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## **R. Thomas Williamson**

**Career Description:** Accomplished Ph.D. level scientist with 19 years of pharmaceutical industry experience in small molecule structure elucidation, drug discovery, drug development, and project management. Skilled in the effective combination of strategic planning, leadership, organization, and technical knowledge required to solve complex problems and drive projects forward. Proven track record for conducting world class research and education in support of basic science, pharmaceutical discovery, and process development goals. Extensive experience in a broad range of organic chemistry, natural products research, spectroscopy, and chromatography techniques provides a unique and well-rounded skill set for this accomplished scientist.

**Education:** 2017-2018 Harvard University, Cambridge, MA  
**Executive Enterprise Leadership Program,  
Corporate Leadership Certification**

1996-2000 Oregon State University; Corvallis, OR  
**Ph.D. Medicinal Chemistry**

1994-1996 University of North Carolina; Wilmington, NC  
**M.S. Organic Chemistry**

1990-1994 University of North Carolina; Wilmington, NC  
**B.A. Chemistry** (Focus in Analytical Chemistry)

### **Experience:**

Oct 2018 – Present      UNC Wilmington, Wilmington, NC

**Yosry and Linda Sayed Distinguished Professor of Chemistry & Biochemistry**

- Working with the UNCW Chemistry & Biochemistry faculty to develop a new, robust Ph.D. program in Pharmaceutical Sciences.

- Developing new courses to support the Pharmaceutical Chemistry and Pharmaceutical Sciences programs at UNCW.

- Working in partnership with Wendy K. Strangman to develop a robust research program focused on natural products drug discovery and method development for molecular structural characterization.

Apr 2014 – Aug 2018      Merck & Co. Inc.; Rahway, NJ; Kenilworth, NJ; Boston, MA; West Point, PA; & South San Francisco, CA.

**DIRECTOR – Structure Elucidation Lead**

-Provided scientific leadership, resource allocation and strategic vision to the Merck NMR resource and provide NMR support and special problem-solving solutions to the entire landscape of Merck research and manufacturing including process development and discovery chemists.

-Judiciously built a diverse team based on gender, cultural background, and skill set composed of ~28 high-performing PhD NMR and MS specialists and 2 NMR engineers focused on the solution of small and large molecule structure elucidation problems and cross-functional collaboration. Group projects include work internal and external to Merck focused on organic chemistry, natural products chemistry, pharmaceutical formulation, drug metabolism, and animal health.

-Created and maintained an effective network of world-class academic collaborators including, but not limited to, research groups at U. Barcelona (T. Parella), U. Wisconsin (T. Bugni), National Cancer Institute (K. Gustafson and others), Harvard Medical School (J. Clardy), Scripps Institute of Oceanography (W.

Gerwick), UCSD (T. Molinski), U. British Columbia (R. Anderson), Max Planck Institute, (C. Griesinger), and Carnegie Mellon (R. Gil).

-Managed the deployment, utilization, and life cycle of 56 liquid and solid state NMR spectrometers ranging from 400-800 MHz and 117 mass spectrometers including FT-ICR-MS, MALDI-Imaging, Orbitrap, TQD, SQD, IMS-MS, and EI-LC-MS systems.

-Responsible for the acquisition, planning, and administration of a \$5M USD annual departmental capital budget and a \$130M USD life cycle management budget for NMR, MS, and LC (5-year cycle) across all of Merck Research Labs.

July 2012 – Apr 2014 Merck & Co. Inc.; Rahway, NJ and Kenilworth, NJ

**DIRECTOR – NMR Lead**

-Provided scientific leadership, resource allocation and strategic vision to the NJ NMR resource and provide NMR support and special problem-solving solutions to Process Development and Discovery chemists.

-Supervised 7 PhD level direct reports and maintained matrix relationships to >4 others and 2 NMR engineers.

Nov 2011 – July 2012 Merck & Co. Inc.; Rahway, NJ and Kenilworth, NJ

**ASSOCIATE DIRECTOR – NMR Lead**

-Provided scientific leadership, resource allocation and strategic vision to the NJ NMR resource and provided NMR support and special problem solving solutions to Process Development and Discovery chemists.

-Supervised 6 PhD scientists and maintained matrix relationships to 2 others.

July 2011 – Nov 2011 Merck & Co. Inc.; Rahway, NJ

**NMR SPECIALIST**

-Provided NMR support and special problem-solving solutions to Process Development and Discovery chemists using both Bruker and Varian / Agilent spectrometers.

2008 - June 2011 Roche Carolina Inc.; Florence, SC

**PRINCIPAL SCIENTIST**

-Highly motivated and successful Project Coordinator / Chemistry Team Leader for various incoming late-stage Process Development projects involving drug candidates in clinical trials with on-site budgets typically exceeding \$1M USD.

