

1- Identification

Product Identifier: Bioink

Product Description: Bioink is a fibrin-based bioink formulated to support neural cell growth and differentiation in culture for over 30 days. This product is the combination of three solutions. Component 1 is made with alginic acid sodium salt derived from algae. Component 2 is a crosslinking agent derived from gardenia fruit. Component 3 is made using dialyzed fibrin derived from human plasma,

Other Means of Identification: Fibrin-based bioink; Fibrinogen/Alginate Bioink

Recommended Use: Recommended for bioprinting in a laboratory setting. Recommended for research purposes. Manufactured under sterile conditions.

To Prepare: Let Component 1 and Component 2 thaw in fridge. Once completely thawed, add Component 2 to Component 1. If incorporating cells, mix the cells with Component 2 before adding to the bioink solution. Use within one hour for best results.

Restrictions on Use: For research use only. Not recommended for *in vivo* use for humans or animals.

Canadian Supplier Identifier: c/o Axolotl Biosciences, Coast Capital Innovation Centre, University of Victoria, 3800 Finnerty Road, Victoria BC, V8W 2Y2

Emergency Telephone Number (and any restrictions on the use of that number, if applicable): _____

2- Hazard Identification

GHS/WHMIS 2015 Classification

Solution	Hazard Classification	Hazard Statements	Precautionary Statements
Component 1	Acute toxicity (oral), Category 3	H301, H313	P264, P270, P301 + P310 + P330, P305+P313, P312, P405, P501
Component 2	Acute toxicity (oral), Category 3	H301, H312	P264, P270, P280, P301+P310+ P330, P302+P352, P305 + P313, P312, P363, P405, P501

COMPONENT 1:

Hazard Classification: Acute toxicity (oral), Category 3

Label Elements

Symbol:



Signal Word: Danger

Hazard Statements: Toxic if Swallowed (H301); May be harmful in contact with skin (H313).

Precautionary Statements: Wash hands thoroughly after using (P264); Do not eat, drink or smoke when using this product (P270); Call a POISON CENTER or doctor/physician if you feel unwell (P312); Store locked up (P405); Dispose of contents/container to an approved waste disposal plant (P501).

Response: IF SWALLOWED: immediately call a POISON CENTRE or doctor/physician, rinse mouth (P301 + P310 + P330).


IF IN EYES: Get medical advice/attention (P305 + P313).

Other Hazards: No data available.

COMPONENT 2

Hazard Classification: Acute toxicity (oral), Category 3

Label Elements

Symbol: 

Signal Word: Danger

Hazard Statements: Toxic if Swallowed (H301); Harmful in contact with skin (H312).

Precautionary Statements: Wash hands thoroughly after using (P264); Do not eat, drink or smoke when using this product (P270); Wear protective gloves/protective clothing/eye protection/face protection (P280); Call a POISON CENTER or doctor/physician if you feel unwell (P312); Wash contaminated clothing before reuse (P363); Store locked up (P405); Dispose of contents/container to an approved waste disposal plant (P501).

Response: IF SWALLOWED: immediately call a POISON CENTRE or doctor/physician, rinse mouth (P301 + P310 + P330).

IF ON SKIN: wash with plenty of soap and water (P302 + P352).

IF IN EYES: Get medical advice/attention (P305 + P313).

Other Hazards: No data available.

3- Composition/Information of Ingredients

Common Name	Synonym	Formula	Molecular Weight	CAS Registry Number	Additives
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Alginate	Alginic acid sodium salt, algin	$C_6H_9NaO_7$	120,000-190,000 g/mol	9005-38-3	Distilled Water
Fibrinogen	Coagulation Factor I	$C_5H_{11}N_3O_2$ (fibrin)	145.16g/mol (fibrin)	9001-32-5	TBS
Genipin	Methyl (1S,2R,6S)-2-hydroxy-9-(hydroxymethyl)-3-oxabicyclo[4.3.0]nona-4,8-diene-5-carboxylate	$C_{11}H_{14}O_5$	226.23g/mol	6902-77-8	DMSO

4- First Aid Measures

First Aid Measures by Route of Exposure:

Inhalation: If breathing difficulties occur, move person to fresh air and consult a physician.

