



Vaccine Excipient & Media Summary

This section begins with a summary of the excipients included in licensed vaccines in the United States, as of the revision date at the bottom of the page.

Excipients are inactive ingredients of a drug product necessary for production of a finished pharmaceutical formulation.

After the list of excipients is a list of culture media used in the manufacturing process of vaccines licensed in the United States.

Growth media are culture materials used to produce mass quantities of a microorganism antibody, or other immunologic agent, suitable for further processing into a finished pharmaceutical product.

All reasonable efforts have been made to ensure the accuracy of this information, but manufacturers may change product contents before that information is reflected here.

Excipients Included in US Licensed Vaccines*		
Excipient	Use	Vaccine
Albumin, egg (Ovalbumin)	Growth medium	Rabies (<i>RabAvert</i>)
Albumin, human serum	Component of growth medium, protein stabilizer	Measles (<i>Attenuvax</i>), MMR (<i>MMR-II</i>), Mumps (<i>Mumpsvax</i>), Rabies (<i>Imovax</i>), Rubella (<i>Meruvax II</i>)
Albumin or serum, bovine	Component of growth medium, protein stabilizer	Hepatitis A (<i>Havrix</i> , <i>Vaqta</i>), Measles (<i>Attenuvax</i>), MMR (<i>MMR-II</i>), Mumps (<i>Mumpsvax</i>), Rabies (<i>Imovax</i> , <i>RabAvert</i>), Rubella (<i>Meruvax II</i>), Vaccinia (<i>Dryvax</i>), Varicella (<i>Varivax</i>)
Aluminum hydroxide	Adjuvant	Anthrax (<i>BioThrax</i>), DTaP (<i>Infanrix</i>), DTaP-Hep B-IPV (<i>Pediarix</i>), DT (Massachusetts), Td (Massachusetts), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hepatitis B (<i>Engerix-B</i>)
Aluminum phosphate	Adjuvant	DTaP (<i>Daptacel</i>), Td (Aventis Pasteur, Massachusetts), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Pneumococcal (<i>Pprevnar</i>), Rabies (<i>BioRab</i>)
Aluminum potassium sulfate	Adjuvant	DTaP (<i>Tripedia</i> , <i>Daptacel</i>), DT (Aventis Pasteur)
Amino acids	Component of growth medium	Anthrax (<i>BioThrax</i>), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Td (Aventis Pasteur), Typhoid oral (<i>Vivotif</i>)
Ammonium sulfate	Protein fractionation	Hib (<i>Act-HIB</i>)
Amphotericin B	Antibacterial	Rabies (<i>RabAvert</i>)
Ascorbic acid	Antioxidant	Typhoid oral (<i>Vivotif</i>)
Bactopeptone	Component of growth medium	Influenza (varies seasonally)
Beta-propiolactone	Viral inactivator	Influenza (<i>Fluvirin</i>), Rabies (<i>Imovax</i> , <i>RabAvert</i>)

This table appears courtesy of Grabenstein JD. *ImmunoFacts: Vaccines & Immunologic Drugs*. St. Louis, MO: Wolters Kluwer Health Inc.; 2005.

Vaccine Excipient & Media Summary

Excipients Included in US Licensed Vaccines*		
Excipient	Use	Vaccine
Benzethonium chloride	Preservative	Anthrax (<i>BioThrax</i>)
Brilliant green	Dye	Vaccinia (<i>Dryvax-historic</i>)
Chlortetracycline	Antibacterial	Rabies (<i>RabAvert</i>), Vaccinia (<i>Dryvax</i>)
DNA	Manufacturing residue	Hepatitis A (<i>Vaqta</i>)
Ethylenediamine-tetraacetic acid sodium (EDTA)	Preservative	Rabies (<i>RabAvert</i>), Varicella (<i>Varivax</i>)
Egg protein	Manufacturing residue	Influenza (all brands), Yellow fever (<i>YF-Vax</i>)
Formaldehyde, formalin	Antimicrobial, preservative	Anthrax (<i>BioThrax</i>), DTaP (all brands), DTaP-Hep B-IPV (<i>Pediarix</i>), DT (all brands), Td (all brands), Hepatitis A (<i>Havrix</i> , <i>Vaqta</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hib (<i>ActHIB</i>), Hib-Hepatitis B (<i>Comvax</i>), Influenza (<i>Fluzone</i>), Japanese encephalitis (<i>JE-Vax</i>), Poliovirus inactivated (<i>Ipol</i>)
Gelatin	Stabilizer in freeze-drying, solvent	DTaP (<i>Tripedia</i>), Influenza (<i>Fluzone</i>), Japanese encephalitis (<i>JE-Vax</i>), Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), Rabies (<i>RabAvert</i>), Typhoid oral (<i>Vivotif</i>), Varicella (<i>Varivax</i>), Yellow fever (<i>YF-Vax</i>)
Gentamicin	Antibacterial	Influenza (<i>FluMist</i>)
Glutaraldehyde	Toxin detoxifier	DTaP (<i>Infanrix</i>), DTaP-Hep B-IPV (<i>Pediarix</i>)
Glycerin	Solvent	Vaccinia (<i>DryVax</i>)
Glycine	Protein stabilizer	DT (most brands), Td (most brands)
Hydrochloric acid	Adjust pH	DTaP (most brands), DT (most brands)
Lactose	Stabilizer in freeze-drying, filling	BCG (<i>Tice</i>), Hib (some packages), Meningococcal (<i>Menomune</i>), Typhoid oral (<i>Vivotif</i>)
Magnesium stearate	Lubricant for capsule filling	Typhoid oral (<i>Vivotif</i>)
Monosodium glutamate	Stabilizer	Influenza (<i>FluMist</i>), Varicella (<i>Varivax</i>)
Mouse serum protein	Manufacturing residue	Japanese encephalitis (<i>JE-Vax</i>)
MRC-5 cellular protein	Manufacturing residue	Hepatitis A (<i>Havrix</i> , <i>Vaqta</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Rabies (<i>Imovax</i>), Poliovirus inactivated (<i>Poliovax</i>), Varicella (<i>Varivax</i>)

