Publishing Your Research

Timothy Hanks

Luiz F. Silva Jr.

ACS Chemistry for Life®

Sociedade Brasileira de Química

CNPq Conselho Nacional de Desenvolvimento Científico e Tecnológico

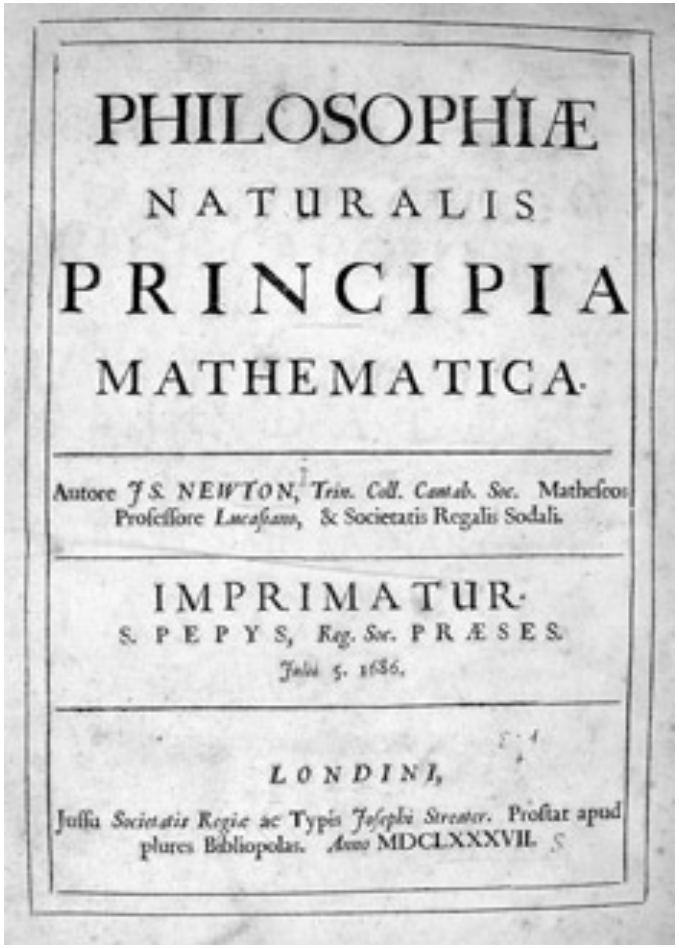
CIÊNCIA SEM FRONTEIRAS

International Activities

WHY ARE YOU INTERESTED?

WHY PUBLISH?

- Build CV
- Serve the public good
- Advance knowledge
- Become famous
- Get noticed by employers
- Graduate
- Share your work with peers


PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore *Is. NEWTON, Trin. Coll. Cantab. Soc.* Matheseos Professore *Lucasiano*, & Societatis Regalis Sodali.

IMPRIMATUR.
S. PEPYS, *Reg. Soc.* PRÆSES.
Julii 5. 1686.

LONDINI,
Justu *Societatis Regiæ* ac Typis *Josephi Streater*. Prostat apud plures Bibliopolas. *Anno* MDCLXXXVII.

WHY PUBLISH?

"… the first to publish a view or finding, *not the first to discover it*, tends to get most of the credit for the discovery."

(National Academy Press, "On Being a Scientist" 1995)

"Interesting and unpublished is equivalent to non-existent"

(G. Whitesides, *Adv. Mater.*, 2004, 16, 1375)

http://www.sciencesurvivalblog.com/phd_life/getting-scooped_2435

WHAT IS "PUBLISHING"?

- Primary method of sharing your original work to your peers and public
- Not just peer reviewed publications
- Research sharing can take various other forms
  - Patents
  - Presentations/Posters at meetings
  - Working papers
  - Internet postings*
    - Blogs, open notebooks, wikis, tweets, etc.
  - Media publicity
- Above mediums generally not considered prior publication but ***verify***
  - More on this later

TOPICS FOR THIS SESSION

- Disclosure types and tips
- Preparing key manuscript sections
- Peer review process
- Publishing ethics

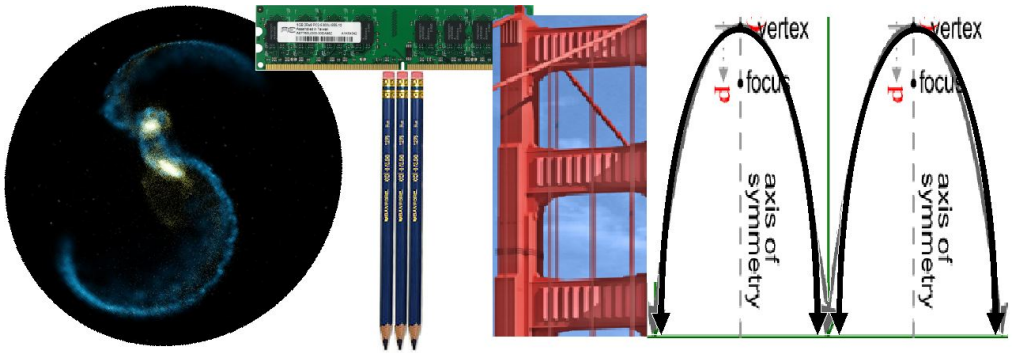


Image credit: http://richardmcarter.edublogs.org/files/2010/10/STEM_5.jpg

ACS by the Numbers

ACS Chemistry for Life®

161,000 Members

187 Local Sections

32 Technical Divisions

75% chemistry degree

60% industry
30% academia
10% students

Over 30,000 cumulative attendance at two national meetings

ACS Publications
MOST TRUSTED. MOST CITED. MOST READ.

More than **40** peer-reviewed journals

More than **1,400** peer-reviewed, multidisciplinary e-books

More than **2.2** million citations in 2012

Over **38,400** articles published annually

83 million article downloads

CAS
A division of the American Chemical Society

3.7 billion+ chemical property records

71 million+ organic & inorganic substances in registry

ACS presence abroad

25,000 members

100+ countries

200 projects/programs have an int'l component

4,500 yearly int'l meeting attendees

7 Pacifichem Congresses co-sponsored/hosted since 1984

67% of articles are authored by int'l researchers

4,700 worldwide organizational C&EN subscribers

68% of articles originate from outside of the US and Canada

68% of article downloads come from outside of North America

50% of content originates int'l

The American Chemical Society
is everywhere

ACS Chemistry for Life™

ACS PUBLICATIONS & MEETINGS

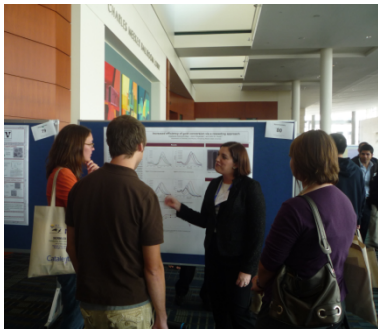
2 national, 8 regional meetings
30,000 posters/orals
40,000 yearly attendees
5,000 yearly int'l attendees

42 journals
38,000+ articles in 2012
67% from int'l authors
2M+ citations in 2012
16 journals impact factor 5+

DISCLOSURE TYPES AND TIPS

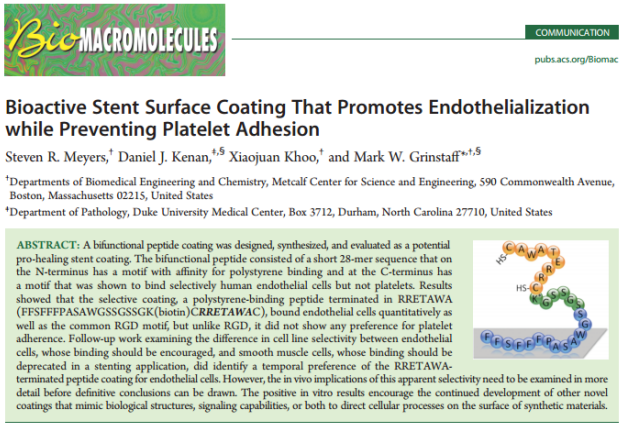
THE 3 P's OF SCIENTIFIC DISCLOSURE

Poster



Presentation

Publication



	Poster	Presentation	Publication
Longevity	Short*	Short**	Forever
Interaction w/peers	High	Medium	Tiny
Peer Review	Minimal	Minimal	Plenty
Work Described	Portion	Portion	Complete

*preprints; **recorded and posted on the internet

FROM DISCOVERY TO DISCLOSURE

Stage	Publication	Poster/Presentation
Discovery	Result of your Research	Result of your Research
Selection	Choice of Journal	Choice of Conference
Writing	Preparation of Manuscript	Preparation of Abstract/Preprint
Submission	Cover Letter/Submission to Editor	Submission to Program Chair
Review	Reviewers	Reviewer(s)
Response	Journal Decision (Accept with or w/o Revisions, Reject)	Conference Decision (Accept/Reject)
Follow-up	Make Revisions	Prepare Poster/Presentation
Disclosure	Publication	Present

PRIOR PUBLICATION

- **Caution**
- If you are planning to publish a manuscript, check with the journal before presenting
  - Preprints
  - Open notebooks
  - Recorded presentations
- **Criteria for judgment**
  1. Sufficient detail to allow replication
  2. Public accessibility
  3. Formal peer review validation

"Publication of a preprint or extended abstract in an ACS Division meeting preprint book in either print or electronic format does not preclude consideration for publication of a full paper in an ACS journal, provided that it includes significant new information and data beyond what was in the preprint or extended abstract. It may well preclude publication of a communication." – ACS Publications

PREPARING KEY MANUSCIPT SECTIONS

PAPER ANATOMY

Title
Authorship/Affiliation
Abstract
Graphical Abstract
(Keywords)
Introduction
Methods
Results
Discussion
Figures/Tables
Conclusion
Acknowledgements
Works Cited
(Appendices/Supplementary Materials)

Biomacromolecules COMMUNICATION

Untreated RGD CRRETAWAC FN

HUVEC: Do Stain (Positive) for PECAM-1

Mixed

UASMC: Do Not Stain (Negative) for PECAM-1

Figure 6. Fluorescence micrographs of HUVEC and UASMC cells placed on a variety of coated surfaces. HUVECs stain positively (red) for PECAM-1.

surfaces regardless of which integrin binder was used. In a separate experiment, HUVEC and UASMC binding studies were performed independently on the CRRETAWAC-modified PS surface and analyzed using an MTS assay. After 2 h, 40% of the 5000 seeded HUVECs attached to the surface, whereas only a few of the 5000 seeded UASMCs attached in the same time period, and the resulting MTS signal was not statistically different from the untreated and negative controls. A similar cell binding preference of HUVEC over UASMC to the RGD coating was observed. This is not to say that UASMC cells do not bind the surface at all, but the time scale for such a binding appears to be slower, or the interaction is weaker and so the cells are readily removed by washing. Other experiments that used a long-term culture of the cells did show that the SMC line will adhere to an interfacial peptide-coated surface, but the attachment interaction is not as rapid as that with the EC phenotype. In this particular short-time case, human ECs are more readily able to adhere to the peptide coating over SMCs. However, the exact benefit such a short temporal selectivity would have in vivo where a device is introduced to a biological system with extracellular-matrix adhered (as opposed to suspended) surrounding cells remains to be observed. What is clear is that the PS-CRRETAWAC coating has a pronounced benefit in lowering the binding and surface recognition ability of platelets to near-background levels while maintaining the ability of ECs to bind to the modified surface.

