

# Poster Presentation Basics

Viterbo University  
Summer Research Symposium  
6/20/2012  
Dr. Bauer

# Sequence of Events

Step 1

- Determine parameters and requirements

Step 2

- Outline content and layout

Step 3

- Add content

Step 4

- Make it attractive

Step 5

- Finalize and print

Step 6

- Present your poster

# Example Poster

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## Effects of 670 nm light therapy and paraquat consumption on longevity and oxidative stress in *Drosophila melanogaster*

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### Overview

We are interested in the mechanisms of and treatments for normal and abnormal aging. Our current research involves investigating the potential therapeutic effects of photobiomodulation.

Photobiomodulation refers to changes in biological activity following exposure to specific wavelengths of light including 670 nm, which interacts with cytochrome c oxidase (complex IV) of the electron transport chain in mitochondria. Research evaluating the therapeutic utility of this light has demonstrated increased wound healing properties and neuroprotective effects against environmental toxins.

Paraquat is an herbicide known to enhance oxidative stress by increasing reactive oxygen species levels in the mitochondria. This can trigger apoptosis leading to neurodegenerative disorders and decreased longevity.

We explored the effects of paraquat exposure and 670 nm light therapy on longevity and oxidative stress in wild-type *Drosophila melanogaster*. We hypothesized that paraquat exposure would reduce longevity and increase oxidative stress, and that 10 minutes of daily light treatment would ameliorate these effects.

### Methods

#### Paraquat Preparation

- Under a fume hood and with protective gear worn, a 15 mM paraquat solution was prepared by mixing 1 g paraquat with 259.25 mL water.

#### Food Preparation

- Mix 8 mL of liquid with 1.50 g of dry food (Ward's Instant Drosophila Medium).  
- Non-paraquat conditions used 8 mL of water; paraquat conditions used paraquat solution. Food was changed every 5 days.

#### Animal Care, Light Treatment, and Longevity Data Collection

- Virgin male wild-type flies were harvested for the experiment.  
- Flies were stored in glass vials in an incubator at 25°C with a 12 hour light/dark cycle at ambient humidity. Each vial started with 10 flies, and each condition consisted of 5 vials.  
- Vials were exposed daily to 670 nm light for 10 minutes at intensity 25 mw/cm<sup>2</sup>.  
- A count of surviving flies was obtained each day.

#### 8-Isoprostane Assay

- Flies were treated for 10 days and then flash frozen in liquid nitrogen.  
- 8-Isoprostane was extracted from whole-body homogenate samples and levels were assessed via spectrophotometry (Cayman catalog No. 516351).  
- Protein levels were determined by the Bradford method (Cayman catalog No. 704002).

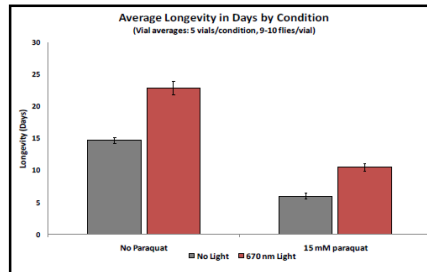
### Results

#### Longevity

- Flies exposed to paraquat exhibited a significant decrease in longevity (56.38%) as compared to flies not exposed to paraquat.  
- Main effect of paraquat:  $F_{1,16} = 250.671, p < 0.001$   
- Flies treated daily with 10 minutes of 670 nm light demonstrated a significant increase in longevity (61.37%) as compared to flies not receiving light treatment.  
- Main effect of 670 nm light:  $F_{1,16} = 89.763, p < 0.001$   
- Longevity was increased with 670 nm light treatment regardless of paraquat exposure:  
- Interaction of paraquat x light:  $F_{1,16} = 7.387, p = 0.015$

#### 8-Isoprostane

- The results of the oxidative stress assay did not yield statistically significant results.  
- Main effect of paraquat:  $F_{1,8} = 1.257, p = 0.295$   
- Main effect of 670 nm light:  $F_{1,8} = 1.337, p = 0.281$   
- Interaction of paraquat x light:  $F_{1,8} = 1.611, p = 0.240$

