

- Hormones
- Cardiac Markers
- Cancer Markers
- Human Proteins
- Enzymes & Related Biochemicals
- Sera, Plasma, & Infectious Agents

## Alkaline Phosphatase, Bovine

Alkaline Phosphatase catalyzes the hydrolysis of phosphate esters yielding alcohols and phosphate molecules. It is a dimer made up of two nearly identical subunits, each with a molecular weight of 69,000. Each subunit contains two molecules of zinc: One is necessary for structural stability, the other for catalytic activity.

Alkaline phosphatase is useful as an indicator enzyme when coupled to antibodies in enzyme immunoassay (EIA) systems. We offer this high grade of alkaline phosphatase in two buffer systems to better accommodate your particular conjugation method: A stable, glycerol formulation (Catalog Numbers A0424 and A0423) and a ready-to-use, triethanolamine preparation (Catalog Number A0524).

Catalog Number	Protein	Activity*	Form
A0425	10 mg/ml (Biuret)	1,800 IU/mg protein	5 mM Tris, 5 mM Magnesium Chloride, 0.1 mM Zinc Chloride, 50% Glycerol, pH 7.0 ± 0.2
A0424	10 mg/ml (Biuret)	1,500 IU/mg protein	5 mM Tris, 5 mM Magnesium Chloride, 0.1 mM Zinc Chloride, 50% Glycerol, pH 7.0 ± 0.2
A0423	10 mg/ml (Biuret)	1,000 IU/mg protein	5 mM Tris, 5 mM Magnesium Chloride, 0.1 mM Zinc Chloride, 50% Glycerol, pH 7.0 ± 0.2
A0524	5 mg/ml (A <sub>280</sub> <sup>1%</sup> = 10.0)	Reported as assayed	30 mM Triethanolamine, 3 M Sodium Chloride, 1 mM Magnesium Chloride, 0.1 mM Zinc Chloride, pH 7.6 ± 0.2

*\*Note: The activity values listed above were determined by assay in a glycine buffer at pH 9.6 and 25°C. Assayed in a diethanolamine buffer at pH 9.8 and 37°C, these values would increase by a factor of approximately 3.3*

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**Source:** Calf Intestine  
**Unit Definition:** One unit hydrolyzes 1 µmole of p-nitrophenyl phosphate per minute in glycine buffer at pH 9.6 and 25°C.  
**Storage:** 2-8°C Do Not Freeze  
**Biohazard:** Not determined for these products.

Intended Use: For Research Use Only. Not for use in diagnostic procedures. Precaution: Although source materials have been tested for certain diseases, no test can absolutely assure the absence of all infectious agents. Therefore, these products should be handled as potentially biohazardous.

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## Avidin

Avidin is a glycoprotein containing four essentially identical subunits, each of which forms an extremely tight complex with biotin. This property makes avidin very useful in the construction of avidin/biotin diagnostic probes. Avidin and biotin are routinely conjugated to indicator enzymes such as  $\beta$ -galactosidase, horseradish peroxidase, and alkaline phosphatase for use in diagnostic kit development and manufacturing.

<u>Catalog Number</u>	<u>Purity</u>	<u>Activity</u>
A1514	Chromatographically pure	10 Worthington units/mg protein
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Source:	Chicken Egg White	
Form:	Lyophilized powder; soluble in distilled water or dilute buffer	
Unit Definition:	One unit binds 1 $\mu$ g of D-biotin at pH 8.0.	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

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## Bilirubin Conjugate

Bilirubin is one of two bile pigments involved in the reabsorption and excretion of erythrocyte components. The breakdown of erythrocytes and their components are carried-out by reticuloendothelial cells of the bone marrow, spleen, liver, and other tissues. Although the mechanisms of erythrocyte demise and removal from circulation are unclear, the reutilization of various erythrocyte components has been well-studied: the iron of heme, the amino acids of globin, and the lipids of the cell membrane are all reutilized by the body, while the porphyrin ring of hemoglobin is catabolized and excreted via bile in the urine and feces. During the catabolism of hemoglobin, the porphyrin ring of heme is cleaved to form the other bile pigment, biliverdin. The subsequent oxidation of biliverdin converts it to bilirubin, which is then transported via albumin from the reticuloendothelial cells to the liver where conjugated with  $\beta$ -glucuronic acid preparing it for excretion.

