Part 1 of a 3-part Series: Writing for a Biomedical Publication

UNDERSTANDING THE INITIATION OF THE PUBLISHING PROCESS

Deana Hallman Navarro, MD
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BIOMEDICAL SCIENTIFIC PUBLISHING

"Gaining knowledge, is the first step to wisdom. Sharing it, is the first step to humanity." - Unknown
New knowledge generated from scientific research must be communicated if it is to be relevant.

Scientists have an obligation to the provider of funds to share the findings with the external research community and to the public.
Communication

• **Personal communication**

• **Public lectures, seminars, e-publication, press conference or new release**
  ◦ Unable to critically evaluate its validity

• **Publication**
  ◦ Professional scientific journals – 1665
  ◦ Primary channel for communication of knowledge
  ◦ Arbiter of authenticity/legitimacy of knowledge
    • **Responsibility shared among authors, peer reviewers, editors and scientific community**
How to Communicate Information

- Publications, brief reports, abstracts, case reports, review article, letter to the editor, conference reports, book reviews...

- **First full-length research publication - 1968**
  - Definition: the first written disclosure of new knowledge that would enable the reader to:
    - Repeat exactly the experiments described
    - To assess fully the observations reported
    - Evaluate the intellectual processes involved
Development of the Manuscript

• To repeat exactly the experiments:
  ◦ Need a comprehensive, detailed methodology section

• To assess fully the observations:
  ◦ Need a very detailed results section
    • With graphs, charts, figures, tables, …
    • And full exposure of hard data
Development of the Manuscript

To evaluate the intellectual process:

- Need a comprehensive introduction with:
  - Rationale for the studies undertaken
  - Scientific basis on which the central hypothesis was formulated
  - Justification for the specific approach taken to test the hypothesis
  - In-depth evaluation of the significance of the findings reported within the framework of the existing body of knowledge in that particular field or discipline
Deana Hallman Navarro, MD

WHAT AND WHEN TO PUBLISH
When to Publish

• It must be the **first** written disclosure of **new** knowledge

• **Advantages** of first to publish:
  ◦ Receives appropriate intellectual credit for
  ◦ Its relevance and importance is manifested by increased citations & stature in the field
    • Leads to… meetings/symposia… grant support… academic promotion… greater compensation
When to Publish

- **Disadvantages** of first to publish:
  - Inability to effectively “mine” a new discovery unhampered by scientific competition
    - As soon as it is published, the entire scientific community has the opportunity to benefit their own research, which creates increased competition
  - Restricts on which new findings can be extensively confirmed
    - Potential for possible errors in publication
What to Publish

- Manuscripts should have masses of data that provide a comprehensive answer to an important scientific question.

- However, relatively succinct and well encompassed smaller studies often merit publication on their own:
  - Particularly for early-career investigators where peer-reviewed productivity is important.
  - Over time, more comprehensive publications should assume a greater role.
What to Publish

• **New**, previously-undisclosed, knowledge that has been obtained by rigorous application of the **scientific method**, and has **relevance** to an identifiable intellectual community, provided that there is absolute **confidence** in their reproducibility and statistically validity.

• Includes **negative findings**, especially from well-controlled clinical trials in the field of medicine.
“Negative Results Need Airing Too”
Gupta and Stopfer, Nature 470:39;2011

• Failure to publish negative findings can:
  ◦ Result in a significant **negative bias** that has the potential to adversely influence the power of subsequent systematic reviews or meta-analyses
  ◦ Subject patients in future clinical trials to unnecessarily participate in **repetitive** studies that have already been done
  ◦ Lead to other basic scientist repeating same study and **wasting** precious resources
What to Publish

- ICMJE has stated:
  - Editors should publish any carefully done study of an important question, relevant to their readers, whether or not the outcomes are statistically significant.
  - “Failure to submit or publish findings because of lack of statistical significance is an important cause of publication bias.”
- Consider an online Open Access scientific journal for the publication of negative findings

www.icmje.org/publishing_1negative.html
What to Publish

“Salami slicing”

- When a comprehensive study and collective data is “sliced” into many individual components as feasible into their “least publishable units” (LPU) prior to publication


Many journals frown upon it

- “Salami publications” are a set of papers covering the same population, methods and research question
Journals Speak

When a manuscript is submitted, one of the many decisions that must be made is whether it meets or exceeds a ‘least publishable unit’ criterion. To make this decision, I ask myself: “Does this manuscript contain enough new data, knowledge, or insight to warrant publication?”

- Editor, American Journal of Speech-Language Pathology

A reasonable yardstick by which to judge redundancy is to ask whether a single paper would be more cohesive and informative than two, without being excessively long.

