



# Vaccines

## Pros and Cons

 SearchSelect Language | Translate

- HOME
- MORE ISSUES
- ABOUT US
- METRICS
- MEDIA
- FAQS
- TRAFFIC
- TESTIMONIALS
- CONTACT US
- DONORS & SPONSORS
- SUPPORT / DONATE
- TEACHERS' CORNER

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## Vaccine Ingredients and Manufacturer Information (alphabetical order by vaccine)

### Vaccines Home

#### Featured Resources

1. Did You Know?
2. Pro & Con Arguments
3. Background
4. Video Gallery

#### Projects

5. **HOT** Top Pro & Con Quotes
6. Comments
7. State Vaccination Exemptions for Children Entering Public Schools
8. 2015 CDC Immunization Schedule
9. Vaccine Ingredients and Manufacturer Information
10. Vaccine Histories and Impact on 10 Diseases
11. State-by-State: Vaccinations Required for Public School Kindergarten

#### Learn More

12. Footnotes & Sources

[FACEBOOK](#)[TWITTER](#)[GOOGLE+](#)[EMAIL](#)[PRINT](#)[CITE](#)

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 31 [vaccines commonly recommended](#) by the Food & Drug Administration (FDA) and 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](#).

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](#)
- II. [Glossary and Details for Ingredients](#)
- III. [Sources](#)

### I. VACCINES AND INGREDIENTS

- |  |   |
|--|---|
| 1. <a href="#">Adenovirus</a>                                  | 16. <a href="#">Japanese Encephalitis</a>               |
| 2. <a href="#">Anthrax</a>                                     | 17. <a href="#">Measles</a>                             |
| 3. <a href="#">BCG (tuberculosis)</a>                          | 18. <a href="#">Meningococcal</a>                       |
| 4. <a href="#">DT (diphtheria &amp; tetanus)</a>               | 19. <a href="#">MMR (measles, mumps, &amp; rubella)</a> |
| 5. <a href="#">DTap (diphtheria, tetanus, &amp; pertussis)</a> | 20. <a href="#">Pneumococcal</a>                        |

13. Source Biographies

+ Additional Resources

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- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>6. DTap-IPV (diphtheria, tetanus, pertussis, &amp; polio)</li> <li>7. DTap-HepB-IPV (diphtheria, tetanus, pertussis, hepatitis B, &amp; polio)</li> <li>8. DTap-IPV/Hib (diphtheria, tetanus, pertussis, polio, &amp; haemophilus influenzae type B)</li> <li>9. Hib (haemophilus influenzae type B)</li> <li>10. Hib/Hep B (haemophilus influenzae type B &amp; hepatitis B)</li> <li>11. Hep A (hepatitis A)</li> <li>12. Hep B (hepatitis B)</li> <li>13. Hep A/Hep B (hepatitis A &amp; hepatitis B)</li> <li>14. HPV (human papillomavirus)</li> <li>15. Influenza</li> </ul> | <ul style="list-style-type: none"> <li>21. Polio</li> <li>22. Rabies</li> <li>23. Rotavirus</li> <li>24. Rubella</li> <li>25. Smallpox</li> <li>26. TD (tetanus &amp; diphtheria)</li> <li>27. Tdap (tetanus, diphtheria, &amp; pertussis)</li> <li>28. Typhoid</li> <li>29. Varicella (chickenpox)</li> <li>30. Yellow Fever</li> <li>31. Zoster (shingles)</li> </ul> |
|---|---|

### 1. Adenovirus Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
Adenovirus Type 4 and Type 7 Vaccine, Live, Oral  --	Barr Labs/Teva Pharmaceuticals (under contract with US Army)  Mar. 2011	<a href="#">human-diploid fibroblast cell cultures (WI-38)</a> , <a href="#">Dulbecco's Modified Eagle's Medium</a> , <a href="#">fetal bovine serum</a> , 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 <a href="#">aluminum lake dye</a> , <a href="#">human serum albumin</a>

### 2. Anthrax Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
Anthrax Vaccine Absorbed  <a href="#">Biothrax</a>	Emergent Biosolutions  Dec. 2008	amino acids, vitamins, inorganic salts and sugars	<a href="#">aluminum hydroxide</a> , <a href="#">benzethonium chloride</a> , <a href="#">formaldehyde</a>

### 3. BCG Vaccine (tuberculosis)

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

### 4. DT Vaccine (diphtheria & tetanus)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Diphtheria and Tetanus Toxoids Absorbed</a> --	Sanofi Pasteur, Ltd. Dec. 2005	peptone, <a href="#">bovine extract</a> , modified <a href="#">Mueller and Miller medium</a>	<a href="#">aluminum sulfate</a> , <a href="#">formaldehyde</a> , <a href="#">thimerosal</a> (trace)

