



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 23, 2024 – 04:33 AM EDT

PDB ID : 5CPA
Title : REFINED CRYSTAL STRUCTURE OF CARBOXYPEPTIDASE A AT 1.54
ANGSTROMS RESOLUTION.
Authors : Lipscomb, W.N.
Deposited on : 1982-05-06
Resolution : 1.54 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 : 4.02b-467
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

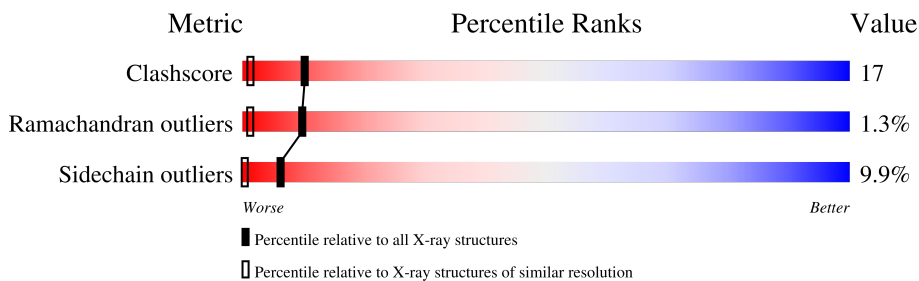
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.54 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	180529	3784 (1.56-1.52)
Ramachandran outliers	177936	3720 (1.56-1.52)
Sidechain outliers	177891	3717 (1.56-1.52)

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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	307	 59% 29% 9%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 2753 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 CARBOXYPEPTIDASE A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	307	2437	1561	406	465	5	0	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	28	GLN	GLU	conflict	UNP P00730
A	31	GLU	GLN	conflict	UNP P00730
A	89	ASN	ASP	conflict	UNP P00730
A	93	ASN	ASP	conflict	UNP P00730
A	114	ASN	ASP	conflict	UNP P00730
A	122	GLU	GLN	conflict	UNP P00730
A	185	ASN	ASP	conflict	UNP P00730
A	228	ALA	GLU	conflict	UNP P00730
A	305	VAL	LEU	conflict	UNP P00730

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Zn	0	0
			1	1		

- Molecule 3 is water.

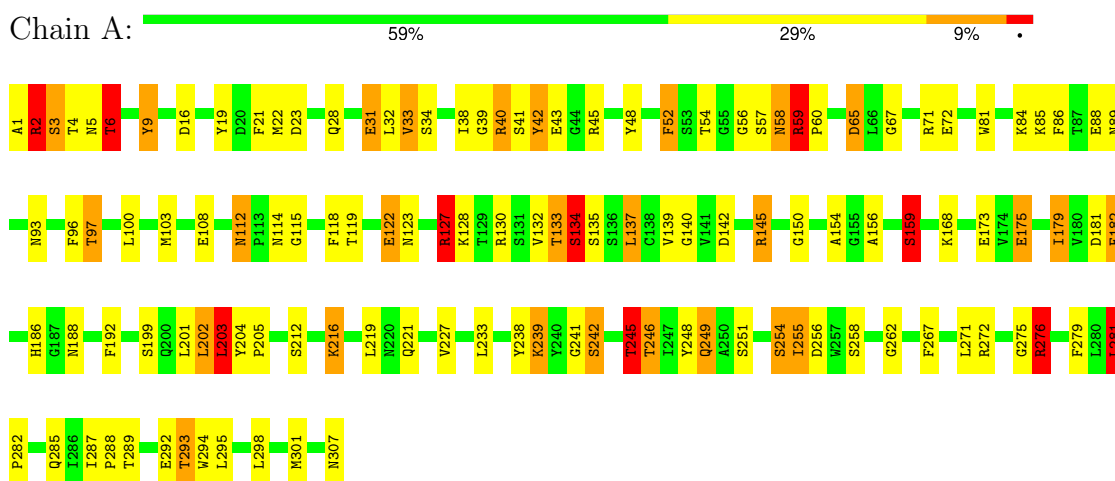
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	315	Total	O	0	0
			315	315		

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. 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. 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.

Note EDS was not executed.

