

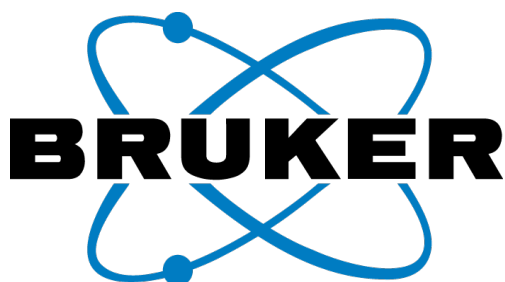
NMR Validation

No Need to PANIC

Quarterly Newsletter



We would like to say a quick **thank you** to our wonderful sponsors!



Now Accepting Abstract and Poster Submissions for the 6th Annual PANIC Conference!

Abstract Submission Closes October 16, 2017

Save the Date! **PANIC**
March 4 to 8, 2018

The Practical Applications of NMR in Industry Conference, PANIC 2018, returns to the San Diego Marriott La Jolla.

Abstract Submission www.panicnmr.com/call-for-papers	User Group Meetings Sunday, March 4, 2018
Meeting Registration www.xpressreg.net/eReg/?Show-Code=PAN10318	The Validation Workshop Thursday, March 8, 2018. www.validnmr.com/validnmr/index.html
Exhibitor and Sponsorship www.panicnmr.com/sponsor-exhibitor	

On behalf of the PANIC Organizing Committee, we invite you to be part of our PANIC 2018 program - and we look forward to seeing you in La Jolla, California!

The idea of ValidNMR was formed at PANIC, and the two organizations have been closely linked from the very beginning. The members of the ValidNMR group meet once every year, at PANIC. This year, the meeting will take place March 4-8, 2018, in sunny La Jolla, California! We are very excited to be returning to the San Diego Marriott La Jolla, where the 3rd Annual PANIC Conference was held in February 2015. The organizers are planning an exciting and dynamic program, so please plan to join us in March 2018!

Mark your calendars for the Validation Workshop at PANIC on March 8th!

Please contact us at admin@validnmr.com if you'd like to give a presentation at the workshop.

A Summary of the 2017 NMR Validation Workshop

by Kaylen Obray and Kim Colson

On February 24, 2017, approximately 50 people convened at the Validation Workshop to discuss the NMR Validation Wiki platform, recapped other events in the NMR community over the prior year, and learned from various flash presentations.

The Validation Workshop takes place following the PANIC Conference each year. This year, we were very excited to have a turnout of over 50 people, which represents an increase from the previous year. We began the day with an introduction from both Kim Colson (Bruker BioSpin) and Torsten Schönberger (Bundeskriminalamt). The group reaffirmed the goals of the forum, including:

- Identify a network of NMR people concerned with validation that can ultimately assist each other through the validation process;
- Harmonize the terminology and a standard approach for NMR validations;
- Position the guidelines produced by consensus of the NMR community so that accreditation agencies can use this process.

An summary of last years' Workshop, that identified issues in the validation community with solutions and actions, gave the attendees a quick start to the day. Attendees also benefited from learning the highlights of other meetings including the validation workshop at SMASH (June 2016) and the qNMR meeting held at Spectral Service in Cologne, Germany (October 2016). To further enhance progress of this community, our Validation Fellow, Kaylen Obray, (Colorado State University), presented the group's new website, ValidNMR, and newsletter, which aim to keep the community informed throughout the year. Kaylen was the first recipient of the Bruker Fellowship for Excellence in NMR Validation, presented by PANIC annually.

Informative presentations on qNMR were given by Bernd Diehl (Spectral Service) and Sitaram Bhavaraju (US Pharmacopeial Convention) and on multivariate NMR methods by Yulia Monakhova (Spectral Service). One of the most exciting and dynamic parts of our workshop was the collection of flash presentations ranging from qNMR, chemometrics, calibration standards and interlaboratory comparisons, presented by Markus Obkircher (Millipore Sigma), Toru Miura (Wako), Vito Gallo (Innovative Solutions), Elina Zailer (Spectral Service). The flash presentations, as well as other presentations, can be found on our website at <http://www.validnmr.com/validnmr/workshop.html>.

The most accomplishing feat of the Validation Workshop was introduced by Claudia Boot (Colorado State University) and Torsten Schönberger (Bundeskriminalamt) with the start of development of NMRValidationWiki pages that aim to serve this community with up-to-date information on current practices in NMR Validation. We broke into teams to address the most important categories that include: Quantitative NMR, Qualitative NMR, Protocols, Nomenclature, Education, Interlaboratory Comparisons, Chemometrics, and Reference Material and Data. Each category now has a chairperson and a team for moving forward in constructing the NMR Validation Wiki!

