Full wwPDB X-ray Structure Validation Report

Nov 10, 2024 – 02:27 AM EST

PDB ID	:	4JW1
Title	:	Crystal structure of N-terminal 618-residue fragment of LepB from Legionella pneumophila
Authors	:	Hu, L.; Yao, Q.; Zhu, Y.; Shao, F.
Deposited on	:	2013-03-26
Resolution	:	3.16 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

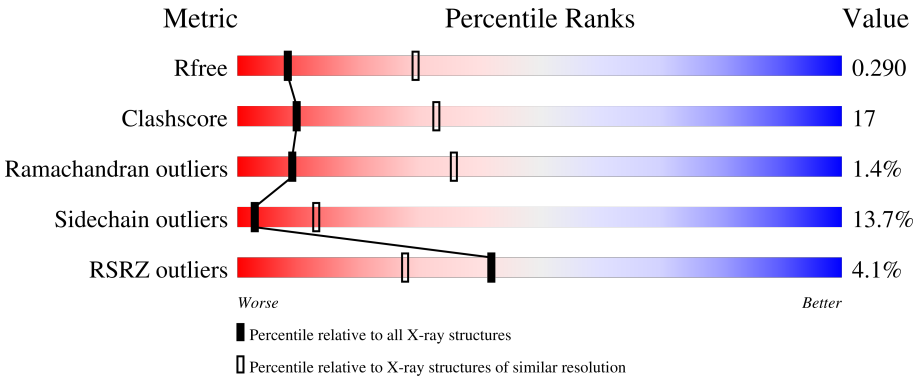
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.16 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}	164625	2168 (3.20-3.12)
Clashscore	180529	2333 (3.20-3.12)
Ramachandran outliers	177936	2266 (3.20-3.12)
Sidechain outliers	177891	2265 (3.20-3.12)
RSRZ outliers	164620	2169 (3.20-3.12)

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% 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	626	3% 51% 24% 7% • 18%
1	B	626	3% 32% 16% • 49%

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	FLC	A	702	-	X	-	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 6745 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.

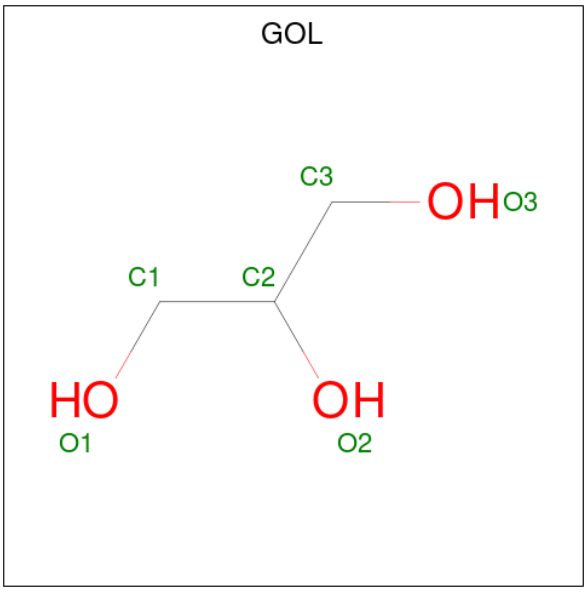
- Molecule 1 is a protein called Effector protein B.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	515	Total	C	N	O	S	Se	0	1	0
			4130	2679	676	758	7	10			
1	B	319	Total	C	N	O	S	Se	0	0	0
			2569	1670	426	467	4	2			

There are 22 discrepancies between the modelled and reference sequences:

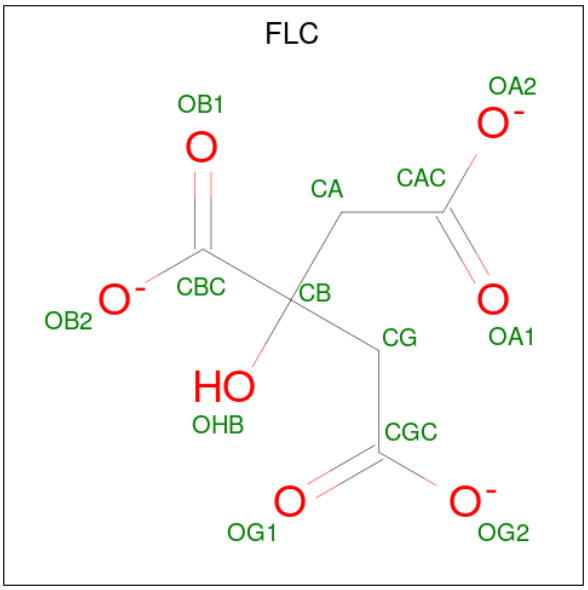
Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	HIS	-	expression tag	UNP Q6X1Y7
A	-6	HIS	-	expression tag	UNP Q6X1Y7
A	-5	HIS	-	expression tag	UNP Q6X1Y7
A	-4	HIS	-	expression tag	UNP Q6X1Y7
A	-3	HIS	-	expression tag	UNP Q6X1Y7
A	-2	HIS	-	expression tag	UNP Q6X1Y7
A	-1	GLY	-	expression tag	UNP Q6X1Y7
A	0	PRO	-	expression tag	UNP Q6X1Y7
A	13	ALA	LYS	conflict	UNP Q6X1Y7
A	14	ALA	GLU	conflict	UNP Q6X1Y7
A	15	ALA	LYS	conflict	UNP Q6X1Y7
B	-7	HIS	-	expression tag	UNP Q6X1Y7
B	-6	HIS	-	expression tag	UNP Q6X1Y7
B	-5	HIS	-	expression tag	UNP Q6X1Y7
B	-4	HIS	-	expression tag	UNP Q6X1Y7
B	-3	HIS	-	expression tag	UNP Q6X1Y7
B	-2	HIS	-	expression tag	UNP Q6X1Y7
B	-1	GLY	-	expression tag	UNP Q6X1Y7
B	0	PRO	-	expression tag	UNP Q6X1Y7
B	13	ALA	LYS	conflict	UNP Q6X1Y7
B	14	ALA	GLU	conflict	UNP Q6X1Y7
B	15	ALA	LYS	conflict	UNP Q6X1Y7

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 3 is CITRATE ANION (three-letter code: FLC) (formula: $C_6H_5O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 13 6 7	0	0

- Molecule 4 is water.