-Provided general spectroscopy and foreign material identification support for both Process Development and Manufacturing (Liquids NMR, Raman, NIR, UV, and FT-IR). This support generally comprised structure verification and chemical shift assignment of 300-500 compounds per year. Also provided final product testing for a >\$1B USD per year drug that utilized NMR as a primary GMP release test.

-Validated and maintained compliance of 2 GMP certified NMR spectrometers.

-Provided expert specialty NMR problem solving support for process development and manufacturing. This role included low-level impurity isolation and identification, troubleshooting unknowns in commercial processes, and assisting process chemists with identification of intermediates and unknown by-products. Critical problems were generally turned around within 24 hours or less.

-Provided Solid State NMR support for all Roche sites as the designated corporate 'Center of Excellence' for polymorph identification and quantitation.

-Developed new NMR techniques to expedite small molecule structure elucidation. These methods provided more efficient approaches to both structure identification and stereochemical determination.

-Developed, implemented, and supervised all Process Analytical Technology (PAT) projects on-site at lab scale, pilot scale, and manufacturing scale (NMR, NIR, Mid-IR, Raman, MS, RI, density, chemometrics, etc.; interface data with automation and plant DCS). Evaluation of at least 20 lab-scale PAT projects and implementation of more than 10 pilot plant and manufacturing scale applications per year made Roche Carolina the corporation's world-wide leader in PAT. Implementation of PAT projects at our site consistently reflected significant cost savings and a 40% average decrease in cycle times for each step. Implementation

of PAT to hazardous chemistry allowed our site to run processes that could not be performed safely at any other Roche API sites.

-Supervised 1 direct report who assisted in the day to day operation of our laboratory. Managed PAT and chemical development projects that typically involved a team of more than 20 scientists and plant engineers & operators from highly diverse backgrounds and education levels.

2004-2008 Roche Carolina Inc.; Florence, SC

**PRINCIPAL SCIENTIST**

-Provided general spectroscopy and foreign material ID support for Process Development and Manufacturing (Liquids NMR, Raman, NIR, UV, and FT-IR).

-Provided specialty NMR problem solving support for Process Development and Manufacturing.

-Developed new NMR techniques to expedite small molecule structure elucidation (Varian / Agilent NMR).

-Supervised a Solid State Characterization laboratory (XRPD, PSD, FT-NIR, FT-Raman, Optical Microscopy, DSC, TGA, etc.).

-Developed and applied polymorph quantitation techniques using SSNMR, XRPD, IR, and Raman spectroscopy.

-Supervised 2 direct reports (1 Solid State and 1 Spectroscopy) and managed a multitude of PAT and chemical development projects typically involving teams of more than 20 people per project.

2000-2003 Wyeth Research; Pearl River, NY

**PRINCIPAL SCIENTIST I (Previously Research Scientist III, Senior Research Scientist I and Senior Research Scientist II)**

-Provided specialty NMR and problem-solving support for Medicinal and Natural Products Chemists.

-Developed new NMR techniques to expedite small molecule structure elucidation.

-Developed new NMR and chemical approaches for the determination of relative and absolute stereochemistry.

-Regularly utilized modern LC techniques coupled with UV, MS, MS-MS, and NMR detection. Our laboratory at Wyeth used Bruker NMR instruments and HP/Agilent LC and MS systems.

-Regularly incorporated low-resolution MS using ESI, CI, APCI, and EI ionization as well as high-resolution FT-ICR-MS and SORI-CAD FT-MS mass spectral data into the solution of routine and non-routine structure problems.

-Supervised 2 NMR specialists and 1 FT-ICR-MS specialist.

1996-2000 Oregon State University; Corvallis, OR

**RESEARCH ASSISTANT**

-Explored the application and development of new NMR pulse sequences to real world problems.

-Studied the isolation, structure elucidation, and biosynthesis of marine cyanobacterial metabolites under the direction of Dr. William H. Gerwick.

-Incorporated a wide breadth of chromatographic techniques and stationary phases into the isolation of structurally challenging and potentially unstable compounds. These techniques included HPLC, GC-MS (chiral and non-chiral), LC-MS, Vacuum Liquid Chromatography (VLC; C18 and Si). In addition, a wide variety of stationary phases such as LH-20, HP-20, Silica Gel, C18, C8, CN, diol, chiral cyclodextrin, and valine-based chiral columns were used as needed to solve specific problems. Isolations ranged from the sub-microgram to gram level.

-Studied the isolation, structure elucidation and biosynthesis of both terrestrial and marine *Streptomyces* sp. secondary metabolites under the direction of Dr. Steven J. Gould and Dr. John R. Carney.

-Gained considerable experience and knowledge in the organic synthesis of a wide variety of isotopically labeled precursors for biosynthetic feeding experiments.

-Acquired a detailed working knowledge of primary and secondary metabolism pathways.

1996-1997 Oregon State University; Corvallis, OR

**GRADUATE TEACHING ASSISTANT**

-Assisted in the teaching of undergraduate and graduate level laboratory classes in Organic Chemistry and Advanced Experimental Chemistry.

