Vaccine ingredients

The Immunisation Advisory Centre

Vaccine manufacture and composition is complex and tightly regulated to maximise potency and safety. The safety of the individual components, and of the vaccine itself, in the amounts administered, must be demonstrated before a vaccine can be approved for use in New Zealand.

All vaccines contain an active component (the antigen) which generates the protective immune response. Vaccines may also contain additional components. A description of these, their function and safety are summarised in this fact sheet.

Types of vaccines and vaccine antigens

There are many approaches to vaccine development, but vaccines can be broadly classified by how the antigen(s), the active component(s) that generate a specific immune response against the disease-causing organism, are prepared. Vaccines may be viral (live or inactivated), viral vector, subunit (protein or polysaccharide) or nucleic acid (DNA or RNA). Combination vaccines may include inactivated, protein-based and/or protein-conjugated polysaccharide vaccine components. Other ingredients in vaccines vary depending on the manufacturing process and the nature of the antigen(s).

There has been an increased focus on vaccine development using the viral-vector and nucleic-acid based platforms since the appearance of the SARS-CoV-2 virus and COVID-19 disease in late 2019.

Live attenuated vaccines

The virus or bacteria is functional/alive but has been weakened so it can replicate in the body several times and generate an immune response without causing the disease, e.g. chickenpox, measles, mumps and rubella, rotavirus, and shingles vaccine viruses. The BCG vaccine contains live weakened tuberculosis bacteria.

Inactivated or dead vaccines

These vaccines do not contain live viruses or bacteria. Viruses in these vaccines are inactivated or split, e.g. polio or influenza vaccines in New Zealand, and bacteria killed. New Zealand does not have a killed bacteria vaccine on the Immunisation Schedule, but a travel-related vaccine is available for purchase. They cannot cause the disease but the inclusion of adjuvants (immune enhancers) in the vaccine help generate an immune response.

Subunit vaccines

These vaccines present proteins or sugars derived from the disease-causing organism.

Protein vaccines

Protein vaccines may include fragments extracted from a virus or bacteria such as inactivated bacterial toxoid proteins, e.g. tetanus and diphtheria vaccines, or be engineered without the disease-causing organism, e.g. virus-like particles in hepatitis B and human papillomavirus (HPV) vaccines.

Protein vaccines may also include bacterial sugar/carbohydrate (polysaccharide) molecules that are joined (conjugated) to proteins, e.g. *Haemophilus influenzae* type b (Hib), meningococcal and pneumococcal conjugate vaccines. The immune system of infants and young children is not able to generate a useful immune response to the sugar molecules on these bacteria, which is one reason why their risk of disease and complications is so high. Joining (conjugating) each sugar molecule to a protein helps their immune system can generate a protective immune response. These vaccines also generate an excellent immune response in adults.

Protein vaccines cannot cause the disease and the inclusion of adjuvants in some vaccines help generate an immune response.

Pure polysaccharide vaccines

Some vaccines only include sugar/carbohydrate (polysaccharide) molecules found on the outside of some bacteria, e.g. some vaccines to protect against pneumococcal or typhoid disease. This type of vaccine can generate a protective immune response in older children and adults and cannot cause the disease.

Nucleic acid-based vaccines

At present, different types of nucleic-acid vaccines are in developmental, pre-clinical and clinical evaluation phases, e.g. for prevention of human immunodeficiency virus (HIV), influenza and malaria diseases and treat some cancers. This vaccine platform is also being used to develop vaccines to prevent COVID-19 disease.

Nucleic acid-based vaccines use the hosts own cell machinery to make the antigen, which is then presented to the immune system. While RNA is encapsulated into lipid nanoparticle and injected, DNA is fired directly in the host cells using a brief electrical pulse.

Vaccine additives

If required, vaccines may contain the following:

Adjuvant

An adjuvant encourages a stronger immune response to the vaccine antigen.

Excipients

A substance other than the active ingredient included in the manufacturing process or contained in a finished pharmaceutical product. They include:

- Buffers and ionic compounds
- Preservatives
- Residuals
- Stabilisers
- Surfactants/emulsifiers
- Diluents
- Solvents

Adjuvants

Aluminium salts

Aluminium salts have been used as adjuvants for over 80 years. Most commonly these are aluminium hydroxide, aluminium phosphate and potassium aluminium sulphate (alum).