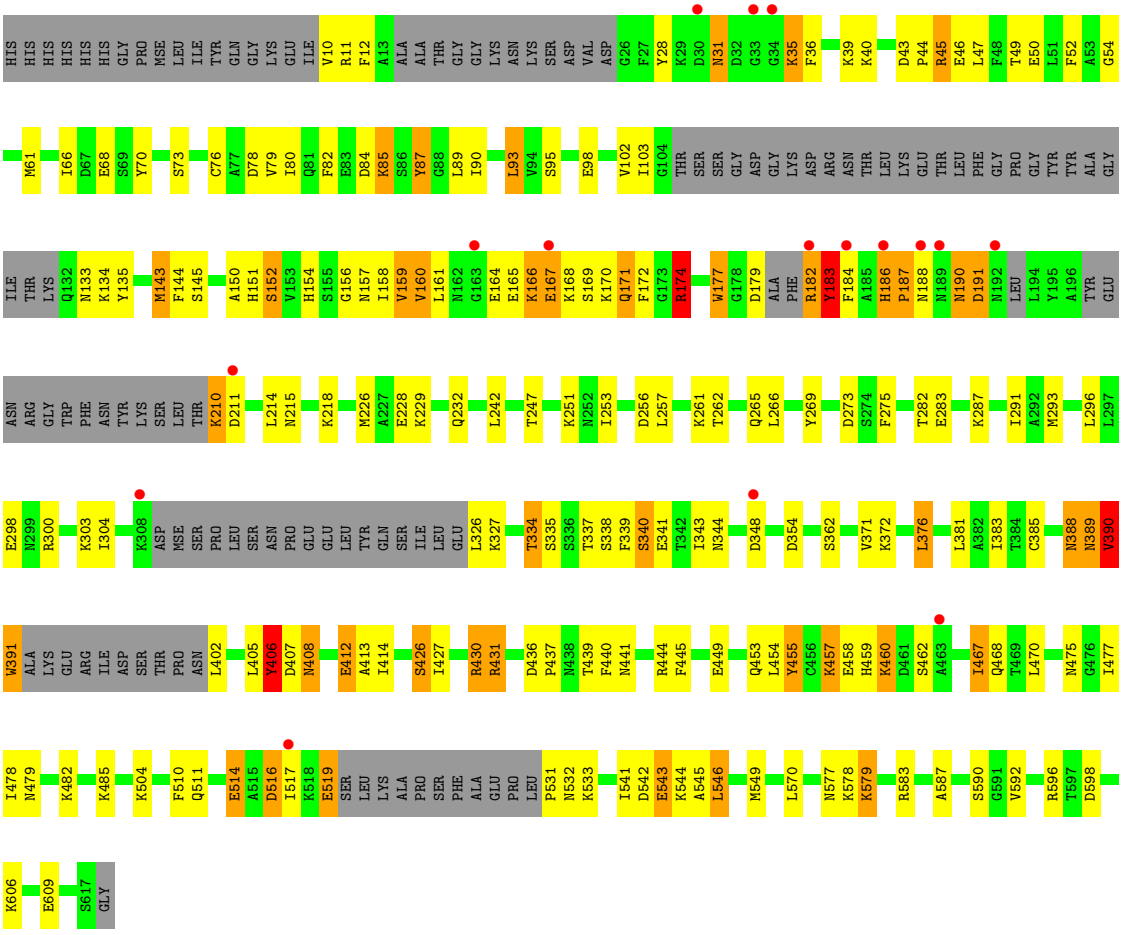
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	2	Total O 2 2	0	0
4	B	1	Total O 1 1	0	0

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.

