G1. Core Mentors

S. Louis Bridges, Jr., MD, PhD (Dept Medicine/Clinical Immunology and Rheumatology). Program Director. Funding Sources: NIH/NIAMS, NIH/NICHD. ***Genetic Influences on Susceptibility, Severity in RA; Biomarkers of Treatment Response in RA.*** Dr. Bridges' research is focused on genetic and non-genetic influences on RA susceptibility and severity in African-Americans; biomarkers of treatment response; and autoantibodies to citrullinated peptides in RA. He also has research interests in gout, and in improving functional status of arthritis patients after joint replacement. He serves as Director of the Biorepository for a PCORI-funded project, and for a large pragmatic trial to evaluate the safety and effectiveness of the herpes zoster vaccine in patients on anti-TNF therapy. He is site PI of the Rheumatoid Arthritis Synovial Tissue Network (REASON) Study, a network of investigators who lead efforts to train rheumatologists to perform ultrasound guided RA synovial biopsies for translational studies.

Kenneth G. Saag, MD, MSc (Dept Medicine/Clinical Immunology and Rheumatology). Associate Program Director. Funding Sources: NIH/NIAMS, AHRQ, NIH/NCATS. ***Outcomes and Quality of Life Research in Arthritis and Osteoporosis.*** Dr. Saag is an outcomes researcher with particular expertise in rheumatoid arthritis, pharmacoepidemiology osteoporosis, and population-based investigations, working with large databases, survey research and quality indicator development. He also has interests in pragmatic clinical trials, and comparative effectiveness research in musculoskeletal disorders such as RA and gout. Dr. Saag is Director of the UAB Center of Research Translation in Gout and Hyperuricemia, Co-Director of the UAB Multidisciplinary Clinical Research Center, and an Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center. Additionally, he serves as PI of the AHRQ-funded UAB Deep South Center for Education and Research in Therapeutics (CERTs), UAB Health Services, Outcomes, and Effectiveness Research T32 Training Program and the UAB K12 in Patient Centered Outcomes Research.

Yi-Ping Li, PhD (Dept Pathology). Associate Program Director. Funding Sources: NIH/NIAMS, NIH/NIDCR. ***Osteoclast Function, Skeletal Development and Osteoporosis.*** Dr. Li's research interests include investigations of bone formation and resorption, brain and craniofacial development, skeleto-muscular development, and their related diseases (osteoporosis, osteopetrosis, Paget's disease, bone metastases, periodontitis, RA). Dr. Li's group published seminal work on the cloning and characterization of genes critical to osteoclast function, including cathepsin K, ATP6i, and RGS10A.

Marcas M. Bamman, PhD (Dept of Cell, Developmental, & Integrative Biology); Funding Sources: NIH/NICHD, NIH/NIA. ***Skeletal muscle mass regulation in aging, arthritis, and exercise medicine; rehabilitation after joint replacement.*** The focus of Dr. Bamman's research is mechanisms of skeletal muscle atrophy and dysfunction in disease states (aging sarcopenia, joint arthroplasty, spinal cord injury, disuse), and restoration of muscle mass and mobility function using exercise as regenerative medicine. He has an R01 will examine interventions to overcome TWEAK signaling to restore muscle mass and mobility after hip or knee replacement in OA. He leads the National Exercise Clinical Trials Network (NExTNet) and the T32 Training Program in Pathobiology and Rehabilitation Medicine, which supports trainees in medicine, neurology, physical therapy, cardiovascular disease, physical medicine and rehabilitation, and endocrinology.

Susan L. Bellis, PhD (Dept of Cell, Developmental, & Integrative Biology); Funding Sources: NIH/NIGMS, NIH/NIDCR, NIH/NCI, AHA. ***Adhesion Receptors in Immunity.*** Dr. Bellis' research seeks to

understand the role of cell-extracellular matrix interactions in normal physiology and pathophysiologic conditions including autoimmune disease. She explores the role that altered glycosylation of receptors plays in the maintenance of normal cellular behavior, as well as in the development of diseases such as arthritis and cancer. Recent studies have focused on the development of biomimicking synthetic extracellular matrices with the goal of engineering implantable substrates that stimulate regeneration of tissues, i.e. soft tissue and bone.

Timothy G. Beukelman, MD (Dept Pediatrics/Rheumatology); Funding Sources: NIH/NIAMS, AHRQ, CARRA, PCORI, Arthritis Foundation. ***Optimization of treatment of juvenile idiopathic arthritis (JIA).*** Dr. Beukelmann's research focus is the optimization and safety of treatment methods of juvenile idiopathic arthritis (JIA). He has led numerous high-impact studies of the risks of serious infection and malignancy associated with JIA. He has received an NIH clinical trial planning grant to study whether methotrexate can prevent worsening of arthritis among children who initially present with a less severe phenotype.

Elizabeth E. Brown, MPH, PhD (Dept Pathology); Funding Sources: NIH/NIAMS, NIH/NCI. ***Genetics and Autoantibodies in the Clinical Course of Systemic Lupus Erythematosus.*** Dr. Brown is a molecular/genetic epidemiologist with interest in the study of aberrant immune function common to inflammatory-mediated chronic disease. She is funded by NIAMS to delineate the effects of genetic variants and autoantibody profiles relative to the rate of progression and severity of lupus nephritis and severe organ damage among patients with SLE.

Yabing Chen, PhD (Dept Pathology); Funding Sources: NIH/NIDDK, NIH/NHLBI, VA. ***Gene Regulation and Function in the Pathogenesis of Vasculopathy and Vascular Calcification.*** Dr. Chen has two NIH R01 grants, focused on the role of O-Glcnacylation on the regulation of vascular smooth muscle in diabetic vasculopathy, and on molecular signaling in oxidative stress-induced vascular calcification.

