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Electronic Supporting Information

A pH-driven, Reconfigurable DNA Nanotriangle

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Experimental Details

Chemicals and Reagents:

All DNAs were purchased from IBA GmbH (Göttingen, Germany) and used as received. DNA **F** was double HPLC purified while DNA **M** and **C** was single HPLC purified by the manufacturer. All chemicals and buffers were purchased from Sigma-Aldrich and were used without further purification unless otherwise stated. All buffers were prepared with ultra-pure MilliQ water (resistance > 18 MΩ cm^{-1}), and were filled through a 0.2 μm Whatman syringe filter before use.

No-denaturing polyacrylamide gel electrophoresis.

All DNA strand/complex concentrations used in the gel electrophoresis analysis were 0.5 μM. The corresponding DNA components were combined at equal molar ratio in Tris buffer (20 mM Tris.HCl, 10 mM NaCl, pH 8.0).

The DNA nanotriangle was formed mixing equal molar of the three DNA strands in Tris buffer and heated to 95°C. The resulting solution was slowly cooled down to room temperature following temperature sequences outline below: 95°C (3 min), 63°C (30 min), 47°C (30 min), 37°C (30 min) and 22°C (30 min).

10% Polyacrylamide (19:1 acrylamide/bisacrylamide) was prepared following manufacturer's instructions. The running buffer consisted of 1 × TBE buffer (*tris-borate-EDTA buffer*, 89 mM Tris, 89

mM Boric acid, 2 mM EDTA, pH8). Gels were run on a DYY-10C electrophoresis unit at 22°C (250 V, constant voltage). After the electrophoresis, the gel was stained with Stains-all dye (Sigma) for 3 hrs and scanned.

Fluorescence Spectroscopy.

All fluorescence spectra were recorded on a Hitachi F-4500 FL Spectrophotometer at 22°C in MES buffer (20 mM MES base, 10 mM NaCl). The samples were excited at 500 nm and the emission data were collected either from 520 nm to 700 nm (for spectra), or fixed at 532 nm (for cycling of the system).

The DNA nanotriangle was prepared in a similar way as those used in the gel electrophresis analysis in MES buffer at 0.5 μM strand concentration. After mixing the three corresponding strands in MES buffer, the resulting solution was heated to 95°C followed by slowly cooling to room temperature in following temperature sequences: 95°C (3 min), 63°C (30 min), 47°C (30 min), 37°C (30 min) and 22°C (30 min). The pH of the system was cycled between 8.0 and 5.0 by manually addition of the required amount of 1 M HCl or 1 M NaOH. The fluorescence intensity plotted in Figure 2B was corrected for the dilution factors following each acid or base addition.

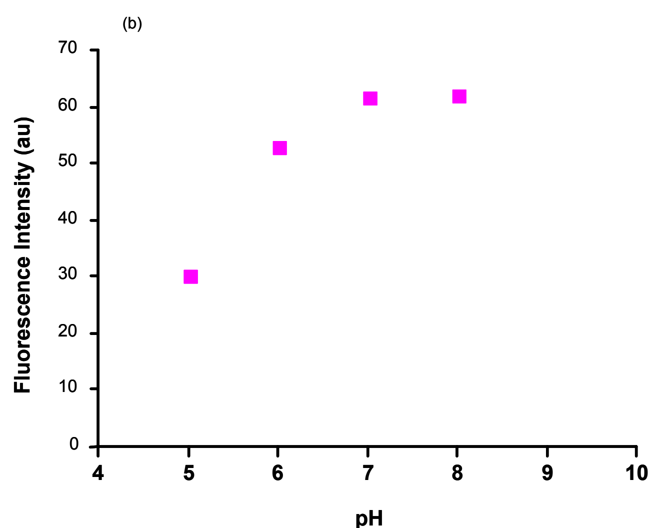

Figure S1. Effect of the pH on the fluorescence intensity of the DNA nanotriangle. The experiment was carried out in MES buffer (20 mM MES base, 10 mM NaCl).