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EDUCATION

Doctor of Medicine
Louisiana State University School of Medicine
New Orleans, LA
1983 – 1987

Bachelor of Arts – Chemistry (Cum Luade)
University of Mississippi
Oxford, MS
1979 - 1983

CERTIFICATIONS

Diplomate, American Board of Clinical Lipidology
2005 - Present

Diplomate, American Board of Family Medicine
1990 - Present

LICENSURE

North Carolina Board of Medicine
2002 - Present

Florida Board of Medicine
1994 - Present

MEDICAL TRAINING

Mead Johnson Graduate Fellowship
Washington University Lipid Research Center
St. Louis, MO
1991

Family Medicine Residency
Trover Clinic Foundation
Madisonville, KY
1987 – 1990

FELLOWSHIPS

American Academy of Family Physicians

American Heart Association
Council on Atherosclerosis, Thrombosis, Vascular Biology

National Lipid Association

ACADEMIC APPOINTMENTS

Adjunct Associate Professor, Hypertension and Vascular Disease Center
Wake Forest University School of Medicine
Winston-Salem, NC
2000 - Present

Associate Clinical Professor, Family Medicine
University of Louisville
Louisville, KY
1992 - 1995

Associate Director, Family Practice Residency Program
Trover Clinic Foundation
Madisonville, KY
1990 - 1991

PROFESSIONAL EXPERIENCE

Chief Medical Officer Precision Health Reports, Inc. Raleigh, NC	2020 - Present
Strategic Director / Discipline Director, Cardiovascular Disease LabCorp, Inc. Burlington, NC	2015 - 2019
Chief Medical Officer LipoScience, Inc. Raleigh, NC	2013 - 2014
Chief, Division of Lipoprotein and Metabolic Disorders Presbyterian Cardiovascular Institute Charlotte, NC	2008 - 2010
Medical Director, Lipoprotein Disorders Presbyterian Cardiovascular Institute Charlotte, NC	2005 - 2008
Chief Medical Officer LipoScience, Inc. Raleigh, NC	1999 - 2004

MEDICAL PRACTICE

Lipoprotein & Metabolic Disorders Institute, PLLC Raleigh, NC	2011 - Present
Novant Heart and Wellness Raleigh, NC	2009 - 2010
Presbyterian Heart and Wellness (Formerly Center for Preventive Cardiology) Charlotte, NC	2005 - 2009
Medical Director, Florida Lipid Institute Orlando, FL	1999
Medical Director, Lipid Consultation Program Lake Wales, FL	1994 - 1997
Medical Director, Lipid Treatment Program Trover Clinic Madisonville, KY	1990 - 1994

MILITARY SERVICE

United States Army Reserve Medical Corps	1988 - 1996
Active Duty – Operation Desert Shield / Desert Storm 807th Mobile Army Surgical Hospital Bronze Star – Meritorious Service	1991

PROFESSIONAL MEMBERSHIPS

American Academy of Family Physicians	1990 - Present
American Heart Association	1997 - Present
National Lipid Association Board of Directors	2011 - 2013
Southeast Lipid Association Board of Directors	2009 - 2011
The Florida Lipid Associates Board of Directors	1996 - 2001

JOURNAL EDITORIAL BOARDS

Journal of Clinical Lipidology (Editorial Board)	2006 - Present
Nutrition, Metabolism & Cardiovascular Diseases (Reviewer)	2011 - Present
Atherosclerosis (Reviewer)	2011 - Present
American Journal of Cardiology (Reviewer)	2010 - Present

CLINICAL RESEARCH

Principal Investigator: Protocol ISIS 301012-CS5: Radichol 1: A Randomized, Double-Blind, Placebo-Controlled Study to Assess the Safety and Efficacy of ISIS 301012 as Add-on Therapy in Homozygous Familial HyperCHOLEsterolemia Subjects. (ISIS Pharm)

Principal Investigator: Protocol ISIS 301012-CS6: An Open-Label Extension Study to Assess the Long-Term Safety and Efficacy of ISIS 301012 in Subjects with Familial Hypercholesterolemia (ISIS Pharm)

