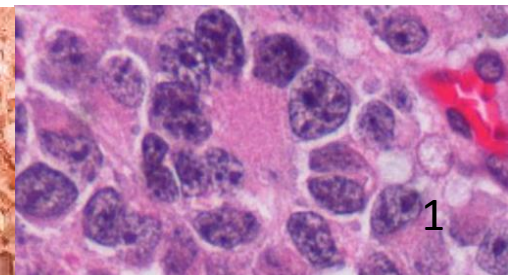
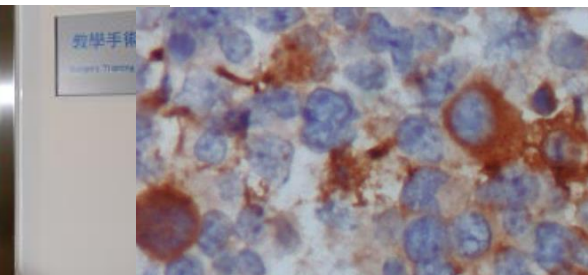


獸醫師及IACUC於AAALAC認證 之角色及經驗分享

NTUCM LAC

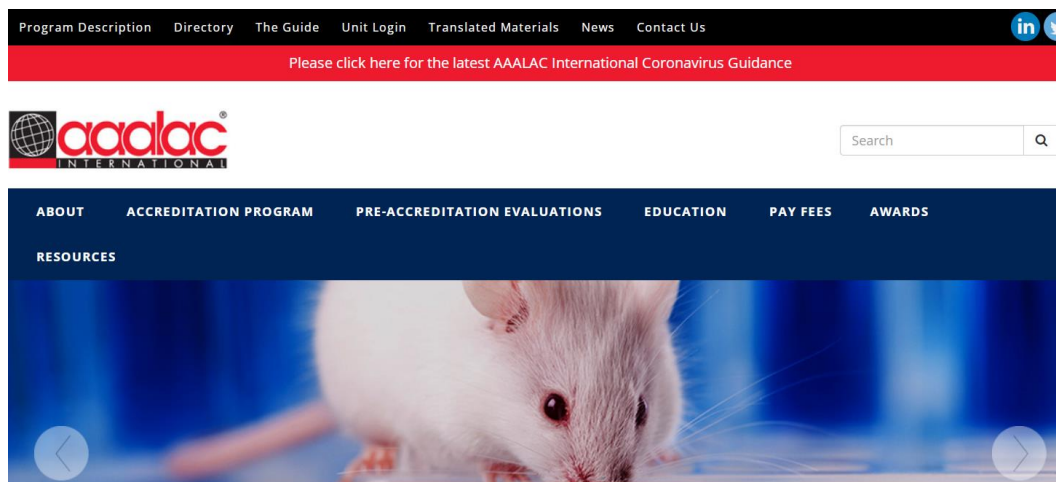
Y.T. Tsai

2022.05.27



AAALAC

- 國際實驗動物管理評鑑及認證協會：
Association for Assessment and Accreditation of
Laboratory Animal Care, International (AAALACi)
- 非政府、非營利國際實驗動物設施認證機構



<https://www.aaalac.org/>



Accredited organizations

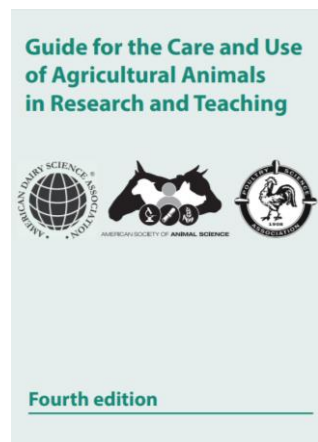
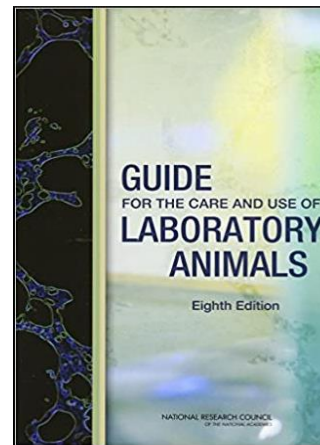
實驗動物中心

- 農業科技研究院
- 樂斯科生物科技
- 長庚大學
- 基隆長庚紀念醫院
- 林口長庚紀念醫院
- 高雄長庚紀念醫院
- 嘉義長庚紀念醫院
- 工業技術研究院
- 高雄醫學大學
- 豬博士動物科技股份有限公司
- 國立屏東科技大學
- 進階生物科技股份有限公司
- 行政院農業委員會畜產試驗所
臺東種畜繁殖場
- 國家實驗研究院國家實驗動物中心
- 國家實驗動物中心南部設施
- 國立成功大學醫學院
- 國防醫學院
- 國家衛生研究院
- 台大醫學院
- 合一生技股份有限公司
- 汎球藥理科技股份有限公司
- 昌達生化科技股份有限公司

AAALAC international standards

實驗動物中心

- **Guide for the Care and Use of Laboratory Animals**
- Guide for the Care and Use of Agricultural Animals in Research and Teaching
- European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes
- **FAQs**
(<https://www.aaalac.org/accreditation-program/faqs/>)

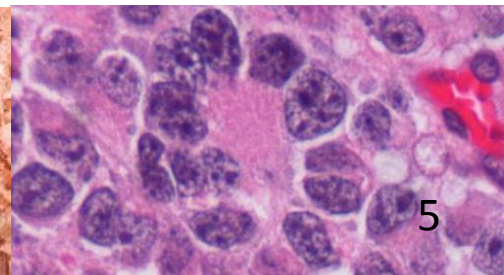
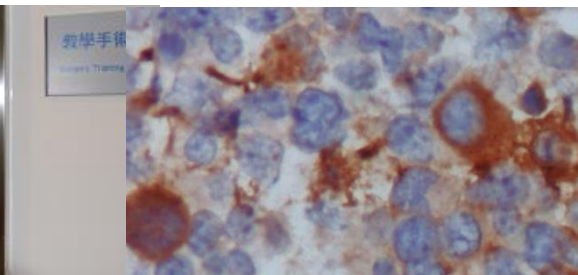


AAALAC Study Group

National Taiwan University
College of Medicine

Guide for the Care and Use of Laboratory Animals (Veterinary Care)

Y.T. Tsai





Medical Management

- There **should** be a timely and accurate method for communication of any abnormalities in or concerns about animal health, behavior, and well-being to the veterinarian or the veterinarian's designee.
- Reports **should** be triaged to ensure that animals most in need receive priority attention, and the veterinarian or veterinarian's designee **should** perform an objective assessment of the animal(s) to determine an appropriate course of action.

- 動物異常處理紀錄表
- 動物死亡處理紀錄表

動物異常處理紀錄表

BD 07-02-D

年

日期	籠號 PI	出生日期 品系/性別	異常狀況	填寫人	診斷 處置/結論	追蹤					獸醫師簽名
						安樂 死	死 亡	分 籠	持 續 觀 察	痊 癒	

動物死亡處理紀錄表

BD 07-02-E

年

日期	籠號 PI	IACUC NO.	品系	性別	數量	填寫人	處置				獸醫師簽名
							清運 處理	通知 user	轉送 病理	病理 結果	



PATHOLOGY REPORT

NTUCM Laboratory Animal Center



實驗動物中心

Accession number: _____ Pathological number: 105033 Pathologist: Yi-Ting Tsai
Received date: 105/10/13 Specimen: _____ Species: Mice Age: 5-month-old
Strain: FVB/N Sex: Female Alive/Dead: Alive Owner: Small animal holding division

1. History:

In the health surveillance program, the sentinel mouse presented neurological symptoms, such as limb claspings, limb grasping and trunk curling (Fig. 1).