Jeffrey R. Curtis, MD, MS, MPH (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, AHRQ, Rheumatology Research Foundation, PCORI, Amgen, CORRONA, Pfizer. ***Safety, Efficacy and Outcomes of Biologic Agents in Inflammatory Arthritis.*** The evaluation of the efficacy, effectiveness, and safety of the medications used to treat RA and other inflammatory arthritis are Dr. Curtis' main research interests. He also studies risk factors for and outcomes of osteoporosis, and ways to improve treatment outcomes in gout. He is PI of a project in the UAB Multidisciplinary Clinical Research Center and of a project in the UAB Center of Research Translation in Gout and Hyperuricemia.

Randall S. Davis, MD (Dept Medicine/Hematology-Oncology); Funding Sources: NIH/NCI, NIH/NIAID, Lupus Research Institute. ***Developmental Immunology of Lymphocytes and Immunoreceptor Biology.*** Dr. Davis's research focus is the cellular and molecular immunobiology of lymphocytes in normal and diseased conditions, as well as B cell chronic lymphocytic leukemia (CLL) and lymphoproliferative disorders. His seminal discovery of a family of Fc receptor-like (FCRL) genes has led to many studies of their function in humans and mice and roles in autoimmune diseases such as systemic lupus erythematosus.

Charles O. Elson, III, MD (Dept. Medicine/Gastroenterology); Funding Sources: NIH/NIDDK, NIH/NIAMS. ***Mucosal Immunity in Response to Microbiota.*** A world expert on the pathogenesis of inflammatory bowel disease, Dr. Elson's research focus is on the regulation of mucosal immune responses and how deregulation of the normal homeostasis contributes to chronic intestinal

inflammation. As PI of a project in the UAB Multidisciplinary Clinical Research Center, in collaboration with Dr. Matt Stoll of Pediatric Rheumatology, they study the role of microbiota and immune response to commensal bacteria in juvenile and adult spondyloarthritis.

Xu Feng, PhD (Dept of Pathology); Funding Sources: NIH/NIAMS. ***The RANKL/RANK/ OPG System in Bone Health and Disease.*** Dr. Feng's primary research focus is the molecular mechanisms of osteoclast formation and function and the pathogenesis of bone loss in the various pathological disorders. He is currently trying to understand whether any of the RANK motifs can server as good therapeutic targets for bone erosion in rheumatoid arthritis.

Orlando M. Gutierrez, MD, MMSc (Dept. of Medicine/Nephrology); Funding Sources: NIH/NINDS, NIH/NIDDK. ***Mineral Metabolism and Outcomes.*** The focus of Dr. Gutiérrez's research is the characterization of bone and mineral metabolism in the pathophysiology of cardiovascular disease and kidney disease. This includes studies of the associations of disorders of phosphorus and vitamin D metabolism with adverse outcomes in kidney disease.

Laurie Harrington, PhD. Associate Professor, Department of Cell, Developmental, & Integrative Biology, School of Medicine. Research theme: Immunology, autoimmunity and inflammation. Dr. Harrington's research interests center on protective and pathogenic CD4+ T cell responses. Given her interest and expertise in training of researchers, she is also a member of the T32 Executive Committee.

Mohammad Hassan, PhD. Assistant Professor, Department of Oral & Maxillofacial Surgery, School of Dentistry. Secondary appointments include Department of Cell, Developmental, & Integrative Biology; and Department of Pathology. Research theme: Bone, cartilage, muscle and connective tissue. Dr. Hassan's research focuses on microRNA biology, including its effects on bone formation and dentinogenesis; and the microRNA-Wnt signaling regulatory network in the pathology of osteoarthritis.

Hui-Chen Hsu, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Development of Autoantibodies and Autoimmunity in Mouse Models.*** Dr. Hsu's lab studies the regulation of immune cells in aging and autoimmune diseases, such as SLE. Dr. Hsu has developed a two-tiered peptide microarray approach, coupled with epitope mapping of known autoantigens, to identify and characterize autoepitopes recognized by BXD2 autoreactive B cells and actively pursues the mechanisms involved in the IL-17-mediated B cell tolerance loss in BXD2 mice.

Amjad Javed, PhD (Dept Oral and Maxillofacial Surgery, School of Dentistry); Funding Sources: NIH/NIAMS, NIH/NIDCR. ***Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis.*** The central focus is the molecular mechanisms that govern the formation and remodeling of skeletal tissues. This includes the role of runt related transcription factor (Runx), in the coordinated regulation of chondrocyte, osteoblast, and odontoblast during skeletogenesis.

Ho-Wook Jun, PhD (Dept. of Biomedical Engineering, School of Engineering); Funding Sources: NIH/NHLBI, NSF, NIH/NIBIB, NuTech Medical. ***Nanostructured Biomaterials, Stem Cells, Tissue Engineering.*** Dr. Jun's multidisciplinary research focuses on tissue regeneration (cardiac, bone, and musculoskeletal tissues) using stem cells and biomimetic nanomatrices. He has significant experience in developing bioactive materials modified by functional peptide sequences. He and his colleagues have successfully constructed extracellular matrix (ECM) mimicking self-assembled nanomatrix directing osteogenic differentiation of human bone marrow mesenchymal stem cells and cardiovascular cellular responses.

John F. Kearney, PhD (Dept Microbiology); Funding Sources: NIH/NIAID, Juvenile Diabetes Research Foundation, AHA. ***Lymphocyte Development and B Cell Clonal Diversity.*** Dr. Kearney's interests are discovering fundamental cellular and molecular mechanisms involved in the development of T and B lymphocytes. In collaboration with Dr. Bridges, Dr. Kearney's lab is analyzing antigen-specific B cells from peripheral blood of RA patients with antibodies to citrullinated peptides.

Frances E. Lund, PhD (Dept Microbiology); Funding Sources: NIH/NIAID. ***Immune Responses to Pathogens, Autoantigens and Allergens.*** Dr. Lund, Chair of the Department of Microbiology, studies functional roles of B cells in infection and autoimmune disease, and mechanisms that control the migration of immune cells to sites of inflammation and infection.

