WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Nov 24, 2021 – 06:14 pm GMT

PDB ID	:	6Z8U
Title	:	Copper transporter OprC
Authors	:	Bhamidimarri, S.P.; van den Berg, B.
Deposited on	:	2020-06-02
Resolution	:	2.61 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 ⓘ) were used in the production of this report:

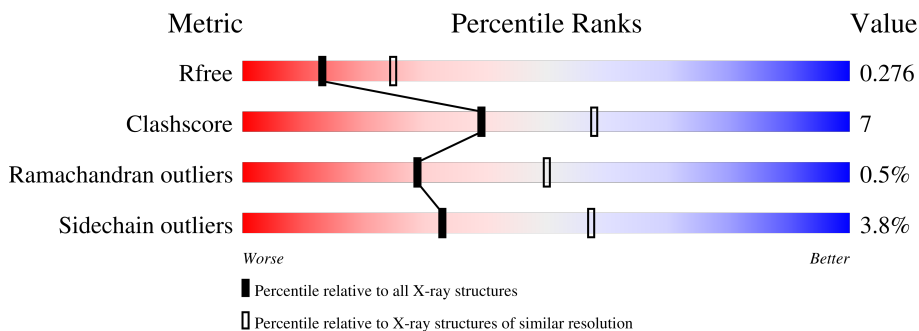|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0267
CCP4	:	7.1.010 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

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 2.61 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	Percentile Ranks	Value
Rfree		0.276
Clashscore		7
Ramachandran outliers		0.5%
Sidechain outliers		3.8%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	723	72%　　　　17%　·　10%
1	B	723	74%　　　　16%　·　9%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 10189 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 copper transport outer membrane porin OprC.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	649	Total	C	N	O	S	0	0	0
			5034	3161	887	970	16			
1	B	656	Total	C	N	O	S	0	0	0
			5078	3187	895	978	18			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	323	ALA	HIS	engineered mutation	UNP G3XD89
B	323	ALA	HIS	engineered mutation	UNP G3XD89

- Molecule 2 is SILVER ION (three-letter code: AG) (formula: Ag).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total	Ag	0	0
			3	3		
2	B	3	Total	Ag	0	0
			3	3		

- Molecule 3 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	44	Total	O	0	0
			44	44		
3	B	27	Total	O	0	0
			27	27		

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. 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.

• Molecule 1: Putative copper transport outer membrane porin OprC

Chain A:

