CURRICULUM VITAE

PERSONAL INFORMATION

Name	Thomas D. Schmittgen, Ph.D.
Business Address & Telephone	University of Florida Department of Pharmaceutics College of Pharmacy Cancer Genetics Research Complex 2033 Mowry Rd P.O. Box 103633 Gainesville, FL 32610 352-273-8028
Electronic Mail	tschmittgen@ufl.edu

EDUCATION

Institution	Degree	Year	Field
College of Pharmacy Ohio State University Columbus, Ohio	B.S.	1985	Pharmacy
College of Pharmacy Ohio State University Columbus, Ohio	Ph.D.	1992	Pharmaceutics (Dr. J. L-S. Au)
School of Medicine University of Southern California Los Angeles, California	Postdoctoral	1992-95	Biochemistry & Molecular Biology (Dr. P. V. Danenberg)

RESEARCH and PROFESSIONAL EXPERIENCE

2015-date Professor, University of Florida College of Pharmacy, Department of Pharmaceutics, Gainesville, Florida.

2013-2015 Professor, Ohio State University College of Pharmacy, Division of Pharmaceutics & Pharmaceutical Chemistry, Columbus, Ohio.

2010-2015 Chair, Division of Pharmaceutics & Pharmaceutical Chemistry, Ohio State University College of Pharmacy, Columbus, Ohio.

2004-2015 Full Member, Comprehensive Cancer Center, Ohio State University, Columbus, Ohio.

2003-2015 Faculty appointment in the program for Molecular, Cellular and Developmental Biology, Ohio State University, Columbus, Ohio.

2002-2013 Associate Professor, Ohio State University College of Pharmacy, Division of Pharmaceutics & Pharmaceutical Chemistry, Columbus, Ohio.

2001-2002 Associate Professor, Washington State University College of Pharmacy, Department of Pharmaceutical Sciences, Pullman, Washington, tenured 2001.

1995-2001 Assistant Professor, Washington State University College of Pharmacy, Department of Pharmaceutical Sciences, Pullman, Washington.

1992-1995 Postdoctoral Fellow, University of Southern California School of Medicine, Department of Biochemistry & Molecular Biology, Los Angeles, California,

1987-1992 Graduate Student, Ohio State University College of Pharmacy, Department of Pharmaceutics and Pharmaceutical Chemistry, Columbus, Ohio.

1985-1987 Formulation Scientist, Eurand America, Inc., (Division of A.H. Robbins), Vandalia, Ohio.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Association for Cancer Research
American Association of Pharmaceutical Scientists
American Association for the Advancement of Science
International Society of Extracellular Vesicles

HONORS AND AWARDS

Best basic science paper, University of Florida, College of Pharmacy, 2017.
Fellow, American Association of Pharmaceutical Scientists.
Co-author of the 21st most cited scientific paper of all time (as reported in Nature, Oct. 2014).
Inventor of the year, TechColumbus Innovation Awards, 2011.
Individual National Research Service Award, National Institutes of Health, 1993-1995.
Berlex Fellow, 1990-91.

EDITORIAL AND REVIEWER SERVICE:

NIH Proposal Reviews

Meeting date, Role	Study Section	Committee Panel Name
2017 Ad hoc member	EBIT	Enabling Bioanalytical and Imaging Technologies
2016 Ad hoc member	ZCA1 PCRB-G (C1)	Special Emphasis Panel, NCI, Cancer Diagnosis
2015 Ad hoc member	ZCA1 TCRB-U (C1)	Special Emphasis Panel, NCI, Cel;l-free Nucleic Acid Based Assays
2013 Ad hoc member	ZCA1 GGG-R (51)	Special Emphasis Panel, NCI, Extracellular RNA Biomarkers
2012 Ad hoc member	ZCA1 SRLB - Q(O1)	Innovative Molecular Analysis Technologies (IMAT) for Cancer, NCI
2010 Ad hoc member	ZCA1 SRLB - Q(M2)	Innovative Technologies Development, NCI
2010 Ad hoc member	ZRG1 IMST-J (15)	Small Business: Genes, Genomes, and Genetics, NCI
2009 Ad hoc member	ZCA1 SRLB - R(O1)	Innovative Technologies Development for Cancer Research, NCI
2008 Ad hoc member	ZCA1 SRRB - Y(M1)	Cancer Prevention Research Small Grant Program, NCI
2008 Ad hoc member	ZCA1 SRLB - Q(M1)	Innovative Molecular Analysis Technologies (IMAT)for Cancer, NCI
2007 Ad hoc member	ZCA1 SRRB-C (M1)	Innovative Technologies for Molecular Analysis of Cancer, NCI
2006 Ad hoc member	ZRG1 MONC-U (01)	Molecular Oncogenesis, NCI
2005 Ad hoc member	ZRG1 BST-F (91)	Assays and Methods Development, NCI
2004 Ad hoc member	ZRG1 BST-F (02)	Assays and Methods Development, NCI
2001 Ad hoc member	ZRG1 SSS-1 (10)	Special Emphasis Panel, NCI

Member of Editorial Board

Cancers
Journal of Nucleic Acid Investigation
Methods
Frontiers Genetics
American Journal of Cancer Research
Noncoding RNA

Guest Editor: "Real-Time Quantitative PCR" for *Methods: A Companion to Methods in Enzymology* 25 (4), 2001.

Guest Editor: "microRNA Part B" for *Methods: A Companion to Methods in Enzymology*. 44 (1), 2008.