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Absorbed</a> <a href="#">Daptacel</a>	Sanofi Pasteur, Ltd. July 2011	<a href="#">Stainer-Scholte medium</a> , modified <a href="#">Mueller's growth medium</a> , modified <a href="#">Mueller-Miller casamino acid medium</a> (without beef heart infusion), casamino acids, dimethyl-beta-cyclodextrin, <a href="#">aluminum sulfate</a> , <a href="#">aluminum phosphate</a>	<a href="#">aluminum phosphate</a> , <a href="#">formaldehyde</a> , <a href="#">glutaraldehyde</a> , <a href="#">2-Phenoxyethanol</a>
<a href="#">Diphtheria and Tetanus Toxoids and</a>	<a href="#">GlaxoSmithKline Biologicals</a>	<a href="#">formaldehyde</a> , <a href="#">glutaraldehyde</a> , <a href="#">Fenton medium</a> (containing <a href="#">bovine extract</a> ),	<a href="#">aluminum hydroxide</a> , <a href="#">polysorbate 80</a> , <a href="#">sodium chloride</a> , <a href="#">formaldehyde</a>

<p><a href="#">Acellular Pertussis Vaccine Absorbed</a> <a href="#">Infanrix</a></p>	<p>Nov. 2011</p>	<p>modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium</p>	
<p><a href="#">Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Absorbed</a> <a href="#">Tripedia</a></p>	<p>Sanofi Pasteur, Inc. Dec. 2005</p>	<p>sodium phosphate, peptone-based medium, bovine extract (US sourced), formaldehyde, ammonium sulfate, aluminum potassium sulfate, modified Mueller and Miller medium, modified Stainer-Scholte medium, isotonic sodium, chloride solution, sodium phosphate</p>	<p>thimerosal (trace), gelatin, polysorbate 80 (Tween 80), formaldehyde, aluminum</p>

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<p><a href="#">Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed and Inactivated Poliovirus Vaccine</a> <a href="#">Kinrix</a></p>	<p>GlaxoSmithKline Biologicals Nov. 2011</p>	<p>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</p>	<p>polysorbate 80 (Tween 80), neomycin sulfate, polymyxin B, aluminum hydroxide, sodium chloride, formaldehyde</p>

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<p><a href="#">Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Hepatitis</a></p>	<p>GlaxoSmithKline Biologicals Nov. 2011</p>	<p>formaldehyde, glutaraldehyde, aluminum hydroxide, aluminum phosphate, lactalbumin hydrolysate, calf serum, Fenton medium (containing bovine</p>	<p>polysorbate 80 (Tween 80), neomycin sulfate, polymyxin B, yeast protein, aluminum salts, sodium chloride, formaldehyde</p>

B (Recombinant) and  
Inactivated Poliovirus  
Vaccine Combined  
[Pediatrix](#)

[extract](#)), [modified Latham medium](#)  
(derived from [bovine casein](#)), [modified](#)  
[Stainer-Scholte liquid medium](#), [Vero cells](#)

### 8. DTap-IPV/Hib Vaccine (diphtheria, tetanus, pertussis, polio, & haemophilus influenzae type B)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Inactivated Poliovirus and Haemophilus b Conjugate (Tetanus Toxoid Conjugate) Vaccine <a href="#">Pentacel</a>	<a href="#">Sanofi Pasteur, Inc.</a> July 2011	<a href="#">aluminum phosphate</a> , <a href="#">formaldehyde</a> , <a href="#">gutaraldehyde</a> , <a href="#">2-phenoxethanol</a> , <a href="#">Mueller's Growth Medium</a> , <a href="#">Mueller-Miller casamino acid medium</a> (without beef heart infusion), <a href="#">Stainer-Scholte medium</a> , <a href="#">casamino acids</a> , <a href="#">dimethyl-beta-cyclodextrin</a> ), <a href="#">MRC-5 cells</a> , <a href="#">CMRL 1969 medium</a> (supplemented with <a href="#">calf serum</a> ), <a href="#">ammonium sulfate</a> , <a href="#">water</a>	<a href="#">polysorbate 80</a> , <a href="#">bovine serum albumin</a> , <a href="#">neomycin</a> , <a href="#">polymyxin B sulfate</a> , <a href="#">aluminum phosphate</a> , <a href="#">formaldehyde</a> , <a href="#">2-phenoxethanol</a>

