



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 9, 2020 – 11:03 AM BST

PDB ID : 2ZB2  
Title : Human liver glycogen phosphorylase a complexed with glucose and 5-chloro-N-[4-(1,2-dihydroxyethyl)phenyl]-1H-indole-2-carboxamide  
Authors : Katayama, N.; Onda, K.  
Deposited on : 2007-10-15  
Resolution : 2.45 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](mailto: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.

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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)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.13.1

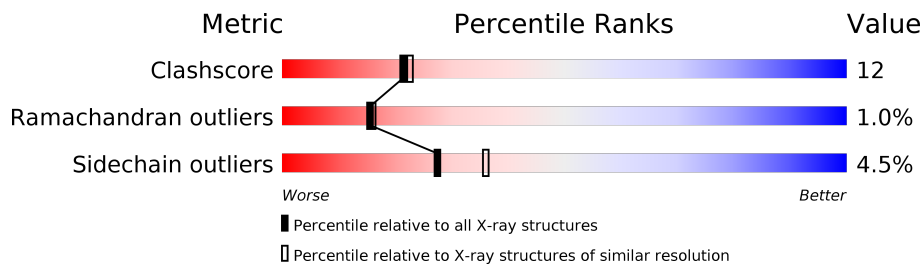
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.45 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	1613 (2.48-2.44)
Ramachandran outliers	138981	1598 (2.48-2.44)
Sidechain outliers	138945	1598 (2.48-2.44)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ .

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	849	
1	B	849	

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
6	MPD	B	852	X	-	-	-

## 2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 13413 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.

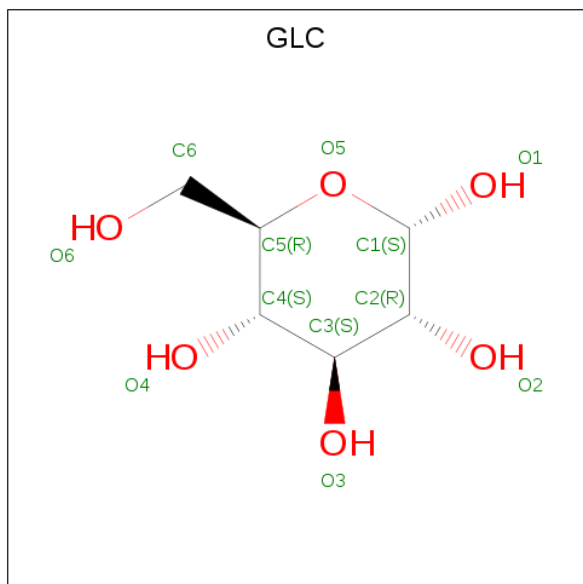
- Molecule 1 is a protein called Glycogen phosphorylase, liver form.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	798	Total 6466	C 4154	N 1097	O 1186	S 29	0	0	0
1	B	791	Total 6410	C 4116	N 1088	O 1177	S 29	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

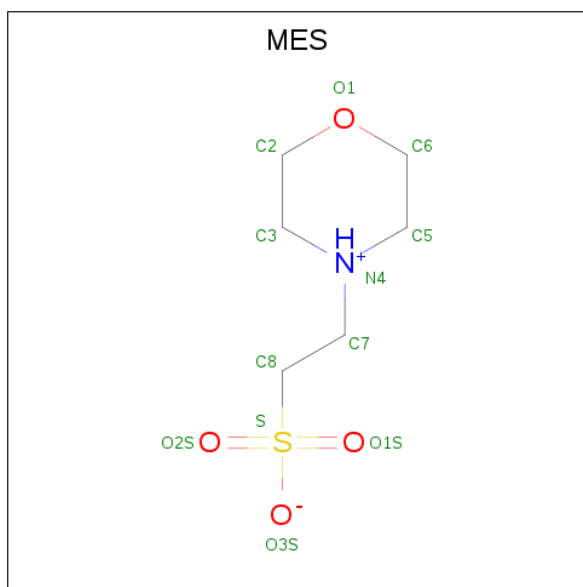
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP P06737
A	-1	SER	-	expression tag	UNP P06737
B	-2	GLY	-	expression tag	UNP P06737
B	-1	SER	-	expression tag	UNP P06737

- Molecule 2 is alpha-D-glucopyranose (three-letter code: GLC) (formula: C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			12	6	6		
2	B	1	Total	C	O	0	0
			12	6	6		

- Molecule 3 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).



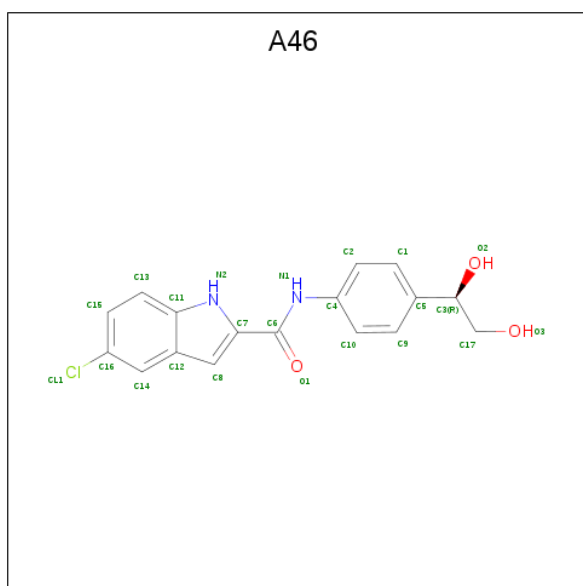
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
3	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 4 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: C<sub>8</sub>H<sub>10</sub>NO<sub>6</sub>P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
4	A	1	15	8	1	5	1	0	0
4	B	1	15	8	1	5	1	0	0

- Molecule 5 is 5-chloro-N-{4-[(1R)-1,2-dihydroxyethyl]phenyl}-1H-indole-2-carboxamide (three-letter code: A46) (formula:  $C_{17}H_{15}ClN_2O_3$ ).



