Wake Forest®
School of Medicine
Institute for Regenerative Medicine

2021 Summer Scholars
WFIRM Program

Tuesday, June 1st to Friday, July 30th, 2021

Multidisciplinary Undergraduate Summer Research

Experiences in Translational Regenerative Medicine

WELCOME PACKET

Program Schedule, Key Dates and Deadlines

Introducing the 2021 WFIRM Summer Scholars

Summer Scholar	Primary Faculty Mentor(s)
Omar Benavides University of Texas, Rio Grande Valley Biomedical Science, Sophomore	**Michael Seeds, PhD**, Professor, WFIRM
Ann Byerley Rochester Institute of Technology Biomedical Engineering & Sciences, Junior	**Colin Bishop, PhD**, Professor, WFIRM
Christopher DiPerna Pennsylvania State University Biomedical Engineering, Junior	**James Yoo, MD, PhD,** Professor, WFIRM **Young Min Ju, PhD,** Assistant Professor, WFIRM
Jacqueline Dizon University of Connecticut Molecular and Cell Biology, Sophomore	**Graca Almeida-Porada, MD, PhD,** Professor, WFIRM **Christopher Porada, PhD,** Professor, WFIRM
Ananya Eeraveni University of California, Los Angeles Human Biology and Society, Freshman	**Anthony Atala, MD**, Professor and Director of WFIRM **Victoria Gail Weis, PhD,** Instructor, WFIRM
Malcolm Frazier Elizabeth City State University Mechanical Engineering and Technology, Senior	**Marshall Schwartz, MD**, Professor, WFIRM
Ellie Gabriel Yale University Biomedical Engineering, Sophomore	**Anthony Atala, MD**, Professor and Director of WFIRM **Eric J. Marrotte, DO, PhD**, Assistant Professor, Neurology
Nitin Gharpure University of Alabama, Birmingham Public Health, Sophomore	**Vijay Gorantla, PhD**, Professor, WFIRM and General Surgery
Juley Harper Clemson University Biological Sciences, Sophomore	**Sean Murphy, PhD**, Assistant Professor
Mollie Harrison University of Missouri, Columbia Chemical Engineering, Junior	**James Yoo, MD, PhD,** Professor, WFIRM **Ji Hyun Kim, PhD,** Assistant Professor, WFIRM
Olivia Jochl Harvard College Undeclared, Freshman	**Anthony Atala, MD**, Professor and Director of WFIRM
Mary Kaufmann Davidson College Philosophy and Pre-Med, Junior	**Ji Hyun Kim, PhD**, Assistant Professor, WFIRM

Summer Scholar	Primary Faculty Mentor(s)
Siyuan (Claire) Li Worcester Polytechnic Institute Biomedical Engineering, Senior	**Sang Jin Lee, PhD**, Associate Professor, WFIRM
Brianna Lorenz Marquette University Biomedical Sciences, Junior	**Baisong Lu, PhD**, Associate Professor, WFIRM
Christina Palles University of Florida Biomedical Engineering, Sophomore	**Guiseppe Orlando, MD, PhD**, Associate Professor, Surgical Sciences – Transplant, WFIRM
Sarah Pennebaker Georgia Institute of Technology Biochemistry, Sophomore	**Patrick McNutt, PhD**, Associate Professor, WFIRM
Kelly Speckl University of Colorado, Bolder Chemical & Biological Engineering, Sophomore	**Shay Soker, PhD**, Professor, WFIRM
David Turicek University of Wisconsin, Madison Microbiology and Spanish, Sophomore	**Tracy Criswell, PhD**, Associate Professor, WFIRM
Exel Valle-Estrada Guilford College Biology& Health Sciences, Junior	**Emmanuel Opara, PhD**, Professor, WFIRM
Sarah Wachtman Florida State University Biology, Philosophy, Junior	**Stephen J. Walker, PhD**, Professor, WFIRM
Wen Tin Zheng Massachusetts Institute of Technology Biological Engineering, Sophomore	**Graca Almeida-Porada, MD, PhD,** Professor, WFIRM **Christopher Porada, PhD,** Professor, WFIRM

