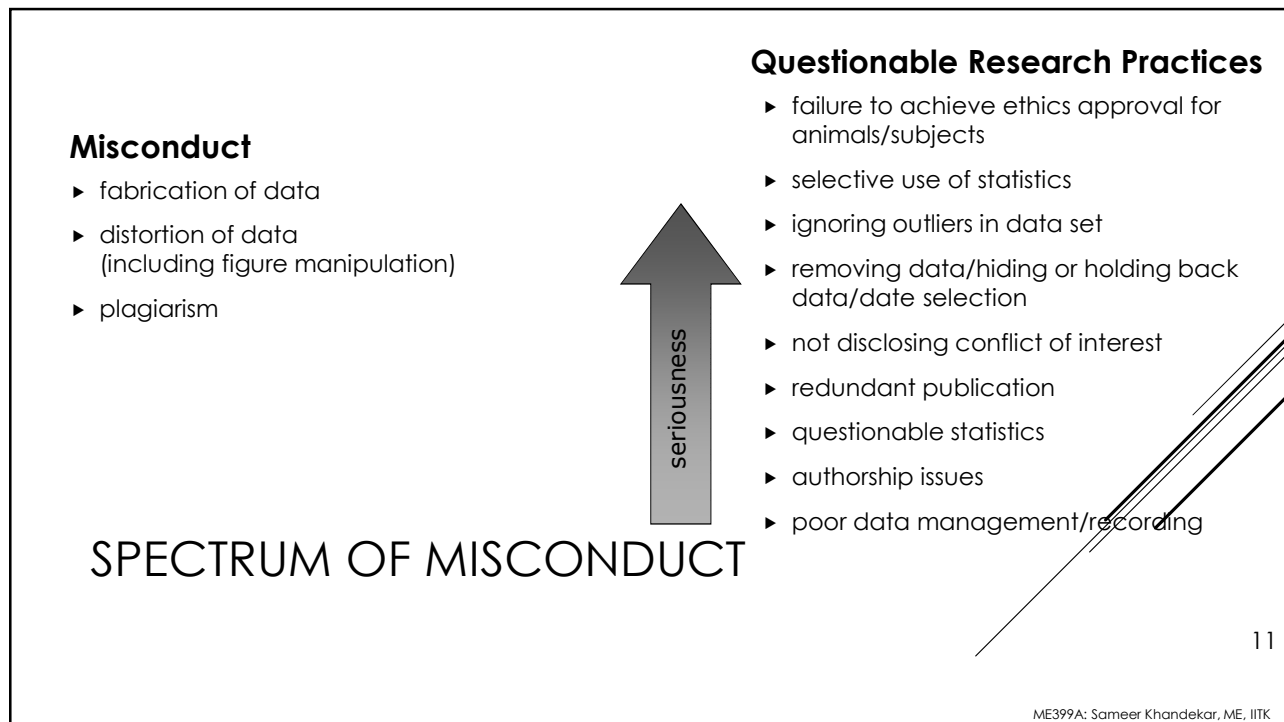
Research misconduct encompasses several activities; there isn't one specific and agreed upon definition for research misconduct

- (a) **FABRICATION** is making up data or results and recording or reporting them
- (b) **FALSIFICATION** is manipulating research materials, equipment or processes, or changing or omitting data or results that the research is not accurately presented in the research record
- (c) **PLAGIARISM** is the appropriation of another person's ideas, processes, results or words without giving appropriate credit
- (d) Research misconduct **DOES NOT** include honest error or differences of opinion or necessarily, inability to replicate

WHAT IS RESEARCH MISCONDUCT?

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- **Plagiarism:** using the ideas or words of another person without giving appropriate credit. Plagiarism includes both the theft or misappropriation of intellectual property and the substantial unattributed textual copying of another's work
- **The theft or misappropriation of intellectual property includes the unauthorized use of ideas or unique methods obtained by a privileged communication, such as a grant or manuscript review.**
- **Self-Plagiarism:** The verbatim copying or reuse of one's own research (IEEE Policy statement)

Both types of plagiarism are considered to be unacceptable practice by most scientific publications

PLAGIARISM

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- ▶ **Author:** Someone who has made substantive intellectual contributions to a published study.
- ▶ Authorship credit should be based on
- ▶ 1) **Substantial contributions** → conception and design, acquisition of data, or analysis and interpretation of data;
- ▶ 2) **Drafting/Revising:** critically for enhancing intellectual content; and
- ▶ 3) **Final approval** of the version to be published.

Authors should meet conditions 1, 2, and 3.

AUTHORSHIP, CREDITS, CONFLICT OF INTEREST

Guest authors are those who do not meet accepted authorship criteria but are listed because of their seniority, reputation or supposed influence; **Gift authors** are those who do not meet accepted authorship criteria but are listed as a personal favour or in return for payment; **Ghost authors** are those who meet authorship criteria but are not listed.

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- ▶ Not recording sources when copying items or taking notes
- ▶ Not placing in quotation marks, or indenting, items used verbatim
- ▶ Drafting some items while not looking at the source materials
- ▶ Not observing copyrights and not obtaining needed permissions
- ▶ Republishing the same findings (except under special circumstances, with the original source cited)
- ▶ Submitting the same manuscript to two or more journals at once
- ▶ Dividing one research project into many little papers (salami slicing/science)
- ▶ Not disclosing interests that might appear to affect their ability to present or review data objectively. These include relevant financial (for example patent ownership, stock ownership, consultancies, speaker's fees), personal, political, intellectual, or religious interests.

