

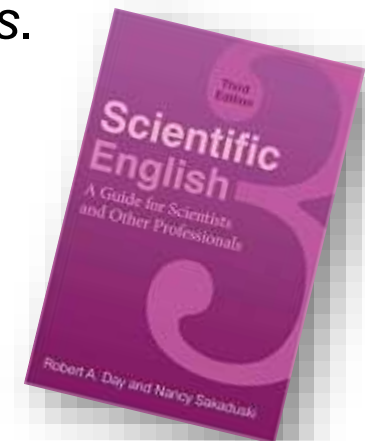
Preparing a Poster

ENGR 361: Scientific Research Communication

<https://www.csulb.edu>

References

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Assignment #5 – Research Poster

- Prepare a Research Poster based on the research report (Assignment 4)
 - Set the size to 4' x 6' (different for PowerPoint)
 - Submission date: April 5th
- Submit electronic (pdf file) on BeachBoard

Assignment #5 – Research Poster

■ Content

- **Title:** Short & descriptive with authors and affiliations
- **Introduction:** Hypothesis/problem statement, background information, goal of the project and relevance
- **Methods:** Brief description of methods, rationale for methods, discussion of comparative groups and controls
- **Results:** Presentation of data (logically and clearly)
- **Conclusions:** Conclusions, connection to the hypothesis and wider context
- **References:** Short list in abbreviated format

Scientific Posters

- Main medium for information exchange at meetings



Scientific Posters

- Summarize research concisely and attractively
 - Publicize findings
 - Generate discussion

- Posters contain
 - Brief text
 - Tables
 - Graphs
 - Pictures

Scientific Posters

■ Meeting Requirements for Posters

- Know the poster requirements and instructions for the meeting
 - Content (Intro, Methods, etc.)
 - Dimensions (std. 4' x 6')
 - Abstract number, citation
 - Method for attachment
 - Day, time, board # for posting
 - Time for attending poster
 - Deadline for take-down



Scientific Posters

■ Poster Preparation

- What is the most important/interesting/astounding finding from my research project?
- How can I visually share my research with conference attendees?
 - Should I use charts, graphs, photos, images?
- What kind of information can I convey during my talk that will complement my poster?

Scientific Posters

- **Organizing the Poster**

- Text is kept to an absolute minimum
- Most of the space is devoted to illustrations, graphics
- Remember to leave sufficient white space

Scientific Posters

- **Organizing the Poster**

- **Introduction**

- Brief but *very clear* statement of the problem

- **Methods**

- Short, only a few sentences
 - If possible, use graphics instead of text (e.g., flowchart)

Scientific Posters

- **Organizing the Poster**

- **Results**

- Main Element of Poster
 - Tables, Plots, Figures, etc.

- **Conclusions**

- Bullet Points
 - No Discussion

- **References**

- Kept to a minimum
 - Shortened citations

Scientific Posters

■ Title Development

- Keep it relatively short
- Large enough to read from 10 feet away!
- If possible, make the title “catchy”, Attention grabbing!

Scientific Posters

■ Title Development

- With short title, passers-by can easily read, know if they want to stop and ask questions

No

- *mTOR inhibition reverses Akt-dependent prostate intraepithelial neoplasia through regulation of apoptotic and HIF-1-dependent pathways*

Good!

- *Regulation of translation initiation by FRAP/mTOR*

Scientific Posters

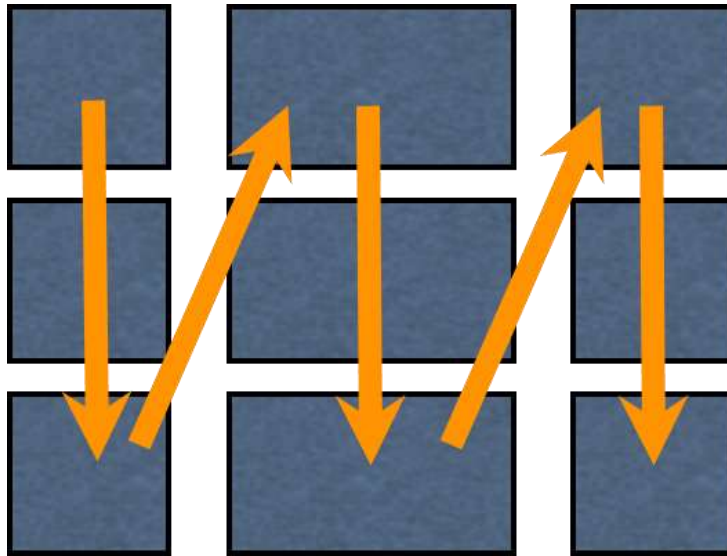
- **Poster Layout**

- Poster should be self-explanatory
 - Allows different readers to move at their own pace
 - Essential story should be understood in a few minutes

Scientific Posters

■ Poster Layout

- Organize sequence top-to-bottom, left-to-right
 - Much easier to follow than reading left-to-right
- Design should allow viewer to quickly grasp your story with minimal effort



Scientific Posters

- **Visual Impact**

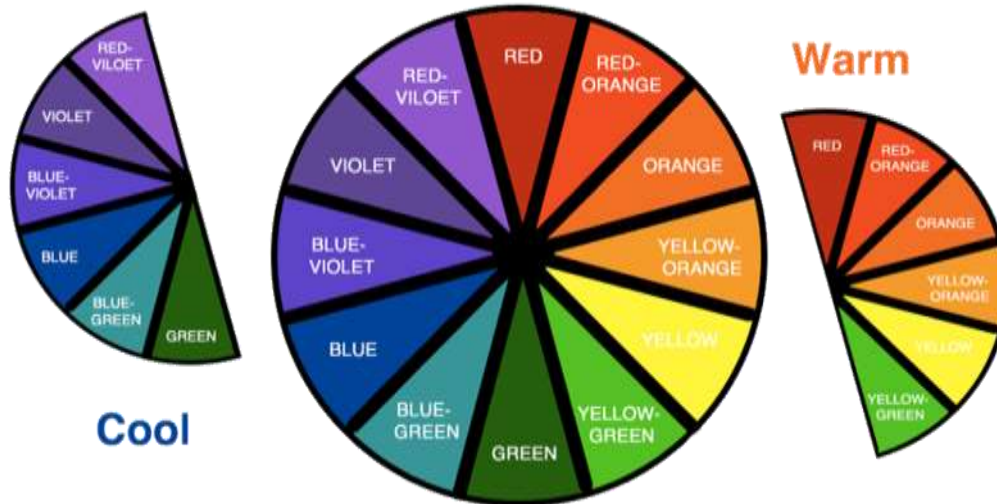
- Avoid too many words/text
- Mostly comprised of
 - Flow Charts
 - Diagrams
 - Line Plots
 - Bar Graphs
 - Photographs
 - Pie Charts
 - Models / Figures
- Limit the number of tables
- The more VISUAL the poster, the better

