BOSTON MEDICAL CENTER

EXCEPTIONAL CARE. WITHOUT EXCEPTION.

BOSTON UNIVERSITY

BOSTON UNIVERSITY CHOBANIAN & AVEDISIAN SCHOOL OF MEDICINE

RHEUMATOLOGY

FELLOWSHIP VIRTUAL TOUR: TINYURL.COM/4JRWMF26

Welcome to Boston University Rheumatology Fellowship Program

Program Mission:

The BUMC Rheumatology fellowship program mission is to train rheumatologists who can accurately diagnose both common and rare rheumatic diseases, deliver compassionate care to people with these diseases based on evidence and accounting for the individual's social circumstances, and critically evaluate and engage in emerging research

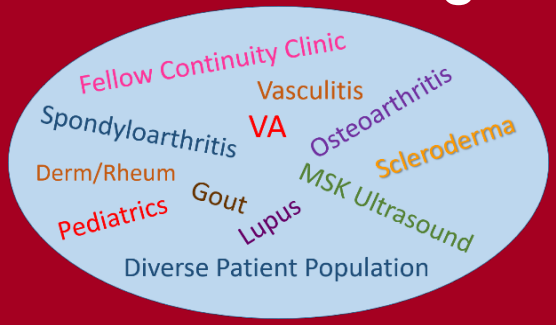
Program Aims:

- To train fellows in the diagnosis and treatment of both common and rare rheumatic diseases including through multidisciplinary care.
- To expose fellows to research methodologies that include clinical, translational, and basic science research concepts.
- To prepare fellows for the use of imaging technologies in clinical practice.
- To engage fellows in a diverse and multicultural training experience which allows them to understand the impact of social and cultural circumstances on health outcomes.

Boston University Chobanian & Avedisian School of Medicine Rheumatology

FELLOWSHIP PROGRAM

Clinical Training



Education Highlights

MSK US Training Course • Cadaveric Injections • Board Review • Physical Exam • Radiology • Research Training • Epidemiology/Biostatistics • Journal Club • Pulmonary-Rheum Rounds • Derm-Rheum Rounds

Fellow Research Training

Research *ACCELERATOR*
Methodology Journal Club
Dedicated Research Mentors
CTSI
T32

Faculty Honors & Awards

Tuhina Neogi: *2022 OARSI Clinical Research Award; Honorary doctorate, Faculty of Medicine of Lund University; Cohen Professor of Rheumatology*
David Felson: *Evans Distinguished Professor of Medicine*
Maureen Dubreuil: *Education Chair and Board Member, SPARTAN*
Eugene Kissin: *ACR Change Maker*
Drs. Felson, Kissin, Neogi, & York: *Boston Top Docs*
Jean Liew: *AxSpA Investigator Award*
Michael York: *Evans Clinician designation*
Reza Jafarzadeh: *RRF Innovative Research Award*

Research

NIH T32 Fellow Research Training Grant Scholars: 18 in last 11 years

Fellows & Post-Docs:
90%: Academic Careers
32 grants
>190 publications

Faculty 2022-2023

Publications: >180
Grants: >$26 million

Faculty Directory 2023

Andreea Bujor, MD, PhD
Assistant Professor of Medicine
Specialty: Scleroderma, gout
Andreea.Bujor@bmc.org 617-358-6783

Monica Crespo-Bosque, MD
Assistant Professor of Medicine
Specialty: Systemic lupus erythematosus
Monica. Crespoi@bmc.org 617-358-9662

Maureen Dubreuil, MD
Assistant Professor of Medicine
Specialty: Epidemiology, spondyloarthritis, pharmacoepidemiology
mdubreui@bu.edu 617-358-9659

David T. Felson, MD, MPH
Professor of Medicine and of Epidemiology, Chief of Clinical Epidemiology
Specialty: Clinical epidemiology/public health/OA
dfelson@bu.edu 617-358-9650

Elizabeth Greaf, DO
Instructor of Medicine
Specialty: Gout, systemic lupus erythematosus, systemic sclerosis
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Kyu Chan Kim, MD
Assistant Professor of Medicine
Specialty: Hip arthritis
bevochan@bu.edu

Eugene Kissin, MD
Professor of Medicine, Fellowship Program Director
Specialty: Education, musculoskeletal ultrasound, spondyloarthritis
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Caryn Libbey, MD
Clinical Associate Professor of Medicine
Specialty: Amyloidosis
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Jean Liew, MD
Assistant Professor of Medicine
Specialty: axSpA and cardiovascular comorbidity
Jean.Liew@bmc.org

Tuhina Neogi, MD, PhD, FRCPC
Professor of Medicine and of Epidemiology, Section Chief Rheumatology
Specialty: Epidemiology, osteoarthritis, gout and other crystal related arthritis, pain mechanisms
tneogi@bu.edu 617-358-9650

Marcin Trojanowski, MD
Assistant Professor of Medicine
Specialty: Scleroderma and CTD-ILD
trojanma@bu.edu 617-358-6784

Michael York, MD
Assistant Professor of Medicine, Clinical Director, Quality Leader
Specialty: Scleroderma, sarcoidosis
mikyork@bu.edu 617-358-3938

Sali Merjanah, MD
Assistant Professor of Medicine
Specialty: Axial Spondyloarthritis (axSpA)
Sali.merjanah@bmc.org

Tuhina Neogi, MD, PhD, FRCPC

Professor of Medicine and of Epidemiology
Section Chief, Rheumatology
Section of Rheumatology
Boston University School of Medicine
650 Albany Street, 2nd floor
Boston, MA 02118

Dr. Tuhina Neogi is Chief of Rheumatology at Boston Medical Center, and is a Professor of Medicine and of Epidemiology at Boston University Schools of Medicine (BUSM) and of Public Health (BUSPH). As a rheumatologist and PhD-trained epidemiologist, her research focuses on osteoarthritis and gout, pain mechanisms in osteoarthritis, and methodologic issues of relevance for rheumatic diseases. She is a past chair of the FDA Arthritis Advisory Committee, serves or has served on the boards of international societies (Crystal-Associated Diseases Network (G-CAN), Osteoarthritis Research Society International (OARSI)), and on committees for the American College of Rheumatology (ACR) and International Association for the Study Pain (IASP), among others. Her work was recognized with the 2014 ACR Henry Kunkel Young Investigator Award for outstanding and promising independent contributions to rheumatology research. She has led or engaged in development of new classification criteria for a number of rheumatic diseases, and has led national ACR treatment guidelines for gout and osteoarthritis. In addition to research and clinical care, Dr. Neogi mentors early stage researchers.

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Twitter: @Tuhina_Neogi

Eugene Y. Kissin, MD

Professor of Medicine
Program Director, Rheumatology Fellowship Program
Director, MSK Ultrasound Training
Section of Rheumatology
Boston University School of Medicine
72 East Concord Street, 5th floor
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I serve as the Program Director for the Rheumatology Fellowship Program and have a shared focus in medical education and in musculoskeletal ultrasound development. I helped found and lead the training program for USSONAR, the preeminent group for musculoskeletal ultrasound education in North America. I was selected to the American College of Rheumatology (ACR) Core Expert Panel for appropriateness criteria for musculoskeletal ultrasound use in rheumatology as well as the ACR musculoskeletal ultrasound task force and RhMSUS Development Project for musculoskeletal ultrasound certification. In addition, I am responsible for education of the medical students and residents at Boston University Medical Center. I am currently leading research projects on musculoskeletal examination learning, ultrasound use for diagnostic procedures, and ultrasound use for diagnosis of salivary gland disease.

https://profiles.bu.edu/Eugene.Kissin

Andreea Bujor, MD

Assistant Professor of Medicine
Section of Rheumatology
Boston University School of Medicine
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Dr. Andreea Bujor is an Assistant Professor in Boston University Medical Center. She is a clinical rheumatologist and a physician scientist with advanced training in scleroderma. Dr. Bujor is the supervising attending for the first year Rheumatology fellows during their continuity clinic, and is actively engaged in the didactic core curriculum experience. In addition to teaching summer lecture series and the weekly board reviews, Dr. Bujor also mentors fellows in scholarly activities, through her basic and translational research laboratory. Her research in scleroderma myeloid dysfunction and fibrosis has been recognized as outstanding by the Rheumatology Research Foundation, receiving the Investigator Award with Malawista designation in 2020. Additionally, she has received the American Heart Association Career Development Award in 2020, and the Scleroderma Clinical Trials Consortium Travel award in 2019 with her project in scleroderma cardiomyopathy.

https://profiles.bu.edu/Andreea.Bujor

Monica Crespo-Bosque, MD

Assistant Professor of Medicine
Co-Director, Rheumatology Multidisciplinary Lupus Program
Section of Rheumatology
Boston University School of Medicine
650 Albany Street, 2nd floor
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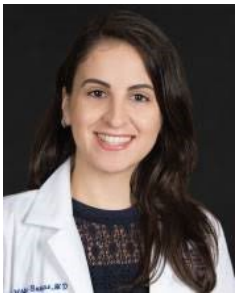

Dr. Crespo-Bosque is an Assistant Professor in Boston University Medical Center. She completed her residency at Boston Medical Center, and went on to do her Fellowship at John Hopkins. Dr. Crespo-Bosque became a faculty member in 2019 with a clinical focus is lupus.

Specialty: Lupus

https://profiles.bu.edu/Monica.CrespoBosque

Maureen Dubreuil, MD, MSc

Assistant Professor of Medicine
Director, Research Training
Chair, Rheumatology Fellow Research Oversight Committee
Section of Rheumatology
Boston University School of Medicine
650 Albany Street, 2nd floor
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Dr. Dubreuil is a rheumatologist, specializing in spondyloarthritis. She works within the Section of Rheumatology at Boston University School of Medicine, where her research focuses on comorbidities and pharmacoepidemiology of spondyloarthritis. In 2013, she was awarded the Arthritis Foundation Clinical to Research Transition Award and in 2016, she began work on a K23-funded project to study patient preferences and the cost-effectiveness of treatment modalities for spondyloarthritis, to inform both clinical care and policy decisions. She is a member of the Spondyloarthritis Research and Treatment Network (SPARTAN), and of the Assessment of Spondyloarthritis International Society (ASAS), and serves on the Early Career Investigator Subcommittee of the American College of Rheumatology.

https://profiles.bu.edu/Maureen.Dubreuil

David Felson, MD, MPH

Professor of Medicine
Director, CTSI Training Program
PI, BU MCRC
Section of Rheumatology
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Dr. Felson is the Principal Investigator, Multidisciplinary Clinical Research Center Grant; Director, Clinical Translational Science Award Training Program; Associate Director, Boston University CTSI. His research interests include: understanding how to prevent and treat osteoarthritis. In osteoarthritis, Dr. Felson's interests include studying whether treatments for rheumatic diseases are effective and particularly in osteoarthritis, identifying biomechanical risk factors for disease and testing biomechanical treatments and characterizing MRI features of normal knees and knees with pain. He also studies outcome measurement in rheumatic disease and has focused in this work on rheumatoid arthritis trials.

https://profiles.bu.edu/David.Felson

Elizabeth Graef, DO

Instructor
Section of Rheumatology
Boston University School of Medicine
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Dr. Graef a clinical rheumatologist. Her primary clinical interests include gout, systemic lupus erythematosus, systemic sclerosis, and patient safety.
In addition to her clinical work, Dr. Graef is a current member of the Global Rheumatology Alliance (GRA) and serves on the Clinical and Scientific Committee. Through this international collaborative research group, she has co-authored more than ten publications since March 2020 on topics related to COVID-19. These projects have involved data collected from international surveys of rheumatology trainees and physician reported cases of patients with rheumatic disease who contracted COVID-19. She is currently working on a focused analysis of patients with gout who were entered into the physician registry.

https://profiles.bu.edu/Elizabeth.Graef

Kyu Chan Kim, MD

Assistant Professor of Medicine
Section of Rheumatology
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Kyu Chan Kim, MD is an Instructor of Rheumatology (Arthritis) at Boston University School of Medicine. Dr. Kim attended medical school at Tulane University School of Medicine. He was trained in the Boston University Rheumatology Fellowship. His research interest is in hip osteoarthritis and he has been a recipient of funding from the Rheumatology Research Foundation. He is also a musculoskeletal ultrasound trained rheumatologist and has helped many fellows earn their USSONAR certification.

https://profiles.bu.edu/KyuChan.Kim

Caryn Ann Libbey, MD

Associate Professor of Medicine
Section of Rheumatology
Boston University School of Medicine
725 Albany Street, 6th floor
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Caryn Ann Libbey, MD is an Associate Professor of Rheumatology (Arthritis) in the Department of Medicine at Boston University School of Medicine. She also is a practicing rheumatology specialist. She received her MD from Tufts University School of Medicine. Dr. Libbey is board certified in internal Medicine and rheumatology. She has special interest in rheumatoid arthritis, osteoporosis, and amyloidosis, scleroderma, systemic lupus erythematosis, Kawasaki Disease and other rheumatic diseases of the joints, soft tissue, and connective tissue.

Dr. Libbey has been in practice for more than 20 years and has affiliations with Maine Veterans Affairs Medical Center, Southern New Hampshire Medical Center, St. Joseph Hospital-Nashua, Boston Medical Center, Bedford Veterans Affairs Medical Center, Edith Nourse Rogers Memorial Veterans Hospital. She is a preceptor for the Rheumatology Fellows at the VA in addition to presenting at Grand Rounds and Fellows Lectures.

