

# Measuring Growth of S. Cerevisiae in Yeast Extract Peptone Dextrose

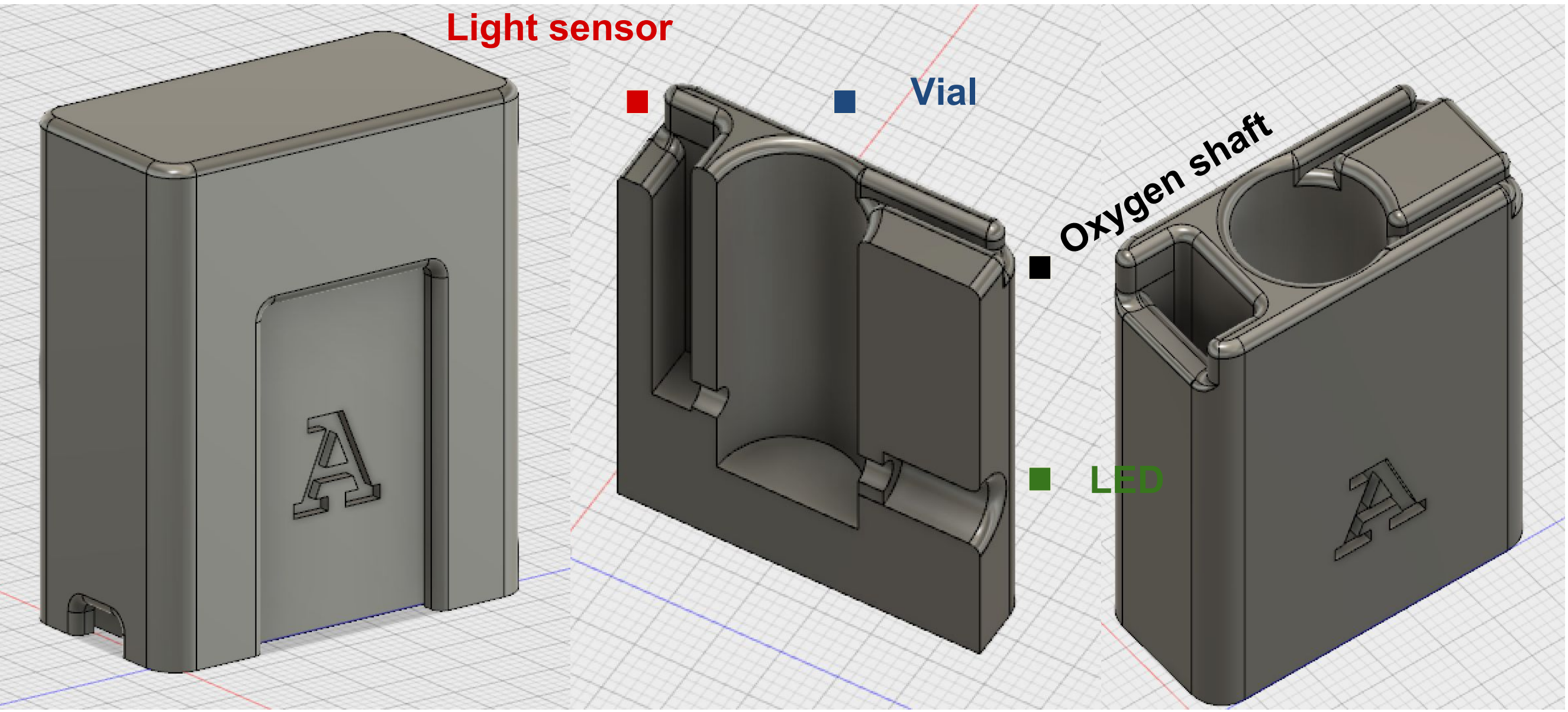
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## Introduction

- S. cerevisiae grows when it has the appropriate resources, such as glucose, YEPD and Bacto Peptone.
- Measuring with Spectrophotometer
- Our aim was to build a mini spectrophotometer that can analyze yeast growth
- In order to prove that our device is measuring cell density we compared the results of its readings on various yeast samples with readings from the Spectrophotometer.

