

MASSURC 2024



**How to design
your research
poster for the
MassURC!**

Introduction to

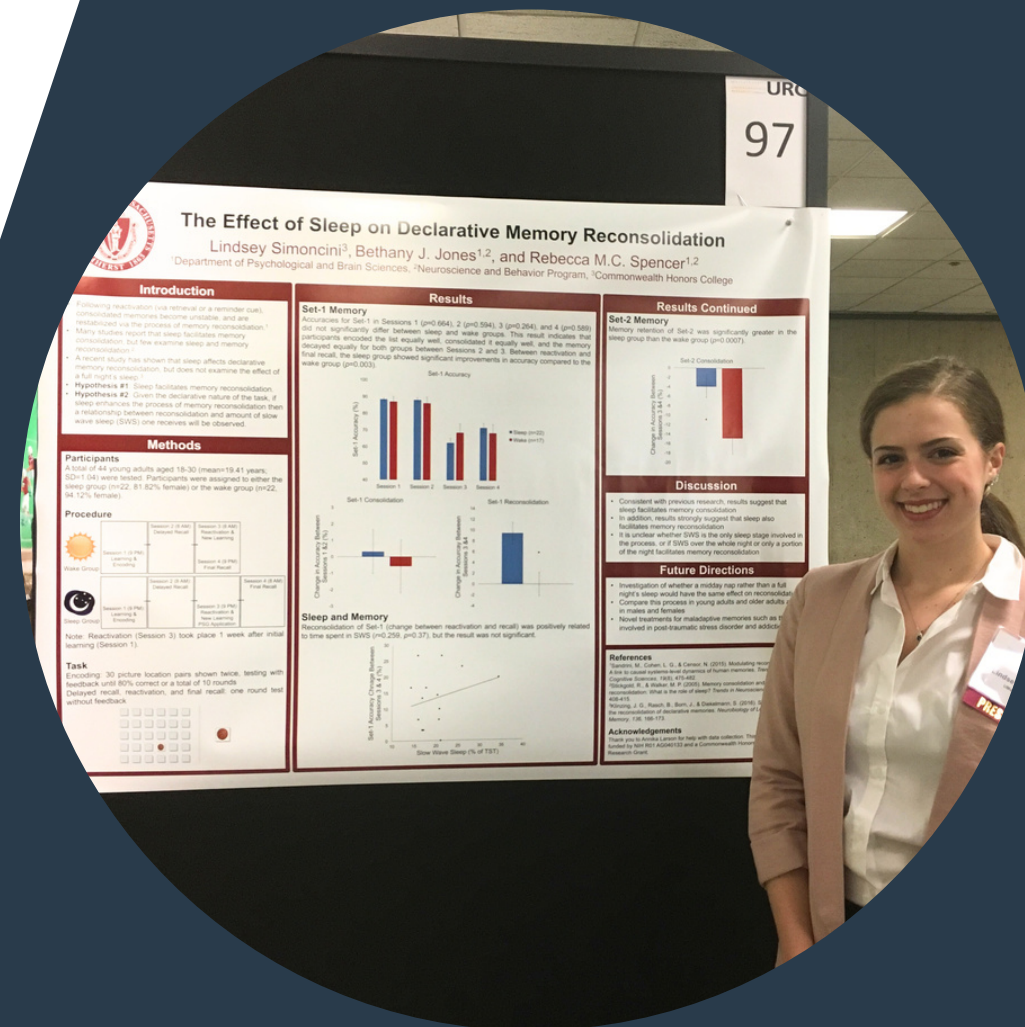
RESEARCH POSTERS



WHAT

IS A RESEARCH POSTER?

