2007

Creating and Presenting a Poster at the Undergraduate Student Symposium

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Creating and Presenting a Poster at the Undergraduate Student Symposium

Workshop by faculty members
Beatrix Aukszi, Christopher Blanar, and Weylin Sternglanz

Setting up your poster

- Poster boards and easels will be provided.
- Notify the Dean's Office if you need other resources for your poster.
- The Dean's Office will notify you of your poster and easel number.

Poster guidelines

- Click here to view poster templates
- Posters should be 36” by 48”.
- Posters can be printed at the Large Format Printing Office (Rosenthal Building, room 216).
- Printing request forms should be submitted by Monday, April 6 at latest.
- Printing request forms can be found here: **http://www.nova.edu/asm/posterprinting.html**
- Students are allowed to print 5 posters per academic term for free.

Top 10 Fears and the Reasons to give a Presentation

1) **Public Speaking**
2) Heights
3) Insects
4) Financial Problems
5) Deep Water
6) Sickness
7) Death
8) Flying
9) Loneliness
10) Dogs

1) Disseminate results ahead of publishing it
2) Communicate ideas
3) Teach the audience
4) Establish future collaborations
5) Secure funding
6) Gain interest of prospective employers

Making the poster

- The purpose of a poster:
  - Source of information
  - Conversation starter
  - Advertisement for your work
  - Summary of your work

- An effective poster:
  - focuses on a single message.
  - tells the story via graphics (i.e., uses text sparingly).
  - is organized , with a well-ordered clear sequence.

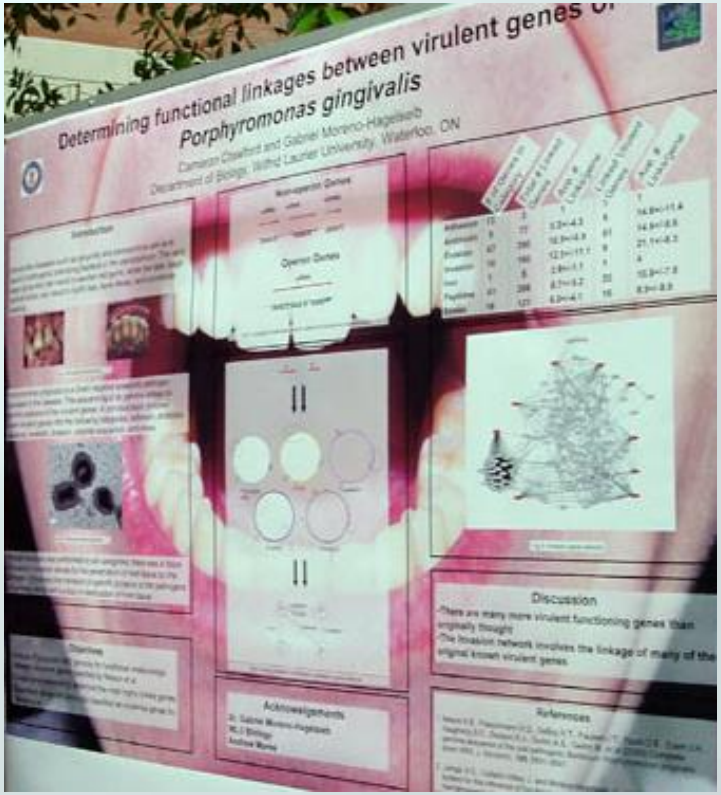
Building your poster

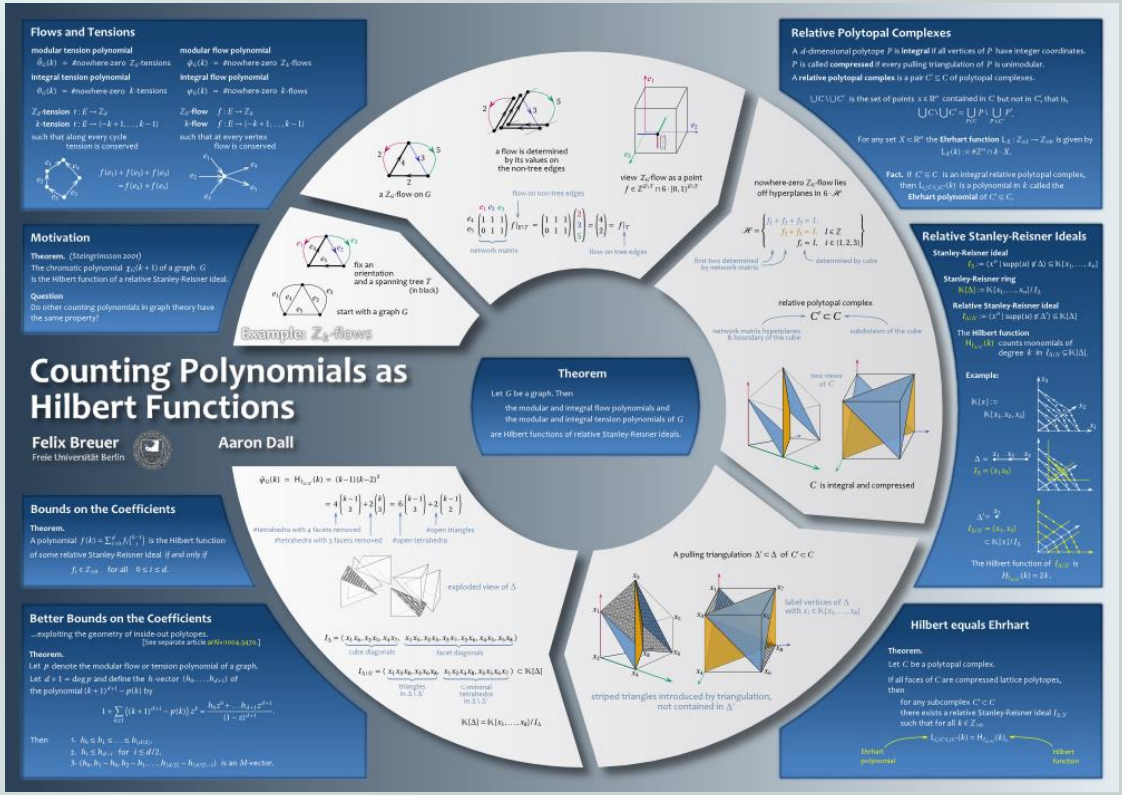
- Build your poster backwards

1. Identify your key message. Express that message in a single sentence. (consider making this your title, too)
2. Collect the graphical elements (graphs, pictures, tables, charts) that summarize the data that support that message.
3. Write a clear, concise summary of your results, referencing the graphical elements.
4. Write only those methods that allowed you to produce the results.
5. Write brief introduction providing background information and framing research question.
6. Briefly discuss results, and clearly reiterate your key message as a conclusion.
7. Thank those who helped you (acknowledge labmates, resource people, funding sources).

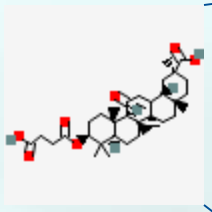
Visual elements on your poster

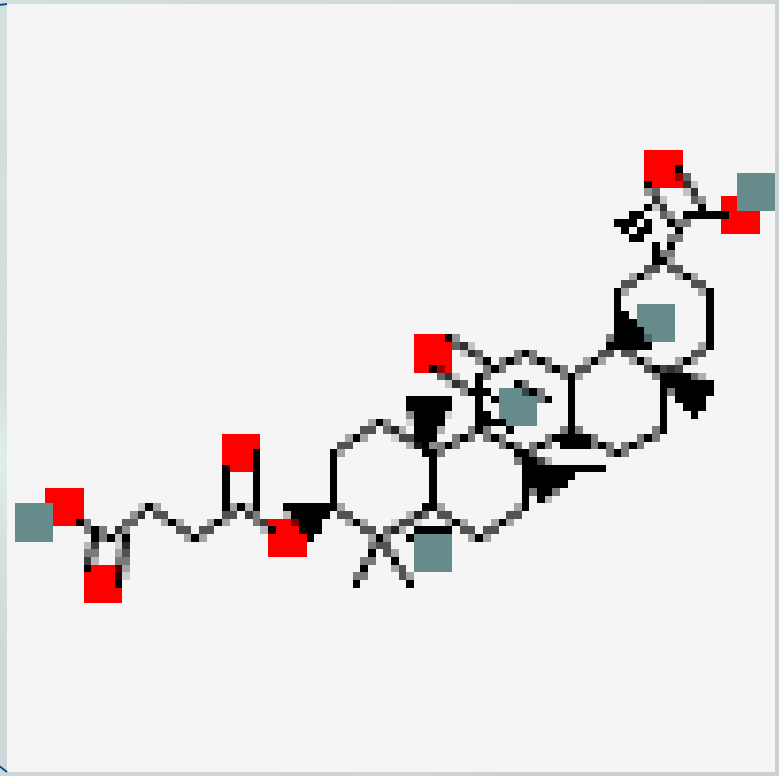
- Simple background is best if you have a substantial number of images/ graphs/ tables to show. Avoid distractions!
- An eye-popping background image is almost always distracting- it is usually only appropriate if you do not have images. Use with caution!





