

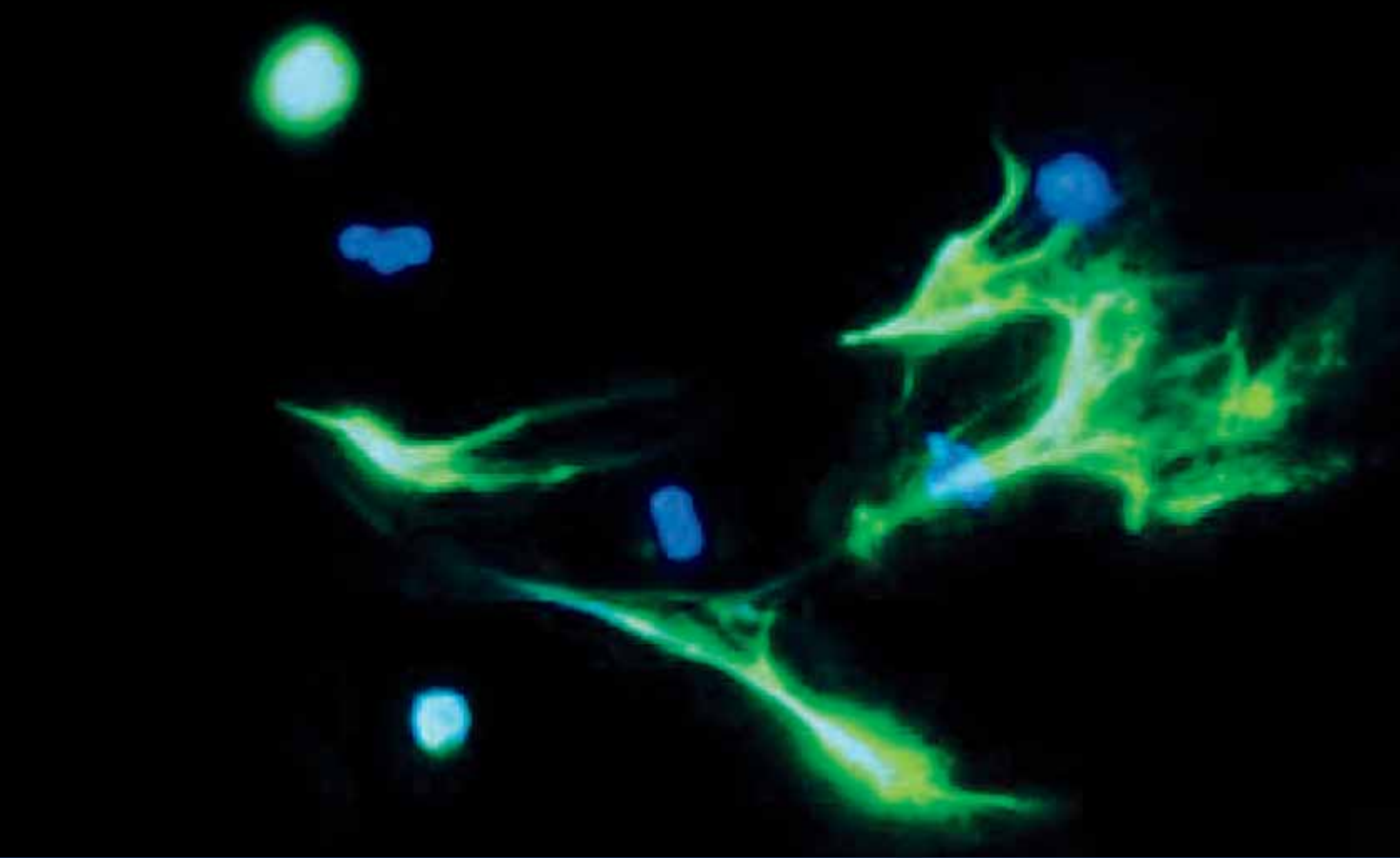


DIVISION OF RHEUMATOLOGY
2010-2011 ANNUAL REPORT

**ADVANCING RHEUMATOLOGY:
CLINICAL AND SCIENTIFIC COLLABORATIONS**

HOSPITAL
FOR
**SPECIAL
SURGERY**





SEMINAL STUDIES, TRANSFORMATIVE INITIATIVES

Every day throughout Hospital for Special Surgery, clinicians and scientists in the Division of Rheumatology and the Department of Medicine pool their knowledge and resources to improve the lives of patients with autoimmune diseases and musculoskeletal disorders. These partnerships have and continue to generate important research questions, expand our understanding of causes and disease processes, and broaden the arsenal of targeted therapies for patients. Collaborations take place in the laboratories and in clinical practices, crossing seamlessly into each domain.

In the Division of Rheumatology at Hospital for Special Surgery, Drs. Kyriakos Kirou, Theresa Lu, and Robert Spiera are navigating the complexities of autoimmune disease in their laboratories and through their clinical practices with a goal of identifying better therapies and ways to improve quality of life. In our *2010-2011 Annual Report*, you will learn about their current projects, as well as the work of their colleagues, that are helping to advance the field of rheumatology today.

KYRIAKOS A. KIROU, MD, DSC, FACP

As Clinical Co-Director of the Mary Kirkland Center for Lupus Care, Dr. Kyriakos Kirou is focused on the challenges in lupus that all clinicians face – identifying the driving forces that lead to lupus, measuring disease activity, predicting its course, developing targeted therapies, and monitoring responses to interventions. “Our approach has been the close comparison of carefully collected clinical with gene expression data from patients,” says Dr. Kirou. He and his colleagues continue to investigate the role of inflammatory cytokine and interferon alpha-inducible genes, as well as other candidate biomarkers for lupus disease activity and damage. Dr. Kirou has been involved virtually from the beginning in identifying a target for therapy in lupus, focusing on interferon, and is now involved in industry trials that are testing whether this is a target that is going to impact control of the disease.

Background Image:

NETs – neutrophil extracellular traps help destroy bacteria in healthy people. In patients with systemic lupus erythematosus, antibodies trigger neutrophils to release more NETs, which then attack the body’s own tissues.

(Reprinted with permission from AAAS)

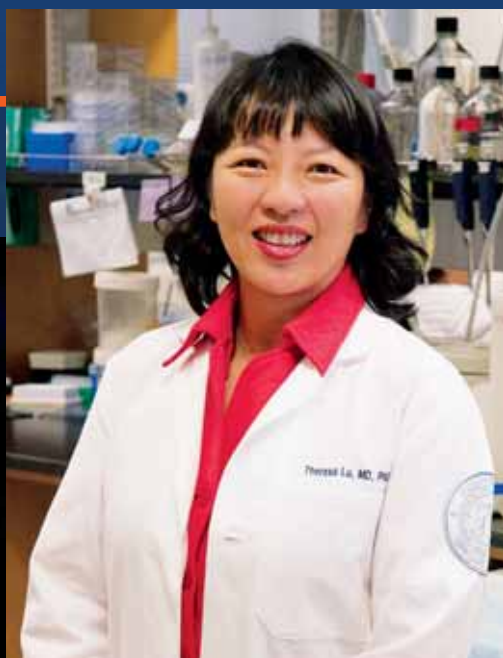


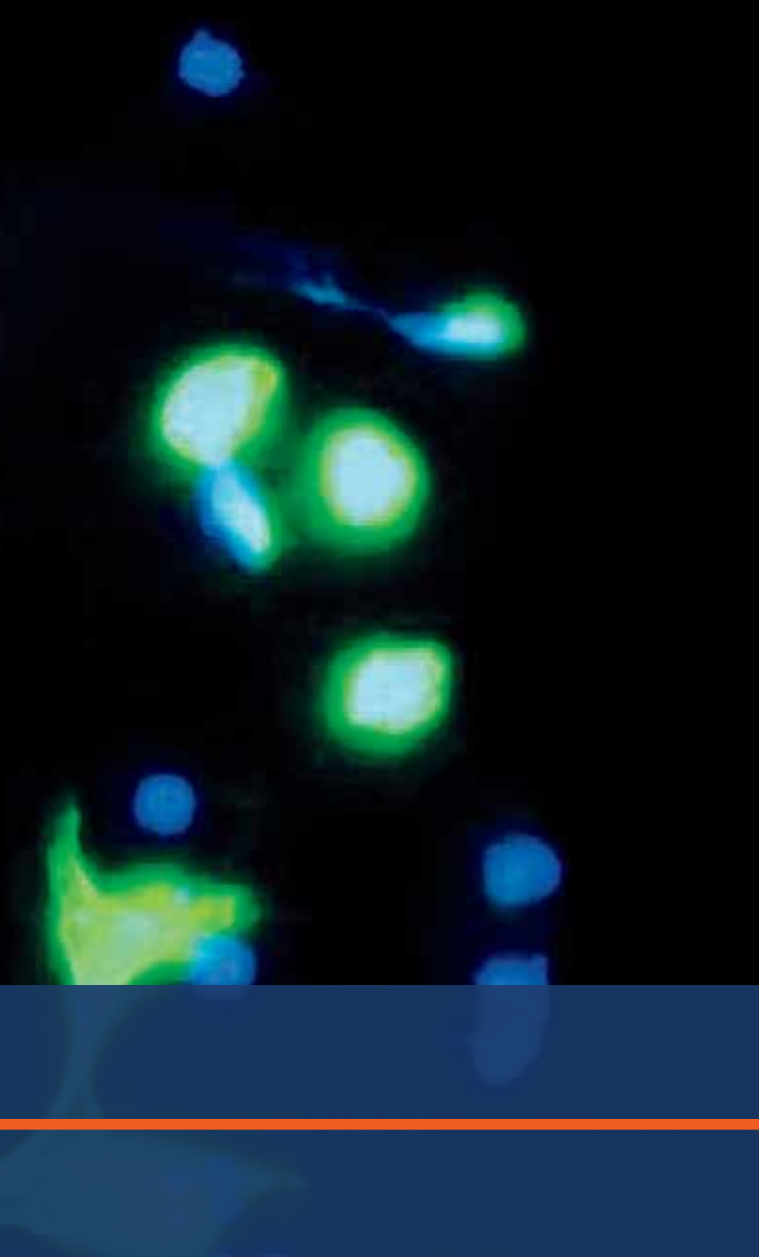
THERESA T. LU, MD, PHD

Dr. Theresa Lu is a pediatric rheumatologist recently elected to the American Society for Clinical Investigation and a two-time Lupus Research Institute grant recipient. As a physician-scientist, Dr. Lu provides the unique perspective needed to ensure the translation of new scientific knowledge into improved patient care and outcomes. Dr. Lu's research efforts have been devoted to understanding what regulates the blood vessels in lymph nodes. She and her collaborators have found a novel role for dendritic cells in modulating vascular growth that occurs during immune responses and have also uncovered that after the blood vessels grow they become more stabilized and can function more normally. "Interestingly enough, when we disrupt this vascular stabilization, the immune response is also disrupted," says Dr. Lu. "This suggests that maybe we could interrupt unwanted autoimmune responses by disrupting vascular stabilization."

ROBERT F. SPIERA, MD

Dr. Robert Spiera is Director of the Vasculitis, Scleroderma, and Myositis Center of Excellence at HSS. He has conducted a number of pioneering investigator-initiated trials of novel treatments for scleroderma and vasculitis. Dr. Spiera and his team completed the first, longest, and largest prospective trial of imatinib mesylate (Gleevec™) in the treatment of scleroderma, observing an improvement in the skin thickening of most patients, as well as stability in pulmonary function tests. "The tyrosine kinase inhibitors class of drugs inhibits pathways that are essential to the process of fibrosis," says Dr. Spiera. "Though we caution that the study was an open label experience, we believe that the promising results of this early phase trial warrant further examination with a randomized, controlled trial."





