Research Day at the Capitol
Poster Preparation Presentation

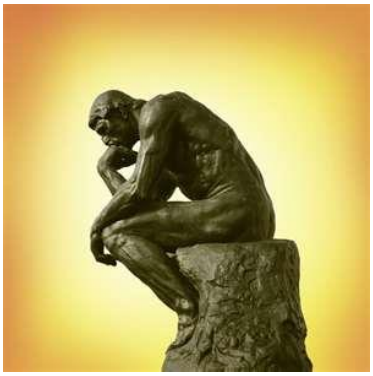
Cody Bahavar
November 16, 2013

What is Research Day at the Capitol?

- Why were you chosen...
- To celebrate excellent undergraduate student research being conducted on Oklahoma's college campuses!
- To attend an annual event sponsored by the Oklahoma State Regents for Higher Education, the National Science Foundation, and the Oklahoma Experimental Program to Stimulate Competitive Research (EPSCoR)
- To let your legislators know what the most outstanding research students like yourself are researching in the state and the progress!

Creating Your Poster

- What do **you** think makes a poster above average?

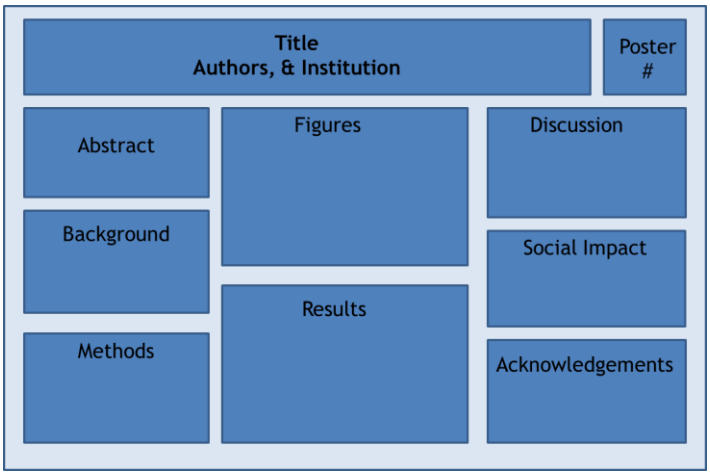


Creating Your Poster

- Create PowerPoint slide with background of choice
  - Choose a simple background - not busy, or a photo
- Format the size of the poster
  - Go to Page Setup - Select Width (Standard is 48”), Select Height (Standard is 36”)
  - Check with print shop and/or your mentor for any size restrictions

Creating Your Poster

- Format of a General Research Poster



Creating Your Poster

- Format of a general poster
  - This is a general, simple format. Every project is unique, and therefore will be different.
  - Keep the flow of the boxes top ↓ bottom, & left → right.
  - Some projects require more boxes, include what is most important, keep flow simple.
  - There are many formats out there, just keep in mind that your poster is NOT necessarily for a scientific crowd, it is for the general public.

Creating Your Poster

Font suggestions for each section

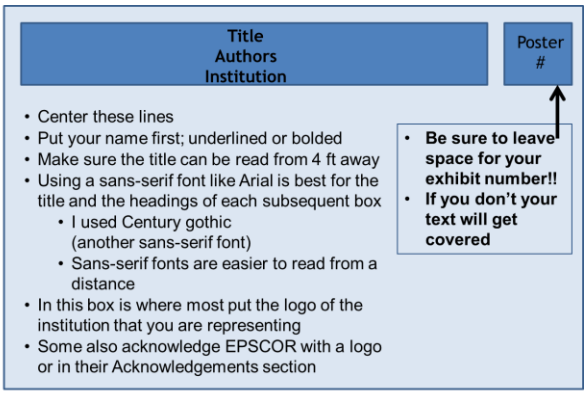
- Use clear, simple fonts - e.g. Times Roman Numeral, Arial
- Title - 135
- Authors & Institution - 66
- Headings of boxes - 35
- Text of boxes - 24
- Figure legends - 24
- Acknowledgements - 22
- may use larger or smaller, just try to fill the space

Adding boxes

- Insert - Shapes - Square
- Inside square draw text boxes as needed for the title & content

