

Curriculum Vitae and Bibliography

Matthew T Drake, MD, PhD

Personal Information

Citizenship: United States of America
Work Address: Mayo Clinic Rochester
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Present Academic Rank and Position

Consultant - Division of Endocrinology, Diabetes, Metabolism, Nutrition, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota 12/22/2010 - Present
Teaching/Examining Privileges in Clinical & Translational Science - Mayo Clinic Graduate School of Biomedical Sciences, Mayo Clinic College of Medicine and Science 07/31/2013 - Present
Associate Professor of Medicine - Mayo Clinic College of Medicine and Science 02/01/2015 - Present
Consultant (Joint Appointment) - Division of Hematology, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota 03/22/2017 - Present
Master's Faculty Privileges in Clinical & Translational Science - Mayo Clinic Graduate School of Biomedical Sciences, Mayo Clinic College of Medicine and Science 03/31/2020 - Present

Education

Harvard College - AB, Biology 1989 - 1993
Washington University - MD/PhD, Medicine Molecular and Cell Biology 1994 - 2001
Duke University Medical Center - Resident, Internal Medicine/Endocrinology 2001 - 2004
Duke University Medical Center - Clinical Research Fellowship, Postdoctoral Fellow 2004 - 2006
Mayo School of Graduate Medical Education, Mayo Clinic College of Medicine - Clinical Research Fellowship, Endocrinology 2006 - 2007

Additional Education

European Calcified Tissue Society Training Workshop: Cancer and Bone - A guide for in vivo experiments 2012 - Present
University of L'Aquila, Department of Biotechnological and Applied Clinical Sciences, L'Aquila, Italy
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) Forum for Clinical Mentored K Awardees 2012 - Present
National Institutes of Health, Bethesda, Maryland

Certification

Board Certifications

American Board of Internal Medicine (ABIM)

Internal Medicine 2004 - 2014
Endocrinology, Diabetes, and Metabolism 2007 - 2027

Other Certifications

Mayo Clinic Quality Academy

Mayo Clinic Quality Fellow: Bronze Level Certification 2011

Licensure

Minnesota	49132 (Medical)	2006 - Present
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Honors and Awards

Magna Cum Laude, A.B. in Biology - Harvard College	1993
Summa Cum Laude Thesis - Harvard College	1993
Fellowship - Foundation Jean Dausset - CEPH	1993 - 1994
Medical Scientist Training Program - Washington University School of Medicine	1994 - 2001
Physician Scientist Training Program - Washington University School of Medicine	2001
Clinical Investigator Pathway - Multi-Specialty MOC Portfolio Program: Clinical Investigator Pathway, American Board of Medical Specialties	2001 - 2007
Young Investigator Award - American Society for Bone and Mineral Research	2009
New Investigator Award - Mayo Clinic Department of Medicine	2010
Outstanding Editorial Board Member - Journal of Bone and Mineral Research	2019

Previous Professional Positions and Major Appointments

Senior Associate Consultant - Division of Endocrinology, Diabetes, Metabolism, Nutrition, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota	10/27/2007 - 12/21/2010
Assistant Professor of Medicine - Mayo Clinic College of Medicine and Science	06/01/2008 - 01/31/2015
Teaching/Examining Privileges of Clinical & Translational Science - Mayo Clinic Graduate School of Biomedical Sciences, Mayo Clinic College of Medicine and Science	07/31/2013 - 03/30/2020

Service**Community Memberships and Services**

American Board of Internal Medicine - Endocrine Examination Committee Member	2018 - Present
American Society for Bone and Mineral Research Program Committee Member, Therapeutic Advances in Rare Skeletal Diseases	2017
Endocrine Society Annual Meeting Steering Committee - Bone and Mineral Team Leader	2016 - 2019
Annual Meeting Abstract Reviewer	2018 - 2020
Fibrous Dysplasia Foundation Scientific Advisory Board	2020 - Present
Orthopaedic Research Society (ORS) Advisory Board Member	2017 - 2020
Rare Bone Disease Alliance Scientific Advisory Board	2016 - Present
Soft Bones Foundation Scientific Advisory Board	2012 - Present

Professional Memberships and Societies**Professional Memberships and Services**

Advances in Mineral Metabolism Member	2007 - Present
Board of Directors Board Member	2014 - 2017

