

# 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



MAY 2016 ~ AUGUST 2016

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## News & Updates:

Dr. Catroppo was promoted from Clinical Assistant Professor to Clinical Associate Professor. Congratulations Dr. Catroppo!

Dr. Carole Oskeritzian served as a reviewer for the NIH/NIAID Immunology IMM-S10B Study Section on June 24, 2016 in Arlington, VA.

Dr. Pirisi-Creek chaired the June, 2016 meeting of the IRG Review Panel for the American Cancer Society in Atlanta, June 14-15, 2016.

Dr. Udai Singh served on the National Institutes of Health (NIH), Immunity and Host Defense Study Section as an ad-hoc member on June 2-3, 2016.

Dr. Mitzi Nagarkatti served on the NIH Systemic Injury by Environmental Exposure (SIEE) Study Section meeting held June 23-24, 2016 in Bethesda, MD.

Dr. Angela Murphy was invited to serve as an associate editor for the journal *Medicine and Science in Sports and Exercise*. This is the flagship journal for the American College of Sports Medicine. Featured topics include: sports medicine practice, physiology, epidemiology, biodynamics, and physical fitness and performance.

Dr. Narendra Singh served on the National Institutes of Health (NIH) "National Center for Complementary and Integrative Health (NCCIH) 2016/10 ZAT1 SM (42) Study Section meeting" held on July 28, 2016.

Dr. Pirisi-Creek made presentations at, and contributed to the organization and implementation of the SC INBRE "Academic Leadership Workshop" designed and organized for SC INBRE by Drs. Martine LaBerge and Edie Goldsmith, and held at the USC SOM on June 16-17, 2016.

Nabihah I. Kumte, a rising sophomore majoring in Public Health and from the Honors College at USC, joined Dr. Carole Oskeritzian's Laboratory in May 2016. After 2 months in the lab, she presented a poster entitled "Mast cells may contribute to angiogenesis in pre-symptomatic atopic dermatitis" at the USC Undergraduate Summer Symposium held on July 28 at the USC Alumni Center. Nabihah was the only rising sophomore to present. She will continue her research in the Oskeritzian Lab for another year, with Dr. John W. Fuseler as her co-mentor.

Dr. Udai Singh served on the Congressionally Directed Medical Research Program (CDMRP), Department of Defense pre-application panel reviewing Inflammatory Bowel Disease grant applications (July 4<sup>th</sup>, 2016) and Interstitial Cystitis grant applications (August 30<sup>th</sup>, 2016).

Dr. Swapan Ray served as an International Expert Reviewer of brain tumor grants submitted to the Flanders Innovation and Entrepreneurship funding program for strategic basic research, Brussel, Belgium.

Ariana Miskin, an Honors Student at the University of South Carolina worked with Dr. Narendra Singh over the summer (May 15-July 31, 2016).

Dr. Pirisi-Creek, as NAIPI Treasurer, contributed to the organization and management of the 2016 Biennial National IDEa Symposium of Biomedical Research Excellence (NISBRE), held in Washington, DC, June 26-29, 2016.

(News & Updates continued)

Michael Hobensack joined the Oskeritzian Lab as an RPMS student over the summer. Michael presented his exciting work entitled "Angiogenesis and mast cells in precancerous prostate" in the Graduate Student Seminar Series on August 31.

Dr. Udai Singh served on the National Institutes of Health (NIH) Small Business: Digestive Science ZRG1 DKUS-N (10) Special Emphasis Panel as an ad-hoc member on July 7, 2016.

Drs. Pirisi-Creek and Goldsmith organized and held the SC INBRE 2016 Symposium at the USC School of Medicine, with about 70 posters and 160 participants, on Saturday, August 27, 2016.

Dr. Carole Oskeritzian chaired the Allergy 1 Session at the 2016 International Congress of Immunology, held in Melbourne, Australia on August 21-26.

Dr. Swapan Ray served as an External Expert Reviewer of 2 book proposals for Academic Press/Elsevier Publisher.

Dr. Udai Singh chaired a session on "Cytokine, Interferon and Inflammation 4" at the International Congress of Immunology held in Melbourne, Australia on August 25, 2016.

Dominique Jackson (Claflin University, Orangeburg), a recipient of a NIH R25 funded grant on Aging, worked with Dr. Narendra Singh from June 1, 2016 to July 31, 2016.

Dr. Pirisi-Creek took the Gyrotonic Pre-Training course (6-day intensive, hands-on training in the Gyrotonic Expansion System discipline, precluding to Foundation training and subsequent Apprenticeship and Certification) in June, 2016.

