Outside Reports for Physiology 12
Human Physiology

This component of the human physiology course is to get **you** the student involved in the importance of physiology in our everyday lives. I am asking that you take time out of your busy schedules to look at newspapers, popular press magazines, etc. for articles dealing with human physiology. Everyday there are numerous articles (some more obscure than others) discussing the hazards of chemical on the body, air quality problems, and stress effects. It is not necessary to pull these topics only from written sources. The topic you are interested in could come from something you saw on TV or is happening in your life right now! (illness of family member or yourself) Or it could be just a topic that is just of interest to you. As long as physiology is talked about, it can be a topic. All of these are important for you to understand and to relate to the concepts that I will be presenting in class.

There are **2, 25 point assignments** involved. Each assignment will be graded using the following criteria:

1) It is not required, but it may possibly help me to understand what the topic is if you take the first page of the article, cut it out and tape it to a single sheet of paper.

2) As stated above, the article can come from the newspaper, popular magazines, journal articles, ect. If you need help please talk to the instructor.

3) On a separate page, an explanation/association should be written on the article. This written page should include:

- **a)** A brief summary of the article **(2-5 point)**
- **b)** An explanation of how specifically this article relates to human physiology and why. This means detail about the relationship and comments expressing your thoughts on the article future directions of research. Also, you will need to pull in references from peer-reviewed literature to discuss the topic **(15 point)**
- **c)** There must be references supporting any statements/conclusions/hypotheses you make in the explanation. These references ***must*** be from refereed (peer-reviewed) journals. These references must be cited in the body of the paper and in the bibliography (using the correct formatting)**(2-5 point)**

4) This explanation page can be no longer than one (1) page. Must have your name, Physio 12 section (i.e. MWF 8am) and date at the top of the page. It must be typed (computer/typewriter). Single or double spaced with a font size no larger than 12 pt and no smaller than 10 pt.

5) They can only be turned in on the set due dates and no more than one (1) can be turned at a time.

On the following page is an example of an "Outside Report" turned by a former student. Check it over and read the comments in the margin.

Sample Outside Report

Myopic defense: innate immune response and cancer

I had heard of cancer growing up, but I didn't develop a personal interest in the little understood form of illness until I was 21 years old and was diagnosed with stage 1B Nonbulky Nodular Sclerosing Hodgkin's Disease. Hodgkins Disease is a lymphoma that is among the more common cancers in young adults—males more than females—and is hypothesized to be linked to Epstein-Barr (E-B) virus. Leading up to and following my own diagnosis I did some research into E-B virus and Hodgkin's Disease, finding only a frustrating lack of insight into what had made my healthy body turn on itself.

Comment: Relevance of the topic from the writers view point. Why is this topic important to the writer and the reader.

A decade later, the etiology of lymphomas still appears mysterious. However, a resurgence of research into the relationship between inflammatory responses and carcinogenesis is showing promise, suggesting important clues about the mechanisms of cell mutation and subsequent reproduction. I became aware of this research when Dr. Toebe assigned an article (attached) from *Time Magazine* (February 23, 2004) titled "The Fires Within," authored by Christine Gorman and Alice Park. Intrigued by the elegance of the connection between the innate immune response and cancer tumor formation, I decided I wanted to take a closer look.

Comment: What is the specific question you want to better understand.

Three reviews of research (Coussens 2002; Hussain & Hofseth 2003; Nathan 2002) indicated that a connection between inflammation and cancer has been hypothesized numerously over the past 150 years, and in each epoch has been tested in accord with the most promising technology of the day. Among the many connections that the authors examined, all discussed the role of free radicals in damaging DNA molecules. Peroxynitrate (ONOO-) and nitric oxide (NO•) are both reactive species of molecules that are released by leukocytes and lymphocytes during an innate immune response, often to viral, bacterial and parasitic infections; both have been shown *in vitro* and *in vivo* (in mice) to affect the division of epithelial cells, causing genetic mutations that are known to cause cancers (Hussain & Hofseth 2003, p.277).

For the purpose of containing this paper I narrowed the focus of my investigation to the better researched area of the etiologies of gastrointestinal cancers, the incidence of which is known to increase as a result of chronic inflammation (Coussens 2002; Hussain & Hofseth 2003; Frommel 1999; Motorna 2001; Nathan 2002). T.O. Frommel's paper (**Medical Hypotheses** 1999, 52(1):27-30) on the relationship between gastrointestinal inflammation and cancers looks specifically at a gene whose expression is paradoxical when viewed from the perspective of cancer research: it protects cells from outright destruction by free radicals while it also prolongs the life of those same protected cells and makes them more prone to mutation. While its focus is on liver cells and not the GI tract *per se*, Motorna, et.al.'s study of *lacI* gene mutations resulting from the innate immune response to parasitic infections (**Mutation Research** 2001, 484:69-76) chronicles the range of *lacI* mutations that occur in liver cells and suggests the findings as a pointer to research into mutagenic pathways of the known gastric carcinogen *Helicobacter pylori*.

Comment: Narrowing of the topic down to something that can be talked about in one page. You can actually write about the same topic in both "outside reports". However, it needs to be of different aspects of the topic.

Comment: Relevant literature to help explain the points of the topic.

The great promise of research into the relationship between chronic inflammation and cancer is the possibility for preventative therapies. Rather than targeting "stress" as a cause of gastric ulcers and subsequent gastric cancers, for example, medicine might find a way to manage immune responses to *H. pylori*, the bacterium that causes gastric ulcers, and circumvent the chain of events that results in tumors. Management of the myopic inflammatory responses that, when sustained, lead to tissue damage, appears to be among the current focal points of cancer research..

Comment: Excellent summary of findings and what was learn by the writer about the topic.

Coussens, L. & Z. Werb. 2002. Inflammation and cancer. **Nature** 420:860-867.

Cunliffe, R & Y. Mahida. 2004. Expression and regulation of antimicrobial peptides in the gastrointestinal tract. **Journal of Leukocyte Biology** 75:49-58.

Frommel, T. & E.J. Zarling. 1999. Chronic inflammation and cancer: potential role of Bc1-2 gene family members as regulators of cellular antioxidant status. **Medical Hypotheses** 52(1):27-30.

Hussain, S. P., L.J. Hofseth & C. C. Harris. 2003. Radical causes of cancer. **Nature Reviews** 3:276-285.

Motorna, O, et.al. 2001. Analysis of *lacI* mutations in Big Blue® transgenic mice subjected to parasite-induced inflammation. **Mutation Research** 484:69-76.

Nathan, C. 2002 Points of control in inflammation. **Nature** 420:846-852.

Yu, Q., S. J. Cok, C. Zeng & A. R. Morrison. 2003. Translational repression of human matrix metalloproteinases-13 by and alternatively spliced form of T-cell restricted intracellular antigen-related protein. **The Journal of Biological Chemistry** 278(3):1579-1584.

Comment: Excellent bibliography, relevant literature, correct formatting. Remember, there needs to be **at least 3** peer-reviewed citations per outside report.