



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 4, 2026 – 06:57 PM UTC

PDB ID : 3O8A / pdb_00003o8a
Title : Crystal structure of Plasmodium falciparum dihydroorotate dehydrogenase bound with novel Inhibitor Genz667348
Authors : Deng, X.; Booker, M.L.; Phillips, M.A.
Deposited on : 2010-08-02
Resolution : 2.30 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

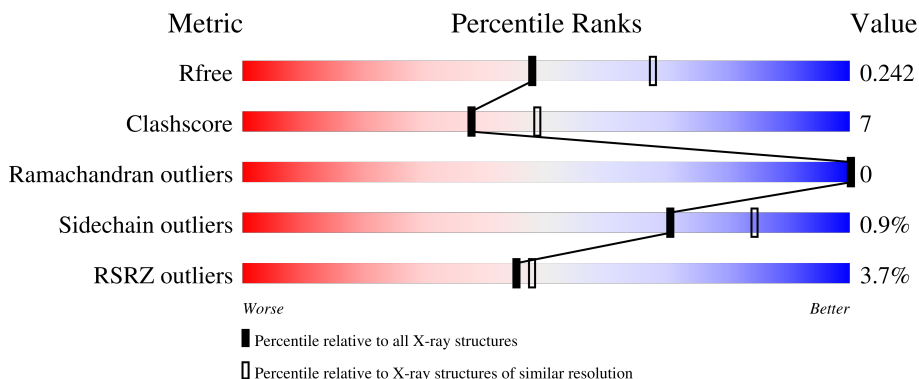
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

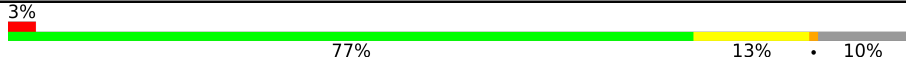
The reported resolution of this entry is 2.30 Å.

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}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	415	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 3095 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 Dihydroorotate dehydrogenase homolog, mitochondrial.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	375	2975	1902	498	560	15	0	1	0

There are 33 discrepancies between the modelled and reference sequences:

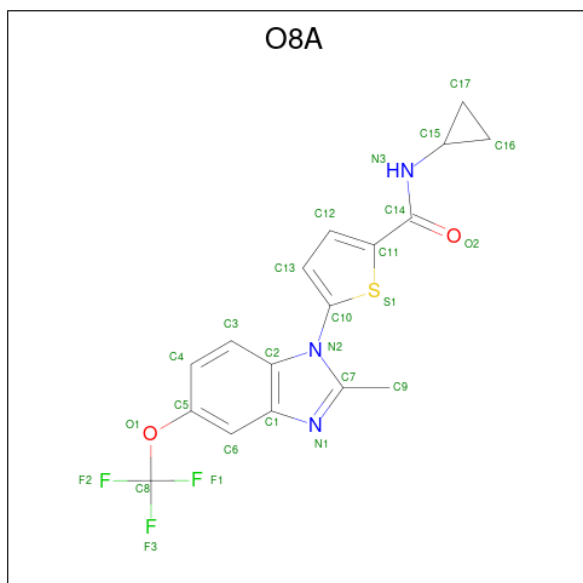
Chain	Residue	Modelled	Actual	Comment	Reference
A	125	MET	-	expression tag	UNP Q08210
A	126	GLY	-	expression tag	UNP Q08210
A	127	SER	-	expression tag	UNP Q08210
A	128	SER	-	expression tag	UNP Q08210
A	129	HIS	-	expression tag	UNP Q08210
A	130	HIS	-	expression tag	UNP Q08210
A	131	HIS	-	expression tag	UNP Q08210
A	132	HIS	-	expression tag	UNP Q08210
A	133	HIS	-	expression tag	UNP Q08210
A	134	HIS	-	expression tag	UNP Q08210
A	135	SER	-	expression tag	UNP Q08210
A	136	SER	-	expression tag	UNP Q08210
A	137	GLY	-	expression tag	UNP Q08210
A	138	LEU	-	expression tag	UNP Q08210
A	139	VAL	-	expression tag	UNP Q08210
A	140	PRO	-	expression tag	UNP Q08210
A	141	ARG	-	expression tag	UNP Q08210
A	142	GLY	-	expression tag	UNP Q08210
A	143	SER	-	expression tag	UNP Q08210
A	144	HIS	-	expression tag	UNP Q08210
A	145	MET	-	expression tag	UNP Q08210
A	146	ALA	-	expression tag	UNP Q08210
A	147	SER	-	expression tag	UNP Q08210
A	148	MET	-	expression tag	UNP Q08210
A	149	THR	-	expression tag	UNP Q08210
A	150	GLY	-	expression tag	UNP Q08210
A	151	GLY	-	expression tag	UNP Q08210

Continued on next page...

