

Avidin and Biotinylated Lectin Staining Kit (Cat. No.: BAK-001)

Kit Composition

The Avidin and Biotinylated Lectin Staining Kit (BAK-001) contains 5mg Avidin FITC and 1mg of the following Biotin Labeled Lectins: Con A, DBA, SBA, LPA, WGA, UEA-I, PNA, GS-I, BPA.

Lectin Specificity

Con A	α -D-Mannose, α -D-Glucose, Branched mannose.
DBA	Methyl-2-acetamido-2-deoxy-D-galactose.
SBA	α and β -GalNAc > α and β -Gal.
LPA	Sialic Acid (N-Acetyl neuraminic acid).
WGA	(GlcNAc- β -(1,4)-GlcNAc) ₁₋₄ > β -GlcNAc > Neu5Ac.
UEA-I	α -L-Fucose.
PNA	Terminal β -Galactose.
GS-I	Melibiose, α -D-Galactose.
BPA	N-Acetylgalactosamine.

Specific Applications

See individual datasheets for References.

General Procedure for Biotin Labeled Lectin

The following is a general Procedure and Trouble-Shooting Guide. The information is provided only for your convenience. The success of your experiments are not guaranteed by EY Laboratories, Inc.

1. Wash and block tissue section or blot. EY Laboratories, Inc. recommends that 1% purified Bovine Serum Albumin (BSA) or defatted milk powder be used for blocking to prevent non-specific binding. Do not use serum products, they contain glycoproteins which may lead to high levels of non specific background. After blocking, rinse briefly with recommended Buffer.
2. Dilute **Biotin Labeled Lectin** to a concentration of 5-50 μ g/ml using recommended Buffer. Incubate section or blot for 30-90 minutes at room temperature in a moist chamber. Slightly longer incubation times may be required if incubation is done at 2-8°C. Rinse 3 times, 5 minutes *each* time with recommended Buffer.
3. Dilute and incubate **Avidin Conjugate** according to manufacturer directions.

Notes: Inhibition of lectin binding may be accomplished by using one of two procedures:

- A. Before proceeding to **Step #3** incubate lectin treated section or blot with inhibitory carbohydrate for 30-60 minutes at room temperature. NOTE: Complete inhibition may not occur.
- B. Preincubate diluted **Biotin Labeled Lectin** with inhibitory carbohydrate for 30-60 minutes at room temperature before applying to section or blot.

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TROUBLE SHOOTING GUIDE

Problem	Cause	Solution
Weak or no Staining	<ol style="list-style-type: none"> 1. Low concentration of specific oligosaccharide on sample. 2. Low concentration of lectin conjugate. 3. Low concentration of avidin conjugate. 4. Insufficient incubation time. 5. Inappropriate treatment of sample prior to labeling. 	Causes #1 - #4 <ol style="list-style-type: none"> a. Increase incubation time. b. Increase concentration of sample (on blot) lectin conjugate and/or avidin conjugate. <ol style="list-style-type: none"> a. Treat section or blot with a different blocking reagent.
High Background	<ol style="list-style-type: none"> 1. Lectin conjugate and/or avidin conjugate is too concentrated. 2. Insufficient washing. 3. Insufficient blocking. 4. Sample contains endogenous enzymatic activity. 	<ol style="list-style-type: none"> a. Decrease concentration of respective reagents. b. Shorten incubation times. <ol style="list-style-type: none"> a. Perform multiple washings and prolong washing time. a. Treat section or blot with a different blocking reagent. <ol style="list-style-type: none"> a. Determine if sample contains activity which would give background staining in the absence of the avidin conjugate.
Unexpected Staining	Multiple causes	<ol style="list-style-type: none"> a. Perform control reactions. b. Use other cytochemical technique to prove or disprove the findings.

Additional Products

In addition to more than 300 labeled lectins, EY Laboratories, Inc. also manufactures a large selection of carbohydrate gels for lectin purification, antibody gels for purification of primary antibodies, and a number of different protein/glycoprotein gels. For further information, please contact customer service at EY Laboratories, Inc.

