



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 29, 2024 – 10:06 PM EST

PDB ID : 1FIQ
Title : CRYSTAL STRUCTURE OF XANTHINE OXIDASE FROM BOVINE MILK
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Deposited on : 2000-08-04
Resolution : 2.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The 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 : 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) : 2.36

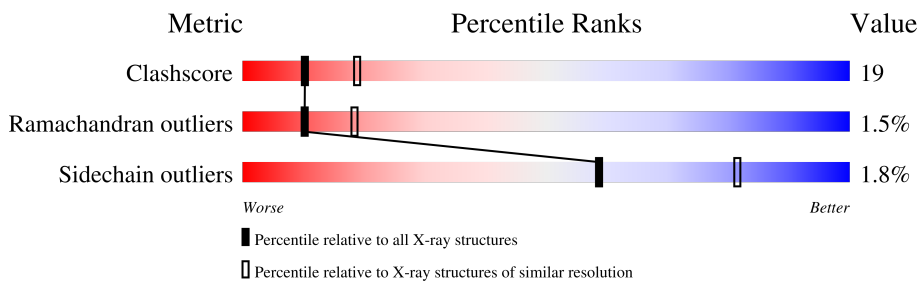
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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 $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	219	
2	B	350	
3	C	763	

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
7	MOS	C	1334	-	-	X	-
9	GOL	C	1336	-	X	X	-

2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 10106 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 XANTHINE OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	164	1255	788	225	230	12	0	0	0

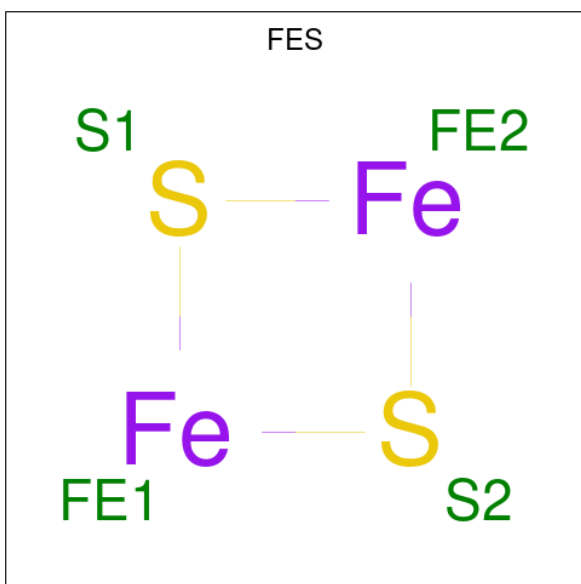
- Molecule 2 is a protein called XANTHINE OXIDASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	305	2389	1539	402	435	13	0	0	0

- Molecule 3 is a protein called XANTHINE OXIDASE.

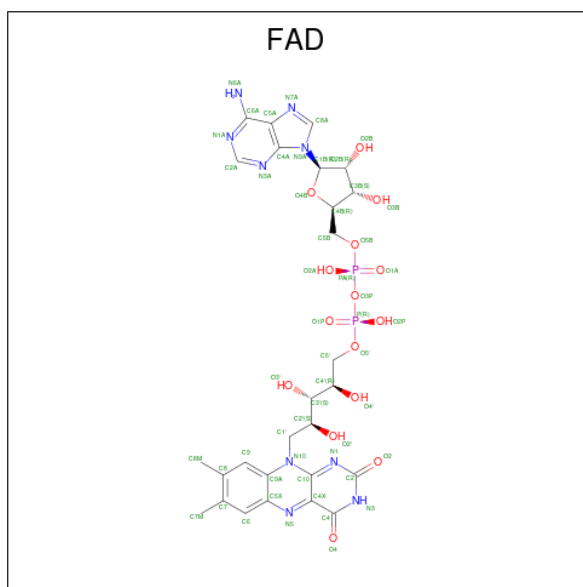
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	745	5761	3643	992	1093	33	0	0	0

- Molecule 4 is FE2/S2 (INORGANIC) CLUSTER (three-letter code: FES) (formula: Fe₂S₂).



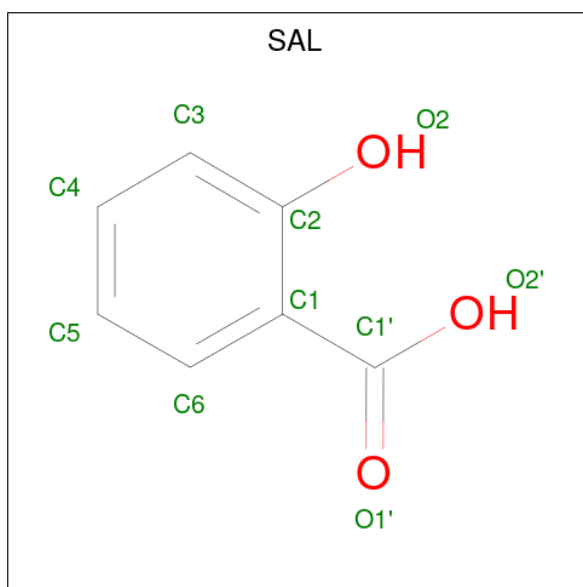
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	Fe	S	0	0
			4	2	2		
4	A	1	Total	Fe	S	0	0
			4	2	2		

- Molecule 5 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
5	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 6 is PHOSPHONIC ACIDMONO-(2-AMINO-5,6-DIMERCAPTO-4-OXO-3,7,8A, 9,10,10A-HEXAHYDRO-4H-8-OXA-1,3,9,10-TETRAAZA-ANTHRACEN-7-YLMETHYL) ESTER (three-letter code: MTE) (formula: $C_{10}H_{14}N_5O_6PS_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	C	1	Total	C	O	0	0
			10	7	3		

- Molecule 9 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	94	Total 94	O 94	0	0
10	B	119	Total 119	O 119	0	0
10	C	383	Total 383	O 383	0	0

4 Data and refinement statistics

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

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	117.83Å 165.40Å 154.45Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	8.00 – 2.50	Depositor
% Data completeness (in resolution range)	97.9 (8.00-2.50)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS 0.5	Depositor
R, R_{free}	0.212 , 0.275	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	10106	wwPDB-VP
Average B, all atoms (Å ²)	49.0	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: GOL, MOS, SAL, FES, FAD, MTE

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	0.37	0/1277	0.66	0/1723
2	B	0.33	0/2438	0.59	1/3290 (0.0%)
3	C	0.35	0/5888	0.62	0/7974
All	All	0.35	0/9603	0.62	1/12987 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	286	GLU	N-CA-C	-5.80	95.34	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	1255	0	1265	42	0
2	B	2389	0	2459	103	0
3	C	5761	0	5685	223	1
4	A	8	0	0	1	0
5	B	53	0	31	1	0
6	C	24	0	10	1	0
7	C	4	0	0	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	C	10	0	4	0	0
9	C	6	0	3	5	0
10	A	94	0	0	3	0
10	B	119	0	0	1	0
10	C	383	0	0	6	2
All	All	10106	0	9457	357	3

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 19.

