

FIFTH EDITION

RHEUMATOLOGY

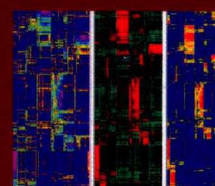
Marc C. Hochberg

Alan J. Silman

Josef S. Smolen

Michael E. Weinblatt

Michael H. Weisman



FIFTH EDITION

RHEUMATOLOGY

Marc C. Hochberg, MD, MPH

Professor of Medicine and Epidemiology and Preventive Medicine;
Head, Division of Rheumatology and Clinical Immunology
University of Maryland School of Medicine
Baltimore, Maryland, USA

Alan J. Silman, MD, MSc, FRCP, FMEDSCI

Medical Director, Arthritis Research UK
Chesterfield, UK;
Professor, Rheumatic Diseases Epidemiology
University of Manchester
Manchester, UK

Josef S. Smolen, MD, FRCP

Professor of Medicine;
Chairman,
Department of Internal Medicine III, Division of Rheumatology,
Medical University of Vienna;
Chairman, Second Department of Medicine
Center for Rheumatic Diseases
Hietzing Hospital
Vienna, Austria

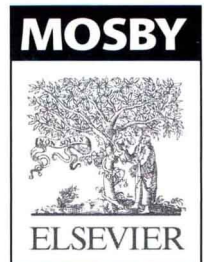


Michael E. Weinblatt, MD

John R. and Eileen K. Riedman Professor of Medicine
Harvard Medical School;
Division of Rheumatology, Immunology and Allergy
Brigham and Women's Hospital
Boston, Massachusetts, USA

Michael H. Weisman, MD

Chief, Division of Rheumatology
Professor of Medicine
Cedars-Sinai Medical Center
David Geffen School of Medicine at UCLA
Los Angeles, California, USA



All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Permissions may be sought directly from Elsevier's Rights Department: phone: (+1) 215 239 3804 (US) or (+44) 1865 843830 (UK); fax: (+44) 1865 853333; e-mail: healthpermissions@elsevier.com. You may also complete your request on-line via the Elsevier website at <http://www.elsevier.com/permissions>.

Notice

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our knowledge, changes in practice, treatment and drug therapy may become necessary or appropriate. Readers are advised to check the most current information provided (i) on procedures featured or (ii) by the manufacturer of each product to be administered, to verify the recommended dose or formula, the method and duration of administration, and contraindications. It is the responsibility of the practitioner, relying on their own experience and knowledge of the patient, to make diagnoses, to determine dosages and the best treatment for each individual patient, and to take all appropriate safety precautions. To the fullest extent of the law, neither the Publisher nor the Editors assumes any liability for any injury and/or damage to persons or property arising out of or related to any use of the material contained in this book.

The Publisher

Library of Congress Cataloging-in-Publication Data

Rheumatology / [edited by] Marc C. Hochberg ... [et al.].—5th ed.

p. ; cm.

Includes bibliographical references and index.

ISBN 978-0-323-06551-1

1. Rheumatology. I. Hochberg, Marc C.

[DNLM: 1. Rheumatic Diseases. 2. Antirheumatic Agents—therapeutic use. WE 544 R47141 2010]

RC927.R48215 2010

616.7'23—dc22

2010009823

Volume 1: 9996077691

Volume 2: 9996077756

Acquisitions Editor: Pamela Hetherington
Developmental Editor: Lucia Gunzel
Publishing Services Manager: Linda Van Pelt
Project Manager: Francisco Morales
Design Direction: Louis Forgione

ACKNOWLEDGMENTS

We would like to acknowledge the tremendous work of the contributors to *Rheumatology*, without whom this book would not have been possible. In addition, we would like to acknowledge our mentors: Drs. Eva Alberman, Harry Currey (deceased), Lawrence E. Shulman (deceased, OBM), Carl Steffen (deceased), Alfred D. Steinberg, Georg Geyer, Mary Betty Stevens (deceased), and Nathan J. Zvaifler.

We would also like to acknowledge the excellent team at Elsevier led by Kim Murphy and including Pamela Hetherington, Lucia Gunzel, and Frank Morales, as well as our secretaries and administrative assistants (Jacqui Oliver, Aida Medina, Johanna Leibl, and Robin Nichols) for all of their hard work and diligence. Last, but certainly not least, we want to acknowledge our patients, who continue to provide stimulating challenges to us in our clinical practices.

DEDICATION

We would like to dedicate this book to our parents (living or of blessed memory) and our wives, children, and grandchildren:

Susan Hochberg; Francine, Jeffrey, and Eleanor (Nora) Zoe Giuffrida; and Jennifer Hochberg
Ruth Silman; Joanna, Timothy, and Daniel Silman
Alice Smolen; Eva and Daniel Hruschka; Nina, Etienne, and Anna Smolen-Wildson; Daniel Smolen; and Alexander Smolen and Meeri Parikka
Barbara Weinblatt; Hillary and Jason Chapman; and Courtney Weinblatt
Betsy Weisman; Greg, Nicole, Mia, and Joey Weisman; Lisa, Andrew, David, and Thomas Cope; and Annie, Bill, and Caroline Macomber

CONTRIBUTORS

Aryeh M. Abeles, MD

Assistant Clinical Professor of Medicine
Division of Rheumatic Diseases
University of Connecticut School of Medicine
Farmington, Connecticut
USA
Inflammation

Abby G. Abelson, MD

Clinical Assistant Professor of Medicine
Interim Chair
Department of Rheumatic and Immunologic Disease
Vice Chair for Education
Orthopaedic and Rheumatology Institute
Cleveland Clinic
Cleveland, Ohio
USA
Management of osteoporosis

Abhishek Abhishek, MD, MRCP

Academic Rheumatology Unit
School of Clinical Sciences
University of Nottingham Faculty of Medicine and
Health Sciences
Nottingham
United Kingdom
Calcium pyrophosphate crystal-associated arthropathy

Steven B. Abramson, MD

NYU Langone Medical Center
New York, New York
USA
Inflammation

Michael A. Adams, BSc, PhD

Reader in Spine Biomechanics
Department of Anatomy
University of Bristol Medical School
Bristol
United Kingdom
Biomechanics of the spine

David M. Adlam, MBBS, BDS, FRCS, FDSRCS

Honorary Lecturer in Surgery
University of Cambridge Medical School
Consultant Maxillofacial Surgeon
Addenbrooke's Hospital
Oral and Maxillofacial Surgeon
Spire Cambridge Lea Hospital
Cambridge
United Kingdom
The temporomandibular joint

Thomas Aigner, MD, DSc

Professor of Pathology
Institute of Pathology and Molecular Pathology
Head of Pathology
University of Würzburg/Coburg Medical Center
Coburg
Germany
Pathogenesis and pathology of osteoarthritis

Shizuo Akira, MD, PhD

Professor
Laboratory for Host Defense
World Premier International Immunology Frontier
Research Center
Osaka University
Osaka
Japan
Principles of innate immunity

Ivona Aksentijevich, MD

Staff Scientist
Laboratory of Clinical Investigation
National Institute of Arthritis and Musculoskeletal and
Skin Diseases
National Institutes of Health
Bethesda, Maryland
USA
The hereditary recurrent fevers

Daniel Aletaha, MD, MSc

Associate Professor
Department of Medicine
Division of Rheumatology
Medical University of Vienna
Vienna
Austria
Evaluation and outcomes of patients with rheumatoid arthritis

Antonios O. Aliprantis, MD, PhD

Instructor in Medicine
Harvard Medical School
Associate Physician
Department of Rheumatology, Allergy, and
Immunology
Brigham and Women's Hospital
Boston, Massachusetts
USA
Relapsing polychondritis

Cornelia F. Allaart, MD, PhD

Associate Professor
Department of Rheumatology
Leiden University Faculty of Medicine
Leiden
The Netherlands
Parenteral gold, antimalarials, and sulfasalazine

Pamela G. Allen, MD

Fellow
Department of Orthopaedics
Union Memorial Hospital
Baltimore, Maryland
USA
The ankle and foot

Roy D. Altman, MD

Professor of Medicine
Department of Medicine
Division of Rheumatology and Immunology
David Geffen School of Medicine at UCLA
Los Angeles, California
USA
Clinical features of osteoarthritis; Animal models of osteoarthritis

Martin Aringer, MD

Professor of Medicine
Carl Gustav Carus Faculty of Medicine
Dresden University of Technology
Chief
Division of Rheumatology
University Clinical Center Carl Gustav Carus
Dresden
Germany
Signal transduction

Dana P. Ascherman, MD

Professor of Medicine
Department of Medicine
Division of Rheumatology and Clinical Immunology
University of Pittsburgh School of Medicine
Pittsburgh, Pennsylvania
USA
Clinical features, classification, and epidemiology of inflammatory muscle disease

Shervin Assassi, MD, MCR

Assistant Professor of Internal Medicine-Rheumatology
University of Texas Medical School at Houston
Houston, Texas
USA
Epidemiology and classification of scleroderma

Sergei P. Atamas, MD, PhD

Associate Professor of Medicine and Microbiology and
Immunology
University of Maryland School of Medicine
Research Health Scientist
Research and Development Service
Baltimore VA Medical Center
Baltimore, Maryland
USA
The principles of adaptive immunity

Alan N. Baer, MD

Associate Professor of Medicine
Johns Hopkins University School of Medicine
Chief of Rheumatology
Good Samaritan Hospital
Baltimore, Maryland
USA
Metabolic, drug-induced, and other non-inflammatory myopathies

Dominique Baeten, MD, PhD

Professor of Clinical Immunology and Rheumatology
University of Amsterdam Faculty of Medicine
Academic Medical Center
Amsterdam
The Netherlands
Etiology, pathogenesis, and pathophysiology of ankylosing spondylitis

Nancy Baker, ScD, MPH

Assistant Professor
Department of Occupational Therapy
University of Pittsburgh School of Health and
Rehabilitation Sciences
Pittsburgh, Pennsylvania
USA
Principles of rehabilitation: physical and occupational therapy

