Full wwPDB X-ray Structure Validation Report ⓘ

May 25, 2020 – 08:44 am BST

PDB ID	:	4RDT
Title	:	Structure of the bacterial Zn-transporter ZnuD from Neisseria meningitidis (flexible conformation bound to a zinc ion)
Authors	:	Calmettes, C.; El Bakkouri, M.; Moraes, T.F.
Deposited on	:	2014-09-19
Resolution	:	3.20 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:

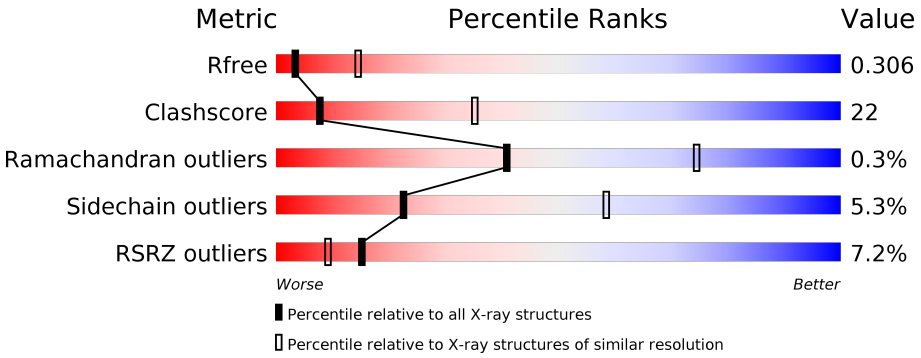
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

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 3.20 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	1133 (3.20-3.20)
Clashscore	141614	1253 (3.20-3.20)
Ramachandran outliers	138981	1234 (3.20-3.20)
Sidechain outliers	138945	1233 (3.20-3.20)
RSRZ outliers	127900	1095 (3.20-3.20)

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	748	5% 53% 29% • 15%
1	B	748	7% 54% 28% •• 15%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	GOL	A	802	-	-	-	X
3	GOL	A	803	-	-	-	X
3	GOL	A	804	-	-	-	X
4	C8E	A	806	-	-	X	-
5	SO4	A	807	-	-	X	-
5	SO4	B	802	-	-	X	-

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 10159 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 ZnuD.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	635	Total	C	N	O	S	0	1	0
			5044	3158	932	945	9			
1	B	635	Total	C	N	O	S	0	0	0
			5032	3150	927	946	9			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-13	MET	-	EXPRESSION TAG	UNP Q9JZN9
A	-12	ALA	-	EXPRESSION TAG	UNP Q9JZN9
A	-11	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-10	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-9	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-8	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-7	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-6	HIS	-	EXPRESSION TAG	UNP Q9JZN9
A	-5	LEU	-	EXPRESSION TAG	UNP Q9JZN9
A	-4	VAL	-	EXPRESSION TAG	UNP Q9JZN9
A	-3	PRO	-	EXPRESSION TAG	UNP Q9JZN9
A	-2	ARG	-	EXPRESSION TAG	UNP Q9JZN9
A	-1	GLY	-	EXPRESSION TAG	UNP Q9JZN9
A	0	SER	-	EXPRESSION TAG	UNP Q9JZN9
B	-13	MET	-	EXPRESSION TAG	UNP Q9JZN9
B	-12	ALA	-	EXPRESSION TAG	UNP Q9JZN9
B	-11	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-10	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-9	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-8	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-7	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-6	HIS	-	EXPRESSION TAG	UNP Q9JZN9
B	-5	LEU	-	EXPRESSION TAG	UNP Q9JZN9
B	-4	VAL	-	EXPRESSION TAG	UNP Q9JZN9
B	-3	PRO	-	EXPRESSION TAG	UNP Q9JZN9

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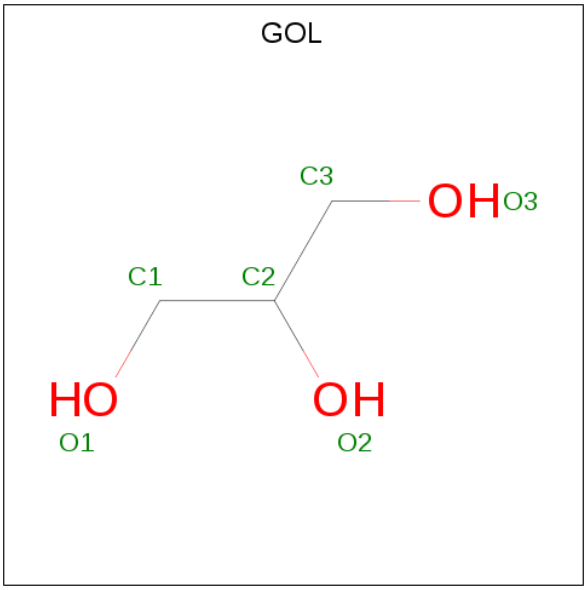
Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	ARG	-	EXPRESSION TAG	UNP Q9JZN9
B	-1	GLY	-	EXPRESSION TAG	UNP Q9JZN9
B	0	SER	-	EXPRESSION TAG	UNP Q9JZN9

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

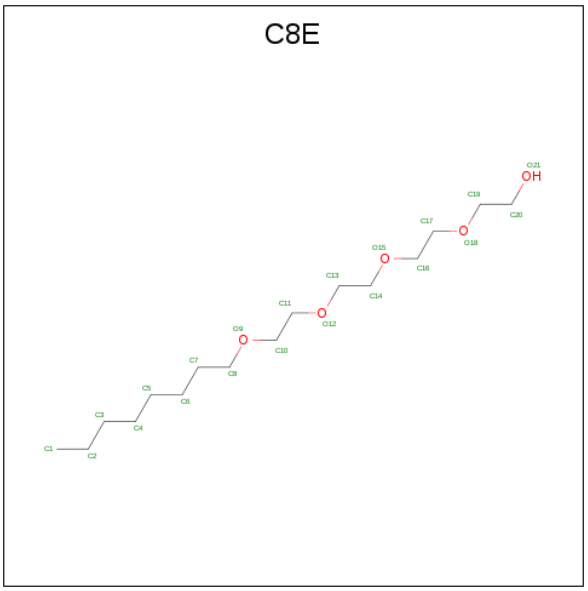
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total Zn 1 1	0	0
2	A	1	Total Zn 1 1	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



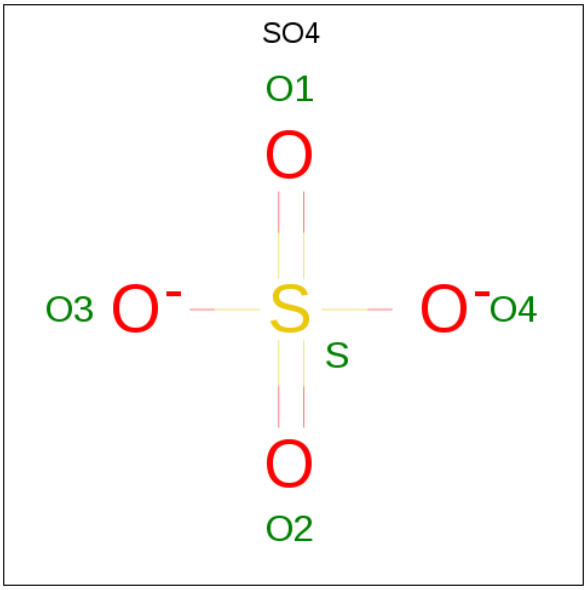
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 6 3 3	0	0
3	A	1	Total C O 6 3 3	0	0
3	A	1	Total C O 6 3 3	0	0

- Molecule 4 is (HYDROXYETHYLOXY)TRI(ETHYLOXY)OCTANE (three-letter code: C8E) (formula: $C_{16}H_{34}O_5$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 21 16 5	0	0
4	A	1	Total C O 21 16 5	0	0

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total O S 5 4 1	0	0
5	B	1	Total O S 5 4 1	0	0

- Molecule 6 is water.

