Writing with Integrity

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Integrity:

From Latin *integer* (whole, complete)

What you
- value
- say
- do

Writing with Integrity

Values? (implicit in all academic writing)

- honesty, objectivity, clarity, accuracy
  - completeness – no relevant information held back
  - authors are the ones who did the work
  - words, results, and ideas are authors' unless stated otherwise

Referencing:

- allows readers to examine original material
- demonstrates respect and gratitude to originator and acknowledges their influence
- gives credit where credit due
- may be a means to refute

Writing with Integrity

Values? (implicit in all academic writing)

- The work represents the author's synthesis and critical analysis of the subject

Writing with Integrity

Values? (implicit in all academic writing)

- published papers
- course essays
- theses
- grant applications
- other applications (grad school, scholarships, etc)
- …

An ethical writer acknowledges the relevant contributions of others and the source of his/her ideas and information.

Roig, M. 2006. *Avoiding plagiarism, self-plagiarism, and other questionable writing practices: a guide to ethical writing.* http://ori.dhhs.gov/education/products/plagiarism/

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This study and our results indicate that the effects of ERα and ERβ are dependent on the promoter region to which they (in)directly bind, as was also suggested by others (Klinge et al., 2004)

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Gene-based vaccination offers the potential to improve the priming of immune responses…(7). In this study, we examined whether gene-based priming could potentiate the neutralizing antibody…

Plagiarism of ideas:

- unintentional / intentional

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As with cloning by nuclear transfer in frogs and mice, the efficiency and yield of reprogrammed genomes declines with increasing age and differentiation status of the donor cell[7], and varies with the methylation state of the donor nucleus[8].

Estrogen receptors α and β (ERα and ERβ) are homologous members of the nuclear receptor superfamily and are encoded by two different genes.

An ethical writer acknowledges sources by summarizing, paraphrasing appropriately, or enclosing in quotations marks.

Here we demonstrate that induced pluripotent stem cells (iPSCs) retain an epigenetic memory of their tissue of origin, which is not apparent when adult somatic cells are reprogrammed to pluripotent stem cells by nuclear transfer.
- Kim et al, 2010

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Although reprogramming adult somatic cells to pluripotent cells by nuclear transfer erases epigenetic memory, reprogramming of the same cells through exposure to a cocktail of transcription factors does not abolish all DNA methylation signatures (Kim et al, 2010).

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What about Materials/Methods or detailed technical descriptions?

Reverse transcription was performed using RT-PCR Master Mix (GE Healthcare). Briefly, 1 µg of total RNA was reverse-transcribed with random primers, and first strand reverse-transcribed cDNA was diluted 1:200 in water before use. Real-time PCR was carried out with LightCycler 480 SYBR Green I Master kit using a LightCycler 480 system (Roche Applied Science) as recommended by the manufacturer.

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"Please note that verbatim copying of entire paragraphs (even in the "Methods" section) whether from other authors' or one's own prior work is never tolerated."

Pharmaceutical Research

An ethical writer performs his/her own synthesis and analysis of the subject
OR
presents another's with acknowledgment.


LETTERS

Production of *p53* gene knockout rats by homologous recombination in embryonic stem cells

"writing" source

Production of *p53* gene knockout rats by homologous recombination in embryonic stem cells – Tong et al. *Nature* 467:211-213 2010

In the past two decades, gene targeting in mouse ES cells has been used as a unique and powerful tool for elucidating gene function and addressing fundamental biological questions in mammals[1]. This ES-cell-based gene targeting technology allows us to create precise and conditional gene replacements (knock-in) or loss-of-function mutations (knockout) of the chosen locus. So far, this technology is only available for the mouse because of the inability to establish germline-competent ES-cell lines from other species. The rat is a more widely used model for studying human normal and disease processes and for testing drug efficacy and toxicity before human clinical trials[4, 5, 6, 7].

Gene targeting in mouse ES cells is a powerful tool for illuminating mammalian gene function and answering important biological questions.[1] The technology permits scientists to create exact or conditional replacements of genes (knock-in) or mutations that disrupt function (knockout) of the locus of interest. To date, this technology is only operational in mice as ES cell-lines capable of contributing to the germ line are not available for other species. Rats, however, are more commonly used than mice in studies involving human disease modelling and in preliminary efficacy and toxicity studies for human drug trials. [4, 5, 6, 7].

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"You plagiarize when you use words so close to those in your source, that if your work were placed next to the source, it would be obvious that you could not have written what you did without the source at your elbow."

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For a variety of biological reasons, rats are most often used to assess the efficacy and toxicity of drugs prior to human clinical trials[1,2,3]. It is frequently the case, however, that the drug being studied is designed for those with a specific genetic or phenotypic attribute or deficiency[4,5], and the wild-type rat is therefore not always the most effective model. The development in mice of the revolutionary technology capable of precisely mutating or deleting genes *in situ* in the organism has enabled huge advances in our understanding, but due to the lack of embryonic cell lines capable of giving rise to the germline in other organisms, this technology has not been available for use in the types of pre-clinical trial studies mentioned above.