Skin Contact: Flush exposed skin with water and consult a physician. Wash contaminated clothing before reuse.

Eye Contact: Flush eyes with water and consult a physician.

Ingestion: Rinse mouth with water. Do not give anything by mouth if person is unconscious. Consult a physician.

Most important symptoms and effects (acute or delayed): Data not available.

Immediate medical attention and special treatment, if necessary: If inhaled or ingested, or contact with skin or eyes occur, consult a physician.

5- Firefighting Measures

Suitable extinguishing media: Water, Class A Fire extinguisher, alcohol resistant foam for Component 1

Unsuitable extinguishing media: Data not available.

Specific hazards arising from the hazardous product (e.g., hazardous combustion products): Component 1 is combustible and may produce carbon oxides.

Special protective equipment and precautions for fire-fighters: Wear self-contained breathing apparatus.

6- Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Avoid inhaling and contact to skin.

Methods and materials for containment and cleaning up: Wipe spilled bioink with paper towel and dispose in appropriate biohazardous waste container. Sanitize area with 70% ethanol after spill is cleared.

7- Handling and Storage

Precautions for safe handling: Use in ventilated area away from open flames.

Conditions for safe storage (including incompatible materials): Keep contents separate when stored frozen. After mixing, use bioink within one hour for best results.

8- Exposure Controls: Personal Protection

Control parameters, including occupational exposure guidelines or biological exposure limits and the source of those values: Data not available.

Appropriate engineering controls: Data not available.

Individual protection measures (e.g. personal protective equipment): Wear gloves and lab coat when using. When working with cells, wear a mask to avoid contamination to constructs and bioprint in sterile conditions.

9- Physical and Chemical Properties

Appearance (physical state, colour, etc.): Opaque liquid

Odour: Odourless

Odour threshold: Data not available.

pH: Between 7.4-7.6

Melting point/Freezing point: Data not available.

Initial boiling point/boiling range: Data not available.

Flash point: Data not available.

Evaporation rate: Data not available.

Flammability (solid; gas): Data not available.

Lower flammable/explosive limit: Data not available.

Upper flammable/explosive limit: Data not available.

Vapour pressure: Data not available.

Vapour density: Data not available.

Relative density: Data not available.

Solubility: Data not available.

Partition coefficient - n-octanol/water: Data not available.

Auto-ignition temperature: Data not available.

Decomposition temperature: Data not available.

Viscosity: Data not available.

10- Stability and Reactivity

Reactivity: Data not available.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions: Data not available.

Conditions to avoid (e.g., static discharge, shock, or vibration): Data not available.

Incompatible materials: Do not freeze bioink after mixing. Frozen bioink will crosslink and become unusable. Do not freeze bioink and crosslinker together after mixing. Do not freeze Component 1 and Component 2 together after mixing.

Hazardous decomposition products: Data not available.

11- Toxicological Information

Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact): Data not available.

Symptoms related to the physical, chemical and toxicological characteristics: Data not available.

Delayed and immediate effects, and chronic effects from short-term and long-term exposure: Data not available.

Numerical measures of toxicity, including acute toxicity estimates (ATEs):

Component 1: 3

Component 2: 3

12- Ecological Information

Ecotoxicity: Data not available.

Persistence and degradability: Data not available.

Bioaccumulative potential: Data not available.

Mobility in soil: Data not available.

Other adverse effects: Data not available.

13- Disposal Considerations

Information on safe handling for disposal and methods of disposal, including any contaminated packaging: Dispose according to biohazardous waste disposal protocols. If contaminated, dispose of product. Do not use if contaminated.

14- Transport Information

UN number:

UN proper shipping name:

Transport hazard class(es): Not dangerous goods.

Packing group:

Environmental hazards: Data not available.

Transport in bulk, if applicable:

Special precautions: Ship on dry ice. Immediately store contents between -20°C and -30°C.

15- Regulatory Information

Safety, health and environmental regulations specific to the product: Data not available.

Date of Latest Revision of SDS: 17-NOV-2020