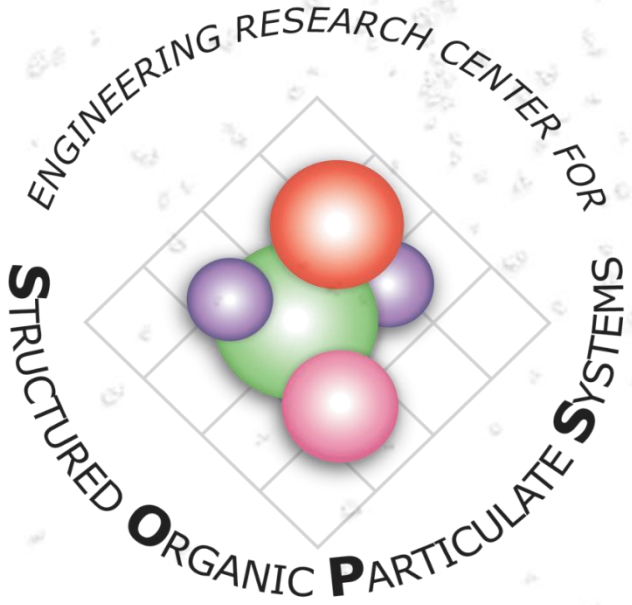
Writing a Quality Research Paper



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September 4, 2015
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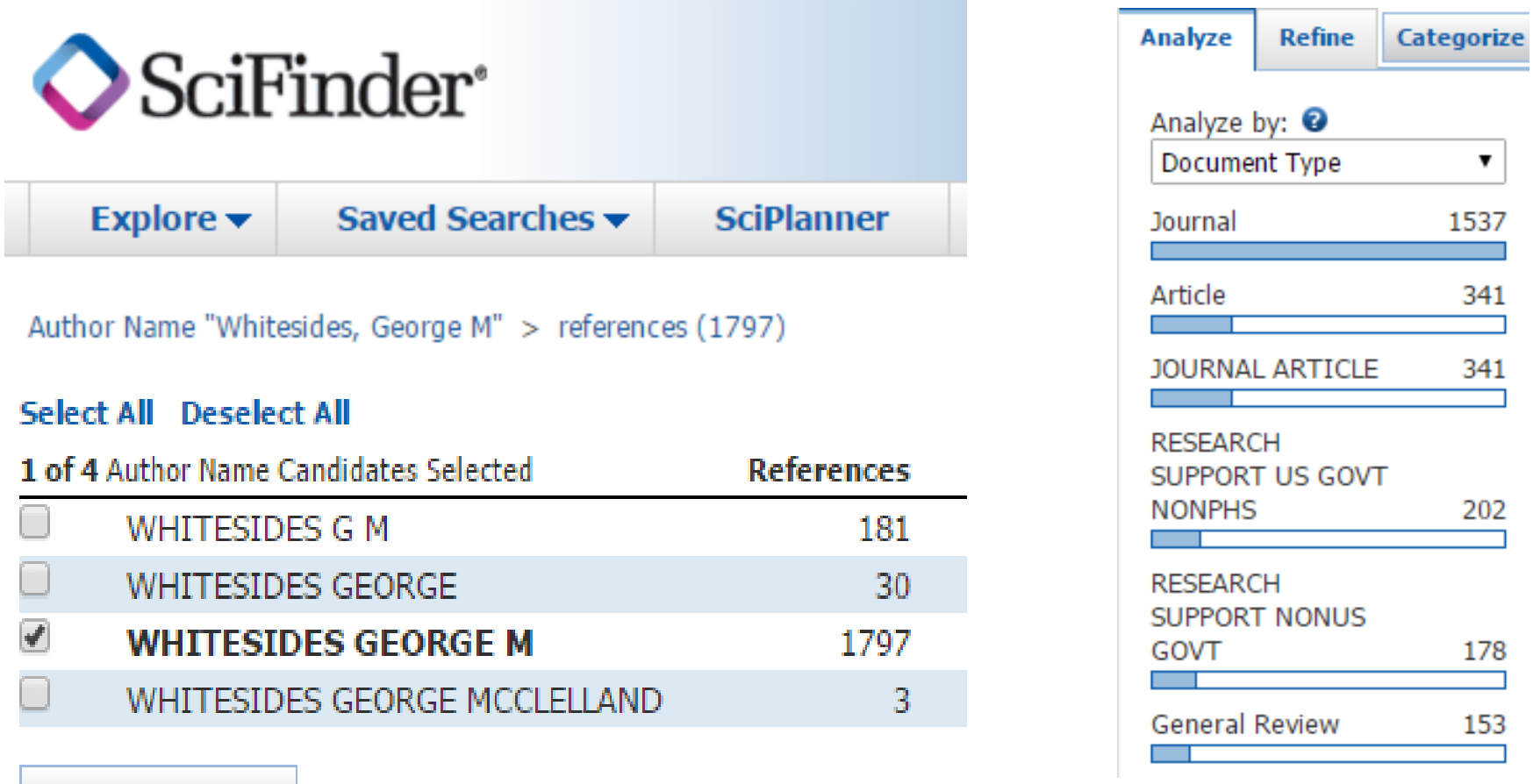
Manuscript Writing
What is a Research Paper?



