DNA Origami Nanoparticles for Cell Delivery: The Effect of Shape and Surface Functionalization on Cell Internalization

Supporting Information

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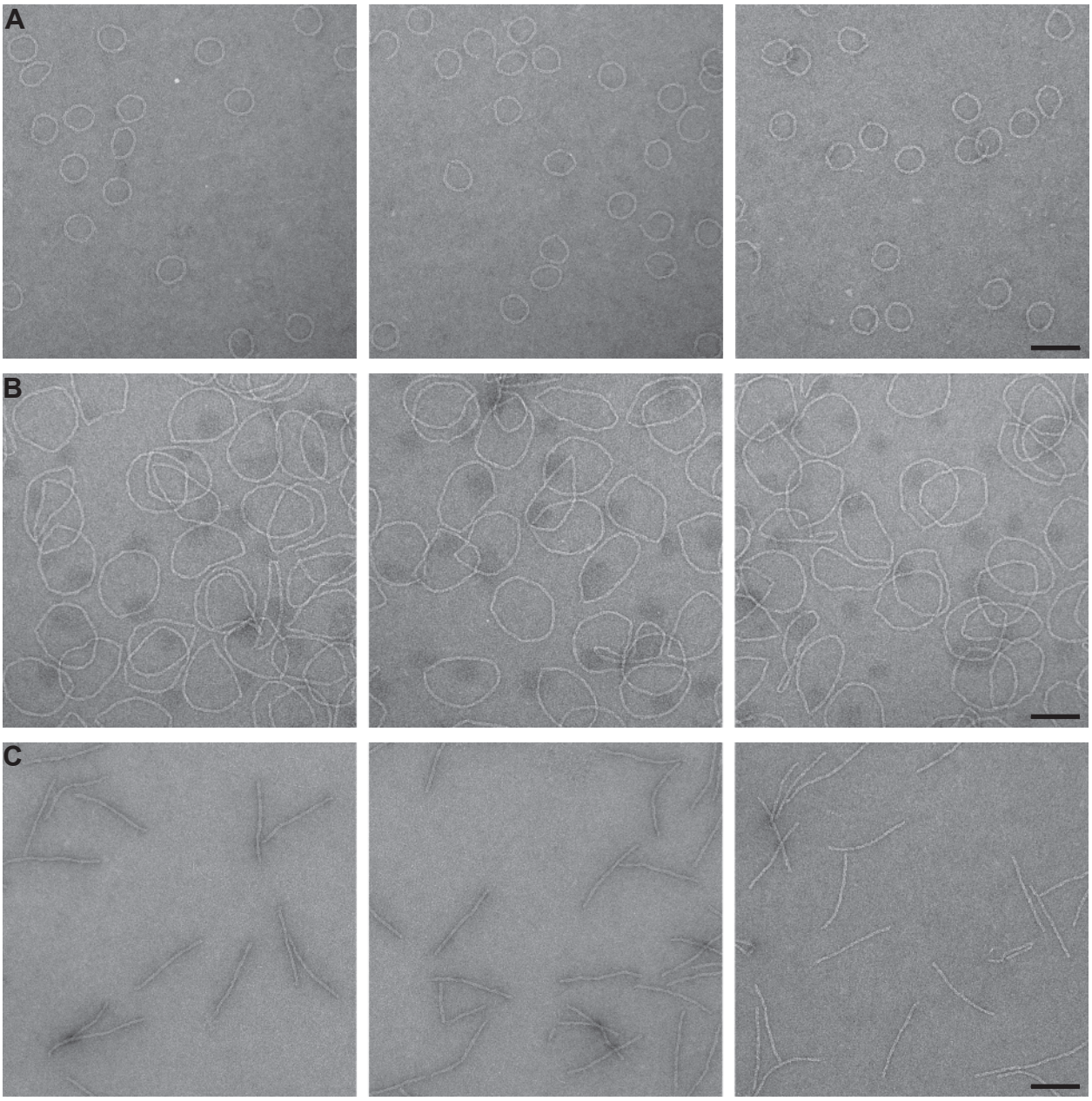
Viability assays

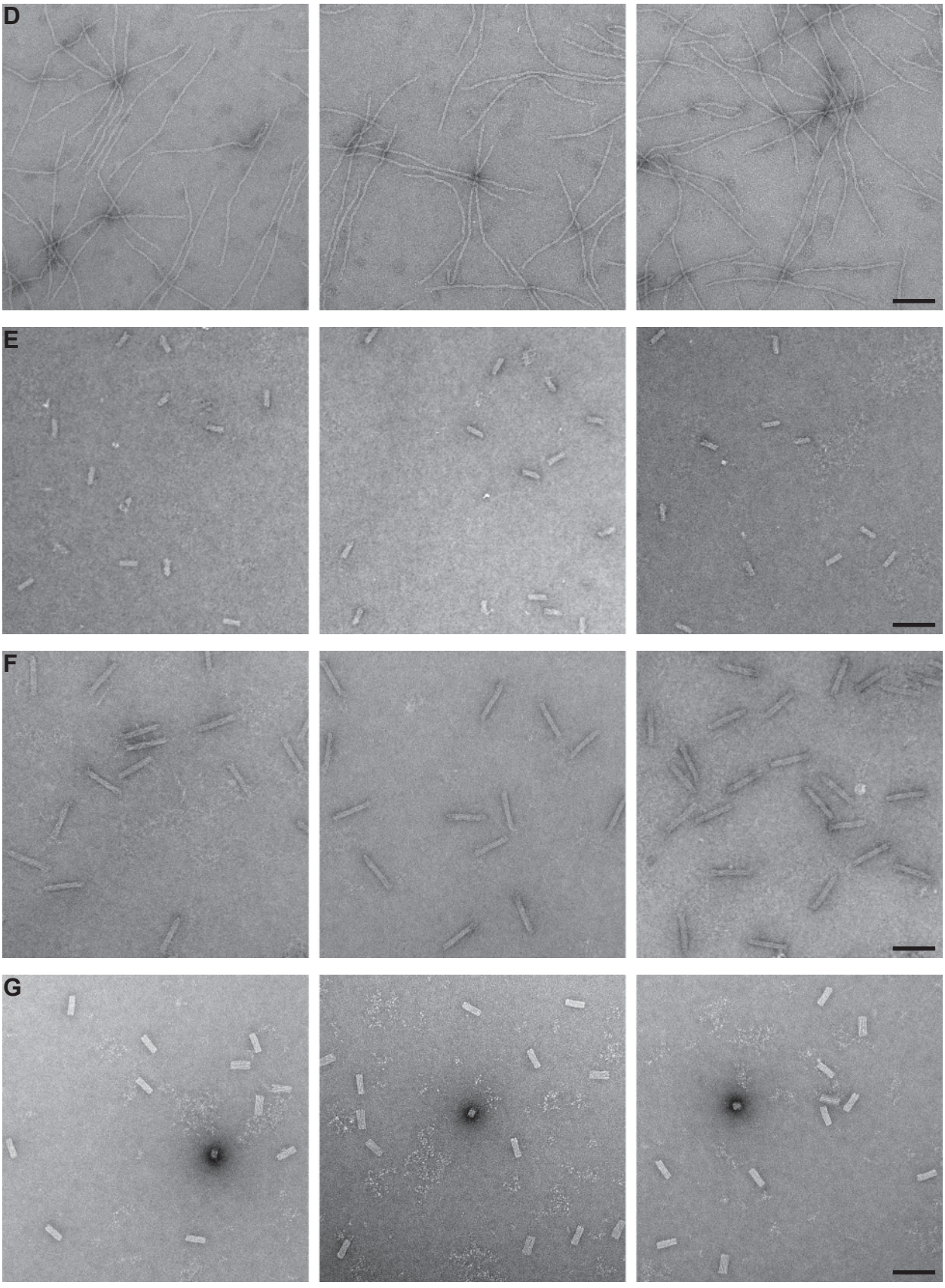
For viability assays, cells were seeded at a density of 50,000 cells/mL into clear bottom, black walled, tissue culture treated 96 well plates (BD Lifesciences). Cells were allowed to grow for 24 hours and then treated with origami particles as described above before being washed twice in PBS (+,+). Calcein AM (invitrogen) or propdium iodide (Sigma Aldrich) was diluted to 1 µM in PBS (+,+) and added to the cells. Cells were incubated for 20-30min @ 37 °C before fluorescence was read on a Spectramax plate reader. % viable cells were determined by comparing to untreated control cells.

Inhibitor studies

For inhibitor studies, cells were seeded into 96 well tissue culture plates as described above. Before adding DNA origami particles, cells were pre-incubated for 30 min with 3 mM amiloride (Sigma) or 80 µM dynasore (kindly provided by Tom Kirchhausen) diluted in serum-free media. Following the 30 min pre-incubation, the media was exchanged for serum-free cell media containing 3 mM amiloride or 80 µM dynasore as well as 24hb-**L** particles at a 1 nM concentration and incubated for 1 hour. 10 minuted before the end of the incubation time, transferrin was added to a final concentration of 625 nM (50 µg/ml). Cells were then treated with DNAse I as described and analyzed by flow cytometry.

Fig. S1: Zoomed out TEM images of DNA origami designs. A = p3024-6hb-ring, B = p7308-6hb-ring, C = p3024-6hb, D = p7308-6hb, E = p3024-24hb, F = p7308-24hb, G = p7308-48hb, and H = p7308-6hb-octahedron, scale bars are 100 nm.




D
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F
G

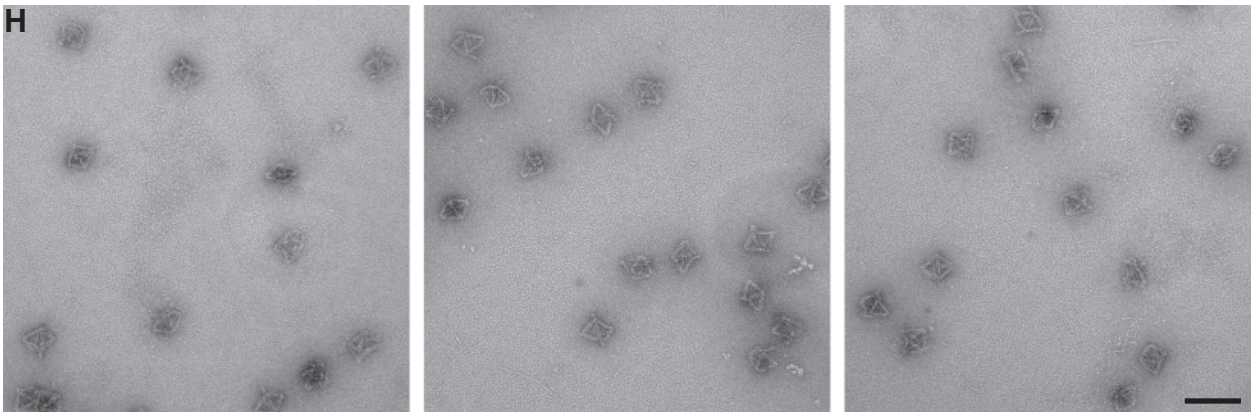
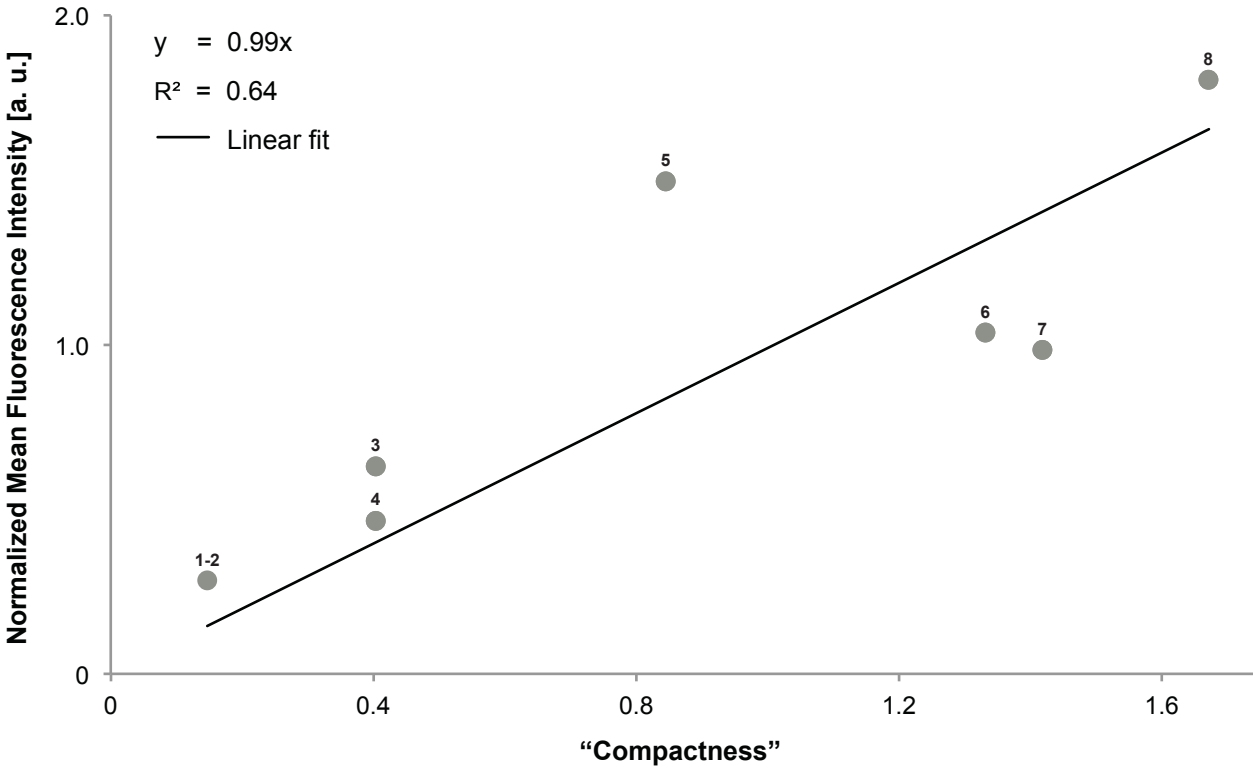

H

Figure S2: Normalized uptake as a function of "compactness", here defined as (accessible surface area)/(effective volume)$^{0.73}$, where accessible surface area is the surface area of the origami nanostructure that can bind to the cell surface. For the ring and octahedron designs this is equivalent to the surface area of the thin_rod of the same molecular weight divided by 2. Effective volume for solid objects is defined as their (maximum dimension)^2 × width. For the rings and octahedron, it is 4 × (radius)^3.



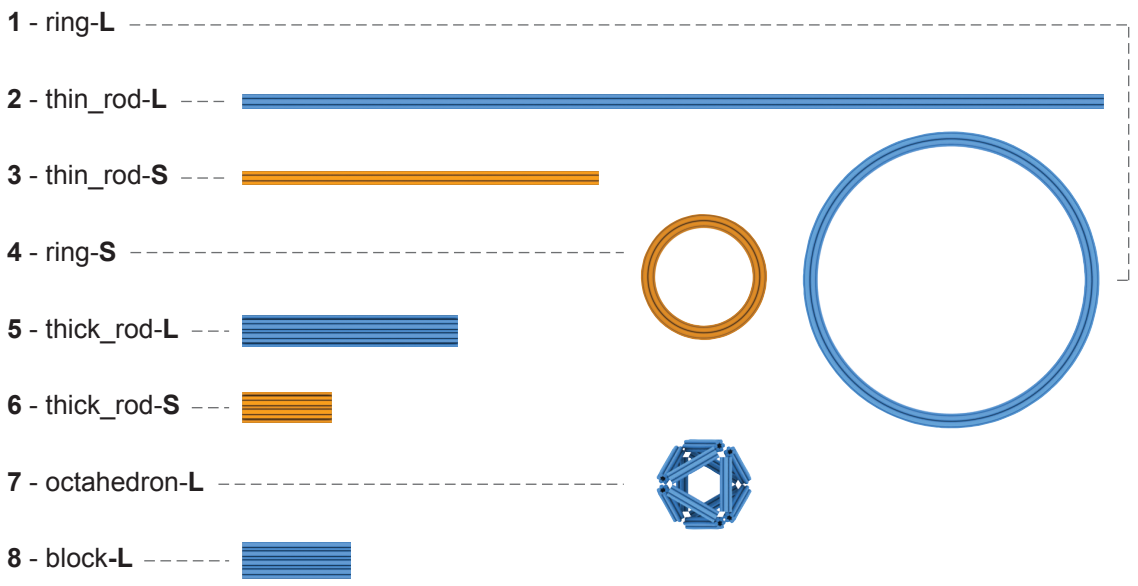
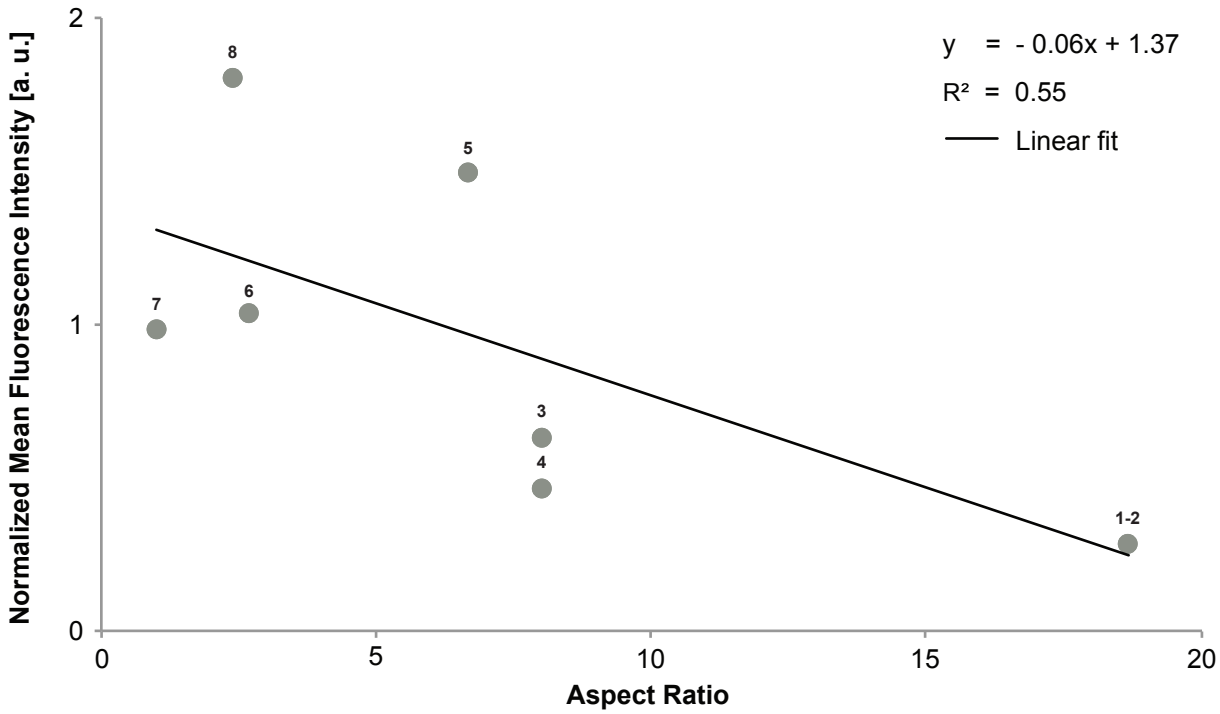


Figure S3: Normalized uptake as a function of aspect ratio. Here, aspect ratio is defined as (maximum dimension)/(2nd largest dimension) or, for the ring shapes diameter/height.



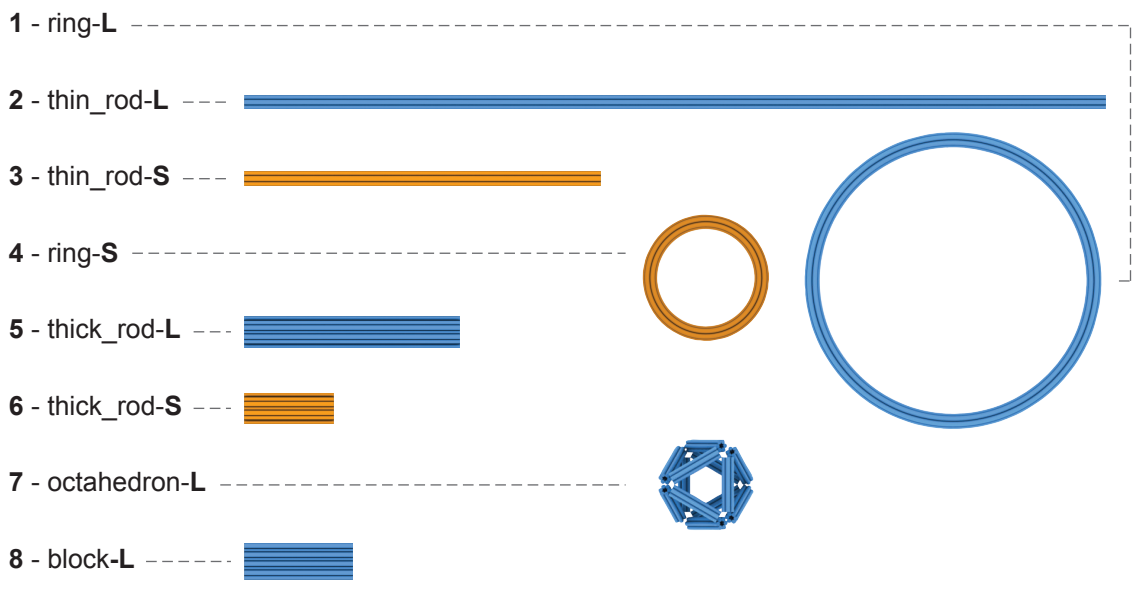
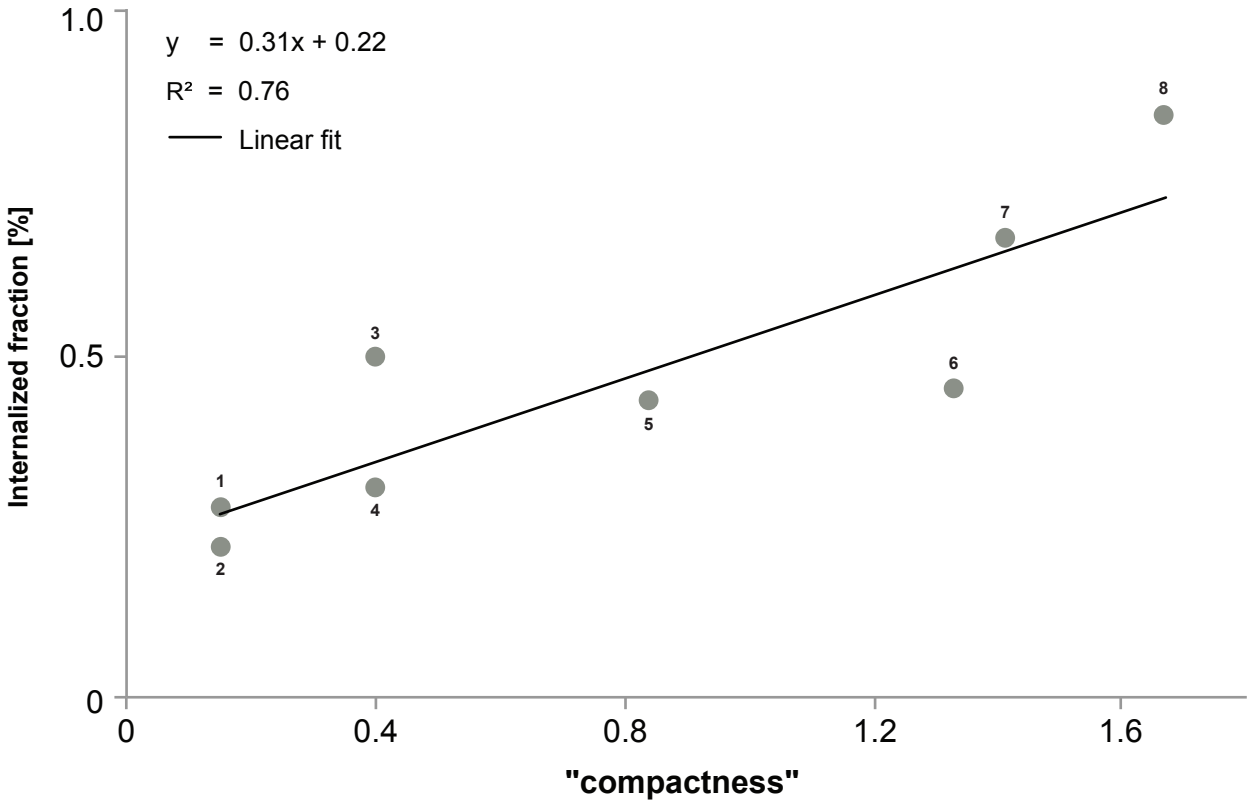


Table S1: Accessible surface area (ASA), effective volume (EV), “compactness”, aspect ratio of the DNA origami nanostructures.

	accessible surface area (ASA) [nm^2]	effective volume (EV) [nm^3]	“compactness” = $ASA/(EV)^{0.73}$	aspect ratio	internalized fraction [%]
ring-**S**	2.0×10^3	1.1×10^5	4.0×10^{-1}	8.0×10^0	3.1×10^1
ring-**L**	4.7×10^3	1.4×10^6	1.5×10^{-1}	1.9×10^1	2.8×10^1
thin_rod-**S**	2.0×10^3	1.1×10^5	4.0×10^{-1}	8.0×10^0	5.0×10^1
thin_rod-**L**	4.7×10^3	1.4×10^6	1.5×10^{-1}	1.9×10^1	2.2×10^1
thick_rod-**S**	2.2×10^3	2.5×10^4	1.3×10^1	2.7×10^1	4.5×10^1
thick_rod-**L**	5.1×10^3	1.4×10^5	8.4×10^{-1}	6.7×10^1	4.4×10^1
block-**L**	3.8×10^3	3.7×10^4	1.7×10^1	2.4×10^1	8.5×10^1
octahedron-**L**	4.7×10^3	6.3×10^4	1.4×10^1	1.0×10^1	6.7×10^1

Figure S4: Interalized fraction versus “compactness”. Internalized fraction is defined as the ratio of non-DNAse I sensitive fluorescence to total cell-associated fluorescence (see empty and filled bars in **Fig. 4)**. “Compactness” is defined as described in **Fig. S2**.



