

Figure S1. Representative images of agarose gels after RE digestion for GTMs-RDL (A) and confirmation of each GTMs-RDL iteration in pBluescript II SK(+) for the final synthesis of the ELP-L4Y4 gene (B). These are the same images as Figure 2 in the main text but without overlaid annotations.

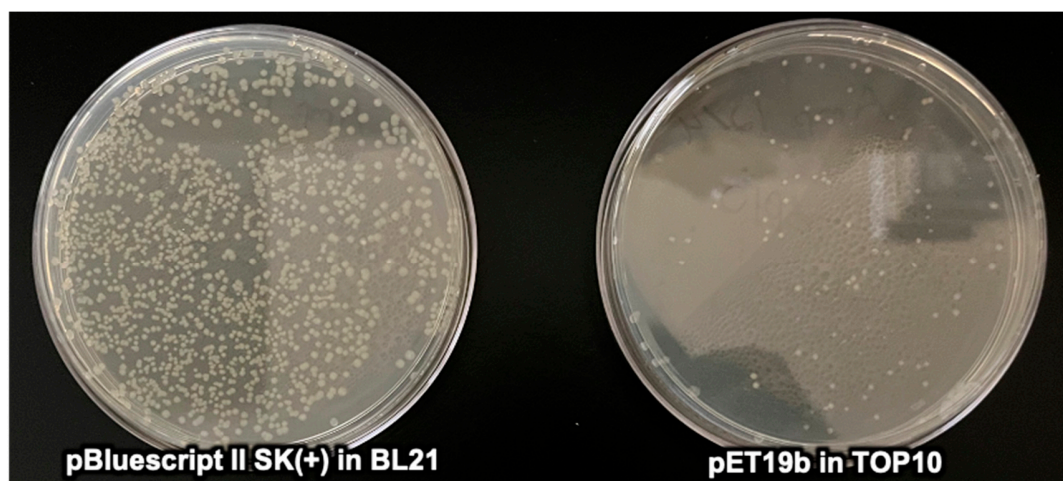


Figure S2. Representative image of the number of colonies on ampicillin-resistant plates after transforming plasmids containing the ELP-L4Y4 gene. Sequencing and confirmation digests (n=4) in both examples showed 75-100% transformation efficiency.

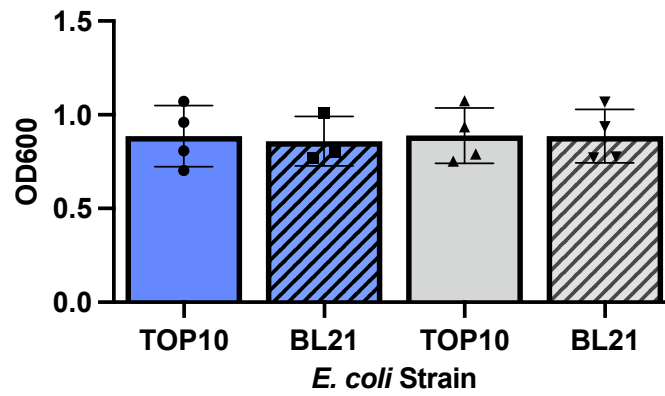
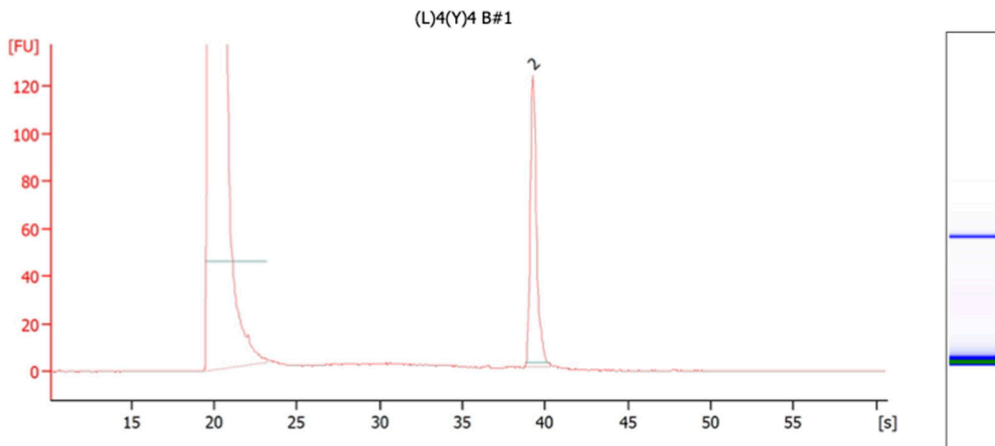


Figure S3. Bacterial growth did not vary based on plasmid or strain selection. The octamer pET19b plasmids (gray) resulted in similar optical density compared to octamer pBluescript II SK(+) plasmids (blue), and BL21 *E. coli* also did not improve optical density compared to TOP10 *E. coli* strains.

