The Usefulness of Autoradiography for DNA Repair Proteins Activity Detection in the Cytoplasm towards Radiolabeled Oligonucleotides Containing 5′,8-cyclo-2′-deoxyadenosine

Supplementary Materials

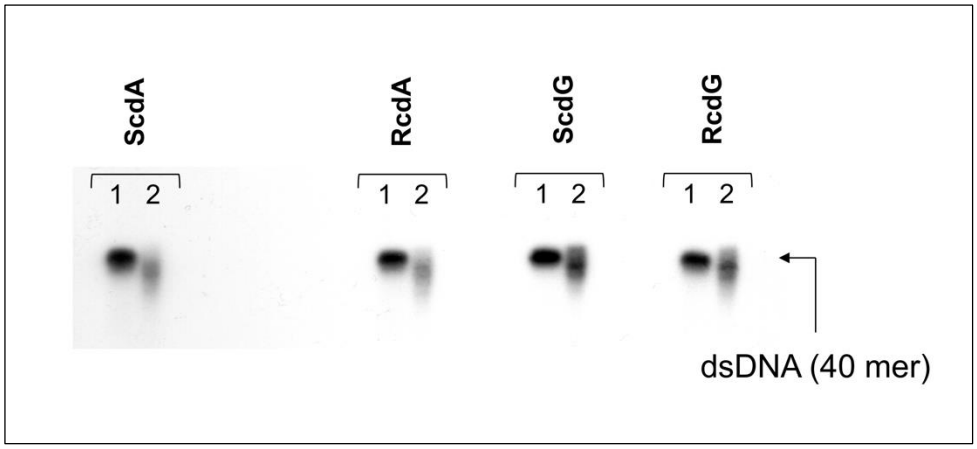


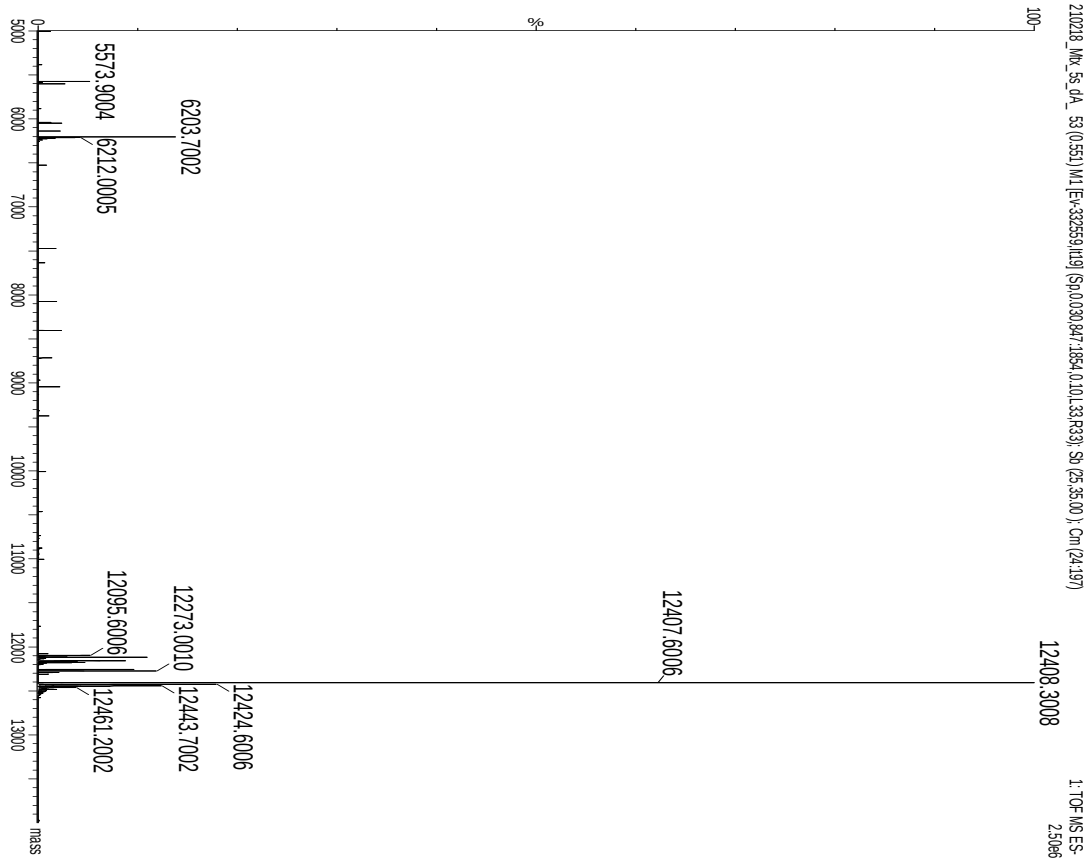
Figure S1. The stability of „matrix" oligonucleotides (Control 2) after treatment with 50 μg of xrs5 cytoplasmatic extracts (CE). Each lane number corresponds with different assay time: lane 1 - 0 min; lane 2 - 120 min.

Table S1. The full sequence list of substrate ds-oligonucleotides with 2′-deoxyuridine (dU) and cdPus.

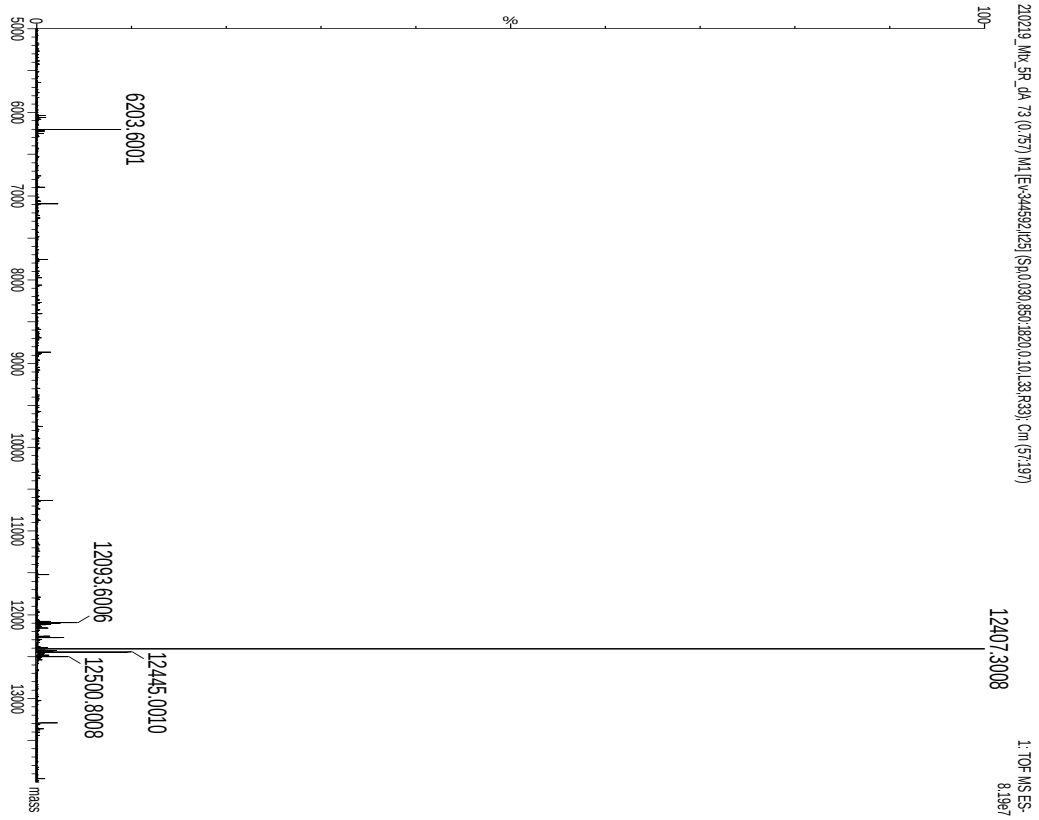
Name	Sequence
Control 1	5′-CTCTTGTCAGGAATATTGTC**U**CTATGCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAGAGATACGAGGGTGGTTTCCG-5′
Control 2	5′-GCCTTTGGTGGGAGCATAG**X**GACAATATTCCTGACAAGAG-3′ 3′-CGGAAACCACCCTCGTATCTCTGTTATAAGGACTGTTCTC-5′
dU−4	5′-CTCTTGTCAGGAATAT**U**GTCTCTATGCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAG**X**GATACGAGGGTGGTTTCCG-5′
dU−1	5′-CTCTTGTCAGGAATATTGT**U**TCTATGCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAG**X**GATACGAGGGTGGTTTCCG-5′
dU0	5′-CTCTTGTCAGGAATATTGTC**U**CTATGCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAG**X**GATACGAGGGTGGTTTCCG-5′
dU+1	5′-CTCTTGTCAGGAATATTGTCT**U**TATGCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAG**X**GATACGAGGGTGGTTTCCG-5′
dU+4	5′-CTCTTGTCAGGAATATTGTCTCTA**U**GCTCCCACCAAAGGC-3′ 3′-GAGAACAGTCCTTATAACAG**X**GATACGAGGGTGGTTTCCG-5′

U – represents 2′-deoxyuridine (a precursor of an AP site); X – represents (5′*S*)-5′,8-cyclo-2′-deoxyadenosine (ScdA) or (5′*R*)-5′,8-cyclo-2′-deoxyadenosine (RcdA).

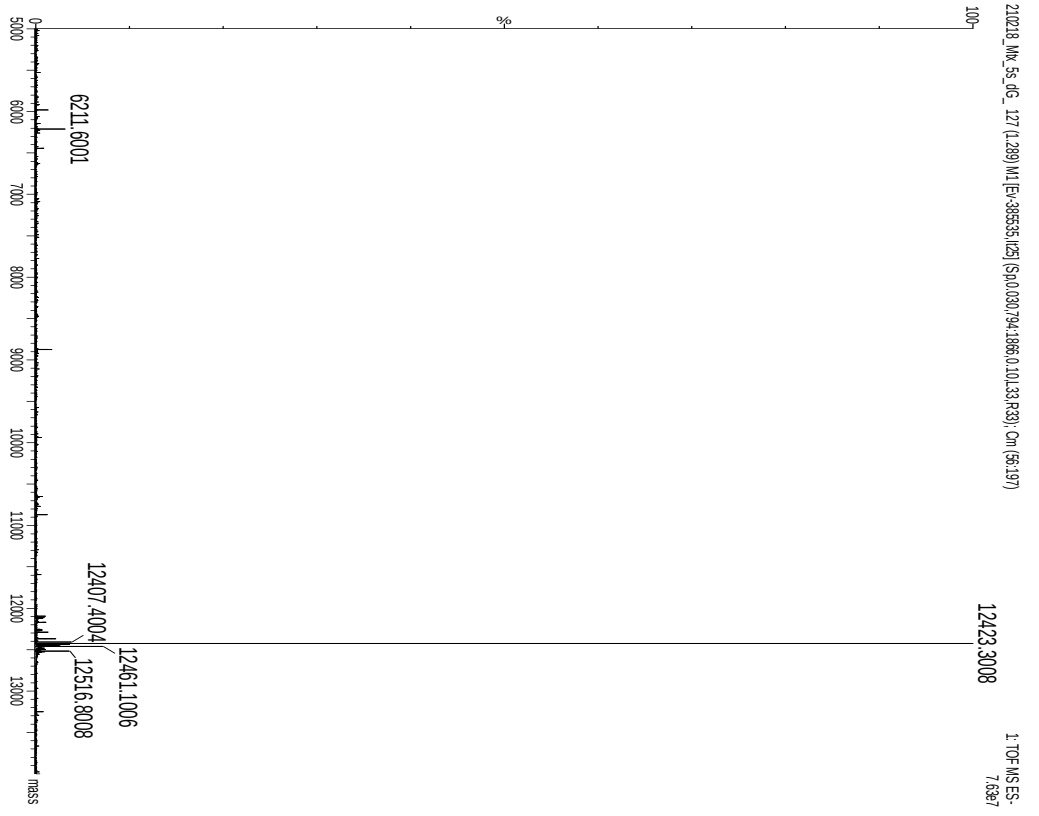
A.


210218_Mix_5s_dA_ 53 (0.551) M1 [Ev-332559.it19] (Sp,0.030,947:1854,0.10,L33,R33); Sb (25,35,00); Cm (24:197)
100
%
0
5000
6000
7000
8000
9000
10000
11000
12000
13000
mass
5573.9004
6212.0005
6203.7002
12095.6006
12273.0010
12407.6006
12408.3008
12424.6006
12443.7002
12461.2002
1: TOF MS ES-
2.50e6

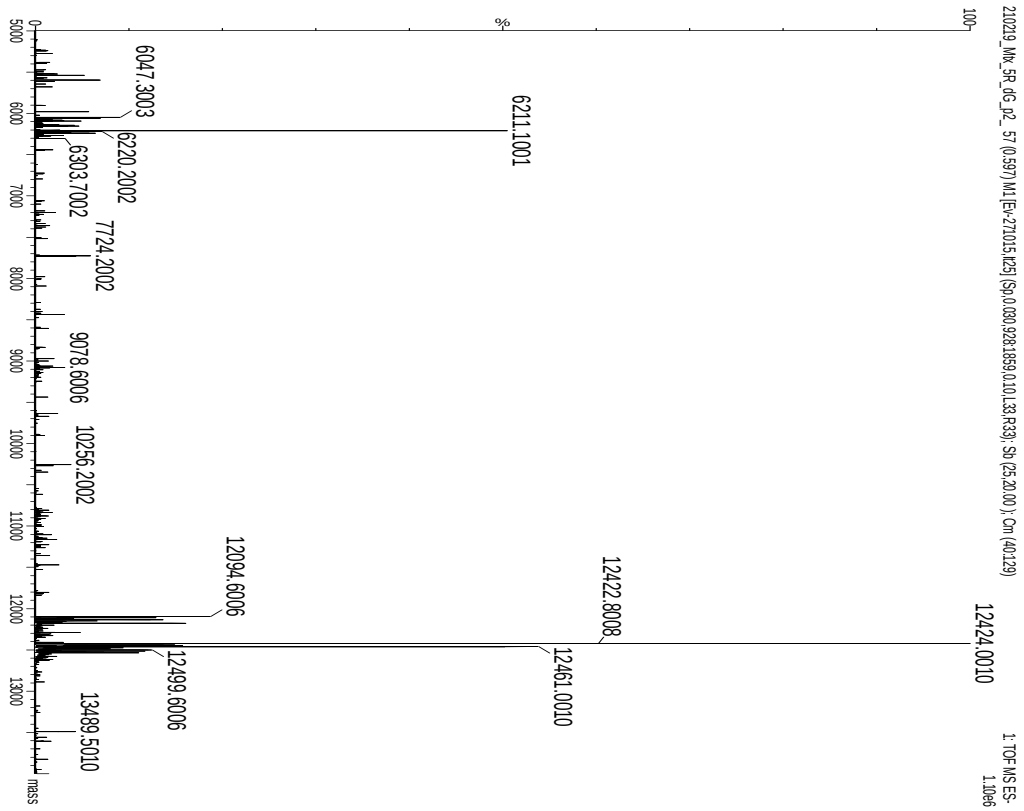
B.


210219_Mix_5R_dA_73 (0.757) M1 [Ev:844592,tF25] (Sp,0.030,850:18200,0.10,L33,R33); Cm (57:197)
100-
%
0
5000
6000
7000
8000
9000
10000
11000
12000
13000
mass
6203.6001
12093.6006
12407.3008
12445.0010
12500.8008
1: TOF MS ES-
8.19e7

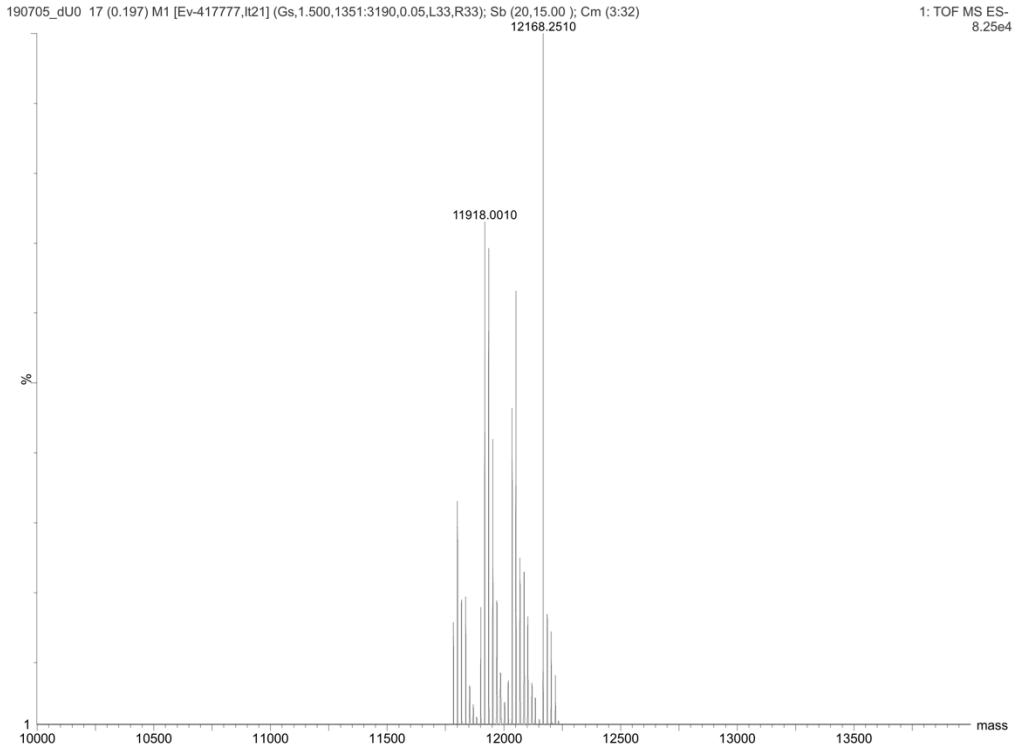
C.


210218_Mix_5s_dG_ 127 (1.289) M1 [Ev:385535,tF25] (Sp,0.030,794:1986,0.10,L33,R39); Cm (56:197)
100-
%
0
5000
6000
7000
8000
9000
10000
11000
12000
13000
mass
6211.6001
12407.4004
12423.3008
12461.1006
12516.8008
1: TOF MS ES-
7.63e7

D.


210219_Mix_5R_dG_p2_ 57 (0.597) M1 [Ev-271015,lt25] (Sp,0.090,928:1859,0.10,L33,R33); Sb (25,20.00); Cm (40:129)
100
%
0
5000
6000
7000
8000
9000
10000
11000
12000
13000
mass
6047.3003
6211.1001
6220.2002
6303.7002
7724.2002
9078.6006
10256.2002
12094.6006
12422.8008
12424.0010
12461.0010
12499.6006
13489.5010
1: TOF MS ES-
1.10e6

E.


190705_dU0 17 (0.197) M1 [Ev-417777,lt21] (Gs,1.500,1351:3190,0.05,L33,R33); Sb (20,15.00); Cm (3:32)
12168.2510
1: TOF MS ES-
8.25e4
11918.0010
%
1
10000
10500
11000
11500
12000
12500
13000
13500
mass

F.

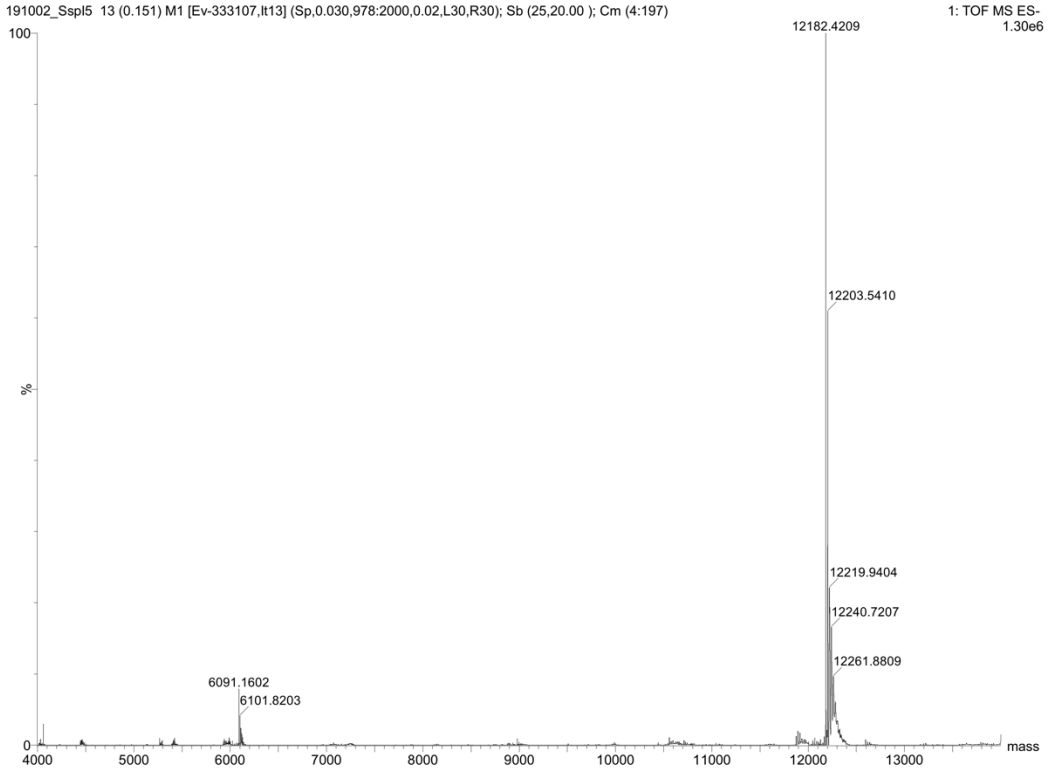


Figure S2. Mass spectra of substrate oligonucleotides containing cdPu. (A) ssDNA with (5′S)-5′,8-cyclo-2′-deoxyadenosine (Mtx-ScdA); (B) ssDNA with (5′R)-5′,8-cyclo-2′-deoxyadenosine (Mtx-RcdA); (C) ssDNA with (5′S)-5′,8-cyclo-2′-deoxyguanosine (Mtx-ScdG); (D) ssDNA with (5′R)-5′,8-cyclo-2′-deoxyguanosine (Mtx-RcdG); (E) ssDNA with 2′-deoxyuridine (Control 1 – dU strand); (F) native ssDNA (Control 1 – native strand).

Table S2. The masses (calculated vs. found) of chosen substrate oligos.

Oligonucleotide	Calculated Mass	Found Mass
Control 1 (dU strand)	12,167.90	12,168.25
Control 1 (native strand)	12,181.98	12,182.42
Mtx-ScdA	12,407.00	12,408.30
Mtx-RcdA	12,407.00	12,407.30
Mtx-ScdG	12,423.00	12,423.30
Mtx-RcdG	12,423.00	12,424.00

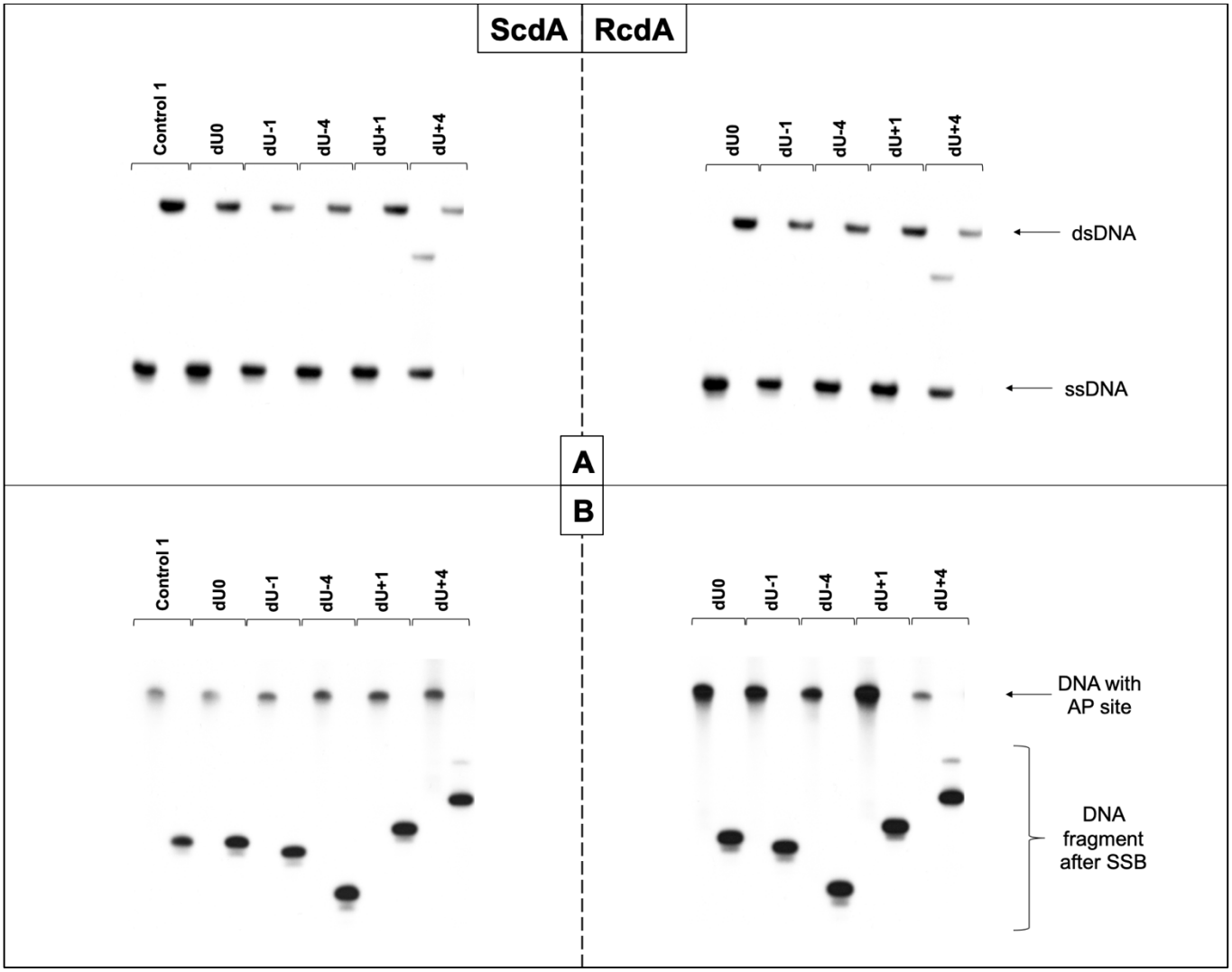


Figure S3. (A) Verification of radiolabeling of single-stranded (ssDNA) and efficient annealing of double-stranded (dsDNA) oligonucleotides on the 15% native polyacrylamide gel **(B)** Verification of AP sites' stability/purity and SSBs formation (after APE1 treatment) on the 15% denaturing polyacrylamide gel. SSB – single stranded break.

Raw numerical data

Table S3. Xrs5 – Control 1. Raw numerical data of densitometry obtained from Quantity One software.