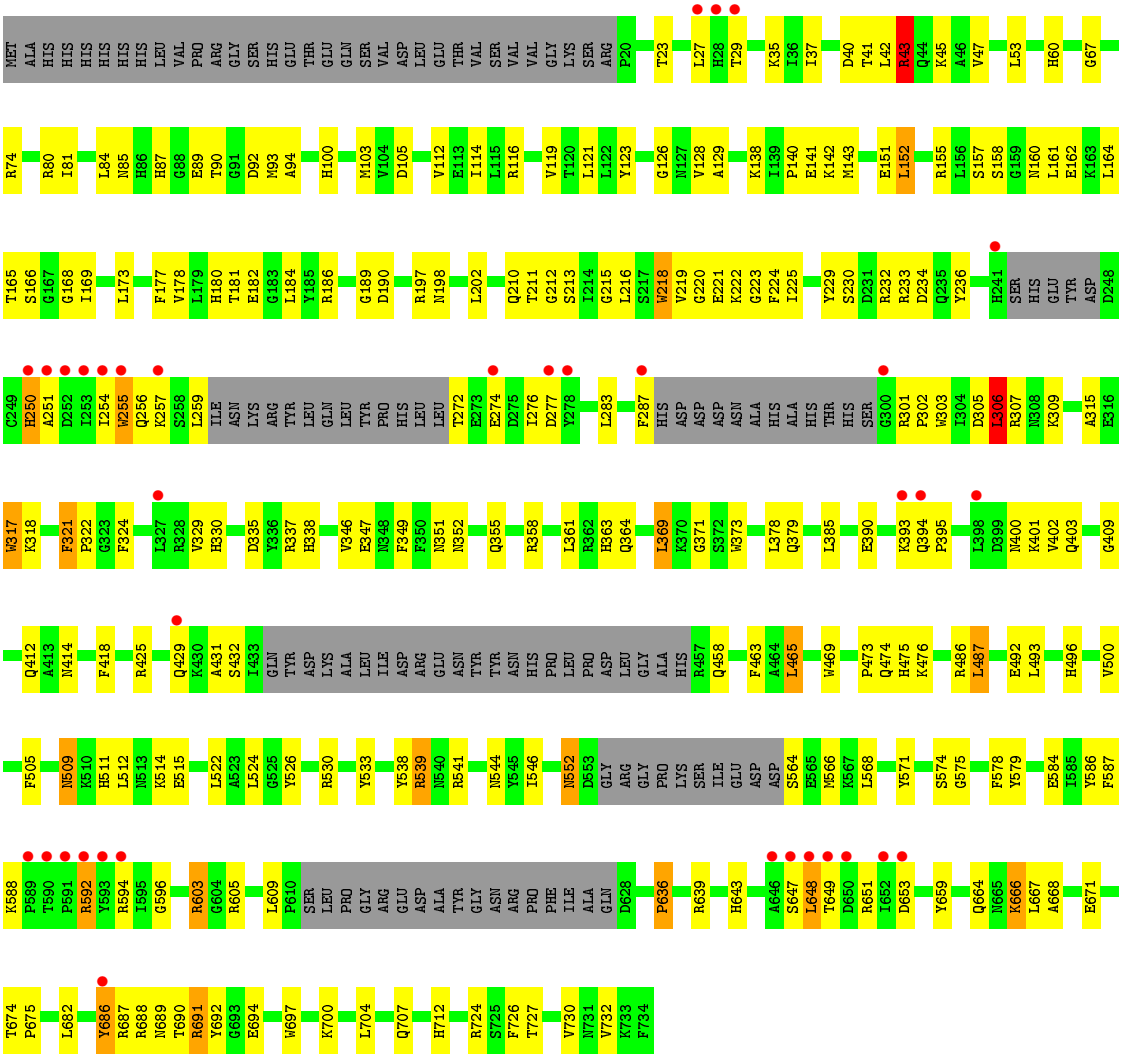
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	9	Total O 9 9	0	0
6	B	2	Total O 2 2	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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.

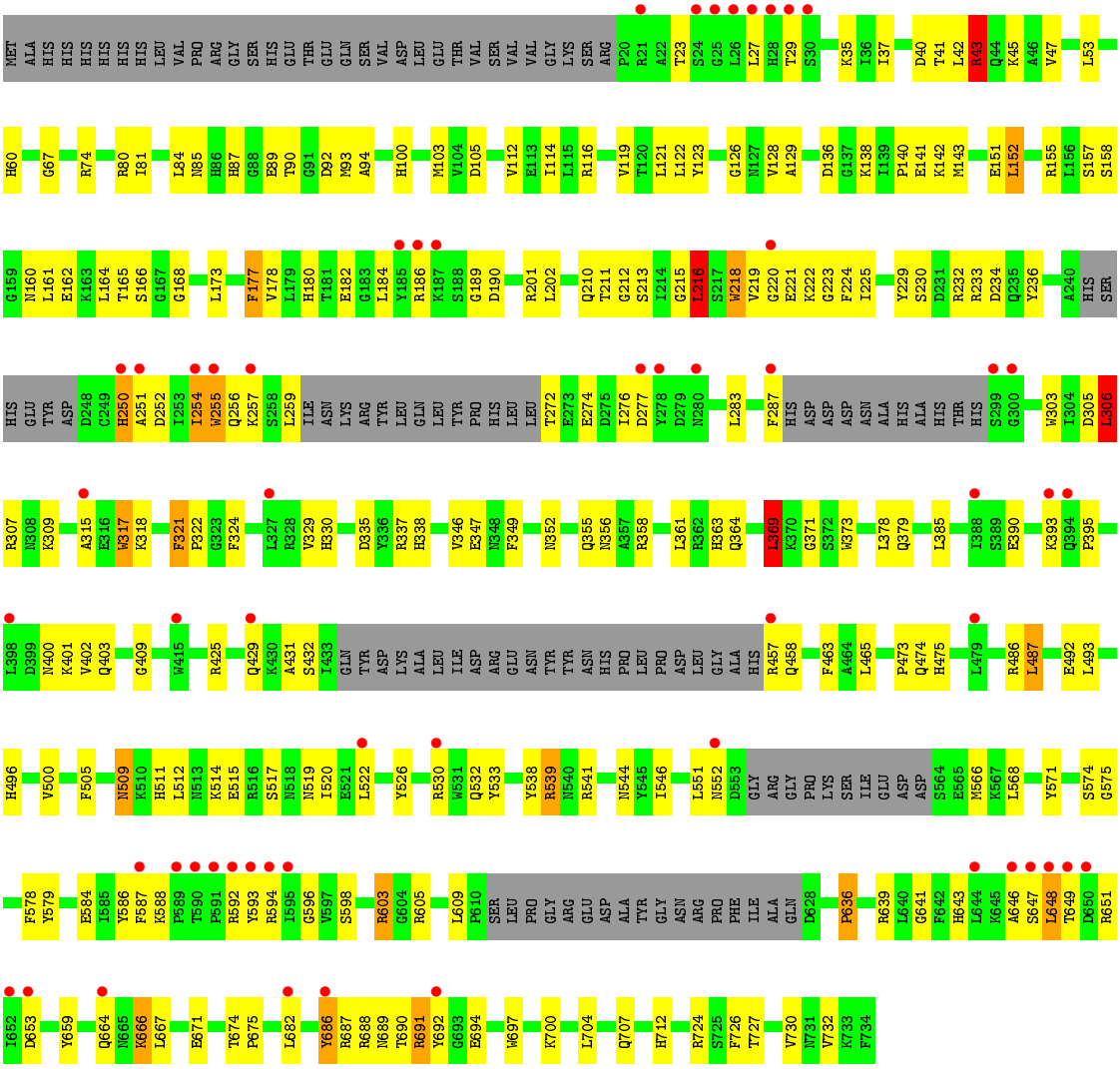
- Molecule 1: ZnuD

Chain A:



- Molecule 1: ZnuD

Chain B:


MET ALA HIS HIS HIS HIS HIS LEU VAL PRO ARG GLY SER HIS GLU THR GLU GLN SER VAL ASP LEU GLU THR VAL SER VAL VAL GLY LYS SER ARG P20 R21 A22 T23 S24 G25 L26 L27 H28 T29 S30 K35 I36 I37 D40 T41 L42 R43 Q44 K45 A46 V47 L53
H60 G67 R74 R80 I81 L84 N85 H86 H87 G88 E89 T90 G91 D92 M93 A94 H100 M103 V104 D105 V112 E113 I114 L115 R116 V119 T120 L121 L122 Y123 G126 N127 V128 A129 D136 G137 K138 I139 P140 E141 K142 M143 E151 L152 R155 L156 S157 S158
G159 N160 L161 E162 K163 L164 T165 S166 G167 G168 L173 F177 V178 L179 H180 T181 E182 G183 L184 Y185 R186 K187 S188 G189 D190 R201 L202 Q210 T211 G212 S213 I214 G215 L216 S217 W218 V219 G220 E221 K222 G223 F224 I225 Y229 S230 D231 R232 R233 D234 Q235 Y236 A240 HIS SER
HIS GLU TYR ASP D248 C249 H250 A251 D252 I253 I254 W255 Q256 K257 S258 L259 ILE ASN LYS ARG TYR LEU GLN LEU TYR PRO HIS LEU LEU T272 E273 E274 D275 I276 D277 Y278 D279 N280 L283 F287 HIS ASP ASP ASP ASN ALA HIS ALA HIS THR HIS S299 G300 W303 I304 D305 L306
R307 N308 K309 A315 E316 W317 K318 F321 P322 G323 F324 I327 R328 V329 H330 D335 Y336 R337 H338 V346 E347 M349 F349 N352 Q355 N356 A357 R358 L361 R362 H363 Q364 L369 K370 G371 S372 W373 L378 Q379 L385 I388 S389 E390 K393 Q394 P395
L398 D399 N400 K401 V402 Q403 G409 W415 R425 Q429 K430 A431 S432 I433 GLN TYR ASP LYS ALA LEU ILE ASP ARG GLU ASN TYR TYR ASN HIS PRO LEU PRO LEU ASP LEU GLY ALA HIS R457 Q458 F463 A464 L465 P473 Q474 H475 L479 R486 L487 E492 L493
H496 V500 F505 N509 K510 H511 L512 N513 K514 E515 R516 S517 N518 N519 I520 E521 L522 Y526 R530 W531 Q532 Y533 Y538 R539 N540 R541 N544 Y545 I546 L551 N552 D553 GLY ARG GLY PRO LYS SER ILE GLU ASP ASP S564 E565 M566 K567 L568 Y571 S574 G575
F578 Y579 E584 I585 Y586 F587 K588 P589 T590 P591 R592 Y593 R594 I595 G596 V597 S598 R603 G604 R605 L609 P610 SER LEU PRO GLY ARG GLU ASP ALA TYR GLY ASN ARG PRO PHE ILE ALA GLN D628 P636 R639 L640 G641 F642 H643 L644 K645 A646 S647 L648 T649 D650 R651
I652 D653 Y659 Q664 N665 K666 L667 E671 T674 P675 L682 Y686 R687 R688 N689 T690 R691 Y692 G693 E694 W697 K700 L704 Q707 H712 R724 S725 F726 T727 V730 N731 V732 K733 F734

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	101.34Å 156.23Å 158.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.93 – 3.20 49.93 – 3.20	Depositor EDS
% Data completeness (in resolution range)	99.2 (49.93-3.20) 93.4 (49.93-3.20)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.90 (at 3.19Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.270 , 0.305 0.272 , 0.306	Depositor DCC
R_{free} test set	1664 reflections (3.95%)	wwPDB-VP
Wilson B-factor (Å^2)	74.0	Xtriage
Anisotropy	0.882	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 68.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.41$, $< L^2 > = 0.24$	Xtriage
Estimated twinning fraction	0.040 for -h,l,k	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	10159	wwPDB-VP
Average B, all atoms (Å^2)	122.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 81.57 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.4419e-07. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: GOL, ZN, C8E, SO4

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	0.41	0/5160	0.76	11/6969 (0.2%)
1	B	0.36	0/5144	0.74	11/6948 (0.2%)
All	All	0.39	0/10304	0.75	22/13917 (0.2%)

There are no bond length outliers.