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Jean Liew, MD, MS

Assistant Professor of Medicine
Section of Rheumatology
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Dr. Jean Liew graduated from the University of Texas at Austin with degrees in Biology and English and went on to earn her MD at the University of Texas Medical Branch in Galveston, TX. She then relocated to the Pacific Northwest to complete an Internal Medicine residency at Oregon Health & Science University in Portland, OR followed by rheumatology fellowship at the University of Washington in Seattle, WA. She concurrently earned an M.S. in Epidemiology through the University of Washington School of Public Health. During her fellowship, the primary focus of her research was in axial spondyloarthritis (axSpA), specifically AS, and cardiovascular comorbidity.

As a member of the COVID-19 Global Rheumatology Alliance (GRA) and a member of its Steering Committee, she is involved in multiple projects relating to data collection, analysis, and dissemination of the impact of the COVID-19 pandemic on individuals with rheumatic disease. In addition to co-authorship on publications from the GRA provider-entered registry, she has co-led a literature review on acute viral respiratory adverse effects of commonly used anti-rheumatic medications, and several peer-reviewed or invited commentaries on data for the use of hydroxychloroquine in COVID-19.

https://profiles.bu.edu/Jean.Liew

Maria Trojanowska, PhD

Professor of Medicine
Director, AADRC
Section of Rheumatology
Boston University School of Medicine
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Dr. Trojanowska's research is aimed at understanding the molecular and cellular mechanisms that regulate ECM synthesis in healthy tissues and in pathological conditions such as fibrosis and tumorigenesis. The majority of her studies focus on the pathogenesis of scleroderma, an autoimmune disease characterized by vascular abnormalities and a prominent fibrosis of the skin. Her laboratory uses molecular and cellular approaches and various experimental models to elucidate the mechanisms responsible for uncontrolled ECM deposition and vessel degeneration in scleroderma. The second area of investigation is related to activation of tumor stroma. These studies examine the molecular mechanisms that mediate controlled regulation of ECM turnover in healthy connective tissue and are responsible for dysregulation of this process during tumorigenesis. Recent studies together with Dr. Lafyatis are examining the role of ER stress in systemic sclerosis.

https://profiles.bu.edu/Maria.Trojanowska

Marcin Trojanowski, MD

Clinical Assistant Professor of Medicine
Director, Rheumatology Clinic
Director, Scleroderma Clinical Trials Program
Section of Rheumatology
Boston University School of Medicine
72 East Concord Street, 5th floor
Boston, MA 02118

Marcin Trojanowski, MD is a Clinical Assistant Professor of Medicine in Rheumatology at Boston University School of Medicine. He has a decade of experience in treatment of systemic sclerosis as well as a passion for medical teaching.

Prior to his arrival at BUMC, Dr. Trojanowski was the head of the Scleroderma Clinic at UAB where he was the primary referral in the region. In this role he carved out a regional role in both systemic sclerosis as well as CTD-ILD. At BUMC, he has overseen an ever-expanding role within the scleroderma clinic. He also serves as the Clinical Director of the Division of Rheumatology.

Dr. Trojanowski has worked on many translational and epidemiological research studies such as the Genome Research in African American Scleroderma Patients (GRASP). He has participated in directly sponsored pharmaceutical research as the principle and sub investigator of dozens of drug trials in systemic sclerosis, systemic lupus and more recently COVID 19.

In education, Dr. Trojanowski excelled at UAB as a top ten teacher in the Department of Medicine as well as a leading teacher in the Division of Rheumatology. He was a member of the Strategic Committee on Education at UAB Department of Medicine. At Boston University, Dr. Trojanowski is the director of the rheumatology musculoskeletal module for the second-year medical students and has developed a multidisciplinary problem-based learning module for first-year students.

Chief Clinical Interests: Systemic Sclerosis, Connective Tissue Diseases, and Lung Disease in Connective Tissue Disease

https://profiles.bu.edu/Marcin.Trojanowski

Michael R. York, MD

Assistant Professor of Medicine
Co-Director, Rheumatology Multidisciplinary Lupus Program
Section of Rheumatology
Boston University School of Medicine
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Our group is currently investigating the role of the innate immune system on the development of systemic sclerosis (scleroderma). This disease is characterized by thick skin and scarring of internal organs such as the lungs as well as vascular problems such as Raynaud's phenomenon, pulmonary hypertension and gangrene. We are trying to determine how the immune system causes these problems and develop new therapeutics to treat this disease.

We are currently focusing on how dysfunction of the patient's immune system occurs and how this leads to vascular and fibrotic disease. We are focusing on receptors of the innate immune system called toll-like receptors that typically recognize viral or bacterial DNA or RNA. Recently it has been found that immune complexes found in patients with systemic lupus erythematosus or scleroderma can trigger these receptors by allowing self-DNA or RNA to enter cells, thereby overcoming some of the protective mechanisms preventing the host to develop an immune response against itself.

https://profiles.bu.edu/Michael.York

Sali Merjanah, MD

Assistant Professor of Medicine
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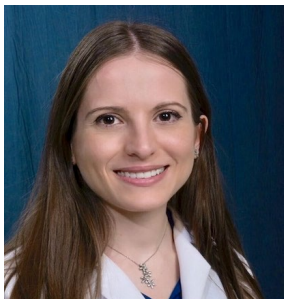

Dr. Merjanah completed her Internal Medicine residency at Case Western Reserve University/Metro Health in Cleveland, OH followed by rheumatology fellowship at Boston University. She is a clinical rheumatologist and her primary clinical interests include spondyloarthritis and inflammatory myositis. She is also a musculoskeletal ultrasound trained rheumatologist and has completed the Ultrasound School of North American Rheumatologists (USSONAR) training program.

In addition to her clinical work, the primary focus of her research is axial spondyloarthritis (axSpA), specifically malignancy risk in AxSpA, fracture risk in AS and major adverse cardiovascular events in spondyloarthritis patients with JAKib use. She is currently involved in the development of SPARTAN referral recommendations for axSpA and the new ACR guidelines for treatment of AxSpA.

BUSM Rheumatology Research Studies *2022/2023*

The Section of Rheumatology has a large, well-funded active research portfolio.

This document contains the following information: overview of the research foci of our faculty; current funded studies; examples of clinical trials; examples of epidemiology/observational datasets/cohorts; biorepository studies/registries; VA studies; examples of completed studies

Overview of Research Foci

Our Clinical Research Program focuses on performing and promoting high-quality research using advanced epidemiologic methods to explore the causes of, therapy for, and consequences of rheumatic and musculoskeletal diseases. Learn more here: https://www.bumc.bu.edu/bostonmcrc/ and see below for examples of studies.

Our Basic Science and Translational Research Program focuses on performing and promoting high-quality research to identify novel pathways and mechanisms of relevance to rheumatic diseases, including fibrosis, vasculopathy, inflammation, and alterations in innate and adaptive immunity. Learn more here: https://www.bumc.bu.edu/rheumatology/research/arthritis-autoimmune-diseases-research-center/.

Our faculty are also involved in clinical trials for a number of rheumatic diseases, including both drug and adjunctive therapies. We actively engage in clinical trials in rheumatic diseases, including scleroderma, lupus, gout, osteoarthritis and most recently, COVID19 trials. Our faculty also advise on clinical trials design. We list some examples below.

Current Funded Grants *(listed in PI alphabetical order); clinical trials listed separately)*

Machine-Learning Analysis of Wearable-sensor Gait Data in Osteoarthritis
Strategies applied to data from multiple wearable sensors during gait will provide new and unique insights into gait abnormalities in those with knee OA, including signs of gait change in early OA, and will identify elements of gait that increase the risk of function loss, pain and pathology in knees and adjacent joints
PI: Katherine Bacon *Funded by Rheumatology Research Foundation (RRF)*

The Role of Fli1 in myeloid cells and its contribution to cardiac fibrosis
To establish whether targeting Fli1 represents a potential therapeutic intervention in SSc organ fibrosis and SSc-CMP
PI: Andreea Bujor *Funded by NIH/NHLBI R01 HL155955*

Spatial frequency domain imaging as a new method to quantify skin changes in scleroderma
To validate SFDI as a sensitive method to quantify skin fibrosis in SSc patients
PI: Andreea Bujor *Funded by Scleroderma Foundation*

The role of lymphatic ERG deficiency in pulmonary fibrosis
To study determine if ERG is essential for lymphatic function homeostasis and loss of ERG expression leads to lymphatic rarefaction.
PI: Adri Chakraborty *Funded by Scleroderma Foundation*

VOCES: A Peer Advocacy Program
To qualitatively assess barriers to effective patient-provider communication between Latinx patients and rheumatology providers.
PI: Monica Crespo-Bosque *Rheumatology Research Foundation*

Effects of Janus kinase inhibitors on structural and safety outcomes in spondylarthritis
Rheumatology Competitive Grant Program
PI: Maureen Dubreuil *Pfizer Inc.*

BUSM Rheumatology Research Studies *2022/2023*

Delay in diagnosis of ankylosing spondylitis
To determine whether time to ankylosing spondylitis diagnosis from first clinically documented back/spine symptom or extraspinal manifestation differs according to patients' self-reported gender, race or ethnicity
PI: Maureen Dubreuil *Arthritis Foundation*

Risk of Fractures and Joint Replacement Surgeries with TNF-inhibitor Use in Ankylosing Spondylitis
Assess rates of adverse events among patients with ankylosing spondylitis in 3 large datasets, related to medication category
PI: Maureen Dubreuil *Funded by NIH/NIAMS R03 AR076495*

Program to Understand the Long-Term Outcomes of Spondyloarthritis (PULSAR) VA Registry
Establish a national registry of patients with spondyloarthritis and related conditions at the VA
PI: Maureen Dubreuil

SPARTAN Referral Project
Develop evidence based guidelines for the referral of adults with chronic back pain for evaluation by a rheumatologist
PI: Maureen Dubreuil *Funded by SpondyloArthritis Research and Treatment Network*

Multicenter Osteoarthritis Study (MOST) Second Renewal - Boston University
A multicenter observational project evaluating the relation of risk factors to the development or progression of symptomatic knee OA and examining the consequences of knee OA
PI: David Felson *Funded by NIH/NIA U01 AG18820*

Fat, Fiber and Knee Osteoarthritis
Understand the relation of various lipids and dietary fiber to risk of knee OA
PI: David Felson *Funded by NIH/NIAMS R01 AR071950*

Dietary Factors in Knee Osteoarthritis and Chondrocalcinosis: Magnesium and Omega-3 Fatty Acids
Evaluate the relation of dietary and supplement intake of magnesium and omega-3 fatty acids to knee OA and to chondrocalcinosis across several cohorts
PI: David Felson *Funded by NIH/NIAMS R01 AR071950*

Boston University CCCR
To carry out and disseminate high-level clinical research informed both by state of the art clinical research methods and by clinical and biological scientific discoveries. Ultimately, we aim either to prevent the diseases we are studying or to improve the lives of those living with the diseases
PI: David Felson *Funded by NIH/NIAMS P30 AR072571*

Bayesian approaches to identify persons with osteoarthritis in electronic health records and administrative health data in the absence of a perfect reference standard
Accurate characterization of osteoarthritis, the most prevalent form of arthritis and a leading cause of disability, in administrative health data is needed to study its public health burden, economic impact, cost of care, inequities in care, and adherence of care to guidelines and attendant comorbidities. Case finding algorithms for osteoarthritis had limited success, often missing more than half of cases, leading to widespread underreporting of osteoarthritis. This project develops Bayesian approaches to accurately identify persons with osteoarthritis from electronic health records and administrative health data
PI: S. Reza Jafarzadeh *Funded by NIH/NIAMS R21 AR081442*

Drug Repurposing to Prevent Posttraumatic Osteoarthritis
This project aims to employ innovative data-driven and pharmacoepidemiology methods to explore the potential repurposing of drugs for prevention of posttraumatic osteoarthritis
PI: S. Reza Jafarzadeh *Funded by the Arthritis Foundation*

Novel Bayesian approaches to identify persons with osteoarthritis in administrative data in the absence of a reference standard

BUSM Rheumatology Research Studies *2022/2023*

This project aims to develop a Bayesian algorithm that allows for estimating the probability of osteoarthritis in an individual by utilizing the conditional dependence of diagnosis and procedure codes within a large administrative database, without requiring chart review or a reference standard
PI: S. Reza Jafarzadeh *Funded by Rheumatology Research Foundation*

Curriculum to Grow Diversity in the Rheumatology Workforce: Boston University Rheumatology
Improved recruiting of URiM residents to rheumatology fellowship is critical to the development of a diversified rheumatology workforce. To achieve this aim, more URiM medical student need exposure to rheumatology. We address these issues through an innovative curriculum to attract URiM residents/medical students to the field of rheumatology through an intensive month-long curriculum of training musculoskeletal anatomy, physical examination, radiography and ultrasound examination that will be delivered in a virtual environment. The PIs and mentors will develop web-based modules in musculoskeletal radiograph interpretation (9 modules), musculoskeletal ultrasound use (8 modules), and surface anatomy and musculoskeletal physical examination (8 modules) to be used as part of this curriculum.
PI: Eugene Kissin *Funded by Arthritis Foundation*

The impact of tumor necrosis factor inhibitor use on cardiovascular events in ankylosing spondylitis
To study the impact of common AS therapies (NSAIDs and tumor necrosis factor inhibitors) on cardiovascular risk factors, (including hypertension), and cardiovascular outcomes (including MI)
PI: Jean Liew *Funded by SPARTAN*

The impact of Axial Spondyloarthritis Treatment on Chronic Opoid Use
To inform clinical practice by evaluating interventions that improve axSpA outcomes
PI: Jean Liew Funded by Rheumatology Research Foundation

