Aptaswitches: new supramolecular tools

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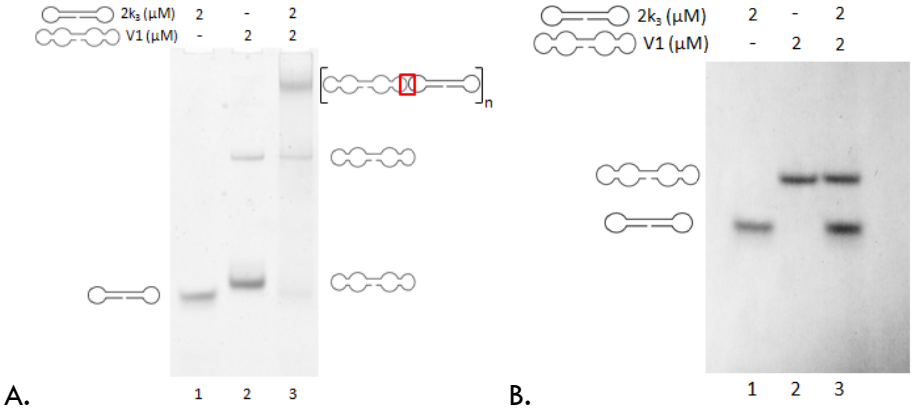
Aptamers are short single-stranded oligonucleotides that like monoclonal antibodies bind to their targets by complementary shape interactions. Indeed, aptamers function by folding into unique globular three-dimensional conformation that dictates high-affinity and specificity binding to a variety of targets (proteins, peptides, nucleic acids, small molecules). Aptamers are commonly evolved *in vitro via* a combinatorial chemistry technique known as SELEX[1,2].

Stem-loop structured aptamers can interact with a stem-loop target through a specific and high-affinity loop-loop interaction, named kissing complex[3]. The lab has engineered stem-loop structured aptamers, as adenosine DNA aptamer[4], by replacing the apical loop for a loop able to engage a kissing complex[5]. These tools, aptaswitchs, allow kissing complex formation (with an aptakiss), conditioned by the presence of the target, through a structural switch.

We report here the use of adenosine aptaswitchs for the development of a supramolecular set. We have prepared dimers of adenosine aptaswitch and other tools, and evaluated their capacity to form conditional supramolecular objects (as nanorods). We aim to monitor the nanorods formation using various techniques, as native-PAGE, fluorescence, SPR or AFM.



native PAGE analysis of double adenosine-aptaswitch (V1) in interaction with double aptakiss (2k3), in presence of adenosine (A.) or inosine as a control (B.). Panel A, lane 3: conditional formation of supramolecular assembly, in presence of adenosine.

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(3) Ducongé, F.; Toulmé, J. J. *RNA* **1999**, *5* (12), 1605–1614.
(4) Huizenga, D. E.; Szostak, J. W. *Biochemistry* **1995**, *34* (2), 656–665.
(5) Durand, G.; Lisi, S.; Ravelet, C.; Dausse, E.; Peyrin, E.; Toulmé, J.-J. *Angew. Chem. Int. Ed.* **2014**, *53* (27), 6942–6945.