

NIAMS

National Institute of Arthritis and
Musculoskeletal and Skin Diseases
About Our Strategic Plan



NIAMS MISSION

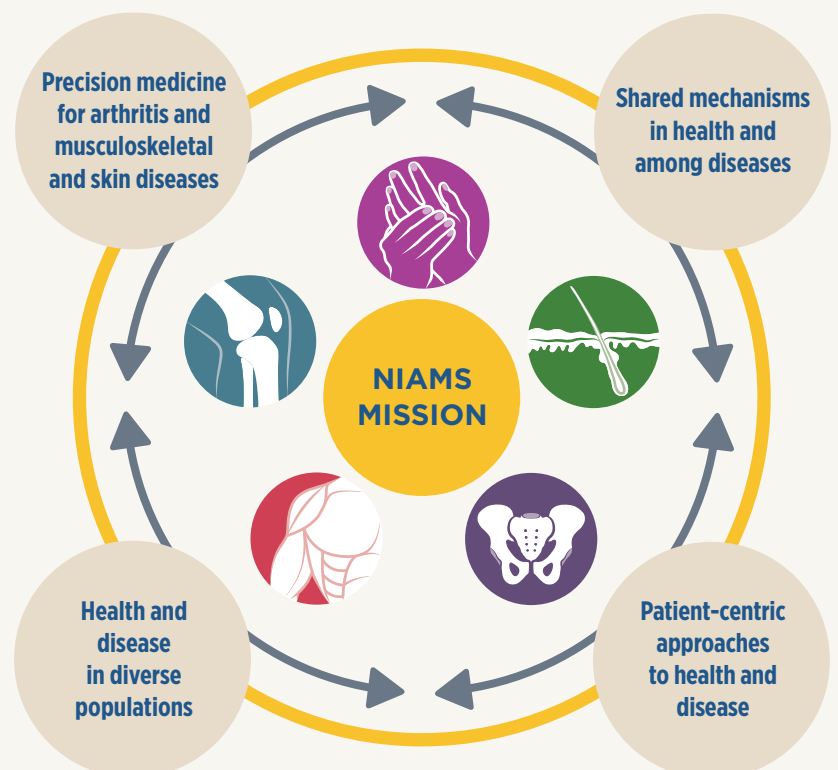
The NIAMS mission is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; training of basic and clinical scientists to carry out this research; and dissemination of information on research progress in these diseases.

STRATEGIC PLAN GOAL

The goal of the plan is to advance and accelerate research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases. The ultimate goal of these efforts is to develop patient-centered, personalized ways to improve outcomes and thereby “turn discovery into health.”

CROSS-CUTTING THEMES AND RESEARCH AREAS

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SYSTEMIC RHEUMATIC AND AUTOIMMUNE DISEASES RESEARCH

RESEARCH OBJECTIVES

- GENETICS, FUNCTIONAL GENOMICS, AND EPIGENETICS
- MECHANISMS OF RHEUMATIC DISEASES
- TARGET ORGAN DAMAGE
- PRECLINICAL AND TRANSLATIONAL RESEARCH
- CLINICAL RESEARCH
- BEHAVIORAL AND BIOPSYCHOSOCIAL RESEARCH



For More information

Read the full NIAMS Strategic Plan:

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PROGRAM SUMMARY

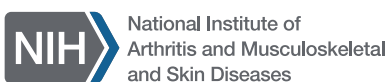
NIAMS Systemic Rheumatic and Autoimmune Diseases programs address basic, translational, and clinical research, including clinical trials and observational and mechanistic studies, focused on immune-mediated arthritis and autoimmune-related acute and chronic disorders in adults and children. Many of these diseases disproportionately affect women and groups historically underrepresented in biomedical research. While the underlying causes for these differences are largely unknown, progress is occurring in understanding them and translating that knowledge into effective treatments. The results of NIAMS-funded research have paved the way for biologic therapies for systemic rheumatic and autoimmune diseases. These therapies have improved outcomes and quality of life for many patients, highlighting the importance of fundamental research in improving health. Going forward, NIAMS will continue to build on this progress to further understanding of systemic rheumatic and autoimmune diseases and to develop even more effective and personalized treatment approaches.

