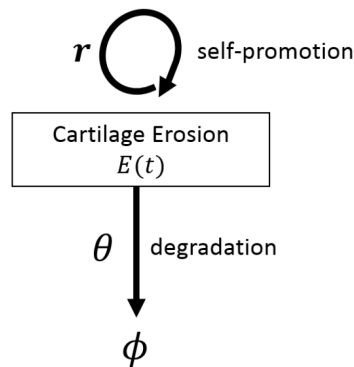


Modelling of cartilage metabolism

project/master thesis

Musculoskeletal tissues (cartilage, bone, muscle, tendon) underlie constant turnover to ensure tissue quality. For this, tissue degradation and formation are usually in equilibrium. However, the equilibrium can be disturbed by physical activity, immobilization, disease and injury.



Simple model of cartilage erosion [1].

This thesis aims at modelling the dynamics of cartilage metabolism in immobilization. First, the relevant physiological processes and their interactions are identified. Then, mathematical models for these processes are developed. Finally, these models are validated with the help of clinical data.

necessary requirements

- good programming skills in e.g. Python or Matlab
- fluent in either English or German
- interest in combining biological data with computational models

additional qualifications (not necessary)

- basic knowledge in human physiology

contact

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¹[1] F.R. Macfarlane et. al., *Quantitative Predictive Modelling Approaches to Understanding Rheumatoid Arthritis: A Brief Review*, Cells (2020)