

**Table S4 Recombinant Ndc80 complex cross-links**

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
Ndc80	1	Ndc80	48	62	1	0
Ndc80	1	Ndc80	67	15	2	0
Ndc80	1	Ndc80	69	7	1	0
Ndc80	1	Ndc80	89	21	1	0
Ndc80	1	Ndc80	122	4	2	0
Ndc80	1	Ndc80	140	11	1	0
Ndc80	1	Ndc80	259	4	1	0.001
Ndc80	1	Ndc80	292	3	1	0
Ndc80	1	Ndc80	305	32	1	0
Ndc80	1	Ndc80	310	6	1	0
Ndc80	1	Ndc80	332	3	1	0
Ndc80	1	Ndc80	338	27	1	0
Ndc80	1	Ndc80	342	1	1	0.008
Ndc80	1	Ndc80	344	14	1	0
Ndc80	1	Ndc80	354	1	1	0.006
Ndc80	1	Ndc80	359	24	1	0
Ndc80	1	Ndc80	370	16	1	0
Ndc80	1	Ndc80	388	2	1	0.001
Ndc80	1	Nuf2	113	3	1	0.004
Ndc80	1	Nuf2	157	19	1	0
Ndc80	1	Nuf2	169	4	1	0
Ndc80	1	Nuf2	200	1	1	0.013
Ndc80	1	Nuf2	220	11	1	0
Ndc80	48	Ndc80	67	21	2	0
Ndc80	48	Ndc80	69	3	1	0.008
Ndc80	48	Ndc80	89	14	1	0
Ndc80	48	Ndc80	122	2	1	0.001
Ndc80	48	Ndc80	138	3	1	0.004
Ndc80	48	Ndc80	140	2	1	0
Ndc80	48	Ndc80	231	5	1	0
Ndc80	48	Ndc80	238	2	1	0.004
Ndc80	48	Ndc80	259	5	1	0
Ndc80	48	Ndc80	292	2	1	0.002
Ndc80	48	Ndc80	305	12	1	0
Ndc80	48	Ndc80	310	1	1	0.043
Ndc80	48	Ndc80	332	1	1	0.005
Ndc80	48	Ndc80	338	12	1	0
Ndc80	48	Ndc80	354	4	1	0.001
Ndc80	48	Ndc80	388	2	1	0.001
Ndc80	48	Nuf2	157	12	1	0
Ndc80	48	Nuf2	169	6	2	0
Ndc80	48	Nuf2	220	1	1	0
Ndc80	48	His <sub>6</sub> -Spc24	159	1	1	0.023
Ndc80	48	His <sub>6</sub> -Spc24	225	1	1	0.006
Ndc80	67	Ndc80	89	21	2	0
Ndc80	67	Ndc80	122	1	1	0.037
Ndc80	67	Nuf2	157	6	2	0

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
Ndc80	67	His <sub>6</sub> -Spc24	183	2	1	0.004
Ndc80	69	Ndc80	89	5	1	0
Ndc80	69	Ndc80	122	1	1	0.002
Ndc80	69	Ndc80	231	1	1	0.036
Ndc80	69	Nuf2	157	3	1	0.001
Ndc80	89	Ndc80	122	11	2	0
Ndc80	89	Ndc80	138	8	1	0
Ndc80	89	Ndc80	140	2	1	0
Ndc80	89	Ndc80	192	2	1	0.001
Ndc80	89	Ndc80	231	10	2	0
Ndc80	89	Ndc80	238	1	1	0.004
Ndc80	89	Ndc80	259	1	1	0
Ndc80	89	Nuf2	113	4	1	0
Ndc80	89	His <sub>6</sub> -Spc24	183	1	1	0.003
Ndc80	122	Ndc80	152	28	4	0
Ndc80	122	Ndc80	155	40	2	0
Ndc80	137	Ndc80	140	18	3	0
Ndc80	140	Ndc80	238	1	1	0.003
Ndc80	259	Ndc80	332	13	1	0
Ndc80	259	Nuf2	169	38	4	0
Ndc80	332	Nuf2	169	3	1	0
Ndc80	342	Nuf2	193	3	1	0.003
Ndc80	344	Ndc80	351	8	1	0.012
Ndc80	344	Ndc80	354	14	1	0.001
Ndc80	344	Nuf2	157	3	1	0.002
Ndc80	344	Nuf2	169	23	4	0
Ndc80	344	Nuf2	187	1	1	0.03
Ndc80	351	Ndc80	359	21	2	0
Ndc80	351	Nuf2	187	62	4	0.001
Ndc80	354	Nuf2	187	52	4	0
Ndc80	359	Ndc80	370	66	2	0
Ndc80	359	Ndc80	388	1	1	0.004
Ndc80	359	Nuf2	157	12	1	0
Ndc80	359	Nuf2	200	20	3	0
Ndc80	359	Nuf2	204	1	1	0
Ndc80	359	Nuf2	217	3	1	0
Ndc80	359	Nuf2	220	7	1	0.001
Ndc80	368	Nuf2	201	2	1	0.003
Ndc80	368	Nuf2	204	40	2	0
Ndc80	370	Nuf2	217	40	2	0.001
Ndc80	370	Nuf2	220	118	2	0
Ndc80	377	Ndc80	388	73	3	0.001
Ndc80	377	Nuf2	220	70	1	0.001
Ndc80	380	Ndc80	388	7	1	0.003
Ndc80	380	Nuf2	220	9	1	0.002
Ndc80	382	Nuf2	220	12	1	0.001
Ndc80	388	Nuf2	220	5	1	0.002
Ndc80	404	Ndc80	409	11	1	0