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Avidin and Biotinylated Lectin Staining Kit Product Information

Catalog Number: BA-101-5

Description: Avidin (egg white) - FITC

Lot Number:

Protein Concentration: 5 mg pure Avidin-FITC / 5 ml of Buffer.
(Based on OD 280)

Purification Procedure: Gel filtration performed after conjugation to remove free FITC.

Specificity: One mole of Avidin (MW 67,000) binds 4 moles of Biotin (MW 244.3). The Biotin-Avidin complex has a binding constant of 10^{15} .

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4. Contains 0.05% sodium azide as a preservative.

Chemical Used for Conjugation: Fluorescein Isothiocyanate, FITC.

Storage: Store liquid material frozen in aliquots in amber vials or covered with foil. Avoid freeze thaw cycles. Clarify by centrifugation.

Stability: The liquid material is stable for several years when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding Avidin. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

Remarks: Fluorescent Conjugates are extremely light sensitive.

References:

1. Heggenes, M.H., et al., *Use of the Avidin-biotin complex for the localization of actin and myosin with Fluorescence Microscopy*. J. Cell Biol., **73**, (1977), 783.

Catalog Number: BA-1104-1

Description: Pure *Canavalia ensiformis* lectin (Con A) from Jackbean, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified Con A Biotin / vial. Reconstitute with distilled water to a final concentration of 1 mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: α -D-Mannose, α -D-Glucose, Branched mannose.

Inhibitory Carbohydrate: Methyl α -D-Mannopyranoside >> α -D-Mannose >> α -D-Glucose.

Activity: Con A is a relatively weak blood agglutinin. More than 10 μ g/ml may be required to give visible agglutination of neuraminidase treated human erythrocytes.

Buffer: 0.05 M Tris - 0.15M NaCl-0.004M CaCl₂, pH 7.0 - 7.2.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References:

1. Hori, T., et al. (1985). Acta Neuropath. (Berlin). **66** : 177.
2. Ree, H.J. (1983). Cancer. **51** : 1639-1646.

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Avidin and Biotinylated Lectin Staining Kit Product Information

Catalog Number: BA-1201-1

Description: Pure *Dolichos biflorus* lectin (DBA) from horsegram, Biotin conjugated.

Lot Number:

Protein Concentration: (Based on OD 280) 1mg purified DBA Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.

Carbohydrate Specificity: Methyl-2-acetamido-2-deoxy-D-galactose.

Inhibitory Carbohydrate: Terminal α -D-GalNAc.

Activity: 4 μ g/ml will agglutinate human type A₁ cells. As much as 200 μ g/ml is needed to agglutinate type A₂ cells.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References: 1. Etzler, M.E. and Kabat, E.A. (1970). *Biochemistry*, **9** : 869-877.

Catalog Number: BA-1301-1

Description: Pure *Glycine max* lectin (SBA) from soybean, Biotin conjugated.

Lot Number:

Protein Concentration: (Based on OD 280) 1 mg purified SBA Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.

Carbohydrate Specificity: α and β -GalNAc > α and β -Gal

Inhibitory Carbohydrate: Terminal α - and β -GalNAc>Galactose.

Activity: Less than 4 μ g/ml will agglutinate fresh A₁ cells. Older B cells can react stronger than A₂ cells.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References: 1. Lotan,R.,et al.(1973). *Biochem. Biophys. Res. Comm.* **55** : 1347-1355.
2. Sela,B.-A.,et al.(1970).*J.Membr.Biol.* **3** : 267-279.
3. Reisner,Y.,et al.(1976). *Biochem.Biophys. Res. Comm.***72** : 1585-1591.
4. O'Reilly,R. J.,et al.(1985).*Transplant.Proc.***17** :455.

