

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^a

Excipient	Use	Vaccine
Albumin, egg (Ovalbumin)	Growth medium	Influenza (<i>Fluarix</i> , <i>FluLaval</i>), Rabies (<i>RabAvert</i>)
Albumin, human serum	Component of growth medium, protein stabilizer	Measles (<i>Attenuvax</i>), MMR (<i>MMR-II</i>), MMRV (<i>ProQuad</i>), Mumps (<i>Mumpsavax</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>), MMRV (<i>ProQuad</i>), Mumps (<i>Mumpsavax</i>), Rabies (<i>Imovax</i> , <i>RabAvert</i>), Rotavirus (<i>RotaTeg</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>), Td (Massachusetts), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hepatitis B (<i>Engerix-B</i>), Tdap (<i>Boostrix</i>)
Aluminum hydroxyphosphate sulfate	Adjuvant	Hib (<i>PedvaxHIB</i>), Hib-Hepatitis B (<i>Comvax</i>), Hepatitis A (<i>Vaqta</i>), Hepatitis B (<i>Recombivax HB</i>), Human papillomavirus (<i>Gardasil</i>)
Aluminum phosphate	Adjuvant	DTaP (<i>Daptacel</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Pneumococcal (<i>Prenvax</i>), Rabies (<i>BioRab</i>), Td (<i>Decavac</i>), Td (Massachusetts), Tdap (<i>Adacel</i>)
Aluminum potassium sulfate	Adjuvant	DTaP (<i>Daptacel</i> , <i>Tripedia</i>), DTaP-Hib (<i>TriHIBit</i>), DT (Sanofi Pasteur)
Amino acids	Component of growth medium	Anthrax (<i>BioThrax</i>), Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Rotavirus (<i>Rotarix</i>), Td (<i>Aventis Pasteur</i>), Typhoid oral (<i>Vivotif</i>)
Ammonium sulfate	Protein fractionation	DTaP-Hib (<i>TriHIBit</i>), Hib (<i>Act-HIB</i>)
Amphotericin B	Antibacterial	Rabies (<i>RabAvert</i>)
Ascorbic acid	Antioxidant	Typhoid oral (<i>Vivotif</i>)

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Excipient	Use	Vaccine
Bactopectone	Component of growth medium	Influenza (varies seasonally)
Beta-propiolactone	Viral inactivator	Influenza (<i>Fluvirin</i>), Rabies (<i>Imovax, RabAvert</i>)
Benzethonium chloride	Preservative	Anthrax (<i>BioThrax</i>)
Brilliant green	Dye	Vaccinia (<i>Dryvax-historic</i>)
Calcium carbonate	Antacid	Rotavirus (<i>Rotarix</i>)
Calcium chloride	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Chlortetracycline	Antibacterial	Rabies (<i>RabAvert</i>), Vaccinia (<i>Dryvax</i>)
Cystine	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Dextran	Medium nutrient	Rotavirus (<i>Rotarix</i>)
DNA	Manufacturing residue	Hepatitis A (<i>Vaqta</i>)
Dulbecco's Modified Eagle Medium (DMEM)	Growth medium	Rotavirus (<i>Rotarix</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>)
Ferric (III) nitrate	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Formaldehyde, formalin	Antimicrobial, toxin inactivator, stabilizer	Anthrax (<i>BioThrax</i>), DTaP (all brands), DTaP-Hep B-IPV (<i>Pediarix</i>), DTaP-Hib (<i>TriHIBit</i>), DT (all brands), Td (all brands), Hepatitis A (<i>Havrix, Vaqta</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), Hib (<i>ActHIB</i>), Hib-Hepatitis B (<i>Comvax</i>), Influenza (<i>Fluzone, Fluvarix, FluLaval</i>), Japanese encephalitis (<i>JE-Vax</i>), Poliovirus inactivated (<i>Ipol</i>), Tdap (<i>Adacel, Boostrix</i>)
Gelatin	Stabilizer in freeze-drying, solvent	DTaP (<i>Tripedia</i>), DTaP-Hib (<i>TriHIBit</i>), Hepatitis B (<i>Recombivax-HB</i>), Human papillomavirus (<i>Gardasil</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>), MMRV (<i>ProQuad</i>), Rabies (<i>RabAvert</i>), Typhoid oral (<i>Vivotif</i>), Varicella (<i>Varivax</i>), Yellow fever (<i>YF-Vax</i>), Zoster (<i>Zostavax</i>)
Gentamicin	Antibacterial	Influenza (<i>Fluarix, FluMist</i>)
Glucose	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Glutamine	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Glutaraldehyde	Toxin detoxifier	DTaP (<i>Infanrix</i>), DTaP-Hep B-IPV (<i>Pediarix</i>), Tdap (<i>Boostrix</i>)
Glycerin	Solvent	Vaccinia (<i>DryVax</i>)
Glycine	Protein stabilizer	DT (most brands), Td (most brands)
Histidine	Stabilizer	Human papillomavirus (<i>Gardasil</i>)
Hydrochloric acid	Adjust pH	DTaP (most brands), DT (most brands)

