

Fellows' Research Opportunities: Rheumatology

| Title/Topic | Details | Researcher |
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| <p>Multiple clinical trials focused on management of osteoarthritis, particularly behavioral interventions, rehabilitation programs and care models.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Opportunities for secondary data analyses of clinical trials of osteoarthritis management.</p> | <p>Name: Kelli Allen, PhD Title: Professor of Medicine</p> <p>Research Interests: Improving care and outcomes for individuals with musculoskeletal and rheumatological conditions, with an emphasis on health disparities.</p> <p>Contact: kdallen@email.unc.edu Link to Dr. Allen's Research</p> |
| <p>Geriatric Data Analysis [multiple projects]</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: We have a number of analyses using large secondary datasets that focus on body composition, frailty, and physical and cognitive function. There are opportunities in designing study questions and authorship.</p> | <p>Name: John Batsis, MD Title: Associate Professor of Geriatric Medicine & Nutrition</p> <p>Research Interests: Obesity and physical function in older adults; using technology such as telemedicine and remote monitoring to enhance health in older adults.</p> <p>Contact: john.batsis@unc.edu Link to Dr. Batsis' Research</p> |
| <p>Weight-loss and Exercise for Communities with Arthritis in North Carolina (WE-CAN)</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: This study is a pragmatic RCT testing the efficacy of intensive diet and exercise on knee pain in overweight and obese adults with knee OA. Extensive baseline and longitudinal data are available for secondary data analyses.</p> | <p>Name: Leigh Callahan, PhD Title: Mary Link Briggs Distinguished Professor of Medicine; Associate Director, Thurston Arthritis Research Center; Director, Osteoarthritis Action Alliance</p> <p>Research Interests: Physical activity and behavioral interventions, health disparities and social determinants of health, health literacy, arthritis mortality and outcomes research.</p> <p>Contact: leigh_callahan@med.unc.edu Dr. Callahan's Research</p> |

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| <p>The Consortium for the Longitudinal Evaluation of African-Americans with Early Rheumatoid Arthritis (CLEAR).</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Established in 2000 to provide a resource for the scientific community to explore genetic and non-genetic factors affecting rheumatoid arthritis (RA) occurrence, and outcomes in African Americans. The long term objective is a database and a repository of 1,100 RA and 550 matched healthy African-American subjects.</p> | <p>Name: Rebecca Cleveland, PhD Title: Assistant Professor of Medicine</p> <p>Research Interests: Osteoarthritis epidemiology, including physical activity in people with OA as well as mortality outcomes associated with OA and related comorbidities. Also, physical activity, OA-related disability & sociodemographic predictors of OA.</p> <p>Contact: becki@unc.edu Link to Dr. Cleveland's Research</p> |
| <p>Role of DNA damage and cellular senescence in osteoarthritis pathophysiology.</p> | <p>Research Category: Basic & Translational</p> <p>Project Summary: Chondrocytes accumulate DNA damage during aging, and understanding how this predisposes cells to become senescent may catalyze more effective treatments for OA.</p> | <p>Name: Brian Diekman, PhD Title: Assistant Professor of Biomedical Engineering</p> <p>Research Interests: The mechanisms by which aging and genetics contribute to osteoarthritis risk and how regenerative medicine technologies may lead to novel treatment strategies.</p> <p>Contact: bdiekman@email.unc.edu Dr. Diekman's Lab</p> |
| <p>Associations between quadriceps muscle mechanics, knee joint loading, and cartilage contact forces.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: We are evaluating how quadriceps muscles accommodate changes in biomechanics commonplace after ACL reconstruction and the resulting influence on cartilage loading relevant to osteoarthritis.</p> | <p>Name: Jason Franz, PhD Title: Associate Professor of Biomedical Engineering</p> <p>Research Interests: Neuromuscular biomechanics, sensorimotor control, aging and age-related mobility impairment.</p> |
| <p>Pain-mediated effects of quadriceps muscle dysfunction on inflammation and cartilage loading.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: We are investigating a potential mechanistic pathway in which quadriceps muscle weakness and knee pain contribute to systemic inflammation and altered cartilage loading.</p> | <p>Contact: jrf Franz@email.unc.edu Link to Dr. Franz's Lab</p> |

