Docket #: S08-436

Magnetic Separation for Cell Sorting and Analysis

Engineers in Prof. Shan Wang's laboratory have developed a patented magnetic sifter device for high throughput cell sorting. This technology employs magnetic nanobead probes to tag cells of interest from raw samples. Those tags are used to sift the molecules through pores specifically configured for biological cell purification. This invention has ultra-high capture and release efficiencies and can easily interface with standard flow equipment with applications in a variety of downstream cellular analyses.

Applications

- **Cell sorting** for:
  - biological research
  - diagnostics
  - biowarfare detection
  - genomics and proteomics
  - collection and isolation of rare cells

Advantages

- **High throughput** - greater than 1 ml/hr
- **Ultra-high capture and release efficiencies** - greater than 95%
- **Multi-functional probes** - the same probes can potentially be used for both capture and detection
- **Low cost, easy to use, simple design**

Publications

- Earhart CM, Hughes CE, Gaster RS, Ooi CC, Wilson RJ, Zhou LY, Humke EW, Xu L, Wong DJ, Willingham SB, Schwartz EJ, Weissman IL, Jeffrey SS, Neal JW, Rohatgi R, Wakelee HA, Wang SX."Isolation and mutational analysis of circulating tumor cells from lung cancer patients with magnetic sifters and biochips." *Lab Chip.* 2013 Aug 22.
- Christopher M. Earhart, Robert J. Wilson, Robert L. White, Nader Pourmand, Shan X. Wang, "Microfabricated magnetic sifter for high-throughput and high-gradient magnetic separation," Journal of Magnetism and Magnetic Materials, Volume 321, Issue 10, May 2009, Pages 1436-1439

Patents

- Published Application: 20110059468

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