1994-1996 University of North Carolina Wilmington, NC

**RESEARCH ASSISTANT**

-Studied the isolation, structure elucidation, total synthesis, and structure-activity relationships of biologically active galactolipids from marine cyanobacteria under the direction of Dr. Pamela Seaton.

-Gained experience in standard chromatographic techniques and structure elucidation as well as a great deal of familiarity and knowledge of modern synthetic chemistry techniques.

1994-1996 University of North Carolina Wilmington, NC

**GRADUATE TEACHING ASSISTANT**

-Assisted and independently taught undergraduate and graduate level laboratory classes in Organic Chemistry, Advanced Analytical Chemistry, and Advanced Techniques in Organic Chemistry.

-Assisted in the development of new advanced organic chemistry laboratory activities for Junior and Senior level chemistry students.

**Professional Memberships:**

**2018-present** Executive Board Member of the North American Stereochemical Society

**2016-present** Executive Board Member of Chirality International

**2011-present** Member of the Magnetic Resonance in Chemistry Advisory Board

**1992-present** Member of the American Chemical Society

**1999-2010** Executive Board Member of the SMASH NMR conference

**Special Honors:**

**2018** Co-program Chair and Lead Organizer for Chirality 2018.

**2018** Plenary lecturer at the 59<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference in Orlando, FL.

**2017** Plenary lecturer at the NJACS NMR Symposium at Princeton University, Princeton, N.J.

**2016** Keynote Speaker at the Inauguration Symposium held for the NMR Center at Denmark Technical University in Lyngby, Denmark.

**2016** Invited Workshop Co-Leader at SMASH for the 17th annual SMASH NMR conference in San Diego, California.

**2014** Invited Overall Program Co-chair for the 15<sup>th</sup> annual SMASH NMR conference in Atlanta, Ga.

**2012** Plenary Speaker at the annual meeting of The Japanese Nuclear Magnetic Resonance Society in Nagoya, Japan.

**2012** Invited Pulse Sequence Session Chair for the annual SMASH NMR conference in Providence, R.I.

**2010** Roche Innovation Award for Operational Excellence for implementation of PAT in Manufacturing.

**2003** Invited Plenary Lecturer for the 2003 Annual Meeting of the Brazilian NMR User's Association (AUREMN) in Rio de Janeiro, Brazil.

**2003** Invited Plenary Lecturer for the 2003 Royal Society of Chemistry Analytical Chemistry Symposium at Cambridge University, Cambridge, England.

**2003** Chair of the NJACS NMR Topical Group for the year 2003.

- 2002** Invited Overall Program Co-chair for the 3<sup>rd</sup> annual SMASH NMR conference (2002) in Breckenridge, Colorado.
- 2002** Invited Pulse Sequence Session Chair for the 3<sup>rd</sup> annual SMASH NMR conference (2002) in Breckenridge, CO.
- 2001** Invited to participate as a member of the scientific advisory board for ACD Labs, Inc.
- 2000** Invited Session Chair for the 2<sup>nd</sup> annual SMASH NMR conference at Argonne National Labs, Chicago.
- 1999** Stroderberg Award for Distinguished Young Scientific Researcher at Oregon State University.
- 1998** Invited Session Chair for the 1<sup>st</sup> annual SMASH NMR conference at Argonne National Labs, Chicago, IL.
- 1996** Distinguished Young Chemist Award from the North Carolina Association of Professional Chemists.
- 1996** Graduate Teaching Assistant of the Year Award from the chemistry department of UNC-Wilmington.

**Publications: (in approximate reverse order of submission or publication)**

126 Peer-reviewed publications, >4,517 citations, h-index = 36, i10 index = 89

Bogart, J. W.; Kramer, N. J.; Turlik, A.; Bleich, R. M.; Catlin, D. S.; Schroeder, F. S.; Nair, S. K.; Williamson, R. T.; Houk, K. N.; Bowers, A. A. J. *Am. Chem. Soc.* **2020**, *Just Accepted*.  
Interception of the "Bycroft-Gowland" intermediate in the enzymatic macrocyclization of thiopeptides.

Ndukwe, I. E.; Wang, X.; Lam, N. Y. S.; Ermanis, K.; Alexander, K. L.; Bertin, M. J.; Martin, G. E.; Muir, G.; Paterson, I.; Britton, R.; Goodman, J. M.; Helfrich, E. J. N.; Piel, J.; Gerwick, W. H.; **Williamson, R. T.** *Chem. Commun.*, **2020**, *Advance Article*. Synergism of anisotropic and computational NMR methods reveals the likely configuration of phormidolide A.

