

BIOGRAPHICAL SKETCH

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NAME: Piyali Dasgupta

eRA COMMONS USER NAME (credential, e.g., agency login): PDASQUPTA

POSITION TITLE: Associate Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Delhi, New Delhi, India	B.S.	1992	Chemistry
Indian Institute of Technology, New Delhi, India,	M.S.	1994	Physiology
National Institute of Immunology, Delhi, India	Ph.D	2000	Life Sciences
Columbia University, New York, NY	Postdoctoral	2001	Cancer Biology
Moffitt Cancer Center, Tampa, FL	Postdoctoral	2007	Cancer Biology

A. Personal Statement**B. Positions and Honors**

1. Dean's Award for Excellence in Basic Research, 2013.
2. Recipient of the John and Francis Rucker Outstanding Graduate Faculty Award, Marshall University, 2011.
3. Recipient of the ASPET-Astellas Award in translational Pharmacology, 2009.
4. Recipient of the Marshall University Distinguished Artists and Scientists Award (MU-DASA), 2009.

Contributions to Science

1. One of my major research interests is the biochemical mechanisms by which tobacco components like nicotine accelerate the growth of human lung cancer. Nicotine is the addictive component of cigarette smoke. During my postdoctoral fellowship, I showed for the first time that nicotine could block the apoptotic activity of gemcitabine, cisplatin and taxol in human lung cancers. Clinical studies show that patients who smoke during chemotherapy have worse outcomes than those who quit before starting chemotherapy. Our observations provided a mechanistic insight into these clinical observations. We also discovered that nicotine accelerated tumor angiogenesis via the Src pathway. We believe our findings are relevant for lung cancer patients who are exposed to nicotine via cigarettes, second hand smoke, electronic cigarettes or patches or gums to quit smoking.
 - a. Friedman, J.R., Richbart, S.D., Merritt, J.C., Brown, K.C., Nolan, N.A., Akers, A.T., Lau, J.K., Robateau, Z.R., Miles, S.L., **Dasgupta, P.** (2019) Acetylcholine signaling system in progression of lung cancers *Pharmacology & Therapeutics* **194**, 2, 224-254
 - b. Brown, K.C., Perry, H. E., Lau, J.K., Jones, D.V., Pulliam, J.F., Thornhill, B.A., Crabtree, C.M., Luo, H., Chen, Y.C. and **Dasgupta, P.** (2013). Nicotine induces the upregulation of the alpha7-nicotinic receptor ($\alpha 7$ -nAChR) in human squamous cell lung cancer cells via the Sp1/GATA pathway. *J. Biol. Chem.* **288**, 33049-59.
 - c. **Dasgupta, P.**, Rizwani, W., Pillai, S., Davis, R., Banerjee, S., Hug, K., Lloyd, M., Coppola, D., Haura, E. and Chellappan, S.P. (2011) ARRB1-mediated regulation of E2F target genes in nicotine-induced growth of lung tumors. *Journal of National Cancer Institute*, **103**, 4, 317-33.

