



How to prepare an effective (poster) presentation

Emre DIKICI, Ph. D.

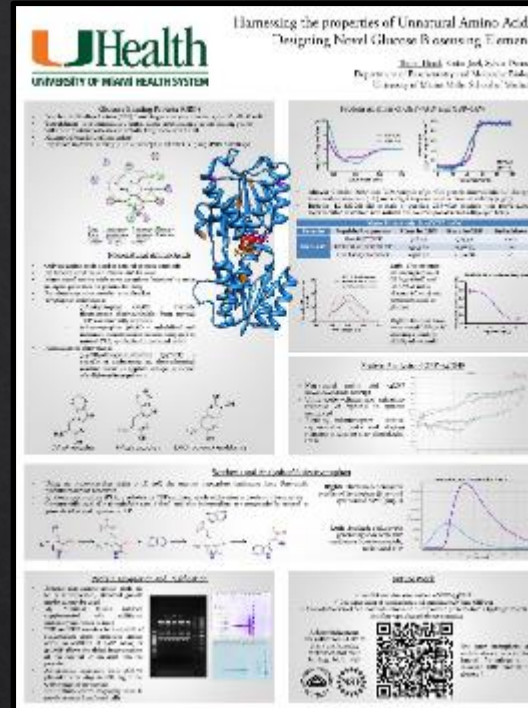
NSF-REU/UM-SURF Seminar Series

07/10/2018

Academic Poster

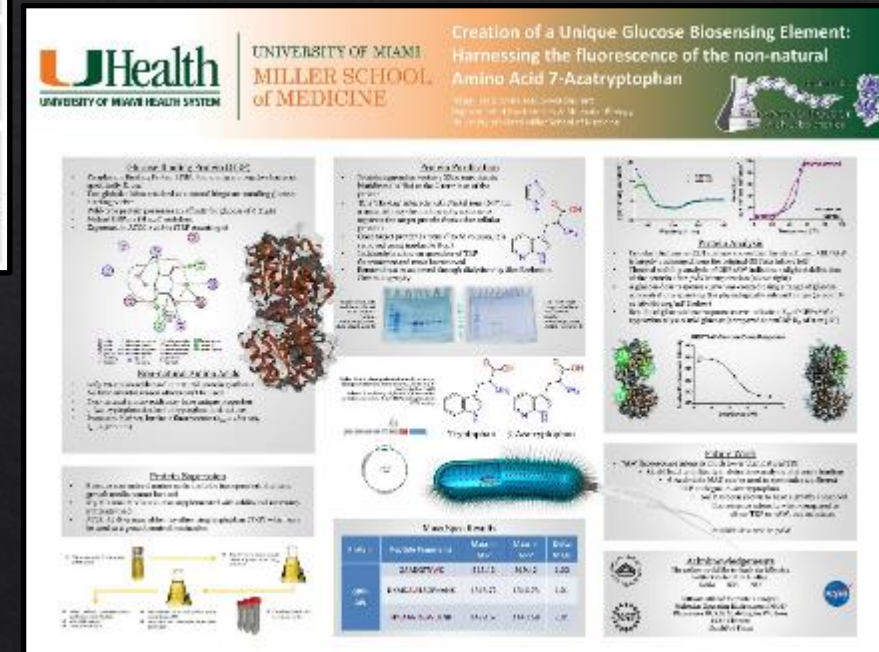


- ◆ Is a summary of your research in a visually engaging way.
- ◆ It must be able to stand on its own as a clear logical presentation of your work without any explanation from you.
- ◆ The more strikingly visual your presentation is the more people will remember it.
- ◆ It should be image driven, but must stand alone.
- ◆ Simply but tightly written.



It can be printed vertically...

The orientation and the size of a poster is usually determined by the rules set by the conference...



or horizontally.

Why are Academic Presentations Important?



- ◇ It represents you and your sponsor's research.
- ◇ It demonstrates expertise.
- ◇ Helps practice public speaking.
- ◇ Deepens the understanding of the topic.
- ◇ Opportunity for teaching and learning, sharing ideas, and create collaborations.
- ◇ Demonstrates attention to detail.
- ◇ Learn about most current results in the field.
- ◇ It is more personal, you interact with people, **who are interested in your work**, one on one.
- ◇ It presents your work even when you are not present.



The more strikingly visual your presentation is, the more people will remember it. And more importantly, they will remember you.”

Paul Arden

First things first...



Do not wait until the last minute to prepare (and print your poster)

Especially true if you know a lot of people are going to be preparing posters for the same event.

Murphy's Law applies to poster presentations... *“In any field of scientific endeavor, anything that can go wrong, will.”*, *“Nothing is as easy as it looks”* and *“Everything takes longer than you think”*.



First things first...



Work with your sponsor

- ◇ Represents their Laboratory.
- ◇ They need to be involved.
- ◇ Only they can decide what should be included... Sometimes new data isn't disclosed until an intellectual property is filed.
- ◇ They will make corrections and revisions.
- ◇ You need to get *final* approval.



Figure out who your audience is...



Is it a rabid competitor?



Is it your peers in the same field?



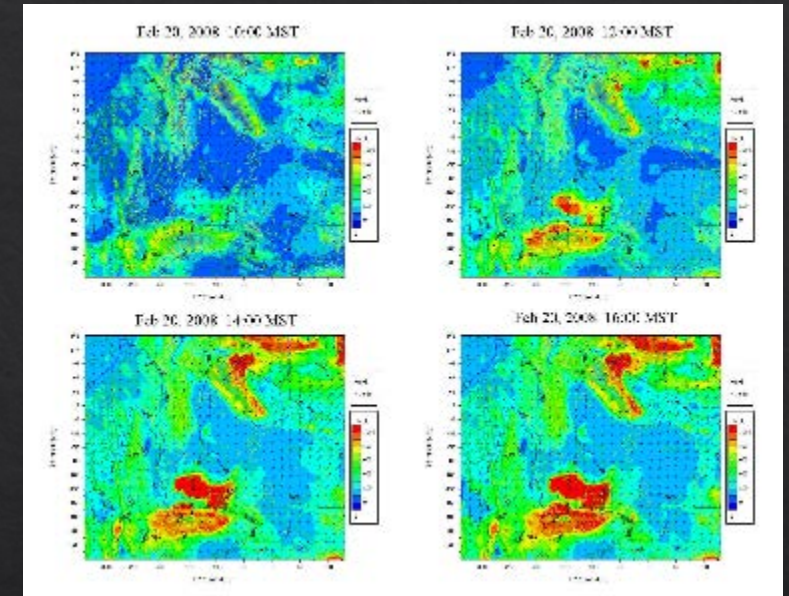
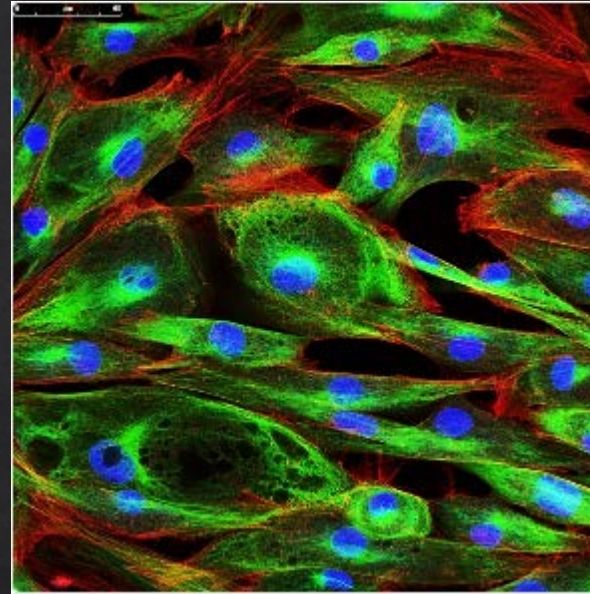
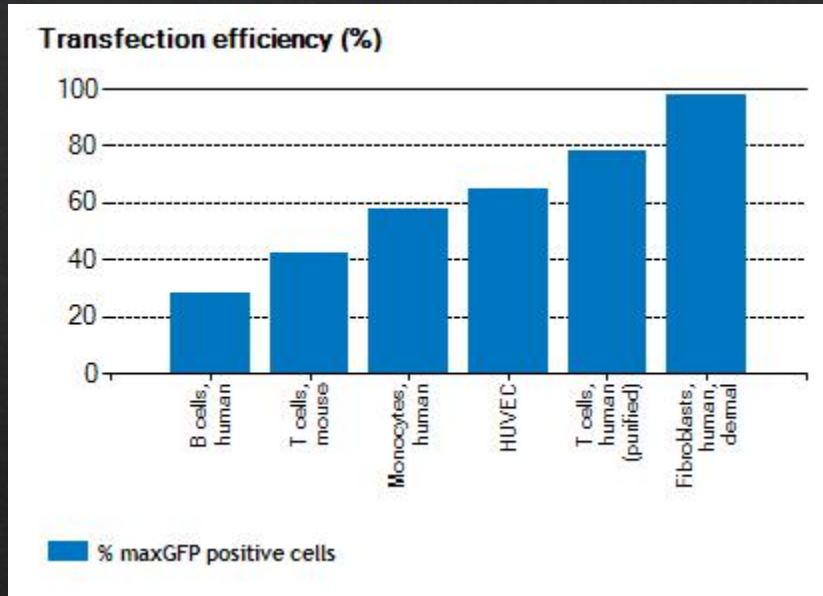
Is it your peers in a different field?

Prepare your poster according to your audience!

- ◆ Who is your target audience?
- ◆ How do you want to impact your audience?.
- ◆ What will you need to do to help your audience understand and appreciate your presentation?

Put yourself in your audience's shoes and prepare a presentation that you would want to see yourself.

Getting started



Always prepare your data figures first, **they will influence your narrative.**

Pick a software program



Adobe
Illustrator



Adobe
InDesign



Microsoft
Publisher

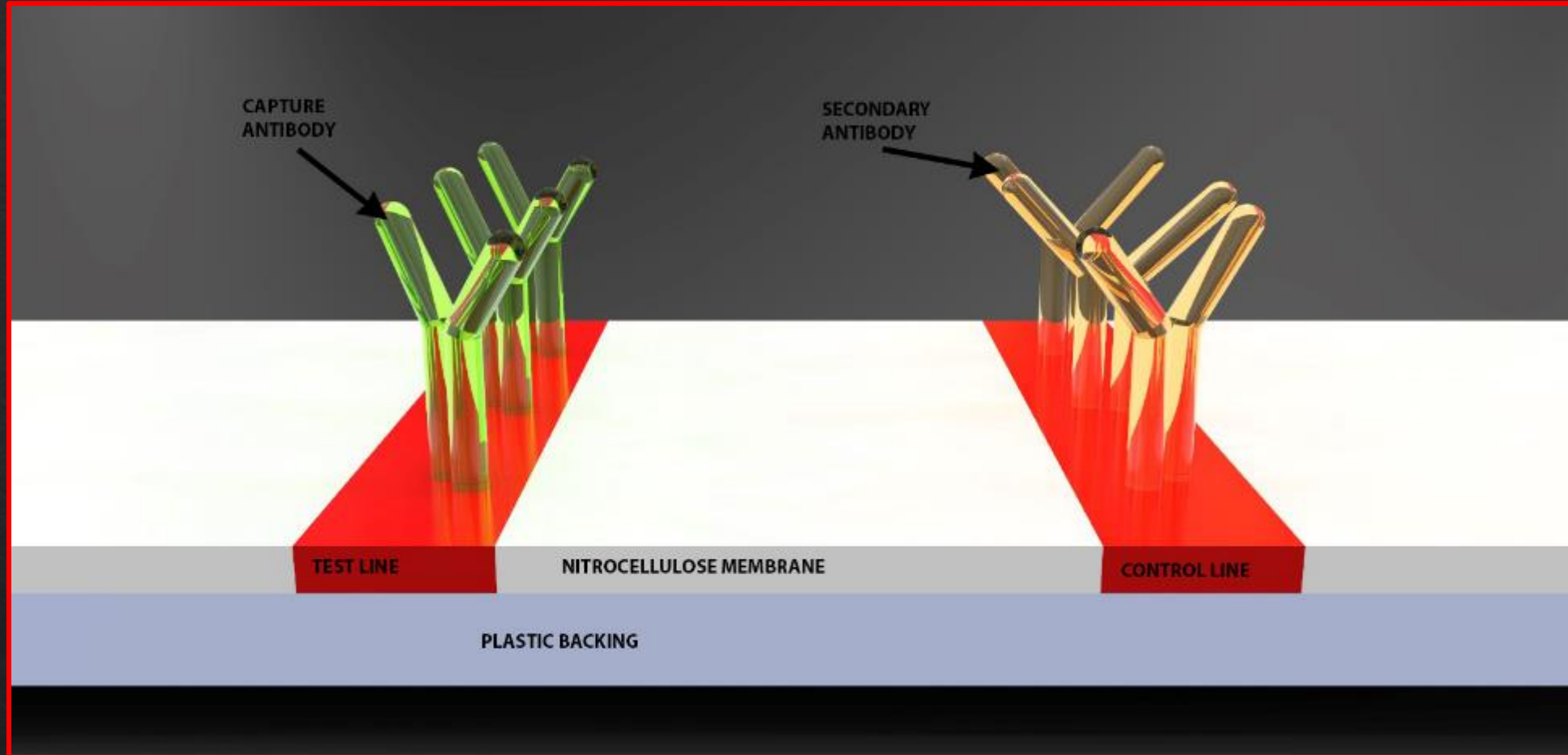


Microsoft
PowerPoint

Some others are; Keynote, Canvas, Publish-It, Corel Draw, LaTeX, etc...

Invest time in learning a true design software, as well as Photoshop. opportunities are endless and it is an extremely valuable skill to learn.

Anatomy of a Lateral Flow Assay



Anatomy of an academic poster



Title, formatted in sentence case (Not Title Case and NOT ALL CAPS), that hints at an interesting issue and/or methodology, doesn't spill onto a third line (ideally), and isn't hot pink

Core technical content

Colin Purrington

666 Teipai Street, Posterville, PA 19801, USA


Visuals

Introduction

Congratulations a reader was willing to read by your title. Now you have 2-3 sentences to both describe the study and more by describing what your question was and why the answer might be of general interest. Concise but relevant information will cause them to walk over if you're standing next to your poster, that is, be downward.

Typography research has shown the body text is easier to read if you use a serif font like Times. The sans-serif fonts are great for title, headings, figure legends, etc. Research also shows that fully justified text (this paragraph is slightly harder to read even though it looks really good).


Figure 1. A photograph in your introduction can help lure people to your poster so non-photogenic research. If it's not your image, ask photographer for permission to use, and cite the photo.



Materials and methods

Few people, if any, really want to know the gory details of what you've been able to do, so be brief. Use lightly-annotated photographs, drawings, or flow charts to visually convey your general experimental approach. To better engage viewers in your protocol or system, try attaching actual objects such as study organisms (food specimens), research grants, photos of hosts, or a short movie (putch on old smart phone will do).

Figure 2. Hire an artist to illustrate the important step in your protocol. A photograph of you actually doing something might be nice, too. (Image by John Snow 1850)



Literature cited

Bender, D.J., D.M. Hayes, and H.M. Bingham. 1996. Error correction influences cognitive (Cav's language) learning. *American Medical Association* 136:413-47.

Brooks, L.D. 1988. The evolution of recombination rates. Pages 87-105 in *The Evolution of Sex*, edited by R.E. Michell and B.R. Levin. Sinauer, Sunderland, MA.

Results

The overall layout in this arena should be visually compelling, with clear cues on how a reader should travel through the components, the message. You might want a large map with inset graphics, or have questions on left with answers and supporting graphs on right. Be sure to separate figures from other graphics by generous use of white space. When the space is too cramped, use a set of colored arrows to guide figures to read first and which legend they refer to other figure.

If you can't fit small drawings or icons to your figures, these visual cues can be an effective side in orienting viewers. And use colored arrows or callouts to focus attention on important parts of graphs. You can even put these annotations next to arrows to tell readers what's going on that's important in relation to the how the hypothesis is being evaluated. E.g., "this outlier was most likely caused by contamination when I collected this tube." Also, don't be afraid of using colored connector lines to show how one part of a figure relates to another figure. These tips might induce groans for published manuscripts, but posters can be more informal and thus better guide viewers.

Figures are preferred, but tables are sometimes unavoidable. Like death, they go to great lengths to make it look professional. Lock in a respected journal and emulate the layout, line types, line thickness, text alignment, etc. exactly. Again, use colored text or arrows to draw attention to important parts of the table.

Paragraph format is fine, but use the bullet list of results:

- 9 out of 12 treatments resulted into survival.
- Transformed rats ate less.
- Control rats completed maze faster, on average, than rats without beams.

Literature cited

Scott, E.C. 2005. *Evolution in Civilization: an Introduction*. University of California Press, Berkeley.

Society for the Study of Evolution. 2005. Statement on teaching evolution. <http://www.evolutionarysocietymeetings.html>. Accessed 2002 Aug 9.

Do treatments differ in their effects?




Figure 3. Legends can briefly describe the experiment, answer the question, and even include statistics if you so choose (unlike a manuscript figure legend).

Do As and Bs respond differently to X?




Figure 4. Avoid elements instead of relying on an overlay that are default on most software. Add pictures and text if they are actually things (e.g., terms of use with, without brain).

Are medians of treatment A and D different?

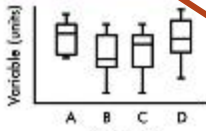


Figure 5. Don't be tempted to reduce font size in figure legends, axis labels, etc. This is because viewers are probably more interested in reading your figures and legends.

Acknowledgments

We thank L. Grier for inventory assistance, Mary Jones for seeds, and Herb Justice for greenhouse care. Funding for this project was provided by the Department of Zoology. Note that people's titles are omitted (titles are TMI).

Conclusions

Conclusions should not be dry restatements of your results. You want to guide the reader through what you have concluded from results, and you need to state why these conclusions are interesting (i.e., don't assume readers will guess). These first several sentences should refer back to the burning issue mentioned in the introduction. If you didn't mention a burning issue in the introduction, fix that.

