ToxGenie Two-Group Comparison Report

Report Date: 2026-06-29 13:39:23

Study Title:	In Vitro Mammalian Chromosomal Aberration Test
Analysis Method:	Student's t-test for % Tail DNA
Study No.:	Test-135
Test Material:	Test Chemicals
Exposure Time:	24-hours
Test Medium:	Not Applicable

Table 1. Raw Data Summary for % Tail DNA

(Unit: mg/kg)

Dose	1	2	3	4	5
Negative Control	4.1000	6.2000	5.5000	3.8000	4.9000
Positive Control	54.1000	58.2000	55.9000	52.8000	56.5000

Step 1. Outlier Detection (Data QA/QC) Analysis

No statistical outliers were detected in the raw data based on Tukey's fences.

*Tukey's fences: Values outside Q1 - 1.5*IQR or Q3 + 1.5*IQR (IQR method).*

Step 2. Descriptive Statistics

Table 2. Descriptive Statistics for % Tail DNA

(Unit: mg/kg)

Dose	N	Mean	SD	SE	CV (%)	Median
Negative Control	5	4.90000	0.98742	0.44159	20.15145	4.90000
Positive Control	5	55.50000	2.10357	0.94074	3.79021	55.90000

Abbreviations & Explanations:

- N: Number of replicates.

- Mean: Average response value.

- SD: Standard Deviation of the mean.

- SE: Standard Error of the mean.

- CV (%): Coefficient of Variation.

- Median: 50th percentile of observed values.

Table 3. Shapiro-Wilk's test for normality on the % Tail DNA

Dose	Statistic	P-value	Result
Negative Control	0.9581	0.7948	Normal Distribution
Positive Control	0.9816	0.9432	Normal Distribution

P>0.05 indicates Normal Distribution.

Final decision: The % Tail DNA data follows a normal distribution.

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Table 4. Levene's test for homogeneity on the % Tail DNA

Statistic	P-value	Result
1.74292	0.22329	Equal Variances

P>0.05 indicates Equal Variances.

Final decision: The % Tail DNA data shows equal variances.

Statistical Analysis Procedure & Decision Tree

The statistical analysis for '% Tail DNA' was conducted based on the following decision steps:

1. Assumption Verification (Normality & Homogeneity):

- *Since the raw data satisfied both the Shapiro-Wilk test (Normality) and Levene's test (Homogeneity of Variance), no data transformation was required.*
- *Consequently, the analysis proceeded directly to Parametric Tests.*

2. Data Transformation Strategy:

- *Not applicable (The raw data already satisfied statistical assumptions).*

3. Final Selected Test Method:

- *Because the data satisfied the required statistical assumptions (normality and homogeneity), the Student's t-test (Parametric) was selected as the final analytical method.*
- *This method was chosen for its high statistical power to detect differences between two groups, ensuring a reliable comparison between the control and treatment groups.*

Table 5. Student's t-test on the % Tail DNA data

Control vs Dose	P-value	Result
Negative Control vs Positive Control	0.0000	Difference from Control

Note: p<0.05 indicates a statistically significant difference from the control group.

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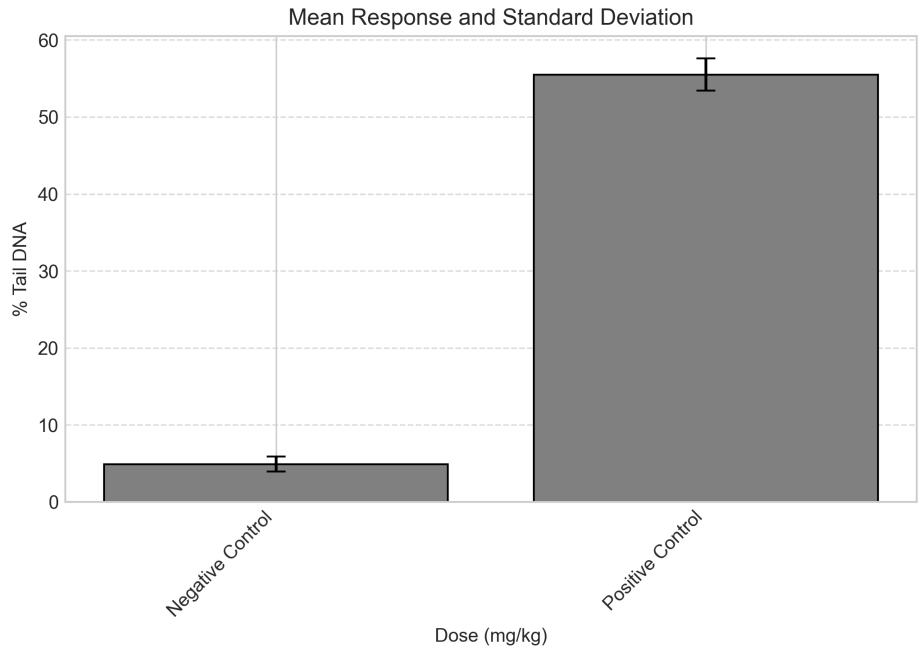

Figure 1. Dose-response trend for % Tail DNA. Bars represent the mean and Standard Deviation (SD).

Analyst: ToxGenie