

Unit 2: Social Determinants of Health

2.1 Introduction

Social Determinants of Health (SDOH, hereafter) are now recognized as major factors affecting the health of people all over the world. Your job in Unit 2 is to write a blog that describes what SDOH are, how they impact health, and what can be done to minimize their negative effects.

Your key source is the video *Unnatural Causes: in sickness and in wealth*. Start here and supplement with other recommended sources per the blog instructions.

2.2. Objectives

When you have completed Unit 2 you should be able to:

- Define social determinants of health and give examples
- Explain the idea of a health gradient
- Tell what happens to cortisol during arousal
- Explain how elevated levels of cortisol can affect the body if arousal does not stop
- List health conditions that, according to the video, are associated with chronically high levels of cortisol
- Develop your own ideas for how to reduce the effects of social class on health

2.3 Writing Blogs

In Unit 2 you will develop your basic understanding of health promotion and disease prevention by researching Social Determinants of Health and writing a blog about the topic. The instructions for the blog will direct you to good information sources and provide you with a list of things to write about. Make sure you do the following when you write your blogs:

- Quotations may ***only be used for definitions*** and ***must be cited correctly***. Failing to give credit for what you have written can result in a series of penalties that are described in the syllabus. We will use the AMA citation and reference approach that you can find at the OWL/Purdue website. See my sample blog below for more details
- Copying the work of other students or sharing your own work will result in a grade of 0 and may result in failing the course. There is no assignment that is worth copying from another student.
- Use only high quality sources such as government agencies, the World Health Organization, university websites, journal articles, and other sources I specifically recommend. ***For this blog you should begin by viewing *Unnatural Causes*.*** You can stream this from the UH Library and instructions are provided in the blog description. This documentary contains input from world experts and tells the story in a very connected way.
- Write for an 8th grade audience. People who visit your website may not have finished high school or gotten college educations. Translating technical information to common language is a real challenge I want you to face as part of your training for work in health promotion.
- Keep your blog brief. That will not be easy, especially at first. You will need two or maybe three drafts to get it right. Plan ahead and make time for this. This is creative work when done well.

See sample blog on the next page

A SAMPLE BLOG ON EPIGENETICS

Note the format of the in-text citations – superscript numbers beginning with number 1. Each claim you make must have a citation. *If you make more than one claim in consecutive sentences based on what you read from the same source, just put one citation after the last claim.*

Note the format of the references – in numerical order in which they appeared in the text

Note how headings give the reader a clue as to what is coming in the text. Be kind to your readers!!

Epigenetics

Whether or not you have taken a Biology class, you have probably heard the terms DNA, genetics, gene, chromosome, mutation, and other terms related to how the cells in our bodies are able to make us the way we are. More recent discoveries in Biology have enabled us to understand some things which were not understood well until now and there is still much more to learn.

The Epigenome Regulates Gene Expression!

Epigenetics is the study of the processes and chemicals through which the operations of genes (made up of DNA) are controlled. The chemicals are called the epigenome. The parts of the epigenome—methyl groups and histone proteins – help determine which genes are used to create the proteins needed to make and run the human body. Methyl groups can be attached to the DNA and, when they are, can get in the way of a gene being used to make a protein. Histone proteins are like spools that the DNA is wrapped around. If the DNA is wrapped too tightly around a Histone, it cannot be read to make proteins. If the DNA is wrapped more loosely around a Histone, it can be read. In these ways, the epigenome can control which proteins are made and which ones are not.¹

So What If The Epigenome Regulates Gene Expression?

