First steps – Questions to Answer

- **Abstract?** This is almost always due a few weeks to a few months before your presentation. Be sure to check if a layperson abstract is needed as well.

- **What poster dimensions are allowed?** Typically this is 48" x 36".

- **Who will my audience be?** This will influence how technical you are allowed to get in your poster. This may include:
  1. Laypeople
  2. Other engineers
  3. Experts in the field (e.g. presenting biomechanics research at a biomechanics-focused conference)
  4. Mixed audience (e.g. College of Engineering Research Open House)
PART 1: THE ABSTRACT
Abstract

- While not part of your poster, this is critical to a successful presentation because it will be printed in the conference program.
  - Conference attendees will read your abstract in the program. Your abstract needs to be intriguing enough to make them want to visit your poster.
- Double check word count limits and due dates!
- Abstract should begin general, focus on specifics in the middle, and end broadly:

  Intro → methods → results → recap
Epilepsy is a disorder whose primary symptom, convulsions, can have a wide variety of underlying causes. Therefore, there is strong motivation to seek novel anticonvulsant drugs. New drug development is an expensive and time-consuming process, so a central goal in this work is to repurpose drugs that are already FDA-approved. In our research, we are utilizing bioinformatics data obtained by our collaborators, who used tissue from the resectioned hippocampus of individuals with temporal lobe epilepsy to perform gene expression analysis. They identified a subset of genes that were differentially expressed in seizing tissue compared to non-seizing tissue. A drug library was applied to cells in vitro, and the gene expression profile was compared to the changes seen in patients. Some drugs induced a gene expression change opposite to that seen in seizing tissue, and were flagged as potential anti-convulsant drugs. We test the efficacy of these drugs in vivo, quantifying their anti-convulsant effect using zebrafish that had also been given pentylenetetrazol (PTZ) to induce seizures. Drugs that lessened PTZ-induced movement were considered to have an anti-convulsant effect. We are also working with CRISPR/Cas9 methods to create loss-of-function mutations in genes linked to human epilepsy, which will allow further testing of potential anticonvulsants. The overall goal of this work is to repurpose FDA approved drugs as novel anticonvulsant medications.
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Abstract example

- **Beginning of end: results**
  - *If you have results, this is where they would go*
  - *One to two sentences*
  - *If you don’t have results, that’s typically okay! Look for past abstracts from previous conferences to see if results are required.*

Epilepsy is a disorder whose primary symptom, convulsions, can have a wide variety of underlying causes. Therefore, there is strong motivation to seek novel anticonvulsant drugs. New drug development is an expensive and time-consuming process, so a central goal in this work is to repurpose drugs that are already FDA-approved. In our research, we are utilizing bioinformatics data obtained by our collaborators, who used tissue from the resected hippocampus of individuals with temporal lobe epilepsy to perform gene expression analysis. They identified a subset of genes that were differentially expressed in seizing tissue compared to non-seizing tissue. A drug library was applied to cells *in vitro*, and the gene expression profile was compared to the changes seen in patients. Some drugs induced a gene expression change opposite to that seen in seizing tissue, and were flagged as potential anti-convulsant drugs. We test the efficacy of these drugs *in vivo*, quantifying their anti-convulsant effect using zebrafish that had also been given pentylenetetrazol (PTZ) to induce seizures. Drugs that lessened PTZ-induced movement were considered to have an anti-convulsant effect. We are also working with CRISPR/Cas9 methods to create loss-of-function mutations in genes linked to human epilepsy, which will allow further testing of potential anticonvulsants. **[Results]** The overall goal of this work is to repurpose FDA approved drugs as novel anticonvulsant medications.
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Abstract example

- Last sentence: **Summary**
  - Remind the reader why your particular research is important
PART 2: THE TITLE
Choosing a Title

■ A title should be intriguing
  - *Not too long*
  - *Not too wordy*
  - *Minimal jargon*

■ Avoid being too generic - specificity is good

■ Don’t reuse an old title! Create a new one that is specific to this poster. Otherwise your CV will be full of the “same” presentation.
Good/bad titles