A good conclusion will also explain how your conclusions fit into the literature on the topic. E.g., how exactly does your research add to what is already published on the topic? It's important to be humble and generous in this section, partly because authors of previous literature may still be alive and even attending the conference. You can also display your appreciation of others' input by citing researchers you have had (with your names).

Finally, you want to tell readers who have found this long what might be next and who should do it. E.g., are you currently taking the next logical step, or should another person with different skills follow up on your amazing result? It's OK to put a bit of personality into this ending because viewers expect posters to be personal (but if you're not actually wanting them to convey your thesis, your poster text should be done that for you).

If you have a graceful way to express the next step of your hypothesis, by all means include it in this section. For example, you might make a graph with hypothetical data that shows an expected result in a future experiment. There's something you normally don't show in a traditional manuscript, but it's totally fine for a poster.

If you're curious, this poster has 653 words. Aim for 500 words. If you use above 1000 words, your poster will be annoyingly long to everyone except your collaborators.

A well designed poster means plenty of white space separating edges of text boxes, graphics, and tables. You also want space between your text and edge of box. Without white space a poster will look cramped and uninviting.

Further information

More tips and templates can be found at "The good conference poster":

<http://colinpurrington.com/tips/poster-design>

Anatomy of an academic poster



Title

Title, formatted in sentence case (Not Title Case and NOT ALL CAPS), that hints at an interesting issue and/or methodology, doesn't spill onto a third line (ideally), and isn't hot pink

Should convey the interesting issue, the experimental approach and the system. **It needs to be catchy.**

Write it **big**, and **bold**, **85** pts are considered a good size for a title.

It can be serif or non-serif. Many people advocate non-serif fonts for titles.



Format the title in sentence case so that the Latin binomials, gene names, allele names and such can be immediately recognized. **Do not use all caps.**

Keep it down to 1-2 lines if possible. It should contain only the essential number of words **People tend not to read long titles.**

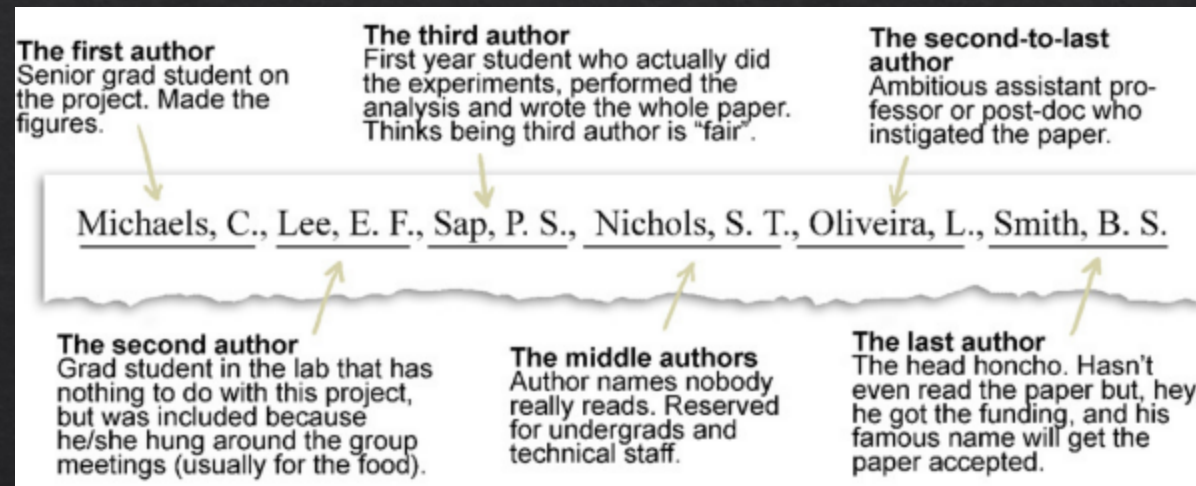
Avoid titles with colons if possible: **They are overused.**

Anatomy of an academic poster



Affiliations

Colin Purrington
666 Teipai Street, Posterville, PA 19801, USA



Write it **big, 56** pts are considered a good size for affiliations.

You can write the department and institutions smaller maybe a **48** pts are considered a good size for affiliations.

Anatomy of an academic poster



Abstract

Title of the abstract should be the same as your poster title.

250 words max..

It should include the following:

- The research problem
- The methods
- The observations
- Analysis, assessment and implications
- Major findings, results and conclusions

In Vivo Assessment of Dexamethasone (DXM) Infused and Coated Poly(lactic-co-glycolic acid) (PLGA) Microneedles as an Improved Drug Delivery System for Intracochlear Biodegradable Devices

Devon Pawley¹; Stefania Goncalves²; Esperanza Bas²; Neil Nayak²; Emre Dikici¹; Sapna Deo¹,
Sylvia Daumert¹; Fred Telischi²

¹ *Department of Biochemistry and Molecular Biology, Miller School of Medicine, University of Miami, Miami, FL, 33174, USA.*

² *University of Miami Ear Institute, Department of Otolaryngology, Miller School of Medicine, Miami, FL, 33136, USA.*

¹ *Devon Pawley, Phone: (305) 243 – 6282, Fax: (305) 243 - 3955, email: d.pawley1@umiami.edu*

² *Stefania Goncalves, Phone: (305) 243 – 65757, Fax: (305) 243 - 3200, email: stefania.goncalves@jhsmiami.org*

Inner ear drug delivery techniques are challenging to develop due to the inherent complexity of the cochlear anatomy, which limits molecular transportation. A promising solution is the use of biodegradable polymers because the continuous release of bioactive molecules without introducing foreign material is highly desirable. Using a microneedle approach lends the drug infused polymeric microneedle the capability to pierce the tissue and be placed inside of the cochlea, allowing the appropriate amount of drug to be released overtime to the desired area.

Biopolymer microneedles were prepared by mixing PLGA copolymer and DXM in an appropriate solvent. The solution was cast into a custom made polydimethylsiloxane elastomer (PDMS) mold engineered via photolithography in the University of Miami's Nanofabrication facility and shaped as the desired microneedles. The needles were allowed to dry, removed from the mold, and coated with DXM. A fluorescent compound, rhodamine B, was used instead of DXM to study the drug release profile. The prepared microneedles were analyzed in an artificial perilymph solution by checking the absorbance of the perilymph solution until the absorbance of the solution at 552 nm is constant. High performance liquid chromatography was also performed.

Otototoxicity assessment was performed using whole organ of **Corti** (OC) explants dissected from 3-day-old rat cochleae, and the OC explants was exposed to the dexamethasone microneedles in culture. Fluorescent microscopy for viable hair cell (HC) counts (FITC-**phalloidin**) was also performed. ANOVA and Bonferroni post hoc testing were used for statistical analysis.

*PGLA, Microneedles, Dexamethasone, Cochlea
Poster presentation requested: Devon Pawley*

Email Address: d.pawley1@umiami.edu

Anatomy of an academic poster



Body of the poster (Introduction A.K.A. Background)

State the research problem or question and the significance.

Include related current investigations.

Why did you chose to study this problem.

What types of models did you use to answer the question.

Start with general topics then go to the specific topics.

Contains the citations and references.

May have purpose and hypothesis embedded.

Write it with at least 24 pt font size for the body text and sub-headings such as introduction should be 36 points.

Introduction

Congratulations: a reader was mildly intrigued by your title. Now you have 2-3 sentences to hook him/her into reading more by describing what your question was and why the answer might be of general interest. Gratuitous background information will cause them to walk away (if you're standing next to your poster, that can be awkward).

Typography research has shown that body text is easier to read if you use a serif font such as Times. But non-serif fonts are great for title, headings, figure legends, etc. Research also shows that fully justified text (this paragraph) is slightly harder to read even though it looks really cool.



Figure 1. A photograph in your introduction can help lure people to your otherwise non-photogenic research. If it's not your image, ask photographer for permission to use, and cite him/her.

Anatomy of an academic poster



Body of the poster (Methods)

Describe procedures and methods detailed enough to allow the audience to understand how the data was obtained.

Describe challenges and lessons learned.

Use text with subheadings, include charts or figures to summarize and simplify.

Make sure to include:

- Subjects
- Experimental Design
- Drugs, chemicals and equipment used
- Statistical methods
- Why did you chose that method?

Methods

Colored Tumor Cells

Transferred to mouse subcutaneous space

Mouse bearing tumor

Figure 1. Animals were maintained on a 12:12 light/dark cycle and maintained on Purina mouse chow. 12CP-7 mouse mammary tumor cells (ATCC) were cultured in DMEM with 5% fetal bovine serum (Gibco-BRL) at 95% CO₂ in T25 coated flasks (Falcon). Cells were collected at 50% confluence and diluted to 10⁶ cells/ml in physiological saline (Hyclone). 0.1 ml of the cell suspension was injected subcutaneously into 5 regions of the back on nude mice. Tumors were allowed to develop for 30 days, and measured. Mice were separated into untreated, sham IP injected, high dose Compound X (7 microgram/gram wt) and low dose (2 microgram/gram wt) groups, and then treated for 30 days. Animals were timed to judge their total daily time spent in grooming activities (Swizman Rodent Depression Test, Swizman et al., 1994), to assess possible depressive effects of the treatment. After 30 days, tumors were measured across their greatest width, both externally and after harvest. Results were analyzed using a student's T-Test.

Methods

100%
80%
60%
40%
20%
0%

First Third
Max Strength
Last Third

Figure 1a. Experimental Design Diagram

MATERIALS

Coating process by Sol-gel methods: Commercially pure titanium (Ti) disks of (15 mm diameter and 2.0 mm thick) were used as substrates. All disks were wet ground with 240, 400 and 600 grit silicon carbide papers, followed by ultrasonic degreasing using acetone and ethanol for 10 minutes each. Deionized water was used for rinsing the disks between applications of each solvent. A passivation procedure was then conducted by exposing the Ti disks to a 40% volumetric acid solution at room temperature for 30 minutes (ASTM F86-91).

Prior to coating on the passivated Ti surfaces, hydroxyapatite (HA) and 1 wt% silver (Ag)-doped HA (HA-Ag) sol were produced. The HA sol was prepared by reacting calcium nitrate tetrahydrate [Ca(NO₃)₂·4H₂O] with methyl alcohol to produce calcium precursors. Phosphorus precursors were also prepared by reacting triethyl phosphate [(OC₂H₅)₃P] in 0.02 ml acetic acid (CH₃COOH). The two precursors were then mixed and 0.1 mol of DCCA (Drying Control Chemical Additive) was added to the mixture. All reactions were carried out in argon atmosphere. Similar to the HA sol, AgHA sol was produced by mixing the calcium and phosphorus precursors with 1.0 wt % silver nitrate (AgNO₃) and 0.1 mol DCCA. AgNO₃ was chosen for Ag doping because of the easy decomposition of nitrate during heating.

The prepared HA and HA-Ag sol were then coated on passivated Ti surface by spin coating at 5,000 rpm for 50 seconds. The coated-Ti surfaces were immediately dried at 70°C for 12 hours, followed by a heat treatment at 650°C for 3 hours. The HA-coated surfaces were used as controls in this study. All samples were autoclaved prior to materials characterization and all culture experiments.

Anatomy of an academic poster



Body of the poster (Results)

Usually the largest section but it varies with the field.

Summarizes the data and reports the results of the statistical tests and analyses.

Draw implications and considerations.

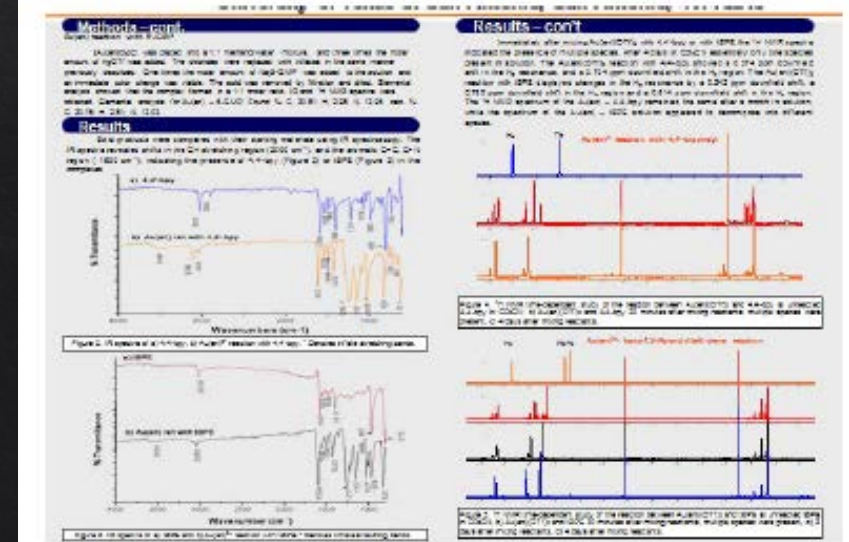
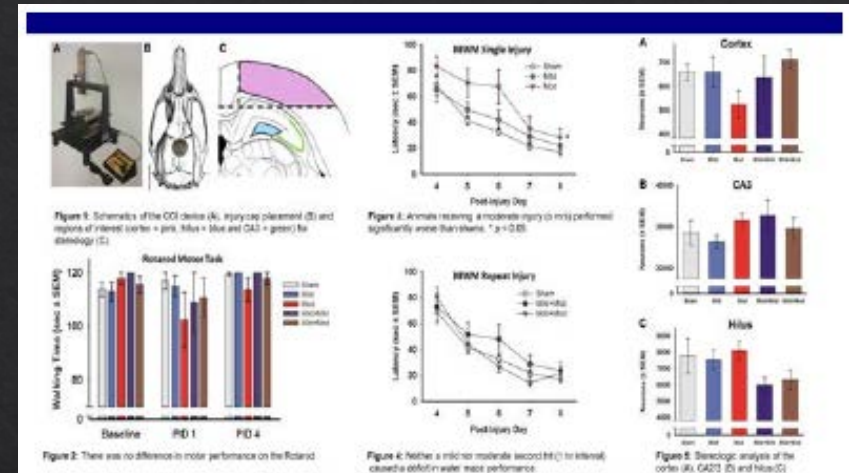
Do NOT present raw data.

Make image based, maximize the use of figures. One image is worth 1000 words.

Minimize the use of tables. Usually harder to grasp than figures.

Use figure legends and/captions as text. Put the text near the figure its describing.

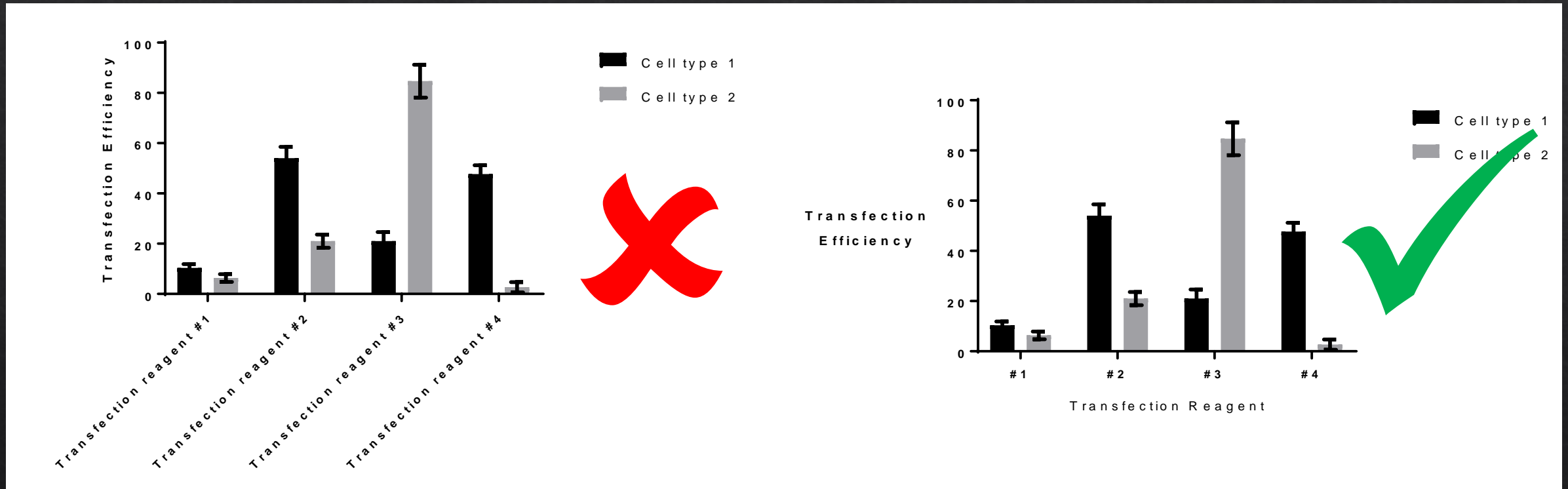
~1 paragraph per image/image group.



