

## CURRICULUM VITAE

### **Pepper J. Schedin, Ph.D.**

Professor of Medicine

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### **Education**

1975-1978 Chemistry & Mathematics Major, Metropolitan State College, Denver, CO  
1979 BA, University of Colorado, Boulder, CO - Molecular, Cellular & Developmental Biology  
1988 PhD, University of Colorado, Boulder, CO - Molecular Genetics (Mentor, Dr. William Wood)  
1989-1993 Postdoctoral Fellow, Center for Cancer Prevention Research, AMC Cancer Research Center, Denver, CO (Mentor, Dr. Henry Thompson)

### **Academic Appointments**

1994-2005 Scientist, AMC Cancer Research Center, Cancer Prevention Division, Lakewood, CO  
2000 Full Member, Comprehensive Cancer Center, University of Colorado Anschutz Medical Campus, Aurora, CO  
2005 Associate Professor, Division of Medical Oncology, Department of Medicine, University of Colorado Denver, Aurora, CO  
2005 Graduate School Faculty: Reproductive Sciences Program, Cell, Stem Cell & Developmental Biology Program, Cancer Biology Program, Medical Scientist Training Program, and Biomedical Science Training program, University of Colorado Anschutz Medical Campus, Aurora, CO.  
2009 Professor, Division of Medical Oncology, Department of Medicine, University of Colorado Anschutz Medical Center, Aurora, CO  
2009 Co-director, Young Women's Translational Breast Cancer Program, University of Colorado, Anschutz Medical Center, Aurora, CO  
2014 Professor, Provisional, Department of Cell & Developmental Biology, School of Medicine, Oregon Health & Science University, Portland, OR

### **Major Research Areas of Interest**

The focus of my research program is on understanding epithelial-stromal interactions in normal and pathologic breast development, to investigate the modulation of these interactions by physiologic and lifestyle interventions, and develop chemoprevention strategies based on knowledge of these interactions. My lab is at the forefront of investigating the normal mammary gland microenvironment and has shown that the extracellular matrix and immune cell compliments are highly plastic, remodeling in response to various physiologic signals and lifestyle interventions. This normal stromal plasticity contributes significantly to breast cancer risk, but also identifies unique developmental windows that can be targeted for the prevention (and treatment) of breast cancer. Current areas of research include understanding how pregnancy and menopause increase risk for breast cancer. The strength in this 'window of risk' approach lies in the ability to limit duration of treatment, thus reducing treatment complications associated with current chemoprevention strategies.

### **Current Research Projects**

1. Determination of the mechanism of pregnancy-associated breast cancer. Women who are diagnosed with breast cancer shortly after pregnancy have significantly reduced survival rates. We are investigating the hypothesis that the natural tissue remodeling of weaning, which occurs in the mammary gland following pregnancy and lactation promotes breast cancer progression and accounts for the high metastatic rate of pregnancy-associated breast cancer. The hypothesis that the mammary microenvironment becomes pro-oncogenic during involution is being evaluated using both 3-dimensional culture models and mouse models for breast cancer metastasis. Our current focus is on immune modulation during normal involution and the role of ECM proteins is mediating immune suppression.
2. Identification of ECM proteomes of the 'breast-cancer protected' and the 'at-risk' mammary gland. For these studies, we are isolating mammary ECM proteins from mammary glands of female rats at reduced risk of developing breast cancer either due to tamoxifen treatment or parity, and from control, 'at-risk' rats. ECM proteins are being identified using novel proteomic approaches developed in our lab in collaboration with Dr. Kirk Hanson. Proteins in common to the 'protected-glands', but absent or reduced in the 'at-risk' glands, will be candidates for ECM proteins that mediate protection. The isolated mammary matrices are being characterized in both in vitro and in vivo models for breast cancer metastasis.
3. Investigation of the link between obesity and postmenopausal breast cancer. We have modeled this metabolic context using rats that differ in their polygenic predisposition for obesity. In response to OVX, Obese rats exhibit less regression of existing tumors and a higher incidence of newly identified tumors. Surprisingly, the post-OVX change in tumor multiplicity was inversely associated with the rate and efficiency of post-OVX weight gain. These observations suggest a novel link between post-OVX tumor promotion and the energy imbalance and utilization of ingested fuels during post-OVX weight gain. Further studies are required to establish causality, but the metabolically inflexible state of obesity and its response to the post-OVX energy imbalance provide a plausible explanation for the relationship between the energetics of post-OVX weight gain and post-OVX tumor promotion.

### **Honors and Awards**

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| 1994 | Invited Participant, Susan G. Komen Breast Cancer Foundation. "For Women's Lives-Dialogues on Breast Cancer", PBS Documentary |
| 1994 | Invited Speaker, Breast Cancer Prevention Research Update, Executive Office of the President, Washington, D.C.                |

- 1997, 1998 Scientific and Educational Excellence Award, External Scientific Advisory Board, AMC Cancer Research Center, Denver, CO.
- 1999 Nominated, Sue Miller Award, for outstanding positive impact in the field of breast cancer, Denver, CO
- 2002 Recipient, Avon Award for New Faculty in the area of Breast Cancer, UCHSC, Denver, CO.
- 2004 Invited Participant, Susan Love Foundation Think Tank, Santa Barbara, CA.
- 2006 Best Abstract Award, 25<sup>th</sup> Congress of the International Association of Breast Cancer Research, Sponsored by Hoffman-La Roche, Montreal, Canada.
- 2007 Progressive Research Recognition, one of seven Department of Defense Breast Cancer Researchers highlighted in the 2007 Congressional Summary.
- 2008 Mary Kay Ash Foundation Scholar
- 2009 Guest Editor, Journal of Mammary Gland Biology and Neoplasia, Special Edition on Involution and Cancer.
- 2009 Research highlighted in the Breast Cancer Research Program 2009 Annual Report, U.S. Army Medical Research and Material Command
- 2010 Vice Chair, Gordon Research Conference on Mammary Gland Biology, Barga, Italy, June 6-11, 2010
- 2010 Guest Editor, Journal of Mammary Gland Biology and Neoplasia, Special Edition on Stroma in the Normal Mammary Gland
- 2010 Anschutz Medical Campus Graduate School Dean's Mentoring Award, In recognition of Exemplary Thesis Advising, University of Colorado Denver.
- 2011 Research highlighted in the Breast Cancer Research Program 2009 Annual Report, U.S. Army Medical Research and Material Command
- 2011 Chair, Gordon Research Conference on Mammary Gland Biology, Salve Regina University, Newport, RI, June 2011
- 2012 Keynote Speaker, National Breast Cancer Coalition, Project Lead Education Session, SABCC, San Antonio, TX
- 2012 Research highlighted in the Breast Cancer Research Semipostal Program 2012 Annual Report, U.S. Army Medical Research and Material Command
- 2012 USA Today Interview. <http://www.usatoday.com/story/news/nation/2012/10/02/breast-cancer-after-pregnancy/1601129/>

### **Professional Memberships**

American Association for Cancer Research  
Women in Cancer Research  
Metastasis Research Society

### **Committee and Service Responsibilities: National**

- 1995-1999 Chair, Day of Caring Program Development, Denver, CO.
- 1995 Department of Defense Breast Cancer Research Program Reviewer, Experimental Therapeutics Panel, Hunt Valley, Maryland.
- 1996 Department of Defense Breast Cancer Research Program Reviewer, Research with Translational Potential Panel, Washington, DC.
- 1998-present Ad hoc Reviewer, partial list: *Cancer Cell, Nature, Cancer Research, JNCI, Clinical Cancer Research, Cancer Epidemiology, Biomarkers & Prevention, Breast Cancer Research and Treatment, Endocrinology, Am J Pathol, Cell Biology International, Matrix Biology, Trends in Molecular Medicine, Breast Cancer Research, Cellular and Molecular Life Sciences, Molecular Carcinogenesis.*

- 1998-2000 Ad Hoc Grants Review Member, Cell Structure & Metastasis Panel, American Cancer Society, Atlanta, GA.
- 2000-2002 Adjunct Faculty Member, Department of Experimental Pathology, School of Medicine, USHSC, Denver, CO.
- 2001-2007 Full Member, Cell Structure & Metastasis Grants Review Panel, American Cancer Society, Atlanta, GA (two cycles).
- 2004 Ad Hoc Reviewer, Health Research Board of Ireland, Research Project Grant Review Panel.
- 2007 California Breast Cancer Research Program Etiology and Prevention Panel Member
- 2007 ACS IRG/UCCC Seed Grant Review Panel, December 19, 2007.
- 2007 American Cancer Society, Member, Cell Structure & Metastasis Panel Member, June 20-21, 2007.
- 2008 California Breast Cancer Research Program Etiology and Prevention Review Member, 2007-2008.
- 2008 Komen Foundation, Member, Grants Program Pathobiology Panel, Jan 6-7, 2008.
- 2008 Association for International Cancer Research, Ad Hoc Grant Reviewer, Scotland.
- 2008 NIH Peer Review Grant Panel Member, Special Emphasis Panel/Scientific Review Group 2009/01 ZRG1 ONC-L (10)
- 2009 Guest Editor; Journal of Mammary Gland Biology and Neoplasia, Special Edition on 'Post-lactational Breast Involution and Breast Cancer', June, 2009
- 2010 Advisor, NIH Physical Sciences and Oncology Centers Program, Mechanical Properties of Cancer Cells and their Microenvironment Workshop, The Beyond Center for Fundamental Concepts in Science, Arizona State University, Feb 12-12, 2010.
- 2011 Chair, Gordon Research Conference on Mammary Gland Biology, Salve Regina University, Newport, RI, June 2011. Responsible for program development, speaker recruitment and fundraising.
- 2011 DOD Era of Hope 2011 Meeting Planning Committee member, The US Army Medical Research and Materiel Command (USAMRMC) Breast Cancer Research Program (BCRP) and 6th Era of Hope (EOH) Conference Technical Planning Committee (TPC); a member of the EOH abstract subcommittee and to participate in the placement of abstracts and design of symposia sessions for the 2011 EOH conference. Washington, D.C., April 7-8, 2011.
- 2011 Susan G. Komen for the Cure, Postdoctoral Training Grant Review Panel.
- 2012 Review Member, PAR-11-146: Collaborative Research in Integrative Cancer biology and the Tumor Microenvironment (U01), NCI/NIH
- 2012 NIH/NCI Workshop on Postpartum Breast Remodeling, Lactation, and Breast Cancer Risk: Towards improved Risk Assessment and Prevention. Title of presentation: Postpartum involution: a window of risk – and opportunity for breast cancer prevention National Cancer Institute, Bethesda, Maryland, March 2, 2012.
- 2012 NIH/NCI TME Study Session, October, 2012.
- 2012 AALAS training event; Keynote Speaker, Mile High Branch AALAS Fall Meeting, "Biomedical research, being wrong and the discovery of a new type of breast cancer: the role of animal husbandry", Colorado State University, Fort Collins, CO, October 4, 2012.
- 2013 NIH/NCI CDP Study Section, February, 2013.
- 2013 Department of Defense (DOD) Breast Cancer Research Program (BCRP) Integration Panel Member, Breakthrough Award mechanism
- 2013 Member, NIH/NCI CDP Study Section