Visual elements on your poster

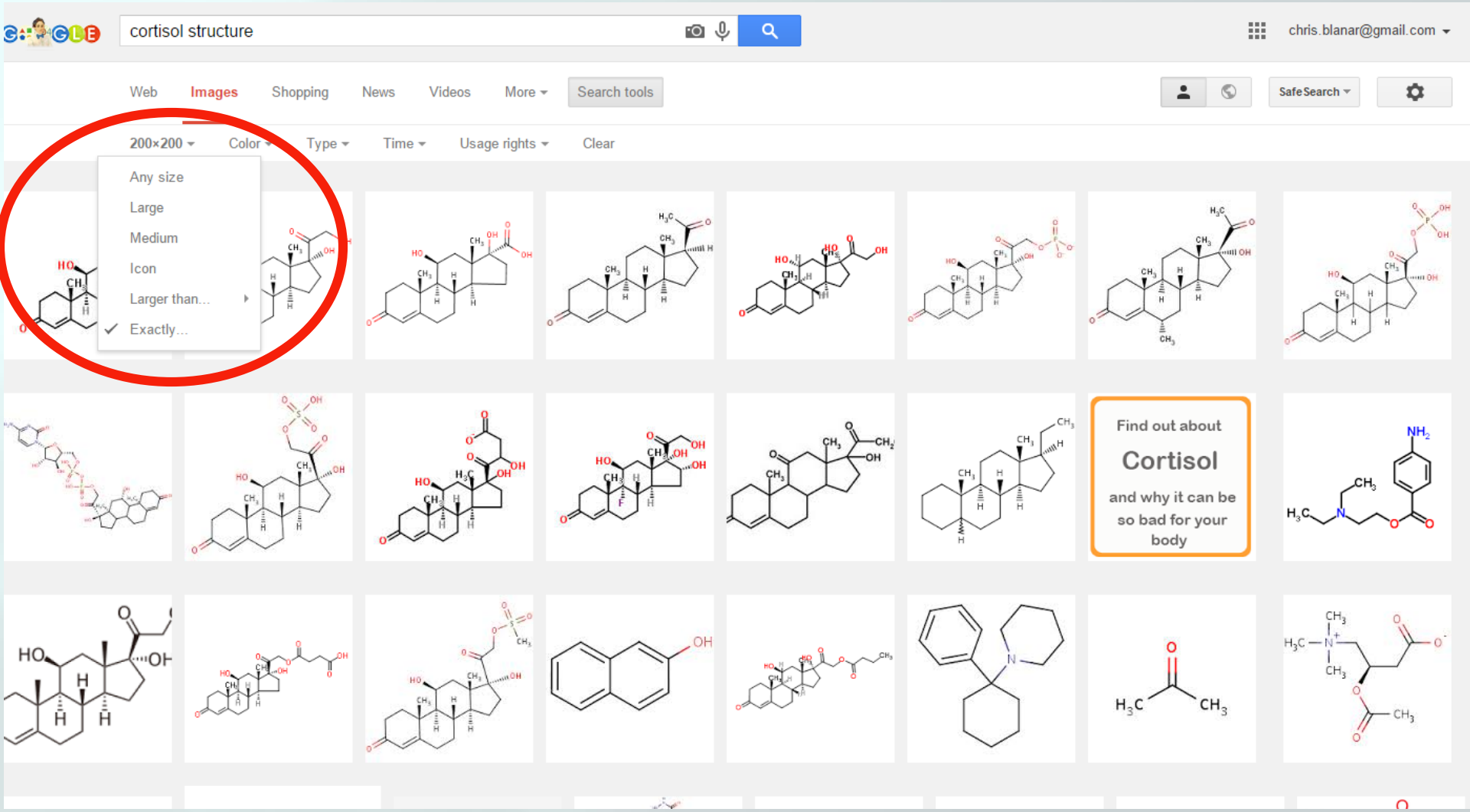




Low resolution images may look great on a computer screen, but become horribly pixelated and blocky when enlarged and printed. Always select the largest images you can.

Avoid jpg or jpeg files, especially if they are <3-4 MB in size.

Visual elements on your poster



Visual elements on your poster

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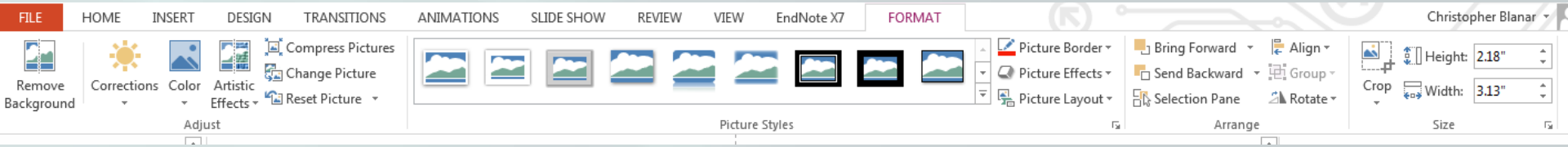
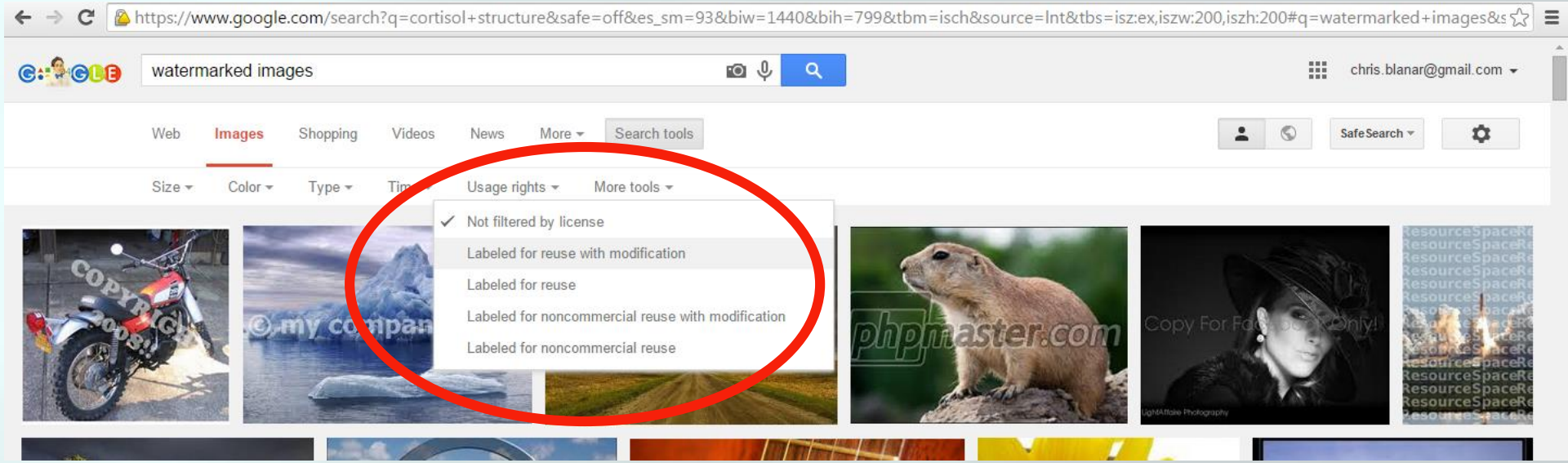
- Use the image editing options in PowerPoint to fully integrate imported images into your poster.
- Contrasting background colors on images are distracting: get rid of them by setting them to “transparent”.
- Improve clarity by dropping brightness and increasing contrast.