Epigenetic gene repression in pulmonary fibrosis
Address the role of epigenetic gene repression in regulating fibroblast activation and lung fibrosis development
PI: Giovanni Ligresti *Funded by NIH/NHLBI R01 HL142596*

Targeting vascular dysfunction to promote lung repair and fibrosis resolution
To investigate the contribution of molecular abnormalities we have discovered in the lung vasculature toward our long term goal of identifying novel targets for the treatment of IPF
PI: Giovanni Ligresti Funded by NIH/NHLBI R01 HL158733

The Role of Urate in Knee Osteoarthritis-Related Inflammation, Pathology and Pain
To determine the role urate plays in the pathophysiology of OA
PI: Tuhina Neogi *Funded by NIH/NIAMS K24 AR070892*

CAPSITE: Community Assessment of Pain and Sensitization in the Elderly
To determine the co-occurrence of multiple chronic pain conditions, and relation of pain sensitization and inflammation to such co-occurrence in older adults.
PI: Tuhina Neogi *Funded by NIH/NIA R01 AG066010*

PRROPS: Pathways of Risk and Resilience for Overlapping Pain and Sensitization
The relation of multisensory sensitivity; autonomic function; resilience, sleep, and physical activity to COPC, QST-assessed pain processing and evolution of chronic pain over time; and to study heritability of QST abnormalities
PI: Tuhina Neogi *Funded by NIH/NINDS R01 NS121419*

Pain in community-based older African American Adults: The Jackson Heart Study

BUSM Rheumatology Research Studies *2022/2023*

To evaluate chronic pain conditions in a community-based older adult AA cohort, the Jackson Heart Study (JHS), to determine the prevalence, correlates, and consequences of chronic overlapping pain
PI: Tuhina Neogi *Funded by NIH/NIA R01 AG066914*

Healthy Knee Aging Vs. Osteoarthritis in Three Large Diverse Cohorts: What Is the Clinical Relevance of Structural Changes Seen on Radiographs?
To identify natural history of joint related changes with aging
PI: Tuhina Neogi *Funded by NIH/NIAMS R01 AR078187*

Boston University Rheumatology Research Training (BURRT) T32 Program
To provide a comprehensive two-year multidisciplinary training program in rheumatic and musculoskeletal diseases for postdoctoral MD and PhD scholars to pursue academic and scientific clinical research careers
PI: Tuhina Neogi *Funded by NIH/NIAMS T32 AR080623*

GATA-6 in Pulmonary Arterial Hypertension
Proposed study has a potential to dissect novel mechanism(s) driving PAH pathogenesis and test potential attractiveness of GATA6 as a novel molecular target for therapeutic intervention
PI: Maria Trojanowska *Funded by NIH/NHLBI R01 HL150638*

Lymphatic Erg signaling in scleroderma fibrosis
To study ERG deficiency in circulatory systems and elucidate the relationship between vasculopathy
PI: Maria Trojanowska Funded by NIH/NIAMS R01 AR080950

Examples of Clinical Trials

Lupus

A Multicenter, Randomized, Double-Blinded, Placebo-Controlled, Phase 3 Study Evaluating the Efficacy and Safety of Anifrolumab (A Monoclonal Antibody Against Type I IFN Receptor) in Adult Subjects with Active SLE

A Multicenter, Randomized, Double-Blinded, Placebo-Controlled, Phase 2 Study Evaluating the Efficacy and Safety of Anifrolumab (A Monoclonal Antibody Against Type I IFN Receptor) in Adult Subjects with Active Proliferative Lupus Nephritis

A Multicenter, Randomized, Double Blind, Placebo Controlled, Phase 3 Study To Evaluate the Efficacy and Safety of BIIB059 in Adult Participants with Active Systemic Lupus Erythematosus Receiving Background Nonbiologic Lupus Standard Of Care

Scleroderma

A Phase II, Randomized, Placebo-Controlled, Double-Blind, Open-Label Extension Multicenter Study to Evaluate the Efficacy and Safety of KD025 in Subjects with Diffuse Cutaneous Systemic Sclerosis

Genome Research in African American Scleroderma Patients (GRASP Study)

A Randomized, double-blind, placebo-controlled, repeat dose, multicenter trial to evaluate the efficacy, safety, tolerability and pharmacokinetics of HZN-825 in patients with diffuse cutaneous systemic sclerosis

COVID-19

Phase III Multicenter Randomized Double-Blind Placebo-Controlled Study to Assess the Efficacy and Safety of Canakinumab on Cytokine Release Syndrome in Patients with COVID-10 Induced Pneumonia (CAN-COVID)

BUSM Rheumatology Research Studies *2022/2023*

Osteoarthritis/MSK Pain

Wearable sensor-based outcomes following physical therapy in knee OA: A Feasibility Study (WESENS-OA)

Pain Sensitization in a Trial of Physical Therapy for OA and Meniscal Tear

Group-Based Mindfulness for Patients with Chronic Low Back Pain in the Primary Care Setting

A randomized, two-arm, placebo-controlled, participant and investigator-blinded study investigating the efficacy, safety and tolerability of DFV890 in patients with symptomatic knee osteoarthritis

A randomized, two-arm, placebo-controlled, participant and investigator-blinded study investigating the efficacy, safety and tolerability of DFV890 in patients with symptomatic knee osteoarthritis

A randomized, two-arm, placebo controlled, participant, investigator and sponsor-blinded, proof of concept study investigating the efficacy, safety and tolerability of QUC398 in patients with symptomatic knee osteoarthritis

Gout

STOP-Gout: Allopurinol versus Febuxostat Randomized Controlled Trial (in the VA system)

Boston University Registry & Repository-Based Studies

Autoimmune kidney research studies and patient registry: *8 year longitudinal study--Focus is on lupus but patients with chronic kidney disease not due to lupus and patients with autoimmune disease other than lupus are enrolled as controls; repository of biological samples and clinical data*

BioSS: This study aims to establish a repository of data and biosamples (blood and skin derived samples) from scleroderma patients and individuals without scleroderma. The overall goal of the repository is to facilitate research looking into the pathogenesis of this incurable disease.

Scleroderma center of research translation – Biomarkers: *5 year longitudinal study--Focus is on patients with scleroderma; repository of biological samples and clinical data*

National Biological Sample and Data Repository for PAH: *Creation of biobank of biological samples and clinical data, genotype and sequencing data for patients with WHO Group 1 pulmonary arterial hypertension*

United States Pulmonary Hypertension: *To characterize the demographics and clinical course of patients newly diagnosed with WHO Group I PAH in the current genomic, imaging and treatment era.*

The BMC electronic medical records system can also be utilized for research purposes.

Large Cohort Observational/Clinical Epidemiology Studies

Existing data resources available for secondary data analysis:

The Health Improvement Network (THIN) *is a longitudinal database of electronic medical records from over 11 million patients in the United Kingdom. This dataset has been used by our group for epidemiologic studies of gout, rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, fracture, joint replacement, and other rheumatic diseases, as well as non-rheumatic diseases (e.g., cardiovascular, renal, etc.). Data includes demographics, diagnoses, prescription records, and recording of labs, imaging, procedures, and hospitalizations.*

Multicenter Osteoarthritis Study (MOST) *is a longitudinal, prospective, observational study of knee OA in older Americans with OA disease or at increased risk of developing it. Clinical assessments of pain and function, among others, radiological data (x-ray and MRI), biospecimens, and other measurements are*

obtained at each visit. The overall aims of MOST are to identify novel and modifiable risk factors, such as biomechanical factors (including physical activity-related factors), bone and joint structural factors (including those assessed by MRI of the knee), and nutritional factors that affect the occurrence and progression of OA-related knee symptoms and radiographic knee OA. We are now in the 16th year of follow-up in this cohort.

Osteoarthritis Initiative (OAI) *is a multi-center, longitudinal, prospective observational study of knee osteoarthritis (OA), similar to the MOST study, with annual evaluations of clinical and radiological data from 4796 men and women ages 45-79 over a ~6-year period.*

National Inpatient Sample (NIS) *is a longitudinal dataset of hospitalizations in the United States since 1993, which includes demographics, insurance information, hospital diagnoses, procedures, and disposition.*

Framingham Osteoarthritis Study (FOS) *is a substudy of the Framingham Heart Study (FHS), comprising both the Original Cohort and Offspring Cohort. We have used data from both FHS and FOS in numerous studies, including genome-wide association studies.*

Boston University Clinical Data Warehouse *contains data from BMC inpatient and outpatient encounter, including demographics, diagnoses, prescriptions, lab & imaging tests and vital status.*

Boston Online Gout Study (BOGS) *is an internet-based study aiming to identify novel triggers for gout attacks.*

Study for Updated Gout Classification Criteria (SUGAR) *is an international cohort of crystal-proven gout subjects and comparators without MSU crystals.*

Osteoarthritis Bariatric Surgery Study (OABS) *is a locally recruited cohort of subjects with knee pain who have undergone bariatric surgery.*

Gout-Osteoarthritis Link Study (GOAL) *is a locally recruited cohort of subjects with knee osteoarthritis with and without hyperuricemia who are having synovial fluid aspiration for proteomics and ultrasound evaluation for features of inflammation.*

Other OA cohort data are available, such as Boston OA Knee Study (BOKS) and Beijing OA Study, as well as other cohort data from collaborators

VA Studies

- Spatial-frequency domain imaging, a novel method to quantify scleroderma skin fibrosis to evaluate the extent of skin fibrosis in scleroderma patients using spatial-frequency domain imaging and compare with the mRSS
- Low-Dose Naltrexone for Chronic Pain in Osteoarthritis and Inflammatory Arthritis
- Program to Understand the Long-Term Outcomes of SpondyloARthritis (PULSAR) VA Registry
- Veteran's Affairs Rheumatoid Arthritis (VARA) Registry
- VA STOP-Gout: Allopurinol vs. Febuxostat

Examples of Completed Funded Studies

The Role of Myeloid Fli1 in Organ Fibrosis in Systemic Sclerosis
Establish whether Fli1 deficiency in monocytes/macrophages contributes to SSc fibrosis & cardiomyopathy
PI: Andreea Bujor *Internal funding (AB); generation of Fli1 floxed mice funded by NIH NIAMS R01 AR42334*

Adverse Events and Comparative Effectiveness of Non-Steroidal Anti-Inflammatory Drugs
This study used a large national electronic medical record and claims database to assess the risk for adverse events associated with use of NSAIDs: 1) within the general population, and 2) among those with rheumatic conditions, relative to other medications for rheumatologic conditions
PI: Maureen Dubreuil

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Patient Preferences for Medications in Spondyloarthritis
In this study we used discrete choice experiments (conjoint analysis) to determine patient preferences for treatment options
PI: Maureen Dubreuil

Cost-Effectiveness Analysis for Spondyloarthritis Treatment Modalities
The analyses in this study were used to determine the cost-effectiveness of treatment options in spondyloarthritis
PI: Maureen Dubreuil

Development of Minimal Disease Activity Criteria in Spondyloarthritis
Examined new criteria as a disease outcome measure for observational studies and clinical trials that identifies minimal disease activity incorporating extra-spinal manifestations of disease in SpA
PI: Maureen Dubreuil

Classification of Axial Spondyloarthritis Inception Cohort (CLASSIC)
To validate the performance of current ASAS classification criteria through a prospective combined cohort of patients presenting to a rheumatologist with undiagnosed current back pain
PI: Maureen Dubreuil *Funded by SpondyloArthritis Research and Treatment Network*

Massive Weight Loss and Its Effects on Knee Pain and Knee Structure
We studied massive weight loss from bariatric surgery (BSX) and its effects on knee pain and structural pathology in knees. The specific aims were: 1) To determine whether the improvement in knee pain in those experiencing weight loss after BSX is less likely in those with specific structural findings. 2) To characterize MRI changes before and one year after massive weight loss and in comparably obese persons not undergoing BSX.
PI: David Felson

Sex Differences Related to Body Composition on Risk of Knee Osteoarthritis
This study evaluated the effect of sex differences in body composition on the differential risk of knee OA
PI: David Felson

Dynamic Treatment Regimens of Physical Activity for Persons with Osteoarthritis
To optimize physical activity intensity and duration for improving long-term osteoarthritis outcomes
PI: Reza Jafarzadeh *Funded by NIH/NIAMS R21 AR074578*

Effects of NSAIDs and Non-NSAID Analgesics on Osteoarthritis Outcomes
To study long-term effects of analgesics use on osteoarthritis progression
PI: Reza Jafarzadeh *Funded by NIH/NIA R03 AG060272*

Central Sensitization in Post-Knee Replacement Pain and Relation to Osteoarthritis Pathology
We sought to comprehensively study the association of: 1) central sensitization with pain post-knee replacement; 2) duration and severity of radiographic knee OA, and specific features of inflammation (synovitis, effusion) and mechanical load (bone marrow lesions) with sensitization.
PI: Tuhina Neogi *Funded by NIAMS R01 AR062506*

Bisphosphonate Effects in Knee Osteoarthritis
This project aimed to determine the long-term effects of bisphosphonates on the trajectory of knee OA, with a specific focus on joint-space width, bone-marrow lesions on MRI, 3D bone shape, symptoms, and knee replacement.
PI: Tuhina Neogi *Funded by Arthritis Foundation Innovative Research Grant*

Central Pain Mechanisms in Rheumatoid Arthritis
This study examined the effects of central sensitization on rheumatoid arthritis disease activity and response to therapy.
Site PI: Tuhina Neogi *Funded by NIAMS R01 AR064850*

