Electronic Supplementary Material (ESI) for Nanoscale Advances.
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Supplementary Table 1

Rod1 for Fig. 2 (one binding site, see Supplementary table 3 for the sequence of anchoring site) ("F" in the staple name indicates the place of Fluorophore (Cy5), and "5L" indicates the place of BG at 5' end)

#	Name	Sequence ("t" denote the polyT to prevent the DNA origami aggregation)
1	Rod_001_4T2	ttttGGGCGATGGCCGTCTATCAtttt
2	Rod_002	CCAACGTTTTCCTGGATCCCCGGGTACCTTCGCGTCTGAGGCTTGCA
3	Rod_003	AAAGAACGTGGACTCAAATCAAGTTTTTAATAACAGAACAATCAGTTGG
4	Rod_004	CACTATTCCGCTCAGCCTGCAGGTCGACGCCAGCTTTCATCA
5	Rod_005_4T	ttttGTAATCATGGTCATAGCTGCAAAGGGCGCCACC
6	Rod_006	AGGAATCGGTTAAATCATCCTGTATCTAGAGTGTGAAATTGTTAT
7	Rod_007_4T2	ttttCATCAAAAATAAGAGCTCGAATTCtttt
8	Rod_008	CTGGCCTGCTCATTTTTTAACAGAGCATCAAATCA
9	Rod_009_4T2	ttttCAATAAAGCCTCCAATAGGAACGCtttt
10	Rod_010_4T	AAAGCTACAAGGCAAAGAATTTTATAGTAAAAATCAGGTCTTTAtttt
11	Rod_011_4T2	ttttCCCTGACTAAGCAAAATTAAGtttt
12	Rod_012_5L	TCGCATTAAATTTTTGTTGTACCAAAAACATACATCCAATAAATCATAC
13	Rod_013	ATTGCATAAACGAGAATGACCATAAATCCAGAAGCAAAGCGG
14	Rod_014_4T2	ttttCATTCAGTGAATAAGGACGTAACAAAGCTGCTtttt
15	Rod_015	CTTGCCCCGCAATAGAGGCGTGGCTTATCCGGTATTC
16	Rod_016	TGACGAGAAACACCGGATATTTGCGGGAGATATAT
17	Rod_017	GTAGTAAGTTCAGACAAAAAGATTAAGAAGCATTATATGACCAAAT
18	Rod_018	CACCGGACCGCTTTCATTACC
19	Rod_019_4T2	ttttGGGAGTTAAAGGACCAGAGGCATGATACACCGGAATCAtttt
20	Rod_020	TCGTCACTTCATAAACGCAGTTAAGGCGATCATATGCGTTAT
21	Rod_021	CCTCAGCTCTTGACAAGAACCAGAACGAACCAGAACGACTTG
22	Rod_022	TTTAGGACAAATCAACAGTTGGCTGGTACTCAGGACTCAGAATCGGTCG
23	Rod_023	AATCAATATCTGGTATTACCGCGGAATAGCCACCAGCCCACGCATAACC
24	Rod_024_4T2	ttttCCTCAGAACCGAAAAACCCACTACGTGAACAGAAGAACTCAAtttt
25	Rod_025	CCGCCACCCTCAGAGGTGTATCCACCCTTTGAATA
26	Rod_026_4T2	ttttCCGCCTCCCTCATACCGCCACtttt
27	Rod_027_4T	GGTTTAGGAGCCGCCGCGCAGAGGCGtttt
28	Rod_028	GGAAACCCCTTATTTCAAAATAGAACCGCACCGTA
29	Rod_029	GAAGGTTATCTAAAATATCACAAAATCACCCTC
30	Rod_030_4T2	ttttCCAAAAGAACTGCCACCACCGGAAtttt
31	Rod_031	GCACTAACAACTAAGATTGCTCAGAGCCCCATCTT
32	Rod_032_4T2	ttttTAAGAACGCATAACGGAATACtttt
33	Rod_033_4T	ttttAATTATTCATTTCAATTACAGAATAATAAGACTGAGGAAA
34	Rod_034	AAAGAAGATGATGATGATAAAATGTTAGCAAAGTT
35	Rod_035	TAATTACTAGAAAAAGCCTTATAGAATTTAGCGAACCTCC
36	Rod_036	CCCAATACGGGAGGTTTTGAAAGCCGAACAAACGTGCGTTTG
37	Rod_037	CCTAATTTACGAGCTACCGACGGGTTATTAATTAAAGAACCTATCATTT
38	Rod_038	GCAAGCAAATCAGAGTTTAGTTTAAATACTGAGCACCAAGTT
39	Rod_039_4T2	ttttACTATCGGCCTTAAAGGAATTGAGtttt
40	Rod_040	ATATCCATCACTTGCCTGAGTCATCACC
41	Rod_041	ACCACCCTATAGCCCCAGCCACTTCTTTGATTAGTTGGGGTC
42	Rod_042	AAGAGTCGAGGTGCCGTAAAGAGCAATATTGCAAC
43	Rod_043	ACATTAACTTGCATCAATTCCACACAACTTGGAAC
44	Rod_044	TAGGCTGGAGGGTAAGTTGCGAGCCCAAAGTGTTGTTCCAGT
45	Rod_045	ACGCAACCCGAAAACGACCGGAAGCATAAAGAGGGTTG
46	Rod_046	CCGAGATTGTAAAGAGTCACGACGTTGTTCGGATTTACCGAT
47	Rod_047	ATACGAGCGGCCAGTGCCAAGATGTGAGTGACAACGACAGCA
48	Rod_048	CCGACAACGAGTAATTAATATTTTGTTACTGTAAT
49	Rod_049	GGTTTAACCCCCTCCGAAAGACTTCAAAATCAATTCGGGAGAAGCCTTT

