1. PURPOSE

This Standard Operating Procedure (SOP) describes the screening of biological material to be used *in vivo* and obtained from an outside source for the presence of rodent or human pathogens.

2. RESPONSIBILITY

Principal Investigator (PI), veterinarian

3. INTRODUCTION

3.1. Biological material refers to cell lines, transplantable tumors, serum, tissues, body fluids, antibody preparations or hybridoma lines of animal or human origin.

3.2. When biological material from an unknown source is introduced into an animal, it is a potential source of contamination by adventitious pathogens if the material originated from or passed through an infected animal. The pathogen has the potential to infect an animal that is inoculated with the biological material.

3.3. Primary cells derived from animals can become contaminated with pathogens from other animal cell lines if the two types of cells are cultured in the same incubator. Thus, a compatible tissue source pathogen status must be verified to prevent cross-contamination.

3.4. In an effort to protect staff members working with animal models that have been exposed to human cells or tissues, human samples should be pre-screened before use when possible. Where testing is not possible, contact Environmental Health and Safety for recommendations.

3.5. Previous testing may be sufficient if documentation is available detailing the testing method, the list of screened pathogens, the testing laboratory, and date of testing , and provided the specimens have not been passed through rodents or rodent cells or serum since the latest testing. Previous use in a colony of rodents for which concurrent health surveillance revealed no infectious agents may also be adequate. Exemption from testing is evaluated on a case-by-case basis by the veterinarian.

3.6. Do not introduce biological materials into rodents in any animal facility without prior consultation with the veterinarian.

4. PROCEDURES

4.1. Use of biological material must be described in the Facility Animal Care Committee (FACC) approved Animal Use Protocol (AUP). Testing results and/or certificates of analysis should be attached to the AUP prior to approval.

4.2. Biological material purchased from commercial vendors is supplied with a certificate of analysis detailing the rodent and/or human pathogens for which it has been screened. If a certificate is not available, or if the biological material has not been screened for all the relevant pathogens as detailed in section 4.7, it must be tested prior to use *in vivo*. Typically, biological material obtained from culture collections, e.g., American Type Culture Collection (ATCC), is not tested for the presence of rodent pathogens.

4.3. Before testing, it is essential to establish a cell line at the volume and concentration planned for the coming years. Aliquots are frozen at -80°C or in liquid nitrogen. One aliquot is tested for pathogens and the remainder, provided it has been tested free of relevant pathogens, can be used as required.

4.4. The need for retesting is evaluated by the veterinarian when the AUP is up for full renewal, every four years.

4.5. Biological material of animal origin (refer to Annex 1):

4.5.1. Material should be tested for all the pathogens detailed in the corresponding rodent profile in section 4.7.3.

4.5.2. Testing of material originating from a McGill animal facility/room within the virtual facility network with same or higher Bioexclusion Level is not required.

4.5.3. If the entire research protocol using material of untested or unknown animal origin will be conducted in a Biocontainment Level 2 (BCL2) facility, and the animals will not be moved to another McGill facility at any point, testing of rodent biologicals prior to use is not required.

4.6. Biological material of human origin (refer to Annex 1):

4.6.1. Material should be tested for human pathogens as detailed in section 4.7.2 and the corresponding rodent profiles detailed in section 4.7.3.

4.6.2. If the entire research protocol using material of untested or unknown human origin will be conducted in a Biocontainment Level 2 (BCL2) facility, and the animals will not be moved to another McGill facility at any point, testing of materials prior to use is not required.

4.6.3. If credible documentation is available that the material has never been passaged through or established in rodents, or exposed to rodent products, e.g., rodent-derived feeder cells, serum, testing of materials for rodent pathogens prior to use is not required. Exemption from testing is evaluated on a case-by-case basis by the veterinarian.

4.6.4. Patient-derived xenografts (PDX):

4.6.4.1. It is recommended for the donor (patient) should be tested for the human pathogens as detailed in section 4.7.2. when possible. When testing is not feasible, contact Environmental Health and Safety for recommendations.

4.6.4.2. If the PDX will not be passaged through rodents, testing for rodent pathogens is not required.

4.7. Panel selection:

4.7.1. Select the testing panel as per the veterinarian's recommendation. The veterinarian may require additional tests based on health status of the host facility.

4.7.2. Human profile:

4.7.2.1. For testing of human primary cells, i.e., cells isolated directly from human tissues, including blood and bone marrow.

VIRUSES
Human immunodeficiency virus (HIV1, HIV2)
Hepatitis viruses (A, B, and C)
Hantaviruses (Hantaan, Seoul, Sin Nombre)
BACTERIA
Mycoplasma spp.

