

Self Assembling 2D and 3D Prestressed Tensegrity Structures built from DNA

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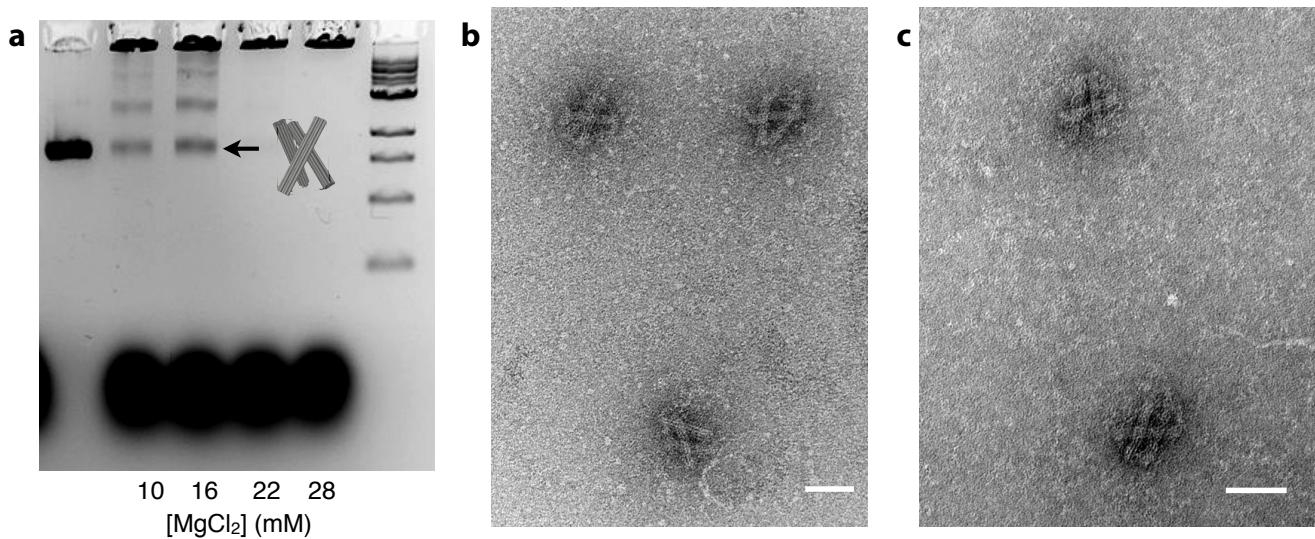


Figure S1 | Prestressed tensegrity object prism.

a) Agarose-gel analysis of the prism (2% agarose, 0.5 µg/mL EtBr, 0.5x TBE, 11 mM MgCl₂, 3 h at 70 V). Lanes from left to right: scaffold p8634, prism folded at 10 mM, 16 mM, 22 mM, and 28 mM concentration of MgCl₂, 1kb ladder. The fastest moving band in the 16 mM MgCl₂ lane was physically extracted from the gel and centrifuged through a spin column (Freeze 'N squeeze, Biorad, Hercules, CA) to filter out agarose residues.

For yield estimation, the fluorescence intensity of the leading band was compared to the fluorescence intensities of the whole lane, including the fluorescence from the gel pockets and the smear between the individual bands.

b) Gel-purified objects were adsorbed on plasma-treated, carbon-coated TEM grids for 2 minutes, stained with 2% uranyl formate, and then imaged on a FEI Tecnai T12 BioTWIN at 80 kV. Scale bars: 50 nm.

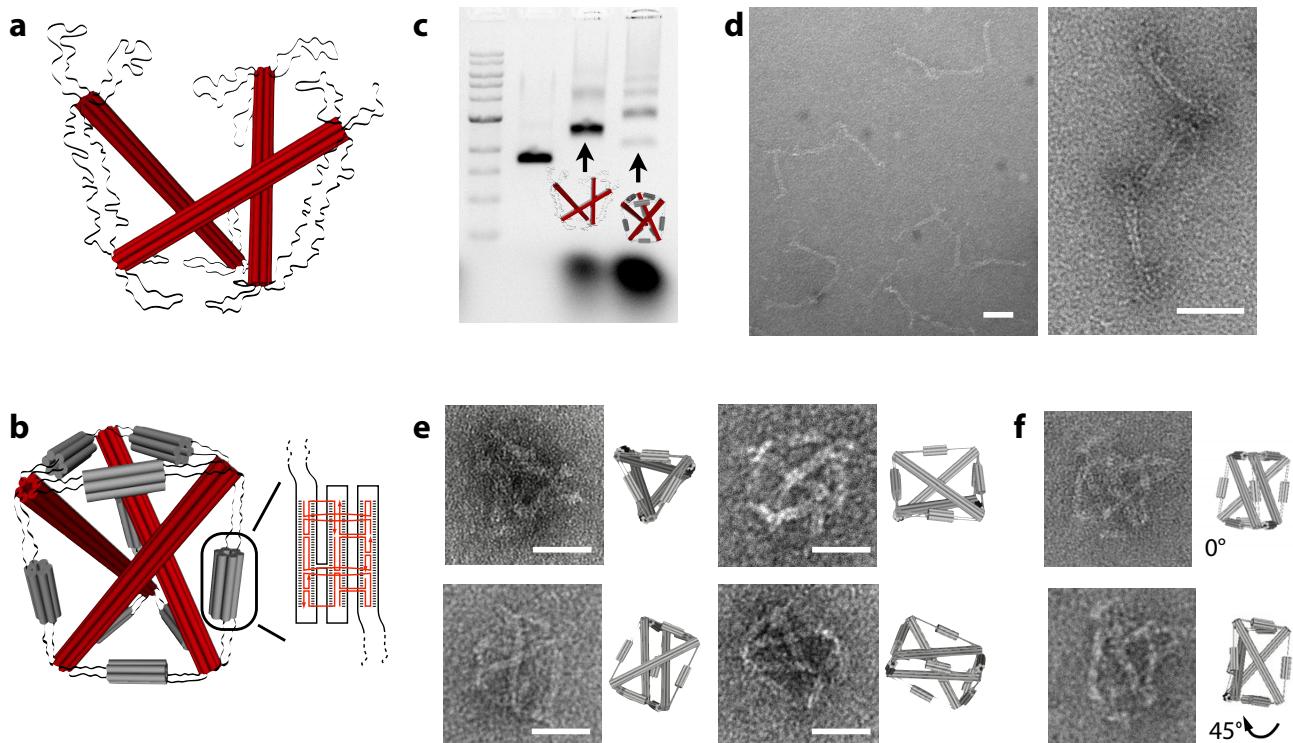


Figure S2 | Six-helix-bundle prism

The six-helix-bundle version of the tensegrity prism is built from three 62 nm long six-helix bundles implemented on a 8064 nt scaffold strand.

- a) The three six-helix bundles of the object are connected by 2 × 2 stretches of unpaired bases (black wiggly lines represents ssDNA and each cylinder represents one dsDNA helix). Further ssDNA sections loop out of the ends of the six-helix-bundle.
- b) Each of these loops is connected to a designated second loop via a short six-helix-bundle motif (clamp, grey cylinders and blow up), in each of which one of the two scaffold loops accounts for two of the six double strands and the other loop for the remaining four double strands. The connection between the loops is hence solely provided by staple oligonucleotide crossovers.

c) Gel analysis of folded structures (2% agarose, 0.5 µg/mL EtBr, 0.5x TBE, 11 mM MgCl₂, 4 h at 70 V). Lanes from left to right: scaffold p8064, three struts without clamps, prism. The fastest moving bands were extracted from the gel, centrifuged through a spin column, and imaged with TEM.

d) Two electron micrographs of structures folded in the absence of the clamping staples. Only triplets of six-helix-bundle connected by ssDNA can be found on the TEM grids. Scale bars: 50 nm.

e) If the clamping staples are present during the folding process, the desired prism structure assembles and can be imaged with TEM after gel-purification. Scale bars: 50 nm.

f) Some of the prisms retain their three dimensional structure after adsorption on the TEM grid. We believe, that in these cases the uranyl formate stain supports the DNA structures. Comparing TEM images and computer models before and after tilting by 45° reveals the three-dimensionality of the object.

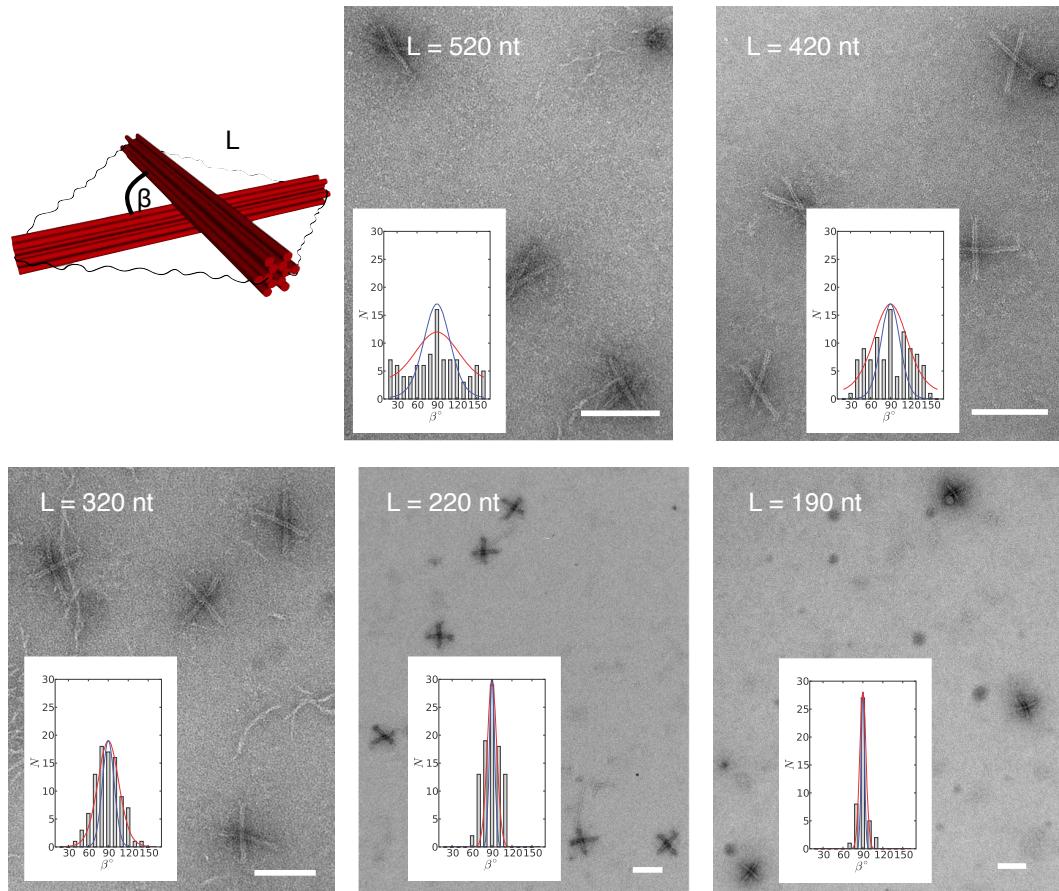
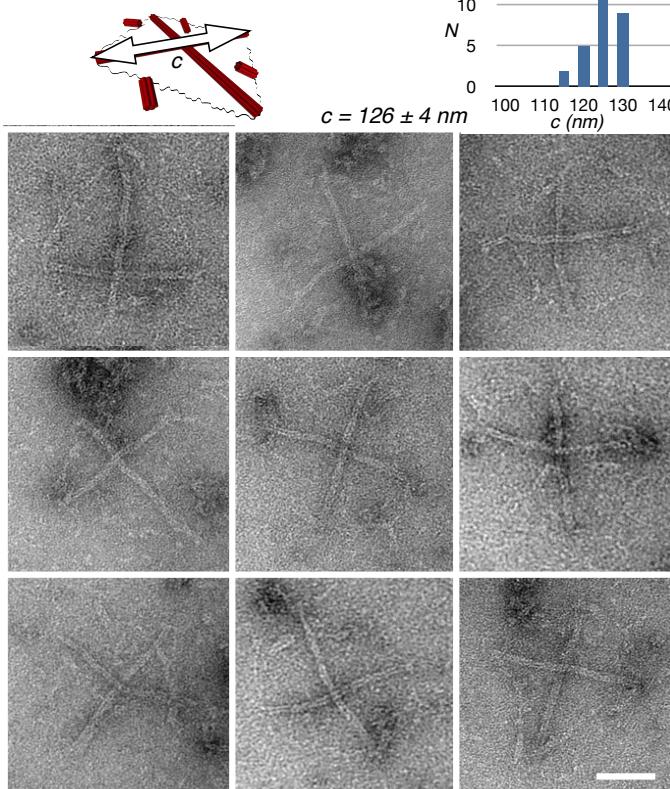
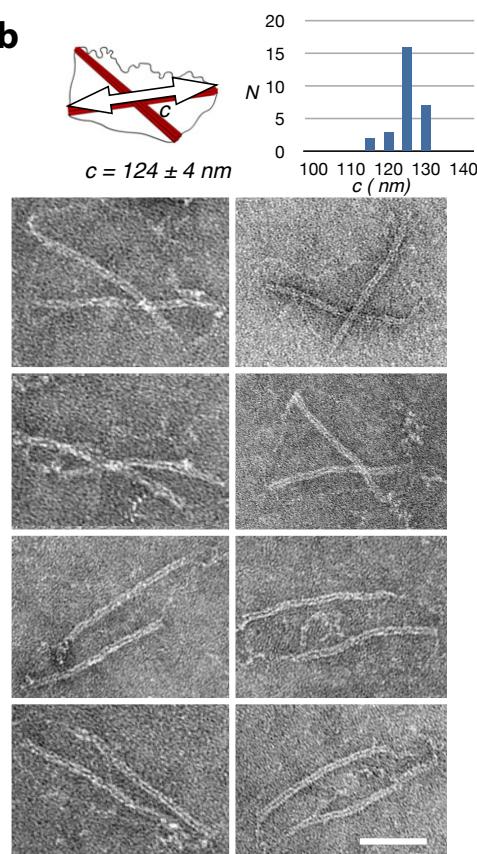


Figure S3 | TEM analysis of Twelve-helix bundle kites

Cylinder model and five electron micrographs of the twelve-helix bundle kites with histograms of the occurring angles β for five different spring lengths. For longer ssDNA springs and hence lower prestressed tension, a large variety of angles between the two crossing struts can be observed. Shortening of the springs by spooling of the unused bases (cf. figure 2) leads to higher tensed springs and a smaller distribution of angles between crossing struts. With increasing tension the yield of correctly folded objects drops. For kites with 170-nt-long springs and shorter we were not able to image two or more objects in one TEM frame. Scalebars are 100 nm.

The red continuous curves overlaying the histograms are numerical calculations of the equilibrium angles calculated from the modified freely jointed chain model, page S9, using the code on page S10.

The blue continuous curves are numerical calculations of the equilibrium angles calculated from a worm-like chain model, code and equation on page S11.

a Before gel purification**b****Figure S4** | Electron micrographs of six-helix bundle kite structures.

Six-helix bundle kites were imaged after the annealing process without further purification or treatment. Only single particles which were separated from aggregates or other particles on the grid were analyzed.

a) Kites adsorbed on the TEM grid show overall square-like appearance and the struts are not bent more than free, uncompressed, six-helix bundles (cf. S7). The average end-to-end distance of the ends of the six-helix bundles c is 126 nm. This is in close agreement with the expected value of 127 nm, the average end-to-end distance of a 128 nm-long six-helix bundle with a persistence length of 2.5 μ m. In a square arrangement, the distance stretched by each DNA spring is 89 nm. The

worm-like-chain model predicts for a 486 nt single strand stretched over this distance a force of 3.3 pN. Hence, a force of 4.7 pN compresses each strut. This is below the critical buckling force of 6.0 pN estimated for a 128 nm long six-helix bundle. Scale bar: 50 nm.

b) The struts of the asymmetric kites exhibit an average end-to-end distance c of 124 nm which is close to the expected value of 127 nm. If both struts are parallel, we can calculate the sum of the forces created by the three 286-nt long springs stretched over 62 nm (4.0 pN) and the 2230-nt long spring stretched over 186 nm (1.3 pN) acting in parallel. The sum (5.3 pN) is still below the critical buckling force of 6.0 pN estimated for a 128 nm long six-helix bundle. Scale bar: 50 nm.

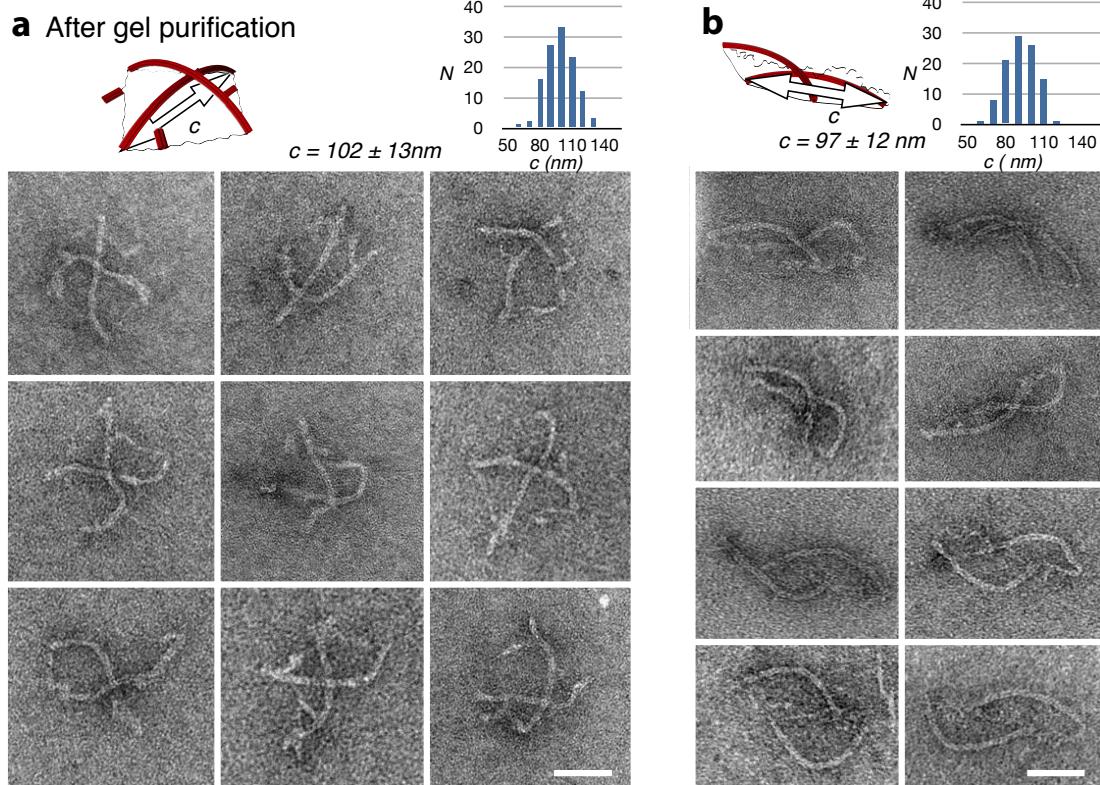


Figure S5 | Electron micrographs of six-helix bundle kite structures after gel-purification.

