

Statistical Analysis of Cell Population Data

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Abstract: Characterizing a population of cells in culture is an important problem in cell standards development. Cell population data can easily be obtained from flow cytometry and automated microscopy. Distribution models can be useful tools for interpreting cell population data and, in principle, should capture both the cell-to-cell variability as well as satisfy the stationarity property for continuously cultured cells. M. Halter et al (2009, J. Theo. Biology **257**, pp.124-130) developed a cell volume distribution model for flow cytometry data which relates to parameters of cell growth rates and division times. The accompanying R package *cellVolumeDist* released by K.M. Mullen et al (2009) in cran.r-project.org contains more efficient statistical fitting methods for fitting parametric multinomial distribution data. Following single cells in time by live cell microscopy can provide insight into the biological variability exhibited by cellular populations, though, reliable cell cycle dependent data is experimentally challenging to acquire. The goal of this talk is to discuss analysis of green fluorescence protein data from live cell images and development of cell population models to facilitate understanding of promoter mechanisms in cell production processes.