Engineering, Work Practice Controls and PPE:

Engineering, work practice controls and PPE must be used to eliminate or minimize exposure to individuals.

Engineering and Work Practices

1) **Hand washing**
   Personnel must wash their hands immediately upon removal of gloves and upon any contact with potential BBP materials.

2) **Mouth pipetting**
   Mouth pipetting is prohibited.

3) **No eating, drinking**
   Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are not permitted in work areas. Food and drink are not to be placed or stored in areas (refrigerators, microwaves, etc.) where potential BBP/OPIM are kept or may be present.

4) **Needles, sharps, and broken glass**
   Used needles and other sharps are not to be sheared, bent, broken, recapped, or resheathed by hand. Used needles are not to be removed from disposable syringes. Disposable sharps must not be reused. All sharps, contaminated or not, shall be disposed of in a puncture-resistant hard sided, labeled sharps container.

   Broken glassware must not be directly handled with a gloved or bare hand. Use a mechanical tool (tongs, dustpan and broom) to collect the pieces into a hard-sided container labeled ‘Broken glass’ (non-contaminated). Contaminated broken glass must be placed in a puncture-resistant hard-sided container and disposed of as biohazardous waste (see Stanford Bio/Medical Waste Guidelines).

   A) **Safety Sharps**
      The Cal-OSHA BBP Standard requires any laboratory using human or primate blood, blood products, cell lines, tissues or other potentially infectious materials to use Needleless Systems/and or engineered sharps (‘safety sharps’).

   B) **Documentation of use of non-safety sharps (Appendix C)**
      A sharps device without safety feature(s) may only be used if:
      - Alternative products are not market-available
      - Alternative products do not clearly improve safety
      - Available product(s) jeopardize(s) patient safety

   The evaluation process for the use of a **non-safety sharp** must be documented; any use of non-safety sharps must be re-evaluated and documented annually. Record the process using Appendix C and retain the document with the Local ECP (Appendix C provided at end of Local ECP).

5) **Minimization of aerosols**
   Biological safety cabinets (Class I or II (A1, A2, B1, B2)) or other physical containment devices must be used whenever possible while performing operations capable of creating aerosols. If a biological safety cabinet cannot be used, the most effective means of minimizing exposure to aerosols is to contain them by using closed containers (sealed centrifuge rotors, capped test tubes, etc.).

6) **Disinfection of work area and spill cleanups**
   The work area must be disinfected before and after handling BBP/OPIM. Non-laboratory personnel should not handle equipment that has been used with potential BBP’s until it has been decontaminated. All spills must be cleaned up immediately and disinfected with a germicide by appropriate decontamination procedures determined by the laboratory supervisor. The laboratory supervisor or other laboratory personnel must immediately report laboratory accidents (major spills, injuries, illnesses) to EH&S (650.723.0448). For additional information see Spills under Reference...
information on the biosafety web page (http://www.stanford.edu/dept/EHS/prod/researchlab/bio/) then Safety/Medical Monitoring Exposure Control Plan.

7) Labeling and Communication

A biohazard warning sign incorporating the universal biohazard symbol ☠ shall be posted on the access door to the laboratory work area. All BBP/OPIM must be stored in containers labeled with a biohazard symbol. Equipment where potentially infectious materials are stored or handled must also be labeled with the biohazard symbol. Placards are available from EH&S.

8) Limited Access

Access to a laboratory is limited or restricted by the laboratory supervisor when work is in progress. When work with blood or blood products is being performed, non-laboratory personnel (maintenance, administrative personnel) and non-authorized should be discouraged from entering. If they must enter a facility, the hazards of the work being performed must be fully explained.

9) Transportation on Campus

Specimens of blood or other potentially infectious materials shall be placed in a primary container that prevents leakage (capped test tube, centrifuge tube, etc.) during collection, handling, and storage. If the specimens are transported through hallways, the primary containers must be placed in a secondary container (bucket, non-breakable tube or container, cooler, etc.) which would contain the contents if the primary container if it were to leak or break.

10) Shipping of Samples

In compliance with the Department of Transportation regulations (Biosafety - under Shipping), personnel involved with shipping of biohazardous agents or potential BBPs must have documented training prior to shipping. Shipping training can be done online with “EHS-2700: DOT: Shipping Biological Goods or Dry Ice” available online at axess.stanford.edu.

11) Blood Collection

All human blood collection shall be performed in accordance with established phlebotomy procedures.

12) Biological Waste Disposal

Specific procedures for the disposal of biological materials are available from are found on the Medical Waste Poster (Medical Waste Guide) and can also be found in the Stanford University Biosafety Manual and on the Biosafety website.

13) HIV, HBV and HCV Research Laboratories

If PI/Supervisor cannot verify personnel experience and proficiency, they shall ensure personnel are provided necessary training prior to assigning work potentially involving HIV, HBV or HCV.

This section applies, in addition to the above requirements, to research laboratories engaged in the culture, production, concentration, experimentation, and manipulation of HIV, HBV and HCV.

A. Laboratory doors shall be kept closed when work involving HIV, HBV or HCV is in progress.

B. Access to the work area shall be limited to authorized persons.

C. All activities involving OPIM shall be conducted in biological safety cabinets or other physical-containment devices within the containment module.

D. Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from animals and diaphragm bottles. All sharps (needles, blades, etc.) must have engineered sharps protection.

E. Written biosafety procedures shall be prepared and adopted into the local Exposure Control Plan; a copy of the approved APB protocol can be used for this purpose. Personnel shall be advised of potential hazards, shall be required to read instructions on practices and procedures, and shall be required to follow them.
F. Personnel shall have prior experience in the handling of human pathogens or tissue culture.
Personal Protective Equipment

Personnel must wear gloves, lab coat, and safety glasses whenever handling blood/BBPs/OPIM. In addition to above items, personnel must wear any additional PPE (booties, face shield, etc.) that is needed to prevent blood or other potentially infectious material from contaminating their street clothes, skin, eyes, mouth, or other mucous membranes under normal conditions. All PPE shall be removed prior to leaving the work place and placed in appropriate designated areas.

Personal protective equipment (PPE) will be provided without cost to all individuals who are at risk of occupational exposure to bloodborne pathogens. The protective equipment will be considered appropriate only if it does not permit blood or other potentially infectious materials to pass through or reach the individual's clothing, skin, eyes, mouth, or other mucous membranes during use. Consultation or advice on PPE is provided by Stanford University EH&S.

1) **Eye protection**
   Protective eye wear must be worn in the laboratory when it is reasonably anticipated that blood or other potentially infected material may make contact with the mucous membranes of the eye. Face shields may be required in addition to protective eyewear if there is a potential for splashes, sprays, or aerosols.

2) **Lab coats and protective clothing**
   Laboratory coats, gowns, smocks, etc. must be worn while in the laboratory. Protective clothing must be removed and left in the laboratory before leaving the lab. Wear appropriate street clothing (i.e. long pants, closed-toed shoes) in addition to PPE. Personnel are not permitted to take home any PPE, including lab coats, for laundering or cleaning.

3) **Gloves**
   All personnel engaged in activities that may involve skin contact with potentially infectious fluids or tissues must wear gloves. Gloves are also required for laboratory workers with dermatitis or other lesions on the hands who may have direct or indirect contact with potentially infectious materials. Gloves must be replaced frequently and immediately if they become contaminated or damaged in any way. Gloves should be removed before touching common equipment (phone, computer, appropriate laboratory equipment) to prevent contamination.