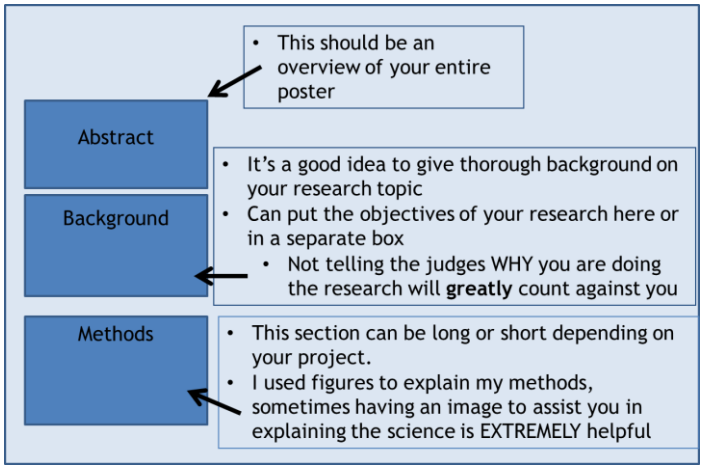
Creating Your Poster

- Title - Keep it simple & concise
- Authors – List all that were involved
- Institution – Campus research took place
- White space for exhibit number – 4.5” x 5.5” (# provided morning of event)