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
Ndc80	409	Nuf2	246	5	2	0
Ndc80	409	Nuf2	388	1	1	0.012
Ndc80	425	Ndc80	432	6	2	0.003
Ndc80	432	Nuf2	270	8	1	0.002
Ndc80	432	Nuf2	271	1	1	0.009
Ndc80	439	Ndc80	439	1	1	0.011
Ndc80	439	Ndc80	445	2	1	0.023
Ndc80	445	Ndc80	448	51	3	0
Ndc80	445	Ndc80	456	1	1	0.032
Ndc80	448	Nuf2	366	2	1	0.01
Ndc80	489	Ndc80	513	6	2	0
Ndc80	489	Ndc80	522	1	1	0.003
Ndc80	513	Ndc80	527	8	2	0
Ndc80	522	Ndc80	527	6	1	0.001
Ndc80	527	Ndc80	537	1	1	0.005
Ndc80	537	Ndc80	548	14	1	0.008
Ndc80	541	Nuf2	322	8	2	0
Ndc80	548	Ndc80	554	34	2	0
Ndc80	548	Nuf2	329	1	1	0.004
Ndc80	551	Ndc80	560	2	1	0.009
Ndc80	554	Ndc80	566	1	1	0.004
Ndc80	554	Nuf2	331	205	1	0
Ndc80	554	His <sub>6</sub> -Spc24	36	1	1	0.022
Ndc80	577	Nuf2	366	23	4	0
Ndc80	582	Nuf2	356	5	1	0.001
Ndc80	582	Nuf2	360	33	3	0
Ndc80	582	Nuf2	366	6	1	0.001
Ndc80	598	Ndc80	602	15	1	0.001
Ndc80	598	Ndc80	613	1	1	0.02
Ndc80	598	Ndc80	627	2	1	0.013
Ndc80	598	Nuf2	388	6	1	0
Ndc80	598	Nuf2	406	2	1	0.001
Ndc80	602	Ndc80	613	56	3	0
Ndc80	602	Ndc80	627	2	1	0.001
Ndc80	602	Nuf2	388	20	1	0.001
Ndc80	602	Nuf2	390	3	1	0
Ndc80	602	Nuf2	393	12	2	0
Ndc80	602	Nuf2	406	2	1	0
Ndc80	611	Nuf2	382	68	2	0
Ndc80	611	Nuf2	388	13	3	0
Ndc80	611	Nuf2	390	107	4	0
Ndc80	611	Nuf2	393	76	3	0
Ndc80	611	Nuf2	406	3	1	0
Ndc80	611	His <sub>6</sub> -Spc24	2	5	1	0
Ndc80	613	Nuf2	388	27	2	0
Ndc80	613	Nuf2	393	4	1	0
Ndc80	613	Nuf2	406	3	1	0.001
Ndc80	627	Ndc80	632	10	1	0

