CLAIMS

1. Use of a radiopharmaceutical compound comprising a somatostatin receptor binding molecule in the manufacture of a medicament for the treatment of small cell lung cancer (SCLC), in particular extensive stage small cell lung cancer (ES-SCLC), in a human subject in need thereof, wherein a therapeutically efficient amount of the radiopharmaceutical compound is to be administered in combination, preferably concomitantly, with a therapeutically efficient amount of one or more chemotherapeutic agents.

2. The use of claim 1, 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.

3. The use of claim 2, 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.

4. The use of claim 2 or 3, wherein C is selected from DOTA (tetraxetan), trizoxetan, DOTAGA,, DTPA, NTA, EDTA, DO3A, TETA, NOTA, NOTAGA, NODAGA, NODAPA, and AAZTA (e.g. AAZTA5) chelating agent, preferably is DOTA, DOTAGA, NOTA or DTPA chelating agent, and more preferably is DOTA chelating agent.

5. The use of any of claims 1-4, wherein P is selected from octreotide, octreotate, satoreotide, lanreotide, vapreotide, and pasireotide, preferably selected from octreotide and octreotate.

6. The use of any of claims 1-5, 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.

7. The use of any of claims 1-6, 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).

8. The use of any of claims 1-7, wherein said subject has not received prior systematic treatment for SCLC, in particular ES-SCLC, in particular said subject has not received prior chemotherapy for treating SCLC, in particular ES-SCLC.

9. The use of any of claims 1-8, wherein said subject is newly diagnosed with SCLC, in particular ES-SCLC.

10. The use of any of claims 1-9, wherein said subject has been selected for the treatment by SPECT/CT or PET/CT or SPECT/MRI, PET/MRI imaging with the same organic compound as used for the radiopharmaceutical treatment but with a radiometal suitable for imaging, preferably ^{68}Ga, ^{67}Ga or ^{64}Cu, more preferably ^{68}Ga.

11. The use of any of claims 1-10, wherein said subject has been diagnosed as SSTR positive by imaging positron emission tomography (PET) scan in at least one target or non-target lesion, preferably with [^{68}Ga]Ga-DOTA-TATE imaging PET scan.

12. The use of any of claims 1-11, wherein said one or more chemotherapeutic agents include carboplatin and etoposide.

13. The use of any of claims 1-12, wherein said radiopharmaceutical compound is to be administered 1 to 8 times, preferably 2 to 7 times, for example 4 to 6 times, wherein there is a treatment interval between every two administrations of said radiopharmaceutical compound.

14. The use of any of claims 1-13, wherein each administration of 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 and/or 6 weeks.

15. The use of any of claims 1-14, wherein said one or more chemotherapeutic agents is(are) to be administered in combination, preferably concomitantly during an induction period comprising two administrations of said radiopharmaceutical compound,

preferably a first administration of said radiopharmaceutical compound at week 1 of the first administration of a chemotherapeutic agent, for example on either Day 3, 4 or 5 of Week 1, and a second administration of said radiopharmaceutical compound between Week 6 and Week 8, preferably Week 7.

16. The use of claim 15, further comprising a maintenance period following the induction period, comprising 1 to 4 administrations of said radiopharmaceutical compound, preferably every 3 weeks.

17. The use of any of claims 1-16, comprising in combination, preferably concomitantly a therapeutically efficient amount of one or two more immune-oncology (I-O) therapeutic agents to be administered, preferably selected from the group consisting of PD-1 inhibitors, PD-L1 inhibitors, or CTLA4 inhibitors, LAG-3 inhibitors, TIM-3 inhibitors, TIGIT inhibitors, GITR antagonists, TGF-b inhibitors, IL15/IL15RA complexes, CD40/CD40L complexes, OX40 inhibitors, 4-1BB/CD137 complexes, ICOS inhibitors, CD47 inhibitors, VISTA inhibitors, GD-2 inhibitors, and B7/H3 inhibitors, cytokines (e.g., interferon, interlukin), cellular immunotherapies, and cancer vaccines, more preferably are PD-1 inhibitors, PD-L1 inhibitors, or CTLA4 inhibitors, or a combination thereof.