- Arthritis Biology Program
- Rheumatic Diseases Integrative Biology Research Program
- Scleroderma, Fibrosis, and Autoinflammatory Disease Program
- Systemic Autoimmune Disease Biology Program

PROGRAM HIGHLIGHT

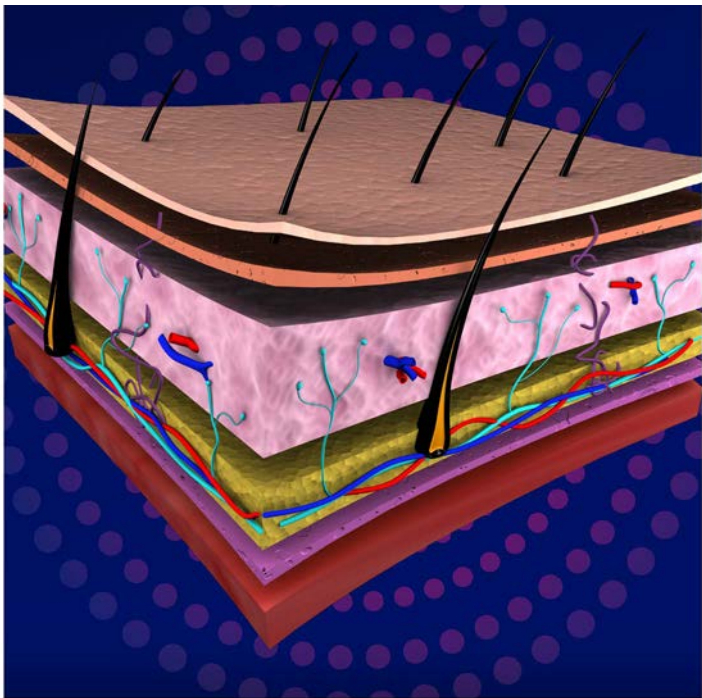
Accelerating Medicines Partnership (AMP) in rheumatoid arthritis and lupus

NIAMS is participating in the AMP in rheumatoid arthritis (RA) and lupus, one component of a public private partnership among NIH, the Foundation for the NIH, biopharmaceutical companies, and nonprofit organizations. The network is adapting cutting-edge, high-throughput technologies to analyze single immune and tissue cells from organs affected by RA and lupus. Through the AMP, researchers are identifying and defining shared and disease-specific biological pathways that scientists can study to identify relevant drug targets for treating autoimmune diseases.



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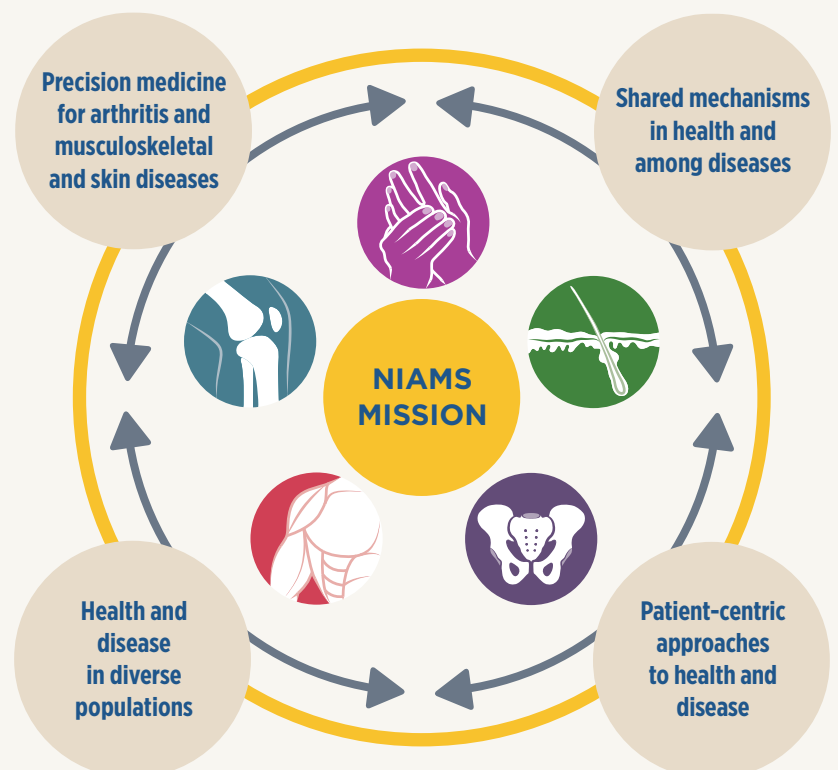
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SKIN BIOLOGY AND DISEASES RESEARCH

