Melanie A. Simpson

Telephone: (919) 515-5680
Fax: (919) 515-2047
E-mail: msimpso3@ncsu.edu

Department of Molecular and Structural Biochemistry
North Carolina State University
Campus Box 7622, 128 Polk Hall
120 Broughton Drive
Raleigh, NC 27695

Education

1992 B.S. Biochemistry, University of Minnesota.
1997 Ph.D. Biochemistry, Molecular Biology, and Biophysics, University of Minnesota.
1998-2002 Postdoctoral Fellow, Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, MN.

Professional Experience

2023-present Director of Research, Integrative Sciences Initiative, North Carolina State University, Raleigh NC.
2017-present Professor and Head, Molecular and Structural Biochemistry, North Carolina State University, Raleigh, NC.
2017-present Member, Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, NC.
2021-2024 Associate Director, Chemistry of Life Division of the Comparative Medicine Institute, North Carolina State University, Raleigh NC.
2017-2021 Adjunct Professor of Biochemistry, University of Nebraska, Lincoln, NE.
2016-2017 Willa Cather Professor of Biochemistry, University of Nebraska, Lincoln, NE.
2014-2017 Associate Director, Center for Biotechnology, University of Nebraska
2002-2017 Member, Fred and Pamela Buffett Cancer Center, University of Nebraska Medical Center, Omaha, NE.
2002-2017 Adjunct Faculty, Department of Oral Biology, University of Nebraska College of Dentistry, Lincoln, NE.
2013-2016 Rosowski Professor of Biochemistry, University of Nebraska, Lincoln, NE.
2011-2013 Susan J. Rosowski Associate Professor of Biochemistry, University of Nebraska, Lincoln, NE.
2005-2013 Scientific Consultant, LI-COR Biosciences, Lincoln, NE.
2008-2011 Associate Professor of Biochemistry with tenure, University of Nebraska, Lincoln, NE.
2002-2008 Assistant Professor of Biochemistry, University of Nebraska, Lincoln, NE.

Professional Service

Grant review

2024 (Sept) NIH NCI ZCA1 RPRB-T (J1), Program Project (P01) Review SEP (co-chair)
2024 (Aug) Department of Defense CDMRP Prostate Cancer Research Program Exploratory Hypothesis Development Award (Chair)
2024 (June) NIH 2024/10 Drug Discovery and Molecular Pharmacology SEP (Ad hoc)
2024 (Feb) NIH ZCA1 RTRB-S (M1) U01 Metastasis Research Network SEP (Chair)
2023 (Nov) NIH ZCA1 RTRB-4 (J1)S U01 Metastasis Research Network SEP
2023 (Aug) Department of Defense CDMRP Prostate Cancer Research Program Exploratory Hypothesis Development Award (Chair)
2023 (Mar) NIH ZCA1 RTRB-4 M1 U01 Metastasis Research Network SEP
2022 Beckman Scholars Program, Institutional Training Awards (Ad hoc reviewer)
2022 (Aug) Department of Defense CDMRP Prostate Cancer Research Program Exploratory Hypothesis Development Award (Ad hoc)
2022 (Feb) NIH ZRG1 OTC1-M(80)R Cancer Therapeutics and Drug Development (Ad hoc)
2021 (Jul) NIH NCI Clinical and Translational R21 and Omnibus R03 (Co-chair)
2021 Beckman Scholars Program, Institutional Training Awards (Ad hoc reviewer)

2021 (Mar) NIH ZCA1 TCRB-Q (M3) S NCI Clinical/Translational R21, R03 (Co-chair)
2021 (Feb) NIH ZCA1 RTRB-Y (M1) R U54 Metastasis Research Network SEP
2019 (Nov) US Army Prostate Cancer Research Program
2019 (Oct) NIH ZCA1 SRB-5 (J1) P01 Special Emphasis Panel (Ad hoc)
2019 (Mar) NIH ZRG1-OBT-D Cancer Biology Special Emphasis Panel (Ad hoc)
2018 (Dec) US Army CDMRP Prostate Cancer Research Program (Ad hoc)
2018 (Nov) NIH ZRG1-OBT-D Cancer Biology Special Emphasis Panel (Ad hoc)
2018 American Heart Association, Cell Structure and Survival Panel co-Chair (Apr, Oct)
2017 (Nov) US Army Prostate Cancer Research Program
2014-2018 NIH Tumor Progression and Metastasis Panel, regular member
2014 (July) NIH Oncological Sciences Fellowship Panel
2013-14 American Heart Association, Membrane & Subcellular Organelles Panel co-Chair
2013 (Feb) NIH Tumor Progression and Metastasis Panel (Ad hoc)
2012 American Heart Association, Membrane & Subcellular Organelles Panel (Apr, Oct)
2012 NIH Oncological Sciences Fellowship Panel (Mar, Nov)
2012 (Feb) NIH MEDI/CMIP Member Conflict Special Emphasis Panel
2012 (Feb) NIH Tumor Progression and Metastasis Panel (Ad hoc)
2011 NIH Oncological Sciences Fellowship Panel (Mar, July, Nov)
2011 (June) NIH Surgical Sciences, Biomedical Imaging and Bioengineering SEP
2011 (May) NIH Tumor Progression and Metastasis Panel (Ad hoc)
2011 American Heart Association, Membrane & Subcellular Organelles Panel (Apr, Oct)
2010 NIH Oncological Sciences Fellowship Panel (Feb, June, Oct)
2010 (Sept) Austrian Academy of Sciences APART Postdoctoral Fellowship Review
2010 (June) US Army Breast Cancer Research Program, Pathobiology-3 Panel
2010 (Mar) US Army Prostate Cancer Research Program, Clin/Exp Therapeutics (Pre-CET-A)
2009 NIH Oncological Sciences Fellowship Panel (June, Oct)
2009 (Sept) Missouri Life Science Research Program
2009 (July) US Army Prostate Cancer Research Program, Detection, Diagnosis & Prognosis
2009 (May) NIH Challenge, Cell Biology
2009 (Mar) US Army Prostate Cancer Research Program, Clin/Exp Therapeutics (Pre-CET-A)
2008 (Sept) US Army Prostate Cancer Research Program, Clin/Exp Therapeutics-2 (CET-2)
2006-11 Bankhead-Coley Cancer Research Program
2007-09 Kansas City Area Life Sciences Institute Research Program
2007 (June) NIH P01 Cellular and Tissue Biology Special Emphasis Panel
2006 (Sept) NIH P01 Cellular and Molecular Biology Special Emphasis Panel
2006 (June) US Army Prostate Cancer Research Program, Cell Biology-3 Panel
2004-05 US Army Prostate Cancer Research Program, Pathobiology-3 Panel
2005 (May) Nanotechnology Institute/Ben Franklin Technology Partners Grant Program
2004-05 Florida Dept. of Health James & Esther King Biomedical Research Program

Manuscript/book chapter review

2022 – present Associate Editor, Proteoglycan Research
2013 – present Editorial Board Member, Matrix Biology
2002 – present Ad hoc review service for:
Analytical Biochemistry, BMC-Cancer, British Journal of Pharmacology, Cancer Research, Cell Biochemistry and Function, Cell Proliferation, Clinical and Experimental Metastasis, Current Urology, European Journal of Biochemistry, Experimental Cell Research, FASEB Journal, FEBS Letters, Glycobiology, In vitro Cellular and Developmental Biology, Journal of Biological Chemistry, Journal of Cellular Physiology, Molecular Cancer, Oncogene, Pathology Research, PLoS One, Tissue Engineering, Stryer's Biochemistry

Academic program review

2025 (Mar) NC State University, Physics Programs (internal reviewer)
2024 (Oct) Virginia Tech Biochemistry Program, Blacksburg, VA
2024 (June) NIEHS, Immunology, Inflammation and Disease Lab, Research Triangle Park, NC
2024 (Apr) University of Massachusetts, Amherst, Biochemistry and Molecular Biology program
2023 (Oct) University of Nebraska Medical Center Cancer Research Training Program, Omaha

Professional memberships

American Association for Cancer Research (2000-present)
American Society for Matrix Biology (2004-present)
American Society for Biochemistry and Molecular Biology (2007-present)
Women in Cancer Research (2007-present)
American Association for the Advancement of Science (2015-present)

