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BMU remodelling simulation using reducer order method

Adam Moroz, Mikhail Goman, David I. Wimpenny BMU remodelling simulation using reducer order method The bone remodelling process, performed by the Bone Multicellular Unit (BMU) is a key multi-hierarchically regulated process, which provides and supports various functionality of bone tissue. It is also plays a critical role in bone disorders, as well as bone tissue healing following damage. Modelling of bone turnover processes could play a significant role in helping to understand the underlying cause of bone disorders and thus develop more effective treatment methods. The reducer order approach to modelling of bone turnover, based on the osteocyte loop of regulation, have been employed, thin wide range of rate parameters using the Monte Carlo method. The optimal control framework for regulation of remodelling has been discussed. The study illustrates the complexity of formalisation of the metabolic processes and the relations between hierarchical subsystems in hard tissue where a relatively small number of cells are active.