50	Rod_050	AGCTTGACTCCGTGCAAATATTTAAATTGTAA
51	Rod_051	CTACAGAACAGACCATTTCAAGCTGAAAAGGTGGC
52	Rod_052	TCGGAACGCTGACCACTTTTGCTACTAATAGTAGTGGAAGCC
53	Rod_053	TATCGCGAATATTCATTGAATTTTCAAC
54	Rod_054	AAATGCTTTAAACAATTGGGCAGAGTAAAGCGAAAAACCATC
55	Rod_055	TTCATCATTGAGATAGCAGATGCCTTAA
56	Rod_056	AGGCGCATTTAATCAAGCCCTCTATTTTCCGTTTTTATTTTCGCCAACG
57	Rod_057	GCAACGGGGCATTTGGCAACATGACCTACTCAACAGTAGGGCAAGCAAG
58	Rod_058	CCCTCATTTTCAGGATATAAGTCAGAGCTAACGGA
59	Rod_059	AACCTCAAATATCAAGGAAAAAGGGTTGGATAGCA
60	Rod_060	TAGGAACTAAGTGCCCACCAGCTTTTACACATTTAACAATTTCATCTTC
61	Rod_061	ATCTAAAGCATCACACCTACAAGGCGGACCATGTA
62	Rod_062	AGAACCACGTCGAGACGCTCAAAATTAACCGTTGTCACTAAA
63	Rod_063	CTTATTAAGAAAATAAATACCCTTACCAGTATAAA
64	Rod_064	AACCCTCGAGCCGTCAATAGAGAAACAACGCCACCTAGCCCC
65	Rod_065	ATCGTAGATCAAGATTAGTTGTTTTAAGTAAAGGTTCGGTCA
66	Rod_066	CTTGCTGTTTGAGGATTTAGAACAGTACAGCCGCCTTTCATC
67	Rod_067	TATAAAACTTACCGATTGTGACGTCATATTTTAATTCGAGCTGGCGCGA
68	Rod_068	ATCAAGAAAACAAATGGTTTGACATACAAAAAGTA
69	Rod_069	GCACCCAGCTACAATAGCTATGAAACGCAGCGCGT
70	Rod_070	GAATCATTACCGCGACAAATTGACCGTGAACAAACTTCGCCTTAGATTA
71	Rod_071	AATTTAAATTAATTATCGGGATAATACA
72	Rod_072	TCGGAACCCTAAAGATCACGCTGGAAAT
73	Rod_073	GCCAGCACAGTACCTTTTGACAAAAGAGTCTGTCCGGAGCCC
74	Rod_074	GAATAGCCCGATTTAGAGCTTACCGAGTGCTCAAT
75	Rod_075	CGCAAGGGTATAAGGGAACAATTTTCCCCCTGGGGTGCCTAAATCAAAA
76	Rod_076	ACTTTGATTTCATGGCTTGCTCCAGTACAAAATCCCTTATAA
77	Rod_077	CCAGTAATGGTTAAGTTGCTAACTCACATTAAATCGGC
78	Rod_078	GTTCCGAATTGCGTGTGCTGCAAGGCGAGATAGGT
79	Rod_079	TGAGTGAGGGTAACGCCAGGGACGGCGGTGAATTT
80	Rod_080	TTCGAGGATTGACCAAAACAGGAAGATTATAAAAA
81	Rod_081	GTATCGGCACGTTGTTGATAATCAGAAAAGCC
82	Rod_082	TTTTAAGTAGCGTCGAACCAGACCGGAATTTAGCTAACCCTCATATATT
83	Rod_083	TTAAATGTGGTCAATAACCTGGCAAACTATGTTTAGACTGGAAACTGGC
84	Rod_084	AAGACTTAAGAGGATTTTTAGATATTTTCATTTGGTCAAAGC
85	Rod_085	CAATACTGCGGAATATTACCTACGGTGTGGCTTTGCTTAAACCCGTAAC
86	Rod_086	CAGATGATATGCGAATAGCAATTTTATC
87	Rod_087	CTGACCATCATTATATAAGAGCGCTAAC
88	Rod_088	ACTCGTATTAAATCTTGCGTAATTGGCCCGACAGATTCCATTAACCGAA
89	Rod_089	AGGACTAAGACTGTAAAGACAATTTTAGAGAATCGCCATATT
90	Rod_090	TTTATCAAGGAAGTATCAAGTTATTTTGCGAGAAAGCCAACATGTAATT
91	Rod_091	ACTGAGTTTTTGCTTTGACAGATGAATA
92	Rod_092	AGAGCCAGCAGCAACGTCTGAAGCGGGGTTCGTCA
93	Rod_093	AAACTACGAAGGATTCAGACGGATTTTCAGTACATAAATCAAAAGAACG
94	Rod_094	GCCTGCAACAGTGCATTGGCACTCAAGAAACGCCT
95	Rod_095	AGGCAGGTAGGATTAATGGATTAATCAGTGAGGCCGACGGGG
96	Rod_096	ATGAAAAGACTTTACAAACAAACGTCAGGAGGTTGTAGCGTC
97	Rod_097	AGTACCGCTGAATCTTACCAACAAGAAAATAAGTTTTGCCTT
98	Rod_098	TCACAATCCCAATAACCAGTCTAGTAAACCAACAGGTCAGGATCGCAAA
99	Rod_099	ATTACCTTTTTTAACAAATATCCACGGACAATGAA
100	Rod_100	CACTCATCGAGAACTTAATTGTTAATTTCATTTGATACAGTAAGTATTA
101	Rod_101	CGGGTATTAAACCATAACAACACTTTTTTGGAAACAGGTTTATTCGACA
102	Rod_102	CCAAGAAGAGCGTCTTTCCAGAGTTAAGCAATAGATCAGTAG
103	Rod_103	AAAGCCGGCGAACGGTTTTTATATTTACCACGCTG