John D. Mountz, MD, PhD (Dept. Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, NIH/NIAID. ***Lymphocyte Development in Autoimmunity and Inflammation.*** Dr. Mountz' lab currently studies the role that defects of marginal zone macrophages (MZ) in the clearance of apoptotic autoantigens plays in the development of lupus and antibody-mediated autoimmune diseases. He and his colleagues have developed a novel hypothesis to explain the apoptotic cell clearance defects in autoimmune BXD2 mice related to defective expression of MKL1 and mechanosensing signaling pathway in MZMs.

Joanne Murphy-Ullrich, PhD (Dept Pathology); Funding Sources: NIH/NCI, DOD, NIH/NIDDK. ***Extracellular Matrix Control of Cell and Growth Factor Function.*** Dr. Murphy-Ullrich's research focus is extracellular matrix remodeling in disease. Her lab discovered that the matricellular protein, thrombospondin1 (TSP1), is a major regulator of latent TGF-β activation and established a critical role for TSP1 in osteoblast differentiation/osteoclast inhibition in a number of disease processes. They have recently proven the efficacy of the TSP1 antagonist in reducing myeloma tumor burden and osteolytic bone disease, and identified new compounds with significantly improved pharmacokinetic profiles to block TSP1-dependent TGF-β activation.

Selvarangan Ponnazhagan, PhD (Dept Pathology); Funding Sources: NIH/NIAMS, NIH/NCI. ***Adeno-Associated Virus Gene Therapy/Experimental Therapeutics of Breast and Prostate Cancers.*** Dr. Ponnazhagan's research is in the area of experimental therapeutics of bone metastasis in breast and prostate cancers. His lab focuses on determination of immune mechanisms of osteolytic bone metastasis and development of interventional strategies that would help both long-term survival and bone repair.

Chander Raman, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Lymphocyte Differentiation, Activation, Immune Tolerance and Autoimmunity.*** Dr. Raman's research interest is the molecular mechanisms by which lymphocytes play a role in autoimmunity. He recently showed that TGFβR3 expression in thymocytes is developmentally regulated, and interruption of its signaling leads to inhibition of T-cell maturation. Efforts are underway to determine the role of TGFβR3 in T cell development and selection. He is also studying the role of signaling pathways in RA lymphocytes.

Troy D. Randall, PhD (Dept. Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, NIH/NIAID, NIH/NHLBI. ***Immune Responses to Pathogens, and Allergens, Immune Tolerance, Autoimmunity.*** Dr. Randall's laboratory studies all aspects of the immune response to influenza, particularly how T and B Cell responses are generated and maintained. He also has an interest

in the development and function of local (tertiary) lymphoid tissues in a variety of inflammatory diseases such as RA and whether they contribute to disease or ameliorate pathology.

Harry W. Schroeder, Jr., MD, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Genetics of Immune Dysfunction (Immune Deficiency and Autoimmunity).*** Dr. Schroeder's laboratory is interested in the development of the B cell and antibody repertoire. In collaboration with Dr. Bridges, his lab is analyzing repertoires of antigen-specific B cells from peripheral blood of RA patients with antibodies to citrullinated peptides. He also studies the role of the HLA region and KIR genomics in common variable immune deficiency, and the role of genetics and autoantibodies in mouse models of SLE. He serves as Director of the Immunologic Diseases and Basic Immunology T32, the Program in Immunology, and as an Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center.

Rosa Serra, PhD (Dept of Cell, Developmental & Integrative Biology); Funding Sources: NIH/NIAMS. ***Mechanism of TGF-ß Action in Developmental and Disease Processes.*** Dr. Serra's research focus is the role and mechanism of embryonic and post-natal skeletal development and to apply this knowledge to the understanding and treatment of human degenerative skeletal disorders.

Jasvinder A. Singh, MD, MPH (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, PCORI, AHRQ. ***Patient Outcomes in Gout and Other Rheumatic Diseases*****.** Dr. Singh's research focus is patient-reported outcomes in various forms of rheumatic diseases, in particular osteoarthritis, joint replacement and gout. He performs studies of comparative effectiveness of treatments used in gout and joint replacement patients and communication of medication risk in minority SLE patients.

Matthew Stoll, MD, PhD, MSCS (Dept Pediatrics/Rheumatology); Funding Sources: NIH/NIEHS, Friends of CARRA, NIH/NIAMS, ACR/RRF, Kaul Pediatric Research Institute. ***Mucosal Immunity and Spondyloarthritis.*** Dr. Stoll's primary research focus is the humoral response to enteric organisms and the nature of the fecal flora in patients with spondyloarthritis. His current work focuses on the role of the intestinal microbiota in children with ERA. His lab is working towards generating a biorepository of fecal microbiota, and planning collaborative studies evaluating the role of immunity directed against the fecal microbiota in children with spondyloarthritis, as well as understanding the role of dysbiosis.

Alexander J. Szalai, PhD (Dept Medicine/Clinical Immunology and Rheumatology). Funding Sources: NIH/NIDDK. ***C-reactive protein in Inflammation and Autoimmunity.*** The goals of Dr. Szalai's research are to understand the biological role of C-reactive protein (CRP) in maintenance of health, tissue response to injury, and propagation of disease, including SLE, RA, and infection.

Victor Thannickal, MD (Dept Medicine/Pulmonary); Funding Sources: NIH/NHLBI, NIH/NIA, Biogen IDEC, Inc. ***Mechanisms of Cellular Senescence, Oxidative Stress and Aging Associated with Chronic Lung Disease.*** Dr. Thannickal' s research focus is in cellular/molecular mechanisms of lung injury-repair, with a focus on the differentiation and fates of mesenchymal stem/progenitor cells; transforming growth factor- β signaling; and the biology of reactive oxygen species. His laboratory has also been active in the development of experimental therapeutics and biomarker discovery in complex lung diseases.