Continued from previous page...

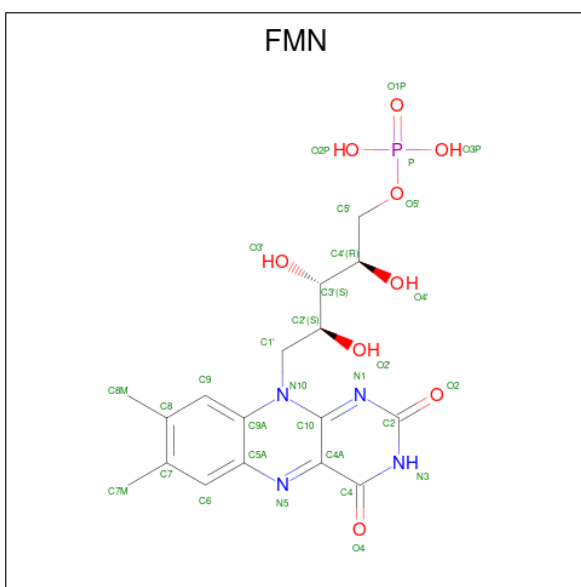
Chain	Residue	Modelled	Actual	Comment	Reference
A	152	GLN	-	expression tag	UNP Q08210
A	153	GLN	-	expression tag	UNP Q08210
A	154	GLY	-	expression tag	UNP Q08210
A	155	ARG	-	expression tag	UNP Q08210
A	156	ASP	-	expression tag	UNP Q08210
A	157	PRO	-	expression tag	UNP Q08210

- Molecule 2 is N-cyclopropyl-5-[2-methyl-5-(trifluoromethoxy)-1H-benzimidazol-1-yl]thiophene-2-carboxamide (CCD ID: O8A) (formula: C₁₇H₁₄F₃N₃O₂S).



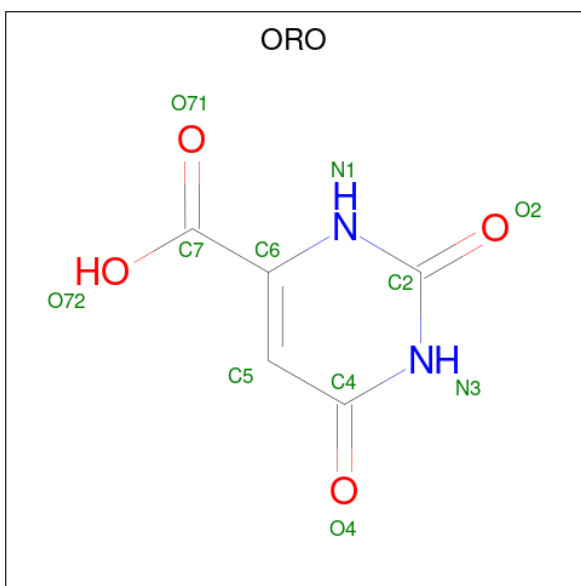
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total	C	F	N	O	S	0	0
			26	17	3	3	2	1		

- Molecule 3 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: C₁₇H₂₁N₄O₉P).



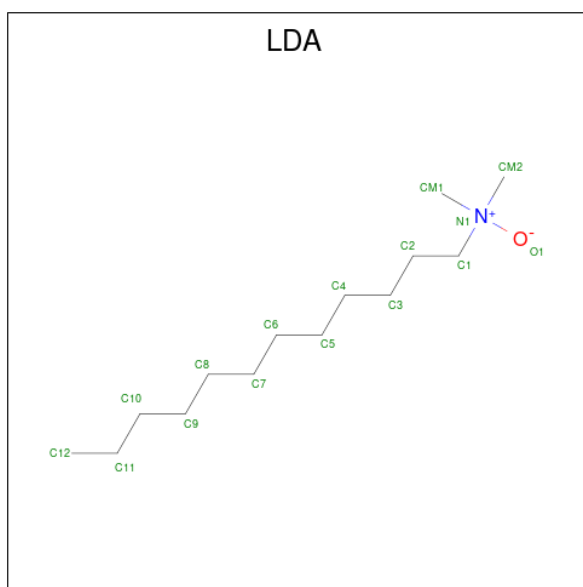
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			31	17	4	9	1		