Aluminium adjuvants work by helping to retain the antigen at the injection site long enough for an immune response to be generated and by inducing immune system cells and a range of inflammatory factors to the local injection site to enhance the immune response. Generally, the use of aluminium adjuvants in vaccines means that less antigen is required, or, with some vaccines, fewer doses are needed. Most current inactivated and protein-based, and some protein-conjugated polysaccharide, vaccines use aluminium salts in some form.

We are born with some aluminium already stored in our body and continue to add to our aluminium stores through eating, drinking, and some medicines. Vaccines contribute very little to this and are given infrequently.

Continued ...

Aluminium salts continued

Even though we regularly consume food and drinks containing aluminium throughout our lifetime, only a small amount of aluminium travels into the blood stream from digestion, the rest comes out in faeces.

Most of the aluminium that enters our blood stream is quickly processed and removed by the kidneys in urine. The small amount that stays in our body is mainly stored in our bones, with some stored in our lungs and brain.

Use of aluminium salts in vaccines has a long and impressive safety record. Some studies have found aluminium containing vaccines to be associated with local reactions and, less often, with the development of subcutaneous nodules at the injection site. This is particularly so if the injection is given too superficially. Other studies have reported fewer reactions with aluminium containing vaccines than those without. This depends on the overall vaccine formulation.

A review of all the available studies of aluminium-containing diphtheria, tetanus and pertussis vaccines (either alone or in combination) did not find any evidence that aluminium salts in vaccines cause serious or long-term adverse events.

Emulsion adjuvants

AS01B and AS01E

No vaccines currently used in New Zealand contain the oil-in-water/QS-21 AS01B or AS01E adjuvants. They are made with modified molecules from the *Salmonella minnesota* bacterium and purified saponin found in the bark of the *Quillaja saponaria* tree. In 2017, the overseas vaccine against shingles (herpes zoster) containing AS01B was approved for use. A vaccine against malaria that contains AS01E has been used since 2019 in Ghana, Kenya and Malawi, and an AS01E containing vaccine against tuberculosis is undergoing clinical trials.

AS03

No vaccines currently used in New Zealand contain the oil-in-water/emulsion AS03 adjuvant. It is made using squalene and DL-a-tocopherol (vitamin E). First approved for use in 2009, it being used in influenza and malaria vaccines overseas.

AS04

No vaccines currently used in New Zealand contain the oil-in-water/aluminium salts AS04 adjuvant. It is made with modified molecules from the *Salmonella minnesota* bacterium and aluminium salts. It has been used in an overseas human papillomavirus vaccine since 2009.

MF59

No vaccines currently used in New Zealand contain the oil-in-water/emulsion MF59 adjuvant. It is made using squalene (a hydrocarbon oil) which is common in foods as well as being produced in the body as precursor to cholesterol and steroid hormones. MF59 significantly enhances immune response to a variety of antigens. First approved for use in 1997, it is mainly used in influenza vaccines overseas.

Nucleotide adjuvants

CpG-ODN

No vaccines currently used in New Zealand contain the nucleotide CpG-ODN adjuvant. Some molecule (nucleotide) sequences that link together to form bacterial DNA have been found to enhance an immune response. This adjuvant is a synthetic (man-made) molecule that has the same pattern as a one of these sequences. In 2017, an overseas hepatitis B vaccine was the first to be approved. Since then, malaria and other hepatitis B vaccines have started early clinical trials.

Other adjuvants

Research continues to identify other adjuvants, such as calcium phosphate that is naturally found in humans, polysaccharides and virus-like particles, that can contribute to the development of specific, protective immune responses to vaccine-preventable diseases.

Excipients

Buffers and ionic compounds

Buffers serve to resist changes in pH, such as monopotassium phosphate and sodium borate. Ionic compounds adjust tonicity and maintain osmolarity. Sodium chloride (table salt) is the most common ionic compound used.

Preservatives

Preservatives stop unwanted microbial contamination of vaccines. They have been used in vaccines for many years. Very few serious adverse events have been associated with the use of these preservatives.

2-phenoxyethanol

2-phenoxyethanol is the most common preservative used in vaccines. It is also used in cosmetics, eye and ear drops, and baby care products where it is absorbed through skin. 2-phenoxyethanol is excreted by being exhaled and in urine and faeces after being metabolised (broken down). There is little toxicity in humans and some irritation with very high doses in animals.