RESEARCH OBJECTIVES

- TRANSDISCIPLINARY BASIC STUDIES
- SKIN AS A BARRIER
- SKIN AS AN IMMUNE, SENSORY, AND ENDOCRINE ORGAN
- SKIN APPENDAGES
- GENETICS OF SKIN DISEASES
- REGENERATIVE MEDICINE
- SKIN MODEL SYSTEMS
- THERAPY DEVELOPMENT
- CLINICAL RESEARCH
- BEHAVIORAL AND BIOPSYCHOSOCIAL RESEARCH

PROGRAM SUMMARY

NIAMS Skin Biology and Diseases programs fund basic, translational, and clinical research in skin, including both common and rare skin diseases. These programs include investigations of the basic molecular, cellular, and developmental biology of skin, as well as studies of skin as an immune, sensory, endocrine, and metabolic organ. Research on wound healing, autoimmunity, inflammation, heritable diseases, and birth defects is also included, with a focus on translating fundamental research findings into novel diagnostic tools, effective therapeutics, and efficient cost-saving disease management. Understanding skin biology in the context of whole-body physiology is a new horizon. Skin is an integral part of the human body, and skin function and skin diseases are influenced by internal and external environments. Increasing evidence suggests that skin homeostasis is modulated by the immune, nervous, and endocrine systems, as well as by circadian rhythms and resident microbial flora. Studying interactions between skin and other organs is increasingly important for advancing knowledge of skin health and disease and thus calls for multidisciplinary collaborations to invigorate and enrich the skin research field

- Epidermis, Dermis and Skin Senses Program
- Skin Immunology and Diseases, Skin Microbiome Program
- Skin Repair, Pigmentation and Appendages, Vasculature/Lymphatic Systems Program

PROGRAM HIGHLIGHT

Understanding Co-occurring Conditions in Psoriasis

Certain chronic diseases seem to occur together, and caring for patients with multiple health issues is challenging. For example, psoriasis is associated with an increased risk of developing conditions such as cardiovascular disease, diabetes, depression, and psoriatic arthritis. NIAMS supports a varied portfolio of research on co-occurring conditions, including a translational research center using new technologies and clinical and laboratory data to predict which psoriasis patients are most likely to develop comorbidities and how best to treat them.

