



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 7, 2026 – 03:33 AM UTC

PDB ID : 2JBR / pdb_00002jbr
Title : Structure of the monooxygenase component of p-hydroxyphenylacetate hydroxylase from *Acinetobacter baumannii*
Authors : Alfieri, A.; Mattevi, A.
Deposited on : 2006-12-11
Resolution : 2.30 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

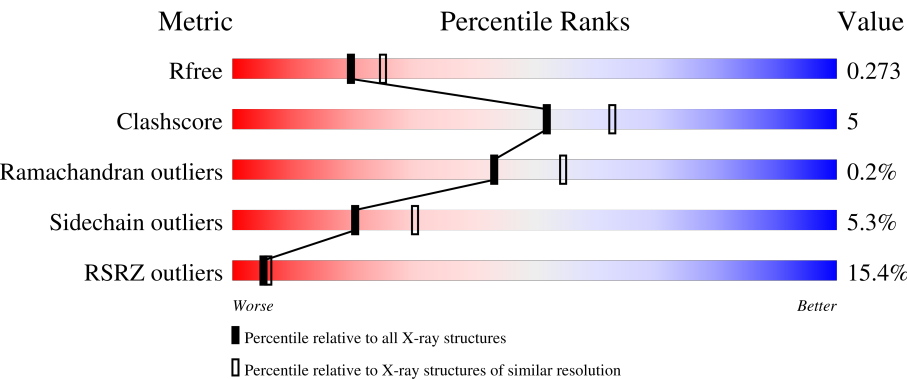
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	422	9% 83%9%• 5%
1	B	422	9% 83%9%• 6%
1	C	422	16% 84%9%• 5%
1	D	422	25% 84%9%• 5%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 12847 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 P-HYDROXYPHENYLACETATE HYDROXYLASE C2 OXYGENASE COMPONENT.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	399	Total	C	N	O	S	0	0	0
			3121	1980	538	582	21			
1	B	398	Total	C	N	O	S	0	0	0
			3109	1974	533	581	21			
1	C	399	Total	C	N	O	S	0	0	0
			3121	1980	538	582	21			
1	D	399	Total	C	N	O	S	0	0	0
			3121	1980	538	582	21			

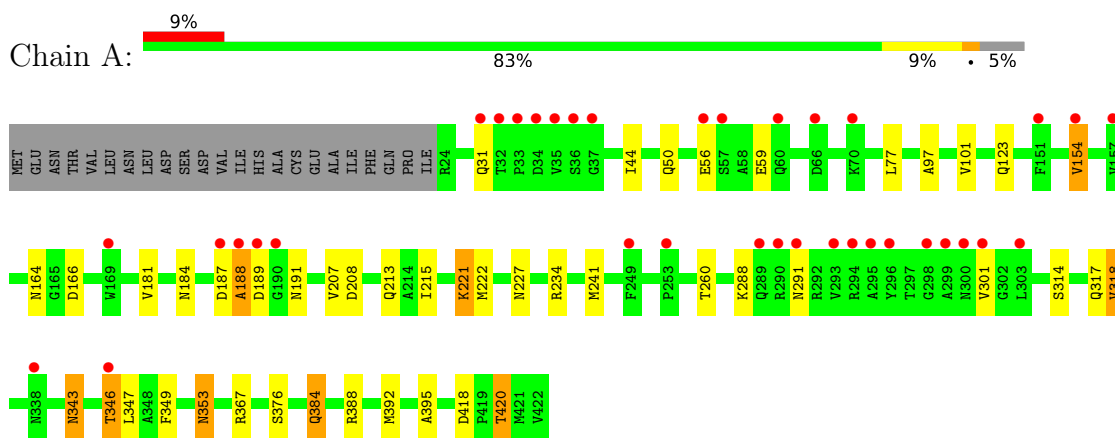
- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	130	Total	O	0	0
			130	130		
2	B	114	Total	O	0	0
			114	114		
2	C	68	Total	O	0	0
			68	68		
2	D	63	Total	O	0	0
			63	63		