- 2014 Review Member, Canadian Institutes of Health Research (CIHR) Roadmap Signature Initiative entitled "Team Grant: Health Challenges in Chronic Inflammation". January 2014

**Committee and Service Responsibilities: Department of Medicine, University of Colorado, Denver**

- 2005-2008 Member, Young Investigators Working Group, Women's Health Research, UCHSC.  
2006-2007 Member, Pathology Research Faculty Search Committee, UCHSC.  
2006-present Steering Committee Member, Division of Medical Oncology, Department of Medicine, UCHSC.  
2006-2007 INET Steering Committee Member, Young Investigators Working Group, Women's Health Research, UCHSC.  
2007-2008 Chair of the Graduate Student Recruitment Committee and member of the Steering Committee, Cell, Stem Cell & Developmental Biology Program.  
2007-2012 Steering Committee Member, Biomedical Sciences Training Program, Graduate School, UCHSC.  
2012-current Admissions Committee, Medical Scientist Training Program, Graduate School, UCAMC.  
2012-2013 Member, University of Colorado Comprehensive Cancer Research Faculty Search Committee, Breast Cancer Recruit, UCHSC.

**Invited Extramural Lectures, Presentations and Visiting Professorships**

**Selected Scientific Presentations**

- 1985 *Intestinal Mosaicism for Expression of Vitellogenin Genes in C. Elegans Intersexes*, C. Elegans 1985 Meeting, Cold Springs Harbor laboratory, Cold Spring Harbor, New York.  
1988 *Tissue-Autonomy, Timing and Reversibility of Sex Determination in Caenorhabditis Elegans*. Southwestern Developmental Biology Society, University of Texas at Austin, Port Aransas, TX.  
1995 *Targeting Mammary Epithelial-ECM interactions with Chemopreventive Agents*, School of Medicine, Texas Tech University, Lubbock, TX.  
1997 *Targeting Mammary Epithelial-ECM Interactions with Chemopreventive Agents*, University of Pittsburgh Cancer Institute, University of Pittsburgh, Pittsburgh, PA.  
1998 *Pathology of Breast Cancer, Relevance of Animal Models*, American College of Sports Medicine, Orlando, FL.  
1999-2000 *Reproductive state of rat mammary gland ECM modulates human breast cancer cell migration and invasion*, Poster Discussion Session, AACR 91<sup>st</sup> Annual Meeting, San Francisco, CA.  
2000 *Role of pre-formed vitamin A intake during adolescence and mammary carcinogenesis in the adult Sprague Dawley rat*, Platform Presentation, Department of Defense Breast Cancer Research Meeting 2000, Atlanta, GA.  
2001 *Mammary extracellular matrix composition and function are under endocrine control; implications for chemoprevention*, Division of Life Sciences, Lawrence Berkeley Laboratories, Berkeley, CA.  
2001 *ECM isolated from post-lactational involuting mammary glands promotes death in normal mammary epithelial cells and invasion in tumor cells; implications for mammary carcinogenesis*. 6<sup>th</sup> World Conference on Advances in Oncology, Crete, Greece.  
2001 *Adolescent Vitamin A Intake Alters Susceptibility to Mammary Carcinogenesis in the Sprague-Dawley Rat*. Department of Human Nutrition, University of Illinois at Chicago, Chicago, IL.  
2002 *Role of the Extracellular Matrix in Breast Cancer Etiology and Prevention*. Department of Human Nutrition, University of Illinois at Chicago, Chicago, IL.

- 2002 *Sexual Maturation, Mammary Gland Maturation and Risk for Breast Cancer are Differentially Affected by whole foods Compared to Preformed Vitamin A in the SD Rat.* Symposia Platform Presentation at the Era of Hope Department of Defense Breast Cancer Research Program Meeting, Orlando, FL.
- 2002 *Adolescent Vitamin A Intake Alters Susceptibility to Mammary Carcinogenesis in the Sprague-Dawley Rat,* Interdisciplinary Faculty of Toxicology, Texas A&M, College Station, TX, 11/18/02.
- 2002 *Mammary stroma is under endocrine regulation, implications for breast cancer prevention,* Breast Disease Research Group, Dept. of Molecular & Cellular Biology, Baylor College of Medicine, Houston, TX, 11/20/02.
- 2003 *Steps of metastasis from a tissue-interaction perspective,* Gordon Research Conference on Mammary Gland Biology, Bristol, RI, 6/04/03.
- 2004 *Mammary gland tissue remodeling; target for breast cancer prevention, and Breast cancer prevention-focus on youth,* 2<sup>nd</sup> Annual Santa Barbara Think Tank on Normal Mammary Gland Biology, Susan Love MD Foundations, Santa Barbara, CA, 3-11-04.
- 2004 *Compositional changes in mammary ECM induced by endocrine state and preventive agents; implications for cancer progression,* Angiogenesis Mechanisms and Microenvironment Mini Symposium, 95<sup>th</sup> Annual Meeting, AACR, Orlando, FL, March 31, 2004.
- 2004 *Tissue remodeling in the mammary gland as a target for breast cancer prevention,* Department of Dermatology, Northwestern University, December 13, 2005.
- 2005 *Remodeling of the mammary tumor microenvironment following pregnancy promotes tumor cell metastasis; a plausible mechanism for poor prognosis of pregnancy-associated Breast cancer,* Keystone Symposium, The Role of Microenvironment in Tumor Induction and Progression, Banff, Canada, February 5, 2005.
- 2005 *Microenvironment of the Involuting Mammary Gland Activates Tumor Angiogenesis and Metastasis,* AACR Special Conference in Cancer Research; Cancer, Proteases, and the Tumor Microenvironment, Bonita Springs, FL, Dec 1, 2005.
- 2005 *Tamoxifen Treatment Functionally Alters the Rat Mammary Stroma Indicating a Role for the ECM in Tumor Suppression,* presented by Rhonda Hattar, Graduate Student. AACR Special Conference in Cancer Research; Cancer, Proteases, and the Tumor Microenvironment, Bonita Springs, FL, Dec 3, 2005.
- 2006 *Functional Changes in Mammary ECM Induced by Endocrine State and Preventive Agents: Implications for Cancer Prevention.* Department of pathology, University of California, San Francisco, Jan 13, 2006.
- 2006 *Physiologic changes in mammary ECM determine tumor progression; implications for cancer prevention.* Program in Cell, Molecular and Developmental Biology, Tufts University, Feb 14, 2006.
- 2006 *Microenvironment of the involuting mammary gland activates tumor metastasis: a new target for chemoprevention?* Gordon Conference on Mammary Gland Biology, Barga, Italy, May 28, 2006.
- 2006 *Plasticity of the mammary gland extracellular matrix and breast cancer progression.* Gordon Conference on Basement Membranes, Barga Italy, June 18, 2006.
- 2006 *Microenvironment of the involuting mammary gland activates tumor metastasis,* 25<sup>th</sup> Congress of the International Association for Breast Cancer Research, Montreal, Canada, Sept 17, 2006.
- 2006 *Plasticity of the mammary gland extracellular matrix and breast cancer progression,* Interdepartmental seminar series, The Cellular and Molecular Basis of Disease, University of New Mexico, Albuquerque, New Mexico, Sept 22, 2006.
- 2007 *Plasticity of the mammary gland extracellular matrix and breast cancer progression.* The Department of Molecular, Cellular and Developmental Biology Medical Seminar Series, University of Colorado, Boulder, April 9, 2007.

