BMBL ABSL

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ABSL1	**BMBL 5th Edition CDC-NIH Dec. 2009**	**N/A**	**Conform**	**Non-Conform**	**Comments**
A.	**Standard Microbiological Practices**				
	1. The animal facility director establishes and enforces policies, procedures, and protocols for institutional policies and emergencies.				
	Each institute must assure that worker safety and health concerns are addressed as part of the animal protocol review.				
	Prior to beginning a study animal protocols must also be reviewed and approved by the Institutional Animal Care and Use Committee (IACUC)5 and the Institutional Biosafety Committee.				
	2. A safety manual specific to the animal facility is prepared or adopted in consultation with the animal facility director and appropriate safety professionals. The safety manual must be available and accessible. Personnel are advised of potential hazards and are required to read and follow instructions on practices and procedures.				
	3. The supervisor must ensure that animal care, laboratory and support personnel receive appropriate training regarding their duties, animal husbandry procedures, potential hazards, manipulations of infectious agents, necessary precautions to prevent exposures, and hazard/exposure evaluation procedures (physical hazards, splashes, aerosolization, etc.). Personnel must receive annual updates and additional training when procedures or policies change. Records are maintained for all hazard evaluations, employee training sessions and staff attendance.				
	4. An appropriate medical surveillance program is in place, as determined by risk assessment. The need for an animal allergy prevention program should be considered.				
	Facility supervisors should ensure that medical staff is informed of potential occupational hazards within the animal facility, to include those associated with research, animal husbandry duties, animal care and manipulations.				
	Personal health status may impact an individual's susceptibility to infection, ability to receive immunizations or prophylactic interventions. Therefore, all personnel and particularly women of childbearing age should be provided information regarding immune competence and conditions that may predispose them to infection. Individuals having these conditions should be encouraged to self-identify to the institution's healthcare provider for appropriate counseling and guidance.				
	Personnel using respirators must be enrolled in an appropriately constituted respiratory protection program.				

	5. A sign incorporating safety information must be posted at the entrance to the areas where infectious materials and/or animals are housed or are manipulated. The sign must include the animal biosafety level, general occupational health requirements, personal protective equipment requirements, the supervisor's name (or other responsible personnel), telephone number, and required procedures for entering and exiting the animal areas. Identification of specific infectious agents is recommended when more than one agent is being used within an animal room.				
	Security-sensitive agent information should be posted in accordance with the institutional policy.				
	Advance consideration should be given to emergency and disaster recovery plans, as a contingency for man-made or natural disasters				
	6. Access to the animal room is limited. Only those persons required for program or support purposes are authorized to enter the facility.				
	All persons including facility personnel, service workers, and visitors are advised of the potential hazards (natural or research pathogens, allergens, etc.) and are instructed on the appropriate safeguards.				
	7. Protective laboratory coats, gowns, or uniforms are recommended to prevent contamination of personal clothing.				
	Gloves are worn to prevent skin contact with contaminated, infectious and hazardous materials, and when handling animals.				
	Gloves and personal protective equipment should be removed in a manner that minimizes transfer of infectious materials outside of the areas where infectious materials and/or animals are housed or are manipulated.				
	Persons must wash their hands after removing gloves, and before leaving the areas where infectious materials and/or animals are housed or are manipulated.				
	Eye and face and respiratory protection should be used in rooms containing infected animals, as dictated by the risk assessment.				
	8. Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption must not be permitted in laboratory areas. Food must be stored outside of the laboratory in cabinets or refrigerators designed and used for this purpose.				
	9. All procedures are carefully performed to minimize the creation of aerosols or splatters of infectious materials and waste.				
	10. Mouth pipetting is prohibited. Mechanical pipetting devices must be used.				
	11. Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented.				
	When applicable, laboratory supervisors should adopt improved engineering and work practice controls that reduce the risk of sharps injuries. Precautions, including those listed below, must always be taken with sharp items. These include:				

