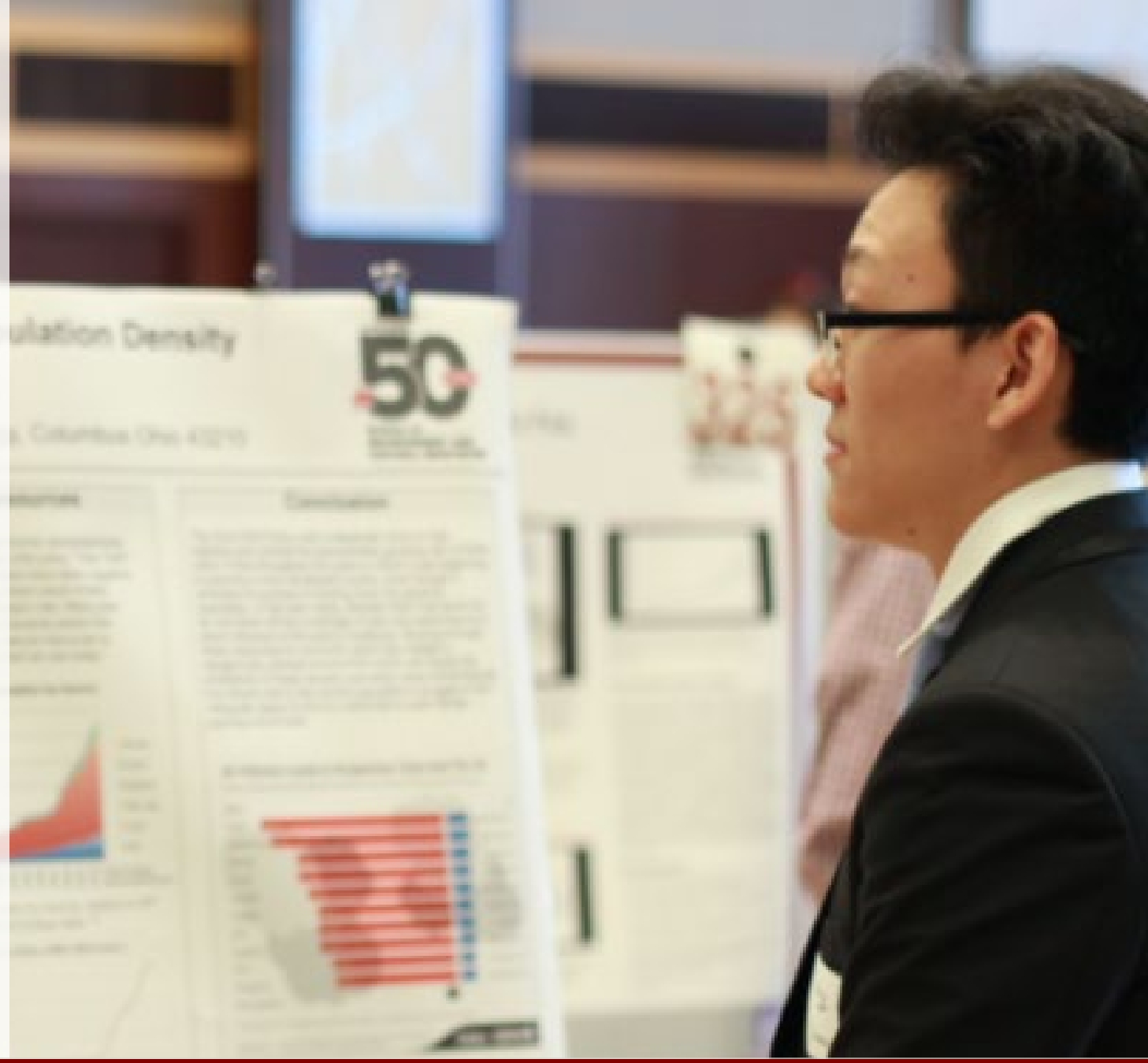
Designing an Effective Poster Presentation

Amy Hark, PhD
Assistant Director, Graduate Career Development



About Amy

Amy Hark, PhD

- Joined UChicagoGRAD in June 2022
- Postdoc Northwestern
- PhD in Neuroscience from Northwestern
- BA in Psychology from Binghamton
  - Double Minor in Biology, Painting

University of Chicago

- Support professional development PhD students and postdocs in all STEM disciplines
- Central resource for UChicago postdocs, convening the Postdoc Advisory Board and acting as a liaison with the Office of the Provost
- myCHOICE program Navigator

UChicagoGRAD Career Development

We provide comprehensive support for careers in academia, industry, nonprofits, and government.

- Skill-building workshops
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- Career exploration opportunities
- Pitch-your-own internship program
- 1:1 advising

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Agenda

1. Overview
2. Format & Design
3. Content
4. Example Poster Review

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Why Design a Better Poster?

Your poster represents the caliber of:

- You
- Your research group
- Your science
- Your department and The University of Chicago

- Don’t rely solely on your science to attract an audience

Why Design a Better Poster?

Your poster represents the caliber of:

- You
- You
- You
- You
  Chi

- Don't
  to attract an audience

To effectively communicate your work to your audience

A Poster is Not A Paper

- While you should still provide the **appropriate scope** and **depth of information** to the audience, the amount of information in a paper is significantly greater than in a poster

A poster needs to

- Be viewed from a distance
- Distill your science
- Be engaging

Effective Posters

- Convey a single message
- Avoid text saturation
- Use a visual hierarchy

Effective Posters

Convey a single message

Clearly and concisely, to a potentially diverse audience, even if you are not present

Avoid text saturation

Emphasize important content

Effective Posters

Convey a single message

Avoid text saturation

Limit your text and tell your story with graphics

Emphasize important content

Effective Posters

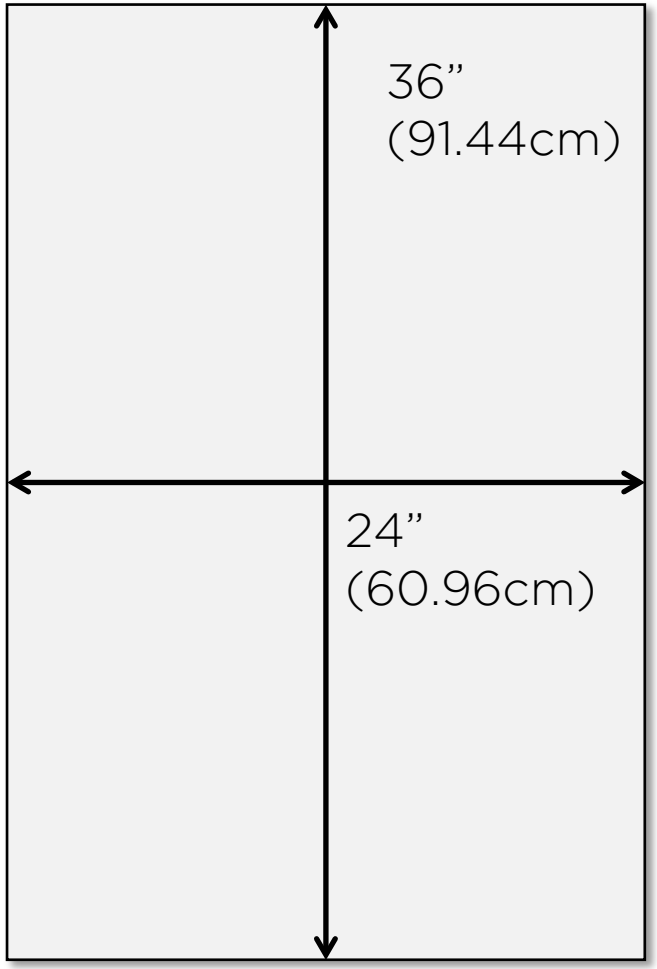
- Convey a single message
- Avoid text saturation
- Emphasize important content