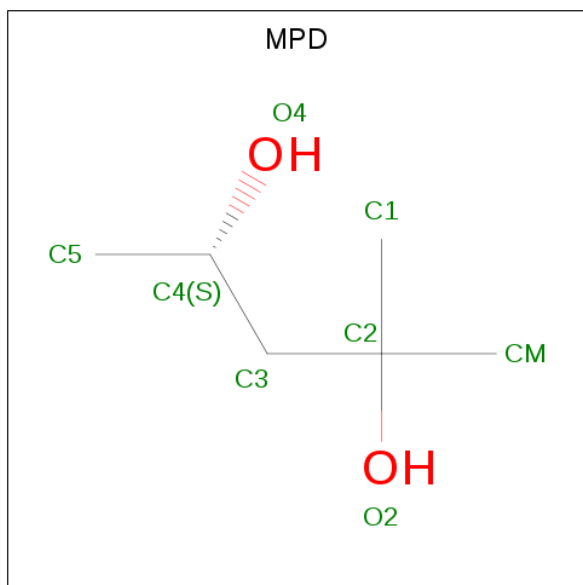
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	Cl	N	O		
5	A	1	23	17	1	2	3	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	Cl	N			O
5	B	1	23	17	1	2	3	0	0

- Molecule 6 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: C<sub>6</sub>H<sub>14</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
6	B	1	8	6	2	0	0
6	B	1	8	6	2	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
7	A	199	199	199	0	0
7	B	198	198	198	0	0

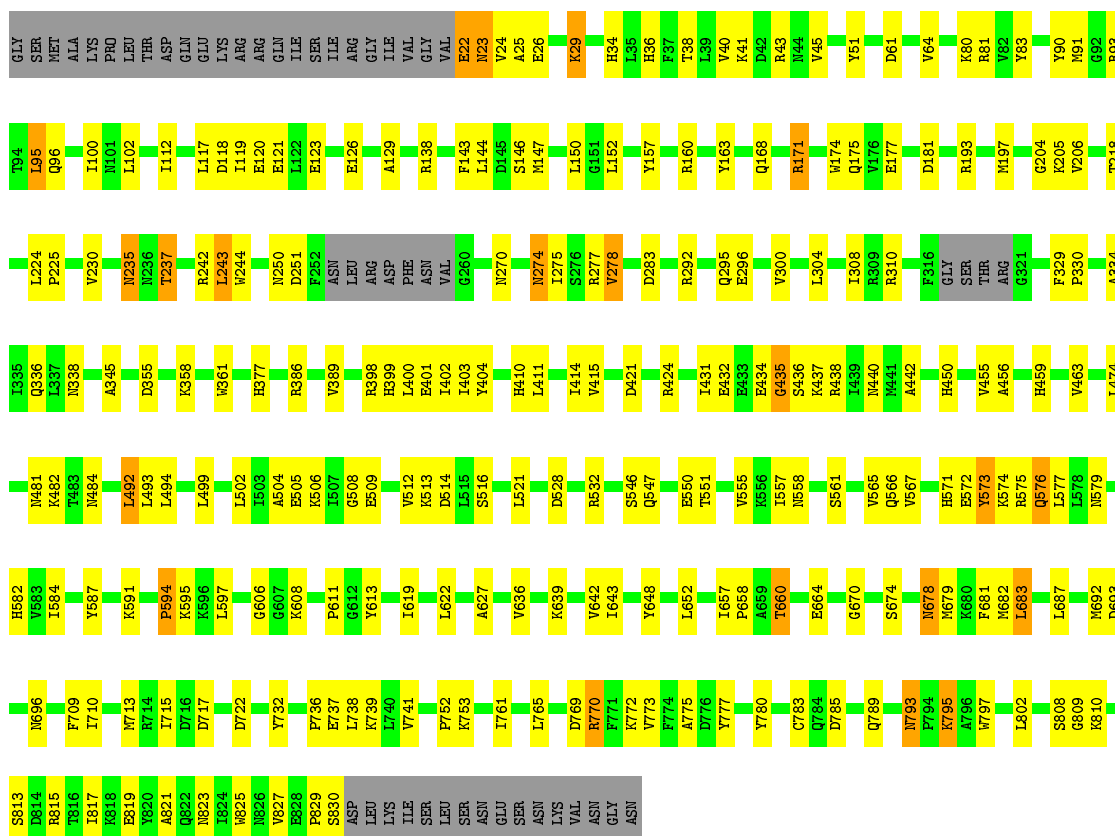
### 3 Residue-property plots [i](#)

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. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

Note EDS was not executed.

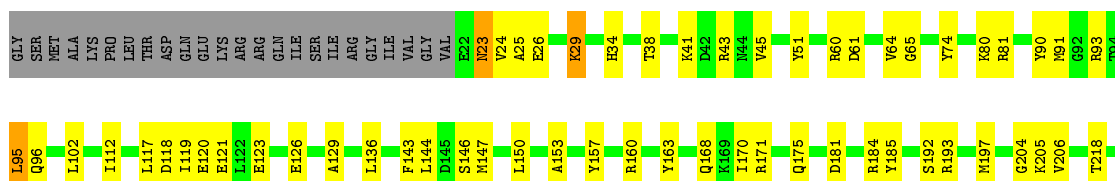
- Molecule 1: Glycogen phosphorylase, liver form

Chain A: 



- Molecule 1: Glycogen phosphorylase, liver form

Chain B: 



V221	ALA	N440	V667	A673	D785
L224	GLY	P441	K568	S674	Q789
P225	V325	A442	H571	N678	N793
Y226	F326	H450	E572	M679	P794
V230	F329	V455	Y573	K680	K795
N235	P330	A456	K574	F681	A796
N236	A334	K457	R575	M682	W797
T237	A345	I458	Q576	L683	L802
R242	T340	H459	N579	L687	S808
L243	H341	V463	C580	M692	G809
W244	P342	L474	V583	D693	K810
N250	A345	N481	Y587	N696	S813
ASP	D355	L492	K591	V697	D814
PHE	K358	L493	P594	E701	R815
ASN	W361	L494	L597	F709	T816
LEU	K370	L499	L597	I710	I817
ARG	V379	L502	V603	M713	E818
ASP	R386	I503	I604	R714	E819
PHE	R389	E505	L605	I715	V827
ASN	V389	E506	G606	D716	E828
VAL	R398	K507	G607	D717	P829
G260	H399	G508	Y613	D722	S830
V266	L400	E509	K617	Y732	ASP
N270	L401	V512	M618	P736	LEU
N274	E401	K513	I619	E737	LYS
I275	I402	D614	I622	L738	ILE
S276	I403	L515	A627	K739	SER
R277	Y404	S516	V636	V741	LEU
V278	E405	L521	K639	F752	LEU
L291	I406	D528	L640	K753	SER
R292	H410	R532	V642	I761	ASN
Q295	L414	S546	E646	L765	ASN
E296	V415	Q547	N647	D769	ASN
V300	D421	E550	Y648	R770	GLY
L304	R424	T551	L652	F771	GLY
R310	I431	V555	I657	K772	ASN
F311	E432	N558	P658	F773	ASN
K312	E433	A434	A659	F774	ASN
A313	E434	G435	T660	A775	ASN
S314	S436	D564	S663	D776	ASN
LYS	K437	V565	E664	Y777	ASN
PHE	R438	V566	Q665	C783	ASN
GLY	I439	Q566		Q784	



## 4 Data and refinement statistics

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

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	123.82Å 123.82Å 123.54Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.18 – 2.45	Depositor
% Data completeness (in resolution range)	99.4 (49.18-2.45)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.37	Depositor
Refinement program	CNX	Depositor
R, $R_{free}$	0.261 , 0.307	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	13413	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	32.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: A46, MPD, GLC, MES, PLP

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	0.54	0/6611	0.61	0/8940
1	B	0.52	0/6553	0.61	0/8865
All	All	0.53	0/13164	0.61	0/17805

There are no bond length outliers.