Future experiments are planned to characterize the RRETAWA coating and its interactions with other cell types prevalent in the circulatory system such as leukocytes and other inflammatory/immune cells. These cells are also known to use a variety of integrins ($\alpha L\beta 2$, $\alpha 4\beta 1$, $\alpha M\beta 2$, $\alpha V\beta 3$, or $\alpha 5\beta 1$) to extravasate and migrate through the stroma, with the main integrins generally from the $\alpha 4\beta 1$ family.[39−45] It is thought that extracellular chemo-attractants or chemical signals are necessitated for leukocyte adherence to a substrate through the $\alpha 5\beta 1$ integrins—the integrin that binds RRETAWA—and that these signals come from activated platelets and ECs.[44] Because we have shown that the RRETAWA coating reduces platelet adherence and provides a natural surface on which the ECs can reside, the release of the chemical signals would be deprecated in the location of the coating, and we hypothesize that it would be unlikely that the immune cells would adhere using the $\alpha 5\beta 1$ integrin because they would not become activated. An examination of leukocyte interaction with the RRETAWA peptide has not been reported to date, and we plan on further examining these issues because it would be important in the development of a RRETAWA based pro-healing stent.

CONCLUSIONS

This coating can be noncovalently applied to devices of any geometry through a simple dip-coating procedure and requires no harsh chemicals or energetic treatments. As shown, the FFSFFFPASAWGSSGSSGK(biotin)CRRETAWAC peptide possesses a number of properties that would be desirable for a stent coating. Importantly, experiments showed that this multifunctional peptide readily coated surfaces and bound ECs but possessed minimal platelet adhesion. Specifically, only background platelet binding was observed with this coating, whereas an RGD-terminated PS peptide performs as expected with significant adhesion. In regards to the interaction with HUVEC and UASMC, there is an apparent short-term difference in adherence, but again, how translatable this difference is to in vivo condition remains to be determined. All results were obtained in the presence of protein-rich media, either plasma or serum, respectively, demonstrating that the peptide coating can function in a complex biological milieu. Continued in vitro and in vivo studies with such interfacial biomaterials may lead to the creation of next-generation pro-healing stent surfaces that promote the endothelialization of the device while simultaneously inhibiting the adhesion and thrombus formation typical of platelet interactions.

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Notes
[§]These authors are cofounders of Affinergy, Inc.

ACKNOWLEDGMENT

M.W.G. and D.J.K. thank the National Institutes of Health for funding through grant EB-000501.

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538 dx.doi.org/10.1021/bm101212s |Biomacromolecules 2011, 12, 530–539

READER COMPREHENSION

- Papers are rarely read linearly
- Print editions are not dominant anymore
  - Internet versions
  - Mobile devices
- Search engines
- Sharing of content through social media

PAPER ANATOMY ACTIVITY

Form pairs and spend a few minutes discussing what areas of the paper are the most important to a reader coming across your paper for the first time. What sections should you, as someone who wants your work to be examined, spend the most time writing?

Section	Your Rank
Title	
Authorship	
Abstract	
Keywords	
Introduction	
Methods	
Results	
Discussion	
Figures/Tables	
Conclusion	
Acknowledgements	
Works Cited	
Appendices	

EXPERT'S OPINION

	Section	ACS Editors	Stanford[1]	FIU[2]	Average
#1	Title	2	1	2	**1.7**
#3	Authorship	7	2	1	**3.3**
#2	Abstract	1	3	3	**2.3**
	Keywords	-	-	-	13.0
	Introduction	-	4	5	7.3
	Methods	-	7	-	11.0
	Results	6	8	6	6.7
	Discussion	5	6	7	6.0
#4	Figures/Tables	4	5	4	**4.3**
	Conclusion	3	-	-	9.7
	Acknowledgements	-	-	-	13.0
	Works Cited	-	-	-	13.0
	Appendices	-	-	-	13.0

[1]Dr. Robert Siegel; Stanford University; http://www.stanford.edu/~siegelr/readingsci.htm
[2]Dr. Laurel S. Collins; Florida International University; http://www2.fiu.edu/~collinsl/Article%20reading%20tips.htm

SCIENTIFIC TITLES

- Advertisement for your research
- Give the reader specifics
- Include descriptive words
  - What was studied: organism, molecule, location, object
  - What was measured: properties, responses, outcomes
- Consider writing last
- Title types
  - **Interrogative** – “Mean Platelet Volume: A Link Between Thrombosis and Inflammation?” **Hypothesis**
  - **Descriptive** – “Assessing the Link Between Thrombosis and Inflammation” **Methods**
  - **Declarative** – “Increased Mean Platelet Volume is Associated with Thrombosis and Inflammation” **Results**

TITLE TYPE OUTCOMES

Type	Number	Mean Downloads	Median Downloads	Mean Citations	Median Citations
Descriptive	1,442	3,906	2,754	16.92	14.23
Declarative	660	3,588	2,565	16.93	12.00
Interrogative	45	5,817	3,723	10.47	6.00

Jamali HR, Nikzad M. *Scientometrics* DOI 10.1007/s11192-011-0412-z

- Titles with a question receive more downloads but less citations
- Longer titles receive fewer downloads and citations

Advice

- Try to avoid question titles
- Write short, compact, but informative titles

TITLE ACTIVITY

Partner with someone sitting near you.
Spend a few minutes and write a descriptive *(method),* declarative *(results)*, and interrogative *(hypothesis)* title for the following:

This paper presents the experimental investigation conducted on Rice Husk Ash (RHA) concrete to evaluate its compressive strength and to study its durability properties. In the preparation of rice husk concrete, cement was replaced at various percentage levels such as 5%, 10%, 15% and 20%. […] Addition of 20% RHA showed higher resistance against sulphate attack for both continuous soaking and cyclic conditions. On the whole addition of RHA as [an additive] improves the strength and durability properties of concrete to a considerable extent.

TITLE EXAMPLE

“Concrete Mixtures”

What about concrete mixtures?
What type of concrete?
What was studied?

“Properties of Rice Husk Ash Concrete”

What properties of Rice Husk Ash?

“Compressive strength and durability properties of Rice Husk Ash concrete” (*KSCE Journal of Civil Engineering*, Jan 2012, Vol 16, Issue 1, pp 93-102)

“Compressive strength and durability properties of Rice Husk Ash concrete using porosity analysis” (Descriptive)

“Rice Husk Ash concretes show increased strength and durability properties over similar materials” (Declarative)

“Does Rice Husk Ash concrete have suitable strength and durability properties for engineering applications? (Interrogative)

PRACTICE MAKES PERFECT

"On the Electrodynamics of Moving Bodies"

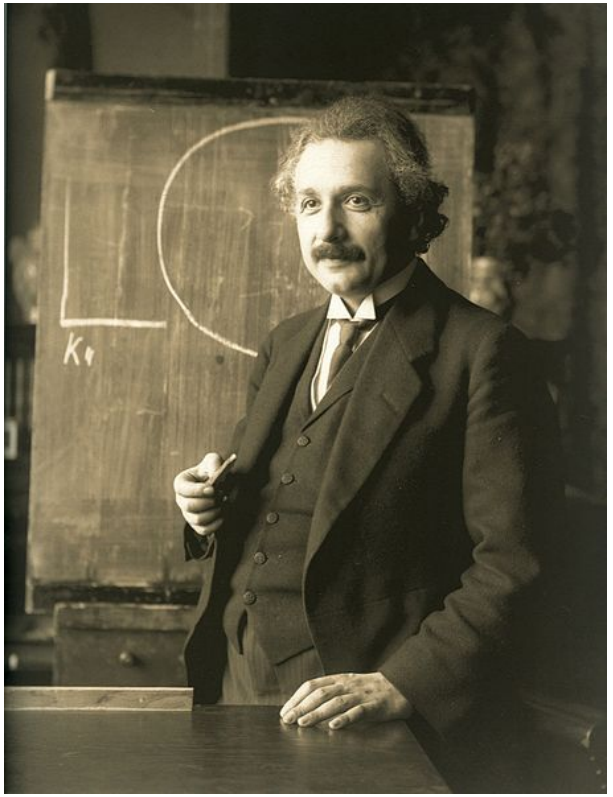
Special Relativity

"On a Heuristic Viewpoint Concerning the Production and Transformation of Light"

Photoelectric Effect

"On the Motion of Small Particles Suspended in a Stationary Liquid, as Required by the Molecular Kinetic Theory of Heat"

Brownian Motion



ABSTRACT OVERVIEW

- Once you've hooked them with the title, the reader will examine the abstract to determine "Should I continue?"
- A well-written abstract is extremely important
- Summarized "mini" paper
  - Not the place to add *new* information
- Oftentimes, only part free on the web
  - Allows readers to find you through search
- Usually a short paragraph with a few hundred words at most (make sure to meet the limits specified)
- Consider writing this last (or next to last)

ABSTRACT FORMAT

1. **Introduction** on what the purpose of this research was
   - Why is your work important? What is your hypothesis?
2. Brief overview of **methods** without being too specific
   - What did you do to get your results? Not the methods section.
     - Tested compounds against cultured cells, modeled bridge building, interviewed patients
3. **Results/Discussion** on what your outcomes were
   - After all your work, what did you achieve?
   - Try to include your important data
4. **Conclusions** on what your outcomes mean
   - What are the implications? How does it affect the world?

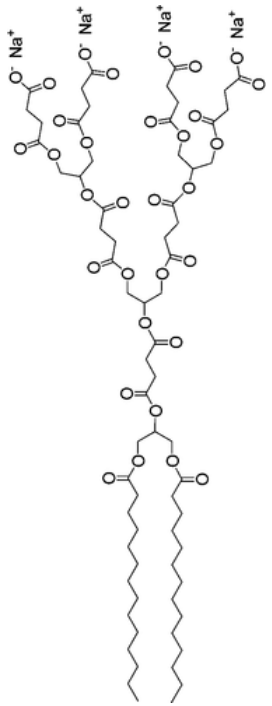
OTHER ABSTRACT TIPS

- **Use the past tense**
  - Don't "will be" your abstract. Will be discussed, Will be determined… State what you did.
- **Abstract should be self-contained**
  - Don't make the reader search the paper to understand it
  - No abbreviations, references, images
- **Use clear results**
  - Say specifically what you did and what the outcomes were. Include important numbers if you have them
- **Don't exaggerate its importance**
  - While your research is important, it is not the most important thing ever. It is most likely not the first time something was done.
- **Use quantitative not qualitative language**
  - Not just: better, faster, larger, more effective, more viable

ABSTRACT ACTIVITY

Partner with someone different sitting close to you. Read the below abstract and list ways it could be improved.

