Claims

1. Use of a water-insoluble controlled-release pattern recognition receptor agonist ("PRRA") or its pharmaceutically acceptable salt or a pharmaceutical composition comprising such water-insoluble controlled-release PRRA or its pharmaceutical acceptable salt for the manufacture of a medicament for the treatment of ~~a cell-proliferation disorder~~cancer, wherein the water-insoluble controlled-release PRRA is to be administered by intra-~~tissue~~ tumoral administration into a solid tumor or lymphoma, ~~and wherein such~~which intra-tissue administration results in local inflammation, wherein the water-insoluble controlled-release PRRA comprises a plurality of PRRA moieties, which PRRA moieties are TLR7/8 agonists covalently and reversibly conjugated to a carrier moiety, which carrier is a PEG-based hydrogel, and wherein PRRA is released from the water-insoluble controlled-release PRRA with a release half-life under physiological conditions of at least 3 days.

2. The use of claim 1, wherein ~~the cell-proliferation disorder is cancer~~intra-tumoral administration of the water-insoluble controlled-release PRRA in a dose X induces a more than 1.5-fold increase in the percent of antigen-presenting cells in tumor draining lymph nodes 7 days following said administration than intra-tumoral administration of a dose of 0.5 to 1.5 X of the corresponding free PRRA.

3. The use of claim ~~2~~1 or 2, wherein the cancer is selected from the group consisting of liquid tumors, solid tumors and lymphomas.

4. The use of any one of claims ~~3~~1 to 3, wherein the cancer is selected from the group consisting of lip and oral cavity cancer, oral cancer, liver cancer/hepatocellular cancer, primary liver cancer, lung cancer, lymphoma, malignant mesothelioma, malignant thymoma, skin cancer, intraocular melanoma, metastasic squamous neck cancer with occult primary, childhood multiple endocrine neoplasia syndrome, mycosis fungoides, nasal cavity and paranasal sinus cancer, nasopharyngeal cancer, neuroblastoma, oropharyngeal cancer, ovarian cancer, pancreatic cancer, parathyroid cancer, pheochromocytoma, pituitary tumor, adrenocortical carcinoma, AIDS-related malignancies, anal cancer, bile duct cancer, bladder cancer, brain and nervous system cancer, breast cancer, bronchial adenoma/carcinoid, gastrointestinal carcinoid tumor,

carcinoma, colorectal cancer, endometrial cancer, esophageal cancer, extracranial germ cell tumor, extragonadal germ cell tumor, extrahepatic bile duct cancer, gallbladder cancer, gastric (stomach) cancer, gestational trophoblastic tumor, head and neck cancer, hypopharyngeal cancer, islet cell carcinoma (endocrine pancreas), kidney cancer/renal cell cancer, laryngeal cancer, pleuropulmonary blastoma, prostate cancer, transitional cell cancer of the renal pelvis and ureter, retinoblastoma, salivary gland cancer, sarcoma, Sezary syndrome, small intestine cancer, genitourinary cancer, malignant thymoma, thyroid cancer, Wilms' tumor and cholangiocarcinoma.

~~5. The use of any one of claims 1 to 4, wherein the intra-tissue administration is intra-tumoral administration.~~

~~6. The use of claim 5, wherein the intra-tumoral administration is administration into a solid tumor or lymphoma.~~

~~7~~5. The use of any one of claims 1 to ~~6~~4, wherein local inflammation is an at least 1.5-fold increase in the levels of at least four proteins selected from the group consisting of TNFα, IL-1β, IL-10, IL-6, MCP-1, MIP-1α, MIP-1β, MIP-2α, MIP-3α, IP-10 and KC compared to baseline tissue measured 3 days after intra-~~tissue~~ tumoral administration.

~~8. The use of any one of claims 1 to 7, wherein the one or more PRRA is selected from the group consisting of Toll-like receptor agonists, NOD-like receptors, RIG-I-like receptors, cytosolic DNA sensors, STING, and aryl hydrocarbon receptors.~~

~~9. The use of any one of claims 1 to 8, wherein the one or more PRRA is a Toll-like receptor agonist.~~

~~10. The use of any one of claims 1 to 9, wherein the one or more PRRA is a TLR7 agonist.~~

~~11. The use of any one of claims 1 to 10, wherein at least 10% of the PRRA of the water-insoluble controlled-release PRRA are imiquimod.~~

~~12. The use of any one of claims 1 to 9, wherein the one or more PRRA is a TLR7/8 agonist.~~

~~13~~6. The use of any one of claims 1 to ~~9 or 12~~5, wherein at least 10% of the PRRA of the water-insoluble controlled-release PRRA are resiquimod.

