

Schepens Eye Research Institute Morphology Core Overview

Philip Seifert, HTL(ASCP)

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Manager, Morphology Core

Schepens Eye Research Institute of Mass Eye and Ear

20 Staniford Street

Boston, MA 02114

Supported by NIH National Eye Institute Core Grant P30EY003790

Purpose

1. Technical assistance and training for light, electron, and confocal microscopy. Services include: frozen, paraffin, methacrylate, epoxy processing and sectioning; complete transmission electron microscopy and scanning electron microscopy services.
2. Equipment resource, housing a new laser microdissection system, two confocal microscopes, automated histology and electron microscopy tissue processors, ultramicrotomes, cryostats, various brightfield, fluorescence and phase microscopes, and 3D additive printer to image processing software.
3. Consultation for various histology, electron microscopy and microscopy procedures and troubleshooting, and training on all microscopes.



SERI Morphology Core Personnel

Darlene Dartt, PhD: Director

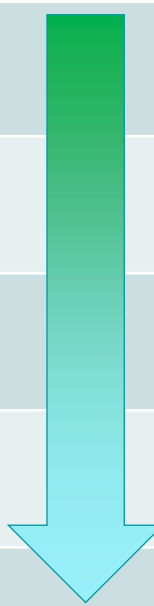
Philip Seifert: Manager, Electron Microscopy Services

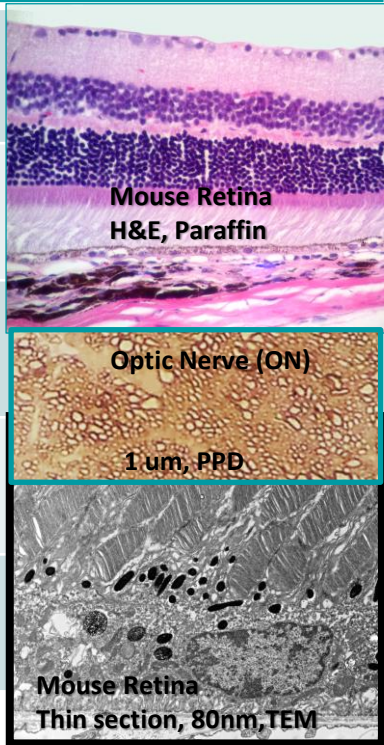
Bianai Fan: Research Technician, Histology Services

Xinyao Hu: Research Technician, Microscope Training & Management, EM



Histology & EM Processes

Process	Endpoint Section Thickness	Immunohistochemistry/ Immunofluorescence/ICC	Resolution & Morph. Preservation
Frozen	~ 8 μm to 20 μm	+++	
Paraffin	~ 6 μm +	++	
GMA (Methacrylate)	~ 3 μm +	No	
Semi-Thin Epoxy	~ 1 μm (~0.5 μm to 2 μm)	+*	
SEM TEM	~70 nm to 200 nm	+*	



*Note: ICC w/ LRWhite resin & immuno-gold labeling (IMG) or other detection procedures at SERI

SERI Morphology

Core

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Core Services

Self Services

Order Services

Morphology

Name, Description	Order Service	Units	PHS Fee	Non-PHS Academic Fee
Paraffin (full service) <i>Please limit sample identification to 6 or less digits/letters with Request</i>	<input type="checkbox"/>		\$52.00	\$72.00
Paraffin Processing	<input type="checkbox"/>		\$21.00	\$28.80
H&E Slide Staining	<input type="checkbox"/>	Sample	\$26.00	\$36.00
Methacrylate <i>(i.e. GMA resin)_Please limit sample identification to 6 or less digits/letters with Request</i>	<input type="checkbox"/>	Sample	\$53.00	\$72.00
Frozen Sectioning	<input type="checkbox"/>	Sample	\$46.00	\$64.80
Semi-Thin (1-micron) Epoxy <i>Please limit sample identification to 6 or less digits/letters with Request</i>	<input type="checkbox"/>	Sample	\$53.00	\$72.00
TEM Full Service <i>Contact SERI Morphology to receive instructions for sample fixation and preparation. Please limit sample identification to 6 or less digits/letters with Request</i>	<input type="checkbox"/>	Sample	\$230.00	\$324.00
TEM (Negative staining service)	<input type="checkbox"/>	Sample	\$113.00	\$158.40
SEM Processing <i>Sample processing inclusive of osmium post-fix, CPD, and Au Sputter Coating</i>	<input type="checkbox"/>	sample	\$40.00	\$57.60



