

Abstracts, bios, and posters

ESMI Summer 2022

Agenda

- How should I title my project?
- What is an abstract?
- What should I include in my bio?
- What should I include in a poster?
- Example from last year

Titles

The title of your project should be 5 to 15 words that accurately describe the scope of your research project. Keep it short and sweet and only use 15 words if absolutely necessary. Titles should:

- Accurately describe the subject and scope of the study
- Avoid using abbreviations
- Stimulate reader interest
- Don't capitalize words like “and”, “the”, ...

Abstracts

An abstract is a short summary of your research. Usually, an abstract is only 1 paragraph long but your abstract should be between ½ a page to 1 page long.

Objectives of an abstract:

- Lets readers understand the gist of your research quickly
- Helps reader remember key points of your research

Abstracts

Information that should be included in an abstract

- Context or background information for your research
 - The question(s) you aimed to answer in your research project
 - What has already been done in previous literature (not required for ESMI applied math)
 - The reason(s)/rationale behind the project (why the reader should care)
 - Research methods (centrality, clustering, ...)
 - Your main findings
 - significance/importance of your findings
- } Half of your abstract should just be these two parts

Abstracts

A few extra notes

- Do not cite references in the abstract unless absolutely necessary
- The reader should be able to understand your research project and your findings without having to look at your poster
- Minimal images/graphics
- Tense (see a blog by Wordvice¹)
 - Any statements of general fact should be written using the present tense
 - Prior research should be mentioned and explained using the past tense
 - If the subject of your sentence is your study or the article you are writing (e.g. “Our study demonstrates...,” or “Here, we show...”), then you should use the present tense
 - If you are stating a conclusion or an interpretation, use the present tense
 - If the subject of your sentence is an actual result or observation (e.g. “Mice in Group B developed...”), you would use the past tense

¹<https://blog.wordvice.com/which-tense-should-be-used-in-abstracts-past-or-present/>

Biographies

The biograph should be a short paragraph about your position, experience, and interests related to your project.

The biography should include:

- Your full name
- Appropriate personal history
- Academic program and major
- Where your interest in your project's subject stems from
- Other related interests
- Future plans (grad school, ...)

Should be in 3rd person!

Posters

Your research posters should be a mixture of brief text mixed with various graphics (tables, graphs, and/or pictures) to summarize your research project. At the Summer Research Symposium (August 4th), you will be presenting your posters!

Posters

What makes a good poster?

- Important information should be readable from about 10 feet away
- Include title of research project
- Total word count of 300-800 words
- Text is clear and to the point
- Use bullets and numbering to make it more exciting to read
- Effective use of graphics, colors, fonts, and headlines
- Consistent layout
- Includes acknowledgements, your names, and institutional affiliation

Posters

Before you start, answer the following:

- 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?



A Randomized, Multi-Center, Prospective Analysis of Diabetic Foot Ulcers treated with TheraGauze alone or TheraGauze+Becaplermin



Adam Landsman, DPM, PhD, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA; Patrick Agnew, DPM, Coastal Podiatry, VA Beach, VA; Robert Joseph, DPM, PhD, Dayton, OH; Lawrence Parish, MD, Thomas Jefferson University, Philadelphia, PA; Robert Galiano, MD, Northwestern University, Chicago, IL

Poster examples

Do you think this is a good or bad example of a poster and why?

ABSTRACT

This study represents the first randomized, multi-center, prospective study utilizing a moisture regulating dressing for the treatment of diabetic foot ulcers, in conjunction with Becaplermin (Regeneron), a topical recombinant growth factor (PDGF-B).

Study subjects (n=12) were randomized to receive either TheraGauze alone or TheraGauze in conjunction with Becaplermin. We found that 40% of the patients in both groups closed within 12 weeks. After 20 weeks, we found that 40% closed with TheraGauze + Becaplermin, and 52% closed with TheraGauze alone. This compares very favorably to historic controls in which only 32% close within 12 weeks, and 47% close in 20 weeks or less. Closure rates, adverse events, and co-variables were also evaluated.

Based on this data, we conclude that moist wound healing with a saline soaked gauze is not enough. Instead, we have demonstrated that Moisture Regulation (i.e. the ability to add or remove moisture as needed) will dramatically improve the rate of wound closure and % of wounds which will go on to heal.

INTRODUCTION

Most wound care with saline-soaked gauze has been a cornerstone of local wound care for many years. However, it is also clear that moisture without precise regulation can lead to wounds which become either macerated or desiccated, and this can greatly diminish the capacity for healing.

TheraGauze is an example of the new class of SMART dressings which are capable of precise moisture regulation. Thus, TheraGauze is able to add or remove moisture as needed by the wound bed. It's complex microstructure enables it to make fine adjustments across the entire wound surface.

