

# Scientific Poster Design

How to keep your poster  
from resembling an  
“abstract painting”



ccmr

Cornell Center for Materials Research

Cornell University, Ithaca, NY

<http://www.ccmr.cornell.edu>



# A poster can be better than giving a talk

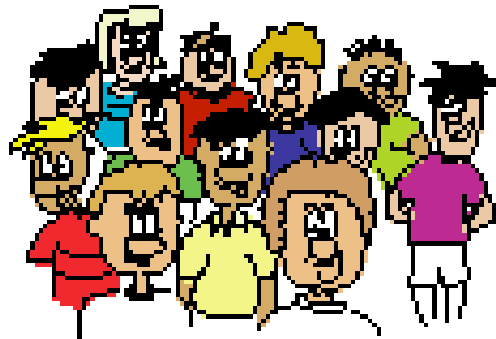
More efficient because:

- you totally bomb at giving talks
- can be viewed while you nap
- can hang in the department for years
- can reach folks not in your field of research



# Posters serve as...

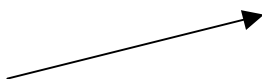
An advertisement of your hard work



Kool, wow!, check  
this out!, you must  
be smart!



# It's just an illustrated abstract



## Poster title goes here, containing strictly only the essential number of words...

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**Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here**  
 Address/es Goes Here, Address/es Goes Here, Address/es Goes Here

### Introduction

First ...

Check with conference organizers on their specifications of size and content before you start your poster. Make the poster size and format as professional as you can.

The typical size for poster presentations is 36" (91.4 cm) tall and 48" (121.9 cm) wide. Do not change the page size. You can scale the size smaller or larger size when printing. You need a different resolution with a larger print. You need a different resolution with a smaller print. You need a different resolution with a smaller print.

Best if the poster is on a white background. Do not use a dark background. Do not use a dark background. Do not use a dark background.

### Method

Tips for making a successful poster ...

- Rewrite your paper in poster format. Simplify everything and use a white background.
- Making a chart or figure is easier than both paper and poster. Use a white background.
- Have someone look at your chart or figure to see if it is clear. Use a white background.
- When laying out your poster, leave breathing space around you text. Do not overcrowd your poster.
- Try using photographs or color graphics. Avoiding numerical tables.
- Spell check and get someone else to proofread.

Caption for the figure: ...

### Results

Reporting the results ...

Pages such as photographs, graphs, diagrams, logos, etc. can be used on the poster.

For some charts or figures in your poster, go through them as if they were "found" from the Internet. Use your computer software to make them look like they were found from the Internet.

Be aware of the images you are using. The average person can see a resolution of about 300 pixels per inch (PPI). Call the University of Cornell for more information.

Do not use images for trends.

### Printing and Lamination

Once you have completed your poster, bring it to the University of Cornell. We will process it and print it for you. Check and proofread. The final poster will be in the print and lamination.

For poster printing and lamination charges contact the University of Cornell.

### Aim

How to make a poster ...

Simplify the text and use a white background. Do not use a dark background. Do not use a dark background.

The poster should be between 36 and 48 inches tall and 48 and 72 inches wide.

Do not use a dark background. Do not use a dark background. Do not use a dark background.

### Conclusion

For more information on Poster Design, Scanning and Digital Photography, and Image/Video.

Contact: Medical Illustration Unit, Princeton Hospital, Princeton, NJ 08540.

### Acknowledgements

Just highlight the funding source with your own. Replicate with your own.



# Is my abstract effective?

- Why should anyone care?
- What am I adding to current knowledge?
- Do I need to explain methods?
- Have I told them what I found and recommend?



# A portrait of a grad student



@#&%!@#\$, I have 12 hours to throw this thing together and get it printed before it's due.

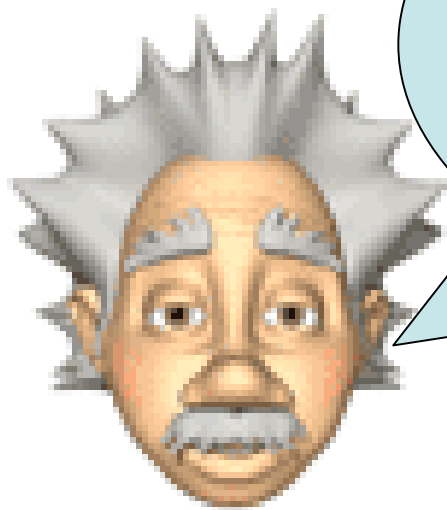


# How do I get months and years of research onto my poster?



- Your poster is a short story
- Describe a few major points
- Arouse the reader's interest to read on
- Limit it to 250 words

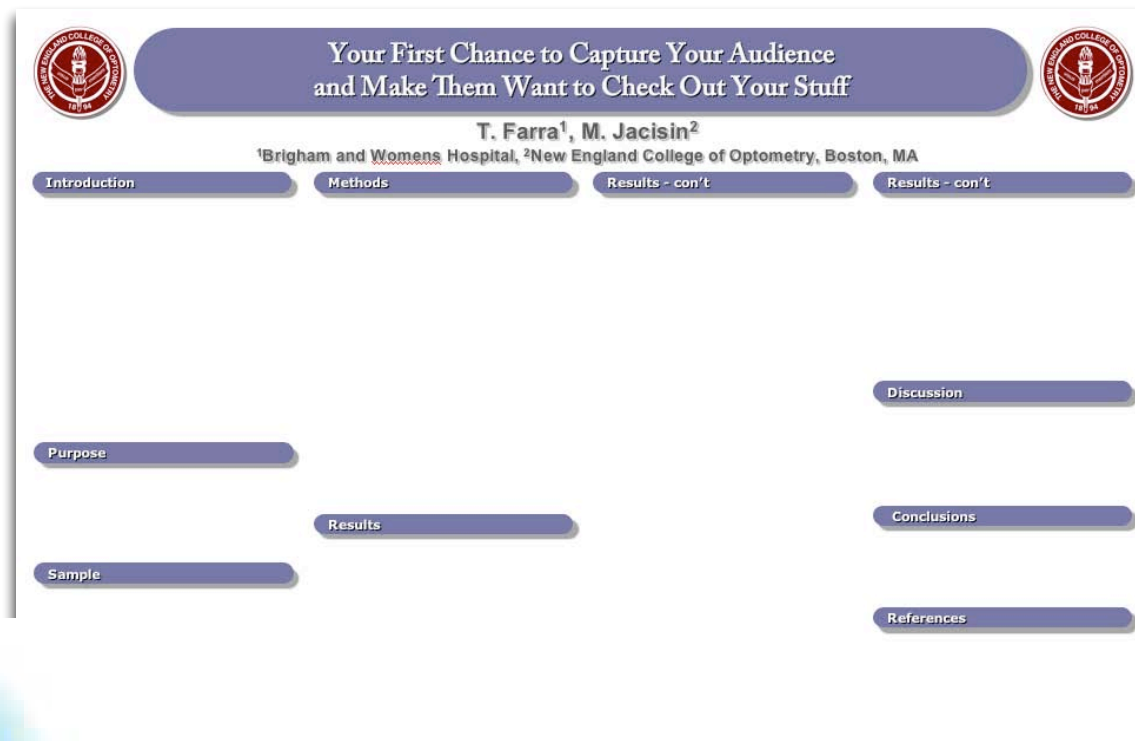




Recite after me,  
Less is best!

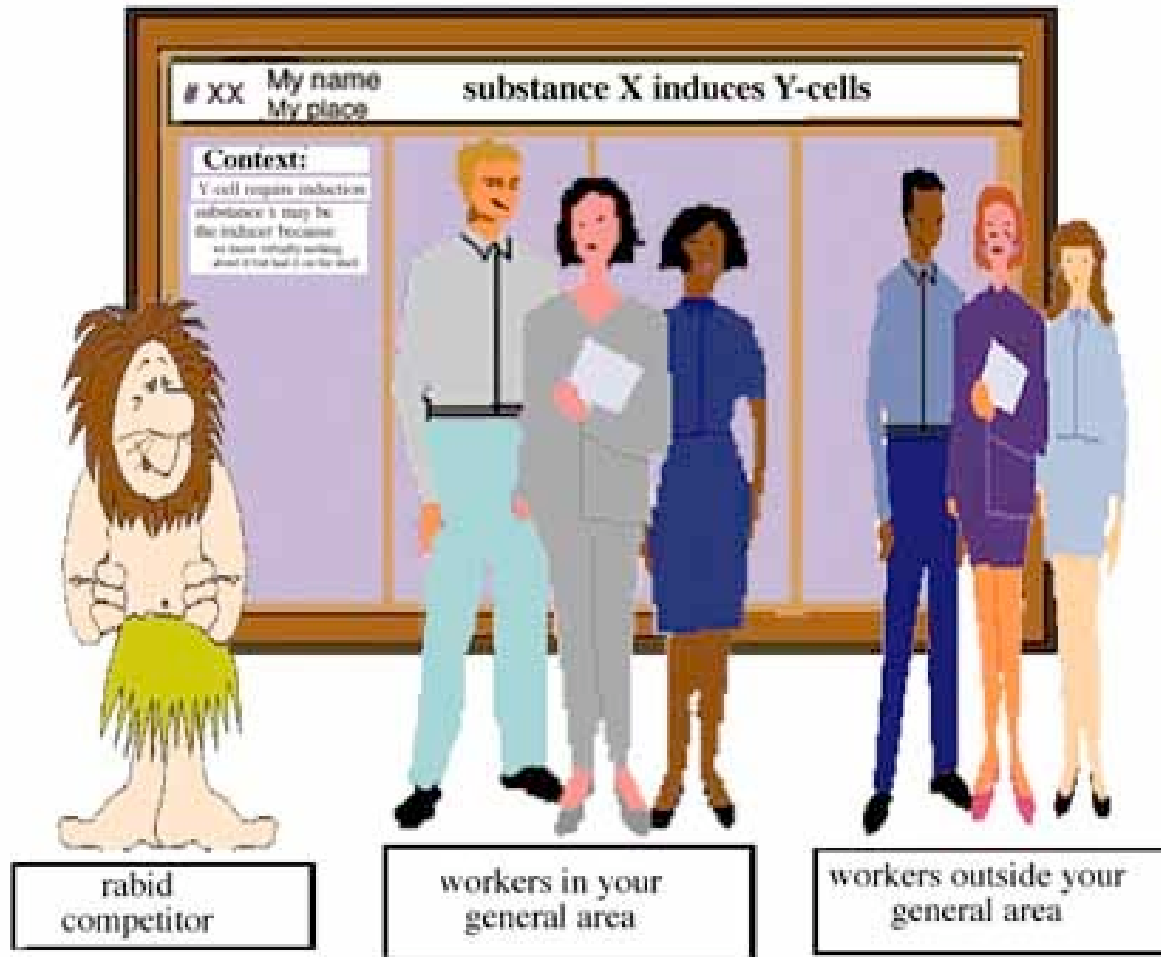


# Simplify your paper into poster format



Find out the size required!

# Who's my audience?



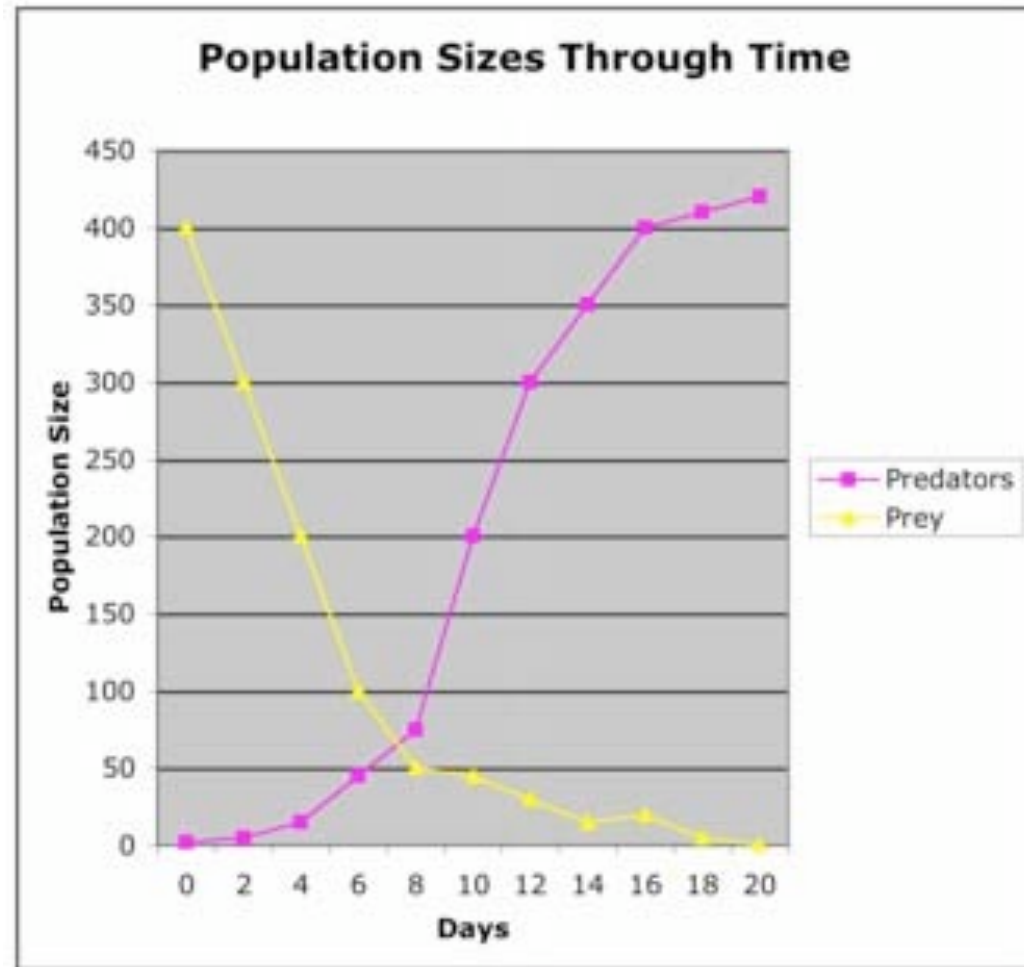


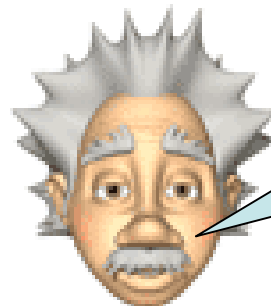
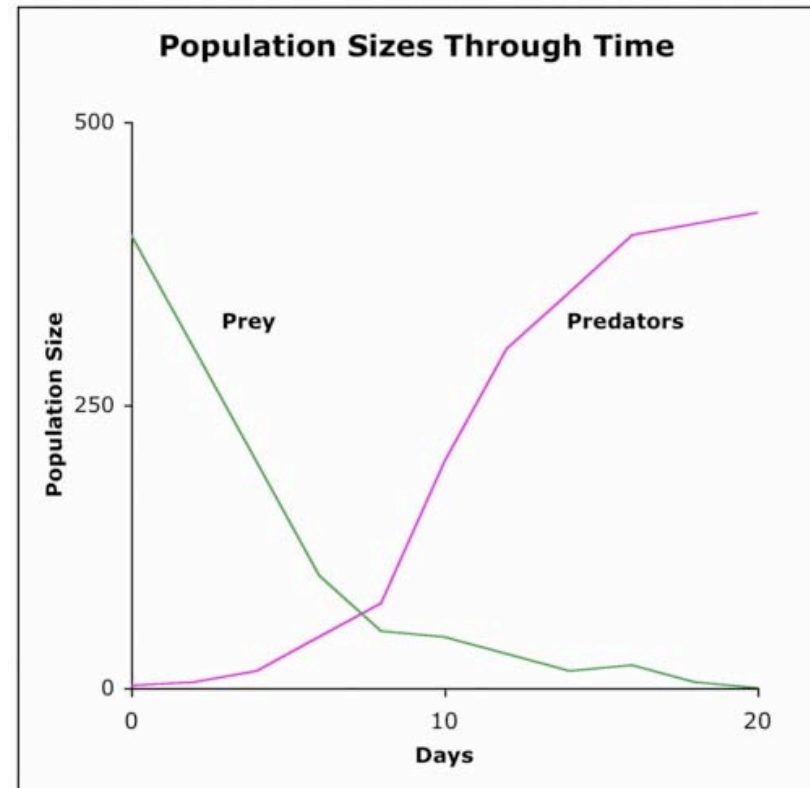
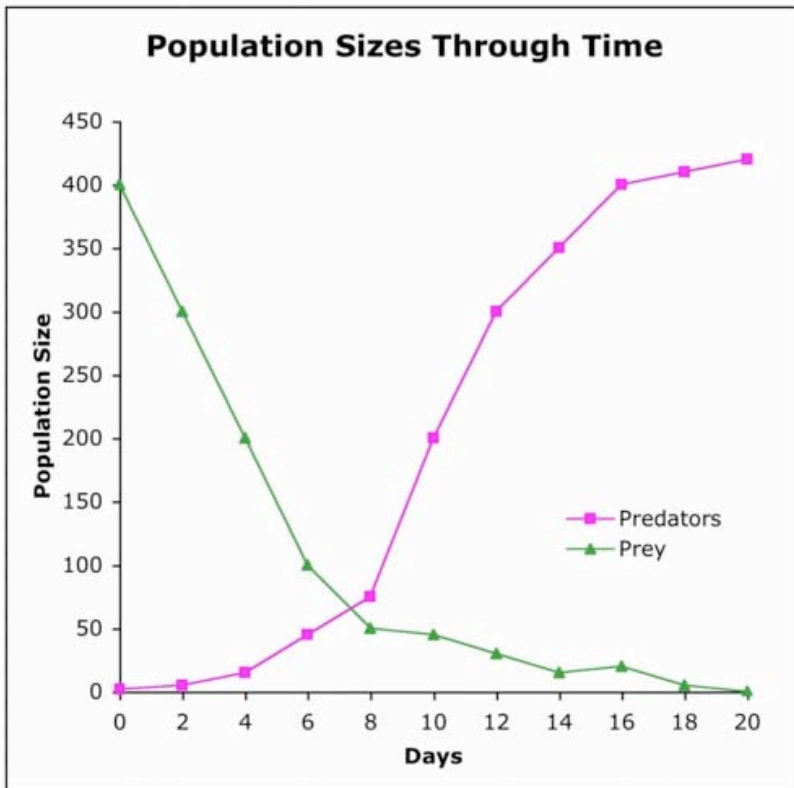


Start putting  
together your  
2 main elements

# 1) Simple, effective data displays

Don't make them stand on their heads to read your data!