There are no bond angle outliers.

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	6466	0	6451	160	0
1	B	6410	0	6394	153	0
2	A	12	0	12	0	0
2	B	12	0	12	0	0
3	A	12	0	12	3	0
3	B	12	0	13	3	0
4	A	15	0	7	0	0
4	B	15	0	7	0	0
5	A	23	0	15	0	0
5	B	23	0	15	1	0
6	B	16	0	28	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	199	0	0	8	0
7	B	198	0	0	13	0
All	All	13413	0	12966	312	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 12.

All (312) 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:204:GLY:O	1:A:205:LYS:HD2	1.79	0.83
1:B:204:GLY:O	1:B:205:LYS:HD2	1.80	0.80
1:B:678:ASN:HD22	1:B:679:MET:H	1.29	0.77
1:A:678:ASN:HD22	1:A:679:MET:H	1.32	0.76
1:A:310:ARG:HE	3:A:848:MES:H72	1.50	0.76
1:A:96:GLN:HB3	1:A:494:LEU:HD21	1.69	0.75
1:A:547:GLN:O	1:A:551:THR:HG23	1.87	0.74
1:B:168:GLN:NE2	1:B:647:ASN:H	1.87	0.72
1:B:163:TYR:HE1	1:B:181:ASP:HB3	1.54	0.71
1:B:547:GLN:O	1:B:551:THR:HG23	1.89	0.71
1:B:29:LYS:HE3	1:B:29:LYS:O	1.91	0.71
1:A:80:LYS:HB3	1:A:827:VAL:HG12	1.71	0.70
1:A:29:LYS:HE3	1:A:29:LYS:O	1.90	0.70
1:A:174:TRP:HB3	7:A:853:HOH:O	1.91	0.69
1:B:96:GLN:HB3	1:B:494:LEU:HD21	1.75	0.69
1:B:770:ARG:HA	7:B:1079:HOH:O	1.92	0.69
1:B:492:LEU:HG	1:B:683:LEU:HD22	1.75	0.68
1:A:595:LYS:HA	1:A:595:LYS:HE2	1.74	0.68
1:A:163:TYR:HE1	1:A:181:ASP:HB3	1.58	0.68
1:B:715:ILE:HG13	7:B:979:HOH:O	1.93	0.68
1:A:274:ASN:HD21	1:B:270:ASN:HD21	1.43	0.67
1:B:157:TYR:HD2	1:B:244:TRP:HE1	1.42	0.67
1:B:678:ASN:HD22	1:B:679:MET:N	1.91	0.67
1:A:193:ARG:HH12	6:B:852:MPD:H12	1.59	0.67
1:A:157:TYR:HD2	1:A:244:TRP:HE1	1.43	0.66
1:B:168:GLN:HE21	1:B:647:ASN:H	1.42	0.66
1:B:80:LYS:HB3	1:B:827:VAL:HG12	1.77	0.66
1:A:80:LYS:HE2	1:A:334:ALA:HB2	1.79	0.65
1:A:270:ASN:HD21	1:B:274:ASN:HD21	1.43	0.65
1:B:692:MET:HE2	1:B:710:ILE:HG21	1.76	0.65
1:A:509:GLU:O	1:A:512:VAL:HG22	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:329:PHE:HB3	1:B:330:PRO:HD3	1.78	0.64
1:B:752:PRO:HG2	1:B:753:LYS:HD2	1.79	0.64
1:A:692:MET:HE2	1:A:710:ILE:HG21	1.80	0.64
1:A:752:PRO:HG2	1:A:753:LYS:HD2	1.80	0.63
1:A:678:ASN:HD22	1:A:679:MET:N	1.95	0.63
1:A:329:PHE:HB3	1:A:330:PRO:HD3	1.79	0.63
1:B:93:ARG:HG2	1:B:126:GLU:HG2	1.80	0.63
1:B:242:ARG:NH2	7:B:941:HOH:O	2.32	0.63
1:A:492:LEU:HG	1:A:683:LEU:HD22	1.80	0.62
1:B:678:ASN:HD22	1:B:678:ASN:N	1.98	0.62
1:B:163:TYR:CE1	1:B:181:ASP:HB3	2.34	0.62
1:B:206:VAL:HG21	1:B:401:GLU:OE1	1.99	0.62
1:A:660:THR:HG21	1:A:681:PHE:HE2	1.64	0.61
1:A:678:ASN:HD22	1:A:678:ASN:N	1.96	0.61
1:B:678:ASN:ND2	1:B:679:MET:H	1.98	0.61
1:A:678:ASN:ND2	1:A:679:MET:H	1.99	0.61
1:A:93:ARG:HG2	1:A:126:GLU:HG2	1.82	0.61
1:A:829:PRO:O	1:A:830:SER:HB2	2.01	0.60
1:B:509:GLU:O	1:B:512:VAL:HG22	2.01	0.60
1:A:119:ILE:O	1:A:123:GLU:HG3	2.01	0.60
1:B:660:THR:HG21	1:B:681:PHE:HE2	1.66	0.60
1:A:163:TYR:CE1	1:A:181:ASP:HB3	2.35	0.60
1:A:206:VAL:HG21	1:A:401:GLU:OE1	2.01	0.60
1:B:204:GLY:HA3	1:B:218:THR:HG22	1.84	0.60
1:B:119:ILE:O	1:B:123:GLU:HG3	2.02	0.60
1:A:204:GLY:HA3	1:A:218:THR:HG22	1.83	0.59
1:A:242:ARG:HH22	3:A:848:MES:H22	1.67	0.59
1:A:310:ARG:HH21	3:A:848:MES:H21	1.66	0.59
1:B:170:ILE:HG12	1:B:646:GLU:HG2	1.84	0.59
1:B:340:THR:HG23	7:B:1022:HOH:O	2.02	0.59
1:B:136:LEU:HD23	7:B:1034:HOH:O	2.02	0.58
1:B:168:GLN:HB3	1:B:647:ASN:HA	1.86	0.58
1:B:678:ASN:ND2	1:B:679:MET:N	2.52	0.58
1:A:22:GLU:HG3	1:A:23:ASN:N	2.19	0.57
1:A:772:LYS:HB3	1:A:775:ALA:HB3	1.86	0.57
1:B:521:LEU:HB3	1:B:802:LEU:HD11	1.86	0.57
1:A:40:VAL:HG11	6:B:851:MPD:HM2	1.85	0.57
1:B:657:ILE:HB	1:B:658:PRO:HD3	1.86	0.57
1:A:274:ASN:ND2	1:A:277:ARG:HE	2.03	0.57
1:B:61:ASP:O	1:B:64:VAL:HG22	2.04	0.57
1:B:810:LYS:O	1:B:815:ARG:HD3	2.05	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:657:ILE:HB	1:A:658:PRO:HD3	1.88	0.56
1:A:81:ARG:NH1	1:A:310:ARG:HD3	2.21	0.56
1:A:431:ILE:N	1:A:431:ILE:HD12	2.20	0.56
1:A:810:LYS:O	1:A:815:ARG:HD3	2.04	0.56
1:B:692:MET:HE1	1:B:710:ILE:HG13	1.88	0.56
1:A:678:ASN:ND2	1:A:679:MET:N	2.54	0.55
1:A:521:LEU:HB3	1:A:802:LEU:HD11	1.88	0.55
1:A:591:LYS:O	1:A:594:PRO:HD3	2.06	0.55
1:B:170:ILE:CG1	1:B:646:GLU:HG2	2.38	0.54
1:B:772:LYS:HB3	1:B:775:ALA:HB3	1.87	0.54
1:A:692:MET:HE1	1:A:710:ILE:HG13	1.88	0.54
1:A:61:ASP:O	1:A:64:VAL:HG22	2.08	0.54
1:A:410:HIS:O	1:A:414:ILE:HG12	2.08	0.54
1:A:177:GLU:HG2	1:A:611:PRO:HG3	1.88	0.54
1:A:160:ARG:HB2	1:A:243:LEU:HB3	1.90	0.54
1:A:168:GLN:OE1	1:A:608:LYS:HA	2.08	0.54
1:B:160:ARG:HB2	1:B:243:LEU:HB3	1.90	0.54
1:B:568:LYS:O	1:B:607:GLY:HA3	2.07	0.54
1:B:112:ILE:HG23	1:B:117:LEU:HB2	1.90	0.54
1:B:379:VAL:HG22	7:B:982:HOH:O	2.09	0.53
1:B:591:LYS:O	1:B:594:PRO:HD3	2.09	0.53
1:B:753:LYS:H	1:B:753:LYS:HD2	1.73	0.53
1:A:753:LYS:HD2	1:A:753:LYS:H	1.73	0.53
1:B:410:HIS:O	1:B:414:ILE:HG12	2.09	0.53
1:A:171:ARG:HA	1:A:171:ARG:HH11	1.73	0.53
