

倒立螢光顯微鏡 THUNDER 使用規範

儀器地點：清華實驗室九樓 927 室

I. 合格程序 Qualification procedure

每個新使用者需要：

Every new user needs to:

1. 在使用顯微鏡前，新使用者需參加過顯微鏡訓練課程（觀看教學影片），以瞭解顯微鏡的基本原理。

Before using the microscopes, new users should attend the microscopy training workshop (Video) to ensure a full understanding of the basics of microscopy.

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

Observation of operation by a certified user three times (a total of 3 h) is required (signatures of a new user are required).

3. 由合格使用者（個人使用時間需達 20 小時以上，並在一學期內無操作不當記錄）全程陪同，自己獨立進行實驗，總時數達 3 小時以上（陪同之合格使用者需簽名）。合格者陪同時數可折抵該實驗室使用時數。

Operation under the supervision of a certified user for three times (a total of 3 h) is required (signatures of a certified user are required).

4. 請指導老師以電子郵件寄發「公用儀器使用同意書—顯微鏡」給學士後醫學系教學助理與段立珩老師。

After completing the aforementioned assignment, please email a signed Agreement Sheet of Instrument by the lab PI to the TA.

5. 與段立珩老師核對使用記錄並進行操作測驗後，開啟清華實驗室 927 室門禁。

Check all the records with the TA and take an operation exam. Then apply for online reservation password and ID-card approval for accessing room 927.

II. 使用規定 Regulations

A. 使用時間 Usage Time

1. 週一至週五早上 09:00 至 17:00

Monday to Friday, 09:00–17:00.

2. 使用經驗達 20 小時且無違規記錄可開夜間與假日使用權限，請聯絡段立珩老師。

Users who have accumulated 20 hours of experience and have no violation records may apply for nighttime and weekend access. Please contact Professor Li-Heng Tuan for authorization.

3. 如需預約請在顯微鏡紙本登記時間，並確實登記使用時數。若預約而未使用達三次，則禁止使用一個月。

To reserve time, please register on the microscope paper sign-in sheet and accurately record your usage hours. If a user reserves time but fails to show up three times, their access will be suspended for one month.

B. 電源 power supplies

1. 每一位使用者在離開前，需按正確順序將所有電源依序關閉。

Every current user should turn off the power supplies of all devices before leaving the room.

2. 若有使用者離開後未關閉電源，視為一次操作不當。

If any user is found or reported to leave without turning off any of the devices, this will be considered misconduct.

C. 物鏡與載物台 Objective lens and stage

1. 欲使用 100x 物鏡請提前 1 週通知管理者，請勿自行更換物鏡。

Please notify the administrator one week in advance if you wish to use the 100x objective lens. Do not replace the objective lens yourself.

2. 若有更換夾具需求，在使用完畢後換回一般玻片用夾具。

If you need to change the specimen holder, please revert to the standard slide holder after use.

3. 使用後將物鏡轉回 4x，並將鏡頭降到最低。若有使用者未完成此動作，視為一次操作不當。

After use, turn the objective lens back to 4x and lower the stage to its lowest position.

D. 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 from changing any setting in the microscope software.

2. 使用前請確認軟體維持在原預設設定。若軟體原設定遭更動，則歸咎在最後一位使用者，視為一次操作不當。

Please confirm the software remained in its default setting before use. If the user was found or reported to alter settings and not returning to default when finished, the last user will be held accountable and an offense will be registered to the user.

3. 使用者可以將自己掃描的設定另存新檔，或者利用既有的掃描檔案重新使用其設定。

Users are encouraged to save their settings in separate files or reuse the configuration of an existing picture.

4. 如有使用溫控及 CO₂，關機前務必關閉溫控及 CO₂ pump，CO₂ 鋼瓶總閥鎖緊。未關閉視為一次操作不當。(2025/11/25：目前尚未開放氣瓶使用，若有實驗需要，請務必提前一個月聯絡管理者。)

Users have to turn off the temperature control and CO₂ pump after usage and make sure the main valve of CO₂ tank is closing. The user who doesn't turn it off will record an offense.

E. 使用記錄 Users' records

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在預約系統取消預約。(2025/11/25：目前未建立網路預約系統，使用紙本登記表預約。)

Users must book a time block each time before use. Users must also fill out 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操作顯微鏡。

Users without certification are not allowed to use the microscope.

3. 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。若需使用電腦超過 30 分鐘，需預約並按一般使用標準收費。

If the user only uses the computer for data processing without using the microscope, you must still record it in the log for reference. If you need to use the computer for more than 30 minutes, a reservation is required and there will be a fee.

4. 純影像處理可使用隔壁電腦之離線軟體（不具 THUNDER 澄清化功能）。

Pure image processing can use offline software on the neighboring computer.