- Molecule 1: CARBOXYPEPTIDASE A



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	51.60Å 60.27Å 47.25Å 90.00° 97.27° 90.00°	Depositor
Resolution (Å)	(Not available) – 1.54	Depositor
% Data completeness (in resolution range)	(Not available) ((Not available)-1.54)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	PROLSQ	Depositor
R, R_{free}	(Not available) , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	2753	wwPDB-VP
Average B, all atoms (Å ²)	11.0	wwPDB-VP

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	1.42	15/2503 (0.6%)	1.92	58/3402 (1.7%)

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	A	0	5

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	254	SER	CA-CB	9.08	1.66	1.52
1	A	108	GLU	CD-OE1	-8.65	1.16	1.25
1	A	258	SER	CB-OG	-7.98	1.31	1.42
1	A	34	SER	CB-OG	-7.58	1.32	1.42
1	A	254	SER	CB-OG	-6.61	1.33	1.42
1	A	173	GLU	CD-OE1	-5.95	1.19	1.25
1	A	212	SER	CA-CB	5.53	1.61	1.52
1	A	242	SER	CB-OG	5.50	1.49	1.42
1	A	43	GLU	CD-OE2	-5.49	1.19	1.25
1	A	72	GLU	CD-OE1	-5.44	1.19	1.25
1	A	3	SER	CB-OG	-5.28	1.35	1.42
1	A	293	THR	CB-OG1	5.21	1.53	1.43
1	A	40	ARG	NE-CZ	5.11	1.39	1.33
1	A	262	GLY	C-O	5.04	1.31	1.23
1	A	21	PHE	CE2-CZ	5.02	1.46	1.37

All (58) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	40	ARG	NE-CZ-NH2	-19.75	110.43	120.30
1	A	59	ARG	CD-NE-CZ	14.09	143.33	123.60
1	A	130	ARG	NE-CZ-NH2	-13.48	113.56	120.30
1	A	255	ILE	CA-CB-CG2	12.64	136.18	110.90
1	A	2	ARG	NE-CZ-NH1	11.86	126.23	120.30
1	A	16	ASP	CB-CG-OD1	-10.80	108.58	118.30
1	A	23	ASP	CB-CG-OD1	10.21	127.48	118.30
1	A	71	ARG	NE-CZ-NH1	-9.35	115.63	120.30
1	A	48	TYR	CB-CG-CD2	-8.61	115.84	121.00
1	A	245	THR	OG1-CB-CG2	8.45	129.44	110.00
1	A	245	THR	N-CA-CB	-8.13	94.84	110.30
1	A	19	TYR	CB-CG-CD1	8.11	125.87	121.00
1	A	21	PHE	CZ-CE2-CD2	-8.11	110.37	120.10
1	A	238	TYR	CB-CG-CD2	-8.10	116.14	121.00
1	A	40	ARG	NH1-CZ-NH2	7.80	127.99	119.40
1	A	42	TYR	CB-CG-CD1	-7.53	116.48	121.00
1	A	9	TYR	CG-CD1-CE1	-7.28	115.47	121.30
1	A	181	ASP	CB-CG-OD2	-7.18	111.83	118.30
1	A	281	LEU	CA-CB-CG	7.05	131.51	115.30
1	A	181	ASP	CB-CG-OD1	7.04	124.63	118.30
1	A	216	LYS	CA-CB-CG	-7.01	97.97	113.40
1	A	145	ARG	CD-NE-CZ	-6.90	113.94	123.60
1	A	279	PHE	CB-CG-CD1	-6.84	116.01	120.80
1	A	182	PHE	CB-CG-CD2	-6.76	116.07	120.80
1	A	39	GLY	O-C-N	6.74	133.49	122.70
1	A	52	PHE	CB-CG-CD2	-6.71	116.11	120.80
1	A	301	MET	CG-SD-CE	6.68	110.88	100.20
1	A	254	SER	CA-CB-OG	-6.63	93.31	111.20
1	A	9	TYR	CB-CG-CD2	-6.52	117.09	121.00
1	A	203	LEU	CA-CB-CG	6.43	130.09	115.30
1	A	127	ARG	CD-NE-CZ	-6.42	114.61	123.60
1	A	118	PHE	CB-CG-CD2	-6.33	116.37	120.80
1	A	6	THR	N-CA-CB	-6.22	98.49	110.30
1	A	145	ARG	NE-CZ-NH1	-6.19	117.20	120.30
1	A	281	LEU	CB-CG-CD2	6.14	121.44	111.00
1	A	56	GLY	C-N-CA	5.96	136.59	121.70
1	A	159	SER	N-CA-CB	-5.93	101.61	110.50
1	A	122	GLU	CA-CB-CG	5.88	126.34	113.40
1	A	16	ASP	CB-CG-OD2	5.78	123.50	118.30
1	A	276	ARG	NE-CZ-NH2	5.76	123.18	120.30
1	A	292	GLU	OE1-CD-OE2	-5.73	116.42	123.30
1	A	249	GLN	CB-CG-CD	5.73	126.49	111.60
1	A	175	GLU	CG-CD-OE1	5.65	129.60	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	65	ASP	CB-CG-OD1	5.62	123.35	118.30
1	A	127	ARG	NE-CZ-NH2	5.58	123.09	120.30
1	A	221	GLN	N-CA-CB	5.57	120.63	110.60
1	A	33	VAL	CB-CA-C	5.53	121.90	111.40
1	A	140	GLY	CA-C-O	5.47	130.45	120.60
1	A	23	ASP	CB-CG-OD2	-5.45	113.39	118.30
1	A	238	TYR	CB-CG-CD1	5.45	124.27	121.00
1	A	21	PHE	CG-CD2-CE2	5.42	126.76	120.80
1	A	1	ALA	CB-CA-C	5.38	118.17	110.10
1	A	295	LEU	CA-CB-CG	5.36	127.62	115.30
1	A	201	LEU	CB-CG-CD1	-5.26	102.05	111.00
1	A	59	ARG	NE-CZ-NH1	-5.18	117.71	120.30
1	A	275	GLY	CA-C-O	-5.14	111.34	120.60
1	A	108	GLU	CG-CD-OE2	-5.10	108.09	118.30
1	A	122	GLU	CG-CD-OE1	5.09	128.48	118.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	127	ARG	Sidechain
1	A	2	ARG	Sidechain
1	A	276	ARG	Sidechain
1	A	40	ARG	Sidechain
1	A	59	ARG	Sidechain

