miRNA Inhibitors

Sigma-Aldrich announced that Sigma Life Science, its biological products and services business, through an exclusive collaboration with Drs. Hideo Iba and Takeshi Haraguchi at the University of Tokyo, released MISSION Synthetic and Lentiviral microRNA Inhibitors based upon the Tough Decoy (TuD) design for the long-term suppression of any miRNA endogenous to humans or mice. Custom designs for other species are available upon request. Each microRNA inhibitor is designed using a proprietary algorithm that evaluates all possible sequences for the design predicted to best maintain the TuD structure, providing maximal miRNA recognition and binding.

Naturally-occurring miRNAs inhibit translation of a large percentage of mRNAs encoding human proteins and play pivotal roles in oncogenesis, development, cell differentiation, and immune responses. Iba and Haraguchi invented TuD RNAs as a more potent tool to suppress specific miRNAs and thus investigate their biological functions.

In contrast to current approaches that use single-stranded RNAs, such as sponge decoys and locked nucleic acids, TuD RNAs are double-stranded. This, along with a stem-loop stabilized secondary structure, resists cellular nuclease degradation and facilitates sustained miRNA inhibition for longer than one month. In addition, both strands of a TuD RNA contain a miRNA binding site for more efficient sequestration of target miRNAs at lower, nanomolar concentrations.

Sigma Life Science provides the TuD RNAs in both synthetic and lentiviral formats to support transient miRNA knockdown as well as long-term miRNA suppression without repeated transfections. The miRNA binding sites are designed using human

and mouse sequence data from the most recent version of miRBase (v.19).

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Links:
[1] http://www.sigma.com/mirna