

How to optimize your research budget using live-cell imaging?

Introduction

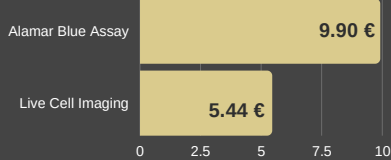
Metabolic activity of cells is often used as a measure for cell viability. However, the major downside of metabolic activity assays (e.g. Alamar Blue assay) is that they are endpoint measurements. Thus, the number of samples needs to be increased to repeat the assay several times. Using non-invasive automated confluence measurements, the same samples can be followed over time, which results in more accurate data with less samples and resources.

Case example

A scientist investigates the effect of the Thapsigargin on cell viability over time using a dose-response experiment containing 96 samples per timepoint. The goal is to determine the viability every 3 h for 24 h leading to 8 timepoints in total. Below, we compare the costs of the Alamar Blue assay with bright-field confluence measurements*. The calculations are based on the culture of C6 cells, the calculations could differ when using different cells.

Step 1: Expansion

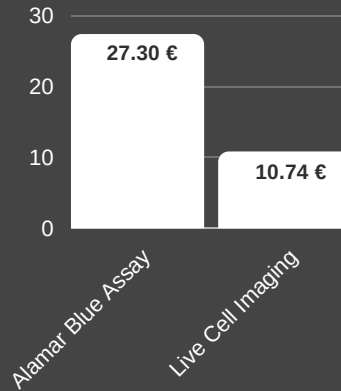
Consumables (pipets, flasks, etc.)



Media (medium, PBS, trypsin)



Total cost



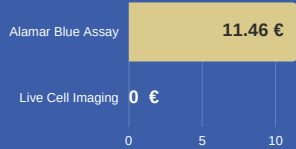
60%

Live-cell imaging can save up to 60 % of your budget in consumables and media.

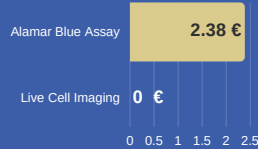
Step 2: Optimization

The incubation time of alamar blue needs to be optimized for each cell type.

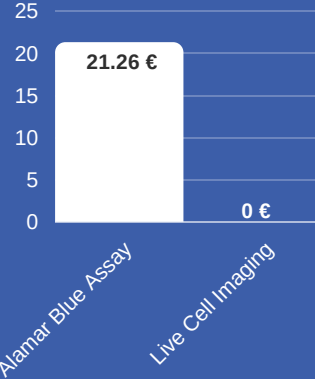
Expansion (media & consumables)



Media

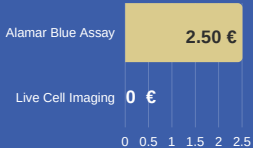


Total cost

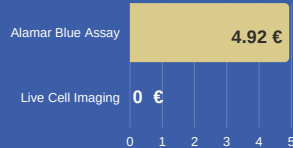


Live-cell imaging allows researchers save money on experiment's optimization.

Consumables



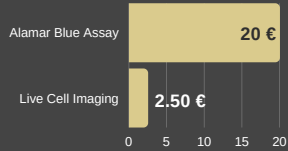
Alamar Blue



Step 3: Experiment

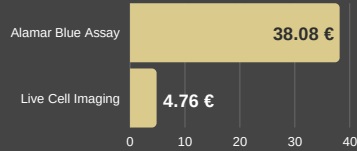
Consumables

96-well plates

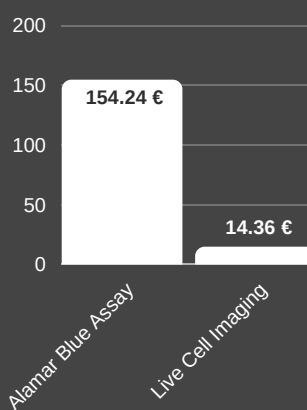


Media

2 x 9.6 ml medium per well plate



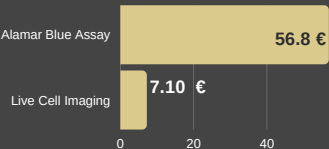
Total cost



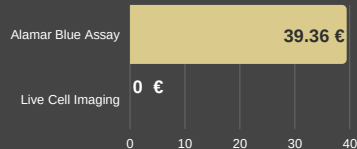
90%

Live-cell imaging can save up to 90 % of your budget in running the metabolic activity assay.

Drug (2 µl Thapsigargin per plate)



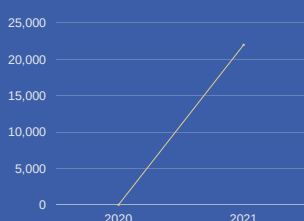
Alamar Blue reagent



Results



Live-cell imaging experiments can be 8x more inexpensive than metabolic activity assays.



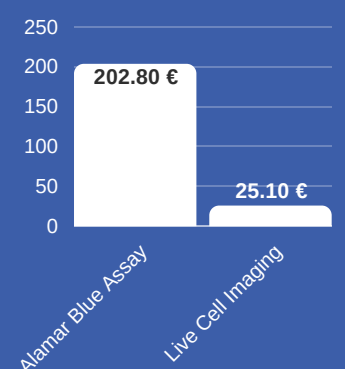
Lab can save up to €22,000 a year in consumables, reagents and drugs.

In total you could save approx €178 in costs per cell viability experiment. In case this experiment is performed regularly in a research facility, e.g. 3 times per week for 40 weeks a year, the lab can save up to approximately €22,000 a year in consumables, reagents and drugs.



Difference in the amount of consumables, media and drugs necessary for the Alamar blue assay (left) and confluence measurements (right).

Total cost of this experiment



*For this case study the CytoSMART® Omni live-cell imager was used.