Electronic Supplementary Material (ESI) for Dalton Transactions.

In vitro selection of deoxyribozymes active with Cd^{2+} ions resulting in variants of DNAzyme 8-17

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Supplementary Figures S1 – S5.

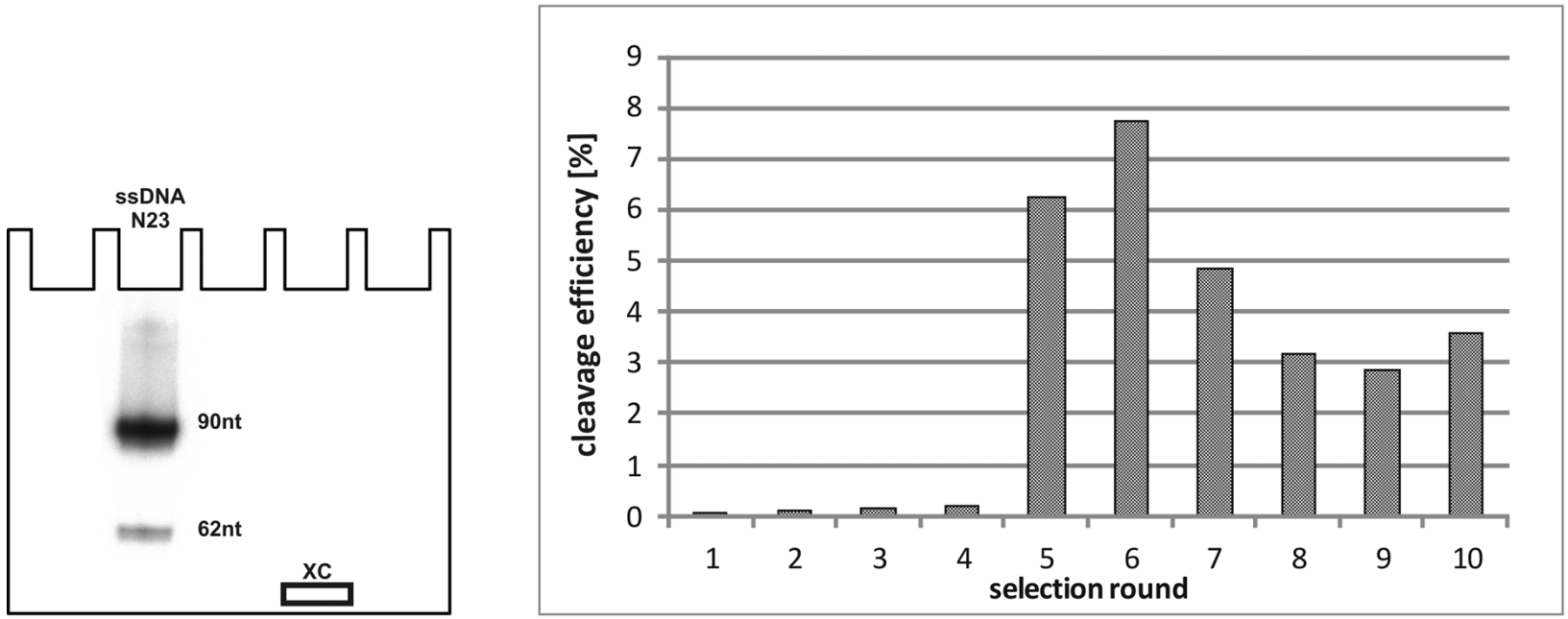

Figure S1. Autoradiogram showing the self-cleaving activity of Cd^{2+}-dependent DNAzyme library after the 5th round of selection (panel on the left) and the cleavage efficiency of the library after each of the ten rounds of selection (panel on the right).