Fig. 1

2. Gross findings:

No significant difference was noted.

3. Histopathological examination:

The cerebral cortex (Fig. 2-3) and hippocampus (Fig. 4-5) presented neuronal necrosis (arrow a). The liver showed multiple coagulative necrosis (arrow b, Fig. 6-7).

Immunohistochemical staining for NeuN presented neuronal cell loss of cerebral cortex (Fig. 8) and hippocampus (Fig. 9). The TUNEL assay revealed neuronal apoptosis of cerebral cortex (Fig. 10) and hippocampus (Fig. 11). Immunohistochemical staining for GFAP indicated reactive astroglia of cerebral cortex (Fig. 12) and hippocampus (Fig. 13). The reactive astrocytes were hypertrophied, with enlarged cell bodies and GFAP-positive thickened, branched processes.



Fig. 2

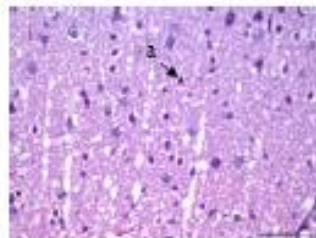


Fig. 3

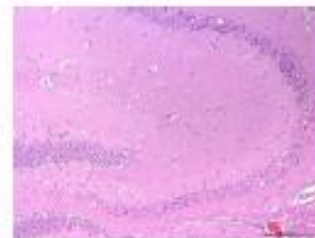


Fig. 4



Medical Management

- For animals on research protocols, the veterinarian or veterinarian's designee **should** make every effort to discuss any problems with the principal investigator or project director to jointly determine the most appropriate course of treatment or action.
 - 於「動物實驗計畫」申請時進行審查
- Recurrent or significant problems involving experimental animal health **should** be communicated to the IACUC, and all treatments and outcomes **should** be documented (USDA 1997).



Emergency Care

- Procedures **must** be in place to provide for emergency veterinary care both during and outside of regularly scheduled hours.
- In the case of a pressing health problem, if the responsible person is not available, the veterinarian **must** have the authority, delegated by senior administration and the IACUC, to treat the animal, remove it from the experiment, institute appropriate measures to relieve severe pain or distress, or perform euthanasia if necessary.
- 動物房於工作時間及假日均有人輪班，在緊急狀況時，即便難以聯絡到PI，獸醫師基於人道考量，可先進行醫療處置或犧牲動物。



Recordkeeping

- A veterinarian **should** be involved in establishing, reviewing, and overseeing medical and animal use records.
 - All those involved in animal care and use **must** comply with federal laws and regulations regarding human and veterinary drugs and treatments.
 - Drug records and storage procedures **should** be reviewed during facility inspections.
-
- 由獸醫師負責醫療及動物使用紀錄之建立及監督
 - 符合動物保護法，並受實驗動物照護及使用委員會監督



Surgery

- Surgical outcomes should be continually and thoroughly assessed to ensure that appropriate procedures are followed and timely corrective changes are instituted.
- 手術紀錄PI自行紀錄於實驗紀錄簿中，需填寫手術紀錄表



國立臺灣大學
醫學院、附設醫院
公共衛生學院

實驗記錄簿



實驗室：_____

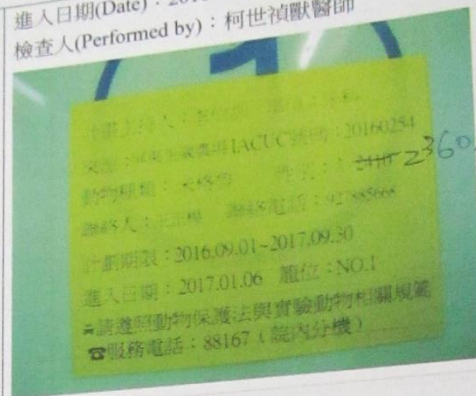
主持人：_____

研究人員：_____

編號：_____

台大動物中心大動物
組動物健康檢查及處
治記錄表(Record of
physical examination
& medical treatment)

進入日期(Date)：2016-01-06
檢查人(Performed by)：柯世禎獸醫師




動物持有人：王政揚
科別：牙科(Owner)：王政揚
電話：0927885668
動物編號(ID)：900250000272615, 耳標：2360
研究主題：新穎電漿熔射法製備金屬混摻氫氧基磷灰石複
合材料於牙科植體之應用
IACUC:20160254

動物種別(Species)：beagle
動物來源(Original)：屏東生歲行
性別(Sex)： 雄 雌 年齡(Age)：20150213,

動物健康檢查原因： New arrival Illness End of quarantine Exportation

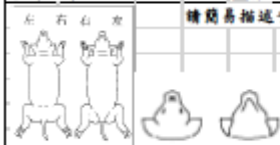
體溫(Temperature)： 食慾(Appetite)：正常

台大醫學院實驗動物中心 啮齒類手術記錄表

基本資料(General Information)		實驗日期: / /													
IACUA:	計劃主持人:	單位編碼:													
實驗人員:	體重:	性別: <input type="checkbox"/> ♂ <input type="checkbox"/> ♀													
術前照護紀錄 (★請於手術前1日下午5點前至動物中心護動物房管理員評估, 手術當天再確認, 異常狀況禁止實驗)															
健康狀況 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常(請勾選下方)															
<input type="checkbox"/> 食慾 <input type="checkbox"/> 排便 <input type="checkbox"/> 排尿 <input type="checkbox"/> 活力 <input type="checkbox"/> 呼吸 <input type="checkbox"/> 外觀 <input type="checkbox"/> 皮膚 <input type="checkbox"/> 眼睛 <input type="checkbox"/> 耳朵 <input type="checkbox"/> 嘴巴 <input type="checkbox"/> 鼻口部 <input type="checkbox"/> 頭背部 <input type="checkbox"/> 胸部 <input type="checkbox"/> 腹部 <input type="checkbox"/> 四肢 <input type="checkbox"/> 其他異常:															
麻醉前處理: <input type="checkbox"/> 動物禁食_____小時(★請詳細說明禁食原因)															
原因:															
<input type="checkbox"/> 動物不禁食															
評估手術: <input type="checkbox"/> YES <input type="checkbox"/> NO, 處置: 動物房管理員:															
手術紀錄(★以下實驗人員填寫)		開始時間: 08 : 30													
麻醉前鎮靜劑: <input type="checkbox"/> Atropine 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Xylazine 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Zoletil 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> 其他 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Isoflurane <input type="checkbox"/> 氣體 5 % Induction, 2 % Maintenance															
止痛劑: <input type="checkbox"/> Butorphanol 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Carprofen 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
抗生素: <input type="checkbox"/> Amoxicillin 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Cephalexin 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
麻醉深度紀錄															
TIME	Baseline	9:00	:	:	:	:	:	:	:	:	:	:	:	:	
ECG	102	102													
SpO2	100	100													
Resp(%)	15	15													
mmHg	120/70	120/70	/	/	/	/	/	/	/	/	/	/	/	/	
TEMP	37.5	37.5													
麻醉分期: 1 2 3 4 3															
★請每15-30分鐘紀錄至少1種麻醉深度評估紀錄															
手術紀錄 <input type="checkbox"/> 存活性手術(應確實填寫術後照護表) <input type="checkbox"/> 非存活性手術															
請簡易描述手術方法(目的)如於手術過程有追加藥物請註明用量及時間															
															