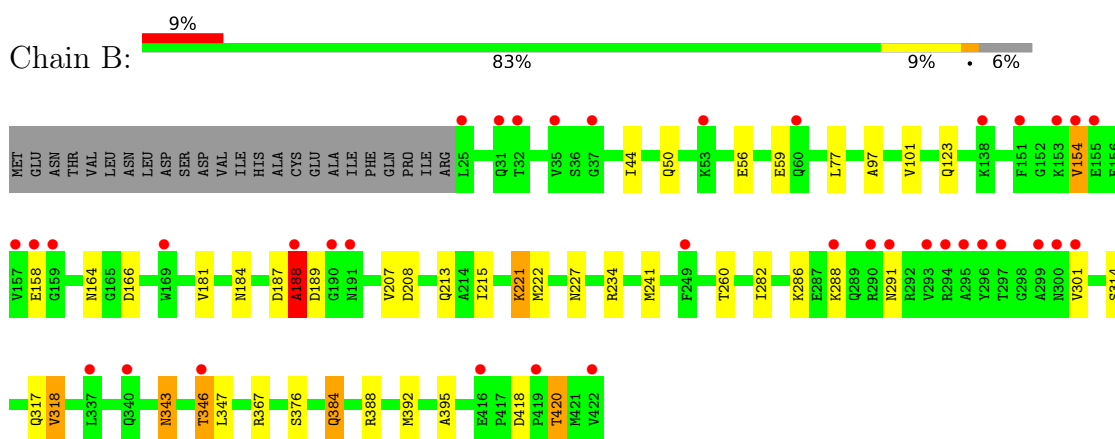
3 Residue-property plots [i](#)

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.

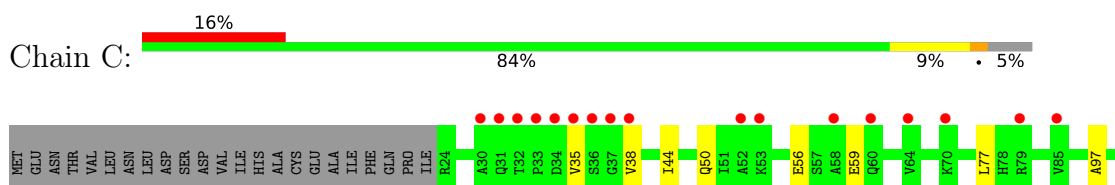
• Molecule 1: P-HYDROXYPHENYLACETATE HYDROXYLASE C2 OXYGENASE COMPONENT

