Claims

1. Use of a radiopharmaceutical compound in the manufacture of a medicament for the treatment of glioblastoma in a subject in need thereof, wherein said radiopharmaceutical compound is a compound of formula:
M-C-S-P wherein :
M is a radionuclide;
C is a chelating agent capable of chelating said radionuclide;
S is an optional spacer covalently linked between C and P;
P is a somatostatin receptor binding peptide covalently linked to C, either directly or indirectly via S, and wherein an efficient amount of said radiopharmaceutical compound is to be administered in combination with a step of irradiating the subject with an efficient dose of ionizing radiations.

2. The use of claim 1, wherein M is selected from ^{90}Y, ^{131}I, ^{121}Sn, ^{186}Re, ^{188}Re, ^{64}Cu, ^{67}Cu, ^{59}Fe, ^{89}Sr, ^{198}Au, ^{203}Hg, ^{212}Pb, ^{165}Dy, ^{103}Ru, ^{149}Tb, ^{161}Tb, ^{213}Bi, ^{166}Ho, ^{165}Er, ^{169}Er, ^{153}Sm, ^{177}Lu, ^{213}Bi, ^{223}Ra, ^{225}Ac, ^{227}Ac, ^{227}Th, ^{211}At, ^{67}Cu, ^{186}Re, ^{188}Re, ^{161}Tb, ^{175}Yb, ^{105}Rh, ^{166}Dy, ^{199}Au, ^{44}Sc, ^{149}Pm, ^{151}Pm, ^{142}Pr, ^{143}Pr, ^{76}As, ^{111}Ag and ^{47}Sc, preferably is ^{177}Lu.

3. The use of claim 1, wherein C is selected from DOTA (tetraxetan), trizoxetan, DTPA, NTA, EDTA, DO3A, TETA, NOTA, NOTAGA, NODOGA, NODASA, NODAPA, and AAZTA (e.g. AAZTA5) chelating agent, preferably is DOTA, NOTA or DTPA chelating agent, and more preferably is DOTA chelating agent.

4. The use of claim 1, wherein P is selected from octreotide, octreotate, lanreotide, vapreotide, and pasireotide, preferably selected from octreotide and octreotate.

5. The use of claim 1, wherein the radiopharmaceutical compound is selected from DOTA-OC, DOTA-TOC (edotreotide), DOTA-NOC, DOTA-TATE (oxodotreotide), satoreotide tetraxetan, DOTA-LAN, and DOTA-VAP, preferably selected from DOTA-TOC and DOTA-TATE, more preferably is DOTA-TATE

6. The use of claim 1, wherein the radiopharmaceutical compound is [^{177}Lu]Lu-DOTA-TOC (^{177}Lu-edotreotide) or [^{177}Lu]Lu-DOTA-TATE (^{177}Lu-oxodotreotide), more preferably [^{177}Lu]Lu-DOTA-TATE (^{177}Lu-oxodotreotide).

7. The use of claim 1, wherein a therapeutically efficient amount of an alkylating agent, preferably temozolomide, to be administered.

8. The use of claim 1, wherein said alkylating agent, preferably temozolomide, is to be administered at an induction phase at a dose of between 50 to 100 mg/m²/day, preferably around 75 mg/m²/day each day for a period between 4 to 8 weeks, preferably 6 weeks.

9. The use of claim 1, wherein both irradiation and alkylating agent, preferably temozolomide, are initiated the same day.

10. The use of claim 1, wherein said alkylating agent, preferably temozolomide, is to be concomitantly administered with the irradiation without interruption.

11. The use of claim 1, wherein said alkylating agent, preferably temozolomide, is to be daily administered at a first dose during the concomitant administration with the radiotherapy, for example for a period of 6 weeks, and at a second dose during a maintenance phase, following the concomitant administration with the radiotherapy for example, for a period up to 24 weeks, wherein said second dose is at least twice the first dose.

