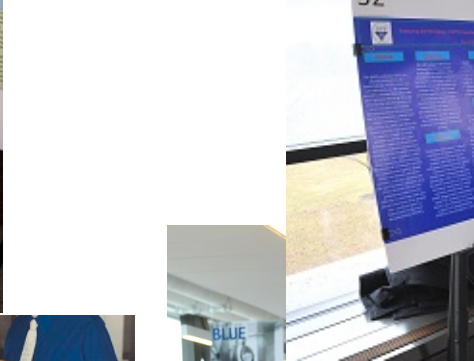


# Poster Design Tips

“Because you didn’t realize that being a scientist also means being an artist”  
KM Everson

POSTER SYMPOSIUM WORKSHOP

TANYA SOULE, ASSOCIATE PROFESSOR OF BIOLOGICAL SCIENCES  
(SOULET@PFW.EDU)



# Design

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Software: Microsoft Powerpoint is the most common and preferred

Page Setup: setting the poster size

- Design-> Slide Size -> Custom
- Older PPT Versions: File -> Page Setup
- PFW Symposium: poster size should be 40”L x 24” H (double check on this)

I find it helpful to work in about 30-66% zoom but to check quality and images for pixilation at 100%

Final posters are printed from a PDF version of the PPT slide, print a color copy of the PDF version on 8.5x11 to check quality before printing the poster

# Use Text Boxes!

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Every section should be its own text box

- This means every header, caption, and main text (intro, methods, etc) section needs to be in a separate text box!
- Do not include table, figures, and captions inside a larger text box
- Do not include multiple sections inside the same text box

This is extremely important since it allows for each part to be moved and manipulated!

Use the Align function to create flush edges between text boxes horizontally and vertically.

# Font

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Font must be legible:

- Title should be over 72pt (1-2 lines max)
  - Authors/Affiliations can be smaller but larger than the body
- Headings should be 30-60pt
- Minimum text size for the body: 16pt
- Captions should be smaller than the body

Font should be consistent and legible; no more than two fonts

- Recommend Helvetica, Times New Roman, Trebuchet, Century Gothic
- Avoid fonts that are clichéd, too distinctive, or unprofessional such as Comic Sans or Papyrus
- Use bold and italics sparingly to emphasize, avoid underlining and capital letters for emphasis
- Avoid Word Art

**Title** ▲ 85 pt  
**Sub-headings** 36 pt ▲  
**Body Text** ◀ 24 pt  
**Authors** ▲ 50 pt  
18 pt ▶ **Captions**

## Introduction to Typography

# Serif

Each letter in the serif font family has both thick and thin stroke widths and decorative “feet” (serifs). Traditionally used for body text.

Sans serif fonts use very little ornamentation. Traditionally used for titles and headings.

# Sans Serif

# Designer

The designer family includes scripts and “fun” fonts. Traditionally used on bake sale flyers and Myspace pages.

**Good Font Combinations for Headings/Body Text:**

Helvetica / Garamond

Caslon / Univers

Futura / Bodo

Garamond / Futura

Gills Sans / Caslon

Minion / Gill Sans

Myriad / Minion

Caslon / Franklin Gothic

Trade Gothic / Clarendon

Franklin Gothic / Baskerville



# Colors

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Easy to read  
Hard to read  
Hurts to read

Light color for the background

Dark color for text

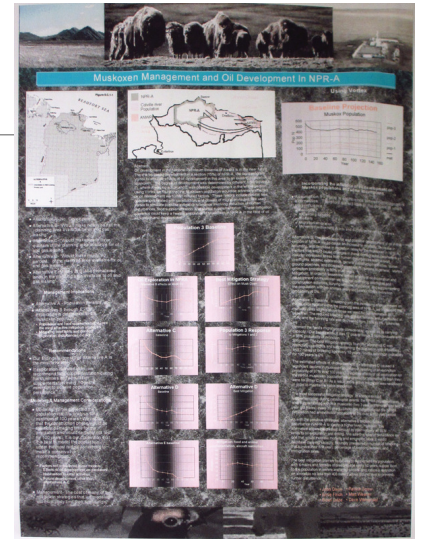
Avoid distracting patterns or complex images in the background