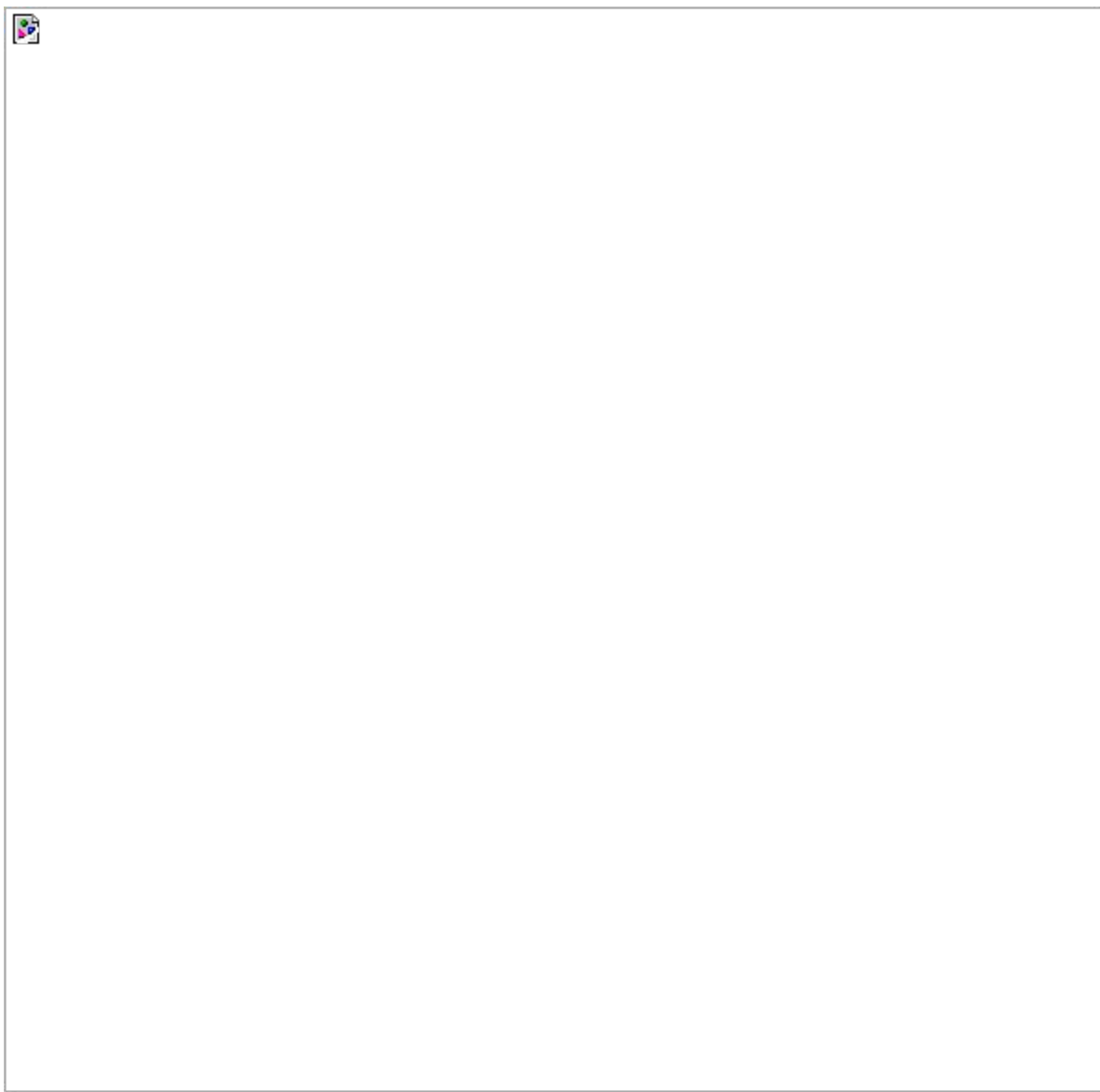
## Design

Simplicity is not just the absence of clutter; it is to bring order to complexity. When designing our device, we wanted to make it both functional and elegant, aiming for a simple design.



