

# 生科二館 640 室之 LSM 5 Pascal & LSM 510

## 共軛焦顯微鏡使用規則

### Regulations and policies of confocal microscopes

#### (LSM 5 Pascal & LSM 510) in LSII-640A/B

2006/12/11

2013/10/21 modified

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## I. 合格程序 Qualification procedure

每位新使用者需要：

Every new user needs to:

1. 參加過顯微鏡訓練課程，或曾經上過共軛焦顯微鏡的相關課程（例如張大慈老師所開的生物巨分子檢驗分析、暑期學分班的生醫影像分析），以瞭解共軛焦顯微鏡的基本原理。

attend the training workshop or have taken any related course about confocal microscopy (e.g., Prof. DT Chang's biological macromolecules, summer class' analysis of biomedical image, etc.) to ensure a full understanding of the basics of confocal microscopy,

2. 跟隨合格使用者完成兩次實驗，總時數達3小時以上，（陪同之新使用者需簽名）。

observe operation by a certified user twice, for a total of 3 hours (signatures of a new user are required)

3. 由合格使用者全程陪同，自己獨立進行兩次實驗，總時數達3小時以上（陪同之合格使用者需簽名）。

operate with a certified user aside twice, for a total of 3 hours (signatures of a certified user are required)

4. Pascal (LSII-640A) 和 LSM510 (LSII-640B) 的使用權採階段性認證方式。所有使用者需先有 Pascal 使用資格後，才可進行 LSM 510 的認證程序。在特殊情況(例如，實驗需要)，使用者可向管理者(焦傳金老師)商議後，直接進行 LSM 510 的認證程序。在此特殊情況下，新使用者需在合格使用者陪同下，自己獨立進行實驗達6小時以上，因此，操作訓練總時數為9小時。

Pascal (LSII-640A) and LSM510 (LSII-640B) microscopes are qualified sequentially. All users have to be qualified for Pascal first, then LSM510. In the special case (e.g., exp demand), users may consult Administrator and be qualified for LSM510 directly. In this special case, 6 hours are required for operating the microscope with a certified user aside, instead of 3 hours (i.e., total of 9 hours for training).

5. 在完成 Pascal 或 LSM 510 的操作訓練後，新使用者需進行顯微鏡操作之筆試，以確定其瞭解顯微鏡使用步驟。

After finishing the training session for either Pascal or LSM 510, new users are required to take a written exam for evaluating the knowledge of microscope operation.

6. 通過筆試後，與教學助理進行操作測驗。

Take an operation exam with TA after passing the written exam.

7. 請指導老師以電子郵件寄發「公用儀器使用同意書--顯微鏡」給教學助理。

email TA a signed Agreement Sheet of Instrument by the lab PI.

8. 經教學助理核對使用記錄無誤後，申請核發網路預約帳號及設定密碼，同時由顯微鏡助理協助開啟門禁。

check all the records with TA and apply for online reservation password and ID-card approval for accessing the confocal room.

9. 如遇特殊情形急需使用顯微鏡，但未參加過顯微鏡訓練課程者，須先經管理者(焦傳金老師)同意，再進行後續認證程序(如時數累積、筆試測驗等)。認證通過後一年內須再參加顯微鏡訓練課程或共軛焦顯微鏡相關課程，否則一年後將取消認證資格。

In the special case (e.g., exp demand), users may consult Administrator and be qualified for Pascal or LSM510 before attending the training workshop. In this special case, users have to take the training workshop or related course about confocal microscopy within 1 year after being qualified, or the qualification will be canceled after 1 year.

## II. 操作不當之處罰 Punishment about misconduct

若使用者有操作不當的行為，

If any misconduct happens,

1. 使用者的第一次操作不當將會以警告方式通知該使用者與其指導教授。  
A warning will be issued for the first misconduct.
2. 若發生第二次操作不當，該使用者將禁用一週。  
Individual user will be penalized for one week for the second misconduct.
3. 若發生第三次操作不當，該使用者所屬實驗室之全部使用者均禁用兩週。  
The whole lab will be penalized for two weeks for the third misconduct.
4. 使用不當記錄以年作單位計算。  
The penalty record runs in a yearly basis.
5. 發生操作不當之使用者所屬實驗室除以上所述之處罰外，仍需負責相關儀器維修費用與責任。  
Individual lab is responsible for the cost of any damages due to the abuse of the instrument.

### III. 其他使用規定 Other regulations

#### A. 螢光燈源及雷射 lasers or Hg lamp

1. 每一位使用者在離開前，理論上需將所有電源關閉。  
The current user by default should turn off everything before leaving the room.
2. 為保護及延長燈源壽命，雷射/螢光燈源必須冷卻 30 分鐘以上才可以再度開啟。  
To protect and extend the light source, subsequent users should turn on lasers or Hg lamp after lasers or Hg lamp has been cooled down for 30 minutes.
3. 若需連續使用雷射/螢光燈源，接續的使用者需提前告知前一位使用者不需關閉雷射/螢光燈源。建議使用者在關閉燈源之前通知下一位使用者。  
The subsequent user is responsible for contacting the current user regarding whether turning off lasers or Hg lamp. The current user is suggested to call the subsequent user before turning off the light source.
4. 若有使用者未等待 30 分鐘即開啟雷射/螢光燈源，則視為一次操作不當。  
If any user is found or reported to turn on lasers or Hg lamp before 30 minutes cool down, this will be considered as one misconduct.