Opakua, A. I. deO.; Klama, F.; Ndukwe, I. E.; Martin, G. E.; **Williamson, R. T.**; Zweckstetter, M. *Angew. Chem. Int. Ed.* **2020**, *59*, 6172–6176. Determination of Complex Small-Molecule Structures Using Molecular Alignment Simulation.  
Rudd, N. D.; Helmy, R.; Dormer, P. G.; **Williamson, R. T.**; Wuelfing, W. P.; Walsh, P. L.; Reibarkh, M.; Forrest, W. P., *Mol. Pharmaceutics*, **2020**, *17*, 530–540.  
Probing in Vitro Release Kinetics of Long-Acting Injectable Nanosuspensions via Flow-NMR Spectroscopy

Roginkin, M. S.; Ndukwe, I.; E Craft, D Levi; **Williamson, R. T.**; Reibarkh, M.; Martin, G; E.; Rovnyak D. *Magn. Reson. Chem.* **2020**, *58*, 625–640.  
Developing Nonuniform Sampling Strategies to Improve Sensitivity and Resolution in 1, 1-ADEQUATE Experiments.

Ndukwe, I. K.; Brunskill, A.; Gauthier Jr., D. R.; Zhong, Y.-L.; Martin, G. E.; **Williamson, R. T.**; Reibarkh, M.; Liu, Y. *Org. Lett.* **2019**, *21*, 4072-4076.  
<sup>13</sup>C NMR-Based Approaches for Solving Challenging Stereochemical Problems.

Buevich, A. V.; Sauri, J.; Parella, T.; De Tommasi, N.; Bifulco, G.; **Williamson, R. T.**; Martin, Gary E. *Chem. Comm.*, **2019**, *55*, 5781-5784.  
Enhancing the utility of <sup>1</sup>J<sub>CH</sub> coupling constants in structural studies through optimized DFT analysis.

Ndukwe, I. E.; Wang, X.; Pelczer, I.; Reibarkh, M.; **Williamson, R. T.**; Liu, Y.; Martin, G. E. *Chem. Comm.*, **2019**, *55*, 4327-4330.  
PBLG as a versatile liquid crystalline medium for anisotropic NMR data acquisition.

Mazzola, E.P.; Deeds, J.R.; Stutts, W.L.; Ridge, C.D.; Dickey, R.W.; White, K.D.; **Williamson, R.T.**; Martin, G.E. *Toxicon*, **2019**, *164*, 44-50. Elucidation and Partial NMR Assignment of Mono-Sulfated Maitotoxins from the Caribbean.

Wang, X.; Gao, Q.; Buevich, A. V.; Yasuda, N.; Zhang, Y.; Yang, R. S.; Zhang, L.-K.; Martin, G. E.; **Williamson, R. T. J. Org. Chem.** **2019**, *84*, 10024–10031. Unexpected Propargylic Retro-Brook Rearrangements in Alkynes

Liu, Y.; Navarro-Vázquez, A.; Gil, R. R.; Griesinger, C.; Martin, G.E.; **Williamson, R.T.** *Nature Protocols*, **2019**, *14*, 217-247. **Invited submission**  
Application of Anisotropic NMR Parameters to the Confirmation of Molecular Structure.

Bertin, M. J.; Sauri, J.; Liu, Y.; Via, C. W.; Roudit, A. F.; **Williamson, R. T. J. Org. Chem.** **2018**, *83*, 13256-13266.  
Trichophycins B-F, chlorovinylidene-containing polyketides isolated from a cyanobacterial bloom.

Sauri, J.; Bermel, W.; Parella, T.; **Williamson, R.T.**; Martin, G.E. *Magn. Reson. Chem.* **2018**, *56*, 1029-1036. **By invitation for special issue.** Incorporating BIRD-based Homonuclear Decoupling in the Dual-Optimized, Inverted  $^1J_{CC}$  1,n-ADEQUATE Experiment.

Gallegos, D. A.; Sauri, J.; Cohen, R. D.; Wan, X.; Videau, P.; Vallota-Eastman, A. O.; Shaala, L. A.; Youssef, D. T. A.; **Williamson, R. T.**; Martin, G. E.; Philmus, B.; Sikora, A. E.; Ishmael, J. E.; McPhail, K. L. *J. Nat Prod.* **2018**, *81*, 1417-1425. **Editors Choice**

Jizanpeptins, Cyanobacterial Protease Inhibitors from a *Symploca* sp. Cyanobacterium Collected in the Red Sea. Liu, Y.; Cohen, R. D.; Martin, G. E.; **Williamson, R. T.** *J. Magn. Reson.* **2018**, *291*, 63-72. A Practical Strategy for the Accurate Measurement of Residual Dipolar Couplings in Strongly Aligned Small Molecules

Huang, Y.; Liu, Sh.; Liu, Y.; Chen, Y.; Weisel, M.; **Williamson, R. T.**; Davies, I. W.; Zhang, X. *Tetrahedron*, **2018**, *74*, 2182-2190. A Mechanistic Investigation of an Iridium-catalyzed Asymmetric Hydrogenation of Pyridinium salts.

