



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 08:39 AM UTC

PDB ID : 6WY8 / pdb_00006wy8
Title : Tcur3481-Tcur3483 steroid ACAD
Authors : Kimber, M.S.; Stirling, A.J.; Seah, S.Y.K.
Deposited on : 2020-05-12
Resolution : 2.10 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

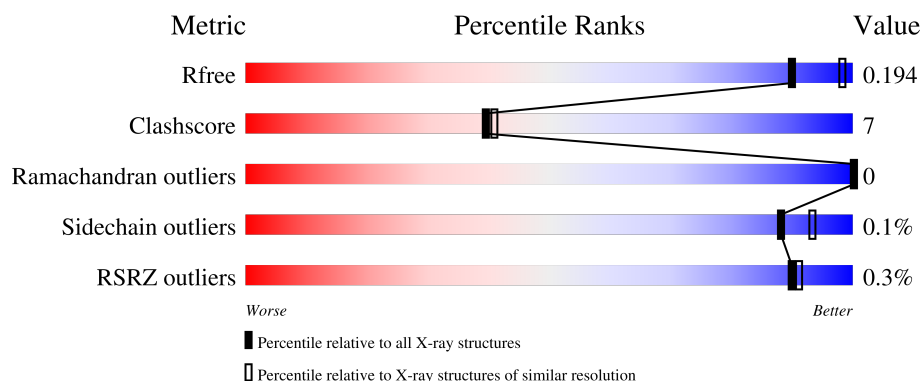
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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	364	% 87% 13%
1	C	364	89% 11%
2	B	407	84% 10% 6%
2	D	407	80% 14% 6%

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 12709 atoms, of which 130 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 Acyl-CoA dehydrogenase domain protein Tcur3481.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	363	Total	C	N	O	S	0	6	0
			2718	1711	481	518	8			
1	C	364	Total	C	N	O	S	0	5	0
			2720	1710	484	517	9			

- Molecule 2 is a protein called Acyl-CoA dehydrogenase domain protein Tcur3483.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	384	Total	C	N	O	S	0	5	0
			2976	1884	522	560	10			
2	D	384	Total	C	N	O	S	0	6	0
			2989	1889	524	565	11			

There are 40 discrepancies between the modelled and reference sequences:

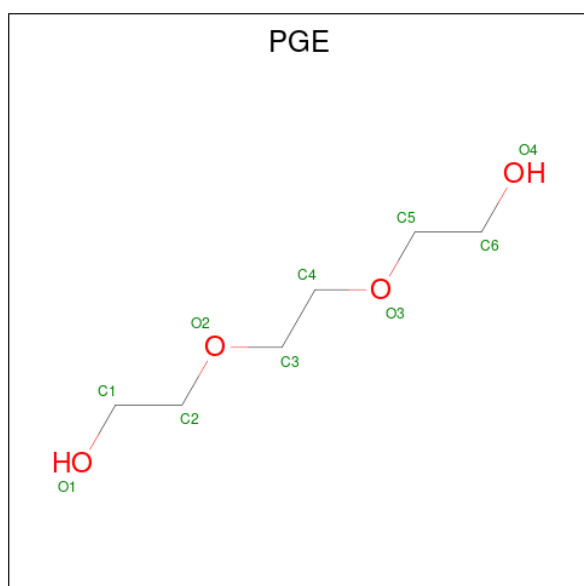
Chain	Residue	Modelled	Actual	Comment	Reference
B	-19	MET	-	initiating methionine	UNP D1AB78
B	-18	GLY	-	expression tag	UNP D1AB78
B	-17	SER	-	expression tag	UNP D1AB78
B	-16	SER	-	expression tag	UNP D1AB78
B	-15	HIS	-	expression tag	UNP D1AB78
B	-14	HIS	-	expression tag	UNP D1AB78
B	-13	HIS	-	expression tag	UNP D1AB78
B	-12	HIS	-	expression tag	UNP D1AB78
B	-11	HIS	-	expression tag	UNP D1AB78
B	-10	HIS	-	expression tag	UNP D1AB78
B	-9	SER	-	expression tag	UNP D1AB78
B	-8	SER	-	expression tag	UNP D1AB78
B	-7	GLY	-	expression tag	UNP D1AB78
B	-6	LEU	-	expression tag	UNP D1AB78
B	-5	VAL	-	expression tag	UNP D1AB78
B	-4	PRO	-	expression tag	UNP D1AB78

