

**Doris M. Benbrook, Ph.D.**  
CURRICULUM VITAE

University of Oklahoma Health Sciences Center  
Department of Obstetrics and Gynecology  
Section of Gynecologic Oncology  
975 N.E. 10<sup>th</sup> St., Rm BRC2 1217A  
Oklahoma City, OK 73104

**Phone:** (405) 271-5523  
**E-mail:** Doris-Benbrook@ouhsc.edu  
**Webpage:** ouhsc.edu/Benbrooklab  
**Profile:** [Stephenson Cancer Center Link](#)

**EDUCATION**

1977 to 1981	North Central College, Naperville, IL Bachelor of Arts, majors in Biology and Chemistry, minor in German.
1981 to 1985	Loyola University Medical Center 2001 South First Ave., Maywood, IL 60101 Ph.D. in Biochemistry, Mentor: Robert V. Miller, Ph.D.

**POSTDOCTORAL EXPERIENCE**

1985 to 1988	In the laboratory of Magnus Pfahl, Ph.D. La Jolla Cancer Research Foundation, 10901 North Torrey Pines Road, La Jolla, CA 92037
1988 to 1991	In the laboratory of Nicholas C. Jones, Ph.D. Imperial Cancer Research Fund, P.O. Box 123, 44 Lincolns Inn Fields, London WC2A. 3PX

**UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER APPOINTMENTS**

Department of Obstetrics and Gynecology, Gynecologic Oncology Section

1997 to 2004	Associate Professor
1991 to 1997	Assistant Professor
2004 to present	Tenured Professor and Director of Research
2009 to present	Endowed Chair in Gynecologic Oncology
1993 to present	Director of Research, Gynecologic Oncology

Department of Biochemistry and Molecular Biology

2005 to 2013	Adjunct Professor
1997 to 2005	Adjunct Associate Professor
1993 to 1997	Adjunct Assistant Professor

Department of Pharmaceutical Sciences

2013-present	Adjunct Professor
--------------	-------------------

Department of Genetic Counseling	2011- present	Adjunct Professor
----------------------------------	---------------	-------------------

Graduate Faculty	1993 to present	Associate Member
------------------	-----------------	------------------

**STEPHENSON CANCER CENTER (PREVIOUSLY OU CANCER INSTITUTE-OU CI) APPOINTMENTS**

2016 to present	Co-Director, Gynecologic Cancer Program
2014 to present	Co-Director, Center for Cancer Prevention and Drug Development (CCPDD)
2011 to 2014	Co-Leader, Women's Cancer Program
2006 to 2009	Co-Chair, Scientific Advisory Committee
2007 to 2009	Director, Women's Cancer Program
2001 to 2006	Co-Director, Gynecologic Cancer Program

2002 to present      Scientific Review Board Member  
2006 to 2014      OUCI Biospecimen Core Operations Committee

### **AWARDS AND HONORS**

2016      Woman of the Year “50 Making a Difference Program” Nominee, *The Journal Record*  
2011      North Central College Sesquicentennial Medal. Presented at the Rall Symposium “In recognition of your distinguished scientific career and gratitude for your service to our alma mater”.  
2009      First Place for best business plan in Oklahoma Governors Cup Competition. Submitted by a team of OU undergraduate interns, called Renephron, to commercialize Dr. Benbrook's Flex-Het drugs for polycystic kidney disease (PKD).  
2009      Second Place for best business plan in the W. Reynolds Tri-State Collegiate Business Plan competition in May '09 in Las Vegas. Submitted by Renephron to commercialize Dr. Benbrook's Flex-Het drugs for polycystic kidney disease (PKD).  
2005      Innovator of the Year on the Brink Award, *The Journal Record*  
2004      Oklahoma Scientist of the Year awarded by the Oklahoma Academy of Science  
2004      Woman of the Year “50 Making a Difference Program” Nominee, *The Journal Record*

**Editor-in-Chief:** *Biologics: Targets & Therapy*, Dove Medical Press, 2008-present

### **EDITORIAL AND ADVISORY BOARDS**

*Cancer Research*, 2010 – 2012  
*Haynes and Boone LLP* 2012 – present, *Expert witness on patent infringement case.*  
*Journal of Cell Death*, 2008- present  
*Open Access Journal of Clinical Trials*, 2008-present  
*Biochemical Journal and Biochemical Society Transactions*, 2007-present  
*Open Medicinal Chemistry Journal*, 2007-present  
*Bioinformatics and Biology Insights*, 2007-present  
*Open Reproductive Science Journal*, 2007-present  
*Current Medicinal Chemistry*, 2006-present  
*Cancer Epidemiology, Biomarkers & Prevention*, 2002-2009  
Native Americans in Biological Sciences Advisory Board (NABS), Oklahoma State University, 2005-07.

Ad Hoc reviewer for *American Journal of Obstetrics and Gynecology*, *American Journal of Pathology*, *Analytica Chimica Acta*, *Analytical Methods*, *Anticancer Agents in Medicinal Chemistry*, *BBA-Gene Regulatory Mechanisms*, *BBA - Molecular Cell Research*, *Biochemical Journal*, *Biochimie*, *Bioinformatics and Biology*, *Biomed Central Cancer*, *Bioorganic and Medicinal Chemistry*, *Bioscience Reports*, *Blood*, *British Journal of Cancer*, *Cancer*, *Cancer Biology*, *Targets and Therapy*, *Cancer Chemoprevention and Pharmacology*, *Cancer Cell*, *Cancer Epidemiology*, *Cancer Cytopathology*, *Biomarkers & Prevention*, *Cancer Investigation*, *Cancer Investigation*, *Cancer Letters*, *Cancer Prevention Research*, *Cancer Research*, *Cellular & Molecular Biology Letters*, *Chemistry Central Journal*, *Clinical Cancer Research*, *Clinical Ovarian Cancer*, *CRC Press*, *European Journal of Cancer*, *Experimental Cell Research*, *Current Cancer Therapy Reviews*, *Current Medicinal Chemistry*, *Fertility and Sterility*, *Gene*, *Gynecologic and Obstetrics Investigations*, *Gynecologic Oncology*, *International Journal of Biochemistry and Cell Biology*, *International Journal of Cancer*, *International Journal of Molecular Science*, *Journal of Biochemistry*, *Journal of Biological Chemistry*, *Journal of Cell Death*, *Journal of Geriatric Oncology*, *Journal of the National Cancer Institute*, *Journal of Neurochemistry*, *Journal of Nutritional Biochemistry*, *Journal of Reproductive Medicine*, *Journal of Surgical Oncology*, *Molecular and Cellular Endocrinology*, *Oncotarget*, *Open Medicinal Chemistry Journal*, *Metallomics*, *Minireviews in Medicinal Chemistry*, *Molecular Biosystems*, *Molecular Cancer Therapeutics*, *Molecular and Cellular Endocrinology*, *Molecules*, *Nature*, *Nutrition and Cancer*, *Oncogene*, *Oncotarget Pharmaceutical Research*, *Oxidative Medicine and Cellular Longevity*, *PLOSOne*, and *Expert Opinion on Therapeutic Patents*.

## **CONSULTANCIES**

Expert Scientific Witness to Patent Litigation Case, Haynes and Boone, LLP, 2012-2013 Consultant to Procter & Gamble, 1999-2002

## **NATIONAL COMMITTEES AND SOCIETIES**

Chair, NIH/NCI Clinical and Translational Omnibus Special Emphasis Panel, 2017

Reviewer, NCI Outstanding Investigator Awards, 2017

Chair, NCI R21/R03 Review Committee ZCA1 SRB-8 (M1), 2016

Chair, NCI Program Project Review Committee ZCA1 RPRB-C M1, 2016

Bankhead-Coley Cancer Research Program Proposal Review, December, 2015

State of Florida Department of Health and Oak Ridge Associated Universities (ORAU) October, 2015

Reviewer for NCI R21/R01 Omnibus ZRG1-OTC-N (80) Study Section, September, 2015

Reviewer for NCI Review Panel of Cancer Detection, Diagnosis and Treatment Technologies for Global Health" (UH2/UH3), July 2015

Co-Chair, NCI SPORE Review Panel ZCA1 RPRB-C (O1) 06/08-09/2015

Reviewer for Hong Kong, Health and Medical Research Fund (HMRF), May 2015

Chair, NCI SPORE Review Panel ZCA1 RPRB-C M1 P, 02/03-04, 2015

Member, Review Panel for NCI Innovative Molecular Analysis Technologies (IMAT) program, 03/17/2015

Chair for NCI SPORE Programs, 2014

NCI Reviewer for Cancer Detection, Diagnosis, and Treatment Technologies for Global Health, 2014

CDMRP Clinical and Experimental Therapeutics – 1 Review Panel, October 2015

Member, AREA R15 Review Panel ZRG1 OTC-N (80), Sept. 2015

Member CDC Special Emphasis Panel on Global Health Research, April 1, 2015

Chair AREA R15 Grant Review Panel, 2015/01 Council ZRG1 OTC-N 80, January, 29, 2015

CDMRP/DOD Reviewer Ovarian Cancer Academy-Dean/Assistant Dean (OCA-D) Awards, 2014

NCI Reviewer for Innovative Molecular Analysis Technologies Program (IMAT) 2014

Chair, AREA R15: Oncological Sciences Application Review Panel. 2014/05 ZRG1 OTC-X (80) A

Chair, Drug Discovery and Molecular Pharmacology (DMP) Special Emphasis Panel, 2014

Chair, Cancer Therapeutics Area Grant Applications Review Panel, NIH, CSR, 2013

Member, Drug Discovery and Molecular Pharmacology (DMP) Study Section, 2009 – 2013

Chair, Cancer Diagnostics and Therapeutics SBIR/STTR AED Review, 2009

NCI Oncology Fellowship and AREA grants, NIH CSR, VED, 2005 – present, Chair (06/08, 09/08)

External Advisory Board Reviewer, New Mexico Cancer Center, 2009

Reviewer, Drug Discovery and Molecular Pharmacology (DMP) Study Section, 2008 - 2009

Member of NCI ZRG1 Cancer Biomarkers Study Section (CBSS), 2004 – 2008

Chair, Review Committee of NIH SBIR Topics 238, 239 and 270, 2009

Chair, Review Committee of NIH SBIR Topics 242 and 243, 2008

Participant, NCI Clinical Development of Small Molecules Workshop, Bethesda, MD, 2008

Chair, Review Committee of NIH SBIR Topics 238 and 239, 2007

Oak Ridge Associated Universities (ORAU) Center of Excellence Award Reviews, 2007 - present

Center for Disease Control (CDC), Improving Public Health Practice through Translation Research, (R18), 2007

Reviewer for U.S. Civilian Research & Development Foundation (CRDF) Cooperative Grants Program (CGP) competition, 2007

Reviewer for Phillip Morris External Research Program, 2003-2007

Drug Discovery and Molecular Pharmacology (DMP) Study Section, 2006

Session Chair: Retinoids and Cancer, FASEB Retinoid Meeting, 2006

Mock Study Section in Grant Writing Workshop for Clinicians, American Association for Cancer Research (AACR) Professional Advancement Series Section, 2006, 2009

Reviewer for NCI SBIR grants (ZCA1 SRRB-U (C1)), 2006

Co-Chair of Translational Research Session of the Ovarian Cancer State of the Art Meeting, sponsored by CTEP and GOG, 2005.

Chair of the National Cancer Institute (NCI) Chemoprevention Committee, Subcommittee E, Cancer Epidemiology, Prevention and Control, 2003-2005. Ad hoc review 2006.

Member of NCI Chemoprevention Committee, Subcommittee E, Cancer Epidemiology, Prevention and Control, 2000-2005.

Gynecological Oncology Group (GOG), Member of the Experimental Medicine Committee (CEM) (since 1992) and Member of Chemoprevention Committee (since 2000).

Chair, Developmental Therapeutics Subcommittee of the GOG CEM Committee, 2006 - present

Substitute Chair and Reviewer for SPORE in Ovarian-GYN Cancer, 2005

Substitute Chair and Reviewer for Early Detection Research Network, Clinical Epidemiology and Validation Centers, 2004

Reviewer, Eppley NCI-Designated Cancer Center Site Visit, January, 2004 Reviewer of Department of Defense Ovarian Cancer Grants, 2002 - 2004.

Department of Veterans Affairs' Medical Research Branch ad hoc grant reviewer since 1992 and nominated for their National Advisory Committee, 2002.

NCI Reviewer for "Clinical Nutrition Research Units", December 2001

Co-Chair of Chemoprevention Workshop for the Gynecologic Cancer Translational Research Retreat II, Chantilly, Virginia May 5-7, 2000.

NCI Scientific Review Group Subcommittee E, Cancer Epidemiology, Prevention and Control Temporary Member, April 2000.

NCI Reviewer for "Molecular Target Drug Discovery", 2000.

NCI Reviewer for "The Early Detection Research Network- Clinical and Epidemiologic Centers.

NCI Reviewer for "Chemoprevention in Genetically-Identified High-Risk Groups: Interactive Research and Development Projects".

NCI Chemoprevention Committee Site Visit Reviewer, June 1999 and January, 2000.

American Association for Cancer Research, Chairman of State Legislative Committee. American Society of Clinical Oncologists (ASCO), Cancer Genetics Trainer

## **NATIONAL WORKSHOPS**

NCI Phase 0 Trials in Oncologic Drug Development, September 5, 2007

NCI Clinical Development of Small Molecules Workshop January 15, 2008

## **INTERNATIONAL GRANT REVIEWS AND SYMPOSIUMS**

Referee for the Italian Research Council, 2002 - present

Reviewer, World Cancer Research Fund International, 2010-11

Chair, Session on Functional genomics, proteomics and signalomics in cancer at the International Cancer Research Symposium 2010: Defining & Translating Science Behind Disease. Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, Kerala, India, December 21, 2010

Reviewer for University Grants Committee, University of Hong Kong, 2006

Referee Biotechnology and Biological Sciences Research Council (BBSRC), 2006 Reviewer of grants for Cancer Research UK (United Kingdom), 2002

## **UNIVERSITY OF OKLAHOMA CLINICAL AND TRANSLATIONAL SCIENCE AWARD (CTSA)**

2008-present Member, Executive Committee, CTS Masters Program.

2009 Co-Director, "Med into Grad" PhD Specialization Program

2006 to 2008 Member, CTSA Grant Planning Committee

2007 to 2008 Chancellor, Clinical and Translational Science Society (CTSS)

2007 to 2008 Member, Clinical and Translational Science MS Program Executive Committee

## **UNIVERSITY OF OKLAHOMA COMMITTEES**

Faculty Advisory Committee for the Core Laboratories, 2006

Chair, Research and Graduate Student Affairs Committee, 2006-2009 Member, CTSA Executive Committee 2006-present.

Search Committee of Deputy Directory of the Basic and Translational Cancer Research Center, 2007

Recruitment Committee, College of Pharmacy, Pharmaceutical Sciences Department Chair, 2007

Vice Chair of the Institutional Biosafety Committee (IBC), 1995-2006  
Chair, Internal Review Committee of the Epidemiology Graduate Program, 2006  
Clinical & Translational Science Awards (CTSA) Degree and Curriculum Committee, 2006  
Co-Chair, Translational Working Group, Clinical & Translational Science Awards (CTSA), 2005  
Search Committee for Cancer Genetics Endowed Chair, 2005-2006  
Search Committee for Children's Medical Research Institute Endowed Chair, 2005-2006  
Faculty Affair Liaison, 2002  
Outstanding Thesis/Dissertation Committee, 2000-2001

## **DEPARTMENTAL COMMITTEES**

### **Obstetrics and Gynecology**

Director of Research, Gynecologic Oncology, 1995 – present  
Promotions Committee, 2003 – 2015, Chair (2007-2015)  
Environmental Health and Safety Training Coordinator, 1995- 2003  
Tuberculosis Coordinator, 1996- 2003 Research  
Administration Liaison, 1994 - 2003

### **Biochemistry Department**

Graduate Program Curriculum/Review Committee, 1995-97  
Adjunct Faculty Review and Evaluation Committee, 1997-2000  
Student Recruitment Committee, 2000-01  
General Examination Committee, 2001-02  
Student Advisory Committee, 2001-02  
Student Admissions and Advisory Committee, 2002-2003  
Dental/Pharmacy Course Curriculum Committee, 2003-2004  
Student Admissions and Recruitment Committee, 2004-2007  
Graduate Student Awards Committee, 2007-2013  
Faculty Search Committee, 2008-2010

## **PATENTS**

Co-inventors: K. Darrell Berlin, PhD, Doris M. Benbrook, PhD, Eldon C. Nelson, PhD  
Title: Heteroarotinoids containing urea or thiourea linker  
US Patent No. 6,586,460  
Issued: July 1, 2003

Co-Inventors: Doris M. Benbrook, PhD, Suresh Guruswamy, PhD, Martin Turmin, MD Title:  
Treatment and Inhibition of Disease Conditions Using Flexible Heteroarotinoids  
US Patent No. 7,612,107 Issued:  
November 3, 2009

## **PROVISIONAL PATENTS**

Inventor: Doris Benbrook  
Title: Treatment and Inhibition of Disease Conditions (Angiogenesis) Using Flexible Heteroarotinoids U.S.  
Patent Application Serial No.12/608,468

Inventor: Doris Benbrook  
Title: Protection of Healthy Cells and Treatment of Diseases by Binding Heat Shock Proteins. U.S.  
Patent Application Serial No. 61/603,694

**CURRENT FUNDING**

NIH/NCI P30CA225520      Mannel (PI)      07/01/2018 – 06/30/2023      0.6 Cal Months

**Stephenson Cancer Center – Cancer Center Support Grant**

The goals are to improve the standard of care, quality of life and clinical outcomes for women with gynecologic cancer in Oklahoma and throughout the world.

Role: Program Co-Leader for the Gynecologic Cancer Program

PHF Clinician Scientist Award Gunderson (PI)      07/01/2018 – 06/30/2019      0.3 Cal Months

**Mebendazole Therapy for Ovarian Cancer      \$75,000**

The goal is to provide preclinical data supporting the repurposing of a veterinary drug, Mebendazole, for treatment of ovarian cancer while studying the role of p53 in the mechanism.