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Avidin and Biotinylated Lectin Staining Kit Product Information

Catalog Number: BA-1501-1

Description: Pure *Limulus polyphemus* lectin (LPA) from horseshoe crab, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified LPA Biotin / 1 ml Buffer.
(Based on OD 280)

Carbohydrate Specificity: Sialic Acid (N-Acetyl neuraminic acid).

Inhibitory Carbohydrate: N-acetylneuraminic acid and N-glycolylneuraminic acid

Activity: 10-20 µg/ml will agglutinate type O human erythrocytes. As much as 100 µg/ml may be necessary to agglutinate type A or B cells.

Buffer: 0.05M Tris - 0.15M NaCl, 0.01M CaCl₂, pH 8.0.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store liquid in aliquots refrigerated at 5-8°C.

Stability: The liquid material is stable for at least 1 year when stored in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

Remarks: Calcium is REQUIRED for binding. The addition of millimolar concentrations of sialic acid in the above buffer of the addition of a calcium chelting agent such as EDTA may be used to inhibit binding. LPA is composed of 18-20 noncovalently bound subunits and may precipitate if frozen. Clarify by low speed centrifugation.

References:

1. Muresan, V., et al. (1982) J. Histochem. Biochem. **30** :938-946.
2. Freeman, H.J. (1983) J. Histochem. Cytochem. **31** : 1241.
3. Robey, F.A. and Liu, T.Y. (1981) J. Biol. Chem. **256** : 969-975.
4. Roche, A. C. and Monsigny, M. (1974) Biochem. Biophys. Acta. **371** : 242-254.

Catalog Number: BA-2101-1

Description: Pure *Triticum vulgare* lectin (WGA) from wheat germ, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified WGA Biotin / vial. If lyophilized, reconstitute with Buffer to a concentration of 1mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: (GlcNAc-β(1,4)-GlcNAc)₁₋₄>β-GlcNAc > Neu5Ac.

Inhibitory Carbohydrate: GlcNAc β(1,4) GlcNAc β(1,4) GlcNAc > GlcNAc β(1,4) GlcNAc > GlcNAc >> sialic acid(Neu5Ac) >> GalNAc

Activity: Less than 4mg/ml will agglutinate human type O erythrocytes. Less than 1 µg/ml will agglutinate neuraminidase treated erythrocytes.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References:

1. Peters, B.P., et al. (1979) Biochemistry. **18** : 5505-5511.
2. Lotan, R. et al. (1975) Biochem. Biophys. Res. Comm. **62** : 144-150.
3. Ebisu, S., et al. (1977) Carbohydrate Res. **58** : 187-191.
4. Watanabe, K. and Hakomori, S.-I. (1973) FEBS Lett. **37** : 317-320.
5. Yamamoto, K., et al. (1981) Biochemistry. **20** : 5894-5899.

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Avidin and Biotinylated Lectin Staining Kit Product Information

Catalog Number: BA-2201-1

Description: Pure *Ulex europaeus* lectin (UEA-I) from gorse, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified UEA-I Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: α -L-Fucose.

Inhibitory Carbohydrate: α -L-Fucose.

Activity: Less than 4 μ g/ml will agglutinate human type O erythrocytes. Less than 0.5 μ g/ml will agglutinate neuraminidase treated erythrocytes.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References:

1. Holthofer, H. et al. (1982) Lab. Investigation. **47** : 60-66.
2. Miettinen, M., et al. (1983) Am. J. Clin. Path. **79** : 32.
3. Walker, R.A. (1985) J. Pathology. **146** : 123-127.
4. Allen, J.U. and Bosslet, K. (1988) Am. J. Clin. Path. **90** : 463-471.
5. Oriol, R., et al. (1986) Vox Sang. **51** : 161-171.
6. Torrado, J. et al. (1989) Am. J. Clin. Path. **91** : 503 (Letter to the Editor).

Catalog Number: BA-2301-1

Description: Pure *Arachis hypogaea* lectin (PNA) from peanut, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified PNA Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: Terminal β -Galactose.

Inhibitory Carbohydrate: Lactose > β -Galactose.