Liu, Y.; Cohen, R.D.; Gustafson, K.R.; Martin, G.E.; **Williamson, R.T.**; *Chem. Comm.*, **2018**, *54*, 4254-4257. Enhanced Measurement of Residual Chemical Shift Anisotropy for Small Molecule Structure Elucidation.

Milanowski, D. J.; Oku, N.; Cartner, L. K.; Bokesch, H. R.; **Williamson, R. T.**; Sauri, J.; Liu, Y.; Blinov, K. A.; Ding, Y.; Li, X.-C.; Ferreira, D.; Walker, L. A.; Khan, S.; Davies-Coleman, M. T.; Kelley, J. A.; McMahon, J. B.; Martin, G. E.; Gustafson, K. R. *Chem. Sci.* **2018**, *9*, 307-314. **Cover Article.**  
Unequivocal Determination of Caulamidines A and B: Application and Validation of New Tools in the Structure Elucidation Toolbox.

Ni, Q. Z.; Yang, F.; Can, T. V.; Sergeev, I. V.; D'Addio, S. M.; Jawla, S. K.; Li, Y.; Lipert, M. P.; Xu, W.; Williamson, R. T.; Leone, A.; Griffin, R. G.; Su, Y. *J. Phys. Chem. B* **2017**, *121*, 8132-8141.  
*In situ* Characterization of Pharmaceutical Formulations by Dynamic Nuclear Polarization Enhanced MAS NMR.

Jia, T.; Zhang, M.; Samuel, P.; Bellomo, A.; Montel, S.; Mao, J.; Dreher, S. D.; Welch, C. J.; Regalado, E. L.; **Williamson, R. T.**; Manor, B. C.; Tomson, N. C.; Walsh, P. J. *J. Am. Chem. Soc.* **2017**, *139*, 8337-8345. **Feature Article.**  
Palladium-Catalyzed Enantioselective Arylation of Aryl Sulfonate Anions: A Combined Experimental and Computational Study

Sauri, J.; Parella, T.; Williamson, R. T.; Martin, G. E. *Magn. Reson. Chem.*, **2017**, *55*, 191-197.  
Improving the performance of J-Modulated ADEQUATE Experiments Through Homonuclear Decoupling and Non-Uniform Sampling.

Liu, Y.; Sauri, J.; Mevers, E.; Peczuh, M. W.; Hiemstra, H.; Clardy, J.; Martin, G. E.; **Williamson, R. T.** *Science*, **2017**, *356*, 43.  
Unequivocal determination of complex molecular structures using anisotropic NMR measurements.

Ji, Y.; Li, H.; Hyde, A. M.; Chen, Q.; Belyk, K. M.; Lexa, K. W.; Yin, J.; Sherer, E. C.; **Williamson, R. T.**; Brunskill, A. Ren, S.; Campeau, L.-C.; Davies, I. W.; Ruck, R. T. *Chem. Sci.* **2017**, *8*, 2841-2851.  
A Rational Pre-catalyst Design for Bis-phosphine Mono-oxide Palladium Catalyzed Reactions.

**Williamson R. T.**; Marquez, B. L. *Magn. Reson. in Chem.* **2017**, *55*, 252. **Editorial**  
Small Molecule NMR in the Pharmaceutical Sciences.

Chan, S. T. S.; Nani, R. R.; Schauer, E. A.; Martin, G. E.; **Williamson, R. T.**; Sauri, J.; Buevich, A. V.; Schafer, W. A.; Joyce, L. A.; Goey, A. K. L.; Figg, W. D.; Ransom, T. T.; Henrich, C. J.; McKee, T. C.; Moser, A.; MacDonald, S. A.; Khan, S.; McMahon, J. B.; Schnermann, M. J.; Gustafson, K. R. *J. Org. Chem.* **2016**, *81*, 10631-10640.  
Characterization and Synthesis of Eudistidine C, a Bioactive Marine Alkaloid with an Intriguing Molecular Scaffold.

Sauri, J.; Reibarkh, M.; Zhang, T.; Cohen, R. D.; Wang, X.; Molinski, T. F.; Martin, G. E.; **Williamson, R. T.** *Org. Lett.* **2016**, *18*, 4786-4789.  
Band-Selective 2D HSQMBBC: A Universal Technique for Detection and Measurement of  $^{35,37}\text{Cl}$  Isotope Effects for  $^{13}\text{C}$  Nuclei.

Mevers, E.; Sauri, J.; Liu, Y.; Moser, A.; Ramadhar, T. R.; Varlan, M.; **Williamson, R. T.**; Martin, G. E.; Clardy, J. *J. Am. Chem. Soc.* **2016**, *138*, 12324-12327.  
Homodimericin A: A Complex Hexacyclic Fungal Metabolite.

