CLAIMS

1. A particle comprising,
- a degradable compound comprising $CaCO_3$,
- the alpha emitting radionuclide ^{224}Ra, and
- the ^{224}Ra radionuclide, progeny selected from the group consisting of ^{220}Rn, ^{216}Po, and ^{212}Pb.

2. The particle according to claim 1, wherein $CaCO_3$ is selected from the group consisting of $CaCO_3$, PEG modified $CaCO_3$, protein modified $CaCO_3$, carbohydrate modified $CaCO_3$, lipid modified $CaCO_3$, vitamin modified $CaCO_3$, organic compound modified $CaCO_3$, polymer modified $CaCO_3$ and/or inorganic crystal modified $CaCO_3$.

3. The particle according to any one of claims 1-2, wherein size of the particle is from 1 nm to 500 µm.

4. The particle according to any one of claims 1-3, further comprising one or more compounds selected from the group consisting of a monoclonal antibody, a polyclonal antibody, a radioimmunoconjugate, an immunoconjugate, a chelate antibody conjugate, vitamins including folate and folate derivatives, peptides, minibodies, and affibodies.

5. The particle according to claim 4, wherein the one or more compounds is/are targeting a target selected from the group consisting of CD19, CD20, CD22, CD33, CD37, CD38, CD45, CD74, CD138, PSMA, HER-2, EGFR, MUC-1, MUC-18, CEA, FBP, NG2, EPCAM, Syndecan-1, Ca-125, LK-26, HMFG, CS-1, and BCMA.

6. The particle according to any one of the claims 1-5, wherein the particle is a medical device or is comprised in a medical device.

7. A composition comprising a particle according to any one of claims 1-6.

8. A composition or pharmaceutical composition, comprising one or more particles according to any one of claims 1-6 and a diluent, carrier, surfactant, and/or excipient.

9. The pharmaceutical composition according to claim 8 or the composition according to claims 7-8, prepared with an amount of radionuclide that is 1kBq to 10GBq per dosing or with an amount of radionuclide that is 50 MBq to 100 GBq suitable for multidose industrial scale production.

10. The composition according to claims 7-8, or pharmaceutical composition according to anyone of claims 8-9 wherein the composition is a particle suspension comprising monodisperse or polydisperse particles according to claims 1-6.

11. The pharmaceutical composition according to any one of claims 8-10 or the composition according to claims 7-8, which is suitable for intravenous or intracavitary injection.

12. The particle according to any one of claims 1-6, or the pharmaceutical composition according to claims 8-11 or the composition according to claims 7-8, for use as a medicament.

13. The particle according to any one of claims 1-6, the composition according to claims 7-8, or the pharmaceutical composition according to claims 8-11, for use in intracavitary therapy, radioembolization or radiosynovectomy.

14. The particle according to any one of claims 1-6, the composition according to claims 7-8, or the pharmaceutical composition according to claims 8-11, for use in the treatment of cancer.

15. The particle according to any one of claims 1-6 or the composition according to claims 7-8, the pharmaceutical composition according to claims 8-11, or the particle for use according to claims 12-14, wherein the cancer is selected from the group consisting of intraperitoneal cancers, intracranial cancers, pleural cancers, bladder cancers, cardiac cancers, and cancers in the subarachnoid cavity.

16. A method for preparing a particle according to any one of claims 1-6, the method comprising bringing an alpha emitting radionuclide ^{224}Ra and a degradable compound comprising $CaCO_3$ in contact with each other with or without using a carrier for the radionuclide.

17. A kit comprising;

- a degradable compound comprising $CaCO_3$,
- a composition comprising the alpha emitting radionuclide ^{224}Ra, and the ^{224}Ra radionuclide progeny selected from the group consisting of ^{220}Rn, ^{216}Po, and ^{212}Pb, and
- optionally instructions to use the kit.

18. A kit according to claim 17, further comprising a chelator-conjugated molecule, including a monoclonal antibody.

19. A two-component kit comprising a radioimmunoconjugate for ^{212}Pb antigen-specific treatment, and a particle according to anyone of claims 1-6.