

Safe use of the Bioimaging Research Hub during the SARS-CoV-2 pandemic: recommendations for core facility staff and user base.

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- Core facilities are by their very nature busy, multi-user research environments.
- The transmission of the SARS-CoV-2 virus between individuals, or from contaminated surfaces within these environments, presents a significant risk to staff and to users of the facility.
- All touchable surfaces on communal imaging equipment (e.g. microscope focus or stage controls, keyboards, computer mice and joystick controllers) as well as other 'high-touch' surfaces such as door handles, furniture, worktops, switches etc represent possible means of transmitting SARS-CoV-2.
- Transmission through the eye (conjunctiva) via microscope eyepieces is a realistic possibility.

The guidelines proposed below are designed to help protect Bioimaging hub staff and users when resuming operations in a post-peak situation with social-distancing measures in operation. In addition to reading this document, all users of the Bioimaging research hub should read Cardiff University's 'COVID-19 secure' Organisational Risk Assessment and must undertake their own risk assessment of their planned activities within the facility based upon the information provided.

Recommended safety measures to be taken by the Bioimaging research hub.

(1) Facility staffing:

- To minimise the risk of transmission, Bioimaging hub staff will adopt flexible working arrangements e.g. staggered or alternating work patterns, with one member of staff dedicated to histology and another to imaging.

(2) Facility access:

- Users are encouraged to download and use the COVID 19 track & trace App when it becomes available on the Google Play or Apple App stores.

- Users who are SARS-Cov-2 positive or are displaying symptoms of COVID-19 infection (e.g. coughing, elevated temperature, anosmia or sneezing), will not be permitted access to the facility.
- Users with underlying health conditions which put them at risk of developing severe COVID-19 symptoms are advised to avoid the facility. N.B. essential work can be undertaken at a supported rate by Bioimaging hub staff.
- Users who have been in high risk areas or have had contact with confirmed SARS-CoV-2 patients, are not allowed to access the facility for 14 days.
- Access to the facility is by prior arrangement only. Casual, drop-ins are not permitted. Please use our group email account: bioimaginghub@cardiff.ac.uk for all histology and bioimaging enquiries. Please do not contact individual bioimaging hub support staff directly.
- Users must not enter the staff office area (E/0.14) or histology suites (E/0.06-E/0.07).
- Access to the instruments is permitted between normal working hours with a 15 minute user-free time slot between sessions. Out of hours access will be dealt with on an individual case by case basis (see below).
- Users must observe all guidelines and signage within the facility relating to COVID-19. Failure to comply will result in possible exclusion.

(3) Risk assessment:

- All users of the Bioimaging research hub must undertake a risk assessment of their planned activities within the facility based upon the information provided in this document.

(4) Histology samples:

- Histological samples must not be brought into the facility for paraffin wax processing unless you have contacted bioimaginghub@cardiff.ac.uk beforehand.
- Users must fill in an online histology request form to specify processing preferences. The form can be found under the histology section of the Bioimaging hub's main pages (link here: <https://www.cardiff.ac.uk/biosciences/research/technology-research-hubs/bioimaging-unit>). Please print and complete the form which should accompany your samples for drop-off at the prearranged time. Please ensure that all samples are clearly labelled with name, sample ID and date.
- Researchers should enter the histology processing laboratory via the door to E/0.08. Samples should be left in the refrigerator observing robust hand hygiene measures at all times. Do not enter the microtomy or staining areas of the laboratory (E/0.06-E/0.07).
- Users will be notified when the job is completed and will be able to collect their samples at a prearranged time.

(5) Microscope bookings:

- While social distancing measures are in operation, room occupancy will be limited to one user at any one time (i.e. one in, one out with 15 minutes user-free time between

bookings). The existing microscope booking calendars will therefore be replaced with room booking calendars, as follows:

BIOSI E/0.03 - confocal/lightsheet microscopy

BIOSI E/0.04 - widefield microscopy

BIOSI E/0.05 - spinning disc microscopy

- Online bookings for remote usage of the [Imaris image analysis workstation](#) will continue as normal; however, local usage of the system in the staff office area is not permitted.
- User log sheets and communal pens will be removed from each microscope workstation. Charges will therefore be based on the length of time the room has been booked at the appropriate microscope charge rate.

(6) Out of hours access:

- Users requiring out of hours access to the Bioimaging hub will need to provide reasonable justification in their risk assessment and will be subject to them downloading and using the [SafeZone App](#).

(7) Technical support/training:

- No direct support or training is available for the microscopes or supporting software while social distancing measures are in operation. We will re-evaluate when measures have been relaxed.
- Standard operating procedures (SOPs), video tutorials and risk assessments are all available through the Bioimaging hub's SOP repository located on our internal server (link here: <http://vmdb.bios.cf.ac.uk/wiki/doku.php>). These can be viewed via desktop shortcuts that have been set up on all internal networked PCs within the facility. If working from outside the University, users can access the SOP repository via a VPN link (please contact University IT for help with this). Training material is also available via the Bioimaging hub's YouTube channel (link here: <https://www.youtube.com/user/biosiconfocal>)
- Please use the internal telephones within the microscopy suites or personal mobile handsets to request remote assistance from hub staff (numbers below).