• Molecule 1: Putative copper transport outer membrane porin OprC

Chain B:
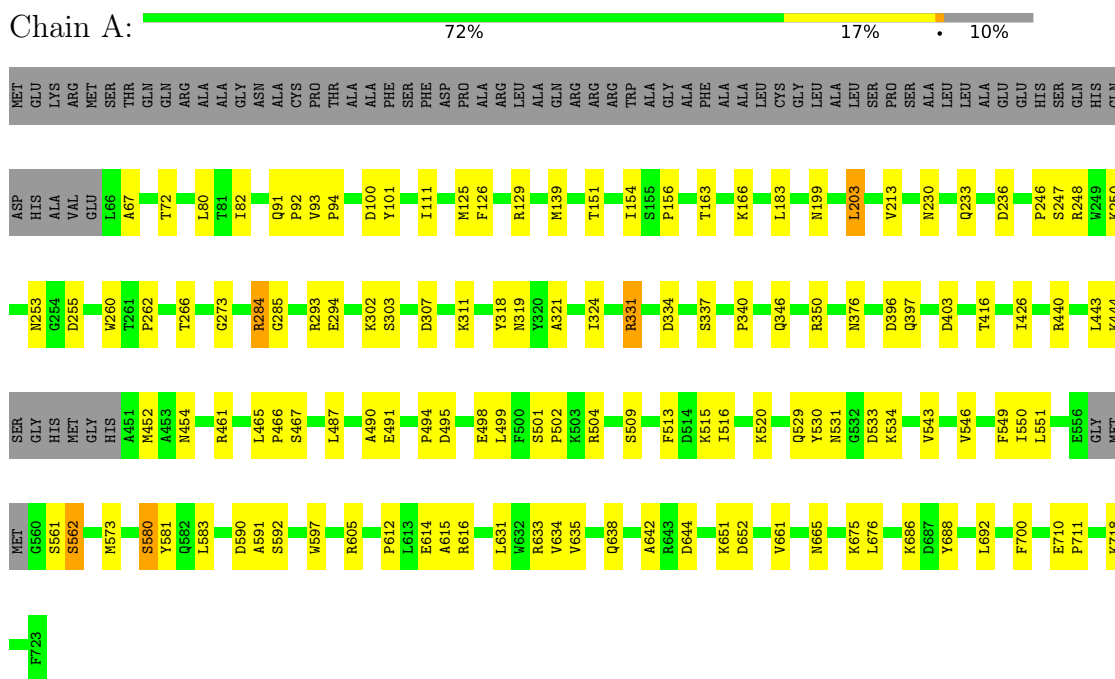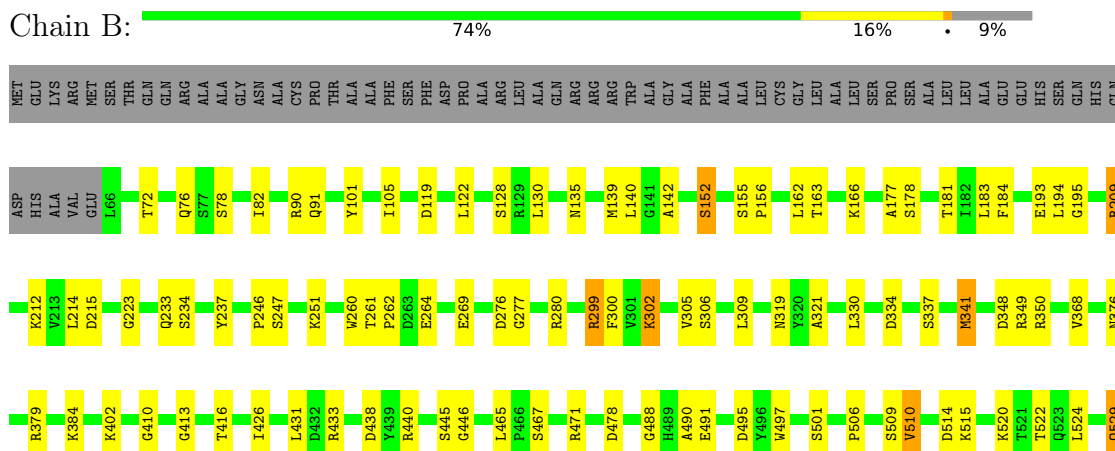
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	155.11Å　195.72Å　165.30Å 90.00°　　90.00°　　90.00°	Depositor
Resolution (Å)	63.14　–　2.61 63.14　–　2.61	Depositor EDS
% Data completeness (in resolution range)	94.9 (63.14-2.61) 97.5 (63.14-2.61)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.03 (at 2.61Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.212　,　0.273 0.215　,　0.276	Depositor DCC
R_{free} test set	3742 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	57.1	Xtriage
Anisotropy	0.325	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	(Not available) , (Not available)	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	10189	wwPDB-VP
Average B, all atoms (Å^2)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.48% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: AG

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	0.44	0/5157	0.66	1/6991 (0.0%)
1	B	0.42	0/5204	0.62	0/7055
All	All	0.43	0/10361	0.64	1/14046 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	340	PRO	C-N-CA	5.66	135.85	121.70

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	5034	0	4818	82	0
1	B	5078	0	4851	63	0
2	A	3	0	0	0	0
2	B	3	0	0	0	0
3	A	44	0	0	5	0
3	B	27	0	0	0	0
All	All	10189	0	9669	145	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 7.

