

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 2022

P Honors & Awards

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I Dr. Angela Murphy received a U01 grant from the National Cancer Institute titled 'A Transdisciplinary Approach to Investigating Metabolic Dysregulation in Obese Parent and Child Dyads and Risk of Colorectal Cancer'. This is a 5-year award in the amount of \$5.8 million. Along with Angela, Dr. James Hebert (Arnold School of Public Health) and Dr. Lorne Hofseth (College of Pharmacy) serve as PIs. PMI faculty Drs. Jason Kubinak, Reilly Enos, and Ioulia Chatzistamou serve as Co-Investigators on this project.

Dr. Philip Brandon Busbee and Dr. Archana Saxena received the 2022 American Association of Immunologists (AAI) Career in Immunology Fellowship.

Dr. Carole Oskeritzian, Co-Chair Elect of the 2022 South Carolina Governor's Awards for Excellence in Science, presented the Young Scientists Award to Dr. Julianne Flanagan, Medical University of South Carolina, during a ceremony held at the State Capitol on May 31, in the presence of Governor McMaster.

Dr. Kiesha Wilson, (Nagarkatti lab) was honored with the STEMNoire 2022 Abstract Scholarship, June 23 2022.

Dr. VanderVeen (Murphy lab) was invited to give a symposium presentation at the American College of Sports Medicine's annual meeting in San Diego, CA. The symposium was titled: Muscle Wasting in Cancer: From Bench to Bedside. Annual Meeting of the American College of Sports Medicine, San Diego, CA, May 31-Jun 4, 2022.

Dr. Carole Oskeritzian was invited to serve as a Panelist at the 2022 Academic Leadership and Career Development Workshop organized by the South Carolina IDeA Networks of Biomedical Research Excellence (SC INBRE) held on June 13 in Columbia, SC.

Dr. Carole Oskeritzian was invited to join a discussion panel at the International Eosinophil Society Meeting held virtually on June 29.

Ms. Khadija Kakar, a Fulbright student in Drs. Nagarkatti's lab was selected from our university to attend a ceremony and reception in Washington, DC for Bono, U2 lead singer and co-founder of ONE and (RED) who was awarded the Fulbright Prize for International Understanding on March 31, 2022. Khadija hails from Pakistan and has been doing charitable work using her personal funds for >8years to fight against poverty affecting literacy and plans to build an organization towards this goal.

Dr. Philip Brandon Busbee served as a grant reviewer for the NIH ZRG1 DKUS-B Small Business: Digestive Sciences Activities Special Emphasis Panel from July 21-22, 2022.

Dr. Carole Oskeritzian was the guest speaker at the UofSC SOM Research Center for Transforming Health Emerging Physician Scientist Faculty Fellowship Program, held virtually on July 21. Dr. Oskeritzian discussed grantsmanship.

Dr. Kiesha Wilson (Nagarkatti lab) was honored to receive the 2022 American Society of Pharmacognosy, (ASP) Annual Meeting Travel Award, July 23, 2022, Charleston, SC.

Dr. Carol McMahon, MD was the recipient of the 2022 Dean's Distinguished Service Award, Diversity and Inclusion Leadership Award. The Dean's Distinguished Service Awards are annual honors established by the Office of the Dean to recognize individuals who demonstrate excellence in service, leadership, advocacy and professional accomplishment.

Alkeiver Cannon, PhD, (Nagarkatti lab) successfully defended her dissertation titled, "Role of epigenome in regulation of inflammation by AhR ligands 2,3,7,8-Tetrachlorodibenzo-p-dioxin and 6-Formylindolo [3, 2-b] carbazole" May 17, 2022. She has joined Harvard University as a Postdoctoral Fellow.

Bryan L. Holloman, PhD, (Nagarkatti lab) successfully defended his dissertation titled, "Role of AhR in the epigenetic regulation of immune cells in lungs during acute respiratory distress syndrome" July 12, 2022. He has joined Baylor University as a Postdoctoral Fellow.

Dr. Swapan Ray acted as the Academic Editor for the recently published peer-reviewed paper: "Supramarginal Resection for Glioblastoma: It Is Time to Set Boundaries! A Critical Review on a Hot Topic". *Brain Sci.* 2022 May 16;12(5):652.

