UCSD Center for Functional MRI
Policies and Procedures for Using the 7T Scanner
(Last Updated: 07/31/23)

Investigators holding faculty (or equivalent) appointments at research institutions in the San Diego area may request access to the 7T magnetic resonance imaging system at the UCSD Center for Functional MRI (CFMRI) for their research studies. Investigators not employed by UCSD will require that their home institution establish a standard License and Equipment Use Agreement with UCSD in order to apply for access to scan on the 7T.

Summary of Key Steps
1. Prior to project submission, Investigators are encouraged to discuss their proposal with the Associate Director of High Field Animal MRI at the CFMRI: David Berry (dbberry@ucsd.edu).
2. Those interested in using the 7T system independently must complete the CFMRI safety training class and hands-on scanner operator training.
3. PIs who currently have projects on the 7T scanner can login to CFMRI CALPENDO and Create a New Project. *New PIs* - if you do not have access to the CFMRI CALPENDO system, please refer to the online User Guide and request an ID.
4. Obtain animal protocol approval from the UCSD IACUC (only required for imaging live animals).
5. UCSD projects require a chart string while non-UCSD projects need a PO prior to approval.
6. When the project is approved by the Science and Finance teams at CFMRI, a project code is assigned and the Investigator may schedule time through CFMRI CALPENDO.
7. Invoices are generated monthly based on scheduled time.
8. An S10 awarded to the center must be referenced as a funding mechanism for any paper that has used the 7T MRI after October 1, 2022. The following sentence and grant <u>must</u> be referenced, "This study was partially supported by the NIH grant S10-OD032343-01".

These steps are described in more detail below. The goal is to keep these procedures simple and straightforward, but they are subject to change when required. Suggestions are always welcome. For questions about these policies, and for inquiries about the status of a submitted proposal, please email cfmri@ucsd.edu

Project Submission
Current PIs – PIs who currently have projects on the 7T scanner can login to CFMRI CALPENDO and Create a New Project.

New PIs - if you do not have access to the CFMRI CALPENDO system, please refer to the online User Guide and request an ID. When you receive your login information you can access Calpendo and go to *Projects/Create Project* to submit a new project.

Project Review
Prior to project submission, Investigators are encouraged to discuss their proposal with the the Associate Director of High Field Animal MRI at the CFMR: David Berry dbberry@ucsd.edu. When the New Project is received by the CFMRI it will be considered by the Science and Finance teams and you will be notified if any additional information is required. Projects must have a current billing info (Project-Task-Fund) or PO, current designated Operator and IACUC approval (if required) before final approval. When the proposal is approved you will be notified that it is ready for bookings in Calpendo. See User Guide for more information.

<u>Saftey Training</u>
<u>In order to enter any magnet room at the CFMRI, individuals must pass the CFMRI safety training</u>

course. More information about the safety training course can be found here: CFMRI-Training.

IACUC Review

In addition to the review at the CFMRI, all studies using live animals must have appropriate UCSD IACUC approval. Proposals can be reviewed by the CFMRI before the UCSD IACUC approval is complete, but the IACUC approval must be on file at the CFMRI before a project code is assigned. A copy of the letter of approval from the appropriate UCSD review board must be attached to the project or e-mailed to cfmri@ucsd.edu. In most cases, Investigators with an existing IACUC protocol will only require an amendment to their existing protocol. Such an amendment will generally need to go to the next IACUC meeting and cannot be done as an administrative amendment.

Key information that must be added to the IACUC protocol is as follows

Section 35 | Building: Center for Functional MRI. Room #: 1036, 1031

Section 36 | For MRI studies, animals will be transferred in disposable ACP approved cages to the Center for Functional MRI. Disposable ACP cages will be placed in a hard opaque secondary transport container. Animals will be transported to rooms 1036 (animal prep room) and 1031 (MRI scanner room). Under anesthesia, animals will undergo a ## hour MRI scan. Transport of animals to the Center for Functional MRI allows for us to use a high field strength MRI machine to non invasively image animal tissue using custom developed MRI protocols.

Animal Transfer

It is the investigator's responsibility to complete the ACP animal transfer form and obtain approval from veterinary staff several days in advance of transfer between the CFMRI and the vivarium. ACP approval does **not** require the animal to be transferred onto a CFMRI IACUC protocol. In compliance with the UCSD IACUC regulations, no animals will stay at the CFMRI for more than 12 hours. No animals will be in the building at night unless they are being scanned in a night-time slot.

