

# Vaccine Ingredients and Manufacturer Information

## (alphabetical order by vaccine)

We have listed **vaccine ingredients** (substances that appear in the final vaccine product), **process ingredients** (substances used to create the vaccine that may or may not appear in the final vaccine product), and **growth mediums** (the substances vaccines are grown in) for vaccines approved by the Food & Drug Administration (FDA) and [commonly recommended by the Centers for Disease Control \(CDC.\)](#) Controversial products used to

make vaccines: [African Green Monkey \(Vero\) cells](#), [aluminum](#), [cow products](#), [Cocker Spaniel cells](#), [formaldehyde](#), [human fetal lung tissue cells](#), [insect products](#), and [mouse brains](#).



1. [Vaccines and Ingredients](#)
2. [Glossary and Details for Ingredients](#)
3. [Sources](#)

Though not listed, each vaccine contains strains of the virus being vaccinated against. Each vaccine entry links to the manufacturer's package insert that contains information about dosage, ingredient quantity, and how the vaccine is made. Some vaccines, like [influenza vaccines](#), are modified frequently and you may wish to consult the package inserts online and your doctor for the most current information.

### I. VACCINES AND INGREDIENTS

- |   |   |
|---|---|
| 1. <a href="#">Adenovirus</a>   | 18. <a href="#">Influenza A &amp; B</a>                 |
| 2. <a href="#">Anthrax</a>  | 19. <a href="#">Japanese Encephalitis</a>               |
| 3. <a href="#">BCG (tuberculosis)</a>   | 20. <a href="#">Meningococcal</a>                       |
| 4. <a href="#">Cholera</a>  | 21. <a href="#">Measles</a>                             |
| 5. <a href="#">DT (diphtheria &amp; tetanus)</a>  | 22. <a href="#">MMR (measles, mumps, &amp; rubella)</a> |
| 6. <a href="#">DTap (diphtheria, tetanus, &amp; pertussis)</a>                              | 23. <a href="#">Pneumococcal</a>                        |
| 7. <a href="#">DTap-IPV (diphtheria, tetanus, pertussis, &amp; polio)</a>                   | 24. <a href="#">Polio</a>                               |
| 8. <a href="#">DTap-HepB-IPV (diphtheria, tetanus, pertussis, hepatitis B, &amp; polio)</a> | 25. <a href="#">Rabies</a>                              |

- 9. DTap-IPV/Hib (diphtheria, tetanus, pertussis, polio, & haemophilus influenzae type B)
- 10. Hib (haemophilus influenzae type B)
- 11. Hib/Hep B (haemophilus influenzae type B & hepatitis B)
- 12. Hep A (hepatitis A)
- 13. Hep B (hepatitis B)
- 14. Hep A/Hep B (hepatitis A & hepatitis B)
- 15. HPV (human papillomavirus)
- 16. Influenza A (H1N1) (swine flu)
- 17. Influenza A (H5N1) (bird flu)

- 26. Rotavirus
- 27. Rubella
- 28. Smallpox
- 29. TD (tetanus & diphtheria)
- 30. Tdap (tetanus, diphtheria, & pertussis)
- 31. Typhoid
- 32. Varicella (chickenpox)
- 33. Yellow Fever
- 34. Zoster (shingles)

## 1. Adenovirus Vaccine

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Adenovirus Type 4 and Type 7 Vaccine, Live, Oral <hr style="border: 0.5px solid black;"/> --	Barr Labs/Teva Pharmaceuticals (under contract with US Army) <hr style="border: 0.5px solid black;"/> Apr. 2014	human-diploid fibroblast cell cultures (WI-38), Dulbecco's Modified Eagle's Medium, fetal bovine serum, sodium bicarbonate	sucrose, D-mannose, D-fructose, dextrose, potassium phosphate, plasdone C, anhydrous lactose, micro-crystalline cellulose, polacrillin potassium, magnesium stearate, cellulose acetate phthalate, alcohol, acetone, castor oil, FD&C Yellow #6 aluminum lake dye, human serum albumin, monosodium glutamate

## 2. Anthrax Vaccine

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u>	<u>PACKAGE INSERT</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
(click for package insert)	<u>DATE</u>		
Anthrax Vaccine Adsorbed	Emergent Biosolutions	amino acids, vitamins, inorganic salts and sugars	aluminum hydroxide, benzethonium chloride, formaldehyde, proteins (including 83kDa  protective antigen)
Biothrax	Nov. 2015		

## 3. BCG Vaccine (tuberculosis)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u>	<u>PACKAGE INSERT</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
(click for package insert)	<u>DATE</u>		
BCG Live	Organon Teknika Corp.	glycerin, asparagine, citric acid, potassium phosphate, magnesium sulfate, iron ammonium citrate	lactose, saline
Tice BCG	Feb. 2009		

## 4. Cholera Vaccine (tuberculosis)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u>	<u>PACKAGE INSERT</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
(click for package insert)	<u>DATE</u>		
Cholera Vaccine Live Oral	Pax Vax Bermuda Ltd.	casamino acids, yeast extract, mineral salts, anti- foaming agent	ascorbic acid, Hy-Case SF (hydrolyzed casein), sodium chloride, sucrose, dried lactose, sodium bicarbonate, sodium carbonate
Vaxchora	June 2016		

## 5. DT Vaccine

## (diphtheria & tetanus)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
Diphtheria and Tetanus Toxoids Adsorbed --	Sanofi Pasteur, Ltd. June 2013	peptone, bovine extract, modified Mueller and Miller medium, aluminum phosphate, isotonic sodium chloride solution, casein, cysteine, dextrose, uracil, inorganic salts, vitamins	aluminum phosphate, formaldehyde

## 6. DTap Vaccine (diphtheria, tetanus, & pertussis)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed <u>Daptacel</u>	Sanofi Pasteur, Ltd. 2013	Stainer-Scholte medium, modified Mueller's growth medium, modified Mueller-Miller casamino acid medium (without beef heart infusion), casamino acids, dimethyl-beta-cyclodextrin, ammonium sulfate, aluminum phosphate, glutaraldehyde, formaldehyde	aluminum phosphate, formaldehyde, glutaraldehyde, 2-Phenoxyethanol
Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed <u>Infanrix</u>	GlaxoSmithKline Biologicals 2013	formaldehyde, glutaraldehyde, Fenton medium (containing bovine extract), modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium, aluminum hydroxide	aluminum hydroxide, polysorbate 80, sodium chloride, formaldehyde
Diphtheria and Tetanus Toxoids	Sanofi Pasteur, Inc.	sodium phosphate, peptone-based medium, bovine	thimerosal, gelatin, polysorbate 80 (Tween 80)

and Acellular  
Pertussis Vaccine  
Adsorbed

Dec. 2005

extract (US sourced),  
formaldehyde, ammonium  
sulfate, aluminum potassium  
sulfate, modified Mueller and  
Miller medium, modified  
Stainer-Scholte medium,  
isotonic sodium chloride  
solution, sodium phosphate

formaldehyde, aluminum

[Tripedia\\*](#)