- Molecule 4 is OROTIC ACID (CCD ID: ORO) (formula: $C_5H_4N_2O_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			11	5	2	4		

- Molecule 5 is LAURYL DIMETHYLAMINE-N-OXIDE (CCD ID: LDA) (formula: $C_{14}H_{31}NO$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			16	14	1	1		

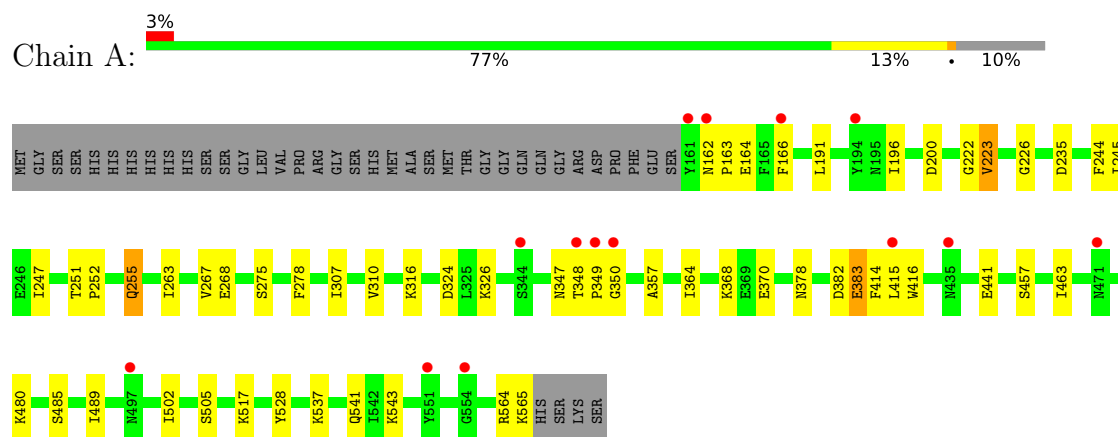
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	36	Total	O	0	0
			36	36		

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Dihydroorotate dehydrogenase homolog, mitochondrial



4 Data and refinement statistics

Property	Value	Source
Space group	P 64	Depositor
Cell constants a, b, c, α , β , γ	85.29Å 85.29Å 138.72Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	40.00 – 2.30 40.00 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.6 (40.00-2.30) 99.7 (40.00-2.30)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.01 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.5.0072	Depositor
R, R_{free}	0.205 , 0.229 0.219 , 0.242	Depositor DCC
R_{free} test set	1297 reflections (5.10%)	wwPDB-VP
Wilson B-factor (Å ²)	63.4	Xtriage
Anisotropy	0.265	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 45.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.064 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	3095	wwPDB-VP
Average B, all atoms (Å ²)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.76% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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: FMN, O8A, LDA, ORO

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	0.97	1/3030 (0.0%)	1.02	3/4080 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	251	THR	CA-CB	5.12	1.60	1.54

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	383	GLU	N-CA-C	-5.78	104.98	111.28
1	A	267	VAL	N-CA-C	5.63	116.37	110.62
1	A	378	ASN	N-CA-C	5.32	118.36	110.48

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	2975	0	3018	38	0
2	A	26	0	14	1	0
3	A	31	0	19	1	0
4	A	11	0	3	1	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	16	0	31	5	0
6	A	36	0	0	1	0
All	All	3095	0	3085	43	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 7.