1:B:274:ASN:ND2	1:B:277:ARG:HE	2.07	0.53
1:B:813:SER:O	1:B:817:ILE:HG12	2.08	0.53
1:B:431:ILE:N	1:B:431:ILE:HD12	2.24	0.53
1:B:583:VAL:HG11	1:B:642:VAL:HG21	1.89	0.53
1:A:713:MET:HB3	1:A:717:ASP:HB2	1.91	0.53
1:A:770:ARG:HA	7:A:938:HOH:O	2.08	0.53
1:A:512:VAL:HG23	1:A:513:LYS:N	2.25	0.52
1:B:713:MET:HB3	1:B:717:ASP:HB2	1.91	0.52
1:A:34:HIS:HD2	1:A:38:THR:OG1	1.93	0.52
1:B:80:LYS:HE2	1:B:334:ALA:HB2	1.91	0.52
1:B:118:ASP:HB3	1:B:121:GLU:HB3	1.92	0.52
1:B:512:VAL:HG23	1:B:513:LYS:N	2.24	0.51
1:A:336:GLN:OE1	1:A:825:TRP:NE1	2.39	0.51
1:A:112:ILE:HG23	1:A:117:LEU:HB2	1.91	0.51
1:A:41:LYS:HD2	1:A:45:VAL:HG23	1.92	0.51
1:A:678:ASN:ND2	1:A:678:ASN:N	2.58	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:100:ILE:HD12	1:A:494:LEU:HD23	1.92	0.50
1:A:785:ASP:O	1:A:789:GLN:HG3	2.11	0.50
1:B:311:PHE:CE2	1:B:325:VAL:HG12	2.46	0.50
1:A:813:SER:O	1:A:817:ILE:HG12	2.10	0.50
1:A:557:ILE:HD11	1:A:643:ILE:HD11	1.93	0.50
1:B:583:VAL:HG13	1:B:640:LEU:HD21	1.92	0.50
1:A:411:LEU:O	1:A:415:VAL:HG23	2.12	0.50
1:B:81:ARG:NH1	1:B:310:ARG:HD3	2.25	0.50
6:B:852:MPD:H53	6:B:852:MPD:H11	1.94	0.50
1:B:411:LEU:O	1:B:415:VAL:HG23	2.12	0.50
1:A:275:ILE:O	1:A:295:GLN:HG2	2.12	0.49
1:B:168:GLN:HG3	1:B:175:GLN:HG3	1.94	0.49
6:B:852:MPD:C5	6:B:852:MPD:H11	2.42	0.49
1:A:648:TYR:HA	1:A:652:LEU:HD23	1.94	0.49
1:B:41:LYS:HD2	1:B:45:VAL:HG23	1.93	0.49
1:B:648:TYR:HA	1:B:652:LEU:HD23	1.95	0.49
1:A:753:LYS:N	1:A:753:LYS:HD2	2.27	0.49
1:B:193:ARG:HH22	3:B:848:MES:C6	2.26	0.49
1:A:152:LEU:HD21	1:A:829:PRO:HA	1.93	0.49
1:B:678:ASN:ND2	1:B:678:ASN:N	2.60	0.49
1:B:450:HIS:HE1	7:B:1035:HOH:O	1.96	0.49
1:A:587:TYR:CZ	1:A:591:LYS:HD2	2.48	0.49
1:B:785:ASP:O	1:B:789:GLN:HG3	2.12	0.49
1:B:693:ASP:O	1:B:696:ASN:HB2	2.13	0.48
1:A:146:SER:O	1:A:150:LEU:HD13	2.14	0.48
1:A:576:GLN:H	1:A:576:GLN:HE21	1.62	0.48
1:A:143:PHE:O	1:A:147:MET:HG3	2.12	0.48
1:A:456:ALA:C	1:A:481:ASN:HD21	2.17	0.48
1:A:829:PRO:O	1:A:830:SER:CB	2.62	0.48
1:B:171:ARG:HH11	1:B:171:ARG:HA	1.77	0.48
1:B:221:VAL:HG11	1:B:275:ILE:HD12	1.96	0.48
1:A:436:SER:O	1:A:438:ARG:HG3	2.14	0.48
1:A:24:VAL:HG23	1:A:25:ALA:N	2.29	0.48
1:B:144:LEU:HB3	1:B:230:VAL:HG11	1.96	0.48
1:B:275:ILE:O	1:B:295:GLN:HG2	2.13	0.48
1:B:514:ASP:OD2	1:B:516:SER:HB3	2.14	0.48
1:B:753:LYS:N	1:B:753:LYS:HD2	2.28	0.48
1:A:693:ASP:O	1:A:696:ASN:HB2	2.14	0.48
1:B:627:ALA:HA	1:B:642:VAL:HB	1.96	0.47
1:A:138:ARG:HB3	7:A:959:HOH:O	2.15	0.47
1:A:100:ILE:HD12	1:A:494:LEU:CD2	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:168:GLN:HG3	1:A:175:GLN:HG3	1.96	0.47
1:A:482:LYS:NZ	1:A:823:ASN:HB2	2.29	0.47
1:B:436:SER:O	1:B:438:ARG:HG3	2.14	0.47
1:A:584:ILE:HG21	1:A:741:VAL:HG13	1.97	0.47
1:A:627:ALA:HA	1:A:642:VAL:HB	1.95	0.47
1:B:386:ARG:HD2	1:B:432:GLU:OE2	2.15	0.47
1:B:558:ASN:HB3	1:B:561:SER:HB3	1.96	0.47
1:A:567:VAL:HB	1:A:648:TYR:CZ	2.50	0.47
1:B:617:LYS:HD3	7:B:1045:HOH:O	2.14	0.47
1:A:91:MET:HB2	1:A:129:ALA:HB3	1.95	0.47
1:B:587:TYR:CZ	1:B:591:LYS:HD2	2.50	0.47
1:B:43:ARG:NH1	1:B:51:TYR:OH	2.48	0.47
1:A:582:HIS:HB2	1:A:780:TYR:CE2	2.50	0.47
1:B:24:VAL:HG23	1:B:25:ALA:N	2.30	0.46
1:B:504:ALA:HA	1:B:508:GLY:O	2.14	0.46
1:A:193:ARG:NH1	6:B:852:MPD:H12	2.28	0.46
1:B:300:VAL:HG13	1:B:345:ALA:HA	1.96	0.46
1:B:292:ARG:O	1:B:296:GLU:HG3	2.14	0.46
1:A:558:ASN:HB3	1:A:561:SER:HB3	1.97	0.46
1:A:355:ASP:O	1:A:358:LYS:HE3	2.16	0.46
1:A:434:GLU:O	1:A:435:GLY:C	2.54	0.46
1:B:566:GLN:HA	7:B:1011:HOH:O	2.14	0.46
1:A:118:ASP:HB3	1:A:121:GLU:HB3	1.97	0.46
1:B:34:HIS:HD2	1:B:38:THR:OG1	1.99	0.46
1:B:682:MET:HG2	1:B:808:SER:OG	2.15	0.46
1:A:100:ILE:CD1	1:A:494:LEU:HA	2.45	0.46
1:A:795:LYS:H	1:A:795:LYS:HD2	1.80	0.46
1:B:619:ILE:HD13	7:B:989:HOH:O	2.16	0.46
1:A:144:LEU:HD22	7:A:949:HOH:O	2.15	0.46
1:A:152:LEU:CD2	1:A:829:PRO:HA	2.46	0.46
1:A:144:LEU:HB3	1:A:230:VAL:HG11	1.97	0.46
1:A:225:PRO:HB3	1:A:244:TRP:CZ3	2.51	0.46
1:A:40:VAL:CG1	6:B:851:MPD:HM2	2.46	0.46
1:A:450:HIS:HD2	7:A:1039:HOH:O	1.98	0.46
1:B:235:ASN:ND2	1:B:237:THR:HG23	2.30	0.46
1:A:572:GLU:O	1:A:575:ARG:HG2	2.15	0.45
1:A:292:ARG:O	1:A:296:GLU:HG3	2.16	0.45
1:A:119:ILE:HG23	1:A:120:GLU:N	2.32	0.45
1:A:459:HIS:O	1:A:463:VAL:HG23	2.16	0.45
1:B:355:ASP:OD2	1:B:398:ARG:HD3	2.17	0.45
1:B:795:LYS:H	1:B:795:LYS:HD2	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:386:ARG:HD2	1:A:432:GLU:OE2	2.17	0.45
1:A:43:ARG:NH1	1:A:51:TYR:OH	2.50	0.45
1:A:514:ASP:OD2	1:A:516:SER:HB3	2.17	0.45
1:B:91:MET:HB2	1:B:129:ALA:HB3	1.98	0.45
1:A:504:ALA:HA	1:A:508:GLY:O	2.17	0.45
1:A:636:VAL:O	1:A:639:LYS:HB2	2.16	0.45
1:B:193:ARG:HH22	3:B:848:MES:H61	1.82	0.45
1:A:197:MET:HE3	1:A:224:LEU:HD13	1.99	0.45
1:B:456:ALA:C	1:B:481:ASN:HD21	2.21	0.45
1:A:300:VAL:HG13	1:A:345:ALA:HA	1.99	0.44
1:B:143:PHE:O	1:B:147:MET:HG3	2.17	0.44
1:B:455:VAL:HG23	1:B:674:SER:HB2	1.99	0.44