Visual elements on your poster



Using someone else's images without their permission is a copyright infraction. Proprietary images often have watermarks, but not always.

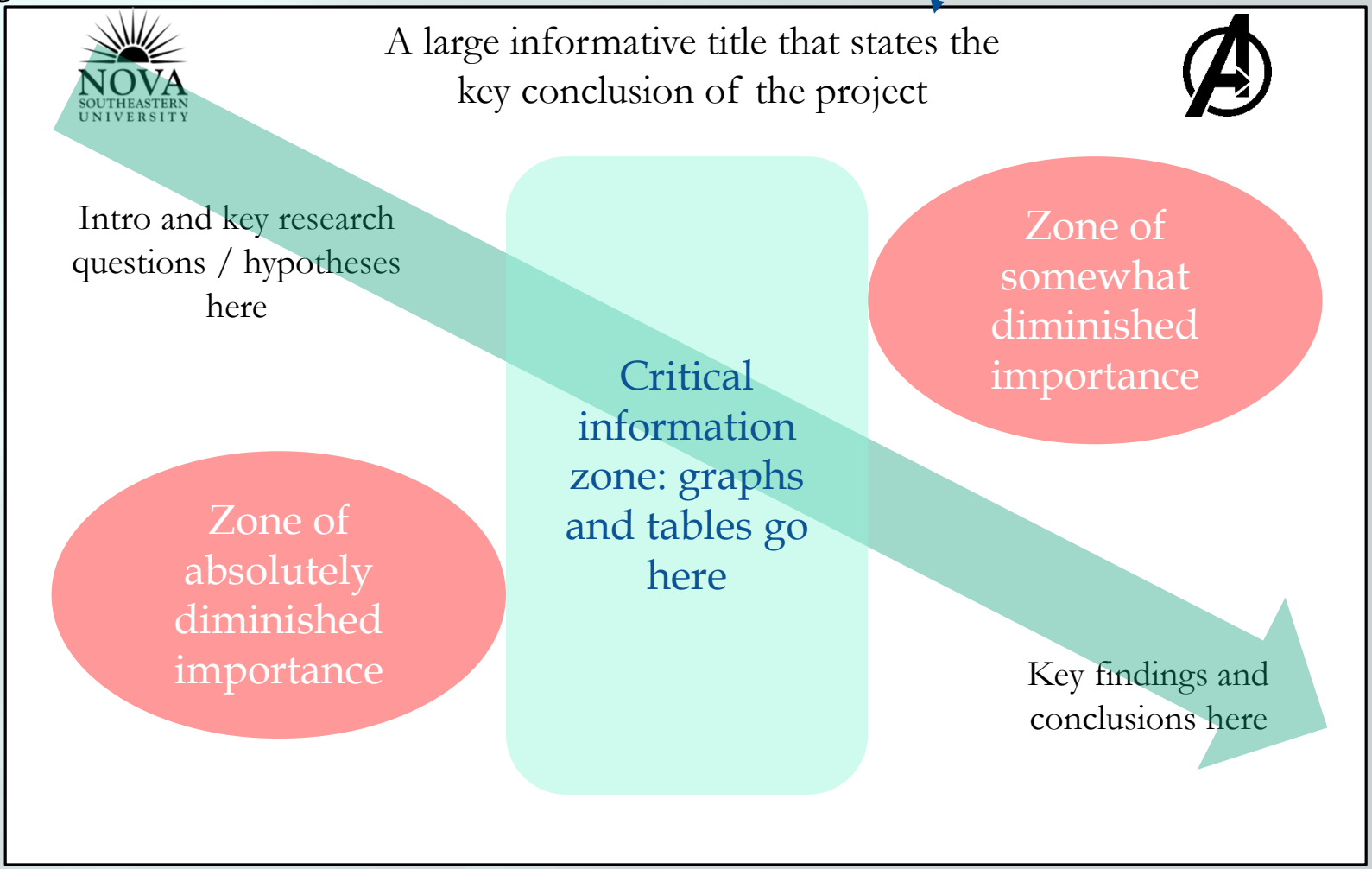
Safest way to proceed is to use Google image search to find images licensed for noncommercial uses… or make your own.

Laying out the poster

- Typical sections of a poster:
  - Title, your name, faculty advisor, NSU logo
  - Abstract **
  - Introduction/Specific Aims/Objectives
  - Materials and/or Method(s) **
  - Results
  - Discussion/Conclusions/Future directions
  - References or Literature Cited **
  - Acknowledgments/Funding/Contacts**
- Figures/Tables/Images should occupy central spaces, dominating the poser visually

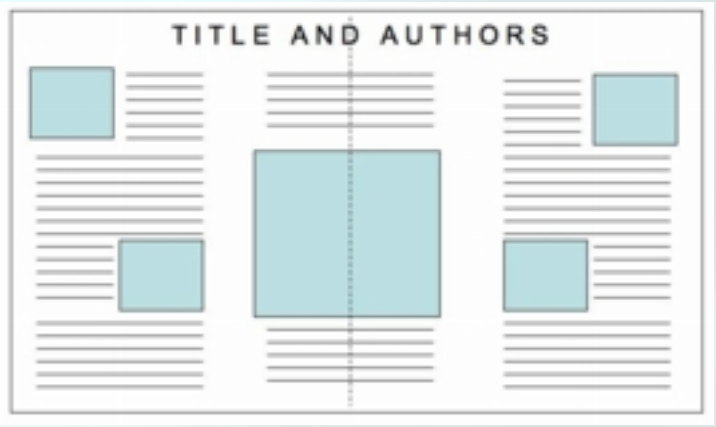
** These elements are less essential in posters and should never dominate. In most cases they can be omitted, or added to a handout to accompany the poster.

The visual appeal of your poster is the first thing people will notice. The second is the title. The average viewer will take less than five seconds to decide whether to actually read the poster, so make the title a grabber.