Several clinical conditions result in elevated serum levels of conjugated and unconjugated bilirubin, such as pernicious anemia, infective hepatitis, Gilbert's disease (a hereditary deficiency of the hepatic enzyme required for the conjugation of bilirubin), and many types of jaundice: hemolytic jaundice, in which excessive erythrocyte destruction results in increased bilirubin formation, exceeding the conjugation capacity of the liver, and results in increased serum levels of unconjugated bilirubin; obstructive jaundice, caused by partial or total blockage of the bile ducts, resulting in increased serum levels of conjugated bilirubin; and hepatocellular jaundice, in which damage to the liver hinders the liver's ability to conjugate bilirubin or enlargement of the liver results in blockage of the bile ducts, resulting in elevated serum levels of either conjugated or unconjugated bilirubin, or both.

The bilirubin conjugate offered below is a highly purified, synthetic bilirubin derivative, and it behaves identically to purified native bilirubin glucuronides within experimental limits.

Catalog Number	Purity by HPLC	Molar Absorptivity at 450nm
B0114	97% combined monotaurobilirubin and ditaur bilirubin	57,000 (anhydrous salt), corrected for residual H <sub>2</sub> O and solvent
<hr/>		
Source:	Synthetic, Ditaurobilirubin, Disodium salt	
Form:	Lyophilized orange powder; blanketed with argon	
Molecular Formula:	C <sub>37</sub> H <sub>44</sub> N <sub>6</sub> O <sub>10</sub> S <sub>2</sub> Na <sub>2</sub>	
Water Content:	3.0% by Karl Fisher Titration	
Residual Solvent:	4.0% total ethanol and dioxane by NMR	
Storage:	2-8°C short term -70°C long term	
Biohazard:	Not determined for this product.	
<i>Note: This product is light and oxygen sensitive.</i>		

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## C-Peptide

C-peptide, or connecting peptide, is one of the cleavage products resulting from the conversion of proinsulin to insulin. Proinsulin is a single polypeptide chain synthesized by pancreatic islet cells. It is comprised of disulfide-linked A and B chains, which make up insulin, and C-peptide, which spans between the A and B chains. After cleavage, C-peptide is released from pancreatic B cells in equimolar amounts with insulin. Serum levels of C-peptide are often helpful in diagnosing abnormal insulin and diabetic states.

The amino acid sequence of proinsulin varies among several species, but this variation is due to sequence differences in the C-peptide only. Scripps Laboratories offers a 31-amino acid synthetic human C-peptide (Catalog Number C1514) and 32-amino acid tyrosylated form (Catalog Number C1515).

<u>Catalog Number</u>	<u>Amino Acid Sequence</u>	<u>Molecular Weight</u>
C1514	Glu-Ala-Glu-Asp-Leu-Gln-Val-Gly-Gln-Val-Glu-Leu-Gly-Gly-Gly-Pro-Gly-Ala-Gly-Ser-Leu-Gln-Pro-Leu-Ala-Leu-Glu-Gly-Ser-Leu-Gln	3,018.5
C1515	Tyr-Glu-Ala-Glu-Asp-Leu-Gln-Val-Gly-Gln-Val-Glu-Leu-Gly-Gly-Gly-Pro-Gly-Ala-Gly-Ser-Leu-Gln-Pro-Leu-Ala-Leu-Glu-Gly-Ser-Leu-Gln	3,181.6

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<b>Source:</b>	Synthetic
<b>Form:</b>	Lyophilized powder
<b>Purity:</b>	80% by HPLC
<b>Thin Layer Chromatography:</b>	Single spot running with the standard
<b>Electrophoresis:</b>	Single spot migrating with the standard toward the cathode
<b>Storage:</b>	2-8°C short term -10°C to -25°C long term
<b>Biohazard:</b>	Not determined for these products.

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## Folate Binding Protein, Bovine

Folate Binding Protein, isolated from bovine milk, exhibits a strong affinity for human folic acid making it useful in the development of folic acid serum assays. The determination of serum folate levels are useful in the diagnosis of megaloblastic anemia and malnutrition. In addition, serum folate levels are shown to be severely depressed in alcoholic individuals.

