BIOGRAPHICAL SKETCH

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NAME: Felson, David T.

eRA COMMONS USER NAME (credential, e.g., agency login): dfelson

POSITION TITLE: Professor of Medicine and Epidemiology; KL2 Director, Boston University CTSI

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Harvard College, Cambridge	AB	1974	History & Biochemistry
Johns Hopkins School of Medicine, Baltimore	MD	1978	Medicine
Boston University School of Public Health	MPH	1984	Epidemiology/Biostatistics

A. Personal Statement

As a rheumatologist and epidemiologist, I have focused my research on risk factors for osteoarthritis in the hope of identifying opportunities for disease prevention or early treatments. Much of my career has been devoted to training students and scholars in clinical research including MD's, epidemiologists and allied health professionals. I was the PI of the Rheumatology T32 and also Boston University K30 grant and then became the director of training and education when the CTSI began. Many of my former trainees are now accomplished funded researchers and several are department chairs.

My OA related publications are listed below.

1. Felson DT: Osteoarthritis of the knee. *N Engl J Med* 354:841-848, 2006. [PMID:16495396]
2. Harvey W, Yang M, Cooke T, Segal N, Lane N, Lewis C, Felson D: Association of leg-length inequality with knee osteoarthritis: a cohort study. *Ann Intern Med* 152:287-295, 2010. eScholarID:79674 PMID:20194234 doi:10.1059/0003-4819-152-5-201003020-00006
3. Neogi T, Bowes M, Niu J, De Souza K, Vincent G, Goggins J, Zhang Y, Felson D: MRI-based three-dimensional bone shape of the knee predicts onset of knee osteoarthritis: Data from the Osteoarthritis Initiative *Arthritis Rheum* 65:2048-2058, 2013. eScholarID:197155
4. Felson DT, Niu J, Quinn EK, Neogi T, Lewis C, Lewis CE, Frey Law L, McCulloch C, Nevitt M, LaValley M. Multiple nonspecific sites of joint pain outside the knees develop in persons with knee pain. *Arthritis Rheumatol* 2016. doi:10.1002/art.39848. PMID:27589036.

B. Positions and Honors

Positions and Employment

1978-1981 Residency in Internal Medicine, Case Western University Hospitals, Cleveland, OH
1981-1984 Fellowship in Arthritis and Connective Tissue Disease, Boston Univ School of Medicine, Boston
1984-1989 Assistant Professor of Medicine and Public Health, Boston University School of Medicine
1989-1994 Associate Professor of Medicine and Public Health, Boston University School of Medicine
1994-present Professor of Medicine and Public Health, Boston University School of Medicine

Other Experience and Professional Memberships

1993-1998 FDA Arthritis Advisory Committee

1994	Elected, American Society of Clinical Investigation
1998-1992	Epidemiology and Disease Control I Study Section (NIH)
1998	Chair, NIH Conference: Stepping Away from Osteoarthritis
2003	Elected, Association of American Physicians
2004-2009	Skeletal Biology Structure and Regeneration Study Section (NIH)
2013-2015	Associate Editor, Journal of Rheumatology
2015-	Co- Editor, Arthritis and Rheumatology

Honors

1991	Kunkel Young Investigator Award, American College of Rheumatology
1999	Osteoarthritis Research Society International: Award for Clinical Research
2000	Chair, NIH Conference on Osteoarthritis
2001	Clinical Research Award, American College of Rheumatology (inaugural recipient)
2005	Recipient, Howley Prize, Arthritis Foundation
2007	Robert Evans Research Mentoring Award, Boston Univ. Medical Center (inaugural)
2012	Lifetime Achievement Award, Osteoarthritis Research Society International
2017	Carol Nachman Prize, Wiesbaden, Germany
2018	Master, American College of Rheumatology
2020	Recipient. Howley Prize, Arthritis Foundation (2nd time)

C. Contributions to Science

1. My first contributions to science were in characterizing the impact of osteoarthritis and identifying obesity as a major risk factor for disease. We carried out the first longitudinal studies showing the obesity caused disease and that weight loss would likely prevent it. We also explored for the first time the possibility that metabolic factors related to obesity might contribute to disease risk.
   a. Guccione AA, Felson DT, Anderson JJ, et al: Specific diseases and their effects on functional limitations in elders in the Framingham Study. *Am J Public Health* 84:351-358, 1994.
   b. Felson DT, Anderson JJ, Naimark A, Walker AM, Swift M, Meenan RF: Obesity and knee osteoarthritis: the Framingham Study. *Ann Intern Med* 109:18-24, 1988.
   c. Felson DT, Zhang Y, Anthony JM, Naimark A, Anderson JJ: Weight loss reduces the risk of symptomatic knee osteoarthritis in women: The Framingham Study. *Ann Intern Med* 116:535-539, 1992.
   d. Li S, Schwartz AV, LaValley MP, Wang N, Desai N, Sun X, Neogi T, Nevitt M, Lewis CE, Guermazi A, Roemer F, Segal N, Felson DT Association of Visceral Adiposity With Pain but Not Structural Osteoarthritis. *Arthritis Rheumatol*. 2020;72(7):1103-1110. Epub 2020/02/11. doi:10.1002/art.41222. PMID:32039565; PMC7329601

