

# MANUFACTURING AND 3D PRINTING

## DISCUSSIONS AND HOW OUR PROJECT CONTRIBUTES TO THIS APPLICATION

We have considered the possibility of using 3D Stereo-Lithography to print 3D structures out of cells. The use of this may be assembling cells that may be genetically engineering to produce a desired product or material. If we can choose the location of cells we have the potential for making structures, but also structures that consists of layers of different cell types.

We considered many different ideas that would allow us to produce 3D structures such as the ones modelled on our [website](#). The method that almost immediately stood out to us was the idea of using 3D Stereo-Lithography to produce our designs.

Fortunately for us, there is a lab that is conducting research in the field of 3D printing in the University of Warwick's School of Engineering. We spoke to Dr Simon Leigh (MSci in Chemistry, PhD in Micro- and Nano-structuring of Surfaces) about the possibility.

Normally this process uses liquefied polymers, which is held in a large, transparent vat. Lasers are then fired at the vat and the nature of the polymer means that it solidifies under these conditions. The process is described in more detail on our 3D Stereo-Lithography page.

Dr Leigh advised that it wasn't feasible to produce a structure like the ones in our models for two main reasons:

1. **Size Scale:** Dr Leigh mentioned that producing structures on a Nano scale would "require equipment that costs around £250,000". With our budgetary constraint it was already apparent that we wouldn't be able to manufacture our structures using this method. The machines available to us are only able to produce structures with dimensions of about 50 microns.
2. **Structural Stability:** Dr Leigh also mentioned that "structures made from DNA will almost certainly not be able to withstand the compressive and tensile forces that they will be subjected to during the manufacturing processes". The DNA in our models have to have very specific shapes so any sort of deformation would render our designs useless.