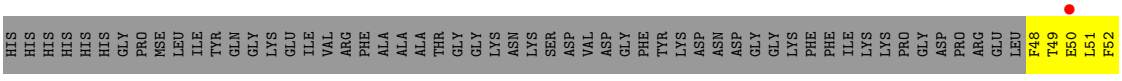
• Molecule 1: Effector protein B

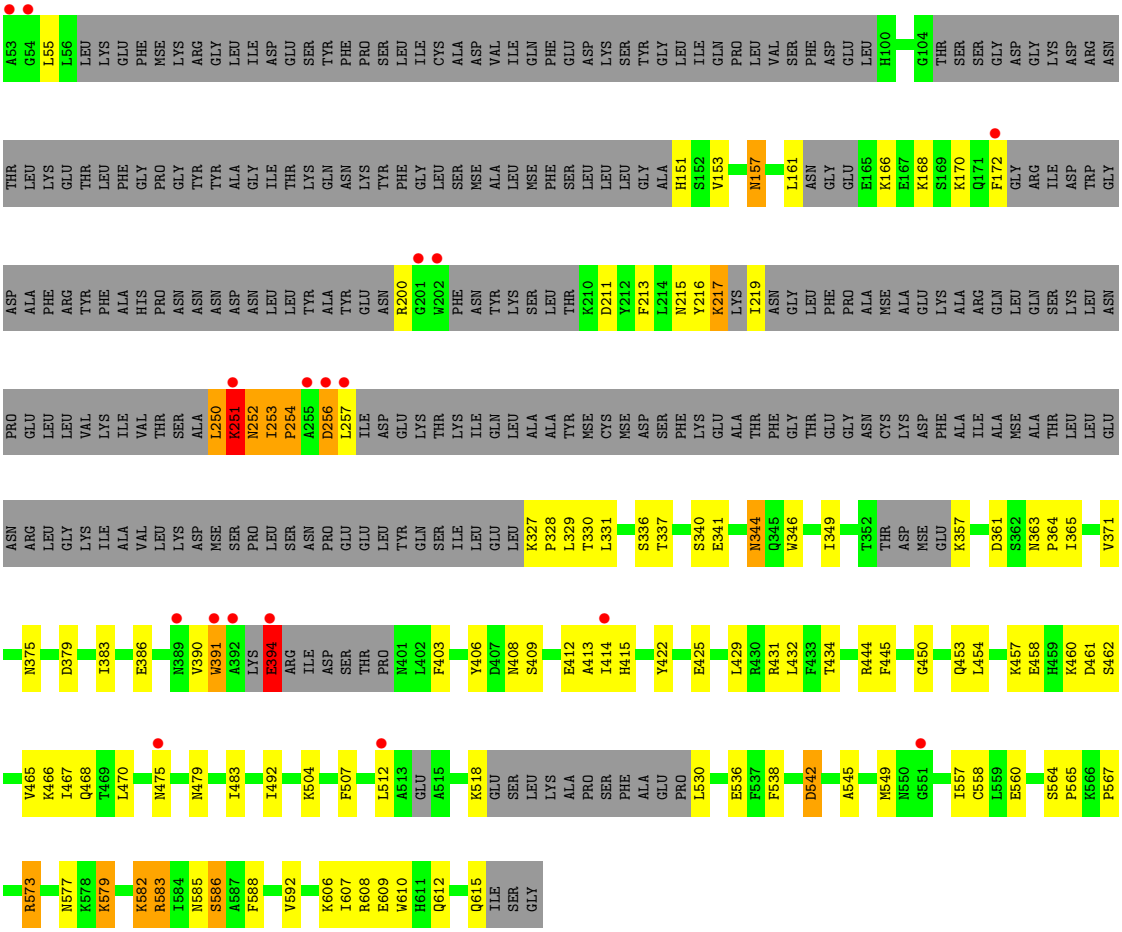
Chain A:



• Molecule 1: Effector protein B

Chain B:




A53 G54 L55 L56 LEU LYS GLU PHE MSE LYS ARG GLY LEU ILE ASP GLU SER TYR PHE PRO SER LEU ILE CYS ALA ASP VAL ILE GLN PHE GLU ASP LYS SER TYR GLY LEU ILE GLN PRO LEU VAL SER PHE ASP GLU LEU H100 G104 THR SER SER GLY ASP GLY LYS ASP ARG ASN
THR LEU LYS GLU THR LEU PHE GLY PRO GLY TYR TYR ALA GLY ILE THR LYS GLN ASN LYS TYR PHE GLY LEU SER MSE ALA LEU MSE PHE SER LEU LEU LEU GLY ALA H151 S152 V153 N157 L161 ASN GLY GLU E165 K166 E167 K168 S169 K170 Q171 F172 GLY ARG ILE ASP TRP GLY
ASP ALA PHE ARG TYR PHE ALA HIS PRO ASN ASN ASN ASP ASN LEU LEU TYR ALA TYR GLU ASN R200 G201 W202 PHE ASN TYR LYS SER LEU THR K210 D211 Y212 F213 L214 N215 Y216 K217 LYS I219 ASN GLY LEU PHE PRO ALA MSE ALA GLU LYS ALA ARG GLN LEU GLN SER LYS LEU ASN
PRO GLU LEU LEU VAL LYS ILE VAL THR SER ALA L250 K251 N252 I253 P254 A255 D256 L257 ILE ASP GLU LYS THR LYS ILE GLN LEU ALA ALA TYR MSE CYS MSE ASP SER PHE LYS GLU ALA THR PHE GLY THR GLU GLY ASN CYS LYS ASP PHE ALA ILE ALA MSE ALA THR LEU LEU GLU
ASN ARG LEU GLY LYS ILE ALA VAL LEU LYS ASP MSE SER PRO LEU SER ASN PRO GLU GLU LEU TYR GLN SER ILE LEU GLU LEU K327 P328 L329 T330 L331 S336 T337 S340 E341 N344 Q345 W346 I349 T352 THR ASP MSE GLU K357 D361 S362 N363 P364 I365 V371
N375 D379 I383 E386 N389 V390 W391 A392 LYS E394 ARG ILE ASP SER THR PRO N401 L402 F403 Y406 D407 N408 S409 E412 A413 T414 H415 Y422 E425 L429 R430 R431 L432 F433 T434 R444 F445 G450 Q453 L454 K457 E458 H459 K460 D461 S462
V465 K466 T467 Q468 T469 L470 N475 N479 I483 I492 K504 F507 L512 A513 GLU A515 K518 GLU SER LEU LYS ALA PRO SER PHE ALA GLU PRO L530 E536 F537 F538 D542 A545 M549 N550 G551 I557 C558 L559 E560 S564 P565 K566 P567
R573 N577 K578 K579 K582 R583 I584 N585 S586 A587 F588 V592 K606 I607 R608 E609 W610 H611 Q612 Q615 ILE SER GLY

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	101.54Å 159.42Å 181.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.95 – 3.16 19.95 – 3.16	Depositor EDS
% Data completeness (in resolution range)	99.5 (19.95-3.16) 99.0 (19.95-3.16)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.94 (at 3.15Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.264 , 0.283 0.251 , 0.290	Depositor DCC
R_{free} test set	1269 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å^2)	35.4	Xtriage
Anisotropy	0.155	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.23 , 42.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.83	EDS
Total number of atoms	6745	wwPDB-VP
Average B, all atoms (Å^2)	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.40% 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: FLC, GOL

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	0.61	8/4207 (0.2%)	0.61	4/5644 (0.1%)
1	B	0.62	1/2615 (0.0%)	0.60	0/3512
All	All	0.62	9/6822 (0.1%)	0.60	4/9156 (0.0%)

