BIOMATERIALS

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BIOMATERIALS

Are any substances (other than drugs), natural or synthetic, that mimic, treat, augment, or replace any tissue, organ, or body function in a safe, reliable, economic, and physiologically acceptable manner.¹

Characteristics of Biomaterial Science

- Multidisciplinary
  - Engineering
  - Material science
  - Biology
  - Medicine
  - Regulations

- Multi-material
  - Polymers
  - Metals
  - Ceramics
  - Composites

- Need-driven
  - Products are used in the treatment of affected population
  - Impacted population growth by over 10% a year

- Huge market
  - Market size represents 7 to 8% of the world wide health care spending

- Risk benefit
  - In spite of the risk of infection from an implant, quality of life has improved
The need for biomaterials stems from an inability to treat many diseases, injuries, and conditions with other therapies or procedures:
HISTORY

- 1400 BC Egyptian artificial toe
- 600 BC Autologous tissue grafts by Hindu surgeons
- 400 BC Artificial limbs and eye inlays for assisting dead in next world
- 300 BC Roman wood/bronze legs
- 1350 Eyeglasses
- 1500’s Functional prosthesis, iron hand
- 1965 Liposomes
- 1970s Stents, Degradable polymers
- 1980s Tissue Engineering
- 1995 Doxil
- 1996 Integra – silicon coated ECM
- 2010s Decellularized matrices, multi-functional, manipulating cells

http://weekly.ahram.org.eg/2002/599/hr1.htm
Warning: unsanctioned slides....
SPEAKERS

- Dhirendra Katti, IIT Kanpur
- Rinti Banerjee, IIT Mumbai
- Suzie Pun, University of Washington
- John Santini, ApoGen Biotechnologies