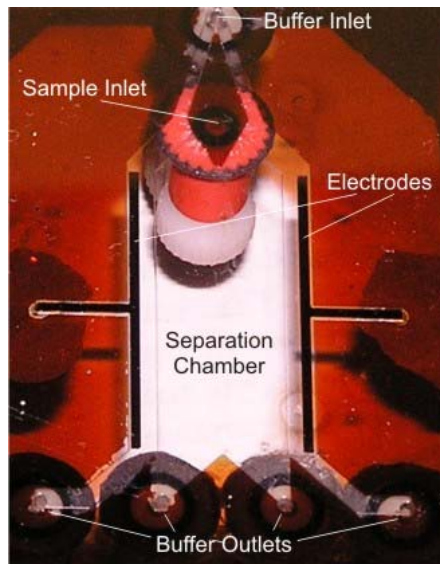


# Microfluidic Devices for Bioanalysis

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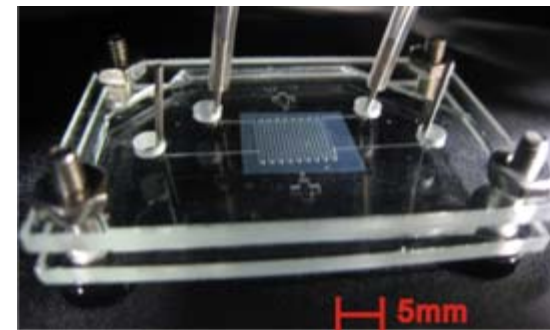
## ● DESCRIPTION OF WORK

- ◆ Developing online Micro Free Flow Electrophoresis separations
- ◆ Measuring single enzyme kinetics using microwell arrays
- ◆ Designing new microscale pumping methods
- ◆ Studying counter flow extraction devices for DNA purification



## ● MAJOR OBSERVATIONS

- ◆  $\mu$ FEE separations are useful for continuous monitoring or microscale preparative separations
- ◆ Developed a piezoelectrically actuated micropump capable of flow rates as low as 30-200 nL/min.
- ◆ Detected individual enzyme molecules in microwell arrays



## ● Publications

- ◆ Vratislav Kostal, Bryan R. Fonslow, Edgar A. Arriaga and Michael T. Bowser. "Fast Determination of Mitochondria Electrophoretic Mobility Using Micro-Free Flow Electrophoresis" *Anal. Chem.*, **81**, 9267-9273 (2009).
- ◆ Ryan T. Turgeon and Michael T. Bowser. "Micro Free Flow Electrophoresis: Theory and Applications" *Analytical and Bioanalytical Chemistry*, **394**, 187-198 (2009).
- ◆ Ryan T. Turgeon and Michael T. Bowser. "Improving Sensitivity in Micro-Free Flow Electrophoresis Using Signal Averaging" *Electrophoresis*, **30**, 1342-1348 (2009).