All (357) 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)
2:B:374:ILE:HD12	2:B:381:ARG:HH12	1.27	0.97
3:C:1046:MET:HE1	3:C:1087:GLY:HA2	1.47	0.97
3:C:1289:ASN:HB3	3:C:1292:GLU:HB2	1.55	0.89
3:C:618:LYS:HD3	3:C:688:THR:HG21	1.58	0.84
3:C:833:MET:HE3	3:C:1222:ARG:C	1.99	0.83
2:B:500:ALA:HB3	2:B:505:ILE:HD11	1.59	0.83
3:C:764:VAL:HG23	3:C:766:THR:HG22	1.60	0.82
3:C:695:ILE:H	3:C:904:ASN:HD22	1.27	0.81
3:C:609:THR:CG2	3:C:664:GLY:HA2	2.13	0.79
3:C:581:ALA:O	3:C:585:GLN:HG3	1.83	0.79
2:B:241:THR:CG2	2:B:243:LYS:HG2	2.14	0.78
2:B:328:ARG:HG2	2:B:328:ARG:HH11	1.49	0.78
2:B:241:THR:HB	2:B:244:GLU:HG3	1.65	0.77
7:C:1334:MOS:S	7:C:1334:MOS:MO	1.96	0.77
3:C:726:ALA:HA	3:C:851:MET:CE	2.15	0.76
2:B:286:GLU:O	2:B:287:LEU:HB2	1.84	0.75
3:C:1021:ILE:HD12	3:C:1031:VAL:HG22	1.67	0.75
3:C:1175:ARG:HG3	3:C:1238:GLU:HB3	1.68	0.73
3:C:1088:GLN:HG2	3:C:1133:TYR:CD1	2.23	0.72
3:C:848:VAL:HG21	3:C:926:TRP:HB2	1.71	0.72
3:C:1108:ASN:ND2	3:C:1111:GLY:HA3	2.06	0.70
3:C:851:MET:HE3	3:C:857:VAL:HG21	1.73	0.69
3:C:1249:ASN:O	3:C:1255:ALA:HA	1.93	0.69
2:B:241:THR:HG22	2:B:243:LYS:HG2	1.74	0.68
2:B:241:THR:HG22	2:B:243:LYS:H	1.59	0.68
3:C:1102:GLU:HB3	3:C:1103:PRO:HD3	1.75	0.67
3:C:1021:ILE:CD1	3:C:1031:VAL:HG13	2.24	0.67
2:B:285:PRO:O	2:B:286:GLU:HB2	1.95	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:768:ASN:ND2	3:C:1076:PRO:HB3	2.09	0.67
2:B:325:GLU:HB2	2:B:412:SER:OG	1.93	0.66
3:C:622:VAL:HG23	3:C:626:GLN:HG3	1.77	0.66
3:C:1033:HIS:HD2	3:C:1035:GLY:H	1.41	0.66
3:C:979:ALA:O	3:C:983:GLU:HG3	1.96	0.65
3:C:779:MET:HG2	3:C:810:VAL:HG13	1.77	0.65
3:C:924:GLU:OE1	3:C:942:ARG:NH1	2.30	0.65
2:B:246:LEU:HB3	2:B:377:ARG:HB2	1.77	0.65
2:B:375:VAL:HG12	2:B:376:SER:N	2.11	0.65
3:C:833:MET:HE3	3:C:1223:GLY:N	2.11	0.65
3:C:1289:ASN:CB	3:C:1292:GLU:HB2	2.26	0.65
2:B:247:ASP:O	2:B:251:GLN:HG3	1.97	0.65
3:C:1247:CYS:N	3:C:1248:PRO:HD3	2.12	0.65
2:B:468:LYS:HB3	2:B:493:GLU:OE2	1.96	0.65
3:C:1048:GLN:HE22	3:C:1187:ASN:HB2	1.63	0.64
3:C:740:ASP:OD2	3:C:833:MET:HG2	1.97	0.64
1:A:152:GLY:HA2	3:C:1200:VAL:HG21	1.79	0.64
3:C:609:THR:HG23	3:C:664:GLY:HA2	1.79	0.64
2:B:284:ILE:HG22	2:B:285:PRO:O	1.97	0.63
3:C:1021:ILE:HD11	3:C:1031:VAL:HG13	1.80	0.63
3:C:884:HIS:CE1	3:C:1006:GLY:H	2.16	0.63
2:B:241:THR:HG21	2:B:243:LYS:HG2	1.79	0.63
3:C:618:LYS:HD3	3:C:688:THR:CG2	2.29	0.63
2:B:287:LEU:O	2:B:302:ALA:HB3	1.99	0.62
3:C:980:ARG:NH1	3:C:1175:ARG:HD3	2.14	0.62
3:C:609:THR:HG21	3:C:664:GLY:HA2	1.81	0.62
2:B:419:SER:HB2	2:B:519:PHE:CD1	2.34	0.62
3:C:695:ILE:H	3:C:904:ASN:ND2	1.97	0.62
2:B:393:TYR:CE1	2:B:394:ARG:HG2	2.33	0.62
3:C:726:ALA:HA	3:C:851:MET:HE2	1.80	0.62
1:A:36:LEU:HD22	1:A:89:GLU:HG3	1.80	0.62
3:C:1203:LEU:HD12	3:C:1203:LEU:O	1.99	0.62
2:B:407:ILE:HD12	2:B:407:ILE:N	2.15	0.62
3:C:880:ARG:HD2	3:C:914:PHE:HB3	1.80	0.62
3:C:747:HIS:CD2	3:C:836:THR:HG21	2.34	0.61
3:C:914:PHE:HA	9:C:1336:GOL:O2	2.00	0.61
1:A:59:ASP:OD2	1:A:61:LEU:HB3	2.00	0.61
1:A:99:HIS:ND1	1:A:100:PRO:HD2	2.15	0.61
2:B:375:VAL:CG1	2:B:376:SER:N	2.64	0.61
3:C:752:ILE:HD12	3:C:763:PHE:HE1	1.64	0.61
3:C:986:LYS:O	3:C:990:GLU:HG3	2.01	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:519:PHE:O	2:B:523:VAL:HG23	2.02	0.60
3:C:757:GLU:HB3	3:C:786:ARG:HE	1.66	0.60
2:B:314:GLU:O	2:B:318:LYS:HD3	2.01	0.60
3:C:1173:ASN:O	3:C:1236:PRO:HA	2.01	0.60
1:A:32:ARG:HD3	3:C:598:ARG:NH2	2.16	0.60
2:B:504:MET:HG2	3:C:1303:GLU:OE2	2.01	0.60
3:C:964:VAL:HB	3:C:965:PRO:HD3	1.84	0.59
3:C:1046:MET:HE1	3:C:1087:GLY:CA	2.28	0.59
2:B:366:MET:HE1	2:B:387:HIS:HA	1.84	0.59
2:B:322:GLN:HG2	2:B:414:GLU:OE2	2.03	0.59
3:C:931:ALA:HA	3:C:941:VAL:HG21	1.84	0.59
2:B:285:PRO:O	2:B:286:GLU:CB	2.51	0.59
3:C:884:HIS:HE1	3:C:1006:GLY:H	1.50	0.59
3:C:1287:ASN:ND2	3:C:1289:ASN:HB2	2.18	0.59
3:C:1278:ILE:O	3:C:1282:ARG:HG3	2.03	0.59
2:B:418:PHE:CD1	2:B:439:ARG:HB2	2.38	0.58
3:C:1088:GLN:HG3	10:C:1622:HOH:O	2.03	0.58
2:B:376:SER:HB3	2:B:402:GLU:HG2	1.86	0.57
3:C:711:GLU:N	3:C:899:ARG:NH1	2.52	0.57
