



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: Dr. Angela Murphy, PhD & Nicki Holt

September - December 2020

P Honors & Awards

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I Dr. Prakash Nagarkatti serves as the UofSC Principal Investigator on a 10-year grant obtained from the Dept. of Energy for \$3.8 billion towards Savannah River National Laboratory (SRNL) management. UofSC is partnering with 4 other universities in the region forming Battelle Savannah River Alliance aimed at conducting research innovation and workforce development at the SRNL.

Congratulations to Mitzi Nagarkatti, PhD, PMI's Department Chair! She was named the National Academy of Inventors Fellow (NAI). The 2020 Fellow class represents 115 research universities and governmental and non-profit research institutes worldwide. Among the 2020 Fellows are recipients of the National Academies of Sciences, Engineering, and Medicine, American Academy of Arts & Sciences, and Nobel Prize, as well as other honors and distinctions. With the election of the 2020 class, there are now 1,403 NAI Fellows worldwide, representing more than 250 prestigious universities and governmental and non-profit research institutes. To date, NAI Fellows hold more than 42,700 issued U.S. patents, which have generated over 13,000 licensed technologies and companies, and created more than 36 million jobs. In addition, over \$2.2 trillion in revenue has been generated based on NAI Fellow discoveries.

Dr. Kandy Velázquez was nominated for the 2021 Distinguished Undergraduate Research Mentor Award.

Alex Sougiannis (Murphy lab) was awarded the A.D. Sobel Trainee Scholar Award at the Pathobiology for Investigators, Students, and Academicians (PISA) Conference held on November 9-13 out of Boston, Mass. (Virtual due to COVID-19). Alex's presentation was titled "Emodin Administration Reduces Tumor Burden by Decreasing Tumor-Associated M2-Type Macrophages in the AOM/DSS Model of CRC".

Brandon VanderVeen (Murphy lab) was granted the Next Generation Researchers of Cancer Cachexia honor and award from the 2020 Cancer Cachexia Conference for his presentation titled "The effects of chemotherapy on skeletal muscle immune cell infiltration and activation".

Dr. Brandon Busbee received the American Association of Immunologists (AAI) Early Career Faculty Travel grant to attend the AAI Meeting in Hawaii from May 8-12, 2020 in Honolulu, Hawaii. The meeting was cancelled due to COVID-19.

Congratulations to Firas Hameed Khathayer (Ray lab) for successfully defending his dissertation, "Mechanism of Therapeutic Efficacy of New Drugs in Glioblastoma", on November 10, 2020.

News & Updates

Prakash Nagarkatti, PhD, was featured in a Newsweek article titled: “Why Moderna’s COVID Vaccine Has a Huge Advantage Over Pfizer’s” by Kashmiri Gander on 11/17/20. <https://www.newsweek.com/covid-vaccine-moderna-pfizer-advantage-1548026>

Newsweek featured Prakash Nagarkatti, PhD, in an article titled: “Unknown COVID Vaccine Side Effects May Appear After Millions Immunized—But Benefits Outweigh Risks” by Kashmiri Gander on 12/3/2020. <https://www.newsweek.com/covid-vaccine-side-effects-rare-long-term-benefits-outweigh-risks-millions-immunized-1552009> .

WSPA, Columbia, SC featured Prakash Nagarkatti, PhD in an interview and article titled: “State health officials, hospitals working to increase public trust in COVID-19 vaccines”, Dec 17, 2020. Dr. Prakash Nagarkatti, the Vice President of Research at the University of South Carolina, said one of the many reasons people are hesitant in taking vaccines is because of possible side effects. He said minor side effects like a fever or fatigue shows the vaccine is working. “It’s a good sign because your immune system is showing that it’s recognizing the encoded spike protein and you will have better immunity – more resistance,” he said. Dr. Nagarkatti said making sure most of the population gets vaccinated is a way to achieve herd immunity and potentially eradicate COVID-19 entirely. <https://www.wspa.com/news/state-health-officials-hospitals-working-to-increase-public-trust-in-covid-19-vaccines/>

Prakash Nagarkatti, PhD, was featured in a USA Today article titled: “USA TODAY vaccine panel: 'Best news so far' in COVID-19 fight, but logistical challenges remain” by Elizabeth Weise and Karen Weintraub on 11/19/20. The apparent effectiveness of both vaccines is a game-changer, said Prakash Nagarkatti, an immunologist and Vice President for Research at the University of South Carolina. Dr. Nagarkatti was especially happy to see data from the Moderna clinical trials that seemed to indicate its vaccine was effective in the elderly and minorities. Because those groups have been among the hardest hit by the pandemic, a strong, effective vaccine is “very encouraging,” he said. <https://www.usatoday.com/in-depth/news/health/2020/11/19/expert-panels-covid-vaccine-clock-leaps-ahead-pfizer-moderna-news/6332802002/>

Dr. Mitzi Nagarkatti reviewed grants for the NIH Systemic Injury by Environmental Exposure (SIEE) Study Section as a standing member on November 5 - 6, 2020.

