Written Assignment: Biology and Technology in the Real World

Addresses course outcomes 2 and 3:

use knowledge of biological principles to ask relevant questions about the natural world

make observations and discriminate between scientific and pseudoscientific explanations

1. Select one of the topics listed below.

2. Find at least two information sources related to the topic. You can find assistance with searching for articles at the UMUC Library Subject Guides at http://libguides.umuc.edu/science.

3. Write a 750-1500 word paper, excluding references and title page. You must read the information sources that you find and summarize the information in your own words, addressing each of the questions and expectations for your chosen topic. Extensive quotes from the article are discouraged. Use APA style for citing references, see http://www.umuc.edu/library/guides/apa.html.

4. Post your assignment to your Assignments folder by the due date listed in the course schedule.

Topics (select one)

a) Genetically modified organisms (GMOs). What is the purpose genetic engineering of crop plants and domestic animals? Briefly explain how GMOs are created. What foods in your supermarket contain GMOs? Are foods that contain GMOs safe for human consumption? What types of regulations exist for these foods? Clearly explain your reasoning for each answer.

b) Stem cells. Your friend had a spinal cord injury after a bad car accident. The medical team has decided that he is a good candidate for a clinical trial using stem cell therapy. Your friend has not had a biology course since high school, so you decide to write him a letter sharing your knowledge of stem cells. Include in your letter a description of the biology of stem cells and how these cells are unique from other cells. Contrast the different types of stem cells, including pros and cons of each. Explain how stems cells are can be used to treat diseases and injury, with special focus on spinal cord injuries. Conclude with your own opinion.

c) Fracking (hydraulic fracturing) and tar sands (oil sands). With society's dependence on nonrenewable fossil fuels, the oil & gas industry is turning to the use of hydraulic fracturing and tar (oil) sands to extract natural gas and oil respectively. A friend asks you "What's all this controversy in the news about fracking and tar sands?" Briefly explain to your friend how hydraulic fracturing and tar (oil) sands are used to obtain these fossil fuels. Then, in more detail, describe the environmental problems that may result from these processes and why they are controversial. Issues that may be addressed involves, but are not limited to, water, air and soil pollution, effects on human health, effects on other species and natural ecosystems. Finally, give your opinions on possible solutions to these environmental problems, with your reasoning backed by the references that you studied.