

- c) a liquid reagent module (LRM) comprising:
 - i) a plurality of blisters comprising fluid assay reagents;
 - ii) a plurality of passageways in fluid connection with said blisters;
 - iii) a sample inlet port in fluid connection with said reaction chamber; and
 - d) an external housing comprising:
 - i) a latched cover for sealing said sample inlet port;
 - ii) a plurality of electronic connections from said interconnections.
- 18.** A biochip cartridge according to claim **17**, wherein said top plate comprises a conductive surface.
- 19.** A method of detecting a plurality of target nucleic acids in a sample comprising:
- a) adding said sample to a cartridge according to claim **1**,
 - b) executing assay operations on said sample to detect target nucleic acids, wherein said operations comprise:
 - i) mixing said sample with a lysis buffer;
 - ii) adding a binding buffer and capture beads to said sample;
 - iii) mixing said capture beads to facilitate target binding;
 - iv) washing said capture beads to remove non-target components;
 - v) eluting said target nucleic acids from said capture beads;
 - vi) amplifying said target nucleic acids to form a plurality of amplicons;
 - vii) adding signaling probes to said amplicons to form a plurality of hybridization complexes;
 - viii) binding said hybridization complexes to said capture probes on said detection electrodes to form a plurality of assay complexes; and
 - ix) detecting said assay complexes by electrochemical detection.
- 20.** A method according to claim **19**, further comprising digesting one strand of said amplicon using an exonuclease prior to step vii).
- 21.** A method according to claim **19**, further comprising washing said detection electrodes prior to step ix).
- 22.** An apparatus for the detection of target analytes comprising:
- a) an instrument bank comprising a plurality of biochip cartridge bays for insertion and analysis of a biochip cartridge, wherein each bay comprises:
 - i) a top bay comprising actuators for a liquid reagent module (LRM); and
 - ii) a bottom bay comprising electrical connections for an electrowetting electrode grid and detection electrodes; and
 - b) a base station comprising:
 - i) a central processing unit; and
 - ii) a user interface comprising a touch screen display having a plurality of bay icons, each icon uniquely corresponding to one of said plurality of bays.
- 23.** An apparatus according to claim **22**, wherein when a biochip cartridge is inserted into one of said bays, said corresponding icon of said user interface is enlarged and/or exhibited.
- 24.** An apparatus according to claim **22**, comprising a plurality of instrument banks.
- 25.** A system for detecting a plurality of target analytes in a sample comprising:
- a) a biochip cartridge according to claim **1**; and
 - b) an apparatus according to claim **22**.
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