



Full wwPDB X-ray Structure Validation Report

Feb 26, 2014 – 03:52 PM GMT

PDB ID : 1NG3
Title : Complex of ThiO (glycine oxidase) with acetyl-glycine
Authors : Settembre, E.C.; Dorrestein, P.C.; Park, J.; Augustine, A.; Begley, T.P.; Ealick, S.E.
Deposited on : 2002-12-16
Resolution : 2.60 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

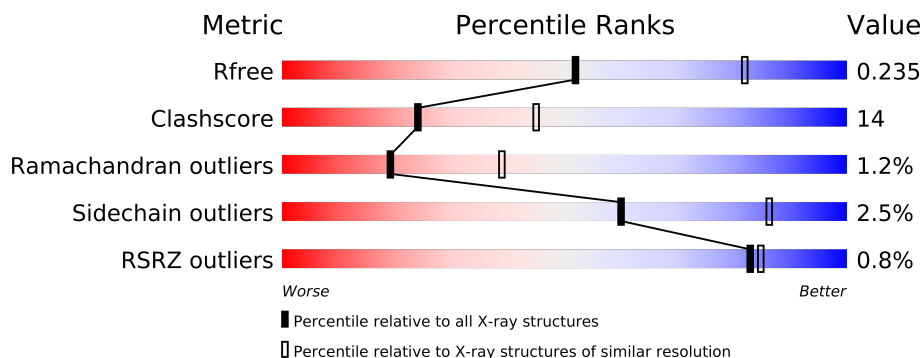
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity	:	4.02b-467
Mogul	:	1.15 2013
Xtriage (Phenix)	:	dev-1323
EDS	:	stable22639
Percentile statistics	:	21963
Refmac	:	5.8.0049
CCP4	:	6.3.0 (Settle)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	stable22683

1 Overall quality at a glance

The reported resolution of this entry is 2.60 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}	66092	1718 (2.60-2.60)
Clashscore	79885	2154 (2.60-2.60)
Ramachandran outliers	78287	2113 (2.60-2.60)
Sidechain outliers	78261	2113 (2.60-2.60)
RSRZ outliers	66119	1718 (2.60-2.60)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	390	
1	B	390	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	PO4	A	402	-	X
4	AAC	A	401	-	X
4	AAC	B	501	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 5926 atoms, of which 0 are hydrogen and 0 are deuterium.

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 Glycine oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	364	Total	C	N	O	S	0	0	0
			2846	1819	488	522	17			
1	B	364	Total	C	N	O	S	0	0	0
			2846	1819	488	522	17			

There are 44 discrepancies between the modelled and reference sequences:

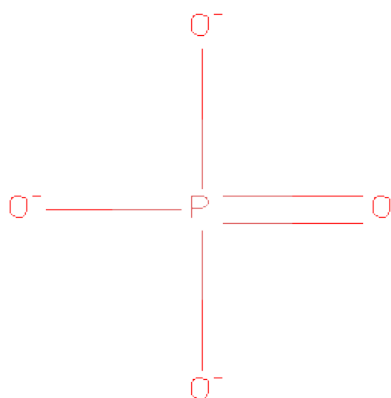
Chain	Residue	Modelled	Actual	Comment	Reference
A	288	PRO	ALA	SEE REMARK 999	UNP O31616
A	-20	MET	-	EXPRESSION TAG	UNP O31616
A	-19	GLY	-	EXPRESSION TAG	UNP O31616
A	-18	HIS	-	EXPRESSION TAG	UNP O31616
A	-17	HIS	-	EXPRESSION TAG	UNP O31616
A	-16	HIS	-	EXPRESSION TAG	UNP O31616
A	-15	HIS	-	EXPRESSION TAG	UNP O31616
A	-14	HIS	-	EXPRESSION TAG	UNP O31616
A	-13	HIS	-	EXPRESSION TAG	UNP O31616
A	-12	HIS	-	EXPRESSION TAG	UNP O31616
A	-11	HIS	-	EXPRESSION TAG	UNP O31616
A	-10	HIS	-	EXPRESSION TAG	UNP O31616
A	-9	HIS	-	EXPRESSION TAG	UNP O31616
A	-8	SER	-	EXPRESSION TAG	UNP O31616
A	-7	SER	-	EXPRESSION TAG	UNP O31616
A	-6	GLY	-	EXPRESSION TAG	UNP O31616
A	-5	HIS	-	EXPRESSION TAG	UNP O31616
A	-4	ILE	-	EXPRESSION TAG	UNP O31616
A	-3	GLU	-	EXPRESSION TAG	UNP O31616
A	-2	GLY	-	EXPRESSION TAG	UNP O31616
A	-1	ARG	-	EXPRESSION TAG	UNP O31616
A	0	HIS	-	EXPRESSION TAG	UNP O31616
B	288	PRO	ALA	SEE REMARK 999	UNP O31616
B	-20	MET	-	EXPRESSION TAG	UNP O31616
B	-19	GLY	-	EXPRESSION TAG	UNP O31616

