

Professor of Biochemistry
Otto Endowed Professor in Chemistry
Director of Undergraduate Research
Department of BCES

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EDUCATION

Ph.D. 2000 Northwestern University, Evanston, Illinois /IGP- Cancer Biology
B.A. 1995 University of Iowa, Iowa City, Iowa /Biochemistry

TEACHING EXPERIENCE

Professor of Biochemistry, 2004-present Wartburg College

Courses: Principles of Chemistry, Hot Topics in Sci/Med, Introduction to Organic Chemistry, Biochemistry, Advanced Biochemistry, Methods of Biochemical Research, Student Originated Research, Senior Seminar, Tanzania & the Global Aids Crisis (May Term Study Abroad Course)

Adjunct Instructor, 2002-2003, North Carolina Central University, Durham, North Carolina (BIO1300 Biology) and University of North Carolina at Chapel Hill, North Carolina (BIO164 Molecular Biology and BME151 General Biology)

RESEARCH APPOINTMENTS

Senior Research Fellow (FUTURE in Biomedicine), University of Iowa, Summer 2014
Research Fellow, University of Iowa, Department of Biochemistry, Summer 2012
Research Fellow (FUTURE in Biomedicine), University of Iowa, Summer 2010
Postdoctoral Fellow, 2000-2004 Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, North Carolina Advisor: Dr. Keith Burridge

PROFESSIONAL SERVICE AND ACTIVITIES

Associated Editor, Journal of the Iowa Academy Science, 2016-present
Sigma Xi Grants-In-Aid-Research Committee, 2003-pres (meets bi-annually in N. Car)
Appointment Rank and Tenure Committee, Wartburg College, 2012-2014
Educational Policies Committee, Wartburg College, 2008-2011 (Chair: 2009-10)
Faculty Review Committee, Wartburg College, 2005-2008 (Chair: 2007-8)
Programming Committee, University of North Carolina Postdoctoral Association (UNC-PDA), 2001-2003 (Chair: 2002)
Steering Committee, UNC-PDA, 2002
Invited Ad Hoc grant reviewer for *The M.J. Murdock Charitable Trust Foundation*, *The Research Corporation for Science Advancement*, and *Iowa Academy of Science*
Invited Ad Hoc reviewer for *Journal of Biological Chemistry*, *EMBO Journal*, *Matrix Biology*, *International Journal of Cancer*, *Journal of Cell Science*, *Journal of Signal Transduction*

Workshops: *Designing Scientific Teaching Tools for BMB Education* (ASBMB, Viterbo University, 2013) and *Introduction to POGIL* (NSF, Mount Mary College, 2009)

AWARDS

John O. Chellevold Student Award for Excellence in Teaching and Professional Service, Wartburg College, 2014 (finalist 2006 and 2010)

Faculty Award for Scholarly and Creative Activity, Wartburg College, 2014

FUTURE in Biomedicine Research Fellowships, University of Iowa, 2010 and 2014

Otto Distinguished Professorship in Chemistry, 2007-present

GRANTS, and FELLOWSHIPS

R.J. McElroy Trust Foundation Faculty-Student Research Grants, 2006-2016 (eight, totaling \$15,202)

American Cancer Society Postdoctoral Fellowship, #PF-02-019-01-TBE, UNC-Chapel Hill “Serine Phosphorylation of RhoA: Functional Consequences and Regulatory Mechanisms”, 2002-2004

NRSA Institutional Postdoctoral Fellowship, #T32 CA09156, “Basic Mechanisms of Viral and Chemical Carcinogenesis” UNC-Chapel Hill, 2000-2001

NRSA Predoctoral Fellowship, #5T32 GM08061, “Cellular and Molecular Basis of Disease” #5T32 Northwestern University, 1999-2000

Chicago Baseball Cancer Charities Predoctoral Fellowship, 1998

PEER REVIEWED ARTICLES/CHAPTERS (25)

Patel, A., Williams-Perez, S., Peyton, N., Reicks, A., Buzick, J., Farley, J., Shirar, S., and Ellerbroek, S.M. (2017) Arg188 Drives RhoC Membrane Binding. Small GTPases 8(2):114-121

Lizalek, J., McKenna, T., Huegel K., Marsh, S., Carolan, A., Kobliska, A., Heying, E., Gardner, N., Miller, G., Kotecki, A., Henningsen, M., Lundt, A., Farley, J., and Ellerbroek, S.M. (2015) Lysophosphatidic Acid Stimulates Urokinase Receptor (uPAR/CD87) in Ovarian Epithelial Cancer Cells Anticancer Research 35 (10): 5263-5270