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
Ndc80	627	Nuf2	406	1	1	0.009
Ndc80	627	Nuf2	409	14	4	0
Ndc80	627	Nuf2	415	76	6	0
Ndc80	627	Nuf2	419	14	1	0.001
Ndc80	627	His <sub>6</sub> -Spc24	2	2	1	0
Ndc80	632	Nuf2	406	20	2	0
Ndc80	632	Nuf2	409	30	4	0
Ndc80	632	His <sub>6</sub> -Spc24	2	2	1	0.005
Ndc80	632	His <sub>6</sub> -Spc24	24	20	1	0
Ndc80	641	His <sub>6</sub> -Spc24	24	64	2	0
Ndc80	641	His <sub>6</sub> -Spc24	137	3	1	0
Ndc80	655	His <sub>6</sub> -Spc24	24	23	1	0
Nuf2	187	Nuf2	201	1	1	0.002
Nuf2	200	Nuf2	204	19	1	0
Nuf2	260	Nuf2	271	11	1	0
Nuf2	322	Nuf2	331	1	1	0
Nuf2	360	Nuf2	366	1	1	0.047
Nuf2	360	Nuf2	375	2	1	0.013
Nuf2	360	Nuf2	393	1	1	0.011
Nuf2	366	Nuf2	375	7	1	0.001
Nuf2	366	Nuf2	419	4	1	0.003
Nuf2	375	Nuf2	393	1	1	0.044
Nuf2	382	Nuf2	393	3	1	0
Nuf2	388	Nuf2	388	1	1	0
Nuf2	388	Nuf2	393	12	2	0
Nuf2	393	His <sub>6</sub> -Spc24	2	3	1	0.011
Nuf2	409	His <sub>6</sub> -Spc24	2	1	1	0.001
Nuf2	415	Nuf2	426	16	1	0
His <sub>6</sub> -Spc24	2	His <sub>6</sub> -Spc24	24	50	1	0
His <sub>6</sub> -Spc24	2	His <sub>6</sub> -Spc24	52	11	1	0
His <sub>6</sub> -Spc24	24	His <sub>6</sub> -Spc24	52	1	1	0.014
His <sub>6</sub> -Spc24	24	His <sub>6</sub> -Spc24	118	2	1	0.006
His <sub>6</sub> -Spc24	24	His <sub>6</sub> -Spc24	143	1	1	0.003
His <sub>6</sub> -Spc24	24	His <sub>6</sub> -Spc24	183	2	1	0.002
His <sub>6</sub> -Spc24	36	His <sub>6</sub> -Spc24	62	1	1	0.002
His <sub>6</sub> -Spc24	36	His <sub>6</sub> -Spc24	118	5	1	0.001
His <sub>6</sub> -Spc24	36	His <sub>6</sub> -Spc24	225	4	1	0.003
His <sub>6</sub> -Spc24	52	His <sub>6</sub> -Spc24	62	16	1	0
His <sub>6</sub> -Spc24	52	His <sub>6</sub> -Spc24	118	1	1	0.009
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	71	7	2	0
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	75	4	1	0.009
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	81	1	1	0.009
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	82	1	1	0.004
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	137	1	1	0.001
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	183	4	1	0.002
His <sub>6</sub> -Spc24	62	His <sub>6</sub> -Spc24	225	1	1	0.013
His <sub>6</sub> -Spc24	71	His <sub>6</sub> -Spc24	81	12	1	0.014
His <sub>6</sub> -Spc24	71	His <sub>6</sub> -Spc24	82	6	1	0.002

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
His <sub>6</sub> -Spc24	71	His <sub>6</sub> -Spc24	118	1	1	0.027
His <sub>6</sub> -Spc24	71	His <sub>6</sub> -Spc24	137	4	1	0.039
His <sub>6</sub> -Spc24	75	His <sub>6</sub> -Spc24	82	23	1	0.005
His <sub>6</sub> -Spc24	82	His <sub>6</sub> -Spc24	92	18	2	0
His <sub>6</sub> -Spc24	82	His <sub>6</sub> -Spc24	110	4	1	0
His <sub>6</sub> -Spc24	82	His <sub>6</sub> -Spc24	118	4	1	0.002
His <sub>6</sub> -Spc24	82	His <sub>6</sub> -Spc24	137	6	1	0.004
His <sub>6</sub> -Spc24	82	His <sub>6</sub> -Spc24	225	5	1	0.01
His <sub>6</sub> -Spc24	92	His <sub>6</sub> -Spc24	118	5	2	0
His <sub>6</sub> -Spc24	92	His <sub>6</sub> -Spc24	155	1	1	0.004
His <sub>6</sub> -Spc24	92	His <sub>6</sub> -Spc24	225	1	1	0.001
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	118	425	1	0
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	137	2	1	0
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	139	6	1	0
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	143	5	1	0
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	155	5	1	0.004
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	204	1	1	0.002
His <sub>6</sub> -Spc24	110	His <sub>6</sub> -Spc24	225	5	1	0
His <sub>6</sub> -Spc24	115	His <sub>6</sub> -Spc24	225	1	1	0.001
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	139	4	1	0.016
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	143	6	1	0.001
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	155	11	1	0.002
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	159	6	1	0
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	181	3	1	0.001
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	183	8	1	0.018
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	204	6	1	0
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	223	7	2	0.001
His <sub>6</sub> -Spc24	118	His <sub>6</sub> -Spc24	225	12	1	0.001
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	143	10	1	0.002
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	155	14	1	0.001
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	159	5	1	0
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	183	7	1	0.017
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	204	2	1	0.005
His <sub>6</sub> -Spc24	137	His <sub>6</sub> -Spc24	225	5	1	0.003
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	155	10	1	0.002
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	159	12	1	0
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	181	2	1	0.001
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	204	6	1	0
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	223	2	1	0.001
His <sub>6</sub> -Spc24	139	His <sub>6</sub> -Spc24	225	5	1	0.013
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	159	23	1	0
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	181	1	1	0.001
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	183	19	1	0
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	204	6	1	0
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	223	3	1	0.002
His <sub>6</sub> -Spc24	143	His <sub>6</sub> -Spc24	225	2	1	0.007
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	159	4	1	0.001
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	181	6	1	0.001