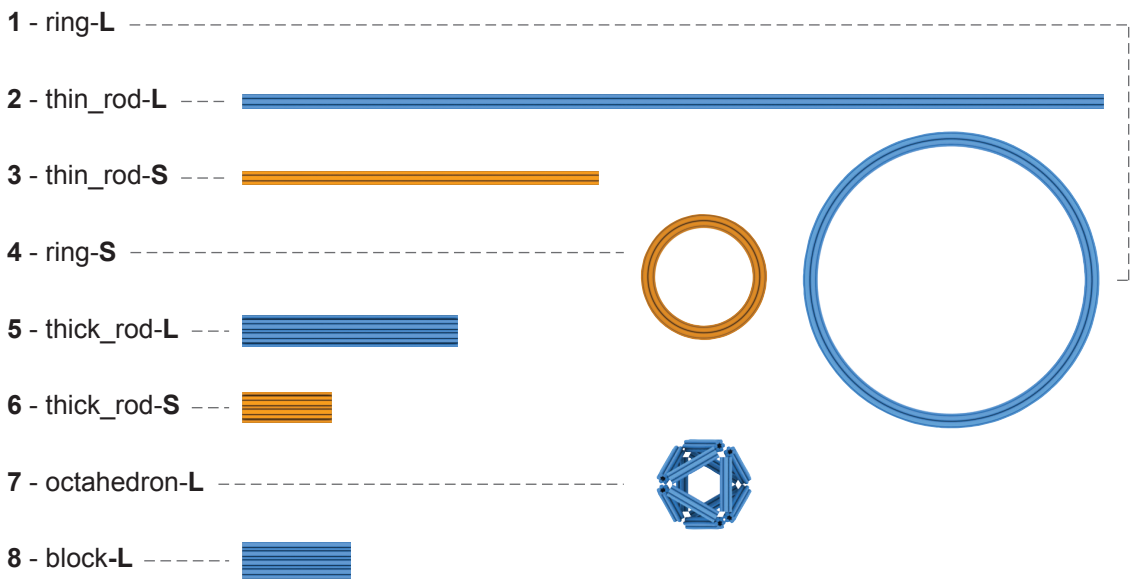
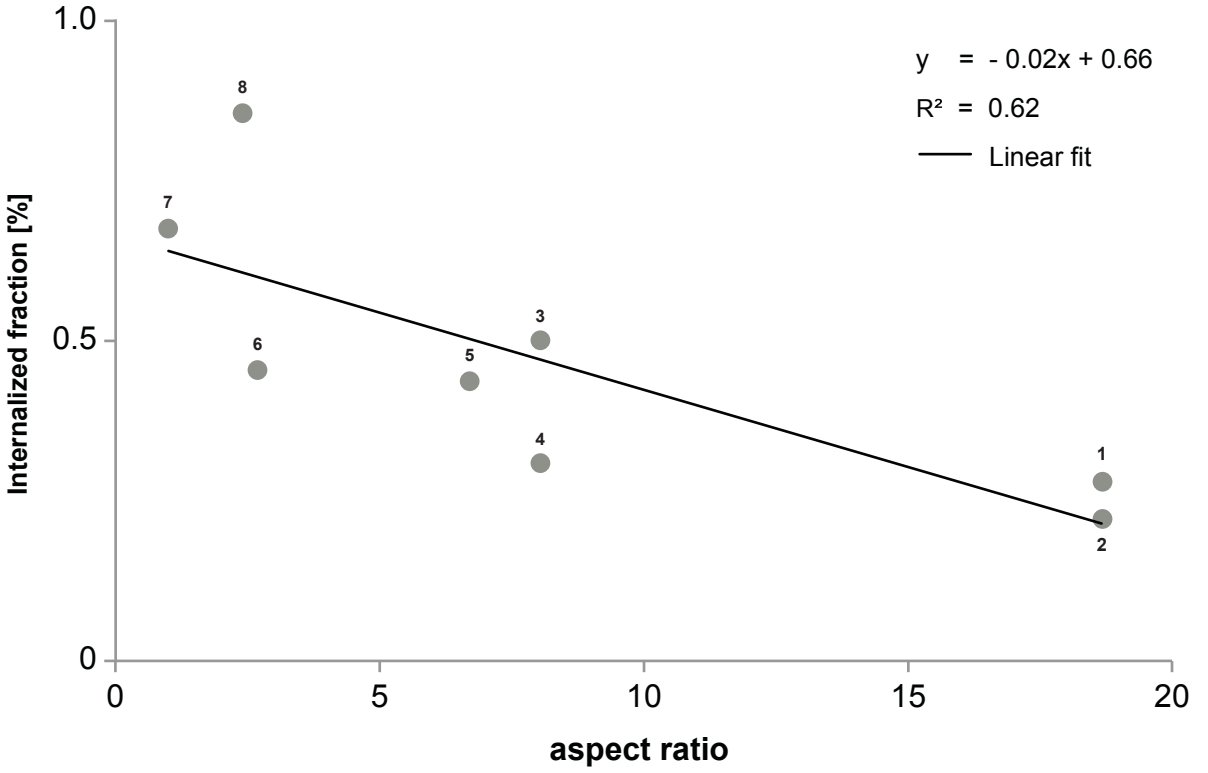


Figure S5: Interalized fraction versus aspect ratio. The internalization fraction is defined as the ratio of non-DNAse I sensitive fluorescence to total cell-associated fluorescence (see empty and filled bars in **Fig. 4)**. Aspect ratio is defined as described in **Fig. S3**.



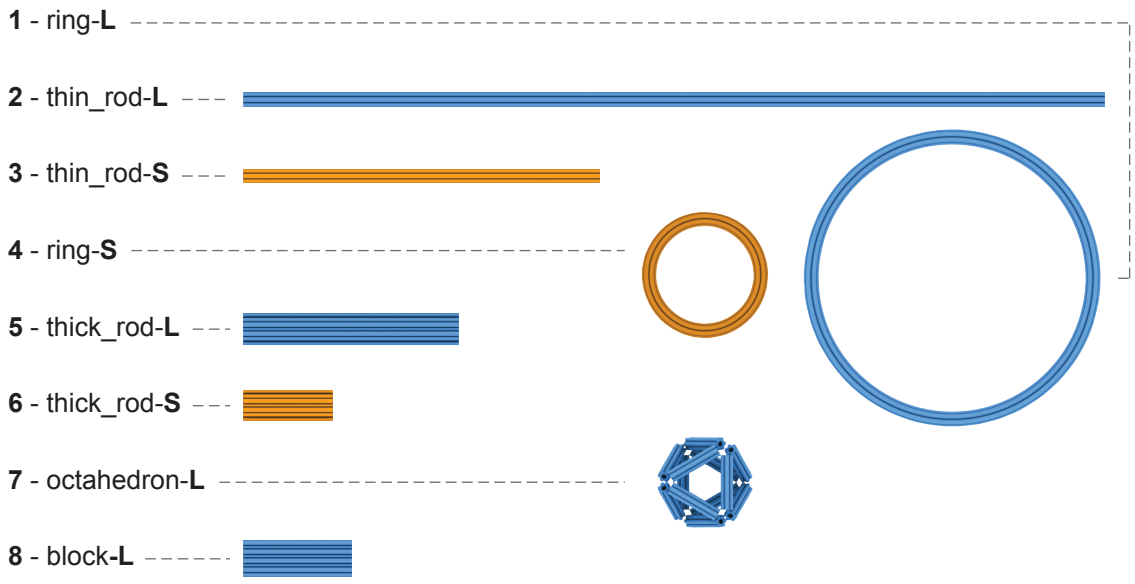


Fig. S6: Viability of HUVECs after treatment with 200 fmole ring-**S**. Error bars represent standard deviation of triplicates.

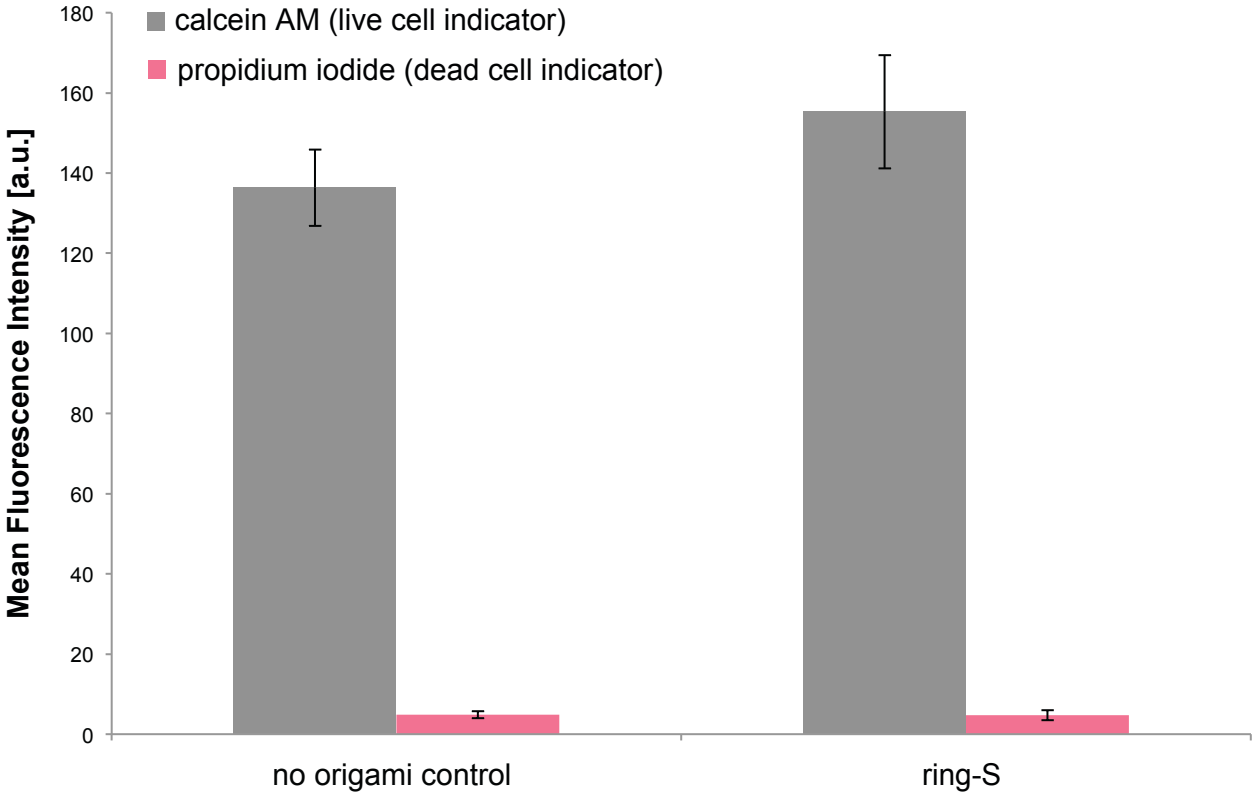


Fig. S7: Uptake of thick_rod-**L** and transferrin with and without pharmacological inhibitor treatment. Means were calculated from three independent experiments. Error bars represent standard deviation.

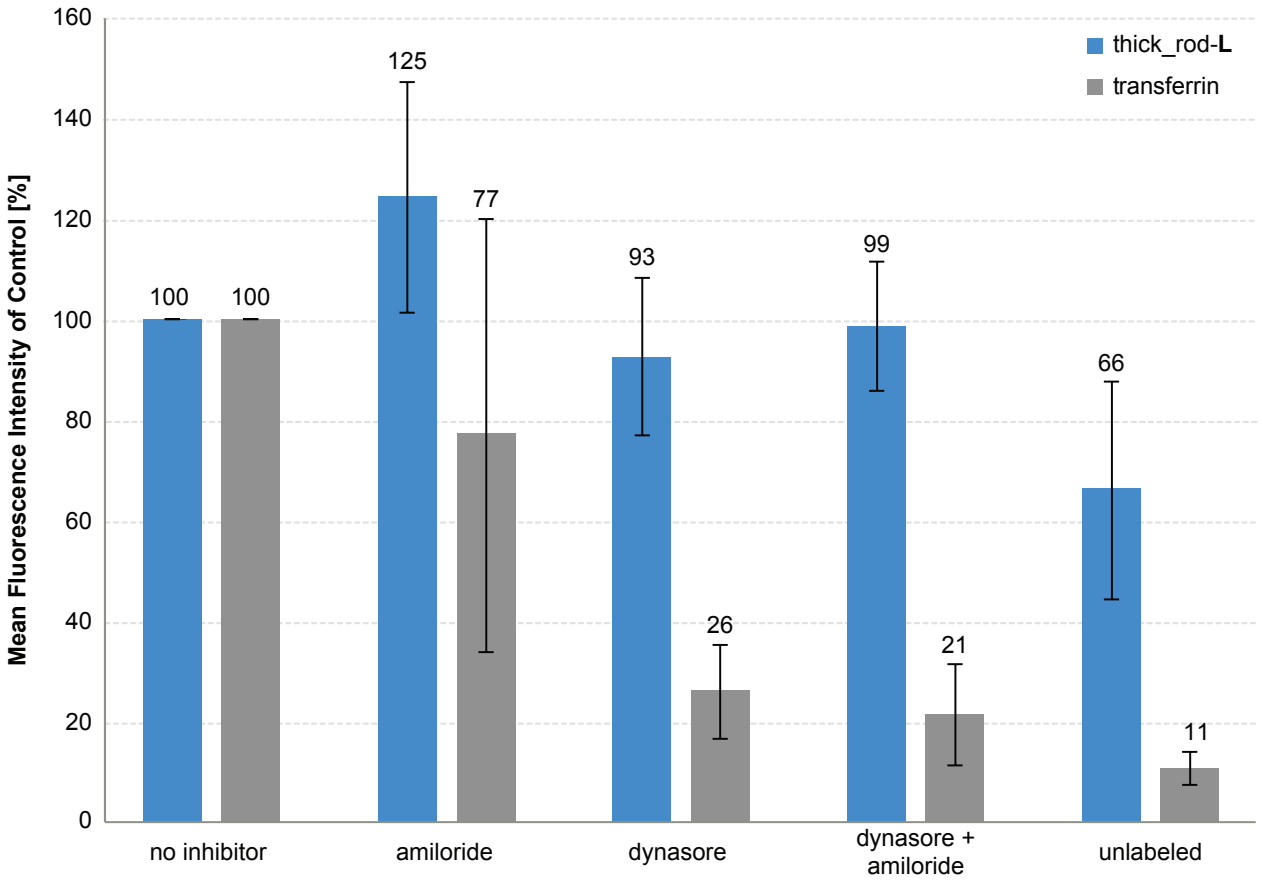


Table S2. DNA sequence of p3024 scaffold.

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Table S3. DNA sequence of p7308 scaffold.

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Fig. S8: Illustration of ring-**S** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.

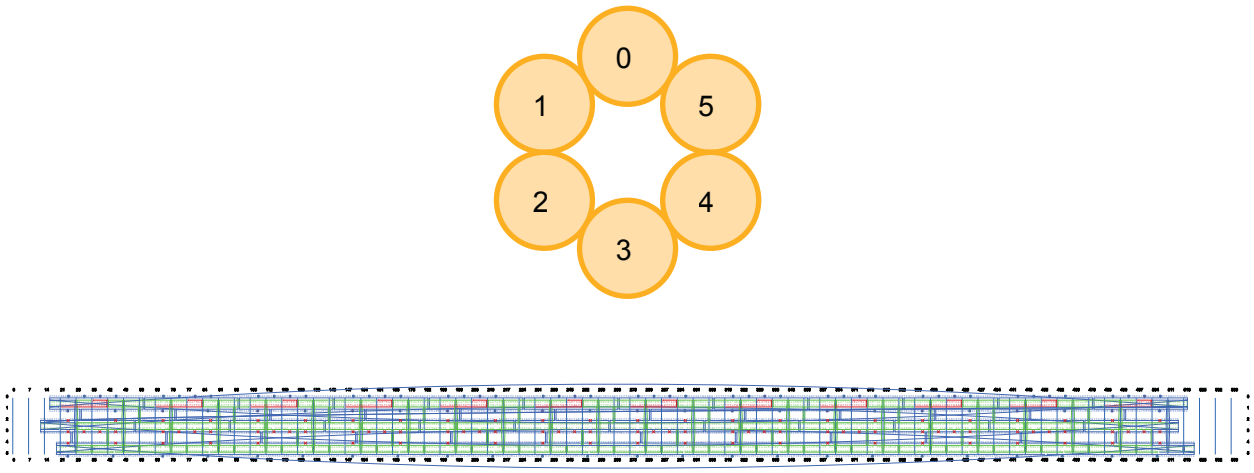
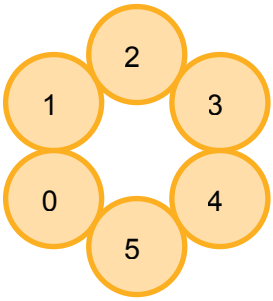


Fig. S9: Illustration of ring-**S** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.



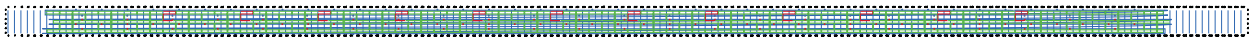


Fig. S10: Illustration of thin_rod-**S** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.

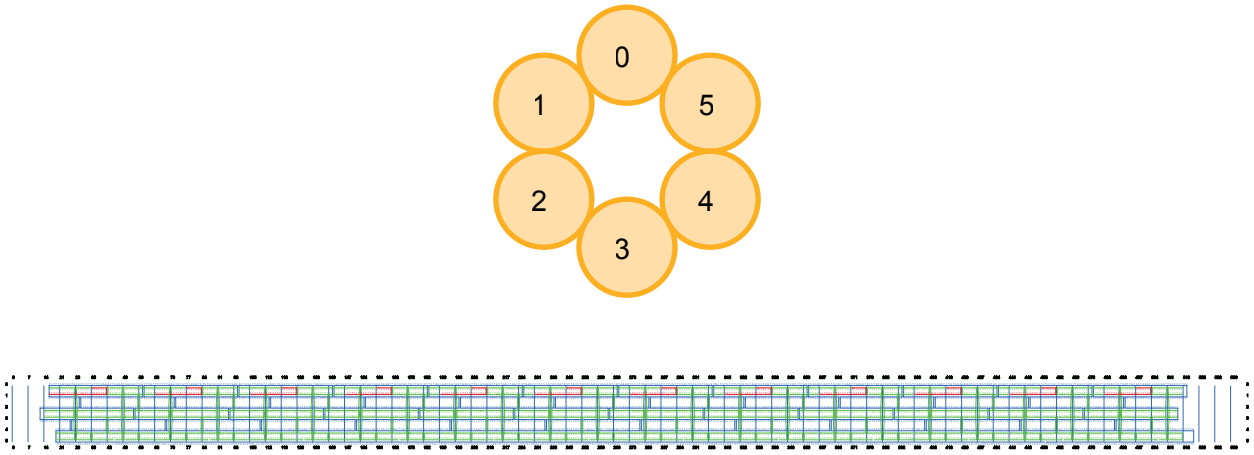
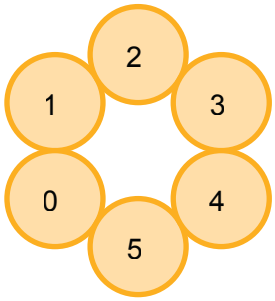


Fig. S11: Illustration of thin_rod-**S** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.



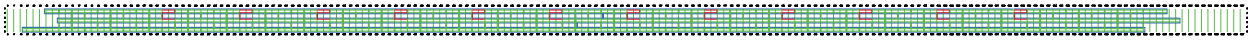
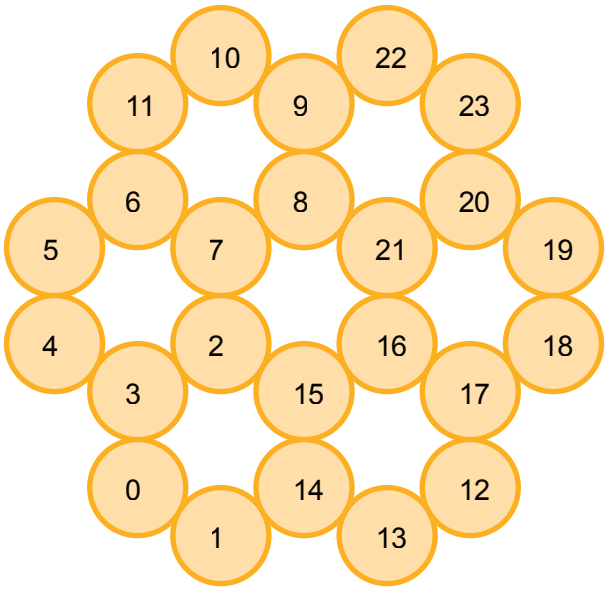


Fig. S12: Illustration of thick_rod-**S** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.