## The Pyboard

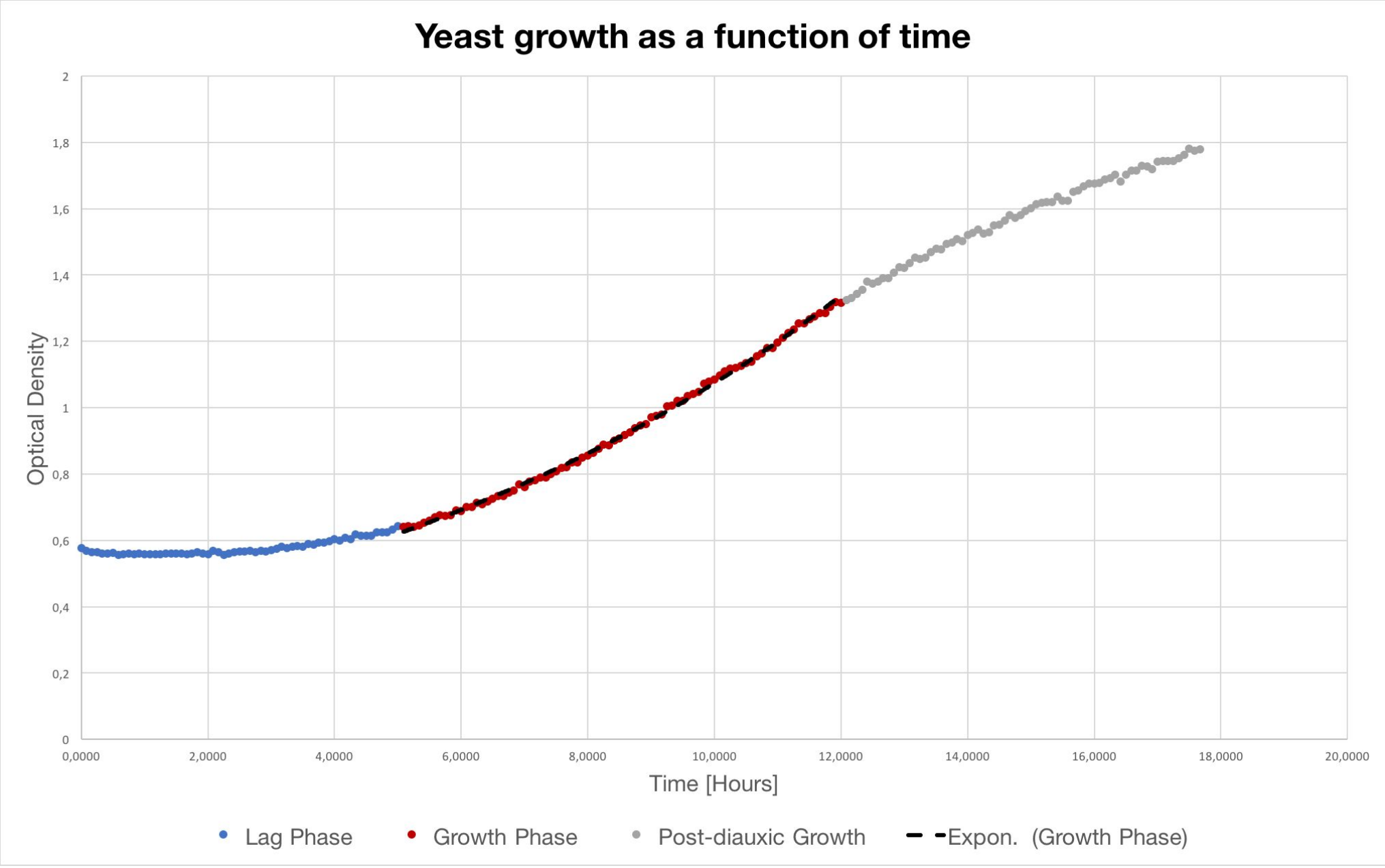
The output was voltage from the light sensor, and voltage from the thermistor



## Conclusion

After doing our experiment we reached our goal of tracking the growth of S. Cerevisiae, but with some degree of uncertainty. We got a doubling time of roughly 6 hours, which we could increase by manipulating the temperature, pH and glucose levels of the media, in a future experiment.

## Data



- The lag phase, which is a little time span in the beginning of the experiment, where the cells are not reproducing exponentially yet.
- During the growth phase the cell population is growing exponentially with a doubling time of roughly 6 hours. During the exponential growth phase, the cells are consuming the glucose present in the media to grow.
- Once they run out of this, we enter the post-diauxic phase, where the growth rate of the yeast cells slowly goes down.