Simple, effective data displays



They must be easily seen,

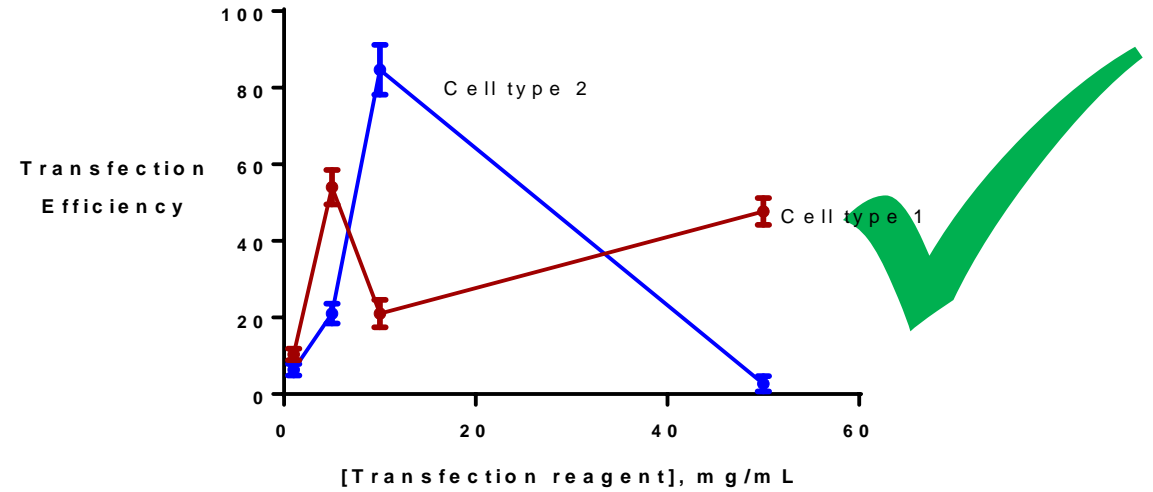
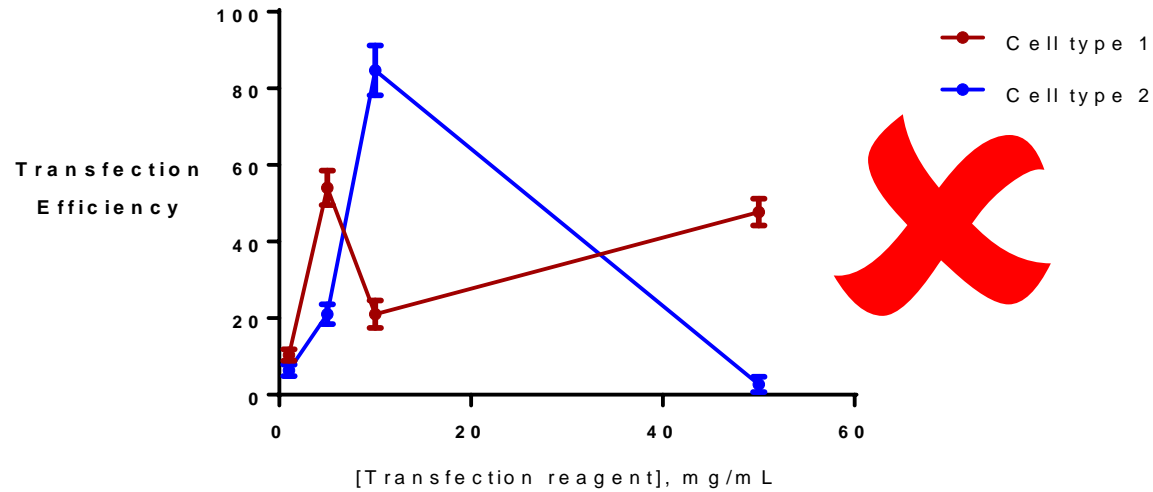


Don't make your audience stand on their head to read your data!

Simple, effective data displays



They must be easily seen,

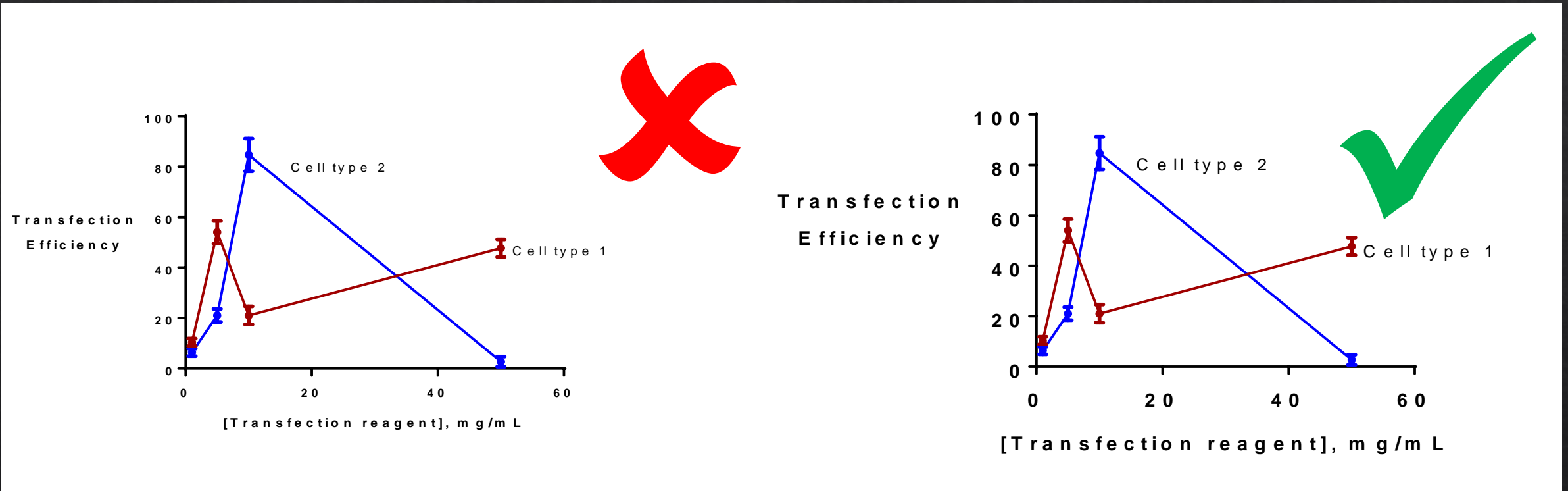


Make it simple, avoid using legends.

Simple, effective data displays



They must be easily seen,

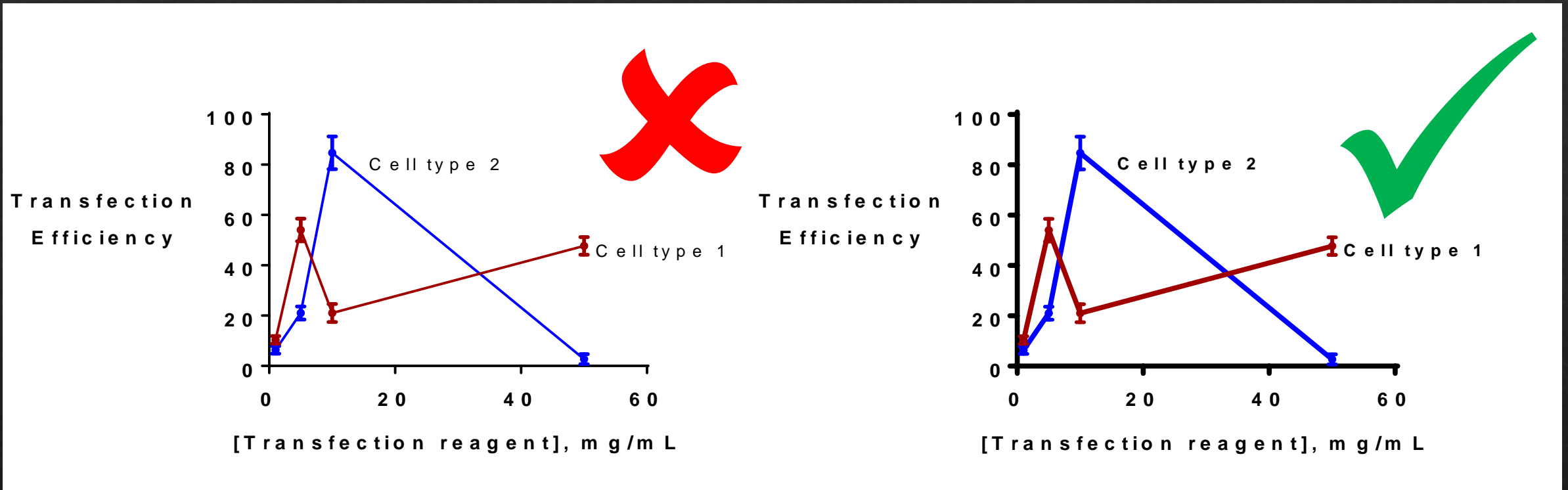


Don't make your audience wish they brought magnifying glass with them!

Simple, effective data displays



They must be easily seen,



Make all lines thick enough!

Simple, effective data displays



Make sure your pictures are not fuzzy or pixelated.

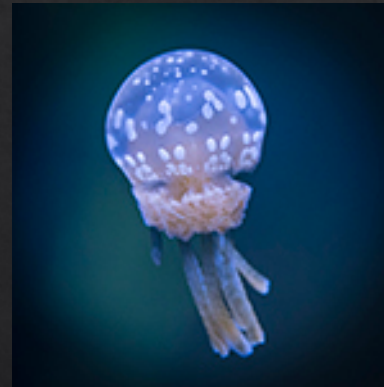
This means you need at least 150 dpi resolution figure, 300 dpi is better but shouldn't go more than that.



600 dpi



300 dpi



150 dpi



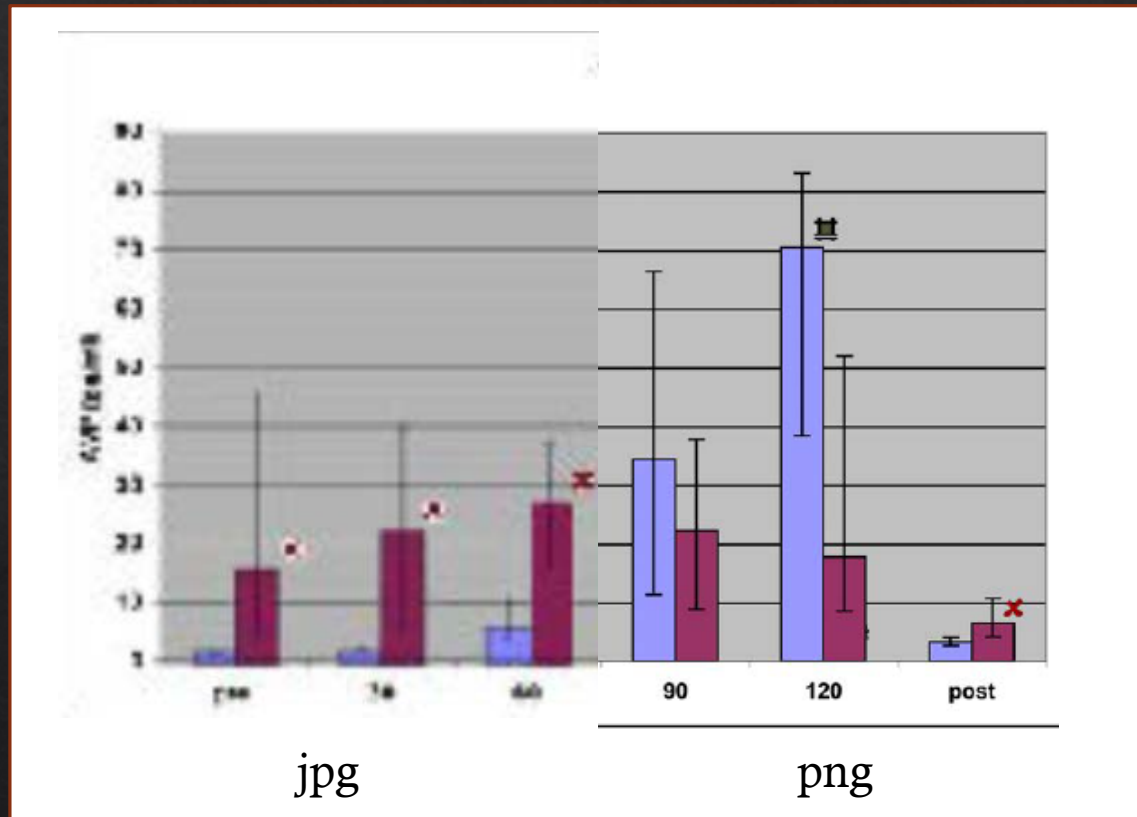
72 dpi

Use web graphics with caution. You need something with high enough resolution so it doesn't look fuzzy when printed.

Simple, effective data displays



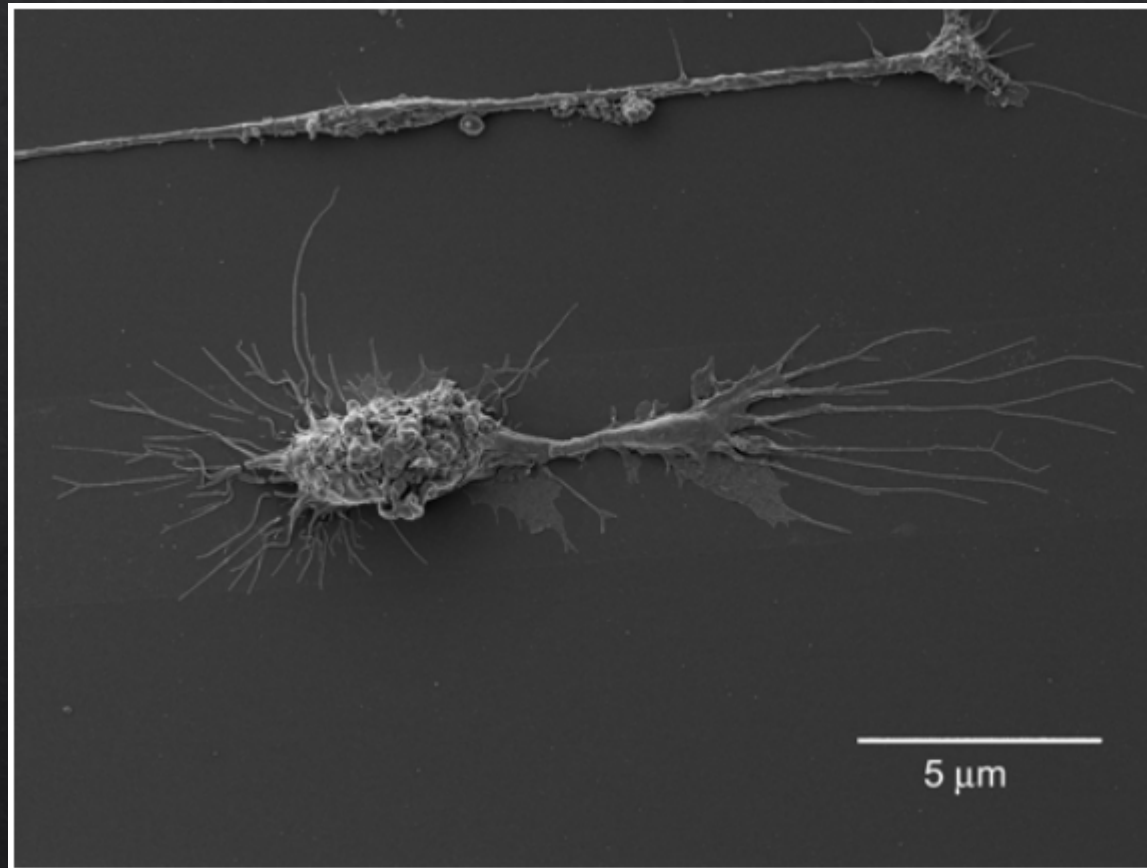
Save your line art as .png not .jpg.



Simple, effective data displays



Make sure each of your image has a description and a scale bar



Use color to engage your audience



Color as an organizational tool

Color as an emotional tool

Periodic Table of Elements

<p>1001 1 Atomic Number</p> <p>1.008 1 Hydrogen</p> <p>Atomic Weight</p> <p>Symbol</p> <p>Name</p>																		
<p>Alkali Metal Haloid Lanthanoid</p> <p>Alkaline Earth Metal Pnictogen Actinoid</p> <p>Transition Metal Diatomic Element Unkown Element</p> <p>Inert Gas Noble Gas</p>																		
H	He																	He
Li	Be	B	C	N	O	F	Ne											Ne
Na	Mg	Al	Si	P	S	Cl	Ar											Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra		Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uut	Ff	Uup	Lv	Uus	Uuo	
<p>Lanthanoid Series</p> <p>La Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu</p> <p>Actinoid Series</p> <p>Ac Th Pa U Np Pu Am Cm Bk Cf Es Fm Md No Lr</p>																		



Use color to engage your audience



Make sure you correct colors.

Red on blue appears blurry to the human eye

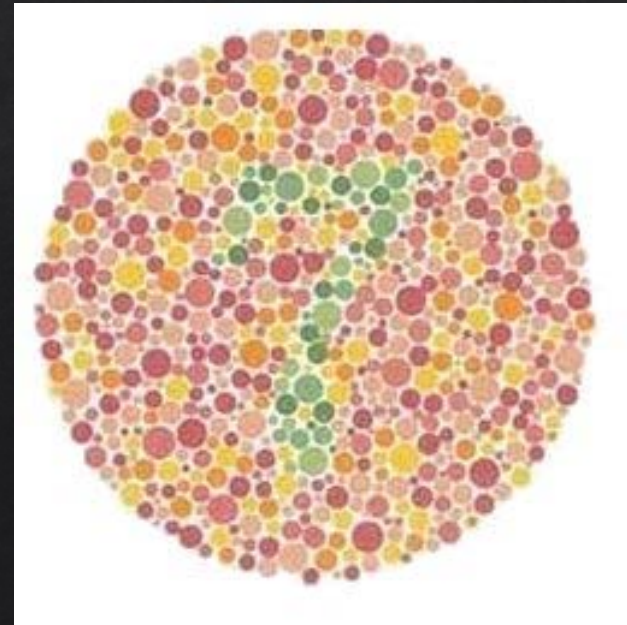
Yellow on white is hard to read

Blue on red appears blurry to the human eye

Avoid color combinations that create problems for those with color-deficient alleles. You can run the jpg of your poster through

<http://www.color-blindness.com/coblis-color-blindness-simulator/>

to test if you have issues in your poster.



Color Theory



THE 10 COMMANDMENTS OF COLOR THEORY

1	2	3	4	5	6	7	8	9	10
KNOW THE COLOR WHEEL WELL! DO YOU KNOW WHAT EACH COLOR SIGNIFIES?	MATCH IT. DO NOT OVERLOOK THE AUSTERITY OF ANALOG COLORS!	CAN'T MATCH IT? CLASH IT WITH COMPLEMENTARY COLORS!	IS CONTRAST TOO INTENSE? THEN, SPLIT IT!	NEED MORE VARIATIONS? GO DOUBLE COMPLEMENTARY!	GO TRIAD WITH 3 DIFFERENT HUES... CHOOSE FROM A GREATER VARIETY!	SOMETIMES, MONOCHROME IS THE WAY TO GO...	OTHER TIMES, AN ACHROMATIC SCHEME SERVES BEST!	KNOW YOUR HUES, TINTS, SHADES AND TONES... WHAT WORKS WHERE?	AND LASTLY, RGB, CMYK AND PANTONE ARE NOT THE SAME!
RED LIVE ENERGY INTENSITY	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	<i>Barber</i>	
YELLOW HIGH INTELLECT ATTENTION									
GREEN FRESHNESS, SAFETY, GROWTH									
BLUE STABILITY, TRUST, SERENITY									
PURPLE ROYALTY, HEALTH, FEMININITY									

Some aesthetic issues



Make sure you leave an adequate amount of white space around your text boxes.