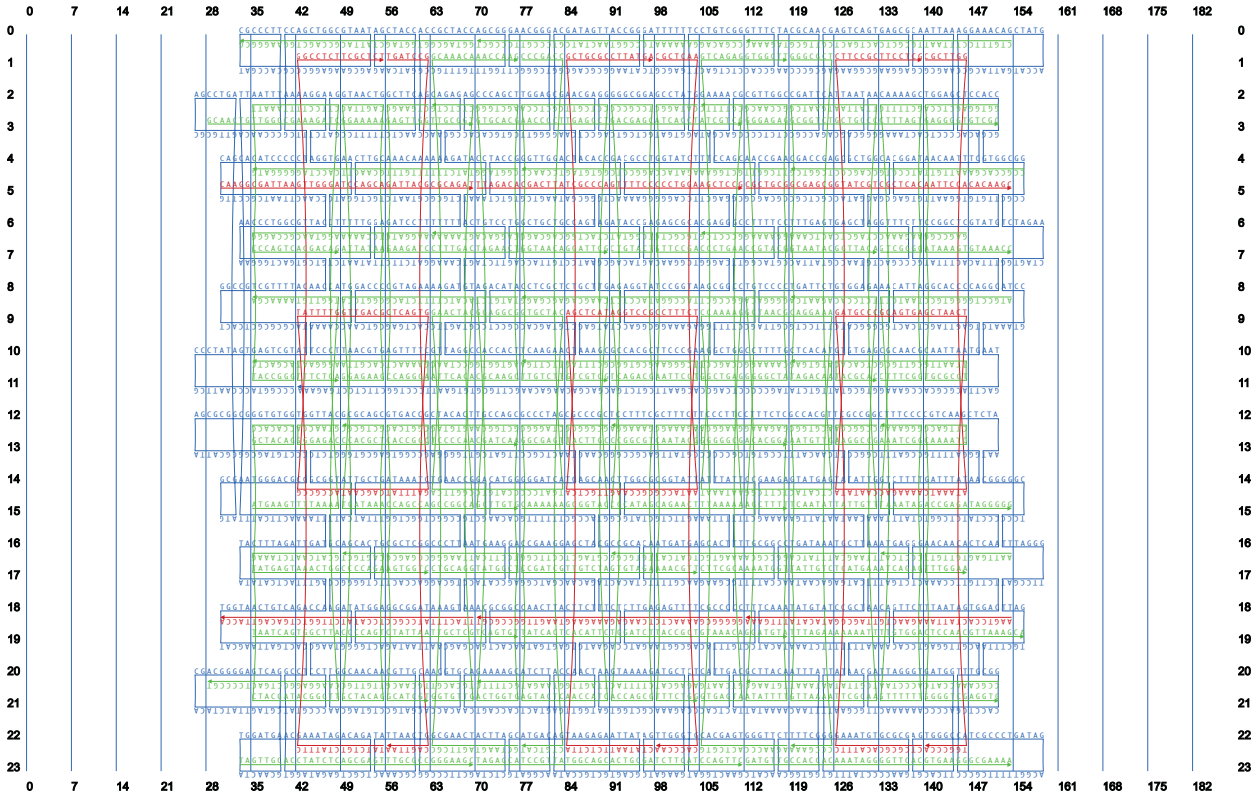
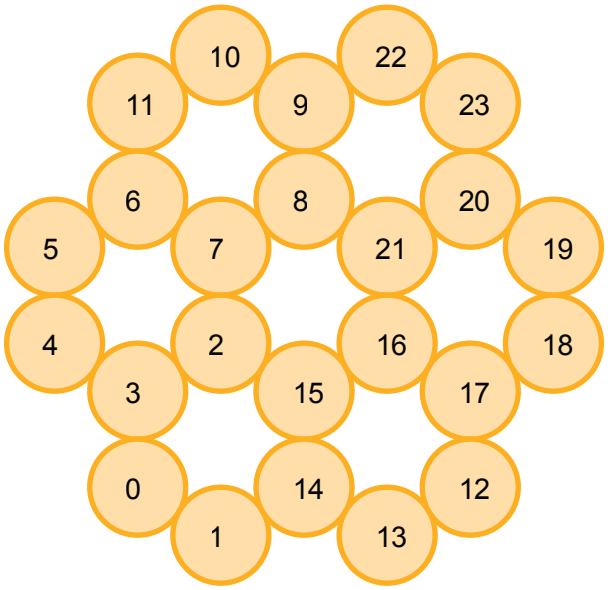


Fig. S13: Illustration of thick_rod-**L** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.



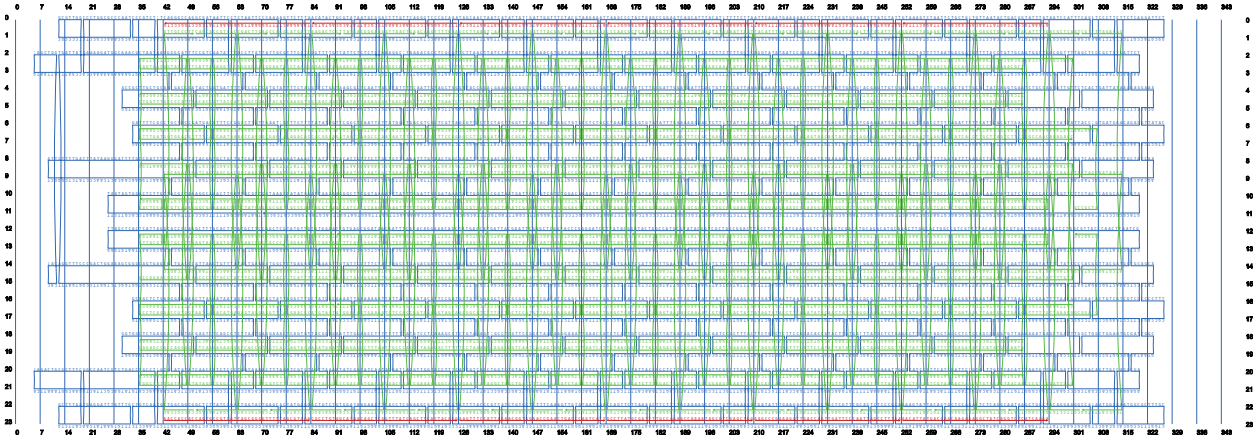
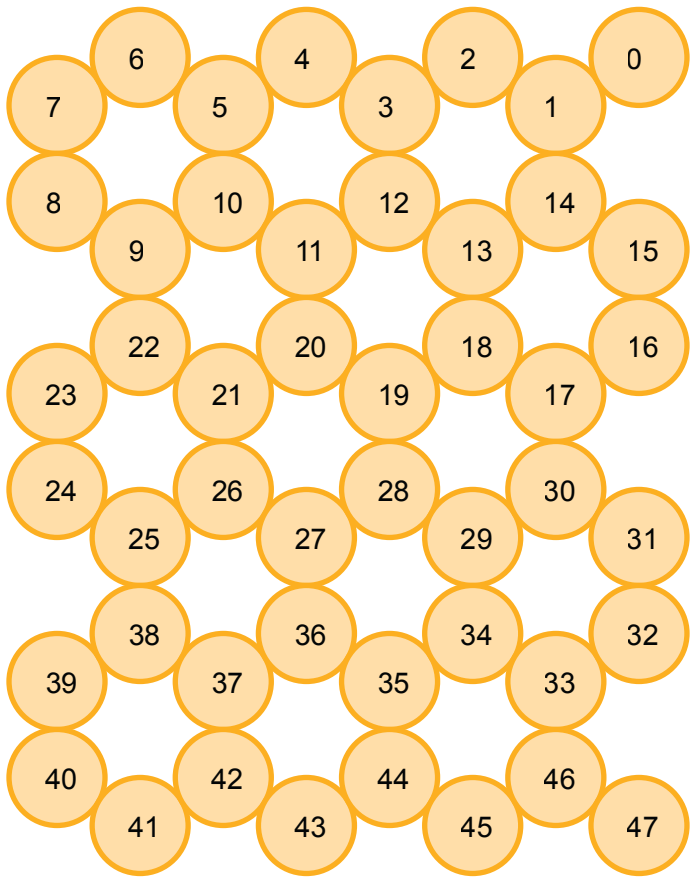


Fig. S14: Illustration of block-**L** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.



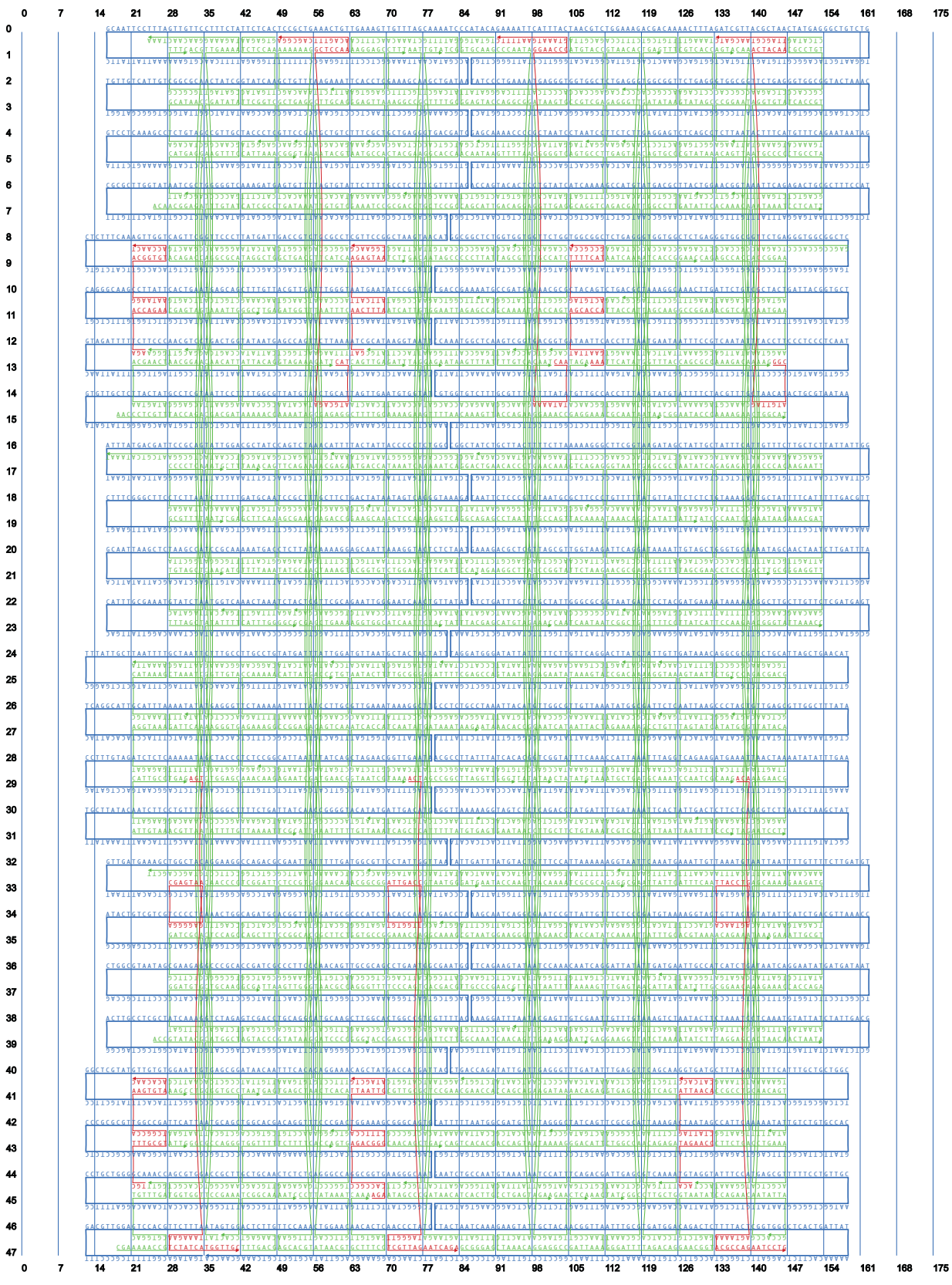


Fig. S15: Illustration of octahedron-**L** design. Blue strand is the scaffold strand, green strands are staple strands, and red strands are handle staple strands. Arrows indicate 3´-end of DNA.

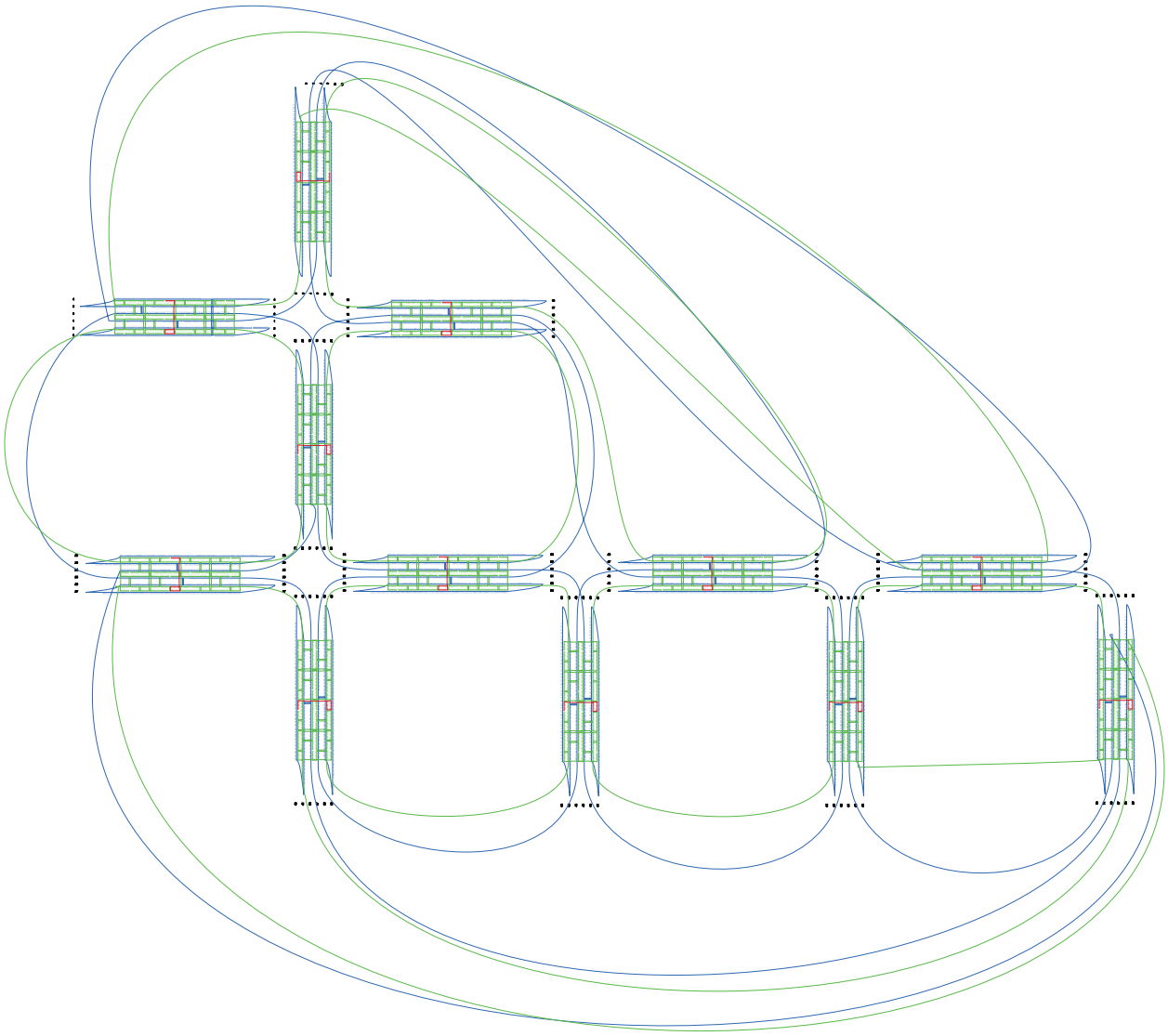


Fig. S16: Uptake of DNA origami shapes without DNAse I treatment. This set of experiments was conducted without DNAse only. Results represent twelve independent experiments. Error bars shows standard deviation.

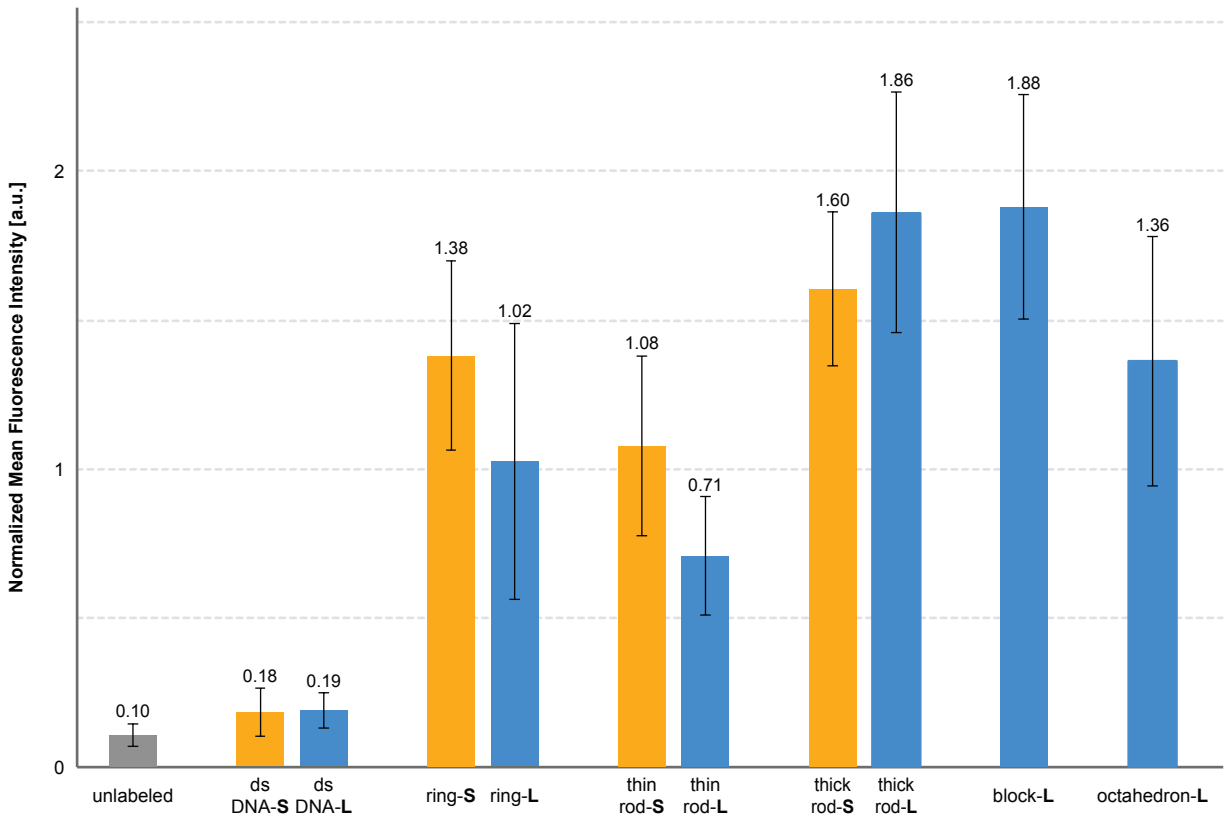


Table S4. Staple strand sequences for p7308-48hb.

1	GTGAGAATCTCCAATTGATACTTCGGTCGAGG
2	TGTATGGGTGCAAGCCCAATAGAAACGCACCAGAAAGTAAGCAGAT
3	TAAAGTTCGTCACCCCTCAGAGTATAGCGGCTGAGCGTATAACCAG
4	CTCATAGCGCCTGTCGCCACCTCACCGTTGAAACACTGCCTAGCAGTCTCCTCATT
5	ACGACGAGGCTACCAGACTGCGGAATCGTCATAAAT
6	AATACCACATAAAAGAAGTTTTAACAAAGTTAAAGACACCACGATTGTA
7	TCGGATTTTGCTAAACAACTTTCAAAGGAGCGAGGTGAGGAGTTAAGCG
8	TTTTTGTCGTCTTTCCAGACGTTAATGTACCAGCCACCCCGTCGAGGAT
9	CAACAAACGTAAAAGAATGAAATAGCAATAGAATATCAAGAGAGAATTT
10	CTTAAACAGCAAAAAAGTACATAAAAAATAGTAGACTGGATAGCGTAAA
11	CAGGTAACACTAAAGGTCGCAATAACCGAAGCCCTTTTGTCAGAGGGGA
12	GTACATTAAACATCTTTCATCGCCTGATAAAGACGGTCGCTGACCGAGT
13	AACGCTGAGGACTGGCTGTAGAAAAAGCGGATTCAGAATTGATAATCGC
14	AAAAATGCCAAAAAGAAGAAATCCGCGACCTGCTCCGCAAAACGAAAGA
15	CGAACAATAAGTTTTAATCATCGGGCAAAATCGAGCGTCTTTCATCCAT
16	TAGAGTGCCTTTTTGATGCAGGTCAGACGATCCTCAGAAATCAAATCAT
17	GAAGAGGGTTTAAAGGTTTCATATAAAAACAGGTAATTTTATCAATCGTCGCATTAC
18	AGACCGGAATATATTGAAAAGACACCTTTACGAGAGATTGAGAAGCCCT
19	TAATCAACGTGATGGTTATAAGAGAGCGAACATTAATGAGAATCGTAAC
20	ATTCATGAGGTTCAGTGCGAGTAGTGGCTTAGCGTTTTTATTTTTTGAG
21	GGCCTACGAAACCGGATATCATTGTACCTTTACTCCAATTCAACCTAAA
22	TAAGATATTCACAAACACGCCACCAGCCACCTTTTTATCCTCCCGAGTA
23	GTTACAGTTAACAGAATACGTCACTGCACCCCCAATCCATTTCATCAAG
24	ACAACGGAGACGAACTGACAGACCTAGATACTGTAGCTTATA
25	AGGCGCATTGTGTCTACACTAAAACACTCGGG
26	ACCTAGCGTTAGCAAATCAGATATTTACGAGCATGTAGATAATATGTAATAAATTA
27	CCAGAACGGTTGAGGATACAGGAGTGTACTGGTCTCAGCATTGACAGGACACC
28	GAGCCGCCACCCTCAGAACAATAAATCTGAATTTACC
29	GACTTGATTCCTGGAAGGCCTTTATCAATATATTCAGGGAAACCATGCC
30	CAGCTCAGAGCCACCACTGGCCTTGCGTCATACATGGCTGAGTAAGCGT
31	TTCGGTCAGAGGCACCATCGTCACCCTCAGCAAGGCCGTTACCTTGATT
32	CAGTTACCATCCTGAATTAAACAGTTAATGGATGCTGAGGGAGAAGAGG
33	TGAAACAAAGTAGGCTGAATCATAAGGGAACTTTGTATGACCCCCAGCG
34	GTTAACGGAATTAAGAGCCCCTCAAAAACAGACGTTAAGTAGCCAGCTT