An ethical writer does not plagiarize him/herself.*

Redundant publication
- "share the same hypothesis, data, discussion points or conclusions"
- the same paper for different courses

Salami publication
- publishing parts of the same study in separate papers

Reuse of previously published text

*Unless certain conditions hold, eg, doesn't violate copyright, the duplication is made explicit

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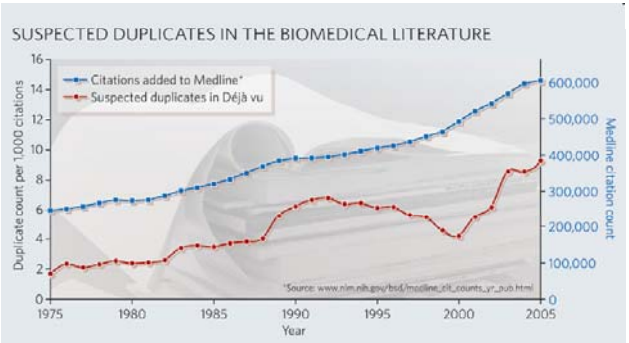

Errami & Garner 2008, Nature 451:397

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"Deception is the key issue in all forms of self-plagiarism"

- The Lancet

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When paraphrasing or summarizing other work, an ethical writer reproduces the exact meaning of the others' ideas or facts

In contrast, *Drosophila* RCC1 lacking residues 2–29 failed to form a stable complex with nucleosome core particles in parallel experiments.

- Makde et al., 2010

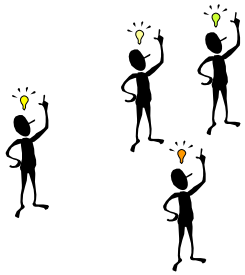
~~…similar in structure to the region of *Drosophila* RCC1 (residues 2-29) that binds nucleosome core particles (Makde et al, 2010)~~

…similar in structure to the region of *Drosophila* RCC1 (residues 2-29) required for stable binding to nucleosome core particles (Makde et al, 2010)

An ethical writer has read and understood all work cited.

The crystal structure of the nucleosome core particle was determined at 2.8 Å thirteen years ago[9], and since then structures of nucleosome core particles containing histone proteins from different species and variant DNA sequences of the original human α-satellite sequence have provided structural insight[9,10,11,12,13,14,15,16,17]

An ethical writer ensures that credit is given to those who first reported the finding or who first had the idea.



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An ethical writer reports evidence or ideas contrary to their own.

When describing one's own studies or supporting studies, any potential flaws or limitations must be described.

The preceding experiments establish a clear role for pRb in fate commitment bias *in vivo* and *in vitro*.

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The preceding experiments establish a clear role for pRb in fate commitment bias *in vivo* and *in vitro*. However, because this analysis was conducted in p53-deficient cells, it is unclear whether *Rb* alone is sufficient to determine this plasticity...

An ethical writer includes all information necessary for the research to be replicated.

METHODS

Mice and rats. CF-1 (Charles River Laboratory Stain Code 023) and Tg(DR4)1Jmi (Jackson Laboratory Stock number 002208) (DR-4) strains of mice were used to prepare mouse embryonic fibroblasts (MEFs). MEFs prepared from the DR-4 mouse strain are resistant to G418, 6-thioguanine, puromycin and hygromycin. E4.5 timed-pregnant Fischer 344 inbred rats (F344/NHsd) and E3.5 pseudo-pregnant Sprague-Dawley outbred rats (Hsd:Sprague Dawley) were purchased from Harlan Laboratories. Animal experiments were performed according to the investigator's protocols approved by the UBC Institutional Animal Care and Use Committee (IACUC).

Rat ES cell culture. Rat ES cells were cultured at 37 °C in a humidified 5% CO_2 incubator. They were routinely passaged on mitotically inactivated CF-1 MEFs with N2B27 medium supplemented with 3μM CHIR99021 and 1μM PD0325901 (2i medium)[3,4]. Rat ES cells attach loosely to the feeders, so it is very easy to detach rat ES cells from the feeders by mechanical pipetting. Rat ES cells were passaged every 2–3 days. For passaging, rat ES cells were detached from feeders by pipetting and harvested by centrifugation. 0.025% trypsin/EDTA was added to the cell pellet to prepare a single cell suspension. 0.025% trypsin/EDTA

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An ethical writer does not exclude valid contrary results.

All statistical practices, interpretation and graphical or other representations are appropriate, honest and objective.