Jannie, K.M., Ellerbroek, S.M., Zhou, D.W., Chen, S., Crompton, D.J., Garcia, A.J., and DeMali, K.A. (2015) Vinculin-dependent actin bundling regulates cell migration and traction forces. Biochemical Journal, 465(3): 383-393

Sloan, C., Quinn, C., Peters, J., Farley, J., Goetzinger, C., Wernli, M., DeMali, K.A., and Ellerbroek, S.M. (2012) Divergence of Rho residue 43 impacts GEF activity. Small GTPases, 3: 15-22

Liu, Y., Burkhalter, R., Symowicz, J., Chaffin, K., Ellerbroek, S., and Stack, M.S. (2012) Lysophosphatidic Acid Disrupts Junctional Integrity and Epithelial Cohesion in Ovarian Cancer Cells. Journal of Oncology, 2012:501492.

Garcia-Mata, R., Wennerberg, K., Arthur, W.T., Noren, N.K., Ellerbroek, S.M., and Burridge, K. (2006) Analysis of activated GAPs and GEFs in cell lysates. Methods in Enzymology 406: 425-437.

- Ellerbroek, SM, Wennerberg, K, Arthur, W.T., Dunty, J.M., Bowman, D.R., DeMali, K., and Burrridge, K. (2004) S-GEF, a RhoG exchange factor involved in macropinocytosis. Molecular Biology of the Cell, 15(7): 3309-3319.
- Wennerberg, K., Forget, M.A., Ellerbroek, S.M., Arthur, W.T., Burrridge, K., Settleman, J., Der, C.J., and Hansen S.H., (2003) Rnd proteins function as RhoA antagonists by activating p190 RhoGAP. Current Biology, 13(13): 1106-1115.
- Ellerbroek, S.M., Wennerberg, K, and Burrridge, K. (2003) Serine phosphorylation negatively regulates RhoA in vivo. Journal of Biological Chemistry, 278(21): 19023-19031.
- Wennerberg, K., Ellerbroek, S.M., Liu, R.Y., Karnoub, A.E., Burrridge, K., and Der, C.J. (2002) RhoG signals in parallel with Rac1 and Cdc42. Journal of Biological Chemistry 277(49):47810-47817.
- Arthur, W.T., Ellerbroek, S.M., Der, C.J., Burrridge, K., and Wennerberg, K. (2002) XPLN, a guanine nucleotide exchange factor for RhoA and RhoB, but not RhoC. Journal of Biological Chemistry 277(45):42964-42972.
- Ellerbroek, S.M., Wu, Y., and Stack M.S. (2002) Regulatory mechanisms for proteinase activity. In Proteinase and Peptidase Inhibition, Smith, H. J., and Simons, C., eds., Harwood Academic Publishers.
- Ellerbroek S.M., Wu. Y.I., Overall, C.M. and Stack M.S. (2001) Functional interplay between type I collagen and cell surface proteolysis. Journal of Biological Chemistry, 276(27):24833-24842.
- Ellerbroek, S.M., Halbleib, J., Benevidez, M., Warmka, J.K., Wattenberg, E.V., Stack, M.S., and Hudson, L.G. (2001) Phosphatidylinositol 3-Kinase Activity in Epidermal Growth Factor-Stimulated Matrix Metalloproteinase-9 Production and Cell Surface Association. Cancer Research, 61:1855-1861.
- Fishman, D.A., Liu, Y.Y., Ellerbroek, S.M., and Stack, M.S. (2001) Lysophosphatidic acid promotes matrix metalloproteinase (MMP) activation and MMP-dependent invasion of ovarian cancer cells. Cancer Research, 61:3194-3199.
- Ellerbroek, S.M., Wu, Y.I, and Stack, M.S. (2001) Stabilization of MMP-2 by Type I collagen. Archives Biochemistry Biophysics 390(1):51-56.
- Schulze, K., Ellerbroek, S., Martin, J. (2001) Matrix composition in opossum esophagus. Digestive Disease Science 46(5):968-975.
- Ghosh, S., Brown, R., Jones, J.C.R., Ellerbroek S.M., and Stack M.S. (2000) Urinary-type plasminogen activator (uPA) expression and uPA receptor localization are regulated by $\alpha\beta 1$ integrin in premalignant oral keratinocytes. Journal of Biological Chemistry 275(31):23869-23876.
- Ghosh, S., Ellerbroek, S. M., Wu, Y., and Stack, M.S. (2000) Tumor cell mediated proteolysis: regulatory mechanisms and functional consequences Fibrinolysis and Proteolysis 14:23869-23876.
- Ellerbroek, S.M., Fishman, D.A., Kearns, A.S., Bafetti, L.M. and Stack, S.M. (1999) Matrix metalloproteinase regulation through $\beta 1$ integrin in ovarian carcinoma cells. Cancer Research 59:1635-41.
- Ellerbroek, S.M. and Stack, M.S. (1999) Membrane associated matrix metalloproteinases and metastasis BioEssays 11:940-949.

