



CEDARS-SINAI®

ANDERS HAYDEN BERG

CURRICULUM VITAE

January 8, 2019

PROFESSIONAL CONTACT INFORMATION

Cedars-Sinai Medical Center
8700 Beverly Blvd.
Advanced Health Sciences Pavilion Room A8110B
Phone: (310) 248-8150 Email: Anders.Berg@cshs.org

EDUCATION:

7/1992 – 6/1996	B.A.	Physics	University of Iowa
7/1996 – 6/2004	M.D.	Medicine	Albert Einstein College of Medicine
7/1996 – 6/2004	Ph.D.	Cell Biology	Albert Einstein College of Medicine
7/2004 – 9/2007	Residency	Clinical Pathology	Brigham and Women's Hospital

LICENSURE:

Massachusetts Board of Registration in Medicine, Lic. #232560
Medical Board of California, Certificate No. C155375

BOARD CERTIFICATION:

2007 – present Clinical Pathology - American Board of Pathology

PROFESSIONAL EXPERIENCE:

Present Position:

8/1/2018 – present Associate Director of Core Laboratories, Cedars-Sinai Medical Center
Associate Professor of Pathology (acting), Cedars-Sinai Medical Center
Pathologist III, Beverly Pathology

Previous Positions:

10/01/2007 – 07/30/2018 Associate Director of Clinical Chemistry Beth Israel Deaconess Medical Center
10/01/2007 – 02/01/2013 Instructor of Pathology, Harvard Medical School

02/01/2013 – 07/30/2018 Assistant Professor of Pathology, Harvard Medical School

PROFESSIONAL ACTIVITIES:

Committee Services:

CSMC:

08/01/2018 – present Director of Quality Assurance, Pathology Quality Steering Committee

Other Committee Services:

01/01/2008 – 12/31/2013 Member, CME review committee, American Association of Clinical Chemists

06/01/2018 - present Member, Nominating and awards committee, Academy of Clinical Laboratory Physicians and Scientists

01/01/2011 – 12/31/2018 Reviewer, Research Grant Review Committee, American Diabetes Association

05/28/2015 – 05/28/2015 Reviewer, NIDDK Special Emphasis Panel SRG ZDK1 GRB-S

Professional Associations/Society Memberships:

2007 – present American Association of Clinical Chemists

2007 – present American Diabetes Association

2013 – present American Society of Nephrology

Editorial Services:

Peer reviewer for following scientific journals:

Nature Reviews Nephrology

Journal of Biological Chemistry

Clinical Chemistry

PLOS One

Journal of American Society of Nephrology

American Journal of Kidney Disease

Atherosclerosis

Endocrinology

Obesity Journal

Journal of Lipid Research

Clin Chim Akta

Hormone and Metabolism Research

Nutrients Journal

Hypertension and Pregnancy

International Journal of Endocrinology

Consulting Activities:

None

Community Services:

None

HONORS AND SPECIAL AWARDS:

07/01/1997 – 09/30/1997 Medical Student Cancer Fellowship, Albert Einstein College of Medicine

07/01/2001 – 06/30/2003 Physician-Scientist Training Award, American Diabetes Association

02/01/2006 Paul E. Stranjord Younger Investigator Award, Academy of Clinical Laboratory Physicians and Scientists

07/01/2015 Harold Dvorak Young Investigator Award, Beth Israel Deaconess Medical Center Chief Academic Officer Pilot Grant Program

RESEARCH GRANTS AND FELLOWSHIPS RECEIVED:**Active/Ongoing:**

R01 HL133399 (PI: Berg) 3/29/2018 – 3/29/2022
NIH/NHLBI \$250,000

Protein carbamylation and uremic cardiomyopathy in chronic kidney disease

This project will evaluate the association between serum carbamylated albumin and mortality risk in non-dialyzed participants from the German Chronic Kidney Disease (GCKD) study, and will utilize mouse models to test whether high urea combined with PGC-1 alpha deficiency have synergistic effects on loss of cardiac function in uremia.

Role: PI, 25% effort

R03 DK115793-01 (PI: Khankin) 9/16/2017-8/31/2019
NIH/NIDDK \$50,000

Mechanisms of Dyslipidemia following Preeclampsia

In this proposal we will evaluate mechanisms associated with elevations of lipids in preeclamptic patients. We will use the mouse model of preeclampsia and human serum samples collected in preeclamptic and normal pregnancies.

Role: Other significant contributor, 5% effort

Inactive/Completed:

ADA Junior Faculty Award (PI: Berg) 01/01/11 – 12/31/13
American Diabetes Association \$114,380

Development of a novel assay for hemoglobin A_{1c} adjusted for age of patient's erythrocytes

Validate a novel assay for a biomarker of erythrocyte age and test its ability to correct for the effects of anemias on measurements of hemoglobin A_{1c}.

BIDMC CAO Award (PI: Berg) 6/1/2014 – 12/31/2015
Institutional funding \$100,000
Title: Testing the benefits of nocturnal hemodialysis in ESRD patients with high carbamylated albumin levels

The aim of this grant is to measure carbamylated albumin levels in patients before and after initiation of nocturnal hemodialysis in order to determine whether nocturnal HD reduces protein carbamylation and whether this is associated with improvements in cardiac function and other clinical endpoints.