Assay Class: High Sensitivity Protein 250
Data Path: C:\... Sensitivity Protein 250_DE54107270_2023-10-10_10-23-30.xad

Created: 10/10/2023 10:23:29 AM
Modified: 10/10/2023 10:54:58 AM

Electropherogram Summary Continued ...



Overall Results for sample 9 : (L)4(Y)4 B#1

Number of peaks found: 1 Total Area: 139.7
Total Rel Conc: 67.4 pg/μl Noise: 0.1

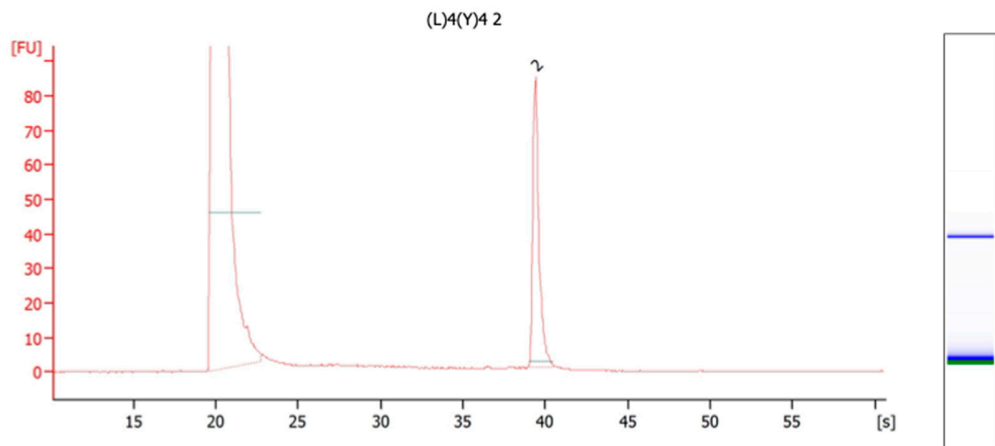
Peak table for sample 9 : (L)4(Y)4 B#1

Peak	Size [kDa]	Rel. Conc. [pg/μl]	Calib. Conc. [pg/μl]	Time corrected area	% of Total	Observations
1	5.0	0.0	0.0	9,181.3	0.00	Lower Marker
2	137.8	67.4	0.0	139.7	100.00	

Assay Class: High Sensitivity Protein 250
Data Path: C:\... Sensitivity Protein 250_DE54107270_2023-10-10_10-23-30.xad

Created: 10/10/2023 10:23:29 AM
Modified: 10/10/2023 10:54:58 AM

Electropherogram Summary Continued ...



Overall Results for sample 10 : (L)4(Y)4 2

Number of peaks found: 1 Total Area: 91.8
Total Rel Conc: 44.3 pg/μl Noise: 0.1

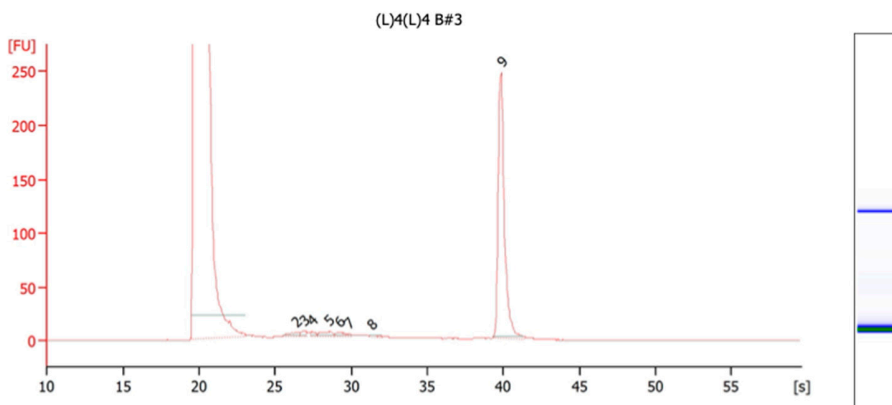
Peak table for sample 10 : (L)4(Y)4 2

Peak	Size [kDa]	Rel. Conc. [pg/μl]	Calib. Conc. [pg/μl]	Time corrected area	% of Total	Observations
1	5.0	0.0	0.0	7,130.4	0.00	Lower Marker
2	139.2	44.3	0.0	91.8	100.00	

Figure S4 continued...