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
Control 1	1.	27,16	87,28	83,54	73,30	54,33	22,16	14,80	12,67
	2.	30,24	67,12	56,67	50,53	43,83	26,37	14,58	12,74
	3.	2,70	53,70	52,80	43,71	35,69	23,62	14,76	7,31
	4.	81,05	80,54	75,51	61,75	44,63	19,35	13,60	10,58
	5.	3,41	64,10	52,09	43,44	38,29	24,70	17,44	9,71
	6.	3,19	46,62	45,36	41,57	38,76	24,98	14,55	8,91
	7.	48,35	78,23	73,57	61,75	56,31	26,62	23,19	5,66
	8.	33,91	85,42	83,60	57,12	44,71	28,11	3,59	1,65
	9.	22,98	62,34	62,62	54,45	48,43	34,05	18,43	10,97
	10.	84,45	82,38	70,51	52,59	33,69	6,89	5,49	6,42
	11.	85,33	80,06	66,44	54,67	35,85	12,44	8,46	7,32
	12.	27,35	64,21	57,68	45,84	36,30	7,69	11,04	6,17
	Avg	37,51	71,00	65,03	53,39	42,57	21,42	13,33	8,34
	SD	30,96	13,16	12,56	9,30	7,48	8,36	5,50	3,23

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
Control 1	1.	4,54	2,75	7,14	19,16	37,93	36,26	10,28	5,79
	2.	4,60	9,19	23,86	32,15	41,82	30,24	14,72	9,19
	3.	11,39	10,74	20,75	35,97	43,28	37,15	24,37	9,56
	4.	2,88	4,17	10,74	27,44	38,98	26,57	10,83	2,81
	5.	2,44	8,15	16,86	30,99	35,29	31,52	17,12	7,93
	6.	1,88	16,76	24,39	31,99	33,82	27,51	15,21	9,81
	7.	7,68	11,58	16,59	30,07	33,98	31,96	22,51	10,92
	8.	4,70	6,32	10,53	33,82	44,58	42,06	3,20	0,51
	9.	14,30	10,23	13,11	19,07	25,20	26,46	16,68	7,19
	10.	7,42	9,72	20,65	40,36	51,18	29,88	11,61	3,58
	11.	6,84	11,89	26,13	35,06	43,37	32,00	14,93	13,04
	12.	1,15	8,07	18,05	32,67	40,89	25,79	21,87	7,50
	Avg	5,82	9,13	17,40	30,73	39,19	31,45	15,28	7,32
	SD	3,95	3,71	6,07	6,30	6,64	4,95	5,94	3,62

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
Control 1	1.	1,57	6,56	8,09	6,04	4,22	2,59	2,34	2,13
	2.	1,11	17,49	16,85	14,62	7,25	4,41	2,07	2,34
	3.	2,05	21,21	21,47	18,66	14,99	11,39	6,27	3,98
	4.	15,54	13,71	12,84	9,20	6,33	3,54	4,23	3,28
	5.	0,00	18,20	25,10	19,99	15,45	9,07	9,65	5,17
	6.	0,56	22,07	22,12	15,25	14,83	9,00	6,12	3,87
	7.	2,39	4,72	6,17	6,08	4,87	3,14	3,05	0,87
	8.	2,62	3,00	3,49	2,67	2,99	2,51	0,97	0,25

	9.	5,54	10,08	10,97	9,92	10,65	8,19	4,33	2,98
	10.	4,80	7,73	8,71	5,34	2,13	0,77	0,51	0,81
	11.	7,68	7,38	6,19	5,39	3,63	1,82	1,56	1,94
	12.	2,35	20,94	20,98	17,19	10,22	1,73	2,72	0,97
	Avg	3,85	12,76	13,58	10,86	8,13	4,85	3,65	2,38
	SD	4,29	6,99	7,42	5,99	4,94	3,57	2,64	1,51

Table S4. BJ – Control 1. Raw numerical data of densitometry obtained from Quantity One software. * rejected values.

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
Control 1	1.	2,57	68,18	62,02	56,17	47,33	31,18	18,17	14,96
	2.	3,51	72,08	71,26	64,48	54,26	38,81	27,10	16,75
	3.	0,14	83,51	78,13	31,25	62,51	50,45	38,85	27,99
	4.	1,53	90,92	89,78	84,89	64,48	39,20	23,65	14,83
	5.	6,27	82,02	83,39	77,69	64,12	42,54	26,29	19,13
	6.	0,79	75,68	65,38	51,44	42,91	34,93	30,60	29,85
	Avg	2,47	78,73	75,00	60,99	55,94	39,52	27,45	20,58
	SD	2,22	8,33	10,71	19,30	9,27	6,63	6,96	6,67

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
Control 1	1.	2,45	9,10	14,33	23,40	38,00	56,45	71,05	72,20
	2.	2,11	8,99	10,74	22,65	27,67	49,41	63,85	76,30
	3.	0,46	4,36	9,36	18,47	27,67	40,78	55,14	66,51
	4.	0,72	2,13	3,91	9,05	28,92	54,32	70,56	79,43
	5.	1,85	6,24	6,08	14,36	29,76	51,89	69,95	77,42
	6.	0,74	8,25	11,65	28,75	39,87	55,26	59,46	59,86
	Avg	1,39	6,51	9,34	19,45	31,98	51,35	65,00	71,95
	SD	0,85	2,82	3,80	7,03	5,48	5,76	6,65	7,49

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
Control 1	1.	0,45	21,39	22,36	20,28	14,52	11,03	7,76	6,98
	2.	1,05	17,87	17,49	12,84	17,93	11,25	7,57	4,21
	3.	0,04	10,83	12,42	1,58	9,69	8,39	4,72	2,05
	4.	0,18	5,92	5,81	5,79	5,76	4,18	3,26	2,52
	5.	4,59	11,35	10,23	7,95	6,12	5,57	3,59	3,12
	6.	0,15	15,61	22,77	19,77	17,10	9,16	8,56	9,27
	Avg	1,08	13,83	15,18	11,37	11,85	8,26	5,91	4,69
	SD	1,76	5,56	6,85	7,63	5,41	2,88	2,33	2,85

Table S5. XPC – Control 1. Raw numerical data of densitometry obtained from Quantity One software. * rejected values.

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
Control 1	1.	0,62	71,04	68,78	61,72	48,16	34,55	30,01	17,16
	2.	8,64	66,97	63,32	54,93	43,37	24,96	18,53	11,46
	3.	7,04	64,27	63,85	57,44	44,03	28,74	5,98*	8,58*
	4.	5,18	53,37	46,01	46,36	40,94	34,45	30,64	26,27
	5.	0,97	63,01	54,92	57,99	46,49	40,74	31,34	19,44
	6.	0,57	65,40	54,26	52,19	43,80	39,13	40,61	31,96
	Avg	3,84	64,01	58,52	55,11	44,47	33,76	30,22	21,26
	SD	3,59	5,91	8,30	5,34	2,53	6,02	7,85	8,00

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
Control 1	1.	3,79	8,11	13,72	20,81	34,53	47,47	48,41	48,44
	2.	12,30	12,66	13,46	26,63	41,82	56,56	52,68	47,71
	3.	5,76	14,21	13,38	24,24	36,20	43,08	13,66*	30,34
	4.	9,37	17,26	26,42	27,89	35,74	45,40	42,67	42,45
	5.	5,46	7,86	20,57	20,67	30,83	37,06	48,56	53,82
	6.	4,34	11,17	25,05	26,69	35,78	39,61	38,52	46,32
	Avg	6,84	11,88	18,77	24,49	35,82	44,86	46,17	44,85
	SD	3,31	3,63	6,07	3,13	3,54	6,86	5,57	8,00

		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
Control 1	1.	0,17	18,73	15,97	17,15	15,98	9,89	9,77	4,84
	2.	1,85	18,27	22,49	18,30	13,50	7,33	7,54	5,38
	3.	1,25	16,72	19,90	16,78	15,21	10,72	1,72	2,92
	4.	0,69	23,06	26,55	25,57	22,52	15,36	19,13	16,06
	5.	0,01	19,01	23,40	20,15	21,14	18,88	12,75	7,73
	6.	0,07	20,37	19,68	20,74	19,47	18,76	19,91	16,43
	Avg	0,67	19,36	21,33	19,78	17,97	13,49	11,80	8,89
	SD	0,75	2,16	3,65	3,25	3,60	4,87	6,99	5,90

Table S6. Xrs5 - ScdA. Raw numerical data of densitometry obtained from Quantity One software.

xrs5 / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	19,35	90,09	86,84	86,76	86,88	86,48	83,78	80,59
	2.	16,68	74,70	72,80	68,97	63,98	63,69	60,44	56,61
	3.	0,61	73,44	73,08	68,24	62,93	60,14	62,70	58,25
	Avg	12,21	79,41	77,57	74,66	71,26	70,11	68,97	65,15
	SD	10,14	9,27	8,03	10,49	13,53	14,29	12,88	13,40
dU-1	1.	2,02	73,91	62,55	30,61	19,89	17,80	16,37	16,80
	2.	2,77	55,27	48,63	44,29	36,96	29,70	27,72	25,56
	3.	0,51	43,55	40,38	31,86	27,36	21,89	18,17	17,11
	Avg	1,77	57,58	50,52	35,58	28,07	23,13	20,75	19,82
	SD	1,15	15,31	11,21	7,56	8,56	6,04	6,10	4,97
dU-4	1.	7,72	83,54	85,31	87,27	83,07	54,26	37,25	32,04
	2.	17,91	86,88	76,85	57,37	39,12	2,95	1,49	2,29
	3.	0,23	66,64	64,83	41,88	23,87	14,27	8,97	8,64
	Avg	8,62	79,02	75,66	62,17	48,69	23,83	15,90	14,33
	SD	8,87	10,85	10,29	23,08	30,74	26,96	18,86	15,67
dU+1	1.	13,15	83,27	86,84	70,91	58,91	36,19	13,76	5,43
	2.	29,74	55,38	51,46	48,97	42,01	30,36	21,76	23,78
	3.	0,97	74,23	70,84	60,04	38,76	20,43	11,20	3,52
	Avg	14,62	70,96	69,71	59,98	46,56	28,99	15,57	10,91
	SD	14,44	14,23	17,72	10,97	10,82	7,97	5,51	11,19
dU+4	1.	0,14	24,44	77,11	78,71	57,71	29,69	10,82	4,62
	2.	0,32	40,38	48,53	45,09	34,97	22,25	13,42	20,87
	3.	0,91	54,80	71,78	50,71	37,18	14,35	7,06	2,38
	Avg	0,46	39,87	65,80	58,17	43,29	22,10	10,43	9,29
	SD	0,41	15,18	15,20	18,01	12,54	7,67	3,20	10,09

xrs5 / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	3,51	0,57	0,57	0,46	0,46	0,77	0,84	0,54
	2.	2,29	2,11	1,92	1,85	2,38	2,95	2,45	1,77
	3.	3,42	3,23	2,34	2,93	1,91	1,55	1,65	1,12
	Avg	3,07	1,97	1,61	1,75	1,58	1,76	1,65	1,14
	SD	0,68	1,34	0,92	1,24	1,00	1,10	0,80	0,62
dU-1	1.	0,73	8,57	25,18	62,55	73,30	67,09	57,36	43,49
	2.	2,44	11,95	32,78	46,06	55,19	51,89	41,64	42,23
	3.	3,12	18,51	33,64	42,81	47,41	45,91	39,54	35,57
	Avg	2,10	13,01	30,54	50,47	58,63	54,96	46,18	40,43
	SD	1,23	5,05	4,65	10,58	13,28	10,92	9,74	4,26
dU-4	1.	0,40	6,53	8,25	7,13	9,81	24,34	26,62	25,39
	2.	3,62	8,65	22,65	41,85	55,01	59,10	54,61	23,76
	3.	0,08	16,25	28,28	53,39	65,25	61,26	56,38	36,14
	Avg	1,37	10,47	19,73	34,12	43,36	48,24	45,87	28,43
	SD	1,95	5,11	10,33	24,08	29,50	20,72	16,70	6,73

dU+1	1.	1,32	1,26	1,10	0,37	0,29	0,09	0,04	0,02
	2.	0,10	0,01	0,00	1,28	0,56	0,41	0,38	0,10
	3.	1,60	3,23	1,48	2,32	0,60	0,36	0,02	0,00
	Avg	1,01	1,50	0,86	1,32	0,48	0,29	0,15	0,04
	SD	0,80	1,63	0,77	0,98	0,17	0,17	0,20	0,06
dU+4	1.	0,26	1,41	4,62	10,61	20,73	24,14	14,38	6,83
	2.	1,32	17,40	22,52	28,73	28,99	19,57	17,44	40,90
	3.	1,46	5,02	9,14	20,61	20,73	16,36	13,18	5,26
	Avg	1,01	7,94	12,09	19,98	23,49	20,03	15,00	17,66
	SD	0,65	8,38	9,31	9,08	4,77	3,91	2,20	20,14

xrs5 / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	1,05	8,38	12,34	12,73	12,62	12,69	15,27	18,76
	2.	0,68	21,55	24,82	28,59	32,97	32,58	35,98	40,18
	3.	0,08	19,86	24,20	28,75	35,09	38,25	35,57	40,57
	Avg	0,60	16,60	20,45	23,36	26,89	27,84	28,94	33,17
	SD	0,49	7,17	7,03	9,20	12,41	13,42	11,84	12,48
dU-1	1.	0,67	7,18	8,52	4,24	2,77	2,04	2,32	2,81
	2.	0,05	9,57	12,55	8,43	5,17	3,05	3,45	3,50
	3.	0,00	17,53	17,90	15,70	13,71	10,20	9,15	8,95
	Avg	0,24	11,43	12,99	9,46	7,22	5,09	4,97	5,09
	SD	0,38	5,42	4,71	5,80	5,75	4,45	3,66	3,36
dU-4	1.	0,00	6,54	4,74	4,32	3,07	0,81	0,53	0,32
	2.	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	3.	0,15	6,42	4,91	2,14	0,26	0,00	0,00	0,00
	Avg	0,05	4,32	3,22	2,15	1,11	0,27	0,18	0,11
	SD	0,08	3,74	2,79	2,16	1,70	0,47	0,31	0,18
dU+1	1.	0,27	6,08	8,55	28,12	40,49	63,47	86,06	94,36
	2.	2,67	18,84	33,57	47,89	56,40	66,04	76,63	75,62
	3.	0,00	10,81	24,20	36,59	59,93	78,91	88,23	95,64
	Avg	0,98	11,91	22,11	37,53	52,28	69,47	83,64	88,54
	SD	1,47	6,45	12,64	9,91	10,36	8,27	6,17	11,21
dU+4	1.	0,00	0,35	4,64	7,70	16,65	33,54	42,11	42,11
	2.	1,04	4,55	15,84	23,45	28,60	35,94	39,34	31,51
	3.	0,66	3,34	10,06	22,99	33,09	50,19	59,52	64,86
	Avg	0,57	2,75	10,18	18,05	26,11	39,89	46,99	46,16
	SD	0,53	2,16	5,60	8,97	8,49	9,00	10,94	17,04

Table S7. Xrs5 - RcdA. Raw numerical data of densitometry obtained from Quantity One software.

xrs5 / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	77,10	82,72	78,23	71,76	69,85	65,84	62,61	59,21
	2.	0,86	64,58	64,30	60,99	57,99	57,60	55,85	53,80
	3.	0,87	60,76	59,46	59,11	58,90	52,00	51,59	56,45
	Avg	26,28	69,35	67,33	63,95	62,25	58,48	56,68	56,49
	SD	44,01	11,73	9,75	6,82	6,60	6,96	5,56	2,71
dU-1	1.	56,57	57,45	53,38	41,19	30,18	30,37	24,58	18,89
	2.	0,80	40,81	35,30	30,70	26,25	22,98	18,25	12,49
	3.	0,43	37,42	37,79	34,04	33,31	28,89	23,61	17,47
	Avg	19,27	45,23	42,16	35,31	29,91	27,41	22,15	16,28
	SD	32,31	10,72	9,80	5,36	3,54	3,91	3,41	3,36
dU-4	1.	47,73	52,83	54,21	58,37	59,42	38,91	47,36	35,47
	2.	3,70	62,81	59,31	49,05	28,72	11,02	8,84	8,56
	3.	14,30	65,76	69,75	72,18	69,56	56,72	60,00	56,84
	Avg	21,91	60,47	61,09	59,87	52,57	35,55	38,73	33,62
	SD	22,98	6,78	7,92	11,64	21,27	23,04	26,65	24,19
dU+1	1.	74,57	83,80	77,65	66,67	52,03	30,01	15,84	11,99
	2.	3,82	56,35	53,19	43,36	35,70	7,96	11,86	4,42
	3.	3,55	51,54	46,23	40,84	32,56	19,07	12,63	7,56
	Avg	27,32	63,89	59,02	50,29	40,10	19,02	13,44	7,99
	SD	40,93	17,41	16,50	14,24	10,45	11,03	2,11	3,80
dU+4	1.	79,15	23,87	63,19	47,15	25,69	5,70	4,28	3,68
	2.	1,61	44,04	46,27	38,04	23,09	8,87	4,17	1,20
	3.	1,70	37,45	43,58	39,64	30,98	13,67	5,16	1,00
	Avg	27,49	40,74	51,01	41,61	26,59	9,41	4,54	1,96
	SD	44,74	4,66	10,63	4,86	4,02	4,01	0,54	1,49

xrs5 / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	0,72	0,96	0,90	2,55	3,06	2,63	1,97	2,52
	2.	0,79	1,93	0,79	0,52	0,67	0,32	0,28	0,19
	3.	1,13	3,06	2,62	3,09	2,90	2,86	1,09	1,58
	Avg	0,88	1,98	1,43	2,05	2,21	1,93	1,12	1,43
	SD	0,22	1,05	1,03	1,35	1,34	1,40	0,85	1,17
dU-1	1.	12,95	13,85	24,48	44,69	57,71	53,36	45,87	36,91
	2.	4,03	17,03	30,23	37,69	42,23	39,43	34,11	18,66
	3.	1,80	26,13	31,69	35,30	37,10	40,32	29,96	25,60
	Avg	6,26	19,00	28,80	39,23	45,68	44,37	36,65	27,06
	SD	5,90	6,37	3,82	4,88	10,73	7,80	8,25	9,21
dU-4	1.	2,92	5,29	7,42	9,29	25,38	32,42	23,51	28,72
	2.	0,00	0,00	37,19	48,93	62,91	67,89	64,34	63,14
	3.	2,35	11,91	10,70	16,06	19,62	20,89	19,23	14,70
	Avg	1,75	5,73	18,44	24,76	35,97	40,40	35,70	35,52
	SD	1,55	5,97	16,32	21,20	23,51	24,49	24,90	24,92

dU+1	1.	0,51	0,90	0,46	0,45	0,21	0,08	0,06	0,08
	2.	4,79	12,70	8,88	3,88	4,40	0,34	0,63	0,25
	3.	4,64	11,03	10,45	7,58	4,55	1,29	0,48	0,03
	Avg	3,31	8,21	6,60	3,97	3,05	0,57	0,39	0,12
	SD	2,43	6,39	5,37	3,57	2,46	0,64	0,29	0,12
dU+4	1.	2,96	0,27	12,43	28,24	37,83	19,92	14,88	21,45
	2.	5,48	9,22	15,94	26,14	30,86	25,74	18,46	8,71
	3.	6,01	16,93	21,52	30,81	32,64	25,37	17,67	17,66
	Avg	4,82	13,08	16,63	28,40	33,78	23,68	17,00	15,94
	SD	1,63	5,45	4,58	2,34	3,63	3,26	1,88	6,54

xrs5 / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	21,94	15,97	20,63	25,11	25,08	27,57	30,75	34,10
	2.	0,14	30,45	33,27	38,38	41,23	41,94	43,65	45,81
	3.	0,15	32,18	37,23	37,68	37,98	44,93	47,31	41,71
	Avg	7,41	26,20	30,38	33,72	34,76	38,15	40,57	40,54
	SD	12,59	8,90	8,67	7,47	8,54	9,28	8,70	5,94
dU-1	1.	29,03	21,51	19,73	11,41	7,44	7,39	8,96	8,92
	2.	0,00	15,92	22,07	20,34	17,45	16,13	13,39	12,93
	3.	0,06	25,22	23,78	21,98	18,85	14,84	18,00	14,22
	Avg	9,70	20,88	21,86	17,91	14,58	12,78	13,45	12,03
	SD	16,74	4,68	2,03	5,69	6,22	4,72	4,52	2,77
dU-4	1.	48,86	39,62	37,32	30,37	5,98	1,74	2,83	1,91
	2.	1,00	2,73	3,50	2,02	0,49	0,06	0,00	0,05
	3.	4,05	17,98	17,93	8,84	2,24	0,43	0,27	0,20
	Avg	17,97	20,11	19,58	13,74	2,90	0,74	1,04	0,72
	SD	26,80	18,54	16,97	14,80	2,81	0,89	1,56	1,03
dU+1	1.	24,28	11,31	20,27	32,32	47,17	69,54	83,86	87,59
	2.	0,00	24,51	35,08	51,80	59,21	91,45	87,05	94,66
	3.	0,28	33,01	42,35	51,21	62,67	79,54	86,85	91,93
	Avg	8,19	22,94	32,57	45,11	56,35	80,18	85,92	91,40
	SD	13,94	10,93	11,26	11,08	8,13	10,97	1,79	3,56
dU+4	1.	5,38	0,98	11,01	21,41	29,54	41,82	50,69	48,70
	2.	0,26	9,60	15,76	28,18	36,20	47,02	53,59	59,85
	3.	0,00	8,81	15,39	25,97	30,83	44,93	58,96	39,75
	Avg	1,88	9,20	14,05	25,18	32,19	44,59	54,42	49,43
	SD	3,03	0,56	2,64	3,45	3,53	2,62	4,20	10,07

Table S8. BJ - ScdA. Raw numerical data of densitometry obtained from Quantity One software. * rejected values, ** not applicable.

BJ / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	1,31	87,04	83,06	77,28	71,67	68,00	70,11	71,58
	2.	1,94	77,98	73,56	64,58	61,45	59,77	59,80	60,53
	3.	0,85	67,21	59,78	59,82	55,63	54,76	55,56	61,65
	Avg	1,37	77,41	72,13	67,23	62,92	60,84	61,82	64,59
	SD	0,55	9,93	11,70	9,02	8,12	6,69	7,49	6,08
dU-1	1.	0,10	81,64	69,42	47,13	31,39	21,53	20,16	13,89
	2.	1,12	58,11	58,24	44,08	35,54	29,85	22,77	22,73
	3.	**	**	**	**	**	**	**	**
	Avg	0,61	69,87	63,83	45,60	33,46	25,69	21,47	18,31
	SD	0,72	16,64	7,91	2,16	2,94	5,89	1,85	6,25
dU-4	1.	0,23	85,91	82,53	62,25	44,40	11,41	11,83	5,87
	2.	1,47	75,18	71,83	60,67	42,19	10,80	4,02	7,45
	3.	**	**	**	**	**	**	**	**
	Avg	0,85	80,54	77,18	61,46	43,29	11,11	7,92	6,66
	SD	0,88	7,59	7,57	1,12	1,56	0,43	5,52	1,12
dU+1	1.	0,14	81,04	83,48	70,53	53,36	28,74	13,73	7,18
	2.	0,86	76,30	76,87	65,84	49,70	29,18	14,58	5,76
	3.	**	**	**	**	**	**	**	**
	Avg	0,50	78,67	80,17	68,18	51,53	28,96	14,16	6,47
	SD	0,51	3,35	4,67	3,32	2,59	0,31	0,60	1,00
dU+4	1.	0,49	56,07	76,66	71,32	8,68*	27,68	15,03	11,98
	2.	0,31	50,01	81,50	67,04	53,48	34,27	22,42	16,23
	3.	**	**	**	**	**	**	**	**
	Avg	0,40	53,04	79,08	69,18	53,48	30,97	18,72	14,11
	SD	0,12	4,28	3,42	3,02	0,00	4,66	5,22	3,01

BJ / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	0,00	1,77	2,45	3,39	4,12	4,15	3,28	4,48
	2.	5,17	2,89	3,94	6,89	6,14	5,57	7,13	6,49
	3.	1,16	8,36	8,39	7,80	8,64	6,78	8,28	2,86
	Avg	2,11	4,34	4,93	6,03	6,30	5,50	6,23	4,61
	SD	2,71	3,52	3,09	2,33	2,26	1,31	2,62	1,82
dU-1	1.	0,25	3,52	19,07	44,70	59,15	72,71	73,58	83,36
	2.	0,84	7,58	25,30	39,43	43,52	54,72	67,92	66,63
	3.	**	**	**	**	**	**	**	**
	Avg	0,55	5,55	22,18	42,06	51,33	63,71	70,75	74,99
	SD	0,42	2,87	4,41	3,72	11,05	12,72	4,00	11,82
dU-4	1.	0,00	8,30	14,22	35,03	53,79	71,08	86,67	91,82
	2.	2,27	10,28	17,16	35,74	55,27	87,19	94,24	90,82
	3.	**	**	**	**	**	**	**	**
	Avg	1,13	9,29	15,69	35,39	54,53	79,14	90,46	91,32
	SD	1,60	1,40	2,08	0,50	1,05	11,40	5,35	0,71
dU+1	1.	0,90	2,80	1,99	2,26	1,42	0,95	0,60	0,32

	2.	0,97	1,83	2,14	2,03	0,85	0,35	0,23	0,96
	3.	**	**	**	**	**	**	**	**
	Avg	0,93	2,32	2,07	2,15	1,14	0,65	0,41	0,64
	SD	0,05	0,68	0,10	0,17	0,40	0,42	0,26	0,45
dU+4	1.	2,93	4,03	5,17	13,79	11,17	22,47	21,93	24,22
	2.	0,96	2,44	6,44	13,98	15,77	20,84	20,49	22,65
	3.	**	**	**	**	**	**	**	**
	Avg	1,94	3,23	5,81	13,89	13,47	21,65	21,21	23,43
	SD	1,39	1,12	0,90	0,14	3,25	1,15	1,02	1,11

BJ / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	0,00	8,97	14,06	18,99	24,02	27,68	26,42	23,45
	2.	0,00	18,70	22,37	28,40	32,33	34,56	32,96	32,61
	3.	0,09	22,87	31,34	32,31	35,71	38,43	36,07	35,38
	Avg	0,03	16,84	22,59	26,56	30,69	33,56	31,82	30,48
	SD	0,05	7,13	8,64	6,84	6,01	5,44	4,93	6,24
dU-1	1.	0,00	7,69	9,35	7,58	8,40	5,29	5,72	1,91
	2.	0,00	6,99	12,88	15,38	20,01	14,37	8,44	8,73
	3.	**	**	**	**	**	**	**	**
	Avg	0,00	7,34	11,11	11,48	14,20	9,83	7,08	5,32
	SD	0,00	0,50	2,50	5,52	8,21	6,42	1,92	4,82
dU-4	1.	0,00	1,14	2,03	2,02	0,86	0,00	0,00	0,00
	2.	0,28	7,11	9,33	2,65	1,62	0,76	0,42	0,06
	3.	**	**	**	**	**	**	**	**
	Avg	0,14	4,12	5,68	2,33	1,24	0,38	0,21	0,03
	SD	0,20	4,22	5,17	0,44	0,54	0,54	0,29	0,04
dU+1	1.	0,00	0,91	8,79	24,45	44,09	69,55	84,97	91,45
	2.	0,00	11,59	16,57	30,37	48,61	70,04	84,69	60,40
	3.	**	**	**	**	**	**	**	**
	Avg	0,00	6,25	12,68	27,41	46,35	69,79	84,83	75,92
	SD	0,00	7,55	5,50	4,18	3,19	0,34	0,20	21,95
dU+4	1.	0,00	2,68	4,45	11,87	12,05	46,64	59,78	59,39
	2.	0,00	0,57	5,94	16,33	26,91	40,73	51,95	50,21
	3.	**	**	**	**	**	**	**	**
	Avg	0,00	1,62	5,19	14,10	19,48	43,69	55,87	54,80
	SD	0,00	1,49	1,05	3,16	10,51	4,18	5,54	6,49

Table S9. BJ - RcdA. Raw numerical data of densitometry obtained from Quantity One software. * rejected values.