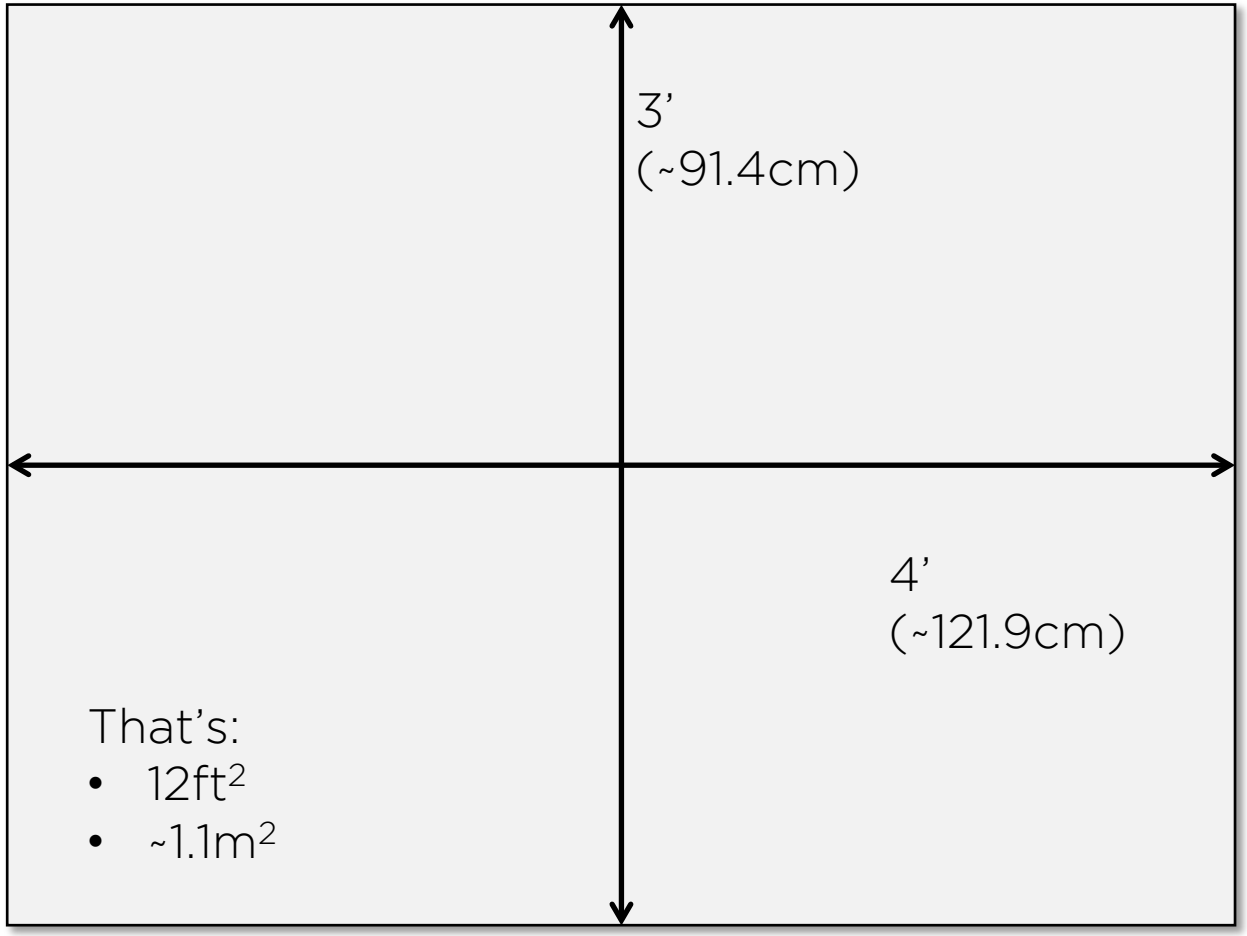
Format your poster to prioritize critical information

Agenda

1. Overview
2. **Format & Design**
3. Content
4. Example Poster Review

Format & Layout



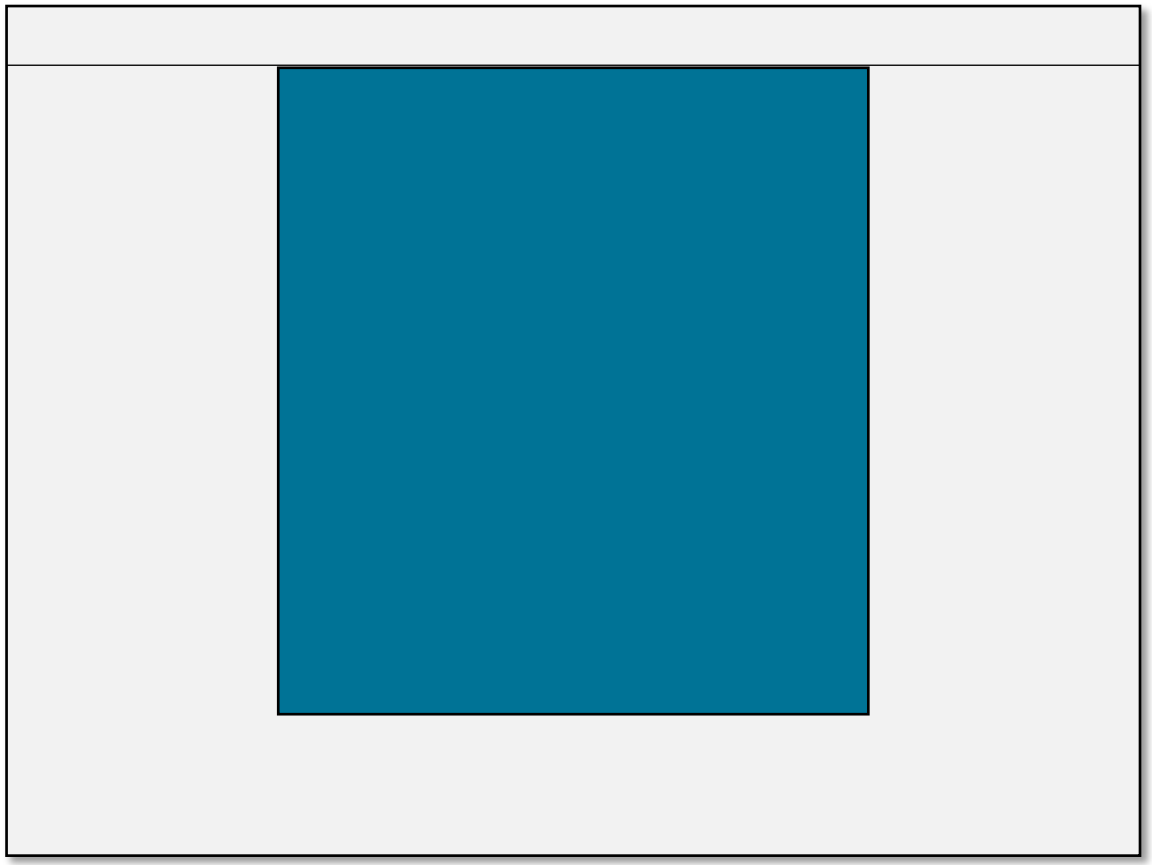


Traditional: All sections are equal

Title Block	
Introduction	Results
Materials & Methods	Conclusions
Acknowledgements, References	

Title Block		
Introduction	Results	Conclusions
Methods		Acknowledgements References

Emphasize High Value Content



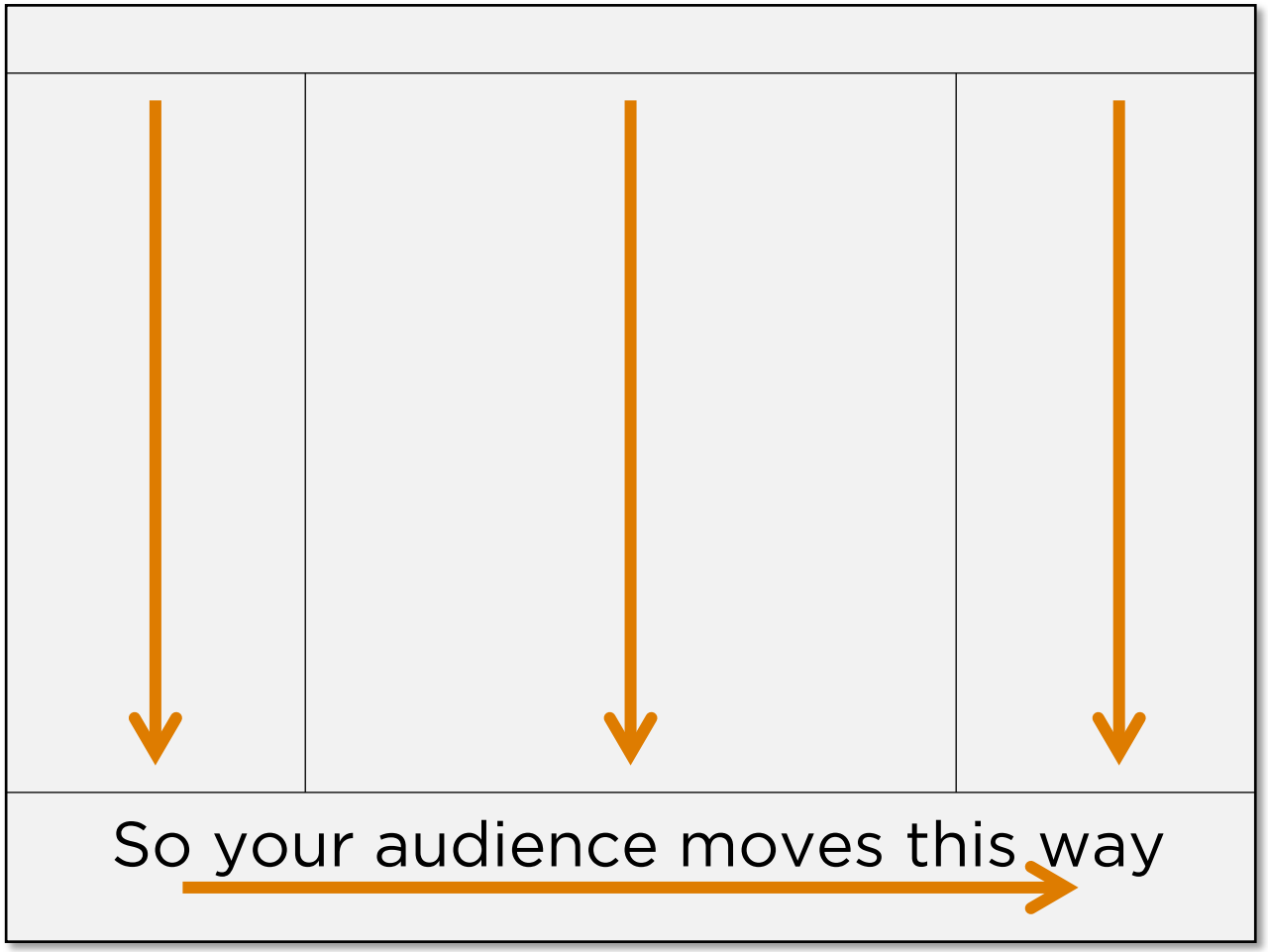
Format to Aid Understanding

Title Block		
Introduction	Results	References
Methods	Conclusions	Acknowledgements
		Further Information

