FORMALDEHYDE

Standard Operating Procedures for Formaldehyde-containing products	
1. Chemicals/Hazards	**Chemical name**: **Formaldehyde** (e.g. as Paraformaldehyde powder or 16% Paraformaldehyde Solution) **CAS number:** 30525-89-4 (Powder) or 30525-89-4 (16% Solution) **Routes of exposure**: Skin, eyes, inhalation, ingestion **How exposure might occur**: Reagents preparation: inhalation wile measuring it out or skin exposure if not properly gloved during use, splashing in the event of a spill. **Target organs:** Eyes, lungs, skin **Signs/symptoms of exposure:** Skin: Causes irritation. May cause allergic reaction. Symptoms of exposure may include: drying, cracking or inflammation of the skin. Eyes: Causes eye irritation. Symptoms of exposure may include: eye irritation, burning sensation, pain, watering, and/or change in vision. Eye injury which may persist for several days. Inhalation: Causes respiratory track irritation. May cause allergic respiratory reaction. Symptoms of exposure may include: nasal discharge, hoarseness, coughing, chest pain, and breathing difficulty. Accumulation of fluid in the lungs (pulmonary edema; symptoms can be delayed for several hours. Ingestion: May be harmful if swallowed. Symptoms of exposure may include: inflammation of mouth, throat, esophagus, and/or stomach. Reproduction: No evidence of reproductive effects.
2. Process	*Formaldehyde use for in situ hybridization* We use 16% paraformaldehyde to fix *Nematostella vectensis* embryos for in situ hybridization. Specifically, it is used in fix solution 1 and fix solution 2 and is made fresh for every procedure. These solutions are used in the hood. We also use 4% paraformaldehyde for florescent in situ hybridization. We use the solution to embed tissue.
3. Planning and Preparation	Hazardous chemical and specific SOP training will be provided to personnel working with Formaldehyde-containing products and any other personnel authorized or required to be in the laboratory during work with the chemical. Enter Formaldehyde-containing products into MyChem inventory, the online UW chemical inventory system. Attach SDS in the process. Appropriate cleaning method(s) for Formaldehyde-containing products will be determined and supplies for cleaning and spill cleanup of Formaldehyde-containing products will be readily available.
4. Environmental/ Ventilation Controls	Work with Formaldehyde-containing products will be performed in a Fume hood . *Formaldehyde will be used in a fume hood only.*
5. Personal Protective Equipment (PPE)	The following PPE will be worn when working with Formaldehyde-containing products: *[Customize list]* • Two pairs disposable nitrile exam gloves or one pair of thicker nitrile or butyl gloves (minimum 10 mil thickness) for concentrated chemical • Disposable nitrile exam gloves for solutions

	• Safety glasses with side shields or chemical safety goggles • Lab coat or equivalent • If splash possible, wear face protection such as a face shield, and an impermeable apron with sleeves • Respiratory protection *[if dust, aerosol or vapor hazard is present]* Gloves will be changed immediately if contaminated, torn, or punctured.
6. Special Handling Procedures & Storage Requirements	**HANDLING** Prep • All preparation of Formaldehyde-containing products solutions will be performed over plastic-backed absorbent pads in a fume hood. Pads will be disposed of after completion of tasks or immediately upon contamination. • Wear nitrile gloves for all procedures involving preparation and handling of Formaldehyde-containing products. • Change gloves after each use, or immediately when torn, punctured, or contaminated. **Preparation of 16% Paraformaldehyde solution** An aliquot of paraformaldehyde is obtained from the -20C freezer to create 16% paraformaldehyde. The ampule is carefully broken and transferred to a 15ml screw cap tube using a small transfer pipette. Aliquot at 500ul per tube and store at -20C. the 16% paraformaldehyde is used to make the fixative solutions for in situ hybridization in the fume hood. **Use** • A sharps container will be in the immediate vicinity for safe sharps disposal. • Per EH&S Guidelines here, non-grossly hazardous pads, paper-towels and gloves should beput in a trash bag, and labelled 'non-hazardous waste' before being placed in the trash. • All formaldehyde-containing chemical waste, as well as any grossly contaminated pads (i.e. pads that got soaked in formaldehyde) will be placed in a red hazardous waste bag (from UWBB-273 in drawer) before scheduling disposal by EH&S using the form here https://webapps.ehs.washington.edu/chemwaste/. • Hands will be washed upon completion of tasks. • Surface will be wiped down with water & detergent **STORAGE** 1. Formaldehyde-containing products containers will be labeled and stored in freezer in UWBB-273. **TRANSPORT** 2. Formaldehyde-containing products will be transported in labeled and sealed non-breakable secondary containers.
7. Spill and Accident Procedures	**Formaldehyde-containing products spills must be cleaned up immediately by properly protected and trained personnel who are not sensitive to formaldehyde (see below).** In the event of a small volume spill or a spill inside the fume hood, formaldehyde waste can be cleaned up using the spill kit, sealed, and disposed of as hazardous waste (**see below)**. Spills of larger volume and outside the fume hood pose an inhalation hazard and must be cleaned up by personnel trained and fitted for