- 2007 *Wound healing signature of mammary gland involution and pregnancy associated breast cancer*, Department of Physiology and Biophysics, University of Illinois Chicago, Oct 26, 2007.
- 2007 *The inflammatory milieu permits metastasis in pregnancy-associated breast cancer*, Interdisciplinary Faculty of Toxicology program, Texas A&M University, Nov 13, 2007.
- 2007 *Wound healing signature of mammary gland involution and pregnancy associated breast cancer*, Department of Molecular and Cellular Biology Seminar Program, Baylor College of Medicine, November 14, 2007.
- 2007 *Identification of the Extracellular Matrix Proteomes Responsible for Breast Cancer Metastasis and Tumor Cell Dormancy*, Butcher Symposium on Genomics and Biotechnology, The Future of Biomedicine in Colorado, A Workshop of the Possible Friday, November 16, 2007 Westin Hotel, Westminster, CO.
- 2007 *The Inflammatory Milieu Permits Metastasis in Pregnancy-Associated Breast Cancer*, Laboratory of Cancer Biology and Genetics Seminar Series, NIH, Bethesda, MD, December 13, 2007.
- 2008 *Pregnancy-Associated Breast Cancer*, Betty Ford Breast Cancer Treatment and Survivorship Symposium, Vail, CO, April 3-5, 2008.
- 2008 *Role of mammary gland involution in promoting metastasis in pregnancy-associated breast cancer (PABC)*. Department of Defense, Era of Hope Meeting, Baltimore, MD, June 27, 2008.
- 2009 *The pro-inflammatory milieu of breast involution as a cancer prevention target*, Hematology–Oncology Grand Rounds Seminar Series, Mount Sinai School of Medicine, January 9, 2009
- 2009 *Physiologic Mammary Gland Involution Promotes Breast Cancer*, Department of Genetics, Cell Biology and Anatomy Grand Rounds, University of Nebraska Medical School, January 14, 2009
- 2009 *Pregnancy-associated Breast cancer: role of epithelium and stroma in tumor aggressiveness*, 2009 Avon Foundation Breast Cancer Forum, Prevention: Research and Strategies for the 21<sup>st</sup> Century, Miami, Fl, February 13, 2009.
- 2009 *Information Conveyed by ECM Proteins in the Mammary Gland*, Keystone Symposia on Extrinsic Control of Tumor Genesis and Progression, Vancouver, British Columbia, Mar 15, 2009.
- 2009 *The involution hypothesis and pregnancy associated breast cancer*, Gordon Research Conference on Mammary Gland Biology, Salve Regina University, Newport, RI, June 16, 2009
- 2009 *Mammary Gland Involution Microenvironment and Tumor Progression*, AACR Special Conference Advances in Breast Cancer Research: Genetics, Biology and Clinical Applications, San Diego, CA, October 15, 2009
- 2009 *Pro-inflammatory tissue remodeling of the postpartum breast and breast cancer progression*, Department of Pathology, Northwestern University, Chicago, IL, October 23, 2009
- 2009 *Pro-inflammatory tissue remodeling of the postpartum breast and breast cancer progression*, Department of Molecular, Cellular and Developmental Biology, University of California Santa Cruz, November 2, 2009
- 2009 *Postnatal breast involution as a highly targeted window for breast cancer prevention*. Eight Annual AACR International Conference, Frontiers in Cancer Prevention Research, Houston, TX, December 9, 2009.
- 2010 *What is the ECM microenvironment of life 1.0 and how is it different from life 1.1? Mechanical Properties of Cancer Cells and their Microenvironment Workshop*, NIH Physical Sciences and Oncology Centers Program, The Beyond Center for Fundamental Concepts in Science, Arizona State University, Feb 10-12, 2010.
- 2010 *Mammary gland involution as a target for breast cancer prevention: insights from macrophages and NSAIDS*. Lab Medicine & Pathology, Grand Rounds Seminar, University of Minnesota, Minneapolis, MN, January 20, 2010.

- 2010 *Mammary Gland Involution as a Target for Breast Cancer Prevention: Insights from Macrophages and NSAIDS*, Cancer Prevention & Population Sciences GRAND ROUNDS, Roswell Park Cancer Institute, Buffalo, New York, March 15, 2010
- 2010 *Mammary Gland Involution as a Target for Breast Cancer Prevention: Insights from Macrophages and NSAIDS*, Research Seminar Series in Cancer & Developmental Biology, Kansas University Medical Center, Kansas City, KS, April 1, 2010
- 2010 *Postpartum involution as a risk factor for Pregnancy-Associated Breast Cancer*, Grand Rounds, University of Arizona Cancer Center, Tucson, Arizona, May 3, 2010.
- 2010 Meet-the-Expert Session, *Role of postpartum involution in the promotion of pregnancy-associated breast cancer*, 2010 Annual AACR Meeting, Washington, DC, April 21, 2010.
- 2010 *Phenotypic plasticity of mammary epithelial cells and implications for breast cancer development and treatment*. Gordon Research Conference on Mammary Gland biology, Barga, Italy, June 13, 2010.
- 2011 *The Benefits and Challenges of Research in Humans*. Doctor Susan Love Research Foundation, Santa Monica, CA, February 23-26, 2011.
- 2011 *Pregnancy Associated Breast Cancer: Role of Epithelium and Stroma in Tumor Aggressiveness*. Avon Foundation Breast Cancer Forum, New York, NY, March 1-2, 2011.
- 2011 *Postpartum mammary gland involution drives breast cancer progression through collagen and COX-2 identifying a target for intervention*. Dana-Farber Cancer Institute, Harvard Medical School, Boston, MA, March 28-30, 2011.
- 2011 *Postpartum mammary gland involution drives DCIS progression through collagen and COX-2, identifying a target for intervention*. Massachusetts General Hospital, Gillette Center for Breast Cancer, Boston, MA, April 11-12, 2011.
- 2011 *Mammary Extracellular Matrix Proteins Contribute to Protective Effect of Parity: Insight into Tumor Cell Dormancy? Session: Silence is Golden: Key Issues in Dormancy and Recurrence*. The US Army Medical Research and Material Command (USAMRMC) Breast Cancer Research Program (BCRP) 6th Era of Hope (EOH) Conference. Orlando, FL, August 2-5, 2011.
- 2011 *Postpartum Mammary Gland Involution Drives Breast Cancer Progression through Collagen and COX-2*, Cancer Prevention and Control Seminar Series, Arizona Cancer Center, University of Arizona, Tucson, Arizona, August 31, 2011.
- 2011 Does postpartum breast involution account for the poor prognosis of pregnancy-associated breast cancer? Mayo Clinic Cancer Center, Jacksonville, Florida, October 7, 2011
- 2011 Keynote Speaker: *I have heard about targeted therapies for breast cancer-but what is a life-cycle targeted therapy?* NBCC Project LEAD Advanced Topic Session, SABCS, San Antonio, Texas, December 6, 2011
- 2011 Platform Presentation: *COX-2 Dependent Collagen Fibrillogenesis Drives Metastasis in the Postpartum Mammary Gland*. CTRC-AACR San Antonio Breast Cancer Symposium, Tumor Microenvironment Forum. San Antonio, Texas, 12/9/2011.
- 2012 2012 Biomedical research, being wrong and the discovery of a new type of breast cancer, Beloit College, Beloit, Wisconsin, April 9, 2012
- 2012 *Mammary Gland Involution as a Target for Breast Cancer Prevention: Insights from Macrophages and NSAIDS*, McArdle Laboratory, Seminar in Cancer Biology, University of Wisconsin Madison, April 11, 2012
- 2012 Platform Presentation: *COX-2 Dependent Collagen Fibrillogenesis Drives Metastasis in the Postpartum Mammary Gland*. IABCR International Association for Breast Cancer Researcher, Stromal-Epithelial Interactions in Breast Cancer Development and Progression, Palace Hotel, Manchester, UK, April 15-18, 2012



- 2012 Tissue remodeling and immunosuppressive mechanisms drive metastasis in the postpartum mammary gland, Breakthrough Breast Cancer Research Centre, The Institute of Cancer Research, Royal Cancer Hospital, London, England, April 20, 2012
- 2012 Tissue remodeling and immunosuppressive mechanisms drive metastasis in the postpartum mammary gland, Vanderbilt Ingram Cancer Center, Vanderbilt University, Nashville, Tennessee, April 30, 2012
- 2012 Tissue Remodeling & Immunosuppressive Mechanisms Drive Metastasis in the Postpartum Mammary Gland Reproductive Biology Seminar Series, Department of Obstetrics and Gynecology, University of Texas Southwestern Medical Center, September 11, 2012
- 2012 COX-2 inhibitors target multiple pathways driving metastasis in postpartum breast cancer. Department of Physiology, Michigan State University, East Lansing, Michigan, November 1, 2012.
- 2012 Host Reproductive Heterogeneity Determines Prognosis of Young Women's Breast Cancer, The 43 International Symposium, Princess Takamatsu Cancer Research Conference Tokyo, Japan, November 15, 2012.
- 2013 Collagen density and structure differentially promote breast cancer; insights gained from the parous mammary gland, Daniel Medina Symposium, Galveston, Texas, March 2, 2013.
- 2013 Tissue Remodeling & Immunosuppression Drive Metastasis in Postpartum Breast Cancer, Oregon Health and Science University, Department of Cell and Developmental Biology, Portland, Oregon, April 29, 2013
- 2013 Advancements in NSAID-based chemoprevention of postpartum breast cancer, Kansas Masonic Cancer Research Institute, University of Kansas Cancer Center, Kansas City, KS, October 22, 2013
- 2013 COX-2 dependent stromal pathways drive metastasis in postpartum breast cancer, 2013 Basic Science Research Symposium, Simmons Cancer Institute, Southern Illinois University, School of Medicine, Springfield, IL, October 26, 2013