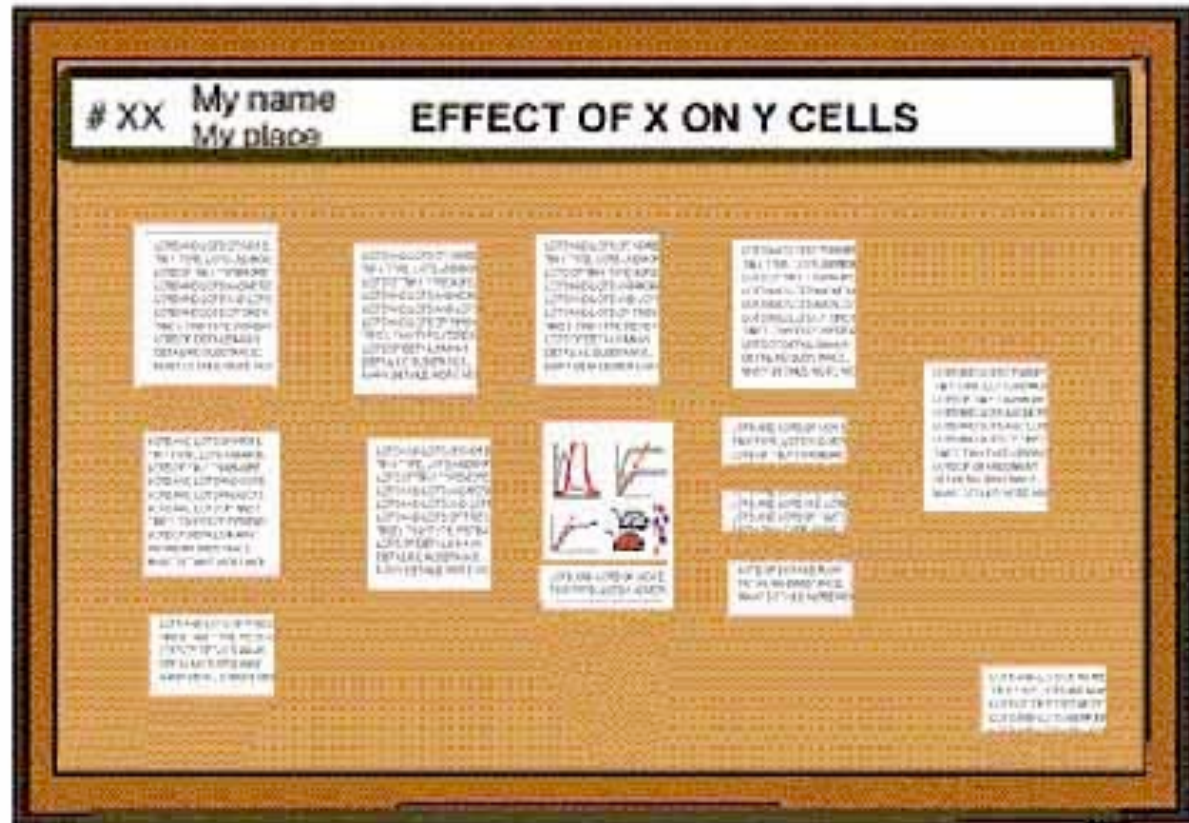
Keep it simple but effective





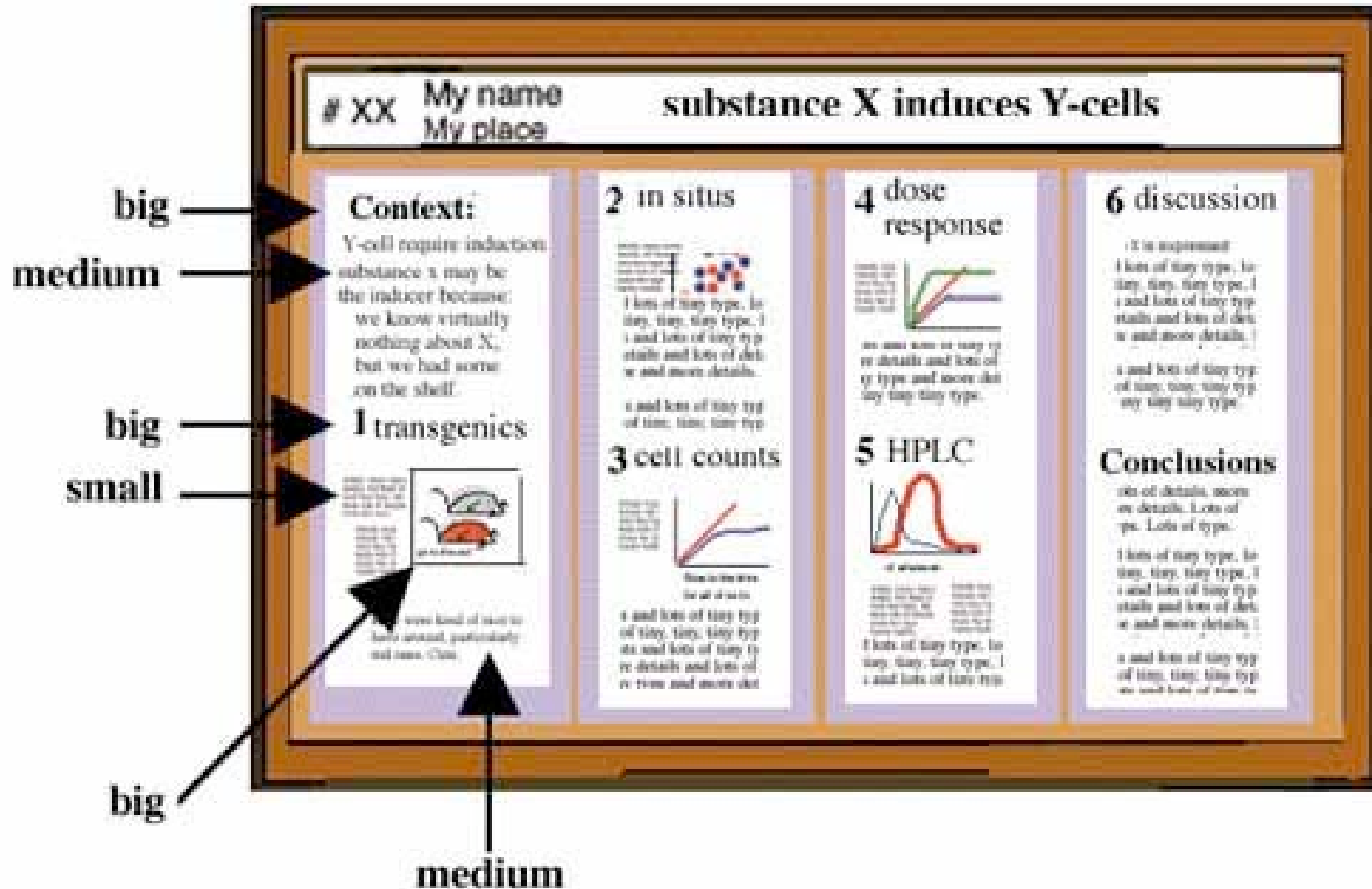
## 2) Small blocks of supporting text

The need for chairs in front of your poster will not go over well





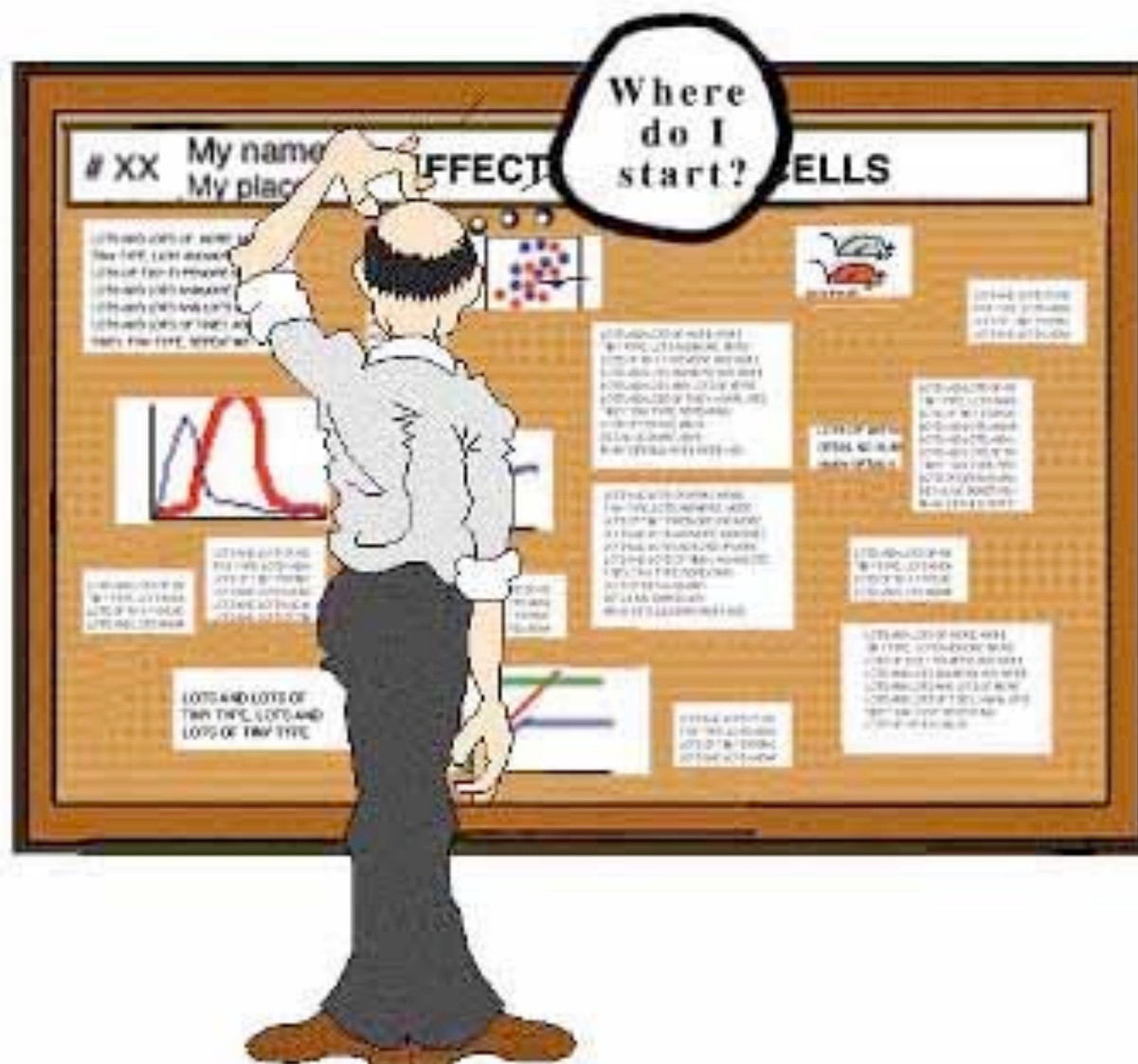
# I could actually read this





# Your copy should answer...

# XX	My name My place	EFFECT OF X ON Y CELLS	
Why?	Methods?	What do I recommend?	
What am I adding?	What did I find?		





# Pick a software program

Although you'll probably gravitate towards PowerPoint, consider a true design program.

[www.postersw.com](http://www.postersw.com) for free poster programs

# PowerPoint



- OK, but the colors will suck
- Easy to use
- Inflexible
- Designed for low resolution



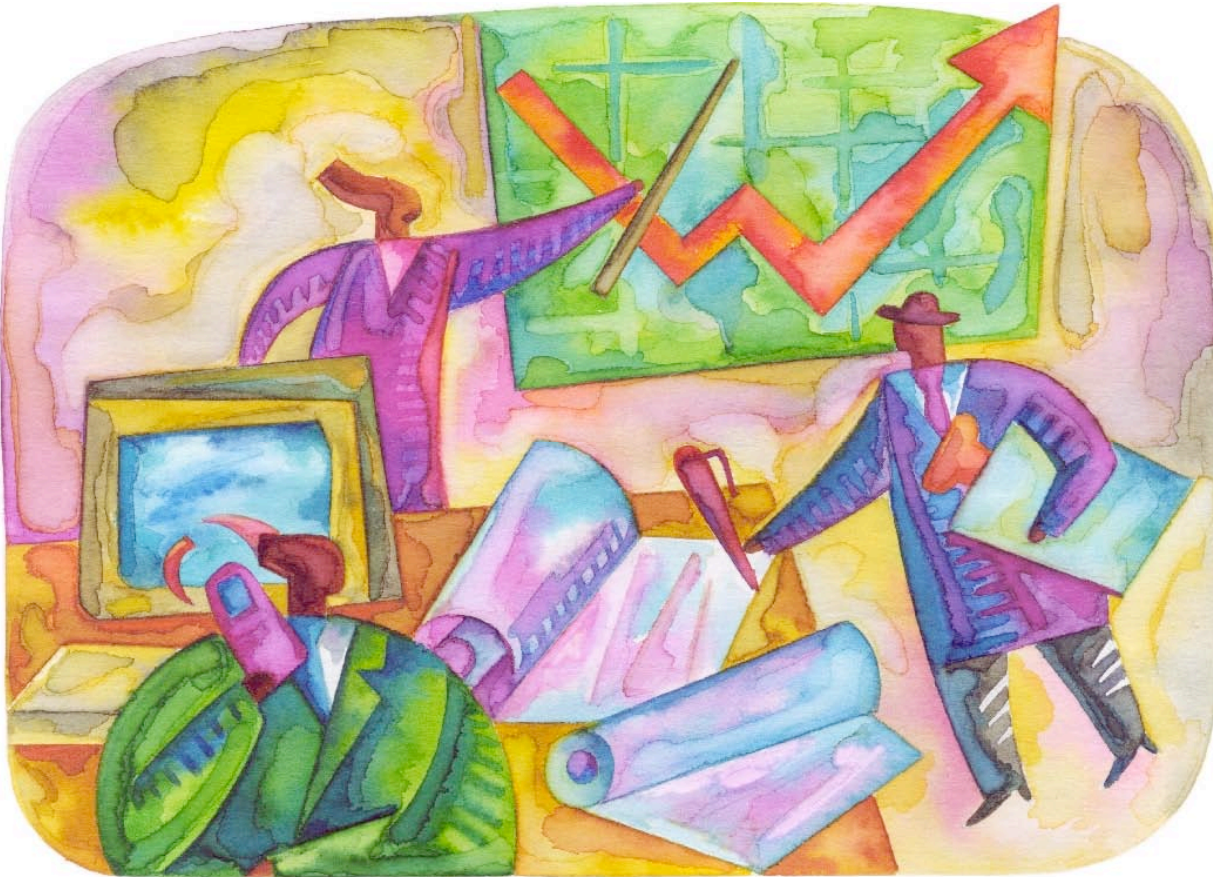
# Adobe Illustrator or InDesign



- Excellent
- More difficult to learn
- What you see is what you get
- Others: Canvas, Publish-It, Corel Draw, LaTeX, etc.