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	183	TYR	CD2-CE2	-7.53	1.28	1.39
1	A	183	TYR	CD1-CE1	-7.23	1.28	1.39
1	A	159	VAL	CB-CG2	-7.20	1.37	1.52
1	B	394	GLU	CB-CG	-5.91	1.41	1.52
1	A	183	TYR	CE2-CZ	-5.82	1.30	1.38
1	A	406	TYR	CD2-CE2	-5.56	1.31	1.39
1	A	160	VAL	CB-CG1	-5.17	1.42	1.52
1	A	275	PHE	CE2-CZ	-5.07	1.27	1.37
1	A	87	TYR	CE2-CZ	-5.06	1.31	1.38

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	174	ARG	NE-CZ-NH1	6.86	123.73	120.30
1	A	174	ARG	NE-CZ-NH2	-6.36	117.12	120.30
1	A	167	GLU	OE1-CD-OE2	5.94	130.43	123.30
1	A	546	LEU	CB-CG-CD2	-5.28	102.03	111.00

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	4130	0	4151	160	0
1	B	2569	0	2573	73	0
2	A	6	0	8	0	0
2	B	24	0	32	0	0
3	A	13	0	5	2	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
All	All	6745	0	6769	234	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 17.

All (234) 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:168:LYS:NZ	1:B:172:PHE:CE2	1.88	1.34
1:A:431:ARG:CG	1:A:431:ARG:HH21	1.67	1.06
1:A:161:LEU:HD12	1:A:165:GLU:HG2	1.07	1.06
1:A:98:GLU:HA	1:A:159:VAL:HG12	1.38	1.05
1:A:431:ARG:HH21	1:A:431:ARG:HG2	1.20	1.05
1:A:390:VAL:HG22	1:A:391:TRP:H	1.21	1.01
1:A:161:LEU:CD1	1:A:165:GLU:HG2	1.89	1.01
1:A:247:THR:HG22	1:A:251:LYS:HZ1	1.33	0.94
1:A:174:ARG:HH11	1:A:174:ARG:CG	1.81	0.93
1:A:390:VAL:CG2	1:A:391:TRP:H	1.81	0.93
1:B:217:LYS:O	1:B:219:ILE:N	2.03	0.90
1:A:431:ARG:HG2	1:A:431:ARG:NH2	1.85	0.87
1:B:168:LYS:HZ1	1:B:172:PHE:HE2	0.95	0.87
1:B:151:HIS:O	1:B:151:HIS:ND1	2.07	0.86
1:B:549:MSE:O	1:B:583:ARG:NH1	2.10	0.84
1:B:200:ARG:NH1	1:B:200:ARG:HB2	1.94	0.82
1:A:389:ASN:OD1	1:A:389:ASN:N	2.13	0.81
1:A:247:THR:HG22	1:A:251:LYS:NZ	1.95	0.81
1:B:461:ASP:O	1:B:466:LYS:NZ	2.12	0.81
1:A:470:LEU:HD22	1:A:517:ILE:HD13	1.61	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:168:LYS:NZ	1:B:172:PHE:CZ	2.50	0.79
1:B:256:ASP:OD1	1:B:256:ASP:N	2.12	0.78
1:A:444:ARG:NH1	1:A:449:GLU:OE1	2.16	0.78
1:B:573:ARG:HH11	1:B:573:ARG:HB3	1.48	0.78
1:A:174:ARG:HH11	1:A:174:ARG:HG2	1.47	0.77
1:A:161:LEU:HD12	1:A:165:GLU:CG	2.03	0.77
1:A:340:SER:O	1:A:344:ASN:ND2	2.17	0.77
1:A:449:GLU:O	1:A:453:GLN:HG3	1.85	0.77
1:B:394:GLU:OE2	1:B:425:GLU:HB2	1.84	0.77
1:B:585:ASN:OD1	1:B:608:ARG:NH1	2.20	0.75
1:A:543:GLU:OE1	1:A:544:LYS:N	2.19	0.75
1:A:390:VAL:HG22	1:A:391:TRP:N	2.00	0.74
1:B:394:GLU:OE1	1:B:394:GLU:N	2.21	0.74
1:A:427:ILE:O	1:A:430:ARG:HG3	1.88	0.73
1:B:168:LYS:NZ	1:B:172:PHE:CD2	2.48	0.73
1:A:174:ARG:HH11	1:A:174:ARG:HG3	1.54	0.72
1:B:200:ARG:HB2	1:B:200:ARG:HH11	1.51	0.72
1:B:151:HIS:CE1	1:B:172:PHE:CE2	2.78	0.71
1:A:183:TYR:HB3	1:A:184:PHE:HA	1.73	0.70
1:A:190:ASN:N	1:A:190:ASN:OD1	2.24	0.69
1:A:514:GLU:HA	1:A:517:ILE:HD12	1.74	0.69
1:A:532:ASN:O	1:A:533:LYS:NZ	2.25	0.69
1:A:12:PHE:HZ	1:A:35:LYS:HE2	1.59	0.68
1:A:61:MSE:HG2	1:A:66:ILE:HD11	1.76	0.67
1:B:151:HIS:CE1	1:B:172:PHE:CD2	2.83	0.67
1:B:151:HIS:ND1	1:B:172:PHE:CE2	2.62	0.67
1:A:426:SER:O	1:A:430:ARG:CD	2.42	0.67
1:A:431:ARG:HH21	1:A:431:ARG:HG3	1.59	0.65
1:B:432:LEU:HD23	1:B:445:PHE:HB3	1.77	0.65
1:A:390:VAL:CG2	1:A:391:TRP:N	2.55	0.65
1:A:177:TRP:O	1:A:183:TYR:OH	2.15	0.64
1:A:247:THR:O	1:A:251:LYS:NZ	2.30	0.64
1:A:431:ARG:CG	1:A:431:ARG:NH2	2.39	0.64
1:B:48:PHE:HB2	1:B:50:GLU:HG3	1.78	0.63
1:A:485:LYS:HE2	3:A:702:FLC:HG1	1.80	0.63
1:A:174:ARG:CG	1:A:174:ARG:NH1	2.48	0.63
1:B:394:GLU:N	1:B:394:GLU:CD	2.51	0.63
1:B:512:LEU:HD12	1:B:512:LEU:O	1.99	0.63
1:B:431:ARG:NH1	1:B:560:GLU:OE1	2.31	0.62
1:B:542:ASP:OD1	1:B:542:ASP:N	2.31	0.62
1:B:475:ASN:O	1:B:479:ASN:ND2	2.32	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:426:SER:O	1:A:430:ARG:HD2	2.00	0.61
1:A:412:GLU:OE1	1:A:413:ALA:N	2.34	0.61
1:B:168:LYS:CE	1:B:172:PHE:CE2	2.84	0.60