" [Good science requires] a specific, extra type of integrity that is [more than just] not lying, but bending over backwards to show how you're maybe wrong" - Richard Feynman, Nobel Laureate

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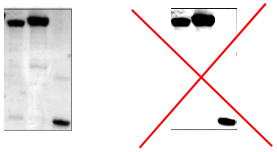

An ethical writer is clear and concise and does his/her best to help the readers understand

On the contrary to the previous reports, in one study, IL-6 did not change the cytotrophoblastic secretion of total hCG, but induced a dose-dependent stimulation of leptin secretion and increased the activity, but not the immunoreactivity, of the matrix metalloproteinases MMP-9 and MMP-2 which were involved in trophoblastic invasion during implantation [11]. These results indicate that IL-6 could be considered as an endometrio-trophoblastic regulator of cytotrophoblastic gelatinases.

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In contrast to previous reports [9,10], Meisser et al [11] showed that IL-6 did not not induce hCG production in cytotrophoblastic cells grown *in vitro*. A possible role for IL-6 in trophoblastic invasion, however, was indicated by their findings that IL-6 induced the activity (but not levels) in these cells of two metalloproteinases involved in trophoblastic invasion, MMP-9 and MMP-2.

An ethical writer is clear and concise and does his/her best to help the readers understand

In academic writing -

> "[T]he real risk-taking...is in precise statements and explicitly articulated arguments, since the point of such formality is to make errors maximally easy to spot. If you are afraid of being caught out, take refuge behind a smokescreen of vagueness and obscurity."
>
> - Timothy Williamson, TLS March 20, 2009 "Plato goes pop"

An ethical writer follows norms of authorship and is conscious of (and reports as required) conflicts of interest.

International Committee of Medical Journal Editors:

Authorship credit should be based on:

1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
2) drafting the article or revising it critically for important intellectual content; and
3) final approval of the version to be published.

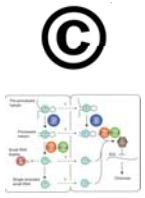
Authors should meet conditions 1, 2, and 3.

Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.

An ethical writer

- acknowledges the relevant contributions of others and the source of his/her ideas and information.
- acknowledges sources by summarizing, paraphrasing appropriately, or enclosing in quotations marks.
- does not self-plagiarize
- reproduces the exact meaning of the others' ideas or facts when summarizing.
- has read and understood all work cited.
- ensures that credit is given to those who first reported the finding or who first had the idea.
- reports evidence or ideas contrary to their own.
- describes any potential flaws or limitations.
- includes all information necessary for the research to be replicated.
- does not exclude valid contrary results
- ensures statistical practices, interpretation and graphical or other representations are appropriate, honest and objective
- is clear, concise and easily understood
- follows norms of authorship and resports/is conscious of conflicts of interest

Issues Specific to Theses



Your work: have you assigned copyright to the journal? If not, get permission from co-authors. If yes, check to see if permission is required from journal.

Others' work (adapting or copying figures, tables): check to see if permission is required. NB: much material on websites is also protected by copyright. ALWAYS cite.

Science

If you wish to take material from *Science*'s journals or websites (figures, extracts, abstracts, even full-text articles) and incorporate them into new works (for example, newsletters, journal articles, book chapters, posters, presentations, reports, film, etc.), you will need to obtain copyright permission.

J. Biol. Chem.

Other parties are welcome to copy, distribute, transmit and adapt the work — at no cost and without permission — for noncommercial use as long as they attribute the work to the original source using the citation above.

Consequences of unethical practices

For others:

- undermining of research record
- loss of trust in science by the public and scientific community
- waste of resources and time
- possible harm to individuals
- tarnished reputation of institution, others involved
- other students are disadvantaged (academic work)
- other authors don't receive credit

Consequences of unethical practices

For yourself:

- retraction of paper
- loss of reputation
- feelings of guilt or shame
- student academic penalty: 0% in assignment or course
  suspension
  notation on transcript - "academic misconduct"
- rescinding of degree
- loss of position
- a return of research funds and/or ineligibility to apply for new grants for a period of time

Factors contributing to questionable practices

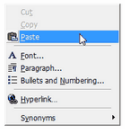
- competition
- lack of time
- need to convince reviewers and readers
- grants, graduation, promotion & tenure, etc
- financial or other conflicting interests
- English as an additional language

Strategies for ethical writing

Avoid getting yourself in a situation where you're pressed for time

- allow time for thorough research
- allow time for revision
- allow time for feedback if appropriate

Strategies for ethical writing



NEVER copy and paste material from other sources into your working document

Strategies for ethical writing

If you struggle at all with writing, develop your abilities:

- read (not just the scientific literature)
- listen attentively to articulate broadcasting or lectures
- practice writing (letters, diary, etc)
- get feedback from those with a good command of English
- take workshops (eg, GPS, Writing Centre)

Strategies for ethical writing

- Thoroughly review the literature
- Find, read and understand any references you're considering citing
- Double check the accuracy of your references
- When writing or making notes, immediately reference others' ideas, information, etc
- Separate your literature research from your writing
- Read the document and ask
  - unless cited appropriately, "Are these ideas and words my own?"
  - "Did I bend over backwards to show how maybe I'm wrong?"
  - "Can others replicate this?" (scientific papers)
  - "Will others understand this easily?"

References

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