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Haemophilus b Conjugate Vaccine (Tetanus Toxoid Conjugate) <a href="#">ActHIB</a>	<a href="#">Sanofi Pasteur, Inc.</a> May 2009	<a href="#">ammonium sulfate</a> , <a href="#">formalin</a> , <a href="#">Modified Mueller and Miller medium</a> , <a href="#">saline diluent</a> , <a href="#">formaldehyde</a>	<a href="#">sucrose</a> , <a href="#">purified capsular polysaccharide</a>

Haemophilus b Conjugate Vaccine (Tetanus Toxoid Conjugate) <a href="#">Hiberix</a>	GlaxoSmithKline Biologicals Dec. 2010	<a href="#">formaldehyde</a> , synthetic medium, semi-synthetic medium	lactose, sodium chloride, <a href="#">formaldehyde</a> , purified capsular polysaccharide
Haemophilus B Conjugate Vaccine (Meningococcal Protein Conjugate) <a href="#">Liquid PedvaxHIB</a>	Merck Sharp & Dohme Corp. Dec. 2010	complex fermentation media, ethanol	<a href="#">amorphous aluminum hydroxphosphate sulfate</a> , sodium chloride

10. **Hib/Hep B Vaccine  
(haemophilus influenzae type B & hepatitis B)**

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

11. **Hep A Vaccine  
(hepatitis A)**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Hepatitis A Vaccine, Inactivated	GlaxoSmithKline Biologicals	<a href="#">MRC-5 cells</a> , <a href="#">formaldehyde</a>	aluminum hydroxide, amino acid supplement, polysorbate 20, formalin, neomycin sulfate, phosphate buffered

<a href="#">Havrix</a>	July 2011	saline, <a href="#">residual MRC-5 cellular proteins</a> , aminoglycoside antibiotic
<a href="#">Hepatitis A Vaccine, Inactivated</a> <a href="#">VAQTA</a>	<a href="#">Merck &amp; Co., Inc.</a> Dec. 2010	<a href="#">amorphous aluminum hydroxyphosphate sulfate</a> , <a href="#">formaldehyde</a> , neomycin, <a href="#">MRC-5 fibroblasts</a> <a href="#">bovine albumin</a> , sodium borate, <a href="#">formaldehyde</a> , non-viral proteins, sodium chloride, neomycin

### 12. Hep B Vaccine (hepatitis B)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Hepatitis B Vaccine (Recombinant)</a> <a href="#">Engerix-B</a>	<a href="#">GlaxoSmithKline Biologicals</a> Oct. 2011	--	<a href="#">aluminum hydroxide</a> , yeast protein, phosphate buffers, sodium chloride, disodium phosphate, dihydrate, sodium dihydrogen
<a href="#">Hepatitis B Vaccine (Recombinant)</a> <a href="#">Recombivax</a>	<a href="#">Merck &amp; Co., Inc.</a> July 2011	yeast protein, soy peptone, dextrose, amino acids, mineral salts, <a href="#">potassium aluminum sulfate</a> , <a href="#">amorphous aluminum hydroxyphosphate sulfate</a> , <a href="#">formaldehyde</a>	<a href="#">formaldehyde</a> , yeast protein

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Hepatitis A Inactivated &amp; Hepatitis B (Recombinant) Vaccine</a> <a href="#">Twinrix</a>	<a href="#">GlaxoSmithKline Biologicals</a> Nov. 2011	yeast protein, <a href="#">aluminum phosphate</a> , <a href="#">aluminum hydroxide</a> , amino acids, phosphate buffer, <a href="#">polysorbate 20</a> , <a href="#">MRC-5 cells</a> , <a href="#">formaldehyde</a> , sodium chloride	neomycin sulfate, <a href="#">MRC-5 cell proteins</a> , <a href="#">formaldehyde</a> , yeast protein, water

### 14. HPV Vaccine (human papillomavirus)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Human Papillomavirus Bivalent (Types 16 and 18) Vaccine, Recombinant <a href="#">Cervarix</a>	GlaxoSmithKline Biologicals July 2011	vitamins, amino acids, lipids, mineral salts, <a href="#">aluminum</a> (as hydroxide salt), sodium dihydrogen phosphate dehydrate,	<a href="#">insect cell and viral protein</a> , sodium chloride, water, <a href="#">aluminum hydroxide</a> , bacterial cell protein
Human Papillomavirus Quadrivalent (Types 6, 11, 16, 18) Vaccine, Recombinant <a href="#">Gardasil</a>	Merck & Co., Inc. Mar. 2011	yeast protein, vitamins, amino acids, mineral salts, carbohydrates, <a href="#">amorphous aluminum hydroxyphosphate sulfate</a> , <a href="#">aluminum-containing adjuvant</a>	L-histidine, <a href="#">polysorbate 80</a> , sodium borate, <a href="#">amorphous aluminum hydroxyphosphate sulfate adjuvant</a> , sodium chloride, yeast protein, water

