

CURRICULUM VITAE

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Personal: Birth date: October 25, 1955

Education: Ohio State University, Columbus, OH: B.S. 1974-1978
Ohio State University, Department of Microbiology: M.S. 1978-1981
Ohio State University, Department of Pathology: Ph.D. 1986-1989
Washington University (HHMI), St. Louis, MO: Post-doctorate. 1990

Academic Positions: Graduate Teaching Associate, Ohio State University Department of Microbiology (1978-1981)
Assistant Professor, Ohio State University Departments of Internal Medicine (1990 - 1997) and Pathology (1995 - 1997)
Member, Molecular, Cellular, and Developmental Biology Program (1995 - 2012)
Associate Professor, Ohio State University Departments of Internal Medicine (1997 - 2013) and Pathology (1997 - 2013)
Investigator, The Heart and Lung Research Institute (2000 - present)
Member, The Integrated Biomedical Science Graduate Program (2000 - present)
Faculty Emeritus, Ohio State University Department of Internal Medicine (2013 - present)

Prof. Membership American Association for the Advancement of Science
American Association of Immunologists
International Complement Society

Committees *Finance Committee*, Division of Nephrology, The Ohio State University, 1996-present
Long-term Planning Committee, Division of Nephrology, The Ohio State University, 1995-2001
University Radiation Safety Committee (Vice Chairman 2004, Chairman 2005), The Ohio State University, 2003-2013
University Radiation Safety Audit Subcommittee, The Ohio State University, 2004 (Chairman), 2008
Faculty Council, College of Medicine, The Ohio State University, 2004-2007
Appointments, Promotion, and Tenure Committee, The Department of Internal Medicine, The Ohio State University, 2005-2010
Research Committee, College of Medicine, The Ohio State University, 2008-2009
Finance Committee, The Department of Internal Medicine, The Ohio State University, 2008-2012
Space Committee, Davis Heart and Lung Research Institute, 2012-2013

Editorial Service Associate Editor, Journal of Immunology, 1999-2004

Ad Hoc Reviewer Journal of Immunology
Arthritis and Rheumatism
Journal of the American Society of Nephrology
Clinical Journal of the American Society of Nephrology
Genes and Immunity

Journal of Immunological Methods
Kidney International
Arthritis Research & Therapy
Journal of Clinical Immunology
Scandinavian Journal of Immunology
Clinical Immunology and Immunopathology
Archives of Biochemistry and Biophysics
Trends in Molecular Medicine
Lupus
Arthritis Care & Research
Translational Research
Journal of Rheumatology

Grants/Contracts:

Completed

OSU Research and Graduate Studies. "Identification of genes encoding primate erythrocyte C3b receptors". 3/1/91-2/28/92. \$10,000. PI

Merck Sharp & Dohme. "The effect of enalapril therapy on immune complex-mediated glomerulonephritis". 4/1/92-6/4/93 \$57,622. Co-PI (25%)

AMGEN. "Effect of EPO on immune responses in dialysis patients". 9/1/92-2/28/94. \$79,642. Co-PI (25%)

Ortho-Biotech. "Effect of recombinant erythropoietin therapy on parameters of SLE activity". 1/1/93-12/31/93. \$14,123 Co-PI (15%)

NIH R01 DK49339. "Genetic anomalies of C4, CR1 and FcR in juvenile IgA-N". 10/1/94-9/30/97. \$618,239. Co-I (PI: LA Hebert)

American Heart Ass (Ohio). "Construction of recombinant regulators of complement activation" 7/1/95-7/30/97. \$60,000 PI

Chiron Corporation. "Inhibition of IC-driven C' activation by complement inhibitor CAB-2 in vivo". 9/1/95-2/28/96 \$26,174. PI

Chiron Corporation. "Protective role of Cytomed inhibitor in a model of atheroembolism of the kidney and extremity in the nonhuman primate". 9/1/95-8/31/96. \$48,900. PI

NIH R01 AR43969 "HLA class III genes and CR1 in rheumatic diseases". NIH R01 AR43969 10/1/95-9/30/99. \$745,617. sub-contracted PI

Bremer Foundation Award. "Identification of genetic variants of CTLA-4 and FcγRIIb1 in SLE". Bremer Foundation Award. 11/1/98-10/31/99, \$50,000. PI

NIH R01 A141729 "CR1 and FcγRIIA/IIIA defects in the pathogenesis of SLE". 1/15/99-12/31/01. \$517,383. PI

NIH P01 DK55546. "Genetic variants of CR1 and FcγR in human SLE nephritis" 4/1/01-1/31/06. \$1,090,000. Project Leader #1 (L.A. Hebert, P01 PI)
No-cost extension to 1/31/07

NIH R21 AG025732 "Depression, Stress, Aging, & Proinflammatory Cytokines". 9/1/06 - 8/31/09. \$338,250 Co-I (PI: J. Kiecolt-Glaser)

Abbott. "Serum levels of vitamin D, calcium, phosphorus, and parathyroid hormone in the 4 months preceding SLE flare: Is a declining Vitamin D level a risk factor for SLE flare?, 8/09 - 7/10, \$38,247, PI

NIH RC2 AR058951. "Lupus Nephritis and Renal Failure: A National Consortium to Explore the Genotypic Basis for Immune-Mediated ESRD". 9/28/09 - 8/31/11. \$3,350,000. Co-I (PI: RP Kimberly; Site PI L.A. Hebert).

Current

UL1TR0001108 & Indiana CTSI. Midwest Strategic Pharma-Academic Research Consortium Awards Program (SPARC) : "Molecular analysis of serial kidney biopsies in lupus nephritis to predict early treatment response". This project will address the need of for better treatment strategies in the management of lupus nephritis (LN) patients. 1/1/15-12/31/16. \$208,429. Co-I (Subcontract PI: Rovin).