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	369	LEU	CA-CB-CG	8.03	133.76	115.30
1	B	369	LEU	CA-CB-CG	7.98	133.66	115.30
1	B	648	LEU	CA-CB-CG	7.76	133.16	115.30
1	A	216	LEU	CB-CG-CD2	7.67	124.04	111.00
1	A	173	LEU	CA-CB-CG	7.23	131.94	115.30
1	A	648	LEU	CA-CB-CG	7.03	131.47	115.30
1	A	43	ARG	CA-CB-CG	6.97	128.73	113.40
1	B	43	ARG	CA-CB-CG	6.86	128.49	113.40
1	B	173	LEU	CA-CB-CG	6.86	131.07	115.30
1	A	539	ARG	CB-CG-CD	6.76	129.16	111.60
1	B	539	ARG	CB-CG-CD	6.57	128.69	111.60
1	B	216	LEU	CB-CG-CD1	6.52	122.09	111.00
1	A	317	TRP	CA-CB-CG	6.43	125.92	113.70
1	B	317	TRP	CA-CB-CG	6.38	125.81	113.70
1	A	306	LEU	CA-CB-CG	5.85	128.76	115.30
1	B	306	LEU	CA-CB-CG	5.84	128.73	115.30
1	B	465	LEU	CA-CB-CG	5.76	128.55	115.30
1	A	465	LEU	CA-CB-CG	5.52	128.00	115.30
1	B	475	HIS	N-CA-C	-5.31	96.67	111.00
1	A	475	HIS	N-CA-C	-5.27	96.76	111.00
1	B	487	LEU	CA-CB-CG	5.07	126.97	115.30
1	A	487	LEU	CA-CB-CG	5.05	126.92	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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	5044	0	4883	220	0
1	B	5032	0	4868	209	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	18	0	24	2	0
4	A	42	0	68	24	0
5	A	5	0	0	3	0
5	B	5	0	0	2	0
6	A	9	0	0	0	0
6	B	2	0	0	1	0
All	All	10159	0	9843	436	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 22.

All (436) 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:143:MET:CG	1:B:219:VAL:HG21	1.65	1.26
1:B:283:LEU:HG	1:B:287:PHE:CE2	1.71	1.25
1:B:283:LEU:CG	1:B:287:PHE:HE2	1.54	1.20
1:A:465:LEU:HD12	4:A:806:C8E:C17	1.72	1.19
1:A:465:LEU:HD12	4:A:806:C8E:H171	1.26	1.12
1:A:143:MET:CG	1:A:219:VAL:HG21	1.80	1.11
1:B:143:MET:HG2	1:B:219:VAL:CG2	1.83	1.08
1:B:255:TRP:CE3	1:B:256:GLN:HG2	1.89	1.06
1:A:143:MET:HG2	1:A:219:VAL:HG21	1.08	1.05
1:B:283:LEU:HG	1:B:287:PHE:HE2	0.92	1.05
1:B:283:LEU:CG	1:B:287:PHE:CE2	2.35	1.03
1:B:283:LEU:O	1:B:287:PHE:HD2	1.42	1.01
1:B:283:LEU:CD1	1:B:287:PHE:CE2	2.44	1.01