### 15. Influenza Vaccine (Flu)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Influenza Virus Vaccine <a href="#">Afluria</a>	CSL Limited Apr. 2013	beta-propiolactone, sodium taurodeoxycholate, <a href="#">allantoic fluid of embryonated chicken eggs</a> , sucrose density agent, phosphate buffered isotonic solution	<a href="#">thimerosol</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-propiolacton

<a href="#">Influenza Virus Vaccine</a> <a href="#">Agriflu</a>	<a href="#">Novartis Vaccines and Diagnostics, Inc.</a> Feb. 21, 2013	kanamycin, neomycin sulfate, cetyltrimethylammonium bromide, <a href="#">allantoic cavity of embryonated hens' eggs</a>	<a href="#">formaldehyde</a> , <a href="#">egg protein</a> , <a href="#">polysorbate 80</a> , CTAB, neomycin, kanmycin
<a href="#">Influenza Virus Vaccine</a> <a href="#">Fluarix Quadrivalent</a>	<a href="#">GlaxoSmithKline Biologicals</a> May 2013	<a href="#">embryonated chicken eggs</a> , sodium phosphate-buffered isotonic sodium chloride solution, sodium deoxycholate, <a href="#">formaldehyde</a> ,	octoxynol-10 (Triton X-100), a-tocopheryl hydrogen succinate, <a href="#">polysorbate 80</a> (Tween 80), hydrocortisone, gentamicin sulfate, <a href="#">ovalbumin</a> , hydrocortisone, <a href="#">formaldehyde</a> , sodium deoxycholate
<a href="#">Influenza Vaccine</a> <a href="#">Flublok</a>	<a href="#">Protein Sciences Corporation</a> Oct. 2013	<a href="#">HA insect cell (fall armyworm, <i>Spodoptera frugiperda</i>) proteins</a> , lipids, vitamins, amino acids, mineral salts	sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, <a href="#">polysorbate 20</a> (Tween 20), <a href="#">host cell proteins</a> , baculovirus, Triton X-100
<a href="#">Influenza Virus Vaccine</a> <a href="#">Flucelvax</a>	<a href="#">Novartis Vaccines and Diagnostics Limited</a> Feb. 2013	<a href="#">Madin Darby Canine Kidney (MDCK) cells</a> , B-propiolactone, cetyltrimethylammonium bromide	<a href="#">residual MDCK cell protein</a> , other cell proteins, <a href="#">MDCK cell DNA</a> , <a href="#">polysorbate 80</a> , cetyltrimethylammonium bromide, B-propiolactone
<a href="#">Influenza Virus Vaccine</a> <a href="#">FluLaval</a>	<a href="#">ID Biomedical Corporation of Quebec</a> 2013-2014	<a href="#">allantoic cavity of embryonated hens' eggs</a> , <a href="#">formaldehyde</a> , sodium deoxycholate	phosphate-buffered saline solution, <a href="#">thimerosal</a> , <a href="#">ovalbumin</a> , <a href="#">formaldehyde</a> , sodium deoxycholate
<a href="#">Influenza Vaccine Live, Intranasal</a> <a href="#">FluMist Quadrivalent</a>	<a href="#">MedImmune, LLC</a> 2012-2014	<a href="#">SPF (specific pathogen-free) eggs</a> , stabilizing buffer	monosodium glutamate, <a href="#">hydrolyzed porcine gelatin</a> , arginine, sucrose, dibasic potassium phosphate, monobasic potassium phosphate, <a href="#">ovalbumin</a> , gentamicin sulfate, ethylenediaminetetraacetic acid (EDTA)
<a href="#">Influenza Virus Vaccine</a> <a href="#">Fluvirin</a>	<a href="#">Novartis Vaccines and Diagnostics Limited</a> Feb. 26, 2013	<a href="#">allantoic cavity of embryonated hens' eggs</a> , neomycin, polymyxin, betapropiolactone, nonylphenol ethoxylate,	phosphate-buffered saline, <a href="#">thimerosal</a> , <a href="#">egg proteins</a> , polymyxin, neomycin, betapropiolactone, nonylphenol ethoxylate

Influenza Virus Vaccine  
[Fluzone: Standard, High Dose, & Intradermal](#)

Sanofi Pasteur, Inc.  
[June 2013](#)

[embryonated chicken eggs](#), Octylphenol Ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, [formaldehyde](#)

[formaldehyde](#), octylphenol ethoxylate (Triton X-100), sodium phosphate-buffered isotonic sodium chloride solution, gelatin (standard formulation only), [thimerosal](#) (standard dosage multi-dose vial only)