## Honors & Awards:

Dr. Mitzi Nagarkatti has been named a Fellow of the Academy of Toxicological Sciences. The title of Fellow of the Academy is bestowed for an exemplary record of professional accomplishments.

Dr. Kandy Velazquez has received a diversity supplement from the National Cancer Institute in the amount of \$206,862. The project is entitled "Cachexia in ApcMin/+ mice: The role of IL-6". This award will support Kandy for two years during which time she will be mentored by Dr. Angela Murphy (PMI) and Dr. Jim Carson (Exercise Science).

Dr. Udai Singh and Dr. Narendra Singh received travel awards from the American Association of Immunology (AAI) to attend the International Congress of Immunology held in Melbourne, Australia on August 21-26, 2016.

Dr. Berlin Londono received a Burroughs Wellcome Fund Collaborative Research Grant to study the role of human C5a in modulating the Jack/STAT pathway in *Aedes aegypti* mosquitoes. This research is in collaboration with Dr. Dimopoulos of Johns Hopkins University.

Dr. Gregorio Gomez was awarded a '2016 Careers in Immunology Fellowship' from the American Association of Immunologists. The award will help support his graduate student Cody McHale conduct research on a project entitled "Mechanism of mast cell desensitization: Role of adenosine receptors".

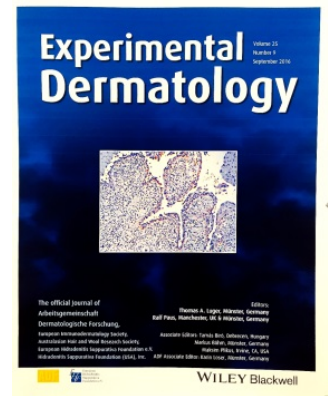
Dr. Udai Singh received a Core Facility Travel Award from COBRE/NISBRE to attend the IDeA symposium held in Washington, DC on July 26-27, 2016.

Dr. Susan Steck (Epidemiology), Dr. Angela Murphy (PMI), and Dr. Zeid Keilani (Clinical Surgery) received a pilot grant in the amount of 40K from the Center for Colon Cancer Research to study "Diet, Obesity and the gut microbiome: Implications for cancer health disparities".

Dr. Udai Singh received a travel award from the American Association of Immunology (AAI) to attend the AAI Annual Meeting held in Seattle, WA on May 13-17, 2016.

(Honors & Awards continued)

One of the histopathology figures of the article "Endoplasmic Reticulum stress is associated with the pathogenesis of Pemphigus Vulgaris" by Mihailidou C, Katsoulas N, Panagiotou E, Farmaki E, Sklavounou A, Kiaris H, and CHATZISTAMOU I, in the journal *Experimental Dermatology* (Sep; 25 (9):731-3 2016) was featured on the cover of the September, 2016 issue.



Taryn Cranford (Murphy Lab) received a \$1500 travel scholarship to attend "Promise, Precision, and Practice: A Workshop on CRISPR/Cas Gene Targeting in Mice" from The Jackson Laboratory, Bar Harbor, ME.

## Publications:

Yang X, Bam M, Nagarkatti PS and Nagarkatti M. RNA-seq Analysis of  $\delta 9$ -Tetrahydrocannabinol-treated T Cells Reveals Altered Gene Expression Profiles That Regulate Immune Response and Cell Proliferation. *J Biol Chem*. 2016 Jul 22;291(30):15460-72.

Bam M, Yang X, Zumbun EE, Zhong Y, Zhou J, Ginsberg JP, Leyden Q, Zhang J, Nagarkatti PS and Nagarkatti M. Dysregulated immune system networks in war veterans with PTSD is an outcome of altered miRNA expression and DNA methylation. *Sci Rep*. 2016 Aug 11;6:31209.

Sido JM, Nagarkatti PS and Nagarkatti M. Production of endocannabinoids by activated T cells and B cells modulates inflammation associated with delayed-type hypersensitivity. *Eur J Immunol*. 2016 Jun;46(6):1472-9.

Abebayehu D, Spence AJ, Qayum AA, Taruselli MT, McLeod JJ, Caslin HL, Chumanevich AP, Kolawole EM, Paranjape A, Baker B, Ndaw VS, Barnstein BO, Oskeritzian CA, Sell SA and Ryan JJ. Lactic Acid Suppresses IL-33-Mediated Mast Cell Inflammatory Responses via Hypoxia-Inducible Factor-1 $\alpha$ -Dependent miR-155 Suppression. *J Immunol*. 2016 Oct 1;197(7):2909-17.