	a. Use of needles and syringes or other sharp instruments in the animal facility is limited to situations where there is no alternative for such procedures as parenteral injection, blood collection, or aspiration of fluids from laboratory animals and diaphragm bottles.				
	b. Disposable needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal. Used disposable needles must be carefully placed in puncture-resistant containers used for sharps disposal. Sharps containers should be located as close to the work site as possible.				
	c. Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.				
	d. Broken glassware must not be handled directly. Instead, it must be removed using a brush and dustpan, tongs, or forceps. Plastic ware should be substituted for glassware whenever possible.				
	e. Equipment containing sharp edges and corners should be avoided.				
	12. Equipment and work surfaces are routinely decontaminated with an appropriate disinfectant after work with an infectious agent, and after any spills, splashes, or other overt contamination.				
	13. Animals and plants not associated with the work being performed must not be permitted in the areas where infectious materials and/ or animals are housed or are manipulated.				
	14. An effective integrated pest management program is required.				
	15. All wastes from the animal room (including animal tissues, carcasses, and bedding) are transported from the animal room in leak-proof, covered containers for appropriate disposal in compliance with applicable institutional, local and state requirements.				
	Decontaminate all potentially infectious materials before disposal using an effective method.				
B	Special Practices				
	None required.				
C	Safety Equipment (Primary Barriers and Personal Protective Equipment)				
	1. A risk assessment should determine the appropriate type of personal protective equipment to be utilized.				
	2. Special containment devices or equipment may not be required as determined by appropriate risk assessment.				
	3. Protective laboratory coats, gowns, or uniforms may be required to prevent contamination of personal clothing.				
	Protective outer clothing is not worn outside areas where infectious materials and/or animals are housed or manipulated. Gowns and uniforms are not worn outside the facility.				

	4. Protective eyewear is worn when conducting procedures that have the potential to create splashes of microorganisms or other hazardous materials. Persons who wear contact lenses should also wear eye protection when entering areas with potentially high concentrations or airborne particulates.				
	Persons having contact with NHPs must assess risk of mucous membrane exposure and wear protective equipment (e.g., masks, goggles, face shields, etc.) as appropriate for the task to be performed.				
	5. Gloves are worn to protect hands from exposure to hazardous materials.				
	A risk assessment should be performed to identify the appropriate glove for the task and alternatives to latex gloves should be available.				
	Change gloves when contaminated, glove integrity is compromised, or when otherwise necessary.				
	Gloves must not be worn outside the animal rooms.				
	Gloves and personal protective equipment should be removed in a manner that prevents transfer of infectious materials.				
	Do not wash or reuse disposable gloves. Dispose of used gloves with other contaminated waste.				
	6. Persons must wash their hands after handling animals and before leaving the areas where infectious materials and/or animals are housed or are manipulated. Hand washing should occur after the removal of gloves.				
D	Laboratory Facilities (Secondary Barriers)				
	1. The animal facility is separated from areas that are open to unrestricted personnel traffic within the building. External facility doors are self-closing and self-locking.				
	Access to the animal facility is restricted.				
	Doors to areas where infectious materials and/or animals are housed, open inward, are self-closing, are kept closed when experimental animals are present, and should never be propped open. Doors to cubicles inside an animal room may open outward or slide horizontally or vertically.				
	2. The animal facility must have a sink for hand washing.				
	Sink traps are filled with water, and/or appropriate liquid to prevent the migration of vermin and gases.				
	3. The animal facility is designed, constructed, and maintained to facilitate cleaning and housekeeping. The interior surfaces (walls, floors and ceilings) are water resistant. Floors must be slip resistant, impervious to liquids, and resistant to chemicals.				
	It is recommended that penetrations in floors, walls and ceiling surfaces be sealed, including openings around ducts, doors and doorframes, to facilitate pest control and proper cleaning.				

