1st Annual
IMMUNE IMAGING SYMPOSIUM

Hosted by:

THE PROGRAM FOR ADVANCED IMMUNE BIOIMAGING

&

UNIVERSITY OF ROCHESTER

Saturday, November 7th, 2015

Saunders Research Building
University of Rochester

8:00 a.m. – 6:30 p.m.

About our program:

PROGRAM FOR ADVANCE IMMUNE BIOIMAGING

Deborah Fowell, Minsoo Kim, Jim Miller and David Topham
Center for Vaccine Biology and Immunology, Department of Microbiology and Immunology, University of Rochester, Rochester NY

Many pathogens enter and reside in barrier tissues of the skin and lung. Pathogen control ultimately requires the recruitment and activation of immune effectors to specific infected tissue microenvironments. While we have gained much insight into effector T cell generation in lymphoid tissues there exists a significant knowledge gap on the fate of effector T cells once they leave the lymph node. The ability of T cells to sense and interpret different inflammatory environments in infected or damaged tissues is poorly understood. Yet it is within the inflamed tissue milieu that T cells must mediate their effector functions, including cytokine secretion and cytolysis, to clear infection. The central premise of this program is that the specific tissue and the local inflammatory milieu will shape T cell recruitment and effector function. Such tissue-control is likely to impact the magnitude and functional diversity of the immune response. Optimizing T cell function in tissues is critical for pathogen clearance and the avoidance of collateral damage. The goal of this program is to define the checkpoints and identify molecular interactions that guide successful immunity at sites of inflammation. The objective is to bring together scientific expertise in migration, effector function and tissue structure to address fundamental effector T cell processes in infected tissues using cutting-edge intra-vital imaging approaches.

1st Annual Immune Imaging Symposium

Saturday, November 7th, 2015
8:00 a.m. – 6:30 p.m.
Saunders Research Building and Helen Wood Hall Auditorium

8:00 - 8:45 a.m.
REGISTRATION, Poster set-up, Continental Breakfast

8:45 - 9:00 a.m,
Deborah Fowell - *WELCOME AND INTRODUCTION*

9:00 - 9:40 a.m.
RONEN ALON, Weizmann Institute of Science
How do neutrophils & T cells translate chemokine signals to squeeze their nuclei through endothelial barriers?

9:40 - 9:55 a.m.
SHORT TALK: **AMY KU,** Roswell Park Cancer Institute
Negative impact of myeloid-derived suppressor cells on CD8 T cell trafficking in the tumor microenvironment

9:55 - 10:35 a.m.
JASON CYSTER, UCSF
Cellular dynamics of the antibody response

10:35 - 10:50 a.m.
SHORT TALK: **ALISON GAYLO,** University of Rochester
Effector CD4+ T cell subsets employ distinct programs for interstitial motility in the inflamed dermis

10:50 - 11:20 am Coffee Break

11:20 - 12:00
KAMAL KHANNA, UConn
Sentinal IL-17A+ resident memory γδ T cells orchestrate the innate response to secondary oral Lm infection

12:00 – 12:15 pm
SHORT TALK: **TARA CAPECE**, University of Rochester
Asymmetric segregation of LFA-1 during T cell activation and division

12:15 – 12:55 pm
MARTIN MEIER-SCHELLERSHEIM, NIAID
Computational analysis and simulation of cellular motion

1:00 – 3:00 pm
LUNCH & POSTER VIEWING and 'Peoples Choice Award'

3:00 – 3:15 p.m.
SHORT TALK: **ELIZABETH SORENSEN**, Harvard Med School
Imaging the role of CXCR3 and its ligands in T cell interactions with the brain vasculature in cerebral malaria

3:15 – 3:55 p.m.
DORIAN MCGAVERN, NINDS
Imaging CNS immunity to infection and injury

3:55 – 4:10 p.m.
SHORT TALK: **ORIANA PEREZ**, UConn
Splenic CD169+ macrophages orchestrate innate immune responses to bacterial infection

4:10 – 4:50 p.m.
MINSOO KIM, University of Rochester
Visualizing and manipulating immunity with light

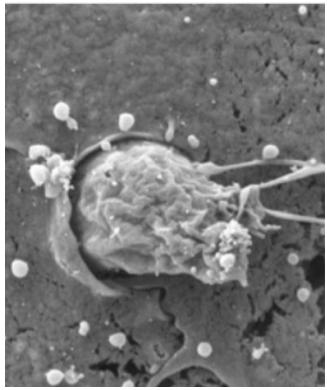
4:50 – 5:00 p.m.
Meeting Wrap-up and Awards

5:00 – 6:30 p.m.
WINE AND CHEESE RECEPTION

9:00 - 9:40 a.m.