Principal Investigator: Protocol ISIS 301012-CS7- RADICHOL II: A Randomized, Double-Blind, Placebo-Controlled Study to Assess Efficacy and Safety of ISIS 301012 as Add-on Therapy in Heterozygous Familial HyperCHOLEsterolemia Subjects with Coronary Artery Disease (ISIS Pharm)

Principal Investigator: Protocol ISIS 301012-CS12: A Randomized, Double-Blind, Placebo-Controlled Study to Assess Safety, Exposure and Efficacy of ISIS 301012 as Add-on Therapy in Low to Moderately-High Risk Hypercholesterolemic Subjects (ISIS Pharm)

Principal Investigator: A Randomized, Double-Blind, Parallel-Group Study of Cardiovascular Safety In Osteoarthritis or Rheumatoid Arthritis Patients With or at High Risk for Cardiovascular Disease Comparing Celecoxib with Naproxen and Ibuprofen. Protocol No. A3191172. (Pfizer)

Principal Investigator: A Randomized, Double Blind, Parallel-Group Study of Cardiovascular Safety In Osteoarthritis or Rheumatoid Arthritis Patients With or at High Risk for Cardiovascular Disease Comparing Celecoxib With Naproxen and Ibuprofen, Protocol no: A3191172 (Pfizer)

Sub-Investigator: A Multi-center, Randomized, Double-Blind, "Crossover" Design study to evaluate the Lipid-Altering Efficacy and Safety of MK 0524B combination Tablet Compared to MK-0524A + Simvastatin Co-administration in patients with Primary Hypercholesterolemia and Mixed Dyslipidemia – Protocol 063 (Merck)

Sub-Investigator: A Multicenter, Randomized, Double-Blind, "Crossover" Design Study to Evaluate the Lipid-Altering Efficacy and Safety of MK-0524B Combination Tablet Compared to MK-0524A + Simvastatin Coadministration in Patients with Primary Hypercholesterolemia and Mixed Dyslipidemia – Protocol 063 (Merck)

Publications

Peer Reviewed Publications / Reviews

1. Precision Screening for Familial Hypercholesterolemia Using a Machine Learning Model Applied to Electronic Health Encounter Data. Myers KD, Knowles JW, Staszak D, Shapiro MD, Howard W, Yadava M, Zuzick D, Williamson L, Shah NH, Banda JM, Sharma K, Leader J, Cromwell WC, Trautman E, Murray MF, Baum SJ, Myers S, Gidding SS, Wilemon K, Rader DJ. *The Lancet Digital Health* 2019;1:e393-402.
2. Sniderman AD, Couture P, Martin SB, DeGraaf J, Lawler PR, Cromwell WC, Wilkins JT and Thanassoulis G. Hypertriglyceridemia and Cardiovascular Risk: A cautionary note about metabolic confounding. *Journal of Lipid Research*. 2018.
3. Grabner M, Winegar DA, Puneekar RS, Quimbo RA, Cziraky MJ and Cromwell WC. Cost Effectiveness of Achieving Targets of Low-Density Lipoprotein Particle Number Versus Low-Density Lipoprotein Cholesterol Level. *Am J Cardiol*. 2017;119:404-409.
4. Tehrani DM, Zhao Y, Blaha MJ, Mora S, Mackey RH, Michos ED, Budoff MJ, Cromwell W, Otvos JD, Rosenblit PD and Wong ND. Discordance of Low-Density Lipoprotein and High-Density Lipoprotein Cholesterol Particle Versus Cholesterol Concentration for the Prediction of Cardiovascular Disease in Patients With Metabolic Syndrome and Diabetes Mellitus (from the Multi-Ethnic Study of Atherosclerosis [MESA]). *Am J Cardiol*. 2016;117:1921-7.
5. Cromwell WC and Triffon DW. Clinical Utility of LDL Particle Number to Optimize Management of LDL-Related Cardiovascular Risk. *J Fam Pract*. 2016;66:S1-8.
6. Santos RD, Raal FJ, Donovan JM and Cromwell WC. Mipomersen preferentially reduces small low-density lipoprotein particle number in patients with hypercholesterolemia. *J Clin Lipidol*. 2015;9:201-9.
7. Thomas GS, Cromwell WC, Ali S, Chin W, Flaim JD and Davidson M. Mipomersen, an apolipoprotein B synthesis inhibitor, reduces atherogenic lipoproteins in patients with severe hypercholesterolemia at high cardiovascular risk: a randomized, double-blind, placebo-controlled trial. *J Am Coll Cardiol*. 2013;62:2178-84.
8. Ennis JL and Cromwell WC. Clinical utility of low-density lipoprotein particles and apolipoprotein B in patients with cardiovascular risk. *J Fam Pract*. 2013;62:S1-8.
9. Cromwell WC, Thomas GS, Boltje I, Chin W and Davidson M. Safety and Efficacy of Mipomersen Administered as Add-on Therapy in Patients with Hypercholesterolemia and High Cardiovascular Risk†. *Journal of Clinical Lipidology*. 2012;6:291-292.
10. Goldberg AC, Hopkins PN, Toth PP, Ballantyne CM, Rader DJ, Robinson JG, Daniels SR, Gidding SS, de Ferranti SD, Ito MK, McGowan MP, Moriarty PM, Cromwell WC, Ross JL and Ziajka PE. Familial hypercholesterolemia: screening, diagnosis and management of pediatric and adult patients: clinical guidance from the National Lipid Association Expert Panel on Familial Hypercholesterolemia. *J Clin Lipidol*. 2011;5:133-40.
11. Goldberg AC, Robinson JG, Cromwell WC, Ross JL and Ziajka PE. Future issues, public policy, and public awareness of familial hypercholesterolemias: recommendations from the National Lipid Association Expert Panel on Familial Hypercholesterolemia. *J Clin Lipidol*. 2011;5:S46-51.