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| <p>Identifying low literacy in the rheumatology clinic.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: This project will identify how many of the pts being seen in the UNC rheumatology clinic have low literacy and compare that to how frequently physicians correctly identify pts with low literacy. Will use results to provide resources to better identify pts with low literacy who are at risk for poor outcomes and strategies to overcome literacy barriers.</p> | <p>Name: Abigail Gilbert, MD Title: Assistant Professor of Medicine</p> <p>Research Interests: The many benefits of physical activity and exercise in individuals with arthritis, and ways to help individuals become more physically active.</p> |
| <p>Optimizing ANA ordering.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: This project will work with the immunology lab to evaluate current ANA orders/results, revise ANA order to request additional info from ordering physician or midlevel (e.g. order indication, suspected disease, etc) and provide additional info on results interpretation (eg frequency of different ANA levels). Will evaluate if decreases number of ANA tests ordered and referrals to rheum for pos ANA without suspected rheum disease.</p> | <p>Contact: abigail.gilbert@unc.edu Dr. Gilbert's Focus Areas</p> |
| <p>Chemotherapy effect on irAE and cancer outcomes.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Assessing irAEs and cancer outcomes in patients receiving ICI with/without use of concurrent chemotherapy.</p> | <p>Name: Rumey Ishizawar, MD Title: Assistant Professor of Medicine</p> |
| <p>Clinical use of CDAI for treat to target in RA patients.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Optimizing CDAI use in RA patients to enhance patient management and disease outcome.</p> | <p>Research Interest: Retrospective and prospective studies examining immune related adverse events (irAEs) in oncology patients receiving immune checkpoint inhibitors (ICIs), to better understand the mechanisms of autoimmunity versus tolerance in the immune system, especially the pathogenesis of rare autoimmune conditions.</p> |
| <p>COVID Rheum-Onc Database (ROD) – Vaccination rate.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Assessing COVID-19 vaccination rate in UNC Rheum Patients.</p> | <p>Contact: rumey_ishizawar@med.unc.edu Dr. Ishizawar's Research</p> |

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| COVID ROD – Outcomes. | Research Category: Clinical & Epidemiological Project Summary: Assessing for rheumatology and COVID outcomes in UNC Rheum patients with/without vaccine. | <p>Name: Rumey Ishizawar, MD Title: Assistant Professor of Medicine</p> <p>Research Interest: Retrospective and prospective studies examining immune related adverse events (irAEs) in oncology patients receiving immune checkpoint inhibitors (ICIs), to better understand the mechanisms of autoimmunity versus tolerance in the immune system, especially the pathogenesis of rare autoimmune conditions.</p> <p>Contact: rumey_ishizawar@med.unc.edu Dr. Ishizawar's Research</p> |
| COVID ROD – Vaccination hesitancy. | Research Category: Clinical & Epidemiological Project Summary: Addressing COVID-19 vaccination hesitancy in UNC Rheum Patients. | |
| Disparities in Access to ICI therapy in NC. | Research Category: Clinical & Epidemiological Project Summary: Assessing disparities in access to ICI therapy in NC (vs other cancer therapy). | |
| Disparities in Cancer Outcomes from use of ICI therapy in NC. | Research Category: Clinical & Epidemiological Project Summary: Assessing disparities in cancer outcomes for patients receiving ICI therapy in NC (vs other cancer therapy). | |
| DMARD effect on irAE and cancer outcomes. | Research Category: Clinical & Epidemiological Project Summary: Assessing irAE events and cancer outcomes with use of DMARD therapy in patients with underlying autoimmune conditions. | |
| IOG Prospective Database QI. | Research Category: Clinical & Epidemiological Project Summary: Utilizing demographic data from screening to develop QI project for optimizing study enrollment. | |
| irAEs in patients with underlying autoimmune conditions. | Research Category: Clinical & Epidemiological Project Summary: Expand and reassess for irAEs in patients with preexisting autoimmune diagnoses. | |

