

# Small Animal-based Computed Tomography Technology Services and Usage Regulations

Article 1 The Small Animal-based Computed Tomography Technology Services and Usage Regulations have been established to optimize instrument usage efficiency.

Article 2 The instruments include the following:

1. Brand and model: Skyscan 1176.
2. Instrument properties:
  - (1) Resolution: 9/18/35 $\mu$ m.
  - (2) X-ray energy range: 20–90kV.
  - (3) Maximum tomography plane pixels: more than 6500 $\times$ 6500 pixels.
  - (4) Physiological monitoring equipment: heartbeat, breathing, and body temperature.
  - (5) Analysis software: quantitative morphology analysis, bone mass density analysis, fat analysis, 3D surface imaging, and 4D image acquisition.
3. Workstation computers:
  - (1) Control workstation computer.
  - (2) Image recombination workstation computer.
  - (3) Micro CT/IVIS Fusion multianalysis computer.
4. Anesthetizers.

Article 3 The instruments are to be used mainly by researchers from the Taipei Medical University (TMU), TMU Hospital, TMU Shuang Ho University, and Taipei Municipal Wanfang Hospital. The instruments may also be used by users from outside the school.

Article 4 Instrument storage location: United Medical Building (Back Building) F1, Laboratory Animal Center.

Article 5 This instrument can be used for the following:

1. Anesthetized live rats and mice.
2. Euthanized rats and mice, dried specimens, soaked specimens, and nonbiological sample materials.

Article 6 Reservations are made as follows:

1. Service reservations should be made 7–30 days before the service

reservation date. Applicants can make reservations via the online reservation system located at the Core Facility Center and Laboratory Animal Experiment.

2. Technical service hours: Monday to Friday 9:00–12:00, 13:00–15:00, and 15:00–17:00.
3. After the applicant completes their online reservation, Laboratory Animal Center technicians evaluate whether to provide services according to the actual reservation information.
4. Applicants who are unable to use the reserved scanning service at the reserved time must cancel the reservation at least one day before the reservation date to enable the center to reduce the MRI wait times for other users. If the applicant does not show up, is 15 minutes late, or shortens the reserved usage hours by more than 3 hours on short notice, the applicant will be **required to pay for the original reservation period** in full.

#### Article 7 Instrument usage regulations:

1. Laboratory Animal Center technicians must be present during all operations of this small animal CT service.
2. Note: Laboratory Animal Center technicians are personnel who have participated in more than 18 hours of radiation protection training approved by the Atomic Energy Council and who have obtained the training certificate. Only Laboratory Animal Center technicians are permitted to operate the instruments.
3. During the scanning process, the scanner activates the X-ray source, and the warning light on top of the machine flashes. Although there is no risk of ionizing radiation, and the exterior of the CT machine is covered with lead grids and glass, experiment personnel must follow the instructions given by on-site operation personnel. If behavior that may influence the experiment operation or radiation safety is detected, the Laboratory Animal Center will immediately force-stop the service. The applicant is responsible for any damage caused in this situation.
4. The CT instrument has an X-ray source. When **scanning an object containing metal (e.g. needles, ear tags, studs, or any metallic objects), the CT image may show deformation.** For damages sustained or costs incurred as a result of the aforementioned reason, the users and their respective laboratories will be held financially responsible.

#### Article 8 Scanning service precautions:

1. Live animals:
  1. The live animal scanning service only accepts animals held in the Laboratory Animal Center and Medical Laboratory Science and Biology Building, 4F.
  2. The applicant is responsible for the prescan preparations,

including anesthetizing, fixating, and administering the contrast agent. After the animal is anesthetized and stable, the Laboratory Animal Center technician conducts the follow-up operations. Animal deaths that occur during the scanning process are considered to be caused by standard operation risks; the Laboratory Animal Center will not be held responsible.