**\*This vaccine has  
been  
discontinued.**

## 7. DTap-IPV Vaccine (diphtheria, tetanus, pertussis, & polio)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER <small>(click for package insert)</small>	PACKAGE INSERT DATE	INGREDIENTS	<small>(not in order of quantity; see package insert for quantities)</small>
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed and Inactivated Poliovirus Vaccine <a href="#">Kinrix</a>	GlaxoSmithKline Biologicals <hr/> 2016	formaldehyde, glutaraldehyde, aluminum hydroxide, Vero cells, calf serum, lactalbumin hydrolysate, Fenton medium (containing bovine extract), modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium	polysorbate 80 (Tween 80) neomycin sulfate, polymyxin B, aluminum hydroxide, sodium chloride, formaldehyde
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed and Inactivated Poliovirus Vaccine <a href="#">Quadracel</a>	Sanofi Pasteur <hr/> Mar. 2015	modified Mueller's growth medium, ammonium sulfate, modified Mueller-Miller casamino acid medium (without beef heart infusion), aluminum phosphate, modified Stainer-Scholte medium (added casamino acids and dimethyl-beta- cyclodextrin), glutaraldehyde, formaldehyde, MRC-5 cells (with added Medium 199 without calf serum)	aluminum phosphate, 2- phenoxyethanol, water, polysorbate 80, formaldehyde, glutaraldehyde, bovine serum albumin, neomycin, polymyxin B sulfate

## 8. DTap-HepB-IPV Vaccine

(diphtheria, tetanus, pertussis, hepatitis B, & polio)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Hepatitis B (Recombinant) and Inactivated Poliovirus Vaccine Combined	GlaxoSmithKline Biologicals 2016	formaldehyde, glutaraldehyde, aluminum hydroxide, aluminum phosphate, lactalbumin hydrolysate, calf serum, Fenton medium (containing bovine extract), modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium, Vero cells	polysorbate 80 (Tween 80) neomycin sulfate, polymyxin B, yeast protein, aluminum salts, sodium chloride, formaldehyde
<u>Pediarix</u>			

9. DTap-IPV/Hib Vaccine

(diphtheria, tetanus, pertussis, polio, & haemophilus influenzae type B)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Inactivated Poliovirus and Haemophilus b Conjugate (Tetanus Toxoid Conjugate) Vaccine	Sanofi Pasteur, Inc. 2013	aluminum phosphate, formaldehyde, glutaraldehyde, 2-phenoxyethanol, modified Mueller's Growth Medium, Mueller-Miller casamino acid medium (without beef heart infusion), modified Stainer-Scholte medium (with added casamino acids, dimethyl-beta-cyclodextrin), MRC-5 cells, CMRL 1969 medium (supplemented with calf serum), ammonium sulfate, water, Medium 199 (without calf serum)	polysorbate 80, bovine serum albumin, neomycin, sucrose, glutaraldehyde, polymyxin B sulfate, aluminum phosphate, formaldehyde, 2-phenoxyethanol
<u>Pentacel</u>			

## 10. Hib Vaccine (haemophilus influenzae type B)

PROPER NAME <hr/> MANUFACTURER <small>(click for package insert)</small>	PROPER NAME <hr/> PACKAGE INSERT  DATE	GROWTH MEDIUMS & PROCESS  INGREDIENTS	VACCINE INGREDIENTS  <small>(not in order of quantity; see package insert for quantities)</small>
Haemophilus b Conjugate Vaccine (Tetanus Toxoid Conjugate) <hr/> ActHIB	Sanofi Pasteur, Inc. <hr/> May 2016	ammonium sulfate, <b>Modified Mueller and Miller medium</b> , saline diluent, <b>formaldehyde</b> , casein derivatives	sucrose, purified capsular polysaccharide
Haemophilus b Conjugate Vaccine (Tetanus Toxoid Conjugate) <hr/> Hiberix	GlaxoSmithKline Biologicals <hr/> 2016	<b>formaldehyde</b> , synthetic medium, semi-synthetic medium, saline diluent, lactose	lactose, sodium chloride, <b>formaldehyde</b> , purified capsular polysaccharide
Haemophilus B Conjugate Vaccine (Meningococcal Protein Conjugate) <hr/> Liquid PedvaxHIB	Merck Sharp & Dohme Corp. <hr/> Dec. 2010	complex fermentation media, ethanol	<b>amorphous aluminum hydroxyphosphate sulfate</b> , sodium chloride

## 11. Hib/Hep B Vaccine (haemophilus influenzae type B & hepatitis B)

PROPER NAME <hr/> MANUFACTURER <small>(click for package insert)</small>	PROPER NAME <hr/> PACKAGE INSERT  DATE	GROWTH MEDIUMS & PROCESS  INGREDIENTS	VACCINE INGREDIENTS  <small>(not in order of quantity; see package insert for quantities)</small>
Haemophilus b Conjugate (Meningococcal Protein Conjugate) and Hepatitis B (Recombinant) Vaccine <hr/> COMVAX*	Merck & Co., Inc. <hr/> Dec. 2010	yeast (vaccine contains no detectable yeast DNA), nicotinamide adenine dinucleotide, hemin chloride, soy peptone, dextrose, mineral salts, amino acids, formaldehyde, potassium, aluminum sulfate, aluminum hydroxyphosphate sulfate,	aluminum hydroxyphosphate sulphate, sodium chloride, formaldehyde

**\*This vaccine has been discontinued.**

sodium borate

## 12. Hep A Vaccine (hepatitis A)

PROPER NAME MANUFACTURER <small>(click for package insert)</small>	PROPER NAME PACKAGE INSERT DATE	GROWTH MEDIUMS & PROCESS INGREDIENTS	VACCINE INGREDIENTS <small>(not in order of quantity; see package insert for quantities)</small>
Hepatitis A Vaccine, Inactivated <u>Havrix</u>	GlaxoSmithKline Biologicals <u>2016</u>	MRC-5 cells	aluminum hydroxide, amino acid supplement, polysorbate 20, formaldehyde, neomycin sulfate, phosphate buffered saline, MRC-5 cellular proteins, aminoglycoside antibiotic
Hepatitis A Vaccine, Inactivated <u>VAQTA</u>	Merck & Co., Inc. <u>Dec. 2010</u>	amorphous aluminum hydroxyphosphate sulfate, formaldehyde, neomycin, MRC-5 fibroblasts	bovine albumin, sodium borate, formaldehyde, non-viral proteins, sodium chloride, neomycin