Dr. Swapan Ray also acted as the Academic Editor for the recently published peer-reviewed paper: "A Novel Classification Model for Lower-Grade Glioma Patients Based on Pyroptosis-Related Genes." *Brain Sci.* 2022 May 28;12(6):700.

In addition, Dr. Swapan Ray served as the Academic Editor for the recently published peer-reviewed paper: "The Progression Related Gene RAB42 Affects the Prognosis of Glioblastoma Patients." *Brain Sci.* 2022 Jun 11;12(6):767.

Dr. Swapan Ray acted as the Academic Editor for the recently published peer-reviewed paper: "Mechanical Properties of the Extracellular Environment of Human Brain Cells Drive the Effectiveness of Drugs in Fighting Central Nervous System Cancers." *Brain Sci.* 2022 Jul 15;12(7):927.

Dr. Swapan Ray acted as the Academic Editor for the recently published peer-reviewed paper: "Comparative Study of Antiproliferative Activity in Different Plant Parts of *Phaleria macrocarpa* and the Underlying Mechanism of Action." *Scientific World Journal.* 2022 Jun 13;2022:3992660.

Dr. Swapan Ray acted as the Academic Editor for the recently published peer-reviewed paper: "Abrogation of Cellular Senescence Induced by Temozolomide in Glioblastoma Cells: Search for Senolytics." *Cells.* 2022 Aug 19;11(16):2588.

News & Updates

Khadija Kakar, graduate student (Nagarkatti lab), was featured in UofSC News and Events May 6, 2022. [UofSC student strives to provide education for Pakistani women - UofSC News & Events | University of South Carolina.](#)

Dr. James F. Catroppo attended the Association of American Medical Colleges (AAMC) Supplemental Electronic Residency Application Service® (ERAS®) Application Overview Webinar for Medical School Advisors (12 May 2022).

Dr. Prakash Nagarkatti chaired the 2022 Virtual EPSCoR PD/PI National Council Meeting, May 16-19, 2022.

Dr. James F. Catroppo attended the Alexander Grass Humanities Institute of the Johns Hopkins University Krieger School of Arts & Sciences webinar “Humanities in the Village” with the authors of *A Scientific Revolution: Ten Men and Women Who Reinvented American Medicine* (23 May 2022).

Dr. Angela Murphy served as a reviewer for NIH/NCI Transition to Independence awards on June 8-9, 2022.

Dr. Prakash Nagarkatti and Dr. Mitzi Nagarkatti co-authored an invited article titled, “Should you get a COVID-19 booster shot now or wait until fall? Two immunologists help weigh the options” published in *The Conversation*, June 27, 2022. <https://theconversation.com/should-you-get-a-covid-19-booster-shot-now-or-wait-until-fall-two-immunologists-help-weigh-the-options-184809>

Dr. James F. Catroppo was chosen to serve on the UofSC SOM Appointment and Promotion Committee for Non-Tenure-Track Basic Science Faculty, Faculty Representation Committee, for a three-year term (1 July 2022 - June 2025).

Dr. Prakash Nagarkatti presented an invited talk titled “Role of Epigenome and Microbiome in the Regulation of Inflammation by Cannabinoids” at the American Society of Pharmacognosy (ASP) Annual Meeting, Charleston, SC, July 23-28, 2022.

Dr. Prakash Nagarkatti was invited to provide his expertise in *The Scientist* article, “What We Know About Getting a Second Booster Shot of COVID-19 Vaccines” by Dan Robitzski, published on Aug 11, 2022. <https://www.the-scientist.com/news-opinion/what-we-know-about-getting-a-second-booster-shot-of-covid-19-vaccines-70350> .

