

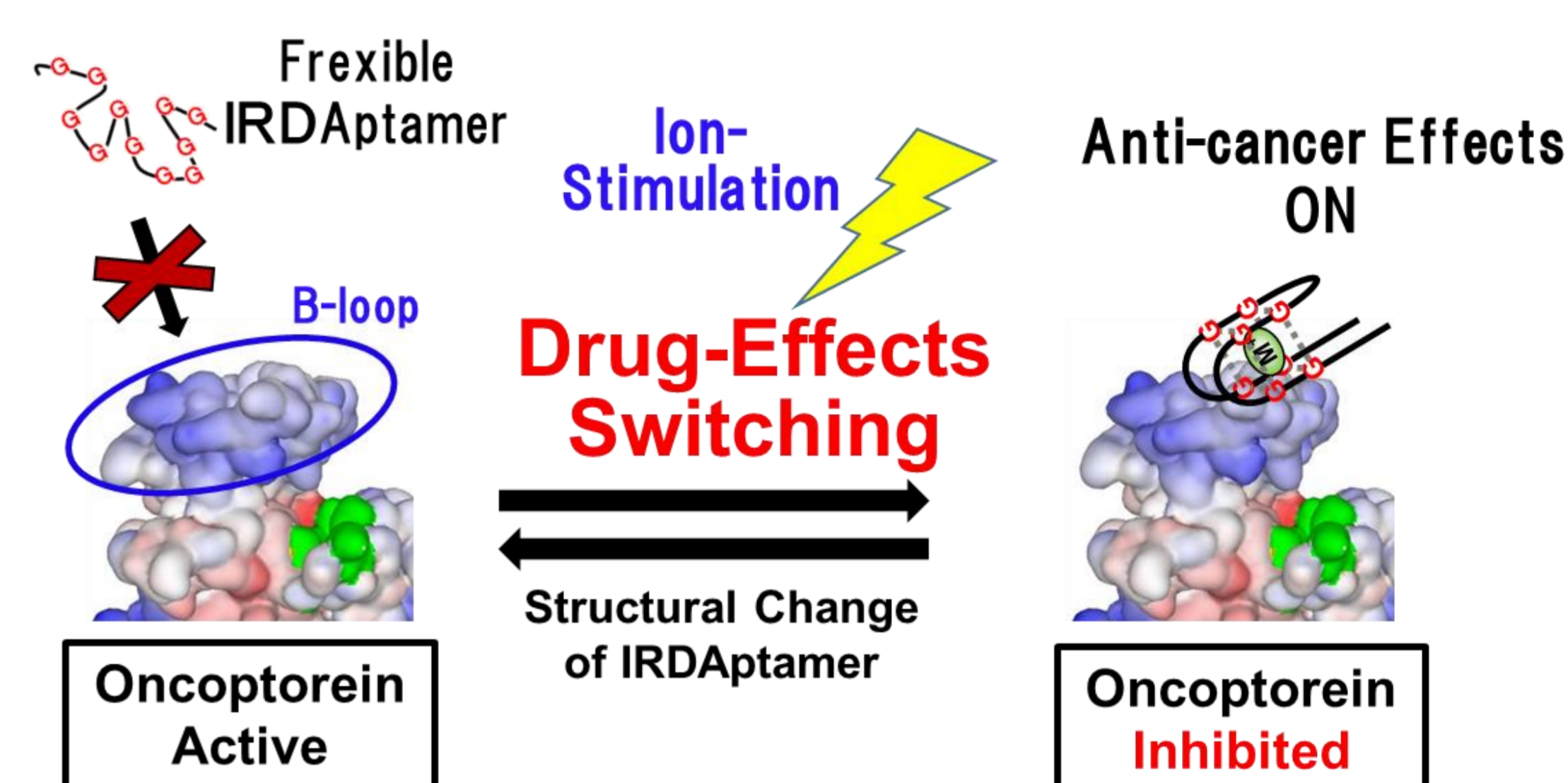
Development of Ion-responsive DNA Aptamer (IRDAptamer) Drugs Targeting Intracellular Oncogenic Proteins

【Keywords】

DNA Aptamer	Stimuli-Responsive molecules	Post-antibody drugs	Anti-cancer drugs	Cell-penetration
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■ Summary

Antibody-drugs are the most rapidly growing drug class and have a major impact on human health, particularly in oncology, autoimmunity and chronic inflammatory diseases. Despite the ability to raise antibodies against different proteins, the applications of antibodies are restricted to extracellular antigens, such as membrane or secreted proteins. We have developed IRDAptamer (Ion-Responsive-DNA Aptamer) targeting intracellular oncogenic protein, and it was automatically introduced into cells without transfection reagent. The purpose of this study is to develop the platform of “post-antibody drugs” which is controllable by stimuli, such as ion, heat and light.



■ Subject Details/Topic

DNA Aptamers are selected nucleic acid binding species with affinities and specificities for protein targets that rival those of monoclonal antibodies. Previously, we have designed ion-responsive DNA Aptamer (IRDAptamer) library based on G-quadruplex DNA and identified several G-quadruplex DNA aptamers targeting intracellular oncogenic protein PPM1D. Our data suggested that IRDAptamer drugs may work as the strong and stimuli-responsive anti-cancer agents with high cellular uptake efficiency.

○ Advantages

- ✓ Low cost, Low antigenicity
- ✓ High sensitivity, High affinity, High stability
- ✓ Switchable its function (**Patent#: 2019-045938**)
- ✓ Applicable for the intracellular target proteins by the cell penetrating activity (**Patent#: 2019-096035**)
- ✓ High versatility by the screening with IRDAptamer library

○ Applications

- ✓ Anti-cancer Drug
- ✓ Development of Light-responsive DNA aptamer
- ✓ Application of disease-detection kit using IRDAptamer

○ Plans

- ✓ In vivo assay, Application of disease-detection kit

■ We hope to collaborate with...

- ✓ Distribution, stability, toxicity and specificity of IRDAptamer in vivo.
- ✓ Development of application kit for disease-detection using IRDAptamers

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