BJ / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	0,56	77,63	72,38	67,39	60,48	60,06	63,86	65,59
	2.	0,37	89,00	84,93	77,88	70,97	69,55	67,17	66,51
	3.	0,25	77,19	78,91	70,46	72,99	68,81	68,32	72,29
	Avg	0,39	81,27	78,74	71,91	68,15	66,14	66,45	68,13
	SD	0,16	6,70	6,28	5,39	6,72	5,28	2,32	3,63
dU-1	1.	0,28	69,62	58,90	48,20	33,04	25,69	21,25	18,72
	2.	0,41	66,00	59,77	54,08	43,00	34,20	30,28	35,03
	3.	0,54	68,22	59,01	48,05	38,02	29,97	27,70	25,33
	Avg	0,41	67,95	59,22	50,11	38,02	29,95	26,41	26,36
	SD	0,13	1,82	0,47	3,44	4,98	4,25	4,65	8,21
dU-4	1.	0,00	82,27	62,31	56,94	53,09	38,21	17,81	8,58
	2.	2,49	89,11	83,24	56,19	24,74	14,08	3,55	5,90
	3.	5,80	85,44	82,95	64,18	37,46	11,27	9,38	10,72
	Avg	2,76	85,61	76,17	59,10	38,43	21,19	10,25	8,40
	SD	2,91	3,42	12,00	4,41	14,20	14,81	7,17	2,41
dU+1	1.	0,68	79,72	77,63	65,63	59,92	36,50	20,98	11,27
	2.	0,56	73,12	72,09	57,08	54,90	32,81	22,69	12,84
	3.	0,59	78,38	72,64	59,56	46,54	34,55	22,57	12,05
	Avg	0,61	77,07	74,12	60,75	53,79	34,62	22,08	12,05
	SD	0,06	3,49	3,05	4,40	6,76	1,84	0,95	0,79
dU+4	1.	3,02	4,62*	4,58*	6,60*	37,10	39,81	36,13	34,29
	2.	0,85	66,97	72,19	60,99	45,74	25,52	15,34	10,91
	3.	1,09	68,17	69,61	56,24	39,81	25,64	13,88	9,53
	Avg	1,65	67,570	70,90	58,61	40,88	30,33	21,79	18,24
	SD	1,19	0,85	1,83	3,36	4,42	8,21	12,45	13,92

BJ / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	2,04	1,74	3,92	3,83	5,25	7,09	4,84	3,31
	2.	2,41	1,85	1,61	3,89	6,07	5,27	5,44	3,56
	3.	0,59	2,87	5,89	8,20	4,93	7,51	6,35	6,85
	Avg	1,68	2,15	3,81	5,31	5,41	6,62	5,55	4,57
	SD	0,96	0,62	2,14	2,51	0,59	1,19	0,76	1,97
dU-1	1.	0,77	14,06	23,89	35,60	54,72	63,36	70,53	75,03
	2.	1,28	15,93	20,63	30,10	44,65	56,80	62,50	60,42
	3.	0,94	14,93	25,32	37,81	50,90	60,69	64,67	67,26
	Avg	1,00	14,97	23,28	34,50	50,09	60,28	65,90	67,57
	SD	0,26	0,93	2,40	3,97	5,09	3,30	4,15	7,31
dU-4	1.	3,09	12,40	32,26	37,35	43,62	59,91	80,59	89,53
	2.	3,01	5,57	5,01*	39,97	72,15	83,05	93,62	91,48
	3.	6,11	7,91	10,00	32,09	59,64	86,95	89,17	87,69
	Avg	4,07	8,63	21,13	36,47	58,471	76,64	87,80	89,56
	SD	1,77	3,47	15,74	4,01	14,30	14,62	6,62	1,89
dU+1	1.	2,32	4,67	4,60	2,32	2,49	0,45	0,24	0,07

	2.	1,51	5,74	7,53	3,98	2,34	0,65	0,92	0,41
	3.	2,75	5,22	4,01	2,83	1,15	0,89	0,67	0,57
	Avg	2,19	5,21	5,38	3,04	1,99	0,66	0,61	0,35
	SD	0,63	0,53	1,88	0,85	0,73	0,22	0,34	0,25
dU+4	1.	7,05	8,86	8,45	9,08	14,25	12,38	10,97	13,87
	2.	4,18	11,22	15,84	22,54	31,30	37,56	39,92	44,23
	3.	5,15	9,01	15,77	20,92	26,96	30,83	31,46	34,10
	Avg	5,46	9,70	13,35	17,51	24,17	26,92	27,45	30,73
	SD	1,46	1,32	4,24	7,35	8,87	13,03	14,89	15,46

BJ / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	0,15	20,04	23,36	28,78	34,22	32,82	31,27	30,94
	2.	0,00	8,24	13,27	18,20	22,82	25,03	27,07	29,08
	3.	0,04	11,38	15,04	21,26	22,02	23,62	25,22	20,73
	Avg	0,06	13,22	17,22	22,74	26,35	27,16	27,86	26,92
	SD	0,07	6,11	5,39	5,45	6,82	4,95	3,10	5,44
dU-1	1.	0,00	13,07	16,74	15,98	12,04	10,77	8,02	5,78
	2.	0,15	15,23	18,28	15,53	12,16	8,73	6,82	3,91
	3.	0,14	12,97	13,72	13,58	10,66	8,88	7,10	6,75
	Avg	0,10	13,76	16,24	15,03	11,62	9,46	7,32	5,48
	SD	0,08	1,27	2,32	1,27	0,83	1,13	0,63	1,44
dU-4	1.	0,00	3,32	4,17	3,89	2,76	0,52	0,00	0,00
	2.	0,83	3,58	11,29	3,20	1,41	0,67	0,16	0,09
	3.	1,44	5,37	6,55	3,43	2,55	1,00	0,48	0,27
	Avg	0,76	4,09	7,34	3,51	2,24	0,73	0,21	0,12
	SD	0,72	1,12	3,63	0,35	0,72	0,24	0,25	0,14
dU+1	1.	0,00	12,45	16,33	31,25	28,56	62,68	78,53	88,42
	2.	0,15	18,92	19,65	38,45	42,51	66,32	76,12	86,55
	3.	0,21	14,51	22,15	36,82	51,81	64,15	76,44	87,09
	Avg	0,12	15,29	19,38	35,51	40,96	64,38	77,03	87,35
	SD	0,11	3,31	2,92	3,78	11,70	1,83	1,31	0,97
dU+4	1.	0,12	0,50*	0,59*	1,06*	26,07	46,86	52,54	51,24
	2.	0,20	1,97	6,85	14,89	20,91	33,79	40,89	40,86
	3.	0,55	6,30	10,28	20,75	30,68	40,79	51,94	52,76
	Avg	0,29	4,14	8,57	17,82	25,89	40,48	48,46	48,29
	SD	0,23	3,06	2,42	4,14	4,89	6,54	6,56	6,48

Table S10. XPC - ScdA. Raw numerical data of densitometry obtained from Quantity One software. * rejected values.

XPC / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	0,20	69,78	66,83	61,13	54,39	49,94	53,49	56,75
	2.	0,91	75,22	69,48	60,91	60,50	57,54	59,56	59,62
	3.	1,01	70,81	66,00	61,21	53,36	56,94	57,29	57,72
	Avg	0,71	71,94	67,43	61,09	56,08	54,81	56,78	58,03
	SD	0,44	2,89	1,82	0,16	3,86	4,23	3,07	1,46
dU-1	1.	0,16	41,25	52,10	44,45	38,49	35,87	35,27	28,64
	2.	0,18	61,42	58,36	44,75	35,23	29,25	31,77	28,01
	3.	0,61	71,84	65,65	47,68	30,14	23,81	18,65	20,22
	Avg	0,32	58,17	58,70	45,63	34,62	29,65	28,56	25,62
	SD	0,25	15,55	6,78	1,79	4,21	6,04	8,76	4,69
dU-4	1.	21,85	92,97	96,06	95,36	31,90	15,71	14,10	12,00
	2.	11,43	88,18	88,35	85,04	13,42	6,08	3,73	8,80
	3.	5,02	76,53	75,05	70,08	33,18	12,38	6,65	5,45
	Avg	12,77	85,89	86,49	83,49	26,17	11,39	8,16	8,75
	SD	8,49	8,45	10,63	12,71	11,05	4,89	5,35	3,27
dU+1	1.	0,86	70,50	65,13	56,96	30,78	18,90	8,12	3,94
	2.	2,02	61,05	60,54	50,49	35,03	16,62	11,24	5,11
	3.	3,09	78,17	75,88	63,88	38,38	13,95	6,58	3,41
	Avg	1,99	69,91	67,19	57,11	34,73	16,49	8,64	4,16
	SD	1,12	8,57	7,87	6,70	3,81	2,48	2,38	0,87
dU+4	1.	2,07	63,59	70,35	65,14	44,72	23,07	11,10	5,74
	2.	2,27	53,74	58,25	50,63	39,93	23,88	17,78	12,78
	3.	3,37	82,34	74,55	62,33	39,84	8,28	8,03	5,90
	Avg	2,57	66,561	67,72	59,37	41,50	18,41	12,30	8,14
	SD	0,70	14,53	8,46	7,69	2,79	8,78	4,98	4,02

XPC / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	2,61	8,57	10,36	7,13	5,62	5,60	5,12	4,36
	2.	9,18	6,00	7,37	7,19	4,14	4,31	3,30	3,21
	3.	5,98	9,15	10,87	9,92	6,08	6,44	4,83	4,62
	Avg	5,92	7,91	9,53	8,08	5,28	5,45	4,42	4,06
	SD	3,28	1,68	1,89	1,59	1,01	1,07	0,98	0,75
dU-1	1.	1,51	9,16	23,42	34,32	47,97	51,59	52,75	62,42
	2.	1,98	11,45	23,38	33,47	47,58	58,17	54,16	58,28
	3.	1,74	8,76	18,16	36,15	59,96	69,37	72,70	68,06
	Avg	1,74	9,79	21,65	34,64	51,84	59,71	59,87	62,92
	SD	0,23	1,45	3,02	1,37	7,04	8,99	11,13	4,91
dU-4	1.	2,33	0,10	0,17	1,72	66,19	81,01	83,98	86,05
	2.	10,00*	2,94	3,35	4,66	83,50	91,59	93,80	89,02
	3.	7,62	8,40	12,94	23,53	65,26	85,73	90,92	92,18
	Avg	4,98	3,81	5,48	9,97	71,65	86,11	89,57	89,08
	SD	3,74	4,22	6,65	11,83	10,27	5,30	5,05	3,06
dU+1	1.	2,52	6,45	4,73	3,10	0,80	0,62	0,60	0,77

	2.	3,38	9,83	8,37	5,55	2,44	0,43	0,34	0,20
	3.	9,84	8,00	7,04	4,15	2,16	0,97	0,68	0,58
	Avg	5,25	8,09	6,71	4,27	1,80	0,67	0,54	0,52
	SD	4,00	1,69	1,84	1,23	0,88	0,27	0,18	0,29
dU+4	1.	3,71	7,46	10,47	12,75	14,49	13,26	12,02	10,97
	2.	0,00*	0,02*	9,95	20,50	18,03	13,38	12,58	10,65
	3.	19,32	6,04	12,41	16,09	15,00	7,10	18,16	18,45
	Avg	11,52	6,75	10,94	16,44	15,84	11,25	14,25	13,36
	SD	11,04	1,00	1,30	3,88	1,91	3,59	3,40	4,41

XPC / ScdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	0,02	19,01	21,95	31,68	39,98	44,46	41,38	38,89
	2.	0,07	15,33	22,46	31,51	35,04	37,81	36,89	36,98
	3.	0,47	10,59	19,05	27,63	39,38	35,98	37,29	36,90
	Avg	0,19	14,98	21,15	30,27	38,13	39,42	38,52	37,59
	SD	0,25	4,22	1,84	2,29	2,70	4,47	2,49	1,13
dU-1	1.	0,04	6,38	20,73	20,44	12,92	11,99	11,37	8,30
	2.	0,01	14,21	14,97	20,61	15,92	11,05	12,54	11,74
	3.	0,14	13,75	13,70	14,16	7,57	5,19	5,13	8,09
	Avg	0,06	11,45	16,47	18,41	12,14	9,41	9,68	9,38
	SD	0,07	4,40	3,75	3,68	4,23	3,69	3,99	2,05
dU-4	1.	1,01	3,35	3,21	2,66	1,13	0,18	0,06	0,07
	2.	0,99	6,30	7,30	9,67	1,95	0,37	0,00	0,00
	3.	2,61	12,80	11,18	6,02	0,56	0,04	0,09	0,00
	Avg	1,54	7,48	7,23	6,12	1,21	0,20	0,05	0,02
	SD	0,93	4,83	3,98	3,50	0,70	0,17	0,05	0,04
dU+1	1.	0,30	13,27	26,25	38,93	67,95	80,14	90,95	94,81
	2.	0,10	11,26	24,42	42,37	62,02	82,72	88,34	94,36
	3.	1,72	7,67	14,90	30,81	58,86	84,72	92,39	95,67
	Avg	0,71	10,73	21,86	37,37	62,94	82,53	90,56	94,95
	SD	0,88	2,84	6,10	5,94	4,61	2,30	2,05	0,67
dU+4	1.	0,67	3,73	11,17	20,46	38,70	61,39	74,27	79,50
	2.	0,09	6,68	13,28	24,79	37,36	58,64	65,98	72,39
	3.	1,13	9,51	7,35	19,39	40,22	76,77	68,50	71,34
	Avg	0,63	6,64	10,60	21,55	38,76	65,60	69,58	74,41
	SD	0,52	2,89	3,01	2,86	1,43	9,77	4,25	4,44

Table S11. XPC - RcdA. Raw numerical data of densitometry obtained from Quantity One software. * rejected values.

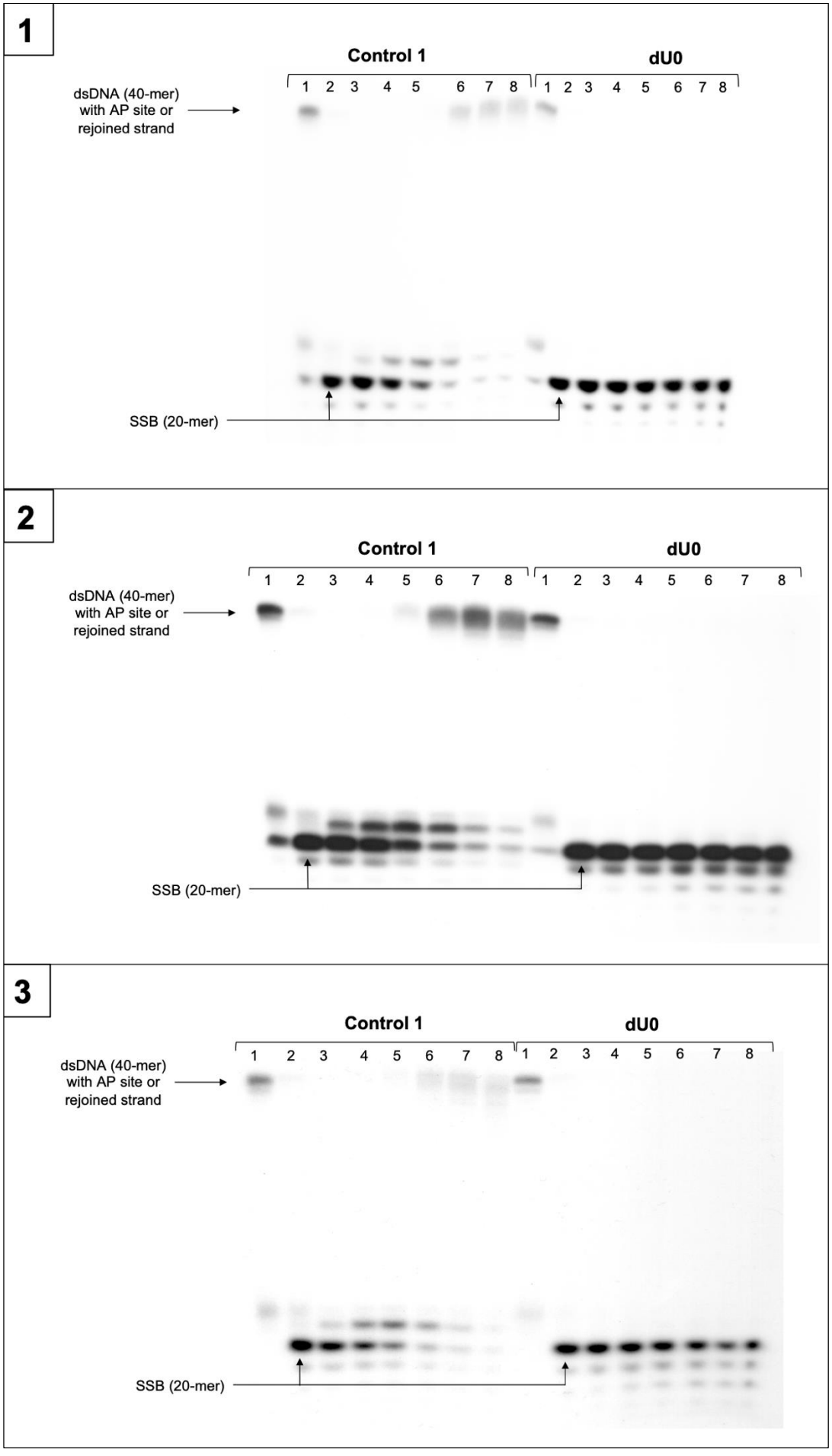
XPC / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Endonuclease activity [%]**							
dU0	1.	1,63	55,15	49,25	52,23	49,63	43,79	41,24	40,28
	2.	1,61	65,24	57,65	53,54	47,02	45,36	44,47	40,82
	3.	2,34	62,15	53,37	54,19	54,30	46,96	47,12	46,84
	Avg	1,86	60,85	53,42	53,32	50,32	45,37	44,28	42,65
	SD	0,42	5,17	4,20	1,00	3,69	1,58	2,95	3,64
dU-1	1.	0,58	46,02	67,87	38,43	34,81	28,19	27,98	29,69
	2.	1,04	64,54	72,60	47,67	40,33	28,86	27,32	27,08
	3.	0,99	71,36	76,40	52,53	37,07	27,15	25,96	23,52
	Avg	0,87	60,64	72,29	46,21	37,41	28,07	27,09	26,76
	SD	0,25	13,11	4,27	7,16	2,78	0,86	1,03	3,10
dU-4	1.	8,40	64,60	70,27	45,45	40,11	12,27	16,71	13,59
	2.	3,44	79,59	87,39	83,62*	84,41*	86,52*	87,05*	84,49*
	3.	3,31	78,74	83,15	65,10	33,76	23,59	23,00	8,58
	Avg	5,05	74,31	80,27	55,28	36,93	17,93	19,86	11,09
	SD	2,91	8,42	8,91	13,90	4,49	8,01	4,45	3,55
dU+1	1.	3,51	60,57	79,40	51,45	43,33	27,95	18,15	6,76
	2.	1,46	70,59	80,35	60,36	46,06	22,87	17,03	6,42
	3.	0,00	80,40	92,06	65,05	51,09	1,41*	12,41	3,07
	Avg	1,65	70,52	83,93	58,95	46,83	25,41	15,86	5,42
	SD	1,76	9,91	7,05	6,91	3,94	3,59	3,04	2,04
dU+4	1.	3,94	36,99	83,13	50,32	23,65	19,04	9,66	5,66
	2.	2,23	32,15	84,51	62,04	47,74	41,44	14,20	7,65
	3.	3,81	46,48	92,10	64,33	51,34	4,87*	14,55	5,79
	Avg	3,33	38,54	86,58	58,90	40,91	30,24	12,81	6,37
	SD	0,95	7,29	4,83	7,52	15,06	15,84	2,73	1,12

XPC / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Polymerase activity [%]**							
dU0	1.	8,90	8,18	7,71	9,24	6,83	6,00	3,94	2,67
	2.	10,52	7,29	5,58	6,79	5,44	4,60	4,22	2,24
	3.	12,83	11,99	8,37	11,44	9,50	7,53	6,43	4,28
	Avg	10,75	9,15	7,22	9,16	7,26	6,04	4,87	3,06
	SD	1,97	2,50	1,46	2,33	2,07	1,46	1,36	1,08
dU-1	1.	2,68	9,65	17,69	36,21	43,08	50,84	50,33	46,06
	2.	2,40	6,72	16,65	33,59	38,80	51,36	44,87	51,58
	3.	3,45	9,86	15,30	36,21	50,12	62,75	62,96	66,04
	Avg	2,85	8,74	16,55	35,34	44,00	54,98	52,72	54,56
	SD	0,55	1,76	1,20	1,51	5,72	6,73	9,28	10,32
dU-4	1.	15,77	15,89	25,31	50,71	56,93	69,38	81,13	83,24
	2.	3,12	6,50	3,44	4,76	6,24	8,67	11,42	13,08
	3.	5,98	9,81	8,14	29,42	62,21	74,69	75,15	89,91
	Avg	8,29	10,73	12,30	28,30	41,80	50,91	55,90	62,08
	SD	6,64	4,76	11,51	22,99	30,90	36,68	38,64	42,56
dU+1	1.	4,95	8,49	3,22	5,51	2,94	1,00	0,50	0,31

	2.	5,85	6,38	1,75	4,20	1,62	0,69	0,65	0,33
	3.	6,11	8,17	1,19	4,96	1,72	10,53	0,00	3,23
	Avg	5,64	7,68	2,05	4,89	2,09	4,08	0,38	1,29
	SD	0,61	1,14	1,05	0,66	0,73	5,59	0,34	1,68
dU+4	1.	16,21	11,27	6,73	25,19	40,15	27,75	31,64	26,02
	2.	11,18	13,86	8,61	18,04	21,41	21,63	29,84	30,79
	3.	25,56	19,13	6,43	17,73	21,20	26,94	31,77	34,83
	Avg	17,65	14,75	7,26	20,32	27,59	25,44	31,09	30,54
	SD	7,30	4,01	1,18	4,22	10,88	3,33	1,08	4,41

XPC / RcdA		Time [min]							
		0	1	5	15	30	60	90	120
Strand	Data set	**Exonuclease activity [%]**							
dU0	1.	0,00	26,32	41,98	38,19	43,33	50,07	54,46	56,54
	2.	0,10	16,14	35,56	38,30	45,93	48,60	50,12	55,07
	3.	0,17	19,42	37,96	34,00	36,05	45,40	46,31	48,77
	Avg	0,09	20,63	38,50	36,83	41,77	48,02	50,30	53,46
	SD	0,08	5,20	3,24	2,45	5,12	2,39	4,08	4,13
dU-1	1.	0,23	10,69	13,52	24,63	21,72	20,37	21,15	23,30
	2.	0,08	12,62	10,45	17,07	20,26	19,55	27,62	21,08
	3.	0,00	11,21	7,86	10,96	12,54	9,78	10,65	9,77
	Avg	0,10	11,51	10,61	17,55	18,17	16,57	19,81	18,05
	SD	0,12	1,00	2,83	6,85	4,93	5,89	8,56	7,26
dU-4	1.	6,12	9,76	2,89	2,92	2,15	0,48	0,30	0,22
	2.	2,33	9,13	4,92	11,12	9,06	3,27	1,17	1,48
	3.	2,81	7,63	7,46	5,12	2,16	0,92	1,18	0,00
	Avg	3,75	8,84	5,09	6,39	4,46	1,56	0,89	0,57
	SD	2,06	1,09	2,29	4,25	3,98	1,50	0,50	0,80
dU+1	1.	0,74	13,99	16,37	41,81	52,93	70,68	81,12	92,66
	2.	0,42	8,78	17,17	34,09	52,07	76,25	82,21	93,13
	3.	0,00	4,59	5,77	28,39	46,40	0,00*	87,07	80,48
	Avg	0,39	9,12	13,10	34,76	50,46	73,46	83,47	88,76
	SD	0,37	4,71	6,37	6,73	3,55	3,94	3,16	7,17
dU+4	1.	0,84	1,71	7,54	22,16	25,71	51,65	57,52	67,06
	2.	0,00	1,06	5,38	17,20	29,53	32,84	55,04	60,42
	3.	0,00	0,00	0,00	15,55	24,47	0,00	51,42	55,67
	Avg	0,28	0,92	4,31	18,30	26,57	28,16	54,66	61,05
	SD	0,49	0,86	3,88	3,44	2,64	26,14	3,07	5,73

Autoradiograms


1
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)
2
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)
3
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)