ADA Innovation Award (PI: Berg) 1/1/2015 – 12/31/2016
American Diabetes Association \$100,000
Award No. 7-14-IN-02

Title: Carbamylated Albumin May Predict Which Patients Benefit from Intensive Hemodialysis
The aim of this project is to determine whether intensive intermittent hemodialysis in HEMO study subjects reduced protein carbamylation and associated mortality risk.

K08 HL121801 (PI: Berg) 9/1/14 – 5/31/18
NIH/NHLBI \$152,200

The role of carbamylation in uremia associated heart disease

The aim of this project is to test the effects of urea and cyanate-induced protein carbamylation on cardiac pathology in mouse models of uremia.

Role: PI, 75% effort

Baxter Renal Clinical Evidence Council (PI: Perl) 1/1/2016 – 12/31/2018
Baxter Pharmaceuticals \$72,734

Title: “Effects of glucose-sparing, low glucose degradation products on amino acid-containing peritoneal dialysis solutions on levels of carbamylated albumin: results from the IMPENDIA, and EDEN Clinical trials” The aim of this project is to measure carbamylated albumin levels in patients on peritoneal dialysis to determine whether amino acid-supplemented PD solutions reduce protein carbamylation

Role: Co-investigator, 5% effort

R56 HL1333399 (PI: Berg) 9/16/16-8/31/2017
NIH/NHLBI \$250,000

Protein Carbamylation and Uremic Cardiomyopathy in Chronic Kidney Disease

This project will evaluate the association between serum carbamylated albumin and mortality risk in non-dialyzed participants from the German Chronic Kidney Disease (GCKD) study, and will utilize mouse models to test whether high horourea combined the PGC-1 alpha deficiency have synergistic effects on loss of cardiac function in uremia.

Role: PI, 25% effort

R01 DK095072-05A1 (PI: Parikh) 12/15/2017–6/30/2021
NIH/NIDDK \$282,837

Mitochondrial Biogenesis in Kidney Disease

The major goal of this project is to understand the role of the mitochondrial biogenesis regulator PGC1 in different forms of kidney injury.

Role: Co-I, 5% effort

R35 HL139424-01 (PI: Parikh)

12/1/2017-11/30/2024

NIH/NHLBI

\$605,642

Mitochondrial Biogenesis in Kidney Disease

The major goal of this project is to understand the role of the mitochondrial biogenesis regulator PGC1 in different forms of kidney injury.

Role: Co-investigator, 5% effort

R01 MD007092-06 (PI: Pollak/ Friedman)

06/01/2017 – 01/31/2022

NIH/NIMHD

\$250,000

Role: Co-I

APOL1 variants: Understanding the basis of disparities in rates of kidney disease

This application proposes to identify additional human genetic and non-genetic modifiers of the APOL1-related kidney phenotype.

Role: Co-investigator, 5% effort

Pending Grants:

R01 DK 095072-01 (PI: Parikh)

9/1/2017 – 8/31/2022

0.6 calendar

NIH

\$282,837

Mitochondrial Biogenesis in Kidney Disease

The major goal of this project is to understand the role of the mitochondrial biogenesis regulator PGC1 in different forms of kidney injury.

Role: Co-I

R35 HL139424-01 (PI: Parikh)

12/1/17-11/30/2024

0.6 calendar

NIH/NHLBI

\$605,642

Tie2-Driven Vascular control Pathways in Critical Illness

The goal of this project is to develop the core hypothesis that the Tie2 axis may be a crucial determinant of the host vascular response in sepsis.

Role: Co-I

RESEARCH FOCUS AND INTERESTS:

I am a physician-scientist with a focus on focus on the metabolic pathophysiology and diagnostic challenges of kidney disease, diabetes mellitus, and their complications. My laboratory is engaged in translational research, using animal models and human clinical correlation studies to understand the pathophysiology of uremia, and developing mass spectrometric diagnostic tests for kidney disease, diabetes mellitus, and vitamin D deficiency.

INVITED LECTURES AND PRESENTATIONS:

1. "The adipocyte-secreted protein Acrp30 enhances liver insulin sensitivity." Televised interview on MSNBC new program "Newsfront" with Lester Holt on discussion of recent paper published in Nature Medicine, 2001.
2. "Laboratory evaluation of serum testosterone: biochemical review, clinical guidelines, and proposed changes in our current laboratory methods." BIDMC Endocrine Grand Rounds, 2010.
3. "Update on testing for anti-neutrophil cytoplasmic antibodies for diagnosis of autoimmune vasculitides." BIDMC Nephrology Clinical Conference, 2012.
4. "Protein carbamylation: new insights into the chemical pathology and treatment of chronic kidney disease." Harvard/Longwood Pathology Grand Rounds and Mini Symposium on Emerging Technologies in Diagnosis and Therapy. 2012
5. "Protein Carbamylation Is Due to Urea-Amino Acid Imbalance and Predicts Kidney Failure Mortality" Invited oral abstract presentation at American Society of Nephrology annual conference, San Diego, CA. 2012
6. BIDMC Renal Biology Grand Rounds. Title: "Protein carbamylation and Cardiovascular Mortality in ESRD" 2013
7. BWH Clinical Pathology Conference. Title: "Kidney failure, protein carbamylation, and cardiovascular disease." 2013
8. "Biomarkers in Kidney disease" Biomarkers in cardiorenal disease International conference hosted by the University of Wurtzburg. Keynote speaker. 2014
9. "The Influence of Vitamin D Binding Proteins on 25 Hydroxy Vitamin D Levels" Invited 90-minute presentation for CME/CE credit at the Northeast Laboratory Conference. Sponsored by Maine/New Hampshire State Society of American Medical Technologists. 2014
10. "Protein and amino acid carbamylation in CKD" Invited talk at the American Society of Nephrology annual Kidney Week Conference. San Diego, CA. 2014
11. "Carbamylated proteins in CKD: A role for atherosclerosis" session. Invited talk at the American Society of Nephrology Annual Kidney Week Conference. San Diego, CA. 2015
12. "24,25-dihydroxyvitamin D3 and vitamin D status of community-dwelling black and white americans." Recorded interview podcast for the journal Clinical Chemistry. June 29, 2015
13. "Carbamylated albumin and uremic cardiomyopathy," Biomarkers of the Cardiorenal axis international conference hosted by University of Wurtzburg, Keynote speaker. 2016
14. BWH Clinical Pathology Conference. Title: "Carbamylated albumin and glycated albumin: investigational assays for possible therapeutic monitoring and treatment of patients with diabetic kidney disease." 2016
15. "Metabolism and Measurement of Vitamin D." National Kidney Foundation Workshop on Vitamin D in Stage 3-4 Chronic Kidney disease. Atlanta, GA. 2017
16. "High glycated albumin and mortality in persons with diabetes mellitus on hemodialysis." Recorded interview podcast for the journal Clinical Chemistry. March 1, 2017

