

The PMI Times

Department of Pathology, Microbiology & Immunology
USC School of Medicine
The Communication Source for PMI Faculty, Staff & Students
Department Chair: Dr. Mitzi Nagarkatti
Editors: Dr. Angela Murphy & Nicki Holt



JANUARY 2015 ~ APRIL 2015

News:

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Dr. Lucia Pirisi-Creek participated in the review of Specialized Programs of Research Excellence (SPOR) grants for the National Cancer Institute (NCI).

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Medical Pathology Course Director Dr. James F. Catroppo attended the Group for Research in Pathology Education (GRPE) Annual Winter Meeting from January 29 through January 31, hosted by the Department of Pathology of the Florida State University College of Medicine in Tallahassee, FL. The theme of this year's meeting was "The Integration of Pathology in Medical Education". Dr. Catroppo participated in – and received AMA PRA Category 1 Continuing Medical Education (CME) credits for – workshops on "Making Mentoring Work – for the Mentor and Mentee", "Integrating Basic Science into the Clinical Years", "Integrative Engaged Learning for Large Groups", "Pathologists as Radiologists?", "The GRPE-UMEDS Learning Competencies Project", and "An Update on the NBME".



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Dr. Swapan Ray served as a member of the USC Breakthrough Awards Committee for selecting the Breakthrough Scholars and Stars in January 2015.

Dr. Angela Murphy served as a reviewer of Nutrition and Obesity Research Center (NORC) P30 grants for the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) in March.

The Oskeritzian Lab has welcomed four new members: Dr. John Fuseler, an expert in imaging and image analysis, joined in March 2015. John is developing novel methods to quantify *in situ* mast cell activation, cell infiltration and angiogenesis in inflamed tissues. Together with Dr. Oskeritzian, he has co-mentored Morgan K. Edwards, an undergraduate student, in fulfilling her research project conducted from January to April 2015. Also joining in March, Katherine Castleberry, a sophomore at USC, has initiated phenotypic analysis of inflammatory infiltrates in inflamed skin samples using immunofluorescence and immunohistochemical methods and image analysis. Ahmed Aladhami, an Iraqi student, officially joined the lab in January 2015 after doing a rotation last summer, as a first year Ph. D. student. Ahmed studies the role of mast cells in carcinogenesis using two preclinical models of prostate cancer, in collaboration with Drs. Angela Murphy and Ioulia Chatzistamou (PMI) and Jennifer Wu (Microbiology and Immunology, MUSC).

Dr. Udai Singh served on the National Institutes of Health (NIH) "Cellular and Molecular Immunology A" study section in February 2015.

Dr. Traci Testerman was invited to write a chapter on the role of *Helicobacter pylori* in vascular disease for a new book, "Vascular Responses to Pathogens", to be published by Elsevier.

Dr. Narendra Singh hosted a table for the *In Vitro* Toxicology Lecture and Luncheon for Students at the 54th Annual Meeting of Society of Toxicology (SOT) held in San Diego from March 22-26.

Dr. Udai Singh is serving on the editorial board of "International Archives of Clinical Pharmacology".

Dr. Angela Murphy gave a talk on 'The Impact of Gut Microbiota in Linking Obesity to Colon Cancer' at the Center for Colon Cancer Research Retreat in January 2015.

Dr. Swapan Ray served as an external reviewer for grants submitted for the Voelcker Fund Young Investigator Award in San Antonio, Texas.

Dr. Udai Singh is serving on the editorial board of "Journal of Bacteriology & Mycology".

Dr. Carole Oskeritzian gave a talk on 'Perspectives on mast cell functions in the tumor microenvironment' at the Cancer Immunology Retreat in Charleston SC in January 2015.

Dr. Angela Murphy has been invited to write a chapter for a new book on Adipocytokines, Energy Balance, and Cancer. The book will be published by Springer.