George M. Whitesides

According to his website, he has over 1200 published works!

http://gmwgroup.harvard.edu/pubs/index.php?b=2010&t=2019

Manuscript Writing
What is a Research Paper?

A paper is an organized description of hypotheses, data and conclusions, intended to instruct the reader. Papers are a central part of research. If your research does not generate papers, it might just as well not have been done. "Interesting and unpublished" is equivalent to "non-existent".

Realize that your objective in research is to formulate and test hypotheses, to draw conclusions from these tests, and to teach these conclusions to others. Your objective is not to "collect data".

G.M. Whitesides, Adv. Mater., 2004, 16, No. 15, August 4

A paper is not just an archival device for storing a completed research program; it is also a structure for *planning* your research in progress. If you clearly understand the purpose and form of a paper, it can be immensely useful to you in *organizing* and conducting your research. A good outline for the paper is also a good plan for the research program. You should write and rewrite these plans/outlines throughout the course of the research. At the beginning, you will have mostly plan; at the end, mostly outline. The continuous effort to understand, analyze, summarize, and reformulate hypotheses on paper will be immensely more efficient for you than a process in which you collect data and only start to organize them when their collection is "complete".

G.M. Whitesides, Adv. Mater., 2004, 16, No. 15, August 4

Importance of Outline

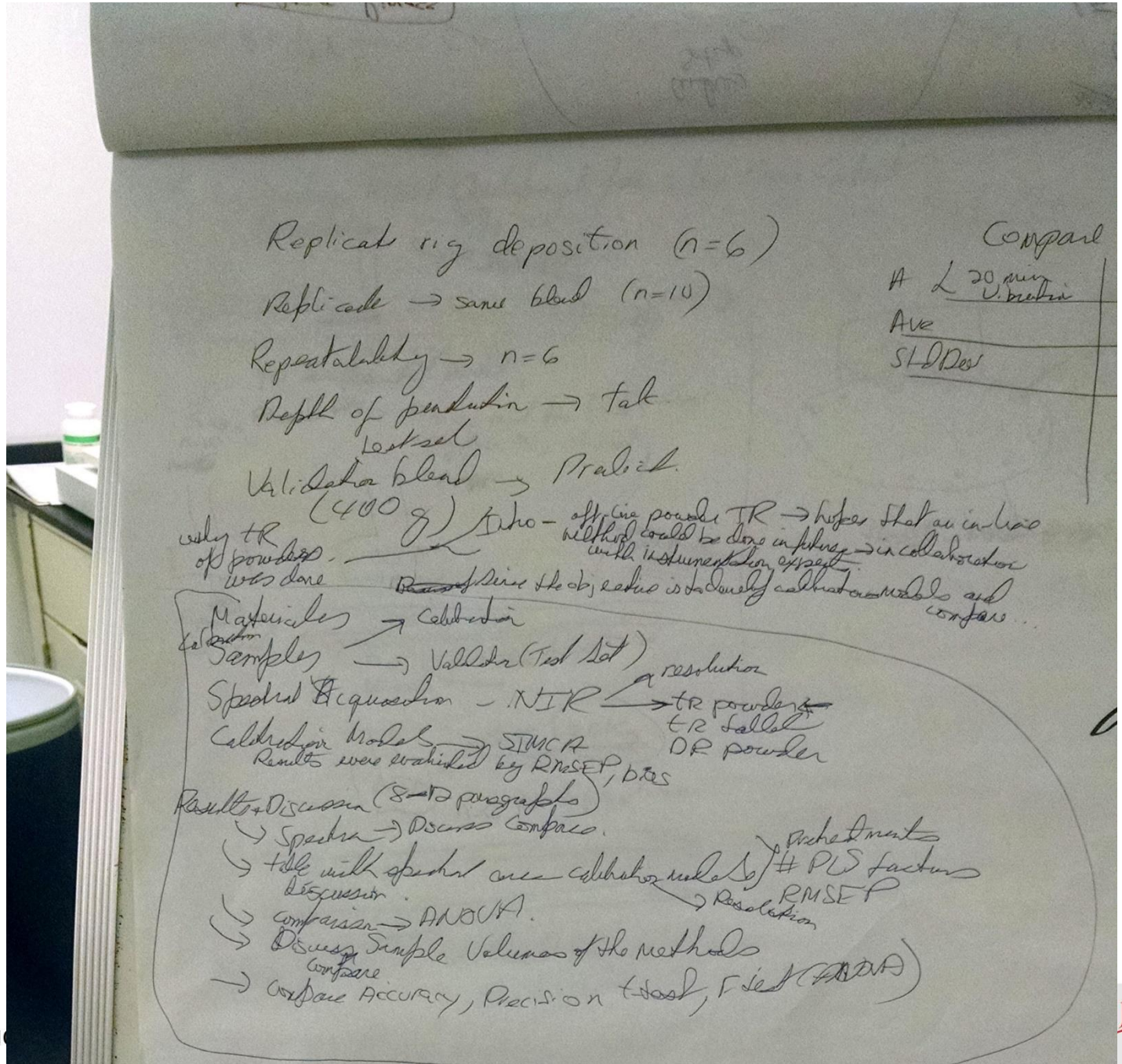
" An outline itself contains little text. If you and I can agree on the details of the outline (that is, on the data and organization), the supporting text can be assembled fairly easily. **If we do not agree on the outline, any text is useless**.