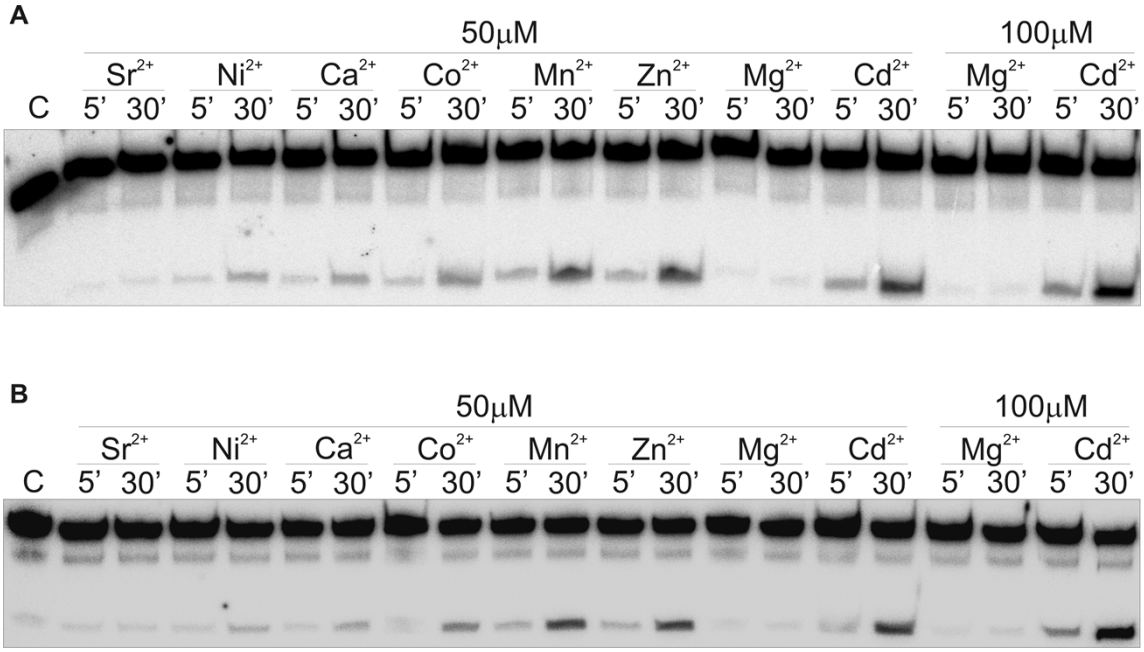

Figure S2. Autoradiograms showing divalent metal-ion specificities of *cis*-acting DNAzymes which belong to the first group of selected variants. (A) DNAzyme 1/VII (B) DNAzyme 22/VII.