104	Rod_104	TTGATATGAGACTCGATTCACGAATCCTGAGAAGTTGGCGAG
105	Rod_105	GATGGTGAAAGGAAGGGAAGATACGCCACAGTCAC
106	Rod_106	CAATGCCACCCCGGGTGTAGAGGGGGATTGCGCTCACTGCCCCCTGTTT
107	Rod_107	CAGCAGGCGAAAATGCTTTCCGCCAGCTGGCGAAATGGGCGC
108	Rod_108	GTAAAGAACTAGCACCGTGCACTATTACAGTCGGGAAACCTGTTTGCCC
109	Rod_109	AAAACGATTCACGTAAAGTTTGCGGTCCACGCTGG
110	Rod_110	AAAGGCCTCGATGAGGGACGACGATCGGAGCTGCATTAATGAGCAGCAA
111	Rod_111	GAGAGTTATCGGCCACTGTTGGGAAGGGCGACAGTATCGGCC
112	Rod_112	TCGTGCCTGCGGGCCTCTTCGTCTGCCA
113	Rod_113	CTCCAAAATCGTAATGTCAATCATATGTTGAGTAA
114	Rod_114	TGAAAATGTTTGAGACGGTAATCGTAAATTCAAAA
115	Rod_115	TATGGTTACCCACAAAAAATCAAGTTTTGTACCTTTAATTGCAGTTTGA
116	Rod_116	ACAAAAGAGCGCTAGAACTAAAGCGAGAGATAAGAGGTCATTATTCTGC
117	Rod_117	CTGGAGCAAACAAGAGAAGGAGACAGTCAAATACAGTTGATTCCCA
118	Rod_118	CGTAATGGCAGACGTGTGTAGCCATTAGATACATTTTAGAGA
119	Rod_119	CCAACCTGTTACTTGGGTGAGGAACGAGTAGATTTTCCTTTT
120	Rod_120	TTTGCGGATGGCTTAGAGCTTCCATATACACCATCAATATGA
121	Rod_121	GCCAGAGGGGGTAAAGGACGTATAAGGGAAACGGGTTTAATTGTAGCAT
122	Rod_122	GGCTTTTGCAAAAGTACGTTAACGAGGCCCACTACAAAAAGGTCATAGT
123	Rod_123	ATAAAAACCAAAATCGGAACAGCTCCAT
124	Rod_124	GATTGAGAACAAAGTACAGGTGACGACG
125	Rod_125	GTCAATCTGGGAAGAGAATTGAGCCTAA
126	Rod_126	AGCCGGAATAAAACATATCAGAATAAAC
127	Rod_127	AAAAGAAGAAATCCGCGACCTACATTATTCAGAGGTCCCAAT
128	Rod_128	AGGAGCCTAAAATAACCGTAAAAATTCACCAATCGAGGCATTTTCGAGC
129	Rod_129	CTCCAAAGAAGGCAAATGAAAGCCAAAGTATGTAAAAGAGAATATAAAG
130	Rod_130	TAATTTTAAGAGGCAGCAAGGTTCAACCTTAGGTTAAAAGGTAAAGTAA
131	Rod_131	AAAAATACCGAACGACCCTTCTGCCCCCTTTCCAGCGAATAA
132	Rod_132	TCCACAGAGAGGCTTCACAAACAGAAATGAGTGAATAACCTTTGCAAAT
133	Rod_133	GAGGCGGTCAGTATACGACCAAGTATTAACAGCCC
134	Rod_134	TAGCGTATTCTGAATTAAAGCCAAAATTTAAATCGTCGCTATATAACTA
135	Rod_135	AGCAGAAGATAAAAATTCTGGCCTATTAACGATCT
136	Rod_136	TGTCGTCTGCCTATCAGTCTCAAGGGTTTTTTCCCTTAGAATCTCCGGC
137	Rod_137	ATCCTCAACATGAAGTAATAATTAGACAGGAACGGAAGCGAA
138	Rod_138	GAAAGCGTTCGGAACCAACAGAGGAGGCCGATTAAGGGCGCT
139	Rod_139	TAACACCCGAACGTTATTAATCGTAAAACAAATAATAGCAGC
140	Rod_140	CGGCTGTTTTGCCAGTTACAAAGAGATATACCAGCCCATCGA
141	Rod_141	CAGAGGTGTTTGAGTAACATTACCATATCAGAATGCGTCACC
142	Rod_142	ATGTAGAAGCCATATTATTTAGTAATTGGGCGACACCGGAAA
143	Rod_143	AACCACCTGCGGAACAAAGAAATAATGGTGAATTTTACCATT
144	Rod_144	CTTTCCTTATCATTTAGGCAGCAAGACATATATGTAAAGAAACTTTGCC
145	Rod_145	AACCAATCAATAATCAGTAATATGCTGAGCTTCTGATTTGCATTTAAAA
146	Rod_146	ATCCCATCCAAATAAGAAACGCACCCTGGGAGGGAGCACCAT
147	Rod_147	AGGAGCGGGCGCTAAGGGATTAAGGGAC
148	Rod_148	GGCAAGTGTAGCGGGCTAAACAGATAGA
149	Rod_149	ACCGTTCCAGTTAATGACCTGGAATCAGAGCGGGATCACGCT
150	Rod_150	CCGCCTGGCCCTGAGCGCGTAACCACCACTCGTTAAAAGCGT
151	Rod_151	CCCTTCAGGCGGTTATTCGCCATTCAGGGATCGCA
152	Rod_152	TTTGTATGACCCCCGAATAGAGTATGGGCTGATTG
153	Rod_153	CCGTTCTGCTATCACAGCTTTAAGCGCCTGCGTATTGGGCGCGCAACAG
154	Rod_154	GAGACGGCAGGGTGCCGGAAACCAGGCACCGGCAC
155	Rod_155_4T2	ttttTTCACCAGTGGGCGCGTAtttt
156	Rod_156	TCAGGAACTGCGCAAACGCGCGGGGAGA
157	Rod_157	AAGGAACCTCCAGCGGTCATTGCCTGAGAGT