- Posters are a popular method of presenting research findings in a concise and visually pleasing format
- On the conference day you will stand by your poster during your presentation slot, showcasing your work to those walking by and allowing you to have a direct and engaging connection with your audience
- Posters generally consist of: concise text, tables, graphs, images, and various formats

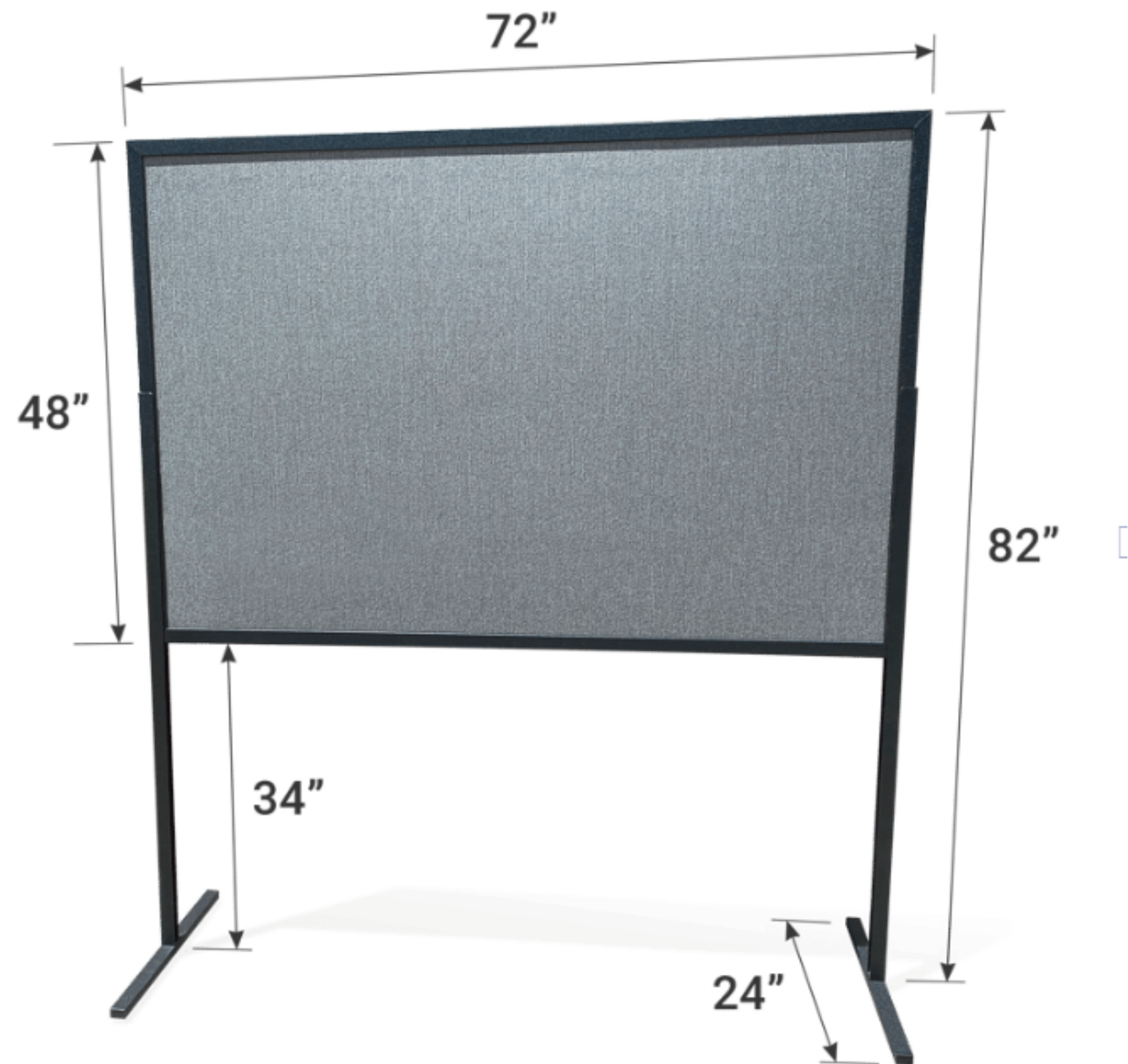


GUIDELINES FOR

MASSURC 2024

- MassURC will provide 48 inches x 72 inches (four feet by six feet) poster boards and pins for display
 - Your poster can be any size up to 4' x 6'. It is not expected to be the same size as the poster board we provide!
- Every participating student must designate a **Faculty Sponsor** who will review and approve their research materials, including the abstract and poster presentation
- Students have the option to present individually or in small groups

