embodiments, each capture reagent is an antibody or an aptamer. In some embodiments, each biomarker capture reagent is an aptamer. In some embodiments, at least one aptamer is a slow off-rate aptamer. In some embodiments, at least one slow off-rate aptamer comprises at least 1, at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, or at least 10 nucleotides with modifications. In some embodiments, each slow off-rate aptamer binds to its target protein with an off rate (t½) of ≥ 30 minutes, ≥ 60 minutes, ≥ 90 minutes, ≥ 120 minutes, ≥ 150 minutes, ≥ 180 minutes, ≥ 210 minutes, or ≥ 240 minutes.

[0026] In some embodiments, a kit is provided, the kit comprising N biomarker protein capture reagents, wherein N is at least 1, and at least 1 of the capture reagents bind to C1GLC, ARL11, GFPT1, IF4A2, LONM, RBP56, RASN, RHG36, or FLII. In some embodiments, each capture reagent binds to a different biomarker protein. In some embodiments, N is 1, N is 2, N is 3, N is 4, N is 5, N is 6, N is 7, N is 8, N is 9, N is 10, N is 11, N is 12, N is 13, N is 14, N is 15, N is 16, N is 17, N is 18, N is 19, or N is 20. In some embodiments, the kit comprises capture reagents from multiple sample processing panels.

[0027] In some embodiments, each of the N biomarker protein capture reagents specifically binds to a biomarker protein selected from Table 1. In some embodiments, each of the N biomarker capture reagents is an antibody or an aptamer. In some embodiments, each biomarker capture reagent is an aptamer. In some embodiments, at least one aptamer is a slow off-rate aptamer. In some embodiments, at least one slow off-rate aptamer comprises at least 1, at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, or at least 10 nucleotides with modifications. In some embodiments, each slow off-rate aptamer binds to its target protein with an off rate (t½) of ≥ 30 minutes, ≥ 60 minutes, ≥ 90 minutes, ≥ 120 minutes, ≥ 150 minutes, ≥ 180 minutes, ≥ 210 minutes, or ≥ 240 minutes. In some embodiments, the kit is for use in detecting the N biomarker proteins in a sample from a subject. In some embodiments, the kit is for use in assessing the quality of the sample or a plurality of samples.

[0027a] In some embodiments, provided herein is a method comprising detecting a level of each of at least 1, 2, 3, 4, 5, 6, 7, 8, or 9 biomarker proteins in a sample, wherein the biomarker proteins are selected from C1GLC, ARL11, GFPT1, IF4A2, LONM, RBP56, RASN, RHG36, and FLII, wherein the sample is a serum sample.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Fig. 1 illustrates a nonlimiting exemplary computer system for use with various computer-implemented methods described herein.

[0029] Fig. 2 illustrates a nonlimiting exemplary aptamer assay that can be used to detect one or more biomarkers in a biological sample.

[0030] Figs. 3-5 show certain exemplary modified pyrimidines that may be incorporated into aptamers, such as slow off-rate aptamers.