CLAIMS

1. A method for diagnosing a patient's risk of developing pancreatic cancer, or the presence of pancreatic cancer in a patient, comprising the steps of:

a) analyzing a blood sample from said patient to obtain quantifying data for one or more than one metabolite marker using high resolution mass spectrometry;

b) comparing the quantifying data for said one or more than one metabolite marker to corresponding data obtained for one or more than one reference blood sample to identify an increase or decrease in the level of said one or more than one metabolite marker in said blood sample; and

c) using said increase or decrease in the level of said one or more than one metabolite marker in said blood sample for diagnosing said risk of developing pancreatic cancer, or the presence of pancreatic cancer in said patient,

wherein a decrease in the level of said one or more than one metabolite marker in said blood sample is identified in the comparing step (b), and

wherein the one or more metabolite marker comprises one or more molecule, wherein the molecular formulae is: $C_{36}H_{62}O_4$, $C_{36}H_{62}O_5$, $C_{36}H_{64}O_5$, $C_{36}H_{66}O_5$, $C_{36}H_{64}O_6$, $C_{36}H_{66}O_6$, $C_{36}H_{68}O_6$, $C_{22}H_{48}NO_7P$, $C_{24}H_{50}NO_7P$, $C_{24}H_{48}NO_7P$, $C_{24}H_{46}NO_7P$, $C_{26}H_{54}NO_7P$, $C_{26}H_{52}NO_7P$, $C_{26}H_{50}NO_7P$, $C_{26}H_{48}NO_7P$, $C_{28}H_{56}NO_7P$, $C_{28}H_{54}NO_7P$, $C_{28}H_{52}NO_7P$, $C_{28}H_{50}NO_7P$, $C_{28}H_{48}NO_7P$, $C_{28}H_{46}NO_7P$, $C_{30}H_{56}NO_7P$, $C_{30}H_{54}NO_7P$, $C_{30}H_{52}NO_7P$, $C_{30}H_{50}NO_7P$, $C_{32}H_{58}NO_7P$, $C_{32}H_{54}NO_7P$, $C_{38}H_{76}NO_7P$, $C_{40}H_{82}NO_7P$, $C_{40}H_{80}NO_7P$, $C_{40}H_{78}NO_7P$, $C_{40}H_{70}NO_7P$, $C_{42}H_{78}NO_8P$, $C_{42}H_{80}NO_8P$, $C_{42}H_{82}NO_8P$, $C_{42}H_{84}NO_8P$, $C_{44}H_{78}NO_8P$, $C_{44}H_{80}NO_8P$, $C_{44}H_{82}NO_8P$, $C_{44}H_{84}NO_8P$, $C_{44}H_{86}NO_8P$, $C_{44}H_{88}NO_8P$, $C_{46}H_{78}NO_8P$, $C_{46}H_{80}NO_8P$, $C_{46}H_{82}NO_8P$, $C_{46}H_{84}NO_8P$, $C_{48}H_{80}NO_8P$, $C_{48}H_{82}NO_8P$, $C_{48}H_{84}NO_8P$, $C_{48}H_{86}NO_8P$, $C_{42}H_{80}NO_7P$, $C_{42}H_{82}NO_7P$, $C_{42}H_{84}NO_7P$, $C_{44}H_{82}NO_7P$, $C_{44}H_{84}NO_7P$, $C_{44}H_{86}NO_7P$, $C_{44}H_{88}NO_7P$, $C_{46}H_{82}NO_7P$, $C_{46}H_{84}NO_7P$, $C_{46}H_{86}NO_7P$, $C_{48}H_{84}NO_7P$, $C_{48}H_{86}NO_7P$, $C_{39}H_{79}N_2O_6P$, $C_{39}H_{80}N_2O_6P^+$, $C_{41}H_{81}N_2O_6P$, $C_{41}H_{82}N_2O_6P^+$,