★手術部位請於圖中圈選															
手術結束時間: 12 : 30															
麻醉醒醒紀錄		保溫方式 <input type="checkbox"/> 保溫箱 <input type="checkbox"/> 保溫燈 <input type="checkbox"/> 電毯 <input type="checkbox"/> 其他													
TIME	Baseline	12:30	:	:	:	:	:	:	:	:	:	:	:	:	
ECG	102	102													
SpO2	100	100													
Resp	15	15													
TEMP	37.5	37.5													
★拔管後應每30分-1小時觀察1次, 直至醒醒恢復情形正常才能送回動物房															
組長/獸醫師:		區域負責人:		PI/研究人員:											
★手術完成後, 應將紀錄表一併交給動物房管理員歸存。															

台大醫學院實驗動物中心 實驗兔手術記錄表

基本資料(General Information)		實驗日期: / /													
IACUA:	計劃主持人:	單位編碼:													
實驗人員:	耳號:	體重:	性別: <input type="checkbox"/> ♂ <input type="checkbox"/> ♀												
術前照護紀錄 (★請於手術前1日下午5點前至動物中心護動物房管理員評估, 手術當天再確認, 異常狀況禁止實驗)															
健康狀況 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常(請勾選下方)															
<input type="checkbox"/> 食慾 <input type="checkbox"/> 排便 <input type="checkbox"/> 排尿 <input type="checkbox"/> 活力 <input type="checkbox"/> 呼吸 <input type="checkbox"/> 外觀 <input type="checkbox"/> 皮膚 <input type="checkbox"/> 眼睛 <input type="checkbox"/> 耳朵 <input type="checkbox"/> 嘴巴 <input type="checkbox"/> 鼻口部 <input type="checkbox"/> 頭背部 <input type="checkbox"/> 胸部 <input type="checkbox"/> 腹部 <input type="checkbox"/> 四肢 <input type="checkbox"/> 其他異常:															
麻醉前處理: <input type="checkbox"/> 動物禁食_____小時															
原因:															
<input type="checkbox"/> 動物不禁食(★請詳細說明不禁食原因)															
評估手術: <input type="checkbox"/> YES <input type="checkbox"/> NO, 處置: 動物房管理員:															
手術紀錄(★以下實驗人員填寫)		開始時間: 08 : 30													
麻醉前鎮靜劑: <input type="checkbox"/> Acepromazine 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Azaperone 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Xylazine 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Ketamine 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Propofol 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Isoflurane <input type="checkbox"/> 氣體 5 % Induction, 2 % Maintenance															
止痛劑: <input type="checkbox"/> Butorphanol 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Carprofen 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
抗生素: <input type="checkbox"/> Amoxicillin 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
<input type="checkbox"/> Cephalexin 劑量_____mg/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:															
氣管內管大小 (Endotracheal Tube Size): 3.5 號															
麻醉深度紀錄															
TIME	Baseline	9:00	:	:	:	:	:	:	:	:	:	:	:	:	
ECG	102	102													
SpO2	100	100													
Resp(%)	15	15													
mmHg	120/70	120/70	/	/	/	/	/	/	/	/	/	/	/	/	
TEMP	37.5	37.5													
麻醉分期: 1 2 3 4 3															
★請每15-30分鐘紀錄至少2種麻醉深度評估紀錄															
手術紀錄 <input type="checkbox"/> 存活性手術(應確實填寫術後照護表) <input type="checkbox"/> 非存活性手術															
請簡易描述手術方法(目的)如於手術過程有追加藥物請註明用量及時間															
															
★手術部位請於圖中圈選															
手術結束時間: 12 : 30															
麻醉醒醒紀錄		保溫方式 <input type="checkbox"/> 保溫箱 <input type="checkbox"/> 保溫燈 <input type="checkbox"/> 電毯 <input type="checkbox"/> 其他													
TIME	Baseline	12:30	:	:	:	:	:	:	:	:	:	:	:	:	
ECG	102	102													
SpO2	100	100													
Resp	15	15													
TEMP	37.5	37.5													
★拔管or未插管, 應每30分-1小時觀察1次, 直至醒醒恢復情形正常才能送回動物房															
組長/獸醫師:		區域負責人:		PI/研究人員:											
★手術完成後, 應將紀錄表一併交給動物房管理員歸存。															

台大醫學院實驗動物中心 實驗豬手術記錄表													
基本資料(General Information)													
IACUA:						實驗日期: / /							
實驗人員:						計劃主持人:			職位編碼:				
耳號:				體重:		性別: <input type="checkbox"/> ♂ <input type="checkbox"/> ♀							
術前照護紀錄 (★請於手術前1日下午5點前至動物中心請動物房管理員評估, 手術當天再確認, 異常狀況禁止實驗)													
健康狀況 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常(請勾選下方)													
<input type="checkbox"/> 食慾 <input type="checkbox"/> 排便 <input type="checkbox"/> 排尿 <input type="checkbox"/> 活力 <input type="checkbox"/> 呼吸 <input type="checkbox"/> 外觀 <input type="checkbox"/> 皮膚 <input type="checkbox"/> 眼睛 <input type="checkbox"/> 耳朵 <input type="checkbox"/> 嘴巴 <input type="checkbox"/> 鼻口部 <input type="checkbox"/> 頭面部 <input type="checkbox"/> 胸部 <input type="checkbox"/> 腹部 <input type="checkbox"/> 四肢 <input type="checkbox"/> 其他異常:													
麻醉前處理: <input type="checkbox"/> 動物禁食_____小時 <input type="checkbox"/> 動物不禁食(★請詳細說明不禁食原因) 原因:													
評估手術: <input type="checkbox"/> YES <input type="checkbox"/> NO, 處置動物房管理員:													
手術紀錄 (★以下實驗人員填寫) Surgeon: 助手: 開始時間: 00 : 30													
麻醉前給藥: <input type="checkbox"/> Atropine 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Acepromazine 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Azaperone 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Xylazine 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: 麻醉劑: <input type="checkbox"/> Zoletil 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Propofol 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Isoflurane <input type="checkbox"/> 氣體 5 % Induction, 2 % Maintenance 神經肌肉阻滯劑: <input type="checkbox"/> succinylcholine 劑量_____ng/kg <input type="checkbox"/> IV <input type="checkbox"/> Nimbex 劑量_____ng/kg <input type="checkbox"/> IV 止痛劑: <input type="checkbox"/> Butorphanol 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Carprofen 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: 抗生素: <input type="checkbox"/> Amoxicillin 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他: <input type="checkbox"/> Cephalixin 劑量_____ng/kg <input type="checkbox"/> IM <input type="checkbox"/> IV <input type="checkbox"/> SC <input type="checkbox"/> IP <input type="checkbox"/> 其他:													
氣管內管大小 (Endotracheal Tube Size): 5.5 號													
麻醉深度紀錄													
TIME	Baseline	0:00	:	:	:	:	:	:	:	:	:	:	:
ECG	102	102											
SpO2	100	100											
Resp(分)	15	15											
mlg	125/70	mmHg	/	/	/	/	/	/	/	/	/	/	/
TEMP	37.5	37.5											
麻醉分期: 1 2 3 4 3													
★請每15-30分鐘紀錄至少2種麻醉深度評估紀錄(麻醉分期請參考附件)													
手術紀錄 <input type="checkbox"/> 存活性手術(應確實填寫術後照護表) <input type="checkbox"/> 非存活性手術													
請簡易描述手術方法(目的)如於手術過程有追加藥物請註明用量及時間													
													
★手術部位請於圖中圈選													
手術結束時間: 12 : 30													
麻醉甦醒紀錄 保溫方式 <input type="checkbox"/> 保溫箱 <input type="checkbox"/> 保溫燈 <input type="checkbox"/> 電毯 <input type="checkbox"/> 其他													
TIME	Baseline	12:30	:	:	:	:	:	:	:	:	:	:	恢復情形
ECG	102	102											拔管時間: 13:00 甦醒時間: 14:30
SpO2	100	100											呼吸 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常 活力 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常
Resp	15	15											心跳 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常 反射 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常
TEMP	37.5	37.5											溫度 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常 溫度 <input type="checkbox"/> 正常 <input type="checkbox"/> 異常
★拔管or未插管, 應每30分-1小時觀察1次, 直至甦醒恢復情形正常才能送回動物房													
組長/獸醫師:				區域負責人:				PI/觀察紀錄人員:					
藥劑配製後, 應將紀錄表一併交給動物房管理員保存。													
版次: 2.0													