This study will determine if an anionic amphiphilic dendrimer is effective or ineffective against cells. Dendrimers have previously shown antibacterial properties (Hong, 2004). We tested the molecule shown in the figure against different cells and measured the outcomes. To perform these tests, cells were exposed to different concentrations of the compound. Next, a metabolism dye was added to the cells at a concentration of 2×10^{-4} and allowed to develop for 2 hours to measure the EC_{50}. Finally, the colors were observed on a spectrophotometer with a reading at 490 nm. As will be described, it was found that if a large concentration of compound was used then the human cells were more viable than the bacterial cells. Control tests showed other compounds had less of an effect. Without a doubt, the dendrimer would work perfectly as an antibiotic.



ABSTRACT ISSUES

Verb Tense: Will Determine, will be described

Qualitative: Effective, Ineffective, Large

Vague: Different Concentration, less of an effect

Lack of Information: What type of cells? What other compounds?

Referrals: reference, image, abbreviations

Extensive Procedure: Don't copy your methods

Missing units: What concentration?

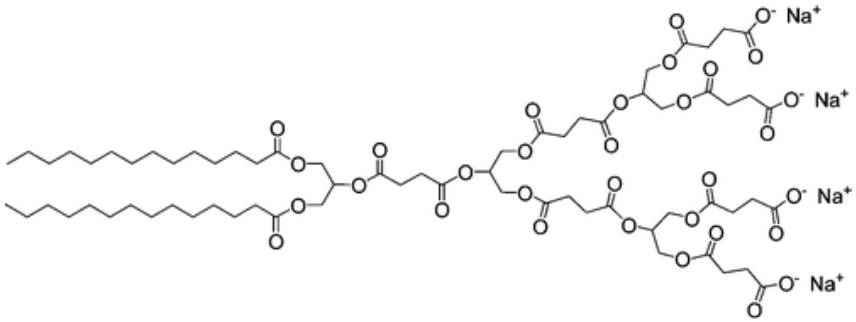
Perspective: Without a doubt, Would work incredibly well

Clear Summary: Not certain what was done or what the results are

Motivation: Rationale for study not clear

This study will determine if an anionic amphiphilic dendrimer is effective or ineffective against cells. Dendrimers have previously shown antibacterial properties (Hong, 2004). We tested the molecule shown in the figure against different cells and measured the outcomes. To perform these tests, cells were exposed to different concentrations of the compound. Next, a metabolism dye was added to the cells at a concentration of 2×10^{-4} and allowed to develop for 2 hours to measure the EC_{50}. Finally, the colors were observed on a spectrophotometer with a reading at 490 nm. As will be described, it was found that if a large concentration of compound was used then the human cells were more viable than the bacterial cells. Control tests showed other compounds had less of an effect. Without a doubt, the dendrimer would work perfectly as an antibiotic.

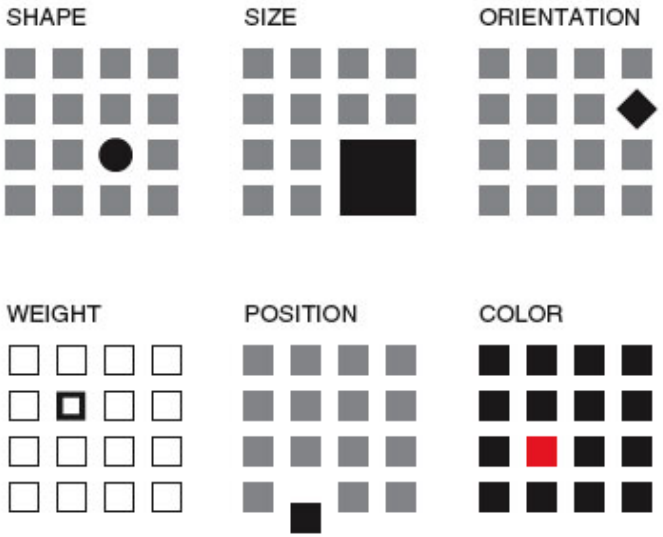
ABSTRACT REDONE



Dendritic macromolecules, due to their structure, unique properties, and precise compositions, are of significant interest and are finding uses in an ever-increasing number of medical applications. A newly synthesized, anionic amphiphilic dendrimer is reported that possesses increased cytotoxicological potency against prokaryotic cells compared to eukaryotic cells. The half-maximal effective concentration (EC_{50}) for the dendrimer against *Bacillus subtilis*, a Gram-positive bacterial strain, was measured through cell-culture viability testing to be 4.1×10^{-5} M, while that against human umbilical vein endothelial cells (HUVEC) was more than 36x greater at a value of 1.5×10^{-3} M. EC_{50} ratios for two commercial amphiphiles, sodium dodecyl sulfate (SDS) and Triton X-100, in addition to a similar synthesized dendritic structure, were at most only 3.8× greater. This biologic selectivity is of chemical, biological, and clinical interest, as antibacterials such as these would potentially be effective against microbial infections without harming the host.

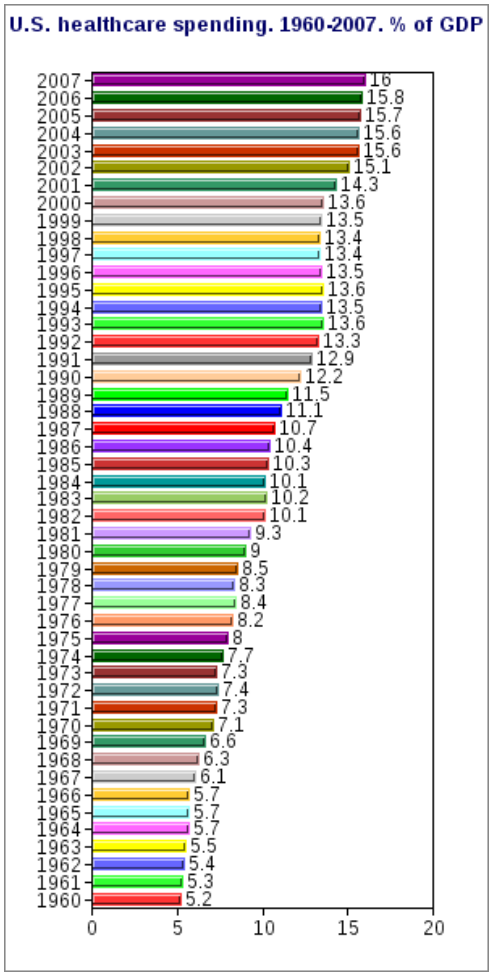
FIGURE DESIGN

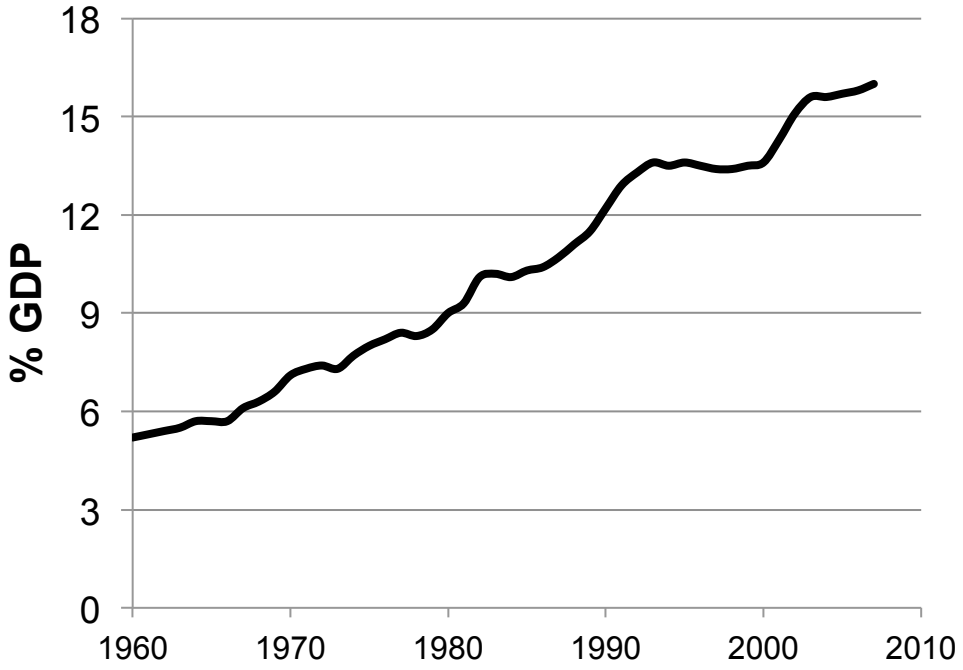
- Design according to your audience
  - What kind of journal is this?
- Figures are key
  - “Organize the outline and the paper around easily assimilated data--tables, equations, figures, schemes--rather than around text.” (G. Whitesides, Adv. Mater., 2004, 16, 1375)
- Keep it simple by limiting your variations
  - Shape, size, orientation, weight, position, color
- Make sure your text is readable and prominent; consider what it would look like with black & white printing
- Remove everything that does not convey data (chart junk)



Rolandi, M., Cheng, K. and Pérez-Kriz, S. (2011), A Brief Guide to Designing Effective Figures for the Scientific Paper. Adv. Mater., 23: 4343–4346. doi: 10.1002/adma.201102518

POOR DESIGN





Health System article; Wikipedia 2010

EXPERT RESULT

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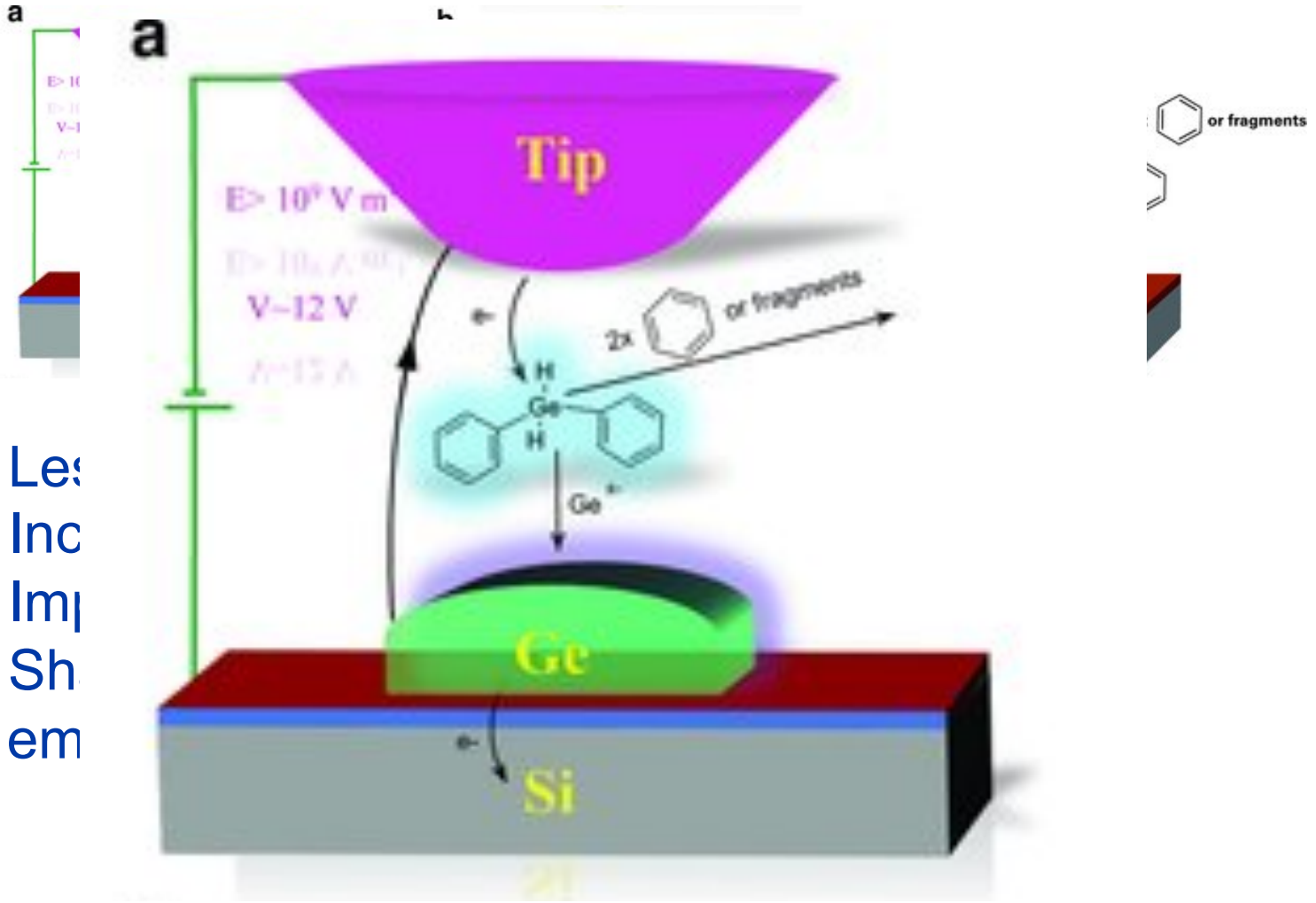
  em