Scientific Posters

■ Visual Impact

— Color selection matters

- Be careful to choose a non-distracting color scheme
- Cool colors usually work best
- Use warm or hot colors only for accent (sparingly)



Scientific Posters

- **Characteristics of good posters**

- Key information should be readable from about 10 feet away
- Title is short and piques interest
- Word count ~300 to 800 words
- Text is clear, to the point

Scientific Posters

- **Characteristics of good posters**

- Use of bullets, numbering, and headlines make it easy to read
- Effective use of graphics, color, and fonts
- Consistent and clean layout
- Includes acknowledgments, your name and contributors' names, and affiliation(s)

Scientific Posters

- **Assembling the Poster**

- Generate graphic and text panels
 - Individual panels manually created or created in other digital media and copied to poster
- Using PowerPoint/Keynote poster templates
 - Import text, graphics onto template
 - Add colors where appropriate
 - Print on large-format paper



- PowerPoint Poster templates available on Web

Scientific Posters

- **Assembling the Poster**

- **PowerPoint:** A popular, easy-to-use option.
- **Adobe Illustrator, Photoshop, & InDesign:** Feature-rich professional software, but they are more complex and expensive
- **Open Source Alternatives:** OpenOffice is the free alternative to MS Office
 - Inkscape and Gimp are alternatives to Adobe products

Dining and Dishing: Analyzing Uses and Gratifications of Facebook and Twitter Interaction by Patrons in the Restaurant Industry

Sunshine Baker and Alex Rister

University of Central Florida



INTRODUCTION

Restaurant owners know that their social media presence is a vital aspect of their marketing and public relations efforts. Facebook Pages and Twitter profiles have become the hubs where restaurants and their customers converse.

People who are Facebook fans of restaurants visit the restaurants 20% more often, recommend them more often, and report significantly greater emotional attachment to the restaurants (Bilgicli & Durkin, 2010). Twitter shows the same impact, with several startup restaurants using exclusively Twitter to market to their customers (Glickman, 2011). Starbucks credits the majority of its growth in recent years to a successful social media strategy (Creek, 2012). It is becoming clear that in order to grow a restaurant in this century, social media interaction is imperative.

OBJECTIVES

This paper examined Uses and Gratifications for Facebook and Twitter use, social media interactions by hospitality customers, the reasons why restaurants should use social media, and the current research into social media interactions between restaurants and their customers.

Research Questions

RQ1: How frequently do Facebook and Twitter users interact with restaurants?

In order to determine how frequently Facebook and Twitter users interact with restaurants, a basic usage scale measured amount of interaction, type of interactions on Facebook, and amount and type of interactions on Twitter on a daily basis.

RQ2: What social and informational gratifications are sought by those who interact with restaurants via Twitter and Facebook?

The Uses & Gratifications scale created by Johnson and Yang (2009), with modifications to focus on restaurant interaction, was used to measure gratifications sought by those who interact with restaurants on Facebook and on Twitter.

RQ3: Do Facebook users seek different social and informational gratifications than Twitter users?

The Uses & Gratifications scale created by Johnson and Yang (2009), as well as this research team's modified scale to include Facebook, was analyzed to determine the differences between Facebook users' gratifications and Twitter users' gratifications.

RQ4: Will the social and informational categories of Johnson and Yang's (2009) uses and gratifications scales correspond with the social and informational categories in our own newly developed restaurant-specific scale?

The research team analyzed the correspondence between restaurant-specific Uses and Gratifications that we labeled as social vs. informational with the accepted social and informational groups in the Johnson and Yang (2009) Likert scale and the modified scale for Facebook.

METHODS

Procedure

To answer the study's research questions, data was collected from anonymous participants through an online survey. All procedures were reviewed and approved by the university's Institutional Review Board, and participation was voluntary.

The survey consisted of 57 questions concerning demographic information, social media use, frequency of social media use, and gratifications sought by social media use.

Participants

Researchers took a convenience sample of Facebook and Twitter users by employing a snowball technique.

A total of 360 participants responded to the online survey. Nearly all the participants ($n = 353$) reported having a personal Facebook account, while just over 56 percent ($n = 204$) indicated they also had a personal Twitter account. The study excluded respondents who reported no association with restaurants through Facebook and/or Twitter, as they were not part of the specific population examined in this study. The final survey sample consisted of 256 participants who "Liked" restaurant pages on Facebook and 75 who followed restaurants on Twitter.

Measures

To measure frequency of social media use, participants were asked to report how many times a day they accessed Facebook and/or Twitter. Social media usage was measured by times logged in per day, and respondents were also asked to self-report how much time they spent using Facebook and/or Twitter in hours and minutes per day. The survey asked participants how many restaurants they "Like" and/or follow on Facebook and Twitter as well as how many times per day they interacted with restaurants on those social media platforms. Both the quantity of restaurant "Likes" followed and the frequency of interaction were measured.

To measure gratifications sought, participants were provided with a list of 22 reasons for using Facebook and 23 reasons for using Twitter to interact with restaurants and were asked to rate their level of agreement or disagreement with each reason. Each item was measured on a five-point, Likert-type scale, with 1 being the lowest level of agreement and 5 being the strongest level of agreement. These two scales were modified from the scale used in Johnson & Yang's 2009 Uses & Gratifications of Twitter study.