Protein 1	Position 1 <sup>a</sup>	Protein 2	Position 2 <sup>a</sup>	No. PSMs <sup>b</sup>	No. Peptides	Best Peptide q-value
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	183	6	1	0.001
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	204	6	1	0.002
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	223	3	1	0.015
His <sub>6</sub> -Spc24	155	His <sub>6</sub> -Spc24	225	8	1	0.002
His <sub>6</sub> -Spc24	159	His <sub>6</sub> -Spc24	159	1	1	0.004
His <sub>6</sub> -Spc24	159	His <sub>6</sub> -Spc24	183	19	1	0
His <sub>6</sub> -Spc24	159	His <sub>6</sub> -Spc24	204	7	1	0
His <sub>6</sub> -Spc24	159	His <sub>6</sub> -Spc24	223	1	1	0
His <sub>6</sub> -Spc24	159	His <sub>6</sub> -Spc24	225	8	1	0
His <sub>6</sub> -Spc24	181	His <sub>6</sub> -Spc24	204	5	1	0
His <sub>6</sub> -Spc24	181	His <sub>6</sub> -Spc24	223	1	1	0.001
His <sub>6</sub> -Spc24	181	His <sub>6</sub> -Spc24	225	4	1	0
His <sub>6</sub> -Spc24	183	His <sub>6</sub> -Spc24	204	23	1	0
His <sub>6</sub> -Spc24	183	His <sub>6</sub> -Spc24	223	4	2	0.002
His <sub>6</sub> -Spc24	183	His <sub>6</sub> -Spc24	225	15	1	0.007
His <sub>6</sub> -Spc24	204	His <sub>6</sub> -Spc24	225	11	1	0
His <sub>6</sub> -Spc24	223	His <sub>6</sub> -Spc24	225	1	1	0.002
His <sub>6</sub> -Spc24	225	His <sub>6</sub> -Spc24	225	6	1	0.003
Spc25	2	Spc25	19	4	1	0
Spc25	2	Ndc80	641	37	1	0
Spc25	2	His <sub>6</sub> -Spc24	2	15	1	0
Spc25	19	Ndc80	655	36	3	0
Spc25	19	His <sub>6</sub> -Spc24	2	23	1	0.001
Spc25	118	Spc25	118	5	1	0
Spc25	118	Ndc80	48	4	1	0
Spc25	118	Ndc80	89	4	1	0
Spc25	118	His <sub>6</sub> -Spc24	110	3	1	0
Spc25	118	His <sub>6</sub> -Spc24	118	3	1	0.002
Spc25	118	His <sub>6</sub> -Spc24	137	15	1	0
Spc25	118	His <sub>6</sub> -Spc24	139	8	1	0.004
Spc25	118	His <sub>6</sub> -Spc24	143	25	1	0
Spc25	118	His <sub>6</sub> -Spc24	155	17	1	0.001
Spc25	118	His <sub>6</sub> -Spc24	159	19	1	0
Spc25	118	His <sub>6</sub> -Spc24	181	1	1	0.002
Spc25	118	His <sub>6</sub> -Spc24	183	10	1	0.004
Spc25	118	His <sub>6</sub> -Spc24	204	13	1	0
Spc25	118	His <sub>6</sub> -Spc24	223	4	2	0.001
Spc25	118	His <sub>6</sub> -Spc24	225	8	1	0

<sup>a</sup>Wild-type sequence of Spc24 starts at residue 21 due to presence of His<sub>6</sub> tag

<sup>b</sup>PSM, peptide spectrum match