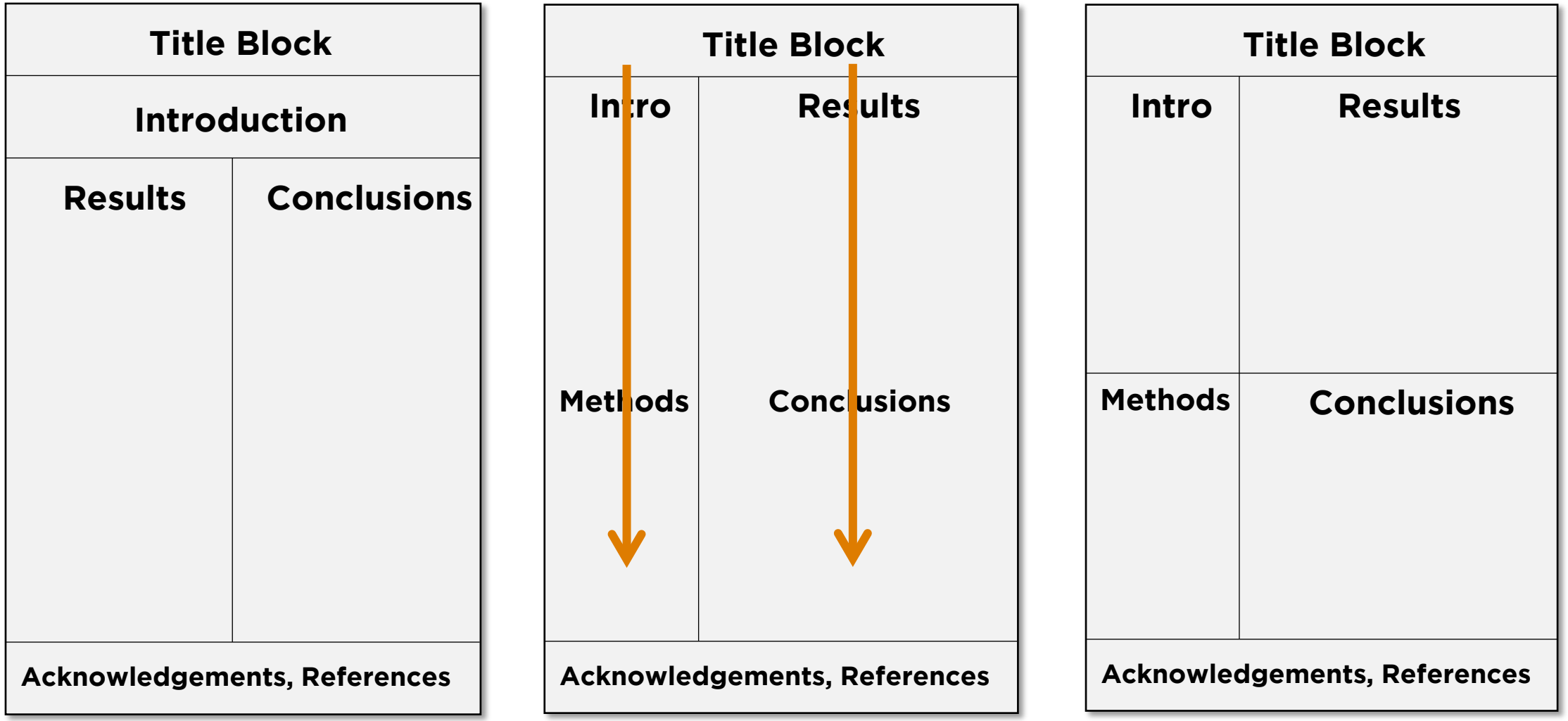
Title Block			
Introduction	Results		Conclusions
Methods	References	Acknowledgements	Further Information

Design In Columns, Not Rows

The audience should move through each section in a logical order



The Same Rules Apply For Vertical Posters

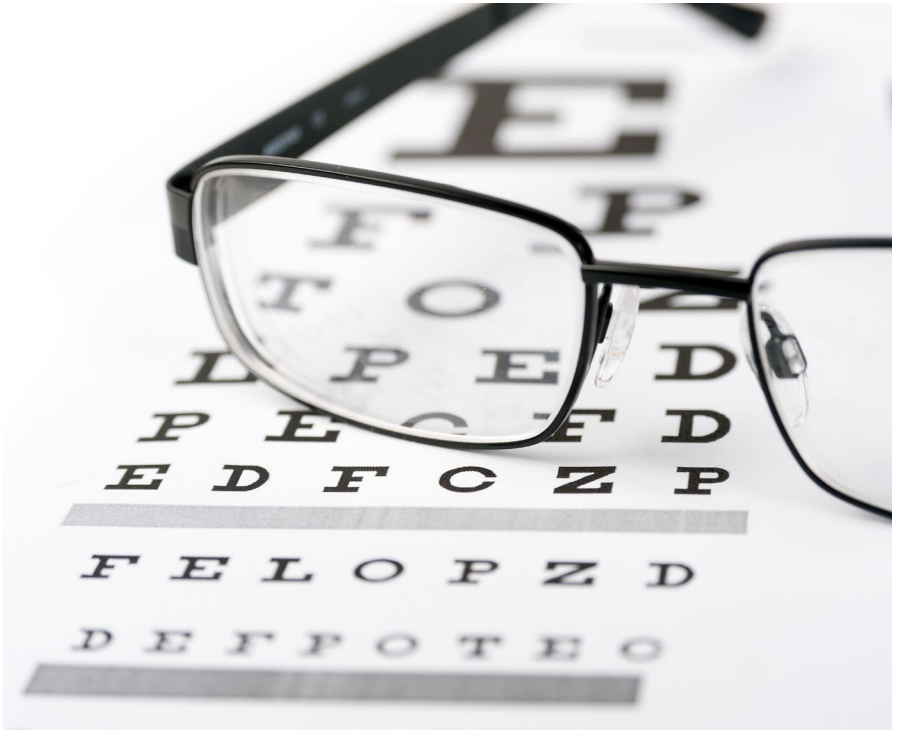


Effective Poster Guidelines

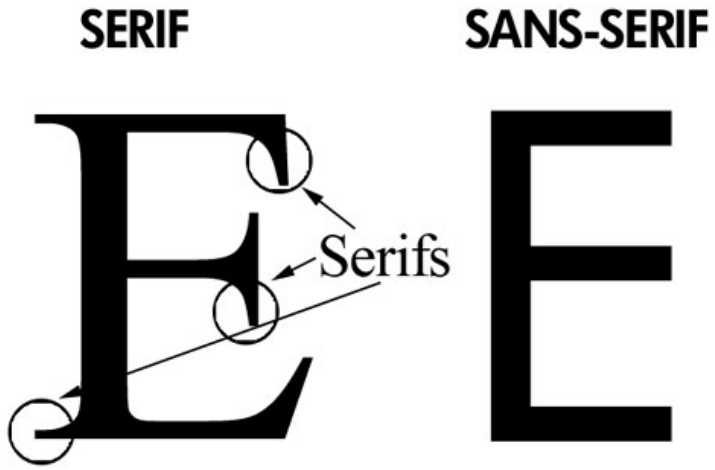
1. Leave sufficient white space (~30-40%)
2. High value content gets the most space
3. Too many words = low readability
4. Flows in a logical manner
5. Don’t be constrained by traditional heading titles

Displaying Text: Size and Capitalization

- Follow the 6 foot rule for font size
  - **Title block:** 65+ pt.
  - **Section headers:** 48+ pt.
  - **Figure titles:** 36+ pt.
  - **All other text:** at least 20 pt.
- To avoid issues with naming conventions, use *Sentence* case for all titles and headings
  - NEVER USE ALL CAPS



Displaying Text: Fonts



Titles and Headings: San-Serif font

Body text: Serif font

Sans-Serif Fonts

Arial

Calibri

Geneva

Helvetica

Lucida Sans

Tahoma

Verdana

Serif Fonts

Book Antiqua

Cambria

Courier

Georgia

Lucida

Palatino

Times

Displaying Text: Font Color

Which can you read easily?