All (43) 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)
5:A:1004:LDA:H51	5:A:1004:LDA:C9	1.81	1.08
5:A:1004:LDA:H51	5:A:1004:LDA:H92	1.39	1.03
1:A:162:ASN:OD1	1:A:163:PRO:HD2	1.72	0.89
1:A:326:LYS:HG2	1:A:370:GLU:HG3	1.63	0.80
1:A:268:GLU:OE1	1:A:268:GLU:C	2.30	0.75
1:A:564:ARG:O	1:A:565:LYS:C	2.30	0.75
1:A:191:LEU:HD22	1:A:196:ILE:HD11	1.68	0.74
1:A:537:LYS:HE2	1:A:541:GLN:NE2	2.07	0.69
1:A:222:GLY:HA3	1:A:244:PHE:CE2	2.30	0.67
1:A:537:LYS:HE2	1:A:541:GLN:HE22	1.60	0.66
1:A:162:ASN:OD1	1:A:163:PRO:CD	2.46	0.64
1:A:326:LYS:HG2	1:A:370:GLU:CG	2.27	0.64
5:A:1004:LDA:C9	5:A:1004:LDA:C5	2.61	0.57
1:A:223:VAL:HG22	1:A:245:ILE:HG13	1.89	0.54
1:A:162:ASN:ND2	1:A:164:GLU:HB2	2.22	0.53
1:A:244:PHE:HB3	1:A:307:ILE:HB	1.92	0.50
1:A:357:ALA:HB2	1:A:441:GLU:HG2	1.93	0.50
1:A:489:ILE:HG23	1:A:502:ILE:HD13	1.93	0.50
1:A:226:GLY:HA3	3:A:1002:FMN:N5	2.27	0.49
1:A:268:GLU:OE1	1:A:268:GLU:O	2.30	0.49
1:A:382:ASP:O	1:A:383:GLU:C	2.54	0.49
5:A:1004:LDA:H21	5:A:1004:LDA:HM11	1.43	0.48
1:A:222:GLY:HA3	1:A:244:PHE:CD2	2.48	0.47
1:A:348:THR:HG23	6:A:630:HOH:O	2.13	0.47
1:A:485:SER:OG	1:A:517:LYS:NZ	2.49	0.46
1:A:564:ARG:O	1:A:564:ARG:HG2	2.16	0.45
1:A:349:PRO:HA	1:A:350:GLY:HA2	1.81	0.45
1:A:457:SER:N	1:A:505:SER:O	2.43	0.45
1:A:463:ILE:HD13	1:A:480:LYS:HB3	1.98	0.45
1:A:326:LYS:CG	1:A:370:GLU:HG3	2.41	0.44
1:A:415:LEU:HD23	1:A:416:TRP:NE1	2.32	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:278:PHE:CE2	4:A:1003:ORO:H5	2.53	0.43
1:A:163:PRO:O	1:A:166:PHE:HB3	2.18	0.43
1:A:255:GLN:OE1	1:A:316:LYS:N	2.46	0.42
1:A:414:PHE:CD1	1:A:414:PHE:N	2.87	0.42
5:A:1004:LDA:C5	5:A:1004:LDA:H91	2.48	0.42
1:A:263:ILE:HG21	2:A:1001:O8A:H16A	2.02	0.41
1:A:275:SER:HA	1:A:347:ASN:CG	2.44	0.41
1:A:247:ILE:HD11	1:A:310:VAL:HG22	2.01	0.41
1:A:364:ILE:O	1:A:368:LYS:HG3	2.21	0.41
1:A:528:TYR:CD2	1:A:528:TYR:C	2.99	0.41
1:A:200:ASP:OD2	1:A:543:LYS:NZ	2.53	0.40
1:A:252:PRO:HG2	1:A:324:ASP:CG	2.46	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	374/415 (90%)	361 (96%)	13 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	333/365 (91%)	330 (99%)	3 (1%)	70 84

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	223	VAL
1	A	235	ASP
1	A	255	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	438	GLN
1	A	450	ASN
1	A	464	ASN
1	A	541	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 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
5	LDA	A	1004	-	13,15,15	3.53	2 (15%)	14,17,17	0.64	0
3	FMN	A	1002	-	33,33,33	1.17	3 (9%)	48,50,50	1.28	5 (10%)
4	ORO	A	1003	-	11,11,11	1.43	2 (18%)	14,15,15	2.36	6 (42%)
2	O8A	A	1001	-	29,29,29	1.81	9 (31%)	43,44,44	2.82	12 (27%)

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
5	LDA	A	1004	-	-	9/13/13/13	-
3	FMN	A	1002	-	-	2/18/18/18	0/3/3/3
4	ORO	A	1003	-	-	4/4/4/4	0/1/1/1
2	O8A	A	1001	-	-	0/17/19/19	0/4/4/4