Do not make your poster too wordy. This is the most common mistake in poster presentations. Aim 1000 words or less including the legends of your figures.

The width of the text boxes should be approximately 45-65 characters.

Use italics instead of underlining. Underlining draws too much of an attention.

When using acronyms and numbers within the body of the text, scale down the font size by a couple of points so their size don't overpower the lowercase text.

Avoid dark backgrounds for text boxes. Dark text on white is easiest for most people to read.

White space is that subtly-pleasing, ink-free space between letters, between words, between lines, and between blocks of text. A good amount of white space is visually inviting from afar and somehow tricks a viewer's brain into thinking more deeply about the content, increasing comprehension and satisfaction.

White space is that subtly-pleasing, ink-free space between letters, between words, between lines, and between blocks of text. A good amount of white space is visually inviting from afar and somehow tricks a viewer's brain into thinking more deeply about the content, increasing comprehension and satisfaction.

© 2004 by Pearson Education

a few classic font pairings:

Myriad Caslon

Myriad Black Minion

Franklin Gothic Demi Baskerville

Gill Sans Garamond

Franklin Gothic Medium Caslon

Some aesthetic issues



YOU READ THIS FIRST

You will read this when skimming

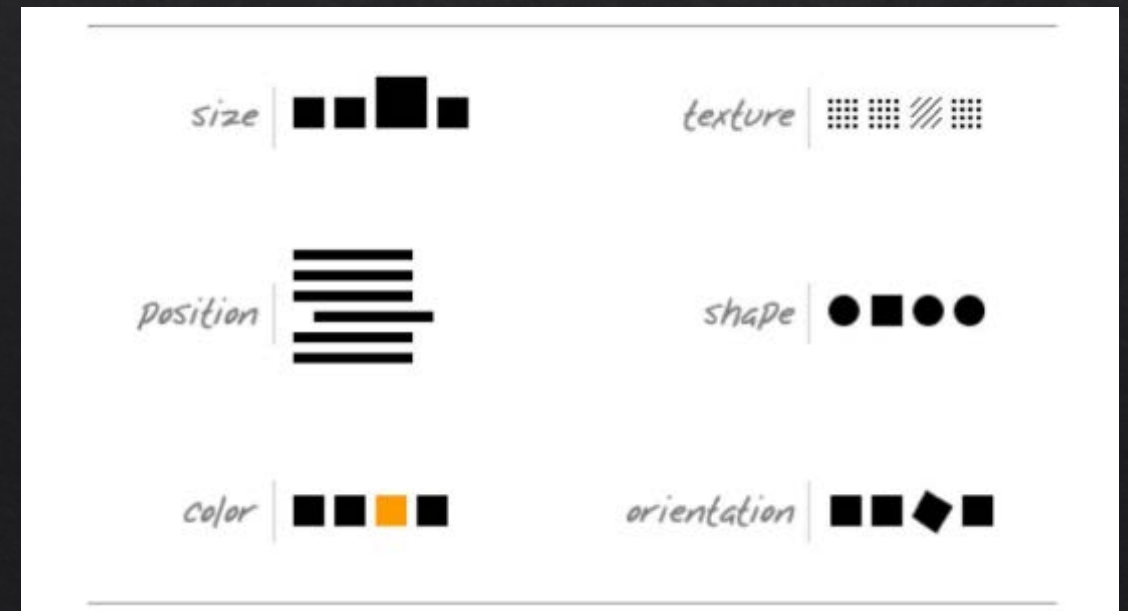
You will probably not read this on a skim

You will not read this. **Unless a phrase is bolded.**

Use a visual hierarchy to guide audience through your poster.

visual hierarchy can be achieved by

- (-/+) space
- Contrast
- Repetition
- Proximity
- Color
- Alignment
- Typography



Anatomy of an academic poster



Body of the poster (Conclusions/Discussions)

Very few words.

Bullets are preferred over blocks of text.

Use bigger font if needed.

Summarize “take home” results.

How did your hypothesis work out?

Tie back to the real world problem.

Conclusions

- We have adapted a group II intron-based system for efficient targeted mutagenesis of *F. tularensis*
- This system is effective and efficient across *F. tularensis* subspecies: *tularensis*, *holarctica*, and *novicida*
- This system was used to successfully disrupt *blaB* found in single copy in the *F. tularensis* genome.
- This system was used to successfully disrupt both copies of the duplicated *ig/C* gene in a single manipulation.
- Targetrons should be a valuable genetic tool for the dissection of *F. tularensis* pathogenesis.

This study was supported by NIH F04AI079616 to XXX and NIH GM10045 to YYY.

SUMMARY AND CONCLUSIONS

In this study, x-ray diffraction analyses of Ag-doped HA thin film by sol gel method indicated peaks corresponding to HA. Contact angles for HA-Ag surfaces were observed to be significantly lower when compared to HA surfaces. *In vivo* bacterial adhesion study indicated a significantly reduced number of *S. epidermidis* and *S. aureus* on HA-Ag surface when compared to HA surface, whereas significantly reduced adhesion of viable *S. aureus* was observed on HA-Ag surface when compared to Ti and HA surfaces. Additionally, no significant difference of osteoblast activity was observed on three different surfaces tested. Overall, it was concluded that the 1% Ag-doping on HA surfaces were non-toxic to osteoblast cells. Additionally, it was also concluded that the 1% Ag doping was effective in reducing bacterial adhesion.

Anatomy of an academic poster



Body of the poster (References/Literature Cited)

Include sources/resources that supported your work.

If someone's work is cited you must include a reference.

Generally “short”. Title is optional.

Keep the font size the same as the size of the normal body.

Format your references carefully. References that are only haphazardly formatted mark a poster, and thus you, as unprofessional and incapable of grasping the importance of details.

Yes you can use EndNote with PowerPoint

Literature cited

Bender, D.J., E.M Bayne, and R.M. Brigham. 1996. Lunar condition influences coyote (*Canis latrans*) howling. *American Midland Naturalist* 136:413-417.

Scott, E.C. 2005. *Evolution vs. Creationism: an Introduction*. University of California Press, Berkeley.

Society for the Study of Evolution. 2005. Statement on teaching evolution. < <http://www.evolutionsociety.org/statements.html> >. Accessed 2005 Aug 9.



Anatomy of an academic poster



Body of the poster (Acknowledgements)

Acknowledge the faculty and staff who supported you.

Thank people-mentor, research group, and people who provided technical assistance.

Reveal possible conflict of interest.

Identify funding agencies.

Can use smaller font.

Acknowledgements

◆ We would like to thank:

- ◆ Our mentors Dr. Stergios Roussos and Dr. Maria G. Pallavicini for their support during the long and strenuous journey of establishing ITCH.
- ◆ All participating ITCH members whose hard work has made this organization a possibility.
- ◆ All community leaders, community professionals, and UCM faculty whose devoted time and patience has been greatly appreciated and has helped with the establishment of ITCH.

Do's of preparing a poster



- Do use the same font type throughout the poster; body, and figure legends and titles and axis fonts need to be the same.
- By the same token, make sure your graphs are consistent. Use consistent axes throughout the whole poster.
- Do left justify your text within the body for the poster.
- Write “data are”, not “data is”. Data is plural, datum is singular.

Hi there, my name is mitch collinsworth and I would like to tell you about myself and how I got this job at cornell. Well you see, my uncle had a friend who knew my cousin on the other side and his daughter worked for facilities. I was down on my luck and my sister told me she knew a guy who's nephew's wife's kid worked for this guys father and what can I say, he hired

Hi there, my name is mitch collinsworth and I would like to tell you about myself and how I got this job at cornell. Well you see, my uncle had a friend who knew my cousin on the other side and his daughter worked for facilities. I was down on my luck and my sister told me she knew a guy who's nephew's wife's kid worked for this guys father and what can I say, he hired me with no questions asked and just told me to keep my mouth shut. So here I am at CCMR.

- If you are reporting a value, leave a space between the number and its unit. Write “16.0 mL”, not 16.0mL. The only units that are written without the space is “%”, “°C”, and the symbols for the degree, minute and second for angle measurements (° ' ")
- Make sure that the details on graphs can be viewed from 6 feet away. This includes the axes labels, figure legends, and numbers on axes.
- Format axis labels in sentence case. People process sentence case faster.

Do's of preparing a poster



- Complete the entire poster in a single platform. Switching from PC to Mac or Mac to PC is inviting disaster. You can lose entire images, have garbled axes, or have serious formatting issues.
- Give your graphs informative titles or phrases. In posters the titles guides the audience.
- Add miniature illustrations to your graphs if possible. Visual additions help attract and inform viewers more effectively than text alone.
- If you include photographs, add a thin line of gray or black as a border to make them stand out against the background.

Don'ts of preparing a poster



- Don't use illegible fonts like *commercial script*, or *brushscript*
- Don't use fonts smaller than 16 pints.
- Don't vary the width of the text boxes (It is visually distracting)
- Don't clutter the top of your poster with logos. If you are required to put a logo on your poster put it at the bottom and put it small.

Put logos at the top of your poster to ruin poster aesthetics, reduce legibility of title, and undermine the ability of your graphs to visually compete for viewers' attention

Colin Purrington
666 Teipai Street, Posterville, PA 19801, USA

Introduction
This poster has multiple logos at the top. The logos are distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster. The logos are also distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster.

Materials and methods
This poster has multiple logos at the top. The logos are distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster. The logos are also distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster.

Results
The poster has multiple logos at the top. The logos are distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster. The logos are also distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster.

Conclusions
The poster has multiple logos at the top. The logos are distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster. The logos are also distracting and clutter the top of the poster. The logos are also illegible and do not add any value to the poster.

References cited
1. Smith J, Jones K, Brown L. 2010. The effects of multiple logos on poster readability. *Journal of Visual Communication*, 10(1), 1-10.
2. Doe A, Lee B, Kim C. 2011. The impact of logo placement on poster aesthetics. *Poster Presentation at the Annual Meeting of the American Psychological Association*, Washington, DC.

Acknowledgments
The author would like to thank the following individuals for their assistance in the preparation of this poster: Dr. John Doe, Dr. Jane Smith, and Dr. Bob Brown.

Further information
For more information on this topic, please contact the author at: Colin.Purrington@posterville.edu

The flow...



- Start with an intro that will catch them.
- Move to methods, briefly summarize.
- Move to results, briefly summarize. Walk through all figures.
- Transition to conclusions.
- Acknowledge people and agencies.
- It is acceptable to number your panels for other people to follow easily.

UNIVERSITY OF MIAMI
MILLER SCHOOL OF MEDICINE

Creation of a Unique Glucose Biosensing Element: Harnessing the fluorescence of the non-natural Amino Acid 7-Azatriptophan

Trajen Head, Jennifer Lee, Jeffrey Glusker
Department of Biochemistry & Molecular Biology,
University of Miami Miller School of Medicine

Start here

Glucose Binding Protein (GBP)

- Proteins: Binding Protein (GBP) found in gram-negative bacteria, specifically *E. coli*
- Two globular lobes attached to a central hinge surrounding glucose-binding pocket
- W64-type protein possesses an affinity for glucose of 0.21 μM
- Mutant GBP_{AW} (81 μg² mutant)
- Expressed in ATCC 49819 (*E. coli* host strain)

Protein Purification

- Protein expression in *E. coli* involves six fractions (cell-free, supernatant, and cell debris)
- This "His-tag" protein with Nickel ions (Ni²⁺) is a metal affinity chromatography column to separate the target protein from other cellular proteins
- Once target protein is "bound" to Ni column, it is removed using imidazole (pH 8)
- Imidazole is a known quencher of TRP fluorescence and must be removed
- Purification can be achieved through dialysis or by Size Exclusion Chromatography

Non-natural Amino Acids

- Only 20 amino acids used in natural protein synthesis
- In fundamental research efforts can't be used
- Some natural amino acids may have unique properties
- 7-Azatriptophan similar to tryptophan in structure
- Proteins: distinct, intrinsic fluorescence ($\lambda_{exc} = 280 \text{ nm}$, $\lambda_{em} = 350 \text{ nm}$)

Protein Expression

- Because non-natural amino acids are to be incorporated, standard growth media cannot be used
- My Medical Media solution supplemented with additional necessary nutrients used
- ATCC 49819 incapable of synthesizing tryptophan (TRP) which can be used as a growth control mechanism

Mass Spec Results

Protein	Peptide Sequence	Mass	Mass in GBP	Delta Mass
GBP _{AW}	GAADGTVN	1545.72	1546.73	1.01
UNEXP	EDKDAKUSGPNR	1438.67	1442.68	2.01

Protein Analysis

- Circular Dichroism (CD) analysis shows that the structure of GBP_{AW} is largely unchanged from the wild-type GBP_{WT} (shown left)
- Thermal stability analysis of GBP_{AW} indicates a slight stabilization of the protein after 7AW incorporation (shown right)
- A glucose dose response curve was created using a range of glucose concentrations spanning the physiologically relevant range (0-200 mM glucose) (shown right) (below)
- Results of glucose dose response curve indicate a $K_{0.5}$ of GBP_{AW} at approximately 0.2 mM glucose (compared to wild-type GBP $K_{0.5}$ of 0.21 μM)

Future Work

- 7AW fluorescence intensity much less than natural TRP
- Could lead to difficulty in detection/analysis of glucose binding
- 6-Azatriptophan (6AZ) can be used to synthesize a different TRP analogue, 6-azatriptophan
- 6AZ has been shown to have a greatly enhanced fluorescence intensity when compared to other TRP or 7AW, but requires further research

Acknowledgments

The author would like to thank the following institutions for their funding:

- NASA
- NSF
- NSF

Software utilized for protein analysis:
Molecular Operating Environment (MOLDO)
Biochemical Web Tools (BioWeb)
UCSF Chimera

Screenshots of posters are courtesy of Dr. Trajen Head

“Do’s” During Presentation



◆ Make sure you have prepared a 2-sentence overview of why your research is interesting and relevant.

◆ Avoid vagueness. Say “our findings showed that the size of the nanoparticles are directly correlated with the concentration of starting materials” instead of “The results are shown here”

◆ Keep a plastic cup of candy with your poster. People love candy.



◆ If you have unpublished data or a research that can be viewed as offensive to non-scientists attach a “Please do not photograph” note on the poster.



◆ Use your fingers or a pointer to point to specific parts of your poster.

◆ Thank your viewers for visiting.

“Don’ts” During Presentation



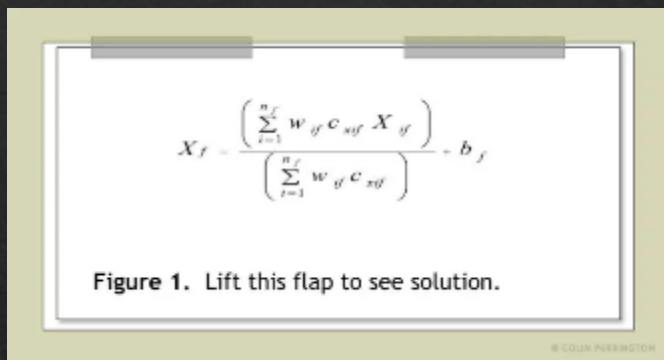
- ◆ Do not refer to notes when presenting your poster.
- ◆ Do not eat, chew gum or tobacco.
- ◆ Do not put your hands in your pockets.
- ◆ Do not wear heavy scents. Or also do not have offensive body odor.



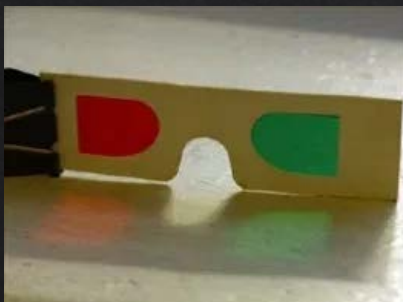
Some Tips to Make Your Poster Stand Out from Others



- ◆ Use a hidden panel approach.



- ◆ If you have 3D-data or complex molecular structure make 3D images and have cheap 3D glasses.



- ◆ If your topic is related to a thing or an object attach it. For example if you have 3D printed housings for smart phones bring one with you.
- ◆ If you wish to present movies attach an Ipad or an I phone. Alternatively put your video online and attach a QR code on your poster.



- ◆ Other ways of improving posters include attaching sounds (Ipad or sound postcard), odors (odor sample bags), you can even use a virtual reality content using a VR goggles and smartphones.

Just in Case Items



◆ Carry your poster with you at all times...



Do not leave as checked baggage

◆ Make sure you have with you...