On 30 September 2020, Dr. James F. Catroppo attended the University of South Carolina Center for Teaching Excellence (CTE) webinar workshop “**Meeting Students' Accommodation Needs in Blackboard**”.

On 22 October 2020, Dr. James F. Catroppo attended the University of South Carolina Center for Teaching Excellence (CTE) webinar workshop “**Resilience in the Classroom**”.



On 17 August 2020, Dr. James F. Catroppo was awarded a Certificate of Completion for the Certificate Program “**Fostering Proactive Learning Environments**” of the University of South Carolina Center for Teaching Excellence (CTE).

**UofSCSOM Medical Student Interest Group for Pathology
2020-2021**



John Korin
President



Amber Prete
Vice-President

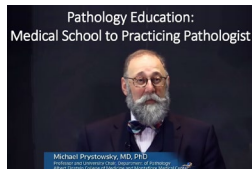


Perry Witt
Secretary/Treasurer



On 25 September 2020 the **Pathology Interest Group**, animated by Class of 2023 Officers John Korin, Amber Prete, and Perry Witt, with Faculty Advisor Dr. James F. Catroppo, hosted a remote WebEx Lunch and Learn

meeting with two video presentations by Dr. Jerad Gardner, formerly Associate Professor of Pathology and Dermatology and Dermatopathology Fellowship Program Director at the University of Arkansas for Medical Sciences (UAMS), and presently dermatopathologist and bone/soft tissue pathologist at Geisinger Medical Center: **“A Day In The Life Of A Pathologist”** and **“Facebook And Rare Cancer Changed My Life”**.



On 25 November 2020 the **Pathology Interest Group** held its second meeting of the academic year, hosting a remote WebEx Lunch and Learn with a video presentation **“Pathology Education: From Medical School To Practicing Pathologist”** by Dr. Michael Prystowsky, Professor and University Chair at the Department of Pathology of the Albert Einstein College of Medicine.

Sarah Tuomala joined the laboratory of Angela Murphy as a research technician in November. Sarah has a background in industry and will now be working primarily on clinical projects in the Murphy laboratory.

Dr. Angela Murphy served as a reviewer for NIH/NCI Transition to Independence awards on October 21-22, 2020.

Dr. Angela Murphy served as a reviewer for NIH SEP-2: NCI Clinical and Translational R21 and Omnibus R03 grants on October 22-23, 2020.

Dr. Angela Murphy served as a reviewer for NIH/NIDDK Nutrition and Obesity Research Centers (NORC) on November 16-17, 2020.

Dr. Carole Oskeritzian served as a grant reviewer for the NIH/NCI Special Emphasis Panel “Research Answers to National Cancer Institute’s (NCI) Provocative Questions” held virtually on October 8.

Dr. Carole Oskeritzian served as a grant reviewer for the NIH/NIAID Special Emphasis Panel “Childhood Asthma in Urban Settings Clinical Research Network - Leadership Center (UM1)” held virtually on November 17.

Dr. Carole Oskeritzian served as a grant reviewer for the NIH/NIAID Special Emphasis Panel “Childhood Asthma in Urban Settings Clinical Research Network - Clinical Research Centers (U01)” held virtually on November 18.

Dr. Carole Oskeritzian served as a grant reviewer for 2020-2021 UofSC Office of the Vice President for Research SPARC Graduate Research Grant Awards.

Dr. Ioulia Chatzistamou served as a Reviewer for NIH/NIAID Study Section: SEP #ZAI1-KJK-X-J3, Emergency Awards: Rapid Investigation of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease 2019 (COVID-19) (R21/R01 Clinical Trial Not Allowed), December 18th, 2020.

Dr. Swapan Ray is acting as a research mentor for the undergraduate student Amanda Manea, who received a prestigious SCHC (South Carolina Honors College) research award on the project “Brain Cancer and Cell Death Mechanisms”.

Dr. Swapan Ray served as a grant reviewer and member of the grant review panel for the FL DOH (Department of Health) Biomedical Research Programs 2020-2021.