WFIRM Summer Scholars 2021 Schedule with Key Dates

The 2021 Program Schedule

Tuesday, June 1, 2021

8:30 am – 9:15 am — Welcome and Overview with Joan Schanck, Summer Scholars Program Director
Virtual Welcome! Join via Zoom link below:
https://us02web.zoom.us/j/88475282018?pwd=ZUpObjJTU0dYTld0V0pwUmJVR1JrQT09

9:30 am – 12:00 pm — Onboarding at Wake Forest Baptist Medical Center to include obtaining badges at medical center and on-line training.
Note: Students do this on their own after Welcome Zoom per instructions provided by Mrs. Terri Bowen. Contact: 336-713-7293; tbowen@wakehealth.edu

3:00 pm - 4:00 pm — Scholars meet WFIRM team and Mentors
Virtual Welcome via Zoom to entire WFIRM Team. Mentors to individually determine one-on-one meetings post group welcome.
Join via Zoom link below:
https://us02web.zoom.us/j/87613346212?pwd=Yk00eWhoMldpTVFoell1SWtMT1Rvdz09

Wednesday, June 2 **Summer Scholars WFIRM Orientation**

9:30 am – 10:00 am — WFIRM Lab Orientation & Overview with Tara Jones, Lab Operations Manager
Join via Zoom link below:
https://us02web.zoom.us/j/87360991648?pwd=VkQxUUR5bXVIQU03MHppaW9GaWRGZz09

Note: Following the Zoom lab orientation overview, Tara will enable short tours and will break students into groups based on identified training needs. Scholars and Tara will separately be provided log of required core training for each student. Each core training to take approximately 30 minutes.

10:00 am – 12:00 pm — Small group specialized training - Break into 4 groups
Location: 2nd Floor collaboration area

- Cell Culture Training
- Imaging Training
- Histology Training

12:00 pm – 1:00 pm — Lunch (Bring your own and remain in Collaboration area of WFIRM, outdoor patio or easy walk into downtown area)

1:00 pm – 1:30 pm — Animal Orientation with Miranda Moore and Amanda Dillard
Join via Zoom link below:
https://us02web.zoom.us/j/84996529287?pwd=RFBDcWpVNFNMbWZVbERJell5a2hzdz09

1:30 pm – 1:40 pm — Break

1:40 pm – 2:10 pm Vivarium Orientation with Dr. Erin Mitchell
Join via Zoom link below:
https://us02web.zoom.us/j/81556053231?pwd=OFlyU0ZpVE8zOS9LVXU3WmdBSzJ0UT09

Note: Following the Zoom vivarium orientation, Gayle Hodges will enable short vivarium tours and will break students into small groups. Weather permitting, Gayle can meet students in outdoor patio area. If weather is not cooperative, Gayle can meet students in 2nd floor collaboration area

2:10 pm – 2:45 pm Vivarium Tour with Gayle Hodges

Monday, June 7 **Summer Scholars Monday Research Meetings begin**
9:00 am – 10:15 am (Scholars within the Monday Research Meeting to be confirmed.)
Faculty leaders: Tracy Criswell, PhD and Steve Walker, PhD
Additional dates: 6/21, 6/28, 7/5, 7/12, 7/19 and 7/26)
Note: Virtual/Zoom link to be provided

Wednesday, June 9 **Director's Welcome**
11:00 am – 11:30 am Dr. Anthony Atala, Director, WFIRM, Chair, Department of Urology
Note: Virtual/Zoom link to be provided

12:00 Noon – 1:00 pm **Summer Scholars Wednesday Seminar Series begin**

- June 9 – Michael Seeds, PhD; Topic: Hypothesis Development and Testing
- June 23 – Tracy Criswell, PhD; Topic: Aging and Gender issues
- June 30 - TBC
- July 7 - TBC
- July 14 – Patrick McNutt, PhD; Topic: Developing Treatments for the World's Most Dangerous Poison
- July 21 – Emmanuel Opara, PhD; Topic: TERM strategies in Kidney, Urologic and Digestive Disease Research

Note: Virtual/Zoom link to be provided

Thursday, June 10 **Thursday Research Meetings begin**
1:00 pm – 2:15 pm Faculty leaders: John Jackson, PhD and Sang Jin Lee, PhD.
Additional dates: 6/24, 7/1, 7/8, 7/15 and 7/22
Note: Virtual/Zoom link to be provided