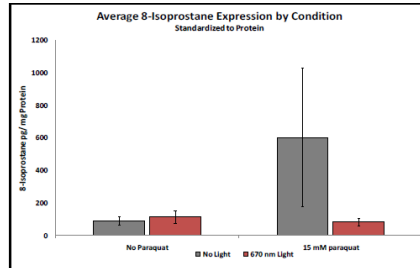
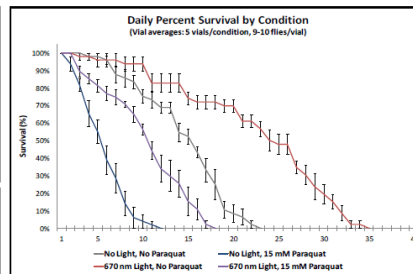


	No Light No Paraquat	670 nm Light No Paraquat	No Light 15 mM Paraquat	670 nm Light 15 mM Paraquat
Average	14.72	22.88	5.94	10.46
SEM	0.47	1.04	0.48	0.54

- Flies exposed to paraquat demonstrated a decrease in average longevity by 56.38% as compared to those not exposed to paraquat.
- Flies treated with light demonstrated an increase in average longevity by 61.37% as compared to those not treated with light.
- Flies exposed to paraquat and receiving daily 670 nm photoradiation treatment demonstrated an increase in longevity of 76.69% as compared to those exposed to paraquat and not receiving daily light treatment.
- Flies not exposed to paraquat and receiving daily 670 nm photoradiation treatment demonstrated an increase in longevity of 55.43% as compared to those not exposed to paraquat and not receiving daily light treatment.

Day	No Light No Paraquat	670 nm Light No Paraquat	No Light 15 mM Paraquat	670 nm Light 15 mM Paraquat
1	100%	100%	100%	100%
5	98%	95%	58%	85%
10	75%	95%	4%	55%
15	52%	73%	0%	5%
20	0%	71%	0%	0%
25	0%	52%	0%	0%
30	0%	24%	0%	0%
35	0%	0%	0%	0%

- By day 10, only 4% of the paraquat-exposed flies not receiving light treatment survived, but 55% of those exposed to paraquat and receiving daily 670 nm photoradiation survived. All of the paraquat-exposed flies died within 18 days.
- By day 25, 0% of the control flies (no paraquat exposure, no light treatment) survived, but 52% of the flies not exposed to paraquat but receiving daily 670 nm photoradiation survived.



	No Light No Paraquat	670 nm Light No Paraquat	No Light 15 mM Paraquat	670 nm Light 15 mM Paraquat
Average	87.51	111.89	601.69	79.93
SEM	26.30	36.59	427.24	22.69

- Oxidative stress was measured by 8-isoprostane standardized to protein.
- Preliminary results suggest an expected increase in oxidative stress in flies exposed to paraquat, with an amelioration of this damage in flies exposed to paraquat and receiving 670 nm photoradiation, however, substantial variability exists in the paraquat-exposed, no light treatment condition and further study is warranted to explore the effects of light treatment on oxidative stress.

### Discussion

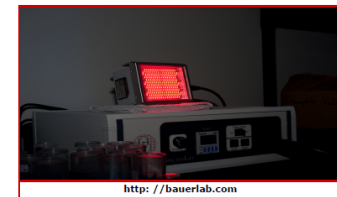
Daily 10-minute treatment with 670 nm light significantly increased average longevity in all flies.

- In flies exposed to paraquat, average longevity increased 76% with light therapy.
- In flies not exposed to paraquat, average longevity increased by 55% with light therapy.

The evaluation of the effects of paraquat and light therapy on 8-isoprostane yielded inconclusive results.

These results suggest a therapeutic utility of 670 nm light therapy in both normal and abnormal aging, and warrant further exploration to identify the specific mechanisms of effect.

Future studies will systematically characterize the effects of various intensity levels and durations of exposure on longevity. Additional studies are also planned to assess the effects of 670 nm light therapy on gene expression, oxidative stress, and neurodegeneration.