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Mary K. Crow, MD, Physician-in-Chief and Chairman of the Division of Rheumatology, Hospital for Special Surgery, and the Joseph P. Routh Professor of Rheumatic Diseases in Medicine, Weill Cornell Medical College

LEADERSHIP REPORT: A MESSAGE FROM THE PHYSICIAN-IN-CHIEF AND CHAIRMAN, DIVISION OF RHEUMATOLOGY

The Division of Rheumatology continued to make significant progress in the clinical, scientific, and educational arenas since our report of last year. I am very fortunate to be surrounded by an extraordinary group of clinicians, scientists, and academic leaders who are devoted to improving the care of patients with autoimmune and musculoskeletal diseases – whether they are seeking to expand therapeutic options through their work in the laboratory, collaborating to bring potential treatments to the bedside, or helping to enhance quality of life by calling on the comprehensive resources in medicine, surgery, nursing, radiology, and rehabilitation therapy available at HSS. Our centers of excellence in systemic lupus erythematosus and antiphospholipid syndrome directed by Jane E. Salmon, MD; inflammatory arthritis directed by Sergio Schwartzman, MD; and scleroderma, vasculitis, and myositis directed by Robert F. Spiera, MD, are flourishing under their leadership. Our programs in osteoarthritis, metabolic bone disease, and pediatric rheumatology continue to make great strides in their respective fields.

Enhancing Our Patient Care Programs

With its specialty focus on musculoskeletal disorders and autoimmune disease, Hospital for Special Surgery provides a unique environment in which we can develop exceptionally comprehensive and integrated programs for patients. A case in point is the Mary Kirkland Center for Lupus Care co-directed by Doruk Erkan, MD, MPH, and Kyriakos A. Kirou, MD, DSc, FACP. The Center optimizes the management of the lupus patient by bringing together rheumatologists, nurses, social workers, and other disciplines to develop and carry out treatment plans. A key member of the team is Monica Richey, MSN, ANP-BC/GNP, a nurse practitioner who has put in place an extended program of care that includes preventive health measures.

The Division of Rheumatology is the main component of the HSS Department of Medicine. It is important to note that in addition to the Department's rheumatologists, the Hospital has on staff a number of internal medicine physicians and medical specialists who not only play a critical role in the care of our patients, but who also enhance our research and education efforts. These include primary care doctors, pediatricians, infectious disease specialists, endocrinologists, and psychiatrists, to name a few, as well as medical consultants from NewYork-Presbyterian Hospital/Weill Cornell Medical Center with whom we work closely.

Patients coming to HSS today for surgery, compared to 10 or 20 years ago, are much sicker. Keeping orthopaedic surgical patients safe is a multifactor endeavor, involving all members of the health care team and support from the highest levels of the institution. Two years ago, HSS established the Quality Research Center under the direction of Steven K. Magid, MD, to bring a scientific perspective to the quality and risk management domain with a goal of improving patient care practice. Under Dr. Magid's leadership, the Center has undertaken studies based on quality initiatives to demonstrate in a reproducible way how Special Surgery and other institutions can minimize risk using research principles, methodologies, and standards.

One of our challenges is how to manage surgical patients whose comorbidities may increase their operative risk. Over the past several years, our rheumatologists and primary care physicians in the Department of Medicine, along with the Hospital's anesthesiologists, have been providing preoperative evaluations of patients undergoing orthopaedic surgery in order to facilitate the best possible surgical outcomes. Led by C. Ronald MacKenzie, MD, who has a longstanding interest in perioperative medicine, the program continued to evolve and has now been formalized as the Perioperative Medicine Division with Linda A. Russell, MD, as its Director. Dr. Russell continues the objectives developed by Dr. MacKenzie and his colleagues, which include improving communication among key services involved in the treatment of surgical patients and addressing quality and safety issues from preoperative medical assessments to postoperative follow-up.

Dr. MacKenzie is incorporating this concept into the Hospital's new Spine Care Institute, developing a model of how perioperative medicine can be integrated into surgical services.

An Impressive Research Agenda

The Research Division, under Steven R. Goldring, MD, Chief Scientific Officer, has established an infrastructure that is facilitating important disease-focused research at the basic, translational, and clinical levels. In 2010, the National Institutes of Health (NIH) awarded HSS scientists multi-year grants totaling \$61.5 million, and increased its funding to HSS by 20 percent over 2009 levels. As of December 2010, the Hospital's annual operating research budget was \$33 million, supported by the Hospital, the NIH, foundations, industry, and generous donors.



HSS Osteoarthritis Summit: Frontiers in OA Research, Prevention, and Care was attended by leaders in the OA community who presented and discussed perspectives and opinions in their areas of expertise and reached consensus whenever possible on current understanding in important areas related to OA prevention, diagnosis, and treatment.

In 2010, additional funding was awarded by the NIH as part of the ARRA stimulus program. Mary B. Goldring, PhD, received a three-year, \$4.1 million award to direct a coordinated effort along with investigators at three other institutions for studies in the molecular parameters for onset and progression of osteoarthritis, and Alessandra B. Pernis, MD, received a two-year \$440,000 research award for studies of cross-talk between estrogen and T cells mediated pathways in lupus pathogenesis. Theresa T. Lu, MD, PhD, was awarded a five-year \$2.3 million award from the NIH to study vascular quiescence and stabilization in immunity; Thomas J.A. Lehman, MD, FAAP, received a two-year research grant from the NIH/National Institute of Arthritis and Musculoskeletal and Skin Diseases in collaboration with Duke University, in support of the Childhood Arthritis and Research Alliance Network and their work toward accelerating an evidence-based culture in pediatric rheumatology; and two of our junior faculty received first time awards from the NIH. Xiaoyu Hu, MD, PhD, received a five-year, \$1.97 million award to study selective regulation of macrophage activation, and Suzanne A. Maher, PhD, received a four-year, \$1.5 million award for designing a meniscal substitute through an integrated experimental computational and statistical approach. To support the transition to independence of junior faculty and with the goal of creating a cohort of clinician-scientists who will establish research careers and become future leaders in academic orthopaedics and rheumatology, the Research Division has created mentoring programs and a peer-reviewed program of internal funding. The Clinician-Scientist and Young Investigator Program will provide candidates with the funding to succeed in bench-to-bedside research and be able to compete for independent research funding.

An Emphasis on Educational Initiatives

Our fellowship training programs in rheumatic disease led by Anne R. Bass, MD, FACP, and Jessica R. Berman, MD, and in pediatric rheumatology, led by Dr. Lehman and Alexa B. Adams, MD, provide rich clinical and research environments in which physicians can develop academic and clinical careers in rheumatology. With the largest concentration of rheumatologists in one center, the training programs provide experiences in the adult and pediatric rheumatology and orthopaedic

subspecialty clinics and inpatient units of HSS; the inpatient consultation services at NewYork-Presbyterian/Weill Cornell and Memorial Sloan-Kettering Cancer Center; and the Clinical Center at The Rockefeller University. The programs are further enhanced by our affiliation with the Weill Cornell Graduate School of Medical Sciences. We currently have 11 fellows in rheumatic disease and four fellows in pediatric rheumatology. I am pleased to note that Ora Singer, MD, a recent graduate of our fellowship program, received the 2010 Distinguished Fellow Award from the American College of Rheumatology (ACR), and Lindsay J. Forbess, MD, a current fellow, received the 2011 award.

In 2011, Juliet B. Aizer, MD, MPH, received a Clinician Scholar Educator Award from the ACR Research and Education Foundation to develop a curriculum in metabolic bone disease for the training of rheumatology fellows. Dr. Berman, a previous recipient of this award, which is in its third year, has been studying methods to teach arthrocentesis to residents and fellows. According to Dr. Berman's research, training fellows in injection techniques on cadavers appears to be a more effective method than using synthetic models. Dr. Berman continues to advance methods to assess the interpersonal skills and professionalism of rheumatology fellows using the Objective Structured Clinical Examination that she developed several years ago.

Weill Cornell Medical College students are benefitting from the Hospital's expertise in rheumatology. Second year medical students participate in a month-long course developed by Edward J. Parrish, MD, and this year, a course on caring for chronic disease developed by Michael D. Lockshin, MD, MACR, was introduced to students.

As you will read on page 6 of this report, Stephen A. Paget, MD, FACP, MACR, and Dr. Berman have developed an education academy based at HSS, which will create a stimulating academic environment that elevates the quality of teaching throughout the Division of Rheumatology and Hospital-wide. In June 2011, HSS hosted an educational forum on osteoarthritis, led by Dr. Steven Goldring and Timothy M. Wright, PhD, Director of Biomechanics, for an international, multidisciplinary group of renowned scientists, thought leaders, and industry and governmental representatives.



Dr. Vivian Bykerk



Dr. Laurie Glimcher

New and Noteworthy

In the most recent *U.S. News & World Report* “America’s Best Hospitals” issue, Hospital for Special Surgery was ranked #1 in orthopaedics and #2 in rheumatology.

I am extremely proud to note that the ACR honored three of our faculty members – Drs. Goldring and Paget, and Joseph A. Markenson, MD, FACP, MACR, with the prestigious designation of Master at its 2010 Annual Scientific Meeting. In addition, Dr. Lockshin was honored at the meeting for serving as Editor-in-Chief of *Arthritis & Rheumatism* for the past five years. At the 2011 meeting, Dr. Paget received the ACR Distinguished Clinician Scholar Award, and Theresa Lu, MD, PhD, received the 2011 Henry Kunkel Young Investigator Award of the ACR.

In 2011, we welcomed Vivian P. Bykerk, MD. Dr. Bykerk most recently served as an instructor at Harvard University in Boston. Prior to that position, she was Director of the Early Arthritis Program at Mount Sinai Hospital in Toronto, Canada, where she started a multicenter early arthritis research cohort study, which she will continue to grow at HSS.

All of our rheumatologists and physicians are on the faculty of our esteemed affiliate, Weill Cornell Medical College. In December 2011, Antonio M. Gotto, Jr., MD, DPhil, who has served as the Stephen and Suzanne Weiss Dean of the Medical College since 1997, will step down to become Co-chairman of the Board of Overseers for the Medical College. Dr. Gotto will be succeeded by Laurie H. Glimcher, MD, one of the nation’s leading physician-scientists and researchers, on January 1, 2012. Dr. Glimcher is the Irene Heinz Given Professor of Immunology at the Harvard School of Public Health and Professor of Medicine at Harvard Medical School. As a rheumatologist who has headed one of the top immunology programs in the world, Dr. Glimcher is a longtime colleague, and we look forward to a productive and collaborative association.

We hope you enjoy reading about the accomplishments of the Division of Rheumatology in our *2010-2011 Annual Report*.

Mary (Peggy) K. Crow, MD
*Physician-in-Chief and Chairman,
Division of Rheumatology*

APS ACTION: A Model International Initiative

Patients with antiphospholipid syndrome (APS) have few treatment options available to them, and research that could change that has been slow to evolve. Several major issues have hampered the progress of APS clinical research, including the lack of standardized tests to detect the antiphospholipid antibodies and difficulty in recruiting large numbers of study participants. “There is an urgent need for a true international collaborative approach to design and conduct large-scale clinical trials involving people who have aPL,” says Doruk Erkan, MD, MPH, Associate Scientist-Physician at the Barbara Volcker Center for Women and Rheumatic Diseases, who co-chaired the Antiphospholipid Syndrome Clinical Research Task Force with Michael D. Lockshin, MD, MACR, at the 13th International Congress on Antiphospholipid Antibodies (aPL) held in April 2010. The task force identified issues that impede APS clinical research and the ability to develop evidence-based recommendations for the management of aPL-positive patients. The task force led to a follow-up international meeting resulting in the formation of the Antiphospholipid Syndrome Alliance for Clinical Trials and International Networking – APS ACTION (www.apsaction.org).

“APS ACTION brings together some of the foremost experts in the field to identify critical APS research questions and establish the process for moving forward in a coordinated, strategic international effort,” says Dr. Lockshin, Director of the Barbara Volcker Center for Women and Rheumatic Diseases. APS ACTION, chaired by Dr. Erkan, includes 28 physicians from 20 international centers based in the United States, Canada, Europe, Asia, and Latin America.

