

Abrin Toxin (B Subunit) from *Abrus precatorius* Seeds

Catalog No. NR-43946

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Contributor and Manufacturer:

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Product Description:

The B subunit of abrin toxin from *Abrus precatorius* (*A. precatorius*) seeds was separated from the holotoxin by galactose affinity chromatography under reducing conditions. The protoxin is post-translationally cleaved into the A and B chains. This preparation may contain several isotypes of the B subunit.¹

A. precatorius is commonly known by a variety of names including: rosary pea, jequirity, Crab's eye, precatory pea or bean, John Crow Bead, Indian licorice, Akar Saga, gidee gidee or Jumbie bead. It is a vine, native to the Old World tropics, but now known to grow throughout the tropical and subtropical areas of the world. The plant is best known for its seeds, which are toxic due to the presence of abrin toxin.² Abrin toxin is a member of the ribosome inactivating protein (RIP) family of toxins, which specifically and irreversibly inhibit protein synthesis in eukaryotic cells by enzymatically altering the 28S rRNA of the large 60S ribosomal subunit. Most RIPs are produced by plants and are thought to represent a defense mechanism against viral or parasitic attacks.³

Abrin is a type II RIP comprised of a catalytically active A subunit and a lectin-like B subunit. The A subunit harbors the RNA N-glycosidase activity and the B subunit is responsible for the binding and trafficking of the toxin in cells.⁴ The crystal structure of abrin has been determined (PDB: [1ABR](#)). The overall protein fold is similar to ricin, but the secondary structure of the A subunit shows some differences. The B subunit displays the positions of several sugar residues linked to predicted glycosylation sites.⁵

NR-43946 has a theoretical molecular weight of 31164 daltons, prior to post-translational glycosylation. The predicted amino acid sequence has been determined and is presented in Table 1.

Material Provided:

Each vial contains approximately 0.05 mg of the B subunit of abrin toxin in PBS. The concentration is shown on the Certificate of Analysis.

Packaging/Storage:

NR-43946 was packaged aseptically in screw-capped plastic cryovials. The product is shipped frozen on dry ice and should be stored at -20°C or colder immediately upon arrival.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Abrin Toxin (B Subunit) from *Abrus precatorius* Seeds, NR-43946."

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. [Biosafety in Microbiological and Biomedical Laboratories](#), 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl5toc.htm.

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References:

1. O'Brien, A. D. and J. F. Sinclair, Personal Communication.
2. Gul, M. Z. et al., "Antioxidant and Antiproliferative Activities of *Abrus precatorius* Leaf Extracts - An *in vitro* Study." BMC Complement. Altern. Med. 13 (2013): 53. PubMed: 23452983.
3. Walsh, M. J., J. E. Dodd and G. M. Hautbergue. "Ribosome-Inactivating Proteins: Potent Poisons and Molecular Tools." Virulence 4 (2013): 774-784. PubMed: 24071927.
4. Bagaria, S., et al. "Mechanistic Insights into the Neutralization of Cytotoxic Abrin by the Monoclonal

Antibody D6F10." PLoS One 29 (2013): e70273. PubMed: 23922965.

5. Tahirov, T. H., et al. "Crystal Structure of Abrin-a at 2.14 Å." J. Mol. Biol. 250 (1995): 354-67. PubMed: 7608980. Erratum in J. Mol. Biol. 252 (1995): 154.

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Table 1 – Predicted Protein Sequence for Abrin Toxin (B Subunit)

1	ANQSPLLIRS	IVEKSKICSS	RYEPTVRIGG	RDGMCVDVYD	NGYHNGNRII
51	MWKCKDRLEE	NQLWTLKSDK	TIRSNGKCLT	TYGYAPGSYV	MIYDCTSAVA
101	EATYWEIWDN	GTIINPKSAL	VLSAESSMG	GTLTVQTNEY	LMRQGWRTGN
151	NTSPFVTSIS	GYSDLQMQAQ	GSNVWMADCD	SNKKEQQWAL	YTDGSIRSVQ
201	NTNNCLTSKD	HKQGSTILLM	GCSNGWASQR	WVFKNDGSIY	SLYDDMVMVDV
251	KGSDPSLKQI	ILWPYTGKPN	QIWLTLF		