

The PMI Times

Department of Pathology, Microbiology & Immunology
University of South Carolina ~ School of Medicine

The Communication Source for PMI Faculty, Staff & Students

Department Chair: Dr. Mitzi Nagarkatti, PhD

Editors: Mitzi Nagarkatti, PhD, Angela Murphy, PhD & Nicki Holt



May - August 2024

P Honors & Awards

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I Drs. Prakash Nagarkatti and Mitzi Nagarkatti received Phase III Center of Biomedical Research Excellence (COBRE) grant on Dietary Supplements and Inflammation for >\$5 million for 5 years to support pilot projects and cores.

Dr. Kandy Velazquez received an R01 grant from NCI titled "The Role of TGF β 2 and Macrophages in Cancer Cachexia."

Dr. Deepak Bhere received a VISN7 Research Development Award for his proposal entitled, "MicroRNA Therapeutics for Melanoma". Dr. Bhere's proposed work will use small, noncoding RNA called microRNAs (miRNA) to develop a miRNA cocktail intended to restore tumor suppressor activity.

Tom Cardaci received an NCI F99/K00 titled "Microbiome-Mitochondrial Interactions Driving Cancer-Induced Cachexia in the Obese State". This award covers 2 years of pre-doctoral work and 4 years of post-doctoral work. Tom's primary mentor is Dr. Angela Murphy in PMI, and his mentoring team includes Drs. Kandy Velazquez (PMI), Norma Frizzell (PPN) and Jie Li (Chemistry and Biochemistry).

Dr. Frank Spinale (SOM) and Dr. James Hebert (ASPH) received an 11-million-dollar CTR-D grant from NIGMS titled "Center for Clinical and Translational Research at the University of South Carolina (ClinTrUSC)". Dr. Leonardo Bonilha (Assoc. Dean for Research, SOM) and Dr. Angela Murphy (PMI) lead the Health Research Core, which supports the Pilot and Developmental Research Project Program.

Brooke Bullard (Murphy Lab) received a 3-year F31 grant from NCCIH titled "Benefits of panaxynol on gut resilience in colitis". Brooke is mentored by Drs. Angela Murphy (PMI), Jason Kubinak (PMI) and Jie Li (Chemistry).



Congratulations to Tom Cardaci for winning The Robert Simmons Micrograph Award & The RUSKA Award At the Annual Meeting of the Southeast Microscopy Conference. Tom was trained in microscopy by Dr. Bob Price and is mentored by Drs. Angela Murphy, Kandy Velazquez, and Norma Frizzell. For more information about the Southeastern Microscopy Society and the RUSKA Award, visit their website: <https://southeasternmicroscopy.org/>

Shanieka Staley was selected to give a Spotlight Talk at MICROBE2024 at the American Society of Microbiology's (ASM) Annual Meeting in Atlanta, GA, June 13-17, 2024.

Dr. Kiesha Wilson received a Diversity Travel Award to attend MICROBE2024, the American Society of Microbiology's (ASM) Annual Meeting in Atlanta, GA, June 13-17, 2024.

Dr. Carole Oskeritzian was elected President of the South Carolina Academy of Science for a two-year term effective July 1.

Dr. Swapan K. Ray has been appointed as the Associate Editor of the MDPI Journal *Brain Sciences* (ISSN 2076-3425) for the section 'Molecular and Cellular Neuroscience'.
(https://www.mdpi.com/journal/brainsci/sectioneditors/Molecular_Cellular_Neuroscience)

Michal Claire Williams, former Undergraduate Honors College student in Dr. Busbee's lab, was accepted into the Medical University of South Carolina (MUSC) and will start in the Fall 2024 semester. Congratulations, Michal Claire!

News & Updates

Dr. Prakash Nagarkatti and Dr. Mitzi Nagarkatti have been individually recognized by the Stanford University/Elsevier as the World's Top 2% Scientists in Clinical Medicine from 2020.

Dr. Prakash Nagarkatti chaired a scientific session on Cannabinoids and Endocannabinoids at the International Drug Abuse Society Meeting

Dr. Prakash Nagarkatti published a policy paper (PMID: 39386949) demonstrating that 94% of NIH funds are awarded to non-IDeA states and that IDeA states such as South Carolina receive only 6%. He shared this with NIH Director Dr. Monica Bertagnolli, who responded that she would look into such geographic inequality in NIH funding that negatively impacts scientists from IDeA states.

Dr. P. Nagarkatti delivered a talk on the geographic inequality in NIH funding to the national EPSCoR/IDeA Coalition and Foundation Board and to NSF as well as to the South Carolina State EPSCoR Office.

