

University of Texas Health Science Center at San Antonio

Standard Operating Procedures For

**Prairie Confocal and Multiphoton Microscope
Optical Imaging Core Facility
STRF 252, Greehey Campus
Laser Controlled Area Laser Controlled Area
ver 4.0 (October 14, 2021)**

Prepared by: Exing Wang

Laser Custodian:

Exing Wang _____
Name Printed Signature Date

Laser Safety Officer:

Jennifer Cerecero _____
Name Printed Signature Date

INTRODUCTION

The Prairie confocal and multiphoton microscope (the far booth from the entrance) contains the following lasers:

Class	Type/Make
3B	Solid state/Cube (405 nm)
3B	Solid state/Excelsior (488 nm)
3B	Solid state/Excelsior (543 nm)
3B	Solid state/Excelsior (561nm)
3B	Solid state/Cube (647 nm)
4	Coherent Chameleon Ultra-II fs-pulsed Tunable Ti:Sapphire (680-1080 nm)

All the visible lasers are connected to the Nikon FN1 upright microscope via a fiber optic cable. All 3B visible lasers and their power supplies are integrated into a single wheeled unit that is placed under the anti-vibration table. The output from the Coherent Chameleon Ti:Sapphire laser is directly coupled through enclosed light path to the microscope.

Laser Custodian

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Name Badge# Contact# Email

Alternative Contact:

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Name	Badge#	Contact#	Email
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Authorized Users

While an important part of your SOP, this list of all Authorized Users, including their badge number, should appear as Appendix C of this document and users should sign the document to verify that they have read and understand the Standard Operating Procedure for the LCA. Appendix C can be updated as frequently as needed.

Incidental Personnel

In addition to the authorized primary users, incidental personnel may be in the room at the time of the experiment. These personnel are not trained on the system, nor have they gone through the laser safety program. They will be observing only and not involved in the operation of the system. They will not be in the room during any alignment or maintenance of the lasers.

Normal Laser Operation

Room STRF 252, Greehey Campus contains the following lasers:

Class	Type	Make/Model	SN	Wavelength (nm)	Output Power mW
3B	Solid state	CUBE	L22798114	405	100
3B	Solid state	Excelsior	CMX1-04473	488	50
3B	Solid state	Excelsior	500004	542	50
3B	Solid state	Excelsior	500077	561	50
3B	Solid state	CUBE	L94175611	640	40
4	FS pulsed	Coherent/Chameleon ultra II	GDP.1117782.7722	680-1080	4,000

All Class 3B visible lasers are connected to the Nikon FN1 microscope via a fiber optic cable. All 3B visible lasers and their power supplies are integrated into a wheeled box that is placed on the floor under the anti-vibration table. The Class 4 Coherent Chameleon ultra II femtosecond pulsed laser is directly coupled in an enclosed light path to the microscope. The Class 4 laser is placed on an anti-vibration table. The sole purpose of the lasers is for fluorescence microscopy: confocal (Class 3B lasers) and multiphoton (Class 4 lasers).

Eyewear section

Wavelength specific eyewear will be used by field service engineers during alignment.

Alignment Hazard Control

All lasers are aligned by service engineers and are not adjusted by users or facility staff.

Laser Hazard Control

1. Access to laser control room is restricted to trained personnel. The room is secured by a card-access door reader. All access is approved by the campus police.
2. The entire system is enclosed by laser proof curtain.
3. Operation of all Class 3B lasers is only accessible through the system software. Computer access is restricted to trained users with unique login names and passwords.
4. A "Laser in Use" warning sign is mounted above the entrance of the enclosed system booth.
5. All lasers are enclosed with no open beam throughout the path.
6. All users are trained in the operation of the NSTORM and the proper use and care for the lasers.

Primary users are trained in the operation of the Prairie and the proper use care for the lasers.

Control of Additional LCA hazards

Indicate other possible hazards associated with the lasers in your LCA.

Associated Chemical Hazard Control

List chemicals used in this LCA include a list MSDS numbers, or attach MSDS's to the end of the document (not required to attach MSDS sheets). If you prefer, provide the chemical list section from your Project Review Document as an Appendix. Indicate in this section if there is a registered Satellite Waste Accumulation Area in the LCA and where it is located. Discuss any site-specific chemical hazards for this LCA in this section.

Emergency Procedures

1. Shut down the laser system. Use "emergency stop" button if equipped.

2. Provide for the safety of the personnel, i.e. first aid, CPR, etc.
3. If a fire has been created as a result of the laser, follow appropriate procedures to put out the fire:
 - Within the surgical field, douse with sterile water
 - For fires in other areas, utilize an appropriate class fire extinguisher to extinguish the fire
4. Obtain medical assistance. In the event of a suspected eye injury, have the injured person keep their head upright and still to restrict any bleeding in the eye.
 - For life-threatening injuries (major burns, cardiac arrest following electrocution), dial 911 for immediate medical assistance.
 - For non-life threatening injuries (laser eye injuries, minor skin burns), employees should be evaluated by a physician as soon as possible. **Do not allow anyone with a potential laser eye injury to drive themselves.**

Emergency Dispatch	911 (from campus phone)
UT Medicine	(210) 450-9100

5. **Immediately** report all accidents, injuries or potential exposures to laser radiation (involving both employees and patients) to the Laser Safety Officer by calling:

8 AM – 5 PM Mon-Fri:	(210) 567-2955
After hours & Weekends:	UT Police – (210)567-2800

6. Inform the Principal Investigator/Laser Custodian of the accident.
7. The laser cannot be used again until the Laser Safety Officer has investigated the incident, taken corrective action, and approved continued use of the laser.

Appendix A

Floor Plan Diagram

If diagrams or floor plans are available for this LCA, the descriptions should be noted and included.

Appendix B

Eyewear section

Shall contain the calculation of O.D. for eyewear. A chart or graph indicating the types of eyewear appropriate to the lasers used in this LCA.

Appendix C

Authorized Users

List all Authorized Users, include their badge number. Users should sign the document to verify that they have read and understand the Standard Operating Procedure for the LCA.

User Name

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