◆ Be there on time



◆ Dress for situation



Wear comfortable shoes

Be there at least 15 minutes before the posters are supposed to hang



Mini Posters



Heavy Duty Push pins



Water



Business Cards



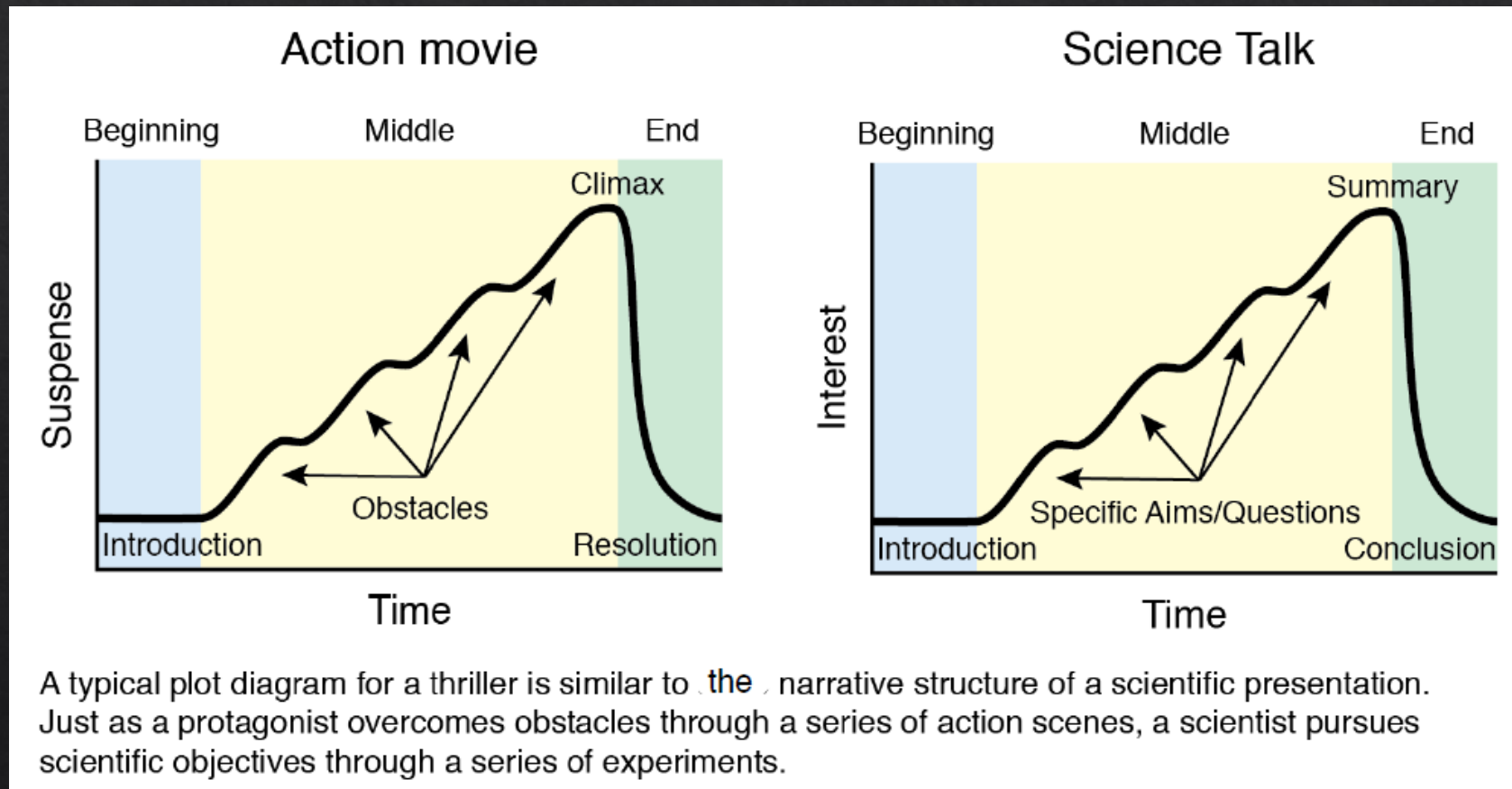
Notepad and a pen





Design a good, logical structure/narrative

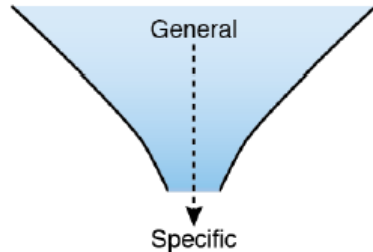
Make sure your scientific talk a story with a beginning, middle and end.



Design a good, logical structure/narrative



Start and end your talk with the big picture.



A good science talk starts with a general question and becomes progressively more and more specific until the speaker asks a unique scientific question.

General

How is the Earth's climate affected by global warming?

As the earth warms, some regions demonstrate anomalous cooling.

Is the decrease in Arctic sea ice in autumn linked to increases Northern Hemisphere snow in the winter?

Specific

General

What are the molecular mechanisms behind the aging process?

In sexual animals that don't self-replicate, telomere shortening correlates with cell senescence.

Is telomere maintenance different in sexual animals and asexual animals that do self-replicate?

Specific

General

How do chemicals cycle through the environment?

Isotopes of iodine play significant environmental roles.

How does ^{131}I cycle throughout terrestrial ecosystems?

Specific



A good science talk ends by progressing from specific conclusions to more and more general statements, placing results in a broader context.

Specific

We showed how ATP binding triggers activation of a P2X receptor.

This mechanism explains many experimental findings and provides insight for the future design of antagonists.

Our methods can be universally applied to other ion channels involved in various physiological processes.

General

Specific

We determined the three-dimensional structure of the IRES subdomain IIa in complex with a benzimidazole translation inhibitor.

Our findings will be a valuable starting point for structure-based designs of HCV inhibitors.

Such drugs may lead to the development of anti-HCV drugs for infected individuals worldwide.

General

Specific

We showed that hatchery pink salmon were larger and grew faster than wild pink salmon during the first summer at sea.

Differences in growth rate may indicate variable growing conditions or food consumption.

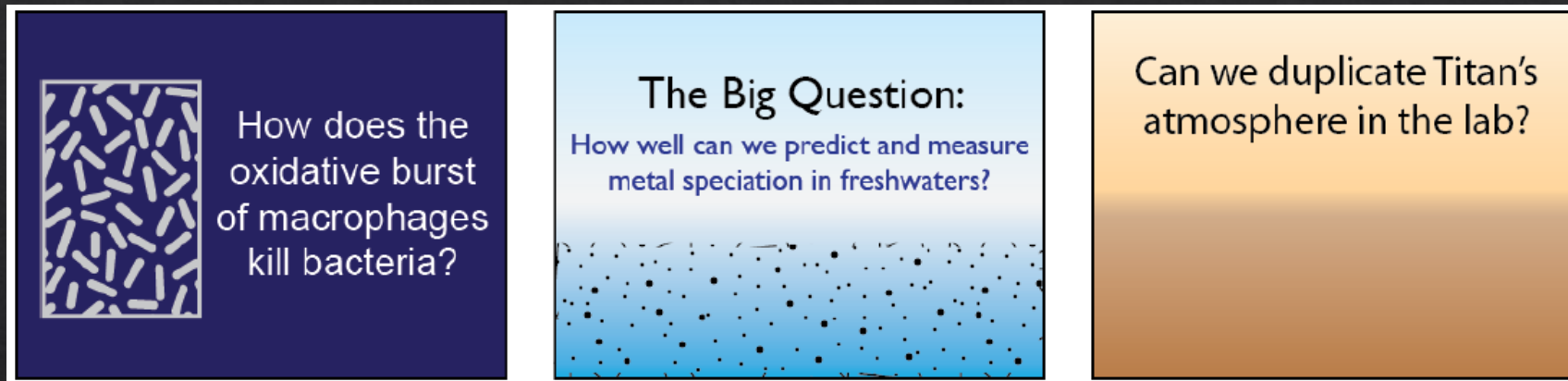
Evidence of competition could indicate that carrying capacity has been reached for the ecosystem.

General

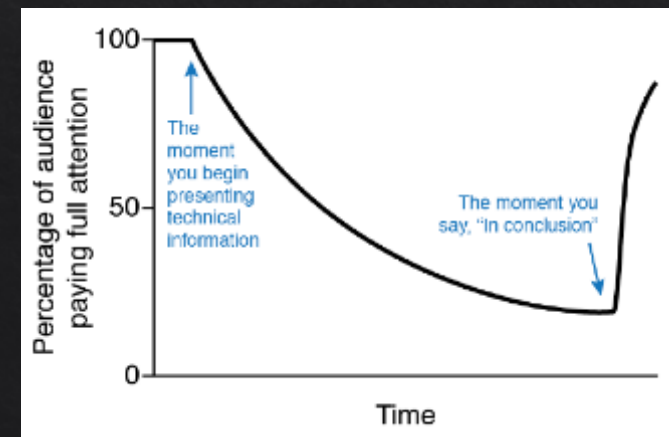
Design a good, logical structure/narrative



- ◆ Inform your audience why they should care about your subject.
- ◆ Somewhere near the beginning of your talk, clearly state your scientific research question and goal/hypothesis.



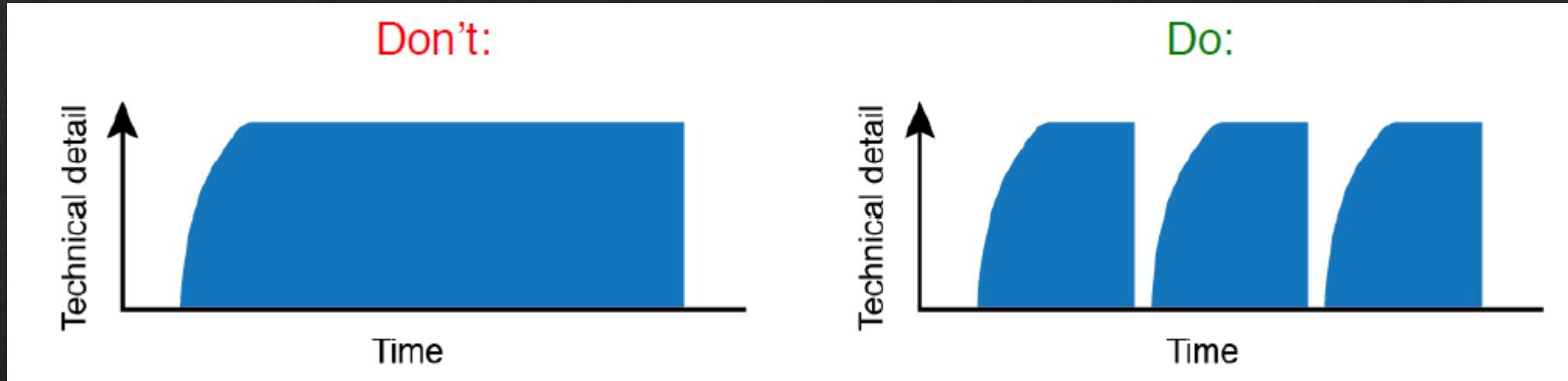
- ◆ For longer talks, prepare for the inevitable shifts in audience attention.



Design a good, logical structure/narrative



- ◆ For longer talks (30-60 min) break up detailed information by occasionally “coming up for air”, summarizing what you have said and introducing new concepts.



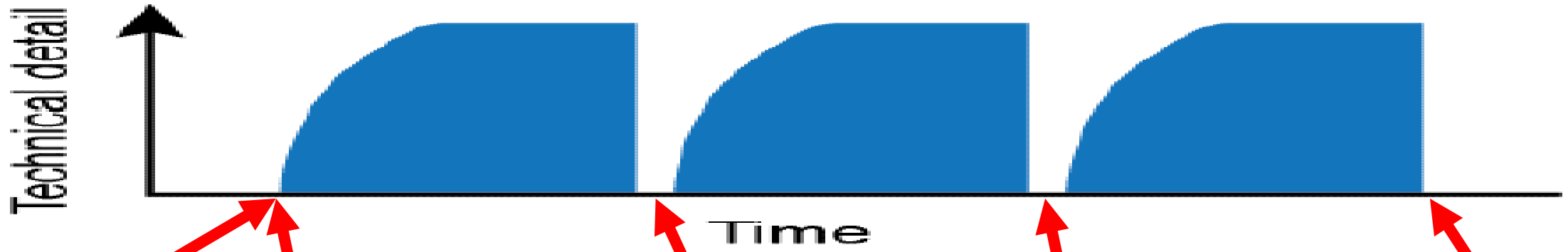
- ◆ Unite sections of a 30-60 minute talk using a “home slide.”



Design a good, logical structure/narrative



Do:



Talk title or general theme

Sea turtle bycatch in the Eastern Pacific Mahi Mahi longline fishery



Photo or diagram that represents the talk

1. Fishing impacts on sea turtle populations
2. Reducing bycatch: do circle hooks work?
3. Convincing fishers and governments to adopt improved gear

Outline of talk

Main point 1

Sea turtle bycatch in the Eastern Pacific Mahi Mahi longline fishery



1. Fishing Impacts on sea turtle populations
2. Reducing bycatch: do circle hooks work?
3. Convincing fishers and governments to adopt improved gear

Main point 2

Sea turtle bycatch in the Eastern Pacific Mahi Mahi longline fishery



1. Fishing impacts on sea turtle populations
2. Reducing bycatch: do circle hooks work?
3. Convincing fishers and governments to adopt improved gear

Main point 3

Sea turtle bycatch in the Eastern Pacific Mahi Mahi longline fishery



1. Fishing impacts on sea turtle populations
2. Reducing bycatch: do circle hooks work?
3. Convincing fishers and governments to adopt improved gear

Talk title or general theme

Sea turtle bycatch in the Eastern Pacific Mahi Mahi longline fishery




Photo or diagram that represents the talk

1. Fishing impacts on sea turtle populations
2. Reducing bycatch: do circle hooks work?
3. Convincing fishers and governments to adopt improved gear

Outline of talk

Design a good, logical structure/narrative



For every result (e.g. graph, table chart), present a brief rationale, statement of methods explanation and conclusion.

“Next, we wondered whether FOXO3 directly binds to the NPY promoter. To test this hypothesis, we used a chromatin immunoprecipitation assay. This assay involves using an antibody to bind to and purify a protein of interest (in this case, FOXO3), then uses PCR techniques to amplify any DNA that is bound to the protein. We found that the NPY promoter was indeed bound to FOXO3, supporting our hypothesis that FOXO3 binds and interacts with the NPY promoter”

◆ End your talk while showing a summary diagram.

A link between ephrins and Vav2

- Eph receptors interact with Vav2
- ephrin stimulation of Eph causes phosphorylation of Vav2

A glycoprotein inhibitor of pectin methylesterase in kiwi fruit (*Actinidia chinensis*)

- Interacts with pectin methylesterase
- 28 kDa glycoprotein
- Inhibits other sources of enzyme

The Optogenetic Toolkit

CRFQ
Stop Function Opines
ChR2, ChR1, ChR3, ChR4, VQR1

MPR1, mCherry, eYFP, mCherry 2
AP-3
Nuc
BRL eSR




Manipulating Endogenous Genes

Stage of information flow	Methods of manipulation
DNA	Gene targeting (knockout, knockin, conditional knockout)
mRNA	RNAi, antisense, microRNA
Protein	Antibody depletion

Design a good, logical structure/narrative



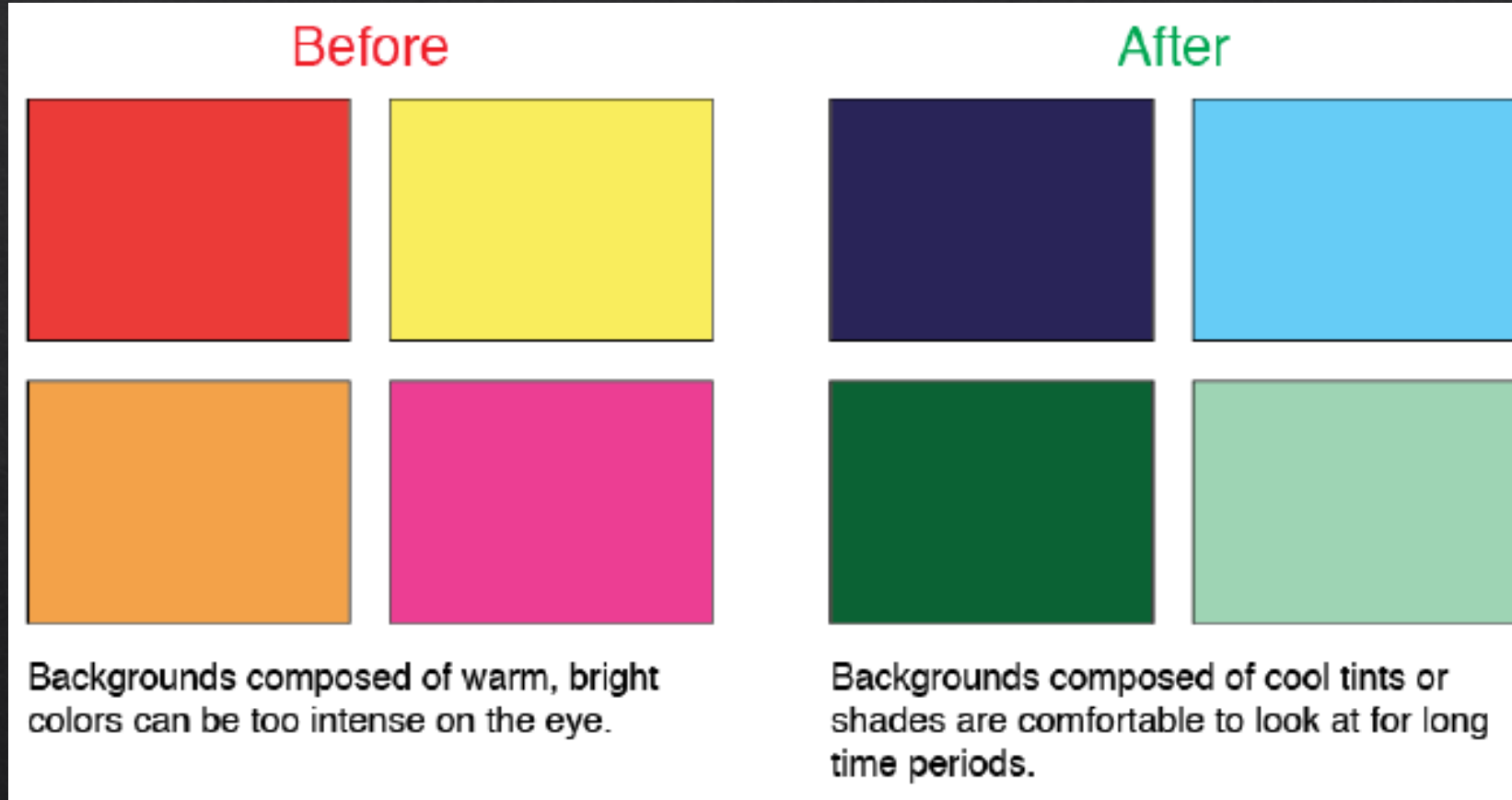
Deliberately emphasize one to three take-home messages.