All (145) 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:72:THR:HB	1:A:631:LEU:HD13	1.65	0.77
1:A:151:THR:HA	1:A:154:ILE:HD12	1.67	0.75
1:A:139:MET:HG3	1:A:319:ASN:HB3	1.69	0.73
1:B:76:GLN:NE2	1:B:529:GLN:OE1	2.20	0.70
1:B:532:GLY:O	1:B:536:GLN:NE2	2.25	0.68
1:B:139:MET:HG3	1:B:319:ASN:HB3	1.75	0.66
1:B:177:ALA:HB1	1:B:181:THR:HG22	1.77	0.66
1:B:280:ARG:NH1	1:B:330:LEU:O	2.29	0.66
1:B:142:ALA:HB2	1:B:349:ARG:HB2	1.79	0.64
1:B:514:ASP:HB3	1:B:515:LYS:HE3	1.79	0.64
1:B:334:ASP:HB3	1:B:337:SER:HB2	1.80	0.64
1:A:236:ASP:OD1	1:A:248:ARG:N	2.29	0.63
1:B:671:THR:HG22	1:B:673:ASN:H	1.63	0.63
1:B:260:TRP:CE2	1:B:262:PRO:HG3	2.34	0.63
1:B:534:LYS:HB3	1:B:581:TYR:HE1	1.64	0.61
1:A:443:LEU:HG	1:A:454:ASN:HB2	1.83	0.60
1:A:163:THR:HG23	1:A:183:LEU:HB2	1.82	0.60
1:A:233:GLN:HB3	1:A:250:LYS:HG3	1.84	0.59
1:A:710:GLU:HG3	1:A:711:PRO:HD2	1.84	0.59
1:B:341:MET:H	1:B:341:MET:HE2	1.68	0.58
1:B:416:THR:HG23	1:B:426:ILE:HG12	1.84	0.58
1:A:499:LEU:HD22	1:A:513:PHE:HA	1.86	0.58
1:A:91:GLN:OE1	1:A:665:ASN:HB3	2.04	0.58
1:A:111:ILE:HG12	1:A:692:LEU:HB3	1.85	0.57
1:A:612:PRO:HB3	1:A:638:GLN:HB2	1.86	0.56
1:A:531:ASN:ND2	3:A:902:HOH:O	2.39	0.56
1:A:293:ARG:HG2	1:A:294:GLU:N	2.20	0.56
1:B:697:ASP:O	1:B:702:PHE:HB2	2.05	0.56
1:A:461:ARG:NH1	1:A:513:PHE:O	2.38	0.56
1:A:126:PHE:O	1:A:129:ARG:HD2	2.07	0.55
1:B:82:ILE:HD11	1:B:166:LYS:HE3	1.88	0.55
1:B:306:SER:HG	1:B:309:LEU:H	1.53	0.54
1:B:368:VAL:O	1:B:413:GLY:HA2	2.07	0.54
1:B:223:GLY:HA2	1:B:261:THR:HG22	1.89	0.54
1:A:139:MET:SD	1:A:293:ARG:HG3	2.47	0.54
1:B:438:ASP:OD2	1:B:440:ARG:NH2	2.37	0.54
1:A:396:ASP:OD1	1:A:397:GLN:NE2	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:82:ILE:HG21	1:B:105:ILE:HD13	1.88	0.54
1:A:203:LEU:HD12	1:A:718:LYS:HB2	1.90	0.53
1:B:209:ARG:HG2	1:B:234:SER:HB2	1.90	0.53
1:A:260:TRP:CE2	1:A:262:PRO:HG3	2.44	0.53
1:A:213:VAL:HG22	1:A:230:ASN:HB2	1.91	0.52
1:A:498:GLU:HG2	1:A:550:ILE:HG21	1.91	0.52
1:A:467:SER:HB3	1:A:490:ALA:HA	1.92	0.52
1:A:416:THR:HG22	1:A:426:ILE:HG12	1.92	0.51
1:A:495:ASP:HB2	3:A:921:HOH:O	2.10	0.51
1:A:255:ASP:CG	1:A:273:GLY:HA3	2.30	0.51
1:A:504:ARG:NH2	1:A:562:SER:OG	2.42	0.51
1:B:506:PRO:O	1:B:509:SER:OG	2.28	0.51
1:A:466:PRO:O	1:A:491:GLU:HG3	2.12	0.50
1:A:154:ILE:O	1:A:156:PRO:HD3	2.11	0.50
1:A:644:ASP:HA	1:A:651:LYS:HD2	1.93	0.50
1:B:276:ASP:OD1	1:B:277:GLY:N	2.44	0.50
1:A:403:ASP:HB2	1:A:440:ARG:HG2	1.94	0.50
1:B:509:SER:O	1:B:510:VAL:HG12	2.12	0.49
1:A:580:SER:HB2	1:A:590:ASP:HB3	1.94	0.49
1:A:101:TYR:CD1	1:A:156:PRO:HG2	2.47	0.49
1:B:128:SER:OG	1:B:495:ASP:OD2	2.24	0.49
1:B:614:GLU:OE1	1:B:633:ARG:NE	2.43	0.49
1:A:82:ILE:HD11	1:A:166:LYS:HE2	1.95	0.48
1:B:82:ILE:O	1:B:163:THR:HA	2.14	0.48
1:B:177:ALA:CB	1:B:181:THR:HG22	2.42	0.48
1:A:262:PRO:HD2	1:A:266:THR:HB	1.94	0.48
1:A:233:GLN:CB	1:A:250:LYS:HG3	2.44	0.47
1:B:193:GLU:O	1:B:195:GLY:N	2.47	0.47
1:A:546:VAL:HG11	1:A:549:PHE:HD1	1.79	0.47
1:B:497:TRP:O	1:B:501:SER:HB2	2.14	0.47
1:B:679:GLY:HA3	1:B:716:TRP:CE2	2.49	0.47
1:A:573:MET:HE3	1:A:597:TRP:CE3	2.49	0.47
1:A:529:GLN:HE21	1:A:529:GLN:HB3	1.48	0.47
1:B:101:TYR:CD1	1:B:156:PRO:HG2	2.49	0.47
1:A:246:PRO:HG2	1:A:700:PHE:CD2	2.49	0.46
1:B:671:THR:HG22	1:B:672:ARG:N	2.30	0.46
1:A:605:ARG:HD3	3:A:925:HOH:O	2.15	0.46
