BSC Lab 8 – Exploring the Effects of HLA-DQA1 Disease. The biomarker HLA-DQA1 has been identified as associated with the following disease condition: Asthma Our goal is to identify the abnormal function of HLA-DQA1 in these specific conditions. We want to identify the potential aspects of the gene/protein abnormality in order to be considered a “good” drug target. In two pages, please cover the following points: 1. The significance of the cell function (and protein, if applicable) of the condition you are trying to target. o Look at the cell function and how the diseased gene/protein behaves within the disease. What do we know about the gene/protein overall? Hint: sequence, functional domains – look at databases like GeneCards or Gene SelfDecode. 2. What evidence suggests that the of the function (protein) is relevant to the disease indicators? o What are the lines of evidence that address the causality of the disease? What kinds of data would you use to determine this? Find primary literature to back up your information that pertain to your gene/protein of interest and the disease itself. 3. What is the targeted area, ie. where the gene is expressed in the diseased condition, that you will examine the various aspects of the disease? o Where in the body is it expressed with respect to the disease? Is there a specific sub-population that is susceptible to this disease? Are there other ailments that are correlated to this disease? Think age, culture, predisposition, environment etc. 4. What is the evidence that the function/molecule is tractable for drug binding & activity-based screening o What will alter the expression of this protein? Is there a requirement for constituent expression of this protein or is it intermittently required? 5. Evidence that suggests inhibitors would be tolerated by humans o If so, what interaction do they have with humans? 6. Outline a bioinformatics workflow (at the level of data sources, tools, and basic criteria) for identifying and sources of information relating to possible treatment of this gene/proteins pertaining to the disease of choice. o What kind of tools would help you identify possible aspects of the gene that could be targeted for treatment. As always, cite all sources of data in your presentation. https://www.uniprot.org/uniprot/P01909 https://www.genecards.org/cgi-bin/carddisp.pl?gene=HLA-DQA1 https://www.genecards.org/cgi-bin/carddisp.pl?gene=HLA-DQA1&keywords=asthma&prefilter=genomic\_location#genomic\_location https://selfdecode.com/gene/hla-dqa1/