BME101 Introduction to Biomedical Engineering

Special Topics in Biomedical Engineering #2

Ankara University
Department of Biomedical Engineering

Biomaterials in Orthopedics

- Orthopaedic Surgery is probably on top of the list among fields using biomaterials in their routine clinical applications.
- Indeed, it is reported that orthopaedic biomaterials market is projected to reach $3.9 billion by 2021 in the US and €376 million by 2019 throughout Europe.
- These biomaterials include metals, ceramics, polymers and some biological components and they have been in clinical use for decades.

Biomaterials in Orthopedics

- Although a great improvement was observed in orthopedic biomaterials field since its first inception making the treatment options better and more feasible, it has been learned that the more we mimic the natural tissue structure, the better the regeneration outcomes can be reached.

Biomaterials in Orthopedics

- Based on this, the field of tissue engineering have emerged as an alternative strategy to generate viable tissue substitutes in the lab.
- There are numerous studies ongoing to produce better engineered bone, cartilage, muscle, tendon and ligament grafts, however, there still is a long way to go for the engineering of clinically applicable substitutes for tissues requiring higher level of functionality.

Biomaterials in Orthopedics

- Clinician-scientist coordination is indispensable for achieving such a goal. Along with this multidisciplinary approach, interdisciplinary contribution from biologists, chemists, biomaterial scientists and tissue engineers is needed for meeting patients' demands.