[www.postersw.com](http://www.postersw.com) for free poster programs





Let's build a poster!



Your poster title:

# Think BIG! Really Big!

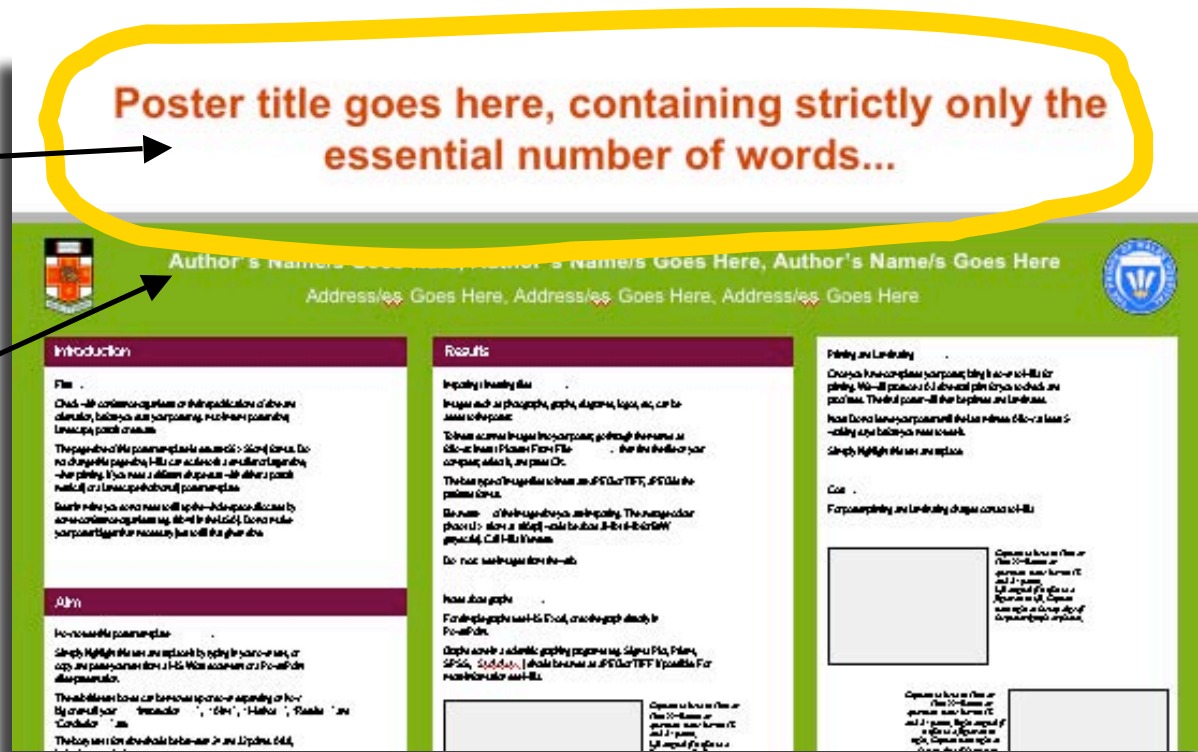
Your biggest impact!

**Boldface** type

Not all caps!

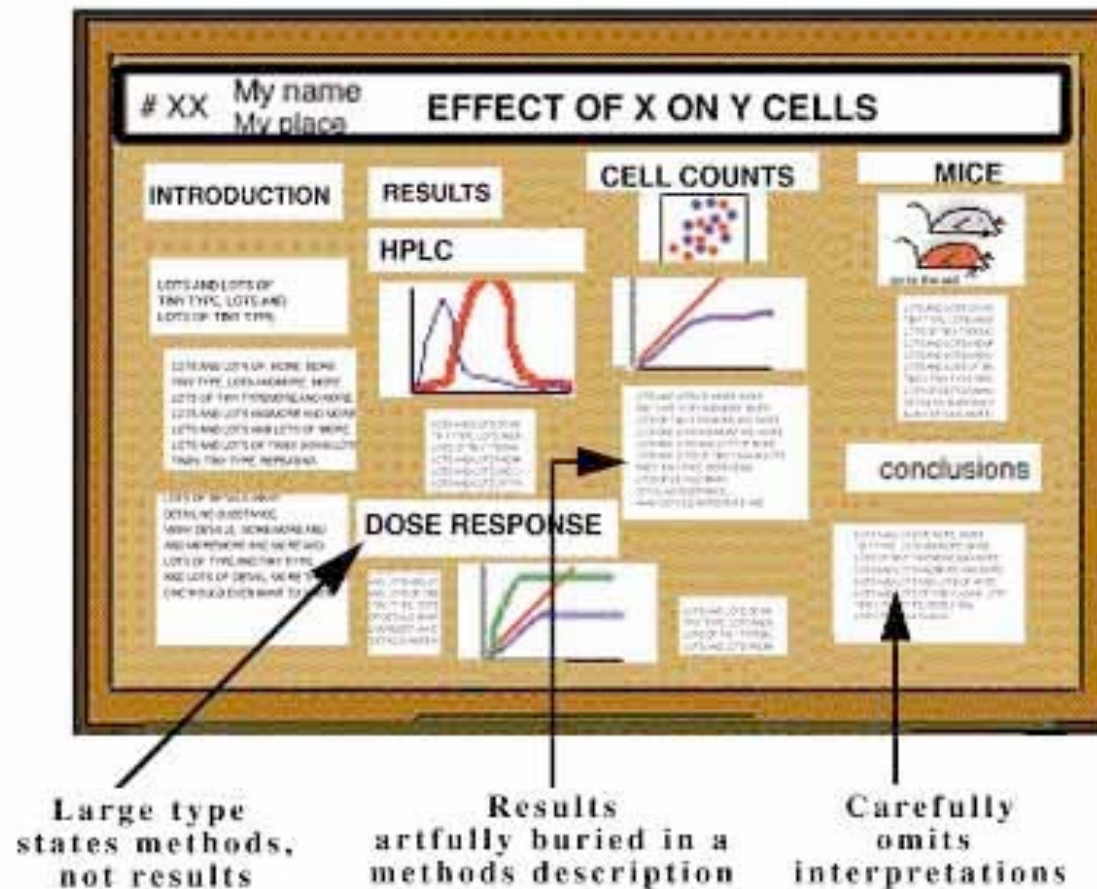
Poster title goes here, containing strictly only the essential number of words...

Group authors names and affiliations






# The Secrets of Killer Body Text:






Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here  
Address: Goes Here, Address: Goes Here



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Introduction

**Title**

Check all contents against or their application of the information, balance, and supporting evidence provided. Language must be clear.

The purpose of the poster is to communicate information to a specific audience. Do not change the purpose of the poster or the information provided. The poster should be a clear and concise summary of the research project.

Check the poster for spelling and grammar errors. Do not make changes to the poster after it has been printed.

Abstract

The abstract is a brief summary of the poster. It should be clear and concise. It should include the purpose of the poster, the methods used, the results, and the conclusions. It should be no more than 250 words.

Introduction

Provide a brief overview of the topic. State the purpose of the poster and the research questions. Provide a brief overview of the methods used and the results. Conclude with a brief statement of the significance of the research.

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Method

Provide a brief overview of the methods used. Describe the experimental design, the materials used, and the procedures followed. Be clear and concise. Use numbered lists for steps in a procedure.

Results

Present the results of the research. Use clear and concise language. Use tables and figures to present data. Refer to the data in the text. Use appropriate units and symbols. Be clear and concise.

Conclusion

Summarize the findings of the research. State the significance of the results. Provide a brief statement of the implications of the research. Conclude with a brief statement of the future directions of the research.

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References

List the references used in the poster. Use a consistent format for all references. List the references in alphabetical order. Use the following format for journal articles: Author(s), Year, Title, Journal, Volume, Issue, Pages.

Acknowledgements

Acknowledge the funding sources and the support of the research team. Be clear and concise. Use the following format: This research was supported by the National Science Foundation (Grant No. XXXX) and the University of Wisconsin (Grant No. XXXX).

References

List the references used in the poster. Use a consistent format for all references. List the references in alphabetical order. Use the following format for journal articles: Author(s), Year, Title, Journal, Volume, Issue, Pages.

- Leave breathing space around your text
- Plain fonts
- Same size and style
- Left-aligned



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.



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.

## Conclusions first!

- Put the most important part first!
- Short and to the point!
- Upper left hand corner

**Your Ingenious Teaser Right Here to Woo Them  
Down to the Body**

Thomson Reuters | 2007

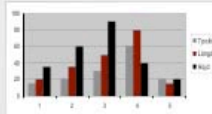
**Conclusions first: 44 pt bold**  
Always put the most important part - your conclusions - first! Place your conclusions in the upper left hand corner of your poster.  
Prepare your material from the reader's perspective. What was done, by who and your conclusion has to be understood within a couple of second's reading! Use active voice when writing the text. **Text size: 34 pt regular**

**Introduction**  
Posters are primarily visual presentations. Your poster should be dominated by self-explanatory illustrations such as graphs and pictures while the amount of text should be kept to the minimum.

**Your aim**  
Your poster is an advertisement for your research and as such it needs to be eye-catching and straight to the point. You only have seconds, or at best a few minutes to attract the attention of the visitor to a poster session. Keep your message short and clear


**Your message**  
Keep your message clear and your text concise. Decide what is relevant for this poster and try to get your message across to your target group.

**Layout, photos and print**  
Contact [Madhuban](#) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [Sudhakar](#). For more information: [www.thomson.com/rls](http://www.thomson.com/rls)




**Tips:**  
The best font for text blocks that are as short as they should be on a poster is a Sans Serif typeface family. Therefore, use sans serif fonts such as Arial or ~~Times~~ sans rather than serif fonts like Times or Courier.  
**AVOID CAPITAL LETTERS IN TEXTS THAT ARE LONGER THAN ONE LINE, SINCE THEY ARE MORE DIFFICULT TO READ.**

**Handouts**  
If you succeed in getting the reader's attention, provide her/him with more detailed information in the form of handouts or printed articles. Include references on your handout instead of your poster.



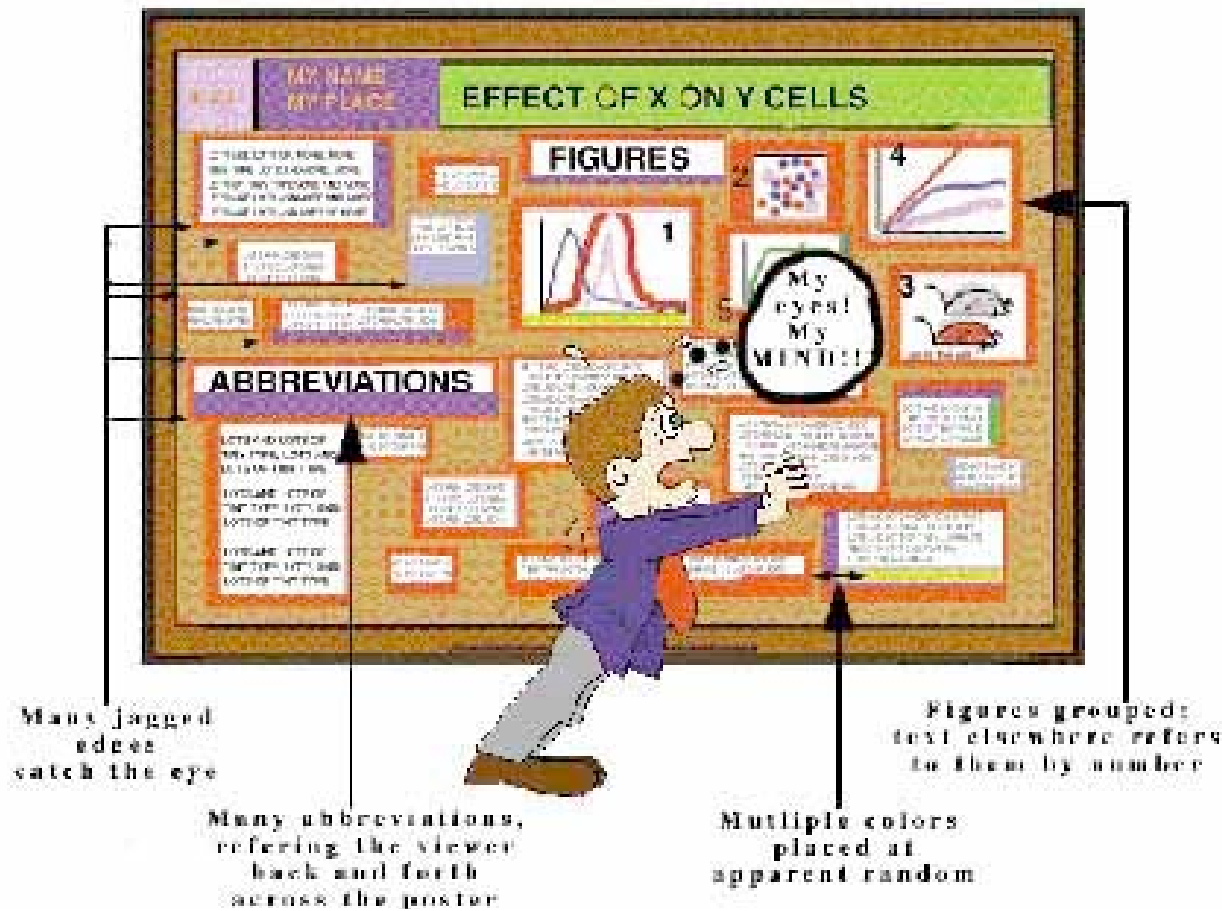
**It is always nice to put in a picture and write some few short notes of what's going on in the future. Put handouts, business cards, nearby - on a table or in an envelope hung with the poster.**



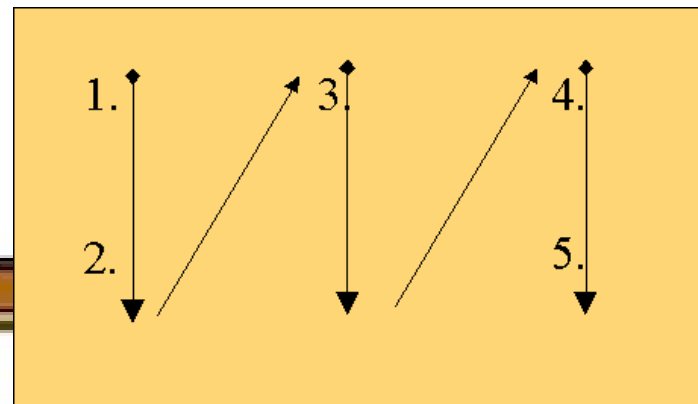
[Kathryn A. Johnson](#) | [Madhuban](#)  
[Faculty Director, CCMR](#) | [Faculty Director, CCMR](#)  
[kjohnson@cornell.edu](#) | [m.johnson@cornell.edu](#)  
 607.255.5200 | 607.255.5200



# Easy for the eye to follow



Utter chaos will make folks dizzy!



# XX My name substance X induces Y-cells  
My place

**Context:**  
Y-cell require induction substance x may be the inducer because we know virtually nothing about X, but we had some on the shelf.

lots and lots of tiny, tiny and lots and lots more details on tiny type and tiny tiny tiny lot of type lots and lots . Details a tails, more a. Lots of

lots and lots of tiny, tiny, and lots and lots more details and tiny type and me tiny tiny tiny type

lots and lots of it lots of tiny, tiny, and lots and lots more details and tiny type and me tiny tiny tiny type

lots and lots of it lots of tiny, tiny, it and lots and lots of more details and tiny type and me tiny tiny tiny

**2** lots and lots of tiny, tiny and lots and lots more details on tiny type and tiny tiny tiny lot of type lots and lots . Details a tails, more a. Lots of

lots of details, on details. Lots Lots of type.

lots of details, on details. Lots Lots of type.