4.7.3. Rodent profiles:

4.7.3.1. For testing of human or animal cell lines, or primary animal cells, intended for use *in vivo* in rodents

	Mouse	Rat	Mouse/Rat Comprehensive
VIRUSES			
Adenovirus Type 1 and 2	●	●	●
Ectromelia	●		●
Group A Rotavirus	●		●
Group B rotavirus		●	●
Hantaan virus	●		●
Hantavirus Seoul		●	●
Kilham's Rat Virus		●	●
Lactate dehyrogenase elevating virus	●	●	●
Lymphocytic choriomeningitis Virus	●	●	●
Minute Virus of Mice	●		●

Mouse cytomegalovirus			●
Mouse hepatitis virus	●		●
Murine norovirus	●		●
Mouse parvovirus (MVM, MPV1-5)	●		●
Mouse T lymphotropic virus			●
Orthoreovirus	●	●	●
Pneumonia virus of mice			●
Polyomavirus	●	●	●
Rat cytomegalovirus		●	●
Rat minute virus		●	●
Rat parvovirus		●	●
Sendai virus	●	●	●
Sialodacryoadenitis virus, Rat coronavirus		●	●
Theilovirus	●	●	●
Toolan's H-1		●	●
BACTERIA			
Mycoplasma pulmonis	●	●	●
Mycoplasma spp	●	●	●

4.8. Submit samples for testing by PCR to a commercial laboratory. Consult the veterinarian for sample preparation instructions.

4.9. Results:

4.9.1. Results should be submitted to the appropriate Facility Animal Care Committee (FACC) with the Animal Use Protocol (AUP), renewals, and amendments.

4.10. Positive results:

4.10.1. Contact a veterinarian to discuss the necessary precautions required to prevent contamination of rodent populations.

4.10.2. For *Mycoplasma spp*, removal agents are available commercially to treat cell lines *in vitro*.

4.10.3. Other contaminants can be eliminated by in vitro subculture or in vivo subpassages in mice or nude rats.

5. SAFETY

5.1. All biologicals are potentially pathogenic, wear disposable gloves and institutional clothing (e.g., lab coat) when handling these materials.

SOP REVISION HISTORY

DATE	NEW VERSION
2015.09.10	4.7.2. For *Mycoplasma spp*, removal agents are available commercially to treat cell lines *in vitro.*
2015.09.10	4.7.3. Other contaminants can be eliminated by in vitro subculture or in vivo subpassages in mice or nude rats.
2019.11.20	**3.5. Previous testing may sufficient if documentation detailing the testing method, list of screened pathogens, testing laboratory, and date of testing is available, and provided the specimens have not been passed through rodents or rodent cells or serum since the latest testing. Previous use in a colony of rodents for which concurrent health surveillance revealed no infectious agents may also be adequate.**
2019.11.20	**4.1. Use of biological material must be described in the Facility Animal Care Committee (FACC) approved Animal Use Protocol (AUP).**
2019.11.20	~~4.1. New cell lines should come with a written report stating that they are free from murine pathogens or otherwise be tested; American Type Culture Collection (ATCC) report is not sufficient as it does not include murine pathogens.~~ **4.2. Biological material purchased from commercial vendors is supplied with a certificate of analysis detailing the rodent and/or human pathogens for which it has been screened. If a certificate is not available, or if the biological material has not been screened for all the relevant pathogens as detailed in section 4.5, it must be tested prior to use in vivo. Typically, biological material obtained from culture collections, e.g., American Type Culture Collection (ATCC), is not tested for rodent pathogens.**
2019.11.20	**4.3.1. Material should be tested for all the pathogens detailed in the corresponding rodent profile in section 4.5.2.**

