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C. difficile

1. List Labs's products in the *C. difficile* group

LIS152 - Toxin A from *C. difficile* **LIS155** - Toxin B from *C. difficile*

2. Key Attributes

Toxins are produced in native organisms and provided at >90% purity. A cytotoxicity test result is provided for each lot.

3. Additional products supporting *C. difficile* research

Toxoids: for production or capture of antibodies
LIS153 - Toxin A toxoid **LIS154** - Toxin B toxoid

Associated enzyme:
LIS159 Glutamate dehydrogenase (GDH) from *C. difficile*

Antibodies: several antibodies are provided for testing
LIS753, LIS754, LIS756, LIS757, LIS758 & LIS759 - Antibodies to Toxin A, Toxin B, Binary Toxin and Glutamate Dehydrogenase

4. Specific Requirements

C.difficile toxins can be handled in a research laboratory setting using good laboratory techniques. They are not for use in humans and are not approved for diagnostic purposes.

5. Technical Information

Clostridium difficile (C. difficile) infection (CDI) is the most common cause of healthcare-associated infections in US hospitals. Once in the intestine of an infected individual, *C. difficile* secretes two toxins, *C. difficile* toxin A (TcdA) and *C. difficile*toxin B (TcdB), which elicit inflammation and diarrheal disease symptoms. Understanding the toxins and how to combat them is an active area of research in biology; the toxins are prime therapeutic targets.

For a good review of the current knowledge of these toxins look for:

- Chandrasekaran R & Lacy DB (2017) The role of toxins in Clostridium difficile infection. FEMS Microbiol Rev. 41(6):723-750. **PMID:29048477**

C.difficile toxins modify by glucosylation and thereby inactivate the Rho-family of GTPases such as Cdc42, RhoA, and Rap2A. Overall the two toxins A and B are very similar, possessing enzymatic domains responsible for modification of small GTPases and having similar functional regions for binding, translocation and self-activation. Toxin A is effective at disrupting the intestinal epithelium, making the intestine more vulnerable and eliciting an immune response. In some applications, toxin B is 100 to 1,000 times more potent than toxin A.

Briefly, *C. difficile* toxins are interesting research tools because, they…

- Are the primary virulence factors of *C. difficile*, and thus the prime therapeutic targets for treatment of the disease,
- Modify cell signaling pathways and can be used to study these processes,
- Represent the family of bacterial toxins and functions using all the processes of intoxication: selective binding, endocytosis, pore formation, translocation, auto-processing, and modification of the host machinery.

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