Casey T. Weaver, MD (Dept Pathology); Funding Resources: NIH/NIAID, NIDDK. ***Adaptive Immune Regulation by CD4 T cells*****.** Dr. Weaver's laboratory focus is on the mechanisms by which CD4 T cells

control adaptive immunity: mechanisms that induce development of the Th17 effector lineage; characterization of mechanisms by which dysregulation of CD4 T cells leads to inflammatory bowel disease; delineation of the adhesion pathways that control effector T cell trafficking; and characterization of the genetic elements that regulate cytokine gene expression in Th1 and Th17 cells.

Jarred Younger, PhD (Dept Psychology, College of Arts and Sciences); Funding Sources: NIH/NIAID, IASP, Fetzer Institute. ***Immune Contributions in Chronic Pain and Fatigue.*** Dr. Younger's research focus is the use of pharmaceutical, psychophysical, neuroimaging, and immune monitoring approaches to develop new diagnostic tools and treatments for pain and fatigue in conditions such as fibromyalgia, chronic fatigue syndrome, and Gulf War Illness.

G2. Content Mentors

Devin Absher, PhD (Dept Genetics/ HudsonAlpha Institute of Biotechnology). ***Genetics and Epigenetics of Rheumatic Diseases.*** Dr. Absher lab uses high-throughput technologies to study the genetics and traits of common diseases, including rheumatic diseases. He is a frequent collaborator with CAMBAC investigators: genome-wide association study in RA; genetic and epigenetic analyses of lupus; genome-wide methylation study in myeloma; epigenetic determinants of lipid response; integrative genomics of CHD.

T. Prescott Atkinson, MD, PhD (Dept Pediatrics, Allergy/Immunology). ***Primary Immunodeficiency.*** Dr. Prescott's research focus is on the etiology and clinical characteristics of disorders related to primary immunodeficiency. His laboratory has also investigated the role of Mycoplasma in chronic diseases, such as asthma and different types of arthritis, and other humoral immunodeficiency. His lab is examining the role of urogenital mycoplasmas in JIA.

Laurence Bradley, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Measurement of Pain and Psychological Variables.*** Dr. Bradley's research focus is on the interplay between biological and behavioral factors that influence persistent pain in persons with rheumatic diseases. His group studies ethnic differences in pain among persons with knee osteoarthritis (OA) through the UPLOAD Study (R Fillingim, PI).

Daniel C. Bullard, PhD (Dept Genetics). ***Roles of Adhesion Molecules in the Pathogenesis of SLE, Psoriasis, and Vasculitic Disorders.*** Dr. Bullard's research interests are centered on defining the cellular and genetic mechanisms by which adhesion molecules, such as the □2 integrins, ICAM-1, and the selectins regulate immune and inflammatory processes, especially during the development of diseases such as systemic lupus erythematosus, vasculitis disorders, rheumatoid arthritis, and multiple sclerosis.

David Chaplin, MD, PhD (Dept Microbiology). ***Interplay Between Innate and Adaptive Immunity in Asthmatic Inflammation.*** Dr Chaplin's former research focused on mechanisms governing the interactions of the innate and adaptive immune responses, with a special interest in the mechanisms of asthmatic inflammation. Dr. Chaplin brings a career-long commitment to the training and career development of scientists in both basic and translational research, and currently serves as Director of the Training Academy of the NCATS-funded UAB Clinical and Translational Science Award, and he will be instrumental in establishing UAB's new Certificate Program in Translational and Molecular Sciences.

W. Winn Chatham, MD (Dept Medicine/Clinical Immunology and Rheumatology). ***Clinical Trials of Investigational New Drugs in SLE.*** In collaboration with clinical trial investigators in the US and other countries, Dr. Chatham is involved in Phase II and Phase III clinical trials of investigational new drugs for systemic lupus erythematosus. He was involved in the pivotal clinical trials of belimumab (Benlysta) for SLE, and is an active collaborator in clinical and translational studies in SLE.

Jake Chen, PhD. Professor, Department of Genetics, School of Medicine. Research theme: Genetics and functional genomics. Jake Y. Chen, Ph.D., is the Associate Director and Chief Bioinformatics Officer of the UAB Informatics Institute. His expertise is bioinformatics, specifically collecting, representing, storing, retrieving and processing data and knowledge for the improvement of human health, and advancing its use in academic, industrial and entrepreneurial efforts. His research is focused on systems biology, data mining, and advanced visual analytics for complex human disease applications.

Randy Q. Cron, MD, PhD (Dept Pediatrics/Rheumatology). ***Pediatric rheumatology and macrophage activation syndrome (MAS).*** Dr. Cron's laboratory studies CD4 T cell gene transcription in primary human CD4 T cells: 1) defining the hCD154 cis-elements and epigenetic changes responsible for CD154 hyper-expression in lupus CD4 T cells; 2) studying the role of the gut microbiota, and the associated host adaptive immune response (both B cells and T cells) in patients with spondyloarthritis; 3) studying macrophage activation syndrome (MAS) patient mutations for their ability to decrease perforin-mediated cytolytic activity in NK cells, and examining the role of MUNC13-4 SNPs, sIL2Ra and sCD163 in distinguishing patients with overt and subclinical MAS from patients with flare of systemic juvenile idiopathic arthritis (sJIA).

Gary Cutter, PhD (Dept Biostatistics, School of Public Health). ***Clinical Trials and Biostatistics.*** Dr. Cutter's major research interest is in design, analysis and interpretation of clinical trials, epidemiologic studies and evaluation research. As a collaborative biostatistician, his contributions span multiple diseases, including, but not limited to cardiovascular disease, osteoporosis, and multiple sclerosis.

Alan W Eberhardt, PhD (Dept Biomedical Engineering, School of Engineering). ***Orthopedic and Injury Biomechanics.*** Dr. Eberhardt's research focuses on orthopedic and injury biomechanics, related to total joint replacements involving biomechanics and biomaterials (surface treatments, implant tribology, implant design, forensic analysis); biomechanical response of the pelvis in automotive side impacts and metastatic bone lesions; and design for people with disabilities. Dr. Eberhardt is the Director of the Experimental Biomechanics Core at UAB, which contains all the modern tools for characterizing bone and soft tissues at the macro-level (MTS systems, drop tower impactor) to the micro-level (Bose Low-force Testbench, Nano-indenter).

