**fitLED**

A function for performing curve fitting to estimate lethal fraction (LF) kinetics

**Data Preparation**

* This function fits lethal fraction (LF) data over time at a given concentration to the lag exponential death model (LED) to quantify cell death kinetics (see Forcina et al. *Cell Systems*)
* Make sure the ‘fitLED.m’ and ‘fitflat.m’ functions are in the same file directory (generally the current file path).
* LF can be calculated by dividing the number of dead cells by the number of total cells in a given treatment condition
* Dead cell numbers are over time are determined using SYTOX fluorescence values quantified using a fluorescence plate reader
* Total cell numbers over time are determined using the fitGrowth function.
* Time points do not need to be in a sequential order and replicates do not need to be averaged

**fitLED structure**

fitLED(time,y\_norm)

time – time points (in hours) for LF measurements in a column vector

y\_norm – calculated LF that correspond to time points in ‘time’ in a column vector for a single concentration

**Running fitLED**

* Generate ‘time’ and ‘LF’ variables as described in fitLED structure.
* To run the supplied example data (README-fitLED\_Ex.mat):

load README-fitGrowth\_Ex.mat;

* Quantification of cell death kinetics is achieved by fitting LF data over time to the LED model using the function fitLED:

[fitresult, header] = fitLED(time,LF)

* fitLED requires a column vector of time points and a column vector of corresponding LF values. Each row can be a different time point or replicate. fitLED returns the fitting results (fitresult) and the description of each column in fitresult (header)

A screenshot of a computer

Description automatically generated

Example output from fitLED

* scatter\_LF – contains the original data sent to fitLED (time,LF)
* plot\_LED – model predictions from LED fitting. First column is time and second column is predicted LF values
* y0 – baseline value (model parameter)
* D0 – onset time (model parameter)
* Dr – maximal rate of death (model parameter)
* Plateau – Maximal LF value (model parameter)
* AUC – Area under the LF curve
* Fit-type – model descriptor (LED or flat)