Paper Writing Summary

- Title/abstract/figures are not an afterthought, spend time on them!
  - #1, #2, and #3 most important
- Introductions put the work in perspective and are useful for those new to the area, but do not add to the value of the paper itself.
- Methods and results sections are vital to those trying to reproduce the work, while the discussion develops ideas that may lead to more citations.
- Many casual readers will only look at introductions and conclusions.
- Acknowledgements keep funders happy!

Break Time!

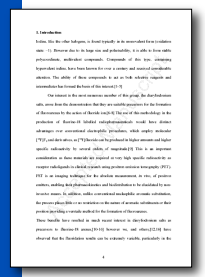
- Please return in 15 minutes.
- Next Topic: Peer Review

PEER REVIEW

Why Peer Review?

- Ensures quality of scientific research
  - The objective is: “to flag what’s important, to set aside what’s pedestrian, and to abjure what’s fraudulent.” (J. C. Polanyi, Globe&Mail, Oct. 3, 2011)
- Improves your research
- Provides a measure of credibility
- Helps an Editor decide what qualifies as “publishable science”
  - What’s original
  - What’s scientifically important
  - What’s within the journal’s scope

The Business of Publishing: Peer Review



Scientific community:
Accepted manuscripts

Typesetter / Printer

Publisher

Published Journal Issues

proofs

author

submission

Library

reader

editor

review

referee

Authors write

Reviewers comment

Editors decide

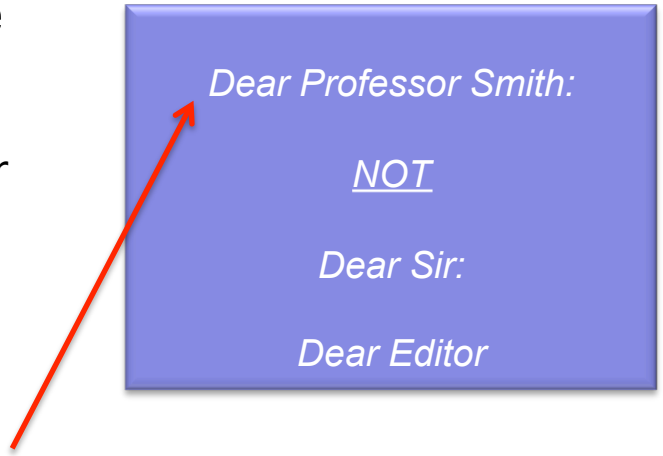
Readers read

Slide by James Milne, Elsevier

Your Cover Letter Makes an Important First Impression

- Aids the editor in deciding if the manuscript is appropriate for the journal

- Tips:
  - Follow the journal guidelines for what to include
  - Describe the most important aspects and implications of your work
  - Include elements of novelty with regard to your study
  - Highlight how your manuscript fits within the scope of the journal
  - Address your salutation to the editor by name



"I obviously can't speak for editors at other journals, but I always read the cover letter. It's often the first thing an editor reads, so don't miss out on a chance to make a good impression."

Joshua Finkelstein, *Nature* blog

Peer-Review in Practice

- **1. The Editor-in-Chief receives a manuscript, examines it, and then:**
  - a) Transmits it to an Associate Editor who has the proper expertise
- b) Decides to decline to publish
  - Inappropriate topic for the journal's readers
  - Poor quality (written in poor English, incorrect formatting)
  - Blatant lack of novelty (in view of previous articles)

Peer-Review in Practice

2. The Associate Editor may:

a) Evaluate on a similar basis

b) Transmit the manuscript to up to six Reviewers for further evaluation

Peer-Review in Practice

3. Editors evaluate the Reviewer comments and decide to:

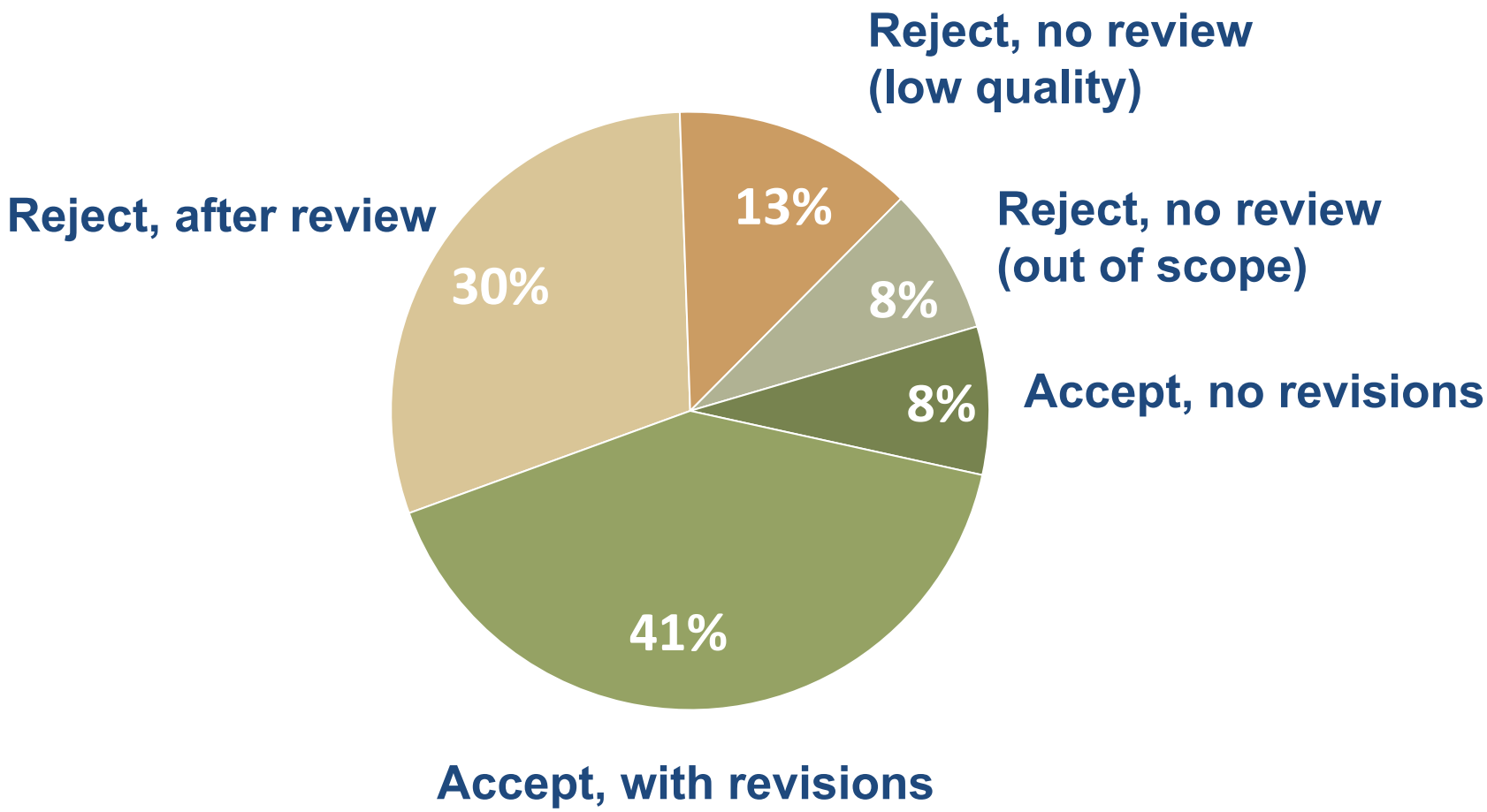
a) Accept the manuscript

b) Return it for revision

c) Decline to publish

Reviewer 1	Reviewer 2	Reviewer 3	Decision
Negative	Negative	Negative	Reject
Positive	Negative	Negative	Reject
Positive	Positive	Negative	Maybe with revisions
Positive	Positive	Positive	Accept with/without minor revisions

Peer Review Outcomes



Peer review: benefits, perceptions, and alternatives. Publishing Research Consortium 2008.

How might an Editor come to a decision?

- Read each Reviewer report carefully, and examine the manuscript.
- Assess the concerns of the Reviewers.
- If questions still remain, the Editor may request the comments of another scientist.
- Transmit the decision to the Authors, often with an explanation, especially in cases of rejection or request for major revisions.

Reviewers Look at Every Aspect of Your Manuscript

- Reviewers are selected based on their expertise in the topic covered by the manuscript
- Reviewer instructions vary, but often ask for general and specific feedback
- Most questions are related to how you have communicated your work in your manuscript

Sample Questions to Reviewers

- ✓ Is the scope of the work appropriate for the journal?
- ✓ Are the methodology and data valid?
- ✓ Are the references complete and well documented?
- ✓ Does the work represent a significant contribution?
- ✓ Is the manuscript original?
- ✓ Is the manuscript written in a concise and effective manner?
- ✓ Is the coverage of the topic complete and well organized?
- ✓ Are the conclusions valid?
- ✓ Will the work have lasting value?

Most common Author mistakes in replies

- Failing to revise and resubmit
  - Even “rejected” papers might be published if a strong response can be made.
- Lack of attentiveness
  - Authors need to thoroughly examine the critique in each review.
- Incomplete revisions
  - Failure to explain why some changes were not made. Each comment by a Reviewer should be examined and addressed point by point whether or not the Author actually makes the requested change.
- Becoming EMOTIONAL
  - Reviews are not personal—do not take them as such.

How should Authors handle Reviewer comments?