	4. Cabinets and bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals. Spaces between benches, cabinets, and equipment should be accessible for cleaning.				
	Chairs used in animal area must be covered with a non-porous material that can be easily cleaned and decontaminated. Furniture must be capable of supporting anticipated loads and uses. Sharp edges and corners should be avoided.				
	5. External windows are not recommended; if present windows must be resistant to breakage. Where possible, windows should be sealed. If the animal facility has windows that open, they are fitted with fly screens. The presence of windows may impact facility security and therefore should be assessed by security personnel.				
	6. Ventilation should be provided in accordance with the Guide for Care and Use of Laboratory Animals.1 No recirculation of exhaust air may occur.				
	It is recommended that animal rooms have inward directional airflow.				
	Ventilation system design should consider the heat and high moisture load produced during the cleaning of animal rooms and the cage wash process.				
	7. Internal facility appurtenances, such as light fixtures, air ducts, and utility pipes, are arranged to minimize horizontal surface areas to facilitate cleaning and minimize the accumulation of debris or fomites.				
	8. If floor drains are provided, the traps are filled with water, and/or appropriate disinfectant to prevent the migration of vermin and gases.				
	9. Cages are washed manually or preferably in a mechanical cage washer. The mechanical cage washer should have a final rinse temperature of at least 180°F. If manual cage washing is utilized, ensure that appropriate disinfectants are selected.				
	10. Illumination is adequate for all activities, avoiding reflections and glare that could impede vision.				
	11. Emergency eyewash and shower are readily available; location is determined by risk assessment.				
ABSL2	**BMBL 5th Edition CDC-NIH Dec. 2009**	**N/A**	**Conform**	**Non-Conform**	**Comments**
A1	The animal facility director establishes and enforces policies, procedures, and protocols for institutional policies and emergency situations.				
	Each institute must assure that worker safety and health concerns are addressed as part of the animal protocol review.				
	Prior to beginning a study animal protocols must also be reviewed and approved by the IACUC and the Institutional Biosafety Committee.				

A2	A safety manual specific to the animal facility is prepared or adopted in consultation with the animal facility director and appropriate safety professionals.				
	The safety manual must be available and accessible.				
	Personnel are advised of potential hazards, and are required to read and follow instructions on practices and procedures. Consideration should be given to specific biohazards unique to the animal species and protocol in use.				
A3	Supervisor must ensure that animal care, laboratory and support personnel receive appropriate training regarding their duties, animal husbandry procedure, potential hazards, manipulations of infectious agents, necessary precautions to prevent hazard or exposures, and hazard/exposure evaluation procedures (physical hazards, splashes, aerosolization, etc.).				
	Personnel must receive annual updates or additional training when procedures or policies change.				
	Records are maintained for all hazard evaluations, employee training sessions and staff attendance.				
	Appropriate medical surveillance program is in place, as determined by risk assessment.				
A4	The need for an animal allergy prevention program should be considered. Facility supervisors should ensure that medical staff is informed of potential occupational hazards within the animal facility, to include those associated with research, animal husbandry duties, animal care and manipulations.				
	Personal health status may impact an individual's susceptibility to infection, ability to receive immunizations or prophylactic interventions. Therefore, all personnel and particularly women of child-bearing age should be provided information regarding immune competence and conditions that may predispose them to infection. Individuals having these conditions should be encouraged to self-identify to the institution's healthcare provider for appropriate counseling and guidance.				
	Personnel using respirators must be enrolled in an appropriately constituted respiratory protection program.				
A5	A sign incorporating the universal biohazard symbol must be posted at the entrance to areas where infectious materials and/or animals are housed or are manipulated when infectious agents are present.				
	The sign must include the animal biosafety level, general occupational health requirements, personal protective equipment requirements, the supervisor's name (or other responsible personnel), telephone number, and required procedures for entering and exiting the animal areas.				
	Identification of specific infectious agents is recommended when more than one agent is being used within an animal room. Security-sensitive agent information and occupational health requirements should be posted in accordance with the institutional policy.				