RESULTS

RQ1 asked how frequently Facebook and Twitter users interacted with restaurants. Participants reported logging on to Facebook 81.34 times per week. More than 70 percent (71.9%) of participants reported spending at least 30 minutes a day on Facebook. While they are logged on to Facebook, participants reported interacting with restaurant Pages 12.53 times per week, on average. The mean number of restaurant Pages "Liked" by Facebook users who reported interacting with restaurant Pages was 9.86 ($SD = 11.82$).

Twitter users, on the other hand, reported logging on an average of 8.97 times per day ($SD = 15.58$), which is equal to an average of 62.79 times per week. Nearly 55 percent (54.7%) of the participants reported spending an average of less than 30 minutes a day on Twitter. While using Twitter, participants reported interacting with restaurants an average of 3.36 times per day ($SD = 7.98$), which is equal to 23.52 times per week. The mean number of restaurant pages followed by Twitter users who reported interacting with restaurant pages was 11.4 ($SD = 14.73$).

RQ2 explored what social and informational gratifications patrons who interacted with restaurants via Facebook and Twitter sought.

Seven of the top eight gratifications sought by Facebook users were informational motives: to get information, to receive special offers, to learn daily specials, to learn menu changes, to see what the food looks like, to learn interesting things, and to get answers to questions about food/restaurant. The second motive to show my support for the restaurant ranked third on the gratifications sought list.

Six of the top eight gratifications sought by Twitter users were informational motives: to get information, to receive special offers, to learn interesting things, to learn menu changes, to see what the food looks like, and to get answers to questions about food/restaurant. The two highest reported social motives were to show my support for the restaurant and to share restaurant information with others, which ranked third and seventh, respectively.

RQ3 asked if Facebook users sought different social and informational gratifications than Twitter users. The means for all informational gratifications and social gratifications were averaged to compare between Facebook and Twitter users. Facebook users sought more informational gratifications ($M = 3.14$, $SD = 1.47$) than social gratifications ($M = 2.13$, $SD = 1.26$), and their level of agreement was slightly higher than Twitter users. While Twitter users reported seeking more informational gratifications ($M = 2.12$, $SD = 1.54$) than social gratifications ($M = 1.72$, $SD = 1.17$) from restaurant's social media, both motives had low levels of agreement.

We did not find a significant correlation between reported social or informational gratifications on Facebook with reported social or informational gratifications on Twitter.

RQ4 questioned whether the social and informational categories of Johnson and Yang's (2009) Uses and Gratifications scales would correspond with the social and informational categories in the research team's restaurant-specific scale. The top five gratifications sought by this study's Facebook users interacting with restaurants and this study's Twitter users interacting with restaurants were compared with the top five gratifications sought by Twitter users in the Johnson and Yang study (Table 3). For all three groups, the top two gratifications sought were informational, and the third highest gratification sought was social.

Facebook	Twitter	Facebook	Twitter	Facebook	Twitter
1. To get information	1. To get information	1. To get information	1. To get information	1. To get information	1. To get information
2. To receive special offers	2. To receive special offers	2. To receive special offers	2. To receive special offers	2. To receive special offers	2. To receive special offers
3. To learn daily specials	3. To learn daily specials	3. To learn daily specials	3. To learn daily specials	3. To learn daily specials	3. To learn daily specials
4. To learn menu changes	4. To learn menu changes	4. To learn menu changes	4. To learn menu changes	4. To learn menu changes	4. To learn menu changes
5. To see what the food looks like	5. To see what the food looks like	5. To see what the food looks like	5. To see what the food looks like	5. To see what the food looks like	5. To see what the food looks like

CONCLUSIONS AND RECOMMENDATIONS

The results of our study show that restaurant customers report more informational than social motivations when interacting with restaurants on Facebook and Twitter.

Since information seeking is the most popular reason why people interact with restaurants on social media, restaurants should be sure to offer a lot of information on Facebook Pages and Twitter profiles. Postings about daily menus, food photos, specials, and events would draw in more users seeking information. The number two motivation for both Facebook and Twitter is to receive special offers, so restaurants that wish to encourage followers should be sure to advertise social media-exclusive promotions on Facebook and Twitter.

Of the social motives, the most frequently reported by both Facebook and Twitter users was to show support for the restaurant. Overall, this was the third most frequently cited reason for interacting with restaurants on social media. Restaurant owners can use this information to focus on building relationships with guests that will motivate them to want to show support.

The results for Facebook and Twitter gratifications sought were very similar, so it appears that an information-driven posting strategy for restaurant social media managers would be effective for both platforms. The main difference we found was in number of Pages "Liked" and profiles followed. Facebook users with informational motives are more likely to "Like" a higher number of restaurant Pages, while Twitter users with social motives are more likely to follow more restaurant profiles on Twitter. This knowledge would encourage restaurant social media managers to be more social on Twitter, using more direct interactions with other users. Overall, our findings reinforce the main tenets of the Uses and Gratifications theory: that people who interact with restaurants on social media are seeking to fulfill a specific purpose. Restaurants can use Facebook and Twitter to share information and to gain support for their restaurants.

REFERENCES

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ACKNOWLEDGEMENTS AND CONTACT INFO

Family Advisor: Dr. Bridget Bohlenberg
For further information please contact sunshine.baker@ucf.edu or alex.rister@knights.ucf.edu

Exercise and Mental Health in University Students

Chelsea Towler

Department of Psychological Sciences

Advisor: Dr. Keith

chelsea.towler-11@sandiego.edu



Abstract

The purpose of this study was to examine the relation between exercise habits and mental health in university students. Participants were instructed to fill out a brief questionnaire asking about their depression, anxiety, and stress levels, and also about their exercise habits. Type, location, and regularity of exercise were also examined. Results showed that symptoms of depression are lowest in people who exercise most regularly, particularly if that exercise is outdoor, group, or individual exercise. Results also showed a significant correlation between regularity of exercise and regularity of exercise dedicated to improving appearance.

