Full wwPDB X-ray Structure Validation Report

Aug 31, 2020 – 09:50 AM BST

PDB ID	:	1EKM
Title	:	CRYSTAL STRUCTURE AT 2.5 A RESOLUTION OF ZINC-SUBSTITUTED COPPER AMINE OXIDASE OF HANSENULA POLYMORPHA EXPRESSED IN ESCHERICHIA COLI
Authors	:	Chen, Z.; Schwartz, B.; Williams, N.K.; Li, R.; Klinman, J.P.; Mathews, F.S.
Deposited on	:	2000-03-09
Resolution	:	2.50 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 following versions of software and data (see references ①) were used in the production of this report:

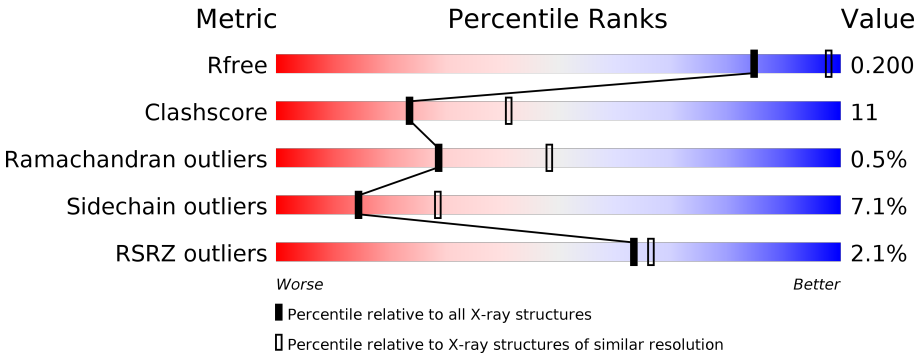
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.13
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.13

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 2.50 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}	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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 on 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 <=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	656	2% 75% 22%
1	B	656	2% 75% 22%
1	C	656	2% 76% 21%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 17070 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 COPPER AMINE OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	656	Total	C	N	O	S	0	0	0
			5197	3308	893	973	23			
1	B	656	Total	C	N	O	S	0	0	0
			5197	3308	893	973	23			
1	C	656	Total	C	N	O	S	0	0	0
			5197	3308	893	973	23			

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

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

- Molecule 3 is water.

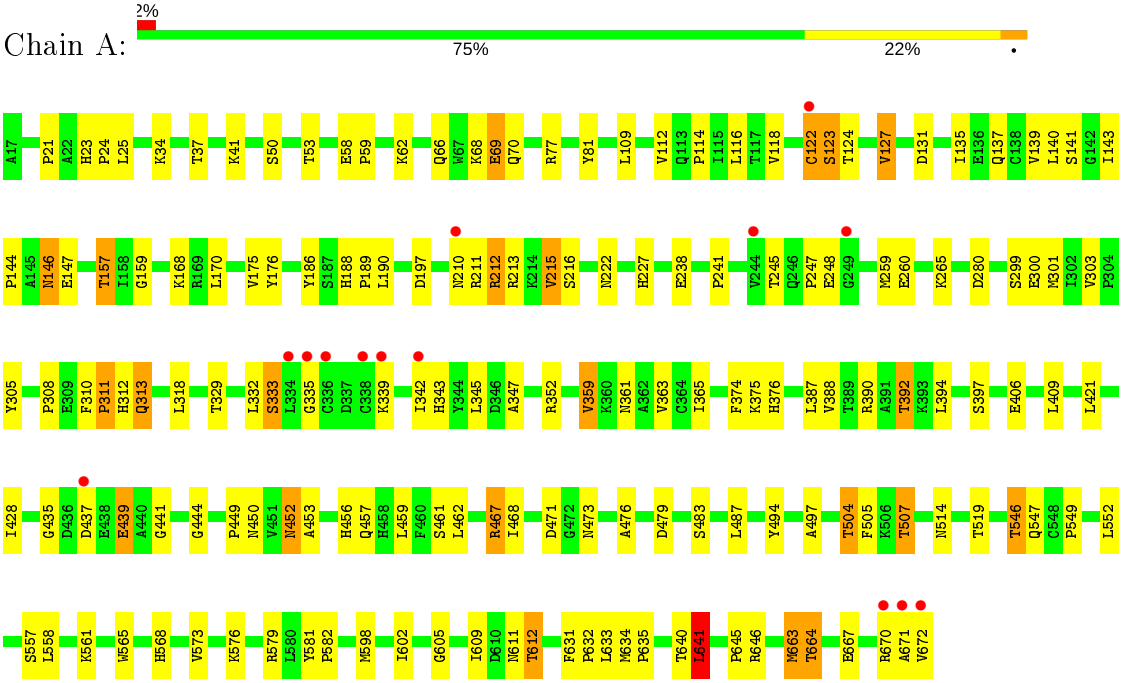
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	492	Total	O	0	0
			492	492		
3	B	491	Total	O	0	0
			491	491		
3	C	493	Total	O	0	0
			493	493		

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.