Paranjape A, Chernushevich O, Qayum AA, Spence AJ, Taruselli MT, Abebayehu D, Barnstein BO, McLeod JJ, Baker B, Bajaj GS, Chumanevich AP, Oskeritzian CA and Ryan JJ. Dexamethasone rapidly suppresses IL-33-stimulated mast cell function by blocking transcription factor activity. *J Leukoc Biol*. 2016 Jul 21. (In Press)

Shamran H, Singh NP, Zumbun EE, Murphy EA, Taub DD, Mishra MK, Price RL, Chatterjee S, Nagarkatti M, Nagarkatti PS and Singh UP. Fatty acid amide hydrolase (FAAH) blockade ameliorates experimental colitis by altering microRNA expression and suppressing inflammation. *Brain Behavior and Immunity*. 2016 Jun 17. (In Press)

Karan D and Dubey S. From Inflammation to Prostate Cancer: The Role of Inflammasomes. *Adv Urol*. 2016 June 27. (In Press)

Troupin A, Londono-Renteria B, Conway MJ, Cloherty E, Jameson S, Vanlandingham D, Higgs S, Fikrig E and Colpitts TM. A novel mosquito ubiquitin targets viral envelope protein for degradation and reduces virion production during dengue virus infection. *Biochim Biophys Acta*. 2016 Sep;1860(9):1898-909.

Velázquez KT, Enos RT, Carson MS, Cranford TL, Bader J, Chatzistamou I, Singh UP, Nagarkatti PS, Nagarkatti M, Davis JM, Carson JA and Murphy EA. Weight loss following diet-induced obesity does not alter colon tumorigenesis in the AOM mouse model. *American Journal of Physiology-Gastrointestinal and Liver Physiology*. 2016 Sep 8. (In Press)

Cranford TL, Enos RT, Velázquez KT, McClellan JL, Davis JM, Singh UP, Nagarkatti M, Nagarkatti PS, Robinson CM and Murphy EA. Role of MCP-1 on Inflammatory Processes and Metabolic Dysfunction Following High-Fat Feedings in the FVB/N Strain. *Int J Obes (Lond)*. 2016 May;40(5):844-51.

Enos RT, Velazquez KT, McClellan JL, Cranford TL, Nagarkatti M, Nagarkatti PS, Davis JM and Murphy EA. High-Fat Diets Rich in Dietary Saturated Fat Protect Against Azoxy methane/Dextran Sulfate Sodium Induced Colon Cancer. *Am J Physiol Gastrointestinal Liver Physiol* 2016 Jun 1;310(11):G906-19.

(Publications continued)

Narsale AA, Puppa MJ, Hardee JP, VanderVeen BN, Enos RT, Murphy EA and Carson JA. Short-term pyrrolidine dithiocarbamate administration attenuates cachexia-induced alterations to muscle and liver in ApcMin/+ mice. *Oncotarget*. 2016 Jul 19. (In Press)

Chakrabarti M, Das A, Samantaray S, Smith JA, Banik NL, Haque A and Ray SK. Molecular mechanisms of estrogen for neuroprotection in spinal cord injury and traumatic brain injury. *Rev Neurosci*. 2016; 27:271-281.

Samantaray S, Das A, Matzelle DC, Yu SP, Wei L, Varma A, Ray SK and Banik NL. Administration of low dose estrogen attenuates gliosis and protects neurons in acute spinal cord injury in rats. *J Neurochem*. 2016; 136:1064-1073.

Jenkins R, Bandera YP, Daniele MA, Ledford LL, Tietje A, Kelso AA, Sehorn MG, Wei Y, Chakrabarti M, Ray SK and Foulger SH. Sequestering survivin to functionalized nanoparticles: a strategy to enhance apoptosis in cancer cells. *Biomater Sci*. 2016; 4:614-626.

Haque A, Ray SK, Cox A and Banik NL. Neuron specific enolase: a promising therapeutic target in acute spinal cord injury. *Metab Brain Dis*. 2016; 31:487-495.

Samantaray S, Das A, Matzelle DC, Yu SP, Wei L, Varma A, Ray SK and Banik NL. Administration of low dose estrogen attenuates persistent inflammation, promotes angiogenesis, and improves locomotor function following chronic spinal cord injury in rats. *J Neurochem*. 2016; 137:604-617.

Chakrabarti M, Klionsky DJ and Ray SK. miR-30e Blocks autophagy and acts synergistically with proanthocyanidin for inhibition of AVEN and BIRC6 to increase apoptosis in glioblastoma stem cells and glioblastoma SNB19 cells. *PLoS One*. 2016; 11:e0158537.

