We succeed in printing a single needle. The needle should achieve the following features:

1. Completely cured but not over-cured
2. Sharp enough to stab into human’s skin
3. Have a printing process finished in at most 10s/layer

Research Objectives

Find the suitable ingredients to make the 3D printing material. As mentioned above, the ingredients should ensure the material is biocompatible and can be polymerized when exposed to ultra-violet.

Methods

We try to find the suitable ingredients by reading research articles. As the article “Photoinitiated polymerization of PEG-diacrylate with lithium phenyl-2,4,6-trimethylbenzophosphinate: polymerization rate and cytocompatibility” suggested, we decided the ingredients of our materials should be PEGDA, Triethanolamine, 1-vinyl-2-pyrrolidinone (0.02756 mM solution), 1x PBS, LAP.

Conclusion & Future Work

1. We succeeded in printing a single needle with the accurate shape.
2. The hardness of the needle can be still improved by adjusting the proportion of PEGDA.
3. We will study how to combine the drugs with the 3D materials in the future.
4. We are going to study Triethanolamine to see the impact of it.