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	1004	LDA	C1-N1	-9.60	1.41	1.51
5	A	1004	LDA	O1-N1	-8.34	1.21	1.42
3	A	1002	FMN	C4A-N5	3.80	1.39	1.30
2	A	1001	O8A	C10-S1	-3.69	1.68	1.73
2	A	1001	O8A	C2-N2	-3.63	1.35	1.41
3	A	1002	FMN	C10-N1	2.86	1.39	1.33
2	A	1001	O8A	C2-C1	2.76	1.44	1.40
2	A	1001	O8A	O2-C14	-2.71	1.18	1.23
2	A	1001	O8A	C7-N2	2.69	1.41	1.38
2	A	1001	O8A	C7-N1	2.45	1.34	1.31
2	A	1001	O8A	C1-N1	-2.38	1.35	1.39
4	A	1003	ORO	C5-C6	2.25	1.41	1.36
4	A	1003	ORO	C2-N1	-2.20	1.33	1.37
2	A	1001	O8A	C14-N3	-2.18	1.29	1.34
2	A	1001	O8A	C15-N3	-2.10	1.42	1.46
3	A	1002	FMN	C4A-C4	-2.02	1.37	1.44

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1001	O8A	C16-C15-N3	-7.60	108.55	118.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1001	O8A	C9-C7-N1	7.41	134.19	124.80
2	A	1001	O8A	C17-C15-N3	-6.82	109.57	118.52
2	A	1001	O8A	C13-C10-N2	-5.56	121.80	128.05
2	A	1001	O8A	C1-C2-N2	4.75	109.52	104.58
2	A	1001	O8A	C1-N1-C7	4.68	111.25	105.57
4	A	1003	ORO	C4-N3-C2	-4.60	121.09	125.55
2	A	1001	O8A	C2-C1-N1	-4.24	104.81	110.19
2	A	1001	O8A	S1-C10-N2	4.15	124.94	120.64
2	A	1001	O8A	C9-C7-N2	-3.97	117.33	123.97
3	A	1002	FMN	C5A-C9A-N10	3.73	121.34	117.97
4	A	1003	ORO	N3-C2-N1	3.67	121.51	115.74
2	A	1001	O8A	N2-C7-N1	-3.50	108.45	112.34
2	A	1001	O8A	C6-C1-N1	3.40	136.63	129.31
4	A	1003	ORO	C6-N1-C2	-3.32	119.10	122.65
4	A	1003	ORO	O4-C4-C5	-3.26	120.96	125.46
3	A	1002	FMN	C9A-C5A-N5	-3.22	119.04	122.45
4	A	1003	ORO	C5-C4-N3	3.14	119.15	115.24
3	A	1002	FMN	O4-C4-C4A	-2.78	119.20	126.53
3	A	1002	FMN	C4A-C4-N3	2.58	119.83	113.25
4	A	1003	ORO	O2-C2-N1	-2.24	117.89	121.86
3	A	1002	FMN	C4-N3-C2	-2.06	121.99	125.64
2	A	1001	O8A	C3-C4-C5	2.04	122.06	119.73

There are no chirality outliers.

All (15) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1003	ORO	N1-C6-C7-O71
4	A	1003	ORO	N1-C6-C7-O72
5	A	1004	LDA	C2-C1-N1-O1
5	A	1004	LDA	C2-C1-N1-CM1
5	A	1004	LDA	C2-C1-N1-CM2
5	A	1004	LDA	C5-C6-C7-C8
5	A	1004	LDA	C6-C7-C8-C9
5	A	1004	LDA	C3-C4-C5-C6
5	A	1004	LDA	C7-C8-C9-C10
3	A	1002	FMN	C5'-O5'-P-O1P
5	A	1004	LDA	C9-C10-C11-C12
5	A	1004	LDA	C1-C2-C3-C4
3	A	1002	FMN	C4'-C5'-O5'-P
4	A	1003	ORO	C5-C6-C7-O71
4	A	1003	ORO	C5-C6-C7-O72

