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APP N04-1: Micro – Design Stage 1

Chip, Chip Holder Design Considerations

- The chip could have two or four channels
    - For simplicity, two channels will allow the easiest tracking and management of the experimental variables
    - Four channels will allow for more simultaneous experiments but will make errors more probable.
- The chip could be shaped in a curved or straight-line fashion
    - Curved lines could allow for more distance to be traveled, but will likely distort the rate of flow so that certain areas of yeast a==]re exposed to a higher volume of water
- The chip should have round holes to allow for the greatest compatibility to accept tubes carrying the transfer liquids.
- The chip should be square and the chip holder should be a larger square. The chip holder should be wider and longer (not necessarily thicker) than the chip so that it could be sandwiched between the top and a corresponding bottom.
- The overall shape of the chip holder will be square. The chip top and bottom will both be square and will sandwich the chip in between them.

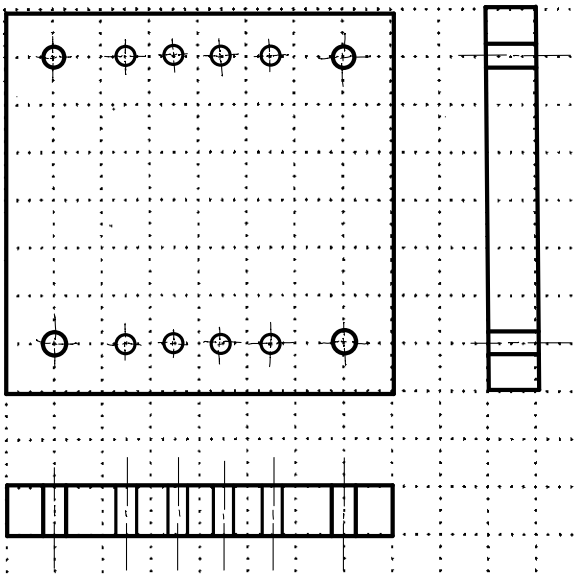
Channel Design Considerations

- The chip will have two to four holes at each end of the top face. The chip top and bottom will have these holes drilled through as well.
- The channel should be rectangular with a width of 250-350 micrometers and a height of 200-250 micrometers. The length will likely be between 1.5 and 2.5 inches.
- The team should take several aspects of LOC design into account during this process, including ease of manufacturing, type of flow induced, and ability to replicate experiments. The channels need to be easy to manufacture and should produce a type of flow that is easy to quantify mathematically, to reduce possibility for error. Moreover, the chips should be designed for durability so that they can be used over and over again.

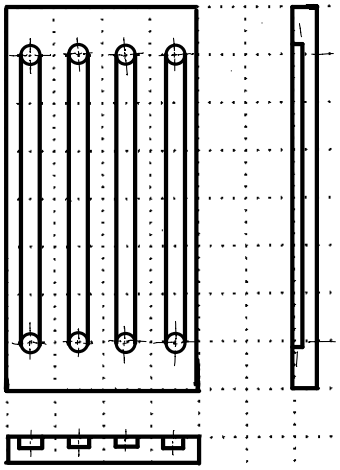
Testing Methodology

- The yeast adhesion in the chip can be tested with:
    - Different pH levels of trasnfer liquids
    - Presence of electrostatic / electric charge in liquid
    - Presence of surfactant in liquids
    - Change in viscosity of liquids
    - Change in temperature of liquids
    - Presence of fungi, mold spores in liquids

CHIP HOLDER TOP & BOTTOM



CHIP TOP & BOTTOM



The Ohio State University First Year Engineering	Dwg. Title: Nanotech Assignment		Dwg. No.: 1
	Scale:	Inst.: Parke	Hour: 12:40
Drawn By: Sean Sullivan		Units:	Date: 2-14-20