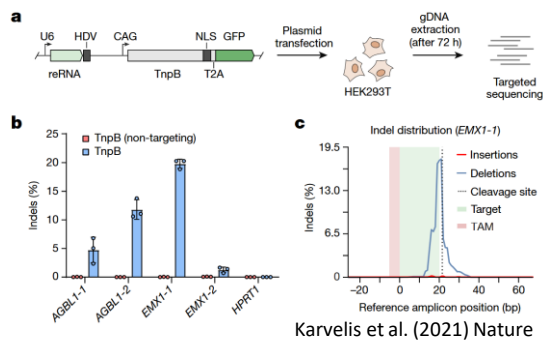


TnpB nucleases – novel genome editors

BRIEF DESCRIPTION OF A TECHNOLOGY

A novel RNA-programmable TnpB system enables targeted cleavage of DNA. This system supports precise genome editing, along with related methods and applications.



Karvelis et al. (2021) Nature

PURPOSE

Compact TnpB proteins form ribonucleoprotein effector complexes with guide RNA molecules (reRNAs). These complexes cleave DNA through sequence-specific recognition, in which the reRNA guide sequence directs the complex to a complementary target sequence, followed by TnpB-mediated DNA cleavage.

FIELDS OF APPLICATION

TnpB nucleases are highly versatile for targeting DNA in vitro, ex vivo, or in vivo, thereby expanding the gene editing toolbox. Beyond DNA cleavage, TnpB can be engineered to block gene expression or detect target sequences without cleavage. TnpB effector complexes can also deliver one or more additional effector molecules to specific sites within DNA. In contrast to current nucleases used for genome editing, the compact size of TnpB provides the advantage of less constrained delivery into cells, for example via adeno-associated viruses, which are preferred vectors for in vivo delivery in clinical applications.

TECHNOLOGY READINESS LEVEL

Validated in lab.

INTELLECTUAL PROPERTY

EP patent application EP4363566A1
US patent application US2024368630A1
JP patent application JP2024524514A
KR patent application KR20240027724A
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PUBLICATIONS

1. Karvelis et al. (2021) Nature.
<https://doi.org/10.1038/s41586-021-04058-1>
2. Sasnauskas et al., (2023) Nature.
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