These local rules cover the use of the fs-pulsed IR laser (Coherent Ultra II Ti-Sapphire) and APE OPO open bench laser system attached to the LaVision Biotech TrimScope located in room B54 in the BRU. They cover the normal use and user maintenance operations and service operations. They implement the University’s laser safety policy at a practical level and form part of the University’s duties under section 2(3) of the Health and Safety at work etc Act 1974.

**Description**

MP-phonon laser scanning microscope system with fs-pulsed IR laser (Coherent Ultra II Ti-Sapphire) class 4, pulsed, 4W maximum power, emitted wavelengths 710 – 1080nm and APE OPO OP (extension to 1580nm) open bench laser system.

**Authorised Users**

Only light microscopy facility staff and persons who are adequately trained by the light microscopy facility staff and are on the authorised users list may use the TrimScope.

Authorised users should be familiar with emergency procedures and the location of safety equipment e.g. fire extinguishers.

**Laser controlled Area**

Unauthorised personnel must always be accompanied by authorised users.

**Procedures**

All non-routine alignment is to be carried out by qualified service personnel or by a member of the microscopy facility only. The irradiance of the beam exiting the main scanning laser exceeds the MPE for eyes by a factor of 3000 and the manipulation laser exceeds it by a factor of 5000.

**Protection measures**

**Class 4 lasers**

The TiSapphire and OPO are fs-pulsed IR lasers, which can be harmful to the eyes and skin

- When starting up or shutting down the infrared lasers, follow the correct procedure.
- Do not place your fingers near to the focus of the objective when handling samples.
- Never look directly into a reflected or full laser beam
- Avoid direct contact with the laser beam
- Avoid eye and skin exposure to scattered laser beam radiation
- If any tool is needed for any change on the microscope (e.g. when changing the objective), use the laser shutters (operated by the software) and deactivate the IR laser.

**Non routine laser alignment**

A Designated Laser Area (DLA) must be created by locking the door to the room and by placing a "NO ENTRY" sign no the door. During these times the following rules apply:

- The room is only accessible to facility staff.
- For alignment use the lowest wavelength and less than 1mW. For TiSapphire: 690nm. For the OPO: 1200nm
- Always use appropriate eye protection for the wavelength range: BS EN 207/208 and 1000-1400 DIRM LB7
- Never look directly into a reflected or full laser beam
- Avoid direct contact with the laser beam
- Always position yourself such that your eye level is above the level of the laser beam.
- No reflective attire that could come into direct contact with the laser beam i.e. rings, bracelets and watches, should be worn within the DLA. Non-reflective tools must also be used.

**General**

- Clear up any spillages or glass breakages immediately and report them to facility staff
- Dispose of all sharps in the sharps bin provided.
- Use lens tissue to remove oil from the objectives after use.
- Avoid contaminating the area with biological or chemical substances from samples.
- In normal circumstances the room is designed for a maximum of 3 people.

**Summary of hazards**

Class 4 laser radiation:

- Eye hazard from both direct beam and scattered radiation
- Retinal hazard – exposure may result in permanent retinal damage within a fraction of a second
- Skin hazard – exposure may result in skin burns and photochemical damage
- The irradiance of the beam exiting the main scanning laser exceeds the MPE for eyes by a factor of 3000 and the manipulation laser exceeds it by a factor of 5000.
- Prolonged exposure to the fluorescent light source can cause long-term damage to the eyes and skin.

See the laser risk assessment for additional rules.

**Contingency Plans**

- In the event of any eye injury or suspected eye injury, proceed straight to Addenbrookes Accident and Emergency and tell staff that it concerns a laser eye injury. Get advice from Moorfields Eye Hospital (020 7253 3411)
- In the event of skin injury or suspected skin injury, proceed straight to Addenbrookes Accident and Emergency (01223 217 118).