- Reviewers are trying to help!
  - Feedback is important and invaluable.
- Breathe, take some time off before replying
- Carefully read the Reviewers' comments
  - Understand the nature of the critique
  - Evaluate their importance
  - Revise according to the critique
- Reply, ensuring all comments are addressed
  - If not responding to everything, indicate why not
  - Tell the reviewer/editor where your changes were made in the text
- Use evidence where possible
  - Cite a paper politely showing why you are correct
- Above all, be polite

Referee Response Activity

- You and you co-author just received the following reviewer comment. Find a partner in the room and write two short responses where 1) you are in agreement with the reviewer; and 2) you are in disagreement.

- **Reviewer Comment**: “Your analysis of the data used a custom polynomial fitting function, which in my opinion, does not fit your underlying system. A Gaussian function would work much better and more accurately model the behavior being measured. I don’t understand why the authors made this decision.”

Referee Responses

- **You are in Agreement:**

- We kindly thank the reviewer for this insightful comment. The custom fitting function that we used does complicate comparisons to previous results. Per the suggestion, we have therefore modified the data analysis to use a Gaussian fit.

- **You are in Disagreement:**

- We kindly thank the reviewer for this insightful comment. We agree with the reviewer that a Gaussian function may also fit the data from our experiments. However, as shown by Miller (Miller et al, 2004), the custom polynomial function we used is a more appropriate method to analyze the data. Further brief clarification on our rationale for selecting the polynomial model fit has been added to the text (Page 5, Paragraph 3).

Peer Review Summary

- Know the process
- Know the journal's policies
- Be polite

COPYRIGHT AND SCHOLARLY PUBLISHING

Why copyright and ethics?

“If your research does not generate papers, it might just as well not have been done.”

(G. Whitesides, *Adv. Mater.*, 2004, 16, 1375)

So why does publishing matter for you?

Graduation

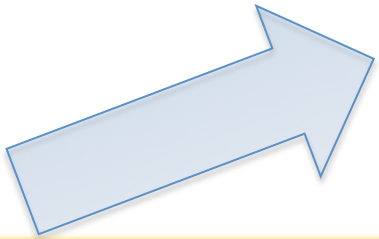
Getting a Job

Tenure/Promotion

Eternal Glory!

Publishing can never be at the expense of scientific integrity…

What is copyright?



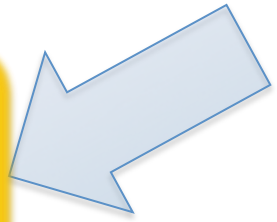
Something YOU created: manuscript, lab notes

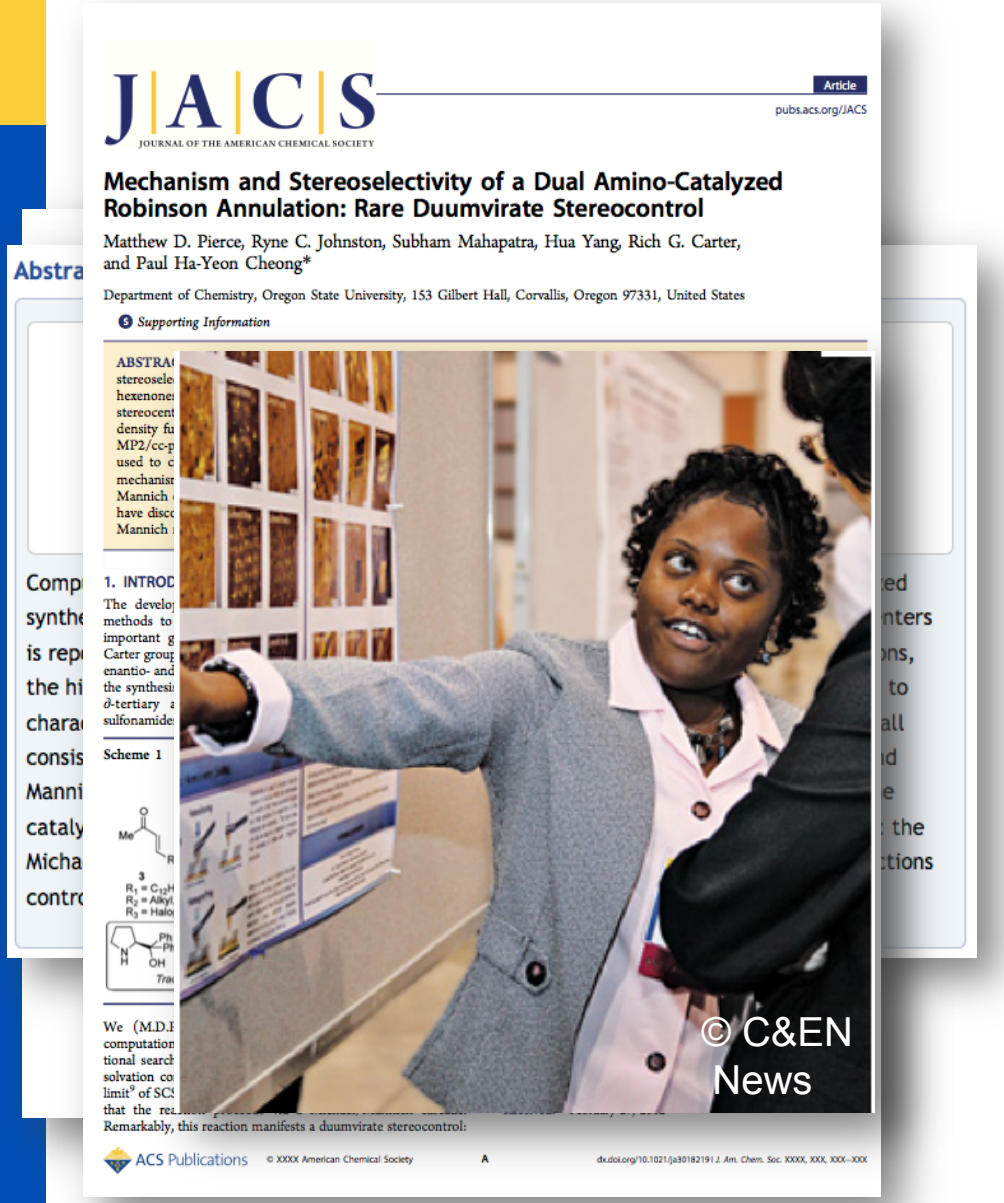
Section 102(a) of Copyright Act:
Copyright protection subsists… in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

What is copyright?

Section 102(a) of Copyright Act:
Copyright protection subsists, …, in original works of authorship fixed in any **tangible medium of expression**, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

Concrete forms of expressing your own ideas: writing on paper or computer





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What do I own and how do I transfer it?

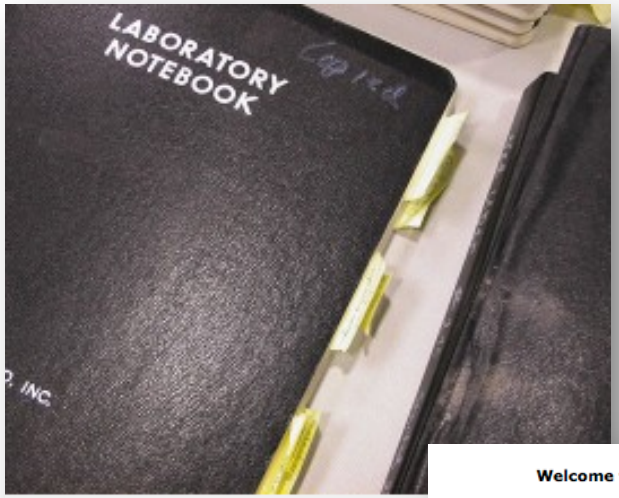

Image: http://www.benjamin

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- Information for Reviewers
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- System Requirements for ACS Paragon Plus

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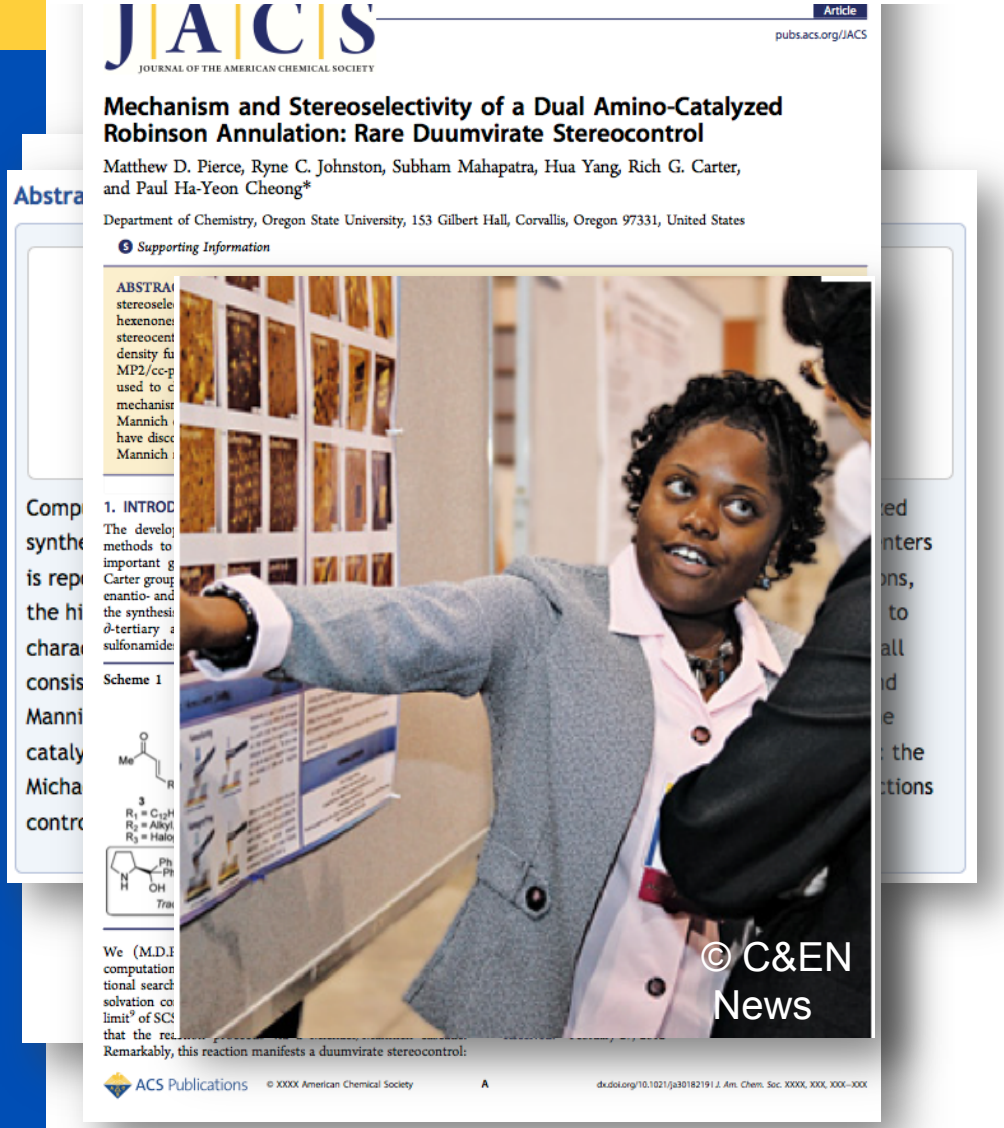

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4. You can display copyright images or graphs publicly only with permission*

* Except for “fair use” activities.