**Note: Unsuitable selection and use of contrast agents may increase the animal mortality risk in the scanning process. Experiment participants are advised to participate in the related courses held by the Laboratory Animal Center or have a basic understanding of animal-use contrast agent selection or dosage before administering the contrast agent. The Laboratory Animal Center is not responsible for any animal deaths that occur during contrast agent administration or the scanning process.**

3. The isoflurane or other types of anesthesia required in the live animal scanning process should be prepared by the project director and submitted to the technician on the day of scan.
  4. The contrast agent required in the live animal scanning process should be prepared by the project director and submitted to the technician on the day of scan.
  5. After the project director or related laboratory individual submits the live animal to the professional technician, the technician conducts the prescan preparation, including anesthetization, fixation, and contrast agent injection. The project director or related laboratory personnel should inform the technician if the animals require special care or have specific fixation needs. Additionally, the technician will participate in the experiment if required.
  6. The scanned animal's physiological variables are monitored and recorded during the CT scanning process. Additionally, animal deaths occurred during the scanning process are considered to be caused by standard operation risks; the Laboratory Animal Center will not be held responsible.
2. In vitro live animals or samples:
    1. The in vitro animal scanning service only accepts perfusion-fixed samples.
    2. Scanning of samples that are wet, sticky, volatile, or radioactive or that cause pollution is prohibited with the exception of completely sealed soaked specimens.
  3. This service provides only the original scan file and does not include a follow-up analysis process. Users can reference the analysis-specialized computer provided by the Laboratory Animal

Center to conduct calculation analysis. Additionally, users can contact the CT technician to apply for other analysis services.

4. Provision of the original scan file:
  1. After the service has been completed, the Laboratory Animal Center sends an e-mail to the user that contains an online address from where the scan file can be downloaded from the cloud. The online address is only accessible through the school internet. Because the size of the original scan file is substantial, the CT scanner, analysis computer, and cloud storage space will not permanently save the file. Users should quickly download the files from the cloud storage. The Laboratory Animal Center deletes the scanned information two weeks after sending the e-mail notice. No other reminders will be sent to the user.

Article 9 Regulations for the recomposition and analysis of workstation computer:

1. User must follow the standard operation procedure when turning the computer on and off. After using the instruments, the user must clean the instruments and operation platforms and remove experiment waste. Violations of this regulation will be evaluated by the Laboratory Animal Center; individuals confirmed to have violated the regulation will be banned from using all instruments for one month starting from the date of notice.
2. The workstation computer is free to use but should be used with conscience and care.
3. If the computer malfunctions, the user should quickly inform the technician. Users are prohibited from taking the computer apart themselves. The cost of repairing instrument damage caused by a user is the responsibility of that user.

Article 10 The instrument usage cost standard has been established to ensure optimal service quality and to increase the effective service years of each instrument. Based on the discussion of the Office of Research and Development, personnel or research units that use the instruments must share the expenses related to instrument consumables, maintenance, and operating personnel service.

1. The usage payment standards are as follows (regardless of in vivo or in vitro testing and image resolution):

	TMU personnel	Non-TMU personnel
Scanning cost	NT\$1200 per hour (not including anaesthetization service cost)	NT\$3600 per hour (not including anaesthetization service cost)

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2. Scanning processes that require contrast agent injections require an additional application for the laboratory animal operation technology service. The service cost is NT\$100 per cage. Applicants must prepare the contrast agent.
3. The usage payment standard for non-TMU personnel is three times that for TMU personnel.
4. Payment methods: The Laboratory Animal Center calculates the technology service usage fee after service completion and sends a payment notice for technology service usage to the user. The technology service payment should be paid to the Laboratory Animal Center and settled within three months of the payment notice issue date. Applicants can make direct payments at the TMU Cashiers Section or write-off the payments through research programs and TMU school budgets.

Article 11 Instrument contact personnel:

Laboratory Animal Center technician: Wang Chueh-Yi TEL: 27361661  
#7153(office);#7264(laboratory).

Article 12 The regulations are implemented after the internal discussion and approval of the Office of Research and Development. Similar procedure is adopted for future revisions of the regulations.