158	Rod_158_4T	ttttAACAGTTTCAGCCGCTTCTAGAGATCTACAAAGAGCTGAT
159	Rod_159	TATTGACGAGAATTGTTGAGATATCATAGAATATAATGCTGTACGGTGT
160	Rod_160_4T	ttttAAACAAAGTACAAAATTAATATGCAACTAAAGT
161	Rod_161	CATCTTTCATCGCCTATTCAACTGGAAGTTTCATTAATTGCT
162	Rod_162	AGCTCAAAGTAAGAGCAACACTTTAGGA
163	Rod_163	ATAGTGAATTTAAAAGGTGACAGGGAATTCAACGAGGCATCATGTTTTA
164	Rod_164	ACCCTCGTTTACCAAGAAAGATTGTGTCTACACTAGGAATTGACGTTAG
165	Rod_165_4T2	ttttCGCCAAAAGGAATTACTAATGCAGATACATAAtttt
166	Rod_166	TGATAAATTCATCAAACTGAAATTTTTTACAAGAA
167	Rod_167	ACGGAGAATACCACAGCGCATATGAAAA
168	Rod_168_4T2	ttttATGGCAATTCATATACAGGCCATTTGATACCAAGCGCGtttt
169	Rod_169	AACTAAAAAACACTACCAGTAAGGTAAAACTACCTCAGACGACGACAAT
170	Rod_170	GGAGTGAAGCGATTGGAATTAATTCATTTCAAAATATGTTCAGCTAATGCAGAA
171	Rod_171	TAAATGAGTATAAACAGTAAGGATTATAAACATAGCGATAGCCTGAGAG
172	Rod_172	TAGCCCTAAAACATAAGAATAAGTGCCCATTTTCT
173	Rod_173	ATTTTGCGTGCCTTTTTGATGCAATATAAAGACGCTGAGAAGAGTCA
174	Rod_174_4T2	ttttTTAGTCTTTAATGCGCTATTTTTGGGGTCATAAACAACTTTCtttt
175	Rod_175_4T	ttttATAAGTTTTAACGAATGGCATGGTTGCTTTGACCGCTACA
176	Rod_176	CATGGCTGAGTAACCGTGGCATATAACGTGCTTTCCACCCGCCGCGCTT
177	Rod_177_4T2	ttttCACCGACTTGAGAGTGTACTGGTAtttt
178	Rod_178	CGCCATTGAAGGAGCGGAATTTTGTTTGCGTCATACAAAATC
179	Rod_179	GTCCTGAGTTTAACGTCAAAATAGACGGGGAAATTGAGCCAG
180	Rod_180_4T2	ttttAATAACATAAAAAATTATCACCGTtttt
181	Rod_181_4T2	ttttCGCGCCTGTTTATAGCAGCCTTTACAGAGAGtttt
182	Rod_182	AAATAATTTCTGTCTTTTAACCCTTGAACTTCTGAACCACCA
183	Rod_183	TCAACAATAGATAAAAACAACCATAGGTTTAGATTATCCTGAATCATCA
184	Rod_184	AATGCGCGAGCACGCAGACAAGAACTGATATTCCTGATTATCAGATG

Supplementary Table 2

Rod2 for Fig. 3 & 4 (8 binding sites, see Supplementary table 3 for the sequences of anchoring sites)
("F" in the staple name indicates the place of Fluorophore (Cy5), and "5L" and "3L" indicate
the place of BG-ligand at 5'- and 3'-end, respectively)