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Excipient	Use	Vaccine
Hydrocortisone	Component of growth medium	Influenza (<i>Fluarix</i>)
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>)
Magnesium sulfate	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Monosodium glutamate	Stabilizer	Influenza (<i>FluMist</i>), MMRV (<i>ProQuad</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</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>), MMRV (<i>ProQuad</i>), Rabies (<i>Imovax</i>), Poliovirus inactivated (<i>Poliovax</i>), Varicella (<i>Varivax</i>)
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>), MMRV (<i>ProQuad</i>), Poliovirus inactivated (<i>Ipol</i>), Rabies (<i>Imovax</i> , <i>RabAvert</i>), Vaccinia (<i>DryVax</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</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>), Rotavirus (<i>Rotarix</i>)
2-Phenoxyethanol	Preservative, stabilizer	DTaP (<i>Infanrix</i> , <i>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 (Sanofi Pasteur)
Phosphate buffers (eg, disodium, monosodium, potassium, sodium dihydrogenphosphate)	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>Fluarix</i> , <i>FluMist</i> , <i>FluLaval</i>), Measles (<i>Attenuvax</i>), Meningococcal (<i>Menactra</i>), Mumps (<i>MumpsVax</i>), Poliovirus inactivated (<i>Ipol</i>), Rabies (<i>BioRab</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), MMRV (<i>ProQuad</i>), Rotavirus (<i>RotaTeq</i>), Typhoid inactivated (<i>Typhim Vi</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</i>)
Polydimethylsiloxane	Antifoaming agent	Typhoid inactivated (<i>Typhim Vi</i>)
Polymyxin B	Antibacterial	DTaP-Hep B-IPV (<i>Pediarix</i>), Influenza (<i>Fluvirin</i>), Poliovirus inactivated (<i>Ipol</i>), Vaccinia (<i>Dryvax</i>)

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Excipient	Use	Vaccine
Polyoxyethylene9-10 nonyl phenol (Triton N-101, octoxynol 9)	Nonionic surfactant (viral inactivation)	Influenza (<i>Fluvirin</i>)
Polyoxyethylated octyl phenol (also called ethylene glycol octyl phenyl ether, octoxynol-10, octyl-phenoxypolyethoxyethanol, p-isooctylphenyl ether, Triton X-100)	Nonionic surfactant (viral inactivation)	Influenza (<i>Fluarix</i> , <i>Fluzone</i>)
Polysorbate 20	Surfactant	Hepatitis A (<i>Havrix</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>)
Polysorbate 80	Surfactant	DTaP (<i>Infanrix</i> , <i>Tripedia</i>), DTaP-Hib (<i>TriHIBit</i>), Human papillomavirus (<i>Gardasil</i>), Influenza (<i>Fluarix</i>), Rotavirus (<i>RotaTeq</i>), Tdap (<i>Adacel</i> , <i>Boostrix</i>)
Potassium chloride	Adjust pH, tonicity, medium nutrient	MMRV (<i>ProQuad</i>), Rotavirus (<i>Rotarix</i>), Zoster (<i>Zostavax</i>)
Potassium glutamate	Stabilizer	Rabies (<i>RabAvert</i>)
Serum, bovine calf	Component of growth medium	Zoster (<i>Zostavax</i>)
Sodium acetate	Adjust pH	DT (some brands), Td (some brands)
Sodium bicarbonate	Adjust pH	MMRV (<i>ProQuad</i>)
Sodium borate	Adjust pH	Hepatitis A (<i>Vaqta</i>), Hib-Hepatitis B (<i>Comvax</i>), Human papillomavirus (<i>Gardasil</i>)
Sodium chloride	Adjust tonicity	Most vaccines, including Anthrax, BCG, Human papillomavirus (<i>Gardasil</i>), Influenza (<i>Fluarix</i>), Measles, Meningococcal (<i>Menactra</i>), Mumps, MMR, MMRV, Pneumococcal, Polio inactivated, Rabies, Rotavirus (<i>Rotarix</i>), Rubella, Typhoid inactivated, Varicella, Yellow fever, Tdap (<i>Boostrix</i>), Zoster (<i>Zostavax</i>)
Sodium citrate	Adjust pH	Rotavirus (<i>RotaTeq</i>)
Sodium deoxycholate	Anionic surfactant (viral inactivation)	Influenza (<i>Fluarix</i> , <i>FluLaval</i>)
Sodium hydrogenocarbonate	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Sodium hydroxide	Adjust pH	DT (most brands), Rotavirus (<i>RotaTeq</i>), Td (most brands)
Sodium phosphate	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Sodium pyruvate	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Sorbitol	Stabilizer, solvent	Measles (<i>Attenuvax</i>), Mumps (<i>MumpsVax</i>), Rotavirus (<i>Rotarix</i>), Rubella (<i>Meruvax II</i>), MMR (<i>MMR-II</i>), MMRV (<i>ProQuad</i>), Yellow fever (<i>YF-Vax</i>)
Streptomycin	Antibacterial	Poliovirus inactivated (<i>Ipol</i>), Vaccinia (<i>Dryvax</i>)