Role: Co-I

NIH/NIMHD 1R25MD011564-01      Stoner, Houchen (MPI) 09/24/2017 – 05/31/2022      1.2 Cal Months

**Addressing Health Disparities among Oklahoma Minority and Rural Communities through Clinical Research Education and Career Development**

The overall goal is to enhance clinical research methods expertise and research careers among underrepresented researchers focused on health disparities and minority health.

Role: Course Coordinator

1R01CA200126 Benbrook, Coleman, Frumovitz, Garcia-Contreras, Woo (MPI's) 06/01/2016-05/31/2021

3.6 Cal Months      NIH/NCI      \$2, 149,232 (Overall Project)

**Targeting HPV Consequences in a Cervical Cancer Clinical Trial**

The purposes of this project are to conduct a Phase 0 clinical trial to determine if oral administration of SHetA2 capsules will achieve sufficient systemic concentrations to reduce cyclin D1 levels in the Stage IB2-IVB cervical cancer tissues; determine if a vaginal administration of SHetA2 suppositories achieves sufficient local SHetA2 levels to reduce cyclin D1 and cervical tumor formation in the K14-HPV16 mice; and determine which Rb pathway defects found in cervical cancer and dysplasia predict SHetA2 sensitivity.

1R01CA196200-01A1      Benbrook (PI)      07/01/2015 - 06/30/2020      4.8 Cal Months

NIH/NCI      \$2,473,312 (Overall Project)

**Ovarian Cancer Chemoprevention**

The goals of this project are to conduct a Phase 0 Clinical Trial of SHetA2 to determine the minimal dose needed to achieve  $\mu M$  blood and fallopian tube tissue drug levels, to test SHetA2 chemoprevention activity in a mouse model of fallopian tube tumorigenesis, and to study the mortalin interactome in the development of SHetA2 sensitivity during fallopian tube tumorigenesis and as pharmacodynamic endpoints for future clinical trials.

CAN # 5-8481381      Rao (PI)      09/24/2015 – 09/23/2017      0.3 Cal Months

NIH/NCI PREVENT      \$713,988 Total Program

**Preclinical PREVENT Cancer Program: Preclinical Efficacy and Intermediate Endpoint Biomarkers: Prevention of Endometrial Hyperplasia and its Transition to Endometrial Cancer with SHetA2 (NSC721689)**

The goals are to establish a genetically engineered mouse model of high grade serous ovarian cancer for use in chemoprevention studies, test the effects of NSC 721689 on development of premalignant lesions and invasive cancer and to develop pharmacodynamics assays to monitor the effects of NSC 721689.

Role (Co-PI, Project Leader)

American Cancer Society

**Overcoming Resistance to Anti-VEGF Therapy with Predictive Modeling**

The goal is to use in silico and animal models to optimize dosing and timing of anti-VEGF therapy to avoid development of resistance.

Role (Co-I)

R01 GM118599 Hays (PI) 07/01/2016 - 06/30/2020 0.6 Cal Months (no cost to grant)

NIH/GMI

**Deciphering ShcA-mediated ROS Production as a Novel Intervention Strategy in Diabetes Therapy**

The goal is to decipher the mechanism of how Shc proteins regulate reactive oxygenation species in cells and apply the results toward developing novel therapies for treatment of diabetes.

Role (Co-I)

CAN # 5-8481381 Rao (PI) 09/24/2015 - 09/23/2017 0.864 Cal Months

NIH/NCI PREVENT

\$628,343 Total Program

**Preclinical PREVENT Cancer Program: Preclinical Efficacy and Intermediate Endpoint Biomarkers: Ovarian Cancer Chemoprevention**

The goals are to establish a genetically engineered mouse model of high grade serous ovarian cancer for use in chemoprevention studies, test the effects of NSC 721689 on development of premalignant lesions and invasive cancer and to develop pharmacodynamics assays to evaluate the effects of NSC 721689 as a mortalin binder.

Role (Co-PI, Project Leader)

1R01GM113940-01 You (PI) 03/01/2015 - 01/31/2016 0.6 Cal Months

NIH/NIGMS

**NIR-activatable Prodrugs for Treating Peritoneally Metastasized Ovarian Cancers**

The goals are to explore delivery methods and optimize a targeting strategy for the treatment of peritoneal ovarian cancers with a prodrug strategy for a synergistic combination of photodynamic therapy.

Role: Co-I

**PAST FUNDING**

TSET Mannel (PI) 07/01/2013 – 06/30/2018 0.3 Cal Months

**Oklahoma Tobacco Settlement Endowment Trust** \$5,500,000 annual direct costs

The purpose of this project is to establish the TSET Cancer Research Program to advance translational, clinical and population-based cancer research and serve to enhance efforts to prevent and combat cancer.

Role: Co-I

Garcia-Contreras (PI) 07/01/2016 - 08/30/2017 0.3 Cal Months

Presbyterian Health Foundation \$100,000 Total Program

**Inhalable Microparticulate SHetA2 Nanocrystals for Lung Cancer Treatment**

The goals are to optimize the manufacture of SHetA2 nanocrystals and subsequently into inhalable microparticles, and to develop an inhalation nanocrystal powder formulation, and establish the superiority of the pulmonary route to achieve therapeutic SHetA2 concentrations in the lungs.

Role (Co-I)

1 F31 EY 025168-01A1 Summers (PI) 07/01/2015 - 06/30/2017 0.6 Cal Months (no cost to grant)  
NIH/EY

**Retinoic Acid Synthesis in Visually Guided Eye Growth**

The goals are to study the synthesis and role of retinoic acid in visually guided eye growth.

Role (Co-Mentor)

Presbyterian Health Foundation/OUHSC Seed Grant Garcia-Contreras (PI) 10/01/2014-09/30/2015  
**Inhaled SHetA2 dry powder aerosols as novel treatment for tuberculosis** \$45,000 direct costs

Role: Co-I

Reynolds Center of Geriatric Nursing Excellence Interdisciplinary Seed Grants Cuaderes (PI)  
09/01/2014-08/31/2015 \$30,000 direct costs

**Correlates of Quality of Life, Biomarkers, and Physical Activity in Older Women with Ovarian Cancer who Experience Chemotherapy-Induced Peripheral Neuropathy Pain (CIPN)**

Role: Co-I

Reynolds Center of Geriatric Nursing Excellence Interdisciplinary Seed Grants Craft (PI)  
09/01/2014-08/31/2015 \$30,000 direct costs

**Descriptive Study of Cognitive Disturbances in Older Breast Cancer Survivors**

Role: Co-I

Vice President for Research Seed Grant Carlson (PI) 2014-20105  
**Memory Consolidation and Cerebral Oxygenation in Elders with Mild Cognitive Impairment**  
Role: Co-I \$29,884.02 direct costs

Norman Faculty Investment Program, Norman Research Council Wenger (PI) 2014-2017  
**Memory Consolidation and Cerebral Oxygenation in Elders with Mild Cognitive Impairment**  
Role: Co-I \$15,000 direct costs

MD Anderson Moonshot Program Benbrook and Garcia-Contreras (Co-PIs) 05/15/15 - 12/30/15  
**Development of SHetA2 vaginal suppositories for treatment of cervical dysplasia**  
\$30,000 total costs

Presbyterian Health Foundation/OUHSC Bridge Grant Benbrook (PI)  
**Sensitization of Ovarian Cancer to DR5 Agonists**  
\$75,000 direct costs

Presbyterian Health Foundation/OUHSC Bridge Grant Benbrook (PI)  
**Optimizing targeting strategy for delivering NIR-activatable prodrugs to peritoneally metastasized ovarian cancers**  
\$75,000 direct costs

MDACC/SCC Collaborative Grant Benbrook and Ozpolant (Co-PIs) 2013-2014  
**Autophagy in Ovarian Cancer Therapeutics and Tumor Microenvironment**  
\$45,000 direct costs

Oklahoma INBRE (IDeA Network of Biomedical Research Excellence) NIH/NCRR (P20RR016478)  
Akins (PI) 2009-2014  
\$20,000 for percent effort over 4 years, (\$13,312,160 total direct cost)  
Role: Mentor of Wei-Qun Ding's Junior Faculty Award

Haynes and Boone, LLC Consultancy Fees Benbrook (Consultant) 2012-2015  
>\$100,000 was generated in the 2013 fiscal year from this consultancy to support Dr. Benbrook's salary and research.



Gynecologic Oncology Group (GOG) NIH/NCI Benbrook (PI) 07/01/2012 - 06/30/2013  
**Translational Research of GOG229I Phase II trial of Brivinab for Persistent or Recurrent Endometrial Cancer.** \$20,000 direct costs

University of Oklahoma Health Sciences Center Vice President of Research (VPR) Bridge Grant Program  
Benbrook (PI) 07/01/2012 – 06/30/2013  
**Heat Shock Proteins and Stress in Cancer Prevention.** \$60,000 direct costs

Stephenson Cancer Center Experimental Therapeutics Program Grant Hays and Benbrook (co-PIs)  
**Therapeutic Targeting of HSP70 Chaperones in Cancer Drug Discovery**  
2013 \$25,000 direct costs

Oklahoma IDeA Network of Biomedical Research Excellence Collaborative grant Rundle (PI)  
**Structure Activity Relationship Studies to Develop Improved Cancer Drugs**  
4/1/12 to 3/31/13 \$49,919 direct costs  
Role: Co-Investigator

Oklahoma INBRE (IDeA Network of Biomedical Research Excellence) NIH/NCRR (P20RR016478)  
**Probing the Interactions of SHetA2 and Hsp70 Mortalin: A new route for Flex-Het Anticancer Activity?** Kelly (PI) 4/1/12 to 3/31/13 \$50,000 direct costs  
Role: Co-investigator

National Cancer Institute, National Institutes of Health (R01) Benbrook (PI)  
**Mechanism of SHetA2 in Ovarian Cancer**  
06/01/2005 – 05/31/2010, \$987,500 total direct costs

Rapid Access to Preventive Intervention Development (RAPID)  
**Flexible Heteroarotinoids for Chemoprevention**  
Role: Principal Investigator  
2007 to 2011

University of Oklahoma Growth Fund  
**Flex-Het Treatment for Polycystic Kidney Disease**  
Role: Principal Investigator  
2009 - 2011: \$50,000

Presbyterian Health Foundation - Equipment Grant  
**Bringing OU Research to New Dimensions with Multiplex Technologies**  
Role: Principal Investigator  
09/01/2008 – 08/31/2009, \$50,000.00

Gynecologic Oncology Group (GOG)  
**A Phase II Evaluation of Enzastaurin in the Treatment of Persistent or Recurrent Epithelial Ovarian or Primary Peritoneal Carcinoma**  
Role: Principal Investigator  
2007 to completion, \$17,279

Gynecologic Cancer Foundation  
**The Role of Ribonucleotide Reductase Regulatory Subunit 1 (RRM1) and Excision Repair Cross Complementation Group 1 (ERCC1) in Determining Chemosensitivity for Advanced Ovarian Cancer**  
Principal Investigator: Kathleen Moore, MD  
Role: Co-Investigator  
2007-2008, \$50,000

American Cancer Society

**Search for the Potential Targets for the Prevention of Carcinogenesis**

Parent Grant: Marie Hanigan

Principal Investigator: Igor Dozmorov

Role: Collaborator

07/01/08 – 06/30/09, \$25,000

Oklahoma INBRE (IDeA Network of Biomedical Research Excellence)

**Investigations of SHetA2 mediated Mitochondrial changes**

Principal Investigator: William Kelly, Ph.D., Southwestern Oklahoma State University Role: Collaborator

05/01/07 – 04/30/08, \$50,000, \$15,383 subcontract to Dr. Benbrook

University of Central Oklahoma Basic Research Grant to Faculty

**Effects of heteroarotinoids on PKC activation and apoptosis in ovarian carcinoma organotypic cultures**

Principal Investigator: Dana Rundel, PhD, University of Central Oklahoma Role: Collaborator

06/01/2007 to 05/31/2008, \$10,000

National Cancer Institute, National Institutes of Health (R01)

**A Murine Model of Endometrial Tumorigenesis**

Principal Investigator: Paul Goodfellow at Washington University in Saint Louis Role: Co-Investigator

04/01/04 – 03/31/07, \$74,996 subcontract to Dr. Benbrook's lab

National Cancer Institute Program Planning Grant for NCI Cancer Research Centers

**Cancer Center Planning Grant (P20)**

Director: Robert S. Mannel, MD

Role: Co-Director of the Women's Cancer Program

7/01/02-6/30/08 \$925,084

National Cancer Institute, National Institutes of Health

**Gene Regulation of Glycan Antigen in Cancer Cells**

Principal Investigator: Richard Cummings, Ph.D.

Role: Collaborator

04/01/05 – 03/31/07, \$200,000

Gynecologic Oncology Group

**Lab Analysis for GOG0207 Phase II Trial of Celecoxib for CINIII**

Role: Principal Investigator

04/01/05 to 03/31/07, \$64,028

Rapid Access to Intervention Development (RAID)

**SHetA2 will Inhibit Cancer Recurrence Without Retinoid-Associated Toxicities**

Role: Principal Investigator

\$2,083,000 for preclinical testing of SHetA2., 2003-2006

Oklahoma INBRE (IDeA Network of Biomedical Research Excellence)

**Investigations of SHetA2 mediated mitochondrial changes**

Principal Investigator: William Kelly, Ph.D.

Role: Collaborator

06/01/06 – 12/31/06, \$50,000, \$15,383 subcontract to Dr. Benbrook

National Cancer Institute, National Institutes of Health (R03)

**Steroids and Stem Cells in Carcinogenesis**

Role: Principal Investigator

09/30/04 – 08/31/06, \$100,000

Mary Kay Ash Charitable Foundation

**Mechanism of ER Activation in Thyroid Hormone Administration in Breast Cancer Survivors**

Role: Principal Investigator

07/01/04 - 06/30/06, \$100,000

Oklahoma Center for the Advancement of Science and Technology (OCAST)

**Does HPV16 E5 affect EGF Receptor Endocytosis and Signaling?**

Principal Investigator: Brian Ceresa, Ph.D.

Role: Co-Investigator

07/01/03-06/30/05, \$100,000

Oklahoma INBRE (IDeA Network of Biomedical Research Excellence)

**Investigations of SHetA2 mediated Mitochondrial changes in Human Cancer Organotypic Cultures**

Principal Investigator: William Kelly, Ph.D., Southwestern Oklahoma State University

Role: Collaborator

06/01/05 – 12/31/05, \$50,000, \$15,383 subcontract to Dr. Benbrook

Gynecologic Oncology Group

**Analysis for GOG229-B, GOG230-B, GOG-231-B Stage I**

Role: Principal Investigator

07/01/02 to 06/30/04 \$25,290

Proxima Concepts LTD, London, England, UK

**Agreement Using Proxima Technology to Screen Libraries of Recombinant Probes**

Role: Principal Investigator

12/22/04 – 5/31/05, \$6,078

National Cancer Institute, National Institutes of Health (R01)

**Mechanism & Potential of Retinoid & DNA Damage Therapy**

Role: Principal Investigator

07/01/99 – 06/30/04 \$310,555 direct

Oklahoma Biomedical Research Infrastructure Network (BRIN) Collaborative Grant

**Is Retinoid Induced Cell Apoptosis Mediated by Superoxide Radical Anion Production**

Principal Investigator: William J. Kelly, Ph.D., Southwestern Oklahoma State University Role: Collaborating Investigator

02/01/04-06/30/04, \$50,000, \$15,383 subcontract to Dr. Benbrook

Novartis Pharmaceutical through PRA International

**Phase II Trial of Gleevec (Imatinib Mesylate Formerly Known as STI571) in Patients with CD1q17(+) Gynecologic Malignancies**

Principal Investigator: D. Scott McMeekin, M.D.

Role: Co-Investigator

November 1, 2002-October 31, 2004, \$65,882

Procter & Gamble

**Determination of Retinoid X Receptor Ligand Structure-Function Properties**

Role: Principal Investigator

02/01/02 – 06/15/02 \$48,000

Cancer Research Foundation of America (CRFA) Fellowship

**Human Papillomavirus and Epidermal Growth Factor Receptor as Biomarkers of Retinoid Cervix Cancer Chemoprevention**

Postdoctoral Fellow: Shennan Lu

Role: Principal Investigator

01/15/00 – 01/14/03 \$60,000

NeoPharm

**Develop and Perform ELISA's for Neo-MS-02 Clinical Trial**

Role: Principal Investigator

05/01/2000- 06/30/02, \$72,000

Procter & Gamble

**Determination of Retinoid Receptor Transactivation Properties**

Role: Principal Investigator

07/01/99 – 09/01/99, \$8890

Mary Kay Ash Charitable Foundation

**Development of Retinoids and Response Biomarkers for Ovarian Cancer**

Role: Principal Investigator

07/01/98 - 06/30/00 \$90,864 direct, \$9,136 indirect

American Institute for Cancer Research (AICR)

**Ligand Activation of Peroxisome Proliferator-Activated Receptors in Rodent Mammary Tumor Models**

Principal Investigator: Stephen Glore, Ph.D.

Role: Collaborator

01/01/98-12/01/00 \$100,000

National Cancer Institute, National Institutes of Health (R01)

**Biological Activity of Heteroarotinoids**

08/01/96 - 11/30/99 \$981,456 direct, \$170,000 indirect

Principal Investigator: Eldon C. Nelson, Ph.D., Oklahoma State University

Role: Co-investigator

08/01/96 – 12/01/99 \$269,761 direct, \$124,190 indirect

American Institute of Cancer Research, 94A63

**Carotenoid Effects on Transcription and Growth in Tumors**

Role: Principal Investigator

07/01/94 - 06/30/96 \$100,000 direct, \$10,000 indirect.

The Presbyterian Health Foundation,

**Radiation and Retinoid Effects on Cervical Cancer**

Role: Principal Investigator

01/01/94 - 01/01/95 \$25,000 direct

National Science Foundation, MCB-9209479,

**DNA Binding Specificities of cJun Dimers**

Role: Principal Investigator

08/01/92 - 01/31/94 \$16,200, \$1,800 indirect.

Milheim Foundation for Cancer Research, 92-14

**Retinoids, cJun and Cervical Cancer**

Role: Principal Investigator

07/01/92 - 06/30/93 \$14,000 direct

Presbyterian Health Foundation, Research Equipment Repair Fund,

Role: Principal Investigator

1992, \$5,000 for **Repair of an Ultracentrifuge**.