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:143:MET:HG2	1:B:219:VAL:HG21	1.01	1.00
1:B:593:TYR:CD1	1:B:646:ALA:HB2	1.99	0.97
1:B:593:TYR:CE1	1:B:646:ALA:CB	2.47	0.97
1:A:283:LEU:O	1:A:287:PHE:HD2	1.48	0.96
1:A:256:GLN:HB3	1:A:257:LYS:HB3	1.50	0.94
1:A:493:LEU:HD12	1:A:512:LEU:HD12	1.51	0.92
1:B:593:TYR:CD1	1:B:646:ALA:CB	2.52	0.92
1:B:493:LEU:HD12	1:B:512:LEU:HD12	1.53	0.90
1:B:283:LEU:O	1:B:287:PHE:CD2	2.25	0.90
1:B:60:HIS:CE1	1:B:639:ARG:HH21	1.90	0.90
1:A:143:MET:HG2	1:A:219:VAL:CG2	2.01	0.90
1:B:283:LEU:HD11	1:B:287:PHE:CE2	2.09	0.88
1:A:465:LEU:HD12	4:A:806:C8E:H172	1.51	0.88
1:A:648:LEU:HA	1:A:649:THR:HG22	1.54	0.88
1:A:60:HIS:CE1	1:A:639:ARG:HH21	1.91	0.88
1:B:143:MET:SD	1:B:219:VAL:HG21	2.14	0.87
1:B:648:LEU:HA	1:B:649:THR:HG22	1.55	0.87
1:A:164:LEU:HD11	1:A:184:LEU:HD11	1.57	0.86
1:B:593:TYR:CE1	1:B:646:ALA:HB1	2.10	0.86
1:B:234:ASP:HB2	1:B:306:LEU:HG	1.60	0.83
1:B:47:VAL:HG21	1:B:186:ARG:HD2	1.60	0.83
1:A:530:ARG:HG3	1:A:587:PHE:HE1	1.43	0.82
1:B:283:LEU:HD11	1:B:287:PHE:CZ	2.14	0.82
1:B:493:LEU:CD1	1:B:512:LEU:HD12	2.10	0.82
1:A:648:LEU:HA	1:A:649:THR:CG2	2.09	0.82
1:A:493:LEU:CD1	1:A:512:LEU:HD12	2.09	0.82
1:A:493:LEU:HG	1:A:509:ASN:O	1.79	0.82
1:A:664:GLN:HG2	1:A:712:HIS:HD2	1.45	0.81
1:B:164:LEU:HD11	1:B:184:LEU:HD11	1.61	0.81
1:A:283:LEU:O	1:A:287:PHE:CD2	2.33	0.80
1:B:648:LEU:HA	1:B:649:THR:CG2	2.11	0.80
1:A:234:ASP:HB2	1:A:306:LEU:HG	1.61	0.80
1:B:493:LEU:HG	1:B:509:ASN:O	1.81	0.80
1:B:519:ASN:O	1:B:520:ILE:HG13	1.81	0.80
1:A:158:SER:HB3	1:A:726:PHE:H	1.47	0.79
1:A:47:VAL:HG21	1:A:186:ARG:HD2	1.65	0.77
1:A:168:GLY:O	1:A:169:ILE:HD13	1.85	0.77
1:A:539:ARG:HD3	5:A:807:SO4:O3	1.83	0.77
1:A:42:LEU:HD11	1:A:112:VAL:HG12	1.66	0.77
1:B:593:TYR:HD1	1:B:646:ALA:HB2	1.46	0.77
1:A:469:TRP:HE3	4:A:806:C8E:C4	1.99	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:160:ASN:HB3	1:A:162:GLU:H	1.51	0.76
1:B:42:LEU:HD11	1:B:112:VAL:HG12	1.66	0.76
1:A:469:TRP:CE3	4:A:806:C8E:H41	2.20	0.76
4:A:806:C8E:H13	4:A:806:C8E:C5	2.15	0.76
1:B:160:ASN:HB3	1:B:162:GLU:H	1.51	0.76
1:B:385:LEU:HD23	1:B:395:PRO:HB3	1.67	0.75
1:A:60:HIS:HD2	1:A:636:PRO:HB3	1.52	0.75
1:A:385:LEU:HD23	1:A:395:PRO:HB3	1.66	0.74
1:A:566:MET:O	1:A:566:MET:HG3	1.88	0.74
1:A:324:PHE:HD1	1:A:363:HIS:HA	1.53	0.74
1:B:324:PHE:HD1	1:B:363:HIS:HA	1.52	0.74
1:A:469:TRP:HE3	4:A:806:C8E:H42	1.54	0.73
1:B:60:HIS:HD2	1:B:636:PRO:HB3	1.54	0.72
1:A:250:HIS:HB2	1:A:254:ILE:HD11	1.71	0.72
1:A:592:ARG:HH21	1:A:649:THR:CG2	2.01	0.72
1:A:60:HIS:CD2	1:A:636:PRO:HB3	2.26	0.71
4:A:806:C8E:H13	4:A:806:C8E:H132	1.70	0.71
1:A:469:TRP:CE3	4:A:806:C8E:C4	2.74	0.71
1:B:158:SER:HB3	1:B:726:PHE:H	1.54	0.71
1:A:143:MET:SD	1:A:219:VAL:HG21	2.31	0.70
1:B:60:HIS:CD2	1:B:636:PRO:HB3	2.26	0.70
1:A:530:ARG:HG3	1:A:587:PHE:CE1	2.27	0.70
1:A:254:ILE:HG21	1:A:393:LYS:NZ	2.08	0.69
1:B:593:TYR:CD1	1:B:646:ALA:HB1	2.27	0.68
1:B:143:MET:SD	1:B:219:VAL:CG2	2.80	0.68
4:A:806:C8E:H13	4:A:806:C8E:H52	1.75	0.68
1:A:210:GLN:NE2	4:A:805:C8E:O12	2.27	0.68
1:B:40:ASP:OD1	1:B:41:THR:N	2.27	0.68
1:A:92:ASP:HB3	1:A:103:MET:HG2	1.76	0.67
1:A:143:MET:SD	1:A:178:VAL:CG2	2.82	0.67
1:A:40:ASP:OD1	1:A:41:THR:N	2.27	0.67
1:B:92:ASP:HB3	1:B:103:MET:HG2	1.77	0.67
1:A:250:HIS:HB2	1:A:254:ILE:CD1	2.26	0.66
1:B:222:LYS:HB2	1:B:317:TRP:HB2	1.76	0.66
1:B:221:GLU:HB3	1:B:222:LYS:HA	1.77	0.66
1:A:324:PHE:CD1	1:A:361:LEU:HD13	2.30	0.66
1:A:255:TRP:CE3	1:A:256:GLN:HG2	2.31	0.66
1:B:143:MET:SD	1:B:178:VAL:CG2	2.84	0.66
1:A:222:LYS:HB2	1:A:317:TRP:HB2	1.76	0.65
1:A:221:GLU:HB3	1:A:222:LYS:HA	1.79	0.65
1:A:105:ASP:OD2	1:A:211:THR:HG21	1.97	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:254:ILE:HG22	1:A:393:LYS:HE3	1.79	0.65
1:B:257:LYS:HE3	1:B:259:LEU:HD11	1.79	0.65
1:B:255:TRP:HE3	1:B:256:GLN:HG2	1.59	0.64
1:B:45:LYS:O	1:B:155:ARG:NH2	2.30	0.64
1:A:257:LYS:HE3	1:A:259:LEU:HD11	1.80	0.64
1:B:324:PHE:CD1	1:B:361:LEU:HD13	2.32	0.64
1:B:505:PHE:HB2	1:B:566:MET:CE	2.28	0.63
1:A:686:TYR:HB3	1:A:697:TRP:HB2	1.80	0.63
1:B:84:LEU:HD13	1:B:87:HIS:HA	1.81	0.63
1:A:256:GLN:CB	1:A:257:LYS:HB3	2.28	0.62
1:A:255:TRP:HB3	1:A:256:GLN:HG3	1.81	0.62
1:A:418:PHE:HE1	4:A:806:C8E:H31	1.65	0.61
1:A:586:TYR:CD1	1:A:596:GLY:HA3	2.35	0.61
1:A:164:LEU:CD1	1:A:184:LEU:HD11	2.29	0.61
1:A:219:VAL:HG12	1:A:220:GLY:N	2.15	0.61
1:B:105:ASP:OD2	1:B:211:THR:HG21	2.01	0.61
1:A:255:TRP:HB2	1:A:393:LYS:HG3	1.82	0.61
1:A:465:LEU:CD1	4:A:806:C8E:H172	2.29	0.61
1:B:80:ARG:NH2	1:B:546:ILE:O	2.34	0.61
1:A:160:ASN:HB3	1:A:162:GLU:N	2.16	0.61
1:A:84:LEU:HD13	1:A:87:HIS:HA	1.81	0.61
1:B:686:TYR:HB3	1:B:697:TRP:HB2	1.81	0.61
1:A:315:ALA:HB3	1:A:329:VAL:HG22	1.83	0.60
1:B:160:ASN:HB3	1:B:162:GLU:N	2.15	0.60
1:B:255:TRP:CE3	1:B:256:GLN:CG	2.77	0.60
1:A:180:HIS:O	1:A:215:GLY:N	2.32	0.60
1:A:80:ARG:NH2	1:A:546:ILE:O	2.35	0.60
1:B:143:MET:CG	1:B:219:VAL:CG2	2.57	0.60
1:B:315:ALA:HB3	1:B:329:VAL:HG22	1.83	0.60
1:B:586:TYR:CD1	1:B:596:GLY:HA3	2.36	0.60
1:B:250:HIS:HB2	1:B:254:ILE:HD11	1.84	0.59
1:B:255:TRP:HB2	1:B:393:LYS:HG3	1.82	0.59
1:A:254:ILE:CG2	1:A:393:LYS:HE3	2.33	0.59
1:A:45:LYS:O	1:A:155:ARG:NH2	2.34	0.59
1:B:143:MET:HG2	1:B:219:VAL:CB	2.32	0.59
1:B:647:SER:HB3	1:B:653:ASP:OD1	2.02	0.59
1:A:233:ARG:HD2	1:A:307:ARG:HG2	1.85	0.58
1:B:157:SER:HB2	1:B:162:GLU:HB3	1.83	0.58
1:B:180:HIS:O	1:B:215:GLY:N	2.32	0.58
1:A:157:SER:HB2	1:A:162:GLU:HB3	1.85	0.58
1:B:225:ILE:HD11	1:B:317:TRP:HZ3	1.69	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:469:TRP:HB2	4:A:806:C8E:C3	2.34	0.58
1:A:141:GLU:HG2	1:A:224:PHE:CZ	2.38	0.58
1:A:355:GLN:HE21	1:A:379:GLN:HE21	1.52	0.57
1:A:647:SER:HB3	1:A:653:ASP:OD1	2.04	0.57
1:B:219:VAL:HG12	1:B:220:GLY:N	2.18	0.57
4:A:806:C8E:H13	4:A:806:C8E:H51	1.85	0.57
1:B:164:LEU:CD1	1:B:184:LEU:HD11	2.33	0.56
1:A:222:LYS:CB	1:A:317:TRP:HB2	2.36	0.56
1:B:539:ARG:NH1	5:B:802:SO4:O1	2.39	0.56
1:A:539:ARG:HD3	5:A:807:SO4:S	2.46	0.56
1:B:505:PHE:HB2	1:B:566:MET:HE1	1.88	0.56
1:B:168:GLY:HA2	1:B:182:GLU:HA	1.88	0.56
1:B:23:THR:HG23	1:B:87:HIS:HE1	1.70	0.56
1:A:225:ILE:HD11	1:A:317:TRP:HZ3	1.70	0.55
1:B:255:TRP:CD2	1:B:256:GLN:HG2	2.39	0.55
1:B:222:LYS:CB	1:B:317:TRP:HB2	2.35	0.55
1:A:23:THR:HG23	1:A:87:HIS:HE1	1.71	0.55
1:A:168:GLY:HA2	1:A:182:GLU:HA	1.88	0.55