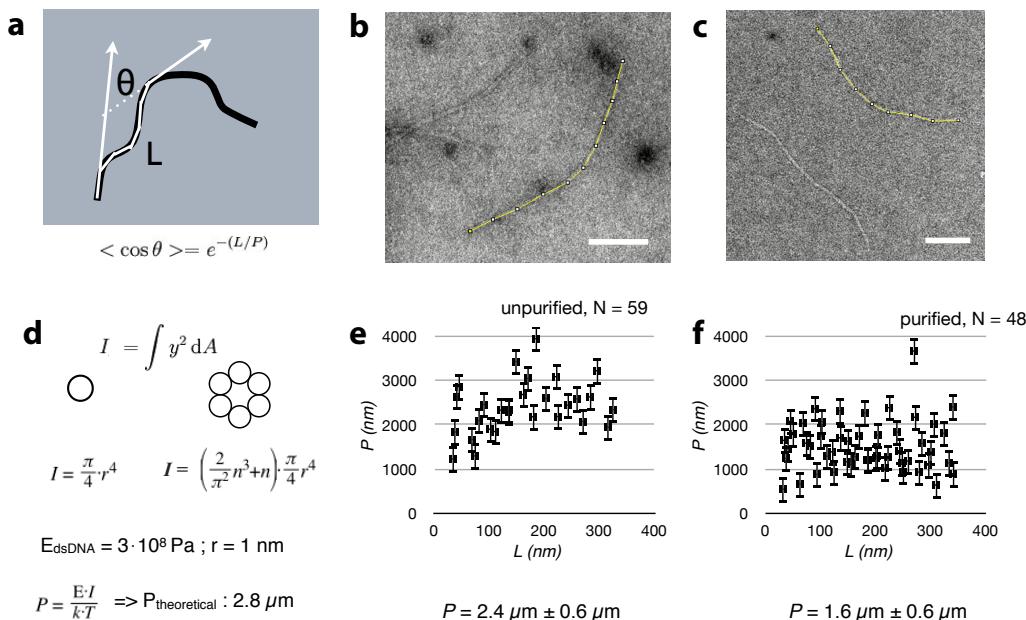
Six-helix bundle kites were imaged after physical extraction from 2% agarose gels.

a) Gel-purified kites show obvious distorted appearance. The struts are bent and the average end-to-end distance c has dropped to 102 nm. We reason, that the ends of the struts are pulled together by the forces generated within the entropic springs. During the process of gel electrophoresis, staining with ethidium bromide, and gel extraction the stability of the six-helix bundles has suffered. The average distance stretched by each DNA spring is now only 72 nm which translates into a force of 2.6 pN along each spring. Hence, a force of 3.7 pN compresses each strut while the strut exerts the equivalent restoring force. Our

estimated value of 3.7 pN is close to the critical buckling force of 3.9 pN estimated for a 128 nm long six-helix bundle after gel-purification. Scale bar: 50 nm.

b) Gel-purified struts of the asymmetric kites exhibit an average end-to-end distance c of 97 nm. The forces created by the three 286-nt long springs stretched over 49 nm (3.0 pN) and the 2230-nt long spring stretched over 146 nm (1.0 pN) acting in parallel sum up to 4.0 pN. This value is in very good agreement with the critical buckling force of 3.9 pN estimated for a gel-purified 128 nm long six-helix bundle. Scale bar: 50 nm.

We have shown in this figure, that the persistence length of gel-purified DNA-origami six-helix bundles drops to ~ 60% of the value of unpurified six-helix bundles. This is in accordance with independent measurements of the persistence length of six-helix bundles as described in figure S8.

**Figure S6 | Persistence length of six-helix bundles I**

a) The persistence length describes the length along the contour of a polymer over which the angular correlation between two tangential vectors is lost. If L defines the contour length between two tangents to the path of a polymer in space and θ the angle between these two tangents the persistence length P can be expressed as: $\langle \cos \theta \rangle = \exp(-L/P)$.

b) Electron micrograph of a 428 nm long six-helix bundle imaged after annealing without further purification or treatment. Segmented lines were drawn along 59 six-helix bundles adsorbed to carbon-coated TEM grids. The angular correlation between the segments of the lines was analyzed. Because the bundles are assumed to adsorb irreversibly to the TEM grid, the 2-dimensional deflection angles in the images should correctly sample the distribution of 3 dimensional deflection angles of the bundles in solution. This assumption has proven to be useful in AFM measurements, where the persistence length of dsDNA and dsRNA adsorbed on mica via polylysine turned out to be in good agreement with measurements using other techniques [Abels05, Joanicot87, Frontali88] Scale bar: 100 nm

c) Electron micrograph of a 428 nm long six-helix bundle imaged after gel-purification.

S6

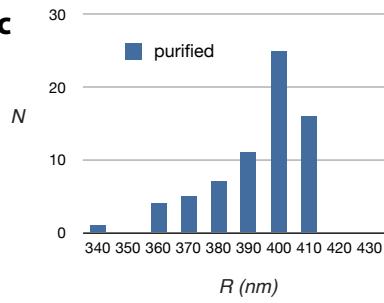
These six-helix bundles show more kinks than the unpurified objects. We attribute this fact to the incorporation of ethidium bromide into the double helices and mechanical damage during gel-extraction. Segmented lines were drawn along 48 gel-purified six-helix bundles and the angular correlation between the segments was analyzed. Scale bar: 100 nm.

d) Simplified cross-sections of a DNA double strand and of a six-helix bundle. The increased 2nd moment of inertia I can be used to estimate the persistence length of such a bundle using the established value of $3 \cdot 10^8 \text{ Pa}$ for dsDNA to be $2.8 \mu\text{m}$.

e) and f) Analysis of angular correlation between polygon segments. Each point of measurement represents values for P determined from the average over all angles measured between any two segments with a given contour distance. The average over all these measurements yields a value for P of $2.4 \pm 0.6 \mu\text{m}$ for unpurified six-helix bundles and $1.6 \pm 0.6 \mu\text{m}$ for gel-purified six-helix bundles.

a

$$\langle R^2 \rangle = 2 \cdot P^2 \left(\exp\left(-\frac{L}{P}\right) - 1 + \frac{L}{P} \right)$$

R : End-to-end distance*L* : Contour length*P* : Persistence length**c**

$$P = 1.0 \pm 1 \mu\text{m}$$

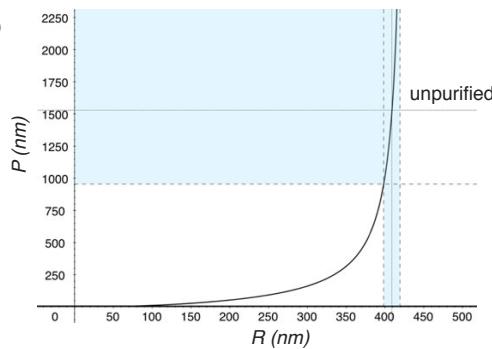
b

Figure S7 | Persistence length of six-helix bundles II

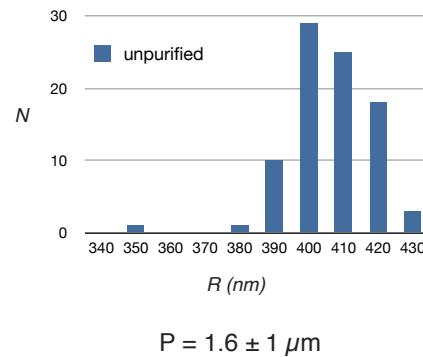
An alternative way to measure the persistence length of a semiflexible polymer is to measure its end-to-end distance [Howard01, Landau80]. This method works best for molecules of a length close to their persistence length. The six-helix bundles investigated here have a length of 428 nm while their persistence length is estimated to be six times larger. For this reason we expect a highly inaccurate measurement, but the tendencies will be the same as in the measurements based on angle-correlation analysis.

a) Expression for the mean-squared end-to-end distance.

b) Expression given in a) plotted for a contour length of 428 nm. The end-to-end distance of 409 ± 10 nm for unpurified six-helix bundles is highlighted. The large region of possible error underlines the inappropriateness of this method for the objects investigated here.

c) Histogram of measured end-to-end distances of gel-purified six-helix bundles.

d) Histogram of measured end-to-end distances of unpurified six-helix bundles.

d

$$P = 1.6 \pm 1 \mu\text{m}$$

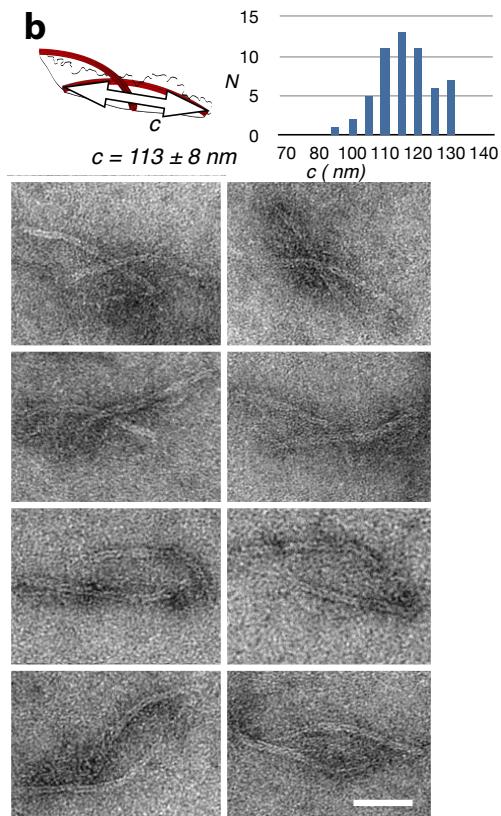
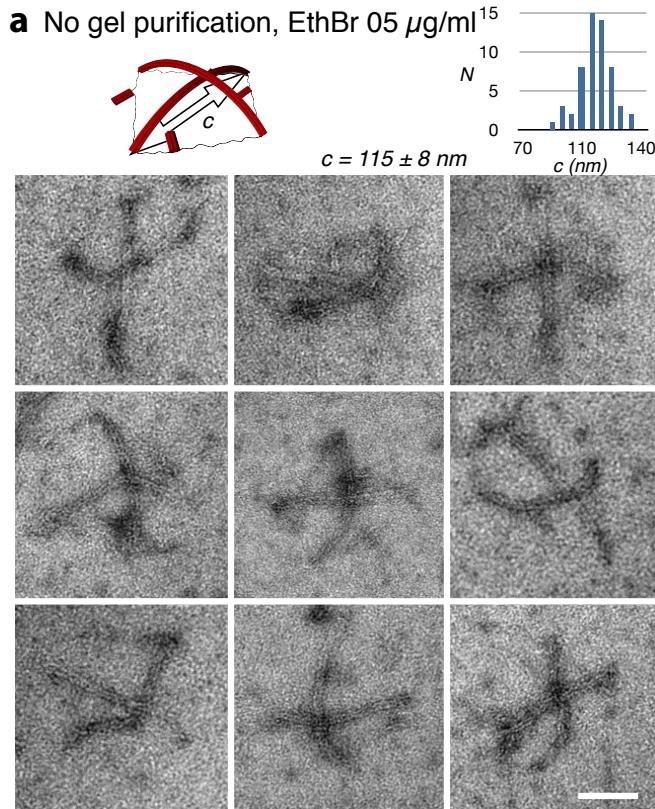


Figure S8 | Electron micrographs of six-helix bundle kite structures soaked in ethidium bromide.

Six-helix bundle kites were imaged after the annealing process followed by a 4 -h-long bath in 1 $\mu\text{g/ml}$ ethidium bromide without further purification. Only particles which were separated from aggregates or other particles on the grid were analyzed.

a) Ethidium-bromide-treated kites show distorted appearance. Most of the struts are bent and the average end-to-end distance c is 115 nm. In this geometry, the average distance stretched by each DNA spring is 81 nm which translates into a force of 2.9 pN along each spring. Hence a force of 4.1 pN compresses each strut and at the same time each strut exerts a restoring force of 4.1 pN. Scale bar: 50 nm.

b) Gel-purified struts of the asymmetric kites exhibit an average end-to-end distance, c , of 113 nm. The sum of the forces created by the three 286-nt long springs stretched over 56 nm (3.5 pN) and the 2230-nt long spring stretched over 170 nm (1.1 pN) acting in parallel. Here we find that a force of 4.6 pN compresses each strut. From this and the measurement described in (a) we estimate the persistence length of ethidium-bromide-soaked six-helix bundles to be $1.7 \pm 0.3 \mu\text{m}$. Scale bar: 50 nm.

In summary, we found that ethidium bromide lowers the stability of DNA-origami six-helix bundles. A drop in persistence length of ~ 70% compared to untreated six-helix bundles has been observed.

Entropic spring DNA

Single stranded DNA can be described in a first approach as a freely-jointed chain (FJC), which reflects a random walk of the chain's elements and does not take into account self avoidance of the elements. There is no restriction to the orientation of each monomer with respect to that of each other. N monomers, (e.g. nucleotides) form the polymer (e.g. chain of nucleotides), whose total unfolded length is:

$$L=N*l,$$

where N is the number of monomers and l the length of the Monomer. The average end-to-end distance, R , of the polymer is given by this expression:

$$\langle R^2 \rangle = (N)*l^2$$

This simple model ignores effects of self-avoidance, which would lead to larger average end-to-end distances.

The Kuhn length l_k reflects the realistic length of one model-chain element (i.e. $l_k \geq l$) and for semiflexible polymers like ssDNA, l_k equals twice the persistence length P . A value of $l_k = 1.5$ nm [Smith96] describes the behavior of ssDNA satisfactorily.

Generally speaking, each possible end-to-end distance can be realized by a number of conformations of the polymer. The shorter the end-to-end distance for a polymer of given length is, the higher is the number of possible conformations the polymer can adopt in space. Thus a short end-to-end distance is more likely than a long end-to-end distance of a stretched polymer. Using the freely-jointed chain model, one can express the force F exerted on each at the ends of a long ($R \gg l_k$) polymer as:

$$\langle F \rangle = -3k_B T \cdot R / N_k(l_k^2)$$

In this expression, N_k refers to the number of Kuhn segments.

Smith et al. demonstrated, that a modified freely jointed chain model (mFJC) that incorporates stretchable Kuhn segments which align under force can serve as a model for ssDNA and dsDNA [Smith96]:

$$R(F) = L \cdot [\coth(Fl_k/k_B T) - k_B T/FI_k] \cdot (1 + F/S)$$

where S is the stretch modulus for the polymer (for ssDNA $S = 800$ pN) and L its contour length (for ssDNA $L = 0.5$ nm · # of bases).

References:

- [Howard01] Howard, J., Mechanics of Motor Proteins and the Cytoskeleton, Sunderland, Sinauer Associates, Inc. (2001)
- [Landau80] Landau, L. D., Lifshits, E. M., Pitaevskii, L. P., Statistical Physics. New York, Pergamon Press (1980)
- [Abels05] Abels, J. A., Moreno-Herrero, F., van der Heijden, T., Dekker, C., Dekker, N.H., Single-Molecule Measurements of the Persistence Length of Double-Stranded RNA. *Biophys. J.* **88**, 2737-2744 (2005)
- [Smith96] Smith S.B., Cui, Y.J., Bustamante C. Overstretching B-DNA: The Elastic Response of Individual Double-Stranded and Single-Stranded DNA Molecules. *Science* **271** 5250, 795-799 (1996)
- [Frontali88] Frontali, C. Excluded-Volume Effect on the Bidimensional Conformation of DNA Molecules Adsorbed to Protein Films. *Biopolymers* **27**, 1329-1331 (1988)
- [Joanicot87] Joanicot, M., Revet, B., DNA Conformation Studies from Electron Microscopy. I. Excluded Volume Effect and Structure Dimensionality. *Biopolymers* **26**, 315-326 (1987)

```

#!/usr/bin/env python
# encoding: utf-8

...
Angle distribution calculation based on mFJC model for the tensegrity kites.

...
# Python standard libraries
import string
import os
import sys

# Some matplotlib libraries
import math
import numpy as np
from scipy import interpolate
from scipy import integrate
import matplotlib.pyplot as pyplot

class calculator():

    def __init__(self):
        #Some constants
        self.Kb=1.3806504E-23
        self.kuhnLen=.5E-9
        self.strutLen=91.0E-9
        self.T=298.15
        self.equiMonolen=0.5E-9
        self.stretchModulus=800.0E-12

    def enFunc(self,c,numbases):
        """Energy function used to calculate spring energy. Variable c is the spring
        end-to-end distance."""
        # Worm like chain, integrate from lnm to c:
        y = integrate.quad(self.fofc,1E-9,c)
        return y[0]

    def sprLen(self,gamma):
        """Given an angle in degrees between the struts, give the spring end-to-end
        distance"""
        return math.sqrt(2*math.pow(self.strutLen/2.0,2)-
                        2*math.pow(self.strutLen/2.0,2)*math.cos(gamma*math.pi/180.0))

    def boltz(self,energy):
        """Given an energy and a temp, calculate the boltzman probability weight of
        that state."""
        return math.exp(-1.0*energy/(self.Kb*self.T))

    def extensionWLC(self,N,f):
        """Returns the extension of mFJC according to Smith, Cui, Bustamante (1996)"""
        cothTerm=math.cosh(f*self.kuhnLen/(self.Kb*self.T))/
                  math.sinh(f*self.kuhnLen/(self.Kb*self.T))
        return N*self.equiMonolen*( cothTerm - self.Kb*self.T/(f*self.kuhnLen) )*
               (1+f/ self.stretchModulus)

    def fillWLCTable(self,fStart,fEnd,points,numBases):
        """Makes a interpolation table of extension vs force with 'points'"""

        number of entries,
        this is later used to get the force for a certain extension."""
        increment=(fEnd-fStart)/points
        forces=[]
        extensions=[]
        for i in range(points):
            force = fStart+increment*i
            forces.append(force)
            extension=self.extensionWLC(numBases,force)
            extensions.append(extension)
        fc=np.array(forces)
        cs=np.array(extensions)
        self.fofc=interpolate.interp1d(cs,fc)

    # This is the L value in this example the spring length is L=520
    numBases=520

    # Start the class up
    calc=calculator()
    calc.fillWLCTable(0.001E-12,60E-12,5000,numBases)

    # For each angle store the boltzmann weight
    angles=np.linspace(20,160,num=200)
    wh=[]
    for angle in angles:
        E1=calc.enFunc( calc.sprLen(angle),numBases )
        E2=calc.enFunc( calc.sprLen(180-angle),numBases )
        totalE=2*E1+E2
        wh.append(calc.boltz(totalE))

    weight=np.array(wh)
    # The theoretical curve for L=520 is now given by x=angles and y=weight
    pyplot.plot(angles,weight,color='red')

```

S10: Code used to numerically calculate the spring equilibrium lengths using the modified freely jointed chain model found in:

Smith S.B., Cui, Y.J., Bustamante C. Overstretching B-DNA: The Elastic Response of Individual Double-Stranded and Single-Stranded DNA Molecules. *Science* **271** 5250, 795-799 (1996)

These calculations are used to get the red numerical curves in the histograms in fig. S3

```

#!/usr/bin/env python
# encoding: utf-8

...
Angle distribution calculation, tensegrity kite.
Using a WLC-model
...

# Python standard libraries
import string
import os
import sys

# Some matplotlib libraries
import math
import numpy as np
from scipy import interpolate
from scipy import integrate
from scipy import optimize
import matplotlib.pyplot as pyplot

class WLCmodel():

    def __init__(self):
        #Some constants
        self.Kb=1.3806504E-23
        self.strutLen=91.0E-9
        self.T=298.15
        self.equiMonoLen=0.5E-9
        self.stretchModulus=50.0E-12
        self.P=0.75E-9
        self.lastValue=0 # This is the starting guess for the numerical solution to
                         # the WLC equation. Stores the last known solution.

    def WLCequation(self,x,F,N):
        '''This is the WLC equation, the roots give the extension at a certain force.
        The equation is solved numerically in method 'self.extension()'.''''
        P = self.P
        Lzro = self.equiMonoLen*N
        Kzro = self.stretchModulus
        kBT = self.Kb*self.T
        return ( F*P/kBT + 0.25 - x/Lzro + F/Kzro )*math.pow( 1 - x/Lzro + F/Kzro ,
2)-0.25

    def extension(self,N,f):
        '''Returns the extension of a WLC according to xxx'''
        self.lastValue=optimize.fsolve(self.WLCequation,self.lastValue,args=(f,N))
        return self.lastValue

    def enFunc(self,c,numBases):
        '''Energy function used to calculate spring energy. Variable c is the spring
        end-to-end distance.'''
        y = integrate.quad(self.fOfC,1E-9,c)
        return y[0]

    def sprLen(self,gamma):
        '''Given an angle in degrees between the struts, give the spring end-to-end
        dist'''
        return math.sqrt(2*math.pow(self.strutLen/2.0,2)-2*math.pow(self.strutLen/
2.0,2)*math.cos(gamma*math.pi/180.0))

    def boltz(self,energy):
        '''Given an energy and a temp, calculate the boltzman probability weight of
        that state.'''
        return math.exp(-1.0*energy/(self.Kb*self.T))

    def fillTable(self,fStart,fEnd,points,numBases):
        """Makes a interpolation table of extension vs force with 'points' number of
        entries,
        this is later used to get the force for a certain extension."""
        increment=(fEnd-fStart)/points
        forces=[]
        extensions=[]
        for i in range(points):
            force = fStart+increment*i
            forces.append(force)
            extension=self.extension(numBases,force)
            extensions.append(extension)
        fc=np.array(forces)
        cs=np.array(extensions)
        self.fOfC=interpolate.interp1d(cs,fc)

    # This is the L value in this example the spring length is L=520
    numBases=520

    # Start the class up
    calc=WLCmodel()
    calc.fillTable(0.001E-12,60E-12,5000,numBases)

    # For each angle store the boltzmann weight
    angles=np.linspace(20,160,num=200)
    wh=[]
    for angle in angles:
        E1=calc.enFunc( calc.sprLen(angle),numBases )
        E2=calc.enFunc( calc.sprLen(180-angle),numBases )
        totalE=2*E1+2*E2
        wh.append(calc.boltz(totalE))

    weight=np.array(wh)
    # The theoretical curve for L=520 is now given by x=angles and y=weight
    pyplot.plot(angles,weight,color='blue')

S11: Code used to numerically calculate the spring equilibrium lengths using the worm-like chain
model described by:

```

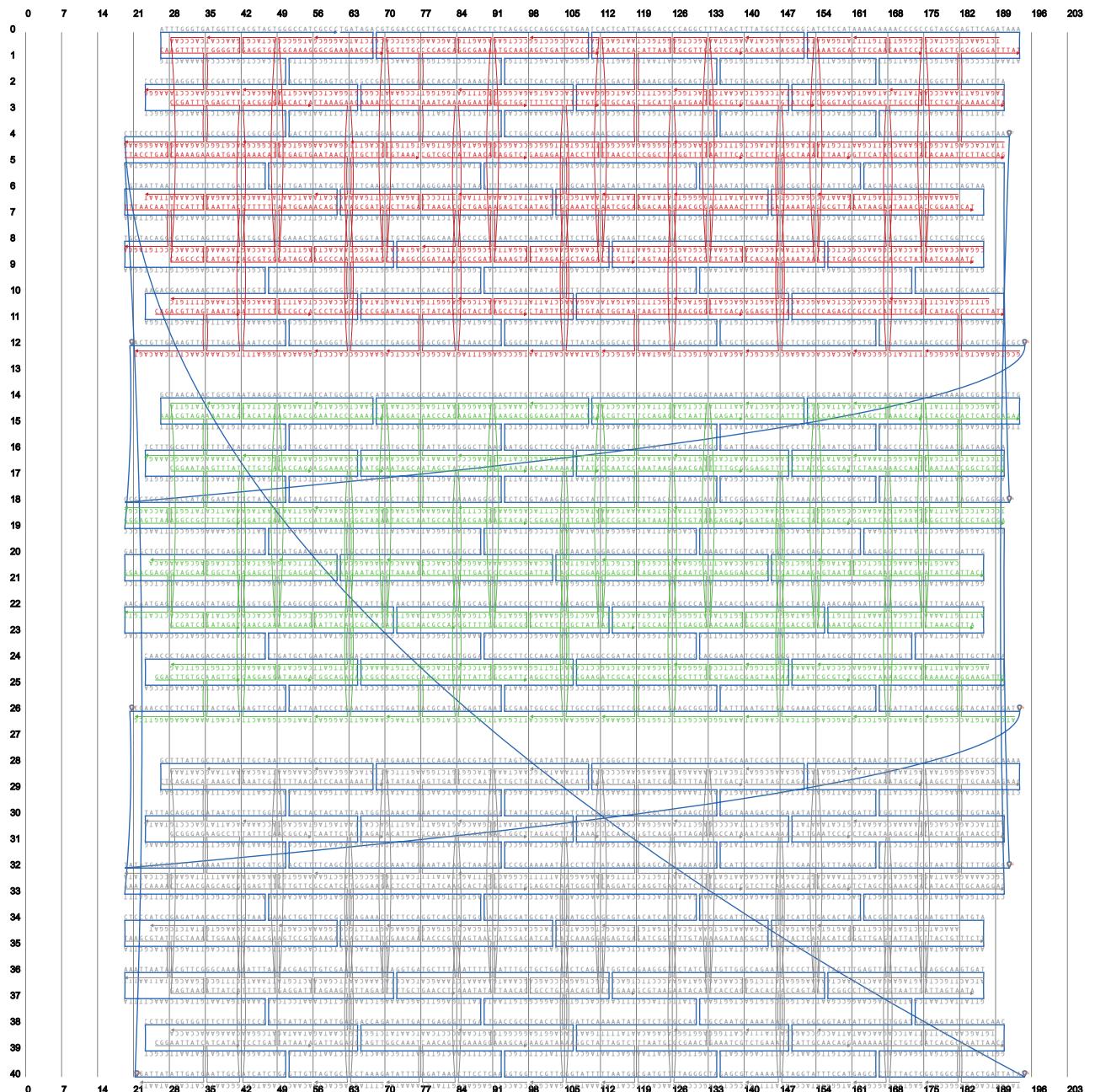
J. F. Marko and E. D. Siggia, Stretching DNA, *Macromolecules* **28**, 8759 (1995)

M. D. Wang, H. Yin, R. Landick, J. Gelles, S. M. Block, Stretching DNA with Optical Tweezers. *Biophysical Journal* **72**, 1335-1346 (1997)

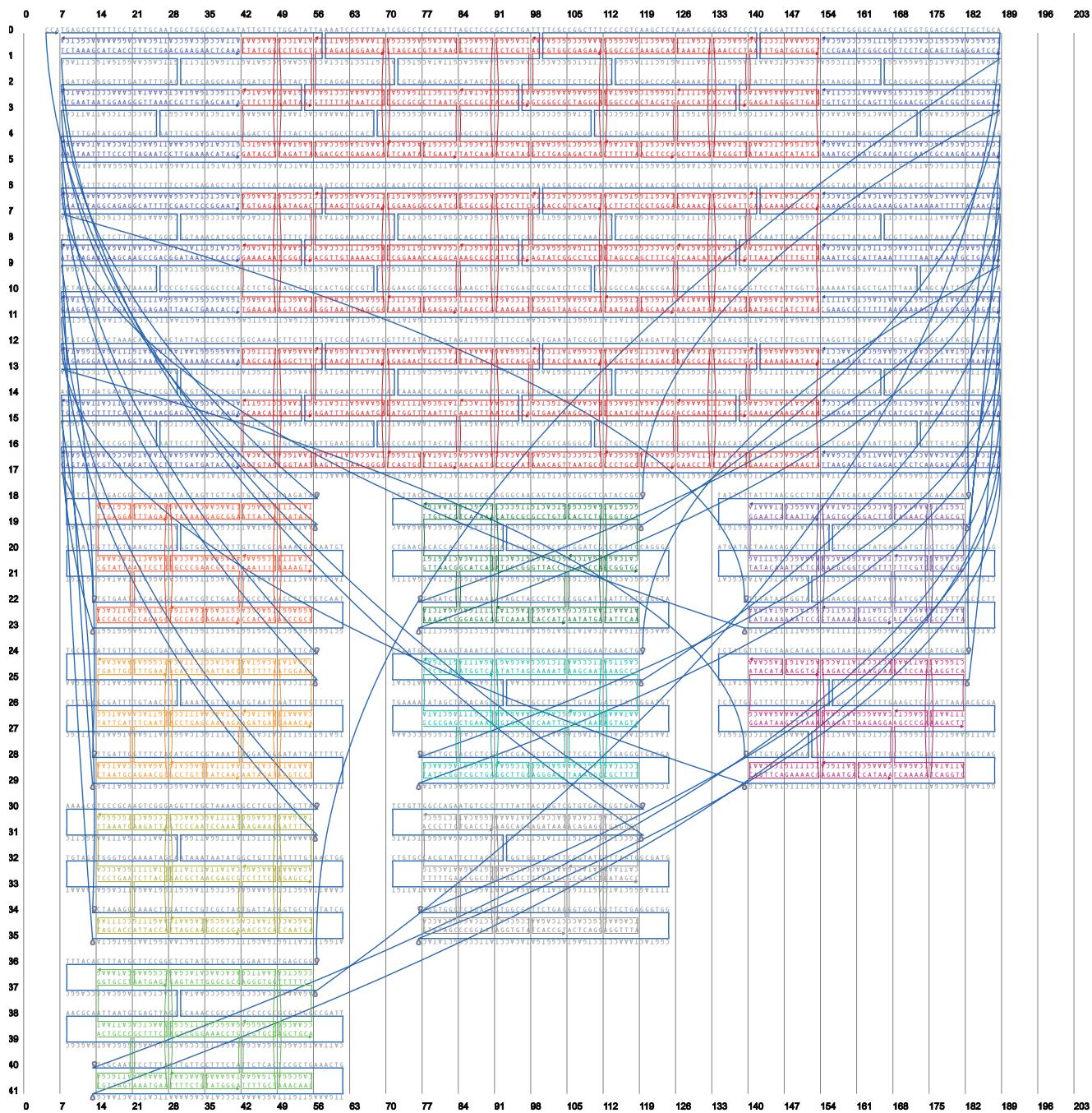
These calculations are used to get the blue numerical curves in the histograms in fig. S3

$$\frac{FP}{k_B T} = \frac{1}{4} \left(1 - \frac{x}{L_0} + \frac{F}{K_0} \right)^{-2} - \frac{1}{4} + \frac{x}{L_0} - \frac{F}{K_0}$$

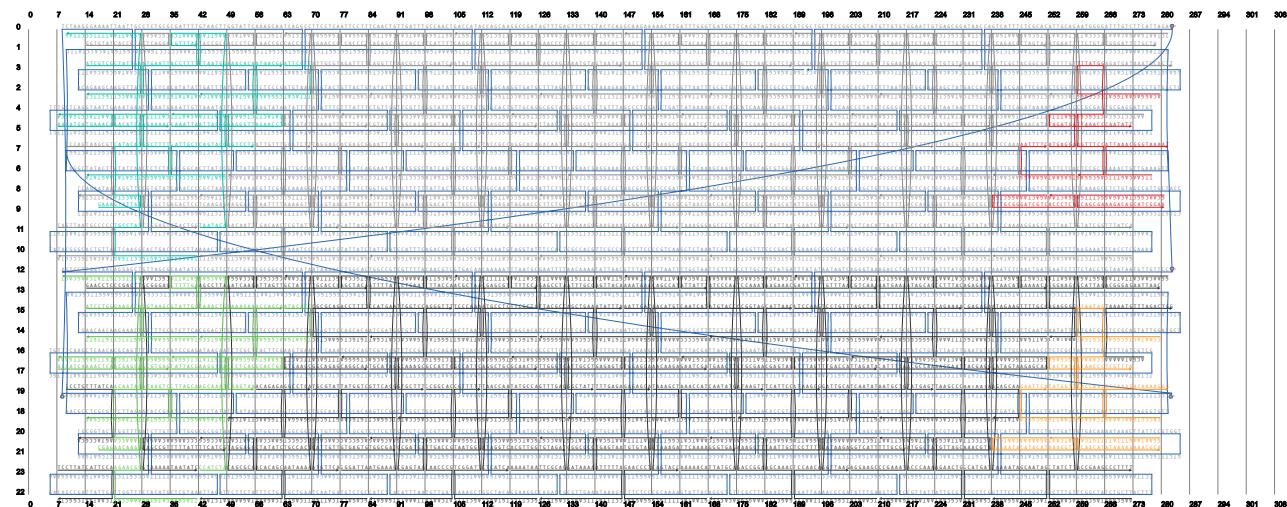
Prism (p8634)



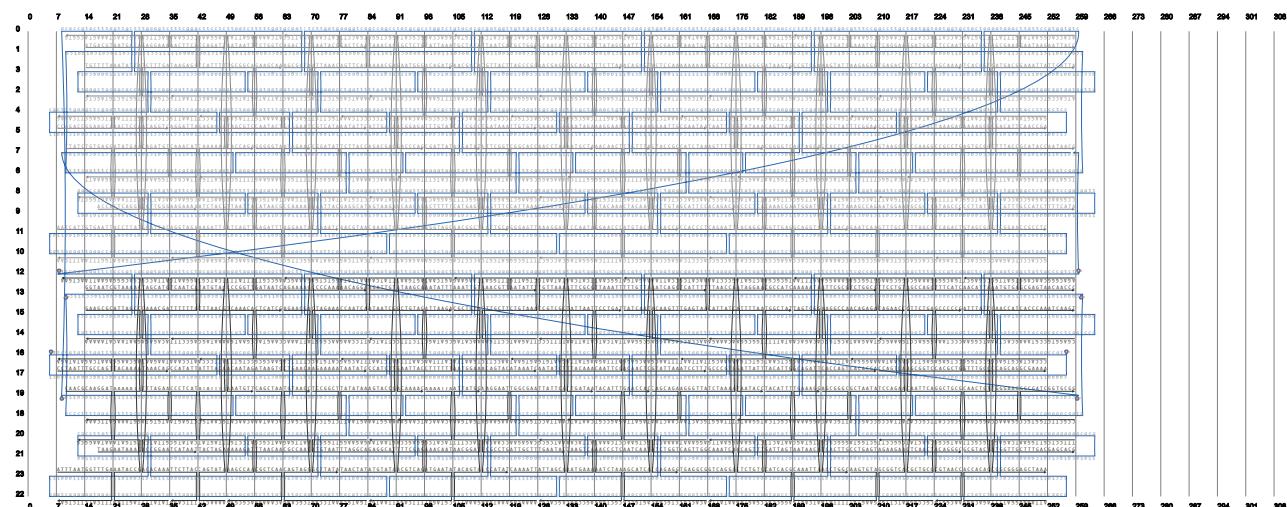
x bundle prism (p7560)



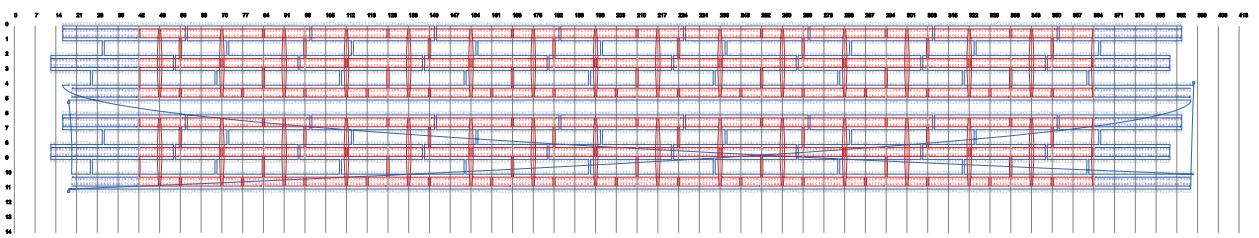
Twelve-helix bundle kite (p8634)



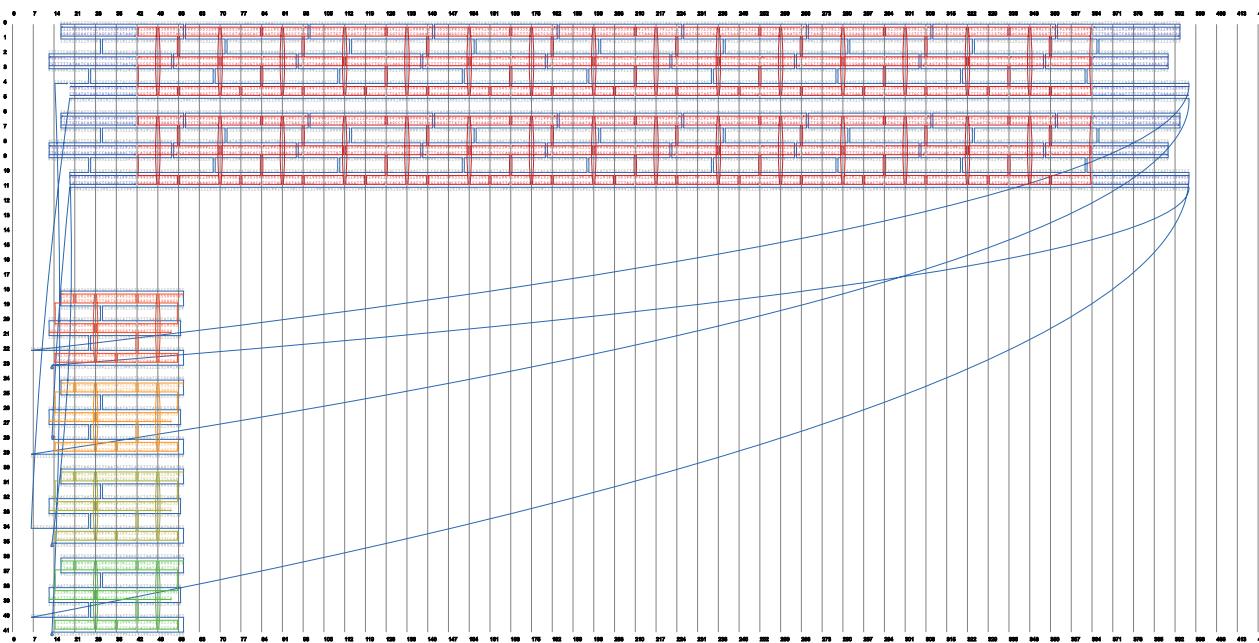
Twelve-helix bundle kite exhibiting enzymatically activated rearrangement (p7848)



Six-helix bundle kite (Three 273-nt-long and one 2204-nt-long spring, p7560)



Six-helix-bundle kite with four clamps (p7560)



sequences_all.txt

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Prism (p8634):

1st Strut (red)

Start Sequence

0[34] CACCAACAGCCCTTACAACGTTCATTAACAAAATTAAT
 0[55] ATGGCCCGATAGCAAGTTGAATGGAAACAGTATCACCCCTC
 0[97] CCCTGAGGAAAGTAAGGATTAAGAGTCATAGTTGCAGTTAA
 0[139] AGTGTAAATTGATATATGGAAAAGAAAACCTTTGACGCCGCC
 0[160] ATGGAGAATCTCAGAGCCGCCACCCATGCGGGTTCAATCCT
 0[189] TCTGAACTCGCTACGAATCAAATC
 1[26] CAAGTTTTAACCTAAAGGG
 1[70] GGTTTGCTCCGAAATCGCGTGGACTCCAACGTTAACACTA
 1[112] TAACTCACAGTCGGAAACCACCAAGTGAGACGGCCGCGTGGT
 1[140] ACAACATACGAGATAATGCACTTCAATTGTTT
 1[175] CGCACTCAAACCCACTCTGTAGTAGCGTTACAAATTCTTACCAAG
 2[41] AAATCGGTGGGGTCGAACCAT
 2[83] TGTTGGTCCCAGCACAGCAAGCGGTCCACCCAGGCGGATAAG
 2[125] CGCTTCCATTAAATGGTGCCTAATGAGTCTCGTTC
 2[167] ATGAGTCACAGGAGAATGGTATCCGCTCACAAATCTCGCTGTG
 2[190] TAGATGATTGCGGGGATTAT
 3[28] CCGATTGAGAAAGCAAAGAAGATGATGAAACATCCGGCGA
 3[56] TTAAAGAAACACTGAGCCAAACCACCCCTATTGTCGCCA
 3[98] TTTTCTTAAGGATTAAAGAGCCTATTATTCTGAAAGCCTGC
 3[112] GTGCCAGAGGGGTTAACCTCCGGCTTAGGTTTCAACGCG
 3[140] TGAAATTAGCCAGATCACAAACAGGTAGACGATTGTTGACA
 3[154] CGGGTACCGAGCACGGAACCGCTCCCCGGCGTTAGAAATAC
 4[41] ACGTGGCAGAGCTTACAAACCATAGTT
 4[62] GGAACAAGAGTCAGGTGAGTGAATAACCACACATA
 4[125] CGGGGAGCTGCATTCTCTGAATTACCAATCGCATATATGT
 4[190] TTATCACGACAAAACATA
 5[19] TTACCTGAGGAAGGGAG
 5[77] CGTCGTATTAACAGAGATAGGTTGAGAAATCAATTGCTC
 5[98] GAGAGACGAGAATTATCAAATTAAAT
 5[140] TCTTCTGGTCAAATATATTAGGGTT
 5[161] GTTCATATGCGTTAGGAAACGATTGAAATTGTAATTAAATG
 6[55] AATCAATATAAACATCAAGAAGAATTACTGCTAAATAATGA
 6[83] TTTCCCTTAAGACTACCGCCGTACCGTACTCACTCGAG
 6[111] AAATGCTTACCTTTGCGTATTGGGCGCCAGGCCTAGGTCT
 6[125] ATATAACAGACAAAGAGTAACTAAGTTAACGGGGTACAT
 6[153] CGACCGTACCTAAATCATGGTCAGCTGTTCGCAATTCA
 6[181] AGAAAAAGCCTGTTAGTATTAATAAGAGGCCAGA
 7[19] TTTAACAAATCCTGTAGCA

sequences_all.txt

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8[76] AGTACATGCTTAGATAGAATCCTGAAATTGCTTCCCAGTT
 8[186] CGGAACCAGAGCCCGGAATCAT
 9[42] AGCGTGGACTACGTGAGGTGCCGCAAAGGGCGAAAAACCGCT
 9[84] TGCCGATAGAGTTGGCGAAAATGCAACAGCTGATTGCCGC
 9[119] CAGTAAGCGTACCCAGCCTGGTGCCTGCCTCAC
 10[83] AGGGTTGATATAAGTATAGCCTAGGAACCGTCTATCAGGGCG
 10[125] GGCTTTGATGATACAGGAAAGCTGAGAGATTACCGCCTGG
 10[167] CCGCCACCCCTCAGAGCCACGGCAAATAATGCCGAAGCATAA
 10[187] GTTTGCCATCTTTCATAGCAGCGCGT
 11[25] CAGACGTTAGCAACTTCAACAGT
 11[42] ATTTCTCAAACGATCTAAAGTTTGTC
 11[56] CCCTCAGAGCCCGGAATAGGTACCCCTCA
 11[98] CTATTCGGGTGTAUTGGTAAAGTGCC
 11[140] GGAGGTTGACACCCCTCAGAGCCGCCACATTTCGGTCCAGAA
 12[55] AGAACATGGGATTTCTTTTTCACCAGGACGGGGAAAGCACT
 12[69] GAACCGCAGCGATAGTACCGTACAAAATCCCTTATTGTTGTTGAAAT
 12[97] TGCCCGAGGTTAGGCTGAGAGCGGGTAAGAATATGTTGA
 12[111] GTATAAACAAATCCTCAAGAGTTCTGTC
 12[139] AGCATCAGTGCCTGAACCGCGCAGTAATGAATCACTGCC
 12[160] ACCACCACCAAGAGCTAAATAATCATTAAGTATCCC
 12[174] TTTCATCATAAACACACCACCTGCCCTATATTAC
 12[193] GCGTCAGACTGTCCCCCTTATT

