

CORE ChemLab - Usage Policy

The San Jose BioCenter is pleased to provide the Bay Area with an Analytics Laboratory, a research facility within the San Jose BioCenter. The goal of this facility is to provide emerging technology companies “the big company advantage”; to provide research instrumentation and equipment that emerging technology companies do not have the capital to buy today. The Chemistry Analytics Lab features a NMR, LC/MS and a HPLC.

The following outlines the general parameters for access to the instruments and safe lab practices for the CORE ChemLab.

Time Allocation:

1. All users must read and sign the SOP before using any instrument in this laboratory.
2. All users must receive training from BioCenter staff. See training schedule for details.
3. Instrument time may be reserved in ½ hour increments. Please use the SJ BioCenter GRID for requesting reservations.
4. Requests are reviewed on a first-in first-out basis.
5. Blocks of time will be billed as per reservation regardless of actual use unless 48 hour advance written notice is received. All cancellations are subject to a 1 hour charge.
6. All time requests and cancellations must be made to Dr. Richard M. Fronko [richard@sjbiocenter.com].
7. Once trained and certified by BioCenter staff, users will be given access to the room with a card key. Each user is responsible for accurately documenting in the “Instrument Log Book” the actual amount of time spent and the number and types of samples performed on the instrument. A separate **username and a password** will be set up for each instrument requesting to use .
8. All unassisted users will have a \$500 security deposit hold on their credit card. Security deposit and payment can also be made by check or cash. Credit card usage will also be billed a 5% bank processing fee.
9. Billing will occur on a monthly basis. Payment terms are due upon receipt.
10. All users of the CORE ChemLab must sign and accept the terms of the User and Safety Agreement as outlined below.
11. Agreement terms are subject to change without notice.

Lab Use and Safety Agreement

Use of the San Jose BioCenter’s CORE ChemLab is a privilege and not a right. All users must follow good laboratory practices when working in these or any labs. In general, use the following to maintain a safe and productive lab.

1. Plan experiments ahead of the scheduled instrument time, when possible.
2. Ensure you have all proper materials and equipment to run the planned experiments.
3. Ensure you have sufficient time to perform all planned experiments.

4. When the experiments are completed, clean up completely the instrument and work area. Leave the lab in as good a condition as you found it.
5. Remember to sign the log book.
6. The information below details use and safety precautions to follow when working near high magnetic fields. Please read and follow these instructions carefully.

High Magnetic fields

High-field NMR instruments use large superconducting magnets to generate magnetic fields. Briefly, the wires making up the electromagnet inside the superconducting magnet are cooled to liquid helium temperature (4 K). At this low temperature the electrical resistance of the wires approaches zero, and the magnet once charged can run continuously and homogeneously.

REMEMBER: The Magnet is Always On

NMR magnets have very strong, static magnetic fields. Magnet strength is normally described in terms of Gauss or Tesla units. (1 T = 10,000 G)

Earth's magnetic field	0.006 Tesla (0.6 Gauss, at equator)
Refrigerator magnet	0.01 -0.015 Tesla (100 - 150 Gauss)
High field NMR magnet	
200 MHz	4.7 Tesla (47,000 G)
300 MHz	7.0 Tesla (70,000 G)
400 MHz	9.4 Tesla (94,000 G)

To put this in perspective, NMR magnets are stronger than the electromagnets used to move old cars around at the junkyard.

The strengths listed above are the strength of the magnet at its center (inside the bore where the sample is placed). The magnet field strength falls off as you move away from the magnet center. The rate at which it decreases depends on the physical size and geometry of the magnet. For example, the wider the magnet bore, the further out the magnetic field lines will extend and the stronger the magnetic field that will be felt by nearby magnetic objects.

Human bodies are not magnetic, so we can't directly feel the strength of the magnetic field. One analogy is "You are walking on the rim of the Grand Canyon in a very heavy fog at night. You know the abyss is on your right, but you can't see quite where it is. How careful would you be?" (from Jim Frye, Varian).

