AUTOCLAVE POLICIES AND PROCEDURES

1. PURPOSE:

The purpose of this policy is to ensure that the Department of Biological Sciences follow uniform procedures for handling, autoclaving and disposal of medical waste in accordance with Stanford University and the State of California medical waste disposal procedures.

2. DEFINITIONS:

AUTOCLAVE: a device designed to sterilize equipment or biological waste by means of heat, and pressure within a chamber.

BIOHAZARDOUS/MEDICAL AGENT: a pathogen that is capable of replication and is a disease causing microorganism capable of causing diseases in humans, animals, or plants. Examples included viruses, microbes and sub-viral particles. The term agent refers to the agent itself, products of infectious agents and the components of infectious agents that present a risk of illness or injury.

BIOHAZARDOUS/MEDICAL MATERIAL: any material that harbors biohazardous agents including human or animal blood, body fluids, or tissues that may be contaminated with biohazardous agents.

BLOOD: human blood, human blood components, and products made from human blood or animal blood infected with human pathogens.

PERSONAL, PROTECTIVE EQUIPMENT: specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

REGULATED WASTE: liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.
STERILIZE: the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

III. RESPONSIBILITIES:

A. Administrative Panel on Biosafety (APB)

   The APB is responsible for advising the University on all matters related to biosafety. With regard to medical waste disposal, the APB describes University medical waste disposal procedures on the EH&S website.

B. EH&S is responsible for the following:

   Preparing and updating, in a timely manner, biosafety policies and guidelines with regard to medical waste.

   Providing biosafety and medical waste disposal information as needed.

   Inspecting Department of Biological Sciences autoclave facilities on a routine basis to ensure compliance with the Medical Waste Management Act and campus medical waste policies.

C. Principal Investigator

   The Principal Investigator is responsible for the following:

   Segregating all medical waste at the point of generation from other laboratory waste

   Training and supervising laboratory staff on proper autoclave operations.

   Providing personal protective equipment, such as gloves and protective aprons to laboratory staff members who must operate the autoclave

   Ensuring that all laboratory staff members who must operate the autoclave are familiar with emergency procedures prior to operating the autoclave.
Notifying appropriate Department of Biological Sciences personnel whenever the autoclave is not operating properly.

IV. PROCEDURES

A. Background Information

A steam autoclave is a device designated to sterilize cultures, media, surgical instruments and non medical waste. Autoclaves will sterilize on the basis of:

   a. length of time in the cycle
   b. temperature
   c. contact
   d. pressure
   e. steam

B. Considerations for effective autoclaving

**DO NOT OVERLOAD THE BAG.** The autoclave steam and heat cannot penetrate the interior of an overloaded bag. The outer contents of the bag will be treated but the inner part of the bag will essentially be unaffected by the autoclave cycle.

**DO NOT** put sharp objects such as broken glass, which could puncture the bag.

**DO NOT OVERLOAD THE AUTOCLAVE**

**USE SECONDARY CONTAINMENT FOR AUTOCLAVING**

**DO NOT** mix autoclave bags and other items to be autoclaved in the same cycle. Media requires a shorter cycle, often 15-20 minutes while other non-hazardous waste may require a longer period of time, such as 30 minutes in order to be effectively sterilized.

C. Safety considerations for autoclave attendants:

Wear personal protective equipment to include heat-resistant gloves, goggles or safety glasses and a lab coat.
Use caution when opening the autoclave door. Allow superheated steam to exit.

Use caution when handling a bag in case sharp objects have been inadvertently placed in the bag. Never lift a bag from the bottom of the bag to load into the chamber. Handle the bag from the top.

Watch out for pressurized containers. Super heated liquids may spurt from sealed containers. Never seal a container of liquid with a cork which may cause a pressurized explosion inside the autoclave.

Agar plates will melt and the agar will become liquefied. Avoid coming in contact with this molten liquid. Use a secondary tray to catch any potential leakage from the bag which would otherwise leak into the autoclave.

Glassware may crack or shatter if cold liquid comes in contact with this superheated glassware. If glass breaks in the autoclave, use tongs, forceps, or other mechanical means to recover the fragments. **DO NOT USE BARE OR GLOVED HANDS TO PICK UP THE BROKEN GLASSWARE.** In the event of cleaning an autoclave for any reason, make certain that the autoclave has been cooled down to avoid surface burns.

Use an absorbent liner for glass vessels containing liquid. Never put autoclave bags or glassware directly in contact with the bottom of the autoclave.

### D. AUTOCLAVE OPERATIONAL PROCEDURES:

1. The autoclave attendant shall not autoclave a bag which has any of the following contents:
   
   a. Medical waste (disposed of as biohazardous waste in the biohazardous waste containers.)
   
   b. Sharps must be placed in a sharps container (disposed of as biohazardous waste); broken glass in a broken glass box
c. Items labeled with the universal radiation symbol (disposed of as radioactive waste)

d. Chemical solvent or reagent bottles (disposed of as chemical waste)

E. RECORDKEEPING

The Department of Biological Sciences autoclave attendant must perform a monthly spore test using the test organism, Bacillus stearothermophilus. This record shall be maintained in a log book and made available on request by county inspectors or EH&S representative. Use only the approved test kit which is the AMSCO spore test kit now available in Bio Stores.

All autoclave thermometer and temperature record tapes must be kept in a secure place for three years. These record must be made available on request by county inspectors or EH&S representatives.

Autoclave training shall be made available to full-time autoclave attendants on an annual basis. The attendance records shall be filed with the Department of Biological Sciences Safety Manager or her/his designee and shall be made available on request.

This SOP shall be signed by the Department Chair and autoclave attendant and filed in the autoclave room. It shall be available on request by county inspectors or EH&S representatives.

Routine autoclave audits shall be conducted by the Department of Biological Sciences Safety Manager or her/his designee and the Stanford Biosafety Officer. A copy of the audit form may be found in Appendix B of this SOP. Copies of the audit forms shall be filed with the Biosafety Officer and Department of Biological Sciences Safety Manager.