1:B:572:GLU:O	1:B:575:ARG:HG2	2.17	0.44
1:B:455:VAL:H	1:B:459:HIS:HD2	1.64	0.44
1:B:571:HIS:HD2	1:B:574:LYS:HD2	1.82	0.44
1:A:809:GLY:HA3	7:A:1021:HOH:O	2.16	0.44
1:B:300:VAL:O	1:B:304:LEU:HD23	2.18	0.44
1:B:355:ASP:O	1:B:358:LYS:HE3	2.18	0.44
1:B:456:ALA:HB3	1:B:673:ALA:O	2.18	0.44
1:A:815:ARG:O	1:A:819:GLU:HG3	2.18	0.44
1:A:274:ASN:HD22	1:A:277:ARG:HE	1.64	0.44
1:B:458:ILE:HG22	7:B:1004:HOH:O	2.18	0.44
1:A:571:HIS:HD2	1:A:574:LYS:HD2	1.83	0.43
1:A:573:TYR:O	1:A:575:ARG:HG3	2.18	0.43
1:A:687:LEU:HD13	1:A:709:PHE:HE1	1.83	0.43
1:B:434:GLU:O	1:B:435:GLY:C	2.55	0.43
1:B:580:CYS:SG	1:B:622:LEU:HD22	2.57	0.43
1:A:300:VAL:O	1:A:304:LEU:HD23	2.17	0.43
1:A:546:SER:O	1:A:550:GLU:HG3	2.18	0.43
1:B:636:VAL:O	1:B:639:LYS:HB2	2.18	0.43
1:A:737:GLU:O	1:A:741:VAL:HG23	2.19	0.43
1:B:546:SER:O	1:B:550:GLU:HG3	2.18	0.43
1:B:714:ARG:HB3	7:B:979:HOH:O	2.18	0.43
1:B:81:ARG:HG3	7:B:1041:HOH:O	2.18	0.43
1:A:484:ASN:HA	1:A:484:ASN:HD22	1.64	0.43
1:A:566:GLN:HA	7:A:912:HOH:O	2.18	0.43
1:B:146:SER:O	1:B:150:LEU:HD13	2.18	0.43
1:A:235:ASN:ND2	1:A:237:THR:HG23	2.33	0.43
1:A:687:LEU:HD12	1:A:797:TRP:CZ3	2.54	0.43
1:B:732:TYR:CZ	1:B:739:LYS:HG3	2.54	0.43
1:B:761:ILE:O	1:B:765:LEU:HB2	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:682:MET:HG2	1:A:808:SER:OG	2.18	0.43
1:B:64:VAL:HG23	1:B:65:GLY:N	2.33	0.43
1:B:505:GLU:O	1:B:506:LYS:HD3	2.19	0.42
1:A:455:VAL:H	1:A:459:HIS:HD2	1.67	0.42
1:B:459:HIS:O	1:B:463:VAL:HG23	2.18	0.42
1:B:709:PHE:HB3	1:B:783:CYS:SG	2.59	0.42
1:A:355:ASP:OD2	1:A:398:ARG:HD3	2.19	0.42
1:A:732:TYR:CZ	1:A:739:LYS:HG3	2.55	0.42
1:A:738:LEU:HB2	1:A:777:TYR:CE2	2.55	0.42
1:A:821:ALA:HB1	1:A:827:VAL:HG23	2.00	0.42
1:A:83:TYR:OH	1:A:310:ARG:HD2	2.19	0.42
1:B:312:LYS:HE3	1:B:326:PHE:HZ	1.84	0.42
1:A:738:LEU:HD13	1:A:777:TYR:CG	2.55	0.42
1:B:119:ILE:HG23	1:B:120:GLU:N	2.34	0.42
1:B:386:ARG:HA	1:B:439:ILE:O	2.20	0.42
1:B:687:LEU:HD12	1:B:797:TRP:CZ3	2.55	0.42
1:A:577:LEU:HG	1:A:619:ILE:CD1	2.50	0.42
1:B:274:ASN:ND2	1:B:277:ARG:HH21	2.18	0.42
1:B:421:ASP:CG	1:B:424:ARG:HB2	2.40	0.42
1:B:576:GLN:H	1:B:576:GLN:HE21	1.66	0.42
1:B:697:VAL:O	1:B:701:GLU:HG3	2.20	0.42
1:B:60:ARG:HD2	5:B:850:A46:C13	2.50	0.42
1:A:45:VAL:HB	3:B:848:MES:H51	2.01	0.42
1:B:197:MET:HE3	1:B:224:LEU:HD13	2.01	0.42
1:B:291:LEU:O	1:B:295:GLN:HG3	2.19	0.42
1:B:687:LEU:HD13	1:B:709:PHE:HE1	1.83	0.42
1:B:815:ARG:O	1:B:819:GLU:HG3	2.20	0.42
1:A:283:ASP:OD1	1:A:571:HIS:NE2	2.51	0.42
1:A:738:LEU:HD13	1:A:777:TYR:CD2	2.55	0.41
1:A:237:THR:HG22	7:A:963:HOH:O	2.20	0.41
1:A:274:ASN:ND2	1:A:277:ARG:HH21	2.18	0.41
1:A:584:ILE:CG2	1:A:741:VAL:HG13	2.50	0.41
1:B:567:VAL:HA	1:B:606:GLY:O	2.19	0.41
1:A:338:ASN:OD1	1:A:377:HIS:NE2	2.53	0.41
1:A:761:ILE:O	1:A:765:LEU:HB2	2.19	0.41
1:B:528:ASP:O	1:B:532:ARG:HG3	2.20	0.41
1:B:715:ILE:HG13	1:B:715:ILE:H	1.64	0.41
1:B:74:TYR:CZ	1:B:153:ALA:HA	2.56	0.41
1:A:399:HIS:O	1:A:403:ILE:HG13	2.20	0.41
1:B:402:ILE:O	1:B:406:ILE:HG13	2.20	0.41
1:A:398:ARG:O	1:A:402:ILE:HG13	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:456:ALA:C	1:A:481:ASN:ND2	2.74	0.41
1:B:565:VAL:HA	1:B:604:ILE:O	2.20	0.41
1:B:168:GLN:O	1:B:647:ASN:HB2	2.21	0.41
1:A:769:ASP:OD2	1:A:773:VAL:HG23	2.20	0.41
1:B:341:HIS:HB2	1:B:342:PRO:HD3	2.02	0.41
1:B:389:VAL:HG23	1:B:437:LYS:O	2.20	0.41
1:B:398:ARG:O	1:B:402:ILE:HG13	2.21	0.41
1:B:737:GLU:O	1:B:741:VAL:HG23	2.21	0.41
1:A:36:HIS:O	1:A:40:VAL:HA	2.20	0.41
1:B:184:ARG:HG2	1:B:185:TYR:CD1	2.55	0.41
1:B:274:ASN:HA	1:B:274:ASN:HD22	1.64	0.41
1:A:440:ASN:OD1	1:A:442:ALA:HB3	2.21	0.41
1:A:493:LEU:HD21	1:A:512:VAL:HG12	2.02	0.41
1:A:528:ASP:O	1:A:532:ARG:HG3	2.21	0.41
1:A:793:ASN:C	1:A:793:ASN:HD22	2.24	0.41
1:B:300:VAL:CG1	1:B:345:ALA:HA	2.51	0.41
1:A:400:LEU:HG	1:A:404:TYR:CE2	2.56	0.40
1:A:709:PHE:HB3	1:A:783:CYS:SG	2.61	0.40
1:B:330:PRO:HB3	1:B:370:LYS:HB3	2.02	0.40
1:B:564:ASP:O	1:B:603:VAL:HA	2.20	0.40
1:B:738:LEU:HB2	1:B:777:TYR:CE2	2.56	0.40
1:A:278:VAL:HG13	1:B:266:VAL:HG11	2.02	0.40
1:A:505:GLU:O	1:A:506:LYS:HD3	2.21	0.40
1:A:582:HIS:HB2	1:A:780:TYR:HE2	1.84	0.40
1:A:566:GLN:HB2	1:A:664:GLU:HB2	2.03	0.40
1:A:670:GLY:H	1:A:693:ASP:CG	2.23	0.40
1:B:769:ASP:OD2	1:B:773:VAL:HG23	2.22	0.40
1:A:389:VAL:HG23	1:A:437:LYS:O	2.22	0.40
1:A:421:ASP:CG	1:A:424:ARG:HB2	2.41	0.40
1:B:663:SER:HG	1:B:665:GLN:HE21	1.68	0.40
1:A:567:VAL:HA	1:A:606:GLY:O	2.22	0.40
1:B:192:SER:HB3	1:B:226:TYR:CE1	2.56	0.40
1:B:440:ASN:OD1	1:B:442:ALA:HB3	2.22	0.40
1:A:304:LEU:O	1:A:308:ILE:HG12	2.22	0.40
1:B:400:LEU:HG	1:B:404:TYR:CE2	2.56	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	792/849 (93%)	739 (93%)	45 (6%)	8 (1%)	15	16
1	B	785/849 (92%)	734 (94%)	43 (6%)	8 (1%)	15	16
All	All	1577/1698 (93%)	1473 (93%)	88 (6%)	16 (1%)	15	16