1:A:457:LYS:O	1:A:460:LYS:HG3	2.00	0.60
1:B:151:HIS:CE1	1:B:172:PHE:HE2	2.19	0.60
1:A:174:ARG:HG3	1:A:174:ARG:NH1	2.16	0.59
1:B:215:ASN:OD1	1:B:216:TYR:N	2.36	0.59
1:B:371:VAL:O	1:B:375:ASN:ND2	2.29	0.59
1:B:379:ASP:O	1:B:383:ILE:HG12	2.02	0.58
1:B:327:LYS:HB3	1:B:328:PRO:HD3	1.85	0.58
1:A:408:ASN:O	1:A:408:ASN:ND2	2.34	0.58
1:A:183:TYR:CB	1:A:184:PHE:HA	2.33	0.58
1:A:215:ASN:ND2	1:A:218:LYS:NZ	2.51	0.58
1:A:261:LYS:HE3	1:A:265:GLN:HE21	1.67	0.57
1:A:166:LYS:NZ	1:A:166:LYS:HB3	2.19	0.57
1:B:341:GLU:OE1	1:B:344:ASN:ND2	2.36	0.57
1:A:45:ARG:HG3	1:A:266:LEU:HD21	1.87	0.57
1:A:441:ASN:OD1	1:A:441:ASN:N	2.38	0.57
1:A:183:TYR:HB3	1:A:303:LYS:HZ2	1.70	0.56
1:B:573:ARG:HB3	1:B:573:ARG:NH1	2.20	0.56
1:B:465:VAL:HA	1:B:468:GLN:HG2	1.87	0.56
1:A:371:VAL:HG22	1:A:478:ILE:HD13	1.88	0.55
1:B:391:TRP:HD1	1:B:391:TRP:H	1.54	0.55
1:A:511:GLN:HA	1:A:514:GLU:HG2	1.88	0.55
1:A:133:ASN:OD1	1:A:134:LYS:N	2.40	0.55
1:A:166:LYS:C	1:A:167:GLU:CG	2.75	0.55
1:A:166:LYS:C	1:A:167:GLU:HG2	2.28	0.54
1:A:183:TYR:CD1	1:A:183:TYR:N	2.73	0.54
1:A:174:ARG:HA	1:A:177:TRP:CG	2.43	0.54
1:B:251:LYS:O	1:B:253:ILE:N	2.40	0.54
1:B:582:LYS:O	1:B:586:SER:HB3	2.07	0.54
1:A:191:ASP:OD2	1:A:191:ASP:N	2.39	0.53
3:A:702:FLC:OHB	3:A:702:FLC:OG1	2.24	0.53
1:A:12:PHE:CZ	1:A:35:LYS:HE2	2.41	0.53
1:A:135:TYR:HB3	1:A:166:LYS:HD3	1.91	0.53
1:A:287:LYS:O	1:A:291:ILE:HG12	2.09	0.53
1:A:152:SER:HB3	1:A:172:PHE:CZ	2.44	0.53
1:A:186:HIS:N	1:A:187:PRO:HD3	2.23	0.53
1:A:531:PRO:HD2	1:A:533:LYS:NZ	2.24	0.52
1:A:341:GLU:OE1	1:A:341:GLU:N	2.34	0.52
1:A:143:MSE:HG3	1:A:144:PHE:N	2.24	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:394:GLU:C	1:B:429:LEU:HD12	2.31	0.52
1:A:80:ILE:HD12	1:A:90:ILE:HD12	1.91	0.51
1:A:427:ILE:O	1:A:430:ARG:CG	2.58	0.51
1:B:151:HIS:CE1	1:B:172:PHE:HD2	2.28	0.51
1:A:406:TYR:HD1	1:A:454:LEU:CD1	2.23	0.51
1:B:327:LYS:HG3	1:B:357:LYS:O	2.11	0.51
1:A:158:ILE:HG13	1:A:214:LEU:HD11	1.93	0.51
1:A:516:ASP:OD1	1:A:516:ASP:N	2.43	0.51
1:A:28:TYR:HB2	1:A:36:PHE:HB2	1.93	0.50
1:A:87:TYR:OH	1:A:256:ASP:HB3	2.11	0.50
1:A:405:LEU:O	1:A:407:ASP:N	2.44	0.50
1:A:436:ASP:OD2	1:A:439:THR:OG1	2.29	0.50
1:A:402:LEU:HD23	1:A:402:LEU:O	2.12	0.50
1:A:179:ASP:O	1:A:182:ARG:N	2.45	0.50
1:A:334:THR:OG1	1:A:335:SER:N	2.45	0.49
1:B:479:ASN:O	1:B:483:ILE:HG12	2.12	0.49
1:A:300:ARG:O	1:A:304:ILE:HG13	2.13	0.49
1:A:371:VAL:HG21	1:A:440:PHE:HD1	1.78	0.49
1:A:413:ALA:HB3	1:A:592:VAL:HG11	1.95	0.49
1:A:262:THR:HA	1:A:265:GLN:HB2	1.94	0.49
1:A:388:ASN:OD1	1:A:388:ASN:N	2.45	0.49
1:B:504:LYS:O	1:B:507:PHE:HB2	2.13	0.49
1:A:215:ASN:ND2	1:A:218:LYS:HZ2	2.11	0.48
1:B:391:TRP:CD1	1:B:391:TRP:N	2.80	0.48
1:A:406:TYR:CD1	1:A:454:LEU:HD12	2.49	0.48
1:A:470:LEU:HB2	1:A:517:ILE:HD11	1.96	0.47
1:A:177:TRP:CE3	1:A:300:ARG:NH1	2.81	0.47
1:B:250:LEU:O	1:B:252:ASN:N	2.46	0.47
1:B:256:ASP:O	1:B:257:LEU:HD23	2.14	0.47
1:A:50:GLU:HG2	1:A:171:GLN:O	2.15	0.47
1:B:409:SER:HB2	1:B:414:ILE:HD11	1.97	0.47
1:A:45:ARG:NH1	1:A:269:TYR:CE1	2.83	0.47
1:A:52:PHE:HE2	1:A:293:MSE:HE3	1.80	0.47
1:A:326:LEU:HB3	1:A:327:LYS:H	1.49	0.47
1:A:577:ASN:OD1	1:A:578:LYS:N	2.48	0.47
1:A:577:ASN:OD1	1:A:579:LYS:N	2.36	0.47
1:B:462:SER:O	1:B:466:LYS:HG2	2.14	0.47
1:A:542:ASP:OD1	1:A:545:ALA:HB3	2.15	0.47
1:A:549:MSE:O	1:A:583:ARG:NH1	2.47	0.47
1:B:151:HIS:ND1	1:B:172:PHE:CD2	2.83	0.46
1:A:458:GLU:CD	1:A:458:GLU:H	2.19	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:LYS:HG3	1:A:93:LEU:HD13	1.97	0.46
1:A:152:SER:O	1:A:152:SER:OG	2.29	0.46
1:B:330:THR:OG1	1:B:331:LEU:N	2.49	0.46
1:A:459:HIS:HB3	1:A:462:SER:HB2	1.96	0.46
1:A:577:ASN:OD1	1:A:579:LYS:HB2	2.16	0.46
1:A:143:MSE:HB3	1:A:226:MSE:HG2	1.97	0.46
1:B:413:ALA:HB3	1:B:592:VAL:HG11	1.98	0.46
1:A:261:LYS:HE3	1:A:265:GLN:NE2	2.30	0.46
