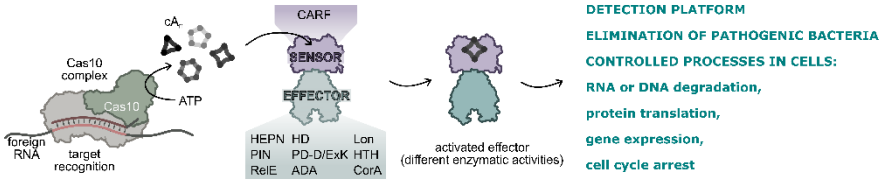
Production of cyclic adenylates and their use as allosteric regulators

BRIEF DESCRIPTION OF A TECHNOLOGY

We have developed a novel method to activate and regulate CRISPR-Associated Rossmann Fold (CARF) domain proteins both *in vitro* and *in vivo* using cyclic (cA_n) or linear oligoadenylates. Cyclic oligoadenylates are produced by the catalytic activity of a polymerase/cyclase-like proteins, such as Cas10. Linear oligoadenylates can be generated either by chemically or enzymatically. These molecules serve as precise regulators, capable of activating a wide range of CARF-domain containing enzymes. This platform enables new possibilities in biotechnology and medicine.



PURPOSE

To produce cyclic oligoadenylates and apply cyclic/linear oligoadenylate-regulated molecular tools with diverse enzymatic activities.

FIELDS OF APPLICATION

- Development of sensitive detection platform for specific transcripts or small RNAs;
- Elimination of pathogenic bacteria;
- Controlled processes such as: RNA or DNA degradation, regulation of protein translation and gene expression, cell cycle arrest in living cells.

TECHNOLOGY READINESS LEVEL

Technology validated in lab.

INTELLECTUAL PROPERTY

Patents: US12123031B2, EP3630966B1.
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INVENTORS

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PUBLICATIONS

Kazlauskiene et al. (2017) Science, doi: 10.1126/science.aao0100
Smalakyte et al. (2020) Nucleic Acids Research, doi: 10.1093/nar/gkaa634
Mogila et al (2023) Science, doi:10.1126/science.adj2107
Smalakyte et al. (2024) Molecular Cell, doi: 10.1016/j.molcel.2024.09.002

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