Manuscript reviewer

Analytical Biochemistry
Clinical Chemistry
Biotechniques
International Journal of Cancer
Nucleic Acids Research
Molecular Cancer Therapeutics
Gut
Mammalian Genome
RNA
PLOSOne
Oncotarget
Cell Death Disease
Stem Cell Trans Med
Hepatology
Blood
BMC Genomics
BMC Molecular Biology
Genomics
British Journal of Cancer
Cancer Research
Laboratory Investigation
Molecular Cancer
Lancet
Proceedings of the Natl. Acad. Sciences (USA)
Gastroenterology
Nanomedicine
J Extracell Vesicles
Tissue Engineering
Nature Communications
Cell Cycle

RESEARCH SUPPORT

Current Support (direct costs listed)

Title: Targeted delivery of microRNA-loaded microvesicle for cancer therapy
Agency: NIH 3UH2TR000914
Amount: $2,164,898
Dates: 7/13 to 6/18
Principal Investigator: Schmittgen, T.D. (corresponding PI), Phelps, M.A. (mPI)

Schmittgen (PI) 12/1/16 to 11/30/17
University of Florida College of Pharmacy, Intramural grant program
A medium throughput screen to discover compounds that interfere with the early events in the development of pancreatic cancer.
$37,000

Past Support (direct costs listed)

Administrative supplement to parent award: Targeted delivery of microRNA-loaded microvesicle for cancer therapy, NIH 3UH2TR000914-03S1, $50,000, 08/16-07/17
Schmittgen, T.D. (mPI), Phelps, M.A. (mPI)

Administrative supplement to parent award: Targeted delivery of microRNA-loaded microvesicle for cancer therapy, NIH 3UH2TR000914-03S1, $50,000, 08/15-07/16
Schmittgen, T.D. (mPI), Phelps, M.A. (mPI)

Administrative supplement to parent award: Targeted delivery of microRNA-loaded microvesicle for cancer therapy, NIH 3UH2TR000914-03S1, $50,000, 08/14-07/15.
Schmittgen, T.D. (mPI), Phelps, M.A. (mPI)
Past Support, cont'd (direct costs listed)

miRNA Biomarkers for Hepatocellular Carcinoma Associated with Viral Hepatitis, NCI, 1R21CA170096, 07/12-6/14, Principal Investigator: T.D. Schmittgen.

Administrative supplement to parent award: miRNA Biomarkers for Hepatocellular Carcinoma Associated with Viral Hepatitis, NIH/NCI, 1R21CA170096, $25,128, 07/13-06/14, Principal Investigator: T.D. Schmittgen.

Administrative supplement to parent award: Targeted delivery of microRNA-loaded microvesicle for cancer therapy, NIH, $50,000, 08/14-07/15, T.D. Schmittgen, M.A. Phelps mPI.

Early Diagnosis of Pancreatic Cancer, NCI, UO1 2U01CA111294-06, $300,000, 07/10-06/15, Principal Investigator: M.A. Hollingsworth, PI of subcontract: T.D. Schmittgen.

Administrative supplement to parent award: Early Diagnosis of Pancreatic Cancer, NIH, UO1 2U01CA111294-06, $50,000, 08/14-07/15, Principal Investigator: T.D. Schmittgen.

Pancreas Specific microRNA Knockout for Tumorigenesis Study, OSUCCC Intramural funding, $100,000, 09/12-10/14, Principal Investigator: T.D. Schmittgen.

Real-time PCR expression profiling of microRNA, NIH, R21/R33 CA114304, $840,732 (total costs), 08/06-05/11, Principal Investigator: T.D. Schmittgen.

Roles of microRNAs and ultraconserved genes in pancreatic cancers, Pancreatic Cancer Action Network-AACR Pilot Grant, $200,000, 07/09-06/11, Principal Investigator: G.A. Calin, Co- Investigator: T.D. Schmittgen.

microRNA profiling in cystic fluid of intraductal papillary mucinous neoplasms, NIH, U01 CA084986, $ 100,000 (direct costs), 02/09-01/11, Principal Investigator: T.D. Schmittgen.

microRNA profiling in microdissected pancreatic precursor lesions, OSU Center for Clinical & Translational Sciences, $5,000, 05/10-04/11, Principal Investigator: T.D. Schmittgen.

microRNA profiling in serum of pancreatic adenocarcinoma patients, Lustgarten Foundation for Pancreatic Cancer Research, $ 90,000, 03/09-02/10, Principal Investigator: T.D. Schmittgen.

Human angiotensin II receptor gene regulation, NIH, 5RO1 HL048848, $872,083, 07/06-06/11, Principal Investigator, T.S. Elton; Collaborative Investigator: T.D. Schmittgen (5% Effort).

Pharmacology of Nonsteroidal Androgen Receptor Ligands, NIH, 1 R01 DK59800-05, $1,452,176, 9/04-8/08, J.T. Dalton, Principal Investigator, T.D. Schmittgen (co-investigator).

Antisense knockdown of microRNA for pancreatic cancer therapy, National Pancreas Foundation, $25,000, 06/06-05/07, T.D. Schmittgen, Principal Investigator.

Aptamer-drug conjugates for prostate cancer therapy, U.S. Army, Department of Defense, DAMD17-02-1-0156, $225,000, 8/03-9/06. T.D. Schmittgen, Principal Investigator.

Improved bioanalytical methods for oligonucleotide drugs, Ohio State University Comprehensive Cancer Center, Experimental Therapeutics seed grant, $10,000, 06/06 to 12/06. T.D. Schmittgen, Principal Investigator.

Micro RNA expression and Cancer, NIH, 1 R21 CA107435, $180,000, 5/04-4/06. T.D. Schmittgen, Principal Investigator.

Aptamers targeting HER2 positive breast cancers, Oklahoma Health Research Program, $135,000, 9/02-8/05, E.R. Jupe Principal Investigator, T.D. Schmittgen, Co-investigator

Aptamers as cellular targeting agents, NIH, 1R21 CA81396-01, $200,000, 4/99-3/01. T.D. Schmittgen, Principal Investigator.

Effects of 5-fluorouracil on uracil-rich mRNA stability, NIH, 1R15 CA74375, $75,000, 6/97-5/00 T.D. Schmittgen, Principal Investigator.