Dr. Udai Singh served on the National Institutes of Health (NIH) ZRG1 special emphasis panel DKUSN for SBIR grants on Digestive and bladder disease in March 2015.

Dr. Angela Murphy was invited to serve on the Review Editorial Board of Sport and Exercise Nutrition, which is a specialty of Frontiers in Nutrition.

On April 15th, the Medical Student Interest Group (MSIG) for Pathology provided Krispy Kreme doughnuts and coffee for 60 M2 student attendees at the Medical Laboratory Professionals Week celebration held in the M2 Classroom. In addition, all of our "rising M3's" who choose to attend were "showered" with "SWAG" (promotional items such as click pens, stylus pens, post-it pads, lanyards with attached lab values "ID type" reference cards, microfiber cloths) and literature from the American Society for Clinical



Pathology (ASCP) and the Intersociety Council for Pathology Information (ICPI). In conjunction with the clinical pathology/laboratory medicine theme of the event Dr. Allan Brett (the Orlando Benedict Mayer Professor of Medicine at USC, director of the Division of General Internal Medicine, Vice Chair of the Department of Medicine, and Editor-in-Chief of the *New England Journal of Medicine Journal Watch General Medicine*) engaged the students with an interactive session on Liver Function Tests, followed by Dr. B. James McCallum (Assistant Professor of Clinical Internal Medicine at USC, Associate Director of Primary Care and Subspecialty Medicine for Inpatient Services and clinical attending at the Wm. Jennings Bryan Dorn VA Medical Center, and a Diplomate of the American Board of Clinical Lipidology) who was equally engaging in a session on Lipid Profiles. The sessions were intended to give "rising M3" students with a "heads up" on some practical issues in laboratory medicine (AKA clinical pathology) so as to help them feel less disoriented upon "hitting the wards and rounding" on their clinical rotations next semester.



Drs. Carole Oskeritzian, Dev Karen, and Angela Murphy were the USC Organizing Committee for the Inaugural Southeast Cancer Immunology Research Retreat for the Medical University of South Carolina, Georgia Regents University and University of South Carolina, held in January 22-23, in Folly Beach, SC.

Dr. Swapan Ray served as an expert reviewer for the grants submitted to the SC Spinal Cord Injury Research Fund (SCIRF) in January 2015.

Dr. Oskeritzian was invited to serve as a member of the scientific organizing committee to the 2015 International Mast Cell & Basophil Meeting to be held in October 21-23 in Marseilles, France. In addition, she is an invited speaker and will give a talk on sphingolipids in mast cell signaling.

Dr. Narendra Singh participated in the "Chat With an Expert (CWAE) program for the Graduate Student Leadership Committee of the Society of Toxicology" at 54th Annual Meeting of Society of Toxicology (SOT) held in San Diego from March 22-26.

Dr. Angela Murphy gave a talk on 'Macrophages in Obesity and Cancer' at the Cancer Immunology Retreat in Charleston SC in January 2015.

Dr. Carole Oskeritzian served as a judge in the Medicine/Pharmacy Session at the 2015 South Carolina Academy of Science Annual Meeting on April 11 at Furman University, Greenville, SC.

The class officers (M2 students Leila Kutob and Jessie Ulmer Ray) and faculty advisor (Dr. James F. Catroppo) of the Medical Student Interest Group (MSIG) for Pathology planned and hosted a lunch with guest speaker Dr. Bradley Marcus, a forensic pathologist and the current Medical Examiner for Richland County, for M1 and M2 students on February 24th. Funding was graciously provided by a grant from the Intersociety Council for Pathology Information (ICPI) as well as by matching funds provided by PMI Department Chair Dr. Mitzi Nagarkatti. Dr. Marcus spoke about his experiences as a forensic pathologist as well as his career "path" and offered any interested students the opportunity to spend some time with him at the Medical Examiner's Office.



Dr Nyland was a featured presenter at "The State of Autoimmune Disease: A National Summit" organized by the American Autoimmune Related Diseases Association at the National Press Club in Washington DC. The presentation was for legislative representatives, press, advocacy groups, and patients.



