CLAIMS

1. A circular polyribonucleotide comprising (a) a sequence encoding a polypeptide immunogen and (b) a sequence encoding an adjuvant or a sequence that is an innate immune system stimulator.

2. The circular polyribonucleotide of claim 1, wherein the sequence encoding:

(a) the polypeptide immunogen is operably linked to an IRES; or

(b) the adjuvant is operably linked to an IRES.

~~3. The circular polyribonucleotide of claim 1 or 2, wherein the sequence encoding the adjuvant is operably linked to an IRES.~~

~~4~~3. The circular polyribonucleotide of ~~any one of claims 1-3~~claim 1 or 2, wherein the adjuvant is a polypeptide.

~~5~~4. The circular polyribonucleotide of claim ~~4~~3, wherein the polypeptide immunogen and the adjuvant polypeptide are encoded by a single open-reading frame operably linked to the single IRES, wherein the expression of the open reading frame produces a polypeptide comprising the amino acid sequence of each of the polypeptide immunogen and the adjuvant polypeptide, optionally wherein the polypeptide immunogen and the adjuvant polypeptide are each separated by a polypeptide linker or a cleavage domain.

~~6. The circular polyribonucleotide of claim 5, wherein the polypeptide immunogen and the adjuvant polypeptide are each separated by a polypeptide linker.~~

~~7. The circular polyribonucleotide of claim 5, wherein the polypeptide immunogen and the adjuvant polypeptide are each separated by a cleavage domain.~~

~~8. The circular polyribonucleotide of claim 6, wherein the cleavage domain is a 2A self-cleaving peptide.~~

~~9~~5. The circular polyribonucleotide of claim ~~4~~3, wherein the circular polyribonucleotide comprises a plurality of IRESs, optionally wherein a first IRES is operably linked to the sequence encoding the polypeptide immunogen and a second IRES is operably linked to the sequence encoding the adjuvant polypeptide.

~~10. The circular polyribonucleotide of claim 9, wherein a first IRES is operably linked to the sequence encoding the polypeptide immunogen and a second IRES is operably linked to the sequence encoding the adjuvant polypeptide.~~

~~11~~6. The circular polyribonucleotide of any one of claims 1-~~10~~5, wherein the expression of the sequence encoding the polypeptide immunogen is at least 2-fold greater than the expression of the sequence encoding the adjuvant, optionally wherein the expression of the sequence encoding the polypeptide

immunogen is at least 5-fold, 10-fold, or 100-fold greater than the expression of the sequence encoding the adjuvant.

~~12. The circular polyribonucleotide of claim 11, wherein the expression of the sequence encoding the polypeptide immunogen is at least 5-fold, 10-fold, or 100-fold greater than the expression of the sequence encoding the adjuvant.~~

~~13~~7. An immunogenic composition comprising a plurality of circular polyribonucleotides, wherein the composition comprises (a) at least a first circular polyribonucleotide comprising a sequence encoding a polypeptide immunogen and (b) at least a second circular polyribonucleotide comprising a sequence encoding an adjuvant or a sequence that is an innate immune system stimulator, optionally wherein the adjuvant is a polypeptide.

~~14. The immunogenic composition of claim 13, wherein the adjuvant is a polypeptide.~~

~~15~~8. The immunogenic composition of ~~claims 13 or 14~~claim 7, wherein the polypeptide immunogen and the adjuvant are each operably linked to an IRES.

~~16~~9. The circular polyribonucleotide or immunogenic composition of any one of claims 1-~~15~~8, wherein the adjuvant is a cytokine, a chemokine, a costimulatory molecule, an innate immune stimulator, a signaling molecule, a transcriptional activator, a cytokine receptor, a bacterial component, or a component of the innate immune system.

