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Hot article: Blue fluorescent RNA: Tag you're it!

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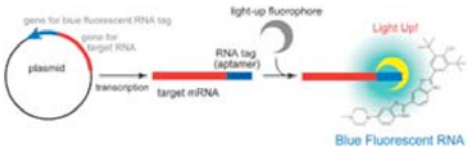
Shinsuke Sando, Yasuhiro Aoyama and colleagues from Kyoto University have chosen an RNA aptamer to selectively bind and 'light-up' a modified Hoechst dye. Usually the Hoechst dye is nonfluorescent, however, specific aptamers can induce change in the bound dye molecules' microenvironment and therefore enhance overall fluorescence.

The RNA aptamers used in this study not only have a high binding affinity towards the Hoechst dye (K_d = 35nM) but also results in high light-up properties. The fluorescence is increased by over a factor of 10 upon binding of the aptamer to the dye. The corresponding quantum yield (26%) is sufficient enough for potential applications in cell biology, such as transcription processes.



Sando has shown *in vitro* that the aptamer, when fused with luciferase mRNA, can be used as a blue fluorescent RNA tag in the presence of the dye to monitor mRNA transcription processes. In this case the luciferase gene can be transcribed and monitored visually, which opens up huge opportunities towards advancing the area of RNA monitoring.

'Of course, our strategy can be applied to other microenvironment-sensitive fluorophores to generate multicolour light-up aptamer-dye pairs' explained Sando. Future challenges for this work lie in the direction of carrying out 'real-time in-cell monitoring of particular RNAs of interest upon stimulation of the cells with hormones and so on. As well as in-cell screening of drugs that would promote or suppress particular RNAs,' said Sando.

Emma Shiells

Link to journal article

Transcription monitoring using fused RNA with a dye-binding light-up aptamer as a tag: a blue fluorescent RNA
Shinsuke Sando, Atsushi Narita, Masayoshi Hayami and Yasuhiro Aoyama, *Chem. Commun.*, 2008, 3858
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