Supporting Information for

I-Motif-Stapled and Spacer-Dependent Multiple DNA Nanostructures

Jiangtao Ren[‡a], Tianshu Wang[‡a], Erkang Wang*[a] and Jin Wang*[a, b]

[a] State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, China
[b] Department of Chemistry and Physics, State University of New York at Stony Brook, New York, 11794, USA

* To whom correspondence should be addressed. Tel: (+86)431-85262003; Email: E-mail: ekwang@ciac.ac.cn; jin.wang.1@stonybrook.edu;

‡These authors contributed equally to this work.

Materials. Ultrapage-purified oligonucleotides (Table S1) and tris(hydroxymethyl)aminomethane (Tris) were obtained from Sangon Biotechnology Co., Ltd (Shanghai, China). 3-Aminopropyltriethoxysilane (APTES) and ethidium bromide (EB) were purchased from Sigma-Aldrich (USA). Acrylamide, N, N'-Methylenebisacrylamide and ammonium persulfate ($(NH_4)_2SO_4$) were obtained from Beijing Dingguochangsheng Biotechnology Co. Ltd (Beijing, China). Magnesium acetate ($Mg(OAc)_2$)) and Tetramethylethylenediamine (TEMED) were purchased from Beijing Chemical Works (Beijing, China) and AMRESCO Inc. (USA), respectively. 50 bp DNA ladder was purchased from New England Biolabs (Beijing), Ltd. The 6×loading buffer (pH=8.0 or 5.0) was prepared containing 25 mM Tris, 10 mM $Mg(OAc)_2$ and 36 % glycerol. TA buffer (pH=8.0 or 5.0) containing 25 mM Tris and 10 mM $Mg(OAc)_2$ was used for sample preparation and electrophoresis. Double distilled water was used throughout.

Table S1: The sequences of oligonucleotides used in this study.

Oligos	***Sequence (5' to 3')***
C1S0	ACTTACACTGCTAGCCGA CCCCCCTCCCCCC
C2S0	TCGGCTAGCAGTGTAAGT CCCCCCTCCCCCC
C1S1	ACTTACACTGCTAGCCGA *T* CCCCCCTCCCCCC
C2S1	TCGGCTAGCAGTGTAAGT *T* CCCCCCTCCCCCC
C1S2	ACTTACACTGCTAGCCGA *TT* CCCCCCTCCCCCC
C2S2	TCGGCTAGCAGTGTAAG *TTT* CCCCCCTCCCCCC
C1S3	ACTTACACTGCTAGCCGA *TTT* CCCCCCTCCCCCC
C2S3	TCGGCTAGCAGTGTAAGT *TTT* CCCCCCTCCCCCC
C1S5	ACTTACACTGCTAGCCGA *TTTTT* CCCCCCTCCCCCC
C2S5	TCGGCTAGCAGTGTAAGT *TTTTT* CCCCCCTCCCCCC
C1S10	ACTTACACTGCTAGCCGA *TTTTT TTTTT* CCCCCCTCCCCCC
C2S10	TCGGCTAGCAGTGTAAGT *TTTTT TTTTT* CCCCCCTCCCCCC

Fig. S1: Typical AFM images and their corresponding cross-sections of multimers produced by mixing of C1S0 and C2S0. Scale bars are 200 nm.

