



Priority Statement Title: Research guided by disease-specific theoretical frameworks

Priority Statement Code: CJ2B

Domain: All domains

Priority Statement

Background and Relevance

Disease processes are inherently multi-factorial and multi-domain. Therefore, addressing only one factor or one domain at a time limits clinical impact and impedes progress in the understanding of disease processes. Theoretical frameworks have been proposed that define the mechanistic pathways leading to the development and progression of chronic joint disease. These frameworks, if validated, can provide a powerful roadmap for developing interventions to reduce disease impact. New analysis tools have become available that can address the complex relationships between biology, structure and function in these frameworks. Research across domains, based on a comprehensive theoretical framework is needed to fully understand and successfully intervene in disease processes.

These frameworks can provide an iterative approach for integrating research across domains to converge on a common set of disease pathways, providing clear targets for clinical diagnosis and intervention. They can act as a guide to specific knowledge gaps that should be addressed via additional research, and adapt to reflect research findings.

The expertise and technologies required to develop and validate these frameworks spans multiple domains and may require collaborative integration across multiple institutions for success.

Objectives

The objectives of the recommendation is to establish collaboration between experts from multiple domains to:

- establish comprehensive, theoretical and multi-domain frameworks (or adapt an existing but untested frameworks) for a particular disease (e.g. osteoarthritis) to provide a roadmap for research
- promote collaborative efforts employing these frameworks to address multiple disease factors, pathways and their interaction, supported by expertise in multiple scales and domains.

Recommended Actions

1. Create or adapt theoretical frameworks that propose specific mechanisms for disease development/progression and provide a roadmap for parallel and successive research efforts.
2. Based on the elements of the framework, establish multidisciplinary collaborations to test individual components of the framework as well as interactions between the components



3. Update the framework based on the new findings and propose and investigate new diagnoses and treatments based on the framework