35	ACTTTTGTCAACGGGAGAATTATCGGCAGAGCCTAATTCGTGTGAGGGT
36	GTCATAAGTGACCCTCATTTTCAGGGATATTGGAGTACCAGGCGGACCG
37	TAGTGACTATTAAATCATGTCAATTCAGCTCATTTTTATGTGAGTCCTT
38	ATAAGTTTATTGAGCCATTTGGAACTTTTGCATCAGCTTGCTTTCCTTT
39	AACCCTCGTTATAGTAAACGAACTGGGA
40	CGGAATACCCAGAAAATCAGCGCCCGGAAATGCCGGAACAAGTTTGAAC
41	GTTCGAGAGGCTTTTGCTCAACTACAGTTGAATGC
42	AGCGGACTGAACACCCTGAGACTAGAATAACAGTACATAAATCAAGATG
43	AGAGCAAAAGAATTAATGAAAAAACGATATTAGTTGGAGGTTGAACAAGTTAAACC
44	CTTTCCAATACGACGATAAAAACCCGCCAAAATTACAGCATTATAGGCT
45	CAGTTGCATCGCTTCAAGTCATTTTTTTAAATTTAGTTCATTTGGGGCG
46	GTCGAAGCAAAATTGCTACGGTGTCCAATTCAGGTGGCATCAATTCTAC
47	AGCTACAAAACTTACCATTCTAAGCGCGCCCTCAATAATCGGCTGGATA
48	CGAAAAAAGACAACATTAGGAATTTTGAAAATAGAAAGGAACAACTAAA
49	ATCAGCTACATAGCGAATTTCATCTTATCATTCCAAGACGCGCCTCTGT
50	ATGTTGCGGATAAATTGCCAGTCACGATATACGATAGTTGCGCCGTTTC
51	AGAAGGCTTAATGTAATAACACCGTATACTTCTGAACCTTGCCCGAACG
52	GCGGCTATTTCAATGAAAAGGTAAAGGTGTACTCAGAACCGCCACAGTA
53	CATAGGCGCACTGCTCAAAGTTTCGCAACGGCTACAGAGCATAACGGAC
54	AGATATGCAATAAAAATCCGGAGAGGAAGGGCCGGCACGAGAGAGAATC
55	TACAACGCGAGCCATATAGAAAAATATAATCTCAAAATGCTCAATTATC
56	TTTAGCTAATTAGCCTAAATCCTTTGATGGATGTGTAATGAAATTG
57	CGAAATCATACATTATGGCCTGCAAGTTGGGAACCTGTTCTTTTCACCA
58	TATATAACAGAATAGCCCCCTTATAGAGCCGCCATGTTACTTAGCTCTT
59	CAAAATAGCATGCCATCCGCGTTTCGGGGTCGATTAGCGGGGTTTTGCT
60	ATAGCTGAAATGCGAACTTCATCAACCCAAAAATACGTGACAGCATCGG
61	TAGTAGTAGCTTGCGGGCGGCCAGTCCCAGTCTGCCCGCAACAGCTGAC
62	AGTCCGACAAACAAACATTGAGTATGCGCGACTGGCCAACAGAGATTTT
63	ATATCTTTCCGTAGGAAATCACCGGCCTTTACAGTGCCACTCCTCAAGA
64	TGCAGAAACGGGTACAAGCCGACCGGAAAGTAGCGATGCCCCTGAAAGTATTA
65	TGTGCAAGGACTAAAGTCCTTTTGTAATTTCTTTAAGACTTGCAGATTT
66	CCAGATTTAGCGGAACATGAATGGCTTCTGACCTGAAAACGCTCATAAA
67	TTTGATTCAACTCTTCGGATCGCACCACGCTTGGTGGTTCCGAAACCAC
68	ATCGGCGTTTATTTTATTAGCAAGTATTCATGATATAAACCGCCACCCT
69	GGGATATGCGCAGATGAACAGAAATGGAAATCCAGAACAATATTAGCCA

70	*ATATTAGGCAGAGGCAATTTCATTTAGAGAGTGGAATTAGAGCCACATT*
71	*AGAAGAAAGGTTTTAGACCAAAAACAGGCAAGGCAAAGATATTTTTGAC*
72	*TATGCCTGATTGCTTTACGTAATGGAAGGGTTATTTACCCTGAGTAGAA*
73	*CTAGGTCTGAGAACAAATAAGAAAGGAAACCGAGGAAAGGCAACATAGA*
74	*TAATTTGAAAAATTACTTTAACAATAAAGTACCTGAACAAGAAAAAAAC*
75	*TGTGTAATCGGTTCTAGATCACCATTTCAACAATACTTATTAACATCCA*
76	*TTTAACCTCAAAAATCACGGCCAGAGGGGGTAATAGTAATGACCATATA*
77	*AATCCAATCGCTTCTGATAGTATCCTTAATTAGTAATTGTTTATCAACA*
78	*ATTGTAAGAAGATTCATTGCCGAGAGATAGGTAAATAAATGCCATAAAGAAAATTA*
79	*ATTTAATTCGCGTCTGGTCGGATTGCATCTGCAGCTTTCGATCGGGCGA*
80	*TAGACATTTAACAATTTATTTCAAGTACCTTACGTAAATGGCAATCATT*
81	*CCAACGGCGGAGATGGGGGTGCCGCTGCGCAAGGGTTTTGCCAAGGGGT*
82	*CTTTTTTAATCGCGCAACAATAATACCATACTGATTGTAAAAGTATTCGACAATT*
83	*AAACAAAGAAGATGTCAGATGATTGCGTATATTCCCACCAGAATAATACACTAATA*
84	*AATACCAAGTATACTTCCTAAACAGGAGGCCGATTAAATAACCGTCTCA*
85	*CGACGCAAATGGGATTTTAGACAGGAACGGTGAGTCTGGTAATATACCT*
86	*CGTCTCCGTGTTTGGAAAGCACGTATAACGTGCTTTCCGAGTGTTCAAA*
87	*ACGAGCCGGCTTAGGTTTAAATAAGGCGTTACAGGTCATTTACCCGAGA*
88	*GAAAATATACAAGAACGAAGACGCAACCCACGAAACAACTGGCAT*
89	*CAAGCCTGTTCCTAAATCCATATTATAACATGGTTTACACATACATGAG*
90	*TTAGGTCGACAGTACCCGTATAAGTGTGAAATGAGCTAACTCACAGTCG*
91	*TTAAACATCGACCAGTAATAAAAGAATGGATTAGAACCCGGATTCATAA*
92	*TTGAAGTATTATATCTTTAGGAGCTCTAAAGCCGCCTGCAACAGTATAT*
93	*AATCCTTTGTGGCAAATCAACAGTATCAATACCAGCAGAAGATAAGCCC*
94	*ACCGTATACGCAATTCCAAGC*
95	*ACCGAGCTCGAATTCTTAAAACGAAGATTTTCGAGCCACCCATCCTAAA*
96	*AGGAACTCGTGAGAATACGCCAACTCCGGTAACGCTAACACCAGTCACC*
97	*GAGGAAGGTTACCTCAAGTGAGGCGGTCAGTTCTTTAAACATTATTCAT*
98	*TTTCCTGGATCCCCCTTGCATACCC*
99	*AGGTAATCATGGTCCGTTGCGCTCCGAACGAACCATCTGGTC*
100	*TTGCTGAATCTAAAAGACTTTAAGGTAAGAGA*
101	*TGAAAAAACTAACAATTTGAGGACGACGGCTCAACACTT*
102	*CTGGGGTGCCGCTGCATCTGCAAGTGCGGGCAAGGGTGGGGTAGCAATT*
103	*GAGTTGTTATCCGCTCACATGGCTTCTAGACGGTTGTAACCCTCACAAC*
104	*GGATAACGCCACTGTTGCAGTCAACTGATAACAGACCGAGAAGCAGATT*

105	TAATTAATTTTTTGGATGAATCATTACCGACTGCCAGTGCATTAGCAAT
106	TTTAAGAAACTGATTATTTATACATTAGTTAAAATAAGATAGCAGAAAG
107	GGCGCCAGGGAAGCGGTCTCCAGCCCAGTTTCTGGAGCAGCCCCAAATG
108	GTGTGGCCCTCGCTTCTCGCATCGATGAACGACCCCGGAACGAGAAAAT
109	CAGTCACACGCCATTAAAAATACACACGACGATTCGCCGATAAATAAGA
110	CTTATAGCCCGATAACATCACTTGATTGGCAGATTCATGGCAAAGGGTC
111	GACTATTTGCTTACATCTGCAAATAGTGAATGAGCGCTCTATCTTATAA
112	CCTTATAAATGTTCCAGGGAACAATCAAAAAAAATTTTTGTTAAACATA
113	GAATGTAGCATACAAAATGGAAACCTTGCTTCTGTAAAAATCATATATG
114	AACCGTCTGAGGACATTACTGATAAACAGAGATATCAAACCCTCATGAA
115	GGCCTTGCTGTCCATCAATTATTCCATTTGATATTAATTAATTTTAGTC
116	TATCAACCCGCCTTCCTTATTTTGTTAAAATTCAGAAAAAACAAGCCGG
117	CCGAGCAAAAATTAATTAATCCTT
118	CGAAAAACCGCGTGGACTGTTTGAGGTT
119	TTTGACGCAAGAGTTCGGCAATTGCAGCTGGTTTTCGTGCCATAAT
120	AGAACCAGAAAATAAGGACGGTGTACCAACTTTCCTCTACCACCTACATCAC
121	GATAACTTTAATTCATTAGAGTAACGGAACGTTCCTCTACCACCTACATCAC
122	CATATGCAGAGCTCCAAACAGTTTCAGCGGATTCCTCTACCACCTACATCAC
123	CAATATAAAAGGAACCCGTAAATGAATTTTCTTCCTCTACCACCTACATCAC
124	AAAGAATTATAGCACCAACTGTAGTTTTCATGCCGCCATTCCTCTACCACCTACATCAC
125	GGCATGTTAGACTACAATTAGCGTAACGATCTTCCTCTACCACCTACATCAC
126	AGTGAGGGGACGAGTAATAAAGAATCTATCATGGTTGCTTCCTCTACCACCTACATCAC
127	ACTTTGGTGTATTGACCTAGGGTTTCGTTAGAATCAGATTCCTCTACCACCTACATCAC
128	ACAAGTAACATTACCTGAGTAAAAACGCCAGAATCCTGTTCCTCTACCACCTACATCAC
129	TGCTTTGCGTTCGGCCAAAGTGTAACACAACTTCCTCTACCACCTACATCAC
130	ACATAGAACCCTATTAGATTAACACATCACCTTCCTCTACCACCTACATCAC
131	AGACACCGCCAGACGGGCTTTCCATTAATTGATAGCTGTTCCTCTACCACCTACATCAC

Table S5. Staple strand sequences for p7308-24hb.

1	CACCACCGTCACTAAACAGTTAATGGGTCAGCGATTGCCCTT
2	CCAGGCATGATTCCCTCAGAGCCACCCTCAGTACGACTTGAG
3	TATGACGGGAGATAGAAAGGAACACAACTTTCAAAGACTCCT
4	ACAGGTTTTGAATGCGGGATCGTCTGAGGCTAAATTAACTGA
5	CAACCCATCCTAAGATTTGTATCATTATACCTTGCCTTAAAT
6	CATCAGTATAAATTCAGTGAATAATTACCCAGGATTTACGAG
7	CAATAGGTTGGGATTCAACTAATGGATTCATCAGCCAACGCT
8	TATAAAATTAATCAGAAAACGAGATTGAATCACTTATATAAC
9	CAAAGAACCTACTAGAGCTTAATTTTTGATATTTACATTTAA
10	ATTTACATTTGACATTAACATCCAAGGTGGCCTCATATCAAA
11	AGTAGATAAAACCGGAGACAGTCATAGGTAAAGGGATTTAGA
12	GCGTACATTTTGATATTTAAATTGGCCCCAAGCAGAGGTGAG
13	CGTTTTAGACAGATCGTAACCGTGGGGATAGAAACGCTCAAT
14	AAATATTCCAATGAAACCAGGGCGACCACGCAATACACCACC
15	TACAGAGAAGCCCAATAATTTGTTTATCGCGTTTTGCACCCT
16	TCAACAACCGCACTCATCGACATGTTTTTAGTATCCAGGCTT
17	TCATAGGTTAGTTAATTTCCGCTGAGCTAGAAGATCAATGAC
18	GATTGTTCAGTAACAGTACTATCAGAAAAACTAATAAATAAA
19	CATCGCCCATCACCTTGCTTAGTCTTCTTGCAACAAATAAAC
20	CAGTGAGAGTAGTATTCATTAAAGGTCCAGGGGAACGGAATA
21	CCCAAGCAAAGGTAAAAACAGGGAAGAGAGGCACGAACCTCC
22	CGACTTTGCTTCCCTGAACAAGAAAAATAACCTATGCGTTAT
23	ACAAATGAGTAGCTACCTTTTTAACCGCAATATTGAAACAAA
24	CATCACCTTAATCTTCTGAATAATGGCAGAATAATTAGAGCC
25	GTCAAACAATTTACCGAACGAACCACCGCCCCCAAAAACGCT
26	ATACATGAGGGACAAAATCACCAGTATCGGTCATTGCAGCAA
27	CAATTGAAAATAGGTAATTGAGCGCTTACCAGAACGTAGAAA
28	ATTTAGAACGCGTCGGCTGTCTTTCCTCCGGTAACCCAGCTA
29	AAACAGTGAATTATCCAATCGCAAGATAATTACAATCGCCAT
30	TCGTACATCAATAATAAAGAAATTGCTCATTTCTTTTAATGG
31	TTCACCTGATAGTGCAACAGTGCCACAAATATCTTCGACAAC
32	CTGGTTTGCCCCATTTGCACCATTACCATTAGCCGATTACAT
33	AAAGGTGGCAACAAGTAATATCAGAGAGATAACAAATTTATC
34	CTGAATCTTACCCTTATTATCATTCCAAGAACGTGCAACAAC
35	GCCAACATGTAAATCACAAAGAACGCGAGAAAAAATAGTACA

36	TAAATCAATATATTATGTAGATTTTCAGGTTTAAATTTTAAA
37	TCCTTTGCCCGATCTAGCTGAGAGCCAGCAGCACGAACAGTC
38	CGGAAACAAAACCGTCAAGTTTGCCTTTAGCGTAAACGTCAA
39	AGAATTGCCCAAATCTTACCGAAGCCCTTTTTAATTACGTGA
40	TAAACCAAATCGGAGAATCATTACCGCGCCCAATAGCCGTAA
41	TCAAATAGGAAAGCCGACCGTGTGATAAATAAGAATTAGAGC
42	AGATGAAAAAGGAGCTGATTGCTTTGAATACCACCAAGGGAA
43	AAAATCTCTGCGCGGGTCAGTTGGCAAATCAACAGGTGTAGC
44	GTTTTCAGACGGAACGGCCCCCTGCCTATTTCGGCATAAGGT
45	GATAGTTAGAATAAAAACTAAAGGAATTGCGAATCAGGCCTT
46	AGATATATAGATAAGATCGCCTGATAAATTGTGTTATGTTTA
47	ATAAATTTCTGAGAAACAGATACATAACGCCAATTGACAAAA
48	CGCAGTATGGATTACTGCTGAATATAATGCTGTGAAGATCCT
49	TGAGGAGATTAAAATGAATCACCATCAATATGAAAGGTAAAA
50	TTGTCAATCGTCTTAATAGTACCGAACCTATTATTCCGGAAT
51	ACAAATTACGAAAGCGTATTCGGTAATAATTTTTTATGACAA
52	AAAGTAAAATCTACAGCCGGATATCGAAATCCGCGGCTGACC
53	ATTAAAACGGAAGCCCATAAATAAAGGAATTACGAAGACTGG
54	GCGGATGAAAAATTGCGCGAGCTAGCTCAACATGTAATAACC
55	GACCTCTGTAACAATTTAATCAGTATTCAACCGTTAACTAGC
56	GTTTACCAGCGCAATCTATCAGGGCGATCGATTCAACAAGGC
57	CAATCCAAATAAATCAAGTTTTTTGGGGCGACGTCAACCACA
58	TGTCCAGACGACAGACCCTAAAGGGAGCCACAGCTAAGGTAT
59	CATAGCGATAGCACCGGCGAACGTGGCGACAAGAGTCCTTTT
60	GGAATTATCATCGCCGGGCGCTAGGGCGTTTGATGGCACGTC
61	AGACAATATTTTCTTAACCACCACACCCTTTAATGCGAATGA
62	AGGGCGAGTCATCGGCAGCAGGCGAAAAGACTCCACAAGAGT
63	ACCATCAAGCCGAACAATATAAAAGAAAGGCCCACTCATATG
64	AGCACTAAGTAGAAGGAACGCTAACGAGTCGAGGTTTTATCC
65	TTGACGGTACACCGGATTTAGGCAGAGGCCCCGATGTAATTC
66	GAAAGCGTAAGGCGAATGTGAGTGAATAAGAAAGGTTGAAAA
67	GGTCACGAAAAGGTTAACGTTATTAATTCTGGCAAAAGGAGC
68	GCCGCTACGGGTAATAATAAAAGGGACAGCCGCGCGTGGCAC
69	GGGGTGCTGTGCCTTGAGTAACAGTGCCAAAGTGTAACATGA
70	TTCCACAGCCAACAGTTTCAGCGGAGTGTTATCCGTTGAAAA

71	GGTCATACTAAGCGCGAAACAAAGTACAGAATTCGGCTCCAT
72	CGTATAACTCAGTTGAGATTTAGGAATAGCATGGCTAGTAAG
73	CGAGGCAAGAGAGGTCATTTTTGCGGATTAGACCTAATATGC
74	CCAAGCTGTAGATTCAAAAGGGTGAGAAAACGACGCTGATAA
75	ATTGCGTCTAATGACCCTCAGAACCGTGGTAATGAAAAGCCT
76	CAGAACCCAACATAGGAACCCATGTAGTATGGGCGCTCACAA
77	AAGGCCGGCTGTTTGGTAGCAACGGCATCTTTGCTTAATCAT
78	AAAGCTGGGATCCCGTAAATTGGGCTCATTATTCATAGTACC
79	TTTAAACAGTCCGCGACTATTATAGTGTACCTTTATTGATAG
80	AATAGTATGCATGCAATTAAGCAATACAATGCCAGGCCAGTG
81	TGTATAATTCCCAGATTTTTGTTAAACGGCGGATCGTAACGC
82	ACCGGAACCGCCAAATCCCCCTTATTAGGTTTGATGGTGGGC
83	CTCATTTTCAGGTACAAAACCGAGGAAAAAGACACCACGGCA
84	CAGCAGCGAAAGGCGTTAAGAACGCGAGTTTCCAGAGCCTTC
85	GCCCTGACGAGAGAGAAAAAAGCCTGTTTTCGAGCCAGTAGA
86	CATAAATCAAAATCTATACCTGAGCAAATGCTTCTGTAAACG
87	TCATACAGGCAATGATAGGAGCACTAACAAGTTTGAGTAAAT
88	GTTAATATTTTGTAAAACCGCCAGCCATGGCCAACAGAGACC
89	TTTCCCTCAGAGCCTGGCTTTTGATGAAGCTTCCGAAATCGG
90	GCGATAGCAAGCCCTCCAGACGTTAGGCAGAATAAGTTTATT
91	CAACAGCATCGGAAAGGCAAAAGAATCAAAAATTTGCCAGTT
92	TAAACACCAGAACGGTTAATAAAACGAAAAATAAGAGAATAT
93	GCATCAGGTCTTTAAAACTCCAACAGCAATTCGTCGCTATTA
94	AAGGCAAAGAATTATTTAGAACCCTCTAGACATTATCATTTT
95	CGTTAAAATTCGCACCCGTCGGATTCGGGGTAGAACCCTTCT
96	AAGTAGGAGGTTTACGAGCCGGAAGCATCGAACCGCCACCCT
97	TCTCCACCGATAAGCCTGTGTGAAATTGAGTGCAGGGAGTTA
98	GTTACACAAGAATACGGGTACCGAGCTCACAATCAACGTAAC
99	AGCAAAATCGTCCTTAGCGACCGTATACCCCCCCTCAAATGC
100	AACTATTGGGGCAACTGCAGGTCGACTCGGATCAATTCTACT
101	ATTAACGGTTGAAATCACGACGTTGTAAAGAAACAGGAAGAT
102	GTTTCCTCATTAAGAGGCTGAGACTCGTACCCACCCTCAGAG
103	GAGGACATAAAAAAAAAGGCTCCAAATTCTCCGTAACACTGA
104	ATTTCCTTGTTAGCCGGAACGAGGCGACTCTACAGAGGCTTT
105	GGATTGCGGCACTATCATAACCCTCGACAATGAGATGGTTTA

106	ATAAATCATAAGTACGGTGTCTGGAAGAGACAGAAGCAAAGC
107	TTAACACCCTGCCGGAGAGGGTAGCTAATGAAGCCTCAGAGC
108	CAGAGCCGCCAGGAGTCTCAAGAGAAGGATCACCGTAGTCAC
109	CAGTACAAAATGAATTAGGAGCCTTTAATTGCCCACGCTAAA
110	GACTTTTTCCTAAAACCAGACGGTCAATCAGAGTAATAACTT
111	TAATCATTGTAACGGATTTACCAGACGACGCAATACTGCATC
112	AAAAAGATTAGGATTAGTTTCATTCCATATTATATTTGCTAA
113	ATCGGTTGTTATTTTAATTTTTGAGAGATCCATATGTCAATA
114	CTAAAGTTTTATTAGGGAGAGGGTTGATATATACACCAGGCA
115	ACCAACCTAATCGTATTGATACCGATAGTTTAACTACACGAT
116	TTGGGAAGACAATAAGGTACAGACCAGGCGACAATGAAAGGC
117	GCGAACCAGGTCATAAGAGGGGGTAATAGTAACTGAAGGACG
118	AACGCAAGGAGCAACATTAGATACATTTCGGTCAAGATCAAA
119	AATGTGAGCAATTACAGAATCGATGAACGGATAACCAATTTC
120	AGGTGTGAATCGATAGCAGCACCGTATAGTATAGCCTAAGTT
121	CAACCAATTAAGAGCAAGAAACAATGTAGCCGACACAATTTT
122	TTCATAACAAGAACAAGCAAGCCGTTCATAGGCTGACACCCC
123	ATAGCACGAATCTTCTGACCTAAATTATAATGTTTGGACAGG
124	TGTTTATATCTTTTACATCGGGAGAAAAAATGGTCTTTAATT
125	ATGTCGAATGAACCTCAAATATCAAAAGATCGTAACTTGAGT
126	CGCCGCCAGGGCAGACTGATCAGTAGCGACGCGGATAAGAGC
127	CAGTACCAGAGCAAAGACACAATCAATAGACCTCATAGTGCT
128	ACAGACAGCAAAGAAAAGAAATAGCAATAGAATTTCTTATCC
129	TTCGAGGTGCTGAAACGAATAAACAGCCATACGTAATGCGCT
130	GGGTAAAATATTAGCAAGTTTATTTTCATCAGGACAGATAAC
131	CTTTGAAAGGTGACAATAACCGACAAAAGGCTCATTATACAA
132	AAGAACTGGTAGCGTTAATAATGGTTTGAAAAAAGAAGTTTT
133	GGCTTTTGCATTTAGATTTTTTCCCTTAGACGTTTTAATAGA
134	CAAATATCGATAGTTACAACAATAACGGATAGATTTAGTCTT
135	CGAACGAGTTCATATTCCACAAAGAAACCATGCGGGAGACTG
136	TAATACTTTCCAGTTGAACCCTCAATCAATTCTGGAGCACTG
137	GCCTGAGAGATTGAATGGGAAAGCGTAAGAAGCCAGCTTATT
138	CCTTCCTGTATCAAACTATTAGTAATAACATCGCCATTCTGG
139	TAAAGAACTTTTGGGAATTAGAGGAATTATCGCCTGGCCCTGTTCCTCTACCACCTACATCAC
140	TTTGCGGGACCCTGAACAAAGTCCGCATTATACGCAGTATGTTTCCTCTACCACCTACATCAC

141	*ATTTCTTACGTAGAAACCAATCAATAATATGATTAGTTGCTATTCCTCTACCACCTACATCAC*
142	*TAAGAAAACATGTAAATGCTGATTCCGGCTCAGTAGGGCTTATTCCTCTACCACCTACATCAC*
143	*AATAGATAAATTTGCACGTAAAAAAGGGTTTTTCATTTGAATTTCCTCTACCACCTACATCAC*
144	*ATAAATACCGTCAGTATTAACACCAGCAGAATTAGACTTTACTTCCTCTACCACCTACATCAC*
145	*AACCACCACCAGTGCCGTCATTAGCGGGGTTTTTAGCGTAAATTCCTCTACCACCTACATCAC*
146	*CGCCTGTAGCATAACAGCTCGGTTTATCAGCTTCACTACGGGTTCCTCTACCACCTACATCAC*
147	*AAGTTTCCATTAGAACGGTGGAACCGAACTGACCCAGTCATTTTCCTCTACCACCTACATCAC*
148	*ACCTTATGCGATTTTGCCAAAACCAAAATAGCGTCGAGCTGGTTCCTCTACCACCTACATCAC*
149	*AAGCCCGAAAGATTGACCAGTTGATTCCCAATTAGCCTTTAATTCCTCTACCACCTACATCAC*
150	*AACATTATGACCAACAAGAAAGGCTATCAGGTCTCATCAAAATTCCTCTACCACCTACATCAC*

Table S6. Staple strand sequences for p7308-6hb.