<p>Key Point #1</p> <p>Nrf-2 is expressed in mesenchymal stem cells</p> 	<p>If you only remember one thing....</p>  <p>Elephants are capable of vocal learning</p>	<p>Overall Result:</p> <p>We developed a method to culture mature astrocytes</p> 
---	---	---

Design visually appealing slides that easily communicate information



The best backgrounds are simply that: backgrounds that, by themselves, lack visual content.



Pro Tip: Use a white slide background for a small room and use a black slide background in a relatively large room.


Design visually appealing slides that easily communicate information



Add design instead of a decoration.

Before

The ChIP assay








- 🌀 Crosslink proteins to DNA
- 🌀 Sonicate to shear DNA
- 🌀 Immunoprecipitate with antibody to protein
- 🌀 Reverse crosslinks and purify DNA
- 🌀 Run PCR using primers for DNA of interest

After

Chromatin immunoprecipitation

Used to determine if a protein interacts with a specific region of DNA

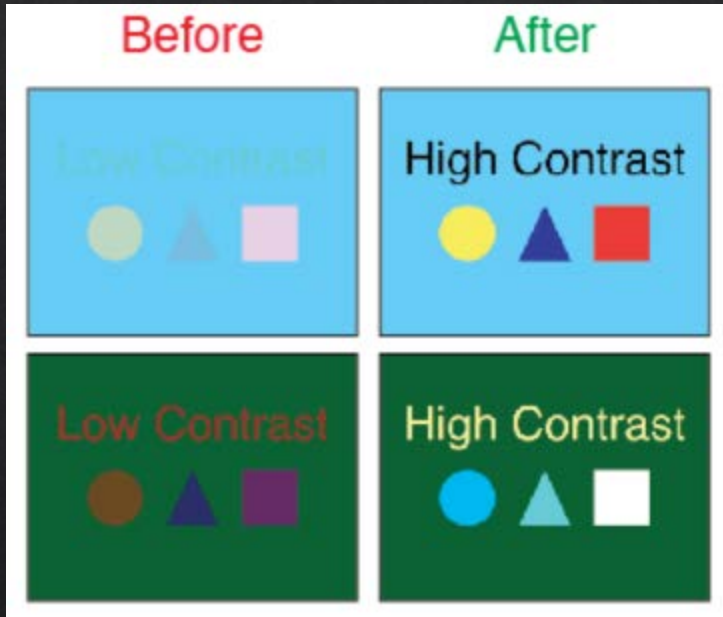
1. Crosslink proteins to DNA 
2. Sonicate to shear DNA 
3. Immunoprecipitate with antibody to protein 
4. Reverse crosslinks and purify DNA 
5. Run PCR using primers for DNA of interest 

Cute pictures may help fill a slide with “stuff,” but designing a slide to communicate with your audience adds meaning, value, and utility

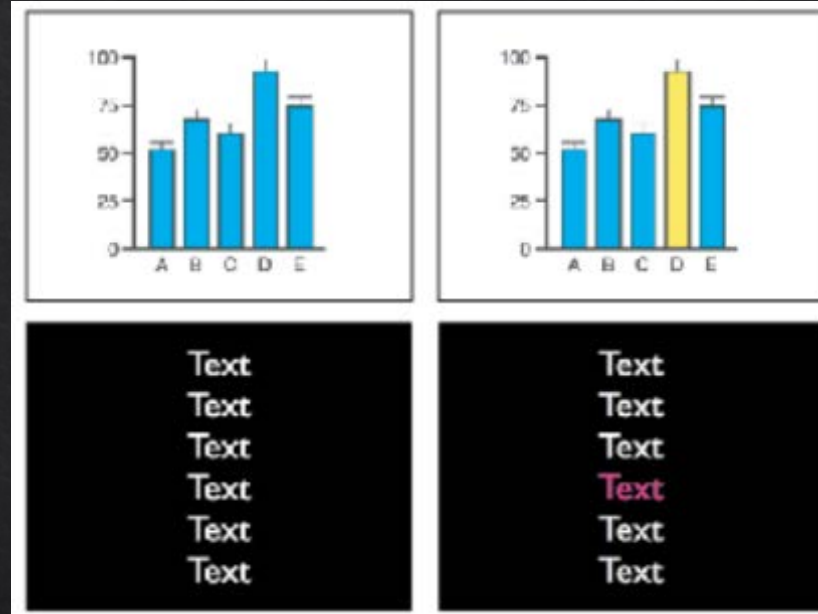
Design visually appealing slides that easily communicate information



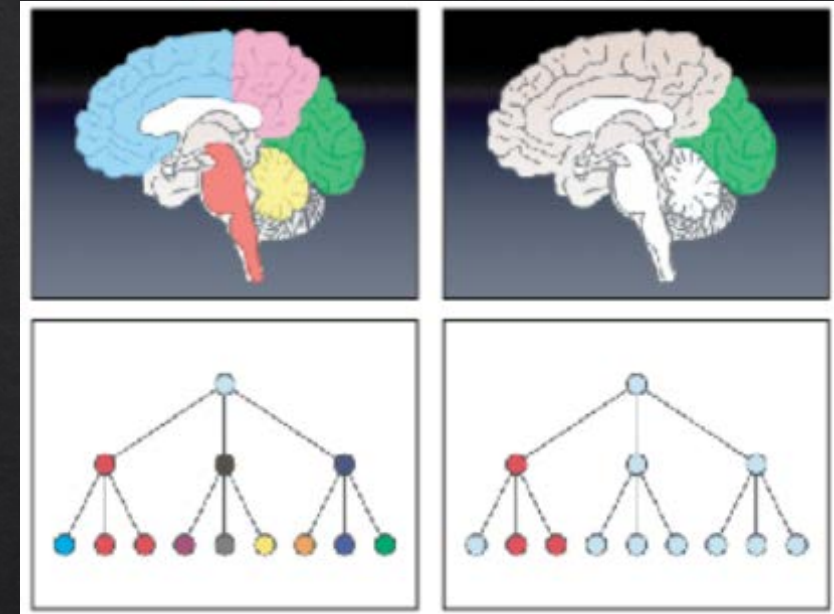
Use color wisely.



Ensure there is high contrast between your foreground and background colors



Use color to emphasize important information.



Use color sparingly so the audience knows what to look at.

Ensure everything on your slide is easy and comfortable to see. Instead of using color to decorate, use color to emphasize what is most important.

Design visually appealing slides that easily communicate information



Use a sans serif font.

Serif fonts have slight projections that finish off the stroke of a letter. This can be helpful in a written document or a book, but a sans serif font is easier to read on a slide projected onto the screen. Commonly used sans serif fonts include:

Calibri
Century Gothic
Gill Sans
Helvetica
Myriad Pro
Tahoma
Verdana

Design visually appealing slides that easily communicate information



Ensure that all text is easy for the audience to read.

On a slide, it is harder to read underlined words or words in ALL CAPS

If you want to emphasize a word, use **bold letters** or *italics*

The font size should be large enough to be seen in the back of the presentation room (20-36 pts.)

It is OK to use a smaller size font for the citations and foot notes but they still should be legible in the back row.

Design visually appealing slides that easily communicate information



Keep text on a slide to an absolute minimum.

A common mistake....

- How many times have you seen a slide like this? Probably too often.
- The use of too much text on one slide is so common that many of us don't even think to question it.
- If presenters are going to write out everything they are going to say during their delivery, then what is the point of attending their presentations? They might as well send their slides to us over email and we can read them whenever we want.

....but no less annoying.

- Seriously, slides like this are awful. Especially when every slide in the entire presentation looks like this.
- Too much text on a slide is one of the top reasons why audiences stop paying attention.
- One hundred years ago, movie studios realized that silent movies shouldn't contain too much dialogue because audiences didn't enjoy reading text on a screen. You'd think we would have learned the same concept in slide presentations by now....

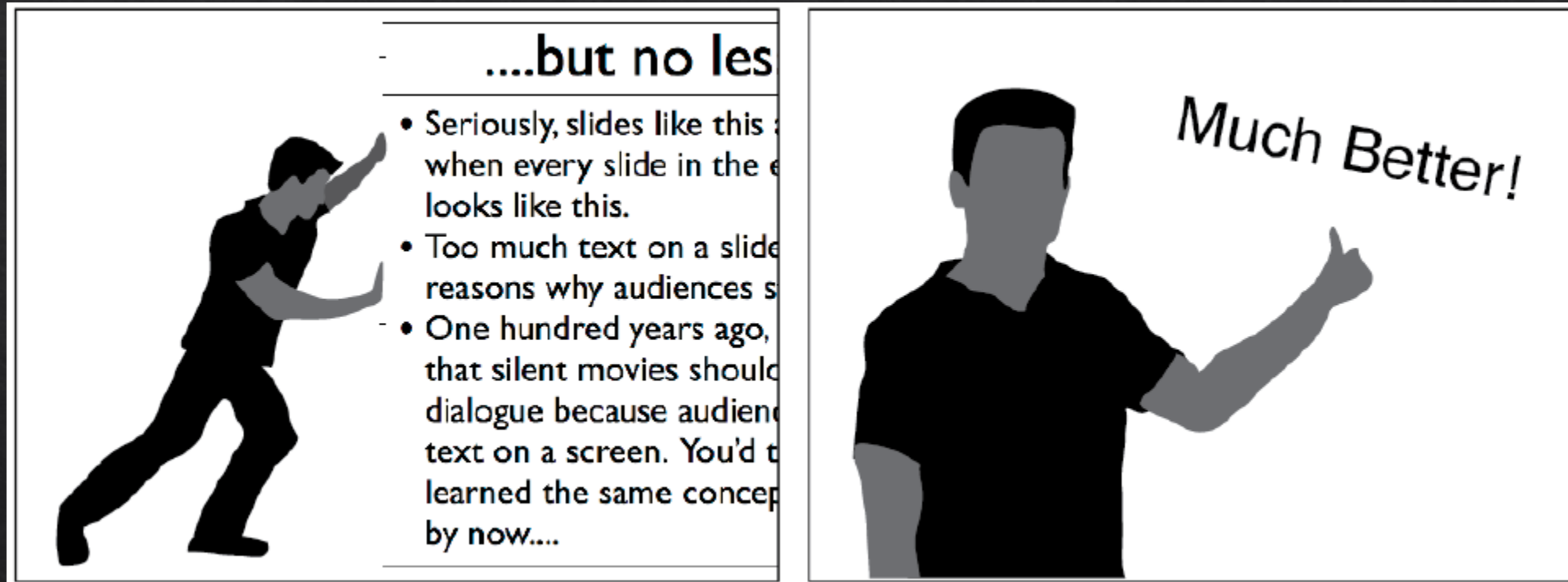
Limit yourself to only two lines of text for any single title, bullet point or statement on a slide.

Limit the total amount of text to only about one fourth of the total area of the slide.

Design visually appealing slides that easily communicate information



Keep text on a slide to an absolute minimum.

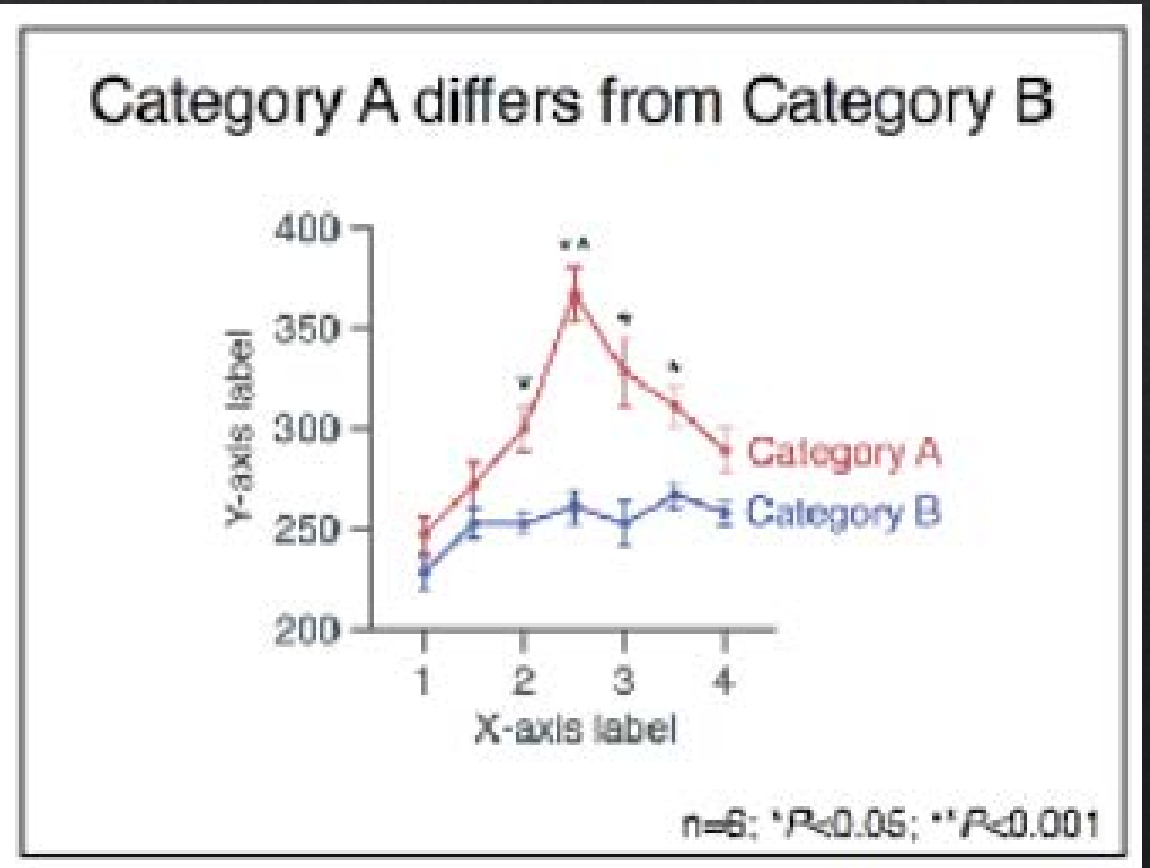
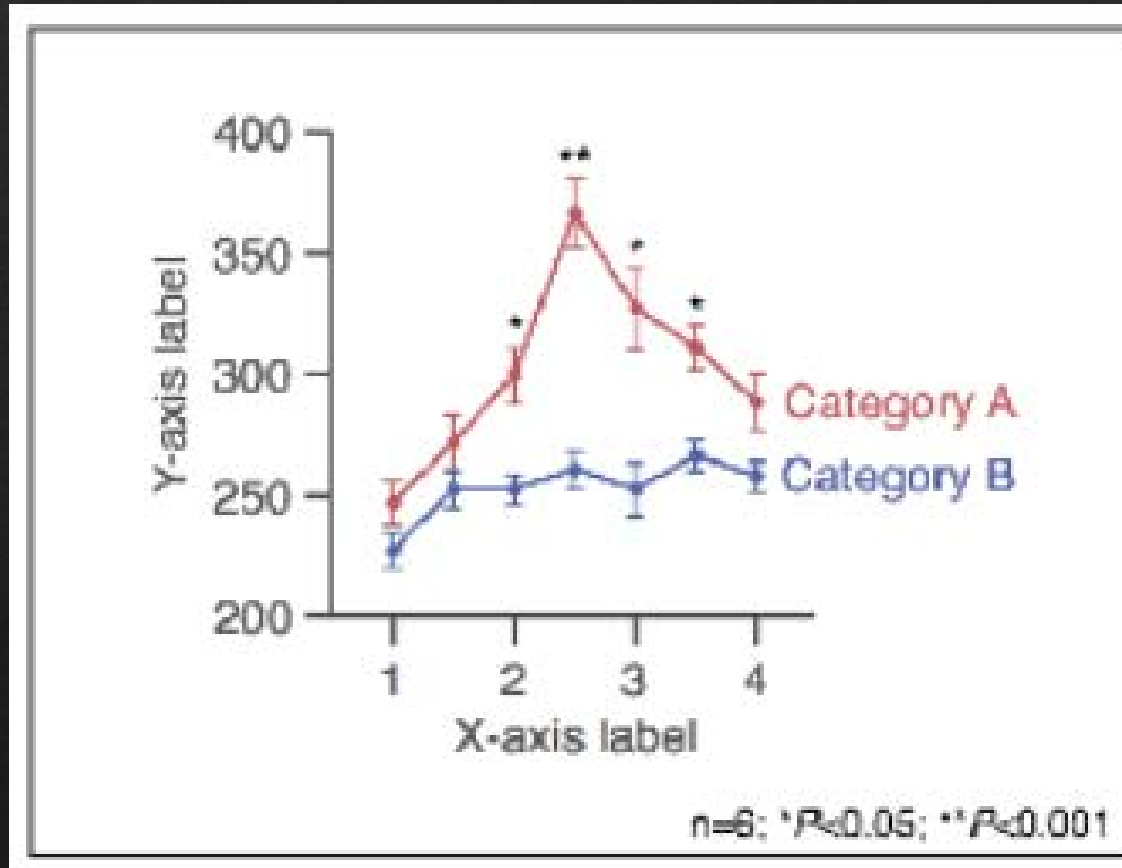


Give yourself a goal of including at least one image in every slide.

Design visually appealing slides that easily communicate information



Use slide titles to make a point



Use a title to make a point, such as when presenting results, background information, ideas, etc.

Design visually appealing slides that easily communicate information



Use slide titles to make a point

<h2>Background</h2> <p>Infants with more experiences of stroking or cuddling:</p> <ul style="list-style-type: none">Cry less oftenVocalize moreSmile more 	<h2>Infants benefit from positive touch</h2> <p>Infants with more experiences of stroking or cuddling:</p> <ul style="list-style-type: none">Cry less oftenVocalize moreSmile more 
---	---

Don't use generic words or phrases like "Background", "Results" or "Conclusion". Instead try to be specific about the larger point you want to emphasize.

