**Agent summary for tetanus toxin**

**Agent information:**

* Tetanus toxin is produced by *Clostridium tetani* - an anaerobic, endospore-forming, gram-positive bacteria found in soil, dust and animal feces.
* Tetanus toxin is a potent neurotoxin, tetanospasmin, which causes tetanus, an acute neurologic condition characterized by painful muscular contractions.
* Tetanus toxin consists of two chains linked by a unique interchain disulphide bond:
* a heavy chain (H, 100 kDa) that binds the toxin to receptors on neuronal cells,
* a light chain (L, 50 kDa) that blocks the release of inhibitory neural transmitter molecules within the central nervous system.
* Natural transmission occurs through contamination of wounds with soil or foreign bodies contaminated with *C. tetani* spores. The incubation period ranges from three to 21 days. The observed symptoms are primarily associated with the presence of the toxin.
* Signs and symptoms:
	+ jaw cramping
	+ sudden, involuntary muscle tightening (muscle spasms) — often in the stomach
	+ painful muscle stiffness all over the body
	+ trouble swallowing
	+ jerking or staring (seizures)
	+ headache
	+ fever and sweating
	+ changes in blood pressure and heart rate
* Accidental parenteral inoculation of the toxin is the primary hazard to laboratory personnel. Because it is uncertain if tetanus toxin can be absorbed through mucous membranes, the hazards associated with aerosols and droplets remain unclear.
* Tetanus is a medical emergency requiring hospitalization, immediate treatment with human tetanus immune globulin, agents to control muscle spasm, antibiotics, and a tetanus toxoid booster.
* Individuals working with tetanus toxin should be offered the tetanus vaccine. Adults should get one dose of the tetanus and diphtheria (Td) vaccine every 10 years.
* Tetanus toxin requires biosafety level 2 containment (BSL2).
* Use personal protective equipment (PPE) as described in the associated SOP for Biological Toxins.

**References:**

* [Biosafety in Microbiological and Biomedical Laboratories, 6](https://www.cdc.gov/labs/pdf/SF__19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf)[th](https://www.cdc.gov/labs/pdf/SF__19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf) [edition. U.S. Department of Health and Human Services; CDC](https://www.cdc.gov/labs/pdf/SF__19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf)  (BMBL6)
* Center for Disease Control and Prevention (CDC) 2019. <https://www.cdc.gov/tetanus/index.html>

Enter the following information:

1. Name of the Principle Investigator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_
2. Applicable IBC protocol number(s) (approved or submitted): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. List the laboratory work locations (Building/room[s]) for tetanus toxin, a BSL2 agent:
* Procedures:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Storage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. List the animal facility building/room(s) for tetanus toxin, ABSL2 containment:
* Procedures:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Housing:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Note: confirm with ULAR that the rooms listed above are suitable for ABSL2 animals.

Date of Agent Summary form completion: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_