Introduction

- ❖ Depression affects between 15 and 20% of students (Gawrysiak et al., 2009)
- ❖ Anxiety affects 21% of students (Bayram & Bilgel, 2008)
- ❖ Exercise may provide a psychological benefit by providing a sense of purpose and satisfaction (Crone & Guy, 2008)
- ❖ Exercise has been shown to decrease symptoms of schizophrenia (Callaghan, 2004)
- ❖ Exercise can reduce symptoms of depression because it causes an increase in the release of several neurotransmitters, including serotonin and dopamine. It also causes the release of endorphins, which lead to a state of euphoria (Callaghan, 2004)
- ❖ Aerobic exercise has positive effects on well-being because it increases heart rate and adrenaline levels, whereas anaerobic exercise increases self-concept (Buckalon et al., 2009)



Hypothesis

Hypothesis 1: University students who engage in exercise most will experience fewer symptoms of depression, anxiety and stress.
Hypothesis 2: Outdoor and group exercise will be associated with the lowest experience with depression, anxiety and stress

Methods

- ❖ Participants were 66 female and 21 male undergraduate students from the University of San Diego
- ❖ Participants responded to a questionnaire consisting of 5 sections:
 1. Beck Depression Inventory
 2. College Life Stress Inventory
 3. Anxiety Level
 4. Exercise Habits
 5. Demographic Information
- ❖ Participants were given a score for each of the following variables: depression, stress, anxiety, total exercise, group exercise, individual exercise, outdoor exercise, indoor exercise, and regularity of exercise dedicated to improving appearance

Results

- ❖ 87 students participated in the survey
- ❖ Calculated Pearson Product-Moment correlations among all the variables
- ❖ Results supported hypothesis 1 in showing that high exercise scores were correlated with low depression scores, especially with respect to groups, individual, and outdoor exercise
- ❖ Results did not demonstrate any significance between exercise scores and anxiety and stress levels

Table

Score	Dep	Stress	Anxiety	Exercise	Group	Individual	Outdoor	Indoor
Depression	1.00							
Stress	-.22**	1.00						
Anxiety	-.22**	-.18	1.00					
Exercise	-.22**	-.18	-.17	1.00				
Group	-.22**	-.18	-.17	-.17	1.00			
Individual	-.22**	-.18	-.17	-.17	-.17	1.00		
Outdoor	-.22**	-.18	-.17	-.17	-.17	-.17	1.00	
Indoor	-.22	-.18	-.17	-.17	-.17	-.17	-.17	1.00
Improvement	-.22	-.18	-.17	-.17	-.17	-.17	-.17	-.17

**p-value<0.05 (significant correlation)

Discussion

- ❖ The correlation between regular exercise and low depression scores may indicate that exercise helps reduce depression
- ❖ Students who wish to avoid depression may want to incorporate an exercise routine into their daily lives, particularly group, individual, or outdoor exercise
- ❖ Results showed a strong correlation between regular exercise and regularity of exercise dedicated to improving appearance
- ❖ Because sample may be more likely to engage in regular exercise, it would be useful to conduct this study with other student populations, and also with child, adult, and elderly samples
- ❖ Because many students are exercising to improve their appearance, negative self concept may be associated with an increase in exercise behavior, as well as an increase in depression

References

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GREEN CHEMISTRY: IONIC LIQUIDS SYNTHESIS AND ITS APPLICATION AS MEDIUM IN DIELS-ALDER REACTION

Benjamin C. Haenni and Gholam A. Mirafzal (Mentor)

College of Arts and Sciences, Department of Chemistry, Drake University



Abstract

Ionic Liquids have been considered as efficient and environmentally friendly reaction medium for a variety of organic reactions. Our experimental results on the synthesis of two of the imidazolium ionic liquids and their use as medium in Diels-Alder reaction will be presented.

Introduction

Ionic liquids¹ are known to be environmentally friendly solvents when compared to their organic equivalents due to their low vapor pressure and recyclability. The Diels-Alder² reaction in particular is a common and important reaction in organic chemistry. We herein report the results of the Diels-Alder reaction of maleic anhydride and cyclohexadiene in 1-ethyl-3-methylimidazolium tetrafluoroborate as well as several synthesized ionic liquids.

Materials & Methods of Analysis

Cyclohexene, maleic anhydride, 1-iodobutane, 1-bromobutane, 1-methylimidazole and cyclohexadiene were all purchased from Sigma Aldrich chemical company, and were used as such without further purification. 1-ethyl-3-methylimidazolium tetrafluoroborate, [EMIM][BF₄], was purchased from Fluka chemical company without further purification.

FT-IR were done either neat or as solution in CDCl₃ on Nicolet 510P Spectrometer. FID-GC were done on HP 5971 instrument, equipped with a HP-1 Cross linked Methyl Silicone Gum with 12m x 0.2mm x 0.33 mm film thickness. The initial column temperature of 60°C (1 min) then 10°/min increments up to 250° (1 min) was used for analyses of Diels-Alder reactions. ¹H-NMR was done on 300 MHz Varian NMR.

Experimental Procedure

Ionic Liquid Synthesis

a) Ultra-sonic bath: 12 mmoles of 1-bromobutane (or 1-iodobutane) and 12 mmoles of 1-methylimidazole (MIM) were added to a test tube and allowed to mix thoroughly for one hour in an ultra-sonic bath. The product was rinsed with diethyl ether to remove un-reacted starting material and used without further purification.

b) Microwave: 12 mmoles of 1-bromobutane (or 1-iodobutane) and 12 mmoles of 1-methylimidazole (MIM) were added to a small beaker and heated for 45 seconds in a SHARP Carousel microwave at 30% power. The product was rinsed with diethyl ether to remove un-reacted starting material and used without further purification.

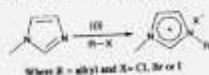
Diels-Alder

In a 3 mL vial containing a magnetic stirbar, 1.2 mmol of maleic anhydride and 2.4 mmol of [EMIM][BF₄] were added. To this stirred solution at room temperature, 6.0 mmol of cyclohexadiene was added. The progress of reaction was followed by GC at 5 minute intervals. After completion of the reaction, the solution was extracted with water and diethyl ether. The organic phase was put on a rotary evaporator to remove the volatile component and then further dried under high vacuum. The final analysis was done by IR and ¹H-NMR.