1:B:139:MET:CE	1:B:321:ALA:HB2	2.46	0.46
1:B:529:GLN:HE21	1:B:529:GLN:HB3	1.59	0.46
1:B:162:LEU:HD13	1:B:184:PHE:CE1	2.51	0.46
1:A:614:GLU:HB2	1:A:635:VAL:HG22	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:255:ASP:OD1	1:A:273:GLY:HA3	2.15	0.46
1:B:524:LEU:O	1:B:542:TYR:HA	2.16	0.46
1:A:591:ALA:HA	1:A:616:ARG:O	2.16	0.46
1:A:230:ASN:OD1	1:A:253:ASN:HB2	2.15	0.45
1:B:163:THR:HB	1:B:183:LEU:HB2	1.99	0.45
1:B:608:PRO:HB3	1:B:642:ALA:HB3	1.98	0.45
1:B:122:LEU:HB3	1:B:130:LEU:HD21	1.97	0.45
1:A:642:ALA:O	1:A:652:ASP:HB2	2.16	0.45
1:B:72:THR:HG22	1:B:91:GLN:CB	2.46	0.45
1:A:499:LEU:HA	1:A:499:LEU:HD23	1.72	0.45
1:B:139:MET:HG2	1:B:140:LEU:H	1.82	0.45
1:B:321:ALA:O	1:B:348:ASP:HA	2.17	0.45
1:A:403:ASP:HB2	1:A:440:ARG:CG	2.47	0.45
1:A:491:GLU:CD	1:A:520:LYS:HD3	2.37	0.44
1:B:497:TRP:HB3	1:B:648:VAL:HG21	2.00	0.44
1:A:302:LYS:O	1:A:311:LYS:HA	2.18	0.44
1:A:516:ILE:HD13	1:A:516:ILE:HA	1.83	0.44
1:A:443:LEU:C	1:A:444:LYS:HE2	2.37	0.44
1:A:163:THR:CG2	1:A:183:LEU:HB2	2.47	0.44
1:B:348:ASP:OD1	1:B:379:ARG:HB2	2.18	0.44
1:A:334:ASP:HB3	1:A:337:SER:HB3	1.99	0.44
1:A:444:LYS:NZ	3:A:908:HOH:O	2.51	0.44
1:A:534:LYS:HB3	1:A:581:TYR:CE1	2.52	0.44
1:B:426:ILE:HD12	1:B:471:ARG:NH1	2.33	0.44
1:A:350:ARG:O	1:A:376:ASN:HA	2.17	0.44
1:B:264:GLU:H	1:B:264:GLU:HG2	1.59	0.44
1:A:139:MET:CE	1:A:321:ALA:HB2	2.48	0.44
1:A:91:GLN:HB3	1:A:92:PRO:HD3	2.00	0.43
1:B:214:LEU:HD12	1:B:215:ASP:H	1.83	0.43
1:A:324:ILE:HG12	1:A:346:GLN:HG3	2.00	0.43
1:A:615:ALA:HB3	1:A:634:VAL:HG23	2.00	0.43
1:B:410:GLY:HA2	1:B:431:LEU:O	2.18	0.43
1:B:467:SER:HB3	1:B:490:ALA:HA	2.00	0.43
1:A:318:TYR:OH	1:A:350:ARG:NH1	2.49	0.43
1:B:465:LEU:HB3	1:B:491:GLU:HB2	2.01	0.43
1:A:416:THR:HG22	1:A:426:ILE:CG1	2.49	0.42
1:B:488:GLY:O	1:B:522:THR:HA	2.18	0.42
1:A:661:VAL:HG21	1:A:688:TYR:CZ	2.54	0.42
1:A:94:PRO:HB3	1:A:100:ASP:HB3	2.01	0.42
1:A:675:LYS:O	1:A:676:LEU:HD12	2.20	0.42
1:A:285:GLY:HA2	1:A:331:ARG:HH12	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:80:LEU:HD22	1:A:166:LYS:O	2.20	0.42
1:A:253:ASN:OD1	1:A:293:ARG:NH2	2.47	0.42
1:A:581:TYR:CD2	1:A:583:LEU:HD23	2.55	0.42
1:A:284:ARG:HA	1:A:284:ARG:HD3	1.83	0.42
1:A:139:MET:CE	1:A:293:ARG:HG3	2.49	0.42
1:B:350:ARG:O	1:B:376:ASN:HA	2.19	0.41
1:A:501:SER:N	1:A:502:PRO:HD2	2.36	0.41
1:A:509:SER:HA	1:A:515:LYS:NZ	2.35	0.41
1:A:125:MET:HE2	1:A:129:ARG:HD3	2.01	0.41
1:A:543:VAL:HG12	1:A:573:MET:HG3	2.02	0.41
1:A:494:PRO:HB2	1:A:499:LEU:HG	2.02	0.41
1:A:93:VAL:HA	1:A:94:PRO:HD3	1.84	0.41
1:B:139:MET:HG3	1:B:319:ASN:CB	2.47	0.41
1:B:237:TYR:HD2	1:B:247:SER:HG	1.66	0.41
1:A:616:ARG:HE	1:A:633:ARG:HD2	1.86	0.40
1:B:300:PHE:HE1	1:B:302:LYS:HB2	1.86	0.40
1:B:491:GLU:CD	1:B:520:LYS:HD3	2.42	0.40
1:A:465:LEU:HB3	1:A:491:GLU:HB2	2.02	0.40
1:B:139:MET:HG2	1:B:140:LEU:N	2.36	0.40
1:B:246:PRO:HG2	1:B:700:PHE:CD2	2.57	0.40
1:A:686:LYS:NZ	3:A:910:HOH:O	2.53	0.40
1:B:76:GLN:NE2	1:B:78:SER:O	2.54	0.40
1:B:152:SER:O	1:B:251:LYS:NZ	2.53	0.40
1:B:269:GLU:HB3	1:B:299:ARG:HG3	2.03	0.40
1:A:125:MET:HE1	1:A:549:PHE:HE1	1.85	0.40
1:B:91:GLN:OE1	1:B:665:ASN:HB3	2.21	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	643/723 (89%)	597 (93%)	43 (7%)	3 (0%)	29	50
1	B	652/723 (90%)	603 (92%)	45 (7%)	4 (1%)	25	45
All	All	1295/1446 (90%)	1200 (93%)	88 (7%)	7 (0%)	29	50