18. The use of claim 17, wherein

(i) said one or more chemotherapeutic agents is(are) to be administered in combination, preferably concomitantly during an induction period comprising two administrations of said radiopharmaceutical compound, preferably a first administration of said radiopharmaceutical compound at Week 1 of the first administration of a chemotherapeutic agent, for example on either Day 3, 4 or 5 of Week 1, and a second administration of said radiopharmaceutical compound between Week 6 and Week 8, preferably Week 7, and

(ii) said immune-oncology agent is to be administered in combination, preferably concomitantly with said chemotherapeutic agent on Week 1, preferably the day of first administration of a chemotherapeutic agent and every 3 weeks during the induction period.

19. The use of claim 18, further comprising a maintenance period following the induction period comprising

(iii) 1 to 4 administrations of said radiopharmaceutical compound every 3 weeks and

(iv) 1 to 4 administration of said immune-oncology agent every 3 weeks.

20. The use of any of claims 17- 19, wherein said PD-1, PD-L1 or CTLA-4 inhibitors are selected from the group consisting of anti-PD1, anti-PD-L1 or anti-CTLA-4 antibodies, for example selected from the group consisting of nivolumab (Bristol-Myers Squibb), ipilimumab, PDR001/spartalizumab (Novartis),Keytruda/pembrolizumab/MK-3475/lambrolizumab (Merk & Co), pidilizumab, durvalumab/MEDI4736, atezolizumab/MPDL3280A/Tecentriq/RG7446 (Roche), avelumab, MEDI0680 (AMP-514, Medimmune), REGN2810/Cemiplimab (Regeneron), TSR-042/Dostarlimab/Dostarlimab-gxly (Tesaro), PF-06801591/Sananlimab (Pfizer), BGB-A317/tislelizumab (Beigene), BGB-108, INCSHR1210/Camrelizumab (Incyte), and AMP-224 (Amplimmune).

21. The use of claim 19, wherein said PD-1, PD-L1 or CTLA-4 inhibitor is tislelizumab, and is preferably to be administered at a dose of about 200 mg or about 300 mg.

22. The use of any of claims 1-20 wherein said subject has not received prior systematic treatment for SCLC, in particular ES-SCLC, in particular said subject has not received prior chemotherapy for treating SCLC, in particular ES-SCLC, wherein said radiopharmaceutical compound is [177Lu]Lu-DOTA-TATE, said one or more chemotherapeutic agent is carboplatin (preferably carboplatin AUC 5 on day 1 of every 3-week-cycle) and etoposide (preferably administered at a daily dose of 100 mg/m2 on days 1, 2 and 3 of every 3-week-cycle)., and said use further comprises a therapeutically efficient amount of tislelizumab to be administered in combination, preferably concomitantly with [^{177}LU]Lu-DOTA-TATE administration.

23. The use of claim 22, wherein

(i) said carboplatin and etoposide are to be administered in combination, preferably concomitantly during an induction period comprising two administrations of [^{177}LU]Lu-DOTA-TATE, preferably a first administration of [^{177}LU]Lu-DOTA-TATE at Week 1 after the first administration of carboplatin and/or etoposide, for example on either Day 3, 4 or 5 of Week 1, and a second administration of [^{177}LU]Lu-DOTA-TATE between Week 6 and Week 8, preferably Week 7, and

(ii) tislelizumab is to be administered in combination, preferably concomitantly with carboplatin and etoposide on Week 1, preferably the day of first administration of carboplatin and every 3 weeks during the induction period.

24. The use of claim 23, which further comprises a maintenance period, following the induction period, comprising

(iii) 1 to 4 administrations of [^{177}LU]Lu-DOTA-TATE every 3 weeks and

(iv) 1 to 4 administrations of tislelizumab agent every 3 weeks.

25. The use of any of claims 1-24, wherein said radiopharmaceutical compound is to be administered at a dose (i.e. daily dose, dose for each administration, non-cumulative dose) ranging between 0.925 GBq (25 mCito 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).