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| <p>Piedmont Health Service – Addressing patient barriers.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Addressing barriers to access for rural patients with autoimmune and rheumatic diseases.</p> | <p>Name: Rumey Ishizawar, MD Title: Assistant Professor of Medicine</p> <p>Research Interest: Retrospective and prospective studies examining immune related adverse events (irAEs) in oncology patients receiving immune checkpoint inhibitors (ICIs), to better understand the mechanisms of autoimmunity versus tolerance in the immune system, especially the pathogenesis of rare autoimmune conditions.</p> <p>Contact: rumey_ishizawar@med.unc.edu Dr. Ishizawar's Research</p> |
| <p>Piedmont Health Service – Expanding provider access.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Engaging community providers in managing patients with autoimmune conditions with barriers to access.</p> | |
| <p>Evaluation of mechanistic role of artemin/GFRα3 signaling in osteoarthritis pain.</p> | <p>Research Category: Basic & Translational Project Summary: Using mouse models of OA, canine tissues, and later naturally occurring OA in pet dogs, this project will determine the role of the artemin/GFRα3 signaling axis in OA pain, and elucidate details of the signaling system.</p> | <p>Name: B. Duncan Lascelles, BVSc, PhD, FRCVS Title: Professor of Translational Pain Research, NCSU</p> <p>Research Interest: Neurobiology, pharmacology, regenerative medicine.</p> <p>Contact: dxlscl@ncsu.edu Dr. Lascelles' Research</p> |
| <p>Is the gut important in multiple joint osteoarthritis? A multimodal investigation in humans and pet dogs.</p> | <p>Research Category: Basic & Translational Project Summary: Using the JoCo human population and a pet dog population, the association between gut barrier function and OA / MJOA will be determined.</p> | |
| <p>Validation of Novel Target for OA Treatment.</p> | <p>Research Category: Basic & Translational Project Summary: Using mouse models of OA and an induced model of OA in dogs, this project will ascertain the therapeutic potential of VEGF 1 & 2 blockade using pazopanib.</p> | |

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| <p>Effects of vitamin K on pain and function in knee OA.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Pilot study to determine the effects of vitamin K supplementation on vitamin K levels and pain and function in individuals with knee OA and vitamin K insufficiency.</p> | <p>Name: Richard Loeser, MD Title: Joseph P. Archie, Jr., Eminent Professor of Medicine; Director, Thurston Arthritis Research Center</p> <p>Research Interest: Mechanisms responsible for joint tissue destruction in osteoarthritis, including the role of aging and oxidative stress and cell signaling stimulated by matrix fragments acting through integrin receptors.</p> <p>Contact: richard_loeser@med.unc.edu Dr. Loeser's Lab</p> |
| <p>Small molecule discovery for disease modification in osteoarthritis.</p> | <p>Research Category: Basic & Translational Project Summary: Lab based study to screen and test small molecules that inhibit chondrocyte MMP-13 production in response to catabolic stimuli.</p> | |
| <p>Drug Delivery for OA therapeutic purposes.</p> | <p>Research Category: Basic & Translational Project Summary: Exploring different drug delivery methods for osteoarthritis (OA) therapy: 1) we are using folate-conjugated liposomes that are capable of being incorporated into macrophages and can be used as drug carriers to release a drug in inflamed tissues; 2) we also working on a different system to deliver nanoparticles loaded with different potential therapeutic molecules into the intra-articular space of osteoarthritic knees in different PTOA rodent models.</p> | <p>Name: Lara Longobardi, PhD Title: Assistant Professor of Medicine</p> <p>Research Interest: The mechanisms leading to osteoarthritis development, especially the role of chemokines in cartilage and bone generation after injury, and how they affect pain response.</p> <p>Contact: lara_longobardi@med.unc.edu Dr. Longobardi's Lab</p> |
| <p>Role of chemokines in osteoarthritis.</p> | <p>Research Category: Basic & Translational Project Summary: Exploring the role of different chemokines (CCLs/CCR2) and glycoproteins (such as fetuin-A) in osteoarthritis (OA), with a particular focus on post traumatic OA (PTOA). Our research focuses on in-vivo analyses of joint/bone degeneration, muscle strength and pain perception in surgical rodent models of OA.</p> | |

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| <p>Phenotyping and Precision Medicine.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: As part of the UNC CCCR, we have a Resource Core focused on novel methods including machine learning for identifying important patient subgroups in conjunction with expert statisticians, computer scientists, and other methodologists for a variety of rheumatic and musculoskeletal diseases.</p> | <p>Name: Amanda Nelson, MD, MSCR, RhMSUS Title: Associate Professor of Medicine</p> <p>Research Interest: A variety of aspects of osteoarthritis (OA), including the contribution of bone shape to OA risk, novel methodologies for analysis of large and complex datasets, ultrasound in OA, and assessment of whole-body burden of OA.</p> |
| <p>The Johnston County studies.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: These studies include a longitudinal cohort with 30 years of follow up and a currently recruiting cohort of younger and more diverse individuals. Both have a wealth of data around a variety of health conditions, medications, pain and function, physical activity, multiple joint radiographs, knee ultrasounds, biomarkers, socioeconomic status, and more.</p> | <p>Contact: anelson@med.unc.edu Dr. Nelson's Research</p> |