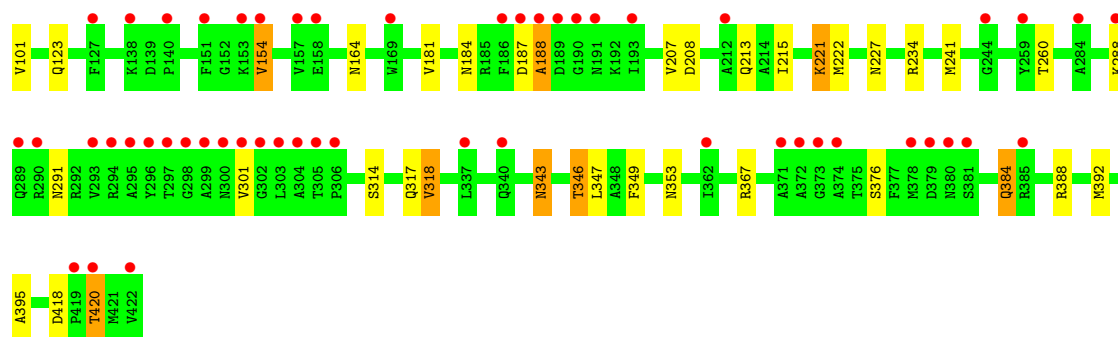


• Molecule 1: P-HYDROXYPHENYLACETATE HYDROXYLASE C2 OXYGENASE COMPONENT

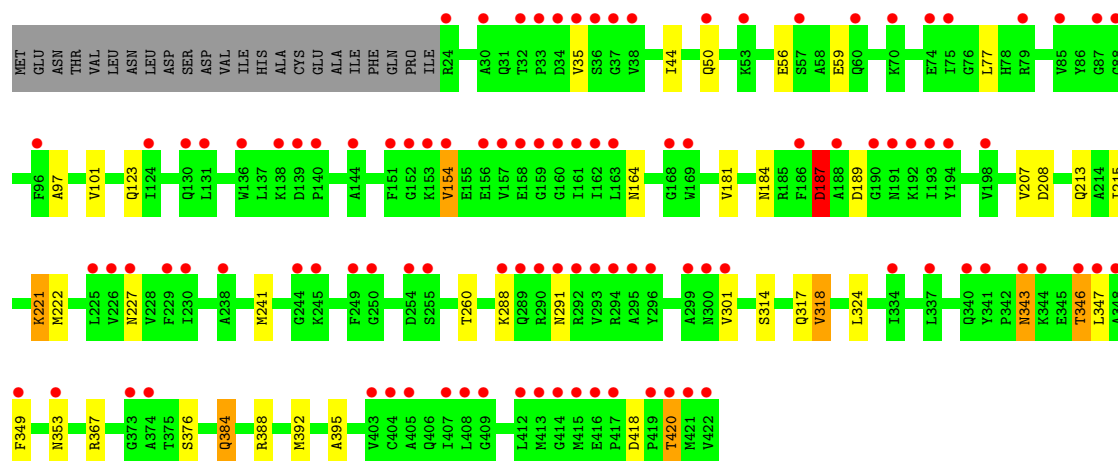
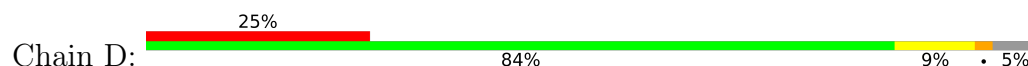


• Molecule 1: P-HYDROXYPHENYLACETATE HYDROXYLASE C2 OXYGENASE COMPONENT





• Molecule 1: P-HYDROXYPHENYLACETATE HYDROXYLASE C2 OXYGENASE COMPONENT



4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	91.44Å 182.08Å 287.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	71.07 – 2.30 71.07 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.0 (71.07-2.30) 99.0 (71.07-2.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.218 , 0.235 (Not available) , 0.273	Depositor DCC
R_{free} test set	1060 reflections (1.00%)	wwPDB-VP
Wilson B-factor (Å ²)	38.6	Xtriage
Anisotropy	0.102	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 48.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	12847	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.92% 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	0.60	2/3193 (0.1%)	0.85	0/4318
1	B	0.62	2/3181 (0.1%)	0.85	0/4302
1	C	0.70	2/3193 (0.1%)	0.85	3/4318 (0.1%)
1	D	0.49	0/3193	0.85	3/4318 (0.1%)
All	All	0.61	6/12760 (0.0%)	0.85	6/17256 (0.0%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	D	0	1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	188	ALA	CA-CB	24.06	1.91	1.53
1	B	188	ALA	CA-CB	15.69	1.79	1.53
1	C	188	ALA	N-CA	14.11	1.63	1.46
1	A	188	ALA	CA-CB	11.69	1.73	1.53
1	B	188	ALA	N-CA	9.35	1.58	1.46
1	A	188	ALA	N-CA	8.86	1.57	1.46

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	187	ASP	CA-C-N	6.84	134.60	121.54
1	D	187	ASP	C-N-CA	6.84	134.60	121.54
1	D	187	ASP	CB-CA-C	6.56	123.48	110.42
1	C	188	ALA	N-CA-CB	-5.89	101.17	109.94
1	C	187	ASP	CA-C-N	-5.74	112.79	120.54
1	C	187	ASP	C-N-CA	-5.74	112.79	120.54

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	D	187	ASP	Peptide

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	3121	0	3060	36	0
1	B	3109	0	3046	36	0
1	C	3121	0	3060	33	0
1	D	3121	0	3060	31	0
2	A	130	0	0	5	0
2	B	114	0	0	8	0
2	C	68	0	0	2	0
2	D	63	0	0	1	0
All	All	12847	0	12226	125	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 5.

