Full wwPDB X-ray Structure Validation Report (i)

Feb 1, 2016 – 07:00 AM GMT

PDB ID	:	2Z5X
Title	:	Crystal Structure of Human Monoamine Oxidase A with Harmine
Authors	:	Son, S.Y.; Ma, J.; Yoshimura, M.; Tsukihara, T.
Deposited on	:	2007-07-20
Resolution	:	2.20 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
http://wwpdb.org/validation/2016/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

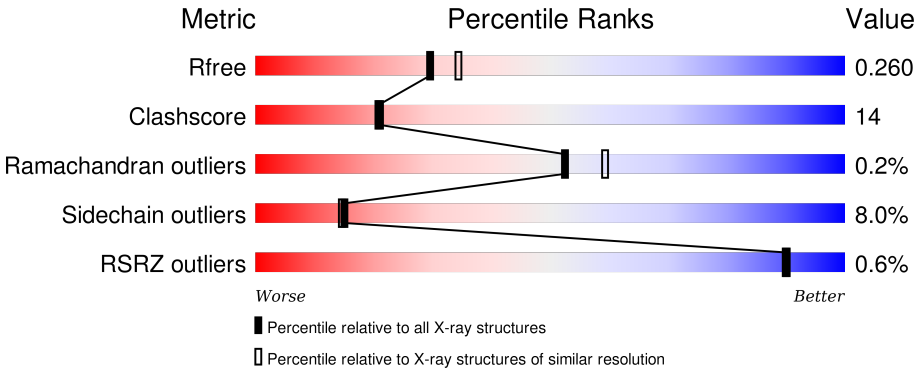
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	trunk26865

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.20 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}	91344	3774 (2.20-2.20)
Clashscore	102246	4477 (2.20-2.20)
Ramachandran outliers	100387	4404 (2.20-2.20)
Sidechain outliers	100360	4405 (2.20-2.20)
RSRZ outliers	91569	3781 (2.20-2.20)

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. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	513	% 71% 26% .

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
4	DCX	A	1	-	-	-	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	GOL	A	3	-	-	X	X
5	GOL	A	701	-	-	X	-
5	GOL	A	702	-	-	X	-

2 Entry composition

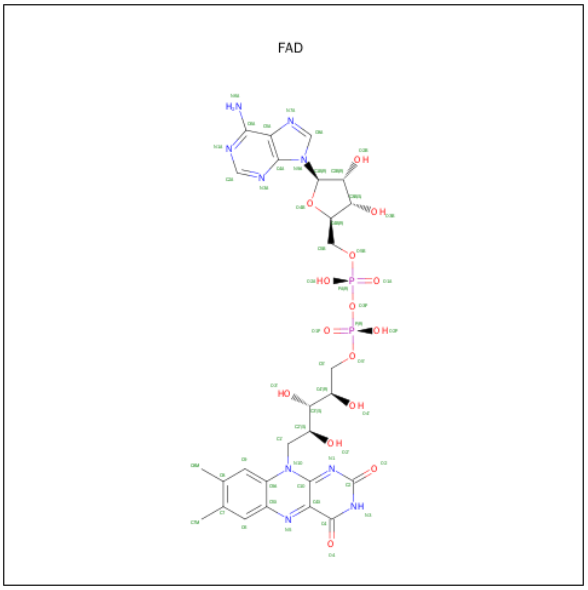
There are 6 unique types of molecules in this entry. The entry contains 4397 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Amine oxidase [flavin-containing] A.

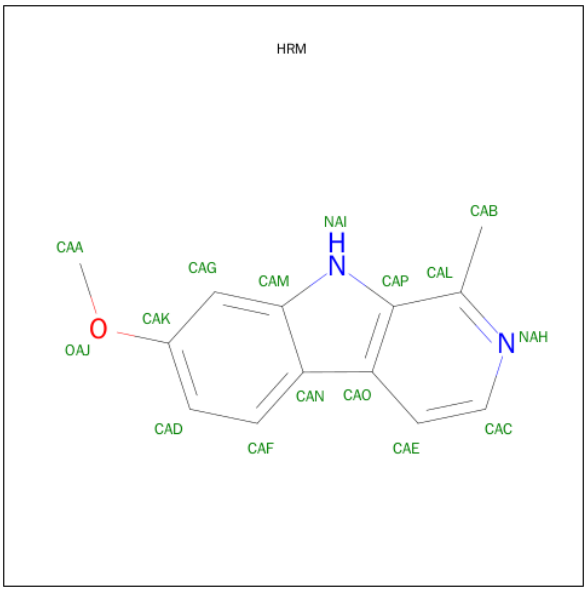
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	513	4100	2634	699	746	21	0	0	0