Publications:

Peer-reviewed articles

1. Cornacoff JB, Hebert LA, Smead WL, VanAman ME, Birmingham DJ: The primate erythrocyte-immune complex clearing mechanism. *J Clin Invest* 71:236-247, 1983.
2. Cornacoff JB, Hebert LA, Birmingham DJ, Waxman FJ: Factors influencing the binding of large immune complexes to the primate erythrocyte CRI receptor. *Clin Immunol and Immunopathol* 30:255-264, 1984.
3. Waxman FJ: Hebert LA, Cornacoff JB, VanAman ME, Smead WL, Kraut EH, Birmingham DJ, Taguam JM: Complement depletion accelerates the clearance of immune complexes from the circulation of primates. *J Clin Invest* 74:1329-1340, 1984.
4. Waxman FJ, Hebert LA, Cosio FG, Smead WL, VanAman ME, Taguam JM, Birmingham DJ: Differential binding of IgA and IgG1 immune complexes to primate erythrocytes *in vivo*: IgA immune complexes bind less well to erythrocytes and show increased uptake by glomeruli. *J Clin Invest* 77:82-89, 1986.
5. Cosio FG, Hebert LA, Birmingham DJ, Dorval BL, Bakaletz AP, Kujula GA, Edberg JC, Taylor RP: Clearance of human antibody/DNA immune complexes and free DNA from the circulation of the nonhuman primate. *Clin Immunol and Immunopath* 42:1-9, 1987.
6. Cosio FG, Birmingham DJ, Sexton DJ, Hebert LA: Interactions between precipitating and nonprecipitating antibodies in the formation of immune complexes. *J Immunol* 138:2587-2592, 1987.
7. Dorval B, Cosio FG, Birmingham DJ, Hebert LA: Human erythrocytes inhibit complement activation. *J Immunol* 142:2721-2727, 1989.
8. Birmingham DJ, Cosio FG: Characterization of the baboon erythrocyte C3b-binding protein. *J Immunol* 142:3140-3144, 1989.
9. Birmingham DJ, Hebert LA, Cosio FG, VanAman ME: Immune complex/erythrocyte complement receptor interactions *in vivo* during induction of glomerulonephritis in nonhuman primates. *J Lab Clin Med* 116:242-252, 1990.
10. Cosio FG, Shen XP, Birmingham DJ, VanAman M, Hebert LA: Evaluation of the mechanisms responsible for the reduction in erythrocyte complement receptors when immune complexes form *in vivo* in primates. *J Immunol* 145:4198, 1990.
11. Hebert LA, Cosio FG, Birmingham DJ, Mahan JD, Smead WL, Goel R: Experimental immune complex-mediated glomerulonephritis in the nonhuman primate. *Kidney Int* 39:44, 1991.
12. Shibata T, Cosio FG, Birmingham DJ: Complement activation induces the expression of decay-accelerating factor on human mesangial cells. *J Immunol* 147:3901-3908, 1991.
13. Hebert LA, Birmingham DJ, Shen X-P, Cosio FG: Stimulating erythropoiesis increases complement receptor expression on primate erythrocytes. *Clinical Immunol Immunopath* 62:301-306, 1992.
14. Mahan JD, Hebert LA, McAllister C, Birmingham DJ, Shen X-P, Cosio FG: Platelet involvement in experimental immune complex-mediated glomerulonephritis of primates. *Kidney Int* 44:716-725, 1993.
15. Hebert LA, Birmingham DJ, Mahan JD, Shen X-P, McAllister C, Cosio FG, Dillon JJ: Effect of chronically increased levels of erythrocyte complement receptor Type 1 on the evolution of experimental glomerulonephritis induced by chronic daily bolus infusion of antigen *Kidney Int* 45:493-499, 1994.
16. Birmingham DJ, Shen X-P, Hourcade D, Nickells MW, Atkinson JP: Primary sequence of an alternatively spliced form of chimpanzee CR1: A candidate for the 75,000 M_r complement receptor expressed on chimpanzee erythrocytes. *J Immunol* 153:691-700, 1994.