Monday, June 14 **RME Course and WSCS: June 14 to 18**
8:00 am – 5pm Note: Virtual/Zoom link to be provided w/agenda

Friday, July 9 **Pizza Lunch with Wake Forest School of Medicine**
12:00 pm – 1:30 pm Students' Regenerative Medicine Interest Group
Leader: Sameh Almousa, Medical Student

Friday, July 16 **HOLD THE DATE – TBC**
WFGS Overview/Tour with Lunch
WFU Graduate School of Arts & Sciences, 525 Vine Street

Sunday, July 25	**Abstract Deadline for Research Day**: Midnight, Sunday, July 25
Tuesday, July 27	**Poster Deadline for Research Day:** 8am Tuesday, July 27
Thursday, July 29 2:30 pm – 5:00 pm	**Final Research Day Dress Rehearsal and Poster Set-Up** **Note:** This event may be held live at the PTCRC building or Virtually. Hold the date and time for now. Specific delivery format TBC.
Friday, July 30 8:30 am – 2:00 pm	**Final Research Day** **Note:** This event may be held live at the PTCRC building or Virtually. Hold the date and time for now. Specific delivery format TBC
2:15 pm to 3:30pm	**Final Goodbyes w/Exit Interview, Post-Program Surveys, Badge Return** Location: TBC

WFIRM Summer Scholars
Visiting Winston-Salem

Check out what to do at: https://www.visitnc.com/listing/zEiQ/visit-winston-salem-visitors-center

Note: WFIRM will also be announcing opportunities to socialize with our team conforming to the health and safety of all. We are all looking to meet you and the time we will have together.

Areas of Interest/Ideas:

Hiking at Pilot Mountain State Park	
Old Salem Museums & Gardens	Historic Town, Salem College; walking distance from WFIRM
Reynolda House and Art Museum	Free for students and employees of WFBMC
Southeastern Center for Contemporary Art	Free admission; rotating exhibitions
Planetarium @ Kaleideum North	Different weekend shows (Museum & Science Center)
North Carolina Zoo	Location: Asheboro, NC (60 minutes away)
Carowinds Amusement Park	Location: Charlotte, NC (90 minutes away)
U.S. National Whitewater Center	Location: Charlotte, NC (90 minutes away)
Visit Winston-Salem Website	Winston-Salem website with a calendar of events

June 14th to 18th, 2021
Wake Forest Medical Education Center Winston Salem, NC

Wake Forest School of Medicine
Institute for Regenerative Medicine

Regenerative Medicine Essentials Course

Often referred to as the next evolution of modern health care, regenerative medicine touches many disciplines – from clinical care and engineering to basic science and bioethics. This one-week course, taught by prominent experts, provides attendees a foundation in this exciting field. From the science behind groundbreaking discoveries to regulatory and manufacturing challenges, the course provides a comprehensive look at progress to date as well as future applications.

Summer Scholars will attend the 7th Annual RME Course which is co-joined with the 18th Annual World Stem Cell Summit

Reminder to register for the RME/WSCS course using the comp code of "SSP2021"
Happy Monday!

Link to register on WFIRM website: https://school.wakehealth.edu/Research/Institutes-and-Centers/Wake-Forest-Institute-for-Regenerative-Medicine/Education-and-Training/Annual-Regenerative-Medicine-Essentials-Summer-Course

RME Dates: Monday, June 14th to 16th, 2021 – Single track sessions to be held between 8am to 6pm daily with full agenda and timeline posted by May 28, 2021.

General Information: The RME course provides a state-of-the-art review of various aspects of regenerative medicine (RM) addressing the fundamental principles and progress in tissue engineering and RM in recent years, including background material, key scientific components of RM, ethical, economic and other issues important to the field. The primary objective of the RME course is to provide a state-of-the-art review of various aspects of RM including background material, the key scientific components of the RM field, ethical, economic, educational, workforce and other issues important to RM as well as an opportunity to network and meet leading professionals in the field through first participating in the RME course. Participants are then able to move "beyond the essentials" as they then engage in the 18th Annual World Stem Cell Summit, held on June 17th and 18th.