12. Davidson MH, Ballantyne CM, Jacobson TA, Bittner VA, Braun LT, Brown AS, Brown WV, Cromwell WC, Goldberg RB, McKenney JM, Remaley AT, Sniderman AD, Toth PP, Tsimikas S, Ziajka PE, Maki KC and Dicklin MR. Clinical utility of inflammatory markers and advanced lipoprotein testing: advice from an expert panel of lipid specialists. *J Clin Lipidol.* 2011;5:338-67.
13. Raal FJ, Santos RD, Blom DJ, Marais AD, Charng M-J, Cromwell WC, Lachmann RH, Gaudet D, Tan JL, Chasan-Taber S, Tribble DL, Flaim JD and Crooke ST. Mipomersen, an apolipoprotein B synthesis inhibitor, for lowering of LDL cholesterol concentrations in patients with homozygous familial hypercholesterolaemia: a randomised, double-blind, placebo-controlled trial. *The Lancet.* 2010;375:998-1006.
14. Cromwell WC and Barringer TA. Low-density lipoprotein and apolipoprotein B: clinical use in patients with coronary heart disease. *Curr Cardiol Rep.* 2009;11:468-75.
15. Cromwell WC, Otvos JD, Keyes MJ, Pencina MJ, Sullivan L, Vasan RS, Wilson PWF and D'Agostino RB. LDL particle number and risk of future cardiovascular disease in the Framingham Offspring Study - Implications for LDL management. *J Clin Lipidol.* 2007;1:583-592.
16. Cromwell WC. High-density lipoprotein associations with coronary heart disease: Does measurement of cholesterol content give the best result? *J Clin Lipidol.* 2007;1:57-64.
17. Jeyarajah EJ, Cromwell WC and Otvos JD. Lipoprotein particle analysis by nuclear magnetic resonance spectroscopy. *Clin Lab Med.* 2006;26:847-70.
18. Cromwell WC and Otvos JD. Heterogeneity of low-density lipoprotein particle number in patients with type 2 diabetes mellitus and low-density lipoprotein cholesterol <100 mg/dl. *Am J Cardiol.* 2006;98:1599-602.
19. Cromwell WC and Otvos JD. Low-density lipoprotein particle number and risk for cardiovascular disease. *Curr Atheroscler Rep.* 2004;6:381-7.
20. Otvos JD, Jeyarajah EJ and Cromwell WC. Measurement issues related to lipoprotein heterogeneity. *Am J Cardiol.* 2002;90:22i-29i.
21. Miller M, Dolinar C, Cromwell W and Otvos JD. Effectiveness of high doses of simvastatin as monotherapy in mixed hyperlipidemia. *Am J Cardiol.* 2001;87:232-4, A9.
22. Cromwell WC and Ziajka PE. Development of tachyphylaxis among patients taking HMG CoA reductase inhibitors. *Am J Cardiol.* 2000;86:1123-7.
23. Cromwell WC, Bystrom K and Eftink MR. Cyclodextrin-adamantanecarboxylate inclusion complexes: studies of the variation in cavity size. *The Journal of Physical Chemistry.* 1985;89:326-332.