17. "Systems based approach to investigating the Vitamin D paradox in Black Americans." NIH Office of Dietary Supplements and the National Institute on Minority Health and Health Disparities conference. 2017
18. "FGF-23, Phosphate, and Vitamin D: Pieces of a Challenging Puzzle, Including the Donald W. Seldin, MD, Memorial Lectureship." American Society of Nephrology Annual Kidney Week Conference. San Diego, CA. 2018
19. "Carbamylated albumin update 2018" Biomarkers of the Cardiorenal axis international conference hosted by University of Wurzburg, Keynote speaker.
20. "Which Methods for Determining Glomerular Filtration Rate Most Strongly Associate with Risk of Progression of Kidney Disease?" Recorded interview podcast for the journal Clinical Chemistry. March 20, 2019

TEACHING ACTIVITIES:

Clinical Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2007-2018	Beth Israel Deaconess Medical Center Clinical chemistry core rotation didactics Provided to pathology residents	Clinical laboratory Formal didactics are approximately 1 hour/day each day of my 17 weeks of annual clinical service (~85 didactic sessions annually).
2009-2018	Beth Israel Deaconess Medical Center Clinical chemistry core rotation didactics Provided to visiting chemistry fellows from Childrens Hospital Boston	Clinical laboratory Fellows rotate through our laboratory approximately 2 months of the year, attending same didactics as residents
2014-2017	Harvard Medical School Models of Disease Boot Camp faculty supervisor	Faculty supervisor for 3 sessions of this course (7/10/14 and 10/28/14).
2018-present	CSMC Chemistry core rotation lectures (3) on Immunoassays, Chromatography, and Mass spectrometry	Prepared didactic lectures on 3 core topics in Clinical Chemistry training

Non-clinical Teaching

Supervised Research Trainees

2008-2010	Yan Zhang, Ph.D. Post-doctoral research fellow. Development of assay for deamidated carbonic anhydrase and assay for age-adjusted Hb A _{1c} . Dr. Zhang has gone on to complete training in Clinical Chemistry at Children's Hospital and is now an assistant director at the University of Rochester hospital.
2008-2010	Sergey Pyatibrat, M.D. Resident research associate. Collection of cases for clinical studies of age-adjusted Hb A _{1c} .
Nov. 2009-Nov. 2010	Eric Yee, M.D. Resident research associate. Development of assay for acetaldehyde-modified hemoglobin and serum 2,3-butanediol as biomarkers of chronic alcohol abuse.

- 2010 - 2011 Stephanie Intriago, undergraduate research volunteer. Senior thesis project validating assay for urine fructosyl-lysine, a glycated amino acid increased in diabetes mellitus.
- 2011 Quyen Nguyen, M.D. Resident research associate. Collection of cases for clinical studies of age-adjusted Hb A_{1c}.
- 2012-2013 Wenda Ramma, PhD. Post-doctoral fellow. Dr. Ramma is assisting with both the Bioavailable Vitamin D and Carbamylated albumin assay projects.
- 2013 Daniel Xia, MD. Resident research associate. Clinical case study project.
- 2013 - 2014 Tamar Hod, MD. Post-doctoral research fellow in laboratory of Ananth Karumanchi. Co-mentor for Dr. Hod through projects on Vitamin D deficiency in heart disease and amino acid deficiency in patients with chronic kidney disease.
- 2014 Emily Calin Goins, undergraduate research volunteer during summer. Learned tissue culture and RNA analysis in project seeking to test effects of urea on muscle cells.
- 2015 – 2018 Christina Chen, MD. Co-mentor for Dr. Chen through project on association between glycated albumin and survival in patients with diabetic end stage renal disease.
- 2015 – 2016 Monica Sircar, MD. Co-mentor for Dr. Sircar for project on biomarkers for gestational diabetes mellitus.
- 2015 – 2016 Khuloud Shukha, MD. Nephrology research fellow. Co-mentor for Dr. Shukha for project on serum ApoL1 levels in patients after liver transplant and in babies with intrauterine growth restriction.
- 2016 Pirianthini Suntharalingam. Medical student research volunteer. Mentored on project studying effects of urea on muscle PGC-1 alpha transcription factor.
- 2016 – 2017 Ken Ralto, MD. Nephrology research fellow. Co-mentor for Dr. Ralto on project study role of nicotinamide and its metabolites in the pathophysiology of acute kidney injury and kidney failure.
- 2016 – 2017 Tim Bergmann, Medical student. Project on effects of urea and carbamylation on PGC-1 alpha expression in cultured cardiac myocytes.
- 2016 – 2018 Mahtab Tavasoli, PhD. Post-doctoral fellow. Mentored project studying effects of urea on cardiac physiology in mouse models of uremia.

