

## Introduction

### What is microneedle patch?

This is a patch which has needles in micron scale. Those needles contain drug and they transfer the drug by dissolving under the layers of skin.

### Advantages of Microneedle Patch

Considering the alternative ways for drug transmission such as syringes, topical creams and pills :

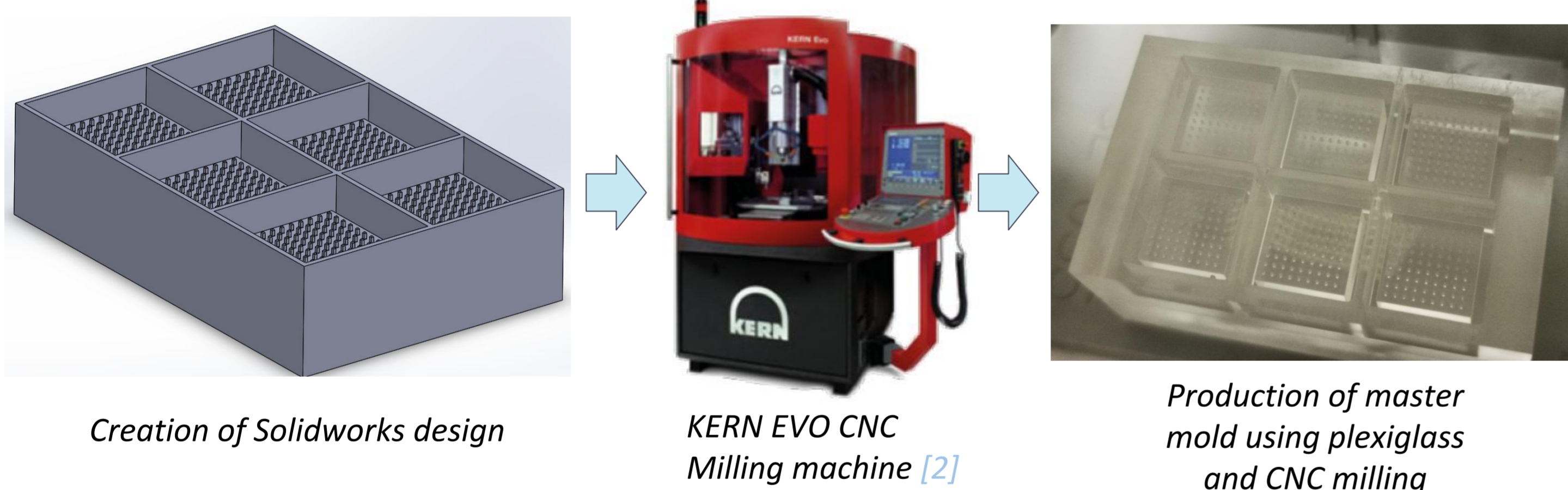
- Healthier
  - preclude needle stick injuries
  - rule out the need for the cold chain
- More effective even in small dosage
- Can be also used for local drug delivery

