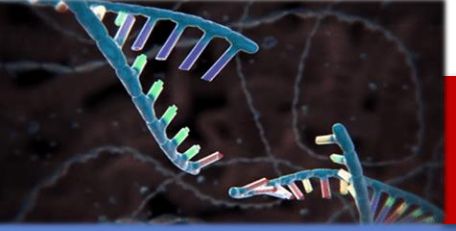
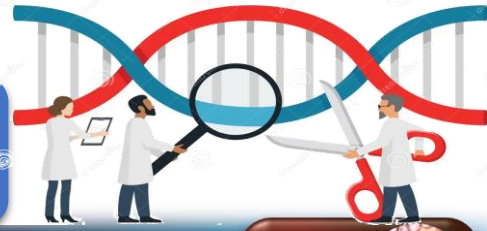


39th IACDE National Conference

PGE 314

CRISPR Cas 9

"A GENE–ius LEAP"

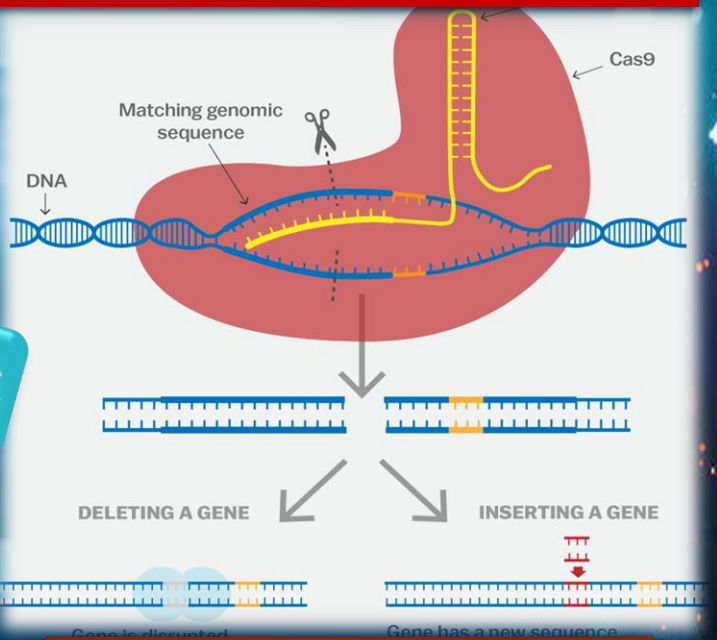


Clustered Regularly Interspaced Short Palindromic Repeat

Discovered by Jennifer Doudna and Emmanuelle Charpentier(2012)

CRISPR Sequences work in bacteria to form an adaptive immune response against invading bacteriophages by integrating sequences derived from the invading DNA

MECHANISM OF ACTION



CRISPR Associated Protein

GENE KNOCKOUT

CRISPR potentially can also be used to edit the genome within patients to study the susceptibility of dental caries through GENE KNOCK OUT.

ROLE IN DENTISTRY

- Craniofacial Malformations
- Oral cancer
- Congenital malformation
- Wound healing
- Cell therapy
- Tooth regeneration
- Viral infections.
- Periodontitis, gingivitis
- Salivary dysfunction

DENTAL CARIES & CRISPR

CRISPR targets Glucotransferases (Gtf) & Polysaccharides(EPS), virulent factors of Streptococcus Mutans and decrease biofilm formation and acid production

CRISPR CAS : KNOCK OUT STRATEGIES

Mutation of

- DEFB1 Gene (G 20A) Variant – greater risk of caries
- Amelogenin (AMELX) ,Enamelin(ENAM), MMP 20, Kallikrein 4(KLK 4) – Enamel malformations