## **Bibliography**

### **A. Publications in Refereed Journals**

- 1) **Schedin P**, Hunter CP, and Wood WB. Autonomy and nonautonomy of sex determination in triploid intersex mosaics of *C. Elegans*. *Development* 1991 Jul; 112: 863-879. PMID:1935692
- 2) Wilson AC, Thompson HJ, **Schedin PJ**, Gibson NW and Ganther H. Effect of methylated forms of selenium on cell viability and the induction of DNA strand breakage. *Biochem Pharmacol* 1992 Mar 3; 43(5):1137-1141. PMID:1554385
- 3) Thompson HJ, Strange R, and **Schedin PJ**. Apoptosis in the genesis and prevention of cancer. *Cancer Epidemiology Biomarkers & Prevention* 1992 Nov-Dec; 1(7): 597-602. PMID:1302573
- 4) **Schedin P**, Jonas P, and Wood WB. Function of the *her-1* gene is required for maintenance of the male differentiated state in adult tissues of *C. elegans*. *Developmental Genetics* 1994; 15:231-239. PMID:8062456
- 5) **Schedin P**, Strange R, Singh M, Kaeck MR, Fontaine SC, and Thompson HJ. Treatment with chemopreventive agents, difluoromethylornithine and retinyl acetate, results in altered mammary extracellular matrix. *Carcinogenesis* 1995 Aug; 16(8):1787-1794. PMID:7634405

- 6) **Schedin P**, and Byers T. Adolescent diet and the risk of breast cancer in adulthood: a role for vitamin A? *International Journal of Applied and Basic Nutritional Sciences, Nutrition* 1997 Oct; 13(10): 924-925. PMID:9357037
- 7) **Schedin P**, Strange R, Mitrenga T, Wolf P, and Kaeck M. Fibronectin fragments induce MMP-activity in mouse mammary epithelial cells; evidence for a role in tissue remodeling. *J Cell Science* 2000 Mar; 113(Pt 5):795-806. PMID:10671369
- 8) **Schedin P**, Mitrenga T, and Kaeck M. Estrous cycle regulation of mammary epithelial cell proliferation, differentiation and death in Sprague-Dawley rat: a potential model for investigating the role of the menstrual cycle in mammary carcinogenesis. *J Mammary Gland Biol. & Neoplasia* 2000 Apr; 5(2):211-225. PMID:11149574
- 9) Bemis LT and **Schedin P**. Reproductive state of rat mammary gland stroma modulates breast cancer cell migration and invasion. *Cancer Research* 2000 Jul 1; 60:3414-3418. PMID:10910049  
Highly Accessed
- 10) Metz R, Kaeck M, Stacewicz-Sapuntzakis M, Mitrenga T, McCarty H, and **Schedin, P**. Adolescent vitamin A intake alters susceptibility to mammary carcinogenesis in the Sprague-Dawley rat. *Nutrition & Cancer* 2002; 42:78-90. PMID:12235654
- 11) **Schedin P** and Elias A. Multistep tumorigenesis and the microenvironment. *Breast Cancer Research* 2004; 6(2):93-101. PMID:14979914
- 12) **Schedin P**, Eckel KL, McDaniel SM, Prescott JD, Brodsky KS, Tentler JJ, and Gutierrez-Hartmann A. ESX induces transformation and epithelial to mesenchymal transition in MCF-12A mammary epithelial cells. *Oncogene* 2004 Mar 4; 23(9): 1766-1779. PMID:14767472
- 13) **Schedin P**, Mitrenga T, McDaniel S, and Kaeck, M. The mammary extracellular matrix composition and function are altered by reproductive state; evidence for extracellular matrix mediating the response of the epithelium to endocrine signaling. *Molecular Carcinogenesis* 2004 Dec 4; 41(4):207-220. PMID:15468292
- 14) McDaniel, S., Rumer, K., Biroc, S., Metz, R., Singh, M., Porter, W., and **Schedin, P**. Remodeling of the mammary microenvironment following lactation promotes breast tumor cell metastasis. *American Journal of Pathology* 2006 Feb; 168(2):608-20. PMID:16436674  
Highly Accessed, and Commentary: N. Polyak, Cancer Cell, March 2006, 152-153, and C. Sonnenschein and A. Soto, American Journal of Pathology, 168 2):363-366, 2006.
- 15) **Schedin P**. Pregnancy-associated breast cancer and metastasis. *Nature Reviews Cancer* 2006 Apr; 6(4):281-291. PMID:16557280
- 16) **Schedin P**, O'Brien J, Rudolf M, Stein T, and Borges, V. The Microenvironment of the involuting mammary gland mediates mammary cancer progression. *J of Mammary gland Biology and Neoplasia* 2007 Mar; 12(1):71-82. PMID:17318269
- 17) McDaniel SM, O'Neill C, Metz R, Tarbutton E, Sapuntzakis M, Heimendinger J, Wolfe P, Thompson H, and **Schedin P**. Whole food sources of vitamin A more effectively inhibit female rat sexual

- maturation, mammary gland development, and mammary carcinogenesis than retinyl palmitate. *J Nutrition* 2007 Jun; 137(6):1415-1422. PMID:17513400
- 18) Hyeong-II K, Gustafson T, Metz P, Laffin B, **Schedin P**, and Porter W. Inhibition of breast cancer growth and invasion by single-minded 2s. *Carcinogenesis* 2007 Feb; 28(2):259-66. PMID:16840439
- 19) Laffin B, Wellberg E, Hyeong-II K, Burghardt RC, Metz RP, Gustafson T, **Schedin P**, and Porter WW. Loss of single-minded-2s in the mouse mammary gland induces an epithelial mesenchymal transition associated with up-regulation of Slug and MMP2. *Molecular and Cellular Biology* 2008 Mar; 28(6):1936-1946. PMID:18160708
- 20) Hattar R, Maller O, McDaniel S, Hansen KC, Hedman KJ, Lyons T, Lucia, Jr Wilson RS, and **Schedin P**. Tamoxifen induces pleiotrophic changes in mammary stroma resulting in extracellular matrix that suppresses transformed phenotypes. *Breast Cancer Res* 2009; 11(1):R5. PMID:19173736. Highly Accessed
- 21) Billups SC, Neville MC, Rudolph M, Porter W and **Schedin P**. Identifying significant temporal variation in time course microarray data without replicates. *BMC Bioinformatics* 2009; 26; 10:96. PMID:19323838. Highly Accessed.
- 22) Hansen KC, Kiemle L, Maller O, O'Brien J, Shankar A, Fornetti J, and **Schedin P**. An in-solution ultrasonic assisted digestion method for improved extracellular matrix proteome coverage. *Mol Cell Proteomics* 2009; 8(7):1648-57. PMID:19351662
- 23) **Schedin P**, and Borges V. Breaking down barriers: The importance of the stromal microenvironment in acquiring invasiveness in young women's breast cancer. *Breast Cancer Res* 2009; 11(2):102. PMID:19344495
- 24) **Schedin PJ** and Watson CJ. The complexity of the relationships between age at first birth and breast cancer incidence curves implicate pregnancy in cancer initiation as well as promotion of existing lesions. Preface. *J Mammary Gland Biol/Neoplasia* 2009; 14(2):85-6. PMID:19437108
- 25) O'Brien J and **Schedin P**. Macrophages in breast cancer: do involution macrophages account for the poor prognosis of pregnancy-associated breast cancer? *J Mammary Gland Biol Neoplasia* 2009; 4(2):145-57. PMID:19350209
- 26) Lyons TR, **Schedin PJ**, and Borges VF. Pregnancy and breast cancer: When they collide. *J Mammary Gland Biol Neoplasia* 2009; 14(2):87-98. PMID:19381788
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- 32) **Schedin P** and Hovey RC. Editorial: The mammary stroma in normal development and function. *J of Gland Biology and Neoplasia* 2010; 15(3): 275-277. PMID:20824491
- 33) Poczobutt JM, Tentler J, Lu X, **Schedin P**, and Gutierrez-Hartman A. Benign mammary epithelial cells enhance the transformed phenotype of human breast cancer cells. *BMC Cancer* 2010; 10: 373. PMID:20637104
- 34) Giles ED, Jackman MR, Johnson GC, **Schedin PJ**, Houser JL, MacLean PS. Effect of the estrous cycle and surgical ovariectomy on energy balance, fuel utilization, and physical activity in lean and obese female rats. *Am J Physiol Regul Integr Comp Physiol* 2010; 299(6):R1634-42. PMID: 20926768
- 35) Lyons TR\*, O'Brien J\*, Borges V, Conklin MW, Keely PJ, Elicieri KW, Marusyk A, Tan AC, and **Schedin P**. Postpartum mammary gland involution drives DCIS progression through collagen and COX-2. *Nature Medicine* 2011 Aug 7; 17(9):1109-1116. PMID:21822285  
*Highlighted F1000*  
*Commentary: T. Tlsty, Cancer Cell, 20: 285-286, September 13, 2011.*  
*Highlighted at SABCS 2011 Annual Meeting as a Most Important Scientific Contribution of 2011*
- 36) O'Brien J, Hansen K, Barkan D, Green J, and **Schedin P**. NSAIDs target pro-tumorigenic extracellular matrix of the postpartum mammary gland. *Int J Dev Biol* 2011; 55(7-9):745-55. PMID:22161831
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- 38) O'Brien J, Martinson H, Durand-Rougely C and **Schedin P**. Macrophages are critical for epithelial cell apoptosis and adipocyte repopulation during mammary gland involution. *Development* 2012; 139(2):269-75. PMID:22129827
- 39) **Schedin P** and Borges V. Pregnancy Associated Breast Cancer: an entity in need of refining the definition. *Cancer* 2012 Jul 1; 118(13):3226-3228. PMID:22086839
- 40) Fornetti J, Martinson H, Borges V, **Schedin P**. Emerging targets for the prevention of pregnancy-associated breast cancer. *Cell Cycle* 2012 Feb 15; 11:4, 639-640. PMID:22374663

