Temple University
Department of Chemistry
NMR Laboratory User Training Record

Purpose: This document will record your training in proper procedures for the Chemistry NMR Facility, and that you have adequate instruction in safety issues arising from the magnets in 001 Beury Hall. This is part of the comprehensive effort the Chemistry department makes to comply with University policies, Temple EHS inspections, and for providing to you a safe experience.

Procedure:After you are trained by Dr. DeBrosse, the facility director, you will be asked to initial, date and sign various parts of this record, agreeing that you have "Read and Understood" the various training aspects. A minimal amount of personal information, including name, phone, email and contact data will be requested.

Retention:Dr. DeBrosse will keep the signed record on file in the facility, and you may have a copy if you wish. These records will be updated as needed and purged when you no longer need access to the facility (e.g. graduating, etc.)

I. Training

All users will be trained by the facility director or his designee. *Students are not to "train" one another.* Training is concluded with signing the training record. Training will consist of:

1. Safety orientation.
2. Hands on operation of the Inova 300 NMR
3. Establishing a user account on the NMR Booking Calendar. User is informed by email of user ID and password for the calendar.
4. Creation of a personal data folder on the Inova 300.
5. Email note giving URL of the lab website, and discussion of what is to be found on the site.
6. Instruction on using the ftp data transfer procedures from the workstations to PCs in Beury Hall
7. Use of the NUTSlite software for offline processing of NMR data.
8. The lab website is found at http://astro.temple.edu/%7Edebrosse/
9. Using the time record log book.

Signature: I have received the training as listed above
(initial, date)_____

II. Laboratory Rules

Good Laboratory Practices for NMR Lab BE001

Because the NMR facilities in our department are valuable resources and are shared by

many users, the Chemistry Department requires users of its NMR instruments to adopt practices that help maintain the equipment and to use the facility in a safe and effective manner. The information below is provided to help accomplish these goals.

Lab BE001 has three superconducting NMR magnets located in it. These magnets project strong "stray" magnetic fields into adjacent space about their circumference, and above and below the cryostat vessels. These fields can affect certain electronic devices, persons with metallic implants and magnetic storage media.

More significantly, these fields will accelerate iron or other ferrometallic items toward the magnets. This is a potential hazard for the equipment and for persons in the path of such an item. Examples might include **gas cylinders, tools, fire extinguishers, loose paperclips, razorblades, staples** etc.

We can mitigate the magnet hazard by prudent practices.

- Persons with **metallic implants**, especially cardiac pacemakers, as well as orthopedic pins, plates, arterial clips or any other metal in their bodies must stay at least 10 feet from any of the magnets.

- **Metal objects** that you may need to bring into the lab must be kept at least 10 ft from the 500 MHz magnet and 6 feet from the 300 and 400 magnets. This includes items on your person, as well as spatulas, keyrings, etc.

- **Limit the contact** you have with the NMR magnet. Do not lean on the magnet while waiting for a spectrum. Avoid crowding in with a group of people close to the magnet. Avoid hitting the magnet with any object, or with your body. (Rowdiness, "horseplay" or similar behavior is dangerous and incompatible with magnets; it will not be tolerated and violators may be banned from the lab.)

- Leave your wallets, purses, credit cards, ID cards, wristwatches, keys etc. in a secure area outside the NMR lab or at the lab entrance. This caution applies especially to floppy disks, magnetic tapes, laptops Temple ID cards, and other data storage media**. Magnetic fields from NMR magnets can destroy data** on these.

- If you ever observe a rapid, unexpected venting of cold gas clouds from the ports on the upper part of a magnet, leave the room immediately. This would be a "quench" condition and could lead to inadequate oxygen levels in the lab. (This is not the normal cryogenics maintenance, carried out by Dr. DeBrosse.)

Clutter both of a general nature and especially chemical clutter is not compatible with a safe NMR facility.