Alejandro Balsa, MD, PhD

Associate Professor of Rheumatology
School of Medicine
Universidad Autónoma de Madrid
Staff Rheumatologist
Hospital Universitario La Paz
Madrid
Spain
Septic arthritis, osteomyelitis, and gonococcal and syphilitic arthritis

Les Barnsley, BMed(Hons), GradDipEpi, PhD, FRACP, FAFRM(RACP)

Associate Professor
Department of Medicine
University of Sydney Medical School
Sydney
Head
Department of Rheumatology
Concord Repatriation Hospital
Concord
New South Wales
Australia
Neck pain

Joan M. Bathon, MD
Professor of Medicine
Johns Hopkins University School of Medicine
Baltimore, Maryland
USA
Management of rheumatoid arthritis: synovitis

Michael A. Becker, MD
Professor Emeritus of Medicine
Division of Rheumatology
University of Chicago Pritzker School of Medicine/
University of Chicago Hospitals
Chicago, Illinois
USA
Etiology and pathogenesis of gout

Professor Jill JF Belch, FRCP, MD
Tayside R&D Director
Head of Institute of Cardiovascular Research, (Vascular
& Inflammatory Diseases Research Unit)
Ninewells Hospital and Medical School
Dundee
United Kingdom
Raynaud's phenomenon

Nicholas Bellamy, MD, MSc, MBA, DSc
Professor of Rehabilitation Medicine
Director
Centre of National Research on Disability and
Rehabilitation Medicine (CONROD)
University of Queensland Faculty of Health Sciences
Brisbane, Queensland
Australia
Principles of clinical outcome assessment

Teresita Bellido, PhD
Professor
Department of Anatomy and Cell Biology
Department of Medicine
Indiana University School of Medicine
Indianapolis, Indiana
USA
Bone structure and function

R. Michael Benitez, MD
Associate Professor
Department of Medicine
Division of Cardiology
University of Maryland School of Medicine
Baltimore, Maryland
USA
The heart in rheumatic disease

Michael Benjamin, BSc, PhD
Professor Emeritus of Musculoskeletal Biology and
Sports Medicine Research
School of Biosciences
Cardiff University
Cardiff
United Kingdom
Enthesopathies

Michael W. Beresford, MBChB, PhD, MRCP(UK), MRCPCH

Senior Lecturer in Paediatric Medicine
Institute of Child Health
University of Liverpool Faculty of Medicine
Honorary Consultant Paediatric Rheumatologist
Clinical Academic Department of Paediatric
Rheumatology
Alder Hey Children's NHS Foundation Trust
Liverpool
United Kingdom
Connective tissue diseases in children

Brian M. Berman, MD
Professor of Family and Community Medicine
University of Maryland School of Medicine
Medical Director
Center for Integrative Medicine
University of Maryland Medical Center
Baltimore, Maryland
USA
Complementary and alternative medicine

Bonnie Lee Bermas, MD
Assistant Professor of Medicine
Harvard Medical School
Associate Rheumatologist
Brigham and Women's Hospital
Boston, Massachusetts
USA
Drugs and pregnancy

George Bertisias, MD, PhD
Investigator
Rheumatology, Clinical Immunology and Allergy
University of Crete School of Medicine
Crete
Greece
Systemic lupus erythematosus: treatment—renal involvement

John P. Bilezikian, MD
Professor of Medicine and Pharmacology
Chief
Division of Endocrinology
Department of Medicine
Columbia University College of Physicians and
Surgeons
New York, New York
USA
Primary hyperparathyroidism: rheumatologic manifestations and bone disease

Philip E. Blazar, MD
Assistant Professor of Orthopaedic Surgery
Harvard Medical School
Attending Physician
Department of Orthopedic Surgery
Brigham and Women's Hospital
Boston, Massachusetts
USA
The wrist and hand

Jane F. Bleasel, MBBS, PhD, FRACP
Clinical Associate Professor
Department of Rheumatology
University of Sydney Medical School
Head
Department of Rheumatology
Royal Prince Alfred Hospital
Sydney, New South Wales
Australia
Hemophilia and von Willebrand disease

Markus Böhm, MD
Associate Professor
Department of Dermatology
University of Münster Faculty of Health Science
Münster
Germany
Skin in rheumatic disease

Christelle Boileau, PhD
Assistant Professor
Department of Pharmacology
University of Montreal Faculty of Medicine
Postdoctoral Fellow
Osteoarthritis Research Unit
University of Montreal Hospital Research Centre
(CR-CHUM)
Montreal, Quebec
Canada
Animal models of osteoarthritis

Marcy B. Bolster, MD
Professor of Medicine
Medical University of South Carolina College of
Medicine
Charleston, South Carolina
USA
Clinical features of systemic sclerosis

Stefano Bombardieri, MD
Professor of Rheumatology and Director of the
Specialty School of Rheumatology
University of Pisa
Director of Rheumatology Operative Unit and Director
of the Department of Internal Medicine
Azienda Ospedaliera Universitaria Pisana
Pisa
Italy
Cryoglobulinemia

Sydney Bonnick, MD
Adjunct Professor
Department of Kinesiology and Biological Sciences
University of North Texas
Medical Director
Clinical Research Center of North Texas
Denton, Texas
USA
DXA and measurement of bone

Dimitrios T. Boumpas, MD, FACP
Professor, Internal Medicine
University of Crete School of Medicine
Heraklion
Chief
Internal Medicine and Rheumatology, Clinical
Immunology, and Allergy
University Hospital of Heraklion
Crete
Greece
Systemic lupus erythematosus: treatment—renal involvement

Richard D. Brasington, Jr., MD
Professor of Medicine—Rheumatology
Director of Clinical Rheumatology
Washington University School of Medicine
St. Louis, Missouri
USA
Clinical features of rheumatoid arthritis

Ferdinand Breedveld, MD
Professor of Rheumatology
Department of Rheumatology
Leiden University Medical Center
Leiden
The Netherlands
Tyrosine kinase inhibition

Earl W. Brien, MD

Cedars Sinai Medical Center
Los Angeles, California
USA
Bone tumors

Anne C. Brower

Retired
Washington, DC
Seronegative spondyloarthropathies: imaging

Matthew A. Brown, MD, MBBS, FRACP

Professor of Immunogenetics
University of Queensland Faculty of Health Sciences
Brisbane
University of Queensland Diamantina Institute of
Cancer, Immunology and Metabolic Medicine
Princess Alexandra Hospital
Woolloongabba, Queensland
Australia
Genetics of ankylosing spondylitis

Ian N. Bruce, MD, FRCP

Professor of Rheumatology
School of Translational Medicine
Arthritis Research Council (ARC) Epidemiology Unit
University of Manchester Faculty of Medical and
Human Sciences
Manchester
United Kingdom
Clinical features of psoriatic arthritis

William D. Bugbee, MD

Associate Professor of Orthopaedic Surgery
University of California, San Diego, School of Medicine
Attending Physician
Division of Orthopaedic Surgery
Scripps Clinic
La Jolla, California
USA
The hip

Marwan A. S. Bukhari, PhD, FRCP

Honorary Senior Lecturer in Clinical Medicine
University of Liverpool Faculty of Medicine
Liverpool
Consultant Rheumatologist
University Hospitals of Morecambe Bay NHS Trust
Lancaster
United Kingdom
Mucopolysaccharidoses

Rubén Burgos-Vargas, MD

Professor of Medicine
Universidad Nacional Autónoma de México
Rheumatologist
Medical Sciences Investigator
Hospital General de México
Mexico City
Mexico
The juvenile-onset spondyloarthropathies

Jane C. Burns, MD

Adjunct Professor
Department of Pediatrics
University of California, San Diego, School of Medicine
La Jolla
Director
Kawasaki Disease Research Center
Rady Children's Hospital San Diego
San Diego, California
USA
Kawasaki disease

David B. Burr, PhD

Professor of Biomedical Engineering
Department of Anatomy and Cell Biology
Indiana University School of Medicine
Indianapolis, Indiana
USA
Bone structure and function

Patricia C. Cagnoli, MD

Clinical Assistant Professor
Department of Internal Medicine
Division of Rheumatology
University of Michigan Medical School/University of
Michigan Health System
Ann Arbor, Michigan
USA
Treatment of non-renal lupus

Leonard H. Calabrese, DO

Professor of Medicine
Cleveland Clinic Lerner College of Medicine of Case
Western Reserve University
Vice Chairman
Department of Rheumatic and Immunologic Diseases
R.J. Fasenmyer Chair of Clinical Immunology
Theodore F. Classen DO Chair of Osteopathic Research
and Education
Cleveland Clinic Foundation
Cleveland, Ohio
USA
Rheumatologic aspects of viral infections

Jeffrey P. Callen, MD

Professor of Medicine—Dermatology
Chief
Division of Dermatology
University of Louisville School of Medicine
Louisville, Kentucky
USA
Cutaneous vasculitis and panniculitis

Juan J. Canoso, MD, FACP, MACR

Adjunct Professor of Medicine
Tufts University School of Medicine
Boston, Massachusetts
USA
Rheumatologist
Department of Medicine
ABC Medical Center
Mexico City
Mexico
Adjunct Professor of Medicine
Department of Medicine
Tufts University School of Medicine
Boston, Massachusetts
USA
*Aspiration and injection of joints and periarticular tissues
and intralesional therapy*

Sabrina Cavallo, MD

Université de Montréal
Département de Médecine Sociale et Préventive
McGill University Health Center: Montreal Children's
Hospital
Montreal
Canada
*Rehabilitation and psychosocial issues in juvenile
idiopathic arthritis*

Tim E. Cawston, BSc, PhD

William Leech Professor of Rheumatology
School of Clinical Medical Sciences
Musculoskeletal Research Group
Institute of Cellular Medicine
Newcastle University
Newcastle upon Tyne
United Kingdom
Tissue destruction and repair

Michael Denis Chard, MD, MB, BS

Consultant Rheumatologist
Worthing Hospital
Worthing
United Kingdom
The elbow

Lan X. Chen, MD, PhD

Clinical Associate Professor of Medicine
University of Pennsylvania
University of Pennsylvania School of Medicine
Attending Physician
Penn Presbyterian Medical Center
Philadelphia, Pennsylvania
USA
Other crystal-related arthropathies