A warm welcome to:

- Alina Hall, laboratory technologist, who joined the lab of Dr. Mitzi Nagarkatti. Alina received her BS from UofSC Columbia and her MS from College of Charleston. Her background is in marine biology with a focus on lipidomics and marine mammal physiology. In her spare time, she trains Brazilian Jiu Jitsu and works at Carolina Wildlife Center as a wildlife rehabilitator.
- Sahmyah Tittle, laboratory technologist, joined the lab of Dr. Mitzi Nagarkatti. Sahmyah graduated from Coastal Carolina University with a bachelor's degree in marine science.

Dr. Carole Oskeritzian was appointed to serve on the UofSC School of Medicine Climate Task Force Faculty Focus Group.

Dr. Carole Oskeritzian was also appointed to serve on the UofSC School of Medicine Strategic Planning Committee on Inclusion and Diversity.

Publications

Sougiannis AT, VanderVeen BN, Cranford TL, Enos RT, Velazquez KT, McDonald S, Bader JE, Chatzistamou I, Fan D, Murphy EA. Impact of weight loss and partial weight regain on immune cell and inflammatory markers in adipose tissue in male mice. *Journal of Applied Physiology*. 2020 Oct 1;129(4):909-919.

Bader JE, Carson MS, Enos RT, Velázquez KT, Sougiannis AT, Singh UP, Becker WJ, Nagarkatti M, Fan D, Murphy EA. High Fat Diet Fed Ovariectomized Mice Are Susceptible To Accelerated Subcutaneous Tumor Growth Potentially Through Adiposity, Adipose Inflammation, And Local Insulin-Like Growth Factor Release. *Oncotarget*. 2020 Dec 8;11(49):4554-4569.

VanderVeen BN, Sougiannis AT, Velazquez KT, Carson JA, Fan D, Murphy EA. The acute effects of 5 fluorouracil on skeletal muscle resident and infiltrating immune cells in mice. *Frontiers in Physiology*. 2020 Dec 7;11:593468.

Saaoud F, Wang J, Iwanowycz S, Wang Y, Altomare D, Shao Y, Liu J, Blackshear PJ, Lessner SM, Murphy EA, Wang H, Yang X, Fan D. Bone marrow deficiency of mRNA decaying protein Tristetraprolin increases inflammation and mitochondrial ROS but reduces hepatic lipoprotein production in LDLR knockout mice. *Redox Biol*. 2020 Oct;37:101609.

Bernhart JA, Turner-McGrievy B, Eustis S, Wilson M, Hutto B, Wilcox S, Frongillo E, Murphy EA. Sensor-measured physical activity and cardiovascular disease risk in African Americans in the NEW Soul study. *Lifestyle Medicine*. In Press.

Sougiannis AT, Enos RT, VanderVeen BN, Velazquez KT, Kelly B, McDonald S, Cotham W, Chatzistamou I, Nagarkatti M, Fan D, Murphy EA. Safety of Natural Anthraquinone Emodin: An Assessment in Mice. *BMC Pharmacology & Toxicology*. In Press.

Soltnamohammadi E, Farmaki E, Zhang Y, Naderi A, Kaza V, Chatzistamou I, Kiaris H. Coordination in the unfolded protein response during aging in outbred deer mice. *Exp Gerontol*. 2020 Dec 5; 144:111191.

Mohammed A, Alghetaa HFK, Miranda K, Wilson K, Singh NP, Cai G, Putluri N, Nagarkatti P, Nagarkatti M. Δ 9-Tetrahydrocannabinol Prevents Mortality from Acute Respiratory Distress Syndrome through the Induction of Apoptosis in Immune Cells, Leading to Cytokine Storm Suppression. *Int J Mol Sci*. 2020 Aug 28;21(17):6244.

Singh NP, Nagarkatti M, Nagarkatti P. From Suppressor T cells to Regulatory T cells: How the Journey That Began with the Discovery of the Toxic Effects of TCDD Led to Better Understanding of the Role of AhR in Immunoregulation. *Int J Mol Sci*. 2020 Oct 22;21(21):7849.

Alkarkoushi RR, Hui Y, Tavakoli AS, Singh U, Nagarkatti P, Nagarkatti M, Chatzistamou I, Bam M, Testerman TL. Immune and microRNA responses to *Helicobacter muridarum* infection and indole-3-carbinol during colitis. *World J Gastroenterol*. 2020 Aug 28;26(32):4763-4785.

Sarkar S, Alhasson F, Kimono D, Albadrani M, Seth RK, Xiao S, Porter DE, Scott GI, Brooks B, Nagarkatti M, Nagarkatti P, Chatterjee S. Microcystin exposure worsens nonalcoholic fatty liver disease associated ectopic glomerular toxicity via NOX-2-MIR21 axis. *Environ Toxicol Pharmacol*. 2020 Jan;73:103281.