3:C:868:GLY:HA3	3:C:907:SER:HA	1.85	0.57
3:C:753:PRO:HD3	3:C:816:ALA:HB1	1.85	0.57
2:B:330:VAL:O	2:B:334:LEU:HG	2.05	0.57
3:C:610:SER:O	3:C:663:VAL:O	2.22	0.57
3:C:1095:GLN:O	3:C:1099:LYS:HG2	2.05	0.57
2:B:255:ALA:HB2	2:B:277:MET:HG2	1.87	0.57
2:B:472:LYS:HG2	2:B:472:LYS:O	2.05	0.57
3:C:715:GLU:HG3	3:C:895:ARG:HB2	1.85	0.57
2:B:286:GLU:C	2:B:288:ASN:H	2.08	0.56
1:A:61:LEU:C	1:A:63:ASP:H	2.06	0.56
3:C:740:ASP:CG	3:C:833:MET:HG2	2.25	0.56
3:C:720:LYS:O	3:C:721:LYS:CB	2.54	0.56
3:C:726:ALA:HA	3:C:851:MET:HE1	1.86	0.56
3:C:1044:THR:O	3:C:1048:GLN:HG3	2.06	0.56
3:C:1209:GLU:HB3	3:C:1227:TYR:CZ	2.40	0.56
3:C:911:PHE:O	3:C:912:ARG:C	2.44	0.56
3:C:684:VAL:HG12	3:C:684:VAL:O	2.06	0.56
3:C:1033:HIS:CD2	3:C:1035:GLY:H	2.23	0.56
7:C:1334:MOS:S	7:C:1334:MOS:O2	2.64	0.55
3:C:880:ARG:HD2	3:C:914:PHE:O	2.06	0.55
2:B:419:SER:HB2	2:B:519:PHE:HD1	1.71	0.55
1:A:152:GLY:O	3:C:1235:ILE:HG21	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:154:ARG:HB3	1:A:155:PRO:HD3	1.87	0.55
2:B:322:GLN:O	2:B:412:SER:HB3	2.07	0.55
2:B:246:LEU:HD13	2:B:377:ARG:HA	1.88	0.55
2:B:287:LEU:C	2:B:300:GLY:HA3	2.27	0.55
3:C:848:VAL:HG22	3:C:859:LEU:CD1	2.37	0.55
3:C:711:GLU:H	3:C:899:ARG:NH1	2.05	0.54
3:C:1058:ILE:HG13	3:C:1059:SER:N	2.23	0.54
2:B:500:ALA:HB3	2:B:505:ILE:CD1	2.34	0.54
2:B:328:ARG:HG2	2:B:328:ARG:NH1	2.22	0.53
3:C:616:LYS:HB3	3:C:690:GLU:HB3	1.90	0.53
2:B:371:LYS:HD2	2:B:408:GLU:OE1	2.09	0.53
3:C:1082:SER:HB2	6:C:1333:MTE:O3P	2.09	0.53
3:C:1282:ARG:NH1	3:C:1308:ALA:O	2.42	0.53
3:C:1295:ARG:HA	10:C:1422:HOH:O	2.08	0.53
3:C:624:GLU:HB3	3:C:684:VAL:HG11	1.91	0.53
3:C:749:THR:HG23	3:C:764:VAL:HG12	1.91	0.53
3:C:770:MET:HE2	10:C:1702:HOH:O	2.08	0.53
2:B:284:ILE:O	2:B:286:GLU:O	2.27	0.52
1:A:131:GLN:HE21	1:A:133:GLU:H	1.56	0.52
1:A:117:THR:HB	1:A:118:PRO:HD3	1.91	0.52
3:C:601:ASN:O	3:C:821:HIS:HD2	1.93	0.52
3:C:909:THR:OG1	3:C:910:ALA:N	2.41	0.52
1:A:117:THR:CG2	3:C:586:ALA:HA	2.39	0.52
2:B:381:ARG:HG3	2:B:381:ARG:HH11	1.75	0.52
3:C:934:CYS:O	3:C:936:LEU:HG	2.09	0.52
3:C:799:GLY:HA2	7:C:1334:MOS:S	2.50	0.52
2:B:257:LEU:HD23	2:B:279:ILE:HB	1.90	0.52
3:C:1003:THR:HG22	3:C:1266:LEU:HD21	1.92	0.52
3:C:703:LYS:C	3:C:704:ASN:HD22	2.14	0.51
3:C:1095:GLN:HB3	3:C:1099:LYS:NZ	2.25	0.51
1:A:74:LEU:O	1:A:76:PRO:HD3	2.10	0.51
2:B:253:PRO:HG3	2:B:401:GLU:HG2	1.91	0.51
3:C:645:GLU:OE2	3:C:650:ASN:HB3	2.10	0.51
3:C:604:PHE:CD2	3:C:675:PRO:HG3	2.44	0.51
1:A:61:LEU:HG	1:A:62:GLN:NE2	2.26	0.51
3:C:1017:ALA:HB1	3:C:1086:TYR:CD2	2.45	0.51
1:A:4:ASP:HB3	2:B:227:LEU:HD22	1.93	0.51
2:B:328:ARG:HH11	2:B:328:ARG:CG	2.21	0.51
3:C:1052:LYS:HD3	3:C:1254:TYR:CZ	2.46	0.51
1:A:3:ALA:HB1	10:A:687:HOH:O	2.11	0.51
2:B:418:PHE:HD1	2:B:439:ARG:HB2	1.76	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:673:ASP:OD2	3:C:677:HIS:HD2	1.93	0.50
3:C:875:HIS:CD2	3:C:879:GLU:OE2	2.64	0.50
3:C:1118:MET:O	3:C:1122:GLN:HG2	2.11	0.50
1:A:99:HIS:CE1	1:A:100:PRO:HD2	2.46	0.50
1:A:3:ALA:HB2	10:B:643:HOH:O	2.12	0.50
3:C:1144:THR:O	3:C:1145:ASN:C	2.50	0.50
3:C:1199:PHE:CE1	3:C:1267:GLY:HA2	2.47	0.50
2:B:473:GLN:O	2:B:476:LYS:HB2	2.11	0.50
2:B:496:LEU:H	2:B:509:ARG:NH2	2.09	0.50
3:C:764:VAL:HG23	3:C:766:THR:CG2	2.36	0.50
3:C:918:GLN:O	3:C:922:ILE:HG13	2.12	0.50
3:C:632:VAL:HB	3:C:671:VAL:O	2.12	0.49
3:C:712:LEU:HD21	3:C:875:HIS:CE1	2.46	0.49
3:C:1143:GLU:O	3:C:1144:THR:HG23	2.12	0.49
1:A:37:ARG:HG2	3:C:595:ASP:HA	1.94	0.49
2:B:376:SER:O	2:B:377:ARG:C	2.50	0.49
3:C:856:ILE:HD13	3:C:945:ASN:CG	2.32	0.49
3:C:1016:GLN:HE21	3:C:1132:PHE:HZ	1.61	0.49
1:A:152:GLY:CA	3:C:1200:VAL:HG21	2.41	0.49
3:C:730:VAL:HG23	3:C:850:PHE:CE2	2.47	0.49
3:C:1281:ALA:O	3:C:1284:GLN:HB3	2.11	0.49
2:B:267:GLU:O	2:B:271:LYS:HB3	2.13	0.49
3:C:741:HIS:CE1	3:C:838:GLY:HA2	2.48	0.49
3:C:1286:THR:CG2	3:C:1310:VAL:HB	2.43	0.49
2:B:249:LYS:NZ	2:B:400:PRO:O	2.46	0.49
3:C:1007:ILE:O	3:C:1008:SER:CB	2.60	0.49
2:B:243:LYS:HD3	2:B:243:LYS:N	2.27	0.49
3:C:1209:GLU:HB3	3:C:1227:TYR:OH	2.13	0.49
2:B:452:LEU:HD23	2:B:470:THR:HG22	1.95	0.48
