**Nicole Putnam, Ph.D., of Vanderbilt University**   
[**“The impact of innate immune recognition of Staphylococcus aureus on bone homeostasis and skeletal immunity”**](https://www.niaid.nih.gov/sites/default/files/nicoleputnamapplicationF31.pdf)

**Training in the Responsible Conduct of Research:**

###### TRAINING IN RESPONSIBLE CONDUCT OF RESEARCH

**BRET RCR Training**

Vanderbilt University provides introductory and ongoing training in Responsible Conduct of Research (RCR) to graduate students and postdoctoral fellows through the Biomedical Research, Education, and Training (BRET) Office to satisfy NIH RCR requirements.

###### Annual Introduction to RCR for Incoming Students

The BRET Office offers an introduction to laboratory ethics to incoming graduate students as a component of orientation. The focus of this course is to define and prevent research misconduct in the forms of plagiarism, fabrication, and falsification by proper methods of record keeping, data management, and sharing. The a 2 hour course led by Dr. Roger Chalkley, Senior Associate Dean for Biomedical Research, Education, and Training, includes lectures, discussions, and case studies. I completed this course in August 2014.

###### Annual RCR Symposium

Each May, the BRET Office organizes a full day (9 hour) symposium that addresses the RCR issues outlined by the Office of Research Integrity (ORI). I completed this training after choosing my thesis laboratory in May 2015, at the end of the first year in the graduate program. Faculty presented face-to-face lectures to expose students to the nine areas of focus for RCR, followed by case studies and small group discussions, with detailed ORI subject matter noted below each topic:

1. Overview of Institutional & NIH Policies regarding grants, research, animal use, and human subjects (Drs. Roger Chalkley, Alyssa Hasty)
   1. Policies regarding humans/live vertebrate animals, safe laboratory practices
   2. Collaborative research
2. What biomedical scientists in training need to know about the NIH funding system: R01s, Training Grants, Program Project Grants, and Center Grants (Drs. Roland Stein, Tony Weil)
   1. The scientist as a responsible member of society, contemporary ethical issues in biomedical research, and the environmental and societal impacts of scientific research
3. Data Management, Record Keeping and Conflict of Interest (Drs. Danny Winder, Roger Colbran)
   1. Conflict of Interest
   2. Data acquisition and laboratory tools, management, sharing and ownership
4. Authorship and Publication (Drs. Roger Colbran, Rebecca Ihrie)
   1. Peer review
   2. Responsible authorship and publication
5. Reproducibility (Drs. Brian Welch, Melanie Ohi)
   1. Research misconduct and policies for handling misconduct
6. Mentorship (Drs. Rebecca Ihrie, Melanie Ohi)
   1. Mentor/mentee responsibilities and relationships

###### Ongoing Training in RCR

Training in Responsible Conduct of Research is constantly ongoing in the Cassat laboratory environment. On a weekly basis, Dr. Cassat and I meet individually to discuss the progress of my research Aims and informally discuss ORI issues as they develop, such as data acquisition, management, and sharing of data. These interactions extend into our weekly laboratory meetings, making RCR a common topic of conversation in the laboratory. For example, Dr. Cassat facilitates discussions in RCR whenever an opportunity arises, such as allowing graduate students in the laboratory to assist in the peer review of manuscripts. Finally, our ongoing training in RCR is formally supplemented with lab meeting presentations covering each of the 9 areas of RCR every 1-2 months.

**Nico Contreras, University of Arizona**

[**“The Immunological Consequences of Mouse Cytomegalovirus on Adipose Tissue”**](https://www.niaid.nih.gov/sites/default/files/F31-sample-application_nico_contreras.pdf)

**Training in the Responsible Conduct of Research:**

**Plan for Instruction in the Responsible Conduct of Research**

The University of Arizona offers a certificate in RCR education designed to meet NIH guidelines. The certificate requires a minimum of nine (9) hours of RCR instruction, comprised primarily of live workshops, presentations, academic coursework and/or face-to-face discussions led and facilitated by faculty, compliance officers, and mentors. The NIH RCR Certificate may be earned by taking an approved course for academic credit or by completing the following workshop-based curriculum:

Core Workshop: 1.5 hrs

* Introduction to the Responsible Conduct of Research (choose one of the following): Introduction to RCR (face- to-face workshop) or Online Introduction to RCR (CITI)

Five Elective Workshops: 7.5 hrs

* Select from RCR Workshop Series (see 2016-2017 schedule below)
* Up to 3 hours of supplemental instruction from faculty mentor(s) may count toward the elective requirement.

**Sample 2016-2017 RCR Workshop Schedule (**Visit rgw.arizona.edu/rcr for most up to date schedule) Fall 2016:

September 9 or 16 Introduction to the Responsible Conduct of Research September 30 Ethics of Research with Human Subjects

October 14 Ethics and Practice of Mentoring

October 21 Animal Research: Ethical and Regulatory Considerations October 28 Data Management, Acquisition, and Ownership

November 11 Ethics, Integrity, and the Handling of Research Misconduct November 18 Ethics of Authorship and Publication

Spring 2017 - Dates TBD: Conflict of Interest, Ethics and Practice of Peer Review, Ethics of Research with Human Subjects, Ethics of Collaborative Research and Working with Industry, Introduction to Safe Laboratory Practices, Ethical Considerations in Biomedical Research, and Ethics of Overlapping Publications.

**Training Completion Deadline**: At the University of Arizona the NIH RCR Certificate program must be initiated within 30 days of the post-award date and completed within one calendar year after the post-award date.

