Biophysical Journal, Volume *118*

Supplemental Information

Protein Diffusion on Charged Biopolymers: DNA versus Microtubule

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Table S1. List of diffusion coefficients for DNA and MT binding proteins.

Protein name	Rg (nm)	N	D1($\mu m^2/s$)	surface	Ref.
Nhp6	1.41	93	0.34	DNA	(1)
HU	1.39	90	0.49	DNA	(1)
Fis	1.44	98	0.16	DNA	(1)
PCNA	2.91	786	1.16	DNA	(2)
B clamp	2.84	732	0.01	DNA	(3)
P53 full	2.30	393	0.16	DNA	(4)
hOgg1	2.20	345	0.58	DNA	(5)
AVP-pVIc	1.88	215	2.20	DNA	(5)
MutY	2.25	369	0.17	DNA	(5)
MutM M74A	2.02	269	0.22	DNA	(5)
BamHI	1.87	213	0.57	DNA	(5)
1lacI	3.36	1196	0.05	DNA	(6)
EcoRV CyB3	1.96	245	1.20	DNA	(7)
MSH2-MSH6	4.14	2206	0.005	DNA	(8)
RNA polymerase	4.71	3233	0.01	DNA	(9)
Tale-cys3	3.19	1030	0.58	DNA	(10)
HoxD9	1.36	60	0.05	DNA	(11)
Tau	2.39	441	0.29	MT	(12–14)
EB1	2.51	506	0.02	MT	(15)
PRC1	2.59	555	0.04	MT	(15)
xmap215	4.02	2032	0.30	MT	(16)
NuMA	2.43	461	0.05	MT	(15)

p150 (basic domain)	2.56	540	0.0015	MT	(17)
p150	1.51	114	0.0017	MT	(17)
p150	3.43	1265	0.0014	MT	(17)
clip170	3.77	1676	0.0035	MT	(18)
coiled-col+Aurora-B	2.84	726	0.06	MT	(19)
Ndc80	3.87	1814	0.09	MT	(20)
ska1	2.92	788	0.23	MT	(20)
Clasp2	3.66	1532	0.33	MT	(20)
EB1	2.02	268	0.31	MT	(21)
NDC80	3.69	1576	0.17	MT	(22)
Mcak+GFP	3.12	963	0.38	MT	(23)
Qdot - Myosin Va	4.94	3710	0.26	MT	(24)
Myosin Va single headed	3.90	1855	0.36	MT	(23)
Kinesin 5 ADP (Eg5)	5.16	4224	0.0007	MT	(25)
Kinesin 5 ATP (Eg5)	5.16	4224	0.0008	MT	(25)
Yeast kinesin 8 (kip3)	3.21	1043	0.0043	MT	(26)
Dyenin , b IC subunit	5.30	4568	0.05	MT	(27)
Dyenin, outer arm	6.71	9136	0.01	MT	(27)
CENP-E	3.56	1422	0.07	MT	(28)
CENP-E tail	2.39	437	1.6	MT	(29)
POK2 (1-589)	3.75	1654	0.04	MT	(30)

Table S2. Electrostatic properties of DNA and MT binding proteins

PDB ID	Chain	Number of residues	Positive residues	Negative residues	Total charge	Dipole	Type
1bc8	C	93	15	6	9	405	DBP
1c9b	A	207	31	22	9	788	DBP
1cf7	B	82	14	10	4	279	DBP
1e3o	C	132	23	20	2	441	DBP
1efa	A	328	26	30	-3	1044	DBP
1f4k	A	115	23	17	6	412	DBP
1fjl	A	65	13	8	6	577	DBP
1hcr	A	52	10	3	7	285	DBP
1ign	A	189	31	30	2	594	DBP
1je8	A	63	14	7	8	305	DBP
1jt0	A	188	25	23	2	398	DBP
1k78	A	124	21	11	10	480	DBP
1lmb	3	87	10	12	-3	395	DBP
1mnm	C	77	16	7	9	350	DBP
1orn	A	214	36	26	10	929	DBP
1per	L	63	9	5	4	236	DBP
1pp7	U	114	18	13	4	420	DBP
1puf	A	77	21	7	14	479	DBP
1puf	B	73	15	8	7	828	DBP
1r71	A	114	18	23	-6	740	DBP
1r8d	A	109	16	18	-2	363	DBP
1rep	C	214	32	21	11	684	DBP
1rh6	B	52	11	7	4	245	DBP
1sax	A	120	21	18	3	1258	DBP
1sfu	A	70	12	6	6	379	DBP
1tc3	C	51	9	5	3	346	DBP
1tro	A	104	13	17	-4	641	DBP
2cgp	A	200	24	23	0	455	DBP
1l3l	A	447	67	60	7	907	DBP
1hlv	A	131	29	15	14	712	DBP
2irf	G	109	20	12	9	294	DBP
1dsz	A	75	14	6	7	385	DBP
1hwt	C	70	16	10	7	642	DBP
1mey	C	83	16	7	8	173	DBP
1ozj	A	126	23	15	8	782	DBP
1tsr	B	194	22	19	3	622	DBP
2drp	A	63	13	4	9	238	DBP