SERI Morphology

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Custom Services

Name, Description	Order Service	Units	PHS Fee	Non-PHS Academic Fee
Custom Service	<input type="checkbox"/>		\$1.00	\$1.44

Miscellaneous

Name, Description	Order Service	Units	PHS Fee	Non-PHS Academic Fee
Non-Core Microscope Setup	<input type="checkbox"/>	Service	\$75.00	\$72.00

Confocal

Name, Description	Order Service	Units	PHS Fee	Non-PHS Academic Fee
Training - SP8			\$205.00	\$0.00
Training - SP5			\$200.00	\$0.00
Training - Nikon E800 (241) Nikon E800 Microscope (room 241, 2nd floor, formerly room 169), with Hamamatsu Camera & Nikon Elements software, F & BF imaging			\$50.00	\$0.00
Training - Nikon E800 & Olympus DP70 (241) Eclipse Microscope with 12MP Olympus DP70 Camera and Olympus MicroSuite Software			\$50.00	\$0.00
Training - Nikon Inverted			\$50.00	\$0.00
Training - LCM			\$100.00	\$0.00



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Service Request

Project name: Gadolinium Triacetate as a Uranyl Acetate substitute for TEM staining

Barcode: SMORPH-37831

Detailed Project Description

Gadolinium Triacetate as a Uranyl Acetate substitute for TEM staining study (Morphology Core Internal Study) en bloc staining comparing 2% Gadolinium Triacetate (GA) and 2% Uranyl Acetate (Uac) and Maleate buffer.(MB)at 30 minute incubation or 60 minute incubation

Sample Information

Species: Mouse

Fixative: 1/2 Karnovsky's

Special instructions: 4/7/2021: 0.1M sodium cacodylate buffer, pH 7.4, rinse and stored under... 4/8/2021 start processing and embedding

Stain: Toluidine Blue (semi-thin)

Work Completed / Tracking

ID #, Service	Date
SMORPH-37831 TEM Full Service	2021-08-26
SMORPH-37831 Custom Service	2021-08-26
Sub Total	
Total	

Department / Organization

Massachusetts Eye & Ear Infirmary

Address: 20 Staniford St, Morphology Core

Funding & Billing Information

Current Funding: 2021-04-01 (533219 - PHS) 4490006 Morphology Core

Department Contacts:

Name	Email	Phone #	Fund #
Masella, Lauren	lmasella@partners.org	617-573-4097	533219

Save

Service Request Number Generated After Submission

Auto-Email Notification to Morphology Core Personnel

Can be updated and edited throughout 'Submitted' and 'Active' phases



SERI Morphology Core Sample Fixation & Submission

- **Sample size & volume**

Ratio of 20:1 volume of fixative:sample (minimum)