The purpose was to determine if precise moisture regulation would result in faster closure times by measuring the rate of closure with TheraGauze, with and without Becaplermin. In order to evaluate this effect, a randomized, multi-center clinical trial was designed to evaluate the rate and percentage of wound closure, and compare this value to historic controls using saline-soaked gauze.




FIG. 1. Precise moisture regulation is achieved with TheraGauze. This advanced polymer dressing is capable of absorbing or releasing fluids, such as saline, simultaneously and differentially across the wound bed, as needed.

HYPOTHESES

We hypothesize that:

- Precise moisture regulation will increase the rate of wound healing.
- Precise moisture regulation will result in a higher percentage of wounds which do not require hospitalization compared to historic controls with saline-soaked gauze.
- The ability of Becaplermin 0.01% gel (Regeneron) to achieve wound closure will be improved as compared to historic clinical trials previously reported.

MATERIALS AND METHODS

This was a randomized, multi-center clinical trial to determine the effect of precise moisture regulation on the rate and percentage of closure for plantar diabetic foot ulcers. For this study, a total of 12 patients (n=12) were enrolled at 4 sites across the country.

Prior to enrollment, all study subjects signed an informed consent, which was site specific, and was approved by the appropriate committees (Northwestern University IRB committee. Monitoring, treatment randomization, and data collection was performed by Actavis BioDevelopment International, Virginia Beach, VA. Uniformity of training for all principal investigators was also conducted by Actavis. Study patients were drawn from the Investigator's existing patient populations. Two cohorts were utilized, and the resultant data was compared to historic results captured from the literature.

***Group TG-B:** Becaplermin (Regeneron) was applied to the wound on a daily basis, along with daily application of TheraGauze moisture regulating dressing as the contact layer.

***Group TG:** TheraGauze alone was applied as the contact layer every other day.

In both groups, the dressings were backed by gauze and topped with a gauze roll. Those assigned to the TG + B groups were only permitted to receive Becaplermin for up to 12 weeks. Becaplermin was applied in accordance with the manufacturer's recommendation, except that TheraGauze was substituted for saline-soaked gauze.

In order to qualify for participation in this study, all study subjects were required to satisfy the inclusion and exclusion criteria. Once enrolled, study subjects had a 1 week lead-in time prior to initiating treatment. During this time, wound closure had to be less than 50% of the initial surface area. Study subjects were followed for up to 20 weeks. All subjects deemed closed (i.e. wound <3.0cm²) were required to return for confirmation after 1 week.

Data analysis included calculations of wound closure rate, and percentage of wounds closed. Kaplan-Meier curves were also calculated. This data was compared to results found from a variety of sources in the literature. Adverse events were also monitored throughout the study.

INCLUSION/EXCLUSION CRITERIA

Inclusion	Exclusion
• Forefoot or midfoot ulcer	• Active infection
• Wagner Grade 1 or 2	• Exposed bone
• Tolerate off-loading w/ healing shoe, foot ankle walker, or NWB	• Osteomyelitis assoc. w' ulcer
• Cellulitis	• Persistent discharge
• Age 18-70	• Dermal ulcers
• HGBA or NDEEM	• Ischemic ulcers
• HgA1C < 10.0	• Evidence of gangrene
• Palpable DP and/or PF pulses	• >1cm ²

RESULTS

In this study, 12 patients (n=12) were enrolled. As of the time of this analysis, data was available on 26 subjects with 4 lost to follow-up before all data could be collected, and 2 had not completed the study at the time of this presentation.

Both cohorts had 13 subjects each, with an average wound size of 1.53cm² (TG-B) and 6.50cm² (TG). There was no statistically significant difference in the size of the wounds between groups (p=0.084).

The % of wounds closed after 12 weeks was compared to historical data for saline-soaked gauze and for wounds treated with Becaplermin with saline-soaked gauze (Fig 2). This data shows that 46.7% of the wounds close with TG + B. This compares to an average of 13% closure rate for saline-soaked gauze calculated by combining the data from references 1,2,3, and 34% for Becaplermin 0.01% from reference 1.

FIG. 2. Rate of Wound Closure (n/12weeks)

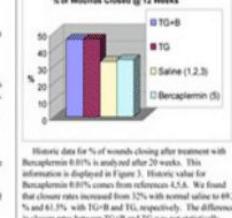


FIG. 2. Rate of Wound Closure (n/12weeks)

Group	Rate of Wound Closure (n/12weeks)
TG+B	0.47
TG	0.13
Saline (1:2)	0.34

FIG. 3. % of Wounds Closed @ 12 Weeks

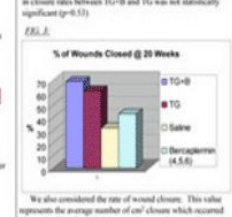


FIG. 3. % of Wounds Closed @ 12 Weeks

Group	% of Wounds Closed @ 12 Weeks
TG+B	46.7%
TG	13%
Saline (1:2)	34%

Historic data for % of wounds closing after treatment with Becaplermin 0.01% is analyzed after 20 weeks. This information is displayed in Fig 3. Historic value for Becaplermin 0.01% comes from reference 1,4,5. We found that closure rates increased from 32% with normal saline to 49.2% and 61.7%, with TG-B and TG, respectively. The difference in closure rates between TG-B and TG was not statistically significant (p=0.51).