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2437	0	2351	81	5
2	A	1	0	0	0	0
3	A	315	0	0	24	169
All	All	2753	0	2351	81	169

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 17.

All (81) 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:A:4:THR:H	1:A:28:GLN:HE22	1.11	0.92
1:A:249:GLN:O	3:A:582(B):HOH:O	1.89	0.88
1:A:137:LEU:HD22	1:A:137:LEU:H	1.39	0.87
1:A:31:GLU:HB2	3:A:453(A):HOH:O	1.74	0.87
1:A:248:TYR:CD1	3:A:580(B):HOH:O	2.28	0.86
1:A:248:TYR:CE1	3:A:580(B):HOH:O	2.28	0.85
1:A:242:SER:O	1:A:246:THR:HG23	1.77	0.85
1:A:2:ARG:HD3	3:A:410(H):HOH:O	1.78	0.82
1:A:289:THR:O	1:A:293:THR:HG22	1.81	0.79
1:A:175:GLU:O	1:A:179:ILE:HD13	1.82	0.79
1:A:154:ALA:HA	3:A:542(B):HOH:O	1.84	0.77
1:A:168:LYS:HG2	3:A:380(A):HOH:O	1.83	0.77
1:A:133:THR:O	1:A:134:SER:HB3	1.86	0.75
1:A:159:SER:HB3	3:A:520(B):HOH:O	1.87	0.74
1:A:134:SER:OG	1:A:135:SER:N	2.20	0.74
1:A:100:LEU:O	3:A:463(A):HOH:O	2.06	0.73
1:A:5:ASN:HD21	1:A:84:LYS:HZ1	1.37	0.71
1:A:242:SER:OG	1:A:245:THR:HB	1.92	0.70
1:A:159:SER:CB	3:A:520(B):HOH:O	2.38	0.70
1:A:256:ASP:OD2	3:A:309(A):HOH:O	2.11	0.68
1:A:67:GLY:O	3:A:577(A):HOH:O	2.14	0.66
1:A:81:TRP:CD1	1:A:287:ILE:HD12	2.31	0.65
1:A:22:MET:HE3	3:A:532(A):HOH:O	1.97	0.64
1:A:86:PHE:HE1	1:A:294:TRP:CZ3	2.16	0.64
1:A:4:THR:N	1:A:28:GLN:HE22	1.91	0.64
1:A:22:MET:CE	3:A:532(A):HOH:O	2.48	0.61
1:A:186:HIS:HD2	1:A:188:ASN:H	1.48	0.61
1:A:93:ASN:O	1:A:97:THR:HG23	2.03	0.59
1:A:137:LEU:H	1:A:137:LEU:CD2	2.16	0.57
1:A:93:ASN:O	1:A:97:THR:CG2	2.54	0.56
1:A:5:ASN:ND2	1:A:84:LYS:NZ	2.54	0.56
1:A:65:ASP:OD2	3:A:564(A):HOH:O	2.18	0.56
1:A:5:ASN:HD21	1:A:84:LYS:NZ	2.03	0.56
1:A:54:THR:OG1	1:A:59:ARG:NH2	2.39	0.56
1:A:119:THR:HA	1:A:123:ASN:O	2.06	0.54
1:A:42:TYR:OH	1:A:132:VAL:HG22	2.07	0.54
1:A:45:ARG:HH11	1:A:114:ASN:ND2	2.06	0.54
1:A:248:TYR:CG	3:A:580(B):HOH:O	2.58	0.53