$C_{41}H_{83}N_2O_6P$, $C_{41}H_{84}N_2O_6P^+$, $C_{47}H_{93}N_2O_6P$, $C_{47}H_{94}N_2O_6P^+$, $C_{47}H_{95}N_2O_6P$, $C_{47}H_{96}N_2O_6P^+$, or combinations thereof; or

wherein the molecule is:

a lysophosphatidylcholine (LysoPC), wherein the LysoPC is: LysoPC 14:1, LysoPC 16:0, LysoPC 16:1, LysoPC 16:2, LysoPC 18:0, LysoPC 18:1, LysoPC 18:2, LysoPC 18:3, LysoPC 20:1, LysoPC 20:2, LysoPC 20:3, LysoPC 20:4, LysoPC 20:5, LysoPC 20:6, LysoPC 22:3, LysoPC 22:4, LysoPC 22:5, LysoPC 22:6, LysoPC 24:4, LysoPC 24:6, LysoPC 30:1, LysoPC 32:0, LysoPC 32:1, LysoPC 32:2, LysoPC 32:6 or combinations thereof; or

a phosphatidylcholine having a molecular formula of $C_{42}H_{78}NO_8P$, $C_{42}H_{80}NO_8P$, $C_{42}H_{82}NO_8P$, $C_{42}H_{84}NO_8P$, $C_{44}H_{78}NO_8P$, $C_{44}H_{80}NO_8P$, $C_{44}H_{82}NO_8P$, $C_{44}H_{84}NO_8P$, $C_{44}H_{86}NO_8P$, $C_{44}H_{88}NO_8P$, $C_{46}H_{78}NO_8P$, $C_{46}H_{80}NO_8P$, $C_{46}H_{82}NO_8P$, $C_{46}H_{84}NO_8P$, $C_{48}H_{80}NO_8P$, $C_{48}H_{82}NO_8P$, $C_{48}H_{84}NO_8P$, $C_{48}H_{86}NO_8P$, or combinations thereof; or

a plasmenylphosphocholine having a molecular formula of $C_{42}H_{80}NO_7P$, $C_{42}H_{82}NO_7P$, $C_{42}H_{84}NO_7P$, $C_{44}H_{82}NO_7P$, $C_{44}H_{84}NO_7P$, $C_{44}H_{86}NO_7P$, $C_{44}H_{88}NO_7P$, $C_{46}H_{82}NO_7P$, $C_{46}H_{84}NO_7P$, $C_{46}H_{86}NO_7P$, $C_{48}H_{84}NO_7P$, $C_{48}H_{86}NO_7P$, or combinations thereof; or

a sphingomyelin having a molecular formula of $C_{39}H_{79}N_2O_6P$, $C_{39}H_{80}N_2O_6P^+$, $C_{41}H_{81}N_2O_6P$, $C_{41}H_{82}N_2O_6P^+$, $C_{41}H_{83}N_2O_6P$, $C_{41}H_{84}N_2O_6P^+$, $C_{47}H_{93}N_2O_6P$, $C_{47}H_{94}N_2O_6P^+$, $C_{47}H_{95}N_2O_6P$, $C_{47}H_{96}N_2O_6P^+$, or combinations thereof; or

wherein the molecule has:

the molecular formula of $C_{36}H_{62}O_4$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 557.4 and the following daughter ions: 495.4, 539.4, 513.3, 279.2, 277.2, 220.7 or 111.2, or combinations thereof; or

the molecular formula of $C_{36}H_{62}O_5$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 573.5 and the following daughter ions: 511.4, 555.3, 537.4, 529.4, 519.4, 493.3, 457.4, 455.3, 443.4, 415.4, 413.3, 411.3, 399.3, 397.3, 389.7, 295.2, 279.2, 277.2, 251.2, 231.1, 223.1, 201.1, 171.1, 169.1, 125.1 or 113.1, or combinations thereof; or

the molecular formula of $C_{36}H_{64}O_5$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 575.5 and the following daughter ions: 513.5, 557.5, 539.5, 531.5, 499.5, 495.5, 459.4, 417.4, 415.3, 413.3, 403.3, 295.2, 279.2, 260.2, 251.2, 197.9, 119.4, 113.1, or 97.0, or combinations thereof; or

the molecular formula of $C_{36}H_{66}O_5$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 577.5 and the following daughter ions: 515.4, 559.4, 546.5, 533.5, 497.4, 419.4, 405.5, 297.2 or 281.2, or combinations thereof; or

the molecular formula of $C_{36}H_{64}O_6$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 591.5 and the following daughter ions: 573.4, 555.4, 528.3, 511.2, 476.1, 419.3, 403.1, 387.3, 297.2, 295.2, 274.0, 255.3, 223.6, 203.5, 201.1, 171.0 or 125.3, or combinations thereof; or