Jeffrey C. Edberg, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Genetic and Epigenetic Influences in Lupus; Biomarkers of Pain Perception in OA.*** Dr. Edberg's research focus is on the role of genetic and epigenetic variation in B and T lymphocytes in susceptibility to SLE; understanding the functional consequences of genetic variation in genes encoding immune response proteins implicated through genome-wide association studies; identification and ethnic variation of biomarkers of pain perception in OA.

Candace Floyd, PhD (Dept Physical Medicine and Rehabilitation). ***Neuronal-Glial Interactions in Traumatic Brain and Spinal Cord Injury.*** Dr. Floyd's lab investigates pathophysiological mechanisms, novel therapeutic targets, and intervention strategies to promote repair and recovery after CNS injury.

Kevin Fontaine, PhD (Dept Health Behavior, School of Public Health). ***Outcomes of Dietary and Physical Activity Intervention.*** Dr. Fontaine's research focuses primarily on clinical obesity treatment and evaluating the effects of various dietary and physical activity interventions on body composition and quality of life in both children and adults with physical disabilities and chronic disease, such as RA.

Mona Fouad, MD (Dept Medicine/Preventive Medicine). ***Primary Disease Prevention in Minorities.*** Dr. Fouad's research focus is in minority health and health disparities. Dr. Fouad has played a prominent leadership role in training minority researchers and leaders in the national effort to eliminate health disparities. She has a strong interest in mentoring minority investigators, fellows, and young faculty.

Angelo Gaffo, MD, MSPH (Dept Medicine, Clinical Immunology and Rheumatology). ***Crystal-Induced Arthritis and Systemic Vasculitis.*** Dr. Gaffo's expertise in research lies in gout, as an investigator in the UAB Center of Research Translation in Gout and Hyperuricemia; and systemic vasculitis and other

complex autoimmune conditions. Dr. Gaffo serves as a mentor for undergraduate Hispanic and Latino students at UAB, and is actively involved in educational and academic initiatives at UAB such as the Kaizen-IM program.

James F. George, PhD (Dept Surgery/Cardiothoracic). ***Immune Regulation of Post-transplant Vascular Disease and Allograft Rejection.*** Dr. George's research is concentrated in transplantation immunobiology, particularly in relation to allograft vascular disease, immune regulation, and the role of heme oxygenase-1.

Shawn Gilbert, MD (Dept Surgery/Orthopaedic Surgery). ***Bone and Blood Vessel Development and Repair in the Skeleton.*** Dr. Gilbert's principal interest has been investigating the role of the hypoxia inducible factor (HIF) pathway and angiogenesis in the skeleton. Dr. Gilbert has developed an interest in obesity and musculoskeletal health. Additional clinical research interests include limb and spine deformity, fractures, skeletal maturation, and musculoskeletal infections.

Paul Goepfert, MD (Dept Medicine/Infectious Diseases). ***Mechanisms Allowing T cells to Control HIV Replication In Vivo.*** The ultimate goal of Dr. Goepfert's research is to aid development of an effective HIV vaccine to prevent infection and disease progression by more fully understanding the correlates of protection against HIV with a focus on cell-mediated immune responses (CD4 and CD8 T cells).

George Howard, PhD (Dept Biostatistics, School of Public Health). ***Biostatistics, Clinical Trial Design, and Clinical Studies of Stroke, and RA.*** Dr. Howard's primary research focus is geographic and racial differences in stroke risk. He is PI of the REasons for Geographic And Racial Differences in Stroke (REGARDS) Study, a longitudinal cohort of 30,239 African American and Caucasian participants. He is a long time investigator in RA, having led the statistical center for the Consortium for the Longitudinal Analysis of African-Americans with RA (CLEAR) Registry, and for the Treatment of Early Aggressive RA (TEAR) Trial.

Hui Hu, PhD. Associate Professor, Department of Microbiology, School of Medicine. **Research theme: Immunology, autoimmunity and inflammation**. Dr. Hu is an immunologist whose research is focused on transcriptional regulation of adaptive immunity, including T follicular helper cell differentiation, germinal center responses, CD8+ T cell quiescence/activation, T cell responses, immune memory, and vaccines.

Laura B. Hughes, MD, MSPH (Dept Medicine/Clinical Immunology and Rheumatology). ***Biomarkers of Treatment Response in RA; Musculoskeletal Ultrasound.*** In addition to serving as Director of the Rheumatology Fellowship Program, Dr. Hughes directs the UAB Rheumatology-Radiology collaborative effort in musculoskeletal ultrasound. She is a collaborative researcher with Dr. Bridges in the Rheumatoid Arthritis Synovial Tissue Network (REASON) Study, a network of investigators who will perform ultrasound guided RA synovial biopsies for translational studies.

Robert P. Kimberly, MD (Dept Medicine/Clinical Immunology and Rheumatology). ***Functional Significance of Genetic Variants in Autoimmune and Immune-Mediated Inflammatory Diseases.*** Dr. Kimberly's laboratory is interested in the role of genetic and epigenetic factors in the development of autoimmune and immune-mediated inflammatory diseases such as SLE and systemic vasculitis. His group's approach has focused on molecular mechanisms of receptor signaling. In his role as Director of the UAB Center for Clinical and Translational Science, he is a leader in facilitation of trans-disciplinary research at UAB.

Bruce Korf, MD, PhD (Dept Genetics). ***Genetics and Management of Neurofibromatosis, and Personalized Medicine for Human Diseases.*** Dr. Korf's research focus is genotype-phenotype correlations and the role of genetic modifiers in neurofibromatosis type 1 (NF1). As director of the Heflin Center for Genomic Sciences at UAB, and Co-Director of the UAB-HudsonAlpha Center for Genomic Medicine, he is involved in the integration of genomics into medical practice, and using exome and genome sequencing to solve complex chronic genetic disorders. Dr. Korf has established a genetic counseling training program.