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	HIS	-	EXPRESSION TAG	UNP O31616
B	-17	HIS	-	EXPRESSION TAG	UNP O31616
B	-16	HIS	-	EXPRESSION TAG	UNP O31616
B	-15	HIS	-	EXPRESSION TAG	UNP O31616
B	-14	HIS	-	EXPRESSION TAG	UNP O31616
B	-13	HIS	-	EXPRESSION TAG	UNP O31616
B	-12	HIS	-	EXPRESSION TAG	UNP O31616
B	-11	HIS	-	EXPRESSION TAG	UNP O31616
B	-10	HIS	-	EXPRESSION TAG	UNP O31616
B	-9	HIS	-	EXPRESSION TAG	UNP O31616
B	-8	SER	-	EXPRESSION TAG	UNP O31616
B	-7	SER	-	EXPRESSION TAG	UNP O31616
B	-6	GLY	-	EXPRESSION TAG	UNP O31616
B	-5	HIS	-	EXPRESSION TAG	UNP O31616
B	-4	ILE	-	EXPRESSION TAG	UNP O31616
B	-3	GLU	-	EXPRESSION TAG	UNP O31616
B	-2	GLY	-	EXPRESSION TAG	UNP O31616
B	-1	ARG	-	EXPRESSION TAG	UNP O31616
B	0	HIS	-	EXPRESSION TAG	UNP O31616

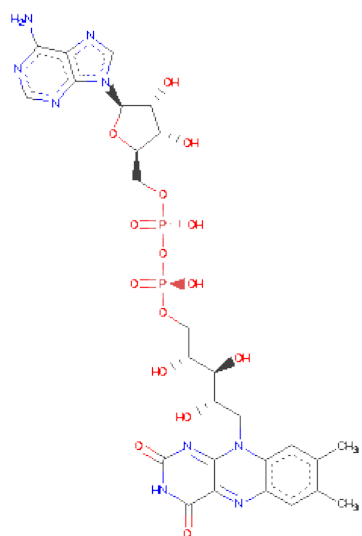
- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	P	0	0
			5	4	1		

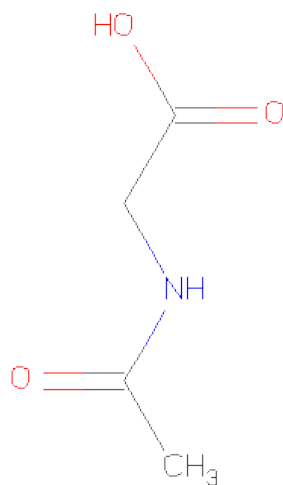
- Molecule 3 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula:

$C_{27}H_{33}N_9O_{15}P_2$).