respirators (**see below**). However, do not attempt to clean up any spill if not trained or comfortable.

In the even of a such a spill, all other persons should leave the area. **For large spills, evacuate the area and call 911* on campus phone for help. If spill is out of control, call 911*. If person injured, exposed, or suspected of being exposed to formaldehyde, follow procedures below in section**

8. Exposure Procedures.

*** On UW Seattle campus call 911 on a campus phone; at medical centers and other locations follow internal emergency procedures.**

- **Spills inside a fume hood, BSC, glove box or approved containment; and**
- **Small Spills (250 ml or less) outside of fume hood or containment**

1. Spills, regardless of size, inside a fume hood can typically be cleaned up by trained people who are not sensitive to formaldehyde.
2. Small spills outside a fume hood (250 ml or less) can also be managed by trained people who are not sensitive to formaldehyde.
3. Personnel must wear a lab coat or smock, safety goggles, two pairs of disposable nitrile exam gloves or one pair of thicker nitrile or butyl gloves (minimum 10 mil thickness) or Silver Shield gloves and shoe covers as needed when cleaning up spills.
4. **Liquids:** Wipe up spilled liquids with absorbent pads. If using a formaldehyde neutralizing absorbent, cover the spill with the absorbent and allow to set for the prescribed contact time (usually 15 min.), and then scoop up and dispose of properly.
5. **Solids:** Gently cover paraformaldehyde solid spills with wetted paper towels or absorbent pads to avoid raising dust and then wipe up.
6. Clean the spill area thoroughly with detergent solution followed by clean water.
7. If spill is extensive within the containment, clean all interior surfaces after completion of the spill cleanup.
8. Double bag all waste in plastic bags labeled with a hazardous waste label that reads "formaldehyde spill debris." Complete either an Online Chemical Waste Collection Request or a Chemical Collection Request Form found on the EH&S website. Email the form to chmwaste@uw.edu.

- **Large spills (greater than 250 ml) outside of fume hood or containment**

1. Large formaldehyde spills (greater than 250 ml) outside a fume hood or containment may generate vapors above formaldehyde exposure limits; therefore, these spills require the use of respiratory protection.
2. Cover spill if possible to keep vapors down.
3. Evacuate area and restrict access. Attend to injured or exposed persons using emergency shower or eyewash. Follow procedures below in 8. Exposure Procedures.
4. As soon as possible report the spill in a safe area by notifying EH&S (during business hours (M-F/8-5) 206-543-0467, outside business hours 911* on a campus phone). Tell them that a spill has occurred, and you need help

	managing the spill. EH&S can arrange for a spill cleanup contractor. Notify supervisor. 5. Be prepared to provide the following information: • Name and phone number of knowledgeable person that can be contacted • Name of chemical spilled, concentration and amount spilled, liquid or solid type spill • Number of injured, if any (refer below to 8. Exposure Procedures in case of emergency) • Location of spill This information can also be used in reporting to the Emergency Department (ED) after potential exposure. 6. **Only if staff are trained, have the proper PPE including respiratory protection and are comfortable with cleaning up the spill, they may proceed to clean it up.** Personnel must wear a lab coat or smock, safety goggles, two pairs of disposable nitrile exam gloves or one pair of thicker nitrile or butyl gloves (minimum 10 mil thickness) or Silver Shield gloves, shoe covers, and a respirator specifically for protection against formaldehyde. Respirator use requires enrollment in UW's respirator program. Contact EH&S at uwresp@uw.edu for information or see https://www.ehs.washington.edu/workplace/respiratory-protection. 7. **Liquids:** Wipe up spilled liquids with absorbent pads. If using a formaldehyde neutralizing absorbent, cover the spill with the absorbent and allow to sit for the prescribed contact time (usually 15 min.), and then scoop up and dispose of properly. 8. **Solids:** Gently cover paraformaldehyde solid spills with wetted paper towels or absorbent pads to avoid raising dust and then wipe up. 9. Clean the spill area thoroughly with detergent solution followed by clean water. 10. Double bag all waste in plastic bags labeled with a hazardous waste label that reads "formaldehyde spill debris." Complete either an Online Chemical Waste Collection Request or a Chemical Collection Request Form on the EH&S website. Email the form to chmwaste@uw.edu. Any spill incident requires the involved person or supervisor to complete and submit the Online Accident Reporting System (OARS) form to EH&S within 24 hours (8 hours if serious injury or hospitalization). For questions on spill cleanup, contact EH&S spill consultants at 206-543-0467. *** On UW Seattle campus call 911 on a campus phone; at medical centers and other locations follow internal emergency procedures.**
8. Exposure Procedures In Case of Emergency	**1. Provide First Aid Immediately** • For sharps injury (needlestick or subcutaneous exposure), scrub exposed area thoroughly for 15 minutes using warm water and sudsing soap. • For skin exposure, use the nearest safety shower for 15 minutes. Stay under the shower and remove clothing. Use a clean lab coat or spare clothing for cover-up. • For eye exposure, use the eyewash for 15 minutes while holding eyelids open.