In *The Scientist*, Aug 31, 2022, article by Catherine Offord titled, “Pfizer and Moderna COVID-19 Omicron Boosters Get OK from the FDA”, Dr. Prakash Nagarkatti, a leading expert was quoted –“Clearly the data show that the bivalent vaccines which incorporate the Omicron variant provide stronger and better protection against the Omicron variants. . . . Thus, it is clearly better to get vaccinated with such newer vaccines than the original vaccines because Omicron is the primary strain that is spreading.” <https://www.the-scientist.com/news-opinion/pfizer-and-moderna-covid-19-omicron-boosters-get-ok-from-the-fda-70441>

Dr. Mitzi Nagarkatti and Dr. Prakash Nagarkatti co-authored an invited article in *The Conversation*, “Will omicron-specific booster shots be more effective at combating COVID-19? 5 questions answered”, published September 1, 2022. <https://theconversation.com/will-omicron-specific-booster-shots-be-more-effective-at-combating-covid-19-5-questions-answered-189610>

Justin Wright, B.S. in Exercise Science, Minor in Chemistry, joined the Oskeritzian Lab to establish the biochemical profile of posterior tibial tendinopathy, in collaboration with Dr. Ben Jackson, Prisma Health Orthopedics and Dr. Baker Mills, Duke Orthopedics.

Hannah Gandy, first year medical student at the UofSC SOMC, joined the Oskeritzian Lab to study the preclinical mechanisms of eczema.

Dylan Kunkel, Magellan Journey Scholar, UofSC Honors College, Pre-Med track, joined the Oskeritzian Lab to study the molecular mechanisms of mast cell activation in early skin allergic responses.

Dr. Carole Oskeritzian, Committee Chair, together with Dr. Christine Wheeler, M.D., Patrice Cunningham, B.S., and Kasie Roark, B.S., PMI committee members, invite you to consult the UofSC SOMC Women in Science and Medicine's webpage (https://www.sc.edu/study/colleges_schools/medicine/internal/committees/women_in_science_and_medicine/index.php). The webpage offers a wealth of information on grants, workshops, professional and career development opportunities, as well as on our recently launched mentorship and networking program. This is a call to PMI Faculty and Staff, to please sign up to serve as mentors to our graduate students enrolled in the Integrated Biomedical Sciences Program.

Dr. Swapan Ray's undergraduate research student Amanda Manea, who is now an Honors College senior with Mathematics and Biological Sciences double-major, has successfully completed and returned from a Summer Internship Program at the Centre for Genomic Regulation in Barcelona, Spain.

Publications

Hou L, Tian HY, Wang L, Ferris ZE, Wang J, Cai M, Older EA, Raja MRK, Xue D, Sun W, Nagarkatti P, Nagarkatti M, Chen H, Fan D, Tang X, Li J. Identification and Biosynthesis of Pro-Inflammatory Sulfonolipids from an Opportunistic Pathogen *Chryseobacterium gleum*. *ACS Chem Biol*. 2022 May 20;17(5):1197-1206.

Bam M, Yang X, Ginsberg JP, Aiello AE, Uddin M, Galea S, Nagarkatti PS, Nagarkatti M. Long non-coding RNA LINC00926 regulates WNT10B signaling pathway thereby altering inflammatory gene expression in PTSD. *Transl Psychiatry*. 2022 May 12;12(1):200.

Cannon AS, Holloman BL, Wilson K, Miranda K, Dopkins N, Nagarkatti P, Nagarkatti M. AhR Activation Leads to Attenuation of Murine Autoimmune Hepatitis: Single-Cell RNA-Seq Analysis Reveals Unique Immune Cell Phenotypes and Gene Expression Changes in the Liver. *Front Immunol*. 2022 Jun 3;13:899609.

Buzoglu Kurnaz L, Luo Y, Yang X, Alabresm A, Leighton R, Kumar R, Hwang J, Decho AW, Nagarkatti P, Nagarkatti M, Tang C. Facial amphiphilicity index correlating chemical structures with antimicrobial efficacy. *Bioact Mater*. 2022 Jun 27;20:519-527.

Miranda K, Becker W, Busbee PB, Dopkins N, Abdulla OA, Zhong Y, Zhang J, Nagarkatti M, Nagarkatti PS. Yin and yang of cannabinoid CB1 receptor: CB1 deletion in immune cells causes exacerbation while deletion in non-immune cells attenuates obesity. *iScience*. 2022 Aug 24;25(9):104994.