Communication between student/professor & research team.

G.M. Whitesides, Adv. Mater., 2004, 16, No. 15, August 4

- "Communication is always difficult."
- "A scientist who does not communicate, is a depressed soul."

Creation - Starting



Creation - Starting

Develop a research manuscript from an outline to communicate

- Title: Descriptive of the Work Performed. (truly important)
- Authors (Byline or Affiliation)
- Abstract: what was done, the main findings.
- Introduction: Describe the reasons for doing the work. Context (describe where the field was before the research and how it has been advanced).
- Experimental: How the experiments were performed, permitting their repetition.
- Results: The results obtained and how they were interpreted.
- Conclusions: how the field was advanced, what was learned. Do not restate the results.

How to Start The Craft

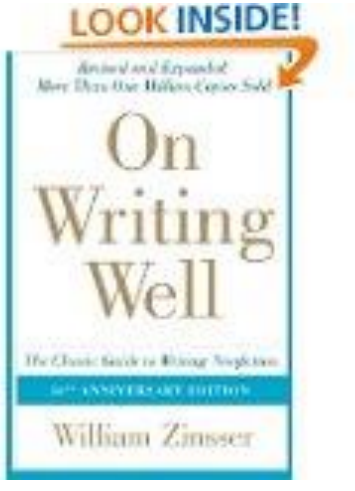
- Write your message, write the scientific advancement, write it for yourself.
- Use [ ] to emphasize un-necessary words.
- Accept that writing requires a lot of hard work. Accept that you will need a number of revisions to clearly express your contribution.
- Learn to be your own critic, demand improvements from yourself. Review prior revisions, try to avoid repeating mistakes.
- Choose one or more well written papers that become your role models. Learn from the masters.

This is the craft – that requires a lot of work, but becomes much easier as it is practiced.

On Writing Well, William Zinsser, The Classic Guide to Writing Nonfiction,

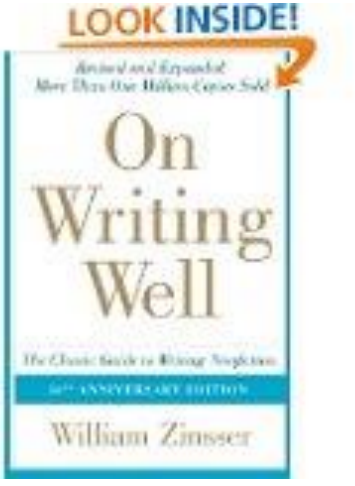
Auto-revision

"Clear thinking becomes clear writing; one can't exist without the other. Its impossible for a muddy thinker to write good English."



On Writing Well, William Zinsser, The Classic Guide to Writing Nonfiction, page 8

Auto-revision



"writing is not a special language owned by the English teacher. Writing is thinking on paper. Anyone who thinks clearly can write clearly, about anything at all. Science, demystified, is just another nonfiction subject. Writing, demystified is just another way for scientists to transmit what they know." Zinsser page 159 – 160.

"The continuous effort to understand, analyze, summarize, and reformulate hypotheses on paper will be immensely more efficient for you than a process in which you collect data and only start to organize them when their collection is "complete". "

G.M. Whitesides, Adv. Mater., 2004, 16, No. 15, August 4

Clutter

- "Clutter is the laborious phrase that has pushed out the short word that means the same thing."
- "Clutter is the official language used by corporations and government to hide their mistakes."
- "At the present time we are experiencing precipitation".
- "The timing apparatus is not currently working."