Training

- Researchers conducting surgical procedures **must** have appropriate training to ensure that good surgical technique is practiced.
 - The IACUC, together with the AV, is responsible for determining that personnel performing surgical procedures are appropriately qualified and trained in the procedures.
-
- 實驗動物管理與使用課程
 - 實驗動物操作技術訓練課程
 - 實驗動物手術訓練課程



Presurgical Planning

- The surgical plan **should** identify personnel, their roles and training needs, and equipment and supplies required for the procedures planned; the location and nature of the facilities in which the procedures will be conducted; and perioperative animal health assessment and care.
 - A veterinarian **should** be involved in discussions of the selection of anesthetic agents and doses as well as the plan for perioperative analgesic use.
 - Presurgical planning **should** specify the requirements for postsurgical monitoring, care, and recordkeeping, including the personnel who will perform these duties.
- 於「動物實驗計畫」申請時進行審查

1.手術分類	存活手術		
手術名稱	經黏膜下軟組織微創腸重建術		
是否為批次手術	是	一批隻數	5
2.動物品種	Rat		
3.手術內容描述			
4.執行場所	本院動物中心		
本院動物中心樓層	8樓		
5.手術執行人員			
6.請描述麻醉藥物名稱、劑量(mg/kg)或氣體麻醉濃度(%)、投予方式與頻率	舒泰 20mg/kg 芬那 0.05mg/100g		
7.若執行恢復手術，請描述器械與儀器消毒方法、動物手術部位消毒方法。			
器械與儀器消毒	高壓滅菌		
批間器械消毒	熱珠滅菌器		
動物手術部位消毒	Povidone-Iodine, Chlorhexidine		
8.請描述手術前使用的輔助藥物(例如止痛藥，抗生素等)，投予方式與頻率，以及手術過程中使用的動物生理監測設備。	無		
9.請描述手術後使用的輔助藥物(例如止痛藥，抗生素，輸液治療等)，投予方式與頻率。	大鼠: Meloxicam(商品名Mobic，鼠用) 0.025g/100g, 口服三天，抗生素萊胃0.05mg/100g塗抹縫合處		
10.什麼方式評估麻醉程度? (What criteria(s) will be used to assess level of anesthesia?)	呼吸頻率 (Respiration rate), 肌肉鬆弛 (Muscular relaxation)		
11.請描述動物手術後觀察頻率和照護作業。	麻醉與手術當日確認動物甦醒，投予止痛藥，投予抗生素		



Surgical Facilities

- Unless an exception is specifically justified as an essential component of the research protocol and approved by the IACUC, aseptic surgery **should** be conducted in dedicated facilities or spaces.
- Major survival surgeries 需於手術房中進行





Surgical Procedures

- Surgical procedures are categorized as **major or minor** and, in the laboratory setting, can be further divided into **survival and nonsurvival**.
- **Major survival surgery** (e.g., laparotomy, thoracotomy, joint replacement, and limb amputation) penetrates and exposes a body cavity, produces substantial impairment of physical or physiologic functions, or involves extensive tissue dissection or transection.
- **Minor survival surgery** does not expose a body cavity and causes little or no physical impairment; this category includes wound suturing and percutaneous biopsy.



Aseptic Technique

- General principles of aseptic technique **should** be followed for all survival surgical procedures.
- Specific sterilization methods **should** be selected on the basis of the physical characteristics of the materials to be sterilized and sterilization indicators **should** be used to validate that materials have been properly sterilized.
- 動物術區需剃毛、刷洗並消毒，手術人員需著無菌手術衣、戴頭套、口罩及無菌手套。
- 以高壓蒸氣滅菌鍋 (autoclave) 滅菌，並以滅菌指示帶 (autoclave tape) 識別滅菌狀態



Postoperative Care

- During this period, animals **should** be in a clean, dry, and comfortable area where they can be observed frequently by trained personnel.
 - Particular attention **should** be given to thermoregulation, cardiovascular and respiratory function, electrolyte and fluid balance, and management of postoperative pain or discomfort.
 - Appropriate medical records **should** also be maintained.
- 手術人員需密切觀察動物術後恢復情形，填寫疼痛評估紀錄表及術後觀察表

台大醫學院實驗動物中心實驗動物疼痛評估記錄表

LD05-02-D

IACUC NO :

手術日期 :

手術人員 :

動物編號 :

動物籠位 :

動物性別 :

評估項目		分數	日期						
			第一天	第二天	第三天	第四天	第五天	第六天	第七天
食慾	正常	0	AM	AM	AM	AM	AM	AM	AM
	飼料未吃完	1							
	未進食	2	PM	PM	PM	PM	PM	PM	PM
外觀/態度	正常	0	AM	AM	AM	AM	AM	AM	AM
	皮膚外觀改變(豎毛)	1							
	步態改變或姿勢異常	2							
	反應遲鈍、姿勢身體動作僵硬、不願走動、人接近時，尖叫並企圖逃跑，疼痛會使其反應更劇烈或甚至具有攻擊性	3	PM	PM	PM	PM	PM	PM	PM
排便	正常	0	AM	AM	AM	AM	AM	AM	AM
	排便量減少	1							
	無排便	2	PM	PM	PM	PM	PM	PM	PM
呼吸	正常	0	AM	AM	AM	AM	AM	AM	AM
	間歇性呼吸異常	1							
	持續性呼吸困難	2	PM	PM	PM	PM	PM	PM	PM
傷口狀況	正常	0	AM	AM	AM	AM	AM	AM	AM
	輕微透明滲出液紅色血液	1							
	不透明滲出液或暗褐色血液	2	PM	PM	PM	PM	PM	PM	PM
	濃樣分泌物	3							
疼痛分數	第一級：按壓或觸診手術部位時，動物無太大反應	1	AM	AM	AM	AM	AM	AM	AM
	第二級：按壓或觸診手術部位時，會引起周圍組織反應，動物對觸診反應尚可接受	2							
	第三級：按壓或觸診手術部位時，會引起周圍組織反應，動物對觸診反應無法接受	3	PM	PM	PM	PM	PM	PM	PM
	第四級：按壓或觸診手術部位時，會引起周圍組織反應，動物對觸診反應激烈並抗拒，呈攻擊行為	4							
總分		0-20							
是否投與藥物?	藥名 劑量 頻率		最少三日須給藥						
			是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>
				否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>
獸醫師	管理員								

分級及建議處治方式(輕度以上疼痛等級第2級,需通知計劃人員處治)

正常: 0-5分, 疼痛等級第1級, 可不給止痛藥觀察

輕度疼痛: 6-10分, 疼痛等級第2級, 給予非鴉片類止痛藥

中度疼痛: 11-15分, 疼痛等級第3級, 每8-12給予鴉片類止痛藥

重度疼痛: 16-20分, 疼痛等級第4級, 每8-12給予鴉片類止痛藥且考慮合併藥或人道犧牲

齧齒類動物術後觀察表 (POST OPERATIVE EVALUATION)

IACUC No. _____ 計畫主持人姓名 _____ 動物品種 _____ 品系 _____
 動物體重 _____ 手術名稱 _____ 手術日期 _____ 年 _____ 月 _____ 日
 連絡人姓名 _____ 連絡電話 _____ 拆線拔釘日期 _____ 年 _____ 月 _____ 日