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| <p>University of North Carolina and Piedmont Health Collaborative Tele-Rheumatology Project to Optimize Rural Health Specialty Access.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Pilot to implement a telemedicine program for a rural and underserved largely Hispanic patient population to enhance access to rheumatology care and develop a rheumatology curriculum for rural care providers to enhance confidence in co-management of rheumatologic diseases.</p> | <p>Name: Alfredo Rivadeneira, MD Title: Professor of Medicine. Medical Director, UNC Therapeutic Infusion Center</p> <p>Research Interest: Pilot to implement a telemedicine program for a rural and underserved largely Hispanic patient population to enhance access to rheumatology care and develop a rheumatology curriculum for rural care providers to enhance confidence in co-management of rheumatologic diseases.</p> <p>Contact: alfredo_rivadeneira@med.unc.edu Dr. Rivadeneira's Research</p> |
| <p>Clinical Trials [multiple projects]</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Join a clinical trial as a sub-investigator and learn how a clinical trial is conducted (sub-specialty fellows only).</p> <ul style="list-style-type: none"> • Exploring New Treatments: Cutting edge clinical trials that test innovative therapies targeting specific molecular pathways in lupus and autoimmune disease. | <p>Name: Saira Sheikh, MD Titles: Linda Coley Sewell Distinguished Professor of Medicine; Associate Professor of Medicine; Director, UNC Rheumatology Lupus Clinic; Director, Clinical Trials Program at TARC; Vice-Chair, Lupus Clinical Investigators Network (LuCIN)</p> <p>Research Interests: As a dual trained rheumatologist and allergist/immunologist, Dr. Sheikh’s work focuses on answering scientific questions that directly impact the care of patients with complex immunologic diseases, such as Systemic Lupus Erythematosus and Sjogren’s syndrome. She is leading national initiatives to develop real-world, practical models to promote inclusion of racially and ethnically diverse participants in lupus clinical trials, particularly using technology-based applications.</p> <p>Contact: szsheikh@email.unc.edu Dr. Sheikh's Research</p> |

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| <p>Develop your own research project.</p> | <p>Research Category: Clinical & Epidemiological; Quality Improvement</p> <p>Project Summary: Use existing clinical databases and infrastructure to develop your own research project (undergraduate, medical students, residents, fellows).</p> <ul style="list-style-type: none"> • Diversity in Lupus Clinical Trials: Patients of racial and ethnic minorities are underrepresented in clinical trials. Projects focusing on promoting inclusion and diversity in lupus clinical trials. • Clinical Research Projects: Research questions that directly impact and enhance the care of patients' complex autoimmune diseases such as Lupus and Sjogren's. Our collaborative multidisciplinary research group, Chapel Hill Alliance Promoting Excellence in Lupus (CHAPEL), welcomes and provides oversight and mentorship of trainees at all levels for conducting research. | <p>Name: Saira Sheikh, MD</p> <p>Titles: Linda Coley Sewell Distinguished Professor of Medicine; Associate Professor of Medicine; Director, UNC Rheumatology Lupus Clinic; Director, Clinical Trials Program at TARC; Vice-Chair, Lupus Clinical Investigators Network (LuCIN)</p> <p>Research Interests: As a dual trained rheumatologist and allergist/immunologist, Dr. Sheikh's work focuses on answering scientific questions that directly impact the care of patients with complex immunologic diseases, such as Systemic Lupus Erythematosus and Sjogren's syndrome. She is leading national initiatives to develop real-world, practical models to promote inclusion of racially and ethnically diverse participants in lupus clinical trials, particularly using technology-based applications.</p> <p>Contact: szsheikh@email.unc.edu Dr. Sheikh's Research</p> |
| <p>Rehabilitation in Rheumatology.</p> | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: An ongoing line of research investigating how to optimize the use of rehabilitation (e.g. physical therapy, occupational therapy, tailored exercise guidance) for patients with rheumatic disease.</p> | <p>Name: Louise Thoma, PT, DPT, PhD</p> <p>Title: Assistant Professor - Dept. of Allied Health Sciences, Div. of Physical Therapy</p> <p>Research Interest: Improving long-term joint and general health after knee injury; Optimizing rehabilitation and recovery after orthopaedic injury and surgery; Physical activity assessment and intervention during rehabilitation; Using large data sets to understand the long-term consequences of orthopaedic injury on individuals, health systems, and society.</p> <p>Contact: louise_thoma@med.unc.edu Dr. Thoma's Research</p> |

