



Washkewicz College  
of Engineering

# How to do research

# How to make a great poster

Liqun Ning, Ph.D.

Assistant Professor

Department of Mechanical Engineering

Washkewicz College of Engineering

Cleveland State University

**Office:** FH104H

**Email:** [l.ning@csuohio.edu](mailto:l.ning@csuohio.edu)

- **What is research?**
  - **Why is research important?**
  - **How to conduct research?**
  - **Tips for great research**
- 
- **How to make a poster?**
  - **Present your poster**

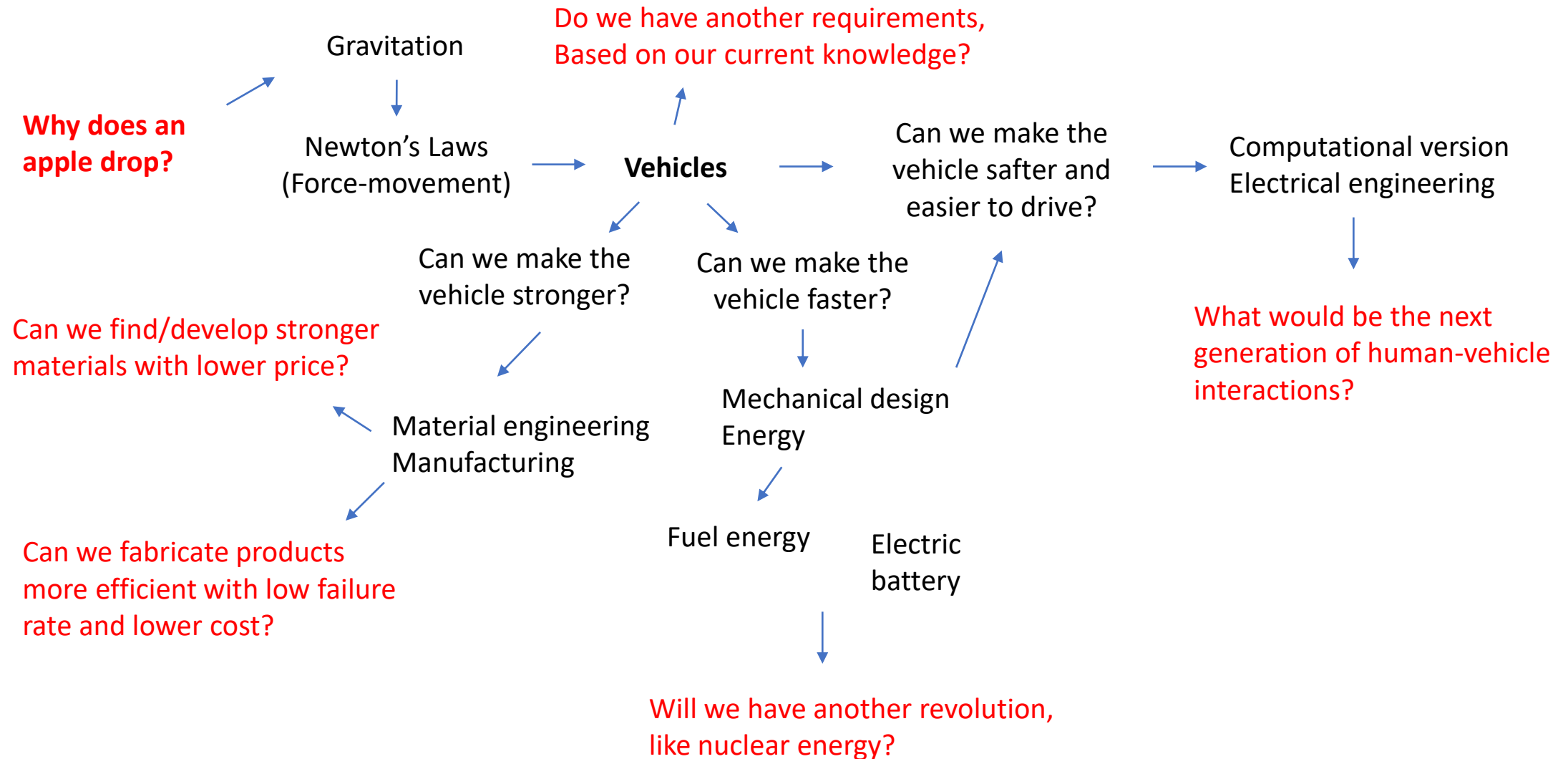
# What is research?