2nd strut (green)

Start Sequence

14[34] TATGTTAGCGATCCTCTGCCAGTAGCAAAGCGAAAGACA
 14[55] TTAAGACATAGAAGCGCCTGATTGAGGACTAAAAACAGGGAT
 14[97] CAAAGTCGGTGCAGGGGGATGTCCAGCGATTATTAAGCGCCA
 14[139] AATTTAAACAAACGGTAGTAAGGGAACCGATTCAACATT
 14[160] CATTACCAAAATCAGCTCATTTCATCGAAACCAA
 14[189] CAAGCCGTTTATTGTAACGTTA
 15[26] AAACGTAGAGAAACGCAAAGA
 15[70] GAGAGATAGAGCAAGAACAGGAAACGCAATAAGTCACCAGA
 15[112] GCGTCTTCAGCCATATTATCAGGGAAAGCGCATTGTGAGAATA
 15[140] AGTTGCTATTGCCAATAGCAAGCTTCTAGGAAT
 15[175] GTACCGCATTCCAACAATAATAATTACAGGCTTGCCCTGACGA
 16[41] TATAAAAAAATACATACGCAG
 16[83] AATAATAACCCACAATTGAGCGCTAATACGGTAACGCCAG
 16[125] AAATAATCCAGAGTCTTACCAACGCTAACGCATC
 16[160] AGATATAGAAGGGAAAGCCTTAAATCACCTTTGCG
 16[190] TTCCTTATCACTCATCGAGAA
 17[28] CGGAATATATGGTTAGGCCGCTTTGCG

sequences_all.txt

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17[56] AGGAAACAATGCGCAATTACAATTGATTGAGCATCATAAAGA
 17[70] AATAGCAAGTAAGCATACGTAATGCCACTACGAAACCCCTTT
 17[98] ACATAAACGAAAGGGCCTCTTCTGTTGGGAAGGGCGCCATT
 17[112] CCAATCCAATGAAAATGCCGTATAAATTGTGTAATGTTAA
 17[140] GGAGGTTTCACGTTGGCGGATCGTCGA
 17[161] TCTAAGATAAATTTTGTGAGTAATCCATAGGC
 18[55] AGTTAATAGTTCCATTAAACAAGACTTTTCATG
 18[83] TAAGAAAATAGCTAGGCATTAAGTTAGCTAAAACAAACGA
 18[125] CGTAAAAAAATAAGCATCGTAACCCTGCCGAGGCGCCTGCTC
 18[190] TCCCACCTCGGCTGTCT
 19[19] GGGAGTTAATACCAGCGC
 19[42] GGATCGACAATAGAAAATTCAAGTTATGGCTATAGATAGAT
 19[98] CGGAGATCTACCAAGCGGAAACAGGCA
 19[140] AGATGAACCACTGACCAACTTGCGAAA
 19[161] GGATTCACTGAATAGAGCATGTAGAACCGGAGGCGCAGACCA
 20[48] AGGTACCCCTCAGCCGGCTACATCAGTAAAGTTGC
 20[69] AAGAGGCGGGTAAAGATAGCCGAACAA
 20[83] CCAACCTACTCATCCATGCGTAAGCTTATTATTGATCCCA
 20[111] CATGTTATTGTATCATAGCAGCCTTACAGAGAAGAGTACAA
 20[125] TCCCGCACAGACGGCTGGCTCCAGCCAGCTTCTGGGAC
 20[153] TGGCTGACGGTGTATTTAGCGAACCTCCCACCTAGAGGAC
 20[181] CAACGTAACAAAGCTGCTCCGTTGACAAAGTCCTG
 21[19] GGAACGAGGCTATTGTT
 22[186] ATTTTGTAAAAATATTATTAC
 23[42] GAACGAATCCTTATTACATAAAGTAACGGAATACCCAAAACA
 23[84] GGTTTCAGAGGGTAAGAATTGAAGACGGGAGAATTAACTGA
 23[119] TGCCAGTTGAGGGCTCTAACCTAATTGAGATT
 24[83] GTCACGACGTTGAAAACGTCGCGAACATGAACTGGCATGA
 24[125] GACGACAGTATCGGCCTCAAACGCTATTACGAAACACCCCTGAA
 24[139] TTCTCCGCGTGAGCGAGTAACAATAATTGCGTCT
 24[153] AAAAACCTGACCGTGCACCCAGCTAC
 24[187] AAGCAAATATTAAAAACACCCGGTT
 25[25] GGACTTGTGCAACAGAGAGGTTCG
 25[42] CAGGAGGAGAACGCGCTGGTCGTTCA
 25[56] TGGCAGACAACGGCCAGTGCCATTAAACC
 25[98] AGGCTGCGCGGAAGATCGCACCGGAAAC
 25[161] GCCCTAAAAGCCCCAAAACCAATAGGAACGCCATC
 26[55] TAATGCTGAACTTAGAGGCTACCAACCATTGTCAGGCAACA
 26[69] AACAGTTGAATACACAATAAACGAATGA
 26[97] TTCGCATTACCCCTTGACCGCTGCAATCTACCTAACCGCC
 26[111] CAGGCAAGCCGAAACAGCTGGAATTATC
 26[139] AAATGGCACCGCTTCAATCAATGGCGAAACGATAGTTACA

sequences_all.txt

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26[160] TAGCCAGCTTCATCATCAAGGGATAGGTTCTTATCCGTAT
 26[174] GATAATCGAACCGGTTCGCATAACCAATGAACGGGTAAAATC
 26[192] ATCATATGTACGGAAGATTG

3rd strut (grey)

Start Sequence

28[34] CAATAAAGAGTAACCGAACGTTGCTAAATTATCTCGGAT
 28[55] CAAAGAAGAGGATTACTCGTAAGTCCGTGAAGAGCAGCACTA
 28[97] AACTAAATTAAACACGCAAATGTATCGACATCATCAGAACGAA
 28[139] TGCATCATCACCAAGCCAACAGAAGATAACGCTTCCATTTGA
 28[160] ACTGGATATTGGCCTTGCTGTAATTGAGTAAAAATAGCGA
 28[188] CCAGAGGGGTAATATTAGTAATA
 29[26] CTCAGAGCAGACCCCTGTAATA
 29[70] ATATAACTAGTTGACCATTAAATAGTAGTAGCAGTACGGCAT
 29[112] ACTTCAACCAGACCGGAAGATTGCTGAATATAATGACTGGCT
 29[140] ATTATAGTCAGACGTCCAATACTGCGAATGTTAG
 29[175] GAGGCTTACGACGACACTATCGAATTACCATACATTGCAAGGAG
 30[41] ACATTATTAAAGCTAATTAAAG
 30[83] GTAGATTAGTTGATGTCAGGTTCAAGTTTCACTTGTGACCTC
 30[125] AAGCGAAATATCGCTAACAGAGGAAGCCCGCCTGAAA
 30[160] GTCATAAATATTTCAGGTCTTACCCGAGCCATA
 30[190] GTTTACCAAGTTGCAAAAGAAG
 31[28] GCGGGAGTTAGAACCTCAACGAGCAGCG
 31[56] CAATTCTTCGACATAGAACGTTCAATAGATAACTATAATA
 31[70] ACATTCTCATTTGACTCCTGTTATCAAGCACTACGTTAGC
 31[98] TAGAGCTGCCAGCACGCCCTGCGAGGTGAGGCGGTAAAGCAG
 31[112] TCCAACATTTCAGGTGACAGTGCAGGTGAGTATCTCCTTAA
 31[140] AATCAAATTCTGGTCACACGTTATTAA
 31[161] CTCAATAGAACTCAAACAAAAACATCGTAGTGTC
 32[55] AAGGTGCGTTGTCGCCATCCCGCGAAACCAAGTT
 32[83] TATATTGCAAATGTAAGCATCACCTACGAACAATGGAAGA
 32[125] TTGCTCCGGTCAGGACCCCTCTGACCACAGAGTGAUTGACGC
 32[190] CGCCAAAAGATAACCCCTC
 33[19] AAATCAAACCTCATATA
 33[42] TGAGTTAACGGATAAAATTAAAGCCTTCTTGCCATTATCA
 33[98] GAGGTACGTACGCATCGCTATTGCACT
 33[140] GTCTTCAGAGTGAAATGCTGAATGCACT
 33[161] TCTAGCTGAAACGAGAGGCATAGATGCTTAAACAGCCAGAG
 34[48] TCATTACGAAGGTGCTGGAAAGGCAATTATCATAT
 34[69] GTTTCTGTGGGAAGGGCGCGAGCTGAA
 34[83] GGTGACCGACCCGTGTTATCTAACAGTTGAAAGGAGTC
 34[111] TGGCATTATGGGTTAACAGAGTCATTTCGCGACTGGGTTG

sequences_all.txt

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34[125] ATGATGTGATCGTAACATCGTTAATGCGCGAACTAGGTGGC
 34[153] AGATGATCAGCGATGTTCAGAAAACGAGAATGATATCGCGTC
 34[181] AAACATTGCTGATACCCTTGGGTTGAGAGCGCTC
 35[19] TAAGCGTATTATTAATT
 36[186] ATCACTTGCCTGTTACTGTTCTT
 37[42] TTTTGTAGCAAAATCGGTTAACATCCAATAATCCC
 37[84] AAATATAGTACGGTCCATTCTGCTGTAGCTAACATGAG
 37[119] GCGTAAAGAATACATAAAAGATGTTTAATTGACT
 38[83] CCCTCAATCAATATCTGGTCGATTAGACTTACAGGCAAGG
 38[125] ACAGACAATATTTGAATCAAACAGTGAATTAAATATGC
 38[139] CATTGGCGAAATCGTCTGAAATGCATTGCAACAGG
 38[153] CCAGCGAACAGTAAGAGCAAAGCGGAT
 38[188] TGTAGCAATACTTCATCACCGGCCACC
 39[25] CGGAATTATCCATCAATATAATC
 39[42] TCCTGATATCGGAACAAAGAAACCA
 39[56] GATTAGAGCCAGTTGGCAAATAAAATAT
 39[98] AAGATAAAAGGCTATTAGTCTCCATTAA
 39[161] AAAAAGTCTGCTTATCCAGAACAAATTACCG
 40[55] ACAACTCAGATGCAACGATTAAATCTATTCAACCAAAA
 40[69] CTTTAGGAGTTAACAAACAACTAGAT
 40[97] CCACCTTGAGGAAGTAGTAACAAAATCGTCAATACGAACGA
 40[111] AAATACCTCAAAGGGCTGAGATACAAAC
 40[139] CGCTCTAGCCCTAACCTGAAAGATAGAATTAGAGAGCTTCA
 40[160] ATGGAATACCTACGTACTCAAAGGGACAACATTGAATCCCC
 40[174] GAGTAATATTATCAGTAGAAAGAGCAATAAAACCAGAATC
 40[193] TATAATCAGTGAAAATTAAACC

Six-helix-bundle Prism (p7560):

Left and right End staples (blue)

Start Sequence

0[41] ATTACCGCCAGCCATTGCAACAGGAAAAACGCTCA
 0[188] TGCAGCAAGCGGTCCACGCTGGTTGCCAGCAG
 1[7] TCTAAAGCATCACCTGCTGAACGAAGAACTCAA
 1[154] TCCGAAATCGGCGCTCCTCACAGTTGAGGATCCC
 2[41] CTTGCCTGAGTACTCAAATATCAAACCTCAATCA
 2[188] GTGCCTGTTCTCGCGTCCGTAAAAATCCCTTAT
 3[7] CTGAATAATGGAAGGGTTAACCGTTAGCAATA
 3[154] TGTTGTTCCAGTTGGAACGCTTACGGCTGGAGGT
 4[41] GTCCATCACGCAAATTGAACCTACCATATCAAAT
 4[188] CCATCCCACGCAACCAAAGAGTCCACTATTAAAGA

sequences_all.txt

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5[7] AATTAATTTCCTAGAATCCTGAAAACATAGC
 5[154] AAATGCTGATGCAAATCCAATCGCAAGACAAAGAA
 6[41] ATAGCTCTACGGAAAAAGAGACGCAGAAACAGCG
 6[188] TAATCGTAAACTAGCATGTCAATCATATGTACCC
 7[7] TAATTTAGGCAGAGGCATTTGAGTCCCAGGAATT
 7[154] AAAACAGGAAGAAAGGATAAAAATTTAGAACCC
 8[41] GCCATGTTTACCCAGCAGTAATAAGAGAATATAAA
 8[188] GGGAGAAGCCTTATTCAACGCTTGATAAGCAA
 9[7] ATCGAGAACAGCAAGCCGACGGATAACCTCACCG
 9[154] AAATTGCAATTAAATTTAATATAATGCTGTAGC
 10[41] TGGAGCCACGGATTTTATTTCATCGTAGG
 10[188] TAGAGCTTAATTGCTGGTTAAATCAGCTCATTTT
 11[7] GAAGCGCATTAGACGGAGATAACTGAACACCC
 11[154] CGAACCCCTTTAAGAAAAGTAAGCAGATAGCCG
 12[41] AGAGGGGTAATAGTAAATGTTAGACTGGATAG
 12[188] AAAATACGTAATGCCACTACGAAGGCACCAACCTA
 13[7] TTGAGGGAGGGAGGTAAATATTTAAAAACCAAAA
 13[154] CTAAAACACTCATTGAGGTGAATTCTTAAACAG
 14[41] ACCAGACGACGAGACGGAAATTATTCAAAAGT
 14[188] TTGTATCGTTTATCAGCTGCTTCTTGACCCCC
 15[7] TGCCATCTTTCATAATCAACGAGGCATAGTAAGA
 15[154] CGGAGATTGTATCATCGCTACAACGCCGTAGCA
 16[41] AACGCCAAAAGGAATTAAATCACCGGAACCAGAGC
 16[188] CGTCACCAAGTACAAACCTGATAAATTGTCGAAA
 17[7] CAGTAAGCGTCATACATGGTTTGTGATGATACAGG
 17[154] TTAAGAGGCTGAGACTCCTCAAGAGAAGGATTAGG

Core Strut I, II, and III (red)

Start Sequence

0[55] ATATCCATAGATTAGAGTAAAGAGTCTCTTCTTGATTAGT
 0[97] TCAGAGCATCATAGGTAGCGGTACGCTCGCCCTACAGGGA
 0[139] GGAGCCCTGGTTGTCAAAGGGCGAAAACCATCACCCACC
 1[70] GTAGCACGTATAACAAACAGGAGGGCGAGTCATAACCACCA
 1[112] GGGCGTAAAGCACAGAGCTTGACGGGGCTTTTATATCAGG
 2[83] GTTGCTTGACGACCGCCGCTTAATGGCGCGTAGTGAATT
 2[125] TGGGGTCAGGTAAATGGCCACTACGTGAACCGTCACCTCCG
 3[56] GTTTTATAATCCGCCAGAACCTGAGGGTAGACAGGAACG
 3[98] GCGGGCGTAGGGAGGGAAAGAAAGCGAAAGCGTGGCGAGAAA
 3[140] GAGATAGGGTTGAGAAATCAAAGAATAATTGATGGTGGT
 4[69] CAAGTGAGGCCACCAAGACGCTGAGAAGATTAAAGGGATTTA
 4[111] GCGCGCTGGCAAGTGTCTGAGAGACTACAAAGCCGGCGAAAA
 4[153] ACGTGGACTCCAACATATAACTATATGTGCGAAATCCTGAG

sequences_all.txt

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5[42]	GATAGCTAACATCTATCGGCCTGCTAAGTAATAACATCA
5[84]	TATCAAAGGGAGCTGTGTTCTCGTTAGGCGCGTACTATG
5[126]	GCTTAGGCCGATTTAAATCGAACCCCTGCAATCAAGTTTT
6[55]	TCCGTGGAGTCAGACAAGCTTCAGAGGGAAACAATCGGCCG
6[97]	TTACGCCAAGAACATCTCAGCCAGCTTAAGCGCCATTGAC
6[139]	GTAATGGAAATAGGCCATAAAAATAATCACACATTAAATCG
7[70]	CGGAAGGGCGATCGAAAGGGGGATGTGTAATATCCGCTTCT
7[112]	GCTTCTCCGTGGGACACGTTGGTAGATAATAAGCTGGCCT
8[83]	CGCAACTGTTGGCCCCGAAACCAGGCACCGGCACAGAGAGA
8[125]	CAACCCGTGGACAGTAGCCAGCTTCATTGGTAGCAAGA
9[56]	ACGTTGAAAAGTGGGTTCCAGTTAACGTTAGGGTAA
9[98]	AGTATCGGCCTCCTGTTGAGGGACGAGCAACCGTGCATCT
9[140]	TTAATATTTGTTAATATTTAAATTGAGAAGAAAAGCCCCA
10[69]	GGGACGGCCAGTGGGTAATTGAGCGCCTGCAAGGCATTG
10[111]	TCAGGAAGATCGCATGAGTTAACGCAATGGCGCATGTTA
10[153]	TAACCAATAGGAACAATAGCTATCTTACCGGTTGATAATCCC
11[42]	TGAACAATGAAGGGTGTGAGAGATAGACCAGAAACGTACAGC
11[84]	TAACCCAAGCTGGGTGCGGGCTTCCGCCATTAGGCTG
11[126]	AACAATGGTAGGTACAAACGGCGATTAAGTGAGCGAGTAA
12[55]	AAAGAAGTGGTAATTAAATGCAGATACATGCAACACTATCATG
12[97]	TGGGAAGCCGTATAAACACCAGAACGAAACTTAATCATCA
12[139]	ACCTTCATTATTCTCATGTTACTTAGCCACCGAACTGACCGC
13[70]	AGAGAACTGGCTCATACGTTAACAAACTCAGTGCATTGGC
13[112]	ACGGTGTACAGACCTAACATTGACAAGACCCCTGCCGGCAG
14[83]	TATGCGATTTAGTGTGGTTAACCGGTTAACGTTGAGTAACTTGAGT
14[125]	GGACAGATGAACGTTCAATCATAAGGGAGGAACGATATTG
15[56]	AGATTAGGAATGAAGAAAGATTCATCATGCAACATTATTAC
15[98]	GTGAATAAGGCTGAAACAAAGCTGCTCAACTACCAATCA
15[140]	GAAACAAAGTACAAAGCGATTATACCAAGCCAAAGAACATACA
16[69]	TTACCACATTCAACAAGTTAACGGGGAACTAACGGAACA
16[111]	ACTGCCCTGACGAGAAACAGTTAATGCCACCGGATATTCACT
16[153]	TCCCGACCTGCTGAAACATGAAAGTAAACGAAAGAGGTG
17[42]	AGTGTACTTTGCTAGCGAGAGGCTTGTAAACCTCGTT
17[84]	AACAGTAAAAATCTTATACCAAGTCAGGTTGTGAATTACCT
17[126]	GAACCTATCAAGAGAGGCGCATAGGCTGGCAACTTGAAAGA

Clamps 1-9 (dark orange, orange, light green, green, dark green, turquoise, grey, purple, pink)

Start Sequence

18[55]	TATCTTAGCCGCCAGGAGGTTGAGGCATAATTTGCGGAAC
19[28]	GTAGAAGGAGCGGACTAACAACTAACGCGCACCGATTGG
20[41]	AAAGAAACCACCATGCCAACGTTATGGTCAGAAGAACCA

sequences_all.txt

2009-09-01

21[14] CGTATTAATTACAACCACCCCTCAGAGCATTAGAGTTAGAA
 22[27] CCTTGATAATCCTTAGACTTACAAACTTGAGGACCGTCAA
 23[42] CCACCAGAGGAGCAATTATCATCATATTCATTTAAAAGTT

