

# W. Greg Miller, PhD

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Professor, Department of Pathology  
Co-Director of Clinical Chemistry  
Director of Pathology Information Systems  
Department of Pathology  
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## Licenses & Certifications

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American Board of Clinical Chemistry, 1976

## Education

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Postdoctoral Fellow in Clinical Chemistry  
Department of Pathology, Division of Clinical Chemistry  
Ohio State University, College of Medicine, Columbus, Ohio 43210  
1973 - 1975

PhD Biochemistry  
University of Arizona, Tucson, Arizona 85721  
1973

## Awards

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European Organization for External Quality Assurance Providers in Laboratory  
Medicine, Adam Uldall Lectureship Award, 2018

Clinical and Laboratory Standards Institute, Russell J. Eilers Memorial Award, 2018

Wadim Roman Traveling Lectureship Award, Australasian Association of Clinical  
Biochemists, 2016

Featured on the cover of *Clinical Chemistry* for an "Inspiring Minds" article, 2016 volume 62 (May), pages 673-5.

Named on *The Pathologist* (UK) 2015 list of the 100 most influential laboratory medicine professionals.

Robert Schaffer Award for Outstanding Achievements in the Development of Standards for Use in Laboratory Medicine, International Federation of Clinical Chemistry and Laboratory Medicine, 2014

Past President's Award, American Association for Clinical Chemistry, 2013

Award for Excellence in Global Leadership in Standards Development, Clinical and Laboratory Standards Institute, 2012

Transatlantic Lectureship Award, Association for Clinical Biochemistry (UK), 2012

Outstanding Lifetime Achievement Award in Clinical Chemistry and Laboratory Medicine, American Association for Clinical Chemistry, 2007

Presidential Citation, American Association for Clinical Chemistry, 2007

Award for Excellence in Consensus Management, Clinical and Laboratory Standards Institute, 2007

Miriam Reiner (2006) and Joseph H. Roe (1997) Awards for Contributions to the Field of Clinical Chemistry, American Association for Clinical Chemistry, Capital Section

## Virginia Commonwealth University and Medical Center Appointments

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Professor, Department of Pathology  
Co-Director of Clinical Chemistry  
Director of Pathology Information Systems

## VCU Service

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Pathology Quality Management Program, Chair  
Pathology Performance Improvement Council  
Hospital Technology Governance Work Group  
Hospital Epic EHR Laboratory Leadership Team, Chair

## Professional Organizations

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American Association for Clinical Chemistry  
Clinical and Laboratory Standards Institute, Delegate for VCUHS

## Professional Service (current)

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National Kidney Foundation-American Society of Nephrology Task Force to Reassess the Inclusion of Race in Diagnosis of Kidney Diseases

Joint Committee for Traceability in Laboratory Medicine, Chair

National Institute of Diabetes and Digestive and Kidney Diseases (NIH),  
Laboratory Working Group, Chair

International Federation of Clinical Chemistry and Laboratory Medicine (IFCC);  
Working group for Commutability in Metrological Traceability, Chair

International Consortium for Harmonization of Clinical Laboratory Results,  
Harmonization Oversight Group

National Glycohemoglobin Standardization Program, Steering Committee

International Organization for Standardization (ISO), Technical Committee 212,  
Clinical laboratory testing and in vitro diagnostic test systems.

United States Technical Advisory Group to ISO Technical Committee 212.

## Editorial Advisory Boards

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*Clinical Chemistry*, Associate Editor

## Recent Invited Presentations

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Reseau de laboratoires de Biologie Medicale Accredites (LABAC), March 8, 2017, Paris, France. "Quality Control and External Quality Assessment."

Korean Society for Laboratory Medicine, Medical Laboratory Tests Standardization Symposium, Daejeon, South Korea, April 12, 2017 "Role of the International Consortium for Harmonization of Clinical Laboratory Results and initiatives with ISO and the US FDA."

Korean Society for Laboratory Medicine, Spring Symposium, Daejeon, South Korea, April 13-14, 2017. "Biomarkers for Chronic Kidney Disease, the Importance of Standardization."

University of Utah and ARUP Laboratories Grand Rounds, April 20, 2017 "Harmonization: why you should care."

EuroMedLab Conference, Athens, Greece, June 15, 2017. Symposium on External Quality Assurance – just a necessary evil or a valuable tool in laboratory management. "How to assess my EQA sample, possibilities and limitations."

American Association for Clinical Chemistry Annual Meeting, San Diego, CA, August 2, 2017; Symposium on Non-harmonized results cause medical errors – unless we prevent them. "Addressing commutability limitations."