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Pain Susceptibility Phenotypes in Knee Osteoarthritis: Risk for Development Persistent Knee Pain
The aim of this study was to determine pain susceptibility phenotypes from neurobiologic mechanisms, psychological factors, and sleep as determinants of developing persistent knee pain, to gain insights into the risk for transitioning from acute to chronic pain.
PI: Tuhina Neogi

Relation of Gastric Acid Suppression to Development of Acute CPP Crystal Arthritis (pseudogout)
This project sought to evaluate the relation of PPIs and H2 blockers to the risk of developing pseudogout and chondrocalcinosis
PI: Tuhina Neogi

Planning a Trial of Novel Footwear for Knee Osteoarthritis
The overall goal of the planning phase of this single center trial was to complete all of the scientific planning and administrative activities required to support a proposal for a trial of a novel footwear for the treatment of painful medial knee OA. Specific aims were: 1. test recruitment strategies so as to develop a recruitment plan 2. develop trial protocols; 3. create a manual of operations.
PI: David Felson *Funded by NIH R34 AR068605.*

The Framingham Osteoarthritis Study
This population-based study examined the prevalence of knee OA. Results suggest that knee OA increases in prevalence throughout the elderly years, more so in women than in men. n.
PI: David Felson *Funded by NIH/NIA AG018393*

The Osteoarthritis Before and After Bariatric Surgery Study (OABS)
Individuals with chronic knee pain often develop central and/or peripheral sensitization (altered pain processing of the nervous system). We sought to determine if knee pain and sensitization improve after massive weight loss in individuals undergoing bariatric surgery.
PI: David Felson *Funded by NIH AR43873 and AR20613, and NIH/NHLBI N01-HC-38038*

The Beijing Osteoarthritis Study
Through his colleague Dr. Nevitt and others at UCSF, linkage with a Chinese investigator, Ling Xu, at the Peking Union Medical College in Beijing, was established. NIAMS funded a study to compare knee, hip, and hand OA among Chinese to Caucasians in the Framingham study and the UCSF Study of Osteoporotic Fractures
Funded by NIH AR43873

Predictors and Consequences of Subchondral Bone Attrition in Osteoarthritis
In this study, we evaluated mechanical and systemic risk factors for bone pathology in OA including an evaluation of vitamin K's role in OA.
PI: Tuhina Neogi *Funded by NIAMS K23 AR055127*

Vitamin K Supplementation in Osteoarthritis
This was the first randomized clinical controlled trial to test whether vitamin K has a beneficial effect on hand OA
PI: David Felson, Co-I: Tuhina Neogi *Funded by Arthritis Foundation Innovative Research Grant*

Evaluating Synovitis as a Link between Knee Osteoarthritis (OA) and Muscle-Related Morbidities
Knee osteoarthritis (OA) is a common joint disease. It causes knee pain and can cause difficulty in carrying out daily activities, such as walking. The research was done to understand if changes in the knee joint fluid can cause any muscle weakness, which can perhaps lead to slower walking speed and/or decreased hand grip strength
PI: Devyani Misra *KL2 Award*

BUSM Rheumatology Research Studies *2022/2023*

A Phase II, Randomized, Placebo-Controlled, Double-Blind, Open-Label Extension Multicenter Study to Evaluate the Efficacy and Safety of KD025 in Subjects with Diffuse Cutaneous Systemic Sclerosis

PI: Marcin Trojanowski Kadmon Corporation

Combining the anti-fibrotic effects of pirfenidone (PFD) with mycophenolate (MMF) for treating scleroderma related interstitial lung disease.

PI: Marcin Trojanowski University of California, UCLA

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FELLOW PUBLICATIONS

A representative list of publications of research performed during their fellowship by current and past graduates of our fellowship-training program, highlighting the strength of the research training and successes of our fellows:

Pablo Weilg

P Waitayangkoon, Weilg P, E Kissin
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Steven C. Vlad

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Grace H. Lo

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Eugene Y. Kissin

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Boston University School of Medicine

Section of Rheumatology

Conference Abstract Presentations

2022-2023

Examples of Accepted Abstracts for

ACR and OARSI World Congress

The longitudinal association of radiographic chondrocalcinosis with location-specific cartilage loss on MRI in Knee OA: The Multicenter Osteoarthritis Study
OARSI 2023 March 17-20, 2023
Jean Liew

Development of an MRI based definition of know osteoarthritis: Data from the Multicenter Osteoarthrosis Study
OARSI 2023 March 17-20, 2023
Jean Liew

Does HSCRP provide insights into an inflammatory phenotype of knee osteoarthritis? Data from the Multicenter Osteoarthritis Study.
OARSI 2023 March 17-20, 2023
Tuhina Neogi

Gait alterations associated with worsening physical function over 2 years: A machine-learning approach in the Multicenter Osteoarthrosis (MOST) Study
OARSI 2023 March 17-20, 2023
Bacon

Prediction of structural disease progression in knee osteoarthritis from 3-D weight bearing joint space width.
OARSI 2023 March 17-20, 2023
Segal, Williams, Roques, Tonkin, Treece, Gee, Poole, Neogi, Nevitt, Lynch, Turmezei,

Comparative Effectiveness of Metformin in Preventing Posttraumatic Knee Osteroarthritis
OARSI 2023 Mary 17 -20, 2023 **POSTER**
S. Jafarzadeh, C. E. Peloquin, D. T. Felson

Longitudinal trajectories of pain sensitization in people with or at risk of knee Osteoarthritis: The Multicenter Osteoarthritis Study.
OARSI 2023 March 17-20, 2023 Oral Presentation
Kosaku Aoyagi, Na Wang, Laura Frey-Law, Cora E. Lewis, Michael Nevitt, Tuhina Neogi

Anterior knee pain is associated with 2-year compartment specific patellofemoral cartilage worsening: the MOST Study- Plenary Session
Corey Lanois, Natalie Collins, Tuhina Neogi, Ali Guermazi, Frank Roemer, Michael LaValley, Michael Nevitt, James Torner, Cora Lewis, Joshua Stefanik

Thursday, November 10, 2022

3:40-5:25PM

Session: Fellows-In-Training: Roundtables- Roundtable 05 -Career in Research I
Tuhina Neogi, MD, PhD | Facilitator |3:40-4:00PM: Location Terrace Ballroom I

Session: Fellows-In-Training: Roundtables - Roundtable 05 - Career in Research II
Tuhina Neogi, MD, PhD | Facilitator |4:00-4:20PM: Location Terrace Ballroom I

Session: Fellows-In-Training: Roundtables- Roundtable 05 -Career in Research III
Tuhina Neogi, MD, PhD | Facilitator |4:20-4:40PM: Location Terrace Ballroom I

Session: Fellows-In-Training: Roundtables- Roundtable 05 -Career in Research IV
Tuhina Neogi, MD, PhD | Facilitator |4:45-5:25PM: Location Terrace Ballroom I

Saturday, November 12, 2022

1:00-3:00PM

Session: (0403–0431) Spondyloarthritis Including PsA – Treatment Poster I: AxSpA

Bimekizumab Improves Physical Function and Health-Related Quality of Life in Patients with Axial Spondyloarthritis: Results from Two Phase 3 Studies
Maureen Dubreuil, MD | 0412 | Virtual Poster Hall |

The Association of Early TNF Inhibitor Use with Incident Cardiovascular Events in Ankylosing Spondylitis
Jean Liew, MD |0415 | Virtual Poster Hall |

3:00 PM- 3:45PM

12S124: Abstracts: Orthopedics, Low Back Pain, and Rehabilitation (0503–0505)
Joshua Stefanik, PhD, PT |Moderator |Location: Room 122

Three-dimensional Ground Reaction Force Symmetry Metrics Largely Fail to Explain Cartilage Worsening in the Contralateral Knee in Persons with Unilateral Knee Osteoarthritis: The Multicenter Osteoarthritis Study
Abstract ID: 1287940 | Presentation Type: Oral |
Patrick Corrigan, PhD, DPT | 3:10-3:15pm | Location Room 112 |

Longitudinal Trajectories of Central Pain Sensitization in People with or at Risk of Knee Osteoarthritis
Abstract ID: 1290054 | Presentation Type: Oral |
Kosaku Aoyagi, PhD, PT | 3:30-3:40pm | Location Room 112 |

12S139: Abstracts: Exemplary Interprofessional Research (0548–0553)

Identifying Subgroups of Patients Undergoing Knee Replacement
Abstract ID: 1290734 | Presentation Type: Oral |
Brooke McGinley, BS, BA | 5:30-5:40PM |Location Room 113

Sunday, November 13, 2022

8:00 – 8:20AM

Session: Critical Eye: How to Interpret Findings from Scientific Papers

Making Sense of the Statistics

Michael LaValley, PhD | Speaker | Location: Room 119

9:00 -10:30AM

Poster Session: (0833–0849) Orthopedics, Low Back Pain, And Rehabilitation Poster

Association of Tibial Acceleration During Walking to Knee Pain and Loading in Adults with Knee Osteoarthritis

Khara James, MS |0839 | Virtual Poster Hall |

Relation of PainDETECT to Unpredictable Pain in People with or at Risk of Knee Osteoarthritis

Kosaku Aoyagi, PhD, PT | 0841 | Virtual Poster Hall |

Poster Session : (1004–1034) Spondyloarthritis Including PsA – Diagnosis, Manifestations, and Outcomes Poster II

Trends in Fracture Rates Among Veterans with Ankylosing Spondylitis

Sali Merjanah, MD |1011 | Virtual Poster Hall |

10:30 – 10:50AM

Session: Rheumatology Online: Disseminating the State of the Art on Social Media

Social Media for Scientific Communication & Medical Education

Jean Liew, MD | Room 126 |Room 126

1:30 -1:35PM

Session: Ignite Session 5B

Trends in Fracture Rates Among Veterans with Ankylosing Spondylitis

Sali Merjanah, MD | 1011 | Location: Center City Stage|

1:00 -3:00PM

Poster Session: (1118–1149) Genetics, Genomics and Proteomics Poster

Epigenome-wide Analysis of Osteoarthritis in the Multicenter Osteoarthritis Study

Michelle Yau, PhD, MPH, | 1143 | Virtual Poster Hall

Poster Session: (1166–1185) Systemic Sclerosis and Related Disorders – Basic Science Poster

Downregulated Fli1 in Systemic Sclerosis Myeloid Cells Contributes to Enhanced Transendothelial Migration

Pablo Weilg Espejo, MD | 1169 | Location: Virtual Poster Hall

1:00 - 2:10PM Community Hub – Virtual Only

572: CH Crystal Arthritis: Improving Clinical Outcomes and Adherence in Gout

Tuhina Neogi, MD |Speaker | 1:00-2:pm |

585: CH Early Career: How to Make Your Data Shine: Tips and Tricks for Preparing Talks, Posters, Visual Abstracts, and Plain Language Summaries

Tuhina Neogi, MD |Speaker | 2-2:10PM|

2:05 - 2:10PM

Session: Ignite Session 6C

Gait Alterations Associated with Worsening Physical Function over 2 Years: A Machine-learning Approach in the Multicenter Osteoarthritis (MOST) Study

Kathy Bacon, PhD, MPH, | 1784 | Location: South Philly Stage

4:30 - 5:30PM

Session: Osteoarthritis (OA) and related disorders

13S163: Real-time Telehealth Consultations to Support Lifestyle Management of People with Osteoarthritis

Joshua Stefanik, PhD, PT |Moderator |Location: Room 122

6:00 - 8:30pm

Boston University ACR Alumni Reception-*Aqimero*, 10 Avenue of the Arts, Philadelphia

Monday, November 14, 2022

9:00 - 10:00AM

14M104: Ankylosing Spondylitis: Treat to Target Spondyloarthritis Including PsA

Maureen Dubreuil, MD | Moderator | Location: Terrace Ballroom II&III

9:00 - 10:30AM

Session: Osteoarthritis (OA) and related disorders

14M113: Abstracts: Osteoarthritis – Clinical (1639–1644)

Joshua Stefanik, PhD, PT |Moderator |Location: Room 120

11:00 - 12:30PM

14M162: Abstracts: Spondyloarthritis Including PsA – Diagnosis, Manifestations, and Outcomes II: Imaging (2254–2259)

Jean Liew, MD | Moderator | Location: Room 204

12:00 - 1:00PM

114M136: STATS BOOTCAMP III Interpret and Visualize Multi-dimensional Omics Data

Michelle Yau, MD | Moderator | Location: Room 119

1:00 - 2:00PM

Community Hub| Virtual | 608: CH Spondylarthritis and Psoriatic Arthritis: Best of the Posters Review

Jean Liew, MD | Speaker |Virtual

1:00 - 3:00PM

Poster Session: (1750–1786) Epidemiology and Public Health Poster III

Gait Alterations Associated with Worsening Physical Function over 2 Years: A Machine-learning Approach in the Multicenter Osteoarthritis (MOST) Study

Kathy Bacon, PhD, MPH | 1784 | Virtual Poster Hall |

Anterior Knee Pain Is Associated with 2-year Compartment Specific Patellofemoral Cartilage Worsening: The MOST Study

Corey Lanois, MS | 1786 | Virtual Poster Hall |

Poster Session: (1787–1829) Metabolic and Crystal Arthropathies – Basic and Clinical Science Poster

Frequency and Patterns of Opioid Use in the Management of Gout: A Population-Based Study

Tuhina Neogi, MD, PhD | 1810 | Virtual Poster Hall |

Poster Session: Session: (1888–1923) Osteoarthritis – Clinical Poster

Associations of Nociceptive Dysfunction with Physical Activity in Knee Osteoarthritis: The Multicenter Osteoarthritis Study