What can I do with my thesis?

- Need to write a dissertation or thesis to satisfy the requirements of your degree-granting institution?

- You may use all or part of the submitted, accepted, or published work.

  BUT!

- *You should secure written confirmation from the respective ACS journal editors to avoid potential conflicts with journal prior publication or embargo policies.*

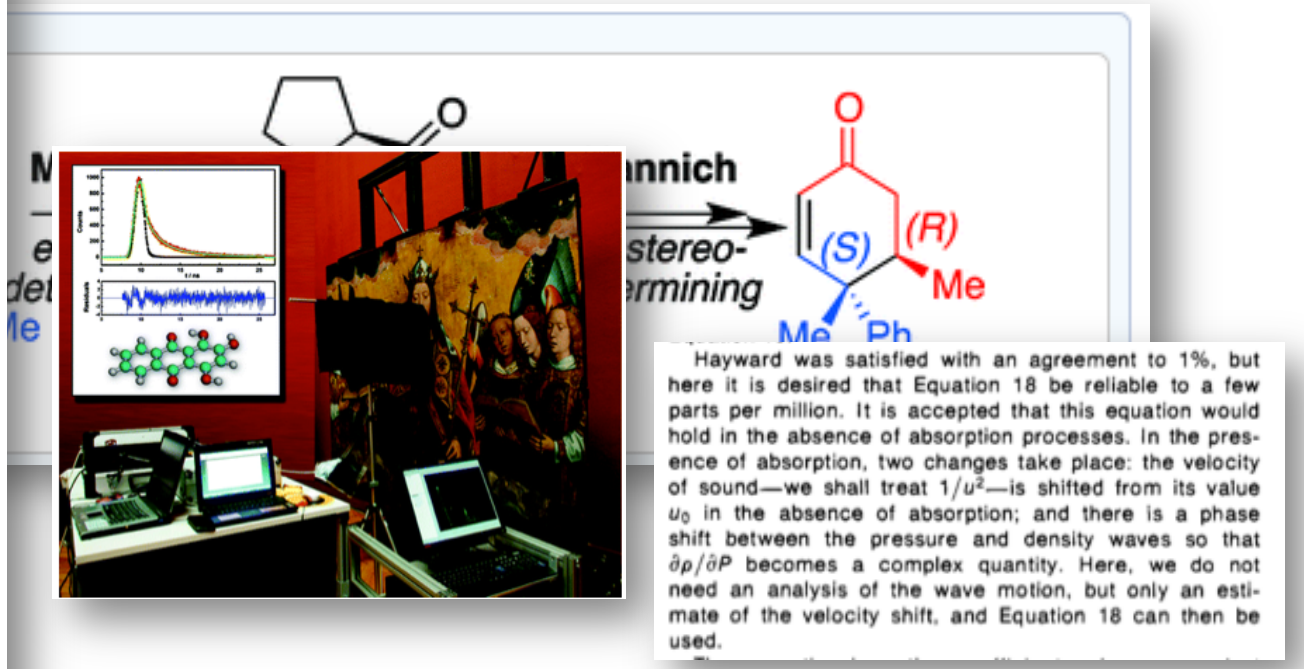
- **In other words…always check with the journal editor.**

What about teaching? Conferences? General reuse?

You can use

Table III. Continued

t, °C, IPTS-68	ρ, kg m^{-3}, Equation 16	$10^6\,\alpha$, K^{-1}, Equation 16	$10^6\,\kappa_T$/bar^{-1} Equation 20	Equation 21
82	970.5417	652.25	46.376	
83	969.9062	657.81	46.497	
84	969.2657	663.34	46.621	
85	968.6203	668.86	46.748	
86	967.9700	674.37	46.878	
87	967.3148	679.85	47.011	
88	966.6547	685.33	47.148	
89	965.9898	690.78	47.287	
90	965.3201	696.23	47.429	47.428
91	964.6457	701.66	47.574	47.574
92	963.9664	707.08	47.722	47.722
93	963.2825	712.49	47.874	47.873
94	962.5938	717.89	48.028	48.028
95	961.9004	723.28	48.185	48.185
96	961.2023	728.67	48.346	48.346
97	960.4996	734.04	48.509	48.510
98	959.7923	739.41	48.676	48.677
99	959.0803	744.78	48.846	48.847
100	958.3637	750.14	49.019	49.020
101	957.642	755.5		49.20
102	956.917	760.8		49.38
103	956.186	766.2		49.56
104	955.451	771.5		49.74
105	954.712	776.9		49.93
106	953.968	782.2		50.13
107	953.220	787.6		50.32
108	952.467	792.9		50.52
109	951.709	798.3		50.72
110	950.947	803.6		50.93
115	947.070	830.4		52.01
120	943.083	857.4		53.17
125	938.984	884.7		54.43
130	934.775	912.3		55.79
135	930.456	940.3		57.24
140	926.026	968.9		58.80
145	921.484	998.0		60.47
150	916.829	1027.8		62.25



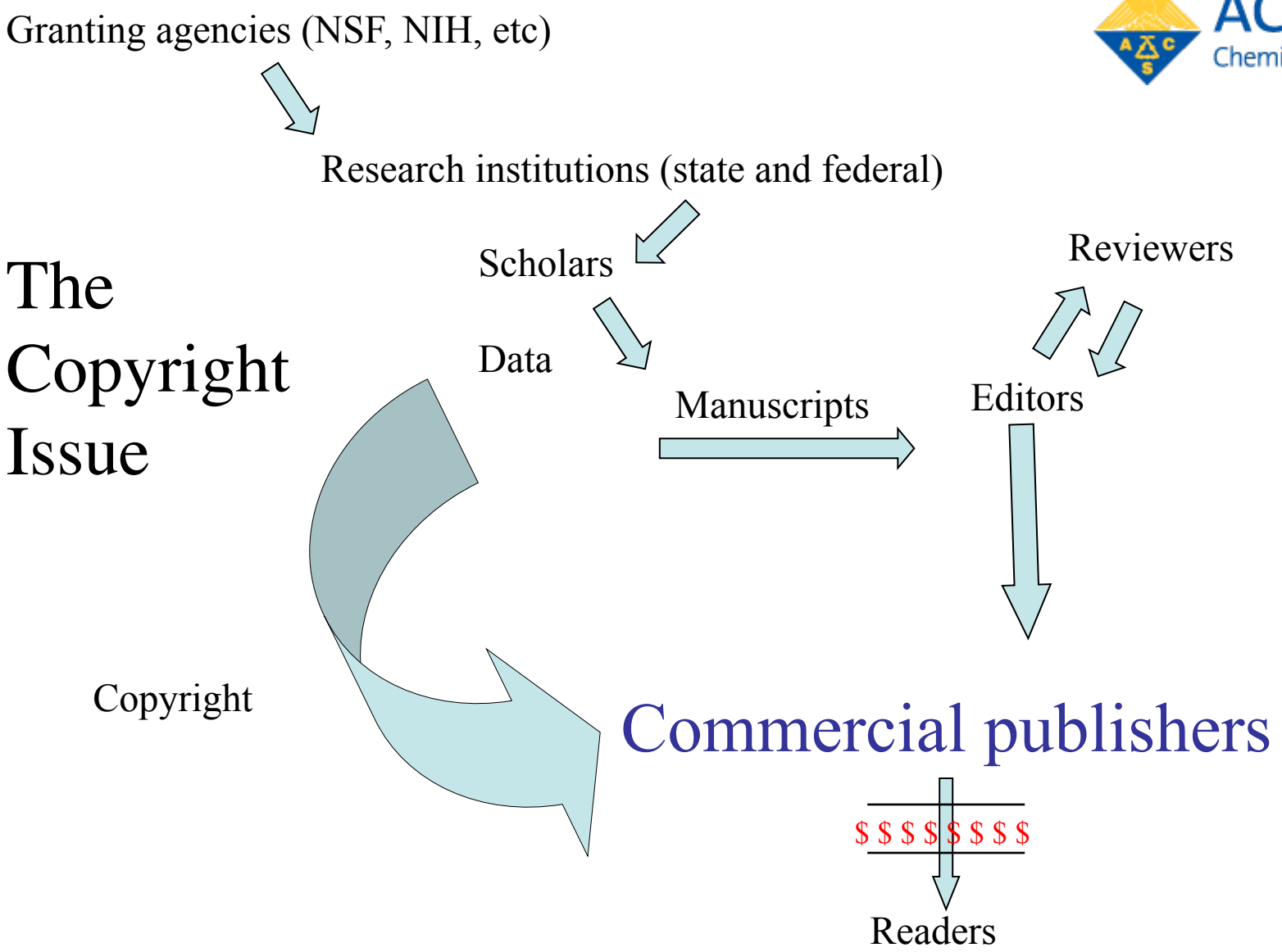
Hayward was satisfied with an agreement to 1%, but here it is desired that Equation 18 be reliable to a few parts per million. It is accepted that this equation would hold in the absence of absorption processes. In the presence of absorption, two changes take place: the velocity of sound—we shall treat $1/u^2$—is shifted from its value u_0 in the absence of absorption; and there is a phase shift between the pressure and density waves so that $\partial\rho/\partial P$ becomes a complex quantity. Here, we do not need an analysis of the wave motion, but only an estimate of the velocity shift, and Equation 18 can then be used.

What about teaching? Conferences? General reuse?