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

- Molecule 4 is ACETYLAMINO-ACETIC ACID (three-letter code: AAC) (formula: $C_4H_7NO_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			8	4	1	3		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	B	1	Total	C	N	O	0	0
			8	4	1	3		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	53	Total	O	0	0
			53	53		
5	B	54	Total	O	0	0
			54	54		

4 Data and refinement statistics

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, α , β , γ	139.38Å 139.38Å 208.16Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.17 – 2.60 52.21 – 2.60	Depositor EDS
% Data completeness (in resolution range)	95.3 (49.17-2.60) 95.3 (52.21-2.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.81 (at 2.61Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.208 , 0.235 0.209 , 0.235	Depositor DCC
R_{free} test set	1905 reflections (5.34%)	DCC
Wilson B-factor (Å ²)	40.5	Xtriage
Anisotropy	0.057	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 30.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 35668 reflections	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	5926	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.91% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, FAD, AAC

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	0/2917	0.66	2/3941 (0.1%)
1	B	0.37	0/2917	0.65	4/3941 (0.1%)
All	All	0.37	0/5834	0.65	6/7882 (0.1%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	258	GLY	N-CA-C	10.30	138.84	113.10
1	B	259	ALA	N-CA-C	7.78	132.01	111.00
1	A	258	GLY	CA-C-N	-6.43	103.04	117.20
1	B	258	GLY	N-CA-C	5.89	127.82	113.10
1	B	258	GLY	CA-C-N	-5.87	104.29	117.20
1	B	260	THR	N-CA-C	-5.14	97.12	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2846	0	2797	89	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	2846	0	2797	74	0
2	A	5	0	0	0	0
3	A	53	0	31	2	0
3	B	53	0	31	2	0
4	A	8	0	6	1	0
4	B	8	0	6	1	0
5	A	53	0	0	3	0
5	B	54	0	0	3	0
All	All	5926	0	5668	163	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 14.

All (163) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:7:ALA:HB3	1:A:30:THR:HG22	1.41	1.02
1:B:7:ALA:HB3	1:B:30:THR:HG22	1.49	0.94
1:A:360:ARG:HH12	1:A:363:ARG:HA	1.34	0.92
1:B:225:GLU:HG2	1:B:260:THR:OG1	1.78	0.83
1:B:220:LEU:HD22	1:B:221:PRO:HD2	1.67	0.77
1:A:335:ALA:HB3	1:A:336:PRO:HD3	1.68	0.76
1:B:62:PHE:HB2	1:B:309:LYS:HE2	1.67	0.74
1:A:88:ILE:HG22	1:A:153:VAL:HA	1.70	0.74
1:A:269:THR:HB	5:A:427:HOH:O	1.87	0.73
1:A:357:HIS:O	1:A:360:ARG:HG3	1.87	0.72
1:B:335:ALA:HB3	1:B:336:PRO:HD3	1.70	0.71
1:B:209:PHE:O	1:B:213:LEU:HD22	1.91	0.71
1:A:105:VAL:O	1:A:109:ARG:HG2	1.91	0.70
1:B:8:VAL:HG11	1:B:186:ILE:HD13	1.71	0.70
1:A:111:MET:HB2	1:A:114:LEU:HD12	1.74	0.68
1:B:59:ARG:HH21	1:B:114:LEU:HD21	1.57	0.68
1:B:160:ALA:O	1:B:164:LEU:HD13	1.94	0.68
1:A:154:CYS:O	1:A:158:VAL:HG23	1.94	0.67
1:B:242:HIS:HD2	1:B:281:LYS:NZ	1.94	0.66
1:B:178:GLU:HB2	1:B:185:PHE:HB3	1.77	0.65
1:B:244:HIS:HB3	1:B:329:ARG:NH2	2.11	0.65
1:A:259:ALA:HB1	1:A:302:ARG:NH2	2.12	0.64
1:A:78:GLU:H	1:A:78:GLU:CD	2.01	0.64
1:A:91:HIS:HB3	1:A:147:HIS:CE1	2.33	0.64
1:A:174:VAL:HG13	1:A:186:ILE:HG23	1.81	0.63
1:A:257:VAL:HG12	1:A:258:GLY:N	2.13	0.63
1:A:275:LEU:O	1:A:279:MET:HG3	1.99	0.62