BIBLIOGRAPHY/PUBLICATIONS:

A.) Research Papers – Peer-Reviewed

1. Engelman JA, **Berg AH**, Lewis RY, Lin A, Lisanti MP, Scherer PE. Constitutively active mitogen-activated protein kinase kinase 6 (MKK6) or salicylate induces spontaneous 3T3-L1 adipogenesis. *J Biol Chem.* 1999;274(50):35630-8.
2. Lin Y, Lee H, **Berg AH**, Lisanti MP, Shapiro L, Scherer PE. The lipopolysaccharide-activated toll-like receptor (TLR)-4 induces synthesis of the closely related receptor TLR-2 in adipocytes. *J Biol Chem.* 2000;275(32):24255-63.
3. Engelman JA, **Berg AH**, Lewis RY, Lisanti MP, Scherer PE. Tumor necrosis factor α -mediated insulin resistance, but not dedifferentiation, is abrogated by MEK1/2 inhibitors in 3T3-L1 adipocytes. *Mol Endocrinol.* 2000;14(10):1557-69.
4. **Berg AH**, Combs TP, Du X, Brownlee M, Scherer PE. The adipocyte-secreted protein Acrp30 enhances hepatic insulin action. *Nat Med.* 2001;7(8):947-53.
5. Combs TP, **Berg AH**, Obici S, Scherer PE, Rossetti L. Endogenous glucose production is inhibited by the adipose-derived protein Acrp30. *J Clin Invest.* 2001;108(12):1875-81.
6. Combs TP, Wagner JA, Berger J, Doebber T, Wang WJ, Zhang BB, Tanen M, **Berg AH**, O'Rahilly S, Savage DB, Chatterjee K, Weiss S, Larson PJ, Gottesdiener KM, Gertz BJ, Charron MJ, Scherer PE, Moller DE. Induction of adipocyte complement-related protein of 30 kilodaltons by PPAR γ agonists: a potential mechanism of insulin sensitization. *Endocrinology.* 2002;143(3):998-1007.
7. Menzaghi C, Ercolino T, Di Paola R, **Berg AH**, Warram JH, Scherer PE, Trischitta V, Doria A. A haplotype at the adiponectin locus is associated with obesity and other features of the insulin resistance syndrome. *Diabetes.* 2002;51(7):2306-12.
8. Gabriely I, Ma XH, Yang XM, Atzmon G, Rajala MW, **Berg AH**, Scherer P, Rossetti L, Barzilai N. Removal of visceral fat prevents insulin resistance and glucose intolerance of aging: an adipokine-mediated process? *Diabetes.* 2002;51(10):2951-8.
9. Combs TP, **Berg AH**, Rajala MW, Klebanov S, Iyengar P, Jimenez-Chillaron JC, Patti ME, Klein SL, Weinstein RS, Scherer PE. Sexual differentiation, pregnancy, calorie restriction, and aging affect the adipocyte-specific secretory protein adiponectin. *Diabetes.* 2003;52(2):268-76.
10. Pajvani UB, Du X, Combs TP, **Berg AH**, Rajala MW, Schulthess T, Engel J, Brownlee M, Scherer PE. Structure-function studies of the adipocyte-secreted hormone Acrp30/adiponectin. Implications for metabolic regulation and bioactivity. *J Biol Chem.* 2003;278(11):9073-85.
11. Combs TP, Pajvani UB, **Berg AH**, Lin Y, Jelicks LA, Laplante M, Nawrocki AR, Rajala MW, Parlow AF, Cheeseboro L, Ding YY, Russell RG, Lindemann D, Hartley A, Baker GR, Obici S, Deshaies Y, Ludgate M, Rossetti L, Scherer PE. A transgenic mouse with a deletion in the collagenous domain of adiponectin displays elevated circulating adiponectin and improved insulin sensitivity. *Endocrinology.* 2004;145(1):367-83.
12. Qi Y, Takahashi N, Hileman SM, Patel HR, **Berg AH**, Pajvani UB, Scherer PE, Ahima RS. Adiponectin acts in the brain to decrease body weight. *Nat Med.* 2004;10(5):524-9.
13. **Berg AH**, Lin Y, Lisanti MP, Scherer PE. Adipocyte differentiation induces dynamic changes in NF- κ B expression and activity. *Am J Physiol Endocrinol Metab.* 2004;287(6):E1178-88.
14. Lin Y, **Berg AH**, Iyengar P, Lam TK, Giacca A, Combs TP, Rajala MW, Du X, Rollman B, Li W, Hawkins M, Barzilai N, Rhodes CJ, Fantus IG, Brownlee M, Scherer PE. The

hyperglycemia-induced inflammatory response in adipocytes: the role of reactive oxygen species. *J Biol Chem*. 2005;280(6):4617-26.