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (three-letter code: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



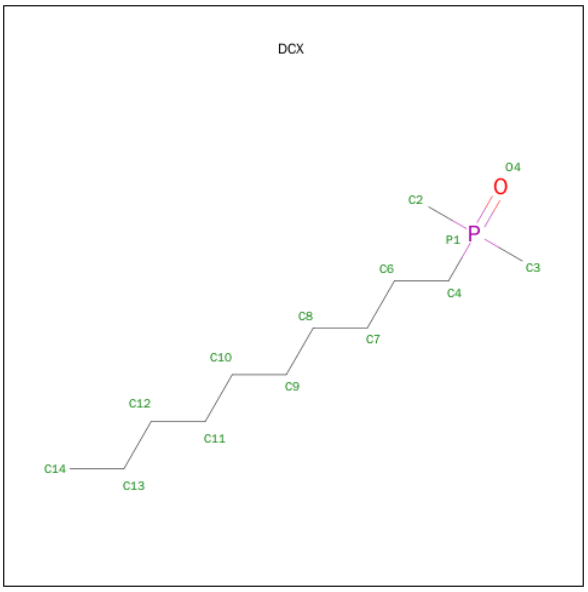
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	53	27	9	15	2	0	0

- Molecule 3 is 7-METHOXY-1-METHYL-9H-BETA-CARBOLINE (three-letter code: HRM) (formula: $C_{13}H_{12}N_2O$).



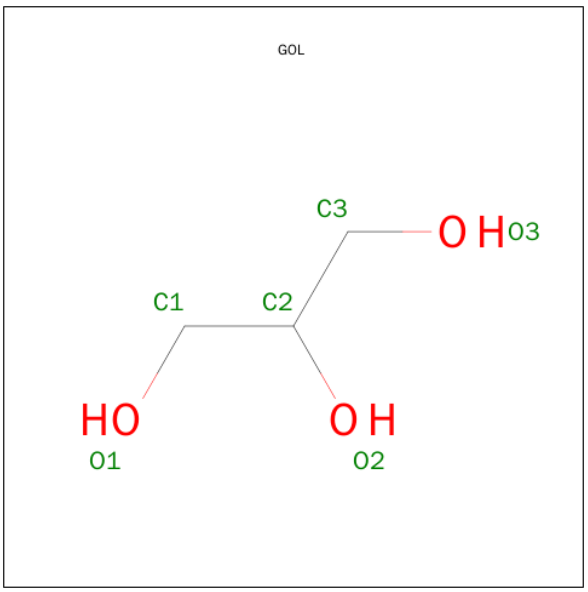
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			16	13	2	1		

- Molecule 4 is DECYL(DIMETHYL)PHOSPHINE OXIDE (three-letter code: DCX) (formula: $C_{12}H_{27}OP$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	O	P	0	0
			14	12	1	1		
4	A	1	Total	C	O	P	0	0
			14	12	1	1		

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



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

- Molecule 6 is water.