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| <p>Mechanisms that drive active disease in SLE.</p> | <p>Research Category: Basic & Translational Project Summary: Translation study of lysosome dysfunction in lupus with a focus on potential therapeutics.</p> | <p>Name: Barbara Vilen, PhD Title: Professor - Dept. of Microbiology and Immunology, UNC School of Medicine</p> <p>Research Interest: Research focused on elucidating the mechanisms that regulate immune responses to self- and foreign-antigen, and to identify how these mechanisms are dysregulated in autoimmunity and autoimmune diseases, particularly systemic lupus erythematosus (SLE).</p> <p>Contact: barb_vilen@med.unc.edu Dr. Vilen's Research</p> |
| <p>Impact of osteoarthritis on pain and histological outcome measures.</p> | <p>Research Category: Basic & Translational Project Summary: Study investigates the relationship between pain and severity of osteoarthritis in rat pain model.</p> | <p>Name: Morika Williams, DVM, PhD Title: Assistant Professor, Dept. of Pathology and Laboratory Medicine; Clinical Veterinarian</p> <p>Research Interest: The mechanisms of neurobiology and neurophysiology of pain processing, neonatal pain, chronic pain, neurobehavior, osteoarthritis, translational medicine, anesthesia/analgesics, and evoked and non-evoked pain assessment tools.</p> |
| <p>Develop your own research project.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Use existing clinical databases and infrastructure to develop your own research project (undergraduate, medical students, residents, fellows)</p> | <p>Contact: morikaw@email.unc.edu Dr. Williams' Research</p> |

Fellows' Research Opportunities: Allergy & Immunology

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| <p>Asthma Registry for Kids (ARK).</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Longitudinal study of patients under 18 years old with history of wheezing or asthma.</p> | <p>Name: Allison Burbank, MD Title: Assistant Professor of Pediatrics</p> <p>Research Interest: The impact of environmental exposures on airway inflammatory responses, use of mobile health tools for improving asthma care in teenagers and young adults, and development of strategies for reducing asthma-related health disparities in under-served minority populations.</p> <p>Contact: allison_burbank@med.unc.edu Dr. Burbank's Research</p> |
| <p>Attack Asthma study.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Study of teenagers with poorly controlled asthma to measure inflammatory markers in the nose during asthma attacks.</p> | |
| <p>Alpha-gal Allergy Research [multiple projects]</p> | <p>Research Category: Basic & Translational Project Summary: Alpha-gal allergy: multiple clinical and basic science projects are ongoing and can be discussed.</p> | <p>Name: Scott Commins, MD, PhD Title: Associate Professor of Medicine & Pediatrics; Associate Chief for Allergy & Immunology; Medical Director, UNC Allergy & Immunology Clinic at Eastowne</p> <p>Research Interest: Alpha-gal syndrome (“red meat allergy”), food allergy, anaphylaxis, stinging insect venom allergy, tick-borne illnesses.</p> <p>Contact: scommins@email.unc.edu Dr. Commins' Research</p> |
| <p>EOE Chart Review</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Eosinophilic esophagitis: chart review of children and adults co-managed by GI and allergy who are on allergy shots.</p> | |
| <p>Real world CSU Epidemiology.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Retrospective EMR review of chronic urticaria health system usage, including referrals, labs, evaluation, and treatment.</p> | |