15. Hertzell AV, Smith LA, **Berg AH**, Cline GW, Shulman GI, Scherer PE, Bernlohr DA. Lipid metabolism and adipokine levels in fatty acid-binding protein null and transgenic mice. *Am J Physiol Endocrinol Metab*. 2006;290(5):E814-23.
16. Darabi K, **Berg AH**. Rituximab can be combined with daily plasma exchange to achieve effective B-cell depletion and clinical improvement in acute autoimmune TTP. *Am J Clin Pathol*. 2006;125(4):592-7.
17. Melanson SE, **Berg A**, Jarolim P, Tanasijevic MJ, McElrath TF. Validation of a formula that calculates the estimated risk of respiratory distress syndrome. *Obstet Gynecol*. 2006;108(6):1471-6.
18. Gao D, Wan L, Inuzuka H, **Berg AH**, Tseng A, Zhai B, Shaik S, Bennett E, Tron AE, Gasser JA, Lau A, Gygi SP, Harper JW, DeCaprio JA, Toker A, Wei W. Rictor forms a complex with Cullin-1 to promote SGK1 ubiquitination and destruction. *Mol Cell*. 2010 Sep 10;39(5):797-808.
19. Powe CE, Ricciardi C, **Berg AH**, Erdenesanaa D, Collerone G, Ankers E, Wenger J, Karumanchi SA, Thadhani R, Bhan I. Vitamin D binding protein modifies the vitamin D-bone mineral density relationship. *J Bone Miner Res*. 2011 Jul;26(7):1609-16. PMID: 21416506
20. Wan L, Zou W, Gao D, Inuzuka H, Fukushima H, **Berg AH**, Drapp R, Shaik S, Hu D, Lester C, Eguren M, Malumbres M, Glimcher LH, Wei W. Cdh1 regulates osteoblast function through an APC/C-independent modulation of Smurf1. *Mol Cell*. 2011 Dec 9;44(5):721-33. PMID: 22152476
21. de Koning L, Al-Turkmani MR, **Berg AH**, Shkreta A, Law T, Kellogg MD. Variation in clinical Vitamin D status by DiaSorin Liaison and LC-MS/MS in the presence of elevated 25-OH vitamin D(2). *Clin Chim Acta*. 2012 Sep 10;415C:54-58. PMID: 22975531
22. Bansal N, Hsu CY, Whooley M, **Berg AH**, Ix JH. Relationship of urine dopamine with phosphorus homeostasis in humans: the heart and soul study. *Am J Nephrol*. 2012;35(6):483-90. PMID: 22572568.
23. Bhan I, Powe CE, **Berg AH**, Ankers E, Wenger JB, Karumanchi SA, Thadhani RI. Bioavailable vitamin D is more tightly linked to mineral metabolism than total vitamin D in incident hemodialysis patients. *Kidney Int*. 2012 Jul;82(1):84-9. PMID: 22398410
24. Gifford AE, **Berg AH**, Lahiff C, Cheifetz AS, Horowitz G, Moss AC. A Random Urine Test Can Identify Patients at Risk of Mesalamine Non-Adherence: A Prospective Study. *Am J Gastroenterol*. 2013 Jan 8. PMID: 23295279
25. **Berg AH (corresponding author)**, Drechsler C, Wenger J, Buccafusca R, Hod T, Kalim S, Ramma W, Parikh SM, Steen H, Friedman DJ, Danziger J, Wanner C, Thadhani R, Karumanchi SA. Carbamylation of Serum Albumin as a Risk Factor for Mortality in Patients with Kidney Failure. *Science Translational Medicine*. 2013 Mar 6;5(175). PMID: 23467560
26. Kalim S, Tamez H, Wenger J, Ankers E, Trottier CA, Deferio JJ, **Berg AH**, Karumanchi SA, Thadhani RI. Carbamylation of Serum Albumin and Erythropoietin Resistance in End Stage Kidney Disease. *Clin J Am Soc Nephrol*. 2013 Aug 22. PMID: 23970130.
27. Welles CC, Whooley MA, Karumanchi SA, Hod T, Thadhani R, **Berg AH**, Ix JH, Mukamal KJ. Vitamin D Deficiency and Cardiovascular Events in Patients with Coronary Heart Disease: Data from the Heart and Soul Study. *American Journal of Epidemiology*. 2014 Apr. 3 PMID: 24699783.