Results & Discussion

Ionic Liquid Synthesis

Ionic liquid was synthesized using two different procedures; microwave and ultra-sonic bath synthesis. For both techniques complete (100%) synthesis was achieved. We have shown that the reaction time using the ultra-sonic bath can be as fast as 2 hours for 1-butylimidazolium iodide reaction ([BMIM][I]). The reaction was further accelerated using the microwave procedure, achieving reaction times as low as 1 minute and 30 seconds for the 1-butylimidazolium bromide reaction ([BMIM][Br]). The general reaction equation and results are shown below.



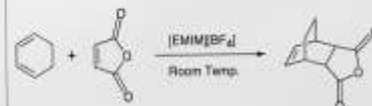
Ionic Liquid	Percent Yield	Sonic-bath Time	Microwave Time
[BMIM][Br]	100%	2 hr 45 min	90 sec
[BMIM][I]	100%	2 hr 0 min	120 sec



Infrared (IR) spectroscopy was used to confirm the completion and purity of product. The strong C-I peak at 734.5 cm⁻¹ from 1-iodobutane completely disappears in the product, suggesting purity. The peaks from 1-methylimidazole shift upon forming the product, demonstrated by the C=O stretch at 1516 cm⁻¹ shifting to 1568.7 cm⁻¹ in the product spectrum. We are in the process of characterizing these ionic liquids by NMR.

Diels-Alder

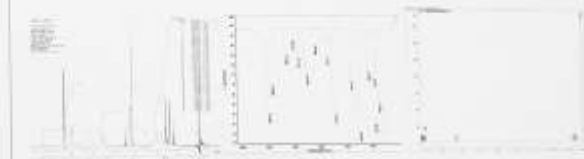
For the reactions with the various ionic liquids, all reactions were carried out at room temperature. The yields after 45 minutes or 1 hour were compared for [BMIM][I], [BMIM][Br], and [EMIM][BF₄]. The two synthesized ionic liquids both performed equally with yields of 58% after 45 minutes. Two separate extraction methods were also compared, one using water and ether and one only using ether. Using only the ether resulted in poor yield, with 17% yield after 1 hour. The results and reaction equation are shown below.



Ionic Liquid	Percent Yield
45 min [BMIM][Br]	58%
45 min [BMIM][I]	58%
45 min [EMIM][BF ₄]	28%
1 hour [BMIM][Br]	62%
1 hour [BMIM][Br] (ether only)	17%

Diels-Alder (cont)

For comparison, the Diels-Alder reaction was done in a traditional molecular solvent. Maleic anhydride was reacted with cyclohexadiene in bromobenzene with stirring at 80°C. The reaction went to completion after 3 hours. This demonstrates the catalytic properties of ionic liquids, as when they are used as solvents the reaction time is greatly increased and no heating is necessary.



GC, IR, and ¹H-NMR were all used to confirm purity of the Diels-Alder product. GC analysis was used by comparing the retention times of both the maleic anhydride and cyclohexadiene starting materials with that of the product. The IR analysis shows the C=O stretches for maleic anhydride (1781.83cm⁻¹, 1850.80cm⁻¹) were shifted to new C=O stretches (1780.82cm⁻¹, 1837.71cm⁻¹) representing the product. The ¹H-NMR data shows there is no presence of the maleic anhydride at delta 7.04 ppm.

Conclusion

Ionic liquids were successfully synthesized in a short time using both microwave and ultra-sonic bath methods. The Diels-Alder reaction of cyclohexadiene and maleic anhydride in ionic liquid at room temperature produced 58% yield in 45 minutes using [BMIM][Br] and [BMIM][I] ionic liquids. The same reaction done with a purchased [EMIM][BF₄] ionic liquid produced 28% yield in 1 hour. These results are favorable compared to the Diels-Alder reactions carried out in bromobenzene solvent which took place in 3 hours under reflux conditions. GC, IR, and NMR analysis support the formation of the product.

Future work

We are exploring using ionic liquids as medium for different substrates in the Diels-Alder reaction. The effect of different ionic liquids on the rates of reactions will further be investigated using different diene and dienophile combinations. The use of ionic liquids as medium for other organic reactions will be tested in the future.

References

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Biomaterials at Work: Applications for Therapeutic Delivery and Stem Cell Studies

Viet Anh Nguyen Huu,¹ Jerome Karpiak,² Cathryn L. McFearn,³ and Adah Almutairi^{3,4}

¹Nanoengineering Department, ²Biomedical Sciences Program, ³Skaggs School of Pharmacy and Pharmaceutical Sciences, ⁴Materials Science and Engineering Program

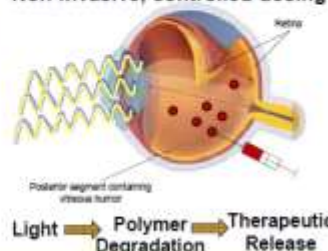
Shining a Light on Drug Delivery to the Eye

Motivation: Need for effective delivery methods of ocular therapeutics to reach the retina without repeat injection, which can cause retinal detachment, hemorrhage, or cataracts

Diseases Potentially Impacted

Glaucoma
Age related macular degeneration
Diabetic retinopathy

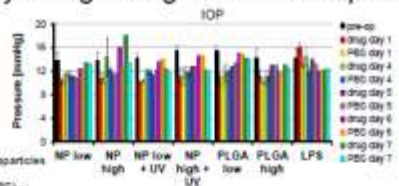
Non-invasive, controlled dosing



Biocompatibility of Light Degradable Nanoparticles

Animal model: Sprague-Dawley albino rats

Administration method: intravitreal injection

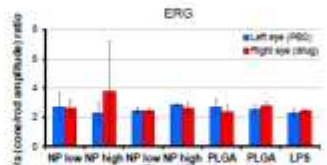


Vehicle Injection:
Phosphate Buffered Saline (PBS) - negative control

Drug Injection:
• Light Degradable Nanoparticles
• PLGA Nanoparticles
• Lipopolyoxazoline (LPS) - positive control

Assessment of physiologic function:
Intraocular pressure (IOP)
• High/Low values indicate abnormal response

Electroretinography (ERG)
• Response of retinal cells to stimuli (light)



In collaboration with the laboratory of Professor Kang Zhang, University of California San Diego, Shiley Eye Center

Acknowledgements

This research was supported by the NIH Director's New Innovator Award 1DP2OD006499-01 and a King Abdulaziz City for Science and Technology center grant to the Center of Excellence in Nanomedicine at UC San Diego.