Honors and Awards

2024-2028	Gordon Research Conference on Proteoglycans Vice Chair/Chair-Elect
2024-2027	President, International Society for Hyaluronan Sciences
2020-2023	Treasurer and President-elect, International Society for Hyaluronan Sciences
2022-present	NSF Alliances for Graduate Education and the Professoriate (AGEP-NC), co-PI
2018-2021	NSF Alliances for Graduate Education and the Professoriate (AGEP-NC), Fellow
2017	Dean's Award for Excellence in Graduate Education
2016-21	Willa Cather Professorship
2015-20	Board of Trustees (elected), International Society for Hyaluronan Sciences
2013	Mortar Board People Who Inspire Award
2013	McNair Faculty Appreciation Award
2012	McNair Program Spotlight Mentor
2012	CASNR Parents Award
2011-16	Susan J. Rosowski Professorship
2009	Beta Theta Pi Fraternity Outstanding Educator Award
2009	Nominated for CASNR Week Outstanding Teaching Award
2008	Invited Member, International Society for Hyaluronan Sciences
2006	University of Nebraska Junior Faculty Award for Excellence in Research
2000-02	National Institutes of Health NRSA Postdoctoral Fellowship
1997	Department of Biochemistry Travel Award
1995-96	President of Biochemistry Graduate Students
1994-96	National Institutes of Health Predoctoral Fellowship
1992-94	Department of Biochemistry Graduate Academic Award
1992	Bachelor of Science, *summa cum laude*

Leadership and Administrative experience

2023-present	Director of Research, Integrative Sciences Initiative, North Carolina State University
2017-present	Department Head, Molecular and Structural Biochemistry, North Carolina State University
2021-2024	Co-director, Chemistry of Life Division of the Comparative Medicine Institute, North Carolina State University
2021-2023	Food Systems Leadership Institute Cohort 17 Alum
2018-2019	LEAD 21 Class 14 Program Alum
2014-2017	Associate Director, Center for Biotechnology, University of Nebraska
2014-2017	Complex Biosystems PhD Program, Founding Director (U of NE)
2013-2017	Molecular Mechanisms of Disease Predoctoral Program, Founding Director

Research Support

External support (current)

Source: UNC Research Opportunity Initiative
Title: AMBI – Accelerated Molecular and Biological Innovation Enabled by Integrated Engineering and Sciences
Role: co-Principal investigator
Period of support: 7/01/2023-6/30/2026

The goal of this grant is to develop a self-driving lab system to synthesize and optimize small molecule inhibitors of specific targets in cancer and antibiotic research.

Source: National Institutes of Health, National Cancer Institute (NCI) P30 CA016086
Lineberger Comprehensive Cancer Center Tier 2 Stimulus Funds
Title: Development of Selective Inhibitors to a Novel Target in Progression of Castration Resistant Prostate Cancer
Role: Principal investigator
Period of support: 7/01/2022-6/30/2024

The goal of this grant is to use computational modeling and a high throughput fluorescence-based screen to develop and optimize conformationally selective small molecule inhibitors of UDP-glucose dehydrogenase.

External support (pending)

Source: National Institutes of Health, National Cancer Institute, R21 CA274027-01A1
Title: Improving prostate cancer therapeutic response by targeting a novel regulatory mechanism
Role: Principal investigator
Period of support: 05/01/2024-04/30/2026
The goal of this grant is to define prognostic value of RSK3-UGDH detection in prostate cancer biopsy specimens, optimize a novel peptide inhibitor of UGDH, and determine the efficacy of RSK3 and/or UGDH inhibition in delaying or preventing loss of therapeutic response.
* 10th percentile score

External support (completed)

Source: NIH NCI Lineberger Comprehensive Cancer Center Tier 1 Pilot Funds
Title: Targeting hormone elimination to control prostate cancer
Role: Principal investigator
Period of support: 05/01/18-10/31/19
The goal of this grant was to conduct preclinical studies to determine if UGDH manipulation has an impact on castration resistant prostate tumor growth.

Source: National Institutes of Health, National Cancer Institute, R01 CA165574-01A1
Title: Mechanisms of hyaluronan signaling and turnover in prostate cancer
Role: Principal investigator
Period of support: 07/01/12-06/30/19 (NCE)
The goals of this project were to define the functions of stromal and epithelial hyaluronan synthesizing and processing enzymes in prostate cancer progression, determine the metastatic counter receptor for hyaluronan-mediated metastasis, and evaluate therapeutic targeting of this pathway.

Source: National Institutes of Health, National Cancer Institute, R01 CA165574-04S1
Title: Mechanisms of hyaluronan signaling and turnover in prostate cancer
Role: Principal investigator
Period of support: 07/01/15-06/30/19 (NCE)
This supplemental diversity award supported training costs for graduate assistant Eryn Lee.

Source: National Institutes of Health, National Cancer Institute R21 CA185993-01A1
Title: Defining aberrant steroid elimination in castration resistant prostate cancer
Role: Principal investigator (MPI with Joseph Barycki)
Period of support: 5/1/15-4/30/18 (NCE)
The goal of this project was to characterize interacting proteins that modulate UGDH activity in prostate tumor cells and sustain the steroid elimination response.

Source: National Institutes of Health, NIGMS 1T32GM107001-01A1
Title: Molecular mechanisms of disease
Role: Principal investigator (MPI with Paul Black)
Period of support: 07/01/15-06/30/20, PI transfer 5/31/17
The goals of this institutional predoctoral training grant application are to provide stipends,

research training, and professional development for twelve trainees per year to become experts in mechanistic disease research.

Source: NIH NIGMS Center of Biomedical Research Excellence 5P20GM103489
PI: Keith Johnson, Buffett Cancer Center and College of Dentistry
Overall project title: Nebraska Center for Cellular Signaling
Role: Mentor (10% effort)
Period of support: 09/01/13-08/31/17
The goal of this grant is to mentor new junior faculty to long-term successful research programs. My role was to serve as an executive committee member and proposal development coordinator (Buffett Cancer Center).

Source: National Institutes of Health, National Cancer Institute R01 CA172574
Title: DNA damage checkpoint recovery and cancer
Role: Co-investigator (PI Aimin Peng, UNMC College of Dentistry)
Period of support: 04/01/13-03/31/17
The goals of this project were to determine the role of greatwall kinase in checkpoint recovery from DNA damage in oral squamous cell carcinoma and determine if its inhibition has therapeutic potential for chemosensitization.

Source: National Institutes of Health, NIGMS 1U54GM115458-01
Title: Great Plains IDeA-CTR
Role: Institutional Coordinator (PI Rizzo, UNMC)
Period of support: 10/01/16-09/30/21, transferred 5/31/17
The goal of this multi-state multi-institutional infrastructure award is to increase collaboration and mentoring of early career faculty at the clinical translational interface.

Source: National Institutes of Health, NIGMS P20 GM113126-01
Title: Nebraska Center for Integrated Biomolecular Communication
Role: Mentor (PI Takacs, UNL)
Period of support: 10/01/16-09/30/21, transferred 5/31/17
The goal of this grant is to mentor new junior faculty to long-term successful research programs. My role is to mentor Cliff Stains, project leader in the Department of Chemistry.

Source: National Science Foundation
PI: Donald F. Becker
Title: Research Experiences for Undergraduates Site: Training in Redox Biology
Role: Investigator/mentor
Period of Support: 03/01/15-02/28/17
The goal of this grant is to train undergraduate scientists in hands on research.

Source: Beckman Research Foundation
PI: Gregory Snow
Title: UNL Beckman Scholars Program
Role: Mentor
Period of Support: 2013-16
The goal of this grant was to provide professional development and hands on research training for six UNL undergraduate scientists.

Source: National Institutes of Health**,** NIGMS 5P30GM103335-03
Title: Redox Biology Center: Emerging regulatory paradigms in glutathione metabolism during cancer progression
Role: PI (Co-I Barycki, Guo)
Period of support: 11/1/14-10/31/16
The goal of this competitive pilot project was to characterize novel alternative metabolic roles for canonical glutathione synthesis and salvage enzymes.

Source: Department of Defense Prostate Cancer Research Program

PI: Ming-Fong Lin, Buffett Cancer Center and UNMC Department of Biochemistry
Title: Nebraska Prostate Cancer Research Program
Role: Investigator/mentor
Period of Support: 03/01/13-02/28/16
The goal of this Collaborative Undergraduate HBCU Student Summer Training Program was to train undergraduate scientists in hands on research.

Source: National Institutes of Health, NIGMS 5P20GM103489
PI: Keith Johnson, Buffett Cancer Center and UNMC College of Dentistry
Overall project title: Nebraska Center for Cellular Signaling
Individual project title: Role of Ment in Lymphomagenesis
Role: PI (MPI with Dr. Rene Opavsky, Eppley Institute for Cancer Research)
Period of support: 09/2014-08/2015
This competitive pilot project investigated the structure and function of a novel tumor modifier called Ment, in vitro and in the context of mouse myc-induced lymphoma.

Source: Nebraska Department of Health and Human Services
Title: Control of androgen inactivation in prostate cancer
Role: Principal investigator
Period of support: 7/1/12-6/30/13
The goal of this project was to characterize expression of UGDH in human prostate cancer tissue microarrays and determine the effect of UGDH manipulation on tumor cell androgen response.

Source: National Institutes of Health, NIGMS P20 GM103489-10
PI: Keith Johnson, Buffett (formerly Eppley) Cancer Center and UNMC College of Dentistry
Overall project title: Nebraska Center for Cellular Signaling
Individual project title: Hyaluronan and desmosome assembly
Role: PI (Multiple PI with Dr. James Wahl, UNMC College of Dentistry)
Period of support: 08/2012-06/2013
This competitive pilot project investigated how excess hyaluronan impacts subunit content, assembly kinetics, and function of desmosomes.

