

University of Texas Health Science Center at San Antonio  
Standard Operating Procedures For

Zeiss LMS 710 Confocal  
Optical Imaging Core Facility  
STRF 252, Greehey Campus  
Laser Controlled Area Laser Controlled Area  
ver 1.0 (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

Room STRF 252, Greehey Campus contains the following laser:  
3-line Argon (458nm, 488nm, 514nm)  
Solid state (405nm)  
Solid state (561 nm)  
Yellow Hene (594 nm)  
Red HeNe (633nm)

Output of from lasers is delivered to the Zeiss Axio Imager.1 microscope via a fiber optic cable.

### Laser Custodian

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Name                    Badge#            Contact#            Email

### Alternative Contact:

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Name                    Badge#            Contact#            Email

### 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**

Zeiss LSM 510 confocal/multiphoton microscope contains the following lasers:

<b>Class</b>	<b>Type</b>	<b>Make/model</b>	<b>S/N</b>	<b>Wavelength (nm)</b>	<b>Power output (mW)</b>
3B	Solid state		NA	405	20
3B	Argon Gas		NA	457-514	50
3B	Solid state		NA	561	50
3A	HeNe Gas		NA	594	3
3B	HeNe		NA	633	15

All lasers are enclosed in a container with rollers under the anti-vibration table. Laser output is delivered to the Zeiss LSM 710 Laser Scanning Confocal Microscope via a fiber optic cable.

The main purpose of these lasers is for laser scanning Confocal imaging of fixed and live specimens.

### **Eyewear section**

Wavelength specific eyewear will be used by field service engineers during alignment into the fiber optic cable. No facility staff and users will be within the laser controlled area during laser maintenance, service or 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 3A and 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 Zeiss LSM 710 confocal and the proper use and 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.

Name(printed)	Badge	Signature

This SOP has been adapted with permission from Argonne National Laboratories.

**User Name**

Aruna Jaiswal  
Ayon Bhattacharya  
Benjamin Jordan  
Bijaya Nayak  
Chih Wei Chou  
Claira Glaser  
Clare Murray  
Doug Lee  
Elizabeth Gould  
Emily Debner  
Eunice Lim  
Hanzhou Wang  
Jennifer Donegan  
Jennifer Donegan  
Jessica Johnson  
Jihoon Lee  
Jorge Gomez  
Kaila Nip  
Kristi Guerrero  
Lauren Schneider  
Li-Ling Lin  
Liang Ye  
Mackenna Wollet  
Manuel Riquelme  
Meizhen Chen  
Meredith Ogle  
Miguel de la Flor  
Nawab Dar  
Nozomi Tomimatsu  
Parveez Ahamed Abdul Azees  
Qianjin Guo  
Ren Na  
Robert Hammack  
Rolando Trevino  
Sadiya Ahmad  
Samuel Harrison  
Sarah DiDomenico  
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