### 16. Japanese Encephalitis Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Japanese Encephalitis Vaccine, Inactivated, Adsorbed</a> <a href="#">Ixiaro</a>	<a href="#">Intercell Biomedical</a> <a href="#">Sep. 2010</a>	<a href="#">Vero cells</a> , protamine sulfate, <a href="#">formaldehyde</a> , <a href="#">aluminum hydroxide</a>	<a href="#">aluminum hydroxide</a> , <a href="#">formaldehyde</a> , <a href="#">bovine serum albumin</a> , <a href="#">host cell DNA</a> , sodium metabisulphate, <a href="#">host cell proteins</a> , protamine sulphate
<a href="#">Japanese Encephalitis Vaccine, Inactivated</a> <a href="#">JE-Vax</a>	<a href="#">Research Foundation for Microbial Diseases of Osaka University</a> <a href="#">Dec. 2005</a>	<a href="#">mice (brains are inoculated with the virus)</a> , phosphate-buffered saline, <a href="#">formaldehyde</a> , 40% w/v sucrose	<a href="#">thimerosal</a> , Sterile Water for Injection, gelatin, <a href="#">formaldehyde</a> , v/v <a href="#">Polysorbate 80</a> , <a href="#">mouse serum protein</a>

### 17. Measles Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Measles Virus Vaccine, Live</a> <a href="#">Attenuvax</a>	<a href="#">Merck &amp; Co., Inc.</a> <a href="#">Feb. 2006</a>	<a href="#">chick embryo cell culture</a> , buffered salt solution, vitamins, amino acids, <a href="#">fetal bovine serum</a> , SPGA (sucrose, phosphate, gluatamate, <a href="#">human albumin</a> ), neomycin	sorbitol, sodium phosphate, sucrose, sodium, chloride, hydrolyzed gelatin, <a href="#">human albumin</a> , <a href="#">fetal bovine serum</a> , neomycin, other buffer and media ingredients

## 18. Meningococcal Vaccine (meningitis)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
Meningococcal Polysaccharide (Serogroups A, C, Y and W-135) Diphtheria Toxoid Conjugate Vaccine <a href="#">MCV4-Menactra</a>	Sanofi Pasteur Inc. Nov. 2011	<a href="#">Mueller Hinton agar</a> , Watson Scherp media, <a href="#">Mueller and Miller medium</a> , <a href="#">formaldehyde</a> , ammonium sulfate	<a href="#">formaldehyde</a> , sodium phosphate buffered isotonic sodium chloride solution,
Meningococcal Groups C and Y and Haemophilus b Tetanus Toxoid Conjugate Vaccine <a href="#">MenHibrix</a>	GlaxoSmithKline Biologicals 2012	synthetic medium, <a href="#">formaldehyde</a> , sucrose, saline diluent	Tris (trometamol)-HCL, sucrose, <a href="#">residual formaldehyde</a>
Meningococcal (Groups A, C, Y, and W-135) Oligosaccharide Diphtheria CRM197 Conjugate Vaccine <a href="#">Menveo</a>	Novartis Vaccines and Diagnostics, Inc. Mar. 2011	Franz Complete medium, <a href="#">formaldehyde</a> , CY medium (contains yeast extracts and amino acids),	<a href="#">formaldehyde</a>
Meningococcal Polysaccharide Vaccine, Groups A, C, Y, W135 Combined <a href="#">Menomune-A/C/Y/W-135</a>	Sanofi Pasteur Inc. Jan. 2009	<a href="#">Mueller Hinton casein agar</a> , Watson Scherp casamino acid media	distilled water, <a href="#">thimersol</a> , polysaccharide from serogroups A, C, Y, and w-135, mercury, lactose

19. **MMR Vaccine**  
**(measles, mumps, & rubella)**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
Measles, Mumps, and Rubella Virus Vaccine, Live <a href="#">M-M-R-II</a>	Merck and Co., Inc. Dec. 2010	<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
Measles, Mumps, Rubella and Varicella Virus Vaccine Live ProQuad, <a href="#">Refrigerator Stable Formulation</a> and <a href="#">Frozen Formulation</a>	Merck and Co., Inc. Aug. 2011	<a href="#">chick embryo cell culture, WI-38 human diploid lung fibroblasts, MRC-5 cells, bovine serum, human albumin</a>	sucrose, hydrolyzed gelatin, urea, sodium chloride, sorbitol, monodium L-glutamate, sodium phosphate, <a href="#">human albumin</a> , sodium bicarbonate, potassium phosphate, potassium chloride, <a href="#">residual 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, potassium phosphate monobasic, potassium phosphate dibasic