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| Asthma Registry for Kids (ARK). | <p>Research Category: Clinical & Epidemiological Project Summary: Longitudinal study of patients under 18 years old with history of wheezing or asthma.</p> | <p>Name: Michelle Hernandez, MD Title: Professor of Pediatric Allergy & Immunology; Director, NC Child Health Research Network;</p> <p>Research Interest: Asthma and the development of novel therapeutics for difficult-to-control asthma in children and teenagers, including effective interventions that can target environmentally induced inflammation to prevent disease in susceptible populations.</p> <p>Contact: Katie Mills – khmills@email.unc.edu Dr. Hernandez's Research</p> |
| Attack Asthma study. | <p>Research Category: Clinical & Epidemiological Project Summary: Study of teenagers with poorly controlled asthma to measure inflammatory markers in the nose during asthma attacks.</p> | |
| Smart and Connected Health. | <p>Research Category: Clinical & Epidemiological Project Summary: Study of teenagers with asthma to identify asthma-related physiological changes observed by wearable devices (e.g., heart rate (HR), heart rate variability (HRV), activity level, spirometry, coughing sounds) to find reliable signatures of impending asthma exacerbation.</p> | |
| Allergic effector cells (i.e. mast cells and basophils) in the treatment of food allergy. | <p>Research Category: Basic & Translational Project Summary: This project centers on the design of in vitro models of the effector phase of alpha-gal syndrome (the red meat / mammalian meat allergy) to dissect molecular pathways behind the effector phase in alpha-gal allergy and to screen potential inhibitors of this process.</p> | <p>Name: Onyinye Iweala, MD, PhD Title: Assistant Professor of Medicine; Director, Allergy Mast Cell Disorders Program</p> <p>Research Interest: Mechanisms of pathogenesis behind alpha-gal mammalian meat allergy, regulation of IgE antibody responses, mast-cell inhibition in the treatment of food allergy, the immunologic mechanisms behind alpha-gal mammalian meat allergy, the epigenetic regulation of allergic responses, and how cutaneous and gastrointestinal parasitic infestation impacts host immune responses.</p> <p>Contact: onyinye.iweala@med.unc.edu Dr. Iweala's Lab</p> |
| Epigenetic dysfunction in T cells and the regulation of allergic responses and anti-parasitic responses. | <p>Research Category: Basic & Translational Project Summary: This project seeks to understand the role of the histone demethylase UTX in the generation of IgE and other antibody responses in an allergic airway peanut sensitization model, a tick-mediated alpha-gal sensitization model, and a model of helminth-induced suppression of vaccine responses, all in mice.</p> | |

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| <p>Regulation of IgE antibody responses in alpha-gal syndrome.</p> | <p>Research Category: Basic & Translational Project Summary: The purpose of this project is to understand the immune pathways that lead to the generation of IgE responses to galactose-alpha-1,3-galactose (alpha-gal) after tick bite using mouse models and human samples, with a focus on unconventional, or innate-like T cells (like iNKT cells).</p> | <p>Name: Onyinye Iweala, MD, PhD Title: Assistant Professor of Medicine; Director, Allergy Mast Cell Disorders Program</p> <p>Research Interest: Mechanisms of pathogenesis behind alpha-gal mammalian meat allergy, regulation of IgE antibody responses, mast-cell inhibition in the treatment of food allergy, the immunologic mechanisms behind alpha-gal mammalian meat allergy, the epigenetic regulation of allergic responses, and how cutaneous and gastrointestinal parasitic infestation impacts host immune responses.</p> <p>Contact: onyinye.iweala@med.unc.edu Dr. Iweala's Lab</p> |
| <p>Understanding and optimizing care for patients with mast cell activation and related disorders.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: This project involves the design and application of a symptom scorecard for the management of presumed or confirmed mast cell activation syndrome and understanding the relationship between neuropathic symptoms, dysautonomia, and mast cell instability.</p> | |
| <p>Epidemiological Analysis of Environmental Factors on Atopic Disease.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Analyses using NHANES data linked to mortality and morbidity data to understand the relationships between allergic diseases, pulmonary, function, and morbidity and mortality.</p> | <p>Name: Corinne Keet, MD, PhD Title: Professor of Pediatrics; Vice Chair of Clinical and Translational Research</p> <p>Research Interest: Clinical and epidemiologic research focused on food allergy, atopic dermatitis and asthma.</p> <p>Contact: corinne_keet@med.unc.edu Dr. Keet's Research</p> |
| <p>Epidemiology of Allergic Disease.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Analyses using publicly available EMR data to understand the epidemiology of allergic diseases.</p> | |
| <p>Impact of air pollution on lung function.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Analyses of the relationship between air pollution and lung function.</p> | |
| <p>Relationship of Medicaid and Allergic Disease.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Analyses using publicly available Medicaid data to understand the epidemiology of allergic disease.</p> | |