Deepak Kumar, PhD, PT | 1912 | Virtual Poster Hall |

The Association of Radiographic Chondrocalcinosis with Localized Structural Outcomes in Knee OA: The Multicenter Osteoarthritis Study

Jean Liew, MD | 1913 | | Virtual Poster Hall |

Development of an MRI-based Definition of Knee Osteoarthritis: Data from the Multicenter Osteoarthritis Study

Jean Liew, MD | 1915 | Virtual Poster Hall |

Defining Early-stage Knee Osteoarthritis: A Scoping Review

Jean Liew, MD | 1916 | Virtual Poster Hall |

Gait and Physical Activity Predictors of Knee Replacement: A Machine Learning Analysis in the Multicenter Osteoarthritis Study

Kerry Costello, PhD | 1920 | Virtual Poster Hall|

Press Conference: Virtual Only – 705: 705. Press Conference: Arthritic Disease - 1:30-2:30PM

Jean Liew, MD | Interviews |

Boston University School of Medicine

Rheumatology Conference Schedule

Evans 542 Conference Room
August 2018

1st Wednesday

8:00 am-9:00 am	**X-Ray Conference** *Systematic, comprehensive, biweekly review of musculoskeletal radiographic studies led by Dr. Gene Kissin based on Dr. Burt Sack's lifetime collection of >2000 radiographs amassed over 40 years in practice*
9:10 am-10:30 am	**Clinical Rounds** *Wednesday morning each week from 9:10-10:30 AM. The fellow on the BMC inpatient consult service presents patients active on the consult service. Approximately 20-25% of cases should relate to musculoskeletal medicine rather than systemic rheumatic diseases. Outpatient cases are encouraged. The subsequent discussion with participating faculty, fellows, students and residents focuses on differential diagnosis and management decisions. Review of the literature relating to at least one of the topics of discussion is strongly encouraged.*
10:30 am-11:30 am	**Grand Rounds (clinical)**

1st Friday

8:00 am-9:00 am	**Fellow Lecture on clinical topic**

2nd Wednesday

8:00 am-9:00 am	**Journal Club** *A biweekly review and critique of recent rheumatology literature from subspecialty and general medicine journals. One fellow generally prepares an article to review for each journal club, with study design topics. Clinical Epidemiology faculty previews the presentations and helps teach on the study design components. Participants include key faculty, other fellows, residents and students.*
9:10 am-10:35 am	**Clinical Rounds**
11:00 am-12:00 pm	**Derm/Rheum Conference** (609 Albany Street, Pochi Conference Room, 2nd floor) *A monthly conference devoted to shared interest with the Department of Dermatology with whom we share a Thursday morning clinic. Both a rheumatology and dermatology fellow present on a case or topic of interest with a faculty discussion to follow.*

2nd Friday

8:00 am-9:00 am	**Rheumatology-Endocrinology-Infectious Disease Bimonthly Satisfaction Seminar** *A bi-monthly seminar devoted to shared interest with the endocrinology and ID fellows. Topics include efficiency at work, stress reduction techniques, contract negotiations, developing an effective lecture etc.*

3rd Wednesday

8:00 am-9:00 am	**X-Ray Conference**
9:10 am-10:35 am	**Clinical Rounds**
10:30 am-11:30 am	**Grand Rounds (research)**

3rd Friday

8:00 am-9:00 am	**Fellow Lecture on clinical topic**

4th Wednesday

8:00 am-9:00 am	**X-Ray Conference vs. soft tissue rheumatism lecture**
9:10 am-10:30 am	**Clinical Rounds**
10:30 am-11:30 am	**Faculty Meeting**

4th Friday

8:00 am – 9:00 am	**Fellow Lecture on clinical topic**

Dr Shing Law Rheumatology Fellow Postgraduate Year 5
Procedure Log Book

Date	MRN	Age	Gender	Procedure	Supervised/ Unsupervised	Location	Setting	Skills Lab	DOPS	Complications	Comments
3rd July 2017	[redacted]	75	M	Left acromioclavicular joint corticosteroid injection	Supervised	Boston Medical Center	Inpatient	No	No	No	
5th July 2017		70	M	Ultrasound guided left elbow joint aspiration and corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
5th July 2017		70	M	Synovial fluid birefringent light microscopy intracellular rhomboid shaped positively birefringent crystals	Supervised	Boston Medical Center	Outpatient	No	No	No	
5th July 2017		26	F	Left tibio-femoral joint aspiration	Supervised	Boston Medical Center	Outpatient	No	No	No	
6th July 2017		68	M	Right 1st CMC joint corticosteroid injection	Supervised	Veterans Affairs	Outpatient	No	No	No	
6th July 2017		56	M	Right acromio-clavicular joint corticosteroid injection	Supervised	Veterans Affairs	Outpatient	No	No	No	
11th July 2017		37	M	Left tibio-femoral joint aspiration and corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
19th July 2017		56	F	Right anserine bursa corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
19th July 2017		56	F	Left anserine bursa corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
25th July 2017		70	M	Right 2nd trigger finger corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
26th July 2017		cadaver	F	1st carpometacarpal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	metacarpophalangeal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	proximal interphalangeal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	radiocarpal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	radioulnar joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	Elbow joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	Glenohumeral joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	Acromioclavicular joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	Temporomandibular joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017		cadaver	F	Sternoclavicular joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver

Dr.Shing Law Rheumatology Fellow Postgraduate Year 5
Procedure Log Book

26th July 2017	[redacted] cadaver F	Hip joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Proximal tibiofibular joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Tibiotalar joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Subtalar joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Talonavicular joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Tarsometatarsal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Metatarsophalangeal joint aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Trigger finger aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	De Quervain's tenosynovial aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Lateral epicondyle injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Medial epicondyle injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Subdeltoid bursa aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Iliolumbar enthesitis injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Greater trochanter injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Iliotibial band injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver

Dr Shing Law Rheumatology Fellow Postgraduate Year 5
Procedure Log Book

26th July 2017	[redacted] cadaver F	Anserine bursa aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Suprapatellar bursa aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Infrapatellar bursa aspiration and injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Posterior tibialis tendon injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Peroneal tendon injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Plantar fascia injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Carpal tunnel injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Supinator syndrome injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Pronator syndrome injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Cubital tunnel injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Suprascapularis nerve injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Tarsal tunnel injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Morton's neuroma injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] cadaver F	Dactylitis injection	Supervised	Boston Medical Center	Skills lab	Yes	No	No	cadaver
26th July 2017	[redacted] 49 F	Right medial epicondyle lidocaine injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
26th July 2017	[redacted] 49 F	Right acromio-clavicular joint corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	
26th July 2017	[redacted] 49 F	Right carpal tunnel corticosteroid injection	Supervised	Boston Medical Center	Outpatient	No	No	No	

Offer of Appointment
PGY
07/01/2022 - 06/30/2023

Evaluated by:
Incoming Resident\Fellow
Boston Medical Center
BMC-Training Program

Completed On:

Offer of Appointment 2022-2023

Instructions:
Boston Medical Center appoints you as a PGY to the program and term noted above, contingent upon the successful completion of your current year of training, if applicable. The current annual salary is

1* I agree to abide by the policies, the procedures, and the bylaws, rules and regulations of Boston Medical Center and all sites to which I am assigned.

- ◯ Yes
- ◯ No

2* I agree to fulfill the educational and clinical responsibilities of the graduate medical education training program, during the effective dates, as noted in the ACGME Program Requirements and other approved standards, and act in accordance with the policies, procedures, and goals/objectives of the training program.

- ◯ Yes
- ◯ No

3* I agree to the release of information to Boston Medical Center pertaining to my professional practice and agree to report to the Institution or its agent(s) incidents involving potential liability during the performance of professional services as part of the training program which occurs at Boston Medical Center or any other health care setting. In addition, I agree to provide reasonable cooperation in the investigation and defense of any such incident by the Institution.

- ◯ Yes
- ◯ No

4* I will have valid U.S. work authorization.

- ◯ Yes
- ◯ No

5* I will have a valid Massachusetts Limited or Full License to practice medicine throughout the appointment. I will provide copies of all license applications and wallet card.

- ◯ Yes
- ◯ No

6* I acknowledge that failure to obtain such U.S. work authorization and/or valid medical license within sixty (60) days of the date of this appointment shall cause this offer to be rescinded. Failure to maintain such U.S. work authorization and/or valid medical license shall be grounds for suspension and/or termination.

- ◯ Yes
- ◯ No

The Resident/Fellow hereby accepts this offer of appointment

Signatures

HOUSE OFFICER AGREEMENT

07/01/2022 TO 06/30/2023

FULL NAME:

PROGRAM:

PGY LEVEL: **ANNUAL STIPEND:**[1]

This Agreement describes the principles which govern the Boston University Medical Center (BUMC) graduate medical education (GME) programs sponsored by Boston Medical Center (BMC) and your rights and obligations as a participant in the Program. Your signature at the end of the Agreement signifies your acceptance and agreement to the terms and conditions of your training at BMC and affiliates.

1 TERMS OF APPOINTMENT

All Residents and Fellows (House Officers) are appointed for a period of one year.

2 EDUCATIONAL EXPECTATIONS

Responsibilities of House Officers:

A All House Officers shall:

Read and understand the expectations, standards and obligations set forth in the House Officer Agreement.

Cooperate fully with the Program and Hospital in coordinating and completing Residency Review Committee (RRC) and Accreditation Council for Graduate Medical Education (ACGME), Commission on Dental Accreditation (CODA) or Council on Podiatric Medical Education (CPME) accreditation submissions and activities, including the legible and timely completion of patient medical/dental/podiatric records, charts, reports, statistical, operative and procedure logs, faculty and Program evaluations, and/or other documentation required by the RRC, ACGME, CODA, CPME, Hospital, Department, and/or Program of study. Further, agree to cooperate fully in any investigations, discovery, and defense that arise. Failure to cooperate may result in personal liability. Failure to complete records on time may result in suspension from the Program until such records are completed or termination from the Program.

Abide by the rules, regulations, procedures and policies of the Program, BMC and any hospital or other facility while on a rotation at such hospital or facility.

Abide by the Institutional and Program Duty Hours Policy and record all duty hours worked through New Innovations or other mechanism determined by BMC weekly unless excused by the Program Director.

Comply with Health Insurance Portability and Accountability Act (HIPAA) and the BMC's policies and procedures regarding confidentiality of medical records and patient information, including policies restricting access to medical records.

Abide by and be governed by the Bylaws, Rules and Regulations of the Medical-Dental Staff, a copy of which is available on the BMC Intranet.

Permit the Hospital to obtain from and provide to all proper parties any and all information as required or authorized by law or by any accreditation body.

Develop a personal program of self-study and professional growth with guidance from the teaching staff.

Participate in safe, effective and compassionate patient care under general supervision, commensurate with his/her level of advancement and responsibility.

Care for patients to the best of his/her ability.

Participate fully in the educational activities of his/her respective Program and, as required, assume responsibility for teaching and supervising other House Officers and students.

[1] The salary increases scheduled for 2022 will be effective at the start of the first full pay period in July of 2022

Participate in BMC and affiliated programs' activities involving the medical staff and adhere to established practices, procedures, and policies of such institutions.

Participate in BMC, Program of study and affiliated institutions' committees and councils, especially those that relate to patient care review activities, patient safety and quality of care.

Participate in evaluation of the quality of education provided by the Program.

Develop an understanding of ethical, socioeconomic, and medical/ethical issues that affect graduate medical education and how to apply cost containment measures in the provision of patient care.

B Conditions for Reappointment and Promotion: Program advancement is based on evidence of satisfactory progressive clinical knowledge and skill, professional behavior, adherence to ethical standards, adherence to BMC policies and procedures, patient/staff interactions, and demonstrated ability to assume increasing responsibility for patient care as determined by the Program Director. Failure to achieve the proficiency level required by the Program may result in the non-promotion, non-renewal or termination of appointment. House Officers who engage in misconduct also may be subject to discipline, including termination. A House Officer may appeal a decision of non-promotion, non-renewal or termination of appointment as described in Article XVI (Discipline) under the Collective Bargaining Agreement between BMC and the Committee of Interns and Residents/Service Employees International Union (CIR/SEIU) (a labor union which represents House Officers at BMC).

C Due process: CIR/SEIU is the exclusive collective bargaining agent for BMC designated House Officers. Every House Officer is entitled to due process under the agreement between BMC and the CIR/SEIU. The CIR/SEIU contract can be found on the GME website on the BMC intranet.

D Supervision: House Officers are trainees under the general supervision of the Program Director and designated faculty.

3 REQUIREMENTS FOR PROGRAM PARTICIPATION

A Licensure: All House Officers must have either (1) a full Massachusetts license or (2) a limited Massachusetts license prior to the date of appointment or the commencement date of the Program. House Officers may not work without a valid medical license, but may attend orientation for which they will be paid. House Officers are responsible for payment of the annual renewal and license fees for a full license only. It is the House Officer's responsibility to provide copies of information, materials and documents required for licensure to the GME Office. Current licensure is a condition for receipt of a salary.

B ECFMG Certificate: All graduates of international medical schools must submit a copy of a valid Educational Council for Foreign Medical Graduates (ECFMG) Certificate. ECFMG Certification is the standard for evaluating the qualifications of International Medical Graduates (IMGs) entering the U.S. health care system. The components of ECFMG Certification include examination requirements (USMLE Step 1, Step 2 (CK) and Step 2 (CS)), medical education credential requirements, and a primary source verification of the IMG's medical diploma and transcripts.