Design visually appealing slides that easily communicate information



Use slide titles to make a point

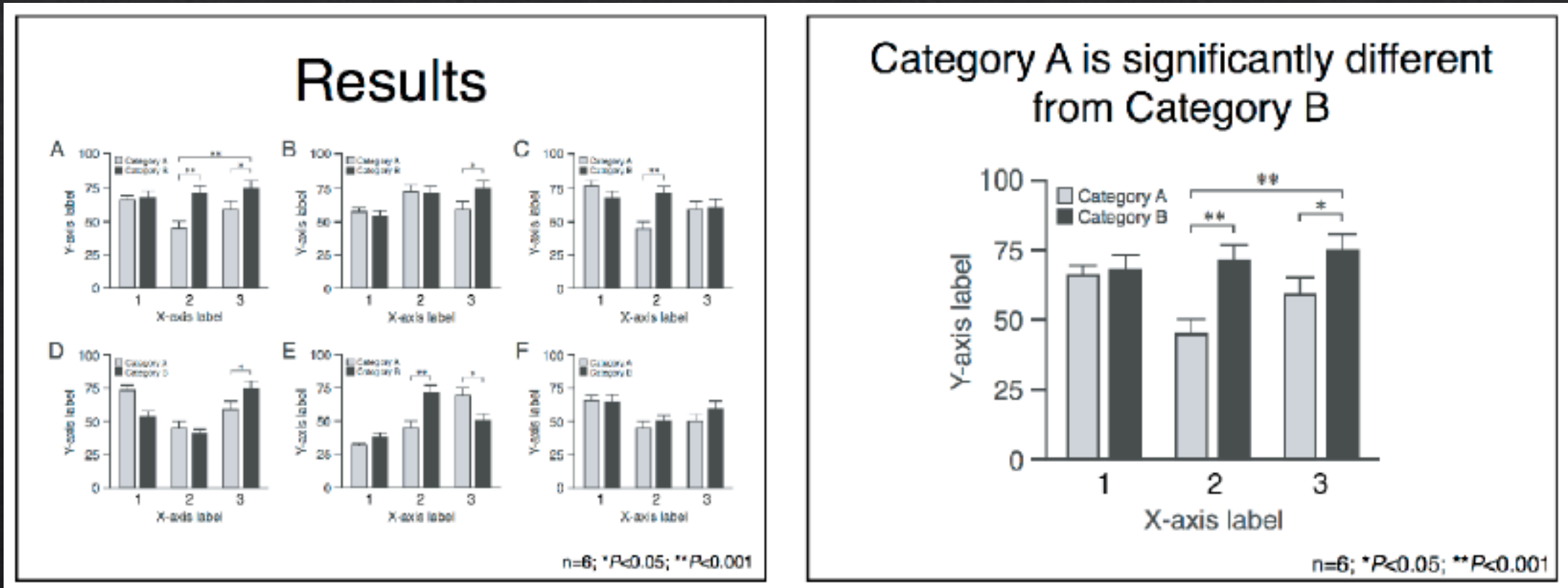


Don't use a title when the contents of a slide are obvious and you don't need to emphasize a point.

Design visually appealing slides that easily communicate information



Try to make only one point per slide

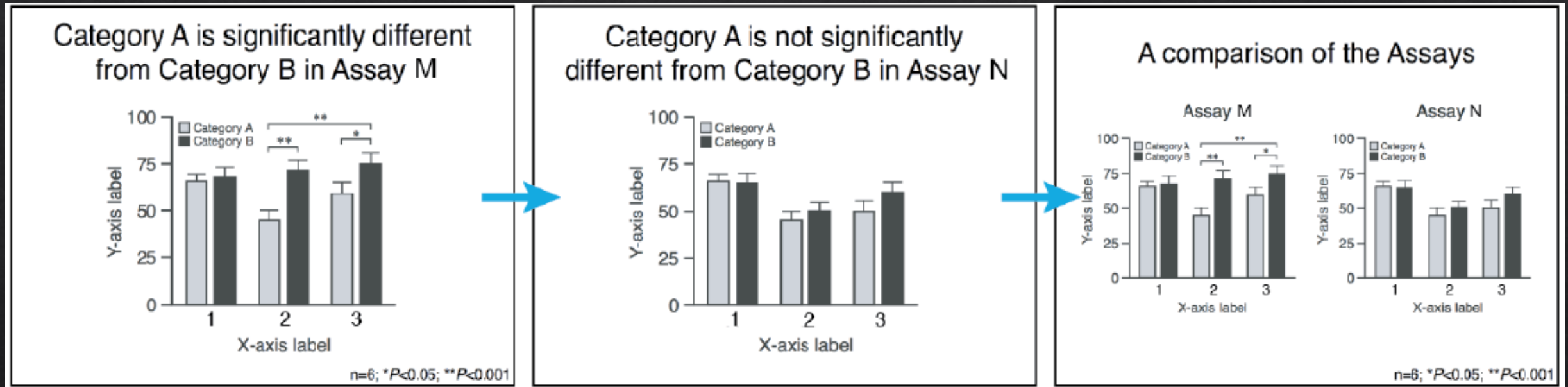


Audiences can only reflect meaningfully on one piece of information at a time. Therefore, try to only show one chart or figure per slide unless you have a good reason not to do so.

Design visually appealing slides that easily communicate information



Try to make only one point per slide



If you want to present two or more figures for side by side comparison or discussion, consider presenting them individually at first and then grouping them together afterwards.

Design visually appealing slides that easily communicate information



Use the best photos/images for talks.



If the photograph is high enough resolution, consider enlarging the photo to fill the entire slide to increase the impact.

Design visually appealing slides that easily communicate information



Use the best photos/images for talks.

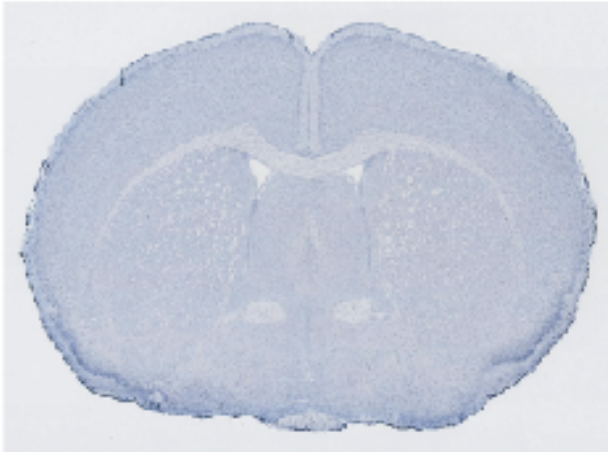


Design visually appealing slides that easily communicate information

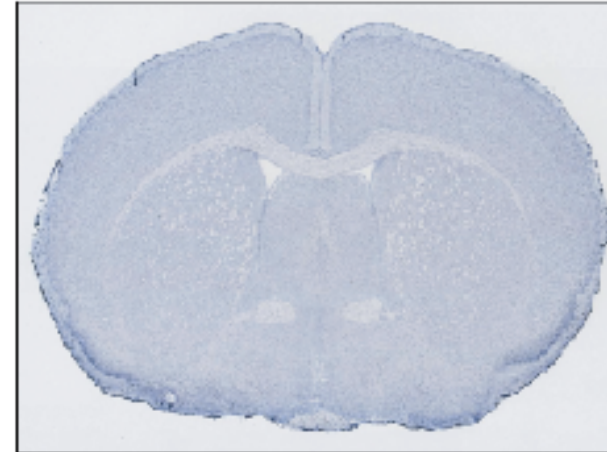


Use the best photos/images for talks.

The striatum is located
in the forebrain



The striatum is located
in the forebrain

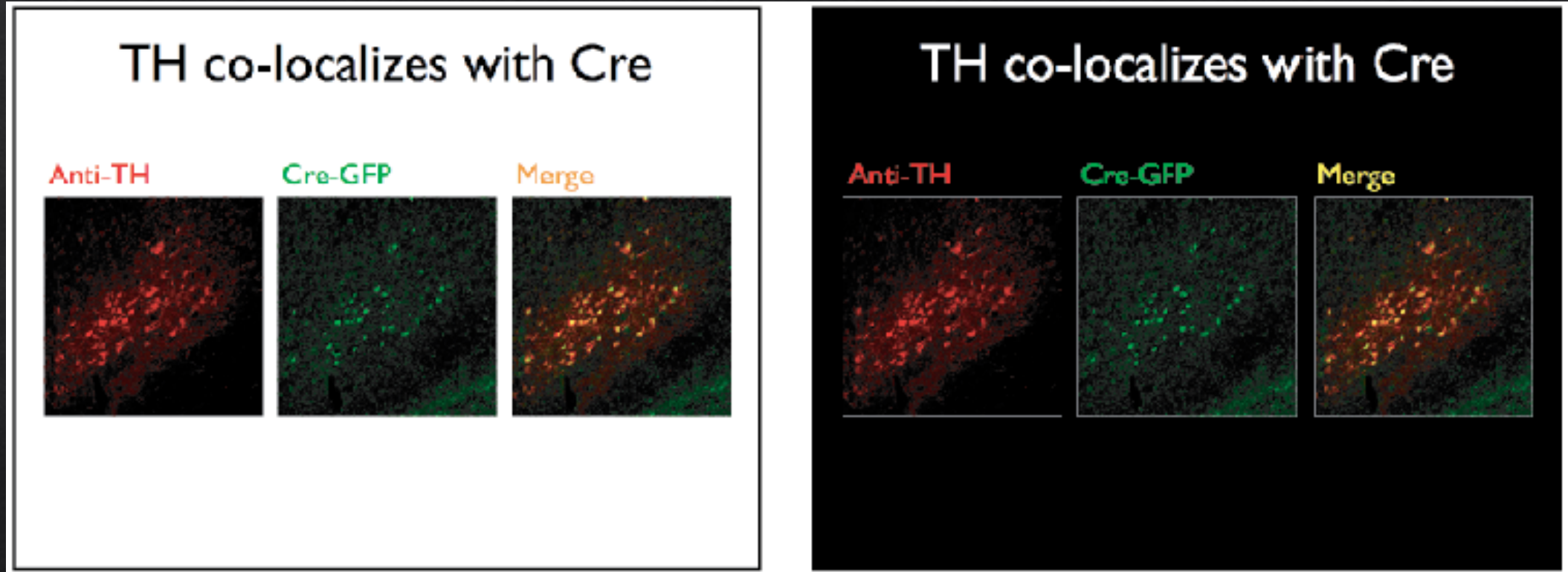


If a photograph does not fill the entire slide, place it within a minimal frame so that it stands out from the background.

Design visually appealing slides that easily communicate information



Use the best photos/images for talks.

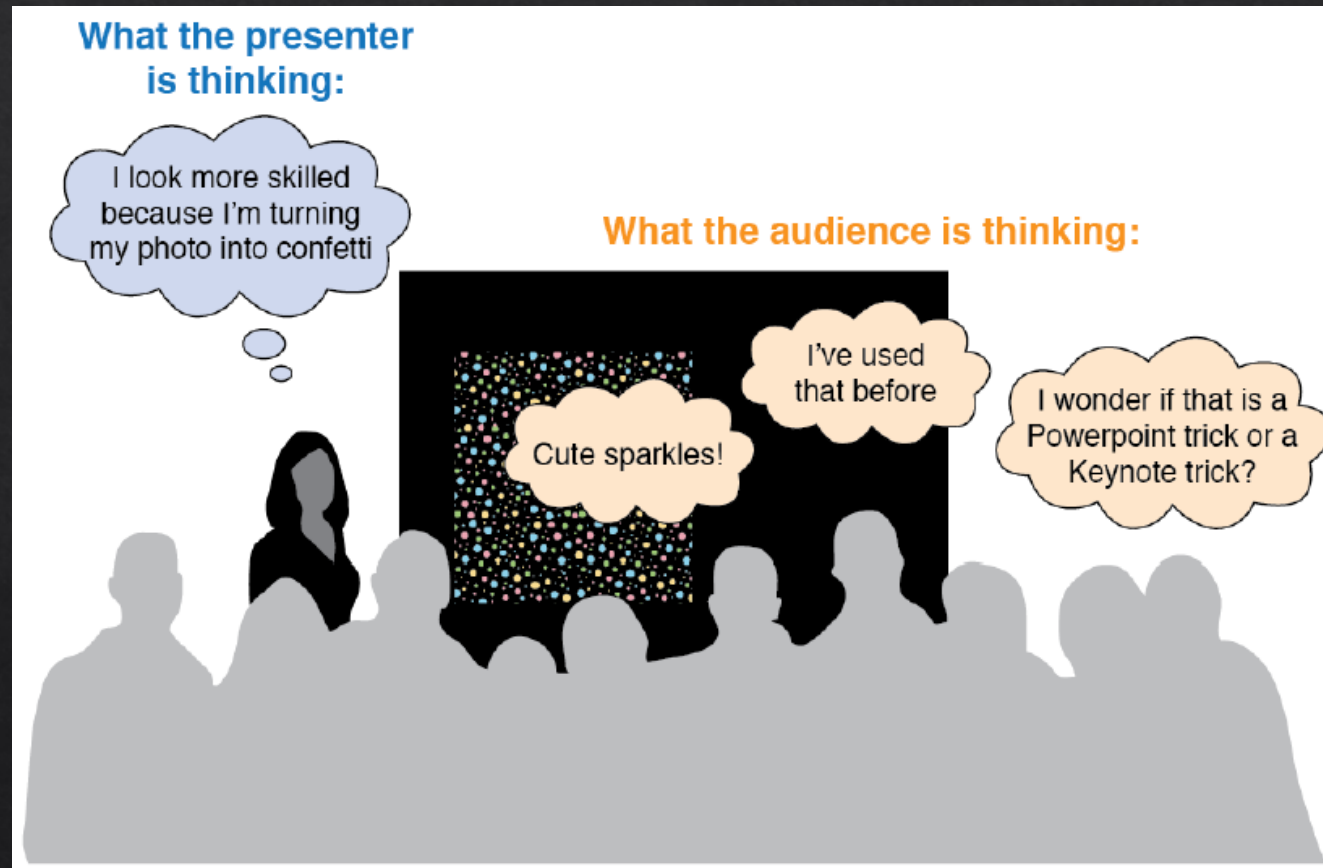


When presenting fluorescent images, use a dark background so that the fluorescent signal is the brightest aspect of the visual scene..

Design visually appealing slides that easily communicate information



Use animation and slide transitions wisely.

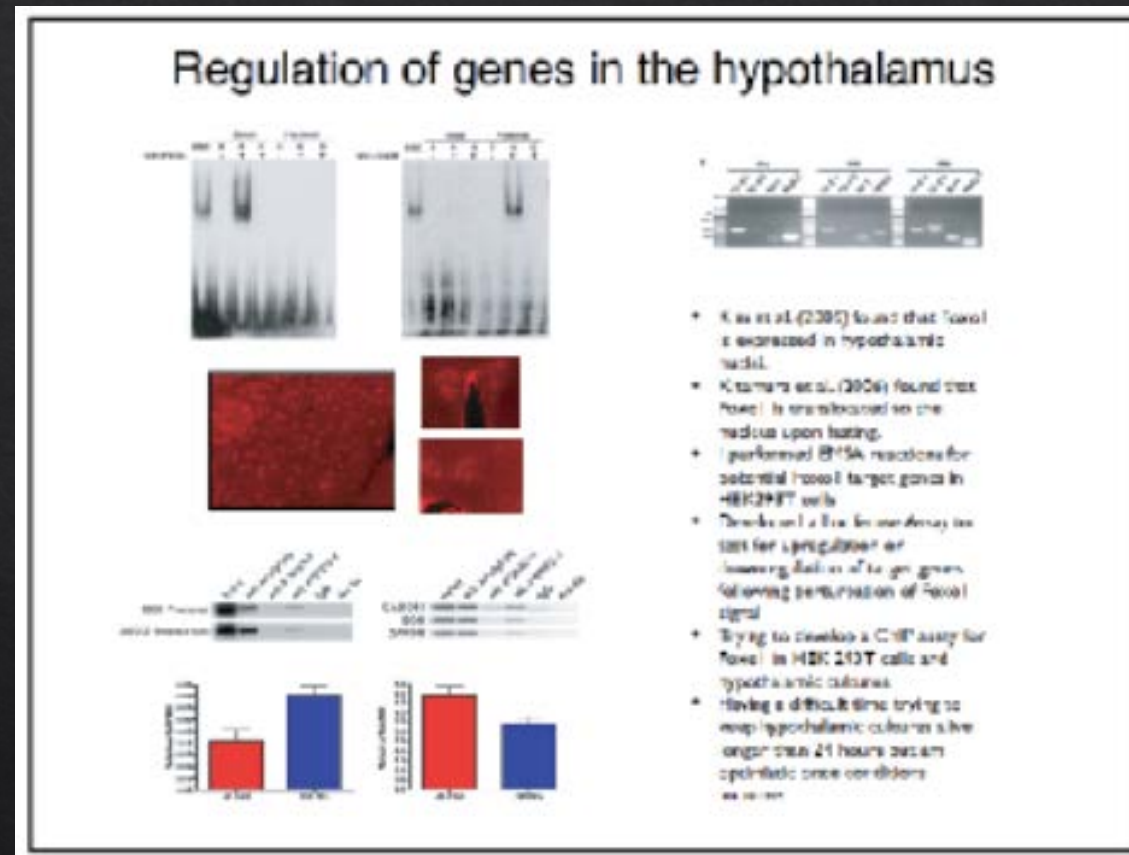


What the audience is *not* thinking about: **your message**

Design visually appealing slides that easily communicate information



Strive for a simple slide layout that instantly communicates information.