American Society for Bone and Mineral Research	
Member	2004 - Present
Mentor, Networking Breakfast	2014 - 2016
Chair, Harold Frost Young Investigator Award Review Committee	2017
Scientific Reviewer, Rising Star Awards	2018 - 2020
Member, Annual Meeting Program Advisory Committee	2019 - Present
American Society for Bone and Mineral Research Ethics Advisory Committee	
Member	2018 - 2019
American Society for Bone and Mineral Research, Rare Bone Disease Working Group	
Chair	2016 - 2017
American Society for Bone and Mineral Research	
Abstract Selection Committee	
Reviewer	2010 - 2018
Cancer and Bone	
Session Chair	2011
Grants in Aid Program (GAP)	
Grant Application Reviewer	2014
Osteoporosis Pathophysiology	
Session Chair	2012
Professional Practice Committee	
Member	2011 - 2014
Task Force on Cell Based Therapies	
Independent Content Reviewer	2014 - 2020
Task Force on Managing Osteoporosis Patients after Long-Term Bisphosphonate Treatment	
	2013 - 2016
American Society of Hematology	
Member	2009 - Present
Endocrine Society	
Member	2004 - Present
Member, Endocrine Facts and Figures Bone Working Group	2014 - 2015
Co-chair, Clinical Practice Guideline Committee for Hypercalcemia of Malignancy	2018 - Present
Task Force on Osteoporosis in Men	
Member	2011 - 2012
International Bone and Mineral Society	
Member	2007 - Present
International Myeloma Society	
Member	2010 - Present
Abstract Review Committee	2017
International Myeloma Working Group	
Member	2009 - Present
Minnesota Medical Association	
Member	2006 - Present
Zumbro Valley Medical Society	
Member	2006 - Present

Study Sections

Department of Defense Congressionally Directed Medical Research Program	
Scientific Reviewer	2010 - 2012
Scientific Reviewer, Fibrous Dysplasia Peer Review Panel	2020
European Society for Alcohol Research	
Scientific Reviewer	2015
National Institutes of Health	
Ad hoc Scientific Reviewer, National Institute on Aging	2016 - 2017
National Institutes of Health	
Ad hoc Scientific Reviewer, National Institute of Diabetes and Digestive and Kidney Diseases	2013 - 2015
Ad hoc Scientific Reviewer, Neurological, Aging and Musculoskeletal Epidemiology Study Section	2020
Netherlands Organization for Scientific Research	
Scientific Reviewer	2018

Journal Responsibilities

Journal Editorial Responsibilities

Bone	
Guest Editor - Sclerostin	2015 - 2017
Editorial Board Member	2016 - Present
Editor	2017 - Present
Current Osteoporosis Reports	
Guest Editor - Osteoporosis and Cancer	2015 - 2016
JBMR Plus	
Editorial Board Member	2017 - Present
Journal of Bone and Mineral Research	
Editorial Board Member	2015 - 2019
Journal of Clinical and Translational Endocrinology: Case Reports	
Editorial Board Member	2014 - 2019
Journal of Clinical Endocrinology & Metabolism	
Editorial Board Member	2013 - 2016
Mayo Clinic Proceedings	
Section Editor - Endocrinology	2016 - Present

Journal Other Responsibilities

American Journal of Hematology	
Ad Hoc Reviewer	
Archives of Internal Medicine	
Ad Hoc Reviewer	
Blood	
Ad Hoc Reviewer	
Blood Cancer Journal	
Ad Hoc Reviewer	
Cancer	
Ad Hoc Reviewer	
Endocrine Reviews	
Ad Hoc Reviewer	
European Journal of Hematology	
Ad Hoc Reviewer	