7. The use of any one of claims 1 to 6, wherein all PRRA of the water-insoluble controlled-release PRRA are resiquimod.

8. The use of any one of claims 1 to 7, wherein intra-tumoral administration is intra-tumoral injection.

~~14. The use of any one of claims 1 to 13, wherein PRRA is released from the water-insoluble controlled-release PRRA with a release half-life under physiological conditions of at least 3 days.~~

~~15. The use of any one of claims 1 to 14, wherein the water-insoluble controlled-release PRRA comprises a plurality of PRRA moieties covalently and reversibly conjugated to a carrier moiety.~~

~~16. The use of claim 15, wherein the carrier comprises a polymer.~~

~~17. The use of claim 15 or 16, wherein the carrier is a hydrogel.~~

~~18~~9. The use of any one of claims 1 to ~~17~~8, wherein the treating of the ~~cell proliferation disorder~~ cancer in addition to the administration of the water-insoluble controlled-release PRRA includes the administration of at least one cancer therapeutic.

10. The use of claim 9, wherein the cancer therapeutic is selected from the group consisting of cytotoxic/chemotherapeutic agents, immune checkpoint inhibitors or antagonists, immune checkpoint agonists, multi-specific drugs, antibody-drug conjugates (ADC), radionuclides or targeted radionuclide therapeutics, DNA damage repair inhibitors, tumor metabolism inhibitors, pattern recognition receptor agonists, protein kinase inhibitors, chemokine and chemoattractant receptor agonists, chemokine or chemokine receptor antagonists, cytokine receptor agonists, death receptor agonists, CD47 or SIRPa antagonists, oncolytic drugs, signal converter

proteins, epigenetic modifiers, tumor peptides or tumor vaccines, heat shock protein (HSP) inhibitors, proteolytic enzymes, ubiquitin and proteasome inhibitors, adhesion molecule antagonists, and hormones including hormone peptides and synthetic hormones.

11. The use of claim 10, wherein the cancer therapeutic is a cytokine receptor agonist.

~~19~~12. A water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof, wherein said water-insoluble controlled-release PRRA releases one or more PRRA and wherein intra-~~tissue~~ tumoral administration into a solid tumor or lymphoma of said controlled-release PRRA causes local inflammation, wherein the water-insoluble controlled-release PRRA comprises a plurality of PRRA moieties, which PRRA moieties are TLR7/8 agonists covalently and reversibly conjugated to a carrier moiety, which carrier is a PEG-based hydrogel, and wherein PRRA is released from the water-insoluble controlled-release PRRA with a release half-life under physiological conditions of at least 3 days.

~~20. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of claim 19, wherein the intra-tissue administration is intra-tumoral administration.~~

~~21. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of claim 19 or 20, wherein the intra-tumoral administration is administration into a solid tumor or lymphoma.~~

13. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of claim 12, wherein intra-tumoral administration of the water-insoluble controlled-release PRRA in a dose X induces a more than 1.5-fold increase in the percent of antigen-presenting cells in tumor draining lymph nodes 7 days following said administration than intra-tumoral administration of a dose of 0.5 to 1.5 X of the corresponding free PRRA.

~~22~~14. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of ~~any one of~~ claim~~s~~ ~~19~~ 12 ~~to~~ or ~~21~~13, wherein local inflammation is an at least

1.5-fold increase in the levels of at least four proteins selected from the group consisting of TNFα, IL-1β, IL-10, IL-6, MCP-1, MIP-1α, MIP-1β, MIP-2α, MIP-3α, IP-10 and KC compared to baseline tissue measured 3 days after intra-~~tissue~~ tumoral administration.

~~23. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 22, wherein the one or more PRRA is selected from the group consisting of Toll-like receptor agonists, NOD-like receptors, RIG-I-like receptors, cytosolic DNA sensors, STING, and aryl hydrocarbon receptors.~~

~~24. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 23, wherein the one or more PRRA is a Toll-like receptor agonist.~~

~~25. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 24, wherein the one or more PRRA is a TLR7 agonist.~~

~~26. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 25 wherein at least 10% of the PRRA of the water-insoluble controlled-release PRRA are imiquimod.~~

~~27. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 24, wherein the one or more PRRA is a TLR7/8 agonist.~~

~~28~~15. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims ~~19 to 24 or 27~~12 to 14, wherein at least 10% of the PRRA of the water-insoluble controlled-release PRRA are resiquimod.

