

**Applicant**

Dr. Brent Richards, McGill University  
Trainee: John Morris

**E-mail Address**

[brent.richards@mcgill.ca](mailto:brent.richards@mcgill.ca)

**Project Title**

Genome Wide Association Study of Osteoporosis

**Project Summary**

Osteoporosis is a common and costly disease that is increasing in incidence with the aging of our population. While risk stratification programs miss most people who will sustain an osteoporotic fracture over their lifetime. One of the major risk factors for osteoporosis and osteoporotic fractures is lowered bone mineral density. All therapies that are used to prevent fractures act, in large part, by increasing bone mineral density, yet we know that most people who have an osteoporotic fracture have normal bone mineral density. Both bone mineral density and fractures themselves are reasonably heritable, but most of their genetic determinants are not known. Thus, in this program, we will identify the genetic determinants of bone mineral density and fracture. We will use this information to identify biological determinants of fracture that are independent of bone density and attempt to use this information to improve risk stratification through machine learning.

**Keywords**

Genome-wide association study, Osteoporosis, Bone mineral density, Fracture