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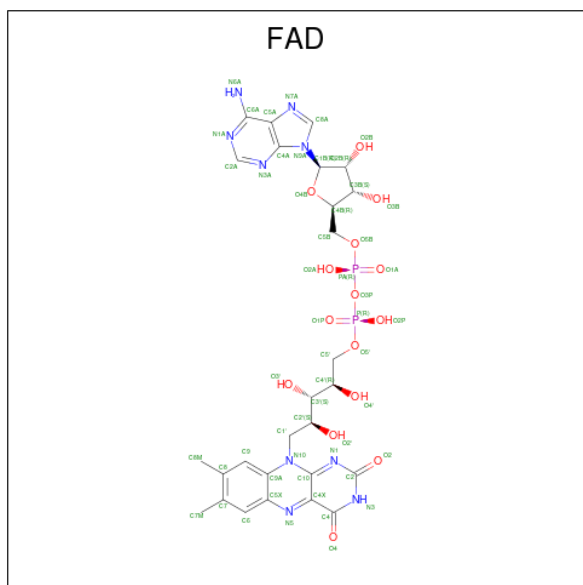
Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	ARG	-	expression tag	UNP D1AB78
B	-2	GLY	-	expression tag	UNP D1AB78
B	-1	SER	-	expression tag	UNP D1AB78
B	0	HIS	-	expression tag	UNP D1AB78
D	-19	MET	-	initiating methionine	UNP D1AB78
D	-18	GLY	-	expression tag	UNP D1AB78
D	-17	SER	-	expression tag	UNP D1AB78
D	-16	SER	-	expression tag	UNP D1AB78
D	-15	HIS	-	expression tag	UNP D1AB78
D	-14	HIS	-	expression tag	UNP D1AB78
D	-13	HIS	-	expression tag	UNP D1AB78
D	-12	HIS	-	expression tag	UNP D1AB78
D	-11	HIS	-	expression tag	UNP D1AB78
D	-10	HIS	-	expression tag	UNP D1AB78
D	-9	SER	-	expression tag	UNP D1AB78
D	-8	SER	-	expression tag	UNP D1AB78
D	-7	GLY	-	expression tag	UNP D1AB78
D	-6	LEU	-	expression tag	UNP D1AB78
D	-5	VAL	-	expression tag	UNP D1AB78
D	-4	PRO	-	expression tag	UNP D1AB78
D	-3	ARG	-	expression tag	UNP D1AB78
D	-2	GLY	-	expression tag	UNP D1AB78
D	-1	SER	-	expression tag	UNP D1AB78
D	0	HIS	-	expression tag	UNP D1AB78

- Molecule 3 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: $C_6H_{14}O_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	H	O	0	0
			24	6	14	4		
3	B	1	Total	C	H	O	0	0
			24	6	14	4		
3	D	1	Total	C	H	O	0	0
			24	6	14	4		

- Molecule 4 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$) (labeled as "Ligand of Interest" by depositor).