17. Hebert LA, Birmingham DJ, Shen X-P, Brandt JT, Sedmak DD, Dillon, JD: Effect of recombinant erythropoietin therapy on autoimmunity in systemic lupus erythematosus. *Am J Kidney Dis* 24:25-32, 1994.
18. Hebert LA, Mahan JD, Birmingham DJ, Cosio FG, Dillon JJ, Sedmak DD, Shen X-P, McAllister C: Enalapril therapy decreases glomerular accumulation of immune complexes and mesangial matrix in a model of glomerulonephritis in the nonhuman primate. *Kidney Int* 46:986-992, 1994
19. Hebert LA, Birmingham DJ, Dillon JJ, Cosio FG, Shen X-P, Hebert MM: Erythropoietin therapy in humans increases erythrocyte expression of complement receptor Type 1 (CD35). *J Am Soc Neph* 4:1786-1791, 1994.
20. Cosio FG, Shibata T, Rovin BH, Birmingham DJ: Effects of complement activation products on the synthesis of decay accelerating factor (DAF) and membrane cofactor protein (MCP) by human mesangial cells. *Kidney Int* 46:987-992, 1994.
21. Atkinson JP, Krych M, Nickells M, Birmingham D, Subramanian B, Clemenza L, Alvarez J, Liszewski K: Complement receptors and regulatory proteins: Immune adherence revisited and abuse by microorganisms. *Clin Exp Immunol* 2:1-3, 1994
22. Sedmak DD, Guglielmo AM, Knight D, Birmingham DJ, Huang EH, Waldman WJ: Cytomegalovirus inhibits major histocompatibility Class II expression on infected endothelial cells. *Am J Pathol* 144:683-692, 1994
23. Hebert LA, Birmingham DJ, Shen XP, Cosio FG, Fryczkowski A: Rate of antigen entry into the circulation in experimental versus naturally occurring immune complex glomerulonephritis. *J Am Soc Nephrol* 5:S70-S75, 1994.
24. Birmingham DJ, Shen XP, Hartman JA, Dillon JJ, Hebert LA: Effect of chronic human recombinant erythropoietin therapy on immune responses in chronic hemodialysis patients. *Kidney Int* 50:543-549, 1996.
25. Birmingham DJ, Logar CM, Shen XP, Chen W: Baboon erythrocyte complement receptor is a glycosphatidylinositol-linked protein encoded by a homologue of the human CR1-like genetic element. *J Immunol* 157:2586-2592, 1996.
26. Hebert LA, Birmingham DJ, Mahan JD, Cosio FG, Dillon JJ, Sedmak DD, Shen XP, McAllister C: Effect of enalapril therapy on glomerular accumulation of immune complexes and mesangial matrix in experimental glomerulonephritis in the nonhuman primate. *Am J Kidney Dis* 30:243-252, 1997.
27. Orosz CG, Huang EH, Bergese SD, Sedmak DD, Birmingham DJ, Ohye RG, VanBuskirk AM: Prevention of acute murine cardiac allograft rejection: anti-CD4 or anti-vascular cell adhesion molecule one monoclonal antibodies block acute rejection but permit persistent graft-reactive alloimmunity and chronic tissue remodelling. *J Heart Lung Transplant*. 16:889-904, 1997.
28. Birmingham, DJ, Hebert LA, Shen X-P, Higgins, P, Yeh G, Creasey, A. Effects of acute intravascular immune complex formation on circulating platelets and leukocytes in the non-human primate. *Clin Immunol* 91:99-105, 1999.
29. Chen W, Logar CM, Shen, XP, and Birmingham DJ. The chimp and cynomolgus immune adherence receptors are encoded by CR1-like genes. *Immunogenetics* 52:46-52, 2000.
30. Moulds JM, Zimmerman PA, Doumbo OK, Kassambra L, Sagara I, Diallo DA, Atkinson JP, Krych-Goldberg M, Hauhart RE, Houcade DE, McNamara DT, Birmingham DJ, Rowe JA, Moulds JJ, Miller LH. Molecular identification of Knops blood group polymorphisms found in LHR-D of complement receptor type 1 (CR1). *Blood* 97:2879-2885, 2001.
31. Birmingham DJ, Rovin BH, Yu CY, Hebert LA. Of mice and men: The relevance of the mouse to the study of human SLE. *Immunologic Res* 24:211-224, 2001
32. Birmingham DJ, Chen W, Liang G, Schmitt HC, Gavit K, and Nagaraja HN. A CR1 polymorphism associated with constitutive erythrocyte CR1 levels affects binding to C4b but not C3b. *Immunology* 108:531-538, 2003
33. Logar CM, Chen W, Schmitt HC, Yu CY, Birmingham DJ. A human CR1-like transcript containing sequence for a binding protein for iC4 is expressed in hematopoietic and fetal lymphoid tissue. *Molecular Immunology* 40:831-840, 2004
34. Moulds JM, Thomas BJ, Doumbo O, Diallo DA, Lyke K, Plowe CV, Rowe JA, Birmingham DJ. Identification of the Kn^a/Kn^b polymorphism and a method for Knops genotyping. *Transfusion* 44:164-169, 2004
35. Rovin, B.H., Song H, Birmingham DJ, Hebert LA, Yu CY, and Nagaraja HN. Urine chemokines as biomarkers of human SLE activity. *J. Am. Soc. Nephrol.* 16:467-473, 2005
36. Rovin, B. H., Y. Tang, J. Sun, H. N. Nagaraja, K. V. Hackshaw, L. Gray, R. Rice, D. J. Birmingham, C. Y. Yu, D. N. Spetie, A. Aziz, and L. A. Hebert. 2005. Clinical significance of fever in the systemic lupus erythematosus patient receiving steroid therapy. *Kidney Int* 68:747-759.
37. Wu, H., R. M. Cantor, D. S. Graham, C. M. Lingren, L. Farwell, P. L. Jager, N. Bottini, J. M. Grossman, D. J. Wallace, B. H. Hahn, H. Julkunen, L. A. Hebert, B. H. Rovin, D. J. Birmingham, J. D. Rioux, C. Y. Yu, J.

