2016 Update: Division of Rheumatology and Immunology
It’s been a productive and satisfying year in the Division of Rheumatology and Immunology here at The Ohio State University. Like so many of you, we’ve kept busy — and fulfilled — by our roles as physicians, scientists and faculty. But in 2015 we stretched ourselves even further. We created new programs, pushed forward with thought-provoking research and represented Ohio State around the globe at a variety of meetings and conferences.

Throughout this publication you will find examples that illustrate what a prolific team I have the privilege of working with each day. You'll read about our multidisciplinary scleroderma clinic that launched in July 2015. Located at The Ohio State University Wexner Medical Center and led by Ali Ajam, MBBS, the program has already created value for our scleroderma patients who can now receive streamlined, comprehensive care with fewer trips back-and-forth to our campus.

You’ll also learn more about the research activities of faculty members who received funding in 2015:

- The NIH renewed Dr. Michael Ostrowski’s R01 grant to study osteoclast differentiation and regulation, allowing him to shift his focus from mouse models to human cells.
- Jian Zhang, MD, and Wael Jarjour, MD, in an effort to study the role of T follicular helper cells in lupus, received more than half a million dollars from The Alliance for Lupus Research to continue our research. Our goal is to identify novel therapeutic targets.
- Matthew Husa, MD, received the Davis Bremer award to study the role of aging and the immune system on osteoarthritis progression.
- Nicholas Young, PhD, was awarded a pilot grant by the OSU Center for Integrative Health and Wellness to continue examining whether moderate exercise and stress reduction can suppress the inflammatory response in people with lupus.

In addition, we have been engaged in many other notable activities and accomplishments worth highlighting:

- Members of our division gave multiple presentations at the 16th Annual European Congress of Rheumatology - European League Against Rheumatism (EULAR) meeting in Rome, and the American College of Rheumatology national meeting in San Francisco.
- Several colleagues and I presented at the Federation of Clinical Immunology Societies (FOCIS) 2015 annual meeting in San Diego. In fact, Dr. Nicholas Young presented his research related to the regulation of a critical inflammatory pathway in lupus during “The Best of Rheumatology 2015” thematic session.

Back on Buckeye soil, we hosted the seventh annual “Clinical Applications of Musculoskeletal Ultrasound” conference in August. Led by Hareth Madhoun, DO, this popular national event once again provided accredited coursework and hands-on training.

Stacy Ardoin, MD, was named the 2015 Jingle Bell Run Medical Honoree by the Central Ohio chapter of the Arthritis Foundation. The annual Jingle Bell 5K Run/Walk takes place in nearly 100 cities across the U.S. and raises money for arthritis research. Dr. Ardoin was recognized for her ongoing involvement with the Arthritis Foundation’s educational and fundraising efforts, as well as her efforts to improve arthritis care for children and adults.

Last, but certainly not least, we welcomed new faculty and fellows this year:

- Sheryl Mascarenhas, MD, completed her rheumatology fellowship training here at Ohio State in 2013 and joined the division in June 2015. She has hit the ground running seeing patients, teaching, and performing musculoskeletal ultrasounds.
- We also were pleased to retain two fellows who chose to stay at OSU for a third year of training. Dr. Alexa Meara will spend the third year of her fellowship focusing on vasculitis, health literacy, numeracy and patient activation. Dr. Brian Lamoreaux will devote his time to scleroderma and pursuing a Master of Medical Science degree.

Thank you for allowing me to share our 2015 achievements. I work with an all-star team and am constantly impressed and humbled by their efforts. As always, I encourage you to send me your comments or questions by e-mailing me at Wael.Jarjour@osumc.edu.
Pioneering Research into Osteoclast Regulation Ready for Testing in Human Cells

More than 20 years’ worth of discoveries from mouse models will soon shift to human cells. Ohio State’s Michael Ostrowski, PhD, along with Sudarshana Sharma, PhD, begins the next phase of osteoclast gene expression and function research — which may pave the way for new targeted therapies for people with rheumatoid arthritis, osteoporosis, and other disorders that affect bone and joints.