JAMA Oncology
Ad Hoc Reviewer

Journal of Clinical Oncology
Ad Hoc Reviewer

Journal of Clinical Pharmacology
Ad Hoc Reviewer

Leukemia
Ad Hoc Reviewer

Leukemia & Lymphoma
Ad Hoc Reviewer

Leukemia Research
Ad Hoc Reviewer

Molecular and Cellular Endocrinology
Ad Hoc Reviewer

Nature Reviews - Endocrinology
Ad Hoc Reviewer

Nature Reviews Rheumatology
Ad Hoc Reviewer

New England Journal of Medicine
Ad Hoc Reviewer

Osteoporosis International
Ad Hoc Reviewer

PLoS ONE
Ad Hoc Reviewer

Proceedings of the National Academy of Sciences
Ad Hoc Reviewer

The Lancet
Ad Hoc Reviewer

The Lancet Diabetes & Endocrinology
Ad Hoc Reviewer

Education Interests and Accomplishments

Curriculum and Course Development

Mayo Clinic Endocrine Grand Rounds Director	08/2012 - 08/2013
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Teaching

Endocrine Fellowship Journal Club Faculty Advisor	2014 - Present
Endocrine Fellowship Clinical Conference Faculty Advisor	2014 - Present
Mayo Medical School - Bone and Mineral Metabolism Course Lecturer	2015 - 2020
Endocrine Fellowship Case Discussion Faculty Advisor	2015 - Present
Histomorphometry - The Basics Lecturer	2016 - Present
Mayo Clinic Endocrine Fellowship Osteoporosis - Part I	2017 - Present

Lecturer Mayo Clinic Endocrine Fellowship Osteoporosis - Part II	2017 - Present
Lecturer Mayo Clinic Endocrine Fellowship Cancer and Skeletal Health	2019 - Present
Lecturer Mayo Clinic Endocrine Fellowship	

Mentorship

Ng, Alvin (Postdoctoral Fellow) Description: Current Status: Physician/Scientist, Singapore General Hospital Outcome:	03/2008 - 05/2009
Nicks, Kristy (Postdoctoral Fellow) Description: Current Status: Program Director, Bone Biology, Metabolic Bone Disorders, and Osteoporosis Program, National Institute of Arthritis and Musculoskeletal and Skin Diseases Outcome:	07/2010 - 06/2015
Zhang, Wei (Postdoctoral Fellow) Description: Current Status: Registered Nurse, Mayo Clinic Outcome:	09/2010 - 03/2014
Elraiyah, Tarig (Postdoctoral Fellow) Description: Current Status: Fellowship, Geriatric Medicine, Michigan Outcome:	02/2012 - 06/2014
Quan, Jinxing (Postdoctoral Fellow) Description: Current Status: Physician, Lanzhou, Gansu Province, China Outcome:	02/2014 - 03/2016
Kumar, Swarup (Postdoctoral Fellow) Description: Current Status: Predoctoral Associate, The Jackson Laboratory Outcome:	07/2014 - 06/2015
Warad, Deepti (Clinical Faculty) Description: Current Status: Senior Associate Consultant, Mayo Clinic Division of Pediatric Hematology Outcome:	01/2015 - Present
Sfeir, Jad (Clinical Fellow) Description: Current Status: Senior Associate Consultant, Mayo Clinic Division of Endocrinology Outcome:	07/2016 - Present
Bedatsova, Lucia (Medical Student) Description: Current Status: Internal Medicine Resident, Lausanne, Switzerland Outcome:	06/2018 - 04/2019

Institutional/Departmental Administrative Responsibilities, Committee Memberships and Other Activities**Mayo Clinic**

American Society for Bone and Mineral Research Publications Committee Working Group for Investigating Reports of Scientific Misconduct in Published Articles

