

**BI392 - The Cell Cycle and Cancer**  
**ESSAY ON THE HUMAN IMPACT OF CANCER**

Below are three scenarios, each of which describes a particular situation about cancer. Your assignment is to choose one of the scenarios, assess the information presented, and then write about that scenario from the perspective of someone involved. The intent of this essay is 1) to give you an opportunity to consider some of the less "biological" aspects of cancer along with clinical or epidemiological aspects of cancer we won't discuss in class, 2) to give you the opportunity to write about scientific issues in lay terms, and 3) to give you the opportunity to exercise your liberal arts creativity in this course.

Your essay will be graded on creativity and care of presentation (40%), scientific accuracy and relevance (40%), and the effective and thorough use of resources (20%). Some of the issues in each essay will be subtle, so consider your essay carefully and creatively. The scenario boundaries are fairly flexible, but don't stray too far from the central issues; write within the context of the scenario you choose and within the context of the course. You will need to do some additional reading for this assignment; the unassigned pages in the cancer issues of *Scientific American* may be useful to you. I expect your paper to be between 7-10 double-spaced pages, but these are also fairly flexible boundaries.

**Your essay is due by 4:00pm, Friday, April 2, 2010.**

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Sean (47) comes from a family with a history of colon cancer. Recent advances in genetics have enabled genetic testing for certain cancer genes and now Sean's insurance company is interested in Sean being tested. Sean's doctor, Dr. Simonds, thinks Sean should be tested because Sean's mother and maternal grandfather both died because of complications from colon cancer. Sean is anxious to find out if he has cancer genes and he wants his son, Bill (24), and his daughter, Erin (17) to be tested, too. Both Bill and Erin do not want to be tested because they are concerned about problems with others gaining access to their private health information. Sean remains adamant and claims they should know if they carry cancer genes. What is genetic testing? What makes analysing the genetic tests for cancer genes different from analysing those for other genes like those for cystic fibrosis or Huntington's Disease? If screening is warranted, who should have access to that information? How can genetic testing be kept confidential? Should genetic testing be done anonymously (like HIV testing can be done in many places)? Write from the perspective of anyone involved.

A statistically significant increase in the number of children diagnosed with acute lymphocytic leukemia (ALL) and acute myelocytic leukemia (AML) has been reported in Churchill County, Nevada. By the end of 2001, 15 children in this sparsely populated area had been diagnosed with ALL or AML. An Expert Panel convened by the state recommended conducting a cross-sectional exposure assessment in Churchill County. The Centers for Disease Control and Prevention (CDC) completed the study in early

2003. Levels of most chemicals in urine and blood samples from Churchill County study participants were not elevated compared with national estimates. However, arsenic levels were elevated in Churchill County participants' urine and tap water samples, but arsenic levels were no different in people with cancer and those without cancer. Likewise, tungsten levels were elevated in Churchill County participants' urine samples, but again, the levels did not differ between people with cancer and those without cancer. The CDC concluded that elevations of some chemicals were identified, but the elevations did not explain the incidence of childhood leukemia in Churchill County. Residents have become frustrated and outraged because no one seems to be taking them seriously. How does cancer arise? What causes it, and how long does it take to appear? Why might small communities have cancer clusters? Write from the perspective of anyone involved but be sure to address the questions from the context of this particular problem.\*

Mrs. Yusuki Fukuta is a postmenopausal 49-year-old native Japanese housewife who has recently returned to Japan after living in the US for almost 20 years. Mrs. Fukuta is approximately 15 kilos overweight. Many of her friends in North America have had relatives or acquaintances who have had breast cancer, but she is not sure whether she should be concerned since she understands that fewer Asian women develop this disease than women in the West. Mrs. Fukuta likes to stay at home; she doesn't exercise much; she is a moderate drinker; she eats quite a bit of beef and pork; she cooks a lot of her food using sweet coconut oil or margarine; she dislikes most vegetables; and she prefers to eat Western-style desserts like cakes and ice cream. "I love traditional Japanese food when I go to restaurants," she says, "but at home my husband and I are so used to Western cooking that I very seldom cook in the traditional style." Mrs. Fukuta occasionally likes to eat three or four desserts at one time. "I try to diet, I try to skip eating breakfast," she says, "but after a few days of dieting like this, I have to have something sweet and delicious. I'm not sure that dieting will make much difference, since all the women in my family become overweight as they get older. I am not interested in becoming slimmer, I just don't want to get cancer." Laboratory tests indicate that Mrs. Fukuta is cancer-free, but her LDL-level is above normal. So, in addition to being overweight, tests indicate that she has consumed too many of the wrong kinds of food. What are the basic risk factors for developing breast cancer as well as other cancers? Are there geographical differences in the types of cancers that are found among populations? What are the links between lifestyle choices (like diet and exercise) and health problems (like cancer)? Is there any information that might be useful to Mrs. Fukuta that would address her concerns? Write from the perspective of anyone who might be involved in Mrs. Fukuta's life. \*\*

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\*The Churchill County scenario is real, and you can find references to it, and to the CDC report on the web. The additional details are interesting, but may not be too helpful for this assignment.

\*\*The last scenario is quoted liberally from a website. Try to avoid tracking it down; there are uncited suggestions that may lead you astray.