

General Principles of Drug Design. Molecular Mechanisms of Disease

1. Many cancers are linked to genetic defects in the gene that encodes for protein known as p53. Based on your own research using available literature and web resources, explain the role of p53 protein of in healthy tissue and outline a plausible mechanism that explains how loss of p53 function leads to cancer.
  
2. Imagine that you are a chief scientific consultant working in a large venture capital firm. A client of the firm is asking for a substantial funding for their new exiting project. They have developed good expertise in DNA microarray, molecular beacon, and proteomics technologies and have already validated their technology by demonstrating that they could identify the gene responsible for phenylketonuria. The client is now asking money in order to identify a protein target, that, when mutated, causes schizophrenia.
  - a) Briefly discuss what is known about the genetic nature of schizophrenia
  - b) Provide your scientific opinion on strengths and weaknesses of your client's plan
  
3. Explain why good understanding of molecular mechanisms of the disease, combined with screening of random combinatorial libraries against well-identified targets may produce lead compounds that have reasonable in vitro activity but are likely to show low potency in vivo.