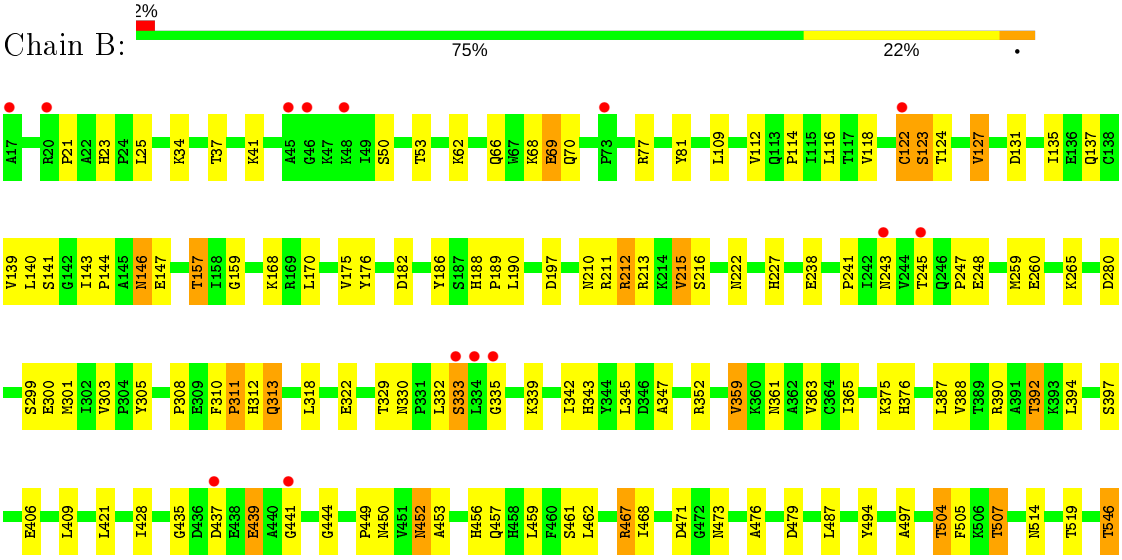
- Molecule 1: COPPER AMINE OXIDASE

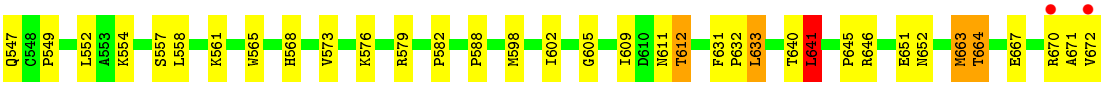
Chain A:



- Molecule 1: COPPER AMINE OXIDASE

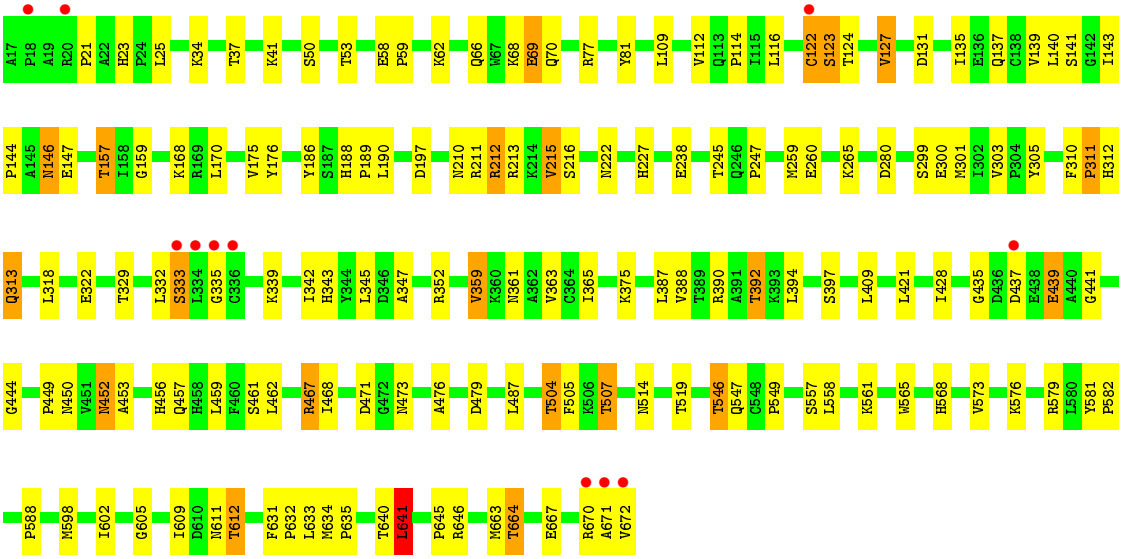
Chain B:





- Molecule 1: COPPER AMINE OXIDASE

Chain C:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	139.23Å 153.51Å 223.41Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	500.00 – 2.50 34.38 – 2.40	Depositor EDS
% Data completeness (in resolution range)	77.9 (500.00-2.50) 73.0 (34.38-2.40)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.80 (at 2.39Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.183 , 0.208 0.174 , 0.200	Depositor DCC
R_{free} test set	6852 reflections (10.12%)	wwPDB-VP
Wilson B-factor (Å^2)	24.0	Xtriage
Anisotropy	0.392	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 39.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	17070	wwPDB-VP
Average B, all atoms (Å^2)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.11% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 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	0.46	1/5348 (0.0%)	0.75	1/7280 (0.0%)
1	B	0.46	1/5348 (0.0%)	0.75	1/7280 (0.0%)
1	C	0.46	1/5348 (0.0%)	0.75	1/7280 (0.0%)
All	All	0.46	3/16044 (0.0%)	0.75	3/21840 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	122	CYS	CB-SG	5.66	1.91	1.82
1	C	122	CYS	CB-SG	5.64	1.91	1.82
1	B	122	CYS	CB-SG	5.61	1.91	1.82

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	641	LEU	CA-CB-CG	7.18	131.82	115.30
1	C	641	LEU	CA-CB-CG	7.18	131.82	115.30
1	B	641	LEU	CA-CB-CG	7.17	131.79	115.30

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	5197	0	5037	137	0
1	B	5197	0	5037	134	0
1	C	5197	0	5037	103	1
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
3	A	492	0	0	10	1
3	B	491	0	0	9	0
3	C	493	0	0	6	0
All	All	17070	0	15111	345	2

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 11.