Avoid bright or clashing colors

Keep in mind that some people cannot distinguish between certain colors (i.e. red/green)

White Space

- Divide sections logically to fill the poster
- Use white space to distinguish sections but avoid large blocks of white space



# Graphics

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Graphics (images, tables, graphs, etc.) should be

- Simple
- Consistent in scale
- Include captions as appropriate; numbered chronologically as presented in the poster text
- Legible from 3 feet away

Figures are preferred over tables

Images should be imported (check resolution with copy/paste)

- Always check resolution, good photos should be at least 150 dpi
- If you make your own image, PNG is a good file type to save before importing
- TIFFS tend to be good, JPEGs ok

Credit sources in the caption as in-text citations



# Images and Tables

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When making graphs or tables paste or import as an image, otherwise they are hard to manipulate as you move and resize them

- For instance, if I want to make a table larger and it was copied without doing this the columns and rows all change as I resize to fit the slide better, however if I paste as an image everything stays the same proportions as I move it around (see next slide)

Cite data, personal photos, or stock web photos

- Stock web photos: cite with url in smaller font under the photo; large urls can be abbreviated to the major web address
- From papers: cite the paper, you can abbreviate with author and year like an in-text citation
- Your photos: no citation necessary, if from a friend/colleague you can cite them with a photo credit

# Table Example

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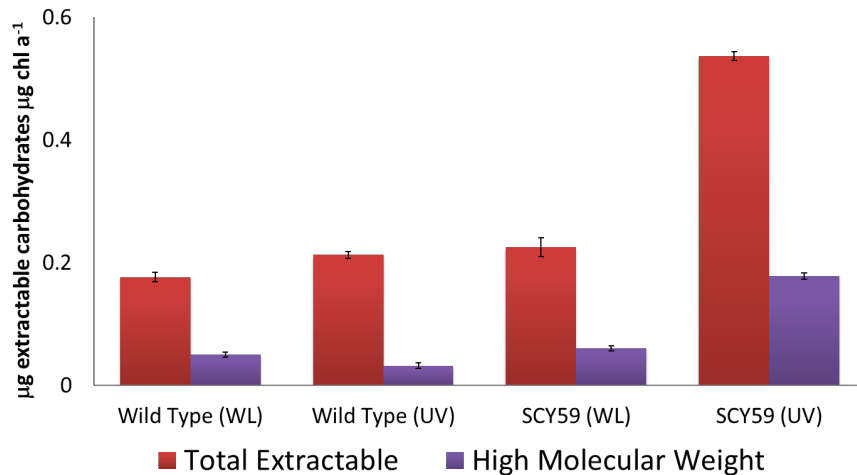
Sample	Treatment 1	Treatment 2	Treatment 3	Treatment 4
1	2.45	3.12	18.45	4.33
2	14.13	5.22	12.56	3.35
3	4.55	3.33	4.25	2.45

Sample	Treatment 1	Treatment 2	Treatment 3	Treatment 4
1	2.45	3.12	18.45	4.33
2	14.13	5.22	12.56	3.35
3	4.55	3.33	4.25	2.45

- Caption goes above tables
- Resizing the top one (regular paste) messes up the columns and rows vs the bottom one which was copied as an image; same happens with figures, especially graphs
- Evenly space (center, etc.)
- Use the same number of significant figures for all values
- Add  $\pm$  standard error or standard deviation as needed

# Figure Example

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Caption goes below figures

No graph title; the caption should be sufficient, no need to write the title again in the graph or table

When presenting show the audience what you are referring to for each point you are making

You should add what the error bars stand for (SE or SD) and how many replicates were used in the caption

Be sure the axes are labeled and include units where appropriate

Include a legend for graphs

# Focus Your Content

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Of all of types of scientific presentations, the paper has the most content, the oral presentation is in the middle, and the poster has the least content.

HOWEVER, posters should be self-explanatory but concise!

Include only the essential elements. You have to decide on the important/essential elements to include based on the message you want to convey.....

What is the take-away message?

- Be sure your most important ideas/findings are highlighted
- Don't waste space on minor details

Avoid wordiness, unnecessary jargon, and abbreviations not commonly known (if necessary, define abbreviations when first used and abbreviate throughout as in a paper)

# Create a Logical Visual Flow

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All posters should include these sections:

- PFW Logo (take from here for convenience)
- Title
- Author(s) and Institutional Affiliations
- Continued on the next slide...