- Kere, T. J. Vyse, and B. P. Tsao. 2005. Association analysis of the R620W polymorphism of protein tyrosine phosphatase PTPN22 in systemic lupus erythematosus families: increased T allele frequency in systemic lupus erythematosus patients with autoimmune thyroid disease. *Arthritis Rheum* 52:2396-2402.
38. Rovin, B. H., H. Song, L. A. Hebert, T. Nadasdy, G. Nadasdy, D. J. Birmingham, C. Yung Yu, and H. N. Nagaraja. 2005. Plasma, urine, and renal expression of adiponectin in human systemic lupus erythematosus. *Kidney Int* 68:1825-1933.
 39. Birmingham DJ, Gavit KF, McCarty SM, Tong J, Yu CY, Rovin BH, Nagaraja HN, and Hebert LA. 2006. Consumption of erythrocyte CR1 (CD35) is associated with protection against SLE renal flare. *Clin Exp Immunol* 143:274-280.
 40. Wu, Y. L., G. C. Higgins, R. M. Rennebohm, E. K. Chung, Y. Yang, B. Zhou, H. N. Nagaraja, D. J. Birmingham, B. H. Rovin, L. A. Hebert, and C. Y. Yu. 2006. Three distinct profiles of serum complement C4 proteins in pediatric systemic lupus erythematosus (SLE) patients: tight associations of complement C4 and C3 protein levels in SLE but not in healthy subjects. *Adv Exp Med Biol* 586:227-247.
 41. Birmingham, DJ, HN Nagaraja, BH Rovin, L Spetie, X Li, Y Zhao, KV Hackshaw, CY Yu, WB Malarkey, and LA Hebert. 2006. Fluctuation in self-perceived stress and increased risk of flare in patients with lupus nephritis carrying the serotonin receptor 1A -1019 G allele. *Arthritis Rheum* 54:3291-3299
 42. Wu H, Boackle SA, Hanvivadhanaku P, Ulgiati D, Grossman JM, Lee Y, Shen N, Abraham LJ, Mercer TR, Park E, Hebert LA, Rovin BH, Birmingham DJ, Chang D, Chen CJ, McCurdy D, Badsha HM, Thong BYH, Chang HH, Arnett FC, Wallace DJ, Yu CY, Hahn BH, Cantor RM, and T. BP. 2007. Association of a common complement receptor 2 haplotype with increased risk of SLE. *Proc. Natl. Acad. Sci.* 104: 3961-3966.
 43. Wang L, Lin S, Rammohan K, Liu Z, Liu J, Liu R, Guinther N, Lima J, Zhou Q, Wang T, Zheng X, Birmingham DJ, Rovin BH, Hebert LA, Wu Y, Lynn DJ, Cooke G, Yu CY, Zheng P, and Liu Y. 2007. A di-nucleotide deletion in CD24 confers protection against autoimmune diseases. *PLoS Genetics*,. *PLoS Genetics*, 3:e49.
 44. Yang Y, Chung EK, W YL, Savellie S, Nagaraja H, Zhou B, Hebert M, Jones KN, Shu Y, Kitzmiller K, Blanchong CA, McBride K, Higgins GC, Rennebohm RM, Rice RR, Hackshaw KV, Roubey RA, Grossman JM, Tsao BP, Birmingham DJ, Rovin BH, Hebert LA, and Yu CY. 2007. Gene copy number variation and associated polymorphisms of complement component C4 in human systemic lupus erythematosus (SLE): Low copy number is a risk factor for, high copy number is a protective factor against, European American SLE disease susceptibility. *Am. J. Hum. Genet.* 80:1037-1054.
 45. Birmingham DJ, Irshaid F, Gavit, KF, Nagaraja HN, Yu CY, Rovin BH, Hebert LA. 2007. A polymorphism in the type one complement receptor (CR1) involves an additional cysteine within the C3b/C4b binding domain that inhibits ligand binding. *Mo.I Immunol.* 44:3510-3516.
 46. Birmingham, D. J., B. H. Rovin, G. Shidham, H. N. Nagaraja, X. Zou, M. Bissell, C. Y. Yu, and L. A. Hebert. 2007. Spot urine protein/creatinine ratios are unreliable estimates of 24 h proteinuria in most systemic lupus erythematosus nephritis flares. *Kidney Int.* 72:865-870.
 47. Rovin, B.H., D.J. Birmingham, H.N. Nagaraja, C.Y. Yu, and L.A. Hebert. 2007. Biomarker discovery in human SLE nephritis. *Bull. NYU Hosp. Joint Dis.* 65:187-193
 48. Wu Y-L, Savelli, SL, Yang Y, Zhou B, Rovin BH, Birmingham DJ, Nagaraja HN, Hebert LA, and Yu CY. 2007. Sensitive and Specific Real-Time PCR Assays to Accurately Determine Gene Copy Number Variations (GCNVs) of Human Complement C4A, C4B, C4-Long, C4-Short and RCCX Modules: Elucidation of C4 GCNVs in 50 Consanguineous Subjects with Defined HLA Genotypes. *J. Immunol.* 179:3012-3025.
 - 49 Birmingham, D., B. Rovin, G. Shidham, M. Bissell, H. Nagaraja, and L. Hebert. 2008. Relationship between albuminuria and total proteinuria in SLE nephritis: diagnostic and therapeutic implication. *Clinical J Am Soc Nephrol*; 3: 1028-1033
 50. Wu H, Birmingham DJ, Rovin B, Hackshaw KV, Haddad N, Haden D, Yu CY, Hebert LA: 2008. D-dimer level and the risk for thrombosis in systemic lupus erythematosus. *Clin J Am Soc Nephrol*; 3: 1628-1636
 51. Wu YL, Yang Y, Chung EK, Zhou B, Kitzmiller KJ, Savelli SL, Nagaraja HN, Birmingham DJ, Tsao BP, Rovin BH, Hebert LA, Yu CY: 2008. Phenotypes, genotypes and disease susceptibility associated with gene copy number variations: complement C4 CNVs in European American healthy subjects and those with systemic lupus erythematosus. *Cytogenet Genome Res*; 123: 131-141
 52. Zhang X, Jin M, Wu H, Nadasdy T, Nadasdy G, Harris N, Green-Church K, Nagaraja H, Birmingham DJ, Yu CY, Hebert LA, Rovin BH: 2008. Biomarkers of lupus nephritis determined by serial urine proteomics. *Kidney Int*; 74: 799-807
 53. Hebert LA, Birmingham DJ, Shidham G, Rovin B, Nagaraja HN, Yu CY: 2009. Random Spot Urine Protein/Creatinine Ratio Is Unreliable for Estimating 24-Hour Proteinuria in Individual Systemic Lupus Erythematosus Nephritis Patients. *Nephron Clin Pract*; 113: c177-c182