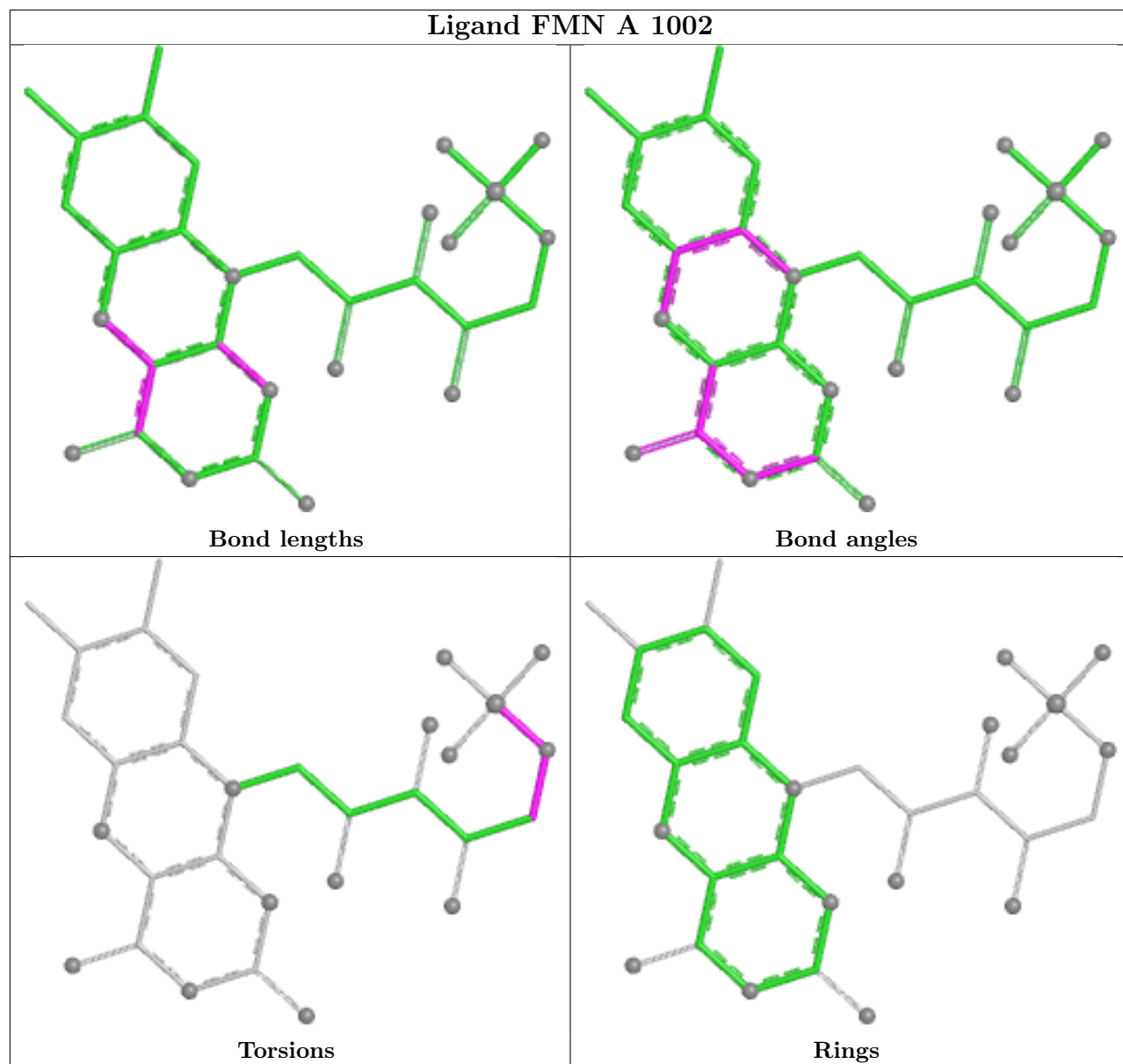
There are no ring outliers.