Dr. P Nagarkatti met with Dr. Panch, NSF Director, seeking more funding support for EPSCoR states such as SC which was very well received.

Jeff Marvis, Senior Correspondent at *Science* magazine interviewed Dr. P. Nagarkatti regarding the geographic inequality in Federal Research Funding.

Daniel Oza, Sharon Begley Fellow from Stat News interviewed Dr. P. Nagarkatti on the decision of Howard Hughes Medical Institute to broaden geographic diversity of their \$24 Billion flagship program.

Dr. Carole Oskeritzian served as a grant reviewer for the South Carolina IDeA Networks of Biomedical Research Excellence (SC INBRE) Developmental Research Project (DRP) program, May 2024.

Dr. Swapan Ray is serving as a member of the Scientific Advisory Council for the Lexington 2 Innovation Center (<https://i2ic.lex2.org/>).

Dr. Carole Oskeritzian was invited to serve as a grant reviewer (R01s and R21s) for NIH/NIAID Arthritis, Connective Tissue and Skin 2024/10 ACTS Study Section, June 25-26, Washington, DC.

Dr. Velazquez served as a reviewer for NCI's K99/K00 Transition to Independence Awards, June 2024.

Dr. Carole Oskeritzian was invited to serve as a grant reviewer for NIH/NIAID Applied Immunology and Vaccine Development DCAI (10) Study Section, July 17-18. Virtual meeting.

Arianna Bastian (2nd year IBS PhD student) and Mitchell Nesmith (1st year IBS PhD student) joined the Murphy lab.

Dr. Catroppo attended the following faculty development sessions:

- The International Association of Medical Science Educators (IAMSE) roundtable discussion "Third Party Resources – Who To Trust" (5 June 2024)
- The Association for Academic Pathology (AAPath) webinar "Becoming More Effective Educators by Using Large Language Models" (11 June 2024)
- The Association of American Medical Colleges (AAMC) Fundamental Role of the Arts and Humanities in Medical Education (FRAHME) webinar "Exploring the Integration of Arts and Humanities for Teaching Health Equity" (12 June 2024)
- The McGraw Hill Master Class webinar "Boosting Student Success Amid Declining Step 1 Pass Rates" (28 June 2024)
- The Association of American Medical Colleges (AAMC) webinar "Navigating Critical Junctures: USMLE Exams" (24 July 2024)
- The Indiana University School of Medicine Inspired Teaching Summer 2024 Series Session "Storytelling as Teaching" (25 July 2024)
- The International Association of Medical Science Educators (IAMSE) roundtable discussion "Wellness for Students" (6 August 2024)
- The Indiana University School of Medicine Inspired Teaching Summer 2024 Series Session "The Power of Mentoring" (8 August 2024)

Publications

Bullard BM, McDonald SJ, Cardaci TD, VanderVeen BN, Mohammed AD, Kubinak JL, Pierre JF, Chatzistamou I, Fan D, Hofseth LJ, Murphy EA. Panaxynol improves crypt and mucosal architecture, suppresses colitis-enriched microbes, and alters the immune response to mitigate colitis. *Am J Physiol Gastrointestinal Liver Physiol*. 2024 May 1;326(5):G591-G606.

Mohammed AD, Ball RAW, Jolly A, Nagarkatti P, Nagarkatti M, Kubinak JL. Studying the cellular basis of small bowel enteropathy using high-parameter flow cytometry in mouse models of primary antibody deficiency. *Front Immunol*. 2024 May 13;15:1278197.

Cannon AS, Holloman BL, Wilson K, Miranda K, Nagarkatti PS, Nagarkatti M. 6-Formylindolo[3,2-b]carbazole, a potent ligand for the aryl hydrocarbon receptor, attenuates concanavalin-induced hepatitis by limiting T-cell activation and infiltration of proinflammatory CD11b+ Kupffer cells. *J Leukoc Biol*. 2024 May 29;115(6):1070-1083.

Gregory K, Xhao L, Felder TM, Clay-Gilmour, Eberth JM, Murphy EA, Steck SE. Prevalence of Health Behaviors Among Cancer Survivors in the United States. *Journal of Cancer Survivorship*. 2024 Jun;18(3):1042-1050.

Carter TH, Weyer-Nichols CE, Garcia-Sanchez JI, Wilson K, Nagarkatti P, Nagarkatti M. Delta-9-Tetrahydrocannabinol Blocks Bone Marrow-Derived Macrophage Differentiation through Elimination of Reactive Oxygen Species. *Antioxidants (Basel)*. 2024 Jul 23;13(8):887.