28. Powe CE, Evans MK, Wenger J, Zonderman AB, **Berg AH**, Nalls M, Tamz H, Zhang D, Bhan I, Karumanchi A, Powe NR, Thadhani R. Vitamin D-Binding Protein and Vitamin D Status of Black Americans and White Americans. *N Engl J Med* 2013; 369(21):1991-2000 November 21, PMID: 24256378.
29. Moss AC, Lillis Y, Edwards George JB, Choudhry NK, **Berg AH**, Cheifetz AS, Horowitz G, Leffler DA. Attitudes to Mesalamine Questionnaire: A Novel Tool to Predict Mesalamine Nonadherence in Patients with IBD. *Am J Gastroenterol*. 2014 Jun 10. doi: 10.1038/ajg.2014.158. [Epub ahead of print] PMID: 24913040.
30. Felton F, Ganetsky M, **Berg AH**. Osmolal Gap without Anion Gap in a 43-year-old Man. *Clin Chem* 2014; 60(3): 446-448.
31. Xia D, McShine R, **Berg AH**. Misleading hemoglobin A1c levels in a patient with paroxysmal nocturnal hemoglobinuria. *Am J Clin Pathol*. 2014 Aug;142(2):261-5. PMID: 25015870.
32. Drechsler C, Kalim S, Wenger J, Suntharalingam P, Hod T, Thadhani R, Karumanchi SA, Wanner C, **Berg AH**. Protein carbamylation is associated with heart failure and mortality in diabetic patients with end stage kidney disease. **Kidney Int**. 2015 Feb 11. PMID: 25671766.
33. Kalim S, Ortiz G, Trottier CA, Deferio JJ, Karumanchi SA, Thadhani RI, **Berg AH**. The Effects of Parenteral Amino Acid Therapy on Protein Carbamylation in Maintenance Hemodialysis Patients. *J Ren Nutr*. 2015 Mar 5. PMID: 25753604.
34. March MI, Geahchan C, Wenger J, Raghuraman N, **Berg A**, Haddow H, Mckee BA, Narcisse R, David JL, Scott J, Thadhani R, Karumanchi SA, Rana S. Circulating Angiogenic Factors and the Risk of Adverse Outcomes among Haitian Women with Preeclampsia. *PLoS One*. 2015 May 12;10(5). PMID: 25965397; PMCID: PMC4428697.
35. **Berg AH**, Powe CE, Evans MK, Wenger J, Ortiz G, Zonderman AB, Suntharalingam P, Lucchesi K, Powe NR, Karumanchi SA, Thadhani RI. 24,25-Dihydroxyvitamin D3 and Vitamin D Status of Community-Dwelling Black and White Americans. *Clin Chem*. 2015 Apr 28. PMID: 25922442.
36. de Seigneux S, Lundby AM, Berchtold L, **Berg AH**, Saudan P, Lundby C. Increased Synthesis of Liver Erythropoietin with CKD. *J Am Soc Nephrol*. 2016 Jan 12. PMID: 26757994.
37. Baltajian K, Bajracharya S, Salahuddin S, **Berg AH**, Geahchan C, Wenger JB, Thadhani R, Karumanchi SA, Rana S. Sequential plasma angiogenic factors levels in women with suspected preeclampsia. *Am J Obstet Gynecol*. 2016 Jul;215(1). PMID: 26827880.
38. Tran MT, Zsengeller ZK, **Berg AH**, Khankin EV, Bhasin MK, Kim W, Clish CB, Stillman IE, Karumanchi SA, Rhee EP, Parikh SM. PGC1 α drives NAD biosynthesis linking oxidative metabolism to renal protection. *Nature*. 2016 Mar 24;531(7595):528-32. PMID: 26982719; PMCID: PMC4909121.
39. Perl J, Kalim S, Wald R, Goldstein MB, Yan AT, Noori N, Kiaii M, Wenger J, Chan C, Thadhani RI, Karumanchi SA, **Berg AH**. Reduction of carbamylated albumin by extended hemodialysis. *Hemodial Int*. 2016 Jun 21. PMID: 27329430.
40. Kalim S, Trottier CA, Wenger JB, Wibecan J, Ahmed R, Ankers E, Karumanchi SA, Thadhani R, **Berg AH**. Longitudinal Changes in Protein Carbamylation and Mortality Risk after Initiation of Hemodialysis. *Clin J Am Soc Nephrol*. 2016 Jul 21. PMID: 27445162.
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42. Shukha K, Meuleer JL, Chung RT, Curry MP, Friedman DJ, Pollak MR, **Berg AH**. The vast majority of ApoL1 is made in the liver. *J Am Soc Nephrol*. 2016 Dec 8. PMID: 27932478.

43. Bøllehuus Hansen L, Rehfeld A, de Neergaard R, Nielsen JE, Iversen LH, Boisen IM, Mortensen LJ, Lanske B, Almstrup K, Carlsen E, **Berg AH**, Jørgensen N, Andersen AN, Juul A, Blomberg Jensen M. Selection of high quality spermatozoa may be promoted by activated vitamin D in the woman. *J Clin Endocrinol Metab.* 2016 Dec 15. PMID: 27977320.
44. Kang AD, Smith KP, Eliopoulos GM, **Berg AH**, McCoy C, Kirby JE. In vitro Apramycin Activity against multidrug-resistant *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. *Diagn Microbiol Infect Dis.* 2017 Mar 16. PMID: 28341099.
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46. Mendoza A, Astapova I, Gallop Molly R, Al-Sowaimel L, MacGowan D, **Berg AH**, Lyubetskaya A, Tenen D, Tsai L, Hollenberg AN. An NCoR1-independent mechanism plays a role in the action of the unliganded thyroid hormone receptor. *PNAS* 2017 Oct 3.
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53. Ganetsky M, **Berg AH**, Solano JJ, Salhanick S. Inhibition of CYP2E1 With Propylene Glycol Does Not Protect Against Hepatocellular Injury in Human Acetaminophen Daily-Dosing Model. *J Clin Pharmacol.* 2018 Aug 27. PMID: 30151903
54. Rana S, Salahuddin S, Mueller A, Berg AH, Thadhani RI, Karumanchi SA. Angiogenic biomarkers in triage and risk for preeclampsia with severe features. *Pregnancy Hypertens.* 2018 Jul;13:100-106. PMID: 30177034

B.) Research Papers– Peer-Reviewed (In Press)

None

C.) Research Papers - Peer-Reviewed (Submitted)

None

Chapters:

1. **Berg AH**, Sacks DB. Diabetes. In: Mitchell G, Gronowski AM, Eby CS, eds. Tietz's Applied Laboratory Medicine, 2nd Edition. 2006. John Wiley & Sons, Hoboken, NJ, 2006, Cases 26-28.

