

Research Misconduct

การประพฤติมิชอบทางการวิจัย

รศ.นิมิตรา มารก旦

มหาวิทยาลัยเชียงใหม่

นพ. สุพลด อันันต์นำเจริญ

วิทยาลัยแพทยศาสตร์พระมงกุฎเกล้า

Learning objectives

After lecture, the audience are able to

- Define behavior classified as research misconduct
- Explain the preventive measures for research misconduct
- Determine authorship credit
- Address some important issues related to publication in biomedical journals

Outline

- Background
- Definition and examples of research misconduct
- Cases
- Preventive measures



The Office of Research Integrity (ORI)

The Office of Research Integrity (ORI) oversees and directs Public Health Service (PHS) research integrity activities on behalf of the Secretary of Health and Human Services with the exception of the regulatory research integrity activities of the Food and Drug Administration.

Organizationally, ORI is located within the Office of the Assistant Secretary for Health (OASH) within Office of the Secretary of Health and Human Services (OS) in the Department of Health and Human Services (HHS).

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RCR RESEARCH MISCONDUCT

RESPONSIBLE CONDUCT OF RESEARCH

This section includes relevant background text, definitions and examples, policy statements, video, and expert commentary. It should be read by those looking for a thorough understanding of research misconduct.

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»Foundation Text«

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 - 3. [John Darsee and Robert Slutsky](#)
 - 4. [Thereza Imanishi-Kari, David Baltimore, and Margot O'Toole; hearings and regulations](#)

Fraud in Science

- In 1974, William Summerlin, the Sloan-Kettering Institute for Cancer Research,
 - reported that he could transplant tissue from genetically unrelated animals without rejection by the recipient animal if he kept the tissue from the donor in organ culture for four to six weeks
 - demonstrated his claims by showing white mice that had black patches on their backs because their skin had been transplanted from unrelated donor mice
 - after Summerlin made a presentation, a technician noticed that these "transplanted patches" were actually drawn on the skin of the mice with a felt-tipped marker
 - the patches could be removed with alcohol

Fraud in Science

- **Vijay Soman**, an assistant professor at Yale, was asked to peer review a paper by Helena Wachslicht-Rodbard. He sent back a negative review, delaying publication, then turned around and submitted the same paper to another journal
- He was found out when, in an amazing twist of fate, Helena Wachslicht-Rodbard was asked to peer review Soman's paper and recognized it as her own

Cause

- Pressure and temptation
 - Research grant: new or continue
 - Publications in famous journals
 - Career path: academic promotion
 - Education: PhD students
 - Others

US Federal policy

- Research misconduct is defined as
 - Fabrication
 - Falsification
 - Plagiarismin proposing, performing, or reviewing research, or in reporting research results.
- It does not include honest error or differences in interpretation

- 1989- Federal regulations governing scientific misconduct in research funded by the Public Health Service (PHS) were put in place
- DHHS set up
 - OSI within NIH
 - OSIR within the Office of Secretary for Health
- Misconduct in science was defined

Integrity and Misconduct in Research. Report of the Commission on Research Integrity. DHHS, 1995.

- OSI and OSIR were accused of having inconsistent policies, vague rules, and procedures
- 1992- Merge OSI and OSIR into the Office of Research Integrity (ORI)
- ORI promotes research integrity and oversight of research misconduct

Integrity and Misconduct in Research. Report of the Commission on Research Integrity. DHHS, 1995.

- As an agency under the Department of Health and Human Services (HHS), NIH follows the Public Health Service (PHS) Policies on Research Misconduct [42 CFR 93](#)
- All institutions receiving PHS funding must have written policies and procedures for addressing allegations of research misconduct
- The HHS Office of Research Integrity (ORI) has the authority and the responsibility to review and monitor investigations of research misconduct allegations involving PHS funding

Integrity and Misconduct in Research. Report of the Commission on Research Integrity. DHHS, 1995.

Definition

§ 93.103 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 such that the research is not accurately represented 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

Federal Register. Tuesday May 17, 2005. 42 CFR Parts 50 and 93 Public Health Service Policies on Research Misconduct; Final Rule.

Fabrication

- Fabrication is making up data or results and recording or reporting them
- การกุห์รีอยกเมฆ ข้อมูลหรือผลการทดลอง แล้วบันทึกและรายงาน
 - อาศาสมมครเสียชีวิตไปแล้ว แต่มีบันทึก follow up
 - อาศาสมมครไม่มาตามนัด กรอกข้อมูล Lab เองแบบเดาสุ่ม
- มีผลทำให้ข้อมูล invalid

- Pfizer paid for a clinical study of Dr. Reuben's on the perioperative use of celecoxib as part of multimodal analgesia for outpatient anterior cruciate ligament reconstructive surgery
- However, Dr. Reuben later admitted that he had not enrolled any patients in the trial but instead, had simply made up the findings

- Anesthesia & Analgesia and other medical journals have retracted more than 20 articles by Dr. Reuben containing fabricated data, according to the publication Anesthesiology News
- Dr. Reuben was sentenced in June 2010 in a Boston, Massachusetts federal court to 6 months in prison for healthcare fraud

