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Purpose / Scope

This policy refers to measures aimed at preventing the introduction and spread of viruses, bacteria, and parasites between animals, groups of animals and humans within laboratory animal facilities and extra-vivarial spaces associated with all animals at Western and its affiliates. This policy outlines the necessary measures that must be in place to maintain appropriate known pathogen levels (specific pathogen free, SPF) in support of optimal animal health and welfare and reduced variability in animal-based research.

Biosecurity therefore involves many aspects of laboratory animal management regarding disease prevention and control. This starts with the development of exclusion lists for animals and means of monitoring and prevention of entry. The most crucial factor is mitigating movement and mixing of animals carrying different microflora, for example during procurement or transfer between facilities. However, microorganisms can be introduced in food, bedding, caging, or on person's including hair, clothing, equipment, and personal effects.

The measures in this policy include:

- Exclusion list establishment
- Procurement and Quarantine - Animal health screening e.g., source health status, quarantine
- Space allocation, controlled access, containment equipment

- Movement of animals, personnel, and materials, e.g., caging, cell lines, biologicals, decontamination practices
- Personal Protective Equipment (PPE)
- Health Surveillance Program

This policy does not include detailed direction re:

- Human safety practices. Follow institution-specific Occupational Health and Safety (OHS) directives.
- Containment and use of pathogenic microorganisms in research studies
- Security of microorganisms that may be used to harm people or animals
- Sick animal response. Follow the Sick Animal Response Policy.

In this policy 'animal area' includes all spaces where live animals are held and used as well as associated support spaces, e.g., cagewash, supplies storage, feed/bedding storage.

Rationale

Biosecurity refers to measures implemented to prevent the introduction or spread of microorganisms from one location to another. This policy refers to animal health biosecurity in the laboratory animal facility and describes important measures to prevent introduction or spread of microorganisms within animal care and use spaces at Western and affiliates. Pathogenic microorganisms are largely excluded at Western and affiliates, and practices within this area are addressed in other policies, procedures, and SOPs. There are also opportunistic or adapted agents that are part of the microbiome of various species that can affect research results. Maintaining consistent and known health statuses for animals is essential to acquire excellent research results.

There are circumstances in which distinct groups of animals may require different health statuses. Animals that are immune compromised genetically or as part of their research protocols, can become ill from normally non-pathogenic microorganisms. These animals require a larger exclusion list. The use of genetically modified animals, especially rodents, has revealed a longer list of microorganisms that may affect animal research. Therefore, the list of excluded agents has changed over time. Ideally, these agents should be excluded from all animals, but as the microbiome can affect experimental results, researchers may want to finish areas of study before changing the microbiome. Finally, collaborations with other institutes where the course of the study may be impacted by quarantine practices. In these cases, short term housing of animals at different health statuses may be indicated. All these circumstances require stringent practices to prevent movement of microorganisms between areas.

Policy Statements

Exclusion List Establishment

Exclusion lists must be determined by the Institutional Veterinarian in collaboration with the area supervisor and institutional occupational health and safety and based on current knowledge of animal pathogens and opportunistic flora including resultant disease, zoonotic potential, interference with research, and ability to contain pathogens.

Exclusion lists must be built by assigning each pathogen to one of the following three categories:

- **Acceptable** – Microorganisms that can be allowed in the facility without requiring any further biosecurity measures.

- **Tolerated** – Microorganisms are not excluded but may be permitted with certain conditions.
- **Excluded** – Microorganisms that are not permitted in a given facility.
- **Unacceptable** – Microorganisms that should not be present in any facility and that should be actively eradicated.

Institutional Veterinarians must ensure Exclusion Lists remain current in conjunction with area supervisors.

Exclusion Lists must be made readily available to all area supervisors, Animal Ethics and Care Program leaders, and area users an up-to-date catalogue of Exclusion Lists pertaining to animal holding and use areas at Western and affiliates.

- A shared online repository will be used.

Every room and/or area must be assigned an Exclusion List by the Institutional Veterinarian.

- Area-specific health statuses will be determined by the pathogens present in the facility and the means to contain them, e.g., Laboratory Animal Facility, extra-vivarial procedure suite.

An Institutional Veterinarian must be consulted before modifications are made to area-specific Exclusion lists.

Procurement and Quarantine

Animal Procurement must follow the *Research Animal Procurement Policy* (POL-008), which addresses biosecurity considerations at that stage.

An Institutional Veterinarian must determine quarantine requirements.

- This includes quarantine practices outlined via the AUP (Animal Use Protocol) and within facilities.
- Common quarantine practices must be followed, as outlined within citywide SOPs, as available.

Space Boundaries, Controlled Access, Containment Equipment

Area-level supervisors must, with an Institutional Veterinarian, establish area and/or room-level boundaries that facilitate maintenance of established health statuses.

Each facility and room must have an established, documented, up-to-date health status – at area and/or room levels – that is readily available to space users.

