SAFETY PROTOCOLS FOR HANDLING UNFIXED HUMAN TISSUE, BLOOD AND BODY FLUIDS IN RESEARCH

A. Introduction

While risks associated with exposure to blood and tissues infected with Hepatitis B can be mitigated by vaccination of laboratory workers, there is always the potential for infection from the risk of other infectious agents such as Hepatitis C, HIV and CJD when handling human specimens.

The risks associated with handling human tissue can be managed by:

1. treating all human specimens, body fluids and blood as potentially infectious.
2. minimising the likelihood of blood-to-blood exposure.

These safety measures are known as 'Universal Precautions' and must be followed when handling human specimens.

Human material must be handled using Universal Precautions as outlined in Section B. If applicable, the Additional Precautions outlined in Section C below are also to be followed.

Procedures for disposal and spill clean up are outlined in Sections D - G. There is also a specific set of protocols to be followed (Section H) in the event of a 'needle-stick' injury.

B. Universal Precautions for Handling Unfixed Human Tissue, Blood and Body Fluids

1. Treat all human blood, tissue and body fluids as potentially infectious.

2. Absolutely no eating or drinking in the laboratory. Food or drink should not be stored in laboratories. Hand/mouth contact should be kept to a minimum.

3. Laboratory coats or appropriate gowns must be worn in the laboratory and fastened properly. Laboratory coats/protective gowns must be removed when leaving the laboratory area to go to tea-rooms, offices, toilets or seminar rooms.

4. Gloves must be worn when handling human blood, tissue and body fluids.

5. All open cuts and abrasions must be covered.

6. Care must be taken to prevent contaminated gloves coming in contact with laboratory furniture, door handles and telephones.

7. Use disposable equipment wherever possible and observe correct disposal procedures (see Section D below).

8. Hands should be washed and dried after removing gloves and before leaving the laboratory/blood collection area.

9. Any spills of infectious (or potentially infectious) material on floors, benches or equipment must be cleaned up immediately with disinfectant (see below).

10. All samples must be properly labelled. Because the outside of the tube may be contaminated, tubes should be handled with care. Samples should be stored in an appropriate labelled, designated refrigerator or portion of the refrigerator or freezer.

11. When transporting samples, sample tubes should be placed within a leak-proof container with a secure lid.

12. Do not attempt to separate needles from syringes. Dispose both together. Do not attempt to recap a needle.

13. Avoid techniques with a high potential for creating aerosol (sonication, vortexing, blowing out pipette contents).

14. All accidents must be reported immediately to the Principal Investigator or Operations Manager and an accident/incident form filled out.

C. Additional Precautions for Working with Human Blood, Unfixed Tissue and Body Fluids

1. Venous blood must only be taken by suitably trained staff. Such staff may be doctors or nurses or those who have undergone training in phlebotomy. Ensure adequate consent has been obtained and that Faculty privacy protocols are followed.

2. All laboratory personnel must have their Hepatitis B antibody checked (and be immunised, if necessary) before handling human blood, tissue or body fluids.

3. Wherever possible, blood or tissue that has been shown not to be contaminated by Hepatitis B, Hepatitis C or HIV should be used.

4. Never use cells from staff or their relatives to transform cell lines, due to higher risk of re-exposure to histocompatible cell lines

5. Work with human blood, wherever possible, should be performed in a certified Class 2 Biohazard cabinet (see also 6 and 7 below).

6. Where blood is being collected with minimal processing (e.g. isolation of serum), work may be conducted outside a certified Class 2 Biohazard cabinet, provided centrifuges are fitted with sealed rotors and Universal Precautions for handling blood are observed.

7. Larger specimens or procedures that will not fit into, or cannot be reasonably accommodated in a Class 2 Hood may be handled outside a Class 2 Biohazard cabinet, provided that there is adequate ventilation for any aerosols that might be generated and adequate protective equipment (face shields) to prevent splashes of biological material into mucous membranes

8. Do not use vacuum aspiration. Pipette supernatants to a disposable tube and then autoclave/chemically sterilise the waste supernatant.