the molecular formula of $C_{36}H_{66}O_6$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 593.5 and the following daughter ions: 557.5, 575.4, 549.4, 531.5, 513.4, 495.4, 433.3, 421.4, 415.2, 391.4, 371.3, 315.3, 311.1, 297.2, 281.2, 277.2, 251.2, 201.1, 195.3, 171.1, 139.1 or 133.5, or combinations thereof; or

the molecular formula of $C_{36}H_{68}O_6$ and is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 595.5 and the following daughter ions: 559.5, 577.4, 551.4, 533.4, 515.5, 497.4, 478.4, 433.3, 423.4, 391.3, 372.3, 315.3, 313.2, 298.2, 297.2, 281.2, 279.2, 239.2, 232.9, 171.1, 169.1 or 141.1, or combinations thereof.

2. The method of claim 1, wherein the quantifying data is obtained using a Fourier transform ion cyclotron resonance, time of flight, magnetic sector, quadrupole or triple quadrupole mass spectrometer.

3. The method of claim 1, wherein the quantifying data is obtained using a Fourier transform ion cyclotron resonance mass spectrometer.

4. The method of claim 2, wherein the mass spectrometer is equipped with a chromatographic system.

5. The method of any one of claims 1 to 4, wherein the blood sample is a blood serum sample.

6. The method of any one of claims 1 to 5, wherein a liquid/liquid extraction is performed on the blood sample whereby non-polar metabolites are dissolved in an organic solvent and polar metabolites are dissolved in an aqueous solvent.

7. The method of claim 6, wherein the extracted samples are analyzed by positive or negative electrospray ionization, positive or negative atmospheric pressure chemical ionization, or combinations thereof.

8. The method of claim 6 or 7, wherein the extracted samples are analyzed by extracted ion current (EIC) chromatography and mass spectrometry.

9. The method of any one of claims 1 to 8, wherein said one or more than one reference blood sample is from one or more pancreatic cancer-negative humans.

10. The method of any one of claims 1 to 9, further comprising:

analyzing a blood sample from said patient to obtain quantifying data for one or more than one internal standard molecule; and

obtaining a ratio for each of the levels of said one or more than one metabolite marker to the level obtained for the one or more than one internal standard molecule;

wherein the comparing step (b) comprises comparing each ratio to one or more corresponding ratios obtained for the one or more than one reference blood sample.

11. The method of any one of claims 1 to 10, wherein the molecule is a lysophosphatidylcholine (LysoPC) selected from LysoPC 14:1, LysoPC 16:0, LysoPC 16:1, LysoPC 16:2, LysoPC 18:0, LysoPC 18:1, LysoPC 18:2, LysoPC 18:3, LysoPC 20:1, LysoPC 20:2, LysoPC 20:3, LysoPC 20:4, LysoPC 20:5, LysoPC 20:6, LysoPC 22:3, LysoPC 22:4, LysoPC 22:5, LysoPC 22:6, LysoPC 24:4, LysoPC 24:6, LysoPC 30:1, LysoPC 32:0, LysoPC 32:1, LysoPC 32:2, LysoPC 32:6 or a combination thereof.

12. The method of any one of claims 1 to 10, wherein the molecule is a phosphatidylcholine having a molecular formula of $C_{42}H_{78}NO_8P$, $C_{42}H_{80}NO_8P$, $C_{42}H_{82}NO_8P$, $C_{42}H_{84}NO_8P$, $C_{44}H_{78}NO_8P$, $C_{44}H_{80}NO_8P$, $C_{44}H_{82}NO_8P$, $C_{44}H_{84}NO_8P$, $C_{44}H_{86}NO_8P$, $C_{44}H_{88}NO_8P$, $C_{46}H_{78}NO_8P$, $C_{46}H_{80}NO_8P$, $C_{46}H_{82}NO_8P$, $C_{46}H_{84}NO_8P$, $C_{48}H_{80}NO_8P$, $C_{48}H_{82}NO_8P$, $C_{48}H_{84}NO_8P$, $C_{48}H_{86}NO_8P$, or a combination thereof.

