



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 25, 2026 – 02:40 AM EDT

PDB ID : 1UVI / pdb_00001uvi
Title : The structural basis for RNA specificity and Ca²⁺ inhibition of an RNA-dependent RNA polymerase phi6p2 with 6nt RNA
Authors : Salgado, P.S.; Makeyev, E.V.; Butcher, S.; Bamford, D.; Stuart, D.I.; Grimes, J.M.
Deposited on : 2004-01-21
Resolution : 2.15 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	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

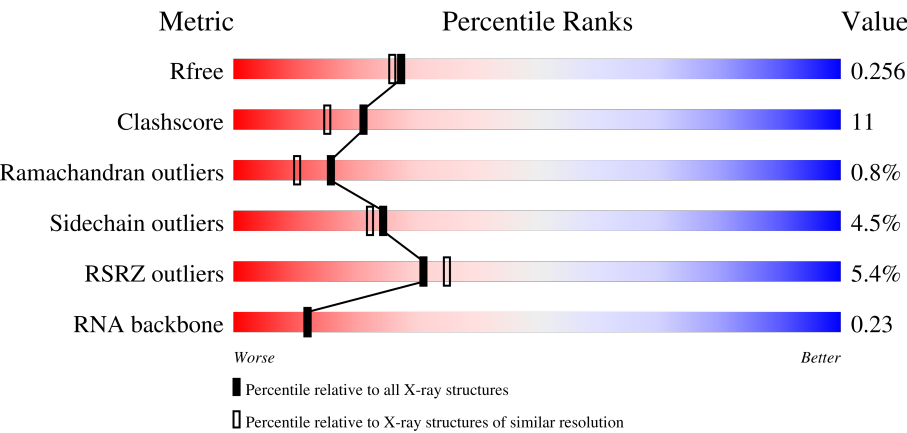
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.15 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}	180053	2057 (2.16-2.16)
Clashscore	190562	2159 (2.16-2.16)
Ramachandran outliers	187476	2134 (2.16-2.16)
Sidechain outliers	187428	2133 (2.16-2.16)
RSRZ outliers	180081	2059 (2.16-2.16)
RNA backbone	3983	1112 (2.50-1.82)

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	664	<div><div>5%</div><div>76%</div><div>21%</div><div></div></div>
1	B	664	<div><div>5%</div><div>76%</div><div>21%</div><div></div></div>
1	C	664	<div><div>5%</div><div>77%</div><div>20%</div><div></div></div>
2	D	6	<div><div>67%</div><div>17%</div><div>17%</div><div>33%</div><div>33%</div></div>

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Mol	Chain	Length	Quality of chain			
2	E	6	67%			
			17%	33%	17%	33%
2	F	6	67%			
			17%	33%	17%	33%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 16447 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 RNA-directed RNA polymerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	664	Total	C	N	O	S	0	0	0
			5265	3342	914	977	32			
1	B	664	Total	C	N	O	S	0	0	0
			5265	3342	914	977	32			
1	C	664	Total	C	N	O	S	0	0	0
			5265	3342	914	977	32			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	456	MET	ILE	conflict	UNP P11124
B	456	MET	ILE	conflict	UNP P11124
C	456	MET	ILE	conflict	UNP P11124

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	D	4	Total	C	N	O	P	0	0	0
			77	36	10	28	3			
2	E	4	Total	C	N	O	P	0	0	0
			77	36	10	28	3			
2	F	4	Total	C	N	O	P	0	0	0
			77	36	10	28	3			

- Molecule 3 is MANGANESE (II) ION (CCD ID: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Mn	0	0
			1	1		
3	B	1	Total	Mn	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	1	Total 1	Mn 1	0	0

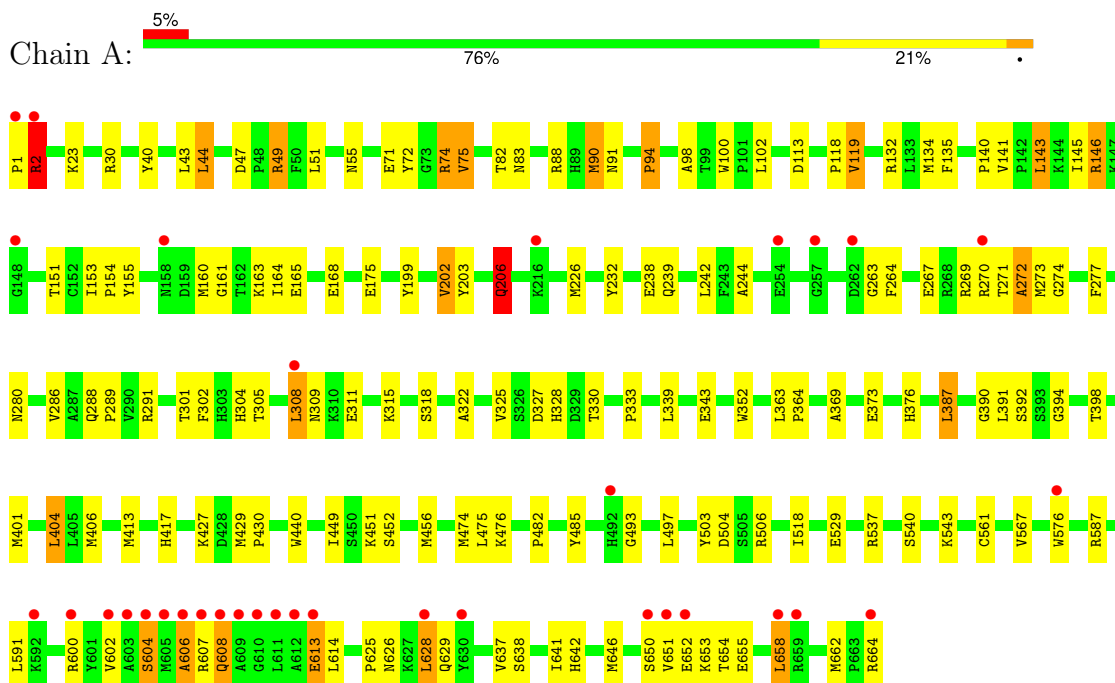
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	116	Total 116	O 116	0	0
4	B	192	Total 192	O 192	0	0
4	C	109	Total 109	O 109	0	0
4	D	1	Total 1	O 1	0	0

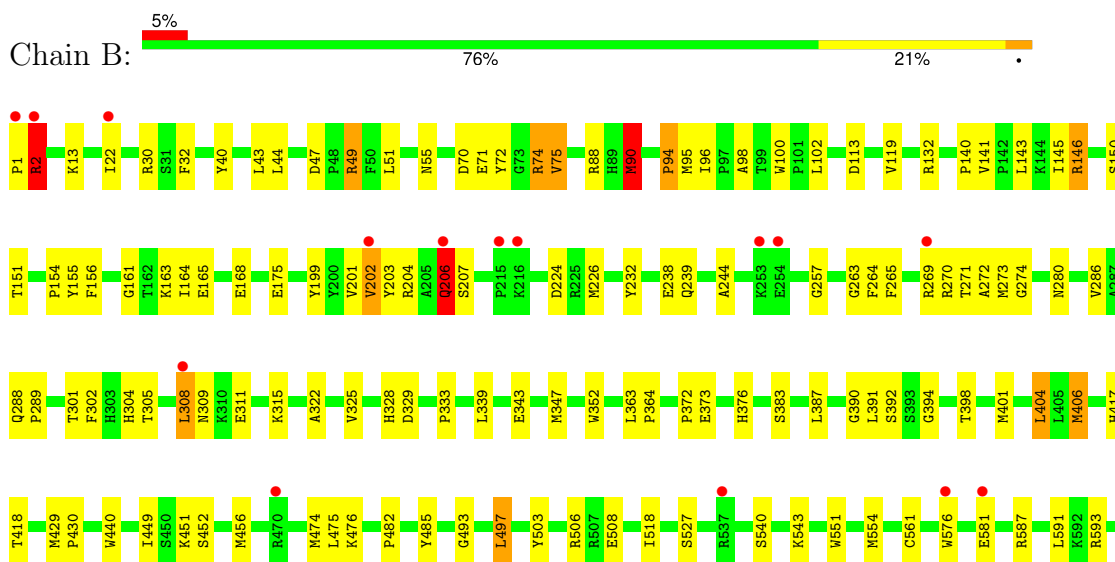
3 Residue-property plots

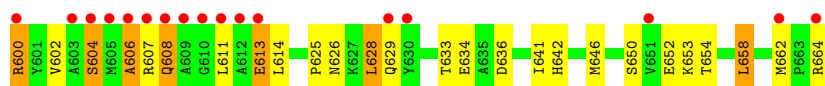
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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.

• Molecule 1: RNA-directed RNA polymerase

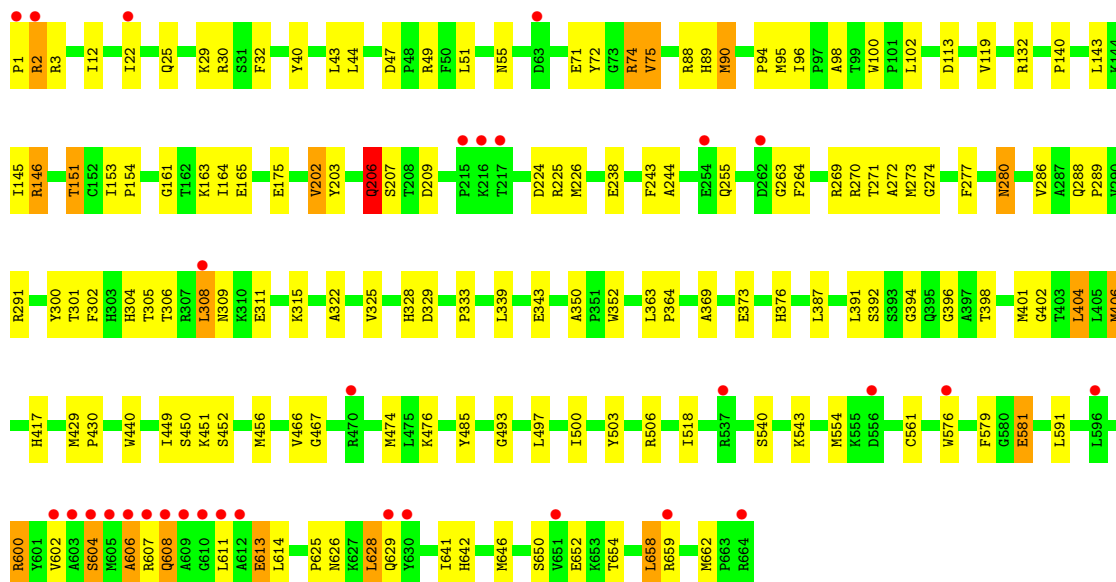
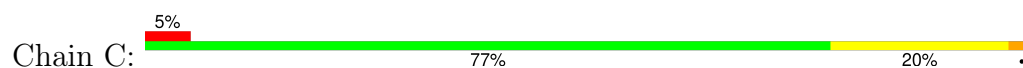


• Molecule 1: RNA-directed RNA polymerase

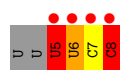




- Molecule 1: RNA-directed RNA polymerase



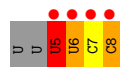
- Molecule 2: 5'-R(*UP*UP*UP*UP*CP*CP)-3'



- Molecule 2: 5'-R(*UP*UP*UP*UP*CP*CP)-3'



- Molecule 2: 5'-R(*UP*UP*UP*UP*CP*CP)-3'



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	105.13Å 93.71Å 140.74Å 90.00° 101.22° 90.00°	Depositor
Resolution (Å)	19.93 – 2.15 19.93 – 2.15	Depositor EDS
% Data completeness (in resolution range)	97.8 (19.93-2.15) 97.7 (19.93-2.15)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.92 (at 2.15Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.230 , 0.256 0.230 , 0.256	Depositor DCC
R_{free} test set	7208 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å ²)	27.7	Xtriage
Anisotropy	0.631	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 38.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	16447	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.28% 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

5.1 Standard geometry

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

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	0.62	1/5396 (0.0%)	1.02	27/7297 (0.4%)
1	B	0.64	1/5396 (0.0%)	1.01	28/7297 (0.4%)
1	C	0.60	1/5396 (0.0%)	1.02	27/7297 (0.4%)
2	D	0.41	0/84	1.03	2/128 (1.6%)
2	E	0.54	0/84	1.17	0/128
2	F	0.45	0/84	1.04	1/128 (0.8%)
All	All	0.62	3/16440 (0.0%)	1.02	85/22275 (0.4%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1
2	D	0	1
2	E	0	1
2	F	0	1
All	All	0	4

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	90	MET	SD-CE	-8.45	1.58	1.79
1	C	90	MET	SD-CE	-7.49	1.60	1.79
1	B	90	MET	SD-CE	-7.29	1.61	1.79

All (85) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	100	TRP	N-CA-C	-9.02	98.44	109.72
1	A	100	TRP	N-CA-C	-8.37	99.53	110.07
1	C	206	GLN	N-CA-C	-8.34	90.57	107.41
1	C	363	LEU	N-CA-C	8.18	120.02	109.64
1	A	206	GLN	N-CA-C	-8.15	90.94	107.41
1	C	302	PHE	N-CA-C	8.07	124.31	113.97
1	B	206	GLN	N-CA-C	-7.90	91.46	107.41
1	C	100	TRP	N-CA-C	-7.79	99.98	109.72
1	A	98	ALA	N-CA-C	-7.38	101.01	110.53
1	B	98	ALA	N-CA-C	-7.36	101.03	110.53
1	C	333	PRO	N-CA-C	7.24	122.08	110.21
1	A	302	PHE	N-CA-C	7.17	123.15	113.97
1	C	98	ALA	N-CA-C	-7.00	101.50	110.53
1	C	153	ILE	N-CA-C	6.93	116.51	108.96
1	C	452	SER	CB-CA-C	-6.73	108.80	116.54
1	B	628	LEU	N-CA-C	-6.72	105.07	113.20
1	B	333	PRO	N-CA-C	6.71	121.48	110.55
2	F	5	U	C2'-C3'-O3'	6.67	119.51	109.50
1	A	153	ILE	N-CA-C	6.58	116.13	108.96
1	B	302	PHE	N-CA-C	6.54	122.34	113.97
1	A	333	PRO	N-CA-C	6.49	120.86	110.21
1	A	277	PHE	N-CA-C	6.45	119.13	111.33
1	C	277	PHE	N-CA-C	6.45	119.13	111.33
1	A	449	ILE	N-CA-C	-6.44	98.85	108.12
2	D	5	U	C2'-C3'-O3'	6.42	119.14	109.50
1	B	390	GLY	N-CA-C	-6.36	103.62	111.45
1	B	22	ILE	N-CA-C	6.25	117.00	110.62
1	B	95	MET	N-CA-C	-6.22	101.89	110.35
1	A	363	LEU	N-CA-C	6.19	118.62	110.08
1	B	452	SER	CB-CA-C	-6.18	109.43	116.54
1	A	318	SER	N-CA-C	-6.13	105.93	113.41
1	C	95	MET	N-CA-C	-6.10	101.90	110.50
1	C	3	ARG	N-CA-C	-6.10	101.45	110.48
1	B	449	ILE	N-CA-C	-6.09	99.35	108.12
1	C	255	GLN	N-CA-C	6.09	118.00	111.36
1	A	628	LEU	N-CA-C	-6.08	105.84	113.20
1	C	449	ILE	N-CA-C	-6.01	99.46	108.12
1	B	363	LEU	N-CA-C	5.97	118.15	109.84
1	C	207	SER	N-CA-C	5.95	119.64	112.38
1	B	265	PHE	N-CA-C	5.94	118.43	109.41
1	B	329	ASP	N-CA-C	5.89	117.70	111.28
1	A	141	VAL	CA-C-N	-5.87	113.92	119.85
1	A	141	VAL	C-N-CA	-5.87	113.92	119.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	485	TYR	N-CA-C	5.81	120.53	112.45
1	C	485	TYR	N-CA-C	5.77	120.33	113.12
1	A	452	SER	CB-CA-C	-5.74	109.94	116.54
1	B	199	TYR	N-CA-C	-5.73	101.20	110.32
1	A	328	HIS	N-CA-C	5.73	117.99	111.11
1	B	485	TYR	N-CA-C	5.70	120.37	112.45
1	B	207	SER	N-CA-C	5.69	118.25	111.71
1	C	628	LEU	N-CA-C	-5.66	106.35	113.20
1	B	94	PRO	N-CA-C	5.63	120.12	111.57
1	C	406	MET	N-CA-C	5.58	117.44	111.36
1	C	22	ILE	N-CA-C	5.58	116.31	110.62
1	A	134	MET	N-CA-C	5.57	117.43	111.36
1	B	155	TYR	N-CA-C	5.57	120.19	112.90
1	C	328	HIS	N-CA-C	5.54	117.75	111.11
1	B	141	VAL	CA-C-N	-5.50	114.30	119.85
1	B	141	VAL	C-N-CA	-5.50	114.30	119.85
1	A	155	TYR	N-CA-C	5.46	120.06	112.90
1	C	151	THR	N-CA-C	-5.46	106.62	113.28
1	A	369	ALA	CA-C-N	5.39	125.01	119.56
1	A	369	ALA	C-N-CA	5.39	125.01	119.56
1	C	554	MET	N-CA-C	5.34	117.51	111.11
1	C	369	ALA	CA-C-N	5.33	124.95	119.56
1	C	369	ALA	C-N-CA	5.33	124.95	119.56
1	A	199	TYR	N-CA-C	-5.32	101.86	110.32
1	C	396	GLY	N-CA-C	5.32	120.80	113.99
1	A	94	PRO	N-CA-C	5.32	119.66	111.57
1	B	328	HIS	N-CA-C	5.28	117.45	111.11
1	A	272	ALA	N-CA-C	-5.26	101.30	109.24
1	C	329	ASP	N-CA-C	5.23	116.98	111.28
1	A	135	PHE	N-CA-C	5.20	118.65	112.72
1	B	201	VAL	N-CA-C	5.16	116.18	108.54
1	B	527	SER	CA-C-N	-5.11	114.46	119.92
1	B	527	SER	C-N-CA	-5.11	114.46	119.92
1	A	390	GLY	N-CA-C	-5.10	105.17	111.45
1	C	450	SER	N-CA-C	5.10	116.04	108.60
1	B	418	THR	CA-C-N	-5.09	117.19	122.89
1	B	418	THR	C-N-CA	-5.09	117.19	122.89
2	D	8	C	N1-C1'-C2'	5.09	119.64	112.00
1	A	118	PRO	N-CA-C	-5.06	103.24	111.03
1	B	406	MET	N-CA-C	5.05	116.86	111.36
1	C	280	ASN	N-CA-C	5.04	116.86	111.36
1	A	242	LEU	N-CA-C	-5.02	99.24	108.02

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	40	TYR	Sidechain
2	D	5	U	Sidechain
2	E	5	U	Sidechain
2	F	5	U	Sidechain

5.2 Too-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 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	5265	0	5165	114	0
1	B	5265	0	5165	114	0
1	C	5265	0	5165	105	0
2	D	77	0	44	16	0
2	E	77	0	44	19	0
2	F	77	0	44	15	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
4	A	116	0	0	3	0
4	B	192	0	0	0	0
4	C	109	0	0	2	0
4	D	1	0	0	0	0
All	All	16447	0	15627	345	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 11.

All (345) 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:B:274:GLY:HA2	2:E:6:U:H1'	1.33	1.11
1:C:274:GLY:HA2	2:F:6:U:H1'	1.42	1.01
1:A:274:GLY:HA2	2:D:6:U:H1'	1.44	0.98
1:A:364:PRO:HA	1:A:387:LEU:HD22	1.56	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:301:THR:HG23	1:C:440:TRP:O	1.75	0.87
1:B:451:LYS:HE2	2:E:8:C:N4	1.90	0.86
1:A:30:ARG:HH12	2:D:5:U:H3	1.24	0.84
1:B:301:THR:HG23	1:B:440:TRP:O	1.79	0.83
1:A:308:LEU:H	1:A:308:LEU:HD22	1.44	0.83
1:A:613:GLU:CD	1:A:613:GLU:H	1.87	0.82
1:A:301:THR:HG23	1:A:440:TRP:O	1.79	0.81
1:C:451:LYS:HE2	2:F:8:C:N4	1.95	0.81
1:C:308:LEU:H	1:C:308:LEU:HD22	1.46	0.80
1:C:629:GLN:HG2	2:F:7:C:C4	2.17	0.80
1:A:2:ARG:O	1:A:2:ARG:HD3	1.83	0.79
1:A:427:LYS:HE3	1:C:12:ILE:HG21	1.63	0.79
1:C:600:ARG:HH11	1:C:600:ARG:HB2	1.48	0.78
1:C:364:PRO:HA	1:C:387:LEU:HD22	1.66	0.77
1:A:47:ASP:OD1	1:A:49:ARG:HD3	1.84	0.77
1:C:613:GLU:CD	1:C:613:GLU:H	1.93	0.77
1:B:274:GLY:CA	2:E:6:U:H1'	2.13	0.76
1:B:613:GLU:H	1:B:613:GLU:CD	1.94	0.76
1:B:364:PRO:HA	1:B:387:LEU:HD22	1.67	0.76
1:C:206:GLN:HG3	1:C:270:ARG:HD2	1.68	0.75
1:B:2:ARG:O	1:B:2:ARG:HD3	1.87	0.75
1:B:308:LEU:HD22	1:B:308:LEU:H	1.50	0.75
1:B:90:MET:HE2	1:B:90:MET:HA	1.70	0.74
1:A:629:GLN:HG2	2:D:7:C:C4	2.22	0.74
1:A:451:LYS:HE2	2:D:8:C:N4	2.04	0.73
1:C:30:ARG:HH12	2:F:5:U:H3	1.37	0.72
1:A:206:GLN:HG3	1:A:270:ARG:HD2	1.71	0.72
1:C:600:ARG:HB2	1:C:600:ARG:NH1	2.04	0.72
1:B:417:HIS:CE1	1:B:474:MET:HE1	2.24	0.72
1:B:600:ARG:HH11	1:B:600:ARG:HB2	1.54	0.72
1:A:658:LEU:HB3	1:A:662:MET:CE	2.20	0.71
1:A:226:MET:HE1	1:A:244:ALA:HB2	1.72	0.71
1:C:140:PRO:HB3	1:C:658:LEU:HD23	1.73	0.71
1:A:600:ARG:HH11	1:A:600:ARG:HB2	1.57	0.70
1:C:417:HIS:CE1	1:C:474:MET:HE1	2.27	0.70
2:E:5:U:O2'	2:E:6:U:OP1	2.06	0.70
1:B:206:GLN:HG3	1:B:270:ARG:HD2	1.73	0.69
1:C:301:THR:HG22	4:C:2083:HOH:O	1.93	0.69
1:C:47:ASP:OD1	1:C:49:ARG:HD3	1.92	0.69
1:C:274:GLY:CA	2:F:6:U:H1'	2.22	0.68
1:C:451:LYS:CE	2:F:8:C:N4	2.56	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:658:LEU:HB3	1:A:662:MET:HE2	1.76	0.67
1:B:47:ASP:OD1	1:B:49:ARG:HD3	1.93	0.67
1:C:226:MET:HE1	1:C:244:ALA:HB2	1.75	0.67
1:A:280:ASN:ND2	1:A:394:GLY:O	2.27	0.67
1:B:602:VAL:HG12	1:B:604:SER:HB3	1.77	0.67
1:C:600:ARG:HH11	1:C:600:ARG:CB	2.08	0.66
2:D:5:U:O2'	2:D:6:U:OP1	2.12	0.66
1:C:132:ARG:NH1	1:C:343:GLU:OE2	2.29	0.66
1:C:90:MET:HE3	1:C:264:PHE:HB3	1.78	0.66
1:A:203:TYR:HE1	1:A:271:THR:HG22	1.60	0.66
1:A:291:ARG:HD3	2:D:8:C:H6	1.61	0.65
1:B:600:ARG:HB2	1:B:600:ARG:NH1	2.11	0.65
1:B:600:ARG:HH11	1:B:600:ARG:CB	2.10	0.64
1:C:140:PRO:CB	1:C:658:LEU:HD23	2.27	0.64
2:F:5:U:O2'	2:F:6:U:OP1	2.14	0.64
1:A:273:MET:HE3	1:A:392:SER:HB3	1.79	0.64
1:C:273:MET:HE3	1:C:392:SER:HB3	1.79	0.64
1:A:140:PRO:HB3	1:A:658:LEU:HD23	1.80	0.63
1:A:417:HIS:CE1	1:A:474:MET:HE1	2.34	0.63
1:B:475:LEU:HD21	1:B:482:PRO:HG3	1.81	0.63
1:A:537:ARG:HD3	4:A:2095:HOH:O	1.98	0.63
1:A:274:GLY:CA	2:D:6:U:H1'	2.26	0.62
1:B:652:GLU:CD	1:B:652:GLU:H	2.08	0.62
1:B:202:VAL:HG22	1:B:272:ALA:HB3	1.80	0.62
1:B:51:LEU:HD22	1:B:90:MET:HE1	1.82	0.62
1:C:202:VAL:HG22	1:C:272:ALA:HB3	1.81	0.62
1:C:2:ARG:HD3	1:C:2:ARG:O	1.99	0.62
1:B:273:MET:HE3	1:B:392:SER:HB3	1.81	0.62
1:C:175:GLU:HA	1:C:352:TRP:CE3	2.35	0.62
1:C:291:ARG:HD3	2:F:8:C:H6	1.65	0.61
4:A:2112:HOH:O	1:B:581:GLU:HG3	1.99	0.61
1:B:30:ARG:HH12	2:E:5:U:H3	1.47	0.61
1:C:602:VAL:HG12	1:C:604:SER:HB3	1.81	0.61
1:A:308:LEU:HD22	1:A:308:LEU:N	2.16	0.61
1:A:600:ARG:HB2	1:A:600:ARG:NH1	2.15	0.61
1:C:1:PRO:HD2	1:C:238:GLU:CD	2.26	0.61
1:C:652:GLU:H	1:C:652:GLU:CD	2.09	0.61
1:B:132:ARG:HD2	1:B:429:MET:HE2	1.82	0.61
1:C:132:ARG:HD2	1:C:429:MET:HE2	1.82	0.61
1:A:55:ASN:OD1	1:A:88:ARG:NH2	2.30	0.60
1:C:1:PRO:HD2	1:C:238:GLU:OE2	2.02	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:88:ARG:HD3	1:A:263:GLY:O	2.02	0.60
1:A:427:LYS:HE3	1:C:12:ILE:CG2	2.30	0.60
1:B:602:VAL:CG1	1:B:604:SER:HB3	2.32	0.60
1:C:1:PRO:HD2	1:C:238:GLU:OE1	2.01	0.60
1:C:30:ARG:O	1:C:376:HIS:HE1	1.85	0.60
1:C:145:ILE:HD12	1:C:164:ILE:HD13	1.84	0.60
1:C:658:LEU:HB3	1:C:662:MET:CE	2.32	0.60
1:A:203:TYR:CE1	1:A:271:THR:HG22	2.36	0.59
1:A:140:PRO:CB	1:A:658:LEU:HD23	2.32	0.59
1:A:451:LYS:CE	2:D:8:C:N4	2.65	0.59
1:B:55:ASN:OD1	1:B:88:ARG:NH2	2.30	0.59
1:C:602:VAL:CG1	1:C:604:SER:HB3	2.33	0.59
1:A:602:VAL:HG12	1:A:604:SER:HB3	1.83	0.59
1:B:650:SER:HB2	1:B:652:GLU:OE1	2.03	0.59
1:A:51:LEU:HD22	1:A:90:MET:HE1	1.85	0.59
1:B:392:SER:O	1:B:398:THR:HG21	2.02	0.59
1:B:140:PRO:CB	1:B:658:LEU:HD23	2.33	0.58
1:B:226:MET:HE1	1:B:244:ALA:HB2	1.83	0.58
1:C:74:ARG:HB3	1:C:503:TYR:CD2	2.37	0.58
1:C:322:ALA:HB2	1:C:456:MET:HE2	1.85	0.58
1:C:325:VAL:HG21	1:C:406:MET:HE2	1.83	0.58
1:B:140:PRO:HB3	1:B:658:LEU:HD23	1.84	0.58
1:B:280:ASN:ND2	1:B:394:GLY:O	2.31	0.58
1:C:88:ARG:HD3	1:C:263:GLY:O	2.04	0.58
1:C:72:TYR:CE1	1:C:476:LYS:HD3	2.37	0.58
1:A:72:TYR:CE1	1:A:476:LYS:HD3	2.38	0.58
1:A:132:ARG:HD2	1:A:429:MET:HE2	1.84	0.58
1:A:74:ARG:HB3	1:A:503:TYR:CD2	2.39	0.57
1:A:652:GLU:CD	1:A:652:GLU:H	2.12	0.57
1:A:90:MET:HA	1:A:90:MET:HE2	1.86	0.57
1:B:72:TYR:CE1	1:B:476:LYS:HD3	2.40	0.57
1:C:55:ASN:OD1	1:C:88:ARG:NH2	2.33	0.57
1:C:203:TYR:HE1	1:C:271:THR:HG22	1.70	0.57
1:B:308:LEU:HD22	1:B:308:LEU:N	2.17	0.56
1:A:30:ARG:O	1:A:376:HIS:HE1	1.89	0.56
1:A:392:SER:O	1:A:398:THR:CG2	2.53	0.56
1:A:202:VAL:HG22	1:A:272:ALA:HB3	1.85	0.56
1:B:401:MET:HA	1:B:401:MET:HE2	1.88	0.56
1:B:628:LEU:O	2:E:8:C:O2	2.24	0.56
1:C:51:LEU:HD22	1:C:90:MET:HE1	1.88	0.56
2:D:8:C:O2	2:D:8:C:H3'	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:392:SER:O	1:C:398:THR:HG21	2.05	0.56
1:B:1:PRO:HD2	1:B:238:GLU:OE1	2.06	0.56
1:A:1:PRO:HD2	1:A:238:GLU:OE1	2.06	0.55
1:B:658:LEU:HB3	1:B:662:MET:CE	2.37	0.55
1:B:145:ILE:HD12	1:B:164:ILE:HD13	1.89	0.55
1:A:364:PRO:HA	1:A:387:LEU:CD2	2.33	0.55
1:A:30:ARG:NH1	2:D:5:U:H3	2.01	0.55
1:B:1:PRO:HD2	1:B:238:GLU:CD	2.32	0.55
1:A:301:THR:HG22	4:A:2078:HOH:O	2.06	0.55
1:C:308:LEU:HD22	1:C:308:LEU:N	2.19	0.55
1:B:132:ARG:NH1	1:B:343:GLU:OE2	2.38	0.55
1:C:175:GLU:HA	1:C:352:TRP:CD2	2.42	0.54
1:C:642:HIS:CE1	1:C:646:MET:HG3	2.42	0.54
1:B:88:ARG:HD3	1:B:263:GLY:O	2.08	0.54
2:F:8:C:H3'	2:F:8:C:O2	2.07	0.54
1:A:119:VAL:O	1:C:25:GLN:HG3	2.08	0.54
1:A:608:GLN:HE22	1:B:593:ARG:CZ	2.21	0.54
1:A:308:LEU:H	1:A:308:LEU:CD2	2.18	0.53
2:E:8:C:O2	2:E:8:C:H3'	2.08	0.53
2:F:5:U:O2	2:F:5:U:O4'	2.25	0.53
1:A:600:ARG:HH11	1:A:600:ARG:CB	2.20	0.53
1:B:392:SER:O	1:B:398:THR:CG2	2.56	0.53
1:A:325:VAL:HG21	1:A:406:MET:HE2	1.89	0.53
1:C:308:LEU:H	1:C:308:LEU:CD2	2.18	0.53
1:B:606:ALA:C	1:B:608:GLN:H	2.17	0.53
1:C:151:THR:CG2	1:C:163:LYS:HG2	2.39	0.53
1:A:291:ARG:HD3	2:D:8:C:C6	2.44	0.53
1:C:311:GLU:O	1:C:315:LYS:HB2	2.09	0.53
1:A:613:GLU:CD	1:A:613:GLU:N	2.65	0.53
1:B:151:THR:CG2	1:B:163:LYS:HG2	2.39	0.53
1:B:203:TYR:HE1	1:B:271:THR:HG22	1.73	0.53
1:B:175:GLU:HA	1:B:352:TRP:CD2	2.44	0.52
1:C:280:ASN:ND2	1:C:394:GLY:O	2.33	0.52
1:C:614:LEU:HD21	1:C:641:ILE:HD11	1.92	0.52
2:D:5:U:O4'	2:D:5:U:O2	2.24	0.52
1:A:44:LEU:HD11	1:B:257:GLY:HA3	1.89	0.52
1:B:1:PRO:HD2	1:B:238:GLU:OE2	2.08	0.52
1:C:339:LEU:C	1:C:339:LEU:HD23	2.34	0.52
1:C:606:ALA:C	1:C:608:GLN:H	2.15	0.52
1:A:151:THR:CG2	1:A:163:LYS:HG2	2.39	0.52
1:B:311:GLU:O	1:B:315:LYS:HB2	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:629:GLN:HG2	2:E:7:C:C4	2.45	0.52
1:A:304:HIS:HA	1:A:309:ASN:ND2	2.24	0.52
1:A:75:VAL:HG12	1:A:493:GLY:HA2	1.91	0.52
1:A:90:MET:HE3	1:A:264:PHE:HB3	1.92	0.52
1:A:401:MET:HE2	1:A:401:MET:HA	1.92	0.52
1:B:164:ILE:O	1:B:168:GLU:HG3	2.10	0.52
1:B:273:MET:HE3	1:B:392:SER:CB	2.40	0.52
1:B:74:ARG:HB3	1:B:503:TYR:CD2	2.45	0.52
1:B:51:LEU:CD2	1:B:90:MET:HE1	2.39	0.52
1:C:203:TYR:CE1	1:C:271:THR:HG22	2.45	0.51
1:B:175:GLU:HA	1:B:352:TRP:CE3	2.45	0.51
1:B:404:LEU:C	1:B:404:LEU:HD12	2.35	0.51
1:A:404:LEU:HD12	1:A:404:LEU:C	2.36	0.51
1:C:506:ARG:HG3	1:C:506:ARG:HH11	1.75	0.51
1:C:392:SER:O	1:C:398:THR:CG2	2.58	0.51
1:C:401:MET:HE2	1:C:401:MET:HA	1.91	0.51
1:A:175:GLU:HA	1:A:352:TRP:CE3	2.46	0.51
1:B:30:ARG:O	1:B:376:HIS:HE1	1.94	0.51
1:C:273:MET:HE3	1:C:392:SER:CB	2.40	0.51
1:A:132:ARG:NH1	1:A:343:GLU:OE2	2.38	0.51
1:A:606:ALA:C	1:A:608:GLN:H	2.18	0.51
1:B:224:ASP:HB3	1:B:226:MET:CE	2.41	0.51
1:B:650:SER:OG	1:B:653:LYS:HG3	2.12	0.50
1:C:628:LEU:O	2:F:8:C:O2	2.29	0.50
1:A:175:GLU:HA	1:A:352:TRP:CD2	2.46	0.50
1:A:288:GLN:HB3	1:A:289:PRO:HD3	1.93	0.50
1:B:325:VAL:HG21	1:B:406:MET:HE2	1.94	0.50
1:A:304:HIS:HA	1:A:309:ASN:HD21	1.77	0.50
1:A:602:VAL:CG1	1:A:604:SER:HB3	2.42	0.50
1:A:650:SER:HB2	1:A:652:GLU:OE1	2.12	0.50
1:A:392:SER:O	1:A:398:THR:HG21	2.12	0.49
1:C:650:SER:HB2	1:C:652:GLU:OE1	2.12	0.49
2:E:5:U:O2	2:E:5:U:O4'	2.30	0.49
1:C:161:GLY:O	1:C:165:GLU:HG3	2.13	0.49
1:C:304:HIS:HA	1:C:309:ASN:HD21	1.77	0.49
1:C:543:LYS:O	1:C:625:PRO:HD2	2.12	0.49
1:C:288:GLN:HB3	1:C:289:PRO:HD3	1.94	0.49
1:C:611:LEU:HD22	1:C:614:LEU:HD12	1.94	0.49
1:A:664:ARG:HG3	1:A:664:ARG:O	2.12	0.49
1:B:161:GLY:O	1:B:165:GLU:HG3	2.12	0.49
1:A:311:GLU:O	1:A:315:LYS:HB2	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:339:LEU:C	1:A:339:LEU:HD23	2.38	0.49
1:A:1:PRO:HD2	1:A:238:GLU:CD	2.38	0.48
1:A:145:ILE:HD12	1:A:164:ILE:HD13	1.94	0.48
1:B:308:LEU:H	1:B:308:LEU:CD2	2.22	0.48
1:A:90:MET:HE3	1:A:264:PHE:CD2	2.48	0.48
1:B:204:ARG:HH12	2:E:7:C:N4	2.11	0.48
1:C:417:HIS:ND1	1:C:474:MET:HE1	2.27	0.48
1:B:551:TRP:CH2	1:B:554:MET:HE1	2.49	0.48
1:A:164:ILE:O	1:A:168:GLU:HG3	2.14	0.48
1:A:429:MET:HB2	1:A:430:PRO:HD3	1.96	0.48
1:A:506:ARG:HG3	1:A:506:ARG:HH11	1.79	0.48
1:B:40:TYR:OH	1:B:587:ARG:NH2	2.46	0.48
1:B:451:LYS:CE	2:E:8:C:N4	2.69	0.48
1:A:232:TYR:HA	1:A:239:GLN:O	2.13	0.48
1:B:506:ARG:HG3	1:B:506:ARG:HH11	1.79	0.47
1:A:82:THR:HG23	1:A:83:ASN:O	2.14	0.47
1:C:291:ARG:HD3	2:F:8:C:C6	2.47	0.47
1:A:518:ILE:HB	1:A:561:CYS:SG	2.55	0.47
1:A:273:MET:HE3	1:A:392:SER:CB	2.43	0.47
1:B:75:VAL:HG12	1:B:493:GLY:HA2	1.97	0.47
1:B:203:TYR:CE1	1:B:271:THR:HG22	2.50	0.47
1:C:146:ARG:NH2	1:C:540:SER:O	2.48	0.47
1:A:94:PRO:CB	1:A:269:ARG:HG3	2.46	0.46
1:A:628:LEU:O	2:D:8:C:O2	2.33	0.46
1:B:633:THR:HG22	1:B:636:ASP:OD2	2.16	0.46
1:A:51:LEU:CD2	1:A:90:MET:HE1	2.45	0.46
2:E:8:C:O2	2:E:8:C:C2'	2.62	0.46
2:F:8:C:O2	2:F:8:C:C2'	2.64	0.46
1:C:32:PHE:CZ	1:C:96:ILE:HD11	2.50	0.46
1:C:304:HIS:HA	1:C:309:ASN:ND2	2.30	0.46
1:B:664:ARG:O	1:B:664:ARG:HG3	2.13	0.46
1:C:75:VAL:HG12	1:C:493:GLY:HA2	1.98	0.46
1:C:89:HIS:CE1	1:C:209:ASP:H	2.34	0.46
1:C:94:PRO:CB	1:C:269:ARG:HG3	2.45	0.46
1:C:429:MET:HB2	1:C:430:PRO:HD3	1.98	0.46
1:B:629:GLN:HA	2:E:8:C:O2	2.16	0.46
1:B:642:HIS:CE1	1:B:646:MET:HG3	2.51	0.45
1:B:543:LYS:O	1:B:625:PRO:HD2	2.16	0.45
1:C:305:THR:H	1:C:309:ASN:ND2	2.14	0.45
1:C:659:ARG:NH1	1:C:659:ARG:HB2	2.31	0.45
2:D:8:C:O2	2:D:8:C:C2'	2.65	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:224:ASP:HB3	1:B:226:MET:HE1	1.98	0.45
1:B:90:MET:HE3	1:B:264:PHE:HD2	1.81	0.45
1:C:404:LEU:HD12	1:C:404:LEU:C	2.42	0.45
1:B:286:VAL:C	1:B:289:PRO:HD2	2.42	0.45
1:B:322:ALA:HB2	1:B:456:MET:HE2	1.98	0.45
1:B:634:GLU:HB2	1:B:642:HIS:NE2	2.32	0.45
1:A:504:ASP:C	1:A:504:ASP:OD1	2.60	0.44
1:B:417:HIS:ND1	1:B:474:MET:HE1	2.32	0.44
1:B:429:MET:HB2	1:B:430:PRO:HD3	1.98	0.44
1:A:301:THR:HG21	1:A:440:TRP:HA	2.00	0.44
1:B:288:GLN:HB3	1:B:289:PRO:HD3	2.00	0.44
1:A:642:HIS:CE1	1:A:646:MET:HG3	2.52	0.44
1:C:305:THR:OG1	1:C:306:THR:N	2.51	0.44
1:C:466:VAL:HG13	1:C:467:GLY:N	2.33	0.44
1:C:518:ILE:HB	1:C:561:CYS:SG	2.57	0.44
1:A:40:TYR:OH	1:A:587:ARG:NH2	2.50	0.44
1:A:518:ILE:HG12	1:A:567:VAL:HG21	1.98	0.44
1:B:506:ARG:O	1:B:508:GLU:HG3	2.17	0.44
1:C:224:ASP:HB3	1:C:226:MET:HE1	2.00	0.44
1:C:506:ARG:HG3	1:C:506:ARG:NH1	2.33	0.44
1:A:161:GLY:O	1:A:165:GLU:HG3	2.18	0.44
1:A:650:SER:OG	1:A:653:LYS:HG3	2.17	0.44
1:A:475:LEU:HD21	1:A:482:PRO:HG3	2.00	0.44
1:B:150:SER:CB	2:E:5:U:H2'	2.48	0.44
1:C:226:MET:HE2	1:C:226:MET:N	2.33	0.44
1:A:160:MET:O	1:A:164:ILE:HG12	2.18	0.44
1:B:94:PRO:CB	1:B:269:ARG:HG3	2.47	0.43
1:B:146:ARG:NH2	1:B:540:SER:O	2.51	0.43
1:B:202:VAL:HG11	2:E:5:U:H5'	2.00	0.43
1:C:90:MET:HA	1:C:90:MET:HE2	1.99	0.43
1:C:301:THR:HG21	1:C:440:TRP:HA	2.01	0.43
1:A:325:VAL:CG2	1:A:406:MET:HE2	2.48	0.43
1:B:232:TYR:HA	1:B:239:GLN:O	2.18	0.43
1:B:451:LYS:HE2	2:E:8:C:H41	1.79	0.43
1:C:658:LEU:HB3	1:C:662:MET:HE2	1.99	0.43
1:A:305:THR:H	1:A:309:ASN:ND2	2.16	0.43
1:B:304:HIS:HA	1:B:309:ASN:HD21	1.84	0.43
1:A:658:LEU:CB	1:A:662:MET:HE2	2.47	0.43
1:A:90:MET:HE3	1:A:264:PHE:HD2	1.81	0.43
1:B:339:LEU:HD23	1:B:339:LEU:C	2.44	0.43
1:B:70:ASP:OD1	1:B:74:ARG:HD2	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:474:MET:HE3	1:B:482:PRO:HB3	2.00	0.43
1:A:529:GLU:O	1:A:529:GLU:HG2	2.19	0.42
1:A:91:ASN:HA	1:A:267:GLU:CD	2.44	0.42
1:A:322:ALA:HB2	1:A:456:MET:HE2	2.00	0.42
1:A:327:ASP:CG	1:A:330:THR:OG1	2.62	0.42
1:B:90:MET:HE2	1:B:90:MET:CA	2.45	0.42
1:A:651:VAL:O	1:A:655:GLU:HB2	2.19	0.42
1:B:32:PHE:CZ	1:B:96:ILE:HD11	2.54	0.42
1:B:70:ASP:OD2	1:B:74:ARG:HD3	2.19	0.42
1:B:305:THR:H	1:B:309:ASN:ND2	2.18	0.42
1:B:13:LYS:NZ	1:B:383:SER:OG	2.53	0.42
1:B:143:LEU:H	1:B:654:THR:HG21	1.84	0.42
1:B:304:HIS:HA	1:B:309:ASN:ND2	2.35	0.42
1:B:518:ILE:HB	1:B:561:CYS:SG	2.59	0.42
1:A:272:ALA:C	1:A:273:MET:HG2	2.45	0.42
1:C:579:PHE:O	1:C:581:GLU:HG2	2.19	0.42
1:B:611:LEU:HD22	1:B:614:LEU:HD12	2.02	0.42
1:C:224:ASP:HB3	1:C:226:MET:CE	2.50	0.42
1:A:637:VAL:O	1:A:638:SER:C	2.63	0.42
1:C:89:HIS:HE1	1:C:209:ASP:H	1.67	0.42
1:C:29:LYS:O	1:C:30:ARG:C	2.62	0.41
1:C:75:VAL:HG21	1:C:500:ILE:HG21	2.01	0.41
2:F:8:C:O2	2:F:8:C:C3'	2.68	0.41
1:A:614:LEU:HD21	1:A:641:ILE:HD11	2.01	0.41
1:B:32:PHE:CD2	1:B:372:PRO:HG3	2.54	0.41
1:C:225:ARG:C	1:C:226:MET:HE2	2.45	0.41
1:C:350:ALA:HB1	1:C:352:TRP:NE1	2.35	0.41
1:A:543:LYS:O	1:A:625:PRO:HD2	2.20	0.41
1:B:343:GLU:O	1:B:347:MET:HG3	2.21	0.41
1:B:497:LEU:HD12	1:B:497:LEU:HA	1.80	0.41
1:B:156:PHE:HB3	2:E:5:U:C5	2.55	0.41
1:A:146:ARG:NH2	1:A:540:SER:O	2.54	0.41
1:A:506:ARG:HG3	1:A:506:ARG:NH1	2.36	0.41
2:D:5:U:O2'	2:D:6:U:P	2.78	0.41
2:E:8:C:O2	2:E:8:C:C3'	2.69	0.41
1:B:273:MET:O	1:B:394:GLY:HA3	2.21	0.41
1:C:243:PHE:CD1	1:C:243:PHE:N	2.88	0.41
2:D:8:C:O2	2:D:8:C:C3'	2.68	0.41
1:A:143:LEU:H	1:A:654:THR:HG21	1.86	0.41
1:B:204:ARG:HH12	2:E:7:C:H42	1.68	0.41
1:C:143:LEU:H	1:C:654:THR:HG21	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:300:TYR:CD1	1:C:300:TYR:C	2.99	0.41
1:A:1:PRO:HD2	1:A:238:GLU:OE2	2.21	0.41
1:A:413:MET:HE3	1:A:482:PRO:CG	2.51	0.41
2:F:5:U:O2'	2:F:6:U:P	2.79	0.41
1:A:23:LYS:HB3	1:A:23:LYS:HE2	1.83	0.40
1:B:301:THR:HG21	1:B:440:TRP:HA	2.03	0.40
1:A:286:VAL:C	1:A:289:PRO:HD2	2.47	0.40
1:B:506:ARG:HG3	1:B:506:ARG:NH1	2.36	0.40
1:C:206:GLN:CG	1:C:270:ARG:HD2	2.46	0.40
1:C:286:VAL:C	1:C:289:PRO:HD2	2.46	0.40
1:C:402:GLY:HA3	4:C:2077:HOH:O	2.22	0.40
1:B:72:TYR:HB2	1:B:74:ARG:HD2	2.03	0.40
1:B:641:ILE:HD13	1:B:641:ILE:HA	1.92	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	662/664 (100%)	636 (96%)	21 (3%)	5 (1%)	16	10
1	B	662/664 (100%)	637 (96%)	20 (3%)	5 (1%)	16	10
1	C	662/664 (100%)	635 (96%)	22 (3%)	5 (1%)	16	10
All	All	1986/1992 (100%)	1908 (96%)	63 (3%)	15 (1%)	16	10

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	604	SER
1	A	608	GLN
1	B	604	SER
1	B	608	GLN

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Mol	Chain	Res	Type
1	C	604	SER
1	C	608	GLN
1	A	2	ARG
1	B	2	ARG
1	C	2	ARG
1	C	606	ALA
1	A	606	ALA
1	A	607	ARG
1	B	606	ALA
1	B	607	ARG
1	C	607	ARG

5.3.2 Protein sidechains ⓘ

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	557/557 (100%)	531 (95%)	26 (5%)	23	21
1	B	557/557 (100%)	531 (95%)	26 (5%)	23	21
1	C	557/557 (100%)	533 (96%)	24 (4%)	26	24
All	All	1671/1671 (100%)	1595 (96%)	76 (4%)	24	22

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ARG
1	A	43	LEU
1	A	44	LEU
1	A	49	ARG
1	A	71	GLU
1	A	74	ARG
1	A	75	VAL
1	A	102	LEU
1	A	113	ASP
1	A	119	VAL
1	A	143	LEU

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Mol	Chain	Res	Type
1	A	146	ARG
1	A	154	PRO
1	A	202	VAL
1	A	206	GLN
1	A	308	LEU
1	A	373	GLU
1	A	387	LEU
1	A	391	LEU
1	A	404	LEU
1	A	497	LEU
1	A	576	TRP
1	A	591	LEU
1	A	613	GLU
1	A	626	ASN
1	A	658	LEU
1	B	2	ARG
1	B	43	LEU
1	B	44	LEU
1	B	49	ARG
1	B	71	GLU
1	B	74	ARG
1	B	75	VAL
1	B	90	MET
1	B	102	LEU
1	B	113	ASP
1	B	119	VAL
1	B	146	ARG
1	B	154	PRO
1	B	202	VAL
1	B	206	GLN
1	B	308	LEU
1	B	373	GLU
1	B	391	LEU
1	B	404	LEU
1	B	497	LEU
1	B	576	TRP
1	B	591	LEU
1	B	600	ARG
1	B	613	GLU
1	B	626	ASN
1	B	658	LEU
1	C	43	LEU

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Mol	Chain	Res	Type
1	C	44	LEU
1	C	71	GLU
1	C	74	ARG
1	C	75	VAL
1	C	102	LEU
1	C	113	ASP
1	C	119	VAL
1	C	146	ARG
1	C	154	PRO
1	C	202	VAL
1	C	206	GLN
1	C	308	LEU
1	C	373	GLU
1	C	391	LEU
1	C	404	LEU
1	C	497	LEU
1	C	576	TRP
1	C	581	GLU
1	C	591	LEU
1	C	600	ARG
1	C	613	GLU
1	C	626	ASN
1	C	658	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	26	GLN
1	A	64	HIS
1	A	89	HIS
1	A	183	GLN
1	A	191	GLN
1	A	309	ASN
1	A	376	HIS
1	A	469	HIS
1	A	608	GLN
1	A	626	ASN
1	B	26	GLN
1	B	64	HIS
1	B	183	GLN
1	B	191	GLN
1	B	194	GLN

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Mol	Chain	Res	Type
1	B	309	ASN
1	B	376	HIS
1	B	626	ASN
1	C	26	GLN
1	C	64	HIS
1	C	183	GLN
1	C	191	GLN
1	C	309	ASN
1	C	376	HIS
1	C	384	ASN
1	C	519	ASN
1	C	626	ASN
1	C	642	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	D	4/6 (66%)	2 (50%)	1 (25%)
2	E	4/6 (66%)	2 (50%)	1 (25%)
2	F	4/6 (66%)	2 (50%)	1 (25%)
All	All	12/18 (66%)	6 (50%)	3 (25%)

All (6) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	D	6	U
2	D	8	C
2	E	6	U
2	E	8	C
2	F	6	U
2	F	8	C

All (3) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	D	5	U
2	E	5	U
2	F	5	U

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 3 ligands modelled in this entry, 3 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.

No monomer is involved in short contacts.

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

6.1 Protein, DNA and RNA chains

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	664/664 (100%)	0.13	34 (5%) 33 37	17, 30, 52, 102	0
1	B	664/664 (100%)	0.07	32 (4%) 35 40	17, 28, 51, 102	0
1	C	664/664 (100%)	0.24	31 (4%) 36 41	18, 31, 53, 103	0
2	D	4/6 (66%)	4.48	4 (100%) 0 0	115, 116, 122, 128	0
2	E	4/6 (66%)	4.02	4 (100%) 0 0	115, 116, 123, 129	0
2	F	4/6 (66%)	3.85	4 (100%) 0 0	115, 116, 123, 129	0
All	All	2004/2010 (99%)	0.17	109 (5%) 31 35	17, 30, 53, 129	0

All (109) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	606	ALA	11.0
1	C	609	ALA	10.1
1	B	609	ALA	8.3
1	C	603	ALA	8.0
1	C	606	ALA	7.4
1	A	603	ALA	7.1
1	B	1	PRO	7.0
1	A	609	ALA	7.0
1	A	610	GLY	6.9
1	B	606	ALA	6.6
1	B	607	ARG	6.2
2	D	5	U	6.0
1	A	605	MET	6.0
1	B	610	GLY	6.0
1	C	604	SER	6.0
1	C	608	GLN	5.8
1	C	610	GLY	5.5
2	E	5	U	5.0
1	C	607	ARG	5.0

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Mol	Chain	Res	Type	RSRZ
1	A	1	PRO	4.9
1	C	1	PRO	4.9
2	F	5	U	4.8
1	C	2	ARG	4.8
1	B	537	ARG	4.7
1	B	604	SER	4.7
1	A	608	GLN	4.6
1	B	576	TRP	4.6
1	A	604	SER	4.5
1	C	605	MET	4.5
1	A	607	ARG	4.5
1	B	2	ARG	4.4
1	B	608	GLN	4.4
2	D	7	C	4.2
2	E	8	C	4.2
1	B	603	ALA	4.1
1	C	470	ARG	4.0
2	D	6	U	4.0
1	C	664	ARG	3.9
2	F	8	C	3.8
1	C	611	LEU	3.8
2	D	8	C	3.6
2	E	7	C	3.5
1	C	612	ALA	3.5
1	A	576	TRP	3.4
1	B	216	LYS	3.4
2	F	7	C	3.4
2	E	6	U	3.4
1	C	216	LYS	3.4
1	A	664	ARG	3.4
2	F	6	U	3.4
1	A	613	GLU	3.3
1	A	602	VAL	3.2
1	C	602	VAL	3.2
1	C	215	PRO	3.2
1	B	581	GLU	3.1
1	B	651	VAL	3.1
1	B	600	ARG	3.1
1	C	556	ASP	3.1
1	A	254	GLU	3.0
1	A	611	LEU	3.0
1	B	470	ARG	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	576	TRP	3.0
1	A	158	ASN	2.9
1	A	651	VAL	2.9
1	A	612	ALA	2.9
1	C	254	GLU	2.8
1	B	662	MET	2.8
1	C	63	ASP	2.8
1	A	492	HIS	2.8
1	A	308	LEU	2.8
1	B	215	PRO	2.8
1	B	202	VAL	2.8
1	A	2	ARG	2.7
1	B	605	MET	2.7
1	B	613	GLU	2.7
1	B	253	LYS	2.6
1	A	652	GLU	2.6
1	C	217	THR	2.6
1	C	596	LEU	2.6
1	B	630	TYR	2.5
1	B	664	ARG	2.5
1	B	22	ILE	2.5
1	B	612	ALA	2.5
1	A	628	LEU	2.5
1	B	308	LEU	2.5
1	C	308	LEU	2.5
1	A	630	TYR	2.4
1	A	592	LYS	2.4
1	B	254	GLU	2.4
1	A	257	GLY	2.4
1	C	629	GLN	2.4
1	A	650	SER	2.4
1	A	600	ARG	2.3
1	C	537	ARG	2.3
1	A	216	LYS	2.3
1	C	22	ILE	2.3
1	C	651	VAL	2.3
1	C	659	ARG	2.3
1	B	611	LEU	2.3
1	C	630	TYR	2.3
1	B	269	ARG	2.2
1	A	262	ASP	2.2
1	A	659	ARG	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	262	ASP	2.2
1	A	270	ARG	2.1
1	B	629	GLN	2.1
1	A	148	GLY	2.1
1	A	658	LEU	2.0
1	B	206	GLN	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 oligosaccharides 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(\AA^2)	Q<0.9
3	MN	A	1665	1/1	0.98	0.04	29,29,29,29	0
3	MN	B	1665	1/1	0.99	0.02	26,26,26,26	0
3	MN	C	1665	1/1	0.99	0.02	30,30,30,30	0

6.5 Other polymers [i](#)

There are no such residues in this entry.