- Annals of the Rheumatic Diseases

When authors fail to disclose all relevant work, they deny referees and editors the opportunity of assessing the true extent of its contribution to the broader body of research.

- Editorial, Nature Materials

As earlier editorials have pointed out, multiple reports of the same observations can overemphasize the importance of the findings, overburden busy reviewers, fill the medical literature with inconsequential material, and distort the academic reward system.

- Editorial, New England Journal of Medicine
In Favor of LPU Publishing

- LPU provides:
  - Easily quantifiable information databases that facilitate citation
  - More rapid advances in scientific progress
  - More rapid feedback to authors on the strengths/deficiencies of the findings reported


- Also, multiple manuscripts would allow multiple first authors for the components most heavily engaged in

- Be sure to focus on quality not quantity!
Perturbation of LPU Publishing

- Publishing essentially the same data in multiple formats, or blending existing data with incremental new data

- A study revealed **13.6% duplicates** (same findings, same authors, different journals)
- After 129 original publications, ~50% existence of subsequent “salami-slicing”

  Schein & Paladugu, Surgery, 129:655;2001

- Beware: re-publication of already published material, even if by same authors, would constitute an act of plagiarism if presented as “new and original”.
Deana Hallman Navarro, MD

THE BIOMEDICAL LITERATURE
Review of the Existing Biomedical Research Literature

IS REQUIRED:

- **Before** deciding to pursue a particular research question
- **Continuously** during the course of the research
- **Just before** submission of a manuscript for publication
  - To assure is truly **new and original**
Biomedical Literature Databases

- NIH’s National Library of Medicine MEDLINE database
  ◦ Contains articles ≥1966
  ◦ Has >18 million references to biomedical journal articles

- National Center for Biotechnology Information (NCBI)’s retrieval service (PubMed) is more comprehensive
  ◦ Citations of articles in biomedical journals not yet approved for inclusion in MEDLINE
  ◦ Citations of articles in MEDLINE-approved journals prior to the time of their inclusion in MEDLINE

- Privately Supported Databases:
  ◦ Highwire Press (http://highwire.stanford.edu)
  ◦ MedBioWorld (http://www.medbioworld.com)
Funded Grant Databases

- With NIH’s Pub Med Central it is possible to:
  - Find NIH grants awarded in a given field, with the PI
  - Read abstracts/peer-reviewed publications resulting from the research supported by the award

- NIH’s RePORTER database
  - [http://projectreporter.nih.gov/reporter.cfm](http://projectreporter.nih.gov/reporter.cfm)

- Grantscape database (enGrant Scientific)
  - [http://search.engrant.com/Search.aspx](http://search.engrant.com/Search.aspx)
  - Information on funded investigators, not publications

- eRA Commons website at NIH
  - “Like This” search engine provides grants and publications that are most “like” the material provided
THE IMPORTANCE OF COMMITMENT

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Keeping up with the Biomedical Literature requires COMMITMENT

- **Keep up** with your own field, also with research trends in related fields

- Identify long-term career objectives centered around a given scientific **sub-discipline**
  - Not possible to maintain a diversity of interests
  - Publications in several different areas reflects a **lack of focus**

- Become **familiar** with your field
  - Relevant journals, their editors, reviewers, and who publishes in them
  - Getting to know individuals who publish requires **NETWORKING**
Seek opportunities to review manuscripts submitted to a journal of interest

- Editors are always looking for qualified and conscientious reviewers
  - Gain access to members of journal editorial boards
  - Volunteer directly to the editor or associate editor
  - Be qualified - have several manuscripts in the journal as 1st or corresponding author

- Do an outstanding job; ask a senior colleague to look at it before sending
  - Return written review of critiqued manuscript promptly

- Gives a different perspective from that of an author
- Gains favor from the editor if a dispute arises with your own manuscript
TIME is a rate limiting for success

- A study followed abstract authors at a medical meeting for 5 years to determine if results were ever published as a primary publication in a peer-reviewed journal
  - 50% were published, of those that did not publish:
    - 42% indicated did not have enough TIME
  - Other reasons:
    - Belief that journal would be unlikely to accept it
    - Results not important enough
    - Not worth the trouble
    - Other investigators had similar results


- Once sufficient data is generated for a publication, establish writing as a **HIGH PRIORITY** immediately
  - Enthusiasm decreases as time elapses:
    - Time since data completion (T1/2) is ~70 days
    - After 6-8 months is unlikely to happen
Time Management

- Establish “habits” and routine/regular time commitments to:
  - writing, searching the literature, editing drafts, and other activities associated with publishing

- Treat publishing-related activities as another critical commitment
  - e.g. Teaching, Meetings

