



## Variable-Focus Lens Assembly

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Inventors: Hongrui Jiang, Abhishek Agarwal, Liang Dong, David Beebe

**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an improved method of making microlenses with adjustable focal lengths.**

### Overview

One component of lab-on-a-chip technology is on-chip microlenses for optical analysis. Prior investigators have demonstrated tiny optical lenses with variable focal lengths. These lenses use specialized fluids that exhibit electrowetting, where the application of an electric field alters the surface tension of the liquid.

### The Invention

UW-Madison researchers have developed an alternative means of making microlenses with adjustable focal lengths. In this method, many fluids may be used for the lens. Responsive hydrogel structures create the tube in which the lens fluid sits. Alternatively, the hydrogel can be coupled to a transparent thin film that will act as the lens. When an environmental parameter, such as temperature or pH, changes, it causes the hydrogel to swell or contract. This in turn causes a change in the focal length of the lens.

### Applications

- Microlenses for optical analysis

### Key Benefits

- Hydrogels are versatile and can be chemically tuned to be responsive to many environmental parameters in addition to electric field.
- Improves flexibility in the design and operation of tunable microlenses in different applications
- Makes possible self-adaptive microlenses
- Compact and easily fabricated
- Many fluids may be used as the lens

### Additional Information

#### For More Information About the Inventors

- [Hongrui Jiang](#)
- [David Beebe](#)

#### Related Intellectual Property

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Tech Fields

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| [info@warf.org](mailto:info@warf.org) | 608.960.9850

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