RONEN ALON Ph.D.
Professor, Weizmann Institute of Science, Israel
How do neutrophils & T cells translate chemokine signals to squeeze their nuclei through endothelial barriers?

RESEARCH INTERESTS

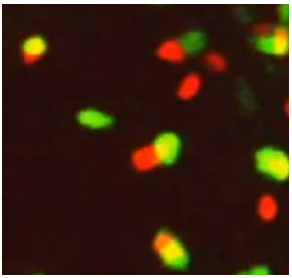


Circulating immune cells must exit blood vessels near specific target sites of injury, inflammation or tissue repair. The vessel wall at these sites displays specific combinations of traffic signals which operate in sequence to recruit only specific circulating subsets with proper receptors to these signals. As these processes take place under shear stress, these traffic molecules have evolved to operate under specialized kinetic and mechanical contexts. Using special flow chambers which simulate blood flow and intravital microscopy in genetically manipulated mice, we dissect how both endothelial and perivascular trafficking molecules promote context- and tissue- selective immune cell exit through distinct blood vessels. We also study how chemotactic and antigenic signals promote the stoppage of lymphocytes on dendritic cells and macrophages. This information is key for the development of novel therapeutic tools for inflammatory disorders, such as autoimmune diseases, atherosclerosis and organ rejection.

9:55 - 10:35 a.m.

JASON CYSTER Ph.D.
Professor, Howard Hughes Investigator, UCSF, San Francisco, CA
Cellular dynamics of the antibody response

RESEARCH INTERESTS



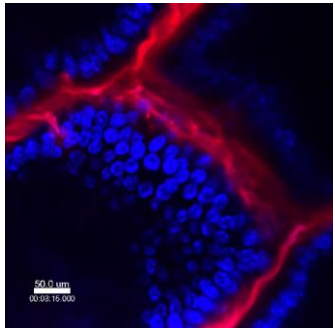
The rapid induction of protective antibodies is critical for host defense against pathogens. Reciprocally, unwanted antibody responses against self-components (antigens) are a cause of autoimmune disease. To mount antibody responses, antigen-specific B and T cells that may be as rare as 1 in 100,000 cells must first encounter the antigen and then interact with each other. These encounters occur within peripheral lymphoid organs - lymph nodes, spleen, and mucosal lymphoid tissues - but the mechanisms that control lymphoid cell migration and that promote interactions between antigen-specific cells are far from understood.
Major goals: (i) define the molecular cues that guide immune cell migration and interactions in lymphoid organs; (ii) visualize immune response dynamics using advanced imaging approaches; (iii) define the selection mechanisms that underlie the antibody affinity maturation program and that help prevent autoantibody production; (iv) characterize the requirements for mounting mucosal IgA responses.

11:20 - 12:00

KAMAL KHANNA Ph.D.
Assistant Professor, UConn, Farmington, CT

Sentinal IL-17A+ resident memory γδ T cells orchestrate the innate immune response to secondary oral Lm infection

RESEARCH INTERESTS

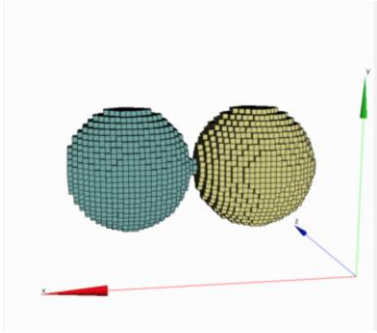


An effective immune response depends on the large-scale, but carefully regulated, movement of cells within and between lymphoid and peripheral tissues. Secondary lymphoid organ structure is the underlying regulator of immune responses and is responsible for promoting interactions between cells as well as between cells and extracellular matrix. In recent years, our understanding of events in secondary lymphoid tissues has been advanced by the use of multiphoton microscopy to visualize lymphocyte movement. Nevertheless, much remains to be revealed about the microanatomy of antigen-specific primary and memory CD8 T cell responses, with relatively limited data currently available from in situ visualization of endogenous CD8 T cell responses. My recent results have helped illuminate the landscape under which the endogenous CD8 T cell immune response occurs (Khanna, et.al. Science, 2007). These findings have set the stage for in situ identification of the cell types and other factors that control the processes driving each anatomical phase of the immune response to infection.

