

Safety rules in the shared NMR lab

Please contact **Paul Xia** (7-3548) or **Ken MacFarlane** (2-2752), or **Maria Ezhova** (2-6787) if you have any questions.

Magnetic Field Hazards:

The magnetic field present in the NMR lab is comprised of the very strong static magnetic field generated by the magnet, and the rapidly time varying magnetic field generated by the gradient coil. Magnetic objects in proximity to the magnet may be uncontrollably pulled towards the magnet by the attractive mechanic force. The closer to the magnet, the larger the force. The larger the mass, the larger the force. Small pieces of metallic tools may become flying objects of high speed when close to the magnet. Keys, wrenches, scissors, screwdrivers have been all documented to be safety hazards. Large equipment (gas cylinders, trolley...) could cause bodies or limbs to become trapped between the equipment and the magnet.

Medical Electronic implants:

The operation of medical implants may be affected by both the static and the changing fields. The magnetic field can exert a torque on the implants that may cause injuries or death. Additionally, an electric current can be induced on the medical implants when close to a rapidly changing field. This induced small current (Eddy current) may cause pace makers to incorrectly start pacing or even prevent pacing when it is actually needed. Induced currents can also cause local heating resulting in burns in local body areas. If you carry medical implants, you should not be in the vicinity of the NMR spectrometers.

Rules:

- You should not bring **any metallic object** close to the magnet. Please be aware of the gas cylinders in the NMR/SIF labs as those are heavy magnetic objects.
- Please keep your bankcards, smart phones, mechanic watches, or any device that may be damaged by the presence of the strong magnetic field in the designated area of the NMR lab. If you are not sure what you can bring to the magnet area, please ask the NMR staff.
- There hasn't been any conclusive evidence that suggests the stray magnetic field or RF in the NMR lab can hurt fetus. However pregnant women are discouraged to go under the magnet to perform manual tuning/matching.
- For variable low temperature experiments, you must only use the non-magnetic liquid nitrogen dewars that are available in the NMR lab as gas supply. You must only use the wood dolly available in the NMR to transport the dewars. Since the castors of the dolly are metal objects, they should be left outside the 5 gauss line of the magnet.
- No food and drink are allowed in the NMR lab.
- Please do not bring any chemicals other than your own NMR samples to the NMR room. The NMR lab is not equipped for wet chemistry. Sample preparations in the NMR lab is discouraged.
- Please do not wear gloves or lab coats in the NMR lab.
- It is your responsibility to report any accident to the NMR technical personnel immediately.

What to do when magnet quenches:

If you ever observe white fume coming out of the top of any of the NMR magnets in the NMR lab, please immediately stop what you are doing and exit the lab quickly and calmly. Please do not panic. The danger is the released helium gas can quickly replace the air in the NMR room, and you may not have enough oxygen to breathe. Please leave the lab calmly, leave both of the lab doors widely open, and call campus security immediately if it happens during off working hours.