Mohammed A, Alghetaa HK, Zhou J, Chatterjee S, Nagarkatti P, Nagarkatti M. Protective effects of Δ 9-tetrahydrocannabinol against enterotoxin-induced acute respiratory distress syndrome are mediated by modulation of microbiota. *Br J Pharmacol*. 2020 Nov;177(22):5078-5095.

Alrafas HR, Busbee PB, Nagarkatti M, Nagarkatti PS. Resveratrol Downregulates miR-31 to Promote T Regulatory Cells during Prevention of TNBS-Induced Colitis. *Mol Nutr Food Res*. 2020 Jan;64(1):e1900633.

Nagarkatti P, Miranda K, Nagarkatti M. Use of Cannabinoids to Treat Acute Respiratory Distress Syndrome and Cytokine Storm Associated with Coronavirus Disease-2019. *Front Pharmacol*. 2020 Nov 6;11:589438.

Becker W, Alrafas HR, Wilson K, Miranda K, Culpepper C, Chatzistamou I, Cai G, Nagarkatti M, Nagarkatti PS. Activation of Cannabinoid Receptor 2 Prevents Colitis-Associated Colon Cancer through Myeloid Cell De-activation Upstream of IL-22 Production. *iScience*. 2020 Aug 27;23(9):101504.

Neamah WH, Busbee PB, Alghetaa H, Abdulla OA, Nagarkatti M, Nagarkatti P. AhR Activation Leads to Alterations in the Gut Microbiome with Consequent Effect on Induction of Myeloid Derived Suppressor Cells in a CXCR2-Dependent Manner. *Int J Mol Sci*. 2020 Dec 17;21(24):9613.

Bam M, Yang X, Busbee BP, Aiello AE, Uddin M, Ginsberg JP, Galea S, Nagarkatti PS, Nagarkatti M. Increased H3K4me3 methylation and decreased miR-7113-5p expression lead to enhanced Wnt/ β -catenin signaling in immune cells from PTSD patients leading to inflammatory phenotype. *Mol Med*. 2020 Nov 14;26(1):110.

Khathayer F, Ray SK. Diosgenin as a novel alternative therapy for inhibition of growth, invasion, and angiogenesis abilities of different glioblastoma cell lines. *Neurochem Res*. 2020 45:2336-2351.

Presentations

Mitzi Nagarkatti gave a virtual talk on “Cannabinoid-induced changes in gut microbiome and suppression of inflammation” at the Center for Research on Ingredient Safety (CRIS) at Michigan State University on November 11, 2020.

Mitzi Nagarkatti was an invited presenter at the 7th HIV and NeuroAIDS and 2nd Nebraska Center on Substance Abuse Research (NSCAR) joint colloquium, November 17, 2020. The topic was Innate Immunity and Inflammasome.

Prakash Nagarkatti was an invited presenter at the 7th HIV and NeuroAIDS and 2nd Nebraska Center on Substance Abuse Research (NSCAR) joint colloquium, November 17, 2020. The topic was Cannabinoid Induced Immunosuppression and Cancer Therapy.

VanderVeen BN, Sougiannis AT, Velazquez KT, Carson JA, Fan D, Murphy EA. The effects of chemotherapy on skeletal muscle immune cell infiltration and activation. Cancer Cachexia Conference, September 8-12, 2020 (Virtual due to COVID-19). Dr. Vanderveen received the Next Generation Researchers of Cancer Cachexia honor and award for this work.

Sougiannis AT, VanderVeen BN, Chatzistamou I, Testerman T, Kubinak J, Nagarkatti M, Fan D, Murphy EA. Emodin Administration Reduces Tumor Burden by Decreasing Tumor-Associated M2-Type Macrophages in the AOM/DSS Model of CRC. Pathobiology for Investigators, Students, and Academicians (PISA) November 9-13, 2020. (Virtual due to COVID-19).

Carlucci C, Chumanevich AP, Fuseler JW, Oskeritzian CA. Regulatory roles of resveratrol in skin inflammation. NIH/NIGMS IDeA Program Meeting, September 22, 2020. (Virtual due to COVID-19).

Busbee PB, Wilson K, Nagarkatti M, Nagarkatti PS, Busbee PB, Alrafas H, Dopkins N, Nagarkatti M, Nagarkatti PS. Indole-3-carbinol prevents murine colitis development via an IL-22-dependent mechanism that regulates anti-microbial peptides and mucus production. Annual Meeting of American Association of Immunologists (AAI) Meeting, May 8-12, 2020, Honolulu, Hawaii. The meeting was cancelled due to COVID-19.