**4** lots of tiny type, tiny, tiny, tiny type and lots of tiny

lots and lots of it lots of tiny, tiny, and lots and lots more details and tiny type and me tiny tiny tiny type

lots and lots of it lots of tiny, tiny, and lots and lots more details and tiny type and me tiny tiny tiny type

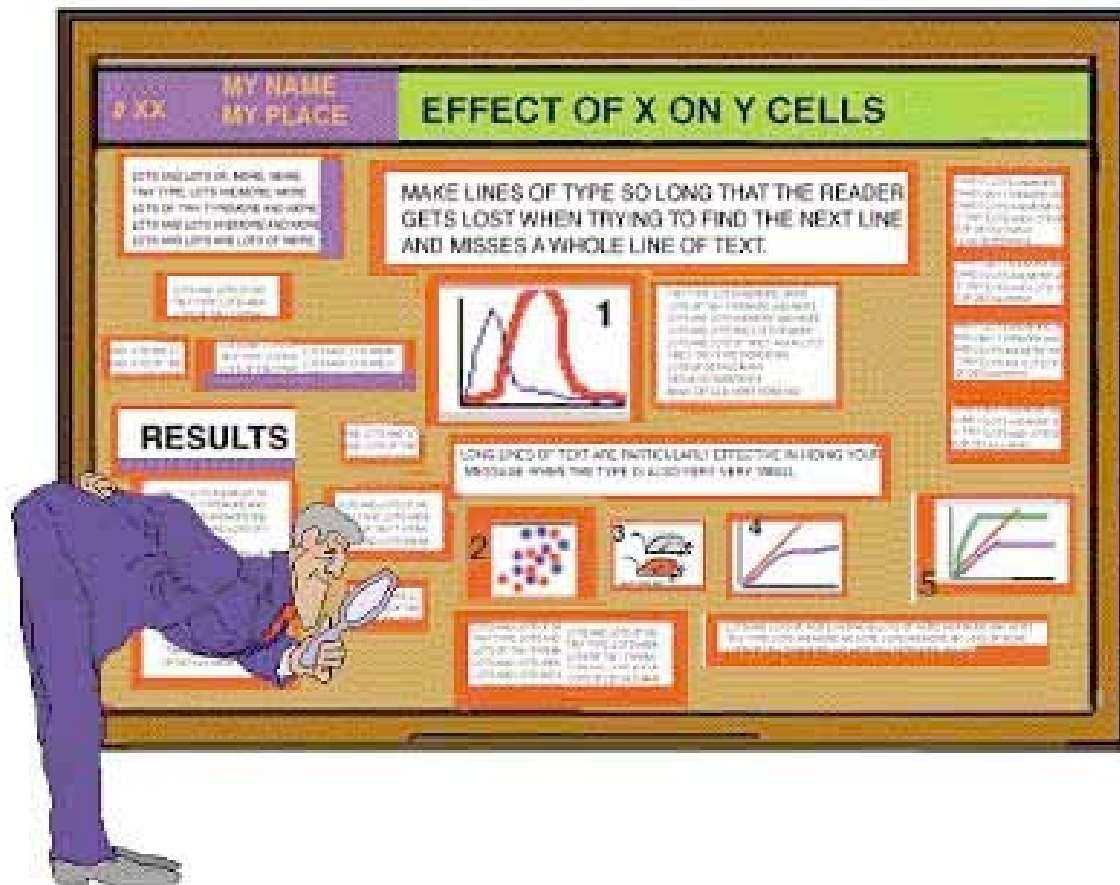
**6** lots of type lots and lots Details and lots of details, more on details. Lots of type. Lots of type.

lots of tiny type, lots and lots of tiny type, lots and lots of tiny type and lots of details and lots of details and more details.

lots and lots of tiny type of tiny, tiny, tiny type and lots of tiny type and more details and lots of tiny type and more details tiny tiny tiny type.

lots and lots of it lots of tiny, tiny, it and lots and lots of more details and tiny type and me tiny tiny tiny

# Can anyone read your body text?





## Text sizes:

Title: 85 point

Authors: 56pt

Sub-headings: 36pt

Body text: 24pt

Captions: 18pt

**Your Ingenious Teaser Right Here to Woo Them Down to the Body**

**Conclusions first: 44 pt bold**  
Always put the most important part - your conclusions - first! Place your conclusions in the upper left hand corner of your poster. Prepare your material from the reader's perspective. What was done, by who and your conclusion has to be understood within a couple of second's reading! Use active voice when writing the text.

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**Your message**  
Keep your message clear and your text concise. Decide what is relevant for this poster and try to get your message across to your target group.

**Layout, photos and print**  
Contact [Medlab](#) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [Bildstockarna](#). For more information: [www.bildstockarna.kth.se](http://www.bildstockarna.kth.se)

**Tips:**  
The best font for text blocks that are as short as they should be on a poster is a Sans Serif typeface family. Therefore, use sans serif fonts such as Arial or ~~Myriad~~ sans rather than serif fonts like Times or Courier. AVOID CAPITAL LETTERS IN TEXTS THAT ARE LONGER THAN ONE LINE, SINCE THEY ARE MORE DIFFICULT TO READ.

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If you succeed in getting the reader's attention, provide her/him with more detailed information in the form of handouts or printed articles. Include references on your handout instead of your poster.

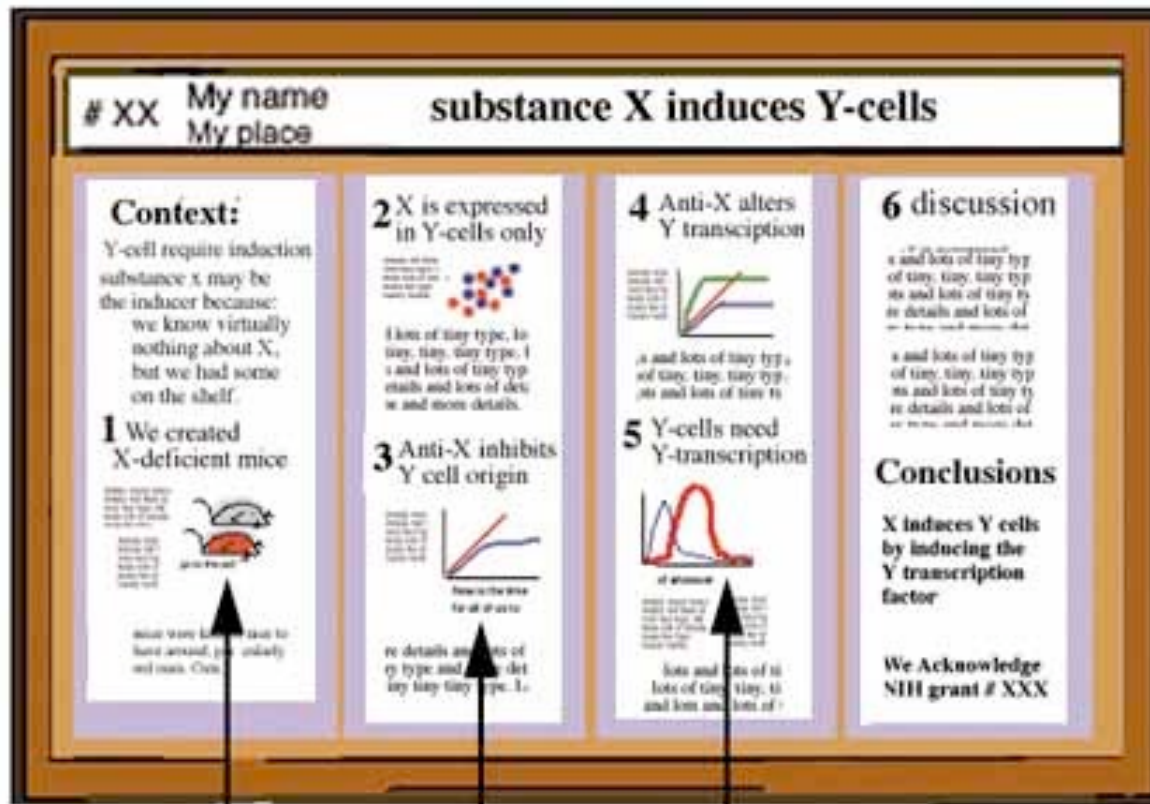
**It is always nice to put in a picture and write some few short notes of what's going on in the future. Put handouts, business cards, nearby - on a table or in an envelope hung with the poster.**

**Karolinska Institutet**  
Forsknings- och utbildningscentrum för medicinsk forskning  
S-141 86 Huddinge, Sverige

**Medlab**  
Välkomna till Medlab!  
För hjälp med layout och bildbehandling

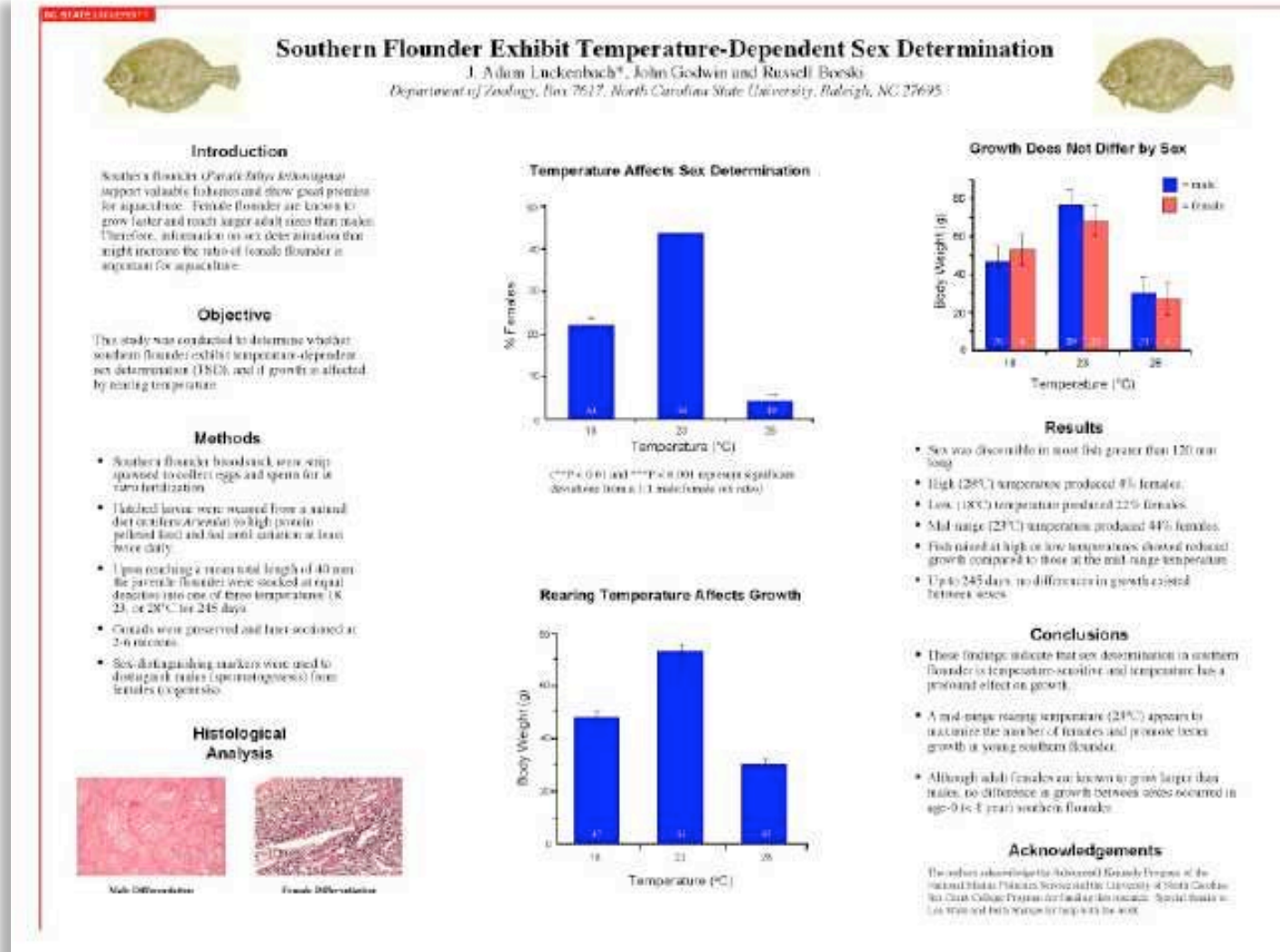
**Bildstockarna**  
Telefon: 08-441 11 22  
Fax: 08-441 11 23

# Images and graphs say much more than words



**BIG figures that use color**

## Keep posters visual!

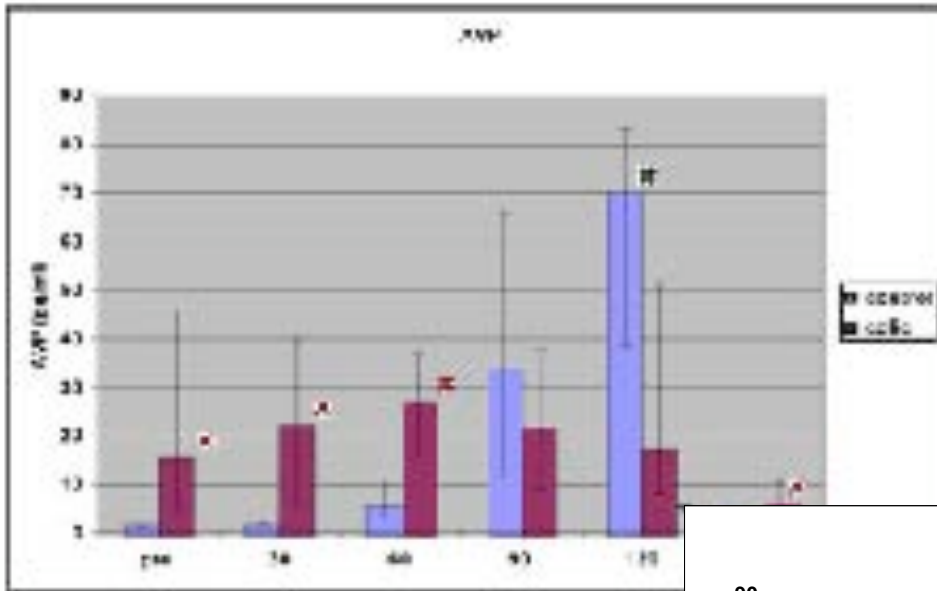


# Picture perfect photos

- Avoid resolution overkill!  
At least 150 dpi, but no more than 350 dpi
- Save photos as jpg or png  
Line art as a png (graphs)
- Web images are usually  
poor resolution