All (345) 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:546:THR:HG21	1:B:546:THR:CG2	1.22	1.60
1:A:546:THR:CG2	1:B:546:THR:HG21	1.24	1.57
1:A:546:THR:CG2	1:B:546:THR:CG2	1.96	1.18
1:A:664:THR:HG22	1:A:667:GLU:H	1.26	0.99
1:C:664:THR:HG22	1:C:667:GLU:H	1.26	0.98
1:A:546:THR:HG21	1:B:546:THR:HG23	1.48	0.96
1:B:664:THR:HG22	1:B:667:GLU:H	1.26	0.95
1:A:313:GLN:HG2	1:B:494:TYR:CD1	2.00	0.95
1:C:23:HIS:HD2	1:C:25:LEU:H	1.08	0.95
1:B:23:HIS:HD2	1:B:25:LEU:H	1.08	0.95
1:B:311:PRO:HA	1:B:313:GLN:HE22	1.35	0.92
1:A:546:THR:CG2	1:B:546:THR:HG23	2.00	0.91
1:A:23:HIS:HD2	1:A:25:LEU:H	1.08	0.90
1:A:311:PRO:HA	1:A:313:GLN:HE22	1.35	0.90
1:A:546:THR:HG23	1:B:546:THR:CG2	2.03	0.89
1:C:311:PRO:HA	1:C:313:GLN:HE22	1.35	0.88
1:A:494:TYR:CD1	1:B:313:GLN:HG2	2.09	0.88
1:C:311:PRO:HA	1:C:313:GLN:NE2	1.96	0.81
1:A:311:PRO:HA	1:A:313:GLN:NE2	1.97	0.80
1:B:311:PRO:HA	1:B:313:GLN:NE2	1.96	0.79
1:A:546:THR:HG23	1:B:546:THR:HG21	1.54	0.79
1:A:546:THR:HG21	1:B:546:THR:HG22	1.58	0.77
1:A:144:PRO:HG2	1:A:147:GLU:HG3	1.67	0.76
1:B:144:PRO:HG2	1:B:147:GLU:HG3	1.67	0.76
1:A:546:THR:HG22	1:B:546:THR:HG21	1.57	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:23:HIS:CD2	1:B:25:LEU:H	2.00	0.75
1:C:144:PRO:HG2	1:C:147:GLU:HG3	1.67	0.75
1:B:157:THR:HB	1:B:159:GLY:H	1.53	0.74
1:A:157:THR:HB	1:A:159:GLY:H	1.53	0.73
1:C:157:THR:HB	1:C:159:GLY:H	1.53	0.73
1:C:23:HIS:CD2	1:C:25:LEU:H	2.01	0.73
1:B:507:THR:HG23	1:B:605:GLY:O	1.89	0.73
1:C:507:THR:HG23	1:C:605:GLY:O	1.89	0.73
1:A:23:HIS:CD2	1:A:25:LEU:H	2.00	0.73
1:C:392:THR:HG22	3:C:804:HOH:O	1.89	0.72
1:B:392:THR:HG22	3:B:873:HOH:O	1.89	0.72
1:A:392:THR:HG22	3:A:767:HOH:O	1.89	0.71
1:A:546:THR:HG21	1:B:546:THR:HG21	0.77	0.71
1:A:507:THR:HG23	1:A:605:GLY:O	1.89	0.71
1:B:50:SER:HB2	1:B:352:ARG:HG2	1.73	0.71
1:A:50:SER:HB2	1:A:352:ARG:HG2	1.73	0.70
1:B:137:GLN:OE1	1:B:212:ARG:NH2	2.25	0.70
1:C:137:GLN:OE1	1:C:212:ARG:NH2	2.25	0.69
1:B:664:THR:HG21	3:B:715:HOH:O	1.92	0.69
1:C:50:SER:HB2	1:C:352:ARG:HG2	1.73	0.69
1:A:137:GLN:OE1	1:A:212:ARG:NH2	2.25	0.68
1:A:664:THR:HG22	1:A:667:GLU:N	2.07	0.68
1:C:664:THR:HG22	1:C:667:GLU:N	2.07	0.68
1:A:68:LYS:HE2	1:A:280:ASP:OD2	1.95	0.67
1:C:68:LYS:HE2	1:C:280:ASP:OD2	1.95	0.67
1:B:664:THR:HG22	1:B:667:GLU:N	2.07	0.66
1:B:670:ARG:NH2	3:B:786:HOH:O	2.28	0.66
1:B:68:LYS:HE2	1:B:280:ASP:OD2	1.95	0.66
1:A:146:ASN:N	1:A:146:ASN:HD22	1.94	0.65
1:A:631:PHE:CG	1:A:632:PRO:HA	2.32	0.65
1:B:631:PHE:CG	1:B:632:PRO:HA	2.32	0.65
1:C:631:PHE:CG	1:C:632:PRO:HA	2.32	0.65
1:B:146:ASN:HD22	1:B:146:ASN:N	1.94	0.64
1:C:598:MET:HE3	1:C:602:ILE:HG13	1.77	0.64
1:C:146:ASN:HD22	1:C:146:ASN:N	1.94	0.64
1:C:211:ARG:NH2	1:C:435:GLY:HA3	2.13	0.63
1:A:211:ARG:NH2	1:A:435:GLY:HA3	2.13	0.63
1:B:211:ARG:NH2	1:B:435:GLY:HA3	2.13	0.63
1:B:598:MET:HE3	1:B:602:ILE:HG13	1.82	0.62
1:A:248:GLU:HB2	1:B:241:PRO:HD2	1.82	0.61
1:A:123:SER:O	1:A:127:VAL:HG12	2.01	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:598:MET:HE3	1:A:602:ILE:HG13	1.83	0.61
1:B:123:SER:O	1:B:127:VAL:HG12	2.01	0.61
1:C:123:SER:O	1:C:127:VAL:HG12	2.01	0.60
1:A:376:HIS:ND1	1:B:406:GLU:OE2	2.35	0.60
1:B:452:ASN:HD22	1:B:453:ALA:N	2.01	0.59
1:C:598:MET:CE	1:C:602:ILE:HG13	2.33	0.59
1:B:146:ASN:HD22	1:B:146:ASN:H	1.51	0.58
1:A:598:MET:CE	1:A:602:ILE:HG13	2.33	0.58
1:B:190:LEU:CD2	1:B:215:VAL:HG13	2.34	0.58
1:B:598:MET:CE	1:B:602:ILE:HG13	2.33	0.58
1:A:452:ASN:HD22	1:A:453:ALA:N	2.01	0.58
1:A:565:TRP:CD1	1:A:582:PRO:HB2	2.39	0.58
1:C:565:TRP:CD1	1:C:582:PRO:HB2	2.39	0.58
1:A:573:VAL:HG11	1:A:598:MET:HE1	1.86	0.58
1:B:565:TRP:CD1	1:B:582:PRO:HB2	2.39	0.58
1:B:468:ILE:H	1:B:473:ASN:HD21	1.52	0.57
1:C:190:LEU:CD2	1:C:215:VAL:HG13	2.34	0.57
1:B:573:VAL:HG11	1:B:598:MET:HE1	1.87	0.57