See page 4 for more information on the Wiki, which can be accessed at <http://www.validnmr.com/w/>.

PANIC 2017 Validation Workshop

Take a look at some photos captured during the NMR Validation Workshop!



The Sonesta resort in beautiful Hilton Head Island, South Carolina.



During the workshop, attendees viewed numerous flash presentations over a variety of different topics.



The participants of the 2017 NMR Validation Workshop!

Mestrelab Research

A New Partner in ValidNMR Efforts

By Leandro Gil-Silva & Mike Bernstein

Mestrelab Research is proud to be associated with, and support, ValidNMR as a sponsor. We believe in the coalition's effort to raise **awareness, credibility, and authority** of NMR analytical methods. This will be a positive force to make qNMR better understood, correctly used, and a first-choice method for quantitation and purity determination. ValidNMR and the associated Wiki will be a step forward in increasing understanding in the broader analytical community, and lowering the threshold to the use of qNMR.

NMR is a proven, and incredibly powerful, orthogonal analytical tool. And yet, outside of its community of users, analysts often have little clear idea of its **implementation and capability**. Whether it is for quantitative analysis, metabolomics research, or simply verifying the 3D structure of a compound, NMR experts frequently find it challenging to convince non-experts of the validity of their conclusions. MRI, which works on the same physical principles as NMR, is already well established in popular culture and its analytical methods are rarely brought to question. The common perception is that high-resolution NMR is expensive and tricky to implement; **ValidNMR** will go a long way to correcting such misapprehensions.

By way of open-source education, standardization of methodologies, and community building we intend for ValidNMR to give high-resolution NMR the same level of authority as that of other analytical methods.

Interested and want to know more about Mestrelab Research??



Mestrelab Research

Feel free to contact both Leandro and Mike!

Leandro Gil-Silva <leandro@mestrelab.com>
Mike Bernstein <mike@mestrelab.com>

NMR Validation Wiki

We've started our Wiki! Visit and add your contribution to a valuable NMR resource!

by Kaylen Obray and Kristie M. Adams

In the beginning stages of the NMR Validation Fellowship, the main focus was the preparation of the Wiki site. An increased awareness for NMR validation within the analytical community is needed to assist the transition from chromatography systems to NMR in GxP environments. The terminology is different, the practices may not be directly transferable, and most importantly, to increase the use and importance of NMR validation within this community, there needs to be a place where one can find definitions, analyses, recent practices, and much more.

After we completed the website foundation, and successfully completed the most recent workshop, the Wiki site has been a main focus. Information was taken from the Validation Workshop and used to populate the portal pages of our Wiki. Three portal areas are now available for public view and contributions. The [Chemometrics](#), [qNMR](#) and [Nomenclature](#) portals provide a location for definitions, current accepted practices, references, etc. Other portal areas ([Education](#), [Reference Material and Data](#), [Qualitative NMR](#), [Interlaboratory Comparisons](#), and [Protocols](#)) are underway for an initial release soon. Each portal will provide an outline to be populated by the greater NMR community. Share your knowledge and help others with the NMR validation process!

Need a Wiki account? [Click here.](#)

Wiki Portals and Contact Information

Chemometrics

[Kim Colson](#) <kim.colson@bruker.com>

[Yulia Monakhova](#) <monakhova@spectralservice.de>

Education

[Andrew Lewis](#) <arl@sfu.ca>

Interlaboratory Comparisons (ILC)

[Vito Gallo](#) <vito.gallo@poliba.it>

Nomenclature

[John Warren](#) <John.warren@lgcgroup.com>

Reference Material and Data

[Michael Maiwald](#) <michael.maiwald@bam.de>

[Kevin Millis](#) <KMillis@isotope.com>

Quantitative NMR

[Elina Zailer](#) <zailer@spectralservice.de>

Qualitative NMR

[Jim DeFelippis](#) <jim@panicco.org>

Protocols

[Carlos Amezcua](#) <amez2dal@yahoo.com>

Meet our *NEWEST* core group members!

To broaden our horizons we expanded our core team to include members from both academic and industrial backgrounds. Your feedback is important to us.

Listed below is the NMR Validation core group, with the newest members highlighted in green.