Oklahoma Medical Alumni Association,

**Retinoids, cJun and Cervical Cancer**

Role: Principal Investigator 09/01/92 - 08/31/93 \$20,000 awarded, \$11,000 accepted due to overlap with other funding.

**INVESTIGATIONAL NEW DRUG (IND) APPLICATIONS**

A Phase 0 Study of SHetA2 (NSC 72168) in Stage IB2-IVb Cervical Cancer (PIND #: 121262)

Prepared by Doris M. Benbrook, PhD

PI: S. Scott McMeekin, M.D. (Clinical Trial)

Co-I's: Doris M. Benbrook, Ph.D. (Pharmacodynamics), Lucila Garcia-Contreras, Ph.D. (Formulation), Sukyung Woo Ph.D. (Pharmacokinetics)

**ONGOING CLINICAL TRIALS AND TRANSLATIONAL RESEARCH**

A randomized Phase III trial of maintenance chemotherapy comparing 12 monthly cycles of single agent paclitaxel or CT-2103 (IND#70177) versus no treatment until documented relapse in women with advanced ovarian, primary peritoneal or fallopian tube cancer who achieve a complete clinical response to primary platinum/taxane chemotherapy

Gynecologic Oncology Group (GOG) Protocol #0212

Study Chair: Larry J Copeland

Scientific Collaborator: Doris M. Benbrook, Ph.D.

**COMPLETED CLINICAL TRIALS WITH COMPLETED OR ONGOING TRANSLATIONAL RESEARCH**

A Randomized Double-Blind Phase II Trial of Celecoxib, a Cox 2 Inhibitor, in the Treatment of Patients with Cervical Intraepithelial Neoplasia 3 (CIN3).

Gynecologic Oncology Group (GOG) Protocol #0207

Study Chair: Janet Rader, M.D., Translational Research Chair: Doris M. Benbrook, Ph.D.

A Phase II evaluation of Brivanib (BMS582664), an oral, multitargeted growth factor tyrosine kinase inhibitor in the treatment of recurrent or persistent endometrial carcinoma.

Gynecologic Oncology Group (GOG) Protocol #0229I

Study Chair: Matthew Powell, MD

Scientific Collaborator: Doris M. Benbrook, Ph.D.

A Randomized, Controlled Phase II Evaluation of Megestrol in Different Dose and Sequence in the Treatment of Endometrial Intraepithelial Neoplasia (EIN) From A Referred Cohort of Atypical Endometrial Hyperplasia (AEH) or EIN

Gynecologic Oncology Group (GOG) Protocol #0224

Study Chair: Michael Method, MD

Collaborating Scientist: Doris M. Benbrook, PhD

A Randomized Phase III trial of maintenance chemotherapy comparing 12 monthly cycles of single agent paclitaxel or Xyotax (CT-2103) (IND#70177) versus no treatment until documented relapse in women with advanced ovarian or primary peritoneal cancer who achieve a complete clinical response to primary platinum/Taxane chemotherapy. Gynecologic Oncology Group (GOG) Protocol #0212

Study Chair: Maurie Markman, M.D. Scientific Collaborator: Doris M. Benbrook, Ph.D.

A Phase II Evaluation of Enzastaurin in the Treatment of Persistent or Recurrent Epithelial Ovarian or Primary Peritoneal Carcinoma, Gynecologic Oncology Group (GOG) Protocol #170J Study

Chair: Lydia Usha, M.D., Scientific Collaborator: Doris M. Benbrook,

A Phase II evaluation of thalidomide in the treatment of recurrent or persistent endometrial carcinoma.

Gynecologic Oncology Group (GOG) Protocol #0229-B Study Chair: Scott McMeekin, M.D.

Translational Research Chair: Doris M. Benbrook, Ph.D.

A Phase II evaluation of thalidomide in the treatment of recurrent or persistent carcinosarcoma of the uterus.

Gynecologic Oncology Group (GOG) Protocol #0230-B Study

Chair: Scott McMeekin, M.D.

Translational Research Chair: Doris M. Benbrook, Ph.D.

A Phase II evaluation of thalidomide in the treatment of recurrent or persistent leiomyosarcoma of the uterus.

Gynecologic Oncology Group (GOG) Protocol #0231-B Study

Chair: Scott McMeekin, M.D.

Translational Research Chair: Doris M. Benbrook, Ph.D.

Comparison of Glycoprotein Expression and T-Synthase Function in Primary versus Metastatic Tumors.

Gynecologic Oncology Group (GOG) Protocol #0221 Study

Chair: Michael Gold, M.D.

Study Co-Chairs: Doris M. Benbrook, Ph.D., Richard Cummings, Ph.D., William Rodgers, M.D.

A randomized study of tamoxifen versus thalidomide in patients with biochemical-recurrence-only epithelial ovarian cancer, cancer of the fallopian tube, and primary peritoneal cancer after first line chemotherapy.

Gynecologic Oncology Group (GOG) Protocol # 0198 Study

Chair: Jean A. Hurteau, M.D.

Translational Research Chair: Doris M. Benbrook, Ph.D.

Phase II Trial of Gleevec (Imatinib Mesylate Formerly Known as STI571) in Patients with CD1q17(+) Gynecologic Malignancies

Principal Investigator: D. Scott McMeekin, M.D., Translational

Research Scientist Doris M. Benbrook, Ph.D.

### **DATA SAFETY AND MONITORING BOARDS**

2005-2009 Chair, "Laser and TLR-Agonist Immunotherapy: A Novel Autologous Melanoma Vaccine Strategy" Principal Investigator: Mark F. Naylor, MD, Co-Investigators: Kent Teague, Ph.D, Wei Chen, Ph.D. Met biannually.

### **PUBLICATIONS**

1. Benbrook, D.M. and Miller, R.V. (1986) Effects of Norfloxacin on DNA metabolism in pseudomonas aeruginosa. *Antimicrobial Agents and Chemotherapy*, **29**: 1-6. PMID:3015000.
2. Benbrook, D. & Pfahl, M. (1987) A Novel Thyroid Hormone Receptor Encoded by a cDNA Clone from a Human Testis Library. *Science*, **238**: 788-791. PMID:3672126.
3. Pfahl, M. & Benbrook, D. (1987) Nucleotide Sequence of cDNA Encoding a Novel Thyroid Hormone Receptor. *Nucleic Acids Research*, **15**: 9613. PMID:3684612.

4. Benbrook, D., Lernhardt, E. & Pfahl, M. (1988) A New Retinoic Acid Receptor Identified from a Hepatocellular Carcinoma. *Nature*, **333**: 669-672. PMID:2836738.
5. Benbrook, D.M. & Jones, N.C. (1990) The Heterodimerization of Creb and Jun. *Oncogene*, **5**: 295302. PMID:2138276.
6. Benbrook, D.M. & Jones, N.C. (1994) Different Binding Specificities and Transactivation of Variant CRE's by CREB complexes. *Nucleic Acids Research*, **22**: 1463-1469. PMID:8190638.
7. Apfel, R., Benbrook, D., Lernhardt, E., Ortiz, M.A., and Pfahl, M. (1994) A novel orphan receptor specific for a subset of thyroid hormone-response elements and its interaction with the retinoid/thyroid hormone receptor subfamily. *Molecular and Cellular Biology*, **14**: 7015-7035. PMID:7935418.
8. Benbrook, D., Rogers, R., Medlin, M., and Dunn, S.T. (1995) Immunohistochemical analysis of differentiation and proliferation in organotypic cultures of cervical tumor cell lines. *Tissue and Cell*, **27**(3): 269-274. PMID:7645007.
9. Benbrook, D. M., Shen-Gunther, J., Nuñez, E.R., Dynlacht, J.R. (1997) Differential retinoic acid radiosensitization of cervical carcinoma cell lines. *Clinical Cancer Research*, **3**: 939-945. PMID:9815769.
10. Johnson, G.A., Mannel, R.S., Khalifa, M., Walker, J.L., Wren, M., Min, K.-W., Benbrook, D.M. (1997) Epidermal growth factor receptor in vulvar malignancies and its relationship to metastasis and patient survival. *Gynecological Oncology*, **65**: 425-429. PMID: 9190969.
11. Benbrook, D.M., Lu, S., Flanagan, C., Shen-Gunther, J., Angros, L.H., Lightfoot, S.A. (1997) Biological assay for activity and molecular mechanism of retinoids in cervical tumor cells. *Gynecological Oncology*, **66**: 114-121. PMID:9234931.
12. Miller, A.M., Sahl, W.J., Brown, S.A., Young, S.K., Quinlan, C.M., Patel, P.R., Benbrook, D.M., Naylor, M.F. (1997) The role of human papillomavirus in the development of pyogenic granulomas. *International Journal of Dermatology*, **38**: 101-105. PMID:9352408.
13. Benbrook, D.M., Madler, M.M., Spruce, L.W., Birckbichler, P., Nelson, E.C., Subramanian, S., Weerasekare, G.M., Gale, J.B., Patterson, Jr., M.K., Wang, B., Wang, W., Lu, S., Rowland, T.C., DiSilvestro, P., Berlin, K.D., Lindamood, C., Hill, D.L. (1997) Biologically active heteroarotinoids exhibit anticancer activity and decreased toxicity. *Journal of Medicinal Chemistry*, **40**: 3567-3583. PMID:9357524.
14. Madler, M.M., Klucik, J., Soell, P.S., Brown, C.W., Liu, S., Berlin, K.D., Benbrook, D.M., Birckbichler, P.J., Nelson, E.C. (1998) Lithium hypochlorite-clorox as a novel oxidative mixture for methyl ketones and methyl carbinols. *Organic Preparations & Procedures International*, **30**: 230-234.
15. Benbrook, D.M., Subramanian, S., Gale, J.B., Liu, S., Brown, C.W., Boehm, M.F., Berlin, K.D. (1998) Synthesis and characterization of heteroarotinoids demonstrates structure-specificity relationships. *Journal of Medicinal Chemistry*, **41**: 3753-3757. PMID:9733501.
16. DiSilvestro, P.A., Stanley, S.A., and Benbrook, D.M. (1999) Ki-67 expression in a cervical carcinoma organotypic model correlates with growth and EGF-R expression. *Journal of the Lower Genital Tract Disease*, **3**: 1-5.
17. Waliszewski, P. Waliszewski, M., Gordon, N., Hurst, R.E., Benbrook, D.M., Dhar, A., Hemstreet, G.P.

- (1999) Retinoid signaling in immortalized and carcinoma-derived human uroepithelial cells. *Molecular and Cellular Endocrinology*, **148**: 55-65. PMID:10221771.
18. Liu, S. Berlin, K.D., Simms-Kelley, M.D., Nelson, E.C., and Benbrook, D.M. (1999) Optimization and Synthesis of (E)-4-[2-(3,4-Dihydro-4,4-dimethyl-2H-1-benzopyran-6-yl)-1-propenyl]benzoic Acid-11[<sup>14</sup>C]. *Journal of Labelled Compounds and Radiopharmaceuticals*, **42**: 789-796.
  19. Dhar, A., Liu, S., Berlin, K.D., Madler, M.M., Ivey, R.T., Birckbichler, P.J., Lu, S., Zacheis, D., Brown, C.W., Klucik, J., Nelson, E.C., Benbrook, D.M. (1999) Synthesis and Structure-Activity Relationships of Nitrogen Heteroarotinoids. *Journal of Medicinal Chemistry*, **42**: 3602-3614. PMID:10479291.
  20. Zacheis, D., Dhar, A., Lu, S., Madler, M.M., Klucik, J. Brown, C.w., Liu, S., Clement, F., Subramanian, S., Weerasekare, G.M., Berlin, K.D., Gold, M., Houck, J.R., Fountain, K.R., Benbrook, D.M. (1999) Heteroarotinoids inhibit the growth of head and neck cancer cell lines *in vitro* and *in vivo* through both RAR and RXR retinoic acid receptors. *Journal of Medicinal Chemistry*, **42**: 4434-4445. PMID:10543887.
  21. Salsman, S., Lu, S., Benbrook, D.M. (1999) The mechanism of retinoid radiosensitization is independent of AP-1 repression in cervical carcinoma cells. *Gynecologic Oncology*, **73**: 253-256. PMID:10329043.
  22. Simoni, D., Roberti, M., Invidiata, F.P., Rondanin, R., Baruchello, R., Malagutti, C., Mazzali, A., Rossi, M., Grimaudo, S., Dusancho, L., Meli, M., Raimondi, M.V., Landino, M., D'Alessandro, N., Tolomeo, M., Dhar, A., Lu, S. Benbrook, D.M. (2001) Heterocycle-Containing Retinoids. Discovery of a Novel Isoxazole Arotinoid Possessing Potent Apoptotic Activity in Multidrug and Drug-Induced Apoptosis Resistant Cells. *Journal of Medicinal Chemistry*, **44**: 2308-2318. PMID:11428925.
  23. Guruswamy, S., Lightfoot, S., Gold, M., Hassan, R., K. Darrell Berlin, Ivey, T.R., Benbrook, D.M. (2001) Effects of Retinoids on the Cancer Phenotype and Apoptosis in Organotypic Cultures of Ovarian Carcinoma. *Journal of the National Cancer Institute*, **93**: 516-525. PMID:11287445.
  24. Scribner, D., Benbrook, D.M. (2002) Retinoids Enhance Cisplatin-based Chemoradiation in Cervical Cancer Cells In Vitro. *Gynecologic Oncology*, **85**: 223-225. PMID:11925151.
  25. Kamelle, S., Sienko, A., Benbrook, D.M. (2002) Retinoids and steroids regulate menstrual phase histological features in human endometrial organotypic cultures. *Fertility & Sterility*, **78** (3): 596-602. PMID: 12215339
  26. Hassan, R., Lerner, M.R., Benbrook, D.M., Lightfoot, S.A., Brackett, D.J., Wang, Q.-C., Pastan, I. (2002) Anti-tumor activity of SS(dsFv)PE38 and SS1(dsFv)PE38, recombinant anti-mesothelin immunotoxins against human gynecologic cancers grown in organotypic culture in vitro. *Clinical Cancer Research*, **8**: 3520-3526. PMID: 12429643
  27. Benbrook, D.M. (2003) An ELISA method for detection of human antibodies to an immunotoxin. *Journal of Pharmacological and Toxicological Methods*. **47**: 169-175. PMID:12628308.
  28. Mic, F. A., Molotkov, A., Benbrook, D. M., and Duester, G. (2003) Retinoid activation of RAR but not RXR is sufficient for mouse embryonic development. *Proceedings of the National Academy of Sciences*. **100**: 7135-7140. PMID:12782789.
  29. Chun, K.-H., Benbrook, D. M., Berlin, K. D., Hong, W. K., and Lotan, R. (2003) Induction of apoptosis in head and neck squamous cell carcinoma (HNSCC) cell lines by heteroarotinoids through a mitochondrial dependent pathway. *Cancer Research*, **63**: 3826-3832. PMID:12839980.



30. Liu, S., Brown, C.W., Berlin, K.D., Dhar, A., Guruswamy, S., Brown, D., Gardner, G.J., Birrer, M., J., Benbrook, D.M. (2004) Synthesis of flexible sulfur-containing heteroarotinoids that induce apoptosis and reactive oxygen species with discrimination between malignant and benign cells. *Journal of Medicinal Chemistry*, **47**: 999-1007. PMID:14761202.
31. Brown, C.S., Liu, S., Klucik, J., Brown, C.W., Berlin, K. D., Brennan, P.J., Devinder, K., Benbrook, D.M. (2004) Novel heteroarotinoids as potential antagonists of *Mycobacterium Bovis* BCG. *Journal of Medicinal Chemistry*, **47**: 1008-1017. PMID:14761203.
32. Tillmans, T.D., Kamelle, S.A., Guruswamy, S., Gould, N.S., Rutledge, T.L., Benbrook, D.M. (2005) Sensitization of Cervical Cancer Cell Lines to Low Dose Radiation by Retinoic Acid Does Not Require Functional p53. *Gynecologic Oncology*, **97**: 142-150. PMID:15790450.
33. Benbrook, D.M., Kamelle, S.A., Guruswamy, S.B., Lightfoot, S.A., Rugledge, T.L., Gould, N.S., Hananafon, B.N., Dunn, S.T., Berlin, K.D. (2005) Flexible Heteroarotinoids (Flex-Hets) exhibit improved therapeutic ratios as anti-cancer agents over retinoic acid receptor agonists. *Investigational New Drugs*, **23**: 417-428. PMID:16133793.
34. Subramanian, S., Smith, C.M., Tabatabai, T., Bryan, C.D., Buettner, B., Hale, S., Wakefield, C.A., Benbrook, D.M., Berlin, K.D. (2005) Synthesis of novel heteroarotinoids with receptor activation capabilities and TGase activity. Single crystal analysis of (E)-4-[(2,3-dihydro-2,2,4,4-tetramethyl-2H1benzo[b]thiopyran-6-YL)-1-propenyl]-2-methylbenzoic acid. *Phosphorus, Sulfur, and Silicon and the Related Elements*, **180**:67-77.
35. Zhang Y. Hua Y. Benbrook D.M. Covey J.M. Dai G. Liu Z. Chan K.K. High performance liquid chromatographic analysis and preclinical pharmacokinetics of the heteroarotinoid antitumor agent, SHetA2. (2006) *Cancer Chemotherapy & Pharmacology*, **58**(5):561-9. PMID:16534614.
36. Chiu, P.-M., Feng, H.-C., Benbrook, D.M., Ngan, H.Y.S., Khoo, U.-S., Xue, W.-S., Tsao, S.W., Chan, K.-W., Cheung, A.N.Y. (2006) Effect of all-trans retinoic acid on tissue dynamics of choriocarcinoma cell lines: an organotypic model. *Journal of Clinical Pathology*, **59**:845-850. PMID:16461808.
37. Matsuzaki, S. Hayes, J.M., Benbrook, D.M., Jankowiak, R. (2006) Nonphotochemical hole-burning study of selectively stained normal and cancerous human ovarian tissues. *Journal of Physical Chemistry B*, **110**: 16124-16130. PMID:16898770.
38. Lu, Shennan, Benbrook, D.M. (2006) Role of AP-1 antagonism in growth inhibition of cervical cancer cell lines by retinoids. *American Journal of Pharmacology and Toxicology* **1**(4): 45-53.
39. Guruswamy, S., Benbrook, D.M. (2006) Retinoids chemosensitize ovarian cancer cell lines to cisplatin independent of nuclear receptors and p53. *American Journal of Pharmacology and Toxicology* **1**(4): 87-93.
40. Hyde, J., Benbrook, D.M. (2006) Sensitivities of uterine adenocarcinoma, mixed mullerian tumor (MMT) and sarcoma cell lines to chemotherapeutic agents and a Flex-Het drug. *American Journal of Pharmacology and Toxicology* **1** (4): 88-91. PMID:19890461
41. Liu, T., Hannafon, B., Gill, L., Kelly, W., Benbrook, D.M. (2007) Flex-Hets differentially induce apoptosis in cancer over normal cells by directly targeting mitochondria. *Molecular Cancer Therapeutics*, **6**: 1814-1822. PMID:17575110.
42. McMeekin, D.S., Sill, M.W., Darcy, K.M., Stearns-Kurosawa, D.J., Eaton, L., Yamada, J., Benbrook, D.M. (2007) A phase II trial of thalidomide in patients with persistent or recurrent endometrial cancer

and correlation with angiogenesis biomarkers: A Gynecologic Oncology Group study. *Gynecologic Oncology*, **105**: 508-516. PMID:17306350.

