



# Full wwPDB X-ray Structure Validation Report i

Feb 27, 2014 – 11:51 PM GMT

PDB ID : 3EOG  
Title : Co-crystallization showing exon recognition by a group II intron  
Authors : Toor, N.; Rajashankar, K.; Keating, K.S.; Pyle, A.M.  
Deposited on : 2008-09-26  
Resolution : 3.39 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

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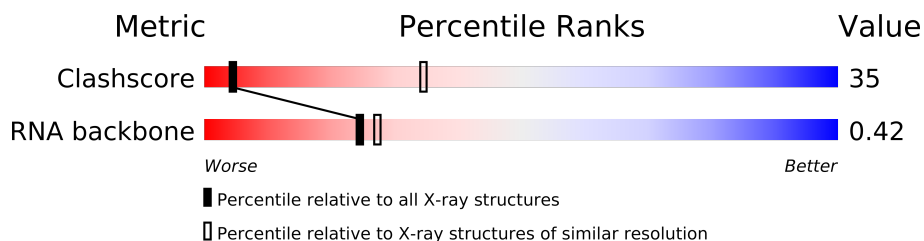
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	<b>FAILED</b>
Percentile statistics	:	21963
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

# 1 Overall quality at a glance

The reported resolution of this entry is 3.39 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	79885	1214 (3.50-3.30)
RNA backbone	1838	1002 (4.02-2.76)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Note EDS failed to run properly.

Mol	Chain	Length	Quality of chain
1	A	412	
2	B	6	

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 8453 atoms, of which 0 are hydrogen and 0 are deuterium.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a RNA chain called Group IIC intron.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	388	Total	C	N	O	P	0	0	1
			8275	3691	1525	2671	388			

- Molecule 2 is a RNA chain called 5'-R(\*UP\*UP\*AP\*UP\*UP\*A)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	6	Total	C	N	O	P	0	0	0
			121	56	18	42	5			

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	31	Total	Mg	0	0
			31	31		

- Molecule 4 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	11	Total	K	0	0
			11	11		

- Molecule 5 is water.

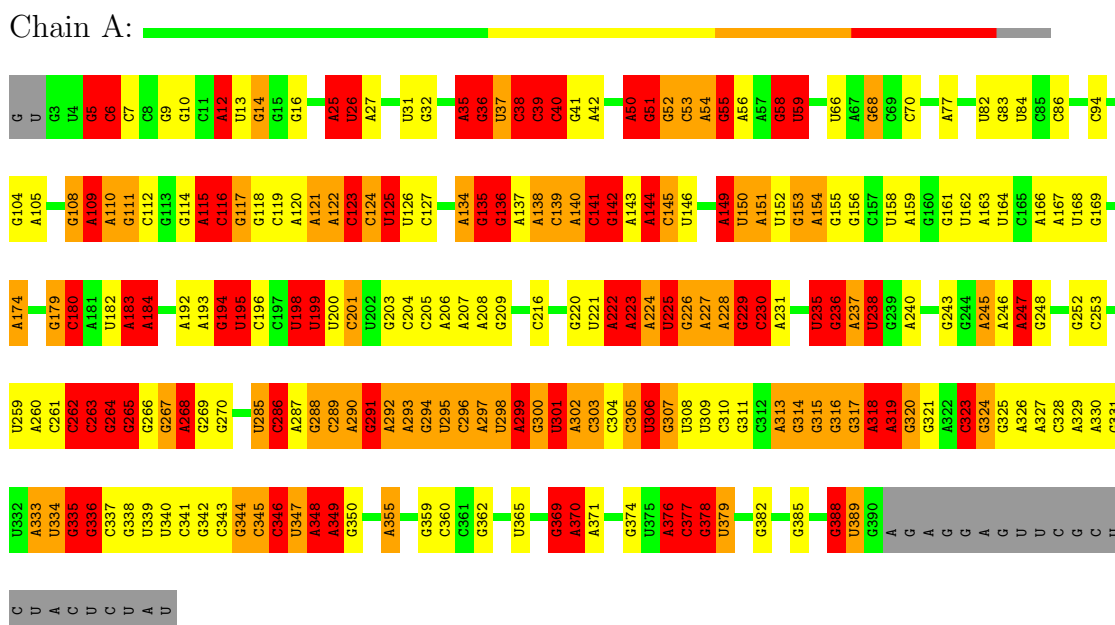
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	14	Total	O	0	0
			14	14		
5	B	1	Total	O	0	0
			1	1		

### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS failed to run properly.

- Molecule 1: Group IIC intron



- Molecule 2: 5'-R(\*UP\*UP\*AP\*UP\*UP\*A)-3'



## 4 Data and refinement statistics

EDS failed to run properly - this section will therefore be incomplete.

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	88.48Å 95.08Å 225.04Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.42 – 3.39	Depositor
% Data completeness (in resolution range)	96.6 (48.42-3.39)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.45 (at 3.40Å)	Xtriage
Refinement program	PHENIX (phenix.refine)	Depositor
R, $R_{free}$	0.208 , 0.263	Depositor
Wilson B-factor (Å <sup>2</sup> )	106.7	Xtriage
Anisotropy	0.166	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtriage
Outliers	0 of 26922 reflections	Xtriage
Total number of atoms	8453	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	103.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.82% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: K, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.53	0/9271	1.32	143/14461 (1.0%)
2	B	0.51	0/134	1.08	1/206 (0.5%)
All	All	0.53	0/9405	1.32	144/14667 (1.0%)

There are no bond length outliers.