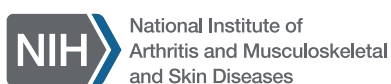
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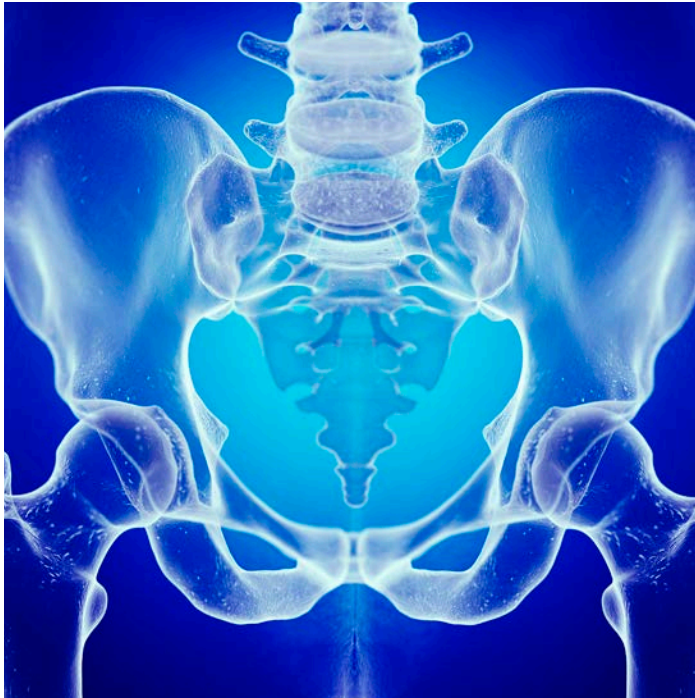
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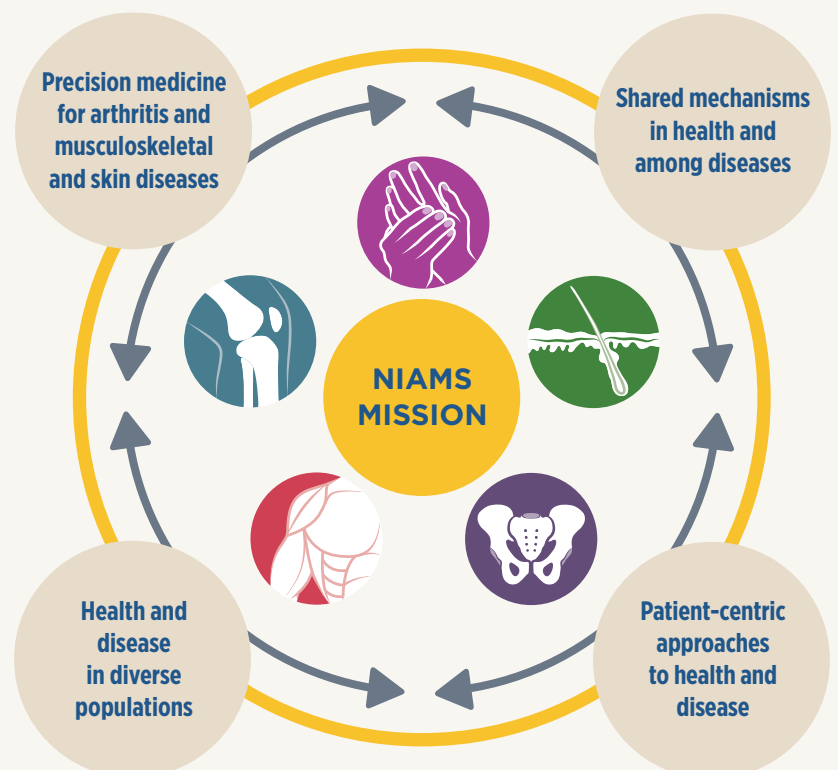
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BONE BIOLOGY AND DISEASES RESEARCH

RESEARCH OBJECTIVES

- BONE BIOLOGY, PHYSIOLOGY, AND DEVELOPMENT
- INTEGRATIVE PHYSIOLOGY
- SKELETAL DEVELOPMENT AND HOMEOSTASIS
- GENETICS, GENOMICS, AND EPIGENETICS OF BONE MASS AND FRACTURE RISK
- MECHANISMS OF BONE DISEASES: PRECLINICAL AND TRANSLATIONAL RESEARCH
- THERAPEUTIC MECHANISMS
- IMAGING AND BIOMARKERS OF BONE QUALITY AND FRACTURE RISK
- CLINICAL RESEARCH FOR RARE BONE DISEASES
- CLINICAL RESEARCH FOR OSTEOPOROSIS

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PROGRAM SUMMARY

NIAMS supports studies on the control of bone remodeling (bone formation, bone resorption) and mineralization, as well as the effects of hormones, growth factors, and cytokines on bone cells. The Institute has overseen several large epidemiologic cohorts to characterize the natural history of osteoporosis and identify genetic and environmental risk factors that contribute to fracture. NIAMS also supports clinical trials to test the effectiveness of interventions to prevent fractures associated with osteoporosis and other metabolic bone diseases. In addition, the NIAMS Bone Biology and Diseases programs support research on the causes, pathophysiology, and treatment of less common bone diseases, such as osteogenesis imperfecta and Paget's disease of bone, as well as a wide range of developmental disorders of the skeleton, many of which are genetic.

- Bone Biology, Metabolic Bone Disorders, and Osteoporosis Program
- Clinical, Integrative Physiology, and Rare Diseases of Bone Program

PROGRAM HIGHLIGHT

NIH Pathways to Prevention Workshop

In October 2018, NIAMS, the National Institute on Aging, and the NIH Office of Disease Prevention hosted a Pathways to Prevention Workshop on the Appropriate Use of Drug Therapies for Osteoporotic Fracture Prevention to identify research gaps and suggest focus areas that could move the field forward. Strategies for disseminating and implementing workshop findings are being developed by federal agencies to improve public health in FY 2020 and beyond.