F. 資料備份 data backup

1. 請使用「經格式化之隨身硬碟轉移資料」，避免公用電腦中毒。

Please use a formatted external hard drive to transfer the data to avoid infecting the computer with viruses.

2. 建議各使用者在每次掃描後，將自己的實驗資料備份。

Backing up data in a separate storage device immediately is strongly encouraged.

3. 管理者將於每月月初移除公用電腦內的資料，不再另行通知。

Files will be removed from the hard drive periodically at the beginning of each month and will be announced in advance.

G. 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 notebook

2. 通知教學助理。

Report to the TA

3. 若有緊急狀況，請立即通知管理者（段立珩老師，分機 35990，手機 0936783753）。

In case of emergency, call the administrator (Li-Heng Tuan) immediately.

H. 清潔 cleaning

1. 使用者需負責本顯微鏡室的清潔（包含地面、桌面、顯微鏡外部、油鏡鏡頭等），並將垃圾帶走。

Users are responsible for cleaning the microscope room (including the floor, desks, the exterior of the microscopes, and oil immersion lenses) and taking out the trash.

2. 本顯微鏡室禁止飲食。

Do not eat or drink in the microscope room.

3. 違反上述規範者，視為一次操作不當記錄。

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

III. 操作不當之處罰 Punishment for 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口頭警告。

A verbal warning will be issued for the first offense.

2. 若發生第二次操作不當，該使用者將禁用一個月並通知該其指導教授。

Individual users will be penalized for a one-month restriction of use for the second offense and the instructing professor will be notified.

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一個月。

The whole lab will be penalized for a month for the third offense.

4. 使用不當記錄以學期作單位計算。

The record of misconduct runs every year.

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。

6. 操作不當認定為下：

Improper operation is defined as follows:

- a. 離開後未關閉任一機台電源，視為一次操作不當。

Failure to turn off any equipment power before leaving will be counted as one improper operation.

- b. 擅自更動軟體預設設定，視為一次操作不當。

Unauthorized modification of any software default settings will be counted as one improper operation.

- c. 使用溫控及 CO₂ 者，未在關機前關閉溫控及 CO₂ pump，視為一次操作不當。

For users of temperature control and CO₂ systems, failure to turn off the temperature control and CO₂ pump before shutting down will be counted as one improper operation.

- d. 使用 CO₂ 者，離開前未將 CO₂ 鋼瓶總閥鎖緊，視為一次操作不當。

For users of CO₂, failure to close the main CO₂ cylinder valve tightly before leaving will be counted as one improper operation.

- e. 使用完畢未清潔油鏡者，視為一次操作不當。

Failure to clean oil-immersion objectives after use will be counted as one improper operation.

- f. 使用完畢未將物鏡歸回 4x 者，視為一次操作不當。

Failure to return the objective lens to 4× after use will be counted as one improper operation.

- g. 使用完畢未將垃圾帶走者，視為一次操作不當。

Failure to remove personal trash after use will be counted as one improper operation.

- h. 於顯微鏡室內飲食，視為一次操作不當。

Eating or drinking inside the microscope room will be counted as one improper operation.

7. 若有非合格使用者自行使用顯微鏡，該使用者將禁用一學期，其所屬實驗室需負相關責任。

If an unqualified user uses any microscope alone, this user will be forbidden to use all fluorescence microscopes for one semester. Individual user's labs will be responsible for all collateral damages and held accountable for the offense.

IV. 收費標準 Fees

1. 顯微鏡之維修與消耗性費用將由使用實驗室按時間比例分攤(自 2025/08/01 公告收費開始計算)。

The maintenance fee and cost of consumable parts of the microscope (please see appendix) will be partitioned to each laboratory according to total use time.

2. 每年 4 月及 11 月各收費一次。帳單會以電子郵件寄到各指導教授及院秘書，費用將直接由教授的系所經費中扣除。

The bill will be emailed to both individual PI and secretary in April and October every year, and money will be deducted from PI's departmental account directly.

3. 院內實驗室使用費計算方式(不滿 30 分鐘以 30 分鐘計)：

顯微鏡使用：NT 100/30 分鐘

CO₂ 氣瓶: NT 25/ 30 分鐘

Usage fee of THUNDER for PI in College of Life Science (see less than 30 min as 30 min)

Basic usage: NT 100/ 30 min

CO₂ tank: NT 25/ 30 min

4. 院外實驗室使用費計算方式(不滿 30 分鐘以 30 分鐘計)：

顯微鏡使用：NT 300/30 分鐘

CO₂ 氣瓶: NT 75/ 30 分鐘

Usage fee of THUNDER for PI NOT in College of Life Science (see less than 30 min as 30 min)

Basic usage: NT 300/ 30 min

CO₂ tank: NT 75/ 30 min