Member	2019
Center for Clinical and Translational Science (CCaTS) Scientific Review Committee	
Reviewer	2016 - Present
Data Safety Monitoring Board - Mayo Clinic Phase 2 COVID-19 and Fisetin Study	
Chair	2020 - Present
Geriatric Medicine and Gerontology Research Committee	
Member	2019 - Present
Mayo Clinic Center for Translational Science Activities	
Associate Member	2008 - Present
Mayo Clinic Committees	
Institutional Review Board	
Board Member	2011 - Present
Mayo Clinic Kogod Center of Aging - Innovation in Aging Research Award	
Reviewer	2018 - 2019
Mayo Clinic in Rochester	
Department of Internal Medicine	
Division of Endocrinology, Diabetes, Metabolism, Nutrition	
Executive Committee, National Institutes of Health T32 Training Grant	2015 - Present
Career Development Award Review Committee	
Reviewer and Member	2014 - Present
Master's Thesis Defense Committee	
Member, Kristy Nicks, Ph.D	2014 - 2015
Chair, Jad Sfeir, M.D.	2019 - 2021
Division of Endocrinology, Diabetes and Metabolism	
Fellowship Selection Committee	
Member	2014 - Present
Hospital Core Group	
Member	2007 - Present
Metabolic Bone Disease Core Group	
Member	2007 - Present
Chair	2015 - Present
Mayo Clinic Comprehensive Metabolomics Resource Core (MCCMRC)	
Grant Reviewer	2014
Mayo Clinic Rochester Committees	
Institutional Review Board	
Executive Committee	
Member	2018 - Present
Radiation Safety Committee	
Vice Chair	2014 - 2017
Mayo Pharmaceutical Formulary Committee General Medicine/Surgery Task Force	
Member	2020 - Present
Activities at Other Institutions	
American Society for Bone and Mineral Research	
Chair, Professional Practice Committee	2019 - Present
Food and Drug Administration (FDA)	
Member, Bone, Reproductive and Urologic Drugs Advisory Committee	2015 - Present

Presentations Extramural**National or International****Invited**

- Effects of Intermittent Parathyroid Hormone Treatment on Osteoprogenitor Cells in Postmenopausal Women 2010
4th Bone Research Seminar
Tokyo, Japan
- Optimizing Bone-Related and Anti-Tumor Properties of Bisphosphonates for Patients with Multiple Myeloma. 2010
Lymphoma & Myeloma Congress
New York, New York
- Measurement of Sclerostin and DKK-1 in Serum: What Insights Has This Provided? 2012
European Calcified Tissue Society
Stockholm, Sweden
- Circulating Sclerostin as a Marker of Bone Health and Disease 2013
Plenary Symposium
American Society for Bone and Mineral Research Annual Meeting
- Bone Mineral Metabolism in Chronic Kidney Disease 2014
Nephrology Update - West Lake Forum
Hangzhou, China
- Monoclonal Gammopathy Associated Bone Loss 2014
Dresden University Medical Center
Dresden, Germany
- Controversies in Pharmaceutical Management of Osteoporosis Therapy 2014
American Association of Clinical Endocrinologists Annual Meeting

Oral

- Bisphosphonates and Bone Health 2008
Mayo Clinical Reviews: Internal Medicine Update
- Impact of vitamin D deficiency on the clinical presentation and prognosis of patients with newly diagnosed multiple myeloma 2009
Advances in Mineral Metabolism Annual Meeting
- Effects of Intermittent PTH Treatment on Gene Expression in Vivo in Osteoblast Progenitor Cells in Bone Marrow of Postmenopausal Women 2009
American Society for Bone and Mineral Research Annual Meeting
- Increases in Serum DKK1 are Associated with Alterations in Skeletal Microstructure in Monoclonal Gammopathy of Undetermined Significance (MGUS) 2009
American Society for Bone and Mineral Research Annual Meeting
- Predicting Fracture Risk 2009
Mayo Clinical Reviews: Internal Medicine Update
- Intermittent PTH Treatment Decreases Circulating Sclerostin Levels in Postmenopausal Women 2010
American Society for Bone and Mineral Research Annual Meeting
- Suppression of FSH in Postmenopausal Women has No Effect on Bone Resorption Markers 2010
American Society for Bone and Mineral Research Annual Meeting
- Bone Turnover Markers 2012
Mayo Clinic Endocrine Course - Mallorca
Mallorca, Spain
- Skeletal Health in Cancer Patients 2012
Mayo Clinic Endocrine Course - Mallorca
Mallorca, Spain