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:163:MET:O	1:B:164:LEU:HD12	1.99	0.62
1:B:5:TYR:O	1:B:195:ALA:HA	2.00	0.61
1:B:28:LYS:O	1:B:30:THR:HG23	2.00	0.61
1:A:5:TYR:HA	1:A:29:ASN:ND2	2.16	0.60
1:A:23:LEU:HB3	1:A:30:THR:HG21	1.83	0.60
1:B:7:ALA:HB3	1:B:30:THR:CG2	2.27	0.60
5:A:433:HOH:O	1:B:159:LYS:HE2	2.02	0.59
1:B:59:ARG:NH2	1:B:114:LEU:HD21	2.17	0.59
1:A:142:ILE:N	1:A:142:ILE:HD12	2.18	0.58
1:A:242:HIS:HD2	1:A:281:LYS:NZ	2.01	0.58
1:A:59:ARG:HG2	1:A:59:ARG:HH11	1.66	0.58
1:A:250:ARG:HD2	5:A:426:HOH:O	2.04	0.56
1:B:222:VAL:HG21	1:B:328:PHE:HE1	1.70	0.56
1:B:8:VAL:HG11	1:B:186:ILE:CD1	2.35	0.56
1:A:186:ILE:HD12	1:A:186:ILE:N	2.21	0.56
1:A:122:LYS:O	1:A:126:LEU:HG	2.06	0.55
1:B:55:GLU:HG3	1:B:330:ASN:HD21	1.72	0.55
1:B:91:HIS:O	1:B:146:VAL:HB	2.07	0.55
1:A:183:ALA:HB1	1:A:195:ALA:O	2.06	0.54
1:A:6:GLU:HB3	1:A:28:LYS:NZ	2.21	0.54
1:A:78:GLU:N	1:A:78:GLU:CD	2.61	0.53
1:B:26:GLU:HB3	1:B:347:MET:CE	2.39	0.53
1:B:123:GLU:CD	1:B:123:GLU:H	2.11	0.53
1:A:149:GLU:O	1:A:153:VAL:HG12	2.09	0.53
1:B:32:LEU:HD23	1:B:33:PHE:N	2.23	0.53
1:B:242:HIS:HD2	1:B:281:LYS:HZ1	1.56	0.53
1:B:162:LYS:C	1:B:164:LEU:H	2.12	0.52
1:A:215:LEU:HD13	1:A:361:ILE:HG21	1.91	0.52
1:A:5:TYR:HA	1:A:29:ASN:HD22	1.75	0.52
1:A:5:TYR:O	1:A:195:ALA:HA	2.10	0.52
1:A:257:VAL:CG1	1:A:258:GLY:N	2.72	0.52
1:B:84:SER:HB2	1:B:159:LYS:HB3	1.92	0.52
1:A:70:GLN:NE2	1:A:144:ASP:HB3	2.25	0.52
1:B:70:GLN:NE2	1:B:144:ASP:HB3	2.24	0.52
1:A:259:ALA:HB1	1:A:302:ARG:HH21	1.74	0.51
1:B:55:GLU:OE1	1:B:329:ARG:HD3	2.10	0.51
1:A:32:LEU:HD23	1:A:32:LEU:C	2.30	0.51
1:B:26:GLU:HB3	1:B:347:MET:HE1	1.93	0.51
1:A:6:GLU:HG3	1:A:29:ASN:HB3	1.92	0.51
1:B:184:LEU:HD22	1:B:184:LEU:N	2.26	0.51
1:A:168:ILE:N	1:A:168:ILE:HD12	2.26	0.50
1:A:174:VAL:HG13	1:A:186:ILE:CG2	2.41	0.50