#	Name	Sequence ("t" denote the polyT to prevent the DNA origami aggregation)
1	Rod2_001_3T	CTGTCGTGCCAGCTGCGGTCGCTGCGCCCACGTCGCCTGAGCAGCAAAtttt
2	Rod2_002	TGCTGAACGCCACGCTGATTCACAATGACATTGGGCGCGGGAAAC
3	Rod2_003	AAACCAAATGTCGAAAGAAACAAAAGGGAGTTAAAGGCCGTTCCAGTC
4	Rod2_004_4T	ACGTCAATTTGCGTAACAACCATAGGCTTGCGTACAACGGAGATTTGTAtttt
5	Rod3_005_4T	ttttAAAAGAAGAAAGCGAACCAGACCGGATAAATTATATGATACTGTAGCCATA AGAAA
6	Rod2_006	CGAGCTTCTTTTGCCAGAGGGGGCCAAGCGCTCCGCGACGCGCCGAC
7	Rod3_007_4T	ttttTCATTTCAATTATCTGAGAGCAGGTCAGACCATCAAATGCCGACCAATAG GAACGCCA
8	Rod2_008_4T	ttttCTCCGGCTTAGGTTGCAAGTACCTTTCATCGAATCCAAAGCTTTCA
9	Rod2_009	TCAACATTTTTTTTAGAGAGGGTAGCTATTTTTTTAATTGAGTACCTGACGATA A
10	Rod2_010	TCCTTTTGAAAGGGTGTCTACAAATTAAATTTTTGTTAAATCAGCTCAAAATGT GA
11	Rod2_011	CGGAGACAATTACCGCTATCAAAAAACTATATGTTACAAAATCGCGC
12	Rod2_012_4T	ttttAACTCCAAACTACCTTGTTTTTATGCACTCATAAAATAGCAGCCTTTA
13	Rod2_013	CAGAGAGTTTATCCCTAGGAATCGTCAAATCGATTAGA
14	Rod3_014_4T	CTACGTGAACCATCACCTACATTCATTGGCAGAGAGCCATAAATTGATAGCG AGAGGCTtttt
15	Rod3_015_4T2	ttttAGAGGCGGAGGGCGAAATTATTTATTGACGCTATCTAAAGCATCACCTAG AGGCGAattattttt
16	Rod2_016	CAGGGTGGTTTTTCTCACTATTACGACCAGTCAGGAAAA
17	Rod2_017	AAAGAAGAGCAACAGTCTCAAATAACGCTCATGGAAATACCCAAATCGGACT CCA
18	Rod2_018	CAGTCACAAAGAACGTAAGTTTTTTGGGGTCGAGGTGCCGCATTGCAA
19	Rod2_019	AGAACGGGTATTAAACGGTTATATTCATAGGCCTGAGCA
20	Rod2_020	TTGAGAGAAGAAAGGCGCGAGTAATAAACAGCCATATTAAATAACAT
21	Rod2_021	GCGCTCACTGCCCGCTCTTTTGCCGATAGTTCTGCTCCAACCGCCT
22	Rod2_022	ATATCTGGGGCGGTCAGGACATTCTTAAACAGGTGAGACGATTGCGTT
23	Rod2_023	GGGATCGTACCCCCAGCGATTATATAATAGTAACCAGACTTAATTGC
24	Rod2_024	ATCATAACAGCCGGAACATCTTTGCACCCTCA
25	Rod2_025_5L	GCAGCGAATCACATTAGGCAACAGCTGATTGCTTGAGTGAGAGATAG
26	Rod2_026	AATCAGATAAGATTCAATAAGAGGCCCGAAAGAGACTGGATAGCGTCCAAAA CACT
27	Rod2_027	AATAAAAGGTATTAACTGTTACTTCCTCGTTTAAATGTTTACTTCAAATATCGC G
28	Rod2_028	ACAACCCGTCGGATTCAATTCGCAGGCTATCA
29	Rod2_029_5L	GGTCATTGAGAGGAAGTCATTTTTGCGGATGG
30	Rod2_030	GAGTGTAAACGTTAATATTTTGTTAA
31	Rod2_031	TCCGTGGGTGTAGGTAATAGAAGGATTAAGACGCAAGACATAACGGATTCG CCTGA
32	Rod2_032	GCAACACTAAAATTAAAGAGGTGATCAGTTGGCAATATTACCGCCAGC
33	Rod2_033	CGAGGCGCTGAATTTCTGGCCAACTTGTTCCATAAATCGGAACCCTAA
34	Rod2_034	TAAAGCACGTTTGGAACAAGAGTCTTTCACCACTTGATAC
35	Rod2_035	TGATGAAAAATACCAAGTAAATGCTGATGCAATTCCTTATAGCAAGCAGTTAC AAA
36	Rod2_036	CAATAATCGGCTGTCTATCCAATCGCTGAGAAAAGAAAAC