20. **Pneumococcal Vaccine**  
**(pneumonia)**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT</u> <u>DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
Pneumococcal 7-valent Conjugate	Wyeth Pharmaceuticals	soy peptone broth, casamino acids and yeast extract-based medium, ammonium sulfate, saccharides	<a href="#">aluminum</a> (as aluminum phosphate adjuvant)

<a href="#">Vaccine (Diphtheria CRM197 Protein)</a> <a href="#">Pevnar</a>	<a href="#">Inc.</a> Mar. 2009		
<a href="#">Pneumococcal 13-valent Conjugate Vaccine (Diphtheria CRM197 Protein)</a> <a href="#">Pevnar 13</a>	<a href="#">Wyeth Pharmaceuticals Inc.</a> Jan. 2012	soy peptone broth, casamino acids and yeast extract-based medium, ammonium sulfate	<a href="#">polysorbate 80</a> , succinate buffer, <a href="#">aluminum</a> (as aluminum phosphate adjuvant)
<a href="#">Pneumococcal Vaccine, Polyvalent</a> <a href="#">Pneumovax-23</a>	<a href="#">Merck &amp; Co., Inc.</a> Oct. 2011	--	isotonic saline solution, phenol

### 21. Polio Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Poliovirus Vaccine Inactivated (Monkey Kidney Cell)</a> <a href="#">IPOL</a>	<a href="#">Sanofi Pasteur, SA</a> Dec. 2005	<a href="#">Vero cells</a> , <a href="#">Eagle MEM modified medium</a> , <a href="#">newborn calf serum</a> , M-199 (without calf serum)	<a href="#">2-phenoxyethanol</a> , <a href="#">formaldehyde</a> , neomycin, streptomycin, polymyxin B, <a href="#">residual calf serum</a>

### 22. Rabies Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Rabies Vaccine</a> <a href="#">IMOVAX</a>	<a href="#">Sanofi Pasteur, SA</a> Dec. 2005	<a href="#">MRC-5 cells</a> , beta-propiolactone	<a href="#">human albumin</a> , neomycin sulfate, phenol red indicator, beta-propiolactone
<a href="#">Rabies Vaccine</a> <a href="#">RabAvert</a>	<a href="#">Novartis Vaccines and Diagnostics</a> Oct. 2006	<a href="#">chicken fibroblasts</a> , synthetic cell culture medium, <a href="#">human albumin</a> , <a href="#">polygeline</a> (processed bovine gelatin), antibiotics,	<a href="#">polygeline</a> (processed bovine gelatin), <a href="#">human serum albumin</a> , potassium glutamate, sodium EDTA, <a href="#">bovine serum</a> ,

B-propiolactone, sucrose density-gradient, [buffered polygeline](#), potassium glutamate

[chicken protein](#), neomycin, chlortetracycline, amphotericin B, Water for Injection

### 23. Rotavirus Vaccine

<b>PROPER NAME</b> <b>COMMERCIAL NAME</b> <small>(click for package insert)</small>	<b>MANUFACTURER</b> <b>PACKAGE INSERT DATE</b>	<b>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</b>	<b>VACCINE INGREDIENTS</b> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Rotavirus Vaccine, Live, Oral, Pentavalent</a> <a href="#">RotaTeq</a>	<a href="#">Merck &amp; Co., Inc.</a> Sep. 2011	<a href="#">chicken fibroblasts</a> , synthetic cell culture medium (added <a href="#">human albumin</a> , <a href="#">polygeline (processed bovine gelatin)</a> , antibiotics), B-propiolactone, sucrose density-gradient, stabilizer solution ( <a href="#">buffered polygeline</a> , potassium glutamate)	<a href="#">polygeline (processed bovine gelatin)</a> , <a href="#">human serum albumin</a> , potassium glutamate, sodium EDTA, <a href="#">bovine serum</a> , <a href="#">chicken protein</a> , neomycin, chlortetracycline, amphotericin B),
<a href="#">Rotavirus Vaccine, Live, Oral</a> <a href="#">Rotarix</a>	<a href="#">GlaxoSmithKline Biologicals</a> Feb. 2011	<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