43. McMeekin, D.S., Sill, M. W., Darcy, K.M., Stearns-Kurosawa, D.J., Webster, K., Waggoner, S., Benbrook, D.M. (2007) A phase II trial of thalidomide in patients with refractory leiomyosarcoma of the uterus and correlation with biomarkers of angiogenesis: A Gynecologic Oncology Group study. *Gynecologic Oncology*, **106**:596-603. PMID:17597196.
44. Le, T.C., Berlin, K.D., Benson, S.D., Eastman, M.A., Bell-Eunice, G., Nelson, A.C., Benbrook, D.M. (2007) Heteroarotinoids with anti-cancer activity against ovarian cancer cells. *Open Medicinal Chemistry Journal*, **1**: 11-23. PMID:19662136.
45. Le, T.C., Berlin, K.D., Benbrook, D.M. (2007) Modified heteroarotinoids as potential anticancer agents-improved syntheses of 2-nitrotetralin and 2-aminotetralin. *Journal of the Saudi Chem Society*, **11**: 351-360.
46. Benbrook, D.M., Lightfoot, S., Ranger-Moore, J., Liu, T., Berry, W., Dozmorov, I. (2008) Karyometric and Gene Expression Analysis in an Organotypic Model of Endometrial Carcinogenesis and Chemoprevention. *Gene Regulation and Systems Biology*, **2**: 21-42. PMID:19784388.
47. Lin, Y.-D, Chen, S., Yue, P., Zou, W., Benbrook, D.M., Liu, S., Le, T.C., Berlin, K.D., Khuri, F.R., Sun, S.-Y. (2008) CAAT/Enhancer Binding Protein Homologous Protein–Dependent Death Receptor 5 Induction Is a Major Component of SHetA2-Induced Apoptosis in Lung Cancer Cells. *Cancer Research*, **68** (13): 5335-5344. PMID:18593935.
48. Ju, T., Lanneau, G.S., Gautam, T., Wang, Y., Xia, B., Stowell, S.R., Willard, M.T., Wang, W., Xia, J.Y., Zuna, R.E., Laszik, Z., Benbrook, D.M., Hanigan, M.H., Cummings, R.D. (2008) Human tumor antigens Tn and sialyl Tn arise from mutations in Cosmc. *Cancer Research*, **68**(6):1636-46. PMID:18339842.
49. Lin, Y., Liu, X., Yue, P., Benbrook, D.M., Berlin, K.D., Khuri, F.R., Sun S.-Y. (2008) Involvement of cFLIP and survivin down-regulation in flexible heteroarotinoid-induced apoptosis and enhancement of TRAIL-initiated apoptosis in lung cancer cells. *Molecular Cancer Therapeutics*, **7**: 3556-3565. PMID:19001438
50. Myers, T., Chenedza, S., Lightfoot, S., Pan, Y., Dedmond, D., Cole, L., Tang, Y., Benbrook, D.M. (2008) Flexible Heteroarotinoid (Flex-Het) SHetA2 inhibits angiogenesis *in vitro* and *in vivo*. *Investigational New Drugs*, **27**:304–318. PMID:18802666.
51. Liu, Z., Zhang, Y.Hua, Y.F., Covey, J.M., Benbrook, D.M., Chan, K.K.(2008) Metabolism of a sulfur containing heteroarotinoid antitumor agent, SHetA2 using liquid chromatography/tandem Mass spectrometry. *Rapid Communications in Mass Spectrometry*, **22**: 3371–3381. PMID:18837006.
52. Liu, T., Masamha, P., Chenedza, P., Berlin, K.D., Lightfoot, S, He, Feng, Benbrook, D. M. (2009) Development of Flexible Heteroarotinoids (Flex-Hets) for Kidney Cancer. *Molecular Cancer Therapeutics*, **8** (5):1227-1238. PMID:19417155.
53. Tuller, E.R., Brock, A.L., Yu, H., Lou, J.r., Benbrook, D.M., Ding, W.-Q. (2009) PPARα signaling mediates the synergistic cytotoxicity of clioquinol and docosahexaenoic acid in human cancer cells. *Biochemical Pharmacology*, **77**: 1480-1486. PMID:19426685.
54. Masamha, C. P., Benbrook, D.M. (2009) Cyclin D1 degradation is sufficient to induce G1 cell cycle arrest despite constitutive expression of cyclin E2 in SHetA2-treated ovarian cancer cells. *Cancer Research*, **69**: 6565-6572. PMID:19638577.

55. Palwai, N.R., Zang, X.-P., Harrison, R.G. Benbrook, D.M. Pento, J.T. (2009) Selective Growth Inhibition of Cancer Cells by L-Methioninase-Containing Fusion Protein Targeted to the Urokinase Receptor. *Pharmacology*, **84**:271-275. PMID:19797936
56. Tuller, E.R., Beavers, C.T., Lou, J.R., Ihnat, M.A., Benbrook, D.M., Ding, W.-Q. (2009) Docosahexaenoic acid inhibits superoxide dismutase 1 gene transcription in human cancer cells: the involvement of PPAR $\alpha$  and HIF-2 $\alpha$  signaling. *Molecular Pharmacology*, **78**:588-595. PMID:19528198.
57. Moxley, K.M., Chenedza, S., Benbrook, D.M. (2009) Induction of death receptor ligand -mediated apoptosis in epithelial ovarian carcinoma: the search for sensitizing agents. *Gynecologic Oncology*, **115**: 438-442. PMID:19804900
58. Chenedza, S., Benbrook, D.M. (2010) NF- $\kappa$ B is involved in SHetA2 circumvention of TNF $\alpha$  resistance, but not induction of intrinsic apoptosis. *Anti-Cancer Drugs*, **21**: 297-305. PMID:20032777
59. Zheng, J., Lou, J.R., Zhang, X.-X., Benbrook, D.M., Hanigan, M.H., Lind, S.E., Ding, W.Q. (2010) Nacetylcysteine interacts with copper to generate hydrogen peroxide and selectively induce cancer cell death. *Cancer Letters*, **298**(2):186-94, PMID: 20667650
60. Hurteau, J., Brady, M.F., Darcy, K.M., McGuire, W.P., Edmonds, P., Pearl, M.L. Ivanov, I., Tewari, K.S., Mannel, R.S., Zanotti, K., Benbrook, D.M. (2010) Randomized Phase III Trial of Tamoxifen versus Thalidomide in Women with Biochemical-Recurrent-Only Epithelial Ovarian, Fallopian Tube or Primary Peritoneal Carcinoma after a Complete Response to First-Line Platinum/Taxane Chemotherapy with an Evaluation of Serum Vascular Endothelial Growth Factor (VEGF): A Gynecologic Oncology Group Study. *Gynecologic Oncology*, **119**:444-450. PMID:20846715
61. Nammalwar, B., Bunce, R. A., Benbrook, D.M., Lu, T., Li, H.-F. , Chen, Y.-D., Berlin, K. D. (2011) Synthesis of N-[3,4-Dihydro-4-(acetoxymethyl)-2,2,4-trimethyl-2H-1-benzothiopyran-6-yl]-N'-(4-nitrophenyl)thiourea and N-[3,4-dihydro-4-(hydroxymethyl)-2,2,4-trimethyl-2H-1-benzothiopyran-6-yl]N'-(4-nitrophenyl)thiourea, a Major Metabolite of N-(3,4-Dihydro-2,2,4,4-tetramethyl-2H-1benzothiopyran-6-YL)-N'-(4-nitrophenyl)thiourea', *Phosphorus, Sulfur, and Silicon and the Related Elements*, **186**: 1,189-204.
62. Usha, L., Sill, M. W., Darcy, K. M., Benbrook, D. M., Hurteau, J. A., Michelin, D. P., Mannel, R. S., Hanjani, P., De Geest, K., Godwin, A. K. (2011) A Gynecologic Oncology Group phase II trial of the protein kinase C-beta inhibitor, enzastaurin and evaluation of markers with potential predictive and prognostic value in persistent or recurrent epithelial ovarian and primary peritoneal malignancies. *Gynecologic Oncology*, **121**:455-461. PMID:21414654
63. Zheng, J., Benbrook, D.M., Yu, H., Ding, W.-Q. (2011) Clioquinol suppresses cyclin D1 gene expression through transcriptional and post-transcriptional mechanisms. *Anticancer Research*, **31** (9): 2739-2747. PMID: 21868515
64. Jiang, H., Taggart, J.E., Zhang, X., Benbrook, D.M., Lind, S.E., Ding, W.-Q. (2011) Nitroxoline (8hydroxy-5-nitroquinoline) is more a potent anti-cancer agent than clioquinol (5-chloro-7-iodo-8quinoline). *Cancer Letters*, **312**:11–17. PMID: 21899946
65. Dozmorov, I. M., Jarvis, J., Saban, R., Benbrook, D. M., Wakeland, E., Aksentijevich, I., Ryan, J., Chiorazzi, N., Guthridge, J. M., Drewe, E., Tighe, P. J., Centola, M., and Lefkovits, I. (2011) Internal standard-based analysis of microarray data2--analysis of functional associations between HVE genes. *Nucleic Acids Research*, **39**: 7881-7899, 2011. PMID: 22498038.

66. Ramachandran I., Thavathiru E., Ramalingam S., Natarajan G., Mills W., Benbrook D., Zuna R., Lightfoot S., Reis A.M.C, Anant S. and Queimado L. (2012) Wnt inhibitory factor 1 induces apoptosis and inhibits cervical cancer growth, invasion and angiogenesis in vivo. *Oncogene*, <http://dx.doi.org/10.1038/onc.2011.455>. PMID: 22002305
67. Kabirov, K.K. Kapetanovic, I.M., Benbrook, D.M., Dinger, N., Mankovskaya, I., Zakharov, A., Detrisac, C., Pereira, M., Martín-Jiménez, T., Onua, E., Banerjee, A., van Breemen, R.B., Nikolić, D., Chen, L., Lyubimov, A.V. (2012) Oral toxicity and pharmacokinetic studies of SHetA2, a new chemopreventive agent, in rats and dogs. *Drug and Chemical Toxicology*, **36**(3): 284-95. PMID: 22947079
68. Doppalapudi, R. S., Riccio, E. S., Davis, Z., Menda, S., Wang, A., Du, N., Green, C., Kopelovich, L., Rao, C. V., Benbrook, D. M., and Kapetanovic, I. M. (2012) Genotoxicity of the cancer chemopreventive drug candidates CP-31398, SHetA2, and phospho-ibuprofen. *Mutation Research*, **746**: 78-88, 2012. PMID: 22498038
69. McMeekin, D.S., Sill, M.W., Darcy, K.M., Abulafia, O., Hanjani, P., Pearl, M.L., Rubin, S.C., Rose, P.G., Small L, Benbrook, D.M. (2012) A phase II trial of thalidomide in patients with refractory uterine carcinosarcoma and correlation with biomarkers of angiogenesis: A Gynecologic Oncology Group study *Gynecologic Oncology*, **12**: 356-61. PMID:22796461
70. Moxley, K.M., Benbrook, D.M., Queimado, L., Zuna, R.E., Thompson, D., McCumber, M., Premkumar, P., Thavathiru, E., Hines, L., Moore, K.N. (2013) The role of single nucleotide polymorphisms of the ERCC1 and MMS19 genes in predicting platinum-sensitivity, progression-free and overall survival in advanced epithelial ovarian cancer. *Gynecologic Oncology*, **130**: 77-382. PMID:23632208
71. Naylor, M.F, Thompson, D.M, Lightfoot, S., Benbrook, D.M. (2013) Anti-Cancer Activities and Interaction of Imiquimod and Flex-Het, SHetA2. *Journal of Cancer Therapy*, **4**: 7-19.
72. Benbrook, D.M., Guruswamy, S., Wang, Y., Sun, Z., Mohammed, A., Zhang, Y., Li, Q., Rao,C.V. (2013) Chemoprevention of Colon and Small Intestinal Tumorigenesis in APC<sup>min/+</sup> Mice by SHetA2 (NSC721689) without Toxicity. *Cancer Prevention Research*, **6**: 908-916. PMID:23852423
73. Benbrook, D.M., Nammalwar, B., Long, A., Matsumoto, A., Singh, A., Bunce, R.A., Berlin, K.D. (2014) SHetA2 interference with mortalin binding to p66shc and p53 identified using drug-conjugated magnetic microspheres. *Investigational New Drugs*. 32:412–423. PMID: 24254390
74. Bishop, E., Thavathiru, E., Benbrook, D. (2014) Insulin exerts direct effects on carcinogenic transformation of human endometrial organotypic cultures. *Cancer Investigation*, **32**: 63–70. PMID: 24499106
75. Slaughter, K.M., Thai, T., Penaroza, S., Benbrook, D.M., Thavathiru, E., Ding, K., Nelson, T., McMeekin, D.M., Moore, K.N. (2014) Measurements of adiposity as clinical biomarkers for first-line bevacizumab-based chemotherapy in epithelial ovarian cancer. *Gynecologic Oncology*, **133**: 11-15. PMID:24680585
76. Powell, M., Sill MW, Goodfellow, P.J., Benbrook, D.M., Lankes, H.A., Leslie, K.K., Jeske, Y., Mannel, R.S., Spillman, M.A., Lee, P.S. (2014) A Phase II Trial of Brivanib in Recurrent or Persistent Endometrial Cancer: An NRG Oncology/Gynecologic Oncology Group Study. *Gynecologic Oncology* **135**:38-43. PMID: 25019571
77. Gnanasekaran, K.K., Benbrook, D.M. Nammalwar, B., Thavathiru, E., Bunce, R.A., Berlin, K.D. (2015) Synthesis and Evaluation of Second Generation Flex-Het Scaffolds Against the Human Ovarian Cancer A2780 Cell Line. *European Journal of Medicinal Chemistry* **96**:209-17. PMID: 25880346

78. Okon, I, Ding, Y., Coughlan, K.A., Wang, Q., Song, P., Benbrook, D.M., Zou, M.-H. (2016) Aberrant NRP-1 Expression Serves as Predictor of Metastatic Endometrial and Lung Cancers. *Oncotarget*. **7**:7970-8. PMID: 26701889
79. Walgama C, Al Mubarak ZH, Zhang B, Akinwale, M., Pathiranaage, A., Deng, J., Berlin, K.D., Benbrook, D.M., Krishnan, S. (2016) Label-Free Real-Time Microarray Imaging of Cancer Protein–Protein Interactions and Their Inhibition by Small Molecules. *Analytical Chemistry* **88**:3130-3135. PMID: 26886845
80. Gunderson, C. Ding, K., Dvorak, J., McMeekin, D.J., Moore, K. Benbrook, D.M. (2016) The Pro-Inflammatory Effect of Obesity on High Grade Serous Ovarian Cancer. *Gynecologic Oncology*, **143**:40-5. PMID: 27423378
81. Griffith, J., Andrade, D., Mehta, M., Berry, W., Benbrook, D.M., Aravindan, N., Tanaka, T., Herman, T.S., Ramesh, R., Munshi, A. (2017) Silencing BMI1 radiosensitizes human breast cancer cells by inducing DNA damage and autophagy. *Oncology Reports*, **37**:2382-2390.
82. Rader, J., Sill, M.W., Beumer, J.H. Lankes, H.A., Benbrook, D.M., Garcia, F., Trimble, C., Thigpen, T. Lieberman, R., Zuna, R.E., Leath, C.A., Spirtos, N.M. Byron, J., Thaker, P.H., Lele, S., Alberts, D., Rader, J. (2017) A stratified randomized double-blind phase II trial of celecoxib for treating patients with cervical intraepithelial neoplasia: The potential predictive value of VEGF serum levels: an NRG Oncology/Gynecologic Oncology Group Study. *Gynecologic Oncology*, **145**: 291-297. PMID: 28285845
83. Janakiram, N., Mohammed, A., Bryant, T., Ritchie, R., Stratton, Ni., Jackson, L., Lightfoot, S., Benbrook, D.M., Asch, A., Mark, L., Rao, C.V. (2017) Loss of natural killer T (NKT) cells promotes pancreatic cancer in LSL-Kras<sup>G12D/+</sup> mice. *Immunology*, **152**:36-51. PMID: 28419443
84. Sharma A., Thavathiru, E., Benbrook, D.M., Woo, S. (2017) Bioanalytical method development and validation of HPLC-UV assay for the quantification of SHetA2 in mouse and human plasma: Application to pharmacokinetics study. *J. Pharm Tech Drug Res.* 6, article 2.
85. Muhjabeen, S., Hatipoglu, M. K., Chandra, V., Benbrook, D.M., Garcia-Contreras, L. (2017) Optimization of a Vaginal Suppository Formulation to Deliver SHetA2 as a Novel Treatment for Cervical Dysplasia. *J Pharm Sci.* **107**:638-646.. PMID: 28989018
86. Benbrook, D.M., Naveena B. Janakiram, N.B., Chandra, V., Pathurib, G., Madk, V., Stratton, N.C., Masamha, C.P., Farnsworth, C.N., Garcia-Contreras, L., Hatipoglu, M.K., Lighfoot, S., Rao, C.V. (2018) Development of a Dietary Formulation of the SHetA2 Chemoprevention Drug for Mice. *Investigational New Drugs*, 2017 Dec 22. *Investigational New Drugs*, 36(4) 561-570 PMID: 29273857, PMCID: PMC6014882, DOI: 10.1007/s10637-017-0550-0.
87. Ramraj, S.K., Smith, K.S., Janakiram, N.B., Toal, C., Raman, A., Benbrook, D. M. (2018) Correlation of clinical data with fallopian tube specimen immune cells and tissue culture capacity. *Tissue and Cell*, June 2018, pages 57-64 <https://doi.org/10.1016/j.tice.2018.04.001>
88. Sharma A, Benbrook D.M., Woo S. (2018) Pharmacokinetics and interspecies scaling of a novel, orally-bioavailable anti-cancer drug, SHetA2. *PLoS One*. **13**:e0194046. PMCID: PMC5892888.
89. Carlson, B.W., Craft, M.A., Carlson, J.R., Razaq, W., Deardeuff, K.K., Benbrook, D.M. (2018) Accelerated vascular aging and persistent cognitive impairment in older female breast cancer survivors. *GeroScience*, doi:10.1007/s11357-018-0025-z. PMID: 29804200

90. Mahjabeen S, Hatipoglu MK, Benbrook DM, Kosanke SD, Garcia-Contreras D, Garcia-Contreras L. Influence of the estrus cycle of the mouse on the disposition of SHetA2 after vaginal administration. *Eur J Pharm Biopharm.* 2018;130:272-80, PMID: 30064701DOI: 10.1016/j.ejpb.2018.07.004.