施術日期起迄七天	/	/	/	/	/	/	/
呼吸/步伐/姿勢 是否正當?	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>
	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>
進食/飲水排糞/排尿 是否正當?	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>
	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>
縫合處是否乾淨 (是)/滲血(否)?	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>	是 <input type="checkbox"/>
	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>	否 <input type="checkbox"/>
疼痛評估得分(0至4分)							
是否投與藥物? 藥名/劑量/頻率							
使用者簽名							
獸醫師簽名							

疼痛評估: 0-正常 normal behavior and physiology, 1-行為生理中度異常-mild behavior and physiological changes (decreased food/water consumption, slightly depressed, minor guarding of incision site), 2-中度疼痛 moderate pain (1 plus swelling/redness/discharge at surgical site, reluctance to move, guarding with vocalization or aggression), 3-重度疼痛 severe pain/distress (1 and 2 plus, immobility, dehiscence of incision, profound dehydration/ weight loss), 4-瀕死狀態 Moribund/comatose。



Pain and Distress

- Certain species-specific behavioral manifestations are used as indicators of pain or distress—for example, vocalization (dogs), depression (all), anorexia (all), rapid or labored respiration (rodents, birds, fish), lack of grooming (mammals and birds), increased aggression (mammals and birds), periocular and nasal porphyrin discharge (rodents), abnormal appearance or posture (all), and immobility (all).



<http://aibolita.com/eye-diseases>





Anaesthesia and Analgesia

- The selection of appropriate analgesics and anesthetics **should** reflect professional veterinary judgment.
 - Animals **should** be closely monitored during and after painful procedures and **should** receive additional drugs.
 - Antinociception occurs at a surgical plane of anesthesia and **must** be ascertained before surgery.
-
- 止痛及麻醉於「動物實驗計畫」申請時進行審查
 - 術後用藥紀錄於疼痛評估紀錄表及術後觀察表



Anaesthesia and Analgesia

- Guidelines for the selection and proper use of analgesic and anesthetic drugs **should** be developed and periodically reviewed and updated as standards and techniques are refined.
 - Agents that provide anesthesia and analgesia **must** be used before their expiration dates and should be acquired, stored, their use recorded, and disposed of legally and safely.
- 可參考台大醫學院實驗動物麻醉止痛使用指引



Euthanasia

- Unless a deviation is justified for scientific or medical reasons, methods **should** be consistent with the AVMA Guidelines on Euthanasia.
- Standardized methods of euthanasia that are predictable and controllable **should** be developed and approved by the AV and IACUC.
- Euthanasia **should** be carried out in a manner that avoids animal distress.
- Special consideration **should** be given to euthanasia of fetuses and larval life forms depending on species and gestational age.



Euthanasia

- Because neonatal rodents are resistant to the hypoxia-inducing effects of CO₂ and require longer exposure times to the agent, alternative methods **should** be considered (e.g., injection with chemical agents, cervical dislocation, or decapitation).
 - Death **must** be confirmed by personnel trained to recognize cessation of vital signs in the species being euthanized.
 - A secondary method of euthanasia (e.g., thoracotomy or exsanguination) can be also used to ensure death.
- 可參考安樂死規範，動物安樂死方法於「動物實驗計畫」申請時進行審查。需確認動物死亡後才能將屍體移入冰櫃

才能移入屍體冰櫃。

動物犧牲箱

請扣好

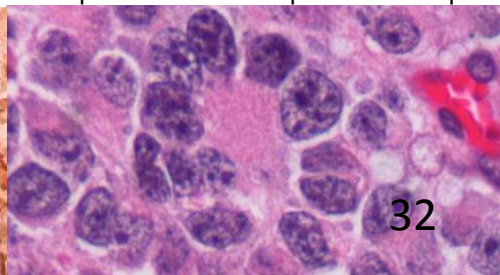
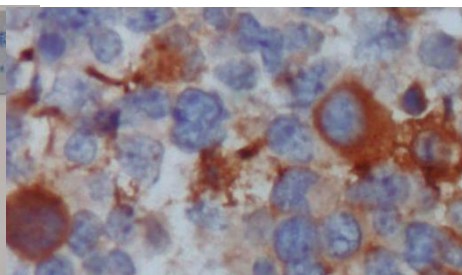
請扣好

目前 CO₂ 已改設定，
按一次之後會打氣
3 分鐘，請在燈熄
之後靜置 1 分鐘，
確認死亡(四肢僵
硬)後再放入冰櫃。
必要時請再按一次



A graphic consisting of three square cards hanging from thin silver wires. The first card is red with a white letter 'Q'. The second card is grey with a black ampersand '&'. The third card is blue with a white letter 'A'.

<http://www.aburicomposites.com/qa/>



E. VETERINARY MEDICAL CARE

1. Calibrating anesthetic equipment

We have a technician come to our facility to calibrate our anesthetic vaporizers on a regular basis. Does this meet AAALAC's expectations for calibration and maintenance of our anesthetic machines? There is a difference between an on-site calibration and having the vaporizer sent to the manufacturer for preventive maintenance. The services performed in each of these instances can be significantly different. During most on-site calibrations, the vaporizer is checked to ensure it is delivering the amount of anesthetic as reflected by the setting. When vaporizers are sent in for preventive maintenance, the vaporizer is broken down and a detailed maintenance is performed that includes cleaning and replacement of worn gaskets and

所在地校正與將氣體麻醉機送回原廠定期維修不太一樣，校正主要確保實際輸出之麻醉氣體與設定值一致；維修則為清理保養並替換磨損零件。氣體麻醉機需定期監控是否洩漏或損壞，廠商需提供合適校正及維修間隔時間及其服務。

Workers Guidelines/Chap5) states that all anesthetic equipment must be regularly monitored for leakage, improper design, or defects. This includes the anesthesia machine as well as the vaporizer since anesthetic machines can develop improperly functioning components such as flutter valves, gaskets, and scavenging equipment. AAALAC International expects that anesthetic machines and vaporizers are evaluated for safe and effective operation on an established schedule, consistent with the the manufacturers recommendations. The manufacturer of your vaporizer should have recommended intervals for both on-site calibration and for maintenance that requires sending the vaporizer in to them, as well as recommended maintenance intervals for the rest of the anesthetic machine.

2. Aseptic surgery and alcohol as a disinfectant

A researcher at our institution plans to use isopropyl alcohol to disinfect the surgical instruments she uses for a survival rodent surgical procedure. Will this be acceptable to AAALAC?

In 2001, AAALAC International published guidance on the use of alcohol as a skin disinfectant and for instrument sterilization (http://www.aaalac.org/publications/Connection/Using_Alcohol_Disinfectant.pdf). At

2001年，AAALAC認為酒精可用於術區皮膚消毒，但不可用於手術器械消毒；但最近研究指出，延長手術器械浸泡於酒精之時間，或是特殊狀況時可使用酒精作為手術器械消毒。

IACUC需依個案不同謹慎評估。

are used (Huerkamp 2002) or for limited numbers of serial rodent surgeries under specific conditions (Keen et al. 2010). The IACUC (or comparable oversight body) must evaluate the use of alcohol on a case-by-case basis with due consideration for animal welfare and scientific outcomes based on a review of current relevant literature, and consistent with expected surgical outcomes.

3. Intraoperative monitoring

On page 128 of the *Guide for the Care and Use of Laboratory Animals (NRC 2011)*, there is a new section which describes the importance of intraoperative monitoring during surgical procedures. The description includes evaluation of parameters such as anesthetic depth, body temperature, cardiac and respiratory rates and pattern as well as blood pressure. Will AAALAC now require that these parameters be monitored and recorded for all surgical procedures?