Mangion, I.; Liu, Y.; Reibarkh, M.; **Williamson, R. T.**; Welch, C. J. *J. Org. Chem.* **2016**, *81*, 6937-6944.  
Using Electron Paramagnetic Resonance Spectroscopy to Facilitate Problem Solving in Pharmaceutical Research and Development.

Nath, N.; Schmidt, M. B.; Gil, R.; **Williamson, R. T.**; Martin, G. E.; Navarro-Vazques, A.; Griesinger, C.; Liu, Y. *J. Am. Chem. Soc.*, **2016**, *138*, 9548-9556. **Spotlight Article**  
Determination of Relative Configuration from Residual Chemical Shift Anisotropy.

- Mangion, I.; Liu, Y.; Reibarkh, M.; **Williamson, R. T.**; Welch, C. J. *J. Org. Chem.*, **2016**, *81*, 6937–6944.  
Using Electron paramagnetic Resonance (EPR) Spectroscopy to Facilitate Problem Solving in Pharmaceutical Process Research and Development,
- Yang, L.; Wenzel, T.; **Williamson, R. T.**; Christensen, M.; Schafer, W.; Welch, C. J. *ACS Central Science*, **2016**, *2*, 332-340. **Feature Article**  
Expedited Selection of NMR Chiral Solvating Agents for Determination of Enantiopurity.
- Saurí, J.; Liu, Y. **Williamson, R. T.**; Martin, G. E. *Magn. Reson. Chem.*, **2016**, *54*, 341-345.  
Observation of Potentially Troublesome  $^2J_{CC}$  Correlations in 1,1- and 1,1-HD-ADEQUATE Spectra.
- Saurí, J.; Liu, Y.; Parella, T.; **Williamson, R. T.**; Martin G. E. *J. Nat. Prod.*, **2016**, *79*, 1400-1406.  
Selecting the Most Appropriate NMR Experiment to Access Weak and/or Very Long-Range Heteronuclear Correlations.
- Reibarkh, M.; Wyche, T.; Saurí, J.; Bugni, T. S.; Martin G. E. and **Williamson R. T.** *Magn. Reson. in Chem.*, **2015**, *53*, 996.  
Structure elucidation of uniformly  $^{13}C$  labeled small molecule natural products.
- Reibarkh, M.; Wyche, T.; Saurí, J.; Bugni, T. S.; Martin G. E. and **Williamson R. T.** *Magn. Reson. in Chem.*, **2015**, *53*, 996-1002.  
Structure elucidation of uniformly  $^{13}C$  labeled small molecule natural products.
- Saurí, J.; Frédérich, M.; Tchinda, A. T.; Parella, T.; **Williamson, R. T.**; Martin, G. E. *J. Nat. Prod.*, **2015**, *78*, 2236-2241.  
Carbon Multiplicity Editing in Long-Range Heteronuclear Correlation NMR Experiments: A Valuable Tool for the Structure Elucidation of Natural Products
- Lorenc, C.; Sauri, J.; Moser, A.; Buevich, A. V.; Williams, A. J.; **Williamson, R. T.**; Martin, G. E.; Pecuh, M. W. *Chemistry Open*, **2015**, *4*, 577-580. **Feature/Cover Article**  
Turning Spiroketal Inside Out: A Rearrangement Triggered by an Enol Ether Epoxidation.
- Sauri, J.; Bermel, W.; Buevich, A. V.; Sherer, E. C.; Joyce, L. A.; Sharaf, M. H. M.; Schiff, P. L., Jr.; Parella, T.; **Williamson, R. T.**; Martin, G. E. *Ang. Chem., Int. Ed.* **2015**, *54*, 10160-10164.  
Homodecoupled 1,1- and 1,n-ADEQUATE: Pivotal NMR Experiments for the Structure Revision of Cryptospirolepine.
- Sauri, J.; Marco, N.; **Williamson, R. T.**; Martin, G. E.; Parella, T. *J. Magn. Reson.* **2015**, *258*, 25-32.  
Extending Long-Range Heteronuclear NMR Connectivities by HMQBC-COSY and HMQBC-TOCSY Experiments.
- Sherer, E. C.; Cheeseman, J. R.; **Williamson, R. T.** *Org. & Biomolec. Chem.* **2015**, *13*, 4169-4173.  
Absolute Configuration of Remisporines A & B.
- Castañar, L.; Sistare, E.; Virgili, A.; **Williamson, R. T.**; Parella, T. *Magn. Reson. in Chem.*, **2015**, *53*, 115-119.  
Suppression of Phase and Amplitude  $^nJ_{HH}$  Modulations in HSQC Experiments.
- Martin, G. E.; Reibarkh, M.; Buevich, A. V.; Blinov, K. A.; **Williamson, R. T.** *eMagRes*, **2014**, *3*, 215-234.  
Application of 1,n-ADEQUATE and modified variants to structure elucidation and spectral assignment problems.
- Blinov, K. A.; Buevich, A. V.; **Williamson, R. T.**; Martin, G. E. *Org. Biomol. Chem.* **2014**, *12*, 9505-9509. **Cover Article**  
The Impact of LR-HSQMBC Very Long-Range Heteronuclear Correlation Data on Computer-Assisted Structure Elucidation.
- Perez-Trujillo, M.; Castañar, L.; Monteagudo, E.; Kuhn, L. T.; Nolis, P.; A. Virgili, **Williamson, R. T.**; Parella, T. *Chem. Comm.*, **2014**, *50*, 10214-10217.  
Simultaneous  $^1H$  and  $^{13}C$  Enantiodifferentiation from Highly-Resolved Pure Shift HSQC Spectra.
- Castañar, L.; Saurí, J.; **Williamson, R. T.**; Virgili, A.; Parella, T.; *Angew. Chem.*, **2014**, *53*, 8379-8382.  
Pure In-Phase Heteronuclear Correlation Experiments.
- Williamson, R. T.**; Buevich, A. V.; Martin, G. E. *Tet. Lett.* **2014**, *55*, 3365-3366.  
Using LR-HSQMBC to Observe Long-Range  $^1H$ - $^{15}N$  Correlations.
- Williamson, R. T.**; Buevich, A. V.; Martin, G. E. *J. Org. Chem.* **2014**, *79*, 3887-3984.  
LR-HSQMBC: A High Sensitivity Technique to Probe Very Long-Range Heteronuclear Coupling Pathways.
- Liu, Y.; Green, M. D.; Marques, R.; Pereira, T.; Helmy, R.; **Williamson, R. T.**; Bermel, W.; Martin, G. E. *Tet. Lett.*, **2014**, *55*, 5450-5453.  
Using Pure Shift HSQC to Characterize Microgram Samples of Drug Metabolites.
- Buevich, A. V.; **Williamson, R. T.**; Martin, G. E. *J. Nat. Prod.*, **2014**, *77*, 1942-1946.  
NMR Structure Elucidation of Small Molecules and Natural Products: Choosing ADEQUATE vs. HMBC.