- **Containers/tubes/vials**

Label Set with

SMORPH <Service Request Number>

Drop off at SERI, Room 139

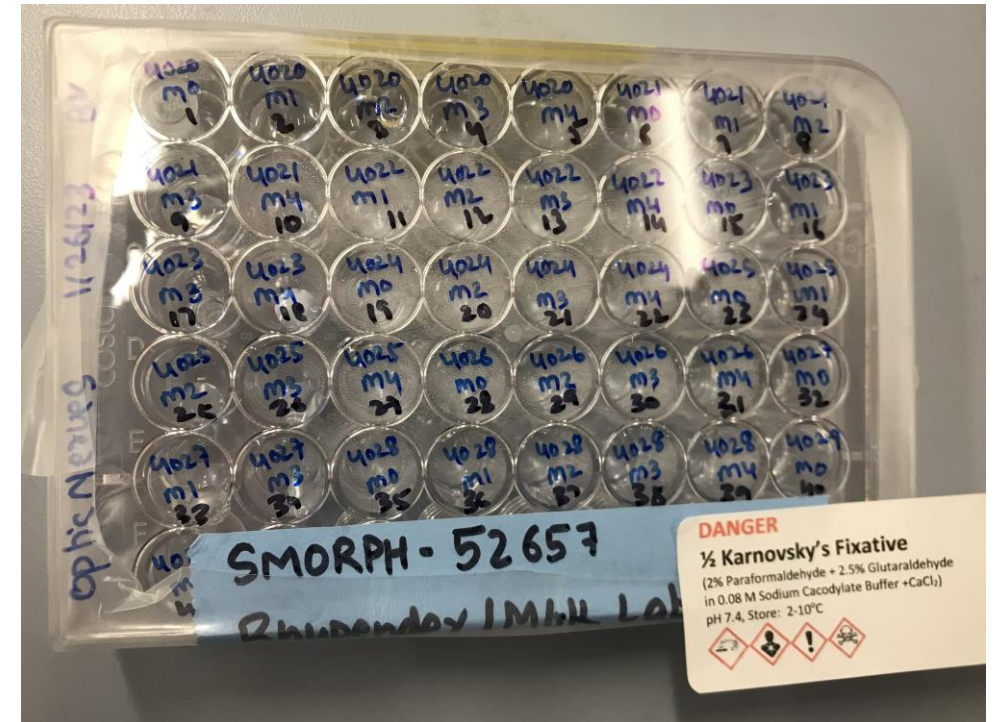


- **Sample Labelling with date and GHS**

Morph Core will assign a block number to each sample;

e.g. '3 = 4020.M2 OD'

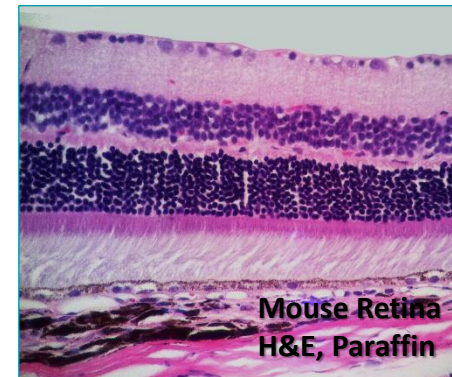
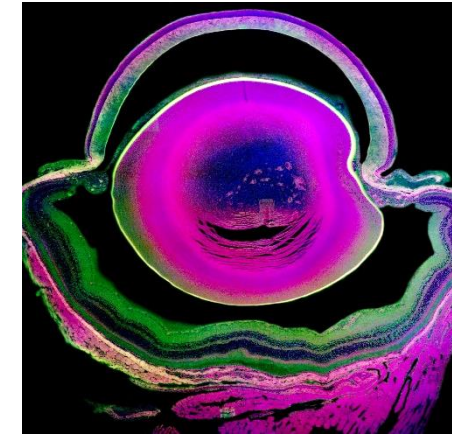
- **Contact Philip Seifert for TEM and SEM studies**



SERI Morphology Core Equipment

Histology Equipment

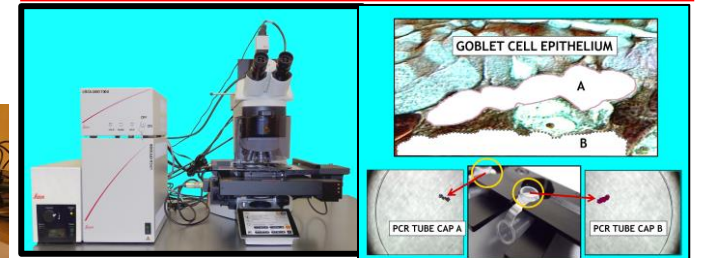
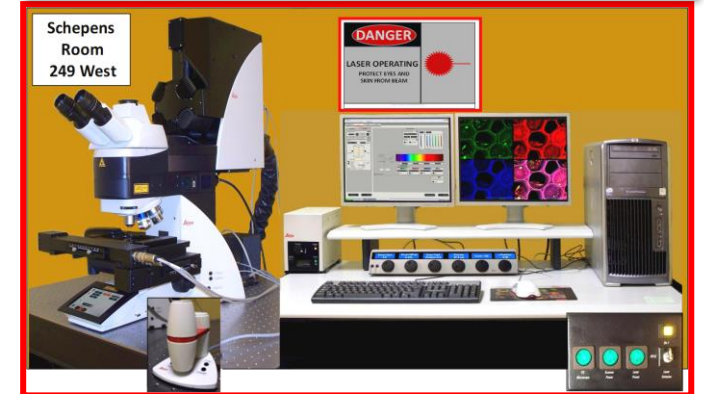
- Leica TP1020 histology tissue processor
- Leica EG1150H and C paraffin embedding center
- Ovens for histology slide drying and paraffin processing
- Leica CM1850 Cryostat
- Leica Nanocut-R microtome with glass knife stage for glycol methacrylate sectioning
- Leica RM2145 microtome for paraffin sectioning
- LKB Glass Knifemaker
- Leica CV5030 Automated glass coverslipper
- ThermoScientific Slidemate glass slide label printer



