

“Biomimetics- A niche for bioinspiration in Restorative Dentistry”

Biomimetic dentistry refers to the study of multi-disciplinary mechanisms and biologically produced materials to design novel products to mimic nature. It is derived from latin word “bio” meaning life, and “mimetic” related to mimicking biochemical process with inspiration from nature.

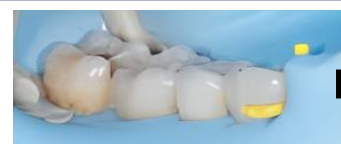
Biomimetics in Restorative Dentistry

Procedures

Restorative treatment approaches
Conventional extensive approach
Biomimetic conservative approach

Biomimetic restorative materials

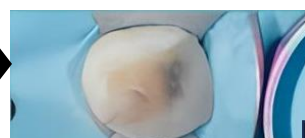
Glass ionomer
Composite resin
Ceramics



Isolation



Carries detection dye



Air abrasion



Restoration



Biobase creation



Dentin sealing

Advantages

- Preserve intact tooth structure
- Minimize pain and sensitivity
- Optimal seal
- Maximize adhesion by upto 40%
- Prevent catastrophic failures



Traditional filling

Bulk-fill filling

Bio-mimetic filling

Decreasing shrinkage stress

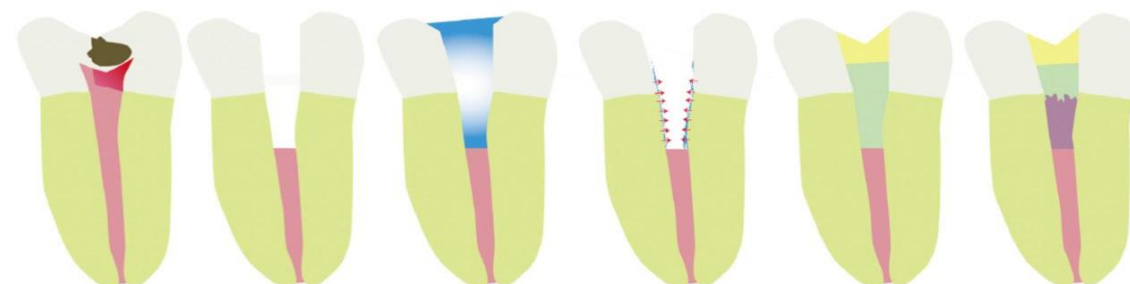
Biomimetics in Regenerative Dentistry

Procedures

Dentin Remineralization
Crystallite growth approach
Bottom-up approach

Biomimetic regenerative materials

Bioglass
CPP-ACP
Polydopamine



Irreversible pulpitis

Pulpotomy

EDTA-Conditioning

Release of growth factors

Insertion of Biomaterial

Regeneration

What's the difference?



Biomimetic Dentistry

Traditional Dentistry

Goals

- Conserve dental pulp
- Repair or eliminate cracks
- Remove pathology
- Preserve the tooth structure
- Reinforce the tooth structure