Analysis of the Study Results

During this animal study, a comparison was made between Pymaceuticals’ drug of interest, Capomulin, against nine other potential treatments for skin cancer. For over 45 days, the tumor development in mice was observed and measured.

Capomulin and Ramicane are the most promising treatment regimens as the mice both treated ended up with smaller final tumor volumes on average. It seems that Capomulin and Ramicane reduce the size of tumors faster. The number of measurements made during Capomulin treatment was higher by 230 times because, over time, the tumor volumes were observed to be reduced faster. Hence, , they needed to be measured more often.

The correlation coefficient between mouse weight and average tumor volume is 0.84 (r = 0.84). There is a positive and strong correlation between the mice’s weight and the tumor volume, suggesting that larger mice have larger tumors. Because the correlation coefficient is closer to 1 than 0, we can predict that mouse weight and tumor volume change together in the same direction. When one variable changes, the other variable changes in the same direction. This means that when the mice’s weight increases, the higher the mice’s weight, the higher the tumor volume.

The scatter graph representing the linear regression best line fit shows that the points are close to the regression line; however, they are not perfectly on the line, so it is not a perfect positive correlation. We cannot ignore that there is an outlier that includes Infubinol as a possible promising treatment. The boxplot shows an outlier (“o” marked red) under Infubinol at approximately 36.32 final tumor volume. This means that at one time, Infubinol treatment produced the same results in a mouse as Capomulin or Ramicane. We know that the r-squared (0.84 x 0.84) value is 0.70, which means 70% of the model fits the data, which is reasonably good for predicting the data from this model. Higher r-squared values represent smaller differences between the observed data and the fitted value. Therefore, we can predict and expect that the tumor volume (dependent variable) will change when the mice’s weight changes.

I received code assistance from the instructor, TA, and Tutor.