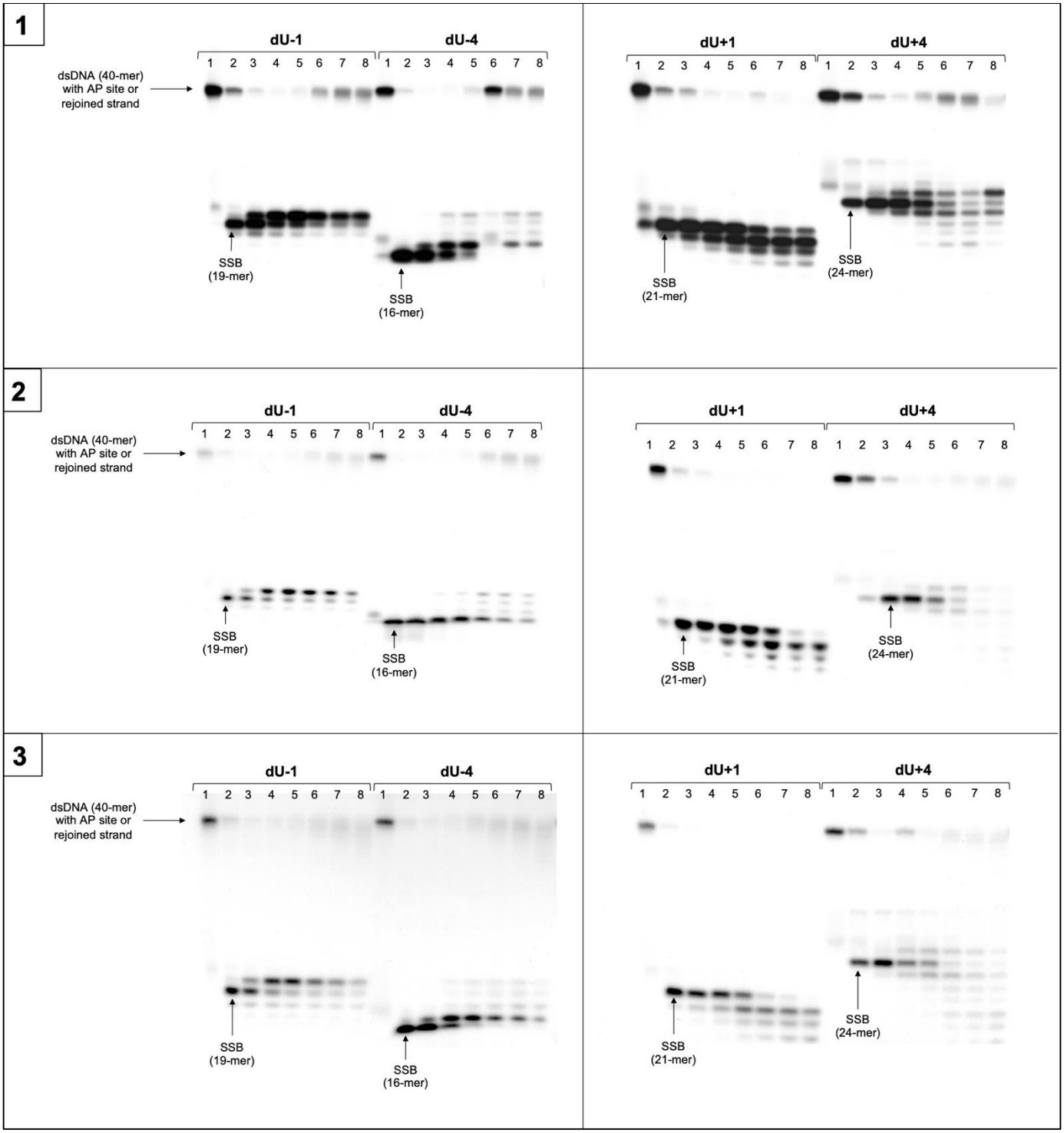
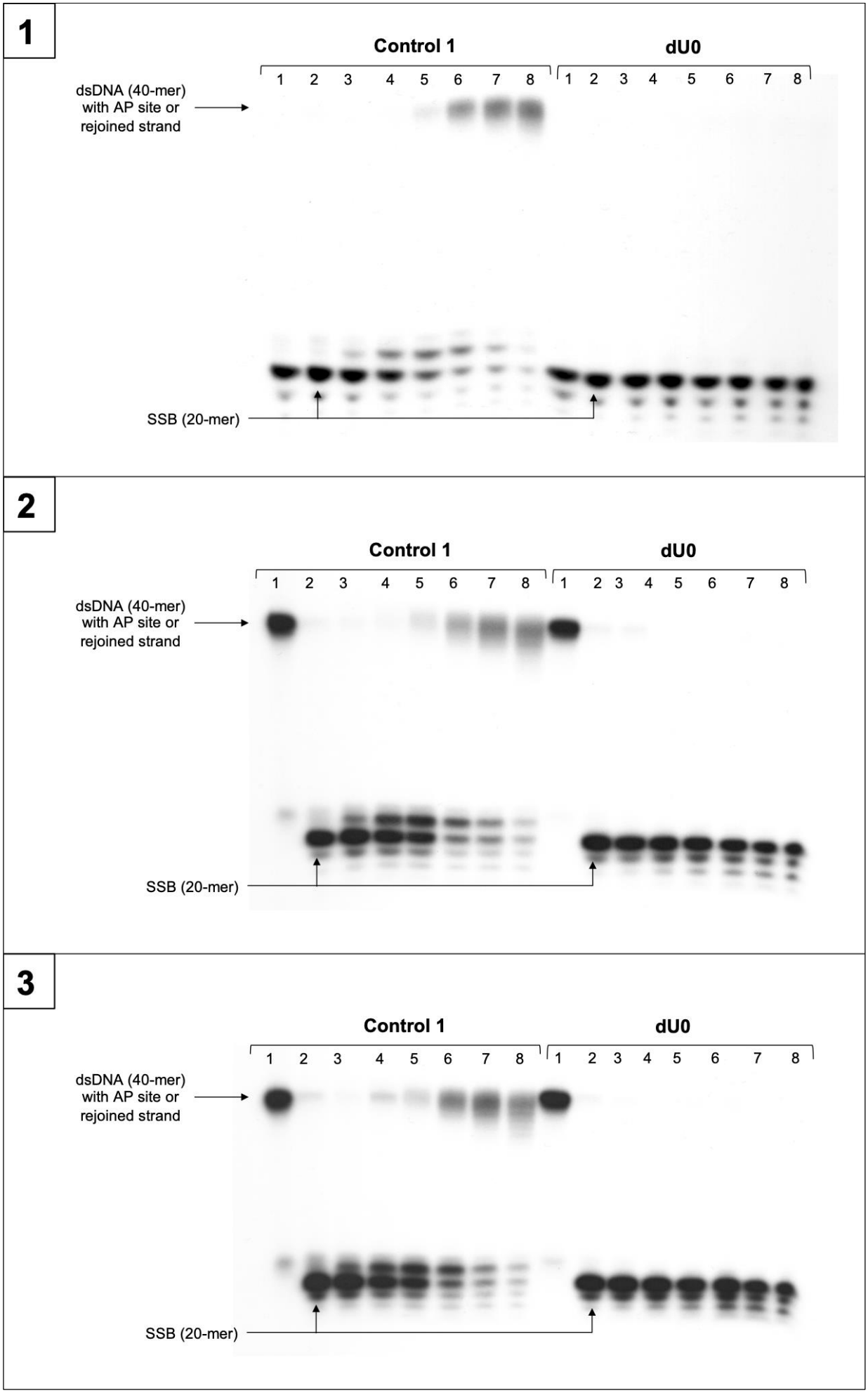


Figure S4. The autoradiograms presenting results of Control 1 and ds-CDL containing **ScdA** by **xrs5** Cytoplasmic Extract. Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.


1
Control 1
dU0
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)
2
Control 1
dU0
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)
3
Control 1
dU0
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
SSB (20-mer)

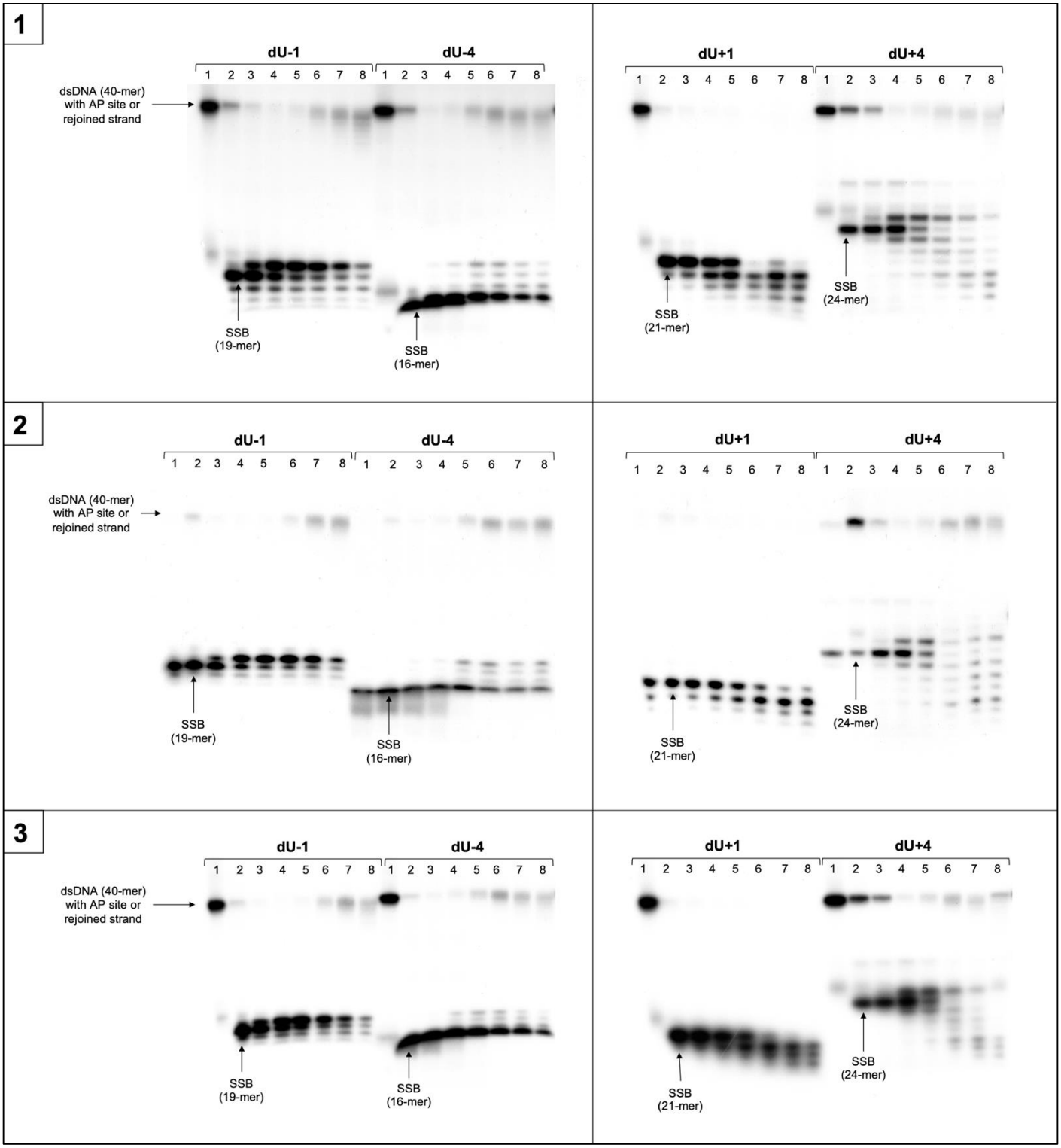
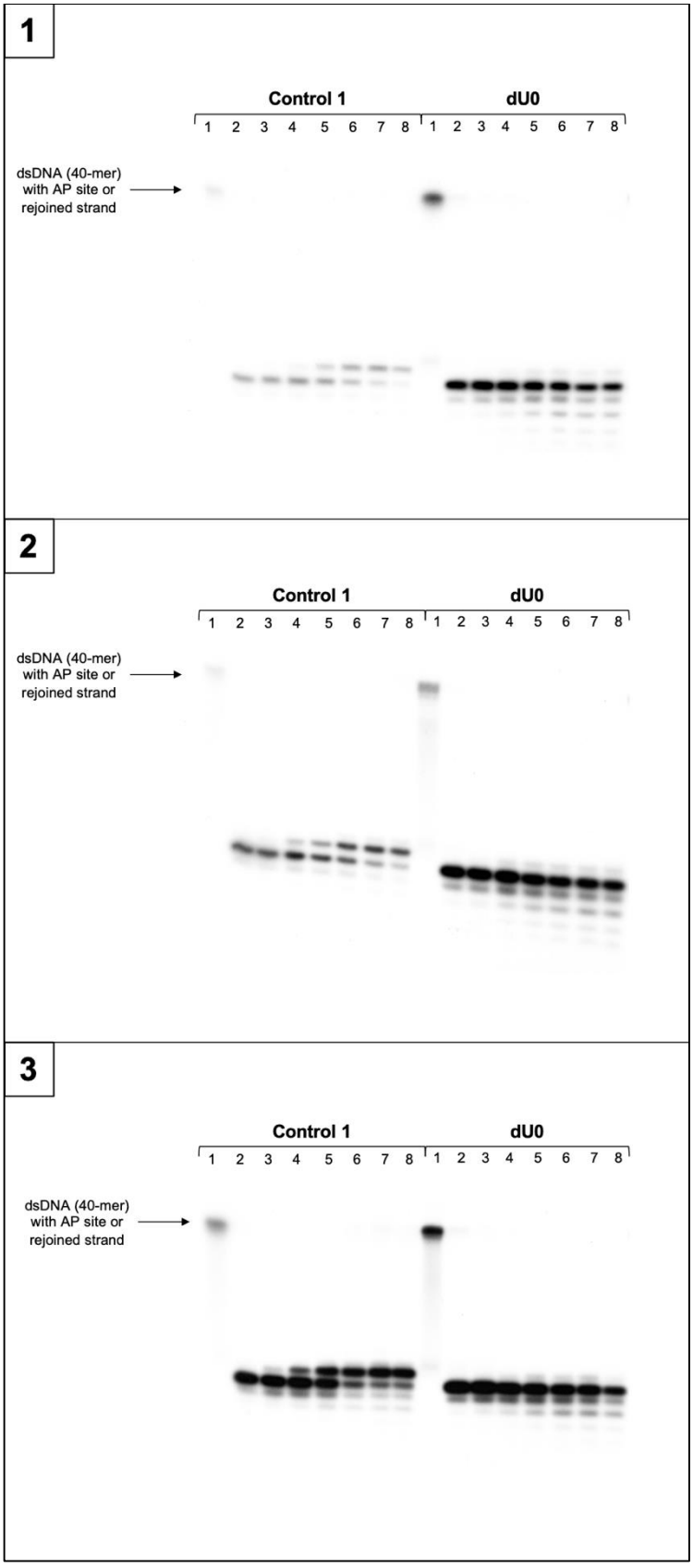


Figure S5. The autoradiograms presenting results of Control 1 and ds-CDL containing **RcdA** by **xrs5** Cytoplasmic Extract. Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.


1
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
2
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
3
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand

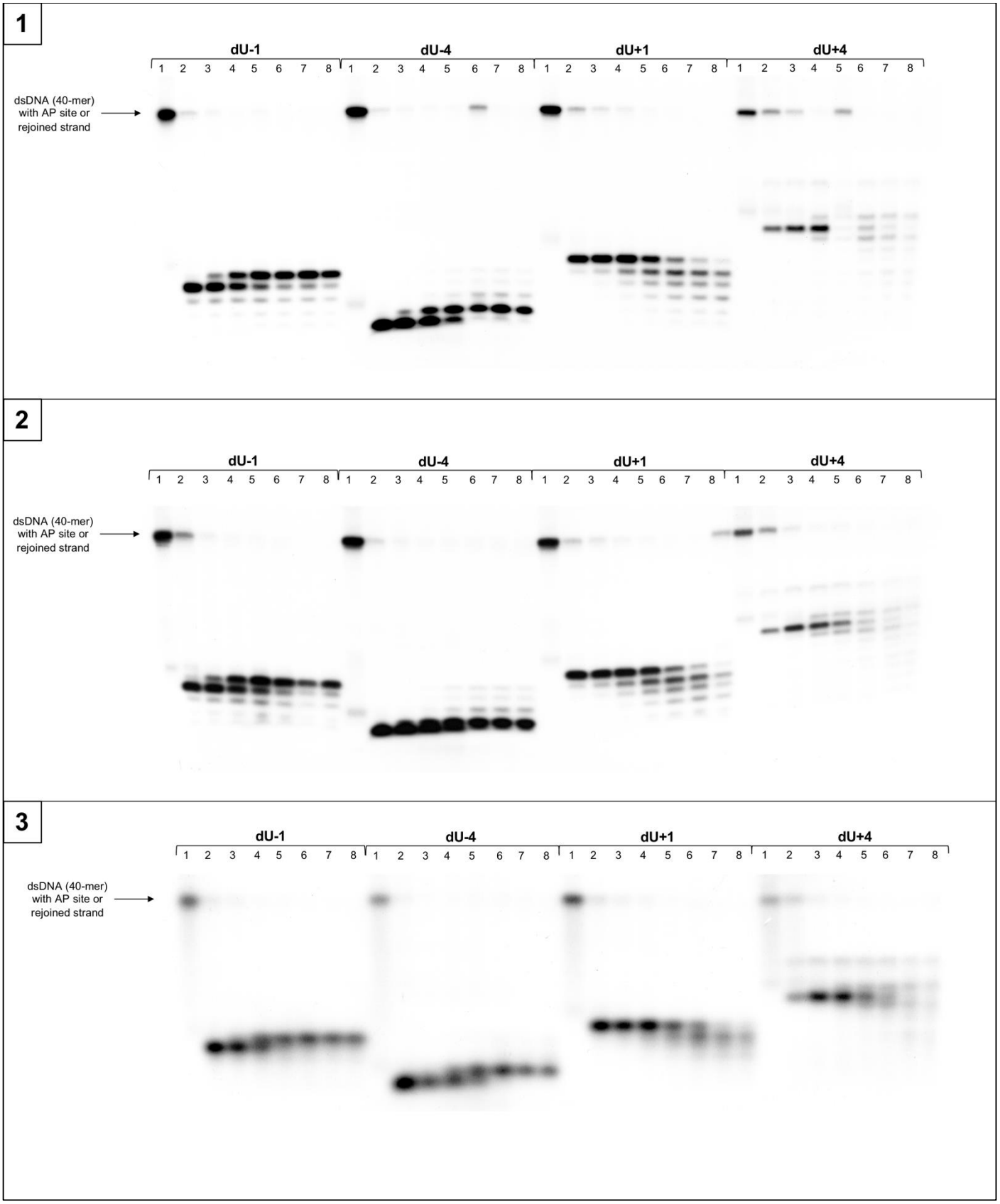
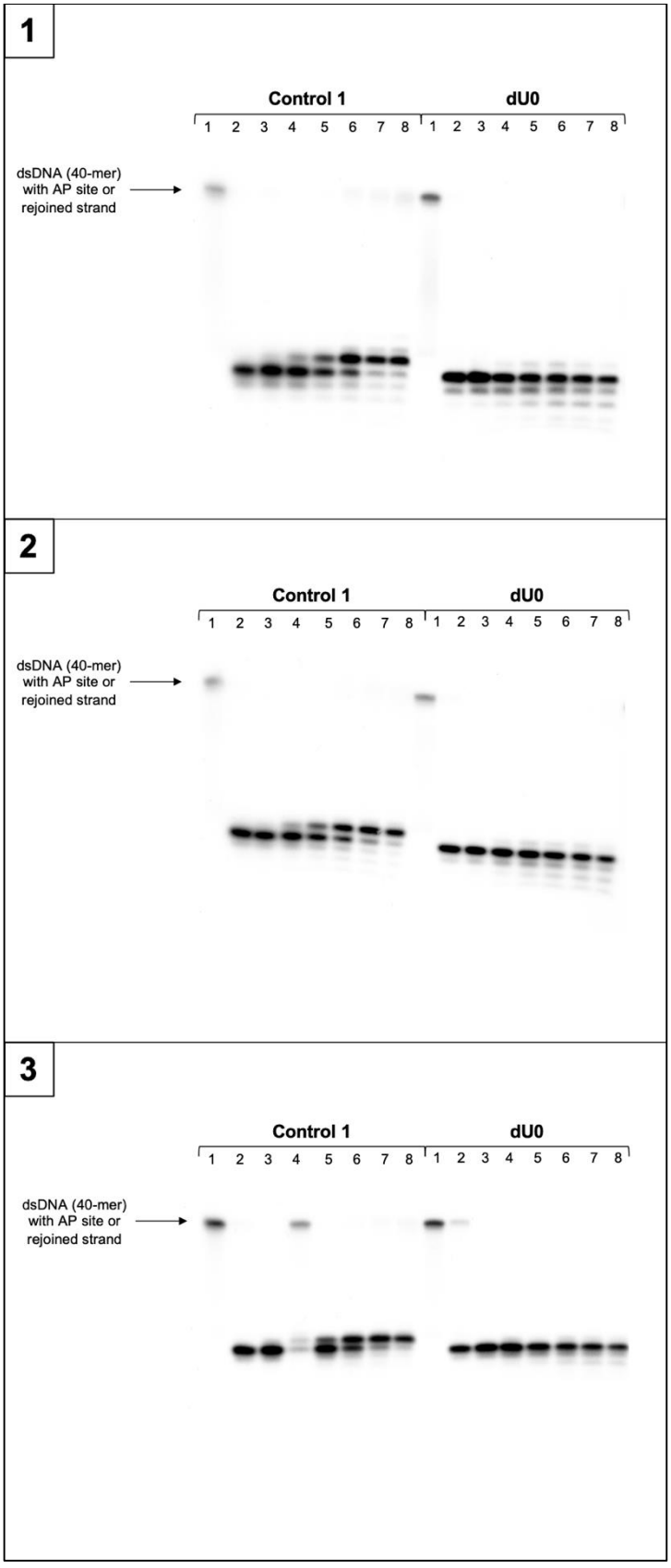


Figure S6. The autoradiograms presenting results of Control 1 and ds-CDL containing **ScdA** by **BJ** Cytoplasmic Extract.
Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.


1
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
2
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
3
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand

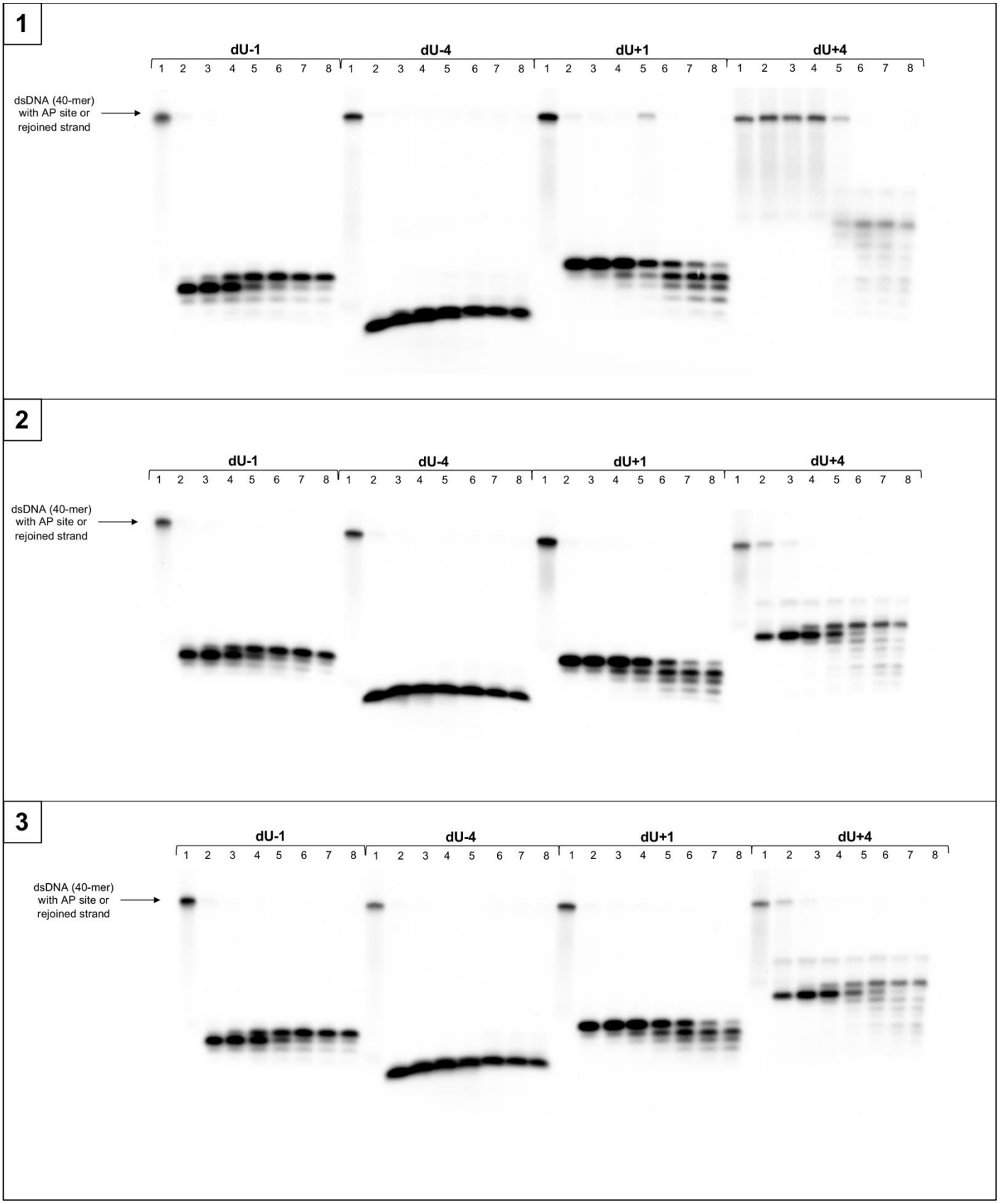
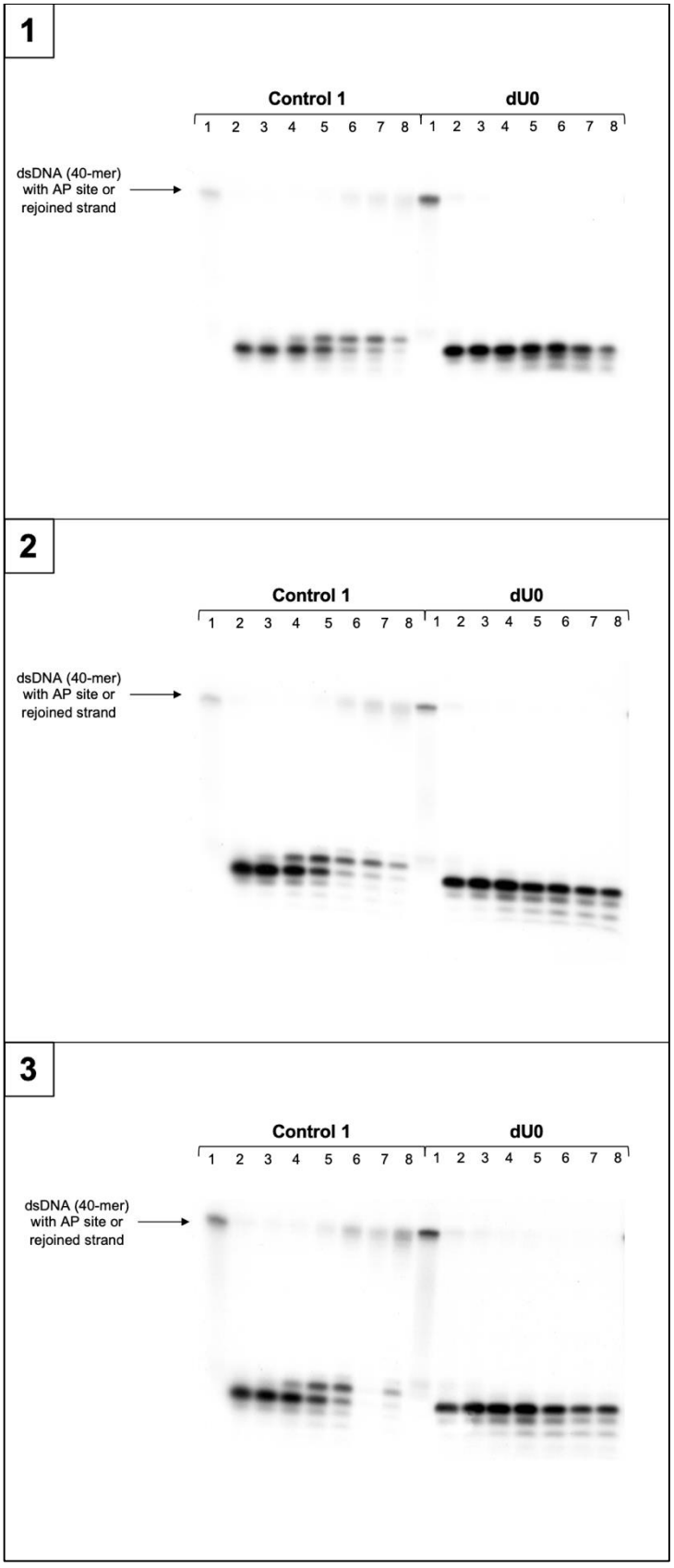


Figure S7. The autoradiograms presenting results of Control 1 and ds-CDL containing **RcdA** by **BJ** Cytoplasmic Extract.
Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.