SERI Morphology Core Equipment

Microscopy

- Leica SP8 Confocal Inverted Microscope (249W)
- Leica SP5 Confocal Upright Microscope (249W)
- Leica Offline Workstation computer with LASX & 3D viewer software (241)
- Leica LMD 7000 Laser Capture Microdissection Microscope (249W)
- Two Nikon Eclipse E-800 Upright Fluorescent and Bright Field Microscopes, with Olympus DP70 and Andor Clara-E[®] cameras (241)
- Nikon Eclipse TiS Inverted Microscope with Andor Clara-E[®] camera (279)
- Zeiss Axio Observer Z1 Inverted Microscope (241)
- Two dual headed Olympus microscopes (139)
- Nikon Stereoscopic Zoom Microscope SM2645 (139)
- Bausch & Lomb Dissecting Microscopes (139)
- AMG EVOS XI digital microscope and camera and viewing screen system
- MOTICAM X3 ocular and macro WIFI camera (139)
- Ocular lens adaptor for cellphone camera photography (139)



SERI Morphology Core Equipment

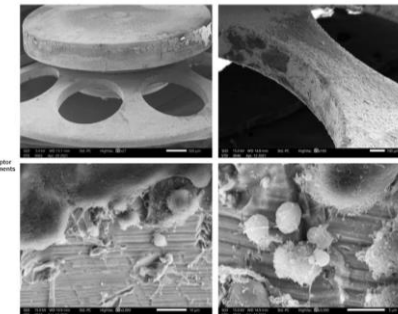
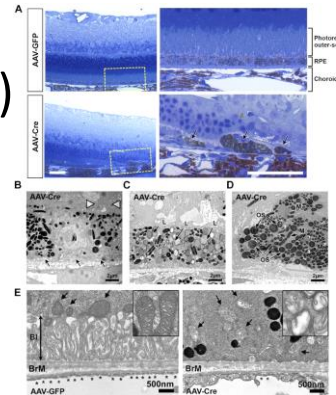
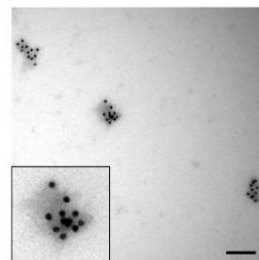
Transmission Electron Microscopy (TEM)

- FEI Tecnai G2 Spirit transmission electron microscope (120KeV) & Tomography system w/AMT XR41 digital CCD camera for FEI TEM (182A)
- EMS Lynx II EM Tissue Processor (139)
- Leica UC-7 and Ultracut UCT ultramicrotomes w/diamond knives (146)
- Air tables to support ultramicrotomes
- Platen grinder (146)
- Ovens used for epoxy resin curing
- HP Computer with ImageJ/FIJI and AMIRA 3D image analysis and volume reconstruction software.