- **Block time off** on your daily calendar for these activities, and adhere to it vigorously

- Publishing must be among a researcher’s top priorities to be successful
DECIDING ON A TARGET JOURNAL

María D. González Pons, PhD
How to identify target journals

- Perform literature searches
  - Identify journals that publish manuscripts in your field
- Available tools
  http://jane.biosemantics.org
These journals have articles most similar to your input:
"helicobacter pylori and colorectal cancer"

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<tr>
<th>Journal</th>
<th>Article Influence</th>
<th>Articles</th>
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<tr>
<td>Helicobacter</td>
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<tr>
<td>World journal of gastroenterology</td>
<td>0.81168</td>
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<tr>
<td>Asian Pacific journal of cancer prevention : APJCP</td>
<td>0.47607</td>
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<tr>
<td>Cancer epidemiology, biomarkers &amp; prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology</td>
<td>1.58635</td>
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<td>Journal of gastroenterology and hepatology</td>
<td>0.59609</td>
<td>Show articles</td>
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<tr>
<td>Genome announcements</td>
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<td>Show articles</td>
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<tr>
<td>Journal of cancer research and therapeutics</td>
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<td>Zhonghua liu xing bing xue za zhi = Zhonghua liuxingbingxue zazhi</td>
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<td>BMC cancer</td>
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<td>Colorectal disease : the official journal of the Association of Coloproctology of Great Britain and Ireland</td>
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<td>Digestive diseases and sciences</td>
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<td>EJIFCO</td>
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<td>Cirugia espanola</td>
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<td>Yi chuan = Hereditas</td>
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<tr>
<td>American journal of epidemiology</td>
<td>2.54943</td>
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<tr>
<td>Cancer causes &amp; control : CCC</td>
<td>1.26229</td>
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<td>International journal of cancer</td>
<td>1.456</td>
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<td>Current opinion in gastroenterology</td>
<td>0.95722</td>
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<td>The Korean journal of gastroenterology = Taehan Sohwagi Hakhoe chi</td>
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<td>Show articles</td>
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<tr>
<td>The Journal of antibiotics</td>
<td>0.42098</td>
<td>Show articles</td>
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Factors to be considered when choosing a journal

1. **Audience**
   - Scope of the journal
   - Target readership (i.e. epidemiologist vs. basic scientists)
   - General vs. specialty journals (i.e. Virology vs. Herpes)

2. **Peer-review**
   - The highest quality scholarly journals are *always* peer reviewed or refereed before being accepted for publication

3. **Publishing**
   - Average acceptance rate
   - Average turnaround time for the initial review
   - Average time between acceptance and publication
Factors to be considered when choosing a journal

4. Impact
   - Indexing (i.e. Is the journal available through PubMed?)
   - Impact Factor
I. Audience

- Target readership
  - Consider the data you are reporting
    - What is your message?
    - Who is it important to?
  - Consider your population, model, type of analysis
    - Does the study focus particular population?
    - Do you use an innovative model or type of analysis?

- General vs. specialty journals
  - In general, it is easier to publish in more specialized journals than in general journals
  - Will depend on the impact of your findings

Understanding the scope of the journal is the first step to selecting candidate journals.
How to determine the scope of your target journal?

- Go to the journal’s website

Gut is a leading international journal in gastroenterology and hepatology and has an established reputation for publishing first class clinical research of the alimentary tract, the liver, biliary tree and pancreas. Gut delivers up-to-date, authoritative, clinically oriented coverage in all areas of gastroenterology and hepatology. Regular features include articles describing novel mechanisms of disease and new management strategies, both diagnostic and therapeutic, likely to impact on clinical practice within the foreseeable future by leading authorities.

Gut is an official journal of the British Society of Gastroenterology.

This home page is under development
About

Aims and scope

*Gut* is a leading international journal in gastroenterology and hepatology and has an established reputation for publishing first class clinical research of the alimentary tract, the liver, biliary tree and pancreas. *Gut* delivers up-to-date, authoritative, clinically oriented coverage in all areas of gastroenterology and hepatology. Regular features include articles describing novel mechanisms of disease and new management strategies, both diagnostic and therapeutic, likely to impact on clinical practice within the foreseeable future by leading authorities.

**Keywords:**

- **clinically oriented** coverage in all areas of gastroenterology…
- **clinical research** of the alimentary tract, the liver, biliary tree and pancreas
- articles describing novel mechanisms of disease and new management strategies…likely to impact on clinical practice in the foreseeable future
Not sure if your manuscript is within the scope of the journal?

