Standard Operating Procedure:

(All users of the MS facility will need to confirm that they have read and agree to the mass spectrometry facility risk assessment and the Standard Operating Procedures before they are allowed to use any instrument within the facility)

Operation of mass spectrometry instruments in lab A111a, during Covid-19 lockdown easing period.

Scope & Applicability	
Scope:	This SOP is specific to lab A111a and provides instructions to MS facility staff on management of routine LCMS analysis and instrument operation by trained users, during the Covid-19 lockdown easing period. This SOP will include detailed instructions on: - How to arrange LC-MS analysis. - How to arrange use of mass spec instrumentation with trained users. - Disinfection procedures between trained users. - Instrument maintenance and troubleshooting
Applicability:	This SOP is for use by MS facility staff only, but also gives instructions relevant to trained users.

Methodology & Procedures

Due to the dimensions of lab **A111a**, the maximum occupancy at any one time (compliant with the 2m social distancing rules) is **1 person**.

Therefore, to prevent maximum occupancy being exceeded, a booking system will be introduced to the routine procedures for LC-MS analysis. Existing booking systems for some instruments will also be modified to accommodate the changes.

In addition, to reduce the risk of exposure between occupants, ample time must be given between trained users & MS facility staff. Enough time must also be allowed for surface disinfection after instrument operation, and the surface disinfection procedure must also be thorough. This will be covered by the new and modified booking systems.

Facilities for hand washing/sanitising will also be provided for each lab in the form of hand sanitiser dispensers (availability pending).

The considerations listed above will also have implications for instrument maintenance and troubleshooting.

To adhere to the considerations listed above, procedures have been written up for the following:

- LC-MS analysis request
- Disinfection of instrument between users
- Instrument maintenance and troubleshooting

Routine LC-MS analysis

Instrument used for LC-MS analysis specific to lab A111a:

- Bruker Amazon X LC-MS
- Bruker Amazon speed ETD LC-MS
- Bruker MaXis II QToF LC-MS
- Waters Xevo-TQXS LC-MS

Originally, LC-MS analysis was performed by trained users themselves.
This has now been changed to a sample collection/analysis service instead.

1. Samples requiring LC-MS analysis should be grouped together in batches and comply with the preparation guideline.
2. The relevant routine LC-MS analysis form (general LC-MS analysis) should then be completed electronically and submitted electronically to a member of MS facility staff for approval.
3. If approved, move on to step 4. If declined, further discussion & resubmission may be required.
4. Once accepted, the user can then book a 15minute timeslot for sample collection (via the Booking page).
5. On the day of collection:
    i. The user should drop their samples off at the designated dropping-off point closest to their lab:
    - C-block lift Floors 1-4
    - CBRF
    - MAS goods-in lift Floors 1 & 4
    ii. MS staff should then collect the samples for analysis from each drop off point at the timeslot booked by the user.
6. After sample analysis, MS staff should send the data electronically to the user via a download link to files.warwick.
7. If sample return is required, MS staff should return the samples to the same dropping off site for the user to collect.

Disinfection Procedure

High-frequency touch point/areas around the instrument should be disinfected, in order to reduce the risk of cross-contamination between users.

1. Instruments & areas around the instrument should be disinfected at the following times:
    i. 1 hour before use.
    ii. 1 hour after use.
    iii. At the end of the working day.
2. Before entry to the lab, MS staff must:
    i. Make sure that the lab is vacant (by referring to the online booking form, and physical check).
    ii. Disinfect the door handle & key card points with 70% IPA.
    iii. Wash hands with hand sanitiser and then enter the lab.
    iv. Dispose of the tissue upon lab entry.
3. Upon lab entry MS staff must wear PPE and comply with social distancing measures.
4. High-frequency touch point/area around the relevant instrument should be disinfected, including:
    i. Benchtops
    ii. Chairs (plastic backs & arms).
    iii. PC: keyboard; monitor; mouse; desk; stationery left in the area.
    iv. Instrument: buttons; autosampler drawers; mobile phase bottles & lines; column covers; waste containers.
5. Disinfection methods should be different for electronics vs surfaces:
    i. Electronics (instrument PC & instrument itself):
        i. Spray a tissue with 70% IPA.
        ii. Thoroughly wipe down one component and dispose of the tissue.
        iii. Use a fresh tissue between components to prevent cross-contamination (e.g monitor/keyboard/mouse, mobile phase bottles & lines/autosampler drawers/covers).
    ii. Surfaces (benchtops/desks/chairs, not close to electrical equipment):
        i. Spray a tissue with 70% IPA (or Virkon or Screen Disinfectant cleaner for Benchtops).
        ii. Wipe the surface down and dispose of the tissue.
        iii. Use a new tissue between surfaces.
6. MS staff should then check that the instrument is operating correctly.
7. When leaving the lab MS staff should follow steps **2.ii. → 2.iv.**

Instrument maintenance:

Operating issues may arise at any time during instrument use, either delaying operation or leading to system crash. The issue will need to be resolved while observing social distancing measures. If the operating issue occurs while the trained user is occupying the lab, the following steps may be advisable:

1. If possible, the user should pause or stop the run.
2. User should disinfect the area, leave the lab and inform MS staff of the issue via email or the telephone number listed on the front of the lab door.

Once aware of the issue MS staff should then:

3. Wait ~1hr before going into the lab if it is safe to do so.
4. Adjust the online booking form to reflect the delay and inform the next user of the delay.
5. Disinfect the area before fixing the issue (following the Disinfect Procedure).
6. Resolve the issue if possible. If not possible, inform the user, arrange a new booking time, and inform the next user that there may be a delay.
7. Restart/resume the run & inform the current and the following user.

Health and Safety

General Health and Safety:

The following PPE is required at all times in any MS facility lab:

- Lab coat (red lab coats available for non-MS staff)
- Goggles
- Gloves

Coronavirus Guidance:

In addition to the above PPE, individuals may also wish to wear face coverings to reduce risk of transmission if they prefer.

Additional health and safety measures should also be consulted and followed. These can be referred to via:

- Coronavirus guidance
- Health and safety guidance on COVID-19

Equipment & Supplies

Generic health and safety equipment & supplies:

- Hand Sanitiser
- Virkon or Screen Disinfectant cleaner (Recommended by the university for wiping down benchtops Cleaning Procedures)
- 70% IPA (Refers to the IPA formulation recommended by the university for wiping down surfaces (Coronavirus FAQ, Cleaning Procedures))
- Tissues

Personal Protective Equipment:

- Lab Coat (red lab coats available for non-MS staff)
- Goggles
- Gloves

Instruments specific to lab A111a:

- Bruker MaXis II QToF LC-MS
- Bruker Amazon X LC-MS
- Bruker Amazon speed ETD LC-MS
- Waters Xevo TQXS LC-MS

Definitions

Trained User/User:	Used interchangeably & refer to the individual (not part of the MS facility staff), who is trained on the operation of the instrument in question.
MS:	Abbreviation of “Mass Spectrometry”
LC-MS:	Abbreviation of “Liquid Chromatography-Mass Spectrometry”
PPE:	Personal Protective Equipment

Virkon or Screen Disinfectant	Refers to the recommended formulations for wiping down benchtops (Cleaning Procedures)
70% IPA:	Refers to the IPA formulation recommended by the university for wiping down surfaces (Coronavirus FAQ, Cleaning Procedures)