A number of subcommittees have formed to begin addressing clinical trial design, an APS patient registry, and outreach to advocacy groups. In 2012, APS ACTION will launch two collaborative international projects – an Internet-based clinical database and repository of aPL-positive patients with or without systemic autoimmune diseases, and a prospective, randomized controlled trial of hydroxychloroquine in the primary thrombosis prevention of persistently aPL-positive but thrombosis-free patients without other systemic autoimmune diseases.

Says Dr. Lockshin, “The whole point of the work of APS ACTION is to develop uniform definitions, joint recruitment, and standard treatment protocols so that we can move forward and help patients who are aPL-positive.”

LEADERSHIP REPORT: NEW INITIATIVES IN MEDICAL EDUCATION



Dr. Stephen Paget

Developing an Academy of Medical Educators

Stephen A. Paget, MD, FACP, MACR, has been the recipient of the Division of Rheumatology's Award for Teaching Excellence many times over. Dr. Paget is passionate about education, and it is no surprise that when he stepped down as the HSS Physician-in-Chief last year, he quickly assumed the role as Chair of the new HSS Rheumatology Education Council. In May 2011, optimizing the teaching contributions of individual faculty members and understanding and prioritizing the education needs of the Division was the focus of a day-long education retreat spearheaded by Dr. Paget. The results of that retreat formed the foundation of the new Hospital for Special Surgery Academy of Rheumatology Medical Educators. "Our goal was to formalize the concept of teaching, just as all other aspects of medicine are formalized," says Dr. Paget, Director of the Academy and a medical educator for more than 35 years. "The Academy's aim is to foster excellence in teaching at all levels, to create a stimulating and formalized academic environment for educators that enhances the quality of their teaching, and to support and reward medical teachers and educators. The concept of the Academy, where intellectual and financial resources are made available to academic Clinician Scholar Educators and their research, is not new, having been successfully implemented at the University of California, San Francisco, and several other U.S. medical schools."



Dr. Jessica Berman

"The Academy provides a framework for institutions to focus on creating stimulating and innovative teaching programs that can enhance the career development of faculty and enable them to develop specialized teaching skills," says Jessica R. Berman, MD, Associate Director of the Rheumatology Fellowship Program and a member of the HSS Rheumatology Education Council. "The Academy will foster the sharing of ideas on teaching and education, and ultimately provide a funding structure for education projects and innovations."

According to Dr. Berman, who along with Juliet B. Aizer, MD, MPH, another member of the Academy, received the Research and Education Foundation Clinician Scholar Educator Award from the American College of Rheumatology, "We teach medical students, fellows, our patients, and our colleagues. We should target the educational experience to what is appropriate for learning at each point in time and based on how people learn best. These education outcomes can be rigidly defined the way you would define science."

One of the Academy's first initiatives is to provide startup funding for proposals for innovative education projects. "We would like for these teaching proposals to include people that are learning at all different levels and that have an interdepartmental orientation," says Dr. Berman. "The goal is for these projects to lead to the development of new assessment tools for learning or to integrate new technologies into the curriculum."

LEADERSHIP REPORT: ADVANCING PERIOPERATIVE CARE



Dr. Michael Lockshin

Learning to Care for Patients with Chronic Disease

With more than three decades caring for women with lupus and other rheumatic diseases, Michael D. Lockshin, MD, MACR, has developed hundreds of long-term relationships with his patients. In fact, these types of enduring relationships between doctors and patients at HSS are not uncommon. The bonds – forged over time and through the ups and downs of their patients’ disease – are a key component of the therapeutic process. In a new course he developed for the Weill Cornell Medical College curriculum, Dr. Lockshin has applied his time-honored experience to teach medical students how to manage the care of a patient with chronic disease.

“Medical schools do an excellent job of teaching students how to treat chest pain, but they don’t necessarily teach them how to care for a lupus patient who has had the disease for 40 years,” notes Dr. Lockshin, who also addresses this topic in his book, *Dancing at the River’s Edge: A Patient and her Doctor Negotiate Life with Chronic Illness*. “The goals of this course are to help make these students better doctors and to improve the care of patients who are living with chronic illness and disability.”

Entitled *Medicine’s 4th and 5th Dimensions*, the course includes discussions on decision making when evidence is incomplete or when the patient disagrees; working with multidisciplinary teams; understanding external factors, including insurers, employers, and families; and helping patients to live a full life.



Dr. Linda Russell

Optimizing the Health of Surgical Patients

Linda A. Russell, MD, has been a rheumatologist with HSS since 1994, and in that time she has served on numerous patient quality and safety committees, including as Chair of the Hospital’s inpatient service line. So with her recent appointment as Director of the new Perioperative Medicine Division, Dr. Russell was able to hit the ground running. “Our goal is to optimize the health of the patients who are going to have surgery here before, during and after the surgery,” says Dr. Russell. “We are seeing older patients with many medical problems, so we need time to evaluate them in preparation for surgery, particularly if they have diabetes, hypertension, or cardiac issues. If a patient is going to spend the night in the Hospital after surgery, he or she must be seen by an HSS medical doctor so we are completely familiar with any health risks, which we can address preoperatively and focus on postoperatively to ensure continuity of care and a successful outcome.”

Dr. Russell and her colleagues have already established many guidelines for perioperative care, including those related to diabetes and insulin pumps, anemia, and for patients who have a pacemaker or defibrillator. “We need to be able to advise if medication should be stopped or continued, and if pumps or pacemakers should remain on or turned off during surgery. As much as possible, we want to systematize the care of patients so that they stay healthy throughout their surgery and recovery.”

CENTER OF EXCELLENCE: RHEUMATOID ARTHRITIS, PSORIATIC ARTHRITIS, AND ANKYLOSING SPONDYLITIS

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Stephen J. DiMartino, MD, PhD
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Theodore R. Fields, MD, FACP
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INFLAMMATORY ARTHRITIS CENTER

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Susan M. Goodman, MD
George D. Kalliolias, MD, PhD
Dana E. Orange, MD
Sergio Schwartzman, MD

Inflammatory diseases continue to garner the attention of the Hospital's clinicians and scientists, with steady progress being made on several fronts. The Inflammatory Arthritis Center, under the direction of Sergio Schwartzman, MD, will benefit from the recent recruitment of Vivian P. Bykerk, MD, to HSS. In her previous position as Director of the Early Arthritis Program, Mount Sinai Hospital in Toronto, Canada, Dr. Bykerk, a clinical researcher, initiated a multicenter early arthritis cohort study, which today has an enrollment of 1,500 patients. The long-term observational study addresses how to best treat and manage patients with new onset arthritis and ensure their early access to care. Dr. Bykerk will continue to grow this study at HSS, which will be a sister site to Mount Sinai Hospital, fostering research collaborations on treatment strategies and outcomes.

The rheumatoid arthritis registry has enrolled approximately 300 patients, and about 150 of these patients have had a follow-up completed. A direct link of the Hospital's electronic medical record system to the registry is now underway, and a direct transfer of laboratory parameters from the Hospital's diagnostics laboratory into the registry has been completed. The registry is forming the basis for several studies, and data was recently used to study the accuracy of patient-reported current and past medications used to treat rheumatoid arthritis (RA). Registries in ankylosing spondylitis and psoriatic arthritis are in development.

Under the auspices of the Inflammatory Arthritis Center, an interest in autoimmune ocular diseases such as uveitis, scleritis, retinal vasculitis and orbital inflammatory disease has evolved. In concert with autoimmune ophthalmologists, HSS rheumatologists have developed an expertise in helping to diagnose and treat these types of patients.

As Medical Director of the Comprehensive Arthritis Program (CAP), Susan M. Goodman, MD, works closely with the Hospital's orthopaedic surgeons in this jointly managed, patient care-driven program for patients with RA, lupus, or inflammatory arthritis who require orthopaedic surgery. Due to the protean organ-related consequences of these conditions, patients who suffer from chronic connective tissue disease are a highly challenging population in the perioperative context, are among the most complex patients undergoing joint replacement surgery, and require close interdisciplinary collaboration to ensure optimal outcomes.

After reviewing their experience with patients with classical severe RA versus patients with RA who were treated earlier in the course of their disease, Dr. Goodman and her colleagues observed that while both groups had excellent outcomes in terms of pain relief, the latter group appeared to have functional outcomes similar to patients with OA. Dr. Goodman, Lisa A. Mandl, MD, MPH, and other collaborators are beginning to study patients using prospectively gathered information to answer a number of questions. Among these are determining if surgical outcomes are due to the change in treatment for RA over the last two decades, which includes the availability of biologics that suppress the disease, or whether there is a fundamental change in immunology.

(continued on page 10)



Dr. Sergio Schwartzman



Dr. Susan Goodman (left) serves as Medical Director of the Hospital's Comprehensive Arthritis Program (CAP) – a unique program that epitomizes collaboration between rheumatologists and orthopaedic surgeons. CAP cares for one of the largest populations of surgical patients with inflammatory or autoimmune diseases in the world. It is one of the few, if not the only service in which rheumatologists and orthopaedic surgeons co-manage these atypical surgical patients. Drs. Goodman and Lisa Mandl (right) are pursuing studies that will enhance the peri-operative care and outcomes of patients with inflammatory disease needing joint replacement surgery.

They will also be looking at the status of the patient's RA and function at the time of surgery to see if by clinically bringing them more towards normal, they can also bring them towards normal in the setting of surgical complications and outcomes.

The researchers are also seeking to learn whether immunosuppressive drugs pose a greater risk of infection for RA patients who have surgery and which medications should be discontinued prior to surgery. A completed study, presented at the ACR meeting, has demonstrated that the expectations of RA patients are significantly lower than those of OA patients for a variety of outcomes after arthroplasty, a finding which correlated with the RA patients' lower quality of life. This may have implications in terms of lower functional outcomes.

A recent study led by Lionel B. Ivashkiv, MD, has shown that the pro-inflammatory protein, tumor necrosis factor (TNF), can also suppress aspects of inflammation, although the mechanisms remained unknown. This study is the first to show a mechanism for how TNF can turn inflammation down. The identification of this mechanism could potentially lead to new treatments for RA and other inflammatory diseases.

In their experiments, the researchers treated human monocytes and macrophages, cells that have a key role in inflammatory diseases, with TNF and then challenged these cells with lipopolysaccharide (LPS), a prototypical inflammatory factor that stimulates receptors important in inflammation. They found

that TNF suppressed the inflammatory response of the macrophages and monocytes. They then gave mice low doses of TNF followed by high doses of LPS and found that the mice were protected from the effects of high dose LPS, which is usually lethal. They discovered that the mechanism by which TNF suppressed the inflammatory response involved a protein known as GSK3 (glycogen synthase kinase 3-alpha) and a gene known as TNFAIP3 that encodes the A20 protein. Experiments with a drug that can inhibit GSK3, as well as experiments with RNA interference of A20, which can block A20 gene function, helped identify the roles of this protein and gene. According to Dr. Ivashkiv, this may be relevant to RA, not only because the macrophages are the same cells that migrate into joints and make the inflammatory cytokines involved in RA, but also because the A20 gene, which has polymorphisms that have been linked to RA pathogenesis, is involved.

Going forward, our rheumatologists will be comparing a protocol for immunizing patients prior to biologic therapy exposure versus routine care with a goal of developing an immunization protocol. In addition, they have begun implementing the American College of Rheumatology quality indicators for RA using the electronic health record to benchmark the care that is provided, determine any variability in the delivery of care, and identify opportunities for improvement. Plans are also underway to develop a "damage index" that will aid in the assessment of patients with RA.