All (125) 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:188:ALA:CA	1:B:188:ALA:CB	1.80	1.58
1:C:188:ALA:CA	1:C:188:ALA:CB	1.90	1.49
1:D:187:ASP:HB3	1:D:189:ASP:H	1.24	1.01
1:A:384:GLN:HG3	1:D:213:GLN:HG3	1.51	0.92
1:A:213:GLN:HG3	1:D:384:GLN:HG3	1.57	0.86
1:A:384:GLN:CG	1:D:213:GLN:HG3	2.06	0.85
1:B:384:GLN:HG3	1:C:213:GLN:HG3	1.63	0.80
1:A:213:GLN:HG3	1:D:384:GLN:CG	2.11	0.80
1:B:384:GLN:CG	1:C:213:GLN:HG3	2.14	0.77
1:B:213:GLN:HG3	1:C:384:GLN:CG	2.16	0.76
1:B:213:GLN:HG3	1:C:384:GLN:HG3	1.68	0.76
1:B:188:ALA:CB	1:B:188:ALA:C	2.65	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:343:ASN:HD22	1:C:343:ASN:C	2.01	0.69
1:A:349:PHE:HD2	1:A:353:ASN:HD21	1.41	0.68
1:D:343:ASN:HD22	1:D:343:ASN:C	2.01	0.68
1:A:343:ASN:C	1:A:343:ASN:HD22	2.02	0.67
1:B:343:ASN:C	1:B:343:ASN:HD22	2.02	0.67
1:A:346:THR:HG21	2:A:2089:HOH:O	1.95	0.66
1:B:392:MET:HE3	1:B:395:ALA:HB3	1.78	0.65
1:C:123:GLN:HG2	1:C:241:MET:HE1	1.78	0.65
1:D:392:MET:HE3	1:D:395:ALA:HB3	1.79	0.64
1:B:158:GLU:HG3	2:B:2026:HOH:O	1.97	0.63
1:A:187:ASP:HB3	1:A:189:ASP:H	1.63	0.63
1:D:123:GLN:HG2	1:D:241:MET:HE1	1.79	0.63
1:B:123:GLN:HG2	1:B:241:MET:HE1	1.80	0.62
1:C:314:SER:O	1:C:318:VAL:HG13	1.99	0.62
1:D:154:VAL:HG11	1:D:184:ASN:O	2.00	0.62
1:A:317:GLN:OE1	1:A:367:ARG:NH2	2.27	0.62
1:C:392:MET:HE3	1:C:395:ALA:HB3	1.81	0.61
1:A:154:VAL:HG11	1:A:184:ASN:O	1.99	0.61
1:A:314:SER:O	1:A:318:VAL:HG13	2.01	0.61
1:C:154:VAL:HG11	1:C:184:ASN:O	2.00	0.61
1:A:123:GLN:HG2	1:A:241:MET:HE1	1.83	0.60
1:D:314:SER:O	1:D:318:VAL:HG13	2.01	0.60
1:A:234:ARG:NH2	2:A:2056:HOH:O	2.34	0.60
1:B:317:GLN:OE1	1:B:367:ARG:NH2	2.25	0.60
1:B:164:ASN:ND2	1:B:227:ASN:H	2.00	0.60
1:A:164:ASN:ND2	1:A:227:ASN:H	2.00	0.59
1:C:164:ASN:ND2	1:C:227:ASN:H	2.00	0.59
1:A:392:MET:HE3	1:A:395:ALA:HB3	1.83	0.59
1:D:349:PHE:O	1:D:353:ASN:ND2	2.31	0.59
1:D:164:ASN:ND2	1:D:227:ASN:H	2.00	0.59
1:A:221:LYS:HE2	2:A:2045:HOH:O	2.02	0.58
1:B:154:VAL:HG11	1:B:184:ASN:O	2.02	0.58
1:D:349:PHE:HD2	1:D:353:ASN:HD21	1.52	0.58
1:C:234:ARG:NH2	2:C:2029:HOH:O	2.37	0.58
1:B:314:SER:O	1:B:318:VAL:HG13	2.04	0.57
1:D:215:ILE:HG12	1:D:392:MET:HG2	1.86	0.57
1:C:349:PHE:O	1:C:353:ASN:ND2	2.37	0.57
1:C:317:GLN:OE1	1:C:367:ARG:NH2	2.28	0.57
1:A:418:ASP:OD1	1:A:420:THR:HB	2.05	0.56
1:C:215:ILE:HG12	1:C:392:MET:HG2	1.87	0.56
1:B:418:ASP:OD1	1:B:420:THR:HB	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:187:ASP:HB3	1:B:189:ASP:H	1.70	0.56
1:D:418:ASP:OD1	1:D:420:THR:HB	2.07	0.55
1:B:215:ILE:HG12	1:B:392:MET:HG2	1.88	0.55
1:B:346:THR:HG21	2:B:2074:HOH:O	2.08	0.54
1:B:188:ALA:CB	1:B:188:ALA:N	2.66	0.54
1:C:418:ASP:OD1	1:C:420:THR:HB	2.08	0.54
1:A:44:ILE:HD11	1:A:77:LEU:HD22	1.90	0.53
1:B:346:THR:HB	2:B:2071:HOH:O	2.08	0.53
1:B:44:ILE:HD11	1:B:77:LEU:HD22	1.91	0.52
1:A:215:ILE:HG12	1:A:392:MET:HG2	1.90	0.52
1:D:44:ILE:HD11	1:D:77:LEU:HD22	1.92	0.52
1:C:44:ILE:HD11	1:C:77:LEU:HD22	1.92	0.51