1:C:468:ILE:H	1:C:473:ASN:HD21	1.52	0.57
1:A:190:LEU:CD2	1:A:215:VAL:HG13	2.34	0.57
1:A:452:ASN:HD22	1:A:452:ASN:C	2.08	0.57
1:C:452:ASN:HD22	1:C:453:ALA:N	2.01	0.57
1:A:146:ASN:H	1:A:146:ASN:HD22	1.51	0.56
1:A:557:SER:O	1:A:561:LYS:HG3	2.05	0.56
1:B:452:ASN:HD22	1:B:452:ASN:C	2.07	0.56
1:B:347:ALA:HB3	1:B:359:VAL:HG13	1.88	0.56
1:A:313:GLN:HG2	1:B:494:TYR:CE1	2.39	0.56
1:C:557:SER:O	1:C:561:LYS:HG3	2.05	0.56
1:C:146:ASN:HD22	1:C:146:ASN:H	1.51	0.56
1:C:452:ASN:HD22	1:C:452:ASN:C	2.07	0.56
1:B:439:GLU:C	1:B:441:GLY:H	2.09	0.56
1:A:468:ILE:H	1:A:473:ASN:HD21	1.52	0.56
1:B:557:SER:O	1:B:561:LYS:HG3	2.05	0.56
1:C:671:ALA:O	1:C:672:VAL:HB	2.06	0.56
1:C:439:GLU:C	1:C:441:GLY:H	2.09	0.55
1:A:347:ALA:HB3	1:A:359:VAL:HG13	1.88	0.55
1:B:124:THR:O	1:B:127:VAL:HG13	2.07	0.55
1:B:146:ASN:ND2	1:B:146:ASN:H	2.05	0.55
1:C:312:HIS:HD2	3:C:1064:HOH:O	1.89	0.55
1:A:146:ASN:ND2	1:A:146:ASN:H	2.05	0.55
1:B:671:ALA:O	1:B:672:VAL:HB	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:573:VAL:HG11	1:C:598:MET:HE1	1.88	0.55
1:A:671:ALA:O	1:A:672:VAL:HB	2.06	0.54
1:C:347:ALA:HB3	1:C:359:VAL:HG13	1.88	0.54
1:A:312:HIS:HD2	3:A:977:HOH:O	1.90	0.54
1:B:479:ASP:HB3	1:B:519:THR:HB	1.90	0.54
1:A:124:THR:O	1:A:127:VAL:HG13	2.07	0.54
1:A:439:GLU:C	1:A:441:GLY:H	2.09	0.54
1:C:504:THR:HG21	3:C:1099:HOH:O	2.08	0.54
1:C:124:THR:O	1:C:127:VAL:HG13	2.07	0.54
1:A:479:ASP:HB3	1:A:519:THR:HB	1.89	0.54
1:A:514:ASN:OD1	1:A:568:HIS:HA	2.07	0.54
1:C:375:LYS:HG3	1:C:388:VAL:HG22	1.90	0.54
1:C:546:THR:HB	3:C:1060:HOH:O	2.08	0.54
1:B:312:HIS:HD2	3:B:1085:HOH:O	1.90	0.53
1:B:514:ASN:OD1	1:B:568:HIS:HA	2.07	0.53
1:C:146:ASN:H	1:C:146:ASN:ND2	2.05	0.53
1:A:375:LYS:HG3	1:A:388:VAL:HG22	1.90	0.53
1:B:375:LYS:HG3	1:B:388:VAL:HG22	1.90	0.53
1:C:514:ASN:OD1	1:C:568:HIS:HA	2.07	0.53
1:A:504:THR:HG21	3:A:994:HOH:O	2.08	0.53
1:C:479:ASP:HB3	1:C:519:THR:HB	1.90	0.53
1:C:664:THR:CG2	1:C:667:GLU:H	2.12	0.53
1:B:504:THR:HG21	3:B:1102:HOH:O	2.08	0.52
1:B:576:LYS:HB2	1:B:579:ARG:HD2	1.92	0.52
1:A:631:PHE:CD1	1:A:632:PRO:HA	2.45	0.52
1:B:144:PRO:HG2	1:B:147:GLU:CG	2.40	0.52
1:C:631:PHE:CD1	1:C:632:PRO:HA	2.45	0.52
1:B:439:GLU:C	1:B:441:GLY:N	2.63	0.52
1:A:459:LEU:HD21	1:A:549:PRO:HG2	1.92	0.52
1:B:168:LYS:HD3	1:B:197:ASP:OD2	2.10	0.52
1:C:168:LYS:HD3	1:C:197:ASP:OD2	2.10	0.52
1:A:439:GLU:C	1:A:441:GLY:N	2.63	0.52
1:B:459:LEU:HD21	1:B:549:PRO:HG2	1.92	0.52
1:C:459:LEU:HD21	1:C:549:PRO:HG2	1.92	0.51
1:C:439:GLU:C	1:C:441:GLY:N	2.63	0.51
1:C:576:LYS:HB2	1:C:579:ARG:HD2	1.92	0.51
1:B:476:ALA:HB2	1:B:504:THR:HA	1.92	0.51
1:B:664:THR:CG2	1:B:667:GLU:H	2.12	0.51
1:A:483:SER:O	1:B:554:LYS:NZ	2.44	0.51
1:C:146:ASN:ND2	1:C:146:ASN:N	2.59	0.51
1:A:241:PRO:HD2	1:B:248:GLU:HB2	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:168:LYS:HD3	1:A:197:ASP:OD2	2.10	0.51
1:A:547:GLN:NE2	1:A:640:THR:H	2.09	0.51
1:A:576:LYS:HB2	1:A:579:ARG:HD2	1.92	0.51
1:B:631:PHE:CD1	1:B:632:PRO:HA	2.45	0.51
1:C:476:ALA:HB2	1:C:504:THR:HA	1.92	0.51
1:A:497:ALA:HB2	1:B:308:PRO:HB3	1.94	0.50
1:A:476:ALA:HB2	1:A:504:THR:HA	1.92	0.50
1:A:146:ASN:ND2	1:A:146:ASN:N	2.59	0.50
1:B:547:GLN:NE2	1:B:640:THR:H	2.09	0.50
1:A:494:TYR:CE1	1:B:313:GLN:HG2	2.47	0.50
1:B:259:MET:CE	1:B:365:ILE:HG21	2.43	0.49
1:C:547:GLN:NE2	1:C:640:THR:H	2.09	0.49
1:A:259:MET:CE	1:A:365:ILE:HG21	2.43	0.49
1:B:645:PRO:O	1:B:646:ARG:HD2	2.13	0.49
1:A:645:PRO:O	1:A:646:ARG:HD2	2.13	0.49
1:C:259:MET:CE	1:C:365:ILE:HG21	2.43	0.49
1:B:546:THR:HB	3:B:771:HOH:O	2.12	0.49
1:C:645:PRO:O	1:C:646:ARG:HD2	2.12	0.49
1:B:146:ASN:N	1:B:146:ASN:ND2	2.59	0.49
1:A:670:ARG:NH2	3:A:1164:HOH:O	2.45	0.48
1:B:397:SER:HB2	1:B:409:LEU:O	2.14	0.48
1:A:376:HIS:HA	1:B:406:GLU:CD	2.34	0.48
1:A:69:GLU:OE2	1:A:467:ARG:NH2	2.47	0.48