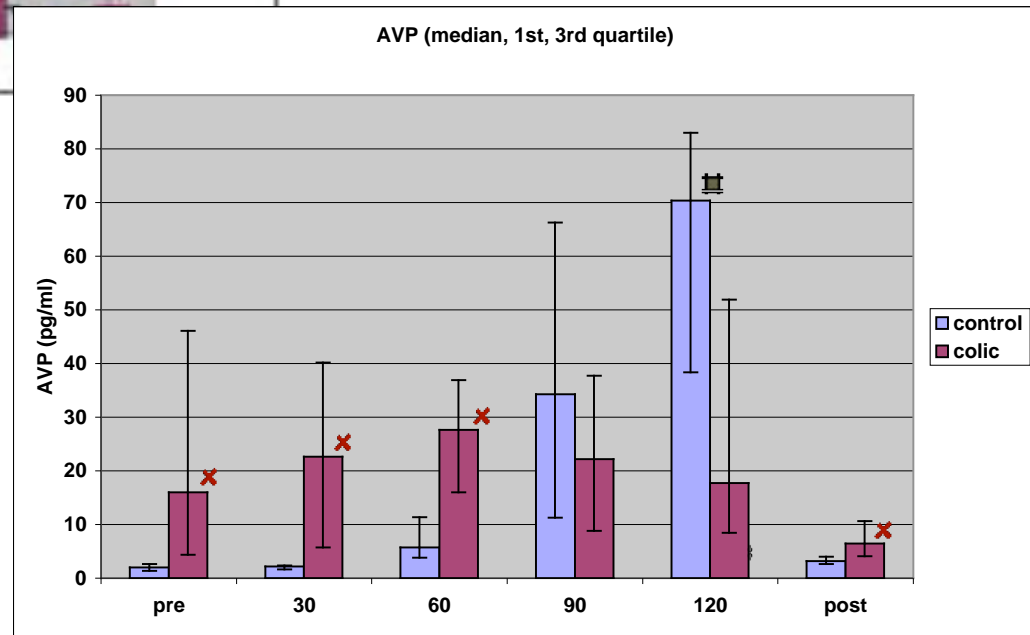


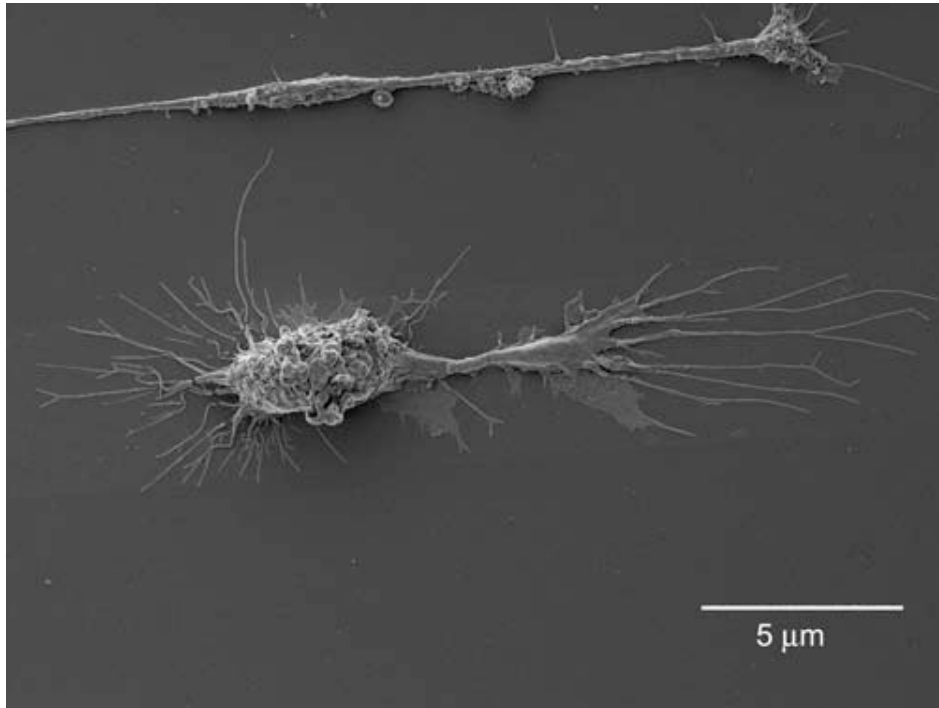




jpg

png



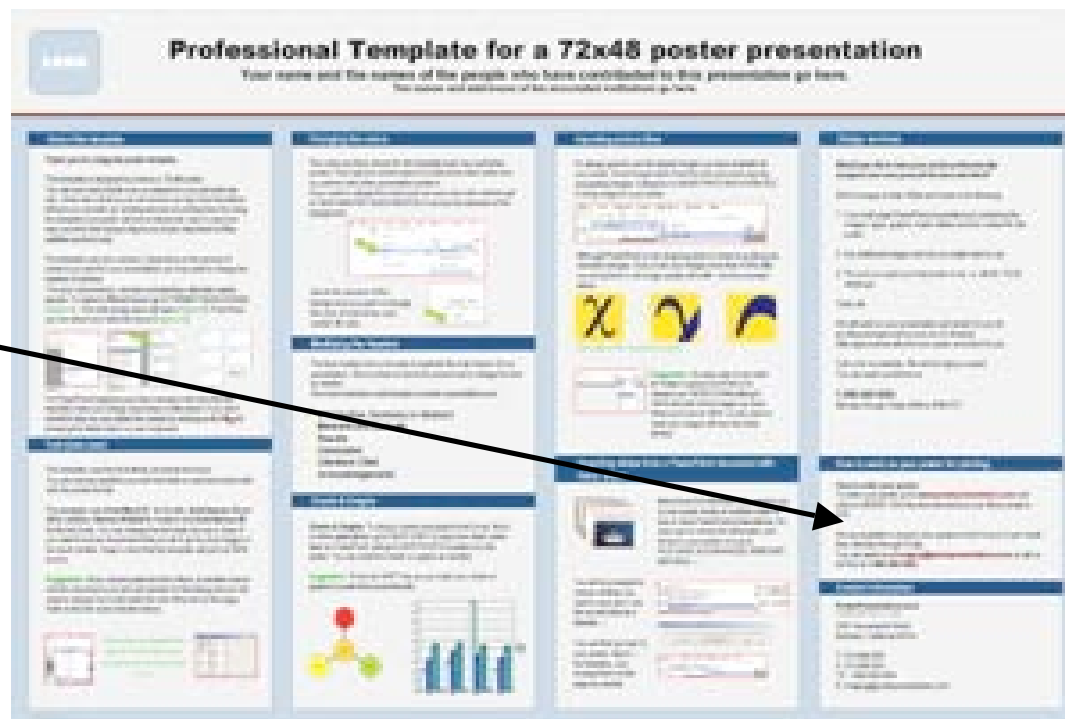


Your cool images  
mean nothing  
without a  
scale bar or  
description



# Don't forget your funding acknowledgements

CNF-NSF-BMR, etc  
Your department can provide you with the required wording





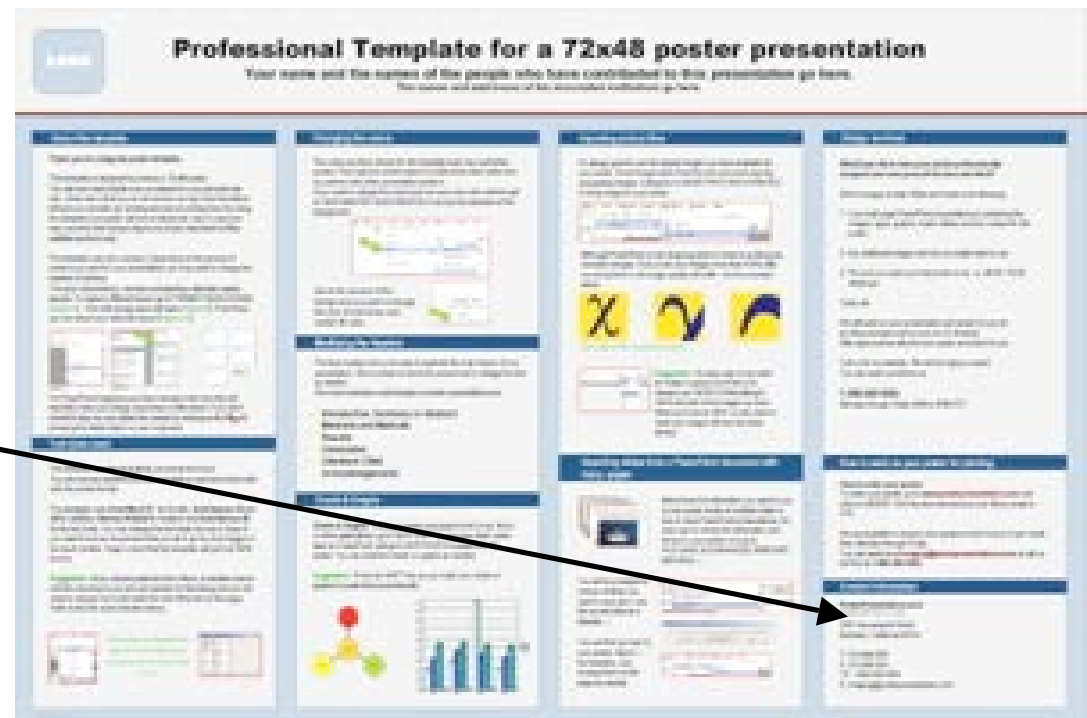
# Your contact info!!!

Without it you'll become

*“ya know, those guys with the awesome poster”*

Include all  
contact info:

- Mail address
- Phone
- E-mail







# Using color to engage your readers

2-3 colors, no more!

Dark type on light color background

**Poster title goes here, containing strictly only the essential number of words...**

**Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here**  
**Address/es Goes Here, Address/es Goes Here, Address/es Goes Here**

**Introduction**  
 Post ...  
 Check with conference organizers on their specifications of size and orientation before you start your poster. Most posters are 36 inches wide by 48 inches high. The paper size of the poster depends on the size of the poster. You can scale to a smaller or larger size when printing. You need a different paper size when a poster is not a standard size. Do not make your poster bigger than necessary to fill the wall size.

**Method**  
 Tips for making a successful poster ...  
 • Review your paper in poster format. Simply overlaying a grid over it.  
 • Headings of more than two words should both upper and lower case your capitals.  
 • Headings of more than two words should both upper and lower case your capitals.  
 • When laying out your poster, leave enough space around your text. Don't overcrowd your poster.  
 • Try using photographs or color graphics. Avoid using numerical tables.  
 • Spelling check and grammar check are important.

**Results**  
 Reporting the results ...  
 Images such as photographs, graphs, diagrams, logos, etc. can be added to the poster.  
 To format images in a poster, you can go through the process as follows: Insert > Picture from File > Insert from your computer > select > Insert OK.  
 The format of the image is either JPEG or TIFF. JPEG is the preferred format.  
 Beware of the image size you are importing. The average color photo (13.5 cm x 18 cm) would be about 3MB. (Most 300 dpi grayscale) Call Us! Please.  
 Do not use images from the web.

**Conclusion**  
 For more information on Poster Design, Scanning and Digital Photography, and Image Editing.  
 Contact:  
 Medical Illustration Unit  
 Photo/Walks in Capital  
 PH0522300  
 Email: mh0522300@cornell.edu  
 Website: mh0522300.usc.cornell.edu

**Acknowledgements**  
 Justify rights to the content with your own text. Rights to the content.



## Whoa! Where's my sunglasses?

**POSTER TITLE GOES HERE, CONTAINING STRICTLY ONLY THE ESSENTIAL NUMBER OF WORDS...**

Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here  
Address/es Goes Here, Address/es Goes Here, Address/es Goes Here

**Poster Design Tips**

- Plan ...
- Check with conference organizers on their specifications of size and orientation before you start your poster design. Maximum poster size is 48" x 72" (landscape) or 36" x 48" (portrait).
- The page size of this poster template is A0 (36" x 48") in landscape (horizontal) format. Do not change the page size. WU can scale it to a smaller or larger size when printing. You need a different setup size with either a portrait (vertical) or a square poster template.
- Be as friendly as you can to those who will be looking at your poster. Use a clear, sans-serif font for all text. Do not make your poster bigger than necessary for wall display.
- Check with conference organizers on their specifications of size and orientation before you start your poster design. Maximum poster size is 48" x 72" (landscape) or 36" x 48" (portrait).
- The page size of this poster template is A0.

**Poster Design Tips**

- Tip for making a successful poster ...
- Rewrite your paper in poster format. Simply everything and save overall.
- Headings other than Section should be both upper and lower case post capitals.
- Never use wide characters in capitals or underlines. Use a sans-serif font.
- When laying out your poster leave plenty of space around your text. Don't overcrowd your poster.
- Try using photographs or other graphics. Avoid long numerical tables.
- Spell check and grammar check before proofread.

**Printing/Printing Tips**

- Images such as photographs, graphs, diagrams, logos, etc. can be added to the poster.
- To insert scanned images into your poster go through the menu as follows: Insert > Picture > From File. This will allow you to insert a picture into your poster. The best format for images is either JPEG or TIFF. JPEG is the preferred format.
- Be aware of the images you are inserting. The size and color of the image will affect the overall appearance of the poster. Call WU for more information. Do not use images from the web.

**Printing and Printing**

- Once you have completed your poster (this includes WU or printing, WU will provide a list of what you need to do and provide). The final poster will be printed and delivered.
- Keep a copy of your poster until the conference is over. It may be needed for a poster session or to replace.

**Contact**

For more information:  
Poster Design, Scanning and Digital Photography, and Image/Video.




Contact:  
Medical Illustration Unit  
Rothman-Walker Hospital  
Ph: 855-2200  
Email: [Rothman-Walker@wisc.edu](mailto:Rothman-Walker@wisc.edu)  
Webpage: <http://med.illustr.wisc.edu>

Just fill in the blanks and replace with your own text. Replace this with your text.

This attracts attention but wears out the eye



# Be careful with the primary colors

			
51.102.255 #3366FF	102.51.255 #6633FF	204.51.255 #CC33FF	255.51.204 #FF33CC
			
51.204.255 #33CCFF	0.61.245 #003DF5	0.46.184 #002EB8	255.51.102 #FF3366
			
51.255.204 #33FFCC	184.138.0 #B88A00	245.184.0 #F5B800	255.102.51 #FF6633
			
51.255.102 #33FF66	102.255.51 #66FF33	204.255.51 #CCFF33	255.204.51 #FFCC33





Blue on Red appears blurry to the human eye.

Yellow on white is hard to read

Red on Blue appears blurry to the human eye.



• aeiko



• Peach Green & Seeds



• Rust



• dollar



<http://www.colorschemer.com/online.html>



## Be aware of busy backgrounds

**NC STATE UNIVERSITY**

### Snook Growth in Habitats with Differing Abiotic Variability

Alesia Read, North Carolina State University, [anread@unity.ncsu.edu](mailto:anread@unity.ncsu.edu)

#### PROPOSED OBJECTIVE

To create a useful tool for assessing potential stocking habitats based on degree of variability in water quality.

- Snook are a popular game fish found in the estuarine creeks of Florida
- Snook population has been on the decline due to overfishing and habitat degradation
- Numerous stock enhancement endeavors are currently underway without sufficient preliminary research
- Abiotic variability is a prominent feature of these estuaries
- Temperature, dissolved oxygen and salinity might play influential roles in the survivorship of the juvenile snook

#### STUDY SITES

#### RESULTS

##### North Creek Lower (High Variability)

Negative Growth:  
Dissolved Oxygen (mg/L) 0-22  
Salinity (ppt) 2-21  
Temp (°C) 25-34

##### North Creek Middle (Medium Variability)

Positive Growth:  
Dissolved Oxygen (mg/L) 0-8  
Salinity (ppt) 16-28  
Temp (°C) 30-38

##### North Creek Upper (Low Variability)

Slow Growth:  
Dissolved Oxygen (mg/L) 0-4  
Salinity (ppt) 16-30  
Temp (°C) 26-33

#### METHODS

1. Juvenile snook are raised in fingerlings (100-200 mm) in the aquaculture facility
2. All snook are tagged with identifying markers for individual growth measurements
3. Fish are placed in cages within variable habitats at the research sites for 40 days
4. Fish are weighed and measured for growth

#### CONCLUSION

- Snook exhibit increased growth in habitats with a medium degree of abiotic variability
- Stock enhancement projects will be more efficient by releasing juvenile snook primarily in nursery habitats with a medium degree of abiotic variability



NC STATE 12/09/13



## Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Godwin and Russell Boeski  
 Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695



### Introduction

Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

### Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

### Methods

- Southern flounder blood and sperm were swabbed to collect eggs and sperm for *in vitro* fertilization.
- Fertilized larvae were reared from a natural diet (meat/Artemia) to high protein pellet-based food and fed until saturation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal densities into one of three temperatures (18, 23, or 28°C) for 245 days.
- Outlets were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

### Histological Analysis

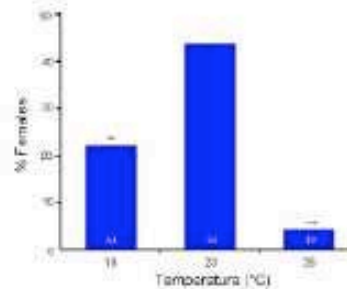


Male Differentiation



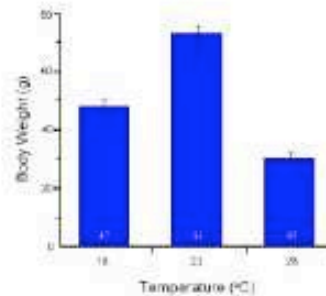
Female Differentiation

### Temperature Affects Sex Determination

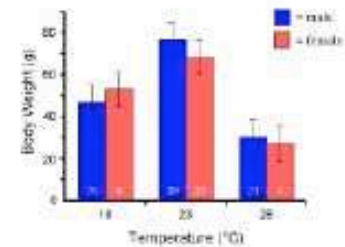


\*\*\* $P < 0.001$  and \*\*\*\* $P < 0.0001$  represent significant deviations from a 1:1 male:female sex ratio.

### Rearing Temperature Affects Growth



### Growth Does Not Differ by Sex



### Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperatures produced 4% females.
- Low (18°C) temperatures produced 22% females.
- Mid-range (23°C) temperatures produced 44% females.
- Fish reared at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no difference in growth existed between sexes.

### Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 to 1-year-old southern flounder.

### Acknowledgements

The authors acknowledge the Advanced Research Program of the National Institute of Fisheries Science and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Lisa Strawn and Beth Strawn for help with the work.