## 13. Hep B Vaccine (hepatitis B)

PROPER NAME MANUFACTURER <small>(click for package insert)</small>	PROPER NAME PACKAGE INSERT DATE	GROWTH MEDIUMS & PROCESS INGREDIENTS	VACCINE INGREDIENTS <small>(not in order of quantity; see package insert for quantities)</small>
Hepatitis B Vaccine (Recombinant) <u>Engerix-B</u>	GlaxoSmithKline Biologicals <u>2016</u>	aluminum hydroxide	aluminum hydroxide, yeast protein, phosphate buffers, sodium chloride, sodium dihydrogen, phosphate dihydrate
Hepatitis B Vaccine (Recombinant) <u>Recombivax</u>	Merck & Co., Inc. <u>2014</u>	yeast protein, soy peptone, dextrose, amino acids, mineral salts, alum	formaldehyde, yeast protein, aluminum

(potassium aluminum sulfate),  
amorphous aluminum  
hydroxyphosphate sulfate,  
formaldehyde

#### 14. Hep A/Hep B Vaccine (hepatitis A & hepatitis B)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Hepatitis A Inactivated & Hepatitis B (Recombinant) Vaccine <u>Twinrix</u>	GlaxoSmithKline Biologicals 2016	yeast protein, MRC-5 cells, formaldehyde, aluminum salts	neomycin sulfate, MRC-5 cell proteins, formaldehyde, yeast protein, water, aluminum phosphate, aluminum hydroxide, amino acids, sodium chloride, phosphate buffer, polysorbate 20

#### 15. HPV Vaccine (human papillomavirus)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Human Papillomavirus Bivalent (Types 16 and 18) Vaccine, Recombinant <u>Cervarix</u>	GlaxoSmithKline Biologicals 2016	vitamins, amino acids, lipids, mineral salts, aluminum (as hydroxide salt), sodium dihydrogen phosphate dihydrate, sodium chloride, water	insect cell and viral protein, sodium chloride, aluminum hydroxide, bacterial cell protein, sodium dihydrogen phosphate
Human Papillomavirus Quadrivalent (Types 6, 11, 16, 18) Vaccine,	Merck & Co., Inc. 2015	yeast protein, vitamins, amino acids, mineral salts, carbohydrates, amorphous aluminum hydroxyphosphate sulfate, aluminum-containing	L-histidine, polysorbate 80, sodium borate, amorphous aluminum hydroxyphosphate sulfate adjuvant, sodium chloride,

<u>Recombinant</u> Gardasil		adjuvant	yeast protein, water
<u>Human Papillomavirus 9-valent Vaccine, Recombinant</u> Gardasil 9	<u>Merck &amp; Co., Inc.</u> 2015	vitamins, amino acids, mineral salts, carbohydrates, yeast cells, <b>aluminum-containing adjuvant</b> (Amorphous Aluminum Hydroxyphosphate Sufate)	<b>aluminum</b> (Amorphous Aluminum Hydroxyphosphate Sulfate, sodium chloride, L-histidine, <b>polysorbate 80</b> , sodium borate, yeast protein, water

## 16. Influenza A (H1N1) Vaccine (swine flu)

<u>PROPER NAME</u> MANUFACTURER (click for package insert)	<u>PROPER NAME</u> PACKAGE INSERT DATE	<u>GROWTH MEDIUMS &amp; PROCESS</u> INGREDIENTS	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<u>Influenza A (H1N1) 2009 Monovalent Vaccine</u> --	<u>CSL Unlimited</u> Nov. 2009	<b>allantoic fluid of chicken eggs</b> , sucrose, beta-Propiolactone, sodium, taurodeoxycholate, phosphate buffered isotonic solution<	sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, monobasic potassium phosphate, potassium chloride, calcium chloride, sodium taurodeoxycholate, ovalbumin, neomycin sulfate, polymyxin B, beta-propiolactone
<u>Influenza A (H1N1) 2009 Monovalent Vaccine</u> --	<u>ID Biomedical Corporation of Quebec</u> Jan. 2010	<b>allantoic cavity of embryonated hens' eggs</b> , <b>formaldehyde</b> , sodium deoxycholate, phosphate-buffered saline solution	<b>thimerosal</b> , <b>egg proteins</b> , <b>formaldehyde</b> , sodium deoxycholate
<u>Influenza A (H1N1) 2009 Monovalent Vaccine</u> --	<u>MedImmune LLC</u> Sep. 2009	<b>specific pathogen-free (SPF) chicken eggs</b> , sucrose, potassium phosphate	monosodium glutamate, <b>hydrolyzed porcine gelatin</b> arginine, sucrose, dibasic potassium phosphate, monobasic potassium phosphate, gentamicin

sulfate

<u>Influenza A (H1N1) 2009 Monovalent Vaccine</u> --	<u>Sanofi Pasteur, Inc</u> Sep. 2009	<u>embryonated chicken eggs, formaldehyde</u> , sucrose density solution, polyethylene glycol p-isooctylphenyl ether (Triton X-100), sodium phosphate buffered isotonic chloride solution	gelatin, <u>formaldehyde</u> , polyethylene glycol p- isooctylphenyl ether, sucrose
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## 17. Influenza A (H5N1) Vaccine (bird flu)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
<u>Influenza Virus Vaccine (H5N1)</u> --	<u>ID Biomedical Corporation of Quebec</u> 2013	phosphate buffered saline solution, <u>allantoic cavity of embryonated hen's eggs</u> , <u>formaldehyde</u> , sodium deoxycholate, DL-a- tocopherol, <u>polysorbate 80</u>	<u>thimerosal</u> , squalene, DL- a-tocopherol, <u>polysorbate 80</u> , ovalbumin, <u>formaldehyde</u> , sodium deoxycholate
<u>Influenza A (H1N1) 2009 Monovalent Vaccine</u> --	<u>Sanofi Pasteur, Inc</u> 2007	<u>embryonated chicken eggs</u> , <u>formaldehyde</u> , linear sucrose density gradient solution, nonionic surfactant, polyethylene glycol p- isooctylphenyl ether (Triton X- 100), sodium phosphate buffered isotonic sodium chloride solution	<u>porcine gelatin</u> , <u>thimerosal</u> , <u>formaldehyde</u> , Polyethylene Glycol p- isooctylphenyl Ether, sucrose