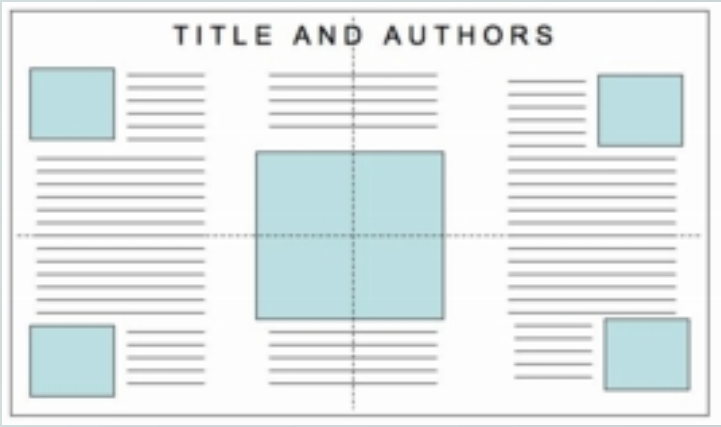


…based on studies of eye movements in test subjects reading scientific posters

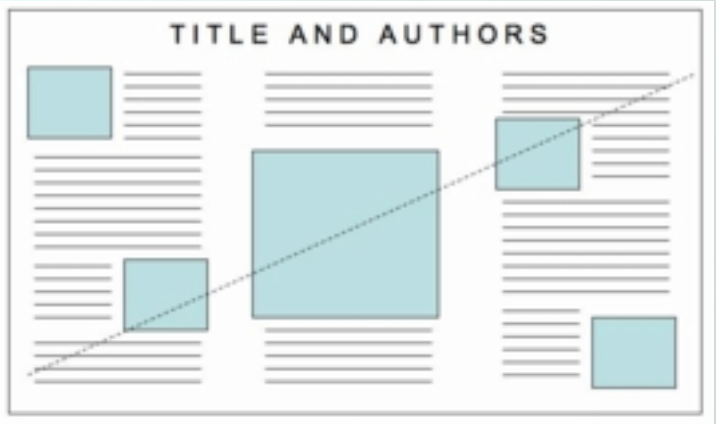
Possible Layouts



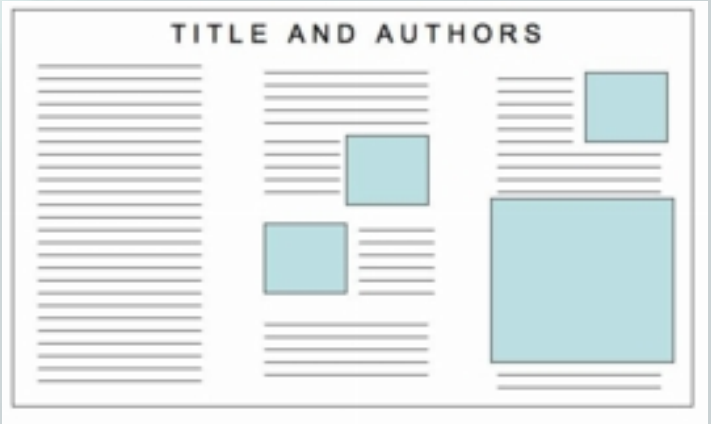
Horizontal Symmetry



Horizontal & Vertical Symmetry



Diagonal Symmetry



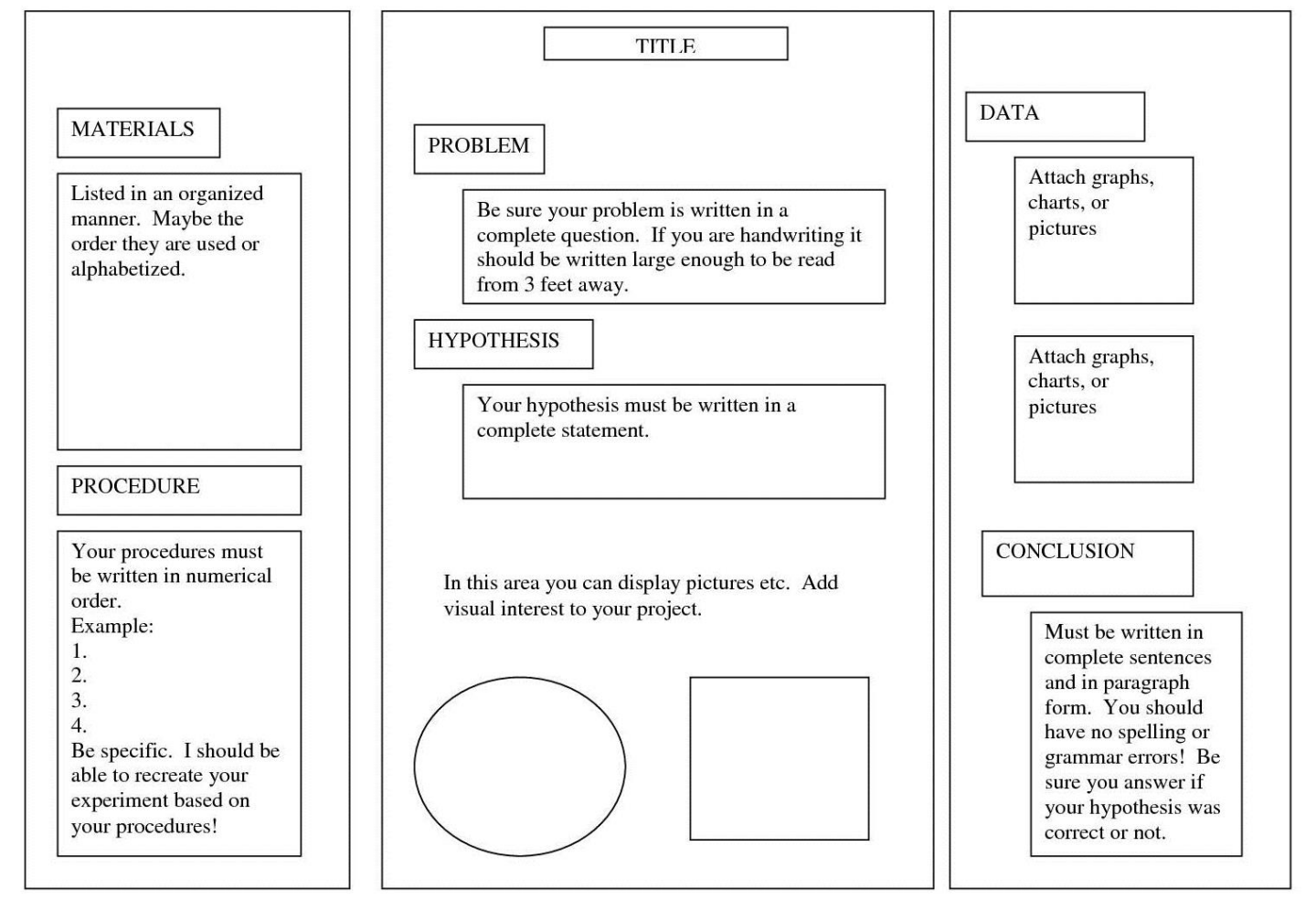
Asymmetry

(text-heavy on left, image-heavy on right)

Images are from: http://www.ncsu.edu/project/posters/NewSite/CreatePosterLayout.html

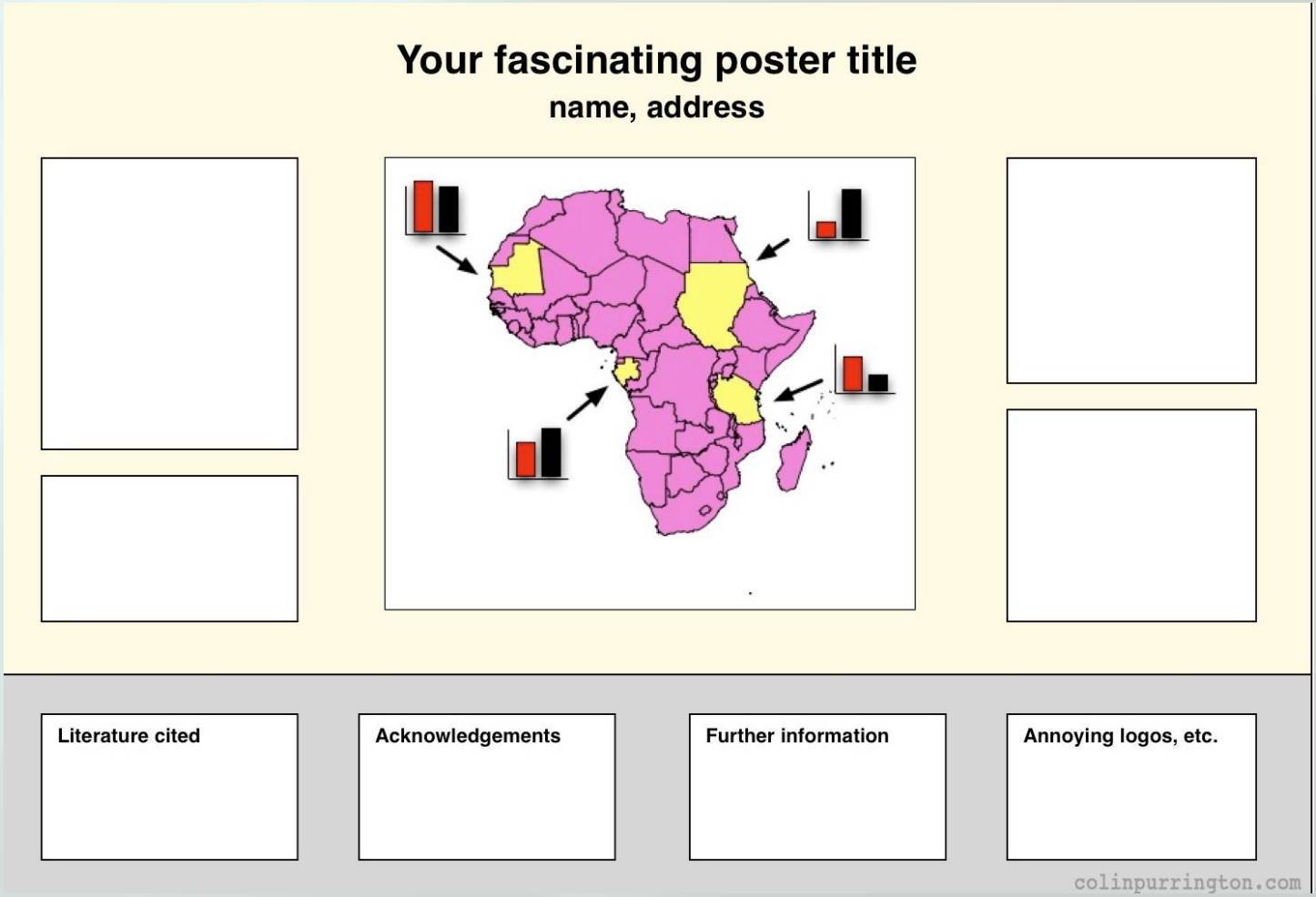
Possible Layouts

- The vertical symmetry divides written text on the sides and keeps visual focus in the center.



