




**CAF Fluorescence Microscopy Unit
 Laboratory Standard Operating Procedures**

BIOSAFETY GUIDELINES FOR BSL-2 CONTAINMENT: SPILLS AND EXPOSURE			
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2021-05-23	2021-06-01	2021-06-07	
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A. Purpose

This document serves as part of the Biosafety Manual and Standard Operating Procedure (SOP) for the Central Analytical Facility (CAF) Fluorescence Microscopy (FM) Unit at the University of Stellenbosch, Room 2022-2025, Mike de Vries Building. It has been developed from previous model Manuals and SOPs currently in place in the laboratory as well as Exposure Control SOPs, Safety Manuals and SOPs developed at other Departments of Stellenbosch University, from the University of Cape Town and guidelines of the World Health Organisation.

All users of the CAF Fluorescence Microscopy Unit are required to fully understand the potential hazards involved in using these facilities and to always follow safety practices. Failure to do so can result in costly instrument damage, cause harm or serious injuries to the user

Use of the equipment is a privilege and not a right. No individual shall enter the facility or use any equipment without the approval of a CAF staff member. Training can be provided, however, it remains the discretion of CAF staff to allow independent use of any equipment.

B. Standard Operating Procedures for Exposure to potentially hazardous material

Exposure can be defined, but is not limited to, as follows:

1. Direct skin, eye or mucosal membrane exposure to an agent or material potentially containing the agent, such as tissue culture media, cells, bodily fluids from infected animals, etc.
2. Parenteral inoculation by a syringe needle or other contaminated sharp such as broken glass or cuts from a blade.
3. Ingestion of a liquid suspension containing infected material or by contaminated hand to mouth exposure.
4. Inhalation of infectious aerosols.

B.1. Exposure to skin

1. In the event of an exposure to or contact with skin directly or via contaminated clothing, remove the clothing immediately and wash the affected area thoroughly with soap and water, but not so hard the skin is abraded.
2. If necessary, exit the lab area and immediately take a shower. Wash thoroughly with soap and water, but not so hard the skin is abraded. An emergency shower is available just outside the entrance to the FM unit.

3. Notify the Unit Manager (refer to section D) and specifically report whether exposure was to a BSL-2 or other potentially hazardous agent.

B.2. Penetrating wound

1. In the event of an injury such as a penetrating wound, cease all current activities and immediately notify either the Unit Manager, Occupational Health, Safety Act (OHSA) committee member or designated first aider (Refer to Section D).
2. A first aid kit is available in the unit office, room 2023 and the designated first aider should treat the wound immediately.
3. The Occupation Health nurse at Campus Health should be notified of the incident (Refer to Section D). A list of all relevant numbers are also displayed in the laboratory.
4. Proceed to Campus Health Services or the Hospital emergency Room for full medical treatment (refer to Section D for directions and addresses).

B.3. Eyes or mucous membrane exposure

1. Immediately, flush eyes or mucous membrane with water for 10-15 minutes. An eye wash station is available just outside the entrance to the FM unit.
2. Notify the Lab Manager, OHSA committee member or designated first aider (Refer to Section D).
3. The Occupation Health nurse at Campus Health should be notified of the incident (Refer to Section D)
4. Proceed directly to Campus Health Services, or the Hospital emergency Room full medical treatment.

C. Standard Operating Procedures for Spills of potentially hazardous material

1. When a spillage in the laboratory occurs, the most appropriate procedure should be followed based on the characteristics of the spilled material.
2. If there is any doubt on the procedure to follow, call the Unit Manager (Refer to section D)


