**PLAN FOR INSTRUCTION IN THE RESPONSIBLE CONDUCT OF RESEARCH**

**(You may use this boilerplate freely. Be sure to customize it to match your other training plan documents and the specific requirements of your funding agency.)**

Scientific integrity and ethics are essential to training scientists and future faculty. To facilitate the development of [Program Trainees] into responsible members of the science and research community and develop them into mentors capable of establishing a culture of responsible conduct in their research groups, we have implemented both formal and informal instruction, as presented below.

**Formal Training in Responsible Conduct in Research**

All [Program Trainees] are required to participate in formal training in Responsible Conduct in Research during their first year of appointment to this program. The formal components will consist of the course, *C234: Ethics and Accountability in Biomedical Research* in Year 1 of training and the RCR Refresher Course in Year 4 of training.

**YEAR 1 Course – C234: Ethics and Accountability in Biomedical** **Research** (Instructors: Dr. Lynn Talton and faculty discussants). This course in Biomedical Research Ethics and Responsible Conduct in Research is designed for trainees in laboratory and computational biosciences disciplines. Trainees are required to attend ten 2-hour sessions, which start with an introductory didactic presentation and discussion, followed by faculty-led case study discussion, in small groups of 10-12 trainees. The faculty members from the participating training programs actively participate as small-group discussion leaders, exposing the students to a number of different perspectives and interpretations of these difficult issues. The class presentations are supported by reading assignments from selections such as *On Being a Scientist*, National Academies Press, *Making the Right Moves*, from the Howard Hughes Medical Institute, and other additional articles. Trainees are asked to present case-studies within their small groups, while the discussion is led by the faculty mentor. Directed discussion is the primary mode of learning, although the course also contains more formal didactic instruction. The course introduces standard and ethical practices in biomedical and life sciences, with emphasis on responsibilities in research activities.

* The **course format** consists of mixture of didactic instruction and small-group discussions around case-studies. The instructor or invited guest speaker will present briefly on the topic of discussion, and then students break into groups of 10-12, to be led by faculty members from the participating training programs. Each student is asked to present a case to the group each session, followed by group discussion of the ethical and practical considerations of each case.
* The **course subject matter** includes standard and ethical practices in the life sciences, with emphasis on responsibilities in research activities, including: research misconduct, malfeasance, and whistle-blowing, questionable research practices, data management - i.e., data acquisition, record-keeping, retention, ownership, security, analysis, interpretation, and sharing; responsible authorship and publication; peer review and open and confidential review standards; conflicts of interest and commitment; mentor/mentee responsibilities and relationships; collaborative research across research groups, with industry and internationally; policies regarding laboratory safety, biosafety, and dual use research of concern; animal and human subjects; maintaining safe and inclusive research environments which promote equity, mental health and wellness and combat discrimination, bias and harassment; views about scientists as responsible members of society; social and environmental impacts of research; and contemporary ethical issues in biomedical research.
* The **course faculty participation** consists of leadership of the small-group case-study discussions. Faculty participants attend the didactic portion of the class and are asked to comment upon the presented material. Then, they lead their group of 10-12 students in discussions of related case-studies. There are opportunities for 70 faculty mentors to participate as a small group leader during the course, and faculty mentor involvement is rotated among the participating training programs so that each program contributes every year and every faculty mentor has a chance to regularly participate.
* The **course duration** is 10 weeks of 2-hour classes offered each Spring quarter, 20 total hours. The **course frequency** is the full C234 course during the first year of training and a refresher course in the fourth year of training.

While the Year 1 course introduces the RCR topics from the perspective of a trainee navigating the training environment and mentored research, the Year 4 formal training, RCR Refresher Course, is taught with the goal of training developing mentors. Participating students are senior trainees in their laboratory group that mentor more junior trainees and most are aspiring faculty mentors. Through the course, trainees develop a playbook of best practices for establishing a culture of responsible conduct of research for their mentees, while reviewing the RCR topics with a more mature perspective from that in Year 1 training.