Site visitors will often evaluate protocols, standard operating procedures and surgical records to assess the appropriateness of anesthesia, analgesia, intraoperative surgical monitoring, post-operative care and outcome. As stated in the 1996 *Guide* and detailed more specifically in the 2011 *Guide*, the overall goal of surgical monitoring is to

術中監控目的為增加手術成功率，其監控項目可因物種差異、麻醉方式、手術侵犯程度、複雜度及手術持續時間而有所調整；不管任何物種，愈複雜、持續時間愈久之手術均需要更詳細密集之術中監控。
非存活性手術也需合適術中監控。

the need for detailed, intensive intraoperative monitoring. The Council expects that the level of intraoperative monitoring and recordkeeping will be based on these factors. For example, the level of intra-operative monitoring might be minimal for short, minor procedures on rodents. In contrast, extensive intraoperative monitoring would likely be required for long, complex, major procedures regardless of the species involved. Appropriate intraoperative monitoring for non-survival surgical procedures is also expected, using the above criteria. As always, the Council will evaluate the adequacy of intraoperative monitoring using a performance based approach which assesses whether procedures meet the goals and provide a successful outcome.

4. Rodent surgery record keeping

What level of monitoring and record-keeping are expected for rodent surgery?

There is clear general consensus in relevant resources (e.g., the *Guide for the Care and Use of Laboratory Animals (Guide)*, NRC 2011; *Medical Records for Animals Used in Research, Teaching, and Testing: Public Statement from the American College of Laboratory Animal Medicine*, ILAR 2007; *Rodents: Laboratory Animal Management*, NRC 1996; *Research Animal Anesthesia, Analgesia and Surgery*, SCAW 2007) that monitoring of rodents during surgery is critical so that animals are maintained under a surgical plane of anesthesia and that therapeutic intervention can be provided should unexpected physiological responses occur. Perioperative assessment of the physiological

為了增加手術成功率，需監控動物生理數值(體溫、呼吸速率、心跳、血壓、血中氣體濃度、心電圖等)及麻醉深度。
儘管AAALAC未規定手術程序，但有建議術前計畫需考慮術中監控及紀錄保存，而其監控及紀錄項目可因手術差異及動物健康等而調整。

Therefore, while AAALAC does not have a policy that stipulates the level of documentation for surgical procedures, the *Guide* does recommend that pre-surgical planning include consideration of record-keeping, and AAALAC would expect that this would occur and that the level of monitoring and record-keeping would be adjusted to the type of procedure, health of the animal, etc. Good record-keeping is also important so the Institutional Animal Care and Use or Oversight Body (IACUC/OB) can track whether or not a specific animal had undergone more than one survival surgical procedure, as multiple survival surgical procedures need to be handled in a specific manner by the IACUC/OB. To summarize, then, there is no “cookie-cutter” approach to monitoring and documentation associated with surgical procedures, but AAALAC site visitors would expect all the factors described to be evaluated by the IACUC/OB for all surgical procedures when making these determinations.

5. Carbon dioxide (CO₂) for euthanasia

The *Guide for the Care and Use of Laboratory Animals* (NRC 2011) notes the ongoing controversy regarding the use of carbon dioxide (CO₂) for euthanasia due to its aversive characteristics. The *Guide* also notes that this is an area of ongoing research and that the suitability of CO₂ as a euthanasia agent for small rodents should continue to be evaluated. Because of the controversy surrounding the use of CO₂ in small rodent euthanasia, we are unsure of AAALAC International's expectations in this regard. Guidance on this topic would be very valuable as our institution develops a standard operating procedure on the utilization of CO₂ as a euthanasia agent in small rodents.

The 2011 *Guide* states that *"Unless a deviation is justified for scientific or medical reasons, methods should be consistent with the AVMA Guidelines on Euthanasia (AVMA 2007 or later editions)."* The 2013 AVMA Guidelines for the Euthanasia of Animals, an

2013 AVMA Guideline 認為安樂死可以逐漸灌注CO₂方式進行，建議氣體替換速率約10%-30% volume/min。

直接將動物放到已灌注100% CO₂之動物犧牲箱是不可接受的。

... *... The practice of immersion, where conscious animals are placed directly into a container prefilled with 100% CO₂, is unacceptable." ... Carbon dioxide "must be supplied in a precisely regulated and purified form without contaminants or adulterants, typically from a commercially supplied cylinder or tank." ... "As gas displacement rate is critical to the humane application of CO₂, an appropriate pressure-reducing regulator and flow meter or equivalent equipment with demonstrated capability for generating the recommended displacement rates for the size container being utilized is absolutely necessary."*

However, as the *Guide* notes (page 13), *"The body of literature related to animal science and use of animals is constantly evolving, requiring Programs to remain current with the information and best practices."* Therefore, the appropriate displacement rate for different rodent species may change as the science regarding CO₂ euthanasia develops.

Based upon these references, the Council on Accreditation developed the following expectations:

1. A 10-30% displacement rate of chamber air with CO₂ gas/minute must be used when euthanizing¹ small rodents to minimize aversion, pain/distress, and escape behavior. The flow rate should be calculated to ensure the equipment meets required displacement specifications. While flow meters are the preferred method of ensuring flow rate, other methods are available.

1. 安樂死應以逐漸灌注CO₂方式進行，建議氣體替換速率約10%-30% volume/min。
2. 使用自動化安樂死系統時，需查核氣體替換速率。
3. 在安樂死間隔，需先移除殘留CO₂。
4. 需由合格人員操作安樂死。
5. 需確認動物死亡。
6. 安樂死時應將動物放置於原本居住的籠子以減少其緊迫及焦慮，若需置於其他籠子，則應清潔並減少其緊迫及焦慮。
7. 應特別注意CO₂安樂死新生齧齒類動物。
8. CO₂安樂死應用透明箱子。
9. 應避免其他的動物聽到安樂死動物之叫聲及聞到氣味。
10. 應被IACUC核可。

animals. Therefore, procedures should be implemented to prevent potential distress resulting from exposure to the vocalizations and odors of frightened animals.

10. The IACUC must review and approve any deviations from the 2013 AVMA Guidelines on CO₂ euthanasia using a performance based approach.

¹This also applies to those rare cases when CO₂ is used for anesthesia.



