

Synthetic Nuclease

Technology Overview

α -synCas is a synthetic nuclease engineered to overcome the limitations of naturally occurring CRISPR-Cas systems. Unlike Cas9, Cas12, or Cas13, α -synCas shows broad substrate versatility, enabling the cleavage of dsDNA, ssDNA, and ssRNA. This makes it a unique platform for both detection and genome engineering applications.

Key Features & Advantages

- Novelty: No natural homologs, representing a new nuclease family.
- Substrate Flexibility: Targets and cleaves DNA (ds/ss) and RNA.
- Trans-Cleavage Activity: Non-specific nucleic acid degradation upon activation.
- No PAM Requirement: Broader target accessibility.
- crRNA Versatility: Compatible with guide RNAs from multiple Cas systems.
- Autonomous Processing: Able to process pre-crRNAs.

Applications

- Nucleic Acid Detection: Development of broad diagnostic platforms.
- Genome Editing: Expanded targeting range and flexibility.
- Gene Regulation: Tools for transcriptional and post-transcriptional control.
- Therapeutics: Potential antiviral and genetic disease applications.

Development Stage

Proof-of-concept established in vitro and in vivo

Variants under development for optimized specificity and delivery.

IP Status

PCT Patent application filed (α -synCas and variants) 18 September 2024

Collaboration Opportunities

We are seeking industrial and academic partners for:

- Co-development of diagnostic kits and genome-editing tools.
- Licensing opportunities for therapeutic and diagnostic applications.
- Joint research projects on novel Cas variants.

CONTACTS

Donatello Castellana, Tech Transfer Manager, dcastellana@cicbiogune.es