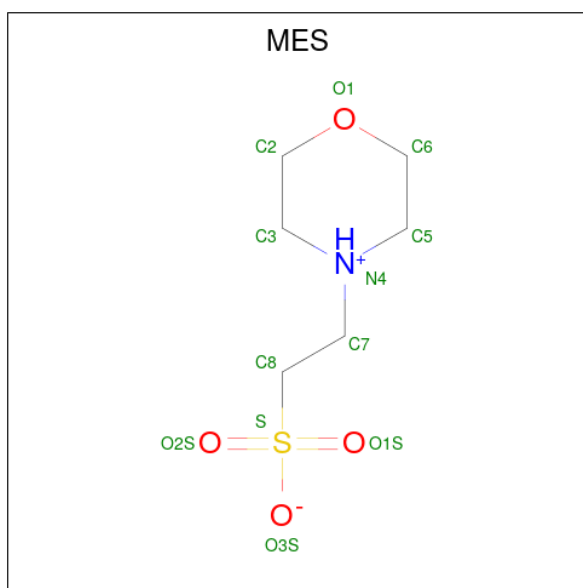
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
4	B	1	Total	C	H	N	O	P	0	0
			84	27	31	9	15	2		
4	D	1	Total	C	H	N	O	P	0	0
			84	27	31	9	15	2		

- Molecule 5 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	1	Total	Cl	0	0
			1	1		
5	C	2	Total	Cl	0	0
			2	2		
5	D	1	Total	Cl	0	0
			1	1		

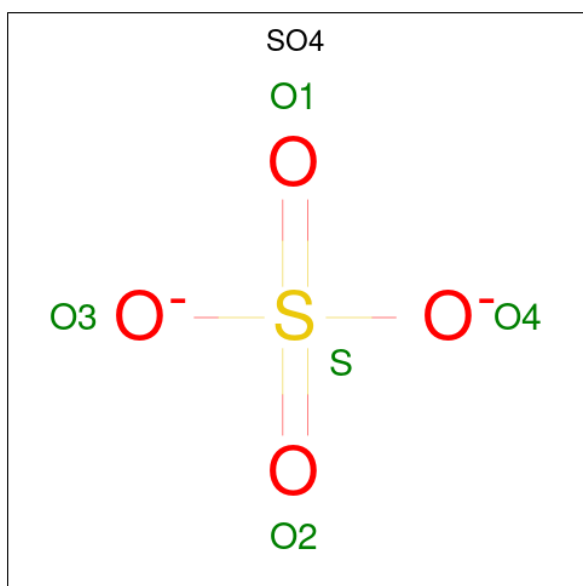
- Molecule 6 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (CCD ID: MES) (formula:

C₆H₁₃NO₄S).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
6	B	1	Total	C	H	N	O	S	0	0
			25	6	13	1	4	1		
6	D	1	Total	C	H	N	O	S	0	0
			25	6	13	1	4	1		

- Molecule 7 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	C	1	Total	O	S	0	0
			5	4	1		

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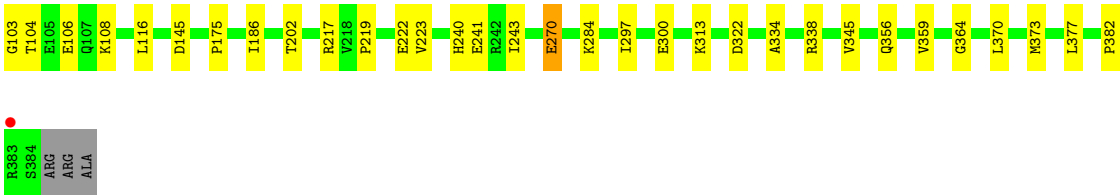
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	224	Total	O	0	0
			224	224		
8	B	254	Total	O	0	0
			254	254		
8	C	229	Total	O	0	0
			229	229		
8	D	295	Total	O	0	0
			295	295		

- Molecule 1: Acyl-CoA dehydrogenase domain protein Tcur3481





4 Data and refinement statistics

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α , β , γ	76.62Å 138.61Å 147.03Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.52 – 2.10 48.52 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.6 (48.52-2.10) 99.6 (48.52-2.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.36 (at 1.73Å)	Xtriage
Refinement program	PHENIX 1.15.2_3472	Depositor
R, R_{free}	0.150 , 0.193 0.151 , 0.194	Depositor DCC
R_{free} test set	8071 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å ²)	24.7	Xtriage
Anisotropy	0.340	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 50.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	12709	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.10% 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: MES, FAD, PGE, SO4, CL