## Aim of the Study

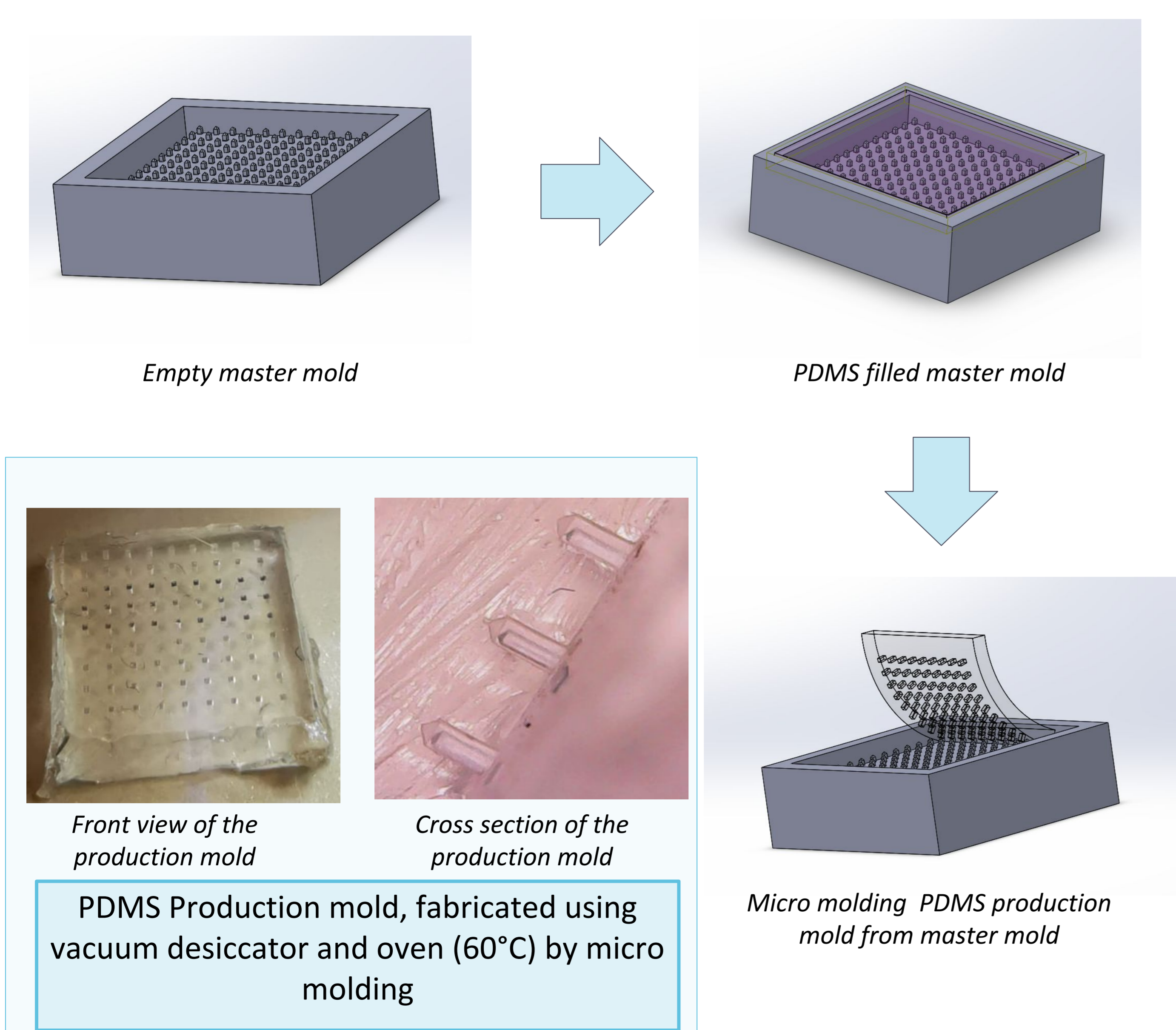
To fabricate a dissolvable microneedle patch considering the production cost, effort and effectiveness.