1:D:317:GLN:OE1	1:D:367:ARG:NH2	2.28	0.51
1:A:343:ASN:ND2	1:A:346:THR:H	2.08	0.51
1:B:343:ASN:ND2	1:B:346:THR:H	2.09	0.51
1:B:347:LEU:HD12	2:B:2083:HOH:O	2.12	0.50
1:C:346:THR:HB	2:C:2042:HOH:O	2.12	0.50
1:A:384:GLN:HG3	1:D:213:GLN:CG	2.34	0.49
1:C:346:THR:HG21	2:D:2001:HOH:O	2.12	0.49
1:A:343:ASN:ND2	1:A:346:THR:HG23	2.28	0.49
1:C:188:ALA:CB	1:C:188:ALA:C	2.80	0.48
1:C:188:ALA:CB	1:C:188:ALA:N	2.74	0.48
1:A:384:GLN:OE1	1:A:388:ARG:NH2	2.39	0.48
1:B:420:THR:HG21	2:B:2029:HOH:O	2.14	0.47
1:C:343:ASN:ND2	1:C:346:THR:HG23	2.29	0.47
1:D:343:ASN:ND2	1:D:346:THR:H	2.13	0.47
1:A:187:ASP:HB2	1:A:191:ASN:H	1.79	0.47
1:A:97:ALA:O	1:A:101:VAL:HG23	2.15	0.46
1:C:343:ASN:ND2	1:C:346:THR:H	2.13	0.46
1:B:207:VAL:HB	1:B:222:MET:HE2	1.97	0.46
1:D:208:ASP:CG	1:D:221:LYS:HE3	2.41	0.46
1:C:376:SER:O	1:C:384:GLN:HB2	2.15	0.46
1:B:343:ASN:ND2	1:B:346:THR:HG23	2.31	0.46
1:D:97:ALA:O	1:D:101:VAL:HG23	2.16	0.46
1:C:314:SER:HA	1:C:367:ARG:HH21	1.81	0.46
1:A:207:VAL:HB	1:A:222:MET:HE2	1.97	0.46
1:D:343:ASN:ND2	1:D:346:THR:HG23	2.31	0.45
1:B:208:ASP:CG	1:B:221:LYS:HE3	2.41	0.45
1:C:349:PHE:HB3	1:C:353:ASN:HD21	1.82	0.45
1:C:207:VAL:HB	1:C:222:MET:HE2	1.98	0.44
1:B:314:SER:HA	1:B:367:ARG:HH21	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:208:ASP:CG	1:A:221:LYS:HE3	2.42	0.44
1:C:164:ASN:HD21	1:C:227:ASN:H	1.64	0.44
1:C:208:ASP:CG	1:C:221:LYS:HE3	2.42	0.44
1:B:97:ALA:O	1:B:101:VAL:HG23	2.17	0.44
1:B:234:ARG:NH2	2:B:2034:HOH:O	2.50	0.44
1:C:97:ALA:O	1:C:101:VAL:HG23	2.18	0.44
1:D:164:ASN:HD21	1:D:227:ASN:H	1.65	0.44
1:A:314:SER:HA	1:A:367:ARG:HH21	1.81	0.43
1:B:376:SER:O	1:B:384:GLN:HB2	2.18	0.43
1:C:349:PHE:HB3	1:C:353:ASN:ND2	2.33	0.43
1:D:314:SER:HA	1:D:367:ARG:HH21	1.83	0.43
1:D:376:SER:O	1:D:384:GLN:HB2	2.18	0.43
1:A:343:ASN:C	1:A:343:ASN:ND2	2.75	0.43
1:D:207:VAL:HB	1:D:222:MET:HE2	2.00	0.43
1:D:343:ASN:C	1:D:343:ASN:ND2	2.74	0.43
1:A:376:SER:O	1:A:384:GLN:HB2	2.18	0.43
1:A:343:ASN:ND2	1:A:346:THR:CG2	2.83	0.42
2:B:2061:HOH:O	1:C:420:THR:HG21	2.20	0.42
1:A:31:GLN:HG3	2:A:2006:HOH:O	2.20	0.42
1:D:384:GLN:OE1	1:D:388:ARG:NH2	2.42	0.42
1:C:384:GLN:OE1	1:C:388:ARG:NH2	2.43	0.41
1:A:384:GLN:CD	1:D:213:GLN:HG3	2.44	0.41
1:B:282:ILE:HG22	1:B:286:LYS:HE2	2.03	0.41
1:A:166:ASP:HB3	1:A:222:MET:SD	2.61	0.41
1:B:343:ASN:ND2	1:B:346:THR:CG2	2.84	0.41
1:A:346:THR:CG2	2:A:2089:HOH:O	2.64	0.41
1:A:213:GLN:HG3	1:D:384:GLN:CD	2.44	0.41
1:D:324:LEU:HD11	1:D:353:ASN:OD1	2.20	0.41
1:B:166:ASP:HB3	1:B:222:MET:SD	2.61	0.40
1:B:367:ARG:HD3	2:B:2093:HOH:O	2.22	0.40
1:B:384:GLN:OE1	1:B:388:ARG:NH2	2.42	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	397/422 (94%)	392 (99%)	4 (1%)	1 (0%)	36	46
1	B	396/422 (94%)	390 (98%)	5 (1%)	1 (0%)	36	46
1	C	397/422 (94%)	390 (98%)	7 (2%)	0	100	100
1	D	397/422 (94%)	389 (98%)	7 (2%)	1 (0%)	36	46
All	All	1587/1688 (94%)	1561 (98%)	23 (1%)	3 (0%)	43	55