1
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
2
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
3
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand

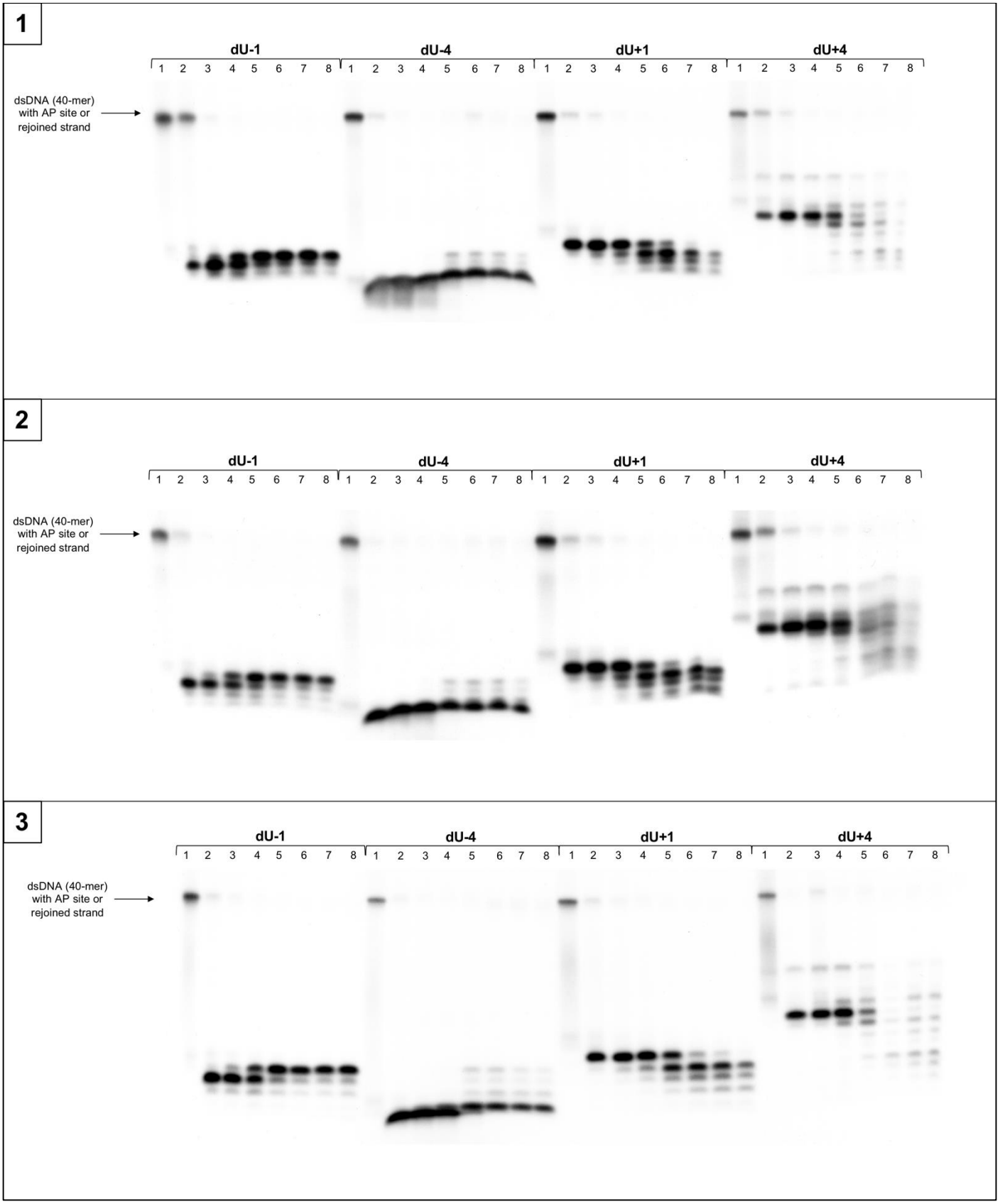
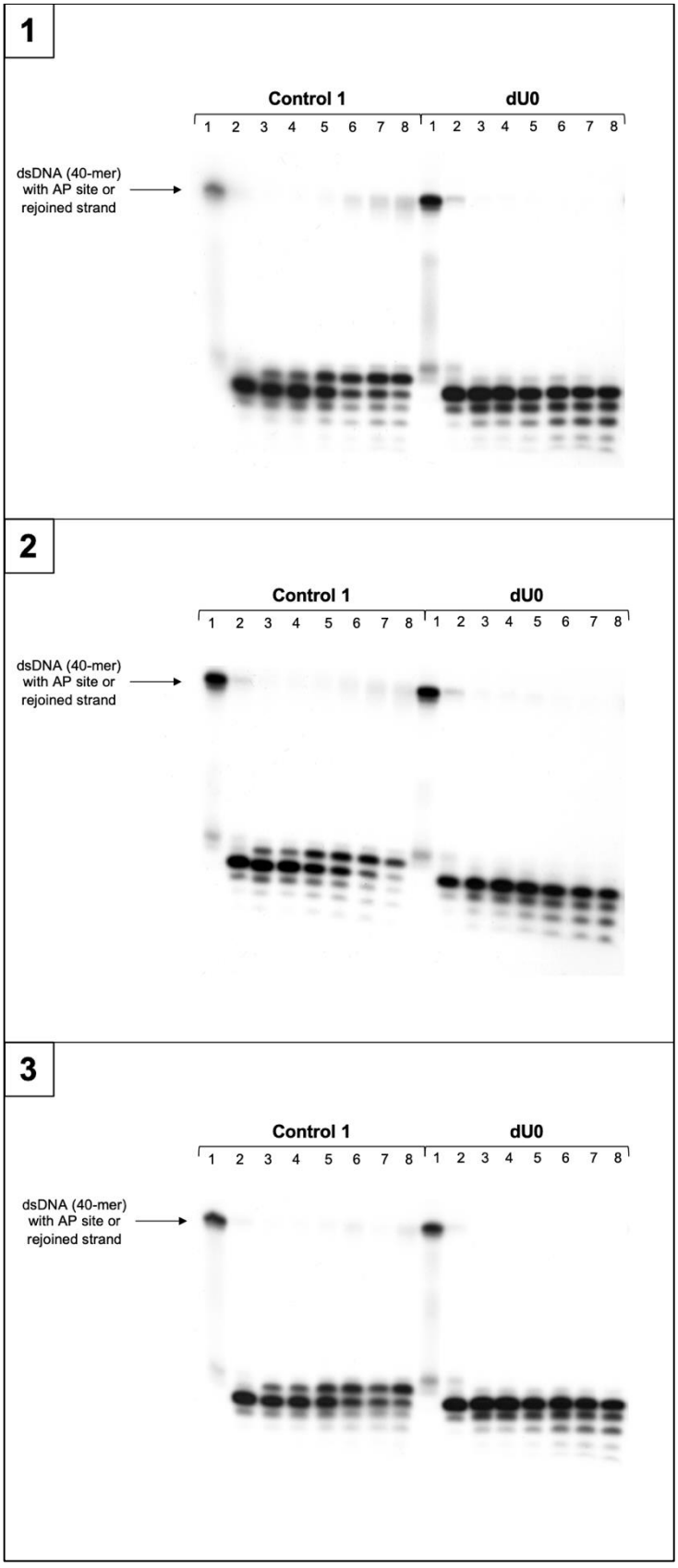


Figure S8. The autoradiograms presenting results of Control 1 and ds-CDL containing **ScdA** by **XPC** Cytoplasmic Extract. Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.


1
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
2
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand
3
Control 1
dU0
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
dsDNA (40-mer)
with AP site or
rejoined strand

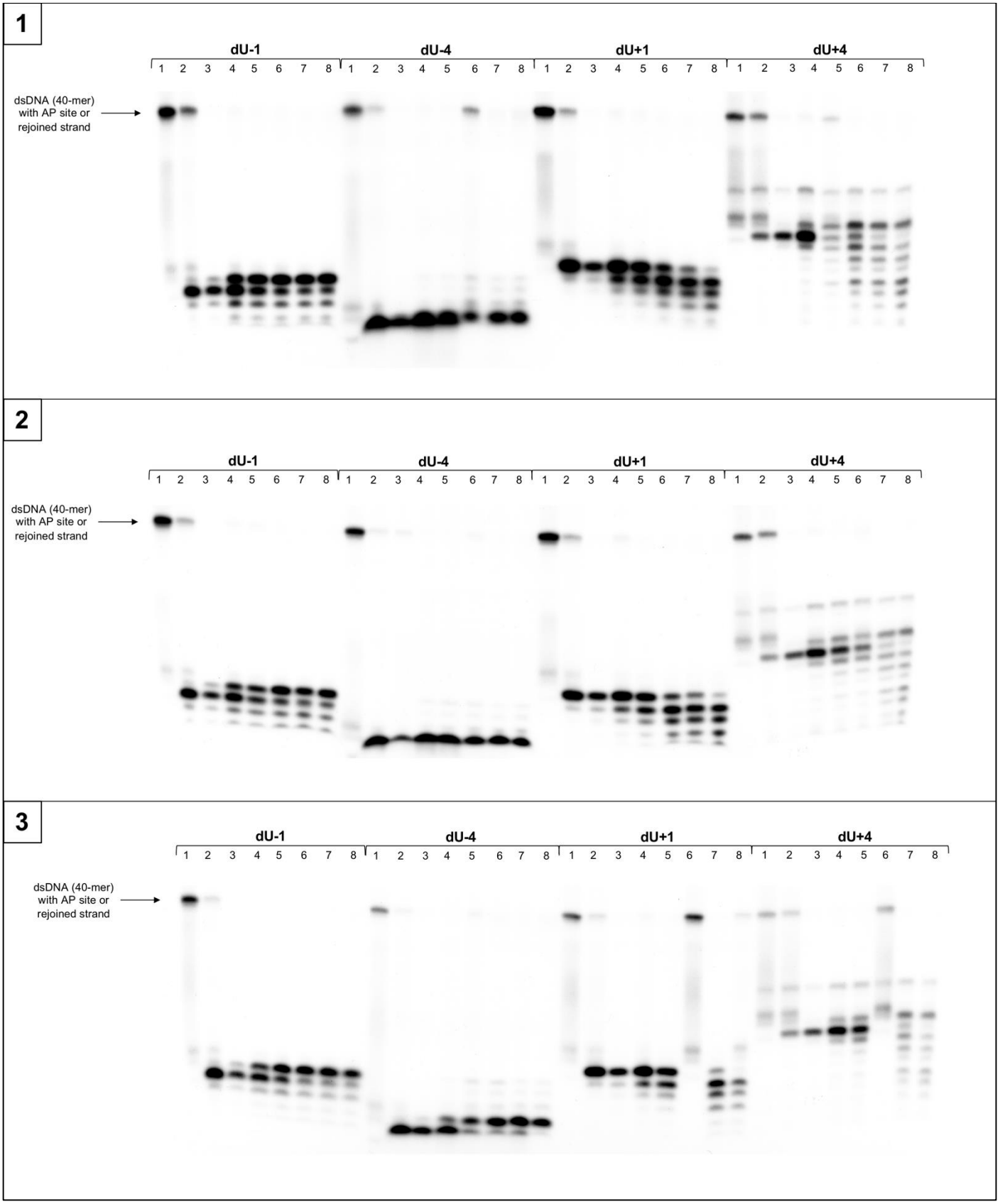
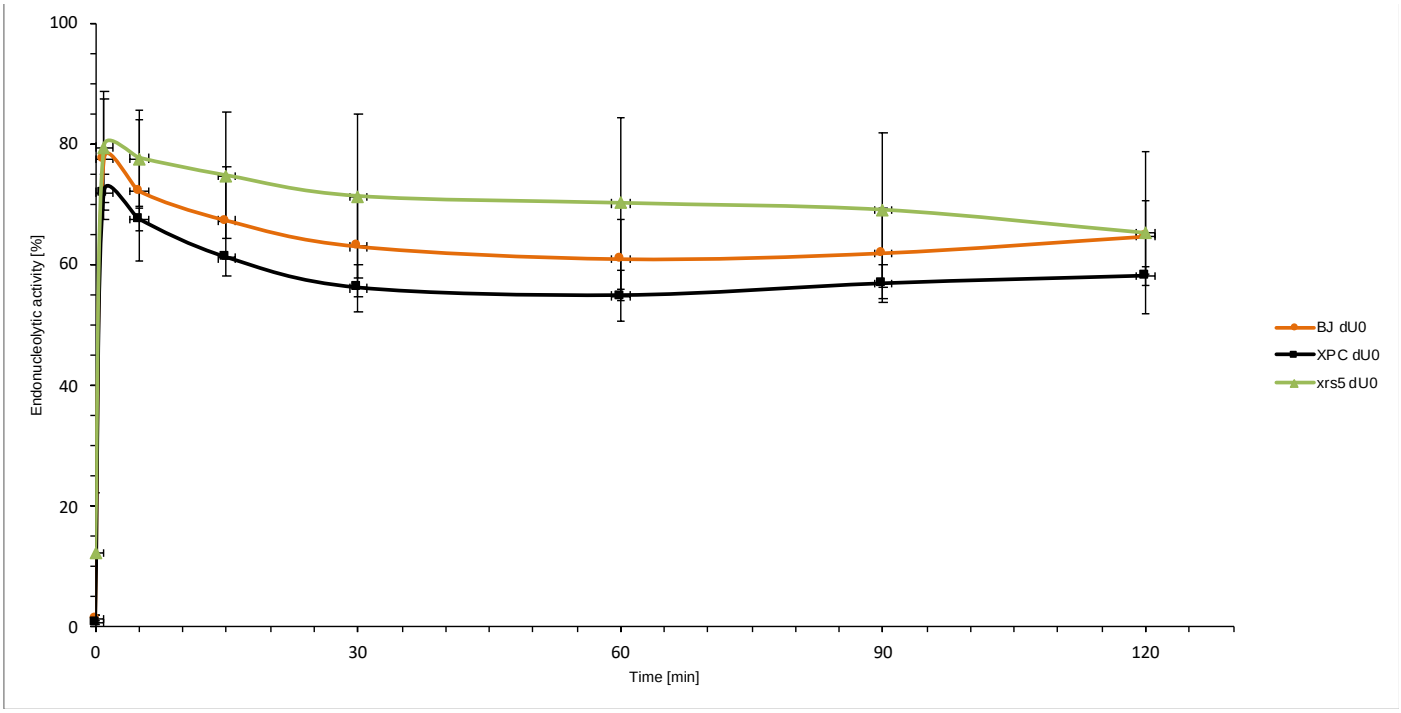
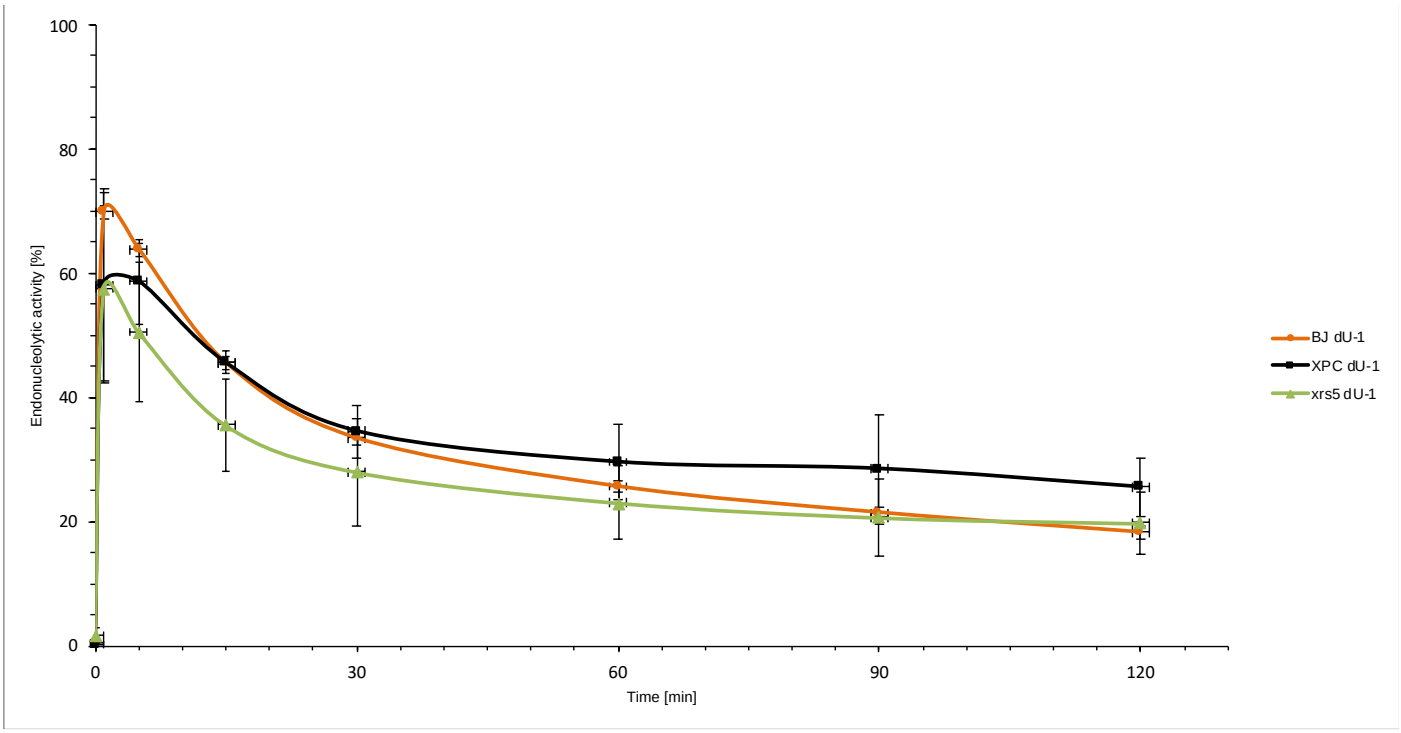
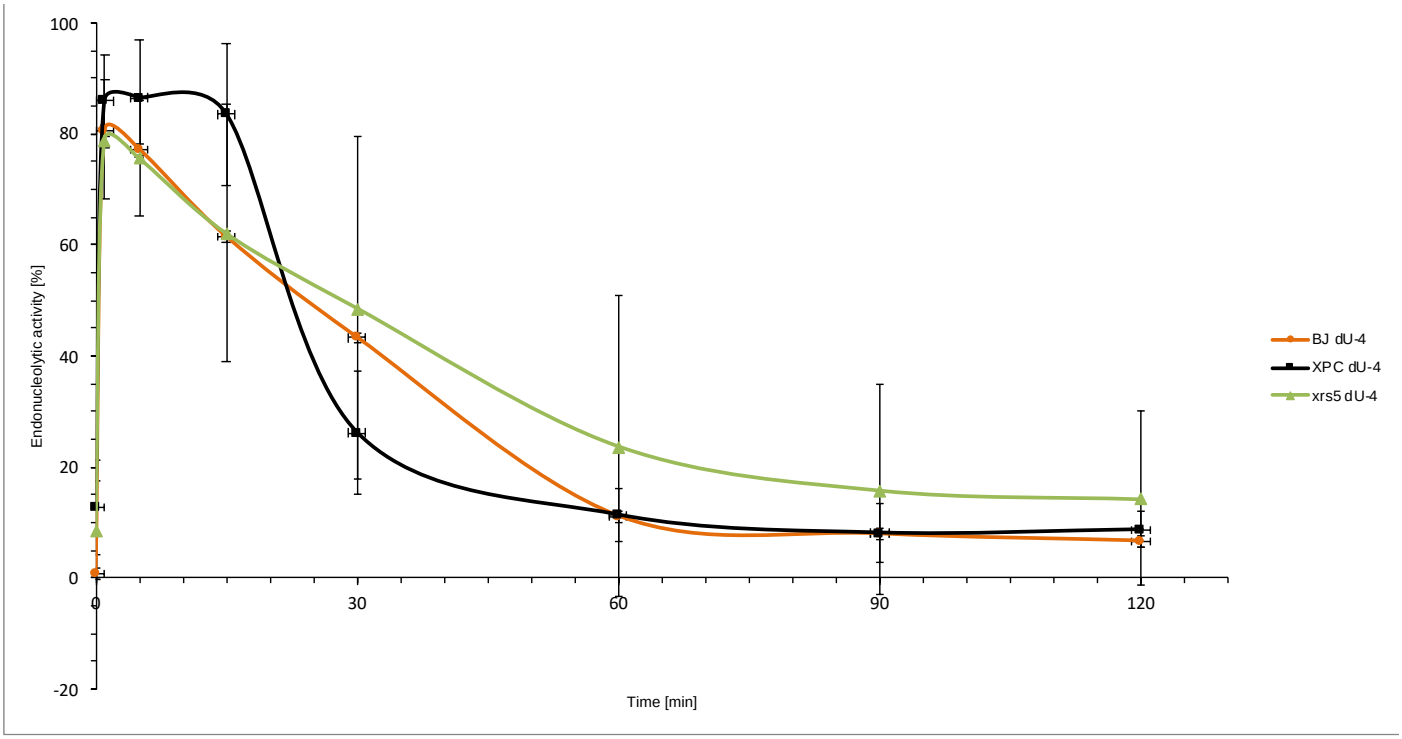


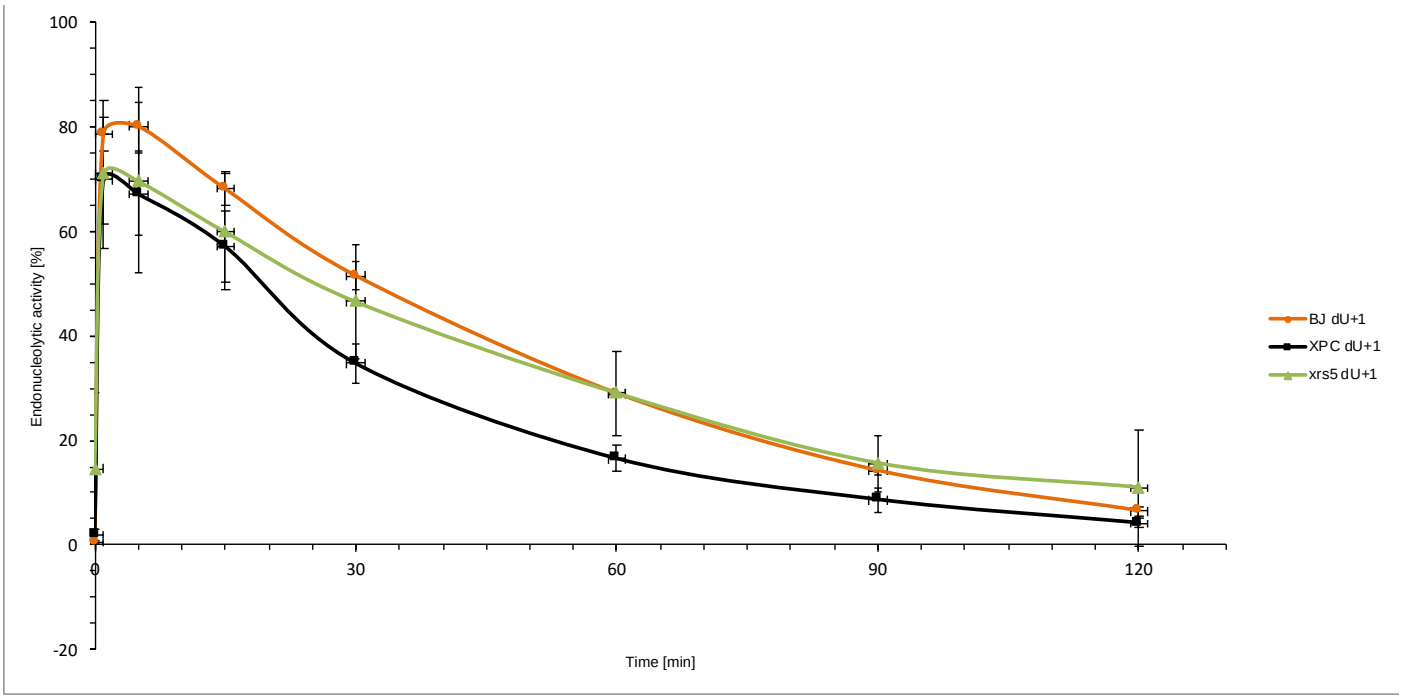
Figure S9. The autoradiograms presenting results of Control 1 and ds-CDL containing **RcdA** by **XPC** Cytoplasmic Extract. Lanes correspond with different assay time: lane 1 - 0 min; lane 2 - 1 min; lane 3 – 5 min; lane 4 – 15 min; lane 5 – 30 min; lane 6 – 60 min; lane 7 – 90 min; lane 8 – 120 min. Three replications of the experiment are shown.