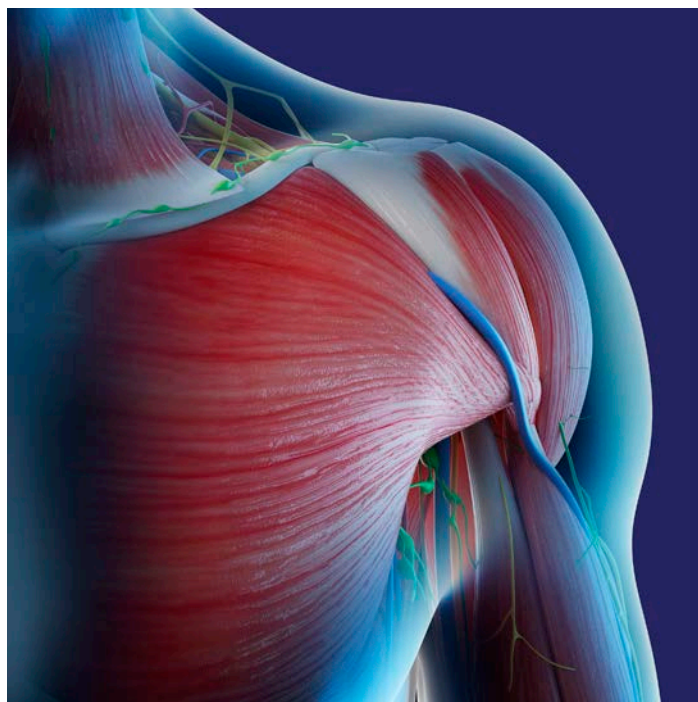


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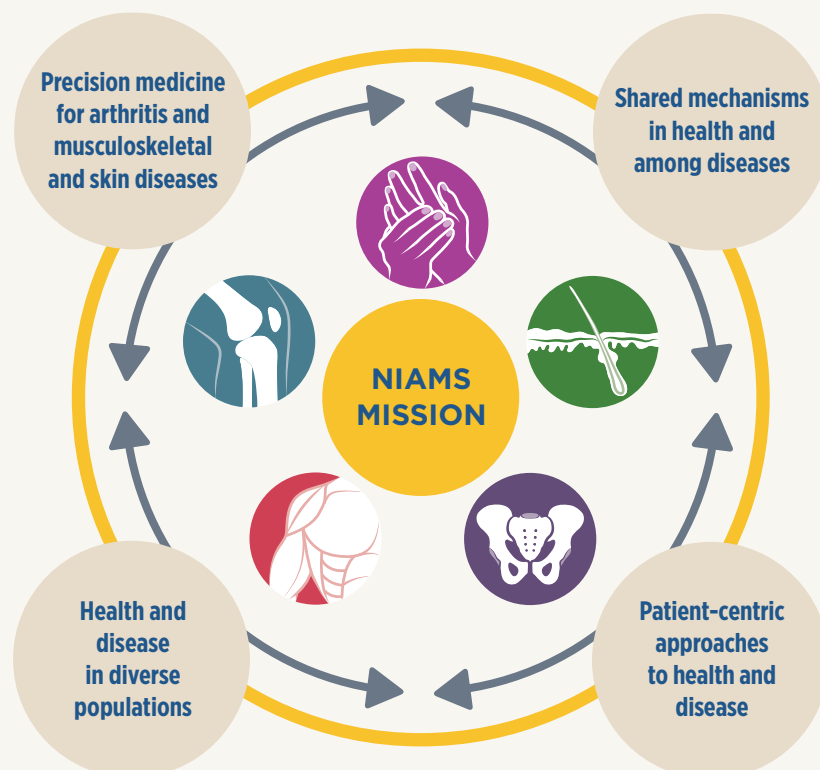
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MUSCLE BIOLOGY AND DISEASES RESEARCH

RESEARCH OBJECTIVES

- MUSCLE DEVELOPMENT AND REGENERATION
- MECHANISMS OF MUSCLE FUNCTION AND DYSFUNCTION
- INTERVENTIONS FOR MUSCLE HEALTH
- MUSCLE DISEASE CLINICAL RESEARCH

Action Plan for the Muscular Dystrophies

Research objectives for muscular dystrophies are presented in this NIAMS Strategic Plan where they overlap with objectives for other muscle diseases. A more specific and detailed description of research objectives for muscular dystrophies is found in the Muscular Dystrophy Coordinating Committee's Action Plan for the Muscular Dystrophies at <https://www.mdcc.nih.gov/action-plan>.