Elliot Lefkowitz, PhD (Dept Microbiology). ***Microbial Genomics and Evolution; Bioinformatics, and Clinical Informatics.*** Dr. Lefkowitz's research interests are directed at developing and utilizing computational tools and bioinformatics techniques to mine sequence and other data for significant patterns characteristic of function and/or evolution. He has been pivotal in developing analytic techniques and approaches to microbiome data and analysis and interpretation of next generation sequencing data.

Robinna Lorenz, MD, PhD (Dept Pathology). ***Mucosal and Systemic Immune Systems Response to Gastrointestinal Microbiota.*** Dr. Lorenz studies the cellular components of the mucosal immune system and their interactions with the gastrointestinal epithelium, the GI microbiome, and the systemic immune response.

Peter Mannon, MD, MPH (Dept Medicine/GI and Hepatology). ***Endotypes of Inflammatory Bowel Disease.*** Dr. Mannon investigates the endotypes of IBD as well as the development of novel therapies to improve outcomes for defined subsets of patients.

Amie Brown McLain, MD (Dept Physical Medicine and Rehabilitation). ***Health Outcomes in Spinal Cord Injury and Neurological Disorders.*** Chair of the Physical Medicine and Rehabilitation Department, Dr. McLain's research and clinical focus is spinal cord injuries and other neurological disabilities, assessing and improving health outcomes in individuals with disabilities.

Sarah Morgan, MD, RD (Dept Medicine/Clinical Immunology and Rheumatology). ***Nutrition and Arthritis, Nutritional Support, Osteoporosis and Bone Densitometry.*** Dr. Morgan has extensively studied arthritis, nutrition, folate supplementation and methotrexate (MTX) metabolism in RA. She was co-leader of a pivotal randomized controlled trial showing folic acid supplements during low dose MTX therapy for RA do not alter the efficacy of therapy. She is Director of the UAB Osteoporosis Clinic and serves as clinical mentor on osteoporosis and metabolic bone diseases for rheumatology fellows and other trainees.

Paul Muntner, PhD (Dept Epidemiology, School of Public Health). ***Epidemiology of Renal and Cardiovascular Disease; Outcomes in Musculoskeletal Diseases.*** Dr. Muntner is an epidemiologist with interest in renal and cardiovascular diseases, and Project Leader on the AHRQ-funded UAB Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs) to investigate a novel tool and multi-modal intervention for improving osteoporosis treatment adherence.

Richard Myers, PhD (HudsonAlpha; Dept Genetics). ***Human Genetics and Genomics in Inflammatory Disease.*** Dr. Myers' research is focused on human genetics and genomics. His specific areas include human population genetics; the genomic basis of vertebrate diversity; and the use of genomics tools and genetics to understand how genes interacting with the environment contribute to human disease phenotypes.

Jan Novak, PhD (Dept Microbiology). ***Pathogenesis and Treatment of Chronic and Autoimmune Diseases.*** Dr. Novak's research is glycoimmunobiology and proteomic and genetic studies relevant to human health and disease, namely in relevance to renal diseases, particularly IgA nephropathy. He has a long track record of investigation in glycosylation of IgA1 and IgG and the changes associated with autoimmune diseases, such as IgA nephropathy, periodontal disease, inflammatory bowel disease and rheumatoid arthritis.

Brent Ponce, MD (Dept. Surgery/Orthopaedic Surgery). ***Biomechanics of the Shoulder***. Dr. Ponce's research and clinical focus is on the biomechanics of the shoulder. He is an active participant in the Orthopaedic Research Committee and actively mentors research projects of orthopaedics residents.

Sasanka Ramanadham, PhD (Dept. Cell, Developmental, & Integrative Biology). ***Role of Lipid Mediators in Signal Transduction.*** Dr. Ramanadham's research focus is lipid signaling in beta-cell biology. His lab demonstrated that activation a calcium-independent phospholipase A2beta (iPLA2□) contributes to beta-cell apoptosis. He also studies the contribution of iPLA2□derived lipids for optimal bone formation, as its deficiency leads to compromises bone integrity.

David Redden, PhD (Dept Biostatistics; Section of Statistical Genetics). ***Statistical Methodologies.*** Chair of the Department of Biostatistics, Dr. Redden's expertise is on design and analysis of group randomized trials, adaptive randomization for clinical trials, estimation and control of admixture within genetic association studies, and application of the sequential probability ratio test to clinical trials and genetic association studies.

Isabel Scarinci-Searles, PhD (Dept Medicine/Preventive Medicine). ***Cancer Disparities Associated with Socioeconomic Status and Race/Ethnicity.*** Dr. Scarinci-Searles' primary area of interest is cancer prevention among low-income, racial/ethnic minorities, and immigrant populations (particularly Latinos and African Americans), with a focus on the development of community-based programs that are theoretically based and culturally relevant to these populations relating to breast and cervical cancer and tobacco control.

Lisa Schwiebert, PhD (Dept Cell, Developmental, & Integrative Biology). ***Airway inflammation; Lung Function; Asthma and Exercise.*** Dr. Schwiebert's research focus is to understand the physiologic mechanisms that underlie lung immunity through molecular and translational approaches.

David Standaert, MD, PhD (Dept Neurology). ***Innate immunity and Parkinson's Disease.*** Dr. Standaert is interested in the mechanisms of Parkinson's Disease (PD) and other conditions which produce abnormalities of movement. Recent findings suggest a fundamental role for immune receptors (FcγRs) in neuronal degeneration in a model of PD, implicating innate immunity involvement in disease progression.