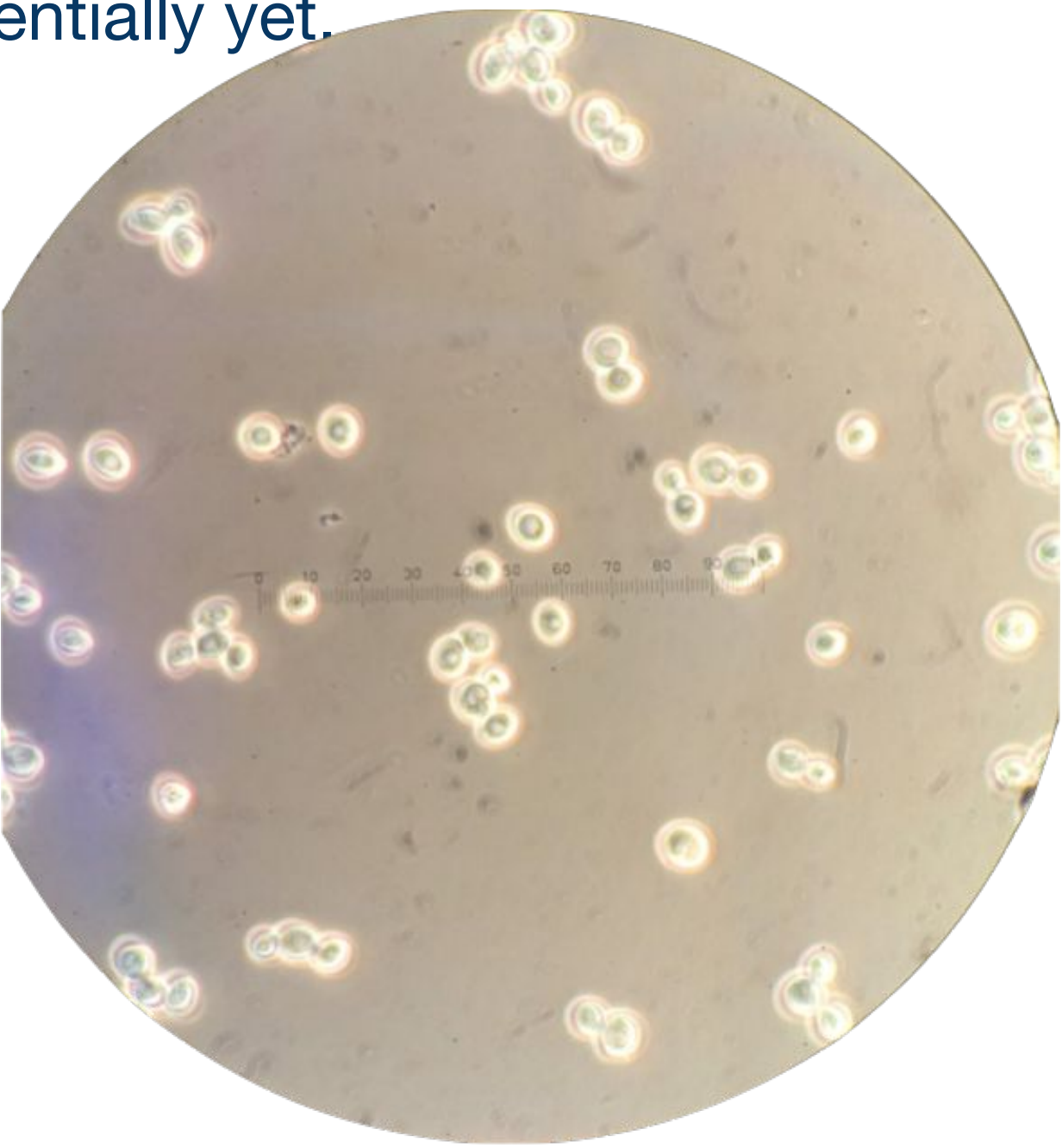


Figure: Post - Diauxic growth

## Increasing precision

To increase the precision of our devices' measurements we made several dilution series and plotted the OD measurements from our device and from the spectrophotometer against each other, so we could find a correlation between the two, and account for that.