Research is a **systematic and rigorous process of inquiry** designed to generate new knowledge and validate existing understanding, with the **ultimate goal** of advancing society and improving the world.

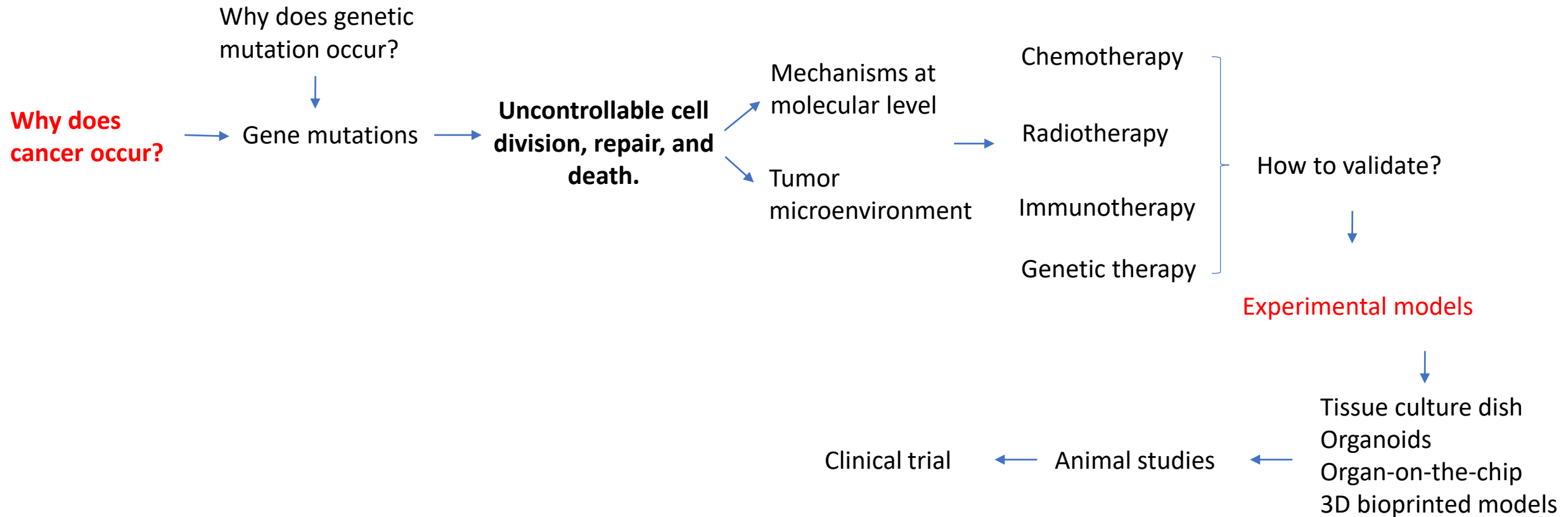
**Basic research** – Aims to uncover knowledge that exists in nature but has yet to be discovered or understood.