	Advance consideration should be given to emergency and disaster recovery plans, as a contingency for man-made or natural disasters.				
A6	Access to the animal room is limited. Only those persons required for program or support purposes are authorized to enter the animal facility and the areas where infectious materials and/or animals are housed or are manipulated.				
	All persons including facility personnel, service workers, and visitors are advised of the potential hazards (natural or research pathogens, allergens, etc.) and are instructed on the appropriate safeguards.				
A7	Protective laboratory coats, gowns, or uniforms are required to prevent contamination of personal clothing.				
	Gloves are worn to prevent skin contact with contaminated, infectious and hazardous materials and when handling animals. Gloves and personal protective equipment should be removed in a manner that minimizes transfer of infectious materials outside of the areas where infectious materials and/or animals are housed or are manipulated.				
	Persons must wash their hands after removing gloves, and before leaving the areas where infectious materials and/or animals are housed or are manipulated.				
	Eye and face and respiratory **protection** should be used in rooms containing infected animals, as dictated by the risk assessment.				
A8	Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human use should only be done in designated areas and are not permitted in animal or procedure rooms.				
A9	All procedures are carefully performed to minimize the creation of aerosols or splatters of infectious materials and waste.				
A10	Mouth pipetting is prohibited. Mechanical pipetting devices must be used.				
A11	Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented.				
	When applicable, laboratory supervisors should adopt improved engineering and work practice controls that reduce the risk of sharps injuries. Precautions, including those listed below, must always be taken with sharp items. These include:				
	Needles and syringes or other sharp instruments are limited to use in the animal facility when there is no alternative for such procedures as parenteral injection, blood collection, or aspiration of fluids from laboratory animals and diaphragm bottles.				
	Disposable needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal. Used disposable needles must be carefully placed in puncture-resistant containers used for sharps disposal.				
	Sharps containers should be located as close to the work site as possible.				

	Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.				
	Broken glassware must not be handled directly; it should be removed using a brush and dustpan, tongs, or forceps.				
	Plasticware should be substituted for glassware whenever possible.				
	Equipment containing sharp edges and corners should be avoided.				
A12	Equipment and work surfaces are routinely decontaminated with an appropriate disinfectant after work with an infectious agent, and after any spills, splashes, or other overt contamination.				
A13	Animals and plants not associated with the work being performed must not be permitted in the areas where infectious materials and/or animals are housed or are manipulated.				
A14	An effective integrated pest management program is required (See Appendix G).				
A15	All wastes from the animal room (including animal tissues, carcasses, and bedding) are transported from the animal room in leak-proof containers for appropriate disposal in compliance with applicable institutional, local and state requirements.				
	Decontaminate all potentially infectious materials before disposal using an effective method.				
B1	Animal care staff, laboratory and routine support personnel must be provided a medical surveillance program as dictated by the risk assessment, and administered appropriate immunizations for agents handled or potentially present, before entry into animal rooms. When appropriate, a base line serum sample should be stored.				
B2	Procedures involving a high potential for generating aerosols should be conducted within a biosafety cabinet or other physical containment device.				
	When a procedure cannot be performed within a biosafety cabinet, a combination of personal protective equipment and other containment devices must be used.				
	Consideration should be given to the use of restraint devices and practices that reduce the risk of exposure during animal manipulations (e.g., physical restraint devices, chemical restraint medications, etc). Consideration should be given to the use of restraint devices and practices that reduce the risk of exposure during animal manipulations (e.g., physical restraint devices, chemical restraint medications, etc).				
B3	Decontamination is recommended for all potentially infectious materials and animal waste before movement outside the areas where infectious materials and/or animals are housed or are manipulated by an appropriate method (e.g. autoclave, chemical disinfection, or other approved decontamination methods). This includes potentially infectious animal tissues, carcasses, contaminated bedding, unused feed, sharps, and other refuse.				
	Consideration should be given to means for decontaminating routine husbandry equipment, sensitive electronic and medical equipment.				