12:15 – 12:55 pm

MARTIN MEIER-SCHELLERSHEIM Ph.D.
Chief, Computational Biology Section, NIAID
Computational analysis and simulation of cellular motion

RESEARCH INTERESTS



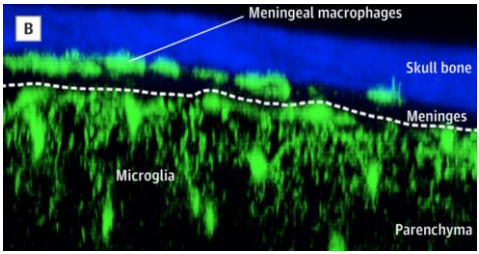
The main limiting factors hindering progress towards a more quantitative biology are the scarcities of detailed quantitative experimental data and of computational tools designed to use such data for the development and testing of biologically meaningful models. This is especially true for cell biology, where predictive models in areas such as immunology or oncology require acquiring and modeling data at multiple spatial/physiological scales, from the subcellular, molecular scale to the scale of whole cells and beyond to cell populations. Using novel computational approaches our research focuses on:

- Exploration of how intra-cellular reaction-diffusion processes determine cellular communication and behavior by using a combination of agent-based techniques and discretized partial differential equations
- Investigation of T-cell proliferation, differentiation, and death to identify mechanisms of T-cell homeostasis and the reasons for its failure after HIV/SIV infection by using sets of coupled, ordinary differential equations and agent-based approaches
- Development of interfaces between proteomic databases and computational modeling tools
- Development of tools for analyzing and simulating reaction-diffusion processes at the level of single-particle dynamics

3:15 – 3:55 p.m.

DORIAN MCGAVERN Ph.D.
Chief, Viral Immunology and Intravital Imaging Unit, NINDS
Imaging CNS immunity to infection and injury

RESEARCH INTERESTS

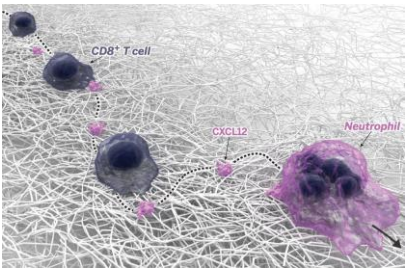


My laboratory focuses on innate and adaptive immune responses to states of acute and persistent viral infection. Of particular interest are pathogens that infect the central nervous system (CNS). From an immunological perspective, the CNS is an interesting compartment because it must preserve neuronal function while still enabling immune cells to survey the environment for pathogens. Many microbes have the ability to invade the CNS, and it is the unique dialogue between immune cells and the infected CNS that guides much of our research. We focus specifically on immune cell surveillance of the infected CNS, pathogenesis of viral meningitis (a disease caused by infection and inflammation of the brain lining), mechanisms that give rise to viral persistence in the CNS and periphery, the impact of chronic innate immune stimulation during viral persistence, and therapeutic approaches to purge persistent viral infections. We use many contemporary approaches to gain novel insights into these research areas, the most exciting of which is intravital two photon microscopy. This approach allows us to watch immune cells clear virus or cause disease in real time. Overall, our laboratory crosses the disciplines of virology, immunology, and neuroscience in order to provide a comprehensive understanding of the different scenarios that unfold when pathogens invade the CNS and periphery.

4:10 – 4:50 p.m.

