MAKING THE ABSTRACT CONCRETE

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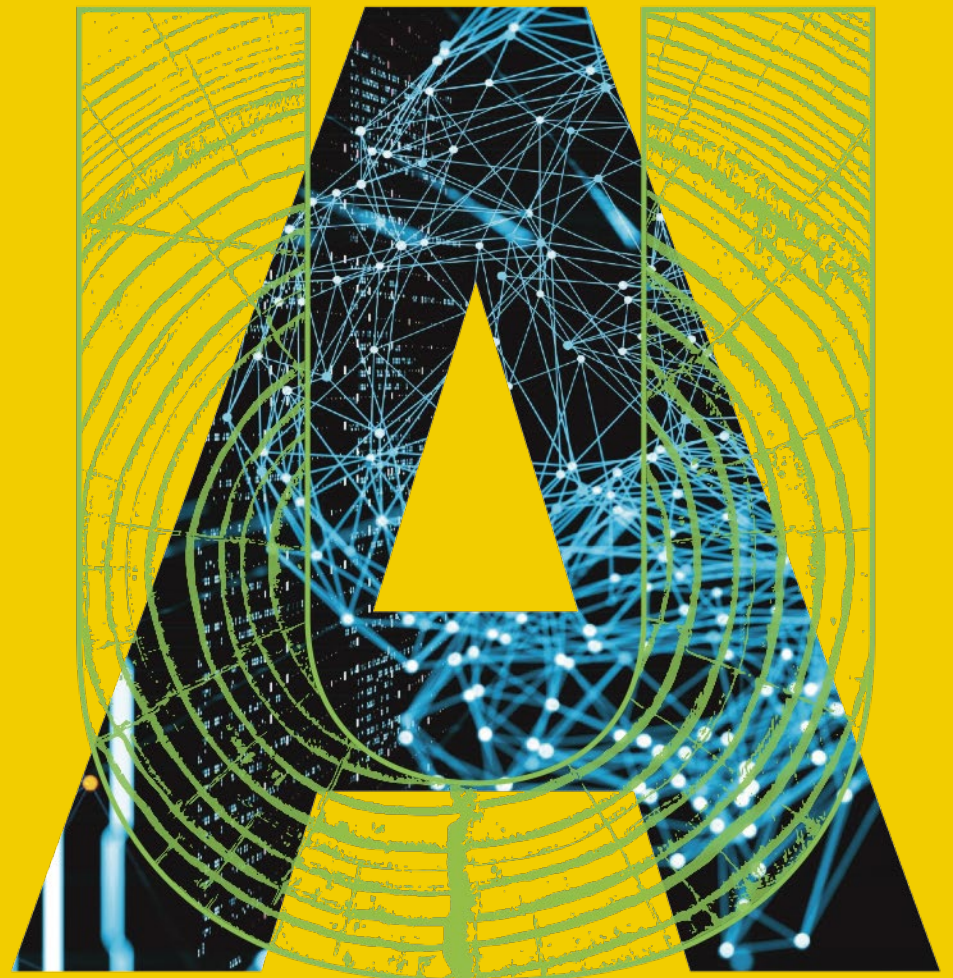

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Agenda:

1. What is an abstract and what is it used for?
2. Components of an abstract
3. Exercise working through examples

What is an abstract and what is it for?

An **abstract** is a brief summary of a research article, thesis, review, conference proceeding, or any in-depth analysis of a particular subject and is often used to help the reader quickly ascertain the paper's **purpose**.

Source: Wikipedia

Why do we write abstracts?

1. To save time!
2. To attract attention to our work

Components of an abstract

1. Relevant background information to identify the topic area
2. Focused background to allow the reader to be led to the specific research question
3. The research question/hypothesis
4. Methodological information
5. Summary of the most important results
6. Importance of the findings in context

Why you may write an abstract

- FOMD summer student research day
- Institute research days
- Summer studentship applications
- Publication of your work
- Undergraduate thesis project

Why are abstracts so hard to write?!

- You know too much! Therefore, you believe all the details are very important
- Identifying how much your target audience knows so your abstract is understandable is difficult to do

Identify your target audience

- Successful communication is strategic communication
- Identify specific groups that you need to understand the work you are presenting (e.g. abstract evaluation committees for research day, grant administrators for studentships)

Select keywords and messages

- Identify keywords and messages that need to be in your abstract to elicit interest from or to help target groups understand your work
- Include essential technical terms that are necessary and whether they require explanations using basic terminology for your target audience
- Identify how much space you have (word count including or excluding spaces)
- Identify whether there is a necessary format to follow

Don’t forget the title!

