



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 08:04 PM UTC

PDB ID : 1C5F / pdb_00001c5f
Title : CRYSTAL STRUCTURE OF THE CYCLOPHILIN-LIKE DOMAIN FROM
BRUGIA MALAYI COMPLEXED WITH CYCLOSPORIN A
Authors : Ellis, P.J.; Carlow, C.K.S.; Ma, D.; Kuhn, P.
Deposited on : 1999-11-22
Resolution : 2.47 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
Mogul : 2022.3.0, CSD as543be (2022)
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

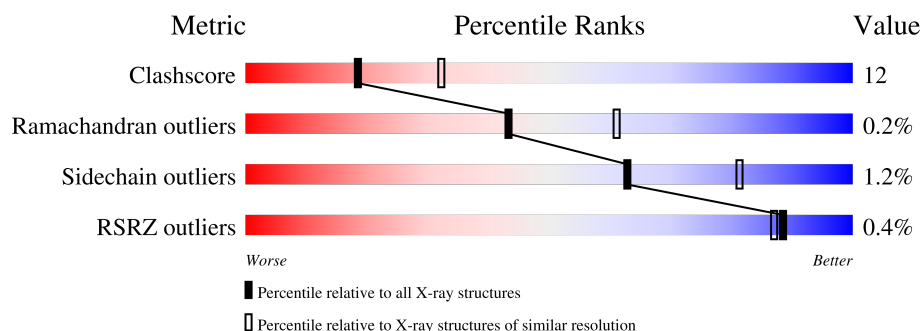
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.47 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	190562	8295 (2.50-2.46)
Ramachandran outliers	187476	8164 (2.50-2.46)
Sidechain outliers	187428	8166 (2.50-2.46)
RSRZ outliers	180081	7593 (2.50-2.46)

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	177	% 80% 19% .
1	C	177	82% 17% .
1	E	177	% 80% 18% ..
1	G	177	76% 21% .
1	I	177	% 72% 25% ..
1	K	177	79% 20% ..

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Mol	Chain	Length	Quality of chain
1	M	177	
1	O	177	
2	B	11	
2	D	11	
2	F	11	
2	H	11	
2	J	11	
2	L	11	
2	N	11	
2	P	11	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	MLE	F	3	-	-	X	-
2	MLE	H	3	-	-	X	-
2	ABA	P	6	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11774 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 PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	177	Total	C	N	O	S	9	0	0
			1365	862	237	255	11			
1	C	177	Total	C	N	O	S	6	0	0
			1365	862	237	255	11			
1	E	174	Total	C	N	O	S	5	0	0
			1342	848	233	251	10			
1	G	172	Total	C	N	O	S	3	0	0
			1325	838	230	247	10			
1	I	173	Total	C	N	O	S	10	0	0
			1333	842	231	250	10			
1	K	175	Total	C	N	O	S	3	0	0
			1351	854	235	252	10			
1	M	175	Total	C	N	O	S	4	0	0
			1351	854	235	252	10			
1	O	172	Total	C	N	O	S	5	0	0
			1325	838	230	247	10			

- Molecule 2 is a protein called CYCLOSPORIN A.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	B	11	Total	C	N	O	0	0	0
			85	62	11	12			
2	D	11	Total	C	N	O	0	0	0
			85	62	11	12			
2	F	11	Total	C	N	O	2	0	0
			85	62	11	12			
2	H	11	Total	C	N	O	0	0	0
			85	62	11	12			
2	J	11	Total	C	N	O	2	0	0
			85	62	11	12			
2	L	11	Total	C	N	O	0	0	0
			85	62	11	12			

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	N	11	Total	C	N	O	0	0	0
			85	62	11	12			
2	P	11	Total	C	N	O	0	0	0
			85	62	11	12			

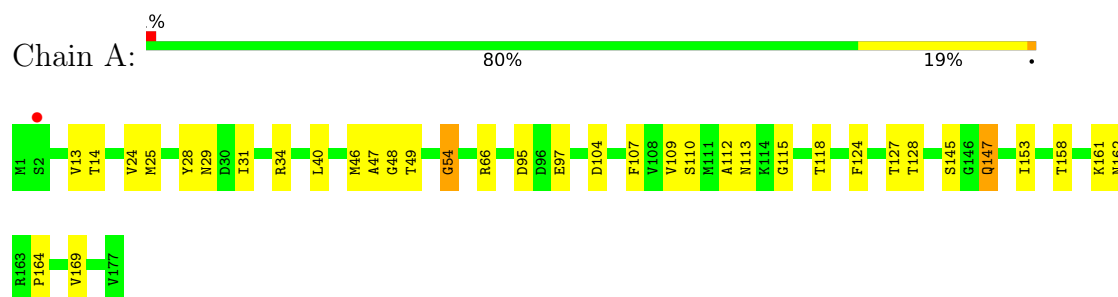
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	40	Total	O	0	0
			40	40		
3	B	1	Total	O	0	0
			1	1		
3	C	49	Total	O	0	0
			49	49		
3	D	3	Total	O	0	0
			3	3		
3	E	44	Total	O	0	0
			44	44		
3	F	1	Total	O	0	0
			1	1		
3	G	30	Total	O	0	0
			30	30		
3	H	2	Total	O	0	0
			2	2		
3	I	24	Total	O	0	0
			24	24		
3	J	2	Total	O	0	0
			2	2		
3	K	51	Total	O	0	0
			51	51		
3	L	3	Total	O	0	0
			3	3		
3	M	45	Total	O	0	0
			45	45		
3	N	1	Total	O	0	0
			1	1		
3	O	41	Total	O	0	0
			41	41		

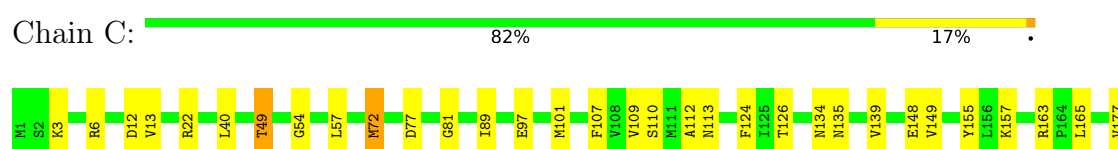
3 Residue-property plots

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.

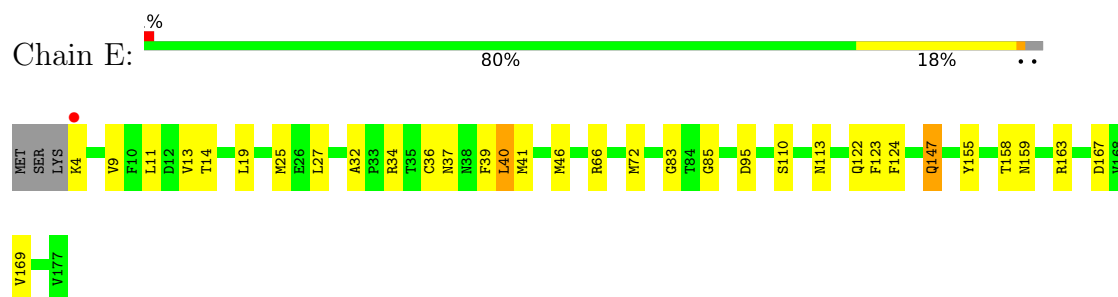
• Molecule 1: PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 1



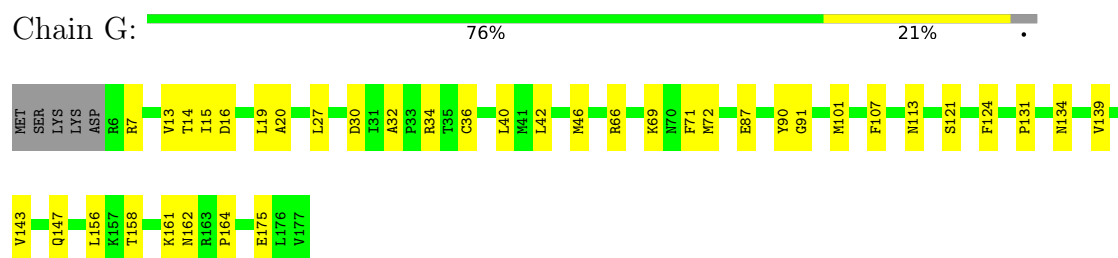
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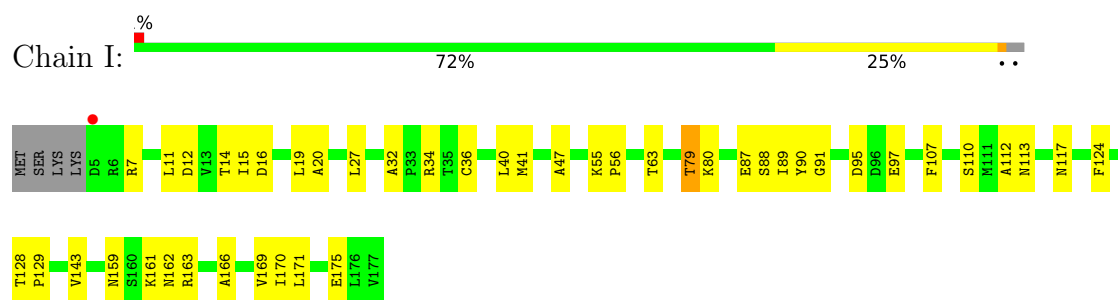
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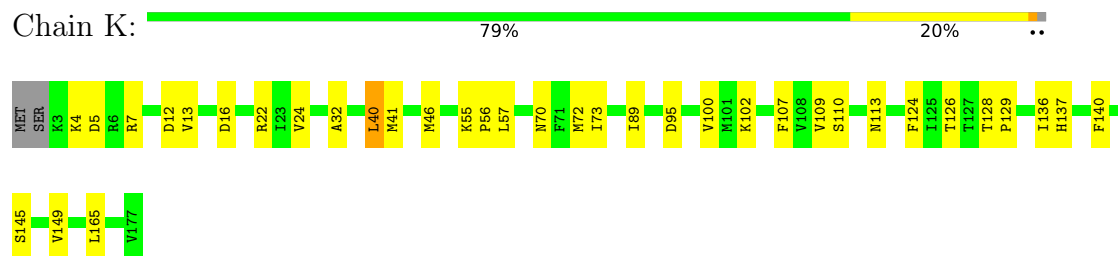
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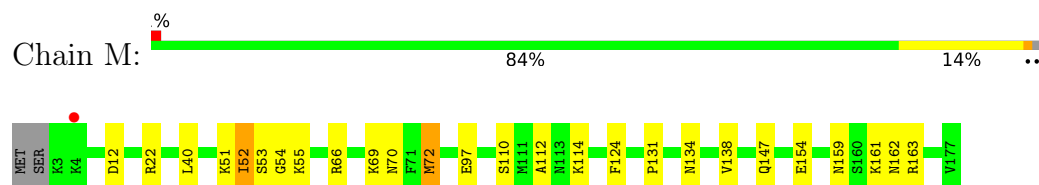
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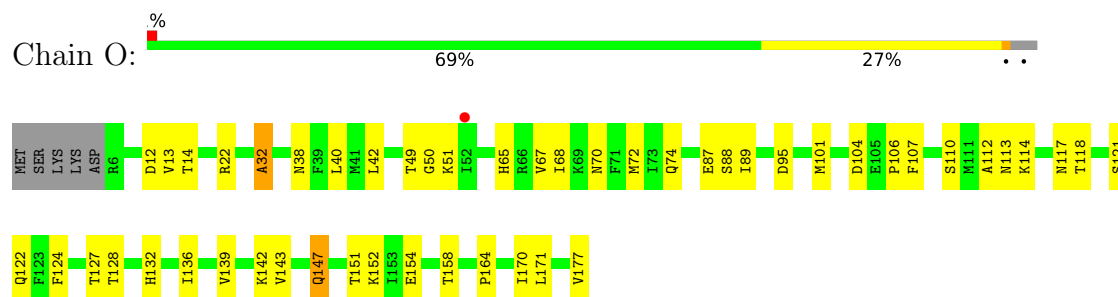
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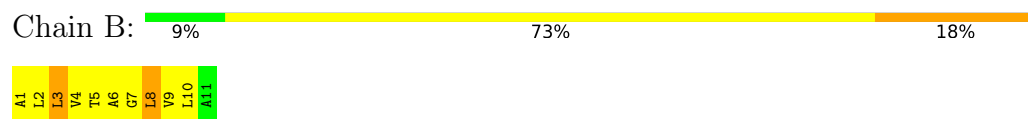
• Molecule 1: PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 1



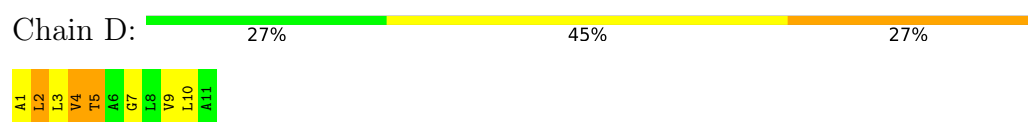
• Molecule 1: PEPTIDYL-PROLYL CIS-TRANS ISOMERASE 1



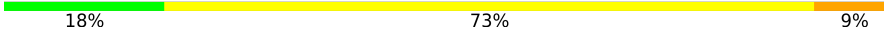
• Molecule 2: CYCLOSPORIN A



• Molecule 2: CYCLOSPORIN A

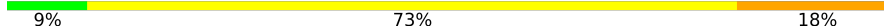


• Molecule 2: CYCLOSPORIN A

Chain F:  18% 73% 9%

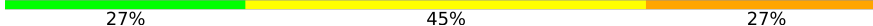


• Molecule 2: CYCLOSPORIN A

Chain H:  9% 73% 18%

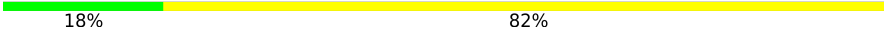


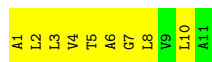
• Molecule 2: CYCLOSPORIN A

Chain J:  27% 45% 27%



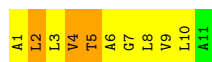
• Molecule 2: CYCLOSPORIN A

Chain L:  18% 82%

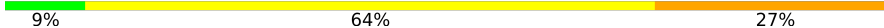


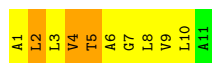
• Molecule 2: CYCLOSPORIN A

Chain N:  9% 64% 27%



• Molecule 2: CYCLOSPORIN A

Chain P:  9% 64% 27%



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	62.00Å 100.16Å 133.92Å 90.00° 93.75° 90.00°	Depositor
Resolution (Å)	47.10 – 2.47 47.10 – 2.47	Depositor EDS
% Data completeness (in resolution range)	95.1 (47.10-2.47) 95.8 (47.10-2.47)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.83 (at 2.48Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.201 , 0.249 0.195 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	43.0	Xtriage
Anisotropy	0.526	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 34.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	11774	wwPDB-VP
Average B, all atoms (Å ²)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.12% 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: MVA, MLE, SAR, BMT, ABA, DAL

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	0.39	0/1391	0.96	5/1872 (0.3%)
1	C	0.43	0/1391	0.94	5/1872 (0.3%)
1	E	0.43	0/1368	0.98	7/1843 (0.4%)
1	G	0.41	0/1351	0.94	3/1821 (0.2%)
1	I	0.39	0/1359	0.96	3/1832 (0.2%)
1	K	0.42	0/1377	0.94	7/1854 (0.4%)
1	M	0.42	0/1377	0.92	4/1854 (0.2%)
1	O	0.42	0/1351	0.97	5/1821 (0.3%)
2	B	0.24	0/10	0.53	0/11
2	D	0.18	0/10	0.71	0/11
2	F	0.29	0/10	0.63	0/11
2	H	0.27	0/10	0.57	0/11
2	J	0.20	0/10	0.64	0/11
2	L	0.42	0/10	0.55	0/11
2	N	0.25	0/10	0.56	0/11
2	P	0.21	0/10	0.65	0/11
All	All	0.41	0/11045	0.95	39/14857 (0.3%)

There are no bond length outliers.

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	112	ALA	N-CA-C	-7.61	100.28	110.55
1	O	170	ILE	N-CA-C	-7.50	98.19	106.21
1	A	48	GLY	N-CA-C	6.80	121.37	111.24
1	M	54	GLY	N-CA-C	-6.70	107.11	115.08
1	K	95	ASP	N-CA-C	6.51	119.13	110.53
1	E	13	VAL	N-CA-C	6.47	118.82	108.85
1	A	95	ASP	N-CA-C	6.34	118.90	110.53
1	K	13	VAL	N-CA-C	6.33	117.59	108.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	O	112	ALA	N-CA-C	-6.21	102.17	110.55
1	E	169	VAL	N-CA-C	6.07	117.33	108.53
1	C	112	ALA	N-CA-C	-6.03	100.73	110.32
1	E	85	GLY	N-CA-C	5.88	119.84	112.79
1	K	165	LEU	N-CA-C	-5.86	105.02	111.82
1	G	32	ALA	CA-C-N	5.83	125.97	119.32
1	G	32	ALA	C-N-CA	5.83	125.97	119.32
1	I	12	ASP	N-CA-C	-5.75	99.36	108.73
1	E	32	ALA	CA-C-N	5.62	125.08	119.24
1	E	32	ALA	C-N-CA	5.62	125.08	119.24
1	E	95	ASP	N-CA-C	5.54	117.88	110.35
1	K	149	VAL	N-CA-C	-5.49	105.02	111.00
1	G	13	VAL	N-CA-C	5.47	117.20	108.89
1	A	112	ALA	N-CA-C	-5.38	102.52	110.48
1	C	97	GLU	N-CA-C	-5.35	103.55	110.19
1	K	4	LYS	N-CA-C	-5.34	106.02	112.54
1	M	112	ALA	N-CA-C	-5.30	101.90	110.32
1	K	32	ALA	CA-C-N	5.30	126.46	119.84
1	K	32	ALA	C-N-CA	5.30	126.46	119.84
1	M	97	GLU	N-CA-C	-5.28	103.07	110.35
1	C	13	VAL	N-CA-C	5.27	116.90	108.89
1	I	79	THR	N-CA-C	-5.24	107.91	114.56
1	C	72	MET	N-CA-C	5.23	115.25	107.88
1	M	72	MET	N-CA-C	5.18	115.38	108.38
1	C	6	ARG	N-CA-C	5.18	117.17	109.25
1	A	169	VAL	N-CA-C	5.14	115.99	108.53
1	A	54	GLY	N-CA-C	-5.10	107.61	114.25
1	O	136	ILE	N-CA-C	-5.10	107.77	111.90
1	E	155	TYR	N-CA-C	5.04	119.07	113.02
1	O	32	ALA	CA-C-N	5.02	126.12	119.84
1	O	32	ALA	C-N-CA	5.02	126.12	119.84

There are no chirality outliers.

There are no planarity outliers.

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	1365	0	1365	20	0
1	C	1365	0	1365	18	0
1	E	1342	0	1335	24	0
1	G	1325	0	1318	29	0
1	I	1333	0	1322	29	0
1	K	1351	0	1348	20	0
1	M	1351	0	1348	24	0
1	O	1325	0	1318	41	0
2	B	85	0	110	10	0
2	D	85	0	109	9	0
2	F	85	0	109	13	0
2	H	85	0	109	12	0
2	J	85	0	110	10	0
2	L	85	0	110	10	0
2	N	85	0	109	15	0
2	P	85	0	109	18	0
3	A	40	0	0	1	0
3	B	1	0	0	0	0
3	C	49	0	0	0	0
3	D	3	0	0	0	0
3	E	44	0	0	1	0
3	F	1	0	0	0	0
3	G	30	0	0	0	0
3	H	2	0	0	0	0
3	I	24	0	0	1	0
3	J	2	0	0	0	0
3	K	51	0	0	2	0
3	L	3	0	0	0	0
3	M	45	0	0	3	0
3	N	1	0	0	0	0
3	O	41	0	0	8	0
All	All	11774	0	11594	275	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 12.

All (275) 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)
2:J:5:BMT:HZ	2:J:5:BMT:HD11	1.59	0.83
1:E:34:ARG:HH12	2:P:8:MLE:HD12	1.45	0.81
1:O:68:ILE:HB	3:O:2018:HOH:O	1.84	0.77

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:69:LYS:HA	3:M:2016:HOH:O	1.85	0.75
1:M:51:LYS:H	1:M:51:LYS:HD2	1.50	0.75
1:O:51:LYS:HE2	3:O:2009:HOH:O	1.86	0.74
1:G:7:ARG:HD3	1:G:175:GLU:OE1	1.87	0.73
1:O:104:ASP:HB3	3:O:2028:HOH:O	1.86	0.73
2:D:1:DAL:C	2:D:3:MLE:HN1	2.20	0.72
1:M:161:LYS:O	1:M:162:ASN:HB2	1.90	0.71
1:E:66:ARG:HH22	2:F:3:MLE:HN3	1.55	0.71
1:O:72:MET:HE3	3:O:2018:HOH:O	1.89	0.70
2:L:1:DAL:C	2:L:3:MLE:HN1	2.21	0.69
1:E:34:ARG:NH1	2:P:8:MLE:HD12	2.08	0.68
1:O:110:SER:HB3	1:O:124:PHE:CZ	2.29	0.68
1:M:66:ARG:HH22	2:N:3:MLE:HN3	1.59	0.67
1:I:34:ARG:HB2	1:I:97:GLU:CD	2.19	0.67
1:A:24:VAL:HB	1:A:145:SER:HB3	1.78	0.66
1:A:25:MET:SD	1:A:109:VAL:HG21	2.37	0.65
1:E:14:THR:HG22	1:E:19:LEU:HD23	1.78	0.65
2:J:5:BMT:HD11	2:J:5:BMT:CZ	2.25	0.65
3:K:2038:HOH:O	2:L:3:MLE:HD23	1.95	0.65
2:J:1:DAL:C	2:J:3:MLE:HN1	2.25	0.65
2:H:1:DAL:C	2:H:3:MLE:HN1	2.27	0.64
1:G:101:MET:HB2	1:G:139:VAL:HB	1.80	0.64
1:E:159:ASN:ND2	1:E:163:ARG:HB3	2.12	0.63
1:M:40:LEU:HD23	1:M:40:LEU:C	2.23	0.63
1:O:147:GLN:CD	1:O:147:GLN:H	2.07	0.62
1:C:3:LYS:O	1:C:3:LYS:HD3	2.00	0.62
1:A:34:ARG:HB2	1:A:97:GLU:CD	2.25	0.61
2:P:6:ABA:C	2:P:8:MLE:HN1	2.30	0.61
1:M:124:PHE:CD1	2:N:4:MVA:HG11	2.36	0.61
1:O:40:LEU:HD23	1:O:40:LEU:O	2.00	0.61
1:G:40:LEU:O	1:G:40:LEU:HD23	2.01	0.61
1:M:51:LYS:HD2	1:M:51:LYS:N	2.15	0.61
1:G:7:ARG:HD2	1:G:40:LEU:CD1	2.31	0.60
1:M:51:LYS:H	1:M:51:LYS:CD	2.15	0.60
1:E:9:VAL:CG1	1:E:40:LEU:HD22	2.32	0.60
1:I:107:PHE:HB3	1:I:143:VAL:HB	1.84	0.60
1:I:124:PHE:CD2	2:J:4:MVA:HG11	2.36	0.59
1:K:41:MET:HE1	1:K:46:MET:HB2	1.83	0.59
2:H:2:MLE:HD13	1:O:132:HIS:HA	1.84	0.59
1:E:113:ASN:O	2:F:5:BMT:HA	2.03	0.58
1:O:114:LYS:HG2	1:O:118:THR:HB	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:P:7:SAR:N	2:P:8:MLE:HN1	2.18	0.58
2:H:1:DAL:O	2:H:3:MLE:HN1	2.04	0.57
1:K:110:SAR:HB3	1:K:124:PHE:CE1	2.39	0.57
1:O:12:ASP:OD1	1:O:22:ARG:HB2	2.04	0.57
1:K:110:SAR:HB3	1:K:124:PHE:CZ	2.39	0.57
1:O:72:MET:HG3	3:O:2018:HOH:O	2.04	0.57
1:G:113:ASN:O	2:H:5:BMT:HA	2.05	0.57
1:A:115:GLY:O	1:A:118:THR:OG1	2.22	0.57
2:B:1:DAL:C	2:B:3:MLE:HN1	2.34	0.57
2:D:5:BMT:O	2:D:7:SAR:HN1	2.04	0.56
1:O:113:ASN:HB2	1:O:118:THR:OG1	2.05	0.56
1:G:87:GLU:O	1:G:121:SAR:HB3	2.04	0.56
1:K:107:PHE:HA	1:K:126:THR:O	2.05	0.56
1:G:66:ARG:HH22	2:H:3:MLE:HN3	1.70	0.56
1:O:40:LEU:HD23	1:O:40:LEU:C	2.31	0.56
1:O:70:ASN:O	1:O:128:THR:HG21	2.06	0.56
1:C:72:MET:HE3	1:C:72:MET:O	2.06	0.56
1:A:47:ALA:HB3	3:A:2013:HOH:O	2.05	0.55
2:L:1:DAL:O	2:L:3:MLE:HN1	2.06	0.55
1:O:38:ASN:HA	1:O:89:ILE:CD1	2.37	0.55
2:P:5:BMT:HD22	2:P:10:MLE:HN2	1.87	0.55
2:D:2:MLE:N	2:D:3:MLE:HN1	2.19	0.55
1:G:158:THR:HG22	1:G:164:PRO:HA	1.88	0.55
2:P:3:MLE:HD13	2:P:10:MLE:HB3	1.87	0.54
1:K:24:VAL:HB	1:K:145:SAR:HB3	1.88	0.54
1:I:79:THR:O	1:I:80:LYS:HD3	2.08	0.54
1:K:72:MET:HE3	1:K:72:MET:O	2.07	0.54
1:E:66:ARG:NH2	2:F:3:MLE:HN3	2.22	0.54
2:F:5:BMT:O	2:F:7:SAR:HN1	2.08	0.54
1:O:177:VAL:O	1:O:177:VAL:HG23	2.08	0.53
1:G:101:MET:CB	1:G:139:VAL:HB	2.39	0.53
1:C:12:ASP:OD1	1:C:22:ARG:HB2	2.08	0.53
1:K:70:ASN:O	1:K:128:THR:HG21	2.08	0.53
1:I:41:MET:HB2	1:I:89:ILE:HG21	1.91	0.53
1:K:126:THR:HG21	3:K:2033:HOH:O	2.08	0.53
1:G:124:PHE:CD2	2:H:4:MVA:HG11	2.43	0.52
1:K:136:ILE:HG13	1:K:137:HIS:CD2	2.44	0.52
1:I:40:LEU:C	1:I:40:LEU:HD23	2.34	0.52
1:E:159:ASN:HD21	1:E:163:ARG:HB3	1.74	0.52
1:O:107:PHE:HB3	1:O:143:VAL:HB	1.92	0.52
2:B:2:MLE:N	2:B:3:MLE:HN1	2.23	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:40:LEU:HD23	1:G:40:LEU:C	2.34	0.52
1:A:49:THR:HG23	1:A:54:GLY:O	2.10	0.52
1:I:63:THR:HG22	1:I:169:VAL:HG22	1.91	0.52
1:A:28:TYR:HD1	1:A:31:ILE:HD12	1.75	0.52
1:G:46:MET:HE2	1:G:46:MET:HA	1.92	0.51
1:A:113:ASN:O	2:B:5:BMT:HA	2.11	0.51
1:O:122:GLN:CD	2:P:6:ABA:HG2	2.35	0.51
1:A:107:PHE:CE1	1:A:127:THR:HG22	2.45	0.51
1:I:47:ALA:HB3	3:I:2008:HOH:O	2.10	0.51
1:I:55:LYS:HB3	1:I:56:PRO:HD2	1.91	0.51
2:H:3:MLE:HN3	2:H:3:MLE:O	2.11	0.51
1:O:95:ASP:HA	1:O:117:ASN:HB3	1.94	0.50
2:F:1:DAL:C	2:F:3:MLE:HN1	2.41	0.50
1:C:40:LEU:HD23	1:C:40:LEU:C	2.37	0.50
2:B:6:ABA:C	2:B:8:MLE:HN1	2.41	0.50
1:G:71:PHE:CD2	1:G:72:MET:HG3	2.47	0.50
1:O:87:GLU:O	1:O:121:SER:HB3	2.11	0.50
2:L:5:BMT:O	2:L:7:SAR:HN1	2.11	0.49
2:N:1:DAL:C	2:N:3:MLE:HN1	2.41	0.49
1:O:38:ASN:HA	1:O:89:ILE:HD13	1.95	0.49
1:M:66:ARG:NH2	2:N:3:MLE:HN3	2.25	0.49
1:I:95:ASP:HA	1:I:117:ASN:HB3	1.95	0.49
1:K:73:ILE:O	1:K:73:ILE:HG13	2.12	0.49
2:B:5:BMT:O	2:B:7:SAR:HN1	2.13	0.49
1:E:11:LEU:CD1	1:E:25:MET:HE1	2.42	0.49
1:K:40:LEU:HD13	1:K:40:LEU:C	2.38	0.49
1:K:100:VAL:O	1:K:102:LYS:HE3	2.13	0.49
2:J:2:MLE:N	2:J:3:MLE:HN1	2.24	0.49
1:I:32:ALA:HB1	1:I:97:GLU:OE1	2.13	0.48
1:I:87:GLU:HG2	1:I:88:SER:N	2.28	0.48
2:F:1:DAL:HA	2:F:2:MLE:HN1	1.49	0.48
2:J:6:ABA:HA	2:J:7:SAR:HN1	1.61	0.48
1:M:159:ASN:HD21	1:M:163:ARG:HB3	1.78	0.48
1:I:15:ILE:HG13	1:I:20:ALA:HB2	1.95	0.48
2:J:5:BMT:HZ	2:J:5:BMT:CD1	2.37	0.48
1:K:113:ASN:O	2:L:5:BMT:HA	2.13	0.48
1:C:3:LYS:HD3	1:C:3:LYS:C	2.39	0.48
1:I:34:ARG:HB2	1:I:97:GLU:OE2	2.13	0.48
1:O:70:ASN:N	1:O:154:GLU:OE2	2.47	0.48
1:I:7:ARG:NH2	1:I:175:GLU:OE2	2.47	0.48
1:A:40:LEU:HD23	1:A:40:LEU:C	2.38	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:124:PHE:CD1	2:D:4:MVA:HG11	2.48	0.48
1:A:147:GLN:H	1:A:147:GLN:CD	2.22	0.47
1:C:113:ASN:O	2:D:5:BMT:HA	2.13	0.47
1:E:110:SER:HB3	1:E:124:PHE:CZ	2.49	0.47
2:L:2:MLE:N	2:L:3:MLE:HN1	2.26	0.47
2:N:1:DAL:O	2:N:2:MLE:HD22	2.14	0.47
2:B:9:VAL:HA	2:B:10:MLE:HN1	1.49	0.47
2:H:9:VAL:HA	2:H:10:MLE:HN1	1.50	0.47
1:I:110:SER:HB3	1:I:124:PHE:CZ	2.49	0.47
1:G:15:ILE:O	1:G:16:ASP:HB2	2.13	0.47
1:G:42:LEU:HD13	1:G:121:SER:HB2	1.95	0.47
2:B:7:SAR:N	2:B:8:MLE:HN1	2.29	0.47
2:F:3:MLE:HD13	2:F:10:MLE:HB3	1.97	0.47
1:G:15:ILE:HD13	1:G:20:ALA:CB	2.44	0.47
2:P:1:DAL:HA	2:P:2:MLE:HN1	1.50	0.47
1:O:72:MET:SD	1:O:72:MET:C	2.98	0.46
2:L:5:BMT:HZ	2:L:5:BMT:HD13	1.96	0.46
1:O:158:THR:HG22	1:O:164:PRO:HA	1.96	0.46
1:I:7:ARG:HG3	1:I:7:ARG:HH11	1.80	0.46
1:O:32:ALA:HB2	3:O:2026:HOH:O	2.14	0.46
1:I:11:LEU:HD22	1:I:170:ILE:HD13	1.97	0.46
1:M:40:LEU:HD23	1:M:40:LEU:O	2.15	0.46
2:P:9:VAL:HA	2:P:10:MLE:HN1	1.47	0.46
2:B:6:ABA:HA	2:B:7:SAR:HN1	1.74	0.46
1:G:15:ILE:HD13	1:G:20:ALA:HB2	1.96	0.46
2:P:3:MLE:HN3	2:P:3:MLE:O	2.16	0.46
1:C:81:GLY:O	1:C:163:ARG:NH2	2.43	0.46
2:L:1:DAL:HA	2:L:2:MLE:HN1	1.49	0.46
2:D:9:VAL:HA	2:D:10:MLE:HN1	1.53	0.46
1:G:27:LEU:HB3	1:G:36:CYS:SG	2.56	0.46
2:B:1:DAL:HA	2:B:2:MLE:HN1	1.52	0.45
2:H:1:DAL:HB1	3:O:2031:HOH:O	2.15	0.45
1:M:161:LYS:O	1:M:162:ASN:CB	2.62	0.45
2:P:5:BMT:O	2:P:7:SAR:HN1	2.17	0.45
1:M:72:MET:HE3	1:M:72:MET:O	2.16	0.45
1:C:157:LYS:HD3	1:C:165:LEU:HD12	1.98	0.45
1:K:128:THR:OG1	1:K:129:PRO:HD2	2.17	0.45
1:C:77:ASP:OD1	1:C:77:ASP:C	2.59	0.45
1:I:128:THR:O	1:I:129:PRO:C	2.60	0.45
1:A:29:ASN:OD1	1:A:29:ASN:N	2.49	0.45
1:A:34:ARG:HB2	1:A:97:GLU:OE2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:4:MVA:HA	2:N:5:BMT:HN1	1.69	0.45
1:G:161:LYS:O	1:G:162:ASN:HB2	2.16	0.45
1:K:12:ASP:OD1	1:K:22:ARG:HB2	2.16	0.45
2:P:1:DAL:C	2:P:3:MLE:HN1	2.46	0.45
2:P:6:ABA:HA	2:P:7:SAR:HN1	1.68	0.45
2:F:9:VAL:HA	2:F:10:MLE:HN1	1.48	0.45
2:J:1:DAL:HA	2:J:2:MLE:HN1	1.54	0.45
1:K:55:LYS:HB3	1:K:56:PRO:HD2	1.98	0.45
2:N:1:DAL:HA	2:N:2:MLE:HN1	1.50	0.45
1:O:114:LYS:HG2	1:O:118:THR:CB	2.46	0.45
1:A:158:THR:HG22	1:A:164:PRO:HA	1.98	0.44
1:O:65:HIS:CE1	1:O:74:GLN:HG2	2.51	0.44
1:C:110:SER:HB3	1:C:124:PHE:CZ	2.51	0.44
1:E:40:LEU:CD1	1:E:40:LEU:C	2.91	0.44
1:G:107:PHE:HB3	1:G:143:VAL:HB	1.98	0.44
1:E:72:MET:SD	1:E:72:MET:C	3.01	0.44
2:H:3:MLE:HB2	2:H:4:MVA:HN1	1.99	0.44
1:I:88:SER:C	1:I:90:TYR:H	2.24	0.44
1:K:136:ILE:HG13	1:K:137:HIS:HD2	1.83	0.44
1:M:124:PHE:CG	2:N:4:MVA:HG11	2.51	0.44
2:N:3:MLE:HA	2:N:4:MVA:HN1	1.82	0.44
1:E:158:THR:HA	1:E:163:ARG:O	2.17	0.44
1:I:14:THR:HG23	1:I:171:LEU:HB2	1.99	0.44
1:M:138:VAL:HG21	3:M:2010:HOH:O	2.18	0.44
2:N:9:VAL:HA	2:N:10:MLE:HN1	1.45	0.44
1:A:46:MET:HE2	1:A:46:MET:HA	2.00	0.43
2:D:5:BMT:C	2:D:7:SAR:HN1	2.48	0.43
1:E:39:PHE:HE1	1:E:123:PHE:CD2	2.36	0.43
2:F:2:MLE:N	2:F:3:MLE:HN1	2.33	0.43
1:G:30:ASP:OD2	1:G:30:ASP:N	2.51	0.43
2:P:4:MVA:HA	2:P:5:BMT:HN1	1.66	0.43
1:A:66:ARG:HH22	2:B:3:MLE:HN3	1.84	0.43
1:E:83:GLY:C	1:E:122:GLN:HE22	2.25	0.43
1:M:110:SER:HB3	1:M:124:PHE:CZ	2.53	0.43
1:A:161:LYS:O	1:A:162:ASN:HB2	2.18	0.43
1:I:27:LEU:HB3	1:I:36:CYS:SG	2.57	0.43
1:M:53:SER:OG	1:M:55:LYS:HB2	2.18	0.43
1:O:106:PRO:HB3	1:O:127:THR:C	2.43	0.43
1:E:40:LEU:C	1:E:40:LEU:HD13	2.43	0.43
1:G:72:MET:SD	1:G:72:MET:C	3.01	0.43
1:C:49:THR:HG23	1:C:54:GLY:C	2.44	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:113:ASN:O	2:J:5:BMT:HA	2.19	0.43
1:G:7:ARG:HD2	1:G:40:LEU:HD11	1.99	0.43
2:L:5:BMT:C	2:L:7:SAR:HN1	2.48	0.43
2:F:3:MLE:HN3	2:F:3:MLE:O	2.19	0.42
2:F:3:MLE:HA	2:F:4:MVA:HN1	1.84	0.42
2:L:6:ABA:HA	2:L:7:SAR:HN1	1.79	0.42
1:C:101:MET:HB2	1:C:139:VAL:HB	2.02	0.42
1:C:155:TYR:CD1	1:E:147:GLN:HG3	2.54	0.42
1:G:69:LYS:HB3	1:G:69:LYS:HE2	1.76	0.42
1:I:7:ARG:HG3	1:I:7:ARG:NH1	2.35	0.42
2:H:2:MLE:N	2:H:3:MLE:HN1	2.33	0.42
1:O:87:GLU:HG2	1:O:88:SER:N	2.35	0.42
1:G:14:THR:HG22	1:G:19:LEU:HD23	2.02	0.42
1:I:19:LEU:HD13	1:O:171:LEU:HD23	2.02	0.42
1:K:5:ASP:O	1:K:7:ARG:HG2	2.20	0.42
1:E:14:THR:HG22	1:E:19:LEU:HA	2.02	0.42
1:G:7:ARG:HD2	1:G:40:LEU:HD13	2.02	0.42
2:N:5:BMT:O	2:N:7:SAR:HN1	2.20	0.42
1:G:34:ARG:HG3	1:G:90:TYR:OH	2.20	0.42
2:H:6:ABA:HA	2:H:7:SAR:HN1	1.74	0.42
1:O:49:THR:HG22	1:O:50:GLY:N	2.35	0.42
1:M:52:ILE:O	1:M:53:SER:C	2.62	0.42
1:M:114:LYS:HD3	2:N:6:ABA:O	2.19	0.42
1:M:131:PRO:HA	1:M:134:ASN:ND2	2.34	0.42
1:O:67:VAL:O	1:O:67:VAL:HG23	2.20	0.42
1:O:38:ASN:O	1:O:42:LEU:HG	2.20	0.41
1:A:13:VAL:HG12	1:A:14:THR:N	2.35	0.41
1:M:52:ILE:HG22	1:M:53:SER:N	2.35	0.41
1:O:151:THR:O	1:O:152:LYS:C	2.62	0.41
1:K:109:VAL:HG12	1:K:140:PHE:CZ	2.55	0.41
2:N:2:MLE:N	2:N:3:MLE:HN1	2.34	0.41
2:N:7:SAR:HA2	2:N:8:MLE:HN1	1.86	0.41
1:C:107:PHE:HA	1:C:126:THR:O	2.20	0.41
2:D:4:MVA:HA	2:D:5:BMT:HN1	1.78	0.41
1:G:156:LEU:O	1:G:158:THR:HG23	2.21	0.41
1:O:38:ASN:OD1	1:O:89:ILE:HG12	2.20	0.41
1:C:148:GLU:HG2	1:C:149:VAL:N	2.36	0.41
1:E:4:LYS:HB2	3:E:2002:HOH:O	2.21	0.41
1:E:27:LEU:HB3	1:E:36:CYS:SG	2.61	0.41
2:P:2:MLE:N	2:P:3:MLE:HN1	2.36	0.41
1:K:57:LEU:HD13	1:K:89:ILE:HA	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:57:LEU:HD13	1:C:89:ILE:HA	2.01	0.41
1:O:122:GLN:NE2	2:P:6:ABA:HG2	2.36	0.41
2:D:1:DAL:HA	2:D:2:MLE:HN1	1.50	0.41
1:E:34:ARG:NH1	2:P:8:MLE:HD23	2.36	0.41
2:F:6:ABA:HA	2:F:7:SAR:HN1	1.73	0.41
1:O:101:MET:HB2	1:O:139:VAL:HB	2.02	0.41
1:G:131:PRO:HA	1:G:134:ASN:ND2	2.36	0.41
1:I:16:ASP:HB2	1:I:166:ALA:HB1	2.02	0.41
1:I:161:LYS:O	1:I:162:ASN:HB2	2.19	0.41
2:N:6:ABA:HA	2:N:7:SAR:HN1	1.74	0.41
1:E:41:MET:HE1	1:E:46:MET:HB2	2.03	0.40
1:I:95:ASP:HA	1:I:117:ASN:CB	2.52	0.40
1:O:13:VAL:HG12	1:O:14:THR:N	2.35	0.40
1:E:37:ASN:O	1:E:41:MET:HG2	2.22	0.40
2:F:3:MLE:HD12	2:F:5:BMT:HD23	2.04	0.40
1:M:69:LYS:O	1:M:70:ASN:HB2	2.21	0.40
1:C:134:ASN:O	1:C:135:ASN:HB2	2.22	0.40
2:J:3:MLE:HA	2:J:4:MVA:HN1	1.75	0.40
1:M:154:GLU:CD	3:M:2016:HOH:O	2.64	0.40
1:O:142:LYS:HE3	3:O:2034:HOH:O	2.21	0.40
1:A:13:VAL:HG11	1:A:153:ILE:HD11	2.04	0.40
1:A:110:SER:HB3	1:A:124:PHE:CZ	2.56	0.40
1:M:12:ASP:OD2	1:M:22:ARG:HB2	2.21	0.40
1:O:106:PRO:HB3	1:O:127:THR:O	2.21	0.40
1:O:124:PHE:CD2	2:P:4:MVA:HG11	2.57	0.40
1:I:159:ASN:OD1	1:I:163:ARG:HB3	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	175/177 (99%)	163 (93%)	12 (7%)	0	100	100
1	C	175/177 (99%)	163 (93%)	12 (7%)	0	100	100
1	E	172/177 (97%)	159 (92%)	13 (8%)	0	100	100
1	G	170/177 (96%)	157 (92%)	12 (7%)	1 (1%)	21	35
1	I	171/177 (97%)	158 (92%)	12 (7%)	1 (1%)	21	35
1	K	173/177 (98%)	161 (93%)	12 (7%)	0	100	100
1	M	173/177 (98%)	157 (91%)	15 (9%)	1 (1%)	21	35
1	O	170/177 (96%)	158 (93%)	12 (7%)	0	100	100
2	B	1/11 (9%)	1 (100%)	0	0	100	100
2	D	1/11 (9%)	1 (100%)	0	0	100	100
2	F	1/11 (9%)	1 (100%)	0	0	100	100
2	H	1/11 (9%)	1 (100%)	0	0	100	100
2	J	1/11 (9%)	1 (100%)	0	0	100	100
2	L	1/11 (9%)	1 (100%)	0	0	100	100
2	N	1/11 (9%)	1 (100%)	0	0	100	100
2	P	1/11 (9%)	1 (100%)	0	0	100	100
All	All	1387/1504 (92%)	1284 (93%)	100 (7%)	3 (0%)	43	61

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	I	91	GLY
1	M	52	ILE
1	G	91	GLY

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	151/151 (100%)	148 (98%)	3 (2%)	48	72
1	C	151/151 (100%)	148 (98%)	3 (2%)	48	72

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	148/151 (98%)	145 (98%)	3 (2%)	48	72
1	G	146/151 (97%)	145 (99%)	1 (1%)	76	88
1	I	147/151 (97%)	147 (100%)	0	100	100
1	K	149/151 (99%)	147 (99%)	2 (1%)	61	80
1	M	149/151 (99%)	148 (99%)	1 (1%)	76	88
1	O	146/151 (97%)	145 (99%)	1 (1%)	76	88
2	B	1/1 (100%)	1 (100%)	0	100	100
2	D	1/1 (100%)	1 (100%)	0	100	100
2	F	1/1 (100%)	1 (100%)	0	100	100
2	H	1/1 (100%)	1 (100%)	0	100	100
2	J	1/1 (100%)	1 (100%)	0	100	100
2	L	1/1 (100%)	1 (100%)	0	100	100
2	N	1/1 (100%)	1 (100%)	0	100	100
2	P	1/1 (100%)	1 (100%)	0	100	100
All	All	1195/1216 (98%)	1181 (99%)	14 (1%)	63	81

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	104	ASP
1	A	128	THR
1	A	147	GLN
1	C	49	THR
1	C	109	VAL
1	C	177	VAL
1	E	40	LEU
1	E	147	GLN
1	E	167	ASP
1	G	147	GLN
1	K	16	ASP
1	K	40	LEU
1	M	147	GLN
1	O	147	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	122	GLN
1	A	135	ASN
1	C	135	ASN
1	E	122	GLN
1	E	135	ASN
1	M	18	ASN
1	M	29	ASN
1	M	162	ASN
1	O	70	ASN
1	O	172	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

72 non-standard protein/DNA/RNA residues 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	$\# Z > 2$
2	MLE	B	8	2	7,8,9	0.80	0	7,9,11	1.05	1 (14%)
2	SAR	J	7	2	3,4,5	0.78	0	1,3,5	1.54	0
2	BMT	J	5	2	11,12,13	1.18	1 (9%)	11,14,16	0.82	0
2	MLE	N	8	2	7,8,9	0.80	0	7,9,11	1.03	0
2	MLE	B	3	2	7,8,9	0.78	0	7,9,11	1.08	1 (14%)
2	MVA	P	4	2	6,7,8	0.81	0	6,8,10	1.43	1 (16%)
2	MLE	L	8	2	7,8,9	0.84	0	7,9,11	0.97	1 (14%)
2	MLE	L	2	2	7,8,9	0.84	0	7,9,11	1.22	0
2	SAR	P	7	2	3,4,5	0.76	0	1,3,5	1.58	0
2	MLE	B	2	2	7,8,9	0.81	0	7,9,11	1.16	0
2	ABA	B	6	2	4,5,6	0.64	0	1,5,7	0.42	0
2	SAR	B	7	2	3,4,5	0.88	0	1,3,5	1.30	0
2	MLE	F	2	2	7,8,9	0.73	0	7,9,11	1.24	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	MLE	J	3	2	7,8,9	0.79	0	7,9,11	1.04	0
2	MLE	J	8	2	7,8,9	0.79	0	7,9,11	0.98	1 (14%)
2	BMT	H	5	2	11,12,13	0.92	0	11,14,16	0.86	0
2	MLE	P	8	2	7,8,9	0.77	0	7,9,11	1.03	0
2	MLE	J	2	2	7,8,9	0.82	0	7,9,11	1.19	1 (14%)
2	ABA	F	6	2	4,5,6	0.61	0	1,5,7	0.31	0
2	MLE	D	3	2	7,8,9	0.86	0	7,9,11	1.02	0
2	MLE	D	10	2	7,8,9	0.79	0	7,9,11	0.89	0
2	MLE	F	10	2	7,8,9	0.72	0	7,9,11	1.09	0
2	BMT	F	5	2	11,12,13	0.94	0	11,14,16	1.09	0
2	MLE	P	2	2	7,8,9	0.76	0	7,9,11	1.31	1 (14%)
2	SAR	H	7	2	3,4,5	0.84	0	1,3,5	1.38	0
2	MLE	L	3	2	7,8,9	0.86	0	7,9,11	1.00	0
2	BMT	D	5	2	11,12,13	0.93	0	11,14,16	1.12	1 (9%)
2	MLE	N	3	2	7,8,9	0.84	0	7,9,11	1.07	0
2	ABA	D	6	2	4,5,6	0.62	0	1,5,7	0.31	0
2	MVA	B	4	2	6,7,8	0.75	0	6,8,10	1.67	1 (16%)
2	SAR	F	7	2	3,4,5	0.62	0	1,3,5	1.66	0
2	MLE	L	10	2	7,8,9	0.78	0	7,9,11	0.95	1 (14%)
2	MLE	B	10	2	7,8,9	0.77	0	7,9,11	0.99	0
2	MLE	H	10	2	7,8,9	0.79	0	7,9,11	1.01	0
2	MLE	N	10	2	7,8,9	0.84	0	7,9,11	0.93	0
2	MLE	F	3	2	7,8,9	0.86	0	7,9,11	1.08	0
2	MVA	J	4	2	6,7,8	0.90	0	6,8,10	1.44	1 (16%)
2	ABA	L	6	2	4,5,6	0.58	0	1,5,7	0.24	0
2	MLE	F	8	2	7,8,9	0.85	0	7,9,11	0.93	0
2	ABA	H	6	2	4,5,6	0.65	0	1,5,7	0.35	0
2	BMT	L	5	2	11,12,13	1.06	0	11,14,16	0.92	0
2	BMT	B	5	2	11,12,13	0.94	0	11,14,16	0.80	0
2	ABA	J	6	2	4,5,6	0.63	0	1,5,7	0.19	0
2	MLE	P	3	2	7,8,9	0.72	0	7,9,11	1.06	0
2	MVA	D	4	2	6,7,8	0.89	0	6,8,10	1.83	1 (16%)
2	MLE	D	8	2	7,8,9	0.74	0	7,9,11	0.98	0
2	MVA	N	4	2	6,7,8	0.90	0	6,8,10	1.54	1 (16%)
2	MLE	J	10	2	7,8,9	0.71	0	7,9,11	1.01	0
2	SAR	D	7	2	3,4,5	0.78	0	1,3,5	1.63	0
2	BMT	P	5	2	11,12,13	0.95	0	11,14,16	0.98	1 (9%)
2	MVA	H	4	2	6,7,8	0.87	0	6,8,10	1.54	1 (16%)
2	MVA	L	4	2	6,7,8	0.97	0	6,8,10	1.56	1 (16%)
2	MLE	D	2	2	7,8,9	0.75	0	7,9,11	1.29	1 (14%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	BMT	N	5	2	11,12,13	0.99	0	11,14,16	1.01	1 (9%)
2	MLE	P	10	2	7,8,9	0.80	0	7,9,11	0.96	0
2	MLE	H	8	2	7,8,9	0.80	0	7,9,11	1.07	1 (14%)
2	ABA	N	6	2	4,5,6	0.56	0	1,5,7	0.27	0
2	MLE	H	3	2	7,8,9	0.82	0	7,9,11	1.13	1 (14%)
2	ABA	P	6	2	4,5,6	0.56	0	1,5,7	0.07	0
2	SAR	L	7	2	3,4,5	0.85	0	1,3,5	1.26	0
2	SAR	N	7	2	3,4,5	0.84	0	1,3,5	1.55	0
2	MVA	F	4	2	6,7,8	0.84	0	6,8,10	1.59	1 (16%)
2	MLE	H	2	2	7,8,9	0.80	0	7,9,11	1.16	0
2	MLE	N	2	2	7,8,9	0.75	0	7,9,11	1.28	1 (14%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MLE	B	8	2	-	1/5/8/10	-
2	SAR	J	7	2	-	1/1/2/3	-
2	BMT	J	5	2	-	1/14/16/18	-
2	MLE	N	8	2	-	0/5/8/10	-
2	MLE	B	3	2	-	0/5/8/10	-
2	MVA	P	4	2	-	0/6/8/10	-
2	MLE	L	8	2	-	0/5/8/10	-
2	MLE	L	2	2	-	0/5/8/10	-
2	SAR	P	7	2	-	1/1/2/3	-
2	MLE	B	2	2	-	0/5/8/10	-
2	ABA	B	6	2	-	1/3/4/6	-
2	SAR	B	7	2	-	1/1/2/3	-
2	MLE	F	2	2	-	0/5/8/10	-
2	MLE	J	3	2	-	0/5/8/10	-
2	MLE	J	8	2	-	1/5/8/10	-
2	BMT	H	5	2	-	1/14/16/18	-
2	MLE	P	8	2	-	0/5/8/10	-
2	MLE	J	2	2	-	0/5/8/10	-
2	ABA	F	6	2	-	0/3/4/6	-
2	MLE	D	3	2	-	0/5/8/10	-
2	MLE	D	10	2	-	0/5/8/10	-
2	MLE	F	10	2	-	0/5/8/10	-
2	BMT	F	5	2	-	1/14/16/18	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MLE	P	2	2	-	1/5/8/10	-
2	SAR	H	7	2	-	1/1/2/3	-
2	MLE	L	3	2	-	0/5/8/10	-
2	BMT	D	5	2	-	1/14/16/18	-
2	MLE	N	3	2	-	0/5/8/10	-
2	ABA	D	6	2	-	0/3/4/6	-
2	MVA	B	4	2	-	1/6/8/10	-
2	SAR	F	7	2	-	1/1/2/3	-
2	MLE	L	10	2	-	0/5/8/10	-
2	MLE	B	10	2	-	0/5/8/10	-
2	MLE	H	10	2	-	0/5/8/10	-
2	MLE	N	10	2	-	0/5/8/10	-
2	MLE	F	3	2	-	0/5/8/10	-
2	MVA	J	4	2	-	0/6/8/10	-
2	ABA	L	6	2	-	0/3/4/6	-
2	MLE	F	8	2	-	1/5/8/10	-
2	ABA	H	6	2	-	1/3/4/6	-
2	BMT	L	5	2	-	1/14/16/18	-
2	BMT	B	5	2	-	1/14/16/18	-
2	ABA	J	6	2	-	1/3/4/6	-
2	MLE	P	3	2	-	0/5/8/10	-
2	MVA	D	4	2	-	0/6/8/10	-
2	MLE	D	8	2	-	1/5/8/10	-
2	MVA	N	4	2	-	1/6/8/10	-
2	MLE	J	10	2	-	0/5/8/10	-
2	SAR	D	7	2	-	1/1/2/3	-
2	BMT	P	5	2	-	1/14/16/18	-
2	MVA	H	4	2	-	0/6/8/10	-
2	MVA	L	4	2	-	0/6/8/10	-
2	MLE	D	2	2	-	0/5/8/10	-
2	BMT	N	5	2	-	1/14/16/18	-
2	MLE	P	10	2	-	0/5/8/10	-
2	MLE	H	8	2	-	1/5/8/10	-
2	ABA	N	6	2	-	1/3/4/6	-
2	MLE	H	3	2	-	0/5/8/10	-
2	ABA	P	6	2	-	0/3/4/6	-
2	SAR	L	7	2	-	1/1/2/3	-
2	SAR	N	7	2	-	1/1/2/3	-
2	MVA	F	4	2	-	0/6/8/10	-
2	MLE	H	2	2	-	0/5/8/10	-
2	MLE	N	2	2	-	0/5/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	J	5	BMT	CE-CZ	2.01	1.44	1.29

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	4	MVA	CB-CA-C	-3.79	108.07	112.96
2	B	4	MVA	CB-CA-C	-3.44	108.52	112.96
2	F	4	MVA	CB-CA-C	-3.15	108.89	112.96
2	L	4	MVA	CB-CA-C	-3.13	108.92	112.96
2	H	4	MVA	CB-CA-C	-3.08	108.98	112.96
2	N	4	MVA	CB-CA-C	-3.05	109.03	112.96
2	P	4	MVA	CB-CA-C	-2.93	109.17	112.96
2	J	4	MVA	CB-CA-C	-2.83	109.31	112.96
2	D	5	BMT	CG2-CD2-CE	2.54	118.09	114.11
2	N	5	BMT	CG2-CD2-CE	2.25	117.63	114.11
2	H	8	MLE	CN-N-CA	2.18	120.23	113.70
2	H	3	MLE	CN-N-CA	2.16	120.17	113.70
2	D	2	MLE	O-C-CA	-2.10	119.38	124.77
2	N	2	MLE	CN-N-CA	2.08	119.91	113.70
2	P	5	BMT	CG2-CD2-CE	2.05	117.32	114.11
2	B	3	MLE	CN-N-CA	2.05	119.83	113.70
2	L	8	MLE	CN-N-CA	2.04	119.81	113.70
2	B	8	MLE	CN-N-CA	2.04	119.78	113.70
2	J	8	MLE	CN-N-CA	2.02	119.73	113.70
2	L	10	MLE	CN-N-CA	2.01	119.69	113.70
2	P	2	MLE	CN-N-CA	2.00	119.69	113.70
2	J	2	MLE	CN-N-CA	2.00	119.69	113.70

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	6	ABA	N-CA-CB-CG
2	H	6	ABA	N-CA-CB-CG
2	J	6	ABA	O-C-CA-CB
2	N	6	ABA	N-CA-CB-CG
2	D	7	SAR	C-CA-N-CN
2	F	7	SAR	C-CA-N-CN
2	H	7	SAR	C-CA-N-CN
2	L	7	SAR	C-CA-N-CN
2	N	7	SAR	C-CA-N-CN
2	B	8	MLE	O-C-CA-CB

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Mol	Chain	Res	Type	Atoms
2	D	8	MLE	O-C-CA-CB
2	F	8	MLE	O-C-CA-CB
2	H	8	MLE	O-C-CA-CB
2	J	8	MLE	O-C-CA-CB
2	J	5	BMT	CG2-CD2-CE-CZ
2	B	5	BMT	CG2-CD2-CE-CZ
2	D	5	BMT	CG2-CD2-CE-CZ
2	L	5	BMT	CG2-CD2-CE-CZ
2	N	5	BMT	CG2-CD2-CE-CZ
2	P	5	BMT	CG2-CD2-CE-CZ
2	H	5	BMT	CG2-CD2-CE-CZ
2	P	2	MLE	N-CA-CB-CG
2	B	4	MVA	O-C-CA-CB
2	N	4	MVA	O-C-CA-CB
2	F	5	BMT	CG2-CD2-CE-CZ
2	B	7	SAR	C-CA-N-CN
2	J	7	SAR	C-CA-N-CN
2	P	7	SAR	C-CA-N-CN

There are no ring outliers.

54 monomers are involved in 96 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	8	MLE	2	0
2	J	7	SAR	1	0
2	J	5	BMT	4	0
2	N	8	MLE	1	0
2	B	3	MLE	3	0
2	P	4	MVA	2	0
2	L	2	MLE	2	0
2	P	7	SAR	3	0
2	B	2	MLE	2	0
2	B	6	ABA	2	0
2	B	7	SAR	3	0
2	F	2	MLE	2	0
2	J	3	MLE	3	0
2	H	5	BMT	1	0
2	P	8	MLE	5	0
2	J	2	MLE	2	0
2	F	6	ABA	1	0
2	D	3	MLE	2	0
2	D	10	MLE	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	F	10	MLE	2	0
2	F	5	BMT	3	0
2	P	2	MLE	2	0
2	H	7	SAR	1	0
2	L	3	MLE	4	0
2	D	5	BMT	4	0
2	N	3	MLE	5	0
2	F	7	SAR	2	0
2	B	10	MLE	1	0
2	H	10	MLE	1	0
2	N	10	MLE	1	0
2	F	3	MLE	8	0
2	J	4	MVA	2	0
2	L	6	ABA	1	0
2	H	6	ABA	1	0
2	L	5	BMT	4	0
2	B	5	BMT	2	0
2	J	6	ABA	1	0
2	P	3	MLE	4	0
2	D	4	MVA	2	0
2	N	4	MVA	4	0
2	D	7	SAR	2	0
2	P	5	BMT	3	0
2	H	4	MVA	2	0
2	D	2	MLE	2	0
2	N	5	BMT	2	0
2	P	10	MLE	3	0
2	N	6	ABA	2	0
2	H	3	MLE	6	0
2	P	6	ABA	4	0
2	L	7	SAR	3	0
2	N	7	SAR	3	0
2	F	4	MVA	1	0
2	H	2	MLE	2	0
2	N	2	MLE	3	0

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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 ⓘ

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	177/177 (100%)	-0.21	1 (0%) 85 83	28, 42, 59, 86	4 (2%)
1	C	177/177 (100%)	-0.37	0 100 100	28, 39, 52, 67	2 (1%)
1	E	174/177 (98%)	-0.31	1 (0%) 85 83	24, 38, 51, 68	2 (1%)
1	G	172/177 (97%)	-0.14	0 100 100	27, 44, 61, 68	1 (0%)
1	I	173/177 (97%)	0.01	1 (0%) 85 83	15, 49, 69, 79	4 (2%)
1	K	175/177 (98%)	-0.32	0 100 100	28, 39, 57, 80	2 (1%)
1	M	175/177 (98%)	-0.20	1 (0%) 85 83	28, 42, 60, 84	3 (1%)
1	O	172/177 (97%)	-0.19	1 (0%) 85 83	31, 44, 60, 63	2 (1%)
2	B	2/11 (18%)	-0.45	0 100 100	38, 38, 38, 44	0
2	D	2/11 (18%)	-0.08	0 100 100	39, 39, 39, 42	0
2	F	2/11 (18%)	-0.07	0 100 100	42, 42, 42, 43	0
2	H	2/11 (18%)	-0.49	0 100 100	37, 37, 37, 40	0
2	J	2/11 (18%)	0.14	0 100 100	44, 44, 44, 49	0
2	L	2/11 (18%)	-0.04	0 100 100	36, 36, 36, 38	0
2	N	2/11 (18%)	0.08	0 100 100	40, 40, 40, 41	0
2	P	2/11 (18%)	-0.25	0 100 100	43, 43, 43, 44	0
All	All	1411/1504 (93%)	-0.22	5 (0%) 88 87	15, 42, 61, 86	20 (1%)

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	I	5	ASP	6.6
1	E	4	LYS	3.0
1	O	52	ILE	2.3
1	A	2	SER	2.1
1	M	4	LYS	2.0

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

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
2	BMT	J	5	13/14	0.78	0.13	41,43,48,49	0
2	MLE	F	8	9/10	0.86	0.13	41,42,43,43	2
2	DAL	P	1	5/6	0.88	0.11	40,41,41,42	0
2	SAR	B	7	5/6	0.88	0.10	43,44,44,44	0
2	MLE	J	3	9/10	0.88	0.12	39,40,41,42	0
2	SAR	P	7	5/6	0.89	0.12	48,48,52,54	0
2	SAR	N	7	5/6	0.89	0.11	37,39,39,41	0
2	MLE	P	8	9/10	0.89	0.14	49,52,55,55	0
2	MLE	B	8	9/10	0.90	0.14	42,44,51,52	0
2	ABA	N	6	6/7	0.90	0.11	42,43,43,45	0
2	MLE	N	8	9/10	0.90	0.11	37,38,40,40	0
2	MVA	F	4	8/9	0.90	0.11	36,39,39,40	0
2	MLE	B	10	9/10	0.90	0.10	41,42,44,45	0
2	BMT	B	5	13/14	0.91	0.10	36,41,45,46	0
2	SAR	J	7	5/6	0.91	0.11	51,52,54,55	0
2	MLE	J	8	9/10	0.91	0.11	50,53,55,56	2
2	BMT	P	5	13/14	0.92	0.11	41,43,50,50	0
2	DAL	B	1	5/6	0.92	0.08	37,37,40,41	0
2	MVA	J	4	8/9	0.92	0.10	38,40,41,41	0
2	MLE	F	3	9/10	0.92	0.10	36,39,41,43	0
2	DAL	L	1	5/6	0.92	0.10	36,36,37,38	0
2	BMT	N	5	13/14	0.92	0.11	34,39,45,46	0
2	MLE	F	10	9/10	0.92	0.10	40,43,46,47	0
2	MLE	P	3	9/10	0.93	0.10	37,40,40,41	0
2	MLE	L	2	9/10	0.93	0.09	28,34,36,36	0
2	ABA	F	6	6/7	0.93	0.08	34,37,38,40	0
2	ABA	J	6	6/7	0.93	0.11	48,52,52,53	0
2	MLE	D	3	9/10	0.93	0.09	28,30,32,32	0
2	DAL	N	1	5/6	0.93	0.08	39,40,40,41	0
2	DAL	J	1	5/6	0.93	0.09	42,42,43,44	0
2	BMT	L	5	13/14	0.93	0.08	31,34,37,38	0
2	MLE	P	10	9/10	0.93	0.10	43,43,44,44	0
2	SAR	H	7	5/6	0.94	0.07	34,35,36,36	0
2	DAL	F	1	5/6	0.94	0.07	40,40,41,41	0
2	MVA	H	4	8/9	0.94	0.08	28,31,32,33	0
2	MLE	B	3	9/10	0.94	0.10	40,41,44,44	0
2	ABA	B	6	6/7	0.94	0.07	41,42,43,44	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	ABA	D	6	6/7	0.94	0.09	39,40,41,42	0
2	MVA	L	4	8/9	0.94	0.08	31,36,38,38	0
2	MLE	L	8	9/10	0.94	0.10	35,37,40,40	0
2	ABA	H	6	6/7	0.94	0.07	33,35,36,37	0
2	MVA	N	4	8/9	0.94	0.09	36,38,40,40	0
2	MLE	D	2	9/10	0.94	0.08	28,31,34,35	0
2	MVA	B	4	8/9	0.94	0.09	38,39,40,41	0
2	SAR	F	7	5/6	0.94	0.06	35,38,40,42	0
2	MLE	D	8	9/10	0.95	0.09	40,42,44,45	0
2	ABA	P	6	6/7	0.95	0.08	43,47,48,49	0
2	MLE	H	3	9/10	0.95	0.08	33,35,36,36	0
2	BMT	D	5	13/14	0.95	0.07	33,35,37,37	0
2	DAL	D	1	5/6	0.95	0.06	35,37,38,38	0
2	MLE	B	2	9/10	0.95	0.09	36,40,40,41	0
2	MLE	N	2	9/10	0.95	0.09	38,39,40,40	0
2	ABA	L	6	6/7	0.95	0.07	33,35,35,36	0
2	MLE	L	10	9/10	0.95	0.08	32,34,37,38	0
2	MLE	N	10	9/10	0.95	0.09	33,35,38,39	0
2	MVA	D	4	8/9	0.95	0.08	33,34,36,38	0
2	MLE	P	2	9/10	0.96	0.07	34,35,38,38	0
2	DAL	H	1	5/6	0.96	0.07	38,39,40,40	0
2	MLE	H	2	9/10	0.96	0.07	32,35,37,38	0
2	MLE	L	3	9/10	0.96	0.07	33,34,35,36	0
2	MLE	D	10	9/10	0.96	0.07	39,40,41,41	0
2	MLE	N	3	9/10	0.96	0.07	34,37,38,39	0
2	MLE	H	10	9/10	0.96	0.08	36,39,42,43	0
2	MLE	J	10	9/10	0.96	0.07	45,46,47,47	0
2	BMT	F	5	13/14	0.96	0.08	34,38,42,43	0
2	SAR	D	7	5/6	0.96	0.06	39,40,42,43	0
2	BMT	H	5	13/14	0.96	0.07	27,29,36,40	0
2	SAR	L	7	5/6	0.97	0.05	33,35,36,36	0
2	MLE	F	2	9/10	0.97	0.07	34,37,39,39	0
2	MLE	H	8	9/10	0.97	0.08	32,36,37,38	0
2	MLE	J	2	9/10	0.97	0.07	36,39,41,41	0
2	MVA	P	4	8/9	0.97	0.07	37,40,42,42	0

6.3 Carbohydrates

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.