Falsification

- Falsification is manipulating research materials, equipment, or processes, or changing, or omitting data or results such that the research is not accurately represented in the research record
- การดัดแปลงวัสดุวิจัย อุปกรณ์ หรือ กระบวนการวิจัย หรือเปลี่ยน หรือลงทะเบียนข้อมูลหรือผลการวิจัย จนกระทั่งบันทึกการวิจัยไม่สะท้อนความเป็นจริง
- “ตกแต่งข้อมูล” ให้ดี
 - Retouch ภาพ
 - เอาข้อมูลคนหนึ่ง ไปใส่บันทึกข้อมูลของอีกคนหนึ่ง
- ทำให้ผลการทดลอง Invalid

	Body Comp&EE		Revised TEE's	
First	TEE-1	TEE-2	TEE1	TEE2
jean		2043.00	2399	2043
ray			3089	2923
beth			3728	3404
seth	2460.00	1838.00	2460	1838
alice		2750.00	2950	2750
thomas	2540.00	2945.00	2945	2540
david			3392	3312
harry		3423.00	3423	2655
frances		1854.00	2377	1854
john		2147.00	3244	2147
anita			2680	2399
carol			2136	2130
anthony	2919.00	3264.00	3264	2919
ron		2950.00	3593	2950

Fabricated value

Reversed value (s)

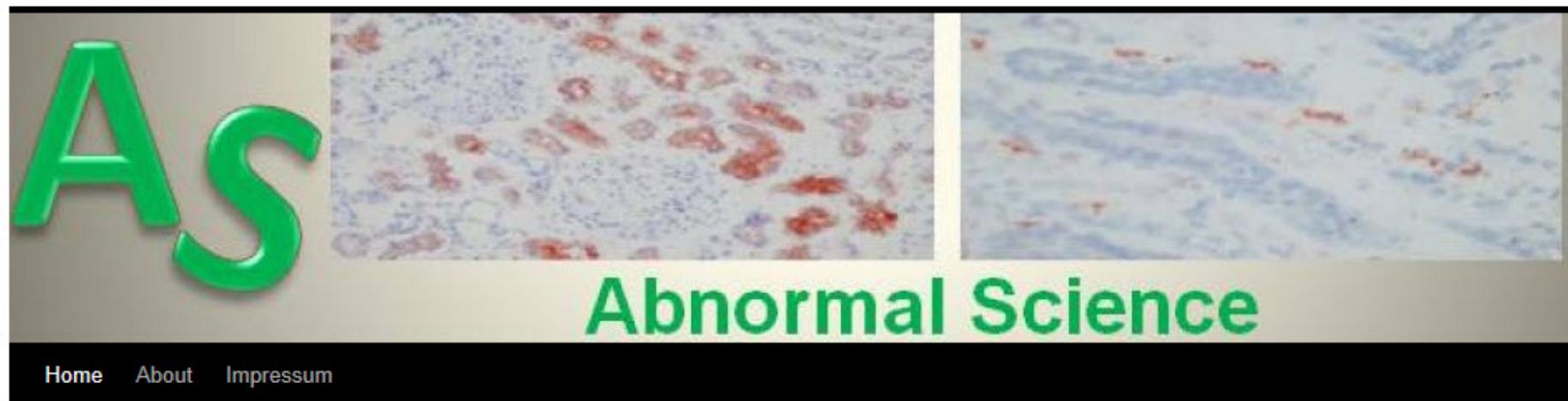
Data on Total Expenditure Value (TEE)

https://ori.hhs.gov/poehlman_notice

	ExcelLongitudinal2	ExcelLongitudinal2[AT]		
	GLUC_1	GLUC_2	GLUC_1	GLUC_2
stephen	89.00	84.00	84.00	89.00
nancy	82.00	77.00	77.00	82.00
suzanne	104.00	80.00	80.00	104.00
marie	92.00	95.00	92.00	95.00
marty	97.00	90.00	97.00	90.00
claude	111.00	103.00	103.00	111.00
dieter	89.00	85.00	85.00	89.00
bill	111.00	87.00	87.00	111.00
jim	98.00	87.00	87.00	98.00
margaret	79.00	.	79.00	86.00
edith	107.00	81.00	81.00	105.00
dan	98.00	87.00	87.00	98.00
phyllis	93.00	84.00	84.00	93.00
arthur	99.00	.	99.00	103.00
beverly	105.00	89.00	89.00	105.00
gardner	102.00	86.00	86.00	106.00
chet	103.00	100.00	103.00	100.00
charles	82.00	91.00	82.00	91.00
John	94.00	82.00	82.00	99.00
jean	99.00	79.00	79.00	99.00
edsel	135.00	113.00	113.00	135.00
marjorie	103.00	87.00	87.00	103.00
jim	104.00	94.00	104.00	94.00
theresa	87.00	81.00	81.00	87.00
russ	102.00	85.00		
marie	103.00	95.00		

	Mean	98.94	87.94	87.79	99.90
	S.D.	8.85	10.67	9.21	10.13
	Count	143.00	126.00	137.00	136.00

Dr. Poehlman's changes to glucose involved near complete reversal of T1 and T2 values, allowing him to claim that glucose levels rose with age when the real data showed the opposite.