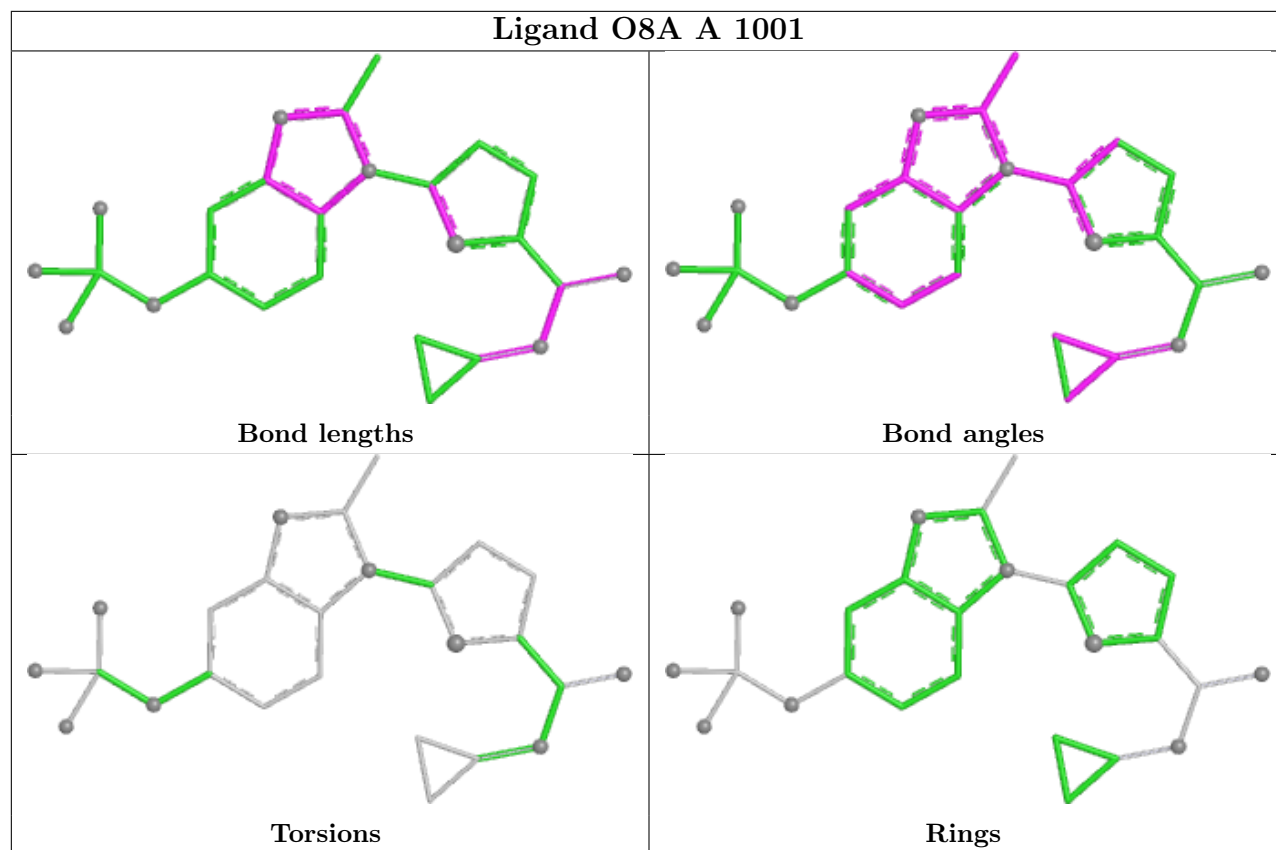
4 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1004	LDA	5	0
3	A	1002	FMN	1	0
4	A	1003	ORO	1	0
2	A	1001	O8A	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.

Ligand FMN A 1002





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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	375/415 (90%)	0.45	14 (3%) 45 48	23, 74, 106, 117	1 (0%)

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	161	TYR	9.4
1	A	350	GLY	4.3
1	A	348	THR	3.4
1	A	162	ASN	3.1
1	A	471	ASN	3.0
1	A	349	PRO	2.9
1	A	344	SER	2.5
1	A	551	TYR	2.4
1	A	554	GLY	2.4
1	A	415	LEU	2.3
1	A	166	PHE	2.2
1	A	194	TYR	2.2
1	A	497	ASN	2.2
1	A	435	ASN	2.0

