The broad focus of our research for the past 20 years has been on the influence of normal and pathological aging on the human musculoskeletal system. In particular, we are dedicated to the study of the influence of aging on locomotion, characterizing the modifiable mechanisms underlying the incidence of falls and fall-related injuries in older adults, and translating our findings to the design, development and deployment of clinically-relevant technologies and interventions. Our work addresses two primary goals. First, we seek to reduce the incidence of falls by older adults. To achieve this goal, our approach has been to characterize biomechanical mechanisms of falls that are directly amenable to intervention. Our second goal is to reduce the likelihood of fall-related fractures. Our approaches include increasing bone quality and enhancing the healing process of those older adults who do experience a fracture.