Video demonstrations of the strength of high-field magnets are shown on the websites:

<http://mind.ucdavis.edu/content/MRISafety.aspx> and <http://www.radiology.uiowa.edu/mri/MRISafety-300K.rm>

Use and Safety Agreement cont.

For most purposes, you only need to know the location where the magnetic field strength drops to 5 Gauss.

Signs, fencing and/or marks on the floor indicate the location of the 5 Gauss field line around each NMR magnet. The magnetic field inside the 5 Gauss region can cause damage to medical implants and pacemakers. **DO NOT ENTER THE 5 GAUSS REGION IF YOU HAVE ANY MEDICAL IMPLANTS WITHOUT APPROVAL OF YOUR PHYSICIAN.**

The location of the 10 Gauss region is located slightly inside the 5 Gauss region. At this field strength, watches, credit cards, and other personal items can be damaged. **MORE IMPORTANTLY, NO TOOLS OR METALLIC OBJECTS SHOULD BE TAKEN CLOSER TO THE MAGNET THAN THIS POINT.**

Metal objects can be attracted to the magnet causing flying metal projectiles. Ferromagnetic objects can reach speed approaching 45 mph entering the bore of the magnet. These objects can cause personal injury or death if there is anyone between them and the center of the magnet. If the objects strike the magnet they can distort the magnet's wires or internal dewars and/or become lodged inside the magnet bore. This can cause the magnet to quench.

A quench is when all the liquid helium inside the magnet suddenly boils off. This causes the magnet to lose its magnetic field and can damage the superconducting coils inside. A quench is caused when the magnet is damaged or the equilibrium inside the magnet is disturbed.

A QUENCH IS VERY DANGEROUS SINCE THE RAPIDLY EXPANDING GASES WILL DISPLACE ALL THE AIR (OXYGEN) IN THE ROOM. IF WHITE VAPOR IS RAPIDLY EXHAUSTING FROM THE TOWERS ON THE MAGNET, THIS MEANS THE MAGNET IS QUENCHING - LEAVE THE AREA IMMEDIATELY AND NOTIFY EVERYONE NEARBY OF THE DANGER.

No metal objects are to be brought close to the magnet. Keep all tools and equipment outside the 5 Gauss area. See the instrument manager before you use any non-routine equipment with any NMR instrument.

ASSUME ALL METAL OBJECTS ARE FERROMAGNETIC AND WILL BE ATTRACTED TO THE MAGNET UNLESS VERIFIED OTHERWISE BY THE INSTRUMENT MANAGER.

Attractive force increases as the distance from the center of the magnet is decreased. The increase is inversely proportional and depends on the mass, shape, and composition of the object. In generally, the larger the metal object, the further away from the magnet, it should be kept.

However, small metal objects, such as paper clips and staples, can also cause problems. If they make it into the bore of the magnetic, they can cause problems with shimming and possibly damage the probe.

NO PAPER CLIPS OR OTHER SMALL METALLIC OBJECTS SHOULD BE BROUGHT INTO THE LAB

Cryogenic gases

The liquid helium and liquid nitrogen used in the NMR magnets are extremely cold. Helium liquefies at 4 K (-269 °C), and nitrogen liquefies at 77 K.

Be careful and stay out of the NMR room when the magnet is being filled with cryogenic gases. Prolonged contact with liquid nitrogen or even brief contact with liquid helium will cause frostbite.

If the magnet quenches, the liquid helium and nitrogen inside the magnet may quickly boil off. Due to their large expansion ratios (nitrogen 695:1, helium 760:1), these gases can quickly displace all the oxygen in the NMR room and cause asphyxiation.

Other hazards

The type of NMR tube needed is 5mm od, 8 in long. Clients must provide their own tubes and supplies.

In the event, the robot is not being utilized - NMR tubes have thin walls and are easily broken. Be careful when inserting tube into the spinner turbine. If you break a tube, clean up any broken glass and chemicals. Dirty sample tubes and dirty spinners can contaminate or damage the probe. Use a Kimwipe to wipe off the sample tube and the spinner.

Carefully align the sample tube using the depth gauges before inserting the tube into the magnet. A misaligned tube can break inside the magnet bore and damage the NMR probe. Also make sure the sample is floating on the lift air before you let go of it.