1:A:587:ALA:O	1:A:590:SER:OG	2.27	0.46
1:A:73:SER:HG	1:A:167:GLU:CD	2.19	0.46
1:A:174:ARG:HG2	1:A:174:ARG:NH1	2.20	0.45
1:A:40:LYS:HD3	1:A:82:PHE:HE2	1.81	0.45
1:A:184:PHE:HA	1:A:303:LYS:HZ2	1.81	0.45
1:A:215:ASN:ND2	1:A:218:LYS:HZ3	2.15	0.45
1:A:296:LEU:O	1:A:300:ARG:HG3	2.16	0.45
1:B:518:LYS:HA	1:B:518:LYS:HD3	1.38	0.45
1:A:543:GLU:HG3	1:A:544:LYS:HD2	1.98	0.45
1:A:70:TYR:O	1:A:73:SER:HB2	2.16	0.45
1:A:11:ARG:HG2	1:A:12:PHE:N	2.29	0.45
1:A:166:LYS:HB3	1:A:166:LYS:HZ3	1.81	0.45
1:A:102:VAL:HG23	1:A:103:ILE:HG23	1.99	0.44
1:A:183:TYR:N	1:A:183:TYR:HD1	2.14	0.44
1:A:170:LYS:HE2	1:A:170:LYS:HB2	1.76	0.44
1:A:228:GLU:O	1:A:232:GLN:HB2	2.17	0.44
1:A:362:SER:O	1:A:485:LYS:NZ	2.50	0.44
1:A:372:LYS:HB2	1:A:372:LYS:HE3	1.78	0.44
1:A:47:LEU:HD12	1:A:89:LEU:HG	1.98	0.44
1:A:381:LEU:HD23	1:A:381:LEU:HA	1.88	0.44
1:A:479:ASN:O	1:A:482:LYS:HB2	2.18	0.44
1:A:531:PRO:HD2	1:A:533:LYS:HZ3	1.82	0.44
1:B:457:LYS:HA	1:B:460:LYS:NZ	2.33	0.44
1:B:558:CYS:HB3	1:B:607:ILE:HD13	2.00	0.44
1:B:504:LYS:HE3	1:B:504:LYS:HB3	1.78	0.43
1:A:517:ILE:O	1:A:519:GLU:N	2.39	0.43
1:A:152:SER:O	1:A:157:ASN:ND2	2.51	0.43
1:A:35:LYS:HG2	1:A:93:LEU:HD22	2.01	0.43
1:B:467:ILE:O	1:B:470:LEU:HB3	2.18	0.43
1:A:73:SER:OG	1:A:167:GLU:CD	2.52	0.43
1:A:78:ASP:OD1	1:A:79:VAL:N	2.50	0.43
1:A:385:CYS:HB3	1:A:391:TRP:CZ2	2.54	0.43
1:A:177:TRP:HZ2	1:A:293:MSE:SE	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:432:LEU:CD2	1:B:445:PHE:HB3	2.47	0.43
1:A:158:ILE:HA	1:A:167:GLU:O	2.19	0.43
1:A:455:TYR:N	1:A:458:GLU:OE1	2.48	0.42
1:B:538:PHE:CE2	1:B:557:ILE:HG23	2.54	0.42
1:A:151:HIS:HB3	1:A:188:ASN:HD22	1.85	0.42
1:A:84:ASP:O	1:A:85:LYS:HB3	2.19	0.42
1:A:31:ASN:OD1	1:A:31:ASN:N	2.52	0.42
1:A:467:ILE:HG22	1:A:468:GLN:N	2.34	0.42
1:B:151:HIS:ND1	1:B:172:PHE:HE2	2.13	0.42
1:B:213:PHE:O	1:B:492:ILE:HG23	2.19	0.42
1:A:371:VAL:HG21	1:A:440:PHE:CD1	2.54	0.42
1:A:376:LEU:HD12	1:A:376:LEU:HA	1.80	0.42
1:A:406:TYR:CD1	1:A:454:LEU:CD1	3.02	0.42
1:A:253:ILE:HG23	1:A:257:LEU:HD22	2.01	0.42
1:A:457:LYS:HB2	1:A:458:GLU:H	1.71	0.42
1:B:331:LEU:HB3	1:B:346:TRP:CE2	2.55	0.42
1:A:546:LEU:HD12	1:A:546:LEU:O	2.19	0.42
1:A:457:LYS:HB2	1:A:458:GLU:OE1	2.20	0.41
1:A:210:LYS:HB3	1:A:210:LYS:HE3	1.28	0.41
1:B:406:TYR:HD1	1:B:454:LEU:HB2	1.85	0.41
1:A:390:VAL:O	1:A:391:TRP:C	2.59	0.41
1:A:510:PHE:O	1:A:514:GLU:HB3	2.20	0.41
1:A:154:HIS:H	1:A:157:ASN:HB2	1.85	0.41
1:A:596:ARG:NH1	1:A:598:ASP:OD2	2.53	0.41
1:B:48:PHE:CD1	1:B:48:PHE:C	2.94	0.41
1:A:54:GLY:HA2	1:A:76:CYS:HB2	2.02	0.41
1:A:98:GLU:OE2	1:A:156:GLY:O	2.38	0.41
1:A:43:ASP:OD1	1:A:44:PRO:HD2	2.21	0.41
1:A:150:ALA:HB1	1:A:168:LYS:NZ	2.36	0.41
1:B:609:GLU:HA	1:B:612:GLN:HG2	2.01	0.41
1:B:415:HIS:HD2	1:B:444:ARG:HD3	1.85	0.41
1:B:450:GLY:O	1:B:453:GLN:HB2	2.21	0.41
1:B:577:ASN:OD1	1:B:579:LYS:HG3	2.21	0.41
1:A:145:SER:OG	1:A:168:LYS:HD2	2.21	0.41
1:A:160:VAL:HG12	1:A:161:LEU:O	2.21	0.41
1:A:504:LYS:HE3	1:A:504:LYS:HB3	1.93	0.41
1:A:606:LYS:O	1:A:609:GLU:HG2	2.21	0.41
1:A:339:PHE:O	1:A:343:ILE:HG12	2.21	0.41
1:B:157:ASN:HD22	1:B:157:ASN:HA	1.56	0.41
1:B:337:THR:HG21	1:B:341:GLU:HG2	2.03	0.41
1:B:564:SER:HA	1:B:565:PRO:HD3	1.94	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:454:LEU:N	1:B:454:LEU:HD23	2.35	0.40
1:A:341:GLU:O	1:A:344:ASN:HB2	2.22	0.40
1:B:606:LYS:HE2	1:B:610:TRP:CZ2	2.57	0.40
1:A:343:ILE:HD12	1:A:477:ILE:HD13	2.02	0.40
1:A:436:ASP:HA	1:A:437:PRO:HD3	1.90	0.40
1:A:242:LEU:HD13	1:A:298:GLU:HB2	2.03	0.40
1:A:426:SER:O	1:A:430:ARG:CG	2.69	0.40
1:B:363:ASN:N	1:B:364:PRO:HD2	2.35	0.40
1:B:422:TYR:OH	1:B:545:ALA:HB1	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	498/626 (80%)	465 (93%)	26 (5%)	7 (1%)	9 36
1	B	293/626 (47%)	267 (91%)	22 (8%)	4 (1%)	9 36
All	All	791/1252 (63%)	732 (92%)	48 (6%)	11 (1%)	9 36

