Substitueix a	Elaborat per	Aprovat per
-	FC, PGH **Personal tècnic** Nom Cognom	PGH **Direcció SCAC** Nom Cognom

1. INTRODUCCIÓ I ÀMBIT D'APLICACIÓ

In the SCAC laboratories, hazardous waste is generated, both liquid and solid. The service staff is responsible for ensuring the proper management of the generated waste, following the UAB internal regulations, reducing the formation of special waste, and being respectful of the environment.

The aim of this document is to specify the **operations that users must carry out**, which are related to the management of the waste generated in the different SCAC laboratories. This procedure applies to the management of non-hazardous, toxic (CMR), and biohazardous waste generated in the SCAC laboratories.

1.1. Definitions

Declassification/Inertization/Inactivation: Waste that has been autoclaved by a validated procedure is reclassified and discarded as ordinary waste, as it is no longer considered biohazardous.
Biohazardous waste: Any waste that is or contains biological agents of risk group 2 or higher, and therefore has the potential to cause an infection, allergy, or toxicity to humans, animals, or plants, or that is hazardous to the environment. Genetically modified organisms (GMOs) of any risk group are also included. In the SCAC, biological waste of group 1 will be treated as if it were group 2**.**
Toxic waste: Waste that is potentially hazardous to health or the environment.
CMR waste: Toxic waste with carcinogenic, mutagenic, or reproductive toxic properties**.**
Ordinary waste: These are wastes that, by their nature, can be treated or stored in the same facilities as domestic waste.
Sharp or pointed waste: An object with sharp edges or points capable of cutting or puncturing the skin or ordinary bags. Decree 27/1999 regulates the disposal of this type of waste generated in healthcare centers, veterinary clinics, or biomedical research facilities with the aim of protecting handlers from physical or infection hazards. Some examples include hypodermic needles, suture needles, lancets, cutting blades (scalpels, microtome blades, razor blades), broken and contaminated laboratory glass, slides and cover slips, capillary tubes, Pasteur pipettes, and other fragile glass materials. Whenever possible, glass materials will be replaced with plastic materials.
Inactivation/Inertization: The inactivation of hazardous waste is a key element in preventing the risk of exposure to biological agents for people and the environment. Some of the waste generated in the SCAC can be inactivated by autoclaving and discarded as ordinary waste (they are no longer hazardous: declassification). Waste that cannot be inactivated at the SCAC is disposed of through the external company selected by the UAB Office of Environmental Affairs.

1.2. User Responsibilities

- They must inform, before starting the work, of the biological or chemical material they will be working with (SCAC/FOR/0320 Self-service and practices request). They must also inform SCAC staff of any modifications that occur regarding this.
- They must properly handle the types of waste generated, separate them at the source, and place them in the appropriate container, following the regulations outlined in this document.

- They must inform the technical staff of any incidents detected or when the waste containers have reached their maximum level.
- It is **forbidden to use any chemical compound in the SCAC facilities that require the use of a fume hood**, except when used in small volumes and concentrations (subject to risk assessment by the UAB's Prevention Service). If Prevention authorizes its use, the user must inform the SCAC. It is the user's responsibility to ensure the proper disposal of these chemicals outside the service's facilities.

- Waste generated during activities involving **human biological material or non-human primate material** is considered **risk group 2 (BSL2)**. Due to the difficulty in separating it at the source from waste generated during risk group 1 (BSL1) activities, all biological waste (BSL1 and BSL2) will be considered and treated as group 2.

Associated documents (Cytometry)
SCAC/IT/0087: Canvi fluids FACSCanto
SCAC/IT/0090: Canvi fluids FACSCanto
SCAC/IT/0273: Cytoflex Quick start guide

2. CLASSIFICATION AND HANDLING OF WASTE GENERATED IN THE SCAC

Waste generated in the SCAC can be classified as follows:

2.1. NON-HAZARDOUS Waste

These are waste materials that can be treated or stored in the same way as domestic waste. This category includes **non-contaminated** laboratory waste that, by its nature or composition, and for management purposes, is comparable to urban waste:

-Non-plastic, non-glass solids are disposed of in containers labeled as ordinary waste (**fig. 1**).
-**Plastic solids**: are disposed of in the container for plastic recycling (**fig. 2**).
-**Glass solids:** These are disposed of in containers for non-contaminated glass located in the IBB.