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The NIAMS Muscle Biology and Diseases programs encourage basic, translational, and clinical research on the biology and disorders of skeletal muscle. Studies address questions about muscle developmental biology, growth, maintenance, and hypertrophy; physiology of muscle contraction; structural biology of the contractile apparatus; mechanisms of muscle diseases and disorders; biomarkers and outcome measures for clinical and preclinical studies; and natural histories of muscle conditions. These programs also support development and testing of therapies for muscle diseases and disorders, including cell and gene therapies, small molecule drugs and biological products, and exercise and other physical interventions to slow or prevent disease progression. Muscular dystrophies are an area of emphasis within the NIAMS muscle research portfolio.

- Muscle Development and Physiology Program
- Muscle Disorders and Therapies Program

PROGRAM HIGHLIGHT

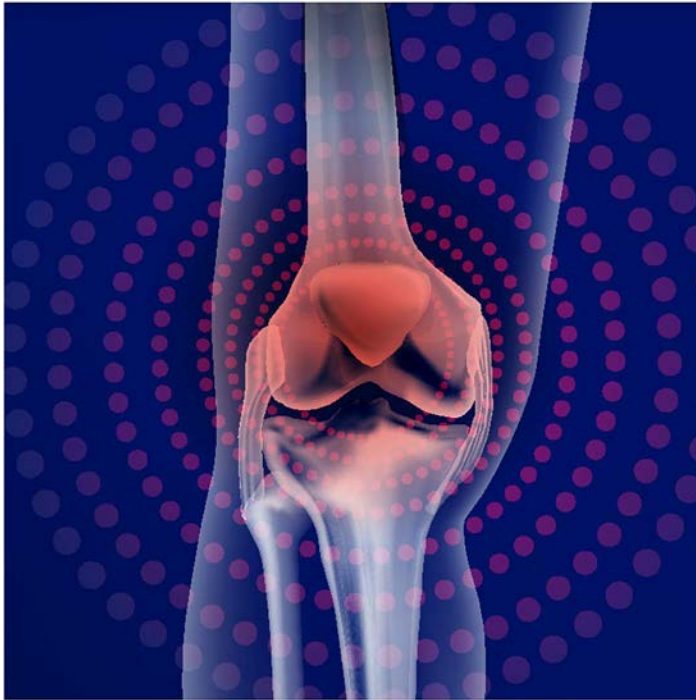
The Paul D. Wellstone Muscular Dystrophy Research Centers

NIH funds a broad portfolio of research into understanding and treating various forms of muscular dystrophy. One component is the Paul D. Wellstone Muscular Dystrophy Research Centers program, established in 2003. Fifteen years later, the NIH Institutes that support the Centers formed a Working Group of the NIAMS Advisory Council to identify best practices for achieving the Wellstone Centers' goals. The report's executive summary, including the working group recommendations, is available at <https://wellstonemdcenters.nih.gov/sites/wellstone/files/WellstoneCenterEvalRptExecSumm-508.pdf>.