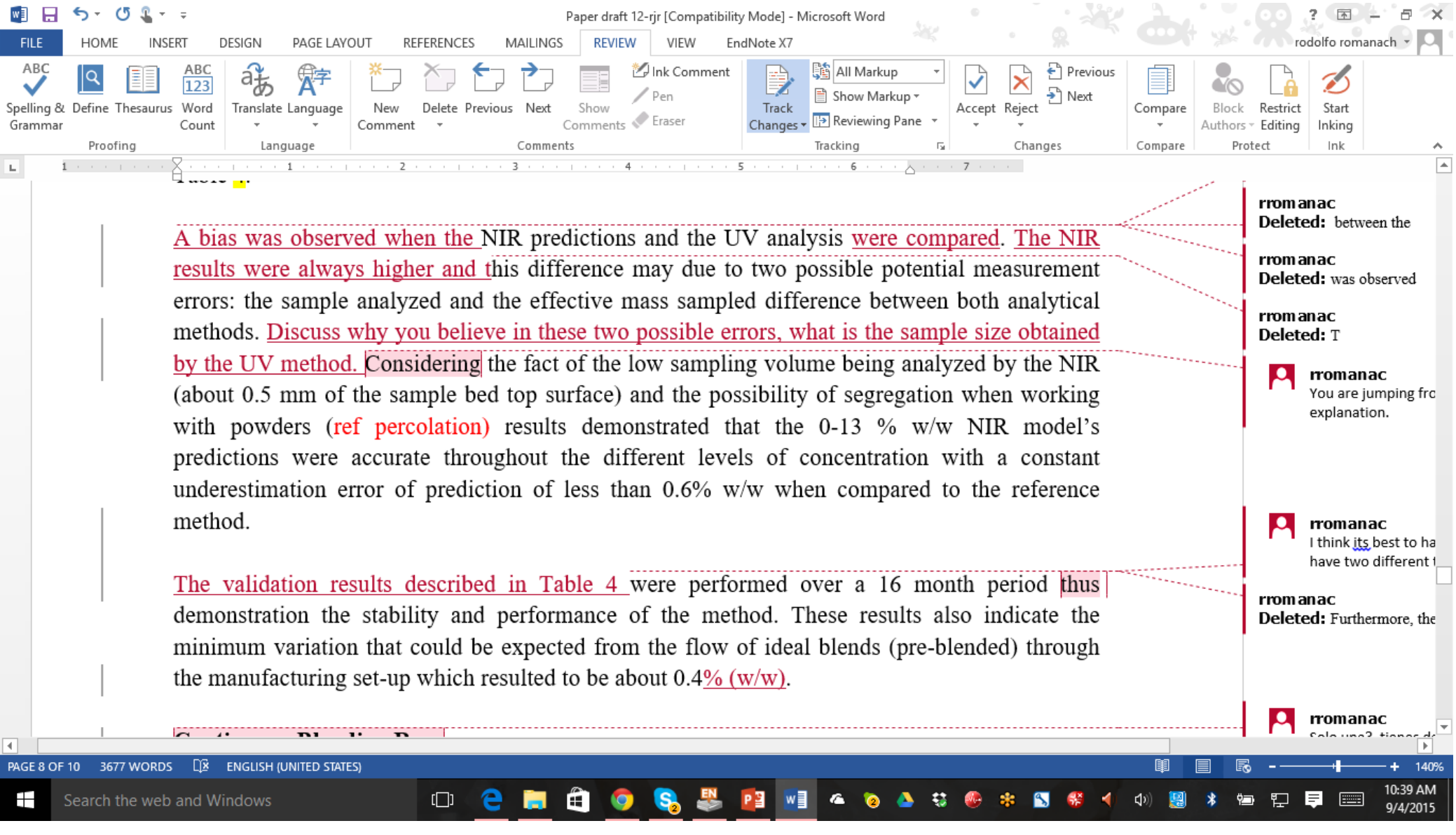
Clutter

"Omit empty phrases such as:

- As already stated
- It has been found
- It has long been known that
- It is interesting to note that
- It is worth mentioning at this point
- It may be said that
- It was demonstrated that
- As can be seen
- It is imperative to note
- In order

ACS Style Guide, 2006, page 54.

Mastering the Craft
Professor's Valuable Revision



“Fresh Eyes”

- After a while it becomes difficult to see errors, you get used to them.
- Ask a collaborator to read it.
- Reserve one of the authors to be the fresh eyes for the final drafts.
- Not uncommon to have over 20 drafts before submitting.

Simple Declarative Sentences

- "Short, simple *declarative sentences—that is, sentences that make statements,* rather than pose questions, issue commands, or exclaim—are the easiest to write and the easiest to read."

ACS Style Guide, 3rd Edition, page 41

Simple Declarative Sentences

- Experimental: How the experiments were performed, permitting their repetition.
- "Why use DoE? DoE has been extensively used in the design of processes in order to understand the effects of multiple interactions of parameters on the quality of the …..
- The powder mixtures were prepared following a D-optimal design ……

Simplicity – Strip Every Sentence to its Cleanest Components

Experimental: How the experiments were performed, permitting their repetition.

- The temperature control is important in order to maintain the system isothermally.
- The temperature control is important [in order] to maintain the system isothermally.
- The temperature was maintained at 30°C using a…….. control.