- Ask the editor DIRECTLY if your manuscript is of interest to the journal
  - Find editor’s email on the journal website
  - Write a brief email explaining your study’s main findings
  - Editors will be straightforward, and sometimes will even suggest alternate journals if not interested

| YES | MAYBE? | NO |
2. Peer review

- Peer-reviewed articles provide a trusted form of scientific communication
- Peer-reviewed work meets standards of scientific quality
  - Provides assurance that an expert in the field has double-checked and approved the manuscript
3. Publishing

- Average acceptance rate
- Average turnaround time for the initial review
- Average time between acceptance and publication

Why is this important?
3. Publishing

• Where can you find this information?
  ◦ Journal’s website

Journal statistics 2015

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<tr>
<td>Acceptance Rate</td>
<td>12% for Original Research</td>
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<tr>
<td>Instant Reject Rate</td>
<td>54% for all papers, receiving a decision within 1-3 days</td>
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<tr>
<td>Time from Submission to First Decision</td>
<td>10 days</td>
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<td>2 – 7 days Fast Track Review</td>
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<tr>
<td>Time from Submission to Final Decision</td>
<td>13 weeks</td>
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• Manuscripts usually have information regarding when it was submitted and accepted on their face page
• Write the editor an email and ask
4. Impact

- Impact factor
  - Is a measure reflecting the yearly average number of citations to recent articles published in that journal
  - Frequently used as a proxy for the relative importance of a journal within its field
  - It SHOULD NOT be the only consideration when selecting a journal
    - More specialized journals have lower impact scores because they cater to a particular audience

For example, *Nature* had an impact score of 41.456 in 2014:[2]

\[
IF_{2014} = \frac{\text{Citations}_{2013} + \text{Citations}_{2012}}{\text{Publications}_{2013} + \text{Publications}_{2012}} = \frac{29753 + 41924}{860 + 869} = 41.456
\]
4. Impact

- Where to find a journal’s Impact Factor
  - At the journal’s website
  - Web of Science (http://login.webofknowledge.com)
  - Ask the journal’s editorial team
4. Impact

- Indexing
  - Where can the journal be found?
    - i.e. **PubMed**, Medline, Google Scholar
  - If your manuscript can’t be found in the most frequently used databases, it can’t be cited
Other considerations

- How long has the journal been in existence?
  - It is generally easier to publish in “younger” journals
  - May not be indexed in PubMed and MEDLINE
  - May not have impact factors yet

- Overall quality of the journal’s published articles

- Beware of fraudulent and non-peer reviewed journals
PUBLIC ACCESS TO SCIENTIFIC PUBLICATIONS

María D. González Pons, PhD
NIH Public Access Policy

• Established in 2005 in order to advance science and improve human health
  • Requires scientists to make their NIH-funded research available on PubMed Central when accepted for publication on or after April 7, 2008

• The Policy applies to studies that:
  ◦ Received direct funding from an NIH grant or cooperative agreement active in Fiscal Year 2008 or after
  ◦ Received direct funding from an NIH contract signed on or after April 7, 2008
  ◦ Received direct funding from the NIH Intramural Program or was performed by an NIH employee

For instructions on how to comply, see: http://publicaccess.nih.gov/determine-applicability.htm
Pros and Cons of publishing in an open access journal

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<th>Pros</th>
<th>Cons</th>
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<tr>
<td>Reduces permission requirements and eliminates price barriers for readers</td>
<td>May have a higher publication fees</td>
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<tr>
<td>Studies show that they receive more citations than subscription publications</td>
<td>Have to be vigilant about quality (peer-reviewed, indexed, fraudulent journals)</td>
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- Examples of open access journals:
  - PLoS journals
  - BioMed Central (BMC) journal
Deana Hallman Navarro, MD

CO-AUTHORSHIP ISSUES
Co-authorship issues are frequently contentious and often divisive

• **Why? It’s a big deal!**

• Multiple authors emerged in modern times
  ◦ In NEJM, single authored articles were:

  >98% in 1885  \[~50\%\text{ in 1945} \]  \[0\%\text{ in 1975}\]

  ◦ Also, average # of authors have been increasing:

  \[~3\text{ in 1970}\]  \[3.5\text{ in 1980}\]  \[8.0\text{ in 1990}\]  \[7.5\text{ in 2000}\]  \[14.8\text{ in 2010}\]

Evans, et al. JAMA, 263:10-14;1990
Co-authorship issues are increasing

- A study at Harvard University of faculty issues brought to the conflict resolution ombudsman, related to co-authorship:
  - In 1991-92 only 2%
  - By 1996-97 increased to 11%

“Although listed as an author, I never reviewed the article, saw the reviewers’ feedback, or signed off on the final document.”

