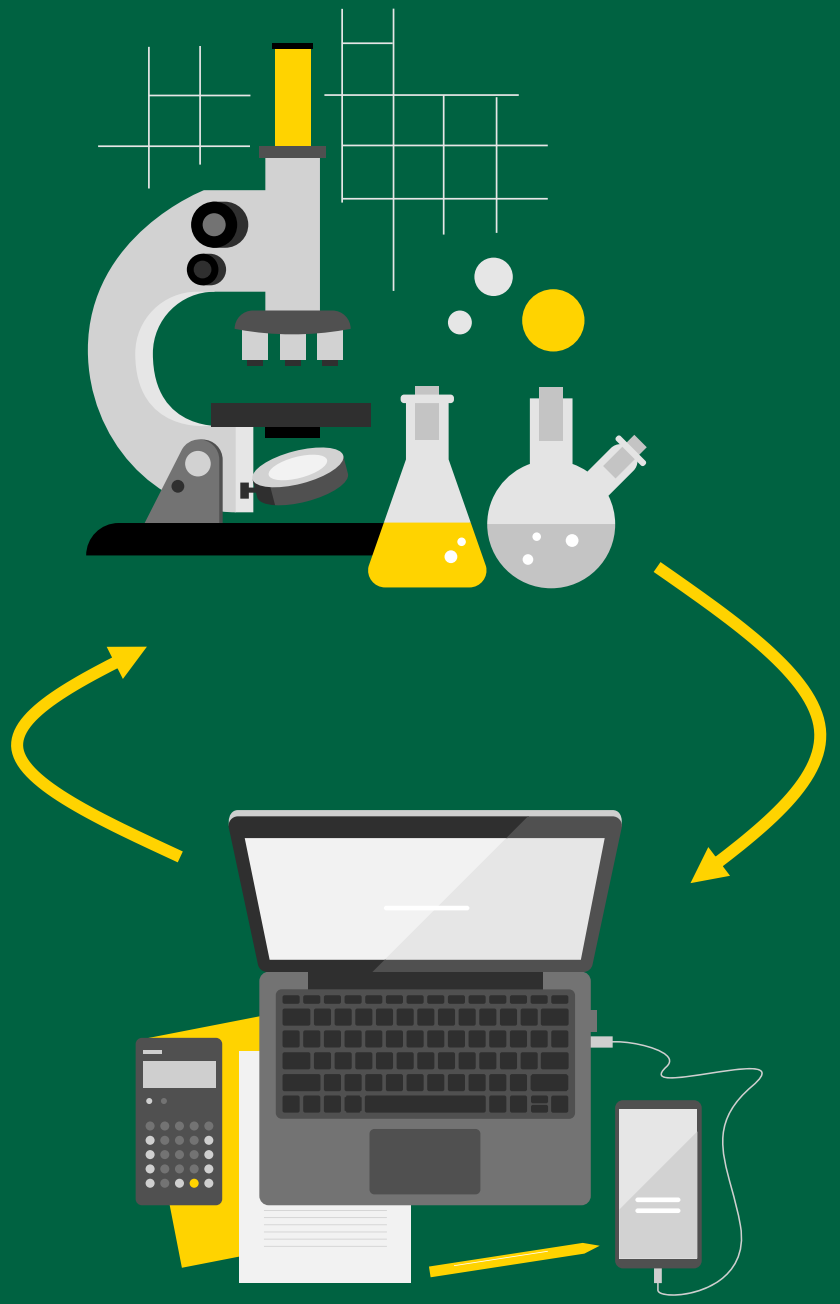
THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Hackin' abstracts

Hackin' Omics | August 5, 2022



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Session goals

- Understand expectation for the showcase
- Review authorship eligibility
- Authorship rubric exercise
- Review the components of an abstract and get writing tips
- Abstract free writing exercise

- Leave the session with an action plan to determine authorship and a rough outline for the abstract

Hackathon showcase

- Wednesday, August 10, 2022, 3-5 pm CT
- Hybrid set-up via zoom or in-person (UAB campus location TBD)
- Presentation format
  - 5 minutes to present (limit to 3-5 slides)
  - 2 minutes to field questions from judges and audience
- There will be a separate awards presentation at a later date

Need inspiration? View the 2021 showcase here:
https://cancer.ubrite.org/hackathon-2021/#stage6

How to determine authorship eligibility

- Many peer-reviewed biomedical journals follow the International Committee of Medical Journal Editors (ICMJE) authorship criteria
- All authors must meet all four ICMJE criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work
2. Drafting the work or revising it critically for important intellectual content
3. Final approval of the version to be published
4. Agreement to be accountable for all aspects of the work

Authorship order

- Primary author with or without *
- Second author
- Middle author
- Last author

Corresponding author (during submission after publication) may be found anywhere on the list but is usually either first or last author.

