DIVISION OF RESEARCH & INNOVATION Research Integrity & Compliance	**Institutional Animal Care and Use Committee** **Standard Operating Procedures**

Title: Use of Paraformaldehyde in Animals

Effective Date:	December 22, 2020	**Document Number:**	IACUC-SOP-02-31.00

Approval/Date:

Jamie Peno — 12/22/2020

Jamie Peno — **Date**

Director, Research Integrity and Compliance

REVISION HISTORY

Date	Section	Author

PURPOSE

Paraformaldehyde (PFA) is the polymerized solid form of Formaldehyde that is a commonly used fixative that is often perfused to preserve and stabilize cells and tissues for examination and processing. Because PFA solution emits formaldehyde gas, a known carcinogen, safe handling of these agents and the appropriate disposal of all affected tissues and carcasses is important.

SCOPE

It is the responsibility of the Principal Investigator (PI) at the University of North Texas to follow the procedures set forth below for safety in preparation, usage, storage, and disposal of PFA.
It is the responsibility of the PI to include the detailed use of PFA for perfusion in the IACUC protocol to be approved before it can be used.
It is the responsibility of the PI to appropriately document and train research personnel in the safe use of this agent in the species approved on the protocol.

DEFINITIONS AND ABBREVIATIONS

UNT- University of North Texas, Denton
IACUC- Institutional Animal Care and Use Committee
PFA- Paraformaldehyde
SOP/SOP's- Standard Operating Procedure(s)
AUP- Animal Use Protocol
PI- Principal Investigator
AV- Attending Veterinarian

PROCEDURES

I. Formulation of PFA

A. PFA is considered a carcinogenic chemical hazard that has the potential to cause harm to people, animals, and the environment.

1. Solutions may contain 0.1%- 37% formaldehyde
2. PFA is toxic by inhalation, ingestion, and skin absorption causing irritation to the respiratory system, eyes, and skin.
3. Prolonged and/ or repeated exposure can cause targeted effects to the kidneys, liver, heart, and central nervous system. PFA should also be considered a developmental and reproductive system toxin.
4. In solid form and higher concentration solutions, PFA is considered flammable, and combustible.

II. Safety Precautions

A. Personnel using PFA should be familiar with the SDS and pertinent laboratory procedures which should be readily available in the lab. Specific questions regarding best safety practices using PFA should be directed to UNT Risk Management Services.

1. Work with this carcinogen should be conducted in a designated and certified chemical fume hood, ducted biosafety cabinet, or downdraft table that has been approved by Risk Management. Workspaces should be lined with an absorbent disposable pad that should be disposed of properly.
2. Use the smallest practical quantities and concentrations for the experiment.
3. Dry reagent should be measured out in a weighing container.
4. Fixed tissues should be rinsed with Phosphate-buffered saline (PBS) when removed from the fixative container and should be handled with forceps.

B. Personal Protective Equipment should always be used appropriately when using PFA and should include:

1. Safety glasses, splash-proof goggles or face shield
2. Clean chemical protection lab coat or gown
3. Nitrile disposable gloves
4. Close-toed shoes

C. Transport and Storage

1. All containers including specimen containers should be clearly labeled with the formulation concentration and the date of preparation.
2. Solutions should be stored in a tightly-closed container in flame-resistant cabinets.
3. When transporting PFA, solutions should be carried in a secondary sealed container.

III. Use in Rodents

A. Perfusing PFA in rodents may only be done as a terminal procedure with the animal under a confirmed surgical plane of anesthesia or post euthanasia.

B. For best practices and detailed perfusion apparatus and procedural figures and resources from NIH see:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3476408/

IV. Disposal

A. All product containers, empty containers, and treated tissues or specimen should be disposed of as hazardous chemical waste.

B. Please contact UNT Risk Management Services for assistance with proper disposal.

REFERENCES

1. The Guide for the Care and Use of Laboratory Animals.
2. Gage GJ, Kipke DR, Shain W. Whole animal perfusion fixation for rodents. J Vis Exp.

2012;(65):3564. Published 2012 Jul 30. doi:10.3791/3564

APPENDICES

IACUC Standard Operating Procedures