1:B:452:ASN:ND2	1:B:452:ASN:C	2.67	0.48
1:C:444:GLY:HA3	1:C:452:ASN:HD21	1.78	0.48
1:C:69:GLU:OE2	1:C:467:ARG:NH2	2.47	0.47
1:B:116:LEU:HD12	1:B:157:THR:HG23	1.97	0.47
1:A:144:PRO:HG2	1:A:147:GLU:CG	2.40	0.47
1:B:444:GLY:HA3	1:B:452:ASN:HD21	1.78	0.47
1:C:310:PHE:HA	1:C:313:GLN:HE21	1.79	0.47
1:A:247:PRO:HG2	1:B:243:ASN:ND2	2.30	0.47
1:A:310:PHE:HA	1:A:313:GLN:HE21	1.79	0.47
1:B:69:GLU:OE2	1:B:467:ARG:NH2	2.47	0.47
1:C:260:GLU:HG2	1:C:265:LYS:HG3	1.97	0.47
1:C:397:SER:HB2	1:C:409:LEU:O	2.14	0.47
1:C:437:ASP:HB2	3:C:988:HOH:O	2.15	0.47
1:C:452:ASN:C	1:C:452:ASN:ND2	2.67	0.47
1:A:116:LEU:HD12	1:A:157:THR:HG23	1.97	0.47
1:A:452:ASN:ND2	1:A:452:ASN:C	2.67	0.47
1:A:641:LEU:C	1:A:641:LEU:HD23	2.35	0.47
1:A:345:LEU:HB2	1:A:363:VAL:HB	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:260:GLU:HG2	1:B:265:LYS:HG3	1.97	0.47
1:B:310:PHE:HA	1:B:313:GLN:HE21	1.79	0.47
1:B:461:SER:HB2	1:B:565:TRP:CE3	2.50	0.47
1:A:397:SER:HB2	1:A:409:LEU:O	2.14	0.47
1:A:124:THR:HA	1:A:127:VAL:CG1	2.45	0.47
1:B:641:LEU:HD23	1:B:641:LEU:C	2.35	0.47
1:C:124:THR:HA	1:C:127:VAL:CG1	2.45	0.47
1:C:461:SER:HB2	1:C:565:TRP:CE3	2.50	0.46
1:A:461:SER:HB2	1:A:565:TRP:CE3	2.50	0.46
1:B:124:THR:HA	1:B:127:VAL:CG1	2.46	0.46
1:A:375:LYS:O	1:B:406:GLU:HG3	2.16	0.46
1:C:301:MET:O	1:C:318:LEU:HA	2.15	0.46
1:A:664:THR:HG21	3:A:1089:HOH:O	2.16	0.46
1:B:437:ASP:HB2	3:B:1025:HOH:O	2.15	0.46
1:C:131:ASP:O	1:C:135:ILE:HG13	2.16	0.46
1:C:345:LEU:HB2	1:C:363:VAL:HB	1.97	0.46
1:C:186:TYR:CD2	1:C:428:ILE:HG21	2.51	0.46
1:C:641:LEU:C	1:C:641:LEU:HD23	2.35	0.46
1:A:186:TYR:CD2	1:A:428:ILE:HG21	2.51	0.46
1:A:68:LYS:HE2	1:A:280:ASP:CG	2.35	0.46
1:B:131:ASP:O	1:B:135:ILE:HG13	2.16	0.46
1:B:68:LYS:HE2	1:B:280:ASP:CG	2.36	0.46
1:A:245:THR:C	1:A:247:PRO:HD3	2.36	0.46
1:A:444:GLY:HA3	1:A:452:ASN:HD21	1.78	0.46
1:A:313:GLN:HG2	1:B:494:TYR:CG	2.47	0.46
1:B:301:MET:O	1:B:318:LEU:HA	2.15	0.46
1:C:144:PRO:HG2	1:C:147:GLU:CG	2.39	0.46
1:C:671:ALA:O	1:C:672:VAL:CB	2.64	0.46
1:C:116:LEU:HD12	1:C:157:THR:HG23	1.97	0.46
1:C:190:LEU:HD21	1:C:215:VAL:HG13	1.98	0.46
1:A:301:MET:O	1:A:318:LEU:HA	2.15	0.46
1:B:671:ALA:O	1:B:672:VAL:CB	2.64	0.46
1:B:66:GLN:HG2	1:B:70:GLN:NE2	2.31	0.46
1:A:247:PRO:HG2	1:B:243:ASN:HD22	1.81	0.46
1:C:68:LYS:HE2	1:C:280:ASP:CG	2.35	0.46
1:A:131:ASP:O	1:A:135:ILE:HG13	2.16	0.45
1:A:260:GLU:HG2	1:A:265:LYS:HG3	1.97	0.45
1:A:437:ASP:HB2	3:A:916:HOH:O	2.15	0.45
1:A:62:LYS:HE2	1:A:62:LYS:HB3	1.70	0.45
1:B:245:THR:C	1:B:247:PRO:HD3	2.36	0.45
1:C:141:SER:O	1:C:215:VAL:HG22	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:299:SER:O	1:A:300:GLU:HB2	2.16	0.45
1:A:671:ALA:O	1:A:672:VAL:CB	2.64	0.45
1:B:141:SER:O	1:B:215:VAL:HG22	2.16	0.45
1:A:21:PRO:HG3	1:A:77:ARG:CZ	2.46	0.45
1:C:21:PRO:HG3	1:C:77:ARG:CZ	2.46	0.45
1:A:66:GLN:HG2	1:A:70:GLN:NE2	2.31	0.45
1:B:186:TYR:CD2	1:B:428:ILE:HG21	2.51	0.45
1:B:299:SER:O	1:B:300:GLU:HB2	2.16	0.45
1:B:175:VAL:HG11	1:B:190:LEU:HD12	1.99	0.45
1:B:345:LEU:HB2	1:B:363:VAL:HB	1.97	0.45
1:A:546:THR:HB	3:A:1147:HOH:O	2.16	0.45
1:B:310:PHE:HA	1:B:313:GLN:NE2	2.32	0.45
1:B:21:PRO:HG3	1:B:77:ARG:CZ	2.47	0.45
1:A:141:SER:O	1:A:215:VAL:HG22	2.16	0.45
1:A:663:MET:HA	1:A:663:MET:HE2	1.98	0.45
1:B:190:LEU:HD21	1:B:215:VAL:HG13	1.98	0.45
1:B:387:LEU:C	1:B:387:LEU:HD23	2.37	0.45
1:C:245:THR:C	1:C:247:PRO:HD3	2.36	0.45
1:C:299:SER:O	1:C:300:GLU:HB2	2.16	0.45
1:A:190:LEU:HD21	1:A:215:VAL:HG13	1.98	0.44
1:C:634:MET:HA	1:C:635:PRO:HD3	1.93	0.44
1:A:333:SER:HB2	1:A:361:ASN:OD1	2.18	0.44
1:A:375:LYS:HE2	3:A:1074:HOH:O	2.16	0.44
1:B:62:LYS:HE2	1:B:62:LYS:HB3	1.70	0.44
1:C:333:SER:HB2	1:C:361:ASN:OD1	2.18	0.44
1:C:66:GLN:HG2	1:C:70:GLN:NE2	2.31	0.44
1:A:175:VAL:HG11	1:A:190:LEU:HD12	1.99	0.44
1:A:387:LEU:HD23	1:A:387:LEU:C	2.37	0.44