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	187	ASP
1	A	188	ALA
1	B	188	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	324/345 (94%)	307 (95%)	17 (5%)	21	31
1	B	322/345 (93%)	307 (95%)	15 (5%)	23	35
1	C	324/345 (94%)	306 (94%)	18 (6%)	19	28
1	D	324/345 (94%)	306 (94%)	18 (6%)	19	28
All	All	1294/1380 (94%)	1226 (95%)	68 (5%)	20	30

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	50	GLN
1	A	56	GLU
1	A	59	GLU
1	A	154	VAL
1	A	181	VAL

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Mol	Chain	Res	Type
1	A	221	LYS
1	A	260	THR
1	A	288	LYS
1	A	291	ASN
1	A	301	VAL
1	A	318	VAL
1	A	343	ASN
1	A	346	THR
1	A	347	LEU
1	A	353	ASN
1	A	384	GLN
1	A	420	THR
1	B	50	GLN
1	B	56	GLU
1	B	59	GLU
1	B	154	VAL
1	B	181	VAL
1	B	221	LYS
1	B	260	THR
1	B	288	LYS
1	B	291	ASN
1	B	301	VAL
1	B	318	VAL
1	B	343	ASN
1	B	346	THR
1	B	384	GLN
1	B	420	THR
1	C	35	VAL
1	C	38	VAL
1	C	50	GLN
1	C	56	GLU
1	C	59	GLU
1	C	154	VAL
1	C	181	VAL
1	C	221	LYS
1	C	260	THR
1	C	288	LYS
1	C	291	ASN
1	C	301	VAL
1	C	318	VAL
1	C	343	ASN
1	C	346	THR

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Mol	Chain	Res	Type
1	C	347	LEU
1	C	384	GLN
1	C	420	THR
1	D	35	VAL
1	D	50	GLN
1	D	56	GLU
1	D	59	GLU
1	D	154	VAL
1	D	181	VAL
1	D	187	ASP
1	D	221	LYS
1	D	260	THR
1	D	288	LYS
1	D	291	ASN
1	D	301	VAL
1	D	318	VAL
1	D	343	ASN
1	D	346	THR
1	D	347	LEU
1	D	384	GLN
1	D	420	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	46	GLN
1	A	164	ASN
1	A	184	ASN
1	A	227	ASN
1	A	343	ASN
1	A	353	ASN
1	B	46	GLN
1	B	164	ASN
1	B	184	ASN
1	B	227	ASN
1	B	343	ASN
1	C	46	GLN
1	C	123	GLN
1	C	164	ASN
1	C	184	ASN
1	C	213	GLN
1	C	227	ASN

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Mol	Chain	Res	Type
1	C	343	ASN
1	C	353	ASN
1	D	46	GLN
1	D	123	GLN
1	D	164	ASN
1	D	184	ASN
1	D	227	ASN
1	D	343	ASN

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	399/422 (94%)	0.70	36 (9%) 15 16	29, 41, 62, 69	0
1	B	398/422 (94%)	0.65	37 (9%) 14 16	29, 41, 60, 67	0
1	C	399/422 (94%)	1.21	69 (17%) 4 4	29, 41, 61, 67	0
1	D	399/422 (94%)	1.44	104 (26%) 1 2	29, 41, 59, 67	0
All	All	1595/1688 (94%)	1.00	246 (15%) 5 6	29, 41, 61, 69	0