Phenol

Phenol is an aromatic alcohol that is infrequently used as a preservative in vaccines.

Thiomersal

No vaccines on the New Zealand Immunisation Schedule contain thiomersal, also called thimerosal. Thiomersal is a mercury derived compound that was used as a preservative in vaccines and other health care products internationally for many years. There is no evidence that thiomersal caused any serious or long-term adverse events.

Residuals

Residuals are the remaining minute quantities of substances that have been used during the manufacturing or production process of individual vaccines. Residuals depend on the process used, which may have involved cell culture mediums, egg proteins or other animal derived ingredients, culture cells, yeast, antibiotics such as neomycin or streptomycin, or inactivating agents such as formaldehyde. These substances are only present as traces and often measured as parts per million and parts per billion in the final vaccine formulation.

Stabilisers

Stabilisers inhibit chemical reactions and prevent components separating or sticking to the vial during transport and storage. Examples of stabilisers include sugars such as lactose and sucrose, amino acids such as glycine and monosodium glutamate (salts of amino acids), proteins such as recombinant human albumin (Recombumin®) derived from baker's yeast or fetal bovine (cow) serum and gelatin, partially hydrolysed collagen usually of porcine (pig) but can be of bovine origin.

Surfactants

Surfactants are a type of emulsifier. They assist particles remain suspended in liquid, preventing settling and clumping by lowering the surface tension of the liquid. An example is polysorbate 80 (Tween 80®), made from sorbitol (sugar alcohol) and oleic acid (omega-9 fatty acid), which is also used in foods such as ice cream. Surfactants are also used in shampoos, toothpastes, inks and fabric softeners.

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Excipients continued

Diluents

A diluent is a liquid used to dilute a vaccine to the proper concentration immediately prior to administration. This is usually sterile water.

Solvents

A solvent is a substance that dissolves another substance, creating a solution. The most common solvent used in everyday living and vaccine manufacture is water.

Animal derived products

Some people have concerns about animal derived products such as gelatin in vaccines. This may be for faith-based reasons or concerns about the safety of animal derived products. More information on animal derived products in vaccines can be found on the Written Resources page on the Immunisation Advisory Centre web site.

Allergies to vaccine ingredients

Very rarely, vaccines provoke a serious allergic reaction called anaphylaxis. The risk of this occurring is between less than once to up to three times out of every million doses of a vaccine. The components more likely to cause such a reaction are gelatin, egg proteins and antibiotics, although theoretically an allergic reaction can be triggered by almost anything.

There are very few occasions when vaccines should not be given. However, a person's allergy history should always be assessed prior to immunisation. A vaccine should not be given when there is a history of anaphylaxis to an ingredient in the vaccine, except for egg anaphylaxis and influenza vaccine, or to a previous dose of the same vaccine. A vaccine can be given when past reactions were not anaphylaxis, for example, reactions which have only involved the skin.

A person with a history of anaphylaxis after exposure to egg can usually be given MMR vaccine and influenza vaccine safely as these vaccines do not contain enough of the egg protein to cause a problem. The presence of hydrolysed gelatin in some live vaccines has been recognised as a cause of post-immunisation anaphylaxis.

Antibiotics in vaccines are only present in minute traces, usually an insufficient amount to cause a problem. An allergy to sulfonamide, beta-lactam or cephalosporin antibiotics is not a contraindication for vaccines containing traces of neomycin, streptomycin, polymyxin B, or gentamicin, the antibiotics typically found in vaccines.

Yeast protein is only present in a trace amounts in yeast-made recombinant vaccines. The amount is not expected to cause a problem, should an individual have anaphylaxis to yeast.

Further advice about allergies and vaccine contraindications should be sought from a medical practitioner with expertise in vaccines or by calling 0800 IMMUNE.

National Immunisation Schedule

Ingredients of vaccines on the current and recent New Zealand National Immunisation Schedules are presented in tables on the following pages. A table showing the vaccine brands on the current Immunisation Schedule can be found on the Written Resources page of the Immunisation Advisory Centre website.

National Immunisation Schedule vaccines are fully funded for certain age groups of children and some adults, for information about who is eligible for specific vaccines ask your doctor, nurse or 0800 IMMUNE.

Vaccine ingredients tables

Ingredients in the National Immunisation Schedule vaccines are presented on the following pages:

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Continued ...