Which can you read easily?

Which can you read easily?

Which can you read easily?

Which can you read easily?

Which can you read easily?

Which can you read easily?

Which can you read easily?

Displaying Text: Font Color

Which can you read easily?

Which can you read easily?

Agenda

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3. **Content**
4. Example Poster Review

Content: Introduction

Aim for ~200 words

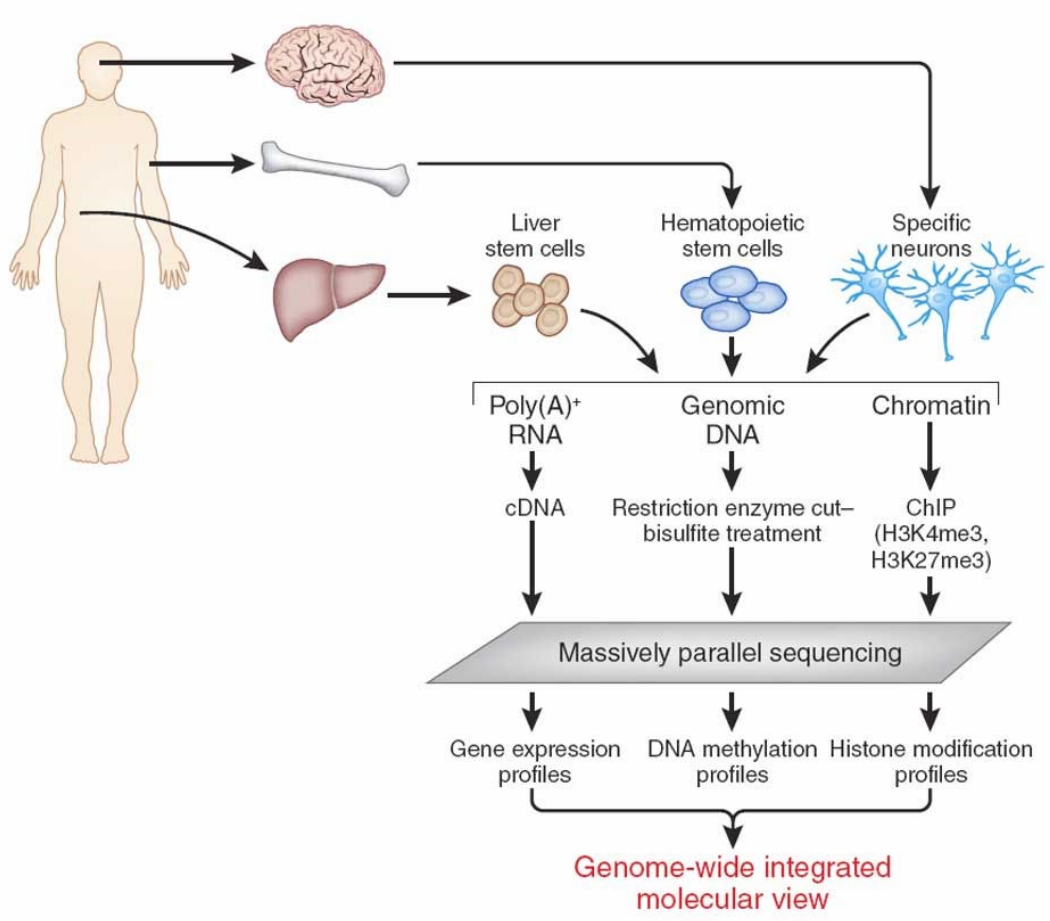
- Briefly describe your issue or question
- Provide context with field/literature
- Propose hypothesis and how you'll test it
- Avoid excessive background information and definitions

Do not just copy & paste your abstract here!

Your abstract is already in the program book or online

Content Is Important, But Be Concise

- Summarize the steps and timeline of experiments in a figure or a flowchart
- Figures can transform complex data into a coherent story
- Have a clear message, with an obvious set of conclusions



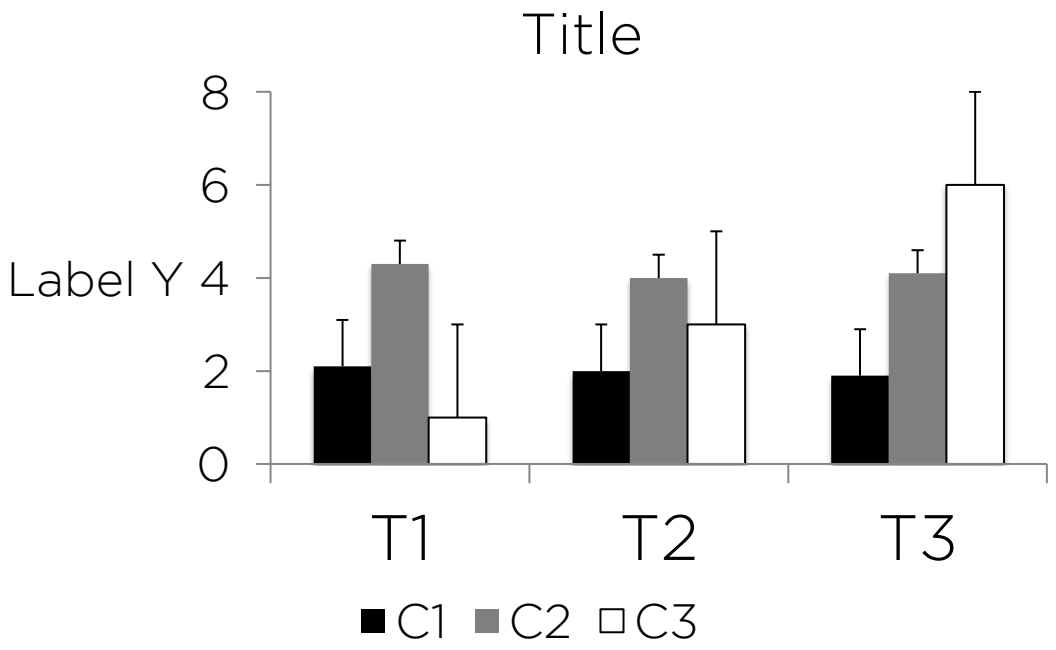
Nature Methods (2010)

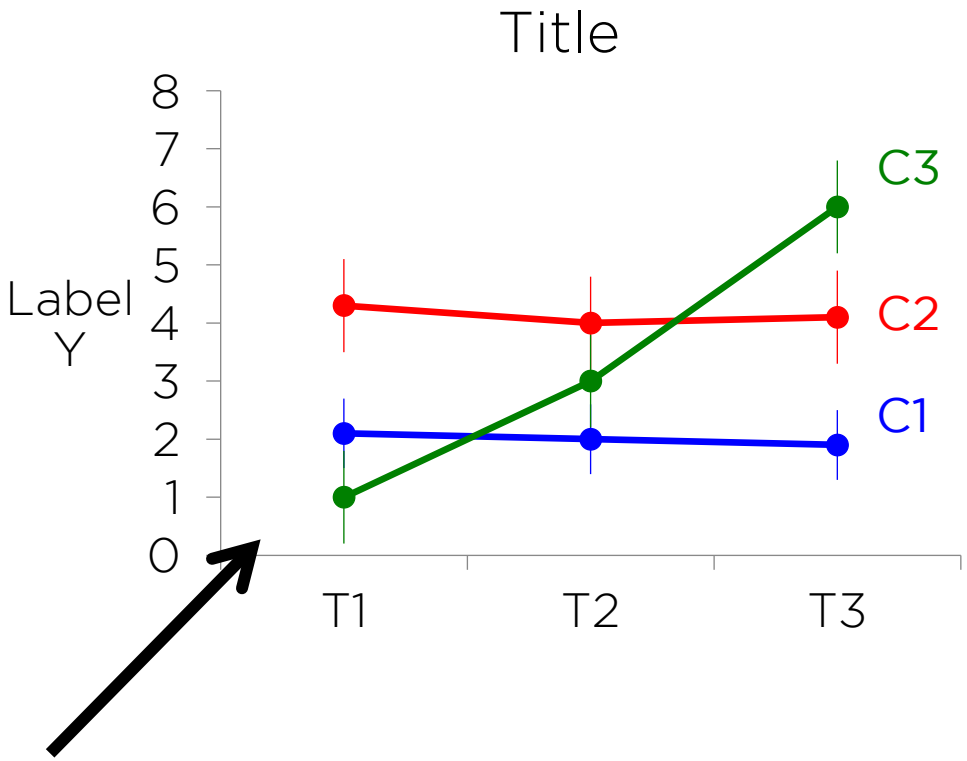
Content: Results

Aim for ~200 words

- Use descriptive titles, not just “Results"
- Limit text and use graphics when possible
- Each figure or table should include one or two lines that states the concluding message

Displaying Data: Graph Type





Which graph most effectively shows the trend?