1a0a	A	63	10	5	5	810	DBP
1am9	A	80	19	8	11	629	DBP
1dh3	A	55	16	9	8	1372	DBP
1gd2	E	65	15	10	4	1591	DBP
1jnm	A	56	17	6	12	1734	DBP
1llm	C	87	18	13	5	1206	DBP
1mdy	A	68	18	8	10	1276	DBP
1nkp	B	83	17	11	5	1375	DBP
1nlw	A	79	19	10	9	851	DBP
1b3t	A	147	16	12	5	1241	DBP
1f44	A	316	47	37	10	1681	DBP
1flo	A	405	53	38	15	1284	DBP
1fzp	B	105	20	17	3	581	DBP
1h89	C	115	26	12	14	686	DBP
1jfi	B	135	18	20	-3	599	DBP
1jj4	A	74	11	5	6	215	DBP
1ku7	A	73	18	14	4	421	DBP
1kx5	B	102	25	7	18	1313	DBP
1kx5	C	128	26	9	17	1183	DBP
1kx5	D	122	28	9	19	1477	DBP
1mnm	A	85	15	9	6	960	DBP
1p7d	A	279	44	36	8	1109	DBP
1skn	P	74	17	10	7	369	DBP
1bdt	A	52	11	7	4	301	DBP
1c8c	A	64	16	8	8	152	DBP
1ecr	A	305	42	32	9	503	DBP
1h6f	A	184	31	19	11	452	DBP
1hjc	A	118	15	10	5	423	DBP
1mjo	A	104	16	19	-3	815	DBP
1owf	B	94	16	12	4	388	DBP
1p71	A	94	17	13	4	324	DBP
1qna	A	182	29	15	14	892	DBP
1a3q	A	285	45	33	12	878	DBP
1e3m	A	765	90	105	-15	1736	DBP
1j3e	A	115	12	12	-1	643	DBP
1jb7	A	460	62	53	9	420	DBP
1jb7	B	216	29	26	3	196	DBP
1jey	A	493	72	69	3	1953	DBP
1mnn	A	290	40	36	4	1819	DBP
1p7h	L	286	38	31	7	795	DBP
1pt3	A	128	28	17	12	466	DBP
1a31	A	457	84	69	15	774	DBP

1a73	A	162	11	9	2	582	DBP
1bl0	A	116	17	14	2	593	DBP
1cez	A	862	104	107	-3	2074	DBP
1d02	A	197	25	27	-2	373	DBP
1dc1	A	310	40	45	-4	904	DBP
1dct	A	324	44	34	10	1011	DBP
1dfm	A	218	28	32	-3	885	DBP
1diz	A	282	28	26	2	526	DBP
1emh	A	223	26	21	5	573	DBP
1bhm	B	208	28	32	-4	579	DBP
1ewn	A	200	26	22	4	356	DBP
1fiu	A	286	30	34	-4	483	DBP
1g38	A	393	53	50	3	1120	DBP
1g9z	A	152	22	17	5	306	DBP
1i3j	A	96	19	7	13	929	DBP
1i6j	A	256	27	24	3	764	DBP
1iaw	A	304	39	40	-2	1035	DBP
1jx4	A	335	62	51	11	799	DBP
1k3x	A	253	30	27	2	563	DBP
1kc6	A	249	31	35	-4	668	DBP
1m3q	A	314	29	31	-2	568	DBP
1m5r	A	351	49	43	6	827	DBP
1mus	A	458	69	52	17	1452	DBP
1nk4	A	580	77	89	-12	1583	DBP
1p8k	Z	252	39	28	11	708	DBP
1qum	A	279	26	38	-12	409	DBP
1r2z	A	273	40	31	8	975	DBP
1rrq	A	344	43	54	-11	918	DBP
1rzt	A	327	43	35	8	1045	DBP
1sl1	A	678	84	101	-17	2976	DBP
1sx5	A	244	34	30	4	427	DBP
1t3n	A	388	48	45	3	1530	DBP
1vas	A	137	22	16	6	493	DBP
2dnj	A	253	21	29	-8	349	DBP
3pvi	A	156	18	20	-2	633	DBP
6mht	A	327	40	39	1	1019	DBP
1dew	A	279	35	34	1	747	DBP
1oup	A	210	27	20	7	985	DBP
2p5o	A	831	108	116	-6	1763	DBP
6hyo	A	131	20	19	0	547	MBP
2qjz	A	117	17	14	2	613	MBP
5lxx	A	477	46	63	-17	758	MBP