Ernest H. S. Choy, MD, FRCP

Clinical Reader
Academic Department of Rheumatology
King's College London School of Medicine and
Dentistry
London
United Kingdom
Immunotherapies: T cell and complement

Daniel J. Clauw, MD

Professor
Departments of Anesthesiology and
Medicine—Rheumatology
University of Michigan Medical School
Ann Arbor, Michigan
USA
Fibromyalgia and related syndromes

Philip J. Clements, MD, MPH

Professor of Medicine
David Geffen School of Medicine at UCLA
Attending Physician
Ronald Reagan UCLA Medical Center
Los Angeles, California
USA
*Immunosuppressives (chlorambucil, cyclosporine,
cytoxan, azathioprine [Imuran], mofetil, tacrolimus)*

Nona T. Colburn, MD

Guest Researcher
Laboratory of Clinical Investigation
National Institute of Arthritis and Musculoskeletal and
Skin Diseases
National Institutes of Health
Bethesda, Maryland
USA
The hereditary recurrent fevers

Laura A. Coleman, PhD, RD

Scientist
Epidemiology Research Center
Marshfield Clinic Research Foundation
Marshfield, Wisconsin
USA
Nutrition in rheumatic disease

Philip G. Conaghan, MBBS, PhD, FRACP, FRCP

Professor of Musculoskeletal Medicine
School of Medicine
University of Leeds Faculty of Medicine and Health
Deputy Director
NIHR Musculoskeletal Biomedical Research Unit
Leeds Teaching Hospitals NHS Trust
Leeds
United Kingdom
Imaging of osteoarthritis

Cyrus Cooper, MD, MA, FRCP, FFPH, FMedSci
 Professor of Rheumatology
 School of Medicine
 University of Southampton
 Director
 MRC Epidemiology Resource Centre
 Southampton General Hospital
 Southampton
 United Kingdom
Epidemiology and classification of metabolic bone disease

Felicia Cosman, MD
 Associate Professor of Clinical Medicine
 Regional Bone Center
 Helen Hayes Hospital
 West Haverstraw, NY
 USA
Pathogenesis of osteoporosis

Karen H. Costenbader, MD, MPH
 Assistant Professor of Medicine
 Harvard Medical School
 Co-Director
 Lupus Center
 Brigham and Women's Hospital
 Boston, Massachusetts
 USA
Epidemiology and classification of systemic lupus erythematosus

Paul Creamer, MD, FRCP
 Senior Clinical Lecturer
 Department of Rheumatology
 University of Bristol Medical School
 Consultant Rheumatologist
 Southmead Hospital
 North Bristol NHS Healthcare Trust
 Bristol
 United Kingdom
Neuropathic arthropathy

José C. Crispin, MD
 Instructor in Medicine
 Harvard Medical School
 Staff Rheumatologist
 Beth Israel Deaconess Medical Center
 Boston, Massachusetts
 USA
Pathogenesis of lupus

Lindsey A. Criswell, MD, MPH, DSc
 Professor of Medicine–Rheumatology and Orofacial Sciences
 University of California, San Francisco, School of Medicine
 San Francisco, California
 USA
The contribution of genetic factors to rheumatoid arthritis

Bruce N. Cronstein, MD
 Paul R. Esserman Professor of Medicine
 New York University School of Medicine
 New York, New York
 USA
Pharmacogenomics in rheumatology

Raymond Cross, MD, MS
 Associate Professor
 Department of Medicine
 Division of Gastroenterology and Hepatology
 Director
 Inflammatory Bowel Disease Program
 University of Maryland School of Medicine
 Chief
 GI Section
 VA Maryland Health Care System
 Baltimore, Maryland
 USA
Gastrointestinal tract and rheumatic disease

Natalie E. Cusano, MD
 Postdoctoral Clinical Fellow
 Department of Endocrinology
 Columbia University Medical Center
 New York, New York
 USA
Primary hyperparathyroidism: rheumatologic manifestations and bone disease

John J. Cush, MD
 Professor of Medicine and Rheumatology
 Director of Clinical Rheumatology
 Baylor Research Institute
 Baylor University Medical Center
 Dallas, Texas
 USA
Tumor necrosis factor blocking therapies

Maurizio Cutolo, MD
 Professor of Rheumatology
 Director
 Research Laboratory and Academic Unit of Clinical Rheumatology
 Department of Internal Medicine
 Medical School
 University of Genoa Faculty of Medicine
 Genoa
 Italy
Effects of the neuroendocrine system on development and function of the immune system

Vivette D'Agati, MD
 Professor of Pathology
 Columbia University College of Physicians and Surgeons
 Director
 Renal Pathology Division
 Columbia University Medical Center
 New York, New York
 USA
Immunopathology of systemic lupus erythematosus

Hanne Dagfinrud, PhD
 Associate Professor
 University of Oslo Faculty of Medicine
 Senior Researcher
 National Resource Center for Rehabilitation in Rheumatology
 Diakonhjemmet Hospital
 Oslo
 Norway
Multidisciplinary approach to rheumatoid arthritis

David I. Daikh, MD, PhD
 Associate Professor of Medicine
 Department of Medicine
 Division of Rheumatology
 University of California, San Francisco, School of Medicine
 Chief
 Rheumatology Section
 San Francisco Medical Center
 San Francisco, California
 USA
Animal models of lupus

Seamus E. Dalton, MBBS, FACRM, FAFRM, FACSP
 Consultant in Rehabilitation and Sports Medicine
 North Sydney Orthopaedic and Sports Medicine Center
 Sydney, New South Wales
 Australia
The shoulder

Shouvik Dass, MA, MBBCh, MRCP(UK)
 Clinical Research Fellow
 Academic Section of Musculoskeletal Disease
 Leeds Institute of Molecular Medicine
 University of Leeds Faculty of Medicine and Health
 Consultant Rheumatologist
 Leeds Teaching Hospitals NHS Trust
 Leeds
 United Kingdom
Rituximab

Jean-Pierre David, PhD
 Group Leader
 Experimental Bone Pathology
 Department of Medicine 3, Rheumatology and Immunology
 University of Erlangen-Nuremberg
 Erlangen
 Germany
Osteoimmunology

Aileen Davis, PhD
 Senior Scientist
 Division of Health Care and Outcomes Research and Arthritis and Community Research and Evaluation Unit
 Toronto Western Research Institute
 Toronto, Ontario
 Canada
Assessment of the patient with osteoarthritis and measurement of outcomes

Chad L. Deal, MD
 Associate Professor of Medicine
 Cleveland Clinic Lerner College of Medicine of Case Western Reserve University
 Head
 Center for Osteoporosis and Metabolic Bone Disease
 Cleveland Clinic
 Cleveland, Ohio
 USA
Management of osteoporosis

Karel De Ceulaer, MD
 Department of Medicine
 University of the West Indies
 Kingston
 Jamaica
Joint and bone lesions in hemoglobinopathies

Chris Deighton, MD, FRCP
 Special Lecturer
 Nottingham University School of Medical and Surgical Sciences
 Consultant Rheumatologist
 Royal Derby Hospital
 Derby
 United Kingdom
The contribution of genetic factors to rheumatoid arthritis

Paul F. Dellaripa, MD
 Assistant Professor of Medicine
 Harvard Medical School
 Staff Rheumatologist
 Co-Director
 Interstitial Lung Disease Center
 Brigham and Women's Hospital
 Boston, Massachusetts
 USA
The lung in rheumatic disease

Alessandra Della Rossa

Clinical Assistant
Azienda Ospedaliera Universitaria Pisana
Pisa
Italy
Cryoglobulinemia

David Dempster, PhD

Professor of Clinical Pathology
Department of Pathology
Columbia University College of Physicians and Surgeons
New York
Director
Regional Bone Center
Helen Hayes Hospital
West Haverstraw, New York
USA
Pathogenesis of osteoporosis

Elaine Dennison

MRC Epidemiology Resource Centre
Southampton
United Kingdom
Epidemiology and classification of metabolic bone disease

Christopher P. Denton, PhD, FRCP

Professor of Experimental Rheumatology
Centre for Rheumatology
Royal Free Campus
University College London
Hampstead
Consultant Rheumatologist
Royal Free Hospital
London
United Kingdom
Pulmonary management of scleroderma

John Denton, MSc

Research Fellow in Osteoarticular Pathology
School of Biomedicine
University of Manchester Faculty of Medical and Human Sciences
Honorary Advanced Practitioner in Osteoarticular Pathology
Central Manchester University Hospitals NHS Foundation Trust
Manchester
United Kingdom
Synovial fluid analysis

Roshan Dhawale, MD, MPH

Fellow
Division of Rheumatology and Clinical Immunology
University of Pittsburgh School of Medicine/University of Pittsburgh Medical Center
Pittsburgh, Pennsylvania
USA
T-cell co-stimulation

Michael Doherty, MD, MA, FRCP

Professor of Rheumatology
Academic Rheumatology Unit
School of Clinical Sciences
University of Nottingham Faculty of Medicine and Health Sciences
Nottingham
United Kingdom
Calcium pyrophosphate crystal-associated arthropathy

Patricia Dolan, MD, BSc

Reader in Biomechanics
Department of Anatomy
University of Bristol Medical School
Bristol
United Kingdom
Biomechanics of the spine

Rachelle Donn, MBChB, PhD

Reader in Complex Disease Genetics
Arthritis Research Campaign (ARC) Epidemiology Unit
School of Translational Medicine
University of Manchester Faculty of Medical and Human Sciences
Manchester
United Kingdom
Etiology and pathogenesis of juvenile idiopathic arthritis

Mary Anne Dooley, MD, MPH

Associate Professor of Medicine
Department of Medicine
Division of Rheumatology and Immunology
Thurston Arthritis Research Center
University of North Carolina at Chapel Hill School of Medicine
Chapel Hill, North Carolina
USA
Drug-induced lupus

