Analysis Report

**Introduction**

This report contains an analysis of the treatment regimen as part of a study conducted by Pymaceuticals Inc. The analysis includes various visualizations such as bar plots, pie charts, box plots, and a linear regression analysis to study the effects of treatments on mouse subjects.

**Summary Statistics**

Below is a summary of tumor volume statistics for each drug regimen, including the mean, median, variance, standard deviation, and standard error of the mean (SEM):

| **Drug Regimen** | **Mean Tumor Volume** | **Median Tumor Volume** | **Tumor Volume Variance** | **Tumor Volume Std. Dev** | **Tumor Volume SEM** |
| --- | --- | --- | --- | --- | --- |
| Capomulin | 40.68 | 41.56 | 24.95 | 4.99 | 0.33 |
| Ceftamin | 52.59 | 51.78 | 39.29 | 6.27 | 0.47 |
| Infubinol | 52.88 | 51.82 | 43.13 | 6.57 | 0.49 |
| Ketapril | 55.24 | 53.70 | 68.55 | 8.28 | 0.60 |
| Naftisol | 54.33 | 52.51 | 66.17 | 8.13 | 0.60 |
| Placebo | 54.03 | 52.29 | 61.17 | 7.82 | 0.58 |
| Propriva | 52.32 | 50.45 | 43.85 | 6.62 | 0.54 |
| Ramicane | 40.22 | 40.67 | 23.49 | 4.85 | 0.32 |
| Stelasyn | 54.23 | 52.43 | 59.45 | 7.71 | 0.57 |
| Zoniferol | 53.24 | 51.82 | 48.53 | 6.97 | 0.52 |

**Total Number of Mouse ID/Timepoints for Each Drug Regimen**

The following bar plot shows the total number of mouse ID/timepoints for each drug regimen:

A graph of number of mouse

Description automatically generatedVisualization: Bar plot showing the count of timepoints for each regimen (e.g., Capomulin, Ramicane, Infubinol, Ceftamin, etc.).

**Distribution of Female vs. Male Mice**

The below pie chart showing the gender distribution of the mice in the study:

A blue and orange circle with text

Description automatically generatedVisualization: Pie chart displaying the proportion of female vs. male mice used in the study.

**Tumor Volume Distribution for Each Treatment Group**

This box plot below shows the distribution of tumor volumes across four different treatment regimens:

A diagram of a number of boxes

Description automatically generated with medium confidenceVisualization: Box plot with tumor volumes for Capomulin, Ramicane, Infubinol, and Ceftamin treatments. Red circles indicate outliers.

**Tumor Volume vs. Time for a Mouse Treated with Capomulin**

The below line plot shows the tumor volume over time for a mouse treated with the Capomulin regimen:

A line graph with blue dots

Description automatically generatedVisualization: Line plot showing how tumor volume decreases over time for a single mouse treated with Capomulin.

**Weight vs. Average Tumor Volume for Capomulin**

The below scatter plot shows the relationship between mouse weight and average tumor volume for mice treated with the Capomulin regimen:

A graph of weight vs. tumor volume

Description automatically generatedVisualization: Scatter plot of mouse weight vs. average tumor volume for Capomulin regimen.

**Correlation and Linear Regression Analysis**

The correlation coefficient between mouse weight and tumor volume is **0.84**, indicating a strong positive correlation. Below is a scatter plot with a linear regression line showing the relationship:

A graph with a red line and blue dots

Description automatically generatedVisualization: Scatter plot with a linear regression line showing the correlation between mouse weight and tumor volume.

* **Slope**: 0.95
* **Intercept**: 21.55
* **R-squared value**: 0.84
* **Standard error**: 0.13