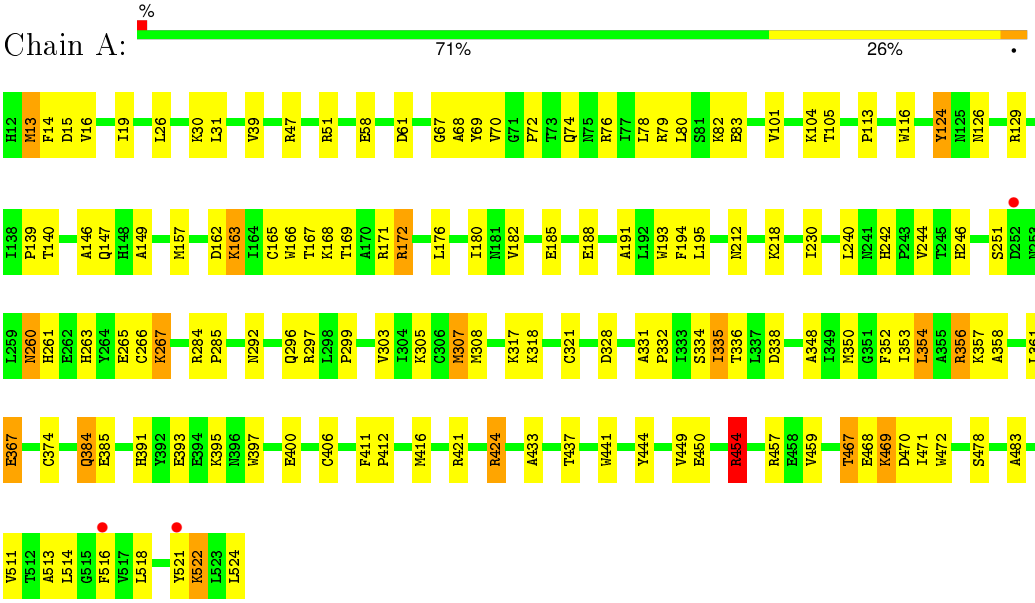
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	182	Total O 182 182	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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: Amine oxidase [flavin-containing] A

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	135.26Å 218.71Å 54.37Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	57.54 – 2.20 57.52 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.7 (57.54-2.20) 99.7 (57.52-2.20)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.68 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.201 , 0.255 0.203 , 0.260	Depositor DCC
R_{free} test set	2091 reflections (5.31%)	DCC
Wilson B-factor (Å^2)	28.0	Xtriage
Anisotropy	0.039	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 42.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Outliers	0 of 41443 reflections	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	4397	wwPDB-VP
Average B, all atoms (Å^2)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.93% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: HRM, GOL, FAD, DCX

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	1.11	7/4202 (0.2%)	1.02	9/5696 (0.2%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	374	CYS	CB-SG	-6.54	1.71	1.82
1	A	83	GLU	CG-CD	6.36	1.61	1.51
1	A	303	VAL	CB-CG1	-6.26	1.39	1.52
1	A	433	ALA	CA-CB	-5.29	1.41	1.52
1	A	124	TYR	CE2-CZ	5.19	1.45	1.38
1	A	367	GLU	CB-CG	5.14	1.61	1.52
1	A	188	GLU	CB-CG	-5.08	1.42	1.52

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	454	ARG	NE-CZ-NH2	-10.53	115.04	120.30
1	A	454	ARG	NE-CZ-NH1	8.96	124.78	120.30
1	A	328	ASP	N-CA-CB	-6.61	98.71	110.60
1	A	13	MET	CG-SD-CE	5.97	109.76	100.20
1	A	416	MET	CG-SD-CE	-5.94	90.69	100.20
1	A	26	LEU	CA-CB-CG	-5.54	102.56	115.30
1	A	424	ARG	NE-CZ-NH2	-5.36	117.62	120.30
1	A	511	VAL	CB-CA-C	5.08	121.04	111.40
1	A	51	ARG	NE-CZ-NH1	-5.07	117.76	120.30

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	4100	0	4095	120	0
2	A	53	0	29	2	0
3	A	16	0	12	1	0
4	A	28	0	54	1	0
5	A	18	0	24	18	0
6	A	182	0	0	12	0
All	All	4397	0	4214	121	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 14.