1:A:88:GLU:OE2	3:A:448(A):HOH:O	2.18	0.53
1:A:93:ASN:ND2	1:A:96:PHE:H	2.07	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:6:THR:HG21	3:A:490(A):HOH:O	2.08	0.52
1:A:241:GLY:HA3	1:A:246:THR:HG21	1.91	0.52
1:A:241:GLY:HA3	1:A:246:THR:CG2	2.41	0.51
1:A:89:ASN:ND2	3:A:445(A):HOH:O	2.45	0.50
1:A:202:LEU:HD12	1:A:227:VAL:HG23	1.93	0.50
1:A:6:THR:CG2	3:A:490(A):HOH:O	2.60	0.50
1:A:204:TYR:HB2	1:A:205:PRO:CD	2.43	0.49
1:A:60:PRO:HB2	1:A:103:MET:HE3	1.95	0.49
1:A:272:ARG:HH11	1:A:285:GLN:HE21	1.61	0.49
1:A:32:LEU:HD11	1:A:100:LEU:HD13	1.95	0.49
1:A:219:LEU:HG	1:A:267:PHE:CZ	2.49	0.48
1:A:203:LEU:HD11	1:A:246:THR:OG1	2.14	0.48
1:A:127:ARG:HG3	1:A:128:LYS:N	2.29	0.47
1:A:281:LEU:HA	1:A:282:PRO:HD3	1.74	0.46
1:A:112:ASN:ND2	1:A:115:GLY:H	2.13	0.46
1:A:289:THR:O	1:A:293:THR:CG2	2.60	0.46
1:A:156:ALA:CA	3:A:556(B):HOH:O	2.63	0.46
1:A:58:ASN:HD21	1:A:188:ASN:HB2	1.81	0.46
1:A:287:ILE:N	1:A:288:PRO:HD2	2.30	0.46
1:A:9:TYR:HB3	1:A:287:ILE:HD11	1.98	0.45
1:A:127:ARG:NH1	3:A:581(B):HOH:O	2.49	0.45
1:A:132:VAL:HG23	1:A:133:THR:OG1	2.16	0.45
1:A:203:LEU:HA	1:A:241:GLY:O	2.16	0.45
1:A:134:SER:HG	1:A:135:SER:H	1.60	0.44
1:A:41:SER:OG	1:A:45:ARG:HB2	2.18	0.44
1:A:192:PHE:HD1	1:A:255:ILE:HD13	1.83	0.44
1:A:142:ASP:OD2	1:A:145:ARG:HD2	2.19	0.43
1:A:186:HIS:HD2	1:A:188:ASN:N	2.14	0.43
1:A:32:LEU:O	1:A:52:PHE:HA	2.17	0.43
1:A:248:TYR:CZ	3:A:580(B):HOH:O	2.62	0.43
1:A:245:THR:HG21	3:A:369(A):HOH:O	2.18	0.42
1:A:9:TYR:CB	1:A:287:ILE:HD11	2.50	0.42
1:A:132:VAL:O	1:A:133:THR:CB	2.68	0.42
1:A:233:LEU:HA	1:A:233:LEU:HD23	1.74	0.42
1:A:85:LYS:HE3	1:A:89:ASN:ND2	2.35	0.41
1:A:137:LEU:HD22	1:A:137:LEU:N	2.22	0.41
1:A:45:ARG:HH11	1:A:114:ASN:HD22	1.68	0.41
1:A:239:LYS:HZ2	1:A:239:LYS:HB2	1.85	0.41
1:A:45:ARG:HD2	1:A:114:ASN:HD22	1.86	0.41
1:A:4:THR:H	1:A:28:GLN:NE2	1.95	0.40
1:A:150:GLY:O	1:A:251:SER:HB2	2.20	0.40