MINSOO KIM
Professor, University of Rochester, Rochester, NY
Visualizing and manipulating immunity with light

RESEARCH INTERESTS



A number of fundamental physiological processes are dependent on cell surface integrins including embryogenesis, development, inflammation, immune responsiveness, wound healing, and regulation of cell growth and differentiation. The role of integrins in the immune system is particularly complex as these molecules regulate many aspects of the immune response. Circulating leukocytes relocate during the course of immune reactions and in so doing dynamically adhere and de-adhere to cells of the vasculature and to other immune cells, as well to components of the extracellular matrix. The activity of integrins to bind ligands is dynamically and tightly regulated through conformational changes from inactive form to the active one that binds ligands with high affinity. Our current research focuses on dynamic LFA-1 integrin-mediated T lymphocyte polarization and migration by employing advanced imaging techniques including two-photon microscopy and live cell FRET.

Effective trafficking of cells to target tissue sites is often the main barrier to achieving successful clinical outcomes of T cell therapies. We have developed a strategy for optically controlling T-cell trafficking using a photoactivatable (PA) chemokine receptor. Directing light onto melanomas is sufficient to recruit PA-CXCR4-expressing tumor-targeting cytotoxic T cells and results in significant reduction in tumor growth in mice. Thus the use of photoactivatable chemokine receptors allows remotely controlled leukocyte trafficking with outstanding spatial resolution in tissues.

POSTERS

Presenter(s) listed BOLD

1.	MECHANISMS FOR AUTOPHAGY MODULATION BY ISOPRENOID BIOSYNTHETIC PATHWAY INHIBITORS IN MULTIPLE MYELOMA CELLS **Kaitlyn M. Dykstra[1],** Cheryl L. Allen[1], Ella J. Born[3] and Sarah A. Holstein[1,2] [1]Department of Medicine, [2]Department of Immunology, Roswell Park Cancer Institute, Buffalo, NY. [3]Department of Internal Medicine, University of Iowa, Iowa City, IA.
2.	IMMUNOREGULATION OF CD28 COSTIMULATION AND LIGAND BINDING **Scott. A. Leddon** and Jim F. Miller David H. Smith Center for Vaccine Biology and Immunology, Center for Oral Biology, Department of Microbiology and Immunology, University of Rochester Medical Center, Rochester, New York.
3.	THE EXTRACELLULAR MATRIX BINDING INTEGRIN AV PLAYS A CRITICAL ROLE IN CD4 T CELL ACTIVATION AND EFFECTOR FUNCTION **Dillon Schrock**, Scott Leddon, and Deborah Fowell Department of Microbiology and Immunology, University of Rochester, Rochester NY
4.	OPTICAL CONTROL OF CA2+ INFLUX IMPROVES INTRATUMORAL CYTOTOXIC T LYMPHOCYTE EFFECTOR FUNCTIONS. **Kyun-Do Kim**, Seyeon Bae, Hristina Nedelkovska and Minsoo Kim Department of Microbiology and Immunology, David H. Smith Center for Vaccine Biology and Immunology, University of Rochester, Rochester, NY.

5.	AN INTRAVITAL TUMOR MICROENVIRONMENT MODEL IN THE XENOPUS TADPOLES FOR INVESTIGATING THE ROLES OF INNATE T CELLS IN TUMORIGENESIS **Jules Park, Maureen Banach,** Francisco Jesus Andino, Eva-Stina Edholm and Jacques Robert Department of Microbiology & Immunology, University of Rochester, Rochester, NY
6.	T CELL-APC INTERACTIONS AT SITES OF INFLAMMATION **Milan Popovic** and Deborah Fowell David H. Smith Center for Vaccine Biology and Immunology, Department of Microbiology and Immunology, University of Rochester Medical Center, Rochester, NY
7.	CD28 INDUCES MITOCHONDRIAL RESPIRATION IN LONG LIVED PLASMA CELLS FOR REACTIVE OXYGEN SPECIES DEPENDENT SURVIVAL **Adam Utley[a]**, Louise Carlson[a], Daniela Ventrone[a], Kelvin P. Leea,[b], [a]Department of Immunology, Roswell Park Cancer Institute, Buffalo, New York [b]Department of Medicine, Roswell Park Cancer Institute, Buffalo, NY
8.	ASYMMETRIC SEGREGATION OF LFA-1 DURING T CELL ACTIVATION & DIVISION **Tara Capece,** Brandon Walling, Kihong Lim, Young-min Hyun, Minsoo Kim University of Rochester Medical Center, Rochester, NY, USA.
9.	REPLICATION-COMPETENT INFLUENZA VIRUSES EXPRESSING A DYNAMIC FLUORESCENT "TIMER" PROTEIN **Aitor Nogales[1],** Michael Breen[1], Steven F. Baker[1], Daniel Perez[2], and Luis Martínez-Sobrido[1] [1] Department of Microbiology and Immunology, University of Rochester School of Medicine and Dentistry, Rochester, NY[2] Department of Microbiology and Immunology, University of Maryland, School of Medicine, Baltimore, MD