54. Brodsky, S. V., G. M. Nadasdy, R. Pelletier, A. Satoskar, D. J. Birmingham, G. A. Hadley, K. Obeidat, and T. Nadasdy. 2009. Expression of the decay-accelerating factor (CD55) in renal transplants--a possible prediction marker of allograft survival. *Transplantation* 88:457.
55. Rovin, B. H., A. M. McKinley, and D. J. Birmingham. 2009. Can we personalize treatment for kidney diseases? *Clin J Am Soc Nephrol* 4:1670.
56. Budu-Grajdeanu, P., R. C. Schugart, A. Friedman, D. J. Birmingham, and B. H. Rovin. 2010. Mathematical framework for human SLE Nephritis: disease dynamics and urine biomarkers. *Theor Biol Med Model* 7:14.
57. Birmingham DJ, Irshaid F, Nagaraja HN, Zou X, Tsao BP, Wu H, Yu CY, Hebert LA, Rovin BH. 2010 The complex nature of serum C3 and C4 as biomarkers of lupus renal flare. *Lupus*, 19:1272.
58. Ardoin, S., D. J. Birmingham, P. L. Hebert, C. Y. Yu, B. H. Rovin, and L. A. Hebert. 2011. An approach to validating criteria for proteinuric flare in systemic lupus erythematosus glomerulonephritis. *Arthritis and Rheumatism* 63:2031.
59. Mok CC, Birmingham DJ, Leung HW, Hebert LA, Song H, Rovin BH. 2012. Vitamin D levels in Chinese patients with systemic lupus erythematosus: relationship with disease activity, vascular risk factors and atherosclerosis. *Rheumatol (Oxford)* 51: 644-652.
60. Mok, C. C., D. J. Birmingham, L. Y. Ho, L. A. Hebert, H. Song, and B. H. Rovin. 2012. Vitamin D deficiency as marker for disease activity and damage in systemic lupus erythematosus: a comparison with anti-dsDNA and anti-C1q. *Lupus* 21:36-42
61. Satoskar AA, Shapiro JP, Bott CN, Song H, Nadasdy GM, Brodsky SV, Hebert LA, Birmingham DJ, Nadasdy T, Freitas MA, Rovin BH. 2012. Characterization of glomerular diseases using proteomic analysis of laser capture microdissected glomeruli. *Modern Pathology* 25:709-721.
62. Birmingham DJ, Hebert LA, Song H, Noonan WT, Rovin BH, Nagaraja HN, Yu CY. 2012. Evidence that abnormally large seasonal declines in vitamin D status may trigger SLE flare in non-African Americans. *Lupus* 21:855-864.
63. Ganesan LP, Kim J, Wu Y, Mohanty S, Phillips GS, Birmingham DJ, Robinson JM, Anderson CL. 2012. FcγRIIb on liver sinusoidal endothelium clears small immune complexes. *J Immunol* 189:4981-4988.
64. Mok C, Birmingham D, Ho L, Hebert L, Rovin B. 2013. High sensitivity C-reactive protein, disease activity and cardiovascular risk factors in systemic lupus erythematosus. *Arthritis Care Res (Hoboken)* 65:441-447
65. Young NA, Friedman AK, Kaffenberger B, Rajaram MV, Birmingham DJ, Rovin BH, Hebert LA, Schlesinger LS, Wu LC, Jarjour WN. 2013. Novel estrogen target gene ZAS3 is overexpressed in systemic lupus erythematosus. *Molec Immunol* 54: 23-31.
66. Birmingham DJ, Shidham G, Perna A, Fine DM, Bissell M, Rodby R, et al. 2014. Spot PC ratio estimates of 24-hour proteinuria are more unreliable in lupus nephritis than in other forms of chronic glomerular disease. *Ann Rheum Dis.* 73(2):475-6
67. Freedman BI, Langefeld CD, Andringa KK, Croker JA, Williams AH, Garner NE, Birmingham DJ, et al. 2014. End-Stage Renal Disease in African Americans With Lupus Nephritis Is Associated With APOL1. *Arthritis Rheumatol.* 66(2):390-6.
68. Caster DJ, Korte EA, Merchant ML, Klein JB, Wilkey DW, Rovin BH, Birmingham DJ, Harley JB, Cobb BL, Namjou B, McLeish KR, Powell DW. 2015. Autoantibodies targeting glomerular annexin A2 identify patients with proliferative lupus nephritis. *Proteomics Clinical Applications.* 9(11-12):1012-20.
69. Birmingham DJ, Bitter JE, Ndukwe EG, Dials S, Gullo TR, Conroy S, Nagaraja HN, Rovin BH, Hebert LA. 2016. Relationship of Circulating Anti-C3b and Anti-C1q IgG to Lupus Nephritis and Its Flare. *Clinical J Am Soc Nephrol.* 11(1):47-53.
70. Cartin-Ceba R, Indrakanti D, Specks U, Stone JH, Hoffman GS, Kallenberg CG, et al. The Pharmacogenomic Association of Fcγ Receptors and Cytochrome P450 Enzymes With Response to Rituximab or Cyclophosphamide Treatment in Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *Arthritis Rheumatol.* 2017;69(1):169-75.
71. Rovin BH, Birmingham D, Cartin-Ceba R, Specks U, Stone JH. Reply. *Arthritis Rheumatol.* 2017.
72. Almaani S, Hebert LA, Rovin BH, Birmingham DJ. The Urine Preservative Acetic Acid Degrades Urine Protein: Implications for Urine Biorepositories and the AASK Cohort Study. *J Am Soc Nephrol.* 2017;28(5):1394-8.
73. Parikh, SV, Malvar, A, Song, H, Alberton, V, Lococo, B, Vance, J, Zhang, J, Yu, L, Birmingham, D, Rovin, BH: Molecular imaging of the kidney in lupus nephritis to characterize response to treatment. *Translational Res.* 182: 1-13, 2017.

Reviews

1. Hebert LA, Cosio FG, Birmingham DJ, Mahan JD: Biological significance of the erythrocyte complement receptor: A primate perquisite. *J Lab Clin Med* 118:301-308, 1991.
2. Hebert LA, Cosio FG, Birmingham DJ: Role of the complement system in renal injury. *Semin Nephrol* 12(5):408-427, 1992.
3. Birmingham DJ: Erythrocyte complement receptors. *Crit Rev Immunol* 15:133-154, 1995
4. Birmingham DJ, Hebert LA. CR1 and CR1-like: The primate immune adherence receptors. *Immunological Rev*, 180:100-111, 2001
5. Yang Y, Chung EK, Zhou B, Lhotta K, Hebert LA, Birmingham DJ, Rovin BH, Yu CY. The intricate role of complement component C4 in human SLE. *Current Direction in Autoimmunity* 7:98-132, 2004
6. Birmingham DJ, Hebert LA. The Complement System in Lupus Nephritis. *Semin Nephrol*. 35(5):444-54, 2016.
7. Birmingham DJ, Merchant M, Waikar SS, Nagaraja H, Klein JB, Rovin BH. Biomarkers of Lupus Nephritis Histology and Flare: Deciphering the Relevant Amidst the Noise. *Nephrol Dial Transplant*, 2017;32(suppl_1):i71-i9.