All (169) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:310(A):HOH:O	3:A:310(C):HOH:O[2_544]	0.00	2.20
3:A:311(A):HOH:O	3:A:311(B):HOH:O[2_545]	0.00	2.20
3:A:315(A):HOH:O	3:A:315(C):HOH:O[2_544]	0.00	2.20
3:A:317(A):HOH:O	3:A:317(C):HOH:O[2_544]	0.00	2.20
3:A:319(A):HOH:O	3:A:319(B):HOH:O[2_545]	0.00	2.20
3:A:323(A):HOH:O	3:A:323(C):HOH:O[2_544]	0.00	2.20
3:A:324(A):HOH:O	3:A:324(B):HOH:O[2_545]	0.00	2.20
3:A:325(A):HOH:O	3:A:325(D):HOH:O[2_555]	0.00	2.20
3:A:326(A):HOH:O	3:A:326(B):HOH:O[2_545]	0.00	2.20
3:A:328(A):HOH:O	3:A:328(B):HOH:O[2_545]	0.00	2.20
3:A:329(A):HOH:O	3:A:329(C):HOH:O[2_544]	0.00	2.20
3:A:330(A):HOH:O	3:A:330(C):HOH:O[2_544]	0.00	2.20
3:A:332(A):HOH:O	3:A:332(C):HOH:O[2_544]	0.00	2.20
3:A:335(A):HOH:O	3:A:335(B):HOH:O[2_545]	0.00	2.20
3:A:340(A):HOH:O	3:A:340(B):HOH:O[2_545]	0.00	2.20
3:A:341(A):HOH:O	3:A:341(B):HOH:O[2_545]	0.00	2.20
3:A:342(A):HOH:O	3:A:342(C):HOH:O[2_544]	0.00	2.20
3:A:344(A):HOH:O	3:A:344(C):HOH:O[2_544]	0.00	2.20
3:A:352(A):HOH:O	3:A:352(C):HOH:O[2_544]	0.00	2.20
3:A:354(A):HOH:O	3:A:354(B):HOH:O[2_545]	0.00	2.20
3:A:357(A):HOH:O	3:A:357(B):HOH:O[2_545]	0.00	2.20
3:A:359(A):HOH:O	3:A:359(B):HOH:O[2_545]	0.00	2.20
3:A:362(A):HOH:O	3:A:362(B):HOH:O[2_545]	0.00	2.20
3:A:363(A):HOH:O	3:A:363(B):HOH:O[2_545]	0.00	2.20
3:A:365(A):HOH:O	3:A:365(B):HOH:O[2_545]	0.00	2.20
3:A:366(E):HOH:O	3:A:366(I):HOH:O[2_544]	0.00	2.20
3:A:367(A):HOH:O	3:A:367(D):HOH:O[2_555]	0.00	2.20
3:A:368(E):HOH:O	3:A:368(F):HOH:O[2_545]	0.00	2.20
3:A:368(E):HOH:O	3:A:368(I):HOH:O[2_544]	0.00	2.20
3:A:368(F):HOH:O	3:A:368(I):HOH:O[1_556]	0.00	2.20
3:A:371(A):HOH:O	3:A:371(B):HOH:O[2_545]	0.00	2.20
3:A:372(A):HOH:O	3:A:372(D):HOH:O[2_555]	0.00	2.20
3:A:374(E):HOH:O	3:A:374(F):HOH:O[2_545]	0.00	2.20
3:A:375(A):HOH:O	3:A:375(B):HOH:O[2_545]	0.00	2.20
3:A:386(A):HOH:O	3:A:386(D):HOH:O[2_555]	0.00	2.20
3:A:388(A):HOH:O	3:A:388(B):HOH:O[2_545]	0.00	2.20
3:A:389(A):HOH:O	3:A:389(D):HOH:O[2_555]	0.00	2.20
3:A:390(A):HOH:O	3:A:390(D):HOH:O[2_555]	0.00	2.20
3:A:392(A):HOH:O	3:A:392(B):HOH:O[2_545]	0.00	2.20
3:A:395(A):HOH:O	3:A:395(G):HOH:O[1_554]	0.00	2.20