Graphical representation of DNA repair assays' results - comparison of individual strands between cell lines


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


100
80
60
40
20
0
-20
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
-20
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

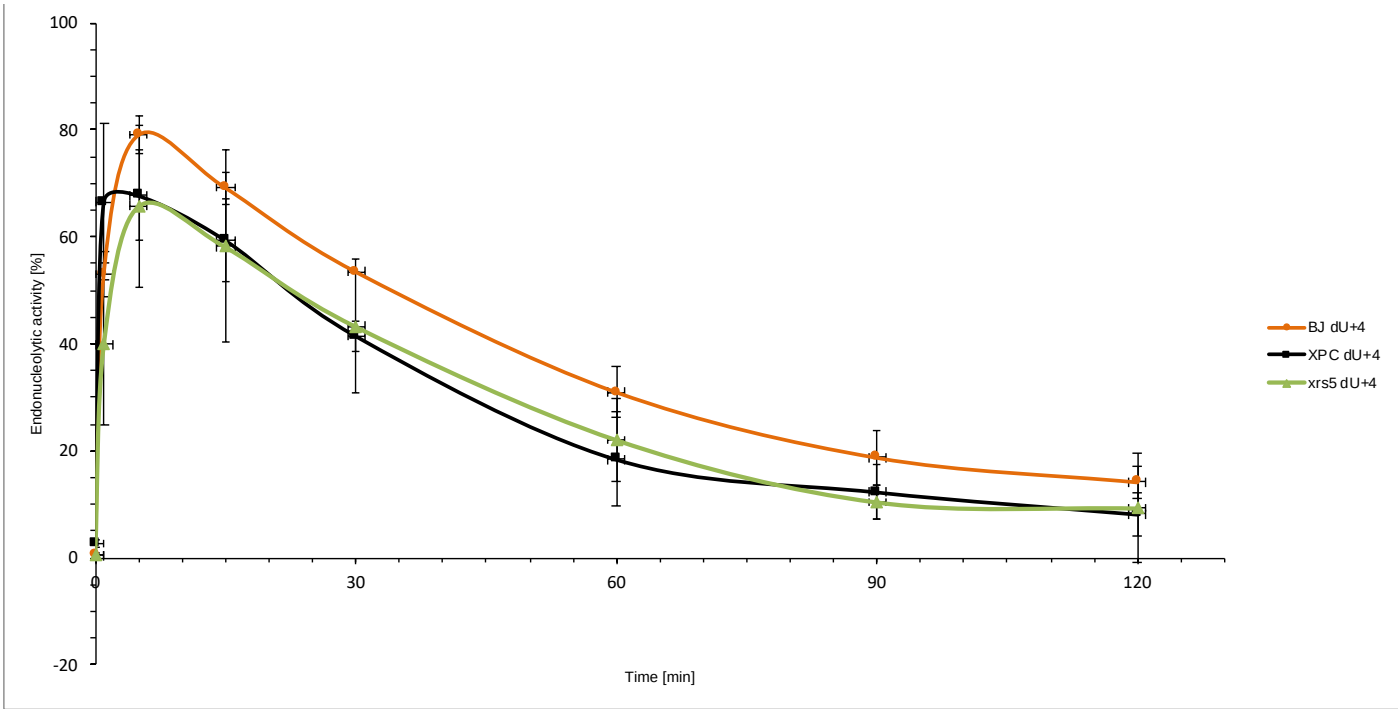
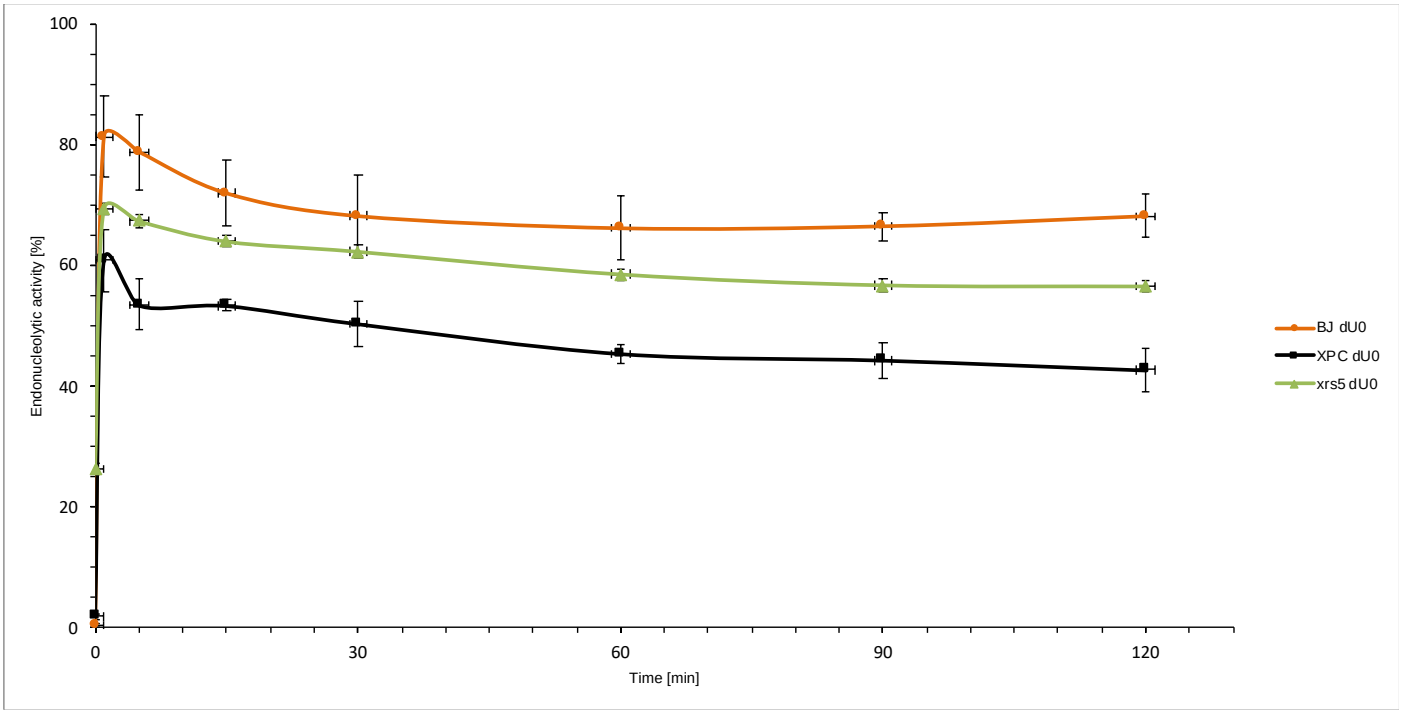
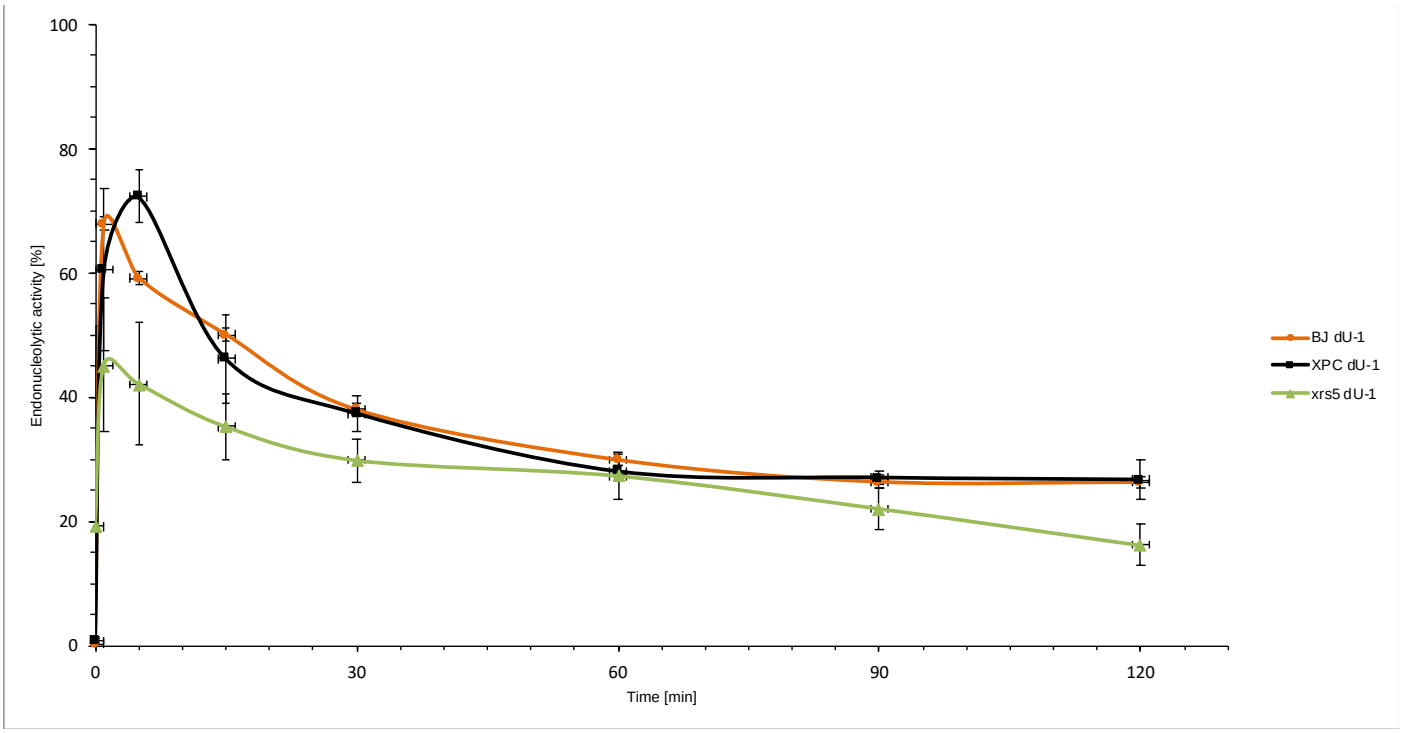
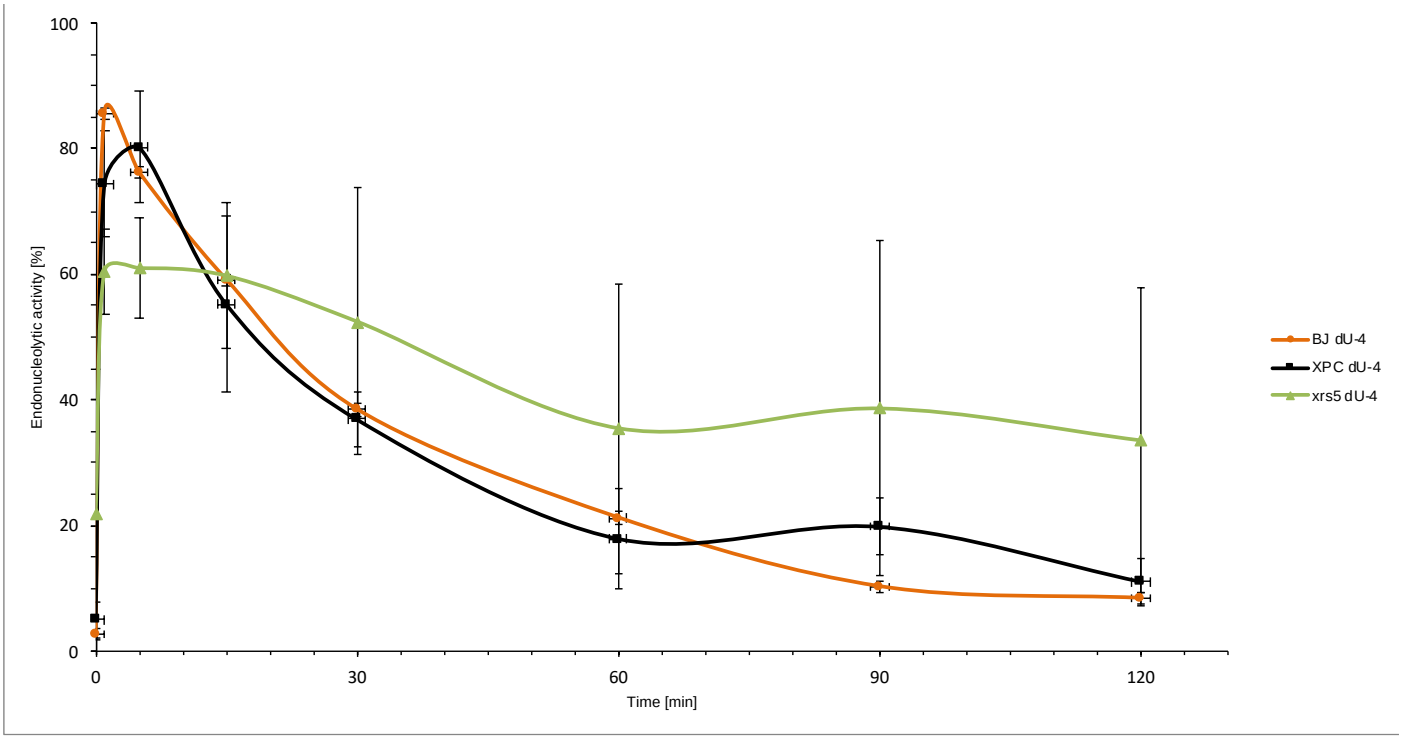
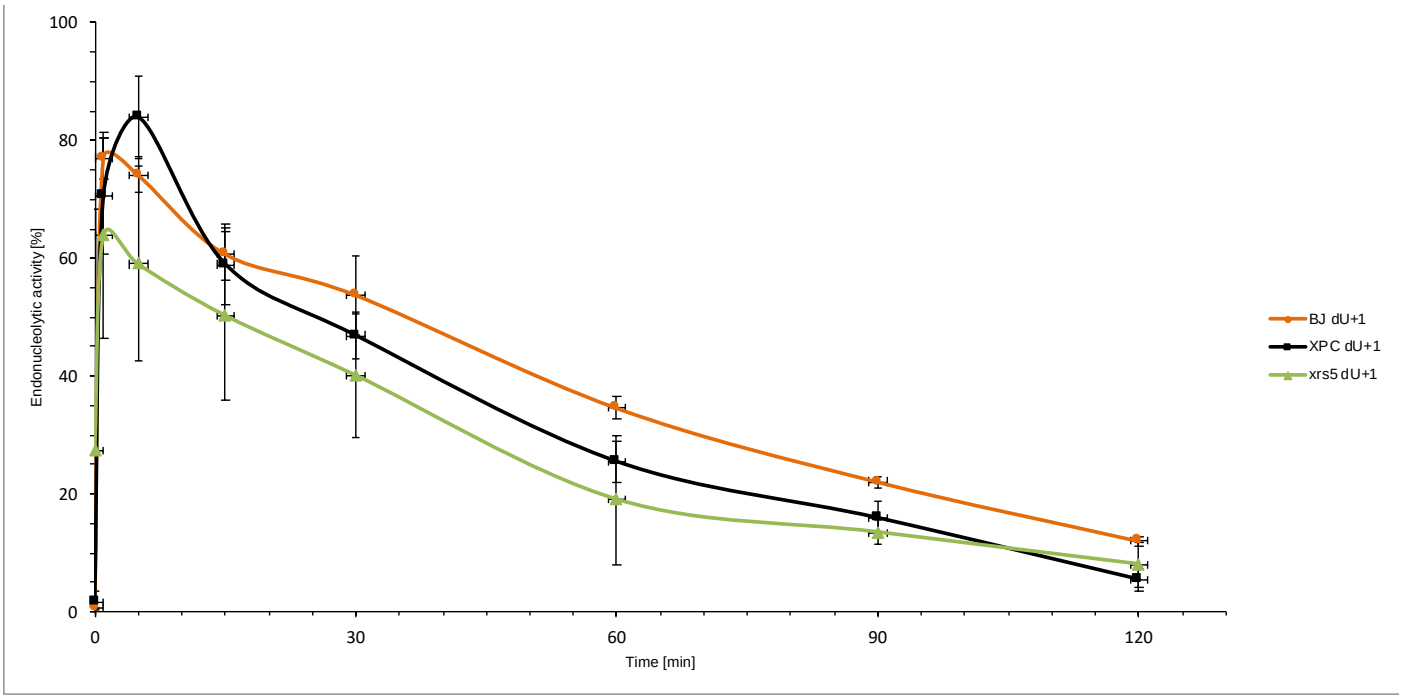


Figure S10. Endonucleolytic activity (strand incision) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **ScdA** Cytoplasmic Extract.


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
Endonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

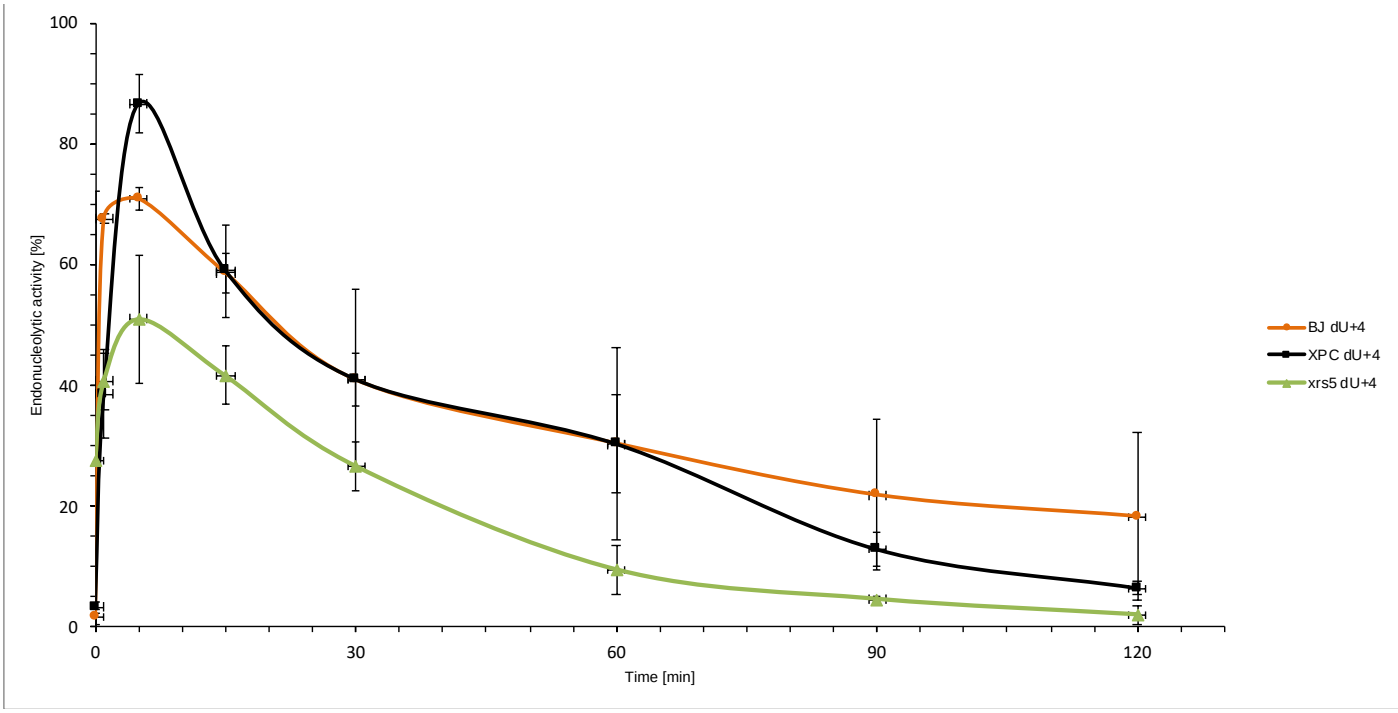
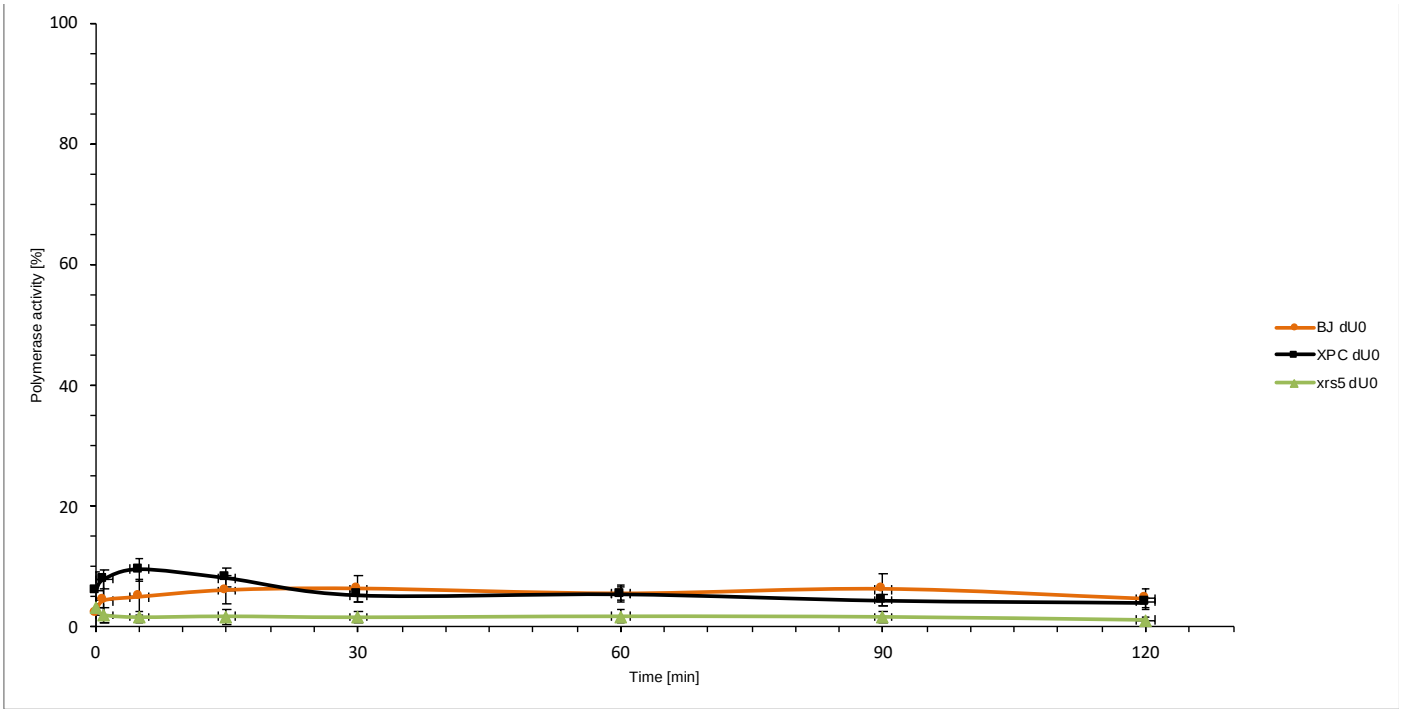
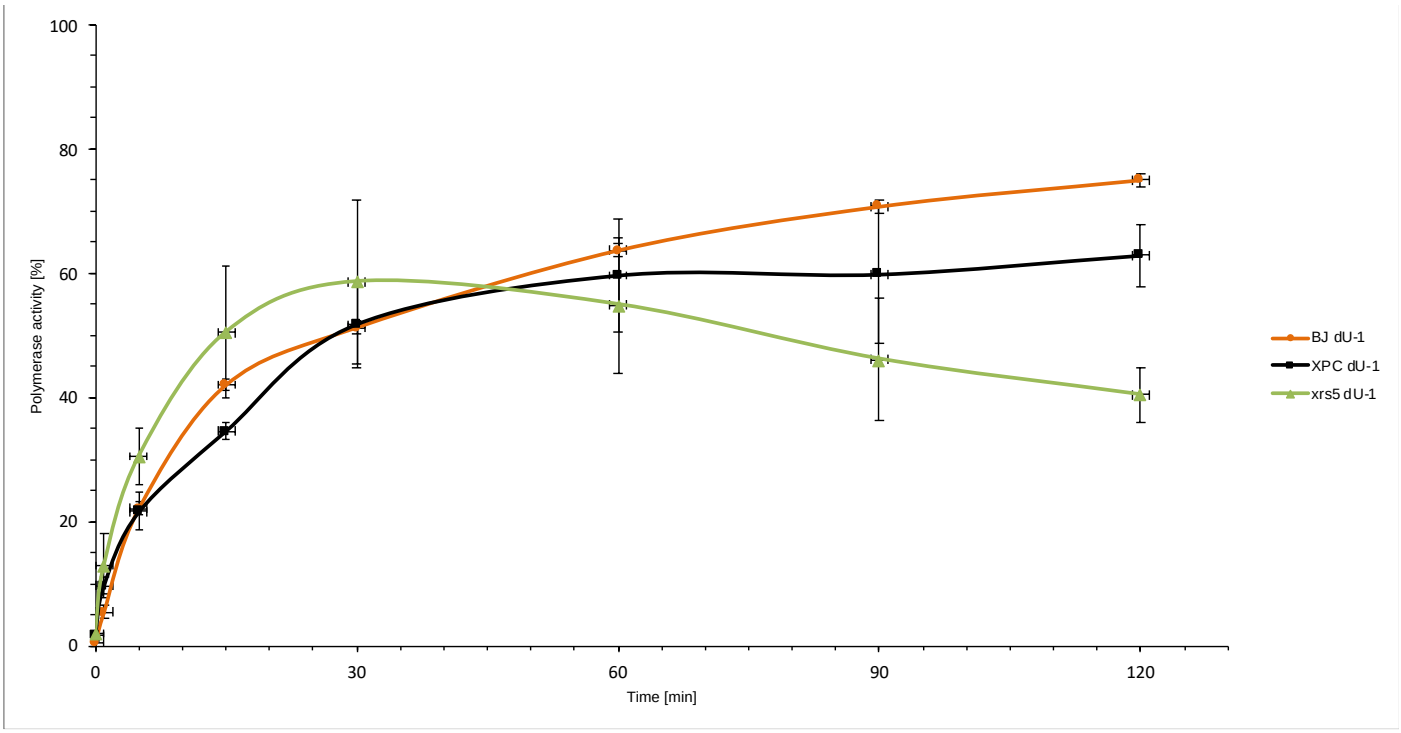
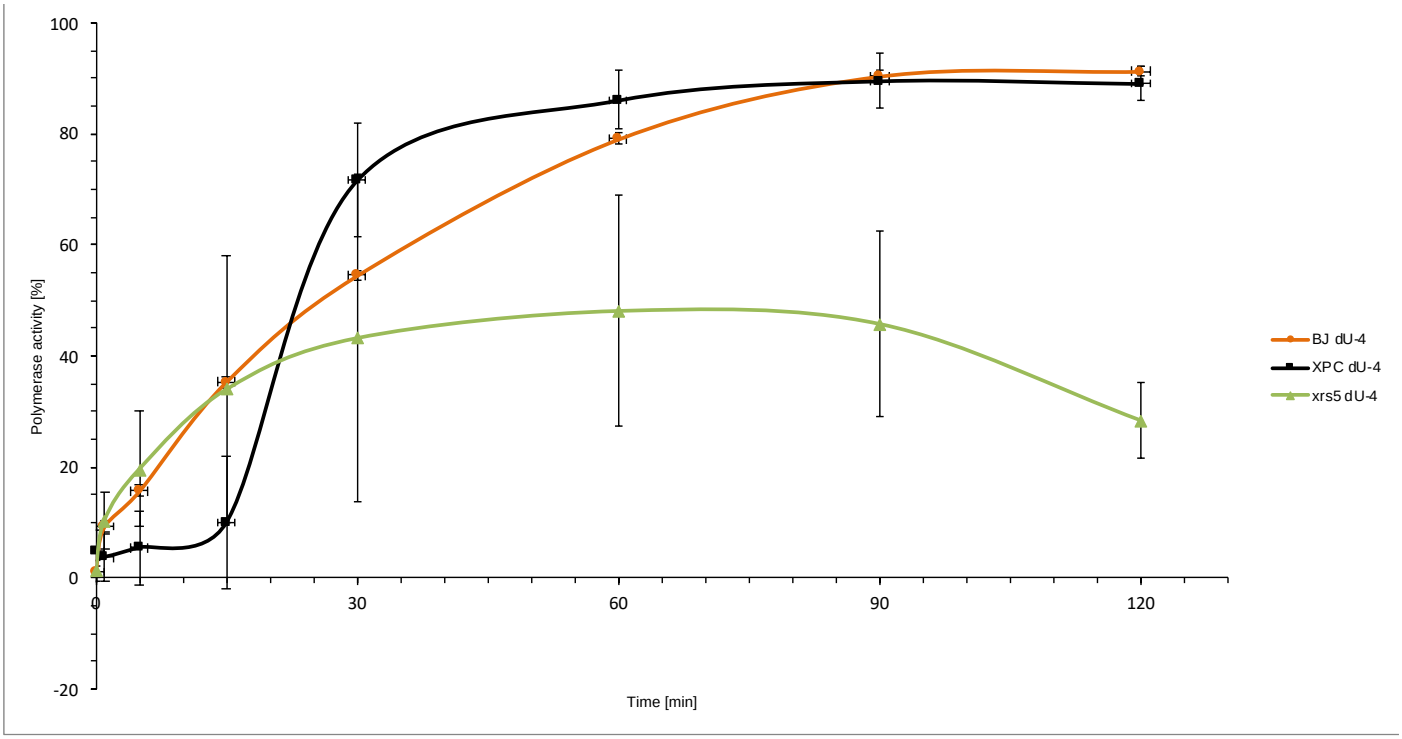
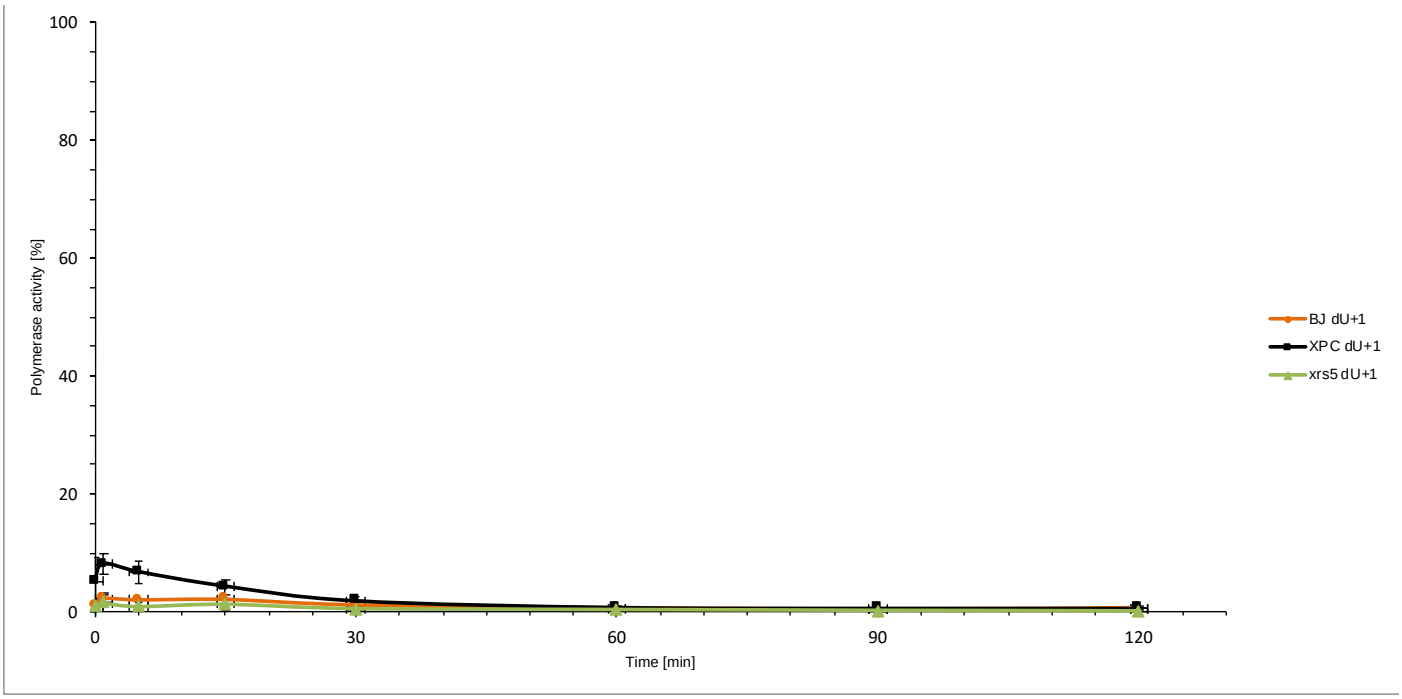


Figure S11. Endonucleolytic activity (strand incision) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **RcdA** Cytoplasmic Extract.