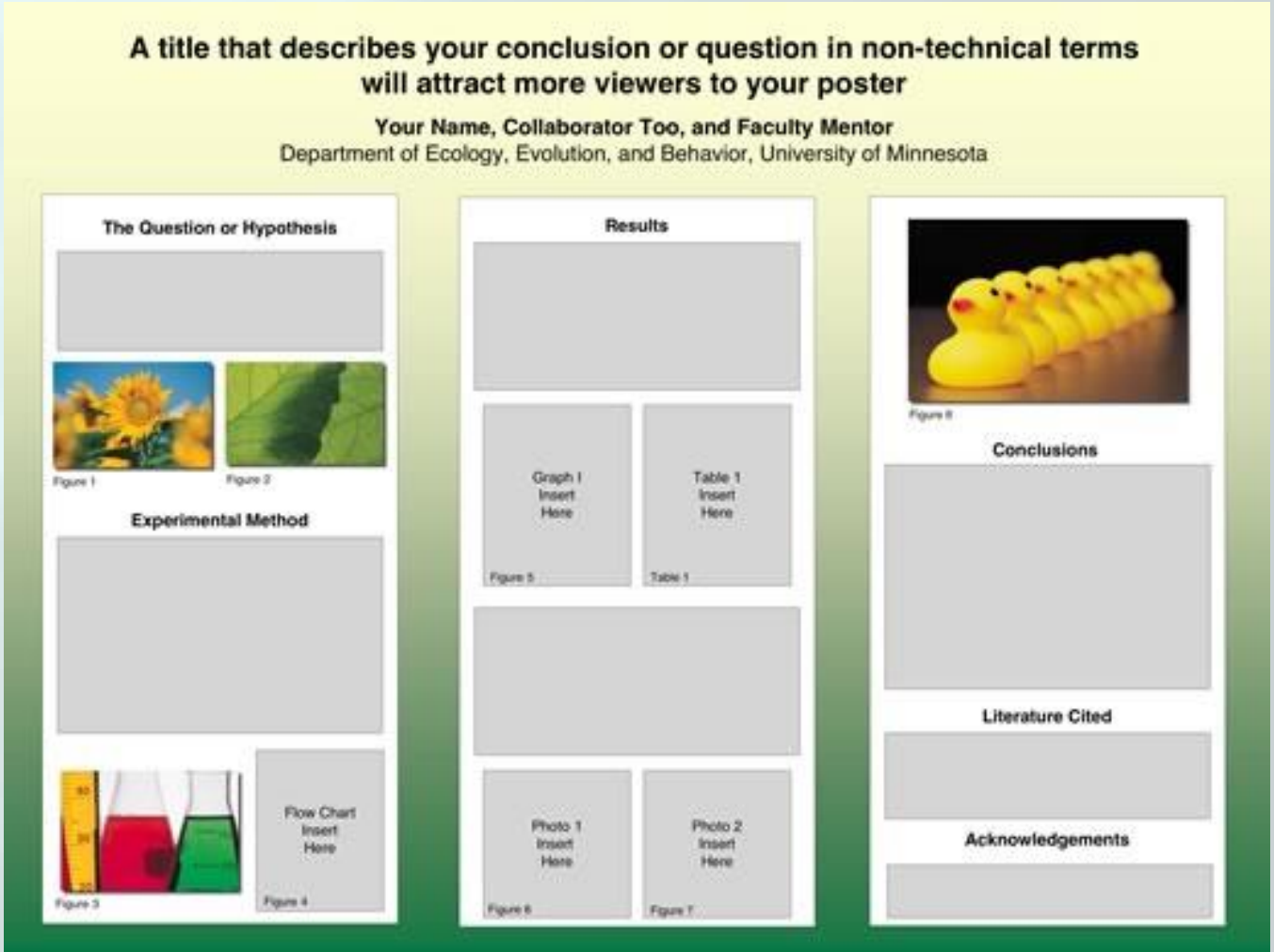
Possible layouts

- The vertical and horizontal symmetry creates a very strong visual focus in the center, featuring your data.



Possible layouts

- The diagonal symmetry alternates the visual focus of your data with the written text outlining details.



Easel 3

Histological Techniques Investigating the Occurrence of Metaplasia in Crassostrea virginica

Rina Bhalani, Tim Chung

Histological Techniques Investigating the Occurrence of Metaplasia in *Crassostrea virginica*

Rina Bhalani and Timothy Chung (Dr. Deanne Roopnarine, Advisor)
Math, Science, and Technology Department
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Introduction

The Macondo oil spill occurred in Louisiana Bay in 2010. It was caused by the explosion of the *Deep Horizon* oil rig. Approximately 4.9 million barrels of oil were spilled into the waters near Louisiana covering a vast area. Although immediate environmental effects were easily observed, studies are now underway investigating the long-term effects of the disaster. Since hydrocarbons are present in oil, studies have shown that there are long-term effects on shellfish due to exposure to certain concentrations of hydrocarbons (Freedman, 1995). It was found that the toxins in the oil caused numerous sub-lethal effects such as necrosis, inflammation, and increased incidence of lesions in the digestive glands, gills, and mantle (Kennish, 1997). The tolerance of oil contamination was lower in the oysters (*Crassostrea virginica*) than the hard clams (*Mercenaria mercenaria*). The purpose of this experiment was to analyze the effects of the oil spill on shellfish, particularly the Eastern oyster Crassostrea virginica. It was hypothesized that oysters might have undergone metaplasia, which is the replacement of one cell type with another. The epithelia of the gills of this species is ciliated simple columnar. Utilizing histological techniques, the results of this study of the oysters from the waters near Louisiana and Apalachicola Bay were compared with the control oysters from Chesapeake Bay to investigate the occurrence of metaplasia.

Methods

Fixating - The oysters were placed in Bouin's fixative for 24 hours. The purpose of the fixative is to preserve the cellular structure and kill pathogens and is the most important step in processing the tissue samples. Fixation stabilizes proteins in cells, which prevents enzymatic degradation of the tissues by autolysis (Bancroft & Gamble, 2008).

Embedding - After fixation, the tissues must be dehydrated. The oysters in the fixative were placed in 50% ethyl alcohol, then 70% alcohol and left overnight. The oyster tissues were placed under vacuum to aid in the removal of water. The samples were then put in increasing concentrations of alcohol of 70% to 100% to complete the dehydration process.

- Xylene was used as a clearing agent and is a solvent miscible with embedding solutions. Xylene removed the alcohol from the tissue samples in preparation for infiltration.

- The samples were placed in a paraffin bath where the was infiltrated the tissues by forming a matrix, which prevented the tissue structures from becoming distorted (Bancroft & Gamble, 2008). The ideal melting point of the paraffin wax is between 55˚C and 58˚C. The tissue samples were oriented on the molds and the paraffin was was dispensed until the molds were filled. The blocks were cooled and kept in the freezer until they were ready to be sectioned.

Sectioning - By using a microtome, the tissue samples were sectioned between 10 and 16 µm thick. The ribbons were transferred to a water bath and were picked up quickly on the slides and placed on a heater in preparation for staining.