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:397(E):HOH:O	3:A:397(H):HOH:O[2_555]	0.00	2.20
3:A:402(A):HOH:O	3:A:402(D):HOH:O[2_555]	0.00	2.20
3:A:408(E):HOH:O	3:A:408(F):HOH:O[2_545]	0.00	2.20
3:A:409(E):HOH:O	3:A:409(H):HOH:O[2_555]	0.00	2.20
3:A:410(E):HOH:O	3:A:410(H):HOH:O[2_555]	0.00	2.20
3:A:412(E):HOH:O	3:A:412(F):HOH:O[2_545]	0.00	2.20
3:A:413(E):HOH:O	3:A:413(H):HOH:O[2_555]	0.00	2.20
3:A:429(E):HOH:O	3:A:429(H):HOH:O[2_555]	0.00	2.20
3:A:429(E):HOH:O	3:A:429(J):HOH:O[2_554]	0.00	2.20
3:A:429(H):HOH:O	3:A:429(J):HOH:O[1_556]	0.00	2.20
3:A:446(E):HOH:O	3:A:446(H):HOH:O[2_555]	0.00	2.20
3:A:514(A):HOH:O	3:A:514(L):HOH:O[1_556]	0.00	2.20
3:A:515(A):HOH:O	3:A:515(L):HOH:O[1_556]	0.00	2.20
3:A:525(A):HOH:O	3:A:525(B):HOH:O[2_545]	0.00	2.20
3:A:533(A):HOH:O	3:A:533(B):HOH:O[2_545]	0.00	2.20
3:A:553(A):HOH:O	3:A:553(B):HOH:O[2_545]	0.00	2.20
3:A:565(A):HOH:O	3:A:565(B):HOH:O[2_545]	0.00	2.20
3:A:572(A):HOH:O	3:A:572(D):HOH:O[2_555]	0.00	2.20
3:A:576(A):HOH:O	3:A:576(L):HOH:O[1_556]	0.00	2.20
3:A:584(A):HOH:O	3:A:584(B):HOH:O[2_545]	0.00	2.20
3:A:366(A):HOH:O	3:A:366(E):HOH:O[1_455]	0.01	2.19
3:A:366(A):HOH:O	3:A:366(I):HOH:O[2_444]	0.01	2.19
3:A:368(A):HOH:O	3:A:368(E):HOH:O[1_455]	0.01	2.19
3:A:368(A):HOH:O	3:A:368(F):HOH:O[2_445]	0.01	2.19
3:A:368(A):HOH:O	3:A:368(I):HOH:O[2_444]	0.01	2.19
3:A:374(A):HOH:O	3:A:374(E):HOH:O[1_455]	0.01	2.19
3:A:374(A):HOH:O	3:A:374(F):HOH:O[2_445]	0.01	2.19
3:A:381(A):HOH:O	3:A:381(E):HOH:O[1_455]	0.01	2.19
3:A:396(A):HOH:O	3:A:396(I):HOH:O[2_444]	0.01	2.19
3:A:397(A):HOH:O	3:A:397(E):HOH:O[1_455]	0.01	2.19
3:A:397(A):HOH:O	3:A:397(H):HOH:O[2_455]	0.01	2.19
3:A:399(A):HOH:O	3:A:399(I):HOH:O[2_444]	0.01	2.19
3:A:407(A):HOH:O	3:A:407(I):HOH:O[2_444]	0.01	2.19
3:A:408(A):HOH:O	3:A:408(E):HOH:O[1_455]	0.01	2.19
3:A:408(A):HOH:O	3:A:408(F):HOH:O[2_445]	0.01	2.19
3:A:409(A):HOH:O	3:A:409(E):HOH:O[1_455]	0.01	2.19
3:A:409(A):HOH:O	3:A:409(H):HOH:O[2_455]	0.01	2.19
3:A:410(A):HOH:O	3:A:410(E):HOH:O[1_455]	0.01	2.19
3:A:410(A):HOH:O	3:A:410(H):HOH:O[2_455]	0.01	2.19
3:A:411(A):HOH:O	3:A:411(I):HOH:O[2_444]	0.01	2.19
3:A:412(A):HOH:O	3:A:412(E):HOH:O[1_455]	0.01	2.19