The COBRE External Advisory Committee Meeting was held Thursday, March 19, 2015 at the Inn @ USC. There were over 100 faculty and staff in attendance, including COBRE EAC Chair, Dr. Daniel Conrad, Dr. Gabriel Fernandes, Dr. Clifford Lowell, and Dr. Roger Markwald. Presentations were given by the Target Faculty & Pilot Faculty, including poster presentations by the Core Director.

Dr. Prakash Nagarkatti chaired the NIH Study Section to review grants submitted to the National Center for Complementary and Alternative Medicine on the Development of National Centers of Excellence for Research on CAM (CERC) on March 12, 2015.

Dr. Prakash Nagarkatti was invited to present a talk at the colloquium organized by the Society of Toxicology and the US FDA Center for Food Safety and Applied Nutrition (CFSAN) on Dietary Supplement Modulation of Autoimmune Diseases on April 14, 2015.

Honors & Awards:

Dr. Traci Testerman was awarded a COBRE pilot grant, entitled "Prevention and treatment of *Helicobacter pylori*-mediated gastritis and cancer by indole-3-carbinol".

Alexa Gandy (Nagarkatti Lab) was the recipient of the "AAI Trainee Poster Award" at the American Association of Immunologist (AAI) Conference, held May 8-12, 2015 in New Orleans, LA.

David Elliot (Nagarkatti Lab), was the recipient of the First Place Award among all the Predoctoral Students at the Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP) held in Miami from April 22-25, 2015 for his presentation "Cannabidiol-induced myeloid-derived suppressor cells ameliorate experimental autoimmune encephalomyelitis through microRNA regulation".

Both Dr. Udai Singh and Dr. Hongbing Guan, Research Associate Professors in the department as well as Dr. Brandon Busbee (Postdoctoral Fellow) and Pegah Mehrpouya (Graduate Student) were awarded Laboratory Travel Grants to present the following papers at the Annual Meeting of the American Association of Immunologists (AAI) that was held in New Orleans from May 8-12, 2015. The AAI has a membership of ~7500 members from ~65 countries.

- Dr. Udai Singh's presentation was on "Blocking fatty acid amide hydrolase reduces T cell activation and attenuates experimental colitis," and is coauthored by Haidar Shamran, Narendra P. Singh, Hongbing Guan, Manoj K. Mishra, Robert L. Price, Mitzi Nagarkatti, and Prakash S. Nagarkatti.
- Dr. Busbee's presentation was entitled, Natural indoles, indole-3-carbinol (I3C) and 3,3'-diindolylmethane (DIM), attenuate staphylococcal enterotoxin B-mediated liver injury by downregulating miR-31 expression and promoting caspase-2-mediated apoptosis, is coauthored by Dr. P. Nagarkatti and Dr. M. Nagarkatti.
- Dr. Guan presented an abstract on "Unique gut commensal bacteria in CD44 deficient mice can ameliorate experimental autoimmune encephalomyelitis" which is coauthored by Udai Singh, Narendra Singh, Haiping Hao, Prakash Nagarkatti and Mitzi Nagarkatti
- Pegah Mehrpouya along with Prakash Nagarkatti and Mitzi Nagarkatti presented studies on "Weight loss induced by blocking CB1 cannabinoid receptors is associated with an altered microRNA profile and suppression of inflammation in adipose tissue".

Dr. Lucia Pirisi-Creek was nominated for and accepted into the Riley Diversity Leadership Initiative course, organized by the Riley Institute (Furman University), one of 40 participants selected among over 400 nominees.

Taryn Cranford (Murphy Lab) received the Breakthrough Graduate Scholar Award from the office of the VP for research. Taryn was one of 7 students at the University that received this prestigious award.

