



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 02:04 PM EST

PDB ID : 8TP8
Title : Structure of the *C. crescentus* WYL-activator, DriD, bound to ssDNA and cognate DNA
Authors : Schumacher, M.A.
Deposited on : 2023-08-04
Resolution : 2.74 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

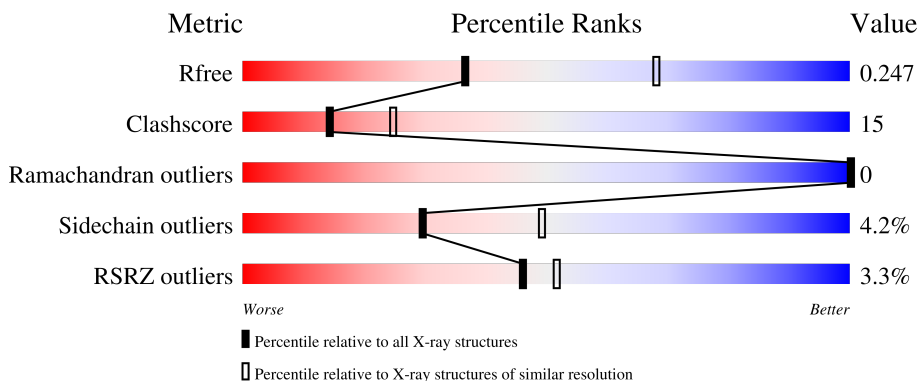
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.74 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))
R_{free}	130704	1271 (2.76-2.72)
Clashscore	141614	1322 (2.76-2.72)
Ramachandran outliers	138981	1297 (2.76-2.72)
Sidechain outliers	138945	1298 (2.76-2.72)
RSRZ outliers	127900	1243 (2.76-2.72)

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 of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	347	 67% 26% • 6%
1	B	347	 3% 64% 28% • 7%
1	C	347	 6% 64% 28% • 7%
1	D	347	 % 69% 23% • 6%
2	F	21	 5% 52% 43% 5%

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Mol	Chain	Length	Quality of chain
2	U	21	
3	R	21	
3	T	21	
4	J	3	
4	K	3	
4	L	3	
4	Y	3	

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 11931 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 protein called DeoR-family transcriptional regulator.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	325	Total 2481	C 1558	N 457	O 457	S 9	0	0	0
1	B	324	Total 2458	C 1543	N 447	O 460	S 8	0	0	0
1	C	324	Total 2436	C 1529	N 445	O 454	S 8	0	0	0
1	D	326	Total 2464	C 1547	N 450	O 458	S 9	0	0	0

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP A0A0H3C5Q6
A	-18	GLY	-	expression tag	UNP A0A0H3C5Q6
A	-17	SER	-	expression tag	UNP A0A0H3C5Q6
A	-16	SER	-	expression tag	UNP A0A0H3C5Q6
A	-15	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-14	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-13	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-12	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-11	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-10	HIS	-	expression tag	UNP A0A0H3C5Q6
A	-9	SER	-	expression tag	UNP A0A0H3C5Q6
A	-8	SER	-	expression tag	UNP A0A0H3C5Q6
A	-7	GLY	-	expression tag	UNP A0A0H3C5Q6
A	-6	LEU	-	expression tag	UNP A0A0H3C5Q6
A	-5	VAL	-	expression tag	UNP A0A0H3C5Q6
A	-4	PRO	-	expression tag	UNP A0A0H3C5Q6
A	-3	ARG	-	expression tag	UNP A0A0H3C5Q6
A	-2	GLY	-	expression tag	UNP A0A0H3C5Q6
A	-1	SER	-	expression tag	UNP A0A0H3C5Q6
A	0	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-19	MET	-	initiating methionine	UNP A0A0H3C5Q6

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	expression tag	UNP A0A0H3C5Q6
B	-17	SER	-	expression tag	UNP A0A0H3C5Q6
B	-16	SER	-	expression tag	UNP A0A0H3C5Q6
B	-15	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-14	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-13	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-12	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-11	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-10	HIS	-	expression tag	UNP A0A0H3C5Q6
B	-9	SER	-	expression tag	UNP A0A0H3C5Q6
B	-8	SER	-	expression tag	UNP A0A0H3C5Q6
B	-7	GLY	-	expression tag	UNP A0A0H3C5Q6
B	-6	LEU	-	expression tag	UNP A0A0H3C5Q6
B	-5	VAL	-	expression tag	UNP A0A0H3C5Q6
B	-4	PRO	-	expression tag	UNP A0A0H3C5Q6
B	-3	ARG	-	expression tag	UNP A0A0H3C5Q6
B	-2	GLY	-	expression tag	UNP A0A0H3C5Q6
B	-1	SER	-	expression tag	UNP A0A0H3C5Q6
B	0	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-19	MET	-	initiating methionine	UNP A0A0H3C5Q6
C	-18	GLY	-	expression tag	UNP A0A0H3C5Q6
C	-17	SER	-	expression tag	UNP A0A0H3C5Q6
C	-16	SER	-	expression tag	UNP A0A0H3C5Q6
C	-15	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-14	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-13	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-12	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-11	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-10	HIS	-	expression tag	UNP A0A0H3C5Q6
C	-9	SER	-	expression tag	UNP A0A0H3C5Q6
C	-8	SER	-	expression tag	UNP A0A0H3C5Q6
C	-7	GLY	-	expression tag	UNP A0A0H3C5Q6
C	-6	LEU	-	expression tag	UNP A0A0H3C5Q6
C	-5	VAL	-	expression tag	UNP A0A0H3C5Q6
C	-4	PRO	-	expression tag	UNP A0A0H3C5Q6
C	-3	ARG	-	expression tag	UNP A0A0H3C5Q6
C	-2	GLY	-	expression tag	UNP A0A0H3C5Q6
C	-1	SER	-	expression tag	UNP A0A0H3C5Q6
C	0	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-19	MET	-	initiating methionine	UNP A0A0H3C5Q6
D	-18	GLY	-	expression tag	UNP A0A0H3C5Q6
D	-17	SER	-	expression tag	UNP A0A0H3C5Q6

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	expression tag	UNP A0A0H3C5Q6
D	-15	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-14	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-13	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-12	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-11	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-10	HIS	-	expression tag	UNP A0A0H3C5Q6
D	-9	SER	-	expression tag	UNP A0A0H3C5Q6
D	-8	SER	-	expression tag	UNP A0A0H3C5Q6
D	-7	GLY	-	expression tag	UNP A0A0H3C5Q6
D	-6	LEU	-	expression tag	UNP A0A0H3C5Q6
D	-5	VAL	-	expression tag	UNP A0A0H3C5Q6
D	-4	PRO	-	expression tag	UNP A0A0H3C5Q6
D	-3	ARG	-	expression tag	UNP A0A0H3C5Q6
D	-2	GLY	-	expression tag	UNP A0A0H3C5Q6
D	-1	SER	-	expression tag	UNP A0A0H3C5Q6
D	0	HIS	-	expression tag	UNP A0A0H3C5Q6

- Molecule 2 is a DNA chain called DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*TP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	U	21	427	206	76	125	20	0	0	0
2	F	21	427	206	76	125	20	0	0	0

- Molecule 3 is a DNA chain called DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*AP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	R	21	428	206	79	123	20	0	0	0
3	T	21	428	206	79	123	20	0	0	0

- Molecule 4 is a DNA chain called DNA (5'-D(P*GP*TP*C)-3').

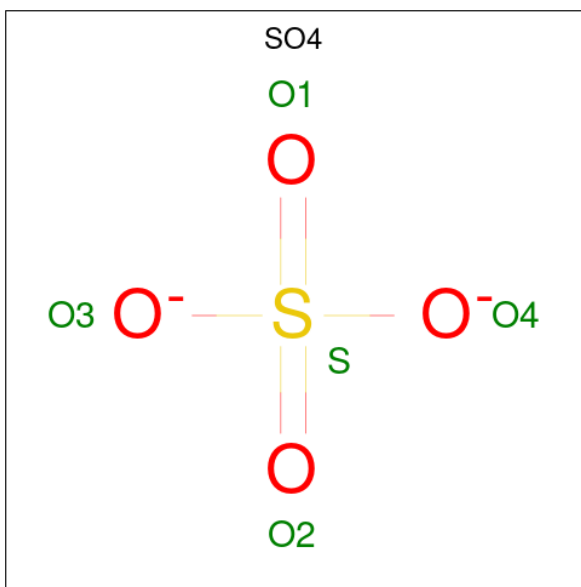
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	L	3	61	29	10	19	3	0	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace	
4	Y	3	Total	C	N	O	P	0	0	0
			61	29	10	19	3			
4	J	3	Total	C	N	O	P	0	0	0
			61	29	10	19	3			
4	K	3	Total	C	N	O	P	0	0	0
			61	29	10	19	3			

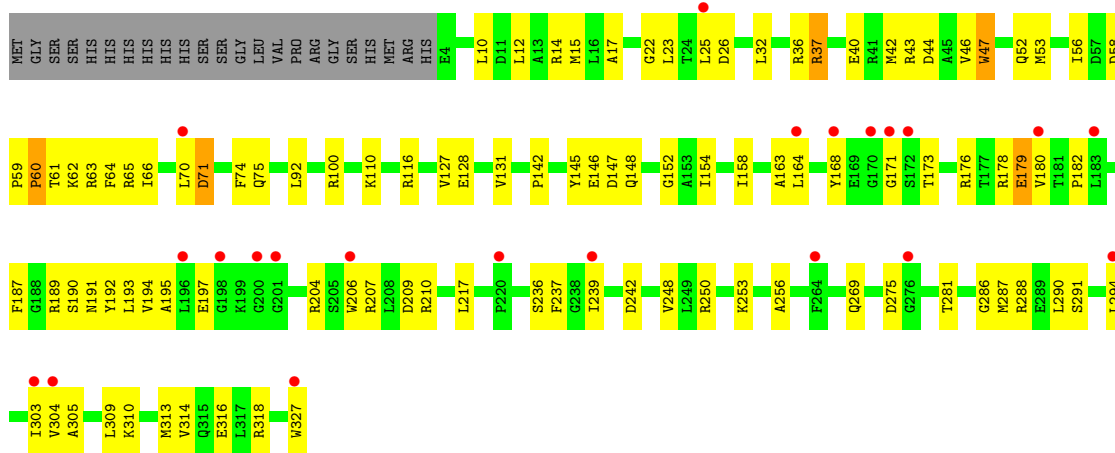
- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



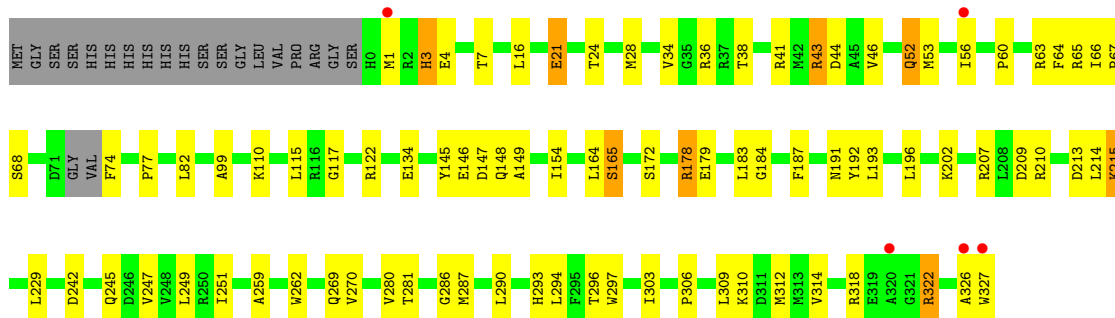
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	O S	0	0
			5	4 1		
5	B	1	Total	O S	0	0
			5	4 1		
5	C	1	Total	O S	0	0
			5	4 1		
5	D	1	Total	O S	0	0
			5	4 1		
5	D	1	Total	O S	0	0
			5	4 1		
5	D	1	Total	O S	0	0
			5	4 1		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	28	Total O 28 28	0	0
6	B	22	Total O 22 22	0	0
6	U	2	Total O 2 2	0	0
6	R	2	Total O 2 2	0	0
6	C	20	Total O 20 20	0	0
6	D	32	Total O 32 32	0	0
6	F	1	Total O 1 1	0	0
6	T	1	Total O 1 1	0	0



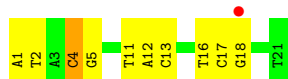
- Molecule 1: DeoR-family transcriptional regulator



- Molecule 2: DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*TP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3')



- Molecule 2: DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*TP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3')



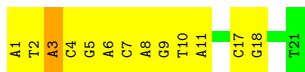
- Molecule 3: DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*AP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3')





- Molecule 3: DNA (5'-D(*AP*TP*AP*CP*GP*AP*CP*AP*GP*TP*AP*AP*CP*TP*GP*TP*CP*GP*TP*AP*T)-3')

Chain T: 38% 57% 5%



- Molecule 4: DNA (5'-D(P*GP*TP*C)-3')

Chain L: 33% 67%



- Molecule 4: DNA (5'-D(P*GP*TP*C)-3')

Chain Y: 100%



- Molecule 4: DNA (5'-D(P*GP*TP*C)-3')

Chain J: 67% 33%



- Molecule 4: DNA (5'-D(P*GP*TP*C)-3')

Chain K: 33% 67%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	69.26Å 178.94Å 92.15Å 90.00° 95.24° 90.00°	Depositor
Resolution (Å)	68.97 – 2.74 68.97 – 2.74	Depositor EDS
% Data completeness (in resolution range)	96.0 (68.97-2.74) 96.0 (68.97-2.74)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.46 (at 2.73Å)	Xtrriage
Refinement program	PHENIX (1.17.1_3660: ???)	Depositor
R, R_{free}	0.196 , 0.241 0.201 , 0.247	Depositor DCC
R_{free} test set	2000 reflections (3.57%)	wwPDB-VP
Wilson B-factor (Å ²)	77.0	Xtrriage
Anisotropy	0.205	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 69.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11931	wwPDB-VP
Average B, all atoms (Å ²)	89.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.40% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: SO4

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	0.51	0/2531	0.69	1/3430 (0.0%)
1	B	0.53	2/2508 (0.1%)	0.68	1/3404 (0.0%)
1	C	0.51	2/2486 (0.1%)	0.66	1/3380 (0.0%)
1	D	0.44	0/2514	0.64	0/3413
2	F	0.90	0/478	1.05	1/736 (0.1%)
2	U	1.04	1/478 (0.2%)	1.07	0/736
3	R	1.04	2/480 (0.4%)	1.12	2/739 (0.3%)
3	T	0.88	0/480	1.06	1/739 (0.1%)
4	J	1.02	0/67	1.10	0/101
4	K	0.80	0/67	1.09	0/101
4	L	1.05	0/67	1.05	0/101
4	Y	1.12	0/67	1.18	0/101
All	All	0.61	7/12223 (0.1%)	0.77	7/16981 (0.0%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	60	PRO	N-CA	13.23	1.69	1.47
1	B	289	GLU	CD-OE2	-5.77	1.19	1.25
3	R	14	DT	C3'-O3'	-5.67	1.36	1.44
2	U	2	DT	C3'-O3'	-5.60	1.36	1.44
1	C	59	PRO	C-N	5.48	1.44	1.34
3	R	12	DA	C3'-O3'	-5.40	1.36	1.44
1	B	289	GLU	CD-OE1	-5.31	1.19	1.25

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	60	PRO	CA-N-CD	-7.07	101.60	111.50
3	R	12	DA	O4'-C4'-C3'	-6.77	101.79	104.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	176	ARG	NE-CZ-NH1	-6.19	117.20	120.30
3	T	3	DA	O5'-P-OP2	-5.92	100.37	105.70
3	R	14	DT	N3-C4-O4	5.38	123.13	119.90
1	B	288	ARG	CG-CD-NE	-5.21	100.86	111.80
2	F	4	DC	C1'-O4'-C4'	-5.12	104.98	110.10

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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 hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2481	0	2460	73	0
1	B	2458	0	2418	91	0
1	C	2436	0	2370	89	0
1	D	2464	0	2410	68	0
2	F	427	0	240	9	0
2	U	427	0	240	18	0
3	R	428	0	239	18	0
3	T	428	0	239	13	0
4	J	61	0	35	1	0
4	K	61	0	35	3	0
4	L	61	0	35	2	0
4	Y	61	0	35	5	0
5	A	5	0	0	0	0
5	B	5	0	0	0	0
5	C	5	0	0	0	0
5	D	15	0	0	1	0
6	A	28	0	0	0	0
6	B	22	0	0	0	0
6	C	20	0	0	0	0
6	D	32	0	0	0	0
6	F	1	0	0	0	0
6	R	2	0	0	0	0
6	T	1	0	0	0	0
6	U	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	11931	0	10756	343	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 15.

All (343) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:60:PRO:N	1:C:60:PRO:CA	1.69	1.41
1:B:288:ARG:HG3	1:B:316:GLU:OE2	1.35	1.22
1:C:70:LEU:HD13	1:C:74:PHE:HB2	1.29	1.10
1:B:288:ARG:CG	1:B:316:GLU:OE2	2.03	1.06
1:B:8:ARG:NE	1:B:42:MET:HE1	1.71	1.04
1:C:36:ARG:HH22	3:T:2:DT:H5''	1.25	0.99
1:C:70:LEU:CD1	1:C:75:GLN:HG3	1.91	0.98
1:D:165:SER:OG	1:D:215:LYS:HE3	1.64	0.96
1:B:34:VAL:HG12	1:B:38:THR:HB	1.47	0.94
1:C:70:LEU:HD12	1:C:75:GLN:HG3	1.55	0.87
1:B:8:ARG:CZ	1:B:42:MET:CE	2.54	0.86
1:C:36:ARG:HH22	3:T:2:DT:C5'	1.87	0.85
1:C:70:LEU:HD11	1:C:75:GLN:HG3	1.59	0.85
1:D:242:ASP:HB2	1:D:286:GLY:H	1.42	0.84
1:A:134:GLU:HG2	1:B:187:PHE:HE2	1.40	0.84
1:B:181:THR:HG23	1:B:221:ALA:HB1	1.60	0.83
1:A:111:LEU:HD12	1:A:111:LEU:O	1.78	0.83
1:C:36:ARG:NH2	3:T:2:DT:H5''	1.93	0.83
1:C:189:ARG:HH22	1:D:296:THR:HG21	1.45	0.82
1:A:154:ILE:HD13	1:A:193:LEU:HD13	1.63	0.81
1:A:116:ARG:HE	1:A:118:SER:HB3	1.45	0.80
1:A:193:LEU:HB3	1:A:206:TRP:HB2	1.63	0.79
1:B:8:ARG:NE	1:B:42:MET:CE	2.47	0.77
2:U:5:DG:H2''	2:U:6:DA:H5'	1.67	0.77
1:D:207:ARG:HD3	1:D:210:ARG:NH1	2.01	0.75
1:C:14:ARG:NH1	1:C:74:PHE:O	2.20	0.74
1:B:34:VAL:CG1	1:B:38:THR:HB	2.18	0.74
1:B:91:SER:HB3	1:B:136:ILE:HD12	1.69	0.74
1:A:36:ARG:NH2	2:U:2:DT:OP2	2.20	0.74
1:B:252:HIS:NE2	1:B:253:LYS:HD3	2.03	0.73
3:T:7:DC:H2''	3:T:8:DA:H5''	1.70	0.73
1:C:100:ARG:NH1	1:C:146:GLU:OE1	2.23	0.72
1:C:180:VAL:HG12	1:C:197:GLU:HA	1.72	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:287:MET:HE2	1:C:309:LEU:HB2	1.71	0.71
1:B:250:ARG:NH1	1:B:273:GLU:OE2	2.20	0.71
1:B:34:VAL:HG12	1:B:38:THR:CB	2.21	0.70
1:B:252:HIS:CD2	1:B:253:LYS:HD3	2.26	0.70
2:U:19:DT:H2''	2:U:20:DA:H5''	1.72	0.70
3:R:3:DA:H2''	3:R:4:DC:H5''	1.74	0.70
1:B:8:ARG:NH2	1:B:42:MET:HE3	2.08	0.68
1:A:43:ARG:NH1	1:A:44:ASP:OD1	2.26	0.68
1:D:3:HIS:CD2	1:D:7:THR:HG21	2.29	0.68
1:B:270:VAL:HG12	1:B:280:VAL:HG23	1.75	0.67
1:A:9:LEU:HG	1:A:46:VAL:HG12	1.77	0.67
1:D:154:ILE:HD13	1:D:193:LEU:HD13	1.77	0.66
1:A:10:LEU:HD21	1:B:10:LEU:HB2	1.77	0.66
3:R:7:DC:H2''	3:R:8:DA:H5''	1.76	0.66
2:U:14:DT:H3	3:R:8:DA:H61	1.41	0.65
1:C:288:ARG:HD3	1:C:316:GLU:OE2	1.97	0.65
1:C:116:ARG:HD2	1:D:68:SER:HB2	1.78	0.65
1:A:43:ARG:NH2	2:U:3:DA:OP2	2.29	0.65
1:A:24:THR:HG22	1:A:63:ARG:HG2	1.79	0.64
1:A:321:GLY:O	1:A:326:ALA:N	2.24	0.64
2:U:11:DT:H2''	2:U:12:DA:C8	2.33	0.64
1:C:207:ARG:NH1	1:C:209:ASP:OD2	2.31	0.64
1:D:43:ARG:NH1	1:D:64:PHE:CZ	2.66	0.63
1:D:165:SER:HG	1:D:215:LYS:HE3	1.64	0.63
1:C:204:ARG:HB2	4:K:18:DG:N3	2.13	0.63
1:C:70:LEU:CD1	1:C:74:PHE:HB2	2.17	0.63
1:D:99:ALA:HB3	1:D:146:GLU:HG2	1.80	0.63
1:C:242:ASP:HB2	1:C:286:GLY:H	1.63	0.63
1:A:24:THR:OG1	1:A:27:GLU:HG3	2.00	0.62
1:B:21:GLU:O	1:B:63:ARG:HD2	2.00	0.62
3:R:17:DC:H2'	3:R:18:DG:C8	2.35	0.62
1:C:70:LEU:HD13	1:C:74:PHE:CB	2.18	0.62
1:D:165:SER:HB2	1:D:179:GLU:HG2	1.82	0.61
1:C:62:LYS:HE2	3:T:3:DA:OP1	2.00	0.61
1:D:293:HIS:O	1:D:296:THR:HB	2.00	0.61
1:A:5:LYS:H	1:A:5:LYS:HD2	1.66	0.61
2:F:4:DC:H2''	2:F:5:DG:C8	2.36	0.61
1:A:167:ARG:NH1	1:A:177:THR:OG1	2.33	0.61
1:A:54:GLU:OE1	1:A:65:ARG:NH1	2.33	0.61
3:R:17:DC:H2'	3:R:18:DG:H8	1.66	0.61
1:B:207:ARG:NH2	1:B:209:ASP:OD2	2.33	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:R:4:DC:H2''	3:R:5:DG:H5''	1.82	0.60
1:C:287:MET:HE3	1:C:309:LEU:HD13	1.82	0.60
1:C:209:ASP:OD1	1:C:209:ASP:N	2.27	0.60
2:F:12:DA:H2''	2:F:13:DC:H5'	1.84	0.60
3:R:3:DA:H2''	3:R:4:DC:C5'	2.31	0.60
1:C:318:ARG:HD3	1:D:326:ALA:O	2.01	0.59
1:C:303:ILE:HD13	1:C:309:LEU:HG	1.84	0.59
3:T:5:DG:H2''	3:T:6:DA:C8	2.38	0.59
1:B:8:ARG:HE	1:B:42:MET:HE1	1.66	0.59
1:B:24:THR:HG23	1:B:27:GLU:H	1.67	0.59
1:B:167:ARG:HA	1:B:177:THR:HA	1.85	0.58
2:U:4:DC:H2''	2:U:5:DG:H8	1.68	0.58
1:B:264:PHE:N	1:B:268:GLN:OE1	2.30	0.58
1:B:119:ALA:O	1:B:123:VAL:HG12	2.03	0.58
1:B:207:ARG:HD2	4:Y:20:DC:OP1	2.03	0.58
1:B:248:VAL:HG12	1:B:305:ALA:HB3	1.86	0.57
1:D:187:PHE:HA	1:D:191:ASN:OD1	2.05	0.57
1:B:173:THR:HG23	1:B:173:THR:O	2.05	0.57
1:B:310:LYS:O	1:B:314:VAL:HG23	2.04	0.57
1:A:251:ILE:HG21	1:A:259:ALA:HB2	1.87	0.57
1:B:307:GLN:NE2	1:B:310:LYS:HD3	2.19	0.57
1:B:211:MET:HB3	1:B:214:LEU:HD11	1.86	0.57
1:B:43:ARG:HB3	1:B:43:ARG:CZ	2.34	0.57
1:C:22:GLY:HA3	1:C:63:ARG:HB3	1.86	0.56
1:C:210:ARG:NH1	4:K:19:DT:OP1	2.38	0.56
1:C:12:LEU:HA	1:C:15:MET:HE2	1.86	0.56
1:D:34:VAL:HB	1:D:38:THR:CG2	2.34	0.56
1:C:248:VAL:HG13	1:C:304:VAL:HB	1.88	0.56
1:D:46:VAL:HG12	1:D:53:MET:CE	2.36	0.56
1:A:8:ARG:NH2	3:R:14:DT:OP1	2.38	0.55
1:C:253:LYS:HA	1:C:256:ALA:HB2	1.87	0.55
1:B:288:ARG:NE	1:B:316:GLU:OE2	2.40	0.55
1:D:213:ASP:O	1:D:215:LYS:HE2	2.07	0.55
1:B:23:LEU:HD12	1:B:28:MET:HG2	1.87	0.55
1:A:36:ARG:HD2	1:A:40:GLU:OE2	2.06	0.55
4:Y:19:DT:H2''	4:Y:20:DC:H5'	1.87	0.55
1:A:317:LEU:HD13	1:B:321:GLY:HA2	1.87	0.55
1:C:127:VAL:O	1:C:131:VAL:HG13	2.06	0.55
1:C:250:ARG:NH2	1:C:275:ASP:OD2	2.40	0.55
1:A:134:GLU:HG2	1:B:187:PHE:CE2	2.32	0.55
1:C:43:ARG:NH1	1:C:44:ASP:OD1	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:8:ARG:NH2	1:B:42:MET:CE	2.67	0.55
1:B:32:LEU:HB2	1:B:34:VAL:CG2	2.36	0.55
1:B:150:VAL:O	1:B:154:ILE:HG13	2.07	0.54
1:A:54:GLU:HB3	1:B:122:ARG:HH12	1.71	0.54
1:D:178:ARG:HH22	4:J:18:DG:P	2.30	0.54
1:C:187:PHE:HE2	1:D:134:GLU:HG3	1.72	0.54
1:B:164:LEU:HD13	1:B:165:SER:N	2.21	0.54
1:B:249:LEU:HB2	1:B:280:VAL:CG1	2.38	0.54
1:D:36:ARG:NH2	2:F:2:DT:OP2	2.40	0.54
2:U:19:DT:H2''	2:U:20:DA:C5'	2.38	0.54
1:A:92:LEU:HD13	1:A:100:ARG:HB2	1.89	0.54
2:F:12:DA:H2'	2:F:13:DC:C6	2.42	0.54
2:U:4:DC:H2''	2:U:5:DG:C8	2.42	0.53
1:C:60:PRO:HB2	3:T:1:DA:H4'	1.90	0.53
1:B:184:GLY:HA3	1:B:229:LEU:HD22	1.89	0.53
1:B:168:TYR:CE2	1:B:210:ARG:HB2	2.44	0.53
1:B:210:ARG:NH1	4:Y:19:DT:OP1	2.42	0.53
1:D:287:MET:HE3	1:D:290:LEU:HD23	1.90	0.53
1:A:147:ASP:O	1:A:149:ALA:N	2.42	0.53
1:C:110:LYS:HD3	1:D:77:PRO:HB3	1.91	0.52
1:B:178:ARG:NH2	4:Y:18:DG:OP2	2.34	0.52
1:B:32:LEU:HB2	1:B:34:VAL:HG23	1.90	0.52
1:B:38:THR:OG1	2:U:15:DG:OP2	2.22	0.52
1:B:86:ARG:HG3	1:B:108:GLU:OE1	2.10	0.52
1:C:42:MET:O	1:C:46:VAL:HG23	2.09	0.52
1:D:164:LEU:HD11	1:D:214:LEU:HD23	1.92	0.51
2:F:17:DC:H2'	2:F:18:DG:C8	2.45	0.51
3:T:3:DA:H2''	3:T:4:DC:O4'	2.10	0.51
1:A:9:LEU:HA	1:A:42:MET:HE1	1.92	0.51
1:C:314:VAL:O	1:C:318:ARG:HG3	2.10	0.51
2:F:11:DT:H2''	2:F:12:DA:C8	2.46	0.51
1:D:245:GLN:HB3	1:D:306:PRO:HG3	1.93	0.51
1:B:248:VAL:CG1	1:B:305:ALA:HB3	2.40	0.51
1:A:110:LYS:HE3	1:B:81:GLU:OE1	2.11	0.51
1:C:193:LEU:HD22	1:C:195:ALA:HB2	1.93	0.50
1:D:251:ILE:HG21	1:D:259:ALA:HB2	1.92	0.50
1:D:270:VAL:HG12	1:D:280:VAL:HG12	1.93	0.50
1:A:116:ARG:HG3	1:A:119:ALA:H	1.76	0.50
1:C:148:GLN:O	1:C:152:GLY:N	2.40	0.50
1:D:147:ASP:OD1	1:D:149:ALA:N	2.43	0.50
1:D:287:MET:HE2	1:D:309:LEU:HB2	1.91	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:U:18:DG:H1	3:R:3:DA:H61	1.58	0.50
1:A:314:VAL:O	1:A:318:ARG:HG2	2.12	0.50
1:D:322:ARG:NH2	1:D:327:TRP:CZ3	2.80	0.50
1:A:116:ARG:NE	1:A:118:SER:HB3	2.20	0.50
1:B:269:GLN:HB3	1:B:281:THR:HG23	1.92	0.50
1:C:47:TRP:CZ2	1:C:53:MET:O	2.65	0.50
1:D:148:GLN:O	1:D:148:GLN:HG3	2.10	0.50
3:R:2:DT:H2'	3:R:3:DA:C8	2.46	0.49
3:T:3:DA:H2''	3:T:4:DC:H5''	1.94	0.49
1:B:164:LEU:HD22	1:B:215:LYS:O	2.12	0.49
1:B:166:PHE:CE2	1:B:168:TYR:HB2	2.47	0.49
1:C:269:GLN:HB2	1:C:281:THR:OG1	2.13	0.49
1:A:34:VAL:HG12	1:A:38:THR:OG1	2.12	0.49
1:B:253:LYS:HA	1:B:256:ALA:HB2	1.92	0.49
1:D:46:VAL:HG12	1:D:53:MET:HE2	1.95	0.49
1:B:52:GLN:HE21	1:B:68:SER:HB3	1.76	0.49
3:R:14:DT:H2''	3:R:15:DG:C8	2.48	0.49
1:C:22:GLY:O	1:C:23:LEU:HD23	2.12	0.49
1:C:22:GLY:HA2	1:C:64:PHE:O	2.12	0.49
3:T:17:DC:H2'	3:T:18:DG:C8	2.47	0.49
1:A:69:GLY:HA2	1:B:119:ALA:CB	2.43	0.49
1:D:247:VAL:HA	1:D:306:PRO:HD3	1.95	0.48
1:A:147:ASP:OD1	1:A:149:ALA:HB3	2.13	0.48
1:B:209:ASP:OD1	1:B:209:ASP:N	2.42	0.48
1:A:245:GLN:HB3	1:A:306:PRO:HG3	1.95	0.48
1:B:166:PHE:CD2	1:B:211:MET:HG2	2.48	0.48
2:U:14:DT:H3	3:R:8:DA:N6	2.09	0.48
3:R:4:DC:H2''	3:R:5:DG:C8	2.48	0.48
1:A:151:LEU:O	1:A:155:ARG:HG3	2.14	0.48
1:B:165:SER:HA	1:B:178:ARG:O	2.14	0.48
3:T:4:DC:H2'	3:T:5:DG:C8	2.48	0.48
1:A:164:LEU:HG	1:A:165:SER:N	2.29	0.48
1:C:164:LEU:O	1:C:179:GLU:HA	2.14	0.48
1:A:178:ARG:NH2	4:L:18:DG:OP2	2.47	0.47
2:U:13:DC:C6	2:U:14:DT:H72	2.49	0.47
3:R:12:DA:H2'	3:R:13:DC:C6	2.49	0.47
1:D:3:HIS:CG	1:D:7:THR:HG21	2.49	0.47
1:D:24:THR:HG22	1:D:63:ARG:HG2	1.95	0.47
1:C:56:ILE:HD11	1:C:65:ARG:NH2	2.28	0.47
1:D:207:ARG:NH1	1:D:210:ARG:HH12	2.12	0.47
1:D:56:ILE:HD11	1:D:65:ARG:CZ	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:303:ILE:O	1:D:310:LYS:NZ	2.47	0.47
1:B:24:THR:HG22	1:B:27:GLU:OE1	2.14	0.47
1:A:179:GLU:OE2	1:A:219:LYS:HE2	2.15	0.47
1:D:41:ARG:O	1:D:44:ASP:HB2	2.14	0.47
1:D:269:GLN:HB3	1:D:281:THR:CG2	2.44	0.47
1:A:79:ALA:HA	1:A:127:VAL:HG12	1.97	0.47
1:C:291:SER:HB3	1:C:313:MET:SD	2.55	0.47
1:B:147:ASP:HB3	1:B:150:VAL:HB	1.97	0.46
1:B:303:ILE:HD13	1:B:309:LEU:HG	1.97	0.46
1:B:207:ARG:HB2	1:B:210:ARG:HG3	1.97	0.46
1:C:10:LEU:O	1:C:14:ARG:HG3	2.16	0.46
1:C:15:MET:CE	1:C:32:LEU:HD11	2.45	0.46
1:C:248:VAL:HG12	1:C:305:ALA:HB3	1.98	0.46
1:B:117:GLY:O	1:B:121:ARG:HG3	2.15	0.46
1:C:116:ARG:HD2	1:D:68:SER:CB	2.46	0.46
1:B:237:PHE:CE1	1:B:290:LEU:HA	2.51	0.46
2:U:21:DT:OP2	2:U:21:DT:H2'	2.16	0.46
1:C:180:VAL:HB	1:C:195:ALA:HB1	1.97	0.46
1:C:187:PHE:CE2	1:D:134:GLU:HG3	2.51	0.46
1:D:145:TYR:HB2	1:D:209:ASP:HB3	1.98	0.46
2:F:16:DT:H2''	2:F:17:DC:O5'	2.16	0.46
1:D:269:GLN:O	1:D:281:THR:HG22	2.17	0.45
1:C:26:ASP:OD1	1:C:36:ARG:HD2	2.17	0.45
1:A:97:ALA:HB1	1:A:100:ARG:HG3	1.97	0.45
1:C:176:ARG:O	1:C:178:ARG:HG3	2.16	0.45
1:B:151:LEU:HD12	1:B:151:LEU:HA	1.68	0.45
1:D:117:GLY:N	5:D:401:SO4:O4	2.49	0.45
1:A:150:VAL:O	1:A:154:ILE:HG13	2.16	0.45
1:B:166:PHE:HB3	1:B:214:LEU:HG	1.99	0.45
1:C:193:LEU:HB3	1:C:206:TRP:HB2	1.99	0.45
2:F:4:DC:H2''	2:F:5:DG:H8	1.81	0.45
1:A:16:LEU:HB2	1:A:66:ILE:HG13	1.98	0.45
1:A:150:VAL:HA	1:A:214:LEU:HD22	1.99	0.45
1:B:79:ALA:HB2	1:B:123:VAL:HG23	1.99	0.45
1:C:71:ASP:N	1:C:71:ASP:OD1	2.50	0.45
1:A:74:PHE:HD2	1:A:115:LEU:HD23	1.81	0.45
1:B:204:ARG:HB2	4:Y:18:DG:N3	2.31	0.45
2:U:3:DA:H2''	2:U:4:DC:O5'	2.17	0.44
1:C:190:SER:OG	1:C:191:ASN:N	2.50	0.44
1:D:52:GLN:O	1:D:67:PRO:HD2	2.17	0.44
1:A:116:ARG:NH1	1:A:116:ARG:HB2	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:244:ILE:HG21	1:A:283:ARG:HH21	1.81	0.44
1:B:160:GLY:O	1:B:162:GLN:HG3	2.18	0.44
2:U:18:DG:H1	3:R:3:DA:N6	2.15	0.44
1:C:70:LEU:CD1	1:C:71:ASP:O	2.65	0.44
1:A:32:LEU:O	1:A:34:VAL:HG23	2.17	0.44
1:A:291:SER:OG	1:A:316:GLU:OE2	2.32	0.44
1:B:59:PRO:HA	1:B:60:PRO:HA	1.77	0.44
1:C:154:ILE:HG22	1:C:158:ILE:HD13	2.00	0.44
1:D:43:ARG:HD3	1:D:64:PHE:CE1	2.53	0.44
1:C:318:ARG:HB3	1:C:327:TRP:CZ2	2.52	0.44
1:D:53:MET:HG3	1:D:66:ILE:HG13	1.98	0.44
1:B:92:LEU:HB2	1:B:101:ALA:HB2	2.00	0.44
2:U:18:DG:H2'	2:U:19:DT:C6	2.53	0.44
1:D:249:LEU:HB2	1:D:280:VAL:CG2	2.48	0.44
1:A:100:ARG:HD3	1:A:187:PHE:CD1	2.53	0.44
1:A:242:ASP:HB2	1:A:286:GLY:H	1.82	0.44
1:B:23:LEU:HB3	1:B:27:GLU:HG2	2.00	0.44
1:C:142:PRO:HD3	1:D:262:TRP:CH2	2.52	0.44
1:C:145:TYR:CZ	1:C:147:ASP:HB2	2.53	0.44
1:C:128:GLU:O	1:C:131:VAL:HG22	2.18	0.44
1:A:244:ILE:CG2	1:A:283:ARG:NH2	2.81	0.43
1:A:257:GLU:CD	1:A:257:GLU:H	2.20	0.43
1:C:26:ASP:OD2	1:C:36:ARG:NH1	2.51	0.43
1:A:71:ASP:N	1:B:114:ALA:O	2.48	0.43
1:A:41:ARG:O	1:A:44:ASP:HB2	2.19	0.43
1:A:107:LEU:O	1:A:111:LEU:HB2	2.18	0.43
1:D:249:LEU:HB2	1:D:280:VAL:HG23	1.98	0.43
2:U:18:DG:H2''	2:U:19:DT:O5'	2.18	0.43
1:C:37:ARG:NH1	1:C:40:GLU:HB3	2.32	0.43
1:C:192:TYR:CZ	1:C:239:ILE:HG21	2.54	0.43
1:D:147:ASP:OD1	1:D:147:ASP:C	2.57	0.43
1:A:120:ARG:HG2	1:B:20:ALA:HB2	2.00	0.43
3:R:4:DC:H2''	3:R:5:DG:H8	1.84	0.43
1:C:193:LEU:O	1:C:206:TRP:N	2.43	0.43
1:D:3:HIS:ND1	1:D:4:GLU:N	2.62	0.43
1:D:314:VAL:O	1:D:318:ARG:HG2	2.18	0.43
1:A:240:TYR:HB2	4:L:20:DC:H1'	2.00	0.43
1:B:56:ILE:HD11	1:B:65:ARG:HE	1.83	0.43
1:B:128:GLU:OE2	1:B:132:GLN:NE2	2.52	0.43
1:A:10:LEU:CD2	1:B:10:LEU:HB2	2.47	0.42
1:A:145:TYR:CZ	1:A:147:ASP:HB2	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:167:ARG:HG2	1:A:175:GLY:O	2.19	0.42
1:A:239:ILE:HD13	1:A:239:ILE:HA	1.82	0.42
1:A:292:TRP:O	1:A:295:PHE:HB3	2.19	0.42
1:D:16:LEU:HD23	1:D:16:LEU:HA	1.82	0.42
1:C:46:VAL:HG12	1:C:53:MET:HE1	2.01	0.42
1:B:24:THR:N	1:B:27:GLU:OE1	2.44	0.42
1:D:165:SER:CB	1:D:179:GLU:HG2	2.49	0.42
3:T:10:DT:H1'	3:T:11:DA:H5'	2.01	0.42
1:B:168:TYR:HA	1:B:210:ARG:O	2.20	0.42
1:C:168:TYR:OH	1:C:207:ARG:N	2.50	0.42
1:D:28:MET:HE1	1:D:43:ARG:HB2	2.01	0.42
1:A:47:TRP:HD1	1:A:47:TRP:O	2.02	0.42
1:C:92:LEU:HD13	1:C:100:ARG:HB2	2.02	0.42
1:B:322:ARG:HA	1:B:322:ARG:NE	2.33	0.42
1:C:37:ARG:HH12	1:C:40:GLU:HB3	1.85	0.42
3:T:8:DA:H2''	3:T:9:DG:C8	2.54	0.42
1:A:69:GLY:HA2	1:B:119:ALA:HB2	2.02	0.42
1:B:192:TYR:HA	1:B:206:TRP:O	2.20	0.42
1:C:193:LEU:HD23	1:C:194:VAL:N	2.34	0.42
1:D:183:LEU:HD11	1:D:196:LEU:HG	2.01	0.42
1:A:111:LEU:HD12	1:A:111:LEU:C	2.33	0.42
1:D:82:LEU:HD23	1:D:82:LEU:HA	1.86	0.42
1:A:5:LYS:H	1:A:5:LYS:CD	2.32	0.42
1:B:196:LEU:HD21	1:B:203:PRO:HG3	2.02	0.42
1:B:258:ASP:O	1:B:262:TRP:HB2	2.20	0.42
1:C:37:ARG:O	1:C:37:ARG:HD3	2.19	0.42
1:C:290:LEU:O	1:C:294:LEU:HG	2.18	0.42
1:A:312:MET:O	1:A:316:GLU:HG3	2.20	0.41
1:B:218:ASP:N	1:B:218:ASP:OD2	2.40	0.41
1:C:58:ASP:O	1:C:61:THR:O	2.37	0.41
1:C:164:LEU:HD13	1:C:182:PRO:HD3	2.01	0.41
1:C:14:ARG:HD3	1:D:110:LYS:HG2	2.03	0.41
1:B:265:HIS:O	1:B:268:GLN:HB2	2.21	0.41
1:B:293:HIS:O	1:B:296:THR:HB	2.20	0.41
1:C:164:LEU:N	1:C:164:LEU:HD12	2.35	0.41
1:A:104:LEU:HD23	1:A:104:LEU:HA	1.84	0.41
1:C:237:PHE:O	1:C:237:PHE:CD1	2.73	0.41
1:B:147:ASP:OD2	1:D:122:ARG:HD2	2.21	0.41
1:C:171:GLY:HA3	4:K:18:DG:H5''	2.02	0.41
1:D:21:GLU:H	1:D:21:GLU:CD	2.24	0.41
1:D:184:GLY:HA3	1:D:229:LEU:HD22	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:25:LEU:HD23	1:C:25:LEU:HA	1.89	0.41
1:D:3:HIS:CG	1:D:4:GLU:H	2.38	0.41
1:C:163:ALA:O	1:C:217:LEU:N	2.39	0.41
1:D:60:PRO:O	2:F:1:DA:H2''	2.20	0.41
1:A:119:ALA:HA	1:A:122:ARG:CZ	2.50	0.41
1:C:70:LEU:HD22	1:C:74:PHE:CB	2.51	0.41
1:A:8:ARG:HG3	1:A:32:LEU:HD22	2.03	0.40
1:A:124:ALA:O	1:A:128:GLU:OE1	2.39	0.40
1:B:207:ARG:HD3	1:B:210:ARG:CZ	2.51	0.40
1:C:15:MET:HE1	1:C:32:LEU:HD11	2.02	0.40
1:C:17:ALA:HA	1:C:66:ILE:HB	2.03	0.40
1:C:327:TRP:HB3	1:D:327:TRP:CE2	2.56	0.40
1:A:56:ILE:O	1:A:56:ILE:HG13	2.22	0.40
1:A:207:ARG:HB3	1:A:210:ARG:HG3	2.01	0.40
1:C:46:VAL:CG1	1:C:53:MET:HE1	2.52	0.40
1:D:115:LEU:HD23	1:D:115:LEU:HA	1.78	0.40
1:D:192:TYR:CE1	1:D:207:ARG:HG3	2.56	0.40
1:D:294:LEU:HA	1:D:297:TRP:HD1	1.86	0.40
1:C:173:THR:O	1:C:173:THR:OG1	2.33	0.40
1:A:78:THR:HG23	1:A:81:GLU:OE2	2.21	0.40
3:R:17:DC:H2''	3:R:18:DG:OP1	2.21	0.40
1:B:91:SER:CB	1:B:136:ILE:HD12	2.43	0.40
3:R:10:DT:H1'	3:R:11:DA:H5'	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [\(i\)](#)

5.3.1 Protein backbone [\(i\)](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	321/347 (92%)	298 (93%)	23 (7%)	0	100 100
1	B	322/347 (93%)	301 (94%)	21 (6%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	322/347 (93%)	294 (91%)	28 (9%)	0	100	100
1	D	322/347 (93%)	298 (92%)	24 (8%)	0	100	100
All	All	1287/1388 (93%)	1191 (92%)	96 (8%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	245/269 (91%)	237 (97%)	8 (3%)	38	59
1	B	242/269 (90%)	230 (95%)	12 (5%)	24	42
1	C	235/269 (87%)	228 (97%)	7 (3%)	41	61
1	D	240/269 (89%)	227 (95%)	13 (5%)	22	38
All	All	962/1076 (89%)	922 (96%)	40 (4%)	30	49

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	LYS
1	A	36	ARG
1	A	57	ASP
1	A	111	LEU
1	A	126	ASP
1	A	148	GLN
1	A	209	ASP
1	A	236	SER
1	B	8	ARG
1	B	38	THR
1	B	43	ARG
1	B	68	SER
1	B	102	SER
1	B	139	HIS

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Mol	Chain	Res	Type
1	B	225	GLN
1	B	246	ASP
1	B	249	LEU
1	B	253	LYS
1	B	254	SER
1	B	288	ARG
1	C	37	ARG
1	C	47	TRP
1	C	52	GLN
1	C	71	ASP
1	C	179	GLU
1	C	236	SER
1	C	310	LYS
1	D	1	MET
1	D	3	HIS
1	D	21	GLU
1	D	43	ARG
1	D	52	GLN
1	D	74	PHE
1	D	165	SER
1	D	172	SER
1	D	178	ARG
1	D	202	LYS
1	D	215	LYS
1	D	312	MET
1	D	322	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	SO4	D	402	-	4,4,4	0.11	0	6,6,6	0.24	0
5	SO4	D	401	-	4,4,4	0.14	0	6,6,6	0.14	0
5	SO4	A	401	-	4,4,4	0.16	0	6,6,6	0.34	0
5	SO4	D	403	-	4,4,4	0.13	0	6,6,6	0.37	0
5	SO4	B	401	-	4,4,4	0.17	0	6,6,6	0.33	0
5	SO4	C	401	-	4,4,4	0.13	0	6,6,6	0.21	0

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.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	401	SO4	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	325/347 (93%)	0.18	4 (1%) 79 83	45, 71, 112, 158	0
1	B	324/347 (93%)	0.31	12 (3%) 41 46	47, 83, 123, 163	0
1	C	324/347 (93%)	0.51	22 (6%) 17 19	48, 89, 145, 185	0
1	D	326/347 (93%)	0.22	5 (1%) 73 79	47, 77, 116, 192	0
2	F	21/21 (100%)	-0.01	1 (4%) 30 34	67, 117, 168, 179	0
2	U	21/21 (100%)	0.17	1 (4%) 30 34	68, 122, 184, 206	0
3	R	21/21 (100%)	0.22	1 (4%) 30 34	81, 115, 163, 177	0
3	T	21/21 (100%)	0.09	0 100 100	85, 105, 150, 158	0
4	J	3/3 (100%)	-0.38	0 100 100	75, 75, 90, 90	0
4	K	3/3 (100%)	0.05	0 100 100	106, 106, 108, 113	0
4	L	3/3 (100%)	-0.36	0 100 100	68, 68, 81, 85	0
4	Y	3/3 (100%)	-0.07	0 100 100	76, 76, 87, 98	0
All	All	1395/1484 (94%)	0.29	46 (3%) 46 52	45, 81, 134, 206	0

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	201	GLY	4.8
1	C	172	SER	4.8
1	C	327	TRP	4.3
1	D	320	ALA	4.2
1	D	327	TRP	3.9
1	C	276	GLY	3.8
1	C	171	GLY	3.6
1	C	168	TYR	3.5
1	C	304	VAL	3.3
1	D	326	ALA	3.2
1	C	200	GLY	3.2

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Mol	Chain	Res	Type	RSRZ
1	C	303	ILE	3.2
1	B	200	GLY	3.1
1	C	239	ILE	3.0
1	C	180	VAL	3.0
1	C	170	GLY	2.9
3	R	7	DC	2.9
1	A	69	GLY	2.8
1	D	1	MET	2.8
1	B	302	GLU	2.6
1	C	25	LEU	2.6
1	B	69	GLY	2.6
1	C	183	LEU	2.6
1	C	220	PRO	2.6
1	B	248	VAL	2.6
1	C	70	LEU	2.5
1	C	196	LEU	2.5
1	B	303	ILE	2.4
1	C	164	LEU	2.4
1	C	206	TRP	2.4
1	B	304	VAL	2.3
1	A	5	LYS	2.3
1	B	64	PHE	2.2
1	C	294	LEU	2.2
2	U	19	DT	2.2
1	A	64	PHE	2.2
1	D	56	ILE	2.1
1	B	284	ALA	2.1
1	B	251	ILE	2.1
1	A	195	ALA	2.0
1	B	318	ARG	2.0
1	C	264	PHE	2.0
1	B	25	LEU	2.0
2	F	18	DG	2.0
1	C	198	GLY	2.0
1	B	28	MET	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
5	SO4	D	402	5/5	0.55	0.23	169,174,175,183	0
5	SO4	D	401	5/5	0.80	0.28	180,181,185,187	0
5	SO4	C	401	5/5	0.86	0.23	137,145,151,151	0
5	SO4	A	401	5/5	0.88	0.25	131,136,146,148	0
5	SO4	B	401	5/5	0.89	0.49	156,164,167,171	0
5	SO4	D	403	5/5	0.92	0.21	144,148,162,164	0

6.5 Other polymers [i](#)

There are no such residues in this entry.