2. My next contribution to science was in the area of osteoarthritis and what structures in the joint are responsible for the pain experienced in persons with disease. My work has documented that structures in the joint outside of cartilage generate pain in disease, especially bone marrow lesions and synovium and that these structures may be good therapeutic targets. I have demonstrated the association of bone marrow lesions with pain, that their fluctuation relates directly to pain fluctuation and that treatment of these lesions in the knee can both shrink the lesions on MRI and reduce knee pain. For synovitis, I have demonstrated an association with pain and that pain fluctuation and synovitis fluctuation are directly related. For both bone marrow lesions and synovitis, we have documented that their presence increases the risk of disease progression and cartilage loss. I have also begun to test treatments for osteoarthritis
   a. Felson DT, Chaisson CE, Hill CL, Totterman, SMS, Gale ME, Skinner KM, Kazis LE, Gale DR: The association of bone marrow lesions with pain in knee osteoarthritis. *Ann Intern Med* 134:541-549, 2001. [PMID:11281736]
   b. Baker K, Grainger A, Niu J, Clancy M, Guermazi A, Crema M, Hughes L, Buckwalter J, Wooley A, Nevitt M, Felson D: Relation of synovitis to knee pain using contrast-enhanced MRIs. *Ann Rheum Dis* 69:1779-1783, 2010. eScholarID:82936 PMID:20472593
   c. O'Neill TW, Parkes MJ, Maricar N, Marjanovic EJ, Hodgson R, Gait AD, Cootes TF, Hutchinson CE, Felson DT. Synovial tissue volume: a treatment target in knee osteoarthritis (OA). *Ann Rheum Dis.* 2016;75(1):84-90. doi: 10.1136/annrheumdis-2014-206927. PubMed PMID: 26116548; PMCID: PMC4717397.

d. Reichenbach S, Felson DT, Hincapie CA et al. Effect of biomechanical footwear on knee pain in people with knee osteoarthritis. The BIOTOK randomized trial. JAMA 2020; 323: 1-22.
e. Bacon K, LaValley MP, Jafarzadeh SR, Felson D. Does cartilage loss cause pain in osteoarthritis and if so, how much? *Ann Rheum Dis*. 2020;79(8):1105-1110. Epub 2020/05/10. doi:10.1136/annrheumdis-2020-217363. PMID:32381567.

3. Our cohort studies included the first knee MRIs from persons in the community, enabling us to study the prevalence of knee abnormalities. One major contribution has been to show that meniscal tears are common and often present in those without symptoms and that other MRI findings are highly prevalent in middle aged and older persons, including in persons without pain.
   a. Englund M, Guermazi A, Gale D….Felson DT: Incidental meniscal findings on knee MRI in middle aged and elderly persons in the United States. *N Engl J Med*, 359:1108-1115, 2008. [PMID:18784100] [PMCID:2897006]
   b. Guermazi A, Niu J, Hayashi D, Roemer F, Englund M, Neogi T, Aliabadi P, McLennan C, Felson D: Prevalence of abnormalities in knees detected by MRI in adults without knee osteoarthritis: Population based observational study (Framingham Osteoarthritis Study) *BMJ* 345:e5339, 2012. eScholarID:168317 PMID:22932918 DOI:101136/bmje5339
   c. Kim C, Nevitt MC, Niu J, Clancy MM, Lane NE, Link TM, Vlad S, Tolstykh I, Jungmann PM, Felson DT*, Guermazi A*. Association of hip pain with radiographic evidence of hip osteoarthritis: Diagnostic test study. *BMJ* 351:h5983, 2015. doi: 10.1136/bmj.h5983. PubMed PMID:26631296 (*equal contributions)
   d. Wallace IJ, Worthington S, Felson DT, Jurmain RD, Wren KT, Maijanen H, Woods RJ, Lieberman DE. Knee osteoarthritis has doubled in prevalence since the mid-20th century. *PNAS* 114:933-9336, 2017. PMID:28808025; PMC5584421.

