CLAIMS

1. Use of a DNA vaccine comprising an attenuated mutant strain of Salmonella typhi Ty21a comprising at least one copy of a recombinant DNA molecule comprising an expression cassette encoding a VEGF receptor protein having the amino acid sequence as found in SEQ ID NO 1, for the manufacture of a medicament for cancer immunotherapy, wherein a single dose of the vaccine is $1x10^9$ or less than $1x10^9$ CFU.

2. The use of claim 1, wherein the expression cassette is a eukaryotic expression cassette.

3. The use of claim 1 or 2, wherein the DNA vaccine comprises the attenuated Salmonella typhi strain Ty21a transformed by a plasmid that contains a DNA encoding the VEGFR-2 protein of SEQ ID NO 1 for use in an anti-angiogenic cancer immunotherapy.

4. The use of claim 3, wherein the plasmid is the 7580bp pVAX10.VR2-1 as depicted in Figure 2 and the DNA vaccine is designated VXM01.

5. The use of any one of claims 1 to 4, wherein the cancer is pancreatic cancer.

6. The use of claim 5, wherein said pancreatic cancer is stage IV or locally advanced pancreatic cancer.

7. The use of any one of claims 1 to 6, wherein the cancer includes metastases.

8. The use of any one of claims 1 to 7, wherein the treatment is accompanied by chemotherapy and/or radiotherapy.

9. The use of claim 8, wherein the chemotherapeutic agent is gemcitabine.

10. The use of claims 8 or 9, wherein the immunotherapeutic treatment with the vaccine is carried out during the chemotherapy treatment cycle.

11. The use of any one of claims 1 to 10, wherein the vaccine is administered orally.

12. The use of any one of claims 1 to 11, wherein a single dose of the vaccine is 1x 10^5, 1x10^6, 1x10^7, 1x10^8, or 1x10^9 colony forming units (CFU).

13. The use according to claim 9, wherein a single dose of the vaccine is from 1x10^8 to 1x10^9 CFU.

14. The use according to claim 9, wherein a single dose of the vaccine is less than 1x10^8 CFU, particularly wherein a single dose of the vaccine is from 1x10^5 to 1x10^8 CFU, more particularly wherein a single dose of the vaccine is from 1x10^6 to 1x10^7 CFU.

15. The use of any one of claims 2 to 14, wherein a single dose comprises from about 10^5 to about 10^{09}, particularly from about 10^6 to about 10^9, more particularly from about 10^6 to about 10^8, most particularly from about 10^6 to about 10^7 colony forming units (CFU).

CLAIMS

1. An attenuated mutant strain of Salmonella typhi comprising at least one copy of a recombinant DNA molecule comprising an expression cassette encoding a VEGF receptor protein, particularly a VEGF receptor protein selected from the group consisting of human VEGFR-2 and a homolog thereof that shares at least about 80% homology therewith, particularly wherein human VEGFR-2 has the amino acid sequence as found in SEQ ID NO 1, for use as a vaccine.

2. A DNA vaccine comprising the attenuated mutant strain of Salmonella typhi of claim 1, wherein the attenuated mutant strain of Salmonella typhi is Salmonella typhi Ty21a, and wherein the expression cassette is a eukaryotic expression cassette, for use in cancer immunotherapy.

3. The DNA vaccine of claim 2, wherein the DNA vaccine comprises the attenuated Salmonella typhi strain Ty21a transformed by a plasmid that contains a DNA encoding the VEGFR-2 protein of SEQ ID NO 1 for use in an anti-angiogenic cancer immunotherapy.

4. The DNA vaccine of claim 3, wherein the plasmid is the 7580bp pVAX10.VR2-1 as depicted in Figure 2 and has the sequence as found in SEQ ID NO 3 and the DNA vaccine is designated VXM01.

5. The DNA vaccine of any one of claims 2 to 4, wherein the cancer is pancreatic cancer.

6. The DNA vaccine of claim 5, wherein said pancreatic cancer is stage IV or locally advanced pancreatic cancer.

7. The DNA vaccine of any one of claims 2 to 6, wherein the cancer includes metastases.

8. The DNA vaccine of any one of claims 2 to 7, wherein the treatment is accompanied by chemotherapy and/or radiotherapy.

9. The DNA vaccine of claim 8, wherein the chemotherapeutic agent is gemcitabine.

10. The DNA vaccine of claims 8 or 9, wherein the immunotherapeutic treatment with the vaccine is carried out during the chemotherapy treatment cycle.

11. The DNA vaccine of any one of claims 2 to 10, wherein the vaccine is administered orally.

12. The DNA vaccine of any one of claims 2 to 11, wherein the single dose of the vaccine is 1x 10^5, 1x10^6, 1x10^7, 1x10^8, 1x10^9,1x10^{10}, or 1x10^{11} colony forming units (CFU).

13. The DNA vaccine for use according to claim 9, wherein the single dose of the vaccine is less than $1x10^9$ CFU, particularly wherein the single dose of the vaccine is from $1x10^8$ to $1x10^9$ CFU.

14. The DNA vaccine for use according to claim 9, wherein the single dose of the vaccine is less than $1x10^8$ CFU, particularly wherein the single dose of the vaccine is from $1x10^5$ to $1x10^8$ CFU, more particularly wherein the single dose of the vaccine is from $1x10^6$ to $1x10^7$ CFU.

15. The DNA vaccine of any one of claims 2 to 14, wherein the single dose comprises from about 10^5 to about 10^{11}, particularly form about 10^6 to about 10^{10}, more particularly from about 10^6 to about 10^9, more particularly from about 10^6 to about 10^8, most particularly from about 10^6 to about 10^7 colony forming units (CFU).

16. The DNA vaccine VXM01, comprising the attenuated Salmonella typhi strain Ty21a transformed by a plasmid that contains a DNA encoding the VEGFR-2 protein of SEQ ID NO 1, wherein the plasmid is a 7580 bp plasmid DNA and comprises the cDNA of VEGFR-2 that is under the control of the CMV promoter, the kanamycin resistance gene, and the pMB1 ori, and is designated as pVAX10.VR2-1.