CLAIMS

WHAT IS CLAIMED IS:

1. A method for identifying a subject, wherein the subject has a cancer, for treatment of adrenal, blood, breast, colorectal, endometrial, kidney, liver, lymphocytic, pancreatic, stomach, or thyroid cancer comprising:

quantifying an amount of metabolic enzyme from an isolated biological sample from the subject,,

wherein the amount of the metabolic enzyme predicts a likelihood of the subject displaying a positive response to a nutrient modulation therapy to treat the cancer,

wherein the metabolic enzyme is one of more of PHGDH, PSAT, and PSPH, and

wherein the quantifying comprises analysis by immunohistochemistry, immunofluorescence, proteomic mass spectrometry, western blot, enzyme-linked immunosorbent assay (ELISA), a genetic reporter, reverse transcription polymerase chain reaction (RT-PCR), quantitative RT-PCR (QPCR), digital PCR (dPCR), in-situ hybridization, RNA-Seq, Sanger sequencing, high throughput sequencing, or microarray.

2. The method of claim 1, wherein the biological sample is a tumor biopsy sample, wherein the biological sample comprises a circulating tumor cell, and/or wherein the biological sample comprises circulating tumor DNA.

3. The method of claim 1 or claim 2, wherein the cancer is pancreatic cancer, breast cancer, colon cancer or endometrial cancer.

4. The method of any one of claims 1-3, wherein the metabolic enzyme is involved in amino acid synthesis, and wherein the biosynthetic metabolic enzyme is involved in serine biosynthesis or glycine biosynthesis.

5. The method of any one of claims 1-4, wherein the metabolic enzyme is i) PHGDH and PSAT1 or (ii) PHGDH and PSAT1 and PSPH.

6. The method of any one of claims 1-5, further comprising, after the quantifying, comparing the amount of the metabolic enzyme in the biological sample to a second amount of the metabolic enzyme in a reference biological sample, wherein the reference biological sample does not comprise a cancer cell, optionally wherein the amount of the metabolic enzyme in the biological sample is lower than the second amount of the metabolic enzyme in the reference sample.

7. The method of any one of claims 1-5, further comprising, after the quantifying, subjecting the amount of the metabolic enzyme to an empirical scoring system, wherein the empirical scoring system has a threshold value, wherein the biological sample having a sample value below the threshold value indicates a likelihood of the subject displaying a positive response to a nutrient modulation therapy,

optionally wherein the sample value is lower than the threshold value of the empirical scoring system.

8. The method of any one of claims 5-7, wherein the metabolic enzyme is PHGDH, and the method further comprises quantifying an amount of PSPH from the isolated biological sample from the subject or from a second isolated biological sample from the subject,

wherein the amount of the PHGDH and the amount of the PSPH predict a successful response of the subject to a nutrient modulation therapy to treat the cancer.

9. The method of any one of claims 5-7, wherein the metabolic enzyme is PSATI, and the method further comprises quantifying an amount of PSPH from the isolated biological sample from the subject or from a second isolated biological sample from the subject,

wherein the amount of PSAT1 and the amount of the PSPH predict a successful response of the subject to a nutrient modulation therapy to treat the cancer.

10. The method of any one of claims 5-7, wherein the metabolic enzyme is PHGDH, and the method further comprises quantifying an amount of PSAT1 from the isolated biological sample from the subject or from a second isolated biological sample from the subject,

wherein the amount of the PHGDH and the amount of the PSAT1 predict a successful response of the subject to a nutrient modulation therapy to treat the cancer.

11. The method of claim 10, wherein the method further comprises quantifying an amount of PSPH from the isolated biological sample from the subject, from the second isolated biological sample from the subject, or from a third isolated biological sample from the subject,

wherein the amount of PHGDH, the amount of PSAT1, and the amount of PSPH predict a successful response of the subject to a nutrient modulation therapy to treat the cancer.

12. Use of a dietary product in the manufacture of a medicament for treating adrenal, blood, breast, colorectal, endometrial, kidney, liver, lymphocytic, pancreatic, stomach, or thyroid cancer in a subject, wherein the subject is identified by the method of any one of claims 1 to 11 and, after the quantifying, the dietary product is to be administered in a therapeutically effective amount, wherein the dietary product is devoid of at least one amino acid.

13. The use of claim 12, wherein radiotherapy and/or chemotherapy is to be administered to the subject.

14. The use of claim 12 or 13, wherein the dietary product is devoid of serine and glycine.

15. The use of claim 14, wherein the dietary product is devoid of serine, glycine, and proline, or wherein the dietary product is devoid of serine, glycine, and cysteine.