13. The method of any one of claims 1 to 10, wherein the molecule is a plasmenylphosphocholine having a molecular formula of $C_{42}H_{80}NO_7P$, $C_{42}H_{82}NO_7P$, $C_{42}H_{84}NO_7P$, $C_{44}H_{82}NO_7P$, $C_{44}H_{84}NO_7P$, $C_{44}H_{86}NO_7P$, $C_{44}H_{88}NO_7P$, $C_{46}H_{82}NO_7P$, $C_{46}H_{84}NO_7P$, $C_{46}H_{86}NO_7P$, $C_{48}H_{84}NO_7P$, $C_{48}H_{86}NO_7P$, or a combination thereof.

14. The method of any one of claims 1 to 10, wherein the molecule is a sphingomyelin having a molecular formula of $C_{39}H_{79}N_2O_6P$, $C_{39}H_{80}N_2O_6P^+$, $C_{41}H_{81}N_2O_6P$, $C_{41}H_{82}N_2O_6P^+$, $C_{41}H_{83}N_2O_6P$, $C_{41}H_{84}N_2O_6P^+$, $C_{47}H_{93}N_2O_6P$, $C_{47}H_{94}N_2O_6P^+$, $C_{47}H_{95}N_2O_6P$, $C_{47}H_{96}N_2O_6P^+$, or a combination thereof.

15. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{62}O_4$ is characterized, in negative ionization mode, by a parent mass of 557.4 and a fragmentation pattern comprising at least one of the following daughter ions: 495.4, 539.4, 513.3, 279.2, 277.2, 220.7, 111.2, or a combination thereof.

16. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{62}O_5$ is characterized, in negative ionization mode, by a parent mass of 573.5 and a fragmentation pattern comprising at least one of the following daughter ions: 511.4, 555.3, 537.4, 529.4, 519.4, 493.3, 457.4, 455.3, 443.4, 415.4, 413.3, 411.3, 399.3, 397.3, 389.7, 295.2, 279.2, 277.2, 251.2, 231.1, 223.1, 201.1, 171.1, 169.1, 125.1, 113.1, or a combination thereof.

17. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{64}O_5$ is characterized, in negative ionization mode, by a fragmentation pattern comprising a parent ion of 575.5 and at least one of the following daughter ions: 513.5, 557.5, 539.5, 531.5, 499.5, 495.5, 459.4, 417.4, 415.3, 413.3, 403.3, 295.2, 279.2, 260.2, 251.2, 197.9, 119.4, 113.1, 97.0, or a combination thereof.

18. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{66}O_5$ is characterized, in negative ionization mode, by a fragmentation pattern comprising apparent mass of 577.5 and at least one of the following daughter ions: 515.4, 559.4, 546.5, 533.5, 497.4, 419.4, 405.5, 297.2, 281.2, or a combination thereof.

19. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{64}O_6$ is characterized, in negative ionization mode, by a fragmentation pattern comprising a parent mass of 591.5 and at least one of the following daughter ions: 573.4, 555.4, 528.3, 511.2, 476.1, 419.3, 403.1, 387.3, 297.2, 295.2, 274.0, 255.3, 223.6, 203.5, 201.1, 171.0, 125.3, or a combination thereof.

20. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{66}O_6$ is characterized by a fragmentation pattern, in negative ionization mode, comprising a parent mass of 593.5 and the following daughter ions: 557.5, 575.4, 549.4, 531.5, 513.4, 495.4, 433.3, 421.4, 415.2, 391.4, 371.3, 315.3, 311.1, 297.2, 281.2, 277.2, 251.2, 201.1, 195.3, 171.1, 139.1, 133.5, or a combination thereof.

21. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{36}H_{68}O_6$ is characterized, in negative ionization mode, by a fragmentation pattern comprising a parent mass of 595.5 and at least one of the following daughter ions: 559.5, 577.4, 551.4, 533.4, 515.5, 497.4, 478.4, 433.3, 423.4, 391.3, 372.3, 315.3, 313.2, 298.2, 297.2, 281.2, 279.2, 239.2, 232.9, 171.1, 169.1, 141.1, or a combination thereof.

22. The method of claim 1, wherein the molecule for the lysophosphatidylcholine metabolite having the molecular formula of $C_{26}H_{50}NO_7P$ is characterized by at least one of a parent mass of 520.3 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 564.3 and a daughter ion of 504.3 in negative ionization mode, a parent mass of 564.3 and a daughter ion of 279.3 in negative ionization mode, or a combination thereof.

