Tuning of Collagen Triple-Helix Stability in Recombinant Telechelic Polymers

Catarina I. F. Silva*[,†,‡], Paulina J. Skrzeszewska[‖,†], Monika D. Golinska[†,‡], Marc W. T. Werten[†], Gerrit Eggink[†,‡] and Frits A. de Wolf*[,†]

[†]Wageningen UR Food & Biobased Research, Bornse Weilanden 9, NL-6708 WG Wageningen, The Netherlands

[‡]Bioprocess Engineering, Wageningen University, Bomenweg 2, NL-6703 HD Wageningen, The Netherlands

[‖]Laboratory of Physical Chemistry and Colloid Science, Wageningen University, Dreijenplein 6, NL-6703 HB Wageningen, The Netherlands

SUPPORTING INFORMATION

Corresponding Authors

*F. A. de Wolf: tel. +31-(0)317481290; email frits.dewolf@wur.nl

*C.I. Silva: tel. +31-(0)317480216; email catarinaifsilva@gmail.com

Table S1 DNA sequences of the trimerizing end blocks.

Gene	Sequence
T_6[a]	CACCCGGTGCTCCCGGTCCGCCTGGTCCACCTGGTCCACCTGGTCCACCGGGTCCTCCCG GACCAGCCGGTGG
T_{12}	CACCCGGTGCTCCCGGTCCGCCTGGTCCACCTGGTCCACCTGGTCCACCAGGACCACCAG GTCCACCTGGACCACCGGGTCCGCCTGGTCCACCTGGTCCACCGGGTCCTCCCGGACCAG CCGGTGG
T_6[b]	CTCGAGAAAAGAGAGGCTGAAGCTGGGTCTCCTGGTCCACCTGGTCCACCTGGTCCACCA GGACCACCAGGTCCACCTGGACCACCTGGTTGAGACGGAATTC

[a] end block used together with $\mathbf{R_4}$ middle block
[b] end block used together with $\mathbf{E_{20}}$ middle block

Table S2 Thermodynamical parameters of individual samples

n	mid block	T_m (°C)	$\Delta H°$ (kJ.mol^{-1})	$\Delta S°$ (J.K^{-1}.mol^{-1})	[triblock] (mM)	[(PGP)$_n$] (mM)	T_m at 1 mM triblock or 2 mM (PGP)$_n$	Average-based[a] T_m at 1 mM triblock or 2 mM (PGP)$_n$
Triblock copolymers:								
6	E20	20	-81	-218	16.57	33.15	-23	4.9
6	R4	8	-17	30	2.44	4.87	-47	4.9
9	R4	41	-175	-465	2.19	4.38	34	40.2
9	R4	42	-192	-505	1.10	2.21	41	40.2
9	R4	41	-319	-896	0.43	0.86	45	40.2
9	R4	41	-192	-511	1.40	2.80	38	40.2
9	R4	47	-192	-509	2.40	4.80	39	40.2
9	R8	42	-209	-573	2.40	4.80	35	40.2
9	P4	42	-204	-557	2.25	4.49	35	40.2
9	P4	42	-224	-608	1.12	2.25	41	40.2
9	P4	42	-204	-526	0.45	0.90	49	40.2
9	P8	42	-234	-651	2.40	4.80	36	40.2
12	R4	58	-263	-682	0.68	1.36	61	60.2
12	R4	59	-365	-988	0.68	1.36	61	60.2
16	R4	73	-418	-1107	1.29	2.58	72	76.4
16	R4	73	-441	-1173	1.29	2.58	72	76.4
16	P4	75	-522	-1399	1.29	2.58	74	76.4
16	P4[b]	74	-334	-830	0.20	0.40	84	76.4
Free (Pro-Gly-Pro)$_n$ peptides:								
5[c]	-	n.p.[d]	-282	n.p.[d]	-	n.p.[d]	-	-23.8
9[e]	-	17	n.p.[d]	n.p.[d]	-	n.p.[d]	-	31.3
10[f]	-	28	-156	-386	-	0.40	45	39.3
10[f]	-	32	-179	-453	-	0.40	47	39.3
10[g]	-	27	n.p.[d]	n.p.[d]	-	1.19	-	39.3
10[c]	-	n.p.[d]	-238	-648	-	n.p.[d]	44	39.3
10[c]	-	25	-215	-630	-	1.00	20	39.3
10[c]	-	37	-215	-583	-	1.40	40	39.3
10[c]	-	37	-199	-528	-	1.30	41	39.3
12[g]	-	38	n.p.[d]	n.p.[d]	-	0.99	-	51.9
14[g]	-	50	n.p.[d]	n.p.[d]	-	0.85	-	61.3
15[g]	-	52	n.p.[d]	n.p.[d]	-	0.79	-	65.2
15[c]	-	65	-314	-810	-	0.92	70	65.2

[a] Calculated form the average $\Delta h°$ and $\Delta s°$ values in Table 1 of the main paper.
[b] From protease knockout.
[c] from literature reference 12.
[d] n.p., value not provided by the literature source.
[e] from literature reference 16.
[f] from literature reference 31.
[g] from literature reference 17.