**Applied Research** – Seeks practical solutions, based on the fundamental knowledge, to real-world problems.

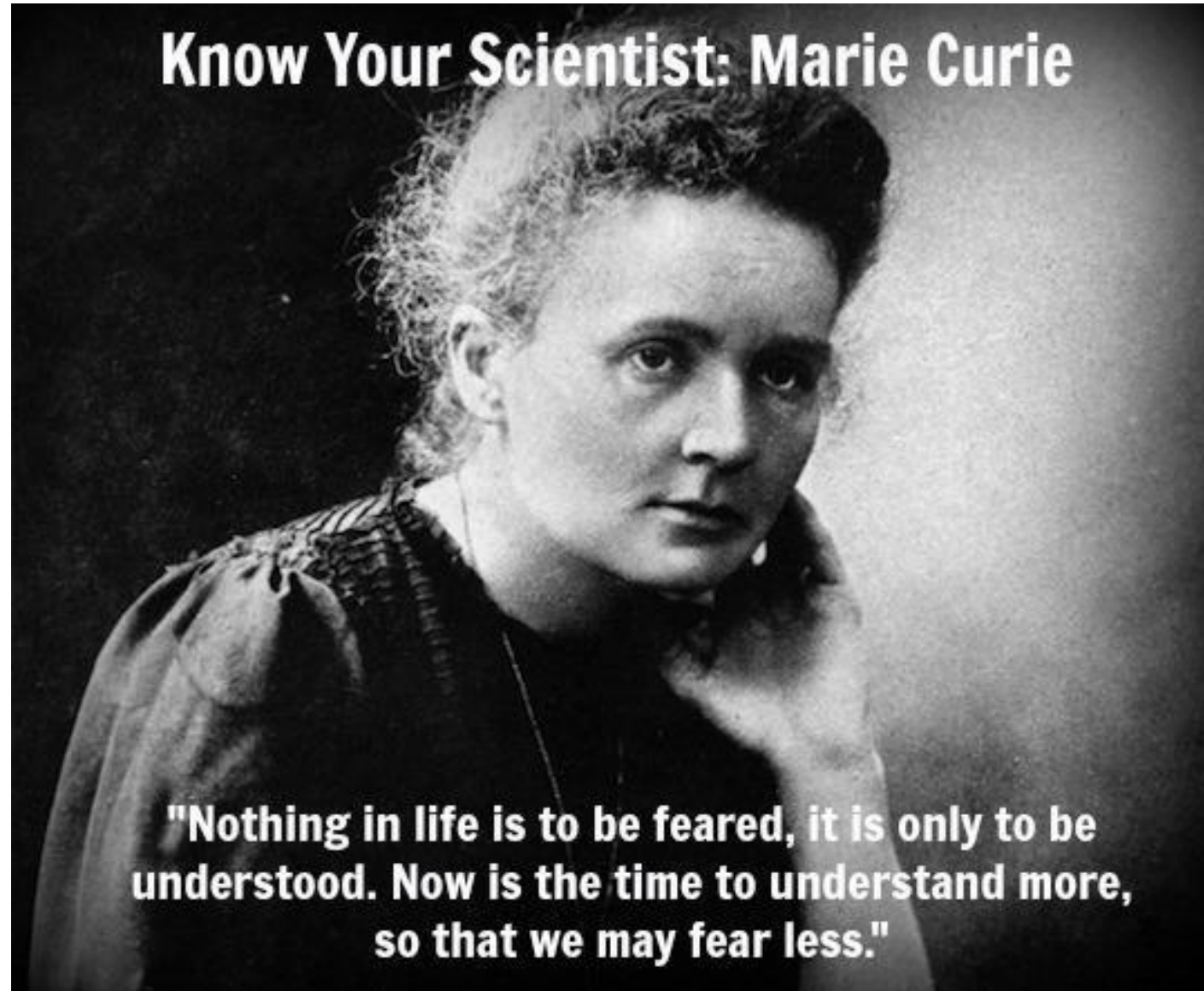
# Why is research important?