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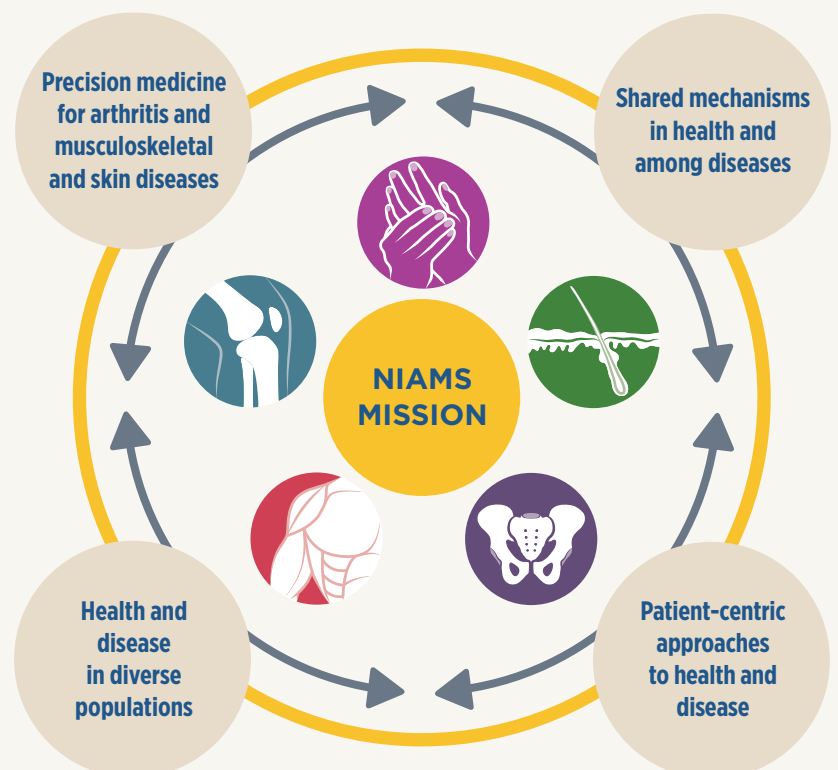
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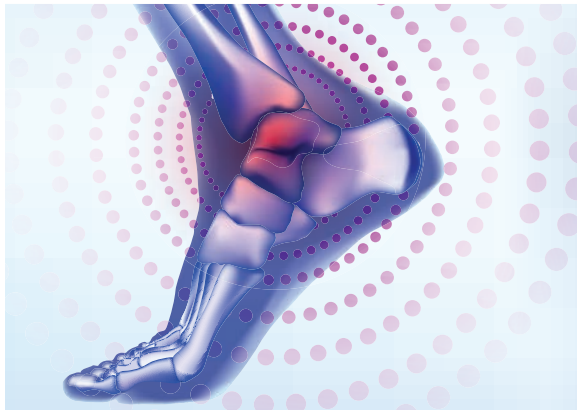
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JOINT BIOLOGY, DISEASES, AND ORTHOPAEDICS RESEARCH

RESEARCH OBJECTIVES

- JOINT BIOLOGY, STRUCTURE, AND FUNCTION
- REGENERATIVE MEDICINE
- PRECLINICAL AND TRANSLATIONAL RESEARCH INTO JOINT REPLACEMENTS
- BIOCHEMICAL AND IMAGING BIOMARKERS AND COMPUTATIONAL MODELING
- CLINICAL RESEARCH



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NIAMS Joint Biology, Diseases, and Orthopaedics programs fund a broad spectrum of basic, translational, and clinical research centered on the interplay among the body's muscles, bones, and connective tissues. These programs include research on the biology, structure, and function of joints and surrounding tissues and the application of this knowledge to a variety of diseases and conditions. Other programs fund tissue engineering and regenerative medicine to facilitate repair of damage caused by trauma to otherwise healthy tissue; molecular biology to understand the mechanisms of joint tissue formation and defects thereof; imaging to improve diagnosis and treatment of bone and joint disorders; and clinical research focused on treatment and prevention of acute and chronic bone and joint injuries and orthopaedic conditions, including musculoskeletal pain.

- Cartilage and Connective Tissue Program
- Clinical Osteoarthritis and Diagnostic Imaging Program
- Musculoskeletal Tissue Engineering and Regenerative Medicine Program
- Orthopaedic Implant Science Program
- Orthopaedic Research Program

PROGRAM HIGHLIGHT

The Osteoarthritis Initiative (OAI)

A free online resource available to any registered researcher, the OAI offers comprehensive datasets and images from nearly 5,000 participants. The data can be examined to develop hypotheses about possible osteoarthritis biomarkers of disease onset and progression, test theories, describe the natural history of osteoarthritis, and investigate factors that influence disease development and severity. For more information, visit <https://www.niams.nih.gov/grants-funding/funded-research/osteoarthritis-initiative>.