10.	LOSS OF INTESTINAL EPITHELIAL AUTOPHAGY LEADS TO CATASTROPHIC SUSCEPTIBILITY TO ACUTE T. GONDII-MEDIATED INFLAMMATION **Elise Burger,** Américo López-Yglesias, Felix Yarovinsky Department of Microbiology and Immunology, University of Rochester Medical Center, Rochester, NY
11.	ARE INFLUENZA SPECIFIC CD8+ TRM CELLS IMPACTED BY ACUTE DEPLETION OF NEUTROPHILS? **Emma C Reilly,** Kris Lambert, and David J Topham University of Rochester, Department of Microbiology and Immunology, Center for Vaccine Biology and Immunology CVBI, Rochester, New York
12.	VISUALIZING NETOSIS ON IMAGESTREAM **Tiffany Emmons[a],** Kelly L. Singel[a], ANM Nazmul H. Khan[b], Kieran O'Loughlin[c], Hans Minderman[c], Brahm H. Segal[a,b,d] Department of [a]Immunology, [b]Medicine, [c]Flow Cytometry, Roswell Park Cancer Institute, Buffalo, NY [d]Department of Medicine, School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY
13.	ECM-CD4 T CELL INTERACTIONS WITHIN INFLAMED DERMAL TISSUE **Ninoshka R.J. Fernandes[1,3],** Dillon Schrock[2,3], Alison E. Gaylo[2,3], Mark R. Buckley[1], and Deborah J. Fowell[2,3] [1] Department of Biomedical Engineering, University of Rochester, Rochester, NY [2] Department of Microbiology & Immunology, University of Rochester Medical Center, Rochester, NY [3] Center for Vaccine Biology & Immunology, University of Rochester Medical Center, Rochester, NY
14.	CHEMOKINE INDEPENDENT T CELL MIGRATION **Brandon Walling,** Tara Capece, Minsoo Kim Department of Microbiology and Immunology, University of Rochester, Rochester, NY

15.	TOXOPLASMA GONDII INFECTIONS ALTER GABAERGIC SYNAPSES AND SIGNALING IN THE CENTRAL NERVOUS SYSTEM **Justin M. Brooks[1],** Gabriela L. Carrillo[2], Jianmin Su[2], David S. Lindsay[3], Michael A. Fox[2,3,] and Ira J. Blader[1] [1] Department of Microbiology and Immunology, SUNY Buffalo School of Medicine, Buffalo, NY [2] Virginia Tech Carilion Research Institute, Roanoke, VA [3] Department of Biological Sciences, Virginia Tech, Blacksburg, VA
16.	SYMPATHETIC NERVOUS SYSTEM MODULATION OF TUMOR FIBRILLAR COLLAGEN AS DETECTED BY MULTIPHOTON SECOND HARMONIC GENERATION **Kelley S. Madden[1],** Ryan P. Dawes[2], Daniel K. Byun[1], Edward B. Brown[1] [1]Biomedical Engineering, [2]Neuroscience Graduate Program, University of Rochester, Rochester, NY
17.	INTERACTION BETWEEN PLANT-MADE VIRUS-LIKE PARTICLES (VLPS) BEARING INFLUENZA VIRUS HEMAGGLUTININ (HA) AND TARGET IMMUNE CELLS: A TIME-LAPSE STUDY **Alexander Makarkov [1],** Sabrina Chierzi [1], Brianne Lindsay [2], Isabelle Rouiller [2], Nathalie Charland [3], Nathalie Landry [3] and Brian J Ward [1] [1] Research Institute of McGill University Health Centre and Department of Experimental Medicine, McGill University, Montréal, QC; [2] Department of Anatomy and Cell Biology, McGill University, Montréal, QC; [3] Medicago Inc, Ste-Foy, QC
18.	GETTING THE BALANCE RIGHT: IMMUNOREGULATION OF HOST-DEFENSE AND TISSUE REPAIR IN SKELETAL MUSCLE DURING T. GONDII INFECTION **Richard M. Jin[1],** Sarah J. Blair[1], Reid R. Heffner[2], Ira J. Blader[1], and Elizabeth A. Wohlfert[1] Departments of [1]Microbiology and Immunology and [2]Pathology and Anatomical Sciences, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

