

BIOTRAIN 751 “The Responsible Scientist I” Spring 2021

Course Director: Erika Crosby, Ph.D.
OBGE RCR/R&R Curriculum Manager
Day/time: Thursday, 5-6 pm
Location: Online
Email: erika.crosby@duke.edu
Phone: 919-684-6205

	Small group 1	Small group 2	Small group 3	Small group 4	Small group 5
Instructors	Terrence Oas	Eva Naumann	Dave Sherwood	Abdelhalim Loukil	Kati Healey
TAs	Shiyu Liu	Keith Keenan	Rossie Clark-Cotton	Steven Shen	Sarah Cunningham

Overview:

This course is developed to engage Biomedical Ph.D. trainees in continued Responsible conduct of research, Rigor and Reproducibility RCR/R&R training, an emerging mandate from the National Institution of Health (NIH) and future requirement for NIGMS T32 Pre-Doctoral Training grants. The course is directed by the RCR Curriculum Manager in the Office of Biomedical Graduate Education (OBGE) in Duke School of Medicine and it is team-taught by faculty members from each SoM Ph.D. training program. The content is delivered as a combination of lectures, small group discussions and online based learning modules.

Course Requirements and Expectations:

This course will have a weekly assignment or meeting. While you will not receive a numeric grade, all modules must be completed and live class meetings attended. There will be a **1 missed class/assignment** grace policy. If you miss 2 classes/assignments, you will be required to complete an additional RCR forum to receive credit for BIOTRAIN751. If you miss 3 or more classes or assignments, you will be required to retake the course next Spring. A reminder that this course is a REQUIREMENT for graduation. All assignments must be completed by the beginning of class the week after they are assigned. For example, the quiz for the online module listed on February 11th must be submitted by 5 pm on February 18th.

Sakai Site and Zoom Meetings:

All course materials, modules, video recordings, and zoom links will be available on the course Sakai site. During small group discussions it is highly encouraged that you have your camera on to help facilitate an open discussion. Please plan to mute your microphone when you are not actively speaking to cut down on background noise.

Tentative Schedule:

All asynchronous assignments should be completed prior to the next class meeting. Changes to the schedule are at the discretion of the course director.

Date	Topics/ Units	Delivery Methods	Assignment Due
28 Jan	Introduction to the Course, Material, and Instructors	Live zoom	
4 Feb	Graduate student panel and small group discussions- Choosing a mentor/lab	Live zoom	
11 Feb	Self-paced Sakai learning module: Communication style assessment	Sakai	
18 Feb	Small Group led by SoM PhD Training Faculty: Communication styles and establishing expectations and goals for graduate school	Live zoom	
25 Feb	Lecture (all): Best practices in data acquisition, record keeping, and transparency (pre-recorded)	Sakai	
4 Mar	Self-Paced Sakai Learning Module and Assessment of Understanding: Blinding and Randomization; Record keeping	Sakai	Mar 11, 5 pm
11 Mar	Small Group led by SoM PhD Training Faculty: Experimental design, sample size, and consideration of biological variables	Live zoom	
18 Mar	Self-Paced Sakai Learning Module and Assessment of Understanding: Cell line authentication and socially responsible science	Sakai	Mar 25, 5 pm
25 Mar	Small Group led by SoM PhD Training Faculty: Discussion of examples of bias, cherry-picking data, and best practices in data acquisition and analysis	Live zoom	
1 Apr	Lecture (all): Reproducible Science and Scientific Misconduct: Discussion of STAP Stem Cell (pre-recorded)	Sakai	
8 Apr	Self-Paced Sakai Learning Module and Assessment of Understanding: Research misconduct case studies	Sakai	Apr 15, 5 pm
15 Apr	Small Groups led by SoM PhD Training Faculty: Discussion of Duke Potti Case: Lessons Learned about Research Oversight, Ethics, and Data Handling and Reproducibility	Live zoom	

RCR topics shown in red; R&R topics shown in blue; Topics that integrate both elements shown in green.

Objectives & Student Learning Outcomes (SLOs):

By the end of the course, participants will be able to demonstrate the following learning outcomes:

Objective 1: Gain knowledge about the responsible conduct of research (RCR)

SLO i: Describe rules and policies for ethical research practices

Objective 2: Be exposed to ethical decision making (EDM) in RCR

SLO ii: Identify an ethical question (ethical sensibility: is there an ethical dilemma?)

SLO iii: Know procedures for reporting and investigating research misconduct

Objective 3: Exhibit moral courage

SLO iv: Understand that knowing what to do does not equal moral courage

Objective 4: Demonstrate Integrity

SLO v: Know the importance of character and being honest and fair

Disability Statement:

Students with disabilities who believe that they may need accommodations in the class are encouraged to contact the Office of Services for Students with Disabilities at 684-5917 or disabilities@aes.duke.edu as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

Academic Integrity:

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity. To uphold the Duke Community Standard:

The student will not lie, cheat, or steal in their academic endeavors;

The student will conduct themselves honorably in all their endeavors; and

The student will act if the Standard is compromised.