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

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

6.3 Carbohydrates [i](#)

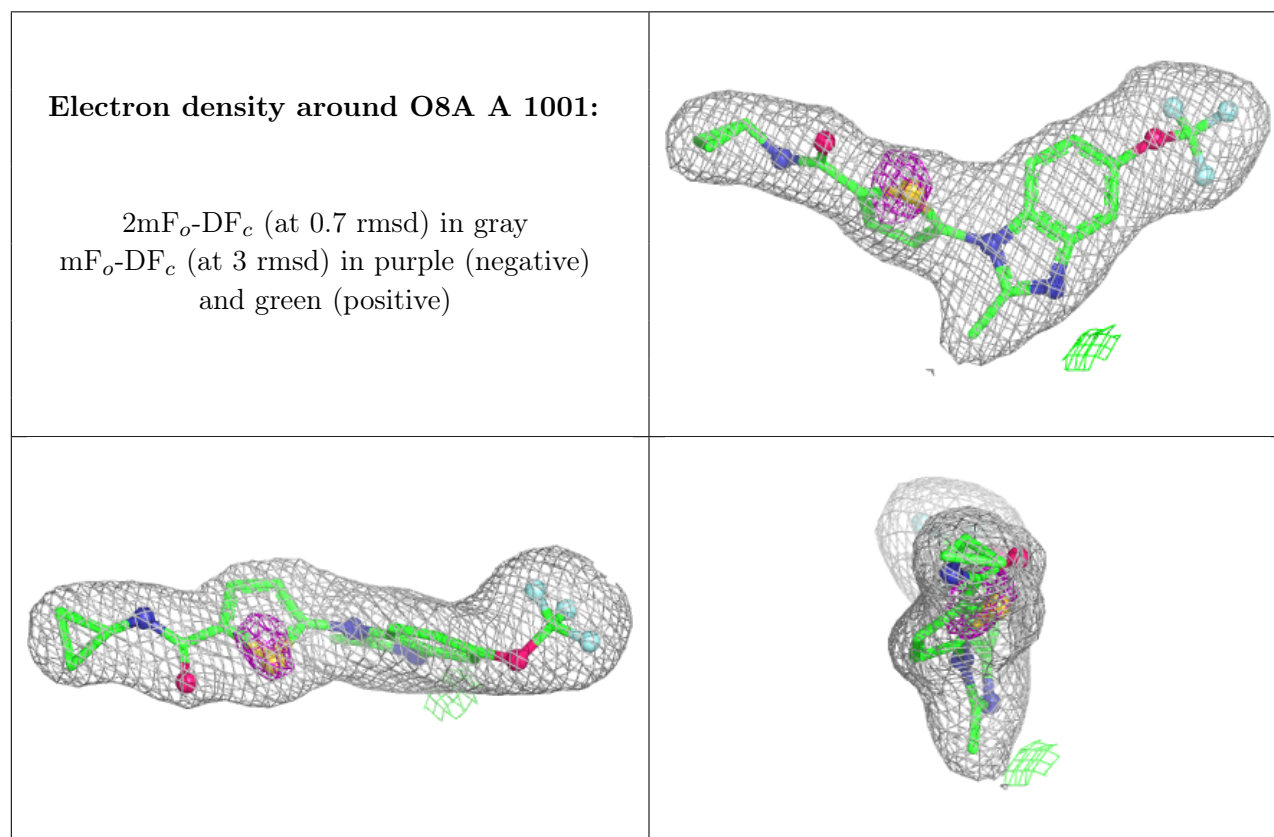
There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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.

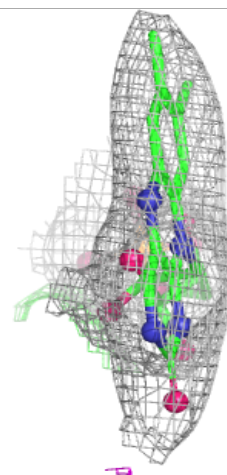
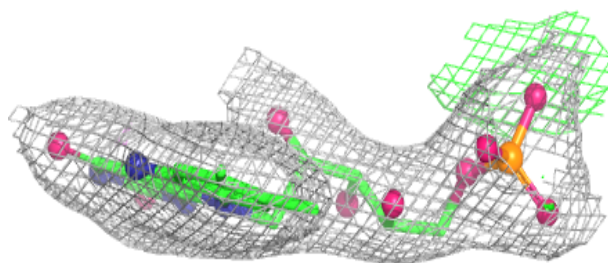
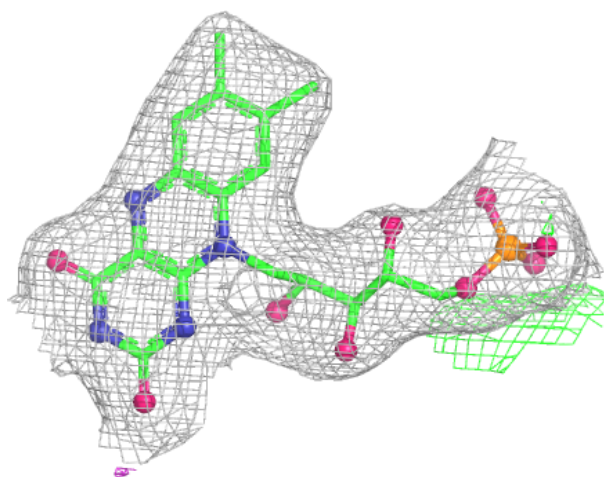
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	LDA	A	1004	16/16	0.80	0.17	72,86,97,97	0
4	ORO	A	1003	11/11	0.94	0.09	55,59,66,69	0
2	O8A	A	1001	26/26	0.96	0.07	52,57,67,69	0
3	FMN	A	1002	31/31	0.96	0.09	58,64,73,75	0

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



Electron density around FMN A 1002:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.