**BIO380: Cancer Biology**

**Homework Assignment #10: Preparation for Microscopy Lab 1**

**50pt, Due Wednesday April 12**

1. **Watch** the video on fluorescence microscopy (<https://www.youtube.com/watch?v=PCJ13LjncMc>) and answer the questions below: (8pt)
   1. How can cellular proteins be made to fluoresce? (4pt)
   2. How might fluorescence microscopy be useful for studying cancer cells? (4pt)
2. **Read** the activity for Wednesday, “Bioimage Informatics: Part 1, Pre-experiment” and answer the following questions: (14pt)
   1. How might you predict real cells differ from the idealized image of a cell shown in Figure 1? (6pt)
   2. How might you predict cancer cells differ from healthy cells when viewed under a microscope? (6pt)
   3. Why are fluorescent images recorded as black and white images rather than color? (2pt)
3. **Complete** the 5 “Spreadsheet Data Analysis Tutorials” at: <http://www.hhmi.org/biointeractive/spreadsheet-data-analysis-tutorials> and fill in your responses to the exercises below. (28pt)

**Tutorial 1:** (1pt)

|  |  |
| --- | --- |
| Mean Beak Depth (mm) = |  |

**Tutorial 2:** (7pt)

|  |  |
| --- | --- |
| Mean |  |
| Variance using function |  |
| Standard Deviation using function |  |
|  |  |
| Sum of Squares |  |
| n-1 |  |
| Variance (sum of squares / (n-1) |  |
| Standard Deviation |  |

**Tutorial 3:** (4pt)

|  |  |  |
| --- | --- | --- |
|  | 1977 | 1978 |
| Mean |  |  |
| Standard Error of the Mean |  |  |

**Tutorial 4:** (6pt)

Is the 1977 beak depth significantly different from the 1978 beak depth? Explain your answer.

**Tutorial 5:** (10pt)

Insert an image of your histogram below.