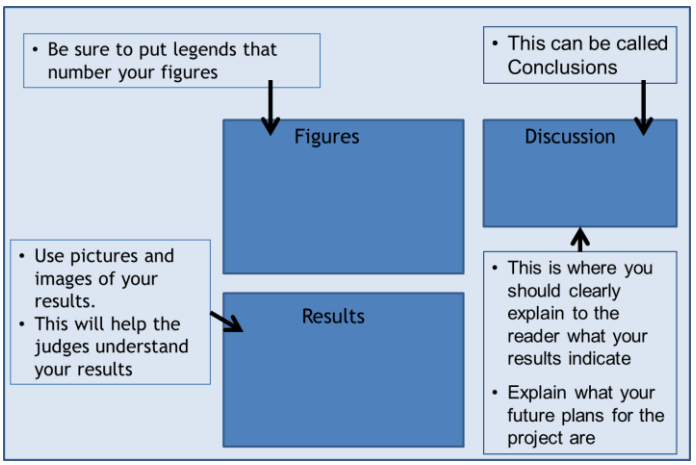
Creating Your Poster

- Abstract, Background, & Methods



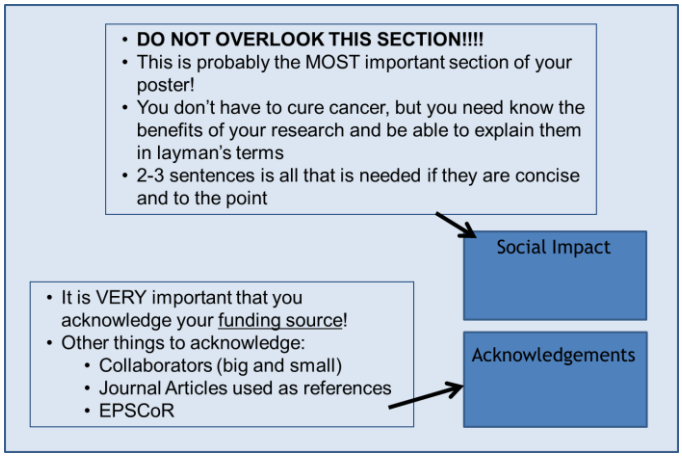
Creating Your Poster

- Figures, Results, & Discussion



Creating Your Poster

- Societal Impact & Acknowledgements



Tips on Presenting

Akwardism

Tips on Presenting

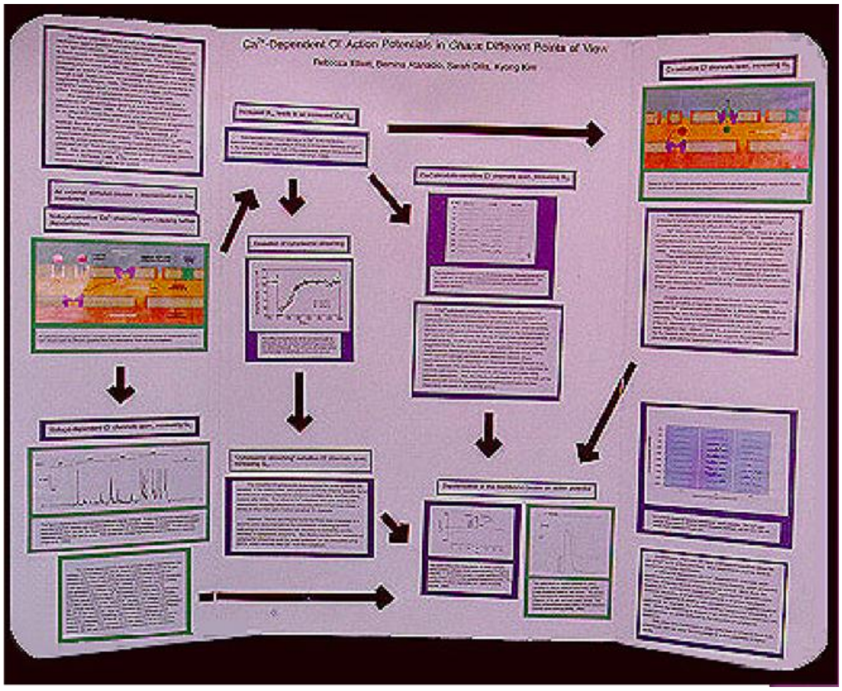
- Common contributors to “Akwardism”
  - Rushing your presentation.
  - Getting stumped on a question.
  - Forgetting your presentation.
  - Awkward hand gesturing.

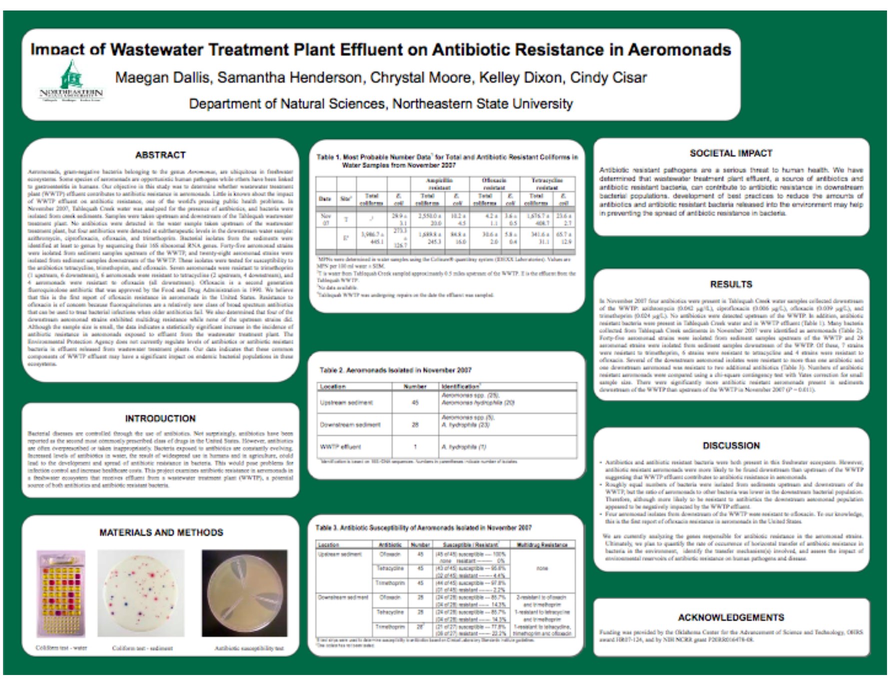
Tips on Presenting

- Solutions to “Akwardism”
  - Pretend you have only 2 minutes to present.
  - Set the judges up for questions.
  - **Do not** freak out if you forget a line!
  - Practice presenting with a rhythm.

An example of why you should NOT use a photo or graphic as your poster background.

Text is impossible to read and potential observers would be too distracted by the image to sort through the information anyway.