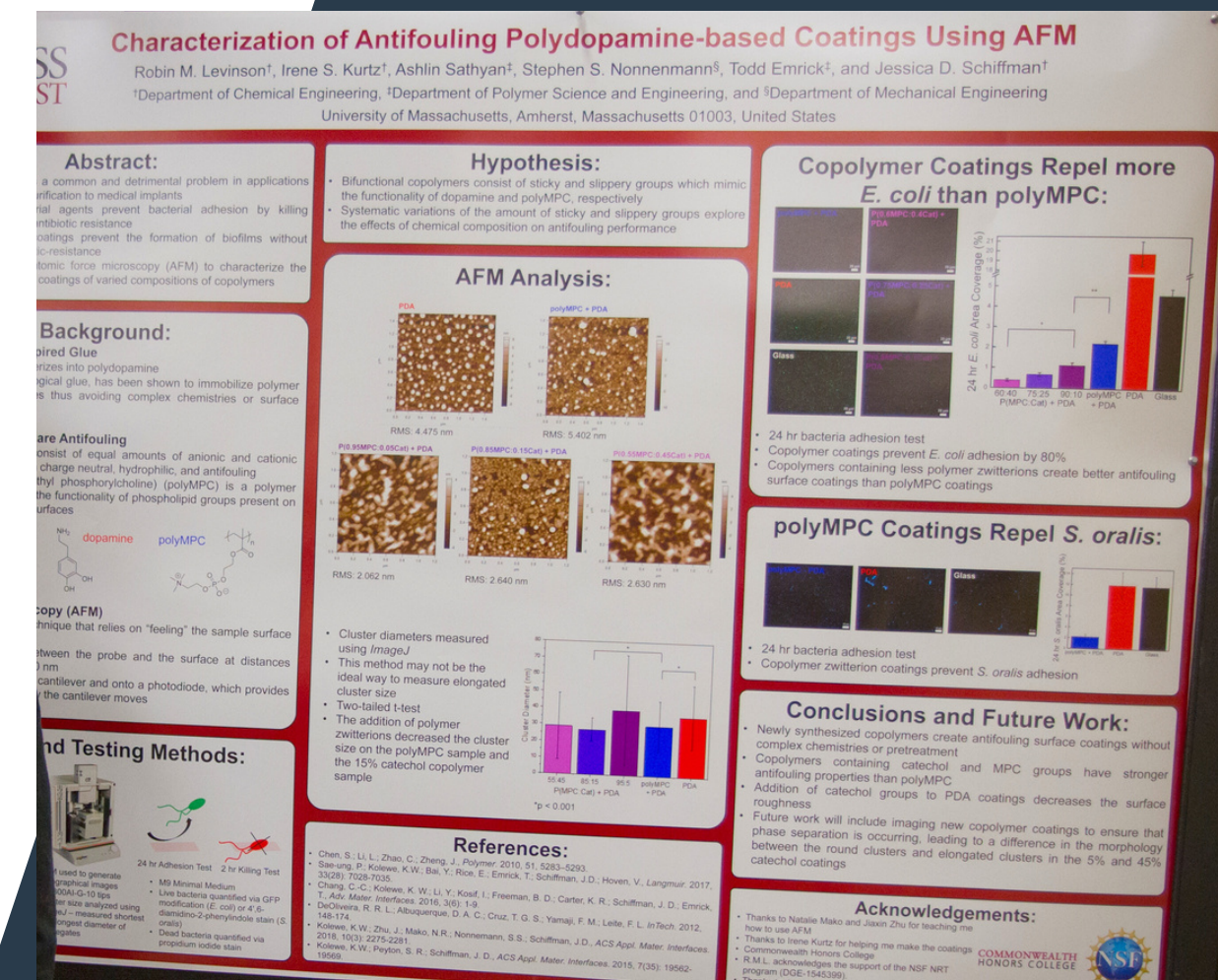
Here is what the poster board provided looks like:



WHAT MAKES AN

EFFECTIVE POSTER?