Maxime Dougados, MD

Medicine Faculty, Paris-Descartes University
Rheumatology B Department
Cochin Hospital
Paris
France
Management of osteoarthritis

Michael F. Drummond, MCom, DPhil

Professor of Health Economics
Centre for Health Economics
University of York
York
United Kingdom
Principles of health economics and application to rheumatic disorders

George S. M. Dyer, MD

Clinical Instructor in Orthopaedic Surgery
Harvard Medical School
Orthopedic Surgeon
Brigham and Women's Hospital and VA Boston Healthcare System
Boston, Massachusetts
USA
The wrist and hand

Brandon E. Earp, MD

Instructor in Orthopedic Surgery
Harvard Medical School
Attending Hand and Upper Extremity Surgeon
Brigham and Women's Hospital
Boston, Massachusetts
USA
The wrist and hand

N. Lawrence Edwards, MD

Professor and Vice Chairman
Department of Medicine
University of Florida College of Medicine
Gainesville, Florida
USA
Clinical gout

Patrick Ellender, MD

Sports medicine: clinical spectrum of injury

Paul Emery, MA, MD, FRCP(UK)

Arthritis Research Campaign (ARC) Professor of Rheumatology
Head
Academic Section of Musculoskeletal Disease
Leeds Institute of Molecular Medicine
University of Leeds Faculty of Medicine and Health
Rheumatologist
Leeds Teaching Hospitals NHS Trust
Leeds
United Kingdom
Rituximab

Luis R. Espinoza, MD

Professor and Chief
Section of Rheumatology
Department of Internal Medicine
Louisiana State University School of Medicine
New Orleans, Louisiana
USA
Mycobacterial, brucellar, fungal, and parasitic arthritis

Joshua M. Farber, MD

Cytokines

Anders Fasth, MD, PhD

Professor of Pediatric Immunology
Department of Pediatrics
Institute of Clinical Sciences
Sahlgrenska Academy
University of Gothenburg
Consultant
Division of Immunology
The Queen Silvia Children's Hospital
Gothenburg
Sweden
Consultant
Pediatric Rheumatology and Immunology Service
Hospital Nacional de Niños "Dr. Carlos Sáenz Herrera"
San José
Costa Rica
Presentations, clinical features, and special problems in children

Debbie Feldman, BScPT, MSc, PhD

Associate Professor
School of Rehabilitation
University of Montreal Faculty of Medicine
Physical Therapist
Montreal Children's Hospital
McGill University Health Center
Epidemiologist
Public Health Department of Montreal
Research Scientist
Center for Interdisciplinary Research in Rehabilitation (CRIR)
Montreal, Quebec
Canada
Rehabilitation and psychosocial issues in juvenile idiopathic arthritis

David T. Felson, MD, MPH

Professor of Medicine and Epidemiology
Chair
Division of Clinical Epidemiology
Boston University School of Medicine
Boston, Massachusetts
USA
Professor of Medicine and Public Health
School of Translational Medicine
Arthritis Research Council (ARC) Epidemiology Unit
University of Manchester Faculty of Medical and Human Sciences
Manchester
United Kingdom
Local and systemic risk factors for incidence and progression of osteoarthritis

G. Kelley Fitzgerald, PT, PhD, FAPTA
Associate Professor
Department of Physical Therapy
University of Pittsburgh School of Health and
Rehabilitation Sciences
Pittsburgh, Pennsylvania
USA
*Principles of rehabilitation: physical and occupational
therapy*

Raymond H. Flores, MD
Associate Professor of Medicine
Division of Rheumatology and Clinical Immunology
University of Maryland School of Medicine
Baltimore, Maryland
USA
Entrapment neuropathies and compartment syndromes

David A. Fox, MD
Professor
Department of Internal Medicine
Division of Rheumatology
University of Michigan Medical School
Ann Arbor, Michigan
USA
Emerging therapeutic targets: IL-15, IL-17, IL-18, IL-23

Clair A. Francomano, MD
Associate Professor of Medicine
Johns Hopkins University School of Medicine
Director of Adult Genetics
Harvey Institute for Human Genetics
Greater Baltimore Medical Center
Baltimore, Maryland
USA
Skeletal dysplasias

Anthony J. Freemont, MD, FRCP, FRCPath
Professor of Osteoarticular Pathology
School of Biomedicine
University of Manchester Faculty of Medical and
Human Sciences
Honorary Consultant in Osteoarticular Pathology
Central Manchester University Hospitals NHS
Foundation Trust
Manchester
United Kingdom
Synovial fluid analysis

Izzet Fresko, MD
Professor of Medicine
Department of Medicine
Division of Rheumatology
Cerrahpasa Medical Faculty
University of Istanbul
Istanbul
Turkey
Behçet's syndrome

Kevin B. Fricka, MD
Orthopaedic Surgeon
Anderson Orthopaedic Clinic
Clinical Instructor
Adult Reconstruction Fellowship
Anderson Orthopaedic Research Institute
Alexandria, Virginia
USA
The hip

Daniel E. Furst, MD
Professor of Medicine
David Geffen School of Medicine at UCLA
Attending Physician
Ronald Reagan UCLA Medical Center
Los Angeles, California
USA
*Immunosuppressives (chlorambucil, cyclosporine,
cytoxan, azathioprine [Imuran], mofetil, tacrolimus)*

Cem Gabay, MD
Professor of Rheumatology
University of Geneva School of Medicine
Head
Division of Rheumatology
University Hospitals of Geneva
Geneva
Switzerland
Cytokine neutralizers: IL-1 inhibitors

Sherine E. Gabriel, MD, MSc
William J. and Charles H. Mayo Professor
Professor of Medicine and Epidemiology
Mayo Clinic College of Medicine
Director of Education
Mayo Clinic Center for Translational Science Activities
Mayo Clinic
Rochester, Minnesota
USA
*Principles of health economics and application to
rheumatic disorders*

Bernat Galarraga, LMC, MRCP(UK), PhD
Hospital Quiron Bizkaia
Erandio
Bizkaia
Spain
Raynaud's phenomenon

Boel Andersson Gäre, MD, PhD
Professor
Department of Quality Improvement and Leadership in
Health and Welfare
Jönköping Academy for Improvement of Health and
Welfare
Jönköping University School of Health Sciences
Director
Futurum—The Academy for Healthcare
Jönköping County Council
Jönköping
Sweden
*Presentations, clinical features, and special problems in
children*

Patrick Garner, DSc, PhD
Director of Research
Synarc
Lyon
France
Biochemical markers in bone disease

Lianne S. Gensler, MD
University of California, San Francisco (UCSF)
San Francisco, California
USA
Clinical features of ankylosing spondylitis

Danielle M. Gerlag, MD, PhD
Associate Professor
Department of Clinical Immunology and
Rheumatology
University of Amsterdam Faculty of Medicine
Academic Medical Center
Amsterdam
The Netherlands
Minimally invasive procedures

Piet P. Geusens
Department of Internal Medicine
Subdivision of Rheumatology
Maastricht University Medical Center
Maastricht
The Netherlands
Biomedical Research Institute
University Hasselt
Belgium
Osteoporosis: clinical features of osteoporosis

Jon T. Giles, MD, MPH
Assistant Professor
Department of Medicine
Division of Rheumatology
Johns Hopkins University School of Medicine
Baltimore, Maryland
USA
Management of rheumatoid arthritis: synovitis

Ellen M. Ginzler, MD, MPH
Distinguished Teaching Professor
Department of Medicine
Division of Rheumatology
State University of New York Downstate Medical
Center College of Medicine
Brooklyn, New York
USA
Clinical features of systemic lupus erythematosus

Alison M. Gizinski, MD
Clinical Lecturer/Research Fellow
Department of Internal Medicine
Division of Rheumatology
University of Michigan Medical School/University of
Michigan Health System
Ann Arbor, Michigan
USA
Emerging therapeutic targets: IL-15, IL-17, IL-18, IL-23

Garry Gold, MD
Associate Professor of Radiology, Bioengineering, and
Orthopaedic Surgery
Department of Radiology
Stanford University School of Medicine
Stanford, California
USA
Magnetic resonance imaging

Tania Gonzalez-Rivera, MD
Rheumatology Fellow
University of Michigan Medical School/University of
Michigan Health System
Ann Arbor, Michigan
USA
Treatment of non-renal lupus

Caroline Gordon, MD, FRCP
Professor of Rheumatology
School of Immunity and Infection
College of Medical and Dental Sciences
University of Birmingham
Birmingham
United Kingdom
*Assessing disease activity and outcome in systemic lupus
erythematosus*

Rachel Gorodkin, MBChB, PhD
Honorary Lecturer in Rheumatology
School of Translational Medicine
Arthritis Research Campaign (ARC) Epidemiology
Unit
University of Manchester Faculty of Medical and
Human Sciences
Consultant Rheumatologist
Kellgren Centre for Rheumatology
Manchester Royal Infirmary
Manchester
United Kingdom
*Complex regional pain syndrome (reflex sympathetic
dystrophy)*

Jorg J. Goronzy, MD
Professor of Medicine
Stanford University School of Medicine
Stanford, California
USA
Polymyalgia rheumatica and giant cell arteritis

Simon Görtz, MD
Resident Physician
Department of Orthopaedic Surgery
University of California, San Diego Medical Center
San Diego, California
USA
The hip

Elena Gournelos
The Complementary Medicine Program
University of Maryland School of Medicine
Baltimore, Maryland
USA
Complementary and alternative medicine

Rodney Grahame, CBE, MD, FRCP, FACP
Honorary Professor of Rheumatology
Department of Medicine
University College London Medical School
Consultant Rheumatologist
University College Hospital Foundation NHS Trust
Honorary Consultant in Paediatric Rheumatology
Great Ormond Street Hospital for Children
Honorary Consultant in Rheumatology
North West London Hospital NHS Trust
London
United Kingdom
Affiliate Professor of Pathology
University of Washington School of Medicine
Seattle, Washington
USA
Hypermobility syndrome

Andrew J. Grainger, MBBS, MRCP, FRCR
Honorary Senior Lecturer
School of Medicine
University of Leeds Faculty of Medicine and Health
Consultant in Musculoskeletal Radiology
Leeds Teaching Hospitals NHS Trust
Leeds
United Kingdom
Imaging of osteoarthritis

