



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 08:11 AM UTC

PDB ID : 4HY3 / pdb_00004hy3
Title : Crystal structure of a phosphoglycerate oxidoreductase from rhizobium etli
Authors : Kumaran, D.; Chamala, S.; Evans, B.; Foti, R.; Gizzi, A.; Hillerich, B.; Kar, A.; Lafleur, J.; Seidel, R.; Villigas, G.; Zencheck, W.; Almo, S.C.; Swaminathan, S.; New York Structural Genomics Research Consortium (NYSGRG)
Deposited on : 2012-11-12
Resolution : 2.80 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

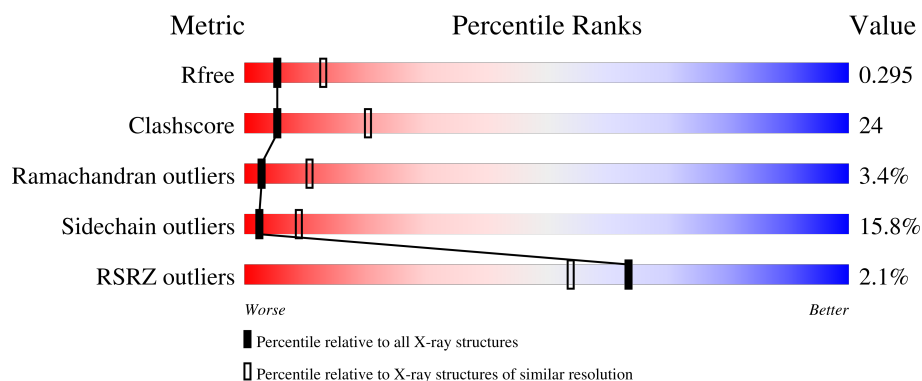
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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	365	0.2% 49% 31% 8% 11%
1	B	365	2% 47% 30% 8% 13%
1	C	365	4% 43% 30% 9% 18%
1	D	365	55% 27% 6% 12%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 9794 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 phosphoglycerate oxidoreductase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	324	Total	C	N	O	S	Se	0	0	0
			2464	1560	432	461	1	10			
1	B	319	Total	C	N	O	S	Se	0	0	0
			2431	1540	427	453	1	10			
1	C	301	Total	C	N	O	S	Se	0	0	0
			2292	1459	398	426	9				
1	D	321	Total	C	N	O	S	Se	0	0	0
			2451	1551	432	457	1	10			

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-21	MSE	-	expression tag	UNP Q2K273
A	-20	HIS	-	expression tag	UNP Q2K273
A	-19	HIS	-	expression tag	UNP Q2K273
A	-18	HIS	-	expression tag	UNP Q2K273
A	-17	HIS	-	expression tag	UNP Q2K273
A	-16	HIS	-	expression tag	UNP Q2K273
A	-15	HIS	-	expression tag	UNP Q2K273
A	-14	SER	-	expression tag	UNP Q2K273
A	-13	SER	-	expression tag	UNP Q2K273
A	-12	GLY	-	expression tag	UNP Q2K273
A	-11	VAL	-	expression tag	UNP Q2K273
A	-10	ASP	-	expression tag	UNP Q2K273
A	-9	LEU	-	expression tag	UNP Q2K273
A	-8	GLY	-	expression tag	UNP Q2K273
A	-7	THR	-	expression tag	UNP Q2K273
A	-6	GLU	-	expression tag	UNP Q2K273
A	-5	ASN	-	expression tag	UNP Q2K273
A	-4	LEU	-	expression tag	UNP Q2K273
A	-3	TYR	-	expression tag	UNP Q2K273
A	-2	PHE	-	expression tag	UNP Q2K273
A	-1	GLN	-	expression tag	UNP Q2K273

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Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	expression tag	UNP Q2K273
B	-21	MSE	-	expression tag	UNP Q2K273
B	-20	HIS	-	expression tag	UNP Q2K273
B	-19	HIS	-	expression tag	UNP Q2K273
B	-18	HIS	-	expression tag	UNP Q2K273
B	-17	HIS	-	expression tag	UNP Q2K273
B	-16	HIS	-	expression tag	UNP Q2K273
B	-15	HIS	-	expression tag	UNP Q2K273
B	-14	SER	-	expression tag	UNP Q2K273
B	-13	SER	-	expression tag	UNP Q2K273
B	-12	GLY	-	expression tag	UNP Q2K273
B	-11	VAL	-	expression tag	UNP Q2K273
B	-10	ASP	-	expression tag	UNP Q2K273
B	-9	LEU	-	expression tag	UNP Q2K273
B	-8	GLY	-	expression tag	UNP Q2K273
B	-7	THR	-	expression tag	UNP Q2K273
B	-6	GLU	-	expression tag	UNP Q2K273
B	-5	ASN	-	expression tag	UNP Q2K273
B	-4	LEU	-	expression tag	UNP Q2K273
B	-3	TYR	-	expression tag	UNP Q2K273
B	-2	PHE	-	expression tag	UNP Q2K273
B	-1	GLN	-	expression tag	UNP Q2K273
B	0	SER	-	expression tag	UNP Q2K273
C	-21	MSE	-	expression tag	UNP Q2K273
C	-20	HIS	-	expression tag	UNP Q2K273
C	-19	HIS	-	expression tag	UNP Q2K273
C	-18	HIS	-	expression tag	UNP Q2K273
C	-17	HIS	-	expression tag	UNP Q2K273
C	-16	HIS	-	expression tag	UNP Q2K273
C	-15	HIS	-	expression tag	UNP Q2K273
C	-14	SER	-	expression tag	UNP Q2K273
C	-13	SER	-	expression tag	UNP Q2K273
C	-12	GLY	-	expression tag	UNP Q2K273
C	-11	VAL	-	expression tag	UNP Q2K273
C	-10	ASP	-	expression tag	UNP Q2K273
C	-9	LEU	-	expression tag	UNP Q2K273
C	-8	GLY	-	expression tag	UNP Q2K273
C	-7	THR	-	expression tag	UNP Q2K273
C	-6	GLU	-	expression tag	UNP Q2K273
C	-5	ASN	-	expression tag	UNP Q2K273
C	-4	LEU	-	expression tag	UNP Q2K273
C	-3	TYR	-	expression tag	UNP Q2K273

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-2	PHE	-	expression tag	UNP Q2K273
C	-1	GLN	-	expression tag	UNP Q2K273
C	0	SER	-	expression tag	UNP Q2K273
D	-21	MSE	-	expression tag	UNP Q2K273
D	-20	HIS	-	expression tag	UNP Q2K273
D	-19	HIS	-	expression tag	UNP Q2K273
D	-18	HIS	-	expression tag	UNP Q2K273
D	-17	HIS	-	expression tag	UNP Q2K273
D	-16	HIS	-	expression tag	UNP Q2K273
D	-15	HIS	-	expression tag	UNP Q2K273
D	-14	SER	-	expression tag	UNP Q2K273
D	-13	SER	-	expression tag	UNP Q2K273
D	-12	GLY	-	expression tag	UNP Q2K273
D	-11	VAL	-	expression tag	UNP Q2K273
D	-10	ASP	-	expression tag	UNP Q2K273
D	-9	LEU	-	expression tag	UNP Q2K273
D	-8	GLY	-	expression tag	UNP Q2K273
D	-7	THR	-	expression tag	UNP Q2K273
D	-6	GLU	-	expression tag	UNP Q2K273
D	-5	ASN	-	expression tag	UNP Q2K273
D	-4	LEU	-	expression tag	UNP Q2K273
D	-3	TYR	-	expression tag	UNP Q2K273
D	-2	PHE	-	expression tag	UNP Q2K273
D	-1	GLN	-	expression tag	UNP Q2K273
D	0	SER	-	expression tag	UNP Q2K273

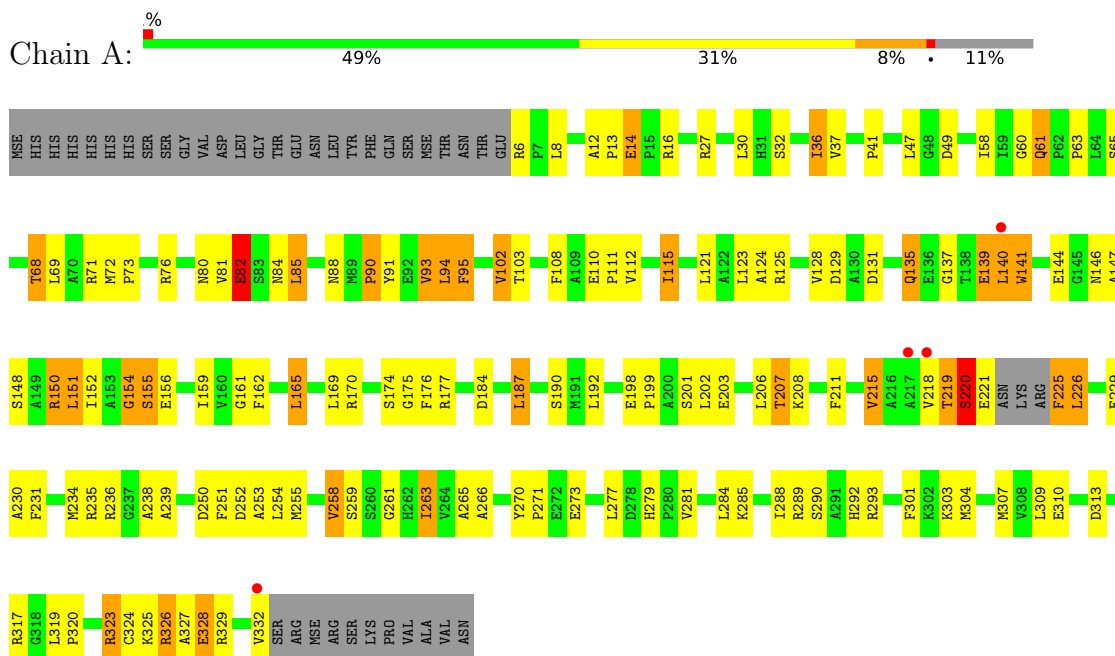
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	29	Total O 29 29	0	0
2	B	36	Total O 36 36	0	0
2	C	37	Total O 37 37	0	0
2	D	54	Total O 54 54	0	0

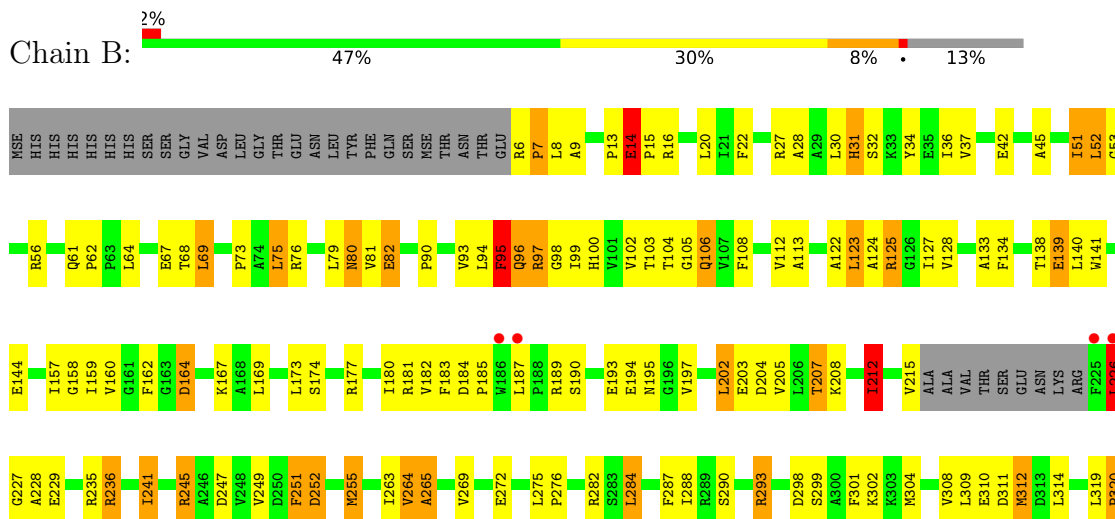
3 Residue-property plots

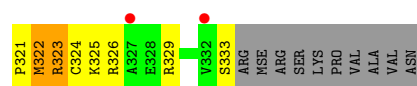
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

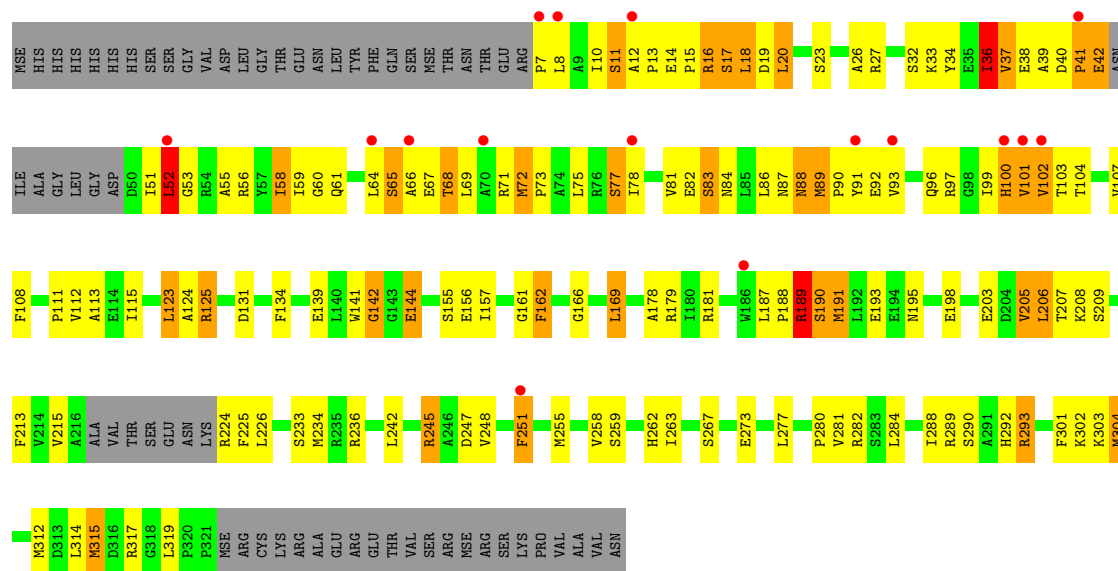
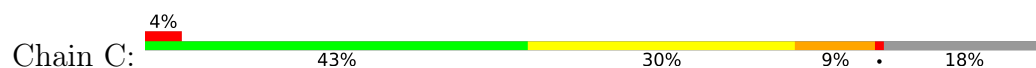


• Molecule 1: phosphoglycerate oxidoreductase

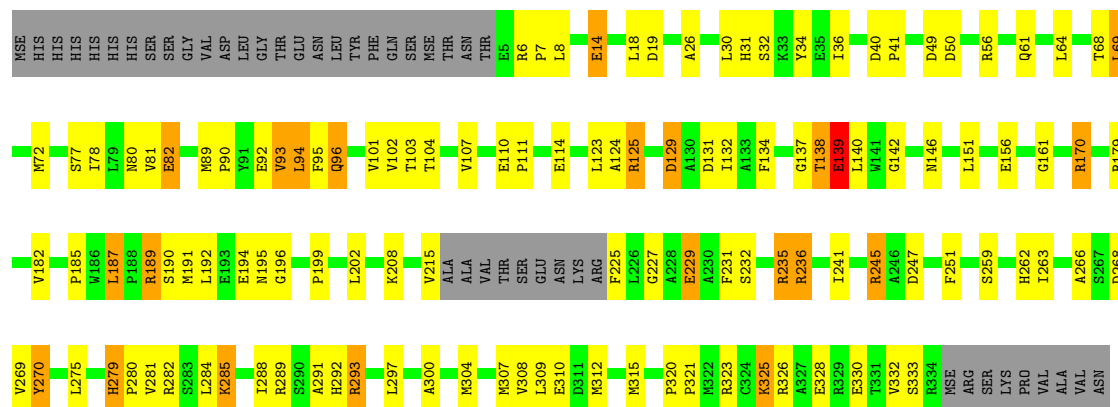




• Molecule 1: phosphoglycerate oxidoreductase



• Molecule 1: phosphoglycerate oxidoreductase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	61.73Å 121.12Å 106.65Å 90.00° 101.40° 90.00°	Depositor
Resolution (Å)	104.55 – 2.80 104.55 – 2.80	Depositor EDS
% Data completeness (in resolution range)	98.9 (104.55-2.80) 98.9 (104.55-2.80)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.97 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.6.0117	Depositor
R, R_{free}	0.204 , 0.291 0.210 , 0.295	Depositor DCC
R_{free} test set	1890 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	50.5	Xtriage
Anisotropy	0.109	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 41.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	9794	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.76% 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](#)

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	0.87	0/2499	1.19	11/3366 (0.3%)
1	B	0.74	0/2466	1.07	9/3320 (0.3%)
1	C	0.81	0/2327	1.13	11/3135 (0.4%)
1	D	1.01	2/2486 (0.1%)	1.22	12/3346 (0.4%)
All	All	0.87	2/9778 (0.0%)	1.16	43/13167 (0.3%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	235	ARG	C-N	12.50	1.49	1.33
1	D	270	TYR	N-CA	5.51	1.50	1.45

All (43) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	236	ARG	O-C-N	-9.54	112.17	122.09
1	A	265	ALA	N-CA-C	7.94	120.79	108.96
1	C	36	ILE	N-CA-C	7.47	118.91	108.23
1	D	138	THR	N-CA-C	7.29	123.02	109.24
1	A	84	ASN	N-CA-C	7.19	120.64	109.07
1	A	32	SER	N-CA-C	-7.11	103.57	111.82
1	A	82	GLU	N-CA-C	-7.08	99.81	110.28
1	D	279	HIS	N-CA-C	6.99	118.17	109.57
1	D	235	ARG	O-C-N	6.96	131.38	122.81
1	A	61	GLN	CA-C-N	-6.85	114.73	119.66
1	A	61	GLN	C-N-CA	-6.85	114.73	119.66
1	B	265	ALA	N-CA-C	6.82	119.12	108.96
1	B	226	LEU	N-CA-C	6.68	119.18	110.43
1	C	18	LEU	N-CA-C	-6.67	105.71	114.31
1	D	268	ASP	N-CA-C	-6.66	105.06	113.72
1	C	59	ILE	CB-CA-C	-6.57	105.87	113.22
1	D	161	GLY	N-CA-C	-6.42	105.10	112.29
1	C	100	HIS	N-CA-C	6.23	119.39	109.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	231	PHE	N-CA-C	6.07	117.89	111.28
1	D	82	GLU	N-CA-C	-5.92	102.15	110.50
1	B	62	PRO	CA-C-N	-5.89	113.87	119.76
1	B	62	PRO	C-N-CA	-5.89	113.87	119.76
1	C	59	ILE	N-CA-C	5.76	112.37	106.21
1	D	26	ALA	N-CA-C	5.73	117.61	111.36
1	A	187	LEU	CA-C-N	5.60	125.61	119.89
1	A	187	LEU	C-N-CA	5.60	125.61	119.89
1	B	263	ILE	N-CA-C	5.57	115.33	108.53
1	B	284	LEU	N-CA-C	5.49	117.67	108.23
1	D	235	ARG	CA-C-N	-5.47	113.16	120.54
1	D	235	ARG	C-N-CA	-5.47	113.16	120.54
1	C	319	LEU	CA-C-N	5.35	125.89	120.38
1	C	319	LEU	C-N-CA	5.35	125.89	120.38
1	D	125	ARG	N-CA-C	5.35	120.99	113.02
1	C	225	PHE	N-CA-C	5.33	117.30	108.13
1	A	27	ARG	CG-CD-NE	-5.30	100.34	112.00
1	C	77	SER	N-CA-C	5.26	117.38	109.23
1	B	8	LEU	N-CA-C	5.16	117.90	109.59
1	C	60	GLY	N-CA-C	5.13	118.62	111.19
1	B	164	ASP	N-CA-C	-5.11	105.89	111.82
1	B	212	ILE	N-CA-C	5.09	115.19	107.75
1	C	102	VAL	N-CA-C	5.03	117.25	108.95
1	A	6	ARG	CA-C-N	5.01	125.00	119.89
1	A	6	ARG	C-N-CA	5.01	125.00	119.89

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	2464	0	2473	125	0
1	B	2431	0	2441	126	0
1	C	2292	0	2299	128	0
1	D	2451	0	2460	112	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	29	0	0	5	0
2	B	36	0	0	6	0
2	C	37	0	0	10	0
2	D	54	0	0	18	0
All	All	9794	0	9673	461	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 24.

All (461) 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:D:208:LYS:HE3	2:D:442:HOH:O	1.29	1.31
1:C:234:MSE:HE1	1:C:263:ILE:HD13	1.28	1.15
1:B:14:GLU:HB3	1:B:15:PRO:HD3	1.21	1.15
1:B:14:GLU:HB3	1:B:15:PRO:CD	1.76	1.13
1:C:68:THR:HA	1:C:71:ARG:HD3	1.31	1.11
1:D:308:VAL:HG12	1:D:312:MSE:CE	1.79	1.11
1:B:125:ARG:HG2	1:B:125:ARG:NH1	1.52	1.10
1:D:308:VAL:HG12	1:D:312:MSE:HE2	1.24	1.09
1:A:14:GLU:HG3	1:A:41:PRO:HG3	1.21	1.07
1:C:64:LEU:HA	1:C:65:SER:CB	1.85	1.06
1:B:125:ARG:HH11	1:B:125:ARG:CG	1.67	1.05
1:D:310:GLU:OE1	1:D:323:ARG:HD2	1.56	1.03
1:C:203:GLU:O	1:C:207:THR:HG22	1.60	1.00
1:C:64:LEU:HA	1:C:65:SER:HB2	1.39	1.00
1:A:238:ALA:HB3	1:A:263:ILE:HG22	1.44	0.97
1:A:16:ARG:HD2	1:A:304:MSE:HE1	1.47	0.96
1:D:308:VAL:CG1	1:D:312:MSE:HE2	1.96	0.96
1:D:14:GLU:HG3	1:D:41:PRO:HG3	1.47	0.95
1:A:124:ALA:HB3	2:A:421:HOH:O	1.67	0.95
1:C:234:MSE:HE3	1:C:263:ILE:HG21	1.50	0.92
1:C:90:PRO:HB2	1:C:93:VAL:HG12	1.52	0.91
1:C:11:SER:H	1:C:37:VAL:HG22	1.33	0.91
1:B:157:ILE:HB	2:B:435:HOH:O	1.68	0.91
1:A:279:HIS:CE1	1:A:281:VAL:HG23	2.08	0.89
1:C:8:LEU:HD22	1:C:55:ALA:HA	1.54	0.89
1:B:13:PRO:HB2	1:B:16:ARG:O	1.72	0.89
1:C:19:ASP:HB3	2:C:414:HOH:O	1.73	0.88
1:C:16:ARG:HG3	1:C:81:VAL:O	1.73	0.88
1:B:299:SER:HA	2:B:413:HOH:O	1.73	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:245:ARG:HB2	2:C:424:HOH:O	1.73	0.88
1:D:107:VAL:HG13	1:D:307:MSE:HE2	1.54	0.87
1:D:6:ARG:HA	2:D:451:HOH:O	1.77	0.85
1:D:139:GLU:OE1	1:D:139:GLU:HA	1.74	0.85
1:D:138:THR:CA	1:D:139:GLU:HB2	2.05	0.85
1:D:279:HIS:HD2	1:D:281:VAL:H	1.22	0.85
1:A:121:LEU:HA	2:A:421:HOH:O	1.76	0.84
1:C:188:PRO:HG2	1:C:191:MSE:HG3	1.60	0.83
1:A:255:MSE:SE	1:A:281:VAL:HG22	2.28	0.83
1:B:159:ILE:HB	1:B:182:VAL:HG22	1.61	0.83
1:D:138:THR:N	1:D:139:GLU:HB2	1.94	0.83
1:B:61:GLN:NE2	1:B:81:VAL:H	1.78	0.82
1:D:138:THR:HA	1:D:139:GLU:HB2	1.63	0.80
1:B:298:ASP:OD2	1:B:302:LYS:HE2	1.82	0.80
1:A:63:PRO:HA	1:A:88:ASN:OD1	1.81	0.80
1:A:90:PRO:HB2	1:A:93:VAL:HG13	1.64	0.79
1:B:245:ARG:HG3	1:B:247:ASP:OD1	1.81	0.79
1:C:20:LEU:HB3	2:C:411:HOH:O	1.82	0.78
1:A:90:PRO:HB2	1:A:93:VAL:CG1	2.15	0.77
1:B:14:GLU:CB	1:B:15:PRO:HD3	2.09	0.76
1:C:141:TRP:O	1:C:142:GLY:O	2.04	0.76
1:D:61:GLN:HE21	1:D:81:VAL:H	1.34	0.76
1:D:61:GLN:NE2	1:D:81:VAL:H	1.83	0.75
1:D:187:LEU:HB3	2:D:452:HOH:O	1.85	0.75
1:B:125:ARG:HG2	1:B:125:ARG:HH11	0.72	0.75
1:B:103:THR:HG22	1:B:105:GLY:H	1.52	0.74
1:A:103:THR:O	1:A:324:CYS:HB3	1.87	0.74
1:A:301:PHE:HD1	1:A:304:MSE:HE2	1.52	0.74
1:D:308:VAL:HG12	1:D:312:MSE:HE1	1.71	0.73
1:B:226:LEU:HG	1:B:227:GLY:N	2.03	0.73
1:B:100:HIS:HD2	1:B:326:ARG:HH21	1.36	0.73
1:C:13:PRO:HB2	1:C:16:ARG:O	1.89	0.72
1:A:125:ARG:O	1:B:293:ARG:NH2	2.22	0.72
1:B:94:LEU:O	1:B:95:PHE:HB2	1.90	0.72
1:D:279:HIS:CD2	1:D:281:VAL:H	2.06	0.72
1:A:139:GLU:HG3	1:A:141:TRP:HE1	1.55	0.72
1:B:100:HIS:CD2	1:B:326:ARG:HH21	2.08	0.71
1:B:22:PHE:HE1	1:B:309:LEU:HD11	1.54	0.71
1:D:279:HIS:CD2	1:D:281:VAL:HG12	2.26	0.71
1:D:245:ARG:HB2	2:D:448:HOH:O	1.90	0.71
1:B:14:GLU:HB2	1:B:61:GLN:OE1	1.91	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:234:MSE:CE	1:C:263:ILE:HG21	2.20	0.71
1:D:61:GLN:HG3	1:D:80:ASN:OD1	1.91	0.71
1:C:125:ARG:O	1:D:293:ARG:NH2	2.24	0.70
1:A:95:PHE:CZ	1:A:328:GLU:HA	2.26	0.70
1:A:165:LEU:HB3	1:A:215:VAL:HG13	1.73	0.70
1:B:123:LEU:HD23	1:B:241:ILE:CD1	2.22	0.69
1:C:73:PRO:HA	1:C:97:ARG:HH22	1.57	0.69
1:C:64:LEU:HA	1:C:65:SER:HB3	1.75	0.69
1:A:279:HIS:ND1	1:A:281:VAL:HG23	2.07	0.69
1:B:139:GLU:OE1	1:B:139:GLU:HA	1.93	0.69
1:C:11:SER:O	1:C:13:PRO:HD3	1.93	0.68
1:C:101:VAL:CG1	1:C:101:VAL:O	2.39	0.68
1:D:179:ARG:HD3	2:D:433:HOH:O	1.92	0.68
1:A:14:GLU:HG3	1:A:41:PRO:CG	2.13	0.68
1:A:71:ARG:O	1:A:73:PRO:HD3	1.94	0.68
1:A:152:ILE:O	1:A:155:SER:CB	2.41	0.68
1:B:96:GLN:HG3	1:C:96:GLN:HG3	1.76	0.67
1:C:73:PRO:HA	1:C:97:ARG:NH2	2.08	0.67
1:C:90:PRO:HB2	1:C:93:VAL:CG1	2.22	0.67
1:A:146:ASN:ND2	1:B:293:ARG:NH1	2.42	0.67
1:C:64:LEU:CA	1:C:65:SER:CB	2.69	0.67
1:A:203:GLU:O	1:A:207:THR:HB	1.95	0.67
1:C:115:ILE:HD12	1:D:125:ARG:HH11	1.59	0.67
1:B:69:LEU:HA	2:B:431:HOH:O	1.95	0.66
1:B:31:HIS:CE1	1:B:36:ILE:HD11	2.30	0.66
1:B:125:ARG:NH1	1:B:125:ARG:CG	2.38	0.66
1:B:255:MSE:HG3	1:B:284:LEU:HD22	1.78	0.66
1:A:273:GLU:HG2	1:B:141:TRP:CZ3	2.30	0.66
1:D:94:LEU:O	1:D:96:GLN:N	2.29	0.66
1:B:69:LEU:HD13	1:B:93:VAL:HG11	1.77	0.65
1:B:183:PHE:HB2	1:B:205:VAL:HG21	1.78	0.65
1:D:307:MSE:HG2	1:D:323:ARG:NE	2.11	0.65
1:D:315:MSE:SE	1:D:321:PRO:HG3	2.47	0.65
1:B:180:ILE:HG21	1:B:197:VAL:HG12	1.79	0.65
1:C:142:GLY:HA3	1:C:144:GLU:H	1.62	0.65
1:A:12:ALA:N	1:A:13:PRO:HD3	2.11	0.65
1:A:16:ARG:NH1	1:A:82:GLU:HA	2.13	0.64
1:C:16:ARG:NH1	1:C:82:GLU:HA	2.12	0.64
1:B:27:ARG:HG3	2:B:425:HOH:O	1.98	0.64
1:B:123:LEU:HD23	1:B:241:ILE:HD13	1.79	0.64
1:A:139:GLU:HG3	1:A:141:TRP:NE1	2.12	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:307:MSE:HG2	1:D:323:ARG:CZ	2.27	0.64
1:D:310:GLU:OE1	1:D:323:ARG:CD	2.38	0.64
1:B:123:LEU:HD13	1:B:288:ILE:HD12	1.78	0.64
1:D:107:VAL:CG1	1:D:307:MSE:HE2	2.28	0.64
1:B:272:GLU:HG2	1:B:276:PRO:HD3	1.79	0.63
1:B:9:ALA:HB3	1:B:36:ILE:HG22	1.79	0.63
1:B:79:LEU:CD2	1:B:308:VAL:HG13	2.28	0.63
1:C:53:GLY:HA2	1:C:73:PRO:HD2	1.80	0.63
1:D:104:THR:OG1	1:D:304:MSE:HG2	1.99	0.63
1:A:206:LEU:HD21	1:A:230:ALA:O	1.99	0.63
1:C:293:ARG:NH2	1:D:125:ARG:O	2.32	0.63
1:D:7:PRO:HD3	2:D:451:HOH:O	1.99	0.63
1:A:258:VAL:HB	1:A:284:LEU:HD21	1.81	0.62
1:C:179:ARG:HD2	2:C:420:HOH:O	1.98	0.62
1:B:75:LEU:O	1:B:99:ILE:HD12	2.00	0.62
1:D:309:LEU:HA	1:D:312:MSE:HE3	1.79	0.62
1:A:273:GLU:OE1	1:A:292:HIS:HD2	1.82	0.62
1:B:64:LEU:O	1:B:90:PRO:HD3	1.98	0.62
1:C:41:PRO:HD2	2:C:407:HOH:O	1.99	0.62
1:C:77:SER:HB3	1:C:315:MSE:SE	2.49	0.62
1:D:50:ASP:HB3	2:D:408:HOH:O	2.00	0.62
1:B:180:ILE:HG23	2:B:435:HOH:O	1.99	0.62
1:B:275:LEU:HD12	1:B:276:PRO:HD2	1.80	0.62
1:A:95:PHE:HZ	1:A:328:GLU:HA	1.61	0.62
1:B:31:HIS:HA	1:B:34:TYR:O	1.99	0.61
1:C:161:GLY:HA3	1:C:215:VAL:O	1.99	0.61
1:B:61:GLN:HE21	1:B:81:VAL:H	1.44	0.61
1:D:320:PRO:HD2	2:D:405:HOH:O	2.00	0.61
1:A:307:MSE:HE2	1:A:324:CYS:SG	2.40	0.61
1:D:30:LEU:HG	1:D:36:ILE:HD11	1.83	0.61
1:D:61:GLN:NE2	1:D:82:GLU:H	1.98	0.61
1:C:19:ASP:O	1:C:27:ARG:NH2	2.34	0.61
1:C:53:GLY:HA2	1:C:73:PRO:CD	2.31	0.61
1:B:106:GLN:HB2	1:B:164:ASP:OD2	2.00	0.60
1:A:310:GLU:OE2	1:D:190:SER:HB3	2.01	0.60
1:C:123:LEU:HD13	1:C:288:ILE:HD12	1.83	0.60
1:A:102:VAL:HG22	1:A:324:CYS:HB2	1.83	0.60
1:B:6:ARG:CB	1:B:7:PRO:HD3	2.31	0.60
1:A:301:PHE:CD1	1:A:304:MSE:HE2	2.35	0.60
1:B:203:GLU:O	1:B:207:THR:OG1	2.20	0.60
1:D:93:VAL:C	1:D:94:LEU:O	2.44	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:107:VAL:HG13	1:D:307:MSE:CE	2.29	0.60
1:D:229:GLU:HG3	2:D:424:HOH:O	2.02	0.59
1:A:266:ALA:HB2	1:A:288:ILE:HB	1.84	0.59
1:B:314:LEU:HD23	1:B:321:PRO:HA	1.85	0.59
1:C:40:ASP:HA	2:C:407:HOH:O	2.03	0.58
1:D:61:GLN:HE21	1:D:81:VAL:N	2.00	0.58
1:A:69:LEU:HA	1:A:72:MSE:HE3	1.84	0.58
1:B:56:ARG:HA	1:B:75:LEU:HA	1.84	0.58
1:D:125:ARG:NE	2:D:415:HOH:O	2.37	0.58
1:C:104:THR:HB	1:C:304:MSE:HG2	1.86	0.58
1:C:134:PHE:CD1	1:D:289:ARG:HD3	2.39	0.58
1:D:137:GLY:C	1:D:139:GLU:HB2	2.28	0.57
1:D:6:ARG:NH1	1:D:31:HIS:O	2.37	0.57
1:A:12:ALA:N	1:A:13:PRO:CD	2.68	0.57
1:B:6:ARG:HB3	1:B:7:PRO:HD3	1.87	0.56
1:C:52:LEU:O	1:C:72:MSE:HA	2.05	0.56
1:D:225:PHE:N	2:D:402:HOH:O	2.38	0.56
1:D:284:LEU:O	1:D:289:ARG:NH2	2.38	0.56
1:C:71:ARG:NH1	2:C:417:HOH:O	2.37	0.56
1:C:155:SER:O	1:C:156:GLU:HB2	2.04	0.56
1:B:158:GLY:HA2	1:B:181:ARG:O	2.06	0.56
1:B:90:PRO:HB2	1:B:93:VAL:HG12	1.88	0.56
1:C:20:LEU:HA	1:C:302:LYS:HZ1	1.71	0.56
1:B:180:ILE:CG2	1:B:197:VAL:HG12	2.36	0.55
1:C:255:MSE:O	1:C:259:SER:HB2	2.06	0.55
1:B:69:LEU:HD13	1:B:93:VAL:CG1	2.36	0.55
1:A:80:ASN:HB3	1:A:103:THR:HG22	1.88	0.55
1:A:323:ARG:HD2	1:A:323:ARG:O	2.06	0.55
1:B:139:GLU:HG3	1:B:141:TRP:HE1	1.71	0.55
1:C:179:ARG:HD3	1:C:181:ARG:NH1	2.21	0.55
1:C:188:PRO:O	1:C:189:ARG:C	2.49	0.55
1:A:211:PHE:CD1	1:A:239:ALA:HB3	2.41	0.55
1:C:11:SER:C	1:C:13:PRO:HD3	2.31	0.55
1:B:45:ALA:HA	1:B:68:THR:HG23	1.88	0.55
1:B:139:GLU:O	1:B:140:LEU:HB2	2.07	0.55
1:D:266:ALA:HA	1:D:288:ILE:O	2.07	0.55
1:B:310:GLU:OE1	1:B:323:ARG:HD3	2.07	0.55
1:C:101:VAL:O	1:C:101:VAL:HG13	2.05	0.54
1:B:123:LEU:HG	1:B:264:VAL:HG13	1.88	0.54
1:B:103:THR:HB	1:B:325:LYS:HB3	1.88	0.54
1:C:289:ARG:NH1	1:D:131:ASP:OD1	2.38	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:207:THR:HG23	1:C:208:LYS:HG3	1.89	0.54
1:A:218:VAL:N	1:A:219:THR:HA	2.22	0.54
1:A:139:GLU:HB3	1:A:141:TRP:CD1	2.43	0.54
1:A:254:LEU:O	1:A:258:VAL:HG23	2.08	0.54
1:B:311:ASP:OD1	1:B:321:PRO:HB2	2.08	0.54
1:D:30:LEU:HG	1:D:36:ILE:CD1	2.38	0.54
1:D:170:ARG:NH1	1:D:196:GLY:HA3	2.23	0.54
1:A:313:ASP:OD2	1:A:317:ARG:NH1	2.40	0.53
1:C:71:ARG:O	1:C:73:PRO:HD3	2.08	0.53
1:C:113:ALA:HA	1:C:169:LEU:HD12	1.90	0.53
1:D:189:ARG:HD3	2:D:420:HOH:O	2.07	0.53
1:D:80:ASN:ND2	1:D:82:GLU:O	2.41	0.53
1:A:131:ASP:O	1:A:135:GLN:HB2	2.09	0.53
1:A:139:GLU:CB	1:A:141:TRP:CD1	2.92	0.53
1:A:156:GLU:HG3	1:A:235:ARG:HH12	1.73	0.53
1:B:108:PHE:O	1:B:112:VAL:HG23	2.09	0.52
1:C:7:PRO:HB3	1:C:56:ARG:HH12	1.75	0.52
1:A:154:GLY:CA	1:A:155:SER:HB2	2.39	0.52
1:D:192:LEU:HD12	1:D:199:PRO:HB3	1.90	0.52
1:B:104:THR:HG22	1:B:324:CYS:SG	2.50	0.52
1:D:77:SER:HB2	1:D:315:MSE:HE1	1.92	0.52
1:A:30:LEU:HG	1:A:36:ILE:HD13	1.92	0.52
1:A:220:SER:O	1:A:221:GLU:O	2.27	0.52
1:C:100:HIS:HD2	1:C:315:MSE:HE1	1.75	0.52
1:C:142:GLY:HA3	1:C:144:GLU:N	2.23	0.52
1:C:142:GLY:HA3	2:C:413:HOH:O	2.08	0.51
1:B:53:GLY:O	1:B:73:PRO:HD2	2.08	0.51
1:C:107:VAL:HG12	1:C:303:LYS:HG2	1.93	0.51
1:B:252:ASP:N	1:B:252:ASP:OD1	2.43	0.51
1:C:40:ASP:C	1:C:42:GLU:H	2.17	0.51
1:D:104:THR:HG23	1:D:304:MSE:HE2	1.92	0.51
1:B:123:LEU:HG	1:B:264:VAL:CG1	2.41	0.51
1:A:30:LEU:HG	1:A:36:ILE:CD1	2.40	0.51
1:A:152:ILE:O	1:A:155:SER:HB2	2.10	0.51
1:C:124:ALA:C	1:C:125:ARG:HG2	2.35	0.51
1:C:205:VAL:O	1:C:206:LEU:C	2.53	0.51
1:A:238:ALA:HB3	1:A:263:ILE:CG2	2.30	0.51
1:A:80:ASN:ND2	1:A:82:GLU:O	2.44	0.51
1:C:82:GLU:O	1:C:84:ASN:N	2.44	0.50
1:D:138:THR:HA	1:D:139:GLU:CB	2.40	0.50
1:D:61:GLN:N	1:D:61:GLN:CD	2.69	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:183:PHE:CE2	1:B:202:LEU:HB2	2.46	0.50
1:B:298:ASP:O	1:B:302:LYS:HG2	2.11	0.50
1:C:87:ASN:HB3	1:C:88:ASN:OD1	2.11	0.50
1:D:110:GLU:HB3	1:D:111:PRO:CD	2.41	0.50
1:A:220:SER:O	1:A:221:GLU:C	2.54	0.50
1:A:91:TYR:O	1:A:94:LEU:O	2.30	0.50
1:A:319:LEU:HB3	1:A:320:PRO:HD2	1.94	0.50
1:B:122:ALA:HA	1:B:127:ILE:HD12	1.93	0.50
1:B:162:PHE:CE2	1:B:195:ASN:ND2	2.80	0.50
1:C:23:SER:N	1:C:26:ALA:HB3	2.27	0.50
1:B:102:VAL:HA	1:B:325:LYS:O	2.12	0.49
1:B:79:LEU:HD22	1:B:308:VAL:HG13	1.94	0.49
1:C:191:MSE:O	1:C:195:ASN:HB2	2.12	0.49
1:A:60:GLY:HA2	1:A:61:GLN:NE2	2.27	0.49
1:C:61:GLN:HB3	1:C:86:LEU:HB2	1.94	0.49
1:C:169:LEU:HD21	1:C:213:PHE:CD1	2.48	0.49
1:C:125:ARG:NH2	1:D:111:PRO:O	2.45	0.49
1:D:68:THR:HG22	1:D:72:MSE:HE2	1.93	0.49
1:A:61:GLN:NE2	1:A:81:VAL:HG22	2.28	0.49
1:A:102:VAL:CG2	1:A:324:CYS:HB2	2.41	0.49
1:B:113:ALA:HA	1:B:169:LEU:HD13	1.94	0.49
1:C:40:ASP:O	1:C:42:GLU:N	2.46	0.49
1:C:51:ILE:O	1:C:52:LEU:C	2.56	0.49
1:A:317:ARG:NH2	1:D:185:PRO:O	2.45	0.49
1:C:139:GLU:O	1:C:139:GLU:HG2	2.13	0.49
1:A:110:GLU:HB3	1:A:111:PRO:HD3	1.95	0.49
1:A:192:LEU:HD12	1:A:199:PRO:HB3	1.93	0.49
1:A:250:ASP:HB3	1:A:253:ALA:HB3	1.95	0.49
1:B:79:LEU:HD23	1:B:308:VAL:HG13	1.95	0.49
1:C:293:ARG:HB2	1:D:146:ASN:OD1	2.12	0.49
1:A:202:LEU:O	1:A:206:LEU:HB2	2.13	0.49
1:B:322:MSE:HE3	1:C:187:LEU:HG	1.94	0.49
1:B:28:ALA:O	1:B:32:SER:HB2	2.12	0.48
1:D:285:LYS:H	1:D:285:LYS:HD2	1.78	0.48
1:A:102:VAL:HA	1:A:325:LYS:O	2.13	0.48
1:A:146:ASN:HD21	1:B:293:ARG:NH1	2.10	0.48
1:A:270:TYR:HB3	1:A:271:PRO:HD2	1.96	0.48
1:A:293:ARG:NH2	1:B:125:ARG:O	2.46	0.48
1:A:152:ILE:O	1:A:155:SER:HB3	2.13	0.48
1:D:170:ARG:HH11	1:D:196:GLY:HA3	1.79	0.48
1:A:251:PHE:CD1	1:A:271:PRO:HD3	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:80:ASN:ND2	1:B:82:GLU:O	2.44	0.48
1:B:265:ALA:O	1:B:287:PHE:HA	2.13	0.48
1:C:20:LEU:HA	1:C:302:LYS:NZ	2.28	0.48
1:C:142:GLY:CA	2:C:413:HOH:O	2.61	0.48
1:C:234:MSE:CE	1:C:263:ILE:HD13	2.20	0.48
1:B:7:PRO:HB3	1:B:56:ARG:HH21	1.78	0.48
1:C:195:ASN:OD1	1:C:195:ASN:O	2.32	0.48
1:A:259:SER:C	1:A:261:GLY:N	2.70	0.48
1:A:323:ARG:HD3	1:A:323:ARG:HA	1.61	0.48
1:C:58:ILE:O	1:C:58:ILE:HG23	2.14	0.47
1:D:64:LEU:HD22	1:D:72:MSE:HE1	1.96	0.47
1:A:68:THR:HB	2:A:407:HOH:O	2.14	0.47
1:A:151:LEU:HD12	1:A:151:LEU:H	1.78	0.47
1:C:36:ILE:N	1:C:36:ILE:HD12	2.29	0.47
1:B:255:MSE:HG3	1:B:284:LEU:CD2	2.43	0.47
1:C:55:ALA:O	1:C:75:LEU:HA	2.15	0.47
1:C:245:ARG:HB3	1:C:247:ASP:OD1	2.15	0.47
1:A:128:VAL:HG22	1:B:128:VAL:HG22	1.96	0.47
1:A:140:LEU:HD12	1:A:144:GLU:HB3	1.96	0.47
1:A:219:THR:HG22	1:A:220:SER:H	1.80	0.47
1:B:61:GLN:HE22	1:B:81:VAL:HG22	1.78	0.47
1:B:96:GLN:C	1:B:98:GLY:N	2.73	0.47
1:B:97:ARG:HB3	1:B:99:ILE:HG12	1.97	0.47
1:C:69:LEU:HD13	1:C:90:PRO:CG	2.45	0.47
1:D:279:HIS:HD2	1:D:281:VAL:HG12	1.77	0.47
1:A:289:ARG:HD2	1:B:134:PHE:CD2	2.50	0.47
1:C:190:SER:HA	1:C:193:GLU:OE2	2.15	0.47
1:B:51:ILE:O	1:B:52:LEU:C	2.58	0.47
1:B:104:THR:OG1	1:B:304:MSE:HG2	2.14	0.47
1:A:8:LEU:HD23	1:A:8:LEU:C	2.41	0.46
1:A:112:VAL:HB	1:A:165:LEU:HD21	1.97	0.46
1:A:154:GLY:HA3	1:A:155:SER:HB2	1.96	0.46
1:A:159:ILE:HG22	1:A:161:GLY:O	2.15	0.46
1:C:75:LEU:HD23	1:C:99:ILE:HD13	1.96	0.46
1:A:207:THR:HG22	1:A:208:LYS:HG2	1.96	0.46
1:A:328:GLU:OE1	1:A:328:GLU:N	2.48	0.46
1:D:34:TYR:HB2	1:D:36:ILE:HD11	1.97	0.46
1:A:65:SER:OG	1:A:68:THR:HG22	2.15	0.46
1:B:22:PHE:CE1	1:B:309:LEU:HD11	2.44	0.46
1:C:8:LEU:HD22	1:C:55:ALA:CA	2.37	0.46
1:C:157:ILE:HD12	1:C:178:ALA:CB	2.46	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:8:LEU:C	1:D:8:LEU:HD23	2.40	0.46
1:A:139:GLU:O	1:A:140:LEU:HB2	2.16	0.46
1:A:115:ILE:HD12	1:B:125:ARG:HB3	1.98	0.46
1:A:225:PHE:N	1:A:225:PHE:CD2	2.84	0.46
1:C:64:LEU:CA	1:C:65:SER:HB3	2.42	0.46
1:C:69:LEU:HD13	1:C:90:PRO:HG3	1.98	0.46
1:A:139:GLU:HG3	1:A:141:TRP:CD1	2.51	0.46
1:B:94:LEU:O	1:B:95:PHE:CB	2.61	0.46
1:C:67:GLU:OE1	1:C:67:GLU:HA	2.15	0.46
1:C:215:VAL:O	1:C:215:VAL:HG23	2.15	0.46
1:A:323:ARG:NH2	1:D:194:GLU:OE2	2.49	0.46
1:C:282:ARG:HD3	1:D:134:PHE:O	2.16	0.46
1:C:315:MSE:C	1:C:317:ARG:H	2.24	0.46
1:B:311:ASP:OD2	1:B:323:ARG:HB3	2.16	0.45
1:D:187:LEU:CB	2:D:452:HOH:O	2.55	0.45
1:B:314:LEU:HD21	1:B:322:MSE:HG2	1.99	0.45
1:D:14:GLU:H	1:D:14:GLU:HG2	1.33	0.45
1:D:330:GLU:OE2	1:D:330:GLU:N	2.42	0.45
1:C:101:VAL:O	1:C:101:VAL:HG12	2.15	0.45
1:B:7:PRO:CB	1:B:56:ARG:NH2	2.79	0.45
1:B:79:LEU:HA	1:B:102:VAL:HG22	1.97	0.45
1:C:82:GLU:O	1:C:83:SER:C	2.59	0.45
1:A:63:PRO:CA	1:A:88:ASN:OD1	2.57	0.45
1:A:170:ARG:NH1	1:A:174:SER:HB3	2.32	0.45
1:C:17:SER:OG	1:C:18:LEU:N	2.48	0.45
1:C:61:GLN:HA	2:C:408:HOH:O	2.17	0.45
1:C:87:ASN:HA	1:C:88:ASN:HA	1.80	0.45
1:B:235:ARG:O	1:B:236:ARG:C	2.59	0.45
1:B:311:ASP:CG	1:B:323:ARG:HB3	2.42	0.45
1:A:68:THR:HA	2:A:407:HOH:O	2.17	0.45
1:A:326:ARG:HH22	1:D:328:GLU:CD	2.24	0.45
1:C:61:GLN:N	1:C:61:GLN:OE1	2.50	0.45
1:A:16:ARG:HD2	1:A:304:MSE:CE	2.35	0.45
1:D:187:LEU:HG	2:D:452:HOH:O	2.16	0.45
1:D:279:HIS:HA	1:D:280:PRO:HD3	1.92	0.45
1:B:100:HIS:HD2	1:B:326:ARG:NH2	2.07	0.45
1:D:64:LEU:O	1:D:90:PRO:HD3	2.15	0.45
1:D:111:PRO:HB3	1:D:297:LEU:HD22	1.99	0.45
1:B:30:LEU:O	1:B:34:TYR:N	2.46	0.44
1:C:11:SER:OG	1:C:18:LEU:HD11	2.18	0.44
1:C:89:MSE:O	1:C:91:TYR:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:308:VAL:O	1:D:312:MSE:HE2	2.17	0.44
1:C:207:THR:HG23	1:C:208:LYS:CG	2.47	0.44
1:D:14:GLU:HG3	1:D:41:PRO:CG	2.32	0.44
1:D:69:LEU:HD22	1:D:90:PRO:HG2	1.98	0.44
1:A:115:ILE:CD1	1:B:125:ARG:HB3	2.48	0.44
1:A:137:GLY:HA2	1:B:282:ARG:HH12	1.83	0.44
1:D:291:ALA:O	1:D:292:HIS:C	2.60	0.44
1:B:112:VAL:O	1:B:113:ALA:C	2.61	0.44
1:D:187:LEU:CG	2:D:452:HOH:O	2.66	0.44
1:A:219:THR:CG2	1:A:220:SER:H	2.30	0.44
1:B:96:GLN:C	1:B:98:GLY:H	2.25	0.44
1:B:162:PHE:HE2	1:B:195:ASN:ND2	2.15	0.44
1:C:23:SER:H	1:C:26:ALA:HB3	1.83	0.44
1:C:131:ASP:OD1	1:D:289:ARG:NH1	2.46	0.44
1:D:81:VAL:HA	1:D:104:THR:HG21	1.98	0.44
1:B:104:THR:CB	1:B:304:MSE:HG2	2.48	0.44
1:A:323:ARG:HH22	1:D:194:GLU:CD	2.26	0.43
1:B:184:ASP:HA	1:B:185:PRO:HD2	1.79	0.43
1:C:236:ARG:O	1:C:262:HIS:O	2.36	0.43
1:D:110:GLU:O	1:D:114:GLU:HG3	2.17	0.43
1:A:71:ARG:C	1:A:73:PRO:HD3	2.42	0.43
1:B:20:LEU:HD11	1:B:301:PHE:CD2	2.53	0.43
1:B:22:PHE:HE1	1:B:309:LEU:CD1	2.25	0.43
1:B:314:LEU:O	1:B:319:LEU:HB2	2.18	0.43
1:A:61:GLN:HG3	1:A:80:ASN:OD1	2.18	0.43
1:A:65:SER:OG	1:A:68:THR:CG2	2.66	0.43
1:A:123:LEU:HG	1:A:288:ILE:HD12	2.00	0.43
1:B:204:ASP:OD1	1:B:208:LYS:NZ	2.52	0.43
1:C:71:ARG:C	1:C:73:PRO:HD3	2.42	0.43
1:A:175:GLY:HA2	1:A:177:ARG:NH1	2.33	0.43
1:C:301:PHE:O	1:C:304:MSE:HB2	2.19	0.43
1:C:162:PHE:HA	1:C:166:GLY:HA3	2.01	0.43
1:D:102:VAL:HA	1:D:325:LYS:O	2.19	0.43
1:A:229:GLU:HG2	2:A:409:HOH:O	2.18	0.43
1:A:307:MSE:HG2	1:A:323:ARG:HG3	2.00	0.43
1:B:160:VAL:O	1:B:215:VAL:HG22	2.17	0.43
1:C:108:PHE:C	1:C:111:PRO:HD2	2.43	0.43
1:C:134:PHE:HD1	1:D:289:ARG:HD3	1.81	0.43
1:D:236:ARG:O	1:D:262:HIS:O	2.37	0.43
1:A:146:ASN:ND2	1:B:293:ARG:HH12	2.17	0.43
1:D:77:SER:OG	1:D:78:ILE:N	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:173:LEU:O	1:B:174:SER:C	2.61	0.43
1:D:227:GLY:HA3	2:D:441:HOH:O	2.19	0.43
1:A:85:LEU:HD21	1:A:327:ALA:CB	2.49	0.42
1:A:225:PHE:O	1:A:226:LEU:C	2.62	0.42
1:D:279:HIS:CD2	1:D:280:PRO:HD2	2.53	0.42
1:A:310:GLU:HG2	2:D:418:HOH:O	2.19	0.42
1:B:183:PHE:CB	1:B:205:VAL:HG21	2.47	0.42
1:C:14:GLU:HA	1:C:15:PRO:C	2.44	0.42
1:D:80:ASN:HB3	1:D:102:VAL:O	2.19	0.42
1:A:176:PHE:O	1:A:177:ARG:C	2.62	0.42
1:B:309:LEU:HA	1:B:312:MSE:HE2	2.00	0.42
1:D:269:VAL:C	1:D:270:TYR:CD2	2.97	0.42
1:A:68:THR:O	1:A:71:ARG:HB2	2.19	0.42
1:A:184:ASP:OD2	1:A:187:LEU:HB2	2.20	0.42
1:C:242:LEU:HB3	1:C:267:SER:HB2	2.02	0.42
1:C:255:MSE:HE3	1:C:284:LEU:HD22	2.00	0.42
1:D:129:ASP:OD2	1:D:129:ASP:N	2.48	0.42
1:C:104:THR:CB	1:C:304:MSE:HG2	2.50	0.42
1:B:95:PHE:HZ	1:B:329:ARG:HH12	1.68	0.42
1:C:312:MSE:C	1:C:314:LEU:N	2.77	0.42
1:D:156:GLU:CD	1:D:235:ARG:HH22	2.28	0.42
1:A:307:MSE:CE	1:A:324:CYS:HA	2.50	0.42
1:B:56:ARG:NH1	1:B:76:ARG:HH21	2.17	0.42
1:B:100:HIS:CE1	2:B:427:HOH:O	2.72	0.42
1:D:297:LEU:O	1:D:300:ALA:HB3	2.20	0.42
1:A:146:ASN:O	1:A:147:ALA:C	2.63	0.41
1:B:133:ALA:HB1	1:B:138:THR:HB	2.02	0.41
1:A:198:GLU:HA	1:A:199:PRO:HD2	1.84	0.41
1:A:279:HIS:CE1	1:A:281:VAL:CG2	2.91	0.41
1:B:124:ALA:O	1:B:125:ARG:HG3	2.20	0.41
1:C:40:ASP:C	1:C:42:GLU:N	2.78	0.41
1:C:75:LEU:HD23	1:C:99:ILE:HG21	2.02	0.41
1:C:226:LEU:HB2	1:C:248:VAL:O	2.20	0.41
1:C:255:MSE:HE1	1:C:280:PRO:HB2	2.02	0.41
1:A:102:VAL:HG13	1:A:324:CYS:HB2	2.03	0.41
1:A:49:ASP:OD2	1:A:71:ARG:NH1	2.42	0.41
1:D:308:VAL:C	1:D:312:MSE:HE2	2.44	0.41
1:A:14:GLU:CG	1:A:41:PRO:HG3	2.15	0.41
1:A:146:ASN:HD22	1:B:293:ARG:HH12	1.68	0.41
1:C:141:TRP:O	1:C:142:GLY:C	2.60	0.41
1:A:150:ARG:NH2	1:A:155:SER:HA	2.36	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:212:ILE:HD12	1:B:212:ILE:C	2.46	0.41
1:C:17:SER:OG	1:C:19:ASP:N	2.53	0.41
1:D:34:TYR:HB2	1:D:36:ILE:CD1	2.50	0.41
1:D:61:GLN:NE2	1:D:81:VAL:N	2.59	0.41
1:D:69:LEU:HA	1:D:72:MSE:HE3	2.03	0.41
1:D:123:LEU:O	1:D:124:ALA:C	2.64	0.41
1:D:308:VAL:O	1:D:312:MSE:CE	2.69	0.41
1:C:7:PRO:HB2	1:C:34:TYR:HA	2.03	0.41
1:D:137:GLY:C	1:D:138:THR:HG23	2.46	0.41
1:B:319:LEU:HA	1:B:320:PRO:HD2	1.74	0.40
1:C:139:GLU:CD	1:D:282:ARG:HH12	2.29	0.40
1:D:18:LEU:O	1:D:19:ASP:C	2.64	0.40
1:B:251:PHE:O	1:B:255:MSE:HE3	2.21	0.40
1:C:87:ASN:HB3	1:C:88:ASN:CG	2.46	0.40
1:C:258:VAL:HA	1:C:263:ILE:O	2.21	0.40
1:A:108:PHE:O	1:A:112:VAL:HG23	2.21	0.40
1:D:192:LEU:HG	2:D:452:HOH:O	2.20	0.40
1:A:231:PHE:O	1:A:234:MSE:HB2	2.21	0.40
1:C:61:GLN:NE2	1:C:81:VAL:HG23	2.36	0.40
1:C:10:ILE:HG23	1:C:37:VAL:HG21	2.03	0.40
1:C:108:PHE:O	1:C:112:VAL:HG23	2.22	0.40
1:D:64:LEU:HB2	1:D:89:MSE:HG2	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	320/365 (88%)	279 (87%)	31 (10%)	10 (3%)	3	12
1	B	315/365 (86%)	264 (84%)	41 (13%)	10 (3%)	3	11
1	C	295/365 (81%)	239 (81%)	40 (14%)	16 (5%)	1	4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	317/365 (87%)	293 (92%)	18 (6%)	6 (2%)	6	22
All	All	1247/1460 (85%)	1075 (86%)	130 (10%)	42 (3%)	3	11

All (42) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	14	GLU
1	B	75	LEU
1	B	95	PHE
1	B	236	ARG
1	C	65	SER
1	C	83	SER
1	C	142	GLY
1	D	139	GLU
1	A	95	PHE
1	A	139	GLU
1	A	154	GLY
1	A	162	PHE
1	A	220	SER
1	A	226	LEU
1	B	189	ARG
1	B	323	ARG
1	C	33	LYS
1	C	52	LEU
1	C	66	ALA
1	C	162	PHE
1	C	189	ARG
1	C	205	VAL
1	C	245	ARG
1	D	94	LEU
1	D	95	PHE
1	D	245	ARG
1	A	155	SER
1	B	228	ALA
1	C	39	ALA
1	D	247	ASP
1	A	236	ARG
1	C	41	PRO
1	C	58	ILE
1	C	206	LEU
1	C	251	PHE
1	D	142	GLY

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Mol	Chain	Res	Type
1	A	140	LEU
1	B	7	PRO
1	B	51	ILE
1	A	90	PRO
1	B	320	PRO
1	C	12	ALA

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	256/281 (91%)	215 (84%)	41 (16%)	2	9
1	B	253/281 (90%)	212 (84%)	41 (16%)	2	8
1	C	238/281 (85%)	199 (84%)	39 (16%)	2	8
1	D	255/281 (91%)	218 (86%)	37 (14%)	3	11
All	All	1002/1124 (89%)	844 (84%)	158 (16%)	2	9

All (158) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	GLU
1	A	36	ILE
1	A	37	VAL
1	A	47	LEU
1	A	58	ILE
1	A	68	THR
1	A	76	ARG
1	A	82	GLU
1	A	85	LEU
1	A	93	VAL
1	A	94	LEU
1	A	102	VAL
1	A	115	ILE
1	A	129	ASP
1	A	135	GLN

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Mol	Chain	Res	Type
1	A	141	TRP
1	A	148	SER
1	A	150	ARG
1	A	151	LEU
1	A	165	LEU
1	A	169	LEU
1	A	190	SER
1	A	201	SER
1	A	207	THR
1	A	215	VAL
1	A	219	THR
1	A	220	SER
1	A	225	PHE
1	A	252	ASP
1	A	258	VAL
1	A	263	ILE
1	A	277	LEU
1	A	285	LYS
1	A	290	SER
1	A	303	LYS
1	A	309	LEU
1	A	323	ARG
1	A	326	ARG
1	A	328	GLU
1	A	329	ARG
1	A	332	VAL
1	B	14	GLU
1	B	31	HIS
1	B	37	VAL
1	B	42	GLU
1	B	52	LEU
1	B	67	GLU
1	B	69	LEU
1	B	80	ASN
1	B	82	GLU
1	B	95	PHE
1	B	96	GLN
1	B	97	ARG
1	B	106	GLN
1	B	123	LEU
1	B	125	ARG
1	B	139	GLU

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Mol	Chain	Res	Type
1	B	144	GLU
1	B	167	LYS
1	B	177	ARG
1	B	187	LEU
1	B	190	SER
1	B	193	GLU
1	B	194	GLU
1	B	202	LEU
1	B	207	THR
1	B	212	ILE
1	B	226	LEU
1	B	229	GLU
1	B	241	ILE
1	B	245	ARG
1	B	249	VAL
1	B	251	PHE
1	B	252	ASP
1	B	255	MSE
1	B	264	VAL
1	B	269	VAL
1	B	290	SER
1	B	293	ARG
1	B	312	MSE
1	B	322	MSE
1	B	333	SER
1	C	11	SER
1	C	16	ARG
1	C	17	SER
1	C	20	LEU
1	C	32	SER
1	C	36	ILE
1	C	37	VAL
1	C	38	GLU
1	C	42	GLU
1	C	52	LEU
1	C	68	THR
1	C	72	MSE
1	C	78	ILE
1	C	88	ASN
1	C	89	MSE
1	C	92	GLU
1	C	101	VAL

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Mol	Chain	Res	Type
1	C	102	VAL
1	C	103	THR
1	C	123	LEU
1	C	125	ARG
1	C	144	GLU
1	C	169	LEU
1	C	189	ARG
1	C	190	SER
1	C	191	MSE
1	C	198	GLU
1	C	209	SER
1	C	224	ARG
1	C	233	SER
1	C	251	PHE
1	C	273	GLU
1	C	277	LEU
1	C	281	VAL
1	C	290	SER
1	C	292	HIS
1	C	293	ARG
1	C	304	MSE
1	C	315	MSE
1	D	14	GLU
1	D	32	SER
1	D	40	ASP
1	D	49	ASP
1	D	56	ARG
1	D	69	LEU
1	D	92	GLU
1	D	93	VAL
1	D	96	GLN
1	D	101	VAL
1	D	103	THR
1	D	129	ASP
1	D	132	ILE
1	D	139	GLU
1	D	140	LEU
1	D	151	LEU
1	D	170	ARG
1	D	182	VAL
1	D	187	LEU
1	D	189	ARG

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Mol	Chain	Res	Type
1	D	191	MSE
1	D	195	ASN
1	D	202	LEU
1	D	215	VAL
1	D	229	GLU
1	D	232	SER
1	D	241	ILE
1	D	251	PHE
1	D	259	SER
1	D	263	ILE
1	D	275	LEU
1	D	285	LYS
1	D	293	ARG
1	D	325	LYS
1	D	326	ARG
1	D	332	VAL
1	D	333	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	61	GLN
1	A	80	ASN
1	A	84	ASN
1	A	146	ASN
1	A	292	HIS
1	B	61	GLN
1	B	84	ASN
1	B	100	HIS
1	B	195	ASN
1	B	262	HIS
1	C	31	HIS
1	C	80	ASN
1	C	87	ASN
1	C	100	HIS
1	C	106	GLN
1	C	135	GLN
1	C	195	ASN
1	C	292	HIS
1	D	43	ASN
1	D	61	GLN
1	D	96	GLN

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Mol	Chain	Res	Type
1	D	279	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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	314/365 (86%)	-0.27	4 (1%) 75 66	15, 43, 71, 90	0
1	B	309/365 (84%)	0.21	6 (1%) 66 57	32, 64, 91, 113	0
1	C	292/365 (80%)	0.14	16 (5%) 30 23	23, 60, 109, 142	0
1	D	311/365 (85%)	-0.51	0 100 100	14, 32, 58, 74	0
All	All	1226/1460 (83%)	-0.11	26 (2%) 63 54	14, 49, 93, 142	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	102	VAL	4.9
1	C	64	LEU	3.4
1	A	217	ALA	3.3
1	C	66	ALA	3.3
1	A	332	VAL	3.3
1	B	225	PHE	3.2
1	C	91	TYR	3.1
1	C	101	VAL	3.1
1	C	186	TRP	3.0
1	C	251	PHE	2.8
1	B	226	LEU	2.6
1	C	100	HIS	2.4
1	B	327	ALA	2.4
1	C	52	LEU	2.4
1	C	78	ILE	2.4
1	C	7	PRO	2.3
1	A	218	VAL	2.3
1	B	187	LEU	2.3
1	C	93	VAL	2.2
1	B	332	VAL	2.2
1	C	12	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	41	PRO	2.1
1	C	8	LEU	2.1
1	B	186	TRP	2.1
1	C	70	ALA	2.1
1	A	140	LEU	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](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.