All (121) 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:307:MET:CE	1:A:350:MET:HG2	1.50	1.36
1:A:218:LYS:CE	5:A:702:GOL:H32	1.61	1.29
1:A:218:LYS:HE3	5:A:702:GOL:C3	1.68	1.21
1:A:307:MET:HE3	1:A:350:MET:HG2	1.15	1.10
1:A:218:LYS:HE3	5:A:702:GOL:H32	1.07	1.07
1:A:307:MET:CE	1:A:350:MET:CG	2.38	1.01
1:A:352:PHE:HB3	1:A:354:LEU:HD13	1.50	0.94
1:A:218:LYS:CE	5:A:702:GOL:C3	2.35	0.94
1:A:47:ARG:HE	5:A:701:GOL:H12	1.33	0.93
1:A:218:LYS:HE2	5:A:702:GOL:H32	1.52	0.92
1:A:14:PHE:O	1:A:266:CYS:HA	1.74	0.87
1:A:454:ARG:HD2	1:A:472:TRP:CH2	2.11	0.86
1:A:79:ARG:N	5:A:3:GOL:H12	1.94	0.82
1:A:137:GLU:HB2	6:A:860:HOH:O	1.81	0.79
1:A:307:MET:HE3	1:A:350:MET:CG	2.04	0.78
1:A:126:ASN:HD22	1:A:129:ARG:HH21	1.32	0.77
1:A:15:ASP:OD1	1:A:267:LYS:HE2	1.85	0.76
1:A:307:MET:HE2	1:A:350:MET:HG2	1.64	0.75
1:A:218:LYS:HE3	5:A:702:GOL:H31	1.69	0.75
1:A:284:ARG:HA	1:A:285:PRO:C	2.07	0.74
1:A:307:MET:HE2	1:A:350:MET:CG	2.18	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:307:MET:SD	6:A:868:HOH:O	2.45	0.73
1:A:307:MET:HE1	1:A:350:MET:HG2	1.70	0.69
1:A:352:PHE:HB3	1:A:354:LEU:CD1	2.22	0.69
1:A:454:ARG:HD2	1:A:472:TRP:CZ2	2.28	0.68
1:A:218:LYS:NZ	6:A:729:HOH:O	2.27	0.67
1:A:137:GLU:CB	6:A:860:HOH:O	2.40	0.67
1:A:240:LEU:O	1:A:242:HIS:HD2	1.77	0.66
1:A:82:LYS:HD3	5:A:3:GOL:H32	1.77	0.66
1:A:305:LYS:HG3	1:A:352:PHE:HE2	1.61	0.66
1:A:395:LYS:HG2	1:A:397:TRP:CE2	2.32	0.65
1:A:157:MET:HE3	1:A:191:ALA:HA	1.79	0.65
1:A:168:LYS:O	1:A:172:ARG:HD3	1.97	0.65
1:A:457:ARG:NH1	6:A:761:HOH:O	2.18	0.64
1:A:441:TRP:O	1:A:444:TYR:HB2	1.97	0.64
1:A:104:LYS:HE2	6:A:882:HOH:O	1.98	0.63
1:A:157:MET:CE	1:A:191:ALA:HA	2.29	0.62
1:A:332:PRO:HA	1:A:361:LEU:HD11	1.82	0.61
1:A:384:GLN:HG3	6:A:806:HOH:O	2.00	0.61
1:A:307:MET:HE2	1:A:350:MET:CB	2.32	0.59
1:A:47:ARG:NE	5:A:701:GOL:H12	2.10	0.59
1:A:305:LYS:HG3	1:A:352:PHE:CE2	2.36	0.59
1:A:133:ASN:HA	1:A:136:LYS:HD2	1.84	0.58
1:A:292:ASN:O	1:A:296:GLN:HG3	2.04	0.58
1:A:126:ASN:HD22	1:A:129:ARG:NH2	2.01	0.57
1:A:157:MET:HE2	1:A:191:ALA:CB	2.34	0.56
1:A:78:LEU:HB2	5:A:3:GOL:H11	1.86	0.56
1:A:297:ARG:O	1:A:299:PRO:HD3	2.06	0.55
1:A:165:CYS:HB2	1:A:171:ARG:HG3	1.88	0.55
1:A:353:ILE:HG22	1:A:358:ALA:HA	1.89	0.55
1:A:218:LYS:CE	5:A:702:GOL:H31	2.30	0.55
1:A:397:TRP:CE3	1:A:400:GLU:HG3	2.41	0.55
1:A:332:PRO:HA	1:A:361:LEU:CD1	2.37	0.55
1:A:469:LYS:H	1:A:469:LYS:HZ2	1.53	0.55
1:A:467:THR:HB	1:A:469:LYS:HZ2	1.71	0.54
1:A:263:HIS:HD2	6:A:851:HOH:O	1.90	0.53
1:A:391:HIS:HE1	1:A:393:GLU:OE2	1.92	0.53
1:A:79:ARG:CA	5:A:3:GOL:H12	2.39	0.53
1:A:157:MET:HE3	1:A:194:PHE:HB3	1.90	0.52
1:A:113:PRO:HD2	1:A:124:TYR:OH	2.10	0.52
1:A:478:SER:HB2	5:A:3:GOL:H11	1.91	0.52