Workshop on Reference Materials in Laboratory Diagnostics, Beijing, China, August 30, 2017. "Harmonization of Laboratory Measurement Procedures: Fitting the Pieces Together" and "Utility and Pitfalls of Reference Materials: Lessons Learned."

Peking Union Medical College Hospital, Beijing, China, August 31, 2017 "Harmonization of Laboratory Measurement Procedures."

IFCC WorldLab Conference, Durban, South Africa, October 23, 2017 "Commutability Issues in Standardization of Laboratory Measurement Procedures."

Siemens Healthineers, Glasgow, Delaware, December 15, 2017

"Standardization/Harmonization, Traceability and Importance of Commutability."

Change in Albuminuria and GFR as End Points for Clinical Trials in Early Stages of Chronic Kidney Disease. A Scientific Workshop Collaboration by the National Kidney Foundation, the European Medicines Agency and the U.S. Food and Drug Administration. Silver Spring, MD. March 15-16, 2018. "Laboratory Considerations – Albuminuria and eGFR."

Siemens Healthineers, Tarrytown, NY, June 25, 2018.

"Standardization/Harmonization, Traceability and Importance of Commutability."

American Association for Clinical Chemistry Annual Meeting, Chicago, IL, July 31, 2018; Symposium on Why are harmonized results difficult to achieve; "How to implement a harmonization protocol."

American Association for Clinical Chemistry Annual Meeting, Chicago, IL, July 31, 2018; Workshop on Quality Control, "Overview and Basic Concepts."

Eighth Meeting of the Athena Society, Corfu, Greece, September 6, 2018; "What's wrong with LOINC and aggregated lab data."

European Organization for External Quality Assurance Providers in Laboratory Medicine, 2018 Symposium, Zagreb, Croatia, 18-19 October 2018; Adam Uldall Award Lecture: "Future challenges in EQA, with special emphasis on harmonization and commutability."

International Conference on Laboratory Medicine; Laboratory Medicine 25 Years On, Padova, Italy, 30 October 2018; "The Standardization Journey and the Path Ahead."

IFCC General Conference, Budapest, Hungary, 10-11 November 2018;  
"International Consortium for Harmonization of Clinical Laboratory Results."

Johns Hopkins Renal Grand Rounds, Baltimore, MD, February 1, 2019;

"Laboratory Considerations – Albuminuria and eGFR."

Mayo Clinic Clinical Biochemistry & Immunology, Clinical Core Laboratory Services, Biochemical Genetics Seminar, Rochester, MN, March 7, 2019;

"Standardization of Biomarker Measurements for Chronic Kidney Disease."

Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology, Sevres, France, April 10-11, 2019; workshop on global coordination of standardization activities.

IFCC EuroMedLab 2019, Barcelona, Spain, May 19-23, 2019; conference participant; working group on commutability meeting.

American Association for Clinical Chemistry Annual Meeting, Anaheim, CA, August 7, 2019; Symposium on Putting Quality Control into Practice.

American Association for Clinical Chemistry Annual Meeting, Anaheim, CA, August 8, 2019; Symposium on Removing Laboratory Barriers to CKD Detection and Monitoring: The Laboratory's Role.

North American Menopause Society, Workshop on Normal Ranges for Estradiol in Postmenopausal Women, Chicago, IL, September 23-24, 2019; "Theoretical and Practical Means of Harmonizing Assays and the Ongoing Process of Quality Control."

Joint Committee for Traceability in Laboratory Medicine, Members and Stakeholders Conference, Sevres, France, December 2-3, 2019. Presentation on: "Understanding and Implementing Commutability" and "ISO 21151 Harmonization Protocol." Workshop on reference materials, procedures and measurement laboratories, December 4, 2019.

Labquality Days, February 6-7, 2020, Helsinki, Finland. Harmonization of Medical Laboratory Practices. "The harmonization journey: where are we going."

American Association for Clinical Chemistry Annual Meeting, Virtual, December 13-17, 2020; Symposium on QC and Proficiency Testing: Myths vs. Best Practices; "What really matters in a QC plan."

American Association for Clinical Chemistry Annual Meeting, Virtual, December 13-17, 2020; Symposium on Fighting CKD together: the patient, clinician, and laboratorian perspective; "Laboratory Tests for the Kidney Profile: Opportunities for Improvement in 2020."

## Recent Publications

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Eckfeldt JH, Inker LA, **Miller WG**. In Reply. Performance in Measurement of Serum Cystatin C by Laboratories Participating in the College of American Pathologists 2014 CYS Survey. *Arch Pathol Lab Med* 2016;140:207-8.

Myers GL, **Miller WG**. The International Consortium for Harmonization of Clinical Laboratory Results (ICHCLR) – A pathway for harmonization. *eJIFCC* 2016;27:30-36.