Jessica Sido (Nagarkatti Lab), was the recipient of the Biotechnology Specialty Section Student Achievement Award at the Annual Meeting of the Society of Toxicology held from March 22-26, 2015 in San Diego, CA. Her presentation was entitled "The impact of elevated endocannabinoid 2-AG in delayed type hypersensitivity" and was coauthored by Prakash Nagarkatti and Mitzi Nagarkatti. The SOT meeting was attended by ~6500 participants from ~50 countries.

Yvon Woappi (Pirisi-Creek lab) won first prize at the Newton Graduate Symposium at the USC School of Medicine.

Kayla Penta was awarded a SPARC Graduate Research Grant for her proposal "In vitro arsenic exposure linked to Type 2 diabetes progression".

Taylor Hall (Murphy Lab) is the recipient of a Magellan Mini Grant. Taylor will be studying, 'Cerebellar defects in a mouse model for muscle eye brain disease'. This is part of a STEM Summer Research Program at the Royal Veterinary College in London, England.

Taryn Cranford (Murphy Lab) received the first place award in the 'Emerging Leaders in Nutritional Science' competition from the American Society of Nutrition (ASN) at the Experimental Biology meeting in Boston in April. Taryn received a \$500 travel award from ASN.

Dr. David Elliot (Nagarkatti Lab) was the recipient of the Early Career Investigator Travel Award from the Society of Neuroimmune Pharmacology (SNIP) for his work on "Cannabidiol-induced myeloid-derived suppressor cells ameliorate experimental autoimmune encephalomyelitis through microRNA regulation", other winners of SNIP Travel Awards were Dr. Jessica Sido and Dr. Marpe Bam. Jessica presented her research on "Marijuana THC attenuates allogeneic host-versus-graft response and skin allograft transplants through induction of MDSCs" which was coauthored by Prakash and Mitzi Nagarkatti. Marpe's abstract was entitled "Dysregulated IL12 expression in the peripheral circulation of ischemic stroke patients is regulated by multiple epigenetic mechanisms." Coauthors included Xiaoming Yang, Souvik Sen, P. Nagarkatti and M. Nagarkatti.

Yvon Woappi and Maria Hosseinipour (Pirisi-Creek lab) defended and passed their Comprehensive Examinations.

Ambrish Kumar, Postdoctoral Fellow working in Dr. Ugra Singh's laboratory, received a Postdoctoral Travel Award from the American Society for Biochemistry and Molecular Biology (ASBMB) to present his research at the Experimental Biology annual meeting held in Boston, MA, during March 28 - April 01, 2015. Poster entitled- "Impairments in Rho GTPase Signaling Mediate the Inhibitory Effects of Metformin on the Survival and Migration of Neuroblastoma Cells" authored by Ambrish Kumar, Nadia Al-Sammarraie, Donald J. DiPette and Ugra S. Singh.

Graduations:

David Elliot (Nagarkatti Lab) successfully defended his dissertation entitled "Attenuation of inflammatory disease with natural compounds: A role for miRNA". David has been accepted to Duke Medical School where he will begin his studies this July.

Jessica Sido (Nagarkatti Lab) defended her dissertation on "Cannabinoid-mediated Epigenetic Regulations of Immune Functions." Jessica has accepted a job offer at Harvard University, working under the well-known Dr. Harvey Cantor, Chair of the Department of Cancer Immunology & AIDS at the Dana-Farber Cancer Institute.

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Kyle Herbert (Murphy lab) successfully defended his M.S. thesis entitled 'The Gastrointestinal Microbiome and Diet-Induced Dysbiosis: Influence on Obesity and Chronic Disease Risk'. This work has been accepted for publication in the journal of Current Opinion in Clinical Nutrition and Metabolic Care.

Publications:

Busbee PB, Nagarkatti M, Nagarkatti PS. Natural indoles, indole-3-carbinol (I3C) and 3,3'-diindolylmethane (DIM), attenuate staphylococcal enterotoxin B-mediated liver injury by downregulating miR-31 expression and promoting caspase-2-mediated apoptosis. *PLoS One*. 2015 Feb 23;10(2):e0118506.