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	251	ASP
1	A	435	GLY
1	A	555	VAL
1	A	715	ILE
1	B	23	ASN
1	B	435	GLY
1	B	555	VAL
1	B	715	ILE
1	A	95	LEU
1	B	95	LEU
1	A	736	PRO
1	B	736	PRO
1	A	674	SER
1	B	594	PRO
1	A	594	PRO
1	B	829	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	696/741 (94%)	663 (95%)	33 (5%)	26	34
1	B	691/741 (93%)	661 (96%)	30 (4%)	29	38
All	All	1387/1482 (94%)	1324 (96%)	63 (4%)	27	36

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	GLU
1	A	23	ASN
1	A	26	GLU
1	A	29	LYS
1	A	90	TYR
1	A	95	LEU
1	A	102	LEU
1	A	171	ARG
1	A	235	ASN
1	A	237	THR
1	A	243	LEU
1	A	250	ASN
1	A	274	ASN
1	A	278	VAL
1	A	361	TRP
1	A	474	LEU
1	A	492	LEU
1	A	499	LEU
1	A	502	LEU
1	A	565	VAL
1	A	573	TYR
1	A	576	GLN
1	A	579	ASN
1	A	597	LEU
1	A	613	TYR
1	A	622	LEU
1	A	660	THR
1	A	678	ASN
1	A	683	LEU
1	A	722	ASP
1	A	770	ARG
1	A	793	ASN
1	A	795	LYS
1	B	23	ASN
1	B	26	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	29	LYS
1	B	90	TYR
1	B	95	LEU
1	B	102	LEU
1	B	235	ASN
1	B	237	THR
1	B	243	LEU
1	B	274	ASN
1	B	278	VAL
1	B	361	TRP
1	B	474	LEU
1	B	492	LEU
1	B	499	LEU
1	B	502	LEU
1	B	565	VAL
1	B	573	TYR
1	B	576	GLN
1	B	579	ASN
1	B	597	LEU
1	B	613	TYR
1	B	622	LEU
1	B	660	THR
1	B	678	ASN
1	B	683	LEU
1	B	722	ASP
1	B	770	ARG
1	B	793	ASN
1	B	795	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	34	HIS
1	A	167	ASN
1	A	168	GLN
1	A	235	ASN
1	A	239	ASN
1	A	274	ASN
1	A	284	ASN
1	A	459	HIS
1	A	481	ASN
1	A	484	ASN