	Materials to be decontaminated outside of the immediate areas where infectious materials and/or animals are housed or are manipulated must be placed in a durable, leak proof, covered container and secured for transport.				
	The outer surface of the container is disinfected prior to moving materials.				
	The transport container must contain a universal biohazard label.				
	Develop and implement an appropriate waste disposal program in compliance with applicable institutional, local and state requirements. Autoclaving of content prior to incineration is recommended.				
B4	Equipment, cages, and racks should be handled in manner that minimizes contamination of other areas.				
	Equipment must be decontaminated before repair, maintenance, or removal from the areas where infectious materials and/or animals are housed or are manipulated.				
	Spills involving infectious materials must be contained, decontaminated, and cleaned up by staff properly trained and equipped to work with infectious material.				
B5	Incidents that may result in exposure to infectious materials must be immediately evaluated and treated according to procedures described in the safety manual. All such incidents must be reported to the animal facility supervisor or personnel designated by the institution.				
	Medical evaluation, surveillance, and treatment should be provided as appropriate and records maintained.				
C1	Properly maintained BSCs, personal protective equipment (e.g., gloves, lab coats, face shields, respirators, etc.) and/or other physical containment devices or equipment, are used whenever conducting procedures with a potential for creating aerosols or splashes. These include necropsy of infected animals, harvesting of tissues or fluids from infected animals or eggs, and intranasal inoculation of animals.				
	When indicated by risk assessment, animals are housed in primary biosafety containment equipment appropriate for the animal species, such as solid wall and bottom cages covered with filter bonnets for rodents, or larger cages placed in inward flow ventilated enclosures or other equivalent primary containment systems for larger animal cages.				
C2	A risk assessment should determine the appropriate type of personal protective equipment to be utilized.				
	Scrub suits and uniforms are removed before leaving the animal facility. Reusable clothing is appropriately contained and decontaminated before being laundered.				
	Laboratory and protective clothing should never be taken home.				
	Gowns, uniforms, laboratory coats and personal protective equipment are worn while in the areas where infectious materials and/or animals are housed or manipulated and removed prior to exiting.				

	Disposable personal protective equipment and other contaminated waste are appropriately contained and decontaminated prior to disposal.				
C3	Eye and face protection (mask, goggles, face shield or other splatter guard) are used for anticipated splashes/ sprays from infectious or other hazardous materials and when the animal or microorganisms must be handled outside the BSC or containment device.				
	Eye and face protection must be disposed of with other contaminated laboratory waste or decontaminated before reuse.				
	Persons who wear contact lenses should also wear eye protection when entering areas with potentially high concentrations or airborne particulates.				
	Persons having contact with the NHP should assess risk of mucous membrane exposure and wear appropriate protective equipment (e.g., masks, goggles, face shields, etc.) as needed. Respiratory protection is worn based upon risk assessment.				
C4	Gloves should be worn to protect hands from exposure to hazardous materials. A risk assessment should be performed to identify the appropriate glove for the task and alternatives to latex gloves should be available.				
	Gloves are changed when contaminated, integrity has been compromised, or when otherwise necessary.				
	Gloves must not be worn outside the animal rooms.				
	Gloves and personal protective equipment should be removed in a manner that prohibits transfer of infectious materials.				
	Do not wash or reuse disposable gloves.				
	Dispose of used gloves with other contaminated waste.				
	Persons must wash their hands after handling animals and before leaving the areas where infectious materials and/or animals are housed or are manipulated.				
	Hand washing should occur after the removal of gloves.				
D1	The animal facility is separated from areas that are open to unrestricted personnel traffic within the building.				
	External facility doors are self-closing and self-locking.				
	Access to the animal facility is restricted.				
	Doors to areas where infectious materials and/or animals are housed or open inward, are self-closing, are kept closed when experimental animals are present, and should never be propped open.				
	Doors to cubicles inside an animal room may open outward or slide horizontally or vertically.				
D2	A hand washing sink is located at the exit of the areas where infectious materials and/or animals are housed or are manipulated.				
	Additional sinks for hand washing should be located in other appropriate locations within the facility				
	If the animal facility has segregated areas where infectious materials and/or animals are housed or manipulated, a sink must also be available for hand washing at the exit from each segregated area.				

