

**CGS 761**  
**Laboratory and Observation**  
**BSB 302**

**Course Placement:** Summer 2017

**Course Description:** A 10-week summer course with emphasis on competencies and processes necessary for conducting clinical or biomedical research. Students will work with a faculty mentor on a project in a specialized research focus.

**Course Objectives:** The course objectives aim towards exposing students to structured enrichment activities that offer an array of diverse strategies and technologies intended to increase awareness of research methods using didactic instruction and first hand experience.

**Prerequisite:** None

**Course Organization:**

- Responsible Conduct of Research (RCR)
- Train under the mentorship of a faculty researcher.
- Research activities and lectures/seminars
- Lab instruction a minimum of 40 hours per week
- Classroom instruction 3 to 5 hours per week
- Written Report with abstract
- 15 minute oral presentation on research project

## Partial listing of student responsibilities

1. Complete Assignments and prepare for RCR class participation
2. Participate actively in summer research project; complete all work assigned by mentor and lab members
3. Prepare and participate in oral presentation program
4. Prepare a final 10 page written report of your research

### Grading:

15%	Responsible Conduct of Research (RCR)
20%	Participation in Lecture series
40%	Lab performance
12.5%	Presentation
12.5%	Written report

Grades will be given on a 4.0 grading scale with 4.0 being the highest possible score.

### Evaluation:

Mentors will evaluate SURP students during week 3, 6 and 9 with final grade for lab will be given after week 10. Presentation are evaluated by the presiding faculty over the presentation time block

### Assignments and Due Dates

RCR: University of Montana Online quiz, June 5, 2017

Project Report 10 pages – Due 8/04/2016 no later than 5:00PM **(Submit as word document only)**

### Final Presentation Dates

Will be determined at a later.

Students are required to attend both a morning and afternoon session. The schedule for the SURP presentations will be sent to faculty and students two-weeks in advance of the SURP Colloquia.

## **Attendance Policy**

Students are expected to attend all assigned lectures/seminars and be present in the lab during the hours assigned by their mentor. No more than 2 absences will be excused, and you must contact your mentor if you must be absent from your lab. Absences longer than 2 days must be approved by the College of Graduate Studies Dean's office.

## **Academic Integrity**

Plagiarism, according to the Online Merriam-Webster Dictionary, is to steal and pass off (the ideas or words from another) as your own, to use the production of another without giving credit to the owner, to commit literary theft and to present an idea that belongs to another source as new and original. Plagiarism is an act of fraud and stealing from someone else and lying to get the credit. This will not be tolerated, so be sure to cite any source of material that is not your own, even if you retrieved it from the Internet.

## **Guidelines for Final SURP Research Paper Presentations and Survey**

### **Written Papers**

A project report must be submitted no later than 5:00 pm. Further instructions will follow on how to submit your **word document**. The report should follow the outline below.

- a. Report should be written as a scientific paper, 10 - 15 pages in length and composed of the following: **Abstract, Introduction, Materials and Methods, Results, Discussion, References**
- b. **Style of the paper: Font: Arial, 12 point, double-spaced, 0.75" margins**
- c. Outline work accomplished in relationship to the work proposed.
- d. Describe the present impact and relevance of this research in relationship to your research area.

### **Oral Presentations**

1. **Presentations will be determined and the schedule will be released at a later date.** The presentations will run concurrently in various locations on campus. It is mandatory that you attend both a morning and afternoon session, i.e., the session in which you are presenting and one other session opposite from your AM or PM slot. **You will be given your location and time slot approximately two weeks prior to the presentation program.**
2. Email the title of your presentation to muscsurp@musc.edu by Friday **July 21, 2017. The final schedule will be sent to you on July 28, 2017.**

3. Each student will have a 15-minute time slot assigned. You should expect to talk about your project for approximately 10 – 12 minutes with 3 – 5 minutes for questions.
4. A typical talk might be organized as follows:
  - 1-2 min – Introduction, background, hypothesis
  - 3-5 min – Methods (How you carried out your studies)
  - 3-5 min – Results (What you found out in your studies)
  - 1-2 min – Discussion, Conclusions, Summary
  - 4-5 min – Questions
5. Do a practice run of your PowerPoint presentation before presenting your research.