Vaccine ingredients

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Boostrix vaccine against diphtheria, tetanus and pertussis diseases	Type: Subunit protein vaccine
Ingredients/dose (0.5 mL)	**Function**
Active substances	
Diphtheria toxoid, adsorbed – not less than 2.5 Lf U	Antigen
Tetanus toxoid, adsorbed – not less than 5 Lf U	
Pertussis toxoid, adsorbed – 8 µg	
Filamentous haemagglutinin, adsorbed – 8 µg	
Pertactin (69 kiloDalton outer membrane protein) – 2.5 µg	
Adjuvants	
Aluminium as aluminium hydroxide – 0.3 mg	Adjuvant
Aluminium as aluminium phosphate – 0.2 mg	
Excipients	
Culture media including bovine derived materials – Residual	Produce *Clostridium tetani* (tetanus), *Corynebacterium diphtheriae* (diphtheria) and *Bordetella pertussis* (pertussis)
Formaldehyde – ≤100 µg	Inactivating agent
Glutaraldehyde – ≤100 µg	
Glycine	Stabiliser
Polysorbate 80 – ≤100 µg	Surfactant
Sodium chloride – 4.4 mg	Solvent
Water for injection	

Engerix-B vaccine against hepatitis B disease	Type: Subunit protein vaccine
Ingredients (1.0 mL)	**Function**
Active substances	
Hepatitis B surface antigen – 20 µg	Antigen
Adjuvants	
Aluminium as aluminium hydroxide – 0.5 mg	Adjuvant
Excipients	
Culture media including yeast protein – Residual	Produce hepatitis B virus-like particles
Sodium chloride	Adjust tonicity
Dibasic sodium phosphate dihydrate – 0.98 mg	Buffer
Monobasic sodium phosphate dihydrate – 0.71 mg	
Polysorbate 20	Surfactant
Water for injection	Solvent

Gardasil 9 vaccine against human papillomavirus disease (9-valent)	Type: Subunit protein vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
r-HPV 31, 33, 45, 52 & 58 – 20 µg each	Antigen
r-HPV 6 L1 protein – 30 µg	
r-HPV 11 & 18 L1 proteins – 40 µg each	
r-HPV 16 L1 protein – 60 µg	
Adjuvants	
Aluminium as amorphous aluminium hydroxyphosphate sulphate – 500 µg	Adjuvant
Excipients	
Culture media including yeast protein – Residual	Produce human papillomavirus-like particles
Sodium chloride – 9.56 mg	Adjust tonicity
Sodium borate – 35 µg	Buffer
L-histidine – 0.78 mg	Stabiliser
Polysorbate 80 – 50 µg	Surfactant
Water for injection	Solvent

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Hiberix vaccine against *Haemophilus influenzae* type b (Hib) disease	**Type: Subunit protein vaccine**
Ingredients (0.5 mL)	**Function**
Active substances	
Haemophilus influenzae type b (Hib) polysaccharide – 10 µg, conjugated to tetanus toxoid – Approximately 25 µg	Antigen Carrier protein
Excipients	
Culture media including bovine derived material – Residual	Produce *Haemophilus influenzae* type b (Hib) and *Clostridium tetani* (tetanus)
Formaldehyde – ≤ 0.5 µg	Inactivating agent
Lactose – 12.6 mg	Stabiliser
Sodium chloride 0.9%	Diluent

Infanrix-hexa vaccine against diphtheria, tetanus, pertussis, polio, hepatitis B, *Haemophilus influenzae* type b (Hib) diseases	**Type: Combination subunit protein and inactivated virus vaccines**
Ingredients (0.5 mL)	**Function**
Active substances	
Diphtheria toxoid, adsorbed – Not less than 30 IU (25 Lf U)	Antigen
Tetanus toxoid, adsorbed – Not less than 40 IU (10 Lf U)	
Pertussis toxoid, adsorbed – 25 µg	
Filamentous haemagglutinin, adsorbed – 25 µg	
Pertactin (69 kiloDalton outer membrane protein) – 8 µg	
r-Hepatitis B surface antigen, adsorbed (HBsAg) – 10 µg	
Inactivated Polio Virus Type 1 – 40 DU	
Inactivated Polio Virus Type 2 – 8 DU	
Inactivated Polio Virus Type 3 – 32 DU	
Haemophilus influenzae type b (Hib) polysaccharide – 10 µg, conjugated to tetanus toxoid – 20–40 µg	Antigen Carrier protein
Adjuvants	
Aluminium as aluminium hydroxide – 0.5 mg	Adjuvant
Aluminium as aluminium phosphate – 0.32 mg	
Excipients	
Culture media including bovine derived material – Residual	Produce *Clostridium tetani* (tetanus), *Corynebacterium diphtheriae* (diphtheria), *Bordetella pertussis* (pertussis); stabilise polio viruses
Formaldehyde – Residual	Inactivating agent
Potassium chloride	Adjust tonicity
Sodium chloride	
Neomycin – Residual	Antibacterial
Polymyxin B – Residual	
Disodium phosphate	Buffer
Monopotassium phosphate	
Glycine	Stabiliser
Lactose	
Polysorbate 20	Surfactant
Polysorbate 80	
Water for injection	Solvent