2:B:374:ILE:HD13	2:B:398:LEU:HD23	1.95	0.48
3:C:728:ASN:HD21	3:C:852:LYS:HG2	1.77	0.48
3:C:857:VAL:O	3:C:857:VAL:HG12	2.13	0.48
3:C:696:ILE:HD13	3:C:1217:GLY:CA	2.43	0.48
2:B:375:VAL:CG1	2:B:376:SER:H	2.27	0.48
2:B:449:VAL:O	2:B:475:SER:N	2.44	0.48
3:C:1143:GLU:C	3:C:1144:THR:HG23	2.34	0.48
1:A:91:ILE:O	1:A:99:HIS:HB2	2.14	0.48
3:C:622:VAL:HG23	3:C:622:VAL:O	2.14	0.48
2:B:406:SER:C	2:B:407:ILE:HD12	2.34	0.48
2:B:257:LEU:HA	2:B:279:ILE:O	2.14	0.47
3:C:615:ALA:HA	3:C:692:LEU:HG	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:287:LEU:HG	2:B:405:LEU:HD12	1.97	0.47
2:B:414:GLU:O	2:B:415:ASP:HB2	2.14	0.47
5:B:606:FAD:H51A	5:B:606:FAD:H8A	1.96	0.47
3:C:1271:PHE:CE1	3:C:1300:ALA:HB2	2.48	0.47
3:C:842:PHE:CE2	3:C:865:SER:HB3	2.50	0.47
3:C:926:TRP:O	3:C:930:VAL:HG23	2.14	0.47
2:B:389:PHE:O	2:B:391:PRO:HD3	2.13	0.47
3:C:1292:GLU:O	3:C:1293:LEU:HD23	2.15	0.47
3:C:782:VAL:CG1	3:C:786:ARG:HG3	2.43	0.47
3:C:968:TRP:HZ3	3:C:1002:PRO:HD3	1.79	0.47
3:C:1270:VAL:O	3:C:1274:ILE:HG13	2.15	0.47
2:B:285:PRO:C	2:B:286:GLU:O	2.53	0.47
3:C:1284:GLN:HG3	3:C:1285:HIS:N	2.30	0.47
2:B:316:VAL:HA	2:B:324:THR:HG21	1.96	0.47
1:A:117:THR:HG22	3:C:586:ALA:HA	1.98	0.46
3:C:923:ALA:HA	3:C:926:TRP:NE1	2.30	0.46
2:B:286:GLU:C	2:B:288:ASN:N	2.69	0.46
3:C:915:GLY:H	9:C:1336:GOL:HO1	1.61	0.46
3:C:1310:VAL:HG13	10:C:1695:HOH:O	2.16	0.46
1:A:11:ASN:OD1	1:A:90:GLY:HA3	2.15	0.46
1:A:61:LEU:C	1:A:63:ASP:N	2.68	0.46
3:C:591:VAL:HG13	3:C:595:ASP:HB2	1.97	0.46
3:C:1261:GLU:N	3:C:1262:PRO:CD	2.78	0.46
3:C:605:LEU:C	3:C:605:LEU:HD23	2.36	0.46
3:C:815:ALA:O	3:C:819:THR:HG23	2.15	0.46
3:C:1191:ASP:O	3:C:1195:VAL:HG23	2.16	0.46
3:C:699:GLU:OE2	3:C:843:LEU:HD22	2.14	0.46
3:C:927:MET:HE3	3:C:945:ASN:HB2	1.98	0.46
3:C:1088:GLN:HG2	3:C:1133:TYR:CE1	2.50	0.46
3:C:1203:LEU:HD12	3:C:1203:LEU:C	2.36	0.46
2:B:232:GLU:OE1	3:C:677:HIS:HE1	1.99	0.46
3:C:1286:THR:HG22	3:C:1310:VAL:HB	1.98	0.46
3:C:720:LYS:O	3:C:721:LYS:HB2	2.15	0.45
3:C:1196:GLU:O	3:C:1200:VAL:HG23	2.16	0.45
3:C:1247:CYS:N	3:C:1248:PRO:CD	2.79	0.45
2:B:244:GLU:O	2:B:248:LEU:HG	2.17	0.45
2:B:389:PHE:C	2:B:391:PRO:HD3	2.35	0.45
3:C:911:PHE:HD2	3:C:912:ARG:N	2.14	0.45
3:C:782:VAL:HG13	3:C:783:PRO:HD2	1.98	0.45
3:C:839:ARG:HG3	9:C:1336:GOL:H12	1.98	0.45
3:C:925:ASN:O	3:C:929:GLU:HG3	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:246:LEU:HB3	2:B:377:ARG:CB	2.46	0.45
2:B:432:ALA:HB2	2:B:502:GLY:HA3	1.98	0.45
2:B:281:PRO:O	2:B:283:TRP:N	2.50	0.45
3:C:695:ILE:N	3:C:904:ASN:HD22	2.05	0.45
3:C:911:PHE:O	9:C:1336:GOL:H11	2.17	0.45
3:C:976:GLN:O	3:C:980:ARG:HG3	2.15	0.45
2:B:318:LYS:HD2	2:B:318:LYS:N	2.30	0.45
3:C:937:PRO:HB2	3:C:940:GLU:HB2	1.99	0.45
3:C:734:LEU:HD12	3:C:1297:ASP:OD1	2.16	0.45
1:A:29:TYR:CZ	1:A:33:LYS:HD2	2.52	0.45
2:B:259:VAL:HG11	2:B:347:SER:HB3	1.99	0.45
1:A:61:LEU:O	1:A:63:ASP:N	2.49	0.44
2:B:438:MET:CE	2:B:454:LEU:HD22	2.47	0.44
3:C:616:LYS:O	3:C:689:TYR:HA	2.16	0.44
1:A:101:VAL:HG12	1:A:121:VAL:HG22	2.00	0.44
2:B:427:ARG:O	2:B:427:ARG:HG2	2.16	0.44
1:A:143:PHE:HB3	3:C:1232:PHE:CE1	2.52	0.44
2:B:443:GLN:HB2	2:B:446:SER:OG	2.18	0.44
3:C:840:HIS:CE1	3:C:908:ASN:HB2	2.53	0.44
1:A:26:LEU:HD22	1:A:80:LEU:HD11	2.00	0.44
3:C:684:VAL:HG13	3:C:686:LYS:HZ2	1.82	0.44
3:C:821:HIS:O	3:C:823:VAL:HG23	2.18	0.44
3:C:980:ARG:NH2	3:C:998:LEU:HD11	2.33	0.44
3:C:1292:GLU:HG2	3:C:1293:LEU:N	2.33	0.44
1:A:46:GLY:HA2	4:A:602:FES:S1	2.58	0.44
3:C:933:THR:O	3:C:1291:LYS:HD3	2.18	0.44
2:B:393:TYR:CD1	2:B:394:ARG:HG2	2.53	0.43
3:C:614:HIS:CE1	3:C:692:LEU:HD12	2.53	0.43
3:C:1103:PRO:O	3:C:1107:LYS:HG3	2.19	0.43
1:A:67:HIS:NE2	1:A:129:ARG:NH1	2.65	0.43
3:C:749:THR:OG1	3:C:764:VAL:HG12	2.17	0.43
2:B:460:ALA:C	2:B:462:ARG:H	2.21	0.43
3:C:712:LEU:HA	10:C:1573:HOH:O	2.17	0.43
3:C:1084:ASP:OD1	3:C:1252:ALA:HB1	2.19	0.43
3:C:1180:MET:CE	3:C:1263:PRO:HG3	2.48	0.43
3:C:736:ILE:CG2	3:C:842:PHE:HB2	2.48	0.43
3:C:839:ARG:NH2	3:C:917:PRO:HG2	2.34	0.43
3:C:719:LEU:HD11	3:C:895:ARG:HD3	2.00	0.43
3:C:913:GLY:HA3	3:C:917:PRO:HG2	2.01	0.43