19.	SPONTANEOUS IMMUNE DYSREGULATION IN THE SKIN IN THE ABSENCE OF WISKOTT-ALDRICH SYNDROME PROTEIN **Katherine E Herman** and Deborah J Fowell David H. Smith Center for Vaccine Biology and Immunology Department of Microbiology and Immunology, University of Rochester, Rochester NY
20.	NEGATIVE IMPACT OF MYELOID-DERIVED SUPPRESSOR CELLS ON CD8 EFFECTOR T CELL TRAFFICKING WITHIN THE TUMOR MICROENVIRONMENT **Amy Ku[1],** Jason Muhitch[2], Scott I. Abrams[1], and Sharon S. Evans[1] Departments of Immunology[1] and Urology[2] Roswell Park Cancer Institute, Buffalo, NY
21.	MAGING SIGNAL TRANSDUCTION IN THE HUMAN PLACENTA **Shawn P. Murphy[1,2,]** Meghan Bushway[1,2,] Scott Gerber[2,3,] Richard K. Miller[1]and Edith M. Lord[2] Departments of [1]Obstetrics and Gynecology, [2]Microbiology & Immunology and [3]Surgery University of Rochester School of Medicine and Dentistry, Rochester, NY
22.	DIFFERENTIAL RESPONSES OF HUMAN TROPHOBLAST SUBTYPES TO TYPE I AND TYPE III INTERFERONS **Shawn P. Murphy[1,2,]** Catherine G. Burke[1,2,] Meghan E. Bushway[2,] Val Pyon[1] and Scott A. Gerber[2,3] Departments of [1]Obstetrics and Gynecology, [2]Microbiology and Immunology, and [3]Surgery University of Rochester School of Medicine and Dentistry, Rochester, NY
23.	INFLUENZA VACCINE COMPOSITION INFLUENCES THE SPECIFICITY AND FUNCTIONAL POTENTIAL OF THE CD4 T CELL AND ANTIBODY RESPONSES **Daphne Pariser,** Jennifer Nayak, Anthony DiPiazza, Zackery Knowlden, and Andrea Sant Department of Microbiology and Immunology, University of Rochester, Rochester NY

24.	SPLENIC CD169+ MACROPHAGES ORCHESTRATE INNATE IMMUNE RESPONSES TO BACTERIAL INFECTION **Oriana Perez[1],** Zhijuan Qiu1, Pablo Romagnoli[1], Alexandre P. Bénéchet[1], Leigh Maher[1], Masato Tanaka[3], Kamal M. Khanna[1,2,*] [1] Department of Immunology, UCONN Health, Farmington, CT, 06030, USA [2] Department of Pediatrics, UCONN Health, Farmington, CT [3] School of Life Science, Tokyo University of Pharmacy and Life Sciences, Hachioji, Japan
25.	A MODEL OF INFLUENZA TRACHEITIS FOR THE STUDY OF LYMPHOCYTE MIGRATION **Kris Lambert Emo,** Young-min Hyun, Michael Overstreet, Karen Bentley, Scott Gerber, Deborah Fowell, Minsoo Kim, and David J. Topham David H. Smith Center for Vaccine Biology and Immunology Department of Microbiology and Immunology University of Rochester School of Medicine and Dentistry, Rochester NY
26.	EFFECTOR CD4+ T CELL SUBSETS EMPLOY DISTINCT PROGRAMS FOR MOTILITY IN THE INFLAMED DERMIS **Alison Gaylo** and Deborah Fowell David H. Smith Center for Vaccine Biology and Immunology, Department of Microbiology and Immunology, University of Rochester School of Medicine and Dentistry, Rochester NY
27.	SENTINEL IL-17A-PRODUCING RESIDENT MEMORY ΓΔ T CELLS ORCHESTRATE THE RESPONSE TO SECONDARY ORAL LM INFECTION **Pablo A. Romagnoli[1],** Brian S. Sheridan[1,2,] Quynh-Mai Pham[1], Leo Lefrançois[1] and Kamal M. Khanna[1,3] [1] Department of Immunology,[3]Department of Pediatrics. Uconn Health Center, Connecticut, USA 06030. [2]Department of Molecular Genetics and Microbiology, Stony Brook University, Stony Brook, NY