Rifai N, Young IS, Nordestgaard BG, Wierzbicki AS, Vesper H, Mora S, Stone NJ, Genest J, **Miller G**. Nonfasting Sample for the Determination of Routine Lipid Profile: Is It an Idea Whose Time Has Come? *Clin Chem* 2016;62:428-35.

**Miller WG**. Time to Pay Attention to Reagent and Calibrator Lots for Proficiency Testing *Clin Chem* 2016;62:666-7.

**Miller WG**, Horowitz GL, Ceriotti F, Fleming JK, Greenberg N, Katayev A, Jones GRD, Rosner W, Young IS. Reference Intervals: Strengths, Weaknesses and Challenges. *Clin Chem* 2016;62:916-23.

Vesper HW, Myers GL, **Miller WG**. Current practices and challenges in the standardization and harmonization of clinical laboratory tests. *Am J Clin Nutr* 2016;104(Suppl):907S-12S.

Faix JD, **Miller WG**. Progress in standardizing and harmonizing thyroid function tests. *Am J Clin Nutr* 2016;104(Suppl):913S-7S.

**Miller WG**, Nichols JH. Quality Control. In *Contemporary Practice in Clinical Chemistry*, 3rd Edition, ed. by Clarke W, AACC Press 2016, p 47-62.

Bachmann LM, **Miller WG**. Spectrophotometry. In *Contemporary Practice in Clinical Chemistry*, 3rd Edition, ed. by Clarke W, AACC Press 2016, p 81-94.

**Miller WG**, Harmonization of Results among Laboratories. In *Contemporary Practice in Clinical Chemistry*, 3rd Edition, ed. by Clarke W, AACC Press 2016, p 253-262.

**Miller WG.** Quality Control. In: Henry's Clinical Diagnosis and Management by Laboratory Methods, 23rd Edition, ed. by McPherson RA and Pincus MR, Elsevier Saunders 2016, p 112-129.

Parvin C, Person NB, Baumann N, Duan L, Durham AP, Gras J, **Miller G**, Sawchuk ME. Statistical Quality Control for Quantitative Measurement Procedures: Principles and Definitions, Fourth Edition. CLSI document C24, Clinical and Laboratory Standards Institute, Wayne, PA, 2016.

**Miller WG**, Sandberg S. Quality control of the analytical measurement process. In: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th Edition, ed. by Rifai N, Horvath AR, Wittwer C. Elsevier 2017.

Ngo A, Gandhi P, **Miller WG**. Frequency that Laboratory Tests Influence Medical Decisions. J Applied Lab Med 2017;1(4):410-4.

Bachmann LM, Yu M, Boyd JC, Bruns DE, **Miller WG**. State of Harmonization of 24 Serum Albumin Measurement Procedures and Implications for Medical Decisions. Clin Chem 2017;63:770-9.

Phinney K, Sempos C, Vesper H, Botelho J, Tai S, Camara J, Wise S, Myers G, Durazo-Arvizu R, Tian L, Eckfeldt J, Hoofnagle A, **Miller G**, Bachmann L, et al. Baseline Assessment of 25-Hydroxyvitamin D Reference Material and Proficiency Testing/External Quality Assurance Material Commutability: A Vitamin D Standardization Program Study. J AOAC Int. 2017;100(5):1288-93.

**Miller WG**. Harmonization; its time has come. Clin Chem 2017;63:1184-6.

Myers GL, **Miller WG**. Challenge to Coordinate Harmonization Activities on an International Level. Clin Chem 2017;63:1429-30.

**Miller WG**, Seegmiller JC, Lieske JC, Narva AS, Bachmann LM. Standardization of Urine Albumin Measurements: Status and Performance Goals. J Applied Lab Med 2017;2:423-9.

Seegmiller JC, **Miller WG**, Bachmann LM. Moving towards standardization of urine albumin measurements. eJIFCC 2017;28:258-67.

**Miller WG**. Commentary on a Clinical Case Study of a Transgender Man Being Evaluated for a Kidney Transplant. Clin Chem 2017;63:1683.



**Miller WG**, Schimmel H, Rej R, Greenberg N, Ceriotti F, Burns C, Budd JR, Weykamp C, Delatour V, Nilsson G, MacKenzie F, Panteghini M, Keller T, Camara JE, Zegers I, Vesper HW, for the IFCC Working Group on Commutability. IFCC Working Group Recommendations for Assessing Commutability Part 1: General Experimental Design. Clin Chem 2018;64:447-54.