2:B:234:VAL:HG12	2:B:235:THR:N	2.34	0.43
3:C:697:THR:H	3:C:700:ASP:HB2	1.82	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:840:HIS:HB2	9:C:1336:GOL:O3	2.19	0.43
3:C:851:MET:HE3	3:C:857:VAL:CG2	2.45	0.43
3:C:1287:ASN:HD21	3:C:1289:ASN:HB2	1.81	0.43
1:A:7:VAL:HG11	1:A:14:LYS:HE3	2.01	0.43
2:B:298:SER:HA	2:B:408:GLU:HA	2.00	0.43
3:C:609:THR:HG23	3:C:664:GLY:CA	2.46	0.43
3:C:707:PHE:HB3	3:C:900:LEU:O	2.19	0.43
3:C:773:GLN:HG2	3:C:784:VAL:HG13	2.01	0.43
3:C:1175:ARG:HG3	3:C:1238:GLU:CB	2.44	0.43
3:C:1095:GLN:HB3	3:C:1099:LYS:HZ3	1.83	0.43
3:C:704:ASN:HD22	3:C:704:ASN:N	2.16	0.42
3:C:856:ILE:HD12	3:C:856:ILE:N	2.33	0.42
2:B:286:GLU:HB3	2:B:405:LEU:HD11	2.00	0.42
3:C:610:SER:HB3	3:C:663:VAL:O	2.18	0.42
3:C:1108:ASN:HD21	3:C:1111:GLY:HA3	1.83	0.42
10:A:687:HOH:O	2:B:229:PHE:HA	2.19	0.42
3:C:696:ILE:HD13	3:C:1217:GLY:N	2.34	0.42
3:C:1282:ARG:O	3:C:1286:THR:OG1	2.35	0.42
3:C:680:ARG:O	3:C:684:VAL:HG23	2.19	0.42
1:A:62:GLN:O	1:A:63:ASP:HB3	2.19	0.42
2:B:337:PHE:O	2:B:338:ALA:C	2.57	0.42
3:C:1196:GLU:HG2	3:C:1241:VAL:HG21	2.01	0.42
1:A:104:ARG:HD2	1:A:104:ARG:HA	1.69	0.42
2:B:381:ARG:HG3	2:B:381:ARG:NH1	2.34	0.42
2:B:403:ILE:HD12	2:B:403:ILE:O	2.20	0.42
2:B:508:ARG:O	2:B:512:THR:HG23	2.20	0.42
3:C:583:ALA:HB3	10:C:1444:HOH:O	2.19	0.42
3:C:631:PHE:CE1	3:C:670:VAL:HG13	2.55	0.42
3:C:609:THR:CG2	3:C:610:SER:N	2.82	0.42
3:C:848:VAL:HG22	3:C:859:LEU:HD12	2.00	0.42
1:A:87:THR:OG1	1:A:89:GLU:HG2	2.18	0.42
2:B:438:MET:HE2	2:B:454:LEU:HD22	2.02	0.42
3:C:602:GLU:HA	3:C:822:PRO:HG2	2.01	0.42
3:C:788:LEU:HD13	3:C:1069:ASN:HB3	2.01	0.42
2:B:304:ALA:O	2:B:307:SER:HB2	2.20	0.41
1:A:129:ARG:HG3	1:A:129:ARG:HH11	1.85	0.41
2:B:328:ARG:NH1	2:B:328:ARG:CG	2.79	0.41
2:B:500:ALA:HA	2:B:501:PRO:HD3	1.92	0.41
3:C:840:HIS:HD2	3:C:877:ILE:HD13	1.84	0.41
3:C:1151:HIS:CE1	3:C:1251:LYS:HD2	2.55	0.41
2:B:305:LEU:HG	2:B:346:ALA:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:442:PHE:HE2	2:B:478:TRP:HB2	1.84	0.41
3:C:1143:GLU:O	3:C:1144:THR:CB	2.69	0.41
1:A:43:CYS:HA	3:C:829:ARG:HB2	2.01	0.41
1:A:158:GLN:HG3	10:A:649:HOH:O	2.20	0.41
3:C:736:ILE:O	3:C:736:ILE:HG23	2.20	0.41
2:B:362:ASN:N	2:B:363:PRO:CD	2.83	0.41
3:C:853:THR:HG22	3:C:944:LYS:HZ2	1.85	0.41
3:C:1286:THR:HG22	3:C:1310:VAL:O	2.19	0.41
2:B:374:ILE:CD1	2:B:381:ARG:HH12	2.14	0.41
2:B:452:LEU:HD23	2:B:470:THR:HA	2.03	0.41
3:C:684:VAL:CG1	3:C:686:LYS:NZ	2.83	0.41
2:B:264:ILE:HD13	2:B:267:GLU:OE2	2.20	0.41
3:C:609:THR:HG22	3:C:610:SER:O	2.21	0.41
3:C:730:VAL:HG23	3:C:850:PHE:HE2	1.85	0.41
3:C:705:ASN:HA	3:C:707:PHE:CE1	2.56	0.41
3:C:877:ILE:HG13	3:C:914:PHE:CZ	2.55	0.41
3:C:911:PHE:C	3:C:911:PHE:CD2	2.94	0.41
3:C:1105:LYS:HG3	3:C:1116:TRP:CH2	2.55	0.41
3:C:1221:THR:HA	3:C:1226:THR:OG1	2.21	0.41
1:A:135:THR:OG1	1:A:138:GLU:HG3	2.21	0.41
1:A:154:ARG:C	1:A:154:ARG:HD2	2.41	0.41
3:C:624:GLU:HB2	3:C:684:VAL:HG12	2.03	0.41
3:C:850:PHE:CD2	3:C:850:PHE:N	2.88	0.41
3:C:911:PHE:HD2	3:C:911:PHE:C	2.24	0.41
3:C:1010:THR:O	3:C:1012:PRO:HD3	2.20	0.41
3:C:1033:HIS:CE1	3:C:1046:MET:HG3	2.56	0.41
3:C:1037:GLU:HB2	3:C:1043:HIS:CD2	2.55	0.41
1:A:117:THR:HG21	3:C:586:ALA:HA	2.03	0.40
1:A:164:ALA:O	1:A:165:LYS:HB2	2.20	0.40
2:B:254:GLU:OE1	2:B:254:GLU:N	2.51	0.40
2:B:522:THR:HG22	2:B:526:LYS:HE3	2.03	0.40
3:C:742:PHE:CZ	3:C:829:ARG:HD3	2.56	0.40
2:B:374:ILE:HD13	2:B:398:LEU:CD2	2.50	0.40
2:B:442:PHE:CE1	2:B:527:LEU:HD21	2.57	0.40
3:C:618:LYS:HB3	3:C:688:THR:HG22	2.04	0.40
3:C:853:THR:HG22	3:C:853:THR:O	2.22	0.40
2:B:416:GLU:OE1	2:B:439:ARG:NE	2.49	0.40
3:C:880:ARG:O	3:C:884:HIS:HD2	2.05	0.40
3:C:804:ARG:N	3:C:804:ARG:HD2	2.36	0.40
1:A:61:LEU:HG	1:A:62:GLN:N	2.37	0.40
2:B:271:LYS:HG3	2:B:271:LYS:O	2.22	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:427:ARG:HD3	3:C:1212:HIS:CG	2.57	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:C:1509:HOH:O	10:C:1509:HOH:O[3_556]	1.82	0.38
3:C:973:LYS:NZ	3:C:973:LYS:NZ[4_556]	1.86	0.34
10:C:1598:HOH:O	10:C:1598:HOH:O[3_556]	1.99	0.21