Displaying Data: Labeling Your Graphs

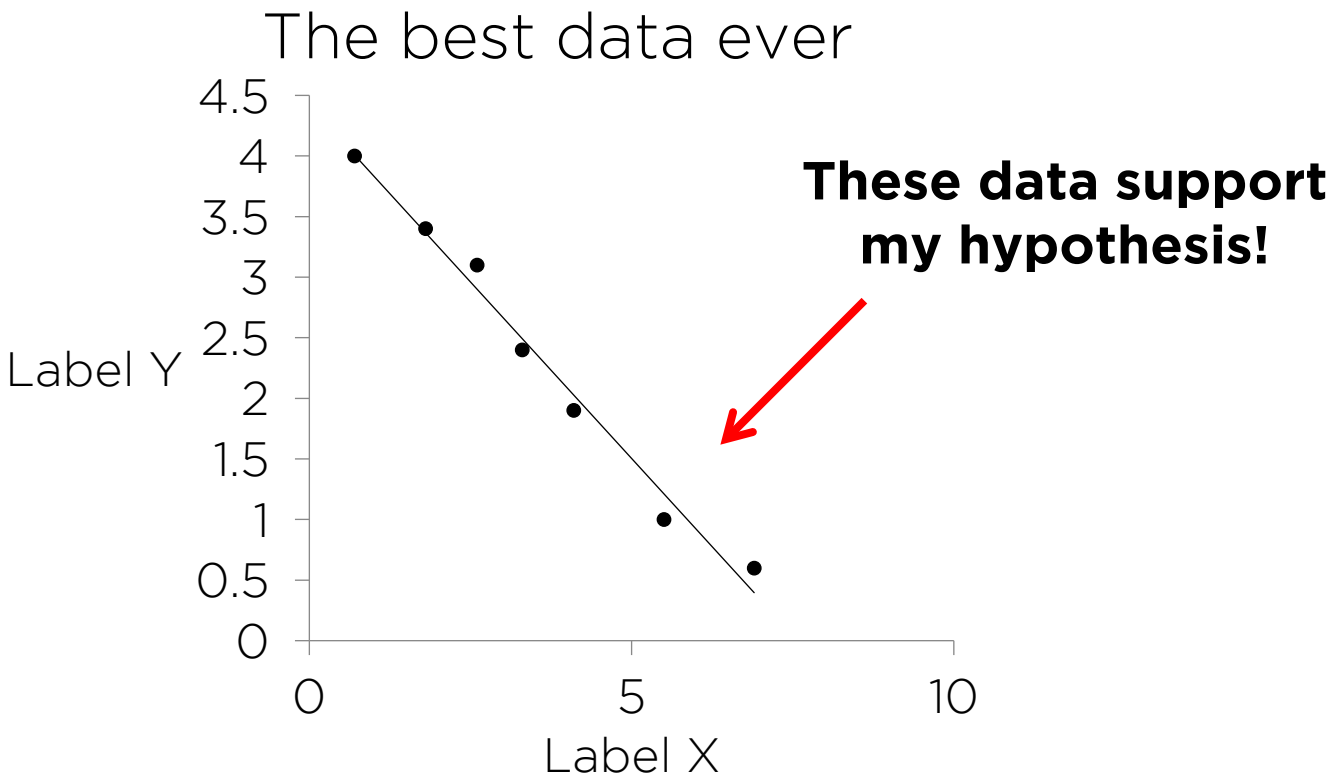
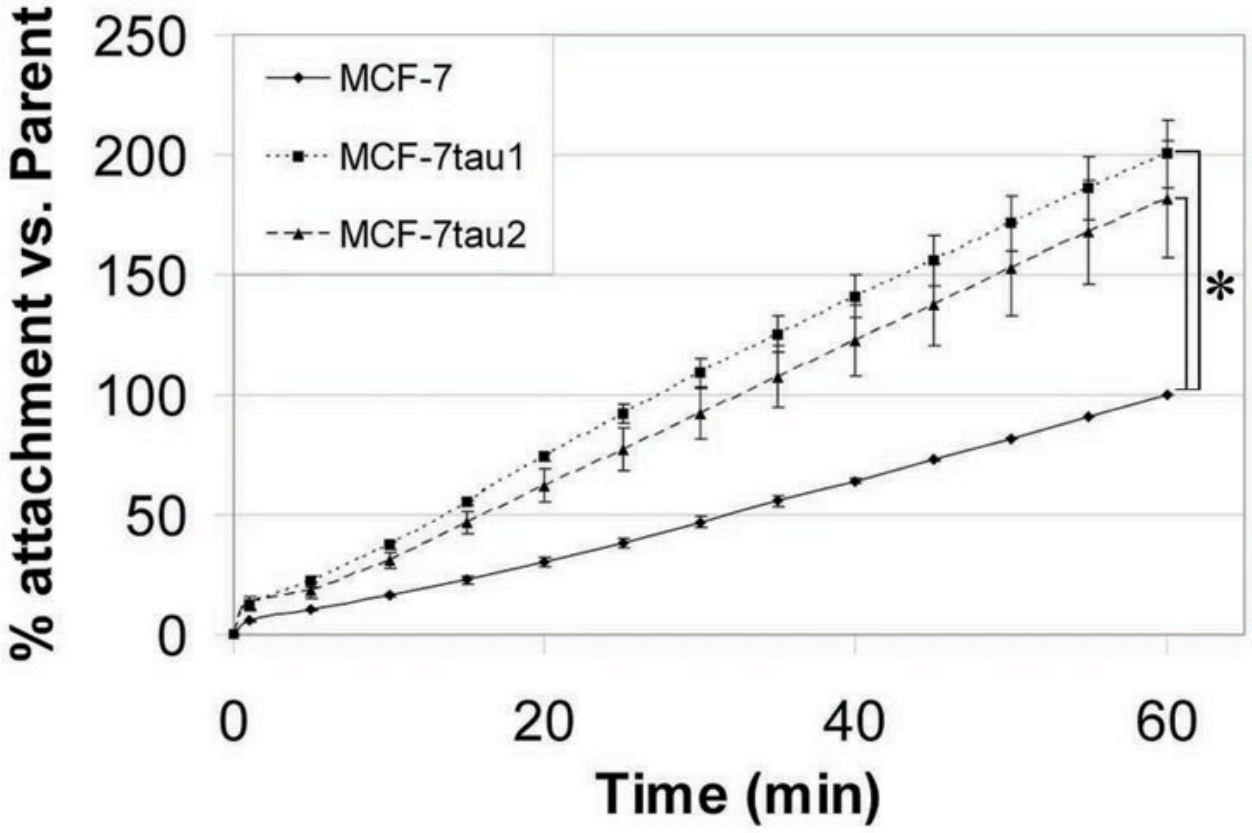


Figure One. X is inversely correlated with Y

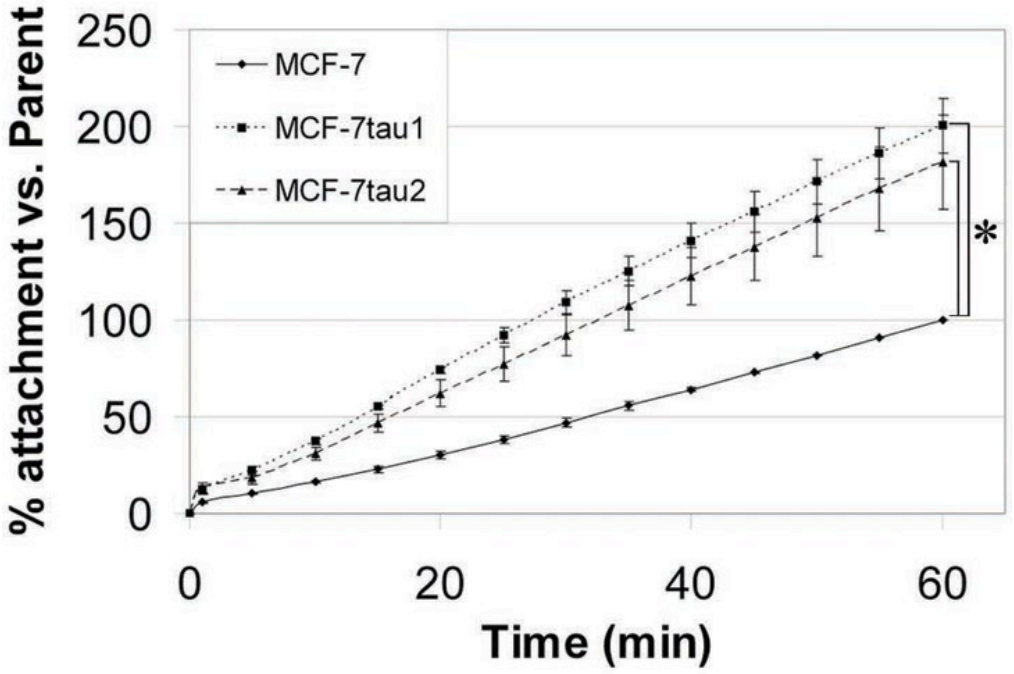
1. Use a descriptive title and figure legends
2. Label your Axes
3. Include appropriate error bars and statistics