Effects of 5-fluorouracil incorporation into the uracil-rich destabilizing sequences of mRNAs involved in growth regulation. American Cancer Society, IRG-119Q, $15,000, 8/95-6/96. T.D. Schmittgen, Principal Investigator.

INVITED LECTURES AND SEMINARS

1. Pharmacodynamics of mitomycin C in cultured human bladder tumors. Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, California, September, 1991.

2. Inhibition of RNA splicing by anticancer drugs. College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois, March, 1994.

3. Inhibition of RNA splicing by anticancer drugs. Department of Pharmacology, Stanford University, Palo Alto, California, December, 1994.

4. Molecular determinants of the pharmacodynamic response to cancer chemotherapy. Washington State University, Department of Pharmaceutical Sciences, Pullman, Washington, March, 1995.

5. Effects of the anticancer drug 5-fluorouracil on mRNA stability: A quantitative RT-PCR analysis. Epoch Pharmaceuticals, Redmond, Washington, October, 1998.

6. Pharmacological studies with RNA. College of Pharmacy, University of Tennessee, Department of Pharmaceutical Sciences, Memphis, Tennessee, March, 1999.

7. Pharmacological studies with RNA. College of Pharmacy, University of Texas, Department of Pharmaceutics, Austin, Texas, September, 1999.

8. RNA-directed activity of fluoropyrimidines. College of Pharmacy, Ohio State University, Department of Pharmaceutics, Columbus, Ohio, December, 2000.

9. Molecular Approaches for the Detection of Prostate Cancer. College of Pharmacy, University of Minnesota, Department of Experimental and Clinical Pharmacology, Minneapolis, Minnesota, June, 2001.

10. Molecular Approaches for the Detection of Prostate Cancer. College of Pharmacy, University of Minnesota, Department of Pharmaceutics, Minneapolis, Minnesota, August, 2001.

11. Aptamer-based drug delivery strategies. College of Pharmacy, Ohio State University, Division of Pharmaceutics, Columbus, Ohio, November, 2001.

12. Aptamer-based drug targeting strategies. College of Pharmacy, Medical University of South Carolina, Department of Pharmaceutical Sciences, Charleston, South Carolina, December, 2001.

13. Real-time expression profiling of microRNAs in cancer, Oklahoma University, Division of Surgery, Oklahoma City, Oklahoma, April, 2005.

14. Real-time expression profiling of microRNAs in cancer, Discovery Science and Biotechnology Conference, Melbourne, Australia, May, 2005.

15. Real-time PCR analysis of precursor and mature microRNAs in pancreatic adenocarcinoma, Cambridge Healthtech Institute conference on nucleic acid-based technologies, Arlington Virginia, June, 2006.

16. microRNA as a potential therapeutic target for pancreatic cancer. Ninth international conference on drug and gene-based therapeutics. Crete, Greece, September, 2006.

17. PCR based microRNA expression profile reveals unique signature in pancreatic cancer. NCI sponsored workshop, Micro RNA: Potential for Cancer Detection, Diagnosis and Prognosis, Rockville, Maryland, November, 2006.

18. Expression profiling of miRNA in human cancer. 14th EDRN steering committee meeting. Denver, Colorado, March, 2007.

19. Expression profiling of miRNA in human cancer. MBI workshop on microRNA in Development and Cancer. Columbus, Ohio, April, 2007.

20. Real-time PCR expression profiling of microRNA. Solid tumor retreat, Ohio State University Comprehensive Cancer Center, Columbus, Ohio, June, 2007.

21. Real-time PCR quantification of precursor and mature microRNA. Applied Biosystems, Foster City, California. August, 2007.

22. microRNA-directed therapy for pancreatic cancer. Isis Pharmaceuticals, Carlsbad, California, August, 2007.

23. Aberrant microRNA expression in pancreatic cancer: Diagnostic and therapeutic implications. Wright State University, Department of Biochemistry and Molecular Biology, Dayton, Ohio, October, 2007.

24. microRNA-directed therapy for pancreatic cancer. Annual meeting of the Korean Society of Pharmaceutical Science and Technology. Seoul, Korea, November, 2007.

25. microRNA-directed therapy for pancreatic cancer. microRNA in human disease and development. Cambridge Healthtech Institute. Cambridge, Massachusetts, March, 2008.

26. microRNA-directed therapy for pancreatic cancer. GTx Inc., Memphis, Tennessee, July, 2008.

27. Real-time PCR quantification of precursor and mature microRNAs as a means to study post transcriptional regulation of microRNA. Ninth principal investigators meeting for the innovative molecular analysis technologies (IMAT) program. Cambridge, Massachusetts, October, 2008.

28. Real-time PCR expression profiling of microRNA. qPCR Symposium USA. San Francisco, California, November, 2008.

29. Real-time PCR expression profiling of microRNA. Applied Biosystems Reception at the 58th Annual Meeting of the American Society of Human Genetics. Philadelphia, Pennsylvania, November, 2008.

30. Role of microRNAs in pancreatic adenocarcinoma. 4th Annual M. D. Anderson/Baylor College of Medicine Symposium: Development of Non-Coding RNAs for Cancer Therapy. Houston, Texas, January, 2009.

31. Real-time PCR expression profiling of microRNA. The Association of Biomolecular Research Facilities (ABRF) Annual Meeting. Memphis, Tennessee, February, 2009.

32. Role of microRNAs in pancreatic cancer. RNAi World Congress. Boston, Massachusetts, May, 2009.

33. Update on microRNA-based biomarkers for pancreatic adenocarcinoma. Presentation to the Board of Directors, Michael Rolfe Pancreatic Cancer Foundation, Chicago, Illinois, June, 2009.

34. Post transcriptional regulation of microRNA processing in human tumors and cancer cell lines. 10th International Conference on Environmental Mutagens (ICEM). Firenze, Italy. August, 2009.