## **REVIEWS**

1. Hurst, R.E., Waliszewski, P., Waliszewska, M., Bonner, R.B., Benbrook, D.M., Dhar, A., Hemstreet, G.P. (1999) Complexity, retinoid-responsive gene networks, and bladder carcinogenesis. *Advances in Experimental Medicine and Biology.* **462**: 449-67. PMID:10599447
2. Benbrook, D.M. (2002) Refining Retinoids with Heteroatoms, *Minireviews in Medicinal Chemistry*, **2**: 277-283. PMID:12370069. (Invited)
3. Benbrook, D.M., Wilkerson, J. C. (2003) Nature Reviews Cancer. *JAMA.* **289**(8):1049-1050.
4. Benbrook, D.M. Organotypic Cultures Represent Tumor Microenvironment for Drug Testing. (2006) *Drug Discovery Today, Disease Models.* **2**: 143-148. (Invited)
5. Benbrook DM. Promise and problems of translational research. *Gynecologic Oncology.* **103**(2 Suppl 1): S14-7, 2006 Nov. PMID:17027066. (Invited)
6. Benbrook, D.M., Masamha, C.P. (2011) The pro-survival function of Akt kinase can be overridden or altered to contribute to induction of apoptosis. *Current Cancer Drug Targets*, **11**: 586-599. PMID:21486222
7. Benbrook, D.M., Long, A. (2012) Integration of Autophagy, Proteasomal Degradation, Unfolded Protein Response and Apoptosis. *Experimental Oncology*, **34**: 286-297. PMID:23070014 (Invited).
8. Benbrook, D.M. (2014) Book Review: Biotechnology and Biopharmaceuticals: Transforming Proteins and Genes Into Drugs, 2<sup>nd</sup> Edition. *Clinical Infectious Diseases.* 2014 Oct 9. Epub 2014/10/11. Eng. PMID: 25301211. (Invited and Peer-Reviewed)
9. Ozpolat, B, Benbrook, D.M. (2015) Targeting autophagy in cancer management - strategies and developments. *Cancer Management Research.* **7**:291-299. PMID: 26392787
10. Chandra, V., Joo, K.J., Benbrook, D.M., Dwivedi, A., Rai, R. (2016) Therapeutic Options for Management of Endometrial Hyperplasia: An Update. *Journal of Gynecologic Oncology*, 27:e8. PMID: 264634354

## **BOOK CHAPTERS**

1. Pfahl, M., Payne, J., Benbrook, D. & Wu, K.C. (1988) Differential Activation of a Hormone Responsive Element in Various Cell Lines. *Steroid Hormone Action*, pp. 161-168.
2. Benbrook, D.M., Tonetti, D.A. & Miller, R.V. (1989) DNA Gyrase of *Pseudomonas Aeruginosa*: Inhibition by Quinolones. *Proceedings International Telesymposium on Quinolones*, Fernandez, P.B. (Ed.) J.R. Prous Science Publishers, pp.171-186.
3. Alberts, D.A., Barakat, R.R., Daly, M., Method, M.W., Benbrook, D.M., et al. (2004) Prevention of Gynecologic Malignancies. In Gershenson, D.M., McGuire, W.P., Gore, M., Quinn, M.A., Thomas, G. editors. *Gynecologic Cancer: Controversies in Management*. Elsevier, Churchill, Livingston, Philadelphia, PA.

4. Benbrook, D., Chambon, P., Rochette-Egly, C., Asson-Batres, M. (2014) History of Retinoic Acid Receptors. In: Asson-Batres MA, Rochette-Egly C, eds. The Biochemistry of Retinoic Acid Receptors: Structure, Activation, and Function at the Molecular Level. Vol 70: Springer Netherlands; pp. 1-20 (Invited) PMID: 24962878

## **ABSTRACTS AND MEETING PRESENTATIONS**

1. Benbrook, D.M., Miller, R. (1983) The effects of Norfloxacin, A pyriconecarboxylic acid-derivative, on DNA replication and DNA gyrase activity in *Pseudomonas aeruginosa*, Presented at the Federation of American Society of Experimental Biology Meeting. Published in Federation Proceedings 42(7):1982-1982
2. Benbrook, D.M., Miller, R. (1984) The effects of Norfloxacin on *Pseudomonas aeruginosa* and its DNA Gyrase. American Society for Microbiology, 84<sup>th</sup> Annual Meeting, 1984.
3. Rogers, R.S., Benbrook, D.M., Walker, J.L., Lord, B.J., Haas, G.G. (1992) "Silent" carriers of human papillomavirus (HPV) identified in sperm bank donor population. *Proceedings of the American Fertility Society, 48th Annual Meeting*.
4. Benbrook, D.M., Medlin, M., Rogers, R., Ahern-Moore, J., Dunn, S.T., Lord, B., Walker, J.L. (1993) "Retinoid effects on tumor cells in organotypic culture." *American Association for Cancer Research Special Conference "Mechanism of Action of Retinoids, Vitamin D, and Steroid Hormones."*
5. Benbrook, D. M., Heldermon, C., Nunez, E.R., and Waliszewski, P. (1994) Retinoic acid receptor RAR $\alpha$  effects in cervical tumor cell lines. *Diet and Cancer: Molecular Mechanisms of Interactions, American Institute of Cancer Research*.
6. Benbrook, D. M., Heldermon, C. (1994) Retinoic acid receptors bind to HPV16LCR sequence and repress transcription indirectly through AP1 sites. *Proceedings of the 13th International Papillomavirus Conference*.
7. Mannel, R. S., Khalifa, M., Wren, M., Walker, J.L., Min, K.-W., Benbrook, D.M. (1994) Epidermal growth factor receptor in vulvar malignancies and its relationship to metastasis and patient survival. *26th Annual Society of Gynecologic Oncologists' Meeting*.
8. Waliszewski, P., Benbrook, D., Nasim, M., Hurst, R.E. (1995) "Human uroepithelial cells contain retinoid signaling pathways." *Proceedings of the American Association for Cancer Research*, **36**:630.
9. Waliszewski, P., Benbrook, D., Blaszewski, M.K., Gupta, M., Drews, M., Hurst, R.E. (1995) The retinoic acid signaling pathway in normal and transformed human intestinal epithelial cells. *Proceedings of the American Association for Cancer Research*, **36**:601.
10. Nuñez, E.R., Heldermon, C., Benbrook, D.M. (1995) Restoration of RAR $\alpha$  expression and function in RAR $\beta$ -deficient cervical tumor cell lines has different effects depending on the intercellular environment. *American Association for Cancer Research Conference "Mechanism of Action of Retinoids, Vitamin D and Steroid Hormones"*.
11. Nuñez, E.R., Benbrook, D. M. (1995) Retinoic acid receptor expression effects growth and retinoid sensitivity in cervical tumor cell lines. *American Association for Cancer Research Conference "Molecular Biology of Cancer: Implications for Prevention and Therapy"*.
12. Nuñez, E.R., Benbrook, D.M., Berlin, K.D., Nelson, E.C. (1995) A heteroarotinoid affects growth and transactivation of a retinoic acid response element in cervical carcinoma cell lines. *The FASEB Journal*, **9(3, part 1)**: 985.

13. Benbrook, D. M., Jordan, T.L., Heldermon, C. and Robinson, K. (1995) Evaluation of endogenous retinoic acid receptor function in cervical tumor cells. *Dietary Phytochemicals in Cancer Prevention and Treatment*, 62.
14. Nuñez, E.R., Jordan, T.L., Benbrook, D.M. (1996) 13-Cis acid is a radiosensitizer of SiHa cervical carcinoma cell line. *Proceedings of the American Association for Cancer Research*. **37**:4144.
15. Madler, M., Benbrook, D.M. Birckbichler, P.J., Nelson, E.C., Berlin, K.D. (1996) Biologically active heteroarotinoids. Presented at the *Annual Meeting of the Medicinal Chemistry Division of the American Chemical Society*, August 96. Published in Abstracts of papers of the American Chemical Society, 212:67 (Part 1), Aug.1996
16. Qian, X., Benbrook, D.M., Berlin, K.D., Cushman, J.C., Madler, M.M., Patrick, S.D., Simms, M.D., Nelson, E.S. (1996) Comparative effects of a diaryl heteroarotinoid and all-trans-retinoic acid on induction of differentiation. *The FASEB Journal*, **10**:4390.
15. Benbrook, D.M., Lu, S., Flanagan, C.W., Jordan, T.L. (1996) Retinoids inhibit growth and activate endogenous receptors in a cervical tumor cell line. Presented at the *1996 FASEB Summer Research Conference on Retinoids*.
16. Lu, S., Flanagan, C.W., Shen-Gunther, J., Benbrook, D.M. (1997) Biological assay for activity and molecular mechanism of retinoids in cervical tumor cells. *Gynecologic Oncology*, **64**(2):312.
17. Flanagan, C., Fishburne, V.H., DiSilvestro, P. Nuñez, E.R., Benbrook, D.M. (1997) Mechanism of retinoid and carotenoid growth inhibition of a cervical tumor cell line. *Gynecologic Oncology*, **64**(2):357.
18. Benbrook, D.M., Lu, S. (1997) Retinoid regulation of endogenous receptors, growth and EGF-R in a cervical carcinoma cell line. *Proceedings of the 88th Annual Meeting of the American Association for Cancer Research*, **38**:453, abstract #3032.
19. Benbrook, D.M., Nuñez, E.R. (1997) Differences in radiosensitization and cell cycle progression of cervical carcinoma cell lines. *Proceedings of the 88th Annual Meeting of the American Association for Cancer Research*, **38**:44, abstract #296.
20. Benbrook, D.M., Berlin, K.D., Birckbichler, P.J. (1997) Correlation of transactivation with growth inhibition and transglutaminase induction by heteroarotinoids. *Proceedings of the 88th Annual Meeting of the American Association for Cancer Research*, **38**:454, abstract #3037.
21. DiSilvestro, P., Flanagan, C., Angros, L., Benbrook, D. (1997) Decrease in Ki-67 and epidermal growth factor receptor expression correlates with retinoic acid induced growth inhibition in a cervical cancer cell line. *Proceedings of the 88th Annual Meeting of the American Association for Cancer Research*, **38**:88, abstract #592.
22. Ivey, R. T., Brown, D., Berlin, K.D., Benbrook, D.M. (1998) Retinoid response of two ovarian carcinoma cell lines. *Proceedings of the American Association for Cancer Research*, **39**:106-107, abstract #722.
23. Lu, S., Dhar, A., Ivey, R.T., Berlin, K.D., Benbrook, D.M. (1998) Heteroarotinoid structure affects receptor specificity and growth inhibitory activities. *Proceedings of the American Association for Cancer Research*, **39**:107, abstract #723.
24. Zacheis, D.H., Houck, J.R., Berlin, K.D., Benbrook, D.M. (1998) Inhibition of the growth of head and neck squamous cell carcinoma by heteroarotinoids. *Fifth Research Workshop on the Biology, Prevention, and Treatment of Head and Neck Cancer*, Abstract #130.



25. Simms-Kelley, M. D., Subramanian, S., Spruce, L. W., Madler, M. M., Patrick, S. D., Grummer, R., Lemire, T. D., Benbrook, D. M., Birckbichler, P. J., Berlin, K. D., and Nelson, E. C. Growth promoting activity of heteroarotinoids in vitamin A deficient rats. Published in *FASEB Journal* 12(5):A840-A840, (Part 2 Suppl. S), Abstract: 4869, Mar. 1998
26. Dhar, A., Berlin, K.D., Madler, M.M., Ivey, R.T., Birckbichler, P.J., Lu, S., Zacheis, D., and Benbrook, D.M. Flexible Nitrogen Heteroarotinoids: Receptor specificity and Therapeutic Potential in Epithelial Cancers. American Association for Cancer Research Annual Meeting, April 10-14, 1999, Philadelphia, Pennsylvania.
27. Simms-Kelley, M. D., Subramanian, S., Madler, M. M., Patrick, S. D., Klucik, J., Browth, C. E., Liu, S., Lemire, T. D., Benbrook, D. M., Birckbichler, P. J., Berlin, K. D., and Nelson, E. C. Heteroarotinoids promote growth in vitamin A-deficient rats. Published in *FASEB Journal*. *FASEB JOURNAL*, 13 (5): A896-A896 (Part 2 Suppl. S), Mar. 1999
28. Liu, S., Berlin, K.D., Madler, M.M., Benbrook, D.M., Nelson, E.C. Synthesis and structure-activity relationships of nitrogen heteroarotinoids. Published in Abstracts of Papers for the American Chemical Society, 217:U1169-U1169, (Part 1), Abstract: 046-MEDI, Mar. 1999
29. Spencer, C., Benbrook, D.M. "Retinoids induce apoptosis in ovarian organotypic cultures" presented at the Western Association for Gynecologic Oncologists 1999 Annual Meeting. Won award for best abstract.
30. Kamelle, S., Sienko, A., Benbrook, D.M. In vitro representation of endometrium using organotypic culture: A future model for the study of endometrial carcinogenesis. Society of Gynecologic Oncologists 31<sup>st</sup> Annual Meeting, San Diego, CA, February 5-9, 2000, Abstract 85, page 169.
31. Hassan, Benbrook, D.M. , Lightfoot, S.A., Lerner, M.R., Brackett, D.J., Chowdhury, P.S., Pastan, I. SS1(DSFV)-PE38, A recombinant anti-mesothelin immunotoxin targets human gynecologic tumors overexpressing mesothelin. The 36<sup>th</sup> American Society of Clinical Oncology (ASCO) Annual Meeting, May 20-23, 2000, New Orleans, LA.
32. Dhar, A., Berlin, K.D., Benbrook, D.M. Structural Features of Synthetic Retinoids Confer Receptor Selectivity and Refined Biological Activities. American Association for Cancer Research Annual Meeting, April 1-5, 2000, San Francisco, CA.
33. Guruswamy, S., Benbrook, D.M. Retinoids Induce Differentiation and Apoptosis in Ovarian Adenocarcinoma Organotypic Culture. American Association for Cancer Research Annual Meeting, April 1-5, 2000, San Francisco, CA.
34. Lu, S., Benbrook, D.M. (2000) Anti-AP-1 activity of retinoids may not be a contribution to their growth inhibition activity in some tumor cell lines. *Proceedings of the American Association for Cancer Research*, **41**:851.
35. Spencer, C. Benbrook, D.M. "Retinoids induce apoptosis in ovarian organotypic cultures" Presented at Plenary Session of American Society of Clinical Oncologists (ASCO) 2000 Annual Meeting.
36. Benbrook, D.M. Graphics illustrating adenoviral p53 gene therapy for ovarian cancer were shown on "Health Check" presented on News Channel 4, February, 2000.
37. Patrick, S.D., Waugh, K., Subramanian, S., Simms-Kelley, M.D., Benbrook, D.M., Berlin, K.D., Nelson, E.C. Synthetic retinoids induce differentiation in F9 cells. *FASEB*, 2000.