## Even better!

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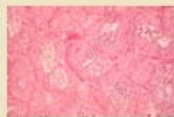
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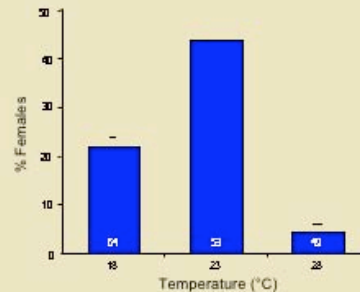


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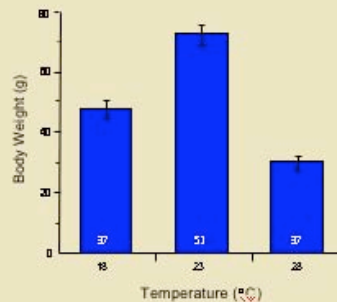
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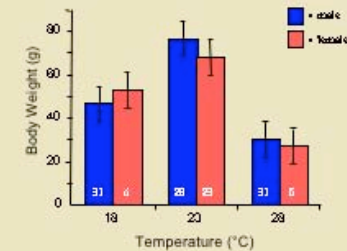


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#### Acknowledgements

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## A little different!

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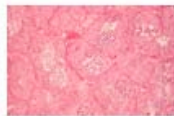
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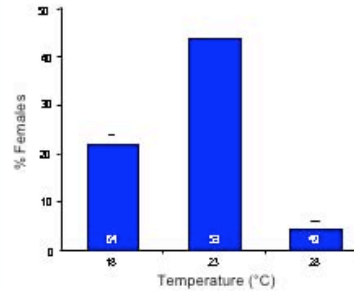


Male Gonad



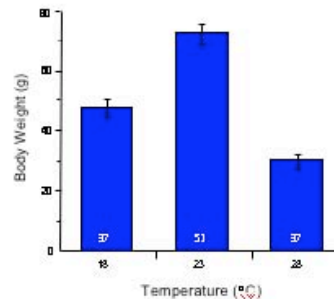
Female Gonad

#### Temperature Affects Sex Determination

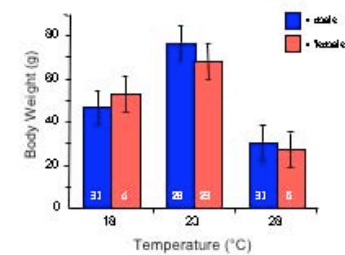


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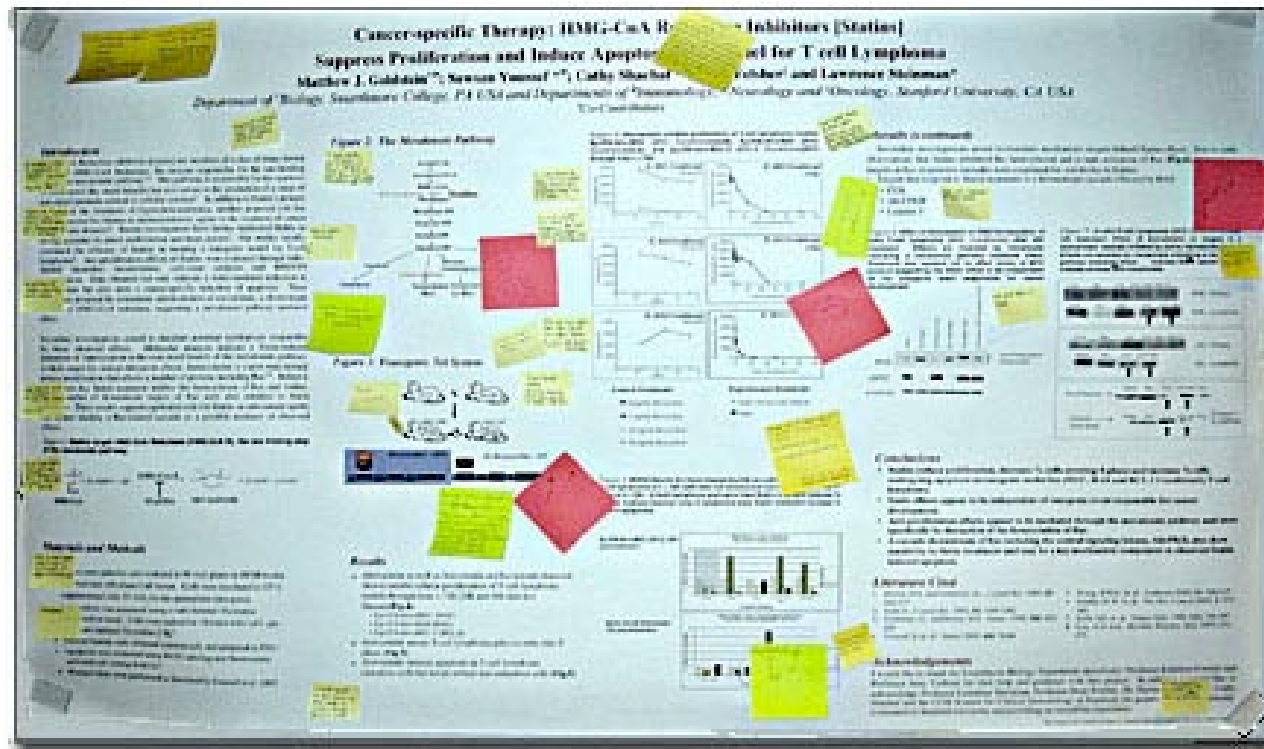
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# Edit, Edit, Edit and Evaluate!







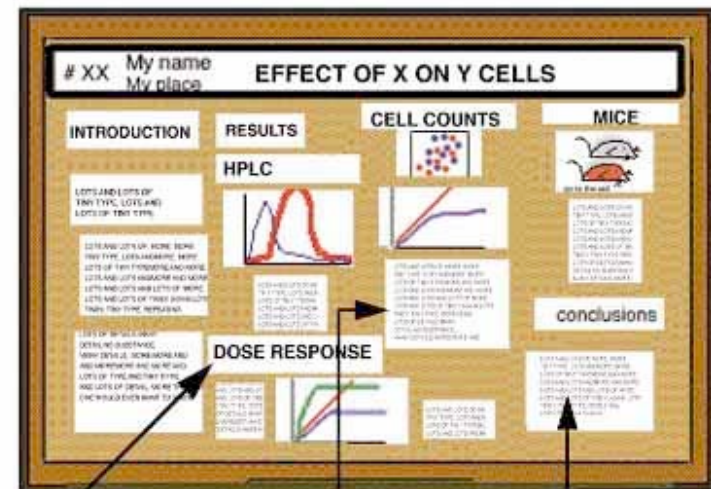
# Print out a letter size draft

Can you read the type?

Are these the colors you really want?

Does it look too busy?

Do my main points pop?



Large type states methods, not results

Results artfully buried in a methods description

Carefully omits interpretations



# CCMR has new poster printers!

Our wonderful computing facilities offers  
state of the art poster printing



The secret of a good poster:  
"Ugly layout print ugly poster"

<http://cf.ccmr.cornell.edu/posters.html>

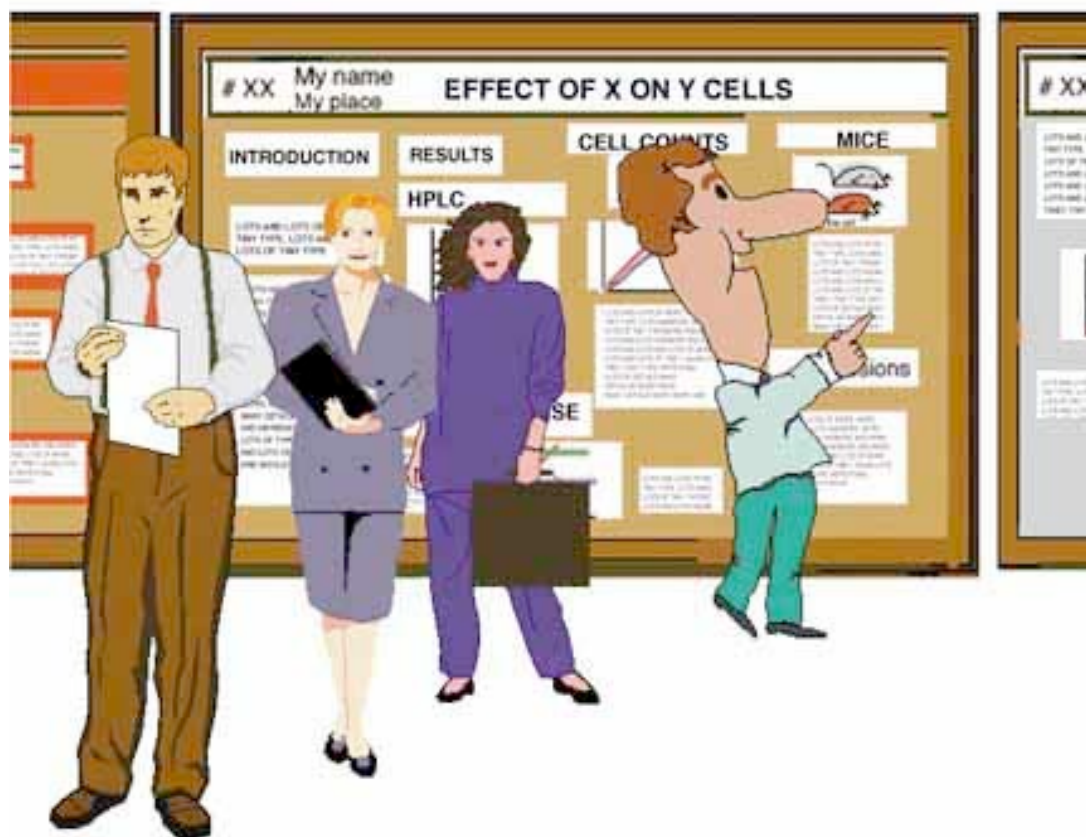




# You're not done yet...

Prepare a 3-5 minute verbal explanation

Is he ever  
going to  
SHUT UP???



# Prepare mini size poster handouts



- Provides a written record for interested folks
- Makes you look together
- Be sure to include complete contact information
- Might even get you a job!



Let's judge some designs  
and see what you've learned

## Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location

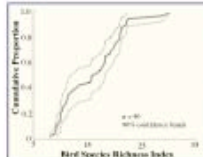
George Hess<sup>1</sup>, John Poulsen<sup>2</sup>, Raymond O'Connor<sup>3</sup>, Jeff Bay<sup>3</sup>

### 1. Windbreaks as Habitat

Agricultural fields — fields, pastures, and orchards — are managed to produce food and fiber for people. In the U.S. Great Plains, an extensive agricultural landscape, windbreaks have been planted to protect fields, crops, livestock, and livestock from the prevailing wind. Windbreaks provide some of the winter-wind habitat for birds and other wildlife that people draw some or other. Windbreaks make up about 25% of the wooded cover in Nebraska, much of the other wooded cover in the Great Plains states.

Although they protect soil from wind erosion and provide habitat for some species, windbreaks also contribute to the fragmentation of prairie grasslands. Prairie fragmentation negatively impacts prairie wildlife such as prairie grouse, dickcissel, upland sandpiper, and prairie falcon.

- Forty windbreaks were sampled using two-stage sampling with a frame stratified by intensity of cultivation.
- Most sample windbreaks fall in or near existing cropland.
- Habitat characteristics of each windbreak were measured in 1994.
- Thirty-five farmers allowed windbreaks to return to forest.



- Using regression factors associated with each sample, we estimated the habitat value of windbreaks for the region (graph left).
- We estimated that half of Nebraska's windbreaks support more than 15 breeding bird species (graph left).
- We also estimated that between 87% and 98% of windbreaks are smaller than 1.5 hectares (data not shown), suggesting that few Nebraska windbreaks provide habitat for forest interior or area sensitive birds.

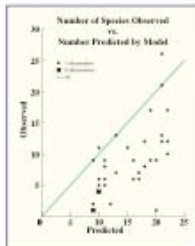


### 4. Validating BSR Model

In 1994, a team of five ornithologists visited 10 of the 40 windbreaks 10 times to record bird counts between May and early July.

Each windbreak was visited two times. Birds were collected between one half hour before and one hour after sunrise. All observed birds were identified to species and recorded using stop-netting techniques. Two hundred observations of the same species were placed on the field past through the windbreak for each visit.

Because the windbreaks were mature, we assumed all species were detected.



### 5. Results of Validation

The model overestimates the number of bird species in the Nebraska windbreaks (graph left). However, the relative qualitative ranking of windbreaks is generally preserved. A total of 91 species were observed.

The strong, significant relationship was found between deviation of observed from predicted number of species and any windbreak attributes or the geographic location of individual windbreaks.

Forest interior, area sensitive, and forest edge species occurred in the larger, taller, more complex windbreaks.

Openland and prairie species occurred in the smaller, shorter, less complex windbreaks.

### 6. Failure of the Model

There are several possible explanations for the failure of the model to predict accurately the number of bird species in the windbreaks.

- 1) Geographic differences in species richness. The model was developed in Kansas, which has 5-20 more species of bird than Nebraska (using the Bird Species Richness Index map of North America).
- 2) Differences in different windbreak characteristics. The number of species in Nebraska's windbreaks depends differently on windbreak characteristics than did the number of species in Kansas.
- 3) Differences in landscape characteristics. The number of species in Nebraska's windbreaks depends on characteristics of the surrounding landscape.

### 7. Local Landscape-Scale Effects

Land cover data were collected for the quarter-section (360 acres) of 100 containing the sample windbreak. Cover categories were tree, woodland, crop, grass, herbaceous, house / non-vegetated, and water. Fences and cattle grazing were also recorded (present / absent).

Landscape metrics computed included relative cover distributions, total edge length, edge / area ratio, number of patches, mean patch size, mean patch perimeter, and area of large fields.

The relation between observed and predicted number of species was not significantly related to any of the landscape metrics. This suggests that neither a region's number of species using a windbreak depends primarily on windbreak attributes.

### 8. Conclusions

- 1) The Bird Species Richness Index for windbreaks cannot be extended simply to describe species richness at large regional scales without either re-calibrating or adding terms that account for differences in regional species pools.
- 2) Local landscape-scale composition and structure do not explain the failure of the model.
- 3) The presence of species pools in windbreaks (e.g., forest interior, prairie) cannot be explained by windbreak size and complexity. The model may be more useful for predicting the presence or absence of species pools than for predicting the total number of species present.

**Acknowledgments:** This work could not have been done without the many dedicated people at the National Agricultural Statistics Service who helped plan and execute the 1994 data collection effort, the land farmers who allowed us to survey their windbreaks, the two ornithologists who spent six weeks traveling around Nebraska, and many other people from the University of Nebraska, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, and the Environmental Protection Agency. Funding was provided by the Environmental Protection Agency and the USDA Agricultural Research Service.

1. North Carolina State University, Forestry Department, Raleigh, NC  
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A bit text heavy  
but not too bad.





## Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location

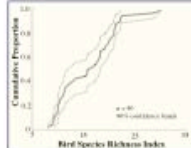
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### 1. Windbreaks as Habitat

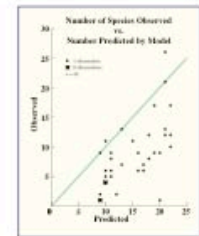
Agricultural lands — fields, pastures, and orchards — are managed to produce food and fiber for people. In the U.S. Great Plains, an extensive agricultural landscape, windbreaks have been planted to protect fields, crops, livestock, and farmsteads from the prevailing winds. Windbreaks provide some of the most essential habitat for birds and other wildlife that people have come to value. Windbreaks make up about 20% of the wooded cover in Nebraska, much of the other wooded cover occurs along riparian corridors.

Although they protect soil from wind erosion and provide habitat for some species, windbreaks also contribute to the fragmentation of prairie grasslands. Prairie fragmentation negatively impacts prairie wildlife such as prairie grouse, chickens, upland sandpipers, and peregrine falcons.

- Forty windbreaks were sampled using two-stage sampling with a frame stratified by intensity of cultivation.
- Most sample windbreaks fell in or near extensive cropland.
- Habitat characteristics of each windbreak were measured in 1994.
- Thirty-five farmers allowed windbreaks to return in 1995.



- Using regression factors associated with each sample, we estimated the habitat value of windbreaks for the region (graph left).
- We estimated that half of Nebraska's windbreaks support three times the bird species richness (graph left).
- We also estimated that between 87% and 99% of windbreaks are smaller than 1.5 hectares (data not shown), suggesting that the Nebraska windbreaks provide habitat for forest interior or area sensitive birds.