- Titles are the hardest part
- Keyword lists will help to identify the most important words that should be included to elicit interest and convey your results

Start early!

- You need time to get feedback
- You can begin to write an abstract before you have finished your experiments (background and methods sections)

Example #1: FOMD Summer Student Research Day

The Role of Atypical Protein Kinase C in Regulation of Placental Microvilli

Background: The syncytiotrophoblast (ST) is a single, massive, multinucleated cell that covers the human placental surface. Branched protrusions, called microvilli, face the maternal blood on the ST. Microvilli provide an increased surface area to aid in the exchange of gas and nutrients at the maternal-fetal interface. The mechanism controlling ST microvilli formation and maintenance is unknown, but a decrease in microvilli abundance is associated with pregnancy complications. Ezrin is a key microvilli component that, when phosphorylated, can anchor the cell membrane to the microvilli's actin cytoskeleton core and aid in structural stabilization. In development, atypical Protein Kinase C (aPKC) isoforms have been shown to phosphorylate and activate ezrin. We hypothesize that in human placental ST aPKC isoforms regulate ezrin and thereby microvilli formation and stabilization.

Methods: Late first-trimester human placental explants were treated with isoform-specific aPKC inhibitors. Western blots were performed and stained for total ezrin and phospho-ezrin. Explants were also stained with fluorescently labelled phalloidin (F-actin marker) and anti-ezrin antibody. Images were then captured by confocal microscopy.

Results: After inhibition of aPKC isoforms, a localized decrease in total ezrin was observed in ST apical membranes, but not in whole placental lysates. The apical actin cytoskeleton structure was also strongly altered by aPKC inhibitor treatment, suggesting a loss or altered shape of ST microvilli. Future directions include treating explants with aPKC isoform-specific siRNA and confirming microvilli shape or abundance changes by electron microscopy. Thus, our preliminary results suggest that aPKC isoforms may regulate ST ezrin expression and microvilli stability. Therefore, aPKC isoforms could be novel targets for the treatment of pregnancy complications.

Keywords/Messages

- Placenta
- Syncytiotrophoblast
- Microvilli
- Ezrin
- Microvilli
- aPKC
- aPKC inhibition decreases ezrin

Target audience:

- Judges preparing for poster/presentation
- Other summer students
- Faculty attending event

Example #2: Lay abstract WCHRI Innovation Grant

The placenta is a critical organ regulating the growth and health of the developing fetus. This organ is responsible for the delivery of nutrients and oxygen to the fetus, removal of waste, and protection from infections. The development and proper function of the cells on the outermost surface of the placenta is particularly important since this is the site where all of these functions occur. Since the surface of the placenta is bathed in the mother's blood, it is a barrier between the mother and the fetus that must be overcome and is also a target of any drugs given to to the mother. Therefore, knowing how drugs effect these cells is important in predicting whether drugs meant to treat the pregnant mother or the fetus may have unintended side-effects in the placenta.

The growth of organs in a dish has proven to be a powerful tool to enable research testing new drugs before they are introduced to people. This model is also useful for scientists to learn fundamentally important information about how cells function. Traditional methods of cell culture where a single layer of cells are attached to a plastic dish cannot properly mimic characteristics of tissues that are normally arranged in a three-dimensional manner. In particular, when we culture the cells that make up the outermost layers of the placenta they fail to grow and cannot carry out other functions they have when they are in the body. Very recently, methods have been developed for the growth of "placentas in a dish" or placental organoids. Though a large step forward towards better models of the placenta than traditional methods, these new models form inside-out and therefore are not suitable for studies looking at things delivered to the placenta from the mother's blood. This includes studies about placental infection and drug delivery. In this project we will work to improve these new placentas in a dish to optimize them so that they form with the proper orientation. This will then allow for future studies looking at delivery of drugs and how infectious agents, such as parasites and viruses, infect the placenta and to understand how the placenta forms.

Keywords/Messages

- Placenta
- The outermost cells of the placenta are very important and the target of and a barrier to drugs.
- Placenta organoid models are new and good, especially for drug testing.
- Current models form inside-out = bad for drug testing and understanding anything that starts out in the mother’s blood.
- Our goal is to make better organoids that aren’t inside-out.
- This will help facilitate future research.

Target Audiences:

1. Grant administrators
2. Funders
3. Medical doctors interested in the placenta (Obstetricians, Family doctors)
4. Pharmaceutical companies
5. Pregnant women

Summary

- Targeted communication is effective communication
- Identify your audience
- Map out key words
- Pay attention to formatting and length requirements
- Get feedback from your target audience
- Start early