37	Rod2_037	AGTGAATTGCCCAATCATTCCAAAAAACAGGGAAGCGCATTAGACGATTTGCCA
38	Rod2_038	TCAAACCCTCAATCATTGCTTTGCAAACATCGAGTCAAT
39	Rod2_039	AACAAACGTCTTTCCAGAGCCTAGGAGAATT
40	Rod2_040_3L	AATGAGTGAGCTAACAGACAGCATCGGA
41	Rod2_041	AGGAATTGCGAACCACCTGACCTGGGTTTATCGCCTGGCCGGGTGCCT
42	Rod2_042	AGGGAACCCGAAAGAGAGGGTAGCAACGGCTAAAGCCTG
43	Rod2_043	ACGGCAAAAGAATACACTAATACTGCTAGTAAGA
44	Rod2_044	AGAACGCGTTAAATGCCTTAATTGAAGCGGATTCATAAATATTCATTGACCTAAAA
45	Rod2_045_3L	GGAATCGTGCATCAAAAAGATTACCTGAGAGTCTG
46	Rod2_046	GCGGATTGACCGTAATATTTAAATCAAACAAGAGAATCGAAGAAGCA
47	Rod2_047	AAATTTTTAATCGTAAAACAGGAAGATTGTATAAGCAAATGGGATAG
48	Rod2_048	ATAGCGACTTAGAGAATGCCTGAGTAATG
49	Rod2_049	CATATATTAGGCGTTTAGAATCCAATATATTGTAACAGTACCTTTTA
50	Rod2_050	CTGAATATACGCCAAATTACCTTTACCGAAAGGAAGGAAACTATCGGCCTTGC
51	Rod2_051	AGGGAGCTGGTAATAAACCCTTCAGCAGAACAATCATAACGAGGCA
52	Rod2_052	CATCCTAATTTACGACTTTTTCATTGAAAACTCATTTGAAAGGAATT
53	Rod2_053	GAACTGACATTGTATCAAAGCGTATCAAAAGATAGAGCTTGACGGGGA
54	Rod2_054	TTTCGAGGAGACGGTGATAAAACTTACATTAGAAACAA
55	Rod2_055	CCCCGATTATAGCCCGAGATAGGGCCTTCACCAGCTTGC
56	Rod2_056	CTGAGAGAGTTGCAGCTTATAAAAGAATACGAAGAACTC
57	Rod2_057	TCCAGAACAAATCAACAGTTGAACATCGGGTAACAATT
58	Rod2_058	TAGCTTAGCTTATCCGAAACCAATAACTGAACACCCTGAACAAAGTCCCAACGCT
59	Rod2_059	AAGAACGCGAGAAAAGCATGTAGGTATTCTAAACGAGCG
60	Rod2_060	AGAACCCTGTCACGTTTTTATCCTGAATCTTAAGAGGGTA
61	Rod2_061	CGGAAGCATAAAGTGTACAGAGGCAGCCTTTACAACTTTGATTAAAAA
62	Rod2_062	TAGGAGCAGCCCTAAAACAATATTAAAAGGCTCCACGCTGATACGAGC
63	Rod2_063	ACATTCAACAGATGAACGTAATGCCTAAAGACTTTTTCATCACACAAC
64	Rod2_064	TTTGAGGACACTACGAAGGCACCAAATCCCCCGATACATAAATGCTGT
65	Rod2_065	CTTGCGGGAAGGATAAATGTTTTAGTCTTTACTTTAAACAGTTCAGAATAAAATA
66	Rod2_066	GGTGTAGATGGGCGCAGCCCCAAAAACTAGCATGTCAATAAAATCAG
67	Rod2_067	CTAATGCATCAAATGCCCTGACTATTATAGTCTGAACGGT
68	Rod2_068	AACGGCGGTTGATAATCAGAAAATCGTAACCTCAACGC
69	Rod2_069	TTATCTAAAATATCTTGTCAGATGGAAACAGTTTAATTAAAGCTCAAC
70	Rod2_070	AATATGCAGGAATACCCAATATAAACTGATACTAACAACAATAACATCACTTGC
71	Rod2_071	AAGCCGGCCTGAGTAGTGGCACAGACATCGCCAAAGAGGA
72	Rod2_072	CGGTGTACTCCAAAATTTGAATGTGGTTCCCGAGAAAGGAAGGGA
73	Rod2_073	GAACGTGGGAAATCGGCAAAATCCCAAGCGGTCCAAAAGG
74	Rod2_074	GTTTGCCCCAGCAGGCGAAAACACTTTCACGTTTCGTGTGTTCAGCA
75	Rod2_075	TTTTAATGAATATACATTAGTTAATTTCATCTAAGAAAAACCTCCCGAGCTACAAT
76	Rod2_076	TAGATAAGTCCTGAACTCTGACCTCGTCGCTAACATAAAT
77	Rod2_077	TTTTCCCTTTAGCGAATAATATCCATTGAGCGCTAATATCAGAGAGATTGCACCCA
78	Rod2_078	AGGTTTTGCTGTAAATAAATTTAGATTTTCAGGTTTAAC
79	Rod2_079	CCTTTATTGTGCATCTGATTAGTTGCTATTTAACCCACA
80	Rod2_080	ATCCGCTCACAATTCGAGGAAGTTGAAAATCAGACCAGAATGCGCG
81	Rod2_081	AGAAAGCGTACTTCTTGTCTTGATGATACAGGAATAATTTCCTCAGAAAATTGTT

82	Rod2_082	AATCGTTACCTGTGTGACCGCCACCCTCAGAGGTTTAGTAGGTAATAA
83	Rod2_083	CATCAGTTATGGTCTCGTCGCTGGCAGCCTCCTCATAAAC
84	Rod2_084	AAAGATTGCTGGCTGATCCCTTACACTGCATTAAACGGGAACGAGA
85	Rod2_085	TACGGTGTGGGAGAAGCCCATAACCTCACCGGAAACAATCCAAACGCG
86	Rod2_086	ACTTTTGCCTGGAAGTGTCCGTTTTTTCACCATAAATCACATATGTA
87	Rod2_087	CCAATAATATTCATATGGTTTCAAGCCAGTTTGAGGGGAGCCACGGG
88	Rod2_088	GTTGATTCCCAAAAACGTACAGCGTGCCAAGCTTTCAGAGGTGGAGCC
89	Rod2_089	CGACGACACCTGTAATGACAAAAGGCATTTTCATAAATAAGCACGTAAAACA GAAA
90	Rod2_090	TTCATTCCACAGGTAGCCATCTTTGTAAGCGTATAATACATTAACCGTTGTAG CAA
91	Rod2_091	GAGATTTAACTAAAGCTTGCTTAAGCCTTAATCAACAAAGAATTGAGTTAAGC
92	Rod2_092	TCAATAGCATACATGGCTTTTTGCGCATAG
93	Rod2_093	ACCTTCATTTGCGAATAGTGTACTCCGCCACCGGGCGCTAGGGCGCTG
94	Rod2_094	AAAGGAGCCTCAGAACCGCTCCTGTTTGATGGGCTATTA
95	Rod2_095	TGTGAGTGTTGCGTAATGGTTTGAAATACCGGCCTGTTTAATACCAGCGCCA AA
96	Rod2_096	TGATTAGTTAATAGATTAGAGCCGTAAAGAAAAATTTATTAGCGTTTG
97	Rod2_097	GCTAATGCAGAACGCACCGTGTGGGTCATAGCCCCCAAC
98	Rod2_098	ATTATGACGTATCGGCTCACAATCAATAGAAAAAGAGCAA
99	Rod2_099	ATGGTCATAGCTGTTTACGGCATCTAAAGGAACAAGAGTACCGTTCCA
100	Rod2_100	TATTAGACGCAGTCTCGGGGTCAGAATAGAAACTCATTTTTCGTAATC
101	Rod2_101	CGGAACCACGAACTAAAGAACCATGGGTAGGTTACCTGCAGCCAGCTCGAA T
102	Rod2_102	AGATGCCGAAGGTTTCTTTGCTCGGGCCAGAGACATTATT
103	Rod2_103	AAACGATGCATAACGGAACGTGCGGCTGGTAGGATATTCGAGTGAGTGCCT TG
104	Rod2_104	ACGGAACACACATCCTCTGATTGCCGTTCCGGGGCGAAAC
105	Rod2_105	CCATGTTTACCAGTCGTAAAGTTGCGAACGTTAATAAA
106	Rod2_106	TTATTTTGCTCAGGAAGATCGCACACGGCCAG
107	Rod2_107	TGTGAGAGCCCAGTCACGACGTTGTAAAACG
108	Rod2_108	TCCAGCCAGCTAAATCGGGAAGGTTTTAGCGGGAATCATAGGGTTAGAACC TAC
109	Rod2_109	ATATAACATTTCATCGGGCGACATCATGTTCAGAAACAATGAAATAGC
110	Rod2_110	AATAGCTAAATAAGTTTGAGGGAGGTTGTACCAATTCT
111	Rod2_111	GCAAGTGTCTGTCCATGTTTTAACTGAATTTAATCTTGAC
112	Rod2_112	AGCGGTCACACCGTACTCAGGAGCCACCACCGGAACAAC
113	Rod2_113	CAGGGATAGCAAGCCCCCCGGAATAGTAACAGGTGAGGCC
114	Rod2_114	AGGTGTATCGCTGCGCGTAACCACCACACCCTATAATCA
115	Rod2_115	TCATAATCAATTATTTGGCGTTAAATAAGAATATAAACAATCAACCGA
116	Rod2_116	AGAGCCACTGGAAAGCTTTACAAAACCGAGTAAAAGAGT
117	Rod2_117	CACGCAAATTTGAGGATTTAGAAGCATATCAAAAAATCACTAGCGCGT
118	Rod2_118	TGTCCAGACGACGACAAAACACCTCAGACTG
119	Rod2_119	AGCATAAAGCTTTCCGCGCAAAGACACCACGGTCTTACC
120	Rod2_120	ATCCCCGGGTACCGAGCGGTGCCG
121	Rod2_121	TATTAAATATAAATCCTAAACAGTAAACAACTACCCATGTAGTTGAGG
122	Rod2_122	GTGCCCCGTCACTGTTGCCCTGCCGGACTTGAATCTACG
123	Rod2_123_3L	GACGTTGGTAACAAAGTGAGCCGGCTGCATCA
124	Rod2_124	GACGATCCCTCCTCACACCGTAACACTGAGTTAAGTGCCGCCTGCCTACGC CAGAA
125	Rod2_125	TAGAACGTCTTTAGTGATGAAGGCCGGAATT
126	Rod2_126_3L	AAAAGAAAGCACCGCTTCTGGTGAGGGTTTTATAGACTT