# Essential Elements Cont.

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- Headings for:
  - Abstract (not always required, see instructions)
  - Background/Introduction
    - Aims/Objectives: <50 words (separate or with intro)
  - Materials and Methods: short and concise, paragraph or numbered steps
  - Results: include accompanying text (minimal), refer to figures/tables, may separate into subsections
  - Summary/Conclusions: ~100 words
  - Acknowledgements: <50 words, smaller font ok (funding, helpers, etc)
  - References should be limited to 3-5 essential sources, use smaller font, abbreviated style
    - Be sure they are in the poster as in-text citations



# A few more points....

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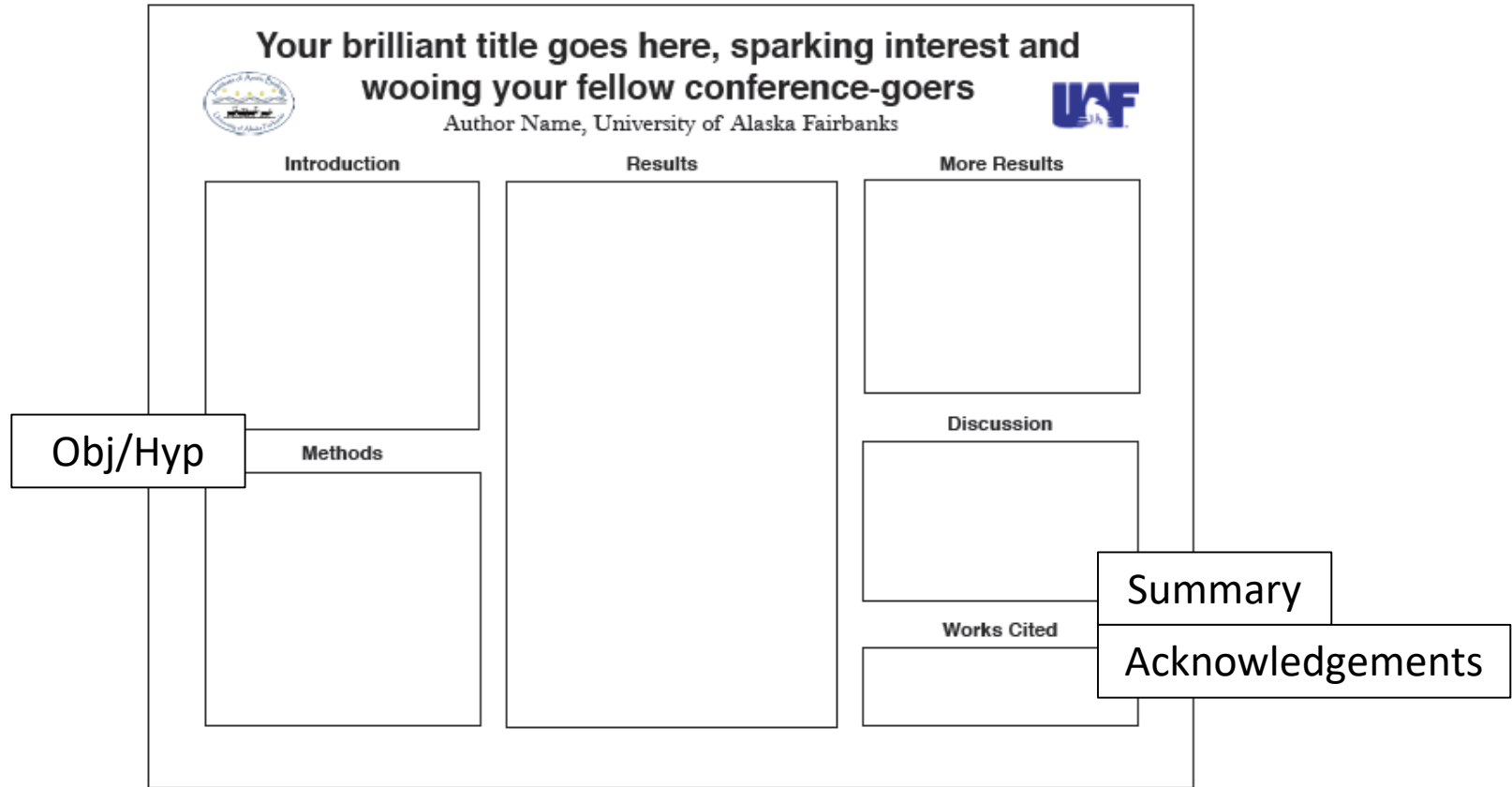
Posters are commonly read left to right, top to bottom