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Hendricks H. Whitman III, MD

With decades of experience providing care for hundreds of thousands of patients with osteoarthritis (OA), Hospital for Special Surgery has been at the forefront of developing both medical and surgical treatments. With more being learned about OA every day, the Hospital's scientists and clinicians are focused on the disease at all of its stages. Many of these efforts are being done at the laboratory level. With a particular emphasis on preventing OA from progressing to a disabling condition, the studies are aimed at identifying how to intercede earlier in the degenerative process.

Public health data indicate that the prevalence, impact, and economic consequences of OA are expected to rise dramatically within the next several decades. Understanding and preventing this disease are urgent research challenges. To that end, in June 2011, the Hospital hosted a two-day international conference – *HSS Osteoarthritis Summit: Frontiers in OA Research, Prevention, and Care*. The Summit brought together, for the first time, a comprehensive multidisciplinary group of world-renowned physicians, scientists, thought leaders, and industry representatives from the United States, Canada, Europe, and Australia. Some 42 members of this diverse international community discussed all aspects of OA, including current research, promising avenues for future investigation, the latest diagnostic tools and treatments, public health strategies, and the most recent information on prevention.

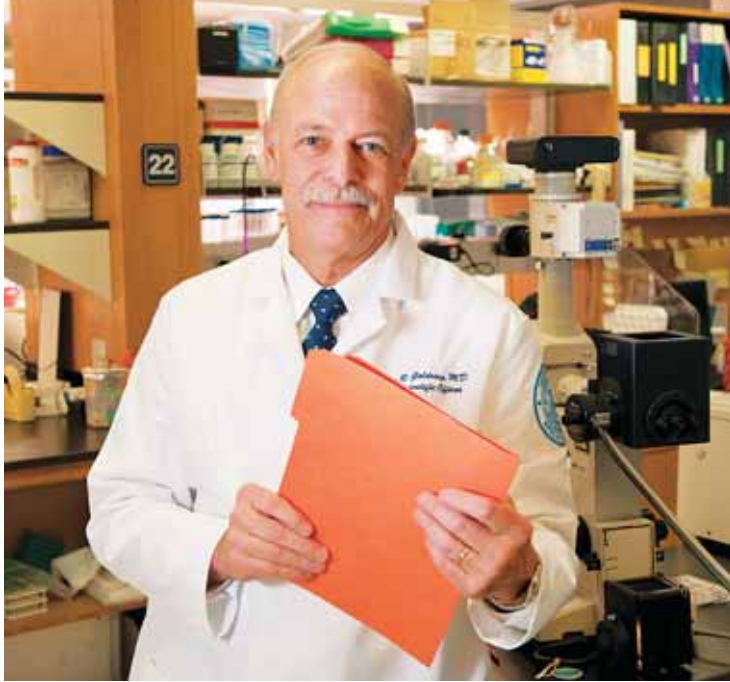
Outcomes of the Summit, which was co-directed by Steven R. Goldring, MD, Chief Scientific Officer, and Timothy M. Wright, PhD, Director of Biomechanics, will be published in the *HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*. The National Arthritis Foundation, Osteoarthritis Research Society International, and other associated foundations and research organizations participated in disseminating the meeting's consensus on future directions for OA research, prevention, and treatment.

The idea for the Summit grew out of the Hospital's launch in 2010 of the OA Initiative. This initiative encompasses the expertise and resources in OA in a coordinated Hospital-wide effort that focuses on basic research activities and clinical trials needed to address the broad-ranging challenges of the disease. Efforts in the laboratory are led by Mary B. Goldring, PhD, who specializes in the study of chondrocyte cells in cartilage. She and her colleagues work with HSS orthopaedic surgeons to obtain tissue samples from patients undergoing joint replacement with which they can investigate genes that may play a role in the regulation of cartilage degradation and repair. In 2010, Dr. Goldring was awarded a major NIH grant to direct studies with investigators at three other institutions focused on defining common molecular parameters for the onset and progression of OA. Their goal is to understand the basic mechanisms involved in the onset and progression of cartilage destruction and thus define cellular targets for treatment. The research will provide a comprehensive and integrated picture of regulatory networks in cartilage and is an outgrowth of Dr. Goldring's studies of chondrocytes over three decades.

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Dr. Mary Goldring



Dr. Steven Goldring (left) and Dr. Timothy Wright chaired the *HSS Osteoarthritis Summit: Frontiers in OA Research, Prevention, and Care* in June 2011. The Summit provided a forum for an international, multidisciplinary group of renowned scientists, physicians, thought leaders, and industry and government representatives to discuss all aspects of the disease.

Dr. Mary Goldring leads a coordinated effort with scientists at SUNY at Stony Brook, San Diego State University, and Harvard School of Dental Medicine to uncover novel causes and critical molecular networks involved in both post-traumatic and genetic OA.

Suzanne A. Maher, PhD, is exploring ways to improve outcomes for patients with meniscal injuries, using a synthetic implant to restore the knee's pre-injury mechanics and prevent progression of early OA. As an initial step, Dr. Maher developed an experimental model to test how well the implants reproduce healthy knee mechanics. With funding from the NIH, Dr. Maher is now validating her experimental model while simultaneously developing computational and statistical models that can be used by scientists attempting to develop a meniscus implant to test the implant's effectiveness.

Several pilot projects are also underway in the area of joint injury, regeneration, and repair. Joint trauma related to sports and other types of injury affects individuals of all ages and can lead to post-traumatic OA, with accompanying joint inflammation and cartilage damage, and ultimately progressive joint degeneration. These projects include measuring gene expression in human anterior cruciate ligaments; looking at the role of stromal-derived factor-1 in the development of post-traumatic arthritis; and investigating complement and its role in synovial inflammation and osteoarthritis progression.

To share new research findings and identify priority interventions for clinical trials, HSS regularly sponsors workshops and symposia focused on OA. In addition to the OA Summit, the

Hospital, in partnership with the Arthritis Foundation, Genzyme, Endo Pharmaceuticals, Smith & Nephew, and the American Orthopaedic Society for Sports Medicine, sponsored the fourth Segal North American Osteoarthritis Workshop (SNOW). The meeting drew leading arthritis researchers to address efforts on pathophysiological mechanisms in distinct forms of OA, identify new targets and interventions for OA, and make recommendations for clinical trials.

With over 95 percent of all joint replacement surgeries performed on patients with OA, large, longitudinal, multinational registries are needed to capture clinical data on the specific implants and clinical outcomes for evaluation and comparative effectiveness studies. To begin to fill the gap in collecting and evaluating such data, HSS, in partnership with Kaiser-Permanente, received funding from the FDA to develop a strategic plan for creating a consortium of large U.S. and international registries to collaborate in acquiring, integrating, and analyzing outcomes data in patients undergoing joint replacement procedures. Spearheaded by Dr. Timothy Wright and colleagues, the consortium is expected to yield data on more than 500,000 orthopaedic surgeries performed in the U.S. and internationally, and capture data on the entire spectrum of implantable devices and procedures currently employed for joint replacement.

CENTER OF EXCELLENCE: SYSTEMIC LUPUS ERYTHEMATOSUS AND ANTIPHOSPHOLIPID SYNDROME

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SYSTEMIC LUPUS ERYTHEMATOSUS AND ANTIPHOSPHOLIPID SYNDROME CENTER OF EXCELLENCE

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Hospital for Special Surgery is home to a renowned team of clinicians and scientists who are seeking to address the many challenges of systemic lupus erythematosus (SLE) and antiphospholipid syndrome (APS). The Mary Kirkland Center for Lupus Research at HSS, which just celebrated its 10th anniversary, continues to make important contributions to understanding the molecular and cellular basis of SLE and the development of new lupus therapies. Since its establishment in 2001 with support from Katherine and Arnold Snider of Rheuminations, Inc., the Kirkland Center has provided support to 19 HSS investigators who have collectively published 213 lupus-related articles and received more than \$50 million in federal, foundation, and industry funding.

The Center has provided support for the SLE Patient Registry and Repository, which has more than 1,000 SLE patients enrolled. The registry provides longitudinal clinical data, disease activity data, laboratory data, and biologic samples for studies led by investigators at HSS and other centers around the country. Research projects address disease susceptibility, alterations in immune function, mechanisms of target organ damage, epidemiology, clinical features, and new therapies for lupus.

The PROMISSE study, led by Jane E. Salmon, MD, with continuous funding from the National Institutes of Health since its launch in 2003, is making progress revealing the many characteristics in patients with lupus and APS that can influence pregnancy outcomes. With nearly 700 patients – each with monthly visits through the course of their pregnancies – enrolled in PROMISSE (Predictors of Pregnancy Outcome: Biomarkers in Antiphospholipid Syndrome and Systemic Lupus Erythematosus), the resulting data is generating questions well beyond what was initially anticipated and producing patterns that were unexpected, enabling Dr. Salmon and her colleagues to delve deep into mechanisms of placental injury, identification of relevant biomarkers of disease, and determinants of pregnancy outcomes. The extraordinary collection of material includes historical and clinical data, as well as physical exams, laboratory tests, and research tests.

The PROMISSE study has already revealed that 8 out of 10 pregnancies can be successful in patients with lupus, that lupus flares are extremely infrequent in pregnant women who are clinically stable at conception, and that these women have uncomplicated pregnancies. In addition, by studying 150 aPL-positive patients, PROMISSE researchers were able to determine that the lupus anticoagulant test is the most powerful predictor of poor pregnancy outcomes. On the other hand, they also learned that the majority of patients who have the anticardiolipin antibody do very well.

Most recently, Dr. Salmon and her collaborators at Washington University School of Medicine, University of Utah, Newcastle University in the UK, and Hôpital Européen Georges-Pompidou in Paris, uncovered genetic mutations in women with lupus and antiphospholipid antibody syndrome associated with increased risk of preeclampsia, as well as in patients with preeclampsia who did not have an autoimmune disease.

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Jane E. Salmon, M.D.



Dr. Jane Salmon



In 2010, Dr. Michael Lockshin and Dr. Doruk Erkan co-chaired the Antiphospholipid Syndrome Clinical Research Task Force at the 13th International Congress on Antiphospholipid Antibodies, leading to the creation of APS ACTION (Antiphospholipid Syndrome Alliance for Clinical Trials and International Networking). Chaired by Dr. Erkan, APS ACTION is an international collaborative that will conduct well-designed, prospective, large-scale multicenter clinical trials of patients with persistent and clinically significant aPL profiles. You can read more about the APS ACTION initiative on page 5 of this report.

They hypothesized that genetic variations in proteins that regulate the complement pathway lead to unchecked inflammation, and that such impaired complement regulation, when it occurs in the placenta, may trigger preeclampsia. The study, which identified the first genetic risk factors associated with preeclampsia in patients with lupus and/or antiphospholipid antibodies, and also validated these risk factors in a population of patients who do not have an autoimmune disease, identifies new targets both for treating preeclampsia and developing tests to identify women at increased risk for preeclampsia.

Supported by grants from the National Institutes of Health and the Lupus Research Institute (LRI), Theresa T. Lu, MD, PhD, is investigating the mechanisms involved in blood vessel growth at sites of immune-mediated tissue injury with the goal of identifying novel approaches for suppressing inflammation and averting organ damage. Lymph nodes are the sites of immune responses. The mechanisms that regulate lymph node vascular growth and the functional consequences of this regulation on the immune system are not well understood. Controlling this vascular activation is important in autoimmune and inflammatory diseases such as SLE and rheumatoid arthritis, which are characterized by enlarged lymph nodes and expanded lymph node vasculature. Dr. Lu is exploring what occurs during an immune response when newly expanded lymph node blood vessels stop growing and become stabilized, hypothesizing that antibody growth and abnormal autoantibodies are upregulated during this period. Interfering with blood vessel stabilization and altering the environment in which autoimmune cells are

generated may provide direction for developing novel therapies using anti-angiogenic drugs to achieve immunosuppression.