16. The use of any one of claims 12 to 15, wherein all PRRA of the water-insoluble controlled-release PRRA are resiquimod.

17. The use of any one of claims 12 to 16, wherein intra-tumoral administration is intra-tumoral injection.

~~29. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 28, wherein PRRA is released from the water-insoluble controlled-release PRRA with a release half-life under physiological conditions of at least 3 days.~~

~~30. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims 19 to 29, wherein the water-insoluble controlled-release PRRA comprises a plurality of PRRA moieties covalently and reversibly conjugated to a carrier moiety.~~

~~31. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of claim 30, wherein the carrier comprises a polymer.~~

~~32. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of claim 30 or 31, wherein the carrier is a hydrogel.~~

~~33~~18. A pharmaceutical composition comprising one or more water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims ~~19~~ 12 to ~~32~~ 17 and at least one excipient.

~~34~~19. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof of any one of claims ~~19~~ 12 to ~~32~~ 17 or the pharmaceutical composition of claim ~~33~~ 18 for use as a medicament for the treatment of cancer.

20. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof or the pharmaceutical composition for use of claim 19, wherein the cancer is selected from the group consisting of lip and oral cavity cancer, oral cancer, liver cancer/hepatocellular cancer, primary liver cancer, lung cancer, lymphoma, malignant mesothelioma, malignant thymoma, skin cancer, intraocular melanoma, metastasic squamous neck cancer with occult primary, childhood multiple endocrine neoplasia syndrome, mycosis fungoides, nasal cavity and paranasal sinus cancer,

nasopharyngeal cancer, neuroblastoma, oropharyngeal cancer, ovarian cancer, pancreatic cancer, parathyroid cancer, pheochromocytoma, pituitary tumor, adrenocortical carcinoma, AIDS-related malignancies, anal cancer, bile duct cancer, bladder cancer, brain and nervous system cancer, breast cancer, bronchial adenoma/carcinoid, gastrointestinal carcinoid tumor, carcinoma, colorectal cancer, endometrial cancer, esophageal cancer, extracranial germ cell tumor, extragonadal germ cell tumor, extrahepatic bile duct cancer, gallbladder cancer, gastric (stomach) cancer, gestational trophoblastic tumor, head and neck cancer, hypopharyngeal cancer, islet cell carcinoma (endocrine pancreas), kidney cancer/renal cell cancer, laryngeal cancer, pleuropulmonary blastoma, prostate cancer, transitional cell cancer of the renal pelvis and ureter, retinoblastoma, salivary gland cancer, sarcoma, Sezary syndrome, small intestine cancer, genitourinary cancer, malignant thymoma, thyroid cancer, Wilms' tumor and cholangiocarcinoma.

21. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof or the pharmaceutical composition for use of claim 19 or 20, wherein the treatment of cancer in addition to the administration of the water-insoluble controlled-release PRRA includes the administration of at least one cancer therapeutic.

22. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof or the pharmaceutical composition for use of claim 21, wherein the cancer therapeutic is selected from the group consisting of cytotoxic/chemotherapeutic agents, immune checkpoint inhibitors or antagonists, immune checkpoint agonists, multi-specific drugs, antibody-drug conjugates (ADC), radionuclides or targeted radionuclide therapeutics, DNA damage repair inhibitors, tumor metabolism inhibitors, pattern recognition receptor agonists, protein kinase inhibitors, chemokine and chemoattractant receptor agonists, chemokine or chemokine receptor antagonists, cytokine receptor agonists, death receptor agonists, CD47 or SIRPa antagonists, oncolytic drugs, signal converter proteins, epigenetic modifiers, tumor peptides or tumor vaccines, heat shock protein (HSP) inhibitors, proteolytic enzymes, ubiquitin and proteasome inhibitors, adhesion molecule antagonists, and hormones including hormone peptides and synthetic hormones.

23. The water-insoluble controlled-release PRRA or the pharmaceutically acceptable salt thereof or the pharmaceutical composition for use of claim 21 or 22, wherein the cancer therapeutic is a cytokine receptor agonist.