<u>Catalog Number</u>	<u>Purity (SDS-PAGE)</u>	<u>Activity</u>
F0524	Single band	Reported as assayed and expressed in µg/ml of folate binding ability
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Source:	Bovine Milk	
Form:	120 mM Sodium Phosphate, 30 mM Sodium Chloride, pH 7.4 ± 0.1	
Protein/Content:	Reported as assayed	
Storage:	-10°C to -25°C	
Biohazard:	Not determined for this product.	

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## Growth Factors

- Epidermal Growth Factor
- Insulin-Like Growth Factor-I
- Nerve Growth Factor

**Epidermal Growth Factor (EGF)** is a polypeptide (approximately 6,050 MW) isolated from the submaxillary gland of male mice. EGF is used *in vitro* to stimulate growth in a variety of epidermal and epithelial tissues.

**Insulin-Like Growth Factor-I (IGF-I)** is a polypeptide growth factor that consists of 70 amino acid residues (approximately 7,600 MW) and resembles proinsulin with A and B chains, intrachain disulfide bridges, and a connecting peptide (see C-peptide, page 59).

*In vivo*, IGF-I mediates the mitogenic and metabolic activity of human growth hormone (hGH). Serum levels of IGF-I are highly predictive of hGH production in humans and, as such, determinations of IGF-I serum levels are useful in the detection and monitoring of hGH-related disorders (see hGH, page 5). In serum, most IGF-I is found as a stable complex with one of several IGF binding proteins (IGFBPs), with < 1% existing as free, unbound IGF-I. This association with the IGFBPs can complicate the clinical detection of IGF-I due to steric hindrance of relevant epitopes, and requires the treatment of clinical specimens to dissociate the IGF-I complex.

*In vitro*, IGF-I stimulates the proliferation of a variety of tissues such as muscle, bone, and cartilage.

**Nerve Growth Factor, 2.5S (NGF)**, is a polypeptide (approximately 13,000 MW) isolated from the submaxillary gland of male mice. NGF affects the growth and development of sensory and sympathetic neurons, and in the peripheral nervous system, it is required for the development and maintenance of sympathetic nerve cells that use catecholamine neurotransmitters.

	Catalog Number	Purity	Protein	Characterization
Epidermal Growth Factor	G0813	95% (PAGE)	Determined by $A_{280}^{1\%} = 30.9$ prior to lyophilization	Immunological identity confirmed by Ouchterlony double diffusion against antiserum to EGF
Insulin-Like Growth Factor-I	I0415	Reported as assayed (SDS-PAGE & HPLC)	Determined prior to lyophilization	ED <sub>50</sub> reported as determined by the dose-dependent stimulation of thymidine uptake by BALB/c 3T3 cells
Nerve Growth Factor, 2.5S	G0913	95% (SDS-PAGE)	Determined by $A_{280}^{1\%} = 14.0$ prior to lyophilization	Half-maximal growth in PC12 cells at 50 ng/ml NGF
<b>Source</b>				
	G0813 & G0913:	Submaxillary Glands of Male Mice		
	I0415:	<i>E. coli</i>		
<b>Form:</b> Lyophilized powder				
<b>Storage:</b> 2-8°C short term -10°C to -25°C long term				
<b>Biohazard:</b> Not determined for these products.				

Intended Use: For Research Use Only. Not for use in diagnostic procedures. Precaution: Although source materials have been tested for certain diseases, no test can absolutely assure the absence of all infectious agents. Therefore, these products should be handled as potentially biohazardous.

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## Immunoglobulin G, Goat

Immunoglobulin G (IgG), purified from goat serum, is often used in immunoassay configurations to reduce non-specific binding.

The goat IgG preparation described below is selectively precipitated with ammonium sulfate from whole goat serum and further purified to yield goat IgG of purity greater than 95%. It contains the heavy and light chains of IgG and shows a single band when electrophoresed versus rabbit anti-whole goat serum.

