

CRISPR ONLINE LEARNING MODULE: LESSON PLAN

This simulation is designed to reveal the ethical complexity of biomedical research. In this simulation students play the role of a scientific researcher developing CRISPR-based therapies and are forced to make choices about their research agenda and how to engage with the public.

LEARNING OBJECTIVES

By the end of this module, students should be able to:

- Be more aware of the contextual factors that influence research agendas.
- Identify some of their personal biases and how they may impact research decisions
- Feel more comfortable making research decisions with complex ethical dimensions
- Be more familiar with ethical concepts like disability, power, equity, and harm.
- Describe responsibilities that a researcher has to a broader community.

PREWORK

Assign the following two videos to students to watch ahead of the simulation class.

- TED. "[How CRISPR lets us edit our DNA.](#)" Youtube. Retrieved 14 September 2023.
- UC Berkeley. "[UCSF, Berkeley, UCLA to launch sickle cell trial using CRISPR.](#)" Youtube. Retrieved 14 September 2023.

DAY 1

(10 MIN) - SETTLE IN AND INTRODUCE CODE OF CONDUCT

- Hand out or share on screen the code of conduct PDF. Give rationale for why this is important, ask for questions and if anyone wants to add anything to the code of conduct.

(~1 HOUR) - RUN THE SIMULATION

- Play Simulation Instruction Video. You can access the Instruction simulation video on the SCi website or [directly on youtube.](#)
- Assign groups of 3-5 students, depending on the size of the class. You don't want to have more than 5 groups. Record who is in each group.
- Provide the [simulation link](#) to the students and have them work through the simulation together as a group (using the link provided will allow you to skip the entry survey, only one student in the group should run the simulation on their computer). Remind students to take time at each decision point to discuss and come to a decision as a group. Also encourage students to take notes on the process as they move through the simulation.

(20 MIN) - QUICK DISCUSSION AND SET UP FOR NEXT CLASS

- When you come back together ask the class:
 - How did the simulation go?
- Assign students to explore the debrief questions (navigate to the "2 The Debrief" tab on the [simulation page](#)) and resource library tabs of the online simulation ahead of next class. Ask them to jot down notes about the essential debrief questions since you will be discussing together in class the next time you meet.

DAY 2

(10 MIN) - SETTLE IN AND INTRODUCE THE DEBRIEF

- Play Debrief Instruction Video. You can access the Debrief Instruction Video on the SCi website or [directly on youtube](#).

(20 MIN) - SMALL GROUP DEBRIEF

- Return students to their same groups. Remind students of the code of conduct you agreed to. You may want to show the PDF again to the class.
- Allow groups to pick topics of their choice from the themes of debrief questions online (navigate to the “2 The Debrief” tab on the [simulation page](#)). Mention that you will be discussing the essential debrief question as a full class, so maybe skip those.

(30-40 MIN) - FULL CLASS DEBRIEF

- Allow students to read through the essential debrief questions and reflect for 5 min on their own, quietly.
- Moderate a discussion with the class using all or some of the essential debrief questions provided below. Feel free to pause throughout the discussion to give students time for quiet reflection when you introduce a new debrief question.

ESSENTIAL DEBRIEF QUESTIONS

- Were there decision points that you found particularly challenging or easier than others? Are there any decision outcomes that you feel uneasy about? Or really good about?
- **Contextual pressures.** Depending on the version of the simulation that you ran, you had a specific set of personal and professional circumstances that likely influenced your choices at each decision point. What contextual pressures influenced your decision making? What rationalizations did you use to support your choices?
- **Personal values.** When making your decision, what personal values did you consider? Were there values in tension as you worked through the simulation within yourself, or between group members? If so, how did you reconcile conflicting values?
- **Additional perspective.** What missing perspective would you have benefited from during the simulation? And why?

(10 MIN) - CLOSING AND SURVEY

- When the debrief discussion wraps up, please ask students to complete the simulation survey in class. The [survey can be found here](#).