35. The potential for microRNA-based biomarkers in pancreatic adenocarcinoma. EDRN Scientific Workshop. Bethesda, Maryland, September, 2009.

36. Methods for qPCR of miRNA and other ncRNA. The Association of Biomolecular Research Facilities (ABRF) Annual Meeting. Sacramento, California, March, 2010.

37. qPCR profiling of precursor and mature microRNA. Workshop on genomics and microRNA. 101st Annual Meeting of the American Association for Cancer Research, Washington D.C., April, 2010.

38. qPCR detection of microRNAs as diagnostic agents for pancreatic cancer. microRNA in Human Disease & Development, Cambridge Healthtech Institute, Cambridge, Massachusetts, March, 2010.

39. Antisense therapy against miR-221 in hepatocellular carcinoma. College of Pharmacy Research Day, Ohio State University, Columbus, Ohio, May, 2010.

40. Role of microRNA in pancreatic adenocarcinoma. Department of Surgery, University of Michigan, Ann Arbor, Michigan, May, 2010.

41. Laser capture microdissection and microRNA profiling. Center for clinical and translational sciences. Ohio State University, Columbus, Ohio, June, 2010.

42. MicroRNA silencing with antagomiR oligonucleotides: miR-221 as a therapeutic target for hepatocellular carcinoma. Pharmaceutics Graduate Student Research Meeting (PGSRM), Columbus, Ohio, June, 2010.

43. microRNAs as diagnostic agents and therapeutic targets for cancer. Division of Pharmaceutical Sciences, Washington State University, Pullman, Washington, July, 2010.

44. microRNA as a therapeutic target for hepatocellular carcinoma. Cancer and Cell Biology Seminar Series, University of Cincinnati, Cincinnati, Ohio, January 2011.

45. qPCR applications of microRNA and other noncoding RNAs. Advances in qPCR Conference, Boston, Massachusetts, April, 2011.

46. Therapeutic microRNA mimetic and antisense oligonucleotides. Lombardi Cancer Center, Georgetown University, November, 2011.

47. Therapeutic microRNA mimetic and antisense oligonucleotides. microRNA in Human Disease & Development, Cambridge Healthtech Institute, Cambridge, Massachusetts, March, 2012.

48. Role of microRNA in pancreatic and liver cancers. microRNA 2012 International Symposium, São Paulo, Brazil, March, 2012.

49. Therapeutic microRNA mimetic and antisense oligonucleotides. Ohio State University Department of Veterinary Medicine, September, 2012.

50. Therapeutic microRNA mimetic and antisense oligonucleotides. University of Oslo, Oslo, Norway, December, 2012.

51. Therapeutic microRNA mimetic and antisense oligonucleotides. Ohio State University College of Pharmacy, Division of Pharmacology, January, 2013

52. Therapeutic microRNA mimetic and antisense oligonucleotides. University of Iowa, College of Pharmacy, Division of Medicinal Chemistry, April, 2013.

53. Engineered microvesicles as targeted delivery agents for cancer. John Carroll University, Department of Chemistry, Cleveland, Ohio, October, 2013.

54. Navigating your way through the patent process in academia. University of Texas Southwestern Medical Center, Dallas, Texas, March 2014.

55. Engineered microvesicles as targeted delivery agents for cancer. 2014 World Forum on Biology. Savanah, Georgia, June, 2014.

56. Engineered microvesicles as targeted delivery agents for therapeutic microRNAs. "Illuminating Genomic Dark Matter" symposium. University of Texas M.D. Anderson Cancer Center, Houston, Texas, October, 2014.

57. microRNA for cancer therapy: Targets, mechanism and delivery. University of Florida Cancer Center, Gainesville, Florida, October, 2014.

58. Microvesicle Engineering for Targeted Delivery of microRNA. The Ohio State University Comprehensive Cancer Center, Translational Therapeutics Retreat, October, 2014.

59. Microvesicle Engineering for Targeted Delivery of microRNA. University of British Columbia Faculty of Pharmaceutical Sciences, Vancouver, BC, November, 2014.

60. The mTOR pathway as a novel therapeutic target for hepatocellular carcinoma. The Ohio State University Gastrointestinal Oncology section, January, 2015.

61. Biological relevance of miRNAs and other non-coding RNAs as diagnostics. National Cancer Institute think tank on establishing best practices in non-coding application in cancer detection, diagnosis and prognosis. Bethesda, Maryland, January, 2015.

62. Engineered microvesicles as targeted delivery agents for therapeutic microRNAs. Gordon Research Conference on RNA Nanotechnology, Ventura, California, February, 2015.

63. Gene knockouts reveal important roles for microRNA during the early development of pancreatic adenocarcinoma. 2nd International Symposium on Frontiers in Molecular Science Non-Coding RNAs and Epigenetics in Cancer. Basel, Switzerland, June 2017.

64. Exosomes, new kid on the block for drug delivery. University of Florida Global Gator Meeting, Dusseldorf, Germany, 2017.

65. Endogenous loading of microRNA into therapeutic extracellular vesicles. First Conference on Biomotors, Virus Assembly, and Nanobiotechnology Applications. Columbus, Ohio, August, 2017.

66. Drug screens targeting the early events in the development of pancreas cancer. University of Florida Drug Discovery Symposia, Gainesville, Florida, September, 2017.

PEER-REVIEWED RESEARCH ARTICLES

1. Wallace, R.A., Boldry, R., Schmittgen, T., Uretsky, N., and Miller, D. Effect of 1-methyl-4-phenyl-1,2,5,6 tetrahydro-pyridine (MPTP) on monoamine neurotransmitters in mouse heart and brain. **Life Sciences**, 35:285-291, 1984.

2. Schmittgen, T.D., Au, J. L-S., Wientjes, M.G., Badalament, R.A., and Drago, J.R. Cultured human bladder tumors for pharmacodynamic studies. **J. Urol.,** 145:203-207, 1991.