**Responsible Conduct of Research Refresher Course** (Instructors: Dr. Lynn Talton and Faculty discussants) The RCR Refresher course is based on the formal C234 introductory course, but the cases and examples are more nuanced, reflecting the greater maturity and experience of the participants. Each module has a course packet that contains case-studies, thought exercises, discussion topics and the opportunity to crowd-source best practices from the participants, instructor and faculty discussant. The format of the discussion is designed to be similar to the *NRMN/CIMER Entering Mentoring* training program, but with an RCR perspective. At the end of each module, the packet is updated with the best practices and samples developed by the group and shared back with the students to take as a handbook to use in their mentoring practice. The refresher course has the following changes from the formal course:

The **refresher course format** is a small class of 15-20 trainees in directed discussion of case studies. The discussion is led by the instructor and a guest faculty mentor. The **refresher course duration** is 8 modules of 1.5 hours each (12 total hours of training). The **refresher** **course frequency** is once in the fourth year of training following the full, formal C234 course in the first year of training. The **refresher course subject** matter covers the same topics as C234, but from a mentorship perspective: research misconduct; questionable research practices, data acquisition, analysis, security, and management; responsible presentation of data and descriptive statistics; responsible authorship and publication; peer review; conflicts of interest and commitment; mentor/mentee responsibilities and relationships; collaborative science across research groups, industries and borders; civility issues in research environments; laboratory safety, biosafety, and dual use research of concern; animal and human subjects; maintaining a safe and inclusive research environment, scientists as responsible members of society; social and environmental impacts of research; and contemporary ethical issues in biomedical research. The **refresher course faculty** participation includes one active faculty mentor co-leading the discussion during each module (8 faculty participants per 15-20 trainees).

**Synergy with Rigor and Reproducibility Training**

**(Many PhD programs have included rigor and reproducibility training in their standard course curriculum. The course mentioned here, MOL BIO 235 was designed for postdoctoral scholars and graduate students whose programs do not include comprehensive R&R training. Omit or customize this section if not applicable for your trainees.)**

[Program Trainees] take both RCR and Rigor and Reproducibility courses in their first year of training, which are designed to be complementary. For example, the Rigor and Reproducibility course, MOL BIO 235, covers the ethical presentation of data and use of descriptive statistics, and the RCR course covers the importance of laboratory safety and responsible use of animals and humans in research as part of rigorous science. Both themes are echoed throughout their informal, non-course training and then repeated again in the RCR Refresher course, which in addition to the standard RCR topics, includes a module on the responsible presentation of data and descriptive statistics, especially towards mentoring others in their usage.

**Further Training in the Responsible Conduct of Research and Reproducibility**

[Program Trainees] also receive informal training in responsible conduct of research and reproducibility through several mechanisms. Primarily, throughout their training they have [monthly] [NAME] meetings with the [Program Directors]. In these meetings, they present their research and get feedback and advice to steer their projects toward rigorous, reproducible science that is high quality and will set them up for success as future research faculty. Their research projects are mentored by experienced and well-respected faculty that provide guidance and instruction in appropriate design and execution of research projects in their discipline, protection of animal and human subjects, and appropriate data management and interpretation. All our faculty mentors participate in the RCR training courses to refresh their expertise, to assess the current level of understanding of their mentees, and to lend their varied perspectives and experience to the training. Trainees work in collaborative environments among more senior researchers that have also received responsible conduct in research training and can provide a model for ethical science. These principles are further enforced in venues such as research presentations, laboratory meetings, departmental seminars, and career development events. Trainees that participate in research involving animal subjects, humans, or agents with biosafety considerations must participate in UCLA-required training and receive certification before they begin any work in these areas. Also, UCLA’s career development training seminars often include career-related topics in ethics, e.g. mentor/mentee responsibilities, fostering scientific rigor and reproducibility, maintaining good scientific notes or laboratory notebooks, intellectual property and technology transfer, and ethical issues at the frontiers of science and medicine.

**[Program] Faculty Mentor Participation in RCR Training**

[Program] faculty mentors regularly participate in our RCR courses by leading small-group discussions. Recent participating [Program] mentors include:

|  |  |
| --- | --- |
| **Faculty Mentor** | **Date of Participation** |
| Name | Spring 2019 |
| Name | Spring 2019 |
| Name | Fall 2020 |
| … | … |

(Training Grant Directors or Coordinators can contact LTalton@mednet.ucla.edu to get the most current record of faculty RCR Training participation).