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:412(A):HOH:O	3:A:412(F):HOH:O[2_445]	0.01	2.19
3:A:413(A):HOH:O	3:A:413(E):HOH:O[1_455]	0.01	2.19
3:A:413(A):HOH:O	3:A:413(H):HOH:O[2_455]	0.01	2.19
3:A:420(A):HOH:O	3:A:420(I):HOH:O[2_444]	0.01	2.19
3:A:421(A):HOH:O	3:A:421(I):HOH:O[2_444]	0.01	2.19
3:A:429(A):HOH:O	3:A:429(E):HOH:O[1_455]	0.01	2.19
3:A:429(A):HOH:O	3:A:429(H):HOH:O[2_455]	0.01	2.19
3:A:429(A):HOH:O	3:A:429(J):HOH:O[2_454]	0.01	2.19
3:A:430(A):HOH:O	3:A:430(J):HOH:O[2_454]	0.01	2.19
3:A:433(A):HOH:O	3:A:433(F):HOH:O[2_445]	0.01	2.19
3:A:434(A):HOH:O	3:A:434(I):HOH:O[2_444]	0.01	2.19
3:A:438(A):HOH:O	3:A:438(I):HOH:O[2_444]	0.01	2.19
3:A:442(A):HOH:O	3:A:442(K):HOH:O[1_655]	0.01	2.19
3:A:444(A):HOH:O	3:A:444(F):HOH:O[2_445]	0.01	2.19
3:A:445(A):HOH:O	3:A:445(E):HOH:O[1_455]	0.01	2.19
3:A:446(A):HOH:O	3:A:446(E):HOH:O[1_455]	0.01	2.19
3:A:446(A):HOH:O	3:A:446(H):HOH:O[2_455]	0.01	2.19
3:A:447(A):HOH:O	3:A:447(I):HOH:O[2_444]	0.01	2.19
3:A:448(A):HOH:O	3:A:448(E):HOH:O[1_455]	0.01	2.19
3:A:451(A):HOH:O	3:A:451(J):HOH:O[2_454]	0.01	2.19
3:A:452(A):HOH:O	3:A:452(I):HOH:O[2_444]	0.01	2.19
3:A:453(A):HOH:O	3:A:453(I):HOH:O[2_444]	0.01	2.19
3:A:454(A):HOH:O	3:A:454(J):HOH:O[2_454]	0.01	2.19
3:A:455(A):HOH:O	3:A:455(F):HOH:O[2_445]	0.01	2.19
3:A:456(A):HOH:O	3:A:456(I):HOH:O[2_444]	0.01	2.19
3:A:457(A):HOH:O	3:A:457(E):HOH:O[1_455]	0.01	2.19
3:A:460(A):HOH:O	3:A:460(E):HOH:O[1_455]	0.01	2.19
3:A:463(A):HOH:O	3:A:463(I):HOH:O[2_444]	0.01	2.19
3:A:472(A):HOH:O	3:A:472(I):HOH:O[2_444]	0.01	2.19
3:A:475(A):HOH:O	3:A:475(H):HOH:O[2_455]	0.01	2.19
3:A:478(A):HOH:O	3:A:478(I):HOH:O[2_444]	0.01	2.19
3:A:490(A):HOH:O	3:A:490(F):HOH:O[2_445]	0.01	2.19
3:A:363(A):HOH:O	3:A:365(B):HOH:O[2_545]	0.79	1.41
3:A:363(B):HOH:O	3:A:365(A):HOH:O[2_555]	0.79	1.41
3:A:463(I):HOH:O	3:A:472(A):HOH:O[2_454]	0.82	1.38
3:A:463(A):HOH:O	3:A:472(I):HOH:O[2_444]	0.83	1.37
3:A:367(A):HOH:O	3:A:533(A):HOH:O[2_555]	0.96	1.24
3:A:367(D):HOH:O	3:A:533(B):HOH:O[2_545]	0.96	1.24
3:A:354(A):HOH:O	3:A:357(B):HOH:O[2_545]	0.99	1.21
3:A:354(B):HOH:O	3:A:357(A):HOH:O[2_555]	0.99	1.21
3:A:490(A):HOH:O	3:A:490(B):HOH:O[2_545]	1.00	1.20