- d. **Dasgupta, P.**, Rizwani, W., Pillai, S., Kinkade, R., Rastogi, S., Banerjee, S., Kovacs, M., Carless, M., E., Kim, Haura, E., Coppola, D. and Chellappan, S. (2009) Nicotine induces cell proliferation, invasion and epithelial-mesenchymal transition in a variety of human cancer cell lines. *International J. Cancer* **124**, 1, 36-45.
 - e. Egleton, R. D., Brown, K.C. and **Dasgupta, P.** (2009) Angiogenic Activity of Nicotinic Acetylcholine Receptors: Implications in Tobacco-related Vascular Diseases. *Pharmacology & Therapeutics* **121**, 2, 205-223.
 - f. **Dasgupta, P.**, Rastogi, S., Joshi, B., Pillai, S., Ordonez, D., Morris, M., Haura, E. and Chellappan, S. (2006) Nicotine induces cell proliferation by beta-arrestin mediated activation of Src and Rb-Raf-1 pathway. *J. Clin. Invest.*, **116**, 2208-17.
 - g. **Dasgupta, P.**, Kinkade, R., Joshi, B., DeCook, C., Haura, E. and Chellappan, S. (2006) Nicotine inhibits apoptosis induced by chemotherapeutic drugs by upregulating XIAP and survivin. *Proc. Natl. Acad. Sci., USA*, **103**, 6332-7.
2. Our publications have revealed new knowledge on the signaling pathways by which nicotine promotes the proliferation, angiogenesis and metastasis of human lung cancers. We conjectured that disruption of the nicotine-signaling pathway should inhibit the growth of human lung cancers. Our studies were the first to show that inhibitors to the nicotine-signaling pathway attenuate angiogenesis and cause apoptosis in human SCLCs. We also extended these drug-discovery studies to tobacco-related diseases like diabetic retinopathy.
- 3.
- a. Dom, A.M., Buckley, A.W., Brown, K.C., Egleton, R.D., Marcelo, A.J., Proper, N.M., Weller, D.E., Shah, Y.H., Lau, J.K., and **Dasgupta, P.** (2010) Nicotine promotes retinal angiogenesis via $\alpha 7$ -nicotinic receptor and a MMP-2/9 dependent pathway. *Investigative Ophthalmology and Visual Science*, **52**, 7, 4428-4438.
 - b. Brown, K.C., Lau, J.K., Luo, H., Crabtree, C.M., Shah, Y.H., Shiflett, B.S., Marcelo, A.J., Proper, N.A., Hardman, W.E., Egleton, R.D., Chen, Y.C., Mangiarua, E.I., **Dasgupta, P.** (2012) MG624, an $\alpha 7$ -nAChR antagonist, inhibits angiogenesis via the Egr-1/FGF2 pathway. *Angiogenesis*, **15**, 99-114.
 - c. Lau, J.K., Brown, K.C., Thornhill, B.A., Crabtree, C.M., Dom, A.M., Witte, T.R., Hardman, W.E., McNees, C.A., Stover, C.A., Luo, H., Chen, Y.C., Carpenter, A.B., **Dasgupta, P.** (2013) Inhibition of cholinergic signaling causes apoptosis in human bronchioalveolar carcinoma. *Cancer Research*, **73**, 4, 1329-1339.
 - d. Kinkade, R., **Dasgupta, P.**, Carie, A., Pernazza, D., Carless, M., Pillai, S., Lawrence, N., Sebti, S.M., Chellappan, S. (2008) A small molecule disruptor of Rb/Raf-1 interaction inhibits cell proliferation, angiogenesis, and growth of human tumor xenografts in nude mice. *Cancer Res.*, **68**, 3810-3818.
 - e. **Dasgupta, P.**, Sun, J., Wang, S., Fusaro, G, Betts, V, Padmanabhan, J., Sebti, S.M. and Chellappan, S. (2004) Disruption of the Rb-Raf-1 interaction Inhibits Tumor growth and Angiogenesis. *Mol. Cell. Biol.* **24**, 9527-41.
 - f. Egleton, R.D., Brown, K.C., **Dasgupta, P.** (2008) Nicotinic Acetylcholine Receptors: Multiple Roles in Proliferation and Inhibition of Apoptosis *Trends Pharmacol Sci*, **29**, 151-158.
 - g. Kinkade, R., **Dasgupta, P.** and Chellappan, S. (2006) The ABCs of Targeting Raf: Novel approaches to Cancer Therapy. *Current Cancer Therapy Reviews* **2**, 305-14
4. The field of "Nutrition and Cancer" is one of the emphasis research areas at the Marshall University School of Medicine. My laboratory studies the anti-tumor activity of capsaicin, the pungent ingredient of chili peppers. Our studies showed for the first time that capsaicin exerted potent anti-tumor activity in human SCLCs. We also found that the bioavailability of capsaicin was greater in the lung compared to the liver, blood and kidneys. Our laboratory also the first to identify the signaling pathway underlying the anti-cancer effect of capsaicin in human SCLC.
- a. Friedman, J.R., Richbart, S.D., Merritt, J.C., Perry, H.E., Brown, K.C., Akers, A.T., Nolan, N.A., Stevenson, C.D., Hurley, J.D., Miles, S.L., Tirona, M.T., Valentovic, M.A., **Dasgupta, P.** (2019) Capsaicinoids enhance chemosensitivity to chemotherapeutic drugs. *Adv. Cancer. Res.*, **144**, 263-298.
 - b. Friedman, J.R., Richbart, S.D., Merritt, J.C., Brown, K.C., Denning, K.L., Tirona, M.T., Valentovic, M.A., Miles, S.L., **Dasgupta, P.** (2019) Capsaicinoids: Multiple effects on angiogenesis, invasion and metastasis in human cancers. *Biomed Pharmacother.* **118**, 109317-109326
 - c. Friedman, J.R., Nolan, N.A. Miles, S.L., Brown, K.C., Akers, A.T. Colclough, K.W. Seidler, J.M., Rimoldi, J.M., Valentovic, M.A. and Dasgupta, P. (2017) Anticancer Activity of Natural and Synthetic Capsaicin Analogs. *J. Pharmacol. Exp. Ther.*, **364**, 472-473.
 - d. Friedman JR, Perry HE, Brown KC, Gao Y, Lin J, Stevenson CD, Hurley JD, Nolan NA, Akers AT, Chen YC, Denning KL, Brown LG, Dasgupta P (2017) Capsaicin synergizes with Camptothecin to induce increased apoptosis via the calpain pathway. *Biochem. Pharmacol.* **29**, 54-66.
 - e. Hurley, J.D., Akers, A.T., Friedman, J.R., Nolan, N.A., Brown, K.C. and **Dasgupta, P.** (2016) Non-pungent long chain capsaicin-analogs arvanil and olvanil display better anti-invasive activity than capsaicin in human small cell lung cancers. *Cell Adhesion and Migration* **11**, 80-97.