- Ensure that crucial information is legible from 10 feet away
- Have a concise and attention-grabbing title
- Include your **acknowledgments, name, and institutional affiliation**
- Use a mix of text, tables, graphs, images, and other formats to summarize and convey information in a succinct and appealing way



Designing your

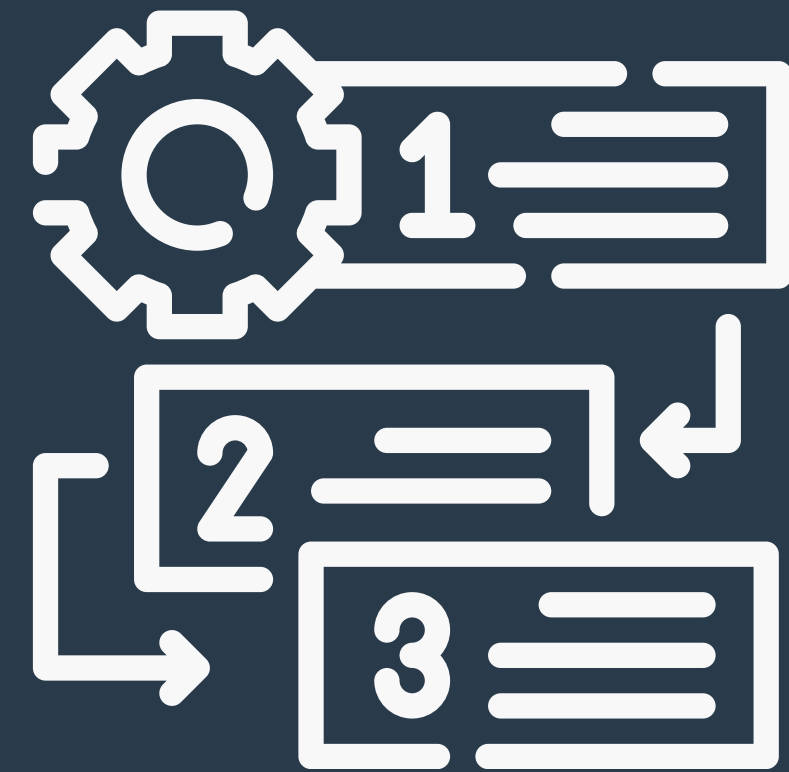
RESEARCH POSTER



ORGANIZE

YOUR CONTENT

- Make good use of headings and subheadings; be sure to organize your content into sections such as “Data”, “Results,” “Key Findings”, for example
- Use bullets and numbering to summarize information and methods utilized
- Arrange your content in a logical order, following the flow of your research process
- Maintain a clean and consistent layout and color scheme throughout the poster



RECOMMENDED

COMPONENTS

- **Provide background:** Make sure you include a section that provides relevant background information that someone unfamiliar with the research field or topic might not know on their own
- **Highlight your research question:** State your research question clearly, so that others understand what exactly you want to achieve with your research
- **Describe your methodology:** Explain the methods and procedures you utilized throughout your research process in a concise and thorough manner
- **Visually convey results/takeaways:** Use tables, charts, and graphics to visually display important information to others

Design Considerations:

- Ensure a good balance of content and white space. Crowded posters can be overwhelming to look at
- Leave sufficient margins around the edges for a clean look

Incorporate
ACCESSIBILITY



WHY ACCESSIBILITY

MATTERS:

- Your poster is a visual representation of your research, and making it accessible involves choosing design elements that are clear and easily understandable.
 - This ensures that your research reaches the widest possible audience!