C.1. Spills of biological material inside the Biosafety Cabinet

1. Stop work immediately.
2. If there was direct contact with skin, eye or mucous membrane follow the steps outlined in B.1 and B.3
3. Immediately change PPE (coat and gloves)
4. Keep the biosafety cabinet running.
5. Contain the spill by careful layering paper towels, avoiding the formation of splatter or aerosols.
6. After most of the spill has been absorbed, carefully remove the absorbed paper towels – if the paper towels are soaked rather transfer to a glass beaker inside the cabinet to prevent further spillage.
7. Cover the spill area with *freshly prepared 1:10 dilution of bleach*. Total exposure time: 15 minutes
8. In the event of a spill into the drip pan/catch basin, follow steps 5-7. Total exposure time: 15 minutes.
9. Following the bleach decontamination, spray the surfaces with dH₂O and wipe away diluted bleach. Finally spray surfaces with 70% ethanol.
10. Disinfect all materials used in the biosafety cabinet by wiping the surface with 70% ethanol. Do not attempt to disinfect contaminated cardboard or other paper items that absorb the liquid. Contaminated items such as these should be disposed of in red biosafety bins. If they are soaked and to prevent further spillage, transfer to a beaker inside the cabinet before discarding in the red biosafety bins.
11. Remove PPE, discard disposable PPE as biohazardous waste and wash hands thoroughly.
12. Run the biosafety cabinet for 10 minutes to purge the air before re-starting work.

C.2. Spills of biological material outside of the Biosafety Cabinet

1. Stop work immediately.
2. If there was direct contact with skin, eye or mucous membrane follow the steps outlined in B.1 and B.3
3. Immediately change PPE (coat and gloves).
4. Ensure that any other people in the vicinity are notified about the spill.

- a. If the risk level is low and you need assistance with the spill clean-up, call the Unit Manager.
5. Depending on the risk level of the material (risk level 2 or above), evacuate the room.
 - a. Post a “Do Not Enter” notice on the door. Notify the Unit Manager immediately (Refer to Section D) who will contact the fire department
6. Assemble the spill clean-up kit (available in the chemical store in the Molecular Lab, room 2026) and don PPE which should include a lab coat, eye protection and/or face shield, 2 pair of gloves, shoe covers and disposable sleeve covers.
7. Contain the spill by covering with paper towels, avoiding the formation of splatter or aerosols. For a large spill, cover with vermiculite (stored under the fume extraction cabinet).
8. Carefully saturate the spill with freshly prepared 1:10 dilution of bleach by slowly pouring from the outside in. Avoid splashing or generating aerosols. Do not use alcohol for large spills.
 - a. Wipe areas of splatter around the spill and any reusable equipment with 1:10 dilution of bleach.
 - b. Total exposure time: 15 minutes
9. Wipe up the spill with absorbent paper towels and dispose the contaminated towels in a biohazard bag; if sharps are present use tongs or a brush and pan and dispose in biohazard sharps container.
 - a. Work concentrically to clean up the absorbent material. Always work from the outer edge of the spill toward the centre.
10. Wipe spill area with water and then follow with 70% ethanol.
11. Place all towels or absorbent materials into a designated container for biohazardous waste.
12. Remove PPE, discard disposable PPE as biohazardous waste and wash hands.
13. Remove the “Do Not Enter” sign and inform others that it is safe to re-enter the room.
14. Once the spill has been contained, complete the OSHA Incidents form (below) and have the Unit Manager send it to the OSHA representative.

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C.3. Chemical spills

1. In the event of a chemical spill, cease all current activities and immediately proceed with the containment and cleaning procedure.
2. Contain the spill by covering the spill carefully with layers of paper towels, avoiding aerosol formation or splashes. In the case of a larger spill, cover with vermiculite (stored under the fume extraction cabinet).
3. For spills of chemicals at a low risk to cause harm, such as saline solutions, the area need to be cleaned with absorbent tissue paper, which is to be discarded into the green chemical waste bin.
4. For spillage of potentially hazardous chemicals, the spill should be cleaned according to the MSDS only.
 - a. Before any such chemicals are brought into the laboratory, it should be confirmed that the unit has all the equipment/material required to contain and clean if a spill should occur and that CAF staff and the person working with the chemical is fully aware of the containment and clean up procedure.
5. Assemble the spill cleaning kit (available in the chemical store in the Molecular Lab, room 2026) and don PPE which should include a lab coat, eye protection and/or face shield, 2 pairs of gloves, shoe covers and disposable sleeve covers.