## 18. Influenza Vaccine

(flu)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
<u>Influenza Virus Vaccine</u> <a href="#">Afluria</a> (Trivalent)	<u>Seqirus Pty. Ltd.</u> 2016	beta-propiolactone, sodium taurodeoxycholate, <a href="#">allantoic fluid of embryonated chicken eggs</a> , sucrose density agent, phosphate buffered isotonic solution	<a href="#">thimerosal</a> (multi-dose vials only), monobasic sodium phosphate, dibasic sodium phosphate, monobasic potassium phosphate, potassium chloride, calcium chloride, sodium taurodeoxycholate, neomycin sulfate, polymyxin B, <a href="#">ovalbumin</a> , mercury, sodium, chloride, beta-propiolactone, sucrose
<u>Influenza Virus Vaccine</u> <a href="#">Agriflu</a> *	<u>Novartis Vaccines and Diagnostics, Inc.</u> Feb. 21, 2013	kanamycin, neomycin sulfate, cetyltrimethylammonium bromide, allantoic cavity of embryonated hens' eggs	formaldehyde, egg protein, polysorbate 80, CTAB, neomycin, kanamycin
<b>*This vaccine has been discontinued.</b>			
<u>Influenza Vaccine, Adjuvanted</u> <a href="#">Fluad</a> (Trivalent)	<u>Seqiris, Inc.</u> 2016-2017	<a href="#">allantoic cavity of embryonated hen's eggs</a> , MF59C.1 adjuvant (MF59), <a href="#">formaldehyde</a> , cetyltrimethylammonium bromide (CTAB)	MF59C.1 adjuvant (squalene, <a href="#">polysorbate 80</a> , sorbitan trioleate, sodium citrate dihydrate, citric acid monohydrate), neomycin, kanamycin, barium, <a href="#">egg proteins</a> , <a href="#">formaldehyde</a> , cetyl trimethylammonium bromide (CTAB)
<u>Influenza Virus Vaccine</u> <a href="#">Fluarix</a> Quadrivalent	<u>GlaxoSmithKline Biologicals</u> 2016-2017	<a href="#">embryonated chicken eggs</a> , sodium phosphate-buffered isotonic sodium chloride solution, sodium	octoxynol-10 (Triton X-100), a-tocopheryl hydrogen succinate, <a href="#">polysorbate 80</a> (Tween 80)

		deoxycholate, <a href="#">formaldehyde</a> , linear sucrose density gradient solution (contains detergent)	gentamicin sulfate, <a href="#">ovalbumin</a> , hydrocortisone, <a href="#">formaldehyde</a> , sodium deoxycholate
Influenza Virus Vaccine <hr/> <a href="#">Fluarix Trivalent</a>	GlaxoSmithKline Biologicals <hr/> 2015-2016	<a href="#">embryonated chicken eggs</a> , linear sucrose density gradient solution (containing detergent), sodium deoxycholate, <a href="#">formaldehyde</a> , sodium phosphate buffered isotonic sodium chloride solution	octoxynol-10 (Triton 272 X0100), a-tocopheryl hydrogen succinate, <a href="#">polysorbate 80</a> (Tween 80) hydrocortisone, gentamicin sulfate, ovalbumin, <a href="#">formaldehyde</a> , sodium deoxycholate
Influenza Vaccine <hr/> <a href="#">Flublok</a> (Trivalent)	Protein Sciences Corporation <hr/> 2016-2017	<a href="#">HA insect cell (fall armyworm, <i>Spodoptera frugiperda</i>) proteins</a> , lipids, vitamins, amino acids, mineral salts, Triton X-100	sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, polysorbate 20 (Tween 20) <a href="#">host cell proteins</a> , baculovirus, Triton X-100, host cell DNA
Influenza Vaccine <hr/> <a href="#">Flucelvax</a> (Quadrivalent)	Seqiris, Inc. <hr/> May 23, 2016	<a href="#">Madin Darby Canine Kidney (MDCK) cells</a> , B-propiolactone, cetyltrimethylammonium bromide, phosphate buffered saline	<a href="#">MDCK cell protein</a> , protein other than HA, <a href="#">MDCK cell DNA</a> , <a href="#">polysorbate 80</a> , cetyltrimethylammonium bromide, B-propiolactone
Influenza Virus Vaccine <hr/> <a href="#">Flucelvax</a> (Trivalent)	Seqiris, Inc. <hr/> Apr. 2016	<a href="#">Madin Darby Canine Kidney (MDCK) cells</a> , B-propiolactone, cetyltrimethylammonium bromide	<a href="#">MDCK cell protein</a> , other cell proteins, <a href="#">MDCK cell DNA</a> , <a href="#">polysorbate 80</a> , cetyltrimethylammonium bromide, B-propiolactone
Influenza Virus Vaccine <hr/> <a href="#">FluLaval</a> (Quadrivalent)	ID Biomedical Corporation of Quebec <hr/> 2016-2017	<a href="#">allantoic cavity of embryonated hens' eggs</a> , <a href="#">formaldehyde</a> , sodium deoxycholate	<a href="#">thimerosal</a> , <a href="#">ovalbumin</a> , <a href="#">formaldehyde</a> , sodium deoxycholate, a-tocopheryl hydrogen succinate, <a href="#">polysorbate 80</a>
Influenza Virus Vaccine	ID Biomedical Corporation of	<a href="#">allantoic cavity of embryonated hens' eggs</a> ,	phosphate-buffered saline solution, <a href="#">thimerosal</a> (multi-