Simplicity – Strip the sentence to its barest components.

Results: The results obtained and how they were interpreted.

- "As can be seen, the three spectra exhibited an identical profile (i.e., no difference in chemical composition between samples was apparent); however, the spectra were shifted by effect of differences in physical properties between samples"
- "[As can be seen], the three spectra exhibited an identical profile [(i.e., no difference in chemical composition between samples was apparent)]; however, the spectra were shifted by effect of differences in physical properties between samples"
- Alternative: Figure # shows three spectra that differ only in baseline. The change in baseline is caused by differences in the physical properties of the samples.

Selecting a Journal to Publish your Research

JOURNAL	IF 2014	SCOPE OF JOURNAL	Fit for Research
Applied Spectroscopy	2.014	publishing high-quality articles, both fundamental and applied, covering all aspects of spectroscopy. Established in 1951, the journal is owned by the Society for Applied Spectroscopy and is published monthly. The journal is dedicated to fulfilling the mission of the Society to "…advance and disseminate knowledge and information concerning the art and science of spectroscopy and other allied sciences." All manuscripts are rigorously peer-reviewed.	1. Is manuscript within scope of journal? 2. Is it likely that journal will have suitable reviewers for manuscript?. Are one or more of the references published in this journal? Are similar articles published in journal? 3. Evaluate recent journal publications. Would I feel proud to publish in this journal? (Format, presentation) 4. Length of time to obtain article review. 5. Previous experience with journal. Received reviews in timely manner? Received fair treatment in revision process? Served as reviewer of journal? 6. Consider impact factor.

Impact Factor

Firstly, the tool's origin and development was guided by the needs of US university and college librarians who wanted to use an objective method to select journals for their holdings. This had at least two consequences: the tool was not initially developed for research evaluation, and the approach was clearly optimized for the US context.

A measure of the average number of citations to recent articles that are published in that journal

Scientometrics, 2009, 79(3), 635 – 649.

Impact Factor

- Developed by Thompson's Scientific ISI Web of Knowledge Data base – and annually updated.
- Recommend comparing a journal's impact factor to others in the same subject area.

libguides.lib.msu/edu.impactfactors

BUYER BEWARE

A checklist to identify reputable publishers

How to perform due diligence before submitting to a journal or publisher.

- Check that the publisher provides full, verifiable contact information, including address, on the journal site. Be cautious of those that provide only web contact forms.
- Check that a journal's editorial board lists recognized experts with full affiliations. Contact some of them and ask about their experience with the journal or publisher.
- Check that the journal prominently displays its policy for author fees.
- Be wary of e-mail invitations to submit to journals or to become editorial board members.
- Read some of the journal's published articles and assess their quality. Contact past authors to ask about their experience.
- Check that a journal's peer-review process is clearly described and try to confirm that a claimed impact factor is correct.
- Find out whether the journal is a member of an industry association that vets its members, such as the Directory of Open Access Journals (www.doaj.org) or the Open Access Scholarly Publishers Association (www.oaspa.org).
- Use common sense, as you would when shopping online: if something looks fishy, proceed with caution. **D.B.**

There are a number of companies with fake peer review procedures. Pay to publish practices

D. Butler, The Dark Side of Publishing, Nature, 2013, 495, 433 – 435.

Manuscript Submission

- Journals have highly automated systems. for handling submissions.
- Upload the manuscript in its parts: abstracts, text, tables, figures. The system then consolidates all these parts and makes a .pdf for your review.
- We usually make a .pdf and then review it, and make many other .pdf files to thoroughly check the manuscript for up to a week before finally submitting it.

Manuscript Submission & Auto-revision

- Just before submitting generate a .pdf version of the manuscript. This will allow you to see what the reviewer will see eventually.
- Review and improve. Are the figures of high quality, will the reviewers learn from them?
- Print out and verify one more time, before finally submitting.

Peer Review Process

Invitation to Peer Review #JOPI-D-15-000

Journal of Pharmaceutical Innovation <em@editorialmanager.com> Sun, Mar 29, 2015 at 2:21 PM
Reply-To: Journal of Pharmaceutical Innovation <aizamae.policarpio@springer.com>
To: Rodolfo J Romanach <rodolfoj.romanach@upr.edu>

Dear Rodolfo:

I am writing to invite you to review the following manuscript which has been submitted to Journal of Pharmaceutical Innovation:

Manuscript Number: JOPI-D-15-000##

Title:

The Abstract is provided below.

We hope you are willing to review the manuscript. If so, would you be so kind as to return your review to us by 19 Apr 2015? Thank you.

To accept this invitation, please click here: http://jopi.edmgr.com/l.asp?i=7179&l=O6GI068A

Who is the Peer Reviewer?