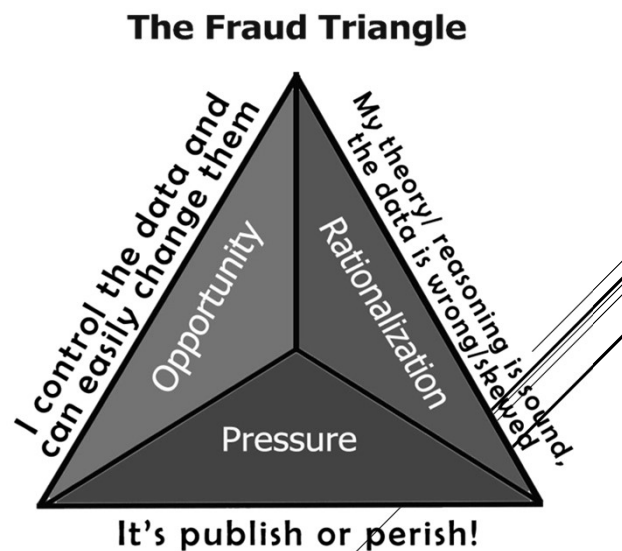
AUTHORSHIP, CREDITS, CONFLICT OF INTEREST

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- ▶ The Fraud triangle is a framework designed to explain the reasoning behind a person's decision to commit workplace fraud.
- ▶ The three stages, categorised by the effect on the individual, can be summarised as pressure, opportunity and rationalisation.

THE FRAUD TRIANGLE



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Some contributing factors:

- ▶ Lack of appropriate training and mentorship about good scientific practice
- ▶ Competition in science: high pressure/high stakes environments that put more weight on the answers than the process, high profile publications, high stakes may inadvertently promote fraud
- ▶ Nature of the work relationships in labs: "honest mistakes" amplified to cover up and fraud
- ▶ Lack of accountability – assumption that it is difficult to get caught and when you do, there are few penalties

ROOTS OF MISCONDUCT

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- ▶ Lack of institutional ethics: feeling that "everyone does this," "cutting corners is OK"
- ▶ Large collaborations where collaborators are not aware of the details of other contributors work
- ▶ Scientific blind-sight: "I am sure that my conclusions are right and so taking shortcuts is OK"
- ▶ Is it human nature to cheat when you can?
- ▶ The relative ease with which electronic data can be altered - photoshop, etc.

ROOTS OF MISCONDUCT

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- ▶ Clear guidelines for responsible research
- ▶ Active mentoring
- ▶ Zero tolerance environment, penalties
- ▶ Clear system by for reporting suspected cases of misconduct
- ▶ visible oversight committees for fair investigation
- ▶ Institute-level standards for record keeping
- ▶ Reward and appreciation system

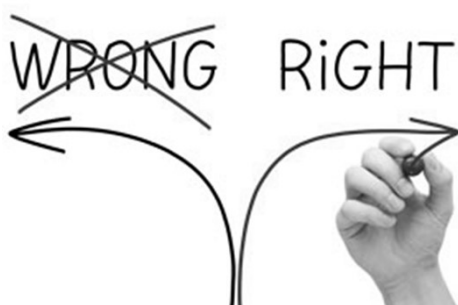
An easy to remember scientific moral code:

- ▶ do not lie (fabrication), cheat (falsification) or steal (plagiarism)

SOME WAYS TO PREVENT MISCONDUCT

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An easy to remember scientific moral code:

Do not lie (fabrication), cheat (falsification) or steal (plagiarism)

CHECKLIST

Approval and Consent	<ul style="list-style-type: none"> • Do you have approval of the relevant Regulatory Authorities, Institutional Review Board and Ethics Committee? • Have you registered your clinical trial? • Have you documented Informed Consent?
Data Accuracy Falsification Fabrication	<ul style="list-style-type: none"> • Is there manipulation of material, equipment, process or data? • Have you double-checked data for accuracy? <p>Is there any lurking fake data?</p>
Plagiarism and Self-Plagiarism	<ul style="list-style-type: none"> • Have you used your own prior work or copied others' work? • If so, have you cited these correctly? • Do you have written permission for reproduced material, figures or tables?
Submission Fraud	<p>Is there simultaneous submission to two journals?</p> <p>Have you published the entire work or part of it (salami-slicing) already?</p> <p>Have you excessively cited your own publications?</p>
Ethics of Authorship	<ul style="list-style-type: none"> • Have you included all the authors in a specific pre-agreed order? • Do you have an agreement with co-authors? • Are the co-authors aware of the contents of the publication? • Have they had access to, and hold themselves responsible for the data and its interpretation? • Is there any Ghost Author or a "Guest Author"?
Conflict of Interest	<p>Have you declared relevant interests and relationships that could be seen as influencing your findings (whether financial or scientific)?</p>

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- ▶ The research being reported should have been conducted in an ethical and responsible manner and should comply with all relevant legislation.
- ▶ Researchers should present their results clearly, honestly, and without fabrication, falsification or inappropriate data manipulation.
- ▶ Researchers should strive to describe their methods clearly and unambiguously so that their findings can be confirmed by others.

SUMMARY

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- ▶ Researchers should adhere to publication requirements that submitted work is original, is not plagiarized, and has not been published elsewhere.
- ▶ Authors should take collective responsibility for submitted and published work.
- ▶ The authorship of research publications should accurately reflect individuals' contributions to the work and its reporting.
- ▶ Funding sources, conflicts of interest should be disclosed.

SUMMARY

The Committee on Publication Ethics (COPE) has guidelines for editors and peer reviewers (substantive) and authorship (substantive).
<http://publicationethics.org/>

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► **Getting original, honest and responsible**

THANK YOU

BE ORIGINAL

HONESTY
sets you
FREE

RESPONSIBILITY

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