

solid support and the cover plate, the connection forming at least one channel around the capture molecule groups, and wherein the channel includes a first end and a second end and wherein the first end of the channel includes an opening; and an absorbent material connected to the second end. In another aspect of the detection device, the solid support includes glass. In another aspect of the detection device the solid support includes a glass slide.

In one embodiment, the capture molecules include antibodies. In another embodiment, the capture molecules are specific for biomarkers selected from Her-2, MMP-2, CA 15-3, VEGF, and OPN. In another embodiment, the capture molecules are specific for Her-2, MMP-2, CA 15-3, VEGF, OPN, p53, CA 125, and SER. In another embodiment, the capture molecules are specific for Her-2, MMP-2, CA 15-3, and OPN. In another embodiment, the capture molecules are Clone 191924, Clone 36006.211, Clone M8071022, and Clone 190312. In another embodiment, the capture molecules are blocked by a blocking agent. In another embodiment, the plurality of distinct groups of capture molecules is arranged in an array format. In another embodiment, the solid support includes at least two capture molecule groups including identical capture molecules, and each of the at least two capture molecule groups including a different number of capture molecules.

In one embodiment, the cover plate includes glass. In another embodiment, the cover plate is a glass cover slip. In one embodiment, the vertical support includes adhesive silicone. In one embodiment, the absorbent material includes a Hi-Flow Plus Nitrocellulose Membrane HF240.

In another aspect, the detection device includes a glass slide including an array of a plurality of distinct groups of antibodies cross-linked to the slide, each distinct group specific for a biomarker selected from Her-2, MMP-2, CA 15-3, and OPN; a glass cover slip positioned above the solid support; and a silicone adhesive connection between the glass slide and the glass cover slip forming at least one channel around the antibody groups, and wherein the channel includes a first open end and a second end connected to a Hi-Flow Plus Nitrocellulose Membrane HF240.

In one embodiment, the detection device further includes a component for detecting biomarkers bound to the solid support. In a related embodiment, the component includes an optical reader and a screen for displaying output from the optical reader.

Also disclosed herein is a method for determining the presence or absence of a plurality of biomarkers in a sample, including: acquiring a liquid mixture, wherein the mixture includes the sample; applying the mixture to the open first end of the at least one channel of the device, described above; allowing the mixture to flow through the at least one channel over the solid support; absorbing the mixture with the absorbent material connected to the second end; and detecting the presence of biomarkers on the solid support, wherein presence of the biomarkers on the solid support indicates the presence of the biomarkers in the sample.

In one embodiment of the method for determining the presence or absence of a plurality of biomarkers in a sample, the detection device described above, is used, the device includes capture molecules including antibodies and the liquid mixture includes the sample, at least one detector antibody, and at least one fluorescent reporter, and the method further including the steps of analyzing the sample with an optical reader to determine the presence or absence of the plurality of biomarkers in the sample; and outputting the data, wherein the data include the presence or absence of the plurality of biomarkers in the sample. In another embodiment of

the method for determining the presence or absence of a plurality of biomarkers in a sample, the detection device, described above, includes capture molecules specific for a plurality of biomarkers selected from the group consisting of CA 15-3, OPN, Her-2, and MMP-2. In another embodiment, the sample includes human blood serum.

Also disclosed herein is an array of antibodies immobilized on a solid support, the array including: a plurality of distinct antibody groups, each distinct antibody group including a plurality of antibodies specific for a biomarker, wherein the plurality of distinct antibody groups is specific for a plurality of biomarkers, and wherein the plurality of biomarkers include CA 15-3, OPN, Her-2, and MMP-2.

Also disclosed herein is a method for determining protein concentration data in a sample with an array, including: acquiring a mixture, wherein the mixture is in a liquid state, and wherein the mixture includes the sample from a mammalian subject, a detector antibody, and a fluorescent reporter; applying the mixture to the array described above; analyzing the sample with a reader to determine the concentration of the plurality of biomarkers in the sample; and outputting the data, wherein the data include protein concentration data for the plurality of biomarkers, and wherein the plurality of biomarkers include CA 15-3, OPN, Her-2, and MMP-2.

Also disclosed herein is a method of scoring a sample acquired from a mammalian subject, including: obtaining a first dataset including quantitative data associated with a plurality of biomarkers associated with breast disease and the plurality of biomarkers include CA 15-3, and OPN, wherein the data include measured values obtained from the sample; analyzing the first dataset against a second dataset to produce a score for the sample; and outputting the score.

In one embodiment, the plurality of biomarkers includes Her-2. In another embodiment, the plurality of biomarkers includes MMP-2. In another embodiment, the plurality of biomarkers includes Her-2 and MMP-2. In another embodiment, the plurality of biomarkers includes Her-2, MMP-2, VEGF, p53, CA 125, and SER. In another embodiment, the quantitative data includes protein concentrations. In another embodiment, the data is immunoassay data. In another embodiment, the protein concentrations are obtained using an immunoassay including antibodies. In a related embodiment, the immunoassay is a sandwich immunoassay. In another embodiment, the protein concentrations are obtained using a multiplexed channel flow-based device. In another embodiment, the antibodies of the immunoassay are Clone 191924, Clone 36006.211, Clone M8071022, Clone 190312, and Clone A183C-13G8.

In another embodiment, the analyzing step includes use of a predictive model. In a related embodiment, the predictive model is developed using principal component analysis. In another related embodiment, the predictive model is developed using linear discriminant analysis. In another embodiment, the analyzing step includes categorizing the sample into categories according to a score produced with the predictive model. In a related embodiment, the categorization is selected from the group consisting of: a healthy categorization, an early-stage disease categorization, and a late-stage disease categorization. In another related embodiment, a probability that the categorization is correct is at least 60%, at least 70%, at least 80%, at least 87%, at least 90%, and at least 95%.

In another embodiment, the method further includes comparing the score to a second score determined for a second sample obtained from the mammalian subject. In a related embodiment, wherein a difference between the first score and the second score indicates a disease stage of breast cancer. In