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Infanrix-IPV vaccine against diphtheria, tetanus, pertussis and polio diseases	Type: Combination subunit protein and inactivated virus vaccines
Ingredients (0.5 mL)	**Function**
Active substances	
Diphtheria toxoid, adsorbed – Not less than 30 IU (25 Lf U)	Antigen
Tetanus toxoid, adsorbed – Not less than 40 IU (10 Lf U)	
Pertussis toxoid, adsorbed – 25 µg	
Filamentous haemagglutinin, adsorbed – 25 µg	
Pertactin, (69 kiloDalton outer membrane protein) – 8 µg	
Inactivated Polio Virus Type 1 – 40 DU	
Inactivated Polio Virus Type 2 – 8 DU	
Inactivated Polio Virus Type 3 – 32 DU	
Adjuvants	
Aluminium as aluminium hydroxide – 0.5 mg	Adjuvant
Excipients	
Culture media including bovine derived material – Residual	Produce *Clostridium tetani* (tetanus), *Corynebacterium diphtheriae* (diphtheria), *Bordetella pertussis* (pertussis); stabilise polio viruses
Formaldehyde – Residual	Inactivating agent
Potassium chloride	Adjust tonicity
Sodium chloride	
Neomycin – Residual	Antibacterial
Polymyxin B – Residual	
Disodium phosphate	Buffer
Monopotassium phosphate	
Glycine	Stabiliser
Polysorbate 80	Surfactant
Water for injection	Solvent

Ipol vaccine against polio disease	Type: Inactivated virus vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
Inactivated Polio virus type 1 (Mahoney) – 40 DU	Antigen
Inactivated Polio virus type 2 (MEF-1) – 8 DU	
Inactivated Polio virus type 3 (Saukett) – 32 DU	
Excipients	
Culture media including phenylalanine, bovine derived material – Residual	Produce polio viruses
Sodium chloride	Adjust tonicity
Neomycin – Residual	Antibacterial
Polymyxin B – Residual	
Streptomycin – Residual	
Hydrochloric acid or sodium hydroxide	Buffer
Formaldehyde – 2–20 µg	Inactivating agent
2-phenoxyethanol – 2–3 µL	Preservative
Polysorbate 80	Surfactant
Water for injection	Solvent

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Prevenar 13 vaccine against pneumococcal disease (13-valent)	Type: Subunit protein vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
Pneumococcal polysaccharide serotypes – 1, 3, 4, 5, 6A, 7F, 9V, 14, 18C,19A, 19F, 23F – 2.2 µg	Antigen
Pneumococcal polysaccharide serotype 6B – 4.4 µg	
All conjugated to diphtheria CRM197 – 34 µg	Carrier protein
Adjuvants	
Aluminium as aluminium phosphate – 0.565 mg	Adjuvant
Excipients	
Culture media – Residual	Produce *Streptococcus pneumoniae* (pneumococcal) and *Corynebacterium diphtheria* (diphtheria)
Sodium chloride	Adjust tonicity
Succinic acid – 295 µg	Buffer
Polysorbate 80 – 100 µg	Surfactant
Water for injection	Solvent

Priorix vaccine against measles, mumps and rubella diseases	Type: Live-attenuated virus vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
Attenuated Schwartz measles virus – Not less than $10^{3.0}$ $CCID_{50}$	Antigen
Attenuated RIT 4385 (derived from Jeryl Lynn) mumps virus – Not less than $10^{3.7}$ $CCID_{50}$	
Attenuated Wistar RA 27/3 rubella virus– Not less than $10^{3.0}$ $CCID_{50}$	
Excipients	
Culture media including bovine derived material – Residual	Produce measles, mumps and rubella viruses
Neomycin – Residual	Antibacterial
Amino acids	Stabiliser
Lactose monohydrate	
Mannitol	
Sorbitol	
Water for injection	Diluent