3. Schmittgen, T.D., Wientjes, M.G., Badalament, R.A., and Au, J. L-S. Pharmacodynamics of mitomycin C in cultured human bladder tumors. **Cancer Res.,** 51:3849-3856, 1991.

4. Schmittgen, T.D., Koolemans-Beynen, A., Rosol, T.J., Webb, T.E., and Au, J. L-S. Effects of 5-fluorouracil, leucovorin, and glucarate in rat colon tumor explants. **Cancer Chemother. Pharmacol.,** 30:25-30, 1992.

5. Schmittgen, T.D., Danenberg, K.D., Horikoshi, T., Lenz, H-J., and Danenberg, P.V. Effect of 5-fluoro- and 5-bromouracil substituted mRNA on the translation of human thymidylate synthase. **J. Biol. Chem.,** 269:16269-16275, 1994.

6. Schmittgen, T.D., Weaver, J.M., Badalament, R.A., Wientjes, M.G., Klein, E.A., Young, D.C., and Au, J. L-S. Correlation of human bladder tumor histoculture proliferation and sensitivity to mitomycin C with tumor pathobiology. **J. Urol.,** 152:1632-1636, 1994.

7. Yen, W.C., Schmittgen, T.D., and Au, J. L-S. Different pH dependency of mitomycin C activity in monolayer and three-dimensional cultures. **Pharmaceutical Res.,** 13:1887-1891, 1996.

8. Ju, J.F., Banerjee, D., Lenz, H.J., Danenberg, K.D., Schmittgen, T.D., Spears, C.P., Schonthal, A.H., Manno, D.J., Hochhauser, D., Bertino, J.R., Danenberg, P.V. Restoration of wild-type p53 activity in p53-null HL-60 cells confers multidrug sensitivity. **Clin. Cancer Res.,** 4:1315-1322, 1998.

9. Tirmenstein, M.A., Nicholls-Grzemski, F.A., Schmittgen, T.D., Zakrajsek, B.A., and Fariss, M.W. Nitric oxide production by isolated rat hepatocyte suspensions. **Toxicol. Sci.,** 53:56-62, 2000.

10. Schmittgen, T.D., Zakrajsek, B.A., Mills, A.G., Gorn, V., Singer, M.J., and Reed, M.W. Quantitative RT-PCR to study mRNA decay: Comparison of endpoint and real-time PCR methods. **Anal. Biochem.,** 285:194-204, 2000.

11. Schmittgen, T.D., and Zakrajsek, B.A. Effect of experimental treatment on housekeeping gene expression: Validation by real-time quantitative RT-PCR. **J. Biochem. Biophys. Methods,** 46:69-81, 2000. *> 1000 citations*

12. Tirmenstein, M.A., Nicholls-Grzemski, F.A., Schmittgen, T.D., Zakrajsek, B.A., and Fariss, M.W. Glutathione-dependent regulation of nitric oxide production in isolated rat hepatocyte suspensions. **Antioxidants and Redox Signaling** 2:767-777, 2000.

13. Livak, K.J., and Schmittgen, T.D. Analysis of relative gene expression data using real-time quantitative PCR and the $2^{-\Delta\Delta Ct}$ method. **Methods,** 25:402-408, 2001. *Twenty first most cited scientific paper of all time (Nature, October, 2014). > 70,000 citations.*

14. Schmittgen, T.D., Zakrajsek, B.A., Hill, R.E., Liu, Q., Reeves, J.J., Axford, P.D., Singer, M.J., and Reed, M.W. Expression pattern of mouse homolog of prostate-specific membrane antigen (FOLH1) in the transgenic adenocarcinoma of the mouse prostate model. **The Prostate,** 55:308-316, 2003.

15. Schmittgen, T.D., Ju, J.F., Danenberg, K.D., and Danenberg, P.V. Inhibition of pre-mRNA splicing by cisplatin and platinum analogs. **Int. J. Oncol.,** 23:785-9, 2003.

16. Schmittgen, T.D., Teske, S., Vessella, R.L., True, L.D., and Zakrajsek, B.A. Expression pattern of prostate specific membrane antigen (PSMA) and three alternatively spliced variants of PSMA in prostate cancer patients. **Int. J. Cancer.,** 107:323-329, 2003.

17. Schmittgen, T.D., Jiang, J., Liu, Q. and Yang, L. A high-throughput method to monitor the expression of microRNA precursors. **Nucleic Acids Res.,** 32:e43**,** 2004. *Top downloaded article (methods category) for all of 2004 from Nucleic Acids Res website.*

18. Schmittgen, T.D., Gissel, K.A., Zakrajsek, B.A., Lawrence, B.P., Liu, Q., Jupe, E.R., Lerner, M.L., Do, S.V., and Brackett, D.J. Diverse gene expression pattern during 5-fluorouridine-induced apoptosis. **Int. J. Oncol.,** 27:297-306, 2005.

19. Jiang, J., Lee, E.J., Gusev, Y and Schmittgen, T.D., Real-time expression profiling of microRNA precursors in human cancer cell lines. **Nucleic Acids Res.,** 33:5394-5403, 2005.

20. Jiang, J., Lee, E.J. and Schmittgen, T.D. Increased expression of microRNA-155 in Epstein-Barr Virus transformed lymphoblastoid cell lines. **Gene Chromosome Cancer,** 45:103-106, 2006.

21. Meng, F., Henson, R., Lang, M., Wehbe, H., Maheshwari, S., Mendell, J.T., Jiang, J., Schmittgen, T.D., and Patel, T. Involvement of human microRNAs in cholangiocarcinoma growth and response to chemotherapy. **Gastroenterology**, 130:2113-2129, 2006.

22. Guan, N., Korukonda, R., Hurgh, E., Schmittgen, T.D., Donkor, I.O. and Dalton, J.T. Apoptosis induced by novel aldehyde calpain inhibitors in human tumor cell lines. **Int. J. Oncol.,** 29:655-663, 2006.