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	510	VAL
1	B	305	VAL
1	B	478	ASP
1	A	247	SER
1	B	446	GLY
1	A	284	ARG
1	A	67	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	519/572 (91%)	505 (97%)	14 (3%)	44	69
1	B	523/572 (91%)	497 (95%)	26 (5%)	24	46
All	All	1042/1144 (91%)	1002 (96%)	40 (4%)	33	57

All (40) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	199	ASN
1	A	203	LEU
1	A	303	SER
1	A	307	ASP
1	A	331	ARG
1	A	452	MET
1	A	487	LEU
1	A	530	TYR
1	A	533	ASP

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Mol	Chain	Res	Type
1	A	551	LEU
1	A	561	SER
1	A	562	SER
1	A	580	SER
1	A	592	SER
1	B	90	ARG
1	B	119	ASP
1	B	135	ASN
1	B	152	SER
1	B	155	SER
1	B	178	SER
1	B	194	LEU
1	B	209	ARG
1	B	212	LYS
1	B	233	GLN
1	B	299	ARG
1	B	302	LYS
1	B	341	MET
1	B	384	LYS
1	B	402	LYS
1	B	433	ARG
1	B	445	SER
1	B	529	GLN
1	B	533	ASP
1	B	534	LYS
1	B	555	ARG
1	B	561	SER
1	B	592	SER
1	B	604	ASP
1	B	630	SER
1	B	656	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	145	ASN
1	A	536	GLN

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 6 ligands modelled in this entry, 6 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 ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers ⓘ

Unable to reproduce the depositors R factor - this section is therefore empty.