

CLAIMS

1. A method for determining whether a subject is at risk of dying from prostate cancer;

wherein the method comprises determining in a biological sample obtained from the subject a quantitative value of at least one biomarker of the following in the biological sample:

- glycoprotein acetyls,
- a ratio of docosahexaenoic acid to total fatty acids,
- a ratio of linoleic acid to total fatty acids,
- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,
- a ratio of omega-3 fatty acids to total fatty acids,
- a ratio of omega-6 fatty acids to total fatty acids,
- a ratio of saturated fatty acids to total fatty acids,
- fatty acid degree of unsaturation,
- histidine; and

comparing the quantitative value(s) of the at least one biomarker to a control sample or to a control value;

wherein an increase or a decrease in the quantitative value(s) of the at least one biomarker, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer;

wherein the at least one biomarker comprises or is glycoprotein acetyls, wherein an increase in the quantitative value of glycoprotein acetyls, when compared to the control sample or to the control value, is indicative of the subject having an increased risk of dying from prostate cancer; and wherein glycoprotein acetyls refers to a nuclear magnetic resonance spectroscopy signal that represents the abundance of circulating glycated proteins.

2. The method according to claim 1, wherein the method comprises determining in the biological sample quantitative values of a plurality of biomarkers, such as two, three, four, five or more biomarkers.

3. The method according to claim 1 or 2, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,

- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer.

4. The method according to any one of claims 1 - 3, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,

- histidine,

- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer.

5. The method according to any one of claims 1 - 4, wherein the prostate cancer comprises or is malignant neoplasm of prostate (C61).

6. The method according to any one of claims 1 - 5, wherein the quantitative value of the at least one biomarker is/are measured using nuclear magnetic resonance spectroscopy.

7. The method according to any one of claims 1 - 6, wherein the method further comprises determining whether the subject is at risk of dying from prostate cancer using a risk score, hazard ratio, odds ratio, and/or predicted absolute risk or relative risk calculated on the basis of the quantitative value(s) of at least one biomarker or of the plurality of the biomarkers.

8. The method according to claim 7, wherein the risk score, hazard ratio, odds ratio, and/or predicted relative risk and/or absolute risk is calculated on the basis of at least one further measure, such as a characteristic of the subject.

9. The method according to claim 8, wherein the characteristic of the subject includes one or more of age, height, weight, body mass index, race or ethnic group, smoking, family history of cancers and/or information from prostate-specific antigen (PSA) screening.

10. The method according to any one of claims 1 - 9, wherein the control sample or control value represents men without known diagnosis of prostate cancer, or men already diagnosed with prostate cancer.

11. The method according to any one of claims 1 - 10, wherein the subject is a man without known diagnosis of prostate cancer.

12. The method according to any one of claims 1 - 11, wherein the subject is a man in a general population screening setting, such as a prostate-specific antigen (PSA) screening test.

13. The method according to any one of claims 1 - 12, wherein the subject is a man already diagnosed with prostate cancer.

14. The method according to any one of claims 1 - 13, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,
- a ratio of docosahexaenoic acid to total fatty acids,
- a ratio of linoleic acid to total fatty acids,
- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,
- a ratio of omega-3 fatty acids to total fatty acids,
- a ratio of omega-6 fatty acids to total fatty acids,

- a ratio of saturated fatty acids to total fatty acids,

- fatty acid degree of unsaturation,

- histidine; and

5 comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an

10 increased risk of dying from prostate cancer.

CLAIMS

1. A method for determining whether a subject is at risk of dying from prostate cancer;

wherein the method comprises determining in a biological sample obtained from the subject a quantitative value of at least one biomarker of the following in the biological sample:

- glycoprotein acetyls,
- a ratio of docosahexaenoic acid to total fatty acids,
- a ratio of linoleic acid to total fatty acids,
- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,
- a ratio of omega-3 fatty acids to total fatty acids,
- a ratio of omega-6 fatty acids to total fatty acids,
- a ratio of saturated fatty acids to total fatty acids,
- fatty acid degree of unsaturation,
- histidine; and

comparing the quantitative value(s) of the at least one biomarker to a control sample or to a control value;

wherein an increase or a decrease in the quantitative value(s) of the at least one biomarker, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer;

wherein the at least one biomarker comprises or is glycoprotein acetyls, wherein an increase in the quantitative value of glycoprotein acetyls, when compared to the control sample or to the control value, is indicative of the subject having an increased risk of dying from prostate cancer; and wherein glycoprotein acetyls refers to a nuclear magnetic resonance spectroscopy signal that represents the abundance of circulating glycosylated proteins.

2. The method according to claim 1, wherein the method comprises determining in the biological sample quantitative values of a plurality of biomarkers, such as two, three, four, five or more biomarkers.

3. The method according to claim 1 or 2, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,

- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer.

4. The method according to any one of claims 1 - 3, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,

- histidine,

- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer.

5. The method according to any one of claims 1 - 4, wherein the prostate cancer comprises or is malignant neoplasm of prostate (C61).

6. The method according to any one of claims 1 - 5, wherein the quantitative value of the at least one biomarker is/are measured using nuclear magnetic resonance spectroscopy.