<u>FluLaval (Trivalent)</u>	<u>Quebec</u> 2015-2016	<u>formaldehyde</u> , sodium deoxycholate	dose vaccine only), <u>ovalbumin</u> , <u>formaldehyde</u> , sodium deoxycholate, a-tocopheryl hydrogen succinate, <u>polysorbate 80</u>
<u>Influenza Virus Vaccine Live, Intranasal</u> <u>FluMist Quadrivalent</u>	<u>MedImmune, LLC</u> 2016-2017	<u>SPF (specific pathogen-free) eggs</u> , stabilizing buffer, sucrose, potassium phosphate	monosodium glutamate, <u>hydrolyzed porcine gelatin</u> , arginine, sucrose, dibasic potassium phosphate, monobasic potassium phosphate, <u>ovalbumin</u> , gentamicin sulfate, ethylenediaminetetraacetic acid (EDTA)
<u>Influenza Virus Vaccine</u> <u>Fluvirin</u>	<u>Sequiris Vaccines, Ltd.</u> 2016-2017	<u>allantoic cavity of embryonated hens' eggs</u> , neomycin, polymyxin, betapropiolactone, nonylphenol ethoxylate	phosphate-buffered saline <u>thimerosal</u> , <u>egg proteins</u> , polymyxin, neomycin, betapropiolactone, nonylphenol ethoxylate
<u>Influenza Virus Vaccine</u> <u>Fluzone (Quadrivalent): Standard, High Dose, &amp; Intradermal</u>	<u>Sanofi Pasteur, Inc.</u> 2016-2017	<u>embryonated chicken eggs</u> , Octylphenol Ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, <u>formaldehyde</u> , linear sucrose density gradient solution	<u>formaldehyde</u> , octylphenol ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, gelatin (standard formulation only), <u>thimerosal</u> (standard dosage multi-dose vial only)

## 19. Japanese Encephalitis Vaccine

<u>PROPER NAME</u> <u>MANUFACTURER</u> (click for package insert)	<u>PROPER NAME</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u> <u>INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Japanese Encephalitis Vaccine, Inactivated, Adsorbed	<u>Intercell Biomedical</u> 2016	<u>Vero cells</u> , protamine sulfate, <u>formaldehyde</u> , aluminum hydroxide	<u>formaldehyde</u> , bovine serum albumin, host cell DNA, sodium metabisulphite, host cell proteins, protamine

Ixiaro

sulphate

Japanese Encephalitis Vaccine, Inactivated

Research Foundation for Microbial Diseases of Osaka University  
Dec. 2005

mice (brains are inoculated with the virus), phosphate-buffered saline, formaldehyde, 40% w/v sucrose

thimerosal, Sterile Water for Injection, gelatin, formaldehyde, v/v Polysorbate 80, mouse serum protein

JE-Vax\*

**\*This vaccine has been discontinued.**

## 20. Measles Vaccine

PROPER NAME

PROPER NAME

GROWTH MEDIUMS & PROCESS

VACCINE INGREDIENTS

MANUFACTURER

PACKAGE INSERT

INGREDIENTS

(not in order of quantity; see package insert for quantities)

(click for package insert)

DATE

Measles Virus Vaccine, Live

Merck &Co., Inc  
Feb. 2006

chick embryo cell culture, buffered salt solution, vitamins, amino acids, fetal bovine serum, SPGA (sucrose, phosphate, glutamate, human albumin), neomycin

sorbitol, sodium phosphate, sucrose, sodium, chloride, hydrolyzed gelatin, human albumin, fetal bovine serum, neomycin, other buffer and media ingredients

Attenuvax\*

**\*This vaccine has been discontinued.**

## 21. Meningococcal Vaccine (meningitis)

PROPER NAME

PROPER NAME

GROWTH MEDIUMS & PROCESS

VACCINE INGREDIENTS

MANUFACTURER

PACKAGE INSERT

INGREDIENTS

(not in order of quantity; see package insert for quantities)

(click for package insert)

DATE

Meningococcal Group B Vaccine  
Bexsero

Novartis Vaccines and Diagnostics  
2015

factor H binding protein (fHbp), Outer Membrane Vesicles (OMV), aluminum hydroxide, sodium chloride, histidine, sucrose, *Escherichia coli* (*E. coli*), deoxycholate

kanamycin

<p>Meningococcal (Serogroups A, C, Y and W-135) Polysaccharide Diphtheria Toxoid Conjugate Vaccine</p> <p><u>MCV4-Menactra</u></p>	<p>Sanofi Pasteur Inc.</p> <hr/> <p>2014</p>	<p>Mueller Hinton agar, Watson Scherp media (containing casamino acid), formaldehyde, ammonium sulfate, modified culture medium (containing hydrolyzed casein)</p>	<p>formaldehyde, sodium phosphate buffered isotonic sodium chloride solution</p>
<p>Meningococcal Groups C and Y and Haemophilus b Tetanus Toxoid Conjugate Vaccine</p> <p><u>MenHibrix</u></p>	<p>GlaxoSmithKline Biologicals</p> <hr/> <p>2013</p>	<p>semi-synthetic media, formaldehyde, sucrose, saline diluent, sterile saline solution</p>	<p>Tris (trometamol)-HCL, sucrose, formaldehyde, saline diluent</p>
<p>Meningococcal (Groups A, C, Y, and W-135) Oligosaccharide Diphtheria CRM197 Conjugate Vaccine</p> <p><u>Menveo</u></p>	<p>Novartis Vaccines and Diagnostics, Inc.</p> <hr/> <p>Aug. 2013</p>	<p>Franz Complete medium, formaldehyde, CY medium (contains yeast extracts and amino acids), purified polysaccharides, CRM197 protein</p>	<p>formaldehyde</p>
<p>Meningococcal Polysaccharide Vaccine, Groups A, C, Y, W135 Combined</p> <p><u>Menomune-A/C/Y/W-135</u></p>	<p>Sanofi Pasteur Inc.</p> <hr/> <p>2016</p>	<p>Mueller Hinton casein agar, Watson Scherp casamino acid media</p>	<p>distilled water, thimerosal, polysaccharide from serogroups A, C, Y, and w-135, mercury, lactose</p>
<p>Meningococcal Group B Vaccine</p> <p><u>Trumenba</u></p>	<p>Wyeth Pharmaceuticals, Inc.</p> <hr/> <p>2016</p>	<p><i>E. coli</i>, defined fermentation growth media, polysorbate 80 (PS80)</p>	<p>polysorbate 80 (PS80), Al<sup>3+</sup> (as AlPO<sub>4</sub>), mM histidine buffered saline</p>