Vaccine Excipient & Media Summary

Excipients Included in US Licensed Vaccines*		
Excipient	Use	Vaccine
Neomycin	Antibacterial	DTaP-Hep B-IPV (<i>Pediarix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Influenza (<i>Fluvirin</i>), Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), Poliovirus inactivated (<i>Ipol</i>), Rabies (<i>Imovax, RabAvert</i>), Vaccinia (<i>DryVax</i>), Varicella (<i>Varivax</i>)
Phenol	Preservative, antibacterial	Pneumococcal (<i>Pneumovax-23</i>), Typhoid inactivated (<i>Typhim Vi</i>) Vaccinia (<i>Dryvax</i>)
Phenol red (phenolsulfonphthalein)	pH indicator, dye	Rabies (<i>Imovax</i>)
2-Phenoxyethanol	Preservative	DTaP (<i>Infanrix, Daptacel</i>), DTaP-Hep B-IPV (<i>Pediarix</i>), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Poliovirus inactivated (<i>Ipol</i>), Td (<i>Aventis Pasteur</i>)
Phosphate buffers (eg, disodium, monosodium, potassium, sodium dihydrogen phosphate)	Adjust pH	DTaP (most brands), DT (most brands), Hib (<i>Act-Hib</i>), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hepatitis B (<i>Engerix-B</i>), Influenza (<i>FluMist</i>), Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), Poliovirus inactivated (<i>Ipol</i>), Rabies (<i>BioRab</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), Typhoid inactivated (<i>Typhim Vi</i>), Varicella (<i>Varivax</i>)
Polydimethylsiloxane	Antifoaming agent	Typhoid inactivated (<i>Typhim Vi</i>)
Polyethylene glycol p-isoctylphenyl ether (Triton X-100)	Nonionic surfactant (viral inactivation)	Influenza (<i>Fluzone</i>)
Polymyxin B	Antibacterial	DTaP-Hep B-IPV (<i>Pediarix</i>), Influenza (<i>Fluvirin</i>), Poliovirus inactivated (<i>Ipol</i>), Vaccinia (<i>Dryvax</i>)
Polyoxyethylene 9-10 nonyl phenol (Triton N-101, octoxy-nol 9)	Nonionic surfactant (viral inactivation)	Influenza (<i>Fluvirin</i>)
Polysorbate 20	Surfactant	Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>)
Polysorbate 80	Surfactant	DTaP (<i>Infanrix, Tripedia</i>), DTaP-Hep B-IPV (<i>Pediarix</i>)
Potassium glutamate	Stabilizer	Rabies (<i>RabAvert</i>)
Sodium acetate	Adjust pH	DT (some brands), Td (some brands)
Sodium borate	Adjust pH	Hepatitis A (<i>Vaqta</i>), Hib-Hepatitis B (<i>Comvax</i>)

