October 14/ 2021

Biological Safety Officer (CBU) - Yearly Report to IBC and VP-A.

**Introduction**

Cape Breton University (CBU) recognizes that ensuring the safety and security of students, faculty and staff is, above all else, the institutions most important mandate. In terms of its dealing with hazardous biomaterials, pathogens and toxins, CBU recognizes its fiduciary responsibilities of safety and security to the wider community and society as well. Ensuring an active and vibrant teaching and research atmosphere must include compliance with relevant regulatory frameworks and oversight procedures that cannot be overruled or overlooked for any reason.

Routine and effective communication between the Biological Safety Officer (BSO), Research Supervisors (RS) and laboratory workers is critical to ensure a healthy and safe work environment for those interacting with bio-hazardous materials.

Mandatory members of the Institutional Biosafety Committee (IBC) include those instructors, researchers (and research assistants) participating in the handling of biomaterial or in biosafety training of students or researchers within the designated areas. See Appendix.

The IBC through the BSO reports directly to Dr. Richard MacKinnon, VP, Academic and Provost. The BSO may coordinate with the VP, Academic & Provost for routine updates and in the case of issues unresolved at the IBC level.

**Latest correspondence from PHAC.**

On October 8 2021, I received a letter of intent from PHAC that a virtual inspection of our microbiology lab will be conducted on Nov 12, 2021. In lieu of an actual in-person visit videos will be made of key components PHAC wishes to see. The inspection will consist of a number of teams meetings on Nov 12 2021. PHAC has asked that CBU microbiology lab users be present. These include:

Paul MacDougall, BSO, Senior Instructor II

Lyndsay Best, Microbiology Lab Technologist and Biosafety Trainer

Angela Keylor, Senior Microbiology Lab Technologist

Dr. Raj Kalia, Research Associate

John MacMillan, OHS officer

**Research projects**

Due to the CoVID-19 pandemic CBU campus was closed, all teaching was online/distance and little in the way of lab-based research was carried out on campus during the period of March 2020 to August 2021. There was no microbiology research conducted during this time.

A molecular biology based SARS-CoV-2 wastewater-testing project, done in partnership with Dalhousie University, was done from February 2021 to August 2021. A dedicated CL2 lab with biosafety cabinets was required. A113 meet these requirements. The project was led by Engineering Dept. Assistant Professor, Dr Allison Mackie. Laboratory work using qPCR molecular technology was done by Research Associate, Praveen Padmakumar (May 2021 CBU Public Health graduate with extensive prior microbiology experience). Once the project finished at the end of August 2021 BSCs, benchtops and other working spaces were disinfected and cleaned thoroughly to resume teaching in September 2021.

**Lab Capacity**

Classes and labs began again in Sept 2021. The number of sections remained approximately the same but numbers in labs were smaller to comply with provincial social distancing rules. Since these were removed in early October, it can be anticipated larger lab sizes will resume in winter 2022 term.

Assuming that CBU will want to maintain a strong international presence post-pandemic and since we teach a Public Health degree CBU may see an even greater demand for our program in the years to come.

At present, the two interconnected microbiology labs can offer up to 18 sections per term. This is limited by faculty though. In order to maximize lab usage a third microbiology technologist would have to be hired. Presently we have two. This is more of an issue for senior administration in consultation with recruitment and admissions to decide but it is important to make note. Nursing is an even more in-demand program and those students take an introductory microbiology course with lab. CBU’s allotment of nursing students was increased to 142 by the province in 2020.

Specific lab courses

PUBH 4108 Biocontaminants in Indoor Environments. (Fall and winter terms)

PUBH 4104 Food Borne Disease. (Fall and winter terms)

MICR 2101 Introductory Microbiology. (Fall and winter terms)

MICR 3103 Environmental Microbiology. (Winter term)

**PHAC requirements**

Part of the role of PHAC is to conduct inspections of microbiology laboratories and make suggestions about areas that may not comply with their regulations. CBU will have its first ever inspection on November 12 2021. Ironically, the pandemic allowed CBU maintenance to conduct a number of activities in A113 to bring it more into line with PHAC lab requirements. These include painting walls, (no chipped paint allowed) repairing floor tiles, filling holes in bench tops, seal where wall and floor meet, etc. During the November inspection/meeting the BSO will explain to PHAC the new research lab (see section below) at CBU and seek guidance if any special things need to be considered. The present understanding of the BSO is the new research lab will follow under the license we already have from PHAC.