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	0.51	0/2773	0.63	0/3787
1	C	0.53	0/2776	0.63	0/3788
2	B	0.51	0/3038	0.61	0/4123
2	D	0.51	0/3049	0.61	0/4136
All	All	0.51	0/11636	0.62	0/15834

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2718	0	2686	45	0
1	C	2720	0	2684	34	0
2	B	2976	0	2977	39	0
2	D	2989	0	2974	45	0
3	A	10	14	14	3	0
3	B	10	14	14	3	0
3	D	10	14	14	0	0
4	B	53	31	31	2	0
4	D	53	31	31	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	1	0	0	0	0
5	C	2	0	0	0	0
5	D	1	0	0	0	0
6	B	12	13	13	0	0
6	D	12	13	13	0	0
7	C	10	0	0	1	0
8	A	224	0	0	3	0
8	B	254	0	0	6	0
8	C	229	0	0	2	1
8	D	295	0	0	8	1
All	All	12579	130	11451	154	1

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 (154) 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:185:LEU:HD11	1:A:201:LEU:HD22	1.35	1.08
2:D:1:MET:N	8:D:501:HOH:O	1.91	1.02
1:C:185[A]:LEU:HD11	1:C:201:LEU:HD22	1.57	0.86
1:A:41:GLU:OE2	8:A:501:HOH:O	1.95	0.83
1:A:257:GLY:HA3	2:B:381:MET:CE	2.11	0.81
2:D:72:GLU:OE2	8:D:502:HOH:O	2.00	0.79
1:A:1:MET:HB2	2:B:2:ASP:O	1.82	0.79
7:C:404:SO4:O4	8:C:501:HOH:O	2.03	0.75
2:D:241:GLU:OE2	8:D:503:HOH:O	2.04	0.74
2:B:15:GLU:HB3	3:B:403:PGE:H62	1.70	0.73
1:C:154:VAL:HG21	1:C:201:LEU:CD1	2.21	0.71
2:B:87:PHE:HE2	2:B:92[B]:VAL:HG21	1.56	0.69
2:D:270[A]:GLU:OE1	8:D:504:HOH:O	2.10	0.68
2:B:32[B]:VAL:HG12	2:B:86:PRO:HD3	1.76	0.68
1:A:3:PHE:C	2:B:1:MET:HE2	2.19	0.67
1:C:36:GLU:OE2	8:C:502:HOH:O	2.12	0.67
2:D:104:THR:OG1	2:D:106:GLU:HG2	1.95	0.66
1:C:154:VAL:HG21	1:C:201:LEU:HD12	1.77	0.66
2:D:60:PRO:HG2	2:D:63:TYR:HD2	1.62	0.64
1:A:194:SER:O	1:A:195:ARG:HB2	1.96	0.64
1:A:163:LEU:HD22	1:A:201:LEU:HD11	1.78	0.63
1:A:23:HIS:CE1	1:A:46:GLU:HG3	2.33	0.63
1:A:150[A]:THR:HG23	3:A:401:PGE:H2	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:56:GLY:HA3	2:B:116:LEU:HD11	1.81	0.62
1:A:7:GLU:HG2	1:A:8:GLU:H	1.65	0.61