- f. Brown, K.C., Witte, T.R., Hardman, W.E., Luo, H., Chen, Y.C., Carpenter, A.B., Lau, J.K. and **Dasgupta, P.** (2010) Capsaicin displays anti-proliferative activity against human small cell lung cancer in cell culture and nude mice models via the E2F pathway. *PLoS ONE*, **5**, 4, e102343.
- g. Lau, J. K., Brown, K.C., Dom, A.M and **Dasgupta, P.** (2011) Capsaicin: Potential Applications in Cancer Therapy, pp15-25. In: NUTRITION AND CANCER, Ed. P.P Claudio, Bentham Press Inc., London, United Kingdom.
- h. Rollyson, W.D., Stover, C.A., Brown, K.C., Perry, H.E., Stevenson, C.D., McNees, C.A., Ball, J.G., Valentovic, M.A. and Dasgupta, P. (2014) Bioavailability of capsaicin and its implications for drug delivery. *J. Controlled Release*, **196**, 96-105.
- i. Lau, J.K., Brown, K.C., Dom, A.M., Witte, T.R., Thornhill, B.A., Crabtree, C.M., Perry, H.E., Brown, J.M., Ball, J.G., Creel, R.G., Damron, C.L., Rollyson, W.D., Stevenson, C.D., Hardman, W.E., Valentovic, M.A., Carpenter, A.B. and **Dasgupta, P.** (2014) Capsaicin induces apoptosis in human small cell lung cancer via the TRPV6 receptor and the calpain pathway. *Apoptosis*, **19**, 1190-201.
- j. Chen, J., Chen, A.Y., Huang, H., Ye, X., Rollyson, W.D., Perry, H.E., Brown, K.C., Rojanasakul, Y., Rankin, G.O., **Dasgupta, P.**, Chen, Y.C. (2015) The flavonoid nobiletin inhibits tumor growth and angiogenesis of ovarian cancers via the Akt pathway. *Int. J. Oncology*, **46**, 2629-2638
- k. Pillai, S., **Dasgupta, P.** and Chellappan S.P. (2015) Chromatin immunoprecipitation assays: analyzing transcription factor binding and histone modifications in vivo. *Methods Mol. Biol.* 1288, 4129-4146.

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/1tClqnxSYE4QT/bibliography/46109014/public/?sort=date&direction=ascending>

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Support

- A. National Institute of Health R-15 AREA grant
PI on Grant
Title: **Capsaicin and Small Cell Lung Cancer Therapy**
Duration of Grant: 2016-2020
Budget: \$100,000/year

There is no overlap between the above grant and the present application.

Completed Research Support

- A. WVU-Marshall Health Partnership grant
Co-PI on Grant
Title: **Long-term effects of e-cigarettes on cardiac and respiratory structure and function**
Duration of Grant: 2016-2017
Budget: \$50,000
- B. American Institute of Cancer Research (AICR)
PI on Grant
Duration of Grant: 2014-2016
Title: **Anti-Metastatic Activity of Capsaicin in SCLC**
Budget: \$75,000/year
- C. National Institute of Health R-15 AREA grant
PI on Grant
Title: **Capsaicin and Small Cell Lung Cancer Therapy**
Duration of Grant: 2012-2015
Budget: \$100,000/year
- D. Young Clinical Scientist Award Program from Flight Attendant Medical Research Institute
PI on Grant
Duration of Grant: 2009-2014
Title: **Nicotine/Acetylcholine Signaling in Lung Cancer**

Budget: \$100,000/year

- E.** American Retina Foundation
PI on Grant
Duration of Grant: 2009-2010
Title: **Nicotine/Acetylcholine Signaling in ARMD**
Budget: \$12,000/year
- F.** ASPET-Astellas Award Program from American Society of Pharmacology and Experimental Therapeutics
PI on Grant
Duration of grant: 2009-2010
Title: **α 7-nicotinic receptor inhibitors in small cell lung cancer therapy**
Budget: \$30,000
- G.** MU-CDDC Pilot grant from Cell Differentiation and Development Center, Marshall University
PI on Grant
Duration of the grant: 2009-2010
Title: **Nicotinic Receptor signaling in atherogenesis**
Budget: \$20,000
- H.** Research Starter Grant from the Pharmaceutical Manufacturer's Association of America.
PI on Grant
Duration of grant: 2007-2009
Title: **" α 7-Nicotinic Receptor Signaling in Non-small cell Lung Cancer"**.
Budget: \$30,000 a year
- I.** COBRE Pilot Grant
PI on Grant
Duration of Grant: 2008-2009
Title: **Anti-Neoplastic Activity of capsaicin in human small cell lung cancer**
Budget: \$35,000