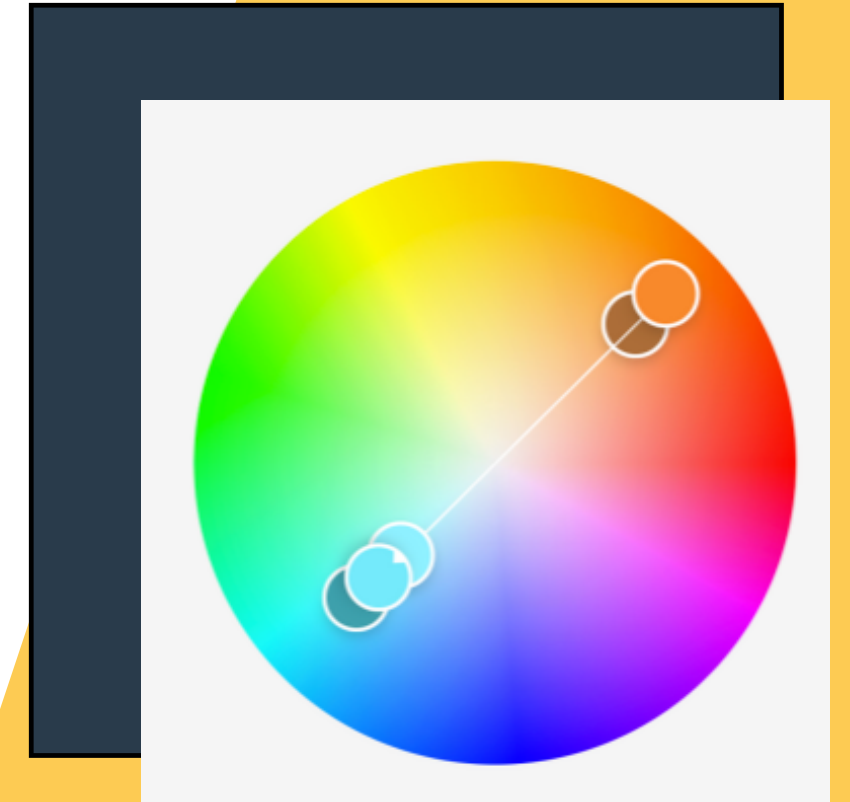


DESIGN TIPS TO CONSIDER TO

ENHANCE READABILITY:

Colors:

- Ensure sufficient contrast between the text and the background.
 - **Color Contrast checking tool** is linked on the MassURC Hub!
- Avoid relying solely on color to convey meaning. Instead, use patterns or shading in addition to color on charts, graphs, illustrations, and maps where color differences are intended to convey information.