24[55] TGAATATAAGCTTAATATCCCACCTAGATGATAATTACA
 25[28] ACATTGAATTACCCAGTACCTTTACAGCCTGTTGAGCATG
 26[41] TTTAACAAATTCCAACCTGAGCAAAGAAATTACTATCAC
 27[14] TATTCAATCAACTAATGCAGAACGCTGGAGTTGAAT
 28[27] TAGAAACTCAATTAGTTACAAATCGCTGATTGCAAACAAT
 29[42] AATAGATACAGTAATTTTAATGAAACAAAATTGAAACAA

30[55] TAAGAACCAATGACAGCACCGTAATCATCTTCAAACAGC
 31[28] GTCCAATCCAAATGTTAGCGAACCTTAGCAACAGAAC
 32[41] CATATTATTATTGAACGCTAACGAGCGGTAGCGAGGCCGA
 33[14] TCCTGAACCTTAGTAGCACCATTACCAACCGACTAAGATTA
 34[27] AAGTTGTCTTACCTATTTGACCCATTAAATCTGGGGA
 35[42] AACGTCAGCGAGGCAAGAACGATTTACAAATAGAGCCT

36[55] CCGCTAAAACAACCAGCGGAGTGAGAATCGGCCGGGGA
 37[28] GAGTATTGGCGCCACACAACATACGAGTTCTGGAACAAC
 38[41] GAGGCGGTTGCGCAGTCGGAAACCTGTAGAAAGTATGGGA
 39[14] ACTGCCATTGCGACGTTAGTAAATGAACCGGAAGAATGAGT
 40[27] TAAAGGAGCTTCCTAACTCACATTAATGGTGCCTATAAAG
 41[42] TTTGCTCAATTCCAGGGTGGTTCTCCAACGCAGCTGCA

18[118] GCGGTATTATTCAAATAATTATGCCGGCAGCCACGATCCA
 19[91] CATGCGCGCTGTGGTCACTGTTGCCCTGTCAAATTAGCTAT
 20[104] GCGCAGTGTCACTCATGCCGGTTACCTGAGAGGGCACCATC
 21[77] GTTAACGAGATCTAAAGGCCGGAGACAGCGCTGTCAATAA
 22[90] TTTTGAGGCATCAGCCTTACACTGGTGTGCTCGTAATGG
 23[105] AATATGAGAGCCGGCACTCTGTGGTGCATCAGAGCGGTGC

24[118] CAGTTGACGCTTCCCTCAGCAGCGAATACTAATCATACAG
 25[91] ATATTAGCAAATTCTCGAACCGAGTGGCTGATCGGAA
 26[104] GCAAGGCAAAGAAAGGTGGCATCAATTAGACAGCAGGGAGT
 27[77] GCGCAGAGCAACGTATTGGTCGCTGAAGATTTAATGGTCA
 28[90] CGAGGGTCTGAAACCTGTTAGCTATATTGCAAGTTGAC
 29[105] TAAAGGCTCCAAAAGCAATAAGCTAATAATAGTAGTA

30[118] TTCACCAAGGTTATCAGAACGCCACCGCGAACTAACCG
 31[91] AAGCAGAAGATAAAGACCAAGTAATAAAAGGTGTACCGCCAC
 32[104] AACGAACCACCAAGTTAGTCTTAATGCCTCAGAACACCCT

sequences_all.txt

2009-09-01

33[77] TTTTGAGCCACCACTATAGCCCGGAATGGGACATTGACCTG
 34[90] CCTCAGAATGGCTACGTAAAGAACATCGTACCCCTCTGGCC
 35[105] ACTCAGGGTCACACACAGAGGTGAGGCAGCTAAAGATAGCC

18[181] TGGTTGGCCTTAAAAGTTAACGATGTTCGTCCACATCC
 19[154] TAGTGCGGACTTGGACCGTGTATAAGTAAAAACCGTTCC
 20[167] TCATAACGGAACGAAACGCGGTCCGTTCTGATTGAAGCCGC
 21[140] TATACAAATTCTCAAAAAGCCTGTTAGGGATCATTAAATA
 22[153] GGTACCACTATAAACATAAAAAAATCCCTAAGGCGTAATTAC
 23[168] ACAGGCAGAAATACCTAGAACGTCAAGCGTGCAGAGTCGTCGC

24[181] CTGGCATTCAAGTCATTATAGTCAGAAGAGCCGACGAGCTT
 25[154] CAGACCGGAAGCAAACCTCTTATTACGCAGAACATGAGATTGCA
 26[167] CAAAGCGAACCAACAAAGATTAAGAGGGACAAAGGCCATAAA
 27[140] GGAATAAGTTAAAATATAAAAGAACGATACATATAGCAAA
 28[153] TCTTTGTCACAATCAGTCAGAAACGAGTATGTAAGGTGG
 29[168] TCAAAAAGATTAAGACTCCAACAGGTCAATTAAAGACTT

Twelve-helix bundle kite (p8634):

1st strut core (grey)

Start Sequence

0[62]	TTGCTTGAAACGCCACCTCAGAACCGTGAGGAAAATAATA
0[104]	AGTTGGCTCATTTTCAGGGATAGCAAGCTTGTGGGTAACAG
0[146]	CTGAGTATAACACTGAGTTCGTACCCACAAGTTGAAACCC
0[188]	GGCCCACGCATTCCACAGACAGCCCTACCGGAAGGCAGCTA
0[281]	TCTAATGAAGACAAATTGGGATTTGCTA
1[14]	GGTGTATCACCGTACTCAGGACGCAGAGTTGGAGTGTACTGG
1[42]	TACCGCCACCCCTCAGAACATCAACAAATTTTAGGATTAGCG
1[84]	CAGAGCCACCAACCAAATCAATTACATAAAAAGAACCCACC
1[126]	GAACCCATGTACCGGAAGAACAGGAAGGTGAAGCGTAAGAAT
1[168]	CTACAACGCCTGTATACTGAGCCAGCTGCGCTTAATGCG
1[210]	CGTAACGATCTAACAAATTCCGCCACGAGTGAGACGGGCAA
1[238]	CCAGACGAAATGACTCCAAAAGGAGCCTGATACCGATAGT
1[252]	ATGAATTTCGTACCCATTGTATCGGTTATCA
3[105]	ATATCATACTCAAATATCAAACCAAGATGAATATA
3[147]	CATCATGGCAATACTTCTTGATAAAAATCTAAAG
3[189]	TCAGGTAACGTCAAAGGGCGAAAGTCCATCACGCA
3[231]	AAATTATCATGGTCATAGCTGTTCCACTATTAAA
2[83]	CAGTAACAGTACCTATTGCGTAGATTAAAGGAATCCACCCCT
2[125]	CATCACCTTGCTGAATCACGCTGAGAGCATGGCCCCAATAG

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2[167]	AATTAACCGTTGTAGGTGAGGCCACCGACCCAAATGTACAAA
2[209]	GAACGTGGACTCCAAATGTTGTTCCAGTATACTGAGTAGTTAG
2[251]	CTCGAATTCTGTAATACTCGCTACGGCGGGTGCAGTTAGTAA
4[76]	GAAATCTAAAATACCATATCAAAATTATTTGCA
4[118]	AGTGCCAGAACAAACAGAGGTGAGGCAGGTACGCCAGAACATCC
4[160]	ATCAGGTGAGGGCAGGAACGGTACGCCAGAACATCC
4[202]	TTGAGGTGAAAAAAATCCCTATAAATCAAAAG
4[275]	AATCCTCGCAAGATGATAAATGCACTT
5[84]	CGTAAACCAGCAGAAGATAAAAATACCTCAATCA
5[126]	TTAACTAAAGGGATTTAGACTAAACAGGTAAATAA
5[168]	TGAGAGGTTCCGAAATCGGCAAATCCTGCCGTCTA
5[210]	AATAGGGTGGAAACGATACTTTATTATCTGTGTG
5[238]	CTGTACAAAACATATTTATCTGAACCGCTCAAAAACAAC
7[9]	TCCAGTAAGCGTTATTCTGA
7[56]	ATTGTTCCGAAACCGACAAACGAAGTATTAGACTTTAAGTTT
7[70]	TAGGAGCCAGATGATGGCAATTCTCATCAATATAAGC
7[98]	ATCGCCAAGTAATATGGCAGAACATCGTCTGAAATGGATCAATA
7[112]	TACCGCCTTTAATGCGCGAACTGATAGCCCTTC
7[140]	AGAGCGGAGGGCGCGAACGAAACGGGAACGTGGCGAGTGGAA
7[154]	TAAAGCAGCACGTATAACGTGCTTCCTCGTTATT
7[182]	CAGCAGGGGGAGAGGCATTAAGTCGGAAACCTGTCCCGAT
7[196]	GGGTGCCGTTGCAGCAAGCGGTCCACGCTGGTTAT
7[224]	TTCACGTGGCTTGCCATAACCACAATGACAACAACCATGCGT
6[90]	ATATTCTGATTATACGAGCGGAATTATCCAACAGAAATAAA
6[132]	TGAATGGCTATTAGAGGCACAGACAATAATACGCCCTGCAAC
6[174]	GGTTGTTTGACGACTACAGGGCGCGTAGTAGTGTTTTATA
6[209]	TGAGAGATAGATTGCCCTCAACCCCCGAGATAGGG
6[237]	AAAGGAATTGCGAATAATAGCCTGCC
8[41]	GGGTTTGATACACGGAGGCTGAGACTCCTCAAGAG
8[83]	AGAAGTAACAAACATTGAGTAACATTATCATTTC
8[125]	ACGTGCCATTGCCAACAGAGATAGAACCCCTCTGA
8[167]	CCGCTAAATCGGGCGCTGCGCGTAACCACAC
8[209]	CAGCTATGAGTGCAGCCAGGGTGGTTTCTTTC
9[49]	AAGGAATTAAATTAAAAGTCCTTGCGGATCTT
9[91]	GGAACAGGGACATTCTGCCACACGACCTTAATAT
9[133]	CCTGAGCAAGTGTAGCGGTCAAGGGCGCTGATGCCG
9[175]	CCGCCGGTTCGTATTGGGACCGCGCGCGCTG
9[217]	ACCAGGGAGTTAAAGGCCGCTCGTGTGAAAGCCCTCT
11[7]	CAGTTAATGCCCTAACAGTGCCGTA
11[77]	GATTAGAGCCGTTACAGTTGACAGGTTAACGTCCGAACGAACAAAAC
11[119]	GAAAAACGCTAAACTCAAACCTCAGCAGCAAATGTAGAGGCCGTTGAATC
11[161]	TAAAGGGAGCCCGTACCATCAGTAAAGAGTCTAATTGATGCTGCC

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11[203] ACTCACATTAATTACACACAACCTGGAACAAAGAGTCCACGAGTCCATTT
 10[83] GATAATACATTGAGGATTATCGTATTGGCCTGA
 10[125] ATACCTACATTTGACGCTCATTCAACCATAATGGTC
 10[167] TTAGAGCTTGACGGGAAAGCGCAAAGTTCTGC
 10[209] TGCGCTCACTGCCGCTTCCTGAATCGCAGCGAT
 10[237] TGCGCCGGATATATTGGTTATCCGTCAGTTTGTCTT
 10[272] GAGGTGAATTCTAACAGCTTAATTCTGCAATGTTTGTACCGAG

2nd strut core (black)

Start Sequence

12[62] CGCCCGGATTAGTTGCTATTTGACCCGCTTATATGTTCA
 12[104] GACGTTGCTTACCAACGCTAACGAGCGTATTTGCTCATCA
 12[146] GTTAATAAGTTACAAAATAAACAGCCATAATTAAAGCAGTACC
 12[188] TCATACAAAGAAACGATTTTGTTAAGACTATTGGTTAAG
 12[281] GGAACAACATTATTACACGGGAGAATTAAC
 13[14] GAACCTCCGACTTGCAGGGAGCGCTAACGTAAGAAAAATAATAC
 13[42] AGCCTTAAATCAAGACCAGGACAGCGCACAATCATTACCGCG
 13[84] ATTTTATCCTGAATTAAAACCGAGTAACGAGATGAACGAAG
 13[126] GAGCCTAATTGCTTTGTTGATAAAATGCATCGTAACCGT
 13[168] ATCCAATCCAAATGGCAAGGGACCGGACCCGGAGACAGTC
 13[210] AATGAAAATAGCAGAAAAATACCCAAAAGTTAGAGCTTAAT
 13[238] ATAACATGAGATTTAAAATAGCAATAGTACAGAAGGAAAC
 13[252] GGGAAAGCGCATTAGAGGTAGAACCGAAGCCCTTT
 15[105] TCCC AAAATTAAAGTTGGTAACGAACACCATCGAT
 15[147] AATTGATGGAAGATTGTATAAGCGCAAAGGGGG
 15[189] ATCCAAGTTCTACTAATAGTAGTTGATAATCAGAA
 15[231] CGAGAGACAAATGCTTAAACAGGGCGCAGCTGA
 14[83] TGTGCTGGAAC TGCGCGCAGACCTTGTCGAAAGCTACA
 14[125] TGTGCTGCAAGGCATGCCATTCTCGCTAGCATTAACCTTCA
 14[167] AAGCCCCAAAACAAACATGTCAATCATTAGCAAATTATT
 14[209] AAAGGTGGCATCAATCCTGTTAGCTATTACCTCGTCAA
 14[251] CATTGAATCCCCTATAGAAGTTTGCCATCAGTTAAAACA
 16[76] TTTGACATTCACTGTGAAGCGGCAGAGCAGGCAA
 16[118] TGCAGCAGCTCACTGCCATTCTAGGCTCGCAACTG
 16[160] ACTAGAGCCTCATCTGGAGCAAACAAGAGAATCGA
 16[202] ATAACAGAAGCAATATTAGTTGACCATTAGATA
 16[275] ACGATAAAAATAAAATGTTAGACTGG
 17[84] TGCATAGGCAAAGGCCATTCTCTGGTGGAGGTTT
 17[126] TTGGGTCAATTGCGTGGAGGTCTACAAAGATATT
 17[168] TGAACCTCTGCGAACGAGTAGAACAGTTCTTAAC
 17[210] CATTAAACGCCAAAAGGAATAACTAATCAGAAAA
 17[238] CATAGTAAGAGCAAGGCTTGTCAAAACAGAGCAAATATCAG

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19[9]	GCCTGTTATCAAGTACCGCA
19[56]	ACAGAGAGAACACACAGCTAGAAATAGAAGAATCTAAT
19[70]	TGCGTATGTTGCCAGGAGGATCTGAACCTATCGA
19[98]	CCGGCACCAAACGGCAACCCGATCAACATTAAATGTGAGATG
19[112]	TAACCAAGCCTCAGGAAGATCGCACTCCAGCCATG
19[140]	TTTGAGAAATGCAAATTTTACCTTATTTCACCGCAGTCTG
19[154]	TAAAGCTTGATAAATTAAATGCCGGAGAGGGTAGGA
19[182]	TCATTCCGAGAGTAAGCAAACGAGCTCAAAGCGAACACCCT
19[196]	GATTGCAATATGCAACTAAAGTACGGTGTCTGGAT
19[224]	TAAGCCCATTACGCAGAACTGACGCAATAAACCGGAAGACT
18[90]	TCGGACTTGTGCAATATGGTCGTTAGGCCGACGACTGGGA
18[132]	CGACGACAGTATCGTATGCCAGTTGAGGGAAAGGGCGATCGG
18[174]	TCAACCGTTCTAGCAAACCATCAATATGAAGGTAACTGTAAA
18[209]	GTTTTAATCAATATAATGCTGCACGCAAATGGTCA
18[237]	AGAGATAACCCACAAGAACGCTAACAT
20[41]	CCCAAGAACAGATAAGCCGTTTATTTTATCG
20[83]	ACGCCACCAACAGCCATTGTTGTGAGTGTGGCGAT
20[125]	GCATCGGAACGCCATAGGTACGTTGGTAGAT
20[167]	AAATCATCGGTTAGTAAAGATTCAAAAGGGTGAG
20[209]	TGCTGAAAAAGATCGATAAGAGGTATTTGCGG
21[49]	TAGGAGGCTATATCTGCCACTGCCCTGGCCTCA
21[91]	CCGATGATTGACCGTAATGGGTGGAACGTTTT
21[133]	GGGCGCCTGAGTAATGTAGTATTTAGAGAGCA
21[175]	AAAGGTTAATTGCTCTTTAGGATTAATAAGCG
21[217]	ATGGCTATGTTAGCAAACGTAACCTTAATAACACATTCTACGAGG
23[7]	TCCTTATCATTCCATCAATAATCGGCTG
23[77]	GGGATTAATGAAAGACGCCACCATGAATTGGTCCCCGGAAAGTGCTT
23[119]	AAAATAATTGCGAGAAATTCTACGCCAGCTGAAGCTATCAGGCTATT
23[161]	AAAACATTATGCACAAAGAAATGTACCCCGTAGGATCCCATAAGTT
23[203]	AGGAAGCCCAGAAATCAGGTCTATTTCTAGGTTGCAGATATATGAGT
22[83]	GCAGACATCATTGATTCAAGAAATAAAATACAA
22[125]	GCCTCCTGTAGCCAGTTCTCGGATTTGTCAC
22[167]	GTAATACTTTGGGGAGAAGGAACCTCTATAAAC
22[209]	TCAAATATCGCGTTTAATTCTCCAACAATATAAA
22[237]	CGAGGAAGCATGATAGATGACCATAAACCTTACAGAGAGA
22[272]	AAGCAGATAGCCGAACAAAGTCTATCTTAAGATTAGGGAAATATT

520, Strut I, left (turquoise)

Start Sequence

3[14]	ATCGTCGCTATTGAATAACCTTGCTTCT
3[63]	ATTGTTTACATCGGGAGAAAGTACATAATCA
2[41]	ATATATGTGAGTGAATTACCTTAAATCGGGTTAG

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4[34] CATTTAGGCTTTGAGAGGGTTGATATAAGTATA
 5[7] AAGATGATGAAACACAATTACCTGAGCA
 5[35] AAAATTAAATTACCGAAGGGTTAGAACCTTACTTATAACGG
 6[48] GGATAAGTGCCGTGATTGCTCAGTACCATTTAACATTTAACATT
 9[17] GAAAGTATTAAGAACCTACATACATTCATTAAACATCAAGAAAAC
 11[42] TAATACAAAGTTACTTAATGAAACACACTGAATAAGTCCTG
 10[41] TAACGGGGTCAGTGCCCTGAGTGCTATGCAATTAAATTTCCTTAG

520, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGTTATGGCTCGGGAGTTCCAGCGGAG
 7[252] ATGAGGAGGATTATAGATGATTAAACCCAATATT
 6[258] TGAGAATAGAAAGGAATTTC
 6[277] TTCAACAGTTTCATTAAACGGGAAAAT
 8[251] AGACTAAAGGCTGGTTGCGGGATCGTCACCCCTCAGGACTAA
 8[280] GCAACGGCTACAGAGGCTTGAGCAGCGAAAGACAGCATCGGAA

520, Strut II, left (green)

Start Sequence

15[14] ATCCTGGGAAGATAAGTTCTTGTGTT
 15[63] ATACATTGGATGAACGGAAAGCAACGAAGTCCG
 14[41] TGAAGACGAAACCGGTAAGCGTATTGCGATATTGGTTTG
 16[34] GGGAGGAATAAGTCCCCTATTCTAAGAACCGAG
 17[7] AAAATCAAACATGTTGAGCTTGA
 17[35] TATTACGAAGGTAACTCTCAGGCAGTGCAGTGCAGCA
 18[48] TATAGAAGGTTATCTTAGCAAGCAAATTGTTATCTGGAT
 21[17] CGAGAACAGCTAACCAACAATAGAACTGCGACGAGCAGCGTGAG
 23[42] CCATCTAGAACGAGTAAACTGGAAAGAAAGCGAAACAGTAA
 22[41] TTACGAGCATGTAGAAACCAAGAACGGAGCTCTGTTATCAAGCACT

520, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCGGAATCGTCATGTAATAGCCAAATTACAGCTCAGAGG
 19[252] TATGGTTAGCGAGACACTATCATAACCCCTGTTA
 18[258] GTAATTGAGCGCTAGAATTCA
 18[279] CACCCCTGAACAAAGGCCAAAGACAAAAGGG
 20[251] AGAAAAACAATGAGGAAATACATACATAAAGGTGAATCAAT
 20[279] GGAATAAGTTATTTGTCACGCAACATATAAAAGAAACGCA

420, Strut I, left (turquoise)

Start Sequence

3[14] TAGGTCTGAGAGGAGTGAATTATCAA

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3[63]	ATTCGTTTACATGGGAGAAAGATTAAGACGCT
2[41]	GAGAAGAGTCAATAATCCTGAAAACATAAAATGGGTTAG
4[34]	AGAATTAGGCTTTGAGAGGGTTGATATAAGTATA
5[7]	TGAGTGAATAACCTCAATTACCTGAGCA
5[35]	GTCGCTATTAAATGGAAGGGTTAGAACCTTACTTATAACGG
6[48]	GGATAAGTGCCGTCGATTGCTCAGTACCATTAATTTCCTT
9[17]	GAAAGTATTAAGAACCTACATACATTTCATTGCTCTGAAATC
11[42]	TAATACAAAGTTACAGCGATAGCTTACACTGAATAAGTCCTG
10[41]	TAACGGGGTCAGTGCCATTGAGTCACACTACCTTTAACCTC