23. Lee, E.J. and Schmittgen, T.D. Comparison of RNA assay methods used to normalize cDNA for quantitative real-time PCR. **Anal. Biochem.,** 357:299-301, 2006.

24. Lee, E.J., Gusev, Y., Jiang, J., Nuovo, G.J., Lerner, M.R., Frankel, W.L., Morgan, D.L., Postier, R.G., Brackett, D.J., Schmittgen, T.D. Expression profiling identifies microRNA signature in pancreatic cancer. **Int. J. Cancer,** 120:1046-1054, 2007. *Top downloaded article for all of 2007 from Int. J. Cancer website.*

25. Foraker, A.B., Ray, A., Da Silva, C., Bareford, L.M., Hillgren, K.M., Schmittgen, T.D., and Swaan, P.W. Dynamin 2 regulates riboflavin endocytosis in human placental trophoblasts. **Molec. Pharmacol.**, 72:553-562, 2007.

26. Calin, G.A., Liu, C.G., Ferracin, M., Hyslop, T., Sevignani, C., Cimmino, A., Wojcick, S., Shimizu, M., Fabbri, M., Picchiori, F., Lee, E.J., Liu, X., Volta, C., Zuppo, S., Herlea, V., Gramantieri, L., Lanza, G., Alder, H., Schmittgen, T.D., Volinia, S., Rassenti, L., Kipps, T.J., Negrini, M. and Croce, C.M. Ultraconserved regions encoding noncoding RNAs are altered in human leukemias and carcinomas. **Cancer Cell**, 12:215-229, 2007.

27. Gusev, Y., Schmittgen, T.D., Lerner, M.R., Postier, R.G. and Brackett, D.J. Computational analysis of biological functions and pathways collectively targeted by co-expressed microRNAs in cancer. **BMC Bioinformatics**, 8(Suppl 7): S16, 2007.

28. Lee, E.J., Baek, M., Nuovo, G.J., Chen, C. and Schmittgen, T.D. Systematic evaluation of microRNA processing patterns in tissues, cell lines and tumors. **RNA,** 14:35-42, 2007.

29. MicroRNAs Modulate Chemoresistance of Tumor Cells. Blower, P.E., Chung, J.H., Verducci, J.L., Lin, S., Park, J. K., Dai1, Z., Liu, C.G., Schmittgen, T.D., Croce, C.M., Weinstein, J.N., and Sadee, W. **Molec. Cancer Ther.,** 7: 1-9, 2008.

30. Jiang, J., Aderca, I., Gusev, Y., Mettler, T.A., Nagorney, D.M., Brackett, D.J., Roberts, L.R. and Schmittgen, T.D. microRNA expression in hepatocellular carcinoma is associated with hepatitis infection, cirrhosis and patient's survival. **Clin. Cancer Res.**, 14: 419-427, 2008.

31. Nuovo, G.J and Schmittgen, T.D. Benign metastasizing leiomyoma of the lung: Clinicopathologic, immunohistochemical, and microRNA analyses. **Diag. Mol. Pathol**., 17:145-150, 2008.

32. Hackanson, B., Bennett, K.L., Brena, R.M., Jiang, J., Maharry, K., Whitman, S.P., Schmittgen, T.D., Lübbert, M., Marcucci, G., Bloomfield, C.D. and Plass, C. Reactivation of epigenetically down-regulated microRNA-124a silences the hematopoietic transcription factor C/EBPα in acute myeloid leukemia. **Cancer Res.** 68:3142-3151, 2008.

33. Datta, J., Kutay, H., Nasser, M.W., Nuovo, G.J., Wang, B., Majumder, S., Liu, C.G., Volinia, S., Croce, C.M., Schmittgen, T.D., Ghoshal, K. and Jacob, S.T. Methylation mediated silencing of microRNA-1-1 gene in hepatocellular carcinoma: Role of miR-1 as negative regulator of tumor cell growth. **Cancer Res.**, 68:5049-5058, 2008.

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BOOK CHAPTERS, REVIEWS & TECHNICAL REPORTS

1. Schmittgen, T.D. Quantitative gene expression by real-time PCR: A complete protocol, in Real-time PCR, M.T. Dorak, Editor. 2006, Taylor and Francis: New York. p. 127-137.

2. Schmittgen, T.D. Quantitative Real-Time PCR. Application Note, NanoDrop Technologies, 2006.

3. Barbarotto, E., Schmittgen, T.D. and Calin, G.A. microRNAs and cancer: Profile, Profile, Profile. Int. J. Cancer. 122:969-977(2007).

4. Schmittgen, T.D., E.J. Lee, and J. Jiang, High-throughput real-time PCR. Methods Mol Biol. 429:89-98 (2008).

5. Schmittgen, T.D., Lee, E.J., Jiang, J., Yang, L., Elton, T.S. and Chen, C. Real-time PCR quantification of precursor and mature microRNA. Methods, 44:31-38 (2008).

6. Schmittgen, T.D., and Livak, K.J. Analyzing real-time PCR data by the comparative CT method. Nature Protocols, 3:1101-1108, 2008. *>2,400 citations.*

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9. Nuovo, G.J., Elton, T.S., Nana-Sinkam, P., Volinia, S., Croce, C.M. and Schmittgen, T.D. A methodology for the combined in situ analyses of the precursor and mature forms of microRNAs and correlation with their putative targets. Nature Protocols, 4:107-115, 2009.

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14. Nuovo, G.J., Nana-Sinkam, P., Crawford, M., and Schmittgen, T.D. In Situ Detection of MicroRNAs in Paraffin Embedded, Formalin Fixed Tissues: Different Methodologies and Co-Localization with Possible Targets. In: RNA interference methods, Neuromethods, Vol. 58, S. Harper, Editor. Humana/Springer. pp. 123-139, 2011.

