**A multiscale cell population-fluid flow model of bone remodeling**

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Bone remodeling is the coordinated process of bone removal by osteoclasts followed by bone formation by osteoblasts. The third type of bone cell involved in bone remodeling are osteocytes which are embedded in the bone matrix and are highly interconnected via the micro porosity of bone (i.e., lacunar canalicular porosity). Pertinent bone biology literature suggests that fluid flow in the micro porosity of bone regulates bone remodeling. Here we develop a multiscale model of bone remodeling which takes into account the biomechanical feedback of fluid flow on bone cells. Using this model we will study the influence of mechanical loading on bone which together with biochemical regulation of bone cell interactions provides new insights into the coupled biochemical and biomechanical regulation of bone remodeling in health and disease.