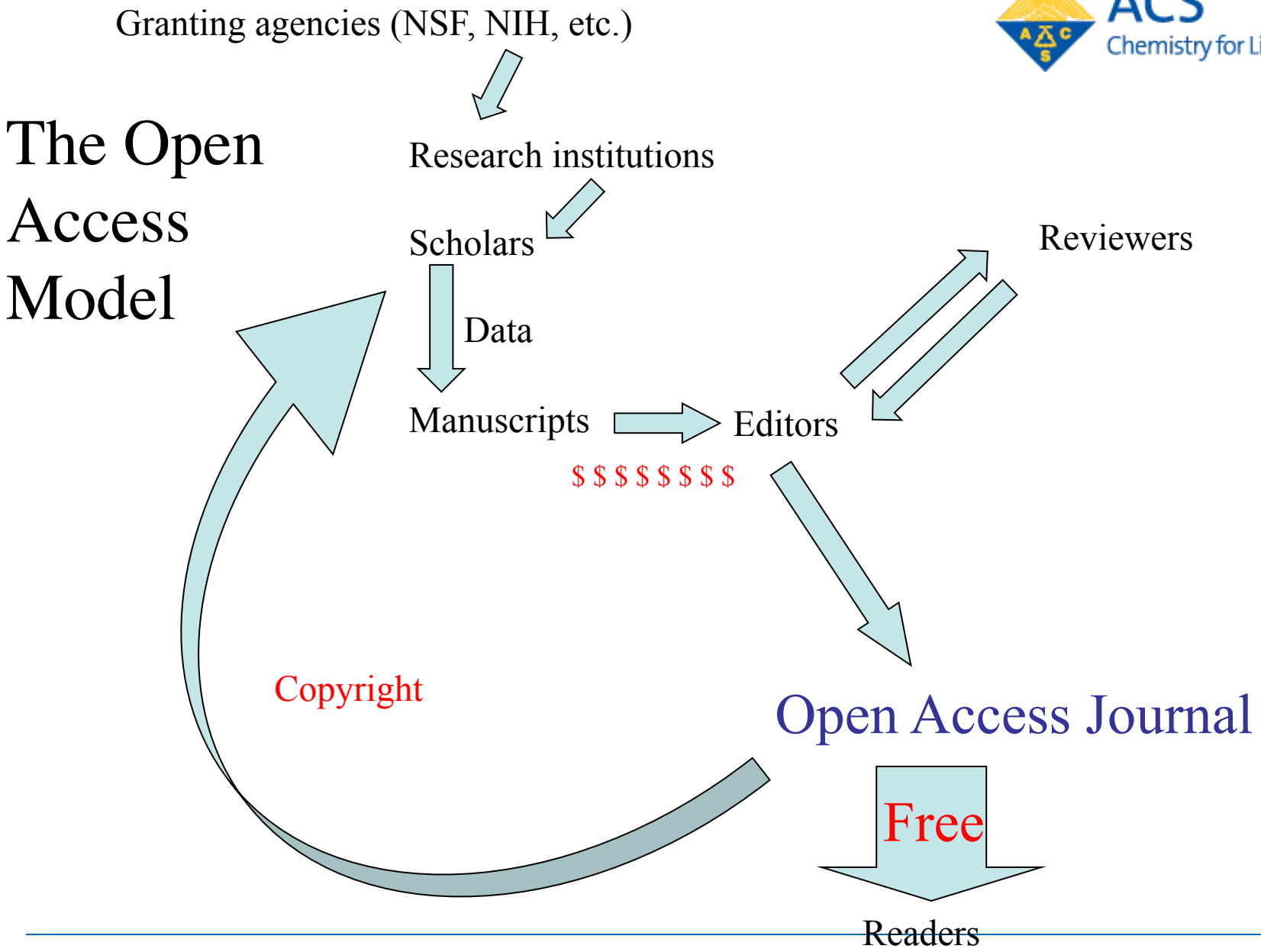
- **Teaching** or training

These terms vary by publisher AND by journal, so be sure to check!

The Copyright Issue



The Open Access Model



Problems with Open Access

- **Nature: Sham journals scam authors**

Con artists are stealing the identities of real journals to cheat scientists out of publishing fees. (http://www.nature.com/news/sham-journals-scam-authors-1.12681)

- **New York Times: Scientific Articles Accepted (Personal Checks, Too)**
- **List of Stand Alone Journals**

Potential, possible, or probable predatory scholarly open-access journals (http://scholarlyoa.com/individual-journals/)

- **Directory of Open Access Journals**

Since 1st August 2013, the Editorial Team has added 348 new titles to the Directory but has also REMOVED 329 journals that failed to meet the current criteria for inclusion. (http://www.doaj.org/doaj?func=news&nId=316&uiLanguage=en)

Who's Afraid of Peer Review?

A spoof paper concocted by *Science* reveals little or no scrutiny at many open access journals (http://www.sciencemag.org/content/342/6154/60.full)

ACS Chemistry for Life®

- On 4 July, good news arrived in the inbox of Ocorrafoo Cobange, a biologist at the Wassee Institute of Medicine in Asmara. It was the official letter of acceptance for a paper he had submitted 2 months earlier to the *Journal of Natural Pharmaceuticals,* describing the anticancer properties of a chemical that Cobange had extracted from a lichen.
- In fact, it should have been promptly rejected. Any reviewer with more than a high-school knowledge of chemistry and the ability to understand a basic data plot should have spotted the paper's short- comings immediately. Its experiments are so hopelessly flawed that the results are meaningless.
- I know because I wrote the paper. Ocorrafoo Cobange does not exist, nor does the Wassee Institute of Medicine. Over the past 10 months, I have submitted 304 versions of the wonder drug paper to open-access journals. More than half of the journals accepted the paper, failing to notice its fatal flaws. Beyond that headline result, the data from this sting operation reveal the contours of an emerging Wild West in academic publishing.

Problems with Open Access

- At least 1000 open access journals have appeared in the last few years.
  - Their quality is unknown
  - Their longevity is unknown
- The publishers cover their costs by charging the scientists.
  - The more articles published, the more they make
  - Researchers with limited funds may have trouble publishing

Break Time!

- Please return in 15 minutes.
- Next Topic: Ethics of Scientific Publishing

ETHICS OF SCHOLARLY PUBLISHING

Take a guess:

What are the most common ethical violations?

- *"I wrote it so it's mine."* **(Self-plagiarism)**
- *"Conference? What conference?"* **(Prior publication)**
- *"It's called hedging."* **(Submitting to multiple journals at the same time)**
- *"I just need the data to fit the paper."* **(Data or Image Fabrication, Manipulation, or Falsification)**
- *"It's an homage, right?"* **(Guest Authorship)**

Retraction Watch

Tracking retractions as a

No small matter: ACS Nano journal growing alarmed by self-plagiarism

with 13 comments

Is self-plagiarism — perhaps best referred to as duplication of your own work – a big problem in nanotechnology research?

The American Chemical Society (ACS) Nano journal retracted a study, "Retraction of Nanoembossing Induced Ferroelectric Lithography on PZT Films for Silver Particle Patterning," late last month because of such duplication:

> This article was withdrawn at the request of the Editor-in-Chief, with agreement by the authors, due to unacceptable redundant text and figures with a previously published article by the same authors (Langmuir 2011, 27, 5167-5170. DOI: 10.1021/la200377b).

This wasn't the first such retraction for the journal. In May, they retracted "Conductance Preservation of Carbene-Functionalized Metallic Single-Walled Carbon Nanotubes for the same reason:"

> This article was withdrawn at the request of the Editor-in-Chief, with agreement by the authors, due to unacceptable overlapwith a previously published paper by the same authors (Small 2011, 7, 1257-1263; DOI:10.1002/smll.201002307) prior to the publication of the article in ACS Nano.

Perhaps it's not surprising, then, that the editors recently published an editorial titled "Recycling Is Not Always Good: The Dangers of Self-Plagiarism." In it, they walk through what's wrong with duplicating your own work and passing it off as new. They don't say how often they've seen the practice, but they describe a number of anonymized cases.

Prior Publication

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JOURNAL OF THE AMERICAN CHEMICAL SOCIETY

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Policy Summary on Prior Publication

The *Journal of the American Chemical Society* considers for publication only original work that has not been previously published and is not under consideration for publication elsewhere. When submitting a manuscript, an author should inform the editor of any prior dissemination of the content in print or electronic format. This includes electronic posting of conference presentations, posters, and preprints on institutional repositories and any other Web sites. Any content that has been made publicly available, either in print or electronic format, and that contains a significant amount of new information, if made part of a submitted manuscript, may jeopardize the originality of the submission and may preclude consideration for publication.

For further details, see the Author Guidelines [PDF] or contact the Editorial Office.

http://pubs.acs.org/page/jacsat/submission/prior.html

TheScientist
EXPLORING LIFE, INSPIRING INNOVATION

ACS Chemistry for Life®

Data manipulation:

Gene Therapy Researcher Faked Data

By Bob Grant | April 25, 2014

A former postdoc in a prominent gene therapy lab is branded a fraud by the US government more than three years after having a slew of papers retracted from various journals.

Accused Scientist Reaches Plea Deal

By Dan Cossins | July 12, 2013

A Chinese researcher working in Wisconsin who was accused of stealing an experimental cancer drug pleads guilty to a lesser charge.

Dutch Researcher Retracts More Papers

By Bob Grant | May 6, 2013

Fifty-three studies authored by shamed Tilburg University social psychologist Diederik Stapel have now been pulled from the literature.

Data manipulation: NMRs

Tohru Fukuyama and co-workers from University of Tokyo: several corrections/additions by NMR manipulation in JACS and OL.

Yields in the manuscript were reported incorrectly for compound **13** (Scheme 4) and compound **18** (Table 3, entry 6). Correct yields are 81% and 88%.

Solvent peaks had been removed from the ^{1}H NMR spectra reported for compounds **13**, **9a**, **9b**, **9c**, **9d**, **14**, **9f**, **9g**, **9i**, **9j**, **9k**, **6a**, **6b**, **6h**, **6j**, **6k**, **6n**, **17**, **18**, and **19**. Original FIDs were located, and the spectra were reprocessed and have been replaced for the above compounds in the revised Supporting Information submitted with this correction. The spectra editing did not affect any of the conclusions of the published paper. The purities calculated on the basis of the revised spectra are as follows: **13** (98%), **9a** (97%), **9b** (99%), **9c** (99%), **9d** (99%), **14** (98%), **9f** (94%), **9g** (88%), **9i** (99%), **9j** (99%), **9k** (99%), **6a** (98%), **6b** (97%), **6h** (91%), **6j** (99%), **6k** (97%), **6n** (97%), **17** (97%), **18** (98%), and **19** (95%).

Image manipulation: *Science, PNAS, Nature Immunology*

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Former NUS don under probe for research fraud

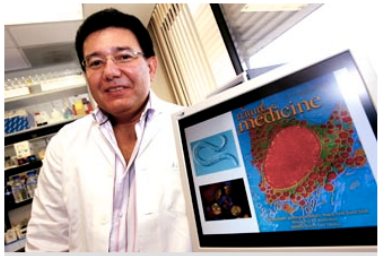
Published on Oct 9, 2011

By Chang Ai-Lien, Senior Correspondent

28 Tweet 249 Share

In what could be the first major case of scientific fraud uncovered here, a former National University of Singapore (NUS) professor is being investigated for fabricating research data.