Figure 1: The microtome with a sample. Figure 2: A sample being sectioned into ribbons

Staining - The embedding process must be reversed in order to remove the paraffin wax. Therefore, the slides were deparaffinized by clearing with xylene, then rehydrated with decreasing alcohol concentrations and water, stained with hematoxylin and eosin, dehydrated, and cleared with xylene. Slides were then cover slipped.

Results

Figure 3: Crassostrea virginica

Figure 4: Gill tissue of Crassostrea virginica

Figure 5: Apalachicola Bay, Florida oyster gill epithelium in 2010, metaplasia

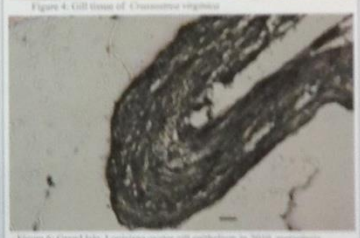

Figure 6: Grand Isle, Louisiana oyster gill epithelium in 2010, metaplasia

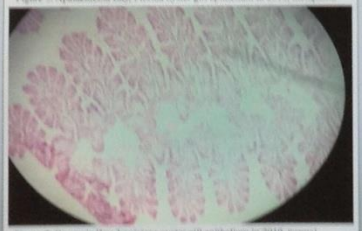

Figure 7: Barataria Bay, Louisiana oyster gill epithelium in 2010, normal

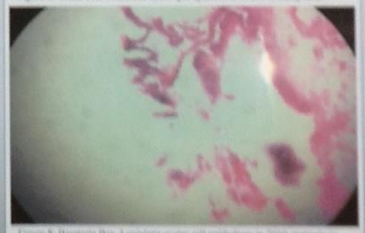

Figure 8: Barataria Bay, Louisiana oyster gill epithelium in 2010, metaplasia

Figure 9: Apalachicola oyster gill epithelium in 2011, normal, 400x

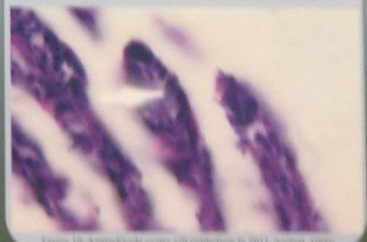

Figure 10: Apalachicola oyster gill epithelium in 2011, normal, 1000x

Discussion

Histological studies done on specimens collected in Apalachicola, Florida, in 2010 did show metaplasia of gill epithelium in 15% of the specimens. The epithelia of their gills was changed from simple columnar to stratified squamous which is demonstrated in Figure 5. However, in 2011, there were no signs of change in specimens collected at this location and the epithelium was 100% simple columnar as shown in figures 9 and 10. This type of epithelium is essential for filtration because most bivalves are filter feeders (Russell & Yonge, 1970). Figures 6 through 8 demonstrate the gill epithelia of oysters collected from Grand Isle and Barataria Bay, Louisiana in August 2010. Thirty-five percent demonstrated metaplasia of gill epithelium. This could be a result of oil being carried in the inhalant current that may have collected within the mantle cavity which surrounds the gill. If the oil is emulsified or absorbed onto silt particles, it may cling to the gills or pass into the gut (Russell & Yonge, 1970). Moreover, hydrocarbons and heavy metals that are present in crude oil are factors that cause morphological changes in the oysters (Burger, 1998). The changes in the gill epithelium is crucial because of the effects on filtration. The gill is an essential organ of the oysters as water is drawn in over them through the beating of cilia of the epithelium. A further function of their gills is the filtering of toxins and unnecessary particles. Consequently, if oysters are unable to filter the inhalant current properly, there could be detrimental effects on their physiology. A pertinent fact, is that the oyster is an important part of the Gulf of Mexico coastal food web.

Future Studies

Further research is currently being done on the digestive system of an Apalachicola oyster to determine if metaplasia had also occurred in this region. Figure 11 illustrates the simple columnar epithelium of the digestive system in the Apalachicola oyster. The histological slides of the Louisiana oyster are currently being made to compare with the Apalachicola specimen.

Figure 11: Apalachicola oyster digestive epithelium in 2011, 400x

References

Bancroft, J., & Gamble, M. (2008). *Theory and Practice of Histological Techniques* (6th ed., p. 725). Edinburgh: Churchill Livingstone. Tissue Processing, 5, 83-92.

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Freedman, B. (1995). Environmental Ecology: *The Ecological Effects of Pollution, Disturbance, and other Stresses* (2nd ed.). San Diego, CA: Academic Press. 165-170.

Kennish, M. (1997). *Practical Handbook of Estuarine and Marine Pollution* (1st ed., p. 524). Boca Raton, FL: CRC Press. 49-88.

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Southgate, P., & Lucas, J. (2008). *The Pearl Oyster* (1st ed.). Amsterdam: Elsevier Science. 213-215.

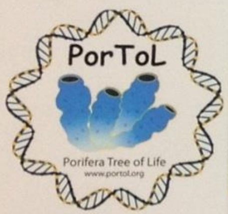
Gene Evolution and Conservation within Marine Sponges: Case study of the *Cinachyrella* and *Discodermia* Sponges

Bryce Parrish | Jose Lopez PhD | Nova Southeastern University |Farquhar College of Arts and Sciences | Division of Math and Science | NSU Ocean Center

Background and Rationale

Bioinformatic studies provide a means to interpret basic genetic data of nucleotides. Due to their age, phylogenetic reconstruction of basal level metazoans, such as sponges and corals, has been difficult. Altering the choice of gene selection based on conservation has given rise to evidence of multiple well supported phylogenetic lineages in metazoans (Nosenko, et al 2013). Genomics and bioinformatics tools can help find good genes to use in phylogenetic studies. The Portal Porifera Tree of Life project is an initiative to solve the problems of Porifera phylogeny. This is accomplished by finding conserved genes that will help solve the discrepancies of porifera phylogeny (Hill et al, 2013). In addition to phylogeny bioinformatics sequence data can provide a means to study unknown or hypothetical proteins (Whisstock et al, 2012).

Novel genes from the local sponge *Cinachryella alloclada* that were looked at in this study were mucin 4, Rab 30, cytochrome p450, Cathepsin L, and ubiquitin e3.



Objective

This experiment aims to develop new gene markers and corresponding PCR primers that can be used to amplify conserved DNA sequences between *Cinachyrella* and *Discodermia*. In later experiments the primers will then be utilized to extract the targeted genes. Future studies could involve sequencing the data obtained from the primers and, they can be used to study phylogeny.

Hypothesis

Bioinformatic studies of previously sequenced DNA transcripts of *Cinachyrella* and *Discodermia* will allow for the creation of PCR primers for genes that are conserved at the protein level.

Current Invertebrate Phylogeny

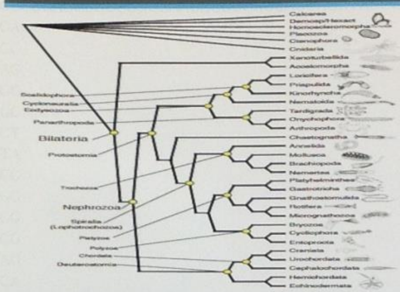


Fig. 1 – Current invertebrate phylogeny adapted from Edgecombe et al. (2011)

Procedure/ Methods

Step 1

Bioinformatic search of novel genes through previously sequenced transcripts that are well conserved at the protein level throughout different species of Poriferas.

Step 2

PubMed

Verification of proteins and DNA sequences with PubMeds blast-P and blast-X. Conserved regions and protein information were recorded.

Step 3

Using the standard genetic code back translation of conserved regions of amino acids to get DNA sequence to be used to make primers. Reverse complements were used to make reverse primers.

Step 4

Run PCR with new primers and study sequences.

Protein/Gene Information

Fig 2. A purposed structure of human Cathepsin L with two inhibitors present. Image from PubMeds protein database. J Med Chem. 2009 Oct 22;52(20):6335-46. doi: 10.1021/jm900596y.

Genes that were looked at in this study were mucin 4, Rab 30, cytochrome p450, Cathepsin L, and ubiquitin e3. Some genes were found to be better conserved than others. Rab 30 is in the family of GTPaseses and, has been shown to be tightly associated with the Golgi apparatus and is important in its morphological structure (Kelly, at al 2012). Cathepsin L has been shown to be a protease that cleaves at specific cysteine residues (Hwang, et al 2007) (Fig. 2). Cytochrome p450 aids in the oxidation of a wide variety of organic substrates. Mucin type proteins are cell membrane bound glycoproteins.