Steven M. Theiss, MD (Dept Surgery/Orthopaedic Surgery). ***Outcomes and Treatment of Spine Trauma and Deformity.*** Dr. Theiss, Director of the Division of Orthopaedic Surgery, has led studies focused on the enhancement and inhibition of bone healing during spine fusion. He has shown that

nicotine inhibited the sequential gene expression of cytokines critical in successful arthrodesis, even as early as several hours after the fusion procedure.

Hemant Tiwari, PhD (Dept Biostatistics, School of Public Health). ***Genetic Linkage Analysis in Autoimmunity and Inflammation.*** Dr. Tiwari's research interests include genetic linkage analysis, disequilibrium mapping, population genetics, molecular evolution, and bioinformatics. He serves as Director of the Section on Statistical Genetics, and is a long standing and frequent collaborator with rheumatology faculty on genetic association studies in SLE and RA.

Trygve Tollefsbol, PhD, DO, (Dept Biology, College of Arts and Sciences). ***Role of Epigenetics in Cancer, Aging and Nutrition.*** Dr. Tollefsbol has contributed numerous novel findings in the molecular mechanisms of epigenetic and epigenomic gene control in nutrition and cancer; as well as, numerous mechanisms for control of methylation spreading that play important roles in gene silencing in cancer, aging and nutrition.

Tim Townes, PhD (Dept Biochemistry and Molecular Genetics). ***Developmental Regulation of Gene Expression.*** Dr. Townes' research focus is gene regulation in hemoglobinopathies such as beta-thalassemia and sickle cell disease. His lab seeks to define the basic mechanisms that control globin gene regulation and to use these discoveries to develop novel strategies to cure hemoglobinopathies.

Hubert Tse, PhD (Dept Microbiology). ***The Role of Oxidative Stress in Autoimmunity.*** Dr. Tse's research focus is the synergy of oxidative stress and autoimmune destruction of insulin-secreting pancreatic beta-cells in Type 1 diabetes. His lab has focused on dissipating free radicals as a potential target to preserve pancreatic beta-cells and to mediate immune tolerance and suppression of autoreactive T cell responses.

Peter Waite, DDS, MD, MPH (Dept Oral & Maxillofacial Surgery, School of Dentistry). ***Musculoskeletal Function of the Jaw.*** Dr. Waite's research focuses on the temporomandibular joint (TMJ), a frequent target in juvenile idiopathic arthritis.

Mark Walter, PhD (Dept Microbiology). ***Structure and Function of Cytokines Involved in Viral Pathogenesis and Autoimmune Diseases.*** Dr. Walter studies interferons and their role in viral infection and in autoimmune diseases such as systemic lupus erythematosus. These studies provide the framework for detailed biochemical and cellular characterization of how cytokines lead to cellular activation and thus trigger autoimmunity.

Amy Warriner, MD (Dept Medicine/Endocrinology). ***Treatment and Outcomes in Osteoporosis.*** Dr. Warriner's research focus is osteoporosis and other disease-related bone changes. She studies bone mineral density changes and the prevalence of fracture in HIV-positive persons through the use of Medicare and Medicaid data. In collaboration with others, Dr. Warriner is leading studies aimed at patient-centered initiatives to improve diagnosis and treatment of osteoporosis.

Timothy Wick, PhD (Dept Biomedical Engineering, School of Engineering). ***Orthopaedic and Cardiovascular Tissue Engineering and Regenerative Medicine***. Dr. Wicks' research is focused on bioreactors and bioprocessing technologies to manufacture musculoskeletal and cardiovascular 3-D tissue constructs. These may ultimately lead to repair or replacement of diseased or damaged organs or joints.

James Willig, MD. Associate Professor, Division of Infectious Diseases, Department of Medicine, School of Medicine. Research Theme: Epidemiology, outcomes and prevention. Dr. Willig's research

interests include quality improvement and medical informatics, as well as the design of software to enhance research and education. This includes incorporation of data from mobile devices (smartphones, etc.) into research. He is an active collaborator with Dr. Jeff Curtis of the UAB Division of Clinical Immunology and Rheumatology.

Yang Yang, PhD (Dept Pathology). ***Translational Research in Bone and Multiple Myeloma.*** Dr. Yang's research focuses on bone microenvironment and cancer, specifically, multiple myeloma bone metastasis. His lab investigates the role of Syndecan-1 heparan sulfate proteoglycan, Heparanase, and, most recently, Runx2.

Majd Zayzafoon, MD, PhD (Dept Pathology). ***Tumor-stroma Interaction and Regulation of Tumor Microenvironment.*** Dr. Zayzafoon's research expertise is molecular mechanisms of prostate cancer bone metastases and osteosarcoma. His lab focuses on understanding tumor-stroma interaction with the goals of defining its pathobiology and discovering novel targets that regulate tumor microenvironment for the treatment of cancer. He is an Associate Director of the CAMBAC, and former Director of the Center for Metabolic Bone Diseases.

Jianyi (Jay) Zhang, MD, PhD. T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership; Professor and Chair, Department of Biomedical Engineering, School of Engineering. Research Theme: Bone, cartilage, muscle and connective tissue. Dr. Zhang has expertise in the fields of myocardial bioenergetics, biomaterial, and stem cells for cardiac repair. Other research interests include scaffold for enhanced delivery of stem cell therapy in failing hearts and in vivo bioenergetics in hypertrophied and failing ventricle. Although his work focuses on the heart, he is actively building a program with the School of Engineering that will include research on stem cells and repair/regeneration of cartilage and bone.

G3. Mentors in Training

Stella Aslibekyan, PhD (Dept Epidemiology, School of Public Health). ***Epidemiology of Chronic Disease.*** Dr. Aslibekyan's research focus is on the intersection of environmental factors and the use of -omics systems biology (i.e. genomics, epigenomics, transcriptomics) to determine their role on chronic disease; specifically, how genes interact with treatment and lifestyle variables in the etiology of rheumatoid arthritis.

