F30/31 RCR Boilerplate for MD-PhDs

All MD-PhD students receive extensive training in Responsible Conduct of Research (RCR). Training is provided each year and takes the form of lectures, web-based programs, workshops, and/or RCR-focused lab meetings. The minimum time spent in training during the pre-PhD and PhD years is 18.5 hrs, of which a minimum of 9 hrs are spent in small-group settings with faculty. Topics covered are research misconduct, data acquisition and management, conflict of interest, responsible authorship/publication, peer review, mentor/mentee responsibilities, collaborative science, use of animals in research, use of humans in research, and the scientist as a responsible member of society. In addition, in their final year of the program, while enrolled in the MD curriculum, students complete an additional required week-long course in bioethics.

First year students are introduced to RCR topics through a one hour on-line program and quiz. Some first-year students participate as well in one 1.5-hr RCR-based lab meeting (described in the last paragraph below) during their spring independent study or summer lab rotation. Second year students cover a variety of RCR related topics as part of the required MD curriculum.

Once they enter the full time PhD phase of the program in year 3, students are provided electronic access to two documents relevant to RCR: *On Being a Scientist: Responsible Conduct in Research* (National Academy Press) and *Responsible Conduct of Biomedical Research* (a handbook developed by BGS). Students are provided electronic access as well to the books *Scientific Integrity* (Macrina, ASM Press) and *Responsible Conduct of Research* (Shamoo and Resnik, Oxford University Press). Each student is provided with a hard copy of *At the Bench* (Cold Spring Harbor Press). Third-year students, in addition to taking a second short (1 hr) on-line program in RCR offered through Collaborative Institutional Training Initiative (CITI), participate in their first of several BGS-organized 1.5-hr small-group workshops held annually to cover select RCR topics. Each workshop comprises 10–12 students and 2 faculty, a size that best promotes informal but still structured exchange. The workshop for third-year students covers research misconduct, including plagiarism, and data management. Students are required to prepare in advance of the workshop (1.5 hr) using resources provided them in the first year and additionally given access to the article ‘What’s in a Picture? The temptation of image manipulation’ (*J. Cell. Biol.* 166: 11–15, 2004). Third-year students, whether continuing lab rotations or entering into dissertation research, usually participate in another 1.5-hr RCR-based lab meeting.

Fourth-year students take a third on-line program in RCR (via CITI) and participate, again with preparation (1.5 hr), in their second 1.5-hr small-group workshop. The workshop covers mentoring and lab supervision, collaboration, and animal and human subjects. All fourth-year students, now uniformly in dissertation research, are required to participate in one 1.5-hr RCR-based lab meeting.

Fifth-year students take a fourth on-line course in RCR (via CITI) and participate, with preparation (1.5 hr), in their third 1.5-hr small-group workshop. The workshop covers publication practices, authorship, peer review and conflicts of interest. All fifty-year students are required to participate in one 1.5-hr RCR-based lab meeting.

All sixth and seventh-year students are required to participate in one 1.5-hr RCR-based lab meeting (unless they have defended and returned to clinics).

During their final year in the program, MD-PhD student participate in a full week bioethics course that is a required component of the Medical School Curriculum.

As referred to above, MD-PhD students participate in annual RCR-based lab meetings starting in the third year at the latest. The lab PI selects one or two RCR topics for discussion among lab members. An RCR-based lab meeting is required each year for every lab. The intent of these meetings is to cover RCR not only in the context of a small group but from the perspective of the work and concerns of the laboratory itself. Lab PIs report their RCR-based lab meetings to BGS, including topics covered, materials used, and trainees participating.