Having found a novel role for dendritic cells in modulating the vascular growth that happens during immune responses, Dr. Lu and her colleagues are now trying to identify what these dendritic cells make that stimulate the blood vessels to grow. They also discovered that the blood vessels become more stabilized after blood vessel growth, identifying a subset of dendritic cells that regulates this stabilization process. Conversely, when they disrupted the vascular stabilization, they showed that the immune response is also disrupted, suggesting a potential target for manipulation.

Another exciting possibility that has arisen from Dr. Lu's work in lymph nodes is that the mechanisms that they find in lymph nodes with regard to vascular growth and function are likely to be applicable to inflamed tissues in other parts of the body. With a Novel Research Grant Award from the LRI, her second LRI award, Dr. Lu is also looking at the role of blood vessel activation in the photosensitivity reaction that develops in some lupus patients following exposure to the sun. She is examining whether an imbalance in certain immune cells in lupus, Langerhans cells, results in excess blood vessel activation in the skin bringing in the inflammatory cells that can result in new skin lesions and disease flares.

With the knowledge that B cell inhibition has been shown to be effective in APS mouse models and that rituximab can result in depletion of peripheral B cells, Doruk Erkan, MD, MPH, and



In the Mary Kirkland Center for Lupus Care, nurse coordinator Monica Richey, MSN, ANP-BC/GNP (left), screens all new lupus patients and manages their ongoing care. Ms. Richey is a member of the Center's multidisciplinary team, which includes (right) Pretima Persad, MPH, Dr. Kyriakos Kirou, Su Jin Kim, LCSW, and Erica Sandoval, MSW, who leads a peer health education program for lupus patients. Two years ago, under the directorship of Dr. Doruk Erkan, the Center established its Cardiovascular Disease Prevention Counseling Program, which now has more than 115 patients enrolled. The program screens lupus patients for cardiovascular disease and teaches healthy lifestyles focused on good nutrition and exercise.

Michael D. Lockshin, MD, MACR, initiated a pilot, open-label, Phase II study to evaluate the safety and efficacy of rituximab in aPL-positive patients. Based on their preliminary analysis, safety appears to be consistent with rituximab's known safety profile and B cell depletion appears to be effective in controlling some of the non-criteria aPL manifestations during six months of follow-up. However, no substantial change in aPL profiles was observed in patients who completed 12 months of follow-up.

FLARE is a carefully followed cohort of lupus patients at HSS directed by Kyriakos A. Kirou, MD, DSc, FACP, and Peggy Crow, MD. In this cohort, 103 patients are followed longitudinally with careful documentation of their clinical phenotype, as well as disease activity. Blood samples are collected for gene expression and proteomic analysis. Based on gene expression data from this cohort, subgrouping of patients has been possible and is expected to help us understand disease pathogenesis. Moreover, data from the cohort have revealed a novel approach for the use of anti-dsDNA titers to predict disease activity. Specifically, it was determined that a rapid surge in anti-dsDNA titers is strongly associated with a severe lupus flare in the following six months.

The Mary Kirkland Center for Lupus Care, led by Drs. Erkan and Kirou, serves as the conduit for discoveries made in the laboratory that may be realized in the clinical arena. The Kirkland Center's multidisciplinary team is piloting protocols to most effectively care for patients with lupus and the associated health issues that impact their health. A nurse practitioner, Monica Richey, MSN, ANP-BC/GNP, plays a major role in the care of patients in the Kirkland Center. Together with Drs. Erkan and Kirou, Ms. Richey instituted a new initiative to monitor the overall prevention and health practices of patients, including flu and pneumonia vaccinations, gynecological exams, colonoscopies, bone density tests, and other preventative actions. To ensure that patients are vaccinated, the Kirkland Center administers flu shots to all patients during flu season, and provides pneumonia vaccines – particularly important to patients about to begin an immunosuppressant regime – throughout the year.

MARY KIRKLAND CENTER FOR LUPUS CARE

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Scleroderma

Established in 2005, the Rudolf Rupert Scleroderma Research Program at Hospital for Special Surgery is one of the few specialized scleroderma programs in the nation. In addition to pursuing clinical, translational, and basic research in scleroderma, the program provides community outreach and patient and physician education.

Program researchers have recently published results of their major clinical trial of imatinib mesylate (Gleevec®) for the treatment of scleroderma in *Annals of the Rheumatic Diseases*. Imatinib, a tyrosine kinase inhibitor, has been of interest in treating fibrosing disorders such as scleroderma. In the open-label experience, they observed that most patients were able to tolerate the medication for at least one year of treatment, and showed improvement in skin thickening, as well as stability in pulmonary function tests. An extension phase of this study is allowing patients in the original study access to continued treatment with imatinib, and further studies are in development to definitively assess the role of tyrosine kinase inhibitors in the treatment of this condition.

Our researchers have also initiated a clinical trial to explore the use of another tyrosine kinase inhibitor, nilotinib (Tasigna®). One drawback to imatinib is the common side effect of edema, which is particularly troubling in patients already suffering from skin thickening and tightening. Nilotinib has been shown to cause significantly less edema in patients with chronic myelogenous leukemia, the disease for which both drugs were approved to treat. Thus, nilotinib may serve as the preferable therapeutic option for our patient population. We have been actively recruiting subjects and hope to fully enroll this trial by fall of this year.

With more than 180 patients now enrolled, the Scleroderma Registry and Repository – a prospective, observational, longitudinal clinical database and biobank – is providing biological specimens to facilitate basic scientific research studies to further elucidate the pathophysiology of scleroderma, develop biomarkers of disease activity, and understand predictors of outcome. Using data from this registry, third-year rheumatology fellow, Lindsay J. Forbess, MD, investigated the prevalence of celiac disease. The registry is also used as a resource for research collaborations with scientists with expertise in immunology and molecular biology, including Alessandra B. Pernis, MD, who is studying immune deregulation in patients with scleroderma.

With investigators at The Rockefeller University, including Barry Collier, MD, we are exploring the contribution of platelet transforming growth factor- β 1 (TGF- β 1) and its systemic activation mechanism to disease activity to improve the prevention, diagnosis, and treatment of disorders that are associated with organ fibrosis.

Hospital for Special Surgery also serves as a site in a multicenter observational longitudinal cohort study of patients with sclerodermas who are at high risk for pulmonary hypertension. The study, Pulmonary Hypertension Assessment and Recognition of Outcomes in Scleroderma (PHAROS), is spearheaded by Jessica K. Gordon, MD.

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Dr. Robert Spiera



(Left) Graduating just last year from the Hospital's rheumatology fellowship program, Dr. Jessica Gordon has already established herself as an emerging, nationally recognized leader in clinical and translational research in scleroderma. Dr. Gordon is a past recipient of the American College of Rheumatology Distinguished Fellow Award. (Right) Dr. Alessandra Pernis is collaborating with colleagues in the scleroderma group, using the Scleroderma Registry and Repository to study immune deregulation in patients.

The Scleroderma Registry and Repository is providing biological specimens to further elucidate the pathophysiology of scleroderma, develop biomarkers of disease activity, and understand predictors of outcome.

A number of pioneering multicenter industry-sponsored trials of novel therapies in scleroderma are also underway. Researchers are involved in trials investigating the use of oral treprostinil (an oral prostacyclin analogue) for the treatment of digital ulcers associated with systemic sclerosis, as well as a trial to evaluate the safety of another tyrosine kinase inhibitor, dasatinib, in patients with scleroderma and pulmonary fibrosis.

Vasculitis

Under the leadership of Dr. Spiera, HSS served as a site for the NIH-sponsored RAVE (Rituxan in ANCA-Associated Vasculitis) study. This groundbreaking trial demonstrated the efficacy of rituximab for patients with Wegener's granulomatosis and microscopic polyangiitis. Based on the study's results, which were published in *The New England Journal of Medicine*, rituximab became the first FDA-approved drug for ANCA-associated vasculitis in April 2011.

The Hospital is a participating clinical center in the NIH-funded Vasculitis Clinical Research Consortium (VCRC), an integrated group of academic medical centers, patient support organizations, and clinical research resources dedicated to advancing research and patient care. The VCRC is part of the Rare Diseases Clinical Research Network.

Dr. Spiera also serves as a principal investigator for an NIH-sponsored multicenter clinical trial evaluating abatacept (Orencia®) in patients with giant cell arteritis and Takayasu's arteritis. He and his study team have also initiated the first clinical trial of tocilizumab (Actemra®) as the first steroid-sparing drug to treat polymyalgia rheumatica (PMR). This biologic, approved for the treatment of rheumatoid arthritis, inhibits IL-6 – a pivotal cytokine in PMR. Researchers here will soon be participating in a multicenter study to identify genes that increase the risk of developing vasculitis, providing the vasculitis research community with crucial information on the cause of these diseases and new ideas for diagnostic tests and therapies.

Myositis

The myositis program continues to grow, with approximately 80 patients seen regularly. Patients will soon begin to be enrolled in a new Myositis Registry, in an effort to increase knowledge on disease course and prognosis. Stephen J. DiMartino, MD, PhD, a specialist in myositis, led the Hospital's efforts in the international, multicenter NIH-sponsored RIM (Rituximab in Myositis) trial and will be spearheading the development of the registry and other upcoming myositis studies at HSS.

CENTER OF EXCELLENCE: METABOLIC BONE DISEASE AND ORTHOPAEDIC BONE HEALTH

Believing that bone health is critical in promoting successful outcomes of treatment of patients with musculoskeletal disorders, HSS maintains a major focus on developing methods to improve bone quality and prevent bone loss.

Few scientific papers have been written on the bone health of patients having spine fusion. Working on the premise that if patients have very soft bone, the instrumentation needed for fusion will not affix well, Linda A. Russell, MD, in collaboration with the Hospital's orthopaedic surgeons, has initiated a pilot program to determine if patients with better bone quality have better surgical results. The project, the first of its kind in the country, is being carried out initially with patients scheduled for spine fusion surgery. Three to six months before surgery, patients undergo a bone health assessment that includes a bone density screening and laboratory tests to check Vitamin D and parathyroid hormone levels. In fact, according to research, nearly half of patients undergoing orthopaedic surgery have Vitamin D deficiency, which can impair their recovery. Based on the results of the bone health evaluation, a treatment plan is devised to maximize the bone health of patients before surgery.

According to HSS researchers, in cases of patients deficient in Vitamin D, their levels need to be brought up to normal before they undergo surgery as Vitamin D is essential for bone healing and muscle function. An important part of the healing process – bone tissue formation – occurs from two to four weeks after surgery, the critical period that the body needs Vitamin D. Joseph M. Lane, MD, and his colleagues retrospectively reviewed the medical records of 723 patients who had orthopaedic surgery between January 2007 and March 2008 at Hospital for Special Surgery. They found that 43 percent of the patients had Vitamin D insufficiency (20 nanograms per milliliter [ng/mL] to less than 32 ng/mL) and 40 percent had Vitamin D deficiency (less than 20 ng/mL). The researchers note that if patients receive 2,000 to 4,000 mg of Vitamin D based on their deficiency value, their levels can usually be corrected in four to six weeks.

In addition to raising Vitamin D levels, patients who smoke will also be advised to stop since tobacco is toxic to osteoblasts. Additionally, since data suggest that bisphosphonates seem to slow spine fusion healing, while teriparatide seems to promote spine fusion, recommendations are made about these drugs accordingly.

This year, the U.S. Preventive Service Task Force recommended screening for osteoporosis in women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors. The Hospital's Osteoporosis Prevention Center, the first of its kind in the country, is today one of only 14 centers nationwide to be accredited by the International Society of Clinical Densitometry.

The Hospital's rheumatologists, surgeons, nurses, and scientists have developed a new clinical pathway of care for patients with osteoporosis. This pathway brings together the expertise and experience of various specialty areas to provide patients with comprehensive assessment, diagnosis, and treatment of osteoporosis.