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From the premier cancer center in the world-part 6

Veröffentlicht am 20. Februar 2012

[From the premier cancer center in the world-part 5](#)

Yadav VR, Prasad S, Gupta SC, Sung B, Phatak SS, Zhang S, Aggarwal BB.

3-Formylchromone interacts with cysteine 38 in p65 protein and with cysteine 179 in I κ B kinase, leading to down-regulation of nuclear factor- κ B (NF- κ B)-regulated gene products and sensitization of tumor cells.

[J Biol Chem. 2012 Jan 2;287\(1\):245-56.](#)

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 Suchen

Fig. 1B

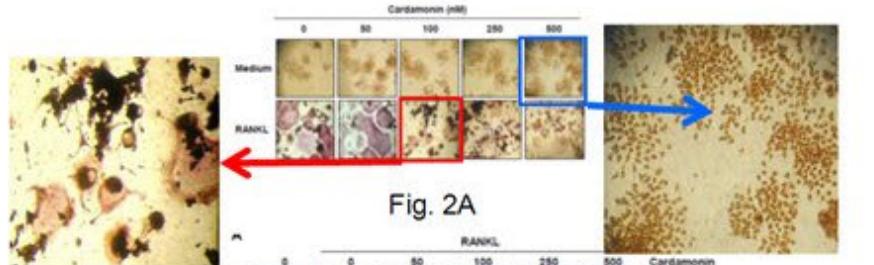


Fig. 2A

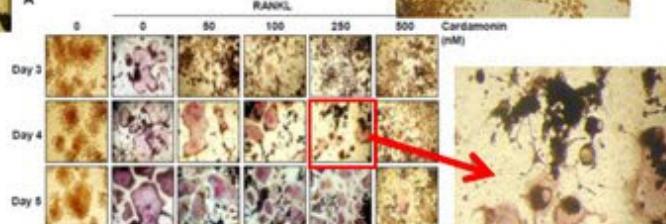
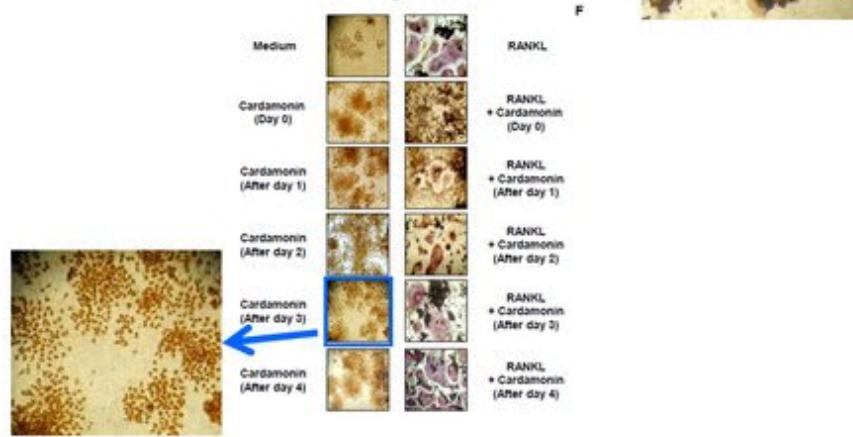


Fig. 3A



Same images, different experimental conditions?