Books & Chapters

1. Cromwell W, Dayspring T. Lipid and lipoprotein disorders: Current clinical solutions. Baltimore: International Guideline Center; 2012.
2. Cromwell W. Treatment of adults and children with familial hypercholesterolemia and evidence for recommendations. In: Toth PP ed. Familial Hypercholesterolemia: Current dilemmas and emerging solutions in screening and treatment. 2012

3. Cromwell WC, Dayspring T, Richman MF. Lipid and lipoprotein disorders: Current clinical solutions. Baltimore: International Guidelines Center; 2009.
4. Cromwell WC. Clinical utilization of advanced lipid testing. In: Toth PP, Sica DA, eds. Clinical challenges in lipid disorders. Oxford: Clinical Publishing; 2008:249-259.
5. Cromwell WC, Otvos JD. Clinical utilization of lipoprotein subfractions. In: Davidson MH, Toth PP, Maki KC, eds. Therapeutic lipidology. Totowa: Humana Press; 2007:321-348.
6. Cromwell WC, Bays HE, Toth PP. Lipoprotein subfraction analysis using nuclear magnetic resonance spectroscopy. In: Adams JE, Apple F, Jaffe AS, eds. Markers in cardiology: A case-oriented approach. London: Blackstone; 2007:217-250.
7. Ziajka PE, Cromwell WC. Establishing and managing a private practice lipid clinic. Philadelphia: Mosby-Wolfe; 2000.

Abstract Publications

1. Brinton EA, Ballantyne CM, Bays HE, Cromwell W, Otvos J, Philip S, Doyle R and Juliano RA. Effects of Icosapent Ethyl on Lipoprotein Particle Concentration and Size in Statin- Treated Patients with Persistent High Triglycerides: ANCHOR Patients with Diabetes Mellitus. Diabetes. 2016;65:A308.
2. Toth PP, Grabner M, Punekar RS, Quimbo RA, Cziraky MJ, Pourfarzib R, Cromwell WC, Winegar DA, Jacobson TA. Journal of Managed Care Speciality Pharmacy. 2015 Apr;21(4 Suppl A):1-96.
3. Toth PP, Grabner M, Punekar R, Quimbo R, Cziraky M, Pourfarzib R, Cromwell W, Winegar D, Jacobson T. Comparison of cardiovascular events between patients achieving low- density lipoprotein particle targets and patients achieving low-density lipoprotein cholesterol targets in a mixed primary/secondary prevention sample. Journal of the American College of Cardiology. 2015;65
4. Cromwell WC, Thomas GS, Boltje I, Chin W, Davidson M. Safety and efficacy of mipomersen administered as add-on therapy in patients with hypercholesterolemia and high cardiovascular risk. Journal of Clinical Lipidology. 2012;6:291-292.
5. Cromwell WC, Thomas GS, Boltje I, Chin W, Davidson M. Safety and Efficacy of Mipomersen Administered as Add- on Therapy in Patients with Hypercholesterolemia and High Cardiovascular Risk. J Am Coll Cardiol 2011;57: E504.
6. Cromwell WC, Santos RD, Blom DJ, Marais DA, Lachmann RH, Gaudet D, Tan JL, Chasan- Taber S, Tribble DL, Flaim J, Raal FJ, Charng M-J. Mipomersen, a first-in-class apolipoprotein b synthesis inhibitor, lowers lipoprotein (a) in patients with homozygous familial hypercholesterolemia. Journal of Clinical Lipidology. 2010;4:22.
7. Cromwell W, Santos R, Blom D, Marais AD, Charng MJ, Lachmann R, Gaudet D, Tan JL, Tribble D, Flaim J, Chasan-Taber S, Donovan J, Raal F. P431 Mipomersen, an apo B Synthesis Inhibitor, Preferentially Reduces Small LDL Particle Number and Increases LDL Particle Size in HoFH Patients. Atherosclerosis. Supplements 2010;11:107-108.