Mitchell C, Staley S, Williams MC, Saxena A, Bogdon R, Roark K, Hailey M, Miranda K, Becker W, Dopkins N, Pena MM, Hogan KM, Baird M, Wilson K, Nagarkatti P, Nagarkatti M, Busbee PB. Regulation of *Bacteroides acidifaciens* by the aryl hydrocarbon receptor in IL-22-producing immune cells has sex-dependent consequential impact on colitis. *Front Immunol*. 2024 Aug 20;15:1444045.

Ray SK. TUNEL-n-DIFL method for detection and estimation of apoptosis specifically in neurons and glial cells in mixed culture and animal models of central nervous system diseases and injuries. *Methods Mol Biol*. 2024:2761:1-26.

Ray SK, Dasgupta S. Chromatographic separation and quantitation of sphingolipids from the central nervous system or any other biological tissue. *Methods Mol Biol*. 2024:2761:149-157.

Muraleedharan A, Ray SK. Bioflavonoids for targeting gut microbiome in Alzheimer's disease. *Encyclopedia: Neurosciences*; <https://encyclopedia.pub/entry/54217>.

Presentations

Nagarkatti M. Role of anandamide in the attenuation of acute respiratory distress syndrome through induction of epigenetic pathways and regulation of dysbiosis. IDARS -Intl Drug & Alcohol Research Society Conference, 26 April – 8 May 2024. Invited Talk.

Nagarkatti PS. Delta-8-tetrahydrocannabinol Attenuates Experimental Multiple Sclerosis Through Modulation of Gut Microbiota. IDARS -Intl Drug & Alcohol Research Society Conference, 26 April – 8 May 2024. Invited Talk.

Bogdan R, Roark K, Saxena A, Mitchell C, Hailey M, Staley S, Nagarkatti P, Nagarkatti M, Busbee PB. Aryl hydrocarbon receptor ligand supplementation impacts colitis-associated depressive-like behavior. The American Association of Immunologists Annual Meeting, Chicago, IL, May 3-7, 2024.

Palrasu M, Kakar K, Aladhani A, Carter T, Wilson K, Yang X, Busbee PB, Singh NP, Nagarkatti PS, Nagarkatti M. Aryl hydrocarbon receptor activation ameliorates colitis via transcriptional regulation of α -defensin1. The American Association of Immunologists Annual Meeting, Chicago, IL, May 3-7, 2024.

Wolfe-Browne A, Cunningham P, James E, Echevarria P, Fan D, Murphy EA, Velázquez KT. Halting Cancer Cachexia: Exploring Natural Supplement Solutions. Cachexia and Wasting Syndrome in Cancer and Chronic Diseases, Keystone Symposium, Novato, CA, May 5-7, 2024.

Cunningham P, James E, Wolfe-Browne A, Echevarria P, Velázquez KT. Macrophage Depletion in Cancer Cachexia Using the ApcMin/+ mouse model. Keystone Symposium Cancer Cachexia. Cachexia and Wasting Syndrome in Cancer and Chronic Diseases, Keystone Symposium, Novato, CA, May 5-7, 2024.

Cardaci TD, Huss AR, VanderVeen BN, Bullard BM, Velazquez KT, Carson JA, Price RL, Murphy EA. Cancer cachexia increases lipid deposition and decreases intramyocellular lipid droplet-mitochondrial contact. Southeast Microscopy Society, Annual Meeting, Chattanooga, TN, May 8-10, 2024.

Gandy H, Kunkel D, Oxendine S, Madden M, Hui Y, Nagarkatti P, Nagarkatti M, Oskeritzian C. Pathogenic Mechanisms of Eczema: Regulatory Roles of Mast Cells and Resveratrol. VA Research Day, William Jennings Bryan Dorn Veterans Affairs Medical Center, Columbia, SC, May 13, 2024.

Muraleedharan A, Ray SK. Neuroprotective efficacy of ursolic acid and donepezil in mouse neuronal culture model of Alzheimer's disease in a setting of gut dysbiosis. Southeastern Chemical Biology and Drug Discovery Symposium (SCBDDS), University of Georgia, Athens, GA, May 14, 2024. Poster.

Rayala N, Ray SK. Comparative neuroprotective efficacy of MCC950 and methylprednisolone in rat neuronal culture model of acute spinal cord injury in a situation mimicking gut dysbiosis. Southeastern Chemical Biology and Drug Discovery Symposium (SCBDDS), University of Georgia, Athens, GA, May 14, 2024. Poster.