Chatzistamou I and Kiaris H. Modeling estrogen receptor-positive breast cancers in mice: Is it the best we can do? *Endocrine Related Cancer*. 2016 Sept 12. (In Press)

Kim J, Vaish V, Feng M, Field K, Chatzistamou I and Shim M. Transgenic expression of cyclooxygenase-2 (COX2) causes premature aging phenotypes in mice. *Aging*. 2016. (In Press)

Finnell JE, Lombard CM, Melson MN, Singh NP, Nagarkatti M, Nagarkatti P, Fadel JR, Wood CS and Wood SK. The protective effects of resveratrol on social stress-induced cytokine release and depressive-like behavior. *Brain Behav Immun*. 2016 Aug 31. (In Press)

Chumanevich AA, Witalison EE, Chaparala A, Chumanevich A, Nagarkatti P, Nagarkatti M and Hofseth LJ. Repurposing the anti-malarial drug, quinacrine: new anti-colitis properties. *Oncotarget*. 2016 Jul 14.

Huang Q, Xiao B, Ma X, Qu M, Li Y, Nagarkatti P, Nagarkatti M and Zhou J. MicroRNAs associated with the pathogenesis of multiple sclerosis. *J Neuroimmunol*. 2016 Jun 15;295-296:148-61.

Londono-Renteria B and Colpitts TM. A Brief Review of West Nile Virus Biology. Book Chapter. West Nile Virus Methods & Protocols. *Springer Methods in Molecular Microbiology*. 2016. Colpitts, TM – Editor.

Mihailidou C, Chatzistamou I and Kiaris H. Chop/GADD153. (Book Chapter). Encyclopedia of Signaling Molecules, 2nd Edition (Springer). In Press, 2016

Farmaki E, Chatzistamou I and Kiaris H. 17q12 cluster cytokines. (Book Chapter). Encyclopedia of Signaling Molecules, 2nd Edition (Springer). In Press, 2016

## Presentations:

McHale C, Shirley D and Gomez G. The Effects of Resveratrol on the Allergic Response from Human Skin Mast Cells. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

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(Presentations continued)

Cui T, Hofseth LJ, Nagarkatti M and Nagarkatti P. Pharmacological potential of American ginseng in targeting Nrf2-mediated cardioprotection. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

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Dattaroy D, Chandrashekar V, Seth RK, Das S, Alhasson F, Michelotti G, Fan D, Nagarkatti M, Nagarkatti P, Diehl AM and Chatterjee S. Administration of Sparstolonin B attenuates fibrotic lesions in nonalcoholic steatohepatitis. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington D.C., June 2016.

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Lombard CM, Finnell JE, Padi A, Singh N, Nagarkatti M, Nagarkatti P, Wood CS and Wood SK. Protective effect of resveratrol on social stress-induced behavioral and cardiovascular dysfunction. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

Seth RK, Dattaroy D, Alhasson F, Chandrashekar V, Nagarkatti M, Nagarkatti P, Liedtke W and Chatterjee S. Resveratrol modulates CYP2E1-induced nonalcoholic steatohepatitis lesions by mimicking TRPV4 effects on inflammation. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

Singh NP, Singh UP, Nagarkatti M and Nagarkatti PS. Resveratrol ameliorates lupus by epigenetic modulation of Foxp3 and IL-17 genes resulting in differential regulation of regulatory T cells and Th17 cells. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington D.C., June 2016.

Singh UP, Singh NP, Price RL, Nagarkatti M and Nagarkatti PS. Flow Cytometry and Cell Sorting Core Facility at University of South Carolina COBRE on Dietary Supplements and Inflammation. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

Singh UP, Mehrpouya-Bahrami P, Bam P, Singh NP, Murphy EA, Price RL, Nagarkatti M, Nagarkatti PS. High fat diet induces microRNA that target T cell homeostasis and macrophage phenotype to sustain chronic inflammation. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

Enos RT, Velázquez KT, McClellan JL, Cranford TL, Nagarkatti M, Nagarkatti PS, Davis JM, Murphy EA. High-fat diets rich in saturated fat protect against azoxymethane/dextran sulfate sodium-induced colon cancer. NIH, NIGMS Sixth Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Washington, D.C., June 2016.

Alghetaa HFK, Mohammed AK, Zumbun EE, Elliot D, Nagarkatti P and Nagarkatti M. Epigenetic-immunological axis of resveratrol-mediated amelioration of acute lung injury. Presented at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.

Mehrpouya-Bahrami P, Ganewatta MS, Tang C, Nagarkatti M and Nagarkatti P. Blockade of DB1 cannabinoid receptor attenuates gut microbiota dysbiosis and inflammation in dietary induced obesity. Presented at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.

