

# $\alpha$ A-Crystallin Protein



## TECHNICAL SPECIFICATIONS

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### Bovine $\alpha$ A-Crystallin Protein Product #: SPP-226

#### Scientific Background

Alpha-crystallins composed of  $\alpha$ A (~20 kDa) and  $\alpha$ B (~20 kDa) subunits, are major water-soluble proteins accounting for almost 50% of total protein in the mammalian transparent eye lens and they are also found in a variety of other tissues (1). The two other crystallin families,  $\beta$  and  $\gamma$ , are homologous to each other but not to the  $\alpha$  family or the sHsp's. Alpha-crystallins are also referred to as small heat shock proteins, since they are induced by increased temperature in a variety of organisms. (2) The  $\alpha$ -crystallins have sequence homology as well as structural and functional similarities with the small Hsp's such as Hsp25/27 (3). Most small heat shock proteins have four common structural and functional features: (i) molecular weight between 12 and 43kDa; (ii) the formation of large oligomeric complexes composed of  $\alpha$ A-crystallin,  $\alpha$ B-crystallin and Hsp25/27; (iii) the moderately conserved  $\alpha$ -crystallin domain in the central region of the protein; and (iv) molecular chaperone activity (2,4). The  $\alpha$ -crystallin domain comprises approximately 90 residues, is bounded by variable N-terminal and C-terminal extensions and is involved in oligomer assembly. Oligomers can reach 800kDa or more and are dynamic, exhibiting subunit exchanges and organizational plasticity, possibly leading to functional diversity. Phosphorylation of serine residues occurs during development and in response to stress, and usually decreases oligomer size (4). Chaperone activity requires, and is modulated by, oligomerization and is limited to binding unfolded intermediates to prevent irreversible aggregation (2,4), although productive release and refolding of denatured proteins requires close cooperation with other chaperones. Other proposed functions include a role in membrane stabilization (2) and modulation of intermediate filament organization during physiological stress and neurodegenerative disease (5).

#### Application Note

On a 15-well minigel system, 100ng of protein per lane should be sufficient when used in a colorimetric Western blot with Stressgen antibodies SPA-221 and SPA-224.

#### References

1. Augusteyn, R.C., and Stevens, A. (1998) *Progress in Polymer Science* **23**: 375-413.
2. Narberhaus, F. (2002) *Microbiol. Mol. Biol. Rev.* **66**(1): 64-93.
3. Merck, K. B., Groenen, P. J., Vooter, C. E., de Haard-Hoelman, W. A., Horwitz, J., Bloemendal, H. and de Jong, W. W. (1993) *J. Biol. Chem.* **268**: 1046-1052.
4. MacRae, T.H. (2000) *Cell Mol. Life Sci.* **57**(6): 899-913.
5. Head, M.W., Goldman, J.E. (2000) *Neuropathol. Appl. Neurobiol.* **26**(4): 304-312.

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## CERTIFICATE OF ANALYSIS

### $\alpha$ A-Crystallin Protein

#### Product #: SPP-226

**Format:** Chromatofocusing purified bovine  $\alpha$ A-crystallin in PBS (0.15M NaCl, 0.05M phosphate buffer, pH 7.2).

**Purity:** This protein is >70% pure as determined by SDS-PAGE analysis.

**STORAGE & SHIPPING:** Store frozen product at or below -70°C. Thawed product may be stored for 2-4 weeks at 4°C. For optimal storage, aliquot to smaller portions and store at -70°C. Avoid repeated freeze/thaw cycles. For maximum product recovery, after thawing, centrifuge the product vial before removing cap. Shipped on gel packs.



**FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES:** This product is not to be used for diagnostic nor therapeutic purposes. By accepting this product, the user confirms that it will be used for research purposes only. Stressgen warrants that its products conform to the information published by Stressgen. Purchaser must determine the suitability of the product for their particular use. Please refer to the MSDS for product safety information.

# MATERIAL SAFETY DATA SHEET

## Section 1 - Product Identification and Use

**Product Name:** Bovine  $\alpha$ A-Crystallin **Product#** SPP-226

*This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.*

Manufacturer's Name: Assay Designs  
Street Address: 5777 Hines Drive  
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Phone: (800) 833-8651 (Toll Free in North America)  
Fax: (734) 668-2793

## Section 2 - Hazardous Ingredients

NOT AVAILABLE. We are not aware of any hazards associated with this product or its ingredients, but the chemical, physical, and toxicological properties of this product have not been investigated thoroughly. Observe normal laboratory precautions.

## Section 3 - Physical Data

This product consists of purified protein in PBS shipped on gel packs (dry ice overseas). The physical properties of this product have not been investigated thoroughly.

## Section 4 - Fire and Explosion Hazard

NOT APPLICABLE

## Section 5 - Reactivity Data

NOT APPLICABLE

## Section 6 - Toxicological Properties

May be harmful by inhalation, ingestion, or skin absorption. The toxicological properties of this product have not been investigated thoroughly. Exercise due caution.

## Section 7 - Preventative Measures

Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.

\*\*\*\*\*MULTIPLE COMPONENT SPILL OR LEAK PROCEDURES\*\*\*\*\*

- Wear protective equipment.
- Absorb on sand or vermiculite and place in closed containers for disposal.
- Dispose or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations.

## Section 8 - First Aid Measures

- If swallowed, wash out mouth with water, provided person is conscious. Call a physician.
- In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. If a rash or other irritation develops, call a physician.
- If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.
- In case of eye contact, flush with copious amounts of water for at least 15 minutes while separating the eyelids with fingers. Call a physician.

## Section 9 - Preparation

Prepared by: Assay Designs	Phone#: (734) 668-6113 Toll Free in North America: (800) 833-8651	Created: 09/09/05	Modified: 12/14/06
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