Bioimaging hub main office: 029 208 76611

Bioimaging hub shared office: 029 202251 0220

Histology lab: 029 208 75139

(8) Work activities:

- A safe two metre distance between individuals must be observed at all times within the facility.
- Only one user should use the main corridor at any one time.

- The main doors to the facility and the internal corridor door will be kept open during normal working hours to reduce risk of door handle contamination and to allow air flow into the facility. The doors to the microscopy suites shall remain closed to allow safe use of the air conditioning system and to facilitate low light imaging; however, the door roller blinds will be kept open to maintain a line of sight between the imaging suites and the corridor.
- Users should always knock before entering any of the internal rooms and are responsible for setting the occupancy/vacancy status of the microscopy suites – this will be via reversible laminated door signage that can easily be wiped clean. The use of headphones is not permitted within the facility.
- Room occupancy is limited to one user at a time. No group usage of instruments is permitted.
- Air conditioning (E/0.03) or extractor fan (E/0.05) should operate continuously during normal working hours.
- Between sessions, a user-free time slot of at least 15 min should be observed. The doors to the microscopy suite should be left open during this time to allow air exchange.

(9) Hand hygiene:

- Hands should be washed with warm water and soap, sanitising gel/foam or alcohol spray according to [WHO recommendations](#) upon entering and leaving the Bioimaging hub.
- We plan to have a gel/foam hand sanitising station set up within the main corridor of the hub. These are also currently available within the BIOSI foyer.
- Hand wash facilities are also available in E/0.03 (confocal/lightsheet suite) and E/0.05 (spinning disc microscopy suite) as well as within the toilets opposite the Bioimaging Hub. These will be supplemented with sanitizing hand gel dispensers in each of the microscopy suites.

(10) Personal protective equipment (PPE):

- Users should wear fresh, clean lab coats on every visit.
- Protective gloves must be worn before touching any surfaces on microscope systems or associated workstations (keyboards, computer mice, eyepieces, focus knobs, joysticks, etc). After use, gloves should be properly disposed of in the appropriate waste containers provided. Users should not enter or leave the facility wearing gloves.
- All users are encouraged to bring and wear their own safety glasses (not supplied) for further protection from virus transmission through the eyes.
- The usage of protective masks (not supplied) to reduce the risk of droplet transmission by asymptomatic carriers is recommended. These should also be properly disposed of after use.

(11) Microscope usage:

- Users should ensure that all microscope surfaces (including keyboards, computer mice, eyepieces, focus knobs, joysticks, etc) and 'high touch' areas are wiped down with

absolute alcohol (provided) before and after usage following the cleaning protocols provided at each imaging workstation.

- To reduce the risk of eye contact, microscopes must be used without the plastic/rubber eyecups.
- Users should wear eye protection (spectacles or safety glasses; not provided) to visualise the sample, or alternatively utilise the camera output via the monitor display.
- Microscope eyepieces can be covered with cling film (provided) secured via rubber bands to provide further protection. The cling film should be replaced after each usage and treated as contaminated waste.

(12) Image processing and analysis:

- All image processing and analysis should be undertaken offsite using either the Bioimaging hub's remote [image analysis workstation](#) or using software downloaded onto your own personal PC.
- The following software is available for download, free of charge, from the developers/manufacturers' websites:

Image J/FIJI: <https://imagej.net/Fiji/Downloads>

Zeiss Zen Lite: <https://www.zeiss.com/microscopy/int/products/microscope-software/zen-lite.html>

Bit plane Imaris: <https://imaris.oxinst.com/downloads>

(13) General rules of behaviour:

Users of the Bioimaging hub:

- are not permitted to drop-in unplanned. All the checking and booking must be done online or via telephone beforehand.
- must wash their hands upon entering and leaving the facility.
- must observe social distancing (i.e. 2 metres separation) within the facility.
- are not permitted to enter the staff office area (0.14A) or histology suites (E/0.06-E/0.07). No more than one user is allowed within each microscope suite at any one time (i.e. one in, one out with at least 15 mins user-free time between bookings).
- must knock before entering any room. Use of headphones within the facility is not permitted.
- must wear gloves before touching any surfaces within the facility. The gloves must be properly disposed of after use in the waste container (provided) and all touched surfaces should be decontaminated with 70% alcohol after use (supplied).
- Must set occupancy status of the microscopy suites upon entering and leaving.

(14) Further reading:

- [German BioImaging recommendations for operating Imaging Core Facilities in a research environment during the SARS-CoV-2 pandemic](#)
- [Leica Microsystems: How to sanitize a microscope](#)
- [Olympus: How to clean and sterilize your microscope](#)
- [Nikon: Recommended handling and disinfecting procedures for Nikon microscope products to reduce spread of infectious agents including SARS-CoV-2 \(coronavirus\)](#)
- [Zeiss: Cleaning and disinfecting the microscope and its optical components](#)