Ca2+-Dependent Cl- Action Potentials in Chara: Different Points of View


Impact of Wastewater Treatment Plant Effluent on Antibiotic Resistance in Aeromonads
Maegan Dallis, Samantha Henderson, Chrystal Moore, Kelley Dixon, Cindy Cisar
Department of Natural Sciences, Northeastern State University
ABSTRACT
INTRODUCTION
MATERIALS AND METHODS
Table 1. Most Probable Number Data for Total and Antibiotic Resistant Coliforms in Water Samples from November 2007
Table 2. Aeromonads Isolated in November 2007
Table 3. Antibiotic Susceptibility of Aeromonads Isolated in November 2007
SOCIETAL IMPACT
Antibiotic resistant pathogens are a serious threat to human health. We have determined that wastewater treatment plant effluent, a source of antibiotics and antibiotic resistant bacteria, can contribute to antibiotic resistance in downstream bacterial populations. development of best practices to reduce the amounts of antibiotics and antibiotic resistant bacteria released into the environment may help in preventing the spread of antibiotic resistance in bacteria.
RESULTS
DISCUSSION
ACKNOWLEDGEMENTS

Development in Potential Anti-HIV & Antimetastatic Drugs: C -Symmetric Tris-Linked Bridged Tetraazamacrocycles as Potential CXCR4 Antagonists

Courtney D. Garcia[1], B. N. Shockey[1], B. Gridley[2], S. J. Archibald[2], Dominique Schols[3], T. J. Hubin[1]
1. Department of Chemistry, Southwestern Oklahoma State University, 100 Campus Drive, Weatherford, OK 73096 USA
2. Department of Chemistry, University of Hull, Cottingham Road, Hull, HU6 7RX, UK
3. University of Leuven, Belgium.

1. Societal Impact:

CXCR4 chemokine receptors are found on the surface of immune, and other, cells, and together with the specific natural ligand, CXCL12,have been revealed to play a role in a number of disease states. CXCR4 expression has also been reported in at least 23 different cancers. Target organs for breast metastases such as liver, lung, and bone have high levels of CXCL12. Due to the wide-ranging potential biomedical applications that might result, our aim is to develop new antagonists for the CXCR4 co-receptor.

2. Objectives:

Our objectives were to synthesize C3-symmetric tris-linked analogues of our most effective bis-tetraazamacrocycle metal complexes and to characterize their chemical and physical properties in preparation for determining if the added macrocycle enhances their antagonism of CXCR4.

3.Methods:

Synthetic routes extending our bis-linked ligand syntheses to use the C 3-symmetric linker 1,3,5-tris(bromomethyl)benzene were developed. Copper(II), nickel(II), cobalt(II), and zinc(II) complexes were made using our previous methods. Electrospray mass spectra, UV-Visible spectra, cyclic voltammograms, magnetic moments, X-Ray crystal structures, and ^{1}H and ^{13}C NMR spectra were collected to characterize the complexes.

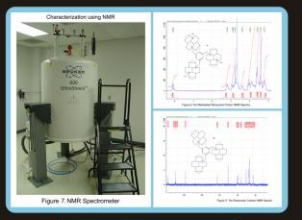
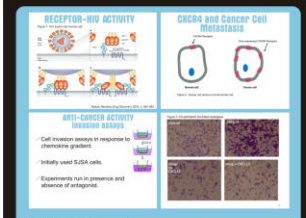
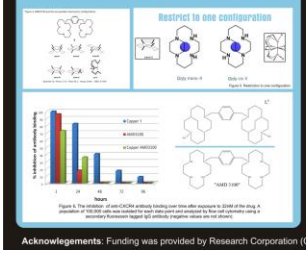
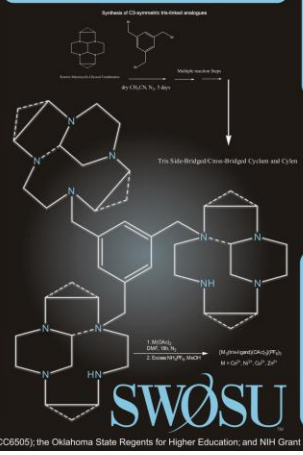
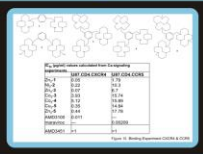