1:A:191:GLU:HG2	2:D:338:ARG:HD2	1.82	0.61
2:B:87:PHE:CE2	2:B:92[B]:VAL:HG21	2.35	0.61
1:A:1:MET:HG3	1:A:3:PHE:CE1	2.36	0.61
2:D:219[A]:PRO:HG2	2:D:222:GLU:HG2	1.83	0.61
1:A:279:CYS:HG	1:A:303:TRP:CD1	2.19	0.60
1:C:57:LEU:HB3	1:C:58:PRO:HD2	1.84	0.60
2:B:276:ARG:NH1	8:B:503:HOH:O	2.34	0.59
2:D:284:LYS:HE2	2:D:322:ASP:OD2	2.03	0.58
2:B:241:GLU:HG2	8:B:616:HOH:O	2.02	0.58
4:B:401:FAD:H9	4:B:401:FAD:H2'	1.85	0.58
2:B:15:GLU:HB3	3:B:403:PGE:C6	2.33	0.57
2:B:128:GLU:HG2	2:B:155:LYS:HD3	1.86	0.57
1:A:257:GLY:HA3	2:B:381:MET:HE3	1.86	0.57
2:D:373:MET:CG	2:D:377:LEU:HD12	2.33	0.57
1:C:23:HIS:HD2	1:C:28:ARG:HH12	1.51	0.57
1:A:202:THR:C	1:A:203:LEU:HD12	2.30	0.57
1:A:187:TRP:HB3	1:A:201:LEU:HD23	1.87	0.56
2:D:186[A]:ILE:HG12	2:D:223:VAL:HG22	1.86	0.56
1:A:163:LEU:CD2	1:A:201:LEU:HD11	2.35	0.56
2:B:57:TYR:CE1	2:B:68:ARG:HG3	2.40	0.56
1:C:17:ARG:NH2	1:C:77:GLU:OE2	2.38	0.56
1:C:281:TRP:CG	2:D:1:MET:HE2	2.41	0.55
2:B:57:TYR:CZ	2:B:68:ARG:HG3	2.42	0.55
1:A:203:LEU:HD12	1:A:203:LEU:N	2.23	0.54
2:D:45:VAL:HA	2:D:48:MET:CE	2.37	0.54
2:D:5:GLU:OE1	8:D:505:HOH:O	2.18	0.54
1:A:148:SER:HA	1:A:203:LEU:O	2.08	0.54
2:D:145:ASP:OD2	2:D:217:ARG:NH2	2.34	0.53
2:D:60:PRO:HB2	2:D:62:GLU:CD	2.33	0.53
1:A:80:ARG:HD3	8:A:568:HOH:O	2.08	0.53
2:D:373:MET:HG3	2:D:377:LEU:HD12	1.90	0.53
1:A:7:GLU:HG2	1:A:8:GLU:N	2.23	0.53
1:A:204:ASP:HB2	3:A:401:PGE:H5	1.90	0.52
2:B:56:GLY:HA3	2:B:116:LEU:CD1	2.39	0.52
1:A:12:LEU:CD1	1:A:52:LEU:CD2	2.88	0.52
1:A:321:GLY:O	1:A:324:VAL:HG22	2.11	0.51
1:C:136[B]:CYS:SG	1:C:151:LYS:HD2	2.51	0.51
2:B:271:GLN:NE2	8:B:501:HOH:O	2.13	0.51
2:B:54:TRP:HZ2	3:B:403:PGE:H3	1.76	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:300:GLU:OE1	8:D:506:HOH:O	2.19	0.51
1:C:258:THR:CG2	2:D:382:PRO:HG2	2.41	0.51
1:A:258:THR:HG22	2:B:382:PRO:HG2	1.92	0.51
2:D:1:MET:HE3	2:D:3:LEU:HD11	1.92	0.51