The RME course integrates information, technologies and skills from biological sciences, engineering, legal, commercial, regulatory, ethical disciplines. Sessions address the science behind regenerative medicine, its application to human disease and its importance to modern society. At the end of the course, participants will have received an enhanced foundation in the rules, regulations and ethics in the regenerative medicine environment, routines for first-in-man clinical trials, the practical and theoretical basis for GMP, and the ethical aspects of translational research.

Specific Learning Objectives and Competencies:

- To provide participants relevant biological, engineering, legal, regulatory and ethical foundation and principles to understand the emerging field of RM
- To become acquainted with topics from the broad spectrum that makes up RM
- To learn about the technology and technique available for RM research
- To springboard off this foundation into current, cutting-edge research
- To learn about the rules, regulatory process and ethics in RM environments and routines for clinical trials, practical and theoretical basis for GMP
- To become familiar with the current state of affairs, successes and challenges in manufacturing RM products and commercialization with introduction to workforce development considerations

Summer Scholars Final Poster Session
Friday, July 30, 2021

INSTRUCTIONS FOR PREPARING AN ABSTRACT FOR INCLUSION IN THE PUBLISHED POSTER SESSION
PROCEEDINGS MANUAL

Deadline for Submission of Abstract is Sunday, July 25, 2021

Abstracts will be included in a Poster Session Proceedings Manual

Each WFIRM Summer Scholar must prepare an abstract for the final poster session presentation. An abstract is a condensed summary of the main topics covered in your presentation. Abstracts are to be submitted electronically as a Word document to Joanne Gray at jgray@wakehealth.edu

Size and presentation

- The text of the abstract (not including authors, institutions/affiliations and titles) should be limited to 550 words, single-spaced. Interns should list *Wake Forest Institute for Regenerative Medicine* as their institutional affiliation and *Summer Scholar* as their title.
- Must be typed single-spaced with 11 point, Times New Roman typeface
- Must be free of typographical and grammatical errors.

Title: Type title in CAPITAL LETTERS. The type should be succinct and clearly state the nature of the research study.

Authors' names: Authors should be listed by surname and initials, with the poster presenter's name marked with an asterisk (*).

Body of abstract: The following are elements should be included in the abstract:

- Brief background
- Statement of objectives and specific aims
- Brief description of research design/methods used
- Data and analysis
- Results and conclusions

References: The abstract should be accompanied by a short list of references which represents the primary sources of information used for the presentation. Place references on the same page as the abstract, and give references in standard scientific style.

Abbreviations: Standard abbreviations may be used for common terms. For uncommon terms, the abbreviations should be given in brackets after the first full use of the word.

EXAMPLES

DIFFERENTIATION OF AUTOLOGOUS SUBCUTANEOUS ADIPOSE-DERIVED STEM CELLS TO EPITHELIAL CELLS

*S. T. Lopresti, S. Natesan, D. O. Zamora, N. L. Wrice, R. J. Christy
*Summer Scholar, Wake Forest Institute for Regenerative Medicine
US Army Institute of Surgical Research, 3698 Chambers Pass, Bldg 3611-BHT1, Fort Sam Houston, TX 78234

Combat burn injuries are often full-thickness burns, involving large total body surface areas (TBSA) of skin (1). Epidermal substitutes have been developed using culture expanded keratinocytes to improve wound healing of burns (2). Although tissue engineered epidermal substitutes using autologous keratinocytes are applicable clinically, their use is limited due to time required for culture expansion and amount of standard skin biopsy sample. Adipose-derived stem cells have gained particular attention due to ease of isolation, relative abundance, and multi-lineage differentiation potential (3, 4). We've recently shown that hypodermal tissue present in discarded skin tissue, that are surgically debrided to remove necrotic tissue during surgical procedure, possess stem cells that retain their ability to differentiate into multilineages and can be isolated in quantities that could be used clinically for burn repair and regeneration (4). We hypothesize stem cells from discarded burn tissue can be differentiated into epithelial cells. These differentiated cells can be used to treat burn wounds that lack an autologous epithelial cell source.