<http://bauerlab.com>

### Acknowledgement

These projects were supported with generous funding from:

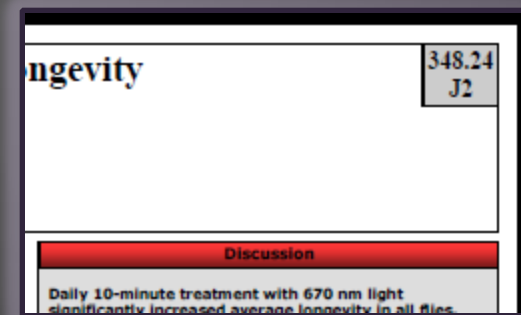
- Viterbo University Summer Research Grant
- Sigma Xi Grant in Aid of Research

### References

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- Liang, M.L., Vothaui, H.T., Edels, J.T., & Wong-Riley, M.T.T. (2008). Near-infrared light via light-emitting diode treatment is therapeutic against rotenone- and 1-methyl-4-phenylpyridinium ion-induced neurotoxicity. *Neuroscience*, 153(4), 963-974.
- Migliore, L., & Coppede, F. (2009). Environmental-induced oxidative stress in neurodegenerative disorders and aging. *Mutation Research/Genetic Toxicology and Environmental Mutagenesis*, 674, 73-84.
- Wallace, D.C. (2005). A mitochondrial paradigm of metabolic and degenerative diseases, aging, and cancer: A dawn for evolutionary medicine. *Annual Review of Genetics*, 35, 359-407.

# Step 1: Determine Parameters and Requirements

- Review the literature for your conference to determine the poster board size
  - Make your poster slightly smaller all around
  - Determine if 3 panel, 1 sheet, or other
    - Example: Society for Neuroscience
      - Single pane flat corkboard, 3'8" high \* 5'8" wide (44" by 68"). Standard posters usually run 36" high by 48 - 60" wide. Note that posters longer than 36" in both directions may be very difficult to print!
- Check for other requirements
  - Poster number in the corner?
  - Anything else?
- Confer with your advisor to make sure you didn't miss anything!



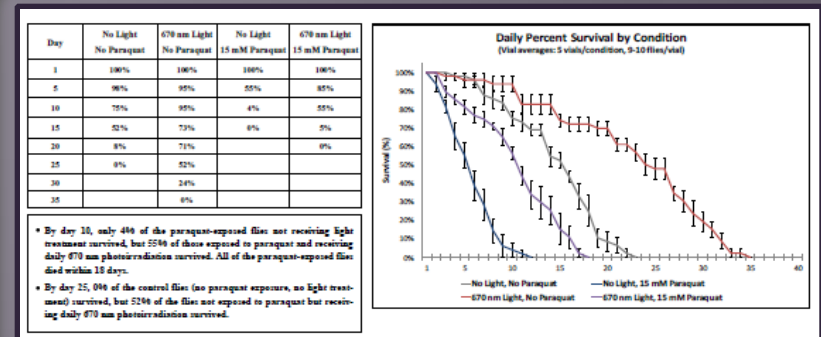
# Step 2: Outline Content and Layout

- Sketch out the main sections of your poster and their arrangement
  - A typical science poster should have:
    - Intro/ Background
    - Methods
    - Results
    - Conclusions/ Discussion
    - References

- Highlight visually appealing aspects
  - Typically, graphs / tables / images
  - Notice the size and location of graphs and tables on the example poster

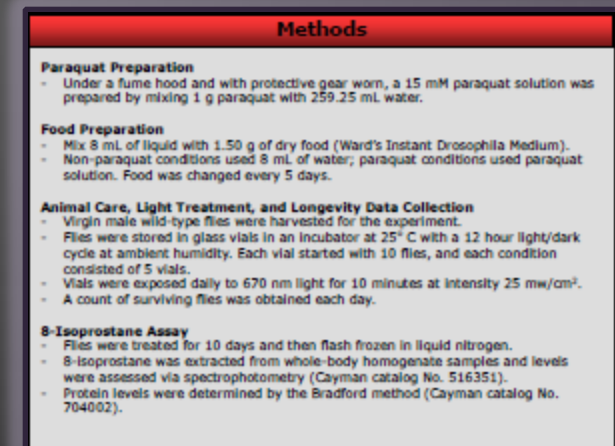
- Create appropriate flow
  - Left to right
  - Top to bottom

- Run it by your advisor and other authors!



# Step 3: Add Content

- Don't go overboard! Most (science) posters shouldn't be a wall of text.
  - Individual preferences
  - Discipline/ conference norms
- LARGE title, legible from at least 10'
  - Large text for main points, legible from at least 4-6'. The example poster uses 74-point font.
- Bullet points and short sentences!