(measles, mumps, & rubella)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
<u>Measles, Mumps, and Rubella Virus Vaccine, Live</u> <a href="#">M-M-R-II</a>	<u>Merck and Co., Inc.</u> Oct. 2015	<a href="#">chick embryo cell culture, WI-38 human diploid lung fibroblasts</a> , Medium 199 (containing vitamins, amino acids, <a href="#">fetal bovine serum</a> , SPGA (sucrose, phosphate, glutamate, recombinant <a href="#">human albumin</a> ), neomycin, Minimum Essential Medium (containing vitamins, amino acids, <a href="#">fetal bovine serum</a> , recombinant <a href="#">human albumin</a> , neomycin), sorbitol, hydrolyzed gelatin stabilizer	sorbitol, sodium phosphate, sucrose, sodium chloride, hydrolyzed gelatin, recombinant <a href="#">human albumin</a> , <a href="#">fetal bovine serum</a> , other buffer and media ingredients, neomycin
<u>&gt;Measles, Mumps, Rubella and Varicella Virus Vaccine Live</u> ProQuad,  <a href="#">Refrigerator Stable Formulation and Frozen Formulation</a>	<u>Merck and Co., Inc.</u> Oct. 2015	<a href="#">chick embryo cell culture, WI-38 human diploid lung fibroblasts</a> , <a href="#">MRC-5 cells</a> , <a href="#">bovine serum</a> , recombinant <a href="#">human albumin</a>	sucrose, hydrolyzed gelatin, urea (refrigerator stable formulation only), sodium chloride, sorbitol, monosodium L-glutamate,  sodium phosphate, recombinant <a href="#">human albumin</a> , sodium bicarbonate, potassium phosphate, potassium chloride, <a href="#">components of MRC-5 cells</a> (including DNA and protein), neomycin, <a href="#">bovine serum albumin</a> , other buffer and media ingredients, sodium phosphate dibasic (frozen formulation only), potassium phosphate monobasic (frozen formulation only), potassium phosphate

### 23. Pneumococcal Vaccine (pneumonia)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Pneumococcal 7-valent Conjugate Vaccine (Diphtheria CRM197 Protein) <a href="#">Pevnar*</a>	Wyeth Pharmaceuticals Inc. <hr/> Mar. 2009	soy peptone broth, casamino acids and yeast extract-based medium, ammonium sulfate, saccharides	aluminum (as aluminum phosphate adjuvant)
<p><b>*This vaccine has been discontinued.</b></p>			
Pneumococcal 13-valent Conjugate Vaccine (Diphtheria CRM197 Protein) <a href="#">Pevnar 13</a>	Wyeth Pharmaceuticals Inc. <hr/> 2016	soy peptone broth, casamino acids and yeast extract-based medium, ammonium sulfate, CRM 197	<a href="#">polysorbate 80</a> , succinate buffer, <a href="#">aluminum</a> (as aluminum phosphate adjuvant)
Pneumococcal Vaccine, Polyvalent <a href="#">Pneumovax-23</a>	Merck & Co., Inc. <hr/> May 2014	--	isotonic saline solution, phenol

## 24. Polio Vaccine

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
Poliovirus Vaccine Inactivated (Monkey Kidney Cell) <u>IPOL</u>	Sanofi Pasteur, SA <u>2015</u>	Vero cells, Eagle MEM modified medium, newborn calf serum, M-199 (without calf serum)	2-phenoxyethanol, formaldehyde, neomycin, streptomycin, polymyxin B, calf bovine serum albumin

## 25. Rabies Vaccine

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
Rabies Vaccine <u>IMOVAX</u>	Sanofi Pasteur, SA <u>Apr. 25, 2013</u>	MRC-5 cells, beta- propiolactone	human albumin, neomycin sulfate, phenol red indicator, beta- propiolactone
Rabies Vaccine <u>RabAvert</u>	Novartis Vaccines and Diagnostics <u>Nov. 2013</u>	chicken fibroblasts, synthetic cell culture medium (with added human albumin), polygeline (processed bovine gelatin), antibiotics, B- propiolactone, sucrose density-gradient, buffered polygeline, potassium glutamate	polygeline (processed bovine gelatin), human serum albumin, potassium glutamate, sodium EDTA, bovine serum, chicken protein, chicken ovalbumin, neomycin, chlortetracycline, amphotericin B, water for injection

## 26. Rotavirus Vaccine

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER (click for package insert)	PACKAGE INSERT DATE	INGREDIENTS	(not in order of quantity; see package insert for quantities)
<u>Rotavirus Vaccine, Live, Oral, Pentavalent</u> <a href="#">RotaTeq</a>	<u>Merck &amp; Co., Inc.</u> June 2013	<a href="#">Vero cells</a> , buffered stabilizer, porcine-derived materials	sucrose, sodium citrate, sodium phosphate monobasic monohydrate, sodium hydroxide, <a href="#">polysorbate 80</a> , cell culture media, <a href="#">fetal bovine serum</a> , DNA for porcine circoviruses
<u>Rotavirus Vaccine, Live, Oral</u> <a href="#">Rotarix</a>	<u>GlaxoSmithKline Biologicals</u> 2016	<a href="#">Vero cells</a> , <a href="#">porcine-derived materials</a> , amino acids, dextran, <a href="#">Dulbecco's Modified Eagle Medium</a> (sodium chloride, potassium chloride, magnesium sulfate, ferric (III) nitrate, sodium phosphate, sodium pyruvate, D-glucose, concentrated vitamin solution, L-cystine, L-tyrosine, amino acids solution, L-glutamine, calcium chloride, sodium hydrogenocarbonate, phenol red), sorbitol, sucrose	calcium carbonate, sterile water, xanthan, porcine cirrovirus type 1

## 27. Rubella Vaccine

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Rubella Virus Vaccine Live	Merck & Co., Inc.	WI-38 human diploid lung fibroblasts, Minimum Essential Medium (MEM; buffered salt solution (vitamins, amino acids, bovine serum), human serum albumin, neomycin), sorbitol, hydrolyzed gelatin stabilizer	sorbitol, sodium phosphate, sucrose, sodium chloride, hydrolyzed gelatin, human albumin, fetal bovine serum, other buffer and media ingredients, neomycin
<b>MERUVAX II*</b>	Feb. 2006		
<b>*This vaccine has been discontinued.</b>			

## 28. Smallpox Vaccine

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Smallpox (Vaccinia) Vaccine, Live	Sanofi Pasteur Biologics Co.	Vero cells, human serum albumin, sodium chloride, mannitol, neomycin, polymyxin B, Dryvax	glycerin, phenol in Water for Injection
<b>ACAM2000</b>	Dec. 2015		

## 29. TD Vaccine (tetanus & diphtheria)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Tetanus and Diphtheria Toxoids Adsorbed For Adult Use	Sanofi Pasteur, Inc.	Mueller and Miller medium, peptone-based medium, extract of bovine muscle tissue, formaldehyde, ammonium sulfate	thimerosal, aluminum potassium sulfate adjuvant, formaldehyde
<b>DECAVAC*</b>	Mar. 2011		
<b>*This vaccine has been</b>			