**Research needs**

Due to the past increased demands on the microbiology teaching space, funds were acquired by a group of CBU researchers to convert an existing lab into a microbiology research only lab. As BSO, I was consulted on the design of the lab and equipment needed for it. This was in early March 2020, prior to the shutdown of campus to regular faculty and most staff. The work was completed between April 2020 and May 2021. Equipment was ordered and put into place over the summer and now the room is a fully functionally Microbiology research lab with its own media preparation and waste autoclaving capacity.

At present Dr. Raj Kalia is the core microbiology researcher at CBU who coordinates all microbiology related research work proposed and or carried out at CBU. He will deal with time in the lab, equipment available for use, follow strict PHAC protocol regarding use and disposal of approved microorganisms, liaise with the BSO and other members of the IBC to ensure everyone is following PHAC regulations, and understands the importance of biosafety and biosecurity concerns. All potential research still has to be vetted by the BSO/IBC and after approval (if given) be coordinated through the microbiology research lead. Research would include anything proposed by faculty members or anyone else affiliated with CBU in a microbiology research capacity on campus. A key aspect of any research at CBU is microbiology expertise and experience.

**Biosecurity Risk Assessment**

The material in this section is a condensed from the PAO, 3rd version (Jan 2019)

“The complexity and detail of the biosecurity program is dependent on the level of risk posed by the pathogens, infectious material, or toxins in possession.” (Canadian Biosafety Handbook 2nd 2016)

The only microorganisms on hand at CBU are ATCC Risk group 2 lab grade bacteria.

There are no higher risk material (i.e., **security sensitive biological agents [SSBAs],** Risk Group 3 [RG3], and Risk Group 4 [RG4]) pathogens, toxins or materials at CBU. There is no plan to have any such material on campus and if a request were made by a researcher, it would be **denied** by the BSO and the IBC.

According to the CBH2 “Individuals, organizations, or groups that may pose a risk to the security of assets present within the facility (e.g., theft) should be identified and listed. Such individuals or groups are considered adversaries or threats.

The BSO and IBC have no present concerns in regards to any biosecurity risks at CBU. The microbiology teaching labs and the new research lab are electronic key fobbed and only a handful of people have access. As BSO, I have access to the teaching and research labs. Testing of various compounds, prepared by CBU Chemistry faculty, for antimicrobial activity will be carried out in the coming months by Raj Kalia and perhaps one or more research associates under his guidance. Raj ordered and received five ATTC level two bacterial strains for this purpose (from Cedarlane labs, in accordance with all regulations regarding transport of bacterial strains). They include:

Bacillus subtilis, subspecies subtilis 6051

Staphylococcus aureus; subsp. aureus 25923

Staphylococcus epidermidis; Strain PCI 1200, 12228

Pseudomonas aeruginosa; Strain Boston 41501, 27853

Escherichia coli 25922

There are no risk concerns with these strains.

It is of the opinion of the BSO and the IBC that due diligence and best practices concerning any possible biosecurity threats be the defining philosophy at CBU. We feel our microbiology faculty, research staff and the members of the IBC are as diligent in their duties as anyone else in comparable situations at small undergraduate universities in the country are and follow the same best practices possible. We have the full endorsement of senior management in this regard.

**Appendix**

Mandatory members of IBC

Paul MacDougall 02-563-1460

Bernie MacLennan 902-563-1293

Angela Keylor 902-563-1854

Lyndsay Best 902-563-1319

Raj Kalia 902-563-1479

General Membership

Occupational health and safety officer in a liaison role

John MacMillan 902-563-1846

There are no term limits imposed on IBC mandatory or general membership. Due to the changing research interests of a university, research members on the IBC will change over time, but Microbiology faculty and the safety officer are expected to serve permanently on the IBC.

Prepared by Paul MacDougall, BSc, MSc, RM, CSMLS

Senior Instructor II, Health Sciences Dept, CBU Biological Safety Officer

Presented to the CBU Institutional Biosafety Committee via internet on October 13 2021

**Circulated to the IBC on Oct 13 2021**

Paul MacDougall BSO, Senior Instructor II, Health Sciences Dept.

Bernie MacLennan Senior Instructor II Microbiology, Health Sciences Dept.

Angela Keylor Senior Microbiology lab technologist, Health Sciences Dept.

Lyndsay Best Microbiology lab technologist, Health Sciences Dept.

John MacMillan OHS officer

Raj Kalia Research Associate

The IBC committee is in agreement with the report. The committee will continue to help fulfill current PHAC regulations and foster a healthy microbiology teaching and research environment at CBU.