- **Clean up** any mess you make. Broken glass is of particular concern. If you break an NMR sample in the instrument, you must contact Dr. DeBrosse at 1-

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- Put waste paper in the recycling bin. Discard gloves in the trash bin.
- **Clean any spills promptly** and with due regard for chemical hygiene.
- **Do not leave any unlabeled sample or solution in the NMR lab**. At minimum, your name, the solvent and the sample ID should be visible on a label. This is for the benefit and safety of others in the lab as well as good laboratory practice. Sample left without proper labels are likely to be disposed of, without notice.
- Remove your data output promptly from the lab printers.
- **Retrieve samples** left for, e.g. overnight runs as soon as possible.
- We cannot permit eating or drinking in the lab. This is both for your personal safety and that of others, and will help protect the equipment from spills, crumbs and grease. This is in line with the University Chemical Hygiene Plan.
- Safety glasses are required in all laboratories. Provide your own safety glasses that meet Temple standards and wear these in the NMR Lab.
- NMR tubes frequently transfer dirt to the inner surfaces of the probe. Minimize this by:
- Hand-washing before coming to the NMR lab, especially with respect to chemical residues. Use of disposable gloves is encouraged and these are provided.

Signature: "I have Read and Understood the NMR Lab Rules given above."

(initial, date)_____

III. Access to the Lab.

Access to the NMR lab is controlled by a punch key lock. The code for entering the lab is: "5-2-4" pressed in sequence. Trained users are allowed to enter. Others are not, except at the director's discretion.

The prime purpose of this restriction is to protect maintenance and other workers who might enter the room with tools, generate metal turnings, etc. Accordingly, users of the facility are expressly not permitted to act on their own to admit untrained people who might knock on the door. You are directed to refer any people needing access to Dr. DeBrosse.

Signature: "I have Read and Understood the Access Notice, given above."

(initial, date)_____

IV. Data Management.

NMR data are kept on instrument disk drives and servers in the building.

You will be instructed as to the proper files to direct data into.

Data on the servers and workstations will be archived to CD-ROM and stored at intervals as needed for good disk management. CD-ROM storage is archived by individual research director.

Data that you copy onto lab PCs or laptops, memory sticks, etc. is your own responsibility, and may best be described as property of your advisor, so you probably should seek the advice of your professor as to electronic record retention, etc.

Signature: "I have Read and Understood the Data Management Notice, given above."

(initial, date)_____

V. NMR Sample Handling

You will be instructed as to how to put an NMR tube into the "spinner collar", a plastic holder that permits tubes to spin. NMR tubes are delicate, so do not force a reluctant tube into a collar. You can easily injure your hand by a broken tube.

- Placement of tubes in the collars is accomplished via a measuring jig, called a "depth gauge". These are large white cylinders with a hole in the center. Each magnet has a custom gauge. Use only the gauge marked for the correct magnet. Push the sample tube into its collar, until the depth gauge bottoms out.

- This will ensure that the liquid part of the sample is centered in the coil, and prevent the tubes from crashing into the bottom of the probe (leading to expensive damage to the delicate insert glassware in the probe, or to loss of your sample, and a tedious cleaning process.

- Clean the outside of the sample tube with a kimwipe before placing it in the spinner collar. Minimize handling of the spinner collar. Keep the bottom (beveled) surface of the spinner clean.

- It will speed the action of the robotic shimming adjustments if solution volumes are normally prepared to a uniform height. To achieve this, We strongly suggest that 0.8 mL (800 uL) of deuterated solvent be the norm.

Cleaning the outside of the sample tube with a kimwipe before placing it in the spinner collar. Minimize handling of the spinner collar. Keep the bottom (beveled) surface of the spinner clean.

- Holding the sample after positioning in the collar (use depth gauge) gently but firmly by the upper part of the tube.

- It will speed the action of the robotic shimming adjustments if solution volumes are normally prepared to a uniform height. To achieve this, we strongly suggest that 0.8 mL (800 μL) of deuterated solvent be the norm.

Signature: "I have Read and Understood the Sample Handling Information, given above."

(inital, date)_____

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I have read the guidelines and rules above, and agree to follow them.

Sign your Name_____ Print your Name_____
Date Signed _____

Advisor's Name (print)_____ Your email address_____

You work in Lab# _____ Your phone number is_____

Short form of your name (used for data folders) Print neatly_____
Your initials (as you might use on a label) _____