#### B. 軟體設定 settings of the software

1. 為確保各使用者均能順利操作，禁止更改任何顯微鏡操作軟體內之預設設定。  
To ensure smooth operation, all users are prohibited to change any setting in the microscope software.
2. 使用者可以將自己掃描的設定另存新檔，或者利用既有的圖片重新使用 (Reuse) 其設定。  
Users are encouraged to save their settings in separate files, or **reuse** the configuration of an existing LSM picture.
3. 若有使用者私自更動軟體內預設設定，則視為一次操作不當。  
If the user was found or reported to change settings without any notice, this will be considered as one misconduct.

### C. 資料備份 data backup

1. 強烈建議各使用者在每次掃瞄後，立即將自己的實驗資料備份。  
Backing up data in a separate storage device immediately is strongly encouraged.
2. 管理者將事先公告且定期移除公用電腦內的資料。  
Files will be removed from the hard drive periodically, and will be announced in advance.

### D. 故障回報 abnormality report

若在使用時發現儀器問題，使用者需：

If you find any abnormality in operating the microscope, you need to

1. 在登記表上註明問題。  
make a note in the logbook
2. 通知顯微鏡助理及教學助理。  
report to the confocal assistant or TA
3. 若有緊急狀況，請立即通知管理者（焦傳金老師）。  
In case of emergency, call the administrator (CC Chiao) immediately.

### E. 鏡頭維護 Objective maintenance

1. 使用油鏡後，用儀器室內的棉花棒沾絕對酒精，以畫同心圓的方式將鏡頭殘留的油份吸收並清理乾淨。  
Use cotton swab with absolute ethanol to clean oil lens after every usage.
2. 顯微鏡上機之前和之後，皆需用拭鏡紙確認所有倍率物鏡是否有鏡油或封片膠殘留。  
Check the objective with kimwipe if immersion oil or mounting gel remains before and after usage.
3. 上機前若發現鏡頭已被汙染，請即刻告知顯微鏡及教學助理。  
If the objective is contaminated before usage, report to the confocal assistant or TA.
4. 在登記本備註欄註明該次上機使用過的物鏡倍率。  
Write down the objectives you use on the logbook.
5. 物鏡若被發現未清理乾淨，責任歸屬於最後一位登記使用過該物鏡的使用者，並視為一次操作不當。  
If the objective is not cleaned well, the last one who uses the objective should take the responsibility. This will be considered as one misconduct.

#### F. 使用紀錄 notebook

1. 使用顯微鏡請務必先在預約系統登記。使用時請填寫登記表記錄使用狀況。預約後若不克前來須上網取消預約。

Users must book time on reservation system each time before use. Users must also fill the form in the notebook after using the microscope. Users have to cancel the reservation if users cannot use the microscope on time.

2. 沒有使用資格者請勿自行預約。

Users without certification are not allowed to use reservation system.

3. 違反上述事項者將視作一次操作不當的行為。

Users will be subjected to one offense for disobeying the above rules.

4. 若只使用電腦處理資料而未使用顯微鏡，也需要在登記表記錄，以備查詢。

The users should also fill the form in the notebook even if using the computer only.

#### IV. 收費標準 Fees

1. 使用費用（請詳見附錄表格）將從各指導教授之系所經費內扣除，每月結算一次。非生科系所使用者收雙倍使用費用。

Fees (see below for charge details) will be deducted directly from PIs' departmental accounts in the monthly basis (double fee for outside users).

2. 汞燈、個別雷射（405、488、543、633）為分開計費。

Hg lamp, 405, 488, 543, 633 lasers will be counted and charged separately.

3. 黃金時段為每天的上九點至晚上九點，非黃金時段的使用費用八折優待。

The golden hours of each day are from 9AM to 9PM. There will be a 20% discount for non-golden hours.

4. LSM 5 Pascal 收費額外八折優待。

There will be a 20% discount for Pascal using fee.



## V. 附錄 Appendix

**Appendix:** Fee and cost (assumed no institutional funding)

Consumable parts	Unit price	Cost	Hourly fee
X-scanner (6000 hr)	\$330,000	\$55/hr	
Y-scanner (6000 hr)	\$330,000	\$55/hr	
Scan driver (6000 hr)	\$140,000	\$23/hr	
PMT controller (6000 hr)	\$90,000	\$15/hr	<b>\$148/hr (base rate)</b>
Hg lamp (250 hr)	\$10,000	\$40/hr	<b>\$188/hr (with Fluorescence light)</b>
405 laser (5000 hr)	\$770,000	\$154/hr	
405 power supply	\$30,000	\$6/hr	\$160/hr (additional charge for using 405 laser)
488 laser (5000 hr)	\$400,000	\$80/hr	
488 power supply	\$140,000	\$28/hr	\$108/hr (additional charge for using 488 laser)
543 laser (7000 hr)	\$220,000	\$31/hr	
543 power supply	\$25,000	\$4/hr	\$35/hr (additional charge for using 543 laser)
633 laser (7000 hr)	\$110,000	\$16/h	
633 power supply	\$25,000	\$4/hr	\$20/hr (additional charge for using 633 laser)

**Institute will share 30% of the cost, thus the actual charge will be multiplied by 0.7.**

系所經費將分擔整體花費的三成，因此實際使用費用為上述價格打七折。

Example	488/543 lasers with fluorescence light for one hour	
Cost without any discount	148+40+108+35 = <b>331</b>	
<b>Actual fee</b>	<b>Golden</b>	<b>Non-golden</b>
<b>LSM 510 (from 2006/3/1)</b>	331*0.7 =232	331*0.7*0.8 =185
<b>LSM 5 Pascal</b>	331*0.8*0.7 =185	331*0.7*0.8*0.8 =148