**BIOLOGY 140: Introduction to Human Disease**

**Exam 2: Study Guide**

**Due Date: May 26th at 11:59 PM**

**This is study guide to help you prepare for Exam #2. You are responsible for all material in my PowerPoint presentations, material discussed in lecture (i.e. stuff that I mentioned that is NOT on the power points), the reflections (#6-10), discussions, PowerPoint presentations, and the reading assignments (#3-Vaccines and #4-Diabetes). Use this study guide to help focus your studying not as substitute for last minute cramming of material. Remember, this is a GUIDE not a comprehensive list of all the material covered in lecture. Also, make certain to use your textbook to further your understanding of material in the study guide and PowerPoint lectures.**

**Chapter 7 (Lecture 7 on Canvas)**

1. What organs or structures are included as part of the circulatory system?
2. What are the 3 functions of blood?
3. What are major constituents (i.e. cells, chemicals, etc.) of blood?
4. What is the function of red blood cells?
5. What hormone leads to stimulation of the bone marrow to make more red blood cells?
6. What is the function of hemoglobin in red blood cells?
7. What do blood stem cells develop into mature blood cells? What are some of the blood-forming organs?
8. What is hemostasis?
9. What are the terms for mis-formation of red blood cells? Platelets? White blood cells?
10. What is Erythrocytopenia? Erythrocytosis
11. What are some tests to diagnose blood disorders?
12. What is anemia? What are some of the signs and symptoms? What are some types of anemia?
13. What is Sickle-Cell Anemia? What are some the symptoms and complications associated with this genetic disease?
14. What are some disorders that affect white blood cells?
15. Be able to describe and distinguish between the different types of leukemia? Which is treated by Gleevec? What is targeted cancer therapy?

**Antibiotics (Lecture 8 on Canvas)**

1. What scientist accidently discovered antibiotics? What was the name of organism that produced this antibiotic and what was the name of the antibiotic? What other organisms can also produce antibiotics?
2. When was the first widespread use of antibiotics to treat infections?
3. How does antibiotic resistance happen? What is the danger of antibiotic resistant bacteria? What ways can healthcare professionals and users of antibiotics do to prevent the development of antibiotic-resistant bacteria?
4. Be able to provide some examples of how antibiotic-resistant bacteria can develop?
5. Be able to describe common antibiotic-resistant bacteria such as MRSA and *C. difficile*. What is a superinfection?

**Vaccines (Lecture 9 on CANVAS)**

1. What are vaccines and how do they work to help prevent infections?
2. What type of cells in the immune system produce antibodies? Why are antibodies important to fight and prevention infections?
3. What are some diseases where we have developed vaccines?
4. How does herd immunity work? Why is important that the majority of people in a population get vaccinated? What happens if we don’t achieve maximum herd immunity?
5. Do vaccines cause autism? Why do people have the misconception that vaccines can cause autism and our maladies?
6. The MMR vaccine is used to prevent infection by which 3 viruses and which 3 diseases caused by these viruses?
7. How does the flu vaccine work? Why has it been difficult to develop an 100% effective vaccine against the flu virus? What happen during the Swine Flu Epidemic of 1918? Can this epidemic happen again?
8. What were some of the vaccine “scares” of recent times? How and why have these “scares” led to the current anti-vax movement?

**Cardiac Diseases (Lecture 10 – Chapter 10)**

1. What is the basic anatomy of the cardiovascular system? How many chambers of the heart? What are arteries, arterioles, capillaries, venules, and veins?
2. What is the difference between the systemic and pulmonary circulatory systems?
3. What are some common symptoms of cardiac disease or issues?
4. What are some non-invasive diagnostic techniques? Invasive diagnostic techniques?
5. What is hypertension? What are the ways to diagnosis and what are some of the consequences of long-term hypertension?
6. What is arteriosclerosis and atherosclerosis? What are the consequences of these diseases?
7. What is a vesicular aneurysm? How do they occur and what are the consequences of this condition? How can the genetic condition known as Marfan Syndrome lead to this condition?
8. What is a myocardial infarction and how can cardiovascular diseases lead to this condition?
9. Briefly describe the surgical procedure known as CABG?
10. What is congestive heart failure and how is this different than a heart attack?
11. What are some ways to reduce the incidences of cardiac diseases in the United States?

**Digestive System Diseases/Disorders (Lecture 11 - Chapter 11)**

1. What are the major organ components of the digestive system? What are some auxiliary organs?
2. What are the major functions of the digestive system?
3. What are some ways that we diagnosis digestive system disorders?
4. What pharyngitis? What causes it?
5. What reflux esophagitis? What causes it? How is treated? What are some the consequence of long-term GERD?
6. What are peptic ulcers? What bacteria is the likely cause of many chronic ulcers?
7. What is Crohn’s disease? How is the related to IBD? What are some of the signs and symptoms?
8. What is colitis? How is this different from Crohn’s? What is IBS?
9. What is colectomy? Ostomy bag?
10. What is appendicitis? How is treated?
11. What are some ways the colon is obstructed?
12. What is dysentery? What is an example of a bacterial infection that can cause this condition?
13. What is colon cancer? How can this condition lead to deadly cancer?
14. Be able to describe celiac disease and the dietary conditions that lead to this condition?

**Endocrine System Diseases/Disorders (Lecture 12 - Chapter 14)**

1. What are some of the glands of the endocrine system?
2. How do these glands deliver hormones to the body?
3. What is hyperpituitarism versus hypopituitarism?
4. What is hyperthyroidism disease?
5. What are the adrenal glands and what hormones do they secrete?
6. What two very important hormones are secreted by the pancreas?
7. What are the two types of Diabetes mellitus? What is the effect on the body of these two related types?
8. What types of conditions can lead to the development of Type I Diabetes? Type II Diabetes?
9. What are the some of the possible complications of someone with Diabetes?
10. What is gestational Diabetes?
11. What is hypoglycemia?

**Genetic Diseases and Disorders (Lecture 13 - Chapter 19)**

1. How chromosomes are in the typical human cell? How many chromosomes are in human sperm cell? Egg cell?
2. What is a karyotype and how is it used to distinguish the correct number of chromosomes in a human?
3. What chromosome determines the sex of a human (or other mammals)?
4. Be able to list some ways for how we diagnosis human genetic diseases?
5. What are some mechanisms that lead to human genetic diseases?
6. How can family history help medical professionals determine if a disease is genetic or not?
7. What are some causes of chromosomal abnormalities? Be able to describe the four mentioned in class?
8. What are the major differences between autosomal dominant, autosomal recessive, sex-linked recessive, and complex genetic disorders? Which ones are due to a single gene mutation versus multiple genes that cause the disorder?
9. What is a pedigree analysis and how can we use a pedigree analysis to determine if a disease is a recessive genetic disease versus a dominant genetic disease?
10. Be able to describe the following diseases and if they are dominant genetic disease versus sex-linked versus recessive.
    * Cystic Fibrosis
    * Huntington’s Disease
    * Sickle-cell Anemia
    * Tay-Sach’s Disease
    * Hemophilia