	Sink traps are filled with water, and/or appropriate liquid to prevent the migration of vermin and gases.				
D3	The animal facility is designed, constructed, and maintained to facilitate cleaning and housekeeping.				
	The interior surfaces (walls, floors and ceilings) are water resistant.				
	Penetrations in floors, walls and ceiling surfaces are sealed, to include openings around ducts, doors and door frames, to facilitate pest control and proper cleaning.				
	Floors must be slip resistant, impervious to liquids, and resistant to chemicals.				
D4	Cabinets and bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.				
	Spaces between benches, cabinets, and equipment should be accessible for cleaning.				
	Furniture should be minimized.				
	Chairs used in animal area must be covered with a non-porous material that can be easily cleaned and decontaminated.				
	Furniture must be capable of supporting anticipated loads and uses.				
	Sharp edges and corners should be avoided.				
D5	External windows are not recommended; if present, windows should be sealed and must be resistant to breakage.				
	The presence of windows may impact facility security and therefore should be assessed by security personnel.				
D6	Ventilation should be provided in accordance with the Guide for Care and Use of Laboratory Animals.1				
	The direction of airflow into the animal facility is inward; animal rooms should maintain inward directional airflow compared to adjoining hallways.				
	A ducted exhaust air ventilation system is provided.				
	Exhaust air is discharged to the outside without being recirculated to other rooms.				
	Ventilation system design should consider the heat and high moisture load produced during the cleaning of animal rooms and the cage wash process.				
D7	Internal facility appurtenances, such as light fixtures, air ducts, and utility pipes, are arranged to minimize horizontal surface areas, to facilitate cleaning and minimize the accumulation of debris or fomites.				
D8	Floor drains must be maintained and filled with water, and/or appropriate disinfectant to prevent the migration of vermin and gases.				
D9	Cages should be autoclaved or otherwise decontaminated prior to washing.				
	Mechanical cage washer should have a final rinse temperature of at least 180°F.				

	The cage wash area should be designed to accommodate the use of high pressure spray systems, humidity, strong chemical disinfectants and 180°F water temperatures, during the cage/equipment cleaning process.				
D10	Illumination is adequate for all activities, avoiding reflections and glare that could impede vision.				
D11	If BSCs are present, they must be installed so that fluctuations of the room air supply and exhaust do not interfere with proper operations.				
	BSCs should be located away from doors, heavily traveled laboratory areas, and other possible airflow disruptions.				
	HEPA filtered exhaust air from a Class II BSC can be safely re-circulated back into the laboratory environment if the cabinet is tested and certified at least annually and operated according to manufacturer's recommendations. BSCs can also be connected to the laboratory exhaust system by either a thimble (canopy) connection or a direct (hard) connection.				
	Provisions to assure proper safety cabinet performance and air system operation must be verified.				
	Correct performance of the BSCs should be recertified at least once a year.				
	All BSCs should be used according to manufacturer's recommendation, to protect the worker and avoid creating a hazardous environment from volatile chemical and gases.				
D12	If vacuum service (i.e., central or local) is provided, each service connection should be fitted with liquid disinfectant traps and an in-line HEPA filter,placed as near as practicable to each use point or service cock. Filters are installed to permit in-place decontamination and replacement.				
D13	An autoclave should be considered in the animal facility to facilitate decontamination of infectious materials and waste.				
D14	Emergency eyewash and shower are readily available; location is determined by risk assessment.				