

MEGANUCLEASES



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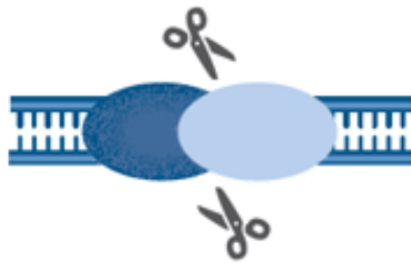
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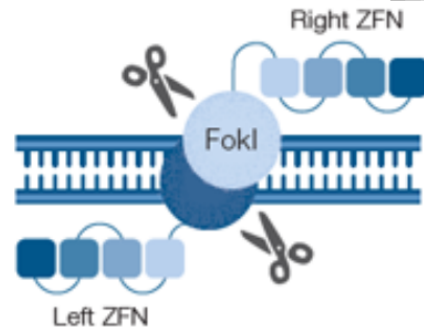
What are they?

- Meganucleases are endonucleases that recognize specific dsDNA sequences with more than 12 bp.
- There are three types of meganucleases: ZFNs (zinc-finger nucleases), TALENs (transcription activator-like effectors nucleases) and CRISPR/Cas9.



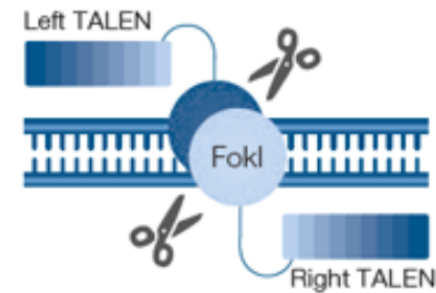
Meganuclease

Engineered meganuclease and re-engineered homing endonucleases



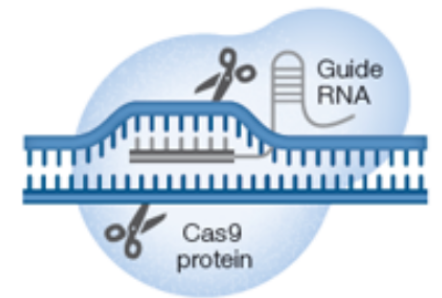
ZFNs

Zinc-finger nucleases (ZFNs)



TAL effector nucleases

Transcription activator-like (TAL) effector nucleases

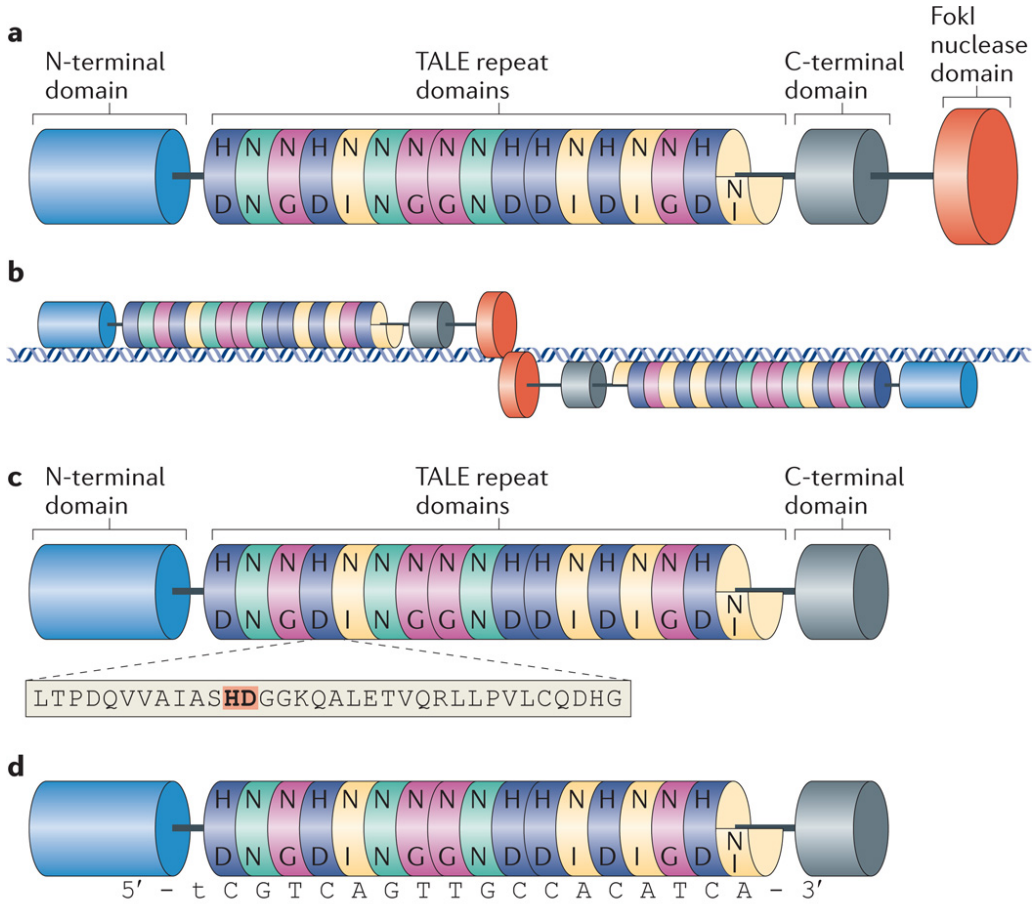


CRISPR-Cas9 nucleases

Clustered regularly interspaced short palindromic repeats nucleases

How do they work?

TALEN



Nature Reviews | Molecular Cell Biology

ZFN

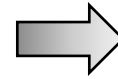


Zinc finger domains



Where are they used?

- Agribusiness
- Protein production
- Medical field
- Others



Perspective for the future, more specifically:

- Introduce transgenes in a determined loci
- Correct or inactivate mutated genes



Example: Use of TALENs to produce mutant pigs, useful for the study of diseases