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	162/219 (74%)	152 (94%)	5 (3%)	5 (3%)	4 5
2	B	303/350 (87%)	274 (90%)	25 (8%)	4 (1%)	12 21
3	C	743/763 (97%)	687 (92%)	47 (6%)	9 (1%)	13 24
All	All	1208/1332 (91%)	1113 (92%)	77 (6%)	18 (2%)	10 18

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	61	LEU
1	A	64	LYS
3	C	1008	SER
3	C	1287	ASN
2	B	282	ALA
3	C	719	LEU
3	C	721	LYS
3	C	912	ARG
3	C	1284	GLN

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Mol	Chain	Res	Type
1	A	62	GLN
3	C	798	PHE
1	A	43	CYS
1	A	63	ASP
2	B	335	ARG
2	B	338	ALA
2	B	377	ARG
3	C	797	GLY
3	C	1253	ILE

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	137/187 (73%)	137 (100%)	0	100	100
2	B	261/302 (86%)	254 (97%)	7 (3%)	44	71
3	C	624/639 (98%)	613 (98%)	11 (2%)	59	81
All	All	1022/1128 (91%)	1004 (98%)	18 (2%)	59	81

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	286	GLU
2	B	328	ARG
2	B	348	LEU
2	B	411	TYR
2	B	419	SER
2	B	438	MET
2	B	485	ASP
3	C	723	PHE
3	C	743	TYR
3	C	829	ARG
3	C	911	PHE
3	C	939	GLU
3	C	951	ASP

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Mol	Chain	Res	Type
3	C	1002	PRO
3	C	1016	GLN
3	C	1203	LEU
3	C	1208	LEU
3	C	1239	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	62	GLN
1	A	71	ASN
1	A	82	HIS
1	A	131	GLN
1	A	146	ASN
2	B	272	ASN
2	B	351	ASN
2	B	471	GLN
2	B	473	GLN
3	C	585	GLN
3	C	614	HIS
3	C	626	GLN
3	C	677	HIS
3	C	683	HIS
3	C	704	ASN
3	C	728	ASN
3	C	821	HIS
3	C	840	HIS
3	C	875	HIS
3	C	884	HIS
3	C	904	ASN
3	C	991	ASN
3	C	1016	GLN
3	C	1033	HIS
3	C	1048	GLN
3	C	1108	ASN
3	C	1284	GLN
3	C	1287	ASN

5.3.3 RNA

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](#)

7 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
4	FES	A	601	1	0,4,4	-	-	-		
8	SAL	C	1335	-	10,10,10	1.83	4 (40%)	13,13,13	2.08	4 (30%)
7	MOS	C	1334	6	0,3,3	-	-	-		
9	GOL	C	1336	-	5,5,5	6.33	5 (100%)	5,5,5	5.69	3 (60%)
6	MTE	C	1333	7	21,26,26	6.98	14 (66%)	21,40,40	4.94	11 (52%)
4	FES	A	602	1	0,4,4	-	-	-		
5	FAD	B	606	-	53,58,58	4.72	38 (71%)	68,89,89	2.19	22 (32%)

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	FES	A	601	1	-	-	0/1/1/1
8	SAL	C	1335	-	-	0/4/4/4	0/1/1/1
9	GOL	C	1336	-	-	2/4/4/4	-
6	MTE	C	1333	7	-	6/6/34/34	0/3/3/3
4	FES	A	602	1	-	-	0/1/1/1
5	FAD	B	606	-	-	2/30/50/50	0/6/6/6