1	AACGCTCATGGAAATAATGAGTGAGCTATGGGTAACGCCAGGTTCCTCTACCACCTACATCAC
2	ACTTGCCTGAGTAGTGAATCGGCCAACGAACTGTTGGGAAGGTTCCTCTACCACCTACATCAC
3	ATCAGTGAGGCCACCTGATTGCCCTTCAGGAAGATCGCACTCTTCCTCTACCACCTACATCAC
4	ATCAGAGCGGGAGCGATGGTGGTTCCGAATGGGATAGGTCACTTCCTCTACCACCTACATCAC
5	ACACCCGCCGCGCTAAGAGTCCACTATTTGTAGCCAGCTTTCTTCCTCTACCACCTACATCAC
6	GTGGCGAGAAAGGATCACCCAAATCAAGAAAATTCGCATTAATTCCTCTACCACCTACATCAC
7	AAGAACTGGCTCATCGGAACAACATTATTACCCCGGTTGATATTCCTCTACCACCTACATCAC
8	GAGAAACACCAGAAAAAGGAATTACGAGGGCTATCAGGTCATTTCCTCTACCACCTACATCAC
9	GAGTAATCTTGACATTTTGCAAAAGAAGCAAATCACCATCAATTCCTCTACCACCTACATCAC
10	TAAGGGAACCGAACATTCATTGAATCCCTTTAGAACCCTCATTTCCTCTACCACCTACATCAC
11	TTGTATCATCGCCTATTATAGTCAGAAGAGCTAAATCGGTTGTTCCTCTACCACCTACATCAC
12	CGAAAGAGGCAAAATTCAAAGCGAACCAAATAGTAGTAGCATTTCCTCTACCACCTACATCAC
13	CTGGAAGTTTCATTCCATATAACAGT
14	AGGATCCCCGGGTACCGGCTAGTACCCGTATA
15	TTAAATATGCAACTAAAGTACGGTGT
16	GTTAAAGGCCGCTTTTGCGGGATCGTCACCCTCAGCAGCG
17	ACGCATAACCGATATATTCGGTCGCTGAGGCTTGCAGGGA
18	ATATTTTAGTTAATTTCATCTTCTGACCTAAATTTAATGG
19	TTTGAAATACCGACCGTGTGATAAATAAGGCGTTAAATAA
20	GCAAGTCCGCTAGCATCATAATTACTAGCAAAGAACGCGAGA
21	GCTTGCATGCCTGCATACAAATTCTTACATATAACTATATGT
22	GTTTTCCCAGTCACGCTTAATTGAGAATGTCTGAGAGACTAC
23	AGGGGGATGTGCTGTTTAGGCAGAGGCAAGACGCTGAGAAGA
24	GCGATCGGTGCGGGAGTACCGACAAAAGTTTCCCTTAGAATC
25	AAAGCGCCATTCGCATAAACAACATGTTAGTGAATAACCTTG
26	CAGCCAGCTTTCCGAACAATAGATAAGTTTACCTTTTTTAAT
27	TGAGGGGACGACGATAATTTACGAGCATTCAAGAAAACAAAA
28	GTTGGTGTAGATGGTTCCTTATCATTCCTCATTTCAATTACC
29	CGTGGGAACAAACGCTCATCGAGAACAAGCTTTGAATACCAA
30	ATCAACATTAAATGATCATTACCGCGCCTACCTTTTACATCG
31	ATCAAAAATAATTCCTTATCCGGTATTCGTAGATTTTCAGGT
32	ATTTTTGTTAAATCCCCGACTTGCGGGATATCAAAATTATTT
33	TTTAAATTGTAAACTGCTATTTTGCACCGCCCCCTGCCTATC
34	ATCAGAAAAGCCCCAACGCTAACGAGCGGGGTCAGTGCCTTG
35	ATCGTAAAACTAGCAAAATAAACAGCCAGCTTTTGATGATAC

36	TGCCTGAGAGTCTGCGATTTTTTGTTTAGCGCAGTCTCTGAA
37	GGGTAGCTATTTTTCAGAGAGAATAACATATTCACAAACAAA
38	TATGATATTCAACCGAATTAACTGAACAGCATTGACAGGAGG
39	CAAAAGGGTGAGAACGCTAATATCAGAGCCCTCAGAGCCGCC
40	ATATTTTAAATGCACAATAATAAGAGCATCAGAGCCGCCACC
41	CCTTTATTTCAACGTACCGAAGCCCTTTTCAAAATCACCGGA
42	TACCAAAAACATTAAAGTTACCAGAAGGTCGGTCATAGCCCC
43	AATTAAGCAATAAATACCCAAAAGAACTTTGCCTTTAGCGTC
44	TAACATCCAATAAATATGTTAGCAAACGCCATCGATAGCAGC
45	GAGCTGAAAAGGTGATATAAAAGAAACGGCACCATTACCATT
46	AATGGTCAATAACCGTCACAATCAATAGACTTGAGCCATTTG
47	GCGAACGAGTAGATGACAAAAGGGCGACTGACGGAAATTATT
48	AATCATGGTCATAGCATTCTGGCCAACAAATACGTGGCACAG
49	TCACAATTCCACACCATTGGCAGATTCATAATGCGCGAACTG
50	AAGCCTGGGGTGCCTACCTACATTTTGAACCGAACGAACCAC
51	GTTGCGCTCACTGTATTACCGCCAGCCGTCAGTATTAACAC
52	CCAGCTGCATTAAAAGAACTCAAACTAAGCAGCAAATGAAA
53	GTTTGCGTATTGGGCAATACTTCTTTGAAAATATCAAACCCT
54	GAGACGGGCAACAGCGAGTAAAAGAGTCAACAGTTGAAAGGA
55	GAGAGTTGCAGCAACGCCAGAATCCTGAAGGAGCACTAACAA
56	CGAAAATCCTGTTTTAAACAGGAGGCCGTACATTTGAGGATT
57	CTTATAAATCAAAAGCACGTATAACGTGGACAACTCGTATTA
58	TTCCAGTTTGGAACTAATGCGCCGCTACAAAAGTTTGAGTAA
59	CCAACGTCAAAGGGTGTAGCGGTCACGCACCAGAAGGAGCGG
60	CACTACGTGAACCAAGGGAAGAAAGCGATGATGGCAATTCAT
61	GGTGCCGTAAAGCATAGAGCTTGACGGGCTTTTCGGAACCTA
62	ATAAAACGAACTAATATACCAGTCAGGAGCTGAGACTCCTCA
63	TTCATCAGTTGAGAATCATTGTGAATTAGCTCAGTACCAGGC
64	GATACATAACGCCACGAGTAGTAAATTGAAGTATAGCCCGGA
65	ACACTATCATAACCTCATTCAGTGAATATAGTACCGCCACCC
66	AAATAGCGAGAGGCAGAACCGGATATTCCCTCAGAGCCACCA
67	GTAATAGTAAAATGGGCGCATAGGCTGGTAGGAACCCATGTA
68	GAATCGTCATAAATTGACCAACTTTGAAAAACTACAACGCCT
69	AACAGTTCAGAAAAGCCGGAACGAGGCGTAGCGTAACGATCT
70	TCTTTACCCTGACTGATAAATTGTGTCGTAAATGAATTTTCT

71	TCAAAAAGATTAAGCAAGCGCGAAACAACAGTTTCAGCGGAG
72	GTTTTAATTCGAGCGAATACACTAAAACTTGCGAATAATAAT
73	TCCAACAGGTCAGGATGCCACTACGAAGAGGCTCCAAAAGGA
74	TGATAAGAGGTCATCTTTTTCATGAGGAGCTTTCGAGGTGAA
75	TGAATATAATGCTGAACGAGGGTAGCAAGCGCCGACAATGAC
76	AGTAATAAAAGGGACTGTTTCCTGTGTGCCTTTGATAGCGAG
77	AAATGGATTATTTAAACATACGAGCCGGACGGCCAGTGCCAA
78	AATATCCAGAACAACCCGCTTTCCAGTCCGCCAGCTGGCGAA
79	ATTAACCGTTGTAGCGCCAGGGTGGTTTGCCGGAAACCAGGC
80	AGACAGGAACGGTAGCGGTCCACGCTGGTGCATCTGCCAGTT
81	GGTTGCTTTGACGAGAATAGCCCGAGATCCCGTCGGATTCTC
82	AGGGCGCTGGCAAGCGAAAAACCGTCTACCAATAGGAACGCC
83	GGGAGCCCCCGATTCTAAATCGGAACCCTGTATAAGCAAATA
84	TAATTTCAACTTTATTTAGGAATACCACATCGATGAACGGTA
85	CGTAACAAAGCTGCCTCGTTTACCAGACATTAATGCCGGAGA
86	CGGTGTACAGACCATTTAGACTGGATAGTGTAGGTAAAGATT
87	CTCCATGTTACTTACGAGAATGACCATATTTTGCGGGAGAAG
88	CCCAGCGATTATACAGGAAGCCCGAAAGCAAAGAATTAGCAA
89	GGGTAAAATACGTAATTAGAGAGTACCTTTCATTTGGGGCGC
90	TTGAGGACTAAAGATTTTGCGGATGGCTAGATACATTTCGCA
91	AAAGACAGCATCGGTAGCTCAACATGTTTGATTCCCAATTCT
92	ACAATATTTTTGAAATCCAATCGCAAGAAAAAAGCCTGTTTA
93	ATAGCCCTAAAACAGCTTAGGTTGGGTTCAGTATAAAGCCAA
94	CAGCAGAAGATAAATATCAAAATCATAGCGCCATATTTAACA
95	CGCCTGCAACAGTGGATAGCTTAGATTATTTTCGAGCCAGTA
96	AATCTAAAGCATCACGCTATTAATTAATGTAAAGTAATTCTG
97	CAATCAATATCTGGAATCAATATATGTGCAGCTAATGCAGAA
98	ATTGAGGAAGGTTACAATTTCATTTGAACCTGAACAAGAAAA
99	CTAATAGATTAGAGTGATGAAACAAACAGTAGAAACCAATCA
100	TAGAAGTATTAGACCAGAGGCGAATTATAAGAACGGGTATTA
101	AATCCTTTGCCCGAGGATTCGCCTGATTGCAAGCCGTTTTTA
102	CATTATCATTTTGCATATACAGTAACAGCAATAGCAAGCAAA
103	AATTATCATCATATAATAAAGAAATTGCTAAGAACGCGAGGC
104	CAATATAATCCTGAGTTAGAACCTACCAGGTTTTGAAGCCTT
105	TTATTCTGAAACATTATAAACAGTTAATCAGCTACAATTTTA

106	AGAGAAGGATTAGGAATAAGTTTTAACGTCTTTCCAGAGCCT
107	GGATAAGTGCCGTCAAGCGTCATACATGTATTATTTATCCCA
108	ATAGGTGTATCACCAGCCAGAATGGAAAACGTCAAAAATGAA
109	TCAGAACCGCCACCACGATTGGCCTTGATAAAAACAGGGAAG
110	CCCTCATTTTCAGGCAGAGCCGCCGCCACCCTGAACAAAGTC
111	CCGTAACACTGAGTCCTCAGAGCCACCAAGATAACCCACAAG
112	GTAGCATTCCACAGCGGAACCGCCTCCCAGAAACAATGAAAT
113	AAAGTTTTGTCGTCCCATCTTTTCATAATTAAGAAAAGTAAG
114	GTATGGGATTTTGCTTTCATCGGCATTTAAACCGAGGAAACG
115	TGAGAATAGAAAGGCGACAGAATCAAGTGGCATGATTAAGAC
116	TTTTTCACGTTGAACGTCACCAATGAAATAGAAAATACATAC
117	GCCTTTAATTGTATCAAAATCACCAGTACAAAGACACCACGG
118	TTTCTTAAACAGCTTATCACCGTCACCGAAAATTCATATGGT
119	AACAACCATCGCCCGGGAAGGTAAATATATTCAACCGATTGA
120	AAACTTTTTCAAATCCTGAAAGCGTAAGGAGATAGAACCCTT
121	AAATGCTGATGCAATGGCTATTAGTCTTCCAGTCACACGACC
122	CTTTTTAACCTCCGTCGCCATTAAAAATCGCTCAATCGTCTG
123	GTCAATAGTGAATTACAGAGGTGAGGCGATTGCAACAGGAAA
124	CTTGAAAACATAGCCCACGCTGAGAGCCTCGGCCTTGCTGGT
125	CTTCTGTAAATCGTCCTTGCTGAACCTCTTAGTAATAACATC
126	GGAAACAGTACATATCAGTTGGCAAATCTGTCCATCACGCAA
127	TTAATTACATTTAATCTAAAATATCTTTGAAGTGTTTTTATA
128	TGAGCAAAAGAAGACCGTCAATAGATAAATTAAAGGGATTTT
129	GTTACAAAATCGCGTTTACAAACAATTCCTTTCCTCGTTAGA
130	GGAGAAACAATAACACGTTATTAATTTTAGGGCGCGTACTAT
131	TTAACGTCAGATGAGGAACAAAGAAACCTGCGCGTAACCACC
132	GCACGTAAAACAGATCCTGATTATCAGAAAGGAGCGGGCGCT
133	TGAATAATGGAAGGTTGTTTGGATTATAGAAAGCCGGCGAAC
134	AGTAACAGTGCCCGGAAAGTATTAAGAGCGTTGGGAAGAAAA
135	AGGAGTGTACTGGTATTAGCGGGGTTTTCCTTATGCGATTTT
136	TTTACCGTTCCAGTGAGAGGGTTGATATGGCTTGAGATGGTT
137	TAAATCCTCATTAAGTACTCAGGAGGTTAGGCTTGCCCTGAC
138	TTGAGGCAGGTCAGCTCAGAACCGCCACATTACCCAAATCAA
139	ACCAGAACCACCACGATAGCAAGCCCAACTGACCTTCATCAA
140	CTCAGAACCGCCACTTCGTCACCAGTACAGAGGACAGATGAA

141	ACCAGAGCCACCACACAGCCCTCATAGTCAGACGGTCAATCA
142	CTTATTAGCGTTTGTTTCCAGACGTTAGAAATCCGCGACCTG
143	AGACTGTAGCGCGTTAAACAACTTTCAAAGTACAACGGAGAT
144	ACCGTAATCAGTAGAACAACTAAAGGAAACTCATCTTTGACC
145	AGCAAGGCCGGAAAAATCTCCAAAAAAAGCACCAACCTAAAA
146	GGAATTAGAGCCAGCGGTTTATCAGCTTAGTTTCCATTAAAC
147	CATTAAAGGTGAATTGATACCGATAGTTCGGCTACAGAGGCT
148	GAATAAACACCGGAGACCGTATACGCATGAGCTCGAATTCGT
149	GTATCATATGCGTTAGGTCGACTCTAGAAAATTGTTATCCGC
150	CGCTCAACAGTAGGGACGTTGTAAAACGAAGCATAAAGTGTA
151	ACGCCAACATGTAACAAGGCGATTAAGTACTCACATTAATTGC
152	ATAAGAGAATATAACCTCTTCGCTATTAGGGAAACCTGTCGTG
153	TCCAGACGACGACACATTCAGGCTGCGCCGCGGGGAGAGGCG
154	CGCGCCTGTTTATCGCACCGCTTCTGGTTTCTTTTCACCAGT
155	ATAATATCCCATCCCAGTATCGGCCTCACCGCCTGGCCCTGA
156	ATAATCGGCTGTCTGCGCATCGTAACCGTTTGCCCCAGCAGG
157	AACCAAGTACCGCAGCGGATTGACCGTAAATCGGCAAAATCC
158	TTTTCATCGTAGGATGAGCGAGTAACAAAGGGTTGAGTGTTG
159	TCAGATATAGAAGGGCGTCTGGCCTTCCAAAGAACGTGGACT
160	GTTTTAGCGAACCTAGCTCATTTTTTAATCAGGGCGATGGCC
161	AAATCAAGATTAGTGTTAATATTTTGTTTTTTTTGGGGTCGA
162	TCCTGAATCTTACCAAAAACAGGAAGATTAAAATCTACGTTA
163	AATTTGCCAGTTACATGTCAATCATATGTACAGGTAGAAAGA
164	ATCCAAATAAGAAAGAGCAAACAAGAGAATTCAACTAATGCA
165	AATAGCAGCCTTTAGAGAGATCTACAAAGCATAGTAAGAGCA
166	CGCATTAGACGGGAGTTCTAGCTGATAAGACGATAAAAACCA
167	AGAGGGTAATTGAGAGGCCGGAGACAGTTTTTGCCAGAGGGG
168	AATTGAGTTAAGCCATGCCTGAGTAATGCGTCCAATACTGCG
169	AGCAATAGCTATCTCAAGGATAAAAATTCCTCAAATGCTTTA
170	CAGATAGCCGAACATGACCCTGTAATACAATCAAAAATCAGG
171	CAATAATAACGGAAGCCTCAGAGCATAACAAAGCGGATTGCA
172	TCCTTATTACGCAGTCATACAGGCAAGGACTTCAAATATCGC
173	ATAAAGGTGGCAACGCATCAATTCTACTGACCGGAAGCAAAC
174	AATAAGTTTATTTTTGTTTAGCTATATTTTAATTGCTCCTTT
175	TTACCAGCGCCAAATTAGTTTGACCATTTAGAGCTTAATTGC

Table S7. Staple strand sequences for p7308-6hb-octahedron.

1	TGGACTCTGAGTGTCAGCAAGCGGTCCAAAGGGAGGTTTTTT
2	GAAATCGCTATTTCGATGATACAGGAGTCAAATAAGACGATT
3	AAATCAATAAACAGTAATAAGTTTTAACAGGTGCCGTAAAAT
4	ATAGGGTCATTGAGGTGCCACGTCAAAGAAATCAACCCCCGA
5	AGCAGGCATGCACTAAATCGGAACCCTACGCTGGTGCCCGAG
6	GGCCTTGGAAAATCCTGTTTGATGGTGGCAGGTCAATCCTCA
7	TTAAAGCGGCTTTTGGAACCTATTATTCAGAAGGACGGGGTT
8	GGGGTCGGGGGTCATAACAGTGCCCGTAAAGAATATTGCCCC
9	CATACATCAGAATGACAGGAGGTTGAGGTTATTAGTTAGGCC
10	ATGCGCCGTGTAGCAAGCCGGCGAACGTAACAGTTGCGGAAT
11	TACGCCAACGTGCTCCAGACGACGATAAACATTCATCATCAG
12	AAAGGAGTTGCTTTAATAGCGAGAGGCTAATATTCATTGAAG
13	CTGGCAAGCTACAGAAGAAGTTTTGCCACAATACTCAGAAAA
14	GGAAGAATTATCCCCCTCAAATGCTTTAGGCGAGATAGGGCG
15	TTGAGATAGGTGTTTTTATAATCAGTGAGAAAGATACTAATG
16	CAGATACTCGTTTATTCCTCGTTAGAATTTAGACAGAGTAAA
17	CGTCATATTTGCAAGGCGCGTACTATGGCGGGCGCAAGGAAG
18	ATAACCCATAACGCCATTATTACAGGTAGGCCACCGGAACGG
19	ATGCTGACCTTTTTTAGCTTAGATTAAGGTCTGGAAATGCTG
20	GGCGTTACAAATATGGAAGCAAACTCCAATTGCATACTATTA
21	TTATCAAAAGAACGAGGATTAGAGAGTAACATGTTTTAAAGC
22	GAGACTATGCAAATTTGCTCCTTTTGATTGAATATAGTTTCA
23	CAATAGTAATATGCAACTAAAGTACGGTACGCTGAGGTCTGA
24	TAGTCAGGACACCGGAATCATAATTACTTACCCTGCAAAAAG
25	ATTAAGACCAGACCATTTTAGTTAATTTCGTGTGAGCCTGTT
26	TAGCTCACCTTTAACCAATCGCAAGACAAATCATAGAAGAGT
27	AAGCGAAGGAAGCCAAAAATCAGGTCTTAGAAAAATAAATAA
28	AAGAGAAAACGCCAACAAATTCTTACCATTGCCCTGCCAGGG
29	AAATAATCGACAATTGCGTTGCGCTCACACAATTCTCCTGTG
30	GGCTTAAAAAGTAATTTCCAGTCGGGAATCTTTTCACCAGTA
31	ATTTAACTATAAAGGTGCCAGCTGCATTATTGGGCTCACCGC
32	CTCAACAGTTGAGACGGGCAACAGCTGAGTATAAATCGCCAT
33	TGAAATTGTTTTACGAGCATGTAGAAACAGCTGTTCACACAA
34	CATACGACATTAATAAACAACATGTTCAGTCCTGATAATCGG
35	TGGTTTTACCTGTCTACCGACAAAAGGTTTGAGAAGCCAACG

36	TAACTCAGCCGGAAGTAATCATGGTCATCAATCAAACAAGAA
37	GGCTTATTAGGAATCCAAGAACGGGTATCGTTAGTCCTCATA
38	CTTACCACTTGCGGCTCATTTTCAGGGAGTATCACGATATAA
39	AACAAGCGCGTTTTCCCAATAGGAACCCTAACGATCTAAAGG
40	TTCATCGCCGGTATGTAACACTGAGTTTAGACAGCAAATGAA
41	CACTCATCCGTTTTGTCGTCTTTCCAGATAAACCATTTTATT
42	GTATAGCCGGTCTTTCCAGAGCCTAATTGAGGGTTCGTACTC
43	AGGAGGTCACCACCGAGGTTTTGAAGCCATTTTATTACAAAA
44	GTTAGCGATGTACCTCTAAGAACGCGAGAAGCCGTAGTACCG
45	TCAGAGCTTAGTACATAAGTGCCGTCGATGCCAGTCCTGAAT
46	ATGTGCTATCGGTGCTTCTGGTGCCGGAATTTTCCATGTGAG
47	AAGTCCGCGACGTTAAAGAAGATGATGATAACGGAGTACCTT
48	TCAGGCTACGCCAGATCAAGAAAACAAACCTTGCTTCTGTGA
49	AAGGGCGGCAAGGCACATTTAACAATTTTCAATATCTTAGAA
50	CCATTCGGGAAATCGTCGCTATTAATTAAACCAGGTGTTGGG
51	TTACATCCCTACGCATGGCTAGTACCCGAGTAACATTCGCCT
52	GATTGCTCTGAGCAGTAAAACGACGGCCTTTGATAATCCCCG
53	TGAATAAATTAATTGATTAAGTTGGGTAGCGCAACCAAAGCG
54	CAATTACTTGAATATCAGATGAATATACTATAAGGGCGAGGC
55	GAGCCTTATAATTTGCTAAACAACTTTCTAAAGAAGGTTAGA
56	CGCTGAGTAAACAGACCAGAAGGAGCGGACTCGTAATTAGAC
57	AAAGGAATTGCTTTATCATATTCCTGATATATCAAAATTAAA
58	GCGAATATAATTGTTGATGGCAATTCATATGGAAGATTGCGT
59	AGTGAGAACTTTGCACGTAAAACAGAAAAACAGTTAGGAATT
60	TTTACAAATTTAAAGGCCGCTTTTGCGGTAGAAGTTTAAATC
61	CTTTGCCAGAAACCCTTGATACCGATAGCCGATATACCCTCA
62	ACCTACCTATCAGAATCGGTTTATCAGCCAACTAATCAGCGG
63	GGAACAACGAACGTTACATTTGAGGATTGATCGTCATTCGGT
64	CCATTGCAACTATCAAATTAACCGTTGTAACGCAAAACATTA
65	CCAACAGAATCGTCGTAGTAGCATTAACTTCGCAAGATTTAG
66	ACATCACAATACCTAAATCATACAGGCAGTAATACTTTTGTA
67	GAACTCAAACAGGAGAATTAGCAAAATTTACCAAAGGATAAA
68	GATTAGTATCGGGAGAAGCCTTTATTTCAGCAATAAGTAGAA
69	TTTGACCAATCTGACCTGAAAGCGTAAGACGAGTAATGGTCA
70	ATAACCTACTAATATGAAATGGATTATTAAGGGACGGCACAG