### **End of the Course Survey**

The SURP end of the course survey will be taken using RedCap. You will receive a link in week 9 to access this survey. **Grades for the course will be held for any student who does not submit the survey.**

### **SURP 2017 Lecture Schedule**

Summer undergraduate research trainees take the following lectures as part of their research. They are required to participate in the lectures **unless they are a second year summer student.**

Descriptions of the lectures and schedule are below.

### **Responsible Conduct of Research (RCR)**

RCR training is given the first week of the SURP. The class meets two hours a day for four days (total 8 contact hours) and attendance is monitored with sign-in sheets. The course director and MUSC Research Integrity Officer, Dr. Edward Krug, has developed and taught this course with the particular needs of undergraduate students interested in biomedical careers. Students are polled prior to the sessions to help understand the demographics of the class: career objectives, anticipated challenges, etc. to help focus the sessions to address their ethical concerns about biomedical research and level of understanding of responsible research practices. The format for most of the sessions is a short lecture followed by small group discussion of case studies facilitated by faculty and senior postdocs. The whole group then discusses key features of the case with a summary of the main issues by the instructor. Literature and on-line resources are provided to encourage continued study of each topic. All lectures and handout materials are archived on the CGS web page for future reference.

## SURP Lecture Schedule 2016

Responsible Conduct of Research (RCR) Room BSB 302

Date		Topic	Lecturer
W	TBD	<b>9-9:50am</b> Responsible Lab Citizenship & Mentoring (lecture/discussion) <b>9:50-10am</b> - - - Break - - - <b>10-10:50am</b> Data Management/Data Manipulation (lecture & case study discussion)	Ed Krug, PhD
Th	TBD	<b>8:30-9:30am</b> Public Perceptions of Scientific Research (“And the Band Played On” video) <b>9:30-9:40am</b> - - -Break- - - <b>9:40-10:20am</b> Questionable Research Practices (lecture and discussion of video scenarios)	Ed Krug, PhD
F	TBD	<b>8:30-9:20am</b> Authorship and Plagiarism (lecture/case study/discussion) <b>9:20-9:30am</b> - - -Break- - - <b>9:30-10:20am</b> Animal Use in Research (lecture & discussion)	Ed Krug, PhD  Alison Smith, DVM
M	TBD	<b>8:30-9:20am</b> Moral Reasoning in Ethical Dilemmas (lecture & case study/discussion) <b>9:20-9:30am</b> - - -Break- - - <b>9:30-10:20am</b> Research Misconduct/Whistleblower Protections (lecture/case study/discussion) <b>10:10-10:20am</b> Closing Comments/Exit Evaluation	Ed Krug, PhD
<p><b>Outside Assignment:</b> Complete the University of Montana On-Line RCR training (link below) - you must score a minimum of 70% on all quizzes. <b>Submit certificate of completed modules as an e-mail attachment to Ms. Stephanie Brown-Guion brownqu@musc.edu (electronic copies only no hard copies will be accepted), no later than 11:00 PM Monday June 5.</b></p>			

### Further detail on how the topics are covered is presented below:

Questionable Research Practices - We use the HBO video “And the Band Played On” to demonstrate the potential impact of questionable research practices. This film, which is about the discovery of HIV, is effective at showing how non-scientific aspects of research, e.g. political, social and professional issues, can have overwhelming impact.