28.	VISUALIZATION OF INFLAMMATION AND THROMBOSIS IN ASCITES FROM PATIENTS WITH ADVANCED OVARIAN CANCER **Kelly L. Singel[1],** Kassondra S. Grzankowski[2], ANM Nazmul H. Khan[3], Tiffany Emmons[1], Joseph D. Tario, Jr[4], and Brahm H. Segal[1,3,5] Departments of [1]Immunology, [2]Gynecologic Oncology, [3]Medicine, [4]Flow and Image Cytometry, Roswell Park Cancer Institute and Department of [5]Medicine, University at Buffalo School of Medicine, Buffalo, NY, USA
29.	PROLIFERATION OF TWO ANATOMICALLY DISTINCT NKP46+ NATURAL KILLER CELLS IN THE PREGNANT UTERUS **Dorothy K. Sojka[1],** Beatrice Plougastel-Douglas[1], Liping Yang[1], Darryl Higuchi[2], and Wayne M.Yokoyama[1,2] [1]Rheumatology Division and [2]Howard Hughes Medical Institute, Washington University School of Medicine, St. Louis, MO
30.	IMAGING THE ROLE OF CXCR3 AND ITS LIGANDS IN THE INTERACTION OF T CELLS WITH THE BRAIN VASCULATURE IN A MURINE MODEL OF CEREBRAL MALARIA. **Elizabeth W. Sorensen,** Jeffery Lian, Shannon K. Bromley, Thorsten R. Mempel, and Andrew D. Luster Center for Immunology & Inflammatory Disease, Massachusetts General Hospital, Harvard Medical School, Boston, MA
31.	DYNAMIC REGULATION OF LFA-1 AND MAC-1 DURING NEUTROPHIL EXTRAVASATION IN LIVE MICE **Young-Min Hyun** and Minsoo Kim David H. Smith Center for Vaccine Biology and Immunology, Department of Microbiology and Immunology, University of Rochester School of Medicine and Dentistry, Rochester NY

PARTICIPATING INSTITUTIONS & DEPARTMENTS

Participating Institutions

Cornell University College of Veterinary Medicine, Ithaca, New York
Cornell University, Ithaca, New York
Massachusetts General Hospital, Boston, Massachusetts
McGill University, Montreal, Quebec
National Institute of Allergy and Infectious Disease, Bethesda, Maryland
National Institute of Viral Immunology and Intravital, Bethesda, Maryland
Roswell Park Cancer Institute, Buffalo, New York
St. John Fisher College, Rochester, New York
State University of New York Upstate Medical University, Syracuse, New York
University at Buffalo, Buffalo, New York
University of Connecticut Health Center, Mansfield, Connecticut
University of Georgia, Athens, Georgia
University of Pennsylvania, Philadelphia, Pennsylvania
University of Pittsburgh, Pittsburgh, Pennsylvania
Washington University, St. Louis, Missouri
Weizmann Institute of Science, Rehovot, Israel

University of Rochester Departments/Centers

Aab Cardiovascular Research Institute
Center for Musculoskeletal Research
Center for Translational Neuromedicine
David H. Smith Center for Vaccine Biology and Immunology (CVBI)
Department of Biology
Department of Biomedical Engineering
Department of Biostatistics and Computational Biology
Department of Dermatology
Department of Electrical & Computer Engineering
Department of Environmental Medicine
Department of Medicine – Allergy/Immunology/Rheumatology
Department of Medicine – Nephrology
Department of Medicine – Pulmonary/Critical Care
Department of Microbiology and Immunology
Department of Neurology
Department of Neurosurgery
Department of Pediatrics – Hematology/Oncology
Department of Pediatrics – Infectious Diseases
Department of Pediatrics – Neonatology
Department of Surgery
The Institute of Optics

Thank you for your participation