## Materials & Methodology

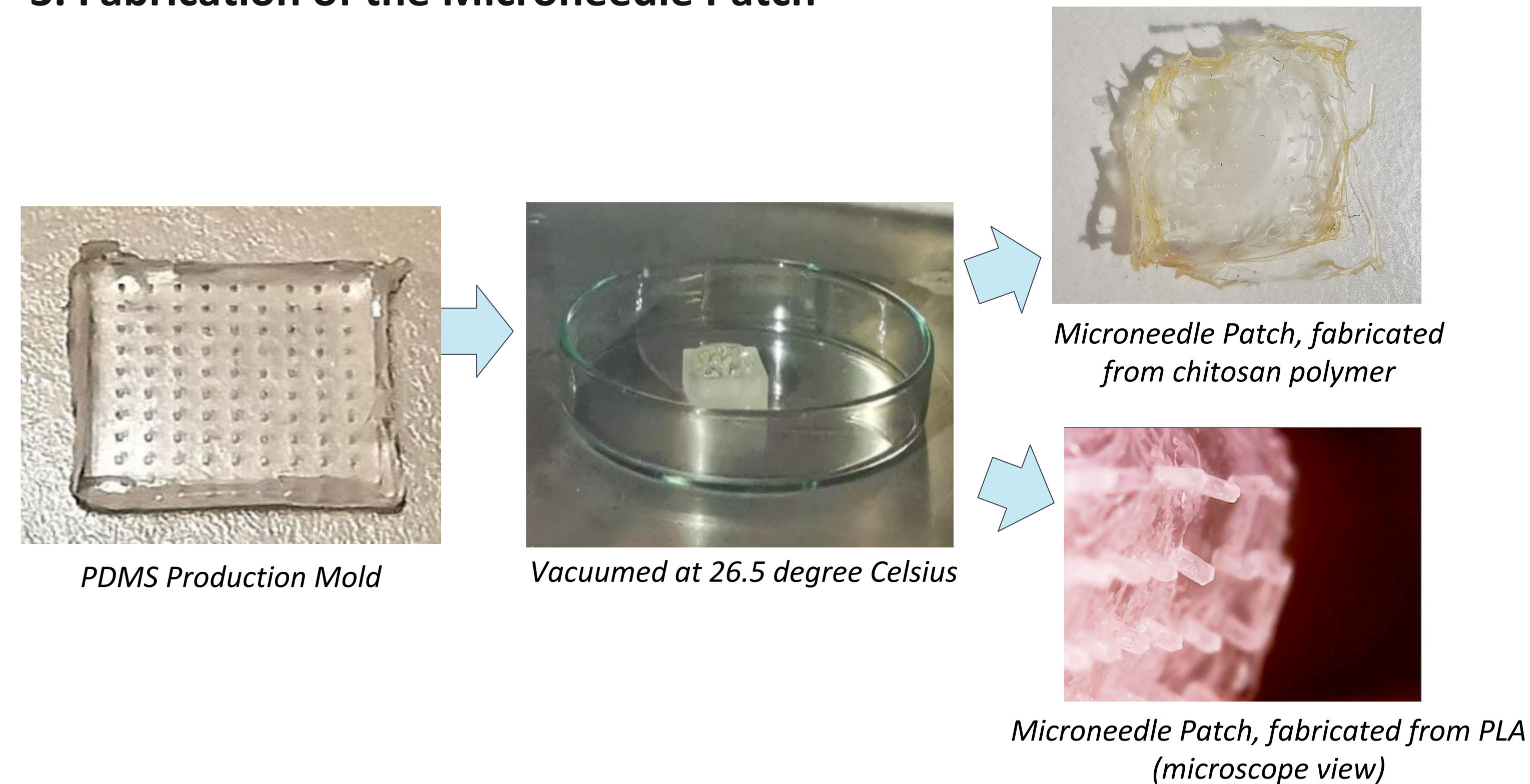
### 1. Micromilling of Mastermold



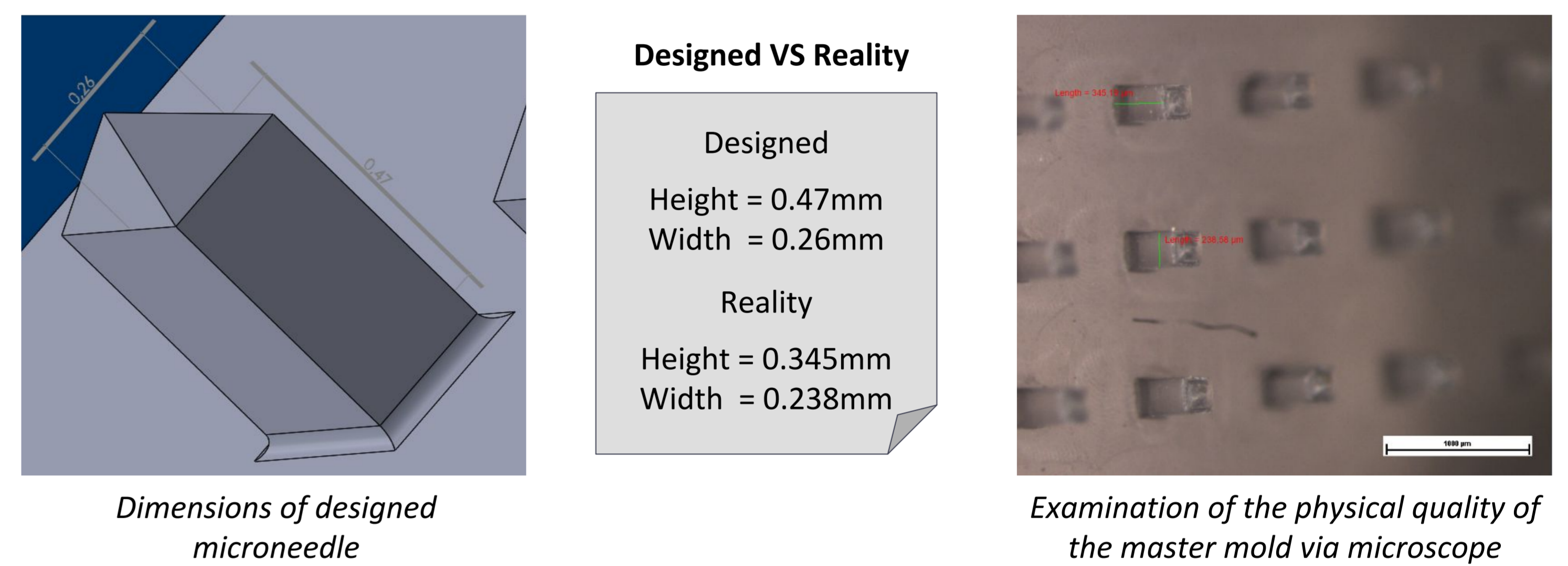
### 2. Fabrication of the Production Mold



### 3. Fabrication of the Microneedle Patch



## Results



## Discussions

- Dimension difference can be caused by
  - Manufacturing errors
  - Measurement errors
- Master Mold is not suitable for PDMS production mold
  - hard to take out PDMS from small gaps
  - need for bigger gaps on the master mold
  - need for mold holder for first female molds
- New polymers should be tested
  - Chitosan solution and master mold should be modified.



## Conclusions

### Work done:

- Literature review
- Design of the master mold
- Manufactured the plexiglass master mold by micromilling
- Fabricated the production mold by micromolding with PDMS using vacuum desiccator and oven
- Design of the parts which will be used in fabrication of the microneedle patches
- New master mold design

### Future Work:

- Fabrication of microneedle patches from CMC hydrogel
- Clinical Trials

## References

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