

include, but are not limited to, binding reagents (preferably, labeled binding reagents, more preferably binding reagents labeled with electrochemiluminescent labels) specific for an analyte of interest, ECL coreactants, enzymes, enzyme substrates, extraction reagents, assay calibration standards or controls, wash solutions, diluents, buffers, labels (preferably, electrochemiluminescent labels), etc. Preferred kits of the invention include cartridges adapted for extracting samples (as described in detail above), preferably samples collected on applicator sticks. These kits preferably include applicator sticks (more preferably swabs) that have properties that are matched to the specific cartridge. Most preferably, the applicator sticks have weak points that are matched to the geometry of a sample introduction chamber in the cartridge such that i) the sticks may be inserted and cleaved in the cartridge to form a head segment and ii) the head segment can be sealed in the sample chamber. Such kits may also include extraction buffers for extracting the sample on the applicator stick. One embodiment of the invention is a kit for measuring upper respiratory pathogens or pathogens that may be found in mucus-containing samples. The kit includes an applicator stick (preferably, a swab) for collecting the sample (the stick preferably comprising a weak point) and a cartridge for measuring a panel of pathogens (e.g., a panel of upper respiratory pathogens, a panel of sexually transmitted diseases, a panel of pathogens that dwell in mucous membranes, etc.), the cartridge preferably comprising one or more binding domains containing binding reagents that bind markers of these pathogens. The kit may also contain (in the cartridge or as a separate component), one or more labeled binding reagents against markers of these pathogens.

**[0363]** The invention includes assay modules (preferably assay cartridges) and module readers (preferably cartridge readers) as described above. These may be supplied as separate components. The invention also includes assays systems that comprise an assay module (preferably a cartridge) and a module reader (preferably a cartridge reader).

**[0364]** The present invention is not to be limited in scope by the specific embodiments described herein. Indeed, various modifications of the invention in addition to those described herein will become apparent to those skilled in the art from the foregoing description and accompanying figures. Such modifications are intended to fall within the scope of the claims. Various publications are cited herein, the disclosures of which are incorporated by reference in their entireties.

1. An assay cartridge comprising a sample chamber, a sample indicator window and an optical path from a reflecting surface to said indicator window, wherein said reflecting surface reflects a sample level in said sample chamber to said indicator window.

2. The assay cartridge of claim 1 wherein said sample indicator window comprises an indicating feature.

3. The assay cartridge of claim 2 wherein said indicating feature is an indicating line that indicates a fluid level within said sample chamber, wherein said level is selected from the group consisting of a sample minimum, a sample maximum, a target level and a combination thereof.

4. The assay cartridge of claim 2 wherein said indicating feature is a boundary of said indicator window.

5. The assay cartridge of claim 1 wherein said reflecting surface is a mirrored surface.

6. The assay cartridge of claim 1 wherein said cartridge comprises a cartridge body and said reflecting surface is provided by total internal reflection at an angled surface in said cartridge body.

7. The assay cartridge of claim 6 wherein said angled surface is configured such that an angle of incidence along said optical path is greater than a critical angle for total internal reflection at said reflecting surface.

8. The assay cartridge of claim 7 wherein said angled surface is provided by a surface of a cavity within said cartridge body such that light traveling through said cartridge body along said optical path intersects an air-body interface at said cavity surface and is reflected along said optical path to said indicator window.

9. The assay cartridge of claim 1 wherein said cartridge comprises a cartridge top, a cartridge bottom and a cover layer mated to said cartridge bottom and said optical path is provided by said cartridge top.

10. The assay cartridge of claim 1 wherein said sample chamber is connected to an overflow chamber via a sample overflow conduit.

11. The assay cartridge of claim 10 wherein said overflow chamber is connected to a sample vent port via a vent conduit.

12. The assay cartridge of claim 11 wherein said vent conduit is positioned at or near the top of said overflow chamber.

13. The assay cartridge of claim 1 wherein said sample chamber further comprises a sample introduction port comprising a sealable closure including a sealing/capping mechanism comprising (a) a flexible hinge; (b) a latching mechanism; and (c) a retention component comprising a retention ring or tab.

14. The assay cartridge of claim 13 wherein said sealing/capping mechanism is a modular detachable insert comprising a cap for sealing said sample chamber.

15.-120. (canceled)

\* \* \* \* \*