Cardaci TD, Huss AR, VanderVeen BN, Bullard BM, Velazquez KT, Murphy EA. Obesity exacerbates myosteatosis and alters lipid droplet-mitochondria contact in a murine model of cancer cachexia. Annual Meeting – American College of Sports Medicine (ACSM), Boston, MA. May 28-31, 2024.

Carlucci CD, Hui Y, Gandy H, Kunkel D, Oxendine S, Robida PA, Chumanovich AP, Mathew S, Nagarkatti P, Nagarkatti M, Oskeritzian CA. Resveratrol-mediated regulation of early-phase skin inflammation and mast cell signaling: a molecular compendium. The European Mast Cell & Basophil Research Network/ The International Mast Cell and Basophil Joint Meeting, Toulouse, France, May 29-31, 2024.

Palrasu M, Kakar K, Aladhami A, Carter T, Wilson K, Yang X, Busbee PB, Singh NP, Nagarkatti PS, Nagarkatti M. AhR-dependent transcriptional induction of β -defensin1 attenuates colitis by preventing microbial dysbiosis and colonic inflammation. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Gandy H, Kunkel D, Oxendine S, Madden M, Hui Y, Nagarkatti PS, Nagarkatti M, Oskeritzian CA. Pathogenic mechanisms of eczema: regulatory roles of mast cells and resveratrol. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Ai W, McCargo A, Fan D, Nagarkatti M, Nagarkatti PS. Benedict College. Targeting KLF4-mediated cell fusion in trained immunity and cancer recurrence. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Davis I, Gourishetti K, Taylor Mills H, Bhere D. Combinatorial Therapeutics for Pancreatic ductal adenocarcinoma. IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Gupta R, Nagarkatti M, Nagarkatti P. Prediction of putative diagnostic and therapeutic biomarkers for post-traumatic stress disorder and related comorbidities through machine learning. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Halder U, Kakkar K, Wilson K, Carter T, Weyer C, Mohammed A, Kaul M, Nagarkatti PS, Nagarkatti M. University of South Carolina. Cannabis component attenuates neurodegeneration through downregulation of microglial cell activation, astrocytosis and by reversing gut dysbiosis in GFAP-gp120 Tg Mice. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Kakar K, Halder U, Palrasu M. Protective Effects of Delta-8-THC Against EAE-Induced Enteric Neuropathy and Neuroinflammation through Regulation of miRNA-Mediated Signaling Networks. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Palrasu M, Kakar K, Hamida FNU, Marudamuthu AS, Carter T, Wilson KM, Saxena A, Yang X, Singh NP, Busbee NP, Nagarkatti PS, Nagarkatti M. Aryl hydrocarbon receptor transcriptionally regulates beta-defensin-1 and consequently suppresses colonic inflammation during colitis. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Oskeritzian CA, Carlucci CD, Hui Y, Gandy H, Kunkel D, Oxendine S, Robida PA, Chumanevich AP, Mathew S, Nagarkatti PS, Nagarkatti M. Resveratrol mitigates multipronged pathogenic mechanisms in early-phase eczema. National IDeA Symposium of Biomedical Research Excellence, NISBRE2024, Washington DC, June 16-19, 2024.

Staley SS, Williams J, Mauya Z, Nagarkatti PS, Nagarkatti M, Busbee PB, Wilson K. The Role of *Bacteroides acidifaciens* in Colitis and Acute Respiratory Distress Syndrome. MICROBE2024. American Society of Microbiology, Atlanta, GA, June 13-17, 2024.

Wilson K. Bioinformatics in Biomedical Sciences. STEMNoire. Washington, DC, June 19-25.

Cardaci TD, VanderVeen BN, Huss AR, Bullard BM, Velazquez KT, Frizzell N, Carson JA, Price RL, Murphy EA. Cancer cachexia increases skeletal muscle lipid deposition and decreases lipid droplet-mitochondrial contact. Annual Meeting – International Biochemistry of Exercise Conference (IBEC), Limerick, Ireland, July 9-11, 2024.

VanderVeen BN, Cardaci TD, Bullard BM, Murphy EA. Unraveling the complex heterogeneity of skeletal muscle immune cells. Annual Meeting – International Biochemistry of Exercise Conference (IBEC), Limerick, Ireland, July 9-11, 2024.

Oskeritzian, C. Local Frenemies: Mast Cells in Inflammation and Cancer. USC SOMC Library Staff Meeting Series, Columbia, SC, July 22, 2024.