## Author and Institutional Affiliations

- May be the same size or smaller than the title but larger than the body
- First Name Last Name, Second Author, etc. Purdue University, Fort Wayne, IN 46805
  - Superscript when you have more than one affiliation

## Aligned sections help with legibility and visual presentation

- Highlight boxes to align, choose Format → Align for several options



**Common Mistakes:**

Poor Image Quality    Font Size Too Small    Columns Too Wide  
Bad Use of White Space    Misalignment    Too Much Text    No Breathing Room  
No Direction    Busy Background    Bad Color Schemes

# Storyboarding

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# Poster Presentation

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Dress for the occasion and be proud of your work!

- Invite friends and family

Prepare a short speech about your poster and practice it several times

- Always assess your audience and try to speak to their understanding
- Always introduce the problem/significance of your work people can understand why it's important
- Be prepared to address future directions, flaws in the study, obstacles, limitations, the literature, etc.
- For the most part your presentation is more of a discussion, prepare to be interrupted and engage with your audience

# A Two-Component Regulatory System Associated with the Ultraviolet Protective Pigment Scytonemin in Cyanobacteria

Tanya Soule, Sejuti Naurin, and Jacob Janssen

Department of Biology, Indiana University-Purdue University, Fort Wayne, IN, 46805



## Introduction

Scytonemin is an ultraviolet radiation (UVR) sunscreen pigment produced by some strains of cyanobacteria. It is a lipid-soluble indole-alkaloid that absorbs in the UVA range with a maxima at 384 nm. The scytonemin operon is composed of 18 genes in *Nostoc punctiforme* (NpR1276-NpF1259; Fig. 1) which increases in expression upon exposure to UVA<sup>1,2</sup>. Upstream and adjacent to this operon is a putative two-component regulatory system (TCRS) that is conserved in over 15 strains of cyanobacteria which have the scytonemin operon. This putative TCRS is composed of a sensor kinase (SK) which senses the environmental signal as well as a response regulator (RR) which receives the signal from the SK and initiates transcription of a specific gene or set of genes (Fig. 2). In the case of scytonemin, it is hypothesized that the SK NpF1277 senses UVA and transfers the signal to the RR NpF1278 through phosphorylation. It is then anticipated that NpF1278 initiates transcription by binding to the promoter region of the scytonemin operon. While much is known about the biosynthesis and ecology of scytonemin, research has not been done on the regulation of the gene cluster.

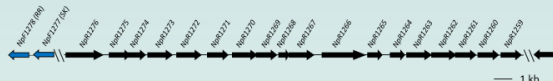


Fig. 1. Scytonemin operon in *Nostoc punctiforme*.

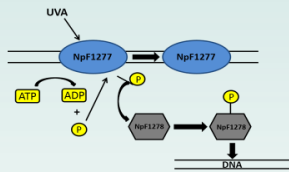


Fig. 2. Model of the two-component regulatory system of this study.

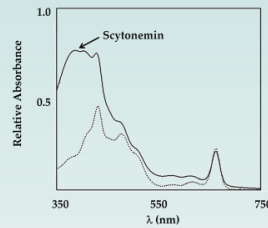
## Research Objectives

1. Construct an NpF1278 (RR) deletion mutant in *N. punctiforme* and assess its ability to produce scytonemin.
2. Measure the gene expression response of this TCRS under a variety of environmental conditions.
3. Determine if the TCRS genes are co-transcribed using reverse-transcription PCR.