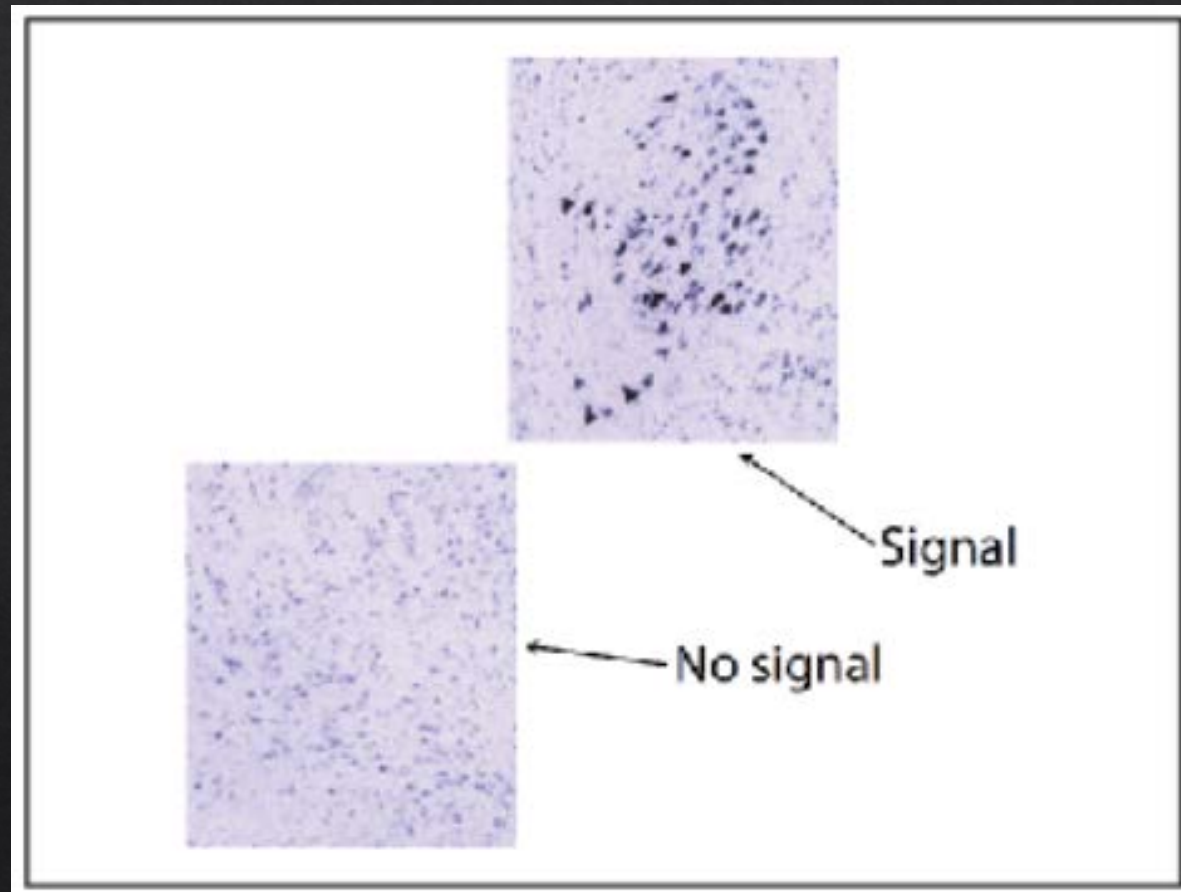


Too busy and overwhelming

Design visually appealing slides that easily communicate information



Strive for a simple slide layout that instantly communicates information.



Too random and chaotic

Design visually appealing slides that easily communicate information



Strive for a simple slide layout that instantly communicates information.

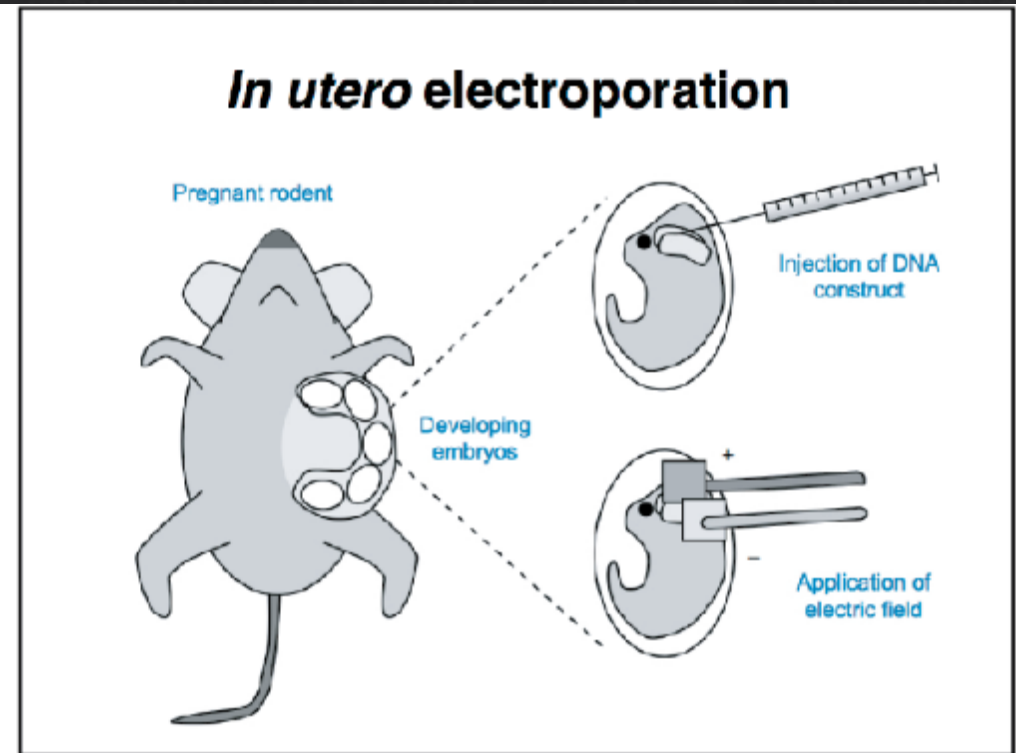
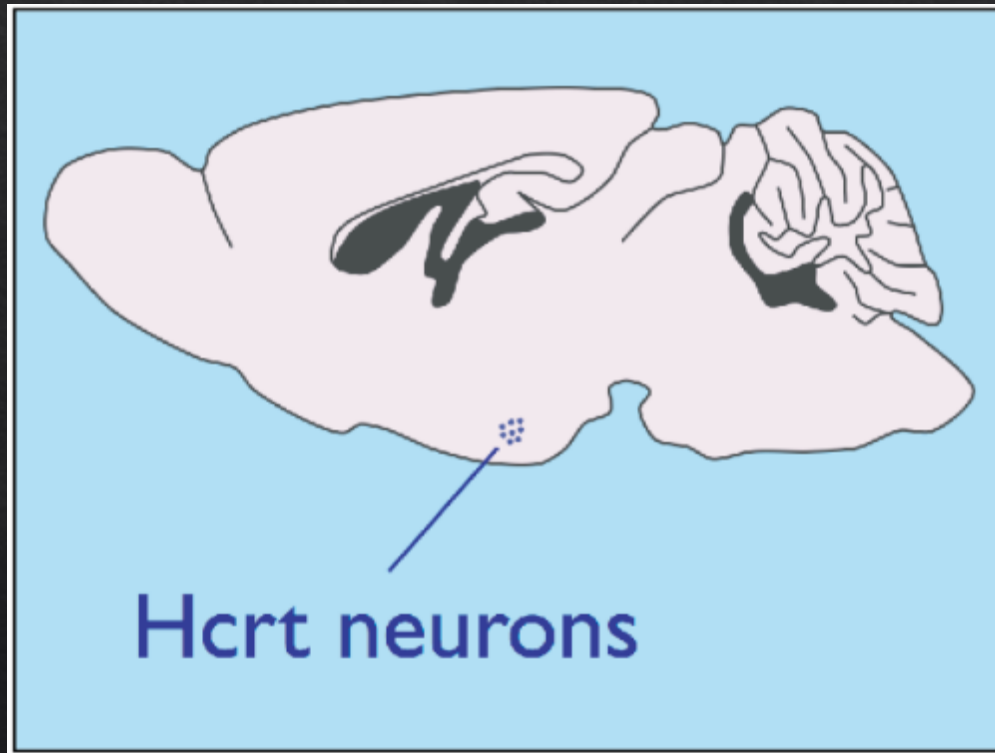
- Is it possible to crystallize the ADC-3 protein?

Too sparse and asymmetric (and why use a bullet?)

Design visually appealing slides that easily communicate information



Try to produce the most simple, easy-to-read slides possible.



The old maxim, “less is more” truly holds for slides. Putting less content on a slide add greater impact to the information that you choose to show, increasing the clarity of your message and simplicity of your delivery.



Rehearse and practice for a good delivery

Rehearse as much as possible.

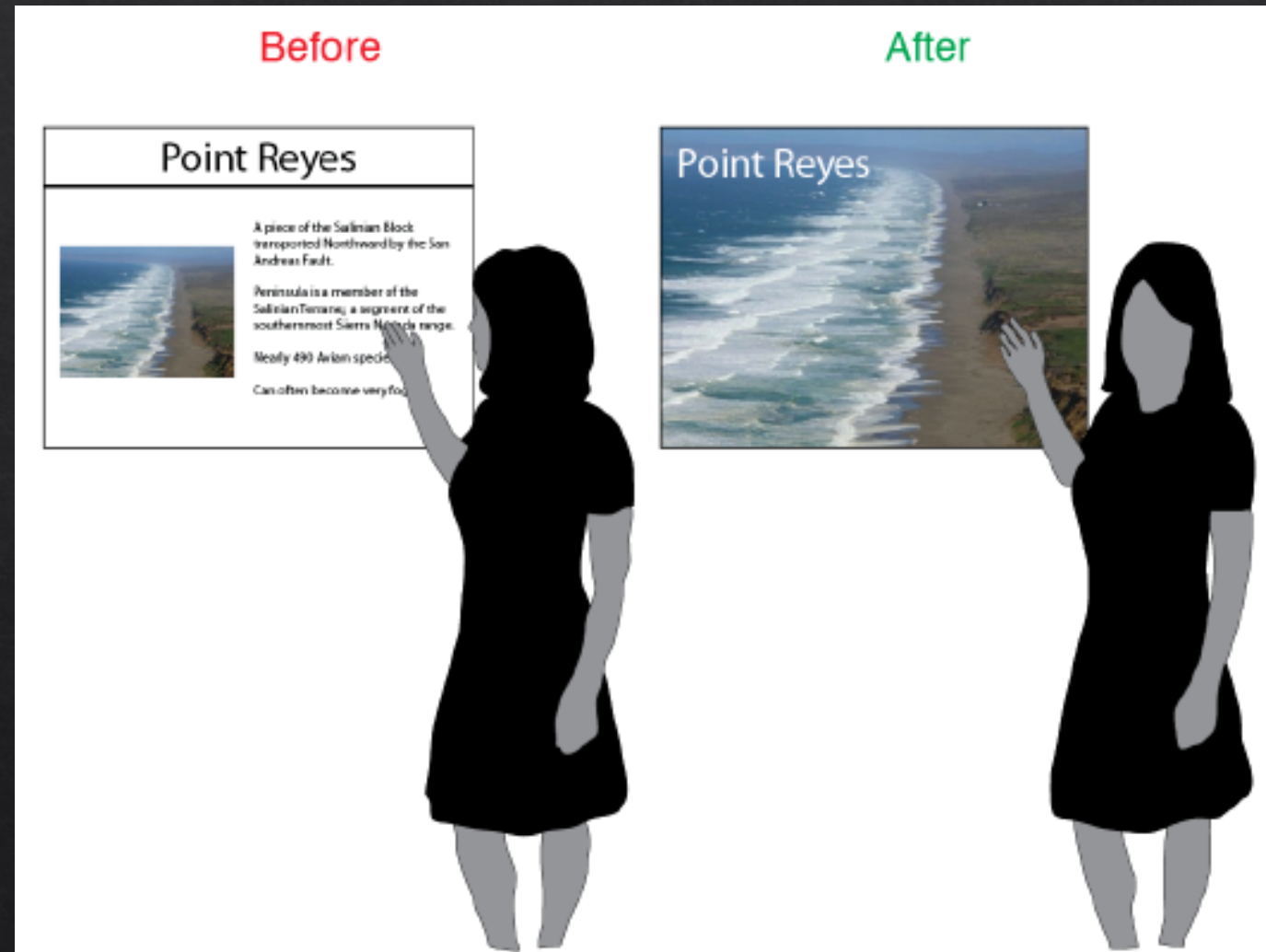




Rehearse and practice for a good delivery

Don't use slides as presentation notes.

- ◆ You design boring slides.
- ◆ You look at your slides rather than maintaining eye contact with your audience.
- ◆ You reduce your ability to be present and attentive to the real-time needs of your audience.
- ◆ Slides are for the audience, not the speaker.





Rehearse and practice for a good delivery

Try to “be present” as much as possible.

Be aware of....



Yourself:

Are you talking too slow, too fast, too quiet, too loud, or too monotonous?

How is your posture?

Is anxiety causing you to perform a nervous, repetitive movement?

Your audience:

Is your audience showing signs of confusion, boredom, or impatience?

Where is your audience maintaining eye contact?

Is your audience distracted by something else in the room?

Your environment:

Is the lighting optimal for viewing slides and keeping the audience awake?

Is the temperature too hot or cold?

Are there visual or audible distractions?



Rehearse and practice for a good delivery

Prepare for inevitable nerves and anxiety.

- ◆ Rehearse for the 5 minutes before your presentation begins. (That's when you are most nervous)
- ◆ Memorize and rehearse the first 1-2 minutes of your talk most of all. (Anxiety begins to fade for most people once they get through the first minute of their presentation)
- ◆ Bring a water bottle.





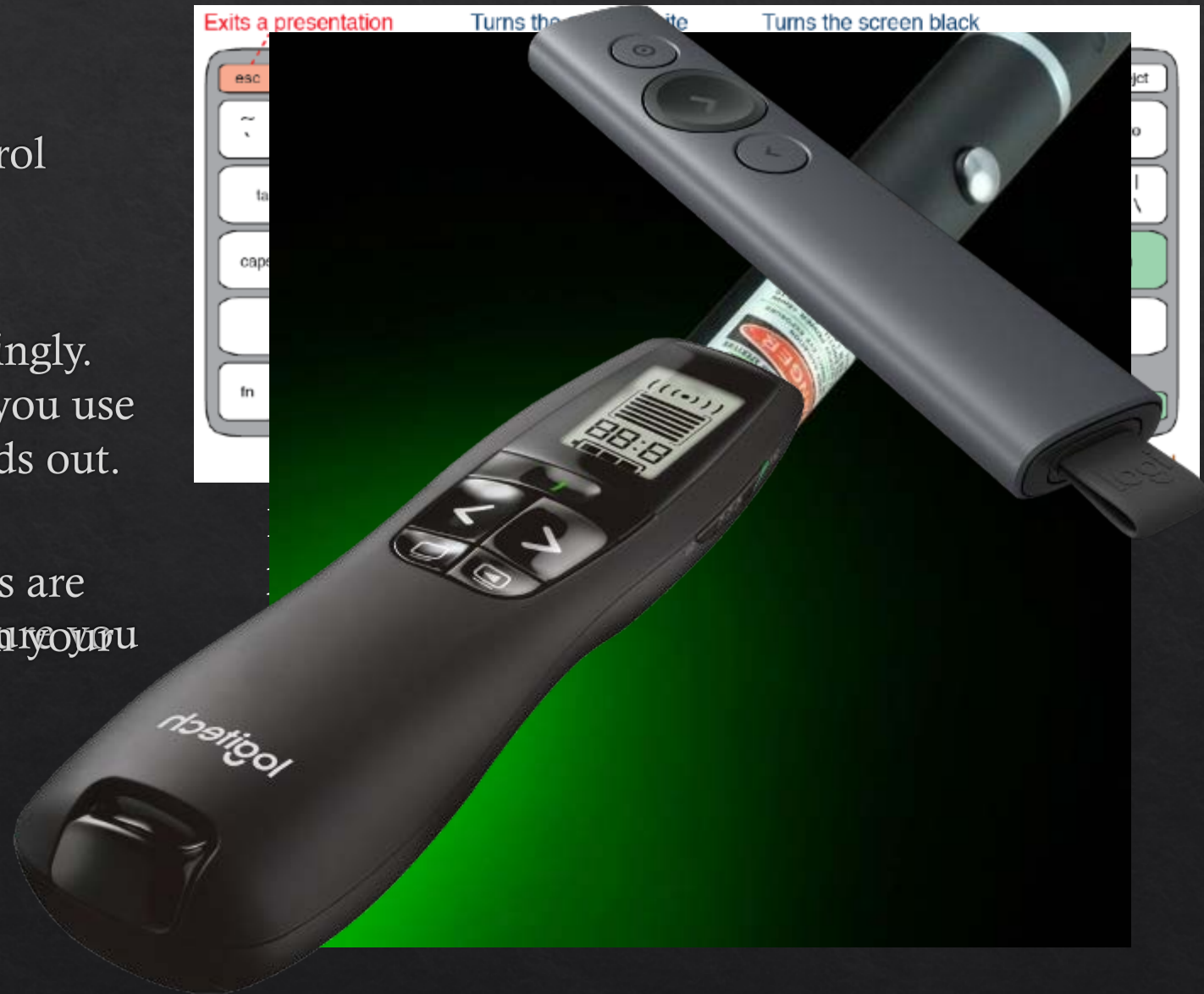
Rehearse and practice for a good delivery

Don't forget to practice using technology.

- ◆ Know how to use your computer to control your presentation. Know your shortcuts.
- ◆ Practice using a laser pointer. Use it sparingly. Just like any highlighting tool, the more you use it, the less your highlighted material stands out.

Don't aim it at the audience. If your hands are

- ◆ shaking, rest your hand on a podium or other surface, and practice holding the hand on your other hand, which button does what.





Rehearse and practice for a good delivery

Soliciting and answering audience questions.

- ◇ After receiving a question, consider rephrasing the question in your own words before providing an answer.
- ◇ You can get difficult questions, it is OK to say “I don’t know” Even then, try to remain calm and project confidence. It is also OK to talk with the questioner after the Q&A session is over.



Final words...



If you are not
having fun, you
are doing it
wrong!

You get better every time.
(Practice makes perfect)

There is no such thing as a perfect talk.
(Except this one, of course...)

The audience is on your side and wants you to do a
great job.

Acknowledgements



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