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


100
80
60
40
20
0
-20
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

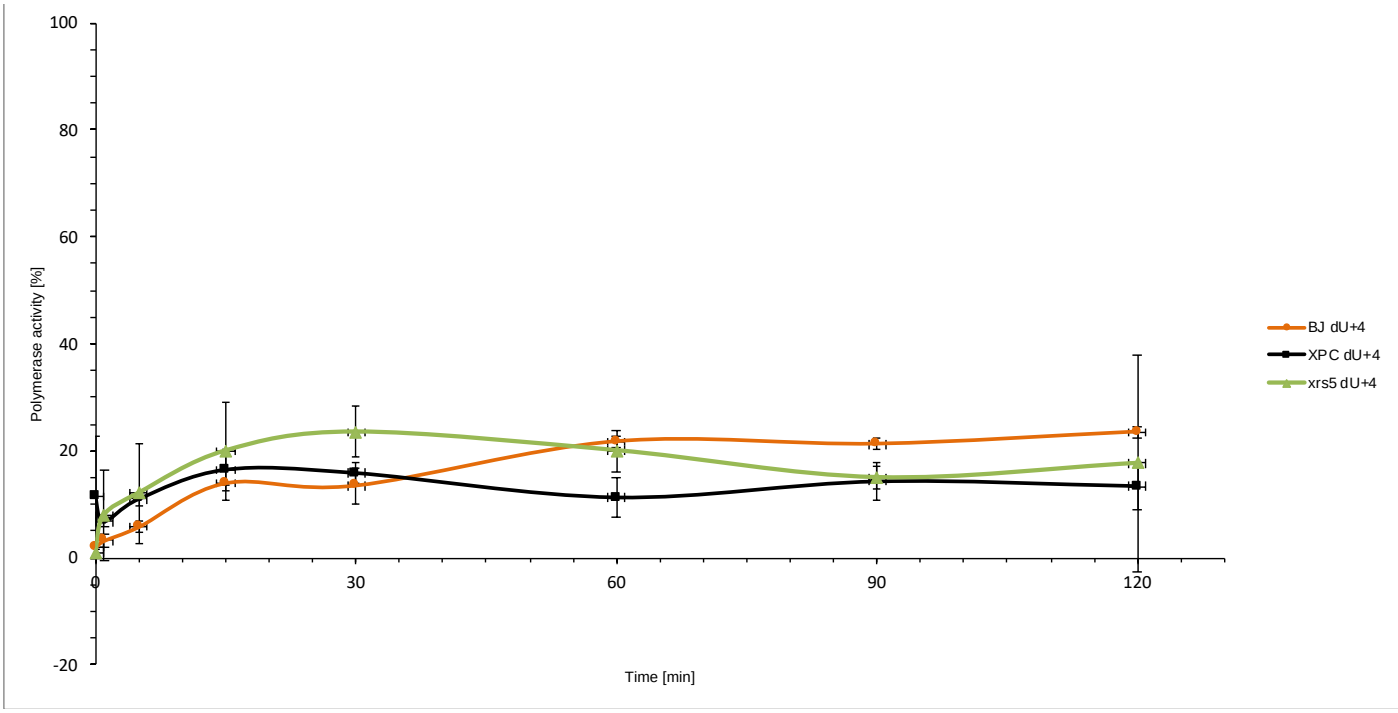
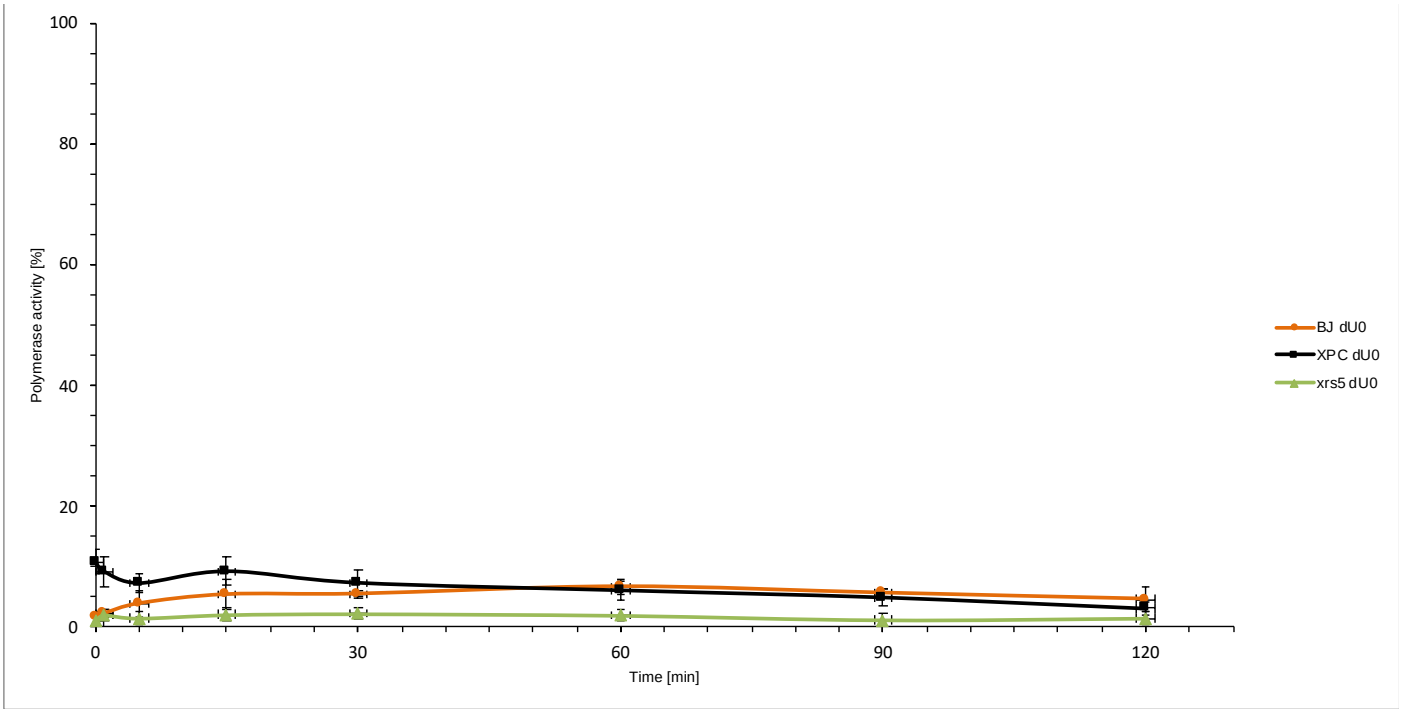
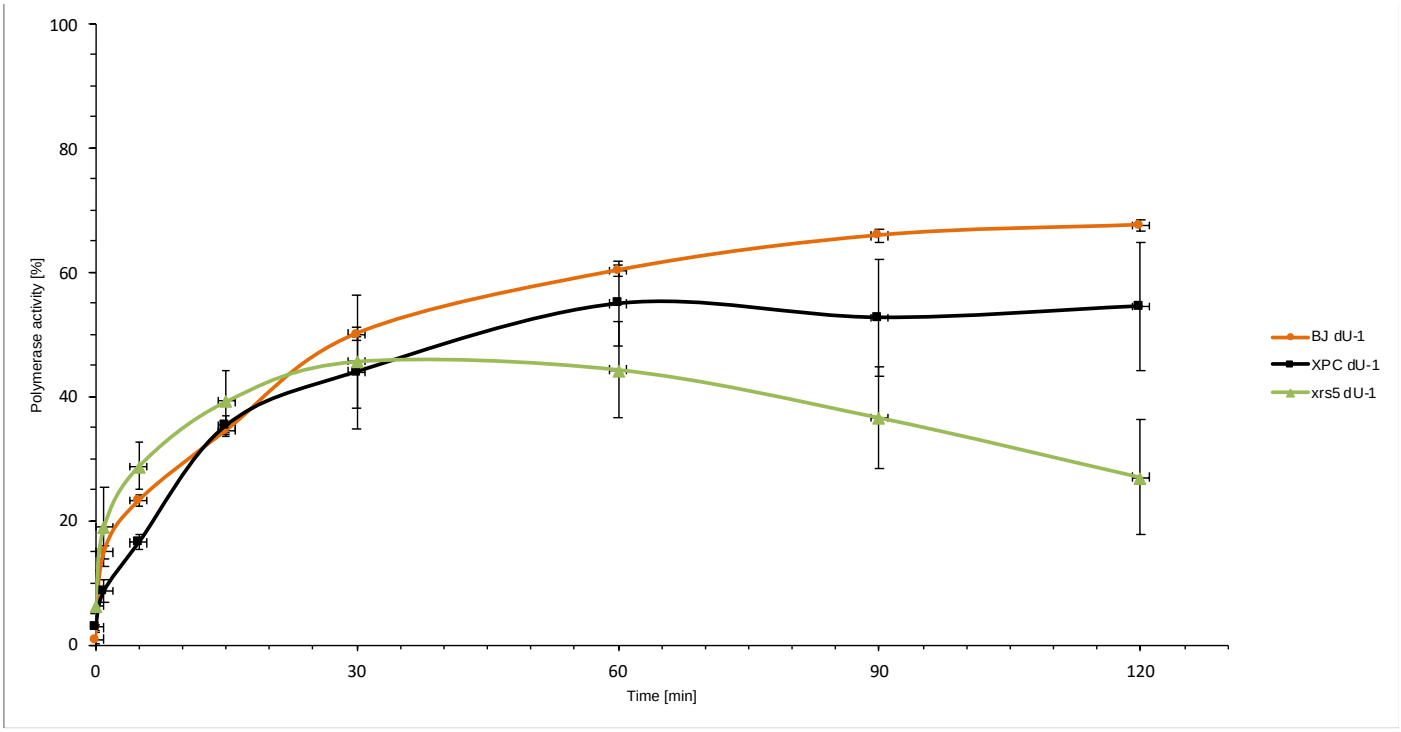
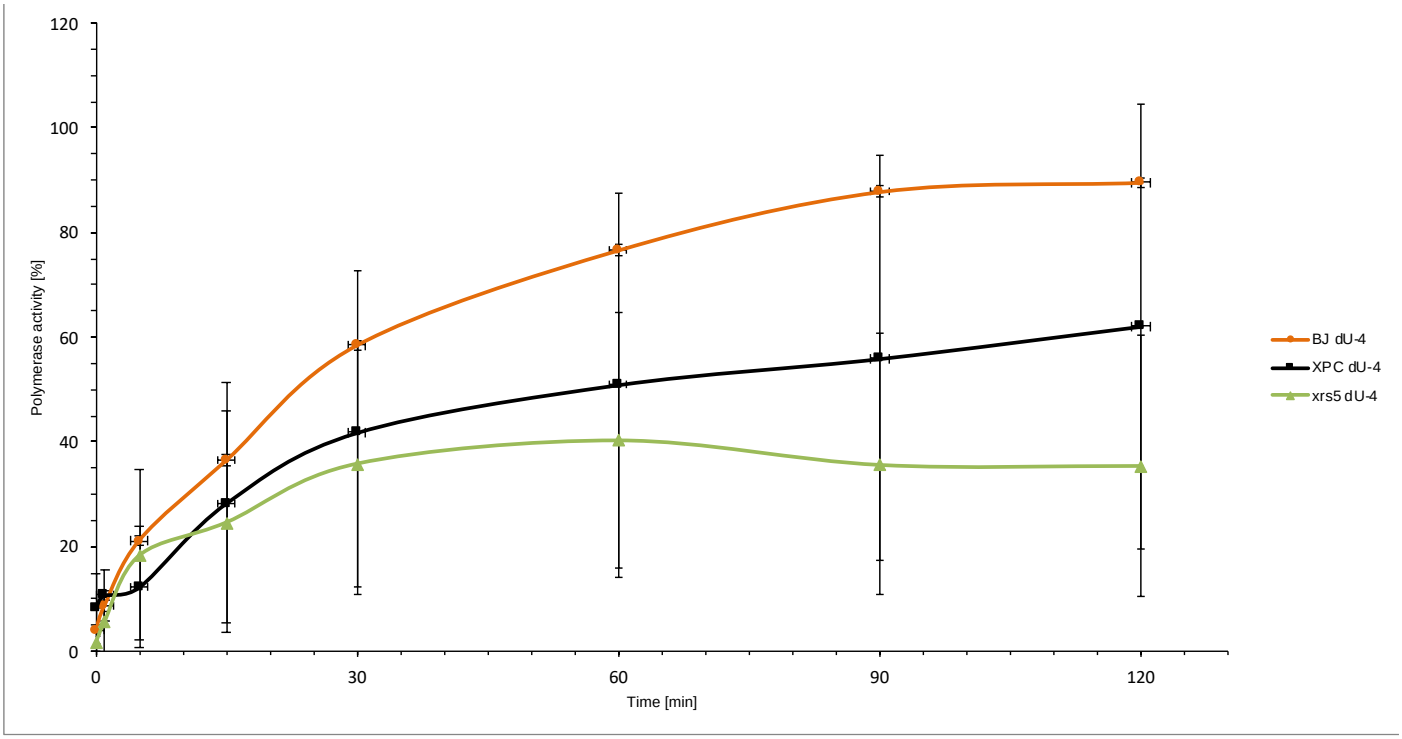
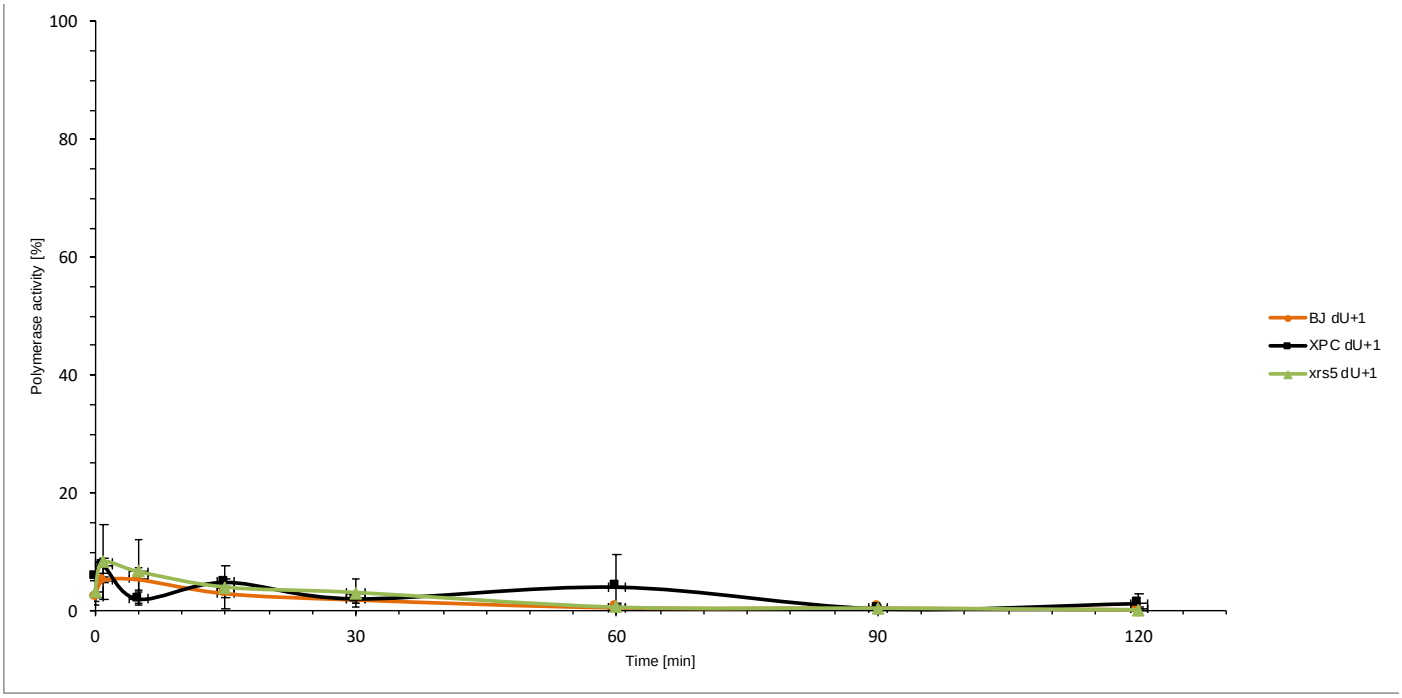


Figure S12. Polymerase activity (strand elongation) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **ScdA** Cytoplasmic Extract.


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


120
100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
Polymerase activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

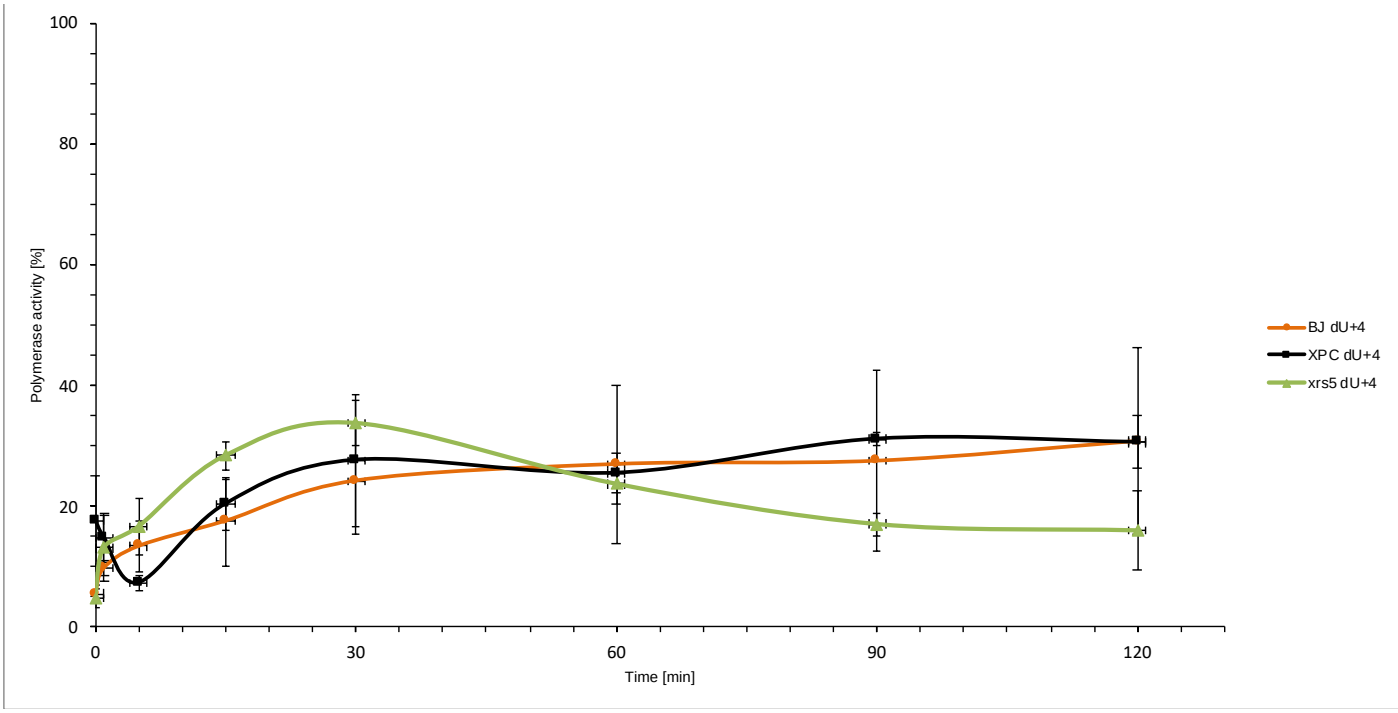
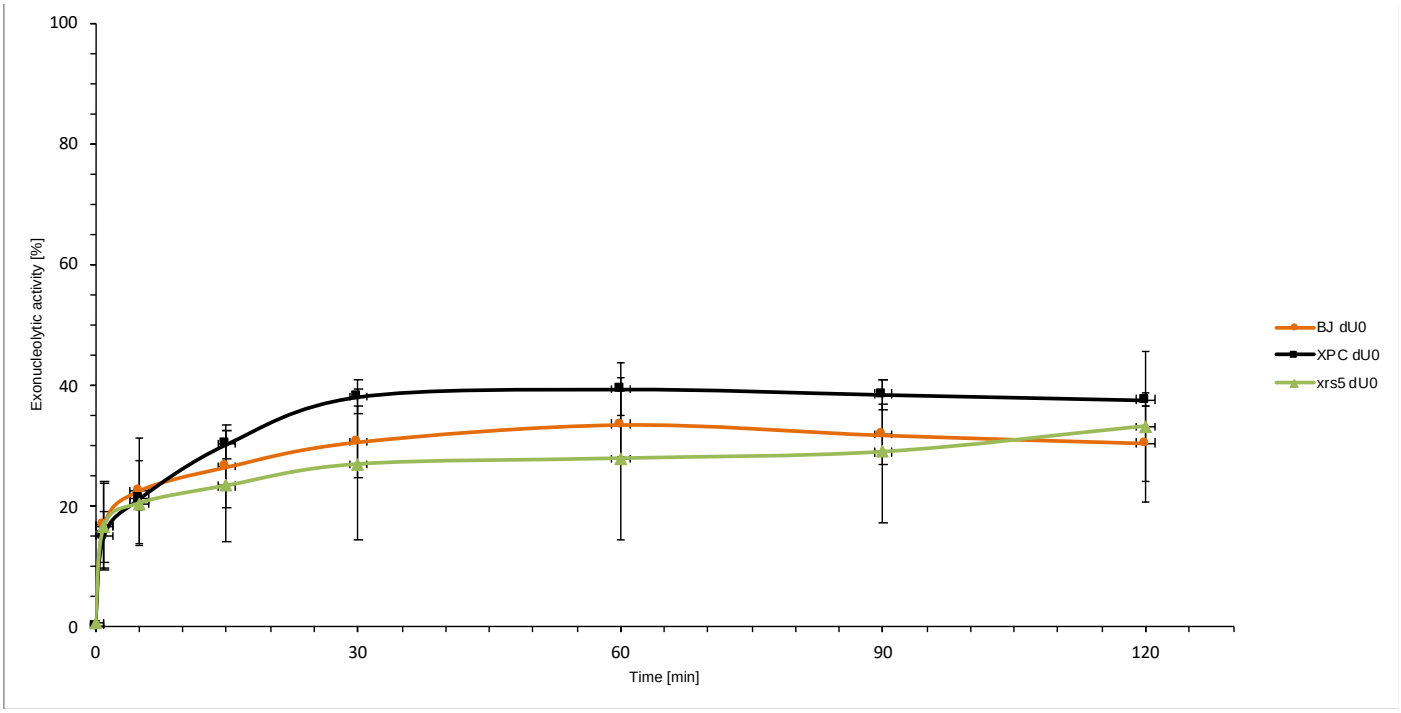
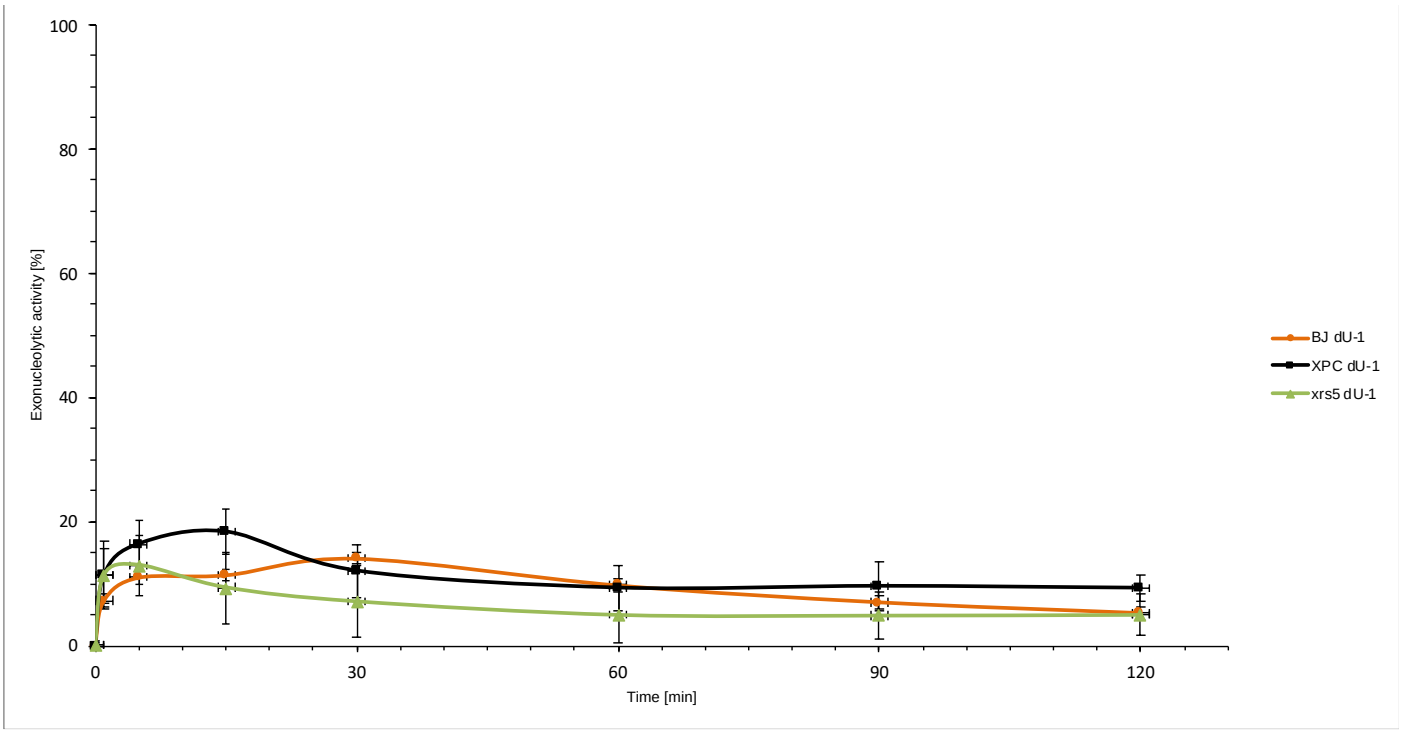
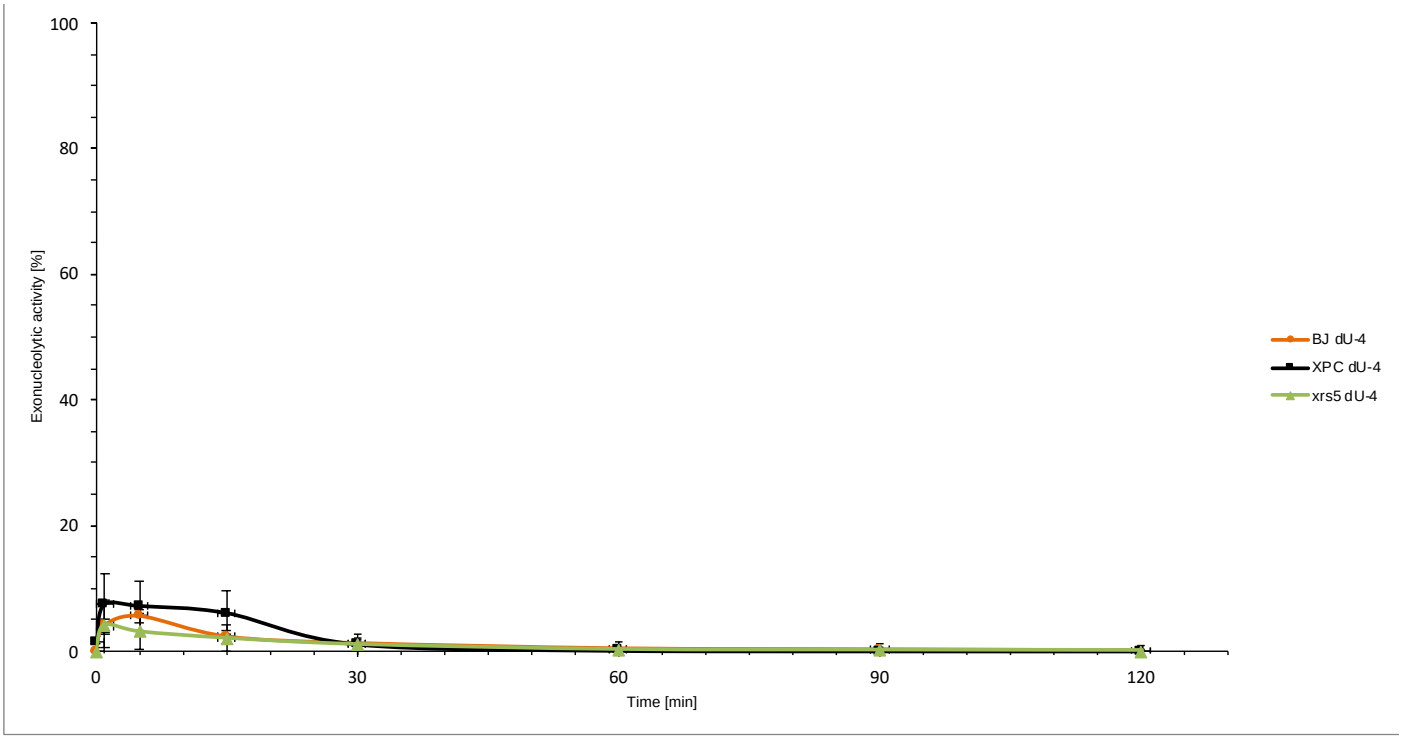
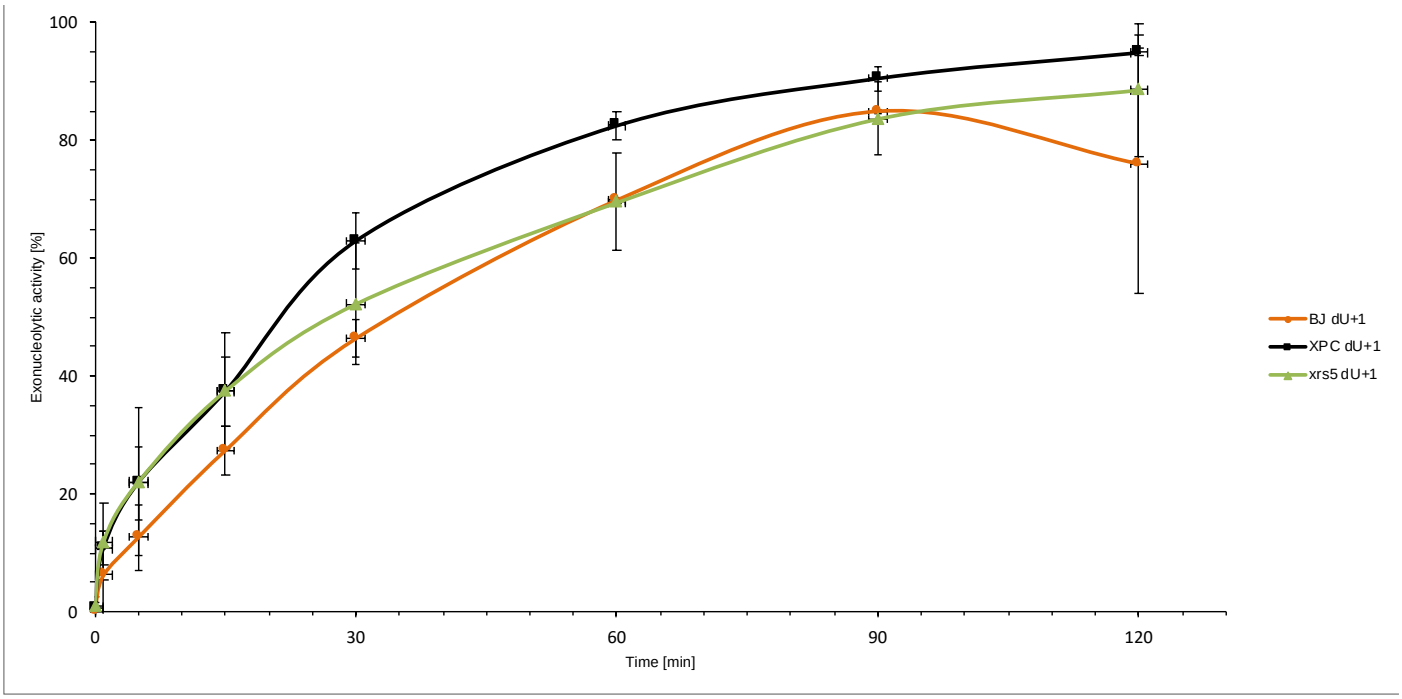


