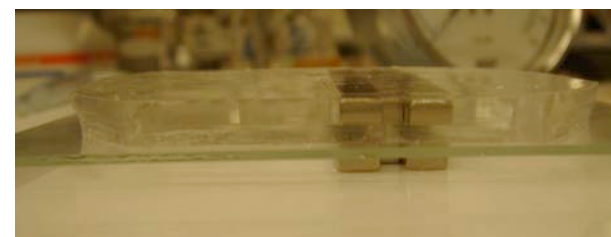
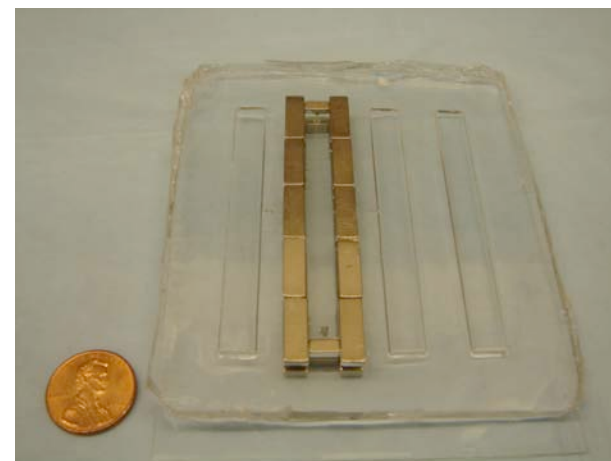


Developing magnetic alternatives for binding gels to glass for microfluidic applications

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Microfluidics is a newly emerging and developing field with great potential in the widely interdisciplinary realm of biotechnology. Referred to as “labs-on-a-chip,” microfluidic devices consist of miniaturized networks of microchannels, valves, and sensors, and are used to model chemical and biological processes. These devices are being used in the rapid screening for new drugs, patient monitoring, and drug delivery. In addition, droplet-based devices can be used to encapsulate, screen, sort, and manipulate single cells. The most widely used material to construct such microfluidic devices is poly(dimethyl siloxane) (PDMS), an elastic gel. Channels are molded into the bottom of the gel, and it is bound to a glass surface. Traditionally, this binding is done by an irreversible and imperfect process called plasma oxidation. We present an alternative method of securing the gel to glass via magnets. This reversible method allows devices to be taken apart easily, cleaned, and reconstructed in perhaps a different manner. The magnet method is also more versatile as it can be used for a variety of different materials and gels. Hopefully, this new technique can be used to further the remarkable advances being made in the field of microfluidics.



Top: Magnets surrounding a large straight rectangular channel

Bottom: Magnets embedded in the PDMS to provide additional stabilization

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