

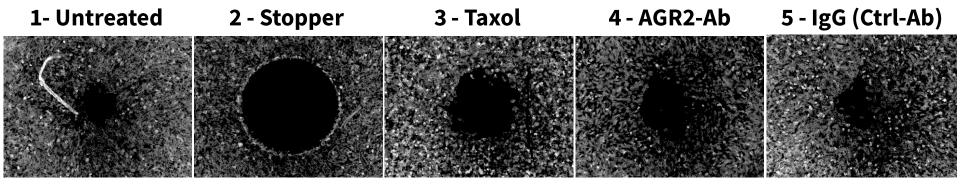
Nonlinear parameter estimation to quantify cellular phenotype

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Motivation





We must advance cancer research from qualitative observations to quantitative conclusions

User friendly

Thus, need tools for phenotype quantification in cancer biology

Examples of data available



SOP: Thawing, Propagating and Cryopreserving of NCI-PBCF-HTB22 (MCF-7)

APPENDIX 2: GROWTH PROFILE OF NCI-PBCF-HTB22 (MCF-7) CELLS

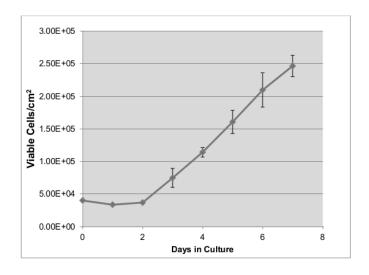


Figure 4: Growth curve for MCF-7 cells; cells were plated at 4 x 10⁴ viable cells/cm²; population doubling time (PDT) is approximately 38 h.

Growth curves from papers

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Plate2_YPFruc - Copy - Notepad
File Edit Format View Help
[config file info]
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[Run Parameters]
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user = "manu t"
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Plate Type = "NUN96ft.pdf"
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Save Mix Labware = "save mix pos use deck map"
Save Mix Reps = "0"
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Absorption_Max = ".3"
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```

High Content Screening Microscope outputs

What can we do with these data?



1- Record and share it

→ MultiCellDS.org

Multicellular Data Standard

2- Quantify key elements of cell phenotype

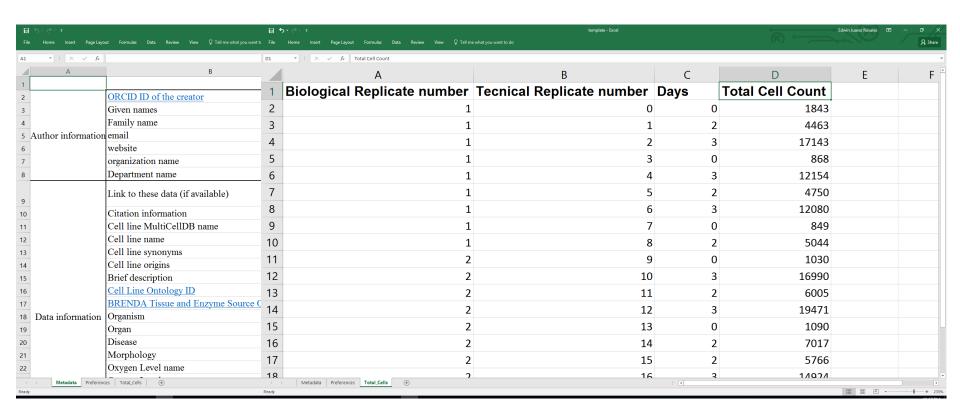
→ CellPD.MathCancer.org

Cell Phenotype Digitizer

Sample inputs from CellPD

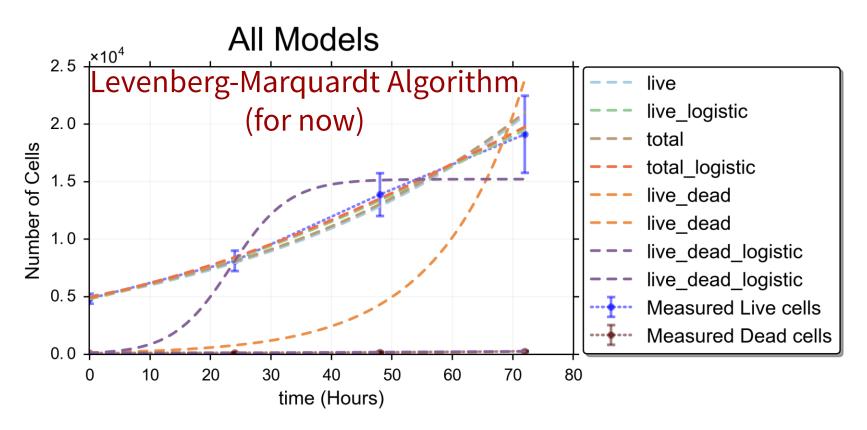


To be user friendly: CellPD requires one excel file as its only input



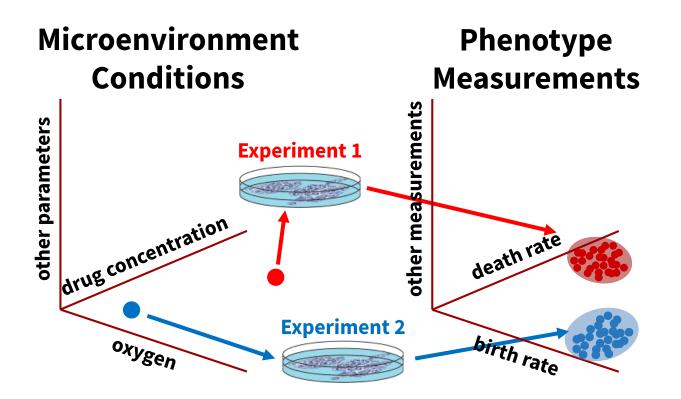
Sample outputs from CellPD





Fit a few basic models to live & dead cell counts → extract relevant parameters

What else can we use CellPD for? Drug classification



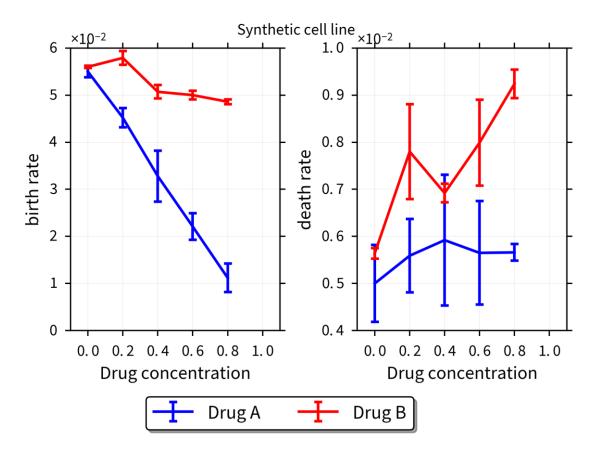
Next:

Let's quantify the effects of two synthetic drugs



Synthetic data analyses





CellPD accurately discerns between a cytostatic drug and a cytotoxic drug



CellPD brings nonlinear parameter estimation to the hands of biologists

Open source: CellPD.MathCancer.org

