

The background is a dark, abstract composition with a gradient of deep blue and purple. On the left side, there is a curved, textured element that resembles a close-up of a woven mesh or a biological structure, illuminated with a warm, orange-gold light. A large, solid white rectangle is positioned in the center of the image, serving as a backdrop for the text.

# Microfluidic Chips

Research

# Microfluidic Chips

## in biological research and medical diagnostics

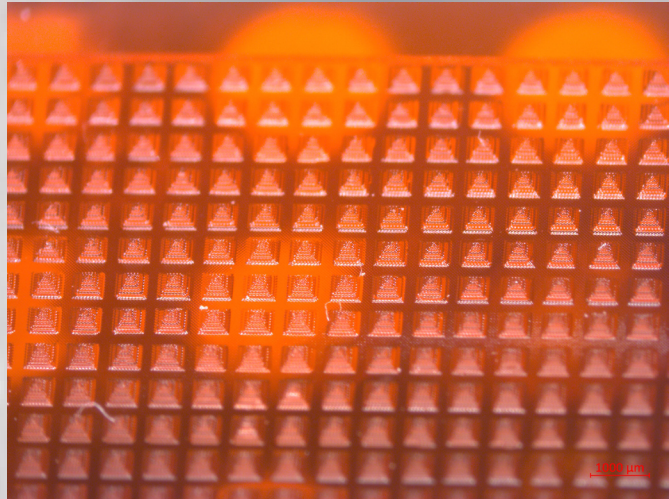
Microfluidics is both the science which studies the behaviour of fluids through microchannels, and the technology of manufacturing micro-miniaturized devices containing chambers and tunnels through which fluids flow or are confined. In biological research and medical diagnostics, an increasing number of microfluidic chips with microchannels are used in order to direct, mix, separate or manipulate fluids to attain multiplexing, automation, and high-throughput systems.

### Production of microfluidic chips

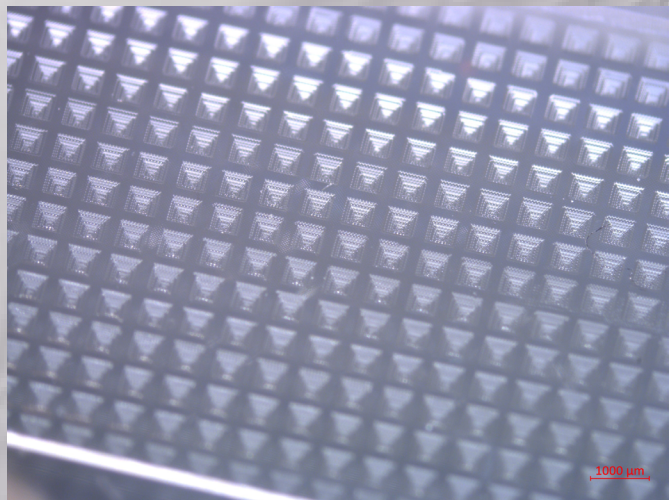
In the field of microfluidic research and development, mostly silicon microfluidic chips (PDMS) are used. For this purpose, molds are produced by means of mask-based lithographic processes. The molds are casted with silicone and the silicone parts applied to glass supports.

### 3D printing as a promising alternative

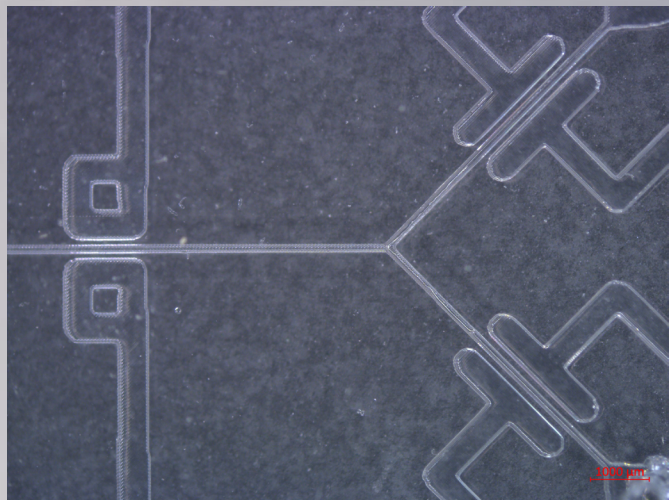
3D printing as a production method for molds is very interesting, since it is possible to produce complex 2.5D structures such as pyramidal-structural elements or channels with large height-to-width ratios. For microchannels larger than 120  $\mu\text{m}$  (x/y, 3 pixels), the use of SolFlex 3D 3D printers is a very promising alternative to the conventional production method.



3D-printed part



Silicone chip



Fluidic channels