FLORIDA ATLANTIC UNIVERSITY

Division of Research
Comparative Medicine

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SOP # 113	**Title: Microbiological Monitoring of Facility Sanitation Procedures**

SCOPE: This SOP is applicable to all Veterinary Services personnel

SOP OWNER: Certified Veterinary Technician (CVT)

PURPOSE: To ensure the microbial cleanliness and effectiveness of sanitation procedures by monitoring bacterial levels and types at all CM managed Vivaria

LOCATION: All Vivaria

Approved by: Sylvia Gografe, D.V.M., Ph.D. Director Veterinary Services

References

1. *Guide for the Care and Use of Laboratory Animals*. National Research Council; National Academy Press, Washington, D.C., 2011
2. Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, CDC/NIH, 2009
3. SOP 114 Microbiological Monitoring Using ATP
4. SOP 115 Microbiological Monitoring Using Microbial Agar
5. SOP 213 Workflow In and Between Vivaria
6. CM#050 Environmental Monitoring Sample Log

I. Responsibilities

a. Laboratory Animal Technician (LAT)
   i. Adhere to procedures as outlined in this SOP.
   ii. Perform only procedures for tasks which have been trained.
b. Certified Veterinary Technician (CVT)
   i. Adhere to procedures as outlined in this SOP.
   ii. Provide appropriate training including hands-on sessions to personnel helping with sampling and other monitoring procedures outlined in this SOP.
   iii. Manages the microbiological monitoring program.
   iv. Reviews results and suggests measures to improve outcome of sanitation procedures based on test results to the AV or other program veterinarian.
c. Facility Manager

i. Adhere to procedures as outlined in this SOP.
ii. Ensure procedures are followed as outlined in this SOP.
iii. Ensure appropriate SOP training is provided to particular personnel depending on function/job description in concert with Training Coordinator.
iv. Directs implementation of measures to improve outcome of sanitation procedures.

d. Director/Attending Veterinarian (AV)
i. Adhere to procedure as outlined in this SOP.
ii. Ensure appropriate training is provided to particular personnel and necessary resources are available.
iii. Oversees environmental monitoring program(s) and reviews all results. Assures implementation of measures to improve outcome of sanitation procedures.

II. General Information

a. Quality assurance practices set forth in this SOP will ensure that sanitation and sterilization of equipment in cage wash, animal housing rooms and procedure rooms in the vivarium yield an adequate reduction or total absence of surface contamination as appropriate for the particular surface/item.
b. Both microbial growth and organic residues exist as a barrier for effective sanitation and sterilization and serve as potential mechanism for pathogen transmission.
c. The microbiological monitoring of facility sanitation employs the use of hard surface contact slides holding a neutralizing microbial agar and an ATP test system at a regular interval or whenever changes in sanitation processes are made (e.g. changes in disinfectants and cage wash chemicals or temperatures).
d. Adenosine triphosphate (ATP) is the universal energy molecule found in all animal, plant, bacterial, yeast, and mold cells. Sanitation effectiveness can be measured by detecting ATP (i.e. organic matter) with a specific ATP test system like the Neogen AccuPoint. A relative light unit (RLU) is the measure of light produced from the enzymatic reaction of luciferase when it reacts with ATP in a sampling swab.
e. D/E Neutralizing Microbial Agar neutralizes a broad spectrum of antiseptic and disinfectant chemicals, which are commonly used in sanitation processes in vivaria. Difco HYcheck™ contact slides with D/E Neutralizing Agar is used for the isolation of microorganisms from environmental surfaces.

III. Procedure

1. General:
a. Quarterly testing of hard surfaces will be performed using both ATP and Microbial Agar testing in all five (5) CM managed centralized vivaria (i.e. 71, 35A, 35B, MC17 and MC19).
b. In average, the total number of samples collected will be 138 ATP and 69 HYcheck™. See table 1 for distribution of samples between the different vivaria.
c. All testing media (ATP swabs and Difco HYcheck plates) must be kept refrigerated and checked for defects and expiration dates before use.
d. Sample sites are areas considered to be of either high risk for transmission and overall spreading of ubiquitous microbes including potential pathogens or sanitized

surfaces/items supposed to be clean (i.e. expected to have no or a very low number of CFUs or RLUs). Sample sites include:

i. High traffic areas in housing, procedure, cage wash rooms and hallways such as door handles, floors and bench/counter tops in procedure rooms.
ii. Difficult to clean areas such as irregular surfaces, O-rings, pockets, groves and corners.
iii. Areas with the potential to create specific health threats to animals such is cage changing station or biosafety cabinet work surfaces and surgical equipment/tables.
iv. Sanitized equipment before returning it into the circulation such as primary enclosures, cage components and environmental enrichment devices.

e. Equipment and room surfaces must be cool and dry prior to testing. This is especially important for ATP swabs.

