**Purpose**

The purpose of this SOP is to describe and explain how to correctly use the Optima MAX-XP centrifuge and general maintenance of the machine in a laboratory setting.

**Scope of Policy**

This machine is to be used only in a lab by lab personnel only for research purposes. PPE should be worn when working the machine to ensure safe operation. When cleaning the machine, PPE should be worn appropriately.

**Introduction**

An ultracentrifuge is capable of separating high-molecular-weight compounds, viruses and subcellular particles for study. The MAX-XP is ideal for applications requiring high speed and g-forces with volume flexibility, like viral vector gene delivery and nanoparticle applications. It also meets the needs of traditional laboratory applications, including separation of subcellular particles and protein purification and isolation.

**Safety when using the machine**

Electrical safety: Do not place containers holding liquid on or near the chamber door. If they spill, liquid may get into the ultracentrifuge and damage electrical or mechanical components.

Safety against risk of fire: This ultracentrifuge is not designed for use with materials capable of developing flammable or explosive vapours. Do not ultracentrifuge such materials (such as chloroform or ethyl alcohol) in this ultracentrifuge nor handle or store them within the required 30cm area surrounding the ultracentrifuge.

Mechanical safety: Do not move or lift the ultracentrifuge while the rotor is spinning. NEVER attempt to slow or stop the rotor by hand.

NEVER attempt to override the door interlock system while the rotor is spinning

In the event of a power failure, do not attempt to retire the sample from the ultracentrifuge for at least 1 hour.

Chemical and biological safety: handle body fluids with care because they can transmit disease.

Do not run toxic, pathogenic or radioactive materials in this ultracentrifuge without taking appropriate safety precautions (speaking to the lab manager)

Dispose of all waste solutions according to appropriate environmental health and safety guidelines.

**Operation**

Basic manual run:

1. Turn the power on
2. Install the rotor according the applicable rotor manual, then close the chamber door.
3. Press the rotor button, then choose the rotor from the rotor list. ( this step is optional, if you do not wish to select a rotor go to step 4)
4. Press the SPEED button, then enter the run speed (5000 to 150000 RPM)
5. Press the TIME button, then enter the run time (up to 99 hours, 59 minutes)
6. Press the TEMPERATURE button, then enter the required run temperature (0 to 40˚C)
7. To accept the default accel/decal rates of maximum, go to step 8. (this step is optional: select the accel/decal menu option, and select the acceleration rate number, from Max(fastest) to 9 (slowest), select the deceleration rate number, from Max (fastest) to 0 (coast).
8. Press the START button to start the run.

If you need to cool down any rotors for low temperature runs, you can place them in the cold room (ground floor) or remove the vacuum in the drum by following the instructions on the display screen.

**Troubleshooting**

For trouble shooting issues, see Optima MAX-XP ultracentrifuge manual.

Retrieving your sample in case of a power failure:

If facility power fails only momentarily, the ultracentrifuge will resume operation (where it left off) when power is restored and the rotor will return to set speed. However, if the rotor came to a complete stop, you will need to restart the run when the power is restore. In either case, the POWER message will appear on the touchscreen interface to indicate that a power outage has occurred. IN THE EVENT OF an extended power failure, it may be necessary to trip the door-locking mechanism manually to remove the rotor and retrieve your sample- the following procedure should be implemented only when absolutely necessary and by qualified service personnel only.

**Maintenance**

Cleaning the vacuum system: keep the chamber O-ring and area around the O-ring clean. Wipe the area with a cloth dampened with a mild detergent, diluted 10 to 1 with water. Clean the chamber O-ring every month with ethanol and a lint free cloth or tissue and coat it lightly, but evenly, with silicone vacuum grease.

Ultracentrifuges surfaces: keep surfaces clean by wiping them with a cloth dampened with a mild detergent (diluted 10 to 1 with water). If salts or other corrosive materials are used or spillage occurs, wash all affected areas immediately.

Do not allow corrosive materials to dry on the ultracentrifuge. Be careful not to spill liquid where there are electrical components could get damaged. Do not use Virkon on the centrifuge as is it may damage the parts.

To clean the touchscreen display, spray or apply cleaner on an antistatic cloth first, then gently wipe the touchscreen. DO NOT spray cleaner or pour liquid directly onto the screen.

All accessories of this centrifuge are safe to be autoclaved.

To sterilise and disinfect the top and side working surfaces, ethanol (70%) may be used. While this will not damage the ultracentrifuge, there is no guarantee of sterilisation or disinfection, consult your laboratory manage regarding proper methods of sterilisation.