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Apparatus for High Throughput Detection of Small Molecules

Detection of molecules is used in many applications ranging from detection of biomarkers to DNA sequencing. The most widely used method is based on fluorescence detection. Although extremely useful, there are several expensive and bulky drawbacks, such as UV light and highly sensitive optical detectors to detect the weak fluorescence light. This is problematic for the detection of small molecules because the fluorescently labeled species may alter the native properties of the small molecules. Also, fluorescence detection is usually an end point test and not suitable for studying the kinetics of molecular interactions and binding processes.

Professor Tao of the Biodesign Institute of Arizona State University has developed a high throughput apparatus for label-free detection of small charged molecules. The apparatus is based on the conversion of molecular binding-induced charge changes into a mechanical signal, which is then detected optically. The apparatus is able to achieve highly sensitive detection of small molecules and is fully compatible with microplate technology and optical microscope setup.

Anticipated applications include high throughput screening of small drug molecules, DNA sequencing (and DNA-based synthesis), kinetic analysis of phosphorylation of proteins, and small molecule-protein interactions.

Potential Applications

- Detection of biomarkers for disease diagnosis
- DNA sequencing
- Drug discovery
- Drug screening

Benefits and Advantages

- Compatible with microplate technology and optical microscope setup
- Sensitive detection of small molecules

For more information about the inventor(s) and their research, please see [Dr. Tao's directory webpage](#)[Dr. Tao's laboratory webpage](#) [Dr. Tao's Biodesign directory webpage](#)