- Ellerbroek, S.M., Hudson, L.G. and Stack, M.S. (1998) Proteinase requirements of epidermal growth factor-induced ovarian cancer cell invasion. International Journal of Cancer 78:331-337.
- Denning, M.F., Guy, S.G., Ellerbroek, S.M., Norvell, S.M., Kowalczyk, A.P., Green, K.J. (1998) The expression of desmoglein isoforms in cultured human keratinocytes is regulated by calcium, serum, and protein kinase C. Experimental Cell Research 239:50-59.
- Stack, M.S., Ellerbroek, S.M., and Fishman, D.A. (1998) The role of proteolytic enzymes in the pathology of epithelial ovarian carcinoma International Journal of Oncology. 12:569-576.
- Soffer, E.E., Thonsawat, S. and Ellerbroek, S. (1998) Prolonged ambulatory duodeno-jejunal manometry in humans: normal values and gender effect. American Journal of Gastroenterology. 8:1318-1323.
- Martin, J.A., Ellerbroek, S.M., and Buckwalter, J.A. (1997) Age-related decline in chondrocyte response to insulin-like growth factor-1: The role of growth factor binding proteins. Journal of Orthopedic Research 15:491-498.

SELECTED CONFERENCES/WORKSHOPS AND INVITED SEMINARS

- American Society for Biochemistry and Molecular Biology Annual Meeting, San Diego, 2016 (student poster)
- American Society for Biochemistry and Molecular Biology Annual Meeting, Boston, MA, 2013 (student posters)
- American Society for Biochemistry and Molecular Biology Annual Meeting, Washington, DC, 2011 (student posters)
- American Society for Biochemistry and Molecular Biology Annual Meeting, New Orleans, LA, 2009 (student posters)
- American Society for Cell Biology Annual Meeting, San Francisco, CA, 2008 (student poster)
- American Society for Biochemistry and Molecular Biology Annual Meeting, Washington, DC, 2007 (student posters)
- Seminar: "XPLN and RhoA Activation" University of Northern Iowa, Cedar Falls, IA, 2006
- Seminar: "SGEF and RhoG, a Cool Way to Ruffle", Drake University School of Pharmacy, Des Moines, IA, 2006
- National Science Foundation Grant Writing Workshop, Columbia University, New York, NY (2004)
- American Society for Cell Biology Annual Meeting, San Francisco, 2003 (poster)
- Seminar: "Cycling with RhoA", Promega Corporation, Madison, WI, 2003
- Conference on the Scholarship of Teaching and Learning at a Research University, Duke University, Durham, NC, 2002
- American Society for Cell Biology Annual Meeting, Washington DC, 2001 (poster)
- Sigma Xi Research Society National Meeting, Raleigh, NC, 2001
- Seminar: "Mechanisms of RhoA Regulation" Department of Biology, North Carolina Central University, Durham, NC, 2001

Seminar: "Role of type I collagen in the regulation of matrix metalloproteinase cell surface activity" Department of Oral Biological and Medical Sciences, University of British Columbia, Vancouver, BC, Canada, 2000

Seminar: "Role of type I collagen in the regulation of matrix metalloproteinase cell surface activity" Department of Cell Biology Vanderbilt University, Nashville, TN, 2000

Matrix Metalloproteinase Gordon Research Conference, Colby Sawyer College, New London, NH. 1999 (poster)

New York Academy of Sciences Conference, "Inhibition of Matrix Metalloproteinases: Therapeutic Applications", Tampa, FL, 1998 (poster)

Seminar: "Fibronectin and versican are important components of the extracellular matrix (ECM) in the normal and hypertrophic opossum esophagus". Midwest Motility Meeting, Dodgeville, WI, 1996. (oral presentation)

REFERENCES

Dr. Kris DeMali (collaborator)
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Associate Professor of Dermatology
University of Iowa Carver College of Medicine
Ph. 319.335.7882
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Dr. Sharon Stack (collaborator, former graduate advisor)
Ann F. Dunne and Elizabeth Riley Director
Harper Cancer Research Institute
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Myrle M. Burk and Vera Burk Will Chair in Biology
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