C Rotations at Affiliates: Most Programs include rotations at one or more affiliated institutions in order to provide the breadth of clinical experience necessary for full training. These affiliated institutions all meet the necessary accreditation requirements for your Program. House Officers on such rotations may receive an appointment to the affiliated hospital upon recommendation of the Program Director.

4 BENEFITS

A Liability Insurance (and Tail Coverage) (Article VI) , Malpractice Insurance, in the Collective Bargaining agreement between BMC and CIR/SEIU): All House Officers are covered for professional liability for all Program related work under a policy provided by BMC. The professional liability policy is on a modified claims made basis, with limits of $1,000,000 per incident/$3,000,000 annual aggregate.

B Professional Activities Outside of the Program (Moonlighting): Professional activities outside of the Program, *e.g.* moonlighting, are permissible only at the discretion of the Program Director and with approval of the GME Office, according to the Program's and BMC's moonlighting policies/procedures. To be covered for moonlighting, the House Officer must file a completed Authorization for Resident & Fellow Moonlighting Addendum with the GME Office for submission to the BMC insurance office prior to moonlighting and be properly credentialed for moonlighting by the appropriate hospitals through their Credentials Committee. If the facility at which a House Officer moonlights requires higher malpractice limits, the House Officer is responsible for the payment of any additional malpractice premium.

C Salary Level: Salary levels for House Officers are determined on the basis of the level commensurate with the total number of year's post-medical school the individual has attained in an accredited program that is a prerequisite for the current program. The salary level shall be set in accordance with the current schedule adopted by BMC, which may include, if applicable, the salary set forth in the CIR/BMC contract.

D Vacation and Other Leave: The Program provides an annual vacation of four weeks with pay except in the Departments of Surgery, Urology, Oral Surgery, Ear, Nose and Throat (ENT), Ophthalmology, Dermatology, and Anesthesia where the respective Chief of Service, with the approval of the Office of Graduate Medical Education, may require the fourth week of vacation leave be in the form of one (1) week of additional compensation in lieu of time off. House Officers will receive fifteen (15) days of sick leave per year. Vacation and sick leave may not be cashed out, and vacation days may not carry over from year to year. Leave, such as professional leave, will be granted at the discretion and with the approval of the Program Director. Parental, and bereavement leaves are granted in accordance with the agreement between BMC and CIR/SEIU. Family and medical leaves will be granted in accordance with applicable federal and state law. Consideration is given to minimum time requirements, i.e. the specialty boards, to ensure the defined number of months of training has been met. Information on eligibility for specialty board examinations is available from the Program Director or the specialty board. House Officers may take up to two (2) personal days in any one academic year (July 1 - June 30) to be paid out of his/her accrued sick leave. Any use of personal days is subject to the approval of the House Officer's department.

E Health, Life, and Disability Indemnity Insurance: House Officers are eligible for health, dental, and life insurance benefits. Completed forms must be returned in a timely manner in order to ensure receipt of benefits. BMC provides for the purchase of long and short-term disability coverage through the Voluntary Hospitals House Staff Benefits Plan of the CIR. The Medical Center maintains a policy regarding reasonable accommodation of employees with a qualified disability. Benefits are effective as of the House Officers' hire date.

F Counseling, Medical, Psychological Support Services: The BMC Employee Assistance Program (the "EAP Program") is available to House Officers and their immediate family members. The EAP Program provides assessment and serves as a referral source for those in need of further counseling. The program is free and is designed to assist with personal, family and work-related matters.

G Collective Bargaining Agreement: The House Officer's salary and benefits are governed by the collective bargaining agreement between the CIR/SEIU and the Boston Medical Center. Should any term or condition of this Section 4 conflict with the terms and conditions in the CIR/SEIU contract, the CIR/SEIU contract will prevail.

5 GRIEVANCE PROCEDURE:

The Grievance Procedure is described in Article IV of the Collective Bargaining Agreement between CIR/SEIU and BMC. A grievance means only a controversy or claim arising directly out of or relating to the interpretation, application or breach of a specific provision(s) of the Agreement during the term of this agreement. Any controversy or claim relating to the academic and/or clinical performance of a House Officer shall not constitute a grievance, but shall be subject to Article XVI, Discipline.

6 CERTIFICATES

Certificates of Program completion will be released a) upon completion of all patient records, including operative notes, and return of all hospital property (books, pagers, uniforms, and other equipment) on or before the date the Program year ends and b) when the House Officer has met all requirements and financial obligations of the Program.

7 INSTITUTIONAL RESPONSIBILITIES

The Hospital has the following obligations:

A To use its best efforts, within available resources, to provide an educational training program that meets the ACGME's, CODA's and/or CPME's accreditation standards or other accrediting agencies.

B To use its best efforts, within available resources, to provide the House Officer with adequate and appropriate support staff and facilities in accordance with federal, state, local, ACGME, CODA and CPME requirements.

C To orient the House Officer to the facilities, philosophies, rules, regulations, and policies of the Hospital and the Institutional and Program Requirements of the ACGME, CODA, CPME and the RRC.

D To provide the House Officer with appropriate and adequate faculty and Medical-Dental Staff supervision for all educational and clinical activities.

E To maintain an environment conducive to the health and well-being of the House Officer.

F To provide the following services: adequate and appropriate ancillary services, meals, on-call rooms, patient and information support services, security, and parking.

G To evaluate, through the Program Director and Program faculty, the educational and professional progress and achievement of the House Officer on a regular and periodic basis. The Program Director shall present to and discuss with the House Officer a written summary of the evaluations at least once during each six (6) month period of training and/or more frequently if required by the Program and the program's accreditation agency. House Officers may review and request a copy of their evaluation files consistent with Hospital policy.

H Provide a fair and consistent review of the House Officer's concerns and/or grievances, without the fear of reprisal. The House Officer should use the grievance procedure under the agreement between BMC and CIR/SEIU as described in section 5 Grievance Procedure.

I To provide a policy preventing sexual and/or other forms of harassment and a mechanism for reporting and investigating such charges. See Medical Center Policy 7.0c (Discrimination and Harassment Policy Including Sexual Harassment).

J To provide a written policy regarding physician impairment, including substance abuse, and inform the House Officer of the Hospital's policies for handling physician impairment, including impairment relating to substance abuse.

8 HOSPITAL OR PROGRAM CLOSURE

In the event that the Hospital and/or Program is reduced or closed:

A The Hospital and/or Program will notify the affected House Officers of a projected reduction, closure, or discontinuation date as soon as practicable after the decision is made.

B The Hospital will either permit the affected House Officers already in the Program to complete their education or assist the affected House Officers in finding appointments to other residency training programs in the same specialty at the appropriate PGY level.

C The Hospital will provide proper care, custody and disposition of residency education records and will provide appropriate notification to licensure and specialty boards.

I accept a position as a House Officer at the Boston Medical Center and I hereby agree with the terms and conditions of this agreement.

House Officer Signature

Program Director Signature

_____

Designated Institutional Official

Boston Medical Center

BU Boston University Medical Campus

BioSquare

Boston HealthNet — Bringing Together the Best

Updated Dec. 2018

FACILITIES AND OTHER RESOURCES

BOSTON UNIVERSITY

Boston University (BU) is the fourth-largest independent university in the United States. With more than 4,000 faculty members and more than 35,000 students, it is a hub of intellectual, scientific, and research activities that pursues the ideal of a research university--that knowledge is best acquired in the pursuit of new knowledge.

BOSTON UNIVERSITY MEDICAL CAMPUS (BUMC)

Boston University Medical Campus (BUMC) is located in the historic South End of Boston, two miles from the Charles River Campus but connected by continuously running shuttles, free cross-campus parking and robust webinar resources. BUMC is a recognized leader in groundbreaking medical research. The Medical Campus houses the School of Medicine, the Goldman School of Dental Medicine, and the School of Public Health. There are currently more than 1.2 million square feet of research space with an additional 320,000 square feet in the final planning phases. Within the past 8 years approximately 437,000 square feet of research space have been created and 122,000 square feet have been renovated. World-renowned researchers at Boston University Medical Center conduct basic, laboratory-based biomedical research, and patient-driven, clinical research programs. Renowned for the quality of teaching and research, and for service to the community, these schools provide education and training in the most current thinking and techniques in their fields, with a particular focus on serving disadvantaged, underserved, and indigent populations. The Provost of the Medical Campus and Dean of the School of Medicine is Karen Antman, MD.

BOSTON UNIVERSITY SCHOOL OF MEDICINE (BUSM)

Boston University School of Medicine (BUSM) is dedicated to the educational, intellectual, professional and personal development of a diverse group of exceptional students, trainees, and faculty who are deeply committed to the study and practice of medicine, to biomedical research, and to public health. As a community, we place great value on excellence, integrity, service, social justice, collegiality, equality of opportunity, and interdisciplinary collaboration. BUSM is one of the major biomedical research institutions in the United States. BUSM is renowned for high quality medical education and teaching, exemplary research, and a commitment to serving the broader Boston community.

BUSM houses many centers and institutes on the Medical Campus that participate in a vast array of research and encompass a research space that exceeds 55,000 square feet. The Clinical Data Warehouse and Clinical Information Exchange are central to this proposal for extracting clinical data. These entities contain data from the emergency, inpatient, and outpatient electronic health records of BMC and Boston HealthNet patients. Accessing these electronic, longitudinal databases provides research opportunities on health services utilization, treatment decisions, and health outcomes of general and special populations across the lifespan. In the present proposal, these resources will be used to provide essential covariates. The medical school is also home to the NIH-funded Clinical and Translational Science Institute.

BUSM combines the dual strengths of a respected academic research center and an innovative, community service-oriented, educational institution. BUSM is a separate, organizationally distinct entity from the Boston University Medical Center (BUMC), its main teaching hospital. However, the school's clinical chairs serve as chiefs of their respective services at BMC. This long-standing integration of academic and clinical leadership has forged a productive collaboration between BMC and BUSM, linking education, research, and service delivery in innovative ways. Boston University Medical Campus is co-located with Boston University School of Medicine (BUSM), Boston University Goldman School of Dental Medicine (BUGSDM), and Boston University School of Public Health (BUSPH). Together, these entities occupy more than 30 buildings on a single campus in close proximity to Boston's low-income neighborhoods.

Section of Rheumatology, Department of Medicine, BUSM

Dr. Tuhina Neogi, Professor of Medicine and of Epidemiology at BUSM and BUSPH is Chief of Rheumatology at BUSM and Boston Medical Center. The Section of Rheumatology is in the Department of Medicine at BUSM. Within this section also sits the Arthritis & Autoimmune Diseases Research Center (**AADRC**), led by Dr. Maria Trojanowska, which focuses on rheumatic disease research. Faculty members of the Clinical Research Unit are located in the second floor of the X Building, totaling over 2,500 square feet of office space at the BU School of Medicine, distributed among approximately twenty offices and other support facilities (reception area, printer/photocopy areas, library, conference room, and kitchen areas). The remaining faculty members and the AADRC are located in the main medical school building on the fifth floor, comprising 10,000 square feet of office and laboratory space. Teleconferencing and web conferencing capabilities are available throughout all office spaces, enabling faculty to conduct meetings with collaborators on a more frequent basis in addition to any face-to-face meetings.

Scientific Environment: Faculty members have research interests focusing on different areas of rheumatic diseases and methodology. Rheumatic disease foci include osteoarthritis, gout, scleroderma, spondyloarthritis, and lupus. The Clinical Research Unit methodology foci include study design and statistical methodology development, causal inference methods, clinical trials methodology and meta-analysis, pharmacoepidemiology, machine learning, and conjoint analysis, among others. Additional research foci include functional limitation and disability, work disability, physical therapy, mobile health technologies, imaging (MRI and musculoskeletal ultrasound), anatomy, genetics, nutrition and exercise, and musculoskeletal pain. Members of the AADRC focus on basic and translational research in scleroderma, lupus, inflammation, fibrosis, and autoimmunity.

Numerous data sources are available for clinical research opportunities, including the Multicenter Osteoarthritis Study (MOST), The Health Improvement Network (THIN), and US healthcare claims data, among others. A number of clinical trials are also conducted within the section.

There is particular attention paid to commitment to **early stage investigators** through team mentoring, weekly research meetings, specific resources made to support research endeavors and conference attendance, pilot grants, peer networking events, grant review panels, writing workshops, seminars, and journal clubs, among other activities and opportunities.

There are administrative staff, project managers, programmers, biostatisticians, epidemiologists, research assistants, postdoctoral fellows, graduate students, and a grants manager within the section as well.

Clinical: Boston Medical Center (BMC) is the primary teaching hospital (see below) for BUSM and because of this relationship; investigators who engage in clinical research have access to the facilities at the licensed 514 bed private, not for profit hospital located on the BUMC. Emphasizing community-based care, BMC is the largest safety net hospital and largest 24-hour Level 1 trauma center in New England. Outpatient clinical facilities include a full service suite of 12 examining rooms, conference center and office space in the Shapiro Center. All rheumatologists who are faculty see patients in the outpatient and inpatient facilities as part of their clinical duties unrelated to research. There are three full-time clinical research coordinators in the Section of Rheumatology with administrative space on the fifth floor of the Evans Research Building.

Laboratory: The laboratory resources of the Arthritis & Autoimmune Diseases Research Center occupies the entire fifth floor of the Evans Research Building at BUSM. There is approximately 10,000 square feet of research space. This space includes two tissue culture facilities, several equipment rooms, two darkrooms, a common contained radioactive area, two imaging suites, one for photomicrography and immunofluorescent work, areal-time PCR facility, and two walk in cold rooms and freezers.

Animal: The work carried to be out in this proposal does not involve animals.

