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Supporting Information

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Biochemical Characterization of a Uranyl-Specific DNAzyme

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The optimal DNAzyme structure

The conserved and crucial DNAzyme sequence is presented in Figure 1B of the paper. Based on this sequence, the DNAzyme can be rationally optimized to reduce size and improve activity, and shown in Figure 1S is one of the most optimal DNAzyme secondary structure. It contains only a G•A pair in the substrate binding arm, while the remaining base pairs are all Watson-Crick pairs. In addition, the size of the loop in the replaceable stem-loop structure has been decreased from nine to four nucleotides. This enzyme has a rate constant of 2.0 min^{-1} (50 mM MES, pH 5.5, 300 mM $NaNO_3$ or NaCl, 1 μM uranyl).

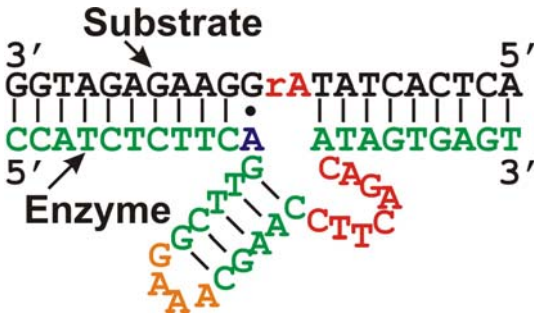

Figure S1. The secondary structure of an optimal uranyl-dependent DNAzyme.