127	Rod2_127	TCTCCGTGAAGCCGCACAGGCGGCCAGCGTGGTGCTGGTCTTGCGGTACTGCTCAT
128	Rod2_128	CTCAAGGCGATTAAGTTGGGTAACGCCCCGGAAAC
129	Rod2_129	CAATTCGACAACTCGACTTCTGACCGCCTCCCAGAATCATAGTTTGAAGCCTCAG
130	Rod2_130	CAAAATTATAAAGGTGCCGTAATCTATCATATTGATTGTTTGGATTAT
131	Rod2_131	AGTAGATTAGTTTGCCAAATATTGAGTAATTCGAAGCCCTTTTTAAGA
132	Rod2_132	AAAGTAAGCAACATATTTATTCATAGCAATAACCATTAGA
133	Rod2_133	TACATTTCCCAGTCAGCGCCACCCACAAACAACCTTTGCCTCCTGAGAAGTGTTTT
134	Rod2_134	TGCCCGTATCATTAAAATCAACGGAAGAAA
135	Rod2_135	TTTCAGCGATTACCCAAGCCAGAA
136	Rod2_136	GCCGCGCTGTTGATATAAGTATAGAATAGGATTCAACAG
137	Rod2_137	ATTTTGCTTAATGCCCTCGAGAGGTAATGCGCCGCTACAG
138	Rod2_138	CACCGGAAATAATGGAAATTACTAGAAAAAGCAAGGTAAACGGAAA
139	Rod2_139	TATAAAGTACCGACAACTGTTTAGAGTAGCGACTCAGAGC
140	Rod2_140	AGAATTAGCAGGCAAAACATACATAAAGGTGGCAGATAGC
141	Rod2_141_3L	CTTCGCGTCCGTGAGCAGCGCAGTGTCAC
142	Rod2_142	TAAAAGTTGTCAGACGCCTATTAAGTAAATAGTACAAAGCCTGTT
143	Rod2_143	TCAGAGCCGATTTTAATGCCCTGACGCACTCAGCGCCTGTGCACTCTGGCACGCGT
144	Rod2_144	TGCATCCGCCGGGCGCGGTGGTCAGCTCATTATA
145	Rod2_145	CGACATAACAAGAATGCCAACGGGGCGCTTTCGAGAAAC
146	Rod2_146_3L	GAACTGGCAGCAACCGAAAAATCCCGTAAAAAGTGAAGGGATAG
147	Rod2_147	TCACGGAAAAAGAGACGTGTACATGCTATATTCCTTATGC
148	Rod2_148	AGAAAATGCGCCATTCGCCATTCGTGCTGC
149	Rod2_149	AGTAGCATAGCGGATCTACGCCAGCTGGCGAAAGGGGGAT
150	Rod2_150	AGGCTGCGAATAAATCCCATTTGGAACGTCACATAAAGCCATCAGATGATGGCAA
151	Rod2_151	CGAACGTTATTAATTTTTCATCAAGCCACCCACCATCGATCAATAACAAGGCAA
152	Rod2_152	GCAAATGGTAGCAGCAAATTATCATAAGAGAACGAACAAAGTTACCAG
153	Rod2_153	AAGGAAAGCAAACGTGACTTGAGATACAGGCCTGTTTA
154	Rod2_154	GGCGCGTAAACGGTATTTCGGAAATTGGCCTTAAGGCT
155	Rod2_155	TGTATGGGTCAGTGAATGATATTC
156	Rod2_156	CTATGGTCAGTACCAGGCGGATTCGTCACCGAATTTTC
157	Rod2_157	CAGACGTTTTCTGAAAGTTTTGCTTGCTTTGACGAGCACG
158	Rod2_158	CTACAACGCCTGTAGTTAGCGGGCATGAAAGCCGATTAA
159	Rod2_159	TCAGAACCTATAATCCGCGTTATACAAATTCGCCAGTAACCGTCACC
160	Rod2_160	ACCACCCTTGAGGCAGTGAGTAACAGGGATTTTAGACAGG
161	Rod2_161	GCAGAGGCATTTTCGATTACCAGTCAATGAA
162	Rod2_162	TAACATCCCAACTGTATTACGCAGTATGTTACCGAGGAA
163	Rod2_163_4T	ttatCCGGGGGTTTCTGCCATGGTGCTCGTCTTTCACCAGAACAGGAGGT
164	Rod2_164_4T	ACCACCACTCAACTTTAATTGGGCTCCAGCATAATGCGGCGGGCCGtttt
165	Rod2_165_3T2T	tttTGATTAAAAATCACCCTAATAGTGCTGAAAATTTGCCGCCGCCATCCCACGCAACtt
166	Rod2_166	AATCATTGTCGGTGGTAGCAGTTGGGCGGTTGCAGAAAC
167	Rod2_167_4T	TTCGCTATAAACTTAAATTTCTtttt
168	Rod2_168_4T	CAACATGTAGCCAGCAGACTCCTTTGGGAAGGGCGATCGGtttt
169	Rod2_169_4T	TTCATTTGAGGCCGGAGAATTAGAATTTAGACGCAATAATAACGGAATACCCAtttt
170	Rod2_170	ATTATCATTTTGCGGCATCATATCCACCAGACATTAGCAGGGCGCGA
171	Rod2_171	AGTTTTGTGCGGCCAGCAGCGGGGTCATTGCACAGCACCGTGAATTA
172	Rod2_172	TATAACGTACAGGAGGTATTAAGAGCATTGACGAGTAGTA