Inserting sample often requires using a stool or ladder. Be careful not to lose your balance and fall.

Indemnification

Users shall indemnify, defend and hold harmless the San Jose BioCenter, its members, their officers, guarantors, directors, employees and agents, any entity having a security interest in the Space or the Premises, and its and their employees and agents (collectively, "Indemnitees") from and against any claims, damages, costs, expenses, (including an amount equal to reasonable attorneys' fees), losses, liabilities or obligations arising out of or in any way connected with this Usage Agreement including, without limitation, claims, damages, costs, expenses, or liabilities for loss or damage to any property, or for death or injury to any person or persons arising out of Licensee's use of the Space.

As insurance is available to protect it, and as long as such waiver does not violate public policy, User(s) hereby waives all claims against the San Jose BioCenter and Indemnitees for damage to any property or injury to or death of any person in, upon or about the Space or the Premises arising at any time and from any cause.

INSURANCE REQUIREMENTS

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Contractor, his agents, representatives, employees or subcontractors.

Worker's Compensation and Employers' Liability:

- Workers' Compensation insurance as required by the State of California
- Employers' liability insurance for injury or death \$1,000,000 each accident.

Commercial General Liability:

1. General Liability:
Including operations, products and completed operations as applicable, \$1,000,000 per occurrence/\$2,000,000 policy aggregate for bodily injury, personal injury and property damage.
2. Automobile Insurance: \$1,000,000 per accident for bodily injury and property damage.
Coverage shall: By "additional Insured" endorsement add as insured **the State of California, the California State University, the Trustees of the California State University, San Jose State University, the San Jose State Research Foundation and the officers, employees, volunteers and agents of each of them (all of which are hereinafter referred to as "State")** with respect to liability arising out of or connected with the work performed by or for the contractor.

The certificate of insurance shall provide:

- (a) that the insurer will not cancel the policy holder's coverage without thirty (30) days prior notice to the campus;
- (b) **that the State of California, the California State University, the Trustees of the California State University, San Jose State University, the San Jose State Research Foundation and the officers, employees, volunteers and agents of each of them (all of which are hereinafter referred to as "State") with respect to liability arising out of or connected with the work performed by or for the contractor** are included as additionally insured entities, but only insofar as the operations under the contract are concerned;
- (c) That **State of California, the California State University, the Trustees of the California State University, San Jose State University, the San Jose State Research Foundation and the officers, employees, volunteers and agents of each of them (all of which are hereinafter referred to as "State")** shall not be responsible for any premiums or assessments on the policy.

Information should be sent to

San Jose State University Research Foundation
Attention: Norma Rossiter
210 North 4th Street
San Jose, CA 95113

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I understand that I am responsible for working cautiously and carefully around the NMR instruments for my own personal safety, the safety of others, and the safety of the equipment.

I will immediately notify others working near the NMR instruments of any dangerous situation, and I will contact the San Jose BioCenter staff as soon as possible.

I will enter the 5 Gauss region of the magnetic field only when absolutely necessary and only for instrument operations for which I have been trained (e.g. sample changes, probe tuning).

I will not bring any items, besides my sample tube, into the 5 Gauss region of the magnet without the specific permission of the San Jose BioCenter.

I will replace any fencing moved immediately when finished using the instrument.

I will follow all training and usage procedures regarding the NMR instruments, and I will request additional training from the San Jose BioCenter whenever I have questions or concerns.

I will present the instrument manager with a written experimental plan for approval prior to performing any experiments that require non-routine equipment or pulse sequences to be used.

I understand that it is my responsibility to follow these safety rules and that any damage to the instrument caused by failing to do so will be my fiscal responsibility.

Failure to follow these rules will result in immediate suspension of ChemLab access privileges, which will only be restored after discussion with the San Jose BioCenter.

Terms and conditions set forth in this Agreement are subject to change with or without notice.

I have read the San Jose BioCenter's CORE ChemLab Use and Safety Agreement. I understand the contents, and agree to comply with the Agreement.

User and Safety Agreement cont.

Signature: _____

Name: _____

Title: _____

Date: _____