Activity: Less than 1 μ g/ml will agglutinate human erythrocytes neuraminidase treatment of the cells.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References:

1. Cooper, H.S. (1984). Human Pathology. **15** : 904-906.
2. Moller, P. (1982) Virchows Arch. **396** : 313-317.
3. Vierbuchen, M. and Klein, P.J. (1983). Laboratory Inv. **48** (2): 181.
4. Ree, H.J. and Hsy, Su-ming. (1983). Cancer. **51** : 1631.

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Avidin and Biotinylated Lectin Staining Kit Product Information

Catalog Number: BA-2401-1

Description: Pure *Griffonia simplicifolia* lectin (GS-I), Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified GS-I Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: Melibiose, α -D-Galactose.

Inhibitory Carbohydrate: α -Galactose.

Activity: 20-30 μ g/ml is required to agglutinate fresh type B blood cells. Lectin activity against all blood types increases after neuraminidase treatment of the cells.

Buffer: 0.01M Phosphate - 0.15M NaCl containing 0.5 mM CaCl_2 , pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

Remarks: Calcium is REQUIRED for binding. 0.5mM Calcium is the maximum concentration in Buffer that will not form a white precipitate.

References:

1. Murphy, L. A. and Goldstein, I. J. (1977). J. Biol. Chem. **252** : 4739-4742.
2. Judd, W. J., et al. (1978). Transfusion (Philadelphia). **18** : 274-280.
3. Eckhardt, A. E., et al. (1982). Cancer Res. **42** : 2977-2979.
4. Maddox, D. E., et al. (1982). PNAS. **79** : 166-170.

Catalog Number: BA-2501-1

Description: Pure *Bauhinia purpurea* lectin (BPA) from Camel's foot tree, Biotin conjugated.

Lot Number:

Protein Concentration: 1 mg purified BPA Biotin / vial. Reconstitute with Buffer to a final concentration of 1mg/ml if lyophilized.
(Based on OD 280)

Carbohydrate Specificity: N-Acetylgalactosamine.

Inhibitory Carbohydrate: N-Acetylgalactosamine.

Activity: Less than 0.5 μ g/ml will agglutinate human erythrocytes after neuraminidase treatment of the cells. Without prior enzyme treatment, at least 25 μ g/ml is required to agglutinate red blood cells.

Buffer: 0.01M Phosphate - 0.15M NaCl, pH 7.2 - 7.4.

Chemical Used for Conjugation: Biotinyl N - hydroxysuccinimide ester (BNOHSE).

Storage: Store lyophilized powder refrigerated at 5-8°C or frozen. Store liquid frozen in aliquots. Avoid freeze-thaw cycles.

Stability: The lyophilized material is stable for several years when stored frozen. After reconstitution the material is stable for at least 1 year when stored frozen in aliquots with 0.05% sodium azide added as a preservative.

Caution: Refer to the enclosed MSDS for information regarding lectins. The aluminum seals have sharp edges and the vial itself may have cracks which can cause lacerations. Use caution when opening the vial.

References:

1. Irimura, T. and Osawa, T. (1972). Arch. Biochem. Biophys. **151** : 475-482.
2. Imai, Y. and Osawa, T. (1983). Scand.J.Immunol. **18** : 217-224.

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MATERIAL SAFETY DATA SHEET

Effective Date: March 31, 2006

Revision 5

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PRODUCT IDENTIFICATION

Name: Purified proteins and enzymes labeled with D-Biotin.
 Catalog Number(s): BAP-01, BA-1102 to BA-9000, BAF-001 to BAF-2354, BAL-1104 to BAL-4701, BA-01 to BA-013, BA-108, BA-109, BA-111, BA-118, BA-119, BA-120, BA-121, BAT-2100 to BAT-2701.
 Formula: Complex polypeptides labeled with D-Biotin
 Synonyms: Protein A, Lectins, Secondary and Monoclonal Antibodies, Horseradish Peroxidase, Alkaline Phosphatase, Lactoperoxidase, Ferritin, and Urease labeled with D-Biotin.
 NOTE: D-Biotin is also known as vitamin H.