Source: National Institutes of Health, National Cancer Institute R01 CA106584
Title: Role of hyaluronan matrix in prostate cancer progression
Role: Principal investigator
Period of support: 7/1/05-10/30/11
The goal of this proposal was to evaluate the respective and concerted functions of hyaluronan synthesizing and processing enzymes in prostate tumor cell growth, motility, angiogenesis and metastasis in mice.

Source: NIH NCRR Center of Biomedical Research Excellence P20 RR018759-07S1
PI: Keith Johnson, Eppley Cancer Center and UNMC College of Dentistry
Overall project title: Nebraska Center for Cellular Signaling
Individual project title: Impact of hyaluronan turnover on signaling through endosomal trafficking
Role: PI (Multiple PI with Dr. Steve Caplan UNMC Biochemistry)
Period of support: 10/2009-09/2011
This competitive supplement, obtained through ARRA funds, was to encourage new collaborative projects. The goal of the project was to define the pathways through which hyaluronan internalization controls cell motility and cell surface receptor expression.

Source: National Institutes of Health, NIGMS R01 GM077289-04S4
Title: Structural insights into redox homeostasis
Role: Co-PI (10% effort; PI Joseph J. Barycki, UNL)
Period of support: 10/30/09-3/31/11
The goal of this Supplement for Collaborative Science was to investigate the consequences of glutathione metabolic enzyme mutagenesis for cellular redox state in liver cell cultures.

Source: American Heart Association
Title: Characterization of disrupted multi-subunit enzyme interactions that impair cardiac valve development and function
Role: Principal investigator (20% effort)
Period of support: 7/1/07-6/30/09

Source: National Institutes of Health, NIGMS R01 GM069961-05
Title: Structure/function studies of the HA receptor for endocytosis
Role: Subcontracted collaborator (PI: Paul H. Weigel, University of Oklahoma)
Period of support: 7/1/04-6/30/08

Source: US Army Medical Research and Materiel Command,
Prostate Cancer Research Program New Investigator Award
Title: Role of hyaluronan in prostate cancer progression
Role: Principal investigator
Period of support: 3/1/04-3/31/07

Source: National Institutes of Health Center of Biomedical Research Excellence (P20)
PI: Margaret Wheelock, Eppley Cancer Center and UNMC College of Dentistry
Overall project title: Nebraska Center for Cellular Signaling
Individual project title: Production of hyaluronan in prostate cancer progression
Role: PI (project leader)
Period of support: 10/1/03-6/30/05

Source: National Institutes of Health (NRSA) 1F32CA084619
Title: Hyaluronan biosynthesis in prostate carcinoma
Role: Principal investigator
Period of support: 04/01/00-08/15/02

Internal support (current)

None.

Internal support (completed)

Source: Office of Research and Institute of Agriculture & Natural Resources
Title: Molecular mechanisms of disease graduate training program pilot grant
Role: Principal investigator (Multiple PI with Dr. Paul Black, UNL)
Period of support: 07/01/13-06/30/15
The goals of this predoctoral training grant pilot were to provide stipends, research training, and professional development for four trainees per year (over two years) to become experts in mechanistic disease research. This pilot provided data for resubmission of the NIH NIGMS 1T32GM107001-01 institutional training grant application in May, 2014.

Source: University of Nebraska Layman Foundation Award
Title: Control of androgen inactivation in prostate cancer
Role: Principal investigator
Period of support: 6/1/12-5/31/13

Source: Redox Biology Center Pilot Award
Title: Redox coordinated extracellular matrix remodeling in cancer
Role: Principal investigator
Period of support: 1/1/09-12/31/09

Source: University of Nebraska Layman Foundation Award
Title: Hyaluronidase activation and function in cancer
Role: Principal investigator
Period of support: 6/1/07-5/31/08

Source: University of Nebraska Research Council Faculty Seed Grant

Title: Mechanisms of hyaluronan-mediated bone growth
Role: Principal investigator
Period of support: 1/1/07-12/31/07

Source: University of Nebraska Agricultural Research Division
Interdisciplinary Research Program
Title: Role of hyaluronan during the ovulatory process in the beef cow
Role: Co-investigator (PI: Andrea Cupp)
Period of support: 6/1/03-5/31/05

Source: University of Nebraska Layman Foundation Award
Title: Role of hyaluronan in prostate cancer
Role: Principal investigator
Period of support: 7/1/03-6/30/04

Source: University of Nebraska Strategic Research Cluster Grant
Title: Regulation of angiogenesis in reproductive tissues
Role: Co-investigator (PI: Andrea Cupp)
Period of support: 7/1/03-6/30/04

Source: Nebraska EPSCoR Small Grants Program for Women in Science
Title: Hyaluronan overproduction in prostate tumorigenesis
Role: Principal investigator
Period of support: 4/1/03-12/31/03

Publications (reverse chronological order, undergraduate authors underlined)

Zimmer BM, Howell ME, Ma L, Enders JR, Lehman D, Corey E, Barycki JJ, and **Simpson MA**. (2021) Altered glucuronidation deregulates androgen dependent response profiles and signifies castration resistance in prostate cancer. Oncotarget 12: 1886-1902. PMCID: PMC9169848.

Hengel H, Bosso-Lefevre C, Grady G, et al (2020) Loss-of-function Mutations in *UDP-Glucose 6-Dehydrogenase* Cause Recessive Developmental Epileptic Encephalopathy. Nat Commun 11: 595.

Nowialis P, Lopusna K, Opavska J, Haney SL, Abraham A, Sheng P, Riva A, Natarajan A, Guryanova O, **Simpson MA**, Hlady RA, Xie M, and Opavsky R. (2019) Catalytically inactive Dnmt3b rescues mouse embryonic development by accessory and repressive functions. Nat Commun. 10(1):4374. doi: 10.1038/s41467-019-12355-7.

McAtee CO, Booth C, Elowsky C, Zhao L, Payne J, Fangman T, Caplan S, Henry MH and **Simpson MA.** (2019) Prostate tumor cell exosomes containing hyaluronidase Hyal1 stimulate prostate stromal cell motility by engagement of FAK-mediated integrin signaling. Matrix Biology 78-79:165-179.

Zimmer BM*, Howell ME*, Wei Q, Ma L, Romsdahl T, Loughman EG, Markham JE, Seravalli J, Barycki JJ, and **Simpson MA**. (2016) Loss of exogenous androgen dependence by prostate tumor cells is associated with elevated glucuronidation potential. Hormones and Cancer, 7(4), 260-271. *Authors contributed equally

Grady G*, Thelen A*, Albers J, Ju T, Guo J, Barycki JJ, and **Simpson MA**. (2016) Inhibiting hexamer disassembly of UDP-glucose dehydrogenase by photoactivated amino acid cross-linking. Biochemistry 55(22):3157-64. *Authors contributed equally

McAtee CO, Berkebile A, Elowsky C, Fangman T, Barycki JJ, Wahl JK, Khalimonchuk O, Naslavsky N, Caplan S and **Simpson MA.** (2015) Hyaluronidase Hyal1 increases tumor cell proliferation and motility through accelerated vesicle trafficking. J Biol Chem 290(21):13144-56.

Haney SL, Hlady RA, Opavska J, Klinkebiel D, Pirruccello SJ, Dutta S, Datta K, **Simpson MA**, Wu L and Opavsky R. (2015) Methylation-independent repression of Dnmt3b contributes to oncogenic activity of Dnmt3a in mouse MYC-induced T-cell lymphomagenesis. Oncogene 34(43):5436-46

McAtee CO, Barycki JJ and **Simpson MA.** (2014) Emerging roles for hyaluronidase in cancer metastasis and therapy. Invited review. Adv Cancer Res. 2014;123:1-34.

Liu Y, Hyde AS, **Simpson MA**, Barycki JJ. (2014) Emerging regulatory paradigms in glutathione metabolism. Invited review. Adv Cancer Res. 2014;122C:69-101.

Kovar JL, Cheung LL, **Simpson MA,** Olive DM. (2014) Pharmacokinetic and biodistribution assessment of a near infrared-labeled PSMA-specific small molecule in tumor-bearing mice. Prostate Cancer. 2014:104248.

Peters SL, Hlady R, Opavska J, Klinkebiel D, Pirruccello SJ, Talmon GA, Sharp JG, Wu L, Jaenisch R, **Simpson MA**, Karpf AR and Opavsky R. (2014) Tumor suppressor functions of Dnmt3a and Dnmt3b in the prevention of malignant lymphopoiesis. Leukemia. 28(5): 1138-42.