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- 42) Borges V and **Schedin P**. Could NSAIDs become a preventive therapy in pregnancy-associated breast cancer? *Breast Cancer Management*, (2012) 1(1), 39-46.
- 43) O'Brien JH, Vanderlinden LA, **Schedin PJ\***, Hansen KC. Rat Mammary Extracellular Matrix Composition and Response to Ibuprofen Treatment During Postpartum Involution by Differential GeLC-MS/MS Analysis. *J. Proteome Res.* 2012; 11(10):4894-905 PMID:22897585 \*Corresponding Author.
- 44) Cruz GI, Martínez ME, Natarajan L, Wertheim BC, Gago-Dominguez M, Bondy M, Daneri-Navarro A, Meza-Montenegro MM, Gutierrez-Millan LE, Brewster A, **Schedin P**, Komenaka IK, Castela JE, Carracedo A, Redondo CM, Thompson PA. Hypothesized role of pregnancy hormones on HER2+ breast tumor development. *Breast Cancer Res Treat* 2012 Jan; 137(1):237-246. PMID:23135573
- 45) Giles ED, Wellberg EA, Astling DP, Anderson SM, Thor AD, Jindal S, Tan AC, **Schedin P**, Maclean PS. Obesity and Overfeeding Affecting Both Tumor and Systemic Metabolism Activates the Progesterone Receptor to Contribute to Postmenopausal Breast Cancer. *Cancer Research* 2012 Dec 7; 72(24):6490-501. PMID:23222299  
*Selected for Journal Issue Cover Art*  
*Highlighted in AACR Press Release, 12-7-2012*
- 46) Faupel-Badger JM, Arcaro KF, Balkam JJ, Eliassen AH, Hassiotou F, Lebrilla CB, Michels KB, Palmer JR, **Schedin P**, Stuebe AM, Watson CJ, Sherman ME. Postpartum Remodeling, Lactation and Breast Cancer Risk: Summary of a National Cancer Institute Sponsored Workshop. *J Natl Cancer Inst.* 2013 Feb 6; 105(3):166-174. PMID:23264680
- 47) Callihan EB, Gao D, Jindal S, Lyons TR, Manthey EI, Edgerton S, Urquhart A, **Schedin P**, and Borges VF, Postpartum Diagnosis Demonstrates a High Risk for Metastasis and Merits an Expanded Definition of Pregnancy-Associated Breast Cancer, *Breast Cancer Res Treat.* 2013 Apr;138(2):549-59. doi: 10.1007/s10549-013-2437-x. PMID:23430224
- 48) Harvell D ME, Kim J, O'Brien J, Tan A, Borges V F, **Schedin P**, Jacobsen B M and. Horwitz K B. Genomic Signatures of Pregnancy-Associated Breast Cancer Epithelial and Stroma and their Regulation by Estrogen and Progesterone. *Horm Cancer.* 2013 Mar 12.
- 49) Holly A. Martinson, Traci R. Lyons, Erin D. Giles, Virginia F. Borges, **Pepper Schedin**, Developmental windows of breast cancer risk provide opportunities for targeted chemoprevention, *Exp Cell Res* (2013), <http://dx.doi.org/10.1016/j.yexcr.2013.04.018>
- 50) Abitha Jacob<sup>1</sup>, Jian Jing<sup>1</sup>, James Lee, **Pepper Schedin**, Simon M. Gilbert, Andrew A. Peden, Jagath R. Junutula, and Rytis Prekeris. Rab40b Regulates MMP2 and MMP9 Trafficking during Invadopodia Formation and Breast Cancer Cell Invasion, *J Cell Sci*, 7-2013 [Epub ahead of print]
- 51) Maller O, Hansen KC, Lyons TR, Acerbi I, Weaver VM, Prekeris R, Tan AC, **Schedin P**. Collagen architecture in pregnancy-induced protection from breast cancer. *J Cell Sci.* 2013 Sep 15;126(Pt 18):4108-10. doi: 10.1242/jcs.121590
- 52) Svasti Haricharan, Jie Dong, Sarah Hein, Jay P. Reddy, Zhijun Du, Michael Toneff, Kimberly Holloway, Susan G. Hilsenbeck, Shixia Huang, Rachel Atkinson, Wendy Woodward, Sonali Jindal,

Virginia Borges, Carolina Gutierrez, Amy Zhang, **Pepper Schedin**, C. Kent Osborne, David J. Tweardy, and Yi Li. Mechanism and Preclinical Prevention of Increased Breast Cancer Risk Caused by Pregnancy. In press, *eLife*, 11-2013

- 53) Jaime Fornetti<sup>1</sup>, Sonali Jindal, Kara A. Middleton, Virginia Borges, and **Pepper Schedin**. Physiologic COX-2 expression in breast epithelium associates with COX-2 levels in ductal carcinoma in situ and invasive breast cancer in young women. *Am J Pathol*, in press, 1-2014.
- 54) Sonali Jindal, Dexiang Gao, Pat Bell, Susan Edgerton, Christine B. Ambrosone, Ann Thor, Virginia F. Borges, and Pepper Schedin, Postpartum breast involution reveals complete lobular regression mediated by tissue-remodeling, *Breast Cancer Research*, in press, 2014

### **B. Published Book Chapters**

- 1) Wood, W.P., Meneely, P., Schedin P., and Donahue, L. Aspects of dosage compensation and sex determination in *Caenorhabditis elegans*. In: Cold Spring Harbor 50th Symposium on Quantitative Biology. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, pp 575-583, 1985.
- 2) Schedin, P.J, L.B. Thackray, P. Malone, S.C. Fontaine, R.R. Fris, and R. Strange. Programmed Cell death and Mammary Neoplasia. In: Mammary Tumor Cell Cycle, Differentiation and Metastasis, R. Dickson and M. Lippman (eds). Kluwer Academic Publishers, pp3-22, 1996.
- 3) Schedin P and Keely, P.J. Mammary Gland ECM Remodeling, Stiffness, and the Role of Force in Normal Development and Tumor Progression. *The Biology of The Mammary Gland*, Cold Spring Harb Perspect Biol. 2011 Jan 1;3(1):a003228. doi: 10.1101/cshperspect.a003228. Review.

### **Mentoring**

#### **Fellows Mentor**

1. Richard Metz, PhD, 2002-2004. Current position: Research Assistant Professor, Veterinary Integrative Biosciences, College of Veterinary Medicine, Texas A&M University
2. Shailaja Raj, MD, 2004-2006. Current position: Private Practice
3. Swapnil Rajurkar, MD, 2005-2006. Current position: Private Practice
4. Traci Lyons, PhD, 2008-2012. Current position: Assistant Research Professor, Department of Medicine, University of Colorado AMC
5. Tanya Russell, PhD, 2009-2013. Current Position: Scientific Editor, Aegis Creative, Lakewood, CO.
6. Sonali Jindal, MD, 2009-present
7. Erin Giles, PhD, 2010-present
8. Dharanija Rao, 2013-present

### **Graduate Student Thesis Mentor**

#### **Graduated:**

1. Elizabeth Tarbutton, Cell and Developmental Biology Program, 2005-2007, MS. Current position:
2. Agne Taraseviciute, Medical Scientist Training Program, 2005-2008, PhD. Current Position: Physician Scientist/Fellow in Pediatric Hematology/Oncology, Fred Hutchinson Cancer Research Center, Seattle, WA
3. Rhonda Hattar, Biomedical Sciences Program, 2004-2008, MS. Current Position: Biology and Chemistry Instructor, Community College of Denver
4. Jenean O'Brien, Cancer Biology Program, 2006-2010, PhD. Current Position: Postdoctoral Fellow, Heide Ford Lab, UCD
5. Ori Maller, Cancer Biology Program, 2007-2012, PhD. Current position: Postdoctoral Fellow, Dr. Valerie Weaver Lab, UCSF, San Francisco, CA

#### **Current:**

1. Jamie Fornetti, Reproductive Sciences Program, Medical Student Training Program, 2008 present
2. Holly Martinson, Cancer Biology Program, 2009-present
3. Qiuchen Guo, Cancer Biology Program, 2011-present
4. Courtney Betts, Cells, Stem Cells and Development Program, 2012-present
5. Erica Goddard, Cancer Biology Program, 2012-present

### **Faculty Mentor**

1. Virginia Borges, MD., Associate Professor & Breast Cancer Oncologist, Division of Medical Oncology, UC Denver, AMC, 2006-present
2. Kirk Hansen, PhD., Assistant Research Professor, Pediatrics, UC Denver, AMC, 2006 present
3. Djuana Harvel, PhD., Assistant Professor, Endocrinology, UC Denver, AMC, 2008-2010
4. Traci Lyons, PhD., Assistant Research Professor, Division of Medical Oncology, UC AMC, 2012-present

### **Senior Scientist/Sabbatical Training:**

1. Sandra Biroc, PhD, Berlex Pharmaceuticals, CA. April -Nov, 2007
2. Bon-Hong Min, PhD, Professor, Dept. of Pharmacology and BK21 Program, College of Medicine, Korea University, Seoul, Korea. Sept 2008-August 2009.
3. Sandra Haslam, Professor, Michigan State University, March 2013

## **Teaching Record**

### **Graduate School Program Committees**

1. Graduate Student Recruitment Interviews; BSP, Cell & Developmental Biology, Cancer Biology and Basic Reproductive Sciences Program, 2006-present
2. Chair of the Graduate Student Recruitment Committee and member of the Steering Committee, Cell & Developmental Biology Program, 2007-2009
3. Chair, Graduate Program in Cell biology, Stem Cells and Development, Graduate Student 2008 Annual Retreat, Oct 3-4, 2008, Vail CO.
4. Member, Steering committee, Biomedical Sciences Program, December 2007-present
5. Member, Admissions committee, Medical Scientist Training Program, 2012-present