Catalog Number	Purity (SDS-PAGE)	Comments
I0514	95%	Predominant bands on SDS-PAGE are the heavy and light chains of IgG
<hr/>		
Source:	Goat Serum	
Form:	Lyophilized powder; essentially salt-free Sterile filtered prior to lyophilization	
Protein/Content:	Total protein determined prior to lyophilization	
Immunological Identity:	Single arc by IEP against rabbit antisera to whole goat serum	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

Intended Use: For Research Use Only. Not for use in diagnostic procedures. Precaution: Although source materials have been tested for certain diseases, no test can absolutely assure the absence of all infectious agents. Therefore, these products should be handled as potentially biohazardous.

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## Immunoglobulin G, Mouse

Immunoglobulin G, purified from mouse serum, is often used in monoclonal antibody-based immunoassay configurations to reduce non-specific binding.

	Catalog Number	Purity (SDS-PAGE)
	I0624	95%
<hr/>		
Source:	Mouse Serum	
Form:	10 mM Sodium Phosphate, 150 mM Sodium Chloride, 0.05% Sodium Azide, pH 7.2 ± 0.1	
Protein/Content:	Determined by $A_{280}^{1\%} = 14.0$	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

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## Immunoglobulin G, Rabbit

Immunoglobulin G, purified from rabbit serum, is often used in immunoassay configurations to reduce non-specific binding.

	<u>Catalog Number</u>	<u>Purity</u>
	I0724	95% by agarose electrophoresis
<hr/>		
Source:	Rabbit Serum	
Form:	10 mM Sodium Phosphate, 150 mM Sodium Chloride, 0.05% Sodium Azide, pH 7.2 ± 0.1	
Protein/Content:	Determined by $A_{280}^{1\%} = 14.0$	
Immunological Identity:	Single arc by IEP against goat antisera to whole rabbit serum	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

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## Intrinsic Factor, Porcine

Intrinsic Factor is synthesized by the parietal cells of the stomach and is a glycoprotein containing approximately 15% carbohydrate. It is composed of two identical subunits, each with one vitamin B<sub>12</sub> binding site. Intrinsic factor is one of four important secretions of the gastric mucosa, along with hydrochloric acid, pepsin, and mucus, and is required for the absorption of vitamin B<sub>12</sub> in the ileum. Vitamin B<sub>12</sub> deficiency leads to pernicious anemia, a type of megaloblastic anemia, and is most often caused not by inadequate intake of the vitamin but by malabsorption due to defective transport systems, parasitic infections, or surgical removal of the stomach.

Because intrinsic factor specifically binds vitamin B<sub>12</sub>, it is useful in the development of assays for vitamin B<sub>12</sub> serum levels. Intrinsic factor is most effective when used in a highly purified state, minimizing the effects of R proteins, which non-specifically bind vitamin B<sub>12</sub>.

<u>Catalog Number</u>	<u>Purity</u>	<u>Activity</u>
I1024	Single band by SDS-PAGE  > 98% intrinsic factor based on vitamin B <sub>12</sub> -binding assays using cobinamide and anti-intrinsic factor antibodies	Reported as assayed in terms of vitamin B <sub>12</sub> -binding ability/mg protein
<hr/>		
Source:	Porcine Stomach	
Form:	Distilled water; dilute with 100 mM Potassium Phosphate, pH 7.5 containing 0.1 mg/ml Albumin	
Protein/Content:	Reported as assayed	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

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## Ovalbumin

Ovalbumin (egg white albumin) acts as a stabilizer, binding protein, transport protein, and growth media supplement. It is very similar to bovine serum albumin in amino acid content and is one of two pure proteins that can adequately meet amino acid nutritional requirements (the other protein is derived from milk). As such, ovalbumin is useful in cell culture, where optimum efficacy as a nutrient or media supplement is essential. Ovalbumin is an ideal replacement for both human and animal blood products, as it is free from the contaminants inherent in human and bovine serum albumins.

	Catalog Number	Purity (SDS-PAGE)
	O0115	98%
	O0114	90%
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Source:	Chicken Egg White	
Form:	Lyophilized powder; essentially salt-free; soluble in distilled water or dilute buffer	
Protein/Content:	Total protein determined prior to lyophilization	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for these products.	