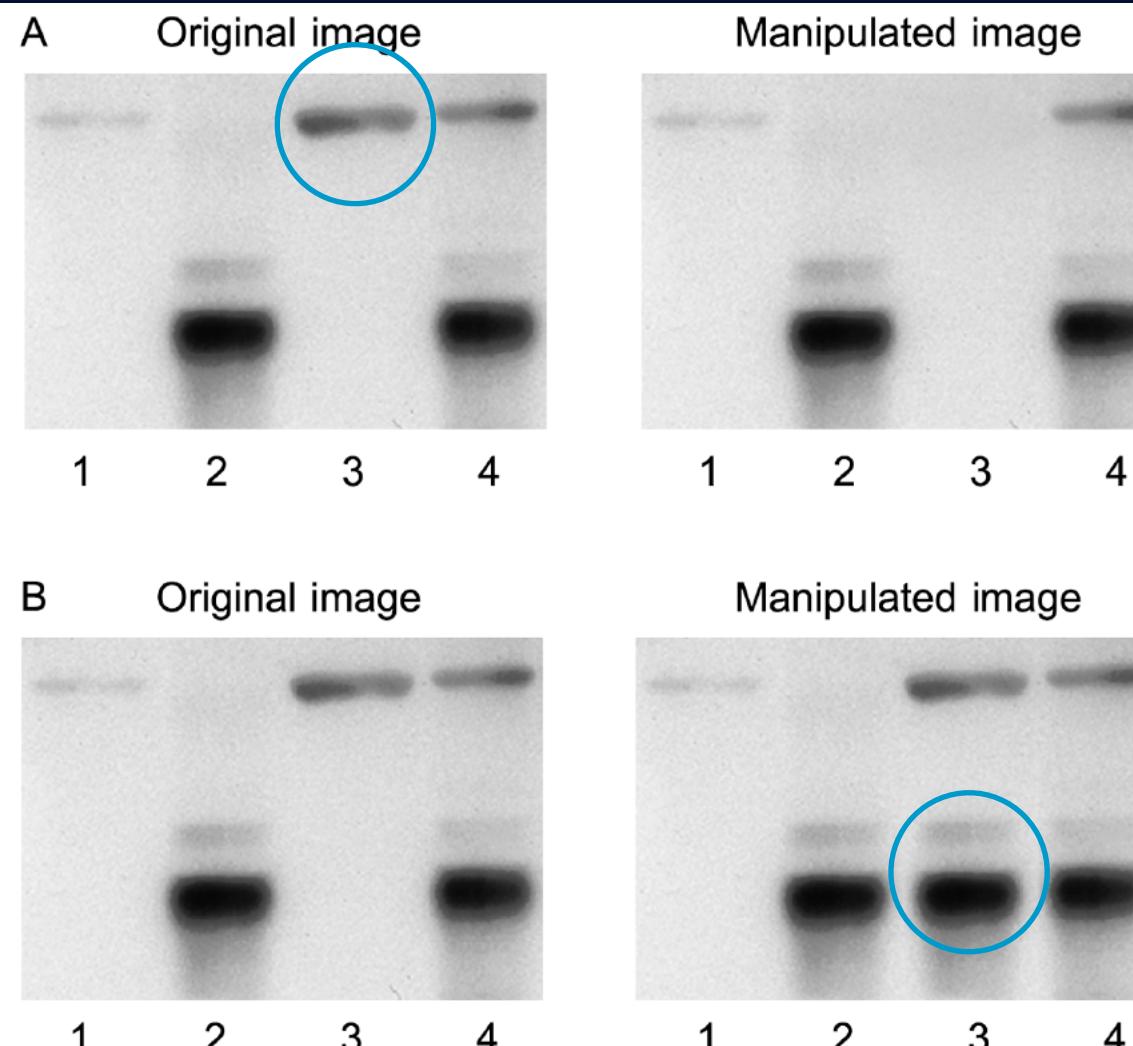


Figure 1. Gross manipulation of blots. (A) Example of a band deleted from the original data (lane 3). (B) Example of a band added to the original data (lane 3).