EMERGENCY INFORMATION

EY Laboratories, Inc.
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**EMERGENCY PHONE:
 650-342-3296**

HAZARDOUS COMPONENTS

Specific protein (s) as listed on the vial label. Solutions are at a concentration generally greater than 0.5mg protein/ ml. Powders are >>95% pure protein unless otherwise indicated on the vial label. Biological activity of these labeled proteins will vary. Vitamin H is an essential vitamin, required in very low amounts. The concentration of bound biotin is less than 10% of the protein amount (w/w). All solutions contain less than 0.05% sodium azide as a preservative.

HEALTH HAZARD INFORMATION

EXPOSURE LIMITS: None established. The toxicological properties of these products have not been thoroughly investigated. Care should be taken when handling any of these materials.
 EFFECTS OF OVEREXPOSURE: May cause localized eye, skin, or mucous membrane irritation. Some sensitive individuals may develop a chronic allergic reaction with exposure. The known effects are due to the protein.
 ROUTES OF EXPOSURE: Inhalation of powders and skin contact with liquids are the primary routes of exposure. Care should be taken to avoid the formation of aerosols when handling any of the solutions.

PHYSICAL CHARACTERISTICS

APPEARANCE: Powders are white to brown. Solutions will be clear to dark brown or red.
 SOLUBILITY: Powders are completely soluble in many biological buffers and water. All liquids are completely miscible in water and biological buffers.

FIRE AND EXPLOSION HAZARDS

EXTINGUISHING MEDIA: Not considered to be a fire hazard.
 SPECIAL FIRE FIGHTING NOTE: Water spray or CO₂.
 NOTE: None required.
 Most solutions contain less than 0.05% sodium azide as a preservative. Azide may react with lead and copper plumbing to form explosive metal azides. Flush with copious amounts of water when disposing material in the sink.

REACTIVITY DATA

STABILITY: Stable. Decomposition products are not known to be hazardous.
 HAZARDOUS POLYMERIZATION: Will NOT occur.
 INCOMPATIBILITY: None known. (Lead and copper may react with sodium azide).

SPILL / LEAK PROCEDURES

MATERIAL RELEASE / SPILL: Avoid contact with powder or liquid. Clean up spill with a paper towel soaked in household bleach. Do not allow solutions to dry on environmental surfaces. Wash affected area with detergent after the area has been treated with bleach.
 WASTE DISPOSAL: Incinerate, autoclave, or dispose of paper waste in accordance with all Local, State, and Federal regulations. Due to the small quantities of material involved these products are generally not considered to be environmental hazards. All of these proteins are fully biodegradable.

EMERGENCY FIRST AID PROCEDURES

May be harmful if swallowed, inhaled, or allowed to absorb through the skin. Wash contacted area with water for 15 minutes. If inhaled remove to fresh air. Report exposure to the appropriate safety official. Consult a physician if irritation occurs or if there is any indication of an allergic response, such as watering eyes, sneezing, or difficulty breathing.

SPECIAL HANDLING PRECAUTIONS

VENTILATION: No special ventilation is required but it is recommended to handle these reagents in a fume hood when possible.
 EYE PROTECTION: Not required under most circumstances but recommended as a safety precaution.
 RESPIRATORY PROTECTION: Recommended as a safety precaution, specifically when working with powders. An approved respirator may be required for those individuals already known to be sensitive to these materials.
 PROTECTIVE GLOVES: Required when handling any of these materials.

SPECIAL PRECAUTIONS

This material is for research and experimental application only. It is not intended for food, drug, household, agricultural, or cosmetic use. All materials should be handled only by technically qualified individuals experienced with working with potentially hazardous chemicals. The above information is correct to the best of our knowledge. The user should make independent decisions regarding completeness of the information, based on all sources available. EY Laboratories, Inc. shall not be held liable for any damage resulting from handling or contact with the above product.

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