### **Graduate Student Thesis Committee Member- Graduated Students**

1. Neal Beeman, (Peggy Neville Lab) Department of Physiology and Biophysics, UCHSC, 2001-2007, PhD.
2. Kim Christenson (Heide Ford Lab), Molecular Biology Program, UCHSC, 2005-2007, PhD.
3. Malinda O'Donnell (Robert Garcia Lab), Cellular and Developmental Biology Program, UCHSC, 2005-2007, MS.
4. John Vanhoven (Linda Barlow Lab), Cell and Developmental Biology Program 2007.
5. Robert Shelton, Cancer Biology Program, UCHSC, Master of Science, final comprehensive examination committee member, 7/27/07, MS.
6. Joanna Poczbutt (Arthur Gutierrez-Hartmann Lab), Molecular Biology Program, UCHSC, 2004-2010, PhD.
7. Agne Taraseviciute (Peter Jones Lab), Cell and Developmental Biology Program, UCHSC, 2004-2008., PhD.
8. Committee Chair, Irene Choi (Kristen Artinger Lab), Cell and Developmental Biology Program, UCHSC 2004-2007, MS.
9. Erica McCoy (Heide Ford Lab), Molecular Biology Program, UCHSC, 2005-2009, PhD.
10. Committee Chair, James Haughian (Andy Bradford Lab), Department of Obstetrics and Gynecology, Reproductive Sciences Program, UCHSC, 2005-2008.
11. Brice McConnell (Arthur Gutierrez-Hartmann Lab), MSTP Program, UCHSC, 2006-2010, PhD.
12. Jian Jing (Rytis Preteris Lab), Cell and Developmental Biology Program, UCHSC, 2006-2009, PhD.
13. Sunshine Daddario (Steve Nordeen Lab), Cancer Biology Program, UCHSC, 2007-2010, PhD.
14. Matias Casa (James DeGregori Lab) Molecular Biology Program, UCHSC, 2008-2009.
15. Tressa Allington (Bill Schiemann Lab), Pharmacology Program, 2010-2011, PhD
16. Jessica Wahlig (Jim McManaman Lab), Cell Biology, Stem Cells and Development Program, UCHSC, 2008-2011, PhD



17. Committee Chair, Brittany Allen (Mary Reyland Lab) Cell and Developmental Biology Program, UCHSC, 2007-2012, PhD
18. Committee Chair, Ray Whitson (Scott Lucia Lab) Cancer Biology Program, UCHSC, 2007-2012
19. Erin Howe (Jennifer Richer Lab) Cancer Biology Program, UCHSC, 2008-2012, PhD
20. Molly Taylor (Bill Schiemann Lab), Molecular Biology Program, 2009-2011
21. Chu-An Wang (Heide Ford lab), Molecular Biology Program, UCHSC, 2009-2012
22. Margaret Heerwagon (Jed Freidman lab), Reproductive Sciences Program, UCHSC, 2009-2013
23. Adriane Stefanski (Virginia Winn Lab), Reproductive Sciences Program, 2011-2012
24. Jonathan Parker (Allen Waziris Lab), MSTP and Cancer Biology Program, 2011-2013
25. Trisha Sippel (Allen Waziri Lab), Cancer Biology Program, UC AMC, 2011-2013

#### **Graduate Student Thesis Committee Member-Matriculated Students**

1. Kristen Jacobsen (Doug Graham Lab), Immunology Program, UC AMC, 2010-
2. Laura Harmacek (Jessica Tyler Lab), Molecular Biology Program, UC AMC, 2010-
3. David Drasin (Heide Ford Lab), Molecular Biology Program, UC AMC, 2011-
4. Katherine Waugh (Jill Slansky Lab), Immunology program, UC AMC, 2011-
5. Abitha Jacob (Rytis Prekeris Lab)-CSD Program, UN AMC, 2012-
6. Deepika Neelakantan (Heide Ford Lab) Molecular Biology Program, UN AMC, 2012-
7. Rebecca Vartuli (Heide Ford Lab) Molecular Biology Program, UN AMC, 2012-

#### **Graduate School/Teaching Responsibilities**

##### **Lab Preceptor**

1. 2004, Preceptor, Cancer Center Summer Student Training Program, June-August, 2004, Laura Daddow, University of Colorado at Denver, CO., and Haley Ross, Saint Olaf College, MN., June-August, 2004
2. 2005, Graduate Student Rotation: Rhonda Hattar, Spring 05 and Liz Tarbutton, Summer 05.
3. 2005, Preceptor, Cancer Center Summer Student Training Program, June-August, 2005, Neena Gupta, Virginia Commonwealth University.
4. 2005, Mentor, Christy Walton Broomfield High School Senior, June-August, 2005.
5. 2005, Graduate Student Rotations: Brittany Allen, Fall 2005; Jenean O'Brian, Winter 2005, Tariq Adwan, Spring 2005.
6. 2006, Preceptor, NIH Summer Research Trainee Program, June-August, 2005, Kimberley Ngo, UCHSC. Accomplishments: Recipient of best poster award, CU Research Forum, Jan 27, 2006 and presenter, WSM Research Forum, Carmel, CA, Feb 5-6, 2006.
7. 2006, Mentor, Anna Andrianakos, Student, University of Colorado, Boulder MCDB graduate, June 2005-September 2006.

8. 2006, Preceptor, Lindsey Hosford, UC Boulder Undergraduate Butcher Foundation Summer Traineeship, June 1-August, 2006.
9. 2007, Preceptor, Kaitlyn Gilman, UCHSC Medical Student, UCHSC Summer Research Traineeship, June-Dec, 2006. Project; Obesity and Breast Cancer. Abstract selected for oral presentation, WSM Research Forum, Carmel, CA, Feb 5-6, 2007.
10. 2007, Mentor, Kafilat Jimo, Student from STEPS program (Strides Toward Encouraging Professions in Science), Metropolitan State college of Denver, 11/06-6/30/07.
11. 2007, Mentor; Mehtap Canastar, Student from Bogazici University, Istanbul, Turkey (Bachelor of Science. Molecular Biology and Genetics), 12/06-3/07.
12. 2007, Graduate Student Rotations: Ori Maller, Spring 2007.
13. Preceptor, Thomas Sweed, 2<sup>nd</sup> Year UCHSC Medical Student, Louise Coulter Foundation Scholarship Recipient, Summer, 2007.
14. 2007, Preceptor, Reema Mallick, 1<sup>st</sup> Year Medical Student, Cancer Center Student Research Fellow, Summer, 2007.
15. 2007, Graduate Student Rotations: Marianne Marshall, Fall 2007.
16. 2007, Marianne Marshall, 1<sup>st</sup> year BSP Student, Fall Semester 2007 Lab Rotation Mentor.
17. 2007, Alice Castile, 1<sup>st</sup> year BSP Student, Winter Semester 2007 Lab Rotation Mentor.
18. 2008, Jaime Fornetti, 2<sup>nd</sup> year MSTP student, spring Semester 2008 Lab Rotation Mentor.
19. 2008, Preceptor, Neena Gupta, 2<sup>nd</sup> year medical student at Virginia Commonwealth, Cancer Center Student Research Fellow, Summer, 2008.
20. 2008, Preceptor, Aarthi Shankar, Cancer Center Student Research Fellow, Summer, 2008.
21. 2008, Holly Martinson, 1<sup>st</sup> year BSP Student, Fall Semester, 2008.
22. 2009, Nicole Snelgrove, Cancer Center Student Research Fellow, Summer Semester, 2009.
23. 2009, Preceptor, Tanya Thielen, Cancer Center Student Research Fellow, Summer Semester, 2009.
24. 2010, Preceptor, Allison Kimball, 2<sup>nd</sup> year medical student, UCAMC, Cancer Center Student Research Fellow, Summer Semester, 2010.
25. 2010, Preceptor, Rena Yang, Cancer Center Student Research Fellow, Summer Semester, 2010.
26. 2011, Preceptor, Andrew Fleming, Yale University, Cancer Center Student Research Fellow, Summer Semester, 2011
27. 2011, Preceptor, Samiat Agunbiade, LabCoats Mentoring Program, University of Colorado Denver, Summer 2011-summer 2012
28. 2012, Preceptor, Kara Middleton, Cancer Center Student Research Fellow, Summer Semester, 2012  
2012, Preceptor, Sheri Rosen, University of Colorado, 2<sup>nd</sup> yr Medical School student, Cancer Center Student Research Fellow, Summer Semester, 2012
29. 2013, Sarah Haeger, MSTP, First Rotation, 2013
30. 2013 Preceptor, Sarah Black, Cancer Center Student Research Fellows, Summer Semester, 2013

31. 2013, Preceptor, Troy Schedin, Cancer Center Student Research Fellows, Summer Semester, 2013
32. 2013, Preceptor, Adriana Jones, Cancer Center Student Research Fellows, Summer Semester, 2013

