CLAIMS

I claim:

1. Use of a therapeutically effective amount of a Zn(II) agent comprising Zn(II)/γ-polyglutamic acid and/or Zn(II)/α-polyglutamic acid, and an immune-oncology agent in the preparation of a medicament for combination therapy for the treatment of a tumor in a patient, wherein the immune-oncology agent is an immune checkpoint inhibitor.

2. The use according to claim 1, wherein said immune checkpoint inhibitor is an anti-cytotoxic T-lymphocyte antigen-4 (CTLA-4) antibody or an antigen-binding portion thereof that binds specifically to CTLA-4 and inhibits CTLA-4 activity; or a programmed cell death-1 (PD-1) antibody or an antigen-binding portion thereof that binds specifically to a PD-1 receptor and inhibits PD-1 activity.

3. The use according to claim 2, wherein said tumor includes tumor cells that have genetic instability mutations and/or genetic instability due to gene overexpression.

4. The use according to claim 3, wherein said genetic instability mutations are dysfunctional mutations in one or more genes selected from ATM; ATR; PAXIP1; BRCA1; BRCA2; WRN; RFC1; RPA1; ERCC1; ERCC4; ERCC6; MGMT; PARP1; PARP2; NEIL3; XRCC1; MLH1; PMS2; TP53; CREBBP; JAK1; NFKB1; MSH2; MSH3; MSH6; and MLH3.

~~5. Use of a therapeutically effective amount of a Zn(II) agent comprising Zn(II)/γ-polyglutamic acid and/or Zn(II)/α-polyglutamic acid in the preparation of a medicament for increasing the tumor infiltrating leukocyte population of CD4+T cells and CD8+T cells in a tumor in a patient.~~

~~6~~5. Use of a therapeutically effective amount of a Zn(II) agent comprising Zn(II)/γ-polyglutamic acid and/or Zn(II)/α-polyglutamic acid, and an immune-oncology agent in the preparation of a medicament for combination therapy for increasing the tumor infiltrating leukocyte population of CD4+T cells and CD8+T cells in a tumor in a patient.

~~7~~6. The use according to claim ~~6~~5, wherein said immune-oncology agent is an immune checkpoint inhibitor.

~~8~~7. The use according to claim ~~7~~6, wherein said immune checkpoint inhibitor is an anti-cytotoxic T-lymphocyte antigen-4 (CTLA-4) antibody or an antigen-binding portion thereof

that binds specifically to CTLA-4 and inhibits CTLA-4 activity; or a programmed cell death-1 (PD-1) antibody or an antigen-binding portion thereof that binds specifically to a PD-1 receptor and inhibits PD-1 activity.

~~9~~8. Use of a therapeutically effective amount of (i) a Zn(II)/polyglutamic acid agent and (ii) an immune-oncology agent that targets a T-lymphocyte marker, a macrophage marker, or a natural killer cell marker in the preparation of a medicament for combination therapy for the treatment of a tumor in a patient.

~~10~~9. The use of claim ~~9~~8, wherein the T-lymphocyte marker comprises at least one of the following: lymphocyte activation gene 3 (LAG-3); T-cell immunoglobulin- and mucin-domain-containing molecule 3 (TIM-3); T-cell immunoglobulin and ITIM domain (TIGIT); B7-H3 (CD276); V-domain containing Ig suppressor of T-cell activation (VISTA); inducible T-cell costimulator (ICOS); CD27; and glucocorticoid-induced TNF receptor (GITR).

~~11~~10. The use of claim ~~9~~8, wherein the macrophage marker comprises at least one of the following: CD47 and indoleamine-2,3-dioxygenase (IDO).

~~12~~11. The use of claim ~~9~~8, wherein the natural killer cell marker comprises at least one of the following: killer immunoglobulin-like receptor (KIR) and CD94/NKG2A.

~~13~~12. The use of any one of claims ~~9~~ 8 to ~~12~~11, wherein said Zn(II)/polyglutamic acid agent comprises polyglutamic acid conjugated to a tumor-targeting moiety and/or a charge-carrying moiety.

~~14~~13. The use of claim ~~13~~12, wherein said polyglutamic acid conjugated to a tumor-targeting moiety and/or a charge-carrying moiety is γ-polyglutamic acid.

~~15~~14. The use of claim ~~13~~12, wherein said polyglutamic acid conjugated to a tumor-targeting moiety and/or a charge-carrying moiety is α-polyglutamic acid.

~~16~~15. The use of claim ~~13~~12, wherein the molecular weight of said polyglutamic acid is in the range of about 2.5 kDa to about 60 kDa.

~~17~~16. The use according to claim 3, wherein said genetic instability due to overexpression is caused by overexpression of APOBEC3B.