Streptavidin – Frequently asked questions

	QUESTION	ANSWER
Properties	**Properties of the native product:**	Native streptavidin is a protein produced by bacteria of the species Streptomyces avidinii. It is a homotetramer made up of four identical protein subunits by non-covalent bonds each consisting of 159 amino acids. It has a total molecular mass of about ~ 60 kDa (from 4 x 16.8 kDa per monomer). Each of the four subunits can bind one molecule of biotin (vitamin B7) with very high affinity (binding constant Ka ~ 1014–1015 M−1). The streptavidin-biotin bond is one of the strongest known noncovalent biological bonds.
	Appearance and Storage	Lyophilized powder of white color, storage at -20
	Solubility of the native product:	Product gives a clear, colorless solution at 5mg/ml in 0.1 M NaCl and is soluble in water at 1 mg/ml, or in phosphate buffered saline (PBS).
	How stable is the Strepavidin tetramer in solution?	When streptavidin is simply dissolved in a non-denaturizing buffer at room temperature, the molecule will be available as stable tetramer. The monomeric and dimeric form is not relevant for its biologically native biotin binding process. Monomeric streptavidin can be used *in vitro* for biotin detection in situations where streptavidin-mediated target aggregation is a concern. The dimerized form is a commonly used mechanism in cell surface signalling, also *in vitro*. By its biochemical and biophysical properties, streptavidin will always tetramerize, due to its lowest energy level of the molecule in order to get aggregated with the target molecule biotin.
	How much sulfur does streptavidin contain?	The monomeric core sequence (from T/Thr-20 to F/Phe-130) does not contain any methionine (M/Met) or cysteine (C/Cys) side chains. The initial flanking sequence may contain 1-2 methionine residues.
	How much salt does the product contain?	The product contains 0.9 mg protein/mg lyophilisate, the balance is sodium chloride (NaCl) meaning that every mg of lyophilized product contains 0.1 mg NaCl (10 %). However, it is dispensed by protein content.With a purchase of 5 mg of streptavidin, also 5 mg of streptavidin lyophilizate is delivered plus additional salt. The information on the NaCl balance is added in case the end user is weighing the product.
Miscellaneous	**In what properties does the native product differ from the recombinant product?**	Stability against denaturation and solubility characteristics of the monomeric streptavidin core sequence (from Thr-20 to Phe-130) is slightly lower in the native product
	What is the difference to Avidin?	Streptavidin and avidin have similar binding affinity to biotin but substantially difference in their physical and chemical properties. In contrast to avidin, a basic glycoprotein from the albumen of many avian and amphibian eggs, showing an isoelectric point of 9.47 and being also bind biotin, streptavidin has an isoelectric point of 6.03. That gives streptavidin a working range closer to neutral conditions. Due to its lower overall charge, non-specific binding in streptavidin systems is less frequent than when using avidin. Furthermore, because streptavidin does not contain glycosylation sites, it cannot bind to any carbohydrate receptors.
	Production	The product is from USA. In its fermentation process, the cell culture media contains bovine-derived components. Its formulation is as follows: lyophilized powder containing ~0.9 mg protein/mg lyophylisate; balanced with sodium chloride.