All (61) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	C	1333	MTE	C7-C6	21.01	1.70	1.53
6	C	1333	MTE	C9-C10	13.44	1.66	1.41
5	B	606	FAD	C4A-N3A	12.51	1.52	1.35
5	B	606	FAD	C9A-N10	11.65	1.61	1.41
9	C	1336	GOL	C3-C2	-10.94	1.06	1.51
6	C	1333	MTE	C6-N5	8.88	1.57	1.45
5	B	606	FAD	C6-C5X	8.60	1.53	1.40
5	B	606	FAD	C9A-C5X	8.28	1.55	1.41
5	B	606	FAD	O4B-C1B	7.99	1.52	1.41
5	B	606	FAD	C6-C7	7.87	1.51	1.39
6	C	1333	MTE	C9-N5	7.73	1.53	1.38
5	B	606	FAD	C2A-N1A	7.43	1.47	1.33
6	C	1333	MTE	C4'-C3'	-7.20	1.42	1.52
6	C	1333	MTE	P-O4'	-7.00	1.37	1.60
5	B	606	FAD	O4-C4	-6.79	1.10	1.23
5	B	606	FAD	C8-C7	6.76	1.57	1.40
5	B	606	FAD	C9-C9A	6.74	1.50	1.39
5	B	606	FAD	C10-N1	6.50	1.46	1.33
6	C	1333	MTE	C9-C4	6.49	1.50	1.41
6	C	1333	MTE	P-O3P	-6.27	1.30	1.54
5	B	606	FAD	C2A-N3A	6.26	1.42	1.32
9	C	1336	GOL	O2-C2	-5.87	1.25	1.43
5	B	606	FAD	C8A-N7A	-5.82	1.24	1.34
5	B	606	FAD	O4B-C4B	5.31	1.56	1.45
5	B	606	FAD	C6A-C5A	5.07	1.62	1.43
5	B	606	FAD	C4X-N5	4.90	1.40	1.30
6	C	1333	MTE	C4-N3	4.71	1.41	1.33
5	B	606	FAD	C5A-C4A	4.61	1.53	1.40
9	C	1336	GOL	O3-C3	-4.60	1.23	1.42
5	B	606	FAD	O2-C2	-4.54	1.15	1.24
5	B	606	FAD	C2-N3	4.37	1.49	1.39
6	C	1333	MTE	C2-N1	4.31	1.43	1.35
9	C	1336	GOL	C1-C2	-4.15	1.34	1.51
5	B	606	FAD	C9-C8	4.07	1.45	1.39
5	B	606	FAD	P-O5'	-3.90	1.43	1.59
5	B	606	FAD	PA-O2A	-3.89	1.37	1.55
5	B	606	FAD	C4-N3	3.42	1.45	1.38
6	C	1333	MTE	O3'-C3'	3.41	1.48	1.43
5	B	606	FAD	P-O2P	-3.25	1.40	1.55
5	B	606	FAD	C4X-C10	3.18	1.53	1.44
5	B	606	FAD	C5B-C4B	3.14	1.61	1.51
6	C	1333	MTE	O3'-C7	3.09	1.48	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	C	1335	SAL	C1-C1'	-3.04	1.43	1.49
5	B	606	FAD	O4'-C4'	2.94	1.49	1.43
9	C	1336	GOL	O1-C1	2.74	1.54	1.42
5	B	606	FAD	C2'-C3'	2.53	1.58	1.53
5	B	606	FAD	O3'-C3'	2.47	1.48	1.43
8	C	1335	SAL	O2'-C1'	-2.47	1.23	1.30
6	C	1333	MTE	P-O2P	-2.45	1.45	1.54
6	C	1333	MTE	C1'-C2'	2.44	1.51	1.35
5	B	606	FAD	C5X-N5	2.39	1.44	1.39
5	B	606	FAD	C3B-C4B	2.33	1.58	1.53
5	B	606	FAD	C10-N10	2.32	1.42	1.37
5	B	606	FAD	O5'-C5'	2.29	1.53	1.44
5	B	606	FAD	C2B-C3B	2.28	1.59	1.53
8	C	1335	SAL	C6-C1	2.24	1.43	1.39
8	C	1335	SAL	C5-C6	2.23	1.43	1.38
5	B	606	FAD	O5B-C5B	-2.21	1.36	1.44
5	B	606	FAD	C1'-C2'	-2.19	1.49	1.52
5	B	606	FAD	O2B-C2B	-2.10	1.38	1.43
5	B	606	FAD	C5A-N7A	-2.07	1.32	1.39

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	1333	MTE	C4-C9-N5	12.00	129.19	119.12
6	C	1333	MTE	P-O4'-C4'	11.80	150.81	118.30
9	C	1336	GOL	O3-C3-C2	9.99	158.08	110.20
9	C	1336	GOL	O2-C2-C3	6.84	139.23	109.12
6	C	1333	MTE	O2P-P-O4'	6.30	123.50	106.73
6	C	1333	MTE	C2-N1-C10	5.95	127.87	114.54
6	C	1333	MTE	O4'-P-O1P	-5.93	89.85	106.47
5	B	606	FAD	O5B-PA-O1A	-5.78	86.47	109.07
5	B	606	FAD	C5X-C9A-N10	-5.24	112.54	117.95
6	C	1333	MTE	C2-N3-C4	5.17	124.14	115.93
5	B	606	FAD	C9-C9A-N10	5.07	128.68	121.84
6	C	1333	MTE	O3P-P-O4'	4.56	118.87	106.73
6	C	1333	MTE	N1-C2-N3	-4.46	118.42	125.42
6	C	1333	MTE	O3'-C7-C6	-4.43	106.01	108.96
5	B	606	FAD	P-O3P-PA	4.36	147.80	132.83
6	C	1333	MTE	N2-C2-N3	4.26	123.88	117.25
5	B	606	FAD	C5A-C6A-N6A	4.19	126.71	120.35
9	C	1336	GOL	O1-C1-C2	3.93	129.06	110.20
5	B	606	FAD	C5X-N5-C4X	3.90	124.56	118.07

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	C	1335	SAL	O2'-C1'-O1'	-3.86	114.78	123.35
5	B	606	FAD	O5B-C5B-C4B	3.81	122.10	108.99
5	B	606	FAD	C4-C4X-N5	3.69	123.48	118.23
8	C	1335	SAL	C2-C1-C1'	3.58	123.85	120.03
5	B	606	FAD	C2A-N1A-C6A	3.47	124.69	118.75
8	C	1335	SAL	C3-C2-C1	3.34	123.48	119.89
5	B	606	FAD	O4B-C4B-C3B	-3.32	98.53	105.11
5	B	606	FAD	O4B-C4B-C5B	-3.22	98.78	109.37
5	B	606	FAD	C10-N1-C2	3.15	123.21	116.90
5	B	606	FAD	C4X-C4-N3	2.82	120.35	113.19
5	B	606	FAD	C5A-C6A-N1A	-2.61	114.43	120.35
5	B	606	FAD	O3'-C3'-C2'	-2.55	102.65	108.81
5	B	606	FAD	O2'-C2'-C3'	2.51	115.21	109.10
6	C	1333	MTE	O3'-C7-N8	-2.42	106.08	108.57
5	B	606	FAD	O5'-C5'-C4'	-2.28	103.28	109.36
5	B	606	FAD	C8M-C8-C7	2.27	125.39	120.74
5	B	606	FAD	C9A-N10-C10	2.25	124.27	120.77
8	C	1335	SAL	O2'-C1'-C1	2.23	121.73	115.31
5	B	606	FAD	C4-N3-C2	-2.21	121.56	125.64
5	B	606	FAD	C9A-C9-C8	2.16	123.64	119.30
5	B	606	FAD	O2'-C2'-C1'	-2.04	104.87	109.80

There are no chirality outliers.