Figure 7. NMR Spectrometer









4. Results:

The ligand syntheses of the side-bridged and cross-bridged C_3-symmetric ligands proceeded similarly to the previously developed bis-ligand routes. Complexation with the desired metal ions proceeded as expected. Characterization of the metal complexes resulted in publishable quality purity in each step of synthesis. Experiments investigating the Calcium release have shown that the C3-symmetric compounds are highly potent as CXCR4 antagonists, just as in the bis-linked compounds. An unexpected benefit of tris linking a CCR5 binding, CCR5 is another important chemokine receptor.

5. Conclusions:

C3-symmetric tris-linked bridged tetraazamacrocycles are easily produced, using an appropriate linker and following synthetic methods adopted from the bis-linked analogues. Metal ion complexation proceeds smoothly following known procedures. Calcium ion release is observed when the natural ligand for CXCR4, CXCL12, binds. Preventing Calcium release is evidence of strong antagonism by the potential drug molecule. Also, several of the C3-symmetric compounds have demonstrated excellent antagonism of a related chemokine receptor, CCR5, as well. This exciting result may lead to a new class of dual chemokine receptor antagonists.

6. Future plans:

Experimental data on the specific disease states of HIV infection and cancer with the resulting complexes will inform our understanding of the requirements for producing even more efficient CXCR4 antagonists of this class.

Acknowlegements: Funding was provided by Research Corporation (CC6505); the Oklahoma State Regents for Higher Education; and NIH Grant P20 RR016478 from the INBRE Program of the National Resources.

Effects of Interstitial Laser Immunotherapy For the Treatment of Metastatic Cancer

Cody Bahavar[1], Thomas Hode[1], Orn Adalsteinsson[1], Gabriela Ferrel[1], John Lunn[1], Xiaosong Li[1], Robert Nordquist[1], Wei Chen[1]*
[1]Department of Engineering and Physics, University of Central Oklahoma, Edmond, OK 73034, USA

Abstract!

Laser immunotherapy (LIT) uses laser irradiation and immunological stimulation to treat metastatic cancers. The current mode of operation of LIT is through dye-enhanced non-invasive irradiation. Although non-invasive LIT has given promising results, there are still a number of challenges with this method, such as limited light penetration for deep tumors and strong light absorption by highly pigmented skins. We have created interstitial laser immunotherapy (iLIT) to overcome these limitations. In this study, rat tumors were treated by iLIT with an 805-nm laser and different doses of glycated chitosan (GC), a novel immunological stimulant. The goal was to observe the effects of different doses of GC on the survival of tumor-bearing rats. We also successfully monitored temperature distribution inside the tumor using magnetic resonance imaging (MRT) during laser irradiation. The results suggested that the optimal dose of GC is in the range of 0.1 to 0.3 ml per rat tumor.!

Background!

Metastatic cancer is the number one cause of cancer death. Patients with late-stage, metastatic cancer face severely limited treatment options. Commonly used methods like chemotherapy, radiation, and surgery are all devastatingly harsh on the body and have shown limited success for metastatic cancers. Immunotherapy, however, has shown progress. Interstitial Laser immunotherapy (iLIT) combines both photothermay and immunotherapy to target the host's immune system to create a long-term tumor suppression. The laser irradiation produces heat inside the target tumor causing destruction of cancer cells and release of tumor antigens. When combined with immunological stimulation, this photothermal reaction can help create a tumor-specific immunity. !

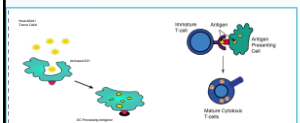


Figure 1. Activated dendritic cells releasing antigens.!

Figure 2. DC antigen presentation to T-Cells.!

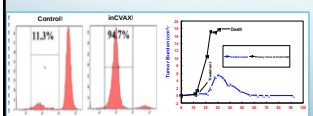
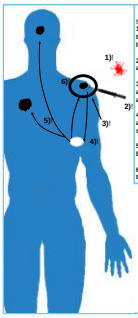


Figure 3. DC presentation of tumor antigens to T-cells (shown by proliferation of T-cells after incubation with DC).!