Kristie M. Adams
Claudia Boot
Kimberly L. Colson
[Andrew Lewis](#)

[Michael Maiwald](#)
Kaylen Obray
Torsten Schönberger
[Dan Sorensen](#)

Bruker Fellowship for Excellence in NMR Validation presented by PANIC

Application Deadline: August 31, 2017

The mission of the NMR Validation Fellow is to provide education and awareness in NMR Validation through fostering communication and progress in the community.

Requirements:

Applicants must have:

- A working knowledge of website administration and design, maintenance and support.
- An understanding of the various social media platforms, and how to use them for disseminating appropriate information.
- Excellent written and spoken communication skills.
- Well-developed organizational skills and ability to multi-task.

Applicants with experience using Adobe programs (e.g., Muse, Dreamweaver, InDesign, Photoshop, etc) would be preferred.

Responsibilities:

Web Presence

- Maintain www.validnmr.com
- Maintain the NMR Validation Wiki-based website and serve as the center point for the NMR Validation group and editorial boards from the PANIC Validation Workshop

Education Campaign Coordinator

- Work closely with PANIC committee to create a Quarterly Newsletter (pdf)

Administration of LinkedIn NMR validation group

- Distribution of news
- Manage cross-posting in the PANIC LinkedIn group

Reporter of NMR validation progress and concerns

- Attend the PANIC 2018 conference
- Assist in the setup of and facilitate the PANIC Validation Workshop
- Present summary of NMR validation group's progress/concerns at the conferences
- Act as Recording secretary (at Annual Workshop)

Details:

Award: \$10,000 USD (includes stipend and travel funds), to be paid quarterly upon satisfactory completion of goals and objectives

Term of appointment: 12 month appointment, beginning October 1, 2017

Eligibility: Must be a current student or postdoctoral fellow, in academic and/or industrial appointments

To be considered for this Fellowship, please send 2 letters of recommendation, a CV and a Short Description of Expertise with a focus on building a scientific digital presence (500 words or less) to committee@validnmr.com

International NMR Interlaboratory Study on Biotherapeutics

Towards Validated NMR Methods for mAbs

Critical quality attributes (CQA) are chemical, physical, biological and microbiological attributes that can be defined by measurement and monitored to ensure biotherapeutic products are within acceptable quality limits. CQAs are linked to the safety and efficacy of a drug product and thus positive public health outcomes. Higher order structure (HOS), is a CQA that is directly coupled to the function of protein biotherapeutics, and deviations in this CQA can be linked to reduced efficacy and pathological functions (i.e. immunogenicity or toxicity). Nuclear magnetic resonance spectroscopy (NMR) can yield structural fingerprints for a protein

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International NMR Interlaboratory Study on Biotherapeutics

biologic at atomic resolution that are directly related to its specific higher order structure.

While NMR spectral methods are well established for small molecules, peptides and small proteins, these approaches are far from standard or routine for proteins above 30 kDa in size, such as monoclonal antibodies (mAbs) which are ~150 kDa. To address this measurement gap, the National Institute of Standards and Technology (NIST), part of the U.S. Department of Commerce, organized an international interlaboratory study to advance and harmonize 2D NMR structural fingerprinting measurement protocol and establish the interlaboratory precision of the method. The study is using the NIST-Fab as a model system. The NIST-Fab was generated from the NIST standard monoclonal antibody (NISTmAb, candidate RM 8670), which was developed as a reference material by NIST. The validation of NMR methods for the characterization of the higher order structure of mAbs is specifically targeted due to the large interest of the pharmaceutical industry in using mAbs as platforms for therapeutic development. Twenty-six partner laboratories representing nine countries are participating in the study. Each laboratory was asked to collect a series of 2D data sets using well defined standard experimental method applied to an isotopically labeled System Suitability Sample and the target unlabeled NIST-Fab. In total, over 400 spectra have been submitted and are currently being analyzed. In addition to aiming to harmonize the method, the wealth of data is allowing a robust analysis of different statistical methods for assessing comparability. Analyses of spectral data will be presented at scientific conferences and ultimately published in a peer reviewed journal.

The NIST NMR Team

John Marino <john.marino@nist.gov>

Robert Brinson <robert.brinson@nist.gov>

Frank Delaglio <frank.delaglio@nist.gov>

Luke Arbogast <luke.arbogast@nist.gov>

NIST

The in NMR

By Michael Maiwald

The 2017 qNMR summit in Berlin attracted over 40 participants from various countries and was filled with talks spanning a variety of topics.

During the qNMR Summit 2017, held March 16-17, 2017 at Bundesanstalt für Materialforschung und -prüfung (BAM) in Berlin, it became clear that quantitative NMR spectroscopy (qNMR) has grown up to an original discipline. The summit was drafted as a European satellite meeting of the international qNMR validation group – aiming at establishing best practices for validating qNMR methods and making method validations more streamlined, so that those methods will be easier to implement and more commonly used in industry – but with guests from Japan, Canada, and Australia the meeting was already very international.