Ellen M. Gravallese, MD
Professor of Medicine and Cell Biology
University of Massachusetts Medical School
Chief
Division of Rheumatology
University of Massachusetts Memorial Medical Center
Worcester, Massachusetts
USA
The rheumatoid joint: synovitis and tissue destruction

Jeffrey D. Greenberg, MD, MPH
Assistant Professor of Medicine—Rheumatology
New York University School of Medicine
Associate Director
Clinical and Translational Sciences
Division of Rheumatology
NYU Hospital for Joint Diseases
New York, New York
USA
Pharmacogenomics in rheumatology

Karlene Hagley, MBBS, MD
Consultant in Internal Medicine
Department of Medicine
University Hospital of the West Indies
Kingston
Jamaica
Joint and bone lesions in hemoglobinopathies

Alan J. Hakim, MBBCh, MA, FRCP
Consultant Physician and Rheumatologist
Director of Strategy and Business Improvement
Whipps Cross Hospital NHS Trust
London
United Kingdom
Hypermobility syndrome

Vedat Hamuryudan, MD
Professor of Medicine
Department of Medicine
Division of Rheumatology
Cerrahpasa Medical Faculty
University of Istanbul
Istanbul
Turkey
Behçet's syndrome

Boulos Haraoui, MD, FRCPC
Associate Professor of Medicine
Department of Medicine
University of Montreal Faculty of Medicine
Montreal, Quebec
Canada
Leflunomide

Adam Harder, MD
Sports medicine: clinical spectrum of injury

John B. Harley, MD, PhD
Professor of Medicine
Chief
Division of Rheumatology, Immunology, and Allergy
Department of Medicine
University of Oklahoma College of Medicine
Chair
Arthritis and Immunology Research Program
Oklahoma Medical Research Foundation
Staff Physician
Oklahoma City VA Medical Center
Oklahoma City, Oklahoma
USA
Genetics of lupus

E. Nigel Harris, MD
Vice Chancellor
The University of the West Indies
Kingston
Jamaica
Antiphospholipid syndrome: overview of pathogenesis, diagnosis and management

Philip J. Hashkes, MD, MSc
Associate Professor of Medicine and Pediatrics
Cleveland Clinic Lerner School of Medicine of Case Western Reserve University
Cleveland, Ohio
USA
Head
Pediatric Rheumatology Unit
Shaare Zedek Medical Center
Jerusalem
Israel
Management of juvenile idiopathic arthritis

Gillian Hawker, MD, MSc
Professor of Medicine—Rheumatology and Health Policy, Management, and Evaluation
University of Toronto Faculty of Medicine
Physician-in-Chief of Medicine
Women's College Hospital
Toronto, Ontario
Canada
Assessment of the patient with osteoarthritis and measurement of outcomes

Philip N. Hawkins, MBBS, PhD, FRCP, FRCPath, FMedSci
Professor of Medicine
Centre for Amyloidosis and Acute Phase Proteins
University College London Medical School
Head
National Amyloidosis Centre
Royal Free Hospital
London
United Kingdom
Amyloidosis

Turid Heiberg, RN, MNS, PhD
Dean
Lovisenberg Diaconal University College
Research Leader
Oslo University Hospital
Oslo
Norway
Multidisciplinary approach to rheumatoid arthritis

Dick Heinegård, MD, PhD
Professor
Department of Clinical Sciences
Division of Rheumatology—Molecular Skeletal Biology
Lund University Faculty of Medicine
Lund
Sweden
The articular cartilage

Simon M. Helfgott, MD
Associate Professor of Medicine
Harvard Medical School
Director of Education and Fellowship Training
Division of Rheumatology
Brigham and Women's Hospital
Boston, Massachusetts
USA
Rheumatoid manifestations of endocrine and lipid disease

Jenny E. Heller, MPhil
Research Associate
Department of Medicine
Division of Rheumatology, Immunology, and Allergy
Brigham and Women's Hospital/Harvard Medical School
Boston, Massachusetts
USA
Lyme disease

Ariane L. Herrick, MD, FRCP
Senior Lecturer in Rheumatology
School of Translational Medicine
Arthritis Research Campaign (ARC) Epidemiology Unit
University of Manchester Faculty of Medical and Human Sciences
Manchester
Attending
Salford Royal NHS Foundation Trust
Salford
United Kingdom
Complex regional pain syndrome (reflex sympathetic dystrophy)

Laurence D. Higgins, MS, MD
Associate Professor
Harvard Medical School
Chief of Sports Medicine
Harvard Shoulder Service
Boston, Massachusetts
USA
Sports medicine: clinical spectrum of injury

J. S. Hill Gaston, MA, PhD, FRCP, FMedSci
Professor of Rheumatology
Department of Medicine
University of Cambridge School of Clinical Medicine
Honorary Consultant in Rheumatology
Cambridge University Hospitals NHS Foundation Trust
Cambridge
United Kingdom
Cellular immunity in rheumatoid arthritis

Marc C. Hochberg, MD, MPH
Management of osteoarthritis

Markus Hoffmann, PhD

Associate Professor
Researcher
Department of Internal Medicine III
Division of Rheumatology
Medical University of Vienna
Vienna General Hospital
Vienna
Austria
Autoantibodies in rheumatoid arthritis

V. Michael Holers, MD

Professor of Medicine and Immunology
University of Colorado–Denver School of Medicine
Staff Physician
University of Colorado Hospital
Aurora, Colorado
USA
The complement system in systemic lupus erythematosus

Michael F. Holick, PhD, MD

Professor of Medicine, Physiology, and Biophysics
Boston University School of Medicine
Program Director
General Clinical Research Unit
Boston Medical Center
Boston, Massachusetts
USA
Osteomalacia and rickets

Christopher Holroyd, BM, MRCP

Academic Clinical Fellow in Rheumatology
University of Southampton
MRC Epidemiology Resource Centre
Southampton General Hospital
Southampton
United Kingdom
Epidemiology and classification of metabolic bone disease

Osvaldo Hübscher, MD, MACR

Associate Professor of Medicine–Rheumatology
CEMIC Medical School
Buenos Aires
Argentina
Pattern recognition in arthritis

Tom W. J. Huizinga, MD, PhD

Professor and Chairman
Department of Rheumatology
Leiden University Faculty of Medicine
Leiden
The Netherlands
Dapsone, penicillamine, thalidomide, bucillamine, and the tetracyclines

David J. Hunter, MBBS, PhD, FRACP

Assistant Professor of Medicine
University of Sydney Medical School
Sydney, New South Wales
Australia
Chief of Research
New England Baptist Hospital
Boston, Massachusetts
USA
Assessment of imaging outcomes in osteoarthritis

M. Elaine Husni, MD, MPH

Assistant Professor of Medicine
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University
Vice Chair
Arthritis and Musculoskeletal Treatment Center
Department of Rheumatic and Immunologic Diseases
Cleveland Clinic
Cleveland, Ohio
USA
Classification and epidemiology of psoriatic arthritis

Robert D. Inman, MD

Professor of Medicine and Immunology
University of Toronto Faculty of Medicine
Senior Scientist
Toronto Western Research Institute
Toronto, Ontario
Canada
Reactive arthritis: etiology and pathogenesis

Zacharia Isaac, MD

Instructor
Department of Physical Medicine and Rehabilitation
Harvard Medical School
Director
Interventional Physical Medicine and Rehabilitation
Brigham and Women's Hospital and Spaulding Rehabilitation Hospital
Boston, Massachusetts
USA
Lumbar spine disorders

Maura D. Iversen, DPT, ScD, MPH

Professor and Chair
Department of Physical Therapy
Northeastern University
Assistant Professor of Medicine–Rheumatology
Harvard Medical School
Behavioral Scientist
Brigham and Women's Hospital
Boston, Massachusetts
USA
Arthritis patient education and team approaches to management

Douglas A. Jabs, MD, MBA

Professor and Chair
Department of Ophthalmology
Chief Executive Officer and Dean for Clinical Affairs
Mount Sinai Faculty Practice Associates
Mount Sinai School of Medicine
New York, New York
USA
The eye in rheumatic disease

Hayley James, BSc, MSc

Research Fellow
Unit of Behavioural Medicine
University College London
London
United Kingdom
Non-pharmacologic pain management

Rose-Marie Javier, MD

Senior Lecturer
Medical University Louis Pasteur
Senior Attending Physician
Rheumatology Unit
University Hospital Hautpierre
Strasbourg
France
Gaucher's disease

David Jayne, MD, FRCP

Consultant in Nephrology and Vasculitis
Addenbrooke's Hospital
Cambridge
United Kingdom
Churg-Strauss syndrome

Alyssa K. Johnsen, MD, PhD

Instructor/Senior Fellow
Division of Rheumatology, Immunology and Allergy
Brigham and Women's Hospital/Harvard Medical School
Boston, Massachusetts
USA
Methotrexate

Joanne M. Jordan, MD, MPH

Herman and Louise Smith Distinguished Professor of Medicine
Associate Professor of Orthopaedics
Chief
Division of Rheumatology, Allergy, and Immunology
Director
Thurston Arthritis Research Center
University of North Carolina at Chapel Hill School of Medicine
Chapel Hill, North Carolina
USA
Osteoarthritis: epidemiology and classification

Melanie S. Joy, PharmD, PhD, FCCP, FASN

Associate Professor of Medicine and Pharmacy
UNC School of Medicine
Division of Nephrology and Hypertension
Chapel Hill, North Carolina
USA
Drug-induced lupus

Tsuneyasu Kaisho, MD, PhD

Team Leader
Laboratory for Host Defense
RIKEN Research Center for Allergy and Immunology
Kanagawa
Japan
Principles of innate immunity

Cees G. M. Kallenberg, MD, PhD

Head
Department of Rheumatology and Clinical Immunology
University Medical Center Groningen
Groningen
The Netherlands
Biology and immunopathogenesis of vasculitis