Chapters – In Press:

None

Letters to the Editor:

None

Reviews:

1. **Berg AH**, Combs TP, Scherer PE. ACRP30/adiponectin: an adipokine regulating glucose and lipid metabolism. In: Trends in Endocrinology and Metabolism. Burlington, MA: Elsevier;2002. p. 84-9.
2. **Berg AH**, Scherer PE. Circ Res 2005; 96(9):939-49. Adipose tissue, inflammation, and cardiovascular disease. In: Circulation Research. Dallas, TX: American Heart Association;2005. p. 939-49.
3. **Berg AH**, Sacks DB. Haemoglobin A1c analysis in the management of patients with diabetes: from chaos to harmony. *J Clin Pathol*. 2008 Sep;61(9):983-7.
4. Kalim S, Karumanchi SA, Thadhani RI, **Berg AH**. Protein carbamylation in kidney disease: pathogenesis and clinical implications. American Journal of Kidney Diseases. 2014 Jul 15. PMID: 25037561

Editorials:

1. **Berg AH**, Van Eyk J. Which Methods for Determining Glomerular Filtration Rate Most Strongly Associate with Risk of Progression of Kidney Disease? *Clin Chem*. 2019 Jan 15. pii: clinchem.2018.300731. doi: 10.1373/clinchem.2018.300731. [Epub ahead of print]
2. **Berg A.H.**, Thadhani R.I. Aiming Too Low: Reevaluation of Target Concentrations of Serum 25-Hydroxyvitamin D in Secondary Hyperparathyroidism. *Am J Nephrol* doi: 10.1159/000499160 [Epub ahead of print]

Papers in Preparation (Research Completed):

1. **Berg AH**, Tavasoli M, Wanner C, Drechsler C. Future risk of chronic kidney disease progression, cardiovascular disease, and death associated with increased carbamylated albumin levels amongst subjects enrolled in the nationwide German Chronic Kidney Disease (GCKD) study. *Manuscript under preparation*.

Abstracts:

1. **Title:** Vitamin D Binding Protein Modifies the Vitamin D-Bone Mineral Density Relationship. Presented at AACC Annual Conference in 2011. *Received Distinguished Abstract award from the National Academy of Clinical Biochemistry, and the Best Abstract Award from the Nutrition Division of the American Academy of Clinical Chemistry.*

2. **Title:** Protein Carbamylation Is Due to Urea-Amino Acid Imbalance and Predicts Kidney Failure Mortality. Presented at 2012 American Society of Nephrology Annual Meeting abstract 1150. *I was invited to present this abstract as an oral presentation at the meeting.*
3. **Title:** Protein Carbamylation, Erythropoietin Resistance, and Mortality in End Stage Kidney Disease Sahir Kalim, Hector Tamez, Elizabeth D. Ankers, Joseph James Deferio, Anders H. Berg, S. Ananth Karumanchi, Ravi I. Thadhani. Presented at 2012 American Society of Nephrology Annual Meeting abstract FR-PO243.
4. **Title:** Carbamylated Albumin Is Better Correlated with time Averaged urea Levels in Chronic Kidney Disease than in End-Stage renal Disease. Tamar Hod, MD and Anders H. Berg, MD, PhD. et. al. Presented at 2013 American Society of Nephrology Annual Meeting abstract 4877.
5. **Title:** The Effects of Parenteral Amino Acid Therapy on Protein Carbamylation in End Stage Kidney Disease. Sahir Kalim and Anders H. Berg, et.al. Presented at 2013 American Society of Nephrology Annual Meeting abstract 1727.
6. **Title:** Carbamylated Albumin Is Better Correlated with Time Averaged Urea Levels in Chronic Kidney Disease Than in End-Stage Renal Disease Tammy Hod, David J. Friedman, S. Ananth Karumanchi, Anders H. Berg. Presented at 2013 American Society of Nephrology Annual Meeting abstract SA-PO165.
7. **Title:** The Relationship of Serum PTH Concentrations with Cardiovascular Events and Death is Stronger in Persons with Lower Urinary Phosphorus Excretion: The Heart and Soul and Seattle Kidney Studies. Joachim H. Ix, Anders Berg, Bryan R. Kestenbaum et. al. Presented at 2013 American Society of Nephrology Annual Meeting.
8. **Title:** Bioavailable 25 (OH) D Is a Better Predictor of PTH and eGFR than Total 25 (OH) D in CKD Patients. Anders H. Berg, Julia Beth Wenger, Ishir Bhan, Hector Tamez, S. Ananth Karumanchi, Ravi I. Thadhani. Presented at 2014 American Society of Nephrology Annual Meeting abstract FR-PO847.
9. **Title:** Glycated Albumin Has a Stronger Association Than Hemoglobin A1C with Mortality in ESRD Patients in the 4D Trial Christina Chen, Christiane Drechsler, Christoph Wanner, S. Ananth Karumanchi, Anders H. Berg. Presented at 2014 American Society of Nephrology Annual Meeting abstract SA-PO995.
10. **Title:** The Association of Carbamylated Albumin and Mortality in Non-Dialyzed Patients with Chronic Kidney Disease Anders H. Berg, John Danziger, David J. Friedman, Sahir Kalim, Julia Beth Wenger, Ravi I. Thadhani, S. Ananth Karumanchi. Presented at 2014 American Society of Nephrology Annual Meeting abstract PUB118.
11. **Title:** Longitudinal Measures of Protein Carbamylation and Mortality on Dialysis Sahir Kalim, Anders H. Berg, Rayhnuma Ahmed, Joshua Wibecan, Caitlin A. Trottier, S. Ananth Karumanchi, Ravi I. Thadhani. Presented at 2015 American Society of Nephrology Annual Meeting abstract FR-PO672.