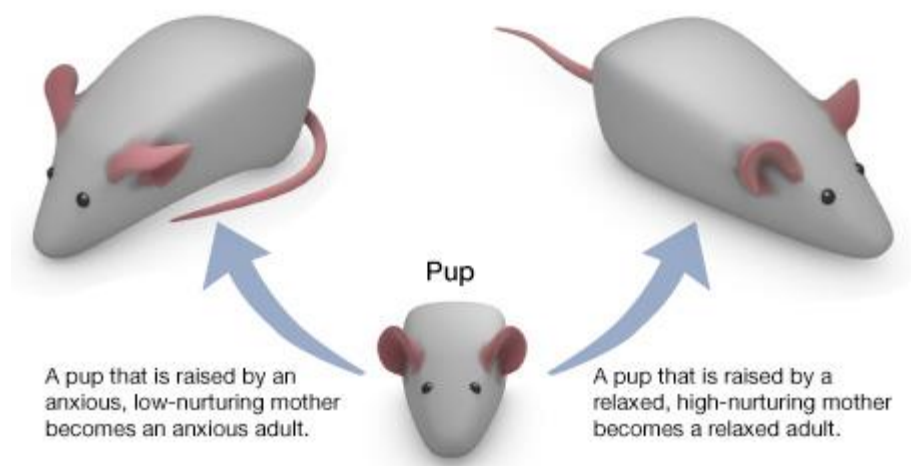
When an egg and a sperm join to form an embryo, it is one cell with all the genes contributed by each parent. As the embryo develops into cells that look very different (your eyes look different from your teeth and muscles are different from both) all cells continue to have all of the genes from both parents. How can these cells look different if they all have the same genes? Well, not all genes are “switched on” in the different types of cells. The chemical processes are complex, but in short, we can say that methyl groups and histones play an important role in switching genes off and on and different genes are switched on in different types of cells.¹

So how does cancer can happen, at least in some cases. Think of the epigenome as being in charge of turning cell growth on and off and cancer is the uncontrolled growth of cells. When “tumor suppressor”² genes are turned off, the stop sign for cell growth goes away. Oncogenes encourage cell growth and when they are not switched off through epigenetic control, cell growth happens. Some types of cancer arise from active oncogenes and/or inactive tumor suppressor genes – cell growth proceeds with less than normal or no control and tumors are made.²

The Epigenome is Affected by the Environment

There is a lot left to learn about when and how the epigenome turns genes on and off. One interesting example shows how the environment can affect what the epigenome does. How much baby rats are [licked by their mothers](#) can shape how calm they grow up to be. The more rats get licked, the calmer they tend to be as adult rats. Calmness seems to be shaped to a large extent by a protein that licked rats make more of than those who are licked less. Furthermore, female rats that are licked less tend to

display less nurturing behavior when they have pups. Figure 1 below describes this in more graphic fashion.



High-nurturing mothers raise high-nurturing offspring, and low-nurturing mothers raise low-nurturing offspring. This may look like a genetic pattern, but it's not. Whether a pup grows up to be anxious or relaxed depends on the mother that raises it - not the mother that gives birth to it.

Source: University of Utah. *Epigenetics, Lick Your Rats*.³

Apparently, licking removes the epigenetic tag that blocks the making of a protein that promotes calmness, so the more the rats are licked, the more of the chemical they are able to detect and the calmer they are. In this way, the epigenome can help the rat adjust to its world. If its mother had time to care for it through licking, the rat will be prepared to live in a less threatening world that allowed its mother to care more for her young. If the mother did not nurture the young as much, the baby will grow up to be “on guard” in a world that did not allow its mother to care for it.³ It is not hard to imagine how this might work out for humans, as well. Think about the blog on social determinants of health and how the environment could shape care for young.

References

1. BBC. Epigenetics. (n.d.). Accessed 10/28/19 from <https://www.youtube.com/watch?v=kp1bZEUgqVI>
2. Esteller, M. Epigenetics provides a new generation of oncogenes and tumour-suppressor genes. *British Journal of Cancer*, v.94(2); 2006 Jan 30. Accessed 10/28/19 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2361113/>
3. University of Utah. Epigenetics: Lick your rats. Accessed 10/28/19 from <https://learn.genetics.utah.edu/content/epigenetics/rats/>