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:184:LEU:HD21	1:A:320:ARG:HB3	1.92	0.50
1:A:101:SER:O	1:A:105:VAL:HG23	2.11	0.50
1:B:89:ARG:HB2	1:B:149:GLU:HG3	1.93	0.50
1:A:220:LEU:HD22	1:A:221:PRO:HD2	1.93	0.50
1:A:226:CYS:SG	3:A:400:FAD:HM72	2.52	0.49
1:B:293:LYS:HD3	5:B:548:HOH:O	2.12	0.49
1:A:248:VAL:HG22	1:A:256:VAL:HB	1.95	0.49
1:B:96:PHE:CE2	1:B:238:LYS:HD2	2.48	0.49
1:A:74:LYS:NZ	1:A:74:LYS:HB2	2.27	0.49
1:A:28:LYS:O	1:A:30:THR:HG23	2.14	0.48
1:A:360:ARG:HH12	1:A:363:ARG:CA	2.15	0.48
1:A:47:ALA:O	1:A:250:ARG:NH2	2.46	0.48
1:A:213:LEU:HD13	1:A:321:ILE:HG21	1.95	0.48
1:B:222:VAL:HG21	1:B:328:PHE:CE1	2.48	0.47
1:B:257:VAL:HG21	1:B:289:ILE:HD11	1.95	0.47
1:A:330:ASN:CG	1:A:334:LEU:HD22	2.34	0.47
1:A:357:HIS:CD2	1:A:360:ARG:HD3	2.49	0.47
1:A:360:ARG:NH1	1:A:363:ARG:HA	2.16	0.46
1:B:2:LYS:HB2	1:B:5:TYR:CZ	2.50	0.46
1:B:259:ALA:HB1	5:B:523:HOH:O	2.14	0.46
1:A:59:ARG:NH1	1:A:59:ARG:HG2	2.30	0.46
1:B:87:ASP:HA	5:B:517:HOH:O	2.14	0.46
1:B:193:VAL:HG12	1:B:194:TRP:N	2.30	0.46
1:A:19:ILE:HD13	1:A:199:VAL:HG11	1.98	0.46
1:B:41:ARG:HD2	1:B:41:ARG:HA	1.80	0.46
1:A:150:PRO:O	1:A:153:VAL:HG13	2.16	0.46
1:A:26:GLU:HB3	1:A:347:MET:HE1	1.98	0.46
1:A:270:PRO:HG3	1:A:298:TRP:O	2.16	0.46
1:B:303:PRO:HB2	1:B:326:GLY:HA2	1.98	0.46
1:A:102:GLU:O	1:A:106:LEU:HD13	2.16	0.46
1:B:53:HIS:HB2	1:B:142:ILE:HD13	1.98	0.45
1:A:317:GLU:O	1:A:318:ASP:HB2	2.16	0.45
1:B:221:PRO:HG3	1:B:266:TRP:CE2	2.52	0.45
1:B:315:HIS:HB3	1:B:318:ASP:O	2.17	0.45
1:B:275:LEU:O	1:B:279:MET:HG3	2.16	0.45
1:A:6:GLU:HB3	1:A:28:LYS:HZ2	1.81	0.45
1:A:242:HIS:HD2	1:A:281:LYS:HZ2	1.64	0.45
1:A:229:VAL:HG22	1:A:255:LEU:HB2	1.98	0.45
1:B:163:MET:C	1:B:164:LEU:HD12	2.37	0.44
1:B:33:PHE:CE2	1:B:186:ILE:HD11	2.52	0.44
1:A:28:LYS:O	1:A:30:THR:N	2.50	0.44
1:A:2:LYS:HB2	1:A:5:TYR:CZ	2.53	0.44