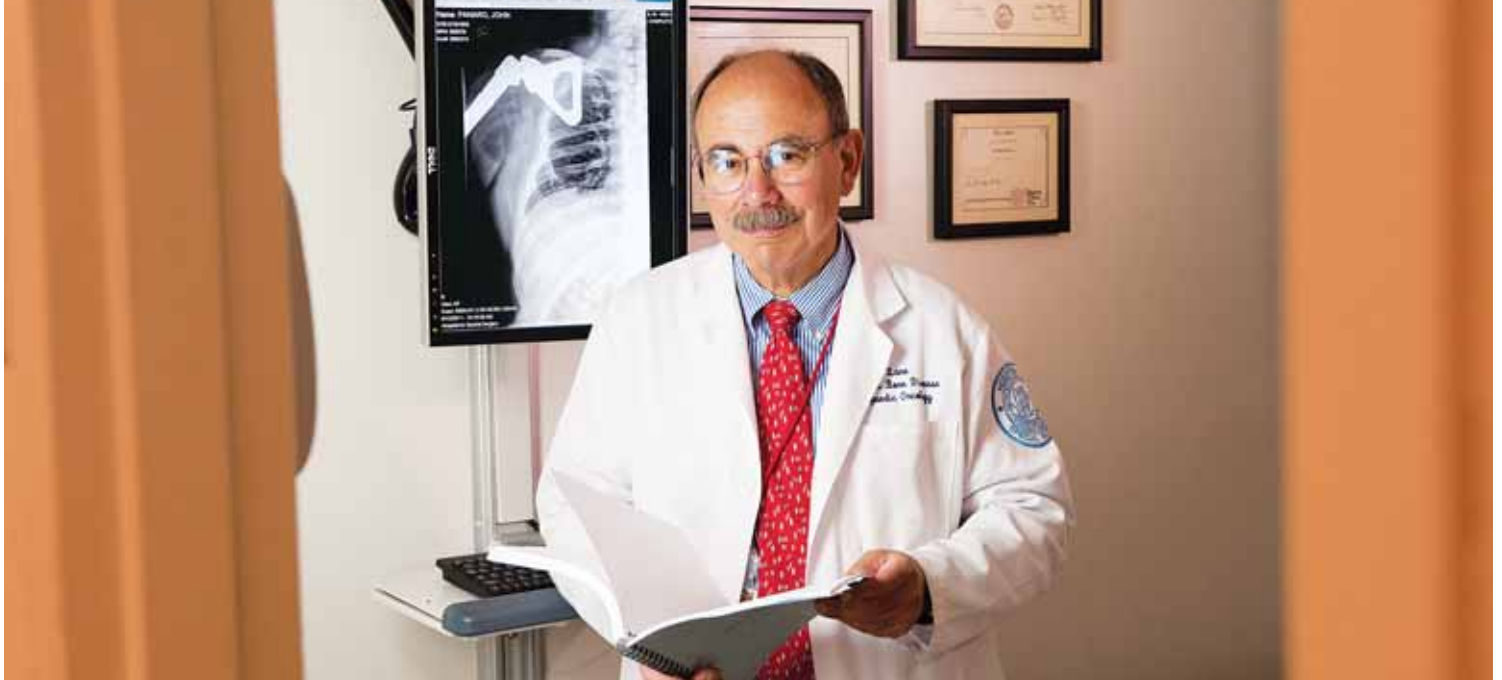
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Dr. Linda Russell



The research of Dr. Joseph Lane helped identify the possible link between long-term use of osteoporosis medications and increased risk for certain types of bone fractures. His work received worldwide attention and contributed greatly to a national change in practice as well as a better understanding of the treatment of postmenopausal women.

Dr. Linda Russell, in collaboration with the Hospital's orthopaedic surgeons, has initiated a pilot program to determine if patients with better bone quality have better surgical results.

While osteoporosis remains underrecognized and undertreated in both men and women, men who sustain fragility fractures experience greater morbidity and mortality. A study by HSS researchers showed that not only do men exhibit advanced comorbidity at the time of hip fracture presentation, there are distinct sex- and gender-specific factors related to the pathophysiology and treatment of osteoporosis that further influence morbidity and mortality. With a selective review of the literature, they evaluated sex- and gender-based differences contributing to increased morbidity and mortality in men with osteoporosis. Sex-specific differences in bone biology and morphology may affect the pathophysiology of osteoporosis, choice of pharmacotherapy, and surgical implant selection. Additionally, estrogen metabolism may play a key role in both fracture prevention and healing. Gender-based differences in recommendations for screening and prevention between men and women may influence the severity at which osteoporosis is recognized. These disparities are a call to action to raise awareness for early prevention and treatment of osteoporosis in men.

Based on the work previously conducted by the Hospital's metabolic bone disease specialists that demonstrated the need for a "pause" from osteoporosis drugs, a protocol has been established that individualizes drug treatment based on specific

patient characteristics, including bone markers and fracture history, with dosing and duration of treatment dependent on patient responses. As a result, complications – including atypical fractures and osteonecrosis of the jaw – associated with long-term use of osteoporotic drugs have decreased. These specialists are among the nation's strongest advocates recommending that patients take a pause in their osteoporosis medication usage after five years, a protocol that has been endorsed by the FDA and adopted by physicians throughout the county.

Under the direction of Dr. Lane, the Metabolic Bone Disease Service is involved in research activities with a common focus on preserving the quality of bone. The Seymour Cohn Metabolic Bone Registry collects and analyzes patient data sets to identify methods to prevent and repair fragility fractures that result from osteoporosis and other metabolic bone disorders. The Bone Mineral Density Core focuses on the repair and regeneration of bone and cartilage and other soft tissues, which is critical to the understanding of osteoporosis, osteoarthritis, and other significant bone diseases. Based on 14 families with three generations of fragility fracture from its Bone Fragility Fracture Registry, Dr. Lane and his colleagues initiated a genetic pilot study to identify possible areas of the human genome that may be contributing to decreased bone quality.



Dr. Thomas Lehman

CENTER OF EXCELLENCE: PEDIATRIC RHEUMATOLOGY

The three full-time pediatric rheumatologists in the Division of Pediatric Rheumatology are committed to providing the best possible advanced care for children. Thomas J.A. Lehman, MD, FAAP, has been at the forefront of clinical care for children with rare and complex rheumatic conditions. The Division is well known for employing the newer biologics and medications primarily used in adults to treat children for whom standard treatments have been unsuccessful or whose diagnosis is elusive. When properly monitored, these agents curtail the progression to severe joint damage and disability, while helping patients avoid liver toxicity, growth problems, and cosmetic issues that can occur with other therapies.

The Division continues to pioneer treating pediatric patients with systemic lupus erythematosus (SLE) with a regimen of cyclophosphamide and rituximab, and minimal doses of prednisone, with continued success and no evidence of active disease. The Division is a principal investigator in the Childhood Arthritis and Rheumatology Research Alliance (CARRA) Registry, a network of pediatric rheumatology research centers across North America dedicated to advancing pediatric rheumatology research. HSS anticipates enrolling some 800 children in the CARRA Registry with follow-up status reports twice a year.

The Division's pediatric rheumatologists continue to participate in nationwide studies, including the development of novel quality of life instruments. In one study, a questionnaire was developed and tested to measure vision-related quality of life in children 8 to 18 years of age who have uveitis associated with juvenile idiopathic arthritis (JIA). The study provided evidence that the instrument, EYE-Q (Effects of Youngsters' Eyesight on Quality of Life), is a valid and reliable tool to measure vision-related quality of life and may become an important tool in the assessment of quality of life in JIA-associated uveitis.

In another study, the Division collaborated with several centers on a worldwide study using a health-related quality of life measurement tool for children with SLE from South America (Brazil and Argentina), Europe (Italy, Spain, Netherlands), and Asia (China). Lakshmi Nandini Moorthy, MD, a pediatric rheumatologist in the Hospital's Ambulatory Care Center and Chief of Pediatric Rheumatology at the Robert Wood Johnson Medical School, served as principal investigator of the study, which used a 26-item health-related quality-of-life assessment tool – SMILEY (Simple Measure of Impact of Lupus Erythematosus in Youngsters) – developed by Dr. Moorthy while she was a pediatric rheumatology fellow at HSS. The scores showed that lupus has a major impact on quality of life, but appears to be highest in Asia. The researchers now seek to understand why the scores are higher in Asia, how cultural factors and family expectations may play a role, and how the instrument can help physicians the world over in the treatment of children and adolescents with lupus.

The Division's pediatric rheumatology fellowship is thriving. It is one of only 21 ACGME accredited programs in the United States, and with four fellows in the program, it is also one of the largest. There are now more than 20 pediatric rheumatologists practicing around the world who have trained under Dr. Lehman's supervision.

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(Endocrinology)

Barry D. Brause, MD, FACP

Chief, Infectious Disease

Mary K. Crow, MD

Physician-in-Chief

Theodore R. Fields, MD, FACP

Allan Gibofsky, MD, JD, DACP, FCLM

Lionel B. Ivashkiv, MD

Thomas J.A. Lehman, MD, FAAP

Chief, Pediatric Rheumatology

Michael D. Lockshin, MD, MACR

Steven K. Magid, MD

Joseph A. Markenson, MD, FACP, MACR

Stephen A. Paget, MD, FACP, MACR

Francis Perrone, MD

(Cardiovascular Disease)

Jane E. Salmon, MD

James P. Smith, MD

(Pulmonary Medicine)

Harry Spiera, MD

Associate Attending Physicians

Anne R. Bass, MD, FACP

Harry Bienenstock, MD

Lisa R. Callahan, MD

(Primary Care Sports Medicine)

Doruk Erkan, MD, MPH

Brian C. Halpern, MD

Chief, Primary Care Sports Medicine

C. Ronald MacKenzie, MD

Carol A. Mancuso, MD, FACP

Jordan D. Metzl, MD

(Primary Care Sports Medicine)

Martin Nydick, MD

(Endocrinology)

Lisa R. Sammaritano, MD

Sergio Schwartzman, MD

Robert F. Spiera, MD

Richard Stern, MD

Mary Beth Walsh, MD

Assistant Attending Physicians

Alexa B. Adams, MD

(Pediatric Rheumatology)

Juliet B. Aizer, MD, MPH

Dalit Ashany, MD

Laura V. Barinstein, MD

John W. Barnhill, MD

Chief, Psychiatry Service

Jessica R. Berman, MD

Matthew L. Buchalter, MD

(Perioperative Medicine)

Trang M. Bui, MD, MPH

(Perioperative Medicine)

Vivian P. Bykerk, MD

James J. Calloway III, MD

(Perioperative Medicine)

Hyun Susan Cha, MD

(Pediatrics)

Gina DelGiudice, MD

Stephen J. DiMartino, MD, PhD

Timothy C. Dutta, MD

(Cardiology)

Doruk Erkan, MD, MPH

Jacobo Futran, MD

Flavia A. Golden, MD

Susan M. Goodman, MD

Marci A. Goolsby, MD

(Primary Care Sports Medicine)

Jessica K. Gordon, MD

Stewart G. Greisman, MD

Wesley Hollomon, MD

(Perioperative Medicine)

Lisa S. Ipp, MD

Chief, Pediatrics

Michael I. Jacobs, MD

(Dermatology)

James J. Kinderknecht, MD

(Primary Care Sports Medicine)

Osrice S. King, MD

(Primary Care Sports Medicine)

Kyriakos A. Kirou, MD, DSc, FACP

Mary J. Kollakuzhiyil, MD

(Perioperative Medicine)

Daniel G. Krauser, MD

(Cardiology)

David Lefkowitz, MD

(Cardiology)

Lawrence F. Levin, MD

(Cardiology)

Emma Jane MacDermott, MD, MRCPI

(Pediatric Rheumatology)

Lisa A. Mandl, MD, MPH

Jacqueline M. Mayo, MD

(Perioperative Medicine)

Alia Menezes, MD

Charis F. Meng, MD

Andrew O. Miller, MD

(Infectious Disease)

Marissa D. Newman, MD

(Perioperative Medicine)

Dana E. Orange, MD

Sonal S. Parr, MD

(Perioperative Medicine)