420, Strut I, right (red)

Start Sequence

2[279]	ACAGGAGAATGGATCCCCGGTTATGGCTCGGGCAGCGATAGCGGAG
7[252]	TGACCCCGGATTTATAGATGATTAAACCCAATATT
6[258]	TGAGAATAGAAAGGAAATCTT
6[277]	TTCAACAGTTCTATACCAAGCGCGAAA
8[251]	CACTCAAAGGCTGGTTGGGGATCGTCACCCCTCAACTAAAA
8[280]	AACGAAAGAGGCAAAAGAACATCGCAGCGAAAGACAGCATCGGAA

420, Strut II, left (green)

Start Sequence

15[14]	TACGCATCGCTATAAGTAACTATCGACA
15[63]	ATACATTGGATGAACGGAAAGCGGCAGTTAAC
14[41]	GAACAAGACCCGTTGGACTGGTACCTGGATATTGGTTTG
16[34]	ACTCGAATAAGTCCGGTATTCTAACGCGAG
17[7]	GGAAACCAGTTCTTGTGAGCTTGTGAAA
17[35]	CTGGGAAGACTCAACTCTCAGGCACTGCCGAAGTGACCAGCA
18[48]	TATAGAAGGCTTATCTTAGCAAGCAAATTCTGTTATCAAGC
21[17]	CGAGAACAGCTAACCAACAATAGAACTCGCTGTTGCCATC
23[42]	CCATCTAGAACGAGGAAGAGTTCTGAAAGCGAAACAAGTAA
22[41]	TTACGAGCATGTAGAACCAAAGAACGGAGTTACGGGGTTGGAGGTCA

420, Strut II, right (orange)

Start Sequence

14[279]	CCAATACTGCGGAATCGTCATGTAATAGCCAAATGACTTGATCAGAGG
19[252]	CGTCACCAGCGAGACACTATCATAACCCCTCGTTA
18[258]	GTAATTGAGCGCTAGAACATC
18[279]	CACCCCTGAACAAAGGCCATTGGGAATTAG
20[251]	GAATTAACAATGAGGAAAATACATACATAAAGGTGAAAGT
20[279]	ATATTGACGGAAATTATTGCAACATATAAAAGAACGCA

320, Strut I, left (turquoise)

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Start	Sequence
3[14]	AAAACTTTTCAGACAAGACAAAGAACG
3[63]	ATTCGTTTTACATCGGGAGAAATGTAAATGCTGA
2[41]	TGCAAATCCAATCGATCTTAGGTTGGTAAAATCGGTTAG
4[34]	TCCGGTAGGCTTTGAGAGGGTTGATATAAGTATA
5[7]	GTCAATAGTGAATTCAATTACCTGAGCA
5[35]	GTCTGAGAGACTGGAAGGGTTAGAACCTTACTTATAACGG
6[48]	GGATAAGTGCCGTCGATTGCTCAGTACCATACCTTTAACC
9[17]	GAAAGTATTAAGAACCTACATACATTTCATTTATCAAATCATAG
11[42]	TAATACAAAGTTACTATATAACTATACACTGAATAAGTCCTG
10[41]	TAACGGGGTCAGTGCTTGAGTGCTATGCAATATATTTAGTTAAT

320, Strut I, right (red)

Start	Sequence
2[279]	ACAGGAGAATGGATCCCCGGTTATGGCTCGGGAACGAGAGCGGAG
7[252]	TTAGCCGGGATTTATAGATGATTAAACCCAATATT
6[258]	TGAGAATAGAAAGGAAGTTAC
6[277]	TTCAACAGTTCGCGCAGACGGTCAATC
8[251]	TCCATAAAGGCTGGTTGGGATCGTCACCCCTCAGACCTGC
8[280]	GATAAATTGTGTCGAAATCCGCGCAGCGAAAGACAGCATCGGAA

320, Strut II, left (green)

Start	Sequence
15[14]	GATCGGTTTGTACGCATCAAAGGAGA
15[63]	ATACATTGGATGAACGGAAAGTGCATATGATGT
14[41]	CTGACGCTGGCATTGGGGTTCAGGATGGATTGGTTGA
16[34]	TCAATGAATAAGTCCC GGTTCTAAGAACCGAG
17[7]	ACCCGTTAGTAACCTGTTGAGCTTGAAA
17[35]	GCATCGCTATTAAACTCTCAGGCACTGCCGAAGTGACCAGCA
18[48]	TATAGAAGGCTTATCTAGCAAGCAAATTGGGGTTGGAGG
21[17]	CGAGAACAGCTAACACAATAGAACTCGCATCGACATCATTAC
23[42]	CCATCTAGAACGAGCAGGTGAGTCAAAGCGAAACAAGTAA
22[41]	TTACGAGCATGTAGAACCAAAGAACGGAGAAAAGATAACGCTTGTGA

320, Strut II, right (orange)

Start	Sequence
14[279]	CCAATACTCGGAATCGTCATGTAATAGCCAAATCCGTAAATTCAAGGG
19[252]	AGCAGCAAGCGAGACACTATCATAACCCCTCGTTA
18[258]	GTAATTGAGCGCTAGATCGAT
18[279]	CACCCCTGAACAAAGCAGTAGCGACAGAACATC
20[251]	AACCAAACAATGAGGAAAATACATACATAAAGGTGCCAATGA
20[279]	TTAGCAAGGCCGGAAACGTCAGCAACATATAAAAGAACGCA

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220, Strut I, left (turquoise)

Start Sequence

3[14] AACACCGGAATCGAAGGCGTTAAATAAG
3[63] ATTCGTTTACATGGGAGAAATTGAAATACCGA
2[41] CCGTGTATAATAATCTTCTGACCTAAATGGGTTAG
4[34] ATTTCTAGGCTTTGAGAGGGTTGATATAAGTATA
5[7] CCAATCGCAAGACACAATTACCTGAGCA
5[35] ACTTTTCAAATGGAAGGGTTAGAACCTTACTTATAACGG
6[48] GGATAAGTGCCGTCGATTGCTCAGTACCATATTTAGTTA
9[17] GAAAGTATTAAGAACCTACATACATTCAAGAACGCGAGAAA
11[42] TAATACAAAGTTACAATTAAATGGTCACTGAATAAGTCCTG
10[41] TAACGGGGTCAGTGCCCTTGAGTCCTATGCATAATTACTAGAAAAAG

220, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGTTATGGCTCGCGTTCATCAAGCGGAG
7[252] GCTGACCGGATTTATAGATGATTAAACCCAATATT
6[258] TGAGAATAGAAAGGAAGGCTG
6[277] TTCAACAGTTTCAGAGTAATCTTGACAA
8[251] GCATAAAAGGCTGGTTGGGATCGTCACCCCTCAACCAGGC
8[280] AGGACAGATGAACGGTGTACAGGCAGCGAAAGACAGCATCGGAA

220, Strut II, left (green)

Start Sequence

15[14] ACATCGGGTTGATAGATGATGACCGTAC
15[63] ATACATTGGATGAACGGAAAGCAGCGATGCCAG
14[41] AGTCTGTAGTGTCAAGGATGCTGAATTTCGATATTGGTTTG
16[34] TGAAAGAATAAGTCCCCTATTCTAAGAACGCGAG
17[7] TGGCATTGCGATCATGTTGAGCTTGA
17[35] CGGTTTGAAACTCTCAGGACTGCCGAAGTGACCA
18[48] TATAGAAGGCTTATCTTAGCAAGCAAATTAGATAACGCTT
21[17] CGAGAACAGCTAACCAACAATAGAACTGCGAAGGAGAGTGAGAT
23[42] CCATCTAGAACGGCGTCGTTCAAAAGCGAAACAAGTAA
22[41] TTACGAGCATGTAGAACCAAAGAACGGAGGTATTATCTTACTGTTTC

220, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCGGAATCGTCATGTAATAGCCAAATTCTTCTCAGAGG
19[252] TTTGCCAACGCGAGACACTATCATAACCCCTCGTTA
18[258] GTAATTGAGCGCTAGATAGCG
18[279] CACCCCTGAACAAAGATAATCAAATCACCG

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20[251] CTTATAACAATGAGGAAAATACATACATAAAGGTGTAGCCCC

20[279] TTTCATCGGCATTTCGTCAGAACATATAAAAGAAACGCA

190, Strut I, left (turquoise)

Start Sequence

3[14] CTGTTTAGTATCGAATAATTACTAGAAA

3[63] ATTCTTTTACATCGGGAGAAAGTTAAATAAGAA

2[41] TAAACACCGGAATCATTACCGACCGTGTAAAATCGGGTTAG

4[34] TGAAATAGGCTTTGAGAGGGTTGATATAAGTATA

5[7] TTTTCAAATATCAATTACCTGAGCA

5[35] TCTTCTGACCTAGGAAGGGTTAGAACCTTACTTATAACGG

6[48] GGATAAGTGCCGTCGATTGCTCAGTACCATATTAATGGTT

9[17] GAAAGTATTAAGAACCTACATACATTCATTTTAGTTAATTCA

11[42] TAATACAAAGTTACGATAAAATAAGGCCACTGAATAAGTCCTG

10[41] TAACGGGGTCAGTGCCTTGAGTGCCATATCGTTATACAAAT

190, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGTTATGGCTCGGGATATTCAAGCGGAG

7[252] GAACCGGGGATTTATAGATGATTAAACCCAATATT

6[258] TGAGAATAGAAAGGAAGACAA

6[277] TTCAACAGTTCTTACCCAAATCAACGT

8[251] ATCTTAAAGGCTGGTTGGGATCGTCACCTCAAAGAGTA

8[280] CATAGGCTGGCTGACCTTCATCGCAGCGAAAGACAGCATCGGAA

190, Strut II, left (green)

Start Sequence

15[14] TTTACATAAACATAGTATTATCTTACTG

15[63] ATACATTGGATGAACGGAAAGATGACCGTACTC

14[41] AAACATCGGGTTGAGGTGCCAGAGTCTGGATATTGGTTTGAA

16[34] AGCGAGAATAAGTCCCAGTATTCTAAGAACCGAG

17[7] GTTTGTAAAAGATTGTTGAGCTTGAAA

17[35] TGCTGAATTCGAACTCTCAGGCACTGCCGAAGTGACCAGCA

18[48] TATAGAAGGCTTATCTAGCAAGCAAATTCGTCGTCTCAC

21[17] CGAGAACAGCTAACCAACAATAGAACTGCGAACGCTGTGAAAA

23[42] CCATCTAGAACGAGTAGTGTAGATGAAAGCGAAACAAGTAA

22[41] TTACGAGCATGTAGAACCAAAGAACGGAGTTGCTGATACCGTTAGC

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190, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCGGAATCGTCATGTAATAGCCAAAATGCCACCTCAGAGG
 19[252] GAACCAGAGCGAGACACTATCATAACCCCTCGTTA
 18[258] GTAATTGAGCGCTAGACACCG
 18[279] CACCCCTGAACAAAGACCGGAACCGCCTCCC
 20[251] AAAATAACAATGAGGAAAATACATACATAAAGGTGCATAATC
 20[279] TATTAGCGTTGCCATCTTGCAACATATAAAAGAAACGCA

170, Strut I, left (turquoise)

Start Sequence

3[14] TATACAAATTCTGAGTTAGTATCATAT
 3[63] ATTCGTTTTACATCGGGAGAAAGGAATCATAATT
 2[41] ACTAGAAAAGCCTATAGGCCTAAATAAAAATCGGGTTAG
 4[34] AAATATAGGCTTTGAGAGGGTTGATATAAGTATA
 5[7] TAATTTCATCTTCTCAATTACCTGAGCA
 5[35] GGTTGAAATACGGAAGGGTTAGAACCTTACTTATAACGG
 6[48] GGATAAGTGCCGTCGATTGCTCAGTACCATCGACCGTGTGAT
 9[17] GAAAGTATTAAGAACCTACATACATTTCATTGACCTAAATTAAAT
 11[42] TAATACAAAGTTACAGAATAAACACCCACTGAATAAGTCCTG
 10[41] TAACGGGGTCAGTGCCTTGAGTGCCTATGCTACCAAGTATAAGCCAA

170, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGTTATGGCTCGCGCGTAACAAGCGGAG
 7[252] AAATCAAGGATTTATAGATGATTAACCCAATATT
 6[258] TGAGAATAGAAAGGAATACCC
 6[277] TTCAACAGTTCAAGCTGCTCATTCACT
 8[251] TTCATAAAGGCTGGTTGCGGGATCGTCACCCCTACCGGATA
 8[280] TCAAGAGTAATCTTGACAAGAAGCAGCGAAAGACAGCATCGGAA

170, Strut II, left (green)

Start Sequence

15[14] ACCGTTAGCTGTATACATAAACATTGC
 15[63] ATACATTGGATGAACGGAAAGGGTTGAGTATTA
 14[41] TCTTACTGTTCTGGATGATGACCGTGATATTGGTTTG
 16[34] TGTCAGAATAAGTCCCGGTATTCTAAGAACCGAG
 17[7] TGTAAAATGCTGATGTTGAGCTTGAA

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17[35] TCACAGCGATGCACTCTCAGGCACTGCCGAAGTGACCAGCA
 18[48] TATAGAAGGCTTATCTTAGCAAGCAAATTCAGAGTCTGTAG
 21[17] CGAGAACAAAGCTAACCAACAATAGAACTGCGATTCGCGTCGTCT
 23[42] CCATCTAGAACGAGACTCAAACATCGAAAGGAAACAGTAACATTGCAA
 22[41] TTACGAGCATGTAGAAACCAAGAACGGAGAACGACATACATTGCAA

170, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCGGAATCGTCATGTAATAGCCAAAATCCCTCAGTCAGAGG
 19[252] ACCGCCTAGCGAGACACTATCATAACCCCTCGTTA
 18[258] GTAATTGAGCGCTAGACCGGA
 18[279] CACCCCTGAACAAAGAGCCGCCACCCCTCAGA
 20[251] CACCAAACAATGAGGAAAATACATACATAAAGGTGCCAGAGC
 20[279] TCATAATCAAATCACCGGAAGCAACATATAAAAGAACGCA

160, Strut I, left (turquoise)

Start Sequence

3[14] CTTACCAAGTATAGAATATGCGTTATACA
 3[63] ATTCTTTTACATGGGAGAAATTACTAGAAAAAA
 2[41] GCCTGTTAGTATCATTAGAATAAACAAAATGGGTTAG
 4[34] TTAAATAGGCTTTGAGAGGGTTGATATAAGTATA
 5[7] TTCTGACCTAAATTCAATTACCTGAGCA
 5[35] ACCGACCGTGTGGGAAGGGTTAGAACCTTACTTATAACGG
 6[48] GGATAAGTGCCGTCATTGCTCAGTACCATATAAAAGGCG
 9[17] GAAAGTATTAAGAACCTACATACATTTCATTTAATGGTTGAAAT
 11[42] TAATACAAAGTTACCCGAATCATAACACTGAATAAGTCCTG
 10[41] TAACGGGGTCAGTGCCTTGAGTGCCATGCAAGCCAACGCTAACAG

160, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGTTATGGCTCGGGCTGCTCAAGCGGAG
 7[252] AACAAAGGGATTTATAGATGATTAAACCCAAATT
 6[258] TGAGAAATAGAAAGGAAACGT
 6[277] TTCAACAGTTCTTCAGTGAATAAGGCT
 8[251] AAATCAAAGGCTGGTTGGGATCGTCACCCCTCAATTACCC
 8[280] TCTTGACAAGAACCGGATATTGCAGCGAAAGACAGCATCGGAA

160, Strut II, left (green)

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Start	Sequence
15[14]	TGAAACGACATATATTGCTGATACCGTT
15[63]	ATACATTGGATGAACGGGAAAGTATCTTACTGTT
14[41]	TCTTACATAAACAGGGTACTCAAACATGATATTGGTTTGAA
16[34]	TGACCGAATAAGTCCCCTGTGAGCTTGAAGAACGCGAG
17[7]	CTGAATTTCGCGTCTGTTGAGCTTGAAGA
17[35]	GCCAGAGTCTGTACTCTCAGGCAGTGCCGAAGTGACCAGCA
18[48]	TATAGAAGGCTTATCTTAGCAAGCAAATTAGTGTAGATGA
21[17]	CGAGAACAAAGCTAACCAACAATAGAACTGCGGTCTCACAGCGAT
23[42]	CCATCTAGAACGAGCGGGTTGAGTATAAGCGAAACAGTAA
22[41]	TTACGAGCATGTAGAAACCAAAGAACGGAGCATTGCAAGGAGTTATA

160, Strut II, right (orange)

Start	Sequence
14[279]	CCAATACTCGGAATCGTCATGTAATAGCCAAAATGCCACCTCAGAGG
19[252]	TCAGAGCAGCAGACACTATCATAACCCCTCGTTA
18[258]	GTAATTGAGCGCTAGACTCCC
18[279]	CACCCCTGAACAAAGCTCAGAACCGCCACCC
20[251]	ACCGCAACAATGAGGAAAATACATACATAAAGGTGCACCGGA
20[279]	AATCACCGGAACCAAGAGGCCACGCAACATATAAAAGAAACGCA

150, Strut I, left (turquoise)

Start	Sequence
3[14]	TAAAGCCAACGCGATACAAATTCTTACC
3[63]	ATTCTTTTACATCGGGAGAAAAAGCCTGTTAG
2[41]	TATCATATCGTTAATCACCGGAATCATAAAATCGGTTAG
4[34]	ATAAAATAGGCTTTGAGAGGGTTGATATAAGTATA
5[7]	AATTAAATGGTTGCAATTACCTGAGCA
5[35]	TGATAATAAGGGGAAGGGTTAGAACCTTACTTATAACGG
6[48]	GGATAAGTGCCGTCGATTGCTCAGTACCATCGTTAAATAAGA
9[17]	GAAAGTATTAAGAACCTACATACATTTCATTAAATACCGACCGTG
11[42]	TAATACAAAGTTACAATTACTAGAAACACTGAATAAGTCCTG
10[41]	TAACGGGGTCAGTGCCTTGAGTGCCTATGCTAACAGTAGGGCTTAA

150, Strut I, right (red)

Start	Sequence
2[279]	ACAGGAGAATGGATCCCCGGTTATGGCTCGCGAGTGAATAGCGGAG
7[252]	CTCATTGGATTATAGATGATTAAACCCAAATT
6[258]	TGAGAATAGAAAGGAAAGCTG

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6[277] TTCAACAGTTCAAGGCTTGCCTGACG
 8[251] AACAAAAGGCTGGTTGGGGATCGTCACCCTCATCACGT
 8[280] AACCGGATATTACATTACCCAAAGCAGCGAAAGACAGCATCGGAA

150, Strut II, left (green)

Start Sequence

15[14] TACATTGCAAGGTACGTTAGCTGAAAC
 15[63] ATACATTGGATGAACGGAAAGTTCTTACATA
 14[41] AACATTGCTGATACGGATCGGTTGAGTGATATTGGTTTGA
 16[34] CAAACGAATAAGTCCCCTTACAGAACGCGAG
 17[7] CGTCGTCTTCACAGTGTGAGCTTGA
 17[35] GTAGTGTAGATAACTCTCAGGACTGCCGAAGTGACCA
 18[48] TATAGAAGGCTTATCTTAGCAAGCAAATTGATGACCGTACT
 21[17] CGAGAACAGCTAACCAACAATAGAACTGCCGATGCCAGAGTCT
 23[42] CCATCTAGAACGAGATTATCTTACTGAAAGCGAAACAAGTAA
 22[41] TTACGAGCATGTAGAAACCAAGAACGGAGAGTTATAATGAGTATC

150, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCGGAATCGTCATGTAATAGCCAAATAGAACCGTCAGAGG
 19[252] CACCCTCAGCGAGACACTATCATAACCCCTCGTTA
 18[258] GTAATTGAGCGCTAGAGCCGC
 18[279] CACCCTGAACAAAGCCACCCTCAGAGCCAC
 20[251] TCAGAAACAATGAGGAAAATACATACATAAAGGTGGCCTCC
 20[279] ACCAGAGCCACCACCGAACATATAAAAGAACGCA

140, Strut I, left (turquoise)