Office: All faculty have private offices that are equipped with 1-2 desks, 1-2 large bookshelves, 2 large locking filing cabinets, up-to-date PC with dual monitors, scanner, printer, and phone with hands-free headset. Trainees have personal cubicles or share office space (no more than 2 trainees to an office), each with their own dedicated computer and phone, and use of network printers and office photocopier, scanner, journals, etc.

Computing: All investigators (faculty and trainees) have state-of-the-art PC's/Mac's and workstations with SAS 9.3 or 9,4, S-Plus 4.5, Microsoft Windows 10, Microsoft Access database software, and Microsoft Office 2016. Other statistical software packages available in the unit include S-Plus 2000, STATA, CART, and DBMS Copy. Investigators have direct wired or wireless network access to the Boston University Medical Center's SUN UNIX computer, to the Boston University Academic Computing System (ACS), a network of IBM RS/60-0 990 (AIX) computers, and to the Boston University Medical Center's Windows-NT server for file storage and backup. SAS is also available on the SUN and ACS mainframe computers. They have also access to a high-speed enterprise network made up of online resources including high performance central servers, collaborative computing, e-mail resources, web services and general applications training. VPN and remote desktop access are available to all faculty and trainees. Boston University has data protections standards for collecting, handling, storing and using sensitive information properly and securely and provides a framework for comprehensive stewardship of sensitive information. Printing devices in the unit include 4 HP LaserJets and 3 color DeskJets; several pdf-converting scanners are available in the unit.

Additional Resources: BUSM also has a Center for Translational Epidemiology that can provide additional data resources, a Center for Improvement and Implementation Science, single cell sequencing capabilities, and a large bioinformatics program.

The **Boston University Clinical and Translational Science Institute (BU CTSI)**, the BU hub of the national CTSA network, is part of an integrated environment that supports the entire spectrum of translational research. From the Center for Nanoscience and Nanotechnology to the Framingham Heart Study, Boston University's breadth of translational science encompasses the spectrum from T1 through T4. The CTSI serves as a center of expertise which provides tools, services, and resources to clinical and translational investigators to maximize the impact of their discoveries and speed the translation of their research to the bedside. In particular, we are committed to improving the health of vulnerable populations through novel discovery approaches and by engaging this population in the research enterprise. The CTSI's vision is to be the strongest advocate for research that represents the needs of diverse populations by creating superior resources that can be transferred reliably to the national CTSA Network. In an effort to do better research and do research better, CTSI's aims are centered on four key focus areas:

- Discover, demonstrate, deploy, and disseminate novel TRAINING methods that will enhance our entire translational science workforce
- Effect meaningful research relationships with all COMMUNITIES AND STAKEHOLDERS that empower bi-directional contributions to strengthen translational research across the lifespan
- Use our unique, full-spectrum RESEARCH strengths to discover, develop, and disseminate improved treatments and diagnostics that address the problems of our community and nation
- Share innovative best practices with other hubs in the national CTSA network, and COLLABORATE in the conduct of coordinated, multi-center, translational research.

Interactions with BUSM CTSI: The BUSM CTSI provides numerous additional resources as needed. For example, several analytical cores can be accessed readily as needed. The CTSI also oversees the Clinical Data Warehouse from which additional pharmacoepidemiology studies can be carried out. The CTSI's General Clinical Research Unit (GCRU) is a resource utilized by faculty to carry out local study protocols involved study subjects, including collection and storage of biospecimens. The GCRU is situated in 10,000 square feet and has a staff of twenty persons. The Pilot Awards Program may also be beneficial for pursuing promising findings for many members of the Section. The CTSI also supports interdisciplinary collaborative projects (Affinity Research Collaboratives (ARCs)) through specific funding mechanisms. There are a number of CTSI cores that are available to support translational

research projects. For example, the CTSI Core Assay Laboratory facilitates translational research in assay planning and performance of laboratory testing using trained laboratory personnel so that clinical researchers who are not lab-based are able to fully engage in meaningful translational research projects.

Other: All of the support services of a major university campus are available to this project including library, computer center, material management, accounting, business and fiscal and personnel services.

The **BMC/BU Medical Campus Institutional Review Board** is a shared function between Boston University Medical Campus and Boston Medical Center. The IRB Office has a staff of 11, has four boards that each meet every two weeks, and annually reviews 600 protocols, 1200 continuing reviews, 2000 study personnel changes, and 850 amendments. The IRB is a portion of the Human Research Protection Program that was accredited by the Association for the Accreditation of Human Research Protection Programs in December 2017.

BU School of Medicine Centers and Institutes located within BUMC. These categorical homes for interdepartmental clinical and translational research that were developed to be organ- or disease-specific. They have been profound successes in the science they have generated since their inception in 1982. Selected centers and institutes are:

- Alzheimer's Center
- Amyloid Treatment & Research Center
- Arthritis & Autoimmune Diseases Research Center
- Cancer Center
- Cardiovascular Proteomics Center
- Center for Clinical Improvement and Implementation Sciences
- Center for Excellence in Sickle Cell Disease
- Center for Global Health & Development
- Center for Regenerative Medicine
- Center for the Study of Traumatic Encephalopathy
- Data Coordinating Center
- Evans Center for Interdisciplinary Biomedical Research
- Framingham Heart Study
- Genome Science Institute
- Pulmonary Center
- Silvio O. Conte Center for Neuroscience
- Slone Epidemiology Center
- Spivack Center for Clinical & Translational Neuroscience
- Whitaker Cardiovascular Institute
- Women's Health Interdisciplinary Research Center

The Division of Graduate Medical Sciences (GMS) at Boston University School of Medicine (BUSM) is a recognized leader in research and graduate education in the biomedical sciences. Students can choose from 33 fields of study, with interdisciplinary programs available in many areas. Students may pursue PhD or MD/PhD degrees in 15 different departments and programs.

The school contains more than 550,000 square feet of research space in multiple buildings. The School of Medicine financially supports many core laboratories, and houses centers and institutes that participate in a vast array of research. The campus possesses an impressive array of basic research cores with state-of-the art equipment vital for early stage translational research, including analytical instrumentation, biomedical and cellular imaging, biospecimen archive, experimental pathology, flow cytometry, high throughput screening, Illumina sequencing, microarray analyses, mass spectrometry, immunohistochemistry, metabolic phenotyping, and animal imaging including IVIS, MRI, and infrared imaging.

The nationally recognized NHLBI-funded **Boston University Framingham Heart Study (FHS)** has been a leader in the field of population- based research, T3 and T4. Since 1948, careful monitoring of the Framingham Study three cohorts of FHS population participants has led to the identification of major cardiovascular disease (CVD) risk factors, as well as valuable information on the effects of these factors such as including blood pressure hypertension, blood triglyceride and cholesterol dyslipidemia levels, diabetes, and obesity, as well as

the contributions of age, gender, sex, and psychosocial issues to CVD risk. Risk factors for other physiological health conditions such as dementia, lung disease, kidney disease, and bone disease have been and continue to be investigated also are under investigation. In addition, the relationships between physical traits and contributions of genetic patterns variation to CVD and other traits are now being studied through genomic analysis initiative using 500K chip technology whole genome sequencing of over 4000 FHS participants. The FHS population research informs current guidelines for the evaluation and management of hypertension and dyslipidemia. New molecular research from the FHS is used by physician scientists where to return to at the bench or to pose new clinical research questions and new basic research projects.

The Framingham Heart Study (FHS), a joint program of at Boston University and the National Heart, Lung, and Blood Institute, is one of the world's most informative and longest running studies on cardiovascular disease (CVD). More than 3,000 articles based on the study's FHS data have been published in peer-reviewed medical journals, including the *New England Journal of Medicine*, the *Journal of the American Medical Association*, *Nature*, *Nature Genetics*, *Circulation*, and the *Lancet*.

The **Laboratory Animal Science Center (LASC)** has been an AAALAC accredited animal care program since 1971. **LASC** has 35,000 square feet and cares for most species of research animals annually under the direction of the Attending Veterinarian. The Institutional Animal Care and Use Committee (IACUC) reviews all protocols prior to ordering of animals. Boston University is a major academic research institution conducting high-quality research as part of its mission of advancing human health. Animal research has been, and continues to be, a critical component of the efforts in advancing our understanding of cancer, heart disease and neurodegenerative diseases such as Alzheimer's and Parkinson's to name a few.

We recognize and embrace the fundamental interdependence of humans and animals and are committed to the core value of humane care in the use of any animals. The institutional committee that oversees the use of animals at Boston University is vigilant in meeting their commitment to animal welfare. The Institutional Animal Care and Use Committee (IACUC) reviews every proposed research protocol.

BOSTON UNIVERSITY NATIONAL EMERGING INFECTIOUS DISEASE LABORATORY (NEIDL)

The National Emerging Infectious Diseases Laboratories (NEIDL) is part of a national network of secure facilities studying infectious diseases that are—or have the potential to become—major public health concerns. The laboratories are dedicated to the development of diagnostics, vaccines, and treatments to combat emerging and re-emerging infectious diseases. In addition to BSL-2 and BSL-3 laboratories, the NEIDL houses a BSL-4 laboratory. The NEIDL adds to the growing life sciences industry in the region, throughout the Commonwealth of Massachusetts, and across the country.

A 192,000-square-foot, $128M, seven-story building located within BUMC, the NEIDL, funded by the NIH/NIAID, is one of the few laboratories in the U.S. that can support BSL-4 research on pathogens such as the Ebola virus. The containment area includes imaging, aerobiology, insectaries, animal facilities, GMP lab space and other specialized cores and support spaces to support basic research and vaccine development in emerging infectious diseases. In addition, the facility houses a state-of-the-art BSL-4 training simulator to provide hands-on training for research staff, faculty, and some support personnel.

The NEIDL uses state-of-the-art technologies designed to conduct research in safe and secure environments. In fact, the facility was designed and constructed with the highest attention to community and laboratory safety and security. The laboratories emphasize comprehensive core research facilities that enable basic, translational, and clinical research and the development of

products related to emerging infectious diseases. Core support laboratories containing sophisticated facilities are housed at the NEIDL.

The NEIDL represents a major step forward in advancing public health and solidifying the New England area's reputation as the biomedical research hub of the nation. Supported by all local research institutions, the 192,000-square-foot, seven-story building serves as a venue and resource for training researchers in infectious diseases. The facility is located within BioSquare, a biomedical research and business park adjacent to the Boston University Medical Campus.

BOSTON UNIVERSITY SCHOOL OF PUBLIC HEALTH (SPH)

The Boston University School of Public Health established in 1976. Dean Sandro Galea, MD, DrPH, a physician and epidemiologist, has served as Dean of BUSPH since 2015. The Associate Dean for Research is Michael McClean, ScD. BUSPH has 333 faculty, 1,177 students, and approximately 9,000 alumni living and working in all 50 states and more than 100 countries. BUSPH is fully accredited by the Council on Education for Public Health (CEPH) and is ranked 10th in Public Health Graduate Schools by the U.S. News & World Report. It has over 65,000 square feet in dry bench research space and approximately $50 million in annual research awards. In addition to the MPH and DrPH degree programs, BUSPH offers four PhD degree programs (Biostatistics, Environmental Health, Epidemiology, Health Services Research), six MA and MS degree programs (Applied Biostatistics, Biostatistics, Environmental Health Data Analytics, Epidemiology, Health Services and Systems Research, Public Health Nutrition), and five dual degree programs (MBA/MPH, JD/MPH, MS/MPH, MD/MPH, MSW/MPH). The research focus areas of the school are Urban Living, Aging and Wellbeing, Health across the Lifecourse, and Health Systems, with a particular emphasis on disadvantaged, underserved, and vulnerable populations. The BUSPH services a number of unique large databases described in the application as resources for T4 research.

The **BUSPH Department of Biostatistics** consists of 25 faculty members who are experts in the areas of statistical genetics, clinical trials, and observational studies. Embracing the multidisciplinary nature of biostatistics, faculty design and conduct important studies that span the continuum of public health. Biostatistics faculty is available to our investigators and the scholars program. The second, the Data Coordinating Center (DCC) is a data collection, management and analysis resource for the entire medical campus community. The center's staff provides assistance to members with study design and data processing at every stage of research.

Fundamental to public health research and policy, biostatistics is also one of the most interdisciplinary departments at Boston University School of Public Health. By designing studies, developing new methodologies, and extracting and analyzing information from data, they help inform decisions to promote better health.

Biostatistics faculty members are internationally recognized for methodological innovations in clinical trials and observational studies, statistical genetics analysis, and Bayesian methods. They have a long history of collaborating to address some of the world's most pressing public health concerns, as well as training the next generation of students to tackle emerging public health and medical issues with cutting-edge methods and technological skills.

The **BUSPH Department of Global Health** seeks to improve the health and well-being of underserved populations in low and middle-income countries through research, education and training of students, as well as technical assistance and service. 32 faculty members are involved in major research projects designed to identify and resolve health disparities across the lifespan in more than 24 countries, the majority of these activities are located in Africa and Asia. There are specific research studies focusing on improving reproductive health, pregnancy outcome, child survival and adolescent health,

reducing the economic impacts of HIV/AIDS, tuberculosis and malaria, and improving the diagnosis and outcomes of non-communicable diseases. There is a new focus on developing point of care diagnostics that has relevance in the US and globally and the potential for diagnostic studies that could be conducted in the CRC. The research studies are funded by NIH, USAID, the Bill and Melinda Gates Foundation and many other organizations. There are opportunities for CRC investigators to collaborate with our in country principal investigators on related studies.