Converting a Figure for a Poster

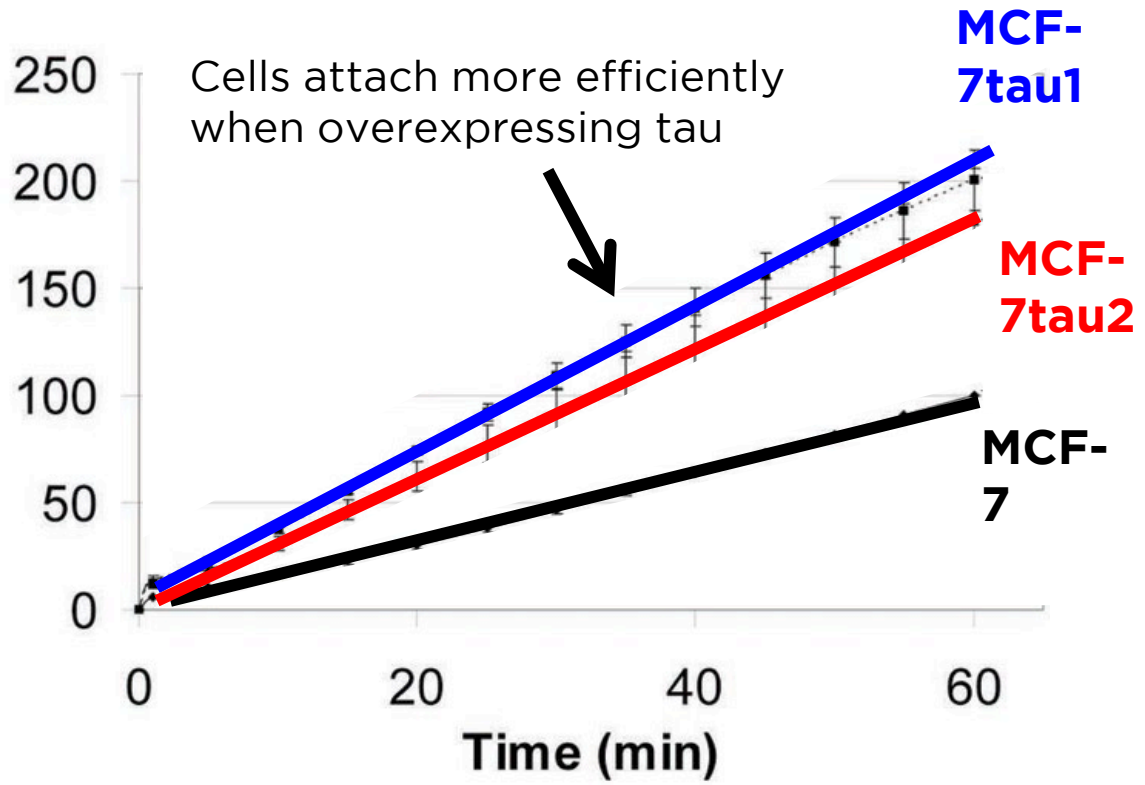


How could this graph be improved?

Converting a Figure for a Poster

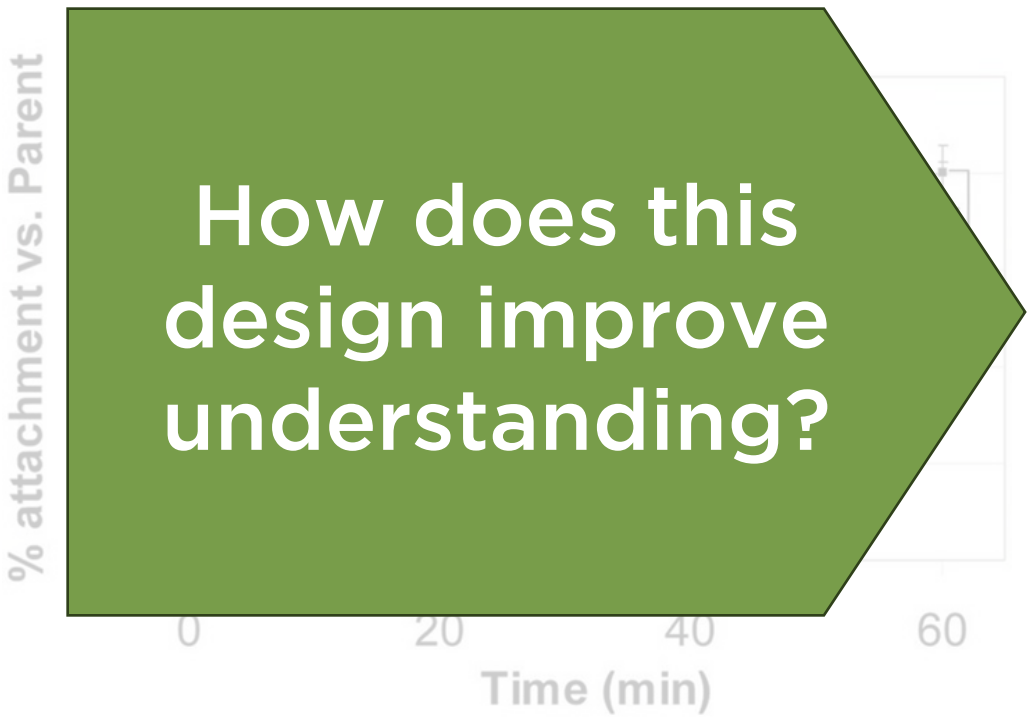


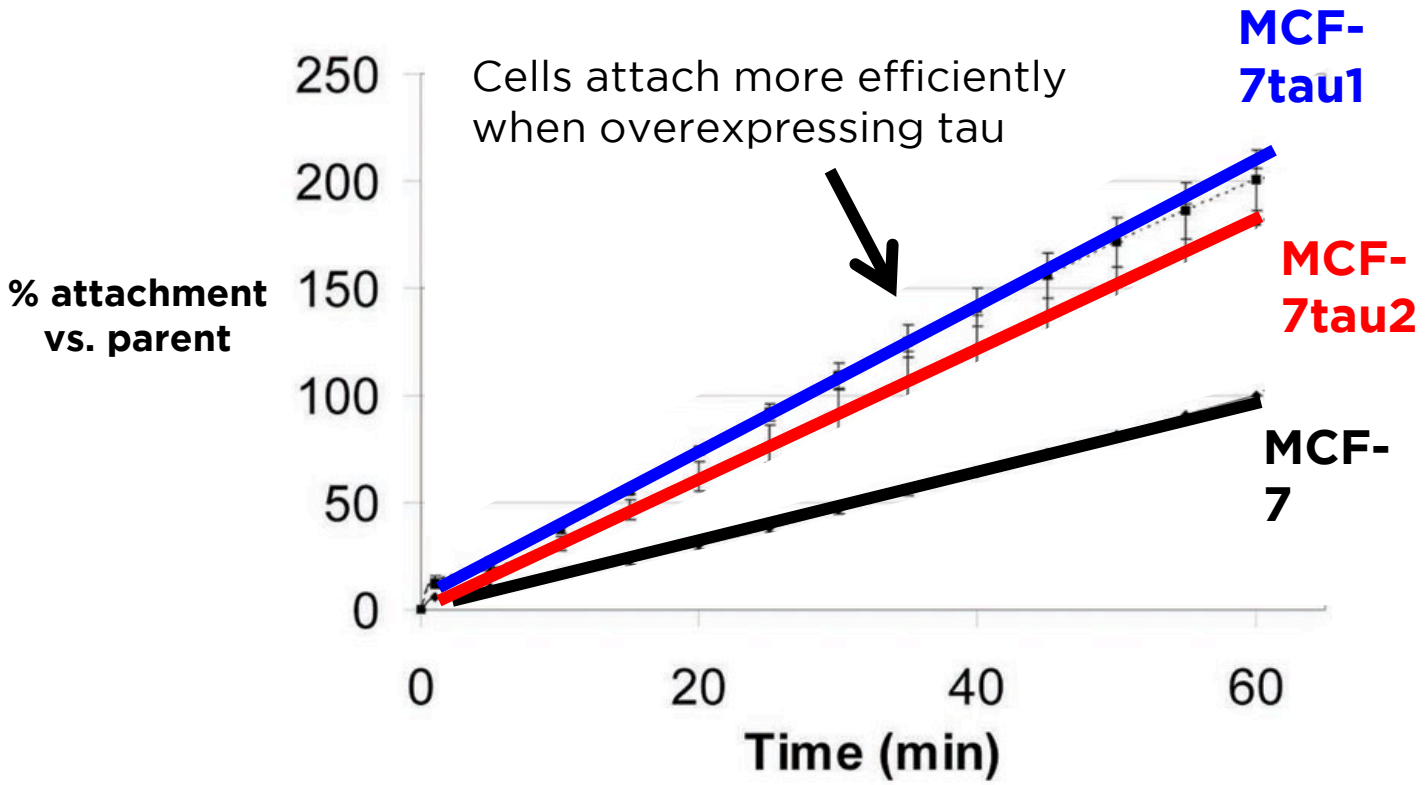
% attachment vs. parent



Converting a Figure for a Poster

How does this design improve understanding?