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## Peroxidase, Horseradish (HRP)

Horseradish Peroxidase (HRP) is a well-established enzyme used as an indicator for various chemical reactions in which peroxide is produced. The enzyme is routinely conjugated to monoclonal or polyclonal antibodies and used within enzyme-based immunoassay systems. Although peroxidase is present in various plants, by far the highest concentration is found in horseradish roots.

Catalog Number	Purity	Activity
H0214	RZ 3.0	250 U/mg material
H0212	RZ 1.0	Reported as assayed

**Source:** Horseradish  
**Form:** Lyophilized, reddish-brown powder; essentially salt-free  
**Protein/Content:** Total protein determined prior to lyophilization  
**Purity:** Reinheitszahl (RZ) is the absorbance ratio  $A_{403}/A_{275}$ . It is a measure of hemin content, not enzymatic activity. Some preparations with a high RZ value may have low enzymatic activity.

**Unit Definition:** One unit catalyzes the production of 1 mg of purpurogallin from pyrogallol in 20 seconds at 20°C and pH 6.0.

Because several hydrogen ion donors have been identified and used to characterize peroxidase preparations, the following conversion table may be useful:

Table of Unit Equivalents

1.0 Purpurogallin unit at 20°C
1.0 Guaiacol unit at 25°C
13.0 IUB units at 25°C
24.0 4-aminoantipyrine units at 25°C

**Storage:** 2-8°C short term  
-10°C to -25°C long term  
**Biohazard:** Not determined for these products.

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## HRP-Conjugate Stabilizer

HRP-Conjugate Stabilizer is a ready-to-use product designed for the reconstitution of lyophilized HRP conjugates. Conjugates prepared in this manner may maintain peroxidase activity for up to two years when stored at 4°C.

The major advantage of a liquid HRP-conjugate is in minimizing the possibility of human error when dissolving the lyophilized conjugate. Adding too much, or not enough of the reconstitution buffer may result in assay-to-assay variation. Until now, the disadvantage of this format was the inherent instability of liquid HRP-conjugates. This problem has now been addressed.

Scripps Laboratories' HRP-Conjugate Stabilizer is an efficient method of improving the performance of your HRP-conjugates. It stabilizes your HRP-conjugates and increases their shelf-life to two years. It also reduces the background interference of your assays.

Simply use HRP-Conjugate Stabilizer to reconstitute and prepare working dilutions of your HRP-conjugates.

Catalog Number	Form
H1521	Phosphate Buffered Saline containing Bovine Serum Albumin and proprietary ingredients.
H1522	Phosphate Buffered Saline containing Bovine Serum Albumin and proprietary ingredients, including a proprietary preservative.
H1523	Phosphate Buffered Saline containing Bovine Serum Albumin, 0.1% Thimerosal, and other proprietary ingredients.
H1623	10X Concentrate in Phosphate Buffered Saline containing Bovine Serum Albumin, 0.1% Thimerosal, and other proprietary ingredients. A 1:10 dilution (with distilled water) of this product will yield a solution of pH 7.21. Note: The thimerosal in this preparation may form a precipitate. If this occurs, invert several times before use and sterile filter if desired.

*Note: Whether or not a preservative has been added, the products above have been 0.2 µm filtered into gamma-irradiated bottles and should be handled using aseptic techniques to ensure proper performance.*

<b>Usage Notes:</b>	Buffer components may crystallize at low temperatures. If this occurs, warm the HRP-Conjugate Stabilizer in a water bath until the crystals have dissolved, then proceed with your reconstitutions and dilutions.
<b>Storage:</b>	2-8°C. Do Not Freeze.
<b>Biohazard:</b>	Not determined for these products.

*Note: In California, Proposition 65 requires that individuals be warned of potential exposure to chemicals identified by the State of California as causing cancer or reproductive toxicity. The State of California has identified any mercury-containing compound (e.g., the thimerosal contained in Catalog Numbers H1523 and H1623) as a chemical that causes reproductive toxicity.*

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## Plate-Coating Stabilizer

Plate Coating Stabilizer is a proprietary mixture of components designed to increase the stability of immobilized antigens and antibodies. This solution is supplied ready-to-use and in many cases can replace current blocking solutions. The sterile solution is supplied without preservatives and must be handled using aseptic techniques. Alternatively, a preservative compatible with the assay may be added.