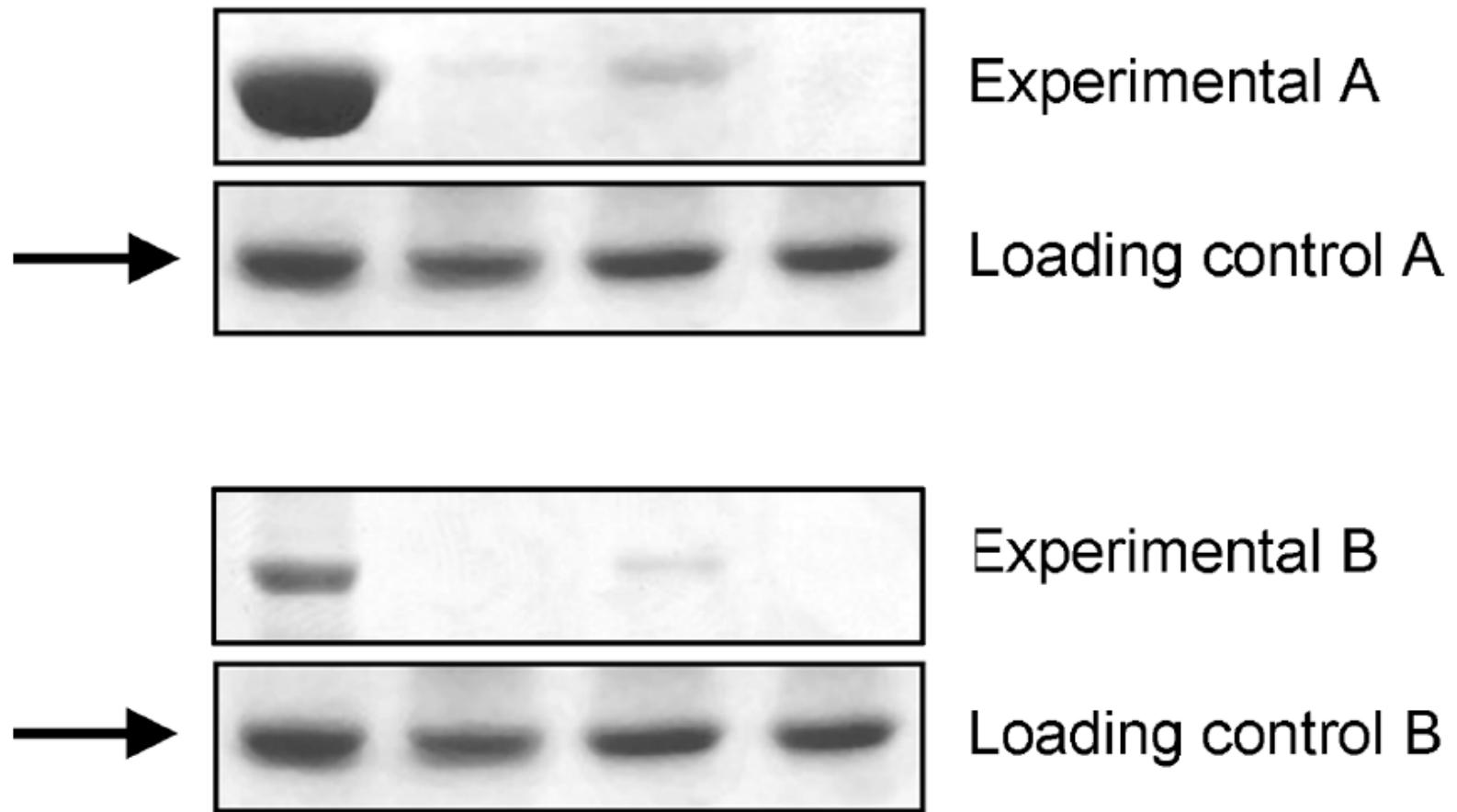
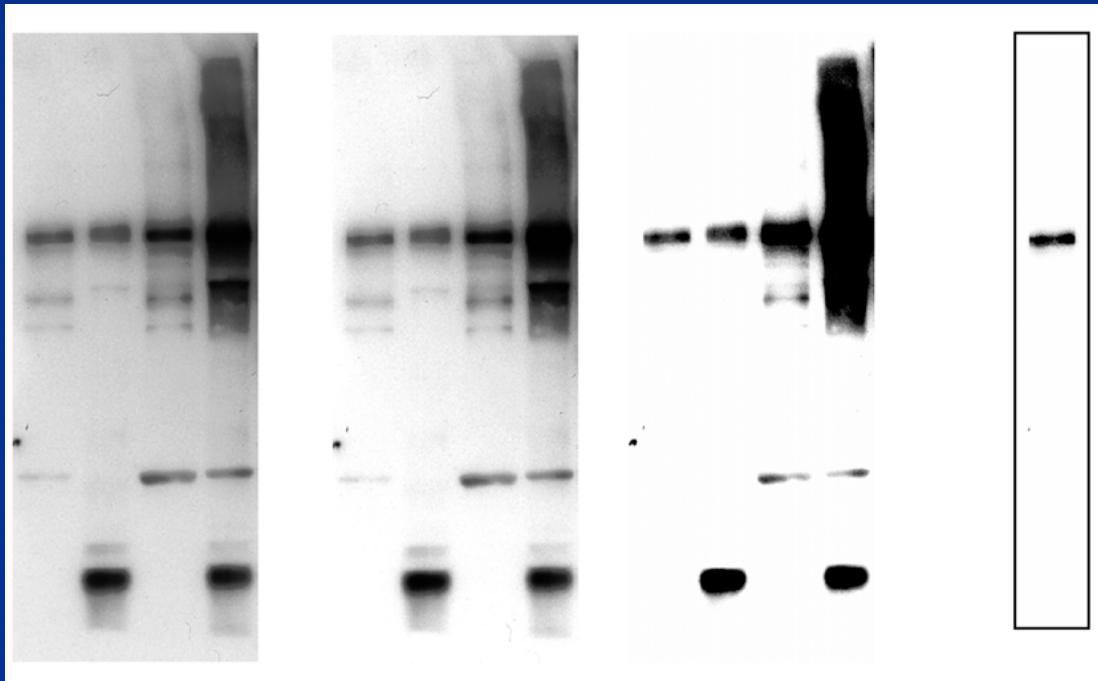
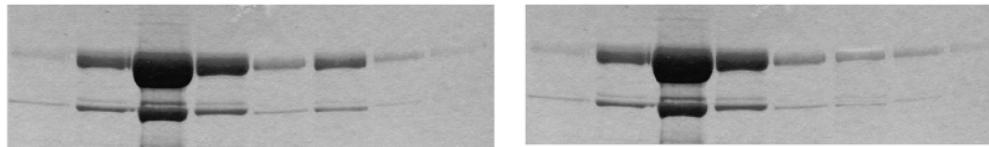
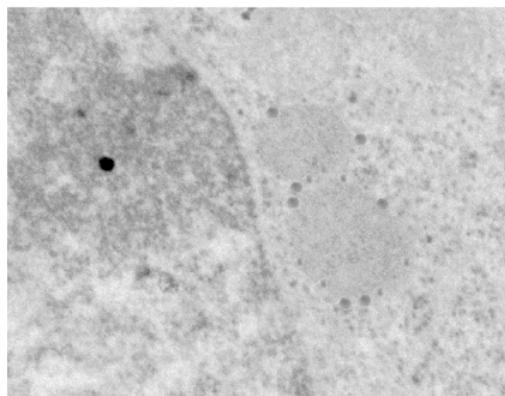


Figure 2. **Gross manipulation of blots.** Example of a duplicated panel (arrows).