1:A:552:ASN:HD22	1:A:552:ASN:N	2.03	0.55
1:B:141:GLU:HG2	1:B:224:PHE:CZ	2.42	0.55
1:B:355:GLN:HE21	1:B:379:GLN:HE21	1.53	0.55
1:B:664:GLN:HG2	1:B:712:HIS:ND1	2.22	0.55
1:B:539:ARG:HG3	1:B:579:TYR:HB3	1.88	0.55
1:B:283:LEU:CD2	1:B:287:PHE:HE2	2.17	0.54
1:A:165:THR:O	1:A:184:LEU:HD12	2.08	0.54
1:A:469:TRP:HB2	4:A:806:C8E:H32	1.90	0.54
1:A:255:TRP:HE3	1:A:256:GLN:HG2	1.71	0.54
1:A:539:ARG:HG3	1:A:579:TYR:HB3	1.89	0.54
1:A:539:ARG:NH1	5:A:807:SO4:O3	2.38	0.53
1:A:651:ARG:HH12	1:A:689:ASN:H	1.56	0.53
1:B:651:ARG:HH12	1:B:689:ASN:H	1.57	0.53
1:B:321:PHE:HB2	1:B:322:PRO:CD	2.38	0.53
1:A:143:MET:SD	1:A:219:VAL:CG2	2.96	0.53
1:A:321:PHE:HB2	1:A:322:PRO:CD	2.39	0.53
1:A:37:ILE:HB	1:A:112:VAL:HG13	1.90	0.53
1:B:155:ARG:HE	1:B:164:LEU:HD23	1.73	0.53
1:B:218:TRP:HB2	1:B:225:ILE:H	1.74	0.52
1:B:505:PHE:HB2	1:B:566:MET:HE3	1.90	0.52
1:A:155:ARG:HE	1:A:164:LEU:HD23	1.74	0.52
1:A:337[B]:ARG:HG3	1:A:351:ASN:OD1	2.10	0.52
1:B:161:LEU:H	1:B:189:GLY:H	1.57	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:255:TRP:CE3	1:B:256:GLN:NE2	2.78	0.52
1:B:324:PHE:CD1	1:B:363:HIS:HA	2.38	0.52
1:A:335:ASP:OD2	1:A:337[B]:ARG:NH2	2.43	0.52
1:A:363:HIS:ND1	1:A:364:GLN:O	2.40	0.52
1:B:530:ARG:O	1:B:587:PHE:HD1	1.93	0.52
1:A:225:ILE:HG23	1:A:315:ALA:HB2	1.91	0.52
1:A:161:LEU:H	1:A:189:GLY:H	1.58	0.51
1:B:165:THR:O	1:B:184:LEU:HD12	2.10	0.51
1:B:539:ARG:HA	1:B:578:PHE:O	2.10	0.51
1:A:89:GLU:HG3	1:A:378:LEU:HD12	1.91	0.51
1:B:219:VAL:CG1	1:B:220:GLY:N	2.74	0.51
1:B:89:GLU:HG3	1:B:378:LEU:HD12	1.92	0.51
1:A:465:LEU:CD1	4:A:806:C8E:H171	2.19	0.51
1:B:309:LYS:HB2	1:B:335:ASP:HB3	1.93	0.51
1:A:219:VAL:CG1	1:A:220:GLY:N	2.74	0.51
1:A:67:GLY:HA3	1:A:236:TYR:CD1	2.45	0.51
1:A:74:ARG:HD3	1:A:538:TYR:CE1	2.46	0.51
1:A:592:ARG:HH21	1:A:649:THR:HG22	1.76	0.51
1:A:198:ASN:OD1	3:A:803:GOL:O2	2.27	0.51
1:B:60:HIS:CE1	1:B:639:ARG:NH2	2.71	0.51
1:A:539:ARG:HA	1:A:578:PHE:O	2.11	0.51
1:B:37:ILE:HB	1:B:112:VAL:HG13	1.91	0.51
1:B:588:LYS:HG2	1:B:594:ARG:HB2	1.93	0.51
1:A:373:TRP:CE3	1:A:409:GLY:HA3	2.46	0.50
1:B:363:HIS:ND1	1:B:364:GLN:O	2.38	0.50
1:A:324:PHE:CD1	1:A:363:HIS:HA	2.38	0.50
1:A:255:TRP:CH2	1:A:394:GLN:NE2	2.80	0.50
1:A:259:LEU:HD23	1:A:272:THR:HA	1.93	0.50
1:A:664:GLN:HG2	1:A:712:HIS:CD2	2.36	0.50
1:B:283:LEU:HG	1:B:287:PHE:CD2	2.37	0.50
1:A:166:SER:HB3	1:A:184:LEU:HD13	1.93	0.50
1:A:222:LYS:HD2	1:A:317:TRP:CD1	2.47	0.50
1:A:254:ILE:O	1:A:255:TRP:HD1	1.95	0.50
1:A:648:LEU:O	1:A:648:LEU:HD12	2.12	0.50
1:B:143:MET:HG2	1:B:219:VAL:HG11	1.93	0.50
1:B:355:GLN:NE2	1:B:379:GLN:HE21	2.09	0.50
1:A:588:LYS:HG2	1:A:594:ARG:HB2	1.94	0.50
1:B:574:SER:CB	1:B:609:LEU:HD23	2.42	0.50
1:A:355:GLN:NE2	1:A:379:GLN:HE21	2.08	0.50
1:B:255:TRP:HE3	1:B:256:GLN:HE21	1.55	0.50
1:B:697:TRP:CD1	1:B:730:VAL:HG13	2.47	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:303:TRP:CZ3	1:A:305:ASP:HB2	2.47	0.49
1:A:84:LEU:HD11	1:A:123:TYR:CD1	2.46	0.49
1:B:225:ILE:HG23	1:B:315:ALA:HB2	1.93	0.49
1:B:85:ASN:HB2	1:B:90:THR:HG22	1.94	0.49
4:A:806:C8E:C1	4:A:806:C8E:C5	2.85	0.49
4:A:806:C8E:C1	4:A:806:C8E:H132	2.40	0.49
1:B:143:MET:SD	1:B:178:VAL:HG22	2.53	0.49
1:B:505:PHE:HB3	1:B:568:LEU:HD13	1.93	0.49
1:B:522:LEU:O	1:B:522:LEU:HD12	2.12	0.49
1:B:121:LEU:O	1:B:425:ARG:HD2	2.13	0.49
1:B:166:SER:HB3	1:B:184:LEU:HD13	1.93	0.49
1:A:221:GLU:CB	1:A:222:LYS:HA	2.42	0.49
1:B:539:ARG:CG	1:B:579:TYR:HB3	2.42	0.49
1:A:143:MET:SD	1:A:178:VAL:HG22	2.52	0.49
1:B:84:LEU:HD11	1:B:123:TYR:CD1	2.48	0.49
1:A:539:ARG:CG	1:A:579:TYR:HB3	2.43	0.49
1:A:574:SER:CB	1:A:609:LEU:HD23	2.43	0.49
1:B:373:TRP:CE3	1:B:409:GLY:HA3	2.48	0.49
1:A:505:PHE:HB3	1:A:568:LEU:HD13	1.95	0.49
1:A:667:LEU:HB2	1:A:671:GLU:HB2	1.94	0.49
1:B:103:MET:SD	1:B:232:ARG:HD3	2.53	0.49
1:A:160:ASN:OD1	3:A:804:GOL:H12	2.12	0.49
1:B:574:SER:HB2	1:B:609:LEU:HD23	1.94	0.49
1:A:697:TRP:CD1	1:A:730:VAL:HG13	2.47	0.48
1:A:469:TRP:CE3	4:A:806:C8E:H42	2.41	0.48
1:B:259:LEU:HD23	1:B:272:THR:HA	1.95	0.48
1:B:574:SER:OG	1:B:575:GLY:N	2.45	0.48
1:A:103:MET:SD	1:A:232:ARG:HD3	2.53	0.48
1:A:330:HIS:HB3	1:A:358:ARG:HG3	1.93	0.48
1:A:574:SER:OG	1:A:575:GLY:N	2.45	0.48
1:B:222:LYS:HD2	1:B:317:TRP:CD1	2.47	0.48
1:A:85:ASN:HB2	1:A:90:THR:HG22	1.95	0.48
1:A:486:ARG:HB3	1:A:515:GLU:HB2	1.95	0.48
1:A:574:SER:HB2	1:A:609:LEU:HD23	1.96	0.48
1:A:274:GLU:HA	1:A:276:ILE:HG22	1.95	0.48
1:B:177:PHE:CE1	1:B:216:LEU:HD21	2.49	0.48
1:B:254:ILE:O	1:B:255:TRP:HD1	1.96	0.48
1:A:309:LYS:HB2	1:A:335:ASP:HB3	1.95	0.48
1:B:274:GLU:HA	1:B:276:ILE:HG22	1.95	0.48
1:A:143:MET:SD	1:A:178:VAL:HG23	2.53	0.47
1:A:465:LEU:CD1	4:A:806:C8E:C17	2.66	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:74:ARG:HD3	1:B:538:TYR:CE1	2.48	0.47
1:B:303:TRP:CZ3	1:B:305:ASP:HB2	2.49	0.47
1:B:330:HIS:HB3	1:B:358:ARG:HG3	1.95	0.47
1:A:121:LEU:O	1:A:425:ARG:HD2	2.14	0.47
1:B:639:ARG:HD2	1:B:659:TYR:CD1	2.50	0.47
1:A:697:TRP:HD1	1:A:730:VAL:HG13	1.80	0.47
1:B:403:GLN:O	1:B:429:GLN:HA	2.14	0.47
1:B:67:GLY:HA3	1:B:236:TYR:CD1	2.49	0.47
1:B:60:HIS:HE1	1:B:639:ARG:HH21	1.52	0.47
1:A:81:ILE:HG22	1:A:129:ALA:HB3	1.97	0.47
1:A:403:GLN:O	1:A:429:GLN:HA	2.14	0.46
1:A:53:LEU:HD22	1:A:114:ILE:HD11	1.97	0.46
1:A:255:TRP:HA	1:A:256:GLN:HA	1.52	0.46
1:A:390:GLU:HG2	1:A:395:PRO:HG3	1.96	0.46
1:B:143:MET:SD	1:B:178:VAL:HG23	2.55	0.46
1:B:29:THR:OG1	1:B:119:VAL:HG13	2.15	0.46
1:B:93:MET:SD	1:B:352:ASN:HB2	2.56	0.46
1:B:493:LEU:HD11	1:B:512:LEU:HD12	1.93	0.46
1:A:690:THR:HG23	1:A:691:ARG:O	2.15	0.46
1:B:648:LEU:HD12	1:B:648:LEU:O	2.14	0.46
1:B:648:LEU:CA	1:B:649:THR:CG2	2.89	0.46
1:A:538:TYR:O	1:A:579:TYR:HA	2.16	0.46
1:A:60:HIS:CE1	1:A:639:ARG:NH2	2.71	0.46
1:B:651:ARG:HA	1:B:687:ARG:HB3	1.98	0.46
1:B:390:GLU:HG2	1:B:395:PRO:HG3	1.98	0.46
1:A:682:LEU:HD22	1:A:704:LEU:HD11	1.97	0.46
1:B:255:TRP:CZ3	1:B:256:GLN:NE2	2.84	0.46
1:B:690:THR:HG23	1:B:691:ARG:O	2.16	0.46
1:A:190:ASP:HB3	1:A:202:LEU:O	2.16	0.46
1:A:301:ARG:HA	1:A:302:PRO:HD3	1.83	0.46
1:B:667:LEU:HB2	1:B:671:GLU:HB2	1.96	0.46
1:A:74:ARG:HB3	1:A:538:TYR:CE2	2.51	0.46
1:A:639:ARG:HD2	1:A:659:TYR:CD1	2.50	0.46
1:B:222:LYS:HB2	1:B:317:TRP:CB	2.45	0.46
1:B:473:PRO:HA	1:B:474:GLN:HA	1.51	0.46
1:B:538:TYR:O	1:B:579:TYR:HA	2.16	0.46
1:A:651:ARG:HA	1:A:687:ARG:HB3	1.97	0.46
1:A:29:THR:OG1	1:A:119:VAL:HG13	2.16	0.45
