CLAIMS

1. An isolated polynucleotide comprising a nucleotide sequence having:

(i) 90% or greater sequence identity over the entire sequence of SEQ ID NO: 10, or a complementary sequence thereto;

(ii) 90% or greater sequence identity over the entire sequence of SEQ ID NO: 11, or a complementary sequence thereto; or

(iii) 90% or greater sequence identity over the entire sequence of SEQ ID NO: 12, or a complementary sequence thereto.

2. The isolated polynucleotide of claim 1, wherein said nucleotide sequence comprises the sequence of any one of SEQ ID NOs: 10-12, or a complementary sequence thereto.

3. The isolated polynucleotide of claim 1 or claim 2, wherein said nucleotide sequence further comprises a sequence having 90% or greater sequence identity to any one of SEQ ID NOs: 4-9 and 13-18, or a complementary sequence thereto.

4. The isolated polynucleotide of claim 3, wherein said nucleotide sequence comprises the sequence of any one of SEQ ID NOs: 4-9 and 13-18, or a complementary sequence thereto.

5. The isolated polynucleotide of any one of claims 1-4, wherein said nucleotide sequence comprises a sequence having 90% or greater sequence identity to the sequence of any one of SEQ ID NOs: 1-3, or a complementary sequence thereto.

6. The isolated polynucleotide of claim 5, wherein said nucleotide sequence comprises the sequence of any one of SEQ ID NOs: 1-3, or a complementary sequence thereto.

7. A recombinant vector comprising the isolated polynucleotide of any one of claims 1-6.

8. The recombinant vector of claim 7, wherein said vector is

(i) an sAd4310A adenoviral vector comprising polynucleotides comprising the sequence of any one of SEQ ID NOs: 40-45, or

(ii) an sAd4287 adenoviral vector comprising polynucleotides comprising the sequence of any one of SEQ ID NOs: 34-39,

(iii) an sAd4312 adenoviral vector comprising polynucleotides comprising the sequence of any one of SEQ ID NOs: 46-51.

9. A recombinant adenovirus comprising the isolated polynucleotide of any one of claims 1-8.

10 The recombinant adenovirus of claim 9, wherein said isolated polynucleotide comprises a deletion in or of the E1 region, said deletion rendering said recombinant virus a replication-defective virus.

11 The recombinant adenovirus of claim 9 or claim 10, wherein said isolated polynucleotide comprises a deletion in or of the E3 region, the E4 region, or both the E3 and E4 regions.

12. The recombinant adenovirus of any one of claims 9-11, wherein said recombinant adenovirus further comprises a heterologous nucleotide sequence encoding an antigenic or therapeutic protein of interest, or fragment thereof

13. The recombinant adenovirus of claim 12, wherein said recombinant adenovirus promotes an antibody immune response against the antigenic or therapeutic protein of interest, or fragment thereof, encoded by the heterologous nucleotide sequence.

14. The recombinant adenovirus of claim 13, wherein said antibody immune response is determined using a D^b/AL11 tetramer binding assay.

15. The recombinant adenovirus of claim 14, wherein said antibody immune response is determined using an IFN-γ ELISPOT assay.

16. The recombinant adenovirus of any one of claims 9-15, wherein said antigenic protein, or fragment thereof, comprises a bacterial, viral, parasitic, or fungal protein, or fragment thereof.

17. The recombinant adenovirus of claim 16, wherein:

(i) said viral protein, or fragment thereof, is from a viral family selected from the group consisting of *Retroviridae*, such as human immunodeficiency virus (HIV), such as an Env, Gag, Pol, Nef, Tat, Rev, Vif, Vpr, or Vpu protein, or a fragment thereof, *Flaviviridae*, such as hepatitis C virus (HCV), yellow fever virus, Zika virus, and Japanese encephalitis virus, *Arenaviridae*, *Bunyaviridae*, *Filoviridae*, such as Ebola virus and Marburg virus, *Togaviridae*, such as rubella virus, *Poxviridae*, such as *Variola major, Variola minor,* and monkeypox virus, *Herpesviridae*, such as varicella zoster virus (VZV), cytomegalovirus (CMV), and herpes simplex virus (HSV), *Orthomyxoviridae*, such as influenza, *Coronaviridae*, *Rhabdoviridae*, such as rabies virus, *Paramyxoviridae*, such as measles virus and mumps virus, *Picornaviridae*, such as hepatitis A virus (Hep A) and poliovirus, *Hepadnaviridae*, such as hepatitis B virus (HBV), *Papillomaviridae*, such as human papillomavirus (HPV), *Parvoviridae*, *Astroviridae*, *Polyomaviridae*, *Calciviridae*, and *Reoviridae*, such as rotavirus; or