2. Sampling procedures:
   a. Following either SOP 114 for ATP and/or SOP 115 for Microbial Agar, arrange for the environmental monitoring of the vivaria by obtaining the appropriate amount/number of test material including HYcheck slides and ATP swabs. Assure that sufficient material is available to finish the sampling process within a one to two day window for all five vivaria.
   b. Identify areas to sample, prepare records and label sample containers.
   c. Gown up with the facility specific PPE and change gloves between different rooms or whenever soiled.
   d. Start sampling in the cleanest areas (e.g. clean cagewash and surgical suite) and follow the workflow based on health status of animals and associated room/facility classifications (See FAU SOP 213).
   e. Sample cagewash room when it is operating. Samples of sanitized items should be taken immediately after removed from the washer and have had time to dry.
   f. Sample a variety of sanitized items in the cage wash area and sample points in animal holding rooms, procedure rooms, storage rooms, surgical suites, and cage wash rooms.
   g. Rotate types of sanitized items and sample point in rooms each quarter.
   h. Collect samples from multiple sites on each surface or item.
   i. Read ATP samples immediately after collection and complete associated ATP sampling record (CM#050).
   j. Store collected samples in refrigerator until shipping to a commercial testing laboratory according to manufacturer's specifications (See FAUSOP 115).
3. Sample Points:
   a. Animal Rooms/Hallways
      i. Room walls and floor surfaces
      ii. Bio Safety Hood interior and exterior surfaces
      iii. Outside of animal cages
      iv. Rack surfaces
      v. Sink interior and exterior
      vi. Overhead cabinets
      vii. Carts, food bins, and trays
      viii. Mop buckets, trash container lids and carts

b. Procedure Rooms
    i. Room walls and floor surfaces
    ii. Surfaces which animals come into contact
    iii. Bench tops, counter tops, and desk tops
c. Cage Wash Room (Samples to be taken from clean and dirty side)
    i. Room walls and floor surfaces
    ii. Floor at exit of interconnecting change room\
    iii. Cage wash racks (dirty and clean surfaces)
    iv. Floor and wall surfaces from random cage types
    v. Enrichment devices
    vi. Feeders, cages, sippers, and water bottles/bowls

4. Test Result Evaluation
    a. ATP results will be compared and eventually classified as *Pass*, *Marginal*, and *Fail* according to ranges established based on prior testing as well as on type of surface or item sampled.
    b. Once all test results have been received the CVT will prepare reports for the review by the veterinarian.
    c. Test results will be discussed by the AV, the CVT and FM depending on results and a strategy developed for resolution of *Fail* ATP results and unacceptable HYcheck results. Further investigations might be initiated to find the reason for unacceptable test results. The FM is responsible for implementation of remedial actions in regards to sanitation. The veterinary staff is responsible for communicating concerns to research personnel, if necessary.
    d. Resolution of unacceptable results can include but are not limited to
        i. Retesting of particular surfaces/items
        ii. Training of CM personnel regarding sanitation procedures
        iii. Adjustment of sanitation frequency/intervals
        iv. Changes in detergents/disinfectants
        v. Improvement of the cage washer function
        vi. Communication of proper procedures to research personnel
    e. Number and type of remedial actions will be decided on a case by case basis.

IV. Record Keeping

a. The *Quarterly EMP Sampling Preparation sheet* will be prepared in advance for guidance during the sampling procedures including the number of samples to be collected per facility, specific sample site(s) within the particular vivarium, and the description of the sampled surface/item.
b. The *Quarterly ATP Sampling Sheet* will be prepared with number of sample, sample site, name of vivarium, and description of sampled surface/item. The columns pertaining to the URL measured, initials of the sampling person, and date and time of sampling will be completed during active sampling and kept as "raw data".
c. The HYcheck Sampling Report found inside the box of HYcheck slides will be prepared in advance in regards to facility being tested, room number, and contact person at this facility. The specific surface/item sampled, name of person taking samples and date and time of sampling will be completed during active sampling. This

report will be copied, the original sent with the samples to the commercial laboratory for testing and the copy kept as "raw data".

d. Final data will include the Microbiological Monitoring Log reporting the results by the commercial laboratory and a test result summary report printed from the Neogen AccuPoint ATP testing system.
e. All quarterly EMP records will be filed in a systematic manner as hard copies and in electronic format if applicable on the CM shared drive.

Table 1: Quantities for ATP & HYcheck Assigned by Building at Quarterly Sampling

Building	35A	35B	71	MC17	MC19	Totals
# of Rooms	13	9	15	17	11	**65**
ATP Qtr	27	16	31	38	22	**131**
HYcheck Qtr	14	9	16	18	11	**68**

Review Date	Revision Date	Revision Number	Description of Revision
8/9/17	8/9/17	113.2	Updated general procedures and quantities in Table 1; changed verbiage; changed formatting