Osteoporosis in Men Endocrine Society Annual Meeting San Francisco, California	2013
The Clinical Spectrum of Hypophosphatasia Soft Bones Patient Education Meeting San Diego, California	2014
Bone Loss in Monoclonal Gammopathy of Undetermined Significance. Advances in Mineral Metabolism Annual Meeting	2014
Regional	
Invited	
Current Issues in Osteoporosis: Long-term Complications of Bisphosphonates and Use of Denosumab Annual Midwest Regional American Association of Clinical Endocrinologists Meeting	2010
Improving Quality of Care in the Treatment of Patients with Osteoporosis Northern Michigan Regional Hospital Grand Rounds Petoskey, Michigan	2010
Vitamin D Deficiency States: Detection and Treatment Strategies Mayo Clinic Health Solutions Disease Management Continuing Education	2010
Understanding Bone Disease Across the Monoclonal Gammopathy Spectrum University of Arkansas Medical Sciences Winthrop P. Rockefeller Cancer Institute Grand Rounds	2011
Skeletal Health Across the Monoclonal Gammopathy Spectrum Washington University School of Medicine St. Louis, Missouri	2011
Skeletal Structural Changes and Fracture Risk in Monoclonal Gammopathy of Undetermined Significance Central Society for Clinical and Translational Research Annual Meeting Chicago, Illinois	2014
Oral	
Parathyroid Hormone: From Basic Biology to Clinical Practice Mayo Clinic Endocrine Grand Rounds	2008
Cancer Associated Bone Disease Mayo Clinic Endocrine Grand Rounds	2009
Alterations in skeletal microstructure in MGUS are associated with increases in serum levels of Dickkopf1 and macrophage inflammatory protein 1-alpha Mayo Clinic Endocrine Research Seminar	2010
Management of Bone Disease in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Portland, Oregon	2010
Management of Bone Disease in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Redwood City, California	2011
Suppression of FSH in postmenopausal women has no effect on bone resorption markers Mayo Clinic Endocrine Grand Rounds	2011
Management of Bone Disease in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Dallas, Texas	2011
Optimizing Bone Health in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Boston, Massachusetts	2012

Optimizing Bone Health in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Philadelphia, Pennsylvania	2013
Monoclonal gammopathy-associated bone loss Mayo Clinic Kogod Center on Aging - New and Exciting Research Developments	2013
Optimizing Bone Health in Multiple Myeloma International Myeloma Foundation Patient & Family Seminar Atlanta, Georgia	2014
Unclassified	
Cancer Associated Bone Loss and How to Manage It Northern California Institute for Bone Health Annual Meeting	2014
Sclerostin Measurement in Health and Disease Northern California Institute for Bone Health Annual Meeting	2014
Sclerostin: A Bone Turnover Marker? American Society for Bone and Mineral Research Annual Meeting - Bone Turnover Markers Working Group	2014
Living Well with Myeloma: Management of Bone Disease International Myeloma Foundation	2014
Antiresorptive Therapy: When is the Holiday Over? Mayo Clinic Endocrine Course - Cancun, Mexico	2015
Hypophosphatasia Mayo Clinic Endocrine Course - Cancun, Mexico	2015
New Tools to Predict Fracture Risk Mayo Clinic Endocrine Course - Cancun, Mexico	2015
What's New in Bone and Calcium? Florida Endocrine Society Annual Meeting	2015
Bone Health in Patients with Bone Marrow Cancers Plenary Symposium II - Bone Health in Patients Treated for Cancer American Society for Bone and Mineral Research Annual Meeting	2015
Reversible Hypoparathyroidism in Riedel's Thyroiditis Advances in Mineral Metabolism Annual Meeting	2015
Skeletal Biomarkers Associated with Aging and Estrogen Deficiency Revealed By RNA Sequencing Endocrine Society Annual Meeting	2015
Monoclonal Gammopathy Associated Bone Loss Tokyo Medical and Dental University	2015
Assessment of Bone Disease in Monoclonal Gammopathies Mayo Clinic - Advancing Myeloma Care in Developing Countries	2016
Bone Marrow Cancers and Bone Health International Congress of Endocrinology/Annual Meeting of the Chinese Society of Endocrinology	2016
Interactions of Bone and Muscle with Aging International Congress of Endocrinology/Annual Meeting of the Chinese Society of Endocrinology	2016
Mechanisms Underlying Bone Loss and Fracture Risk with Aging, Diabetes, and MGUS Hospital for Special Surgery - Metabolic Bone Disease Grand Rounds	2016
Monoclonal Gammopathy Associated Bone Disease - Is It Time to Rename MGUS? Mayo Clinic Endocrine Research Seminar	2016
Amiodarone and the Thyroid – What the Cardiologist Should Know International Clinical Cardiology Course - Vina del Mar, Chile	2016