23. The method of claim 1, wherein the molecule for the lysophosphatidylcholine metabolite having the molecular formula of $C_{26}H_{54}NO_7P$ is characterized by at least one of a parent mass of 524.3 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 568.3 and a daughter ion of 508.4 in negative ionization mode, a parent mass of 568.3 and a daughter ion of 283.3 in negative ionization mode, or a combination thereof.

24. The method of claim 1, wherein the molecule for the lysophosphatidylcholine metabolite having the molecular formula of $C_{28}H_{48}NO_7P$ is characterized by at least one of a parent mass of 542.3 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 586.3 and a daughter ion of 526.3 in negative ionization mode, a parent mass of 586.3 and a daughter ion of 301.2 in negative ionization mode, or a combination thereof.

25. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{42}H_{80}NO_8P$ is characterized by at least one of a parent mass of 758.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 802.6 and a daughter ion of 742.6 or a parent mass of 802.6 and a daughter ion of 279.2 for PtdCho 16:0/18:2 in negative ionization mode, a parent mass of 802.6 and a daughter ion of 742.6 or a parent mass of 802.6 and a daughter ion of 255.3 for PtdCho 18:2/16:0 in negative

ionization mode, a parent mass of 802.6 and a daughter ion of 742.6 or a parent mass of 802.6 and a daughter ion of 281.2 for PtdCho 16:1/18:1 in negative ionization mode, a parent mass of 802.6 and a daughter ion of 742.6 or a parent mass of 802.6 and a daughter ion of 253.2 for PtdCho 18:1/16:1 in negative ionization mode, or a combination thereof.

26. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{44}H_{78}NO_8P$ is characterized by at least one of a parent mass of 780.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 824.6 and a daughter ion of 764.6 or a parent mass of 824.6 and a daughter ion of 279.2 for PtdCho 18:2/18:3 in negative ionization mode, a parent mass of 824.6 and a daughter ion of 764.6 or a parent mass of 824.6 and a daughter ion of 301.2 for PtdCho 16:0/20:5 in negative ionization mode, a parent mass of 824.6 and a daughter ion of 764.6 or a parent mass of 824.6 and a daughter ion of 255.2 for PtdCho 20:5/16:0 in negative ionization mode, or a combination thereof.

27. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{44}H_{82}NO_8P$ is characterized by at least one of a parent mass of 784.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 828.6 and a daughter ion of 768.6 or a parent mass of 828.6 and a daughter ion of 305.2 for PtdCho 16:0/20:3 in negative ionization mode, a parent mass of 828.6 and a daughter ion of 768.6 or a parent mass of 828.6 and a daughter ion of 255.2 for PtdCho 20:3/16:0 in negative ionization mode, a parent mass of 828.6 and a daughter ion of 768.6 or a parent mass of 828.6 and a daughter ion of 279.2 for PtdCho 18:1/18:2 in negative ionization mode, a parent mass of 828.6 and a daughter ion of 768.6 or a parent mass of 828.6 and a daughter ion of 281.2 for PtdCho 18:2/18:1 in negative ionization mode, or a combination thereof.

28. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{44}H_{84}NO_8P$ is characterized by at least one of a parent mass of 786.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 830.6 and a daughter ion of 770.6 or a parent mass of 830.6 and a daughter ion of 279.2 for PtdCho 18:0/18:2 in negative ionization mode, a parent mass of 830.6 and a daughter ion of 770.6 or

a parent mass of 830.6 and a daughter ion of 283.2 for PtdCho 18:2/18:0 in negative ionization mode, a parent mass of 830.6 and a daughter ion of 770.6 or a parent mass of 830.6 and a daughter ion of 281.2 for PtdCho 18:1/18:1 in negative ionization mode, or a combination thereof.

29. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{46}H_{78}NO_8P$ is characterized by at least one of a parent mass of 804.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 848.6 and a daughter ion of 788.6 or a parent mass of 848.6 and a daughter ion of 301.3 for PtdCho 18:2/20:5 in negative ionization mode, a parent mass of 848.6 and a daughter ion of 788.6 or a parent mass of 848.6 and a daughter ion of 279.2 for PtdCho 20:5/18:2 in negative ionization mode, a parent mass of 848.6 and a daughter ion of 788.6 or a parent mass of 848.6 and a daughter ion of 327.6 for PtdCho 16:1/22:6 in negative ionization mode, or a combination thereof.

30. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{46}H_{80}NO_8P$ is characterized by at least one of a parent mass of 806.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 850.6 and a daughter ion of 255.2 for PtdCho 22:6/16:0 in negative ionization mode, a parent mass of 850.6 and a daughter ion of 303.2 for PtdCho 18:2/20:4 in negative ionization mode, or a combination thereof.

31. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{46}H_{82}NO_8P$ is characterized by at least one of a parent mass of 808.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 852.6 and a daughter ion of 792.6 or a parent mass of 852.6 and a daughter ion of 301.3 for PtdCho 18:0/20:5 in negative ionization mode, a parent mass of 852.6 and a daughter ion of 792.6 or a parent mass of 852.6 and a daughter ion of 329.3 for PtdCho 16:0 / 22:5 in negative ionization mode, a parent mass of 852.6 and a daughter ion of 792.6 or a parent mass of 852.6 and a daughter ion of 303.2 for PtdCho 18:1/20:4 in negative ionization mode, a

parent mass of 852.6 and a daughter ion of 792.6 or a parent mass of 852.6 and a daughter ion of 255.2 for PtdCho 22:5/16:0 in negative ionization mode, or a combination thereof.

32. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{46}H_{84}NO_8P$ is characterized by at least one of a parent mass of 810.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 854.6 and a daughter ion of 794.6 or a parent mass of 854.6 and a daughter ion of 303.2 for PtdCho 18:0/20:4 in negative ionization mode, a parent mass of 854.6 and a daughter ion of 794.6 or a parent mass of 854.6 and a daughter ion of 283.2 for PtdCho 20:4/18:0 in negative ionization mode, a parent mass of 854.6 and a daughter ion of 794.6 or a parent mass of 854.6 and a daughter ion of 305.3 for PtdCho 18:1/20:3 in negative ionization mode, a parent mass of 854.6 and a daughter ion of 794.6 or a parent mass of 854.6 and a daughter ion of 307.3 for PtdCho 18:2/20:2 in negative ionization mode, a parent mass of 852.6 and a daughter ion of 794.6 or a parent mass of 852.6 and a daughter ion of 331.3 for PtdCho 16:0/22:4 in negative ionization mode, or a combination thereof.

33. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{48}H_{80}NO_8P$ is characterized by at least one of a parent mass of 830.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 874.6 and a daughter ion of 814.6 or a parent mass of 874.6 and a daughter ion of 327.3 for PtdCho 18:2/22:6 in negative ionization mode, or a combination thereof.

34. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{48}H_{82}NO_8P$ is characterized by at least a parent mass of 832.6 and a daughter ion of 184.2 in positive ionization mode.

35. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{48}H_{84}NO_8P$ is characterized by at least one of a parent mass of 834.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 878.6 and a daughter ion of 818.6 or a parent mass of 878.6 and a daughter ion of 283.2 for PtdCho 22:6/18:0 in negative ionization mode, or a combination thereof.

36. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{39}H_{79}N_2O_6P$ is characterized by at least one of a parent mass of 703.6 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 747.6 and a daughter ion of 687.6 or a parent mass of 747.6 and a daughter ion of 168.1 in negative ionization mode, or a combination thereof.

37. The method of claim 1, wherein the molecule for the metabolite having the molecular formula of $C_{47}H_{93}N_2O_6P$ is characterized by at least one of a parent mass of 813.7 and a daughter ion of 184.2 in positive ionization mode, a parent mass of 857.6 and a daughter ion of 797.6 or a parent mass of 857.6 and a daughter ion of 168.1 in negative ionization mode, or a combination thereof.

38. A method for diagnosing a patient's risk of developing pancreatic cancer, or the presence of pancreatic cancer in a patient, comprising the steps of:

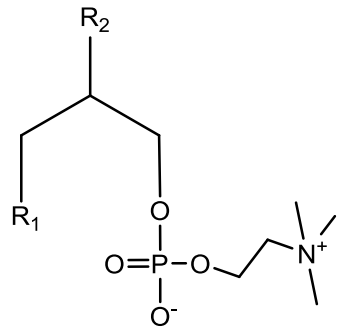
a) analyzing a blood sample from a patient to obtain quantifying data for one or more than one metabolite marker using a colorimetric chemical assay, antibody-based enzyme-linked immunosorbant assay, dipstick chemical assay, or a mass spectrometry-based system;

b) comparing the quantifying data for said one or more than one metabolite marker to corresponding data obtained for one or more than one reference blood sample to identify an increase or decrease in the level of said one or more than one metabolite marker in said blood sample; and

c) using said increase or decrease in the level of said one or more than one metabolite marker in said blood sample for diagnosing said risk of developing pancreatic cancer, or the presence of pancreatic cancer in said patient,

wherein the one or more metabolite marker comprises:

(i) a diacylphosphatidylcholine, plasmanylphosphocholine or plasmenylphosphocholine of Formula (I):



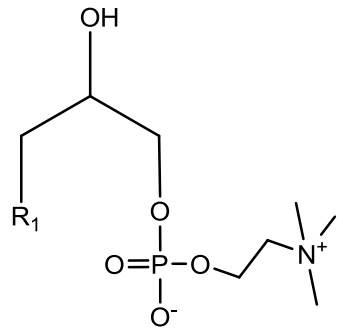
(I)

including adducts or salts thereof, wherein

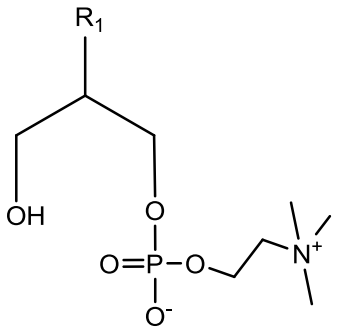
R_1 is a 16:0, 16:1, 18:0, 18:1, 18:2, 18:3, 20:3, 20:4, 20:5, 22:5 or 22:6 fatty acid or alcohol moiety bonded to the glycerol backbone, the bond being an acyl linkage when the metabolite marker comprises a diacylphosphatidylcholine, an ether linkage when the metabolite marker comprises a plasmanylphosphocholine, or a vinyl-ether linkage when the metabolite marker comprises a plasmenylphosphocholine; and

R_2 is a 16:0, 16:1, 18:0, 18:1, 18:2, 18:3, 20:3, 20:4, 20:5, 22:5, or 22:6 fatty acid moiety bonded to the glycerol backbone through an acyl linkage;

(ii) a 2-lysophosphatidylcholine of Formula (II) or 1-lysophosphatidylcholine of Formula (III):



(II)

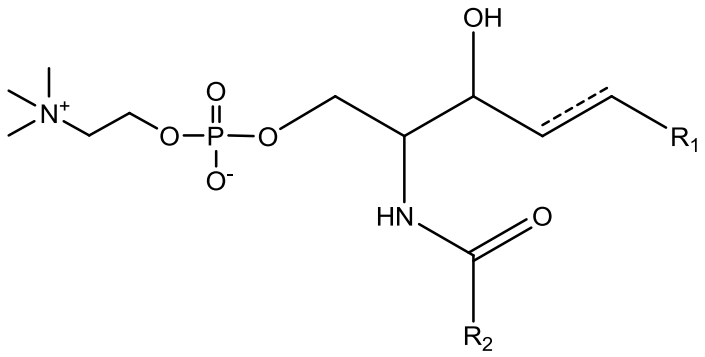


(III)

including adducts or salts thereof, wherein

R_1 is a 14:1, 16:0, 16:1, 16:2, 18:0, 18:1, 18:2, 18:3, 20:1, 20:2, 20:3, 20:4, 20:5, 20:6, 22:3, 22:4, 22:5, 22:6, 24:4, 24:6, 30:1, 32:0, 32:1, 32:2 or 32:6 fatty acid moiety bonded to the glycerol backbone through an acyl linkage; or

(iii) a sphingomyelin as defined in Formula (IV):



(IV)

including adducts or salts thereof, wherein the dashed line represents an optional double bond;

R_1 is a C_{13} alkyl group; and

R_2 is a C_{11} to C_{25} alkyl or alkenyl group, said alkenyl group having from 1 to 3 double

bonds.

39. The method of claim 38, wherein the quantifying data is obtained using a Fourier transform ion cyclotron resonance, time of flight, magnetic sector, quadrupole or triple quadrupole mass spectrometer.

40. The method of claim 38, wherein the quantifying data is obtained using a Fourier transform ion cyclotron resonance mass spectrometer.