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16. Henry, J.C., Azevedo, A.C.P., and Schmittgen, T.D. microRNA replacement therapy for cancer. Pharm. Res., 28:3030-3042, 2011.

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20. Azevedo-Pouly, A.C.P. and Schmittgen, T.D. Pathology, genetic alterations, and targets of differentially expressed microRNAs in pancreatic cancer. Gastrointestinal Cancer: Targets and Therapy 2014:4 75-87.

21. Sutaria, D.K., Badawi, M. and Schmittgen, T.D. Achieving the promise of therapeutic extracellular vesicles: The devils is in the details of therapeutic loading. Pharm. Research., 34(5):1053-1066, 2017.

PATENTS

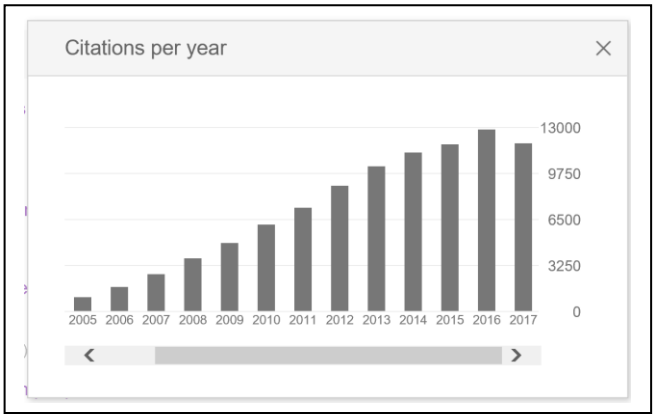
1. U.S. Patent No. 8,192,938. Methods for quantifying microRNA precursors, Inventor: T.D. Schmittgen, issued on June 5, 2012.

2. microRNA expression profile associated with pancreatic cancer. T.D. Schmittgen and D.J. Brackett, Publication number: US 2010/0286232 A1, Filing date: Mar 2, 2007.

INDICATORS OF RESEARCH PRODUCTIVITY

Combined Past and Current Funding as PI/mPI (1995-present)				
	Direct Costs			Total of Direct & Indirect Costs
Role	NIH	Other Agencies	Total	
P.I.	$4,044,112	$566,000	$4,610,112	$6,725,152

Citations: > 96,000, **H-index** = 44 (Google Scholar)



ABSTRACTS (since 2010)

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43. Henry, J.C., Park, J.K., Jiang, J., Nagorney, D.M., Roberts, L, Banerjee, S. and Schmittgen, T.D. miR-199a-3p targets CD44 and reduces proliferation of CD44 positive hepatocellular carcinoma cell lines. Proc. Am. Assoc. Cancer Res., 52: 1183, 2011.

44. Park, J.K., Kogure, T., Nuovo, G.J., Jiang, J., Phelps, M.A., He, L., Kim, J.H., Croce, C.M., Patel, T., and Schmittgen, T.D. Silencing of miR-221 with anti-microRNA oligonucleotides is an effective therapeutic for hepatocellular carcinoma. Proc. Am. Assoc. Cancer Res., 52: 4711, 2011. *Selected for oral presentation.*

45. Lin, S.H., Jiang, J., Kuo, C.T., Ye, W., Xu, P., Li, H., Liu, J.Y., Zhong, S., Schmittgen, T.D., and Lin, Y.C. Differential miR-141 expression in primary cultured human breast cancer epithelium (PCHBCEs) and normal adjacent part epithelium (PCHBNEs) correlates with tumor suppressor protein tyrosine phosphatase γ (PTPγ). Proc. Am. Assoc. Cancer Res., 52: 3956, 2011.

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49. Azevedo-Pouly, A.C., Jiang, J., Sutaria, D., Schmittgen, T.D. Regulation of NRSF/REST by miR-217; Implications during pancreatic acinar ductal trans-differentiation. Proc. Amer. Assoc. Cancer Res., 54:4187, 2013.

50. Braconi,C., Valeri, N., Gasparini, P., Jiang, J., Kogure, T., Croce, C., Schmittgen, T., and Patel, T. Transcribed ultraconserved regions are aberrantly expressed and can be modulated by interleukin 6 in cholangiocarcinoma. The Lancet, Volume 381, Issue, Page S26, 27 February 2013.

51. Sutaria, D.S., Jiang, J., Elgamal, O.A., Azevedo-Pouly, A.C., Pavlovicz, R., Li, C., Phelps, M.A. and Schmittgen, T.D. Engineering of microRNA loaded targeted microvesicles for cancer therapy. Presented at NIH exRNA consortium bi-annual meeting. Rockville, MD, May, 2014.

52. Kim, J., Phelps, M.A. and Schmittgen, T.D. Development of a Bioanalytical Method for PK/PD of Therapeutic miRNA Mimics. AAPS Annual Meeting, November 2-6, 2014, San Diego.

53. Sutaria, D.S., Jiang, J., Elgamal, O.A., Azevedo-Pouly, A.C.P., Pavlovicz, R.E., Li, C., Phelps, M.A. and Schmittgen, T.D. Engineering of hairpin loop enhances the loading of endogenously expressed pre-miRNA into extracellular vesicles. Proc. Amer. Assoc. Cancer Res., 57:2068, 2016.

54. Han, S., Belsare, S., Zhang, D.Y., Beveridge, M., Rinaldi, C., Trevino, J.G., Schmittgen, T.D. and Hughes, S.J. Exosomal delivery of stroma-derived miR-145 inhibits pancreatic cancer cell proliferation. Proc. Amer. Assoc. Cancer Res., 58:4322, 2017.

55. Badawi, M., Kim, J., Sutaria, D., Motiwala, T., Reyes, R., Wani, N., Jacob, S., Phelps, M., and Schmittgen, T.D. CD44 positive and sorafenib resistant hepatocellular carcinomas respond to the ATP-competitive mTOR inhibitor INK128. Proc. Amer. Assoc. Cancer Res., 58:141, 2017.