FIG. 4. % of Wounds Closed @ 20 Weeks

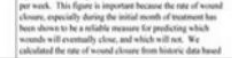


FIG. 4. % of Wounds Closed @ 20 Weeks

Group	% of Wounds Closed @ 20 Weeks
TG+B	40%
TG	52%
Saline (1:2)	47%

We also considered the rate of wound closure. This value represents the average number of cm² closure which occurred per week. This figure is important because the rate of wound closure, especially during the initial month of treatment has been shown to be a reliable measure for predicting which wounds will eventually close, and which will not. We calculated the rate of wound closure from historic data based

RESULTS (CONTINUED)

on the average size of the wound at initial treatment, and the average time to closure (reference 1,4,6). (Figure 4)

FIG. 4.

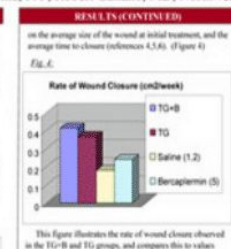


FIG. 4. Rate of Wound Closure (n/12weeks)

Group	Rate of Wound Closure (n/12weeks)
TG+B	0.47
TG	0.13
Saline (1:2)	0.34

DISCUSSION

Based on the data presented here, the value of precise moisture regulation can be appreciated. Not only do wounds close more frequently, but they also close more quickly. The value of moist wound healing has been discussed in the literature for years. However, the ability to regulate this moisture content by adding or subtracting fluid from the wound bed, without causing maceration or desiccation is relatively new in the field of wound management.

TheraGauze represents the first among a new generation of SMART dressings which are able to adapt to the needs of a wound on a continuous basis. We believe that by regulating and continuously adjusting the moisture content of the wound, there is a greater period of time where conditions are optimal for wound healing. This change is reflected in the fact that the closure rate is increased by approximately 39.3% in the first 12 weeks, and by nearly 50% over 20 weeks, as compared to good local wound care given in conjunction with saline-soaked gauze.

The mechanism by which TheraGauze regulates wound moisture within the wound margin can be appreciated by examining the electron micrograph (Figure 5). Tube-like structures and canals, which are only a few microns in diameter, are able to differentially regulate moisture content across the wound at the cellular level, giving the clinician precise control over the wound field.

CONCLUSIONS

In this study, we demonstrated that precise moisture regulation results in an increase in the percentage of wounds closing, and increases the rate of wound progression. This improvement is attributed to the fact that conditions are being continuously optimized.

We demonstrated that there was no statistically significant difference in the rate and percentage of wounds closed, regardless of whether Becaplermin was used in conjunction with the precision moisture regulating dressing or the precision moisture regulating dressing was used alone (p=0.51).

ACKNOWLEDGMENTS

This study was funded by InVivo Systems, LLC, Newport News, VA. The authors would also like to thank the College of William and Mary, Applied Research Center, Materials Characterization Laboratory, Newport News, VA, for providing scanning electron microscopy of the TheraGauze material.

CONCLUSION (CONTINUED)

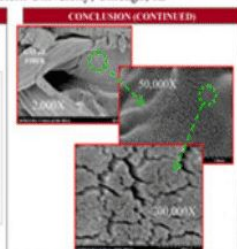


FIG. 5. Electron micrograph illustrates the unique structure of TheraGauze. The polymer dressing appears to be a biomimetic material - it consists of a series of tube-like structures and canals which enable the dressing to regulate moisture at the cellular level across the wound interface.

Although this study clearly demonstrates the benefits of moisture regulation, it was not powered to be the definitive study in this area. Future studies will undoubtedly demonstrate the benefits of this new technology.

We found that the precise moisture regulating dressing directly appears to outperform Becaplermin covered with saline-soaked gauze as percentage of wounds closed by 12 and 20 weeks.

Based on the data presented here, it is clear that precise moisture regulation is a powerful tool to help achieve clear closure in patients with diabetes. We anticipate that there will be other scenarios where something other than saline will be regulated with a smart dressing as well. The ability to regulate all types of fluid added to the wound bed, such as mints, antibiotics, and a host of other topical agents, leads us to believe that there could be many unique applications for a dressing such as this.