Books

1. Hebert LA, Cosio FG, Birmingham DJ, Sedmak DD: Circulating immune complexes. Chapter in: *Immunochemistry*, Carel van Oss (Ed), Marcel Dekker, New York, 1994, pp 653-680.
2. Hebert LA, Cosio FG, Birmingham DJ: The role of complement in glomerular and vascular injury. In: *Textbook of Nephrology*. Massry SG, Glasscock RJ (Eds), 3rd Ed, Williams and Wilkins, Baltimore, 1995, pp 659-670.
3. Birmingham DJ. The type one complement receptor (CR1) and human SLE. Chapter in: *Lupus: Cellular and Molecular Pathogenesis*. Kammer GM, Tsokos GC, (Eds), Humana Press Inc, Totowa, NJ, 1999.
4. Hebert LA, Cosio FG, Birmingham DJ. Complement and complement regulatory proteins in renal disease. Chapter in: *Immunologic Renal Diseases*. Neilson EG, Couser, WG (Eds) 2nd Ed, Lippincott-Raven, Philadelphia, 2001
5. Yang Y, Chung EK, Lhotta K, Wu YL, Higgins GC, Rennebohm RM, Hebert LA, Birmingham DJ, Rovin BH, and Yu CY. Complement components C4A and C4B in human lupus. Chapter in *Molecular Autoimmunity*. Moncef Zouli (Ed). Kluwer Academic Publishers, Dordrecht, Netherlands, 2005
6. Hauptmann G, Yu CY, Yang Y, Wu YL, Birmingham DJ, Rovin BH, and Hebert LA. Complement deficiencies in human systemic lupus erythematosus (SLE) and SLE nephritis. In *SLE Companion to Rheumatology*, Elsevier 2005.
7. Yu CY, Hauptmann G, Yang Y, Wu YL, Birmingham DJ, Rovin BH and Hebert LA: Complement deficiencies in human systemic lupus erythematosus (SLE) and SLE nephritis: epidemiology and pathogenesis. In: Tsokos GC, Gordon C and Smolen JS (eds) *Systemic Lupus Erythematosus: a Companion to Rheumatology*. Philadelphia: Elsevier, pp183-193, 2007
8. Rovin BH, Birmingham DJ, Nadasdy T. "Renal Involvement in Systemic Lupus Erythematosus." In *Diseases of the Kidney and Urinary Tract*. Edited by Schrier R, Nelson E, Molitoris B, Coffman T, Falk R, 2012
9. Rovin BH, Birmingham DJ, Nadasdy T. "Systemic Lupus Nephritis and the Kidney." In *Core Concepts in Parenchymal Kidney Disease*. Edited by Fervenza F, Li J, Singh AK, 2012.
10. Birmingham DJ. "Complement Regulation in the Kidney." In *Encyclopedia of Medical Immunology*. Edited by MacKay I, Rose NR, 2012.

Abstracts Note: Only those in which Dr. Birmingham is principle investigator are listed.

1. Birmingham DJ, Cosio FG: C3b binding proteins of primate erythrocytes (E). *Complement and Inflamm*. 6:315A, 1989. Presented at the 13th International Complement Workshop, San Diego, CA.
2. Birmingham DJ, Cosio FG: Determination of factor I cofactor function of nonhuman primate erythrocyte (E) C3b receptors. *FASEB J*. 4:A2188. 1990. Presented at the 1990 AAI (FASEB) Meeting, New Orleans, LA.
3. Birmingham DJ, Cosio FG, McCourt DW, Atkinson JP. 1991. N-terminus amino acid analysis of the baboon erythrocyte C3b receptor. *FASEB J*. 5:A1716. 1991. Presented at the 1991 AAI (FASEB) Meeting, Atlanta, GA.
4. Birmingham DJ, Atkinson JP: Identification of an alternatively spliced transcript of the chimpanzee type one complement receptor (CR1). *J. Immunol*. 150:224A. 1993. Presented at the 1993 AAI (FASEB) Meeting, Denver, CO.