Hyde AS*, Thelen AM*, Barycki JJ, **Simpson MA**. (2013) UDP-glucose dehydrogenase activity and optimal downstream cellular function require dynamic reorganization at the dimer-dimer subunit interfaces. J Biol Chem 288(49): 35049-35057. *Co-first authors

Peters SL, Hlady R, Opavska J, Klinkebiel D, Novakova S, Smith LM, Lewis RE, Karpf AR, **Simpson MA**, Wu L and Opavsky R. (2013) An essential role for Dnmt1 in prevention and maintenance of MYC-induced T cell lymphomas. Mol Cell Biol. 33(21): 4321-4333.

Kovar JL, Curtis E, Othman S, **Simpson MA** and Olive DM. (2013) Characterization of IRDye 800CW chlorotoxin as a targeting agent for brain tumors. Anal Biochem. 440(2): 212-9.

Stephens E, Saltarrelli J, Balaoing LR, Baggett S, Nandi I, Anderson K, Morrisett J, Reardon M, **Simpson M**, Weigel P, Olmsted-Davis E, Davis A and Grande-Allen KJ. (2012) Hyaluronan turnover and hypoxic brown adipocytic differentiation are co-localized with ossification in calcified human aortic valves. Pathol Res Pract. 208(11): 642-50.

Hyde AS, Farmer EL, Easley KE, van Lammeren K, Christoffels VM, Barycki JJ, Bakkers J, and **Simpson MA**. (2012) UDP-glucose dehydrogenase polymorphisms from patients with congenital heart valve defects disrupt enzyme stability and quaternary assembly. J Biol Chem 287(39): 32708-16.

Natarajan SK, Zhu W, Zhang L, Liang X, Demers AJ, Zimmerman M, **Simpson MA** and Becker DF. (2012) Proline dehydrogenase is essential for proline protection against hydrogen peroxide induced cell death. Free Radicals in Biology and Medicine. 53(5): 1181-91.

Simpson MA*, Weigel JA and Weigel PH. (2012) Systemic blockade of the hyaluronan receptor for endocytosis (HARE) prevents lymph node metastasis of prostate cancer. Int J Cancer. 131: E836–E840. *Corresponding author

Hlady R, Novakova S, Opavska J, Klinkebiel D, Peters SL, Bies J, Hannah J, Iqbal J, Anderson K, Siebler H, Smith LM, Greiner T, Bastola D, Joshi S, Lockridge O, **Simpson MA**, Felsher D, Wagner K-U, Chan W, Christman J and Opavsky R. (2012) Loss of Dnmt3b maintenance function up-regulates the novel tumor modifier Ment and accelerates mouse lymphomagenesis. J Clin Invest. 122(1): 163-77.

Willis M, Liu Y, Biterova E, **Simpson MA**, Kim H, Lee J and Barycki JJ. (2011) Enzymatic defects underlying hereditary glutamate cysteine ligase deficiency are mitigated by association of the catalytic and regulatory subunits. Biochemistry 50(29): 6508-17.

Kovar JL, Xu X, Draney D, Cupp AS, **Simpson MA** and Olive, DM. (2011) Near infrared labeled tetracycline-derivative is an effective marker of bone deposition in mice. Anal Biochem 416(2): 167-73.

Bharadwaj AG, Goodrich NP, McAtee CO, Haferbier K, Oakley GG, Wahl III JK, and **Simpson MA**. (2011) Hyaluronan suppresses prostate tumor cell proliferation through diminished expression of N-cadherin and aberrant growth factor receptor signaling. Exp Cell Res. 317: 1214-1225.

Huang D, Casale G, Tian J, Lele SM, Pisarev VM, **Simpson MA** and Hemstreet III GP. (2010)

UDP-glucose dehydrogenase as a novel field-specific candidate biomarker of prostate cancer. Int J Cancer 126(2): 315-327.

Zhang L, Bharadwaj AG, Casper A, Barkley J, Barycki JJ and **Simpson MA**. (2009) Hyaluronidase activity of human Hyal1 requires active site acidic and tyrosine residues. J Biol Chem 284: 9433-9442.

Wei Q, Galbenus R, Raza A, Cerny RL and **Simpson MA**. (2009) Androgen-stimulated UDP-glucose dehydrogenase expression limits prostate androgen availability without impacting hyaluronan levels. Cancer Research 69(6): 2332-2339.

Bharadwaj AG, Kovar JL, Loughman E, Elowsky C, Oakley GG and **Simpson MA**. (2009) Spontaneous metastasis of prostate cancer is promoted by excess hyaluronan synthesis and processing. Amer J Pathol. 174(3): 1027-1036.

Kovar JL, Ke S, Volcheck WM, Sevick-Muraca E, **Simpson MA** and Olive DM. (2009) Characterization and performance of a near infrared 2-deoxyglucose optical imaging agent for mouse cancer models. Anal Biochem, 384(2): 254-262.

Bharadwaj AG, Rector K, **Simpson MA**. (2007) Inducible hyaluronan production reveals differential effects on prostate tumor cell growth and tumor angiogenesis. J Biol Chem. 282(28): 20561-72.

Kovar JL, Volcheck WM, Chen J and **Simpson MA**. (2007) Purification method directly influences effectiveness of an epidermal growth factor-coupled targeting agent for noninvasive tumor detection in mice. Anal Biochem. 361(1): 47-54.

Easley KE, Sommer BJ, Boanca G, Barycki JJ, and **Simpson MA**. (2007) Characterization of human UDP-glucose dehydrogenase reveals critical catalytic roles for lysine 220 and aspartate 280. Biochemistry 46(2): 369-78.

Kovar JL, Johnson MA, Volcheck WM, Chen J and **Simpson MA**. (2006) Hyaluronidase expression induces prostate tumor metastasis in an orthotopic mouse model. Amer J Pathol. 169(4): 1415-26.

Simpson MA. (2006) Concurrent expression of hyaluronan biosynthesis and processing enzymes promotes growth and vascularization of prostate tumors in mice. Amer J Pathol. 169(1): 247-57.

McCarthy J, Turley E, Wilson C, Price M, Bullard K, Beck M, **Simpson M**. (2005) Hyaluronan biosynthesis in prostate carcinoma growth and metastasis. In Hyaluronan: Structure, Metabolism, Biological activities, Therapeutic Applications; Chapter 4, Hyaluronan and Tumors. Eds E.A. Balasz and V.C. Hascall. (Matrix Biology Institute, New Jersey)

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Kim HR, Wheeler MA, Wilson CM, Iida J, Eng D, **Simpson MA**, McCarthy JB and Bullard KM. (2004) Hyaluronan Facilitates Invasion of Colon Carcinoma Cells *In Vitro* via Interaction with CD44. Cancer Res. 64: 4569-76.

Bullard KM, Kim HR, Wheeler MA, Wilson CM, Neudauer CL, **Simpson MA**, McCarthy JB. (2003) Hyaluronan synthase-3 is upregulated in metastatic colon carcinoma cells and manipulation of expression alters matrix retention and cellular growth. Int J Cancer 107: 739-46.

Simpson MA, Wilson CM, McCarthy JB. (2002) Inhibition of prostate tumor cell hyaluronan synthesis impairs subcutaneous growth and vascularization in immunocompromised mice. Amer J Pathol, 161(3): 849-857.

Simpson MA, Wilson CM, Furcht LT, Spicer AP, Oegema TR, McCarthy JB. (2002) Manipulation of hyaluronan synthase expression in prostate adenocarcinoma cells alters pericellular matrix retention and adhesion to bone marrow endothelial cells. J Biol Chem. 277: 10050-10057.

Simpson MA, Reiland J, Burger SR, Furcht LT, Spicer AP, Oegema TR Jr, McCarthy JB. (2001) Hyaluronan Synthase Elevation in Metastatic Prostate Carcinoma Cells Correlates with Hyaluronan Surface Retention, a Prerequisite for Rapid Adhesion to Bone Marrow Endothelial Cells. J Biol Chem. 276(21): 17949-17957.

Iida J, Pei D, Kang T, **Simpson MA**, Herlyn M, Furcht LT, McCarthy JB. (2001) Melanoma Chondroitin Sulfate Proteoglycan Regulates Matrix Metalloproteinase-dependent Human Melanoma Invasion into Type I Collagen. J Biol Chem. 276(22): 18786-18794.

Eisenmann KM, McCarthy JB, **Simpson MA**, Keely PJ, Guan JL, Tachibana K, Lim L, Manser E, Furcht LT, Iida J. (1999) Melanoma Chondroitin Sulphate Proteoglycan Regulates Cell Spreading Through Cdc42, Ack-1 and p130cas. Nature Cell Biol. 1: 507-513.

Simpson MA, LiCata V, Ribarik Coe N, Bernlohr DA. (1999) Biochemical and Biophysical Analysis of the Intracellular Lipid-binding Proteins of Adipocytes. Mol Cell Biochem. 192: 33-40.

Coe NR, **Simpson MA**, Bernlohr DA. (1999) Targeted Disruption of the Adipocyte Lipid Binding Protein (aP2 protein) Gene Impairs Fat Cell Lipolysis and Increases Cellular Fatty Acid Levels. J Lipid Res. 40: 967-72.

