## Topic 1 Immunity stimulated by antigens entering through the skin

1. Look up "lamellar bodies," as shown on page 1 in Module 7, Topic 1.   
   Describe their function in the skin and a genetic disorder that affects their function. What are the symptoms of the disorder? (Cite your sources).   
   **(*5 marks*)**
2. Look up and describe the type IV hypersensitivity reaction to poison ivy (Chapter 14, p. 402 in the Parham textbook and other sources- please cite them). How can a poison ivy rash be treated? **(*5 marks*)**

## Topic 2 Mucosal Immunity

1. What are mucins? How many genes do humans have for these proteins and what are the **two** categories of mucins? List **three** ways that mucins contribute to the protective properties of mucus. **(*5 marks*)**
2. How do intestinal epithelial cells sense infection with pathogens, and why is the inflammatory response generated this way relatively short-lived?   
   **(*5 marks*)**
3. The textbook describes **two** subclasses of IgA (section 10-14). Briefly outline the differences between them and where they are most likely to be secreted. **(*3 marks*)**
4. Some individuals are deficient in the production of IgA. In what parts of the world is this most prevalent? Why is IgA deficiency less serious than it might be? **(*2 marks*)**

## Topic 3 Healing and Anti-inflammatories

1. Look up the genetic disorder "Leukocyte Adhesion Deficiency" LAD1 and LAD2 (Parham textbook section 13-14 and other references; please cite any other references you use). What genes are defective in these disorders and what are the symptoms? **(*5 marks*)**
2. Glucocorticoids (also known as corticosteroids) are commonly used to treat inflammation of many kinds, from skin rashes and allergies to chronic autoimmune disorders. Most of the prescribed corticosteroid drugs are derivatives of natural glucocorticoids. Name **two** commonly prescribed synthetic corticosteroid drugs and describe how they differ from natural glucocorticoids. What are **three** side effects of oral corticosteroid drugs that limit their usage? (Cite your references) **(*5 marks*)**

## Topic 4 Hypersensitivity, Autoimmunity and Chronic Inflammation

1. Epinephrine (EpiPen®) very quickly reverses the symptoms of anaphylaxis. Why is it recommended that patients who have suffered an anaphylactic reaction go to the hospital to be checked, even after epinephrine has been administered? What other treatments might be recommended? (Cite your reference(s)). **(*5 marks*)**
2. Hashimoto's thyroiditis and Graves' disease are both mediated by anti-thyroid antibodies. How do they differ? To what class of hypersensitivity would Hashimoto's thyroiditis belong? (Include your references) **(*5 marks*)**
3. Several monoclonal antibodies are mentioned as therapeutics in this topic. List **four** of these and state the antigen to which they bind and how this helps alleviate symptoms of particular diseases for which they are used.

List **two** of the possible side effects of these medications.

**(*10 marks: 2 each for antibodies; 2 for side effects*)**

1. The textbook discusses the use of intravenous immunoglobulin (IVIG) as a treatment option for several examples of autoimmune diseases. What is IVIG and how is it thought to work to alleviate the symptoms of autoimmunity? Give at least **two** examples of autoimmune diseases treated with IVIG.   
   **(*5 marks*)**
2. What is RhoGAM and what is it used to treat? How does it work? When is it given? **(*5 marks*)**
3. Explain how genetic defects in certain complement proteins can contribute to SLE. Which proteins are commonly found to be defective? **(*5 marks*)**
4. List **four** autoimmune diseases and the MHC allotypes associated with susceptibility to them and **one** allotype that is protective. For at least **one** disease, explain how the particular MHC allotype might work to confer susceptibility. **(*7 marks*)**

List **two** other non-MHC gene variants that are known to be associated with development of an autoimmune disease (other than complement proteins and SLE). **(*3 marks*)**

1. Review the [Treatments in Development](https://mssociety.ca/research-news/treatments-in-development) listed on the Multiple Sclerosis Society Canada website and select **one** of these new treatments. Describe a study that showed the effectiveness of this new treatment, and explain how the drug works. Give any extra references. **(*5 marks*)**
2. How does contact sensitivity to nickel in jewelry develop? In what ways is the reaction to poison ivy similar? **(*5 marks*)**

## Topic 5 Immunological Memory and Vaccines

1. Section 14-5 in the textbook discusses how concern for safety of the *B. pertussis* (whooping cough) vaccine led to resurgence of disease in Japan in the 1970s.

What was used in the DPT vaccine in the 1970s and what adverse reactions were sometimes associated with this vaccination? What percentage of children in Japan were vaccinated against whooping cough in the late 1970s, and what were the consequences? What changes to the vaccine have been made since 1981 that reduced the side effects and what is the incidence of whooping cough in Japan today? **(*7 marks*)**

(See also [Why Immunize?](https://www.cdc.gov/vaccines/vac-gen/why.htm) on the Centers for Disease Control and Prevention website, and [Six Common Misconceptions About Immunization](https://www.who.int/vaccine_safety/initiative/detection/immunization_misconceptions/en/index1.html), on the World Health Organization website.)

1. What are two adjuvants used in human vaccines? Why are there not more?   
   **(*3 marks*)**

(See section 14-3 in the textbook and [Adjuvants Help Vaccines Work Better](https://www.cdc.gov/vaccinesafety/concerns/adjuvants.html), on the Centers for Disease Control and Prevention website.)

1. The incidence of measles is reaching epidemic proportions in some parts of North America and Europe. Investigate why vaccination rates for measles have declined in recent years and what Public Health officials are doing to educate the public about the effectiveness of vaccines and the dangers of contracting the measles virus. You can use various news sources- please cite all your references.

Knowing what you do at this point in the course, what do you think could be done to encourage vaccinations? **(*15 marks*)**