C.4. Emergency Spills that pose an Environmental Risk

1. In the event of a chemical spill that poses an environmental risk, cease all current activities, and immediately proceed with the containment and cleaning procedure.
2. Notify other people in the vicinity that a spill has occurred and that the room should be evacuated. Post a "Do Not Enter" notice on the door. Notify the unit manager.
3. Call the Fire Department (021 808 8888) and provide details on the spillage to the operator.
4. Take appropriate precautionary steps to limit exposure or spread of the spill to other areas.

D. Post Exposure Procedures

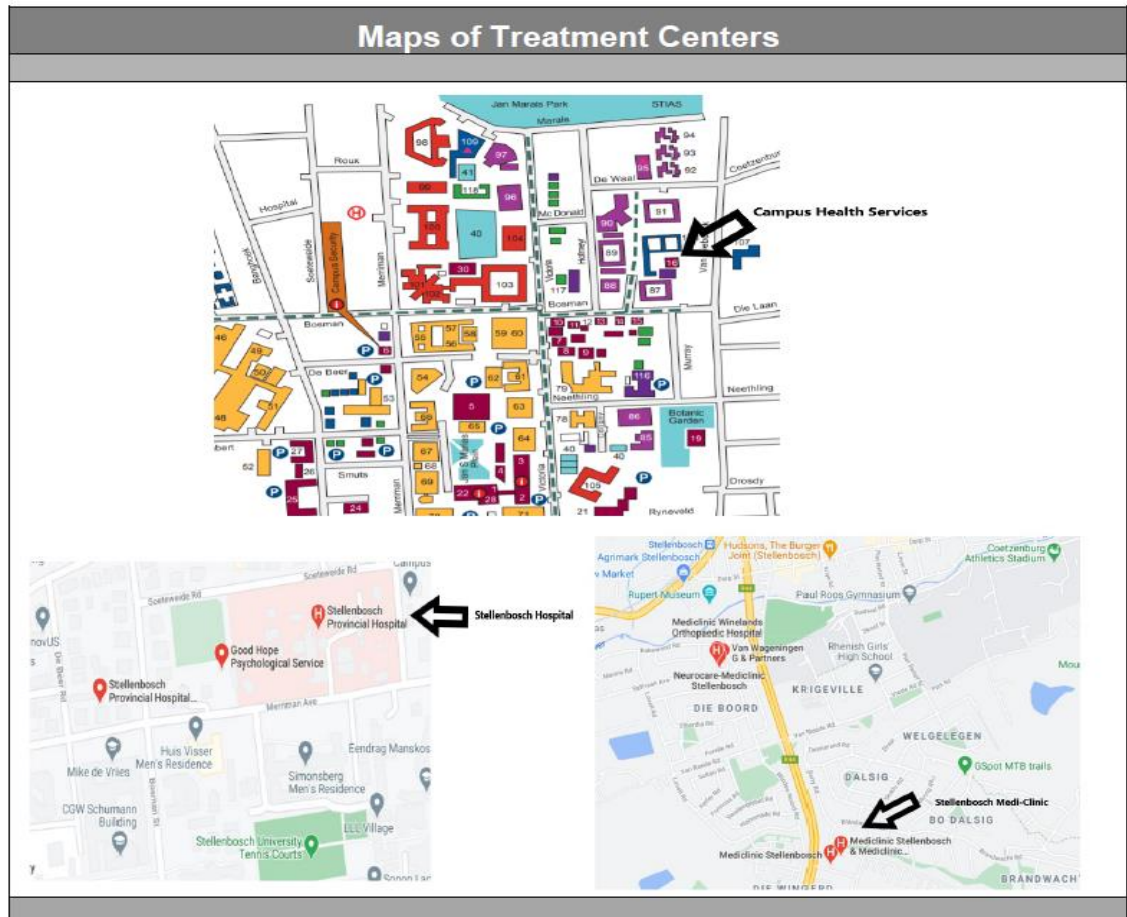
1. Post exposure prophylaxis or treatment must be initiated as soon as possible after exposure.