12. **Title:** The Effect of Extended Duration Nocturnal Hemodialysis on the Human Metabolome Sahir Kalim, Ron Wald, Dihua Xu, Anders H. Berg, Eugene P. Rhee, Jeffrey Perl. Presented at 2016 American Society of Nephrology Annual Meeting abstract. TH-PO729
13. **Title:** The Effect of Extended Duration Nocturnal Hemodialysis on the Human Metabolome. Sahir Kalim, MD, MMSc; Ron Wald, MD; Dihua Xu, PhD; Anders H. Berg, MD, PhD; Clary Clish, PhD; Eugene Rhee, MD; Jeffrey Perl, MD Presented at 2017 American Society of Nephrology Annual Meeting.
14. **Title:** The Effects of Peritoneal Dialysis and Intraperitoneal Amino Acids on Protein Carbamylation. Sahir Kalim, MD, MMSc; Jeffrey Perl, MD; Megan Freeman, MD; Caitlin A. Trottier; Anders H. Berg, MD-PhD. Presented as oral abstract at 2017 American Society of Nephrology Annual Meeting.
15. **Title:** Impact of intrarenal and circulating APOL1 expression levels on phenotypes in nephrotic syndrome. SA-PO349 K Yasutake, Anders H Berg, Khuloud Shukha, Martin R Pollak, Matt G Sampson. Presented at 2017 American Society of Nephrology Annual Meeting abstract SA-PO349.
16. **Title:** Effects of Acute Administration of Ergocalciferol on Vitamin D Catabolism in Hemodialysis Patients. Anders H. Berg, Ananth Karumanchi, Katherine Wesseling-Perry, Ravi I. Thadhani, Isidro Salusky. Presented at 2017 American Society of Nephrology Annual Meeting. FR-PO274.
17. K Yasutake, Anders H Berg, Khuloud Shukha, Martin R Pollak, Matt G Sampson. Presented at 2017 American Society of Nephrology Annual Meeting abstract SA-PO349.
18. **Title:** Taurine Protects Against Urea-Induced Protein Carbamylation and Renal Fibrosis in an Oxalate Model of Kidney Injury. Mahtab Tavasoli, Anders H Berg. Presented at 2018 American Society of Nephrology Annual Meeting abstract SA-PO831

Report of Technological and Other Scientific Innovations:

8/31/2010 **Patent Title: Development and clinical validation of assay for Calculated Bioavailable Vitamin D**

Vitamin D deficiency is a common contributor to osteoporosis and has been implicated as a risk factor for a diverse list of maladies such as heart disease, and patients are now routinely tested for low serum concentrations of total vitamin D. Most serum vitamin D is tightly bound to Vitamin D binding protein, however. In collaboration with co-investigators Ananth Karumanchi and Ravi Thadhani, we have recently developed a novel assay for measurement of non-protein bound bioavailable vitamin D in serum, and completed a clinical study demonstrating that the correlation between bioavailable Vitamin D concentrations and bone mineral density is clearly superior to that of serum total vitamin D (manuscript currently

under review). My contributions to this project were to suggest that bioavailable vitamin D is the best index of physiologically active vitamin concentrations (superior to measurement of total vitamin D concentrations), I developed the methods for measuring and calculating bioavailable vitamin D and performed these calculations, and my hypothesis regarding this specific marker was supported by the clinical correlation analysis. This assay will facilitate clinical research in the role of vitamin D deficiency in disease pathogenesis using a more physiologically relevant endpoint, and has the potential to replace existing assays for total vitamin D.

Patent Title: DIAGNOSIS, PROGNOSIS, AND TREATMENT OF KIDNEY DISEASE

7/13/2012 There is a need for improved diagnostic and prognostic methods for patients suffering from kidney disease, as well as methods for treating such patients. We have developed diagnostic and prognostic methods for monitoring and treatment of kidney disease (e.g., end stage renal disease; ESRD) based on the discovery that carbamylation of albumin correlated with both average blood urea concentrations and with mortality rates in kidney disease. We have discovered that albumin carbamylation can be reduced by administration of certain compounds, including free amino acids, thus indicating their usefulness in treatment of kidney disease (e.g., ESRD), and we hypothesize that patients deficient in carbamylation-scavenging amino acids will be especially prone to protein carbamylation and its associated risk of CVD. We have also found that serum albumin carbamylation may be reduced by increasing patients' dose weekly dose of renal replacement therapy (hemodialysis), and that this reduction correlates with reduction of cardiac hypertrophy. Analogous to the utility of measuring glycated hemoglobin A_{1c} to determine long-term glucose control in diabetes mellitus, %C-Alb may provide a clearer depiction of urea load than a BUN measurement that can fluctuate 40-70% around any given dialysis session. Because carbamylation may be linked directly to kidney disease pathology, the present invention features methods of treating kidney disease (e.g., ESRD) by administration of a composition that is capable of reducing protein carbamylation in a subject.