- 2 – 3 scientists who have published in the field relative to the paper.
- One of the scientists that you referenced in the manuscript (or that you should have..)
- A busy person, don’t make the reviewer waste time.
- A peer that will help you improve your work. More often a friend than enemy.
- Someone that you nominated (way of increasing an Editor’s database). Practically all journals require that you suggest four reviewers.

Review Time

- It may take 3 days or even a month for the journal to assign the reviewers.
- Reviewers are usually given 3 – 4 weeks to provide review.
- Journal provides a web site that keeps you up to date on the progress of the review process.

Manuscript #	15-07911
Current Revision #	0
Submission Date	2015-03-02 18:18:09
Current Stage	Potential Reviewers Assigned

Manuscript #	15-07911
Current Revision #	0
Submission Date	2015-03-02 18:18:09
Current Stage	Editor-In-Chief Decision Started

Review Time

- Most journals provide reviews in 2 – 3 months.
- Journals try to keep the review process short to be attractive to potential authors.

ARTICLE INFO

Article history:
Received 30 May 2014
Received in revised form 14 July 2014
Accepted 17 July 2014
Available online 27 July 2014

Challenges of Being a Peer Reviewer

- Defining and identifying the contribution. Context of contribution.
- Understanding what was done.
- Linking the experimental and results sections.
- Following the sequence of experiments.
- Traveling back and forth between text and figures + tables. They are separated.

The better your manuscript, the more that you will minimize the challenges for the reviewer.

Definition of Context

- Full Definition of CONTEXT
- **1 -** the parts of a discourse that surround a word or passage and can throw light on its meaning
- **2** the interrelated conditions in which something exists or occurs **:** ENVIRONMENT, SETTING <the historical *context* of the war>

http://www.merriam-webster.com/dictionary/context- Sept 1, 2015.

Context – Defines Contribution

- The first time that the particle size of a material is controlled (or the first nanoparticles), even though the material was synthesized many years ago.
- The first time that an analytical technique has been used to understand a pharmaceutical process.
- The first theoretical approach for observations made years ago.

Discussion of Context needs to convince that contribution is important.

Context

Near infrared (NIR) spectroscopy has been extensively used for monitoring batch processes [6–8], but this work describes the monitoring of a continuous mixing process with NIR spectroscopy. The NIR methods for batch manufacturing have been used to evaluate the endpoint of the mixing process [9, 10]. The NIR methods for continuous blending need to monitor the variation in the mixing after steady state is achieved [11, 12]. The evaluation of method precision is extremely important to discern between the variation from the mixing process and the variation associated to the NIR method that is monitoring the blending process. Thus, in this work, the precision and accuracy of the NIR method are thoroughly evaluated. A five-component blend is analyzed and significant efforts to incorporate previous knowledge from this field which has shown the importance of carefully constructing calibration sets capable of predicting the future manufacturing process [12].

Colón, Y., Florian, M., Acevedo, D., Méndez, R., Romañach, R., 2014. Near Infrared Method Development for a Continuous Manufacturing Blending Process, J Pharm Innov 9, 291-301