“A fellow is demanding the first author position but the contribution was primarily in implementing the experiments, not in creating the design or writing.”

“After I left my lab, I got no credit for the project on articles that used my work.”

“Honorary” and “Ghost” Authors


- **Honorary** – included as co-authors but whose contributions, in the opinion of other co-authors, do not merit that distinction or honor
- **Ghost** – not cited as co-authors but whose contributions, in the opinion of other co-authors, would probably merit co-authorship

Survey of authors of research, reviews and editorials in prominent journals found:

- **Honorary** more prevalent than **Ghosts** (19% vs. 10%)
- More in review/editorials than research articles
- So, 10-20% of authors are considered problematic

Unfortunately, including honorary authors may divert the credit from the actual author (honorary authors are often better known with a stronger scientific reputation).
Darsee data fabrication incident

- 1979-1982
  - Dr. J. Darsee (Emory University) published >20 very high quality peer reviewed manuscripts in high impact medical journals (and even more abstracts at meetings)

- Feb 1983
  - NIH concluded an investigation on data falsification

- Jun 1983
  - Dr. Darsee published (NEJM) a letter to retract articles because they contained “inaccurate and fabricated” information.

- Co-authors admissions
  - Had not carefully examined the manuscripts
  - Some were not aware were included as co-authors
  - Claimed “benign neglect” and argued not to be held accountable for Darsee’s transgressions
Huth Committee Principles

• Claims of “benign neglect” by Darsee’s co-authors were well received

• The issue of responsibility in co-authorship was addressed by many efforts

• Most prominent was the AMA committee, chaired by Dr. E. Huth

• Committee designed a series of specific criteria to assist in making decisions on co-authorship
  ◦ Encompassed 5 specific areas

  Huth, E., Annals of Internal Medicine, 104:269-74;1986
1. Public Responsibility for the Content

- Not ethically acceptable to claim lack of knowledge of the content of a publication in the event that the reported findings would be subsequently found to be falsified.
- “Each author should have participated sufficiently in the work to take public responsibility for the content.”
- Each co-author should be able to scientifically defend the contents of the article, including all published data, methods, conclusions and interpretation.
- Each co-author should be willing to publicly concede errors of fact or interpretation, and in the event of fraud, be willing to help clarify the nature and extent of the deception and make a conscientious effort to account for its occurrence.
2. Specific Active Participation

- Each co-author should have actively contributed to one or more of the processes involved in manuscript publication.
- “Participation must include 3 steps: (1) conception/design of the work, or analysis/interpretation of the data, or both; (2) drafting/revising the article for critically important content; and (3) final approval of the version to be published.”
- (1) includes formation of the hypothesis or the question, means of data collection or evidence, actually collecting the data or other evidence, or critically analyzing the evidence.
- Authors should be sufficiently involved in the writing to ensure the validity of the arguments/conclusions, so they can defend the article as a true and accurate report of the work that led to its creation.
3. Readily Identifiable Contribution

- “Each part of the content of an article critical to its main conclusions and each step in the work that led to its publication (steps 1, 2, 3 in Principle 2) must be attributable to at least one author.”

- Each element of a scientific paper vital to its conclusion must be publically defensible, and all authors must be able to scientifically defend all elements deemed critical to the conclusions.

- So, individuals whose contribution primarily involves statistical evaluation of the data to ensure validity should probably be included as co-authors if the statistical evaluation would be “critical to its main conclusions.”
4. Conceptual Appreciation for the Message

- Excludes individuals who have participated in the project but do not satisfy the requirements of the 1st Principle.

- Individuals participating in the data collection but unable to sufficiently understand the conceptual issues of the project to publicly defend the content – should NOT be co-authors.

- Generation of data and other evidence gathered by persons not necessarily fully aware of the intellectual substance or significance of the data.
5. Intellectual Breadth of the Contribution

- “Persons who have contributed intellectually, but whose contributions do not justify authorship may be named and their contributions described.”

- Recognition in the **Acknowledgments** section:
  - A colleague who provided a critique of the study design
  - Individuals only involved in data collection
  - Colleagues providing a critical evaluation of the completed manuscript prior to submission, but not engaged in the project.
  - Authors who do not want to be placed in a position of responsibility for everything.

- Must first receive permission, in advance, to include them in an acknowledgement.
Adopting Principles of Co-authorship

- Many top journals adopted them
  - Require cover letter to explain the extent of participation
  - Nature, Academic Medicine, Medical Education, JAMA, NEJM: www.library.vcu.edu/blog/mlnews/handouts/AuthorCriteria-5journals-July09.pdf

- ICMJE issued **Uniform Requirements** (www.icmje.org)
  - “All persons designated as authors should qualify for authorship, and all those who qualify should be listed … Acquisition of funding, the collection of data, or general supervision of the research group, by themselves, do not justify authorship.”