(ii) said bacterial protein, or fragment thereof, is from *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium microti*, *Mycobacterium leprae*, *Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Escherichia coli*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Francisella tularensis*, *Brucella*, *Burkholderia mallei*, *Yersinia pestis*, *Corynebacterium diphtheria*, *Neisseria meningitidis*, *Bordetella pertussis*, *Clostridium tetani*, or *Bacillus anthracis*; or

(iii) said parasitic protein, or fragment thereof, is from *Toxoplasma gondii*, *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale*, *Plasmodium malariae*, *Trypanosoma* spp., or *Legionella* spp; or

(iv) said fungal protein, or fragment thereof, is from *Aspergillus*, *Blastomyces dermatitidis*, *Candida*, *Coccidioides immitis*, *Cryptococcus neoformans*, *Histoplasma capsulatum var. capsulatum*, *Paracoccidioides brasiliensis*, *Sporothrix schenckii*, *Zygomycetes* spp., *Absidia corymbifera*, *Rhizomucor pusillus*, or *Rhizopus arrhizus*.

18. The recombinant adenovirus of claim 17, wherein said viral protein is a protein or fragment thereof from a Zika virus.

19. The recombinant adenovirus of claim 17, wherein said viral protein is an envelope glycoprotein or fragment thereof.

20. The recombinant adenovirus of claim 19, wherein said envelope glycoprotein or fragment thereof is from a Zika virus.

21. The recombinant adenovirus of any one of claims 9-20, for use in treating a subject having a disease.

22. The recombinant adenovirus for use according to claim 21, wherein said recombinant adenovirus comprises a heterologous nucleotide sequence encoding an antigenic protein, or fragment thereof, that promotes an immune response in said subject against an infective agent.

23. The recombinant adenovirus for use according to claim 22, wherein said antigenic protein, or fragment thereof, comprises a bacterial, viral, parasitic, or fungal protein, or fragment thereof.

24. The recombinant adenovirus for use according to claim 23, wherein:

(i) said viral protein, or fragment thereof, is from a viral family selected from the group consisting of *Retroviridae*, such as human immunodeficiency virus (HIV), such as an Env, Gag, Pol, Nef, Tat, Rev, Vif, Vpr, or Vpu protein, or a fragment thereof, *Flaviviridae*, such as hepatitis C virus (HCV), yellow fever virus, Zika virus, and Japanese encephalitis virus, *Arenaviridae*, *Bunyaviridae*, *Filoviridae*, such as Ebola

virus and Marburg virus, *Togaviridae*, such as rubella virus, *Poxviridae*, such as *Variola major, Variola minor,* and monkeypox virus, *Herpesviridae*, such as varicella zoster virus (VZV), cytomegalovirus (CMV), and herpes simplex virus (HSV), *Orthomyxoviridae*, such as influenza, *Coronaviridae*, *Rhabdoviridae*, such as rabies virus, *Paramyxoviridae*, such as measles virus and mumps virus, *Picornaviridae*, such as hepatitis A virus (Hep A) and poliovirus, *Hepadnaviridae*, such as hepatitis B virus (HBV), *Papillomaviridae*, such as human papillomavirus (HPV), *Parvoviridae*, *Astroviridae*, *Polyomaviridae*, *Calciviridae*, and *Reoviridae*, such as rotavirus; or