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:490(B):HOH:O	3:A:490(F):HOH:O[1_655]	1.00	1.20
3:A:518(A):HOH:O	3:A:518(B):HOH:O[2_545]	1.00	1.20
3:A:520(A):HOH:O	3:A:520(B):HOH:O[2_545]	1.00	1.20
3:A:521(A):HOH:O	3:A:521(B):HOH:O[2_545]	1.00	1.20
3:A:523(A):HOH:O	3:A:523(B):HOH:O[2_545]	1.00	1.20
3:A:531(A):HOH:O	3:A:531(C):HOH:O[2_544]	1.00	1.20
3:A:535(A):HOH:O	3:A:535(B):HOH:O[2_545]	1.00	1.20
3:A:540(A):HOH:O	3:A:540(B):HOH:O[2_545]	1.00	1.20
3:A:542(A):HOH:O	3:A:542(B):HOH:O[2_545]	1.00	1.20
3:A:554(A):HOH:O	3:A:554(C):HOH:O[2_544]	1.00	1.20
3:A:556(A):HOH:O	3:A:556(B):HOH:O[2_545]	1.00	1.20
3:A:558(A):HOH:O	3:A:558(B):HOH:O[2_545]	1.00	1.20
3:A:559(A):HOH:O	3:A:559(C):HOH:O[2_544]	1.00	1.20
3:A:561(A):HOH:O	3:A:561(C):HOH:O[2_544]	1.00	1.20
3:A:569(A):HOH:O	3:A:569(B):HOH:O[2_545]	1.00	1.20
3:A:573(A):HOH:O	3:A:573(C):HOH:O[2_544]	1.00	1.20
3:A:575(A):HOH:O	3:A:575(B):HOH:O[2_545]	1.00	1.20
3:A:576(A):HOH:O	3:A:576(B):HOH:O[2_545]	1.00	1.20
3:A:576(B):HOH:O	3:A:576(L):HOH:O[2_554]	1.00	1.20
3:A:578(A):HOH:O	3:A:578(B):HOH:O[2_545]	1.00	1.20
3:A:579(A):HOH:O	3:A:579(C):HOH:O[2_544]	1.00	1.20
3:A:580(A):HOH:O	3:A:580(B):HOH:O[2_545]	1.00	1.20
3:A:581(A):HOH:O	3:A:581(B):HOH:O[2_545]	1.00	1.20
3:A:582(A):HOH:O	3:A:582(B):HOH:O[2_545]	1.00	1.20
3:A:585(A):HOH:O	3:A:585(C):HOH:O[2_544]	1.00	1.20
3:A:586(A):HOH:O	3:A:586(B):HOH:O[2_545]	1.00	1.20
3:A:434(I):HOH:O	3:A:438(A):HOH:O[2_454]	1.13	1.07
3:A:434(A):HOH:O	3:A:438(I):HOH:O[2_444]	1.15	1.05
3:A:410(A):HOH:O	3:A:413(E):HOH:O[1_455]	1.72	0.48
3:A:410(A):HOH:O	3:A:413(H):HOH:O[2_455]	1.72	0.48
3:A:410(E):HOH:O	3:A:413(A):HOH:O[1_655]	1.72	0.48
3:A:410(E):HOH:O	3:A:413(H):HOH:O[2_555]	1.72	0.48
3:A:410(H):HOH:O	3:A:413(A):HOH:O[2_445]	1.72	0.48
3:A:410(H):HOH:O	3:A:413(E):HOH:O[2_545]	1.72	0.48
3:A:573(C):HOH:O	3:A:579(A):HOH:O[2_554]	1.74	0.46
3:A:362(A):HOH:O	3:A:374(A):HOH:O[1_655]	1.84	0.36
3:A:362(B):HOH:O	3:A:374(A):HOH:O[2_455]	1.84	0.36
3:A:362(A):HOH:O	3:A:374(F):HOH:O[2_545]	1.85	0.35
3:A:362(B):HOH:O	3:A:374(E):HOH:O[2_555]	1.85	0.35
1:A:38:ILE:O	3:A:585(C):HOH:O[2_544]	1.91	0.29
3:A:478(I):HOH:O	3:A:488(A):HOH:O[2_454]	1.97	0.23

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:578(B):HOH:O	3:A:580(A):HOH:O[2_555]	1.98	0.22
1:A:182:PHE:CD2	3:A:554(C):HOH:O[2_544]	2.03	0.17
1:A:100:LEU:O	3:A:463(I):HOH:O[2_444]	2.07	0.13
3:A:535(B):HOH:O	3:A:542(A):HOH:O[2_555]	2.07	0.13
1:A:182:PHE:CE2	3:A:554(C):HOH:O[2_544]	2.11	0.09
1:A:88:GLU:OE2	3:A:448(E):HOH:O[1_455]	2.18	0.02

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	305/307 (99%)	284 (93%)	17 (6%)	4 (1%)	10 1

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	57	SER
1	A	133	THR
1	A	134	SER
1	A	199	SER

5.3.2 Protein sidechains [i](#)

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	263/263 (100%)	237 (90%)	26 (10%)	6 0

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	SER
1	A	6	THR
1	A	31	GLU
1	A	33	VAL
1	A	58	ASN
1	A	97	THR
1	A	112	ASN
1	A	122	GLU
1	A	127	ARG
1	A	134	SER
1	A	137	LEU
1	A	139	VAL
1	A	159	SER
1	A	179	ILE
1	A	202	LEU
1	A	203	LEU
1	A	216	LYS
1	A	239	LYS
1	A	245	THR
1	A	246	THR
1	A	254	SER
1	A	271	LEU
1	A	276	ARG
1	A	281	LEU
1	A	298	LEU
1	A	307	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	A	28	GLN
1	A	37	GLN
1	A	58	ASN
1	A	89	ASN
1	A	93	ASN
1	A	112	ASN
1	A	114	ASN
1	A	171	ASN
1	A	186	HIS
1	A	285	GLN

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](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.