Fig.1 Papelera residuos banales.

Fig.2 Contenedor plástico para reciclar.

2.2. HAZARDOUS Waste

This is the group of waste that includes toxic (CMR) and biohazardous solid and liquid waste.
The different types of hazardous waste generated in the SCAC are:

2.2.1. Carcinogenic, Mutagenic, and Reprotoxic (CMR) Waste

All CMR waste generated in the MRB/-106 **Cytometry**, MRB/-107.1 **Cell lines**, and MRB/-109.1 **Primary** Laboratories is collected separately and placed in the approved blue container for toxic waste (**fig 3**) located in those rooms.
The CMR waste generated in the MRB/-109.2 **Virus** Laboratory will be placed in a small container (**fig 4**) marked with the "C" symbol for cytotoxic.

When the small CMR containers in the MRB/-109.2 Virus laboratory (**fig 4**) are full, the **SCAC staff** will remove the bag and replace it with an empty one.

2.2.1. For formaldehyde (toxic CMR waste)

Formaldehyde waste must be placed inside a closed container (primary container) which will be placed inside one of the approved 30 or 60-liter cytotoxic drums (fig.3). The exterior label must specify that it contains formaldehyde waste.

Fig. 3 60 L container for toxic waste (CMR)

Fig. 4 Temporary container for cytotoxic or CMR waste

2.2.2. Liquid Biohazardous Waste

The liquid waste generated in the SCAC is that which has been in contact with biological material.

→*In the* ***laminar flow hoods,*** these waste liquids are aspirated from the cell cultures using a vacuum pump and are delivered into a container (**fig 5**) that has a trap to prevent the liquid waste from refluxing back into the pump, in case the maximum filling volume is exceeded.

The *suction tube* **should be cleaned** every time the user finishes their activity. Inside the cabin, while in operation and with the suction pump running, pass 70% ethanol through the silicone tube (perform at least two sprays). Leave the silicone tube in its original position and turn off the vacuum pump. The container is replaced by the technical staff when it reaches the red mark (maximum fill volume 70%), or when necessary for any other reason.

Fig. 5. Detail of a drum for biohazardous liquid waste

→*In* ***Flow Cytometer analyzers,*** the liquid waste generated in the flow cytometers is collected in a specific container (**Fig. 6**). The biological material in this waste is highly diluted by the flushing and cleaning fluids of the equipment. The containers are replaced or emptied when indicated by the equipment or when necessary. The replacement of the flow cytometer containers can be carried out by both SCAC staff and authorized users who operate them in self-service mode.

Replacement of the flow cytometer containers

The flow cytometer analyzers (FACSCanto, FACSCalibur, CytoFlex, and CytoFlex LX) have a spare container located next to the cytometry laboratory sink (MRB/-106).

When the equipment indicates that the waste container is full, the user or the technical staff of the unit must proceed with its replacement.

Set the cytometers to standby mode (STANDBY). Follow the procedures SCAC/IT/0087 Canvi fluids FACSCanto, SCAC/IT/0090 Canvi fluids FACSCalibur, and SCAC/IT/0273 Cytoflex Quick Start Guide.

Replacement of the container

FACSCalibur Cytometer: Unscrew the connectors of the waste container to remove it from the equipment and replace it with the reserve container + 120 ml of bleach. Close the replaced container with the cap. Reconnect the container (*SCAC/IT/0090*).

FACSCanto Cytometer: Disconnect the connectors that attach the container to the equipment. Remove the container and replace it with the reserve container + 300 ml of bleach, swapping the caps of the reserve container with the caps that have connectors and a filter from the replaced container. Reconnect the container (SCAC/IT/0087)

CytoFLEX Cytometer: Disconnect the connector that attaches the container to the equipment. Remove the container and replace it with the reserve container + 120 ml of bleach. Reconnect the container (SCAC/IT/0273)

CytoFLEX LX Cytometer: Disconnect the connector that attaches the container to the equipment. Remove the container and replace it with the reserve container + 300 ml of bleach. Reconnect the container (SCAC/IT/0273)

Fig. 6a Container for biohazardous liquid waste from the FACSCalibur

Fig. 6b Container for biohazardous liquid waste from the FACSCanto

Fig. 6c Container for biohazardous liquid waste from the Cytoflex

Fig. 6d Container for biohazardous liquid waste from the Cytoflex LX

2.2.3. Biological Hazardous

→In the **laminar flow hoods**, the separation of plastic waste from glass waste is carried out during work in the hood. For this, two temporary waste holders are used, which are placed inside the hood at the start of the work: a tripod with a plastic bag for plastic waste (**Fig. 7**) and a hard plastic container with a plastic bag for glass waste (**Fig. 8**).