All (144) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	377	C	N1-C1'-C2'	-15.09	94.38	114.00
1	A	6	C	N1-C1'-C2'	-13.32	96.69	114.00
1	A	262	C	N1-C1'-C2'	-12.52	97.73	114.00
1	A	235	U	P-O3'-C3'	11.93	134.02	119.70
1	A	123	C	N1-C1'-C2'	-11.75	98.73	114.00
1	A	225	U	N1-C1'-C2'	-11.58	98.95	114.00
1	A	195	U	N1-C1'-C2'	-11.41	99.16	114.00
1	A	116	C	N1-C1'-C2'	-11.30	99.31	114.00
1	A	199	U	N1-C1'-C2'	-11.19	99.46	114.00
1	A	346	C	N1-C1'-C2'	-11.12	99.55	114.00
1	A	38	C	N1-C1'-C2'	-10.92	99.81	114.00
1	A	301	U	O4'-C1'-N1	10.77	116.81	108.20
1	A	238	U	N1-C1'-C2'	-10.44	100.43	114.00
1	A	55	G	P-O3'-C3'	-10.14	107.53	119.70
1	A	198	U	P-O3'-C3'	10.14	131.87	119.70
1	A	180	C	N1-C1'-C2'	-9.84	101.17	112.00
1	A	370	A	P-O3'-C3'	-9.84	107.89	119.70
1	A	26	U	N1-C1'-C2'	-9.76	101.26	112.00
1	A	109	A	P-O3'-C3'	-9.56	108.23	119.70
1	A	184	A	P-O3'-C3'	-9.54	108.25	119.70
1	A	35	A	P-O3'-C3'	9.53	131.14	119.70
1	A	40	C	N1-C1'-C2'	-9.45	101.60	112.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	195	U	P-O3'-C3'	-9.43	108.39	119.70
1	A	39	C	N1-C1'-C2'	-9.32	101.75	112.00
1	A	123	C	P-O3'-C3'	-9.31	108.53	119.70
1	A	238	U	P-O3'-C3'	-9.04	108.85	119.70
1	A	263	C	P-O3'-C3'	-9.03	108.87	119.70
1	A	169	G	P-O3'-C3'	-9.02	108.87	119.70
1	A	347	U	N1-C1'-C2'	-9.00	102.10	112.00
1	A	323	C	N1-C1'-C2'	-8.91	102.20	112.00
1	A	347	U	P-O3'-C3'	-8.76	109.19	119.70
1	A	230	C	P-O3'-C3'	-8.66	109.31	119.70
1	A	247	A	P-O3'-C3'	-8.62	109.36	119.70
1	A	230	C	N1-C1'-C2'	-8.40	102.76	112.00
1	A	121	A	P-O3'-C3'	8.34	129.70	119.70
1	A	323	C	O4'-C1'-N1	8.24	114.79	108.20
1	A	58	G	P-O3'-C3'	8.11	129.43	119.70
1	A	336	G	P-O3'-C3'	-8.03	110.07	119.70
1	A	125	U	N1-C1'-C2'	-7.99	103.21	112.00
1	A	323	C	P-O3'-C3'	-7.98	110.12	119.70
1	A	183	A	N9-C1'-C2'	-7.94	103.27	112.00
1	A	109	A	P-O5'-C5'	-7.89	108.27	120.90
1	A	135	G	P-O3'-C3'	7.89	129.17	119.70
1	A	50	A	O4'-C1'-N9	7.69	114.35	108.20
1	A	25	A	P-O3'-C3'	7.68	128.92	119.70
1	A	263	C	N1-C1'-C2'	-7.68	103.55	112.00
1	A	50	A	P-O3'-C3'	7.65	128.88	119.70
1	A	183	A	P-O3'-C3'	-7.51	110.69	119.70
1	A	320	G	P-O3'-C3'	-7.24	111.01	119.70
1	A	6	C	P-O3'-C3'	-7.19	111.08	119.70
1	A	318	A	P-O3'-C3'	-7.09	111.19	119.70
1	A	14	G	P-O3'-C3'	-7.08	111.20	119.70
1	A	225	U	P-O3'-C3'	-7.02	111.27	119.70
1	A	319	A	P-O3'-C3'	-7.02	111.27	119.70
1	A	388	G	P-O3'-C3'	7.00	128.10	119.70
1	A	26	U	P-O3'-C3'	-6.92	111.39	119.70
1	A	369	G	P-O3'-C3'	6.90	127.97	119.70
1	A	262	C	P-O3'-C3'	-6.89	111.43	119.70
1	A	180	C	P-O3'-C3'	-6.77	111.58	119.70
1	A	378	G	P-O3'-C3'	-6.77	111.58	119.70
1	A	12	A	P-O3'-C3'	6.69	127.73	119.70
1	A	236	G	P-O5'-C5'	-6.60	110.34	120.90
1	A	183	A	C3'-C2'-C1'	6.43	106.65	101.50
1	A	142	G	P-O3'-C3'	-6.42	112.00	119.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	38	C	P-O3'-C3'	-6.34	112.09	119.70
1	A	199	U	P-O3'-C3'	-6.34	112.09	119.70
1	A	154	A	P-O3'-C3'	-6.33	112.10	119.70
1	A	265	G	C3'-C2'-C1'	6.33	106.56	101.50
1	A	119	C	O4'-C1'-N1	6.32	113.26	108.20
1	A	229	G	P-O3'-C3'	-6.28	112.17	119.70
1	A	247	A	N9-C1'-C2'	-6.28	105.10	112.00