56. Sutaria, D.S., Jiang, J., Azevedo-Pouly, A-C., P., Lee, E.J., Lerner, M.R., Brackett, D.J., Vandesompele, J., Mestdagh, P., and Schmittgen, T.D. Expression profile identified LncRNA HNRNPU-AS1 with oncogenic properties in pancreatic ductal adenocarcinoma. Poster presented at 2nd International Symposium on Frontiers in Molecular Science Non-Coding RNAs and Epigenetics in Cancer. Basel, Switzerland, June 2017.

57. daSilva, L., Mathews, J., Li, C., Luesch, H.., and Schmittgen, T.D. Drug screens targeting the early events in the development of pancreas cancer. University of Florida Drug Discovery Symposia, Gainesville, Florida, September, 2017.

RESEARCH INTERESTS

- Exosomes as drug delivery vesicles.
- RNA-directed therapeutics for cancer.
- Development of noncoding RNA biomarkers for cancer.
- Role of noncoding RNAs in cancer.

ADVISING/MENTORING ACTIVITY

Undergraduate Research Student Advisor:

1996-1997	Cindi Reeder (WSU, Biology) Recipient of Howard Hughes Undergraduate Student Research Award
1996-1997	Brian Zakrajsek (WSU, Biology)
1999	William King (WSU, Pharmacy) Recipient of AACP Gateway Fellowship
2004-2005	Isaac Boakye (OSU. Pharm. Sciences) Undergraduate Honors Thesis
2005-2007	Myung Won Baek (OSU, Biology)
2006-2007	Matthew Welsch (OSU, Biochemistry)
2007-2008	Jonathan Vang (OSU, Pharmaceutical Sciences)
2009-2010	Lindsey Jones (University of Notre Dame) Recipient of Summer Undergraduate Research Fellowship
2009	Sin Chu (Case Western Reserve University)
2010-2011	Lucas Serdar (OSU, Pharmaceutical Sciences) Recipient of Summer Undergraduate Research Fellowship
2013-2014	Andrea Haughtvedt
2013-2014	Luke Bramlage
2016-2017	Katlyn Ethridge (UF, Nutrition)
2016-2017	Zac Doran (UF, Pharmacy)
2017	Emily Wilson (UF, SURF program)

Graduate Students:	Student	Role
2017-date	Nasser Koopaei	Major Advisor
2016-date	Julie Bray	Major Advisor
2016-date	Saima Subhani	Major Advisor
2016-date	Lais DaSilva	Major Advisor
2013-date	Mohamed Badawi	Major Advisor
2012-2016	Dhruvit Sutaria	Major Advisor-Ph.D. received 12/2016
2011-2016	Ola Elgamal	Major Advisor-Ph.D. received 4/2016
2010-2015	Jihye Kim	Major Advisor-Ph.D. received 8/2015
2007-2013	Ana Clara Azevedo	Major Advisor-Ph.D. received 8/2013
2011-2012	Miranda McClain	Major Advisor-Masters received 12/2012
2010-2012	Jon C. Henry	Major Advisor-Masters received 6/2012
2006-2012	Jong-Kook Park	Major Advisor-Ph.D. received 3/2012
2008-2015	Ji Hye Kim	Major Advisor-Masters received 6/2010

2004-2008	Eun Joo Lee	Major Advisor-Ph.D. received 7/2008
2003-2007	Liuqing Yang	Major Advisor-Masters received 3/2008
2000-2003	Qian Liu	Major Advisor- Masters received 5/2003

Noteworthy accomplishments of graduate students for whom I was advisor of record.

Qian Liu, best poster, annual research meeting of Pharmacology &Toxicology Graduate Students, 2000.

Qian Liu, Dorothy Otto Kennedy Graduate Student Award in Cancer Research, 2000.

Qian Liu Dorothy Otto Kennedy Graduate Student Award in Cancer Research, 2001.

Eun Joo Lee, recipient of the 2006-2007 Proctor and Gamble fellowship in pharmacogenomics.

Eun Joo Lee, recipient of Scholar-in-Training travel award, American Association for Cancer Research, 2006.

Ana Clara Azevedo, recipient of NIH F31 predoctoral fellowship, 2009-2013.

Jon C. Henry, recipient of NIH T32 Oncology Training Grant, 2010-2012.

Noteworthy accomplishments of graduate students for whom I was advisor of record (cont'd).

Jong-Kook Park, first place poster, Experimental Therapeutics Section. OSU Comprehensive Cancer Center Annual Meeting, 2011.

Ana Clara Azevedo, recipient of Ray travel award, Council of Graduate Students, Ohio State University, 2011.

Jon C. Henry, first place presentation, Columbus Surgical Society, 2011.

Jon C. Henry, best poster in Clinical and Translational Sciences, OSU College of Pharmacy Research Day, 2011.

Ana Clara Azevedo, best poster in Clinical and Translational Sciences, OSU College of Pharmacy Research Day, 2012.

Ola Elgamal, third place poster, Graduate Student Category, OSU College of Pharmacy Research Day, 2013.

Mohamed Badawi, Frank Fellowship in Pharmaceutics, 2013-date.

Jihye Kim, Lilly Fellowship in PK/PD, 2013-14.

Matt Dixon, Richard Summer Fellowship, College of Pharmacy.

Dhruvit Sutaria, second place poster, Graduate Student Category, OSU College of Pharmacy Research Day, 2014.

Jihye Kim, AFPE Fellowship, 2014-15.

Dhruvit Sutaria, second place poster, Graduate Student Category, OSU College of Pharmacy Research Day, 2015.

Dhruvit Sutaria, best poster, Pre-doctoral Student Category, University of Florida Heath Science Cancer Center Research Day, 2016.

Julie Bray, recipient of NIH F31 predoctoral fellowship, 2017-2020.

Julie Bray, attendee, Cold Springs Harbor Workshop in Pancreatic Cancer, June 2017.