Yuka Kanno, MD, PhD

Staff Scientist
Laboratory of Clinical Investigation
National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health
Bethesda, Maryland
USA
Principles and techniques in molecular biology

Elizabeth W. Karlson, MD

Associate Professor of Medicine
Harvard Medical School
Associate Physician
Brigham and Women's Hospital
Boston, Massachusetts
USA
Classification and epidemiology of rheumatoid arthritis

Dimitrios G. Kassimos, MD, MSc

Consultant Rheumatologist
Head
Education Department
401 General Military Hospital of Athens
Athens
Greece
Neuropathic arthropathy

Daniel L. Kastner, MD, PhD

Clinical Director
Laboratory of Clinical Investigation
National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health
Bethesda, Maryland
USA
Principles and techniques in molecular biology; The hereditary recurrent fevers

Jeffrey N. Katz, MD, MSc

Associate Professor of Medicine and Orthopaedic Surgery
Harvard Medical School
Director
Orthopedic and Arthritis Center for Outcomes Research
Brigham and Women's Hospital
Boston, Massachusetts
USA
Lumbar spine disorders

Arthur Kavanaugh, MD

Professor of Medicine
University of California, San Diego
San Diego, California
USA
Tumor necrosis factor blocking therapies

Jonathan Kay, MD

Professor of Medicine
Department of Medicine
Division of Rheumatology
University of Massachusetts Medical School
Director of Clinical Research
Division of Rheumatology
UMass Memorial Medical Center
Worcester, Massachusetts
USA
Miscellaneous arthropathies including synovial tumors and foreign body synovitis and nephrogenic systemic fibrosis

Jennifer A. Kelly, MPH

Statistician and Research Project Director
Arthritis and Immunology Research Program
Oklahoma Medical Research Foundation
Oklahoma City, Oklahoma
USA
Genetics of lupus

Edward Keystone, MD, FRCPC

Professor of Medicine
University of Toronto Faculty of Medicine
Consultant in Rheumatology
Mount Sinai Hospital
Toronto, Ontario
Canada
Leflunomide

Munther A. Khamashta, MD, PhD, FRCP

Reader in Medicine
King's College London School of Medicine
Consultant Physician
Director
Lupus Research Unit
St. Thomas' Hospital
London
United Kingdom
Antiphospholipid syndrome: overview of pathogenesis, diagnosis, and management

Dinesh Khanna, MD, MSc

Assistant Professor
Department of Medicine
Division of Rheumatology and Immunology
David Geffen School of Medicine at UCLA
Los Angeles, California
USA
Assessing disease activity and outcome in scleroderma

Peter W. Kim, MD, PhD

Clinical Fellow
Laboratory of Clinical Investigation
National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health
Bethesda, Maryland
USA
The hereditary recurrent fevers

Ingvald Kjeklen, PhD

Senior Researcher
National Resource Center for Rehabilitation in Rheumatology
Diakonhjemmet Hospital
Oslo
Norway
Multidisciplinary approach to rheumatoid arthritis

Alisa E. Koch, MD

Staff Physician
VA Ann Arbor Healthcare System
Fredrick G.L. Huetwell and William D. Robinson, MD
Professor of Rheumatology
Department of Internal Medicine
Division of Rheumatology
University of Michigan Medical School
Ann Arbor, Michigan
USA
Angiogenesis in rheumatoid arthritis

Matthew F. Koff, PhD

Assistant Scientist
Department of Radiology and Imaging-MRI
Hospital for Special Surgery
New York, New York
USA
Biomechanics of peripheral joints

Virginia Byers Kraus, MD, PhD

Associate Professor
Department of Medicine
Division of Rheumatology
Duke University School of Medicine
Durham, North Carolina
USA
Rare osteoarthritis: ochronosis, Kashin-Beck disease, and Meleni joint disease

Hillal Maradit Kremers, MD, MSc

Professor of Epidemiology
Mayo Clinic College of Medicine
Mayo Clinic
Rochester, Minnesota
USA
Principles of health economics and application to rheumatic disorders

Hollis Elaine Krug, MD

Associate Professor of Medicine
University of Minnesota Medical School
Staff Rheumatologist
Minneapolis VA Medical Center
Minneapolis, Minnesota
USA
Principles of opioid treatment of chronic musculoskeletal pain

Pradeep Kumar, MD, FRCP

Consultant Rheumatologist
Aberdeen Royal Infirmary
Aberdeen
Scotland
Raynaud's phenomenon

Tore K. Kvien, MD, PhD

Professor of Rheumatology
University of Oslo Faculty of Medicine
Head
Department of Rheumatology
Diakonhjemmet Hospital
Oslo
Norway
Multidisciplinary approach to rheumatoid arthritis

Robert Lafyatis, MD

Professor of Medicine
Boston University School of Medicine
Laboratory Director
Boston University Medical Center
Boston, Massachusetts
USA
Pathogenesis of systemic sclerosis

Talia Landau, BA

Medical Student (Third Year)
University of Maryland School of Medicine
Baltimore, Maryland
USA
Gastrointestinal tract and rheumatic disease

Robert B. M. Landewé, MD

Professor of Rheumatology
Department of Internal Medicine
Division of Rheumatology
Maastricht University Faculty of Medicine
Maastricht
Consultant
Atrium Medical Center
Heerlen
The Netherlands
Interpreting the medical literature for the rheumatologist: study design and levels of evidence

Carol A. Langford, MD, MHS

Director
Center for Vasculitis Care and Research
Department of Rheumatic and Immunologic Diseases
Cleveland Clinic
Cleveland, Ohio
USA
Takayasu's arteritis

Ronald M. Laxer, MD, FRCPC

Professor of Pediatrics and Medicine
University of Toronto Faculty of Medicine
Staff Rheumatologist
The Hospital for Sick Children
Toronto, Ontario
Canada
Management of juvenile idiopathic arthritis

Thomas J. Learch, MD

Chief of Musculoskeletal Imaging
Department of Imaging
Cedars-Sinai Medical Center
Los Angeles, California
USA
Imaging of rheumatoid arthritis

Marjatta Leirisalo-Repo, MD, PhD

Professor of Rheumatology
University of Helsinki Faculty of Medicine
Chief Physician
Department of Medicine
Division of Rheumatology
Helsinki University Central Hospital
Helsinki
Finland
Reactive arthritis: clinical features and treatment

George T. Lewith, MD, MA, FRCP, MRCGP

Professor of Health Research
School of Medicine
University of Southampton
Honorary Consultant Physician
Southampton Hospitals NHS Trust
Southampton
United Kingdom
Complementary and alternative medicine

Yi Li, MD

Research Assistant
Department of Medicine
University of Florida College of Medicine/Shands at UF
Gainesville, Florida
USA
Autoantibodies in systemic lupus erythematosus

Katherine P. Liao, MD

Research Fellow in Medicine
Harvard Medical School
Fellow in Rheumatology
Brigham and Women's Hospital
Boston, Massachusetts
USA
Classification and epidemiology of rheumatoid arthritis

Geoffrey Littlejohn, MD, MPH

Associate Professor of Rheumatology and Medicine
Monash University Faculty of Medicine, Nursing, and
Health Sciences
Director
Division of Rheumatology
Monash Medical Centre
Melbourne, Victoria
Australia
Diffuse idiopathic skeletal hyperostosis

Michael D. Lockshin, MD

Professor of Medicine and Obstetrics-Gynecology
Weill Cornell Medical College
Attending Physician
New York-Presbyterian Hospital
Hospital for Special Surgery
New York, New York
USA
*Systemic lupus erythematosus in the pregnant patient
and neonatal lupus*

Pilar Lorenzo, PhD

Researcher
Department of Clinical Sciences
Lund University Faculty of Medicine
Lund
Sweden
The articular cartilage

Thomas A. Luger, MD

Professor and Chairman
Department of Dermatology
University of Münster Faculty of Health Science
Münster
Germany
Skin in rheumatic disease

Ingrid E. Lundberg, MD, PhD

Professor and Consultant
Rheumatology Unit
Department of Medicine
Karolinska University Hospital
Stockholm
Sweden
*Inflammatory muscle disease—etiology and pathogenesis
(myositis)*

Harvinder S. Luthra, MD

John Finn Minnesota Arthritis Foundation Professor
Mayo Medical School
Consultant
Division of Rheumatology and Internal Medicine
Mayo Clinic
Rochester, Minnesota
USA
Relapsing polychondritis

Klaus P. Machold, MD

Associate Professor of Medicine
Medical University of Vienna
Deputy Head
Division of Rheumatology
Department of Internal Medicine
Vienna General Hospital
Vienna
Austria
*Evaluation and management of early inflammatory
polyarthritis*

C. Ronald Mackenzie, MD

Associate Professor of Clinical Medicine
Associate Professor of Public Health
Division of Medical Ethics
Weill Cornell Medical College
Associate Attending Physician
Department of Rheumatology
Hospital for Special Surgery
New York, New York
USA
*Ethics in clinical trials; Perioperative care of the rheumatic
disease patient*

Maren Lawson Mahowald, MD

Professor
Department of Medicine—Rheumatology
University of Minnesota Medical School
Chief
Rheumatology Section
Department of Internal Medicine
Minneapolis VA Medical Center
Minneapolis, Minnesota
USA
*Principles of opioid treatment of chronic musculoskeletal
pain*

Alfred D. Mahr, MD

Classification and epidemiology of vasculitis

Joan C. Marini, MD, PhD

Chief
Bone and Extracellular Matrix Branch
National Institute of Child Health and Human
Development
National Institutes of Health
Bethesda, Maryland
USA
Heritable connective tissue disorders

Eresha Markalanda, MD

Practicing Physician
Colombo
Sri Lanka
*Immunosuppressives (chlorambucil, cyclosporine,
cytoxan, azathioprine [Imuran], mofetil, tacrolimus)*

Javier Marquez, MD

Professor of Internal Medicine—Rheumatology
Pontifical Bolivarian University School of Health
Sciences
Staff Physician
Rheumatology Service
Hospital Pablo Tobon Uribe
Medellín
Colombia
Mycobacterial, brucellar, fungal, and parasitic arthritis