A. Original image Manipulated image



Original image



Manipulated image

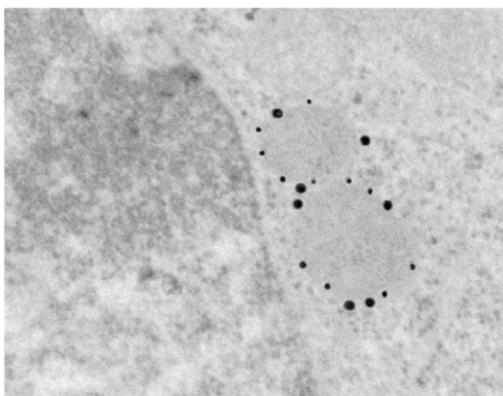
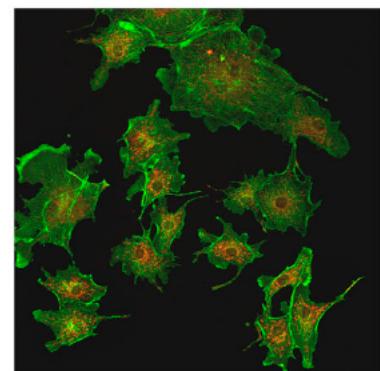


Figure 5. **Misrepresentation of immunogold data.** The gold particles, which were actually present in the original (left), have been enhanced in the manipulated image (right). Note also that the background dot in the original data has been removed in the manipulated image.

Manipulated image



Manipulation revealed by contrast adjustment

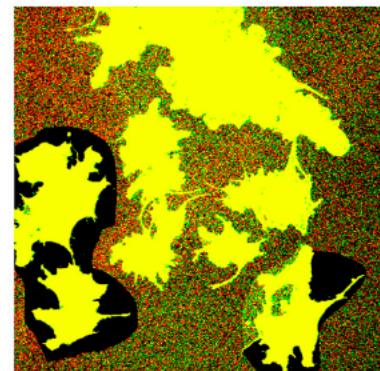


Figure 6. **Misrepresentation of image data.** Cells from various fields have been juxtaposed in a single image, giving the impression that they were present in the same microscope field. A manipulated panel is shown at the top. The same panel, with the contrast adjusted by us to reveal the manipulation, is shown at the bottom.

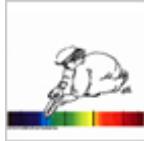
The Journal of Cell Biology Guidelines

- Adjustments of brightness, contrast, or color balance are acceptable if they are applied to the whole image and as long as they do not obscure or eliminate any information present in the original
- Nonlinear adjustments (e.g., changes to gamma settings) must be disclosed in the figure legend”

Guidelines

Guidelines for Best Practices in Image Processing

Please click on each guideline for further details. Also, see the guidelines demonstrated in [Photoshop Videos](#).



Treating Images as Data: Digital scientific images should be treated as data



Filters Degrade Data: Use of software filters to improve image quality is usually not recommended for biological images.



Saving the Original: Manipulations of digital images should always be done on a copy of the raw image data. The original must be retained.



Cloning Degrades Data: Cloning objects into an image or from other parts of the image is very questionable.



Making Simple Adjustments: Simple adjustments to the entire image are usually acceptable.



Making Intensity Measurements: Intensity measurements of digital images should be performed on raw data and the data should be calibrated to a known standard.



Cropping is usually OK: Cropping an image is usually acceptable.



Lossy Compression Degrades Data: Avoid the use of lossy compression.

<https://ori.hhs.gov/education/products/RlandImages/guidelines/list.html>

Plagiarism

“Plagiarism is the appropriation of another person’s ideas, processes, results, or words without giving appropriate credit”

- รวมถึงการลัก (theft) หรือ ยักยอก (misappropriation) ทรัพย์สินทางปัญญา และ **ข้อความ** จากผลงานของผู้อื่น
- ทับซ้อนกับการละเมิดลิขสิทธิ์
- ไม่นับการโต้แย้งในส่วนแบ่ง % ในผลงาน หรือ รายชื่อผู้นิพนธ์ (authorship dispute)

Plagiarism

นักวิจัย ระหว่างการทำ peer- review process แล้วนำความติด
เห็นของผู้อื่นในบทความที่ตนทบทวนมาใช้ในผลงานเขียนของตนเอง

นักศึกษา คัดลอกเอาเอกสารหรือข้อมูลแบบคำต่อคำ โดยไม่ได้
อ้างอิงแหล่งที่มา ในวิทยานิพนธ์ ของตนเอง

หน่วยงาน นำเอาวิทยานิพนธ์และผลงานจากนักศึกษามาตีพิมพ์โดย
ไม่ได้อ้างอิงถึงเจ้าของผลงาน

การอ้างอิงต้องอ้างอิงเหลล่ที่มาเสมอ

1. การคัดลอกคำต่อคำ(Verbatim)
2. การถอดความ(Paraphrase)
3. การสรุป(Summary)
4. กล่าวถึง ข้อเท็จจริง, สารสนเทศ, ข้อมูล ยกเว้นกรณีที่เป็น ความรู้ทั่วไป(common knowledge) หรือ ความรู้สาธารณะ(public knowledge)

Common Knowledge

- ความรู้ที่คนส่วนใหญ่ทราบ ไม่มีใครเป็นเจ้าของความรู้นั้น “everybody knows that”
 - ดวงอาทิตย์ขึ้นทางทิศตะวันออก
 - น้ำทະเลเคม
 - โลกมีสัณฐานกลม
 - หนึ่งปีมี 365 วัน
- Facts commonly known by average high school and college students
- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