Animal Transportation

It is recommended that the Investigator transport their animals to CFMRI at the time of scanning. If animals are being delivered by animal transportation, the Investigator or relevant team members must be at the CFMRI to receive the animals. The same applies for pick up by animal transportation.

Access to 7T Magnet Room

Access to the 7T magnet room is limited to personnel who have received MRI Safety Certification from the Center without exception. A more detailed policy describing magnet room access is at http://cfmriweb.ucsd.edu/UserTools/7T/policies.html (choose the link to "Policies regarding magnet room access, operator status, and PI-related activities"). To learn how to obtain MRI Safety Certification from the Center, see http://cfmriweb.ucsd.edu/UserTools/7T/training.html.

Operator Certification and Training

To assist PIs with starting projects on the 7T system, the CFMRI provides an operator training program and staff consultation at the beginning of a new study. The goal of operator training is to train users to use the MRI console and ancillary equipment independently. The Center recommends that PIs designate an operator to be trained to carry out their study. In some limited cases, staff may be available for scanning by prior agreement.

Operator certification will be granted to those individuals who have successfully completed the training and have clearly demonstrated the ability to safely operate the scanner without supervision. Keeping the restrictions stated above in mind, the PI of an approved project can submit an operator training request form through http://cfmriweb.ucsd.edu/operator-training/. See http://cfmriweb.ucsd.edu/UserTools/7T/training.html for additional information about training.

Only Certified Operators are permitted to run the scanner, and the right to withhold or withdraw

certification is at the discretion of the CFMRI Director. Certification will expire if an Operator does not serve as the designated Operator for 4 months. After 4 months, he/she must arrange with the Center staff for re-certification. In addition, each Operator must pass the Safety Certification test each year. The designated Operator for each scan session is fully responsible for the enforcement of the safety policies and for the proper treatment of the equipment. Further details on Operator eligibility and responsibilities are provided at http://cfmriweb.ucsd.edu/UserTools/7T/policies.html (choose the link to "Policies regarding magnet room access, operator status, and PI-related activities").

Scanning during night/weekend hours may only be performed by highly experienced Certified Operators. Operators must obtain prior approval from David Berry (dbberry@ucsd.edu) to scan during night and weekend hours.

Scheduling
Once approvals are on file at the CFMRI and a Certified Operator has been identified, a project code is created in CFMRI CALPENDO under the PI's name. The PI or a member of the PIs Lab who has been associated with the project as an Operator, Trainee Operator or Research Coordinator can schedule approved resources in Calpendo as needed.

The Center **reserves the right** to make minor adjustments to the schedule to make the most effective use of available time. For example, if there are several 2 hour studies scheduled during the day that are spaced apart by 2 hour unscheduled time blocks, the Center may work with the Investigators to reduce the unscheduled time blocks in order to allow for an additional study to occur on that day. Center staff will coordinate any adjustments with the Investigators.

Billing
Billing is done in half-hour increments. Hourly rates are subject to change, and are currently as follows:

UCSD Recharge Rate $250 per hour or $332 per hour with a technician
Non-UCSD Invoice Rate $363 per hour or $482 per hour with a technician

The non-UCSD invoice rate includes a 45% differential fee to fund University resources. This 45% is normally recovered via indirect costs by UCSD researchers from their sponsored research grants. For non-UCSD users, the same fee must be recovered by the University.

7T Cancellation Policy
CFMRI CALPENDO must be used to reserve time for any activity that is performed on the scanner console or magnet. Time reserved using Calpendo will be billed (or penalized with pilot hour loss; see below)to the PI who books it whether or not the time is used, with these exceptions:

1. A reservation that is made and cancelled within two hours of the creation of the booking will not be billed. PI's can use this feature to temporarily hold time while coordinating with others.
2. If a PI cancels a reservation and another PI books the same slot, the PI who originally reserved will not be billed.
3. A slot that is cancelled more than 14 days before the scheduled time will not be billed to the PI who reserved it.
4. When Center staff move the time to "technical difficulty".

7T Pilot Hour Program (applicable only to UCSD-funded projects)
1. *Paid Hours:* Hours actually paid for. Each month the Paid Hours used by each project are tallied.
2. *Lost Hours:* Lost Hours are time slots that go unused but were previously reserved by a PI for more than 2 hours during the previous 14 days. Lost Hours are also tallied monthly by project.
3. *Pilot Hours*: Effective August 1, 2013 Pilot Hours will be calculated for each project at a rate of:

1 Pilot Hour awarded for each 2 Hours of Paid Scan time.

To calculate the number of *net* Pilot Hours, the Center will subtract the number of Lost Hours from the number of potential Pilot Hours (e.g. potential Pilot Hours – Lost Hours = net Pilot Hours). See Example below.

