**Setting up a single material bioprint**

* Things you need to setup a single material bioprint
  + Simplify3D
  + Slicing profile matching the syringe and needle used in the print
  + STL-file of the object to be printed
  + Python3 installed - https://www.python.org/downloads/release/python-3103/

1. Start Simplify3D, go to Tools 🡪 Options 🡪 Machine. Click on Add under “Printer model” and select the file suitable file for your plate insert. This will give you a view of how the print bed is looking and allows you to place the model in the well you wish to print in.
2. Import your STL into Simplify3D. The file will be dropped into the model of the print platform. Orient it appropriately, position the part in the well you want to print in.
3. Select the printing profile and adjust settings such as layer height, nozzle diameter. Make sure that your desired tool is selected in the “Extrusion”-tab of Simplify3D.
4. Generate the g-code file and export it.
5. The following procedure can be done in several ways. Since we are printing into a well, we need to make sure that the tool is located correctly in the XY-plane BEFORE moving to the Z=0 position.
   1. Place the g.code file you generated from Simplify3D in the same folder as the supplied python program. The executable file can be downloaded from U-PRINTs Github page. Run the program and follow the instruction in the terminal. it will generate a new g-code-file as well as a picture of what wells will be printed into. Upload the newly generated g-code file to Duet Web Control (DWC).
6. Upload you gcode file to DWC via the “Files”-tab.
7. Prepare your syringe with bioink and attach it to the tool you are planning to use. If the plunger of the syringe does not fit, go into DWC and run the macro “Tx – Select” and manually move the plunger until the syringe and syringe holder fits. Then run “Tx – Deselect”
8. Now that bioink is loaded and g-code uploaded, its time to tell the printer where to start.
9. Run “Tx – Pickup” and jog the needle to the well you are going to print in. Jog the Z-axis until the needle is sufficiently submerged in the support bath or placed appropriately above the surface you will print on.
10. Run the macro “Zero Z-axis”, followed by T-1 to leave the tool in its dock. Now the printer knows where to start, the only thing we need to do now is to prime the nozzle to make sure that bioink can be extruded.
11. Select the tool you are planning to use with the macro “Tx – Select” then jog the plunger until you see bioink leaving the needle. Deselect the tool with the macro “Tx – Deselect”
12. Now everything should be prepared. To start the print, go to “Jobs” and start the g-code you uploaded earlier.