Public Knowledge

- “knowledge that is available to anyone”
 - รายงานข่าวจำนวนผู้ติดเชื้อ COVID-19
 - รายงานสภาพภูมิอากาศของกรุงอุตุนิยมวิทยา

Public Domain

▪ “works that no copy right protection”

- งานที่มีผู้ร่วมสร้างสรรค์ผลงานที่เก่าแก่มากกว่า 95 ปี
- งานที่สร้างสรรโดยเจ้าของผลงานท่านเดียวแต่เก่าแก่กว่า 70 ปี หลังจากเจ้าของผลงานเสียชีวิตไปแล้ว
- สามารถใช้ได้อย่างเป็นอิสระไม่ต้องขออนุญาติจากเจ้าของผลงานหรือผู้ถือครองลิขสิทธิ์
- ในทางจริยธรรมไม่สามารถนำมาอ้างเป็นของตนและยังคงต้องอ้างอิงผู้ที่สร้างผลงาน เช่น เพลง ผลงานเพลงของ Shakespeare

www.plagiarism.org

Avoid Copy & Paste

ตัวอย่างการเขียนที่ไม่เหมาะสม

จากการศึกษาของ Henry GB et al. ในปี 2004 ซึ่งทำการศึกษาใน 15 randomly chosen colonic resection พบว่า 7 cases เป็น.... และ 75% of all positive nodes were under 2.0 mm จากผลการวิจัยสรุป ได้ว่า significant difference in diameter of metastatic (5.9 mm) และ non metastatic (3.9mm) nodes, แต่ lymph node size is not a realistic indicator for lymph node metastasis in colon cancer

Verbatim: must be enclosed in “quotation marks”

Original Source Material: Technology has significantly transformed education at several major turning points in our history. In the broadest sense, the first technology was the primitive modes of communication used by prehistoric people before the development of spoken language. Mime, gestures, grunts, and drawing of figures in the sand with a stick were methods used to communicate -- yes, even to educate. Even without

Correct Version

In examining technology, we have to remember that computers are not the first technology people have had to deal with. Frick (1991) believes that "... the first technology was the primitive modes of communication used by prehistoric people before the development of spoken language" (p. 10).

- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

Block Quotations

For example quoting directly from Iverson, et al (2007; p. 361):

Block Quotations. – If material quoted from texts or speeches is longer than 4 typewritten lines. The material should be set off in a block, i.e., in reduced type and without the quotation mark. Paragraph indents are generally not used unless the quoted material is known to begin a paragraph. Space is often added both above and below these longer quotations.

Although the evidence indicates that most authors, including college students, are aware of

- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

Inappropriate paraphrasing

“Because the intracellular concentration of potassium ions is relatively high, potassium ions tend to diffuse out of the cell. This movement is driven by the concentration gradient for potassium ions. Similarly, the concentration gradient for sodium ions tends to promote their movement into the cell. However, the cell membrane is significantly more permeable to potassium ions than to sodium ions. As a result, potassium ions diffuse out of the cell faster than sodium ions enter the cytoplasm. The cell therefore experiences a net loss of positive charges, and as a result the interior of the cell membrane contains an excess of negative charges, primarily from negatively charged proteins.”¹ (p. 204).

Because the intracellular concentration of potassium ions is _ high, potassium ions tend to diffuse out of the cell. This movement is triggered by the concentration gradient for potassium ions. Similarly, the concentration gradient for sodium ions tends to promote their movement into the cell. However, the cell membrane is much more permeable to potassium ions than to it is to sodium ions. As a result, potassium ions diffuse out of the cell more rapidly than sodium ions enter the cytoplasm. The cell therefore experiences a _ loss of positive charges, and as a result the interior of the cell membrane contains a surplus of negative charges, primarily from negatively charged proteins.¹ (p. 204).

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Appropriate Paraphrase

A textbook of anatomy and physiology¹ reports that the concentration of potassium ions inside of the cell is relatively high and, consequently, some potassium tends to escape out of the cell. Just the opposite occurs with sodium ions. Their concentration outside of the cell causes sodium ions to cross the membrane into the cell, but they do so at a slower rate. According to these authors, this is because the permeability of the cell membrane is such that it favors the movement of potassium relative to sodium ions. Because the rate of crossing for potassium ions that exit the cell is higher than that for sodium ions that enter the cell, the inside portion of the cell is left with an overload of negatively charged particles, namely, proteins that contain a negative charge.

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Summarized Version

- The interior of a cell maintains a negative charge because more potassium ions exit the cell relative to sodium ions that enter it, leaving an over abundance of negatively charged protein inside of the cell.¹
- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

ต้องอ้างอิงแหล่งที่มาของข้อมูลเสมอ ไม่ว่าจะเป็นการคัดลอกคำต่อคำ การ
ถอดความ หรือการสรุป

ต้นฉบับเขียนว่า

- While appendicitis was confirmed histological in 65 of 80 (81.2%) male patients, it could only be confirmed histological in 57 of 110 (51.8%) female patients

ปรับเป็น

- In 2007, Singhal V, et al⁷ reported that for nearly one fifth of male and half of female patients who underwent appendectomy the histopathology result was unconfirmed appendicitis

REF:

7. Singhal V, Jadhav V. Acute appendicitis: are we over diagnosing it? Ann R CollSurg Engl. 2007 Nov; 89(8):766-9.

ระวัง! มีเครื่องมือตรวจจับ!