The contributions of Peer Reviewers

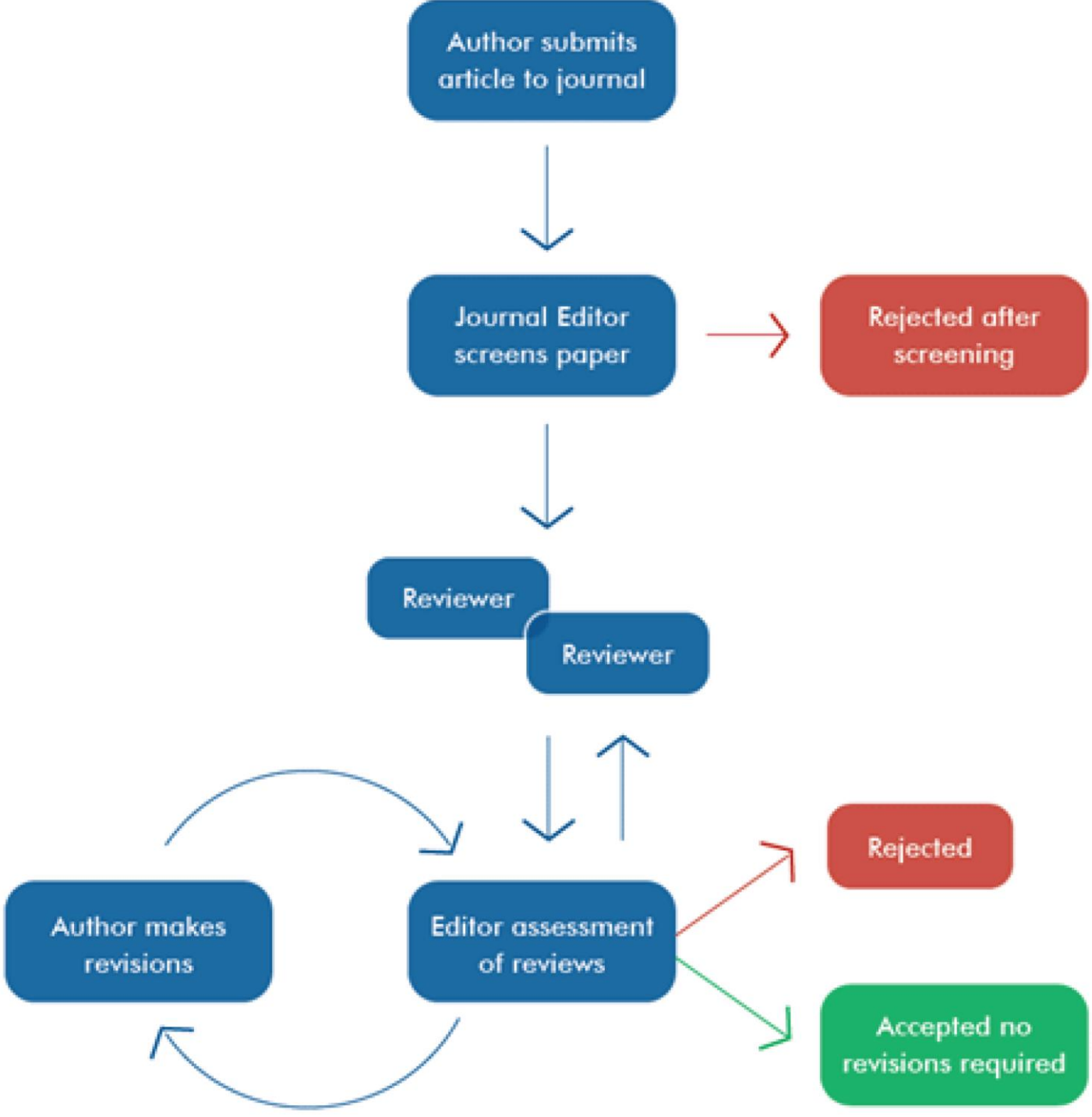
Reviewer provides:

1. Evaluation of work. Is the work original and worthy of publication as an advancement in science? Check that work has not published before.
2. Corrections & improvements that are needed before publication. Manuscript will be substantially better after the review process.
3. Alert editors on possible cases of fraud, ethical issues (work should not be published as original in two or more journals).

Role of Reviewers

Dear Professor Romanach,

A paper by ------ appeared in another journal 51 (2006) 419-426. I am enclosing the pdf file of this paper. As I see, the authors described there their NIR method for the determination of ----- acid in tablets in the transmittance mode. The ------ paper was accepted for publication in April, 2006, when the authors submitted their manuscript to our journal. It is difficult to understand why the authors do not even mention in the manuscript submitted to JPBA the other paper. When you send me your opinion, please take the existence of other paper also into consideration. Although the other reviewer accepted the first revision of the paper, I shall accept your opinion whatever it will be. I think the publication of the --------. paper detracts from the value the present manuscript which is questionable anyway. With best regards,



http://journalauthors.tandf.co.uk/review/peer.asp

Progress of Manuscript Review

Stage	Start Date
Review Started (Reviewer #1)	2015-03-05 17:52:59
First Reviewer Accepted	2015-03-05 17:52:59
Potential Reviewers Accept (Reviewer #1)	2015-03-05 17:52:59
Contacting Potential Reviewers	2015-03-04 18:16:59
Potential Reviewers Assigned	2015-03-04 18:16:48
Waiting for Potential Reviewer Assignment	2015-03-04 10:55:55
Associate Editor Assigned	2015-03-04 10:55:54
Potential Associate Editor Assigned	2015-03-04 10:55:54
Waiting for Potential Associate Editor Assignment	2015-03-02 18:19:53
Editor-In-Chief Assigned	2015-03-02 18:19:53
Waiting for Editor-In-Chief Assignment	2015-03-02 18:18:09
Initial QC Complete	2015-03-02 18:18:09
Initial QC Started	2015-03-02 14:29:24
Author Approved Converted Files	2015-03-02 14:29:23
Waiting for Author Approval of Converted Files	2015-02-11 07:27:21
File Conversion Complete	2015-02-11 07:27:21
Waiting for File Conversion	2015-02-11 07:23:11
Waiting for Files to be Sorted	2015-02-11 06:00:18
Manuscript Submitted	2015-02-11 06:00:18
Manuscript Files Submitted	2015-02-11 06:00:17
Preliminary Manuscript Data Submitted	2015-02-11 05:32:03

Dealing with Reviews

Reviewer #1 Evaluations:
Novelty: Excellent
Significance of Results: Excellent
Conclusions Supported: Good
Of interest to readers: Excellent
Length Appropriate: Yes
Clarity organization/writing: Excellent
Quality figs/tables: Good
Recommendation: publishable only after major revisions

Reviewer #1 (Comments for the Authors):

Line 48: "The larger surface area from smaller particles" Is it ok? Could it be better the following: "The larger surface area to volume ratio from smaller particles"

Line 63: This reviewer understands "better" as larger. Is it ok?
But there is a question: what about porosity or roughness of the surface?