Start Sequence

3[14] GCTCAACAGTAGGATACCACTGATAAAGC
 3[63] ATTGTTTTACATGGGAGAAAAGTATCATATGC
 2[41] GTTATACAAATTCTATATAATTACTAGAAAAATCGGTTAG
 4[34] GAATCTAGGCTTTGAGAGGGTTGATATAAGTATA
 5[7] TTTGAAATACCGACCAATTACCTGAGCA
 5[35] GGCCTTAAATAAGGAAGGGTTAGAACCTTACTTATAACGG
 6[48] GGATAAGTGCCGTCATTGCTCAGTACCATGAATAAACACCG
 9[17] GAAAGTATTAAGAACCTACATACATTTCATTCTGTGATAAATAA
 11[42] TAATACAAAGTTACAAAGCCTGTTCACTGAATAAGTCCTG
 10[41] TAACGGGGTCAGTGCCTTGAGTGCCTATGCGCTTAATTGAGAATCG

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140, Strut I, right (red)

Start Sequence

2[279] ACAGGAGAATGGATCCCCGGGTTATGGCTGCCGGCTGCCAGCGGAG
7[252] GAATAAGGATTATAGATGATTAACCCAATATT
6[258] TGAGAATAGAAAGGAATCACT
6[277] TTCAACAGTTCCGTACGAGAACACCA
8[251] CTCATAAAGGCTGGTTGCGGGATCGTACCCCTAAAAGCTG
8[280] TCATTACCAAATCACGTAACGCAGCGAAAGACAGCATCGGAA

140, Strut II, left (green)

Start Sequence

15[14] GGAGTTATAAATAAAACGACATACATT
15[63] ATACATTGGATGAACGGAAAGTAAACATTGCTG
14[41] ATACCGTTAGCTGGGTATTATCTACGATATTGGTTTG
16[34] GTT GAGAATAAGTCCCCTGATTCTAAGAACCGCAG
17[7] ACAGCGATGCCAGATGTTGAGCTTGAA
17[35] ATGATGACCGTAAACTCTCAGGACTGCCGAAGTGACCAGCA
18[48] TATAGAAGGCTTATCTAGCAAGCAAATTCTAACACATCGG
21[17] CGAGAACAAAGCTAACACAATAGAACTGCGGTCTGTAGTCAG
23[42] CCATCTAGAACGAGTGGTTCTTACAAAGCGAAACAAGTAA
22[41] TTACGAGCATGTAGAACCAAAGAACGGAGTGAGTATCAATGAGTTAG

140, Strut II, right (orange)

Start Sequence

14[279] CCAATACTGCCAATCGTCATGTAATGCCAAATCCCTCAGTCAGAGG
19[252] ACCGCCAAGCGAGACACTATCATAACCCCTCGTTA
18[258] GTAATTGAGCGCTAGATCAGA
18[279] CACCCCTGAACAAAGAGCCACCACCCCTCAGA
20[251] CACCCAACAATGAGGAAAATACATACATAAAGGTGGAGCCGC
20[279] CCACCGGAACCGCCTCCCTCAGCAACATATAAAAGAACGCA

For the asymmetric Kite in Fig. 2d we used the turquoise, red, and green staples for the 320-Kite and the orange staples for the 140-kite

Twelve-helix-bundle kite exhibiting enzymatically activated rearrangement (p7848):

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Strut I (grey)

Start Sequence

0[62] ATCAAAATCTGGTCAGACTCTGAATACCCATCAAGCCAAATC
 0[104] AGACCAGTATTAAATGCTGTATTAATCAACCATCGACTTGCA
 0[146] ACCGATATTATAGCAATTCAAGCGACTTGTATCAGTAACCG
 0[188] GGTTGATGTGAGTTGACTGGAATGATGGTCACCAAGCGACA
 0[230] CACCATTCTCCAATGGATGGTAGCGAAGGTTATTGTCGGAACGCCCTC
 0[258] ACACCACGGAATAAGAATAAGAATTACC
 1[14] ATGACGTAATGACAGAGGAAAGACTTCAGCATTACAGGTAGAAGTAGTA
 1[49] AATAATTAGATTAATCAGTTGAAAAACGAACTAACAAAAAATGTACCT
 1[84] TAAACACGGCTCTGGCGCATAGGAACGAAAACATATCATAACC
 1[126] GCAACATGCTCTGCGTTGCGCCCCATAACGTAATGCCACTA
 1[168] ATATGGTGTGTGTATAAGTAGACAGGATTCATAGTTAGCGT
 1[210] TCAGGAAGGATGGCACCATATTAGCGGGAGTCTCTGAATT
 3[14] TGTTTAAATATTATGGTGTAGCTC
 3[63] AGCGTACCCCTGACTATTATAGTATGGCTTAGAGCTTAATTG
 3[105] AACGGCAGACCAACTTGTAAAGAACCTAAATCAA
 3[147] ACAGCGTCTGCTTCGAGGTGAACGGTCAATCAT
 3[189] CCGTCATTGCTCAGTACCAAGGCAGCCTTAATTG
 3[217] CCTCACCCATATGGCCAAGGCCGCTGCATTTCTCAGACTCTCAGAG
 3[231] TCACCGTCATTGGATTAGAGAGAGAAGGATTA
 2[34] CTGAATCTCTTGATAAGAGGCCGAAAAACTTCACCAGATT
 2[83] AAATCAGGTCTTAATTAAACAGTTCACTGACCTTGACTCAA
 2[125] AAGGGAACCGAAACTCGTTACTTAGCCGGAACACATGCTGGC
 2[167] TATCGGTTATCAGACTCCAAAAAAAAGAATAGGTAATGC
 2[209] GGATTAGCGGGGTTAAGTATTAAGAGGCCGAAACGAAATGG
 2[258] ATCACCGTCACCGACTTGAGCCATGACGGAAATTATTCA
 4[41] TTAATTGCTCTGCCAGATGTTGAAAGCATCAATAGAAATT
 4[76] TGCTTCTGACAAGCGGAATCGTCATAAATATT
 4[118] CCATGCATAACCCACATCGCCTGATAAATTGTC
 4[160] AAATCTCAGGAGCAAACAAAGGAATTGCGAATAA
 4[202] TGAAACCATCGATGTGCCCTGCCTATTCGGAA
 4[251] GAAGGTAATATCATTACCATATTGATTGATGATGACTATAT
 5[7] CCAGACCGGAAGCATTGAGCTTCAAAG
 5[35] AGGATTAGAGAGGATAGCGTCCAATACTTAAAGGAAGCAA
 5[84] ATTGACAACGGAGATTGTATAGCGCGAACAGATG
 5[126] GAAATGAGAATAGAAAGAACACAGTTTTCTTAA
 5[168] TAATTCCGTATAAACAGTTAACCTTGAGATAAGTG
 5[210] CCTATTACCAAGCGCTAAAGACGAAAATTAGCAAAA
 7[9] TTATCTGTGAGGAACCTGGCTC
 7[56] GGGGTATAATGCGAGAGATTCTGACGAGAACAC
 7[70] CGGATATGAGAGGCTTGCAGAAAGTTGATCATTGA

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7[98] CGATTATGAGGAAGTGGTAGCGCAGCGAAAGACAGCACTGCT
 7[112] ATTCGGTATACTAAACACTCATCTTGACCTA
 7[140] AACAACTTTCGCGAACCCATTTCAGGGATAGCACCGCT
 7[154] GTACCGCGTAAATGAATTCTGTATGGGTTTCG
 7[182] CGGGGTCTTGATAGGTTGAGAGAGGCCGCCAGCACCGCC
 7[196] GCACCGTGTACAGGAGTGTACTGTAATAAGTGT
 6[41] TTACGACCAACATCGAACACATTGACGTTGGGAAGAAAA
 6[90] AAAACAAAATAGCTTACAGACGACTAATCCCCCTCAA
 6[132] AAAGAGGCAGAACGCGACCAACCTAACGTTGACCTGCT
 6[174] CTTTCCAGACGTTACATCTAAAGTTGGCTTACGTTGA
 6[216] ACATGGCTTTGATAATTCCAGTAAGCGTTATTCTGAAACA
 6[258] TCGATACATCAGGAGCATACCAATAACG
 8[83] CTCGTATTACCCACGAATTACGAGGCATAGTAAGA
 8[125] CGAAGCTGAGGCAGAAGTTCCATTAAACGGGTAA
 8[167] AACGACCTCTAGAACGCTGTAGCATTCCACAGACA
 8[209] TACCGTCAGTAGACTTCATTAAAGCCAGAATGGAAAGCGCTCATAGCCC
 8[258] CCGGAACCAGAGCCACCACTAGCGTTGCCATTTTCTATA
 9[17] ACCAGTCAGGATTTAAGATATGAAGTTTAAACTCCAACAGGTC
 9[42] ATCTACGTTAATTACATAACGCCAAAGATTCAACATAGAAC
 9[91] GCAACAGACTTTTCTAGAGGAGGCTTACGATAT
 9[133] AATACCAAGTACAAACTACAACCACTGAGTTTTA
 9[175] ACCCTCACAAACGAATGGATCGATTGGCAGTAGCA
 9[231] CCTTATTCATCGGAGTGCAGTCATAAAAAAGGGCGACATTCAACCGA
 11[7] AATCATTGTGAATTGGTTAATTCAA
 11[77] AACGTAACAAAGTCGGCTGGCAAAACGAGAATGGGAACAAAGGACCCAG
 11[119] GGGAGTTAAGGAGCGACAATAACGAGGCGCAGATCAGCGGAAATGCTA
 11[161] CCACCCCTCAGAATTAGCCGGCTCCAAAAGGGTAACAGTTTTAA
 11[203] GAATCAAGCCGCCACCAGAACCAACCCACCGCAGGTATGAGAG
 10[34] ATTGGGCTTGAGAACCTTATAAGCAACTAAAGTACGGTG
 10[48] CAGAACGAAGATTGAGGAAGTCATTGGCAGTAGACTACCAGA
 10[83] CATTCAAGTGAATAAGGCTTGCAGGAATAAGATTGC
 10[125] TTTGGGATCGTCACCCCTAAACGGCTCTGTAC
 10[167] ACCCTCAGAGCCACCAACCTCATGTACCCCTTGAT
 10[223] CCACCAACCTCAGAGTTGCCAGGCTGAGACT
 10[251] GCCACCCCTCAGAACGCCACCGTAGCGCTTAGTAG

Strut II (black)

Start Sequence

12[62] AGCGTTGATAATCAGAAAAGCCCCAAAGGTCTGAGCTTATA
 12[104] AGTCAATAATTTAAATTGTAACGTTTGATACCATAT
 12[146] TGGCAATTAAATTGGTTAAATCAGCCCATTACCAAGAGG
 12[188] TGCGCGACGCCATAAAAATAATTGCGGAAAGGAACCTGGC

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12[230] TGACGGGTTCATCACACATTAAATGTGATGATTGCCGCCGGAGCTAAA
 12[258] AGACGGGCAACAGCGCGAGTAACAACCC
 13[14] GGTAAATCGAAAATAGCATGATTACCGACACAAATTCTTACTTCAAA
 13[49] CCCGGTTTTATTAGCCAAATCCTGTTAGTATATATTTATTCCCA
 13[84] AGATTGTATAAGCAAGTGAATACGTCAAGGGAGGCCAGTAATAA
 13[126] TGTAAAATCGCGTCATCAAATGAAAATTACAAATCGCG
 13[168] TTAACCAATAGGAAACTGATAGTCTGCTCTAGAAAGGAATTG
 13[210] TTCCTGTAGCCAGCGAAAGCCGCTGCGCAGTATCGGCCTT
 15[14] GAAGCGCATTAGCGAATAACATAAAAA
 15[63] AGAACGAATTAAACCAAGTACCGAATGAAAATAGCAGCCTT
 15[105] CGCTGTAAACATAGCGATAGCTTCTTCCTTATCA
 15[147] TATCAATGCGGAATTATCATCATATTAAATTTC
 15[189] TAGTCGGACAGACAATATTTTGGCGGAACAAAGA
 15[217] CTTCTGAGAGTTGCCAATTCAAGGCTGCAATGCCGTAACCAACGGTA
 15[231] ATTTATTATCGAACCTAAAGGGACCTGAAGCG
 14[34] ACAGAGACAAACGATTTTGAGGAATCTCAATCATATGTAC
 14[83] TTCCAAGAACGGGTCTAGAAACCAATCAAATCATAAACAGGA
 14[125] TTAGAACCTTGAACCTGCTTCTGTAAACTGATTGAATATT
 14[167] AACACCAGAAGGAACAAGTTGAGTAAACATCGTATTT
 14[209] TAAGAATACGTGGCAAGGCCAACAGAGAGTGGCGATCTGCC
 14[258] CGAGGTGCCGTAAAGCACTAACAAACCATCACCCAAATCAAGT
 16[41] ATCCAATAAGAATTAGAAATGTGAGGTAAAGATTCAA
 16[76] CATGTACCTTCACTGAACAAGAAAAATAATATC
 16[118] AACCTTCTGAATTAAATGAAACAGTACATAATC
 16[160] TTTAACGAACGAGGACAACACTCGTATTAAATCCTT
 16[202] ATTCTGAAAGCGACGAGATTCAACAGTCACACGA
 16[251] CCCACTACGTGACCTGGAGGGAAACCAGGAAAGGCCATTGCCAT
 17[7] CCTAATTGCCAGTAAATCAGATATAGA
 17[35] CCATATTATTCACAACAATAGATAAGTCGAACCGCGCTCATCG
 17[84] CCATCTGAATTACCTTTTCATTAAATTAAAGA
 17[126] AATATCTTACAACAATTGATTAGATCCTGAT
 17[168] GCCCGTGGATTATTTACATTGGCTCAATTGGCTAT
 17[210] CCAGTCAGCGGTCCACGCTGCCTGAGAGCCCCG
 19[9] CAACGCAAGGATAATAAGGCG
 19[56] CAGCTAAATGCCGCTAAACAAAGAACGCGAG
 19[70] TCCGGCTCTGTCAGACGACAAATAACAAACATGCAATGC
 19[98] AAAATTATACATCGATGAATACGTAGATTTCAAGGTTATGC
 19[112] AAGGAATAAGAAGATGATGAAACAAACATCAAGAA
 19[140] TACATTTCTCAAATAATCTAACGCTGAGAGGCCAGCACGT
 19[154] CAGCAGACAACATAAGATTAGAGGCCGTCAATATC
 19[182] TACATTTAATACTTCATCACGAGGCCACCGAGTAAATATTA
 19[196] AGCGGGCTTGCAACAGGAAAAACGCTCATGGAATC

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18[41] CTGAGTACCCCTCATCATATGCGTTATGACCGGAATCATAAT
 18[90] AAGGTAAAGTAATTATATAAAGTACCGATCTAATTACGAG
 18[132] AATTACCTGAGCAATGGCGAATTATTCAAATGTGAGTGAAT
 18[174] TTTAGGTGCACTAAAGGGTTATCTAAAAAAAACGTTATTAAT
 18[216] ATTACCGCCAGCCAGCTAATATCCAGAAAGAATAAAAGGGAC
 18[258] CCGCTTCTGGTGCAGCGATCGGTGCGG
 20[83] GAGAAGGTTGGGTTATGTAATTAGGCAGAGGCAT
 20[125] CAGAGAACCAACAGTCGCCTGATTGCTTGAAATAC
 20[167] AGGAAATAAAACTTATCTGGTCAGTTGGCAAATCA
 20[209] GCTGGTAGGGCGCGTCACTGCCTGAGTAGAAGAACTCAACTACAGGGC
 20[258] TTTCTCGTTGGAATCAGAGCATGGTTGCTTGACGAGCACG
 21[17] TAAGAATAAACTGTGATAAAAAATTAGCAAGCTACAAATAAACAG
 21[42] TACTAGAAAAAGATTTAACAACGCCAACATTGAGTGTAAACC
 21[91] TTTCGAGAAACAATAACGGATTACCTTTATTATGG
 21[133] CAAGTCAAACCCCTCAATCAATGCTGAACGAACCAC
 21[175] ACAGTTGATTAGTAATAACATTGTAGCTGAAAGG
 21[231] GCGTACTCGCGCTTCAACTGTGCCTGGCGTTGCCCGAGCAGGCGAAAA
 23[7] ATTTAATGGTTGATTCATCTTCTGAC
 23[77] TAACTATATGTATATTCAAAATACTGGCTGTAGCAATTTCACAAAAC
 23[119] CAAAATTATTAGCATATAATCTCGCGTATTAATAGTATTATTGATAA
 23[161] TGAGGCAGTCAGGAGGCCAACATTATCATTAAACGTCTGATAATACC
 23[203] AAAGTGTAGAAGTGTGTTATAATCAGTGCAAATTAAGTTAA
 22[34] TATATTTAGTTAAACCGCGACGGGAGAATTAAGTAA
 22[48] AAAACTTCAGTATATCATGTTAACGTCAAACACCTGTTAAATGTT
 22[83] TGATGCAAATCCAATCGCAAGCAGTAGGGAAAGCA
 22[125] AAAACAGAAATAAGAAATTGTACAGTATAAGAAG
 22[167] ACACCGCCTGCAACAGTGCCAAGCATCAAAGATGA
 22[223] CGCCAGAATCTTGAGCGGTAGGCAGACTAGAACCC
 22[251] ATTTAAGGGATTTAGACAGGACCACACCCGAGCT

Complement to EcoRI site:

TCTAGAGGATCCCCGGGTACCGAGCTCGAATTGTAATCATGGT

Six-helix-bundle kite (Three 273-nt-long and one 2204-nt-long spring):

Left and right End staples (blue)

Start Sequence

0[41] AACAGGAGGCCGATTAAGGGATTTT
 0[393] GAAGATTGTATAAGCAAATTTAAATTGT
 1[16] AGACAGGAACGGTAGCACGTATAACG
 1[364] CGTTGATAATCAGAAAAGCCCCAAAAACAG

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2[41] TTGCTTGACGACGCCAGAATCCTGAGAAG
 2[389] GCATGTCAATCATATGTACCCGGCA
 3[12] TGTGTTATAATCACCGCCGCGCTTAATGC
 3[364] ATCGATGAACGGTAATCGTAAACTA
 4[41] CGCGTAACCACCAACCGTGAGGC
 4[396] TCAGGTCAATTGCGCTGAGAGTCTGGAGCAAACAA
 5[19] GAACCGGATATTCAATTACCCAAA
 5[364] CTCGTTACCAAGACGACGATAAAAACCAAAATA
 6[41] TGAGGACTAAAGACTTTTATGAGG
 6[393] ACAAGAATTGAGTTAACGCCAATAATAAGA
 7[16] AAGTTTCCATTAAAGAAAGACAGCAT
 7[364] GCTTGAGCGCTAATATCAGAGAGATAACCC
 8[41] ACCCTCAGCAGCCGGTAAATACGTAATG
 8[389] ACCCTGAACAAAGTCAGAGGGTAATA
 9[12] CCACTACGAAGGCAAGGCTTGCAGGGAGTT
 9[364] GCATTAGACGGGAGAATTAACGTGAAC
 10[41] ATATATTGGTCGCTGCCAACCT
 10[396] AGCCTTACAGAGAGATAACATAAAACAGGG
 11[19] ACCAGACCGGAAGCAAACCTCAA
 11[364] CAAGGCAAAGAATTAGCAAAATTAAGCAATAAA

Core Strut I and II (red)

Start	Sequence
0[55]	CAGAGCGAACAAAGTAGCGGTACGCTGGCCGCTACAGGGAG
0[97]	GAGCCCCAACACCTCAAAGGGCGAAAAACCATCACCCAAAC
0[139]	CAAAATCTTCAACGGCAACAGCTGATTGCAAGCGGTCCATG
0[181]	CCTGCGAACTGGCTTCCACACAACATATGCCTAATGAGTTG
0[223]	TGTTACCTACGTTAGCACGAATATAGGCATTCTCCGAAGC
0[265]	CCAAAATAGAAAGACCAAGCTTCTCAGTGTGAATTATGAC
0[307]	ATTACGCTAATGCAACTCCAGCCAGCTTAAAGGCCATTGA
0[349]	CGTAATGAAGAGCACGCCATCAAAAATAATCACATTAAATC
1[70]	GACCGTAAAGCACTGAGCTTGACGGGGAAATAAGGATCAGGG
1[112]	CCAATCCTGTTGAAATCAAAGAATAGATTGGCACCCCT
1[154]	TTGCGCTCACTGCCTGCATTAATGAATCATTACCTGAAGCAT
1[196]	TCGAGTAAACAGGGAGACGGAGGATCCCAGGACGTATCGGCT
1[238]	GACTGAATTGTCACCTCTAATCTATTCGGAACACAGGGTG
1[280]	ACGGAGGGCGATCCGAAAGGGGGATTTAGGACCGCTTC
1[322]	TGATTCTCCGTGGTCACGTTGGTAGAAAGGAATCTGGCC
2[83]	GGGGTCGAGGTGAGGGCCCACATACGTGAACCGTCTTGGCCC
2[125]	CCAGCAGCGAAAGCTGAGAGAGTTGCAGCCCTTGTGAGAT
2[167]	ATTAATTGCGTTGCTGAAAGCCTGGGCGAGCGTATGCGA
2[209]	GGTTGGTGAATATCATTACATAAAATGCCTGATGGGAAG

