

# Introduction to Biomaterials

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LEC (4)

# Sequence of local events following implantation in soft tissue

- Injury
- Acute inflammation
- Granulation tissue
- Foreign body reaction
- fibrosis

# Soft tissue response to an implant

- Acute (mins to hrs)  
Cell type: Leukocytes  
Function: Recognition, engulfment and degradation (killing)
- Chronic (days to months)  
Cell types: Macrophages, monocytes and lymphocytes.
- Granulation tissue formation (3-5 days)  
Cell types: Endothelial cells (forming blood vessels), fibroblasts (forming connective tissue)
- Foreign body reaction (days to life time)  
Cell types: Foreign body giant cells, Macrophages, fibroblasts
- Fibrosis & Fibrous encapsulation  
Cell type: Fibroblasts

# Bioactive and Osteointegration

- A chemical bonding between bone and material will be formed.  
(Bioactive, Hydroxylapatite)
- A direct contact between bone and impant under light microscope.  
(Osterintegration, titanium)

# Blood material interaction

- Hemolysis (red cells)
- Coagulation (Platelets)