38. Kamelle SA, Sienko A, Benbrook D. An in vitro model of normal endometrium using organotypic culture: The first step in producing a model to study endometrial carcinogenesis. Society of Gynecologic Oncology (SGO) Annual Meeting 2000
39. Daniele Simoni, Marinella Roberti, Riccardo Rondanin, Marcello Rossi, Riccardo Baruchello, Stefania Grimaudo, Manlio Tolomeo, Dhar Arindam, and Doris Benbrook. "A New Class of HeterocyclicContaining Arotinoids Endowed with Potent Differentiating and Apoptotic Activity" XVIth International Symposium on Medicinal Chemistry, Bologna, Italy, September 18-22, 2000.
40. Kamelle, S., Sienko, A., Berlin, K.D., Benbrook, D.M. "Retinoid inhibition of ovarian cancer xenograft growth" Western Association of Gynecologic Oncologist (WAGO) Annual Meeting, Monterray, CA, May, 2000.
41. Patrick, S.D, Waugh. K., Subramanian, S., Simms-Kelley, M.D., Benbrook, D.M., Berlin, K.D., Nelson, E.C. Synthetic retinoids induce differentiation in F9 cells. Federation of the American Society of Experimental Biology, Bethesda, MD, Published in FASEB Journal, 14 (4): A245-A245, Mar. 15 2000.
42. Guruswamy, S., Berlin, K.D., Benbrook, D.M. Chemosensitization of two ovarian carcinoma cell lines to cisplatin by heteroarotinoids. Proceedings of the American Association for Cancer Research. 42:953-954, #5127, 2001.
43. Ju, K.-H., Benbrook, D.M., Berlin, K.D., Hong, W.K., Lotan, R. Induction of apoptosis in head and neck squamous cell carcinoma cell (HNSCC) lines by selected heteroarotinoids. Proceedings of the American Association for Cancer Research. 42:548-549, #2947, 2001.
44. Benbrook, D.M., Sienko, A. A hormonally responsive organotypic model of cycling endometrium. Proceedings of the American Association for Cancer Research. 42:547, #2939, 2001.
45. DuPont, N. Benbrook, D.M. MUC-1 as an indicator of cellular differentiation in ovarian cancer, American College of Obstetricians and Gynecologist (ACOG) District VII meeting, September 25, 2001, Tulsa, OK.
46. Berlin, K.D., Brown, C.W., Benbrook, D.M. Modified heteroarotinoids-anticancer activity. Published in *Abstracts of papers of the American Chemical Society*, 221: U54-U54 (Part 2), Abstract:307-MEDI, Apr. 1 2001
47. Benbrook, D.M., Kamelle, S., Joyce, K., Guruswamy, S., Tillmanns, T., Gould, N., Rutledge, T. Evaluation of Human Papillomavirus and p53 transcriptional activation in the mechanism of 9-cisretinoic acid radiosensitization of squamous gynecologic cancer cell lines. Proceedings of the American Association for Cancer Research 43: 433, #2154, 2002.
48. Guruswamy, S., Benbrook, D.M. The roles of p53, retinoid receptors, and DNA damager response genes in the mechanism of retinoid sensitization of OVCAR-3 to cisplatin. Proceedings of the American Association for Cancer Research 43: #2150, 2002.
49. DuPont, N. Benbrook D.M. The Clinical Significance of MUC-1 Expression in Ovarian Cancer". American College of Obstetricians and Gynecologists District VII meeting, October 11, 2002, New Orleans, LA.
50. Benbrook, D.M. Both receptor-active and receptor-independent retinoids regulate of growth, differentiation and apoptosis without toxicity in an ovarian cancer xenograft model. Proceedings of the American Association for Cancer Research: 2003.

51. Arendse, C.E., Brennan, M., Benbrook, D.M., Hendricks, D.T. Characterisation of heteroarotinoids as potential agents in the treatment of oesophageal cancer. IUBMB conference in Toronto, Ontario, Canada, July 2003
52. Benbrook, D.M. and Lightfoot, S.L. Reactive Oxygen Species (ROS) are involved in the mechanism of SHetA2-induced apoptosis but not differentiation in ovarian cancer organotypic cultures. *Proceedings of the American Association for Cancer Research* 45: 2004
53. Lightfoot, S.L. and Benbrook, D.M. Effects of steroids and retinoids in an organotypic model of endometrial carcinogenesis. *Proceedings of the American Association for Cancer Research* 45: 2004
54. Liu, Z. Covey, J., Benbrook, D., Chan, K. "Pharmacokinetic and Metabolism Study of SHetA2 (NSC 683864), a New Heteroarotinoid Antitumor Agent in the Rat" American Association for Pharmaceutical Sciences (AAPS), Nov., 2004
55. Hannafon, B.N., Dearnley, D.D., Benbrook D.M. Gene Expression of the Angiogenic Factor Thrombospondin 4 can be inhibited by SHetA2 in Ovarian Cancer Cells. MD Anderson 5<sup>th</sup> International Conference on Ovarian Cancer, Dec. 1-4, 2004.
56. Dearnley, D.D., Hannafon, B.N., Benbrook, D.M. A Novel Chemotherapeutic Agent, SHetA2, Inhibits Expression of Platelet Derived Endothelial Cell Growth Factor (PD-ECGF) in Ovarian Cancer and Angiogenesis *In Vitro*. MD Anderson 5<sup>th</sup> International Conference on Ovarian Cancer, Dec. 1-4, 2004.
57. De Bault, L.E., Lu, S., Angros, L.H., Benbrookm D.M. Retinoic acid effects on the expression of EGFreceptor mRNA and its protein in cervical cancer cells in vitro. *Journal of Histochemistry & Cytochemistry*, 52:S36-S36, Jul. 2004
58. Dearnley, D.D., Hannafon, B., Ding, W.-Q., Lind, S., Cook, S. Benbrook, D.M. Regulation of Gene Expression and Vascular Capillary Formation by a Novel Anticancer Compound, SHetA2. *Proceedings of the American Association for Cancer Research* 46: 2005
59. Kelly, W.J., Gill, L.W., Hannafon, B., Benbrook, D.M. SHetA2 induces mitochondrial swelling, superoxide formation and apoptosis in human cancer cells. Published in *Abstracts of the American Chemical Society*, 22: U492-U492 (Part) 1, Abstract: 874-CHED, 2005 .
60. Lightfoot, S, Chenedza, S., Naylor, M., Benbrook, D.M. Inhibition of thymidine phosphorylase (TP), thrombospondin 4 (TSP4) and angiogenesis by flexible heteroarotinoids (Flex-Het), SHetA2. *Proceedings of the American Association for Cancer Research* 47:57, 2006
61. Benbrook, D.M., Lightfoot, S., Ranger-Moore, J. Karyometric analysis of inhibition of DMBA carcinogenesis by flexible heteroarotinoids (Flex-Het) SHetA2 in an endometrial organotypic model. *Proceedings of the American Association for Cancer Research* 47:917, 2006
62. Ju, T.Z., Lenneau, G., Gautam, T., Wang, Y.C., Benbrook, D., Hanigan, M.H., Cummings, R.D. Expression of Tn and SialylTn antigens in human tumor cell lines raised from mutation in molecular chaperone cosmc. *Glycobiology* 16 (11): 1113-1113, 2006
63. Myers, T., Benbrook, D.M. Thymidine phosphorylase is a molecular target of SHetA2 antiangiogenesis activity. *Angiogenesis Research & Therapeutics* February 8-9<sup>th</sup>, 2007
64. Myers, T. Benbrook, D.M. Thymidine phosphorylase is a molecular target of SHetA2 antiangiogenesis activity. *Proceedings of the American Association for Cancer Research* 48:4615, 2007

65. Ju, T., Lanneau, G.S., Gautam, T., Wang, Y., Xia, B., Stowell, S.R., Willard, M.T., Benbrook, D.M., Hanigan, M.H., Cummings, R. D. Human tumor antigens arising from mutations in Cosmc Proceedings of the American Association for Cancer Research 48:406, 2007
66. Chenedza, S. Liu, T., Benbrook, D.M. SHetA2 Effects on Thymidine Phosphorylase and NF- $\kappa$ B activity. AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, October 22-26, 2007
67. Masamha, C. P., Liu, T., Benbrook, D.M. SHetA2 targets cyclin D1 for proteasomal degradation through a GSK3 $\beta$ -independent mechanism leading to G1 cell cycle arrest. AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, October 22-26, 2007. Published in *Molecular Cancer Therapeutics* 6(12):3372S-3372S, Dec. 2007
68. Liu, T. Masamha, C.P., Chenedza, S., Benbrook, D.M. Regulation of apoptosis, cell cycle progression and differentiation by SHetA2 in renal cancer cells is associated with alterations in Bcl-2, Cyclin D1 and E-Cadherin proteins. AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, October 22-26, 2007
69. Chenedza, S., Benbrook, D.M. Effects of SHetA2 on I $\kappa$ Ba and NF- $\kappa$ B in Ovarian Cancer. NFkappaB Keystone Symposium, February 12-17, 2008. Published in *Molecular Cancer Therapeutics*, 6 (12): 3442S-3443S, Dec. 2007
70. Masamha, C.P. Liu, T. Benbrook, D.M. Elucidation of the roles of cyclin D1 and up- and down-stream effectors in the mechanism of SHetA2 induced G1 cell cycle arrest. 2008. Abstract # 143. The Cell Cycle. Cold Spring Harbor Laboratory, Cold Springs Harbor, New York. p142
71. Chenedza, S., Benbrook, D. M. Inhibition of NF- $\kappa$ B Activity By SHetA2 Overcomes Tumor Necrosis Factor-Alpha Resistance in Ovarian Cancer Cells. Poster Presentation. Third Annual NIH National Graduate Student Research Festival. September 11 - 12, NIH, Bethesda, MD.
72. McDaniel, S., Benbrook, D. M. Deciphering Structural Features Important for Heteroarotinoid Growth Inhibition Activity in Normal and Cancerous Ovarian Cells. Poster Presentation at 2008 Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) National Conference being held in Atlanta, GA, October 23-27, 2008.
73. Ju, T.Z., Lanneau, G.S., Gautam, T., Wang, Y.C., Xia, B.Y., Stowell, S.R., Willard, M.T., Wang, W.Y., Xia, J.Y., Zuna, R.E., Laszik, Z., Benbrook, D.M., Hanigan, M.H., Cummings, R.D. Anticancer Research, 28(5C): 3337-3337, Meeting Abstract: 315 , Sep-Oct, 2008
74. Moxley, K. Dozmorov, I., Lightfoot, S., Benbrook, D.M. Dynamics of DMBA-induced transformation and gene expression in endometrial organotypic cultures. Proceedings of the AACR 100th Annual Meeting 2009 in Denver, CO, Abstract #3305.
75. Masamha, P. Benbrook, D.M. p21 prevents aberrant cyclin E2 expression from interfering with G1 arrest caused by SHetA2-induced cyclin D1 loss in ovarian cancer cell lines. roceedings of the AACR 100th Annual Meeting 2009 in Denver, CO, Abstract #1280.
76. Chenedza, S., Benbrook, D.M. Sensitizatoin of ovarian cancer cell lines to death receptor ligands by the flexible heteroarotinoid (Flex-Het), SHetA2. AACR 100th Annual Meeting 2009 in Denver, CO, Abstract #5121.
77. Usha, L., Sill, M.W., Darcy, K.M., Benbrook, D.M., Hurteau, J., Michelin, D.P., Mannel, R.S, Hanjani, P., DeGeest, K., Godwin, A. A Gynecologic Oncology Group phase II trial of the protein kinase C $\beta$

inhibitor, enzastaurin and evaluation of markers with potential predictive and prognostic value in persistent or recurrent epithelial ovarian and primary peritoneal malignancies. *Gynecologic Oncology* 116:S16-S16 Suppl. 1, 2010.

78. Hurteau, J., McGuire, W., Darcy, K., Pearl, M.L., Ivanov, L., Tewari, K., Mannel, R. S., Zanotti, K.M., Benbrook, D. M. A Randomized Phase III Trial of Tamoxifen versus Thalidomide in Women with Biochemical-Recurrent Only Epithelial Ovarian, Fallopian Tube or Primary Peritoneal Carcinoma with an Evaluation of Serum Vascular Endothelial Growth Factor: A Gynecologic Oncology Group Study. Society of Gynecologic Oncology 2010
79. Moxley, K., Benbrook, D., Moore, K., Zuna, R. The role of single-nucleotide polymorphisms in the ERCC1 gene in predicting the sensitivity of epithelial ovarian carcinoma to platinum-based chemotherapy and overall patient survival *Gynecologic Oncology* 116: S154-S155 Suppl. 2010.
80. Zakharov, A.D., Kabirov, K.K., Nikolić, D., Chen, L., Mankovskaya, I., van Breemen, R.B., Benbrook, D.M., Kapetanovic, I.M., Lyubimov, A.V. Analysis of a new chemo preventative agent SHetA2 and its metabolites in Beagle dog liver, American Association for Cancer Research Annual Meeting, Chicago, IL March-April, 2012.
81. Benbrook, D., Bishop, E. Nugent, E., Lightfoot, S., Elangovan, T., Long, A., Zhao, D. Modeling effects of diabetes and obesity co-morbidities in endometrial cancer development and progression. BMC Proceedings Vol 6, Suppl. 3: P56. Metabolism Diet and Disease. Georgetown University Hotel and Conference Center, Washington, D.C. May 29-31, 2012.  
<http://www.biomedcentral.com/bmcproc/supplements/6/S3>
82. Nugent, E., Long, A., Mathews, C., Bishop, E., Moxley, K., Benbrook, D., Wild, R., McMeekin, D. Biomarkers associated with metabolic syndrome, endometrioid adenocarcinoma (EC) of the uterus, and disease prognosis. *Gynecologic Oncology*, Volume 127, Issue 1, October 2012, Pages S7-S8.
83. Ankur Sharma, Doris M. Benbrook, Sukyung Woo, Application of interspecies scaling to predict SHetA2 pharmacokinetics in humans, 38th annual GREAT Symposium, OUHSC, OKC, OK. April 1-4, 2013 (Abstract#76)
84. Lightfoot, S., Zhao, D., Thavathiru, E., Benbrook, D.M. SHetA2 decreases mitoses and growth, and alters pathology of MNU-induced rat mammary tumors. Annual American Association for Cancer Research Meeting, Washington, D.D., April 6-10, 2013
85. Nugent, E., Benbrook, D., Long, A, Moxley, K., Wild, R., McMeekin, D.S. Biomarkers associated with metabolic syndrome, endometrioid adenocarcinoma (EC) of the uterus, and disease prognosis. Volume 130, Issue 1, July 2013, Pages e86–e87. PMID: 24989593
86. Ankur Sharma, Doris M Benbrook, Sukyung Woo, First-in-Human Dose Determination for a Phase 0 Study of SHetA2, a Novel Anticancer Agent Using the Interspecies Scaling. 2013 AAPS Annual Meeting and Exposition, San Antonio, USA.  
(<http://abstracts.aaps.org/Verify/aaps2013/postersubmissions/T3236.pdf>) (Abstract#T3236)
87. M. Ibrahim, D.M. Benbrook, and L. Garcia-Contreras. "Formulation and Characterization of Sheta2 Capsules for Phase 0 Clinical Trials". American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition. San Antonio, TX, November 2013
88. Gunderson, C.C., Benbrook, D.M., Farris, R., Butler, J.L., Ding, K., Smith, K.M. "Factors Affecting Differential Incidence of Adenocarcinoma of the Cervix." Accepted for Oral Presentation at American Society of Colposcopy and Cervical Pathology Biennial Meeting, Scottsdale, AZ; April 2014.

89. Slaughter, K., Thai, T.C., Penarozza, S., Benbrook, D.M., Thavathiru, D.M., Ding, K., Nelson, T., McMeekin, D.S. (2014) Measurements of adiposity as predictive biomarkers for response to first-line bevacizumab-based chemotherapy in epithelial ovarian cancer. *Gynecologic Oncology*, Volume 130, Issue 1, July 2013, Pages e86-e87. PMID 24680585
90. Ibrahim, M., Benbrook, D., Garcia-Contreras, L. (2014) Development of a Powder-Filled Capsule Formulation for SHetA2, a Novel Anticancer Drug. 2014 American Association of Pharmaceutical Sciences (AAPS) Annual Meeting and Exposition, November 2-6, 2014 at the San Diego Convention Center in San Diego/CA. Poster #:T3199.
91. Ankur Sharma, Elangovan Thavathiru, Doris M Benbrook, Sukyung Woo Physiologically-Based Pharmacokinetic Models for SHetA2 in Orthotopic Murine Model of Ovarian Cancer. 2015 AAPS Annual Meeting and Exposition, Orange County Convention Center, Orlando, Fla, USA (<http://abstracts.aaps.org/Verify/AAPS2015/PosterSubmissions/R6310.pdf>) (Abstract#R6310)  
**\*Awarded 2015 AAiPS Research Award in PPDM section**
92. Eschiti, V., Benbrook, D., Sanford, S., Rhoades, D., Doescher, M., Warson, E., Lauderdale, J., & Matzo, M. (2015) "Art Interventions for Palliative Care Symptom Management in Comanche Cancer Survivors." Podium presentation, Partners in Quality: Evidence-based Practice and Quality Improvement, Oklahoma City, OK.
93. M. Ibrahim, D.M. Benbrook, and L. Garcia-Contreras. "Optimization of Inhalable SHetA2 Microparticles for Tuberculosis Treatment". American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition. Orlando, FL. October 25-29, 2015.
94. Ankur Sharma, Elangovan Thavathiru, Satish K Ramraj, Doris M Benbrook, Sukyung Woo, Physiologically-Based Pharmacokinetic Models For SHetA2 In Orthotopic Murine Model Of Ovarian Cancer. 2016 Stephenson Cancer Center Research Symposium, OUHSC, OKC, January 29, 2016.
95. Satish Kumar Ramraj, Elangovan Thavathiru, Coralee Toal, Katie Smith, Elisa Crouse, Doris M. Benbrook, Targeting mortalin-p53 interaction in differential induction of apoptosis in cancer over normal cells. 2016 Stephenson Cancer Center Research Symposium, OUHSC, OKC, January 29, 2016.
96. Sanjida Mahjabeen, Sanjida, Chandra, Vishal, Hatipoglu, Manolya K., Benbrook, Doris M., Garcia-Contreras, Lucila. Formulation of SHetA2 in a Vaginal Suppository for Chemoprevention Against Cervical Dysplasia. 2016 Stephenson Cancer Center Research Symposium, OUHSC, OKC, January 29, 2016.
97. Yari, Hooman, Hatipoblu, Manolya Kukut, Benbrook, Doris M., Garcia-Contreras, Lucila. Formulation of SHetA2 Nanoparticles for the Treatment of Lung Cancer. 2016 Stephenson Cancer Center Research Symposium, OUHSC, OKC, January 29, 2016.
98. Pouland, T., Bunce, R. Berlin, K.D., Benbrook, D.M. Structure Activity Relationship of Analogs of a Cancer- Selective Small Molecule, OK-1. International Ovarian Cancer Research Symposium. Stephenson Cancer Center, Aug. 28 – 30, 2016
99. S. Mahjabeen, V. Chandra, M.K. Hatipoglu, D. Benbrook, L. Garcia-Contreras. "Formulation of SHetA2 in a Vaginal Suppository for Chemoprevention against Cervical Dysplasia." American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition. Denver, CO. November 13-17, 2016.
100. S.K. Hatipoglu, S. Mahjabeen, D. Benbrook, L. Garcia-Contreras. "Development and Validation of Reverse Phase HPLC Method for SHetA2 in Gynecological Tissue for Treatment of Cervical

Dysplasia.” American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition. Denver, CO. November 13-17, 2016.

