NMR Facilities in Chemistry

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A guide to the new instruments

http://www.sussex.ac.uk/Users/ijd22/nmr_service/

Purpose

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The purpose of these slides is to introduce the new NMR facilities here in the Chemistry Department and outline some rules and guidelines for their use.

The operation of these instruments is quite different from the old machines - new software to learn!

Access to the instruments will be to trained users only

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Instruments

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- 3 new state-of-the-art NMR spectrometers
- Virtually any liquid-state experiment possible

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VNMR400

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400 MHz with an AutoX DB probe

^{1}H-^{19}F / ^{31}P-^{15}N

- This instrument is ideal for direct observation of heteronuclei
- It is also capable of ^{19}F detection
- VT operation is also possible
- Operated in “hands-on” mode
- Works with J-Young tubes
- Similar role to nmr300b

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VNMR500

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500 MHz with an AutoX ID probe
$^{1}H\{^{31}P\text{-}^{15}N\}$

- SMS-50 autosampler
- This is the main machine for ^{1}H and indirect experiments (e.g. HSQC and HMBC)
- Operated in “walkup” mode
- Will work with J-Young tubes
- Similar role to nmr300a

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VNMR600

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600 MHz with AutoX DB and Penta probes

Ideal for both heteronuclear NMR and more biological samples

This is a research instrument, access will be by scientific need, supported by data from the 400 and 500

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Choosing the appropriate machine

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Nucleus / Experiment	Machine
^{1}H, COSY, TOCSY, NOESY, ROESY, ^{13}C-HSQC, ^{13}C-HMBC (i.e. typical organic structure determination expts.)	VNMR500
^{15}N-HSQC, ^{15}N-HMBC, X-HSQC, X-HMBC	VNMR400
^{19}F and ^{19}F-X correlations expts. e.g. ^{19}F-^{13}C HSQC!	VNMR400
Direct observation of ^{31}P, ^{13}C, ^{15}N, ^{195}Pt, ^{119}Sn, ^{207}Pb etc.	VNMR400
Proteins - come and see me to discuss options	VNMR600

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Training

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All users **must** receive training *before* using each instrument

- Even if you've used Varian instruments before!
- There are significant differences to the old systems!
- You will need to be signed off before you use the systems

Second-hand training is **not** permitted

- i.e. you cannot be trained by other members of your group!

Separate training will be required for the 400 and 500

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Training

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Courses will be run as soon as the instruments are available for use

Followed by courses at the beginning of the academic year for new students / post-docs

At other times as needed - if you need to use an instrument you are not trained for come and see me to arrange a time

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Rules of the NMR Lab

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1. Samples must be removed from the SMS once expts are complete
2. Samples older than 7 days which are left in the NMR lab will be thrown away! — You have been warned!
3. Users must supply their own tubes and solvents
4. Spinner turbines **must not** be removed from the NMR lab
5. Do not attempt to fix problems with the spectrometers above your competence level — ***if in doubt, don't***
6. *Always* report any and all issues / problems / suggestions to me

Failure to comply with these rules may hinder your access to the NMR facilities!

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Contact me

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Or find me in the NMR lab!

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