**Training Topics**: RCR educational topic areas include but are not limited to: Animal Subjects Protection\*\*; Collaborative Science; Conflict of Interest; Data Acquisition, Management, Sharing and Ownership; Human Subjects Protection\*\*; Mentor/Trainee Relationships; Peer Review; Publication Practices and Responsible Authorship; and Research Misconduct. ***\*\*Special Note***: At the University of Arizona, research with human subjects (orcr.arizona.edu/hspp) and animals (orcr.arizona.edu/iacuc) require specific training requirements that are additional to and are not satisfied by the RCR training requirements described in this Institutional Plan for NIH-required RCR training.

**Contact Hours Required**: The University of Arizona requires a minimum of 9 hours of RCR instruction to earn the NIH RCR Certificate. However, more hours are encouraged.

**Instructional Format**: At least 7.5 hours must be comprised of live instructional formats such as workshops, academic course hours, and face-to-face discussions with faculty mentor(s) and peers. The University of Arizona encourages NIH-funded scholars, trainees, and fellows to participate in as much live instruction as possible. No more than 1.5 hours of supplemental online instruction in RCR may count toward RCR Certificate. **Tracking and Verification of Hours**: Principal Investigators conducting NIH-supported research are responsible for ensuring that all students and postdoctoral researchers associated with the award complete the RCR training requirements as described above. Individuals should keep documentation of the RCR training they receive, including all workshops and face-to-face discussions with faculty mentors.

**Monitoring Compliance**: The University of Arizona, through the Office for Research and Discovery, is responsible for certifying that the RCR training plan is in place and verifying certificate completion. UAccess Learning will be the primary tool for this verification.

**Consequences of Noncompliance**: Noncompliance with the NIH requirements for RCR training may result in the forfeiture of research funds and sanctions against future NIH or other federal agency research funding, in addition to any institutional sanctions pursuant to relevant UA personnel or other policies.

**The Value of RCR**: Fulfillment of NIH requirements in Responsible Conduct of Research (RCR) training is just one, albeit very useful, component of training generations of University of Arizona researchers in the highest professional standards. Professional excellence in research includes a dedication to integrity. Education in the responsible conduct of research meets more than just regulatory standards and requirements. It also promotes ethical professional values and behaviors.

**Samantha Lynne Schwartz, Emory University**

[**“Regulation of 2'-5'-Oligoadenylate Synthetase 1 (OAS1) by dsRNA”**](http://www.niaid.nih.gov/sites/default/files/F31-Sample-Application_Samantha-Schwartz.pdf)

**Training in the Responsible Conduct of Research:**

### RESPONSIBLE CONDUCT OF RESEARCH

All Emory University graduate students are required to take a six-hour ethics seminar course, called Jones Program in Ethics (JPE 600), at the start of their first year. The ethics course covers general topics applicable to all disciplines and is supported by the Laney Graduate School in collaboration with the Emory Center for Ethics. I am also required to attend at least four additional workshops sponsored by the Laney Graduate School or the Emory Center for Ethics. I attended my first workshop this semester, where I met the Editor-in- Chief of the European Journal of Neuroscience, Dr. Paul Bolam. We discussed the ethical conundrums that plague science publishing, such as the “crisis” in the peer review process, conflicts of interest, and plagiarism. He also gave us an inside look at the publishing timeline and the stages manuscripts must go through from submission to acceptance.

As a graduate student in the Biochemistry, Cell, and Developmental Biology (BCDB) Program, I attend monthly, one-hour ethics workshops (eight per school year) sponsored by the program and currently directed by Drs. Guy Benian (Professor, Pathology) and William Dynan (Professor, Biochemistry). For my first two years in the program, I am required to attend all eight of the monthly ethics workshops. As a third year and beyond, I am required to attend at least one ethics workshop per semester. This requirement therefore meets the National Institutes of Health (NIH) requirement for retraining every four years. Students, typically a junior and senior student, are paired with a faculty advisor to put together each interactive, discussion-based workshop, supported by a Powerpoint presentation on one of the following topics outlined in the table below. Many of the faculty advisors attend multiple sessions, and other BCDB faculty, e.g. Drs. Richard Kahn (Biochemistry) and Michael Koval (Medicine), also attend to contribute to the discussions.

**Topic Year Faculty Advisor (Department)**

Conflict of Interest

2015-16\* Paul Doetsch (Biochemistry) 2016-17 Kenneth Moberg (Cell Biology)

David Pallas (Biochemistry) David Katz (Cell Biology)

2015-16

2016-17\*

Animal Experiments and IACUC

Human Subjects and Tissues

2015-16

Judy Fridovich-Keil (Human Genetics)

\*Denotes the two ethics presentations I have given to date.

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| --- | --- | --- |
|  | 2016-17 |  |
| Mentor-Mentee Responsibilities | 2015-16 | G. Benian (Path.), W. Dynan (Biochem.) |
| and Relationships | 2016-17 | Keith Wilkinson (Biochemistry) |
| Collaborative Research | 2015-16 | Eric Ortlund (Biochemistry) |
| Peer Review 2015-16 Graeme Conn (Biochemistry) 2016-17 Alexa Mattheyses (Cell Biology) | | |
| Data Management and Sharing | 2015-16  2016-17 | Ichiro Matsumura (Biochemistry) Maureen Powers (Cell Biology) |
| Research Misconduct and Data | 2015-16 | Christine Dunham (Biochemistry) |
| Manipulation | 2016-17 | David Pallas (Biochemistry) |
| Responsible Authorship and | 2015-16 | Judy Fridovich-Keil (Human Genetics) |
| Publication | 2016-17 | William Kelly (Biology) |