Figure 4. Results of pre-clinical studies with rats. Rats treated with iLIT had higher survival rates and lower tumor burdens than rats with no treatment.!

Method of Operation (MOA)!



1) Insertion of optical fiber into any one accessible tumor, then treat for 10 minutes. Heating with laser leads to local tumor destruction and antigen release. !

2) Injection of GC around laser-treated tumor activates dendritic cells (DC) locally.!

3) Activated DC interact with heat-killed tumor cells, and begins processing of [whole-cell] tumor antigens.!

4) DC migrate to lymph nodes and present tumor antigens to T-cells, initiating proliferation of tumor-specific T-cells. !

5) Infiltration of T-cells into tumors throughout the body. !

6) Infiltrating cytotoxic T-cells attack tumor cells throughout the body.

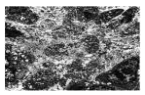


Figure 5. Heat killed tumor cells.!

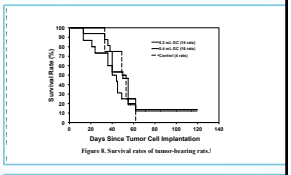


Figure 8. Survival rates of tumor-bearing rats.!

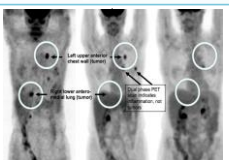


Figure 9. 2 year follow up PET scan of the lungs of a breast cancer treated with iLIT. !

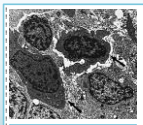


Figure 6. Infiltration of T-cells into tumors throughout the body. Arrows in figure below point at lymphocytes in tumor tissue after treatment.!

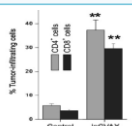


Figure 7. DC presentation of tumor antigens to T-cells (shown by proliferation of T-cells after incubation with DC).!

Social Impact and Future Work

Although interstitial laser immunotherapy is still being developed it has shown to be very successful in clinical trials involving patients with late-stage breast cancer and melanoma. With iLIT, we can treat local tumors and induce a systemic anti-tumor reaction. Figure 9 shows a PET scan of several tumors on the lungs of one of our breast cancer patients before and after laser immunotherapy treatment. Although only chest wall breast tumor was treated directly, the tumor specific immunity generated in the patient caused tumors in the lungs to be destroyed as well. Since our results suggested that the optimal dosage of GC lies between 0.1 and 0.3 ml we will repeat our animal studies with these volumes. Our future research will be exploring the molecular properties of GC and performing more animal studies to optimize our treatment. !

References:

Xiaosong Li, Gabriela L. Ferrel, Maria C. Guerra, Tomas Hode, John A. Lunn, Orn Adalsteinsson, Robert E. Nordquist, Hong Liu, and Wei R. Chen, "Preliminary safety and efficacy results of laser immunotherapy for the treatment of metastatic breast cancer patients," *Photochemical & Photobiological Sciences*. 10, 817-821, 2011. !

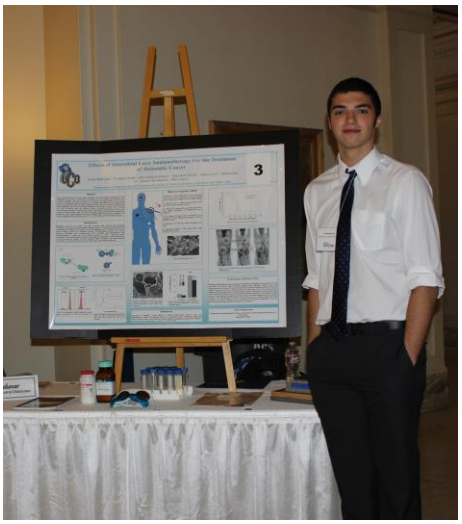
Acknowledgements

Department of Engineering and Physics, University of Central Oklahoma, Edmond, OK 73034, USA!
Oklahoma EPSCoR!

