Module 10 Assignment

585.751 Immunoenginnering

1. (50 points) PEG is extensively used in designing nanoparticles and larger biomaterials to prevent immune cell recognition. Answer the following questions about PEG:
   1. (20 points) What is the mechanism by which PEG reduces immune recognition of and response to a nanoparticle or implanted biomaterial?
   2. (15 points) What are the advantages and disadvantages of PEGylation?
   3. (15 points) Describe one alternative approach to PEGylation in engineering materials with “stealth” properties.
2. (50 points) The immune system plays a key role in tissue engineering and regenerative medicine that is still being elucidated. List 3 ways in which the immune system has been shown to be involved in tissue regeneration (either from the lecture videos or your own research). Additionally, describe one way in which a biomaterial for tissue engineering can be designed to modulate the immune system in order to improve regeneration.