The Summit started with a guided tour through the BAM NMR labs and two well-attended workshops on automated procedures using spectral modeling as well as a double integration procedure for high-precision qNMR. This attracted already most of the 45 participants to the optional part of the workshop. The main meeting consisted of various keynote talks spanning a bridge from basic methods to applications and open space discussions.



A group photo of the participants at the 2017 qNMR summit in Berlin.

[The 'q' artwork and the qNMR Summit logo are by <https://gfp.people.uic.edu/qnmr/content/theq.htm>. They are licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. The license can be found at <https://creativecommons.org/licenses/by-sa/4.0/legalcode>.]

Spotlight on Upcoming Events

September 21, 2017: qNMR Minisymposium following SMASH in Baveno, Italy
 Chaired by Michael Maiwald (BAM) and Michael Bernstein (Mestrelab)

The principle themes of the Minisymposium will be:

How: the practicalities of implementation

When: applicability and validation

Enabling: what's available to help implementation

Off-the-shelf: brief descriptions or demonstrations of manufacturers' related products



For more information:

<http://mestrelab.com/events/qnmr-mini-symposium/>

November 24, 2017: qNMR Day at Politecnico di Bari in Bari, Italy

Co-organized by Vito Gallo (Politecnico di Bari)



November 24th, 2017
Politecnico di Bari, Aula Magna A. Alto
via Orabona 4 - CAMPUS, Bari

The goal of this qNMR day is to highlight the power of NMR spectroscopy in quantitative analysis. Scientific results will be shown and discussed with the aim to provide:

- objective standards for individual laboratories
- comparison of analytical results from different laboratories
- effective ways to check the quality and the accuracy of the analytical work
- examples of interesting NMR applications from all over the world

Registration (deadline: November 12, 2017)

Fee for GIDRM members: € 30,00
 Fee for non-members: € 50,00 (GIDRM membership included)
 Please, fill in the registration form at www.gidrm.org
 For info email to qnmr2017@gidrm.org or visit www.gidrm.org and www.soc.chim.it/it/gruppi/risonanze/home

10 Attendance Grants will be available for young SCI member scientists (under 35). Grants will cover the registration fee only. Submit your CV and a presentation letter from your current research supervisor before October 31, 2017 by e-mail to girm.sci@gmail.com

Speakers

- Maurizio Bettinelli (UNICHIM, Italy)
- Kim Colson (Bruker, USA)
- James Donarski (Fera, UK)
- Vito Gallo (Polytechnic University of Bari, Italy)
- Michael Maiwald (Fed. Inst. for Material Res. and Testing, BAM, Germany)
- Silvia Mari (Mestrelab, Spain)
- Piero Mastrorilli (Polytechnic University of Bari, Italy)
- Toru Miura (Wako Pure Chemical Industries, Japan)
- Markus Obkircher (Sigma-Aldrich, Switzerland)
- Torsten Schoenberger (Forensic Science Institute, Germany)
- Takako Suematsu (Jeol, Japan)
- Elina Zailer (Spectral Service, Germany)

Prof. Guido Pauli (University of Illinois at Chicago, USA) is gratefully acknowledged for qNMR logo available under a creative common license



Organizing Committee:

- V. Gallo, P. Mastrorilli, M. Latronico, S. Pontrelli, A. Rizzuti, S. Todisco, R. Ragone

Scientific Committee:

- C. Airolidi, L. Calucci, D. Capitani, M. Chierotti, M. D'Onofrio, V. Gallo, M. Geppi, S. Mammì, A. Mucci, G. Pileio, P. Turano, C. Zuccaccia

Sponsored by



November 24th, 2017
Politecnico di Bari, Aula Magna A. Alto

PROGRAM

- 9.00-9.30 Registration
- 9.30-9.45 Opening
- Angela Agostiano (President of the Italian Chemical Society)
- Marco Geppi (President of GIDRM)
- 9.45-10.00 Dedication of the Chemistry Labs at POLIBA to Prof. Franco Nobile
- Eugenio Di Sciascio (Rector of the Polytechnic University of Bari, POLIBA)
- Umberto Fratino (Director of DICATECh - POLIBA)
- Piero Mastrorilli (Director of the Chemistry Labs at POLIBA)