Content: Conclusion

Aim for ~200 words

Make strong conclusions and:

- State whether your data supports your hypothesis
- Discuss how/why your results are conclusive and relevant to published work
- Indicate future directions

Presenting your Poster

1. Be mindful of your demeanor, gestures and appearance
2. Introduce yourself, shake hands!
3. Have a one sentence pitch to potential viewers
4. Be able to explain your poster in full in 3-5 minutes
5. Finish talking to current viewers BEFORE new ones

    OR allow viewers to read and then answer questions if needed

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What Works?

- Use of white space and text
- Clear hierarchy of information
- Figures clearly labelled
- Clear conclusions

What Could be Improved?

- Graphical introduction or illustration would ease understanding
- The two tones of purple do not aid the design
- Title should be black, to be more legible

Sex Differences in Trace Eyeblink Conditioning in C57Bl6 Mice

Amy Rapp[1], M Matthew Oh[2], Craig Weiss[2], John F Disterhoft[1,2]

[1]Interdepartmental Neuroscience Graduate Program, [2]Department of Physiology, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA

Northwestern University

Introduction

The study of sex differences has become ever more important as many neurological and psychiatric disorders indicate differences in occurrence, manifestation and treatment efficacy according to sex[1]. For instance, women are more likely to develop both depression and Alzheimer's Disease compared to men, while men show more severe symptoms in schizophrenia or Parkinson's Disease[1].

Past research has been largely limited to exclusively male subjects due to prior belief that female subjects would exhibit increased variability due to their estrous cycle. Trace eyeblink conditioning (tEBC) is a forebrain-dependent temporal associative memory task that has been widely used to investigate the mechanisms of associative memory across multiple species, including humans. While past studies[2] have shown that female and male rats acquire tEBC at different rates, similar studies have not been performed in mice. Furthermore, it was recently shown that male and female mice exhibit similar variability in acquiring multiple behavioral tasks, but tEBC was not included in this study[3]. Therefore, we examined the role of sex in acquisition of tEBC in a C57Bl/6J mouse model.

To determine if estrogen plays a role in acquisition of associative memory, we have also included both ovariectomized and intact females as separate groups. Understanding the role of sex in associative memory provides a more complete picture of the mechanisms of learning with implications for future targeted therapies.

Methods

Subjects: 41 young adult (3-4 months) C57Bl/6J mice from Jackson Labs. Ovariectomies were performed by Jackson Labs at least 2 weeks prior to shipment.

Habituation: Mice were handled for (5 min/day for 3 days) then habituated to the head-fixed wheel apparatus for 2 days (45 min/day).

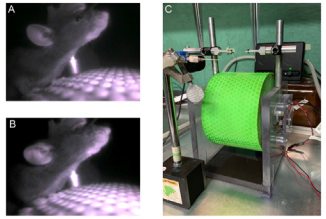
Training: Conditioned Stimulus (CS): tone (65dB, 250ms); Unconditioned Stimulus (US): corneal airpuff (30 ±1 psi, 30ms); 10 sessions; 1 session/day. Conditioned: 50 paired trials/session; ITI: 35-55s; Pseudoconditioned: 50 CS alone, 50 US alone, in random order; ITI: 117.5-27.5s. Trials were not presented when the animals were moving, which was visually monitored with a Logitech C270 camera.

Learning Criterion: 60% Late Conditioned Response (CR) (200ms prior to US onset), or 6 consecutive late CRs

Behavioral Response: Blinks were detected as EMG recordings from microwires implanted on the muscularis orbicularis oculi.

Data Analysis: CRs must last for at least 15ms and have an amplitude of 4 SD greater than the mean baseline (250ms before CS onset).

Figure 1(A) Headfixed mouse on wheel shown with eye open prior to CS or US presentation (B) Mouse shown blinking to US (C) Behavioral chamber showing wheel preparation for headfixed mouse



Trace Eyeblink Conditioning

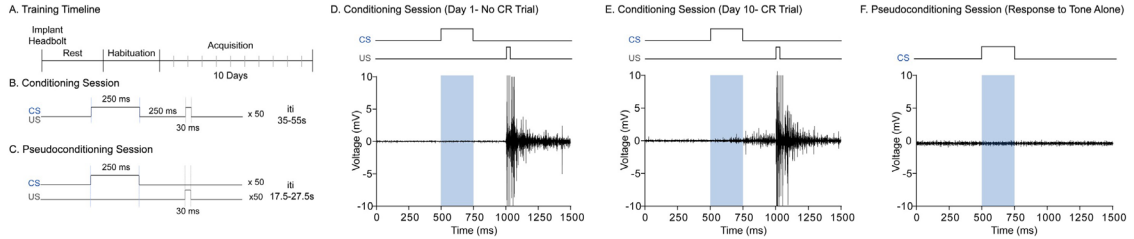


Figure 2(A) Timeline depicting behavioral training. (B) CS/US presentation during a conditioning session. (C) Separate CS/US trials during pseudoconditioning session. (D) Upper- CS/US presentation (D) Lower- EMG recorded during Day 1, UR, no CR. (E) Upper- CS/US presentation (E) Lower- EMG recorded during Day 10, CR and UR. (F) Upper- CS presentation (F) Lower- EMG, no UR, no CR

Sex Differences in Learning Rate

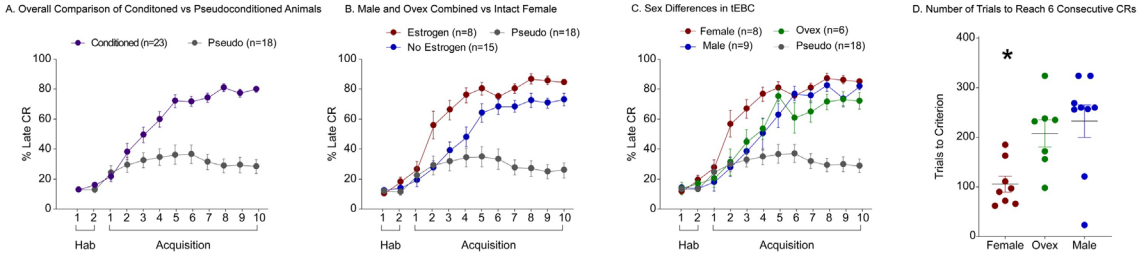


Figure 3(A) Learning curve comparing all conditioned and all pseudoconditioned animals ($p < 0.0001$) (B) Ovex and Males grouped together (blue) compared to Females (red) ($p < 0.05$) and all Pseudoconditioned (gray)($p<0.001$). (C) Female, Male, Ovex and Pseuconditioned animal learning curves shown. Female, Male and Ovex learn at different rates (Interaction Session*Sex $p < 0.05$). (D) Distribution plot depicting number of trials required for individual animals to reach 6 consecutive CRs. Female mice take less trials to reach criterion compared to Ovex and Male mice ($p < 0.05$).

Conclusions

- Intact female mice learn tEBC at a faster rate than male and ovariectomized mice
- Male and intact female mice reach the same level of learning
- Both females and males should be included in future behavioral work

Intact females learn tEBC faster than both males and ovariectomized mice. Intact females reach 6 consecutive late CRs earlier in training than both ovariectomized females and males (106, 208 and 233 trials respectively).

Future Directions

Ongoing work focuses on in-vivo single unit and local field potential (LFP) recording of learning related changes in the lateral entorhinal cortex (LEC). Investigating the role of LEC in the normal brain during associative learning will provide a more complete understanding of the intricacies of the entorhinal-hippocampal circuit that can be used in future work to determine how the circuit changes in conditions such as Alzheimer's Disease, where entorhinal cortex dysfunction has been implicated[4]. Sex differences have been shown in the morphology and electrophysiological properties of hippocampal neurons[1] but less is known about sex differences in LEC.

By including both sexes in this work in LEC, we may also gain a better understanding on how sex contributes to the differences in incidence and manifestation of Alzheimer's Disease.