1f9v	A	313	31	35	-4	727	MBP
2qfa	A	137	22	25	-3	852	MBP
5lzn	A	111	14	11	4	252	MBP
4kml	A	109	10	14	-4	273	MBP
4o59	O	332	36	33	3	602	MBP
5d94	A	119	18	16	3	614	MBP
2xhi	A	316	30	30	1	666	MBP
2zfi	A	329	40	41	-1	1514	MBP
5fmu	A	131	22	16	6	483	MBP
1ry6	A	319	46	42	4	470	MBP
2o0a	A	270	31	38	-6	387	MBP
2vvg	A	308	38	35	2	881	MBP
4a14	A	296	29	41	-13	1437	MBP
4ggf	C	108	13	20	-6	336	MBP
3mmy	A	354	35	35	0	617	MBP
3zcw	A	321	39	42	-3	1039	MBP
1fzq	A	176	20	23	-3	560	MBP
4b91	A	474	49	56	-7	980	MBP
3zfd	A	340	45	40	4	712	MBP
3nrx	A	123	25	24	1	565	MBP
6mq7	A	244	31	33	-2	616	MBP
1bg2	A	323	39	43	-5	968	MBP
1eo6	A	116	18	17	1	249	MBP
3b6u	A	323	44	39	4	622	MBP
5wde	A	320	34	43	-8	1206	MBP
5fmt	A	134	16	14	2	170	MBP
2of3	A	266	38	35	3	582	MBP
2qjx	A	115	19	15	4	380	MBP
3dc4	A	291	25	26	-1	828	MBP
4au8	A	276	37	32	5	964	MBP
6ctn	A	326	52	47	5	1152	MBP
3wx8	A	153	21	17	4	302	MBP
4g3a	A	220	28	32	-3	757	MBP
3nwn	A	308	32	35	-2	663	MBP
4ja7	A	466	58	62	-4	2114	MBP
4c9y	A	120	23	14	9	210	MBP
2heh	A	324	47	37	10	936	MBP
6mq5	A	227	30	27	2	584	MBP
2ct9	A	185	25	35	-10	723	MBP
3cob	A	355	48	44	5	566	MBP
3lre	A	289	35	30	5	836	MBP
6jzc	A	251	35	22	13	803	MBP

6nje	A	297	37	32	5	435	MBP
1ft1	A	315	40	50	-10	333	MBP
5wdh	A	298	28	30	-3	661	MBP
1goj	A	354	42	38	4	938	MBP
5azh	A	127	16	18	-3	600	MBP
6nwp	A	75	13	7	6	507	MBP
2ggm	A	142	25	38	-14	510	MBP
3t0q	A	304	34	34	0	779	MBP
3u06	A	359	37	48	-11	850	MBP
6b5c	A	293	43	47	-4	771	MBP
4gkp	A	229	28	30	-1	361	MBP
1t5c	A	322	42	36	5	548	MBP
3fwb	A	153	18	39	-21	735	MBP
4xa3	A	142	20	28	-9	469	MBP
5x3e	A	375	43	48	-5	678	MBP
5c46	F	175	22	23	-2	385	MBP
4bn2	A	326	37	32	6	891	MBP
5gsz	A	306	33	40	-7	604	MBP
4rfx	A	100	14	26	-12	481	MBP
2owm	A	328	38	45	-6	1462	MBP
5an9	J	250	46	40	6	922	MBP
5wc1	A	262	34	37	-3	850	MBP
4aj5	K	108	19	18	1	857	MBP
6gvw	A	312	33	35	-2	719	MBP
6b0i	K	368	52	41	11	603	MBP
6h3c	A	255	34	29	5	699	MBP
5nd4	C	337	42	31	11	598	MBP
5mlv	A	344	41	40	0	910	MBP
5mm4	K	382	44	45	-1	652	MBP
5mjs	D	121	17	16	1	335	MBP
5m5c	C	118	16	12	4	357	MBP
1ycs	A	191	22	19	3	593	heterodimer
1ycs	B	193	11	35	-25	755	heterodimer
1a4y	A	460	40	62	-22	1362	heterodimer
1a4y	B	123	20	10	10	319	heterodimer
1qbk	B	856	79	121	-41	973	heterodimer
1qbk	C	187	27	18	9	1301	heterodimer
1am4	A	199	15	20	-6	763	heterodimer
1am4	D	174	19	21	-3	399	heterodimer
1emv	A	83	7	15	-8	370	heterodimer
1emv	B	131	26	21	5	291	heterodimer
1fin	A	298	37	33	4	142	heterodimer