1:C:328:TYR:CD1	1:C:329:PRO:HD2	2.46	0.50
2:D:45:VAL:HA	2:D:48:MET:HE3	1.93	0.50
2:D:356:GLN:O	2:D:359:VAL:HG22	2.12	0.50
2:B:147:ASP:HB2	8:B:506:HOH:O	2.10	0.50
1:C:321:GLY:O	1:C:324:VAL:HG22	2.10	0.50
2:D:74:TYR:CD1	2:D:243[B]:ILE:HG23	2.46	0.50
2:D:334:ALA:HB1	2:D:345:VAL:HG23	1.93	0.50
1:A:1:MET:HG3	1:A:3:PHE:HE1	1.76	0.50
4:D:401:FAD:C9	4:D:401:FAD:H2'	2.42	0.50
2:B:227[B]:ILE:O	2:B:228:ASN:HB2	2.11	0.50
1:C:328:TYR:CG	1:C:329:PRO:HD2	2.47	0.50
1:C:272:GLU:O	1:C:276:MET:HG3	2.12	0.49
2:D:313:LYS:HD2	2:D:370:LEU:CD1	2.42	0.49
2:D:56:GLY:HA3	2:D:116:LEU:HD21	1.93	0.49
2:B:254:ARG:NH2	8:B:507:HOH:O	2.42	0.49
1:C:12:LEU:CD1	1:C:52:LEU:HD22	2.42	0.49
1:A:4:THR:C	2:B:1:MET:HE3	2.37	0.49
1:C:194:SER:O	1:C:195:ARG:HB2	2.13	0.49
2:D:76:LEU:HD23	2:D:76:LEU:C	2.37	0.49
2:B:227[A]:ILE:O	2:B:228:ASN:HB2	2.13	0.48
1:C:258:THR:HG22	2:D:382:PRO:HG2	1.96	0.48
1:C:23:HIS:CE1	1:C:46:GLU:HG3	2.48	0.48
2:B:325:ARG:HB3	8:B:660:HOH:O	2.14	0.48
1:C:41:GLU:CD	1:C:118[B]:ARG:HH12	2.21	0.48
1:C:136[B]:CYS:SG	1:C:151:LYS:CD	3.02	0.47
2:D:240:HIS:HB2	8:D:503:HOH:O	2.13	0.47
2:B:136:ALA:HB3	2:B:179:LYS:HE2	1.95	0.47
2:D:27:ASP:OD1	2:D:28:GLU:N	2.48	0.47
1:C:185[A]:LEU:HD11	1:C:201:LEU:CD2	2.38	0.47
1:A:328:TYR:CD1	1:A:329:PRO:HD2	2.49	0.47
2:B:32[B]:VAL:HG12	2:B:86:PRO:CD	2.41	0.47
1:A:119:LEU:HD22	1:A:162:HIS:HB2	1.96	0.47
1:A:194:SER:O	1:A:195:ARG:CB	2.63	0.47
2:D:103:GLY:O	2:D:108:LYS:HE3	2.15	0.46
1:C:154:VAL:HG21	1:C:201:LEU:HD11	1.97	0.46
1:A:328:TYR:CG	1:A:329:PRO:HD2	2.50	0.46
2:D:313:LYS:HE3	2:D:364:GLY:O	2.15	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:17:ARG:O	2:B:21:ASN:ND2	2.45	0.46
2:D:9:LEU:HD22	2:D:75:VAL:HG21	1.98	0.46
1:A:23:HIS:HD2	1:A:28:ARG:HH12	1.64	0.45
1:A:305:ASP:OD2	1:A:350:ASP:OD2	2.35	0.45
1:A:30:ARG:NH2	1:A:326:VAL:HG23	2.31	0.45
2:B:206:MET:HE3	2:B:206:MET:HB2	1.70	0.45