References

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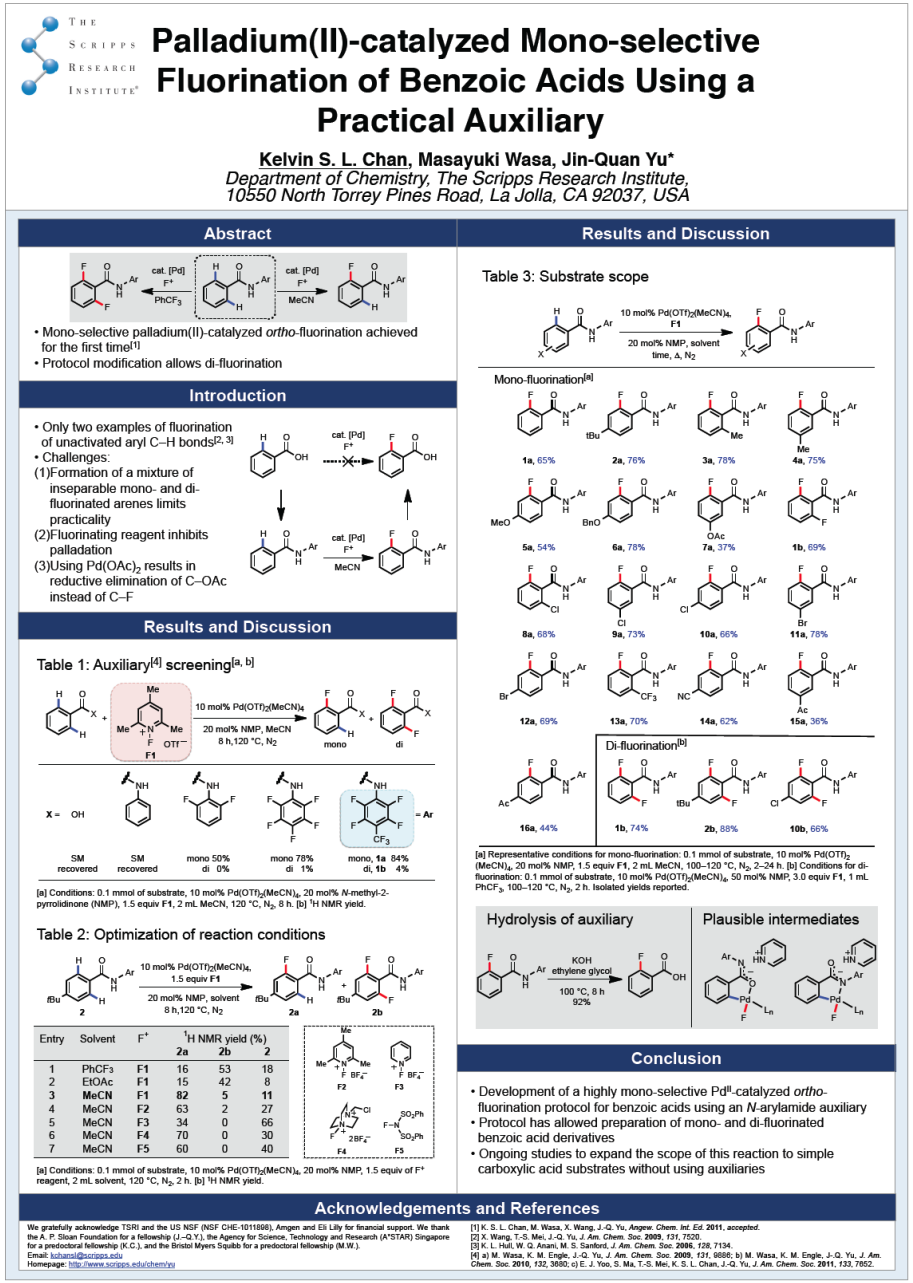
2. Dalla, C. & Shors, T. J. Sex differences in learning processes of classical and operant conditioning. Physiol. Behav. 97, 229–238 (2009).

3. Meziane, H., Ouagazzal, A. M., Aubert, L., Wietrzych, M. & Krezel, W. Estrous cycle effects on behavior of C57BL/6J and BALB/cByJ female mice: Implications for phenotyping strategies. Genes, Brain Behav. 6, 192–200 (2007).

4. Khan, U. A. et al. Molecular drivers and cortical spread of lateral entorhinal cortex dysfunction in preclinical Alzheimer's disease. Nat. Neurosci. 17, (2013).

Supported By: NIH AG 008796



Palladium(II)-catalyzed Mono-selective Fluorination of Benzoic Acids Using a Practical Auxiliary

Kelvin S. L. Chan, Masayuki Wasa, Jin-Quan Yu*
Department of Chemistry, The Scripps Research Institute, 10550 North Torrey Pines Road, La Jolla, CA 92037, USA

Abstract

- Mono-selective palladium(II)-catalyzed *ortho*-fluorination achieved for the first time[1]
- Protocol modification allows di-fluorination

Introduction

- Only two examples of fluorination of unactivated aryl C–H bonds[2, 3]
- Challenges:

(1)Formation of a mixture of inseparable mono- and di-fluorinated arenes limits practicality

(2)Fluorinating reagent inhibits palladation

(3)Using $Pd(OAc)_2$ results in reductive elimination of C–OAc instead of C–F

Results and Discussion

Table 1: Auxiliary[4] screening[a, b]

Table 2: Optimization of reaction conditions

Entry	Solvent	F^+	^{1}H NMR yield (%) 2a	2b	2
1	$PhCF_3$	F1	16	53	18
2	EtOAc	F1	15	42	8
3	**MeCN**	F1	**82**	**5**	**11**
4	MeCN	F2	63	2	27
5	MeCN	F3	34	0	66
6	MeCN	F4	70	0	30
7	MeCN	F5	60	0	40

[a] Conditions: 0.1 mmol of substrate, 10 mol% $Pd(OTf)_2(MeCN)_4$, 20 mol% NMP, 1.5 equiv of F^+ reagent, 2 mL solvent, 120 °C, N_2, 2 h. [b] ^{1}H NMR yield.

Results and Discussion

Table 3: Substrate scope

[a] Representative conditions for mono-fluorination: 0.1 mmol of substrate, 10 mol% $Pd(OTf)_2(MeCN)_4$, 20 mol% NMP, 1.5 equiv F1, 2 mL MeCN, 100–120 °C, N_2, 2–24 h. [b] Conditions for di-fluorination: 0.1 mmol of substrate, 10 mol% $Pd(OTf)_2(MeCN)_4$, 50 mol% NMP, 3.0 equiv F1, 1 mL $PhCF_3$, 100–120 °C, N_2, 2 h. Isolated yields reported.

Hydrolysis of auxiliary

Plausible intermediates

Conclusion

- Development of a highly mono-selective Pd^{II}-catalyzed *ortho*-fluorination protocol for benzoic acids using an *N*-arylamide auxiliary
- Protocol has allowed preparation of mono- and di-fluorinated benzoic acid derivatives
- Ongoing studies to expand the scope of this reaction to simple carboxylic acid substrates without using auxiliaries

Acknowledgements and References

We gratefully acknowledge TSRI and the US NSF (NSF CHE-1011698), Amgen and Eli Lilly for financial support. We thank the A. P. Sloan Foundation for a fellowship (J.-Q.Y.), the Agency for Science, Technology and Research (A*STAR) Singapore for a predoctoral fellowship (K.C.), and the Bristol Myers Squibb for a predoctoral fellowship (M.W.).

Email: kchan5@scripps.edu
Homepage: http://www.scripps.edu/chem/yu

[1] K. S. L. Chan, M. Wasa, X. Wang, J.-Q. Yu, *Angew. Chem. Int. Ed.* **2011**, *accepted*.
[2] X. Wang, T.-S. Mei, J.-Q. Yu, *J. Am. Chem. Soc.* **2009**, *131*, 7520.
[3] K. L. Hull, W. Q. Anani, M. S. Sanford, *J. Am. Chem. Soc.* **2006**, *128*, 7134.
[4] a) M. Wasa, K. M. Engle, J.-Q. Yu, *J. Am. Chem. Soc.* **2009**, *131*, 9886; b) M. Wasa, K. M. Engle, J.-Q. Yu, *J. Am. Chem. Soc.* **2010**, *132*, 3680; c) E. J. Yoo, S. Ma, T.-S. Mei, K. S. L. Chan, J.-Q. Yu, *J. Am. Chem. Soc.* **2011**, *133*, 7652.

What Works?

- Great use of white space and text
- Clear hierarchy of information
- Contrasting figures/data
- Color used for emphasis

What Could be Improved?

- The question is unclear from the title and labels
- The information emphasized by color is not the most critical

Concluding Thoughts

1. Give yourself an adequate timeline
2. Emphasize high value content
3. Font size and style is important
4. Limit you text and tell your story with graphics
5. Your poster and how you present it represents you, your science, and UChicago

Questions?

Amy Hark

amyrapp@uchicago.edu

References

1. Principae – Jean-luc Doumont
2. Better Posters - Blog by Dr. Zen Faulkes
3. Designing Conference Posters – Colin Purrington
4. Adventures in poster making - Blog post by Robyn Hall
5. Poster presentation - Eastern Kentucky University
6. Designing Effective Posters - University of Kansas Medical Center
7. Poster Session Tips - Pennsylvania State University
8. Design of Scientific Posters - Pennsylvania State University
9. How To Make a Great Poster - American Society of Plant Biologists
10. Creating Effective Poster Presentations - North Carolina State University