1:A:449:PRO:O	1:A:450:ASN:HB2	2.18	0.44
1:C:175:VAL:HG11	1:C:190:LEU:HD12	1.99	0.44
1:A:308:PRO:HB3	1:B:497:ALA:HB2	2.00	0.44
1:C:387:LEU:HD23	1:C:387:LEU:C	2.37	0.44
1:A:310:PHE:HA	1:A:313:GLN:NE2	2.32	0.44
1:B:333:SER:HB2	1:B:361:ASN:OD1	2.18	0.44
1:B:449:PRO:O	1:B:450:ASN:HB2	2.18	0.44
1:B:139:VAL:HA	1:B:143:ILE:O	2.18	0.43
1:B:476:ALA:CB	1:B:504:THR:HA	2.48	0.43
1:C:310:PHE:HA	1:C:313:GLN:NE2	2.32	0.43
1:A:670:ARG:C	1:A:672:VAL:H	2.22	0.43
1:C:670:ARG:C	1:C:672:VAL:H	2.21	0.43
1:A:176:TYR:CE1	1:A:189:PRO:HB3	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:53:THR:O	1:A:81:TYR:HA	2.18	0.43
1:A:664:THR:HG23	1:B:182:ASP:OD1	2.18	0.43
1:B:53:THR:O	1:B:81:TYR:HA	2.18	0.43
1:A:342:ILE:HG22	1:A:343:HIS:N	2.34	0.43
1:B:176:TYR:CE1	1:B:189:PRO:HB3	2.53	0.43
1:A:581:TYR:HA	1:A:582:PRO:HD3	1.59	0.43
1:C:176:TYR:CE1	1:C:189:PRO:HB3	2.53	0.43
1:C:449:PRO:O	1:C:450:ASN:HB2	2.18	0.43
1:C:53:THR:O	1:C:81:TYR:HA	2.18	0.43
1:A:476:ALA:CB	1:A:504:THR:HA	2.48	0.43
1:A:641:LEU:CD2	1:A:641:LEU:C	2.87	0.43
1:C:476:ALA:CB	1:C:504:THR:HA	2.48	0.43
1:A:23:HIS:HA	1:A:24:PRO:HD3	1.95	0.42
1:A:573:VAL:HG11	1:A:598:MET:CE	2.48	0.42
1:B:641:LEU:C	1:B:641:LEU:CD2	2.87	0.42
1:C:139:VAL:HA	1:C:143:ILE:O	2.18	0.42
1:C:573:VAL:HG11	1:C:598:MET:CE	2.48	0.42
1:B:342:ILE:HG22	1:B:343:HIS:N	2.34	0.42
1:A:139:VAL:HA	1:A:143:ILE:O	2.18	0.42
1:B:663:MET:HE2	1:B:663:MET:HA	2.01	0.42
1:C:62:LYS:HE2	1:C:62:LYS:HB3	1.70	0.42
1:B:573:VAL:HG11	1:B:598:MET:CE	2.48	0.42
1:C:342:ILE:HG22	1:C:343:HIS:N	2.34	0.42
1:C:37:THR:O	1:C:41:LYS:HG3	2.20	0.42
1:A:210:ASN:N	1:A:210:ASN:HD22	2.18	0.42
1:B:670:ARG:C	1:B:672:VAL:H	2.21	0.42
1:C:58:GLU:HA	1:C:59:PRO:HD3	1.90	0.42
1:A:305:TYR:CD2	1:A:456:HIS:HB3	2.55	0.42
1:A:37:THR:O	1:A:41:LYS:HG3	2.20	0.42
1:B:188:HIS:CD2	1:B:216:SER:HB3	2.55	0.42
1:B:305:TYR:CD2	1:B:456:HIS:HB3	2.55	0.42
1:A:58:GLU:HA	1:A:59:PRO:HD3	1.90	0.42
1:B:37:THR:O	1:B:41:LYS:HG3	2.20	0.42
1:B:505:PHE:HB3	1:B:609:ILE:HD11	2.02	0.42
1:A:68:LYS:HE2	1:A:280:ASP:OD1	2.19	0.41
1:A:505:PHE:HB3	1:A:609:ILE:HD11	2.02	0.41
1:B:467:ARG:HH11	1:B:471:ASP:CG	2.23	0.41
1:C:188:HIS:CD2	1:C:216:SER:HB3	2.55	0.41
1:C:467:ARG:HH11	1:C:471:ASP:CG	2.23	0.41
1:A:303:VAL:HA	1:A:457:GLN:O	2.20	0.41
1:B:68:LYS:HE2	1:B:280:ASP:OD1	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:210:ASN:HD22	1:C:210:ASN:N	2.18	0.41
1:A:598:MET:O	1:A:598:MET:HE3	2.21	0.41
1:C:581:TYR:HA	1:C:582:PRO:HD3	1.58	0.41
1:C:641:LEU:CD2	1:C:641:LEU:C	2.87	0.41
1:C:68:LYS:HE2	1:C:280:ASP:OD1	2.19	0.41
1:A:188:HIS:CD2	1:A:216:SER:HB3	2.55	0.41
1:C:305:TYR:CD2	1:C:456:HIS:HB3	2.55	0.41
1:B:210:ASN:N	1:B:210:ASN:HD22	2.18	0.41
1:A:634:MET:HA	1:A:635:PRO:HD3	1.93	0.41
1:B:303:VAL:HA	1:B:457:GLN:O	2.21	0.41
1:A:664:THR:CG2	1:A:667:GLU:H	2.12	0.41
1:B:457:GLN:HE22	1:B:552:LEU:H	1.69	0.41
1:C:222:ASN:HB3	1:C:227:HIS:ND1	2.36	0.41
1:C:303:VAL:HA	1:C:457:GLN:O	2.20	0.41
1:A:222:ASN:HB3	1:A:227:HIS:ND1	2.36	0.41
1:A:374:PHE:CD1	1:B:633:LEU:HD13	2.55	0.41
1:A:612:THR:HG21	3:A:975:HOH:O	2.21	0.41
1:B:222:ASN:HB3	1:B:227:HIS:ND1	2.36	0.41
1:B:598:MET:HE3	1:B:598:MET:O	2.21	0.41
1:C:124:THR:HA	1:C:127:VAL:HG13	2.03	0.41
1:C:505:PHE:HB3	1:C:609:ILE:HD11	2.02	0.41
1:A:118:VAL:HG13	3:A:905:HOH:O	2.21	0.41
1:A:457:GLN:HE22	1:A:552:LEU:H	1.69	0.41
1:A:467:ARG:HH11	1:A:471:ASP:CG	2.23	0.41
1:B:118:VAL:HG13	3:B:1014:HOH:O	2.21	0.40
1:A:375:LYS:NZ	1:B:330:ASN:HD22	2.19	0.40
1:A:406:GLU:OE2	1:B:376:HIS:ND1	2.49	0.40
1:B:322:GLU:HG2	1:B:588:PRO:HG3	2.03	0.40
1:B:612:THR:HG21	3:B:1083:HOH:O	2.21	0.40
1:C:322:GLU:HG2	1:C:588:PRO:HG3	2.03	0.40
1:C:612:THR:HG21	3:C:1062:HOH:O	2.21	0.40
1:B:651:GLU:O	1:B:652:ASN:C	2.60	0.40
1:C:598:MET:O	1:C:598:MET:HE3	2.21	0.40