1:A:272:GLU:O	1:A:276:MET:HG3	2.17	0.45
1:C:23:HIS:CD2	1:C:28:ARG:HH12	2.33	0.45
2:D:2:ASP:OD1	2:D:4:ARG:NH1	2.45	0.45
2:D:59:TRP:CD2	2:D:100:MET:HE1	2.52	0.45
2:D:175:PRO:HG3	8:D:677:HOH:O	2.17	0.45
2:D:59:TRP:CG	2:D:100:MET:HE1	2.52	0.44
2:D:74:TYR:HD1	2:D:243[B]:ILE:HG23	1.82	0.44
1:C:23:HIS:O	1:C:28:ARG:HG2	2.18	0.44
2:B:213:TYR:CD1	2:B:213:TYR:N	2.85	0.44
2:B:356:GLN:HE21	2:B:356:GLN:HA	1.81	0.44
2:B:76[B]:LEU:C	2:B:76[B]:LEU:HD23	2.42	0.44
1:A:324:VAL:O	2:D:202:THR:HA	2.19	0.43
2:D:101:LYS:NZ	2:D:102:TYR:OH	2.52	0.43
4:B:401:FAD:H9	4:B:401:FAD:C2'	2.46	0.43
1:A:204:ASP:HB2	3:A:401:PGE:C5	2.49	0.43
2:D:69:SER:O	2:D:73:GLN:HG3	2.18	0.43
1:C:1:MET:HG3	2:D:297:ILE:HG13	2.01	0.43
1:C:86:PRO:C	1:C:89:PRO:HD2	2.44	0.43
1:C:216:LEU:N	1:C:217[A]:PRO:HD2	2.33	0.43
1:A:93:ALA:HA	1:A:164[A]:LEU:HD12	2.00	0.42
1:A:293:ASP:O	1:A:357:LEU:HD13	2.18	0.42
2:B:179:LYS:HG3	2:B:180:HIS:CD2	2.54	0.42
2:B:186:ILE:HG12	2:B:223:VAL:HG22	2.01	0.42
1:A:258:THR:CG2	2:B:382:PRO:HG2	2.48	0.42
2:D:87:PHE:HB3	2:D:89:PHE:CE2	2.54	0.42
2:B:227[B]:ILE:HD12	2:B:227[B]:ILE:N	2.34	0.42
1:C:114:ASP:OD1	1:C:114:ASP:C	2.62	0.42
1:A:30:ARG:NH1	8:A:512:HOH:O	2.48	0.42
1:A:12:LEU:HD11	1:A:52:LEU:HD22	2.02	0.42
2:B:189:PRO:HG2	2:B:192:ALA:HB2	2.02	0.42
1:C:231:GLN:HA	1:C:231:GLN:OE1	2.19	0.42
1:A:86:PRO:C	1:A:89:PRO:HD2	2.45	0.42
1:C:86:PRO:HB3	1:C:156:SER:CB	2.49	0.42
1:C:254:ARG:HD2	1:C:258:THR:OG1	2.20	0.42
2:D:56:GLY:HA3	2:D:116:LEU:CD2	2.50	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:57:TYR:CZ	2:D:68:ARG:HG3	2.55	0.41
1:C:185[B]:LEU:C	1:C:185[B]:LEU:HD23	2.45	0.41
1:C:177:LEU:C	1:C:177:LEU:HD23	2.45	0.41
1:A:87:LEU:HD23	1:A:87:LEU:HA	1.90	0.41
1:C:305:ASP:OD2	1:C:350:ASP:OD2	2.38	0.41
2:B:6:PRO:HD2	2:B:9:LEU:HD12	2.03	0.41
2:B:104:THR:OG1	2:B:107:GLN:HG3	2.21	0.41
1:A:86:PRO:HB3	1:A:156:SER:CB	2.51	0.40

