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Curriculum Units by Fellows of the National Initiative

2018 Volume V: Manipulating Biology: Costs, Benefits and Controversies

The Power and Responsibility of Human Changes to Biology: Malaria, Mosquitoes, and CRISPR Technology

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In this unit, I present to my 7th grade life science students the topic of manipulating biology to eradicate malaria through the use of CRISPR technology. I use science-fiction author Octavia Butler's book, *Parable of the Sower* to introduce the subject and engage students to begin thinking about making ethical decisions. While referencing quotes revolving around "change" as being the center of the universe and ironically the only constant, we will work on hands-on labs that will prepare students to become familiar and comfortable with cellular biology. They will complete a karyotype chromosome lab, a strawberry DNA extraction lab, and a Punnett square lab among other activities. They will go on to make a decision of whether using gene drive technology is ethical in driving malaria-transmitting mosquitoes into extinction in order to save millions of human lives each year, including those of many young children. We will research the benefits, costs, and controversies associated with gene drive technology. We can look at the monetary costs involved in preventing malaria and make decisions based not solely on ethics but also financial costs. This unit addresses the Next Generation Science Standards (NGSS) and the International Baccalaureate's key concepts, related concepts, and global contexts.

(Developed for Life Science, grade 7; recommended for Biology, grades 7-9)

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