Vaccine Excipient & Media Summary

Excipients Included in US Licensed Vaccines*		
Excipient	Use	Vaccine
Sodium chloride	Adjust tonicity	Most vaccines, including Anthrax, BCG, Measles, Mumps, MMR, Pneumococcal, Polio inactivated, Rabies, Rubella, Typhoid inactivated, Varicella, Yellow fever
Sodium hydroxide	Adjust pH	DT (most brands), Td (most brands)
Sorbitol	Stabilizer, solvent	Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), Yellow fever (<i>YF-Vax</i>)
Streptomycin	Antibacterial	Poliovirus inactivated (<i>Ipol</i>), Vaccinia (<i>Dryvax</i>)
Sucrose	Stabilizer	Hib (<i>Act-HIB</i>), Influenza (<i>Flu-Mist</i>), Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), MMR (<i>MMR-II</i>), Typhoid oral (<i>Vivotif</i>), Varicella (<i>Varivax</i>)
Thimerosal	Preservative in some multi-dose containers (see package labeling for precise content)	DTaP (some multidose containers), DT (some multidose containers), Td (some multidose containers), Hepatitis B (some multidose containers), Hib (some multidose containers), Influenza (some multidose containers), Japanese encephalitis (<i>JE-Vax</i>), Meningococcal (<i>Menomune</i>), Rabies (<i>BioRab</i>). Some single-dose containers contain trace amounts of thimerosal from the production process, but substantially lower concentrations than if used as a preservative. Consult product monographs and labeling for details.
Vitamins unspecified	Component of growth medium	Anthrax (<i>BioThrax</i>), Rabies (<i>Imovax</i>), Td (<i>Aventis Pasteur</i>)
Yeast protein	Component of growth medium	DTaP-Heb B-IPV (<i>Pediarix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hepatitis B (<i>Engerix-B</i> , <i>Recombivax-HB</i>), Hib (<i>HibTiter</i>), Hib-Hepatitis B (<i>Comvax</i>)

* Proprietary names appear in italics.

Vaccine Excipient & Media Summary

Vaccine-Production Media*	
Vaccine Culture Media	Vaccine(s)
Bovine protein	DTaP-Hep B-IPV (poliovirus component, <i>Pediarix</i>), Pneumococcal (<i>Pneumovax-23</i>), Typhoid oral (<i>Vivotif</i>)
Calf skin	Vaccinia (<i>Dryvax</i>)
Chick embryo fibroblast tissue culture	Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsavax</i>), combination vaccines containing them, Rabies (<i>RabAvert</i>)
Chick kidney cells	Influenza (master viruses for <i>FluMist</i>)
Chicken embryo (fertilized egg)	Influenza (all brands), Yellow fever (<i>YF-Vax</i>)
Cohen-Wheeler, modified (pertussis components)	DTaP (alternate is Stainer-Scholte media)
Human diploid tissue culture, MRC-5	Hepatitis A (<i>Havrix</i> , <i>Vaqta</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Poliovirus inactivated (<i>Poliovax</i>), Rabies (<i>Imovax</i>), Varicella (<i>Varivax</i>)
Human diploid tissue culture, WI-38	Rubella (<i>Meruvax II</i>), combination vaccines containing it, Varicella (<i>Varivax</i>)
Lathman medium derived from bovine casein	DTaP (<i>Infanrix</i> , tetanus component), DTaP-Hep B-IPV (<i>Pediarix</i>)
Linggoud-Fenton media containing bovine extract	DTaP (<i>Infanrix</i> diphtheria component), DTaP-Hep B-IPV (<i>Pediarix</i>)
Monkey kidney tissue culture, Vero (Vervet or African green monkeys)	DTaP-Hep B-IPV (poliovirus component, <i>Pediarix</i>), Poliovirus inactivated (<i>Ipol</i>)
Mouse brain	Japanese encephalitis (<i>JE-Vax</i>)
Mueller-Miller media	Diphtheria and tetanus vaccines (most brands)
Rhesus fetal lung tissue culture	Rabies (<i>BioRab</i>)
Stainer-Scholte	DTaP (<i>Daptacel</i> , <i>Infanrix</i> , pertussis component), DTaP-Hep B-IPV (<i>Pediarix</i>)
Soy peptone broth	Pneumococcal (<i>Prevnar</i>)
Synthetic/semi-synthetic	Anthrax (<i>BioThrax</i>), BCG (<i>Tice</i>), DT (all brands), Td (all brands), Hib (all brands), Meningococcal (<i>Menomune</i>), Pneumococcal (<i>Pneumovax-23</i>), Typhoid inactivated (<i>Typhim Vi</i>)
Yeast or yeast extract (typically <i>Saccharomyces cerevisiae</i>)	Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hepatitis B (<i>Engerix-B</i> , <i>Recombivax-HB</i>), Hib (<i>HibTiter</i>), Hib-Hepatitis B (<i>Comvax</i>), Medium for growing <i>Corynebacterium diphtheriae</i> strain C7 (b197) to obtain CRM ₁₉₇ protein for conjugation to polysaccharides (<i>HibTiter</i> , <i>Pprevnar</i>).

* Proprietary names appear in italics.

References: Canadian National Advisory Committee on Immunization. Statement on thimerosal. *Can Comm Dis Rep*. 2003;29(ACS-1):1-10.

CDC. Thimerosal in vaccines: a joint statement of the American Academy of Pediatrics and the Public Health Service. *MMWR*. 1999;48:563-565.

Grabenstein JD. Immunologic necessities: Diluents, adjuvants, and excipients. *Hosp Pharm*. 1996;31:1387-92,1397-1401.

Grabenstein JD. Clinical management of hypersensitivities to vaccine components. *Hosp Pharm*. 1997;32:77-84,87.

Offit PA, Jew RK. Addressing parents's concerns: Do vaccines contain harmful preservatives, adjuvants, additives, or residuals. *Pediatrics*. 2003;112:1394-1401.