5. Birmingham DJ, Shen XP: Identification of a CR1-like transcript in the baboon bone marrow. Presented at the 1995 Experimental Biology Meeting, Atlanta, GA.
6. Birmingham, D.J., Logar, C.M., Shen, X.P.: Baboon CR1b, a homologue of the human CR1-like element, encodes the baboon erythrocyte complement receptor. *Mol. Immunol.* **33**:38, 1996. Presented at the 16th International Complement Workshop, Boston, MA.
7. Logar CM, Birmingham DJ: CR1-like, a C3b binding protein of non-human primate erythrocytes, is expressed in human bone marrow. 1997 Presented at the 1997 International Society of Developmental and Comparative Immunology, Williamsburg, VA.
8. Allred LK, Birmingham DJ: Polymorphisms of Fc γ RIIIa and the associated γ subunit in normals and SLE patients. Presented at the 1998 Experimental Biology Meeting (AAI).
9. Birmingham DJ, Chen W, Shen XP: Certain mutations of CR1 segregate with normals or SLE patients with nephritis. *Molecular Immunology* **35**:334, 1998. Presented at the 17th International Complement Workshop, Rhodes Greece.
10. Birmingham DJ, Moulds JM, Chen W. A CR1 polymorphism associates with the B allele and with SLE patients. 1998. Presented at the 17th International Complement Workshop, Rhodes Greece.
11. Birmingham DJ, Chen W, Shen XP, Liang G: A CR1 polymorphism associates with SLE Nephritis and Juvenile-onset IgA Nephritis. *Mol Immunol* **36**:304, 1999, Presented at the 7th European Meeting on Complement in Human Disease-EC99, Helsinki, Finland
12. Birmingham DJ, Liang G, Shen XP. CR1 polymorphisms associated with SLE. *Immunopharmacology* **49**:29, 2000. Presented at the 18th International Complement Workshop, Salt Lake City, Utah.
13. Birmingham DJ, Logar CM, Chen W. Characterization of the human CR1-like transcript. *Immunopharmacology* **49**:11, 2000. Presented at the 18th International Complement Workshop, Salt Lake City, Utah.
14. Birmingham DJ, Chen W, Liang G, Schmitt HC. A CR1 polymorphism exhibits enhanced binding to C4b which may contribute to protection against SLE in Caucasians. 2001. Presented at the Complement Associated Diseases, Animal Models, and Therapeutics Workshop, Santorini, Greece.
15. Logar CM, Chen W, and Birmingham DJ. Human CR1-like express a transcript in bone marrow for a C4b binding protein. Presented at the 7th International Workshop on MHC evolution and VIII Complement Genetics Workshop and Conference. October 2002, Perth, Western Australia.
16. Birmingham DJ, Chen W, Schmitt HC, Gavit K. A CR1 polymorphism associated with constitutive erythrocyte CR1 levels affects binding to C4b but not C3b Presented at the 7th International Workshop on MHC evolution and VIII Complement Genetics Workshop and Conference. October 2002, Perth, Western Australia.
17. Gavit KF, Nagaraja HN, Yu CY, Rovin BH, Hebert LA, Birmingham DJ. Erythrocyte CR1 levels and SLE flare. Presented at the 7th International Lupus Congress, May 9-13, 2004, New York, NY.
18. Birmingham DJ, Gavit KF, McCarty S, Yu CY, Rovin BH, Hebert, LA. Erythrocyte CR1 levels and SLE flare. Presented at the Annual American Society of Nephrology Meeting, August 14-18, 2004, New York City, NY.
19. Gavit KF, Tong J, Nagaraja HN, Birmingham DJ. Two CR1 polymorphism in SCR 8 independently affect binding to C4b and/or C3b. Presented at the 20th International Complement Workshop, June 13-18, 2004, Honolulu, HI.
20. Irshaid F, Yu CY, Birmingham DJ. Human fetal liver and bone marrow express a transcript that encodes the two N terminal SCRs of CR1-like. Presented at the 20th International Complement Workshop, June 13-18, 2004, Honolulu, HI.
21. Birmingham, DJ. Gavit KF, McCarty S, Tong J, Yu CY, Rovin BH, Nagaraja HN, Hebert, LA, Consumption of erythrocyte CR1 is associated with protection against SLE renal flare. Presented at the 10th European Meeting on Complement in Human Disease, September 9-13, 2005, Heidelberg, Germany.
22. Birmingham DJ, Nagaraja HN, Rovin BH, Spetie L, Zhao Y, Li X, Hackshaw KV, Malarkey WB, Hebert LA. Fluctuation in Self-Perceived Stress Increases Risk of Flare in SLE Nephritis Patients Carrying the 5-HT_{1A}-1019G Allele. Presented at the 2006 American Society of Nephrology, Nov 14-19, 2006, San Diego Ca
23. Birmingham DJ, Rovin BH, Zou X, Yu CY, Tsao BP, Wu H, Nagaraja HN, Hebert LA. Multivariate Analysis of Traditional Biomarkers Identifies Markers and Forecasters of Lupus Nephritis Flare. Presented at the 8th International congress on SLE, May 23-27, 2007, Shanghai, China
24. Bitter J, Dials S, Nagaraja HN, Yu CY, Rovin BH, Hebert LA, Birmingham DJ. Changes in Anti-C1q IgG Levels Neither Forecast nor Mark a Lupus Nephritis Flare. Presented at the 9th International congress on SLE. June 23-27, 2010, Vancouver BC, at the 23rd International Complement Workshop, Aug 1-5, 2010, New York NY, and at the American Society of Nephrology, Nov 16-21, Denver, Co.

25. Birmingham DJ, Hebert LA, Song H, Nagaraja HN, Noonan WT, Rovin BH, Yu CY. Evidence that Decline in Vitamin D Status may be Mechanistically Related to SLE Flare. Presented at the 9th International congress on SLE. June 23-27, 2010, Vancouver BC, and at the American Society of Nephrology, Nov 16-21, Denver, CO.

Presentations

Other academic institutions

1. "Effect of erythropoiesis on circulating levels of erythrocyte complement receptors". Presented at the Washington University Complement Seminar Series, Washington University, St Louis MO, May 10, 1991
2. "CR1 isoforms expressed in primates". Presented at the Cincinnati Complement Club, March 26, 1992
3. "Immune complex receptor polymorphisms in SLE and SLE nephritis". Presented at the MCP Hahnemann University School of Medicine the Dept. of Microbiology & Immunology Seminar Series, Philadelphia, PA, January 31, 2001
4. "A CR1 polymorphism exhibits enhanced binding to C4b which may contribute to protection against SLE in Caucasians". Presented at the International Meeting on Complement Associated Diseases, Animal Models, and Therapeutics, Santorini Greece, October 14th, 2001
5. "Primate immune adherence receptors". Presented at the 7th International Workshop On MHC, Evolution, and Complement Genetics Workshop, Perth, Western Australia, October 2002
6. "A CR1 polymorphism associated with constitutive erythrocyte CR1 levels affects binding to C4b but not C3b". Presented at the 7th International Workshop On MHC, Evolution, and Complement Genetics Workshop, Perth, Western Australia, October 2002
7. "The Ohio SLE Study". Presented to the Ohio Arthritis Consortium, Columbus, OH, September 22, 2003
8. "Identifying biomarkers of Lupus Nephritis (LN) Flare: The role of anti-C1q (and others)". Presented to Nephrology and Urology Research Affinity Group, Nationwide Children's Hospital, Columbus, OH, May 19, 2010