Simpson MA and Bernlohr DA. (1998) Testing of the Portal Hypothesis: Analysis of a Series of Adipocyte Lipid Binding Protein Phenylalanine 57 Mutants. Biochemistry 37: 10980-10986.

Bernlohr DA, Ribarik Coe N, **Simpson MA**, Hertzel AV. (1997) Regulation of gene expression in adipose cells by polyunsaturated fatty acids. Adv Exp Med Biol. 422: 145-156.

Ory J, Kane CD, **Simpson MA**, Banaszak LJ and Bernlohr DA. (1997) Biochemical and Crystallographic Analyses of a Portal Mutant of the Adipocyte Lipid-binding Protein. J Biol Chem. 272: 9793-9801.

LaLonde JM, **Levenson (Simpson) MA**, Roe JJ, Bernlohr DA and Banaszak LJ. (1994) Adipocyte Lipid-binding Protein Complexed with Arachidonic Acid: Titration Calorimetry and X-ray Crystallographic Studies. J Biol Chem. 269: 25339-25347.

Book chapters, review articles, and journal special editions

Zimmer BM, Harwood H, Barycki JJ, **Simpson MA**. 2025. Recent insights into the implications of UGDH mutations for human health. Biochemical Society Transactions, invited review. Submitted

Simpson MA. 2025. Impacts of hyaluronan on extracellular vesicle production and signaling. Cells: special issue on Role of Hyaluronan in Human Health and Disease. Invited review. Accepted for publication.

Zimmer BM, Barycki JJ, and **Simpson MA**. (2022) Mechanisms of coordinating hyaluronan and glycosaminoglycan production by nucleotide sugars. Am J Physiol Cell Physiol. 322(6):C1201-C1213.

Zimmer BM, Barycki JJ, and **Simpson MA**. (2021) Integration of Sugar Metabolism and Proteoglycan Synthesis by UDP-glucose Dehydrogenase. J Histochem Cytochem, 69(1):13-23.

Melanie Simpson, Liliana Schaefer, Vincent Hascall, Jeffrey D. Esko. (2021) Essentials of Glycobiology, 3rd edition. Chapter 16: Hyaluronan.

Simpson MA. Hyaluronan Pericellular Matrix: Particle Exclusion Assay. (2019) Methods Mol Biol. 1952:103-110.

Grady G, **Simpson MA**, and Barycki JJ. (2016) UDP-glucose dehydrogenase, multifaceted branch point for distribution of essential metabolite precursors. Invited review, BBA: Proteins and Proteomics.

International Journal of Cell Biology: Signaling, Regulation and Disease Mechanisms. (2015) Edited by Paul H. Weigel, **Melanie A. Simpson**, Carol de la Motte, and Larry S. Sherman

Advances in Cancer Research: Hyaluronan Signaling and Turnover. (2014)
Volume 123, Pages 1-385; Edited by **Melanie A. Simpson** and Paraskevi Heldin

Simpson MA. (2009) Hyaluronan synthesis and turnover in prostate cancer. Chapter 16 in Hyaluronan in Cancer Biology, pp. 309-327. Ed. Robert Stern, Oxford: Academic Press.

Simpson MA and Lokeshwar VB. (2008) Hyaluronan and hyaluronidase in genitourinary tumors. Invited Review. Frontiers in Bioscience 13: 5664-80.

Kovar JL, **Simpson MA,** Geschwender A and Olive DM. (2007) A systematic approach to the development of fluorescent contrast agents for optical imaging of mouse cancer models. Review. Anal Biochem. 367(1): 1-12.

McCarthy JB and **Simpson MA**. (2003) Hyaluronan in prostate cancer progression. Glycoforum online reviews (invited). http://www.glycoforum.gr.jp/science/hyaluronan/HA26/HA26E.html

Bernlohr DA, **Simpson MA**, Hertzel AV and Banaszak LJ. (1997) Intracellular Lipid-binding Proteins and their Genes. Ann Rev Nutr. 17: 277-303.

Bernlohr DA and **Simpson MA**. (1996) Adipose tissue and lipid metabolism. In *Biochemistry of Lipids, Lipoproteins and Membranes*. D.E. Vance and J.E. Vance (Eds.). Elsevier Science BV.

Manuscripts in preparation

Utz A, Ma L, Zimmer BM, Milici M, Su S, Grady G, Enders J, Barycki JJ, Liu P, and **Simpson MA**. Phosphorylation of UDP-glucose dehydrogenase promotes anchorage independent growth through increased glycosaminoglycan biosynthesis (Submission planned for Feb 2025)

Zimmer BM, Wobker S, de la Rosa J, **Simpson MA**. Expression of UGDH is elevated in biopsies of prostatic intraepithelial neoplasia and prostate adenocarcinoma, and is associated with biochemical recurrence. (Submission planned for Feb 2025)

Zimmer BM, Harwood H, Barycki JJ, **Simpson MA**. Homozygous mutation of human UGDH aspartate 379 diminishes cofactor binding and results in developmental disorders. (Submission planned for Mar 2025)

Zimmer BM, Allego E, Barycki JJ, **Simpson MA**. 2025. Invited review. Canonical and emergent form and function among the human hyaluronidases (Submission planned for Mar 2025)

Brownfield A, Ma L, Lee E, Barycki JJ, **Simpson MA**. Impact of active site conformation on stability and activity of four human hyaluronidases.

Patent

Castration-Resistant Prostate Cancer, Simpson MA and Barycki JJ, inventors.
US Patent No. 11,478,457 issued 10/25/2022

Invited talks and panels

Gordon Research Conference on Proteoglycans, Andover, NH, July 7-12, 2024. Invited speaker: Accelerating cancer diagnosis and therapeutic development through machine learning

North Carolina State University, February 15, 2024. Invited panelist for the Postdoc Readiness for Professorship Program Session -- How to Negotiate the Faculty Offer

HA 2023: 14th International Conference on Hyaluronan, Portland, OR, June 4-8, 2023. Session organizer and chair: tumor biology

HA 2021: 13th International Conference on Hyaluronan, held virtually June 14-15, 2021. Session organizer and chair: tumor biology

North Carolina Student Academy of Sciences Keynote Speaker, held virtually March 27, 2020. Sugar in prostate cancer: tools, fuels, and steroid foils.

University of South Alabama, Mitchell Cancer Institute, Mobile, AL, Pathology Research Seminar

Series, March 19, 2020. [Postponed due to COVID-19] Impact of metabolite partitioning on hormone elimination and extracellular communication.

HA 2019: 12th International Conference on Hyaluronan, Cardiff, Wales, June 9-13, 2019. Session chair and invited speaker: Nucleotide sugar partitioning deregulates androgen dependence in prostate tumor cells

University of Eastern Finland, Kuopio, Finland, August 16, 2018. Invited speaker: Impact of metabolite partitioning on hormone elimination and extracellular communication

University of North Carolina Lineberger Comprehensive Cancer Center, Chapel Hill, NC, May 30, 2018. Invited speaker: Targeting hormone elimination to control prostate cancer

HA 2017: 11th International Conference on Hyaluronan, Cleveland, OH, June 11-15, 2017
Invited speaker: Tumor cell exosomes containing hyaluronidase Hyal1 activate stromal cell motility.

University of Nebraska Commencement Speaker, Lincoln, NE, August 13, 2016. Title: Get a job (and other subtle advice to maximize the value of your degree).

University of Oklahoma Health Science Center Department of Physiology, Oklahoma City, OK, Oct 8, 2015. Invited speaker: Hyaluronan-based signaling in the prostate tumor microenvironment

University of Minnesota Department of Pharmacology and Masonic Cancer Center, Minneapolis, MN, Sept 24, 2015. Invited speaker: Targeting steroid elimination in prostate cancer

University of Nebraska Board of Regents Presentation, Lincoln, NE, June 12, 2015. Invited speaker: Illuminating and targeting metastatic prostate cancer

University of Nebraska NUTech Board of Directors meeting, Lincoln, NE, May 22, 2015. Invited speaker: Targeting steroid elimination in prostate cancer

University of Minnesota Biochemistry Centennial Symposium, Minneapolis, MN, May 14-15, 2015. Invited speaker: Musings of a biochemist by nature and by training.

