Supplementary Material

Below are the drag coefficients for the 4 canonical modes of motion for all separation distances and all three contact angles. Blank entries indicate the simulation was not undertaken at that separation
distance

$\dfrac{l}{a}$	F_1(d/a=0.5)	F_1(d/a=1)	F_1(d/a=1.5)
2.2	1.74	4.19	6.93
2.5	1.52	2.61	3.81
3	1.34	1.89	2.45
4	1.14	1.49	1.79
5	1.08	1.21	1.61
7	1.06	1.13	1.37
7.5	1.02	1.27	1.35
10	1.01	1.08	1.26

$\dfrac{l}{a}$	F_2(d/a=0.5)	F_2(d/a=1)	F_2(d/a=1.5)
2.2	0.65	0.64	0.63
2.5	0.66	0.66	0.64
3	0.69	0.68	0.65
4	0.73	0.73	0.7
5	0.77	0.76	0.77
6	0.78	0.78	0.78
7	0.81	0.8	0.8
7.5	0.83	0.81	0.79
8		0.86	0.8
10	0.86	0.85	0.83

$\dfrac{l}{a}$	F_3(d/a=0.5)	F_3(d/a=1)	F_3(d/a=1.5)
2.2	1.24	1.81	2.17
2.5	1.15	1.54	1.7
3		1.35	1.47
4	1.02	1.22	1.29
5		1.14	1.16
6		1.15	1.17
7	0.97	1.07	1.11
8	0.95	1.06	1.08

$\dfrac{l}{a}$	F_4(d/a=0.5)	F_4(d/a=1)	F_4(d/a=1.5)
2.2	0.73	0.72	0.71
2.5	0.74	0.75	0.73
3		0.78	0.76
4	0.79	0.82	0.81
5		0.85	0.84
6	0.82	0.88	0.85
7		0.89	0.87
8	0.85	0.9	0.88