Plastic Waste: Once the activity is completed, the user will place the bag with the waste generated in the hood into the autoclave bag located inside the temporary plastic solid waste container (**Fig. 9**). For proper inertization of the waste, the bag must be left open.
The user will notify the SCAC staff if they detect any issues or if the container is full (do not compress its contents).
The SCAC staff collects the autoclave bags from the temporary containers daily (**Fig. 9**).

Sharp or cutting Solid Waste:
Glass (Pasteur pipettes): This type of waste is only generated in the cell culture laboratories for cell lines (MRB/-107.1) and primary cultures (MRB/-109.1).
Once the activity is completed, the user will place the bag with the waste generated in the hood into the approved biosanitary container of group III (**Fig. 10**) located in each of the culture laboratories (MRB/-107.1, MRB/-109.1). Users will notify the SCAC technical staff if they notice that any of the containers are full.
The use of glassware is not permitted in the cell culture and virus laboratory (MRB/-109.2).

*Needles and Scalpels: the user must dispose of these types of waste in the approved container, which allows the safe disposal of needles and scalpels without handling them (**Fig. 11**) (DO NOT RECAP THE NEEDLES). For use, the container must be placed inside the hood. Once the work is completed, it should be returned to its original location. When the container reaches the maximum fill line, the SCAC staff will proceed with its removal.
The use of needles and scalpels **is not permitted** in the cell culture and virus laboratory (MRB/-109.2)

Fig. 7 Temporary support for plastic waste

Fig. 8 Detail of a temporary support for sharp/glass puncture waste

Fig. 9 Temporary container for non-sharp/non-puncture solid waste

Fig. 10 Sharp/puncture solid waste from glass with and without protective screen

Fig. 11 Sharp/puncture solid waste

→*In **Flow cytometers**, the use of needles and other sharp or puncturing materials is not allowed*.

Plastic solid waste (test tubes): the solid biohazardous waste generated in the cytometry laboratory mainly consists of test tubes containing samples that are analyzed in flow cytometers, which are pre-processed to minimize sample handling. If sample manipulation is necessary, plastic materials will always be used, and the resulting waste will be disposed of in a plastic container (with a disposable bag) designated for this purpose (**fig 12**). Closed cytometry tubes, which contain the leftover liquid from the analysis, will also be disposed of in these bags.

Fig. 12 Temporary support for bio-contaminated plastic waste

2.2.4. Plate Reader

The user has the option to manage the waste (consisting of the plate and its contents) in their own laboratory.

If they choose to leave it in the SCAC, it must be disposed of in the CMR waste container (**fig 3**) in the cytometry laboratory (MRB/-106), where the reader is located.

2.2.5. Blood simples, secretions, tissues, etc.

They should be kept in their **closed primary plastic containers** (tubes, bottles, etc.). Once the activity is completed, they will be disposed of in the non-sharp and non-puncture solid waste containers (**fig 9**).

2.2.6. Laboratory Animals

Users of the SCAC who use animals in our facilities are responsible for their disposal outside of the Service's facility.

2.2.7. Biohazardous waste generated in the VIRUS LABORATORY (MRB/-109.2)

Considering the type of activity conducted in this laboratory, the procedures for waste management will be specifically detailed in the experimental procedure approved by the UAB Biosafety Committee (CBS), which is available in the CBS application (UAB intranet) and in the SCAC BDD (IP of the activity).

The use of glassware and sharp or cutting materials is forbidden, as well as the use of a vacuum pump for aspirating liquid waste.

Liquid waste is collected within the hood, in plastic tubes or bottles that can be sealed airtight. Once the activity is completed, the user fully seals the tubes and/or bottles and disposes them together with the solid waste in the temporary solid waste support inside the hood (**fig 8**). After finishing their work in the hood, the user places the bag with the plastic solid waste inside an autoclave bag (located in the laboratory drawers), seals it completely, and disposes of it in the approved biohazardous waste container (**fig. 10**) located in this room.