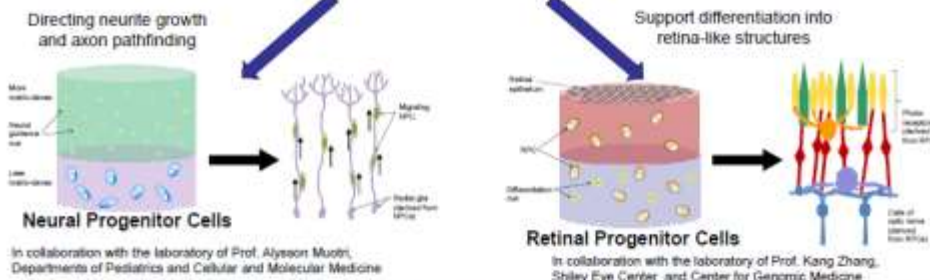
Layering a Good Foundation for Developing Tissue

Density Gradient Multilayer Polymerization (DGMP): simple, biocompatible, and suitable to many tissue engineering problems

Biocompatibility: PEG gel layers containing fluorescent cell adhesion peptides (blue) promote growth of myoblast cells in a well defined spatial area



DGMP allows incorporation of chemical and mechanical cues to modulate cell fate of progenitor cells to develop into model tissues

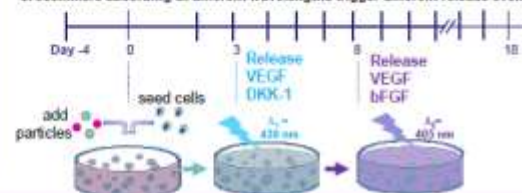


A Milder Method for Encapsulating Fragile Proteins

The mild aqueous two phase emulsion (ATPE) formulation conditions retain protein activity providing optimal delivery of fragile proteins like growth factors



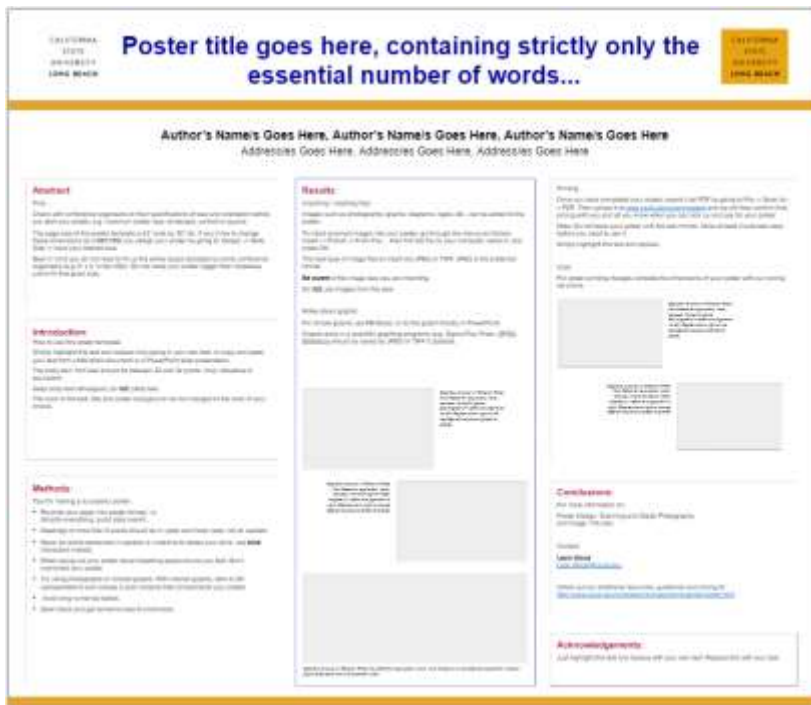
Stage-specific molecular cues (growth factors) direct stem cell differentiation



Scientific Posters

■ CSULB links for poster templates

- <https://web.csulb.edu/colleges/cnsm/sas/g2lab/poster-create.html>
- <https://web.csulb.edu/colleges/cnsm/sas/g2lab/docs/poster-template-42x36.pptx>



- If you use this template, REMOVE the abstract section!

Assignment 6 & 7 Grant Proposal: Prospectus

- Students will be assigned to a team of investigators
- Teams will develop a grant proposal, which will include five parts:
 - Proposal prospectus
 - Two proposal drafts
 - Final proposal document
 - Oral presentation of the proposal (Assignment 7)

Assignment #6 Part 1: Prospectus

- A proposal prospectus is a short preliminary grant proposal (the final proposal would be longer and contain more detail) that gives the granting agency a good idea about your work and whether or not they should consider a full proposal from you. The prospectus must be compelling and interesting to the funding agency.
- Since the prospectus is a small version of the proposal, without the detailed specifics, it should contain the same basic features as a proposal. The prospectus document requires a title and authors, a description of the proposed research project focusing on the goal of the project and why it is worthy of study. The document should contain a hypothesis or study goal, and the approach proposed to address these objectives.

In-Class Activity

- Separate into groups of 3 to 4 students
- Brainstorm ideas with your group and submit a draft by the end of class
- Answer the following questions
 - What are you interested in studying?
 - What is the long-term goal?
 - What is the objective?
 - What is your hypothesis?
 - What are your specific aims?
 - What is your proposed method?