Accreditation process

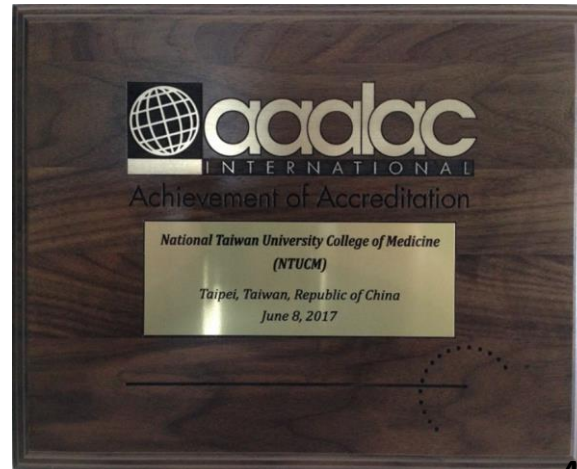
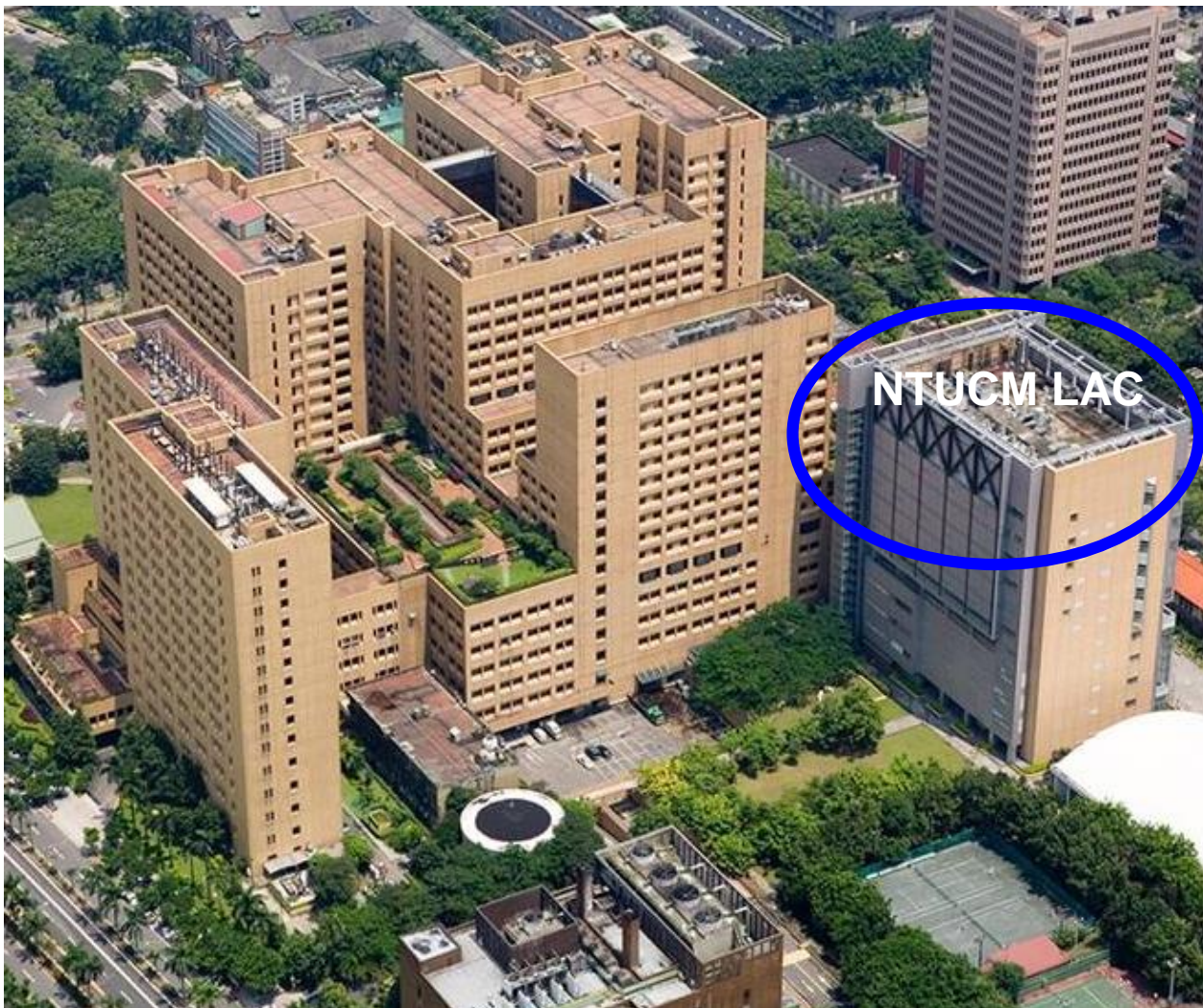
- Program description
- Document submission and fee payment
- Site visit
- Post Site Visit Communication (PSVC)
- After awarded AAALAC International accreditation, the institution will need to submit an “annual report” every year.
- Subsequent site visits are held every three years



NTUCM LAC



實驗動物中心



IO

Institutional official:

bears ultimate responsibility for the Program and is responsible for resource planning and ensuring alignment of Program goals with the institution's mission.

LAC
Director

Attending veterinarian:
responsible for the health and well-being of all laboratory animals used at the institution.

The IO, the Chair of the IACUC and the Director of the Laboratory Animal Center meet on a regular basis and maintain an open line of communication regarding all aspects of the animal care and use program.

AV

IACUC
chair

Veterinary and Other Professional Staff Veterinarians

- 首席獸醫師
- 大動物組(8F): 2位獸醫師
- 小動物組(9F): 2位獸醫師
- 繁殖組(10F): 2位獸醫師
- 研發組(10F): 1位獸醫師

institutional animal care and use committee

委員22人：主任委員、實驗動物中心主任、獸醫師、牙醫專業學院代表、藥學專業學院代表、公衛學院代表、不使用動物之委員或社會公正人士2人，基礎學科所代表、醫學系臨床學科所代表、其他學所及專業性研究中心代表、校外委員

IACUC responsibilities

- **Animal protocol review**
 - i. Experimental and humane endpoints
 - ii. Pain and distress, anesthesia, and analgesia
 - iii. Physical restraint
 - iv. Multiple survival surgical procedures
 - v. Food and fluid regulation
 - vi. Use of non-pharmaceutical-grade drugs and other substances
 - vii. Animal reuse
 - viii. Environmental enrichment
 - ix. Animal transportation on campus
- **Post approval monitoring, PAM**
- **Annual supervision report**
- **Facility inspection**
 - i. Animal environment, housing and management
 - ii. Emergency, weekend and holiday care
 - iii. Animal health monitoring, seasonal
 - iv. Semiannual facility inspection
- **Training program**
- **Receiving complaint of violation of animal use**
- **Committee meetings**



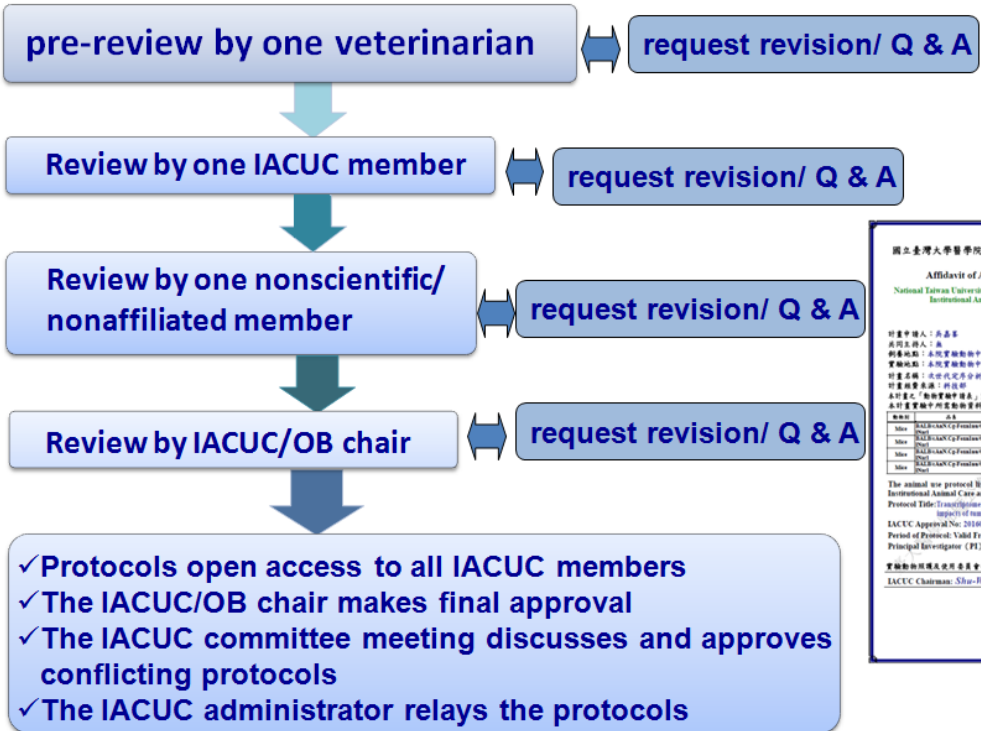
1. Disaster plan did not mention how to deal with animals.