(ii) said bacterial protein, or fragment thereof, is from *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium microti*, *Mycobacterium leprae*, *Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Escherichia coli*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Francisella tularensis*, *Brucella*, *Burkholderia mallei*, *Yersinia pestis*, *Corynebacterium diphtheria*, *Neisseria meningitidis*, *Bordetella pertussis*, *Clostridium tetani*, or *Bacillus anthracis*; or

(iii) said parasitic protein, or fragment thereof, is from *Toxoplasma gondii*, *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale*, *Plasmodium malariae*, *Trypanosoma* spp., or *Legionella* spp; or

(iv) said fungal protein, or fragment thereof, is from *Aspergillus*, *Blastomyces dermatitidis*, *Candida*, *Coccidioides immitis*, *Cryptococcus neoformans*, *Histoplasma capsulatum var. capsulatum*, *Paracoccidioides brasiliensis*, *Sporothrix schenckii*, *Zygomycetes* spp., *Absidia corymbifera*, *Rhizomucor pusillus*, or *Rhizopus arrhizus.*

25. The recombinant adenovirus for use according to claim 24, wherein said viral protein is a protein or fragment thereof from a Zika virus.

26. The recombinant adenovirus for use according to claim 24, wherein said viral protein is an envelope glycoprotein or fragment thereof.

27. The recombinant adenovirus for use according to claim 26, wherein the envelope glycoprotein or fragment thereof is from a Zika virus.

28. The recombinant adenovirus for use according to any one of claims 21-27, wherein said disease is acquired immune deficiency syndrome (AIDS), cancer, tuberculosis, leprosy, typhoid fever, pneumonia, meningitis, staphylococcal scalded skin syndrome (SSSS), Ritter's disease, tularemia (rabbit fever), brucellosis, Glanders disease, bubonic plague, septicemic plague, pneumonic plague, diphtheria, pertussis (whooping cough), tetanus, anthrax, hepatitis, smallpox, monkeypox, measles, mumps, rubella, chicken pox, polio, rabies, Japanese encephalitis, herpes, mononucleosis, influenza, Ebola virus disease, hemorrhagic fever, yellow fever, Marburg virus disease, toxoplasmosis, malaria, trypanosomiasis,

legionellosis, aspergillosis, blastomycosis, candidiasis (thrush), coccidioidomycosis, cryptococcosis, histoplasmosis, paracoccidioidomycosis, sporotrichosis, Zika, or sinus-orbital zygomycosis.

29. The recombinant adenovirus for use according to any one of claims 21-28, wherein said subject is human.

30. The recombinant adenovirus for use according to any one of claims 21-29, wherein:

(a) said recombinant adenovirus is formulated for intramuscular, intravenous, intradermal, percutaneous, intraarterial, intraperitoneal, intralesional, intracranial, intraarticular, intraprostatical, intrapleural, intratracheal, intranasal, intravitreal, intravaginal, intrarectal, topical, intratumoral, peritoneal, subcutaneous, subconjunctival, intravesicular, mucosal, intrapericardial, intraumbilical, intraocular, oral, topical, or local administration, for administration by inhalation, injection, infusion, continuous infusion, localized perfusion bathing target cells directly, catheter, lavage, or gavage, or in a creme or lipid composition; and/or

(b) said adenovirus is formulated as a pharmaceutical composition comprising a pharmaceutically acceptable carrier.

31. The recombinant adenovirus for use according to claim 30, wherein said pharmaceutical composition is formulated for administration in at least one or two doses.

32. The recombinant adenovirus for use according to claim 31, wherein said pharmaceutical composition is formulated for administration as a prime boost.

33. A method of producing a recombinant adenovirus according to any one of claims 9-20, wherein said method comprises culturing a cell in a suitable medium; transfecting said cell with an isolated polynucleotide according to any one of claims 1-6 or a recombinant vector according to claim 7 or 8; allowing replication of said polynucleotide or vector in said cell; and harvesting produced recombinant adenovirus from said medium and/or said cell.

34. The method of claim 33, wherein said cell is a bacterial, plant, or mammalian cell.

35. The method of claim 34, wherein said mammalian cell is a Chinese hamster ovary (CHO) cell.