Scientific Session 1: NMR, the quantitative technique

- 10.00-10.40 Vito Gallo (Polytechnic University of Bari, Italy)
- "Presentation of the results of the NMR interlaboratory comparison IS-NMR-ILC 01-2016 (Project Re.Ge.V.I.P.)"
- 10.40-11.00 Piero Mastrorilli (Polytechnic University of Bari, Italy)
- "New metrics in qNMR performance assessment"
- 11.00-11.30 Coffee Break
- 11.30-11.50 Silvia Mari (Mestrelab, Spain)
- "Data processing and peak integration methods in qNMR"
- 11.50-12.10 Elina Zailer (Spectral Service, Germany)
- "Quality improvement in qNMR spectroscopy"
- 12.10-12.30 Toru Miura (Wako Pure Chemical Industries, Japan)
- "qNMR method applied to the Japanese Industrial Standard"
- 12.30-12.50 Markus Obkircher (Sigma-Aldrich, Switzerland)
- "Recent research developments in the certification of organic reference materials by ¹H, ³¹P and ¹⁹F quantitative NMR"

12.50-14.30 Lunch

Scientific Session 2: Worldwide interest on NMR applications

- 14.30-14.50 Kim Colson (Bruker, USA)
- "Material validation by NMR: significance and implementation with a global effort"
- 14.50-15.10 Takako Suematsu (Jeol, Japan)
- "Considerations for the validation of quantitative NMR"
- 15.10-15.30 Maurizio Bettinelli (UNICHIM, Italy)
- "Ten years results of UNICHIM proficiency tests"
- 15.30-16.00 Coffee Break
- 16.00-16.20 Michael Maiwald (Fed. Inst. for Material Res. and Testing, BAM, Germany)
- "qNMR metrology and current "primary" reference material activities"
- 16.20-16.40 James Donarski (Fera, UK)
- "The FoodIntegrity Project - Use of NMR applications to tackle future food fraud issues"
- 16.40-17.00 Torsten Schoenberger (Forensic Science Institute, Germany)
- "How to convict an offender by qNMR"
- 17.00-18.00 Panel discussion and concluding remarks

Sponsored by



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For more information:

<http://www.gidrm.org/index.php/activities/workshops/2017-workshops/qnmr-day-a-gidrm-organized-in-cooperation-with-girm>

Spotlight on Upcoming Events Continued

January 29-30, 2018: qNMR Meeting in Tokyo, Japan

Organized by Takako Suematsu (JEOL RESONANCE Inc.) and Toru Miura (Wako Pure Chemical Industries, Ltd.)

Venue: Fukuracia Marunouchi oazo

Schedule:

Monday, Jan. 29

1:00 pm - 5:00 pm

International qNMR Forum: "Working toward ISO - Understanding NMR standards in the world"

Tuesday, Jan. 30

9:00am - 11:30 am

USP Session: Compendial NMR and qNMR: "NMR and qNMR in Pharmacopeial Context"

Tuesday, Jan. 30

1:00 pm - 5:30 pm

International qNMR Symposium: "qNMR in the pharmaceutical industry : Present and Future"

Registration will open in September 2017. Further details to be posted on [qnmr.jp](http://www.wako-chem.co.jp/english/labchem/product/analytical/qNMR/). <<http://www.wako-chem.co.jp/english/labchem/product/analytical/qNMR/>>

Please contact [Takako Suematsu](mailto:tfujimot@jeol.co.jp) <tfujimot@jeol.co.jp> or [Toru Miura](mailto:miura.toru@wako-chem.co.jp) <miura.toru@wako-chem.co.jp> with questions.

Recently Published Papers

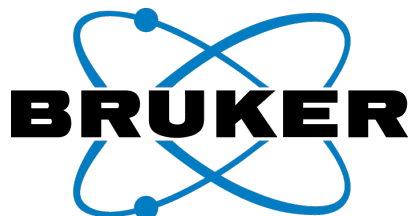
Mauri, L.; Boccardi, G.; Torri, G.; Karfunkle, M.; Macchai, E.; Muzi, L.; Keire, D.; Guerrini, M. Qualification of HSQC methods for quantitative composition of heparin and low molecular weight heparins. *J. Pharma. Biomed. Anal.* **2017**, *136*, 92-105. <http://doi.org/10.1016/j.jpba.2016.12.031>

If you know of recently published papers that will help others with NMR validation, please send the title and reference to admin@validnmr.com.

Want to be featured in the next ValidNMR newsletter?

The deadline for submissions and contributions to the next newsletter is November 3, 2017.

Please contact us at committee@validnmr.com!



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For more information
contact:

Jim DeFelippis