Edward J. Parrish, MD

Stephanie L. Perlman, MD

(Pediatrics)

Jill M. Rieger, MD

(Perioperative Medicine)

Linda A. Russell, MD

Director, Perioperative Medicine

Ariel D. Teitel, MD

Lisa C. Vasanth, MD, MS

Arthur M.F. Yee, MD, PhD

Christine Yu, MD

(Perioperative Medicine)

Christine M. Yu, MD

(Perioperative Medicine)

Florence Yu, MD

(Perioperative Medicine)

Wendy S. Ziecheck, MD

Instructor in Medicine

George D. Kalliolias, MD, PhD

Physicians to the Ambulatory Care Center

Bento R. Mascarenhas, MD
Lakshmi Nandini Moorthy, MD
Alana C. Serota, MD
Hendricks H. Whitman III, MD
Dee Dee Wu, MD
David A. Zackson, MD

Fellows in Rheumatic Disease

2010-2011

Elana Bernstein, MD
Soumya Chakravarty, MD, PhD
Lindsay J. Forbess, MD
Diana Goldenberg, MD, MPH
Beverly Johnson, MD
Susan Kim, MD
Lindsay Lally, MD
Alana Levine, MD
Danielle Ramsden-Stein, MD
Lauren Wong, MD
Weijia Yuan, MB

Fellows in Pediatric Rheumatology

2010-2011

Cassyanne Aquiar, MD
Christina Mertelsmann-Voss, MD
Nancy Pan, MD
Heather Walters, MD

RESEARCH DIVISION

Leadership

Steven R. Goldring, MD
Chief Scientific Officer
Lionel B. Ivashkiv, MD
*Associate Chief Scientific Officer
and Director of Basic Research*
Robert N. Hotchkiss, MD
Director of Clinical Research

ENDOWED CHAIRS, PROFESSORSHIPS, AND FELLOWSHIPS

Named Chairs and Professorships

Franchellie M. Cadwell Chair
Sergio Schwartzman, MD
*Joel and Anne Bick Ehrenkranz
Research Chair*
John N. Insall Chair in Knee Surgery
Steven B. Haas, MD

Collette Kean Research Chair

Jane E. Salmon, MD
*F.M. Kirby Chair
in Orthopaedic Biomechanics*
Timothy M. Wright, PhD

David H. Koch Chair for Arthritis and Tissue Degeneration Research

Lionel B. Ivashkiv, MD

Korein-Wilson Professorship in Orthopaedic Surgery

Thomas P. Sculco, MD

Richard S. Laskin, MD, Chair in Musculoskeletal Education

Charles N. Cornell, MD

David B. Levine, MD, Chair in Scoliosis

Oheneba Boachie-Adjei, MD

C. Ronald MacKenzie, MD, Chair in Ethics and Medicine supporting

Wayne N. Shelton, PhD, and
Stephanie M. Vertrees, MD

Richard L. Menschel Research Chair

*Stephen A. Paget, MD, Chair
in Rheumatology*

Stephen A. Paget, MD

Leon Root, MD, Chair in Pediatric Orthopaedics

Leon Root, MD

Benjamin M. Rosen Chair in Immunology and Inflammation Research

Mary K. Crow, MD

Joseph P. Roth Professor of Rheumatic Diseases in Medicine

Mary K. Crow, MD

Virginia F. and William R. Salomon Chair in Musculoskeletal Research

Carl P. Blobel, MD, PhD

Eduardo A. Salvati, MD, Chair in Hip Arthroplasty

Eduardo A. Salvati, MD

St. Giles Research Chair

Steven R. Goldring, MD

Starr Chair in Mineralized Tissue Research

Adele L. Boskey, PhD

Starr Chair in Tissue Engineering Research

*Russell F. Warren Research Chair
supporting* Suzanne Maher, PhD

Named Fellowships

*Robert and Helen Appel Fellowship
in Biomedical Engineering*
Natalie Galley, MASC, and
Russell P. Main, PhD

Finn and Barbara Caspersen Fellowship for Spine Research

*Charles L. Christian, MD,
Research Fellowship*

Lisa A. Mandl, MD, MPH

Ira W. DeCamp Fellowship in Musculoskeletal Genetics

Mary B. Goldring, PhD

Leo Farbman Fellowship for Pediatric Musculoskeletal Research

Michelle Leach, MS, OTR/L

Helen Frankenthaler Fellowship in Restorative Mobility

Andrew D. Pearle, MD

Ken and Jill Iscol Fellowship in Orthopaedic Research

Eduardo M. Suero, MD

Irving and Sally Lipstock Fellowship in Orthopaedic Surgery

Lawrence V. Gulotta, MD

Ludwig Fellowship for Women's Sports Medicine Research

*William T. Morris Fellowship
in Pediatric Rheumatology*

Theresa T. Lu, MD, PhD

Stavros S. Niarchos –

Thomas P. Sculco, MD, International Orthopaedic Fellowship

Lazaros Poultsides, MD, PhD

Mary Rodgers and Henry Guettel Fellowship in Biomedical Mechanics

Stephanie Tow

Robert and Gillian Steel Fellowship in Musculoskeletal Research

Inez Rogatsky, PhD

Nancy Dickerson Whitehead Research Fellowship

Philipp Mayer-Kuckuk, PhD

Fellowship in Arthroplasty

Edward Purdue, PhD

Immunology and Inflammation Fellowship

2010-2011 NOTABLE ACHIEVEMENTS

Rheumatologists at HSS are regularly cited for their professional achievements and outstanding contributions to patient care, research, and education. They hold leadership positions and are on numerous committees of national and international organizations and professional societies, and serve as editors and on editorial boards of the major peer-reviewed journals in the field.

AWARDS AND SPECIAL RECOGNITION

Juliet B. Aizer, MD, MPH

2011 Clinician Scholar Educator Award,
American College of Rheumatology

Mary K. Crow, MD

Margaret D. Smith Lifetime Achievement Award,
Arthritis Foundation, New York Chapter
Pfizer Visiting Professor, University of California at San Diego

Doruk Erkan, MD, MPH

Invited Speaker (selected), Current Concepts and Controversies
in Orthopedic Surgery: Ankara, Turkey EULAR Congress
2011, London, UK; ACR Annual Meeting 2011, Chicago, IL

Lindsay J. Forbess, MD

2011 Distinguished Fellow Award,
American College of Rheumatology

Allan Gibofsky, MD, JD, DACP, FCLM

Visiting Professor, University of Puerto Rico
School of Medicine, Division of Rheumatology
Visiting Professor, Vanderbilt University School of Medicine,
Department of Medicine
Visiting Professor, Brown University
School of Medicine, Division of Rheumatology

Mary B. Goldring, PhD

Invited Speaker (selected), European Cells and Materials
Conference, Davos, Switzerland; 23rd Annual Meeting of the
Japanese Society of Cartilage Metabolism, Kagoshima, Japan;
Joint Annual Meeting of the European Society for Magnetic
Resonance in Medicine and Biology for Magnetic Resonance
Imaging, Stockholm, Sweden; American Society for Bone and
Mineral Research-2010, Meet-the-Professor; American College
of Rheumatology-2010, Basic Science Symposium; 3rd Joint
Meeting of the European Calcified Tissue Society and the
International Bone and Mineral Society: ECTS/IBMS Training
Course – Joints: formation, function and failure with a focus
on osteoarthritis, Athens, Greece; 3rd Joint Meeting, Bone
Research Society and British Orthopaedic Research Society,
Cambridge, UK; American Society for Bone & Mineral
Research-2011, Working Group on Osteoporosis in Rheumatic
Diseases, San Diego; American College of Rheumatology-2011,
Osteoarthritis Study Group

Steven R. Goldring, MD

2010 Master, American College of Rheumatology
Invited Speaker, Annual Meeting of the Osteoarthritis
Society International, Brussels, Belgium; EULAR Congress,
Rome, Italy; European Workshop on Rheumatology,
Bamberg, Germany

Catherine Lee Hayter, MBBS

2011 Graduate Award: Charles L. Christian, MD Award for
Excellence in Musculoskeletal Research
“Magnetic Resonance Imaging of Metal on Metal Hip
Resurfacing Implants,” Hospital for Special Surgery

Michael D. Lockshin, MD, MACR

2010 Master, American College of Rheumatology
Honored at the American College of Rheumatology Meeting,
Atlanta, for serving as Editor-in-Chief of *Arthritis &
Rheumatism*, 2005-2010

Theresa T. Lu, MD, PhD

2011 Henry Kunkel Young Investigator Award,
American College of Rheumatology
Election to the American Society for Clinical Investigation
Charter Member, Study Section, National Institutes of Health
Atherosclerosis and Inflammation of the
Cardiovascular System

Lisa A. Mandl, MD

Grant Reviewer, Biotechnology and Biological Sciences
Research Council, United Kingdom

Joseph A. Markenson, MD, FACP, MACR

2010 Master, American College of Rheumatology

Stephen A. Paget, MD, FACP, MACR

2010 Master, American College of Rheumatology
2011 Distinguished Clinical Scholar Award,
American College of Rheumatology
Award for Teaching Excellence,
Division of Rheumatology 2011 Graduation,
Hospital for Special Surgery

Laura Robbins, DSW

2011 Lifetime Achievement Award for Rheumatology
Health Professionals (ARHP), American College of Rheumatology

Jane E. Salmon, MD

Laura J. Haddad Lectureship, Georgetown University Hospital
Soderberg Prize Symposium, Swedish Society of Medicine,
Stockholm
Michael Einbender Distinguished Lectureship
University of Missouri-Columbia School of Medicine

LEADERSHIP POSITIONS

Anne R. Bass, MD, FACP

Rheumatology Section Editor, Medical Knowledge Self-Assessment Program; Chairman, Training Resources Subcommittee, Committee on Workforce and Training, American College of Rheumatology

Mary K. Crow, MD

Chair, Scientific Advisory Board, Alliance for Lupus Research Board of Trustees, Arthritis Foundation, New York Chapter Scientific Advisory Board, Arthritis National Research Foundation Member, Steering Committee, SLE Biomarkers Workshop, Food and Drug Administration Study Section, National Institutes of Health/ National Institute of Arthritis and Musculoskeletal Skin Disease (NIAMS) Training Grants; NIAMS Centers of Research Translation; Scleroderma Foundation

Doruk Erkan, MD, MPH

Founder Member and Executive Committee Chair, Antiphospholipid Syndrome Alliance for Clinical Trials and International Networking (APS ACTION) Coordinator, International Catastrophic Antiphospholipid Syndrome Registry Medical Advisory Board, APS Foundation of America Member, National Thrombotic Storm Study Group Co-Chair, Abstract Review Committee, Antiphospholipid Syndrome, American College of Rheumatology Co-Chair, Antiphospholipid Syndrome Clinical Research Task Force International Summit, Miami, Florida Member, Medical and Scientific Committee, Arthritis Foundation, New York Chapter

Theodore R. Fields, MD, FACP

Medical Advisor, Men's Health Network, Washington, D.C. Member, Abstract Selection Committee, Quality Measures and Innovations in Practice Management and Care Delivery, American College of Rheumatology

Allan Gibofsky, MD, JD, DACP, FCLM

Chair, U.S. Steering Committee for the Treat-to-Target Rheumatoid Arthritis Initiative Member, Treat-to-Target International Steering Committee Special Consultant, Center for Drug Evaluation and Research, Arthritis Division, U.S. Food and Drug Administration

Mary B. Goldring, PhD

Member-at-Large, Board of Directors, Osteoarthritis Research Society International Third Vice President, Presidential Line, Orthopaedic Research Society

Steven R. Goldring, MD

Member, Organizing Committee, Annual Sun Valley Workshop in Musculoskeletal Biology Member, Organizing Committee, Third Annual Osteoimmunology Meeting, Santorini, Greece