1fin	B	260	26	30	-4	738	heterodimer
1d09	A	310	30	35	-5	954	heterodimer
1d09	B	153	19	19	0	427	heterodimer
1wq1	R	166	19	27	-8	300	heterodimer
1wq1	G	320	34	40	-6	764	heterodimer
1fss	A	532	49	58	-9	1847	heterodimer
1fss	B	61	9	5	4	212	heterodimer
1ef1	A	289	45	40	5	1925	heterodimer
1ef1	C	87	19	19	0	221	heterodimer
1f60	A	440	61	54	7	366	heterodimer
1f60	B	90	7	19	-13	583	heterodimer
1itb	A	153	18	19	-1	507	heterodimer
1itb	B	310	36	39	-3	1952	heterodimer
1ai8	H	249	37	30	7	419	heterodimer
1ai8	I	9	0	4	-5	112	heterodimer
2pcf	A	99	6	15	-9	292	heterodimer
2pcf	B	250	27	28	-1	806	heterodimer
1bml	A	250	26	23	3	349	heterodimer
1bml	C	318	37	51	-14	457	heterodimer
1frv	A	262	22	28	-6	244	heterodimer
1frv	B	530	60	60	0	819	heterodimer
2pcb	A	294	33	44	-11	844	heterodimer
2pcb	B	104	21	12	9	242	heterodimer
1tba	A	67	5	14	-10	288	heterodimer
1tba	B	180	27	15	12	855	heterodimer
12as	A	327	33	47	-14	787	homodimer
1a3c	A	166	23	27	-4	603	homodimer
1a4i	A	285	30	36	-6	407	homodimer
1a4u	A	254	25	24	1	608	homodimer
1aa7	A	158	18	16	2	457	homodimer
1ad3	A	446	48	54	-6	637	homodimer
1ade	A	431	50	60	-10	742	homodimer
1af5	A	126	15	12	4	257	homodimer
1afw	A	390	38	41	-2	915	homodimer
1ajs	A	412	45	43	2	523	homodimer
1amk	A	250	25	23	2	86	homodimer
1aor	A	605	73	84	-11	843	homodimer
1aq6	A	245	23	30	-7	190	homodimer
1auo	A	218	15	24	-9	231	homodimer
1b3a	A	67	10	5	4	408	homodimer
1b5e	A	241	28	33	-5	136	homodimer
1b67	A	68	13	12	1	232	homodimer

1b8a	A	438	60	76	-16	3101	homodimer
1b8j	A	448	41	52	-11	279	homodimer
1bam	A	200	26	31	-5	794	homodimer
1bbh	A	131	14	18	-4	454	homodimer
1bd0	A	381	42	45	-3	663	homodimer
1bif	A	432	54	64	-10	127	homodimer
1biq	A	339	33	48	-15	167	homodimer
1bis	A	146	16	16	0	321	homodimer
1bjw	A	381	44	50	-6	1000	homodimer
1bkp	A	278	31	40	-9	768	homodimer
1bmd	A	327	36	42	-6	485	homodimer
1brw	A	433	52	57	-5	935	homodimer
1bsl	A	323	28	44	-16	105	homodimer
1bsr	A	124	17	9	9	406	homodimer
1buo	A	121	8	16	-8	843	homodimer
1bxg	A	349	24	41	-17	979	homodimer
1bxk	A	341	32	43	-11	293	homodimer
1cdc	A	96	13	13	0	312	homodimer
1cg2	A	389	48	51	-3	138	homodimer
1chm	A	401	41	55	-14	1158	homodimer
1cmb	A	104	15	19	-4	676	homodimer
1cnz	A	363	37	47	-10	656	homodimer
1coz	A	126	19	23	-4	133	homodimer
1csh	A	435	41	41	0	734	homodimer
1ctt	A	294	21	30	-9	313	homodimer
1cvu	A	552	56	59	-3	996	homodimer
1czj	A	110	11	15	-4	503	homodimer
1daa	A	277	36	41	-5	479	homodimer
1dor	A	311	27	37	-10	433	homodimer
1dpg	A	485	54	76	-22	303	homodimer
1dqs	A	381	47	44	2	495	homodimer
1dxg	A	36	3	7	-4	86	homodimer
1e98	A	210	32	29	3	264	homodimer
1ebh	A	436	51	56	-5	539	homodimer
1f13	A	722	81	95	-12	1676	homodimer
1fip	A	73	11	7	3	521	homodimer
1fro	A	176	23	28	-5	395	homodimer
1gvp	A	87	10	7	3	178	homodimer
1hhp	A	99	10	8	1	401	homodimer
1hjr	A	158	15	12	3	515	homodimer
1hss	A	111	11	10	1	292	homodimer
1hxp	A	340	33	42	-9	798	homodimer

1icw	A	69	13	8	4	297	homodimer
1imb	A	273	27	34	-5	326	homodimer
1isa	A	192	13	19	-6	212	homodimer
1ivy	A	452	38	43	-5	537	homodimer
1jhg	A	101	13	16	-3	688	homodimer
1jsg	A	111	13	18	-5	210	homodimer
1kba	A	66	5	4	2	259	homodimer
1kpf	A	111	12	13	-2	450	homodimer
1lyn	A	125	22	11	11	357	homodimer
1m6p	A	146	19	19	-1	186	homodimer
1mkb	A	171	20	21	-1	360	homodimer
1mor	A	366	34	47	-13	424	homodimer
1nox	A	200	27	23	3	297	homodimer
1nse	A	416	40	44	-4	1275	homodimer
1nsy	A	271	36	46	-10	207	homodimer
1oac	A	719	74	95	-21	1067	homodimer
1opy	A	123	9	16	-7	284	homodimer
1pgt	A	210	20	23	-3	169	homodimer
1pre	A	449	40	47	-8	1242	homodimer
1qfh	A	212	20	29	-8	1204	homodimer
1qhi	A	304	24	27	-2	314	homodimer
1qr2	A	230	22	26	-4	349	homodimer
1r2f	A	283	23	35	-12	370	homodimer
1reg	A	122	21	18	3	371	homodimer
1rfb	A	119	18	19	-1	211	homodimer
1rpo	A	61	7	13	-6	651	homodimer
1ses	A	421	58	62	-4	1125	homodimer
1slt	A	130	13	16	-3	214	homodimer
1smn	A	241	24	24	0	584	homodimer
1smt	A	98	9	9	-1	670	homodimer
1sox	A	463	46	59	-13	1219	homodimer
1tc1	A	175	24	25	-1	456	homodimer
1tox	A	515	51	65	-12	1661	homodimer
1trk	A	678	65	69	-4	319	homodimer
1uby	A	348	44	51	-7	678	homodimer
1utg	A	70	9	10	-1	300	homodimer
1vfr	A	217	24	32	-8	378	homodimer
1vok	A	192	30	16	14	898	homodimer
1wtl	A	108	8	8	-1	235	homodimer
1xso	A	150	12	19	-7	242	homodimer
2arc	A	161	14	16	-3	359	homodimer
2ccy	A	127	17	15	2	270	homodimer

2hdh	A	286	37	35	3	815	homodimer
2ilk	A	155	22	21	1	692	homodimer
2lig	A	157	11	14	-3	209	homodimer
2mcg	A	215	17	18	-1	510	homodimer
2nac	A	374	38	48	-10	282	homodimer
2ohx	A	374	42	38	4	725	homodimer
2spc	A	107	15	20	-5	880	homodimer
2sqc	A	623	69	82	-13	1279	homodimer
2tct	A	198	21	26	-5	783	homodimer
2tgi	A	112	11	10	1	485	homodimer
3dap	A	320	30	45	-15	425	homodimer
3grs	A	461	50	49	1	1027	homodimer
3sdh	A	145	19	15	4	446	homodimer
3ssi	A	108	6	10	-4	439	homodimer
4cha	A	11	0	0	0	97	homodimer
4kbp	A	424	47	43	5	1959	homodimer
5csm	A	250	37	39	-2	280	homodimer
5rub	A	436	43	48	-6	836	homodimer
8prk	A	282	35	43	-8	382	homodimer
9wga	A	170	10	9	2	186	homodimer

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