Calcium Supplementation for Skeletal Health: Effects on Cardiovascular Disease Risk International Clinical Cardiology Course - Vina del Mar, Chile	2016
Cancer and Bone Health Mayo Clinic Endocrine Course - South Beach, Florida	2017
Career Advice for Bone Researchers Osteologie 2018 - Dresden	2018
MGUS, Myeloma, and Bone Health Osteologie 2018 - Dresden	2018
Vitamin D and Cancer French - American Meeting in Endocrinology	2018
Hypophosphatasia - The Overview Inaugural Soft Bones Scientific Symposium	2018
Bone Health: Prevention of Osteoporosis and Fractures Living Well with Prostate Cancer – Mayo Clinic Patient Education Symposium	2018
Meet the Professor: Effects of Cancer on the Skeleton American Society for Bone and Mineral Research	2018
Management of Myeloma Bone Disease and Other Supportive Care Strategies International Myeloma Society Educational Workshop	2018
Osteoporosis in Older Adults with Monoclonal Gammopathies American Society of Hematology Scientific Workshop on Hematology and Aging	2018
Clinical Aspects of Bone Disease Across the Monoclonal Gammopathy Spectrum Bone Disease Program of Texas Bone Seminar Series	2019
Understanding Non-Invasive Measures of Bone Microarchitecture Endocrine University	2019
The Osteoporotic Patient: Medical Management Strategies and Potential Complications of Pharmacologic Treatments Mayo Clinic Community Internal Medicine Conference	2019
Medical Approaches to Optimizing Bone Health in Spine Surgery Patients Mayo Clinic Orthopedic Spine Surgery/Neurosurgery Conference	2020
Monoclonal Gammopathy of Skeletal Significance Italian Society of Osteoporosis and Metabolic Bone Diseases (SIOMMMS)	2020
Osteoporosis Therapy: Forever is a Long Time... Mayo Clinic Endocrine Course - San Juan	2020
X-Linked Hypophosphatemia Mayo Clinic Endocrine Course - San Juan	2020
Treating Patients with Osteoporosis During the COVID-19 Pandemic ASBMR Webinar Panel	2020
COVID-19 and Bone Health American Society for Bone and Mineral Research Annual Meeting	2020
Bone Health and the Prevention of Future Fractures: Challenges of Referrals and Treatment Fragility Fracture Network Pre-Congress Regional Meeting	2021
COVID-19 Vaccination and Osteoporosis Management ASBMR Webinar Panel	2021
New and Current Therapeutic Approaches in Bone Metastases and Multiple Myeloma European Calcified Tissue Society 2021 Digital Congress	2021
Optimization of Bone Health in MGUS, Smoldering and Multiple Myeloma Washington University Division of Bone and Mineral Diseases Grand Rounds	2021

Updates in Skeletal Aging Mayo Clinic Division of Geriatric Medicine and Gerontology Grand Rounds	2021
Supportive Care in Multiple Myeloma - Bone Disease Mayo Clinic Workshop in Plasma Cell Disorders: Robert Kyle Symposium	2021
Drugs Used to Treat Osteoporosis in MGUS and Myeloma National Osteoporosis Foundation/Interdisciplinary Symposium on Osteoporosis	2021

Visiting Professorship

Visiting Professorships

Dresden Center for Regenerative Therapies Monoclonal Gammopathy-Associated Bone Loss	2014 - Present
Memorial Sloan-Kettering Cancer Center Endocrinology Grand Rounds Visiting Professor	2014 - Present
University of California San Diego Division of Endocrinology The Evaluation and Management of Hypophosphatemic Disorders	2018 - Present

Clinical Practice, Interests, and Accomplishments

Disorders of skeletal and mineral metabolism. Cancer-associated bone loss.

Research Interests and Accomplishments

Mechanisms underlying, and skeletal architectural changes occurring with, age-related bone loss. Mechanisms of skeletal metastasis and malignancy-associated bone loss.