~~17. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the cytokine is a pro-inflammatory cytokine.~~

~~18. The circular polyribonucleotide or immunogenic composition of claim 17, wherein the pro-inflammatory cytokine is selected from GM-CSF, IL-1 alpha, IL-1 beta, TGF-beta, TNF-alpha, and TNF-beta.~~

~~19. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the cytokine is a Th-1 inducing cytokine.~~

~~20. The circular polyribonucleotide or immunogenic composition of claim 19, wherein the Th-1 inducing cytokine is selected from IFN-gamma, IL-2, IL-12, IL-15, and IL-18.~~

~~21. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the cytokine is a Th-2 inducing cytokine.~~

~~22. The circular polyribonucleotide or immunogenic composition of claim 21, wherein the Th-2 inducing cytokine is selected from IFN-gamma, IL-4, IL-5, IL-6, IL-10, and IL-13.~~

~~23. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the chemokine is selected from MCP-1, MIP-1alpha, MIP-1beta, Rantes, and TCA-3.~~

~~24. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the costimulatory molecule is selected from CD80, CD86, CD40-L, CD70, and CD27.~~

~~25. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the innate immune stimulator is selected from STING, TLR3, TLR4, TLR9, TLR7, TLR8, TLR7, RIG-I/DDX58, and MDA-5/IFIH1.~~

~~26. The circular polyribonucleotide or immunogenic composition of claim 25, wherein the innate immune stimulator is a constitutively active mutant.~~

~~27. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the signaling molecule is selected from STING, TRIF, TRAM, MyD88, IPS1, ASC, MAVS, MAPKs, IKK-alpha, IKK complex, TBK1, B-catenin, and caspase 1.~~

~~28. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the transcriptional activator is selected from AP1, NF-kappa B, IRF3, IRF7, IRF1, and IRF5.~~

~~29. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the cytokine receptor is selected from IL-2betaR, IFN-gammaR, and IL-6R.~~

~~30. The circular polyribonucleotide or immunogenic composition of claim 16, wherein the bacterial component is selected from flagellin and MBL.~~

~~31. The circular polyribonucleotide or immunogenic composition of any one of claims 1-30, wherein the sequence encoding the adjuvant further encodes a signal sequence.~~

~~32. The circular polyribonucleotide or immunogenic composition of any one of claims 1-31, wherein the sequence encoding the polypeptide immunogen further encodes a signal sequence.~~

~~33. The circular polyribonucleotide or immunogenic composition of any one of claims 1-31, wherein the sequence encoding the polypeptide immunogen does not encode a signal sequence.~~

~~34. The circular polyribonucleotide or immunogenic composition of claim 1 or 13, wherein the sequence that is an innate immune system stimulator is selected from a GU-rich motif, an AU-rich motif, a structured region comprising dsRNA, or an aptamer.~~

~~35~~10. A circular polyribonucleotide comprising a plurality of sequences, each sequence encoding a polypeptide immunogen, wherein at least two of the polypeptide immunogens have at least 90% amino acid sequence identity, optionally wherein the circular polyribonucleotide comprises at least three, at least

four, at least five, at least six, at least seven, at least eight, or at least nine sequences, each sequence encoding a polypeptide immunogen.

~~36. The circular polyribonucleotide of claim 35, wherein the circular polyribonucleotide comprises at least three, at least four, at least five, at least six, at least seven, at least eight, or at least nine sequences, each sequence encoding a polypeptide immunogen.~~

~~37~~11. The circular polyribonucleotide of ~~claims 35 or 36~~claim 10, wherein each of the sequences encoding each of the polypeptide immunogens is operably linked to an internal ribosomal entry site (IRES).

~~38. The circular polyribonucleotide of claim 37, wherein the circular polyribonucleotide comprises a single IRES.~~

~~39~~12. The circular polyribonucleotide of claim ~~38~~11, wherein each of the polypeptide immunogens is encoded by a single open-reading frame operably linked to ~~the~~ a single IRES, wherein the expression of the open reading frame produces a polypeptide comprising the amino acid sequence of each the polypeptide immunogens, optionally wherein the polypeptide immunogens are each separated by a polypeptide linker or cleavage domain.