- NIH adopts Huth Committee and ICMJE guidelines
  - Also: “individuals who have assisted in the research by their encouragement and advice or by providing space, financial support, reagents, occasional analyses or patient materials should be acknowledged in the text but NOT be authors.”
Deciding the order of co-authors

- **First author**
  - Made the major significant contribution to the work
  - Intimately involved in the writing and critical review

- **Last author**
  - Most senior, supervised research and/or provided most of the necessary resources

- **Corresponding author**
  - Traditionally, either the 1st or senior author, but not always

- **Conflict on ≥ 2 co-authors as 1st author**
  - Include footnote for authors (e.g. J. Doe* and X. Smith*)
  - *Both J. Doe and X. Smith have contributed equally to the work presented in this manuscript.

- **Other positions: 3rd, 4th, 5th, etc.**
  - Preferable to be either 2nd or next to last
  - Diminishing impact in remaining positions
A semi-quantitative method to determine the order of authors

- Authors are assigned relative points in each category
- Tabulate the total points “earned” by each author
- The listing order should emerge

Points:
Minimal = 1
More than minimal = 3
Significant = 5

Categories:
(a) conception of project
(b) design of study
(c) implementation of project
(d) data analysis
(e) preparation of 1st draft of manuscript
(f) final revision/review of manuscript
(g) willingness to take public responsibility

- Provides a practical method for resolving potential conflicts

Ahmed et al., Family Medicine, 29:42-44; 1997
Co-authorship issues are unlikely to be fully resolved within the immediate future

- Citations in PubMed regarding co-authorship issues:
  - <1983 was <100 annually
  - By 1990, was ~250 citations
  - By 2000, was >500 citations
  - By 2006, was 1142 citations

- Clarify co-authorship issues “up front”, before a collaborative project is initiated
  - Individuals recruited after initiation, should be advised of the existent agreement, and any potential modifications should be discussed with all parties involved.

- Helps minimize difficulties when it is time to write and submit the manuscript
Everyone should establish personal guidelines that justify co-authorship

- Especially if an invited co-author on a manuscript and not involved in conception, research design, and/or interpretation to warrant co-authorship.


Berger PA, Ginsberg RA, et al. “Platelet Monoamine Oxidase in Chronic Schizophrenic Patients” Am J Psychiatry, 135:95-99; Jan 1978 Paranoid schizophrenic can be distinguished from others based on the platelet levels of monoamine oxidase.

- Extremely unusual - senior authors in both were the same: DL Murphy and RJ Wyatt!

- Every author must be aware of, and agree with, the information presented in the manuscript.
PREPARATION OF A BIOMEDICAL MANUSCRIPT FOR PUBLICATION
Deana Hallman Navarro, MD

CONCEPTUAL FRAMEWORK
Key Elements Needed to Achieve Objectives in Writing a Manuscript

- **Time** – Must be identified **every day**
  - When full productivity & highest priority can be anticipated

- **Instructions to Authors**
  - Up-to-date copy of the journal
    - Length of title, # of words in abstract/manuscript, citation format, supplemental information, etc.
  - *If a randomized clinical trial:*
    - Go to [www.consort-statement.org](http://www.consort-statement.org)
    - Checklist & flow diagram addressing issues of design, conduct, analysis and interpretation
Key Elements Needed to Achieve Objectives in Writing a Manuscript

• **Have Hard (or Electronic) Copies of Primary Data**
  ◦ Tables, graphs, charts, figures and diagrams that will support the conclusions

• **Full Knowledge of Relevant Literature**
  ◦ Get publications directly relevant to the manuscript and read them well
  ◦ Any citation referenced in the manuscript must be read by the author before using
Key Elements Needed to Achieve Objectives in Writing a Manuscript

- **Know the Overall Goal of the Manuscript**
  - Will it answer a question or solve a problem?
  - As a **1st step:** write in a single sentence the **take-home lesson** of the manuscript:
    - *The single essential piece of new knowledge that I want all readers of the manuscript to come away with is that……*
  - It should be the answer to a question or the solution to an important problem
Key Elements Needed to Achieve Objectives in Writing a Manuscript

• **Know the Structure of the Manuscript**
  ◦ Basic **IMRD** format:
    • Introduction, Materials/Methods, Results, Discussion
    • Other components: Descriptive Title, Abstract, Key Words, Acknowledgements, Literature Citations

• **Remain Enthusiastic**
  ◦ May diminish when encountering obstacles
  ◦ Learn to navigate through these challenges