Nilsson G, Budd JR, Greenberg N, Delatour V, Rej R, Panteghini M, Ceriotti F, Schimmel H, Weykamp C, Keller T, Camara JE, Burns C, Vesper HW, MacKenzie F, **Miller WG**, for the IFCC Working Group on Commutability. IFCC Working Group Recommendations for Assessing Commutability Part 2: Using the Difference in Bias Between a Reference Material and Clinical Samples. Clin Chem 2018;64:455-64.

Budd JR, Weykamp C, Rej R, MacKenzie F, Ceriotti F, Greenberg N, Camara JE, Schimmel H, Vesper HW, Keller T, Delatour V, Panteghini M, Burns C, **Miller WG**, for the IFCC Working Group on Commutability. IFCC Working Group Recommendations for Assessing Commutability Part 3: Using the Calibration Effectiveness of a Reference Material. Clin Chem 2018;64:465-74.

**Miller WG**, Jones GRD. Estimated Glomerular Filtration Rate; Laboratory Implementation and Current Global Status. Adv Chronic Kidney Dis 2018;25:7-13. Schwartz GJ, Wang H, Erway B, Nordin G, Seegmiller J, Lieske JC, Bäck S-E, Miller WG, Eckfeldt JH. Multicenter Laboratory Comparison of Iohexol Measurement. J Applied Lab Med 2018;2:711-24.

**Miller WG**, Greenberg N. Commutability of Certified Reference Materials. JCTLM Database Newsletter, Special Report, April 2018.

Myers GL, **Miller WG**. The roadmap for harmonization: status of the International Consortium for Harmonization of Clinical Laboratory Results. Clin Chem Lab Med 2018;56:1667-72.

**Miller WG**. The standardization journey and the path ahead. J Lab and Precis Med 2018;3:87.

**Miller WG**, Bachmann LM, Fleming JK, Delanghe JR, Parsa A, Narva AS. Recommendations for Reporting Low and High Values for Urine Albumin and Total Protein. Clin Chem 2019;65:349-50 (letter).

McEnroe RJ, Dimeski G, Durham AP, Miller JJ, **Miller WG**, Petrides V, Rheinheimer DW, Smith MB, Sonntag O, Warren KL, Zaharik ML. Interference Testing in Clinical Chemistry, Third Edition. CLSI document EP07, Clinical and Laboratory Standards Institute, Wayne, PA, 2018.

**Miller WG**, Sandberg S. Quality Management. In: Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics, 8th Edition, ed. by Rifai N, Horvath AR, Wittwer CT. Elsevier 2019, p 90-107.

**Miller WG**, Plebani M. Why harmonization is essential to realize the manifesto for the future of laboratory medicine. Clin Chim Acta 2019;495:76 (letter).

**Miller WG**, Bachmann LM, Delanghe JR, Inker LA, Jones GRD, Vasalotti JA. Optimal use of biomarkers for chronic kidney disease. Clin Chem 2019;65:949-55.

Danilenko U, Vesper HW, Myers GL, Clapshaw PA, Camara JE, **Miller WG**. An updated protocol based on CLSI document C37 for preparation of off-the-clot serum from individual units for use alone or to prepare commutable pooled serum reference materials. Clin Chem Lab Med 2020;58:368-74.

**Miller WG**, Budd J, Greenberg N, Weykamp C, Althaus H, Schimmel H, Panteghini M, Delatour V, Ceriotti F, Keller T, Hawkins D, Burns C, Rej R, Camara JE, MacKenzie F, van der Hagen E, Vesper H, for the IFCC Working Group on Commutability. IFCC Working Group Recommendations for Correction of Bias Caused by Noncommutability of a Certified Reference Material Used in the Calibration Hierarchy of an End-User Measurement Procedure. Clin Chem 2020;66:769-78.

Ellis AD, Gross AR, Budd JR, **Miller WG**. Influence of reagent lots and multiple measuring systems on estimating the coefficient of variation from quality control data; implications for uncertainty estimation and interpretation of QC results. Clin Chem Lab Med 2020;58:1829-35.

van der Hagen EAE, Weykamp C, Sandberg S, Stavelin AV, MacKenzie F, **Miller WG**. Feasibility for aggregation of commutable external quality assessment results to evaluate metrological traceability and agreement among results. Clin Chem Lab Med 2020 Aug 6;/j/cclm.ahead-of-print/cclm-2020-0736/cclm-2020-0736.xml. doi: 10.1515/cclm-2020-0736. Online ahead of print.

**Miller WG**, Greenberg N. Harmonization/standardization: where are we now. *J Applied Lab Med* 2020; 2020 Nov 26;jfaa189. doi: 10.1093/jalm/jfaa189. Online ahead of print.

**Miller WG**, Greenberg N, Budd J, Delatour V, for the IFCC Working Group on Commutability. The evolving role of traceability in metrological traceability. *Clin Chim Acta* 2021;514:84-9.