the liquid radiopharmaceutical composition consists of: (a) ^{25}Ac- DOTA-TATE present in the radiopharmaceutical composition at a concentration equivalent to 10 mCi/L to 25 mCi/L; (b) sodium L-ascorbate present in the radiopharmaceutical composition at a concentration of about 100mM; (c) DTPA, present in the radiopharmaceutical composition at a concentration of about 0.05 mg/mL; and (d) sodium chloride saline solution at a concentration of about 0.9% w/w.

[024] In one aspect, provided herein is a method of treating a somatostatin receptor-positive (SSTR+) neuroendocrine tumor in a subject in need thereof, comprising administering to the subject a therapeutically effective amount of a liquid radiopharmaceutical composition, wherein the liquid radiopharmaceutical composition is formulated as a unit dose form that has about 12mL of the solution, and wherein the liquid radiopharmaceutical composition consists of: (a) ^{225}Ac-DOTA-TATE present in the radiopharmaceutical composition in an amount of 146 – 275 µCi in about 12 mL solution; (b) sodium L-ascorbate present in the radiopharmaceutical composition at a concentration of about 18.5 mg/mL; (c) DTPA present in the radiopharmaceutical composition at a concentration of about 0.05 mg/mL; and (d) sodium chloride saline solution at a concentration of about 0.9% w/w.

[024a] In one aspect, provided herein is a liquid radiopharmaceutical composition comprising: a) a conjugate that comprises (i) a targeting ligand, wherein the targeting ligand binds to a somatostatin receptor (SSR), (ii) a metal chelator covalently attached to the targeting ligand, and (iii) a radionuclide, wherein the radionuclide is ^{225}Ac and is bound to the metal chelator; b) one or more stabilizing agents; and an aqueous vehicle.

[024b] In one aspect, provided herein is a liquid radiopharmaceutical composition comprising: (a) a conjugate that comprises (i) a targeting ligand, wherein the targeting ligand binds to a somatostatin receptor (SSR), (ii) a metal chelator covalently attached to the targeting ligand, and (iii) a radionuclide, wherein the radionuclide is ^{225}Ac, (b) a means for scavenging free radicals in the radiopharmaceutical composition or a means for maintaining a pH of the radiopharmaceutical composition, wherein the pH of the radiopharmaceutical composition is about 4 to about 8; (c) a means for scavenging free radionuclide in the radiopharmaceutical composition; and (d) an aqueous vehicle; wherein the radiopharmaceutical composition is a solution, and wherein the radiopharmaceutical composition retains at least 90 % of the ^{225}Ac content as part of the radionuclide after 120 hours at about 20ºC to about 25°C as determined by radio thin-layer chromatography (radio-TLC).

[024c] In one aspect, provided herein is a liquid radiopharmaceutical composition comprising: (a) a conjugate that comprises (i) a targeting ligand, wherein the targeting ligand binds to a somatostatin receptor (SSR), (ii) a metal chelator covalently attached to the targeting ligand, and

(iii) a radionuclide, wherein the radionuclide is ^{225}Ac, wherein the conjugate is present in the radiopharmaceutical composition at a concentration equivalent to about 1 mCi/L to about 50 mCi/L, or at a concentration equivalent to about 10 mCi/L to about 35 mCi/L, or at a concentration equivalent to about 10 mCi/L to about 25 mCi/L; (b) a radiolysis stabilizer; (c) a free metal chelator; and (d) an aqueous vehicle; wherein the radiopharmaceutical composition is a solution, and wherein the radiopharmaceutical composition retains at least 90 % of the ^{225}Ac content as part of the radionuclide after 120 hours at about 20ºC to about 25°C as determined by radio thin-layer chromatography (radio-TLC).

[024d] In one aspect, provided herein is a use of a liquid radiopharmaceutical composition as described herein in the manufacture of a medicament for treating a somatostatin receptor-positive (SSTR+) neuroendocrine tumor in a subject in need thereof, wherein the liquid radiopharmaceutical composition is to be administered to the subject in an effective amount.

[024e] In one aspect, provided herein is a method of making a radiopharmaceutical composition as described herein, comprising: a) combining a radionuclide with an un-labeled conjugate, wherein the un-labeled conjugate comprises a targeting ligand and a metal chelator covalently attached to the targeting ligand, thereby producing a labeled conjugate, and b) combining the one or more stabilizing agents with the labeled conjugate.

[024f] In one aspect, provided herein is a method of making a radiopharmaceutical composition as described herein, comprising: a) combining a radionuclide with an un-labeled conjugate in the presence of one or more stabilizer agents, wherein the un-labeled conjugate comprises a targeting ligand and a metal chelator covalently attached to the targeting ligand, thereby producing a mixture comprising a labeled conjugate, and b) optionally combining one or more stabilizing agents to the mixture.

[024g] In one aspect, provided herein is a use of the radiopharmaceutical composition as described herein in the manufacture of a medicament for treating a disease in a subject in need thereof wherein the radiopharmaceutical composition is to be administered to the subject, optionally wherein the disease is a cancer, optionally wherein the cancer is a somatostatin receptor-positive (SSTR+) cancer.

[024h] In one aspect, provided herein is a use of the radiopharmaceutical composition as described herein in the manufacture of a medicament for treating an SSTR+ cancer in a subject in need thereof, wherein an H-score of a cancer sample of the subject is at least 11.

[024i] In one aspect, provided herein is a use of the radiopharmaceutical as described herein in the manufacture of a medicament for treating a disease in a subject in need thereof, wherein a level of SSTR expression is to be determined in a sample of the subject and wherein the radiopharmaceutical composition is to be administered to the subject; optionally wherein the

level of SSTR expression in a sample is to be determined by calculating an H-Score, and wherein the H-Score is between 11 and 300.

[024j] In one aspect, provided herein is a liquid radiopharmaceutical composition as described herein for use in therapy.

INCORPORATION BY REFERENCE

[025] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference for the specific purposes identified herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[026] The novel features of the disclosure are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present disclosure will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the disclosure are utilized, and the accompanying drawing (also "figure" and "FIG." herein), of which:

[027] FIG. 1A depicts the structures of exemplary radiolysis stabilizers catechins and their derivatives; FIG. 1B illustrates the structures of exemplary stabilizing agents cyclodextrin; FIG. 1C illustrates the structures of exemplary stabilizing agents (antioxidants); FIG. 1D illustrates the structures of exemplary stabilizing agents (amino acids); and FIG. 1E illustrates the structures of exemplary stabilizing agents.

[028] FIG. 2A illustrates the structures of exemplary small molecule targeting ligands; FIG. 2B illustrates the structures of exemplary binding peptide.

[029] FIG. 3- FIG. 17 depict the structures of representative metal chelators.

[030] FIG. 18A and FIG. 18B illustrate the abbreviations and modification of amino acids.