### 24. Rubella Vaccine

<b>PROPER NAME</b> <b>COMMERCIAL NAME</b> <small>(click for package insert)</small>	<b>MANUFACTURER</b> <b>PACKAGE INSERT DATE</b>	<b>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</b>	<b>VACCINE INGREDIENTS</b> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Rubella Virus Vaccine Live</a> <a href="#">MERUVAX II</a>	<a href="#">Merck &amp; Co., Inc.</a> Feb. 2006	<a href="#">WI-38 human diploid lung fibroblasts</a> , <a href="#">Minimum Essential Medium (MEM)</a> ; buffered salt solution (vitamins, amino	sorbitol, sodium phosphate, sucrose, sodium chloride, hydrolyzed gelatin, <a href="#">human albumin</a> , <a href="#">fetal bovine serum</a> ,

acids, [bovine serum](#)), [human serum albumin](#), neomycin), sorbitol, hydrolyzed gelatin stabilizer

other buffer and media ingredients, neomycin

### 25. Smallpox Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Smallpox (Vaccinia) Vaccine, Live</a> <a href="#">ACAM2000</a>	<a href="#">Sanofi Pasteur Biologics Co.</a> Aug. 2007	<a href="#">Vero cells</a> , <a href="#">human serum albumin</a> , sodium chloride, mannitol USP, meomycin, polymyxin B	glycerin USP, phenol USP in Water for Injection USP

### 26. TD Vaccine (tetanus & diphtheria)

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Tetanus and Diphtheria Toxoids Adsorbed For Adult Use</a> <a href="#">DECAVAC</a>	<a href="#">Sanofi Pasteur, Inc.</a> Mar. 2011	<a href="#">Mueller and Miller medium</a> , peptone-based medium, <a href="#">extract of bovine muscle tissue</a> , formaldehyde, ammonium sulfate	<a href="#">thimerosal</a> , <a href="#">aluminum potassium sulfate adjuvant</a> , residual formaldehyde
<a href="#">Tetanus and Diphtheria Toxoids Adsorbed For Adult Use</a> <a href="#">TENIVAC</a>	<a href="#">Sanofi Pasteur, Ltd.</a> Dec. 2010	<a href="#">modified Mueller-Miller casamino acid medium</a> without beef heart infusion, formaldehyde, ammonium sulfate, <a href="#">modified Mueller's growth medium</a> , <a href="#">aluminum phosphate</a> , 2-phenoxyethanol, sodium chloride	<a href="#">aluminum phosphate</a> , residual formaldehyde, 2-phenoxyethanol, sodium chloride, water for injection
<a href="#">Tetanus and Diphtheria Toxoids, Adsorbed</a> --	<a href="#">Mass Biologics</a> Feb. 2011	<a href="#">modified Mueller's media</a> (contains <a href="#">bovine extracts</a> ), formaldehyde, ammonium sulfate, <a href="#">aluminum phosphate</a>	<a href="#">aluminum adjuvant</a> , residual formaldehyde, thimerosal

<a href="#">Tetanus Toxoid</a> --	<a href="#">Sanofi Pasteur, Inc.</a> Dec. 2005	peptone-based medium, <a href="#">formaldehyde</a> , ammonium sulfate, physiological saline solution	<a href="#">thimerosal</a> , <a href="#">formaldehyde</a>
<a href="#">Tetanus Toxoid Adsorbed</a> --	<a href="#">Sanofi Pasteur, Inc.</a> July 2005	peptone-based medium (contains extract of <a href="#">bovine muscle tissue</a> ), <a href="#">formaldehyde</a> , ammonium sulfate, <a href="#">aluminum potassium sulfate (alum)</a>	<a href="#">thimerosal</a> , physiological saline solution

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

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine, Adsorbed</a> <a href="#">Adacel</a>	<a href="#">Sanofi Pasteur, Ltd.</a> Dec. 2010	<a href="#">Stainer-Scholte medium</a> , casamino acids, dimethyl-beta-cyclodextrin, glutaraldehyde, formaldehyde, <a href="#">aluminum phosphate</a> , <a href="#">modified Mueller-Miller casamino acid medium</a> without beef heart infusion, ammonium sulfate, <a href="#">2-phenoxyethanol</a> , water for injection	<a href="#">aluminum phosphate</a> , <a href="#">residual formaldehyde</a> , residual glutaraldehyde, <a href="#">2-phenoxyethanol</a>
<a href="#">Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine, Adsorbed</a> <a href="#">Boostrix</a>	<a href="#">GlaxoSmithKline Biologicals</a> Jan. 2012	<a href="#">modified Latham medium</a> derived from <a href="#">bovine casein</a> , <a href="#">Fenton medium</a> containing <a href="#">bovine extract</a> , <a href="#">formaldehyde</a> , <a href="#">Stainer-Scholte liquid medium</a> , glutaraldehyde, <a href="#">aluminum hydroxide</a>	<a href="#">aluminum hydroxide</a> , sodium chloride, <a href="#">residual formaldehyde</a> , <a href="#">polysorbate 80 (Tween 80)</a>

### 28. Typhoid Vaccine

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<a href="#">Typhoid Vi</a>	<a href="#">Sanofi Pasteur SA</a>	semi-synthetic medium without animal proteins, hexadecyltrimethylammonium	residual polydimethylsiloxane or fatty-acid ester-cased antifoam, isotonic