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Two New Taxoids from European Yew (*Taxus baccata*) That Act as Pyrethroid Insecticide Synergists with the Black Vine Weevil (*Otiorhynchussulcatus*).

## Selected Oral Presentations:

**Williamson R. T.** July 2017.  
"New Anisotropic NMR Methods for Structure Elucidation."  
Invited speaker at Osaka University, Japan.

**Williamson R. T.** July 2017.  
"New Anisotropic NMR Methods for Structure Elucidation."  
Invited speaker at Chirality 2017, Tokyo, Japan.

**Williamson R. T.** July 2016.

"New NMR Methods for Structure Elucidation."  
Invited speaker at the Marine natural Products Gordon Conference, Ventura California.

**Williamson R. T.** June 2016.  
"Expedited Selection of NMR Chiral Solvating Agents for Determination of Enantiopurity."  
Invited speaker at Chirality 2017, Heidelberg, Germany.

**Williamson R. T.** June 2016.  
"Expedited Selection of NMR Chiral Solvating Agents for Determination of Enantiopurity."  
Invited speaker at Chirality 2017, Boston, MA.

**Williamson, R. T.** Dec. 2014.  
"Small Molecule Structure Characterization: New and Improved NMR Methods"  
Invited Speaker at the New England NMR Topical Group, Cambridge, MA.

**Williamson, R. T.** Sept. 2014.  
"New Developments in Pulse Sequences for Small Molecule NMR"  
Invited Speaker at the NJACS Topical Group, New Brunswick, NJ.

**Williamson, R. T.** Feb. 2014.  
"Small Molecule Structure Characterization: New and Improved NMR Methods"  
Invited Speaker at Pennsylvania State University, University Park, State College, PA.

**Williamson, R. T.** Feb. 2013.  
"New Developments in the ADEQUATE Family of NMR Experiments"  
Invited Speaker at the National Cancer Institute (NCI) Frederick, Md..

**Williamson, R. T.** Jan. 2013.  
"Stereochemical Determination in In a Fast Paced World"  
Invited Speaker at Carnegie Mellon University, Pittsburgh, PA.

**Williamson, R. T.** Nov. 2012.  
"New (and Old) Developments in Relative and Absolute Stereochemical Determination by NMR Spectroscopy"  
Invited Speaker at the Eastern Analytical Symposium, Somerset, NJ.

**Williamson, R. T.** Nov. 2012.  
"New Developments in the ADEQUATE Family of NMR Experiments."  
Invited Speaker at the 51st Annual Meeting of the Japanese Society of NMR, Nagoya, Japan.

**Williamson, R. T.** Mar. 2012.  
"New (and Old) Developments in Relative and Absolute Stereochemical Determination by NMR Spectroscopy"  
Invited Speaker at the NJACS Topical Group, New Brunswick, NJ.