### 4. Validating BSRI Model

In 1995, a team of five ornithologists revisited 35 of the 40 windbreaks (5 farmers refused further visits) between May and early July.

Each windbreak was visited four times. Data were collected between one-half hour before and one hour after sunrise. All observed birds were identified to species and recorded using spot mapping techniques. Tape recorded vocalizations of the common nighthawk were played on the loudspeaker through the windbreak for each visit. Because the windbreaks were narrow, we assumed all species were observed.

### 6. Failure of the Model

There are several possible explanations for the failure of the model to predict accurately the number of bird species in the windbreaks.

- 1) Geographic differences in species richness. The model was developed in Kansas, which has 3-20 more species of bird from Nebraska (including Bird Survey species richness map of North America).
- 2) Dependence on different windbreak characteristics. The number of species in Nebraska's windbreaks depends differently on windbreak characteristics than did the number of species in Kansas. This suggests that within a region, the number of species using a windbreak depends primarily on windbreak attributes.
- 3) Dependence on landscape-scale characteristics. The number of species in Nebraska's windbreaks depends on characteristics of the surrounding landscape.

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**7. Local Landscape-Scale Effects**

Land cover data were collected for the quarter-section (160 acres), 60 by 60 containing the sample windbreak. Cover categories were tree, wetland, crop, grass, herbaceous, barren, non-vegetated, and water. Fences and earth grazing were also recorded (present/absent).

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### 5. Results of Validation

The model overestimates the number of bird species in the Nebraska windbreaks (graph left). However, the relative quality ranking of windbreaks is generally preserved. A total of 31 species were observed.

The strong, significant relationship was found between deviation of observed from predicted number of species and any windbreak attribute or the geographic location of individual windbreaks.

Forest interior, area sensitive, and forest edge species occurred in the larger, taller, more complex windbreaks.

Crow-tailed and grassland species occurred in the smaller, shorter, less complex windbreaks.

### 8. Conclusions

- 1) The Bird Species Richness Index for windbreaks cannot be extended simply to describe species richness at large regional scales without either revalidating regionally or adding terms that account for differences in regional species pools.
- 2) Local landscape-scale composition and structure do not significantly influence the model.
- 3) The presence of species pools in windbreaks (e.g., forest interior, grassland) may be explained by windbreak size and complexity. The model may be more useful for predicting the presence or absence of species pools than for predicting the total number of species present.

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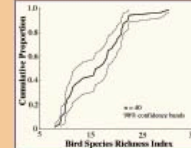
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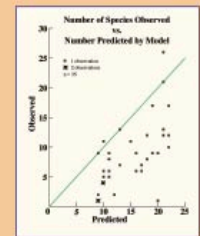
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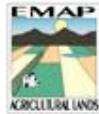
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3. North Carolina State University, Statistics Department, Raleigh, NC



## A Framework for Assessing the Condition of Agricultural Lands

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**Mission:** To develop indicators of the condition of agricultural lands within an ecological framework, and to monitor and evaluate this condition on a regional basis.



**Sustainable agriculture** has been discussed, defined, and discussed in countless papers. Definitions tend to be broad and encompass ecological, economic, social, and even policy dimensions. Although these dimensions are interrelated, each may be treated independently. In our efforts, we sought methods to examine only the ecological aspects of sustainability.

**The ecological condition** of agricultural land is defined by its productivity and the degree to which natural biotic and abiotic resources are conserved and protected. Agricultural land in good condition is productive and shows an appropriate natural resource sustainability in the ability to maintain good condition over time.

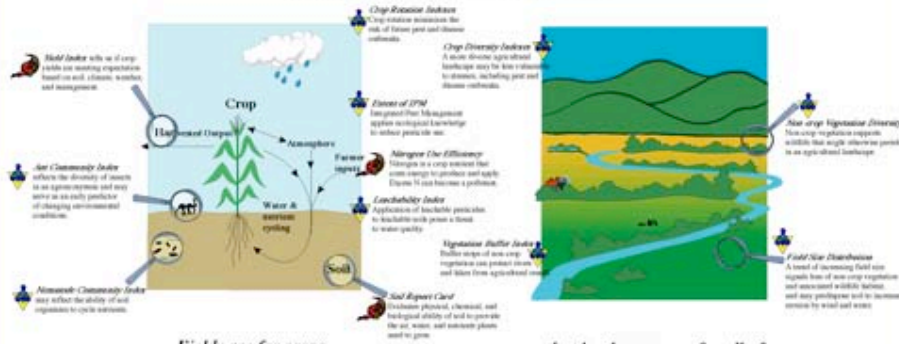


**Indicators were selected to reflect crop productivity and land stewardship.** In making an assessment, condition is reported for each indicator. An overall condition may also be reported, but depends critically on the relative weighting of the goals for agricultural lands. For sustainability one can examine trends in crop productivity and stewardship practices.

### Potential Indicators for Annually Harvested Herbaceous Cropland

As a working guide, we chose to concentrate our efforts on developing indicators for annually harvested herbaceous cropland — land planted with crops that are harvested every year whether the plants are annual or perennial. Common examples are corn, wheat, soybeans, alfalfa hay, and sorghum.

We also endeavored to supplement, rather than duplicate, existing efforts. Our conceptual framework is flexible enough to incorporate indicators based on data from other monitoring efforts. For example, an erosion indicator could be developed using the USDA National Resources Conservation Service's National Resource Inventory data.



Fields are for crops . . .

. . . but landscapes are for all of us.

**Acknowledgements:** The EMAP Agricultural Lands Resource Group thanks the many individuals and organizations that made this effort a success. The individuals on our immediate advisory list, the organizations include the USDA's Agricultural Research Service, Forest Service, National Agricultural Statistics Service, and National Resources Conservation Service; the U.S. Environmental Protection Agency; North Carolina State University; University of Missouri; Oregon State University; University of Tennessee; and North Carolina State University. A pretty long list. Thanks to all!

1. North Carolina State University, Forestry Department, Raleigh NC;
2. Duke University Medical Center, Durham NC;
3. North Carolina State University, Department of Plant Pathology, Raleigh NC;
4. USDA National Resources Conservation Service, Raleigh NC;
5. USDA Agricultural Research Service, Raleigh NC.



## Where do I begin?





## PREVALENCE OF OBESITY AMONG INNER CITY LATINO CHILDREN AND ADOLESCENTS

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Children's National Medical Center and George Washington University School of Medicine and Health Sciences, Washington, DC

**Background:** Obesity is a major global and public health problem, being attributed substantially to the USA. It is particularly significant in the increasing prevalence of obesity and overweight among the Latino population. Among the ethnic group there is a strong trend of health and children who are poorer. Studies of the present field on children have been for a substantial consensus that children should be for being similar other factors include TV, obesity prevalence and adolescents is increasing not only because of the increased health and nutritional care financing, but also because there children tend to be more obese adults. More obesity is associated with being obese diabetes, it will be a more serious impact on the health care system.

**Purpose of Study:** To examine the extent of obesity among inner city Latino children and adolescents with the overall goal of identifying the need for an obesity intervention program.

**Study Design:** The matched questionnaire for obese of children and adolescents aged 4 to 17 years was conducted in inner city Washington DC in Children's National Medical Center. Data for the previous year 2016. The study was an example of 100% of parents a family, approximately 100% are Latino, predominantly from 20 families. Information collected from children included weight, height, blood pressure, 2-year prevalence history and physical findings associated with obesity complications. Study data from 2016 was compared from previous height and weight. This report was from using 2016 research.

**Results:** The baseline data of the study is shown in Table 1. About 14% were obese. The majority was 10-17 years with a 60% of 10-17 age range of 44 out of 107 years. The mean BMI was 20.8 (range 16.7-34.4) with a range of 14.7-33.5. Overall 44% of the children and adolescents were overweight (BMI). The prevalence of 44% of the overweight child (10-17) population, with no ethnic equal differences between the two categories. Table 2. Table 3 shows more than overweight and obesity for inner city children, but the gender differences are not statistically significant. The prevalence of overweight was higher for youth aged 10-17 years.

Variable	Frequency (%)
Gender	
Male	68.4
Female	31.6
Age Categories (years)	67 (62)
0-3	4%
4-9	12.4
10-14	37.4
15-17	45.8
18-24	38.4
25-34	15.8
35-44	13.2

**Results continued:** Table 2 shows the distribution of overweight and obesity by overweight by age category. There was more the prevalence of overweight and obesity in overweight in high in children living at 10-17 years. Although the prevalence of overweight and obesity by overweight is increased in the age group 10-17 years, the differences were not statistically significant (Fisher's exact test,  $p=0.01$  and  $p=0.001$  respectively).

Table 3 compares the height, weight, and overweight for 10-17 years overweight children and youth with inner city children living there. There was no difference in the frequency of overweight of other young population in the inner city area, among children, adolescents and young adults, and ADHD patients the overweight and non-overweight group. Only 10% of the overweight children had been diagnosed with obesity. The percentage of overweight was 11.1 (20/180). The percent of the population that were overweight, normal, and low weight was 17.8 (32/180). There were no significant associations between overweight and obesity or children living parents in the inner city. Only 20% of the overweight children and youth were diagnosed with attention deficit disorder (ADHD) requiring they overweight status by their health care providers. There were no statistical differences between the overweight and non-overweight group.

BMI Category	Frequency (%)
At Risk for overweight (BMI 25-29.9)	33.8
1. Underweight (<17)	23.4
2. Underweight (17-19)	19.4
3. Underweight (20-24)	19.4
Overweight (BMI >=30) (Overweight)	22.4
1. Underweight (<17)	18.4
2. Underweight (17-19)	18.4

Age Category	At Risk for Overweight (%)	Overweight (%)
0-3	0.0	0.0
4-9	4.4	12.4
10-14	17.4	37.4
15-17	37.4	45.8
18-24	27.4	38.4
25-34	15.4	15.8

**Conclusion & Recommendations:** The prevalence for the overweight and obesity for overweight among children and youth in the inner city Latino community is more than twice the national average. Obesity health care providers should acknowledge and assess the presence of obesity and overweight in children and adolescents early and prevent appropriate management of the problem. Targeted interventions and preventive strategies for overweight and obesity in children and adolescents are urgently needed for this population.



I'm feeling  
sleepy

## Early Outcomes of the First 1471 Consecutive Kyphoplasty Procedures in the United States for the Fixation of Painful Osteopenic Vertebral Body Compression Fractures (VCF)

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### BACKGROUND

- 700,000 VCFs per year
- 275,000 diagnosed, ~80% due to pain
- Spinal deformity associated with
  - Significant morbidity
  - 23% increased mortality (Med, Ann Int Med 1999)
- Current treatments ineffective
  - Open surgery fail
  - Medical management palliative
- Vertebroplasty
  - Bilateral transpedicular cement fill
  - Relieves pain
  - Requires high pressure and runny cement
  - High risk of cement leaks
    - Up to 73% where documented (Wool et al., Radiology 1997)
  - Major complications (Chiras, J Int Neurosurg 1997)
    - 1.3% in osteoporosis
    - 10% in metastatic cancers

### KYPHOPLASTY

Kyphoplasty is a minimally invasive orthopedic procedure for reducing and fixing painful vertebral body compression fractures secondary to osteoporosis. Using a posterior approach, one or two inflatable Bone Tamps (Fig. 1) are inserted into the fractured vertebral body, generally using a bilateral transpedicular approach (Fig. 2). The surgeon carefully inflates the balloon tamps (Fig. 2) using radiographic contrast medium with image, volume and pressure control. The increased balloon tamp volume compacts the inner cancellous bone as it pushes the fractured outer cortical bone back toward its normal position. The inflation path is also controlled by placement, volume and balloon design. After reduction, the balloon tamp is removed, and the resulting void is filled with thick PMMA under low manual control and low pressure. The steps of Kyphoplasty are illustrated in Fig. 3.

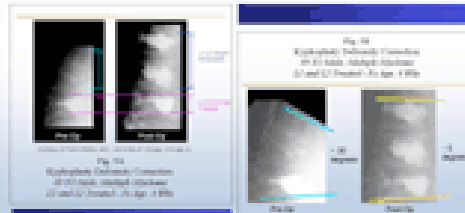


OK, but which way do I go?

### STUDY DESIGN AND METHODS

A retrospective multi-center review to assess early outcomes with Kyphoplasty. Pain was localized by physical examination. The presence of fracture deformity and collapse was confirmed on MRI. General or deep local anesthesia was chosen based on anatomy, number of levels and patient status. The first 125 patients at our centers were asked to characterize their back pain as improved, the same or worse 24 hours post-op and at final follow-up. Fractured and nearest normal vertebral body heights were measured anterior, middle and posterior in the first 27 vertebral body fractures treated by one surgeon (MAM). The height of the nearest normal vertebral body was used to calculate the % of predicted height for all the vertebral bodies (Fig. 4A) and for the sub-set where which had lost 15% or more of height before treatment (Fig. 4B).

The pre-treatment height was subtracted from the predicted height, then divided by the post-treatment height subtracted from the predicted height, to find the percentage of total height restored. One set of X-rays by one surgeon (FMP) are used to show an example height restoration (Fig. 5A) and deformity correction (Fig. 5B). Device-related major complications from all procedures are reported. Minor leaks in the first 70 procedures performed by one surgeon (HL) were assessed with X-ray and MRI.



### PRELIMINARY RESULTS

- 100% fracture (acute/chronic)
- Average (range) height: 41 mm
- Range: 10 days/1 year
- 80% complete
- 100% fracture (acute/chronic)
- Average reduction: 17%
- Average height post-op: 70% (range: 61-78)
- Average tamp volume: 1.5 cc (range: 1-10 cc)
- Mean time to fracture resolution: 10 days
- 100% fracture resolution
- 80% fracture resolution at 1 month
- 80% fracture resolution at 3 months
- 100% fracture resolution at 6 months
- 100% fracture resolution at 1 year
- 100% fracture resolution at 2 years
- 100% fracture resolution at 3 years
- 100% fracture resolution at 4 years
- 100% fracture resolution at 5 years
- 100% fracture resolution at 6 years
- 100% fracture resolution at 7 years
- 100% fracture resolution at 8 years
- 100% fracture resolution at 9 years
- 100% fracture resolution at 10 years

### CONCLUSIONS

Kyphoplasty is an important treatment option that provides immediate mobility and return to activities of daily living to patients with acutely painful vertebral body compression fractures secondary to osteoporosis. Kyphoplasty facilitates fracture reduction and deformity correction. While reduction is more likely in acute fractures (less than 6 weeks or less), it has been seen in fractures over one year old. Kyphoplasty also provides rapid pain relief in the nearly all patients, and this result is independent of fracture reduction. The safety profile of Kyphoplasty compares favorably to the published safety profile of vertebroplasty.



## Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here

Address/es Goes Here, Address/es Goes Here, Address/es Goes Here

### Introduction

**Fit ...**  
 Check with conference organizers on their specifications of board dimensions before you start your poster (e.g., most posters are landscape format for easier viewing).  
 The page size of the poster template is A0 (36" x 180"), landscape (horizontal) format. Do not change the page size. You can scale it to a smaller or larger size when printing. You need a different setup with either a portrait (vertical) or a square poster template.  
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### Aim

**How to use the poster template ...**  
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 The body text font size should be between 24 and 32 points. Use 14, 16, 18, 20, 24, or 36 point.  
 Keep body text left aligned, do not justify text.  
 The color of the text, the poster background can be changed at the discretion of your choice.

### Method

**Tips for making a successful poster ...**

- Re-write your paper in poster format. It is simply a writing style and not a font.
- Headings other than Section Headers should be both upper and lower case initial capitals.
- Never use the same word in capitals or unadorned small caps for your primary bold characters (titles).
- When laying out your poster leave breathing space around your text. Don't overcrowd your poster.
- Try using photographs or colour graphics. Avoiding mathematical symbols.
- Spell check and get someone else to proof read.



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 Images such as photographs, graphs, diagrams, logos, etc., can be added to the poster.  
 To make colour images fit on your poster go through the menu as follows: Insert > Picture > From File. Use the font of your computer, select and press OK. The computer will save the file as a JPEG or TIF. JPEG is the preferred format.  
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### Acknowledgements

Simply highlight the text and replace with your own text. Replace it with your text.



# Perfect!

## A Large-Scale Public Library Renovation in Taiwan

**A Large-Scale Public Library Renovation in Taiwan**

**Library Association of E.O.C.  
National Taichung Library of Taiwan**

**ABSTRACT**

There are 323 public libraries, including city, county, and village public libraries, in Taiwan. As a result of the 1990s, they are not fit in the digital environment of our own needs.