Sci Data. 2022; 9: 341.
Published online 2022 Jun 15. doi: 10.1038/s41597-022-01463-7
Data Descriptor

PMCID: PMC9200708
PMID: 35705638

Datasets for benchmarking antimicrobial resistance genes in bacterial metagenomic and whole genome sequencing

Amogelang R. Raphenya,[1,2,3] James Robertson,[4] Casper Jamin,[5] Leonardo de Oliveira Martins,[6] Finlay Maguire,[7,8,9] Andrew G. McArthur,[1,2,3] and John P. Hays[10]

Determining authorship activity

- A rubric to help researchers make decisions about authorship and author order
- It is NOT a final decision maker
- It IS a tool to foster communication and transparency in research
- Instructions:
  - Determine contribution by marking each activity that was performed by each contributor. Activities may have more than one contributor.
  - The activity rank scales from 1 to 3 where a score of
    - 1 does not grant authorship
    - 2 may grant authorship
    - 3 is an automatic guarantee of authorship
  - Base authorship decisions on relative contribution and activity rank

Activity Category	Activity Rank	Contributers											
Research design conceptualization and refinement													
Literature search	1												
Instrument/software/tool selection	2												
Securing funding/financing	3												
Research execution													
Collection and preparing input data/specimens	2												
Writing/troubleshooting of code/scripts	3												
Collection and compiling output data	1												
Selection and performace of statitical tests/analyses	1												
Preliminary data visualization (preparing tables, figures etc)	1												
Final data visualization (preparing tables, figures etc)	3												
Interpretation and guidance	2												
Manuscript/poster prepartion													
Drafting	3												
Major revisions	2												
Minor editing (eg. proofreading, grammar)	1												
Submission and post-submission roles													
Submission correspondence	3												
Post-submission review	3												
Delivery (ex. oral presentation or poster)	3												

Abstracts for scientific publications

- Short, self-contained, impactful statement that summarizes a larger body of work
- May be unstructured or structured

Abstract

Single-cell sequencing is widely used in biological and medical studies. However, its application with multiple samples is hindered by inefficient sample processing, high experimental costs, ambiguous identification of true single cells, and technical batch effects. Here, we introduce sample-multiplexing approaches for single-cell sequencing in transcriptomics, epigenomics, genomics, and multiomics. In single-cell transcriptomics, sample multiplexing uses variants of native or artificial features as sample markers, enabling sample pooling and decoding. Such features include: (1) natural genetic variation, (2) nucleotide-barcode anchoring on cellular or nuclear membranes, (3) nucleotide-barcode internalization to the cytoplasm or nucleus, (4) vector-based barcode expression in cells, and (5) nucleotide-barcode incorporation during library construction. Other single-cell omics methods are based on similar concepts, particularly single-cell combinatorial indexing. These methods overcome current challenges, while enabling super-loading of single cells. Finally, selection guidelines are presented that can accelerate technological application.

Abstract

Background: Bancroftian filariasis remains endemic in Fiji despite >10 years of mass drug administration (MDA) using diethylcarbamazine and albendazole (DA). The addition of ivermectin to this combination (IDA) has improved efficacy of microfilarial clearance at 12 months in individually randomized trials in nocturnal transmission settings, but impact in a setting of diurnally subperiodic filarial transmission has not been evaluated.

Methods: This cluster randomized study compared the individual efficacy and community impact of IDA vs DA as MDA for lymphatic filariasis in 35 villages on 2 islands of Fiji. Participants were tested at enrollment for circulating filarial antigen and, if positive, for microfilariae. Weight-dosed treatment was offered according to village randomization. Communities were visited at 12 months and retested for lymphatic filariasis. Infected individuals from Rotuma were retested at 24 months.

Results: A total of 3816 participants were enrolled and 3616 were treated. At 12 months, microfilariae clearance was achieved in 72 of 111 participants detected with infection at baseline, with no difference in efficacy between treatment groups: DA, 69.2% (95% confidence interval [CI], 57.2%-79.1%) vs IDA, 62.5% (95% CI, 43.6%-78.2%); risk difference, 11.3 % (95% CI, -10% to 32.7%); P = .30. There was no difference between treatment groups in community prevalence of microfilariae at 12 months or individual clearance at 24 months.