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2[251]	GTGTCCTTAGTGTATTCTTAAGTGGTGAGAACACATTAT
2[293]	GCGCAACTGTTGGCGCCGAAACCAGGCTCCGGCAATACAC
2[335]	ACAACCCGTGGCCTGTAGCCAGCTTCATTCGCGTTACGAG
3[56]	CGGGCGCTAGGGATGGAAGAACAGCAAAGACTGGCGAGAAAG
3[98]	TATTAAGAACGCCTTGGAAACAAGAGTAATTGAGTGTGTT
3[140]	GTTTTCTTTCAAGGTATTGGGCCAGTCGGAGAGGGCGGT
3[182]	TGTGAAATTGTTGGGTCAAGCTGTTGATCGAATTGTAA
3[224]	CATCTGTAAGCATGCCACAGTCGGCCTGGAGTGACTCTAT
3[266]	GACGTTGAAAAGTCAGGGTTTCCCAGCCTTAAGTGGTA
3[308]	CAGTATCGGCCTCCAGTTGAGGGGACGCGTAACCGTGCATC
3[350]	AGCTCATTGTTGATTAAATTGTTATGTTGTTAAAATT
4[69]	CGCGCTGGCAAGTGTGTCATTCACTGAAGCCGGCAACAT
4[111]	GGTGGACTCCAACGAGAACGAGTAGTAACCCGAGATAGGGG
4[153]	AAACCAGTGAGACGTTAACATTGTGAGGCCAACGCGCGGG
4[195]	GAATCCGCTCACAACTATTACCGACTCCGGTACCGAGCAA
4[237]	GAACTCGTCGGTGGATAAAACGAACTAACGCTGCCCTGCT
4[279]	TGCGACGCCAGTGTTCATCAAGTGAGAGCTGCAAGGCAGC
4[321]	TTCAGGAAGATCGCGATAACATAACGCCATGGCGCATCGCT
4[363]	GAAACCAATAGGAAACACTATCATAACCAAACGTTAATATAC
5[42]	TCAACGTGGAGCTATGCTTCTCGTTAGGCCGCTACTATGG
5[84]	TGACGAGCGATTAAAATCGAACCCCTACCATCAAGTTTTT
5[126]	GGTTAACCTTATATGGGGTCCGAAAGGCCTGGTTGCC
5[168]	TTTAAGTGCCAGCCGCTTCCAGTCGGCCGAGCTAACTCAC
5[210]	AAAAATCTCGATAACTTAAGCTACGTGGCTCTGACCTCCT
5[252]	TACAGGTAAACCCGCCATTGACAATGTTCCGACGACTTAA
5[294]	ATTCAACCAGCTGGGTGCGGCCCTTACGCCATTCAAGGCT
5[336]	GCATAGTGGATAGGAACAAACGGCGATAATGTGAGCGAGTA
6[55]	GGCTACAGGATTAGCCACGCATAACCGAAAGGCCGTTTG
6[97]	GGAGCCTATTTGTGCTAACAACTTACAACAAAGGAGT
6[139]	CCTGTAGTGTAGCTACCCCTAGAACCGCATAGCAAGCCATT
6[181]	GGCGGATCTGGAAGAGTTAACGCCCCCTAAAGTATTAAGACC
6[223]	TTCCAGTGAACGAGGCCAGCATTGATGATATTACAACC
6[265]	CCACCACTGGTCAAATCAAGTTGCCCTTTTGGTCATAGC
6[307]	GAGCCAGGCTAAAAAGACAAAAGGGCTATTGACGGAAAGA
6[349]	TACATAAACATCCAACAAAGTTACAGAACCCAAAAGAACTT
7[70]	AATTGAAAATCTCCTATCGGTTATCAGTGTCTTTAGCG
7[112]	TGTGAGTTCGTCACAGACAGCCCTCATCTTAATTAGAGCCA
7[154]	TATTAAGGATTAGCGGTGAGAGGGTTGATATGCAATCGGAAC
7[196]	AAGAATGGAAAGCGATACATGGCTTGTACAGTTGAGGC
7[238]	CATTTCTATACTAGCCTCCCTCAGAGCCCATTAGAGACTGT
7[280]	CACCGTCACCGACTACCACTAGCACCATAATTAAACCGAT
7[322]	TTCGCACTATGTTAACATATAAAAGAACTACTAACGAGGAA

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8[83]	AATTTTTCACGCAGAGAATAGAAAGGACAACAGTTTGATA
8[125]	GTACCGTAACACTCCCTATTTCAGGGCACCTCGCTGAAT
8[167]	TCAAGAGAAGGATCTATTCTGAAACATGGCCTATTCTAAAGT
8[209]	TCATTAAGCCAGTCAGACGATTGCCCTCAGGAGGATCCC
8[251]	GCGTTGCCATCGACGTTCATCGGCATAGCGTCATACATT
8[293]	GGTGAATTATCACCGGAGGGAAAGTAAAGACATTCCATTGG
8[335]	GACTCCTTATTATAATAAACGGAATAGGAAACTAGTAGT
9[56]	CGCCGACAATGAGTGCTTGATACCGATACAGTGAATTCTTA
9[98]	AAATGAATTTCACGTCTTCCAGACGTAAGATCTAAAGTT
9[140]	AGTACCGCCACCATAACCGTACTCAGGAGAACCGGAATAGGTG
9[182]	TTGAGTAACAGTGTAAACGGGGTCAGACTGTACTGGTAAT
9[224]	GCCACCAAGACCCGGCCACCACCCCTCAGACAACCGCCACCC
9[266]	AGCACCGTAATCAGAATGAAACCATCGAAGGGCCGGAACGT
9[308]	AAATTCATATGGGCTTGTACAATCAAATCACGGAATAAGT
9[350]	TAAGAAAAGTAAGCTTACCGAAGCCCTAGAAATAGCAATA
10[69]	GACAACAACCATCGAGAGTACCTTAATCTTGCTTGCAGAC
10[111]	CCTGTATGGGATTCGGATGGCTTAGAGAGTTAGCGTAACAA
10[153]	CTCTCAGAACCGCCAACATGTTAAATATAAGTATAGCCG
10[195]	AGGCCCGTATAAAACTTCATTCCATATAATGATAACAGGAGCA
10[237]	AGACCACCAGAGCCTAGATTTAGTTGACGCCACCCCTAGCG
10[279]	TGAGTAGCGACAGATAACCTGTTAGCTTACCATAGCAAAG
10[321]	ACTTTACCAGCGCCAGGTGGCATCAATTACGCAAAGACACTA
10[363]	AAGCAGATAGCGAATAATCATACAGGGCAAGAAACAATCA
11[42]	CAGGTAGAGGCTTCGGAACGAGGGTAGGTTGGGATCGTC
11[84]	AGAGGTCTTAATTGAAAAAAAAGGCTCTAATTGCGAATAAT
11[126]	ATAATGCCATTCCACCAGTACAAACTACGTATAGGAACCCAT
11[168]	ACGGTGTAACTGCCGGTTTGCTCAGTTGGCTGAGACTCC
11[210]	ATTCTGCAAGCGTCCAGTCTCTGAATTAGACAAATAATCC
11[252]	TCGCAAACGGAACCAAATCACCGAACCTAGCCCCCTTATTA
11[294]	GGCGCGACAAAATCTGAGCCATTGGGATATTATTCAAAA
11[336]	AGCATTAAGGTGGCGAAACGTAGAAAATTGGCATGATTAA

Six-helix-bundle kite with four clamps (p7560):

Left and right End staples (blue)

Start Sequence

0[41]	AACAGGAGGCCGATTAAAGGGATTT
0[393]	GAAGATTGTATAAGCAAATATTTAAATTGT
1[16]	AGACAGGAACGGTAGCACGTATAACG
1[364]	CGTTGATAATCAGAAAAGCCCCAAAAACAG
2[41]	TTGCTTGACGCCAGAACCTGAGAAG

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2[389]	GCATGTCAATCATATGTACCCCGGCA
3[12]	TGTTTTATAATCACGCCGCGCTTAATGC
3[364]	ATCGATGAACGGTAATCGTAAACTA
4[41]	CGCGTAACCACCAACACGTGAGGC
4[396]	TCAGGT CATTGCCTGAGAGTCTGGAGCAAACAA
5[19]	TTGATATAAGTATAGCCCGAAT
5[364]	GCGAATAATAATTTTACGTTGAAAATCTCC
6[41]	CGAAAGACACCACGGAATAAGTTA
6[393]	ACCTACCATATCAAATTATTGCACGTAA
7[16]	TTTGTCACAATCAAACGTAGAAAAT
7[364]	ATTATACTTCTGAATAATGGAAGGGTTAGA
8[41]	AGTATGTTAGCAATAGAAAATTATGTT
8[389]	CAATATAATCCTGATTGTTGGATT
9[12]	TTACCAGGCCAAATACCCAAAAGAACTGG
9[364]	CTGATTATCAGATGATGGCAATTAT
10[41]	CGCAATAATAACGGAAGACAAAAA
10[396]	AGAAACCACCAAGAGGAGCGGAATTATCATCAT
11[19]	CATTATAACCAGTCAGGACGTTGG
11[364]	AAAACGAGAATGACCATAAAATCAAAAATCAGGT

Core Strut I and II (red)

Start	Sequence
0[55]	CAGAGCGTCACCGTTAGCGGTACGCTGGCCGCTACAGGGAG
0[97]	GAGCCCCCCCACCCCTCAAAGGGCGAAAAACCATCACCCAAAC
0[139]	CAAAATCTCAGGGAGGCAACAGCTGATTGCAAGCGGTCCATG
0[181]	CCTGCGTGAGTTTCCACACAACATATGCTTAATGAGTTG
0[223]	TGTTACCCACAGACGCACGAATATAGGGCATTCTCCGAAGC
0[265]	CCAAAATTCTGCTTCCAAGCTTCTCAGTGTGAATTATGAC
0[307]	ATTACGCTTGCTAACTCCAGCCAGCTTAAAGCGCCATTGA
0[349]	CGTAATGAAAGGAACGCCATAAAAATAATCAACATTAAATC
1[70]	GACCGTAAAGCACTGAGCTTGACGGGGAGTACCGCATCAGGG
1[112]	CCAATCCTGTTGAAATAAAAGAATAGTCAGAGCACCGCCT
1[154]	TTGCGCTACTGCCTGCATTAATGAATCGAACCGAAGCAT
1[196]	TCGAGTAAACAGGGAGACGGAGGATCCCACTACAAATCGGCT
1[238]	GACTGAATTGTCACCTCTAATCTATTGCGTAACCAGGGTG
1[280]	ACGGAAGGGCGATCCGAAAGGGGGATGTAATGAATCCGCTTC
1[322]	TGATTCTCCGTGGGTACGTTGGTAGGTTCACTACGCTGGCC
2[83]	GGGGTCGAGGTGAGGGCCCACTAGTGAACCGTCTCACCTC
2[125]	CCAGCAGGCAGGAGCTGAGAGAGTTGCAGCCCTCCACCAAC
2[167]	ATTAATTGCGTTGCTGTAAGCCTGGGCGAGCCGATGTACC
2[209]	GGTTGGTGTAAATCATTCACATAAAATGCCTTGACGCCGT
2[251]	GTGTCCTTAGTGTATTCTTAAGTGGTGAGAAGCGATCTAA

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2[293]	GCGCAACTGTTGGGCCGGAAACCAGGCTCCGGCATTCTGT
2[335]	ACAACCCGTGGCCTGTAGCCAGCTTCATTGCAGGGAGTG
3[56]	CGGGCGCTAGGGATGGAAGAAAGCGAAAGAGTGGCGAGAAAG
3[98]	TATTAAGAACGCCCTTGGAACAGAGTAATTGAGTGTGTT
3[140]	GTTCAGGTATTGGGCCAGTCGGGAGAGGGCGT
3[182]	TGTGAAATTGTTGGGTCTAGCTGTTGATGAATTGTAA
3[224]	CATCTGTAAGCATGCCGACAGTCGGGCTGGAGTGA
3[266]	GACGTTGAAAAGTCAGGGTTCCCAGCCTTAAGTTGGTA
3[308]	CAGTATCGGCCCTCAGTTGAGGGGACGCGTAACCGTGCATC
3[350]	AGCTCATTGTTGATTAATTGTTATGTTGTTAAAATT
4[69]	CGCGCTGGCAAGTGA
4[111]	CTCAGGAGGTTAAAGCCGACAGGCGCACCCCCGAGATAGGGG
4[153]	AAACCAAGTGA
4[195]	GAATCCGTCACAACGTACCAAGTACAACGGGTACCGAGCAA
4[237]	GAACTCGTCGGTGGAGCCCTCATAGTTAACGCTGCCCTGCT
4[279]	TGCGACGGCCAGTGTCCAGACGTTAGTAGCTGCAAGGCAG
4[321]	TTCAGGAAGATCGCAACAACTTCAACAATGGCGCATCGCT
4[363]	GAAACCAATAGGAACA
5[42]	AAAGGTTAGGAGCTATGCTTCTCGTTAGGCGTACTATGG
5[84]	AGAACCGCGATTAAAATCGGAACCTACCATCAAGTTTTT
5[126]	CTCATTCTTATATGGGGTCCGAAAGGCCTGGTTGCC
5[168]	GTAACACTGCCAGCCGCTTCCAGTCGGCGAGCTAACTCAC
5[210]	AGCATTCTCGATAACTTAAGCTACGTGGCTCTGACCTCCT
5[252]	AGTTTGAAACCCGCTTATGACAATGTTCCGACGACTAA
5[294]	ATGGGATCAGCTGGGTGCGGGCCTTACGCCATTAGGCT
5[336]	AGAATAGGGATAGGAACAAACGGCGATAATGTGAGCGAGTA
6[55]	ACATATAATCTACGAAACCGGAGAACATGATTAAGACCA
6[97]	CCCAATAAGGTAGACATAAAACAGGGACTGAACAAAGTC
6[139]	ACAAAATCAACTAAGAGGTTTGAAGCCGCTACAATTAGT
6[181]	GAATCATTAGTAAGATGTAGAAACCAATGAACGGGTATTAAT
6[223]	CAATAAGATAAAATGCCATTAAATTGAGCCAGTACG
6[265]	GAATCATTGCCAGAGCGAGAAA
6[307]	TCATAGGCCAATACACCTTGCTTGTATCCTGAAACACA
6[349]	CAAACATCAAATGCACATCGGGAGAAACAAGTTACAAATAT
7[70]	CCAGAGAGATAACCCAAGAAACAATGAACGTTAGACGG
7[112]	TGAGCGTCTTCCACATATTATTCGAGATTAAGATTA
7[154]	GTACAAGCAAGCCGCCAATAGCAAGCAGCAGCCAAACGGCTGT
7[196]	ATAAAGGTAAAGTATTCTAGCTAATGCAGAACCTCAACATGT
7[238]	TCAAATAAGCGTTAGAAAAAGCCTGTTAGGCTTTATTTA
7[280]	AATGAGAAGAGTCAGACTACCTTTAAATGTTGCTATTA
7[322]	CTCAATTACCTGAGACAAATTAAATTACAAATATTGATTCG
8[83]	AGCGCTAATATCCTATTAACTGAACACCAGCGCATAACACA

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8[125] CCAACGCTAACGTTCTATTTGCACCCATTAAATCAGGAATA
 8[167] CACTCATCGAGAATCCTTATCATTCCAACAATAATGGAATTA
 8[209] AAAGTACCGACAAATAGGCAGAGGCATTCAACGCCGTTACC
 8[251] CGACCGTGTGATTTATTCATCTTGATCAAATATGCAAAA
 8[293] AGATTAAGACGCCTATTTCCCTTAGAAAATCGTCAGACTGG
 8[335] AATTATTCACTTTTGCTTGAATACCAATAACGCATTGAA
 9[56] GATAGCCGAACAGATTTAAGAAAAGTAGGATCTTACCGAAG
 9[98] TAGCAGCCTTATGTAACGTAAAAATGTAGAAAACGATTTT
 9[140] TTTAGCGAACCTTTCTAAGAACCGAGAGAAGGCTTATCCG
 9[182] AATATCCCACCTTGCCTGAACAAGAAGTTATCAACAATAG
 9[224] CTCAACAGTAGGTAACCAGTATAAAGCCACCGTTACAAAT
 9[266] AAATCCAATCGCTAATATGTAATGCTGACGTTGGTTATAT
 9[308] TAAATCAATATAGATTTAATGGAAACAGAACATTGAAATTAC
 9[350] GAATATACAGTATCTCAGGTTAACGTCGAGAAATTGCGTAG
 10[69] GAAAGTTACCAAGAAGTTATAAAACGAAATAGCAATAGCTCA
 10[111] GTCAGAGAGATAAAAGATTCATCAGTTCAATCCAATAAAG
 10[153] CTCCCGACTTGCCTGCAGATAACATAACATCAGATATAGTT
 10[195] AATAATTACGAGCAGAACACTATCATAACGCCCTGTTAG
 10[237] GTGCTTAATTGAGAACAAAATAGCGAGTAGTATCATATGGA
 10[279] ATAAGACAAAGAACGGGGTAATAGTAACCTCCGGCTAGCG
 10[321] CTTGTGAGTGAATATGCGGAATCGTCATATTAAACAATTAA
 10[363] ATACAGTACCTTTTAAACAGTTAGAACAGAAATAAAA
 11[42] GAAGAAAAAGAAAACATACATAAAGGTAGTCCTTATTACGC
 11[84] TTATTACATAAGAGCACAAGAATTGAGTAAAGAGGGTAATTG
 11[126] CCACATTAAACAGCGAGCCTAATTGCCGCTCCTGAATCTTA
 11[168] CGAGGCATACCGCGTTTTATTTCTACAAACCAAGTACCG
 11[210] AGACGACCAACATGATTCTGTCAGACGAAATAAGAGAAATAT
 11[252] GAAGTTAATTACTAAATAAGATAAACATGGTTGAATAAC
 11[294] ATAGCGTTCTGAGAATAGTGAATTATCTATAGCGATAGCTT
 11[336] TCCCCCTCAAGAAACAAAAGAAGATGATAGCGCCAGAGGCG

Clamps 1-4 (dark orange, orange, light green, green)

Start Sequence

18[57] GAGAAAGGCACATTATCTGTAATACTTTGAAATTTTAGAA
 19[28] CTTAATGTGTAGGTAGTCAAATCACCAGCTAAATAGCCTT
 20[41] GCAATGCCTGAGGACAACGCAAGGATAACGGGAGACGGTTGT
 21[12] AGGGTAGCTATTTTTAAATTAAATGCCGGTTCAACCATT
 22[27] ATTGAGAGATCTACCCCTCAGAGCATAAACATATGGTTCTAG
 23[42] ACCAAAACGGAGACAAAGATTCAAAAGGCATATATTTAAAT
 24[57] CTTTGCCTGCAGCTGCGAGGTGAATTCTATGACAACACC
 25[28] CAGCTGAGGCTTGCACCCCTCAGCAGCGACCTTAACCTGATA
 26[41] ATATATCGGTCACTAGTTGCCTGACATAAACAGTTGTATC

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27[12] AGGACTAAAGACTT GAGGCTACAGAGGCTTTGAACGCATCG
28[27] CCTTCATGAGGAAGGCTCCAAAAGGAGAAGACAGAGGGTAG
29[42] GGTTTATGATCGTCAGGGAGTTAAGGCCACGCATAACCG
30[57] CTATTATTGTTCCAGCGTCATACATGGCTTTAACGGGTC
31[28] TTAGTTAATGCCCTGAAAGTATTAAGAAGCGCAGATACAGG
32[41] GCCCGTATAAACAGTACTGGTAATAAGTTGATGTCTCTGA
33[12] CTCAGTACCAGGCGTGGATTAGCGGGTTTTCAAGACTCC
34[27] AGGATAAGTGCCGTAAAGCCAGAATGGAAGGCTGAGAGAAGGA
35[42] ATTTACCTGAAACACTGCCTATTCGGACCTTGAGTAACAGT
36[57] ATTTAGAAGCCCTCAATATCTGGTCAGTTGTTATCTAAAATA
37[28] CCGAGCCGTCAATACTTACAAACAATTGCTGAAAACAGTT
38[41] ACTAATAGATTACGGAATTGAGGAAGGGCAAATCCCTCAA
39[12] AAAGTTGAGTAACAAAACGTTATTAATTTTAAATCGTA
40[27] GAATTATCATTTGCTAAAGCATCACCTGACAACCTCTTG
41[42] TATCAAATATTAGAGATAATACATTGATAGGAGCACTAACAA