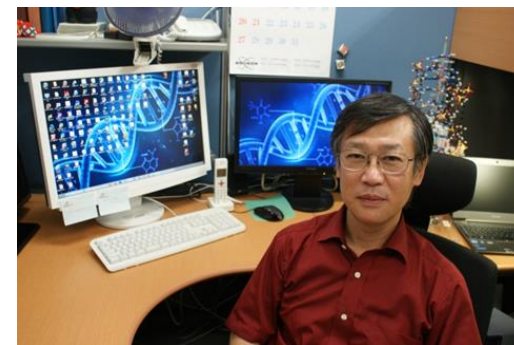


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Reserch Theme in This Project: Development of photoresponsive gel actuator

Main Research Results, Publications:

By introducing azobenzenes as a photoswitch, we have succeeded in the reversible photoregulation of the formation and dissociation of DNA duplex. By using the photoresponsive DNA, we prepared nano-to-micro meter-sized photoresponsive DNA gel, and succeeded in the gel-to-sol transition by irradiating appropriate light. This photoresponsive DNA could encapsulate Dox, an anticancer drug, which could be released by irradiating 400 nm light. We also achieved photo-targeting towards cancer cell (HeLa cell) *in vitro* with this photoresponsive gel.

1) "Reversible photoswitching of RNA hybridization at room temperature with an azobenzene C-nucleoside."

Goldau, T.; Murayama, K.; Brieke, C.; Steinwand, S.; Mondal, P.; Biswas, M.; Burghardt, I.; Wachtveitl, J.; Asanuma, H.; Heckel, A.
Chem. Eur. J., **2015**, *21*, 2845-2854.

2) "Synthetic gene involving azobenzene-tethered T7 promoter for the photocontrol of gene expression by visible light."

Kamiya, Y.; Takagi, T.; Ooi, H.; Ito, H.; Liang, X.G.; Asanuma, H.
ACS Synth. Biol., **2015**, *4*, 365-370.

3) "De Novo Design of Functional Oligonucleotides with Acyclic Scaffolds"

Asanuma, H.; Kashida, H.; Kamiya, Y.
Chem. Rec. **2014**, *14*, 1055-1069.

4) "Light-driven DNA nanomachine with a photoresponsive molecular engine."

Kamiya, Y.; Asanuma, H.
Acc. Chem. Res., **2014**, *47*, 1663-1672.

Recent Activities (hobbies, etc.): Recently, I get tired easily with the age.