



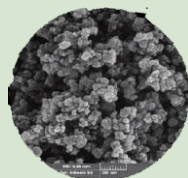
NANO-SHIELD: DEFENDING SMILES AGAINST CAVITIES

INTRODUCTION

- In recent years, nanotechnology has shown great application prospects in the development of anti-caries materials.

METAL NANOPARTICLES USED AS ANTI-CARIES AGENTS

- Silver Nanoparticle (N_{Ag})
- Nano-Zinc (NZn) and (NZnO)
- TiO₂ nanoparticles (NTiO₂)
- MgO nanoparticles (NMgO)

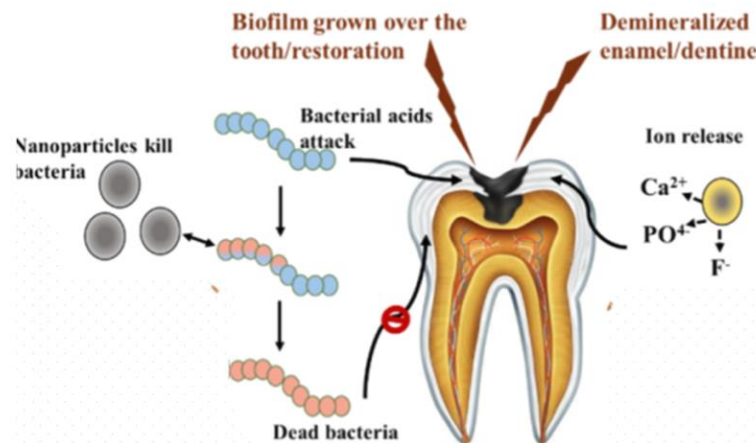


REMINERALIZING NANO ANTI-CARIES MATERIALS

- Nano Particulate Hydroxyapatite (NHAP)
- Nanosized Calcium Fluoride (N_{CaF}2)

PROPERTIES OF NANOMATERIALS

- Antibacterial activity
- Antiviral activity
- Antifungal activity
- Reduce biofilm production
- Remineralizing carious lesion



ROLES OF ANTI-CARIES NANOMATERIALS

Application of Nanomaterials in dentistry

Preventive Dentistry

Metal nanoparticles, inorganic salts

Teeth Restoration

Amalgams, composites, resins containing quaternary ammonium compounds, metal alloys.

Endodontic

Composites, odontoblast stimulation, Drug eluting NPs, polymeric matrix etc.

Prosthetic

Implants should be microbial resistant as well as hardy enough to hold roots/teeth.

Orthodontic

The metallic or polymeric material having antibiofilm properties.

Periodontology and bone regeneration

Nanoparticles assists in regeneration of pulp and removal of microbes.

Dental nanomaterial available in market



CONCLUSION

- Various inorganic based nanoparticles (NPs) and their metal oxide NPs (e. G. Ag, Zn, hydroxyapatite and N_{CaF}2 base NPs) have been shown to increase anti-caries capabilities in filling and other materials.

REFERENCE

- Chen H, Gu L, Liao B, Zhou X, Cheng L, Ren B. Advances of anti-caries nanomaterials. *Molecules*. 2020 Oct 30;25(21):5047
- Al-Hijazi AY, Hasan N, Nasr BK, Al-Khafaji HH, Al-Khafaji B, Alanssari BF, Jalil AT. Recent advances in the use of inorganic nanomaterials as anti caries agents. *Heliyon*. 2023 Apr 1;9(4).