

Title (en)

SINGLE PROTEIN PRODUCTION IN LIVING CELLS FACILITATED BY A MESSENGER RNA INTERFERASE

Title (de)

EINZELPROTEINHERSTELLUNG IN LEBENDEN ZELLEN MITTELS MESSENGER-RNA-INTERFERASE

Title (fr)

PRODUCTION D'UNE SEULE PROTEINE DANS DES CELLULES VIVANTES FACILITEE PAR UNE INTERFERASE D'ARN MESSAGER

Publication

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Application

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Abstract (en)

[origin: WO2006055292A2] The present invention describes a single-protein production (SPP) system in living E. coli cells that exploits the unique properties of an mRNA interferase, for example, MazF, a bacterial toxin that is a single stranded RNA- and ACA-specific endoribonuclease, which efficiently and selectively degrades all cellular mRNAs in vivo, resulting in a precipitous drop in total protein synthesis. Concomitant expression of MazF and a target gene engineered to encode an ACA-less mRNA results in sustained and high-level (up to 90%) target expression in the virtual absence of background cellular protein synthesis. Remarkably, target synthesis continues for at least 4 days, indicating that cells retain transcriptional and translational competence despite their growth arrest. SPP technology works well for yeast and human proteins, even a bacterial integral membrane protein. This novel system enables unparalleled signal to noise ratios that should dramatically simplify structural and functional studies of previously intractable but biologically important proteins.

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