All (246) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	295	ALA	8.5
1	D	35	VAL	6.2
1	A	188	ALA	5.6
1	D	32	THR	5.5
1	B	295	ALA	5.5
1	C	293	VAL	5.5
1	C	296	TYR	5.0
1	A	35	VAL	5.0
1	C	35	VAL	4.9
1	A	293	VAL	4.9
1	B	296	TYR	4.7
1	D	130	GLN	4.6
1	B	340	GLN	4.6
1	B	299	ALA	4.6
1	A	299	ALA	4.4
1	D	296	TYR	4.4
1	B	190	GLY	4.3
1	D	417	PRO	4.3
1	D	85	VAL	4.2
1	A	301	VAL	4.1
1	D	409	GLY	3.9

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Mol	Chain	Res	Type	RSRZ
1	A	36	SER	3.9
1	D	36	SER	3.9
1	D	293	VAL	3.9
1	A	33	PRO	3.8
1	C	301	VAL	3.8
1	D	422	VAL	3.8
1	C	33	PRO	3.8
1	D	37	GLY	3.8
1	D	159	GLY	3.8
1	D	30	ALA	3.7
1	A	151	PHE	3.7
1	D	151	PHE	3.7
1	B	419	PRO	3.7
1	C	337	LEU	3.7
1	D	301	VAL	3.6
1	C	187	ASP	3.6
1	A	295	ALA	3.6
1	D	33	PRO	3.6
1	C	60	GLN	3.6
1	C	188	ALA	3.6
1	A	169	TRP	3.5
1	A	32	THR	3.5
1	B	60	GLN	3.5
1	B	297	THR	3.5
1	C	373	GLY	3.5
1	C	340	GLN	3.5
1	D	192	LYS	3.4
1	D	299	ALA	3.4
1	B	158	GLU	3.4
1	C	53	LYS	3.4
1	C	38	VAL	3.4
1	D	250	GLY	3.4
1	D	169	TRP	3.4
1	B	153	LYS	3.4
1	C	151	PHE	3.4
1	C	169	TRP	3.4
1	D	186	PHE	3.4
1	D	153	LYS	3.4
1	D	413	MET	3.3
1	C	36	SER	3.3
1	D	340	GLN	3.3
1	C	288	LYS	3.3

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Mol	Chain	Res	Type	RSRZ
1	C	374	ALA	3.2
1	C	290	ARG	3.2
1	D	79	ARG	3.2
1	D	188	ALA	3.2
1	D	295	ALA	3.2
1	A	34	ASP	3.2
1	D	412	LEU	3.2
1	B	154	VAL	3.2
1	C	422	VAL	3.2
1	A	189	ASP	3.1
1	D	157	VAL	3.1
1	A	66	ASP	3.1
1	A	190	GLY	3.1
1	D	291	ASN	3.1
1	C	30	ALA	3.1
1	C	306	PRO	3.0
1	D	140	PRO	3.0
1	D	38	VAL	3.0
1	D	230	ILE	3.0
1	C	420	THR	3.0
1	B	294	ARG	3.0
1	D	24	ARG	3.0
1	C	212	ALA	3.0
1	B	25	LEU	3.0
1	A	296	TYR	3.0
1	D	50	GLN	3.0
1	D	343	ASN	3.0
1	D	57	SER	3.0
1	C	298	GLY	3.0
1	C	304	ALA	2.9
1	C	303	LEU	2.9
1	B	422	VAL	2.9
1	B	191	ASN	2.9
1	D	294	ARG	2.9
1	B	32	THR	2.9
1	D	407	ILE	2.9
1	C	259	TYR	2.9
1	B	293	VAL	2.9
1	D	162	ILE	2.9
1	C	79	ARG	2.8
1	B	151	PHE	2.8
1	C	378	MET	2.8