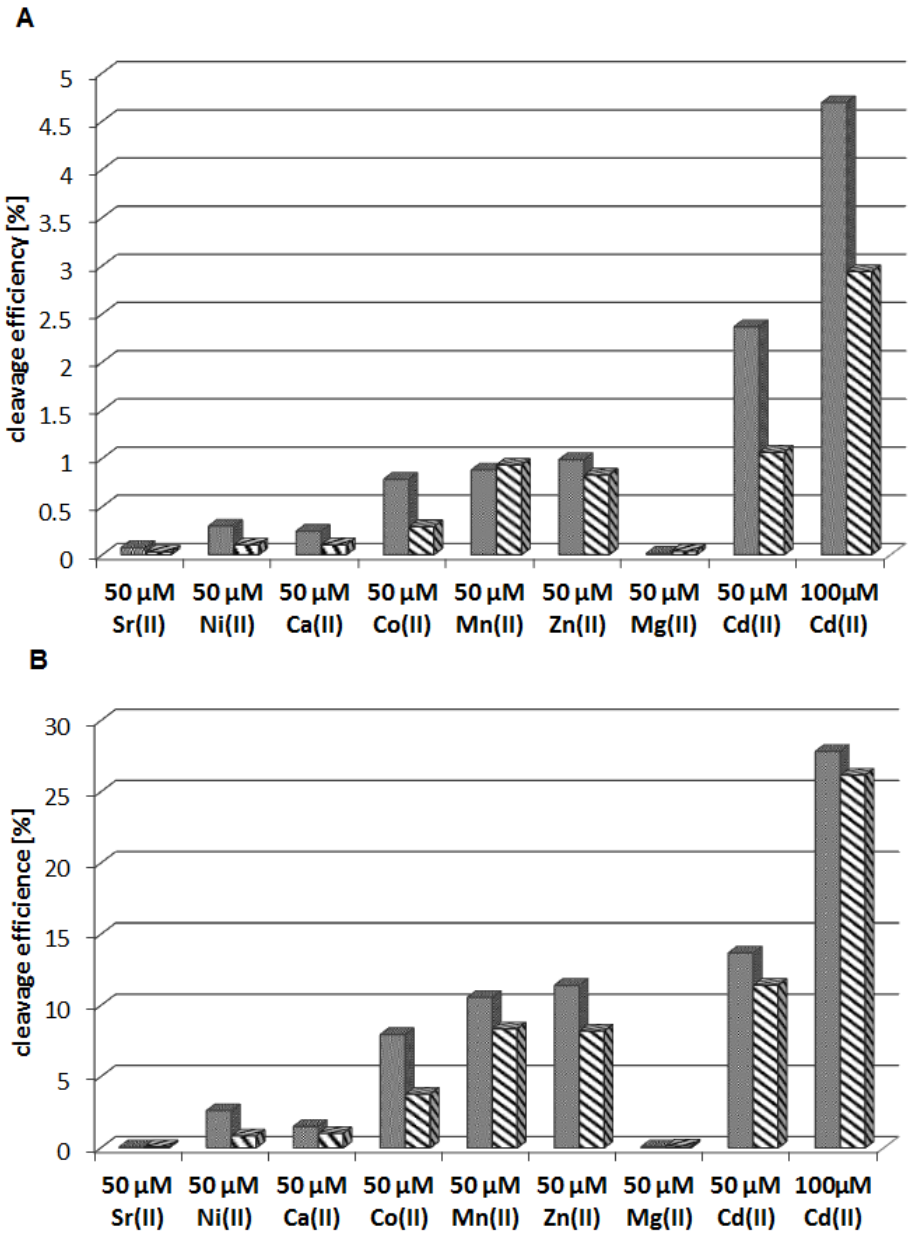

Figure S3. Survey of metal-ion selectivity of the DNAzyme 1/VII (grey bars) and DNAzyme 22/VII (bars with diagonal lines). The assays were carried out with various divalent metal ions at pH 7.0. (A) for 5 min at 25 °C and (B) for 30 min incubation at 25 °C.

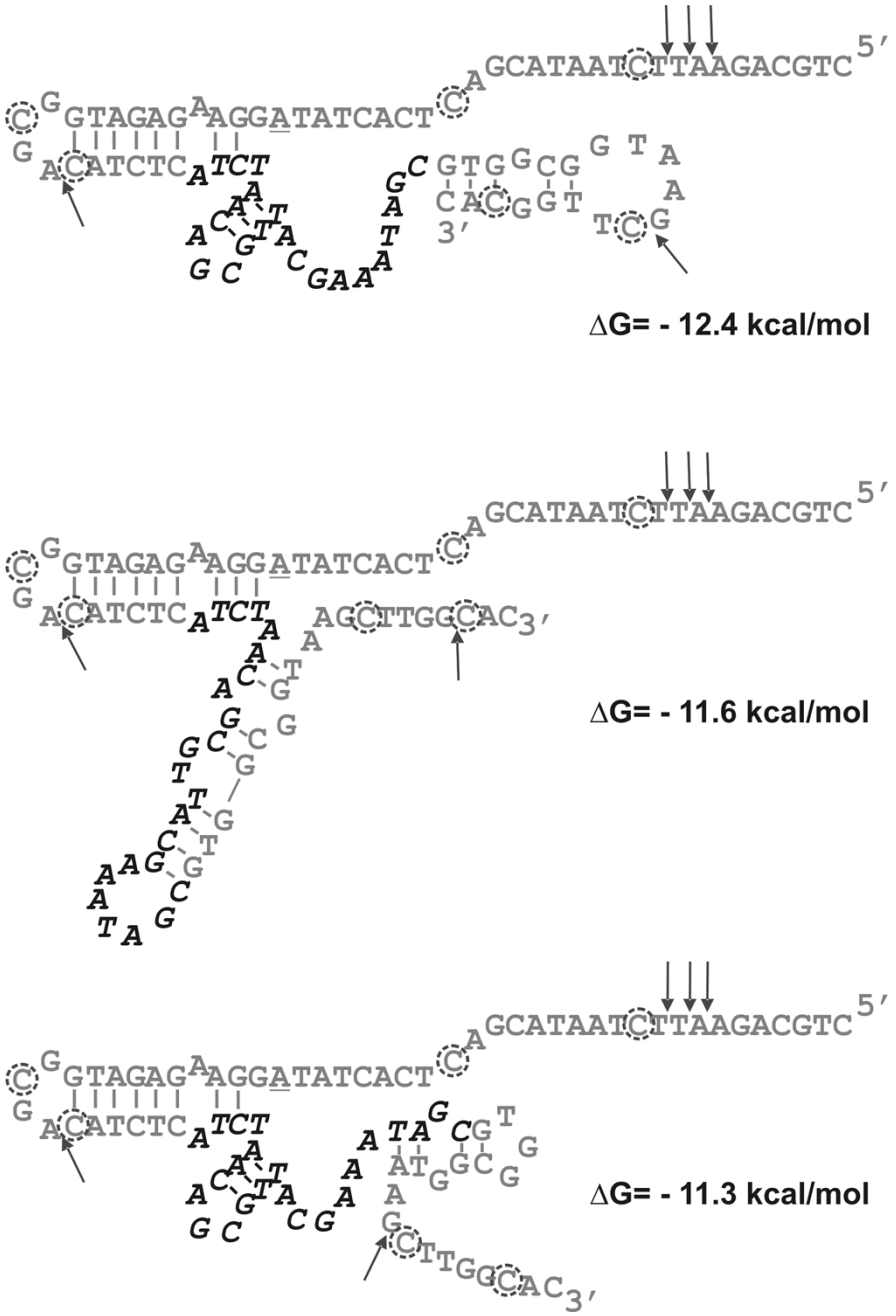

Figure S4. Proposed secondary structure models of DNAzyme 1/VII which were generated by RNAstructure 5.4 program using the constrains from structural enzymatic and chemical probing. The DMS-modified cytosine residues are marked by dark grey circles. Digestions with nuclease S1 are denoted by arrows. Italic black letters mark the catalytic core of DNAzyme 1/VII.