Midwest Tumor Microenvironment Conference, Madison, WI, May 11-13, 2015
Invited speaker: Hyaluronan-based signaling in the prostate tumor microenvironment

UNMC Cancer Genes and Molecular Regulation Division, Omaha, NE, May 5, 2015
Invited speaker: Targeting steroid elimination in prostate cancer

American Society for Matrix Biology, Cleveland, OH, October 12-15, 2014
Invited panelist: Women mentoring women

Rachel Lloyd Memorial Conference on Women in Science, University of Nebraska – Lincoln
October 2, 2014
Sugar in prostate cancer: Tools, fuels, and steroid foils

UCARE Kickoff invited faculty speaker, September 3, 2014
University of Nebraska – Lincoln

McNair Program annual retreat guest faculty speaker, August 24, 2013
University of Nebraska – Lincoln

HA 2013: 9th International Conference on Hyaluronan, Oklahoma City, OK, June 2-7, 2013
Session chair: Tumor Biology
Invited speaker: Hyaluronan-based signals generated by tumor cells in prostate cancer

University of Iowa Carver College of Medicine, Holden Comprehensive Cancer Center, Iowa City, IA, Feb 12, 2013.
Defining the glucuronidation axis in prostate cancer

Biochemistry/Redox Biology Center Seminar, January 8, 2013, University of Nebraska – Lincoln
Prostate cancer progression: unanticipated roles for glucuronidation in toxicity management

McNair Program annual retreat guest faculty speaker, August 25, 2012
University of Nebraska – Lincoln

Research Experiences for Undergraduates, panelist, "What graduate schools look for" July 2012
University of Nebraska – Lincoln

Innovation Impact, hosted by LI-COR Biosciences, Lincoln, NE, April 19, 2012
Iluminating Prostate Cancer

McNair Program annual retreat guest faculty speaker, August 27, 2011
University of Nebraska – Lincoln

ADVANCE Conversation Series panelist on promotion and tenure, October 2011
University of Nebraska – Lincoln

Gordon Research Conference on Proteoglycans, Andover, NH, July 11-16, 2010.
Hyaluronan accumulation or steroid sequestration: outcomes of aberrant glucuronidation.

Gordon Research Conference on Glycobiology, Ventura, CA, Jan 18-23, 2009
Glucuronidation in prostate cancer: hyaluronan accumulation versus androgen inactivation

LI-COR Biosciences Imaging Workshop, Lincoln, NE, January 13, 2009
Iluminating Cancer Progression

UNMC Prostate Cancer Interest Group, Omaha, NE, June, 2008
Role of hyaluronan matrix in prostate cancer progression

LI-COR Biosciences In vivo Animal Imaging Workshop
University of Nebraska Medical Center, Omaha, NE, April 30, 2008
Iluminating Prostate Cancer Progression

Keystone Symposium: Molecular Mechanisms of Angiogenesis in Development and Disease
Vancouver, Canada, January 19, 2008
Prostate tumor growth, metastasis and vascularization are modulated by differential turnover of hyaluronan

Fourth Omaha Imaging Symposium
Creighton University, Omaha, NE, September 22, 2007
Illuminating the molecular mechanisms of prostate cancer progression

UNL Biotechnology/Life Sciences Seminar, September 19, 2007
Illuminating the molecular mechanisms of prostate cancer progression

University of South Dakota Cancer Research Center, Sanford School of Medicine
Sioux Falls, SD, September 12, 2007
Illuminating the molecular mechanisms of prostate cancer progression

Nebraska Center for Cellular Signaling Annual Symposium, Plenary Lecture
Omaha, NE, June 13, 2007
Hyaluronan synthesis and turnover promotes prostate cancer progression

Indiana University School of Medicine, Department of Cellular and Integrative Physiology Seminar, Indianapolis, IN, May 3, 2007, Hyaluronan metabolism in prostate cancer progression

HA 2007: 7th International Conference on Hyaluronan, Charleston, SC, April 22-27, 2007
Hyaluronan synthesis and turnover induces metastasis of prostate tumor cells

University of Cincinnati, Department of Molecular Genetics, Biochemistry and Microbiology Seminar, Cincinnati, OH, March 20, 2007, Hyaluronan metabolism in prostate cancer progression

Purdue University Biological Sciences Seminar, West Lafayette, IN, January 30, 2007
Hyaluronan metabolism in prostate cancer progression

University of Toledo Health Science Campus, Biochemistry and Cancer Biology Seminar

Toledo, OH, January 12, 2007, Hyaluronan metabolism in prostate cancer progression

UNL Biochemistry Department Seminar, November 7, 2006
Hyaluronan metabolism and its role in prostate cancer progression

UNL Chemistry Student Seminar, October 31, 2006
Hyaluronan and its role in prostate cancer progression

Midwest Connective Tissue Conference, Chicago, IL, October 20-21, 2006
Hyaluronan turnover promotes prostate cancer progression

Gordon Research Conference on Proteoglycans, Andover, NH, July 9-13, 2006
Progression of prostate cancer is induced by hyaluronan synthesis and turnover

American Cancer Society, UNL Chapter, February 28, 2006
Hyaluronan and the progression of prostate cancer

In Vivo Molecular Imaging Conference, La Jolla, CA, November 16-17, 2005
Selected poster talk: Monitoring progression of prostate tumors in mice by receptor-targeted near infrared optical imaging

Des Moines University Medical College, Des Moines, IA, September 16, 2005
Hyaluronan and the progression of prostate cancer

Vanderbilt University, Nashville, TN, May 17, 2005
Near infrared imaging of prostate cancer progression

LI-COR Biosciences, Lincoln, NE, April 16, 2005
Near infrared imaging of prostate cancer progression

Great Plains Society for Molecular Biology, annual symposium
Creighton University, Omaha, NE, June 8, 2004
Hyaluronan matrix and prostate cancer progression

University of Oklahoma Health Sciences Center, Biochemistry Departmental Seminar
Oklahoma City, OK, April 14, 2004, Role of hyaluronan matrix in prostate cancer progression

UNL Microbiology Student Seminar, January 30, 2004
Role of hyaluronan matrix in prostate cancer progression

Creighton University Biochemistry club, Omaha, NE, January 20, 2004
Role of hyaluronan matrix in prostate cancer progression

Meat Animal Research Center, Clay Center, NE, November 7, 2003
Hyaluronan matrix and prostate cancer progression

UNL Animal Sciences Department, October 2003, Animal Systems Biology Seminar
Hyaluronan and prostate cancer

UNMC Prostate Cancer Interest Group, March 6, 2003
Role of hyaluronan matrix in prostate cancer progression

Midwest Connective Tissue Conference, Chicago, IL, October 19-20, 2001
Simpson MA, Wilson CM, Oegema TR, McCarthy JB.
Hyaluronan Biosynthesis and Prostate Carcinoma.

Midwest Connective Tissue Conference, Chicago, IL, November 4-6, 1999
Simpson MA, Reiland J, Wilson CM, Oegema TR, Spicer AP, McCarthy JB.
Hyaluronan and Prostate Carcinoma.

Teaching experience

Current

Macromolecular Structure and Function, BCH 701 (3 credits, Fall 2023 - present)
Introduction to Biochemistry, BCH 103 (1 credit, two sections, Fall 2019 - present)

Biochemistry Graduate Seminar, BCH 610/810 (1 credit, Fall 2017 – present)
Biochemistry Departmental Seminar, BCH 601/801 (1 credit, Fall 2017 – present)
Graduate student grantsmanship workshop (Maymester course, 2020 – present)

Past

Metabolic Function and Dysfunction (University of Nebraska, Biochemistry 935, 3 credit hours. Fall 2010, 2011, 2012, 2013, 2014, 2015, 2016. Average course evaluation 3.86/4.0; average personal evaluation 3.9/4.0)

Nutraceuticals and Functional Foods (University of Nebraska, FDST 470/870, Spring 2012, 2014, 2016, two guest lectures on cancer and the impact of food components)

Creativity in the Arts and Sciences (University of Nebraska, UHON198H, Spring 2014, 2015, 2016, guest lecturer on cancer research)

Biosystems Research I: Big Questions (University of Nebraska, LIFE 891, Fall 2015, Fall 2016, course director and lecturer on cancer research and applications of whole genome sequencing. Enrollment: 6-8 graduate students in Complex Biosystems)

Scientific Analysis and Technical Writing (University of Nebraska, Biochemistry 498 (205), 2 credit hours. Spring 2014, Spring 2015. Enrollment: 13 sophomore biochemistry students.)

Biomolecules and Metabolism (University of Nebraska, Biochemistry 431/831, 4 credit hours. Fall 2003, Spring 2004, Fall 2004, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009. Average enrollment is 160 advanced undergraduate and graduate students. Average course evaluation: 3.15/4.0; average personal evaluation 3.54/4.0)

Advanced Topics in Biochemistry (University of Nebraska, Biochemistry 998, 1 credit hour. Fall 2004, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009. Average enrollment: 10 Biochemistry graduate students.)

Graduate Seminar in Biochemistry (University of Nebraska, Biochemistry 992k, 1 credit hour. Spring 2008, Fall 2008, Fall 2009. Average enrollment: 15-25 Biochemistry graduate students.)

Preparing Future Faculty workshop entitled “Positioning for Future Funding” (University of Nebraska, August 1, 2007)

Graduate survey of Biochemistry (University of Nebraska, Biochemistry 839, Fall 2002, 3 lectures, 12 Biochemistry graduate students.)

