

**20.** The method according to claim 19, wherein said metabolic property is motility.

**21.** The method according to claim 19, wherein said metabolic property is chemotactic behavior.

**22.** A method for labeling vesicles of cells contained in a sample, comprising the steps of:

- a. providing a substrate having a culture surface;
- b. depositing a layer semiconductor nanocrystals onto said culture surface;
- c. seeding said cells onto said culture surface;
- d. incubating said cells for an effective length of time to allow for said cells to take up said semiconductor nanocrystals;
- e. measuring the amount of semiconductor nanocrystals taken up by said cells.

**23.** The method according to claim 22, further comprising the step of removing labeled cells and culturing removed cells in the absence of semiconductor nanocrystals.

**24.** The method according to claim 23, comprising the addition of more than one size semiconductor nanocrystal.

**25.** A method for identifying a specific cell lineage, comprising the steps of:

- a. providing a substrate, having a culture surface;
- b. depositing a layer of semiconductor nanocrystals onto said culture surface;
- c. seeding cells onto said culture surface;
- d. incubating said cells for an effective length of time to yield labeled cells that have taken up at least one of said semiconductor nanocrystals; and
- e. allowing said cells to divide continuously and pass on said semiconductor nanocrystals that have been taken up to all daughter cells to create a population of labelled cells having semiconductor nanocrystals.

**26.** A kit comprised of a cell culture dish coated with a culture surface and one or more layers of semiconductor nanocrystals.

**27.** The kit of claim 26, wherein the cell culture dish has a culture surface underneath one or more layers of semiconductor nanocrystals.

**28.** A kit comprised of a cell culture plate having one or more wells, wherein each of said wells is coated with a culture surface and one or more layers of semiconductor nanocrystals.

**29.** The kit of claim 28, wherein each of said wells has a culture surface underneath one or more layers of semiconductor nanocrystals.

**30.** An apparatus for determining metabolic properties of a cell, comprising:

- a. an inert substrate;
- b. a culture surface deposited on said substrate; and
- c. a continuous layer of semiconductor nanocrystals contacting said culture surface.

**31.** The apparatus of claim 30, further comprising a layer of cells seeded onto said semiconductor nanocrystals.

**32.** The apparatus of claim 30, wherein said semiconductor nanocrystals are between about 5 and 20 nm in diameter.

**33.** The apparatus of claim 32, wherein said semiconductor nanocrystals have an outer siloxane shell.

**34.** The apparatus of claim 33, wherein the semiconductor nanocrystals are of two different sizes.

**35.** The apparatus of claim 34, wherein the semiconductor nanocrystals are coupled to a biological molecule.

**36.** The apparatus of claim 30, further comprising a light source and a confocal microscope for imaging changes in the layer of semiconductor nanocrystals caused by said cells seed onto the culture surface.

**37.** The apparatus of claim 36, wherein said high intensity light source is selected from the group consisting of, a mercury lamp, a xenon lamp, a laser, a halogen lamp, a light emitting diode and a UV lamp.

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