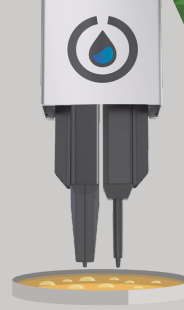




SYNTEX



Colony Picking Project

A Collaboration with iGEM Marburg

Greetings fellow iGEMers!

We are more than happy that you found your way to our official collaboration PDF. You probably wonder what all of this is about and can most likely imagine in what direction we are steering by just looking at the title. So let me explain to you, what we planned here:

Have you ever imagined not having to do your tedious lab work? Being able to outsource it somehow, so you can focus on other (important) tasks? Well, we did! And in recent years automated lab processes have gone a long way, but the problem is, that mostly it is still really expensive - and that's why all of us love Opentrons so much!

Our contribution to this awesome Opentrons Community will be a colony picking bot, or, more precisely, modules and scripts, that allow others - just like you! - to turn their own OT-2 into a colony picking bot.

To achieve this goal we need all the help we can get. We need to feed the artificial intelligence we are currently building with lots and lots of data, so that it is able to recognize the colonies by itself. And this is where you come into play: As most of you are probably working with *E. Coli* in the lab it would be **awesome** if you could provide us with pictures of your agar plates (with colonies on them of course)!

What's in for you, you ask? Well, of course we will publish every script, code and module we create, but if that's not enough for you, don't worry - we got some prizes! The first ten teams that send us 100 pictures will get some small surprise and the team which sends us the most pictures until 31st of July will get... well, a bigger surprise! And of course the pictures should actually be usable and not just something you took really fast just to get more. We have put together some instructions on these next couple of pages that will guide you step by step to the perfectly usable pictures we need!

Thank you so much for participating and helping us out, it really means a lot!

Much love from Marburg,
your SYNTEX Team.

Plate criteria:

- 1.) Colonies should be evenly distributed, easily distinguishable and not clump together
- 2.) There shouldn't be too many colonies, so no lawns please.
- 3.) It should be *E. Coli* colonies, nothing else for the beginning (also no colour/fluorescence expressing colonies like GFP / mCherry etc. pls)
- 4.) Use standard 9cm petri dishes with no labeling.
- 5.) Make sure to use LB Medium only! Colonies should be a little bit bigger than normal.



igem.marburg.2019



@GEMmarburg2019

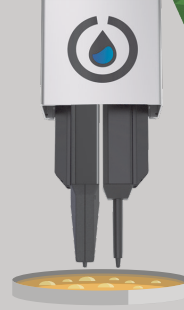


@GEMMarburg2019





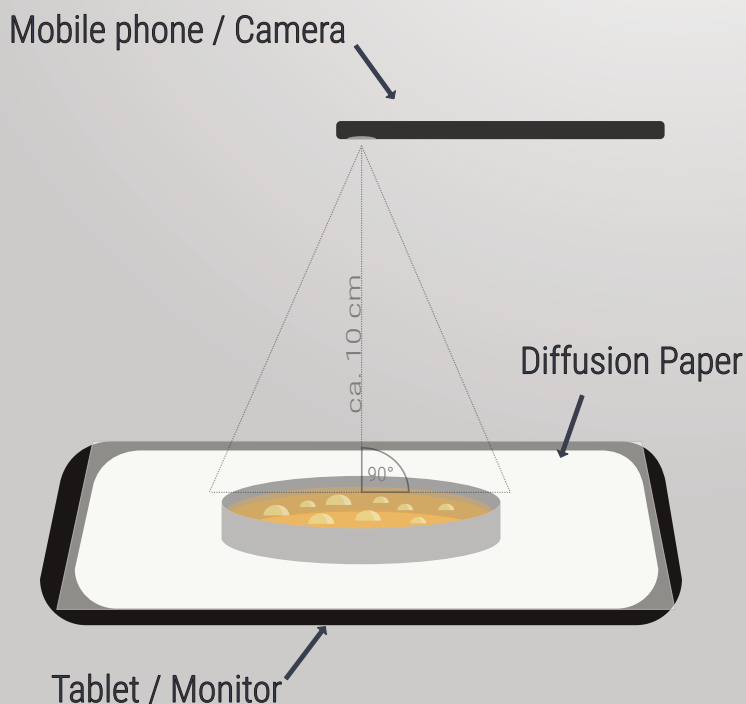
YNTEX



First Step: Taking the Picture

- 1.) Set a monitor/tablet to the highest brightness level. Make sure the screen displays a completely white image. Now please put the transparent paper we sent you on top of the monitor. Lastly put the agar plate on top of the paper and remove the lid.
- 2.) Take a camera that should have **at least** 12 megapixels. It doesn't matter if it's a mobile phone or an SLR camera. We would be more than happy if you could take the pictures in raw format.
- 3.) Please make sure not to use a fisheye or any other lens that could distort the picture.
- 4.) The image should be taken as close as possible to the agar plate so the boundary is still visible. **DO NOT** use the zoom function!
- 5.) It is important that the image is as sharp as possible, so avoid unfocused or blurred images.
- 6.) The plate should be evenly exposed. Avoid light reflections from any other sources. **DO NOT** use the flashlight. (You can also take the pictures in a dark room)
- 7.) No objects other than the agar plate should be visible.
- 8.) The image should now be taken directly from above at a 90 degree angle.

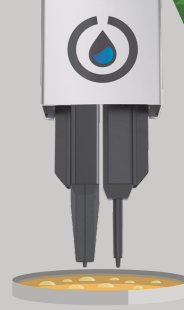
If the above criteria are met and you have a good picture you can go on to the second step.



An example of a colony picture



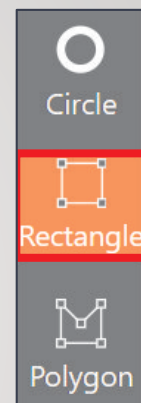
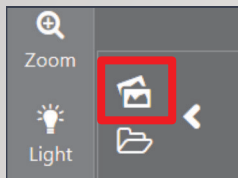
YNTEX



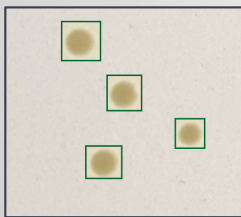
Second Step: Image Labeling

Now the bacteria colonies on the pictures can be marked using a web based tool.
A working example of the tool is as follows:

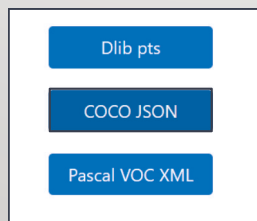
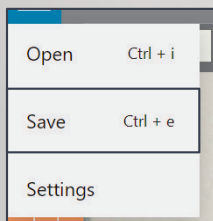
- 1.) Go to the weblink <https://www.vinca.de/igem/label/>
-> **optional:** If you took a picture in raw format, make sure to convert it into a jpeg file for the labeling process (**please** keep the raw file).
- 2.) Upload your colony plate picture that you took in the first step.



- 3.) Choose the rectangle option on the very left side of the website.
- 4.) Mark **single (no overlapping)** colonies with rectangles.
Make sure the whole colony is selected.
Just to be sure include some agar around the colony.



- 5.) Finally once done, save your picture and export the result as a .json file.
The .json file's name should be identical to that of the picture.



- 6.) Finally the pictures (raw and jpeg) as well as the corresponding .json file should be uploaded in a new folder inside the google drive folder that was sent to you.
If you're done, please fill out the following form with your metadata:
<https://tinyurl.com/collabform19>

Thank you very much for participating in our collaboration project!

The winners of the giveaway will be announced after the 31st of July!
Prepare yourselves, prices are coming!