<table>
<thead>
<tr>
<th>Good titles</th>
<th>Titles that could be improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement and Modeling of Cochlear Mechanics in Otitis Media with Effusion</td>
<td>Role for Stiffness in Vascular Fate</td>
</tr>
<tr>
<td>Development of Epilepsy-in-a-dish Method for Antiepileptic Drug Discovery</td>
<td>A kinase inhibitor screen identifies small-molecule modulators during human pluripotent stem cell-derived cardiac progenitors into cardiomyocytes</td>
</tr>
<tr>
<td>Using Synthetic Biology To Engineer Inducible Hybrid Biomagnetic Materials</td>
<td>Quantification of T1, T2 and Spin Density with a Segmented Inversion Recovery TrueFISP Sequence (IR TrueFisp) in the Myocardium In-Vivo</td>
</tr>
</tbody>
</table>

Which one of these posters would you most likely visit, given you only knew their title?
PART 3: MAKING THE POSTER
Designing your poster: preliminary steps

■ A common approach:

1. Write an abstract, which will contain much of your intro and methods section on your poster

2. Prepare your figures: crunch the data, make the graphs and charts that will be included on your poster, and think about what conclusions you’ll make. You probably do this pretty frequently anyway, but make sure you have all your figures before you continue.

3. Begin designing your poster
Breakdown

- Title/authors/affiliations
- Main sections
  - Introduction
  - Methods
  - Results
  - Conclusions
- Other sections that could be included
  - Preliminary Data
  - Approach
  - Future Directions (if the project is still in progress)
Designing your poster: Getting Started

- Use PowerPoint – it conserves resolution, so things won’t get pixelated
  - Make the slide size the same as the poster size you’re printing:
Choose a sans-serif font (e.g. Ariel, Helvetica, Gill Sans, Franklin Gothic)
- Title font size 65-95, name font size 45-60, affiliations font size 35-45

Use numbers to denote departmental/institutional affiliations

Find high-quality images of your university/department logo
- Google image search → tools → size → large or medium
Introduction

- Start with a bulleted version of your abstract. Then, add details and reference your figures/citations as necessary.

- Emphasize:
  1. What you’re studying
  2. How it’s studied
  3. Why this research is important.

- Use bold/italics/underline to emphasize

- This section should not take up much room (<25% of your total space).

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**Introduction**

- Epilepsy is a seizure disorder whose primary symptom occurs when the brain spontaneously sends erratic signals throughout the nervous system, which causes convulsions.
- Novel anticonvulsant drugs are necessary to better treat seizure disorders including epilepsy.
- Collaborators screened a library of FDA-approved drugs for their ability to normalize seizure-associated changes in gene expression levels in cultured hippocampal cells.
- Drugs that downregulated seizure associated genes are potential anticonvulsants, and drugs that upregulated seizure associated genes are potential proconvulsants.
- Pentylenetetrazol (PTZ) is a proconvulsant that is used to accurately model seizure activity in zebrafish.

**Goal:** To test whether potential anticonvulsants identified in a gene-expression-based screen inhibit PTZ-induced seizures in zebrafish.

**Significance:** This work has the potential to identify FDA-approved drugs that can be repurposed to treat seizure disorders.

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**Introduction**

- Osteoarthritis (OA) is a disease characterized by the breakdown of articular cartilage.
- 40% of individuals who undergo anterior cruciate ligament reconstruction (ACLR) develop knee OA within 8 years. \[1\]
- Early OA progression can be quantified using a magnetic resonance imaging (MRI) variable known as transverse relaxation (T2) time. \[2\]
- Increased T2 indicates decreased collagen matrix integrity, a sign of cartilage degradation (Fig. 1). \[3\]
- Using the uninjured knee as a control, inter-limb differences (ILDs) can be used to quantify asymmetry in cartilage degradation:
  
  \[ILD = \text{Involved T2} - \text{Uninvolved T2}\]

- When comparing two MRIs taken at different timepoints, 3D orientation of the knee may change, making it difficult to compare specific cartilage regions between MRIs accurately.
- Registration can be used to correct for this (Fig. 2).
- Segmentation (Fig. 3) can be used to determine health of each cartilage region, granting increased precision in understanding the mechanism of cartilage breakdown in early-onset OA.
Methods