Students should also read the Duke policy on Academic Dishonesty at

<https://studentaffairs.duke.edu/conduct/z-policies/academic-dishonesty>

BIOTRAIN 753 “Data Management and Quality for Biomedical PhD Students”

Overview:

This course is developed to engage Biomedical Ph.D. trainees in continued Responsible conduct of research, Rigor and Reproducibility RCR/R&R training, an emerging mandate from the National Institution of Health (NIH) and future requirement for NIGMS T32 Pre-Doctoral Training grants. The course is directed by the RCR Curriculum Manager in the Office of Biomedical Graduate Education (OBGE) in Duke School of Medicine and is offered via Duke LMS (Learning Management System). In Years 2 and 3, PhD students in the School of Medicine are required to take this course comprised of 3 online interactive modules. Each module is accompanied by an assessment. This course is presented with interactive graphics, text-based activities, short videos, and discipline specific scenarios. Data Management and Quality for Biomedical PhD Students includes 3 modules:

1. Research Quality and Reproducibility

Learning outcomes:

- Discuss the issue of research reproducibility from your personal perspective, from the perspective of your peers, and from the perspective of research stakeholders.
- Explain how meta-science contributes to our understanding of research quality and reproducibility.
- Discuss the terminology used to describe research metrics.
- Understand the perspective and role of research stakeholders as strategies are developed to address research reproducibility.
- Articulate why training in research quality and reproducibility is important.
- Identify general risks to research quality and reproducibility.
- Explain how understanding the basis of irreproducible research can inform and advance science.
- Summarize the current concerns (causes, costs, consequences) associated with research rigor, quality, and transparency.

2. Data Management

Learning outcomes:

- Recognize the complexities of the research data ecosystem, including a wide range of data types, sizes, sources, and formats.
- Describe the stages of the data life cycle and corresponding data stewardship practices in the context of documentation and training, organization, and governance and ownership.
- Explain how data security regulations may affect research quality and reproducibility.
- Identify best practices for management of small datasets in spreadsheets.
- Discuss special considerations and common pitfalls in managing image data.
- Recognize best practices for the sharing and archiving of data.
- Identify funder requirements for formal data management plans and data sharing.

RCR topics shown in red; R&R topics shown in blue; Topics that integrate both elements shown in green.

3. Data and Resource Sharing

Learning outcomes

- Articulate the importance of sharing and critically evaluating data and data-related resources.
- Identify stakeholder requirements and regulations for data and resource sharing.
- Identify the pros and cons of data sharing.
- Explain the importance of methodological transparency in the effective reuse of data.
- Describe the ecosystem of resources for post-publication data sharing.
- Discuss current advocacy for including incentives for data sharing.

BIOTRAIN 754 “The Responsible Scientist II” Spring 2021

Course Director: Erika Crosby, Ph.D.
OBGE RCR/R&R Curriculum Manager

Day/time: Thursday, 4-5 pm
Location: Online

Email: erika.crosby@duke.edu

Phone: 919-684-6205

	Small group 1	Small group 2	Small group 3	Small group 4	Small group 5
Instructors	Charlie Gersbach	Romain Cartoni	Ed Miao	Bernard Slater	Breanna Sheahan
	Joshua D. Gross	Rebecca Irwin	Jacques Stout	Marina Tuyishime	Michael Borack
				Soumen Saha	

Overview:

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Sakai Site and Zoom Meetings:

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Tentative Schedule:

All asynchronous assignments should be completed prior to the next class meeting. Changes to the schedule are at the discretion of the course director.

Date	Topics/ Units	Delivery Methods	Assignment Due
28 Jan	Introduction to the Course, Material, and Instructors	Live zoom	
4 Feb	Lecture (all): How to build successful academic and industry collaborations	Sakai	
11 Feb	Small Group led by SoM PhD Training Faculty: Building and maintaining a professional network	Live zoom	
18 Feb	Self-Paced Online Learning Module and Assessment of Understanding: Writing a scientific paper: making figures, determining authorship order, and responsible referencing	Sakai	Feb 25, 4 pm
25 Feb	Small Group led by SoM PhD Training Faculty: Responsible Authorship, Publication and Peer Review	Live zoom	
4 Mar	Self-Paced Online Learning Module and Assessment of Understanding: Navigating authorship conflicts and responding to peer review comments	Sakai	Mar 11, 4 pm
11 Mar	Lecture (all): Research with human subjects/ vertebrate animals/IACUC	Sakai	
18 Mar	Self-Paced Online Learning Module and Assessment of Understanding: Research with animal and human subjects	Sakai	Mar 25, 4 pm
25 Mar	Panel discussion about conflicts of interest and industry	Live zoom	
1 Apr	Small Group led by SoM PhD Training Faculty: Case studies: Socially responsible science	Live zoom	
8 Apr	Self-Paced Online Learning Module and Assessment of Understanding: Science and social responsibility	Sakai	Apr 15, 4 pm
15 Apr	Lecture (all): Diversity, inclusion, and representation in science and scientific literature	Sakai	

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Objectives & Student Learning Outcomes (SLOs):

By the end of the course, participants will be able to demonstrate the following learning outcomes:

Objective 1: Gain knowledge about responsible conduct of research (RCR)

SLO i: Recognize and follow ethical research practices

Objective 2: Be exposed to ethical decision making (EDM) in RCR

SLO ii: Use a moral method to address an ethical issue

SLO iii: Know that there are (might be) a plurality of views

Objective 3: Exhibit moral courage

SLO iv: Report unethical practices when encountered

SLO v: Recognize that "authority figures" aren't always "right"

Objective 4: Demonstrate Integrity

SLO vi: Be conscious of your integrity and the integrity of those around you

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