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Microcantilever Biosensors

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Micromachined cantilever beams respond to molecular adsorption by with mechanical bending. For small concentrations, the bending signal is directly proportional the surface concentration of adsorbed molecules. Selectivity in detection is accomplished by immobilizing specific receptors on one of the surfaces of the cantilever. We have developed microcantilever arrays for multiplexed, label-free detection of biomolecules. Piezoresistive readout of cantilever bending offers a simple method of signal transduction that is compatible with microfabrication. Although the microcantilever-based biosensing appears to high sensitivity and selectivity, reproducibility of the technique appears to be a challenge. We have developed a novel method of immobilizing receptors that increases the reproducibility. We have demonstrated simultaneous detection of cancer and cardiac markers using cantilever arrays with immobilized receptors. We will also discuss a receptor-free mode of achieving selectivity.