

Supplementary Text S1. Standardized Prompt Used for LLM-Based Plate Effect Assessment

Attached is an Excel file containing 4 sheets, each representing luminescence measurements from a 96-well microtiter plate. All wells contain identical samples at EC50 concentration.

Objective: Assess whether any plate effects are present in the assay.

Preprocessing Step:

- Calculate the average signal per well across all 4 plates and include this as a fifth dataset for comparative analysis.

Analysis to perform (for each individual plate and the averaged plate):

1. **ANOVA** to detect row-wise effects.
2. **ANOVA** to detect column-wise effects.
3. **Signal heatmap** visualization for spatial distribution.
4. **Comparison of average signal with 95% confidence intervals** for the following subsets:
 - Row A
 - Row H
 - Column 1
 - Column 12
 - All 96 wells
 - Only interior wells (excluding outer rows and columns)
5. **Z-score analysis** across wells.
6. **Spatial analysis** to identify any systematic spatial patterns or anomalies.

Please ensure all analyses are performed separately for each plate and for the averaged dataset.

If code is generated, it must be written in R, not Python.