Scanning Electron Microscopy (SEM)

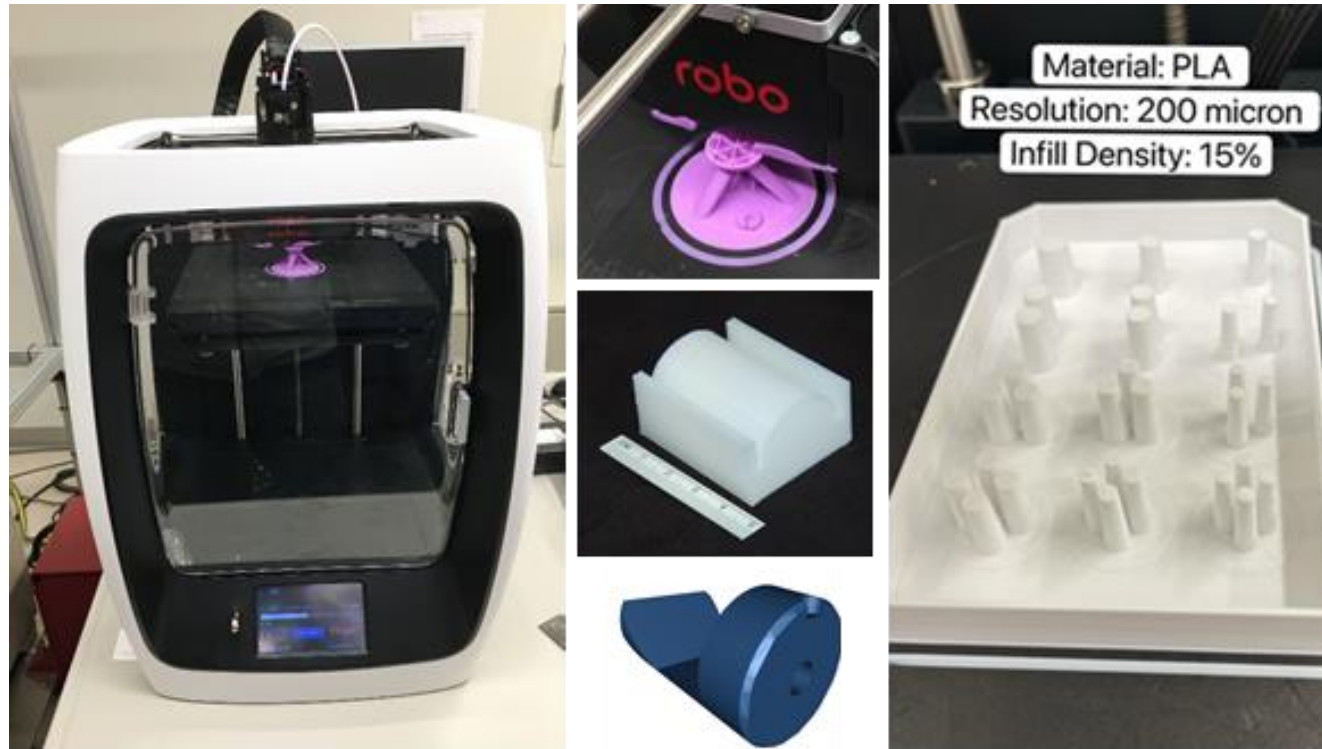
- JEOL JCM-7000 Neoscope Scanning Electron Microscope (250W)
- Tousimis Samdri 795 Critical Point Dryer (250W)
- SMARTCoater for sputter coating with Au (250W)



SERI Morphology Core Equipment

3D Printer

ROBO R2 Additive Printer (PLA and ABS filaments) (251W)
'Custom Service' with user provided 3D digital file (e.g. .stl or .obj)



SERI Morphology
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Confocal

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
◆	Leica TCS SP8 Confocal Microscope	Training Required	User Fee - SP8 Training - SP8	Hourly	\$19.00 \$205.00	Schedule
◆	Leica TCS SP5 Confocal Microscope	Training Required	User Fee - SP5 Training - SP5	Hourly	\$12.50 \$200.00	Schedule

Confocal

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
◆	Leica Offline Work Station	Training Required	User Fee - LASX Leica Offline Work Station	Hourly	\$5.00 \$25.00	Schedule Schedule