101. Thavathiru, E., Chandra, V., Rai, R., Benbrook, D.M. Mortalin precursor as potential marker for chemoprevention with SHetA2. American Association for Cancer Research (AACR) Annual Meeting, Washington D.C., April 1-5, 2017.
102. Chandra, V., Long, A., Masamha, C.P., Benbrook, D.M. Mitophagy induction and interference with cancer-specific apoptosis in SHetA2-treated cells. American Association for Cancer Research (AACR) Annual Meeting, Washington D.C., April 1-5, 2017.
103. Ramraj, Satish Kumar, Pelikan, R., Chandra, V., Benbrook, D. SHetA2 targets mortalin-p53 interaction in differential induction of apoptosis in ovarian cancer over normal cells. American Association for Cancer Research (AACR) Annual Meeting, Washington D.C., April 1-5, 2017.
104. Watts FM; Berlin KD; Benbrook DM; Bunce, RA. Synthesis of Oxygen Analogues of a Promising Anticancer Drug. The 62<sup>nd</sup> Annual Oklahoma Pentasectional Meeting of the American Chemical Society, March 24-25, 2017, at Cameron University, Lawton, Oklahoma.
105. Watts FM; Berlin KD; Benbrook DM; Bunce, RA. 26th Meeting of the International Society of Heterocyclic Chemists-ISHC Regensburg, Germany, September 3, 2017 to September 8, 2017.
106. Ramraj, S. K., Benbrook, D.M. “*Synergistic combination of mortalin-targeting and p53 reactivator drugs for ovarian cancer*” to the [12th Biennial Ovarian Cancer Research Symposium](#) on September 13-15<sup>th</sup>, 2018 at the University of Washington in Seattle, WA.

#### **INVITED LECTURES**

1. “Interaction of CREB and Jun transcription Factors” September 1991 Department of Microbiology, Oklahoma State University
2. “Interaction of CREB and Jun Transcription Factors” September 1991 Department of Biochemistry and Molecular Biology, University of Oklahoma
3. “Effects of Retinoids on Organotypically Grown Tumors” 1993 Department of Biochemistry and Molecular Biology, Oklahoma State University
4. “The Influence of Diet and Retinoic Acid on Cancer” 1993 Science Forum, Combined NIH Training Grants Meeting Oklahoma Memorial Research Foundation
5. “Retinoid Effects on Organotypically Grown Cervical Tumor Tissue” 1993 Department of Anatomy, University of Oklahoma
6. “Radiation and Retinoid Effects on Cervical Cancer” 1994 Department of Pathology , University of Oklahoma
7. “Drug Discovery and Design” 1994 Premed Club, University of Oklahoma Undergraduate School, Norman, Oklahoma
8. "Translational Research: Studying the Relationship Between Nutrition and Cancer" November 1995, Obstetrics and Gynecology Grand Rounds, University of Oklahoma
9. "The Food You Eat Can Change You" November 1997 The Science Forum at the Oklahoma Medical Research Foundation
10. “Oncogenes and Tumor Suppressor Genes” May 1997 Obstetrics and Gynecology Grand Rounds, University of Oklahoma
11. “Oncogenes and Tumor Suppressor Genes” June 1997 Cancer Conference at INTEGRIS Baptist Medical Center, Oklahoma City, Oklahoma
12. “Prevention and Treatment of Cervical Cancer with Synthetic Retinoids” July 1997 Drug Dynamic Institute, University of Texas at Austin, Texas



13. "Cancer Genetics" October 1997  
Womens Health Symposium, Marriot Hotel, Oklahoma City, Oklahoma
14. "Potential and Molecular Markers for 4HPR in Chemoprevention of Ovarian Cancer"  
July 1998, Gynecological Oncology Group Semi-annual Meeting, Toronto, Ontario
15. "Translational Research to Develop Retinoids for Gynecological Cancers" September 1998  
Department of Cellular Biology, Louisiana State University, Shreveport, LA
16. "Translational Research to Develop Retinoids for Gynecological Cancers" September 1998  
Department of Biochemistry and Molecular Biology, University of Oklahoma HSC
17. "Translational Research to Develop Retinoids for Gynecological Cancers" September 1998  
Department of Cellular and Molecular Medicine, University of Ottawa, Ottawa, Ontario
18. "Translational Research to Develop Retinoids for Gynecological Cancers" October 1998 Oklahoma  
Memorial Research Foundation, Oklahoma City, OK
19. "Anti-AP1 activity of Retinoids: Correlation with Growth Inhibition and Radiosensitization"  
February 1999, Steroid Hormone Receptor Group, Oklahoma City, OK
20. "Organotypic Culture Models of Gynecological Cancer and Disease" March 1999 Obstetrics and  
Gynecology Grand Rounds University of Oklahoma HSC
21. "Adenoviral p53 Gene Therapy for Ovarian Cancer" February 2000  
"Health Check" News Channel 4
22. "Molecular Biological Techniques" February, 2000  
Obstetrics and Gynecology Grand Rounds University of Oklahoma HSC
23. "Molecular Advances in Cancer Therapy" March, 2000 Academy of Medicine, Oklahoma City, OK
24. "Molecular Mechanisms of Retinoids Against Gynecologic Cancers" June 2000  
Federation of the American Association of Experimental Biology (FASEB)  
Special Meeting on Retinoids, Copper Mountain Colorado
25. "Retinoids, not just for Acne Anymore" September 2000  
Oklahoma Memorial Research Foundation, Oklahoma City, OK
26. "Molecular Mechanisms of Retinoid Drugs" October 2000  
Shanghai Institute of Biochemistry, Shanghai, China
27. "Tumor Suppressor Genes and DNA Tumor Viruses" April, 2001  
Annual Spring Meeting of the Texas Section of the American Association for Clinical Chemistry.  
Sam Noble Historical Museum, Norman, OK
28. "Retinoids, Apoptosis and Cancer", June 7, 2001 Policlinico P. Giaccone, Palermo, Italy
29. "Development of Retinoids for Chemoprevention" June 21, 2001 Dip. Sc. Farmaceutiche, Ferrara,  
Italy
30. "Refining Retinoids with Heteroatoms" March 14, 2002 Procter & Gamble, Cincinnati, OH
31. "Relations of Differentiation, Apoptosis and MUC1 in Retinoid Growth Inhibition of Ovarian Cancer"  
June 24<sup>th</sup>, 2002 FASEB Summer Research Conferences, Retinoids, Tucson, AZ
32. "Molecular Biology of Endometrial Cancer" December 5-6, 2002  
Controversies in the Management of Gynecologic Malignancies Conference 3, Washington, D.C.
33. "Organotypic Models of Carcinogenesis" December 13, 2002  
Cancer Group, Oklahoma Memorial Research Foundation, Oklahoma City, OK
34. "Biomarkers, Histology & Stem Cells in Endometrial Cycling & Cancer" February 19, 2003  
Gynecologic Oncology Program of the OU Cancer Center Meeting, Oklahoma City, OK
35. "Understanding Cancer and Developing New Prevention and Treatment Strategies"  
February 21, 2003, Womens Health Center Research Meeting  
University of Oklahoma Health Sciences Center, Oklahoma City, OK
36. "SHetA2 Regulation of Growth, Differentiation and Apoptosis in Cancer Cells and Tumors without  
Evidence of Toxicity" April 1, 2003 National Cancer Access to Intervention and Development  
(RAID) Program, National Cancer Institute, Bethesda, MD
37. "Carcinogenesis and Chemoprevention of Gynecologic Cancers" April 30, 2003, Department of  
Biochemistry and Molecular Biology, University of Oklahoma Health Sciences Center, Oklahoma  
City, OK



38. "Development of Chemoprevention Drugs that Regulate Growth, Apoptosis and Differentiation in Cancer Cells without Toxicity" May 6, 2003, Breast Cancer Program of the OU Cancer Center Meeting, University of Oklahoma Health Sciences Center, Oklahoma City, OK
39. "Translational Research and the Dawn Hope Tissue Bank" May 12, 2003, Aventis Site Visit, Section of Gynecologic Oncology, Department of Obstetrics and Gynecology University of Oklahoma Health Sciences Center, Oklahoma City, OK
40. "Development of Heteroarotinoids for Chemoprevention" May 19, 2003, Encore Site Visit, Free Radical Biology Section, Oklahoma Medical Research Foundation (OMRF), Oklahoma City, OK
41. "How to Get an NCI Grant" September 5, 2003  
Grant Writing Workshop, OU Cancer Center, Oklahoma City, OK
42. "Preclinical Development of SHetA2 for Cancer", October 10, 2003  
Huntsman Cancer Center, Ovarian Cancer Research Group, Salt Lake City, Utah
43. "Mechanism of Differentiation and Apoptosis Induction in Cancer Cells by a Retinoid Receptor-Independent Heteroarotinoid, SHetA2" June 12-17, 2004, FASEB Summer Research Conference on Retinoids, Callaway Gardens, GA
44. "Preclinical Development of SHetA2 for Cancer" August 23, 2004, Department of Medicine Grand Rounds, University of Oklahoma Health Sciences Center, Oklahoma City, OK
45. "Preclinical Development of Flex-Hets" December 16, 2004, Section of Endocrinology Grand Rounds, Department of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK
46. "Drug Development in Oklahoma" Aired on January 5<sup>th</sup> and 6<sup>th</sup>, 2005, Oklahoma Innovations Radio Show, KCCU, KLCU, KYCU, KCCU, KTOK, KRMG and KMCU Oklahoma and Texas (AM and FM),
47. "Development of Drugs that Target Mitochondria" January 10, 2005, Department of Microbiology, Oklahoma State University, Stillwater, OK
48. "Flex-Hets" Meet the Scientist, i2E, Oklahoma City, OK, January 26, 2005
49. "How to make a Chemical into a Drug" March 10, 2005, Chemistry Club, Southwestern Oklahoma State University, Weatherford, OK,
50. "Mitochondria and Gene Expression in Flex-Het Induction of Apoptosis in Cancer versus Normal Cells". Winship Cancer Center, Emory University, Atlanta, GA, July 15, 2005
51. "Glycoproteins in Cervical Cancer Metastases" November 8, 2005, OU Cancer Center Cell Biology Program, OUHSC, Oklahoma City, OK
51. "Angiogenesis Biomarkers in GOG Thalidomide Trials" January 21, 2006, Gynecologic Oncology Group (GOG) semi-annual meeting, San Diego, CA, "Developing Drugs and Biomarkers for Cancer" May 10, 2006, Biochemistry and Cell Biology Seminar Series, University of Oklahoma Health Sciences Center
52. "Flex-Het Regulation of Gene Expression, Angiogenesis and Apoptosis" 2006, Federation for the American Association of Experimental Biology (FASEB) Conference on Retinoids, Indian Wells, CA.
53. "Angiogenesis targeting in Ovarian Cancer" November 30, 2006, 7th Annual International Conference on Ovarian Cancer, MD Anderson Cancer Center, Houston
54. "Molecular Mechanisms of Apoptosis and Angiogenesis Regulation by Flex-Het Drugs" December 11, 2006, University of Maryland, MD
55. "Reversal of Abnormal Differentiation in Cancer and Polycystic Kidney Disease by Flex-Hets" October 1, 2007, Pathology Grand Rounds, University of Oklahoma Health Sciences Center
56. "Translating Flex-Het Drug and Biomarker Research to Clinical Application" November 7, 2007 Gynecologic Oncology Grand Rounds, MD Anderson Cancer Center, Houston, TX
57. "Translating Flex-Het Drug and Biomarker Research to Clinical Application" November 8, 2007 College of Pharmacy Research Seminar, University of Oklahoma Health Sciences Center
58. "Developing a Pill for Cancer Prevention" various dates, 2008 Newspaper articles: The Tulsa World, The Oklahoman, Television News: NewsChannel 9 (KWTU), NewsChannel 4 (KFOR) January 31, 2008; OETA, February 1, 2008, Tulsa World Editorial, February 3, 2008, Edmond Sun, February 11<sup>th</sup>
59. "Signal Transduction Mechanisms of Flex-Het Therapeutic and Chemoprevention Activity" March 18, 2008, University of Illinois at Chicago, Chicago, IL

60. "Systems Biology of Flex-Het Drugs and Cancer Biomarkers in Experimental Models and Clinical Trials" May 13<sup>th</sup>, 2008, Notre Dame, Indiana
61. Oklahoma Sunday Magazine Interview aired by Citadel Radio on various stations, including KATTFM, KYIS-FM, WWLS-FM & AM and KKWD, August 24, 2008
62. Interview with Robing Decken-Kite about my research on Community Talk Radio aired on KTLR AM890 September 30, 2008
81. "Systems Biology and Translation of an Organotypic Model of Carcinogenesis and Chemoprevention" Sep 11, 2008, Department of Physiology, University of Oklahoma Health Sciences Center
82. "OU Medicine Minute", 04/08/09 06:06:15AM Oklahoma City (KWTv) 01:00 News 9 This Morning; 04/08/09 05:17:19PM Oklahoma City (KWTv) 01:00 News 9 @ 5pm; 04/09/09 04:43:56PM Oklahoma City (KWTv) 01:00 News 9 @ 4pm; 04/10/09 12:04:09PM Oklahoma City (KWTv) 01:00 News 9 @ Noon; 04/10/09 06:03:24PM Oklahoma City (KWTv) 01:00 News 9 @ 6pm; 04/11/09 06:12:05AM Oklahoma City (KWTv) 01:00 News 9 Saturday Morning; 04/12/09 10:06:14PM Oklahoma City (KWTv) 01:00 News 9 @ 10pm Sunday
83. "Translation of Biological Systems Driving Experimental Carcinogenesis and Chemoprevention to Clinical Application" April 30, 2009, University of Louisiana Shreveport Cancer Center, LA
84. "We're Betting on a Cure" Speaking part in thirty second media commercial, produced by Skyline Media Group, Inc., aired May, 2009
85. "Oklahoma Students Care", video production, June 2009
86. "Preclinical Development of SHetA2" February 4, 2010, College of Veterinary Sciences, Oklahoma State University, Stillwater, OK
87. "Progress Report on Development of SHetA2 for Chemoprevention" April 3, 2010, HOPE Ovarian Cancer Survivor Group, University of Oklahoma Health Sciences Center
88. "Development of Flex-Het Drugs for Prevention and Treatment of Cancer: From basic laboratory science to clinical trials" June 23, 2010, University of Cape Town, Cape Town, South Africa
89. "Development of a Flex-Het Drug and Biomarkers for a Chemoprevention Clinical Trial", December 21, 2010, International Cancer Research Symposium 2010: Defining & Translating Science Behind Disease. Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, Kerala, India
90. "Before You Can Shoot, You Need to Know What the Target Is" February 9, 2011, Symposium on Drug Design and Molecular Pharmacology. University of Southern California
91. "Collaboration in Drug Discovery and Translation to Clinical Trials" May 17, 2011, The 14th annual Rall Symposium for Undergraduate Research, North Central College, Naperville, IL
92. "How to know which targets to hit in the fight against cancer" June 15, 2011, Departments of Biochemistry & Molecular Biology and Cell Biology Seminar Series, University of Oklahoma Health Sciences Center,
93. "Development of a cancer prevention pill", October 22, 2011 Ovarian Cancer Support Group, Bartlesville, OK
94. "Heat Shock Proteins and Stress Response Pathways in Cancer Drug Development" October 12, 2012, Department of Biochemistry, Oklahoma State University, Stillwater, OK
95. "Stress Response in Ovarian Cancer Resistance", September 29, 2012 MD Anderson Cancer Center and Stephenson Cancer Center Collaborative Retreat, MD Anderson Cancer Center, Houston, TX
96. "Leveraging Cell Stress Response Pathways in Drug Discovery", December 3, 2012 Tumor Microenvironment and Drug Discovery Conference, Stephenson Cancer Center
96. "Phase 0 Trial of SHetA2", October 26, 2013 Women's Cancer Program Monthly Meeting, Stephenson Cancer Center, Oklahoma City, OK
97. "Mechanism of SHetA2 Differential Effects on Cancer over Normal Cells" Experimental Therapeutics Program Monthly Meeting, Stephenson Cancer Center, Oklahoma City, OK December 12, 2013
98. "Translating mechanistic and pharmacokinetic studies into S-Het-A2 drug clinical trials" February 1, 2013, Monthly Research Seminar Series, Stephenson Cancer Center, Oklahoma City, OK  
"Curing Cancer with Chemistry" March 7, 2013, Chemistry Club Meeting, University of Central Oklahoma, Edmond, OK

94. "Cancer Prevention" March 16, 2013, Women's Enrichment Fellowship Talk Show, Forward in Faith Ministries International, Farmers Branch, TX
95. "Development of a Cancer Drug: From Tubes to Tissues to Treatments" September 24, 2013 Department of Cell Biology and Biochemistry, Texas Tech University, Lubbock Texas
96. "Bringing our small molecule drug over the pharmaceutical wall into clinical trial" January 28, 2014 Department of Pharmaceutical Sciences, University of Oklahoma Health Sciences Center
97. "How Cancer Cells Use ER Stress and Autophagy to Eat Stroma" February 9<sup>th</sup> - 11<sup>th</sup>, 2014 1st Annual Meeting of the International Ovarian Cancer Consortium: Tumor Microenvironment and Drug Discovery, Stephenson Cancer Center, OUHSC, Oklahoma City, OK
98. "Drug-Conjugated Nanoparticles Reveal Mechanism of SHetA2 Drug Activity" 17-19 April 2014 2nd International BAU Drug Design Congress, Istanbul, Turkey
99. "Phase 0 Trial of SHetA2 for Ovarian Cancer Chemoprevention" May 28, 2014 Gynecologic Cancers Program Meeting, Stephenson Cancer Center, Oklahoma City, OK
100. "Autophagy and Immunology in Ovarian Cancer" August 28, 2014. MD Anderson Cancer Center/Stephenson Cancer Center (MDACC/SCC) Collaboration
101. "Integration of autophagy and apoptosis in the tumor microenvironment and downstream of mortalin/client protein disruption" Eppley Seminar Series, University of Nebraska, September 5, 2014
102. "A Journey from Vitamin A to Mortalin in a Quest to Prevent Cancer" Institute for Natural Products Applications & Research Technologies (INPART) Seminar, University of Oklahoma Norman, OK, April 16, 2015
103. "Targeting Mortalin in Ovarian Cancer Chemoprevention", 2nd Annual Meeting of the International Ovarian Cancer Consortium and the Symposium on Tumor Microenvironment and Therapeutic Resistance on August 16 - 18, 2015 at the Stephenson Cancer Center in Oklahoma City.
104. "Ovarian Cancer" National Ovarian Cancer Philanthropy Event organized by OU Student Organization, Lambda Delta Psi, University of Oklahoma, Norman, OK, September 17, 2015
105. "Finding and Fighting the Origins of Cancer", Physiology Seminar Series, University of Oklahoma Health Sciences Center, Oklahoma City, OK. February 25, 2016.
106. "Ovarian Cancer Prevention. HOPE Ovarian Cancer Survival Group, Stephenson Cancer Center, Oklahoma City, OK. April 4, 2016
107. Finding and Fighting the Origins of Cancer", Central Travel Club, Oklahoma City, OK. April 15, 2016
108. "Why an Ounce of Prevention Costs More than a Pound of Cure", Annual Stephenson Cancer Center Board of Advocates Meeting, Oklahoma City, OK August 12, 2016
109. "An Ounce of Prevention Costs More than a Pound of Cure" Hematology Oncology Grand Rounds, Stephenson Cancer Center, University of Oklahoma Health Sciences Center, Oklahoma City, OK August 19, 2016
110. Speaker and Panel Member OKC Chamber of Commerce Annual Breakfast, Oklahoma City, OK September 7, 2016
111. "Identifying and validating molecular targets for development of cancer prevention and treatment drugs." Obstetrics and Gynecology Grand Rounds, University of Oklahoma Health Sciences Center, Oklahoma City, OK. September 9, 2016.
112. "Bringing an Oklahoma-Made Drug to Clinical Trial" Annual Stephenson Cancer Center Symposium, University of Oklahoma Health Sciences Center, January 27, 2017.
113. "How We Are Trying to Prevent & Kill Cancer Without Harming You" Gynecologic Cancer's Survivors Workshop, September 16, 2017,

## **TEACHING AND EDUCATIONAL ADMINISTRATION**

### **Foundations in Translational Research Course (Course Director), 2014-present**

- This course

### **Translational Research Certificate for PhD Degrees (Director)**

- Assisted Dean of the Graduate College to develop infrastructure and submit CTSA grant section to support this specialty.