9. Use sealed tubes for centrifuging blood samples. Use sealed rotors to minimise contamination in the event of tube failure. In the event of a failure of tubes the centrifuge rotor and bowls should be disinfected with 1% Virkon solution (see Section E below).

10. Laboratory benches and hood surfaces where blood has been handled must be cleaned and decontaminated at the completion of work. Use swab impregnated in an intermediate disinfectant such as 0.05% sodium hypochlorite, a peroxygen biocide such 1% Virkon or proprietary disinfectant such as Trigene

11. Report any accident or spillage of infectious material to the Principal Investigator or Operations Manager immediately.

D. Disposal of Waste Equipment

1. All disposable equipment, tissues and gloves that have been used in processing and handling of human specimens must be disposed as biohazardous waste. Double-bag any material that might potentially puncture medical waste bag. When in doubt, discard waste into a sharps bin in preference to a biohazardous waste bag.

2. Glass containers, vacutainer tubes, scalpels, needles and syringes must be disposed in sharps bins. Sharps bins must never be overfilled. Ensure lids to sharps bins are properly secured before putting the bins out for collection.

E. Cleaning and Disinfecting Equipment

1. Soak glass in fresh 0.05% sodium hypochlorite or a proprietary disinfectant (Virkon, Trigene) at concentrations recommended by the manufacturer for at least 30 minutes. The action of many disinfectants is severely hampered by presence of protein. Where possible, remove proteinaceous material before soaking.

2. Metal will be corroded by sodium hypochlorite. Use alternative proprietary disinfectant solutions (1% Virkon, 1% Trigene) to disinfect centrifuge rotors, centrifuge bowls and other metal equipment.

F. Disposal of Waste Specimens

1. Blood, small human tissue specimens or contaminated waste, wherever practicable, must be decontaminated, preferably by autoclaving.

2. Where autoclaving is impractical, small amounts of human material can be placed in a sealed sample tube and treated with hypochlorite (final concentration 0.05%), Virkon (to a final concentration of 1%) or Trigene (to a final concentration of 1%), held for 30 minutes, and sent out for disposal as medical waste.

3. Where sluice sinks are employed, human material must be decontaminated by autoclaving or by treatment with hypochlorite, Virkon or Trigene prior to discharge (see 2 above).

4. Where risk assessment demonstrates that rendering larger specimens nonviable on site may involve extra risk and increase the likelihood of splashes and generating aerosols, alternative procedures may be employed. Specimens may be sent directly to medical waste provided extra precautions are taken to ensure all material (including blood) is double contained and the likelihood of spills at any stage en route is kept to an absolute minimum.

5. All disposal of human tissue must be consistent with tissue consent procedures and donors wishes.

G. Clean up of Blood Spills

1. Wear gloves throughout the clean up procedure.

2. Spills can be decontaminated with Sodium hypochlorite (freshly made dilution of 1:100 final concentration of household bleach or 5% solution).

3. Surfaces can be decontaminated with a swab impregnated with 0.05% sodium hypochlorite.

After clean-up, dispose of gloves in medical waste and wash hands.

H. 'Needle Stick' Injury

1. Any ‘needle stick’ or similar injury involving blood or body fluids must be reported and medical assistance sought immediately. It should not be assumed that blood from a colleague is safe, or that past Hepatitis B vaccination will provide sufficient levels of antibody against HBV.

2. Wherever possible, contact Auckland Hospital Accident and Emergency to provide advance notice of ‘needle stick’ injury.

3. It is important that such accidents are reported and the assistance of Auckland Hospital Emergency Department is sought immediately.

4. The Auckland Hospital Emergency Department may need to arrange tests to detect Hepatitis B, Hepatitis C and HIV infection in the donor. Wherever possible, the person who was the source of the blood should also attend.