Microscope

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
◆	Nikon Eclipse E800 (241)	Training Required	User Fee-E800(241) Training - Nikon E800 (241)	Hourly	\$10.00 \$50.00	Schedule
◆	Nikon E800 & Olympus DP70 (241) Nikon e800 Eclipse Microscope with 12MP Olympus DP70 Camera and Olympus MicroSuite Software	Training Required	User Fee-Nikon E800 & Olympus DP70 (241) Training - Nikon E800 & Olympus DP70 (241)	Hourly	\$10.00 \$50.00	Schedule
◆	Nikon Eclipse Inverted	Training Required	User Fee-Inverted Nikon Training - Nikon Inverted	Hourly	\$10.00 \$50.00	Schedule
◆	Leica LMD 7000 Laser Capture Microscope	Training Required	User Fee - LCM Training - LCM	Hourly	\$10.00 \$100.00	Schedule
◆	Zeiss Axio Observer Z1 Inverted	Training Required	User Fee- Zeiss Inverted Zeiss Axio Observer Z1 Inverted Training	Hourly	\$10.00 \$50.00	Schedule Schedule



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Core

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Cryostat

	Name, Description	Pre-Requisites	Service Name	Units
◆ ■	Leica CM1850 Cryostat All users must supply consumables and sample disks and may need to be rescheduled by SERI Morphology Core Personnel due to AREA 2 lab use around Cryostat.	Training Required.	139 Leica CM1850 Cryostat	Schedule

Scanning Electron Microscope

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
◆ ■	JEOL JCM-7000 SEM Training	Training required	User Fee- SEM imaging with Morphology Core Personnel JEOL JCM-7000 SEM Training	Hourly	\$75.00 \$100.00	Schedule Schedule



Request Equipment & Microscope Training

1. After you log in to the MGB Core facility website, you can click on 'Core Service'.

Home Cores Services External Services Explore About Us Resources PI Admin User

Dashboard

My Cores

You are not part of any Cores at the moment

Cores I use

You dont not have any active requests at the moment

Training I

No inform

Upcomin

No inform



Request Equipment & Microscope Training

2. Click on Drop down, select **SERI**, then Click on '**Search**'. SERI Morphology Core will appear.
3. Click on '**SERI Morphology Core**'

Mass General Brigham

Home Cores Services External Services Explore About Us Resources PI Admin User

Core Categories

- Admin Cores
- Advanced Imaging
- Animal Resources
- Biorepositories
- Cellular Biology
- Databanks
- Flow Cytometry
- Histology
- Informatics and Biostatistics
- Microbiology
- Microscopy
- Miscellaneous
- Physiological Chemistry
- Research IT
- Sequencing and Omics
- Translational Research

SERI Search... Search Reset

Driving Simulator Core

High fidelity driving simulator with 225 degree horizontal field of view equipped with a 6-camera remote eye and head tracking system.

Gene Transfer Vector Core

Gene Transfer Vector Core (GTVC) provides high titer, high quality research-grade Adeno-Associated viruses (AAV) viral vectors for customized and Titters by ddPCR, purity analysis by SDS-PAGE is included in the service. Endotoxin testing can be requested if needed.

SERI Flow Cytometry Core

SERI Morphology Core

The Schepens Eye Research Institute of Mass. Eye and Ear (SERI) Morphology Core provides histology preparation, technical assistance and training electron microscopy.

Request Equipment & Microscope Training

4. Click on 'Equipment', then all the active equipment available to request to get trained.
The training fee and user fee are displayed

SERI Morphology

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✉ Darlene Dartt

✉ Philip Seifert

👤 (617) 912-0209

✉ Bianai Fan

✉ Xinyao Hu



Planned
Installed
Running
Down
Retired

Confocal

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
■	Leica TCS SP8 Confocal Microscope	Training Required	User Fee - SP8 Training - SP8	Hourly	\$19.00 \$205.00	Request Training
■	Leica TCS SP5 Confocal Microscope	Training Required	User Fee - SP5 Training - SP5	Hourly	\$12.50 \$200.00	Request Training