Rotarix vaccine against rotavirus disease	Type: Live-attenuated virus vaccine
Ingredients (1.5 mL)	**Function**
Active substances	
Attenuated RIX 4414 strain of human rotavirus of the G1P[8] type – $10^{6.0}$ $CCID_{50}$	Antigen
Excipients	
Culture media including bovine and porcine derived material – Residual	Produce rotaviruses
DNA from porcine circoviruses 1 – Fragments	From porcine-derived material used during manufacture
Disodium adipate	Buffer
Sucrose	Stabiliser
Water for injection	Solvent

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Synflorix vaccine against pneumococcal disease (10-valent)	Type: Subunit protein vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
Pneumococcal polysaccharide serotypes 1, 5, 6B, 7F, 9V, 14, 23F [†] – 1 µg each	Antigen
Pneumococcal polysaccharide serotype 4 [†] – 3 µg	
Pneumococcal polysaccharide serotype 18C [††] – 3 µg	
Pneumococcal polysaccharide serotype 19F [†††] – 3 µg	
Conjugated to:	
[†] Protein D (derived from non-typeable *Haemophilus influenzae*) – 9–16 µg	Carrier protein
[††] Tetanus toxoid – 5–10 µg	
[†††] Diphtheria toxoid – 3–6 µg	
Adjuvants	
Aluminium as aluminium phosphate – 0.5 mg	Adjuvant
Excipients	
Culture media – Residual	Produce *streptococcus pneumoniae* (pneumococcal), *Corynebacterium diphtheria* (diphtheria), *Haemophilus influenzae* and *Clostridium tetani* (tetanus)
Sodium chloride – 4.3 mg	Adjust tonicity
Water for injection	Solvent

Varilrix (human albumin-free) vaccine against varicella (chickenpox) disease	Type: Live-attenuated virus vaccine
Ingredients (0.5 mL)	**Function**
Active substances	
Attenuated Oka strain varicella-zoster virus – $10^{3.3}$ PFU	Antigen
Excipients	
Culture media including amino acids, fetal bovine serum – Residual	Produce varicella-zoster virus
Neomycin – Residual	Antibacterial
Lactose	Stabiliser
Mannitol	
Sorbitol	
Water for injection	Diluent

Varivax vaccine against varicella (chickenpox) disease	Type: Live-attenuated virus vaccine
Ingredients	**Function**
Active substances (0.5 mL)	
Attenuated Oka/Merck strain varicella-zoster virus – 1350 PFU	Antigen
Excipients	
Culture media including bovine calf serum, MRC-5 cell DNA and protein – Residual	Produce varicella-zoster virus
Potassium chloride – 57 µg	Adjust tonicity
Sodium chloride – 2.3 mg	
Neomycin – Residual	Antibacterial
Monosodium L-glutamate – 0.36 mg	Buffer
Potassium phosphate monobasic – 57 µg	
Sodium phosphate dibasic – 0.33 mg	
Hydrolysed gelatin – 8.9 mg	Stabiliser
Sucrose – 18 mg	
Urea – 3.6 mg	

Continued ...

Vaccine ingredients

The Immunisation Advisory Centre

Zostavax vaccine against herpes zoster (shingles) disease	Type: Live-attenuated virus vaccine
Ingredients (0.65 mL)	**Function**
Active substances	
Attenuated Oka/Merck strain varicella-zoster virus – 19400 PFU	Antigen
Excipients	
Culture media including bovine calf serum, MRC-5 cell DNA and protein – Residual	Produce varicella-zoster virus
Potassium chloride – 0.13 mg	Adjust tonicity
Sodium chloride – 5.25 mg	
Neomycin – Residual	Antibacterial
Monosodium L-glutamate – 0.82 mg	Buffer
Potassium phosphate monobasic – 0.13 mg	
Sodium phosphate dibasic – 0.75 mg	
Hydrolysed porcine gelatin – 20.53 mg	Stabiliser
Sucrose – 41.05 mg	
Urea – 8.55 mg	