Displaying Your Poster

The Display

- Table-top or free standing (You bring this with you.)
- Provided: table, floor length table cloth, and 2 chairs
- Things to bring: YOUR POSTER!!!! EASEL, PUSH PINS or clips to attach poster, backing for your poster (foam board), and any visual aids (small enough to set on your table)
- I chose table-top - easel (~$25) & foam board (~$10) from Hobby Lobby



The Judges

Judging

- 4-5 judges - WELL educated, but not experts in your field of study
- 1 judge will be timing you, all others will have clipboards & be taking notes
- When they walk up - SMILE, introduce yourself, be confident (this is your project, you are your own expert on the matter), walk them through what you have done - using your poster as a guide or reference.
- You will have 5 minutes with the judges: 3 min. to explain your research & 2 min. for questions.

The Judges

- Questions are to re-affirm or clarify something about your presentation
  - Kinds of questions - Procedural, social impacts, future aspirations, etc.
- Other Tips for your presentation
  - Eye contact is important, face them as you reference your poster
  - No gum & keep your hands out of your pockets
  - Use more general terms to clarify complex terms
  - PRACTICE, PRACTICE, PRACTICE - try not to say “um”
  - Be ENTHUSIASTIC about your project yet speak calmly, clearly, and with confidence

KNOW Your State Legislators

- This is very critical!
  - They will stop by your poster & expect you to know who they are
  - Explain to them your research in layman’s terms making sure to EMPHASIZE your societal impact!
  - Each of you have a Home Representative and Home Senator based on which district you live in
  - You may also have a different School Representative and School Senator
  - www.capitolconnect.com/oklahoma/default.aspx

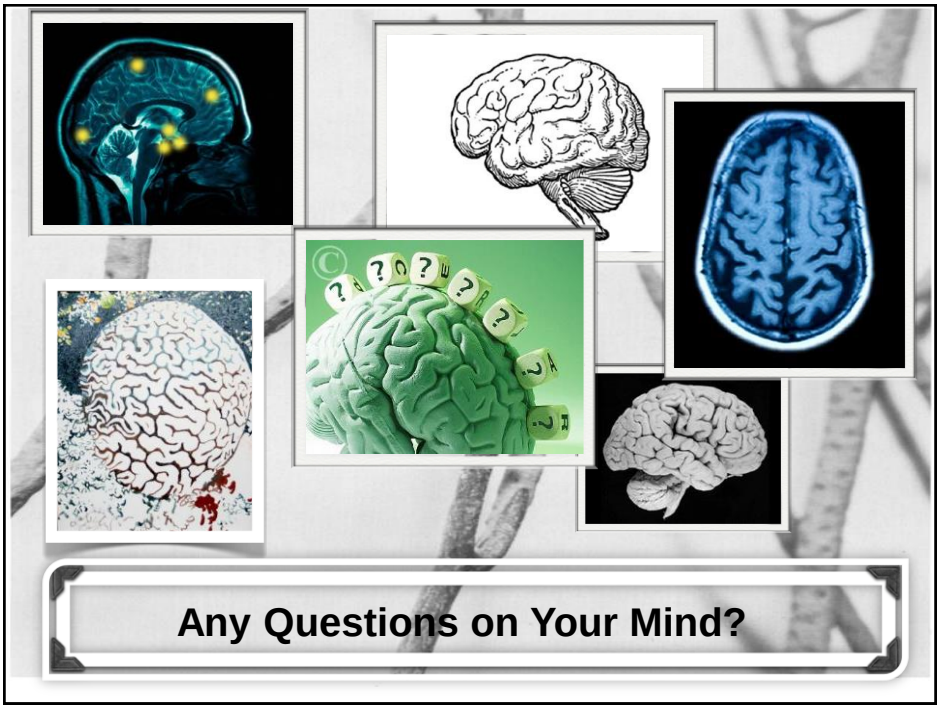
This Could be You!

2013 1st Place Award Recipient
Regional College Category

Chancellor Glen D. Johnson will present awards at end of the day

Things to Remember

- You were chosen for a REASON!
  - Be Enthusiastic, friendly, and SMILE
  - EMPHASIZE your societal impact!
  - Judges are looking for someone who has the total package!
  - Be prepared and mentally ready
  - Dress professionally and be punctual
  - Know your legislators!


Any Questions on Your Mind?