Lab 6

The Cell Cycle and Cancer

In this assignment you will be reviewing the steps and regulation of the cell cycle—and what can happen when regulation does not work properly. Please read the article titled, “FBP1 promotes ovarian cancer development through the acceleration of cell cycle transition and metastasis” by Xiong et al. (2018), and answer the following questions. You may also use lecture/lab notes and reliable sources found online to help find information and formulate answers. Be sure to write your answers in your own words—don’t copy and paste from sources.

1. Briefly explain the phases of the cell cycle. Be sure to include what it takes to move through checkpoints and between the stages. Explain the important processes occurring in each stage. (2 pts.)
2. What influence does the FBP1 protein have on the cell cycle and how can this proliferate the cancer? What are the investigators aiming to understand with this research and what is their hypothesis? (2 pts.)
3. In two or three sentences, briefly explain how each of methods used works. What will these methods tell you? (10 pts. For the question)
   1. FBP1 Knockdown (How does knockdown work?) (2pts.)
   2. Cell viability and plate formation assays (2 pts.)
   3. Western Blot Analysis (2 pts.)
   4. Flow cytometry for cell cycle and cell apoptosis analysis (2 pts.)
   5. Wound healing and transwell migration assay (2pts.)
4. Briefly explain the results from the paper. The following questions can help guide you to find some important information. If you find anything else that you see as an important thing to note, please do so! (4 pts.)
   * What effect did the expression of FBP1 have in the different tissue types?
   * What influence did the FBP1 Knockdown (FBP1-KD) have on the cell cycle and proliferation?
   * What type of migration or metastasis did the investigators see in the cells with the FBP1 protein?
5. After reading the results, what checkpoint in the cell cycle is most likely the one that is mainly influenced and why does the down regulation of the checkpoint lead to cancer? Do not simply answer this by saying it leads to unregulated cell growth! Think through why that particular checkpoint is important and what is happening at that checkpoint. (2 pts.)