In-Class Activity

- The body of the prospectus should be 250-300 words (double-spaced) & should contain the following parts (explained below):
 - **Problem Statement** (or Needs Assessment, if you prefer)
 - **Project Long Term Goal, Hypothesis, & Specific Aims** (2-3)
 - **Project Methods or Design**
 - **Project Evaluation**
 - **Outcomes and Impact**
 - **Budget**
 - **References**

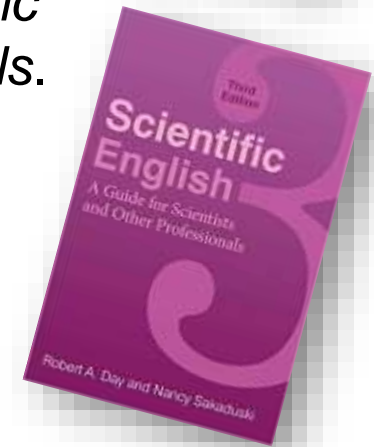
Graphical Presentation of Data in the Paper / Poster

ENGR 361: Scientific Research Communication

<https://www.csulb.edu>

References

- Alred, G. J., Brusaw, C. T., & Oliu, W. E. (2009). *Handbook of technical writing*. Macmillan.
- Day, R. A., Sakaduski, N., & Day, N. (2011). *Scientific English: A guide for scientists and other professionals*. ABC-CLIO.



Preparing Figures and Tables

- **Tables**

- Specific comparisons

- **Bar Graphs**

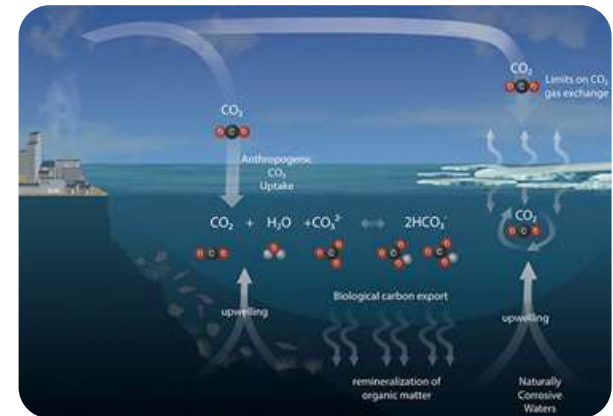
- Less numerically specific
 - Comparisons of size, magnitude, amounts

- **Line Graphs**

- Not numerically specific
 - Exhibit movement, change, trends
 - Over time or concentration

- **Pictures & Schematics**

- Mechanisms
 - Designs



Preparing Figures and Tables

- Designing effective Tables
 - Use Tables to show repetitive types of data
 - No need to report huge amounts of data just because you have them in your notebook

Preparing Figures and Tables

- Designing effective Tables
 - Tables should be self-contained, titled

Inhibitor	V_{\max} ($\mu\text{M/s}$)	K_M (mM)
none	95 ± 3	12 ± 0.8
compound X	96 ± 4	33 ± 1.2
compound Y	68 ± 2.5	8 ± 0.4
compound Z	59 ± 3	11 ± 0.6

Table I. Effect of Various Inhibitors on Enzyme Kinetic Constants

Preparing Figures and Tables

- What's wrong with the table below?

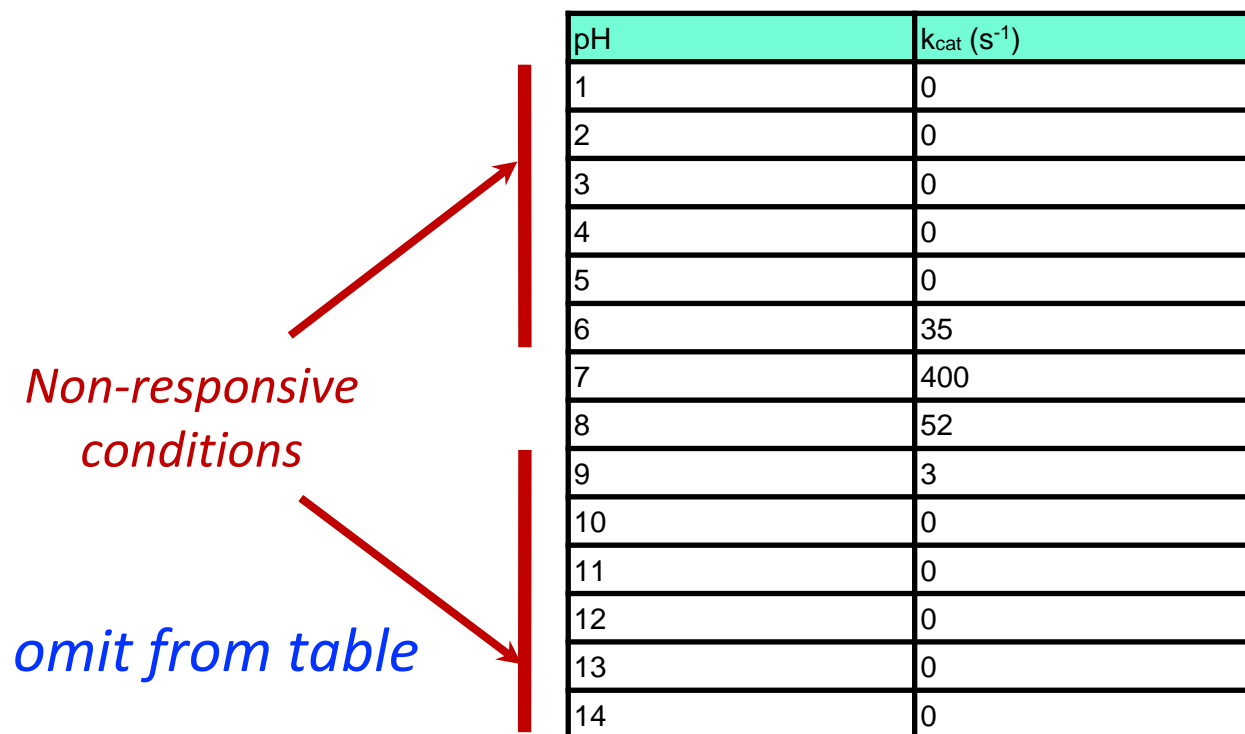
Temp (°C)	No. Trials	Substrate	k_{cat} (s ⁻¹)
25	5	X	1000
25	5	Y	0

Non-variables, non-data

Results can be included in the text—readily understood

Preparing Figures and Tables

- What's wrong in the table below?



pH	k_{cat} (s^{-1})
1	0
2	0
3	0
4	0
5	0
6	35
7	400
8	52
9	3
10	0
11	0
12	0
13	0
14	0

Non-responsive conditions

omit from table

All table is telling us is that the enzyme is active over a fairly narrow pH range (pH 6-8)

Preparing Figures and Tables

- What's wrong with the table below?