## Materials and Methods

1. An in-frame marker-less mutant strain of *N. punctiforme* deficient in the response regulator ( $\Delta$ NpF1278) was generated using fusion PCR and conjugation. The phenotype of  $\Delta$ NpF1278 was assessed for scytonemin production following UVA radiation.
2. Expression of the TCRS genes was measured using quantitative PCR following exposure to UVA ( $6 \text{ Wm}^{-2}$ ), UVB ( $0.5 \text{ Wm}^{-2}$ ), high light ( $135 \mu\text{mol photons m}^{-2}\text{s}^{-1}$ ), and oxidative stress ( $2 \mu\text{M}$  methylene blue) for 20, 40, and 60 min.
3. Co-transcription of the TCRS genes was evaluated using reverse-transcription PCR (RT-PCR). Primers targeted the intergene regions of the TCRS genes and control genes on the cDNA of the 20 min UVA-stressed samples above.

## Response Regulator Mutant



Following UVA radiation, the mutant strain  $\Delta$ NpF1278 was unable to produce scytonemin as compared to the wild type (Fig. 3).

Fig. 3. Lack of scytonemin in the  $\Delta$ NpF1278 strain (dashed) compared to the wild type (solid) following UVA.

## Gene Expression Response

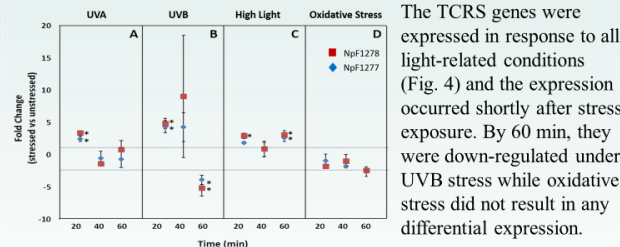


Fig. 4. Expression of the TCRS genes following exposure to each stress condition as compared to the wild type. Asterisks represent  $p \leq 0.05$  and error bars represent standard deviation of triplicate samples.

## Co-Transcription

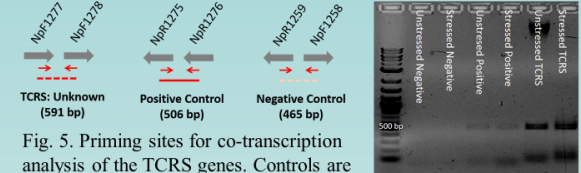


Fig. 5. Priming sites for co-transcription analysis of the TCRS genes. Controls are also shown, see Fig. 1 for reference.

Fig. 6. RT-PCR products.

The intergene regions between the TCRS genes and control genes were amplified using specific primers on cDNA from cells exposed to UVA for 20 min (Fig. 5). Amplification of a product for the TCRS intergene region (Fig. 6) suggests that the genes are co-transcribed. As expected, a product was obtained for the positive control while none was amplified for the negative control.

## Summary and Conclusions

Based on the phenotype of the  $\Delta$ NpF1278 mutant strain it appears as though the RR NpF1278 regulates scytonemin biosynthesis in *N. punctiforme*. The TCRS genes also respond to UVA, UVB, and high light stress. This response, however, is rapid and occurs within 20 min, much earlier than the 48 hrs required for peak expression of the biosynthetic genes<sup>2</sup>. These genes are also not responsive to oxidative stress, which suggests that the TCRS is sensing UVA and not the reactive oxygen generated by UVA. Furthermore, the TCRS genes appear to be co-transcribed.

## Acknowledgements

We would like to thank the Indiana Academy of Sciences and the IPFW Office of Research, Engagement, and Sponsored Projects for the financial support to conduct this research as well as the IPFW Department of Biology for providing the facilities and additional support.

## References

1. Soule, T *et al.* (2007) *J Bacteriol* **189**(12) 4465-4472
2. Soule, T *et al.* (2009) *J Bacteriol* **191**(14) 4639-4646

# Resources

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University of Texas at Austin: Office of Undergraduate Research

- <http://www.utexas.edu/ugs/our/poster/samples>

The Scientist's Guide to Poster Design

- <http://www.kmeverson.org/academic-poster-design.html>

IPFW Poster Symposium Website Resources

- <http://www.ipfw.edu/offices/resp/students/2015-symposium.html>

Take a moment to study the poster layouts around your department and at the PFW Research Symposium, be inspired!

Get feedback from friends and classmates.