Claims

[Claim 1] An *in vitro* method for diagnosing non-small cell lung cancer in a human, the method comprising:

providing a biomarker panel comprising N = 6 or 7 biomarker proteins, wherein the biomarker proteins are (i) epidermal growth factor receptor 1 (EGFR1), (ii) matrix metalloproteinase 7 (MMP7), (iii) carbonic anhydrase 6 (CA6), (iv) Complement component C9, and (v) at least two proteins selected from stem cell growth factor receptor (KIT), C-reactive protein (CRP), and alpha1-antichymotrypsin (SERPINA3); and detecting the biomarker proteins, in a biological sample from the human, to give biomarker values that each corresponds to one of the N biomarker proteins in the panel, wherein the non-small cell lung cancer is diagnosed based on the biomarker values, wherein the biological sample is selected from a group consisting of a whole blood, a plasma, and a serum.

[Claim 2] The method of claim 1, wherein the detecting the biomarker values includes performing an in vitro assay.

[Claim 3] The method of claim 2, wherein the in vitro assay includes one capture reagent corresponding to each of the biomarker proteins, and wherein the one capture reagent is an aptamer.

[Claim 4] The method of claim 1, wherein the biological sample is a serum.

[Claim 5] The method of claim 1, wherein the human is an Asian.

[Claim 6] The method of claim 1, wherein the human is a smoker.

[Claim 7] The method of claim 1, wherein the human has a pulmonary malignant nodule.

[Claim 8] The method of claim 1, wherein the N is 6.

[Claim 9] The method of claim 1, wherein the N is 7.

[Claim 10] The method of claim 1, wherein the biomarker values have measured values of Complement component C9, carbonic anhydrase 6 (CA6), C-reactive protein (CRP), epidermal growth factor receptor 1 (EGFR1), matrix metalloproteinase 7 (MMP7), alpha1-antichymotrypsin (SERPINA3), and stem cell growth factor receptor (KIT).

[Claim 11] The method of claim 3, wherein the biomarker values are measured by detecting the aptamers using any one of (i) real-time PCR (qPCR), (ii) microarray, and (iii) Luminex microbead assay.

[Claim 12] The method of claim 1, wherein the non-small cell lung cancer is diagnosed with a statistical method.

[Claim 13] The method of claim 12, wherein the statistical method is selected from a group comprising a linear discriminant analysis, a logistic regression, a naïve Bayesian classification, a support vector machine, and a random forest.

[Claim 14] A protein biomarker panel comprising N = 6 or 7 biomarker proteins, wherein the biomarker proteins are (i) epidermal growth factor receptor 1 (EGFR1), (ii) matrix metalloproteinase 7 (MMP7), (iii) carbonic anhydrase 6 (CA6), (iv) Complement component C9, and (v) at least two proteins selected from stem cell growth factor receptor (KIT), C-reactive protein (CRP), and alpha1-antichymotrypsin (SERPINA3); wherein the panel enables *in vitro* detection of the presence of non-small cell lung cancer in a biological sample from a human.

[Claim 15] The panel of claim 14, wherein the N is 6.

[Claim 16] The panel of claim 14, wherein the N is 7.

[Claim 17] The panel of claim 14, wherein the panel has Complement component C9, carbonic anhydrase 6 (CA6), C-reactive protein (CRP), epidermal growth factor receptor 1 (EGFR1), matrix metalloproteinase 7 (MMP7), alpha1-antichymotrypsin (SERPINA3), and stem cell growth factor receptor (KIT).

[Claim 18] The panel of claim 14, wherein the human is an Asian.

[Claim 19] The panel of claim 14, wherein the human is a smoker.

[Claim 20] The panel of claim 14, wherein the human has a pulmonary malignant nodule.