**discontinued.**

Tetanus and  
Diphtheria Toxoids  
Adsorbed For Adult  
Use

TENIVAC

Sanofi Pasteur,  
Ltd.  
Apr. 2013

modified Mueller-Miller  
casamino acid medium  
(without beef heart infusion),  
formaldehyde, ammonium  
sulfate, modified Mueller's  
growth medium, aluminum  
phosphate

aluminum phosphate,  
formaldehyde, sodium  
chloride, water for  
injection

Tetanus and  
Diphtheria Toxoids,  
Adsorbed

--

Mass Biologics  
Feb. 2011

modified Mueller's media  
(contains bovine extracts),  
formaldehyde, ammonium  
sulfate, aluminum phosphate

aluminum adjuvant,  
formaldehyde, thimerosal

Tetanus Toxoid

--\*

**\*This vaccine has  
been  
discontinued.**

Sanofi Pasteur,  
Inc.  
Dec. 2005

peptone-based medium,  
formaldehyde, ammonium  
sulfate, physiological saline  
solution

thimerosal, formaldehyde

Tetanus Toxoid  
Adsorbed

--\*

**\*This vaccine has  
been  
discontinued.**

Sanofi Pasteur,  
Inc.  
July 2005

peptone-based medium  
(contains extract of bovine  
muscle tissue), formaldehyde,  
ammonium sulfate, aluminum  
potassium sulfate (alum)

thimerosal, physiological  
saline solution

### 30. Tdap Vaccine (tetanus, diphtheria, & pertussis)

**PROPER NAME**

**MANUFACTURER**

(click for package insert)

**PROPER NAME**

**PACKAGE INSERT**

**DATE**

**GROWTH MEDIUMS & PROCESS**

**INGREDIENTS**

**VACCINE INGREDIENTS**

(not in order of quantity; see package  
insert for quantities)

Tetanus Toxoid,  
Reduced  
Diphtheria Toxoid  
and Acellular  
Pertussis Vaccine,  
Adsorbed

Sanofi Pasteur,  
Ltd.  
2015

modified Stainer-Scholte  
medium (added casamino  
acid, dimethyl-beta-  
cyclodextrin), glutaraldehyde,  
formaldehyde, aluminum  
phosphate, modified Mueller-

aluminum phosphate,  
formaldehyde,  
glutaraldehyde, 2-  
phenoxyethanol, water for  
injection

Adacel

Miller casamino acid medium (without beef heart infusion), ammonium sulfate, 2-phenoxyethanol, water for injection

Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine, Adsorbed

GlaxoSmithKline Biologicals  
2016

modified Latham medium derived from bovine casein, Fenton medium (containing bovine extract), formaldehyde, modified Stainer-Scholte liquid medium, glutaraldehyde, aluminum hydroxide

aluminum hydroxide, sodium chloride, formaldehyde, polysorbate 80 (Tween 80)

Boostrix

### 31. Typhoid Vaccine

**PROPER NAME**

**PROPER NAME**

**GROWTH MEDIUMS & PROCESS**

**VACCINE INGREDIENTS**

**MANUFACTURER**

**PACKAGE INSERT**

**INGREDIENTS**

(not in order of quantity; see package insert for quantities)

(click for package insert)

**DATE**

Typhoid Vi Polysaccharide Vaccine

Sanofi Pasteur SA  
Mar. 2014

semi-synthetic medium, hexadecyltrimethylammonium bromide

formaldehyde, phenol, polydimethylsiloxane or fatty-acid ester-cased antifoam, isotonic phosphate buffered saline, sodium chloride, disodium phosphate, monosodium phosphate, sterile water for injection, vi polysaccharide

Typhim Vi

Typhoid Vaccine Live Oral Ty21a

Berna Biotech, Ltd.  
Sep. 2013

yeast extract, casein, dextrose, and galactose, sucrose, ascorbic acid, amino acids, lactose, magnesium stearate

sucrose, ascorbic acid, amino acid mixture, lactose, magnesium stearate

Vivotif

### 32. Varicella Vaccine

## (chickenpox)

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
<u>Varicella Virus Vaccine, Live</u> Varivax, <a href="#">Frozen</a> and <a href="#">Refrigerated</a>	<u>Merck &amp; Co., Inc.</u> Dec. 2012	human embryonic lung cell cultures, embryonic guinea pig cell cultures, <a href="#">WI-38 human diploid cell cultures</a> , <a href="#">MRC-5 human diploid cell cultures</a> , sucrose, phosphate, glutamate, processed gelatin, urea (refrigerated vaccine only)	sucrose, hydrolyzed gelatin, urea (refrigerated vaccine only), sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, components of <a href="#">MRC-5 cells</a> (DNA, protein), neomycin, <a href="#">bovine calf serum</a> , sodium phosphate monobasic, EDTA, <a href="#">fetal bovine serum</a>

## 33. Yellow Fever Vaccine

<u>PROPER NAME</u>	<u>PROPER NAME</u>	<u>GROWTH MEDIUMS &amp; PROCESS</u>	<u>VACCINE INGREDIENTS</u>
<u>MANUFACTURER</u> (click for package insert)	<u>PACKAGE INSERT</u> <u>DATE</u>	<u>INGREDIENTS</u>	(not in order of quantity; see package insert for quantities)
<u>Yellow Fever Vaccine</u> YF-Vax	<u>Sanofi Pasteur, Inc.</u> June 2016	living avian leukosis virus-free (ALV-free) chicken embryos	sorbitol, gelatin, sterile diluent (sodium chloride)

## 34. Zoster Vaccine

(shingles)

PROPER NAME	PROPER NAME	GROWTH MEDIUMS & PROCESS	VACCINE INGREDIENTS
MANUFACTURER	PACKAGE INSERT	INGREDIENTS	(not in order of quantity; see package insert for quantities)
(click for package insert)	DATE		
Zoster Vaccine, Live	Merck & Co., Inc.	--	sucrose, hydrolyzed porcine gelatin, sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, components of MRC-5 cells (DNA, protein), neomycin, bovine calf serum, urea (refrigerator stable only)
Zostavax, Frozen and Refrigerator Stable	Feb. 2016		



## II. GLOSSARY AND DETAILS FOR INGREDIENTS

### Possible Ingredients

**Product** (Ingredients depend on which modification is used.)

2-Phenoxyethanol

2-Phenoxyethanol is a glycol ether used as a preservative in vaccines.

Aluminum

Aluminum is used in vaccines as an adjuvant, which helps the vaccine work more quickly and more powerfully.