All (10) torsion outliers are listed below:

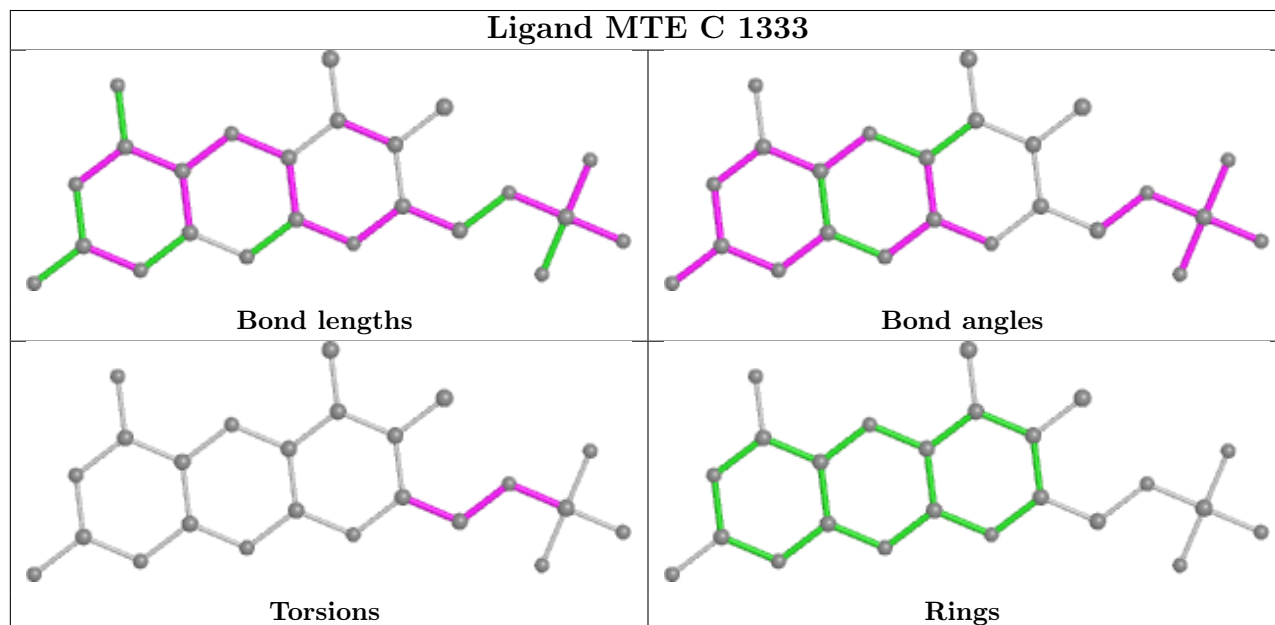
Mol	Chain	Res	Type	Atoms
6	C	1333	MTE	C3'-C4'-O4'-P
6	C	1333	MTE	C4'-O4'-P-O1P
6	C	1333	MTE	C4'-O4'-P-O2P
6	C	1333	MTE	C4'-O4'-P-O3P
9	C	1336	GOL	O1-C1-C2-O2
9	C	1336	GOL	C1-C2-C3-O3
5	B	606	FAD	C4'-C5'-O5'-P
6	C	1333	MTE	C2'-C3'-C4'-O4'
6	C	1333	MTE	O3'-C3'-C4'-O4'
5	B	606	FAD	O4B-C4B-C5B-O5B

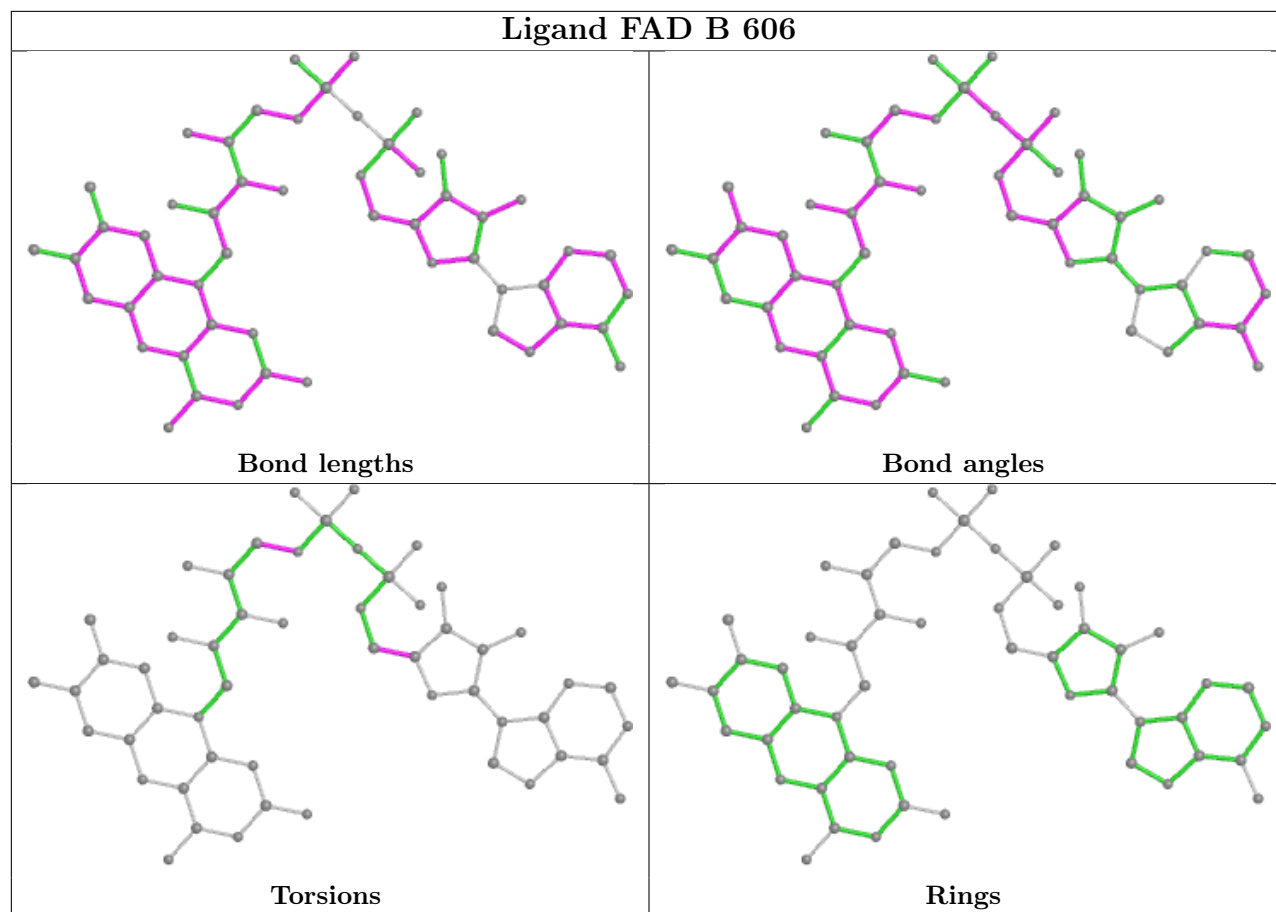
There are no ring outliers.

5 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	1334	MOS	3	0
9	C	1336	GOL	5	0
6	C	1333	MTE	1	0
4	A	602	FES	1	0
5	B	606	FAD	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 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.