1:A:686:TYR:HD1	1:A:687:ARG:N	2.14	0.45
1:B:218:TRP:O	1:B:219:VAL:HG23	2.15	0.45
1:B:697:TRP:HD1	1:B:730:VAL:HG13	1.80	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:MET:SD	1:A:352:ASN:HB2	2.56	0.45
1:A:674:THR:HG22	1:A:675:PRO:O	2.16	0.45
1:B:486:ARG:HB3	1:B:515:GLU:HB2	1.97	0.45
1:A:473:PRO:HA	1:A:474:GLN:HA	1.52	0.45
1:B:53:LEU:HD22	1:B:114:ILE:HD11	1.99	0.45
1:B:178:VAL:O	1:B:216:LEU:HA	2.15	0.45
1:B:143:MET:HG2	1:B:219:VAL:CG1	2.45	0.45
1:A:418:PHE:CE1	4:A:806:C8E:H31	2.47	0.45
1:B:221:GLU:CB	1:B:222:LYS:HA	2.40	0.45
1:B:566:MET:HG3	1:B:566:MET:O	2.16	0.45
1:A:152:LEU:O	1:A:732:VAL:N	2.46	0.45
1:B:682:LEU:HD22	1:B:704:LEU:HD11	1.97	0.45
1:A:218:TRP:CE3	1:A:219:VAL:O	2.70	0.45
1:A:526:TYR:HB3	1:A:533:TYR:CE2	2.52	0.45
1:A:60:HIS:HE1	1:A:639:ARG:HH21	1.53	0.45
1:B:219:VAL:CG1	1:B:220:GLY:H	2.29	0.45
1:B:674:THR:HG22	1:B:675:PRO:O	2.17	0.45
1:A:221:GLU:OE1	1:A:318:LYS:HE2	2.17	0.44
1:B:347:GLU:HB3	1:B:500:VAL:HG11	1.99	0.44
1:B:35:LYS:HE3	1:B:584:GLU:OE2	2.18	0.44
1:B:74:ARG:HB3	1:B:538:TYR:CE2	2.52	0.44
1:A:74:ARG:HH11	1:A:116:ARG:HD3	1.82	0.44
1:B:74:ARG:HH11	1:B:116:ARG:CD	2.31	0.44
1:B:686:TYR:HD1	1:B:687:ARG:N	2.15	0.44
1:A:74:ARG:HH11	1:A:116:ARG:CD	2.31	0.44
1:A:694:GLU:O	1:A:732:VAL:HA	2.18	0.44
1:B:81:ILE:HG22	1:B:129:ALA:HB3	2.00	0.44
1:B:152:LEU:O	1:B:732:VAL:N	2.46	0.44
1:B:539:ARG:HD2	1:B:541:ARG:HH12	1.83	0.44
1:A:321:PHE:CD1	1:A:321:PHE:N	2.85	0.44
1:A:43:ARG:HD2	1:A:151:GLU:OE1	2.18	0.44
1:A:160:ASN:H	1:A:161:LEU:HA	1.83	0.44
1:A:84:LEU:HD11	1:A:123:TYR:CE1	2.53	0.44
1:A:346:VAL:HG11	1:A:349:PHE:CE1	2.53	0.44
1:A:493:LEU:HD11	1:A:512:LEU:HD12	1.95	0.44
1:B:43:ARG:HD2	1:B:151:GLU:OE1	2.17	0.44
1:B:694:GLU:O	1:B:732:VAL:HA	2.18	0.44
1:B:122:LEU:O	1:B:358:ARG:NH2	2.32	0.43
1:B:335:ASP:OD2	1:B:337:ARG:NH2	2.50	0.43
1:A:324:PHE:CE1	1:A:361:LEU:CD1	3.02	0.43
1:A:324:PHE:CE1	1:A:361:LEU:HD13	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:233:ARG:HD2	1:B:307:ARG:HD3	2.00	0.43
1:A:222:LYS:HB2	1:A:317:TRP:CB	2.45	0.43
1:A:469:TRP:CB	4:A:806:C8E:H32	2.47	0.43
1:B:517:SER:OG	1:B:519:ASN:OD1	2.36	0.43
1:B:401:LYS:HB3	1:B:432:SER:HB2	2.00	0.43
1:B:84:LEU:HD11	1:B:123:TYR:CE1	2.52	0.43
1:B:221:GLU:OE1	1:B:318:LYS:HE2	2.19	0.43
1:B:324:PHE:CE1	1:B:361:LEU:HD13	2.54	0.43
1:B:690:THR:OG1	1:B:691:ARG:N	2.52	0.43
1:A:347:GLU:HB3	1:A:500:VAL:HG11	1.99	0.43
1:B:94:ALA:HA	1:B:100:HIS:HB2	2.00	0.43
1:B:539:ARG:HD3	1:B:539:ARG:HH11	1.63	0.43
1:A:210:GLN:O	1:A:232:ARG:HA	2.19	0.43
1:A:35:LYS:HE3	1:A:584:GLU:OE2	2.19	0.43
1:A:648:LEU:CA	1:A:649:THR:CG2	2.89	0.43
1:B:210:GLN:O	1:B:232:ARG:HA	2.19	0.43
1:B:321:PHE:N	1:B:321:PHE:CD1	2.86	0.43
1:A:213:SER:HA	1:A:229:TYR:O	2.19	0.43
1:A:220:GLY:N	1:A:223:GLY:O	2.52	0.43
1:A:552:ASN:ND2	1:A:552:ASN:O	2.52	0.43
1:A:492:GLU:HA	1:A:571:TYR:CD2	2.54	0.43
1:A:592:ARG:NH2	1:A:649:THR:CG2	2.77	0.43
1:B:700:LYS:HB3	1:B:727:THR:HB	2.01	0.43
1:A:126:GLY:O	1:A:128:VAL:HG13	2.19	0.42
1:A:254:ILE:HG21	1:A:393:LYS:HZ1	1.80	0.42
1:A:458:GLN:OE1	1:A:458:GLN:N	2.53	0.42
1:B:190:ASP:O	1:B:201:ARG:HD3	2.19	0.42
1:A:94:ALA:HA	1:A:100:HIS:HB2	2.02	0.42
1:A:700:LYS:HB3	1:A:727:THR:HB	2.02	0.42
1:B:37:ILE:HB	1:B:112:VAL:CG1	2.50	0.42
1:B:643:HIS:HE1	1:B:659:TYR:OH	2.02	0.42
1:A:512:LEU:HD13	1:A:546:ILE:HD13	2.02	0.42
1:B:160:ASN:H	1:B:161:LEU:HA	1.84	0.42
1:B:603:ARG:NH2	1:B:666:LYS:HE3	2.35	0.42
1:A:530:ARG:HA	1:A:530:ARG:HD2	1.95	0.42
1:B:346:VAL:HG11	1:B:349:PHE:CE1	2.55	0.42
1:B:526:TYR:HB3	1:B:533:TYR:CE2	2.54	0.42
1:A:212:GLY:O	1:A:230:SER:HA	2.20	0.42
1:B:212:GLY:O	1:B:230:SER:HA	2.20	0.42
1:A:140:PRO:C	1:A:142:LYS:H	2.23	0.42
1:A:218:TRP:HE3	1:A:219:VAL:O	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:476:LYS:O	1:A:524:LEU:HD12	2.20	0.42
1:B:274:GLU:HG2	1:B:277:ASP:HB3	2.02	0.42
1:B:306:LEU:HB2	1:B:338:HIS:HB3	2.01	0.42
1:B:593:TYR:HE1	1:B:646:ALA:CB	2.20	0.42
1:A:220:GLY:HA2	1:A:221:GLU:C	2.40	0.42
1:A:306:LEU:HB2	1:A:338:HIS:HB3	2.02	0.42
1:B:252:ASP:O	1:B:254:ILE:HG13	2.19	0.42
1:B:598:SER:O	1:B:641:GLY:N	2.36	0.42
1:A:138:LYS:HE2	1:A:213:SER:OG	2.19	0.42
1:A:60:HIS:HE1	1:A:639:ARG:NH2	2.16	0.42
1:A:274:GLU:HG2	1:A:277:ASP:HB3	2.02	0.41
1:A:27:LEU:HD22	1:A:371:GLY:HA2	2.02	0.41
1:A:37:ILE:HB	1:A:112:VAL:CG1	2.50	0.41
1:A:401:LYS:HB3	1:A:432:SER:HB2	2.01	0.41
1:A:539:ARG:HD2	1:A:541:ARG:HH12	1.84	0.41
1:A:169:ILE:N	1:A:181:THR:O	2.45	0.41
1:A:42:LEU:HD11	1:A:112:VAL:CG1	2.45	0.41
1:B:60:HIS:HE1	1:B:639:ARG:NH2	2.15	0.41
1:A:690:THR:OG1	1:A:691:ARG:N	2.53	0.41
1:B:136:ASP:CG	1:B:138:LYS:HD3	2.40	0.41
1:B:492:GLU:HA	1:B:571:TYR:CD2	2.55	0.41
1:A:552:ASN:ND2	1:A:552:ASN:N	2.69	0.41
1:B:324:PHE:CE1	1:B:361:LEU:CD1	3.03	0.41
1:B:400:ASN:HD22	1:B:402:VAL:HG23	1.85	0.41
1:B:532:GLN:O	1:B:586:TYR:N	2.44	0.41
1:A:259:LEU:HB2	1:A:272:THR:HA	2.03	0.41
1:B:27:LEU:HD22	1:B:371:GLY:HA2	2.02	0.41
1:A:458:GLN:HB3	1:A:487:LEU:HD21	2.03	0.41
1:A:530:ARG:O	1:A:587:PHE:HD1	2.03	0.41
1:B:190:ASP:HB3	1:B:202:LEU:O	2.21	0.41
1:A:651:ARG:NH1	1:A:688:ARG:HA	2.36	0.41
1:B:651:ARG:NH1	1:B:688:ARG:HA	2.36	0.41
1:A:401:LYS:HD3	1:A:432:SER:HB2	2.03	0.41
1:A:400:ASN:HD22	1:A:402:VAL:HG23	1.85	0.40
1:A:429:GLN:HE21	1:A:431:ALA:HB2	1.86	0.40
1:A:603:ARG:NH2	1:A:666:LYS:HE3	2.35	0.40
1:A:643:HIS:HE1	1:A:659:TYR:OH	2.03	0.40
1:A:667:LEU:HD12	1:A:668:ALA:O	2.22	0.40
1:A:724:ARG:HD3	1:A:726:PHE:CE1	2.56	0.40
1:B:140:PRO:C	1:B:142:LYS:H	2.25	0.40
1:B:356:ASN:ND2	6:B:901:HOH:O	2.47	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:369:LEU:HD12	1:B:369:LEU:O	2.21	0.40
1:A:412:GLN:NE2	1:A:414:ASN:HD21	2.19	0.40
1:B:126:GLY:O	1:B:128:VAL:HG13	2.21	0.40
1:B:223:GLY:HA3	1:B:317:TRP:HA	2.02	0.40
1:B:486:ARG:HH21	1:B:515:GLU:CD	2.25	0.40
1:A:161:LEU:N	1:A:189:GLY:H	2.19	0.40
1:B:259:LEU:HB2	1:B:272:THR:HA	2.03	0.40
1:B:539:ARG:HD3	5:B:802:SO4:S	2.62	0.40
1:B:724:ARG:HD3	1:B:726:PHE:CE1	2.57	0.40
4:A:806:C8E:C1	4:A:806:C8E:H52	2.48	0.40
1:B:429:GLN:HE21	1:B:431:ALA:HB2	1.86	0.40
1:B:551:LEU:HA	1:B:551:LEU:HD23	1.79	0.40
1:B:213:SER:HA	1:B:229:TYR:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	622/748 (83%)	569 (92%)	51 (8%)	2 (0%)	41	74
1	B	621/748 (83%)	569 (92%)	50 (8%)	2 (0%)	41	74
All	All	1243/1496 (83%)	1138 (92%)	101 (8%)	4 (0%)	41	74