Figure S13. Polymerase activity (strand elongation) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **RcdA** Cytoplasmic Extract.


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

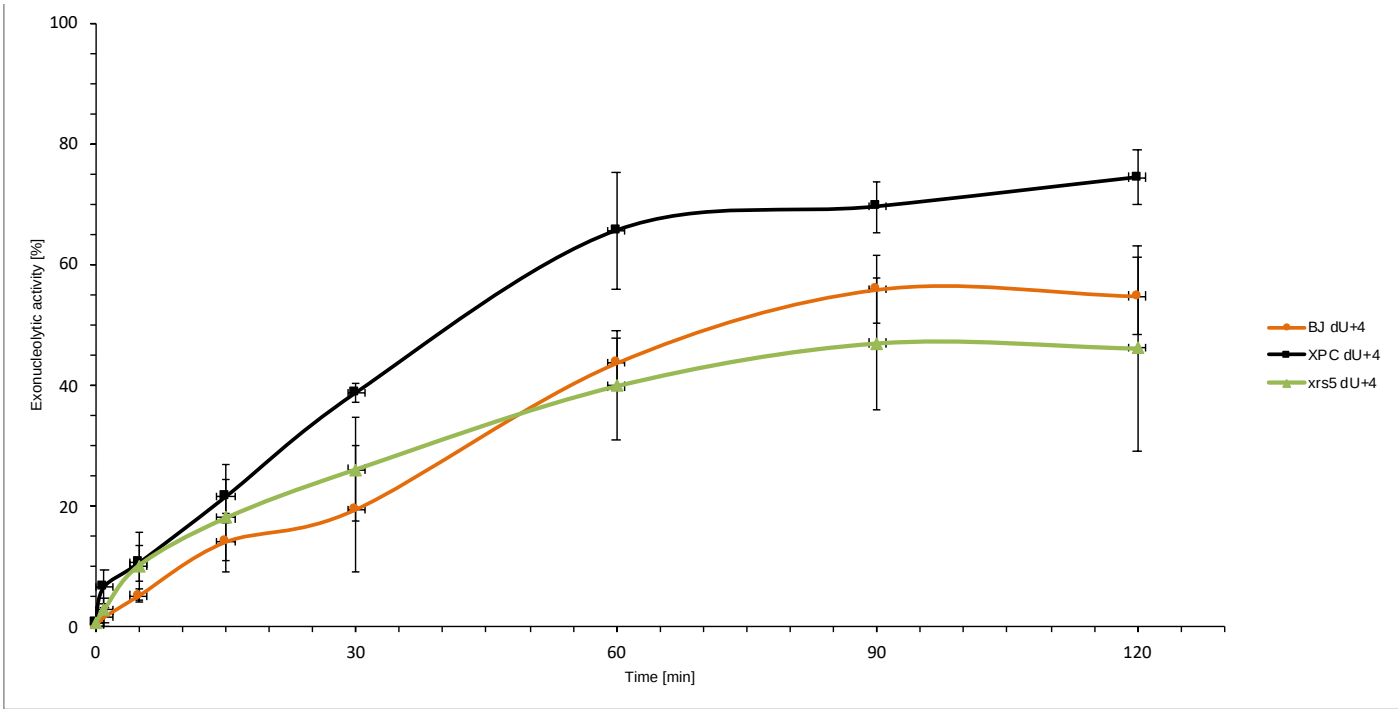
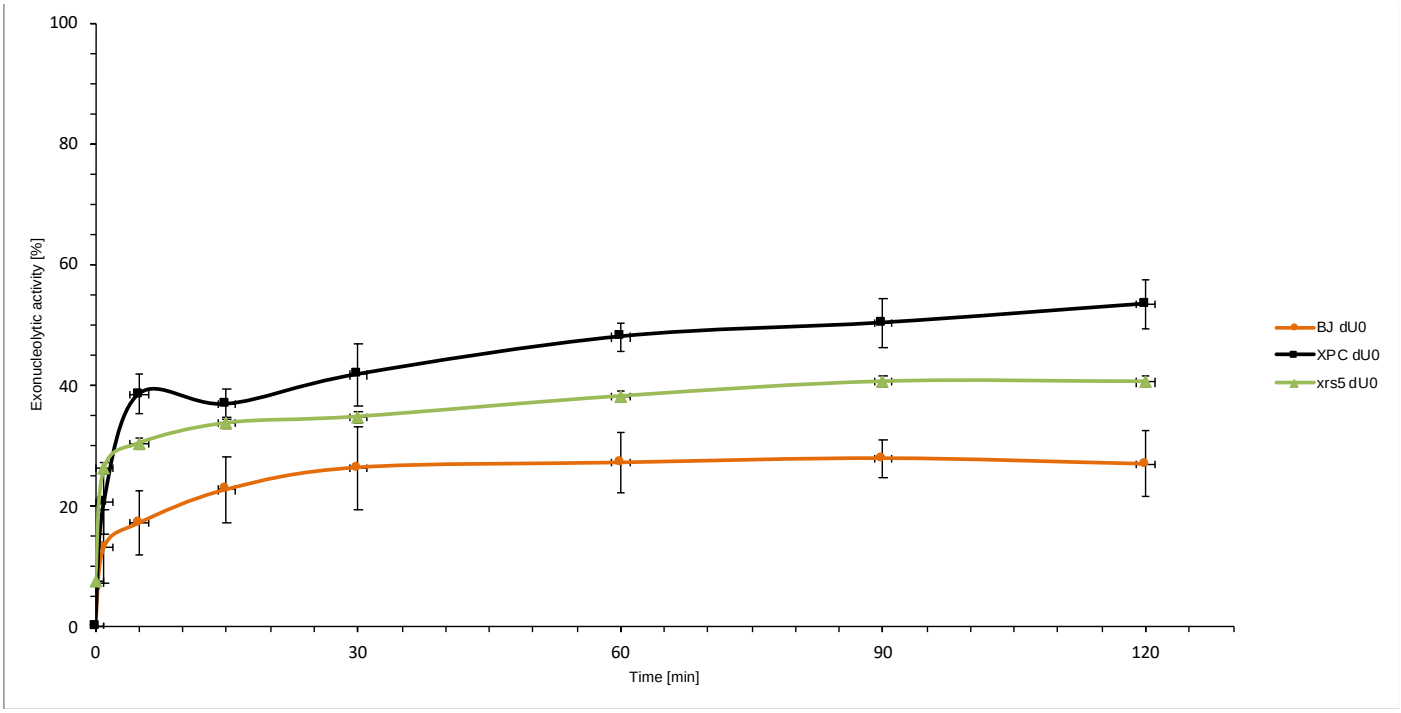
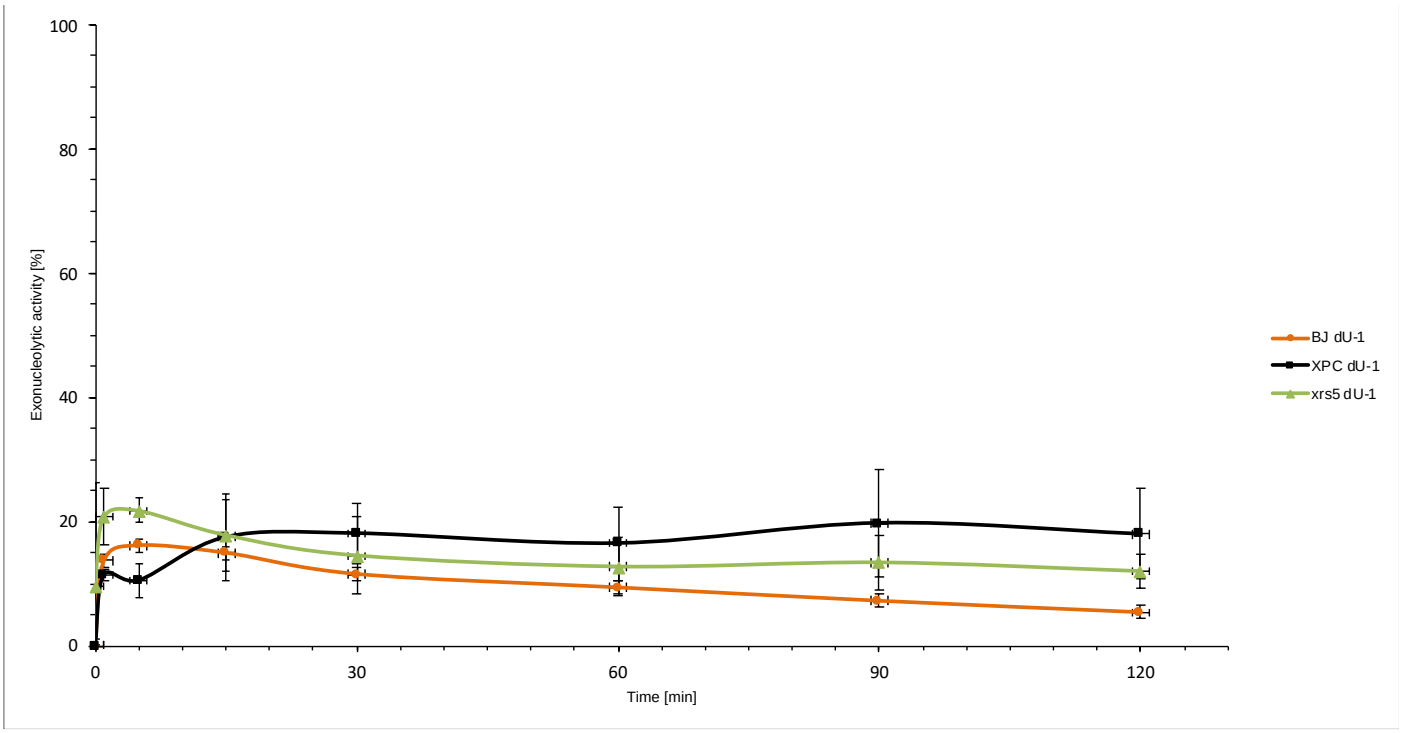
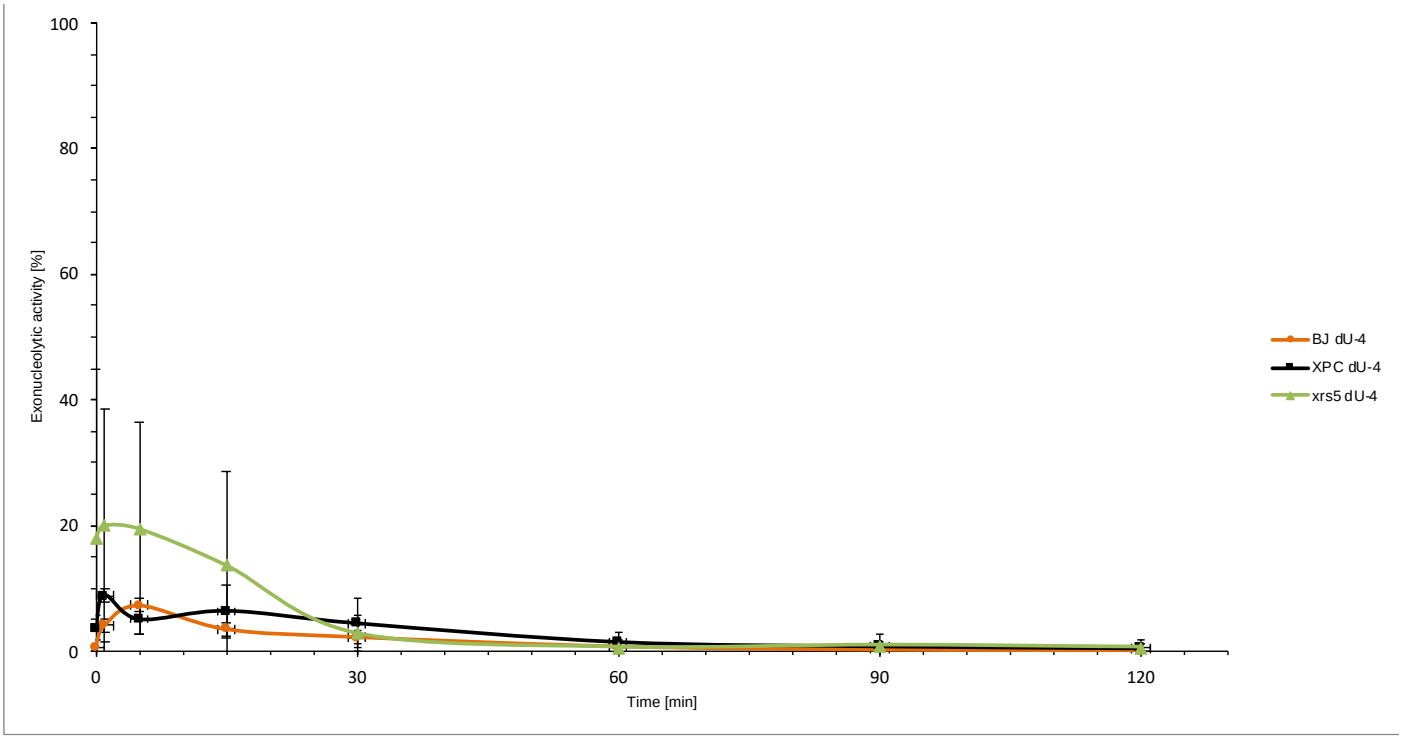
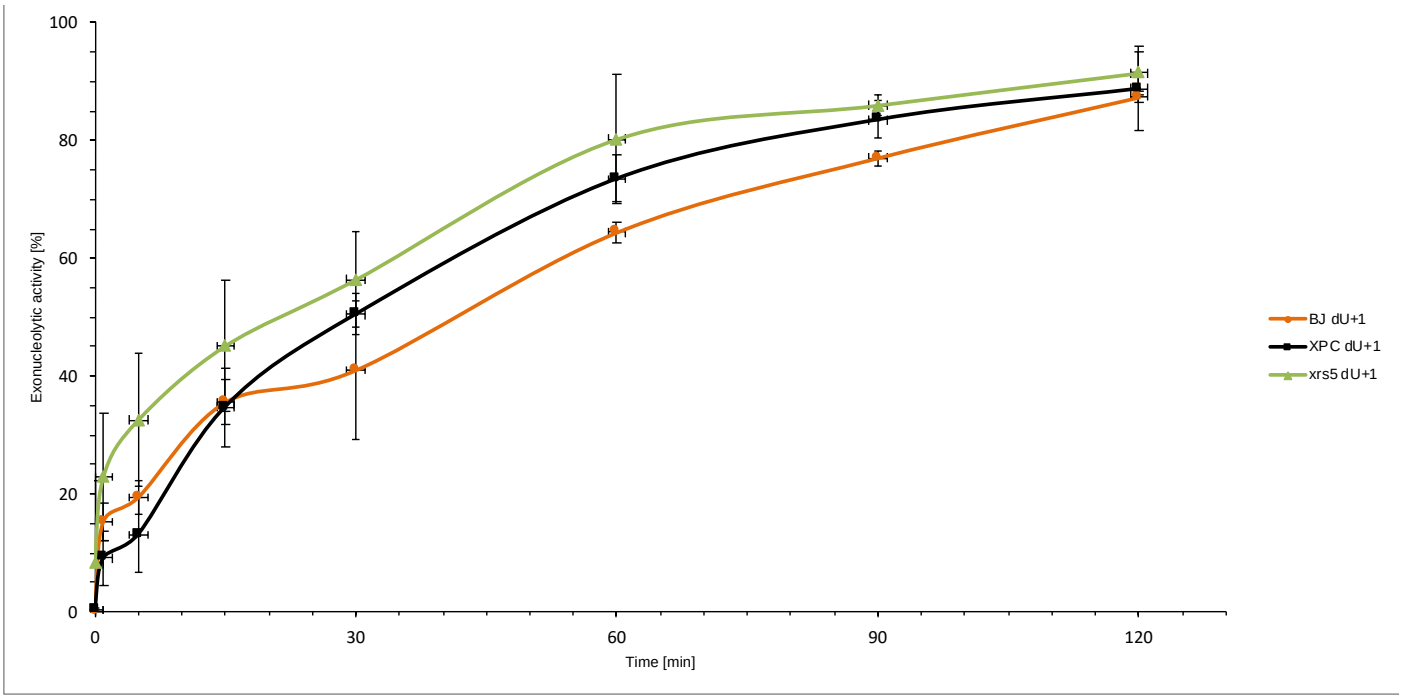


Figure S14. Exonucleolytic activity (strand degradation) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **ScdA** Cytoplasmic Extract.


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU0
XPC dU0
xrs5 dU0


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-1
XPC dU-1
xrs5 dU-1


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU-4
XPC dU-4
xrs5 dU-4


100
80
60
40
20
0
Exonucleolytic activity [%]
0
30
60
90
120
Time [min]
BJ dU+1
XPC dU+1
xrs5 dU+1

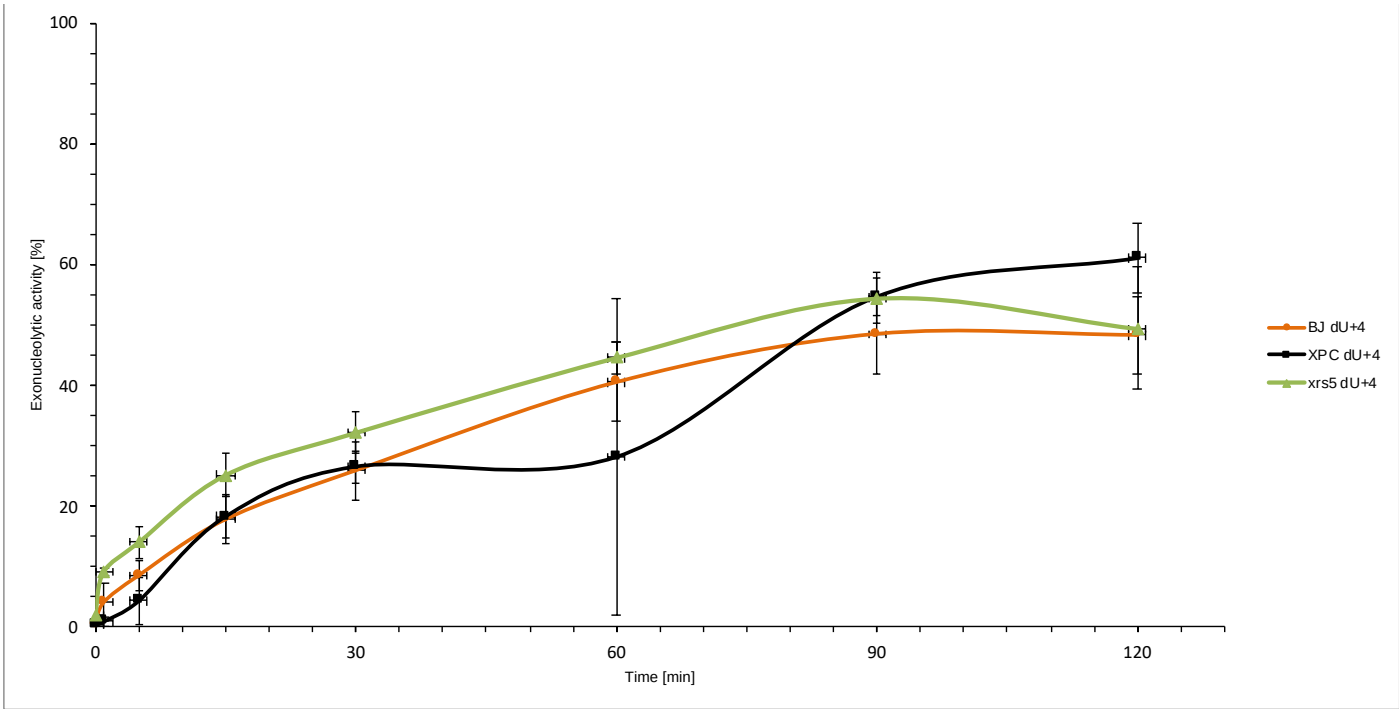


Figure S15. Exonucleolytic activity (strand degradation) [%] of xrs5 vs. BJ vs. XPC – comparison of individual strands – **RcdA** Cytoplasmic Extract.