In this study, subcutaneous adipose-derived stem cells were isolated from discarded human skin samples (dsASCs) following previously established protocol (4). Immunocytochemical analysis of human dsASCs showed positive expression for stem cell markers; CD54, CD105, and STRO-1. The dsASCs possessed multilineage differentiation ability, as confirmed through their commitment to differentiate into adipogenic and osteogenic, lineages. For epithelial-like differentiation, dsASCs were treated with a combination of inducers and/or growth factors such as keratinocyte growth factor (KGF), epidermal growth factor (EGF), hepatocyte growth factor (HGF), and insulin-like growth factor (IGF), all- trans retinoic acid (ATRA). Passage 2 dsASCs were seeded on top of a type-I collagen hydrogel matrix (70,000 cells/ml of gel), prepared according to the manufacturer's instructions by adjusting the pH to 6.8-7.0. After 48 hours incubation of dsASCs-gel in MesenPro media they were switched to DMEM media containing 5% fetal bovine serum supplemented with above mentioned growth factors and/or inducers. On day 5 the collagen gels were air-lifted to induce cell stratification. Light microscopy photos were taken at different days (4, 8 and 10) and mRNA was isolated at day 2, 4, 8, and 12. Real- time PCR analysis was used to determine the expression levels of such epithelial markers as keratins KRT5, KRT7, KRT8, KRT10, KRT13, KRT14, KRT18, KRT19, involucrin (IVL) and loricrin (LOR).

After treating the collagen gels with induction media, the dsASCs started to align into squamous cell-like morphology by day 4, and when air-lifted exhibited characteristic epithelial-like cuboidal cell morphology by day 10. Differentiating dsASCs expressed low levels (<10 fold) of both simple (KRT7, KRT8, KRT18 and KRT19) and stratified keratin markers (KRT5, KRT10, KRT13, KRT14) at early time points (day 4 and 8). By day 12, the cells exhibited a robust (>50 fold) increase in expression of stratified epithelial cell markers, along with cytoskeletal proteins IVL and LOR, which are responsible for formation of intermediate filaments in skin epithelia. In summary, we showed that stem cells from discarded human burn tissue can be potentially used as an autologous cell source for epithelial cells and differentiated dsASCs can potentially be used for developing regenerative skin products for burn wounds.

References:

1. Wolf SE, Kauvar DS, et al. Comparison between civilian burns and combat burns from Operation Iraqi Freedom and Operation Enduring Freedom Ann Surg. 2006;243(6):786-92.
2. Bremner LF, Mazurek M. Reconstructive challenges of complex battle field injury. J Surg Orthop Adv 2010, 19, 77.
3. Zuk PA, Zhu M, Mizuno H, et al. Multilineage cells from human adipose tissue: implications for cell-based therapies. Tissue Eng 2001, 7,211.
4. Brzoska M, Geiger H, et al. Epithelial differentiation of human adipose tissue-derived adult stem cells. Biochem Biophys Res Commun 2005, 330,142.
5. Natesan S, Wrice NL, Baer DG, Christy RJ. Debrided Skin as a Source of Autologous Stem Cells for Wound Repair. Stem Cells, 2011, Jun 14 [Epub ahead of print]

BIOFABRICATION OF FUNCTIONAL SKIN GRAFTS USING A 3D BIOPRINTER

J. A. Marco, C. G. Jeong, J. J. Yoo, A. Atala
Summer Scholar, Wake Forest Institute for Regenerative Medicine

Full-thickness skin wounds and extensive burn injuries are one of the major causes of morbidity and mortality. Globally, 11 million burn injuries are reported per year. Between 1998 and 2007, the overall mortality rate due to burn injuries was 4.9%. Currently, the clinical standard for wound treatment is the use of autologous split-thickness skin grafts. Unfortunately, this requires surgery to remove a portion of the patient's skin and is not applicable to extensive wound coverage. An alternative therapy is the use of allografts, but immunosuppression is used in conjunction with this therapy, leading to increased patient susceptibility to illness and pain.

The application of skin cells onto wound sites to improve wound healing is a promising area of research. This can provide wound coverage with minimal skin grafting as cells can be expanded to cover larger wound areas. Cell printing by a 3D bioprinter has been suggested as a primary form of cell application for wounded skin or skin grafting to cover such larger wound sites. The objective of this study was to create functional skin grafts by printing not only human fibroblasts and keratinocytes but also human papilla cells for hair follicle formation and human melanocytes for skin pigmentation, all with carefully controlled layering techniques. Fibroblasts and papilla cells were suspended in a printable hydrogel containing fibrin. These cells were printed first in order to create the dermal layer. Keratinocytes and melanocytes were suspended in the same hydrogel and were printed second to create the epidermal layer. The constructs were 1cm x 1cm and only two layers thick in order to mimic the thickness of normal mouse skin. Once the constructs were printed, they were cross-linked with thrombin to make the gels stable and firm. The bilayered skin grafts were cultured for 5 days and then implanted onto nude mice.