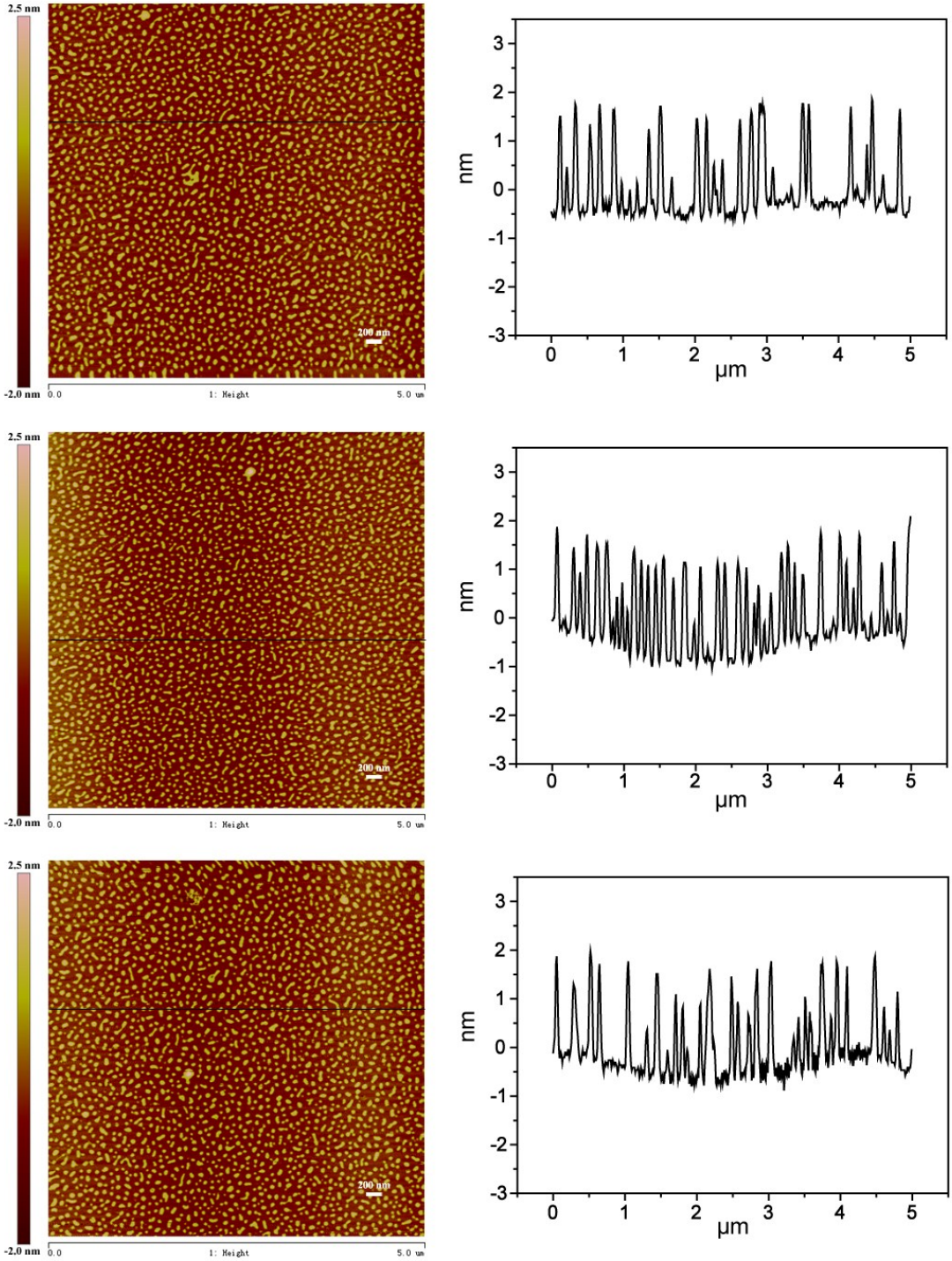

Fig. S2: Frequency distribution of length of multimer products produced from C1S0/C2S0.

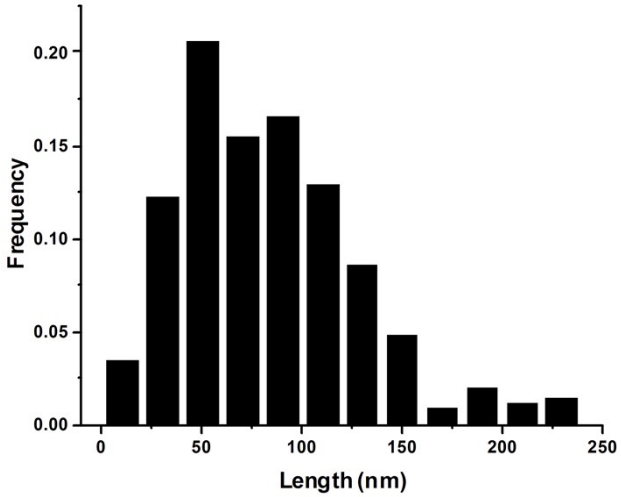

Fig. S3: (A) Native PAGE analysis of assembled products by mixing respectively annealed C1S0 and C2S0 at pH 5.0 (lane 3). Lanes 1 and 2 represent C1S0 and C2S0, respectively. (B) Native PAGE data of C1S10/C2S10 mixture (lane 6), for verifying formation of monomer structures. Lanes 4 and 5 represent C1S10 only and C2S10 only, respectively.