### **Course Teaching**

1. Lecturer, *Role of Tissue Remodeling in Pregnancy-Associated Breast Cancer*, UCHSC Medical Oncology Fellow Conference, Fall 2004.
2. Lecturer, *Compositional Changes in Mammary ECM by reproductive state and preventive agents; implications for mammary carcinogenesis*. Graduate Program in Cell and Developmental Biology 2004 Retreat, Breckenridge, CO, Sept 11, 2004.
3. Lecturer, *Compositional changes in mammary ECM induced by endocrine state and preventive agents; implications for cancer progression*, Cell and Developmental Biology Program Seminar Series, UCHSC, January 5, 2005. Lecturer, *Pregnancy-associated breast cancer*, MST Program, Feb 15, 2006.
4. Lecturer, Cancer Biology Program, CANB 7600, Overview of Metastasis, Part 1, 2006.
5. Lecturer, Cancer Biology Program, CANB 7600, Overview of Metastasis, Part 2, 2006.
6. Lecturer, *The dynamic interplay between mammary stroma and epithelium; implications for carcinogenesis*, Program in Cell & Developmental Biology Retreat, Glenwood Springs, CO, Sept 9-10, 2005.
7. Lecturer, *Multistep Tumorigenesis and the Microenvironment*, Medical Oncology Fellows Conference, Sept 16, 2005.
8. Lecturer, *Pregnancy Associated Breast Cancer and Metastasis-Review of Aims*, Basic Reproductive Sciences, Department of Obstetrics and Gynecology, UCHSC, Sept 30, 2005.
9. Lecturer, *The dynamic interplay between mammary stroma and epithelium, implications for carcinogenesis*, Cell & Developmental Biology Retreat, Estes Park, Oct 13-14, 2006.
10. Lecturer, *The role of the microenvironment in pregnancy-associated breast cancer*, Hormone Related Malignancies & Division of Endocrinology, Metabolism & Diabetes, UCHSC, October 17, 2006.
11. Lecturer, *The role of the microenvironment in pregnancy-associated breast cancer*, Grand Rounds, Department of Pathology, UCHSC, December 15, 2006.
12. Lecturer, *Model development for the study of obesity and breast cancer*. Functional Development of the Mammary Gland Retreat, UCHSC Jan 18, 2007.
13. Lecturer, *Breast cancer chemoprevention; studies on pubertal intake of vitamin A and progesterone signaling*. Functional Development of the Mammary Gland Retreat, UCHSC Jan 18, 2007.
14. Lecturer, *Overview of estrous cycle in the rat*. Functional Development of the Mammary Gland Retreat, UCHSC Jan 19, 2007.
15. Lecturer, Cancer Biology Program, CANB 7600, *Overview of Metastasis*, Feb 2, 2007.
16. Lecturer, Cancer Biology Program, CANB 7600, *Multistep tumorigenesis and the tumor microenvironment*, Feb 4, 2007.

17. Lecturer, *Targeting adolescent diet for breast cancer prevention: a role for vitamin A supplementation?* The Center for Human Nutrition Seminar Series, UCHSC, April, 13, 2007.
18. Lecturer, *Does the Menstrual cycle matter? Conducting Clinical Research Studies in Women.* A seminar sponsored by the Investigator Network to Promote Interdisciplinary Research in Women's health and Gender-based Disease, Division of Reproductive Sciences, UCHSC, April 14, 2007.
19. *Plasticity of the mammary gland ECM and breast cancer progression.* School of Pharmacy Seminar, UCHSC, April 19, 2007.
20. *Physiologic inflammation as a target for breast cancer prevention.* Developmental Therapeutics Program Retreat, Division of Medical Oncology, UCHSC, April 20, 2007.
21. Lecturer, Cancer Biology Program, CANB 7600, *Cancer Prevention*, May 5, 2007.
22. Lecturer, *Characterization of putative macrophages during mammary gland involution.* Division of Basic Reproductive Science, Department of Obstetrics & Gynecology, Inaugural Graduate Program Retreat, Denver Botanic Gardens, Denver, CO, September 7, 2007.
23. Cancer Biology Program, CANB 7600, Multistep tumorigenesis and the tumor microenvironment, Feb 13, 2008.
24. Cancer Biology Program, Stromal-Epithelial Models in Ovarian Cancer, Feb 20, 2008.
25. Reproductive Sciences Mammary Gland Lactation Course, Role of ECM in normal and breast disease, April 30, 2008.
26. Cancer Biology Program, CANB 7600, Cancer Prevention, May 5, 2008.
27. **Class Co-Director**, Special topics in CSD, CSDV 7670 Cancer Cell Signaling in the Microenvironment, Fall Semester, 2008.
28. Cancer Biology Program, CANB 7600, Cancer Metastasis and Invasion, Feb 4, 2009.
29. Cancer Biology Program, CANB 7600, The Tumor Microenvironment, April 24, 2009.
30. Cancer Biology Program, CANB 7600, Cancer Prevention-Potential or Pipe Dream?, April 29, 2009.
31. Cancer Biology Program, CANB 7600, Extracellular matrix in normal and breast disease, Feb 22, 2010.
32. Cancer Biology Program, CANB 7600, Update on Cancer Prevention, Fantasy or Reality? May 10, 2010.
33. Special Topics in Tumor Immunology IMMU 7602, Holes in the epithelial centric view of cancer, National Jewish, Spring 2011.
34. Cancer Biology Program, CANB 7600, Tumor Microenvironment, and Overview, February 11, 2011.
35. Lecturer, *Mammary stroma as a target of NSAIDs; implications for pregnancy-associated breast cancer* The Program in Reproductive Science Seminar Series, UCD, March 22, 2011.
36. Lecturer; *COX-2 Dependent Collagen Fibrillogenesis Drives Metastasis in the Postpartum Involuting Mammary Gland*, University of Colorado Cancer Center Hormone Related Malignancies Retreat, March 25, 2011.
37. Cancer Biology Program, CANB 7600, Update on Cancer Prevention, Fantasy or Reality? May 11, 2011.

38. **Course Director**, Spring Semester, 2012: Special Topics in Cancer Biology CANB 7660 entitled 'Tissue-Based Theory of Carcinogenesis & the Microenvironment'. UCD-AMC.
39. Lecturer: Special Topics in Immunology 7602, National Jewish Hospital, March 6, 2012
40. Pre-invasive and Immune Competent Models of Breast Cancer Progression, New Models in Hormone Related Malignancies, HRM Program Retreat, University of Colorado Comprehensive Cancer Center, August 10, 2012
41. Cancer Biology Program, CANB 7600, Tumor Microenvironment Overview, April, 2013.

### **Community Service Speaking Engagements**

- 1990 Invited Speaker, High Priority Breast Cancer Research/Information, Network Annual Meeting, Orange County, CA.
- 1992 Invited Speaker, Susan G. Komen Breast Cancer Foundation. For Women's Lives-Dialogues on Breast Cancer, PBS Documentary.
- 1993 Breast Cancer Presentation, Research Strategies to Prevent Breast Cancer. Executive Office of the President, Washington, DC.
- 1995 What is Cancer Prevention? Music Industries Executives Meeting, Warner Music Group, New York, New York.
- 1995 Diets and Vitamins; Facts, Myths and the Media, Day of Caring, Denver, CO.
- 1996 Breast Cancer Prevention Research; Targeting the Cancer Cell's Environment. National Volunteers Convention, Palm Springs, FL.
- 1996 Breast Cancer Prevention Research; Targeting the Cancer Cell's Environment. National Volunteers Convention, Baltimore MD.
- 1996 Breast Cancer Prevention Research; Targeting the Cancer Cell's Environment. National Volunteers Convention, New York, NY.
- 1996 Breast Cancer Prevention; Hope for the Future, Denver Rotary Club, Denver, CO.
- 1996 Breast Cancer Prevention; A Developmental Biologists Perspective, Day of Caring, Denver, CO.
- 1997 Research Strategies to Prevent Breast Cancer, American Cancer Society and La Plata County Breast Health Task Force, Durango, CO.
- 1997 Research Strategies to Prevent Breast Cancer, Elks Club, Boulder, CO.
- 1995 Research Today for Our Daughters and Granddaughters, Day of Caring, Denver, CO.
- 1998 Cancer Prevention and Treatment Research, Optimist Club, Cherry Creek Club, Denver, CO.
- 1999 Breast Cancer Research: Focus on Prevention, Day of Caring, Denver, CO.
- 2000 Breast Cancer Prevention; Hope for the Future, Day of Caring, Denver, CO.
- 2000 Breast Cancer Prevention; Hope for the Future, Day of Caring, Hays, Kansas.
- 2002 Fundamentals of Breast Cancer Research, Jefferson County Open School, Lakewood, CO.
- 2004 Role of Adolescent Diet in Determining Breast Cancer Risk, University of Colorado Cancer Center Community Advisory Board Meeting, Nov 17, 2004