71	TGACCCTAGGCAAAAAAACGCTCATGGATTGCCTGCTTCTTT
72	CAATTCTGTTTAGCTCCCAATTCTGCGAAATACGTATTCTGG
73	TGCAACAAGCAGAATATTAGTCTTTAATAAGATCGGTGCATC
74	ATTGAGGTCACCTTAATGTGAGCGAGTAAGCTCATATTCGCA
75	CGCCATTGCAAATGGTCGGATTCTCCGTTTGAGGGGACGATG
76	AACCACCGTGCCACAACGGCGGATTGACCGTAACCCACTCCA
77	CCCTAAATTCGACAGTATCGGCCTCAGGGCGCGAACCGAACG
78	TTAAATTACAATATCTTTAGGAGCACTATGTTAAATTTTTAA
79	CCAATAGAACATTAGCTGAACCTCAAATAACAGTTATAGATT
80	TGCCAGTGGGAACAGCTGAGAGCCAGCAAAAAATACTGATAG
81	TTTCATCGAACGCCAAACGTTAATATTTACAACTAGAAAGGA
82	AGCTGCTATCTTGATTTGAAAGAGGACACAGAACCCCTCAGA
83	ACTGGCTGAGTAGTATTTTCGGTCATAGCCATCGAAAGGCCG
84	ATAGGCTCCTGACGATTAGCGTTTGCCACCCTCAGAGCCACC
85	AAGAGTACATTCAGATAATCAAAATCACCCGCCACACCACCA
86	AGACCAGCACCACCCTCAGAGCCGCCACGATGAACCTTCATC
87	GAAACGTGCCAGGACGTTGGGAAGAAAACATTAGCTAGCAGC
88	ACCGTAACATCGGCAAATTGGGCTTGAGATGCGATTTAATAA
89	ACCGCCATCTTTTCTGAATAAGGCTTGCGGCTGACGGTGTAC
90	GCGTTTTTCAGTAGAGTAGCACCATTACATCTACGTTTAAGA
91	ATTAATGAGTCAAAATATTTTAAATGCAGCCATTTCGGAAAT
92	TATGTACAGGTCATAGTTTATTTTGTCAACGCAGTACTGGCA
93	ATTCAAAGAGAGATTAGAAAATTCATATTAAAGGTGAATTCT
94	CGGAGACCCGGAGACAGCGCCAAAGACAATATTGAGGGAATT
95	TGTAGGTGAATCACCGTCACCGACTTGAATGCCTGGAAAGGC
96	TGATTAAAATCAGAAAAGCCCCAAAAACCAAAAGAATGTTAG
97	CAAACGTCGGAATATGCCTGAGAGTCTGTAGCATGTTGTATA
98	TATTCATGGTTTACGGGTAGCTATTTTTAGGGTGAAGTAATG
99	GACACCAAGAAAATAATAACGGAATACCAGGAAGATCAATCA
100	TGAACACAGAATAAATCCCAATCCAAATCGGTCAAAATCCGC
101	GAAGCCCGATAACCAAGAATACACTAAATTTTCATACAGAGG
102	AAAAATGATTGAGCTCTTTGACCCCCAGTCCATGTTACTTCT
103	TACAGAGCCTGAACACCAAGCGCGAAACGTGTCGATCATAAG
104	TGTTTAAGAAGCCGGAACGAGGCGCAGAAAGAAACCAGCCTT
105	CTTTGAGCGGTAAGCAGATAGCCGAACAAACGGCTGAGGAAG

106	TTTCCATGAGGCAACACAAGAATTGAGTATAGCTACAGAAGG
107	GACCTGCCGATTATAAAGTCAGAGGGTAAAAATAGGATTTTT
108	AACGAAATAAACGGGGAACGAGGGTAGCAAGTTACTCTTACC
109	CCCCTGCGCAAAATCCCTTAT
110	ACGTATAGAATCCTGAGAACG
111	ACTTTTTAATAAGAATAAAAT
112	CAGACGAATCCCATCCTAAAG
113	CTCCCGAACGCTAACGAGCAG
114	CCAGTCACTAGCGACCGTAAT
115	AATTTCTGCTTGCAGGGAGAG
116	GACGCTCAGATAGAACCCTTA
117	TAAAGCAAAGGTTATCTAAAT
118	CCAGAACCATTATACCAGTGC
119	GGCTATCCCCGGTTGATAAAG
120	TCAGAGATTTTTAAGAAAATC
121	TTGCTCAAGCATTGGAAAGCGTTTTAGCTACATTAAATCGCCACCC
122	TTTAGAGAGAGTTGTGTTCCATTTTTAGCGTCGAGGGGGGCGCTTA
123	AGAGTCTGGAACAACAAAAGGTTTTTTACCTTATGGTTTCTGTAGC
124	CGAGAATACGGGGAGGTCACGTTTTTACCGACCATCTTCAGCTTCA
125	TAGTATCATAAATCCGAAAGATTTTTTTGCGTAATGAATCAGTAAT
126	TTCCATAATAGCGAAACCTCCTTTTGTAATAATACATTGGTGGCAT
127	CTGTCTTCGAATTCGCATAAATTTTCTAGACCAGTGCCATTCATTT
128	CTGGCCCGCGTTATACATGTATTTTATCACCCGGCGAAAAAGAACG
129	TAAACAGCAGGCGGCGCCACCTTTTATAAATTAAAGTACAATTAAC
130	TTTTCTGTATCATTCATTACCTTTTTAGATAAGCTAATGAGTGAGC
131	GGTACCGTTTAACGCCAAGTTTTTTCTGAATACAATATACCAAAAG
132	TCCTTGAGGCACCGCGGGCCTTTTTTAATTGCAAGAGGTTATGTAA
133	GCAGCGATAGATAATATTAATTTTTGCAAATCATCAAACAGCCAGC
134	AGATTTTGGATTTTTTTCACGTTTTATTCCACCGTCACCTATAGAA
135	ACAATATAGTTGATTATATTTTTTTGGCGCATCGTAATGCACCGCC
136	AATTTTTATCACGCGGCCTTGTTTTAGGGATTCAGAGCGCACTATC
137	AGAGCCGAAATTGTATCAAAATTTTGTAAAACGAGCAAAACGCAAA
138	GCCAGCTGAATGGCGATAAAATTTTACATAAACATTTGAAAGGGGG
139	AACGAACAATCACCCGACAGATTTTAAGGTAAAAAGGGCCTGATAA
140	GAGCCGCGACCAACCAAGAACTTTTCCTCAAGTGAAACATAAGCGT

141	*AGCAAATACGCAATACATACATTTTAATAGCATAAGCCCAACCTAA*
142	*AGAGCCACCCTCATTCACCATTTTTTCGGTTGAAGCAATCCGCCAG*
143	*AAACCGACAGCATCGTAAAATTTTTCGCATAATTGCGCCATTTTGC*
144	*GGAACCGATTATTTCATAAAATTTTCTCAGAGCGGAACCGTAACAA*
145	*TCACAAAGTACTGGTTAATGCTTCCTCTACCACCTACATCAC*
146	*GAATACCAAACCAAGACGAGCTTCCTCTACCACCTACATCAC*
147	*AAAGCGGACAGGTCCGAGAAATTCCTCTACCACCTACATCAC*
148	*TCCGCTCTGCCCGCTTCTGTCTTCCTCTACCACCTACATCAC*
149	*AATAGGTTAGCAAGAGCGAACTTCCTCTACCACCTACATCAC*
150	*GAAACAAAACAAACGGTTTTCTTCCTCTACCACCTACATCAC*
151	*TTCGACAAATTATCCGAGGTGTTCCTCTACCACCTACATCAC*
152	*GATACATATCCAATACATTTTTTCCTCTACCACCTACATCAC*
153	*TTAAATCACAACCCAAAAATCTTCCTCTACCACCTACATCAC*
154	*AATGAAACCCCCTTAGAAACATTCCTCTACCACCTACATCAC*
155	*CCTTATTCAATCAACTACAAATTCCTCTACCACCTACATCAC*
156	*AAAGACTACACTCAGCTAATATTCCTCTACCACCTACATCAC*

Table S8. Staple strand sequences for p7308-6hb-ring.

1	CCCGTATAAGGATCCATTACTAGAAAAAGCCGCGAGAAAACTT
2	TAGCGAGGCAAGTCTTCTTACCAGTATATATATGTAAATGCT
3	CAGTGCCAAGCTTGCGAGAATCGCCATATGACTACCTTTTTAA
4	TAACGCCAGGGTTTAGGCATTTTCGAGCGAAGAGTCAATAGT
5	CCAGCTGGCGAAAGGAAAGGTAAAGTAATAATCCTTGAAAACA
6	ACTGTTGGGAAGGGGTTCAGCTAATGCATTGCTTCTGTAAAT
7	TGCCGGAAACCAGGCAGTCCTGAACAAGAAATGGAAACAGTAC
8	CAGGAAGATCGCACATGTAGAAACCAATCATTAATTACATTT
9	ACCGTGCATCTGCCACAAGAACGGGTATTCTGAGCAAAAGAAG
10	CCGTAATGGGATAGGCAAGCCGTTTTTAGTTACAAAATCGCG
11	GTAACAACCCGTCGGAATAGCAAGCAAATGAGAAACAATAACG
12	GGCCTTCCTGTAGCAGAACGCGAGGCGTAACGTCAGATGAAT
13	CATTTTTTAACCAATTTTGAAGCCTTAAACGTAAAACAGAAAT
14	AATATTTTGTTAAACTACAATTTTATCCTAACCTATTATTTT
15	AAAACAGGAAGATTGTCCAGAGCCTAATTTCAGTGCCCGTATA
16	ATGTCAATCATATGTTTATCCCAATCCATGTACTGGTAATAA
17	TGGAGCAAACAAGAGAAAATGAAAATAGCGTTCCAGTAAGCGT
18	TTTGAGAGATCTACAGGGAAGCGCATTATCATTAAAGCCAGA
19	CAACCGTTCTAGCTGAAAGTCAGAGGGTAGGTCAGACGATTGG
20	TGAGAAAGGCCGGAACAAGAATTGAGTTACCACCAGAGCCGC
21	TAAATGCAATGCCTGGAAATAGCAATAGCTCCACCCTCAGAGC
22	ATTTCAACGCAAGGTAAGCAGATAGCCGACACCGGAACCGCC
23	CAAAAACATTATGACACGCAATAATAACGGTGCCATCTTTTCA
24	TTAAGCAATAAAGCACTCCTTATTACGCGTTTTCATCGGCAT
25	TAACATCCAATAAATCATAAAGGTGGCAAGCGACAGAATCAAG
26	CGAGCTGAAAAGGTAATAAGTTTATTTTCGTCACCAATGAAA
27	GCAAATGGTCAATAATACCAGCGCCAAAGAAAATCACCAGTAG
28	TTCTGCGAACGAGTGAGGGAAGGTAAATTCACCGTCACCGAC
29	TCCGCTCACAATTCCAGCGTAAGAATACGTCTTTAATGCGC
30	TGTAAAGCCTGGGGGGGACATTCTGGCCTAAAAATACCGAAC
31	TTGCGTTGCGCTCATTACATTGGCAGATGTGAGGCGGTCAG
32	TGCCAGCTGCATTAATACCTACATTTTGCTGAGAGCCAGCA
33	GTTTGCGTATTGGATATTACCGCCAGCTGCTGAACCTCAA
34	GAGACGGGCAACAGAAGAACTCAAACTACAGTTGGCAAATCA
35	GAGAGTTGCAGCAAGAATACTTCTTTGATCTAAAATATCTT

36	GAAAATCCTGTTTGAAGTAAAAGAGTCTAGCCGTCAATAGAT
37	TATAAATCAAAAGACCAGAATCCTGAGAGACTTTACAAACA
38	CAGTTTGGAACAAGACAGGAGGCCGATTCCCGAACGTTATTA
39	CGTCAAAGGGCGAAGTATAACGTGCTTTTTTTGCGGAACAA
40	CGTGAACCATCACCCGCCGCTACAGGGCCATCATATTCCTGA
41	GTAAAGCACTAAATGGTCACGCTGCGCGTAATCCTGATTGT
42	GAGCTTGACGGGGAAAAAGCGAAAGGAGGGCTGAAACATGAA
43	AAGAAAAATCTACGTTTAAGAACTGGCTAGAAGGATTAGGA
44	ATTACAGGTAGAAATTTAATTTCAACTTGGATAAGTGCCGTC
45	CATTCAACTAATGCCGAGAAACACCAGAAATAGGTGTATCA
46	GCATAGTAAGAGCACGTAACAAAGCTGCCCCTCAGAACCGCC
47	ACGATAAAAACCAAAGTAATCTTGACAAACCACCCTCATTT
48	TTGCCAGAGGGGGTGTGTACAGACCAGGCATGTACCGTAACA
49	TCCAATACTGCGGAAGGGAACCGAACTGAACGCCTGTAGCA
50	CAAATGCTTTAAACAATGTTACTTAGCCTAACGATCTAAAGT
51	AAAAATCAGGTCTTTTCATCGCCTGATATGAATTTTCTGTA
52	CGGATTGCATCAAACGATTATACCAAGCGTTTCAGCGGAGTG
53	AATATCGCGTTTTAAGGCAAAAGAATACTGCGAATAATAAT
54	AGCAAACTCCAACAATACGTAATGCCACAAGGCTCCAAAAGG
55	TCCTTTTGATAAGATAAAGACTTTTTCATTGCTTTCGAGGT
56	ATTGCTGAATATAAATCGGAACGAGGGTAGTTGCGCCGACAA
57	CCTTCTGACCTGAAACACAACATACGAGACGCATGGCTAGTA
58	ACCAGTAATAAAATGCCTAATGAGTGAGACTCTAGACCTTTGA
59	AAAACGCTCATGGAAATGAATCGGCCAAGGCGATTAAGTTGGG
60	ACTTGCCTGAGTAGCTGATTGCCCTTCACATTCAGGCTGCGCA
61	CAGTGAGGCCACCGTGGTGGTTCCGAAACGACAGTATCGGCCT
62	GAGCGGGAGCTAAAGTCCACTATTAAAGCAAACGGCGGATTGA
63	CGCCGCGCTTAATGCAAATCAAGTTTTTAAATAATTCGCGTCT
64	GAAAGGAAGGGAAGAGCCGGCGAACGTGTAAATTGTAAACGTT
65	GGGCTTGAGATGGGATTCATCAGTTGAGAATCGTAAAACTAGC
66	ATTACCCAAATCAAACACTATCATAACCGAGAGGGTAGCTATT
67	AGGACAGATGAACGAATAGTAAAATGTTAAAGATTCAAAAGGG
68	CCGCGACCTGCTCCGTTCAGAAAACGAGGCGGGAGAAGCCTTT
69	CTTTGACCCCCAGAAGATTAAGAGGAAGAAAGAATTAGCAAAA
70	ATTAAACGGGTAAAGGTCAGGATTAGAGTTTTCATTTGGGGCG

71	GAGGCTTTGAGGACGGTCATTTTTGCGGATTAGATACATTTC
72	CAGCGAAAGACAGCTGCTGTAGCTCAACACAGTTGATTCCCAA
73	GAACTGATAGCCCTCGCAAGACAAAGAACTGTTTAGTATCAT
74	GAACCACCAGCAGTGGGTTATATAACAAGCCAACGCTCAAC
75	TATTAACACCGCCTCATAGGTCTGAGATTAACAACGCCAACA
76	GCAAATGAAAAATGATTAAGACGCTGACAGTAATAAGAGAA
77	ATATCAAACCCTCATAATTTTCCCTTAGTCTGTCCAGACGAC
78	ACAGTTGAAAGGAGTGAGTGAATAACCGAACGCGCCTGTTT
79	TAGGAGCACTAACAAATTACCTTTTTTAAAATAATATCCCAT
80	AATACATTTGAGGATCAAGAAAACAAAAATAATCGGCTGTC
81	ATTCGACAACTCGTTCATTTCAATTACAAACCAAGTACCGCA
82	ATTTTAAAAGTTTCTTTGAATACCAATTTTCATCGTAGGAA
83	AGAAACCACCAGAAACCTTTTACATCGGCAGATATAGAAGGC
84	TTATCAGATGATGAGATTTTCAGGTTTTTTAGCGAACCTCC
85	TTGGATTATACTTCCAAAATTATTTGCATCAAGATTAGTTGC
86	AGTATTAAGAGGCCCTGCCTATTTCGGGAATCTTACCAACG
87	TTAGCGGGGTTTTGAGTGCCTTGAGTAAGCCAGTTACAAAAT
88	GAGAGGGTTGATAGATGATACAGGAGAATAAGAAACGATTT
89	CCGTACTCAGGAGGCTCTGAATTTACCAGCCTTTACAGAGAG
90	ACCCTCAGAACCGAAACAAATAAATCCGACGGGAGAATTAA
91	TCAGGGATAGCAAGAGGAGGTTGAGGCAATTGAGCGCTAATA
92	CTGAGTTTCGTCACCGCCACCAGAACCAAGCCCAATAATAA
93	TTCCACAGACAGCCCACCCTCAGAACCGATCTTACCGAAGCC
94	TTTGTCGTCTTTCGGAACCAGAGCCACACAAAGTTACCAGA
95	TGGGATTTTGCTAACCCTTATTAGCGTTAATACCCAAAAGAA
96	AGAATAGAAAGGACAGACTGTAGCGCAGTATGTTAGCAAAC
97	TTTTTCACGTTGAAACCGTAATCAGTACATATAAAAGAAACG
98	AGCCTTTAATTGTAGCAAGGCCGGAAAGTCACAATCAATAG
99	GAATTTCTTAAACAGAATTAGAGCCAGCACAAAAGGGCGACA
100	TGACAACAACCATTTAAAGGTGAATTAATTGACGGAAATTA
101	TTTCAAATATATTTTTGAATGGCTATTAGTGGCACAGACAAT
102	GATGCAAATCCAATAAAACATCGCCATAACAGAGATAGAAC
103	CCTCCGGCTTAGGTAAGATAAAACAGAGTCACCAGTCACACG
104	GAATTTATCAAAATGCAACAGTGCCACGACGCTCAATCGTC
105	TAGCGATAGCTTACTAAAGCATCACCTCATTGCAACAGGA

106	*CGTCGCTATTAATATCAATATCTGGTTCGGCCTTGCTGG*
107	*ATAAATCAATATATATTGAGGAAGGTTATTAGTAATAACATC*
108	*AACAATTTCATTTGACTAATAGATTAGGTCCATCACGCAAA*
109	*ATGATGAAACAAACATTTAGAAGTATTAAGTGTTTTTATAAT*
110	*CAGAGGCGAATTATATTAAATCCTTTGAAAGGGATTTTAGA*
111	*GATTCGCCTGATTGGAGTAACATTATCACCTCGTTAGAATCA*
112	*ATACAGTAACAGTGGAGCGGAATTATGCGTACTATGGTT*
113	*AAAGAAATTGCGTGCAATTCATCAATATAACCACCACACC*
114	*AGAACCTACCATATTGAATAATGGAAGCGGGCGCTAGGGCG*
115	*AACAGTTAATGCCCTGAGACTCCTCAAGCATTATACCAGTGA*
116	*GTTTTAACGGGGTCCTCAGTACCAGGCTAATCATTGTGAAT*
117	*CATACATGGCTTTTTAAGTATAGCCCGGACGAGTAGTAAATT*
118	*ATGGAAAGCGCAGTTTTAGTACCGCCATCATTCAGTGAATA*
119	*CCTTGATATTCACCCACCCTCAGAGCCGAACCGGATATTC*
120	*CGCCAGCATTGACCCCAATAGGAACCCGCATAGGCTGGC*
121	*CACCACCCTCAGAGCCAGTACAAACTACACCAACTTTGAAAG*
122	*TCCCTCAGAGCCGCCTCATAGTTAGCGGGAACGAGGCGCAG*
123	*TAATCAAAATCACCCAGACGTTAGTAAAAATTGTGTCGAAAT*
124	*TTTCGGTCATAGCCACAACTTTCAACAGCGAAACAAAGTAC*
125	*TTTGCCTTTAGCGTACAACTAAAGGAATACTAAAACACTCAT*
126	*CCATCGATAGCAGCAATCTCCAAAAAATACGAAGGCACCAA*
127	*CACCATTACCATTATCGGTTTATCAGCTGAGGAAGTTTCC*
128	*TTGAGCCATTTGGGCTTGATACCGATAGCAACGGCTACA*
129	*ACACCGGAATCATACCGGGTACCGAGCTGTGTGAAATTGTTA*
130	*ATGCGTTATACAAACGCTAGCGACCGTATCCGGAAGCATAAAG*
131	*AGTAGGGCTTAATTATGCCTGCAGGTCGCTAACTCACATTAA*
132	*TGTAATTTAGGCAGTCCCAGTCACGACGTTCGGGAAACCTGTCG*
133	*TATAAAGTACCGACAGGGATGTGCTGCAACGCGCGGGGAGAGGCG*
134	*GACAATAAACAACATCGATCGGTGCGGGCCTTTCTTTTCACCAGT*
135	*ATCAACAATAGATAAAAGCGCCATTCGCCCGCCTGGCCCTGA*
136	*CCTAATTTACGAGCTCCAGCCAGCTTTCCTTGCCCCAGCAGGC*
137	*TTTCCTTATCATTCGTTTGAGGGGACGATCGGCAAAATCCCT*
138	*CTCATCGAGAACAAGTCACGTTGGTGTAGGTTGAGTGTTGTTC*
139	*TCATTACCGCGCCCATTCTCCGTGGGAAAACGTGGACTCCAA*
140	*TTATCCGGTATTCTACAGCTTTCATCAACAGGCGATGGCCCACTA*

141	CGACTTGCGGGAGGTAGGAACGCCATCAATGGGGTCGAGGTGCC
142	TATTTTGCACCCAGATTCGCATTAAATTTGAGCCCCCGATTTA
143	CTAACGAGCGTCTTTATAAGCAAATATTGCCAGGACGTTGGG
144	AAACAGCCATATTATACCCCGGTTGATAAAACGGAACAACATT
145	TTTGTTTAACGTCAAATCGATGAACGGTATTTAGGAATACCA
146	AATAACATAAAAACAAAGGCTATCAGGTCAAAGGAATTACGAG
147	CTGAACACCCTGAACATAAATTAATGCCGCTCGTTTACCAGACG
148	TCAGAGAGATAACCCGACAGTCAAATCACCTTTGCAAAAGAAGTT
149	GAGCAAGAAACAATAGTAATGTGTAGGTTAGACTGGATAGCG
150	CTTTTTAAGAAAAGATAAAAATTTTTAGACATTGAATCCCCCT
151	AGGAAACCGAGGAACCTGTAATACTTTTAATGACCATAAATC
152	CTGGCATGATTAAGCTCAGAGCATAAAGCAGTCAGAAGCAAAG
153	GTAGAAAATACATACATACAGGCAAGGCCCCGAAAGACTTCA
154	CAAAGACACCACGGGGCATCAATTCTACTCGAACCAGACCGGA
155	AAAATTCATATGGTTCCTGTTTAGCTATAAGTACCTTTAATTGC
156	TTCAACCGATTGAGGAGATTTAGTTTGACCATGGCTTAGAGCTTA
157	TGGGTGTCTGGAAGTGATAAATAAGGCGTTCTGACCTAAATT
158	CAACTAAAGTACGTGCCGCTTTTGCGGGCGATATATTCGGTC
159	ATAGGGAGTTAAAGCATAGCTGTTTCCTCGAATTCGTAATCA
160	GCTGAGGCTTGCTTTAGTTAATTTCATCTTAAATAAGAATAA
161	TAATGGTTTGAACACGCCCACGCATAACATCGTCACCCTCAG
162	TTATACCGACCGTGTTTCATTCCATATAATGTTTTAAATATG
163	TGAAATGGATTATCTGCCCGCTTTCCAGTGTAAAACGACGGCTTCCTCTACCACCTACATCAC
164	TAATATCCAGAACAGCGCCAGGGTGGTTTCTTCGCTATTACGTTCCTCTACCACCTACATCAC
165	TTAACCGTTGTAGCCGGTCCACGCTGGTGGCACCGCTTCTGGTTCCTCTACCACCTACATCAC
166	CAGGAACGGTACGATAGCCCGAGATAGGATGGGCGCATCGTATTCCTCTACCACCTACATCAC
167	GCTTTGACGAGCACAAACCGTCTATCAGTTAAATGTGAGCGATTCCTCTACCACCTACATCAC
168	CTGGCAAGTGTAGCCGGAACCCTAAAGGTTGTTAAATCAGCTTTCCTCTACCACCTACATCAC
169	TACCTTATGCGATTTAATAAAACGAACTTCAGAAAAGCCCCATTCCTCTACCACCTACATCAC
170	AGGCTTGCCCTGAAGATACATAACGCCAATTGCCTGAGAGTCTTCCTCTACCACCTACATCAC
171	TGACCTTCATCAAGAATAGCGAGAGGCTATCAATATGATATTTTCCTCTACCACCTACATCAC
172	ACGGTCAATCATAATCGTCATAAATATTACCCTCATATATTTTTCCTCTACCACCTACATCAC
173	AACGGAGATTTGTAACCCTGACTATTATTAAATCGGTTGTACTTCCTCTACCACCTACATCAC
174	CCTAAAACGAAAGATTCGAGCTTCAAAGAATAGTAGTAGCATTTCCTCTACCACCTACATCAC

Table S9. Staple strand sequences for p3024-24hb.