Excipients Included in US Licensed Vaccines^a

Excipient	Use	Vaccine
Sucrose	Stabilizer	DTaP-Hib (<i>TriHIBit</i>), Hib (<i>Act-HIB</i>), Influenza (<i>FluMist</i>), Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsavax</i>), MMR (<i>MMR-II</i>), MMRV (<i>ProQuad</i>), Rotavirus (<i>RotaTeq</i>), Typhoid oral (<i>Vivotif</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</i>)
Sucrose	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Thimerosal	Preservative in some multidose containers (see package labeling for precise content)	DTaP (some multidose containers), DTaP-Hib (<i>TriHIBit</i>), DT (some multidose containers), Td (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.
Tocopheryl hydrogen succinate	Component of growth medium	Influenza (<i>Fluarix</i>)
Tyrosine	Medium nutrient	Rotavirus (<i>Rotarix</i>)
Urea	Stabilizer	Varicella vaccine (<i>Varivax</i> , refrigerator stable)
Vitamins unspecified	Component of growth medium	Anthrax (<i>BioThrax</i>), Rabies (<i>Imovax</i>), Rotavirus (<i>Rotarix</i>), Td (Sanofi Pasteur)
Xanthan	Thickening agent	Rotavirus (<i>Rotarix</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>)

^a Proprietary names appear in italics.

Vaccine Excipient & Media Summary

Vaccine-Production Media ^a	
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>Mumpsvax</i>), combination vaccines containing them, MMRV (<i>ProQuad</i>), 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)
Fenton media containing bovine casein	Tdap (<i>Boostrix</i>)
Human diploid tissue culture, MRC-5	Hepatitis A (<i>Havrix</i> , <i>Vaqta</i>), Hepatitis A-Hepatitis B (<i>Twinrix</i>), MMRV (<i>ProQuad</i>), Poliovirus inactivated (<i>Poliovax</i>), Rabies (<i>Imovax</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</i>)
Human diploid tissue culture, WI-38	Rubella (<i>Meruvax II</i>), combination vaccines containing it, MMRV (<i>ProQuad</i>), Varicella (<i>Varivax</i>), Zoster (<i>Zostavax</i>)
Lathan medium derived from bovine casein	DTaP (<i>Infanrix</i> , tetanus component), DTaP-Hep B-IPV (<i>Pediarix</i>), Tdap (<i>Boostrix</i>)
Linggoud-Fenton medium containing bovine extract	DTaP (<i>Infanrix</i> diphtheria component), DTaP-Hep B-IPV (<i>Pediarix</i>), Tdap (<i>Boostrix</i>)
Medium 199 (including amino acids, vitamins, sucrose, phosphate, glutamate, human albumin, fetal bovine serum)	Measles (<i>Attenuvax</i>), Mumps (<i>Mumpsvax</i>), combination vaccines containing them
Minimum essential medium (including amino acids, vitamins, fetal bovine serum, human albumin)	Rubella (<i>Meruvax II</i>), combination vaccines containing it
Monkey kidney tissue culture, Vero (Vervet or African green monkeys)	DTaP-Hep B-IPV (poliovirus component, <i>Pediarix</i>), Poliovirus inactivated (<i>Ipol</i>), Rotavirus (<i>RotaTeq</i>)
Mouse brain culture	Japanese encephalitis (<i>JE-Vax</i>)
Mueller-Hinton agar medium	Meningococcal conjugate (<i>Menactra</i>)
Mueller-Miller medium	Diphtheria and tetanus vaccines (most brands), meningococcal conjugate (<i>Menactra</i>)
Puziss-Wright medium 1095	Anthrax (<i>BioThrax</i>)
Rhesus fetal lung tissue culture	Rabies (<i>BioRab</i>)
Stainer-Scholte medium	DTaP (<i>Daptacel</i> , <i>Infanrix</i> , pertussis component), DTaP-Hep B-IPV (<i>Pediarix</i>), Tdap (<i>Boostrix</i>)
Soy peptone broth	Pneumococcal (<i>Prenvar</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>)
Watson-Scherp medium	Meningococcal conjugate (<i>Menactra</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> , <i>PedvaxHIB</i>), Hib-Hepatitis B (<i>Comvax</i>), Human papillomavirus (<i>Gardasil</i>), Medium for growing <i>Corynebacterium diphtheriae</i> strain C7 (b197) to obtain CRM ₁₉₇ protein for conjugation to polysaccharides (<i>HibTiter</i> , <i>Prenvar</i>).

^a 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.
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This document can be found on the CDC website at:
<http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/excipient-table-1.pdf>