1:A:424:ARG:HB3	1:A:437:THR:HB	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:157:MET:HE2	1:A:191:ALA:HB1	1.92	0.51
1:A:412:PRO:HB3	6:A:829:HOH:O	2.11	0.50
1:A:258:THR:OG1	1:A:260:ASN:ND2	2.45	0.50
1:A:395:LYS:HG2	1:A:397:TRP:NE1	2.26	0.49
1:A:16:VAL:HG21	1:A:459:VAL:HG11	1.94	0.49
1:A:307:MET:CE	1:A:350:MET:CB	2.90	0.49
1:A:116:TRP:CE3	4:A:1:DCX:H31	2.47	0.49
1:A:182:VAL:HG11	1:A:193:TRP:CH2	2.47	0.49
1:A:193:TRP:CG	1:A:411:PHE:HB2	2.48	0.48
1:A:361:LEU:HD22	1:A:364:LEU:HD22	1.95	0.48
1:A:454:ARG:HD3	6:A:721:HOH:O	2.12	0.48
1:A:357:LYS:NZ	6:A:821:HOH:O	2.45	0.48
1:A:449:VAL:O	1:A:450:GLU:C	2.51	0.48
1:A:76:ARG:HB3	1:A:449:VAL:HG11	1.95	0.47
1:A:308:MET:O	1:A:348:ALA:HA	2.14	0.47
1:A:185:GLU:OE2	1:A:356:ARG:HB2	2.15	0.47
1:A:67:GLY:HA2	2:A:600:FAD:C4X	2.45	0.47
1:A:137:GLU:O	1:A:139:PRO:HD3	2.15	0.47
1:A:163:LYS:HG3	1:A:163:LYS:O	2.15	0.47
1:A:331:ALA:O	1:A:357:LYS:NZ	2.43	0.46
1:A:70:VAL:HA	1:A:74:GLN:OE1	2.14	0.46
1:A:126:ASN:ND2	1:A:129:ARG:HH21	2.09	0.46
1:A:457:ARG:HB3	1:A:471:ILE:HA	1.97	0.46
1:A:72:PRO:HB3	1:A:483:ALA:HA	1.97	0.46
1:A:176:LEU:HG	1:A:180:ILE:HD12	1.97	0.46
1:A:307:MET:HE2	1:A:350:MET:HB2	1.97	0.46
1:A:361:LEU:HA	1:A:361:LEU:HD23	1.64	0.46
1:A:397:TRP:CD1	2:A:600:FAD:HM71	2.51	0.46
1:A:254:ILE:O	1:A:265:GLU:HA	2.15	0.45
1:A:72:PRO:HG2	1:A:212:ASN:HA	1.98	0.45
1:A:395:LYS:NZ	5:A:701:GOL:H32	2.31	0.45
1:A:162:ASP:HA	1:A:171:ARG:HE	1.81	0.45
1:A:16:VAL:HB	1:A:39:VAL:HG13	1.99	0.45
1:A:246:HIS:HB2	1:A:257:GLU:HB3	1.97	0.45
1:A:361:LEU:CD2	1:A:364:LEU:HD22	2.47	0.45
1:A:510:SER:O	1:A:513:ALA:HB3	2.17	0.45
1:A:469:LYS:H	1:A:469:LYS:NZ	2.15	0.45
1:A:363:LYS:HB2	1:A:363:LYS:HE2	1.59	0.44
1:A:318:LYS:HB3	1:A:318:LYS:HE2	1.59	0.44
1:A:69:TYR:CE2	1:A:218:LYS:HD2	2.53	0.44
1:A:400:GLU:OE1	5:A:701:GOL:H31	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:334:SER:HB2	1:A:354:LEU:HD22	2.00	0.43
1:A:76:ARG:HB3	1:A:449:VAL:CG1	2.49	0.43
1:A:16:VAL:CG2	1:A:459:VAL:HG11	2.48	0.43
1:A:335:ILE:HD11	3:A:700:HRM:OAJ	2.19	0.43
1:A:521:TYR:C	1:A:522:LYS:HG2	2.39	0.43
1:A:30:LYS:HD2	1:A:230:ILE:HG12	2.01	0.43
1:A:257:GLU:OE2	1:A:261:HIS:HD2	2.02	0.42
1:A:321:CYS:O	1:A:338:ASP:HB2	2.20	0.42
1:A:478:SER:HA	5:A:3:GOL:H2	2.01	0.42
1:A:68:ALA:HB1	1:A:218:LYS:NZ	2.35	0.41
5:A:701:GOL:H11	6:A:790:HOH:O	2.19	0.41
1:A:191:ALA:O	1:A:195:LEU:HG	2.20	0.41
1:A:166:TRP:CE3	1:A:167:THR:HG22	2.56	0.41
1:A:146:ALA:HB3	1:A:149:ALA:HB2	2.02	0.41
1:A:457:ARG:HD3	1:A:470:ASP:O	2.21	0.41
1:A:80:LEU:HD21	1:A:230:ILE:HD11	2.03	0.41
1:A:19:ILE:HG12	1:A:244:VAL:HG21	2.02	0.40
1:A:336:THR:HA	1:A:350:MET:O	2.21	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	511/513 (100%)	486 (95%)	24 (5%)	1 (0%)	52 59