Conclusions: We found no difference between IDA and DA in individual clearance or community prevalence of lymphatic filariasis at 12 months, and no improved efficacy following a second annual round of IDA. Possible explanations for the apparent lack of benefit of IDA compared to DA include drug and parasite factors affecting clearance, and higher than expected reinfection rates. Clinical Trials Registration: NCT03177993 and Australian New Zealand Clinical Trial Registry: N12617000738325.

Strategies for writing an abstract

Abstract MadLibs!!

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 _____ +/- _____
(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
_____ and may one day help solve the problem of
(buzzword)
_____.
(supreme sociological concern)

Keywords: _____, _____, _____
(buzzword) (buzzword) (buzzword)

Piled Higher and Deeper ***by Jorge Cham***
www.phdcomics.com

title: "Abstract Mad Libs" - originally published 1/14/2009

Better strategies for writing an abstract

- Check author guidelines to determine if the abstract needs to be structured
- Succinctly explain the problem with the most relevant background information
- Describe the hypothesis or goal of the project
- Explain the methodology
- Summarize the results and conclusions
- Explain the implications of the findings
- Stay within the word limit set by the Journal – but don't fixate on this point until after the first few drafts

Abstract writing tips

Parameter	Details
Continuity	Use the same key-terms; use consistent order of details; use a similar point of view in the question and the answer; use either parallel form or consistent point of view for comparisons and other parallel ideas
Verb tense	Use past tense for the experiment and the results; use present tense for the question; use past/present tense to answer the question
Sentence Structure	Use short sentences; avoid noun clusters
Abbreviations	Abbreviations are useful once a long-phrase must be repeated several times in the abstract (if an abbreviation is used in the abstract, it must be explained)
Signaling to the topics	Use signaling the topic at the beginning of the sentence: (1) Question: To determine… (the word "hypothesis" help the reader to find the hypothesis of the study easier); (2) Experiment: To test the hypothesis…, to answer the question…; (3) Result: We found…; (4) Answer: We conclude/concluded…, therefore, …; (5) Implication: These findings suggest that…
Length	Follow the author guidelines (usually 250 words or less is recommended). Some strategies for shortening an abstract: (1) Eliminate meaningless phrases; (2) Eliminate phrasal verbs and superlatives; (3) Cut prepositions, especially "of"; (4) Change noun phrases to verbs

Bahadoran et al *Int J Endocrinol Metab* 2020

Common flaws in abstracts

Providing too general, too much, or not enough background information
Using the same sentence for the first line of the abstract and the first line of the introduction
Stating claims that are not supported within the paper
Holding back important information to try to get the reader to go through the paper
Using terms that are too technical or too generic
Using generic quantification (e.g., many, several, few)
Using words and phrases that add no value, like vague expressions and abstract nouns (refer to intangible things, like actions, feelings, ideals, concepts, and qualities)
Over and unjustified use of subjective adjectives (e.g., innovative, interesting, fundamental, challenging, vital, cutting-edge)
Providing unnecessary details
Including too many or not enough methods
Using abbreviation, jargon, and other language shortcuts that may lead to confusion
Not following the instructions to authors provided by the target journal
Not articulating the hypothesis, rationale for the study, sample size, and conclusions

Bahadoran et al *Int J Endocrinol Metab* 2020

Abstract brainstorming activity

- Free writing activity. Write without thinking too critically about the flow and ignore spelling or grammar mistakes
- Introduction – 3 minutes
- Methods – 2 minutes
- Results – 2 minutes
- Discussion – 3 minutes

Abstract brainstorming - Introduction

- 3 minutes!
- What is the project about?
- What need does it fill?
- What about your topic has been ignored/misunderstood in the past?
- What is the scope?
- What is your hypothesis?

Abstract brainstorming - Methods

- 2 minutes!
- What approach did you use?
- Source of datasets? Software tools?
- What was your pipeline?
- Are your methods new to the field or a novel application of methods?

Abstract brainstorming - Results

- 2 minutes!
- What did you find/What do you think you will find?
- Describe the data collected

Abstract brainstorming - Conclusion

- 3 minutes!
- Interpret the findings
- Did you accomplish what you set out to do? / are the results consistent with the hypothesis?
- Why are these findings interesting/useful
- What are the future implications or directions for society and future research?

Final thoughts

- Don’t be afraid to make big changes to the abstract
- Go over the word limit in first drafts - it is easier to edit down then add more
- Use version control for abstract drafts and save old versions
- If you get stuck, switch activities and look at it with fresh eyes later
- Get feedback from others on the project and an outsider for feedback on readability

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