Results: Alignment data of Cathepsin L

```
1Smith_5_1_MEKDYGYLFNIILLGDTGVGKSSILMQYKDGRFAFGAPPTLGIDFCIKTHEIDCSDVKLQ
2Smith_5_1_MEKEHGYVFNVILLGDSGVGKSSILLQYKDGKFAFEGSVTLGIDFWIKEHNIDGNTVKLQ
3Smith_5_1_METEYDYLFKIVLIGDAGVGKTSIVRRYTDGVFTSAGIPTIGVDFCIKTLQIGSSAVKLQ

1Smith_5_1_VWDTPGQEQFRAVTRSYYR[illegible]DIGDAETFHHLSYWNGELKKYAKEDVHCLLVG
2Smith_5_1_VWDTPGQEKYRAVTRSYYH[illegible]DIGRTKTFESISYWLEEVKKYAKEDVHCPLVG
3Smith_5_1_IWDTAGQERFRTITQSYYRSADAIVLVYDISSATSFRNLPEWLAEVERYAGNSVHRILIG------

1Smith_5_1_NKSDLPSKPGKSDKPYKKGEVREVTTKSGKQFADENGMPFMESTAINWENINGLFVQLQ----
2Smith_5_1_NKSDLPDKSDKLDEPDKADKSSKPDKSDKPDEPDKADKPDM--------------------------
3Smith_5_1_NKSD------RSD------- REIETDLGKQFAQENSMPFLE---TSAKNSSNIDQLFLQLAK

1Smith_5_1_TLLEKKPTPPEEESDIQEESATGKASSIHESSAILESSTVDIVVLDGCKKPKRRRKYC-----
2Smith_5_1_PDEPNKADKPDKTDMPDEP-----------DKP-------------------------------
3Smith_5_1_TLRDS-----HVDKKLKSPHSIGGASAKPHTVSLTEPA-----------KKPEQGGGCCC----
```

Fig. 3 Alignment data for the gene Cathepsin at the protein level. Color sequences appear to be most conserved and thus used for PCR primer design.

Conclusion

Homologous (having one ancestor) genes were found to have diverse sequences that end up coding for the same protein. However, alignments were still possible. The below PCR primer sequences were established. The sequences for cytochrome p450 and the e3 subunit of ubiquitin did not align well. Mucin 4 aligned well but, the conserved regions were to close together and protein blast indicated that some of the sequences were in fact mucin 19 like and not mucin 4 like.

Gene	Primer
Rab 30	RAB30-GD(TSA)GVGK-F 5'GGN GAY RCN GGN GTN GGN AA 3'
Rab 30	RAB30-KQFA(DQ)EN-Rc 5' TT YTC NTY NGC RAA YTG YTT 3'
Cathepsin L	Cathepsin E(EC)WEAWK-F 5'GAR RRN TGG GAR GCN TGG AA3'
Cathepsin L	Cathepsin AEFAKQ-F 5' 5' GCN GAR TTY GCN AAR CA 3'
Cathepsin L	Cathepsin KDMYIVK- RC 5' TT NAC DAT RTA CAT RTC YTT 3'
Cathepsin L	Cathepsin WGM(QK)GYI-RC 5' AT RTA NCC YTK CAT NCC CCA 3'

Table 1. Table of the primer sequences for Cathepsin L and Rab 30 genes.

Work Cited

1) Edgecombe, G.D., Sørensen, M.V., Dunn, C.W., Hejnol, A., Kristensen, R.M., Rouse, G.W., Worsaae, K., Giribet, G., 2011. Evolution 11. 151–172

2) [illegible] E. Kelly, Francesca Giordano [illegible] (2012). Cell (2012) 104, 84–101 research article Rab30 is Required for the Morphological Integrity of the Golgi apparatus. PubMed (Biol. Cell (2012) 104, 84–101 DOI: 10.1111/boc.201100080)

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5) Nosenko, T., Schreiber, F., Adamska, M., Adamski, M., Eitel, M., Hammel, J., Maldonado, M., Müller, W.E.G., Nickel, M., Schierwater, B., Vacelet, J., Wiens, M., Wörheide, G., Deep metazoan phylogeny: When different genes tell different stories. Molecular Phylogenetics and Evolution (2013), doi: http://dx.doi.org/10.1016/j.ympev.2013.01.010

6) Bioinformatics picture found at WWW.[illegible]

7) Shenoy RT, Chowdhury SF, Kumar S, Joseph L, Purisima EO, Sivaraman J. J Med Chem. (2009) A combined crystallographic and molecular dynamics study of cathepsin L [illegible] inhibitors

8) Hill MS, Hill AL, Lopez J, Peterson KJ, Pomponi S, et al. (2013) Reconstruction of Family-Level Phylogenetic Relationships within Demospongiae (Porifera) Using Nuclear Encoded Housekeeping Genes. PLoS ONE 8(1): e50437. doi:10.1371/journal.pone.0050437

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Anticancer Effects of Pumpkin Seed Extracts on LNCaP Prostate Cancer Cell Line

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INTRODUCTION

Pumpkin seed (PS) is derived from the pumpkin plant (*Cucurbita pepo*). They are a source of fatty acids that help maintain healthy blood vessels, nerves and tissues. Clinical research has shown that Pumpkin seed is effective in alleviating symptoms of benign prostatic hyperplasia, inflammatory prostatitis, and prostatic secretion. There is however insufficient amount of scientific data available regarding the cytotoxic effects of PS on prostate cancer cells. Results from studies directed at cytotoxic assay, ROS measurement, mitochondrial membrane potential, DNA fragmentation, and PARP cleavage will be used to further validate apoptotic events induced by Pumpkin Seeds. The hypothesis of this study was to evaluate the cytotoxic effects of aqueous and alcohol extracts of PS on the LNCaP prostate cancer cell line and elucidate the mechanisms involved in mediating these effects.

MATERIALS & METHODS

Cell Line: LNCaP cells were grown in RPMI medium in a humidified air/CO_2 (19:1) atmosphere at 37°C

Cytotoxic assay: LNCaP cells were treated separately with aqueous and ethanol extracts of PS in 50-200 µg/ml concentrations. After 24 hours of treatment, cell viability was evaluated using the trypan blue dye exclusion method.

Measurement of ROS: After 16 hrs of treatment, ROS levels in LNCaP cells produced was determined using the NBT reduction assay and measured at 630 nm using a spectrophotometer.

JC-1 mitochondrial membrane potential staining: After 16 hrs of treatment, the cells were stained with the JC-1 mitochondrial membrane staining and viewed under Leica fluorescence microscope using red and green filters.

DNA fragmentation assay: The LNCaP cells were treated for 24 hrs and the DNA was extracted using Qiagen DNeasy kit and quantified. The concentration was adjusted to 1 ng/µL. 10 ng of DNA from each of the sample was electrophoresed and viewed with UVP image analyzer.

PARP Cleavage: After 24 hrs of treatment, proteins from the cells were extracted and quantified using BCA reagent kit. The concentration was adjusted to 1 mg/ml. 25 µg of protein was separated on SDS-PAGE Gel. The proteins were transferred to nitrocellulose membrane and viewed with UVP image analyzer.