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	85	LYS
1	A	187	PRO
1	A	390	VAL
1	B	251	LYS
1	A	211	ASP
1	A	406	TYR
1	A	455	TYR
1	B	252	ASN
1	A	457	LYS

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Mol	Chain	Res	Type
1	B	567	PRO
1	B	254	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	446/526 (85%)	389 (87%)	57 (13%)	3	15
1	B	278/526 (53%)	236 (85%)	42 (15%)	2	10
All	All	724/1052 (69%)	625 (86%)	99 (14%)	3	13

All (99) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	VAL
1	A	31	ASN
1	A	35	LYS
1	A	39	LYS
1	A	45	ARG
1	A	46	GLU
1	A	49	THR
1	A	68	GLU
1	A	93	LEU
1	A	95	SER
1	A	143	MSE
1	A	152	SER
1	A	164	GLU
1	A	166	LYS
1	A	169	SER
1	A	171	GLN
1	A	174	ARG
1	A	177	TRP
1	A	182	ARG
1	A	183	TYR
1	A	186	HIS

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Mol	Chain	Res	Type
1	A	190	ASN
1	A	191	ASP
1	A	210	LYS
1	A	229	LYS
1	A	273	ASP
1	A	282	THR
1	A	283	GLU
1	A	334	THR
1	A	337	THR
1	A	338	SER
1	A	340	SER
1	A	348	ASP
1	A	354	ASP
1	A	376	LEU
1	A	383	ILE
1	A	388	ASN
1	A	389	ASN
1	A	390	VAL
1	A	391	TRP
1	A	408	ASN
1	A	412	GLU
1	A	414	ILE
1	A	426	SER
1	A	430	ARG
1	A	431	ARG
1	A	445	PHE
1	A	460	LYS
1	A	467	ILE
1	A	475	ASN
1	A	514	GLU
1	A	516	ASP
1	A	519	GLU
1	A	541	ILE
1	A	543	GLU
1	A	570	LEU
1	A	579	LYS
1	B	49	THR
1	B	51	LEU
1	B	52	PHE
1	B	55	LEU
1	B	153	VAL
1	B	157	ASN

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Mol	Chain	Res	Type
1	B	161	LEU
1	B	166	LYS
1	B	170	LYS
1	B	211	ASP
1	B	217	LYS
1	B	250	LEU
1	B	251	LYS
1	B	253	ILE
1	B	254	PRO
1	B	256	ASP
1	B	329	LEU
1	B	336	SER
1	B	340	SER
1	B	344	ASN
1	B	349	ILE
1	B	361	ASP
1	B	365	ILE
1	B	386	GLU
1	B	390	VAL
1	B	391	TRP
1	B	394	GLU
1	B	403	PHE
1	B	408	ASN
1	B	412	GLU
1	B	434	THR
1	B	458	GLU
1	B	530	LEU
1	B	536	GLU
1	B	542	ASP
1	B	573	ARG
1	B	579	LYS
1	B	582	LYS
1	B	583	ARG
1	B	586	SER
1	B	588	PHE
1	B	615	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	265	GLN
1	B	157	ASN

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Mol	Chain	Res	Type
1	B	479	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 oligosaccharides in this entry.