Barman PK, Shin JE, Lewis SA, Kang S, Wu D, Wang Y, Yang X, Nagarkatti PS, Nagarkatti M, Messaoudi I, Benayoun BA, Goodridge HS. Production of MHCII- expressing classical monocytes increases during aging in mice and humans. *Aging Cell*. 2022 Aug 30:e13701.

Bullard BM, McDonald SJ, Cardaci TD, VanderVeen BN, Murphy EA. Non-Pharmacological Approaches for Improving Gut Resilience to Chemotherapy. *Current Opinion in Supportive & Palliative Care*. 2022 In Press.

Wang J, Wang Q, Guan Y, Sun Y, Wang X, Lively K, Wang Y, Luo M, Kim JA, Murphy EA, Yao Y, Cai G, Fan D. Breast cancer cell-derived microRNA-155 suppresses tumor progression via enhancing immune cell recruitment and anti-tumor function. *J Clin Invest*. 2022 In Press.

Cunningham P, Patton E, VanderVeen BN, Unger C, Aladhami A, Enos RT, Madero S, Chatzistamou I, Fan D, Murphy EA, Velázquez KT. Sub-chronic oral toxicity screening of Quercetin in mice. *BMC Complementary Medicine and Therapies*. 2022 In Press.

VanderVeen BN, Cardaci TD, McDonald SJ, Madero SS, Unger CA, Bullard BM, Enos RT, Velazquez KT, Kubinak JL, Fan D, Murphy EA. Obesity reduced survival with 5-Fluorouracil and did not protect against chemotherapy-induced cachexia or immune cell cytotoxicity in mice. *Cancer Biology and Therapy*. 2022 In Press.

VanderVeen BN, Cardaci TD, Madero SS, McDonald SJ, Bullard BM, Price RL, Carson JA, Fan D, Murphy EA. 5 fluorouracil disrupts skeletal muscle immune cells and impairs skeletal muscle repair and remodeling. *Journal of Applied Physiology*. 2022 In Press.

Bawazir M, Amponnawarat A, Hui Y, Oskeritzian CA, Ali H. Inhibition of MRGPRX2 but not FcεRI or MrgprB2-mediated Mast Cell Degranulation by a Small Molecule Inverse Receptor Agonist. *Front Immunol*. 2022 In Press.

Al-Sammarraie N, Ray SK (2022). Targeting mTOR signaling to promote autophagy for functional recovery after spinal cord injury. In: *Cellular, Molecular, Physiological, and Behavioral Aspects of Spinal Cord Injury – The Neuroscience of Spinal Cord Injury* (eds. Rajendram R, Reddy V, and Martin CR), Elsevier, New York, NY, p. 263-274.

Presentations

Al-Sammarraie N, Ray SK. Augmented bone morphogenetic protein 4 signaling impaired autophagy flux and induced apoptosis in VSC4.1 motoneurons in cell culture model of spinal cord injury. Annual Meeting of the American Society for Neurochemistry (ASN), Roanoke, VA, April 10, 2022.

Wilson K, Nagarkatti PS, Nagarkatti M. Single-cell RNA landscape of lungs from Staphylococcal enterotoxin B-induced acute respiratory distress syndrome (ARDS) reveals effects on various cell types. STEMNoire, Virtual, June 23-25, 2022.