RESULTS

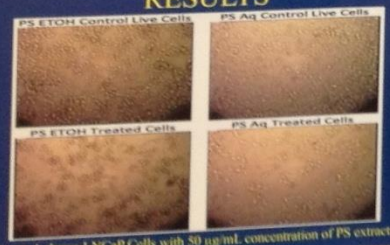

Figure 1 shows LNCaP Cells with 50 µg/mL concentration of PS extracts

Cytotoxic Assay

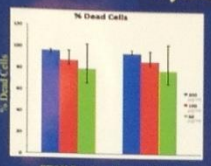

Figure 2 shows the Dose Response to 50-200 µg/ml concentrations of Ethanol and Aqueous extracts of PS

Figure 3 shows the Number of Live Cell in 50-200 µg/ml concentrations PS extract treated cells and their controls

ROS Measurement

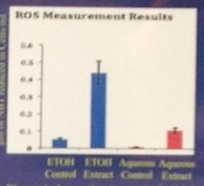

Figure 4 shows the Amount of ROS released by the treated cells more than the controls

Mitochondrial Membrane Potential

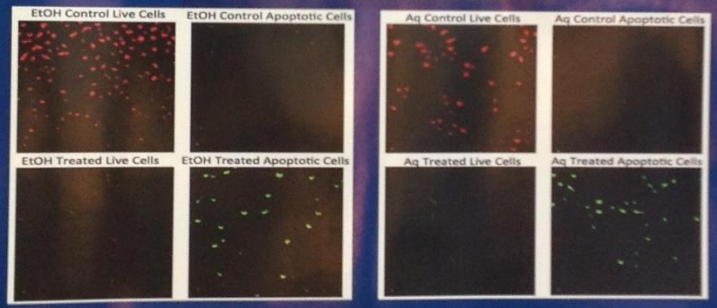

Figure 5 shows the GREEN fluorescence by monomer of JC-1 due to lowered membrane potential of mitochondria in apoptotic cells. Control cells show RED fluorescence due to the aggregates of JC-1.

DNA Fragmentation

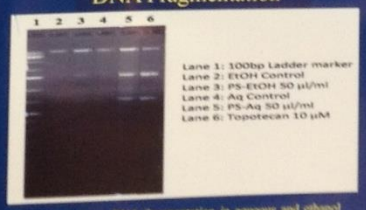

Figure 6 shows DNA fragmentation in aqueous and ethanol PS extracts treated cells

Western Blot of PARP Cleavage

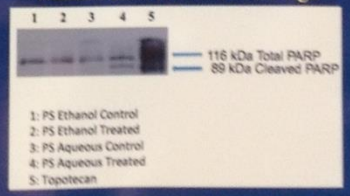

Figure 7 shows proteins identified by Western Blotting and the protein of interest: PARP

DISCUSSION

- The purpose of this study was to analyze the cytotoxic effects of aqueous and ethanol extracts of Pumpkin Seed (PS) on LNCaP prostate cancer cells.
- Figure 1 shows cytotoxic effects of 50 µg/ml concentration of both aqueous and ethanol extracts after 24 hrs treatment.
- Figure 2 shows 80% cell death after ethanol PS extract treatment and 78% cell death after aqueous PS extract treatment. In dose response assay, as the concentration of the drug increases, the percentage of cell death increases.
- Figure 3 shows number of live cells in control and in different concentrations of PS extracts (aqueous and ethanol) treated cells.
- Since 50 µg/ml concentration of the extract yielded the most cytotoxicity, that was used for other experiments.
- Figure 4 indicates the level of reactive oxygen species (ROS) that was increased significantly in PS extract treated cells.
- Figure 5 shows the green fluorescence observed due to JC-1 monomers indicating low mitochondrial membrane potential. Normal mitochondrial membrane forms the JC-1 aggregates and showed more red fluorescence.
- Figure 6 indicates DNA fragmentation, a hallmark of cellular apoptosis, that was observed in PS extract treated cells.
- Figure 7 shows PARP cleavage in the aqueous PS extract treated cells. In ethanol PS extract treated cells, the PARP cleavage was not significant.

CONCLUSION

Both extracts impacted the precursory indicators of the apoptotic cascade, and increased the levels of ROS, reduced the mitochondrial membrane potential, caused DNA fragmentation, and PARP cleavage. Thus, the hypothesis was accepted that the aqueous and ethanol extracts of Pumpkin Seed (PS) have the ability to induce cytotoxicity through mitochondrial membrane damage as well as nuclear apoptosis in LNCaP prostate cancer cells.

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Sure Tips

- Your poster qualifies you as a scholar!
  - Objectives and Aims should be easy to find.
  - Always use the logo approved by your institution.
  - Choose proper, easy-to-read font type and size!
  - **Use good-quality graphics that are easy to interpret.**
  - Create overall organizational theme to guide the viewer through your poster.
  - **Check your spelling again, and again, and again!**

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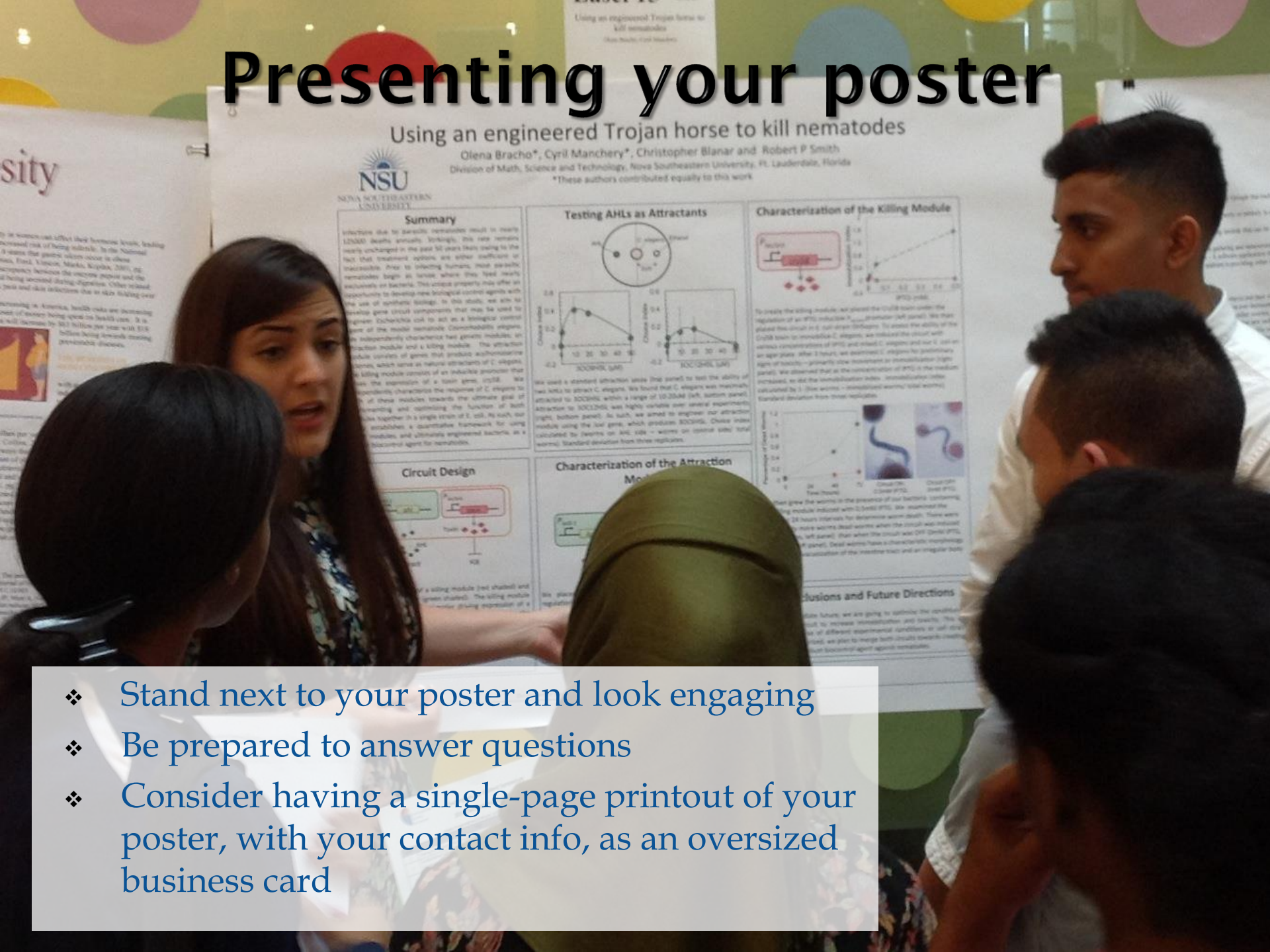

- Stand next to your poster and look engaging
- Be prepared to answer questions
- Consider having a single-page printout of your poster, with your contact info, as an oversized business card

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Questions?

- If you think of other questions later, please contact the following faculty members:
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