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Suspended microchannel resonators for biomolecular detection

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Our research focuses on using silicon microfabrication to develop quantitative, high throughput and real-time techniques for measuring biomolecular interactions. Over the last two years, we have developed a new detection method where specific biomolecules adsorb to the walls of a suspended microchannel resonator and thereby lower its resonant frequency. Confining the fluid to the inside of the resonator significantly increases sensitivity by eliminating high damping and viscous drag. It also enables direct integration with conventional microfluidic systems and allows the resonator to be actuated by electrostatic forces. In this presentation, I will introduce the resonator, show recent progress towards achieving its fundamental limit of detection, and discuss applications for real-time biomolecular detection.