1145-92-781   **Ruqiah A Muhammad*** (`ruqiah-muhammad@uiowa.edu`), Department of Mathematics, 14 MacLean Hall, Iowa City, IA 52242-1419, Iowa City, IA 52242. *Mathematical Model of Bone Regeneration in Bone Marrow-derived Mesenchymal Stem Cell Populations.* Preliminary report.

Millions of people fracture their bones every year. We focus on the bone regeneration process in vitro using multipotent bone marrow-derived mesenchymal stem cells (BMSCs) due to their ability to differentiate into bone cells. We have created a deterministic model that consist of a system of ordinary differential equations to capture the process of calcium formation, necessary for bone formation. This model is unique due to the use of chemically modified ribonucleic acid encoding a bone morphogenetic protein for the transfection of the BMSCs. It also incorporates gene expression levels of specific genetic markers. We will discuss our preliminary results. (Received September 14, 2018)