■ การซ้ำของข้อความ

- Turnitin
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- ScanMyEssay
- eTBLAST (Deja vu Database)

■ การแต่งภาพ

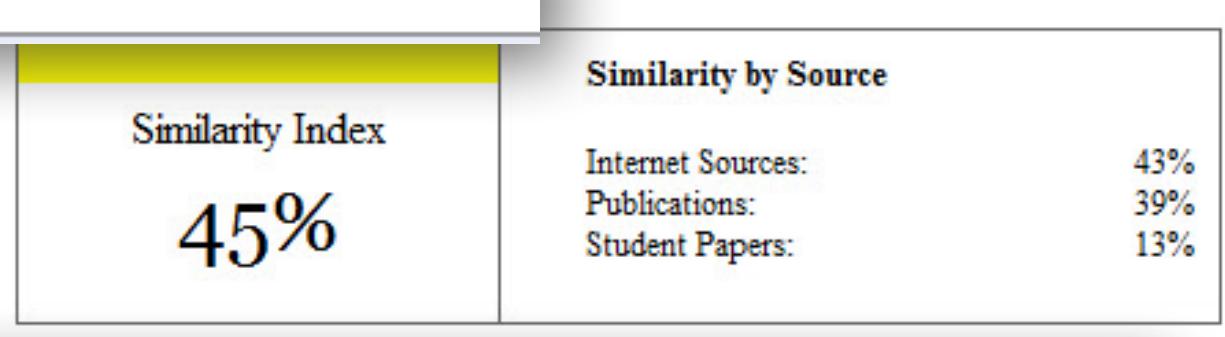
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Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing

Miguel Roig, Ph.D.

<https://ori.hhs.gov/sites/default/files/plagiarism.pdf>

Self-plagiarism

- Self-Plagiarism is defined as a type of plagiarism in which the writer republishes a work in its entirety or reuses portions of a previously written text while authoring a new work
- Self-plagiarism can infringe upon a publisher's copyright
- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

- Republishing the same paper that is published elsewhere without notifying the reader nor publisher of the journal
 - Publishing a significant study as smaller studies to increase the number of publications rather than publishing one large study(Salami slicing/data fragmentation)
-
- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

- Reusing portions of a previously written (published or unpublished text)
 - **Data augmentation** occurs when a researcher publishes a study and subsequently collects additional data, which typically end up strengthening the original effect, and publishes the combined results as a new study
-
- Miguel Roig: Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing.

Duplication/Redundant

Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication

Updated April 2010

Publication Ethics: Sponsorship, Authorship, and Accountability
International Committee of Medical Journal Editors

Redundant(Duplicate) Publication

- Publication of a paper that overlaps substantially with one already published in print or electronic media
- Result in inadvertent double counting or inappropriate weighting of the results of a single study, which distorts the available evidence

- This policy does not preclude the journal from considering
 - a paper that has been rejected by another journal, or
 - a complete report that follows publication of a preliminary report, such as an abstract or poster displayed at a professional meeting
 - a paper that has been presented at a scientific meeting but was not published in full
 - clinical trial registries

- When submitting a paper, the author must always make a complete statement to the editor about all submissions and previous reports (including meeting presentations and posting of results in registries) that might be regarded as redundant or duplicate publication
- Copies of such material should be included with the submitted manuscript to help the editor decide how to handle the matter

Acceptable Secondary Publication

1. The authors have received approval from the editors of both journals (the editor concerned with secondary publication must have a photocopy, reprint, or manuscript of the primary version)
2. The priority of the primary publication is respected by a publication interval of at least 1 week (unless specifically negotiated otherwise by both editors)
3. The paper for secondary publication is intended for a different group of readers; an abbreviated version could be sufficient

4. The secondary version faithfully reflects the data and interpretations of the primary version
5. The footnote on the title page of the secondary version informs readers, peers, and documenting agencies that the paper has been published in whole or in part and states the primary reference. A suitable footnote might read: “This article is based on a study first reported in the [title of journal, with full reference]”

Authorship credit

- Authorship credit should be based only on a substantial contribution to the following:
 - Conception and design, acquisition of data or analysis and interpretation of data
 - Drafting the article or revising it critically for important intellectual content
 - Final approval of the version published

All three of these conditions must be met

สรุป

- Research misconduct คือ fabrication, falsification และ plagiarism
- สหรัฐอเมริกามีหน่วยงานกลางที่กำกับดูแลและเผยแพร่ผลการสอบสวน คือ ORI
- ประเทศไทยเริ่มมีการป้องกันการคัดลอกผลงาน และมีการลงโทษบ้างแล้ว
- นักวิจัยพึงระมัดระวังและไม่ควรประพฤติมิชอบทางวิชาการ

QUESTIONS