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Mol	Chain	Res	Type
1	A	541	ASN
1	A	547	GLN
1	A	566	GLN
1	A	576	GLN
1	A	579	ASN
1	A	678	ASN
1	A	789	GLN
1	A	793	ASN
1	A	822	GLN
1	A	826	ASN
1	B	34	HIS
1	B	106	ASN
1	B	167	ASN
1	B	168	GLN
1	B	235	ASN
1	B	239	ASN
1	B	250	ASN
1	B	274	ASN
1	B	284	ASN
1	B	459	HIS
1	B	481	ASN
1	B	484	ASN
1	B	541	ASN
1	B	566	GLN
1	B	576	GLN
1	B	579	ASN
1	B	678	ASN
1	B	789	GLN
1	B	793	ASN
1	B	822	GLN
1	B	826	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates i

There are no monosaccharides in this entry.

## 5.6 Ligand geometry i

10 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	GLC	A	847	-	12,12,12	0.47	0	17,17,17	0.64	0
6	MPD	B	851	-	7,7,7	1.27	1 (14%)	9,10,10	1.23	0
4	PLP	A	849	1	15,15,16	1.81	4 (26%)	20,22,23	1.19	0
2	GLC	B	847	-	12,12,12	0.39	0	17,17,17	0.46	0
5	A46	B	850	-	22,25,25	2.04	7 (31%)	27,35,35	2.06	9 (33%)
5	A46	A	850	-	22,25,25	1.48	3 (13%)	27,35,35	1.84	7 (25%)
6	MPD	B	852	-	7,7,7	0.72	0	9,10,10	1.20	1 (11%)
3	MES	A	848	-	12,12,12	1.62	2 (16%)	14,16,16	2.67	5 (35%)
4	PLP	B	849	1	15,15,16	1.43	4 (26%)	20,22,23	1.12	0
3	MES	B	848	-	12,12,12	1.07	1 (8%)	14,16,16	2.15	5 (35%)

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	GLC	A	847	-	-	0/2/22/22	0/1/1/1
6	MPD	B	851	-	-	1/5/5/5	-
5	A46	B	850	-	-	0/11/14/14	0/3/3/3
2	GLC	B	847	-	-	0/2/22/22	0/1/1/1
4	PLP	A	849	1	-	0/6/6/8	0/1/1/1
5	A46	A	850	-	-	2/11/14/14	0/3/3/3
6	MPD	B	852	-	1/1/2/2	1/5/5/5	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MES	A	848	-	-	4/6/14/14	0/1/1/1
4	PLP	B	849	1	-	0/6/6/8	0/1/1/1
3	MES	B	848	-	-	3/6/14/14	0/1/1/1

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	850	A46	C16-CL1	-5.43	1.62	1.74
3	A	848	MES	O3S-S	4.66	1.64	1.47
4	A	849	PLP	C5-C4	4.60	1.45	1.40
5	B	850	A46	C4-N1	-3.82	1.33	1.41
4	A	849	PLP	C3-C4	3.31	1.47	1.40
5	B	850	A46	C8-C7	3.11	1.45	1.39
5	A	850	A46	C13-C15	3.07	1.43	1.36
4	B	849	PLP	C4A-C4	-3.07	1.45	1.51
3	B	848	MES	O3S-S	2.96	1.58	1.47
5	A	850	A46	C14-C16	2.93	1.42	1.36
5	B	850	A46	C5-C3	-2.83	1.46	1.51
3	A	848	MES	C8-S	2.51	1.81	1.77
4	B	849	PLP	C6-C5	2.48	1.42	1.37
5	B	850	A46	C14-C16	2.46	1.41	1.36
4	A	849	PLP	C6-C5	2.43	1.42	1.37
5	A	850	A46	C1-C2	2.40	1.43	1.38
4	B	849	PLP	C3-C4	2.37	1.45	1.40
5	B	850	A46	C13-C15	2.31	1.41	1.36
4	A	849	PLP	C3-C2	2.30	1.43	1.40
5	B	850	A46	C10-C4	2.29	1.43	1.39
4	B	849	PLP	C5-C4	2.15	1.42	1.40
6	B	851	MPD	C1-C2	2.06	1.58	1.52