1	TGAAGCAGGTACTCTTCCTTTCCAGCGTTTCCTCTACCACCTACATCAC
2	CATAGTTGCCTGACTCCCCTCCTATCTCTTCCTCTACCACCTACATCAC
3	TTTTGATTTTAAAAGGGCGAAAGCGCGCTTCCTCTACCACCTACATCAC
4	TCGGGAAACCGTAAGCGCAGGAAAGAACTTCCTCTACCACCTACATCAC
5	CTCAAGAAGATCTCGCCTCCACCAGCCGTTCCTCTACCACCTACATCAC
6	AGAAGTCCGACCCTGCCGCGGTCGTGCGTTCCTCTACCACCTACATCAC
7	AAGGGTTCGGGGTCTAACCAAAAAGCACTTCCTCTACCACCTACATCAC
8	AAAACGTCTACGTGAACCACGCACCACAGTGTAGCTTCCTCTACCACCTACATCAC
9	GTTGTCACGCTCACTTTTAAAAGATCCTAGATTATTTCCTCTACCACCTACATCAC
10	ATGCCATCCTTCGGTCCTCCTGCAAAAATTCCTCTACCACCTACATCAC
11	AGGACAGTATTTGGTATCTGAGAAGTGGTTCCTCTACCACCTACATCAC
12	TTGCCCGGCGTCCGGTGGTAGTGGCAGCAGACGAATTCCTCTACCACCTACATCAC
13	TTCGTTATCAGGGTCCGGGTTCCACATAAGAAAGCTGGAACG
14	AGCGATCCGCGTAAAGAATAC
15	AATCAGTGATCCACGGCAAACGCCGCAGTTCGATC
16	AAACAAATAGGGCATCATGAGCGGATACCACTATAGTGCCTC
17	TACCAATAAATGAGTAAACTTTTTTGGTCATCCAG
18	ATGTGAGCAAAACGGGTTATCCACAGAACCTGTGTATAGTTG
19	ACTCAGCTAAGGGCTTGTTAATAGTTTGCGCAAGC
20	GCAATAACGCTGGTGTCATTGAATACGC
21	TATATAGAATGAAGCGGCCTTTCTCCCTTCGGGTA
22	CATAGCTACACAACGAAATTGTCATGGT
23	CAAAAACACTTTCATTGTTCCGCGCACAGTTAATA
24	ATCTTTTCTACGGGGTCTGCTAAAAAAGTGTCAAAAGAATAG
25	CAAAAAGTAAGGGAGGGTCGTGTAGATACAGTGCT
26	TTGCGCTCACTGCCCGCTTTGTTTAAATGTTGGTC
27	CGGGGAGCTGCATTGGGGCCAGCAAAAGGTTTTTC
28	TTACGCTCAGTGGATACGGGATTTCATC
29	AAAAAAATTACCATTACCGCGTCTCAGGAGAAGTGTGTCTAT
30	TGAGTAAGCCGCGTTTGATCCTAGTTCTAGAGCTTTCAGGGGATAACTT
31	CGCTGTTGAGATGATAGGGTTCCGAAAT
32	ACCGAGAAGGCAAAAATTAAAATCGAAAACTCTCA
33	CTGCAACTTTATCCTTCACCTTCGATACCGATTACGCGCAGA
34	CTCTCCTTAGAGCTAACTCACATTAAGCAGCTCCCCGAAACC
35	CGTTTCCCCCTGGAGGTTTGCGAGCTCCGCTGGGGTGCCTAA

36	GAACAAGAGTCCGGGAGTGTTGTTCCAG
37	CGGCAAACATTTTTGCGTTAAAAATTGG
38	GCCGGGAAGCTAAGTCCAGTCTATTAATGGAGGAT
39	GAAGGGCTTATCAGAGACCCAGATTTTT
40	CGACAGGCGCTCAACCCTGACACGGAAG
41	AGCAGCGCAATAAAATCAAGGCGAGTTAAGGTTTGGTATGGC
42	AAGCCCCGTCAGAGGCACGAACCCCCCGTATTCGGTGTAGGT
43	AGAGCTTGAACCCTATCAGCTATCCCTTATAAATT
44	TTCATTCAGCTCCCACAGGCACTGGTGAGTACTGC
45	AGCGGTTCATGATCTCCAGATCGAGCGC
46	CGTTCGCTCCAAGTCATAGCTACTACGGCTACATC
47	CGGTAACTTCAGCCAAATCGAACTATAA
48	TAAATCGGATCACCCTAATCAAGTTTTTGTGCCGTTAACTAT
49	GCCGGTTCCCAACGCCGAGTAAGTAGTTCGCCAAAAAAGGGA
50	TTGCTGGGCTGTGTGTTTACCGGATACCTGTCCGCCCCCATG
51	TGGCGAGATTTTTGGACACGGATGCCGCGGGTGAG
52	TGTTTGCGTCACGCTCGTCCTCCGTAAGCATAATT
53	CATAAAGTAGGTATCTCAGTCAGTTCTTGCGAGGT
54	GCGTAACGGGAAAGCCGGCCTCCGATTT
55	TCTGTGATCGTGGTAACGTTGTTGCCATGATGCTC
56	TGGCCTACACGCTGTGAAGCGTGGCGCTTGGTTAC
57	GCTACAGGTCTTGAGTAAGACGAGCATCGCTCACTGTATTGGCAACGCG
58	TTCGCCATTCAGAACCCGCCGCGCTTAATGGCCCATCCGAAA
59	GGTCACGGCGCTAGGAAGGGAGCAGAACGTTGAAT
60	AAGTCATTCTGAGAATAGTTGATGCTTT
61	CTCTTACATGGTTATAAGTTGAAACCACTCTAAAG
62	ATGTAGGGGTAACACTTATCGCAATTCCCGCTGCGCGGCTGCAATGAAT
63	CGAGTAACAAGCTTGTCTTGTGGCCAGGGAATTCA
64	AGCCATTGAGCTCCAGCTTTTGTGGCCGCCACCGC
65	CGATCGGTGCGGGCTCATCAGGGCGCTGCAGTCAC
66	CTTCGGAAAAAGACGAGCCGAGGATTAGTTAGTGAGGGTTAA
67	GTAATACGTTTTCCGCGCTGCGCAACTG
68	CACGACGGCCAGTGTTGGGTATATTGTCATATTAT
69	ACCTTTCCGTCGTCACGTATGCGGCGAC
70	GGGGGGCTATAGACATTTACGGAGGCACTGACAGT

71	*CATAGCTGTTCCCTCAGCGCTCTGCTGA*
72	*GGCGTAATTATCCGGTAATACAGCGGTA*
73	*TGGGTAACGCCAGGGATGCAAGGCGATT*
74	*GACGTTGTAAAACGGGAGCGGCTCAACC*
75	*TTCGTGGCTGAGTGATCACTCTGCTAGA*
76	*TTCGCTATGTAAGCTTTCCCCCTTCAGCATCTTTTAGCCAGTTCGATGT*
77	*GGGATAACTGGCCCACTACGAACGAAAACTCACGTGACTTTG*
78	*GTAGCTCTGCTGGCGCCAGGAACCTGTCGTGCCAGAGTTGCG*
79	*TGTGCCTATATTTGGAAAAAT*

Table S10. Staple strand sequences for p3024-6hb-ring.

1	AGTGTTGTGCGATGGATTTTGT
2	AAGAATAATCACCCCCTAAATTGTAAGTTTTTGTTAAACG
3	TGAGCGGAGGGTCGACAGGAAGGCGAAA
4	CATTTATTAAATCGCGTTTCTGGGTGAAAGGGAATAAGTT
5	TTACCGCTCCCCCGACCGAGTTGCACTT
6	CGGGGCGGGAAAGCGAGAATAGTGTATAATACGGGATAGT
7	ACTGCATAGAAAGGAGCGAGTTACCAAG
8	TTATCACAGGAGCGTCCGGTTCCCAACTGTGCAAAAAATC
9	ATAGTTTGGCAAGTGTAAACCAGCCTTC
10	TAGAGTAGCGTAACGGCTCCAGATTTAGAGCGCAGAAGGA
11	GTGTAGATGCTTAATTAAAGTATACCAC
12	CCATAGTGCGTCCCAATGAAGTTTTAAGTCTGACAGTTTC
13	GAACGAAATGCGCAAAACCACCGCTTTA
14	TCTACGGATCGGTGAGCTCTTGATCCGTTTTTGTTTGCGT
15	ACTACGGCTTACGCCAGTCCAACCAAAG
16	AGAGTTCGATGTGCATCCGGTAACTATTTATCGCCACTCG
17	CTCAGTTCTTGGGTAGGAAGCTCCCGCT
18	CTCATAGCAGTCACGATACCAGGCGTTTGTTCCGACCCGG
19	TAGGCTCCCGGCCAGGGTAATACGAGGA
20	GCCGCGTCGACTCAGTATCAGCTCACTCAGGGGATAACTC
21	GCGGTTTGGGTACCGCCTAATGAGTGCG
22	AATCGGCGCCAGGGAAAGTGTAAAGCCTTAATTGCGTTAC
23	TAATCATGTTGTCTTTCGGTGCGCGCCG
24	GTTAAACGTTAATCCCACTACGTG
25	CACATTTCCCCAACAAATAGGGGTTCTCGTATT
26	GCAAAAGCAAAAAGGTGCCGTAAA
27	CAGCATCTTTTTCTGCACCCAACTGAGATCGAT
28	GGCGTCGCGGCGATTTAGAGCTTG
29	GAGTACTCAACATGCTTTTCTGTGACTCCATGC
30	CCATGTGATCAAGAGGGAAGAAAG
31	GTTTGGTATGGCAGTGGTGTCACGCTAGCCATT
32	AGGGCCTCAGCAATAGCGGTCACG
33	TACCGCGAGACTACCCCAGTGCTGCAAAGAGGG
34	AACTTGATCAATCGCGCCGCTACA
35	ACCTAGATCCTTGTATCAAAAAGGATTCGATTT

36	GTGGTTGCAAACACTGTTGGGAAG
37	TACCTTCGGAACGGCTCTGCTGAAGCCTCAGTA
38	CACGACCGTCTTGAGCTGGCGAAA
39	TTCAGCCCGACCTTGTGCACGAACCCCTCGCTC
40	CTCTCCTCCCCCTACGCCAGGGTT
41	CGAAACCCGACGTGCTCAAGTCAGAGCTGCATC
42	CAGAATCAAAGGCTGAGCGCGCGT
43	GGTCGTTCGGCTGACTGACTCGCTGCAACTTCC
44	CTCACATGGGGTGGGTTTCTCAGG
45	ACAACATACGAGTTCCGCTCACAATTAACCTGT
46	TTGATTGCACCTTGTCGTCGTCAG
47	AGTGCCATAATCAAGTTTTTTGTACATATTTGAATAA
48	TCACCAGGAACCCTAAAGGGAGGTTGAGATCCAGTAG
49	TCATTCTCGGCGAACGTGGCGAATTCTCTTACTGTTT
50	ATTCAGCGGCGCTAGGGCGCTGCGCAACGTTGTTGTG
51	GCTCACCCACCACACCCGCCGCAACTACGATACGGGC
52	AATTAAAATTCGCCATTCAGGCACTCACGTTAAGGAT
53	AGTTGGTCGGGCCTCTTCGCTATACACTAGAAGGATT
54	GCGCCTTTGCAAGGCGATTAAGGGTGTAGGTCGTTAC
55	CTATAAAGACGTTGTAAAACGAGCCCCCCTGACGATT
56	GCGAGCGCTATAGGGCGAATTGCGTATTGGGCGCTAG
57	GAAGCATAATTCACACGCAAGCGTCATAGCTGTTTTG
58	AACCGACCGAGAAAAATCCCTTATAAACGTCAGC
59	GCACCAGGGTTATTTTTCAATATTATTTCGGCGA
60	ACGGAAAACTCTATCATTGGAAAACGTTGATACC
61	CGAATCATGGTTAAGTAAGTTGGCCGCCGGCGGT
62	CTGCAGTAGTTCTTAATTGTTGCCGGGATTGGTC
63	GGGCTGCCTGACATCTGTCTATTTCGTCTACCAA
64	GGCGGGTCTGACAGAAGATCCTTTGATCAAAGCA
65	GGGGTTGAAGTGGGTATGTAGGCGGTGCCGGCAG
66	TTCCCTCACGCTTCGGGAAGCGTGGCGGTTGCCG
67	AATATGCTGGCGGGCCAGGAACCGTAAGCGCAGG
68	AGAACAACGCGCCGTGCCAGCTGCATTCCGCGCT
69	GAGGGTTATTCGTGCTATAGACAATACTACGGATCCACCGTCAAAGG
70	GCGAAAGAACGTGGACTCCTAAAGAG

71	*TAAAAACCGGGGGGCTGAGTCTATCAGGTCCAGTTTGGAACGT*
72	*ACGAAATTGCGCAGCTTTTGTTCCCTTAATAGTT*
73	*TCATTTTTTAACCAATAGAAATTCGC*
74	*CACGGAAATGTTGAATACAAAATGCC*
75	*GCGCCACATAGCAGAACTCGTTGCCC*
76	*TAGCTCCTTCGGTCCTCCATGATCCC*
77	*CTGCAACTTTATCCGCCTTCGCCGGA*
78	*TGCTTAATCAGTGAGGCAGGTGAGTA*
79	*GCAGATTACGCGCAGAAAATGTAGCG*
80	*CAGCCACTGGTAACAGGAGCGTAAGA*
81	*CTTACCGGATACCTGTCCTGCGTGCG*
82	*AAAGAACATGTGAGCAAAACTATCCA*
83	*CACTGCCCGCTTTCCAGTTCAGCTAA*
84	*CTAGAGCGGCCGCCACCGTAAAGTCA*
85	*TCCACTATTAGCCGAAATCGGCTAGGGTTGTTCCTCTACCACCTACATCAC*
86	*TAGAAAAATATCATACTCTTCCTTGTCTCATTCCTCTACCACCTACATCAC*
87	*GTAACCCACTTTAAAAGTGCTCCAAGGATCTTCCTCTACCACCTACATCAC*
88	*CATCCGTAAGGATCGTTGTCAGATGGCAGCTTCCTCTACCACCTACATCAC*
89	*GCTACAGGCACCATCCAGTCTAGCCAGTTATTCCTCTACCACCTACATCAC*
90	*CTTACCATCTCCTATCTCAGCGTCCCCGTCTTCCTCTACCACCTACATCAC*
91	*TGGTCATGAGAAAAGGATCTCAGCTCAGTGTTCCTCTACCACCTACATCAC*
92	*TTTGGTATCTTTAGCAGAGCGAGTGGCCTATTCCTCTACCACCTACATCAC*
93	*CAAGCTGGGCGCCTTTCTCCCTGTAGGTATTTCCTCTACCACCTACATCAC*
94	*ACAAAAATCGAGGCCAGCAAAATTTTTCCATTCCTCTACCACCTACATCAC*
95	*GCTTCCTCGCCGGGAAACCTGTGGGGAGAGTTCCTCTACCACCTACATCAC*
96	*GTGAAATTGTCGGTGGAGCTCCGCTTGGCGTTCCTCTACCACCTACATCAC*

Table S11. Staple strand sequences for p3024-6hb.

1	*AAGAGTCCCATCACAAATTTTTGTGGCCCA*
2	*AGTGTTGTTGGGGTTATTTTGTTAAAATTTTAACCAATAGAG*
3	*ATGTATTGCACTAACAAAAAAGGTGTAA*
4	*CATGAGCGGGAGCCAAACAGGAAGGCAAGAAATGTTGAATTT*
5	*CAGTTCGTGACGGGCGGCGTCAACTGGG*
6	*GATCTTAGTGGCGAGGCGACCGAGTTGCGCCACATAGCAGCA*
7	*TACTGTCAAAGCGACCCCCATGTAATAG*
8	*GGCAGCAAGGGCGCGATCAAGGCGAGTTTAGCTCCTTCGGGG*
9	*CGTTGTTGTCACGCCCGGAAGGGCCGGT*
10	*GCCAGTTACACCCGTATCAGCAATAAACTCCTGCAACTTTAG*
11	*TACGATACCGCTACATGAGTAAACGGCT*
12	*ACTCCCCTCGCCATTTAAATCAATCTAACCAATGCTTAATGA*
13	*CTCACGTTGTTGGGCTGGTAGCGAAAAA*
14	*TGACGCTCGGGCCTGATCCGGCAAACAACAAGCAGCAGATCT*
15	*CTACACTCAGCTGGACCCGGTAATTGGT*
16	*GAAGTGGGCTGCAAGTAACTATCGTCTTACTGGCAGCAGCTC*
17	*TTCGGTGGTAACGCGCTCCCTCGGCGCC*
18	*CTCACGCTCACGACACCAGGCGTTTCCCGACCCTGCCGCTGC*
19	*GCTCCGCGCCAGTGTAATACGGTGACTA*
20	*GTTGCTGGACTCACTATCAGCTCACTCAGGATAACGCAGGCT*
21	*CGGTTTGGGTACCGCCTAATGAGTGCGG*
22	*CGGCCAAAGCCAGGTAAAGTGTAAAGCCAATTGCGTTGCGTC*
23	*GTAATCAGCTTGTCTTTCGGTGCGAGCC*
24	*CTCATTTTCGCGTTCCTAATCAAG*
25	*TGCCACCTAAATGAGCACATTTCCCCGAGTCAAAT*
26	*CGACACGAATGCCGATCGGAACCC*
27	*TCACCAGCGTTTTACTTCAGCATCTTTTGTCGTGC*
28	*ATACCGCTCTTGCCGAAAGCCGGC*
29	*AGTCATTCTGAGTGCTGGTGAGTACTCACAAGATG*
30	*AAGCGGTACATGATAAGGAGCGGG*
31	*CTTCATTCAGCTCCGCTCGTCGTTTGGTTTGGCAT*
32	*GAAGTGGCAGCCAGTGCGCGTAAC*
33	*ACCCACGCTCACCTCTGCAATGATACCGGTCCATC*
34	*ACAGTTAAGTATATAGGGCGCGTC*
35	*TCCTTTTAAATTGTAAAGGATCTTCACCCCGTCAT*

36	TTGTTTGACCACCGAAGGGCGATC
37	TCGGAAAAAGAGGATGCTGAAGCCAGTTGGTTTGG
38	TATCGCCGAGTCCACGAAAGGGGG
39	AGCCCGACCGCTTGTGCACGAACCCCCCTCTCCAA
40	CTGTTCCCCTGGAACAGGGTTTTC
41	GAAACCCGACAGTAGCTCAAGTCAGAGGATCATCA
42	AATCAGGAAGGCGGAGCGCGCGTA
43	CGGTCGTTCGGCTGTCACTGACTCGCTGCCTCTTC
44	TCACATTTGGGGTGGGTTTCTCAG
45	CACACAACATACGCGTTATCCGCTCACAGATTTCC
46	ATTGATTACGCACCTTGTCGTCGT
47	GCGTTAACGAGGTGCCGTAAATAGAAAAATAAATG
48	TGAGCAACCCGATTTAGAGCTATGTAACCCACTCT
49	TGTATGCGAAAGGAAGGGAAGATGCCATCCGTAAG
50	TCCCAACTGGCAAGTGTAGCGGCCATTGCTACAAT
51	CCAGATTCCGCGCTTAATGCGCGGGAGGGCTTATC
52	TGAAGTTTCAGGCTGCGCAACTAAGGGATTTTGTG
53	AGCTCTTCTTCGCTATTACGCAGAAGGACAGTATC
54	TTATCCGGGCGATTAAGTTGGTAGGTCGTTCGCTT
55	TAAAGATGTTGTAAAACGACGCCCCCTGACGAGAG
56	CGAGCGGTATAGGGCGAATTGCGTATTGGGCGCGC
57	GGAAGCAGAATTCACACGCAATGGTCATAGCTGAT
58	TTTTTTCCAGTTAGACCGAGATAGGAAGCCGA
59	TAAAGGATACATTATCAGGGTTATTACACTCA
60	GAACCCGCTGTGGGGCGAAAACTCTACAACTT
61	CGCTCTGCATAGTTATCACTCATGGATTCCTC
62	CACCAATAGTTAGCTAGAGTAAGTACGATCCG
63	CCATGTCGTGTTTCATCCATAGTTGTACAGTG
64	GGTGCAGTGGAGATCTTTTCTACGGACTACGC
65	ATGTTGGCCTACGGTGCTACAGAGTGTCACTG
66	CCAGTGTAGGTCGTGGCGCTTTCTCTGTACCG
67	ATACGCGTTTTGAACCGTAAAAAGGCGAAAGA
68	GAGACGCGCGGCCAGCTGCATTAATATCTCAC
69	AATCGGCAAAATCCCTTATGTAAATCAG
70	TACTCTTCCTTTTTCAATAGCATAAGGG

71	*TAAAAGTGCTCATCATTGGATCGGGATA*
72	*CGATCGTTGTCAGAAGTAAGATGCAAAA*
73	*CCTCCATCCAGTCTATTAAACGAGCGCA*
74	*AGGCACCTATCTCAGCGATTGTGGTCTG*
75	*GCAGAAAAAAAGGATCTCAAAGGTTTTT*
76	*GTAACAGGATTAGCAGAGCTCCACGACT*
77	*GATACCTGTCCGCCTTTCTTGCGCTCTC*
78	*ACATGTGAGCAAAAGGCCAACTCCACAG*
79	*TGCCCGCTTTCCAGTCGGGGCAGCTAAC*
80	*AGTTCTAGAGCGGCCGCCACCGCGTTGTAAGTC*
81	*ACGTGGACTCCAACAAATCAAAAGAATTGGAACTTCCTCTACCACCTACATCAC*
82	*AGGGGTTCCTTATTGAAGCATTATTTGATTCCTCTACCACCTACATCAC*
83	*ACCCAACTGAAAACGTTCTTCTGAGATCTTCCTCTACCACCTACATCAC*
84	*CTTTTCTGTGTTGGCCGCAGTATTCTCTTTCCTCTACCACCTACATCAC*
85	*CGTGGTGTCTTGTTGCCGGGATGCGCAATTCCTCTACCACCTACATCAC*
86	*TGGCCCCAGCTGTCTATTTCGAGATAACTTCCTCTACCACCTACATCAC*
87	*GAGATTATCAGAAGATCCTTTACGAAAATTCCTCTACCACCTACATCAC*
88	*TATCTGCGCGAGGTATGTAGGACTACGGTTCCTCTACCACCTACATCAC*
89	*GCTGGGCTGCCCTTCGGGAAGATCTCAGTTCCTCTACCACCTACATCAC*
90	*CAAAAATCGGCAAAAGGCCAGTCCATAGTTCCTCTACCACCTACATCAC*
91	*CGCTTCCTCAAACCTGTCGTGGGAGAGGTTCCTCTACCACCTACATCAC*
92	*TGTGTGAAAGTGGAGCTCCAGGCTTGGCTTCCTCTACCACCTACATCAC*

Table S12. Staple strand sequences for p3024-dsDNA.

