

Variant	SE-UPLC	
	RT (min)	% Purity
F104	2.34	98.1
F104W	2.48	92.7
F104I	2.47	97.7
F104H	2.46	98.3
F104D	2.39	98.5
F104K	2.46	98.1
F104E	2.43	89.2
F104S	2.45	89.7
F104G	2.40	91.1
F104R	2.43	91.5
Y30R	2.37	93.1
Y30H	2.29	93.8
Y30N	2.33	86.3
Y30D	2.37	94.9
Y30Q	2.31	93.0
Y30G	2.26	93.6
F92W	2.45	90.2
F92H	2.39	90.5
F92V	2.39	90.3
F92R	2.40	92.2
F92S	2.37	89.7
F92G	2.35	90.0

Table S1. SE-UPLC retention times (RT) and % purity tabulated for each variant.

Variant	D_0 (cm ² /s)	R_h values (nm)						Δ AC-SINS
		1 mg/mL	2 mg/mL	4 mg/mL	6 mg/mL	8 mg/mL	10 mg/mL	
F104	2.51E-07	8.9	12.1	13.0	14.0	15.3	16.2	29
F104W	3.87E-07	6.3	6.8	6.9	7.0	7.3	7.4	16
F104I	3.78E-07	6.5	7.2	7.9	8.6	9.5	9.9	25
F104H	3.35E-07	7.1	8.3	9.2	9.9	10.7	11.3	27
F104D	4.60E-07	5.4	5.5	5.6	5.8	5.9	6.0	12
F104K	4.56E-07	5.5	5.5	5.5	5.6	5.6	5.7	6
F104E	4.39E-07	5.6	5.9	6.1	6.3	6.6	6.8	19
F104S	3.96E-07	6.2	6.6	7.0	7.0	7.3	7.8	22
F104G	3.09E-07	7.6	9.2	10.1	11.3	11.9	12.8	27
F104R	4.17E-07	5.9	6.1	6.2	6.3	6.4	6.8	16
Y30R	4.20E-07	5.9	6.2	6.5	6.6	6.8	6.8	17
Y30H	2.43E-07	10.8	11.2	12.7	NA	NA	NA	30
Y30N	3.32E-07	7.8	8.0	8.9	NA	NA	NA	30
Y30D	4.20E-07	5.9	6.0	6.0	6.3	6.3	6.3	5
Y30Q	3.48E-07	7.5	8.1	9.3	NA	NA	NA	28
Y30G	3.08E-07	7.5	9.3	10.5	11.9	12.2	12.7	29
F92W	2.87E-07	8.2	10.3	10.2	11.4	12.3	13.2	29
F92H	3.96E-07	6.2	6.7	6.9	7.1	7.5	7.8	25
F92V	4.00E-07	6.1	6.6	6.9	7.1	7.5	7.8	21
F92R	4.22E-07	5.9	6.0	6.1	6.3	6.4	6.6	16
F92S	3.28E-07	7.2	8.4	9.1	9.3	10.1	10.6	28
F92G	3.24E-07	7.3	8.5	9.2	9.5	10.1	10.7	28

Table S2. Tabulated diffusional coefficients (D_0), hydrodynamic radii (R_h) measured over the range of 1-10 mg/mL, and Δ AC-SINS values (in nm) for all variants evaluated. "NA" denotes not measured or available.