UNIVERSITY OF BIRMINGHAM

Health and Safety Guidance
Work with Non-human Primate Body Fluids and Tissues

GUIDANCE/25/NHPBFT/15

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Guidance on work with non-human primate body fluids and tissues

Introduction

Work with non-human primate material is undertaken infrequently within the University, but simians naturally harbour a number of infectious agents and the material may potentially pose a high risk to those persons handling it. Appropriate measures therefore need to be in place before the material is received on site and work is carried out.

Simians (monkeys and apes) can be divided into two groups – Old and New World species. New World primates (e.g. marmosets) are less likely to be infected with serious zoonotic agents than Old World primates (e.g. macaques). However, deficiencies in quarantine or handling arrangements can lead to the transfer of pathogens between species. Some simian pathogens are listed at the end of this guidance note.

Tissue culture involving primate sourced cells is considered to pose a high risk because of the potential for the presence of infectious agents. If these cells are authenticated and characterised the risk is immediately lowered.

Risk assessment and SOPs

An assessment of the work should outline the following:

- Aims and objectives of the work;
- Nature of the material, and importantly, its source;
- Details of screening carried out on material, and the results;
- Likelihood of infectious agents present;
- Assignment of appropriate containment level;
- Control measures in the laboratory;
- Details of waste treatment;
- Accident and Emergency procedures (to include Occupational Health involvement).

Accompanying Standard Operating Procedures (SOPs) should then provide further detail on laboratory procedures and waste disposal.

Containment

CL2 would be the minimum acceptable containment level for work with primate material. However, additional controls, or a higher containment level, will almost certainly be necessary depending on the results of screening and the likelihood of infectious agents being present. The agents associated with Old World monkeys can be transmitted by a number of routes including inhalation, accidental inoculation with sharps, or splashes on mucosal membranes. An emergency policy in the event of an accident is essential, and is described in the ACDP/HSE publication, “Working safely with simians – Management of infection risks”, which is essential reading for those working with primate material.

Simian herpes B virus

Up to 90 percent of adult rhesus macaques are infected with the herpes B virus. The virus is relatively benign in the macaque, but causes a severe infection in humans, for which there is no vaccine or cure (there is chemotherapy which should be administered early). People may be exposed to the virus when handling bodily fluids of infected animals, or when they are scratched or bitten.

Herpes B virus may be present as a latent infection in Old World simians. It is classified as a HG4 agent, and cannot therefore be handled within the University. There have been a number of documented deaths from occupational infection with the virus, and animal material must be confirmed as being Herpes B virus seronegative, or coming from seronegative animals, before it is accepted onto the premises. Although serological tests do not always provide a complete guarantee of freedom from infection, it is essential that appropriate action has been taken to screen the colony and to ensure, so far as is possible, that the source primate population is free from B virus. Guidance on this is contained within the ACDP/HSE document, "Working safely with simians – Management of infection risks". An animal can be considered seronegative if it has had a negative test for B virus antibody on two occasions, separated by at least 2 months, during which it has been kept isolated from other animals that may be infected.

Occupational Health issues

Exposure to simian material through needlestick injuries, splashes onto mucous membranes etc, should be reported to Occupational Health immediately. GPs should also be informed of the nature of the individual's work in the event of unusual ill health.

APPENDIX 1
Examples of simian pathogens

Simian Herpes B virus

HG4 agent - Carried by Old World simians, mainly rhesus monkeys, but also other macaques. Disease generally sub-clinical or benign with vesicles on tongue, mouth and lips. Animals that have seroconverted probably remain latently infected for life. Infection may reactivate spontaneously if the animal is immunocompromised, stressed or pregnant. Human B virus infection in humans presents as an ascending encephalomyelitis, with a mortality rate of 80%.

Filovirus (Ebola and Marburg)

HG4 agents - Primates may serve as intermediate hosts. Clinical signs of infection in animals include fever, lethargy, hypovolaemic shock and haemorrhage. In humans the incubation period is approximately 5 - 10 days. Marburg is an acute febrile illness with severe diarrhoea and haemorrhage. Ebola onset is abrupt with headache, joint pain, fever and sore throat. Death follows hypovolaemic shock. There is no treatment for either disease, merely supportive therapy.

Tuberculosis

HG3 and HG2 agents, depending on species. The agents (*Mycobacterium tuberculosis*, *Mycobacterium bovis* etc) may be found in Old World monkeys in research animal facilities. Wild caught monkeys contract the disease typically from humans in the country of origin. Inhalation is the major route of entry for humans.

Simian Immunodeficiency Virus (SIV) and Simian T cell Lymphotrophic virus (STLV)

HG3 agents – common in African green monkeys. SIV is closely related to HIV-2 and was isolated from captive rhesus macaques. STLV was isolated from African green monkeys and chimpanzees, and is similar to HTLV-1. SIV infection has been reported in lab workers. Transmission would be via needlestick injuries.

APPENDIX 2
Animal health import licences and CITES – Convention on International Trade in Endangered Species

Anyone wishing to import primate material (or indeed material from other animals) should be aware of the need for import licences. An import licence from Defra may be required for incoming shipments of animal by-products and these may need to be applied for in advance. For further information see the University's guidance note on imports and consult Defra's Animal and Plant Health Agency website: https://www.gov.uk/transporting-animal-by-products#importing-exporting-and-trading-abps

Primate material may require a CITES licence, and advice on the import of any primate material should be sought from the appropriate authority (see below).

CITES is an international convention which regulates and monitors trade in endangered animals and plants, and products derived from them. It does not aim to end trade in wildlife but seeks to ensure that any trade is carried out in a sustainable way that ensures the long term survival of all species. CITES regulates trade in over 30,000 species of plant and 5500 species of animal. CITES works by categorising endangered species and placing them into different appendices (I – III), which offer different levels of protection. For further information on CITES, contact Defra at:

Department for Environment, Food and Rural Affairs (Defra)
Better Regulation, EU and International
Zone 1/145, Temple Quay House
2 The Square
Temple Quay
BRISTOL BS1 6EB

Tel: +44 (117) 372 36 00
Email: cites.ukma@defra.gsi.gov.uk
Website: http://www.gov.uk/cites-controls-import-and-export-of-protected-species

Further information:

Available online - Working safely with simians: Management of infection risks (ACDP)

Available online - Biological Agents: Managing the risks in laboratories and healthcare premises (ACDP)

Both of these documents can be obtained from the HSE website – www.hse.gov.uk