41. The method of claim 39, wherein the mass spectrometer is equipped with a chromatographic system.

42. The method of any one of claims 38 to 41, wherein the blood sample is a blood serum sample.

43. The method of any one of claims 38 to 42, wherein a liquid/liquid extraction is performed on the blood sample whereby non-polar metabolites are dissolved in an organic solvent and polar metabolites are dissolved in an aqueous solvent.

44. The method of claim 43, wherein the extracted samples are analyzed by positive or negative electrospray ionization, positive or negative atmospheric pressure chemical ionization, or combinations thereof.

45. The method of claim 43, wherein the extracted samples are analyzed by extracted ion current (EIC) chromatography and mass spectrometry.

46. The method of any one of claims 38 to 45, wherein said one or more than one reference blood sample is from one or more pancreatic cancer-negative humans.

47. The method of any one of claims 38 to 46, further comprising:

analyzing a blood sample from said patient to obtain quantifying data for one or more than one internal standard molecule; and

obtaining a ratio for each of the levels of said one or more than one metabolite marker to the level obtained for the one or more than one internal standard molecule;

wherein the comparing step (b) comprises comparing each ratio to one or more corresponding ratios obtained for the one or more than one reference blood sample.

48. The method of any one of claims 38 to 47, wherein a decrease in the level of said one or more than one metabolite marker in said sample is identified in the comparing step (b).

49. The method of any one of claims 38 to 48, wherein the metabolite is a lysophosphatidylcholine (LysoPC), wherein the LysoPC is LysoPC 14:1, LysoPC 16:0, LysoPC 16:1, LysoPC 16:2, LysoPC 18:0, LysoPC 18:1, LysoPC 18:2, LysoPC 18:3, LysoPC 20:1, LysoPC 20:2, LysoPC 20:3, LysoPC 20:4, LysoPC 20:5, LysoPC 20:6, LysoPC 22:3, LysoPC 22:4, LysoPC 22:5, LysoPC 22:6, LysoPC 24:4, LysoPC 24:6, LysoPC 30:1, LysoPC 32:0, LysoPC 32:1, LysoPC 32:2, LysoPC 32:6 or a combination thereof.

50. The method of any one of claims 38 to 48, wherein the metabolite is a phosphatidylcholine having a molecular formula of $C_{42}H_{78}NO_8P$, $C_{42}H_{80}NO_8P$, $C_{42}H_{82}NO_8P$, $C_{42}H_{84}NO_8P$, $C_{44}H_{78}NO_8P$, $C_{44}H_{80}NO_8P$, $C_{44}H_{82}NO_8P$, $C_{44}H_{84}NO_8P$, $C_{44}H_{86}NO_8P$, $C_{44}H_{88}NO_8P$, $C_{46}H_{78}NO_8P$, $C_{46}H_{80}NO_8P$, $C_{46}H_{82}NO_8P$, $C_{46}H_{84}NO_8P$, $C_{48}H_{80}NO_8P$, $C_{48}H_{82}NO_8P$, $C_{48}H_{84}NO_8P$, $C_{48}H_{86}NO_8P$ or a combination thereof.

51. The method of any one of claims 38 to 48, wherein the metabolite is a plasmenylphosphocholine having a molecular formula of $C_{42}H_{80}NO_7P$, $C_{42}H_{82}NO_7P$, $C_{42}H_{84}NO_7P$, $C_{44}H_{82}NO_7P$, $C_{44}H_{84}NO_7P$, $C_{44}H_{86}NO_7P$, $C_{44}H_{88}NO_7P$, $C_{46}H_{82}NO_7P$, $C_{46}H_{84}NO_7P$, $C_{46}H_{86}NO_7P$, $C_{48}H_{84}NO_7P$, $C_{48}H_{86}NO_7P$, or a combination thereof.

52. The method of any one of claims 38 to 48, wherein the metabolite is a sphingomyelin having a molecular formula of $C_{39}H_{79}N_2O_6P$, $C_{39}H_{80}N_2O_6P^+$, $C_{41}H_{81}N_2O_6P$,

$C_{41}H_{82}N_2O_6P^+$, $C_{41}H_{83}N_2O_6P$, $C_{41}H_{84}N_2O_6P^+$, $C_{47}H_{93}N_2O_6P$, $C_{47}H_{94}N_2O_6P^+$, $C_{47}H_{95}N_2O_6P$, $C_{47}H_{96}N_2O_6P^+$, or a combination thereof.