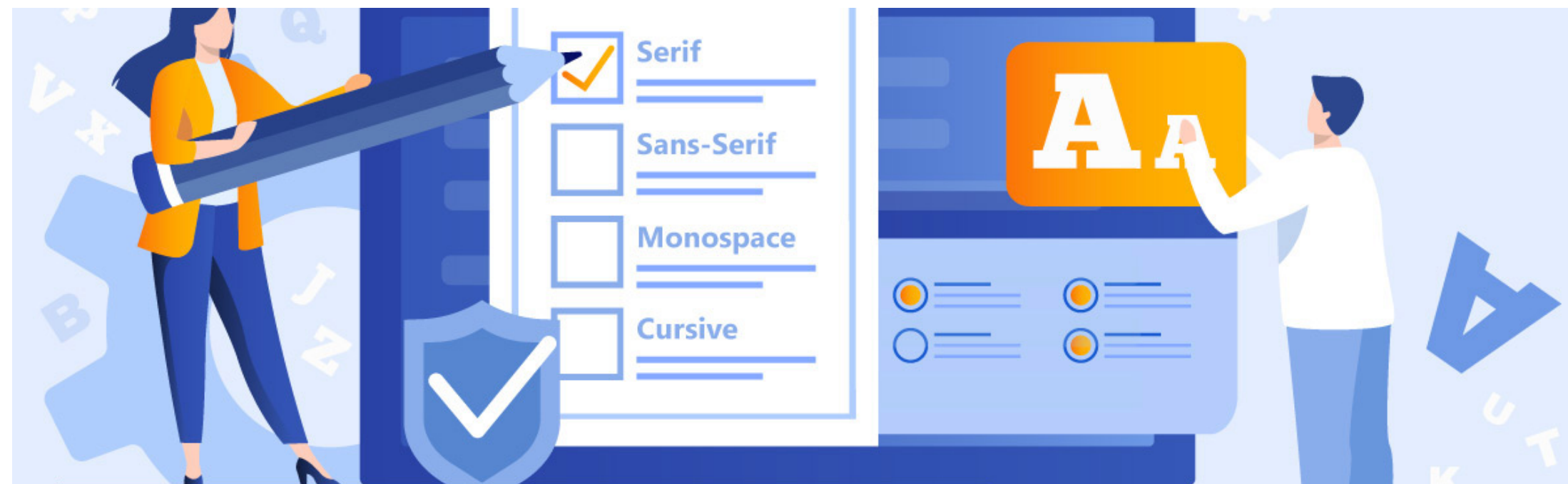


DESIGN TIPS TO CONSIDER TO

ENHANCE READABILITY:

Fonts:

- Recommended: **Sans-serif fonts** such as Arial, Gill Sans, Helvetica, and Verdana for body and heading text.
- **Serif fonts** such as Times New Roman and Garamond are recommended for headings only.

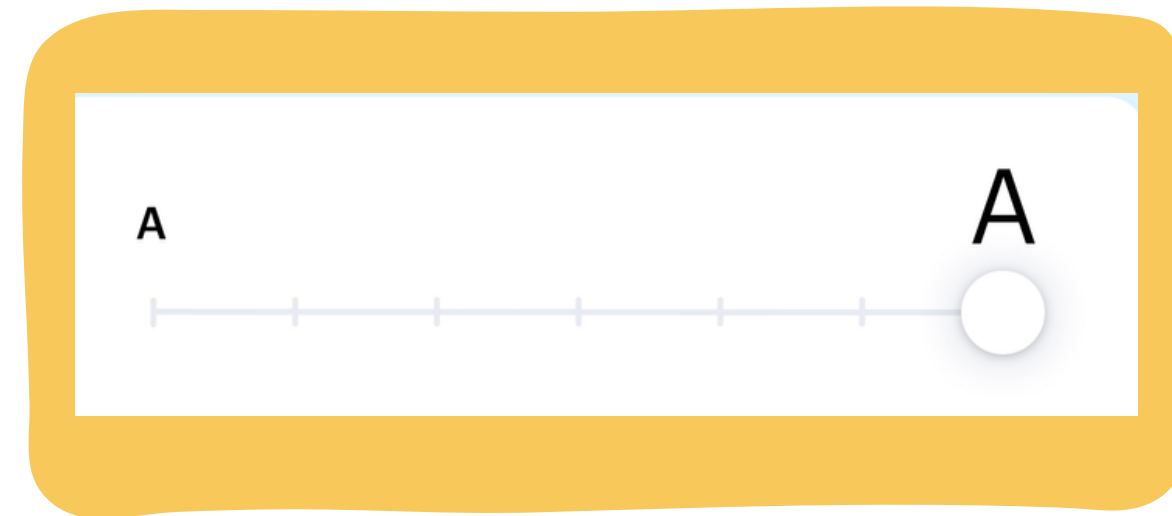


DESIGN TIPS TO CONSIDER TO

ENHANCE READABILITY:

Text size:

- Bigger is better!
- Recommendations:
 - Main title: 72 point (minimum) - 158 point (ideal)
 - Section headings: 42 point (minimum) - 56 point (ideal)
 - Body text: 24 point (minimum) - 36 point (ideal)
 - Captions: 18 point (minimum) - 24 point (ideal)



CONSIDER YOUR

VERBAL COMMUNICATION

Why it matters:

On the day of the conference, you will be walking attendees through your research verbally. By considering accessibility, you guarantee that your spoken explanations are inclusive and contribute to a clear and coherent understanding of your work for everyone in the audience.