- If you will be standing with your poster the entire time (e.g. you will be able to explain it to readers), avoid using too much text in this section.
  - *Shown is a methods section whose author was standing with the poster the entire time*

- If you will not be standing with your poster, still use lots of visuals – but accompany them with figure legends and more thorough descriptions.
Methods

- Make use of colors! This can make a world of difference for a viewer.
- Be sure to label figures, views, drawings, etc.
  - *Below: a poster that was made to be viewable without the author present*
Results

- Important things to include:
  - *Titles/figure numbers if appropriate*
  - Axes, labels, units (preferably the same axis range for all plots)
  - Error bars (Standard Error or Standard Deviation?)
  - Significance markers
  - *n (i.e. number of subjects/samples/data collections)*

![Results](image-url)

*Figure 4: Regional inter-limb differences 3 months post-ACLOR.*

*Figure 5: Regional inter-limb differences 6 months post-ACLOR.*
Conclusions

Use 1-2 bullets to accomplish the following:

- Explain results in prose
- Make conclusions
- Discuss future directions, if applicable

Note that the example shown below is made for a poster that stood without its author (so it is more detailed)

Conclusions & Future Directions

- At 3 months post-ACLR, significant ILDs present in multiple regions, indicating a change in collagen matrix integrity.
- At 6 months post-ACLR, ILDs decrease and are no longer significant in five of six regions.
- While ILDs were not remarkably high at these timepoints, this is not unexpected considering subjects were studied early after ACLR. If later timepoints were examined, increased ILDs would be expected if collagen was breaking down and OA was progressing within one of the limbs.
- This temporary effect may be related to inter-limb gait asymmetries that have been observed at early time-points after ACLR. Perhaps eventual OA development occurs in subjects who cannot adequately restore gait symmetry.
- Future Direction I: Continued observation of subject cartilage health at timepoints after 6 months post-ACLR.
- Future Direction II: Examine correlations between biomechanical gait variables and T2 ILDs.
References

- Don’t need full APA-style references – see an example below, or refer to your lab’s previous posters.

Funding sources

- Don’t forget to acknowledge funding sources!
  - Ask your PI or graduate students which to include.

Work is supported by National Science Foundation (#1460757) and National Institutes of Health (R01-HD087459, P30-GM103333 and T32-HD00749).
TIPS AND TRICKS
Suggested format for excel bar graphs

- How to make your bar graph look like it didn’t come straight from Excel:
  - Everything: Arial font, black lines/font
  - Y-axis: 1.5 pt line, major tick marks inside, size 9 pt font numbers, bold 10 pt axis label
  - X-axis: 1.5 pt line, minor tick marks outside
  - Bars: 1.5 pt outline, fill bars with a bold color
  - Error bars: 1.5 pt outline
  - Turn off major gridlines
Creating a Diagram

- Create a new Powerpoint document and create the diagram using simple shapes/images.
- Select all → right click → save as picture. Then import that picture to your poster.
- This method is better than creating the diagram directly in your poster because
  1. *This prevents having 100 little shapes in the poster that you could accidentally click on and move*
  2. *By creating this diagram separately, you can more easily use it later in a publication, a presentation, etc...*

- Examples:
Centering
Grouping

- Use the grouping function to avoid having to select every shape every time in a flowchart, figure, etc.

Source: https://uploads.toptal.io/blog/image/123441/toptal-blog-image-1498710950837-712a52204bf2243bbcc93f5dc3d049cf.gif
Moving vertically/horizontally

- Hold shift + click and drag the item you’re moving, and it will only move in one direction
Pasting Figures from Excel

- In Excel, copy the figure you want to paste using control+c
- In Powerpoint, choose paste → paste special → picture (enhanced metafile) to preserve image quality
Color picking

Want to make your header match your school’s logo’s color? Use the color picker tool:

1. Paste the logo and create the banner shape (big rectangle)
2. Select the rectangle, choose the eyedropper tool.
3. Click on the color in the logo.

Result: