



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 10:27 AM UTC

PDB ID : 3D9W / pdb_00003d9w
Title : Crystal Structure Analysis of Nocardia farcinica Arylamine N-acetyltransferase
Authors : Li de la Sierra-Gallay, I.; Pluvinaige, B.; Rodrigues-Lima, F.; Martins, M.; Dupret, J.M.
Deposited on : 2008-05-28
Resolution : 2.70 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

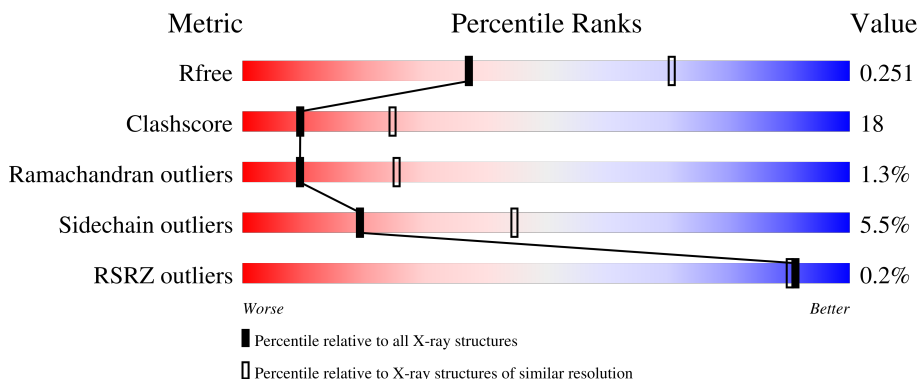
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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	3538 (2.70-2.70)
Clashscore	190562	3843 (2.70-2.70)
Ramachandran outliers	187476	3778 (2.70-2.70)
Sidechain outliers	187428	3778 (2.70-2.70)
RSRZ outliers	180081	3538 (2.70-2.70)

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	293	 67% 28% . .
1	B	293	 58% 35% . .
1	C	293	 55% 37% . .
1	D	293	 57% 33% 5% . .

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 9230 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 Putative acetyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	284	Total	C	N	O	S	0	0	0
			2264	1433	411	416	4			
1	B	281	Total	C	N	O	S	0	0	0
			2237	1417	405	411	4			
1	C	282	Total	C	N	O	S	0	0	0
			2246	1422	406	414	4			
1	D	281	Total	C	N	O	S	0	0	0
			2237	1417	405	411	4			

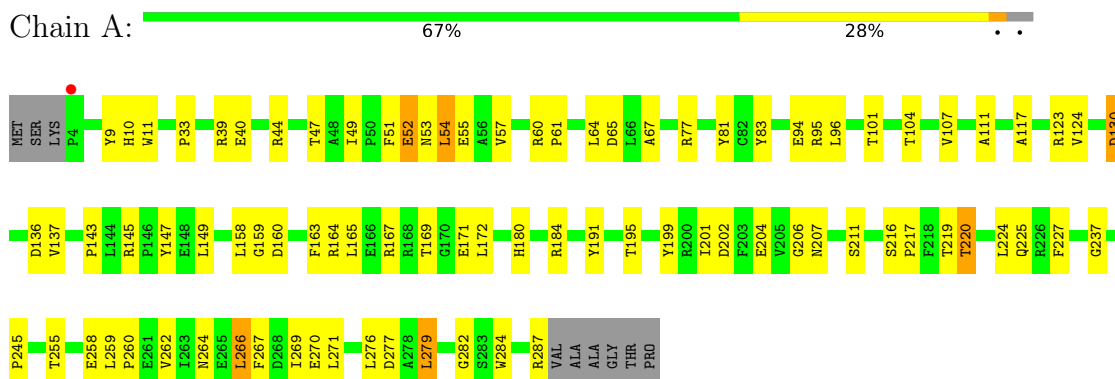
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	68	Total	O	0	0
			68	68		
2	B	65	Total	O	0	0
			65	65		
2	C	56	Total	O	0	0
			56	56		
2	D	57	Total	O	0	0
			57	57		

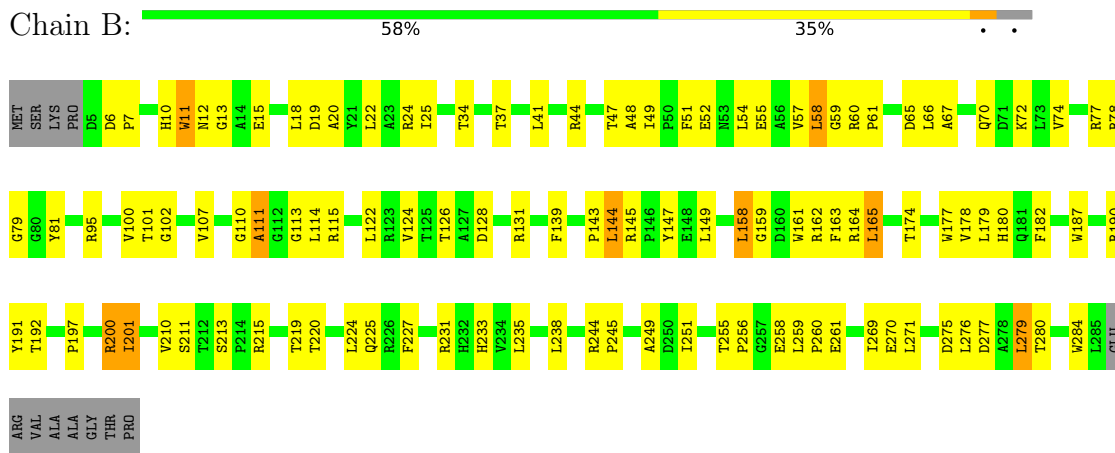
3 Residue-property plots

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.

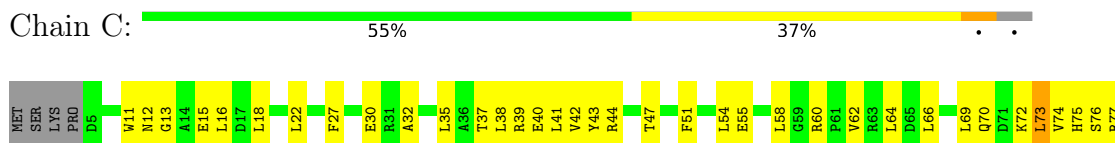
• Molecule 1: Putative acetyltransferase

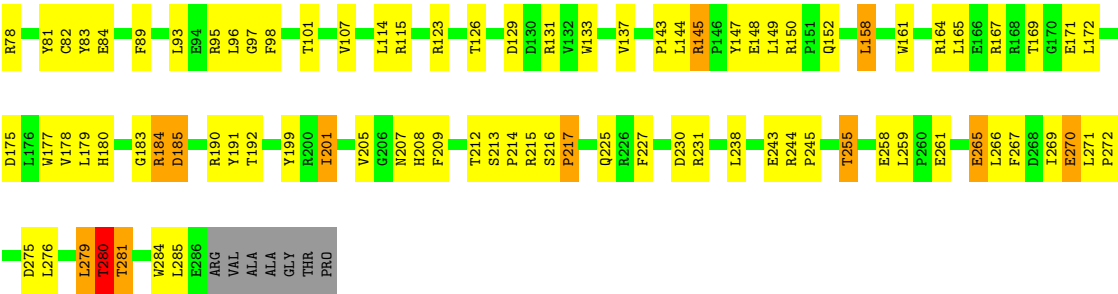


• Molecule 1: Putative acetyltransferase

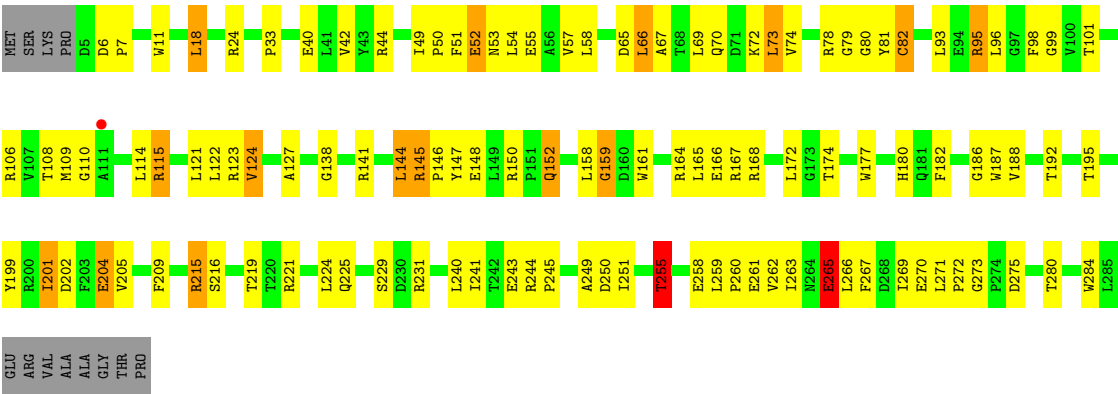


• Molecule 1: Putative acetyltransferase





● Molecule 1: Putative acetyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	61.34Å 140.92Å 74.85Å 90.00° 101.83° 90.00°	Depositor
Resolution (Å)	45.70 – 2.70 45.70 – 2.70	Depositor EDS
% Data completeness (in resolution range)	97.7 (45.70-2.70) 97.8 (45.70-2.70)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.28 (at 2.69Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, R_{free}	0.190 , 0.251 0.190 , 0.251	Depositor DCC
R_{free} test set	1672 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	29.7	Xtriage
Anisotropy	0.474	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 45.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	9230	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.12% 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

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	0.48	0/2327	0.97	7/3170 (0.2%)
1	B	0.47	0/2299	0.99	12/3133 (0.4%)
1	C	0.48	0/2308	0.97	9/3145 (0.3%)
1	D	0.46	0/2299	0.98	10/3133 (0.3%)
All	All	0.47	0/9233	0.98	38/12581 (0.3%)

There are no bond length outliers.

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	49	ILE	N-CA-C	8.93	116.31	108.63
1	D	266	LEU	N-CA-C	8.21	121.35	111.82
1	A	49	ILE	N-CA-C	8.04	115.55	108.63
1	D	11	TRP	N-CA-C	7.37	121.72	111.56
1	B	11	TRP	N-CA-C	7.17	123.06	112.94
1	C	11	TRP	N-CA-C	6.86	121.32	112.41
1	D	159	GLY	N-CA-C	-6.82	103.06	111.45
1	B	159	GLY	N-CA-C	-6.68	99.60	110.95
1	A	237	GLY	N-CA-C	-6.24	105.93	111.67
1	B	124	VAL	N-CA-C	6.21	118.41	108.85
1	B	244	ARG	CA-C-N	6.17	126.63	119.47
1	B	244	ARG	C-N-CA	6.17	126.63	119.47
1	C	255	THR	N-CA-C	-5.99	102.05	110.31
1	B	158	LEU	N-CA-C	-5.95	95.73	107.69
1	C	137	VAL	N-CA-C	5.92	117.86	112.29
1	C	83	TYR	N-CA-C	5.91	117.72	111.28
1	D	255	THR	N-CA-C	-5.90	101.53	110.50
1	B	213	SER	CA-C-N	5.75	125.60	119.28
1	B	213	SER	C-N-CA	5.75	125.60	119.28
1	D	216	SER	N-CA-C	5.58	116.67	109.65
1	A	124	VAL	N-CA-C	5.56	116.49	108.48
1	A	159	GLY	N-CA-C	-5.55	101.51	110.95
1	A	11	TRP	N-CA-C	5.53	119.67	111.87

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	124	VAL	N-CA-C	5.52	117.35	108.85
1	B	219	THR	N-CA-C	-5.51	106.92	113.97
1	C	152	GLN	CA-C-N	5.50	125.33	119.28
1	C	152	GLN	C-N-CA	5.50	125.33	119.28
1	A	276	LEU	N-CA-C	-5.37	105.33	111.07
1	B	100	VAL	N-CA-C	5.35	115.56	107.75
1	C	73	LEU	N-CA-C	5.33	118.01	111.82
1	D	127	ALA	N-CA-C	-5.18	106.97	113.28
1	C	158	LEU	N-CA-C	-5.16	98.15	107.75
1	A	54	LEU	N-CA-C	5.13	117.53	111.33
1	B	210	VAL	N-CA-C	5.10	115.71	110.36
1	D	18	LEU	N-CA-C	5.09	117.22	111.11
1	C	267	PHE	N-CA-C	5.05	119.53	113.17
1	D	152	GLN	CA-C-N	5.04	124.82	119.28
1	D	152	GLN	C-N-CA	5.04	124.82	119.28

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	2264	0	2183	56	0
1	B	2237	0	2156	81	0
1	C	2246	0	2162	113	0
1	D	2237	0	2156	84	0
2	A	68	0	0	8	0
2	B	65	0	0	4	0
2	C	56	0	0	1	0
2	D	57	0	0	1	0
All	All	9230	0	8657	316	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 18.

All (316) 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:178:VAL:HG22	1:B:192:THR:HG22	1.40	1.02
1:D:215:ARG:HH11	1:D:215:ARG:HB3	1.36	0.90
1:C:131:ARG:HD3	1:C:133:TRP:CZ2	2.07	0.89
1:B:54:LEU:HD13	1:B:271:LEU:HD11	1.57	0.86
1:D:255:THR:HG23	1:D:258:GLU:HG3	1.58	0.85
1:C:255:THR:HG22	1:C:258:GLU:HG3	1.60	0.82
1:A:101:THR:HG23	1:A:123:ARG:HB3	1.63	0.80
1:B:143:PRO:HD3	1:B:190:ARG:HH12	1.48	0.77
1:A:101:THR:HG21	1:A:123:ARG:HD3	1.66	0.77
1:C:51:PHE:HB3	1:C:225:GLN:HB2	1.68	0.76
1:C:16:LEU:HA	1:C:70:GLN:HE22	1.50	0.76
1:D:164:ARG:HB2	1:D:180:HIS:HB2	1.67	0.76
1:B:271:LEU:HB2	1:B:276:LEU:HD13	1.69	0.75
1:C:215:ARG:HD2	1:D:204:GLU:OE2	1.87	0.74
1:D:115:ARG:HD2	1:D:115:ARG:N	2.02	0.74
1:D:82:CYS:HA	1:D:138:GLY:HA3	1.72	0.71
1:B:77:ARG:HB2	1:B:270:GLU:HB2	1.72	0.71
1:D:195:THR:HG21	2:D:348:HOH:O	1.93	0.69
1:D:258:GLU:O	1:D:262:VAL:HG23	1.92	0.69
1:A:39:ARG:HD2	2:A:307:HOH:O	1.91	0.69
1:A:101:THR:CG2	1:A:123:ARG:HD3	2.22	0.69
1:D:72:LYS:HE2	1:D:79:GLY:O	1.92	0.69
1:D:263:ILE:HG23	1:D:269:ILE:HB	1.73	0.69
1:C:78:ARG:HD2	1:C:269:ILE:HG23	1.73	0.68
1:D:215:ARG:HB3	1:D:215:ARG:NH1	2.08	0.68
1:D:42:VAL:HG21	1:D:146:PRO:HG3	1.75	0.68
1:C:255:THR:HG22	1:C:258:GLU:CG	2.23	0.68
1:D:243:GLU:HG3	1:D:249:ALA:HB2	1.74	0.67
1:C:169:THR:O	1:C:169:THR:HG23	1.93	0.67
1:D:141:ARG:O	1:D:141:ARG:HG2	1.94	0.66
1:D:201:ILE:HD12	1:D:202:ASP:H	1.60	0.66
1:C:131:ARG:HD3	1:C:133:TRP:HZ2	1.58	0.66
1:C:244:ARG:HG3	1:C:244:ARG:HH11	1.61	0.65
1:C:22:LEU:HD13	1:C:27:PHE:HD2	1.62	0.65
1:A:164:ARG:HB2	1:A:180:HIS:HB2	1.79	0.64
1:B:57:VAL:C	1:B:59:GLY:H	2.05	0.64
1:C:144:LEU:O	1:C:145:ARG:HG2	1.98	0.64
1:C:58:LEU:CD1	1:C:60:ARG:HH21	2.09	0.64
1:A:201:ILE:HG12	2:A:362:HOH:O	1.97	0.64
1:D:144:LEU:HD11	1:D:159:GLY:HA3	1.79	0.64
1:B:201:ILE:HG13	2:B:359:HOH:O	1.98	0.63
1:C:39:ARG:NH1	1:C:145:ARG:HD3	2.13	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:129:ASP:OD2	1:C:131:ARG:HD2	1.99	0.63
1:D:33:PRO:HD3	1:D:96:LEU:O	1.99	0.63
1:A:54:LEU:HD13	1:A:271:LEU:HD11	1.79	0.62
1:A:9:TYR:CZ	1:B:114:LEU:HD13	2.35	0.62
1:D:147:TYR:HB3	1:D:158:LEU:HD11	1.81	0.62
1:B:24:ARG:HB2	1:B:74:VAL:HG13	1.82	0.62
1:A:195:THR:HG21	2:A:332:HOH:O	1.99	0.61
1:C:72:LYS:O	1:C:76:SER:HB3	2.00	0.61
1:B:143:PRO:HG3	1:B:163:PHE:CZ	2.35	0.61
1:C:22:LEU:HD13	1:C:27:PHE:CD2	2.35	0.61
1:C:73:LEU:HD12	1:C:73:LEU:N	2.15	0.61
1:A:204:GLU:OE2	1:B:215:ARG:HG3	2.01	0.61
1:C:179:LEU:HD23	1:C:190:ARG:HD2	1.82	0.61
1:C:16:LEU:HA	1:C:70:GLN:NE2	2.16	0.60
1:C:66:LEU:O	1:C:70:GLN:HG3	2.01	0.60
1:C:77:ARG:HG3	1:C:270:GLU:OE1	2.02	0.60
1:C:201:ILE:HD12	1:C:201:ILE:N	2.17	0.60
1:C:147:TYR:HB3	1:C:158:LEU:HD11	1.84	0.60
1:C:47:THR:HA	1:C:227:PHE:O	2.01	0.60
1:B:143:PRO:HD3	1:B:190:ARG:NH1	2.15	0.59
1:C:58:LEU:HD13	1:C:60:ARG:HH21	1.67	0.59
1:B:251:ILE:N	1:B:251:ILE:HD12	2.18	0.59
1:C:272:PRO:HD2	1:C:275:ASP:OD2	2.03	0.59
1:B:164:ARG:HB2	1:B:180:HIS:HB2	1.84	0.59
1:A:171:GLU:HG2	1:A:172:LEU:HG	1.85	0.58
1:B:51:PHE:HB3	1:B:225:GLN:HB2	1.85	0.58
1:C:114:LEU:HD21	1:D:199:TYR:CD2	2.38	0.58
1:C:73:LEU:HD12	1:C:73:LEU:H	1.69	0.58
1:C:213:SER:O	1:C:216:SER:HB3	2.03	0.58
1:C:72:LYS:HB3	1:C:73:LEU:HD12	1.85	0.58
1:D:51:PHE:HB3	1:D:225:GLN:HB2	1.86	0.58
1:C:148:GLU:OE1	1:C:150:ARG:NE	2.36	0.57
1:D:270:GLU:O	1:D:271:LEU:HG	2.03	0.57
1:B:11:TRP:CE3	1:B:200:ARG:HD3	2.40	0.57
1:C:149:LEU:HD13	1:C:149:LEU:O	2.03	0.57
1:C:244:ARG:HG3	1:C:244:ARG:NH1	2.18	0.57
1:C:58:LEU:HD21	1:C:279:LEU:HD22	1.85	0.57
1:C:101:THR:HB	1:C:123:ARG:HB3	1.87	0.57
1:A:10:HIS:HB3	1:A:94:GLU:OE2	2.04	0.57
1:C:129:ASP:HB2	1:C:131:ARG:HG2	1.87	0.56
1:C:98:PHE:HE1	1:C:126:THR:HG22	1.71	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:30:GLU:OE2	1:C:32:ALA:HB3	2.06	0.56
1:C:129:ASP:CG	1:C:131:ARG:HD2	2.30	0.56
1:C:62:VAL:HG11	1:C:81:TYR:CZ	2.41	0.55
1:A:101:THR:HG22	2:A:316:HOH:O	2.06	0.55
1:C:39:ARG:CZ	1:C:145:ARG:HD3	2.37	0.55
1:D:78:ARG:NH1	1:D:271:LEU:HD21	2.21	0.55
1:C:201:ILE:H	1:C:201:ILE:CD1	2.20	0.55
1:C:205:VAL:HG13	1:D:209:PHE:HB2	1.89	0.55
1:B:200:ARG:HG2	1:B:200:ARG:HH11	1.71	0.55
1:A:267:PHE:O	1:A:269:ILE:HG13	2.07	0.55
1:C:98:PHE:CE1	1:C:126:THR:HG22	2.42	0.55
1:A:172:LEU:HD11	1:B:101:THR:HG21	1.89	0.54
1:D:24:ARG:HG3	1:D:74:VAL:HA	1.88	0.54
1:B:251:ILE:CD1	1:D:251:ILE:HG12	2.38	0.53
1:C:15:GLU:HB2	1:C:66:LEU:HD12	1.89	0.53
1:C:230:ASP:OD1	1:C:231:ARG:HG2	2.08	0.53
1:C:89:PHE:O	1:C:93:LEU:HG	2.09	0.53
1:C:107:VAL:O	1:C:115:ARG:HD3	2.09	0.53
1:D:73:LEU:HD23	1:D:73:LEU:N	2.23	0.53
1:A:211:SER:O	1:A:219:THR:HG22	2.09	0.52
1:C:69:LEU:HD21	1:C:84:GLU:HG2	1.91	0.52
1:C:284:TRP:CE2	1:C:285:LEU:HG	2.45	0.52
1:D:244:ARG:NH2	1:D:250:ASP:OD2	2.42	0.52
1:C:77:ARG:HE	1:C:270:GLU:CD	2.18	0.52
1:B:161:TRP:CE2	1:B:245:PRO:HG3	2.45	0.52
1:D:144:LEU:C	1:D:145:ARG:HG2	2.34	0.52
1:B:165:LEU:HD22	1:B:177:TRP:HE3	1.74	0.52
1:D:241:ILE:HG12	1:D:251:ILE:HD12	1.90	0.52
1:D:267:PHE:O	1:D:269:ILE:HG13	2.10	0.52
1:D:54:LEU:HD13	1:D:271:LEU:HD11	1.91	0.52
1:D:263:ILE:HG22	1:D:269:ILE:O	2.10	0.52
1:A:77:ARG:NH2	1:A:264:ASN:OD1	2.43	0.51
1:B:54:LEU:O	1:B:58:LEU:HG	2.09	0.51
1:A:81:TYR:OH	1:A:211:SER:HB3	2.10	0.51
1:A:262:VAL:O	1:A:266:LEU:HB2	2.11	0.51
1:C:201:ILE:N	1:C:201:ILE:CD1	2.73	0.51
1:B:72:LYS:HE2	1:B:79:GLY:O	2.09	0.51
1:B:238:LEU:HD11	1:B:256:PRO:HD3	1.91	0.51
1:B:249:ALA:HB3	1:D:251:ILE:HB	1.92	0.51
1:C:114:LEU:HD21	1:D:199:TYR:CG	2.45	0.51
1:D:65:ASP:OD2	1:D:67:ALA:HB3	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:255:THR:HG23	1:D:258:GLU:CG	2.33	0.51
1:B:24:ARG:HG3	1:B:74:VAL:HA	1.92	0.51
1:B:179:LEU:HD23	1:B:190:ARG:HD2	1.93	0.51
1:A:130:ASP:OD2	1:A:130:ASP:N	2.43	0.51
1:B:81:TYR:OH	1:B:211:SER:HB3	2.11	0.50
1:B:47:THR:HA	1:B:227:PHE:O	2.12	0.50
1:B:177:TRP:O	1:B:192:THR:HA	2.10	0.50
1:C:178:VAL:HG22	1:C:192:THR:HG22	1.94	0.50
1:D:18:LEU:HD21	1:D:96:LEU:HD21	1.93	0.50
1:C:16:LEU:HD12	1:C:70:GLN:CD	2.36	0.50
1:B:6:ASP:HB2	1:B:7:PRO:HD2	1.94	0.50
1:D:66:LEU:CD1	1:D:70:GLN:HG3	2.42	0.50
1:D:261:GLU:O	1:D:265:GLU:HG2	2.11	0.50
1:B:259:LEU:HB2	1:B:260:PRO:HD3	1.93	0.50
1:B:277:ASP:HA	1:B:280:THR:OG1	2.11	0.50
1:D:148:GLU:HG2	1:D:150:ARG:HG2	1.93	0.49
1:A:53:ASN:O	1:A:57:VAL:HG23	2.13	0.49
1:D:51:PHE:CD1	1:D:51:PHE:C	2.90	0.49
1:C:69:LEU:CD2	1:C:84:GLU:HG2	2.41	0.49
1:D:144:LEU:O	1:D:145:ARG:HG2	2.12	0.49
1:A:204:GLU:OE1	1:B:215:ARG:NH1	2.45	0.49
1:D:66:LEU:HD22	1:D:69:LEU:HD12	1.93	0.49
1:D:106:ARG:HD3	1:D:115:ARG:O	2.13	0.49
1:A:9:TYR:CE2	1:B:114:LEU:HD13	2.48	0.49
1:C:164:ARG:HB2	1:C:180:HIS:HB2	1.95	0.49
1:D:58:LEU:HD13	1:D:275:ASP:OD1	2.13	0.49
1:D:241:ILE:HG23	1:D:251:ILE:HD13	1.93	0.49
1:B:162:ARG:HB2	1:B:182:PHE:HB3	1.94	0.49
1:A:104:THR:HG22	1:A:117:ALA:HB1	1.95	0.48
1:B:57:VAL:C	1:B:59:GLY:N	2.71	0.48
1:C:74:VAL:HG12	1:C:75:HIS:CD2	2.48	0.48
1:D:272:PRO:O	1:D:273:GLY:C	2.54	0.48
1:B:231:ARG:HD2	1:B:233:HIS:CE1	2.49	0.48
1:C:184:ARG:HG2	1:C:243:GLU:OE1	2.13	0.48
1:C:214:PRO:C	1:C:216:SER:H	2.21	0.48
1:B:13:GLY:HA3	1:B:95:ARG:HG2	1.96	0.48
1:B:139:PHE:CZ	1:B:190:ARG:HG3	2.48	0.48
1:C:40:GLU:O	1:C:44:ARG:HD3	2.13	0.48
1:C:167:ARG:O	1:C:167:ARG:HD3	2.12	0.48
1:D:161:TRP:CE2	1:D:245:PRO:HG3	2.48	0.48
1:A:147:TYR:HB3	1:A:158:LEU:HD11	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:150:ARG:HD2	2:C:319:HOH:O	2.13	0.48
1:B:51:PHE:CD1	1:B:51:PHE:C	2.92	0.48
1:B:25:ILE:O	1:B:44:ARG:HB3	2.13	0.48
1:D:164:ARG:HG3	1:D:187:TRP:CZ3	2.48	0.48
1:C:169:THR:O	1:C:169:THR:CG2	2.60	0.48
1:D:93:LEU:O	1:D:98:PHE:HB2	2.13	0.48
1:C:43:TYR:HD2	1:C:44:ARG:HD2	1.77	0.48
1:D:259:LEU:HB2	1:D:260:PRO:HD3	1.96	0.47
1:C:55:GLU:HG2	1:C:78:ARG:HH22	1.79	0.47
1:D:6:ASP:HB2	1:D:7:PRO:HD2	1.96	0.47
1:C:261:GLU:O	1:C:265:GLU:HB2	2.15	0.47
1:A:107:VAL:HA	1:A:191:TYR:HB3	1.97	0.47
1:C:209:PHE:CD2	1:D:205:VAL:HG22	2.49	0.47
1:D:182:PHE:CE1	1:D:186:GLY:HA2	2.49	0.47
1:B:52:GLU:HB3	1:B:224:LEU:HD22	1.97	0.47
1:B:251:ILE:HD13	1:D:251:ILE:HG12	1.96	0.47
1:C:167:ARG:HB2	1:C:177:TRP:CZ3	2.50	0.47
1:C:216:SER:HA	1:C:217:PRO:HD3	1.71	0.47
1:A:136:ASP:HA	2:A:319:HOH:O	2.14	0.47
1:B:15:GLU:HB2	1:B:66:LEU:HD22	1.96	0.47
1:C:73:LEU:H	1:C:73:LEU:CD1	2.27	0.47
1:D:108:THR:O	1:D:109:MET:C	2.57	0.47
1:C:62:VAL:HG11	1:C:81:TYR:OH	2.16	0.47
1:D:270:GLU:C	1:D:271:LEU:HG	2.40	0.47
1:A:64:LEU:HD11	1:A:207:ASN:HB2	1.96	0.46
1:A:199:TYR:N	1:A:202:ASP:OD2	2.36	0.46
1:B:37:THR:O	1:B:41:LEU:HG	2.14	0.46
1:C:64:LEU:HD11	1:C:207:ASN:HB2	1.97	0.46
1:B:107:VAL:HA	1:B:191:TYR:HB3	1.97	0.46
1:D:101:THR:HB	1:D:123:ARG:HB3	1.97	0.46
1:A:64:LEU:HD11	1:A:207:ASN:CB	2.45	0.46
1:D:177:TRP:O	1:D:192:THR:HA	2.15	0.46
1:A:55:GLU:HG2	2:A:363:HOH:O	2.15	0.46
1:A:284:TRP:O	1:A:287:ARG:HG2	2.14	0.46
1:C:238:LEU:HD21	1:C:259:LEU:HD11	1.97	0.46
1:B:58:LEU:HD21	1:B:279:LEU:HD23	1.97	0.46
1:A:40:GLU:HG3	2:A:322:HOH:O	2.15	0.46
1:B:275:ASP:O	1:B:279:LEU:HB2	2.16	0.46
1:B:161:TRP:HA	2:B:332:HOH:O	2.16	0.46
1:D:150:ARG:O	1:D:152:GLN:HG3	2.15	0.46
1:A:199:TYR:CD2	1:B:114:LEU:HD21	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:13:GLY:CA	1:B:95:ARG:HG2	2.46	0.45
1:D:231:ARG:HG2	1:D:231:ARG:HH11	1.80	0.45
1:C:70:GLN:O	1:C:74:VAL:HB	2.16	0.45
1:C:208:HIS:CE1	1:C:212:THR:HG21	2.52	0.45
1:C:279:LEU:C	1:C:281:THR:H	2.24	0.45
1:C:171:GLU:OE2	1:D:101:THR:HG23	2.17	0.45
1:D:49:ILE:HA	1:D:50:PRO:HD3	1.79	0.45
1:A:33:PRO:HD3	1:A:96:LEU:O	2.17	0.45
1:A:255:THR:OG1	1:A:258:GLU:HG3	2.16	0.45
1:B:66:LEU:O	1:B:70:GLN:HG3	2.15	0.45
1:A:143:PRO:HG3	1:A:163:PHE:CZ	2.52	0.45
1:D:70:GLN:O	1:D:74:VAL:HB	2.17	0.45
1:D:240:LEU:HD23	1:D:240:LEU:C	2.42	0.45
1:A:40:GLU:O	1:A:44:ARG:HG2	2.16	0.45
1:D:110:GLY:HA3	1:D:188:VAL:HG23	1.99	0.45
1:A:54:LEU:HD22	1:A:279:LEU:HD21	1.98	0.45
1:A:65:ASP:OD2	1:A:67:ALA:HB3	2.17	0.45
1:D:55:GLU:HG2	1:D:78:ARG:NH2	2.32	0.45
1:C:41:LEU:HD11	1:C:96:LEU:HD12	1.99	0.44
1:B:110:GLY:O	1:B:111:ALA:C	2.60	0.44
1:C:51:PHE:CD1	1:C:51:PHE:C	2.94	0.44
1:C:199:TYR:CD1	1:D:114:LEU:HD21	2.52	0.44
1:C:58:LEU:HD12	1:C:60:ARG:HH21	1.80	0.44
1:D:40:GLU:O	1:D:44:ARG:HG2	2.18	0.44
1:B:19:ASP:O	1:B:20:ALA:C	2.61	0.44
1:B:255:THR:O	1:B:256:PRO:C	2.61	0.44
1:D:215:ARG:HH11	1:D:215:ARG:CB	2.19	0.44
1:C:183:GLY:C	1:C:185:ASP:H	2.25	0.44
1:B:6:ASP:HB2	1:B:7:PRO:CD	2.48	0.44
1:C:209:PHE:O	1:C:213:SER:HB3	2.18	0.44
1:A:47:THR:HA	1:A:227:PHE:O	2.18	0.43
1:C:18:LEU:HD21	1:C:96:LEU:HD21	2.00	0.43
1:A:52:GLU:OE1	1:A:54:LEU:HB2	2.18	0.43
1:B:18:LEU:O	1:B:22:LEU:HG	2.18	0.43
1:C:54:LEU:HD13	1:C:271:LEU:HD11	2.00	0.43
1:C:89:PHE:CE2	1:C:93:LEU:HD11	2.53	0.43
1:C:123:ARG:NH1	1:D:172:LEU:HD13	2.33	0.43
1:D:145:ARG:HB2	1:D:158:LEU:HD22	2.00	0.43
1:C:77:ARG:NE	1:C:270:GLU:OE2	2.48	0.43
1:B:55:GLU:HG2	1:B:72:LYS:HZ1	1.84	0.43
1:C:12:ASN:O	1:C:13:GLY:C	2.61	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:81:TYR:O	1:D:82:CYS:C	2.62	0.43
1:D:241:ILE:HG12	1:D:251:ILE:CD1	2.47	0.43
1:B:147:TYR:HB3	1:B:158:LEU:HD11	2.01	0.43
1:A:83:TYR:OH	1:A:206:GLY:HA3	2.19	0.42
1:A:95:ARG:HD2	1:A:95:ARG:HA	1.88	0.42
1:D:52:GLU:HB3	1:D:224:LEU:HD22	2.00	0.42
1:D:99:GLY:O	1:D:124:VAL:HA	2.19	0.42
1:A:259:LEU:HB2	1:A:260:PRO:HD3	2.01	0.42
1:D:53:ASN:O	1:D:57:VAL:HG23	2.19	0.42
1:C:27:PHE:CZ	1:C:37:THR:HG23	2.55	0.42
1:B:224:LEU:HD12	1:B:235:LEU:HD23	2.01	0.42
1:C:107:VAL:HA	1:C:191:TYR:HB3	2.01	0.42
1:A:216:SER:HA	1:A:217:PRO:HD3	1.82	0.42
1:B:51:PHE:O	1:B:224:LEU:HA	2.20	0.42
1:C:40:GLU:HG2	1:C:44:ARG:HD3	2.02	0.42
1:C:201:ILE:HD12	1:C:201:ILE:H	1.80	0.42
1:D:109:MET:O	1:D:110:GLY:C	2.63	0.42
1:A:282:GLY:HA3	1:A:284:TRP:CD1	2.55	0.42
1:C:255:THR:N	1:C:258:GLU:OE1	2.49	0.42
1:C:279:LEU:O	1:C:281:THR:N	2.53	0.42
1:D:95:ARG:CG	1:D:95:ARG:HH11	2.32	0.42
1:A:60:ARG:HB3	1:A:61:PRO:HD2	2.01	0.42
1:B:60:ARG:HB3	1:B:61:PRO:HD2	2.02	0.42
1:B:201:ILE:HG13	1:B:201:ILE:H	1.56	0.42
1:C:12:ASN:HB2	1:C:66:LEU:HD11	2.01	0.42
1:C:131:ARG:HD3	1:C:133:TRP:CE2	2.54	0.42
1:A:57:VAL:HG13	1:A:220:THR:O	2.19	0.41
1:C:38:LEU:O	1:C:42:VAL:HG23	2.20	0.41
1:C:143:PRO:C	1:C:145:ARG:H	2.28	0.41
1:C:280:THR:O	1:C:281:THR:HG23	2.20	0.41
1:B:44:ARG:O	1:B:48:ALA:HB2	2.20	0.41
1:D:144:LEU:CD2	1:D:229:SER:HA	2.50	0.41
1:A:163:PHE:HA	1:A:180:HIS:O	2.20	0.41
1:B:77:ARG:O	1:B:269:ILE:HA	2.21	0.41
1:B:162:ARG:HB3	1:B:187:TRP:CH2	2.55	0.41
1:C:95:ARG:C	1:C:97:GLY:H	2.28	0.41
1:A:160:ASP:O	1:A:245:PRO:HB3	2.20	0.41
1:B:10:HIS:O	1:B:200:ARG:NE	2.47	0.41
1:B:12:ASN:ND2	2:B:309:HOH:O	2.53	0.41
1:C:73:LEU:N	1:C:73:LEU:CD1	2.82	0.41
1:C:167:ARG:HD3	1:C:167:ARG:C	2.46	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:171:GLU:O	1:C:172:LEU:HB2	2.20	0.41
1:C:279:LEU:HD13	1:C:279:LEU:HA	1.87	0.41
1:B:55:GLU:HG2	2:B:361:HOH:O	2.20	0.41
1:B:144:LEU:HD12	1:B:145:ARG:HG2	2.01	0.41
1:B:276:LEU:HA	1:B:276:LEU:HD12	1.85	0.41
1:A:51:PHE:HB3	1:A:225:GLN:HB2	2.02	0.41
1:C:55:GLU:HG2	1:C:78:ARG:NH2	2.35	0.41
1:C:191:TYR:CD1	1:C:191:TYR:C	2.98	0.41
1:A:104:THR:HG21	1:A:117:ALA:O	2.21	0.41
1:B:101:THR:HG22	1:B:102:GLY:N	2.36	0.41
1:B:163:PHE:HA	1:B:180:HIS:O	2.21	0.41
1:B:258:GLU:O	1:B:261:GLU:HB3	2.20	0.41
1:C:39:ARG:HG2	1:C:39:ARG:HH11	1.86	0.41
1:D:121:LEU:O	1:D:122:LEU:HD12	2.21	0.41
1:D:167:ARG:HB2	1:D:177:TRP:CZ3	2.56	0.41
1:B:238:LEU:CD1	1:B:256:PRO:HD3	2.50	0.40
1:D:166:GLU:OE1	1:D:168:ARG:NH2	2.31	0.40
1:B:65:ASP:OD2	1:B:67:ALA:HB3	2.20	0.40
1:A:172:LEU:HD12	1:B:197:PRO:HG3	2.03	0.40
1:B:34:THR:HA	1:B:128:ASP:OD1	2.21	0.40
1:B:190:ARG:HG2	1:B:191:TYR:CD2	2.57	0.40
1:C:12:ASN:HB3	1:C:66:LEU:HD12	2.04	0.40
1:C:161:TRP:CE2	1:C:245:PRO:HG3	2.56	0.40
1:D:51:PHE:HA	1:D:80:GLY:O	2.21	0.40
1:A:52:GLU:HB3	1:A:224:LEU:HD22	2.04	0.40
1:A:137:VAL:N	2:A:319:HOH:O	2.46	0.40
1:B:78:ARG:HD2	1:B:269:ILE:HG23	2.04	0.40
1:C:276:LEU:HA	1:C:276:LEU:HD23	1.81	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	282/293 (96%)	264 (94%)	15 (5%)	3 (1%)	11	29
1	B	279/293 (95%)	256 (92%)	18 (6%)	5 (2%)	6	18
1	C	280/293 (96%)	246 (88%)	30 (11%)	4 (1%)	9	23
1	D	279/293 (95%)	260 (93%)	16 (6%)	3 (1%)	11	29
All	All	1120/1172 (96%)	1026 (92%)	79 (7%)	15 (1%)	9	25

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	82	CYS
1	A	111	ALA
1	C	280	THR
1	D	265	GLU
1	A	184	ARG
1	B	58	LEU
1	B	111	ALA
1	B	220	THR
1	C	185	ASP
1	D	284	TRP
1	A	220	THR
1	B	284	TRP
1	C	184	ARG
1	B	113	GLY
1	C	217	PRO

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	234/240 (98%)	223 (95%)	11 (5%)	23	51
1	B	231/240 (96%)	220 (95%)	11 (5%)	23	50
1	C	232/240 (97%)	220 (95%)	12 (5%)	21	47
1	D	231/240 (96%)	214 (93%)	17 (7%)	13	32
All	All	928/960 (97%)	877 (94%)	51 (6%)	19	45

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	GLU
1	A	130	ASP
1	A	145	ARG
1	A	149	LEU
1	A	165	LEU
1	A	167	ARG
1	A	169	THR
1	A	266	LEU
1	A	270	GLU
1	A	277	ASP
1	A	279	LEU
1	B	115	ARG
1	B	122	LEU
1	B	126	THR
1	B	131	ARG
1	B	144	LEU
1	B	149	LEU
1	B	165	LEU
1	B	174	THR
1	B	200	ARG
1	B	201	ILE
1	B	279	LEU
1	C	35	LEU
1	C	82	CYS
1	C	145	ARG
1	C	165	LEU
1	C	175	ASP
1	C	201	ILE
1	C	265	GLU
1	C	266	LEU
1	C	270	GLU
1	C	279	LEU
1	C	280	THR
1	C	281	THR
1	D	52	GLU
1	D	66	LEU
1	D	73	LEU
1	D	95	ARG
1	D	115	ARG
1	D	144	LEU
1	D	145	ARG
1	D	165	LEU

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Mol	Chain	Res	Type
1	D	174	THR
1	D	201	ILE
1	D	204	GLU
1	D	215	ARG
1	D	219	THR
1	D	221	ARG
1	D	255	THR
1	D	265	GLU
1	D	280	THR

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	12	ASN
1	B	12	ASN
1	B	180	HIS
1	B	207	ASN
1	C	12	ASN
1	C	75	HIS
1	C	180	HIS
1	C	228	HIS
1	D	12	ASN
1	D	228	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 [i](#)

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

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	284/293 (96%)	-0.42	1 (0%) 88 87	16, 25, 38, 48	0
1	B	281/293 (95%)	-0.35	0 100 100	15, 27, 44, 54	0
1	C	282/293 (96%)	-0.29	0 100 100	17, 29, 42, 53	0
1	D	281/293 (95%)	-0.29	1 (0%) 88 87	18, 29, 42, 48	0
All	All	1128/1172 (96%)	-0.34	2 (0%) 91 90	15, 28, 42, 54	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	4	PRO	2.7
1	D	111	ALA	2.2

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.