Recombinant DNA Laboratory (University of Minnesota, Biology 5125, Spring 1998, 4 credit hours. 24 advanced undergraduate and graduate students.)

Postdoctoral associates trained

Current

None.

Former

Brenna Zimmer (2018 – 2022), currently Research Scholar, Simpson lab, NC State, Raleigh.
George Grady (2018-19), currently Grifols Pharmaceutical Company, Clayton, NC
Caitlin McAtee (2014-16), currently Research Instructor at Vanderbilt University
Qin Wei (May 2006-Jan 2010), research associate at Baylor College of Medicine
Kimberly K. Hansen (2004-05), currently Assistant Professor of Practice, University of Nebraska

Graduate students trained

Current

Emily Allego (2019 – present, coadvised with Joe Barycki, Biochemistry)
Ash Utz (2021-present)
Jade Fluharty (2022-present)
Ashton Stowe (2023-present)
Kristy Witte (2023-present, coadvised with Caroline Proulx, Chemistry)

Former

David Smith (M.S. 2023)
Thesis Title: Use of protein chemistry to determine the impact of phosphorylation on physical and functional properties of UDP-glucose dehydrogenase

Monica Milici (M.S. 2022)
Thesis title: RSK3-mediated phosphorylation of UDP-glucose dehydrogenase impacts physical properties in vitro and cellular function

Andy Brownfield (M.S. 2021)
Thesis title: A Study of Hyaluronidases and UDP-Glucose Dehydrogenase as Contributing Factors to Prostate Cancer Progression

Accola Hudson (M.R. 2021, coadvised with Joe Barycki)

Brenna Zimmer (2012-2018, Ph.D.)
Thesis title: Role of UDP-glucose dehydrogenase in prostate cancer therapeutic resistance

George Grady (2013-2018, Ph.D.)
Thesis title: Examination of human UDP-glucose dehydrogenase structure and function reveals regulatory approaches

Eryn Lee (M.S. 2018)
Thesis title: Functional characterization of human hyaluronidases

Christine Booth (2012-2017, Ph.D.)
Thesis title: Role of hyaluronan metabolism in prostate tumor aggressiveness and stromal transformation

Michelle Howell (2013-2017, Ph.D.)
Thesis title: Characterization of UDP-glucuronate partitioning in androgen-dependent and castration resistant prostate cancer reveals trends for therapeutic targets.

Caitlin McAtee (2008-2014, Ph.D.)
Thesis title: Impact of the hyaluronidase Hyal1 on prostate cancer progression through accelerated vesicle trafficking and cell-cell communication

Annastasia Hyde (2010-2014, Ph.D.)
Thesis title: Use of experimentally controlled quaternary structure mutants to probe regulatory modes of UDP-glucose dehydrogenase

Jianwei Li (2009-2011)

Ting Liu (M.S. 2009)
Thesis title: Expression and properties of human hyaluronidase 2

Alamelu (Dharini) Bharadwaj (2003-2009, Ph.D.)
Thesis title: Consequences of hyaluronan metabolism for cell cycle progression in prostate tumor growth and metastasis

Ling Zhang (M.S. 2009)
Thesis title: Functional analysis of two human hyaluronidases

Robert Galbenus (M.S. 2007)
Thesis title: Regulation of human UDP-glucose dehydrogenase and its role in hyaluronan production

Monica Serban (2003-05)

Mahadevan Lakshminarasimhan (2002-04)

Graduate thesis committees

Rebecca Bott, Animal Sciences (M.S. 2006)
Melissa Lucas, Biochemistry (M.S. 2007)
Gina Boanca (reader), Biochemistry (M.S. 2007)
Sebastian Kehr, Biochemistry (M.S. 2008)
Vyacheslav Labunskyy (reader), Biochemistry (Ph.D. 2008)
David Adle (reader), Biochemistry (Ph.D. 2008)
Anton Turanov (reader), Biochemistry (Ph.D. 2008)
Perry Ridge (reader), Biochemistry (M.S. 2008)
Daraporn Pittayakhajonwut, Biological Sciences (Ph.D. 2010)
Bijia Wang, Chemistry (Ph.D. 2010)
Amanda Sutton, Chemical Engineering (Ph.D. 2010)

Jintana Saowapa, UNMC Oral Biology (M.S. 2010)
Byung Cheon Lee (reader), Biochemistry (Ph.D. 2010)
Mikalai Malinouski (reader), Biochemistry (Ph.D. 2011)
Melanie Willis, Biochemistry (Ph.D. 2011)
Marina Kasaikina (reader), Biochemistry (Ph.D. 2011)
Adam Rogers, Biological Sciences (Ph.D. 2013)
Tobi Louw (reader), Chemical and Biomolecular Engineering (Ph.D. 2013)
Kay Crabtree, Biological Sciences (Ph.D. 2013)
Ben Arentson, Biochemistry (Ph.D. 2013)
Roopa Reddy, University of Nebraska Medical Center, Oral Biology (Ph.D. 2013)
Nick Eurek, Biochemistry (M.S. 2014)
Nicole Milkovic, Biochemistry (Ph.D. 2014)
Brett J. Roberts, University of Nebraska Medical Center, Oral Biology (Ph.D. 2014)
Gaurav Budhiraja, Chemical and Biomolecular Engineering (Ph.D. 2015)
Nipun Saini (reader), Biochemistry (Ph.D. 2015)
Lu (Julia) Zhang, Biochemistry (Ph.D. 2015)
Tong Ju, Chemistry (Ph.D. 2016)
Samantha Swenson, Biochemistry (Ph.D. 2017)
Abby Gelb, Chemistry (Ph.D. 2018)
Xinqi Zhou, Chemistry (Ph.D. 2018)
Medhanjali Dasgupta, Biochemistry, University of Nebraska (Ph.D. 2019)
Mareca Lodge, Biochemistry, NC State (Ph.D. 2023)
Grace Scheidemantle, Biochemistry, NC State (Ph.D. 2023)
Siena Montooth, Molecular Biosciences, NC State (Ph.D. 2024)
Ellen Warner, Chemistry, NC State (Ph.D. 2024)
Rachel Dykes, Biochemistry, NC State

Undergraduates trained (* indicates authors of manuscripts submitted or published)

Current

Varsha Krishnan (2023-present)
Pooja Narasimhan (Swaisgood Scholar, 2023-present)
Autumn Harding (2024-present)

Former

Brandi Sommer* (jointly with Joseph Barycki, Honors, B.S. 2004)
Mariya Apostolova (UCARE, B.S. 2004)
Elizabeth Lenihan (B.S. 2004)
Janee Burks (B.S. 2005, UCARE)
Joel Barkley* (B.S. 2005)
Natalie Hart (B.S. 2006, UCARE)
Eric Andrews (B.A. 2006, UCARE)
Jeremy Howe (B.S. 2006, UCARE)
Josh Schlautman (B.S. 2006, UCARE)
Andrew Casper* (B.S. 2006)
Kara Pozehl (B.S. 2008, UCARE)
Danita Curtiss (B.S. 2009, UCARE)
Alisha O'Malley (B.S. 2009, Honors and UCARE)
Nate Goodrich* (B.S. 2009, Honors and UCARE)
Willie Novotny (B.S. 2009, McNair scholar)
Kenneth Shum (B.S. 2009, Honors)
Annastasia Hyde* (2009 summer REU)
Dulce Boucher (B.S. 2010, Honors)
Emily Brown (2010 summer REU)
Nathan Franssen (B.S. 2011)
Katie Haferbier* (B.S. 2011, McNair and UCARE)
Erin Farmer* (2011 summer REU)

Daniel Sotelo	(McNair, 2011-12)
Zach Bailey	(B.S. 2012, UCARE)
Abbey Berkebile*	(B.S. 2012 with High Distinction; UCARE, Honors, Goldwater Honorable Mention, received NSF Predoctoral Fellowship to attend University of Iowa)
Luke Messmer	(UCARE, 2010-2012)
Lia Morales	(2009-2013)
Brooke Micek	(UCARE and McNair, 2011-2013)
Kayla Kumm	(B.S. 2013 with Highest Distinction; UCARE and Honors, 2011-2013)
Ashley Thelen*	([§] UCARE, Honors, Goldwater Honorable Mention, Beckman Scholar, NSF Predoctoral Fellowship to attend UC Berkeley, 2010-2014)
Keirha Baker	(2014 summer REU)
Alyssa Yeates	(UCARE and McNair, 2012-2014)
David Beauclair	(2014-15)
Tyler Wahl	(B.S. 2015, UCARE)
Brooke Brauer	(2015 summer REU)
Jaleen Albers	(B.S. 2015, Honors)
Jeremy Payne	(B.S. 2016, Honors)
Danielle Hittle	(B.S. 2016, UCARE)
Ashlee Williams	(2016 summer REU)
Allison Vlach	(Honors, Beckman Scholar, 2014-2017)
Brandon Thelen	(Honors, 2015-2017)
Sophia Kisling	(Honors, 2016-2017)
Emily Jezewski	(Honors, 2016-2017)
Aalia Sharif	(Honors, 2017-2019)
Brianna Harvey	(Honors, 2017-2020)
Hailey Patel	(Honors, 2019-2020)
Gina Russo	(2019-2020)
Ari Feldman	(Park Scholar, 2019-2020)
Yoon Mi Asada	(Honors, 2019-2020)
Malone Hanis	(Honors, 2019-2022)
Jasmine Alleyne	(B.S. 2022)
Ryan Klug	(B.S. 2022)
Em Wilds	(B.S. 2023)
Sophie Korenik	(Honors, Office of Undergraduate Research Scholar, B.S.2023)
Joslene Morgan	(2023-2024)
Astha Patel	(B.S. 2024)
Skylar Harrelson	(Honors, Beckman Scholars Program, Horton Award, B.S. 2024)
Hali Harwood	(Swaisgood Scholar, B.S. 2024)