Moral Reasoning in Resolving Conflicts - Participants are introduced to the moral reasoning strategies for resolving ethical dilemmas, using the classic “Heinz and the Druggist” case as a training exercise. The moral reasoning strategy is then applied to scenarios from the “Band Played On” video to discuss how the moral reasoning

approach to conflict suggests alternative actions that might have better contained the outbreak of HIV from the onset. Discussion of all case studies throughout the rest of the session is based on applying the tenets of moral reasoning – identify the points of conflict, identify the interested parties and assess their legitimate expectations and potential actions, determine the potential outcomes of those actions, and finally assess the moral basis behind each.

Data Management - The responsibilities for maintain a valid data record and associated research materials is discussed, along with issues of data manipulation, data selection, and ownership of the data record. Case studies and literature reports are used for small group discussions.

Authorship, Peer Review and Plagiarism - As publications are the “currency” of science they are often the source of most conflicts between the postdoc and principal investigator based on faulty assumptions of what constitutes justification for authorship. This session addresses issues such as when and how to discuss authorship practices, generally acceptable criteria for inclusion, and the potential ramifications of “honorary” authorship. Case studies regarding confidentiality in the peer review of manuscripts and grants are discussed, as well as proper mechanisms for involving third parties in the process. The potential consequence of plagiarism is emphasized.

Animals Use in Research - There are several key issues covered in this interactive lecture given by one of the faculty in the Division of Laboratory Animal Resources: prevalence of animal use in research, why it is important, how it is regulated, training requirements and educational opportunities, and a brief virtual tour of MUSC facilities. Animal rights issues are discussed openly to make students aware of important issues. Case studies are used to highlight frequent infractions and misconceptions of animal use.

Reporting Misconduct and Whistleblower Protections - The instructor explores the HHS ORI, MUSC ORI, and other websites to highlight available resources and demonstrate the potential disciplinary actions for misconduct. Literature is used that describes how a finding of misconduct effects others in the laboratory, and steps that principal investigators have taken in response to minimize possible future events. Whistleblower rights and means for reporting misconduct are presented. The University of Alabama’s web-based Research Misconduct Training module “Amanda’s Dilemma” is used to stimulate group discussion.

## SURP 2017

### Common Core Curriculum for All Tracks

Room Basic Science Bldg. 302 8:30 am - 9:30 am

The Core Lectures of the SURP are held on Monday, Wednesday, and Friday during the month of June. These lectures provide a multidisciplinary focus on fundamental biochemical, molecular, cellular and organismal aspects of the biomedical sciences. All participants of the SURP are required to attend these lectures unless the student is a second year SURP student.

<i>Date</i>			<i>Topic</i>	<i>Lecturer</i>
W	TBD	1	Chromosome and Gene Structure; Recombinant DNA technology	David Kurtz, PhD
F	TBD	2	Gene Expression: Transcription, RNA processing, regulatory RNAs.	Tilman Heise, PhD
M	TBD	3	Contemporary Techniques for High-throughput analysis of gene expression: Microarray Analysis and RNA seq	Jeremy Barth, PhD
W	TBD	4	Protein Structure and Post-translational Modification	Shaun Olsen, PhD
F	TBD	5	Proteomics Technology	Lauren Ball, PhD
M	TBD	6	Lipid signaling and lipidomics	Ashley Cowart, PhD
W	TBD	7	Receptors and Signal Transduction	Steven Rosenzweig, PhD
F	TBD	8	Microscopy of Living Cells And Tissues: Confocal/Multiphoton Instrumentation	John Lemasters, MD, PhD
M	TBD	9	Developmental Biology	Michael Kern, PhD
W	TBD	10	Stem cells and iPS cells: a frontier for basic science, disease modeling, and therapeutics	Amanda Larue, PhD
F	TBD	11	Contemporary animal models: transgenic, knockout, CRISPr	Bart Smits

\*\*\*Lecture dates will be published when the new schedule for summer 2017 is finalized\*\*\*

### **SURP 2016 Specialized Curriculum**

Lectures in this category provide SURP students with more focused didactic lectures that are tailored to focus on the student's specific research area. These lectures expose and acquaint the students to the most current knowledge in Cancer, Cardiovascular Neuroscience and Oral Health Sciences. SURP students take the courses that are most related to their research; a roster of students assigned to each track is attached at the end of this document.