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	61	ASP

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	439/439 (100%)	404 (92%)	35 (8%)	15 15

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	13	MET
1	A	31	LEU
1	A	58	GLU
1	A	101	VAL
1	A	105	THR
1	A	140	THR
1	A	147	GLN
1	A	163	LYS
1	A	169	THR
1	A	172	ARG
1	A	251	SER
1	A	260	ASN
1	A	267	LYS
1	A	307	MET
1	A	317	LYS
1	A	335	ILE
1	A	354	LEU
1	A	356	ARG
1	A	367	GLU
1	A	384	GLN
1	A	385	GLU
1	A	406	CYS
1	A	421	ARG
1	A	454	ARG
1	A	467	THR
1	A	468	GLU
1	A	469	LYS
1	A	505	ILE
1	A	509	THR
1	A	510	SER

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Mol	Chain	Res	Type
1	A	514	LEU
1	A	516	PHE
1	A	518	LEU
1	A	522	LYS
1	A	524	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	126	ASN
1	A	242	HIS
1	A	246	HIS
1	A	253	ASN
1	A	260	ASN
1	A	261	HIS
1	A	263	HIS
1	A	271	ASN
1	A	296	GLN
1	A	391	HIS
1	A	418	GLN

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 carbohydrates 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	DCX	A	1	-	13,13,13	1.14	1 (7%)	12,15,15	1.56	2 (16%)
4	DCX	A	2	-	13,13,13	1.20	1 (7%)	12,15,15	2.03	3 (25%)
5	GOL	A	3	-	5,5,5	0.71	0	5,5,5	1.65	1 (20%)
2	FAD	A	600	-	48,58,58	1.46	7 (14%)	54,89,89	2.34	13 (24%)
3	HRM	A	700	-	16,18,18	1.81	6 (37%)	23,26,26	1.93	7 (30%)
5	GOL	A	701	-	5,5,5	0.17	0	5,5,5	0.91	0
5	GOL	A	702	-	5,5,5	0.65	0	5,5,5	0.78	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	DCX	A	1	-	-	0/11/11/11	0/0/0/0
4	DCX	A	2	-	-	0/11/11/11	0/0/0/0
5	GOL	A	3	-	-	0/4/4/4	0/0/0/0
2	FAD	A	600	-	-	0/30/50/50	0/6/6/6
3	HRM	A	700	-	-	0/2/2/2	0/3/3/3
5	GOL	A	701	-	-	0/4/4/4	0/0/0/0
5	GOL	A	702	-	-	0/4/4/4	0/0/0/0