Dr. Ostrowski is professor and vice chair of the Department of Molecular Virology, Immunology and Medical Genetics at The Ohio State University College of Medicine. His continued work, in collaboration with Wael Jarjour, MD, director of Ohio State’s Division of Rheumatology and Immunology, is enabled by the renewal of an R01 grant he received in February 2015.

New Revelations about Transcription Factors

A basic scientist with a special interest in signaling pathways and how they affect cell differentiation, Dr. Ostrowski began studying osteoclast differentiation — including the effects of over-differentiation and subsequent bone destruction — in 1998. Since then his efforts have been aided by four R01 grant renewals, the application of molecular biology, mouse genetic models, and a venture into the field of functional genomics with Dr. Sharma. Together, they and the rest of their team have made several important discoveries related to transcription factors and their impact on osteoclast formation and regulation.

Dr. Ostrowski explains that osteoclasts are one of several types of cells that have different functions, even though they come from the same precursor. For example, osteoclasts, which are critical for development and maintenance of bone, and macrophages, which are special warrior cells that kill viruses and other invaders, both derive from the myeloid cell lineage.

“We wanted to understand how a cell decides to become an osteoclast versus a macrophage, and along the way have learned much about the role of transcription factors in cell differentiation,” says Dr. Ostrowski. “Our work has revealed there are two transcription factors necessary for creating osteoclasts, called PU.1 and MITF. We believe PU.1 is the master regulator of myeloid cell lineage. When it partners with MITF, they turn on the gene responsible for osteoclast differentiation. The osteoclast then receives signals from the local microenvironment that help regulate its form and function.”

The Next Milestone: Human Osteoclasts

While he has gained important insights through his animal model work, Dr. Ostrowski says he must next test his hypotheses using osteoclasts and circulating osteoclast precursors found in human blood. Together with Dr. Jarjour, Dr. Ostrowski and Dr. Sharma, the team will extend their studies into human cell cultures acquired from patients who have rheumatoid arthritis.

“While our current work is preclinical, after completion of this new grant we may be ready to move into clinical trials,” says Dr. Ostrowski. “Our long term goal, in addition to understanding how osteoclasts are regulated and why dysfunction occurs, is to develop targeted therapies that prevent inappropriate osteoclast differentiation from happening in the first place.”
Ohio State Rheumatologist’s a National Leader in Patient Advocacy

It’s been a busy but fulfilling year for Stacy Ardoin, MD, MHS, who volunteers her time to promote awareness of pediatric rheumatic diseases and support efforts to increase the number of medical students entering the field of rheumatology.

Dr. Ardoin has dual roles as associate professor in Ohio State’s Division of Rheumatology and Immunology and associate professor in pediatric rheumatology. She also participates in research and teaching activities. In 2015, Dr. Ardoin took on four new volunteer positions with local and nationally affiliated medical organizations:

- As part of her three-year term as chair of the Special Committee on Pediatric Rheumatology for the American College of Rheumatology (ACR), Dr. Ardoin helps address issues unique to childhood onset rheumatic conditions. She’s also helping the ACR with its efforts to combat the nation’s shortage of pediatric rheumatologists and the resulting impact on access to care.

- Dr. Ardoin works toward bridging the gap between pediatric and adult care in her role as chair of the Transition Task Force for the ACR. The task force is part of a national effort, led by the American College of Physicians, to create best practices for transitioning children from pediatric to adult specialty care. Dr. Ardoin is helping the ACR develop a toolkit for rheumatology providers. Resources may include policies for transitioning youth, guidelines for assessing a patient’s readiness to transition, and recommendations for adult rheumatologists who are transitioning young adults into their practices.

- At the local level, Dr. Ardoin was appointed to the board of the Arthritis Foundation, Central Ohio Chapter, an organization she has been involved with for several years. As a board member, Dr. Ardoin will continue to help with local advocacy and fundraising for people with arthritis.