Affiliated with the School of Public Health and the Sargent College, the **Slone Epidemiology Center** is a research organization that focuses on studying the possible health effects of medications and a wide variety of other factors in adults and children. Staff of approximately 100 includes specialists in epidemiology, adult and pediatric medicine, nursing, pharmacy, biostatistics, and computer science. Slone researchers use a variety of epidemiological tools, including case-control and follow-up studies, clinical trials, surveillance studies, risk management studies, and population-based surveys.

BOSTON UNIVERSITY GOLDMAN SCHOOL OF DENTAL MEDICINE (GSDM)

The Henry M. Goldman School of Dental Medicine is the dental school at Boston University. Jeffrey Hutter, DMD, is the Dean, and Maria Kukuruzinska, PhD, is the Associate Dean for Research. GSDM is located in a six story building on the BUMC that is the center for teaching, patient care and clinical research. The Henry M. Goldman School of Dental Medicine (GSDM) offers the DMD (both the traditional four-year program and a two-year Advanced Standing program for internationally trained dentists) and advanced certificates and degrees in all recognized specialties. It offers a Doctor of Science in Dentistry (DScD), a Doctor of Science in Oral Biology (DSc), and a Doctor of Philosophy in Oral Biology (PhD). The School has faculty of 450 and 800 students. GSDM is also noted for its student and faculty research and is ranked highly in the nation. GSDM now ranks 12th out of 56 U.S. Dental Schools in research funds awarded by NIH. *Jeffrey Hutter, DMD, is the Dean, and Maria Kukuruzinska, PhD, is the Associate Dean for Research.*

Boston University Henry M. Goldman School of Dental Medicine offers state-of-the-art dental care through our teaching clinic and faculty practice. Emphasizing preventive and restorative dentistry, our experienced dentists, hygienists, and students provide a range of patient services at our Patient Treatment Centers.

The scope of research at GSDM is broad, spanning areas of basic, clinical, public health, and translational sciences. Faculty research interests are in the fields of:

- Endodontics
- Health policy and health services
- Molecular and cell biology
- Oral and maxillofacial surgery
- Oral cancer
- Oral health disparities
- Orthodontics
- Pediatric dentistry
- Periodontology and oral biology and
- Restorative sciences/ biomaterials.

The **GSDM Center for Clinical Research** provides clinical researchers with a location to see research subjects for studies of oral conditions and diseases, as well as oral complications of systemic diseases and facilitates collection of tissue specimens from the oral cavity including saliva, pellicle, scalpel and brush biopsies and swabs of oral mucosa.

The Center for Clinical Research at the School of Dental Medicine is a virtual center, facilitating clinical research activities within all BU GSDM patient treatment centers. In addition to patient oriented research, the CCR provides support to investigators involved in epidemiologic and behavioral studies, as well as health outcomes and health services research.

Within the GSDM, social determinants of health are studied as part of the **Office of Global and Population Health (GPH)**. GPH is funded by the following grants:

- Community Based Dental Partnership Program (CBDPP): 13-year grant from the Health Resource and Services Administration (HRSA) totaling just over $3.5 million
- Transformative Primary Care for Older Adults: Integrating URM Faculty Development and Retention/Dental Faculty Development and Loan Repayment Program (LRP): 5-year grant from the Health Resource and Services Administration (HRSA) totaling just over $1.3 million
- Integrating Interactive Parent Text Messaging and Oral Health Guidelines into Pediatric Community Health Centers to Reduce Early Childhood Caries: Dr. Henshaw is currently a Co-PI on 5-year grant from the National Institute of Dental and Craniofacial Research (NIDCR) totaling just over $4.5 million

The overall mission is to improve oral, dental and craniofacial health through research, research training, and the dissemination of health information, with a focus on the elimination of oral health disparities.

BOSTON MEDICAL CENTER (BMC)

A nonprofit institution, Boston Medical Center (BMC) was formed in 1996 by the merger of Boston City Hospital, Boston Rehabilitation Specialty Hospital, and Boston University Medical Center Hospital. BMC encompasses a 514-bed hospital with a Level I Trauma Center, the city's busiest emergency department, and extensive ambulatory services, offering primary care and over 70 medical subspecialties. It employs more than 760 physicians and 1,700 nurses, with approximately 5,700 full-time equivalent employees. BMC is the largest safety net provider in New England, serving more than 840,000 patients per year. More than half are classified as low-income with an annual income below federal poverty level.

Unwavering in its commitment to serve the community, Boston Medical Center is dedicated to providing accessible health care. Approximately 72% of our patient visits come from underserved populations, such as the low-income and elderly, who rely on government payors such as Medicaid, the Health Safety Net, and Medicare for their coverage; thirty two percent do not speak English as a primary language. BMC also offers numerous outreach programs and services, including skin cancer screenings, cholesterol tests, blood pressure screenings, prostate cancer screenings, osteoporosis screenings, eye exams, smoking cessation counseling, and flu shots. In addition, cancer education and prevention seminars are offered in the community, and youth outreach workers are trained for involvement in schools and health fairs.

With more than 26,000 admissions and 1,000,000 patient visits in the last year, BMC provides a comprehensive range of in- and outpatient, clinical, and diagnostic services in more than 70 areas of medical specialties and subspecialties, including cardiac care, neurological care, orthopedics, geriatrics, and women's health.

As the principal teaching affiliate of Boston University School of Medicine, BMC is devoted to training future generations of health care professionals. Every member of the hospital's medical and dental staff holds an academic appointment at the Boston University School of Medicine or at the Boston University Goldman School of Dental Medicine. BMC operates 62 residency training programs with 788 resident and fellowship positions.

Boston Medical Center is a recognized leader in groundbreaking medical research. BMC is the 11th largest recipient of funding in the U.S. from the National Institutes of Health among independent hospitals. BMC received more than $117 million in budgeted sponsored research funding in 2016, and oversees 568 research and service projects separate from research activities at Boston University School of Medicine. The world-renowned researchers at Boston Medical Center conduct both basic,

laboratory-based biomedical research and clinical research programs, including sickle cell, infectious disease, cardiology, vascular biology, Parkinson's disease, geriatrics, endocrinology, and hematology/oncology.

BMC co-supports key translational research functions including the IRB, IACUC, and LASC. BMC operates its own **Office of Clinical Research and Office of Research Administration**, which assists investigators with BMC-based and patient-oriented grants and contracts, assuring compliance with GCP including proper assignment of research and standard-of-care billing for patients participating in clinical trials. BMC provides substantial institutional support for the BU GCRU in services. Clinical research programs based at BMC have an exceptional track record of minority enrollment on clinical trials. For example, in 2017, the Cancer Clinical Trials Office screened 1,000 new cancer cases diagnosed or treated at BMC for participation in clinical trials. Trials offered include those for treatment, symptom management, prevention, quality of life and translational research. The overall enrollment onto trials was 9%, compared to the national average of 5%. Furthermore, 63% of those patients enrolled onto clinical trials were minority patients.

BMC is a founding partner of **Boston HealthNet, Inc.**, an affiliation of BMC, Boston University School of Medicine, and 14 community health centers (CHCs) located in Boston's most impoverished neighborhoods. The community centers are all within 8 miles of the medical campus. Physicians from the CHCs provide inpatient rounds at BMC and BMC physicians provide a range of specialty care clinics in the CHCs. A shuttle bus system provides round-trip patient transportation. This integrated urban safety net system has garnered national attention. In 2016, Boston HealthNet health center patients accounted for 32.7 percent of outpatient visits and 37.8 percent of all inpatient admissions to Boston Medical Center.

BMC HealthNet Plan (BMCHP) is a not-for-profit health maintenance organization founded in 1997 by Boston Medical Center. BMCHP's Massachusetts business, BMC HealthNet Plan, serves over 240,000 members across the state through several product lines that include MassHealth (Medicaid, including CarePlus) and Qualified Health Plan. BMCHP also offers a senior care options plan for individuals age 65 and older who are also eligible for Medicaid. Because of its ongoing commitment to quality, BMC HealthNet Plan's Qualified Health Plan program has been awarded accredited status from NCQA, the highest accreditation level available at this time. In New Hampshire, BMCHP does business as Well Sense Health Plan. More than 70,000 Medicaid recipients have joined Well Sense Health Plan since New Hampshire began offering managed care coverage to Medicaid recipients in December 2013. Comprehensive coverage for hospital, primary, specialty, and behavioral health care are among the benefits and services provided to all members. In addition, members receive extras beyond traditional benefits, such as free car safety seats and bike helmets for kids, manual breast pumps and dental kits (including electric toothbrush), access to a 24/7 Nurse Advice line, and reimbursements for qualified gym memberships.

BMC hosts a health information exchange linking the CHCs to BMC across a common platform. With investments from BMC, the Health Resources and Services Administration, and private foundations, BMC and the CHCs have implemented a common electronic health record and exchange a range of clinical information. e-Prescribing and e-Referrals are used throughout the system. Data warehouses are in place for BMC and the CHCs and have been programmed to populate diabetes and immunization registries. **The Clinical Data Warehouse and Health Information Exchange**, which contain data from the emergency, inpatient, and outpatient electronic health records of BMC and Boston HealthNet patients, offers unlimited research opportunities on health services utilization, treatment decisions, and health outcomes of general and special populations across the lifespan.

To implement the state's new accountable care organization model which changes how children and adults covered by MassHealth (Medicaid) are cared for and insured in order to reduce costs, the BMC Health System—which includes BMC, its physician practices, and the BMC HealthNet Plan—has formed its own ACO, **Boston Accountable Care Organization (BACO)**. Mercy Medical Center, Signature Healthcare, Southcoast Health and number of the Boston HealthNet CHCs are also members of BACO. With BACO's launch in early 2018, BMC will receive a fixed amount of money to pay for the care of

each MassHealth patient and will be responsible for coordinating everything patients need to stay healthy—both outpatient and inpatient services, as well as community-based services. The result will allow for improved ability to predict patient's health needs and provide more targeted care. BMC has also created a Population Health Services division to provide a mechanism for integration of health plan and hospital expertise. This division will oversee case management services for complex patients, care transitions as well as for specific diseases such as diabetes.

In conjunction with BACO, BMC has created the **THRIVE Screening and Referral Program** to identify and address its patients' social and economic needs, which will improve patient health and lower system costs. More than half of BMC's patients have multiple social determinants of health needs and want help addressing them. The THRIVE Program will help BMC better understand its patients' social needs, communicate those needs and individual care plans to other care providers through electronic medical record documentation, and empower patients and connect them with internal and community resources as requested. The program is currently screening for 8 social determinants of health domains: housing, food, medication affordability, transportation, utilities, caregiving, employment and education.

Finally, BMC has long prided itself on developing and delivering innovative and integrative substance use treatment, training, prevention and research programs, many of which have been replicated at the national level. Recently it received a $25 million gift from the Grayken family, the largest donation in its history and the largest private gift in the US in the last decade for addiction treatment and medicine, to create the **Grayken Center for Addiction** at BMC. Expert faculty affiliated with the Grayken Center regularly advise local, state, federal, and international governmental agencies on how to address the evolving opioid crisis and to reduce barriers to addiction treatment and harm reducing approaches like naloxone access. It expands existing training programs for doctors, nurses, pharmacists, and other clinicians on addiction medicine, and develops educational materials for prescribers, pharmacists, and other providers. The Grayken Center increases the pace of innovative research at BMC, already one of the most highly respected addictions research programs in the country, with a body of published work that has transformed addiction care. Through pilot research grants to faculty, the center will invest in the "incubation" of ideas in the BMC community (faculty, residents, fellows), and enable further multi-disciplinary research on new approaches examining innovative care models. The Center serves as a clearing house, bringing together leading researchers to share their findings, the trends they are observing, and their work. National conferences will showcase and examine findings from Grayken Center supported pilot projects and other research efforts. Finally, the Grayken Center increases the reach of research led by BMC teams focusing on evidence-based care models, and bringing together the experts to establish metrics against which outcomes can be tracked and more advanced data and analytics infrastructure developed. The Center enables BMC to more broadly disseminate research findings and to scale these programs or export them to partners nationally and internationally, and in the process expand access to treatment and reduce the significant cost of the disease to the health care system.

CHARLES RIVER CAMPUS (CRC)

The Charles River Campus (CRC) is the home for unique translational research resources in engineering, chemistry, physics, biology, and the home for the Photonics Center and the Center for Nanoscience and Nanobiotechnology. The BU School of Engineering has two world-renowned departments: its Biomedical Engineering Department is the only recipient of both Coulter and Fraunhofer endowment programs that support nationally recognized programs in point of care diagnostics, microfluidics, and photonics, among others. Boston University hosts one of the first interdisciplinary PhD programs in computational mathematics, renamed Bioinformatics, which gave birth to the bioinformatics revolution. Unique programs in chemical synthesis in the Department of Chemistry in the School of Arts and Sciences complement strong research in cancer biology in the

Biology Department. Boston University's College of Health & Rehabilitation Sciences, Sargent College, is a unique entity that fosters programs in physical rehabilitation medicine and research. The university financially supports core laboratories and facilities, as well as houses centers and institutes that participate in a vast array of research.

SUMMARY

The association of the Boston University Medical Campus including the Schools of Medicine, Dentistry, and Public Health, Boston Medical Center hospital, and the BU Charles River Campus provides the foundation for an academic home with an integrated research and training environment dedicated to quality, safety, efficiency and cost effectiveness of clinical and translational research. BMC provides a unique urban safety net population, with a proven record of accomplishment of diversity and successful enrollment on clinical trials. BU provides expertise in training and research in biomedical engineering, informatics, nanosciences, photonics, etc. that supports innovative device development and a strong basic science foundation.