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| <p>UNC Food Allergy Initiative.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: The UNC Food Allergy Initiative conducts numerous NIH and industry sponsored clinical trials that trainees can participate on. Trainees can expect to develop experience with clinical skills in food allergy diagnostics and novel therapeutics, basic protocol development, safety assessment and reporting, and data analysis.</p> | <p>Name: Edwin Kim, MD, MS Title: Associate Professor of Pediatrics and Medicine</p> <p>Research Interest: Development of novel therapeutics for food allergies, food immunotherapy (oral, sublingual, epicutaneous), and sublingual immunotherapy (SLIT) for the treatment of peanut allergy.</p> <p>Contact: edwin_kim@med.unc.edu Dr. Kim's Research</p> |
| <p>Developing Strategies to increase Beta-Lactam Antibiotic Use in High Needs Patients.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Consider PCN Allergy in high needs populations (Heme-Onc, Transplant, etc.) and develop strategies to increase their use of beta-lactam antibiotics.</p> | <p>Name: Millie Kwan, MD, PhD Title: Assistant Professor of Medicine</p> <p>Research Interest: Penicillin Allergy Delabeling (Antibiotic Stewardship), Chronic Urticaria (hives) and Angioedema, Antibody Deficiencies (Primary and Secondary causes), Recurrent Sinus Infections/Chronic Sinusitis, Chronic Cough, Allergic Rhinitis, Asthma</p> |
| <p>Rates of PCN Allergy Evaluation Before and After Inpatient PCN Allergy Evaluation Pilot.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Retrospective study to look at the rates of PCN allergy evaluation in the Adult Allergy Clinic before and after the initiation of the Inpatient PCN Allergy Evaluation Pilot from 9/2017 – 6-2019.</p> | <p>Contact: mildred_kwan@med.unc.edu Dr. Kwan's Areas of Interest</p> |

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| <p>Rates of PCN Allergy Evaluation Before and After Outpatient PCN Allergy Evaluation Program.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Retrospective study looking at the rates of PCN allergy evaluation and delabeling in the Adult Allergy Clinic before and after the initiation of the Outpatient PCN Allergy Evaluation program that started in August 2020 and continues presently.</p> | <p>Name: Millie Kwan, MD, PhD Title: Assistant Professor of Medicine</p> |
| <p>Rates of PCN Allergy Evaluation in Privileged versus Underserved Populations.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Examine the rates of PCN allergy evaluation in underserved/underrepresented minority populations compared to privileged populations and develop strategies to address these differences in rates.</p> | <p>Research Interest: Penicillin Allergy Delabeling (Antibiotic Stewardship), Chronic Urticaria (hives) and Angioedema, Antibody Deficiencies (Primary and Secondary causes), Recurrent Sinus Infections/Chronic Sinusitis, Chronic Cough, Allergic Rhinitis, Asthma</p> |
| <p>Use of perioperative cefazolin in PCN allergy patients before and after use of screening.</p> | <p>Research Category: Clinical & Epidemiological Project Summary: Examine the baseline rate of perioperative cefazolin use in surgical specialties excluding Orthopedics and compare to the rates in Orthopedics following inception of the Perioperative Cefazolin Use in PCN Allergy Labeled Patients pilot.</p> | <p>Contact: mildred_kwan@med.unc.edu Dr. Kwan's Areas of Interest</p> |
| <p>Defining the immune mechanisms of allergic sensitization to foods.</p> | <p>Research Category: Basic & Translational</p> | <p>Name: Timothy Moran, MD, PhD Title: Associate Professor of Pediatrics</p> |
| <p>Defining the immune mechanisms of environment-mediated lung disease.</p> | <p>Research Category: Basic & Translational</p> | <p>Research Interest: Impact of environmental exposures, such as microbes and pollutants in the indoor environment, on food allergy and asthma, with the goal of identifying interventions that mitigate risk of allergic disease development.</p> |
| <p>Investigating the role of the indoor exposome in peanut allergy development.</p> | <p>Research Category: Clinical & Epidemiological</p> | <p>Contact: tmoran@email.unc.edu Dr. Moran's Information</p> |