**Williamson R. T.** Nov. 2010.  
"Recent PAT Applications at Roche Carolina, Inc. Adventures with Phosgene and Beyond"  
Invited speaker at the 5th International Conference and Exhibition of Process Analytical Technology. Clearwater, FL.

**Williamson R. T.;** Russell, D. J.; Josephs, J. Sept., 2010.  
"Bringing it all Together: Multi-disciplinary Structure Elucidation."  
Invited Workshop at the SMASH NMR conference in Portland, OR.

**Williamson, R. T.** Mar. 2009.  
"Process Analytical Tools in the Pharmaceutical Industry"  
Invited speaker at UNC Wilmington Chemistry Department.

**Williamson, R. T.** May 2006.  
"Stereochemical Determination by NMR"  
Invited Speaker at the National Institute of Health, Bethesda, MD.

**Williamson, R. T.** Sept. 2004.  
"New Developments in NMR for the Pharmaceutical Industry"  
Invited Speaker at the Varian Users Meeting at the 5<sup>th</sup> Annual SMASH NMR Conference in Breckenridge Colorado.

**Williamson R. T.** Aug 2003.  
"New Developments in NMR for the Pharmaceutical Industry"  
Invited Speaker for the 2003 Annual Meeting of the American Society of Pharmacognosy in Chapel Hill, N.C.

**Williamson, R. T.** Apr. 2002.  
"The Pharmaceutical Approach to Relative and Absolute Stereochemical Determination" April 2001  
Invited Speaker at the Nalorac Symposium. 41<sup>st</sup> Annual ENC. Asilomar, CA.

**Williamson, R. T.** July 2001.

"Survey of NMR Experiments for the Determination of  $nJ_{CH}$  Heteronuclear Coupling Constants in Small Molecules." Sept. 2001 ( *canceled due to events of Sept. 11*)

Invited Speaker at the 3<sup>rd</sup> Annual Small Molecules Are Still Hot Conference. Argonne National Labs. Chicago, IL

**Williamson, R. T.** Mar. 2001.

"New Developments in Small Molecule NMR"

Invited Speaker at the Nalorac Symposium. 40<sup>th</sup> Annual ENC. Orlando, Fla.

**Williamson R. T.** July 2001.

"Highlights of the Wyeth Way of Doing Small Molecule NMR"

July NJACS NMR Topical Group ACS Meeting, Princeton, NJ.

**Williamson R. T.** Jan. 2001.

"The New Way of Doing Pharmaceutical NMR"

January Minnesota ACS Spectroscopy Topical Group ACS Meeting, Minneapolis, MN.

**Williamson R. T.** Mar. 2000.

"New NMR Experiments for the Dereplication of Known and Nuisance Compounds in Natural Products Mixtures"

National Spring Meeting of the American Chemical Society. San Francisco, CA.

**Williamson, R. T.;** Mitra, A.; Seaton, P. J.; Capitani, J. Mar., 2000.

"NMR Characterization of the Intermolecular Interactions of Quinoline in Solution."

National Spring Meeting of the American Chemical Society. San Francisco, CA.

**Williamson, R. T.;** Gerwick, W. H. Sept., 1999.

"NMR Applications to New and Exciting Natural Products from Marine Cyanobacteria."

Invited Speaker at Wyeth-Ayerst Research. Princeton, NJ.

**Williamson, R. T.** Aug. 1999.

"Application of Progressive NMR Experiments to the Structure Elucidation of Natural Products."

Invited Speaker at Dow Agrosience, Indianapolis, IN.

**Williamson, R. T.** Aug. 1999.

"New Gradient-Selected HSQMBC Experiments for the Rapid and Efficient Analysis of Long-Range Heteronuclear Coupling Constants."

Invited Speaker at the Charter Small Molecules Are Still Hot Conference. Argonne National Labs, Chicago, IL.

**Williamson, R. T.** Mar. 1999.

"Application of Contemporary NMR Techniques to "Small" Molecule NMR."

Invited Speaker at University of California at Santa Cruz Chemistry Department, Santa Cruz, CA.

**Williamson, R. T.** Mar. 1999.

"Application of Contemporary NMR Techniques to "Small" Molecule NMR."

Invited Speaker at Kosan Biosciences. Hayward, CA.

**Williamson, R. T.;** Jan. 1999.

"Application of New NMR Techniques to Small Molecule NMR."

Invited Speaker at UNC-Wilmington Chemistry Department Wilmington, NC.

**Williamson, R. T.** Nov. 1998.

"Application of New NMR Techniques to Small Molecule NMR."

Invited Speaker at Shaman Pharmaceuticals. San Francisco, CA.

**Williamson R. T.** Mar. 1996.

"Isolation, Structure Elucidation, Total Synthesis, and Structure-Activity Relationships of Galactolipids from Marine Algae."

National Spring Meeting of the American Chemical Society. New Orleans, LA.