Patient Care

Multidisciplinary Scleroderma Clinic Simplifies Care for Patients

A new clinic designed to meet the unique needs of the scleroderma population is already improving access to and coordination of care for patients at The Ohio State University Wexner Medical Center.

Launched in July 2015, the multidisciplinary clinic houses rheumatology and pulmonology in a shared space, offering a convenient one-stop experience for scleroderma patients who often require visits with multiple specialists. Patients can have procedures such as lung function tests and echocardiograms on the same day as their physician appointment. The program also streamlines referrals to gastroenterologists, vascular medicine physicians and other specialists. In addition, patients benefit from access to emerging therapies through clinical trials.

Ali Ajam, MBBS, assistant professor in the Division of Rheumatology and Immunology, together with Namita Sood, MD, associate professor in the Division of Pulmonary, Allergy, Critical Care and Sleep Medicine, developed and jointly run the new clinic.

“Most primary care physicians are not familiar enough with scleroderma to manage it, so they typically refer their patients to specialists,” says Dr. Ajam. “Because it’s an uncommon condition that can affect so many different organs, it’s important for patients to seek care from specialists who have extensive knowledge and experience. While Ohio State has such specialists on staff, we realized we could provide even more value to our patients by creating a clinic that gets them in quicker and reduces the number of trips back and forth to our campus.”

Dr. Ajam notes that with so few scleroderma centers in the U.S., patients may travel out of state to find the care they need. Some patients in the Midwest may reduce travel and other expenses, now that a new multidisciplinary clinic has opened closer to their home.

“Even though the clinic has been open less than a year, we’re already finding that the model works,” says Dr. Ajam. “Patients love having the ability to receive all of their services under one roof, but perhaps more importantly this model allows us to really focus on the needs of the scleroderma population. It’s making our relationship with our patients that much stronger.”
• Dr. Ardoin also was appointed chair of the Lupus Committee for the Childhood Arthritis and Rheumatology Research Alliance (CARRA), the main research organization for pediatric rheumatology in North America. For the remainder of her three-year term, she will help guide CARRA’s pediatric lupus research activities.

Dr. Ardoin, who is board certified in both adult and pediatric rheumatology, says she finds meaning in doing whatever she can, through research and advocacy, to enhance understanding of pediatric rheumatic diseases and to help ensure patients can find proper care.

“Pediatric rheumatology diseases often don’t get the awareness and funding they deserve,” she says. “My involvement with each of these boards and committees helps me be a stronger advocate for my patients.”

Ohio State’s Lupus Clinic

Back Left to Right: Hareth Madhoun, DO, Stacy Ardoin, MD, Lee A. Hebert, MD, Samir Parikh, MD. Front Left to Right: Anthony Alvarado, MD, Wael Jarjour, MD, Brad Rovin, MD. Isabelle Ayoub, MD is not pictured.

Ohio State Researcher Aims to Link Age and Systemic Inflammation with Osteoarthritis Progression

Findings could lead to new strategies for diagnosing and treating OA

Matthew Husa, MD, is one step closer to determining who among us will get osteoarthritis (OA) and why.

Dr. Husa, assistant professor of medicine in the Division of Rheumatology and Immunology, is a recipient of a 2015 William H. Davis Endowment for Basic Medical Research and Richard P. and Marie R. Bremer Medical Research Fund Pilot Award. Three $50,000 grants are given annually to physician scientists at The Ohio State University College of Medicine. The funding will help him generate preliminary data related to age-induced inflammation and its impact on OA progression, which will lay the groundwork for future grant submissions.

A Growing Health Crisis in an Aging Population

Often labeled as a localized, “wear-and-tear” disease with few treatment options outside of joint replacement, osteoarthritis poses significant challenges for patients and the physicians treating them. The painful disease affects roughly 30 million people in the U.S. today – and currently there are no disease-modifying treatments that can alter its progression.

“One of my research goals is to better define clinical phenotypes of OA, and learn how each phenotype responds to medical management,” says Dr. Husa.