Cryostat

	Name, Description	Pre-Requisites	
■	Leica CM1850 Cryostat All users must supply consumables and sample disks and may need to be rescheduled by SERI Morphology Core Personnel due to AREA 2 lab use around Cryostat.	Training Required.	Request Training


Microscope

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
■	Nikon Eclipse E800 (241)	Training Required	User Fee-E800(241) Training - Nikon E800 (241)	Hourly	\$10.00 \$50.00	Request Training
■	Nikon E800 & Olympus DP70 (169) Nikon e800 Eclipse Microscope with 12MP Olympus DP70 Camera and Olympus MicroSuite Software	Training Required	User Fee-Nikon E800 & Olympus DP70 (169) Training - Nikon E800 & Olympus DP70 (169)	Hourly	\$10.00 \$50.00	Request Training
■	Nikon Eclipse Inverted	Training Required	User Fee-Inverted Nikon Training - Nikon Inverted	Hourly	\$10.00 \$50.00	Request Training
■	Leica LMD 7000 Laser Capture Microscope	Training Required	User Fee - LCM Training - LCM	Hourly	\$10.00 \$100.00	Request Training
■	Zeiss Axio Observer Z1 Inverted	Training Required	Zeiss Zeiss Axio Observer Z1 Inverted Zeiss Axio Observer Z1 Inverted	Hourly Hourly	\$10.00 \$0.00 \$50.00	Request Training Request Training

Request Equipment & Microscope Training

5. Click on 'Request Training' on the microscope that you want to get trained on.

Confocal

Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
Leica TCS SP8 Confocal Microscope	Training Required	User Fee - SP8 Training - SP8	Hourly	\$19.00 \$205.00	

6. Click on 'Create this Training Request'. A training request email will send to Xinyao Hu or Philip Seifert .

Information



Equipment *

Leica TCS SP8 Confocal Microscope

Status *

Pending

Comments

Schedule Equipment & Microscope

Note: Schedule at least 24 hours in advance for equipment, 4-hour maximum time/day

- Click on 'Schedule', the schedule for all the morphology Core equipment will show up. If you want to only show the target microscope schedule. You can click on 'Enable Filters'

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[Contact information](#)
 Darlene Dartt
 Philip Seifert
 (617) 912-0209
 Bianai Fan
 Xinyao Hu

◀ ▶ Today Jan 29 - Feb 04, 2023
iCal Enable Filters Week Mont

	Sun 01/29	Mon 01/30	Tue 01/31	Wed 02/01	Thu 02/02	Fri 02/03
7am						
8am						
9am	User Fee - SP8 - Refaian, Nasrin	User Fee - SP8 - Xi, Lei		User Fee - SP8 -		User Fee - SP8 - Xi, Lei
10am				User Fee - SP8 - Kahale, Francesca	User Fee - SP8 - Hoppe, Cindy	User Fee - SP8 - Adhikari, Yadav
11am		User Fee - SP8 - Shirahama, Shintaro	User Fee - SP8 - Verma, Bhupender		User Fee-Nikon E800 & Olympus	User Fee - SP8 - Verma, Bhupender
12pm		User Fee-Nikon E800 & Olympus DP70 (241) - Tan, Shintaro				User Fee - SP8 - Li, Song
1pm			User Fee - SP8 - Blank, Elyse	User Fee - SEM - Lee, Changrim	User Fee - SP8 - Blank, Elyse	User Fee - SP8 - Lee, Changrim
2pm		User Fee - SP8 - Verma, Bhupender	User Fee-Nikon E800 & Olympus DP70 (241) - Tan, Shintaro	139 Leica CM1850 Cryostat - Gunes, Kasim		
3pm	User Fee - SP8 - Shirahama, Shintaro			User Fee - SEM Imaging with Morphology		User Fee - SP8 - Li, Song
4pm			User Fee - SP8 - Li, Song	User Fee - SP8 - Li, Song	139 Leica CM1850 Cryostat - Cho, Kin	139 Leica CM1850 Cryostat - Gunes, Kasim
5pm		User Fee - SP8 - Li, Song				
6pm	User Fee - SP8 - Xi, Lei		User Fee - SP8 - Shirahama, Shintaro			
7pm					User Fee - SP8 -	

Schedule Equipment & Microscope

2. After click on 'Enable Filters', you can select on the microscope that you are interested in. then click on 'Done'. You can always click on 'Reset' to show all the morphology core microscopes.