• **Focus on Ultimate Goal**
  ◦ Have manuscript accepted for publication
  ◦ Have readers understand the take-home lesson
THE TITLE

KEY WORDS

THE ABSTRACT

María D. González Pons, PhD
General Tips for Title & Abstract

- Should generate interest
  - People judge manuscript titles when deciding whether to read the abstract
  - The abstract will influence whether the entire paper will be read
  - May be the first (and sometimes only) parts of a paper that can be viewed by everyone, unless the journal is ‘open access’

- Should be specific and concise
  - Should be specific enough to describe the contents of the paper, highlight the novelty/relevance, and major findings

- Should include keywords
  - Keywords facilitate the paper making it to your target audience
Title

- Key to the success of any published manuscript

- The purpose of the title is to:
  - Establish the existence of the paper in the publication database (i.e. PubMed)
  - Help potential readers find the publication
  - Attract potential readers to read the abstract, and subsequently the manuscript

- Types of titles
  - Indicative
  - Informative
  - Questioning
Examples of Type of Titles

- Indicative
  - “Levels of systemic inflammatory mediators following administration of antibiotics in patients with colorectal cancer”

- Informative
  - “Azithromycin and amoxicillin induce high levels of TNF-\( \alpha \) and IL-6 in patients with colorectal cancer”

- Questioning
  - “Do antibiotics increase cytokine levels in patients with colorectal cancer?”

The last two formats should be used if findings are novel and/or go against what was known in the field.
How to Generate Potential Titles

- First – go to “instructions to authors” to see if the journal has word/character specifications

- Second - write down 12-15 keywords that describe your study and rearrange them to generate possible titles
  ◦ Just by looking at the list you should get a general idea about what the study is about
  ◦ Only well known acronyms should be used

- Third – Share with colleagues

The end result of this exercise is to identify a title that is highly informative and generates enthusiasm among potential readers.
Potential Titles: Poor, In Progress, Better

- **Poor**
  “Mouse Courtship Behavior”
  - **Why?** Too general

- **In Progress**
  “The Effects of Estrogen on the Nose-Twitch Courtship Behavior in Mice”
  - **Why?** key words identify a specific behavior, a modifying agent, and the experimental organism

- **Better**
  “Estrogen Stimulates Intensity of Nose-Twitch Courtship Behavior in Mice”
  - **Why?** in addition to above, this title contains key result
Keywords

- Are used to index manuscript in databases
  - Enhance the opportunity for potential readers to find the manuscript in relevant databases (i.e. PubMed)

- Should be in the Medical Subject Heading database (MeSH), which is the basis of PubMed/MEDLINE databases
  - Always do a quick search to ensure they are in MeSH
  - Can delete keywords in the title
  - Should be a 4-6 keywords
Abstract

- The most important section of the peer-reviewed manuscript
  - Appears in databases
  - Provides a succinct overview of what is in the published manuscript
    - **Self-contained** summary of work
    - Emphasizes key results and significance
  - Should encourage readers to read the entire manuscript
  - Should be written in a way that it is understandable to non-experts in the field
  - Should be written in past tense
    - Exception: concluding remarks
  - Should only use well-recognized acronyms
  - Should not include citations
This paper presents a _________ method for _________
(synonym for *new*) (sciencey verb)
the _________________. Using ________________, the
(noun few people have heard of) (something you didn’t invent)
_________ was measured to be _______ +/- _______. Results show __________ agreement with
(property) (number) (number)
_________. Results show __________ agreement with
(units) (sexy adjective)
theoretical predictions and significant improvement over
previous efforts by __________ et al. The work presented
(Loser)
here has profound implications for future studies of
(buzzword) and may one day help solve the problem of

(buzzword) (bzzzword) (bzzzword)

(supreme sociological concern)

Keywords: __________, __________, __________
(buzzword) (buzzword) (buzzword)
Parts of an Abstract

- **Background**
  - Introduces the general topic
  - Highlights relevance/importance of the study
- **Aim/Hypothesis**
  - Describes the question/purpose of the investigation
  - States hypothesis clearly
- **Methods**
  - Briefly describes the general methods used
- **Results**
  - Summarizes key results
- **Conclusion**
  - Summarizes the *significance* and *impact* of the findings.
  - Places your results into a broader context and ends with a strong sentence.
Types of abstracts

- **Structured** vs. **Unstructured**

**Long-term use of antibiotics and risk of colorectal adenoma.**

Cao Y1,2,3, Wu K3, Mehta R1,2, Drew DA1,2, Song M1,2,3, Lochhead P1,2, Nguyen LH1,2, Izard J4, Fuchs CS5,6,7, Garrett WS8,9,10, Huttonower C8,9,11, Ogino S8,12,13, Giovannucci EL1,2,12,14, Chan AT1,2,9,14.