- ‘Higher’-to-‘Lower’ status room order lists must be available for all areas, including animal holding, procedure and support space.

Appropriate room set-up for varying conditions must be developed in conjunction with an Institutional Veterinarian, e.g.,

- Biosafety cabinets (BSC) and associated practices must be used in barrier areas to contain the spread of microorganisms between cages and within a room.
- Containment equipment and practices for experimental use of pathogens that can affect resident animal populations must be undertaken in containment conditions that address biosecurity concerns in addition to biosafety, as established by Institutional Veterinarians and Institutional Occupational Health and Safety.

Movement of Animals, Personnel and Materials

General

Facility and room-level entry and exit procedures, and maintenance practices must be developed, followed and readily available to users to prevent introduction of excluded microorganisms.

Movement of animals, personnel and materials must follow from 'higher' to 'lower' health status areas with the following considerations:

- This is especially important for movement between spaces that hold species with potential to share pathogens.
- In multi-species areas, 'lower' vs. 'higher' health status will be impacted by the potential of categories of species (e.g., rodents) to share pathogens with other species categories.
- The Institutional Veterinarian will provide directions on determining the most suitable flow from clean to dirty areas.

Movement of Animals

Animals must only be moved to procedure and housing rooms of equivalent or lower health status. Once moved to a lower health status, animals must not return to a room of a higher health status.

- SOPs associated with animal transport must be followed as they address biosecurity management.

Movement of animals within a Laboratory Animal Facility must be overseen by the Facility Supervisor responsible to ensure alignment with this policy.

Movement of animals outside of and/or between Laboratory Animal Facilities must be overseen by an Institutional Veterinarian with area-specific supervisors.

Movement of Personnel

Within each Animal Facility, personnel must enter rooms in the order outlined within the area-specific Room Order List.

If personnel have entered a facility or animal area with a lower health status, prior to entering an animal room with a higher health status, they must have a full shower, including hair wash and change of clothing (not exposed to a dirtier area).

- Additional requirements may apply for areas containing specific pathogens.
- Facility-specific SOPs may choose to have more stringent practices based on risk assessment, except personnel required by the ACC's Terms of Reference to have access to all animal areas.

Personnel that have animals at home must consult with the facility supervisor in collaboration with an Institutional Veterinarian to determine the most appropriate means of mitigating potential pathogen transfer into research animal populations.

Movement of Materials

If materials, e.g., supplies, equipment, clothing, have entered a facility or animal area with a lower health status, prior to entering an animal room with a higher health status,

- Re. supplies and equipment - they must be decontaminated as per the area supervisor under the direction of the Institutional Veterinarian.

- Re. clothing worn by personnel, as directed by the Facility Supervisor.

Biological agents such as cells and tissues may carry pathogens depending on their source. If health status is unknown at the source, PCR testing for relevant pathogens may be indicated.

Decontamination options include the following with specific use based upon the microorganism(s) of concern:

- Surface decontamination of impervious, washable materials
- Autoclave
- Gaseous sterilization method
- Machine washing

Personal Protective Equipment (PPE)

Area supervisors must develop, implement, and enforce PPE standards that align with institutional OHS requirements (e.g., Animal Allergens Guidelines, Laboratory Safety Guidelines) and animal health biosecurity standards.

- PPE must be made available to users at the Facility and other animal areas.
- Associated PPE signage must be posted at entryways for ready access by users.
- Different zones within a given Animal Facility may have different PPE requirements; boundaries for donning and doffing of PPE must be established.

Area users:

- Must wear scrubs, lab coats, or coveralls when working within animal areas, e.g., holding rooms, procedure rooms, cage cleaning areas.
- Should avoid wearing lab coats and/or animal area-dedicated apparel (e.g., scrubs, coveralls, Tyveks) outside of the specific area.
 - Some exceptions may apply, e.g., transport to another space with equal or lower health status.

Health Surveillance Program

Regular assessment of the presence of pathogens and opportunistic microorganisms in animal areas must be conducted. Testing modalities, scope and frequency must be determined in conjunction with the Institutional Veterinarian.

- For rodents, prevalent pathogens must be monitored quarterly, and comprehensive testing completed annually.
- For other species, a program for monitoring of pathogens must be developed with an Institutional Veterinarian and depends on the length of time populations are held continuously in the facility.

Depending on the facility or area and species, a combination or single method(s) of testing may be used, e.g.,

- PCR on soiled bedding, or samples collected from research animals,
- PCR on exhaust air dust sampled from ventilated racks,
- Fecal analysis,
- Serology on research animals.

Testing parameters may vary depending on the underlying needs of the research program and in consultation with the Institutional Veterinarian.

References

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Revision History

Version	Date <i>dd-mm-yyyy</i>	Description of Changes	Author
00	11-04-2024	New Policy	JSN

Glossary