~~40. The circular polyribonucleotide of claim 39, wherein the polypeptide immunogens are each separated by a polypeptide linker.~~

~~41. The circular polyribonucleotide of claim 39, wherein the polypeptide immunogens are each separated by a cleavage domain.~~

~~42. The circular polyribonucleotide of claim 41, wherein ethe cleavage domain is a 2A self-cleaving peptide.~~

~~43~~13. The circular polyribonucleotide of claim ~~37~~11, wherein the circular polyribonucleotide comprises a plurality of IRESs, optionally wherein each IRES is operably linked to an open reading frame comprising a sequence encoding a polypeptide immunogen.

~~44. The circular polyribonucleotide of claim 43, wherein each IRES is operably linked to an open reading frame comprising a sequence encoding a polypeptide immunogen.~~

~~45~~14. The circular polyribonucleotide of any one of claims ~~35-44~~10-13, wherein the circular polyribonucleotide further comprises at least one sequence encoding an adjuvant, optionally wherein the at least one sequence encoding the adjuvant is operably linked to an IRES.

~~46. The circular polyribonucleotide of claim 45, wherein the at least one sequence encoding the adjuvant is operably linked to an IRES.~~

~~47~~15. The circular polyribonucleotide of claim ~~45 or 46~~14, wherein the adjuvant is a polypeptide, optionally wherein the adjuvant is a cytokine, a chemokine, a costimulatory molecule, an innate immune stimulator, a signaling molecule, a transcriptional activator, a cytokine receptor, a bacterial component, or a component of the innate immune system.

~~48. The circular polyribonucleotide of claim 47, wherein the adjuvant is a cytokine, a chemokine, a costimulatory molecule, an innate immune stimulator, a signaling molecule, a transcriptional activator, a cytokine receptor, a bacterial component, or a component of the innate immune system.~~

~~49. The circular polyribonucleotide of any one of claims 35-48, wherein the circular polyribonucleotide further comprises a sequence that is an innate immune system stimulator.~~

~~50. The circular polyribonucleotide of claim 49, wherein the sequence that is an innate immune system stimulator is a GU-rich motif, an AU-rich motif, a structured region comprising dsRNA, or an aptamer.~~

~~51~~16. An immunogenic composition comprising (a) at least a first circular polyribonucleotide comprising a sequence encoding a first polypeptide immunogen and (b) at least a second circular polyribonucleotide comprising a sequence encoding a second polypeptide immunogen, wherein the first and second polypeptide immunogens have at least 90% amino acid sequence identity and less than 100% amino acid sequence identity.

~~52~~17. The immunogenic composition of claim ~~51~~16, wherein each polypeptide immunogen is operably linked to an IRES.

~~53. The circular polyribonucleotide or immunogenic composition of any one of claims 35-52, wherein each of the polypeptide immunogens have less than 100% amino acid sequence identity.~~

~~54~~18. The circular polyribonucleotide or immunogenic composition of any one of claims ~~35-53~~10-17, wherein each of the polypeptide immunogens comprises one or more epitopes that identifies a target, optionally wherein the target is a pathogen.

~~55. The circular polyribonucleotide of claim 54, wherein the target is a pathogen.~~

~~56. The circular polyribonucleotide of claim 55, wherein the pathogen is a virus, a bacterium, a fungus, or a parasite.~~

~~57. The circular polyribonucleotide of claim 54, wherein the target is a cancer cell.~~

~~58. The circular polyribonucleotide of claim 55, wherein the target is a toxin or an allergen.~~

~~59~~19. A pharmaceutical composition comprising the circular polyribonucleotide or immunogenic composition of any one of claims 1-~~58~~18, and a pharmaceutically acceptable excipient.

~~60~~20. ~~A~~The circular polyribonucleotide or immunogenic composition, or pharmaceutical composition of any one of claims 1-19 for use in ~~method of~~ inducing an immune response in a subject~~, the method comprising administering to the subject the circular polyribonucleotide or immunogenic composition, or pharmaceutical composition of any one of claims 1-59~~.

21. Use of the circular polyribonucleotide or immunogenic composition, or pharmaceutical composition of any one of claims 1-19 in the manufacture of a medicament for inducing an immune response in a subject.