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Mol	Chain	Res	Type	RSRZ
1	C	85	VAL	2.8
1	C	158	GLU	2.8
1	D	138	LYS	2.8
1	B	301	VAL	2.8
1	D	60	GLN	2.8
1	D	194	TYR	2.8
1	D	288	LYS	2.8
1	D	421	MET	2.8
1	C	294	ARG	2.8
1	D	416	GLU	2.7
1	D	154	VAL	2.7
1	A	298	GLY	2.7
1	A	303	LEU	2.7
1	C	305	THR	2.7
1	D	87	GLY	2.7
1	D	193	ILE	2.7
1	C	153	LYS	2.7
1	D	344	LYS	2.7
1	D	419	PRO	2.7
1	D	405	ALA	2.7
1	C	127	PHE	2.7
1	B	288	LYS	2.7
1	A	37	GLY	2.7
1	C	52	ALA	2.6
1	A	154	VAL	2.6
1	C	64	VAL	2.6
1	B	37	GLY	2.6
1	B	290	ARG	2.6
1	D	374	ALA	2.6
1	D	34	ASP	2.6
1	A	57	SER	2.6
1	B	159	GLY	2.6
1	C	190	GLY	2.6
1	D	373	GLY	2.6
1	D	420	THR	2.6
1	A	290	ARG	2.6
1	B	291	ASN	2.6
1	C	189	ASP	2.6
1	D	415	MET	2.6
1	C	297	THR	2.6
1	B	31	GLN	2.5
1	C	34	ASP	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	198	VAL	2.5
1	D	124	ILE	2.5
1	D	238	ALA	2.5
1	C	186	PHE	2.5
1	B	416	GLU	2.5
1	C	299	ALA	2.5
1	D	341	TYR	2.5
1	C	300	ASN	2.5
1	A	294	ARG	2.4
1	B	157	VAL	2.4
1	D	161	ILE	2.4
1	D	53	LYS	2.4
1	D	245	LYS	2.4
1	D	254	ASP	2.4
1	D	300	ASN	2.4
1	D	334	ILE	2.4
1	C	138	LYS	2.4
1	D	70	LYS	2.4
1	B	337	LEU	2.4
1	B	155	GLU	2.4
1	A	346	THR	2.4
1	B	346	THR	2.4
1	C	381	SER	2.4
1	C	154	VAL	2.4
1	D	136	TRP	2.4
1	A	187	ASP	2.4
1	B	300	ASN	2.4
1	C	37	GLY	2.4
1	D	158	GLU	2.4
1	D	139	ASP	2.3
1	C	302	GLY	2.3
1	A	338	ASN	2.3
1	B	53	LYS	2.3
1	B	138	LYS	2.3
1	C	70	LYS	2.3
1	D	226	VAL	2.3
1	D	131	LEU	2.3
1	A	300	ASN	2.3
1	C	284	ALA	2.3
1	C	372	ALA	2.3
1	A	291	ASN	2.3
1	C	379	ASP	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	353	ASN	2.3
1	D	88	GLY	2.3
1	D	152	GLY	2.3
1	C	58	ALA	2.3
1	D	348	ALA	2.3
1	C	32	THR	2.3
1	A	31	GLN	2.3
1	C	289	GLN	2.3
1	D	74	GLU	2.3
1	A	70	LYS	2.3
1	A	157	VAL	2.3
1	D	225	LEU	2.2
1	C	362	ILE	2.2
1	D	290	ARG	2.2
1	B	188	ALA	2.2
1	D	96	PHE	2.2
1	D	349	PHE	2.2
1	D	227	ASN	2.2
1	D	168	GLY	2.2
1	D	255	SER	2.2
1	D	408	LEU	2.2
1	D	229	PHE	2.2
1	D	156	GLU	2.2
1	A	60	GLN	2.2
1	C	244	GLY	2.2
1	B	169	TRP	2.1
1	C	191	ASN	2.1
1	D	249	PHE	2.1
1	D	289	GLN	2.1
1	D	292	ARG	2.1
1	A	56	GLU	2.1
1	A	289	GLN	2.1
1	C	140	PRO	2.1
1	D	190	GLY	2.1
1	D	404	CYS	2.1
1	C	193	ILE	2.1
1	D	75	ILE	2.1
1	D	163	LEU	2.1
1	D	347	LEU	2.1
1	C	31	GLN	2.1
1	A	253	PRO	2.1
1	C	157	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	D	403	VAL	2.1
1	A	249	PHE	2.1
1	D	160	GLY	2.1
1	C	371	ALA	2.1
1	C	380	ASN	2.1
1	D	191	ASN	2.1
1	B	249	PHE	2.1
1	D	244	GLY	2.1
1	D	414	GLY	2.1
1	D	346	THR	2.0
1	B	35	VAL	2.0
1	D	144	ALA	2.0
1	D	337	LEU	2.0
1	C	385	ARG	2.0
1	C	419	PRO	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.