5.6 Ligand geometry

6 ligands are modelled in this entry.

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	$\#\|Z\| > 2$
2	GOL	A	701	-	5,5,5	0.38	0	5,5,5	0.27	0
2	GOL	B	702	-	5,5,5	0.36	0	5,5,5	0.25	0
2	GOL	B	701	-	5,5,5	0.35	0	5,5,5	0.38	0
2	GOL	B	704	-	5,5,5	0.37	0	5,5,5	0.30	0
3	FLC	A	702	-	12,12,12	3.67	7 (58%)	17,17,17	2.72	6 (35%)
2	GOL	B	703	-	5,5,5	0.37	0	5,5,5	0.31	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
2	GOL	A	701	-	-	4/4/4/4	-
2	GOL	B	702	-	-	2/4/4/4	-
2	GOL	B	701	-	-	1/4/4/4	-
2	GOL	B	704	-	-	3/4/4/4	-
3	FLC	A	702	-	-	8/16/16/16	-
2	GOL	B	703	-	-	2/4/4/4	-

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	702	FLC	CB-CBC	6.20	1.59	1.53
3	A	702	FLC	CG-CB	-5.99	1.46	1.54
3	A	702	FLC	CA-CB	5.69	1.61	1.54
3	A	702	FLC	OB1-CBC	4.30	1.35	1.22
3	A	702	FLC	OHB-CB	3.62	1.50	1.43
3	A	702	FLC	OB2-CBC	-3.25	1.18	1.30
3	A	702	FLC	CA-CAC	2.85	1.59	1.50

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	702	FLC	OHB-CB-CBC	7.79	120.01	108.96
3	A	702	FLC	CG-CB-CBC	-4.52	100.05	110.03
3	A	702	FLC	CB-CG-CGC	-2.80	106.28	113.92
3	A	702	FLC	OG2-CGC-CG	2.74	123.02	114.35
3	A	702	FLC	OG1-CGC-CG	-2.43	116.07	122.95
3	A	702	FLC	CG-CB-CA	2.26	115.11	109.31

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701	GOL	O1-C1-C2-C3
2	B	702	GOL	O1-C1-C2-C3
2	B	704	GOL	O1-C1-C2-C3
3	A	702	FLC	CAC-CA-CB-CBC
3	A	702	FLC	CBC-CB-CG-CGC
3	A	702	FLC	OHB-CB-CG-CGC
3	A	702	FLC	CA-CB-CG-CGC
2	A	701	GOL	O2-C2-C3-O3
3	A	702	FLC	CAC-CA-CB-OHB

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Mol	Chain	Res	Type	Atoms
2	A	701	GOL	C1-C2-C3-O3
2	B	701	GOL	C1-C2-C3-O3
2	B	703	GOL	O1-C1-C2-C3
2	B	704	GOL	O1-C1-C2-O2
3	A	702	FLC	CB-CA-CAC-OA2
3	A	702	FLC	CAC-CA-CB-CG
2	A	701	GOL	O1-C1-C2-O2
2	B	702	GOL	O1-C1-C2-O2
3	A	702	FLC	CB-CA-CAC-OA1
2	B	704	GOL	O2-C2-C3-O3
2	B	703	GOL	O1-C1-C2-O2

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	702	FLC	2	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	505/626 (80%)	0.16	16 (3%)	50	35	9, 36, 71, 104	1 (0%)
1	B	317/626 (50%)	0.44	18 (5%)	30	19	15, 47, 80, 92	0
All	All	822/1252 (65%)	0.27	34 (4%)	42	28	9, 41, 75, 104	1 (0%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	188	ASN	3.7
1	B	392	ALA	3.6
1	A	308	LYS	3.6
1	B	257	LEU	3.3
1	B	391	TRP	3.2
1	B	389	ASN	3.2
1	A	189	ASN	3.2
1	A	163	GLY	3.1
1	B	202	TRP	3.0
1	A	167	GLU	3.0
1	A	186	HIS	2.7
1	B	50	GLU	2.7
1	B	251	LYS	2.6
1	B	255	ALA	2.6
1	A	184	PHE	2.5
1	B	394	GLU	2.5
1	A	517	ILE	2.4
1	A	348	ASP	2.3
1	A	34	GLY	2.3
1	B	53	ALA	2.3
1	A	211	ASP	2.3
1	B	172	PHE	2.2
1	A	463	ALA	2.2
1	B	54	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	201	GLY	2.2
1	A	192	ASN	2.2
1	B	512	LEU	2.2
1	B	551	GLY	2.2
1	A	33	GLY	2.2
1	A	30	ASP	2.1
1	B	475	ASN	2.1
1	B	414	ILE	2.0
1	B	256	ASP	2.0
1	A	182	ARG	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	GOL	B	704	6/6	0.73	0.15	49,52,73,78	0
2	GOL	B	702	6/6	0.83	0.12	36,51,55,65	0
2	GOL	B	703	6/6	0.86	0.12	35,58,65,66	0
2	GOL	B	701	6/6	0.86	0.14	21,38,43,59	0
3	FLC	A	702	13/13	0.88	0.13	28,36,60,67	0
2	GOL	A	701	6/6	0.90	0.15	39,48,56,59	0

6.5 Other polymers (i)

There are no such residues in this entry.