NUS and the other universities involved are retracting two of his articles

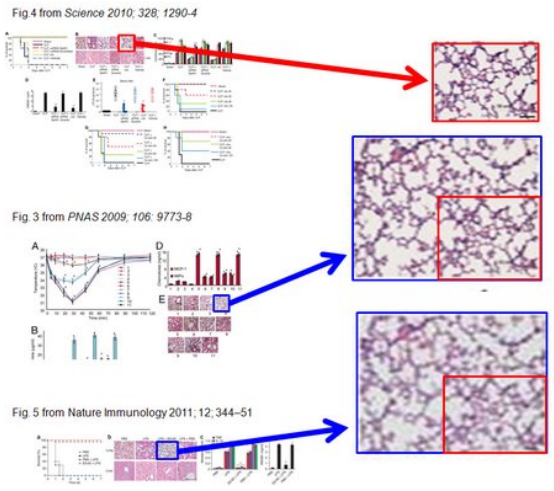


Dr Alirio Melendez (above), a former professor at the

Padmam Puneet, Celestial T. Yap, Lingkai Wong, Lam Yulin, Dow Rhoon Koh1, Shabbir Moochhala, Josef Pfeilschifter, Andrea Huwiler5, Alirio J. Melendez.
SphK1 Regulates Proinflammatory Responses Associated with Endotoxin and Polymicrobial Sepsis
Science 4 June 2010: Vol. 328 no. 5983 pp. 1290-1294
Figure 4

The cytokine interleukin-33 mediates anaphylactic shock.
Pushparaj PN, Tay HK, H'ng SC, Pitman N, Xu D, McKenzie A, Liew FY, Melendez AJ.
PNAS 2009;106:9773-8.
Figure 3

Padmam Puneet, Mairi A McGrath, Hwee Kee Tay, Lamyaa Al-Riyami, Justyna Rzepecka, Shabbir M Moochhala, Shazib Pervaiz, Margaret M Harnett, William Harnett, Alirio J Melendez.
The helminth product ES-62 protects against septic shock via Toll-like receptor 4–dependent autophagosomal degradation of the adaptor MyD88.
Nature Immunology 2011; 12; 344–351. (already retracted)
Figure 5



Retraction Watch

Trackin

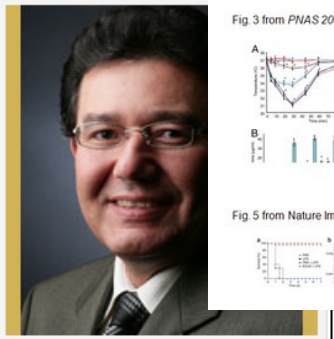
70 papers by Alirio Melendez under investigation: report

with 35 comments

The National University of Singapore (NUS) is reviewing about 70 papers by Alirio Melendez, a once-promising researcher whom, as we've reported, has been forced to retract a paper in *Nature Immunology* and has another paper in *Science* subject to an Expression of Concern.

The *Straits Times*, which reported the NUS investigation this weekend, says Melendez' former team is cooperating:

> In Singapore, the eight researchers involved include scientists, academics, research fellows and students from NUS and DSO National Laboratories. DSO and the personnel involved are assisting the university in its investigation.



Alirio Melendez

Guest authorship: *Europhysics Letters*

Retraction Watch

Tracking retractions as a window into the scientific process

Physics retraction as rogue authors add six colleagues to a paper they didn't write

leave a comment »

Forged authorship — in which researchers add the names of people who've had nothing to do with a paper, either to boost its chance of being published, pay tribute (in a misguided way), or both — has become a common theme at Retraction Watch. But we're pretty sure we haven't seen a case involving as many faked authors as a now-retracted paper in *Europhysics Letters*. Here's the notice: Read the rest of this entry »

http://retractionwatch.wordpress.com/

Case Study for Discussion

- A postdoctoral Fellow leaves a lab and submits a manuscript to a journal on work he did while in the supervisor's lab after employment ended. The supervisor did not give permission to publish, saying that the manuscript was premature. He claimed Fellow left under disagreements and only contributed to "one part" of the research. The Fellow submitted a manuscript with himself as the sole author. The manuscript was accepted for publication but supervisor objected. How should the journal proceed?

Case Study for Discussion

- Who owns the copyright?
- Are there intellectual property issues?
- Was the fellow a legitimate employee at the time the data was collected?
- Can an author proceed on his own?
- What are the responsibilities of the journal?
- Are both the supervisor and fellow being reasonable?

Case Study Resolution

- Journal proceeded with publication posting an unusual addendum which read: “This work was done in the laboratories of the [SUPERVISOR] while [FELLOW] was a postdoctoral associate working with us. While we all contributed to many of the ideas and experiments presented in the manuscript, to the best of our knowledge much of the work has yet to be reproduced by [FELLOW] or by us. We believe that some of the conclusions may be erroneous, and we intend to correct them in a future manuscript that credits all of those involved with the work. Until the data have been reproduced and the proper control experiments have been done, none of us feels comfortable including our names as coauthors.”

Ways violations are uncovered

Scientists (authors, editors, & reviewers)

- ✓ Have exceptional memories
- ✓ Access to Google, PubMed, SciFinder
- ✓ Access to software that detects plagiarism, image manipulations, etc.

Scientific community is watching and policing itself

- ✓ Social Networking (blogs, Facebook, Twitter) offer new means to question published works in a very public forum

Publishers using technology to identify possible violators

- ✓ CrossCheck: compares text to published work
- ✓ Image checking software: http://www.jcb.org/cgi/doi/10.1083/jcb.200406019

Avoid the Pitfalls: Consequences

1. Rejection/Retraction
2. Ban on further submissions
3. Black list
4. Notification of the institutions or agencies that funded research
5. Loss of position
6. Criminal charges?

Retractions from ACS journals?

<0.05%

of total articles published per year in ACS journals from 2002 to 2011 were retracted.

Thanks to the entire author community: editors, reviewers, authors, and readers like YOU!

Avoid the Pitfalls: Ethical Obligations

- ✓ Present ***original*** research
- ✓ Present an ***accurate account*** of the research performed
- ✓ Present an ***objective discussion*** of its significance
- ✓ Make sure ***all coauthors are aware*** of the submission
- ✓ Submit to only ***one journal*** at a time
- ✓ Disclose ***submission history*** of manuscript

PUBLISHING IN ENGLISH

Common Issues in Manuscripts

- Structural problems in the Manuscript.
- Language Issues.
- Wrong Journal for the Message

Structural Problems

Excessively long Introductions

Inadequate terminology in the Experimental Section

Clutter. Too much data (Tables, especially) and too many Figures

Equations and derivations thereof

More attention to language than to logical presentation of the Discussion

Excessive priority claims

For the first time ever, we have shown…

To our knowledge, this is the first time that…

Asking forgiveness or giving excuses

English is the language of chemistry (and science in general).

English is a deceptively simple-looking language.

Simplicity requires precision of form:

Inadequate use of prepositions (in/on; by/with; to/with etc.)

Inadequate use of conditionals (should/would/could; might/may/can)

Incorrect placement of: also, too, just, only

Incorrect use of: among/between

Incorrect use of: some/several/various

Incorrect use of: as/because/since

Incorrect use of: show/demonstrate

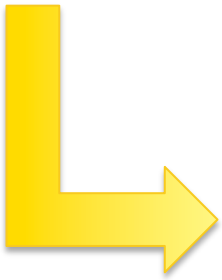
Avoid Common Language and Writing Errors

Incorrect verb tense

(When did this happen?)

- Use past tense to describe events that have happened (procedures, results, previous studies)
- Do not mix verb tenses in sentences and paragraphs

Confusion of singular and plural forms



Singular	Plural
Stimulus	Stimuli
Datum	Data
Analysis	Analyses
Formula	Formulae

Irrelevant Information

- Anecdotes or stories
- Subjective language ("*We felt that the fixative was bad…*")
- Superlatives (*huge, incredible, wonderful, exciting, most important, never-before-seen*)
- Irrelevant words and phrases in titles and abstracts (*original, a study of, an investigation of)*

Avoid Common Language and Writing Errors

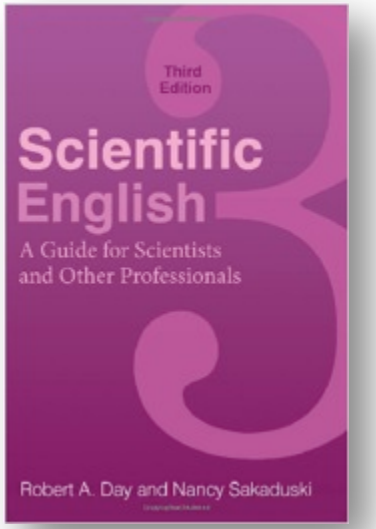
Use of scientific lingo*

Lingo	"Translation"
"It has long been known"	*I didn't look up the original reference*
"In my experience"	*Once*
"In case after case"	*Twice*
"In a series of cases"	*Thrice*
"It is believed that"	*I think*
"It is generally believed that"	*A couple of others think so too*

Lingo: (programming language)

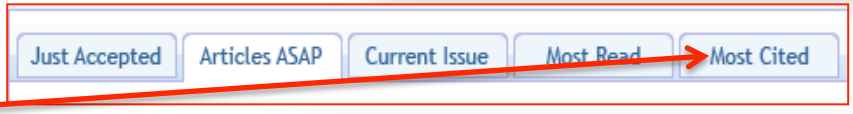
From *Scientific English: A Guide for Scientists and Other Professionals*
By Robert A. Day, Nancy Sakaduski, Nancy Day, page 43.

- Poorly written captions
  Captions should be understandable without reference to the text (*ACS Style Guide*)
- Inconsistencies and contradictions within the text
- Inadequate citations



Simple Tools + Strategies = Improved English Communication

- Continue to read published content within and outside of your field
  - Most Cited Papers
  - Most Read Papers
  - “Best” Papers
- Participate in peer review



Take Time for a Few Last Steps

- ✓ Review the journal's instructions to authors
  - Have you addressed all requirements?
  - Have you gathered the necessary information to submit the manuscript (e.g., full contact information for all authors and for suggested reviewers).
- ✓ Ask a colleague who is a native English speaker to read your manuscript and cover letter

Take Time for a Few Last Steps

- ✓ Consider using a professional editing service
  - Services go beyond editing and include formatting according to specific journal instructions or templates
  - Look for well-respected companies that employ researchers as editors

Take Time for a Few Last Steps

Questions to Ask *(for any Editing Services).*

- ✓ Which services does your company provide?
- ✓ Which scientific fields do your editors serve?
- ✓ What are your policies on confidentiality of the manuscript and the submission process?
- ✓ Which file formats do you handle (PC, MAC, TeX, etc.)?
- ✓ By what methods can I submit a manuscript?
- ✓ What turnaround timeframe can I expect?
- ✓ What type of editing is performed? (For example, checking of grammar, style, spelling, punctuation, adding quality, editing the language for clear presentation of scientific ideas.)
- ✓ What is your policy if I am not satisfied with your work?
- ✓ Do you provide a sample free edit of an abstract or short paper before contracting the work?
- ✓ Can secure payment be made online? If not, how are payments made?
- ✓ How are fees determined?

Take Time for a Few Last Steps

Language Editing Services

http://pubs.acs.org/page/4authors/tools/language_editing.html

Authors may want to have their manuscripts edited professionally before submission to improve the clarity.

ACS has compiled a list of language-editing companies, listed alphabetically below.

This list is provided for convenience only.

No recommendation is implied, and use of any of these services or other editing services is neither a requirement nor a guarantee of manuscript acceptance.

Some of the listed companies have indicated they will offer a discount to ACS authors.

Company	Web Site	Location
American Journal Experts	www.JournalExperts.com	USA
Bioedit Ltd.	www.bioedit.co.uk	UK
Cambridge Language Consultants	www.camlang.com	UK
ChemEdit Corporation	www.chemedit.com	USA
Edanz Editing	http://www.edanzediting.com	Japan
Editage	www.editage.com	USA
Genedits	www.genedits.com	UK
Liwen Bianji (Edanz Editing, China)	http://www.liwenbianji.cn	China
ScienceDocs, Inc.	www.sciencedocs.com	USA
Science Manager	www.sciencemanager.com	Australia
SciTechEdit International	www.scitechedit.com	USA
Sees-editing Ltd.	http://www.sees-editing.co.uk	UK
Write Science Right	www.writescienceright.com	USA