◀ ▶ Today Jan 29 - Feb 04, 2023  | Enable Filters Week Month Agenda Services

Personal

My events only

Service

<input type="checkbox"/> 139 AREA 1 (Fume Hood & Microtomes)	<input type="checkbox"/> 139 AREA 3	<input type="checkbox"/> 139 Leica CM1850 Cryostat
<input type="checkbox"/> JEOL JCM-7000 SEM Training	<input type="checkbox"/> Leica Offline Work Station	<input type="checkbox"/> Training - LCM
<input type="checkbox"/> Training - Nikon E800 (241)	<input type="checkbox"/> Training - Nikon E800 & Olympus DP70 (241)	<input type="checkbox"/> Training - Nikon Inverted
<input type="checkbox"/> Training - SP5	<input type="checkbox"/> Training - SP8	<input type="checkbox"/> User Fee - LASX
<input type="checkbox"/> User Fee - LCM	<input type="checkbox"/> User Fee - SP5	<input type="checkbox"/> User Fee - SP8
<input type="checkbox"/> User Fee- SEM imaging with Morphology Core		
Personnel	<input type="checkbox"/> User Fee- Zeiss Inverted	<input type="checkbox"/> User Fee-E800(241)
<input type="checkbox"/> User Fee-Inverted Nikon	<input type="checkbox"/> User Fee-Nikon E800 & Olympus DP70 (241)	<input type="checkbox"/> Zeiss Axio Observer Z1 Inverted Training

Service Request

Technicians

<input type="checkbox"/> Connor, Trevor	<input type="checkbox"/> fan, bianai	<input type="checkbox"/> Hu, Xinyao
<input type="checkbox"/> Seifert, Philip		

Schedule Equipment & Microscope

There is another way to access the microscope schedule

1. Click on 'Equipment', Schedule will be available after your training completed.
2. Click on 'Schedule'. You will be able to access the schedule for this microscope.

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✉ Philip Seifert
👤 (617) 912-0209
✉ Bianai Fan
✉ Xinyao Hu

Search... Search Reset List view

Planned Installed Running Down Ret

Confocal

	Name, Description	Pre-Requisites	Service Name	Units	PHS Fee	
■	Leica TCS SP8 Confocal Microscope	Training Required	User Fee - SP8 Training - SP8	Hourly	\$19.00 \$205.00	Schedule
■	Leica TCS SP5 Confocal Microscope	Training Required	User Fee - SP5 Training - SP5	Hourly	\$12.50 \$200.00	Request Training



Schedule Equipment & Microscope

Event

From * 2023-02-02 **To *** 3:00pm 4:00pm 2023

Service Request **User *** Hu, Xinyao

Technician * **Service ***

Technician is required if service request is specified

Description

Billable Repeat

Funding Information

Fund * Morphology Core (Dartt, Darlene)

Create **Cancel**

3. You can click on the date you want to use the microscope.
4. The new event window will appear.
5. Change the time to the desired time session.
6. Click on the service, all core microscopes that you have been trained on will be available to choose.
7. Double check the funding number.
8. Click On 'create'

SERI Morphology Core Billing

- All users are required to use approved and active fund (6-digit) numbers
Update accounts when fund numbers change
- Automatic Invoice sent on 7th day of every month,
Client User receives a summary invoice and PI receives summary of
all user charges for fund number(s)
- Clients reach out for any discrepancies or fund number changes
Invoice re-generation needed by 15th of month
- After 15th contact IGA or administrator



SERI Morphology Core Equipment Use Policies and Rules

- All users must be trained then receive access to the equipment schedule
- No 'Rogue Users' or untrained Lab Colleagues using equipment scheduled from other trained users
- Each user must document equipment use on equipment user forms
- Please contact Morphology Personnel with any technical or schedule issues via text, phone or email
- At the end of every equipment session, place covers on all microscopes, back-up all digital files onto external media (MEE approved flash drive or hard drive)