Andre Ballesteros-Tato, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Therapeutic use of IL-2 in SLE.*** One of Dr. Ballesteros' research areas is the potential therapeutic use of low doses of IL-2 in systemic lupus erythematosus. His recent findings indicate that exogenous IL-2 administration prevents aberrant accumulation of follicular helper T cells (Tfh) and germinal center B cells in lupus-prone mice. He has an NIH R01 to examine the T-Cell-dependent B Cell response to influenza.

Krista R. Casazza, PhD, RD (Dept Pediatrics). ***Optimization of Musculoskeletal System During Puberty.*** Dr. Casazza's training and expertise lie in the intersection of nutrient delivery and utilization and the musculoskeletal system in pediatrics. She is interested in the relationship between fat and bone, and cross-talk between tissues during pubertal transition. She is PI of a K99/R00 grant from NIH.

Maria Danila, MD, MSc, MSPH (Dept Medicine/Clinical Immunology and Rheumatology). ***Personalized Medicine/Outcomes in Rheumatoid Arthritis.*** Dr. Danila's research focus is personalizing the care of patients with rheumatic diseases. She is interested in developing prediction models for disease outcomes in rheumatoid arthritis and other rheumatic diseases using clinical, proteomic and genetic data. She is PI of an NIH K23 grant.

Jennifer J. DeBerry, PhD. Assistant Professor, Division of Molecular and Translational Biomedicine, Department of Anesthesiology and Perioperative Medicine, School of Medicine. Research Theme: Neurobehavioral medicine. Dr. DeBerry's research is focused on understanding the sensory pathways and mechanisms underlying urinary bladder pain and dysfunction, which has direct applicability to chronic pain in rheumatic and musculoskeletal diseases.

Lauren Graham, MD, PhD. Assistant Professor, Department of Dermatology, School of Medicine. Research Theme: Bone, cartilage, muscle and connective tissue. Dr. Graham completed a Dermatology residency at Northwestern University, with a research interest in scleroderma, mentored by Drs. John Varga and Monique Hinchcliff in the Division of Rheumatology. Her clinical interests include fibrotic skin diseases (morphea, scleroderma), and the intersection of diseases in dermatology and rheumatology.

Beatriz Y. Hanaoka, MD. Assistant Professor, Division of Clinical Immunology and Rheumatology, Department of Medicine, School of Medicine. Research Theme: Bone, cartilage, muscle and connective tissue. Dr. Hanaoka is an NIH K23 awardee who is conducting clinical studies on skeletal muscle function and physical activity in patients with rheumatic diseases, particularly rheumatoid arthritis. More specifically, she is investigating if insulin resistance is an underlying cause of skeletal muscle dysfunction in RA patients by conducting clinical trials utilizing an insulin sensitizer.

Beatriz León-Ruiz, PhD (Dept. Microbiology). ***In Vivo Regulation of T cell and B cell Responses in Rheumatoid Arthritis.*** One of Dr. Leon's research interests is new methods to identify autoreactive B cells with the long-term goal of using these reagents to determine how autoreactive B cell develop and cause pathology in RA. She is exploring mechanisms to either improve antigen presentation by dendritic

cells to elicit extensive T-cell responses with therapeutic effects. She has an NIH R01 to examine the regulation of T cell responses to allergens and environmental microbes.

Richard J. Reynolds, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Genetics of Inflammatory Diseases.*** Dr. Reynold's research focus includes the association of HLA DRB1 with RA in African Americans, and gene-environment interactions in gout and hyperuricemia. He is PI of an NIH K01.

Lizhong Wang, PhD (Dept Genetics). ***Genetics and Epigenetics of Cancer.*** Dr. Wang's research focus is on cancer genetics and molecular epidemiology. Dr. Wang has a broad background in cancer and autoimmune genetics and genomics.

Amy Weinmann, PhD (Dept Microbiology). ***Regulation of Immune Cell Fate.*** Dr. Weinmann's research is focused on the T-box and BTB-ZF transcription factor families, which are required to promote cellular transitions in numerous developmental systems. Dr. Weinmann and colleagues have defined a novel role for the T-box transcription factor family in establishing the epigenetic states that are required for cellular transition.

Robert Welner, PhD. Assistant Professor, Division of Hematology and Oncology, Department of Medicine, School of Medicine. Research Theme: Genetics and functional genomics. Dr. Welner's research is focused on stem cell biology, transcription factors, and gene regulation differences between normal adult cells and their diseased counterpart. His research projects investigate the role of steady-state and perturbed microenvironments on hematopoetic stem cell self-renewal and differentiation, and more importantly the interplay between these contradictory forces within the stem cell niche, particularly applied to leukemia.

Huifeng Yun, PhD. Assistant Professor, Department of Epidemiology, School of Public Health. Research Theme: Epidemiology, outcomes and prevention. Dr. Yun is a biostatistician and epidemiologist who is an active member of the UAB Pharmacoepidemiology and Economic Research (PEER) group, which is co-led by Dr. Jeff Curtis of the UAB Division of Clinical Immunology and Rheumatology. The PEER group specializes in the design and implementation of research using large administrative claims and other databases. Dr. Yun's current research interests are comparative effectiveness and pharmacoepidemiology with a focus on medications used to treat rheumatoid arthritis and osteoporosis.

Nabiha Yusuf, PhD (Dept Dermatology). ***Mechanisms Involved in Regulation of Cytokine Genes in Psoriasis***. Dr. Yusuf's research is the mechanism of gene regulation in psoriasis. The ultimate goal of these studies is to define the role of TLR4 in the development of immune suppression after UV radiation, and to identify genetic loci that are involved in these processes and to develop immune-preventive and immunotherapeutic approaches toward them.

Ping Zhang, PhD (Dept Pediatric Dentistry, School of Dentistry). ***Mechanisms of Periodontal Bone Loss.*** Dr. Zhang's primary interest lies in understanding the innate regulation of inflammation and bone loss in the pathogenesis of periodontitis. Her current research focus is on the underlying signaling events regulating the functional interactions between inflammation and osteoclastogenesis in the context of infection with periodontal pathogens.