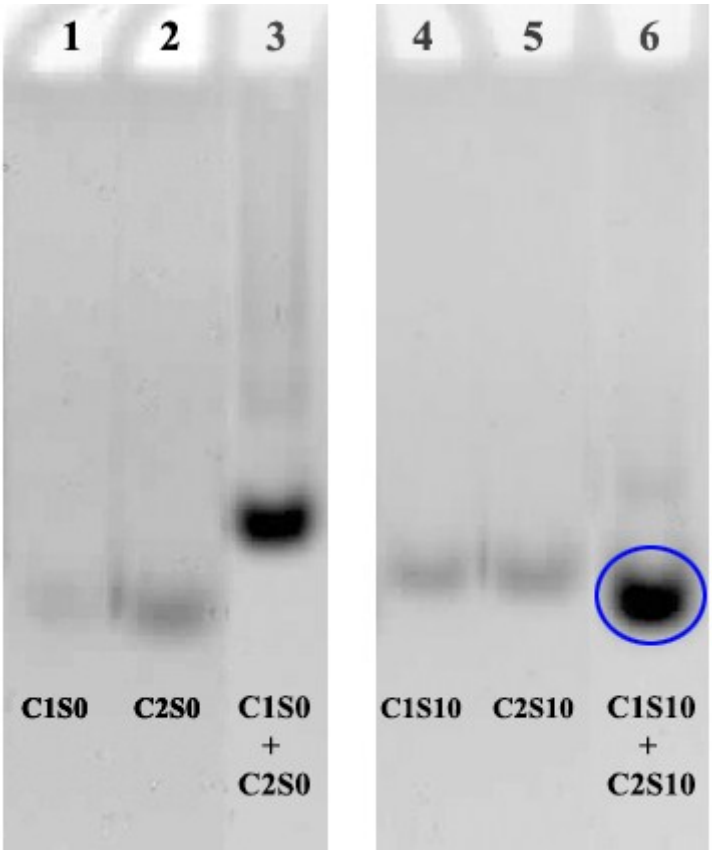

Fig. S4 The AFM images and their corresponding cross-sections of dimers produced from C1S2/C2S2 (A and B), and monomers produced from C1S10/C2S10 (C and D). Scale bars are 200 nm.

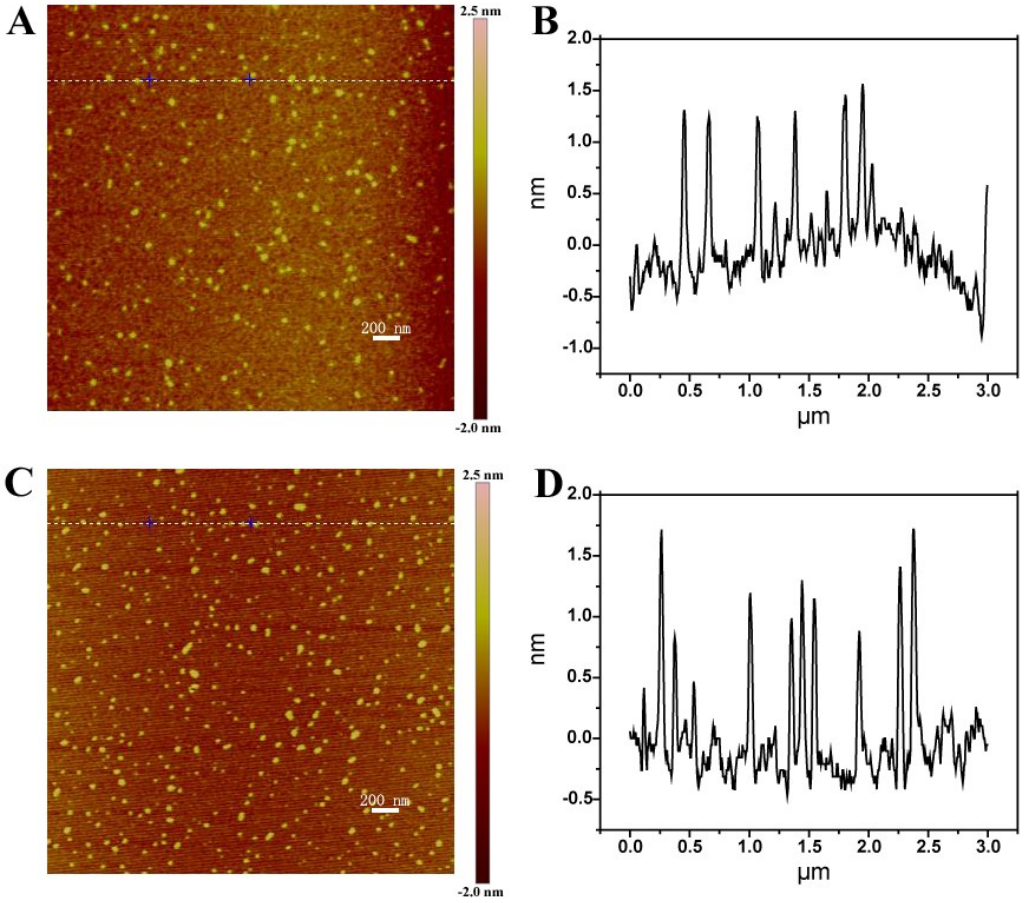

Fig S5: CD spectra of mixtures of C1S2/ C2S2 (A) and C1S5/ C2S5 (B) at pH 5 and pH 8, for demonstrating the formation of i-motif structures.