[§] UCARE: Undergraduate Creative Activities and Research Experiences

Undergraduate honors' thesis committees

Brandi Sommer	(B.S. 2004, with High Distinction)
Allison Stangel	(B.S. 2004)
Ashley Fagot	(B.S. 2004)
Michaela Weeks	(B.S. 2004)
Anthony Fehr	(B.S. 2005)
Patrick Kennedy	(B.S. 2005)
Deame Hua	(B.S. 2005)
Nathan Beins	(B.S. 2005)
Natalie Hart	(B.S. 2006)
Alexander Lin	(B.S. 2007)
Tara Somer	(B.S. 2008)
Alisha O'Malley	(B.S. 2009)
Kenneth Shum	(B.S. 2009)

Josh Bies	(B.S. 2010)
Rebecca Somer	(B.S. 2010)
Dulce Boucher	(B.S. 2010, with High Distinction)
Abbey Berkebile	(B.S. 2012, with High Distinction)
Kayla Kumm	(B.S. 2013, with Highest Distinction)
Jaleen Albers	(B.S. 2015, with Highest Distinction)

Committee service and citizenship

North Carolina State University Service (current)

Faculty Search Committee: Director of Interdisciplinary STEM Education (Sept 2024 – present)
Executive Committee, Comparative Medicine Institute (July 2024 – present)
Provost Campus Health Briefing Committee (Jan 2021 – present)
Integrative Sciences Initiative and Building Planning Committee (Jan 2021 – present)
Polk Hall Renovations Committee (Sept 2022 – present)
Dabney Hall Renovations Committee (Sept 2022 – present)
Dept of Chemistry Named Professorships Committee (Sept 2018 – present)
Executive Committee, Molecular Education, Technology, and Research Innovation Center - METRIC (June 2017 – present)

University Service (past)

North Carolina State University

Search Committee Chair, Integrative Sciences Initiative Director of Operations (Oct – Dec 2024)
CALS nomination committee for University Faculty Scholars (Chair, October 2024)
CALS Core Budget Model Committee (July 2019 – June 2022)
CALS Faculty Hiring Committee (Aug 2018 – June 2021)
BTEC 5-year review committee (Feb 2021)
Provost Department Head Executive Committee (July 2019-June 2021)
CALS Department Heads representative (July 2019-June 2020)
College of Agriculture and Life Sciences Safety Committee (July 2017 – 2019)
Search Committee for Senior Associate Dean for Administration (Nov 2017 – Jan 2018)
Search Committee, Dean of CALS (Jan 2022 – May 2023)
University Honorary Degrees Committee (Sept 2020 – June 2023)
Search Committee, CALS Associate Dean of Academic Programs (Sept 2023 – May 2024)
Faculty Search Committee: Translational Predictive Biology cluster, candidate in data analytics and machine learning (Aug 2023 – May 2024)
Park Scholars Faculty Advisory Committee (Sept 2018 – June 2024)

University of Nebraska

College of Agricultural Sciences and Natural Resources (undergraduate) Recruitment, Retention and Placement Committee (Aug 2002 – May 2017)
UNL Graduate Council (Aug 2012 – May 2017)
Vice Chancellor's Research Advisory Board (Oct 2013 – May 2017)
Academic Planning Committee, UNL Graduate Council representative and Chair elect (July 2015 – May 2017)
Graduate Student Association Liaison (Aug 2016 – May 2017)
Chancellor's Task Force on Achieving Distinction, co-Chair (Sept 2016 – May 2017)
Nebraska Center for the Prevention of Obesity-related Disease (NPOD), internal advisory board member (Oct 2016 – May 2017)
Search Committee for Vice President and Vice Chancellor of the Institute of Agriculture and Natural Resources (May 2016 – October 2016)
Department of Food Science and Technology faculty search committee (Feb 2016 – Oct 2016)
Chancellor's Commission on the Status of Women (Aug 2010 – Dec 2015)
Chair of Faculty Council (2011 – Dec 2015)
Department of Chemical and Biomolecular Engineering faculty search committee (Oct 2014 – April 2015)

University Professorships Committee (2014-2015)
Vice Chancellor's task force on Proteomics and Metabolomics (Jan 2015 – March 2015)
Undergraduate Research Faculty Advisory Board (Aug 2012 – May 2014)
Department of Food Science and Technology faculty search committee (Sept 2013 – April 2014)
Search committee for Dean of the College of Arts and Sciences (Sept 2013 – April 2014)
CASNR Curriculum Committee (April 2012 – May 2014)
ADVANCE Faculty Advisory Committee (Oct 2010 – May 2013)
Life Sciences Curriculum Planning Team (May 2012 – Aug 2012)
CASNR Faculty Advisory Committee (Aug 2011 – April 2012)
Search Committee for Attending Veterinarian (Jan 2012 – May 2012)
Search Committee for Vice President and Vice Chancellor of the Institute of Agriculture and Natural Resources (Oct 2009 – May 2010)
Department of Chemistry faculty search committee: Organic Chemist (Oct 2009 – March 2010)
Department of Chemistry faculty search committee: Organic Chemist (June 2008 – Dec 2008)
Search committee for Associate Dean of the Institute of Agriculture and Natural Resources (Feb 2008 – Sept 2008)
Nebraska Life Sciences Graduate Recruitment Program: committee representative for Bioengineering, Biomolecular Nutrition, and Biomedical Sciences (May 2008 – Oct 2008)
Search committee for Assistant Director of the Robert Kutak Center for Teaching and Study of Applied Ethics (May 2008 – July 2008)
Life Sciences Interdisciplinary Graduate Recruitment Program (LSIGRP) Executive Committee (Mar 2005 – Dec 2007)

University of Nebraska Biochemistry Departmental Service

Past
Web site redesign subcommittee
Graduate recruitment subcommittee
Graduate core curriculum revision subcommittee
Six-year review undergraduate program subcommittee (2005)
Faculty search committee: Biochemistry academic advisor (June 2005)
Faculty search committee: Instructional Biochemist (May-June 2006)
Search committee for Biochemistry Department Chair (Sept 2006 – May 2008)
Faculty search committee: Redox Biochemist (Oct 2007 – March 2008)
Search committee for Director of Mass Spectrometry (June 2008 – Sept 2008)
Faculty search committee: Molecular Genetics and Biological Chemistry (Sept 2009 – May 2010)
Six-year review Teaching II Graduate Subcommittee, Chair (2010-11)
Six-year review Research II Subcommittee (2010-11)
Instructional Improvement Committee (May 2009 - 2011)
Student Awards and Fellowships Committee (Jan 2008 – May 2011)
Academic Honesty Committee, Chair (March 2010 – June 2012)
By-Laws revision subcommittee, Chair (Jan 2012 – April 2012)
Faculty Awards Committee (Oct 2012 – Sept 2013)
Faculty search committee, Chair: Complex Disease (Jan 2015 – July 2015)
Promotion and Tenure Committee (July 2008 – June 2012, Sept 2013 – June 2015)
Center for Biological Chemistry (CBC) Graduate Committee, Chair (Aug 2007 – Aug 2015)
CBC Curriculum Committee (Aug 2005 - July 2015)
PEARL CBC Graduate Assessment Committee, co-Chair (Oct 2008 – June 2016)
Executive Committee (Sept 2008 – June 2013, Aug 2015 – July 2016)
Center for Biological Chemistry (CBC) Graduate Program Committee (Aug 2007 – May 2017)

Outreach Activities (past examples)

Women in Science (annual). Two-day event to recognize talented female Nebraska high school students with an interest in science. Participation includes attendance of the recognition dinner and conducting a one-hour workshop in my laboratory with a group of 10-15 students.

Honors student recognition reception (annual). Recruitment event for University of Nebraska

consisting of a reception and question/answer session about UNL and its majors for high school Honors students and their parents.

Nebraska First Huskers (inaugural Aug 17, 2015). Presentation entitled “How to succeed in large classes”. The program is part of a week-long series of workshops and interactive sessions to help first generation college undergraduates succeed at UNL.