7. The method according to any one of claims 1 - 6, wherein the method further comprises determining whether the subject is at risk of dying from prostate cancer using a risk score, hazard ratio, odds ratio, and/or predicted absolute risk or relative risk calculated on the basis of the quantitative value(s) of at least one biomarker or of the plurality of the biomarkers.

8. The method according to claim 7, wherein the risk score, hazard ratio, odds ratio, and/or predicted relative risk and/or absolute risk is calculated on the basis of at least one further measure, such as a characteristic of the subject.

9. The method according to claim 8, wherein the characteristic of the subject includes one or more of age, height, weight, body mass index, race or ethnic group, smoking, family history of cancers and/or information from prostate-specific antigen (PSA) screening.

10. The method according to any one of claims 1 - 9, wherein the control sample or control value represents men without known diagnosis of prostate cancer, or men already diagnosed with prostate cancer.

11. The method according to any one of claims 1 - 10, wherein the subject is a man without known diagnosis of prostate cancer.

12. The method according to any one of claims 1 - 11, wherein the subject is a man in a general population screening setting, such as a prostate-specific antigen (PSA) screening test.

13. The method according to any one of claims 1 - 12, wherein the subject is a man already diagnosed with prostate cancer.

14. The method according to any one of claims 1 - 13, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,
- a ratio of docosahexaenoic acid to total fatty acids,
- a ratio of linoleic acid to total fatty acids,
- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,
- a ratio of omega-3 fatty acids to total fatty acids,
- a ratio of omega-6 fatty acids to total fatty acids,

- a ratio of saturated fatty acids to total fatty acids,

- fatty acid degree of unsaturation,

- histidine; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from prostate cancer.

15. A method for determining whether a subject is at risk of dying from breast cancer;

wherein the method comprises determining in a biological sample obtained from the subject a quantitative value of at least one biomarker of the following in the biological sample:

- glycoprotein acetyls,

- a ratio of docosahexaenoic acid to total fatty acids,

- a ratio of linoleic acid to total fatty acids,

- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,

- a ratio of omega-3 fatty acids to total fatty acids,

- a ratio of omega-6 fatty acids to total fatty acids,

- a ratio of saturated fatty acids to total fatty acids,

- fatty acid degree of unsaturation,

- histidine; and

comparing the quantitative value(s) of the at least one biomarker to a control sample or to a control value;

wherein an increase or a decrease in the quantitative value(s) of the at least one biomarker, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from breast cancer;

wherein the at least one biomarker comprises or is glycoprotein acetyls, wherein glycoprotein acetyls refers to a nuclear magnetic resonance spectroscopy signal that represents the abundance of circulating glycosylated proteins.

16. The method according to claim 15, wherein the subject is a woman without known diagnosis of breast cancer.

17. The method according to claim 15 or 16, wherein the method comprises determining in the biological sample quantitative values of a plurality of biomarkers, such as two, three, four, five or more biomarkers.

18. The method according to any one of claims 15 - 17, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,
- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from breast cancer.

19. The method according to any one of claims 15 - 18, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,
- histidine,
- at least one fatty acid measure(s) of the following: the ratio of docosahexaenoic acid to total fatty acids, the ratio of linoleic acid to total fatty acids, the ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids, the ratio of omega-3 fatty acids to total fatty acids, the ratio of omega-6 fatty acids to total fatty acids, the ratio of saturated fatty acids to total fatty acids, fatty acid degree of unsaturation; and comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from breast cancer.

20. The method according to any one of claims 15 - 19, wherein the breast cancer comprises or is malignant neoplasm of breast (C50).

21. The method according to any one of claims 15 - 20, wherein the quantitative value of the at least one biomarker is/are measured using nuclear magnetic resonance spectroscopy.

22. The method according to any one of claims 15 - 21, wherein the method further comprises determining whether the subject is at risk of dying from breast cancer using a risk score, hazard ratio, odds ratio, and/or predicted absolute risk or relative risk calculated on the basis of the quantitative value(s) of at least one biomarker or of the plurality of the biomarkers.

23. The method according to any one of claims 15 - 22, wherein the subject is a woman in a general population screening setting, such as a mammography.

24. The method according to any one of claims 15 - 23, wherein the method comprises determining in the biological sample obtained from the subject a quantitative value of the following biomarkers:

- glycoprotein acetyls,
- a ratio of docosahexaenoic acid to total fatty acids,
- a ratio of linoleic acid to total fatty acids,
- a ratio of monounsaturated fatty acids and/or of oleic acid to total fatty acids,

- a ratio of omega-3 fatty acids to total fatty acids,
- a ratio of omega-6 fatty acids to total fatty acids,
- a ratio of saturated fatty acids to total fatty acids,
- fatty acid degree of unsaturation,
- histidine; and

comparing the quantitative value(s) of the biomarkers to a control sample or to a control value(s);

wherein an increase or a decrease in the quantitative value(s) of the biomarkers, when compared to the control sample or to the control value, is/are indicative of the subject having an increased risk of dying from breast cancer.