- 動物中心意外暨緊急狀況應變程序: 災害發生後，由首席獸醫師(AV)及其獸醫師團隊裁決依據是否能維持其科學可信度來保留動物以供繼續做實驗。大小鼠為防範災害發生，宜事先凍存胚，大型動物優先保留。繼續動物實驗的科學可信度能維持時，可保留所有或大部分動物；若認為動物科學實驗的可信度不能維持，如缺少人員、缺乏環境控制.....等，焦點轉向保留無可取代或高經濟價值的實驗動物，不能免受災害後果或承受疼痛不適者，不能重新安置者，需進行人道安樂死。

2. Non-scientific / non-affiliated member was not involved in the detailed review of each protocol.

➤ Revised version

Protocol review process





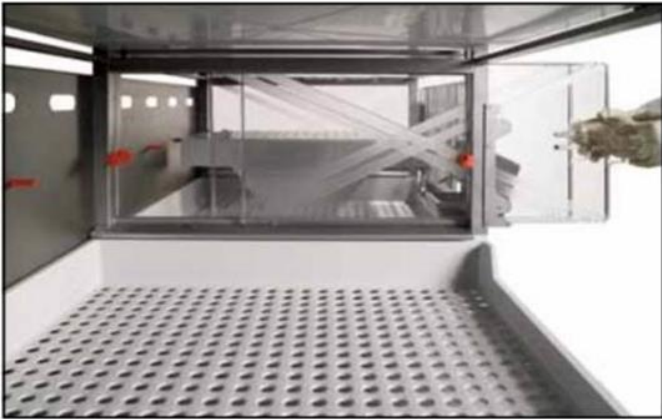
3. In a number of areas, animals were found to be singly housed.

- 實驗動物環境豐富化及獨飼規範：群居動物如需獨飼應寫在動物實驗計劃中並經IACUC同意。待部分原因消除後可重回原籠，所有獨飼籠應添加豐富化的物品。獨居飼養之動物需與其同類動物相處一室並可利用視覺、聽覺和嗅覺，隔著柵欄或網片得知同種動物的存在。
- 如有下述情況或臨床症狀出現，可採取獨居飼養，但須經獸醫師同意：動物具有攻擊或打架的傾向、懷孕母畜、繁殖動物離乳時單一性別只有一隻動物、術後照護(至復原)、動物身上繫有導管、健康狀態不佳。



Figure 1-3: Comparison of the new and old cage.

The basal area of new cage is $2,623\text{cm}^2$ and old one is 825cm^2 .





4. Surgical rooms in satellite units were not adequately designed or maintained to perform aseptic survival surgery.
- 存活性手術操作及場所規範：存活性手術應在動物中心操作，不在動物中心進行存活性手術，必須於實驗動物計畫中敘明原由及欲進行手術的實驗場所，經IACUC同意其說明後，IACUC將訪視進行存活性手術之實驗場所，若IACUC認為該場所不具備存活性無菌手術之條件，得禁止該實驗場所進行動物存活手術實驗。



5. Safety signage

- Autoclave, rack washer, H₂O₂ fumigation chamber

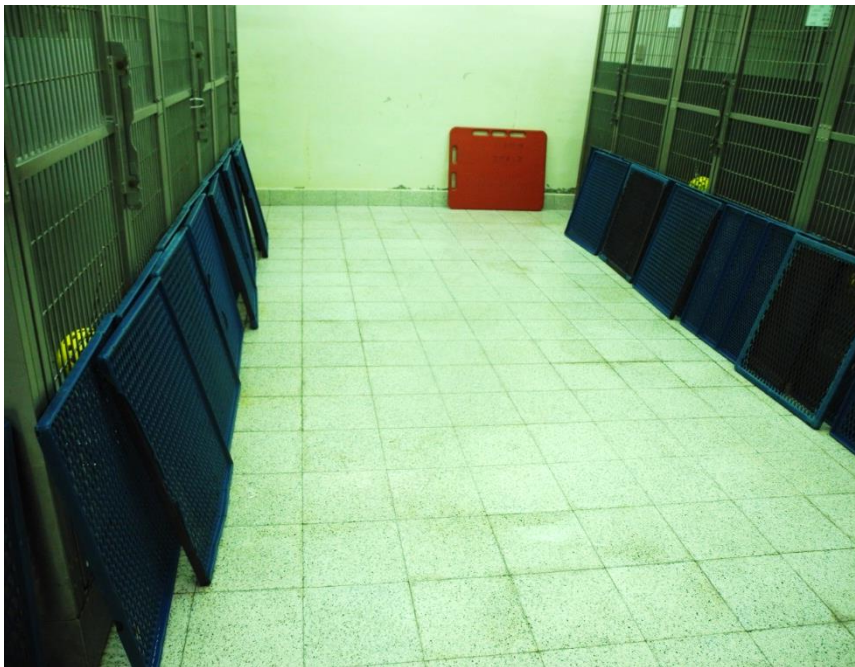




PSVC

6. IACUC members did not have any opportunity to have medical check which covered animal allergies.
- IACUC will provide additional annual medical checks to all IACUC members which cover animal allergies.

7. Rusty suspended flooring in pig pens



8. Poor wall maintenance with cracks and peeling paint

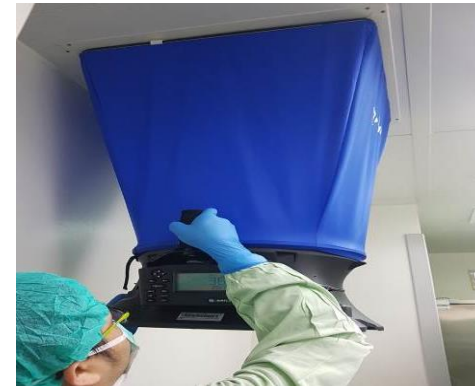




PSVC

9. Some deficiencies were noted with the **HVAC system** e.g. the number of air changes per hour in some animal rooms did not meet the minimum requirements as set out by the guide.

量測送風量：368CMH
量測排風量：117CMH,115CMH (共232CMH)
量測空間體積：33m ³
換氣次數(次/hr)：11次/hr(正壓)





10. The unit allows to use toe clipping to identify animals up to 3 weeks, as said in the Guide, toe-clipping should be used only when no other individual identification method is feasible.

- 啣齒類標識方法規範：優先使用其他標記方法，使用剪腳趾方式須要寫在動物實驗計畫中提供科學理由，並經IACUC同意方可執行。只在小於7日齡鼠使用，大於7日齡鼠操作時需要麻醉。限制每肢最多只能剪二趾。



11. Enrichment items were provided to animals, but a enrichment program was only offered to singly-housed rats or mice on studies.

- 實驗動物環境豐富化及獨飼規範：巢料、避難區域(例如管子與小屋等)、粗飼料或可供啃咬的物品(例如木棒)及食物、提供玩具、對大小鼠和倉鼠可增加葵花子、對天竺鼠及兔子提供青料或生鮮蔬果



Annual report

- AAALAC international unit contact
- Responsible institutional official
- Attending veterinarian
- IACUC/ACC/EC (if applicable) chairperson
- Physical areas
- Note addition or deletion of animal rooms, laboratories, units, or buildings.
- State and describe changes in organizational structure of the program.
- Were any research, testing, or teaching protocols suspended during this reporting period for animal welfare related reasons or impacted due to COVID-19?
- Were any major problems identified or deficiencies noted by animal welfare oversight authorities/bodies/agencies during this reporting period?
- Did you self-identify any serious deviations from your institutional animal care and use program requirements or policies?
- Enter the approximate annual usage for the above stated reporting period.
- List key personnel changes since last reporting period.

Thank you for your attention

