

Supporting information for 'An improved synthesis of poly(amidoamine)s for complexation with self-amplifying RNA and effective transfection'

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Table S1. Original, unoptimised conditions used to prepare pABOL.

Reagent	Mass (mg)	Volume (μL)	Moles	Equivalents
4-Amino-1-butanol (ABOL)	-	78	0.840	1
<i>N,N'</i> -cystaminebisacrylamide (CBA)	221	-	0.840	1
Triethylamine (TEA)	-	12	0.084	0.1
Methanol/Water mixture (4/1, v/v)	-	176	-	-

Table S2. Evolution of pABOL M_n , M_w and \bar{D} over 336 h under [ABOL] = 0.60, [CBA] = 0.60, T = 45°C and an argon atmosphere.
^aMeasured with DMF-SEC.

Time (h)	$M_{n,SEC}$ (g mol^{-1}) ^a	$M_{w,SEC}$ (g mol^{-1}) ^a	\bar{D} ^a
24	2600	3600	1.38
48	4000	6200	1.56
72	5600	8800	1.58
96	7200	12700	1.75
168	14000	25700	1.84
240	17900	47400	2.64
336	20200	90700	4.49

Table S3. Evolution of pABOL M_n , M_w and \bar{D} over 336 h under [ABOL] = 0.60, [CBA] = 0.60, T = 45°C and an air atmosphere.
^aMeasured with DMF-SEC.

Time (h)	$M_{n,SEC}$ (g mol^{-1}) ^a	$M_{w,SEC}$ (g mol^{-1}) ^a	\bar{D} ^a
24	2800	3700	1.31
48	3900	6100	1.57
72	5000	8000	1.59
96	5700	9700	1.69
168	9100	13200	1.45
240	10300	15700	1.52
336	10200	15600	1.52

Table S4. Evolution of pABOL M_n , M_w and \bar{D} over 96 h under [ABOL] = 0.60, [CBA] = 0.60 and an air atmosphere under four different heating regimes, conventional heating at 25°C, 45°C and 60°C and microwave heating at 100°C. ^aMeasured with DMF-SEC.

	Time (h)	$M_{n,SEC}$ (g mol ⁻¹) ^a	$M_{w,SEC}$ (g mol ⁻¹) ^a	\bar{D} ^a
25°C Conventional Heating	24	1700	1900	1.07
	48	2300	2800	1.22
	72	2700	3500	1.32
	96	3100	4300	1.41
45°C Conventional Heating	24	2800	3700	1.31
	48	3900	6100	1.57
	72	5000	8000	1.59
	96	5700	9700	1.69
60°C Conventional Heating	24	4500	6900	1.53
	48	8000	10800	1.35
	72	8600	12200	1.41
	96	9100	12900	1.41
100°C Microwave Heating	0.5	2300	2700	1.13
	2	4000	5500	1.38
	4	5300	7800	1.48
	7	6400	10200	1.59
	24	10700	22600	2.12

Table S5. Evolution of pABOL M_n , M_w and \bar{D} over 72 h under an air atmosphere, T = 60°C and four different monomer concentrations where [ABOL] and [CBA] = 3.2 M, 0.8 M, 0.45 M and 0.24 M. ^aMeasured with DMF-SEC.

[M]	Time (h)	$M_{n,SEC}$ (g mol ⁻¹) ^a	$M_{w,SEC}$ (g mol ⁻¹) ^a	\bar{D} ^a
3.2	24	7800	15100	1.93
	48	9600	21500	2.24
	72	15100	34100	2.26
0.8	24	5400	8100	1.49
	48	8800	12000	1.35
	72	9400	13200	1.4
0.45	24	3800	5000	1.31
	48	4900	7000	1.42
	72	5000	7800	1.57
0.24	24	3100	3900	1.24
	48	3800	5100	1.34
	72	4500	6000	1.34

Table S6. Effect of ABOL:CBA ratio on pABOL molar masses. Molar masses recorded after 48 h polymerisation performed at 60°C at [CBA] = 0.60 M under an air atmosphere. ^aMeasured with DMF-SEC.

[ABOL]/[CBA]	$M_{n,SEC}$ (g mol⁻¹)^a	$M_{w,SEC}$ (g mol⁻¹)^a	\bar{D}^a
1	5500	8200	1.49
1.01	5500	8400	1.52
1.025	4800	6900	1.43
1.05	4700	6700	1.43
1.10	4100	5500	1.34
1.20	No polymer detected		

Table S7. Repeatability of 'old' and 'new' conditions. 'Old' conditions are [M] = 3.2 M, 45°C and an inert atmosphere whilst 'new' conditions refer to [M] = 0.6, 60°C and an air atmosphere. ^aMeasured with DMF-SEC.

Polymerisation conditions	Replicate	$M_{n,SEC}$ (g mol⁻¹)^a	$M_{w,SEC}$ (g mol⁻¹)^a	\bar{D}^a
Old	1	6400	8500	1.32
	2	6900	9000	1.31
	3	7400	9700	1.32
New	1	5600	14200	2.54
	2	3800	12800	3.35
	3	4900	23100	4.66

Table S8. Molecular weight details and chromatogram features of polymers utilised in transfection studies. ^aMeasured with DMF-SEC.

Polymer	$M_{n,SEC}$ (g mol⁻¹)^a	$M_{w,SEC}$ (g mol⁻¹)^a	\bar{D}^a	Chromatogram features
P1	14500	36400	2.51	Unimodal
P2	5500	32800	5.97	Bimodal
P3	4900	40500	8.27	Bimodal
P4	7300	25600	3.51	Unimodal
P5	5000	13500	2.70	Unimodal
P6	9100	46000	5.06	Bimodal