Substrate	Product Formed
D-glucose	+
D-mannose	+
D-galactose	+
L-glucose	-
L-mannose	-
L-galactose	-

- These data can be included in the text (e.g., “All D-isomers of unsubstituted hexoses were suitable substrates for the enzyme.”)

Preparing Figures and Tables

- Organize data so that variables are read down, not across (lower table)

Esterase	K_m (mM)	V_{max} ($\mu\text{M/s}$)	k_{cat} (s^{-1})
1	25	110	600
2	15	75	900
3	45	325	2300

Easier to read,
tends to be
more compact

Characteristic	esterase 1	esterase 2	esterase 3
K_m (mM)	25	15	45
V_{max} ($\mu\text{M/s}$)	110	75	325
k_{cat} (s^{-1})	600	900	2300

Preparing Figures and Tables

- Reference table in sentence where data is first mentioned:

#1

- *“As shown by the results in Table II, the esterases were inhibited by the fluoride compounds.”*

#2

- *“All fluoride compounds tested blocked the activity of the esterases (Table II).”*

Preparing Figures and Tables

- Use journal tables as a model—don't re-invent the wheel!
 - Roman v. Arabic numerals
 - Alignment of headings
 - Capitals, italics
 - Placement of footnotes
 - Type of footnote symbols

- Use three “horizontal lines” rule—avoid vertical lines

Preparing Figures and Tables

Title

methods

value meanings

3 Horizontal Lines

TABLE I

Effect of ascorbate, Zn^{2+} , and Cu^{2+} treatment on ASGP receptor endocytic activity

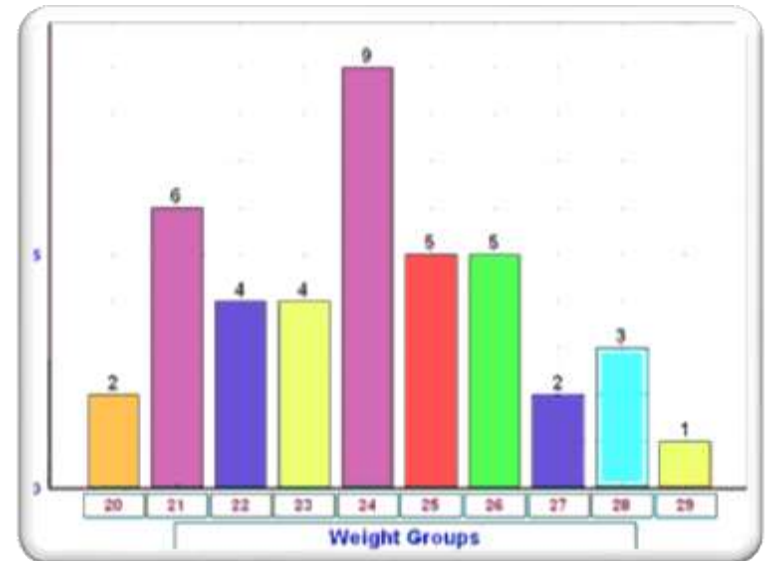
Hepatocytes (2×10^6 cells/ml) in BME-BSA were incubated with or without the designated amounts of ZnCl_2 , CuCl_2 , or ascorbate for 2 h at 37 °C. Cells were chilled at 4 °C, washed twice in BME-BSA to remove excess metal, then prebound with ^{125}I -ASOR at 4 °C for 1 h. After cells were washed free of unbound ^{125}I -ASOR, cells were resuspended in fresh BME-BSA with or without ZnCl_2 , CuCl_2 , or ascorbate (similar to that during the original 2-h incubation) and incubated at 37 °C for 15 min. The cells were chilled at 4 °C and assayed for total bound and internalized ^{125}I -ASOR. Values represent the mean \pm standard deviation of duplicate samples. Values as a function of a percentage of untreated control cells are included in parentheses.

Metal	Treatment		Cell-associated ^{125}I -ASOR	
	[Metal]	[Ascorbate]	Total	Internal
	μM	mM	<i>fmol/sample</i>	
Zn^{2+}	0	0	254 \pm 3 (100)	181 \pm 2 (100)
	220	0	68 \pm 5 (27)	21 \pm 1 (12)
	0	1.0	256 \pm 3 (101)	182 \pm 4 (100)
	220	0.1	76 \pm 1 (30)	30 \pm 8 (17)
	220	0.3	77 \pm 2 (30)	35 \pm 4 (19)
	220	1.0	60 \pm 3 (24)	26 \pm 1 (14)
Cu^{2+}	0	0	371 \pm 10 (100)	269 \pm 3 (100)
	75	0	260 \pm 1 (70)	25 \pm 6 (9)
	0	1.0	354 \pm 2 (95)	281 \pm 6 (104)
	75	0.1	201 \pm 2 (54)	16 \pm 2 (6)
	75	0.3	202 \pm 1 (54)	11 \pm 1 (4)
	75	1.0	213 \pm 1 (57)	11 \pm 1 (4)

Preparing Figures and Tables

■ Bar Graph

- Bar graphs are a very good way to visually compare numbers, see trends
- Some bias against bar graphs—way to hide shortcomings



Visual Impact?

- *For small amounts of data, table preferred*

Preparing Figures and Tables

- Tables and Figures

- Use tables whenever exact values or comparison with others is essential
- Use graphs when the relationship between an independent variable and a dependent variable is the principal point

Preparing Figures and Tables

- Illustrate a single point
- No disagreement with text
- Highlight difference between test and control
- Avoid overloading a figure
- Succinct figure caption-describe what is shown
- Axis and labels are appropriate and not misleading
- Uncertainty and statistics are included

Final Paper & Poster

- Use the information in this lecture to improve the data presentation in your paper
 - Prepare the data for presentation in your Poster