Research Grants Awarded

Active Grants

Federal

Co-Investigator	Epidemiology of Age-Related Bone Loss and Fractures. Funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases. (R01 AR 27065)	06/2016 - 05/2022
Co-Investigator	Beta1-selective blockade for prevention of postmenopausal bone loss: A randomized controlled trial . Funded by National Institute on Aging. (R01 AG 65154)	01/2021 - 12/2025
Others	Mayo Clinic Center for Clinical and Translational Science (CCaTS UL1). Funded by National Center for Advancing Translational Sciences. (UL1 TR 02377)	09/2017 - 06/2022

Federal sub award

Program Director / Principal Investigator	Prevention of Fractures in Patients with Parkinson's Disease (TOPAZ). Funded by National Institute on Aging. (AG 59417)	03/2021 - 02/2022
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Industry

Co-Investigator	Prevalence of Hypophosphatasia in Patients with Fibromyalgia at the Mayo Clinic . Funded by Alexion Pharmaceuticals, Inc.	05/2017 - 04/2019
Co-Investigator	Amendment #1 A Randomized, Double-Blind, Placebo-Controlled, Single-Administration, Dose-Escalation Study of Entolimod on Immunosenescence in Healthy Geriatric Subjects Receiving Influenza Vaccination . Funded by Genome Protection, Inc.. (Entolimod (CBLB502))	09/2019 - 09/2021
Others	A Phase 3, Efficacy and Safety Study of Oral Palovarotene for the	05/2018 - 05/2021

Treatment of Fibrodysplasia Ossificans Progressiva (FOP). Funded by Clementia Pharmaceutical. (PVO-1A-301)

Completed Grants

Federal

Program Director / Principal Investigator	Pathogenesis of Monoclonal Gammopathy Bone Disease. Funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases. (K08 AR 59138)	08/2010 - 07/2015
Co-Investigator	Prevalence and Progression of Monoclonal Gammopathies. Funded by National Cancer Institute. (R01 CA 107476)	03/2009 - 04/2014
Co-Investigator	Physiology of Bone Metabolism in an Aging Population. Funded by National Institute on Aging. (P01 AG 04875)	07/2009 - 06/2014
Co-Investigator	Canonical and noncanonical Wnt signaling in osteoclast functions. Funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases. (R01 AR 65402)	06/2015 - 05/2021
Co-Investigator	Physiology of Bone Metabolism in an Aging Population. Funded by National Institute on Aging. (P01 AG 04875)	06/2015 - 04/2021
Co-Investigator	Osteoclast Regulation of Bone Formation. Funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases. (R01 AR 67129)	07/2015 - 06/2021

Federal sub award

Program Director / Principal Investigator	Risk Factors for MGUS Progression (MCA Multiple Myeloma SPORE). Funded by National Cancer Institute. (CA 186781)	09/2015 - 08/2016
Program Director / Principal Investigator	Prevention of Fractures in Patients with Parkinson's Disease. Funded by National Institute on Aging. (AG 59417)	09/2018 - 02/2020

Foundation

Principal Investigator	Multiple Myeloma and Bone: Understanding the Destruction. Funded by Multiple Myeloma Research Foundation	09/2007 - 08/2008
Co-Investigator	Assessment of fracture risk with radiologic bone mineral densities and serological markers in children and young adults with bleeding disorders. Funded by Hemostasis & Thrombosis Research Society	07/2018 - 12/2020
Co-Investigator	Assessment of Cortical and Cancellous Bone In Cross Sex Hormone Therapy In Transgender Individuals. Funded by Endocrine Fellows Foundation	11/2020 - 10/2021

Industry

Program Director / Principal Investigator	Bimagrumab in patients after surgical treatment of hip fracture. Funded by Novartis. (CBYM338D2201)	11/2015 - 11/2017
Co-Investigator	A 29 week, randomized, double-blind, placebo-controlled, multi-center, parallel group dose range finding study to assess the effect of monthly doses of bimagrumab 70, 210 and 700 mg on skeletal muscle strength and function in older adults with Sarcopenia . Funded by Novartis. (Protocol BYM338E2202)	09/2014 - 02/2016
Co-Investigator	Resubmission_Amendment #2: A Phase 1b Study to Assess the Anti-fatigability Effect of CK-2127107 in Elderly Male and Female Subjects with Limitations in Mobility. Funded by Astellas Pharma Global Development, Inc. (APGD). (3318-CL-3001)	05/2017 - 11/2018

