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**Link et al.**

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(54) **MICROFLUIDIC DEVICES AND METHODS OF USE IN THE FORMATION AND CONTROL OF NANOREACTORS**

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See application file for complete search history.

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(57) **ABSTRACT**

The present invention provides novel microfluidic devices and methods that are useful for performing high-throughput screening assays and combinatorial chemistry. The invention provides for aqueous based emulsions containing uniquely labeled cells, enzymes, nucleic acids, etc., wherein the emulsions further comprise primers, labels, probes, and other reactants. An oil based carrier-fluid envelopes the emulsion library on a microfluidic device, such that a continuous channel provides for flow of the immiscible fluids, to accomplish pooling, coalescing, mixing, sorting, detection, etc., of the emulsion library.

**20 Claims, 17 Drawing Sheets**