Ohio State

1. Presentations (~ 3/yr) at the Nephrology Research Conference series. 1991-present
2. Yearly presentations at the College of Medicine/Pathology Immunobiology Seminar Program. 1994-2005
3. "The Complement System". Presented at the Nephrology Fellows Research Conference, January 3rd, 2001
4. "The physiology of immune adherence". Presented at the HLRI lecture series. May 2, 2001
5. "The Ohio SLE Study". Presented at the OSU Internal Medicine Grand Rounds. August 23, 2001
6. "Is FcγRIIIa pro- or anti-inflammatory? Deciphering its true role in human immune complex disease". Presented at the HLRI Research in Progress lecture series. October 3, 2001
7. "Update on CR1 and SLE". Presented at the SLE seminar series, February 22nd, 2002
8. "Genetic variation of immune complex receptors: Does it play a role in immune complex disease?". Presented to the Department of Statistics research group, April 16th, 2002.
9. "CR1L, a new member of the Regulators of Complement Activation (RCA) gene cluster". Presented at the HLRI Research in Progress lecture series. February 7th, 2003.
10. "Complement and kidney disease". Presented at the Nephrology Fellows Reunion conference, September 26, 2003.
11. Stats?
12. "Where there's smoke...Pursuing a novel complement receptor". Present at the Department of Pathology Immunology Seminar Program, September 28th, 2004.
13. "Erythrocyte CR1 consumption is associated with protection against SLE renal flare". Presented at the HLRI Research in Progress lecture series, April 15th, 2005.
14. "Genetic and Clinical Risk Factors for Human SLE Nephritis". Presented at the Nephrology Fellows Research Conference, July 29th, 2005
15. "The role of complement in health and disease". Presented at OSU Internal Medicine Grand Rounds. October 27th, 2005.
16. "Fluctuation in Self-Perceived Stress and Increased Risk of Flare in Patients with Lupus Nephritis Carrying the Serotonin Receptor 1A (5HT1A) -1019 G Allele". Presented at the Nephrology Fellows Research Conference, July 28th, 2006.
17. "The Ohio SLE Study, from bench to bedside and back again". Presented at the HLRI Research in Progress lecture series, June 29th, 2007.

18. "The Ohio SLE Study: A study of the pathogenesis of SLE renal flare". Presented at the Nephrology Fellows Research Conference, September 7th, 2007.
19. "The Ohio SLE Study: Characterizing renal flare in patients with systemic lupus erythematosus (SLE)". Presented at the Comprehensive Transplant Conference, April 16th, 2008
20. "Deciphering the complex role of the complement system in the pathogenesis and prediction of lupus nephritis flare". Present at the Department of Pathology Immunology Seminar Program, January 27, 2009
21. "Complement activation and regulation: How this balance influences SLE nephritic flare". Presented at the Nephrology Fellows Research Conference, March 6th, 2009.
22. "Is a declining vitamin D level a risk factor for SLE flare?". Present at the Department of Pathology Immunology Seminar Program, April 23rd, 2010.
23. "Understanding the role of anti-C1q autoantibodies in lupus nephritis flare: Crossed up by cross-sectional studies". Presented at the HLRI Research in Progress lecture series, August 13th, 2010.
24. "Autoantibodies to complement in lupus nephritis (LN) and its flares". Presented at the Everett D. Reese Immunology and Rheumatology Research Seminar Series, April 20th, 2011.
25. "Anti-C3b autoantibodies define the role of anti-C1q autoantibodies as a biomarker of lupus nephritis flare" Presented at the Nephrology Fellows Research Conference, October 21st, 2011.
26. "T cell transcripts in Lupus Nephritis Flare". Presented at the Nephrology Fellows Research Conference, April 6th, 2012.
27. "Interrogating 30 different urine analytes as biomarkers of lupus nephritis flare". Presented at the Nephrology Fellows Research Conference, May 24th, 2013.
28. "Changing complement phenotypes during lupus nephritis flare: The OSS experience" Presented at the Ohio State University Reese Seminar Series, September 13, 2016.

Education

Formal course work

1. Course coordinator for IBGP 703.03.
A 3 credit hour core course in the Integrated Biomedical Science Graduate program (IBGP) that was taught every spring quarter to first year IBGP graduate students, including those in the MD/PhD tract. Consisted of 30 lectures on the heart, lung, kidney and vasculature. From 2004 to 2013.
2. Co-developed MVIMG 801: Immunogenetics and Autoimmunity.
A 3 credit hour course developed in collaboration with Dr. Yung Yu in the Department of Pediatrics that was offered from 2002 until 2007. The focus of this course was the genetics, etiology, and pathogenesis of human autoimmune disease, and was designed for 2nd year graduate students across many health science disciplines.
3. Lectured and moderated small group session on host defense for Med-Immuno I Integrated Pathway.
Lecture was on immune complex disease. From 2004 to 2007.
4. Lectured for MVIMG 845
Four lectures on the history of the complement system. Offered to 2nd and 3rd year graduate students. Course offered in 2009 and 2010.
5. Lecture for MVIMG 701: Cellular and Molecular Immunology
This graduate level course is the basic immunology course for first year graduate students, and is co-listed with the Department of Microbiology. I give two lectures on antibody structure and function. From 2003 to 2013.

Mentoring

1. Dissertation advisor: Laura Allred, PhD, Pathology, 2001
2. Dissertation advisor: Fawzi Irshaid, MCDB, 2005
3. Dissertation Committee member: Kristi Rupert, OSBP, 1999
4. Dissertation Committee member: Craig A. McClure, molecular Genetics (University of Australia), 2005
5. Dissertation Committee member: Kathryn Kitzmiller, IBGP, 2009
6. Dissertation Committee member: Ashley Carpenter, IBGP, 2016
7. Lab mentor, Chris Logar, Medical Student, recipient of the Bertha Bouroncle Research Award, 1996
8. Lab mentor, Katie Gavit, Masters of Epidemiology, 2002 - 2004
9. Lab mentor, Scott McCarty, undergraduate student, 2003 - 2005
10. Lab mentor, Kate Sasser, IBGP lab rotation, 2004
11. Lab mentor, Mahvish Ahmed, undergraduate student, 2005 - 2006

13. Lab mentor, Ruo-Qi Hu, Nephrology Fellow, 2006
12. Lab mentor, Sarah Dials, undergraduate student (Otterbein biology honors project), 2008
13. Lab mentor, Josh Bitter, Nephrology Fellow, 2009
14. Lab mentor, Sanya Dosani, undergraduate student, 2009 - 2010
15. Lab mentor, Ezinne Nduke, undergraduate student, 2010 - 2011
16. Lab mentor, Terese Gullo, undergraduate student, 2012 - 2013
17. Lab mentor, Nicole Reyes, undergraduate student, 2012 - 2013
18. Lab mentor, Maria Khan, Nephrology Fellow, 2013-2014
19. Lab mentor, Salem Almaani, Nephrology Fellow, 2015-2016