REFERENCES

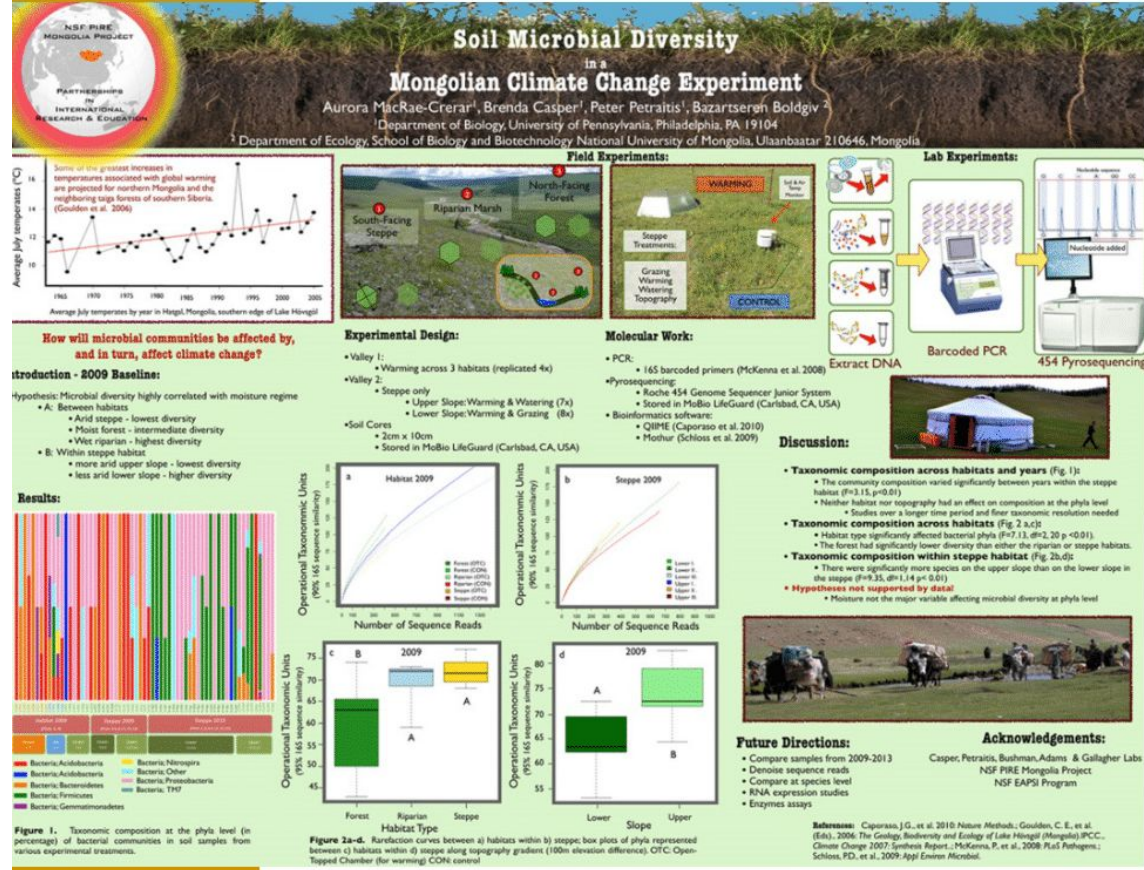
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Poster example

Do you think this is a good or bad example of a poster and why?



Posters

Your poster should:

- Be visually appealing
- **Be “stand alone” (understandable in halls, unstaffed) but also should be a visual aid as you talk about your project**
- Include
 - Intro (or short abstract)
 - Methods (can be a flow chart)
 - Results (mixture of figures and text)
 - Discussion/conclusion (could be bulleted)
 - References (papers you used as inspiration) and acknowledgements (supervisors/funding)
- Have an obvious flow (for example, left to right)
- Use “white space” or color frames to organize

Posters

Miscellaneous notes:

- Every member of your group should know ALL details of the project
- No smaller than 16 point font
- I suggest making the poster using PowerPoint, google Slides, or Latex

Talking to people at the poster fair

How to start off:

- Smile, stay near poster
- If they come closer
- Say, “Hello”
- Give name. Get their name.
- Give grade level, university (Cornell), and program
- Ask if they’d like “you to walk them through your poster” YES? Then GO!
 - This is work that I performed this summer in the ____ program in the laboratory of Dr. _____ at Cornell University.

Talking to people at the poster fair

What to talk about:

- Start with Intro that will catch their attention
- Move to methods
- Move to results (should be the longest section)
- Transition to conclusion
- Ask if there are any questions

Important dates...

- Friday, July 22nd: draft abstract, bios, poster and presentation slides are due (next Friday!)
- Friday, July 29th: final abstract, bios, poster and presentation slides are due
- Thursday, August 4th: Summer Research Symposium

Presentations should be about 8 minutes long.

Write your biographies now!

Also, applied math students: you should start analyzing your data on Wednesday!