Carter TH, Nagarkatti P, Nagarkatti M. THC decreases bone marrow-derived macrophage activation in a dose-dependent manner. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Cannon AK, Nagarkatti P, Nagarkatti M. Ameliorative role of AhR ligands in concanavalin-induced liver injury is due to increased miR-100 expression leading to mTOR downregulation and promoter hydroxymethylation. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Varsha KK, Nagarkatti P, Nagarkatti M. EAE suppression caused by Δ-8-THC treatment is due to downregulation of CNS infiltrating CD4+ T-cells, proinflammatory cytokines and apoptotic genes expression. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Yang X, Yang XC, Julian J, Schnell T, Albrecht H, Owens W, Yang XS. Epigenetic regulation of inflammatory genes involving histone methylation is associated with hyperimmune response in COVID-19 patients. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Varsha KK, Zhong Y, Yang X, Nagarkatti PS, Nagarkatti M. TLR-9 agonist CpG activates macrophages and modulates expression of microRNAs involved in cancer drug resistance and various signaling pathways. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Holloman BL, Nagarkatti M, Nagarkatti P. Pulmonary macrophage activation and recruitment in lipopolysaccharide-induced acute lung injury mediates neutrophil infiltration: Role of AhR ligation in intervention. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Saxena A, Mitchell C, Staley S, Wilson K, Rutkovsky A, Wisniewski PJ, Dopkins N, Nagarkatti M, Nagarkatti P, Busbee PB. I3C-mediated protection against colitis dependent on AHR expression on Vil1-expressing colonic epithelial cells. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Kakar K, Nagarkatti M, Nagarkatti PS. EAE suppression caused by Δ -8-THC treatment is due to downregulation of CNS infiltrating CD4+ T-cells, proinflammatory cytokines and apoptotic genes expression. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Kumte NI, Hui Y, Chumanevich AP, Chatzistamou I, Davis T, Pena M, Fuseler JW, Oskeritzian CA. Mast cells as early diagnostic markers of colonic polyps and colorectal cancer. Columbia Veterans Affairs Health Care System Research Day, Columbia, SC, May 20, 2022.

Cardaci TD, VanderVeen BN, McDonald SJ, Bullard BM, Madero SS, Fairman CM, Price RL, Murphy EA. Impact of Obesity and Chemotherapy on Murine Skeletal Muscle Mitochondria. International Biochemistry of Exercise Conference, Toronto, Canada, May 25-28, 2022.

VanderVeen BN, Cardaci TD, McDonald SJ, Murphy EA. Chemotherapy disrupts Skeletal Muscle Repair and Remodeling. International Biochemistry of Exercise Conference, Toronto, Canada, May 25-28, 2022.

Cardaci TD, VanderVeen BN, McDonald SJ, Madero SS, Velazquez K, Fairman CM, Fan D, Murphy EA. 5-Fluorouracil Alters Skeletal Muscle Mitochondrial Content and Inflammation in Mice. Annual Meeting of the American College of Sports Medicine, San Diego, CA, May 31-Jun 4, 2022.


VanderVeen BN, Rosa-Caldwell ME, Bland K, Lonbro S, Fairman CM. Muscle Wasting in Cancer: From Bench to Bedside Symposium. Annual Meeting of the American College of Sports Medicine, San Diego, CA, May 31-Jun 4, 2022.

Wilson K, Sultan M, Cannon A, Nagarkatti PS, Nagarkatti M. Prophylactic CBD Treatment Improves Fatal Inflammatory Response Exhibited in SEB-Induced ARDS. American Society of Pharmacognosy (ASP) Annual Meeting, Charleston, SC, July 23-28, 2022.

McDonald SJ, Bullard BM, VanderVeen BN, Cardaci TD, Madero SS, Chatzistamou I, Hofseth LJ, Murphy EA. Panaxynol Alleviates Murine Colitis Associated Colorectal Cancer via Macrophage Suppression. American Society of Pharmacognosy (ASP) Annual Meeting, Charleston, SC, July 23-28, 2022.

Oskeritzian CA. All roads lead to mast cells, inflammation and cancer hub cells. Veterans Affairs Summer Undergraduate Research Program, UofSC SOM, Columbia, SC, July 27, 2022.

Dr. Jason Kubinak presented his Tenure and Promotion seminar, August 29, 2022, titled "Good Germ, Bad Germ: How humoral immunity maintains benign host-microbiota symbiosis".



Roland MM, Kubinak JL. B-cell Intrinsic MHCII Promotes Host-Microbiota Diversity; July 18th, 2022; Society for the Study of Mucosal Immunology (SMI) Annual Meeting, Seattle, Washington, July 20-26, 2022.

Roland MM, Kubinak JL. B-Cell Intrinsic MHCII Limits Bacteremia and Prevents Systemic Invasion by *Citrobacter rodentium*. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022.

Mohammed AD, Kubinak JL. Defective humoral immunity disrupts bile acid homeostasis that promotes inflammatory disease of the small bowel. American Association of Immunologists (AAI) Annual Meeting, Portland, Oregon, May 6-10, 2022