Polysaccharide <u>Vaccine</u> <a href="#">Typhim Vi</a>	Dec. 2005	bromide	phosphate buffered saline, sodium chloride, disodium phosphate, monosodium phosphate, sterile water for injection
Typhoid Vaccine Live <u>Oral Ty21a</u> <a href="#">Vivotif</a>	Berna Biotech, Ltd. Aug. 2006	yeast extract, casein, dextrose, and galactose, sucrose, ascorbic acid, amino acids, lactose, magnesium stearate	sucrose, ascorbic acid, amino acid mixture, lactose, magnesium stearate

### 29. **Varicella Vaccine (chickenpox)**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<u>Varicella Virus Vaccine, Live</u> <a href="#">Varivax, Frozen and Refrigerated</a>	<a href="#">Merck &amp; Co., Inc.</a> Aug. 2011	<a href="#">human embryonic lung cell cultures</a> , 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	sucrose, hydrolyzed gelatin, urea, sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, residual 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>

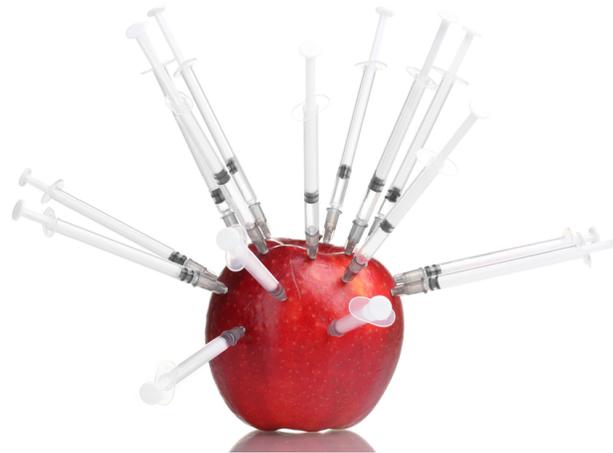
### 30. **Yellow Fever Vaccine**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> (click for package insert)	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> (not in order of quantity; see package insert for quantities)
<u>Yellow Fever Vaccine</u> <a href="#">YF-Vax</a>	<a href="#">Sanofi Pasteur, Inc.</a> Jan. 2010	<a href="#">living avian leukosis virus-free (ALV-free) chicken embryos</a>	sorbitol, gelatin

### 31. **Zoster Vaccine**

**(shingles)**

<u>PROPER NAME</u> <u>COMMERCIAL NAME</u> <small>(click for package insert)</small>	<u>MANUFACTURER</u> <u>PACKAGE INSERT DATE</u>	<u>GROWTH MEDIUMS &amp; PROCESS INGREDIENTS</u>	<u>VACCINE INGREDIENTS</u> <small>(not in order of quantity; see package insert for quantities)</small>
<a href="#">Zoster Vaccine, Live</a> <a href="#">Zostavax</a>	Merck & Co., Inc. June 2011	--	sucrose, <a href="#">hydrolyzed porcine gelatin</a> , sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, residual components of <a href="#">MRC-5 cells</a> (DNA, protein), neomycin, <a href="#">bovine calf serum</a>



**II. GLOSSARY AND DETAILS FOR INGREDIENTS**

<b>Product</b>	<b>Possible Ingredients*</b>
2-Phenoxyethanol	2-Phenoxyethanol is a glycol ether used as a preservative in vaccines

Aluminum	<p>Aluminum is used in vaccines as an adjuvant, which helps the vaccine work more quickly and more powerfully.</p>
Bovine casein	<p>A casein is a family of phosphoproteins commonly found in mammalian milk. 80% of the proteins in cow's milk are casein.</p> <p>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."</p> <p>"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.</p> <p>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.</p> <p>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.</p>
Bovine serum	<p>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.</p> <p>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.</p> <p>Bovine serum is categorised according to the age of the animal from which the blood was collected as follows:</p> <ul style="list-style-type: none"><li>•'Fetal bovine serum' comes from fetuses</li><li>•'Newborn calf serum' comes from calves less than three weeks old</li><li>•'Calf serum' comes from calves aged between three weeks and 12 months</li><li>•'Adult bovine serum' comes from cattle older than 12 months</li></ul> <p>Serum processed from donor blood is termed 'donor bovine serum'. Donor animals can be up to three years old."</p>

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
<a href="#">Human albumin</a>	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, Earle's Basal Medium in Earle's balanced salt solution with bovine serum.
Mueller Hinton Agar	beef extract, acid hydrolysate of casein, starch, agar
Muller-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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\*Ingredients depend on which modification is used.



### III. SOURCES

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