1	A	264	G	P-O3'-C3'	-6.27	112.17	119.70
2	B	4	U	P-O3'-C3'	6.23	127.17	119.70
1	A	335	G	P-O3'-C3'	-6.23	112.23	119.70
1	A	286	C	P-O3'-C3'	-6.22	112.23	119.70
1	A	122	A	C3'-C2'-C1'	6.21	106.47	101.50
1	A	222	A	P-O3'-C3'	6.08	126.99	119.70
1	A	149	A	P-O3'-C3'	-6.05	112.43	119.70
1	A	235	U	N1-C1'-C2'	6.04	121.85	114.00
1	A	346	C	P-O3'-C3'	-5.98	112.53	119.70
1	A	40	C	C3'-C2'-C1'	5.97	106.28	101.50
1	A	38	C	C3'-C2'-C1'	5.96	106.27	101.50
1	A	265	G	P-O3'-C3'	-5.93	112.59	119.70
1	A	116	C	P-O3'-C3'	-5.91	112.61	119.70
1	A	247	A	C3'-C2'-C1'	5.90	106.22	101.50
1	A	335	G	C3'-C2'-C1'	5.89	106.22	101.50
1	A	268	A	N9-C1'-C2'	-5.88	105.53	112.00
1	A	51	G	P-O3'-C3'	-5.87	112.65	119.70
1	A	346	C	C3'-C2'-C1'	5.87	106.19	101.50
1	A	111	G	P-O3'-C3'	-5.84	112.69	119.70
1	A	299	A	P-O3'-C3'	5.84	126.71	119.70
1	A	122	A	P-O3'-C3'	-5.84	112.70	119.70
1	A	149	A	C3'-C2'-C1'	5.83	106.16	101.50
1	A	306	U	O4'-C1'-N1	5.82	112.85	108.20
1	A	59	U	C3'-C2'-C1'	5.81	106.15	101.50
1	A	6	C	C3'-C2'-C1'	5.81	106.15	101.50
1	A	154	A	C3'-C2'-C1'	5.76	106.11	101.50
1	A	289	C	O4'-C1'-N1	5.70	112.76	108.20
1	A	336	G	C3'-C2'-C1'	5.69	106.05	101.50
1	A	194	G	P-O5'-C5'	-5.67	111.82	120.90
1	A	376	A	P-O3'-C3'	5.64	126.47	119.70
1	A	116	C	C3'-C2'-C1'	5.61	105.99	101.50
1	A	184	A	C3'-C2'-C1'	5.61	105.98	101.50
1	A	238	U	C3'-C2'-C1'	5.60	105.98	101.50
1	A	268	A	P-O3'-C3'	-5.57	113.02	119.70
1	A	51	G	C3'-C2'-C1'	5.56	105.94	101.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	377	C	O4'-C1'-N1	5.54	112.63	108.20
1	A	236	G	C3'-C2'-C1'	5.53	105.92	101.50
1	A	111	G	C3'-C2'-C1'	5.53	105.92	101.50
1	A	378	G	C3'-C2'-C1'	5.51	105.91	101.50
1	A	320	G	C3'-C2'-C1'	5.48	105.88	101.50
1	A	36	G	C3'-C2'-C1'	5.46	105.87	101.50
1	A	291	G	P-O3'-C3'	5.45	126.23	119.70
1	A	265	G	O4'-C1'-N9	5.43	112.55	108.20
1	A	141	C	P-O3'-C3'	-5.43	113.18	119.70
1	A	199	U	C3'-C2'-C1'	5.43	105.84	101.50
1	A	370	A	C3'-C2'-C1'	5.43	105.84	101.50
1	A	229	G	C3'-C2'-C1'	5.40	105.82	101.50
1	A	144	A	O4'-C1'-N9	5.39	112.51	108.20
1	A	348	A	P-O3'-C3'	5.39	126.16	119.70
1	A	118	G	P-O3'-C3'	-5.38	113.25	119.70
1	A	115	A	P-O3'-C3'	5.36	126.14	119.70
1	A	26	U	C3'-C2'-C1'	5.34	105.77	101.50
1	A	174	A	O4'-C1'-N9	5.33	112.46	108.20
1	A	5	G	P-O3'-C3'	5.31	126.07	119.70
1	A	136	G	C8-N9-C4	-5.31	104.28	106.40
1	A	50	A	C2-N3-C4	-5.28	107.96	110.60
1	A	223	A	C3'-C2'-C1'	5.26	105.70	101.50
1	A	319	A	C3'-C2'-C1'	5.24	105.69	101.50
1	A	289	C	P-O3'-C3'	5.24	125.98	119.70
1	A	349	A	C3'-C2'-C1'	5.23	105.68	101.50
1	A	59	U	N1-C1'-C2'	-5.23	106.25	112.00
1	A	125	U	P-O3'-C3'	-5.22	113.43	119.70
1	A	286	C	C3'-C2'-C1'	5.19	105.65	101.50
1	A	180	C	O4'-C1'-N1	-5.19	104.05	108.20
1	A	365	U	O4'-C1'-N1	5.19	112.35	108.20
1	A	86	C	P-O3'-C3'	-5.18	113.49	119.70
1	A	125	U	C3'-C2'-C1'	5.11	105.59	101.50
1	A	124	C	O4'-C1'-N1	5.10	112.28	108.20
1	A	318	A	C3'-C2'-C1'	5.04	105.53	101.50
1	A	198	U	O3'-P-O5'	5.04	113.57	104.00
1	A	198	U	N1-C1'-C2'	5.04	120.55	114.00
1	A	136	G	N7-C8-N9	5.03	115.61	113.10
1	A	245	A	O4'-C1'-N9	5.01	112.20	108.20

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8275	0	0	273	0
2	B	121	0	0	1	0
3	A	31	0	0	0	0
4	A	11	0	0	0	0
5	A	14	0	0	0	0
5	B	1	0	0	0	0
All	All	8453	0	0	273	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 35.

All (273) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:227:A:N3	1:A:228:A:C8	2.20	1.10
1:A:227:A:C2	1:A:228:A:C5	2.43	1.07
1:A:161:G:C4	1:A:162:U:C5	2.46	1.03
1:A:161:G:C5	1:A:162:U:C5	2.50	1.00
1:A:161:G:C6	1:A:162:U:C4	2.51	0.98
1:A:222:A:C2	1:A:224:A:C2	2.52	0.97
1:A:222:A:N1	1:A:224:A:C2	2.35	0.95
1:A:149:A:C6	1:A:226:G:O6	2.24	0.90
1:A:161:G:C6	1:A:162:U:O4	2.25	0.88
1:A:163:A:C2	1:A:164:U:C5	2.61	0.88
1:A:138:A:N6	1:A:224:A:C8	2.42	0.87
1:A:228:A:N3	1:A:229:G:C8	2.42	0.86
1:A:227:A:C2	1:A:228:A:N7	2.44	0.85
1:A:227:A:C4	1:A:228:A:C8	2.70	0.80
1:A:229:G:C2'	1:A:230:C:C6	2.64	0.79
1:A:345:C:O2	1:A:346:C:C6	2.36	0.78
1:A:222:A:C6	1:A:224:A:C2	2.72	0.78
1:A:298:U:C6	1:A:299:A:C2	2.74	0.76
1:A:227:A:C4	1:A:228:A:N7	2.55	0.75
1:A:138:A:C5	1:A:225:U:C5	2.74	0.75
1:A:227:A:C2	1:A:228:A:C8	2.75	0.74

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:298:U:C5	1:A:299:A:C2	2.76	0.74
1:A:345:C:C2	1:A:346:C:C5	2.75	0.74
1:A:161:G:C5	1:A:162:U:C4	2.76	0.72
1:A:227:A:N3	1:A:228:A:N7	2.36	0.71
1:A:138:A:C4	1:A:225:U:C4	2.80	0.70
1:A:301:U:C4	1:A:318:A:C8	2.79	0.70
1:A:163:A:C2	1:A:164:U:C6	2.80	0.70
1:A:237:A:O2'	1:A:238:U:P	2.51	0.69
1:A:252:G:C6	1:A:253:C:C4	2.81	0.69
1:A:183:A:O2'	1:A:184:A:C8	2.47	0.68
1:A:227:A:C2	1:A:228:A:C4	2.81	0.68
1:A:124:C:C2	1:A:125:U:C5	2.83	0.67
1:A:222:A:C2	1:A:224:A:N3	2.63	0.66
1:A:156:G:N2	1:A:180:C:C5	2.64	0.65
1:A:293:A:O2'	1:A:294:G:C8	2.50	0.64
1:A:377:C:O2'	1:A:378:G:P	2.55	0.64
1:A:135:G:N1	1:A:136:G:N1	2.45	0.64
1:A:138:A:C2	1:A:150:U:N3	2.66	0.64
1:A:138:A:N6	1:A:224:A:O2'	2.32	0.63
1:A:228:A:C2	1:A:229:G:C5	2.86	0.63
1:A:54:A:C2	1:A:55:G:C4	2.87	0.63
1:A:134:A:N7	1:A:135:G:C6	2.67	0.62
1:A:6:C:C5	1:A:286:C:C4	2.88	0.62
1:A:50:A:C2	1:A:198:U:N3	2.68	0.62
1:A:54:A:N3	1:A:55:G:C8	2.67	0.62
1:A:301:U:O4	1:A:318:A:C8	2.53	0.61
1:A:136:G:C8	1:A:138:A:O4'	2.53	0.61
1:A:110:A:C2	1:A:259:U:N3	2.68	0.61
1:A:222:A:C6	1:A:224:A:N1	2.69	0.61
1:A:301:U:O2'	1:A:302:A:C8	2.54	0.61
1:A:359:G:C5	1:A:360:C:C5	2.90	0.60
1:A:292:A:C4	1:A:293:A:C8	2.89	0.60
1:A:227:A:N1	1:A:228:A:C5	2.70	0.60
1:A:54:A:C2	1:A:55:G:C5	2.90	0.60
1:A:226:G:N3	1:A:227:A:C8	2.70	0.59
1:A:161:G:O6	1:A:162:U:O4	2.20	0.59
1:A:135:G:N2	1:A:136:G:C5	2.71	0.59
1:A:235:U:O2'	1:A:236:G:OP2	2.21	0.59
1:A:135:G:N1	1:A:136:G:C6	2.71	0.58
1:A:58:G:O2'	1:A:59:U:P	2.60	0.58
1:A:377:C:O2'	1:A:378:G:OP1	2.21	0.58
1:A:265:G:O2'	1:A:266:G:C5'	2.52	0.57

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:35:A:O2'	1:A:37:U:OP2	2.23	0.57
1:A:25:A:O2'	1:A:26:U:OP2	2.23	0.57
1:A:222:A:O2'	1:A:223:A:O5'	2.23	0.57
1:A:324:G:C6	1:A:325:G:N1	2.73	0.57
1:A:138:A:C4	1:A:225:U:O4	2.58	0.57
1:A:292:A:C5	1:A:293:A:N7	2.73	0.56
1:A:161:G:C4	1:A:162:U:C6	2.91	0.56
1:A:318:A:O2'	1:A:319:A:C5'	2.54	0.56
1:A:183:A:C2	1:A:184:A:C5	2.93	0.56
1:A:114:G:C6	1:A:115:A:C2	2.93	0.56
1:A:267:G:O2'	1:A:285:U:O4	2.24	0.56
1:A:267:G:O2'	1:A:268:A:P	2.64	0.56
1:A:108:G:C4'	1:A:109:A:OP1	2.54	0.56
1:A:264:G:C4	1:A:265:G:C8	2.95	0.55
1:A:138:A:C5	1:A:225:U:C4	2.94	0.55
1:A:228:A:C2	1:A:229:G:C4	2.94	0.55
1:A:300:G:OP2	1:A:300:G:C3'	2.55	0.55
1:A:228:A:C2	1:A:229:G:C8	2.94	0.55
1:A:294:G:C2	1:A:295:U:C2	2.95	0.55
1:A:53:C:O2'	1:A:54:A:C8	2.58	0.55
1:A:124:C:O2'	1:A:125:U:C5'	2.55	0.55
1:A:124:C:O2	1:A:125:U:C6	2.60	0.55
1:A:138:A:C2'	1:A:138:A:N3	2.70	0.55
1:A:226:G:C4	1:A:227:A:N7	2.75	0.55
1:A:306:U:O2'	1:A:307:G:C8	2.60	0.54
1:A:163:A:N1	1:A:164:U:C5	2.75	0.54
1:A:156:G:C2	1:A:180:C:C4	2.96	0.54
1:A:58:G:O2'	1:A:59:U:O5'	2.26	0.54
1:A:327:A:C5	1:A:328:C:C5	2.95	0.54
1:A:134:A:C2	1:A:144:A:N7	2.75	0.54
1:A:136:G:N1	1:A:141:C:N4	2.55	0.54
1:A:226:G:O2'	1:A:227:A:P	2.66	0.53
1:A:299:A:C1'	1:A:300:G:OP1	2.56	0.53
1:A:345:C:C2	1:A:346:C:C6	2.96	0.53
1:A:161:G:N1	1:A:162:U:C4	2.77	0.53
1:A:264:G:O2'	1:A:265:G:O5'	2.27	0.53
1:A:25:A:O2'	1:A:26:U:P	2.68	0.52
1:A:222:A:O2'	1:A:224:A:OP2	2.27	0.52
1:A:183:A:O2'	1:A:184:A:C5'	2.58	0.52
1:A:228:A:C4	1:A:229:G:N7	2.78	0.52
1:A:290:A:C2	1:A:291:G:C6	2.97	0.52
1:A:263:C:O2'	1:A:264:G:O5'	2.28	0.52

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:335:G:O2'	1:A:336:G:O5'	2.27	0.52
1:A:183:A:O2'	1:A:184:A:O5'	2.27	0.52
1:A:220:G:C6	1:A:221:U:C4	2.97	0.52
1:A:296:C:O2'	1:A:297:A:P	2.68	0.51
1:A:145:C:C2	1:A:146:U:C5	2.98	0.51
1:A:38:C:O2'	1:A:39:C:C5'	2.58	0.51
1:A:145:C:C2	1:A:229:G:N2	2.78	0.51
1:A:139:C:O2'	1:A:140:A:O5'	2.29	0.51
1:A:149:A:C6	1:A:226:G:C6	2.99	0.51
1:A:265:G:O2'	1:A:266:G:O4'	2.28	0.51
1:A:228:A:C4	1:A:229:G:C8	2.98	0.51
1:A:268:A:C1'	1:A:298:U:C2	2.93	0.50
1:A:183:A:O2'	1:A:184:A:P	2.69	0.50
1:A:54:A:O2'	1:A:55:G:C5'	2.59	0.50
1:A:149:A:N6	1:A:226:G:O6	2.43	0.50
1:A:262:C:O2'	1:A:263:C:C5'	2.59	0.50
1:A:291:G:O2'	1:A:292:A:P	2.69	0.50
1:A:227:A:N1	1:A:228:A:C6	2.79	0.50
1:A:183:A:C6	2:B:3:A:N1	2.80	0.50
1:A:6:C:C4	1:A:286:C:N4	2.80	0.50
1:A:293:A:O2'	1:A:294:G:C5'	2.60	0.50
1:A:226:G:C4	1:A:227:A:C8	3.00	0.49
1:A:323:C:O2'	1:A:324:G:O4'	2.30	0.49
1:A:51:G:C2	1:A:52:G:N7	2.80	0.49
1:A:134:A:C5	1:A:144:A:C8	3.00	0.49
1:A:344:G:O2'	1:A:345:C:C6	2.66	0.49
1:A:348:A:O2'	1:A:349:A:N7	2.45	0.49
1:A:38:C:C2	1:A:39:C:C5	3.01	0.49
1:A:52:G:O2'	1:A:53:C:O5'	2.31	0.49
1:A:115:A:O2'	1:A:116:C:C5	2.65	0.49
1:A:317:G:O2'	1:A:318:A:P	2.71	0.48
1:A:151:A:C4	1:A:153:G:N2	2.82	0.48
1:A:36:G:C5	1:A:247:A:C6	3.02	0.48
1:A:229:G:O2'	1:A:230:C:O4'	2.32	0.48
1:A:267:G:C2'	1:A:285:U:O4	2.61	0.48
1:A:338:G:C6	1:A:339:U:C4	3.02	0.48
1:A:51:G:O2'	1:A:52:G:O5'	2.31	0.48
1:A:355:A:C4	1:A:389:U:O2	2.67	0.48
1:A:301:U:C4	1:A:318:A:N7	2.82	0.48
1:A:263:C:O2'	1:A:264:G:C8	2.67	0.48
1:A:52:G:O2'	1:A:53:C:C6	2.67	0.47
1:A:134:A:C6	1:A:144:A:N7	2.82	0.47

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:290:A:C2	1:A:291:G:O6	2.67	0.47
1:A:252:G:C5	1:A:253:C:C5	3.02	0.47
1:A:262:C:O2'	1:A:263:C:C6	2.68	0.47
1:A:68:G:C5	1:A:120:A:C2	3.03	0.47
1:A:58:G:O2'	1:A:59:U:C5	2.67	0.47
1:A:264:G:O2'	1:A:265:G:C5'	2.62	0.47
1:A:220:G:C5	1:A:221:U:C5	3.03	0.47
1:A:139:C:O2'	1:A:140:A:C8	2.67	0.47
1:A:54:A:C4	1:A:55:G:C8	3.03	0.47
1:A:359:G:C4	1:A:360:C:C6	3.03	0.47
1:A:267:G:O2'	1:A:268:A:OP2	2.33	0.46
1:A:52:G:N3	1:A:53:C:C5	2.83	0.46
1:A:338:G:C6	1:A:344:G:O6	2.68	0.46
1:A:294:G:O2'	1:A:295:U:O5'	2.34	0.46
1:A:247:A:O2'	1:A:248:G:C5'	2.63	0.46
1:A:140:A:C8	1:A:141:C:N3	2.84	0.46
1:A:151:A:N3	1:A:153:G:N2	2.63	0.46
1:A:288:G:N9	1:A:377:C:N4	2.63	0.46
1:A:39:C:O2'	1:A:40:C:O5'	2.34	0.46
1:A:314:G:C2	1:A:315:G:C5	3.04	0.46
1:A:323:C:O2'	1:A:324:G:C5'	2.64	0.46
1:A:388:G:O2'	1:A:389:U:C6	2.69	0.46
1:A:329:A:C4	1:A:330:A:N7	2.83	0.45
1:A:55:G:N2	1:A:201:C:O2	2.49	0.45
1:A:333:A:O2'	1:A:334:U:P	2.74	0.45
1:A:77:A:C6	1:A:104:G:C6	3.05	0.45
1:A:307:G:O6	1:A:313:A:N6	2.50	0.45
1:A:134:A:N1	1:A:144:A:N7	2.64	0.45
1:A:226:G:O2'	1:A:227:A:O5'	2.35	0.45
1:A:369:G:C4'	1:A:370:A:OP1	2.65	0.45
1:A:301:U:O2'	1:A:302:A:O5'	2.35	0.45
1:A:138:A:N7	1:A:225:U:C5	2.85	0.44
1:A:68:G:C6	1:A:120:A:C2	3.05	0.44
1:A:344:G:O2'	1:A:345:C:P	2.76	0.44
1:A:297:A:O2'	1:A:298:U:C6	2.69	0.44
1:A:182:U:O4	1:A:183:A:N6	2.51	0.44
1:A:135:G:N2	1:A:136:G:C6	2.86	0.44
1:A:330:A:C2	1:A:331:G:C8	3.05	0.44
1:A:268:A:N3	1:A:268:A:C5'	2.81	0.44
1:A:294:G:O6	1:A:324:G:N3	2.50	0.44
1:A:296:C:C5	1:A:297:A:C6	3.06	0.44
1:A:13:U:N3	1:A:110:A:OP2	2.50	0.44

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:10:G:C2	1:A:263:C:N3	2.85	0.44
1:A:345:C:O2'	1:A:346:C:OP2	2.34	0.44
1:A:296:C:O2'	1:A:297:A:OP2	2.35	0.44
1:A:38:C:O2'	1:A:39:C:C6	2.70	0.44
1:A:194:G:C6	1:A:195:U:C4	3.06	0.44
1:A:108:G:C6	1:A:262:C:N4	2.86	0.44
1:A:314:G:O2'	1:A:315:G:C8	2.70	0.44
1:A:5:G:C2'	1:A:376:A:N6	2.81	0.44
1:A:226:G:O2'	1:A:227:A:OP2	2.36	0.43
1:A:124:C:C2	1:A:125:U:C6	3.06	0.43
1:A:288:G:C4	1:A:377:C:C4	3.05	0.43
1:A:295:U:O2'	1:A:296:C:P	2.76	0.43
1:A:305:C:C5	1:A:306:U:C4	3.05	0.43
1:A:136:G:C8	1:A:138:A:C4'	3.01	0.43
1:A:294:G:O2'	1:A:295:U:P	2.76	0.43
1:A:300:G:OP2	1:A:301:U:C5'	2.66	0.43
1:A:236:G:C5	1:A:370:A:C6	3.05	0.43
1:A:300:G:O4'	1:A:300:G:N3	2.51	0.43
1:A:116:C:OP2	1:A:117:G:N7	2.52	0.43
1:A:52:G:O2'	1:A:53:C:P	2.77	0.43
1:A:296:C:O2'	1:A:297:A:O5'	2.36	0.43
1:A:326:A:N7	1:A:327:A:C8	2.87	0.43
1:A:123:C:O2'	1:A:124:C:C5'	2.66	0.43
1:A:39:C:C2	1:A:40:C:C6	3.07	0.43
1:A:36:G:O2'	1:A:37:U:C5'	2.66	0.43
1:A:138:A:C4	1:A:225:U:C5	3.07	0.42
1:A:297:A:N3	1:A:297:A:C2'	2.82	0.42
1:A:53:C:C2	1:A:54:A:N7	2.87	0.42
1:A:138:A:N3	1:A:225:U:O4	2.52	0.42
1:A:6:C:C4	1:A:286:C:C4	3.06	0.42
1:A:39:C:O2'	1:A:40:C:P	2.77	0.42
1:A:302:A:C6	1:A:316:G:N1	2.87	0.42
1:A:51:G:N3	1:A:52:G:N7	2.67	0.42
1:A:52:G:C4	1:A:53:C:C5	3.07	0.42
1:A:5:G:N2	1:A:376:A:OP1	2.52	0.42
1:A:139:C:O2'	1:A:140:A:P	2.77	0.42
1:A:225:U:O2'	1:A:226:G:C5'	2.67	0.42
1:A:39:C:O2'	1:A:40:C:C6	2.72	0.42
1:A:134:A:C5	1:A:135:G:C5	3.08	0.42
1:A:228:A:N3	1:A:229:G:N7	2.66	0.42
1:A:296:C:N4	1:A:297:A:N6	2.66	0.42
1:A:334:U:O2	1:A:334:U:C2'	2.67	0.42

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:124:C:N4	1:A:243:G:N1	2.68	0.42
1:A:222:A:N1	1:A:224:A:N1	2.67	0.42
1:A:138:A:P	1:A:139:C:C5	3.13	0.42
1:A:292:A:O2'	1:A:293:A:P	2.78	0.42
1:A:9:G:C6	1:A:264:G:O6	2.73	0.42
1:A:145:C:N3	1:A:229:G:N2	2.68	0.41
1:A:307:G:C6	1:A:308:U:C2	3.08	0.41
1:A:205:C:N3	1:A:206:A:C8	2.88	0.41
1:A:31:U:C4	1:A:32:G:C5	3.08	0.41
1:A:140:A:C4	1:A:141:C:O2	2.73	0.41
1:A:229:G:C4	1:A:230:C:C5	3.08	0.41
1:A:199:U:O2'	1:A:200:U:C5'	2.68	0.41
1:A:158:U:C2	1:A:159:A:N7	2.88	0.41
1:A:226:G:C2	1:A:227:A:C8	3.09	0.41
1:A:268:A:C1'	1:A:298:U:O2	2.69	0.41
1:A:229:G:O2'	1:A:230:C:C6	2.74	0.41
1:A:161:G:N3	1:A:162:U:C6	2.88	0.41
1:A:237:A:O2'	1:A:238:U:OP2	2.39	0.41
1:A:12:A:C4	1:A:14:G:N7	2.89	0.41
1:A:362:G:C6	1:A:382:G:N1	2.89	0.41
1:A:141:C:O2'	1:A:142:G:C5'	2.69	0.41
1:A:156:G:N2	1:A:179:G:O2'	2.53	0.41
1:A:52:G:C2	1:A:53:C:C4	3.09	0.41
1:A:203:G:C6	1:A:204:C:C4	3.09	0.41
1:A:139:C:C2	1:A:140:A:C8	3.09	0.41
1:A:345:C:O2'	1:A:346:C:P	2.79	0.41
1:A:252:G:C2	1:A:253:C:C2	3.09	0.41
1:A:127:C:C2	1:A:240:A:C2	3.09	0.41
1:A:149:A:C5	1:A:226:G:O6	2.70	0.41
1:A:292:A:C5	1:A:326:A:C4	3.09	0.41
1:A:302:A:O2'	1:A:303:C:O5'	2.39	0.41
1:A:236:G:C3'	1:A:237:A:C5'	2.99	0.41
1:A:192:A:C6	1:A:193:A:C6	3.09	0.41
1:A:376:A:C8	1:A:379:U:OP1	2.74	0.40
1:A:9:G:C6	1:A:264:G:C6	3.10	0.40
1:A:35:A:C5	1:A:38:C:C4	3.09	0.40
1:A:292:A:C6	1:A:293:A:N7	2.90	0.40
1:A:318:A:O2'	1:A:319:A:C8	2.75	0.40
1:A:265:G:O2'	1:A:266:G:O5'	2.39	0.40
1:A:317:G:N3	1:A:317:G:O2'	2.54	0.40
1:A:293:A:O2'	1:A:294:G:O5'	2.40	0.40
1:A:50:A:O2'	1:A:51:G:C5'	2.70	0.40



There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone ⓘ

There are no protein chains in this entry.

### 5.3.2 Protein sidechains ⓘ

There are no protein chains in this entry.

### 5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	A	386/412 (93%)	155 (40%)	74 (19%)
2	B	5/6 (83%)	2 (40%)	0
All	All	391/418 (93%)	157 (40%)	74 (18%)

All (157) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	A	6	C
1	A	7	C
1	A	12	A
1	A	16	G
1	A	26	U
1	A	27	A
1	A	36	G
1	A	37	U
1	A	38	C
1	A	39	C
1	A	40	C
1	A	41	G
1	A	42	A
1	A	51	G
1	A	52	G
1	A	53	C
1	A	54	A
1	A	55	G
1	A	56	A
1	A	58	G

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Mol	Chain	Res	Type
1	A	59	U
1	A	66	U
1	A	68	G
1	A	70	C
1	A	83	G
1	A	84	U
1	A	94	C
1	A	105	A
1	A	108	G
1	A	109	A
1	A	110	A
1	A	111	G
1	A	112	C
1	A	116	C
1	A	117	G
1	A	122	A
1	A	123	C
1	A	125	U
1	A	126	U
1	A	134	A
1	A	135	G
1	A	136	G
1	A	137	A
1	A	138	A
1	A	139	C
1	A	140	A
1	A	141	C
1	A	142	G
1	A	143	A
1	A	144	A
1	A	145	C
1	A	149	A
1	A	150	U
1	A	151	A
1	A	152	U
1	A	153	G
1	A	154	A
1	A	155	G
1	A	166	A
1	A	167	A
1	A	168	U
1	A	174	A

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Mol	Chain	Res	Type
1	A	179	G
1	A	180	C
1	A	184	A
1	A	194	G
1	A	195	U
1	A	196	C
1	A	199	U
1	A	201	C
1	A	207	A
1	A	208	A
1	A	209	G
1	A	216	C
1	A	223	A
1	A	224	A
1	A	225	U
1	A	226	G
1	A	227	A
1	A	228	A
1	A	229	G
1	A	230	C
1	A	231	A
1	A	236	G
1	A	237	A
1	A	238	U
1	A	246	A
1	A	247	A
1	A	260	A
1	A	261	C
1	A	263	C
1	A	264	G
1	A	265	G
1	A	268	A
1	A	269	G
1	A	270	G
1	A	286	C
1	A	287	A
1	A	288	G
1	A	289	C
1	A	290	A
1	A	292	A
1	A	293	A
1	A	294	G

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Mol	Chain	Res	Type
1	A	295	U
1	A	296	C
1	A	297	A
1	A	298	U
1	A	299	A
1	A	300	G
1	A	301	U
1	A	302	A
1	A	303	C
1	A	304	C
1	A	305	C
1	A	306	U
1	A	307	G
1	A	309	U
1	A	310	C
1	A	311	G
1	A	313	A
1	A	314	G
1	A	315	G
1	A	316	G
1	A	317	G
1	A	318	A
1	A	319	A
1	A	320	G
1	A	321	G
1	A	323	C
1	A	324	G
1	A	333	A
1	A	334	U
1	A	336	G
1	A	337	C
1	A	341	C
1	A	342	G
1	A	343	C
1	A	344	G
1	A	345	C
1	A	346	C
1	A	347	U
1	A	348	A
1	A	349	A
1	A	350	G
1	A	355	A

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Mol	Chain	Res	Type
1	A	369	G
1	A	370	A
1	A	371	A
1	A	374	G
1	A	377	C
1	A	378	G
1	A	379	U
1	A	385	G
1	A	389	U
2	B	4	U
2	B	5	U

All (74) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	A	5	G
1	A	6	C
1	A	12	A
1	A	25	A
1	A	26	U
1	A	35	A
1	A	36	G
1	A	38	C
1	A	40	C
1	A	50	A
1	A	51	G
1	A	55	G
1	A	58	G
1	A	59	U
1	A	82	U
1	A	108	G
1	A	109	A
1	A	110	A
1	A	111	G
1	A	115	A
1	A	116	C
1	A	121	A
1	A	122	A
1	A	123	C
1	A	125	U
1	A	135	G
1	A	149	A

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Mol	Chain	Res	Type
1	A	153	G
1	A	154	A
1	A	180	C
1	A	183	A
1	A	184	A
1	A	195	U
1	A	198	U
1	A	199	U
1	A	222	A
1	A	223	A
1	A	225	U
1	A	229	G
1	A	230	C
1	A	235	U
1	A	236	G
1	A	237	A
1	A	245	A
1	A	247	A
1	A	260	A
1	A	262	C
1	A	263	C
1	A	265	G
1	A	267	G
1	A	268	A
1	A	285	U
1	A	286	C
1	A	291	G
1	A	299	A
1	A	309	U
1	A	318	A
1	A	319	A
1	A	320	G
1	A	323	C
1	A	333	A
1	A	335	G
1	A	336	G
1	A	340	U
1	A	346	C
1	A	347	U
1	A	349	A
1	A	369	G
1	A	370	A

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Mol	Chain	Res	Type
1	A	376	A
1	A	377	C
1	A	378	G
1	A	388	G
1	A	389	U

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

Of 42 ligands modelled in this entry, 42 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

EDS failed to run properly - this section will therefore be empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

EDS failed to run properly - this section will therefore be empty.

### 6.3 Carbohydrates ⓘ

EDS failed to run properly - this section will therefore be empty.

### 6.4 Ligands ⓘ

EDS failed to run properly - this section will therefore be empty.

### 6.5 Other polymers ⓘ

EDS failed to run properly - this section will therefore be empty.