	• For inhalation exposure, move out of contaminated area. Get medical help. **2. Get Help** • Call 911* on campus phone or go to nearest Emergency Department (ED). Give details of exposure, i.e. chemical, dose, route of exposure, time since exposure. Bring to the ED the SDS and this SOP. • Notify your supervisor as soon as possible for assistance. • Secure area before leaving. **3. Report Incident to Environmental Health & Safety** • During business hours (M-F/8-5) call 206-543-7262. • Outside business hours call 206-685-UWPD (8973) or 911* to be routed to EH&S staff on call. • If serious accident, hospitalization or fatality, notify EH&S immediately after providing first aid and/or getting help. • For all incidents and near misses, the involved person or supervisor completes and submits the UW Online Accident Reporting System (OARS) form to EH&S within 24 hours (8 hours if serious injury or hospitalization). *** On UW Seattle campus call 911 on a campus phone; at medical centers and other locations follow internal emergency procedures.**
9. Waste Collection and Disposal Waste Formaldehyde Treatment (if applicable)	**Collection** • Waste formaldehyde-containing chemical is considered a hazardous chemical waste. • Accumulate waste in a sturdy, chemically compatible container with a secure closure. For contaminated debris, a bag may be used, but it must be strong enough to prevent the contents from puncturing through. • Double bag all used and contaminated (not grossly contaminated) disposable items, such as gloves, paper towels and absorbent pads, in plastic bags. Label as non-hazardous waste before disposing in the trash. • Place grossly contaminated disposable items in double plastic bags for hazardous waste pickup. • All waste containers must be properly labeled with all of the contents. • All waste containers must be properly closed or sealed. • Waste formaldehyde-containing solutions with specimens or tissue samples must be separated before disposal. The specimens may be considered biohazardous waste, which would need to be handled according to procedures given at www.ehs.washington.edu/biological/biohazardous-waste **Disposal** • For waste pickup: Complete either an Online Chemical Waste Collection Request or a Chemical Waste Collection Request Form (PDF) on the EH&S website. Email the form to chmwaste@uw.edu. • Contact EH&S Environmental Programs Office at 206-616-5835 or email chmwaste@uw.edu for waste disposal guidance and instructions.
10. Special Precautions for Use of Formaldehyde-containing products in Animals (if applicable)	Use of Formaldehyde-containing products in animals will be documented and approved by IACUC. NA

Particularly hazardous substance involved?	X YES:	Blocks #11 to #13 are Mandatory
	__ NO:	Blocks #11 to #13 are Optional.

11. Approval Required	All staff working with Formaldehyde-containing products must be trained on this SOP prior to starting work. They must also be trained on the Formaldehyde-containing products SDS, and it must be readily accessible in the laboratory. All training must be documented and maintained by the PI or their designee.
12. Decontamination	All surfaces will be decontaminated with detergent and water after removing the plastic backed pads.
13. Designated Area	All work with Formaldehyde-containing products must be done in a designated laboratory, work space, and fume hood. This work will be conducted in BB273

Name: Jesse Zaneveld	Title: Associate Professor
Signature: 	Date: 6/16/23

Zaneveld Lab Documentation of Training **Standard Operating Procedure for** Formaldehyde-containing products		
Name	**SOP Training Date**	**Signature**
Tanya Brown	6/16/2023	
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