2. Proceed immediately to Campus Health/Hospital/Mediclinic for further medical evaluation. If the injury is serious/life threatening, proceed to the Hospital Emergency Department or call an ambulance. Contact information is in the table below.

Campus Health Services	021 808 3494/6
Unit manager: Lize Engelbrecht	079 699 4131
Occupational Medicine – Sr Anneke van Heerden	021 808 3494
Ambulance	084 124 (ER24) 082 911 (Netcare)
Medi-Clinic 24h Emergency	021 861 2000
CSCD 24-Hour Crisis Service	082 557 0880

3. Provide as much detail as possible on the incident to ensure that the physician is aware of all materials that were being used at the time of exposure (e.g., virus, bacteria, human tissue, animal tissue, other potentially infected material).
4. Inform the Healthcare Provider of any medical conditions that you currently have (i.e. pregnancy, immunosuppression, current drug treatment) so to evaluate and initiate a proper treatment plan.
5. Follow up with the Occupational Health nurse at Campus Health Services (021 808 3494)
6. Have the Unit Manager or OHS committee member complete an incident report using the template in section E which needs to be submitted to Campus Health Services on the same day as the incident.

7. Map of Medical centres in Stellenbosch:



- Campus Health Services:
7 Claassen St, Stellenbosch Central, Stellenbosch, 7600
@ -33.93464646552302, 18.86952183068654
- Stellenbosch Medi-Clinic:
1 Elsie Du Toit Drive, Stellenbosch, 7600
@ -33.95365946717416, 18.857369720738323

E. Spills and Exposure Event Reporting Procedure

The official incident report of injuries and exposure should be completed as soon as possible after exposure:

<http://www.sun.ac.za/english/CampusHealth/medical-services/occupational-health>

Injuries/illnesses: Complete sections A, B, C, D

Environmental incidents, hazards, fires and property damage: Complete sections A, B, D

SECTION A: DETAILS OF PERSON INVOLVED IN INCIDENT or PERSON REPORTING HAZARD

Person involved in incident **or** Person reporting hazard/damage

Full name and Surname _____

ID number _____

Department _____

Faculty/ Address _____

Telephone _____

Male Female

Staff UG Student PG Student Contractor Visitor

SECTION B: INCIDENT DETAILS or NATURE OF HAZARD or DAMAGE
Use separate sheet(s) if insufficient

Date of incident/ hazard/ damage _____

Time _____

Date when first noticed/diagnosed _____

Location of incident/hazard/damage **Building:** _____

Location: _____

Campus: _____

Normal duties Travelling on duty In class/lecture Off-

campus activity

Playing sport Other: _____

Brief description of incident, hazard, fire or damage (what happened)

SECTION C: INJURY/ILLNESS DETAILS

This section to be completed only if an injury has occurred

Describe injuries/illness including part(s) and side(s) of body affected:

Name of Witness or First Person on

Scene: _____

Telephone: _____

Treatment details:

None First aider On-campus medical service

Own doctor

Hospital: in-patient casualty

Signature of injured person: _____ Date: _____

Signature of person completing form: _____ Date: _____

If not injured person:

Name: _____

ID No: _____

SECTION D: INVESTIGATION AND CORRECTIVE/PREVENTIVE ACTION
Use separate sheet(s) if insufficient space

ACCIDENT/INCIDENT: Notifiable Other Environmental Hazard/Near Miss
Investigation results (why did it occur?)

Corrective/Preventive action recommended / taken:

1 Health & safety representative: _____

Signature: _____ Date: _____

2 Safety Committee chair person: _____

Signature: _____ Date: _____

Recommendations in **D** have been implemented:

Yes No In Progress