“We know there are differences in the severity, incidence and prevalence of OA among both genders and among races. If we can classify OA patients by specific disease attributes, such as age or obesity, we may be able to offer more individualized treatment, possibly delaying OA progression and ultimately leading to better clinical outcomes.”

Dr. Husa explains that age, a primary risk factor for OA, is also associated with chronic systemic inflammation. However, the data is limited on how an aging immune system and related inflammation affect OA development.

A Two-Pronged Approach

Aided by the Davis Bremer award, Dr. Husa and his team plan to test their theory that systemic inflammation caused by aging enhances progression of OA, even in unaffected knees.

After conducting a series of experiments using mouse models, they’ll attempt to validate their findings in the human population – and eventually determine, among other things, whether blocking age-induced inflammation will slow the progression of age-related OA.

Profound Implications

“If we can confirm that an aging immune system is involved in OA progression, we may be able to develop new diagnostic or therapeutic approaches,” says Dr. Husa. “The epidemiological impact would be monumental.”
After results in mouse models suggested that moderate exercise or stress reduction may be potent means to control the chronic inflammation associated with lupus, Nicholas Young, PhD, is translating his findings to the clinic.

Dr. Young is a research scientist in the Division of Rheumatology and Immunology at The Ohio State University’s Wexner Medical Center, and works in a laboratory led by Wael Jarjour, MD, director of the division. His study will enroll up to 30 patients in a Tai Chi class and track their progress over six months to determine whether inflammatory activity is suppressed. This next phase of research is funded by a pilot grant from Ohio State’s Center for Integrative Health and Wellness and an award from the Rheumatology Research Foundation.

In his previous work, Dr. Young studied the effects of exercise and social stress using mice that spontaneously develop lupus nephritis. He and his team, including Saba Aqel and Jeffrey Hampton, found there was a clear difference in the amount of inflammation and kidney damage in mice that were exercised daily compared to the mice that did not exercise.

Simultaneously, Dr. Young, in collaboration with John Sheridan, PhD, from Ohio State’s Institute for Behavioral Medicine Research, and Nicole Powell, PhD of Ohio Dominican University, examined the effects of social stress on lupus progression in an animal model. Compared to the control pool, the mice who experienced social stress developed significantly higher blood urea nitrogen levels and renal inflammation.

In applying these findings to people, Dr. Young says he chose Tai Chi because it is a form of moderate exercise that also incorporates stress reduction techniques including deep breathing and meditation. With the help of fellow laboratory members Giancarlo Valiente and Holly Steigelman, he will begin recruiting lupus patients once the study is approved by Ohio State’s Institutional Review Board.

“This is just the beginning of research that could have far-reaching potential,” says Dr. Young. “Even though we’re starting with a small number of patients, our goal is to generate pilot data to be able to create a strong NIH grant submission that allows us to continue the study on a much larger scale.”

Dr. Young adds that in exploring the molecular mechanisms by which exercise and social stress are involved in suppressing the inflammatory response, including the impact on pro-inflammatory cytokine levels, it may be possible to determine precisely how and why they are effective. This could allow physicians to prescribe specific exercise and/or stress management regimens for patients with autoimmune disorders to follow along with their current pharmaceutical therapy.
Continuing Medical Education Annual Conference: Clinical Applications of Musculoskeletal Ultrasound

Hareth Madhoun, DO, will lead a two-day, intensive workshop in spring of 2017 featuring experts in musculoskeletal ultrasound from academic medical centers across the country.

The workshop features:

• Presentations on ultrasound scanning techniques, normal extremity anatomy and common pathology in inflammatory arthritis
• More than 10 hours of hands-on training in small groups, including learning ultrasound-guided injections on cadavers
• The current approach for incorporating the role and use of musculoskeletal ultrasound in the care of patients with inflammatory arthritis
• Training to recognize on ultrasound the common pathologies of the musculoskeletal system

Registration will open in early 2017. For information or to register, please visit ccme.osu.edu. You can also visit our website at internalmedicine.osu.edu/rheumatology.
A selection of journal articles from the impressive list of publications authored or co-authored by our faculty:


