Table S1. ^{15}N chemical shift differences between the U_{exch} and F_{exch} states of the drkN SH3 domain at 20 °C extracted from fits of relaxation dispersion profiles measured at 500, 600 and 800 MHz.

	$\Delta\omega_{rex}$ (ppm) [a]	$\Delta\omega_{rex}$ (ppm) [b]	$\Delta\omega_{UF}$ (ppm)
Ala3	5.07 ± 0.50	4.38 ± 0.15	4.35
Ile4	1.66 ± 0.45	c	1.70
Lys6	4.35 ± 0.30	4.73 ± 0.30	4.39
His7	5.46 ± 0.28	6.03 ± 0.43	6.04
Asp8	1.57 ± 0.74	1.35 ± 0.30	1.54
Ser10	6.71 ± 1.00	6.27 ± 0.22	6.20
Ala11	1.35 ± 0.47	1.10 ± 0.05	1.21
Ala13	2.61 ± 0.17	2.47 ± 0.20	2.43
Asp15	5.64 ± 0.68		5.80
Glu16	2.45 ± 0.22	2.24 ± 0.28	2.19
Leu17	3.80 ± 0.16		3.50
Ser18	2.01 ±0.32	2.21 ± 0.22	2.10
Phe19	7.14 ± 0.90		6.60
Arg20	1.67 ± 0.42		1.60
Thr22	3.00 ± 0.16	3.73 ± 0.39	3.30
Gln23		1.45 ± 0.15	1.40
Ile24		1.34 ± 0.50	1.20
Leu25	3.63 ± 0.55		3.19
Ile27	2.66 ± 0.27		2.42
Leu28	4.03 ± 0.49		3.70
Asn29	5.12 ± 0.52	4.77 ± 0.14	4.78
Met30	2.90 ± 0.38	2.92 ± 0.20	2.83
Asp33	2.94 ± 0.29	2.70 ± 0.21	2.66
Arg38	1.40 ± 0.60	1.52 ± 0.05	1.45
Ala39	6.67 ± 0.59	6.37 ± 0.73	6.38

Leu41	3.89 ± 0.26		4.20
Gly43		4.72 ± 0.42	4.53
Lys44	2.06 ± 0.35		2.00
Gly46		1.64 ± 0.35	1.63
Ser50	3.88 ± 0.35	4.03 ± 0.26	3.92
Asn51	4.91 ± 0.42		4.60
Tyr52	1.88 ± 0.44	2.31 ± 0.26	1.76
Glu54	4.21 ± 0.25	4.24 ± 0.21	4.22
Met55	2.66 ± 0.22		2.80
Lys56	1.43 ± 0.90		1.46
Asn57		1.08 ± 0.54	1.30

[a] Parameters extracted by fitting eq 2 to relaxation dispersion data from the F_{exch} state.

[b] Parameters extracted by fitting eq 2 to relaxation dispersion data from the U_{exch} state.

[c] Blank spaces indicate that peak overlap precludes analysis.

Table S2. Parameters for the slow time scale exchange process between the U_{exch} and F_{exch} states of the drkN SH3 domain at 20 °C extracted from the N_z experiment[a]

	k_{fu} (s^{-1})	k_{uf} (s^{-1})
Ala3	0.63 ± 0.10	1.30 ± 0.18
Ala5	0.77 ± 0.02	1.39 ± 0.13
Lys6	0.74 ± 0.07	1.54 ± 0.17
His7	0.71 ± 0.12	1.35 ± 0.15
Asp8	0.75 ± 0.02	1.51 ± 0.09
Phe9	0.71 ± 0.06	1.56 ± 0.10
Ser10	0.64 ± 0.06	1.51 ± 0.24
Ala13	0.69 ± 0.05	1.47 ± 0.12
Asp14	0.71 ± 0.02	1.61 ± 0.03
Glu16	0.76 ± 0.02	1.50 ± 0.25
Ser18	0.75 ± 0.02	1.42 ± 0.25
Thr22	0.74 ± 0.09	1.25 ± 0.10
Leu25	0.72 ± 0.07	1.54 ± 0.19
Ile27	0.62 ± 0.10	1.27 ± 0.14
Leu28	0.77 ± 0.11	1.51 ± 0.18
Asn29[b]	0.77 ± 0.12	
Met30[b]	0.70 ± 0.04	
Ser34	0.80 ± 0.05	1.61 ± 0.04
Arg38	0.77 ± 0.03	1.56 ± 0.09
Ala39	0.80 ± 0.12	1.43 ± 0.30
Glu40	0.70 ± 0.03	1.35 ± 0.14
Gly43	0.66 ± 0.04	1.57 ± 0.23
Gly46	0.69 ± 0.08	1.61 ± 0.07
Ile48	0.79 ± 0.07	1.71 ± 0.20
Ser50[b]		1.41 ± 0.16

Tyr52	0.82 ± 0.07	1.59 ± 0.13
Ile53	0.83 ± 0.10	1.53 ± 0.28
Glu54	0.84 ± 0.03	1.69 ± 0.31

[a] Folding (k_{uf}) and unfolding (k_{fu}) rate constants were extracted by fitting the experimental data on both auto peaks (ff and uu) and both exchange cross peaks (uf and fu) simultaneously.

[b] For residues for which only one of the two exchange cross peaks is resolved, rate constants were extracted by fitting the experimental data on both auto peaks and the single exchange cross peak.