- 2006 The future of Breast Cancer Prevention, Colorado Cancer Cure Annual Meeting, Denver, CO, August, 2006
- 2007 Novel Breast Cancer Research at UCHSC, Colorado Cancer Cure Annual Meeting, Denver, CO, January, 2007.
- 2007 New Research in Cancer Prevention, Colorado Cancer Cure Presentation, Denver, CO, Sept, 2007.
- 2008 Keynote speaker, Cancer League of Colorado Annual Business Meeting, March 20, 2008.
- 2008 Keynote speaker, AMC Hartford county Chapter's end-of-year fiscal year event, Champaign Brunch and Celebration, Baltimore, MD, June 29, 2008.
- 2009 Visiting Scientist and AP Biology Lecturer, Oak Lawn Community High School, Oak Lawn, IL, Oct, 2009
- 2011 Lecturer, Learn About Cancer Day, University of Colorado Cancer Center, February 18, 2011
- 2011 Lab Host, "Learn About Cancer Day (LACD)". An event that brings to our campus 150 high school students from advanced sciences classes in selected schools in the Denver metro area, including Aurora, Denver, Cherry Creek and Douglas County School districts, October 6, 2011
- 2011 Susan G. Komen Breast Cancer Foundation, presentation entitled, I have heard about targeted therapies for breast cancer-but what is a life-cycle targeted therapy? Cancer Center Meet and Greet, October 19, 2011.
- 2011 Denver Book Club Lab tour in recognition of Book entitled "The Immortal Life of Henrietta Lacks", October 13, 2011.
- 2012 Keynote Speaker, National Breast Cancer Coalition, Project Lead Education Session, SABCC, San Antonio, TX
- 2012 Invited speaker, Career Development Forum, Making the Transition from Fellowship to Faculty, SABCS, December 6, 2011. Objective: promote dialogue and respond directly to questions from young investigators on the topic of transitioning to independence.
- 2012 Biomedical research, being wrong and the discovery of a new type of breast cancer, University of Colorado Anschutz Medical Campus, CCM Staff Education Series, June 27, 2012
- 2012 AALAS training event; Keynote Speaker, Mile High Branch AALAS Fall Meeting, "Biomedical research, being wrong and the discovery of a new type of breast cancer: the role of animal husbandry", Colorado State University, Fort Collins, CO, October 4, 2012.
- 2012 Speaker, Cocktails, Cancer and a Cure Event sponsored by CancerCure, Greenwood Village, CO, Sept 12, 2012. Fundraiser for Cancer Prevention Chair.
- 2013 Learn About Cancer Day at the University of Colorado Anschutz Medical Campus in Aurora on Thursday, February 28, 2013.
- 2013 Laboratory Tour, Eternal Life Campaign Steering Committee Members, Sept 27, 2013

## **Ongoing Support**

### **Active**

ACTIVE

W81XWH-11-1-0776 (Schedin)

08/01/2011 – 07/31/2014

DOD

\$167,867/yr

Title: A Multidisciplinary Approach to Pregnancy-Associated Breast Cancer

Goal of Project: Test the hypothesis that macrophage infiltration and collagen reorganization during postpartum mammary gland involution are interdependent and causal to tumor cell metastasis.

P01 CA151135-01A1 (Ambrosone)

08/01/2011-07/31/2016

Schedin Role: Consultant on Project 2 (5% effort), PI: Julie Palmer, Boston University

NIH

\$5,200,000

Title: P01 Epidemiology of Breast Cancer Subtypes in African American Women: A Consortium

Goal of Project: The goal of the PO1 is to investigate 4 distinct hypotheses that may account for the poor prognosis in Women of African ancestry (AA) who are diagnosed with breast cancer before age 45. Specific objectives: to assess the relation of reproductive factors, specifically parity and lactation, to genetic factors to explore how these factors interact to influence risk of breast cancer subtypes in African American (AA) women.

R01 CA164166-01A1 (Schedin, MacLean)

02/01/2013- 01/31/2018

NIH

\$207,500/yr

Title: A Narrowed Window for Targeting Metabolic Flexibility in Breast Cancer Prevention

Goals of Project: The hypothesis tested is that obesity associated impaired metabolic regulation establishes a susceptibility to the tumor promoting effects of the menopause-induced weight gain. In the first aim, in rodent models, we will test the dual-requirement hypothesis by manipulating metabolic control and energy balance during the critical window of OVX-induced weight gain. Two relevant interventions known to improve metabolic control (metformin, regular exercise) will be employed transiently during the narrow window of OVX induced weight gain, to assess their impact on long term tumor outcomes. In the second aim, we employ a 24-hr multi-tracer study of energy balance and fuel utilization to examine if obesity impairs the metabolic response to OVX-induced overfeeding and imparts an "aggressive" glycolytic/lipogenic phenotype in tumors. In the third aim, we investigate the cause and consequences of the obesity-associated elevation in PR expression.

R01 CA169175-01 (Schedin, Borges)

04/01/2013-3/31/2018

NIH

\$387,364/yr

Title: NSAID during postpartum involution for breast cancer prevention

Goals of Project: Perform a prospective phase 0 clinical trial to investigate postpartum involution as a window of tissue remodeling in human breast. Evaluate efficacy and safety of NSAID based intervention in rodent models of pregnancy associated breast cancer and investigate anti-inflammatory activity of fish oil in the context of postpartum involution in rodent models.

W81XWH-13-1-0078 (Borges)

7/1/2013-6/30/2016

Schedin Role: -collaborator)

DOD

\$125,000/yr

Title: Can Exosomes Induced by Breast Involution Be Markers for the Poor Prognosis and Prevention of Postpartum Breast Cancer?

Goal of Project: This research is designed to lead to the development of a 'postnatal pill', with administration limited to postpartum involution, and suitable for the vast majority of recently pregnant women, as well as identify new targets for treatment of postpartum breast cancer.

BCRP, IDEA Expansion Award BC123567 (Schedin, Hansen) 10/1/2013-9/30/2015  
DOD \$272,084/yr

Grant Title: Define tumor-suppressive signatures and how they change upon loss of tumor dormancy

Goals of Project: Use quantitative mass spectrometry approaches to identify ECM proteomes of MCF10DCIS xenograft breast tumor tissue arising in four different host models that range from tumor suppressive to promotional. Determine the influence of NSAID treatment on the tumor ECM proteome using rodent models and clinical samples from women newly diagnosed with early stage breast cancers and treated with NSAID therapy or no therapy, prior to definitive surgery.

**Partial Listing, Completed Support**

Department Of Defense, Synergy Extension Grant-BC104100/BC104100P1, 9/2011-9/2013

Role on Project: Schedin Role, PI: Borges Role, PI

Title: A Multidisciplinary Approach to Pregnancy-Associated Breast Cancer

Goal of Project: Test the hypothesis that macrophage infiltration and collagen reorganization during postpartum mammary gland involution are interdependent and causal to tumor cell metastasis.

Avon Foundation Center of Excellence Grant (PI: Kate Horwitz) 7/2012-6/2013

Schedin Role: PI of Project #2

Title: Does risk and reproductive history alter post-partum involution and change the window of opportunity for prevention?

Goal of Project: Determine if time course and mechanisms of postpartum mammary gland involution identified in a Colorado Caucasian population with average breast cancer risk occurs in populations of women with high risk and enriched in AA women with distinct reproductive histories.

Defense -BC101904 4/2011-4/2013

Schedin Role: PI

Title: The immune modulatory program of postpartum involution promotes pregnancy associated breast cancer

Goals of Project: Determine the role of regulatory T cells during postpartum involution in rodents and humans, association of Tregs with PABC and impact of their suppression during involution on disease progression.

Avon Foundation Center of Excellence Grant (PI: Kate Horwitz) 7/2011-6/2012

Role of Grant: PI of Project #2

Title: Tumor promotional macrophages identify and underscore the metastatic potential of pregnancy-associated breast cancer

Goal of Project: Investigate the role of macrophages in PABC

Aim 1: Characterize macrophages that infiltrate human PABC for markers of polarization.

Aim 2: Determine if macrophage phenotype quantity and or phenotype are independent or dependent on underlying subtype of breast cancer.

Department of Defense BC095850 9/2010-9/2012

Schedin Role: PI



Title: Defining the dormant tumor environment for breast cancer prevention and treatment studying stroma of quiescent glands induced by parity and tamoxifen.  
Goal of Project: Use models of primary tumor quiescence to gain insight into role of ECM in tumor cell dormancy.

NIH-R21CA132741

9/2010-8/2012

Schedin Role: Co-Investigator - (PI Kirk Hansen)

Title: Methods for the Analysis of Tumor Extracellular matrix

Goals of Project: Develop methods for solubilization of extracellular matrix proteins with the objective of improving sequence coverage and protein identification.

Komen Foundation for the Cure KG090629

7/2009-6/2012

Schedin Role: PI

Title: Targeting the pro-inflammatory milieu of the involuting gland to suppress pregnancy-associated breast cancer metastasis

Goals of Project: To determine whether fish oil and ibuprofen treatment targeted to involution prevent breast cancer promotion and metastasis in pre-clinical models of PABC, thus identifying mammary gland involution as a rational target for breast cancer prevention.

AACR- BCRF 09-06-26BORG Virginia Borges, PI

01/2009-12/31/2011

Schedin Role: Co-PI

Title: Targeting the Inflammatory Milieu of Pregnancy-Associated Breast Cancer

Goal: Demonstrate a 10 point change in mean Ki-67% index between baseline tumor sample and sample taken at the time of definitive surgery in patients receiving either fish oil supplementation or celecoxib for 2-3 weeks pre-operatively as compared to controls. Secondary Objectives: To preliminarily assess the safety of administration of fish oil supplementation and celecoxib in the pre-operative period.

KG081323

09/2008-08/2011

Role: Collaborator (Steve Anderson PI) –

Title: Modulation of Obesity-Induced Breast Cancer Risk by Metformin

Goals of Project: In pre-clinical rodent models, investigate the relationships between pre-menopausal weight gain, post-menopausal breast cancer risk and effects of intervention targeted to glucose utilization.

Specific Aims: AIM 1. Determine whether oral administration of Metformin will reduce NMU-induced mammary tumorigenesis in OP rats, to levels characteristic of OR control rats. AIM 2: Determine whether Metformin reverses the OP humoral phenotype and define the molecular targets associated with Metformin treatment.

Department of Defense Synergistic Idea Award

07/2007-07/2009

Schedin Role: PI, Borges Role: Co-PI

Title: The Inflammatory Milieu Permits Metastasis in Pregnancy Associated Breast Cancer

Goal: Determine whether pregnancy-associated breast cancer (PABC) is characterized by desmoplastic stroma and develop new animal models for the study of PABC.