Jessica K. Gordon, MD

Medical and Scientific Advisory Board, Scleroderma Foundation, Tri State Chapter

Michael D. Lockshin, MD, MACR

Co-Chair, Antiphospholipid Syndrome Clinical Research Task Force International Summit, Miami, Florida

Theresa T. Lu, MD, PhD

Charter Member, Study Section, National Institutes of Health Atherosclerosis and Inflammation of the Cardiovascular System

C. Ronald MacKenzie, MD

Chair, Ethics and Conflict of Interest Committee, American College of Rheumatology

Carol A. Mancuso, MD, FACP

Reviewer, Study Sections, Special Emphasis Panel, Clinical Trial Pilot Studies, and Research Dissemination and Implementation, National Institutes of Health/ National Heart, Lung and Blood Institute

Stephen A. Paget, MD, FACP, MACR

Member, Rheumatology Subspecialty Board, American Board of Internal Medicine

Robert F. Spiera, MD

Member, Medical Advisory Board, Grant Reviewer Scientific Advisory Board, Vasculitis Foundation Chairman, Medical Advisory Board; Member, Medical and Scientific Advisory Board, Scleroderma Foundation, Tri-State Chapter President and Member, Executive Committee, New York Rheumatism Association Member, Annual Meeting Planning Committee; Abstract Selection Committee, Vasculitis, American College of Rheumatology

EDITORIAL APPOINTMENTS

Mary K. Crow, MD

Associate Editor, *Annals of the Rheumatic Diseases* Editorial Board, *Arthritis Research and Therapy*

Doruk Erkan, MD, MPH

Editorial Board, *HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*

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2010-2011 NOTABLE ACHIEVEMENTS

EDITORIAL APPOINTMENTS *(continued)*

Theodore R. Fields, MD, FACP

Advisory Editor, *Arthritis & Rheumatism*

Reviewer: *Arthritis & Rheumatism; Arthritis Care & Research; HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*

Allan Gibofsky, MD, JD, DACP, FCLM

Reviewer: *Annals of the Rheumatic Diseases; Journal of Rheumatology*

Mary B. Goldring, PhD

Co-Editor, *Arthritis & Rheumatism*

Associate Editor; *Arthritis Research & Therapy; Journal of Cellular Physiology; Biochimica et Biophysica Acta: Molecular Basis of Disease*

Editorial Board: *Journal of Orthopaedic Research; Osteoarthritis and Cartilage*

U.S. Section Head, *Cartilage Biology & Osteoarthritis*:
Faculty of 1000 – Medicine, Rheumatology & Clinical Immunology

Theresa T. Lu, MD, PhD

Review Editorial Board, *Frontiers in Antigen Presenting Cell Biology*

C. Ronald MacKenzie, MD

Editorial Board, *Current Reviews in Musculoskeletal Medicine*
Deputy Editor, *HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*

Jane E. Salmon, MD

Associate Editor, *Annals of the Rheumatic Diseases*

Robert F. Spiera, MD

Editorial Board, *Rheumatology News*

Advisory Editor, *Arthritis & Rheumatism*

Ad Hoc Reviewer: *The American Journal of Medical Sciences; Arthritis and Rheumatism Clinical Immunology; Clinical Rheumatology; The Journal of Rheumatology; Mayo Clinic Proceedings; Arthritis Care & Research; Nature Clinical Practice Rheumatology; Annals of the Rheumatic Diseases*



PEER-REVIEWED JOURNALS

Akman HO, Davidzon G, Tanji K, Macdermott EJ, Larsen L, Davidson MM, Haller RG, Szczepaniak LS, Lehman TJ, Hirano M, DiMauro S. Neutral lipid storage disease with sub-clinical myopathy due to a retrotransposal insertion in the PNPLA2 gene. *Neuromuscular Disorders*. 2010 Jun;20(6):397-402.

Alpert DR, Salmon JE. False-positive tests for heparin-induced thrombocytopenia in patients with antiphospholipid syndrome and systemic lupus erythematosus: a rebuttal. *Journal of Thrombosis and Haemostasis*. 2010 Jun;8(6):1439-4.

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Barbhaiya M, Erkan D. Primary thrombosis prophylaxis in antiphospholipid antibody patients: where do we stand? *Current Rheumatology Reports*. 2011 Feb;13(1):59-69.

Bass AR, Mattern CJ, Voos JE, Peterson MGE, Trost D. Inferior vena cava (IVC) filter placement in patients undergoing orthopedic surgery. *The American Journal of Orthopedics*. 2010 Sep;39(9):435-9.

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Bernstein EJ, Kay J, Gibofsky A. Treating rheumatoid arthritis to target: an international initiative. *Current Reviews in Musculoskeletal Medicine*. 2011 Jul 5. [Epub ahead of print]

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Branch W; Obstetric Task Force. Report of the Obstetric APS Task Force: 13th International Congress on Antiphospholipid Antibodies, 13th April 2010. *Lupus*. 2011 Feb;20(2):158-64.

Brandl K, Sun L, Nepl C, Siggs OM, Le Gall SM, Tomisato W, Li X, Du X, Maennel DN, Blobel CP, Beutler B. MyD88 signaling in nonhematopoietic cells protects mice against induced colitis by regulating specific EGF receptor ligands. *Proceedings of the National Academy of Sciences USA*. 2010 Nov 16;107(46):19967-72.

Burmester GR, Lipsky PE, Dörner T; Kitasato Meeting Faculty. Kitasato Symposium 2010: new prospects for cytokines. *Arthritis Research & Therapy*. 2010;12(6):301.

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Cervera R, Tekdonidou MG, Espinosa G, Cabral AR, Gonzalez EB, Erkan D, Vadya S, Adroque HE, Solomon M, Zandman-Goddard G, Shoenfeld Y. Catastrophic APS, APS nephropathy, and heart valve lesions: catastrophic APS and non-criteria APS Manifestations Task Force Report (I). *Lupus*. 2011 Feb;20(2):165-73.

Cervera R, Tekdonidou MG, Espinosa G, Cabral AR, Gonzalez EB, Erkan D, Vadya S, Adroque HE, Solomon M, Zandman-Goddard G, Shoenfeld Y. Task force on catastrophic antiphospholipid syndrome (APS) and non-criteria APS manifestations (II): thrombocytopenia and skin manifestations. *Lupus*. 2011 Feb;20(2):174-81.

Chakravarty SD, Yee AF, Paget SA. Rituximab successfully treats refractory chronic autoimmune urticaria caused by IgE receptor autoantibodies. *Journal of Allergy and Clinical Immunology*. 2011. In press.

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Chen J, Ivashkiv LB. IFN- γ abrogates endotoxin tolerance by facilitating toll-like receptor-induced chromatin remodeling. *Proceedings of the National Academy of Sciences USA*. 2010 Nov 9;107(45):19438-43.

(continued on page 32)

PEER-REVIEWED JOURNALS (continued)

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- Chyou S, Benahmed F, Lu TT. Coordinated regulation of lymph node vascular-stromal growth first by CD11c+ cells and then by T and/or B cells. *Journal of Immunology*. 2011. In press.
- Claassen H, Schicht M, Brandt J, Reuse K, Schädlich R, Goldring MB, Guddat SS, Thate A, Paulsen F. C-28/I2 and T/C-28a2 chondrocytes as well as human primary articular chondrocytes express sex hormone and insulin receptors – Useful cells in study of cartilage metabolism. *Annals of Anatomy*. 2011 Feb 20;193(1):23-9.
- Clowse M, Copland S, Hsieh TC, Chow Sc, Hoffman G, Merkel P, Spiera RF, Davis J, McCune J, Ytterberg S, Specks U, Stone J, WGET Research. Oral cyclophosphamide therapy diminishes ovarian reserve in women with Wegener's granulomatosis. *Arthritis & Rheumatism*. 2011. In press.
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- Coughlan TC, Crawford A, Goldring MB, Hatton PV, Barker MD. Lentiviral shRNA knock-down of ADAMTS-5 and -9 restores matrix deposition in 3D chondrocyte culture. *Journal of Tissue Engineering and Regenerative Medicine*. 2010 Dec;4(8):611-8.
- Crotti TN, O'Sullivan RP, Shen Z, Flannery MR, Fajardo RJ, Ross FP, Goldring SR, McHugh KP. Bone matrix regulates osteoclast differentiation and annexin A8 gene expression. *Journal of Cellular Physiology*. 2011 Feb 22. [Epub ahead of print]
- Crow MK. Interferon-alpha: a therapeutic target in systemic lupus erythematosus. *Rheumatic Disease Clinics of North America*. 2010 Feb;36(1):173-86.
- Crow MK. Type I interferon in organ-targeted autoimmune and inflammatory diseases. *Arthritis Research & Therapy*. 2010 12 (Suppl 1):S5.
- Day M, Nam D, Goodman SM, Su E, Figgie M. Psoriatic arthritis: a review. *Journal of the American Academy of Orthopaedic Surgeons*. 2011. In press.
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- Douglas EJ, Nestor BJ, Sculco TP, Ivashkiv LB, Goldring SR, Purdue PE. Cross-talk between phagocytic and osteoclastogenic pathways in the determination of cell fate in granulomatous inflammation. *The Journal of Immunology*. 2010 Jul 15;185(2):1265-73. [Epub ahead of print]
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- Erkan D, Barbhaiya M, George D, Sammaritano LR, Lockshin MD. Moderate versus high-titer persistently anticardiolipin antibody positive patients: are they clinically different and does high-titer anti-beta 2-glycoprotein-I antibody positivity offer additional predictive information? *Lupus*. 2010 Apr;19(5):613-9.
- Erkan D, Derksen R, Levy R, Machin S, Ortel T, Pierangeli S, Roubey R, Lockshin MD. Antiphospholipid syndrome clinical research task force report. *Lupus*. 2010 Feb;20(2): 219-24.
- Erkan D, Espinosa G, Cervera R. Catastrophic antiphospholipid syndrome: updated diagnostic algorithms. *Autoimmunity Reviews*. 2010 Dec;10(2):74-9.
- Erkan D, Kozora E, Lockshin MD. Cognitive dysfunction and white matter abnormalities in antiphospholipid syndrome. *Pathophysiology*. 2011 Feb;18(1):93-102
- Erkan D, Lockshin MD. Non-criteria manifestations of antiphospholipid syndrome. *Lupus*. 2010 Apr;19(4):424-7.
- Evans SF, Irmady K, Ostrow K, Kim T, Nykjaer A, Saftig P, Blobel CP, Hempstead BL. Neuronal brain-derived neurotrophic factor is synthesized in excess, with levels regulated by sortilin-mediated trafficking and lysosomal degradation. *The Journal of Biological Chemistry*. 2011 Aug 26;286(34):29556-67.
- Finnson KW, Parker WL, Chi Y, Hoemann CD, Goldring MB, Antoniou J, Philip A. Endoglin differentially regulates TGF- β -induced Smad2/3 and Smad1/5 signalling and its expression correlates with extracellular matrix production and cellular differentiation state in human chondrocytes. *Osteoarthritis and Cartilage*. 2010 Nov;18(11):1518-27.

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- Foldi J, Chung AY, Xu H, Zhu J, Outtz HH, Kitajewski J, Li Y, Hu X, Ivashkiv LB. Autoamplification of Notch signaling in macrophages by TLR-induced and RBP-J-dependent induction of Jagged1. *The Journal of Immunology*. 2010 Nov 1;185(9):5023-31.
- Friedewald VE, Ganz P, Kremer JM, Mease PJ, O'Dell JR, Pearson TA, Ram CV, Ridker PM, Salmon JE, Roberts WC. AJC editor's consensus: rheumatoid arthritis and atherosclerotic cardiovascular disease. *American Journal of Cardiology*. 2010 Aug 1;106(3):442-7.
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DIVISION OF RHEUMATOLOGY 2010-2011

The 2010-2011 Annual Report of the Division of Rheumatology is produced by Education and Academic Affairs of Hospital for Special Surgery.

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