## Bovine casein

A casein is a family of phosphoproteins commonly found in mammalian milk. 80% of the proteins in cow's milk are casein.

## Bovine serum

Bovine "[s]erum is the centrifuged fluid component of either clotted or defibrinated whole blood. Bovine serum comes from blood taken from domestic cattle. Serum from other animals is also collected and processed but bovine serum is processed in the greatest volume."

"Bovine serum is a by-product of the meat industry. Bovine blood may be taken at the time of slaughter, from adult cattle, calves, very young calves or (when cows that are slaughtered are subsequently found to be pregnant) from bovine fetuses. It is also obtained from what are called 'donor' animals, which give blood more than once.

Blood is available from bovine fetuses only because a proportion of female animals that are slaughtered for meat for human consumption are found (often unexpectedly) to be pregnant.

Blood is available from very young calves because calves, especially males from dairy breeds, are often slaughtered soon, but not necessarily immediately, after birth because raising them will not be economically beneficial. Older animals are, of course, slaughtered for meat.

Only donor cattle are raised for the purpose of blood donation. Donor cattle are invariably kept in specialized, controlled herds. Blood is taken from these animals in a very similar way to that used for human blood donation.

Irrespective of whether blood is taken at slaughter or from donors, the age of the animal is an important consideration because it impacts the characteristics of the serum.

Bovine serum is categorized according to the age of the animal from which the blood was collected as follows:

- 'Fetal bovine serum' comes from fetuses
  - 'Newborn calf serum' comes from calves less than three weeks old
  - 'Calf serum' comes from calves aged between three weeks and 12 months
  - 'Adult bovine serum' comes from cattle older than 12 months
- Serum processed from donor blood is termed 'donor bovine serum'. Donor animals can be up to three years old."

Chicken Eggs	Viruses can be grown in chicken eggs before being used in vaccinations.
CMRL-1969	L-alanine, L-arginine (free base) <sup>b</sup> , L-aspartic acid, L-cysteine-HCL, L-cystine, L-glutamic acid-H <sub>2</sub> O, L-glutamine, glycine, L-histidine (free base) <sup>b</sup> , L-hydroxyproline, L-isoleucine, L-leucine, L-lysine, L-methionine, L-phenylalanine, L-proline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, <i>p</i> -aminobenzoic acid, ascorbic acid, <i>d</i> -biotin, calcium pantothenate, cholesterol, choline chloride, ethanol, folic acid, glutathione, <i>i</i> -inositol, menadione, nicotinamide, nicotinic acid, pyridoxal-HCL, pyridoxine-HCL, riboflavine, riboflavine-5-phosphate, sodium acetate-3H <sub>2</sub> O, thiamine-HCL, Tween 80, vitamin A acetate, vitamin D (calciferol), vitamin E (α-tocopherol phosphate), D-glucose, phenol red, sodium chloride, potassium chloride, calcium chloride, magnesium sulphate heptahydrate, sodium phosphate dibasic, sodium dihydrogen phosphate, monopotassium phosphate, sodium bicarbonate, iron nitrate nonahydrate
Dulbecco's Modified Eagle's Serum	glucose, sodium bicarbonate, L-glutamine, pyridoxine HCl, pyridocal HCl, folic acid, phenol red, HEPES (2-[4-(2-hydroxyethyl)piperazin-1-yl]ethanesulfonic acid), L-methionine, L-cystine, sodium phosphate mono-basic, sodium pyruvate, vitamins
Earle's Balanced Salt Medium	inorganic salts, D-glucose, phenol red, calcium, magnesium salts
Fenton Medium	bovine extract
Formaldehyde	Formaldehyde is used in vaccines to inactivate the virus so the person being inoculated does not contract the disease.
Human albumin	Human albumin is a blood plasma protein produced in the liver that, among other functions, transports hormones, fatty acids, and other compounds, and buffers pH.
Insect Cells	Cabbage moth and fall armyworm cells are used to grow viruses for

vaccines.

Latham  
Medium

bovine casein

MDCK (Madin-  
Carby canine  
kidney cells)

cells from normal female adult Cocker Spaniel (harvested in 1958 by SH Madin and NB Darby), EMEM(EBSS) (Eagle's Minimum Essential Medium with Earle's Balanced Salt Solution), glutamine, non essential amino acids, foetal bovine serum

Mouse Brains

Live mice brains are inoculated with the Japanese encephalitis virus to grow the virus used in the vaccine.

MRC-5

Medical Research Council 5, human diploid cells (cells containing two sets of chromosomes) derived from the normal lung tissues of a 14-week-old male fetus aborted for "psychiatric reasons" in 1966 in the United Kingdom, Eagle's Basal Medium in Earle's balanced salt solution with bovine serum.

Mueller Hinton  
Agar

beef extract, acid hydrolysate of casein, starch, agar

Mueller-Miller  
Medium

glucose, sodium chloride, sodium phosphate dibasic, monopotassium, phosphate, magnesium sulfate hydrate, ferrous sulfate heptahydrate, cystine hydrochloride, tyrosine hydrochloride, urasil hydrochloride, Ca-pantothenate in ethanol, thiamine in ethanol, pyridoxin-hydrochloride in ethanol, riboflavin in ethanol, biotin in ethanol, sodium hydroxide, beef heart infusion (de-fatted beef heart and distilled water), casein solution

Polysorbate 80

Also called Tween 80, Alkest 80, or Canarcel 80 (brand names). Polysorbate 80 is used as an excipient (something to basically thicken a vaccine for proper dosing) and an emulsifier (something to bond the ingredients).

Porcine gelatin

Gelatin is used to protect viruses in vaccines from freeze-drying or heat and to stabilize vaccines so they stay stable.

Stainer-Scholte  
Liquid Medium

tris hydrochloride, tris base, glutamate (monosodium salt), proline, salt, monopotassium phosphate, potassium chloride, magnesium chloride, calcium chloride, ferrous sulfate, ascorbic acid, niacin, glutathione

Thimerosal

Thimerosal is an organomercury compound used as a preservative.

Vero Cells  
(African Green  
Monkey Cells)

cells derived from the kidney of a normal, adult African Green monkey in 1962 by Y. Yasumura and Y. Kawakita

WI-38 human  
diploid cells

Winstar Institute 38, human diploid lung fibroblasts derived from the lung tissues of a female fetus aborted because the family felt they had too many children in 1964 in the United States



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**History**



**Pro & Con  
Quotes**



**Pro & Con  
Arguments**

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