8. Cromwell W, Dufour R, Gagne C, Gaudet D, East C, Donovan JM, Chin W, Tribble DL, McGowan M. Mipomersen, An Apolipoprotein B Synthesis Inhibitor, Reduces Small LDL Particle Number and Increases LDL Particle Size in Patients with Heterozygous Familial Hypercholesterolemia and Coronary Artery Disease. *Circulation* 2010;122:A19931.
9. Raal F, Santos R, Niu D-M, Lachmann RH, Gaudet D, Le Tan J, Cromwell WC, Marais D, Tribble DL, Flaim JD, Crooke ST. Abstract 1311: Mipomersen, a first-in-class apo-b synthesis inhibitor, lowers ldl-c in patients with homozygous familial hypercholesterolemia: Results of a phase iii study. *Circulation*. 2009;120:S475-b-476.
10. Cromwell W, Santos R, Lachmann R, Gaudet D, Tan JL, Marais D, Raal F. Abstract 1312: Mipomersen, a first-in-class apolipoprotein b synthesis inhibitor, lowers lp(a) in patients with homozygous familial hypercholesterolemia and high baseline lp(a): Results of a phase iii study. *Circulation*. 2009;120:S47.
11. Cromwell WC, Otvos JD. LDL Particle Number is Highly Heterogeneous Among Patients With Type 2 Diabetes Mellitus At LDL Cholesterol Target Goal <100 mg/dL . *Circulation* 2005;112:II-786.
12. Otvos J, Cromwell W, Shalaurova I, Parise H, Wilson P, Robins S, D'Agostino R, Schaefer E. LDL particles, but not LDL cholesterol, are highly elevated in the metabolic syndrome – Results from the Framingham Offspring Study. *Circulation* 2003;108:IV-740.
13. Otvos J, Cromwell W, Alexander C, et al. Effects of simvastatin and atorvastatin on total and fractionated HDL cholesterol. (XIIth International Symposium on Atherosclerosis, June 2000, Stockholm, Sweden) *Atherosclerosis* 2000; 151(1):48
14. Bhatnagar D, Cromwell WC, Roskoski R. Fluorescence polarization studies on the ATP binding site of hexokinase. *Fed Proc*. 1985;44:1812
15. Eftink MR, Riggins M, Cromwell W. Thermodynamic and fluorescence studies of the pH dependence of the binding of NAD⁺ to liver alcohol dehydrogenase. *Biophys J*. 1983; 41:306.

Presentations

National and International Meetings

> 250 Lectures on topics including:

Evaluation and Treatment of Dyslipoproteinemia

Role of Lipoprotein Quantification in Evaluation and Management of Atherosclerosis

Pathophysiology of Atherosclerosis

Lipoprotein Abnormalities in the Metabolic Syndrome

Lipoprotein Abnormalities in Type 2 Diabetes Mellitus

Local/Regional Meetings

> 2000 Lectures on topics including:

Evaluation and Treatment of Dyslipoproteinemia

Role of Lipoprotein Quantification in Evaluation and Management of Atherosclerosis

Pathophysiology of Atherosclerosis

Lipoprotein Abnormalities in the Metabolic Syndrome

Lipoprotein Abnormalities in Type 2 Diabetes Mellitus

I confirm the information in this document is accurate as of June 1, 2021.