

What are TALENs?

Transcription Activator-Like Effector Nucleases

TALENs are used by scientists to help improve food crops

TALEs (Transcription Activator-Like Effectors) are natural proteins made and used by harmful plant bacteria to control plant genes during infection



Scientists have used the discovery of TALEs to:

modify TALEs into TALENs

TALENs



design TALENs to target selected, specific DNA sequences



make a cut in the targeted DNA sequence



initiate the cell's own repair mechanisms to remove or introduce new DNA at the target site



How are TALENs used to improve our crops?

TALENs are another tool to extend the diversity of traits and allows breeders to selectively change the qualities they want, such as:

improved yields



better taste



resistance to disease and pests



resilience to climate change, drought, or salinity



improved quality of products derived from crops



Examples of TALENs used to improve our crops:

Soybeans that produce premium quality oil



Rice which is more aromatic and resistant to bacterial blight



Potatoes with better taste, less browning, and lower levels of potentially carcinogenic acrylamides



Wheat with complete resistance to powdery mildew



How are TALENs different from CRISPRs?

TALENs are extremely precise gene editing tools that can target any sequence and perform better than CRISPR in some cases.

TALENs have additional capabilities to:

perform nucleic acid-free editing



discriminate between DNA modifications like methylation that affect a gene's expression



modify DNA within organelles such as mitochondria and chloroplasts, which contribute to cell function



How to gain access to TALENs technology?

2BLADES
FOUNDATION

The 2Blades Foundation holds exclusive global rights for uses of the TALE Code in plants.

2Blades has worked extensively to create simple, broad access to this versatile platform to maximize its benefits for plant breeding



Consistent with its two-pronged mission, 2Blades licenses the technology for commercial applications on a non-exclusive, tiered basis to a wide range of large commercial seed companies to smaller agribiotech companies

2Blades also gives no-cost TALEN rights to non-profit and multilateral entities, such as the International Rice Research Institute (IRRI), to facilitate the improvement of crop varieties and support innovation to benefit food security