### **Med into Science Initiative**

- Service on committee to develop a Medical Specialty Certificate for PhD students and submit a grant to the Howard Hughes Medical School to Support this initiative.
- Developed Course “Clinical Validation of Basic Science Results”

### **Medical School Curriculum**

- Molecular and Cellular Systems, Committee to Revise Curriculum for systems based learning approach 2007 – 2008

### **Clinical and Translational Science Award (CTSA) Summer Scholar Program 2007-present.**

- Clinical and Translational Science (2 hours)
- The University of Oklahoma Cancer Institute (1 hour)

### **Clinical Bioinformatics (RADI5403, RADI5413)**

Assisted in development of this new course in 2005 and lectured in:

- Structural Biology (1.5 hrs)
- Carcinogenesis, Chemoprevention and Cancer Genetics (1.5 hrs)
- Angiogenesis, molecular targets for treatment, diagnosis, monitoring & imaging (1.5 hrs)
- Cancer Metastasis and Immunity, treatment, diagnosis, monitoring & imaging (1.5 hrs) □  
Lunch and Learn (2 hrs)

### **Integrated Graduate Student Curriculum.**

- CSI and CSII, Cellular Systems, Integration of Cell Death and Survival Pathways (4.5 hrs) 2012-present
- CSI and CSII, Cellular Systems, Apoptosis (1.5 hours) 2007-2009
- Cell Death (2 hrs) 2011
- BMSC 5221 Cancer Journal Club (4 hours) 2002-2003, 2005-present
- BMSB 6100 Laboratory Rotations (20 hours) 2 students per year.
- BMSB6121 Molecular Mechanisms of Disease
- Carcinogenesis and Chemoprevention (2 hours), 2004-2006
- Molecular Mechanisms of Cancer (1 hour), 2006
- CELL 6331 Cancer Genetics/Biomarkers (1.5 hours) 2004- present
- Regulation of Gene Expression (4.5 hours), 2002 - 2003
- Oncogenes and Tumor Suppressor Genes (4 hours), 2001- 2003
- Nucleic Acids: RNA Splicing Mechanisms (4 Hours), 2000
- Current issues in Biomedical Research: Clinical Trials (2 Hours), 2000 – 2003

### **Biochemistry and Molecular Biology Department (Current).**

- BIOC 6321 Glycobiology 1, Biomarkers (1.2 hours)
- BIOC 6221-002, Cellular and Molecular Biology Journal Club (1 hour) □ BIOC 6980 Research Project (Full time PhD thesis research of two students)

### **Biochemistry Curriculum prior to 2000.**

- Biochemistry 6234: DNA tumor viruses and Chemical Carcinogenesis (4 hours)
- Biochemistry 5224: DNA Sequencing and EMSA (2 hours)
- Biochemistry 6224: 7 week laboratory rotations for Graduate Students.
- Biochemistry 6980: Chair of Ph.D. thesis committee of Shennan Lu.
- Biochemistry 6980: Chair of Ph.D. thesis committee of Suresh Guruswamy.
- Biochemistry 6502: Advanced Topics in Human Molecular Genetics (2 hours) □ Biochemistry 5970: Student Research Seminar, 1 hour per week

**Other Curriculum.**

- Dental Biochemistry: Carcinogenesis, 1 hour, 1999-2001
- Annual Lectures, Oncogenes and Tumor Suppressor Genes, Departments of Pathology and Radiological Sciences, 1993 - 2004.
- Ph.D. comprehensive qualifying written exams and qualifying oral examination committees □  
Annual Obstetrics and Gynecology Grand Rounds Lectures with various topics. □  
ASCO trainer in Cancer Genetics

**GRADUATE STUDENTS MENTORED, CHAIR OF THESIS/DISSERTATION COMMITTEE**

Shennan Lu, Ph.D.	Biochemistry and Molecular Biology Currently NIH Employee	Ph.D. 2001
Suresh Guruswamy, Ph.D.	Biochemistry and Molecular Biology Currently Academic Faculty	Ph.D. 2002
Shylet Chenedza, Ph.D.	Biochemistry and Molecular Biology Currently Academic Faculty	Ph.D. 2009
Patience Masamha, Ph.D.	Biochemistry and Molecular Biology Currently Postdoc. Fellow	Ph.D. 2010
Pavithra Premkumar, B.S.	Genetic Counseling Currently in Laboratory Research	M.S.
Andrew Long, Ph.D.	Biochemistry and Molecular Biology Currently Postdoc. Fellow	Ph.D. 2013
LaToya Perry, M.D.	Clinical and Translational Sciences	M.S. 2014
Camille Gunderson	Clinical and Translational Sciences	M.S. 2016
Katrina Slaughter	Clinical and Translational Sciences	M.S. 2016
Timothy Poulard	Pharmaceutical Sciences	Transferred
Zitha Isingiswe	Pharmaceutical Sciences	PhD
Amy Bosley	GPIBs Student/athology Department Applicant	PhD

**POSTDOCTORAL FELLOWS**

Tongzu Liu, MD, PhD	Postdoctoral Fellow in Dr. Benbrooks Lab, 2005-2009 Currently in Faculty at Wuhan University, Wuhan, China
Arindam Dhar, PhD	Postdoctoral Fellow in Dr. Benbrooks Lab, 1997-2000 Fellow, Interagency Oncology Task Force, (NCI/FDA) 2005-2008 Cancer Research Training Associate, (NCI) 2000-2005 GlaxoSmithKelin, Phase I Trial Director, 2008-present
Shennan Lu, PhD	Postdoctoral Fellow in Dr. Benbrooks Lab, 2001-2002 Currently NIH Employee
Satish Ramraj, PhD	Promotion to Assistant Professor of Research in progress
Vishal Chandra, PhD	Promoted to Assistant Professor of Research
Rajani Rai, PhD	Currently under Dr. Benbrook's mentorship

**CLINICAL FELLOW RESEARCH MENTORED (40% Currently in Academia)**

Evelyn Rosas Nuñez, M.D.	Gynecologic Oncology	1994-1995
Rick Erikson MD	Otorhynolaryngology	1994-1995
Cole Flanagan, M.D.	Gynecologic Oncology	1995-1996
Janet Larsen, M.D.	Maternal Fetal Medicine	1995-1996
Tim Zacheis, M.D.	Otorhynolaryngology	1995-1996
Jane Shen-Gunther, M.D.	Gynecologic Oncology	1996-1997

Paul A DiSilvestro, M.D.	Gynecologic Oncology	1996-1997
Todd Ivey, M.D.	Gynecologic Oncology	1997-1998
Michael Gold, M.D.	Gynecologic Oncology	1998-1999
Scott Kamelle, M.D.	Gynecologic Oncology	1999-2000
Avi Khafif, MD,	Otorhynolaryngology	1999-2000
Dennis Scribner, M.D.	Gynecologic Oncology	2000-2001
Todd Tillmanns, M.D.	Gynecologic Oncology	2000-2001
Natalie Gould, M.D.	Gynecologic Oncology	2001-2002
Teresa Rutledge, M.D.	Gynecologic Oncology	2001-2002
Camille Falkner, M.D.	Gynecologic Oncology	2002-2004
Daynelle Dearnley, M.D.	Gynecologic Oncology	2004-2005
Johnny Hyde, M.D.	Gynecologic Oncology	2005-2006
Granger Lanneau, M.D.	Gynecologic Oncology	2005-2006
Tashana Myers, M.D.	Gynecologic Oncology	2006-2007
Erin Tuller, M.D.	Gynecologic Oncology	2007-2008
Kathleen Moxley, M.D.	Gynecologic Oncology	2008-2009
Erin Bishop, M.D.	Gynecologic Oncology	2010-2011
Kathleen Essel	Gynecologic Oncology	2017-2018
Tara Castellano	Gynecologic Oncology	2018-2019

### **SERVICE ON OTHER DISERATATION/THESIS COMMITTEES**

Todd Corn	Biochemistry and Molecular Biology	Ph.D. 1995
Kim Kyker	Biochemistry and Molecular Biology	M.S. 1996
Shankar Sachithanandam	Radiological Sciences	Ph.D. 1997
Ahmed Mohamed Mahmoud Abou-Eisha,	Cairo University	Ph.D. 2000
Dustin Smith	Biochemistry and Molecular Biology	Ph.D. 2005
Richard Langeras	Biochemistry and Molecular Biology	Ph.D. transf.
Mathew S. Gibson	Cell Biology	Ph.D. 2007
Staphanie Si Liu	Biochemistry, University of Hong Kong	Ph.D. 2003
Chaitali Tophkhane	Pathology	Ph.D. 2007
Amy Knoll	Cell Biology	Ph.D., 2010
Bin Zhang	Cell Biology	Ph.D., 2010
Ann R. Howell	Pharmacy	PharmD/M.S. 2009
Krysten Farjo	Cell Biology	Ph.D. 2010
Feng Li	Biochemistry	Ph.D. 2010
Monica Draper	Cell Biology	Ph.D. transf.
Wei Wu	Cell Biology	Ph.D. 2011
Liao Xiaoyun	Pathology, University of Hong Kong	Ph.D. 2008
Madhu Unnikrishnan	Pathology	Ph.D. transf.
Jason Kesinger	Pharmacy	PharmD/M.S. 2011
Feng He	Biochemistry	Ph.D. 2013
William Berry	Cell Biology	Ph.D. 2013
Ravillha Durgadevi	Pathology	Ph.D. 2013
Andrea Patterson	Microbiology and Immunology	Ph.D. 2015
Shuai Wang	Pathology	Ph.D. 2014
Matthew Caleb Martin	Biochemistry and Molecular Biology	Ph.D. 2015
Ankur Sharma	Pharmaceutical Sciences	Ph.D. 2017
Dhawal Raghuvanshi	Pharmaceutical Sciences	Ph.D. trnsf
Angelica Harper	Cell Biology	Ph.D. 2016
Mariam Ibrahim	Pharmaceutical Sciences	Ph.D. 2017
Yifan Xu	Pathology	Ph.D.
Taleah Farasyn	Pharmaceutical Sciences	Ph.D.
Christa DeVette	Microbiology and Immunology	Ph.D. 2017

Joshua Corbin	Pathology	Ph.D.
Sanjida Mahjabeen	Pharmaceutical Sciences	Ph.D.
Adam Walter	Clinical and Translational Sciences	M.S. 2016
Rachel Ruskin	Clinical and Translational Sciences	M.S.
Lauren Dockery	Clinical and Translational Sciences	M.S. 2017
Alexandra Crowe	Pharmaceutical Sciences	Ph.D.
Alexander Quaas	Clinical and Translational Sciences	M.S. 2017
John Wood	Physiology	Ph.D.

**CLINICAL FACULTY MENTORED**

Raffit Hassan, MD	Hematology Oncology	Assistant Professor	1999-2002
Karl Hanson, MD	Reproductive Endocrinology	Assistant Professor	2003-2006
Abbas Shoberi, MD	Urogynecology	Assistant Professor	2003-2004
Mark F. Naylor, MD	Dermatology	Member, OMRF	2004-2005
Kathleen Moore, MD	Gynecologic Oncology	Assistant Professor	2007-2012
Wei-Qun Ding, PhD	Pathology	Assistant Professor	2007-2013
Franklin Hays, PhD	Biochemistry	Assistant Professor	2010-2013

**GRADUATE RESEARCH PROJECTS MENTORED**

Coy Heldermon	Biochemistry	1992
Kent Rodgers	Biochemistry	1993
Terry Kay Epperson	Biochemistry	1994
Hai Ying Qui	Biochemistry	1996
Shennan Lu	Biochemistry	1996
Suresh Guruswamy	Biochemistry	1997
Xiaohong Zhong	Biochemistry	1997
Bahara Ebadifar	Graduate Program in Biomedical Sciences (GPiBS) Research Rotation	2003
Anne Murray	GPiBS Research Rotation	2003
Julie Scott	GPiBS Research Rotation	2003
Shylet Chenedza	GPiBS Research Rotation	2005
Patience Masamha	GPiBS Research Rotation	2006
William Berry	GPiBS Research Rotation	2006
Laura Russell	GPiBS Research Rotation	2006
Yanfang Pan	Biochemistry Research Rotation	2007
Alysha Ann Rauhauser	University of Central Oklahoma	2007
Feng He	Biochemistry Research Rotation	2007-8
Xiaolei Liu	GPiBS Research Rotation`	2011

**RESIDENT RESEARCH PROJECTS MENTORED**

Dana Stone, M.D.	Obstetrics and Gynecology Resident	1997-1998
Carla Spencer, M.D.	Obstetrics and Gynecology Resident	1998-1999
Nefertiti DuPont, M.D.	Obstetrics and Gynecology Resident	1999-2003

**MD GRADUATE RESEARCH PROJECTS MENTORED**

Ankita Raman, M.D.	Year-long research project	2017-2018
Saumyakkumar Gosai, M.D.	Year-long research project	2017-2018

**MEDICAL STUDENT RESEARCH PROJECTS MENTORED**

Rod Rogers	Medical Student Research Project	1992
Cassandra Onofre	Medical Student Summer Research Project	1993
Virginia Fishburne	Medical Student Summer Research Project	1997
Marylin Webster	Medical Student Summer Research Project	1998
Margaret P. O'Connell	Medical Student Summer Research Project	2005

Lauren Ritterhouse	MD/PhD Program Research Rotation	2006
Larissa Hines	Clinical and Translational Summer Scholar	2008
Christina Highley	Clinical and Translational Summer Scholar	2009
Mira Georgey	Clinical and Translational Summer Scholar	2009
Nasim Maryam Niroumand	Medical Student Summer Research Project	2010
Trung, Pham	Medical Student Academic Year Shadow	2014
Coralee Toal	CTS Summer Research Training Program (SRTP)	2016
Abigail Jebaraj	CTS Summer Research Training Program (SRTP)	2016
Gina Moon	Medical Student Summer Research Project	2018

#### **UNDERGRADUATE STUDENT RESEARCH PROJECTS MENTORED**

Amy Noll, B.S.	Summer Pre-graduate Student	2003
Ashley Hopkins	Summer Undergraduate Research Experience (SURE)	2003
Jen'nea Ose, B.S.	Biomedical Research Infrastructure Network (BRIN)	2003
Barbara Jeske	Summer Undergraduate Research Experience (SURE)	2004
Lance Gill	Oklahoma Biomedical Research Infrastructure Network	2004-5
Ann Nelson	Oklahoma Biomedical Research Infrastructure Network	2005-6
Chasity Jackson	Undergraduate Biomedical Education Program (UBEP)	2005
Oba Hughes	Oklahoma Biomedical Research Infrastructure Network	2007
Sheree McDaniel	Langston's Integrated Network College (LINC)	2008
Cassadie Holybee	IDeA Network for Biomedical Research Excellence (INBRE)	2016
Amy Bosley	Summer Undergraduate Research Experience (SURE)	2016
Julie Nguyen	Stephenson Cancer Center C.U.R.E. Summer Program	2016

#### **HIGH SCHOOL STUDENT/TEACHER RESEARCH PROJECTS MENTORED**

Anjan Shah	High School Student, Summer Academy	1992
Lulla Moore Wilson	Minority Program, High School Teacher, Summer	1992
Anjan Shah	School of Math and Science, Winter Semester	1992
Mary Ruth Boone	Minority Program, High School Student, Summer	1993
Kelly Jester	Summer Academy, Summer	1993
Regina Harper	Summer Academy, Summer	1994
Jacqueline Maliwat	Summer Minority Program,	1996
Ebony Allen	Summer Minority Program	1996
Kayla Brooks	Science Fair Project, Regional Winner	2001
Kelsie Brooks	Science Fair Project, Regional Winner	2003
Frank Han	Oklahoma School of Math and Science, Fall Semester	2008
Magaret Wang	Oklahoma School of Math and Science, Fall Semester	2008
Joy Oshomuvwe	Oklahoma School of Math and Science,	2016 - 2017