Paid Hours of Scanner time	Potential Pilot Hours (2:1)	Actual Lost Hours	Pilot Hours Awarded/Deducted
10	5	0	5
10	5	2	3
10	5	7	-2

4. *Reconciliation of accounts*: Periodically the Center will reconcile all accounts for a PI, removing Pilot Hours from their other accounts, if necessary, to offset deficits in other Pilot Hour accounts. If a PI accrues a negative Pilot Hour balance, then the Center reserves the right to invoice for scan time that was previously used and scheduled with Pilot Hours.

5. *Scheduling Pilot Hours.* When making a scan time booking in CFMRI CALPENDO the booker will have the option of using Pilot Hours for the scan. Details of the current Pilot Hour balance can be viewed under the "Pilot Hours Summary" section in Calpendo.

6. *6cm Gradient insert operations.* The CFMRI has a gradient insert that can be used with the 22mm inner diameter (Rapid Biomed: V-HQ-070-AAK V01**)** and 33mm inner diameter (Bruker: T12431**)** Tx/Rx coils. See https://cfmriweb.ucsd.edu/Howto/7T/RFCoils.html for coil details. If you would like to use to use the gradient insert for your experiment, please select the gradient insert option when reserving time *and* email David Berry (dbberry@ucsd.edu) to provide the date and time during which you would like to use the equipment. This equipment takes an additional 15 minutes to install and uninstall, thus time must be allotted for this action to occur. Time to install and uninstall the equipment will be reserved by the CFMRI and not the operator. However the operator must allow adequate time (72 hours) notice to facilitate this process.

Technical Problems

A "technical problem" includes basic scanner functions as well as functionality of the standard ancillary equipment (physio monitoring system, anesthesia equipment, etc.). Problems should be reported immediately through the *Problem Report* page of CFMRI CALPENDO. This will alert Center personnel of the problem, so it can be addressed efficiently. If the scanner is down due to technical issues, CFMRI staff will alert the 7T imaging community and provide status updates until service is restored.

Billing Adjustments for Technical Problems

If technical problems arise with the scanner, there will be no charge for lost time. CFMRI CALPENDO is also the billing database so it is important to report the technical problem within **72 hours** of the incident.

Billing will not be adjusted for:
1. Technical problems that have not been reported by the PI or Operator within 72 hours;
2. Time lost due to problems that are the responsibility of the PI or Operator (e.g., the PI's computer fails or the Operator uses the wrong pulse sequence parameters);
3. Minor system glitches that do not prevent completion of the scan session.

Please note that the Pilot Hours provided to each account (see 7T Pilot Hour Program above) are absorbed by the Center in an effort to help the PI deal with the various problems associated with getting good data, such as optimization of their techniques and minor system glitches. The hours used will be adjusted only if there is a major failure of the functionality of the 7T MRI system.

Pilot Studies

There are no "free" Pilot Hours available at the start of a new project. Instead, Pilot Hours are credited monthly in accordance with the policy described above. The 7T Pilot Hour Program is applicable only to UCSD-funded projects.

Material Transfer Policies
All projects are expected to follow IACUC approved policies with regards to the safe transfer of materials related to the experiment. In the event that these policies are not followed and Center personnel need to transport material after the completion of a study, the Center reserves the right to deduct Pilot Hours (nominally 2 hours per incident) from the associated project.

Annual Report
If live animals are used the IACUC approval for a project will need to be renewed each year and a current copy of the approval must be emailed to cfmri@ucsd.edu. At the time of renewal we also ask that each PI submit a brief report on the progress of the study. This should include the number of studies performed, results to date, and any problems encountered.

NIH Reporting
The upgrade to the Bruker Avance NEO system was supported by an S10 grant (S10-OD032343-01). As per NIH guidelines, *"Each publication, press release or other document that cites results from NIH grant-supported research must include an acknowledgment of NIH grant support […]". Per NIH-wide policies, any publication that reports data collected using an S10 instrument must be linked to the S10 award using MyNCBI (like it would be done for any research grant, for example an R01) or acknowledge the award in the body of the paper."* Thus please include the following in the acknowledgements and grants sections of any publication that reports data collected on this system, **"This study was partially supported by the NIH grant S10-OD032343-01"**