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:360:ARG:HB2	1:A:360:ARG:NH1	2.33	0.44
1:B:184:LEU:HD21	1:B:320:ARG:HB3	1.99	0.44
1:A:3:ARG:HG2	1:A:3:ARG:HH11	1.83	0.44
1:A:89:ARG:HB2	1:A:149:GLU:HG3	1.99	0.44
1:A:26:GLU:HB3	1:A:347:MET:CE	2.48	0.44
1:A:91:HIS:O	1:A:146:VAL:HB	2.17	0.44
1:B:6:GLU:OE1	1:B:29:ASN:HB3	2.17	0.44
1:B:32:LEU:C	1:B:32:LEU:HD23	2.38	0.44
1:A:59:ARG:HD2	1:A:59:ARG:N	2.32	0.44
1:B:346:ILE:C	1:B:348:ASN:H	2.20	0.43
1:A:46:ALA:HB2	3:A:400:FAD:O2'	2.18	0.43
1:B:242:HIS:HD2	1:B:281:LYS:HZ2	1.65	0.43
1:A:66:ALA:HA	1:A:334:LEU:HD11	2.00	0.43
1:A:223:LYS:HB3	1:A:262:LYS:HB2	2.00	0.43
1:B:48:GLY:HA3	1:B:148:VAL:O	2.17	0.43
1:B:225:GLU:HG2	1:B:260:THR:HG1	1.79	0.43
1:A:91:HIS:CB	1:A:147:HIS:CE1	3.00	0.43
1:A:241:TYR:OH	4:A:401:AAC:HC43	2.18	0.43
1:B:35:SER:O	1:B:171:HIS:HA	2.18	0.43
1:A:229:VAL:CG2	1:A:255:LEU:HB2	2.48	0.42
1:B:17:SER:OG	1:B:158:VAL:HG23	2.19	0.42
1:B:287:PRO:HB2	1:B:288:PRO:HD3	2.01	0.42
1:B:331:GLY:HA3	3:B:500:FAD:H4'	2.02	0.42
1:A:228:SER:OG	1:A:295:ASP:HB3	2.19	0.42
1:A:59:ARG:HD2	1:A:59:ARG:H	1.83	0.42
1:A:213:LEU:HD13	1:A:321:ILE:HD13	2.01	0.42
1:B:105:VAL:O	1:B:109:ARG:HG2	2.20	0.42
1:A:310:PRO:HG3	1:A:327:HIS:HA	2.01	0.42
1:B:226:CYS:SG	3:B:500:FAD:HM72	2.59	0.42
1:A:186:ILE:HD11	1:A:198:VAL:HG22	2.02	0.42
1:B:185:PHE:CZ	1:B:192:ASP:HB3	2.55	0.41
1:A:287:PRO:HB2	1:A:288:PRO:HD3	2.01	0.41
1:A:357:HIS:CE1	1:A:360:ARG:HE	2.38	0.41
1:A:257:VAL:HG11	1:A:282:ALA:HB2	2.02	0.41
1:A:363:ARG:O	1:A:364:LYS:C	2.58	0.41
1:B:312:ILE:HA	1:B:323:PHE:O	2.20	0.41
1:A:115:ASP:O	1:A:116:SER:HB2	2.19	0.41
1:A:322:LEU:N	1:A:322:LEU:HD12	2.36	0.41
1:B:159:LYS:O	1:B:163:MET:HG2	2.21	0.41
1:A:98:LEU:HA	1:A:139:ALA:HB2	2.03	0.41
1:B:204:VAL:O	1:B:204:VAL:HG22	2.21	0.41
1:A:10:ILE:HG23	1:A:174:VAL:HG21	2.03	0.41

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:B:286:LEU:O	1:B:289:ILE:HG22	2.20	0.41
1:B:23:LEU:HD13	1:B:30:THR:HG21	2.03	0.41
1:A:150:PRO:HA	1:A:153:VAL:CG1	2.51	0.41
1:B:329:ARG:O	4:B:501:AAC:HC43	2.21	0.41
1:A:174:VAL:CG1	1:A:186:ILE:HG23	2.50	0.41
1:B:91:HIS:HB3	1:B:147:HIS:CE1	2.56	0.41
1:B:19:ILE:HD13	1:B:199:VAL:HG11	2.03	0.41
1:B:314:ARG:HD3	1:B:319:SER:HB2	2.03	0.40
1:B:225:GLU:HG2	1:B:225:GLU:H	1.70	0.40
1:B:352:ASN:OD1	1:B:354:ASP:HB2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution. The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	362/390 (93%)	335 (92%)	22 (6%)	5 (1%)	16	32
1	B	362/390 (93%)	333 (92%)	25 (7%)	4 (1%)	21	42
All	All	724/780 (93%)	668 (92%)	47 (6%)	9 (1%)	19	39

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	29	ASN
1	B	328	PHE
1	A	318	ASP
1	A	259	ALA
1	A	328	PHE
1	B	60	ASP
1	B	163	MET
1	A	180	ASP
1	B	2	LYS

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution. The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	296/318 (93%)	290 (98%)	6 (2%)	68	90
1	B	296/318 (93%)	287 (97%)	9 (3%)	53	82
All	All	592/636 (93%)	577 (98%)	15 (2%)	60	86

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	59	ARG
1	A	96	PHE
1	A	123	GLU
1	A	153	VAL
1	A	248	VAL
1	A	334	LEU
1	B	96	PHE
1	B	107	GLN
1	B	123	GLU
1	B	213	LEU
1	B	216	ASN
1	B	225	GLU
1	B	240	LEU
1	B	248	VAL
1	B	286	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	29	ASN
1	A	53	HIS
1	A	90	GLN
1	A	147	HIS
1	A	197	HIS
1	A	216	ASN
1	A	242	HIS
1	A	353	GLN
1	B	27	ASN

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Mol	Chain	Res	Type
1	B	53	HIS
1	B	70	GLN
1	B	90	GLN
1	B	216	ASN
1	B	242	HIS
1	B	330	ASN
1	B	348	ASN

5.3.3 RNA ⓘ

There are no RNA chains in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry ⓘ

5 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	$\# Z > 2$
3	FAD	A	400	-	58,58,58	2.19	14 (24%)	85,89,89	1.81	13 (15%)
4	AAC	A	401	-	7,7,7	0.94	0	8,8,8	1.27	1 (12%)
2	PO4	A	402	-	4,4,4	0.84	0	6,6,6	0.40	0
3	FAD	B	500	-	58,58,58	2.27	15 (25%)	85,89,89	1.77	16 (18%)
4	AAC	B	501	-	7,7,7	0.90	0	8,8,8	1.33	1 (12%)

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
3	FAD	A	400	-	-	0/34/50/50	0/1/6/6
4	AAC	A	401	-	-	0/5/5/5	0/0/0/0
2	PO4	A	402	-	-	0/0/0/0	0/0/0/0
3	FAD	B	500	-	-	0/34/50/50	0/1/6/6
4	AAC	B	501	-	-	0/5/5/5	0/0/0/0

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	500	FAD	C9A-N10	7.82	1.50	1.38
3	A	400	FAD	C9A-N10	7.77	1.50	1.38
3	A	400	FAD	C5X-N5	5.12	1.43	1.35
3	B	500	FAD	C4A-N3A	5.09	1.43	1.35
3	B	500	FAD	C5X-N5	4.71	1.42	1.35
3	A	400	FAD	C4A-N3A	4.67	1.42	1.35
3	B	500	FAD	C1'-N10	-4.52	1.43	1.48
3	A	400	FAD	C2A-N3A	4.51	1.41	1.32
3	B	500	FAD	C2A-N3A	4.45	1.41	1.32
3	A	400	FAD	C1'-N10	-4.36	1.43	1.48
3	B	500	FAD	C4X-N5	4.34	1.45	1.36
3	A	400	FAD	C4X-N5	4.23	1.45	1.36
3	B	500	FAD	C5A-C4A	-4.11	1.31	1.40
3	A	400	FAD	C5A-C4A	-4.03	1.31	1.40
3	A	400	FAD	C8A-N9A	3.88	1.42	1.36
3	B	500	FAD	C8A-N9A	3.79	1.42	1.36
3	B	500	FAD	C1'-C2'	-3.45	1.48	1.51
3	A	400	FAD	C4-N3	2.96	1.42	1.37
3	B	500	FAD	C4-N3	2.95	1.42	1.37
3	A	400	FAD	C5'-C4'	-2.92	1.47	1.51
3	B	500	FAD	C5'-C4'	-2.87	1.47	1.51
3	A	400	FAD	C2B-C3B	-2.72	1.45	1.53
3	B	500	FAD	C2B-C3B	-2.66	1.46	1.53
3	A	400	FAD	C9A-C5X	2.64	1.48	1.42
3	B	500	FAD	C9A-C5X	2.40	1.47	1.42
3	B	500	FAD	C4A-N9A	2.27	1.41	1.37
3	A	400	FAD	C4A-N9A	2.07	1.40	1.37
3	B	500	FAD	C8A-N7A	-2.05	1.30	1.34
3	A	400	FAD	O4-C4	2.01	1.28	1.24