1	TGAAGCAGGTACTCTTCCTTTCCAGCGTTTCCTCTACCACCTACATCAC
2	CATAGTTGCCTGACTCCCCTCCTATCTCTTCCTCTACCACCTACATCAC
3	TTTTGATTTTAAAAGGGCGAAAGCGCGCTTCCTCTACCACCTACATCAC
4	TCGGGAAACCGTAAGCGCAGGAAAGAACTTCCTCTACCACCTACATCAC
5	CTCAAGAAGATCTCGCCTCCACCAGCCGTTCCTCTACCACCTACATCAC
6	AGAAGTCCGACCCTGCCGCGGTCGTGCGTTCCTCTACCACCTACATCAC
7	AAGGGTTCGGGGTCTAACCAAAAAGCACTTCCTCTACCACCTACATCAC
8	AAAACGTCTACGTGAACCACGCACCACAGTGTAGCTTCCTCTACCACCTACATCAC
9	GTTGTCACGCTCACTTTTAAAAGATCCTAGATTATTTCCTCTACCACCTACATCAC
10	ATGCCATCCTTCGGTCCTCCTGCAAAAATTCCTCTACCACCTACATCAC
11	AGGACAGTATTTGGTATCTGAGAAGTGGTTCCTCTACCACCTACATCAC
12	TTGCCCGGCGTCCGGTGGTAGTGGCAGCAGACGAATTCCTCTACCACCTACATCAC
13	TTCGTTATCAGGGTCCGGGTTCCACATAAGAAAGCTGGAACG
14	AGCGATCCGCGTAAAGAATAC
15	AATCAGTGATCCACGGCAAACGCCGCAGTTCGATC
16	AAACAAATAGGGCATCATGAGCGGATACCACTATAGTGCCTC
17	TACCAATAAATGAGTAAACTTTTTTGGTCATCCAG
18	ATGTGAGCAAAACGGGTTATCCACAGAACCTGTGTATAGTTG
19	ACTCAGCTAAGGGCTTGTTAATAGTTTGCGCAAGC
20	GCAATAACGCTGGTGTCATTGAATACGC
21	TATATAGAATGAAGCGGCCTTTCTCCCTTCGGGTA
22	CATAGCTACACAACGAAATTGTCATGGT
23	CAAAAACACTTTCATTGTTCCGCGCACAGTTAATA
24	ATCTTTTCTACGGGGTCTGCTAAAAAAGTGTCAAAAGAATAG
25	CAAAAAGTAAGGGAGGGTCGTGTAGATACAGTGCT
26	TTGCGCTCACTGCCCGCTTTGTTTAAATGTTGGTC
27	CGGGGAGCTGCATTGGGGCCAGCAAAAGGTTTTTC
28	TTACGCTCAGTGGATACGGGATTTCATC
29	AAAAAAATTACCATTACCGCGTCTCAGGAGAAGTGTGTCTAT
30	TGAGTAAGCCGCGTTTGATCCTAGTTCTAGAGCTTTCAGGGGATAACTT
31	CGCTGTTGAGATGATAGGGTTCCGAAAT
32	ACCGAGAAGGCAAAAATTAAAATCGAAAACTCTCA
33	CTGCAACTTTATCCTTCACCTTCGATACCGATTACGCGCAGA
34	CTCTCCTTAGAGCTAACTCACATTAAGCAGCTCCCCGAAACC
35	CGTTTCCCCCTGGAGGTTTGCGAGCTCCGCTGGGGTGCCTAA

36	GAACAAGAGTCCGGGAGTGTTGTTCCAG
37	CGGCAAACATTTTTGCGTTAAAAATTGG
38	GCCGGGAAGCTAAGTCCAGTCTATTAATGGAGGAT
39	GAAGGGCTTATCAGAGACCCAGATTTTT
40	CGACAGGCGCTCAACCCTGACACGGAAG
41	AGCAGCGCAATAAAATCAAGGCGAGTTAAGGTTTGGTATGGC
42	AAGCCCCGTCAGAGGCACGAACCCCCCGTATTCGGTGTAGGT
43	AGAGCTTGAACCCTATCAGCTATCCCTTATAAATT
44	TTCATTCAGCTCCCACAGGCACTGGTGAGTACTGC
45	AGCGGTTCATGATCTCCAGATCGAGCGC
46	CGTTCGCTCCAAGTCATAGCTACTACGGCTACATC
47	CGGTAACTTCAGCCAAATCGAACTATAA
48	TAAATCGGATCACCCTAATCAAGTTTTTGTGCCGTTAACTAT
49	GCCGGTTCCCAACGCCGAGTAAGTAGTTCGCCAAAAAAGGGA
50	TTGCTGGGCTGTGTGTTTACCGGATACCTGTCCGCCCCCATG
51	TGGCGAGATTTTTGGACACGGATGCCGCGGGTGAG
52	TGTTTGCGTCACGCTCGTCCTCCGTAAGCATAATT
53	CATAAAGTAGGTATCTCAGTCAGTTCTTGCGAGGT
54	GCGTAACGGGAAAGCCGGCCTCCGATTT
55	TCTGTGATCGTGGTAACGTTGTTGCCATGATGCTC
56	TGGCCTACACGCTGTGAAGCGTGGCGCTTGGTTAC
57	GCTACAGGTCTTGAGTAAGACGAGCATCGCTCACTGTATTGGCAACGCG
58	TTCGCCATTCAGAACCCGCCGCGCTTAATGGCCCATCCGAAA
59	GGTCACGGCGCTAGGAAGGGAGCAGAACGTTGAAT
60	AAGTCATTCTGAGAATAGTTGATGCTTT
61	CTCTTACATGGTTATAAGTTGAAACCACTCTAAAG
62	ATGTAGGGGTAACACTTATCGCAATTCCCGCTGCGCGGCTGCAATGAAT
63	CGAGTAACAAGCTTGTCTTGTGGCCAGGGAATTCA
64	AGCCATTGAGCTCCAGCTTTTGTGGCCGCCACCGC
65	CGATCGGTGCGGGCTCATCAGGGCGCTGCAGTCAC
66	CTTCGGAAAAAGACGAGCCGAGGATTAGTTAGTGAGGGTTAA
67	GTAATACGTTTTCCGCGCTGCGCAACTG
68	CACGACGGCCAGTGTTGGGTATATTGTCATATTAT
69	ACCTTTCCGTCGTCACGTATGCGGCGAC
70	GGGGGGCTATAGACATTTACGGAGGCACTGACAGT

71	*CATAGCTGTTCCCTCAGCGCTCTGCTGA*
72	*GGCGTAATTATCCGGTAATACAGCGGTA*
73	*TGGGTAACGCCAGGGATGCAAGGCGATT*
74	*GACGTTGTAAAACGGGAGCGGCTCAACC*
75	*TTCGTGGCTGAGTGATCACTCTGCTAGA*
76	*TTCGCTATGTAAGCTTTCCCCCTTCAGCATCTTTTAGCCAGTTCGATGT*
77	*GGGATAACTGGCCCACTACGAACGAAAACTCACGTGACTTTG*
78	*GTAGCTCTGCTGGCGCCAGGAACCTGTCGTGCCAGAGTTGCG*
79	*TGTGCCTATATTTGGAAAAAT*

Table S13. Staple strand sequences for p7308-dsDNA.

1	ATTAAGCAATAAAGCCTCAGAGCATAAAGCTAAATCGGTTGT
2	ACCAAAAACATTATGACCCTGTAATACTTTTGCGGGAGAAGC
3	CTTTATTTCAACGCAAGGATAAAAATTTTTAGAACCCTCATA
4	TATTTTAAATGCAATGCCTGAGTAATGTGTAGGTAAAGATTC
5	AAAAGGGTGAGAAAGGCCGGAGACAGTCAAATCACCATCAAT
6	ATGATATTCAACCGTTCTAGCTGATAAATTAATGCCGGAGAG
7	GGTAGCTATTTTTGAGAGATCTACAAAGGCTATCAGGTCATT
8	GCCTGAGAGTCTGGAGCAAACAAGAGAATCGATGAACGGTAA
9	TCGTAAAACTAGCATGTCAATCATATGTACCCCGGTTGATAA
10	TCAGAAAAGCCCCAAAAACAGGAAGATTGTATAAGCAAATAT
11	TTAAATTGTAAACGTTAATATTTTGTTAAAATTCGCATTAAA
12	TTTTTGTTAAATCAGCTCATTTTTTAACCAATAGGAACGCCA
13	TCAAAAATAATTCGCGTCTGGCCTTCCTGTAGCCAGCTTTCA
14	TCAACATTAAATGTGAGCGAGTAACAACCCGTCGGATTCTCC
15	TTGGTGTAGATGGGCGCATCGTAACCGTGCATCTGCCAGTTT
16	GAGGGGACGACGACAGTATCGGCCTCAGGAAGATCGCACTCC
17	AGCCAGCTTTCCGGCACCGCTTCTGGTGCCGGAAACCAGGCA
18	AAGCGCCATTCGCCATTCAGGCTGCGCAACTGTTGGGAAGGG
19	CGATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAA
20	GGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGG
21	TTTTCCCAGTCACGACGTTGTAAAACGACGGCCAGTGCCAAG
22	CTTGCATGCCTGCAGGTCGACTCTAGACCTTTGATAGCGAGG
23	CAAGTCCGCTAGCGACCGTATACGCATGGCTAGTACCCGTAT
24	AAGGATCCCCGGGTACCGAGCTCGAATTCGTAATCATGGTCA
25	TAGCTGTTTCCTGTGTGAAATTGTTATCCGCTCACAATTCCA
26	CACAACATACGAGCCGGAAGCATAAAGTGTAAAGCCTGGGGT
27	GCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCA
28	CTGCCCGCTTTCCAGTCGGGAAACCTGTCGTGCCAGCTGCAT
29	GGGCGCCAGGGTGGTTTTTCTTTTCACCAGTGAGACGGGCAA
30	CAGCTGATTGCCCTTCACCGCCTGGCCCTGAGAGAGTTGCAG
31	CAAGCGGTCCACGCTGGTTTGCCCCAGCAGGCGAAAATCCTG
32	TTTGATGGTGGTTCCGAAATCGGCAAAATCCCTTATAAATCA
33	AAAGAATAGCCCGAGATAGGGTTGAGTGTTGTTCCAGTTTGG
34	AACAAGAGTCCACTATTAAAGAACGTGGACTCCAACGTCAAA
35	GGGCGAAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAA

36	CCATCACCCAAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAA
37	GCACTAAATCGGAACCCTAAAGGGAGCCCCCGATTTAGAGCT
38	TGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAG
39	AAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG
40	GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCG
41	CCGCTACAGGGCGCGTACTATGGTTGCTTTGACGAGCACGTA
42	TAACGTGCTTTCCTCGTTAGAATCAGAGCGGGAGCTAAACAG
43	ATCCTGAGAAGTGTTTTTATAATCAGTGAGGCCACCGAGTAA
44	AAGAGTCTGTCCATCACGCAAATTAACCGTTGTAGCAATACT
45	TCTTTGATTAGTAATAACATCACTTGCCTGAGTAGAAGAACT
46	CAAACTATCGGCCTTGCTGGTAATATCCAGAACAATATTACC
47	GCCAGCCATTGCAACAGGAAAAACGCTCATGGAAATACCTAC
48	ATTTTGACGCTCAATCGTCTGAAATGGATTATTTACATTGGC
49	AGATTCACCAGTCACACGACCAGTAATAAAAGGGACATTCTG
50	GCCAACAGAGATAGAACCCTTCTGACCTGAAAGCGTAAGAAT
51	ACGTGGCACAGACAATATTTTTGAATGGCTATTAGTCTTTAA
52	TGCGCGAACTGATAGCCCTAAAACATCGCCATTAAAAATACC
53	GAACGAACCACCAGCAGAAGATAAAACAGAGGTGAGGCGGTC
54	AGTATTAACACCGCCTGCAACAGTGCCACGCTGAGAGCCAGC
55	AGCAAATGAAAAATCTAAAGCATCACCTTGCTGAACCTCAAA
56	TATCAAACCCTCAATCAATATCTGGTCAGTTGGCAAATCAAC
57	AGCACTAACAACTAATAGATTAGAGCCGTCAATAGATAATAC
58	ATTTGAGGATTTAGAAGTATTAGACTTTACAAACAATTCGAC
59	AACTCGTATTAAATCCTTTGCCCGAACGTTATTAATTTTAAA
60	AGTTTGAGTAACATTATCATTTTGCGGAACAAAGAAACCACC
61	AGAAGGAGCGGAATTATCATCATATTCCTGATTATCAGATGA
62	TGGCAATTCATCAATATAATCCTGATTGTTTGGATTATACTT
63	CTGAATAATGGAAGGGTTAGAACCTACCATATCAAAATTATT
64	TGCACGTAAAACAGAAATAAAGAAATTGCGTAGATTTTCAGG
65	TTTAACGTCAGATGAATATACAGTAACAGTACCTTTTACATC
66	GGGAGAAACAATAACGGATTCGCCTGATTGCTTTGAATACCA
67	AGTTACAAAATCGCGCAGAGGCGAATTATTCATTTCAATTAC
68	CTGAGCAAAAGAAGATGATGAAACAAACATCAAGAAAACAAA
69	ATTAATTACATTTAACAATTTCATTTGAATTACCTTTTTTAA
70	TGGAAACAGTACATAAATCAATATATGTGAGTGAATAACCTT

71	CCTTGAAAACATAGCGATAGCTTAGATTAAGACGCTGAGAAG
72	AGTCAATAGTGAATTTATCAAAATCATAGGTCTGAGAGACTA
73	CCTTTTTAACCTCCGGCTTAGGTTGGGTTATATAACTATATG
74	TAAATGCTGATGCAAATCCAATCGCAAGACAAAGAACGCGAG
75	AAAACTTTTTCAAATATATTTTAGTTAATTTCATCTTCTGAC
76	CTAAATTTAATGGTTTGAAATACCGACCGTGTGATAAATAAG
77	GCGTTAAATAAGAATAAACACCGGAATCATAATTACTAGAAA
78	AAGCCTGTTTAGTATCATATGCGTTATACAAATTCTTACCAG
79	TATAAAGCCAACGCTCAACAGTAGGGCTTAATTGAGAATCGC
80	CATATTTAACAACGCCAACATGTAATTTAGGCAGAGGCATTT
81	TCGAGCCAGTAATAAGAGAATATAAAGTACCGACAAAAGGTA
82	AAGTAATTCTGTCCAGACGACGACAATAAACAACATGTTCAG
83	CTAATGCAGAACGCGCCTGTTTATCAACAATAGATAAGTCCT
84	GAACAAGAAAAATAATATCCCATCCTAATTTACGAGCATGTA
85	AACGGGTATTAAACCAAGTACCGCACTCATCGAGAACAAGCA
86	AGCCGTTTTTATTTTCATCGTAGGAATCATTACCGCGCCCAA
87	TAGCAAGCAAATCAGATATAGAAGGCTTATCCGGTATTCTAA
88	GAACGCGAGGCGTTTTAGCGAACCTCCCGACTTGCGGGAGGT
89	TTTGAAGCCTTAAATCAAGATTAGTTGCTATTTTGCACCCAG
90	CTACAATTTTATCCTGAATCTTACCAACGCTAACGAGCGTCT
91	TTCCAGAGCCTAATTTGCCAGTTACAAAATAAACAGCCATAT
92	TATTTATCCCAATCCAAATAAGAAACGATTTTTTGTTTAACG
93	TCAAAAATGAAAATAGCAGCCTTTACAGAGAGAATAACATAA
94	AAACAGGGAAGCGCATTAGACGGGAGAATTAACTGAACACCC
95	TGAACAAAGTCAGAGGGTAATTGAGCGCTAATATCAGAGAGA
96	TAACCCACAAGAATTGAGTTAAGCCCAATAATAAGAGCAAGA
97	AACAATGAAATAGCAATAGCTATCTTACCGAAGCCCTTTTTA
98	AGAAAAGTAAGCAGATAGCCGAACAAAGTTACCAGAAGGAAA
99	ATGATTAAGACTCCTTATTACGCAGTATGTTAGCAAACGTAG
100	AAAATACATACATAAAGGTGGCAACATATAAAAGAAACGCAA
101	AGACACCACGGAATAAGTTTATTTTGTCACAATCAATAGAAA
102	ATTCATATGGTTTACCAGCGCCAAAGACAAAAGGGCGACATT
103	CAACCGATTGAGGGAGGGAAGGTAAATATTGACGGAAATTAT
104	TCATTAAAGGTGAATTATCACCGTCACCGACTTGAGCCATTT
105	GGGAATTAGAGCCAGCAAAATCACCAGTAGCACCATTACCAT

106	TAGCAAGGCCGGAAACGTCACCAATGAAACCATCGATAGCAG
107	CACCGTAATCAGTAGCGACAGAATCAAGTTTGCCTTTAGCGT
108	CAGACTGTAGCGCGTTTTCATCGGCATTTTCGGTCATAGCCC
109	CCTTATTAGCGTTTGCCATCTTTTCATAATCAAAATCACCGG
110	AACCAGAGCCACCACCGGAACCGCCTCCCTCAGAGCCGCCAC
111	CCTCAGAACCGCCACCCTCAGAGCCACCACCCTCAGAGCCGC
112	CACCAGAACCACCACCAGAGCCGCCGCCAGCATTGACAGGAG
113	ATAAATCCTCATTAAAGCCAGAATGGAAAGCGCAGTCTCTGA
114	ATTTACCGTTCCAGTAAGCGTCATACATGGCTTTTGATGATA
115	CAGGAGTGTACTGGTAATAAGTTTTAACGGGGTCAGTGCCTT
116	GAGTAACAGTGCCCGTATAAACAGTTAATGCCCCCTGCCTAT
117	TTCGGAACCTATTATTCTGAAACATGAAAGTATTAAGAGGCT
118	GAGACTCCTCAAGAGAAGGATTAGGATTAGCGGGGTTTTGCT
119	CAGTACCAGGCGGATAAGTGCCGTCGAGAGGGTTGATATAAG
120	TATAGCCCGGAATAGGTGTATCACCGTACTCAGGAGGTTTAG
121	TACCGCCACCCTCAGAACCGCCACCCTCAGAACCGCCACCCT
122	CAGAGCCACCACCCTCATTTTCAGGGATAGCAAGCCCAATAG
123	GAACCCATGTACCGTAACACTGAGTTTCGTCACCAGTACAAA
124	CTACAACGCCTGTAGCATTCCACAGACAGCCCTCATAGTTAG
125	CGTAACGATCTAAAGTTTTGTCGTCTTTCCAGACGTTAGTAA
126	ATGAATTTTCTGTATGGGATTTTGCTAAACAACTTTCAACAG
127	CGAATAATAATTTTTTCACGTTGAAAATCTCCAAAAAAAAGG
128	CTCCAAAAGGAGCCTTTAATTGTATCGGTTTATCAGCTTGCT
129	TTCGAGGTGAATTTCTTAAACAGCTTGATACCGATAGTTGCG
130	CCGACAATGACAACAACCATCGCCCACGCATAACCGATATAT
131	TCGGTCGCTGAGGCTTGCAGGGAGTTAAAGGCCGCTTTTGCG
132	GGATCGTCACCCTCAGCAGCGAAAGACAGCATCGGAACGAGG
133	GTAGCAACGGCTACAGAGGCTTTGAGGACTAAAGACTTTTTC
134	ATGAGGAAGTTTCCATTAAACGGGTAAAATACGTAATGCCAC
135	TACGAAGGCACCAACCTAAAACGAAAGAGGCAAAAGAATACA
136	CTAAAACACTCATCTTTGACCCCCAGCGATTATACCAAGCGC
137	GAAACAAAGTACAACGGAGATTTGTATCATCGCCTGATAAAT
138	TGTGTCGAAATCCGCGACCTGCTCCATGTTACTTAGCCGGAA
139	CGAGGCGCAGACGGTCAATCATAAGGGAACCGAACTGACCAA
140	CTTTGAAAGAGGACAGATGAACGGTGTACAGACCAGGCGCAT

141	GATATTCATTACCCAAATCAACGTAACAAAGCTGCTCATTCA
142	GTGAATAAGGCTTGCCCTGACGAGAAACACCAGAACGAGTAG
143	TAAATTGGGCTTGAGATGGTTTAATTTCAACTTTAATCATTG
144	TGAATTACCTTATGCGATTTTAAGAACTGGCTCATTATACCA
145	GTCAGGACGTTGGGAAGAAAAATCTACGTTAATAAAACGAAC
146	TAACGGAACAACATTATTACAGGTAGAAAGATTCATCAGTTG
147	AGATTTAGGAATACCACATTCAACTAATGCAGATACATAACG
148	CCAAAAGGAATTACGAGGCATAGTAAGAGCAACACTATCATA
149	ACCCTCGTTTACCAGACGACGATAAAAACCAAAATAGCGAGA
150	GGCTTTTGCAAAAGAAGTTTTGCCAGAGGGGGTAATAGTAAA
151	ATGTTTAGACTGGATAGCGTCCAATACTGCGGAATCGTCATA
152	AATATTCATTGAATCCCCCTCAAATGCTTTAAACAGTTCAGA
153	AAACGAGAATGACCATAAATCAAAAATCAGGTCTTTACCCTG
154	ACTATTATAGTCAGAAGCAAAGCGGATTGCATCAAAAAGATT
155	AGCTTCAAAGCGAACCAGACCGGAAGCAAACTCCAACAGGTC
156	AGGATTAGAGAGTACCTTTAATTGCTCCTTTTGATAAGAGGT
157	CATTTTTGCGGATGGCTTAGAGCTTAATTGCTGAATATAATG
158	CTGTAGCTCAACATGTTTTAAATATGCAACTAAAGTACGGTG
159	TCTGGAAGTTTCATTCCATATAACAGTTGATTCCCAATTCTG
160	CGAACGAGTAGATTTAGTTTGACCATTAGATACATTTCGCAA
161	ATGGTCAATAACCTGTTTAGCTATATTTTCATTTGGGGCGCG
162	AGCTGAAAAGGTGGCATCAATTCTACTAATAGTAGTAGCATT
163	AGCTGAAAAGGTGGCATCAATTCTACTAATAGTAGTAGCATT
164	AACATCCAATAAATCATACAGGCAAGGCAAAGAATTAGCAAATTCCTCTACCACCTACATCAC
165	GTGGGAACAAACGGCGGATTGACCGTAATGGGATAGGTCACGTTCCTCTACCACCTACATCAC
166	TAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTTTCCTCTACCACCTACATCAC
167	GAGGCCGATTAAAGGGATTTTAGACAGGAACGGTACGCCAGATTCCTCTACCACCTACATCAC
168	AGTTGAAAGGAATTGAGGAAGGTTATCTAAAATATCTTTAGGTTCCTCTACCACCTACATCAC
169	GCTTCTGTAAATCGTCGCTATTAATTAATTTTCCCTTAGAATTTCCTCTACCACCTACATCAC
170	GAAACCAATCAATAATCGGCTGTCTTTCCTTATCATTCCAAGTTCCTCTACCACCTACATCAC
171	CCGAGGAAACGCAATAATAACGGAATACCCAAAAGAACTGGCTTCCTCTACCACCTACATCAC
172	GTTGAGGCAGGTCAGACGATTGGCCTTGATATTCACAAACAATTCCTCTACCACCTACATCAC
173	TTTCAGCGGAGTGAGAATAGAAAGGAACAACTAAAGGAATTGTTCCTCTACCACCTACATCAC
174	AGGCTGGCTGACCTTCATCAAGAGTAATCTTGACAAGAACCGTTCCTCTACCACCTACATCAC
175	AAGAGGAAGCCCGAAAGACTTCAAATATCGCGTTTTAATTCGTTCCTCTACCACCTACATCAC