

Writing an abstract

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Title and abstract

Title

- A statement about the research
 - Short, understandable, but informative on its own

Abstract

- A **summary** of all your work: what did, what you found, and the importance or significance of your findings in a defined context
- A **window** on the article
- A **hook** to entice someone to read your article, or to go to your presentation

The title and the abstract will be the first things that someone reads about your work. Make them want to read or listen to the rest!

Suggested by Dr Noeline Wright UoW

What makes a good abstract?

- An abstract should state succinctly:
 1. The background, purpose/aim of the study
 2. How the study was carried out
 3. The principal results – findings
 4. The main conclusions – significance of results
- Self-explanatory and intelligible in itself, i.e. **able to stand alone**
 - Someone shouldn't have to read the rest of your article or listen to your presentation to understand your abstract

For the conference, you might not have progressed far enough with your work to have results and conclusions. If that's the case, say how you will do your study, and what you expect to do with your results and what they might tell you

Things to avoid

One of the biggest mistakes students make in abstracts is that it is all 'background' - it says very little about what the student has actually **done or will do**

- Should not be 'teaser' with only promise of research and results
 - E.g. DON'T write "We will present interesting results and interpret their meaning"
- Don't be vague
- Instead, explicitly say what the results actually are and give their meaning:
 - "Twelve of the fourteen subjects showed increased activity post-stimulation ($p=0.012$) indicating enhanced motor-circuit recruitment"
 - "Conductivity varies by only 10% across the range 20 Hz to 5.0 kHz but then increases rapidly with increasing frequency"
- Use complete sentences and **avoid jargon**/non-standard abbreviations
 - If essential, define technical terms or abbreviations at first mention
- Don't exceed the set word limit

In the graduate conference, remember that your audience will be students and staff from across science disciplines - so make sure your abstract is understandable to a wide range of people

Here's a good example from a previous student conference



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Title says what the talk is about,
though it could be made more 'catchy'

Allosteric regulation and inhibition of HisG in *Campylobacter jejuni*

Some
background

The human pathogen *Campylobacter jejuni* is the dominant global cause of gastroenteritis and is associated with the nervous system disorder Guillain-Barré syndrome. The development of multi-drug resistant *C. jejuni* has accelerated the search for new treatments using novel mechanisms of action¹. Transition state analogues offer such an approach to drug design by binding tightly and irreversibly to inhibit an enzymes activity. ATP phosphoribosyltransferase (HisG) catalyses the first committed step of histidine biosynthesis in microbes and plants, but is absent in mammals². HisG is a highly conserved, highly regulated enzyme that moderates an intensely energetic biosynthetic pathway. We propose HisG has potential as a drug target through transition state analogue inhibition.

The point of
the work

HisG is a large homohexamer with a catalytic core, flanked by two regulatory domains. The active sites reversibly condense PRPP and ATP to form PR-ATP. HisG is regulated competitively, by AMP, and allosterically by histidine. These modes of inhibition are well studied, and conserved in other pathogens such as, *Escherichia coli*, and *Mycobacterium tuberculosis*.

What's
been done
in this
research
and
results

We have purified the active form of HisG from *C. jejuni* and characterised the kinetics of this enzyme by measuring PR-ATP production using stopped-flow spectrophotometry. We show HisG inhibition by addition of 20 μ M histidine, reducing enzymatic rate by 15%. We are using macromolecular rate theory (MMRT) to characterise the heat capacity of HisG and the mechanism of inhibition to inform drug design. In collaboration with the Parker Lab we will design and test inhibitors and investigate HisG enzymes from other pathogens.

Explicit

Enzymatic and structural characterisation of HisG from *C. jejuni* and other pathogens will be used to investigate transition state analogue inhibitors, for the development of novel antimicrobials with lowered target effects to the host.

Significance

1. Ducati, R. G., Harijan, R. K., Cameron, S. A., Tyler, P. C., Evans, G. B., & Schramm, V. L. (2018). *Transition-State Analogues of Campylobacter jejuni* 5'-Methylthioadenosine Nucleosidase. *ACS chemical biology*, 13(11), 3173-3183.

2. Morton, D. P., & Parsons, S. M. (1976). *Biosynthetic direction substrate kinetics and product inhibition studies on the first enzyme of histidine biosynthesis, adenosine triphosphate phosphoribosyltransferase*. *Archives of biochemistry and biophysics*, 175(2), 677-686.

References in full

Standard
definitions in
molecular
biology, but
these should
have been
defined for
a graduate
conference
abstract

- Normally omit references to literature, illustrations, tables
 - If a reference is essential, cite in full
 - Length varies according to journal/instructions. Often a few hundred words.
- Scientists or engineers usually skim-read only the title and sometimes abstract of a paper hence both must be good
 - For journal articles, abstract is often written last, commonly after paper completed
 - Can be good idea to sit down and just start writing afresh (rather than trying to lift key sentences from text)
 - For conferences, abstract is usually written before the talk or poster.

So for the postgraduate conference, you need to think about what you will put in your talk now - don't leave the thinking till after you've done the abstract

(Strong) suggestions

- Get on to writing the abstract now, if you haven't started already
- Get your supervisors' input to it
- Get other students to read it (since they are really your target audience for this conference)
 - Include students who are outside your research area
 - E.g. if you are studying Earth Science, show your abstract to a Molecular Biology student. They might not understand all the subtleties, but they should be able to grasp the general idea.