Assay Class: High Sensitivity Protein 250
Data Path: C:\... Sensitivity Protein 250_DE54107270_2023-11-05_15-57-02.xad
Created: 11/5/2023 3:57:01 PM
Modified: 11/5/2023 4:28:30 PM

Electropherogram Summary Continued ...



Overall Results for sample 9 : (L)4(L)4 B#3

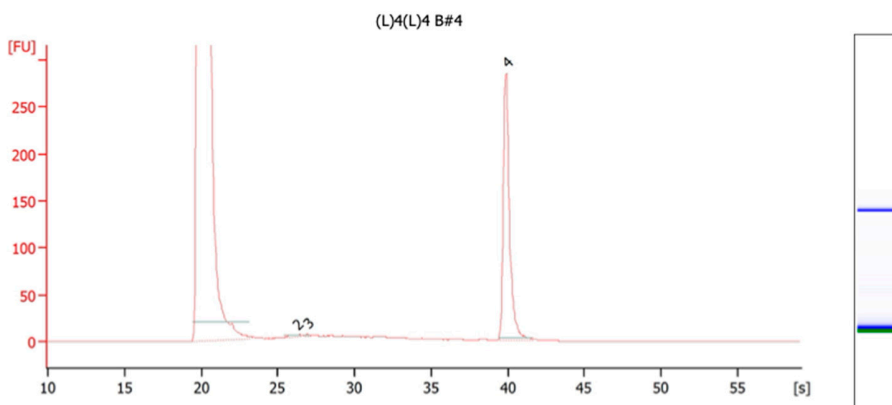
Number of peaks found: 8
Total Area: 354.3
Total Rel Conc: 134.7 pg/μl
Noise: 0.2

Peak table for sample 9 : (L)4(L)4 B#3

Peak	Size [kDa]	Rel. Conc. [pg/μl]	Calib. Conc. [pg/μl]	Time corrected area	% of Total	Observations
1	5.0	0.0	0.0	9,599.9	0.00	Lower Marker
2	26.8	5.3	0.0	14.0	3.95	
3	29.8	2.7	0.0	7.1	2.01	
4	33.4	2.4	0.0	6.3	1.78	
5	40.5	5.9	0.0	15.5	4.38	
6	45.4	3.5	0.0	9.3	2.62	
7	49.0	0.9	0.0	2.4	0.68	
8	58.9	1.5	0.0	4.0	1.13	
9	138.9	112.4	0.0	295.7	83.45	

Assay Class: High Sensitivity Protein 250
Data Path: C:\... Sensitivity Protein 250_DE54107270_2023-11-05_15-57-02.xad
Created: 11/5/2023 3:57:01 PM
Modified: 11/5/2023 4:28:30 PM

Electropherogram Summary Continued ...



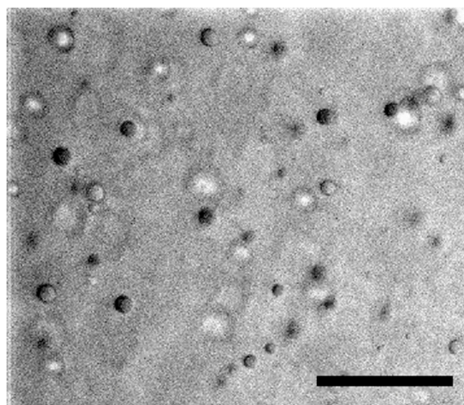
Overall Results for sample 10 : (L)4(L)4 B#4

Number of peaks found: 3
Total Area: 348.8
Total Rel Conc: 132.6 pg/μl
Noise: 0.1

Peak table for sample 10 : (L)4(L)4 B#4

Peak	Size [kDa]	Rel. Conc. [pg/μl]	Calib. Conc. [pg/μl]	Time corrected area	% of Total	Observations
1	5.0	0.0	0.0	10,418.3	0.00	Lower Marker
2	26.0	3.9	0.0	10.2	2.93	
3	30.1	1.2	0.0	3.1	0.90	
4	139.4	127.5	0.0	335.4	96.17	

Figure S4. Auto-generated reports on ELP purity and size from the 2100 Agilent Bioanalyzer. Each electropherogram numbers detected protein peaks and shows its percentage of the total area under the curve in the tables below. The mass of each detected protein is determined through a comparison of the integration time on the x-axis with a supplied protein ladder (not shown).



Video S1. Original video of images used for Figure 4 in the main text.