After a week of in vivo implantation, the constructs showed revascularization and started to mimic the structure of mouse skin. This indicated that the mice were not rejecting the implanted skin grafts. The constructs were also able to maintain their structural integrity during this time and were easily retrieved for analysis. A gel-only group (used as control) was also implanted on each mouse along with cell-seeded hydrogels. The gel-only group did not maintain its structure and was not retrievable after one week. This indicated that the cells within the construct were producing a sturdy matrix. Massons Trichrome staining confirmed the presence of ECM in the cell-containing constructs. Finally, it was noted that the wound size containing construct were slightly bigger than the gel only group, indicating that cells from the surrounding area are not migrating in to close the wound and suggesting that the construct is being allowed to integrate into the skin. Further analysis and relevant results from this study are ongoing. Based on the current data, we conclude that the constructs are capable of forming and maintaining their skin-like structure even after 1 week of in vivo implantation (12 days after printing). Constructs will be retrieved again at 3 weeks in vivo (26 days after printing) in order to examine the structural integrity, to determine if follicles are being formed, and to ascertain if any further pigmentation can be seen.

Acknowledgements: The summer scholars research reported was supported by the Douglas Jerome Bodner Fund for Research in Regenerative Medicine. A special thanks to Stephen L. Rego for technical assistance.

References

1. Peck MD. Epidemiology of burns throughout the world. Part I: Distribution and risk factors. Burns 2011; 37:1087–1100.
2. Miller SF, Bessey P, Lentz CW et al. National burn repository 2007 report: A synopsis of the 2007 call for data. J Burn Care Res 2008; 29:862– 870; discussion 871.

Guidelines for Poster Preparation

Poster Submission Deadline: Tuesday, July 27, 2021, 8 am

Drop Box Invite to Be Provided

General Aim and Format

- A poster is a graphically based approach to presenting research. In presenting your research with a poster, you should aim to use the poster as a means for generating active discussion of the research.
- Limit the text to about one-fourth of the poster space, and use "visuals" (graphs, photographs, schematics, maps, etc.) to tell your "story."
- Utilize the provided WFIRM Summer Scholar poster template (36 ” x 48 ”)

Design and Layout Specifications

- Your entire poster (use WFIRM Poster Template, size 36” x 48”), will be mounted using push pins on a 40" x 60" foam-core board. Both the foam-core board and easel for display will be provided on site.
  The board must be oriented in the "landscape" position (long dimension is horizontal).
- A banner displaying your poster title, name, and department (or class, if appropriate) should be positioned at top-center of the board (see Figure 1).
- Make it obvious to the viewer how to progressively view the poster. The poster generally should read from left to right, and top to bottom. Numbering the individuals panels, or connecting them with arrows is a standard "guidance system" (see Figure 1).
- Leave some open space in the design. An open layout is less tiring to the eye and mind.