Tips to Consider:

- **Clarity:** Speak clearly and at a moderate pace to aid understanding for all attendees
- **Inclusive Language:** Use language that is inclusive and avoids jargon, making your research accessible to a diverse audience
- **Descriptions of Visuals:** to assist those with visual impairments, provide detailed descriptions verbally for any visuals you may have included

LAST MINUTE TIPS!

- You will likely be explaining your work to a lot of people. Prepare a short “elevator pitch” that consists of a concise verbal summary of your research process and results so far so that you have one ready to go!
- If you want to bring extra “props” or components of your research outside of your poster, you can do so
 - You can make a request for a small table to display through the accommodations form on the MassURC Hub, but we cannot guarantee that we will be able to provide it
- If you have any friends, family, or other guests that you would like to invite to the conference, they can fill out the guest check-in form that is available on the MassURC Hub!

Research Poster

EXAMPLES



POSTER

EXAMPLES

- [Follow this link to see more examples of posters](#)

UMASS AMHERST

Characterization of Antifouling Polydopamine-based Coatings Using AFM

Robin M. Levinson[†], Irene S. Kurtz[‡], Ashlin Sathyan[‡], Stephen S. Nonnenmann[§], Todd Emrick[‡], and Jessica D. Schiffman[†]
[†]Department of Chemical Engineering, [‡]Department of Polymer Science and Engineering, and [§]Department of Mechanical Engineering
University of Massachusetts, Amherst, Massachusetts 01003, United States

Abstract:

- Bacterial adhesion is a common and detrimental problem in applications ranging from water purification to medical implants
- Traditional antibacterial agents prevent bacterial adhesion by killing microbes, leading to antibiotic resistance
- Antifouling surface coatings prevent the formation of biofilms without contributing to antibiotic-resistance
- Our goal is to use atomic force microscopy (AFM) to characterize the surface topography of coatings of varied compositions of copolymers

Hypothesis:

- Bifunctional copolymers consist of sticky and slippery groups which mimic the functionality of dopamine and polyMPC, respectively
- Systematic variations of the amount of sticky and slippery groups explore the effects of chemical composition on antifouling performance

Background:

Dopamine: A Bioinspired Glue

- Dopamine self-polymerizes into polydopamine
- Polydopamine, a biological glue, has been shown to immobilize polymer zwitterions to surfaces thus avoiding complex chemistries or surface pretreatment

Polymer Zwitterions are Antifouling

Polymer zwitterions consist of equal amounts of anionic and cationic moieties, making them charge neutral, hydrophilic, and antifouling. Poly(methacryloyloxyethyl phosphorylcholine) (polyMPC) is a polymer zwitterion that mimics the functionality of phospholipid groups present on many cell membrane surfaces.

AFM Analysis:

AFM images and RMS values for various coatings:

- PDA: RMS: 4.475 nm
- polyMPC + PDA: RMS: 5.402 nm
- P(0.95MPC:0.05Cat) + PDA: RMS: 2.062 nm
- P(0.85MPC:0.15Cat) + PDA: RMS: 2.640 nm
- P(0.55MPC:0.45Cat) + PDA: RMS: 2.630 nm

Cluster diameters measured using ImageJ:

- This method may not be the ideal way to measure elongated cluster size
- Two-tailed t-test
- The addition of polymer zwitterions decreased the cluster size on the polyMPC sample and the 15% catechol copolymer sample

Microscopy (AFM)

A technique that relies on "feeling" the sample surface between the probe and the surface at distances of 10 nm. The cantilever and onto a photodiode, which provides the deflection of the cantilever moves.

and Testing Methods:

- Used to generate topographical images
- 900A1-G-10 tips
- Cluster size analyzed using ImageJ - measured shortest and longest diameter of elongates
- M9 Minimal Medium
- Live bacteria quantified via GFP modification (*E. coli*) or 4',6'-diamidino-2-phenylindole stain (*S. oralis*)
- Dead bacteria quantified via propidium iodide stain

24 hr Adhesion Test **2 hr Killing Test**

Copolymer Coatings Repel more *E. coli* than polyMPC:

24 hr *E. coli* Area Coverage (%)

Coating	24 hr <i>E. coli</i> Area Coverage (%)
P(MPC:Cat) + PDA	0.40
P(0.75MPC:0.25Cat) + PDA	0.75
P(0.90:10) polyMPC + PDA	2.00
PDA	19.00
Glass	10.00

polyMPC Coatings Repel *S. oralis*:

24 hr *S. oralis* Area Coverage (%)

Coating	24 hr <i>S. oralis</i> Area Coverage (%)
polyMPC + PDA	1.00
PDA	10.00
Glass	10.00

Conclusions and Future Work:

- Newly synthesized copolymers create antifouling surface coatings without complex chemistries or pretreatment
- Copolymers containing catechol and MPC groups have stronger antifouling properties than polyMPC
- Addition of catechol groups to PDA coatings decreases the surface roughness
- Future work will include imaging new copolymer coatings to ensure that phase separation is occurring, leading to a difference in the morphology between the round clusters and elongated clusters in the 5% and 45% catechol coatings

Acknowledgements:

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- Thanks to Irene Kurtz for helping me make the coatings
- Commonwealth Honors College
- R.M.L. acknowledges the support of the NSF NRT program (DGE-1545399).
- Thanks to the support from UMass Amherst

References:

- Chen, S.; Li, L.; Zhao, C.; Zheng, J., *Polymer* 2010, 51, 5283-5293.
- Sae-ung, P.; Kolewe, K.W.; Bai, Y.; Rice, E.; Emrick, T.; Schiffman, J.D.; Hoven, V., *Langmuir* 2017, 33(28): 7028-7035.
- Chang, C.-C.; Kolewe, K. W.; Li, Y.; Kosif, I.; Freeman, B. D.; Carter, K. R.; Schiffman, J. D.; Emrick, T., *Adv. Mater. Interfaces* 2016, 3(6): 1-9.
- DeOliveira, R. R. L.; Albuquerque, D. A. C.; Cruz, T. G. S.; Yamaji, F. M.; Leite, F. L. *In Tech* 2012, 148-174.
- Kolewe, K.W.; Zhu, J.; Mako, N.R.; Nonnenmann, S.S.; Schiffman, J.D., *ACS Appl. Mater. Interfaces* 2019, 10(3): 2275-2281.
- Kolewe, K.W.; Peyton, S. R.; Schiffman, J. D., *ACS Appl. Mater. Interfaces* 2015, 7(35): 19562-19569.

URC
Robin Levinson
UMass Amherst
PRESENTER

Reminder:

PRESENTER RESOURCES





MASSURC HUB

- One-stop-shop for all MassURC information!
- The **Poster Tips, Color Contrast Checker, and Example Posters** that we've mentioned today will live here!

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Home Contact Us



Welcome to the MassURC Hub!

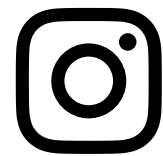
We're excited for your interest in the 30th Massachusetts Undergraduate Research Conference (MassURC), where students from across Massachusetts come together to present original research in their respective field of study. If you are interested in presenting or are serving as a Faculty Sponsor, please make sure you register to create a user account.

The [MassURC Hub](#) is where you will register for the conference, submit, revise, and review abstracts. In addition, [MassURC Hub](#) will be your resource for live schedules, searching, notifications, and updates on conference day.

To Register

CONNECT

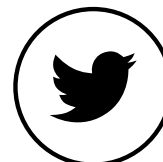
WITH US ON OUR SOCIALS



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<https://honorspaths.honors.umass.edu/massurc>

QUESTIONS?

Still have questions?

 [Email the conference team](#)