In order to upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning, in 2003, the central government of Taiwan approved a budget of NT\$1.2 billion (US\$ 4 million) as a large-scale public library renovation project in 323 public libraries.

National Taichung Library was designated as coordinate library to execute the project from February 2003 to June 2004. 323 public libraries were divided into eight groups according to the geographical areas, and a steering committee was formed, consisting of committee members from the fields of library and information science, architecture, space design, structure, and history. By committee members were assigned to one of eight groups of 323 public libraries to help and to give suggestions of renovation, improvement, replacement, service programs of each library.

The project was executed and completed efficiently and effectively in June 2004. This poster presentation will display the results of the renovation, improvement, replacement, library management, and services of 323 public libraries in Taiwan. The contents of the poster will be explained by words, pictures, and statistical tables.

**Keyword:** Public libraries  
<http://www.ntl.gov.tw>

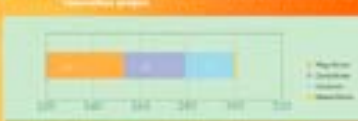
### Background

The last three years, many people have been talking about the digital environment of our own needs. In order to upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning, in 2003, the central government of Taiwan approved a budget of NT\$1.2 billion (US\$ 4 million) as a large-scale public library renovation project in 323 public libraries.

### Figure 1: Number of Public Libraries in Taiwan

Category	Number	Percentage	Category	Number	Percentage
City	10	3.1%	County	100	31.0%
Village	213	65.9%	Total	323	100%

### Figure 2: Number of Libraries in each administrative level involved in the renovation project



### Figure 3: Pictures of renovation design and interior of libraries before renovation



### How to achieve the project



### Methods: Developing between public renovation, funding and staff management, public library performance, and information science

- 1. Objectives**
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.
- 2. Developing between public renovation, funding and staff management**
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.
- 3. Funding and staff**
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.
  - Upgrade the quality of public library services in Taiwan to meet users' needs and to build lifelong learning.

### Implementation period: February 2003 to June 2004



### Implementation period: February 2003 to June 2004



[www.ntl.gov.tw](http://www.ntl.gov.tw)



Oh my gawd!



## WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?

Darm Kalisak, PES Student

Contact: ddk2@cornell.edu

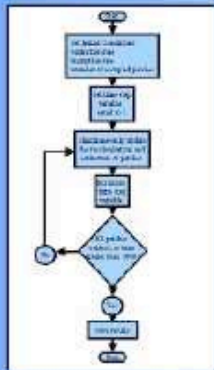
### INTRODUCTION AND OBJECTIVES

Many people consider the number of patches as the most important factor in determining the overall performance of a network. However, the connectivity of the network is also a very important factor. This project aims to investigate the relationship between the number of patches and the connectivity of the network.

The objectives of this project are to: 1) Investigate the relationship between the number of patches and the connectivity of the network. 2) Determine the optimal number of patches for a given network. 3) Compare the results of this project with existing research.

The results of this project will be used to design a network that is optimized for performance. This project is a continuation of the research conducted by the author in his previous work.

### THE PROGRAM



### ASSUMPTIONS AND LIMITATIONS

The number of patches is assumed to be constant, and the connectivity is assumed to be constant.

The connectivity is assumed to be constant, and the number of patches is assumed to be constant.

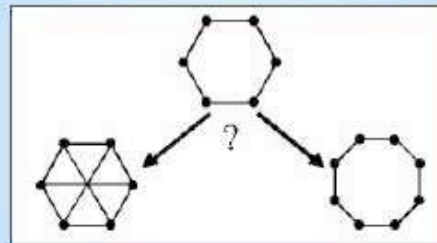
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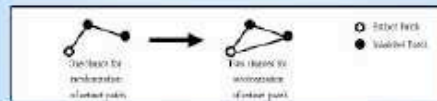
### THE ISSUE



A network topology is a collection of discrete population patches, in which individual patches vary typically in size, shape and location. In the long-term stability of the network topology is largely driven by adding new patches or by increasing the number of migration pathways between existing patches.

Adding patches increases the overall population of the network, and increases a total extinction rate, likely by increasing the direct number of patches which would have to go extinct.

Adding migration pathways can increase the likelihood of recolonization of extinct patches, by giving extinct patches more routes for immigration.

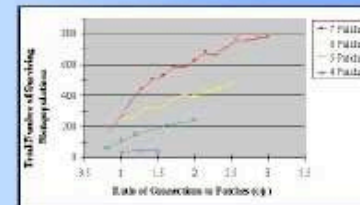


### RESULTS

Results of the study by using the model which involves the parameters:

- number of patches (from 4, 5, 6, and 7)
- stability constant (assumed constant)
- the ratio of migration pathways to number of patches,  $\alpha$
- the step migration probability of 0.4, 0.5, and 0.6

The overall stability of the network, measured by the number of patches which are not extinct, is a function of the number of patches and the connectivity of the network. The results show that increasing the number of patches and the connectivity of the network leads to a higher number of patches which are not extinct. However, increasing the number of patches also leads to a higher number of patches which are extinct. Therefore, the overall stability of the network is a function of the number of patches and the connectivity of the network.



### CONCLUSIONS

The results of the model show that, when possible, adding patches to a network leads to a higher number of patches which are not extinct. However, increasing the number of patches also leads to a higher number of patches which are extinct. Therefore, the overall stability of the network is a function of the number of patches and the connectivity of the network.

It is worth noting that the model assumes that the number of patches is constant. In reality, the number of patches can change over time. Therefore, the model is a simplification of the real world.



Nice flow, but too metallic





## Fusing <sup>18</sup>F-FDG-hybrid PET To CT Images Significantly Alters Treatment Planning In The Radical Treatment Of Non-Small Cell Lung Carcinoma

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Toronto-Sunnybrook Regional Cancer Centre, Sunnybrook and Women's College Health Sciences Centre,<sup>1</sup> and University of Toronto, Toronto, CANADA



### Abstract

A prospective clinical trial was conducted to determine the impact of integrating PET information into treatment planning for radical treatment of non-small cell lung carcinoma. Twenty-five patients were treated with radical resection and adjuvant chemotherapy. PET-CT scans were obtained pre-treatment and post-treatment. PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning. PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning. PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning.

### Potential of <sup>18</sup>F-FDG-hybrid PET for Radiation Therapy Planning

"Fluoro-deoxyglucose (FDG) is a glucose analogue that is metabolically trapped in cells. Many malignant tumours are associated with increased glycolysis and thus demonstrate increased uptake of FDG. In lung cancer staging, PET-CT has proven to have greater sensitivity and specificity than CT in radiation planning. It may help to distinguish between those other processes such as inflammation. As a functional imaging modality, FDG-PET may complement the anatomical data from CT.



Figure 1. PET-CT reveals focal hypermetabolism which indicates malignancy (red arrows). Areas of other processes such as inflammation are found on the PET-CT, respectively.

**Study Objective:** To determine the impact of integrating <sup>18</sup>F-FDG-hybrid PET images with CT planning images on treatment planning of patients with NSCLC.

### Problem

Local control with radical resection therapy for non-small cell lung carcinoma (NSCLC) is often poor. Some escalation with SBRT for the potential to improve outcomes. The treatment fails with any dose escalation approach to the ability to accurately define the gross tumour volume (GTV). We are examining imaging techniques such as PET or MRI. It is often difficult to distinguish malignant from normal tissues, particularly when nodules are small. PET and MRI are also well suited to the determination of any metastatic lymph nodes are involved. A standard acute sensitive to lymph node involvement would help guide treatment strategies.

### Prospective Study Design

**Imaging:** In treatment position and same day

- FDG-hybrid PET**
  - Minimum 4 hour fast prior
  - 4 - 10 mCi <sup>18</sup>F-FDG injected
  - Image 1 hour 1 hour's PET-CT is obtained
  - Repeat PET scans
  - 10 - 15 min high respiratory rate scan
  - Repeat scan 1 hour 1 hour's scan
- CT simulation**
  - Right and left lateral
  - Repeat CT scan 10
  - Repeat CT with new chest
  - Redesign and new scan also needed
  - Repeat the CT at 1 hour, 10 min

### Image Registration

The CT and PET-CT scans were co-registered using a 3D rigid body registration software program and eight fiducial markers. All registrations achieved a composite deviation of less than 1 mm.

### Patient Selection

- confirmed for radical resection therapy
- able to be in treatment position for CT simulation
- appropriate to advanced consent
- preclinical selection for post-treatment follow-up on diagnostic CT

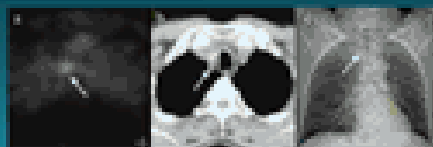
### Treatment Planning

- PET-CT based using CT only and then with PET-CT by each RT physician
- Separate plans generated for CT based PET-CT and CT-PET based PET-CT
- AP-PA, RAR, LA, RL, and other views added for PET-CT to the treatment plan
- Final dose calculated for RT by CT-CT generated for PET-CT and used

### Impact of FDG-hybrid PET on Patient Management

- In 1/25 (4%) patients, radiation therapy was changed from radical to palliative intent.

Figure 2. Case example where therapy was changed from radical to palliative intent because of the diagnosis of "lung metastasis" on PET-CT scans. The PET-CT scan and CT scan demonstrate a large volume of FDG uptake in the lung, which was not seen on the CT scan. This was confirmed by a subsequent biopsy of the lung, which showed metastatic disease.



### Impact of Co-registered FDG-hybrid PET on PTV Coverage

- In 1/25 (4%) patients, the volume of PTV<sub>95%</sub> receiving at least 95% of the prescribed dose with the CT only based plan was less than 95%.

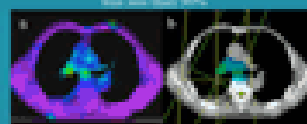


Figure 3. Case example to which our hypothesis that PET-CT based treatment planning would be more accurate than CT-only based planning. The PET-CT scan and CT scan demonstrate a large volume of FDG uptake in the lung, which was not seen on the CT scan. This was confirmed by a subsequent biopsy of the lung, which showed metastatic disease.

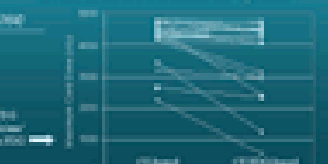


Figure 4. Coverage of PTV<sub>95%</sub> based on PET-CT coverage. The results on the coverage of PTV<sub>95%</sub> based on PET-CT coverage are shown in the table. The table shows that 96% of the PTV<sub>95%</sub> based on PET-CT coverage is covered by the CT only based plan. The table also shows that 4% of the PTV<sub>95%</sub> based on PET-CT coverage is covered by the CT only based plan.

### Impact of FDG-hybrid PET on Spinal Cord Dose

- In 1/25 (4%) cases, the maximum cord dose was reduced by more than 20% with PET-CT data.

Figure 5. The maximum dose to the spinal cord in the CT only and PET-CT based plans is shown for comparison. The results on the average of the maximum dose to the spinal cord in the CT only and PET-CT based plans are shown in the table. The table shows that 4% of the PTV<sub>95%</sub> based on PET-CT coverage is covered by the CT only based plan.



### Discussion

The impact of integrating PET-CT scans into treatment planning for radical resection and adjuvant chemotherapy for non-small cell lung carcinoma was examined in terms of patient management, PTV coverage, and maximum dose to the spinal cord. In 1/25 (4%) of patients, PET-CT scans revealed a change in management. In 1/25 (4%) of patients, PET-CT scans revealed a change in management. In 1/25 (4%) of patients, PET-CT scans revealed a change in management.

In this study, PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning. PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning.


### Conclusions

The timing of PET-CT before PET images in CT planning images significantly altered treatment plans in 4% of our cases. Integration of PET-CT before PET scans before planning increases the probability of more radical resection and therefore a better outcome. PET-CT scans were used to identify areas of increased FDG uptake, which were used to guide treatment planning.



I've fallen, and I can't get up





## Your Ingenious Teaser Right Here to Woo Them Down to the Body

The name of the author is 23pt regular

**Conclusions first: 44 pt bold**

Always put the most important part - your conclusions - first! Place your conclusions in the upper left hand corner of your poster.

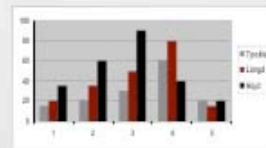
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**Introduction**

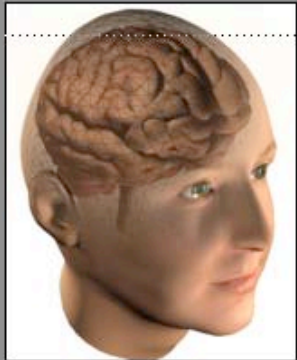
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Your poster is an advertisement for your research and as such it needs to be eye-catching and straight to the point. You only have seconds, or at best a few minutes to attract the attention of the visitor to a poster session. Keep your message short and clear



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## Gorgeous!



## LESSONS LEARNED FROM AIRWAY PRESSURE RELEASE VENTILATION (APRV)

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### INTRODUCTION

Airway Pressure Release Ventilation (APRV, aka. BiPAP) has been previously demonstrated to be a useful modality to maintain patients with acute lung injury (ALI) or the acute respiratory distress syndrome (ARDS). As this is a fundamentally different mode than conventional cyclic (tidal) ventilation, we conducted a single institution's experience with APRV to determine safety, complication detection, and efficacy, at resolving hypoxemia and hypercarbia.

### METHODS

Consecutive patients transitioned from either volume or pressure targeted ventilation to APRV (Dräger Esol4 Pulmonary Workstation) at a University hospital surgical ICU were retrospectively reviewed. Patients initially ventilated with APRV were excluded. Initial APRV settings to correct hypoxemia ( $pO_2 \leq 60$  torr vs  $FiO_2 \geq 0.5$ ) were a  $P_{high}$  at the prior plateau pressure, a  $T_{high}$  of 6.0 sec and a  $T_{low}$  of 0.8 sec. Hypercarbia ( $pCO_2 \geq 55$  torr and  $pH \leq 7.2$ ) patients were set to a  $T_{high}$  of 5.0 sec and a  $T_{low}$  of 1.0 sec. Settings were adjusted to resolve hypoxemia and hypercarbia. IRB approved abstracted data included principal diagnoses, ventilation parameters, laboratory values and ventilator associated complications. Data before and after APRV were compared using a two-tailed paired t-test or Chi-square as appropriate; significance was assumed for  $p < 0.05$ .

### RESULTS

#### Demographics

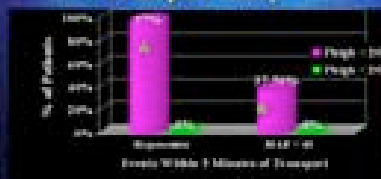


#### APRV

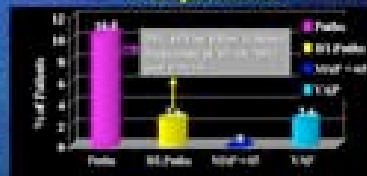


Element	Value
% Hypoxemia	88%
% Hypercarbia	12%
Time to $SpO_2 \geq 92\%$	$7 \pm 4$ min
Time to $EtCO_2 \leq 6.8$	$5.2 \pm 0.9$ hr
Time to $pCO_2 \leq 40$ torr	$42 \pm 7$ min
Time to norm $pCO_2$	$76 \pm 12$ min
Mean change in $V_T$	$-0.2 \pm 0.3$ L/min <sup>2</sup>

#### Transport Safety



#### Complications



### CONCLUSIONS

1. APRV is a safe rescue mode for hypoxemic or hypercarbic respiratory failure and requires a significantly lower  $V_T$  than conventional ventilation.
2. Decreasing release phase volumes and a rising  $pCO_2$  are strong indicators of pneumothorax in a patient on APRV. Routine end-tidal  $CO_2$  monitoring is recommended.
3. Preparation for safe intra-hospital transport may be keyed to the  $P_{high}$  required for oxygenation and ventilation. Patients requiring a  $P_{high} > 20$  cm  $H_2O$  should be transported on the ventilator.



Welcome to  
the 80's  
Fer sure!



Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here



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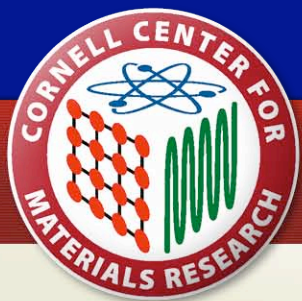
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