Johanne Martel-Pelletier, PhD

Professor of Medicine
Titular Head
Chair in Osteoarthritis
University of Montreal Faculty of Medicine
Co-Director
Osteoarthritis Research Unit
University of Montreal Hospital Research Centre
(CR-CHUM)
Notre-Dame Hospital
Montreal, Quebec
Canada
Animal models of osteoarthritis

Emilio Martin-Mola, PhD

Associate Professor of Rheumatology
Faculty of Medicine
Universidad Autonoma Madrid
Head
Rheumatology Division
Hospital Universitario La Paz
Madrid
Spain
*Septic arthritis, osteomyelitis, and gonococcal and
syphilitic arthritis*

Manuel Martinez-Lavin, MD

Professor
Department of Rheumatology
Faculty of Medicine
National Autonomous University of Mexico
Chief
Rheumatology Department
National Institute of Cardiology
Mexico City
Mexico
Digital clubbing and hypertrophic osteoarthropathy

Elena M. Massarotti, MD

Associate Professor of Medicine
Harvard Medical School
Co-Director
Center for Clinical Therapeutics
Division of Rheumatology
Brigham and Women's Hospital
Boston, Massachusetts
USA
Hemochromatosis

Eric L. Matteson, MD, MPH

Professor of Medicine
Mayo Clinic College of Medicine
Chair
Division of Rheumatology
Mayo Clinic
Rochester, Minnesota
USA
*Extra-articular features of rheumatoid arthritis and
systemic involvement*

Maureen Mayes, MD, MPH

Professor of Medicine
Department of Internal Medicine
Division of Rheumatology
University of Texas Medical School at Houston
Houston, Texas
USA
Epidemiology and classification of scleroderma

Bongani M. Mayosi, PhD, FCP(SA)

Professor of Medicine
Department of Medicine
University of Cape Town
Physician-in-Chief
Groote Schuur Hospital
Cape Town
South Africa
Acute rheumatic fever

Timothy McAlindon, MD, MPH
 Professor of Medicine
 Tufts University School of Medicine
 Chief
 Division of Rheumatology
 Tufts Medical Center
 Boston, Massachusetts
 USA
Osteonecrosis

Rex M. McCallum, MD
 Professor of Medicine–Rheumatology
 Duke University School of Medicine
 Attending Rheumatologist
 Duke University Hospital
 Durham, North Carolina
 USA
Cogan syndrome

Geraldine McCarthy, MD, FRCPI
 Associate Clinical Professor of Medicine
 School of Medicine and Medical Science
 University College Dublin
 Consultant Rheumatologist
 Mater Misericordiae University Hospital
 Dublin
 Ireland
Basic calcium phosphate crystal deposition disease

W. Joseph McCune, MD
 Professor
 Department of Internal Medicine
 Division of Rheumatology
 University of Michigan Medical School/University of
 Michigan Health System
 Ann Arbor, Michigan
 USA
Treatment of non-renal lupus

Stephany A. McGann, MD
 Medical Director
 Rheumatology Fellow
 University of Maryland School of Medicine
 Baltimore, Maryland
 USA
Entrapment neuropathies and compartment syndromes

Dennis McGonagle, MD
 Professor of Investigative Rheumatology
 University of Leeds
 Leeds
 United Kingdom
*Etiology and pathogenesis of psoriatic arthritis;
 Entesopathies*

Lachy McLean, PhD, FRCP
 Senior Medical Director
 Takeda Pharmaceuticals
 Lake Forest, Illinois
 USA
Etiology and pathogenesis of gout

Philip J. Mease, MD
 Clinical Professor of Medicine
 University of Washington School of Medicine
 Director
 Rheumatology Clinical Research
 Swedish Medical Center
 Chief
 Seattle Rheumatology Associates
 Seattle, Washington
 USA
Management of psoriatic arthritis

Peter A. Merkel, MD, MPH
 Associate Professor of Medicine
 Boston University School of Medicine
 Boston, Massachusetts
 USA
Classification and epidemiology of vasculitis

Jamal A. Mikdashi, MD, MPH
 Associate Professor of Medicine
 University of Maryland School of Medicine
 Baltimore, Maryland
 USA
Primary angiitis of the central nervous system

Frederick W. Miller, MD, PhD
 Chief
 Environmental Autoimmunity Group
 National Institute of Environmental Health Sciences
 National Institutes of Health Clinical Research Facility
 Bethesda, Maryland
 USA
Management of inflammatory muscle disease

Paul D. Miller, MD, FACP
 Distinguished Clinical Professor of Medicine
 University of Colorado–Denver School of Medicine
 Denver
 Medical Director
 Colorado Center for Bone Research
 Lakewood, Colorado
 USA
Renal osteodystrophy

Kirsten Minden, MD
 Consultant in Pediatric Rheumatology
 Department of Pediatric Pneumology and Immunology
 Charité Universitätsmedizin Berlin
 Scientist
 German Rheumatism Research Center—A Leibnitz
 Institute
 Berlin
 Germany
*Classification and epidemiology of juvenile idiopathic
 arthritis*

Dimitris I. Mitsias, MD
 Research Associate
 Department of Pathophysiology
 University of Athens School of Medicine
 Athens
 Greece
Sjögren's syndrome

Girish M. Mody, MD, MBChB, FRCP, FCP
 Fellow of the University of Kwa Zulu-Natal
 Aaron Beare Family Professor of Rheumatology
 Nelson R. Mandela School of Medicine
 University of Kwa Zulu-Natal
 Durban
 South Africa
Acute rheumatic fever

Paul A. Monach, MD, PhD
 Rheumatology Fellow
 Brigham & Women's Hospital
 Boston, MA
 USA
The rheumatoid joint: synovitis and tissue destruction

Larry W. Moreland, MD
 Margaret Jane Miller Endowed Professor for Arthritis
 Research
 University of Pittsburgh School of Medicine
 Chief
 Division of Rheumatology and Clinical Immunology
 Department of Medicine
 University of Pittsburgh Medical Center
 Pittsburgh, Pennsylvania
 USA
T-cell co-stimulation

Haralampos M. Moutsopoulos, MD, FACP, FRCP
 Professor and Chairman
 Department of Pathophysiology
 University of Athens School of Medicine
 Athens
 Greece
Sjögren's syndrome

Gauthier Namur, MD
 Consultant
 Department of Nuclear Medicine
 University Hospital of Liege
 Liege
 Belgium
Bone scintigraphy and positron emission tomography

Esperanza Naredo, MD
 Professor and Cofounder
 Ultrasound School of the Spanish Society of
 Rheumatology
 Senior Rheumatologist
 Hospital Universitario Severo Ochoa
 Madrid
 Spain
*Aspiration and injection of joints and periarticular tissues
 and intralesional therapy*

David J. Nashel, MD
 Professor of Medicine
 George Washington & Georgetown
 University
 VA Medical Center
 Washington, DC
 USA
Entrapment neuropathies and compartment syndromes

Amanda E. Nelson, MD
 Associate Professor of Medicine
 University of North Carolina at Chapel Hill School of
 Medicine
 Chapel Hill, North Carolina
 USA
Osteoarthritis: epidemiology and classification

Stanton P. Newman, DPhil, DipClinPsych, MRCP(Hon)
 Professor of Clinical Health and Psychology
 Head
 Unit of Behavioural Medicine
 Division of Research Strategy
 University College London Medical School
 Honorary Consultant
 University College Hospital
 London
 United Kingdom
Non-pharmacologic pain management

Johannes C. Nossent, MD, PhD
 Professor of Medicine
 University of Tromsø Faculty of Health Sciences
 Institute for Clinical Medicine
 Consultant in Rheumatology
 University Hospital North Norway
 Tromsø
 Norway
Adult-onset Still's disease

Ulrich Nöth
 Orthopaedic Center for Musculoskeletal Research
 Orthopaedic Clinic
 König-Ludwig-Haus
 Julius-Maximilians-University
 Würzburg
 Germany
*Principles of tissue engineering and cell- and gene-based
 therapy*

Philip O'Connor, MD, MRCP, FRCP
 Consultant in Musculoskeletal Radiology
 Leeds Teaching Hospitals NHS Trust
 Leeds
 United Kingdom
Musculoskeletal ultrasound

Chester V. Oddis, MD
 Professor of Medicine
 Director
 Fellowship Training Program
 Department of Medicine
 Division of Rheumatology and Clinical Immunology
 University of Pittsburgh School of Medicine
 Pittsburgh, Pennsylvania
 USA
Clinical features, classification, and epidemiology of inflammatory muscle disease

K. Sigvard Olsson, MD, PhD
 Associate Professor
 Section of Hematology and Coagulation
 Sahlgrenska University Hospital
 Gothenburg
 Sweden
Hemochromatosis

Michael J. Ombrello, MD
 Clinical Fellow
 Laboratory of Clinical Investigation
 National Institute of Arthritis and Musculoskeletal and Skin Diseases
 National Institutes of Health
 Bethesda, Maryland
 USA
Principles and techniques in molecular biology

Philippe Orcel, MD, PhD
 Professor of Rheumatology
 Paris-Diderot Faculty of Medicine
 University of Paris 7
 Head
 Rheumatology Department
 Medical Coordinator
 Musculoskeletal Division
 Hospital Lariboisière
 Public Assistance Hospitals of Paris
 Paris
 France
Gaucher's disease

John J. O'Shea, MD
 Scientific Director and Chief
 Molecular Immunology and Inflammation Branch
 National Institute of Arthritis and Musculoskeletal and Skin Diseases
 National Institutes of Health
 Bethesda, Maryland
 USA
Cytokines; Signal transduction

Stephen A. Paget, MD
 Professor of Medicine
 Weill Cornell Medical College
 Physician-in-Chief Emeritus
 Medical Director for Academic, International, and Philanthropic Initiatives
 Hospital for Special Surgery
 New York, New York
 USA
Ethics in clinical trials; Perioperative care of the rheumatic disease patient

Carlo Patrono, MD
 Professor and Chair
 Department of Pharmacology
 Catholic University School of Medicine
 Rome, Italy
Nonsteroidal anti-inflammatory drugs