The following schedules for these courses are listed below. They list the courses that are offered in these specialized tracks. Dates for specialized lectures will be available when the syllabus is finalized.

### **SURP 2017**

#### **Cardiovascular Specialized Curriculum**

**Room 302 Basic Science Bldg. 8:30 am - 9:30 am**

<i>Date</i>			<i>Topic</i>	<i>Lecturer</i>
W	TBD	1	Atherosclerosis	Samar Hammad, PhD
F	TBD	2	The Heart	Perry Halulshka, PhD, MD
M	TBD	3	Electrical Properties of the Heart	Rupak Mukherjee, PhD
W	TBD	4	Aspirin & NSAIDS	Perry Halushka, PhD, MD
Fri	TBD	5	Arterial Pressure Control & High Blood Pressure	Perry Halulshka, PhD, MD
Mon	TBD	6	Imaging the Heart	Joseph Schoepf, MD
Wed	TBD	7	Renal Regulation of Homeostasis	Ed Soltis, PhD

**SURP 2017****Cancer Specialized Curriculum****Room 102 Library 8:30 am - 9:30 am**

<i>Date</i>			<i>Topic</i>	<i>Lecturer</i>
W	TBD	1	Cancer as a disease of dysregulated cell growth	Cynthia Wright, PhD
F	TBD	2	Chromosomal and genomic diagnostic tools	Dayna Wolff, PhD Julie Hirschorn, PhD
M	TBD	3	Tumor Suppressors and Oncogenes	Robert Gemmill, PhD
W	TBD	4	Metabolism and Bioenergetics: Normal vs Cancer Cells	Eduardo Maldonado, PhD
F	TBD	5	Viral causes of cancer	Paula Traktman, PhD
M	TBD	6	Tumor Microenvironment	Robin Meuse-Helmericks, PhD
W	TBD	7	Cancer immunology and immunotherapy	Azizul Haque, PhD
F	TBD	8	Cancer Chemotherapy	David Kurtz, PhD

**SURP 2017****Neuroscience Specialized Curriculum****Room 103 Library 8:30 am – 9:30 am**

<i>Date</i>			<i>Topic</i>	<i>Lecturer</i>
W	TBD	1	Retinoids & Vision	Masahiro Kono, PhD
F	TBD	2	Your Brain, Stress, and Anxiety	Art Riegel, PhD
M	TBD	3	Preclinical models of Affective disorders	Rachel Anderson, PhD
W	TBD	4	Spinal Cord Injury	Narendra Banik, PhD
F	TBD	5	Stress/anxiety/olfaction	Bernadette Cortese, PhD
M	TBD	6	Modeling Neurodegeneration	Heather Boger, PhD
W	TBD	7	Sleep and Circadian Rhythms	Priyattam Shiromani, PhD
F	TBD	8	Addiction & Drugs	Patrick Mulholland, PhD

**SURP 2017****Oral Health Sciences Specialized Curriculum****Room 252 Basic Science Bldg. 9:00 am – 10:00 am**

<b>Date</b>			<b>Topic</b>	<b>Lecturer</b>
	TBD	1	Overview of Dentistry & Dental Materials	Joe Vuthiganon, DMD
	TBD	2	Temporomandibular Joint Biomechanics	Hai Yao, PhD
	TBD	3	Periodontal Disease	Keith Kirkwood, DDS, PhD
	TBD	4	Oral Infections	Caroline Westwater, PhD
	TBD	5	Oral Pharyngeal Cancer	Boyd Gillespie, MD
	TBD	6	Tooth Development	Michael Kern, PhD
	TBD	7	Oral Health Community Engagement	Renata Leite, DDS
	TBD	8	Craniofacial Anomalies	Michael Kern, PhD