LICENSING OPPORTUNITY: APTAMER REGULATED TRANSCRIPTION FOR IN-VITRO SENSING AND TRANSDUCTION

DESCRIPTION

Problem

Molecular biosensors that accurately measure protein concentrations without external equipment are critical for solving numerous problems in diagnostics, therapeutics, and biomanufacturing; yet modularly transducing the binding of protein antibodies, protein switches or aptamers into a useful output remains challenging.

Invention

It relates to nucleic acid transcription templates, systems and methods for detection and measurement of molecules and biomolecules (e.g., biomarkers). Particularly, systems and methods utilize a transcription template with an aptamer domain configured to bind a molecule of interest to regulate production of a transcribed output ribonucleic acid (RNA).

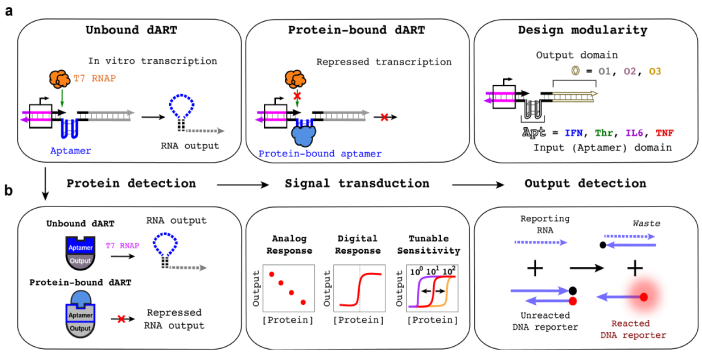
BENEFITS

Commercial Application

Clinical diagnostics, protein sensing, biomanufacturing.

Competitive Advantage

The new method enables facile development of inexpensive and rapid biosensors for molecular detection and measurement.



(a) Without an aptamer's protein ligand, dARTs are transcribed to produce RNA outputs (left), while protein binding represses transcription (middle). The input and output domains are decoupled (right), enabling modular design of dARTs by swapping out the aptamer domain or customizing the output sequences. (b) dARTs serve as the protein sensing layer (left) whose outputs can be coupled with downstream circuits (middle). RNA outputs are measured via fluorescence (right).

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