# Step 3: Add Content (cont'd)

- Emphasize main points:
  - Hypotheses
  - Results
  - Conclusions
- Use LARGE and easily understood graphs and tables
  - Label all axes and use legends if necessary
- Although you will present the poster, it should still “speak for itself”... a reader should be able to understand your main points if you are not available

**Overview**

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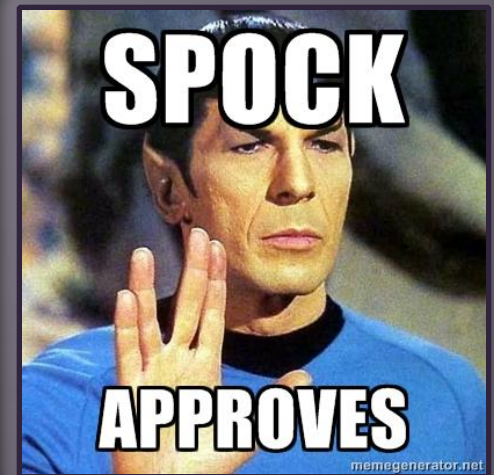
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We explored the effects of paraquat exposure and 670 nm light therapy on longevity and oxidative stress in wild-type *Drosophila melanogaster*. We hypothesized that paraquat exposure would reduce longevity and increase oxidative stress, and that 10 minutes of daily light treatment would ameliorate these effects.

# Step 3: Add Content (cont'd)

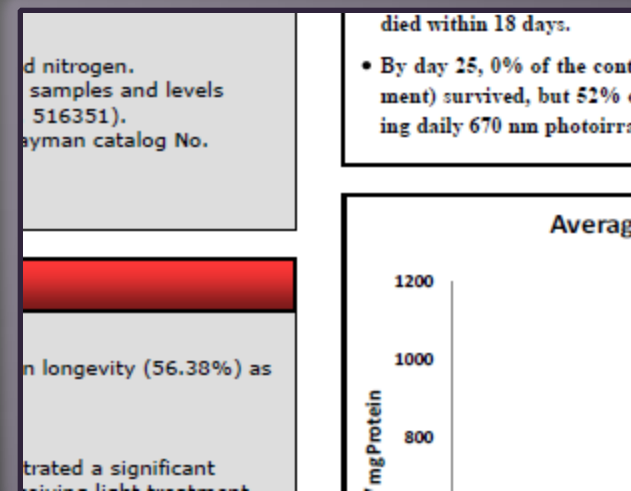
- Use a formal, scientific tone
  - Logical, dry and crisp!
  - Which of the following sounds better?
    - Statement A: “We are going to run some more studies in the future to look at how long flies live when they receive different doses of light.”
      - Grade level: 8.7
    - Statement B: “Future studies will systematically characterize the effects of various intensity levels and durations of exposure on longevity.”
      - Grade level: 19.4
- Triple-check for accuracy and readability
- Run it by your advisor!





# Step 4: Make it attractive

- No distracting background or images
- Appropriate, simple, and consistent color scheme
- Even and consistent spacing within and between sections
- Same font throughout
- Pay attention to detail!



# Step 5: Finalize and Print

- Quadruple-check **E V E R Y T H I N G**
  - Nothing's worse than a sloppy poster
  - All authors should inspect carefully
- Save as \*.PDF
  - Then check everything again! Seriously!  
The conversion process often screws things up.
- Print on appropriate paper, at least 3 days before conference
  - Allow time for reprinting
  - Select flat, glossy, or laminated paper



# Step 6: Present Your Poster

- Be prepared! Practice, practice, and then practice some more.
  - Practice **out loud!**
  - 30-second version
  - 3-5 minute version
- Dress professionally
- Don't get distracted by your cronies
- If possible, stand by your poster for the entire session
- Have handouts available
  - Copies of poster
  - Contact information



Hang out after the session, not during!

# Final Advice

- There's no “right” or “wrong” poster, but stick to conventions
- Make it simple, attractive, and easy to read
- Be prepared
- Work with your advisor (and other authors) throughout the entire process
- Find plenty of examples online (try Google Images)

