39th IACDE National Conference

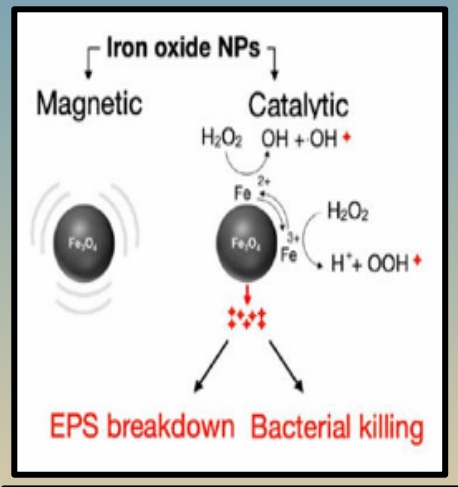
MICROROBOTICS IN ENDODONTICS; REDEFINING NEW AGE DENTISTRY

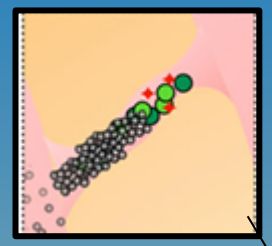
Microrobotics in endodontics is the use of tiny robots to treat and diagnose dental issues in the root canal.

Types of microrobots

- Aggregated microswarms
- 3D-molded hellicoids
- Helical silica nanorobots

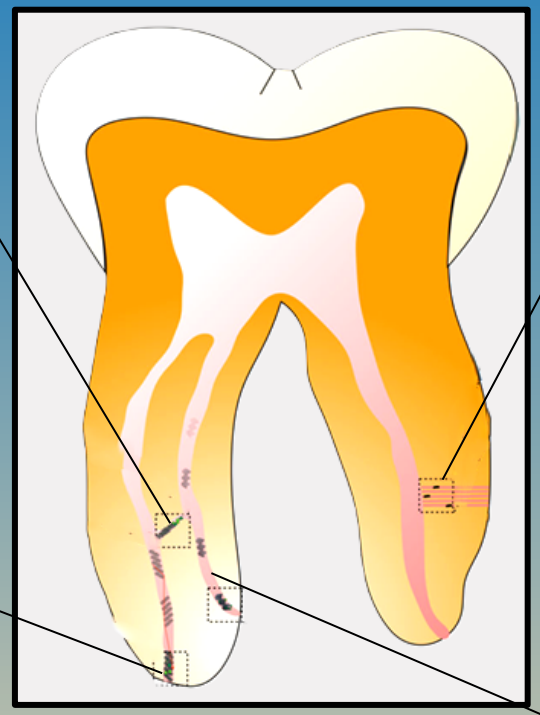
Mechanism



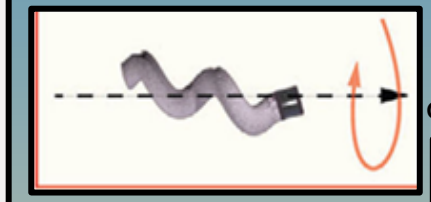


Aggregated Microswarm at isthmus

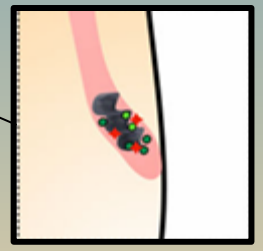
Aggregated Microswarm at apical region



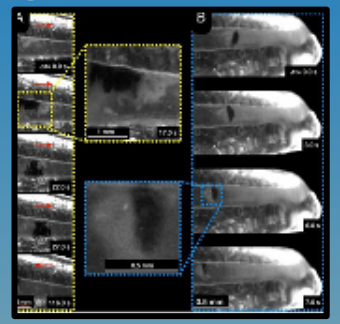
Nanorobots at dentinal tubules



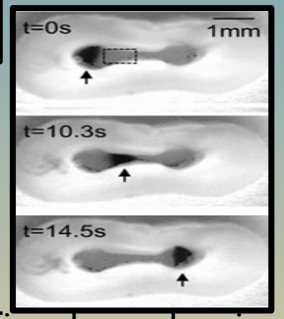
Iron core silica bomb



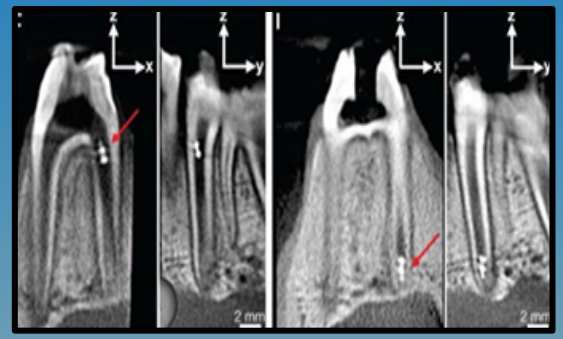
Guided 3D molded robots



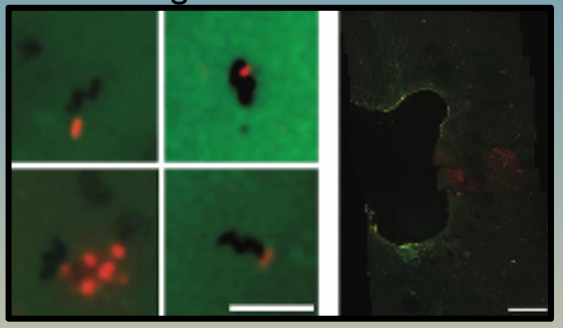
Time-lapse showing apically directed aggregated microswarms disrupting biofilm



Time-lapse showing aggregated microswarms navigating through an isthmus space



CBCT showing 3Dmolded robots infused with opacifier at coronal region



CLSM images showing antimicrobial efficacy of magnetic hyperthermia showing killing of bacterial cells

Conclusion-Microrobotics in endodontics has the potential to significantly advance root canal therapy, precise, and minimally invasive treatment options while reducing procedural complications with new concept for precision biofilm treatment using microrobots.

REFERENCE-Babeer A, Bukhari S, Alrehaili R, Karabucak B, Koo H. Microrobotics in endodontics: A perspective. International Endodontic Journal. 2024 May 18.Microrobotics in Endodontics: A Perspective