Experimental:
Materials and sample preparation: The authors decided to sieve each raw material. There is no explanation about this decision. This material preparation drives to a very specific material behavior in terms of particle size distribution, so the conclusions of this Manuscript are highly related to the low particle size distribution of each raw material. So, what would be the extension to the routine pharmaceutical manufacturing where no low PSD sieving is done?

Line 118-121: Please, can you compare the selected shear levels to those usually performed during manufacturing?

Line 140-141: Please justify the difference in terms of sample scans between diffuse reflectance and transmission measurements.

Results and Discussion:
Line 181: Please include a figure of spectra of pure raw materials.

Dealing with Reviews

- Sometimes need to wait a few days after receiving the review. Calm down.
- Carefully consider reviews. If the reviewer was confused, many other readers will be.
- Need to address point by point each of the revier's comments, although some may be combined.
- Some journals will require a manuscript version with the changes indicated and others with the improvements. Others just a version with the changes.

Letter to Editor

Dear Editor,

The authors thank the reviewers for their extremely valuable revision to correct the manuscript and improve the quality of the manuscript for an eventual publication.

We have improved the manuscript following the reviewers' suggestions. In addition, we have improved Tables II and III to more clearly specify the RMSEP and RSEP(%).

We provide the following detailed responses to the reviewers suggestions:

Example of Response to Review

- **Reviewer comment in bold.**
- We have amended the manuscript to explain that the differences in the calibration models are also related to the difficulty in measuring the volume of solids and the fact that the material has a number of voids or pores.
- **h- Line 328, ".. critical product parameters ..": Shouldn't it be "critical process parameters"?**
- Yes, the correction was made.

Paper Acceptance

Your Submission #AAPSPT-D-12-00085R1 Has Been Accepted for Publication

AAPSPT Editorial Office <aapsptsubmit@aaps.org> Mon, Jul 9, 2012 at 11:56 AM
To: Rodolfo Romanach <rodolfoj.romanach@upr.edu>

Re: Manuscript AAPSPT-D-12-00085R1
Evaluation of Three Approaches for Real Time Monitoring of Roller Compaction with Near Infrared Spectroscopy
AAPS PharmSciTech

Dear Dr. Romanach,

I am pleased to inform you that your manuscript "Evaluation of Three Approaches for Real Time Monitoring of Roller Compaction with Near Infrared Spectroscopy" has been accepted for publication in AAPS PharmSciTech.

Once your manuscript enters the production queue and the copyediting process is completed, the Corresponding Author will receive a link to the online proof via email. This proof version could contain queries raised by the Copyeditor and you will need to address these in the proof review stage. Instructions for the proof stage will be sent in the email message containing the link to the online proof.

Galley Proof

You will receive the galley proof in the most uncomfortable moment, when you have too much work or are traveling.

They want the galley proof within 48 hours.

Changes must be minimal, now done mostly on-line

Paper Published: the End Result and the Beginning

- Papers will be listed in your resume or graduate school applications.
- Help a company or professors understand how you can contribute.
- Interviews: What was exactly your contribution.
- "Past behavior predicts future behavior."

Paper Published
End Result, Beginning or Continuation for your Professor

AAPS PharmSciTech 2002; 3 (3) article 24 (http://www.aapspharmsci.org).

Blend Uniformity Analysis Using Stream Sampling and Near Infra-red Spectroscopy

Submitted: July 12, 2002; Accepted: September 5, 2002

Manuel Popo[1], Saly Romero-Torres[1], Carlos Conde[2] and Rodolfo J. Romañach[1]

[1]University of Puerto Rico, Mayaguez Campus, Department of Chemistry, PO Box 9019, Mayaguez, PR 00680
[2]Glaxo-Smith-Kline Pharmaceuticals, Cidra, PR 00739

Near-Infrared Spectroscopic Method for Real-Time Monitoring of Pharmaceutical Powders During Voiding

MARTHA J. BARAJAS, ALEX RODRIGUEZ CASSIANI, WANDYLIS VARGAS, CARLOS CONDE, JORGE ROPERO, JORGE FIGUEROA, and RODOLFO J. ROMAÑACH*

Department of Chemistry, University of Puerto Rico–Mayagüez Campus, PO Box 9019, Mayagüez, Puerto Rico, 00682 (M.J.B., A.R.C., W.V., J.R., J.F., R.J.R.); and Wyeth Pharmaceutical Company, Call Box 10012, Guayama, Puerto Rico, 00785 (C.C.)

Volume 61, Number 5, 2007 0003-7028/07/6105-0490$2.00/0

APPLIED SPECTROSCOPY