Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET
Conotoxin

CHARACTERISTICS	
Natural Source	Neurotoxic venom naturally produced by the *Conus* genus of gastropod mollusks
Laboratory Source	Isolated toxin
Characteristics	Conotoxins are polypeptides comprised of 10-30 amino acids and stabilized by distinct patterns of disulfide bonds. Mechanisms of action for five conotoxins have been determined so far: α-conotoxin: Acetylcholine nicotinic receptor inhibitor μ-conotoxin: Voltage-gated sodium channel inhibitor δ-conotoxin: Inhibitor of the inactivation of voltage-gated sodium channels ω-conotoxin: N-type voltage-gated calcium channel inhibitor κ-conotoxin: Potassium channel inhibitor

HEALTH HAZARDS	
Route of Entry	Inhalation, ingestion, absorption, and injection
Signs and Symptoms	General symptoms include severe pain to spreading numbness. Severe intoxication exhibits itself through muscle paralysis, blurred or double vision, difficulty breathing and/or swallowing, and respiratory or cardiovascular collapse.
Toxicity Dose Data	LD_{50} = 5 μg/kg

MEDICAL PRECAUTIONS / TREATMENT	
Diagnosis	No rapid diagnostic assays are currently available
Prophylaxis	None available
Vaccines	None available
Treatment	No antidote available. Administer supportive care (artificial respiration to support breathing).
Emory Requirements	Report all exposures immediately

CONTAINMENT REQUIREMENTS	
BSL-2	Most manipulations of conotoxins
BSL-3	Large scale production of c or activities with a high potential for aerosol or droplet generation

SUPPLEMENTAL REFERENCES	
BMBL: 5th Edition	http://www.cdc.gov/biosafety/publications/bmbl5/
Essentials of Toxicology	Klaassen CD, Watkins JB. 2003. Casarett & Doull's Essentials of Toxicology. New York (NY): McGraw-Hill.
Biological Safety: Principles & Practices	Flemming DO, Hunt DL. 2006. Biological Safety: Principles and Practices. 4th Edition. ASM Press.

SPILL PROCEDURES	
Small	Notify others working in the lab. Rinse gloves with decontamination solution and don new gloves. Cover area of the spill with paper towels and apply decontamination solution, working from the perimeter towards the center. Exit and keep others from entering the laboratory. Allow 1 hour of contact time before entering the laboratory without respiratory protection. Cleanup and dispose of spill materials.
Large	Contact Emory's Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or The Spill Response Team (404-727-2888).

EXPOSURE PROCEDURES		
Mucous membrane	Flush eyes, mouth or nose for 15 minutes at eyewash station.	
Other Exposure	Wash area with soap and water for 15 minutes.	
Reporting	Immediately report incident to supervisor, complete an employee incident report in PeopleSoft.	
Medical Follow-up	7am-4pm (OIM): EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	After Hours: OIM NP On Call 404-686-5500 PIC# 50464
	Needle Stick (OIM): EUH (404-686-8587) EUHM (404-686-2352)	Yerkes: Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
Decontamination	Use a reactive disinfectant such as glutaraldehyde and formaldehyde.
Inactivation	Autoclaving is not an effective method of physical inactivation of conotoxins.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Minimum PPE Requirements	At minimum, personnel are required to don gloves, closed toed shoes, lab coat, and appropriate face and eye protection prior to working with conotoxin. Additional PPE may be required depending on lab specific SOPs.
Additional Precautions	Depending on the risk assessment, respirators may be required when working with conotoxins. Fit testing and training is required annually per Emory's Respiratory Program: http://www.ehso.emory.edu/content-manuals/RespiratoryProtectionProgram.pdf

ADDITIONAL REQUIREMENTS	
Regulatory Requirements	Conotoxins are select agents and are regulated under the federal regulation 42 CFR Part 73. Conotoxins are not regulated if the amount under the control of a principal investigator, treating physician or veterinarian, or commercial manufacturer or distributor does not exceed **100 mg**, at any time. Possession of select agent toxins above the maximum amount without CDC registration is a criminal offense and punishable by up to five years in prison and/or $500,000 in fines. Please contact your Biosafety Officer if you do not have biosafety approval for working with Conotoxin.