| Title/Topic | Details | Researcher |
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| Human “Test Tube” Intestines: How does peanut allergen affect intestinal epithelial cell barrier permeability? | <p>Research Category: Basic & Translational</p> <p>Project Summary: Explore how peanut allergen affects intestinal epithelial cell barrier permeability in cultured intestinal epithelial cells from patient-derived biopsies using molecular biology techniques and fluorescence microscopy.</p> | <p>Name: Erin Steinbach, MD, PhD</p> <p>Title: Assistant Professor of Medicine, Division of Rheumatology, Allergy, and Immunology; Instructor</p> <p>Research Interest: Peanut allergy, food allergy, eosinophilic gastrointestinal disease (EGID), and gastrointestinal dysfunction in food allergy.</p> <p>Contact: erin_steinbach@med.unc.edu Dr. Steinbach’s Research</p> |
| Human “Test Tube” Intestines: How does peanut allergen cross the intestinal epithelial cell barrier? | <p>Research Category: Basic & Translational</p> <p>Project Summary: Explore how peanut allergen traverses the intestinal epithelial cell barrier in cultured intestinal epithelial cells from patient-derived biopsies using transcellular transport pathway inhibitors and fluorescence microscopy.</p> | |
| Revealing the role of angiopoietin-like 4 in intestinal epithelial cells in peanut allergy susceptibility and/or severity. | <p>Research Category: Basic & Translational</p> <p>Project Summary: Study the expression and function of angiopoietin-like 4 in cultured intestinal epithelial cells from patient-derived biopsies using molecular biology techniques.</p> | |
| Safety of investigational therapies. | <p>Research Category: Basic & Translational</p> <p>Project Summary: Safety of investigational therapies such as oral immunotherapy and sublingual immunotherapy and predicting which patients are most likely to benefit.</p> | <p>Name: Yamini Virkud, MD, MPH</p> <p>Title: Assistant Professor, Pediatric Allergy-Immunology</p> <p>Research Interest: The phenotyping of different patients with food allergy and understanding the mechanisms of investigational therapies for food allergy.</p> <p>Contact: virkud@email.unc.edu Dr. Virkud’s Lab</p> |
| Food allergy patient transcriptomic and metabolomic profiles. | <p>Research Category: Basic & Translational</p> <p>Project Summary: Studying metabolite and ribonucleic acid (RNA) profiles of patients with food allergy.</p> | |
| Food Allergy Registry/Biorepository | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Long term follow-up study of the acquisition and development of pediatric food allergy.</p> | |
| Adolescent Food Allergy Patient Transition Planning | <p>Research Category: Clinical & Epidemiological</p> <p>Project Summary: Developing improved transitional and educational programs to prepare adolescents to navigate adulthood with food allergies. Collaborating with UNC Accessibility & Resources to study use of accessibility resources by college students.</p> | |

Other Faculty Contacts for Fellows

| Educators | Name | Email Address |
|-----------|----------------------|--|
| | Beth Jonas, MD, FACP | beth_jonas@med.unc.edu |
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Resources: QI and Metrics

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|---------------------------------|---|---|
| Rheumatology | American College of Rheumatology (ACR) | https://www.rheumatology.org/Practice-Quality |
| Allergy & Immunology | American Academy of Allergy Asthma and Immunology (AAAAI) | https://education.aaaai.org/quality/group/quality-corner |

Resources: Research

| Name | Description | Link |
|---|--|--|
| <p>Chapel Hill Alliance Promoting Excellence in Lupus (CHAPEL)</p> | <p>CHAPEL is a multidisciplinary collaborative research group for developing research ideas involving various stakeholders. CHAPEL, co-founded by Dr. Saira Sheikh, and co-led by Drs. Sheikh, Vimal Derebail, Keisha Gibson, and Susan Hogan is supported by the UNC Thurston Arthritis Research Center and the UNC Kidney Center. CHAPEL members bring together expertise in SLE and glomerular diseases including lupus nephritis (LN) and work closely on translational and clinical research projects which focus on improving knowledge, management, and outcomes in lupus.</p> | <p>Contact: Dr. Saira Sheikh szsheikh@email.unc.edu Dr. Sheikh's Research</p> |
| <p>Glomerular Disease Collaborative Network (GDCN)</p> | <p>The CHAPEL group widely utilizes the GDCN database and biobank cohorts in their research projects and have published manuscripts that made use of the GDCN lupus cohort. The GDCN comprises a well characterized longitudinal cohort of over 3500 lupus patients from NC and neighboring states. Of these, 858 individuals are enrolled in the LN inception cohort with ongoing, prospective data collection on disease course and outcomes from the time of diagnostic biopsy. The GDCN provides the framework to follow clinical and laboratory variables from the time of renal biopsy at LN diagnosis in patients of the lifetime inception GDCN cohort with corresponding longitudinal samples (tissue RNA and miRNA and peripheral blood DNA) and detailed nephropathology.</p> | <p>Contact: Dr. Saira Sheikh szsheikh@email.unc.edu Dr. Sheikh's Research Learn More</p> |
| <p>Carolina Data Warehouse for Health (CDW-H)</p> | <p>An enterprise-wide data warehouse, CDW-H is an important research resource developed by the UNC Healthcare System (UNCHCS). The purpose of this warehouse is to meet the dual challenges of enhancement of quality of care and clinical research with our patient populations. The warehouse is managed by NC TraCS and contains data from various clinical and operations systems within UNCHCS, primarily from the EHR system EPIC. As of April 2020, CDW-H contained >6.2 million unique patients representing 15+ years of patient records and is an important potential data source for retrospective research.</p> | <p>Contact: Dr. Saira Sheikh szsheikh@email.unc.edu Dr. Sheikh's Research Learn More</p> |