All (31) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	400	FAD	C8A-N9A-C4A	-9.35	99.76	106.90
3	B	500	FAD	C8A-N9A-C4A	-8.62	100.32	106.90
3	B	500	FAD	N3A-C2A-N1A	-5.17	124.39	128.71
3	A	400	FAD	N3A-C2A-N1A	-4.85	124.65	128.71
3	B	500	FAD	C1'-N10-C9A	-4.26	114.73	118.87
3	A	400	FAD	C1'-N10-C9A	-3.98	115.00	118.87
3	A	400	FAD	N3A-C4A-N9A	-3.73	118.69	125.43
3	B	500	FAD	N3A-C4A-N9A	-3.45	119.20	125.43
3	A	400	FAD	C5A-C4A-N9A	3.45	112.15	107.16
3	B	500	FAD	C5A-C4A-N9A	3.05	111.57	107.16
3	A	400	FAD	C2-N1-C10	3.03	118.03	114.98
4	A	401	AAC	C2-N1-C3	2.97	127.89	121.49
3	A	400	FAD	C8A-N9A-C1B	2.89	132.08	126.38
3	B	500	FAD	C2-N1-C10	2.78	117.78	114.98
3	B	500	FAD	O5B-C5B-C4B	-2.72	98.97	108.94
3	B	500	FAD	C4X-C10-N10	-2.63	119.20	120.51
3	B	500	FAD	C8A-N9A-C1B	2.50	131.31	126.38
3	B	500	FAD	C2'-C1'-N10	2.48	115.74	112.45
4	B	501	AAC	C2-N1-C3	2.47	126.82	121.49
3	A	400	FAD	O5B-C5B-C4B	-2.46	99.92	108.94
3	A	400	FAD	C2'-C1'-N10	2.42	115.66	112.45
3	A	400	FAD	C1'-N10-C10	2.41	122.59	119.17
3	B	500	FAD	C1'-N10-C10	2.39	122.56	119.17
3	B	500	FAD	O2B-C2B-C3B	2.25	119.17	111.83
3	B	500	FAD	C10-C4X-N5	2.16	123.08	120.45
3	A	400	FAD	O4B-C1B-C2B	-2.14	103.49	106.77
3	B	500	FAD	C3B-C2B-C1B	2.12	104.23	100.91
3	A	400	FAD	C10-C4X-N5	2.10	123.01	120.45
3	B	500	FAD	O4B-C1B-C2B	-2.09	103.56	106.77
3	B	500	FAD	C4-C4X-C10	2.06	120.28	116.95
3	A	400	FAD	C2B-C1B-N9A	2.01	118.43	113.27

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th 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	364/390 (93%)	-0.19	3 (0%) 83 85	19, 39, 65, 87	0
1	B	364/390 (93%)	-0.32	3 (0%) 83 85	18, 38, 68, 90	0
All	All	728/780 (93%)	-0.26	6 (0%) 83 85	18, 39, 68, 90	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	182	GLU	4.2
1	A	180	ASP	3.6
1	A	183	ALA	3.4
1	B	350	GLU	2.6
1	B	180	ASP	2.5
1	B	179	ARG	2.3

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

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

6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

6.4 Ligands ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th 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	RSR	LLDF	B-factors(\AA^2)	Q<0.9
4	AAC	A	401	8/8	0.33	6.67	61,68,76,76	0
2	PO4	A	402	5/5	0.25	6.58	60,62,63,64	0
4	AAC	B	501	8/8	0.28	2.27	58,58,62,66	0
3	FAD	A	400	53/53	0.14	0.26	15,27,31,33	0
3	FAD	B	500	53/53	0.14	0.11	17,27,33,37	0

6.5 Other polymers ⓘ

There are no such residues in this entry.