Jean-Pierre Pelletier, MD
 Professor of Medicine
 Head
 Arthritis Centre
 University of Montreal Faculty of Medicine
 Head
 Arthritis Division
 University of Montreal Hospital Centre (CHUM)
 Notre-Dame Hospital
 Director
 Osteoarthritis Research Unit
 Research Centre
 University of Montreal Hospital Research Centre (CR-CHUM)
 Montreal, Quebec
 Canada
Animal models of osteoarthritis

Silvia Pierangeli, PhD
 Professor
 Division of Rheumatology, Department of Internal Medicine
 University of Texas Medical Branch
 Galveston, Texas
 USA
Antiphospholipid syndrome: overview of pathogenesis, diagnosis, and management

Heather Pierce, MD
 Associate Professor of Pediatrics
 University of California, San Diego, School of Medicine
 La Jolla
 Pediatric Hospitalist
 Department of Medicine
 Rady Children's Hospital San Diego
 San Diego, California
 USA
Henoch-Schönlein purpura

Clarissa A. Pilkington, MBBS, BSc, MRCP(Paed)
 Honorary Lecturer
 Institute of Child Health
 University College London Medical School
 Consultant in Paediatric and Adolescent Rheumatology
 Great Ormond Street Hospital NHS Trust
 London
 United Kingdom
Connective tissue diseases in children

Michael H. Pillinger, MD
 Associate Professor of Medicine and Pharmacology
 Director
 Rheumatology Training
 Director
 Masters of Science in Clinical Investigation Program
 New York University School of Medicine
 Section Chief
 Rheumatology
 New York Harbor Health Care System—NY Campus
 Department of Veterans Affairs
 New York, New York
 USA
Inflammation

Carlos Pineda, MD
 Subdirector
 Biomedical Research
 Instituto Nacional de Rehabilitación
 Mexico City
 Mexico
Digital clubbing and hypertrophic osteoarthropathy

Robert M. Plenge, MD, PhD
 Assistant Professor of Medicine
 Harvard Medical School
 Director
 Genetics and Genomics
 Division of Rheumatology, Immunology, and Allergy
 Brigham and Women's Hospital
 Boston, Massachusetts
 USA
The contribution of genetic factors to rheumatoid arthritis

Luminita Pricop, MD
 Associate Scientist
 Hospital for Special Surgery
 New York, NY
 USA
Immunopathology of systemic lupus erythematosus

Lars Rackwitz
 Orthopaedic Center for Musculoskeletal Research
 Orthopaedic Clinic
 König-Ludwig-Haus
 Julius-Maximilians-University
 Würzburg
 Germany
Principles of tissue engineering and cell- and gene-based therapy

Gautam Ramani, MD
 Assistant Professor of Medicine, Cardiology
 University of Maryland School of Medicine
 Baltimore, Maryland
 USA
The heart in rheumatic disease

Angelo Ravelli, MD
 Associate Professor of Pediatrics
 University of Genoa College of Medicine
 Attending
 Istituto G. Gaslini
 Department of Pediatrics II
 Largo G. Gaslini
 Genoa
 Italy
Evaluation of musculoskeletal complaints in children

Westley H. Reeves, MD
 Marcia Whitney Schott Professor of Medicine
 Chief
 Division of Rheumatology and Clinical Immunology
 Department of Medicine
 University of Florida College of Medicine
 Gainesville, Florida
 USA
Autoantibodies in systemic lupus erythematosus

Elaine F. Remmers, PhD
 Staff Scientist
 Laboratory of Clinical Investigation
 National Institute of Arthritis and Musculoskeletal and Skin Diseases
 National Institutes of Health
 Bethesda, Maryland
 USA
Principles and techniques in molecular biology

Heikki Repo, MD
 Senior Lecturer in Medicine
 Department of Bacteriology and Immunology
 University of Helsinki Faculty of Medicine
 Attending Physician
 Department of Medicine
 Helsinki University Central Hospital
Reactive arthritis: clinical features and treatment

Luis Requena, MD

Professor of Dermatology
 Universidad Autónoma Medical School
 Chairman
 Department of Dermatology
 Fundación Jiménez Díaz
 Madrid
 Spain
Cutaneous vasculitis and panniculitis

Clio Ribbens, MD, PhD

Clinic Head
 Department of Rheumatology
 University Hospital of Liege
 Liege
 Belgium
Bone scintigraphy and positron emission tomography

Graham Riley, BSc, PhD

Arthritis Research Campaign (ARC) Senior Research Fellow
 School of Biological Sciences
 University of East Anglia
 Norwich
 United Kingdom
Tendons and ligaments

Christopher Ritchlin, MD, MPH

Professor of Medicine
 University of Rochester School of Medicine and Dentistry
 Attending Physician
 University of Rochester Medical Center
 Rochester, New York
 USA
Etiology and pathogenesis of psoriatic arthritis

Ivan O. Rosas, MD

Assistant Professor of Medicine
 Department of Internal Medicine
 Division of Pulmonary Medicine
 Brigham and Women's Hospital/Harvard Medical School
 Boston, Massachusetts
 USA
The lung in rheumatic disease

Ronenn Roubenoff, MD, MHS

Associate Professor of Medicine
 Tufts University School of Medicine
 Adjunct Professor of Nutrition
 Tufts University School of Nutrition Science and Policy
 Boston
 Global Head of Translational Medicine
 Musculoskeletal Diseases
 Novartis Institutes for Biomedical Research
 Cambridge, Massachusetts
 USA
Nutrition in rheumatic disease

A. D. Rowan, BSc, PhD

Professor of Molecular Rheumatology
 School of Clinical Medical Sciences
 Musculoskeletal Research Group
 Institute of Cellular Medicine
 Newcastle University
 Newcastle upon Tyne
 United Kingdom
Tissue destruction and repair

Martin Rudwaleit, MD

Associate Professor of Medicine
 Universitätsmedizin Berlin
 Consultant in Rheumatology
 University Hospital Charité–Campus Benjamin Franklin
 Berlin
 Germany
Classification and epidemiology of spondyloarthritis

Kenneth G. Saag, MD, MSc

Jane Knight Lowe Professor of Medicine
 University of Alabama at Birmingham School of Medicine
 Birmingham, Alabama
 USA
Systemic corticosteroids in rheumatology

Jane E. Salmon, MD

Associate Clinical Director
 Roche
 Switzerland
Immunopathology of systemic lupus erythematosus

David C. Salonen, MD, BSc, FRCPC

Associate Professor
 Department of Medical Imaging and Orthopedics
 University of Toronto Faculty of Medicine
 Staff Radiologist
 University Health Network, Mount Sinai, and Women's College Hospitals
 Toronto, Ontario
 Canada
Seronegative spondyloarthropathies: imaging

Donald M. Salter, MBChB, MD, FRCPath

Professor of Osteoarticular Pathology
 Centre for Inflammation Research
 Queen's Medical Research Institute
 University of Edinburgh Medical School
 Consultant Histopathologist
 Royal Infirmary of Edinburgh
 Edinburgh
 United Kingdom
Connective tissue responses to mechanical stresses

Daniel J. Salzbberg, MD, FACP

Assistant Professor of Medicine
 University of Maryland School of Medicine
 Baltimore, Maryland
 USA
The kidney and rheumatic disease

Philip N. Sambrook, MD, FRACP

Professor of Rheumatology
 University of Sydney Medical School
 Sydney, New South Wales
 Australia
Glucocorticoid-induced osteoporosis

Benjamin Sanofsky, MD

Sports medicine: clinical spectrum of injury

Tore Saxne, MD, PhD

Professor
 Department of Clinical Sciences
 Section of Rheumatology
 Lund University Faculty of Medicine
 Consultant
 Department of Rheumatology
 Lund University Hospital
 Lund
 Sweden
The articular cartilage

Hans-Georg Schaible, MD

Professor of Physiology
 Institute of Physiology/Neurophysiology
 Friedrich Schiller University of Jena School of Medicine
 Director
 Department of Neurophysiology
 University Hospital
 Jena
 Germany
Scientific basis of pain

Georg Schett, MD

Professor of Rheumatology and Immunology
 Department of Internal Medicine 3
 University of Erlangen–Nuremberg Faculty of Medicine
 Erlangen
 Germany
Osteoimmunology

Nicole Schmitz, PhD

Senior Research Scientist
 Department of Pathology
 University of Leipzig
 Leipzig
 Germany
Pathogenesis and pathology of osteoarthritis

Lew C. Schon, MD

Acting Director
 Foot and Ankle Fellowship
 Department of Orthopaedics
 Union Memorial Hospital
 Baltimore, Maryland
 USA
The ankle and foot

H. Ralph Schumacher, Jr., MD

Professor of Medicine
 University of Pennsylvania School of Medicine
 Philadelphia, Pennsylvania
 USA
Miscellaneous arthropathies including synovial tumors and foreign body synovitis and nephrogenic systemic fibrosis; Other crystal-related arthropathies

David G. I. Scott, MD, FRCP

Professor of Rheumatology
 School of Medicine
 University of East Anglia
 Consultant Rheumatologist
 Norfolk and Norwich University Hospital
 Norwich
 United Kingdom
Polyarteritis nodosa and microscopic polyangiitis

Brooke Seidelmann, BA, MA

Allergy Director
 Joan Hisaoka Healing Arts Gallery
 Washington, DC
 USA
Complementary and alternative medicine

Andrea L. Sestak, MD, PhD

Research Assistant Member
 Arthritis and Immunology Research Program
 Oklahoma Medical Research Foundation
 Oklahoma City, Oklahoma
 USA
Genetics of lupus

Margaret Seton, MD

Assistant Professor of Medicine
 Harvard Medical School
 Director
 MGH Rheumatology Fellowship Program
 Massachusetts General Hospital
 Boston, Massachusetts
 USA
Paget's disease of bone

Nancy A. Shadick, MD, MPH

Director of Translational Research Development
 Division of Rheumatology, Immunology, and Allergy
 Brigham and Women's Hospital
 Boston, Massachusetts
 USA
Lyme disease