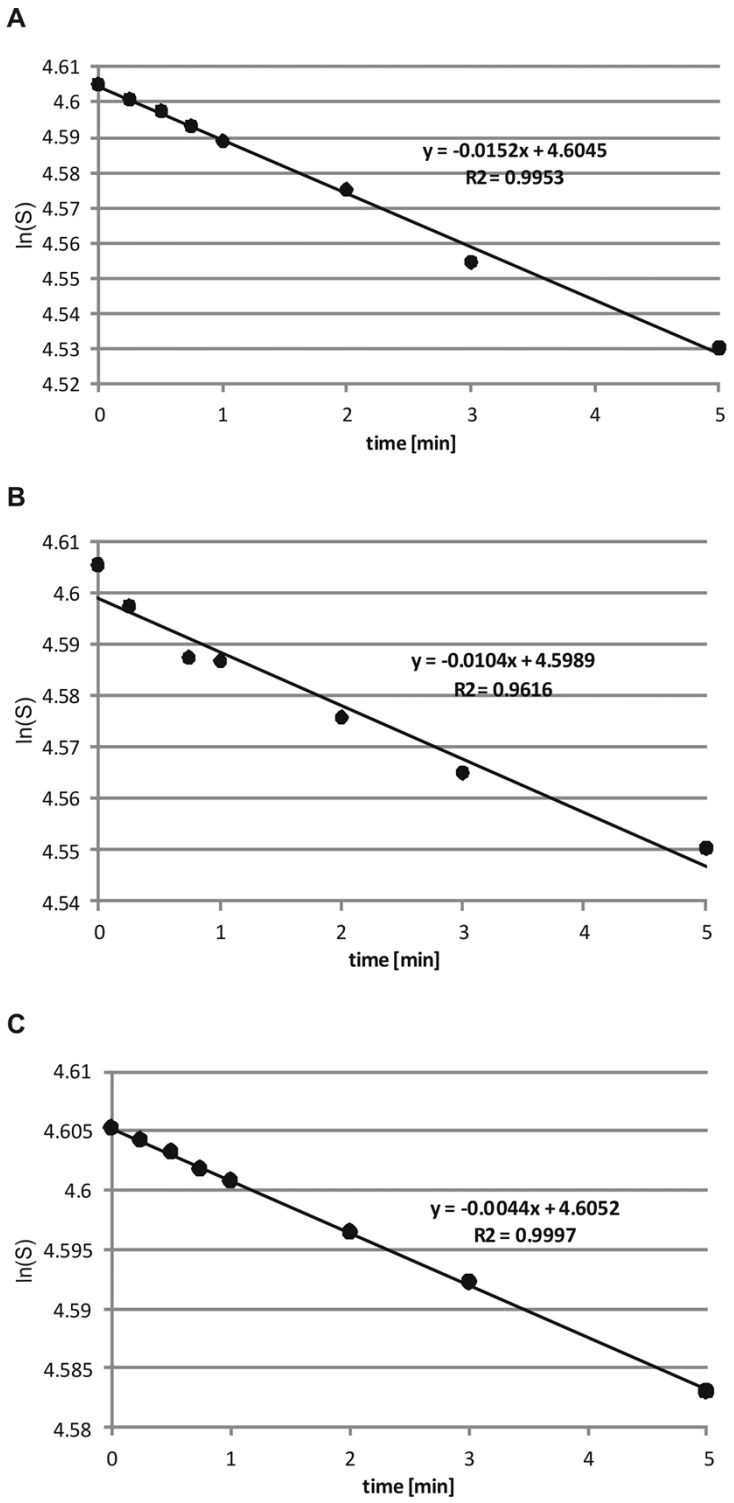

Figure S5. Determination of the cleavage rate constant, k_{obs} of the shortened *cis*-acting DNAzymes Dz1/VIIWS (A), Dz5/XWS (B) and Dz15/XWS (C) in the presence of Cd^{2+} ions. The assays were carried out with 50 μM metal ions at pH 7.0 and 25 °C. The k_{obs} values were determined by plotting the natural logarithm of the fraction of DNA that remained unreacted versus the reaction time.