Hegde VL, Singh UP, Nagarkatti PS, Nagarkatti M. Critical Role of Mast Cells and Peroxisome Proliferator-Activated Receptor γ in the Induction of Myeloid-Derived Suppressor Cells by Marijuana Cannabidiol In Vivo. *Journal of Immunology* 2015: pii: 1401844. [Epub ahead of print; published online Apr 27]. PMID: 25917103.

Tomar S, E Zumbun E, Nagarkatti M, Nagarkatti PS. Protective role of cannabinoid receptor 2 activation in galactosamine/lipopolysaccharide-induced acute liver failure through regulation of macrophage polarization and microRNAs. *J Pharmacol Exp Ther*. 2015 May;353(2):369-79.

Zhou J, Chaudhry H, Zhong Y, Ali MM, Perkins LA, Owens WB, Morales JE, McGuire FR, Zumbun EE, Zhang J, Nagarkatti PS, Nagarkatti M. Dysregulation in microRNA expression in peripheral blood mononuclear cells of sepsis patients is associated with immunopathology. *Cytokine*. 2015 Jan;71(1):89-100.

Tomar S, Nagarkatti M, Nagarkatti PS. 3,3'-Diindolylmethane attenuates LPS-mediated acute liver failure by regulating miRNAs to target IRAK4 and suppress Toll-like receptor signalling. *Br J Pharmacol*. 2015 Apr;172(8):2133-47.

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Chen L, Yang S, Zumbun EE, Guan H, Nagarkatti PS, Nagarkatti M. Resveratrol attenuates lipopolysaccharide-induced acute kidney injury by suppressing inflammation driven by macrophages. *Mol Nutr Food Res*. 2015 May;59(5):853-64.

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Murphy EA, Enos RT, Velázquez KT. Influence of Exercise on Inflammation in Cancer: Direct Effect or Innocent Bystander? *Exercise and Sports Science Reviews (In Press)*

Narsale AA, Enos RT, Puppa MJ, Chatterjee S, Murphy EA, Fayad R, Pena MO, Durstine JL, Carson JA. Liver Inflammation and Metabolic Signaling in ApcMin/+ Mice: The Role of Cachexia Progression. *PLoS One*. 2015 Mar 19;10(3):e0119888.

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Adams SA, Wirth MD, Khan S, Murphy EA, Heiney SP, Davis LC, Davis B, Drayton RF, Hurley TG, Blair SM, Hebert JR. The Association of C-Reactive Protein and Physical Activity Among African Americans. *Preventative Medicine* (In Press).

Presentations:

Elliott DM, Nagarkatti P, Nagarkatti M. Cannabidiol-induced myeloid-derived suppressor cells ameliorate experimental autoimmune encephalomyelitis through miRNA regulation. Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP), Miami FL, April 22-25, 2015.

Sagar D, Singh NP, Huang X, Ginwala R, Philip R, Nagarkatti M, Nagarkatti P, Khan ZK, Jain P. Antibody blocking of Clec12A delays the course and attenuates EAE severity by impairing myeloid cell CNS infiltration: A potential new therapy for multiple sclerosis. Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP), Miami FL, April 22-25, 2015.

Sido JM, Nagarkatti PS, Nagarkatti M. Marijuana THC attenuates allogenic host-versus-graft response and skin allograft transplants through induction of MDSCs. Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP), Miami FL, April 22-25, 2015

Bam M, Yang X, Nagarkatti P, Nagarkatti M. Dysregulated IL-12 expression in the peripheral circulation of ischemic stroke patients is regulated by multiple epigenetic mechanisms. Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP), Miami FL, April 22-25, 2015.

Yang X, Bam M, Nagarkatti P, Nagarkatti M. Delta-9-tetrahydrocannabinol mediates alterations in gene expression in lymphocytes. Annual Meeting of the Society of Neuroimmune Pharmacology (SNIP), Miami FL, April 22-25, 2015.