12. The use of claim 1, wherein said alkylating agent, preferably temozolomide, is to be administered during the maintenance phase at a dose of between 50 to 400 mg/m²/day, preferably between 75 to 300 mg/m²/day, more preferably between 150 to 200 mg/m²/day each day for 5 consecutive days followed by 2 days of rest every 28 days for a period between 20 to 28 weeks, preferably 24 weeks.

13. The use of claim 1, wherein said subject has been selected from subject with positive methylated O-6-methylguanine-DNA methyltransferase promoter status.

14. The use of claim 1, wherein said radiopharmaceutical compound is to be administered at a dose ranging between 0.925 GBq (25mCi) to 29.6 GBq (800 mCi), preferably between 1.48 GBq (40 mCi) to 18.5 GBq (500 mCi), preferably between 1.85 GBq (50 mCi) to 14.8 GBq (400 mCi), more preferably between 3.7 GBq (100 mCi) to 11.1 GBq (300 mCi), even more preferably of around 3.7 GBq (100 mCi), 5.55 GBq (150 mCi), 7.4 GBq (200 mCi) or 9.25 GBq (250 mCi).

15. The use of claim 1, wherein said radiopharmaceutical compound is to be administered 1 to 8 times per treatment at the induction phase, preferably 2 to 7 times per treatment, more preferably 4 to 6 times per treatment.

16. The use of claim 1, wherein said radiopharmaceutical compound comprises a treatment interval of 2 weeks, or 3 weeks, or 4 weeks, or 5 weeks or even 6 weeks, preferably 3 or 4 weeks, more preferably every 3 weeks.

17. The use of claim 1, wherein a first dose of said radiopharmaceutical compound is to be administered 1 to 20 days, preferably 3 to 15 days, more preferably 7 to 10 days prior to initiation of irradiation.

18. The use of claim 1, wherein said irradiation induction is to be conducted at a dose between 1 Gy to 4 Gy/day, preferably around 2 Gy/day during a period between 3 to 7 days, preferably around 5 days per week during a period between 4 to 8 weeks, preferably 6 weeks.

19. The use of claim 1, wherein said irradiation is to be conducted for 5 consecutive days followed by 2 days of rest for 6 consecutive weeks.

20. The use of claim 1, wherein said irradiation is whole-brain irradiation.

21. The use of claim 1, wherein said subject has been selected for the treatment by SPECT/CT or PET/CT or SPECT/MRI, PET/MRI imaging with the same radiopharmaceutical compound as defined for the treatment but with a radiometal suitable for imaging instead of ^{177}Lu, preferably ^{68}Ga, ^{67}Ga or ^{64}Cu, more preferably ^{68}Ga, by evaluating said radiopharmaceutical compound suitable for imaging uptake in said subject.

22. The use of claim 1, wherein said subject is newly diagnosed with glioblastoma or suffers from recurrent glioblastoma.

23. The use of claim 22, wherein said subject is newly diagnosed with glioblastoma and has a positive methylated O-6-methylguanine-DNA methyltransferase promoter status, wherein said radiopharmaceutical compound is to be administered to said subject in combination with radiotherapy and an alkylating agent, preferably temozolomide, wherein a first dose of said radiopharmaceutical compound is to be administered preferably 7 to 10 days prior to initiation of radiotherapy.

24. The use of claim 22, wherein said subject is newly diagnosed with glioblastoma and has a negative methylated O-6-methylguanine-DNA methyltransferase promoter status, wherein said radiopharmaceutical compound is to be administered to said subject in combination with radiotherapy and wherein not in combination with other chemotherapeutic agent, such as temozolomide; and wherein the treatment interval between two administrations of said radiopharmaceutical compound is for the first two intervals 4 weeks, and for the third and any following intervals, 3 weeks; wherein a first dose of said radiopharmaceutical compound is to be administered preferably 7 to 10 days prior to initiation of radiotherapy.