Mayo Clinic

Principal Investigator	Molecular Basis for Bone Destruction in Multiple Myeloma. Funded by Mayo Career Development Award Funding	01/2007 - 12/2009
Principal Investigator	Testosterone Levels and Sexual Function in Women. Funded by Mayo Clinical and Translational Science Award Small Grants Award	03/2008 - 02/2009
Principal Investigator	Bone Microarchitecture at the Ultra-Distal Radius in Monoclonal Gammopathy of Undetermined Significance and Multiple Myeloma. Funded by Mayo Hematologic Malignancies Program	03/2008 - 02/2010
Program Director / Principal Investigator	Pathogenesis of Monoclonal Gammopathy Bone Disease. Funded by Early Career Supplement Award	07/2010 - 06/2012
Co-Investigator	Bisphosphonate-Related Insufficiency Fractures. Funded by SGP - Small Grants Program <\$10K	01/2009 - 12/2009
Co-Investigator	Pilot Study of Teriparatide for Postsurgical Hypoparathyroidism - SGP. Funded by SGP - Small Grants Program <\$10K	07/2010 - 07/2012
Co-Investigator	Measurement of Semaphorin 3A and Other Osteoanabolic Molecules in a Single Patient with High Bone Density Associated with Metastatic Oligodendroglioma . Funded by SGP - Small Grants Program <\$10K	04/2013 - 04/2015
Co-Investigator	Assessment of Bone Microstructure by High Resolution Peripheral Quantitative CT (HRpQCT) Scanning in Adults with Low-Trauma Fractures Who Have Normal or Near-Normal Bone Density. Funded by SGP - Small Grants Program <\$10K	07/2014 - 07/2016

Bibliography

Peer-reviewed Articles

1. **Drake MT**, Baldassare JJ, McConkey CL, Gonzalez EA, Martin KJ. Parathyroid hormone increases the expression of receptors for epidermal growth factor in UMR 106-01 cells. *Endocrinology*. 1994 Apr; 134(4):1733-7. PMID: 8137737
2. Iida-Klein A, Guo J, **Drake MT**, Kronenberg HM, Abou-Samra AB, Bringhurst FR, Segre GV. Structural requirements of parathyroid hormone/parathyroid hormone-related peptide receptors for phospholipase C activation and regulation of phosphate uptake. *Miner Electrolyte Metab*. 1995; 21(1-3):177-9. PMID: 7565444
3. Iida-Klein A, Guo J, Takemura M, **Drake MT**, Potts JT Jr, Abou-Samra A, Bringhurst FR, Segre GV. Mutations in the second cytoplasmic loop of the rat parathyroid hormone (PTH)/PTH-related protein receptor result in selective loss of PTH-stimulated phospholipase C activity. *J Biol Chem*. 1997 Mar 14; 272(11):6882-9. PMID: 9054374
4. Zhu Y, **Drake MT**, Kornfeld S. ADP-ribosylation factor 1 dependent clathrin-coat assembly on synthetic liposomes. *Proc Natl Acad Sci U S A*. 1999 Apr 27; 96(9):5013-8. PMID: 10220410 PMCID: 21808
5. **Drake MT**, Downs MA, Traub LM. Epsin binds to clathrin by associating directly with the clathrin-terminal domain. Evidence for cooperative binding through two discrete sites. *J Biol Chem*. 2000 Mar 3; 275(9):6479-89. PMID: 10692452
6. **Drake MT**, Zhu Y, Kornfeld S. The assembly of AP-3 adaptor complex-containing clathrin-coated vesicles on synthetic liposomes. *Mol Biol Cell*. 2000 Nov; 11(11):3723-36. PMID: 11071902 PMCID: 15032
7. Zhu Y, **Drake MT**, Kornfeld S. Adaptor protein 1-dependent clathrin coat assembly on synthetic liposomes and Golgi membranes. *Methods Enzymol*. 2001; 329:379-87. PMID: 11210557
8. **Drake MT**, Traub LM. Interaction of two structurally distinct sequence types with the clathrin terminal domain beta-propeller. *J Biol Chem*. 2001 Aug 3; 276(31):28700-9. Epub 2001 May 29. PMID: 11382783 DOI: 10.1074/jbc.M104226200
9. Green AD, Colon-Emeric CS, Bastian L, **Drake MT**, Lyles KW. Does this woman have osteoporosis? *JAMA*. 2004 Dec 15; 292(23):2890-900. PMID: 15598921
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