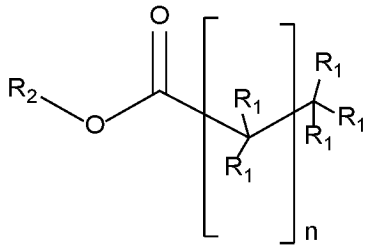
CLAIMS (clean version)

1. A method of diagnosing cachexia or precachexia in a subject, the method comprises the steps of:

   c) *in vivo* imaging with Computed Tomography brown and/or beige adipose tissue (BAT) in said subject, comprising administering a peroral contrast agent comprising a biocompatible formulation of iodinated fatty acids having 16 to 18 carbon atoms and/or esters thereof according to general formula I:



Formula I

wherein n = 14-16;
R_1 is H or I, with the provisions that the number of iodine atoms is 1 to 6, and that the iodine atoms are neither geminal nor vicinal;
and where R2 is H, unsaturated or saturated, linear or branched alkyls, alkyls, alkoxyalkyl, hydroxyalkoxyalkyl, polyhydroxyalkyl, hydroxy poly alkyleneoxyalkyl and generating a CT scan;

   d) the obtained CT scan of step a) is then compared to a normal subject and diagnosis of cachexia or precachexia is performed by establishing positive or increased enhancement of BAT and / or beige adipose tissue or by detecting the white adipose tissue (WAT) browning and / or BAT activity in said subject.

2. The method of diagnosing cachexia or precachexia according to claim 1, wherein the contrast agent is adapted for non-invasive *in vivo* imaging, quantification, and/or monitoring of the activity of the brown and/or beige adipose tissue (BAT) in said subject.

3. The method of diagnosing cachexia or precachexia according to any of claims 1-2, wherein the *in vivo* imaging with Computed Tomography of step a) is performed by PET-CT imaging.

4. The method of diagnosing cachexia or precachexia according to any of claims 1-3, wherein the biocompatible formulation is an ethiodized oil formulation.

5. The method of diagnosing cachexia or precachexia according to any of claims 1-4, wherein the biocompatible formulation is an emulsion.

6. The method of diagnosing cachexia or precachexia according to any of claim 5, wherein the emulsion is a nano-emulsion.

7. The method of diagnosing cachexia or precachexia according to any of claims 6, wherein the contrast agent consists in a biocompatible nano-emulsion of iodinated fatty acids having 16 to 18 carbon atoms according to general formula I.

8. The method of diagnosing cachexia or precachexia according to any of claims 6-7, wherein the iodinated fatty acid is an iodinated linolenic acid.

9. The method of diagnosing cachexia or precachexia according to any of claims 6-8, wherein the nano-emulsion comprises biocompatible emulsifiers selected among lecithin, polyethylene glycol ethers with fatty alcohols, polysorbates and sorbitan esters or their mixtures.

10. The method of diagnosing cachexia or precachexia according to claim 9, wherein the amount of said biocompatible emulsifiers in the nano-emulsion is between 5 – 30 % (w/w) of the total nano-emulsion.

11. The method of diagnosing cachexia or precachexia according to any of claims 1-10, wherein the peroral CT contrast agent is administrated at a dose corresponding to between 0.05 and 1.6 mg of iodine per gram of body weight.

12. The method of diagnosing cachexia or precachexia according to any of claims 1-11, wherein cachexia is a cancer cachexia.

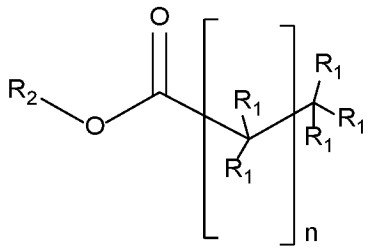
13. The method of diagnosing cachexia or precachexia according to any of claims 1-11, wherein cachexia is a non-cancer cachexia associated with a disorder selected from the group consisting of HIV/AIDS, chronic kidney disease, chronic obstructive pulmonary disease (COPD), chronic heart failure, tuberculosis, Crohn's disease, chronic bowel disease, rheumatoid arthritis and geriatric cachexia.

14. The method of diagnosing cachexia or precachexia according to any of claims 1-13, wherein the method is adapted to diagnose early stages of cachexia in a subject suffering or suspected to suffering thereof.

15. The method of diagnosing cachexia or precachexia according to claim 14, wherein the early diagnosis of cachexia is done before the subject has lost more than 5 % body weight.

16. A method of diagnosing a cancer in a subject, the method comprises the steps of:

c) *in vivo* imaging with Computed Tomography brown and/or beige adipose tissue (BAT) in said subject, comprising administering a peroral contrast agent comprising a iodinated fatty acids having 16 to 18 carbon atoms and/or esters thereof according to general formula I:



Formula I

wherein n = 14-16;
R_1 is H or I, with the provisions that the number of iodine atoms is 1 to 6, and that the iodine atoms are neither geminal nor vicinal;
and where R_2 is H, unsaturated or saturated, linear or branched alkyls, alkyls, alkoxyalkyl, hydroxyalkoxyalkyl, polyhydroxyalkyl, hydroxy poly alkyleneoxyalkyl and generating a CT scan;

d) the obtained CT scan of step a) is then compared to a normal subject and diagnosis of a cancer is performed by establishing positive or increased enhancement of BAT and / or beige adipose tissue or by detecting the white adipose tissue (WAT) browning and / or BAT activity in said subject, and

wherein said cancer is selected from the list consisting of lung cancer, pancreatic cancer, liver cancer, colon cancer, gastric cancer, prostate cancer, breast cancer, esophageal, head and neck, ovarian cancer, cervical cancer, or sarcoma.

17. The method of diagnosing a cancer according to claim 16, wherein the peroral contrast agent is an ethiodized oil formulation.

18. The method of diagnosing a cancer according to any of claims 16-17, wherein the contrast agent is a biocompatible nano-emulsion of iodinated fatty acids having 16-18 carbon atoms according to general formula I.

19. The method of diagnosing a cancer according to any of claims 16-18, wherein the *in vivo* imaging with Computed Tomography of step a) is performed by PET-CT imaging.