Singh UP, Shamran H, Singh NP, Mishra MK, Price RL, Nagarkatti M, and Nagarkatti PS. Blocking fatty acid amide hydrolase reduces T cell activation and attenuates experimental colitis. Presented at the AAI annual meeting held in May 2015 in New Orleans, LA.

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Guan H, Singh UP, Singh NP, Hao H, Nagarkatti PS, Nagarkatti M. Unique gut commensal bacteria in CD44 deficient mice can ameliorate experimental autoimmune encephalomyelitis. Presented at the AAI annual meeting held in May 2015 in New Orleans, LA.

Mehrpouya P, Nagarkatti PS, Nagarkatti M. Weight loss induced by blocking CB1 cannabinoid receptors is associated with an altered microRNA profile and suppression of inflammation in adipose tissue. Presented at the AAI annual meeting held in May 2015 in New Orleans, LA.

Singh UP, Shamran H, Singh NP, Mishra MK, Price RL, Nagarkatti M, and Nagarkatti PS. Fatty acid amide hydrolase inhibitors modulates microRNAs, reduces T cell activation and immune mediators to attenuate experimental colitis. Presented at the Society of Toxicology annual meeting held in March 2015 in San Diego, USA.

Katsoulas N, Michaelidou V, Panagiotou E, Farmaki E, Chatzistamou I, Kiaris H, Sklavounou A. Endoplasmic Reticulum Stress may contribute to the pathogenesis of pemphigus vulgaris: an immunohistochemical and in vitro study. Annual meeting of the American Academy of Oral Medicine and the American Academy of Oral & Maxillofacial Pathology, San Diego CA, April 18-23, 2015.

Chakrabarti M, Walden Ai, Ray SK (2015) Synergistic anti-tumor effects of luteolin and silibinin with overexpression of miR-7-1-3p inhibited autophagy and promoted apoptosis in glioblastoma. In: Proceedings of the 105th Annual Meeting of the American Association for Cancer Research; 2015 April 18-22; Philadelphia, PA. Philadelphia (PA): AACR; 2015. Abstract number 1010.

Piper Wedman, second year Ph. D. student (Oskeritzian Lab), presented her research at the Annual Newton Symposium in January 30, 2015. She discussed "Mast cells and sphingosine-1-phosphate during the development of atopic dermatitis".

Chakrabarti M, Murphy A, Ray SK. Quercetin inhibited starvation-induced autophagy to increase apoptosis in CD133+ neuroblastoma stem cells in vitro and in vivo. In: Proceedings of the 105th Annual Meeting of the American Association for Cancer Research; 2015 April 18-22; Philadelphia, PA. Philadelphia (PA): AACR; 2015. Abstract number 1011.

Kayla Penta (Dr Nyland's lab) presented a short talk "In vivo arsenic exposure linked to Type 2 diabetes progression" at the REACH (Reproductive, Environmental, and Child Health) meeting with colleagues from USC, MUSC, College of Charleston, and NOAA in Charleston, SC.

Morgan K. Edwards presented her research entitled "quantitative analysis of intact and degranulated mast cells using image analysis" at USC Discovery Day on April 24, 2015. Dr. Carole A. Oskeritzian served as a primary mentor and Dr. John W. Fuseler served as a co-mentor to Morgan.

Cranford TL, Enos RT, Velazquez KT, McClellan JL, Nagarkatti M, Murphy EA. Influence of High Fat Diet on Macrophage Behavior and Metabolic Processes in Obesity Sensitive and Resistant Mice: Role of Monocyte Chemoattractant Protein 1. Experimental Biology Annual Meeting, Boston MA, 2015.

Pritchett CM, Velazquez KT, Enos RT, McClellan JM, Murphy EA. Role of miRNA-155 on high-fat-diet related pathologies in the hepatic tissue. Discovery Day, University of South Carolina, Columbia SC, 2015.