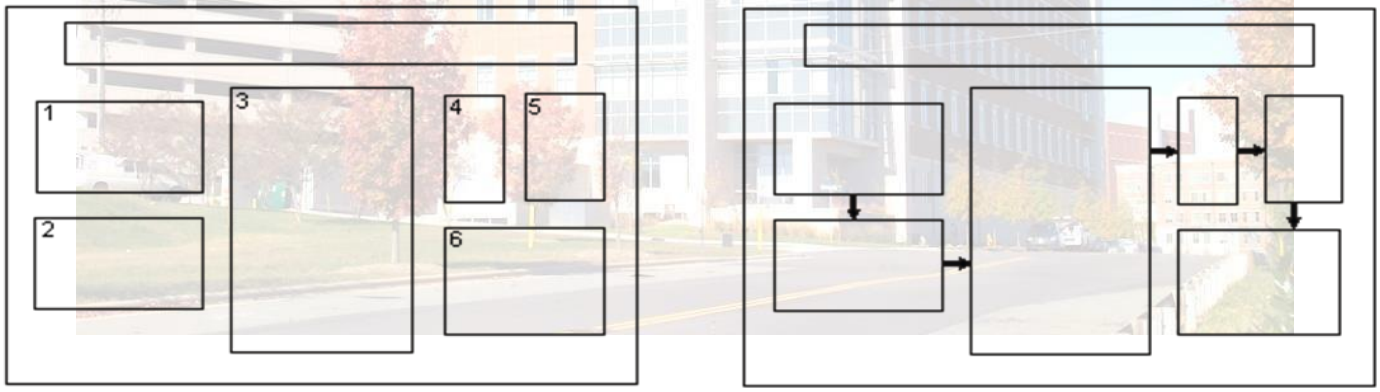

Figure 1: Conventional layouts for a poster. Long panel at top-center is title/author banner. Individual panels can be connected by numbers and arrows. Also, note the use of space between panels to achieve visual appeal. (*From*: C. W. Connor, 1992, The Poster Session: A Guide for Preparation: U. S. Geological Survey Open-File Report 88-667.)

Lettering

- Word-process all text (including captions). Print on plain white paper with a laser printer or inkjet printer.
- Text should be readable from five feet away. Use a *minimum* font size of 18 points.
- Lettering for the title should be large (at least 70-point font). Use all capital letters for the title.

Visuals

- Present numerical data in the form of graphs, rather than tables (graphs make trends in the data much more evident). If data must be presented in table-form, KEEP IT SIMPLE.
- Visuals should be simple and bold. Leave out or remove any unnecessary details.
- Make sure that any visual can "stand alone" (i.e., graph axes are properly labeled, maps have north arrows and distance scales, symbols are explained, etc.).
- Use color to enhance comprehension, not to decorate the poster. Neatly coloring black-line illustrations with color pencils is entirely acceptable.
- Make sure that the text and the visuals are integrated. Figures should be numbered consecutively according to the order in which they are first mentioned in the text.
  Each visual should have a *brief* title (for example: Figure 1- Location of study area).

Text

- Keep the text brief. For the most part, blocks of text should not exceed three paragraphs (viewers won't bother to read more than that). Use text to (a) introduce the study (what hypothesis was tested or what problem was investigated? why was the study worth doing?), (b) explain visuals and direct viewers' attention to significant data trends and relationships portrayed in the visuals, and (c) state and explain the interpretations that follow from the data. In many cases, conclusions can be summarized in a bullet-point list.
- Depending upon the stage or nature of your project, the text could also include sections on future research plans or questions for discussion with viewers.
- Cite and reference any sources of information other than your own, just as you would do with a research paper. Ask your professor about the particular citation system that you should use (every discipline uses slightly different styles). The "References Cited" is placed at the end of the poster.

Miscellaneous Suggestions

- SIMPLICITY IS THE KEY. Keep to the point, and don't try to cover too many things. Present only enough data to support your conclusions. On the other hand, make sure that you present sufficient data to support your conclusions.
- When you begin to make your poster, first create a list of the visuals that you would use if you were describing your project with *only the visuals*. Write the text *after* you have created the list of visuals.
- Mat the components of the poster on separate pieces of colored poster board. This sets-off the text and illustrations from the white mounting board. Also, you can easily attach each component to the mounting board with push-pins or thumb-tacks.
- Before the poster session, rehearse a brief summary of your project. Many viewers will be in a hurry and will want a quick "guided tour" of your poster. Don't be afraid to point out uncertainties in your work; this is where you may get useful feedback.

Wake Forest University Baptist Medical Center

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I understand and agree that these materials will become the property of WFUBMC and will not be returned.

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I hereby hold harmless and release and forever discharge WFUBMC from all claims, demands, and causes of action which I, my heirs, representatives, executors, administrators, or any other persons acting on my behalf or on behalf of my estate have or may have by reason of this authorization or any use of the photograph.

I am at least 18 years of age and am competent to contract in my own name. I have read this release before signing below and I fully understand the contents, meaning, and impact of this release.

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Signature: _____ Date: _____

If the person signing is under age 18, there must be consent by a parent or guardian, as follows:

I hereby certify that I am the parent or guardian of _____, named above, and do hereby give my consent without reservation to the foregoing on behalf of this person.

Parent/Guardian Print Name: _____

Parent/Guardian Signature: _____ Date: _____

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