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	700	HRM	CAL-CAP	-2.90	1.39	1.42
3	A	700	HRM	CAN-CAO	-2.38	1.38	1.45
3	A	700	HRM	CAG-CAM	-2.21	1.38	1.41
2	A	600	FAD	O4B-C1B	2.05	1.43	1.41
3	A	700	HRM	CAD-CAK	2.06	1.42	1.38
2	A	600	FAD	C8A-N7A	2.22	1.38	1.34
3	A	700	HRM	CAB-CAL	2.45	1.52	1.50
2	A	600	FAD	C4A-N3A	2.53	1.39	1.35
2	A	600	FAD	C5X-N5	2.57	1.39	1.35
3	A	700	HRM	CAE-CAC	2.69	1.39	1.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	600	FAD	C4X-N5	2.79	1.37	1.33
4	A	2	DCX	P1-O4	3.11	1.58	1.50
4	A	1	DCX	P1-O4	3.48	1.59	1.50
2	A	600	FAD	C2A-N3A	3.94	1.39	1.32
2	A	600	FAD	C4-N3	4.58	1.41	1.33

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	600	FAD	N3A-C2A-N1A	-11.96	119.73	128.89
2	A	600	FAD	C1B-N9A-C4A	-5.19	119.12	126.94
4	A	2	DCX	O4-P1-C2	-4.85	105.34	113.32
3	A	700	HRM	CAE-CAC-NAH	-4.75	119.72	123.91
2	A	600	FAD	C4X-C4-N3	-4.36	117.63	123.59
4	A	1	DCX	O4-P1-C2	-3.37	107.78	113.32
4	A	1	DCX	O4-P1-C3	-3.23	108.01	113.32
2	A	600	FAD	O2'-C2'-C1'	-2.81	103.03	109.94
3	A	700	HRM	OAJ-CAK-CAG	-2.67	117.90	124.62
3	A	700	HRM	CAD-CAF-CAN	-2.48	117.73	121.49
3	A	700	HRM	CAF-CAD-CAK	-2.41	117.14	120.14
2	A	600	FAD	C6-C5X-N5	-2.21	116.11	118.96
2	A	600	FAD	C1'-C2'-C3'	-2.14	103.70	109.82
4	A	2	DCX	O4-P1-C3	-2.04	109.97	113.32
2	A	600	FAD	O5'-P-O1P	-2.02	101.79	109.62
3	A	700	HRM	CAN-CAO-CAP	2.02	108.42	106.14
2	A	600	FAD	C4-C4X-C10	2.22	121.36	119.94
2	A	600	FAD	O2'-C2'-C3'	2.41	115.06	109.02
2	A	600	FAD	O2A-PA-O1A	2.45	125.80	112.53
5	A	3	GOL	O1-C1-C2	2.61	122.85	110.18
2	A	600	FAD	C2A-N1A-C6A	2.77	123.71	118.77
2	A	600	FAD	C4X-N5-C5X	2.85	120.04	116.76
3	A	700	HRM	CAC-NAH-CAL	3.17	123.33	118.49
3	A	700	HRM	CAF-CAN-CAM	3.54	123.71	119.70
4	A	2	DCX	C2-P1-C3	4.16	112.09	106.28
2	A	600	FAD	C4-N3-C2	4.27	118.94	115.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

6 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1	DCX	1	0
5	A	3	GOL	6	0
2	A	600	FAD	2	0
3	A	700	HRM	1	0
5	A	701	GOL	5	0
5	A	702	GOL	7	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	513/513 (100%)	-0.27	3 (0%)	90	90	21, 35, 55, 93	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	516	PHE	2.7
1	A	521	TYR	2.6
1	A	252	ASP	2.0

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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å^2)	Q<0.9
5	GOL	A	3	6/6	0.83	0.29	9.88	38,42,45,46	0
4	DCX	A	1	14/14	0.88	0.22	2.95	64,74,88,88	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(Å^2)	Q<0.9
5	GOL	A	702	6/6	0.92	0.14	1.78	43,47,48,48	0
3	HRM	A	700	16/16	0.97	0.13	0.72	26,29,33,36	0
5	GOL	A	701	6/6	0.93	0.14	0.62	45,52,54,57	0
2	FAD	A	600	53/53	0.98	0.10	-0.40	16,22,28,31	0
4	DCX	A	2	14/14	0.90	0.22	-	83,85,89,90	0

6.5 Other polymers

There are no such residues in this entry.