2019.11.20	4.3.3. If the entire research protocol will be conducted in a Biocontainment Level 2 (BCL2) facility, and the animals will not be moved to another McGill facility at any point, testing of rodent biologicals prior to use ~~can be eliminated per veterinarian approval~~ **is not required**.
2019.11.20	~~4.3.1. Human cells should be tested for human pathogens if donor's status is unknown. Otherwise biological material should be handled under appropriate Biosafety Level.~~ **4.4.1. Material should be tested for human pathogens as detailed in section 4.5.1 and the corresponding rodent profile detailed in section 4.5.2.** **4.4.2. If the entire research protocol using material of untested or unknown human origin will be conducted in a Biocontainment Level 2 (BCL2) facility, and the animals will not be moved to another McGill facility at any point, testing of materials prior to use is not required.** **4.4.3. If credible documentation is available that the material has never been passaged through or established in rodents, or exposed to rodent products, e.g., rodent-derived feeder cells, serum, testing of materials for rodent pathogens prior to use is not required.** **4.4.4. Patient-derived xenografts (PDX):** **4.4.4.1. The donor (patient) should be tested for the human pathogens as detailed in section 4.5.1.** **4.4.4.2. If the PDX will not be passaged through rodents, testing for rodent pathogens is not required.**
2019.11.20	**4.6.3. Cells do not need to be viable for PCR testing.**
2023.06.09	1. PURPOSE This Standard Operating Procedure (SOP) describes the screening of ~~new~~ biological material to be used in vivo and obtained from an outside source for the presence of rodent or human pathogens.
2023.06.09	2. RESPONSIBILITY Principal Investigator (PI), ~~veterinary care staff, Diagnostic and Research Support Service (DRSS) staff~~ **veterinarian**.
2023.06.09	3.1. Biological material refers to cell lines, transplantable tumors, serum, tissues, body fluids, antibody preparations or hybridoma lines **of animal or human origin**.
2023.06.09	3.2. When biological material from an unknown source is introduced into an animal, it is a potential source of contamination by adventitious pathogens if the material originated from **or passed through** an infected animal. The pathogen has the potential to infect an animal that is inoculated with the biological material.
2023.06.09	3.4. In an effort to protect staff members working with animal models that have been exposed to human cells or tissues, ~~all~~ human samples ~~must~~ **should** be pre-screened before use **when possible**. **Where testing is not possible, contact Environmental Health and Safety for recommendations.**
2023.06.09	3.5. Previous testing may be sufficient if documentation is available detailing the testing method, the list of screened pathogens, the testing laboratory, and date of testing , and provided the specimens have not been passed through rodents or rodent cells or serum since the latest testing. Previous use in a colony of rodents for which concurrent health surveillance revealed no infectious agents may also be adequate. **Exemption from testing is evaluated on a case-by-case basis by the veterinarian.**
2023.06.09	3.6. Do not introduce biological materials into rodents in any animal facility ~~at McGill University~~ without prior consultation with the veterinarian.
2023.06.09	4.1. Use of biological material must be described in the Facility Animal Care Committee (FACC) approved Animal Use Protocol (AUP). Testing results and/or certificates of analysis should be attached to the AUP **prior to approval.**
2023.06.09	**4.3. Before testing, it is essential to establish a cell line at the volume and concentration planned for the coming years. Aliquots are frozen at -80°C or in liquid nitrogen. One aliquot is tested for pathogens and the remainder, provided it has been tested free of relevant pathogens, can be used as required.**
2023.06.09	**4.4. The need for retesting is evaluated by the veterinarian when the AUP is up for full renewal, every four years.**
2023.06.09	4.5. Biological material of animal origin **(refer to Annex 1)**:
2023.06.09	4.6.3. If credible documentation is available that the material has never been passaged through or established in rodents, or exposed to rodent products, e.g., rodent-derived feeder cells, serum, testing of materials for rodent pathogens prior to use is not required**. Exemption from testing is evaluated on a case-by-case basis by the veterinarian.**
2023.06.09	4.6.4.1. **It is recommended for** the donor (patient) should be tested for the human pathogens as detailed in section 4.6.1. **when possible. When testing is not feasible, contact Environmental Health and Safety for recommendations.**
2023.06.09	4.7.1. **Select the testing panel as per the veterinarian's recommendation.** The veterinarian may require additional tests based on health status of the host facility.
2023.06.09	**4.7.2.1. For testing of human primary cells, i.e., cells isolated directly from human tissues, including blood and bone marrow.**
2023.06.09	4.7. ~~Submitting~~ **Submit** samples **for testing by PCR to a commercial laboratory. Consult the veterinarian for sample preparation instructions.** ~~4.7.1. Contact the DRSS at (514) 398-8289 or drss@mcgill.ca to arrange testing of biological material.~~ ~~4.7.2. Submit 2 undiluted aliquots of at least 200µL each (to allow for confirmatory testing).~~ ~~4.7.3. Cells do not need to be viable for PCR testing.~~ ~~4.7.4. Cell number is not critical; however, please indicate if there are more than 5 x 107 cells/mL.~~ ~~4.7.5. Please indicate protein concentration if greater than 1.5 mg/mL.~~
2023.06.09	4.9.1. Contact a veterinarian to discuss the necessary precautions required to prevent contamination of rodent populations ~~(e.g., rederivation of the population or isolation of the inoculated population)~~.

Annex 1 – Guidelines for testing of biological material

NOT TESTED	TESTED
Biological material originating from the same animal facility.	Biological material originating from outside a McGill animal facility within the virtual facility network.
Biological material originating from a McGill animal facility within the virtual facility network with same or higher Bioexclusion Level with veterinarian's approval.	Biological material originating from a McGill animal facility within the virtual facility network with a lower Bioexclusion Level.
Biological material for which detailed documentation of previous testing is available, with veterinarian's approval.	Biological material originating from an unknown source.
Biological material that will be used in a study conducted in its entirety in a Biocontainment Level 2 (BCL2) facility.	Biological material of human origin where donor's status is unknown.
	Biological material for which no detailed documentation of previous testing is available.