4. I have actively pursued the testing and development of biomechanical treatments for osteoarthritis, a mechanically driven disease, carrying out a major trial of heel wedges, peforming a meta-analysis which showed that these treatments do not have an effect on pain and then carrying out a major trial of patellofemoral braces, the latter showing a prominent effect of reducing pain and shrinking bone marrow lesions on MRI.
   a. Parkes M, Maricar N, Lunt M, Lavalley M, Jones R, Segal N, Takahashi-Narita K, Felson D: Lateral wedge insoles as a conservative treatment for pain in patients with medial knee osteoarthritis: A meta-analysis. *JAMA*, 310(7), 722-30, 2013. eScholarID:206097 PMID:23989797 DOI:10.1001/*JAMA*.2013.243229
   b. Callaghan MJ, Parkes MJ, Hutchinson CE, Gait AD, Forsythe LM, Marjanovic EJ, Lunt M, Felson DT. A randomised trial of a brace for patellofemoral osteoarthritis targeting knee pain and bone marrow lesions. *Ann Rheum Dis* 74:1164-1170, 2015. doi:10.1136/annrheumdis-2014-206376. PubMed PMID: 25596158; PMCID:PMC4771926.
   c. Jones RK, Chapman GJ, Parkes MJ, Forsythe L, Felson DT. The effect of different types of insoles or shoe modifications on medial loading of the knee in persons with medial knee osteoarthritis: A randomised trial. *J Orthop Res* 2015. doi:10.1002/jor.22947. PubMed PMID: 25991385. PMCID: PMC4737200.
      d. Felson DT, Parkes M, Carter S, Liu A, Callaghan MJ, Hodgson R, Bowes M, Jones RK. The efficacy of a lateral wedge insole for painful medial knee osteoarthritis after prescreening: A randomized clinical trial. *Arthritis Rheumatol*. 2019;71(6):908-915. Epub 2019/01/08. doi:10.1002/art.40808. PMID:30615299; PMC6536343.

5. Lastly, I led the efforts to define and standardize outcomes in rheumatoid arthritis trials and created the concept of a core set of outcomes. The outcomes we developed were widely adopted including by the FDA.
   a. Felson DT, Anderson JJ, Boers M, et al: American College of *Rheumatology* preliminary core set of disease activity measures for use in rheumatoid arthritis clinical trials. *Arthritis Rheum* 36:729-740, 1993.
   b. Felson DT, Anderson JJ, Boers M, et al: American College of Rheumatology preliminary definition of improvement in rheumatoid arthritis. *Arthritis Rheum* 38:727-735, 1995.
   c. Felson DT, Smolen JS, Wells G, et al American College of *Rheumatology*; European League Against Rheumatism: provisional definition of remission in rheumatoid arthritis for clinical trials *Arthritis Rheum* 63:573-586, 2011. eScholarID:118631 PMID:21294106 DOI:101002/art30129

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1beov9voFdvQg/bibliography/46074301/public/?sort=date&direction=ascending

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

1U54TR001012 [Center UL1 RR25771] Center (PI) Felson (Co-I) 04/1/20-03/31/25
NIH/NCRR
Boston University Clinical and Transitional Science Award (CTSA) Program
This Award will create an academic home for clinical and translational research and training. It will fund a hospital and University wide institute that will add multiple other programs to the portfolio of resources available for clinical researchers, including community outreach, research ethics, and bioinformatics
Role: Co-I Dir, Training/Education

P30 AR072571 (Felson) 9/14/2019– 8/31/2024
NIH/NIAMS
Boston University CCCR
The overall goal of this center is 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.

U01 AG18820 Felson (PI) 09/30/01- 05/31/21
NIH/NIA
Multicenter Osteoarthritis Study (MOST) and MOST Renewal
This is a multicenter observational project evaluating the relation of risk factors to the development or progression of symptomatic osteoarthritis, particularly OA of the knee.
Role: PI

R01 AR071950-01 Felson (PI) 08/01/17-07/31/21
NIH/NIAMS
Fats, Fiber and Osteoarthritis
Study assesses whether serum levels of omega-3 fatty acids, several other lipids and alkylresorcinol, a biomarker of fiber intake, affect the risk of knee osteoarthritis.

R01 AR070139 (Capellini) 4/1/2018 – 1/31/2023
NIH/NIAMS
Uncovering the Genetic Mechanisms Behind Joint-Specific Osteoarthritis
Oversee the research conducted by an analyst who will perform an association study of OA knee shape and GDF5 variants using shape data acquired from Mike Bowes using Osteoarthritis Initiative (OAI) images and genotyping data via dbgap database.

Dr. Felson has an honorary appointment as Professor at the University of Manchester in England for which he receives a part time cost share salary which is provided by the university not in conjunction with any specific research project.

Completed Research Support

R01AR062506 Neogi (PI) (Felson Co-I) 9/14/12-08/31/18
NIAMS Central Sensitization in Post-Knee Replacement Pain and Relation to OA Pathology
Specific aim of this project is to evaluate the roles of sensitization in post-knee replacement pain and OA pathology contributing to occurrence of sensitization.

P60 AR47785 Felson (PI) 9/24/01-8/31/18
NIAMS Multidisciplinary Clinical Research Center at Boston University
This is a multi-project center grant supporting four clinical research projects including one clinical trial, a population-based observational study, and patient-based cohort studies.
Role: PI

R01 AR05316 Felson (PI) 08/11/06-07/31/09
NIH/NIAMS Structural Correlates of Knee Pain
This is an ancillary study to MOST. The goal is to examine structural findings on MRI that are correlated with the presence and severity of knee pain.
Role: PI

R01 AG18393 Felson (PI) 05/01/01 - 04/30/06
NIH/NIA The Framingham Osteoarthritis Study
The major goals of this study are to examine the effect of physical activity in the development/progression of radiographic osteoarthritis and to also evaluate the prevalence of knee MRI findings in a community-based sample.
Role: PI