# Why is research important?



# Why is research important?



# How to conduct research?

## Ask the question (research issue)

- This question is significant
- This question is specific
- This question is based on strong knowledge
- This question is asked because of deep interest

# How to conduct research?

## Talk to your mentors and colleagues

- Get suggestions regarding the question
- Get suggestions on how to answer that question
- Identify the hypothesis



# How to conduct research?

## Start to read

- Collect information from literature
- Identify possible way to answer the question

# How to conduct research?

## Conduct experiments

- Finalize the experimental design
- Get training before start
- Conduct the experiment following the design step by step
- Ensure proper experimental documentation

# How to conduct research?

## Data analysis

- Explain the data
- Repeat as needed

# How to conduct research?

## Summarize your research

- Prepare a report summarizing your research and results
- If your findings are significant, consider submitting your work for publication
- If your work demonstrates novelty and potential for application, explore the possibility of filing a patent

# Tips for great research

- Always put safety at the first place
- Be passionate, be ambitious, and don't be afraid to ask questions
- Build collaborations
- Keep reading and learning
- Make a good time management
- Take breaks
- Be a good lab member
- Be professional, do not make up data and findings
- Enjoy the journey

# How to make a poster?





# How to make a poster?

## Student Research

### Undergraduate Research [^](#)

- [Undergraduate Research Award \(URA\)](#)
- [Undergraduate Summer Research Award \(USRA\)](#) [^](#)
  - 2025 Award Recipients
- [TRIO McNair Scholars](#)

### Graduate Research [^](#)

- [Travel Request Form](#)
- [Graduate Assistantships](#)

#### Mailing Address

Cleveland State University  
2121 Euclid Avenue  
Parker Hannifin Hall, 2nd Floor  
Cleveland, OH 44115-2214

#### Campus Location

Parker Hannifin Hall, 2nd Floor  
2258 Euclid Avenue  
Phone: 216.687.9364  
Fax: 216.687.9214

## Undergraduate Summer Research Award Program



The purpose of this program is to provide undergraduate students an engaged learning experience that involves intellectual inquiry and faculty mentoring during the summer. Another intention of the program is to foster an engaged environment that promotes a culture of student involvement in research and scholarship at the University. Review the guidelines below for more information.

### GUIDELINES & COVER PAGE

- [USRA Guidelines](#)
- [Cover Page](#)
- [Research Poster Presentation Template](#)

**NOTE:** Undergraduate Summer Research Award applications must be submitted by faculty - not students. See the Guidelines,

# How to make a poster?

Research Project Title

Project Participants



<div>Objectives</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>	<div>Trustworthiness</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>	<div>Findings</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>	<div>Findings</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>
<div>Literature Review</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>	<div>Setting</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>		
<div>Statement of the Problem</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>	<div>Findings</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>		<div>Discussion</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>
<div>Purpose of the Study</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>			<div>Limitations</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>
<div>Methods</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>			<div>Conclusion</div> <div><ul style="list-style-type: none"><li>Placeholder text here</li><li>Placeholder text here</li><li>Placeholder text here</li></ul></div>



# How to make a poster?

- **Software**

- PowerPoint, Adobe Illustrator, InDesign, Canvas, Publish-It, Corel Draw, LaTeX, etc.
- Library requires pdf file for plotting

- **Size**

- Typically 3 feet x 4 feet, or 3 feet x 2 feet
- Landscape orientation
- Library plotter has 42” width

# How to make a poster?

- **Title (84-96 pt)**
  - Summarize the overall content of your work
  - Capture attentions from audience
- **Authors (30-56 pt)**
- **Text (24-32 pt)**
- **References, acknowledgements, captions (18-24 pt)**

# How to make a poster?

- **Text (Introduction, methods, results, discussion, conclusions)**
  - Make it condense, clear, and precise
  - Guide the reader
  - Use more visuals (figures/graphs/pictures) than words
  - Use high quality graphics
  - Enhance engagement

# Present your poster

- **Prepare a spiel**
  - In 2 to 3 sentences, tell me about your research
- **Prepare some questions for engagement**
- **Dress the part**
- **Meet your neighbors**
- **Remain attentive**

# Questions?