@ Author information

**Abstract**

**OBJECTIVE:** Recent evidence suggests that antibiotic use, which alters the gut microbiome, is associated with an increased risk of colorectal cancer. However, the association between antibiotic use and risk of colorectal adenoma, the precursor for the majority of colorectal cancers, has not been investigated.

**DESIGN:** We prospectively evaluated the association between antibiotic use at age 20-39 and 40-59 (assessed in 2004) and recent antibiotic use (assessed in 2008) with risk of subsequent colorectal adenoma among 16,442 women aged ≥60 enrolled in the Nurses’ Health Study who underwent at least one colonoscopy through 2010. We used multivariate logistic regression to calculate ORs and 95% CIs.

**RESULTS:** We documented 1,195 cases of adenoma. Increasing duration of antibiotic use at age 20-39 (p_trend=0.002) and 40-59 (p_trend=0.001) was significantly associated with an increased risk of colorectal adenoma. Compared with non-users, women who used antibiotics for ≥2 months between age 20 and 39 had a multivariable OR of 1.36 (95% CI 1.03 to 1.79). Women who used ≥2 months of antibiotics between age 40 and 59 had a multivariable OR of 1.69 (95% CI 1.24 to 2.31). The associations were similar for low-risk versus high-risk adenomas (size ≥1 cm, or with tubulovillous/villous histology, or ≥3 detected lesions), but appeared modestly stronger for proximal compared with distal adenomas. In contrast, recent antibiotic use within the past four years was not associated with risk of adenoma (p_trend=0.44).

**CONCLUSIONS:** Long-term antibiotic use in early-to-middle adulthood was associated with increased risk of colorectal adenoma.


**Gut Colonization by Methanogenic Archaea Is Associated with Organic Dairy Consumption in Children.**

van de Pol JA1, van Best H2, Mbakwe CA3, Thijs C4, Savellkool PH4, Arts IC5, Hormel MW6, Mommsen M3, Penders J4.

@ Author information

**Abstract**

The gut microbiota represents a complex and diverse ecosystem with a profound impact on human health, promoting immune maturation, and host metabolism as well as colonization resistance. Important members that have often been disregarded are the methanogenic archaea. Methanogenic archaea reduce hydrogen levels via the production of methane, thereby stimulating food fermentation by saccharolytic bacteria. On the other hand, colonization by archaea has been suggested to promote a number of gastrointestinal and metabolic diseases such as colorectal cancer, inflammatory bowel disease, and obesity. Archaea have been shown to be absent during infancy while omnipresent in school-aged children, suggesting that colonization may result from environmental exposure during childhood. The factors that determine the acquisition of methanogenic archaea, however, have remained undefined. Therefore, we aimed to explore determinants associated with the acquisition of the two main gastrointestinal archael species, *Methanobrevibacter smithii* and *Methanospirillum stadtmanae*, in children. Within the context of the KOALA Birth Cohort Study, fecal samples from 472 children aged 6-10 years were analyzed for the abundance of *M. smithii* and *M. stadtmanae* using qPCR. Environmental factors such as diet, lifestyle, hygiene, child rearing, and medication were recorded by repeated questionnaires. The relationship between these determinants and the presence and abundance of archaea was analyzed by logistic and linear regression respectively. Three hundred and sixty-nine out of the 472 children (78.2%) were colonized by *M. smithii*, and 39 out of the 472 children (8.3%) by *M. stadtmanae*. The consumption of organic yogurt (odds ratio: 4.25, CI95%: 1.51; 11.95) and the consumption of organic milk (odds ratio: 5.58, CI95%: 1.83; 17.01) were positively associated with the presence of *M. smithii*. We subsequently screened raw milk, processed milk, and yogurt samples for methanogens. We identified milk products as possible source for *M. smithii*, but not *M. stadtmanae*. In conclusion, *M. smithii* seems present in milk products and their consumption may determine archael gut colonization in children. For the first time, a large variety of determinants have been explored in association with gut colonization by methanogenic archaea. Although more information is needed to confirm and unravel the mechanisms in detail, it provides new insights on microbial colonization processes in early life.
How to write an abstract

• First – check for journal requirements in “instructions to authors”

• Second – write a draft of your abstract in a structured format regardless of the type of abstract required
  • Forces author to think logically about key information that the reader should know about the study
  • Write ~2 sentences per section

• Third – if unstructured, delete headings and edit the wording as needed so that sentences flow
  ◦ Edit to comply with word count
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Questions?