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	251	ALA
1	B	251	ALA
1	A	636	PRO
1	B	636	PRO

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	527/625 (84%)	500 (95%)	27 (5%)	24 60
1	B	526/625 (84%)	497 (94%)	29 (6%)	21 57
All	All	1053/1250 (84%)	997 (95%)	56 (5%)	22 58

All (56) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	43	ARG
1	A	152	LEU
1	A	177	PHE
1	A	197	ARG
1	A	218	TRP
1	A	250	HIS
1	A	255	TRP
1	A	306	LEU
1	A	321	PHE
1	A	369	LEU
1	A	463	PHE
1	A	496	HIS
1	A	509	ASN
1	A	511	HIS
1	A	514	LYS
1	A	522	LEU
1	A	544	ASN
1	A	552	ASN
1	A	564	SER
1	A	592	ARG
1	A	603	ARG
1	A	605	ARG
1	A	666	LYS
1	A	686	TYR
1	A	691	ARG
1	A	692	TYR
1	A	707	GLN

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Mol	Chain	Res	Type
1	B	43	ARG
1	B	152	LEU
1	B	177	PHE
1	B	216	LEU
1	B	218	TRP
1	B	250	HIS
1	B	254	ILE
1	B	255	TRP
1	B	306	LEU
1	B	321	PHE
1	B	369	LEU
1	B	457	ARG
1	B	458	GLN
1	B	463	PHE
1	B	487	LEU
1	B	496	HIS
1	B	509	ASN
1	B	511	HIS
1	B	514	LYS
1	B	544	ASN
1	B	552	ASN
1	B	592	ARG
1	B	603	ARG
1	B	605	ARG
1	B	666	LYS
1	B	686	TYR
1	B	691	ARG
1	B	692	TYR
1	B	707	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	60	HIS
1	A	355	GLN
1	A	400	ASN
1	A	403	GLN
1	A	412	GLN
1	A	429	GLN
1	A	549	GLN
1	A	552	ASN
1	A	630	GLN

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Mol	Chain	Res	Type
1	A	685	ASN
1	A	712	HIS
1	B	60	HIS
1	B	355	GLN
1	B	394	GLN
1	B	400	ASN
1	B	403	GLN
1	B	412	GLN
1	B	549	GLN
1	B	630	GLN
1	B	685	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 carbohydrates in this entry.

5.6 Ligand geometry

Of 9 ligands modelled in this entry, 2 are monoatomic - leaving 7 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
4	C8E	A	806	-	20,20,20	0.33	0	19,19,19	0.47	0
3	GOL	A	804	-	5,5,5	0.40	0	5,5,5	0.23	0
5	SO4	B	802	-	4,4,4	0.15	0	6,6,6	0.05	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	GOL	A	802	-	5,5,5	0.37	0	5,5,5	0.24	0
5	SO4	A	807	-	4,4,4	0.15	0	6,6,6	0.04	0
4	C8E	A	805	-	20,20,20	0.32	0	19,19,19	0.50	0
3	GOL	A	803	-	5,5,5	0.42	0	5,5,5	0.15	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	C8E	A	806	-	-	10/18/18/18	-
3	GOL	A	802	-	-	4/4/4/4	-
3	GOL	A	804	-	-	4/4/4/4	-
3	GOL	A	803	-	-	2/4/4/4	-
4	C8E	A	805	-	-	9/18/18/18	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	804	GOL	O1-C1-C2-C3
3	A	803	GOL	O1-C1-C2-C3
4	A	806	C8E	O15-C16-C17-O18
4	A	805	C8E	O15-C16-C17-O18
3	A	803	GOL	O1-C1-C2-O2
4	A	805	C8E	C6-C7-C8-O9
3	A	804	GOL	C1-C2-C3-O3
3	A	802	GOL	O1-C1-C2-C3
3	A	802	GOL	C1-C2-C3-O3
4	A	806	C8E	C4-C5-C6-C7
3	A	804	GOL	O1-C1-C2-O2
3	A	802	GOL	O1-C1-C2-O2
4	A	806	C8E	C6-C7-C8-O9
4	A	806	C8E	O9-C10-C11-O12
4	A	805	C8E	O18-C19-C20-O21
3	A	804	GOL	O2-C2-C3-O3
4	A	805	C8E	C4-C5-C6-C7

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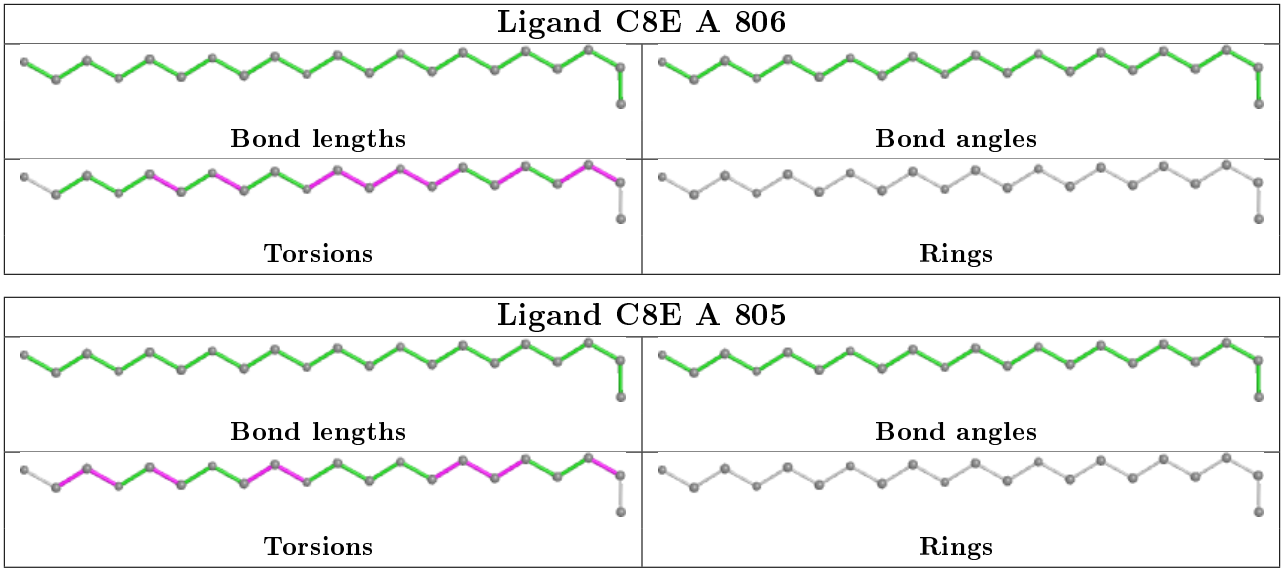
Mol	Chain	Res	Type	Atoms
4	A	805	C8E	C5-C6-C7-C8
4	A	806	C8E	C11-C10-O9-C8
4	A	805	C8E	C20-C19-O18-C17
4	A	806	C8E	C10-C11-O12-C13
4	A	806	C8E	C13-C14-O15-C16
4	A	805	C8E	C14-C13-O12-C11
4	A	806	C8E	C1-C2-C3-C4
4	A	806	C8E	C7-C8-O9-C10
4	A	806	C8E	C2-C3-C4-C5
4	A	805	C8E	C1-C2-C3-C4
3	A	802	GOL	O2-C2-C3-O3
4	A	805	C8E	O12-C13-C14-O15

There are no ring outliers.

6 monomers are involved in 31 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	806	C8E	23	0
3	A	804	GOL	1	0
5	B	802	SO4	2	0
5	A	807	SO4	3	0
4	A	805	C8E	1	0
3	A	803	GOL	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



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	635/748 (84%)	0.16	35 (5%)	25	14	43, 87, 164, 259	0
1	B	635/748 (84%)	0.49	56 (8%)	10	5	94, 137, 213, 273	0
All	All	1270/1496 (84%)	0.33	91 (7%)	15	9	43, 119, 195, 273	0

All (91) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	647	SER	7.4
1	B	28	HIS	6.5
1	B	29	THR	6.4
1	A	591	PRO	6.0
1	B	646	ALA	5.5
1	B	593	TYR	5.0
1	B	591	PRO	4.9
1	B	429	GLN	4.8
1	B	25	GLY	4.7
1	B	26	LEU	4.6
1	A	29	THR	4.6
1	A	647	SER	4.4
1	A	241	HIS	4.3
1	A	27	LEU	4.3
1	A	250	HIS	4.3
1	B	590	THR	4.2
1	B	649	THR	4.0
1	B	457	ARG	3.9
1	B	287	PHE	3.8
1	B	652	ILE	3.8
1	A	254	ILE	3.7
1	B	648	LEU	3.7
1	A	649	THR	3.7
1	B	255	TRP	3.6