Chitralla KN, Guan H, Busbee B, Gandy A, Ganewatta MS, Tang C, Nagarkatti PS and Nagarkatti M. Deletion of DC44 leading to amelioration of experimental autoimmune encephalomyelitis results in altered gut microbiome profile and short-chain fatty acid production. Presented at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.

Busbee P, Nagarkatti M and Nagarkatti PS. Natural dietary indole, indole-3-carbinol, prevents gut microbiota dysbiosis during murine TNBS colitis induction, effectively alleviating colitis associated symptoms. Presented at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.

Singh NP, Singh UP, Nagarkatti PS and Nagarkatti M. Resveratrol-induced myeloid-derived suppressor cells attenuate experimental autoimmune encephalomyelitis by regulating microRNA profile. Platform Presentation at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.



(Presentations continued)

Singh UP, Marpe B, Singh NP, Murphy EA, Price RL, Mishra MK, Nagarkatti M and Nagarkatti PS. Cellular and molecular mechanism of resveratrol-mediated amelioration of experimental colitis and associated colon cancer. Platform Presentation at the International Congress of Immunology (ICI), Melbourne, Australia, August 21-26, 2016.

Das BC, Chakrabarti M and Ray SK. Boron containing retinoids as potential therapeutics for spinal cord injury. Presented in the Boron in the Americas (BORAM) 2016 – BORAM XV Meeting, June 25 – 28, Queen's University, Kingston, ON, Canada.

Velázquez KT, Enos RT, Cranford TL, Bader JE, Davis JM, Chatzistamou I, Carson JA, Nagarkatti M, Nagarkatti PS, Chatterjee S and Murphy EA. Prolonged high-fat-diet feeding promotes NAFLD in association with alterations in the gut microbiome profile. Physiology Conference, July 29-31, Dublin, Ireland.

Bader JE, Velázquez KT, Enos RT, Cranford TL, Davis JM and Murphy EA. Macrophage depletion decreases inflammation and tumorigenesis in the AOM/DSS mouse model of colon cancer. The American Association of Immunologists Annual Meeting (AAI), May 13-17, 2016, Seattle, WA.

Singh UP, Mehrpouya-Bahrami P, Bam P, Singh NP, Murphy EA, Price RL, Nagarkatti M, Nagarkatti PS. High fat diet induces microRNA that target T cell homeostasis and macrophage phenotype to sustain chronic inflammation. Presented at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Dr. Pirisi-Creek presented the (invited) keynote lecture for the West Virginia INBRE Summer Symposium at WVU, in Morgantown, West Virginia, on July 25, 2016. The title of her presentation was "HPV-mediated transformation of human cells: *in vitro* and *in vivo*".

Tonya Colpitts gave a talk entitled "Dengue infection of human skin mast cells and effects on microvascular dermal endothelial cells" at the Gordon Conference in Girona Spain in July.

Dr. Carole Oskeritzian was invited to give a talk entitled "Local remodeling, mast cell activation and sphingosine-1-phosphate elevation precede atopic dermatitis" at the 2016 International Congress of Immunology, August 21-26, Melbourne, Australia.

Dr. Narendra Singh was invited to present research work in a Seminar on Environment and Health organized by Queensland University of Technology (QUT) on August 29, 2016.

McHale C, Deppen J, Gomez G, Shirley D. Human skin mast cells constitutively express gp130 and functional IL-6 receptor. Presentation at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Becker W, Nagarkatti P, Nagarkatti M. Allogeneic skin transplantation triggers unique miRNA signature profiles in CD4+ T cells with potential therapeutic implications. Poster presentation at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Miranda K, Mehrpouya-Bahrami P, Nagarkatti P, Nagarkatti M. Anti-inflammatory role of cannabinoid receptor type 1 antagonist AM251 in high fat diet-induced obesity – a focus on microRNAs. Presentation at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Mehrpouya-Bahrami P, Zumbrun EE, Fahren Z, Nagarkatti P, Nagarkatti M. Netrin-1 mediates macrophage retention in adipose tissue through AGAP-2 interaction with the dependence receptor UNC5B via miR-762 and miR-346. Presentation at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Gandy, KA, Nagarkatti M, Nagarkatti P. Differential epigenetic regulation of encephalitogenic T cells in relapse-remitting and chronic-progressive mouse models of multiple sclerosis. Presentation at the American Association of Immunologists (AAI) meeting held in Seattle, WA on May 13-17, 2016.

Dr. Gregorio Gomez presented a poster at a conference of the Federation of American Societies for Experimental Biology (FASEB) entitled "IgE and Allergy, 50 Years & Onward" in West Palm Beach, FL. The title of his poster was "Adenosine is a negative regulator of human mast cells".