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細胞膜透過可能なキューブ型DNAアプタマー：IRDAptamer
Cell Membrane Permeable Cubic DNA Aptamer: IRDAptamer

【Keywords】

Oligonucleotide therapeutics	DNA aptamer	membrane permeability	Drug modality	Stimulus response

■Summary

While antibody drugs, which use antibodies as a drug, have the advantages of high specificity and selectivity for their target and few side effects, there is a major obstacle in that they cannot penetrate cell membranes and cannot be used for intracellular proteins, which account for many of the proteins in diseases. The IRDAptamer, a stimulus-responsive DNA aptamer formed from a single-stranded DNA developed by our laboratory, has a cube-shaped structure based on a G4 structure and is a new drug discovery modality with cell membrane permeability. As this molecule is constructed as a library with a diversity of over 100 billion, it can be used to search for inhibitors that act specifically on various disease-causing proteins inside and outside the cell, and is expected to have a wide range of applications.

■Subject Details/Topic

Nucleic acid aptamers, which are formed from single-stranded DNA or RNA, are expected to be used as post-antibody drugs because of their high specificity and affinity for targets, as well as their advantages of being chemically synthesizable (inexpensive), easily chemically modifiable, and having low antigenicity. In addition to the advantages of nucleic acid aptamers, our original drug tool “IRDAptamer” have the following features(1) It is membrane permeable and has cell membrane permeability, (2) It can be controlled On/Off by external stimuli such as ions and light, (3) It is constructed as a library. Thus, IRDAptamer can be used for a variety of diseases inside and outside the cell and it has potential as a next-generation drug discovery modality.

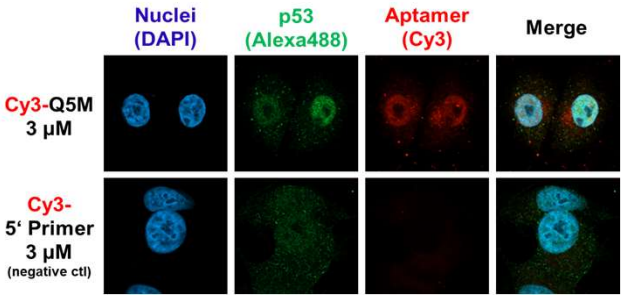

Fig. 1 Membrane permeability of IRDAptamer

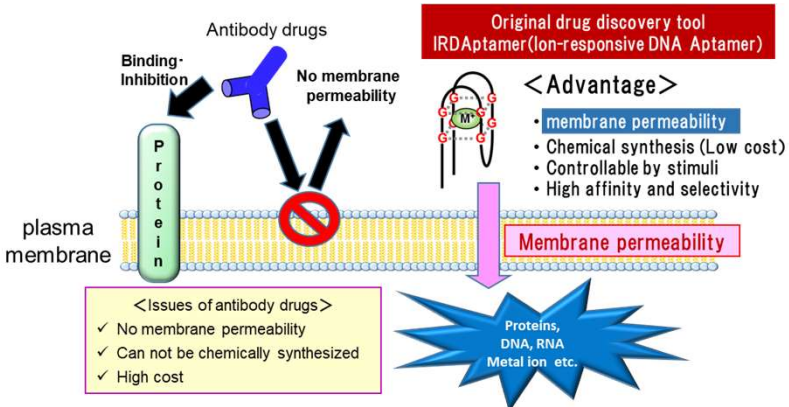

Fig. 2 Original drug tool “IRDAptamer” with membrane permeability

■We hope to collaborate with…

Drug discovery, Diagnostic reagents, Biosensors

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