173	Rod2_173_4T	ttttGGAGCTAAGCTTTCCTAAGAGAAGGATTAGGACATTCCAC
174	Rod2_174_3TT	ttttAGGAGCGGAATTATAACAAAGACGCCGCCAGGCTGAGACGATCTAAAGACAGCCt
175	Rod2_175	CAGAGCCGTCCTGATTAACGCTCAACAGTAGG
176	Rod2_176_4T_F	ttttCCATATTTAACAACGCGCTTAATTACCATTAC
177	Rod2_177_4T2	ttttATATATTCATTAATGAATCGGttttCCAACGCGCGGGG
178	Rod2_178_4T3	ttttGCGTCAATTCtttttttTTCTAGCTGAAtttt
179	Rod2_179_4T2	TCAAAAATTGGCCTTCTTCAACCGttttAGCAAGCCTTTtttt
180	Rod2_180_4T3	ttttTCACATAACCGttttTGAAATGGAAACCGTCTATCAtttt
181	Rod2_181_4T2	CGATTTTTTGTTTttttAACGTCAAAAATGCGAGAACAtttt
182	Rod2_182_4T2	CAATCGTCtttttttttGGGCGATGGCCCA

Supplementary Table 3

modification staples for Rod1 and Rod2

("F" in the staple name indicates the place of Fluorophore (Cy5), and "5L/3L" indicates the place of BG at 5'- and 3'- end)

#	Mod	Pos	Name	Sequence ("*" denotes the modification such as NH2 or C6dT)
Rod1	5L		Rod_012_5NC12	*ttttttttTCGCATTAAATTTTTGTTGTACCAAAAACATACATCCAATAAATCATAC
Rod1	F		Rod_174_Cy5	Cy5-ttttttttTTAGTCTTTAATGCGCTATTTTTGGGGTCATAAACAACTTTC
Rod2	5L	1	Rod2_025_5L-NdT3_T30	*T*T*ttttttttttttttttttttttttttttttttttGCAGCGAATCACATTAGGCAACAGCTGATTGCTTGAGTGAGAGATAG
Rod2	5L	2	Rod2_029_5L-NdT3_T30	*T*T*ttttttttttttttttttttttttttttttttttGGTCATTGAGAGGAAGTCATTTTTGCGGATGG
Rod2	3L	3	Rod2_040_3L-NdT3_T30	AATGAGTGAGCTAACAGACAGCATCGGAttttttttttttttttttttttttttttttttt*T*T*
Rod2	3L	4	Rod2_045_3L-NdT3_T30	GGAATCGTGCATCAAAAAGATTACCTGAGAGTCTGttttttttttttttttttttttttttttttttttt*T*T*
Rod2	3L	5	Rod2_123_3L-NdT3_T30	GACGTTGGTAACAAAGTGAGCCGGCTGCATCAttttttttttttttttttttttttttttttttt*T*T*
Rod2	3L	6	Rod2_126_3L-NdT3_T30	AAAAGAAAGCACCGCTTCTGGTGAGGGTTTTATAGACTTttttttttttttttttttttttttttt*T*T*
Rod2	3L	7	Rod2_141_3L-NdT3_T30	CTTCGCGTCCGTGAGCAGCGCAGTGTCACttttttttttttttttttttttttttttttttt*T*T*
Rod2	3L	8	Rod2_146_3L-NdT3_T30	GAACTGGCAGCAACCGAAAAATCCCGTAAAAAGTGAAGGGATAGttttttttttttttttttttttttt*T*T*
Rod2	F		Rod2_176_4T_Cy5	*ttttCCATATTTAACAACGCGCTTAATTACCATTAC