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	B	850	A46	C8-C12-C11	5.55	111.11	106.27
3	A	848	MES	C5-N4-C3	5.28	120.71	108.83
3	A	848	MES	O1S-S-C8	4.99	112.92	106.92
3	A	848	MES	O2S-S-C8	-4.50	101.50	106.92
5	B	850	A46	C7-C8-C12	-4.32	101.17	106.55
5	A	850	A46	C14-C16-CL1	4.31	125.03	119.64
3	B	848	MES	O3S-S-C8	3.90	112.08	105.77
3	B	848	MES	C2-C3-N4	3.50	115.41	110.10
5	B	850	A46	C10-C9-C5	-3.39	117.79	121.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	850	A46	C7-C6-N1	3.26	121.94	114.04
5	A	850	A46	C7-N2-C11	3.23	111.18	104.45
5	A	850	A46	C15-C16-C14	-2.99	118.45	121.99
3	B	848	MES	C6-C5-N4	2.93	114.55	110.10
5	A	850	A46	C16-C14-C12	2.89	122.21	119.15
5	B	850	A46	C7-N2-C11	2.73	110.14	104.45
3	B	848	MES	C5-N4-C3	2.65	114.78	108.83
3	B	848	MES	O3S-S-O2S	-2.59	104.96	111.27
5	B	850	A46	C13-C15-C16	-2.55	116.26	119.21
5	B	850	A46	C9-C5-C1	2.50	121.42	118.29
5	B	850	A46	C7-C6-N1	2.50	120.09	114.04
5	B	850	A46	C16-C14-C12	2.36	121.65	119.15
3	A	848	MES	C6-C5-N4	2.33	113.63	110.10
6	B	852	MPD	CM-C2-C1	2.24	115.24	110.57
3	A	848	MES	O3S-S-O1S	-2.20	105.90	111.27
5	A	850	A46	C9-C10-C4	2.09	122.71	120.30
5	B	850	A46	C14-C12-C11	-2.07	116.99	119.87
5	A	850	A46	C1-C5-C3	2.00	124.50	120.68

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
6	B	852	MPD	C4

All (11) torsion outliers are listed below:

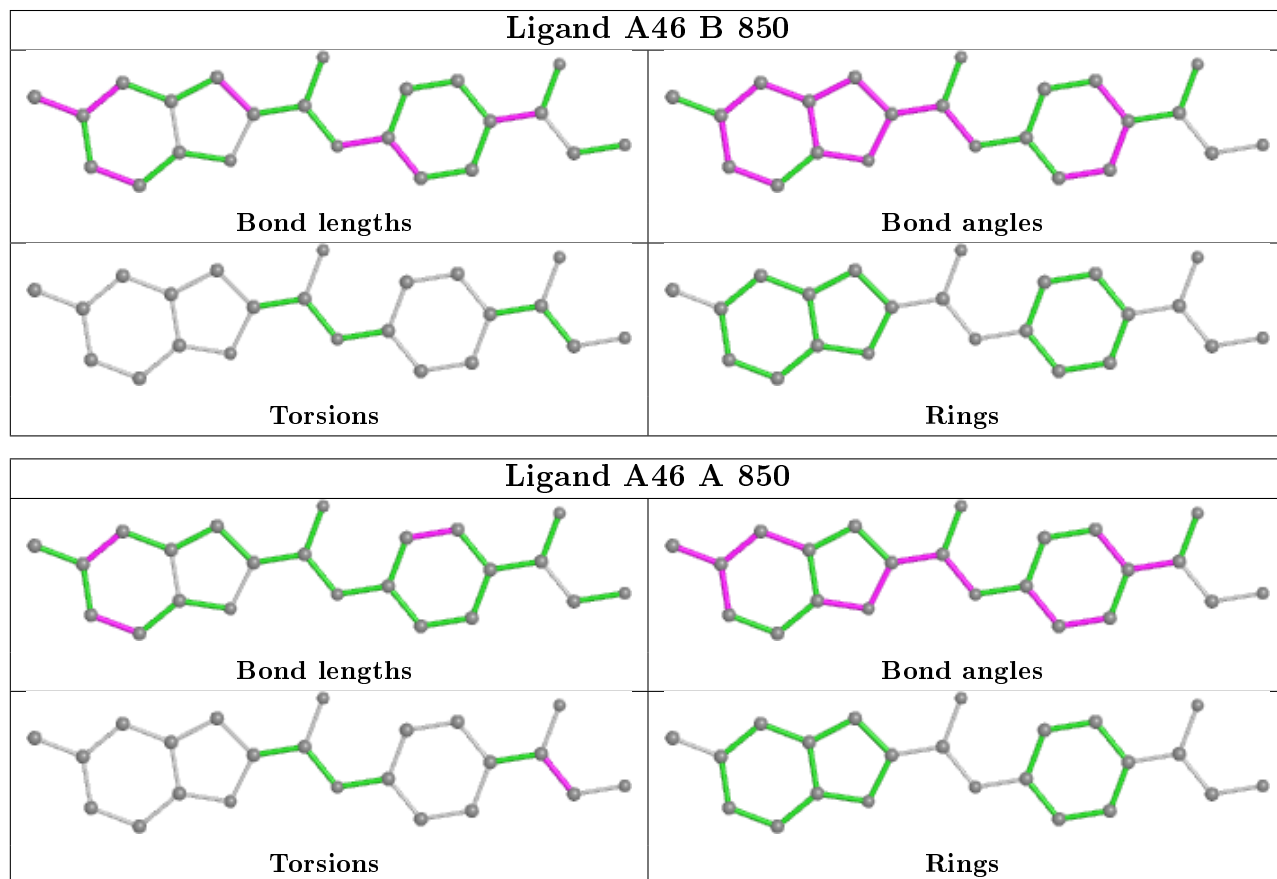
Mol	Chain	Res	Type	Atoms
6	B	851	MPD	C2-C3-C4-C5
5	A	850	A46	O3-C17-C3-O2
3	A	848	MES	C7-C8-S-O1S
3	A	848	MES	C7-C8-S-O3S
5	A	850	A46	O3-C17-C3-C5
3	B	848	MES	C8-C7-N4-C5
6	B	852	MPD	C2-C3-C4-C5
3	A	848	MES	C7-C8-S-O2S
3	A	848	MES	C8-C7-N4-C5
3	B	848	MES	C8-C7-N4-C3
3	B	848	MES	C7-C8-S-O2S

There are no ring outliers.

5 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	851	MPD	2	0
5	B	850	A46	1	0
6	B	852	MPD	4	0
3	A	848	MES	3	0
3	B	848	MES	3	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 than 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 [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

### 6.4 Ligands

EDS was not executed - this section is therefore empty.

### 6.5 Other polymers

EDS was not executed - this section is therefore empty.