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Mol	Chain	Res	Type	RSRZ
1	B	589	PRO	3.6
1	A	590	THR	3.5
1	B	254	ILE	3.5
1	B	327	LEU	3.5
1	B	27	LEU	3.5
1	A	646	ALA	3.4
1	A	287	PHE	3.4
1	B	300	GLY	3.3
1	B	587	PHE	3.3
1	A	394	GLN	3.3
1	A	277	ASP	3.3
1	B	653	ASP	3.3
1	B	592	ARG	3.3
1	B	24	SER	3.3
1	B	299	SER	3.2
1	A	650	ASP	3.0
1	A	251	ALA	3.0
1	B	250	HIS	3.0
1	A	652	ILE	3.0
1	A	327	LEU	3.0
1	A	300	GLY	2.9
1	A	398	LEU	2.9
1	B	277	ASP	2.9
1	B	21	ARG	2.8
1	B	682	LEU	2.8
1	B	644	LEU	2.7
1	B	185	TYR	2.7
1	B	30	SER	2.7
1	B	595	ILE	2.7
1	B	650	ASP	2.7
1	A	429	GLN	2.7
1	B	186	ARG	2.7
1	A	592	ARG	2.7
1	A	593	TYR	2.6
1	B	251	ALA	2.6
1	B	686	TYR	2.6
1	B	530	ARG	2.6
1	B	315	ALA	2.6
1	A	255	TRP	2.6
1	B	394	GLN	2.6
1	A	653	ASP	2.6
1	B	187	LYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	257	LYS	2.5
1	A	28	HIS	2.5
1	A	393	LYS	2.5
1	B	594	ARG	2.4
1	B	479	LEU	2.4
1	B	220	GLY	2.4
1	A	278	TYR	2.3
1	B	692	TYR	2.3
1	A	253	ILE	2.3
1	A	252	ASP	2.3
1	A	686	TYR	2.3
1	A	594	ARG	2.3
1	B	415	TRP	2.3
1	B	280	ASN	2.3
1	A	648	LEU	2.2
1	B	552	ASN	2.2
1	B	398	LEU	2.2
1	A	257	LYS	2.2
1	A	274	GLU	2.2
1	B	388	ILE	2.2
1	B	278	TYR	2.1
1	B	393	LYS	2.1
1	B	664	GLN	2.1
1	B	522	LEU	2.0
1	A	589	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 carbohydrates in this entry.

6.4 Ligands (i)

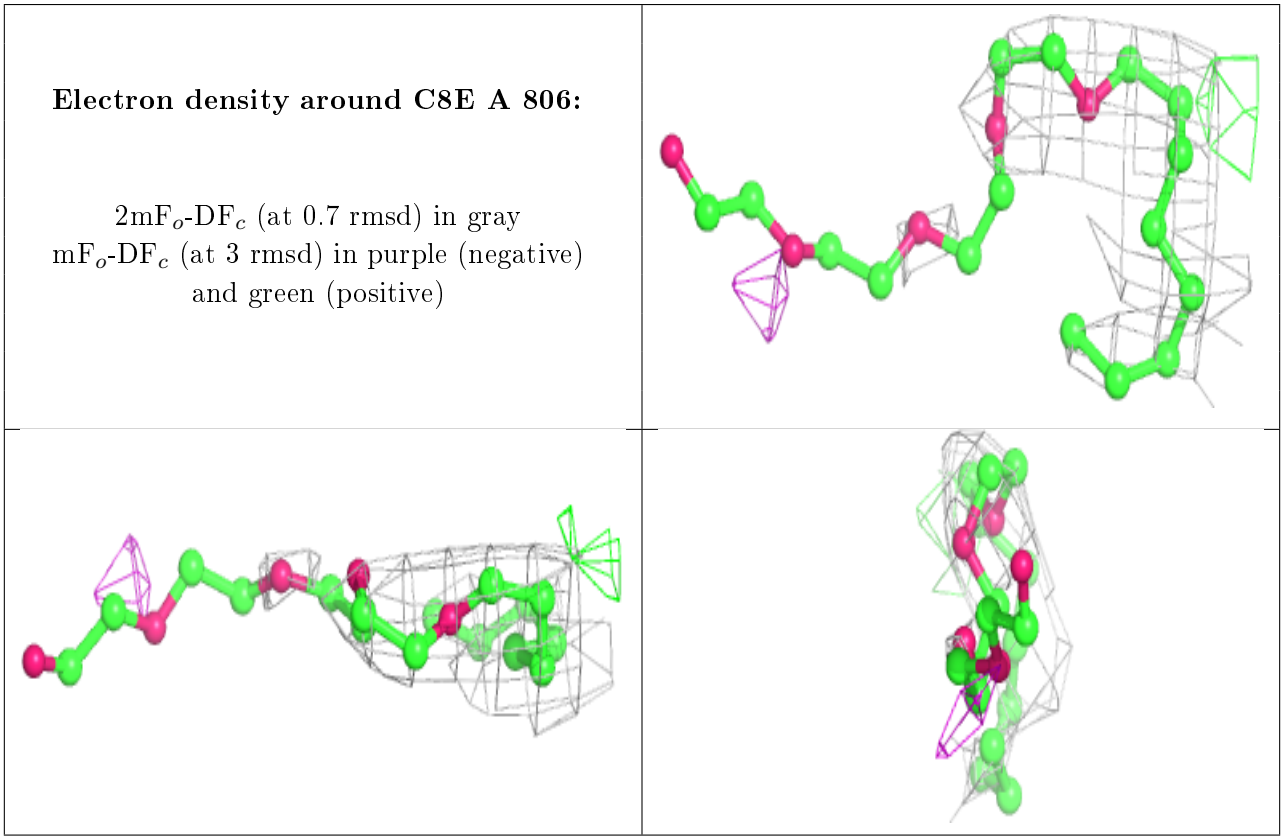
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
5	SO4	B	802	5/5	0.61	0.23	173,176,176,177	0
3	GOL	A	803	6/6	0.62	0.74	92,113,117,123	0
3	GOL	A	802	6/6	0.67	0.66	118,132,135,137	0
3	GOL	A	804	6/6	0.70	0.82	97,104,112,113	0
5	SO4	A	807	5/5	0.74	0.26	157,158,162,169	0
4	C8E	A	806	21/21	0.86	0.52	80,98,130,132	0
4	C8E	A	805	21/21	0.89	0.32	39,92,137,142	0
2	ZN	A	801	1/1	0.93	0.34	127,127,127,127	0
2	ZN	B	801	1/1	0.95	0.20	82,82,82,82	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

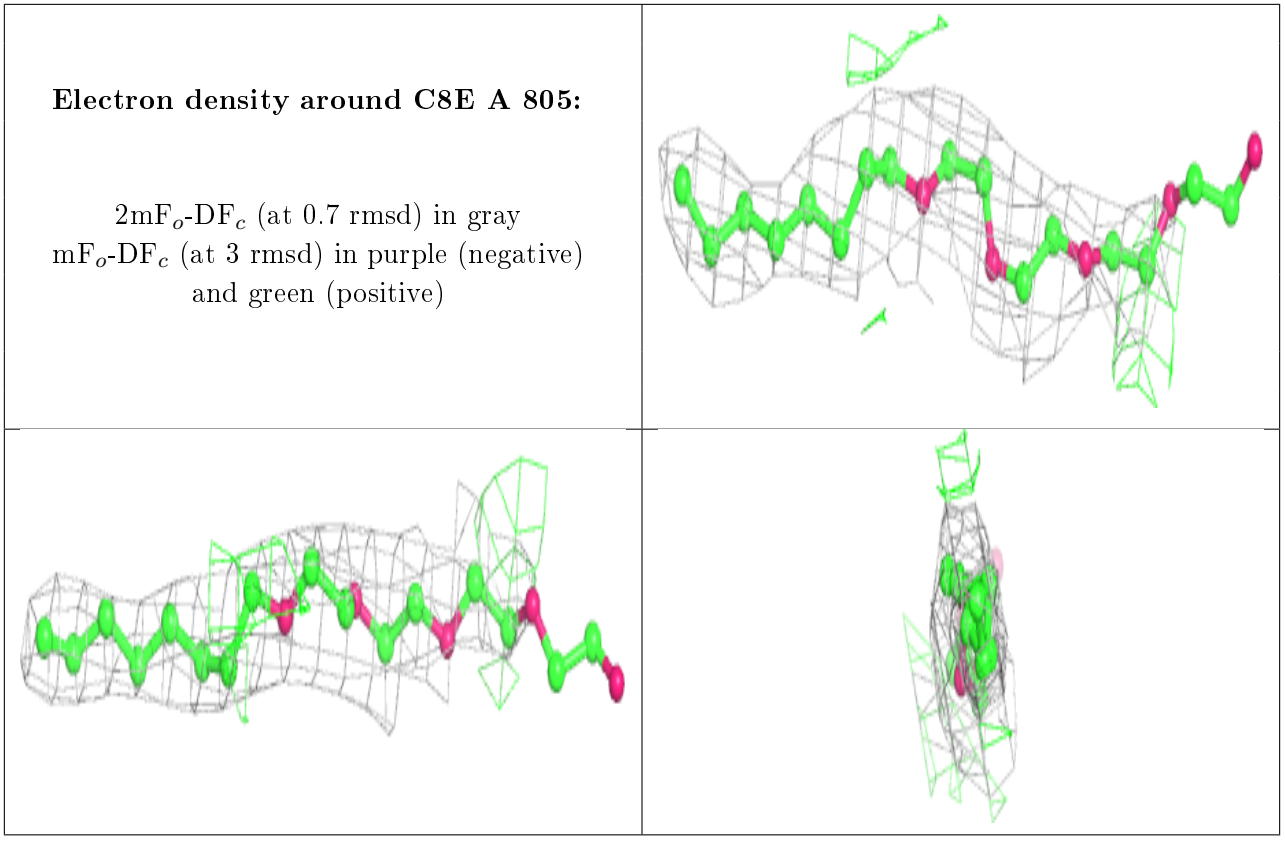
Electron density around C8E A 806:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around C8E A 805:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers

There are no such residues in this entry.