Catalog Number  
P3323

Form  
Proprietary mixture of non-toxic components, 0.2 µm filtered

*This product does not contain a preservative and must be handled aseptically.*

**Storage:** 2-8°C Do Not Freeze  
**Biohazard:** Not determined for this product.

### Recommended Procedure

1. Immobilize antigen or antibody according to existing protocols and wash to remove excess material.
2. Immediately after washing, but before the plate or membrane has dried, add sufficient Plate Coating Stabilizer to cover all adsorbed material. Incubate for 30 minutes at room temperature.
3. Aspirate the Plate Coating Stabilizer. Do Not Wash. A film of stabilizer must remain on the material during the drying process.
4. Dry the plate or membrane for 1 to 2 hours at room temperature. Membranes should be suspended while drying.
5. For long term storage, dry the plates or membranes either at 25°C for two hours in a vacuum oven, at 40°C in an oven or incubator, or in a humidity-controlled chamber or desiccator until dry. Drying times will vary.
6. For optimum stability, package the material in a vapor barrier bag with a 2-gram desiccant pouch.

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## Protein A

Protein A from a bacterial source is well-known for its ability to bind the Fc region of most mammalian immunoglobulins, especially IgG. The Protein A described below is a polypeptide surface receptor (approximately 42,000MW) isolated from cell membranes of *Staphylococcus aureus*. It contains four nearly homologous regions and can bind two immunoglobulin molecules. Protein A binds the Fc region of immunoglobulin molecules without interfering with the antigen binding sites, and thus allows the formation of ternary complexes consisting of Protein A, antibody, and antigen. These properties make Protein A useful as a ligand for the affinity purification of monoclonal and polyclonal antibodies, and in various immunoassay techniques, such as ELISA, Western blot, and immunoprecipitation.

	Catalog Number	Activity
	P0814	> 95% binding to Human IgG Agarose
Source:	<i>Staphylococcus aureus</i>	
Form:	Lyophilized from distilled water; essentially salt-free	
Protein/Content:	Determined by $A_{280}^{1\%} = 1.40$ prior to lyophilization	
Storage:	2-8°C short term -10°C to -25°C long term	
Biohazard:	Not determined for this product.	

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## Streptavidin and Streptavidin-HRP Conjugate

The fermentation of *Streptomyces avidinii* results in the production of this biotin-binding protein. Each molecule consists of four subunits, which bind one biotin molecule each. Streptavidin and biotin are routinely conjugated to indicator enzymes such as  $\beta$ -galactosidase, horseradish peroxidase, and alkaline phosphatase for use in diagnostic kit development and manufacturing. Unlike its counterpart, egg white avidin, streptavidin does not contain a carbohydrate moiety and, thus, possesses a lower isoelectric point (approximate pI = 7.0). As a result, streptavidin has a lower non-specific binding characteristic than that of avidin, making streptavidin/biotin complexes more useful than avidin/biotin complexes in applications in which low non-specific binding is crucial.

### Streptavidin

Catalog Number	Purity (SDS-PAGE)	Protein	Activity (HABA Assay)
S1214	95%	95% protein versus dry weight	Reported as assayed (approximately 15 U/mg solid)
.....			
Source:	<i>Streptomyces avidinii</i>		
Form:	Lyophilized powder; essentially salt-free		
Protein/Content:	Determined by $A_{281}^{1\%} = 31.0$ prior to lyophilization		
Unit Definition:	One unit of streptavidin will bind 1 $\mu$ g of biotin.		
Storage:	2-8°C short term -10°C to -25°C long term		
Biohazard:	Not determined for this product.		

### Streptavidin-HRP Conjugate

Catalog Number	Protein
S1624	Approximately 1 mg/ml
.....	
<i>Note: Streptavidin-HRP Conjugate is designed for use in ELISA applications and has been purified to remove unreacted components to reduce non-specific binding and improve sensitivity.</i>	
.....	
Source:	Purified Streptavidin and Horseradish Peroxidase
Form:	Thimerosal-free stabilized solution
Storage:	2-8°C Do Not Freeze
Biohazard:	Not determined for this product.

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