All (2) 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)
1:C:546:THR:CG2	1:C:546:THR:CG2[3_555]	1.83	0.37
3:A:1119:HOH:O	3:A:1119:HOH:O[3_555]	2.13	0.07

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	654/656 (100%)	620 (95%)	31 (5%)	3 (0%)	29	48
1	B	654/656 (100%)	620 (95%)	31 (5%)	3 (0%)	29	48
1	C	654/656 (100%)	620 (95%)	31 (5%)	3 (0%)	29	48
All	All	1962/1968 (100%)	1860 (95%)	93 (5%)	9 (0%)	29	48

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	123	SER
1	B	123	SER
1	C	123	SER
1	A	333	SER
1	A	335	GLY
1	B	333	SER
1	B	335	GLY
1	C	333	SER
1	C	335	GLY

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	566/566 (100%)	526 (93%)	40 (7%)	14	28
1	B	566/566 (100%)	526 (93%)	40 (7%)	14	28
1	C	566/566 (100%)	526 (93%)	40 (7%)	14	28

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1698/1698 (100%)	1578 (93%)	120 (7%)	14 28

All (120) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	34	LYS
1	A	69	GLU
1	A	109	LEU
1	A	112	VAL
1	A	114	PRO
1	A	122	CYS
1	A	127	VAL
1	A	140	LEU
1	A	146	ASN
1	A	157	THR
1	A	170	LEU
1	A	212	ARG
1	A	213	ARG
1	A	215	VAL
1	A	238	GLU
1	A	311	PRO
1	A	313	GLN
1	A	329	THR
1	A	332	LEU
1	A	339	LYS
1	A	359	VAL
1	A	390	ARG
1	A	392	THR
1	A	394	LEU
1	A	421	LEU
1	A	439	GLU
1	A	452	ASN
1	A	462	LEU
1	A	467	ARG
1	A	487	LEU
1	A	504	THR
1	A	507	THR
1	A	546	THR
1	A	558	LEU
1	A	611	ASN
1	A	612	THR
1	A	633	LEU

