

Integrated Health Studies

DAS 497 – The Role of Scientific Reasoning & Ethics in Cancer Research

Literature Review and Analysis

Colorectal cancer is the second leading cause of cancer deaths in men and women (American Cancer Society, 2024)

While colorectal cancer can affect a person at any age, it is more common in adults over the age of 50. A number of risk factors can also contribute colorectal cancer, such as family history of colon cancer, low-fiber/high fat diets, lack of exercise, diabetes, obesity, smoking, alcohol use, and more (Mayo Clinic, 2023).

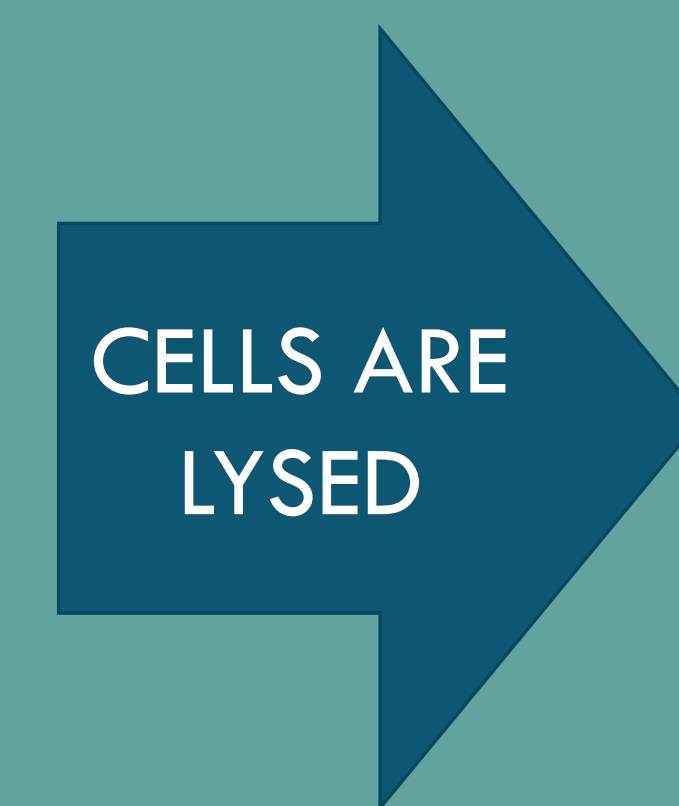
There are various treatment options available for individuals diagnosed with colorectal cancer, such as surgery, radiation, and chemotherapy (National Cancer Institute, 2024). However, not all of these options are available to the entire population, such as those lacking health insurance. So, ethical researchers must take these populations into consideration, as well as their duty to uphold the pillars of medical ethics.

The pillar of justice specifically applies to medical research in my opinion. The pillar of justice calls for equal treatment of individuals, regardless of their demographics. This pillar is a core part of ethical research, as it requires that the needs of every population be taken to account (McCormick, n.d.). In my work in the Asano Laboratory, I try my best to keep the individuals who can benefit from my research in mind. In doing so, I practice my best work and ensure that quality procedures are in place so that patients from every population may one day benefit from my findings.

A crucial part of quality research is the use of scientific and statistical reasoning on a day to day basis. We utilize many scientific instruments that need to be maintained and monitored properly within my lab. For example, my specific research project requires the use of three principal machines: the French Press, fast protein liquid chromatography (FPLC), and the bilayer interferometry machine (Blitz).



French Press



FPLC



Blitz

The technology used by research laboratories has many benefits, and it has allowed for great progress in the world of healthcare. However, it is also important to understand that technology is fallible. This is why repeatability is important in research as well as the ability to recognize unusual patterns within the data. All in all, the technology used within laboratories is only as good as its operator, which explains the need for 'reasoning' in science and statistics.

Why Integrated Health Studies?

As an aspiring physician, I do my best to be well-rounded, and the Integrated Health Studies (IHS) secondary major gave me the opportunity to further this desire. IHS incorporates a number of themes in a way that no other secondary degree does. IHS not only aligned well with my own degree path in biology, but it also allowed me to step outside of my comfort zone and take courses that I never would have thought of taking.

Chosen Experience

For my Integrated Health Studies capstone, I chose to participate in a research project regarding colorectal cancer, and specifically the study of 5mp, which is an oncoprotein. My work was completed in Dr. Asano's cancer research lab over the course of the past four years.

Abstract

This document serves as an exploration of scientific reasoning and ethics within cancer research at Kansas State University.

It aims to outline the technical processes involved in cancer research laboratories that utilize scientific reasoning to conceptualize the innerworkings of cancers such as colorectal cancer. It further seeks to define and consider the ethics associated with clinical research.

Statement of Interests

The aim of the Asano Laboratory is to understand how eukaryotic initiation can be used as a target for the control of gene expression. Our laboratory further explores how dysregulation in translation initiation can lead to malignant phenotypes, as in cancer.

Cancer affects such a large portion of the population, so learning its intricacies has always been of interest to me. I also have family members who have been affected by cancer. Because of my personal connection to the disease, I am interested in completing ethical research that can benefit the population as a whole using scientific tools and reasoning.

Implications for the Future & Questions

Work conducted in research labs such as my own is ongoing in the study of colorectal cancer. It is important that these labs take into consideration the ethical ramifications of their studies so that all patients can benefit in accordance with the medical pillar of justice. Furthermore, researchers must diligently implement scientific and statistical reasoning when working as to further ensure the quality of the research being conducted. With the use of ethical thinking as well as scientific reasoning, I believe that researchers can momentarily affect the outcomes of cancer patients. Consider the following:

- To what extent does lack of access to care contribute to a patient's cancer diagnosis?
- How can researchers challenge the statistics associated with colorectal cancer and work towards change?
- How can college students make a difference in the medical world?

Works Cited

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