NMR NEWS

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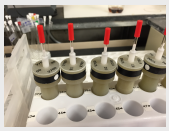
ENC Update

Bruker News! The Experimental NMR Conference (April 19-24) this year held some surprises. See pg. 2 for details.

Reminder about Samples



With robotic sample handling now on 3 instruments please don't forget to label your important samples (*e.g.* on the cap) so that if the tape label does not get re-attached properly you can still find your sample. **For completed samples, don't forget to retrieve them when done.**

NEW - Metabolomics

We are now running biological NMR metabolomics on the v700. See pg. 3 for details.

Training Requirements

We have begun checking on up-to-date *WHMIS* training. We are also strongly recommending that all NMR users have the online *Laboratory-Safety* and *Chemical-Safety* training courses. see pg. 3

Robotic Sample Handling

With strong support from the department and Professors Broadhurst, Bundle, Fedorak, Hall, Lowary, Vederas, and West we have been able to acquire the very last Agilent 7620 sample handling robot. This instrument was installed in late January and testing completed in February. Mark has adapted the VNMRJ software to conform with the rest of the NMR facility and therefore the user experience will be almost identical to the other instruments. The priority will still emphasize large/challenging molecules, and any spare time will be available to commercial users. Check the online schedule for availability.

Please see the NMR staff for specifics regarding use of the v700 robotic sample handling.

ENC Update

Bruker News: Remember that Varian Inc. was one of the two original NMR companies, and sold in 2010 to Agilent. The Experimental NMR Conference (ENC) this year was quite a bit different with the withdrawal of Agilent from the NMR market in October of 2014. Bruker naturally held a much stronger presence this year through the entire conference as the largest sponsor. The pre-ENC Bruker User's meeting on the Sunday was understandably packed. However when the President of Bruker Inc. began the meeting to "address the elephant" in the room we all thought he would be announcing obvious price increases. This was not the case. He (and many others) spent the first few hours strongly defending and reinforcing the idea that **Bruker "despite business pressures, would not be leaving the NMR market"**. This was surprising since Agilent's departure leaves Bruker with a virtual monopoly. The only other much smaller manufacturer of NMR spectrometers is JEOL Inc. of Japan along with JASTEC a Japanese steel who specialize in superconducting coil production. The announcement of price increases came much later, but the market pressure was the important issue.

While Bruker's announcement was surprising, the market pressures that pushed Agilent to leave, are also still present for Bruker. The NMR market is not growing, or at least not growing fast enough. Stock holders are constantly pushing corporations to abandon areas that are not meeting growth expectations and the associated profit. These expectations are dramatically effected by the massive infrastructure stimulus spending in the US from 2008-2010. The stimulus spending resulted in a large number of NMR purchases with the logical subsequent drop in sales the following years as the stimulus finished the cycle. Essentially everyone who could buy an NMR did so and there wasn't funding to keep up the purchases. The sales drop after 2010 is cited as a reason to leave the market as the longer term sales trend does not appear be bouncing back.

Bruker spent the entire morning assuring the crowd by detailing how they were dedicated to research and development (substantial budget expenditures), presented up-and-coming new products, new magnets, and where their intentions of future equipment would be headed. Despite the reassurance, a common impression among attendees was that if Bruker's engineering roots are overwhelmed by their business influences (*i.e.* "young MBA's in suits") it is quite possible we might be back to the 50's or 60's making our own NMR consoles and probes.

On the "keeping things working" front, an evening session at the conference was dedicated to all the Varian/Agilent NMR facilities combining their knowledge and experiences regarding 3rd party companies now offering service and support for Varian/Agilent instrumentation. The combined resources presented gave me quite a bit of comfort that we will be able to maintain our current level of support to the departmental users for quite sometime.

Anyone needing further details or with questions should contact Ryan (E4-17 or 2-9950).

Metabolomics and v700 Robotics Usage

The new Agilent 7620 sample handing robot means that multiple over night and/or weekend experiments can be queued up without users having to be present to exchange samples. Notifications and status updates to users will be handled identically to the other systems (*i.e.* m400 and u500 spectrometers) via email. Special thanks to Mark for setting up everything with consistent user interfaces.

This improved capability opens up a substantial amount of inexpensive new spectrometer time. One of the potential users for this capacity is the high throughput field of metabolomics. NMR is one of two major techniques (the other being mass spectrometry) used to determine the chemical metabolic content of various samples. These samples are typically bio-fluids and in humans the most commonly utilized samples are urea and plasma. The ease of collection is an obvious advantage hence the strong interest as opposed to more difficult prospects that have been published (like cerebral spinal or ocular fluid).

Metabolomics requires exceedingly stable spectrometers and environments and a substantial amount of spectrometer access to run dozens, hundreds, or even thousands of samples in a project. For example the proposed Hepatitis studies are considering hundreds of thousands of human samples to establish reliable baselines.

For chemistry users, the impact will be negligible with metabolomics users preferring overnight runs a few times a month. We will make every effort to inform researchers of reserved time for metabolomics and/or long biomolecular NMR experiments, so please check the NMR schedule page for availability and planning of longer experiments.

Training Requirement Changes

The NMR facility is checking to see that researchers and students have their up-to-date WHMIS training as per departmental requirements. We are now also strongly recommending that anyone handling samples for NMR analysis also have completed the UofA Environmental Health and Safety (EHS) Chemical, and Laboratory online training courses. These courses are available on the EHS website (http://www.ehs.ualberta.ca) on the title page (see inset). Both courses take an hour or two and have quizzes at the end with a limited number of trials. Safety inspectors will begin checking for these in the laboratory documentation so we're encouraging researchers to get a jump on the courses. Anyone with questions let Ryan know.