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Mol	Chain	Res	Type
1	A	641	LEU
1	A	663	MET
1	A	664	THR
1	B	34	LYS
1	B	69	GLU
1	B	109	LEU
1	B	112	VAL
1	B	114	PRO
1	B	122	CYS
1	B	127	VAL
1	B	140	LEU
1	B	146	ASN
1	B	157	THR
1	B	170	LEU
1	B	212	ARG
1	B	213	ARG
1	B	215	VAL
1	B	238	GLU
1	B	311	PRO
1	B	313	GLN
1	B	329	THR
1	B	332	LEU
1	B	339	LYS
1	B	359	VAL
1	B	390	ARG
1	B	392	THR
1	B	394	LEU
1	B	421	LEU
1	B	439	GLU
1	B	452	ASN
1	B	462	LEU
1	B	467	ARG
1	B	487	LEU
1	B	504	THR
1	B	507	THR
1	B	546	THR
1	B	558	LEU
1	B	611	ASN
1	B	612	THR
1	B	633	LEU
1	B	641	LEU
1	B	663	MET

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Mol	Chain	Res	Type
1	B	664	THR
1	C	34	LYS
1	C	69	GLU
1	C	109	LEU
1	C	112	VAL
1	C	114	PRO
1	C	122	CYS
1	C	127	VAL
1	C	140	LEU
1	C	146	ASN
1	C	157	THR
1	C	170	LEU
1	C	212	ARG
1	C	213	ARG
1	C	215	VAL
1	C	238	GLU
1	C	311	PRO
1	C	313	GLN
1	C	329	THR
1	C	332	LEU
1	C	339	LYS
1	C	359	VAL
1	C	390	ARG
1	C	392	THR
1	C	394	LEU
1	C	421	LEU
1	C	439	GLU
1	C	452	ASN
1	C	462	LEU
1	C	467	ARG
1	C	487	LEU
1	C	504	THR
1	C	507	THR
1	C	546	THR
1	C	558	LEU
1	C	611	ASN
1	C	612	THR
1	C	633	LEU
1	C	641	LEU
1	C	663	MET
1	C	664	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (56) such

sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	HIS
1	A	66	GLN
1	A	70	GLN
1	A	146	ASN
1	A	210	ASN
1	A	218	HIS
1	A	243	ASN
1	A	286	HIS
1	A	288	ASN
1	A	312	HIS
1	A	313	GLN
1	A	330	ASN
1	A	450	ASN
1	A	452	ASN
1	A	457	GLN
1	A	473	ASN
1	A	529	ASN
1	A	547	GLN
1	A	611	ASN
1	B	23	HIS
1	B	66	GLN
1	B	70	GLN
1	B	146	ASN
1	B	210	ASN
1	B	218	HIS
1	B	243	ASN
1	B	286	HIS
1	B	288	ASN
1	B	312	HIS
1	B	313	GLN
1	B	330	ASN
1	B	450	ASN
1	B	452	ASN
1	B	457	GLN
1	B	473	ASN
1	B	529	ASN
1	B	547	GLN
1	B	611	ASN
1	C	23	HIS
1	C	66	GLN
1	C	70	GLN
1	C	146	ASN

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Mol	Chain	Res	Type
1	C	210	ASN
1	C	218	HIS
1	C	286	HIS
1	C	288	ASN
1	C	312	HIS
1	C	313	GLN
1	C	330	ASN
1	C	450	ASN
1	C	452	ASN
1	C	457	GLN
1	C	473	ASN
1	C	529	ASN
1	C	547	GLN
1	C	611	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 3 ligands modelled in this entry, 3 are 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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	656/656 (100%)	-0.34	14 (2%)	63	66	13, 21, 40, 69	0
1	B	656/656 (100%)	-0.30	16 (2%)	59	62	13, 21, 40, 69	0
1	C	656/656 (100%)	-0.37	11 (1%)	70	72	13, 21, 40, 69	0
All	All	1968/1968 (100%)	-0.34	41 (2%)	63	66	13, 21, 40, 69	0

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	334	LEU	6.6
1	A	672	VAL	6.4
1	A	335	GLY	5.5
1	B	672	VAL	5.2
1	C	672	VAL	5.2
1	C	334	LEU	4.9
1	B	335	GLY	4.9
1	A	671	ALA	4.8
1	C	335	GLY	4.5
1	A	336	CYS	3.8
1	A	339	LYS	3.6
1	C	437	ASP	3.5
1	C	671	ALA	3.4
1	C	333	SER	3.3
1	A	670	ARG	3.2
1	B	437	ASP	3.1
1	B	122	CYS	3.0
1	A	210	ASN	3.0
1	A	334	LEU	2.9
1	B	670	ARG	2.9
1	C	20	ARG	2.8
1	C	122	CYS	2.5
1	A	249	GLY	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	244	VAL	2.4
1	A	437	ASP	2.4
1	C	18	PRO	2.4
1	B	243	ASN	2.4
1	C	670	ARG	2.4
1	A	338	CYS	2.4
1	B	17	ALA	2.4
1	C	336	CYS	2.3
1	B	46	GLY	2.3
1	B	73	PRO	2.2
1	B	45	ALA	2.2
1	B	20	ARG	2.1
1	A	342	ILE	2.1
1	B	48	LYS	2.1
1	A	122	CYS	2.0
1	B	441	GLY	2.0
1	B	245	THR	2.0
1	B	333	SER	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 monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	ZN	B	701	1/1	0.99	0.03	21,21,21,21	0
2	ZN	A	701	1/1	1.00	0.04	21,21,21,21	0
2	ZN	C	701	1/1	1.00	0.07	21,21,21,21	0

6.5 Other polymers (i)

There are no such residues in this entry.