All (1) 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)
8:C:540:HOH:O	8:D:716:HOH:O[1_455]	2.07	0.13

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	367/364 (101%)	358 (98%)	9 (2%)	0	100	100
1	C	367/364 (101%)	361 (98%)	6 (2%)	0	100	100
2	B	387/407 (95%)	383 (99%)	4 (1%)	0	100	100
2	D	388/407 (95%)	383 (99%)	5 (1%)	0	100	100
All	All	1509/1542 (98%)	1485 (98%)	24 (2%)	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	270/265 (102%)	270 (100%)	0	100	100
1	C	270/265 (102%)	270 (100%)	0	100	100
2	B	307/321 (96%)	307 (100%)	0	100	100
2	D	308/321 (96%)	306 (99%)	2 (1%)	78	86
All	All	1155/1172 (98%)	1153 (100%)	2 (0%)	88	93

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	270[A]	GLU
2	D	270[B]	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	GLN
1	A	27	GLN
1	A	313	HIS
1	A	352	GLN
2	B	73	GLN
2	B	356	GLN
1	C	23	HIS
1	C	313	HIS

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 13 ligands modelled in this entry, 4 are monoatomic - leaving 9 for Mogul analysis.

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	PGE	A	401	-	9,9,9	0.37	0	8,8,8	0.30	0
3	PGE	B	403	-	9,9,9	0.37	0	8,8,8	0.39	0
7	SO4	C	403	-	4,4,4	0.22	0	6,6,6	0.24	0
7	SO4	C	404	-	4,4,4	0.31	0	6,6,6	0.26	0
6	MES	B	404	-	12,12,12	2.16	1 (8%)	15,16,16	1.56	2 (13%)
4	FAD	B	401	-	58,58,58	0.49	1 (1%)	85,89,89	0.55	1 (1%)
6	MES	D	404	-	12,12,12	2.21	1 (8%)	15,16,16	1.56	3 (20%)
3	PGE	D	403	-	9,9,9	0.35	0	8,8,8	0.33	0
4	FAD	D	401	-	58,58,58	0.66	2 (3%)	85,89,89	0.89	2 (2%)

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	PGE	A	401	-	-	4/7/7/7	-
3	PGE	B	403	-	-	3/7/7/7	-
6	MES	B	404	-	-	0/6/14/14	0/1/1/1
4	FAD	B	401	-	-	2/34/50/50	0/6/6/6
6	MES	D	404	-	-	0/6/14/14	0/1/1/1
3	PGE	D	403	-	-	1/7/7/7	-
4	FAD	D	401	-	-	3/34/50/50	0/6/6/6

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	404	MES	C8-S	-7.25	1.67	1.77
6	B	404	MES	C8-S	-7.07	1.67	1.77
4	D	401	FAD	P-O3P	2.94	1.62	1.59
4	D	401	FAD	C1'-C2'	2.58	1.56	1.52
4	B	401	FAD	C1'-C2'	-2.22	1.49	1.52

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	401	FAD	C4'-C3'-C2'	5.63	122.94	113.57
4	D	401	FAD	O2'-C2'-C3'	-4.14	99.56	109.25
6	B	404	MES	C6-C5-N4	-3.45	104.87	110.12
6	D	404	MES	C5-N4-C3	3.03	115.37	108.84
6	D	404	MES	O1S-S-C8	2.70	110.81	106.73
6	D	404	MES	C6-C5-N4	-2.60	106.17	110.12
6	B	404	MES	O1S-S-C8	2.34	110.27	106.73
4	B	401	FAD	O2'-C2'-C1'	-2.19	101.20	110.20

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	401	FAD	C2'-C1'-N10-C10
3	B	403	PGE	O2-C3-C4-O3
3	D	403	PGE	O1-C1-C2-O2
3	A	401	PGE	O2-C3-C4-O3
3	A	401	PGE	C6-C5-O3-C4
4	D	401	FAD	O3'-C3'-C4'-C5'
4	D	401	FAD	O3'-C3'-C4'-O4'
3	B	403	PGE	C1-C2-O2-C3
3	B	403	PGE	O1-C1-C2-O2
3	A	401	PGE	C3-C4-O3-C5
3	A	401	PGE	O1-C1-C2-O2
4	D	401	FAD	C2'-C3'-C4'-O4'
4	B	401	FAD	O3'-C3'-C4'-C5'

There are no ring outliers.

5 monomers are involved in 10 short contacts:

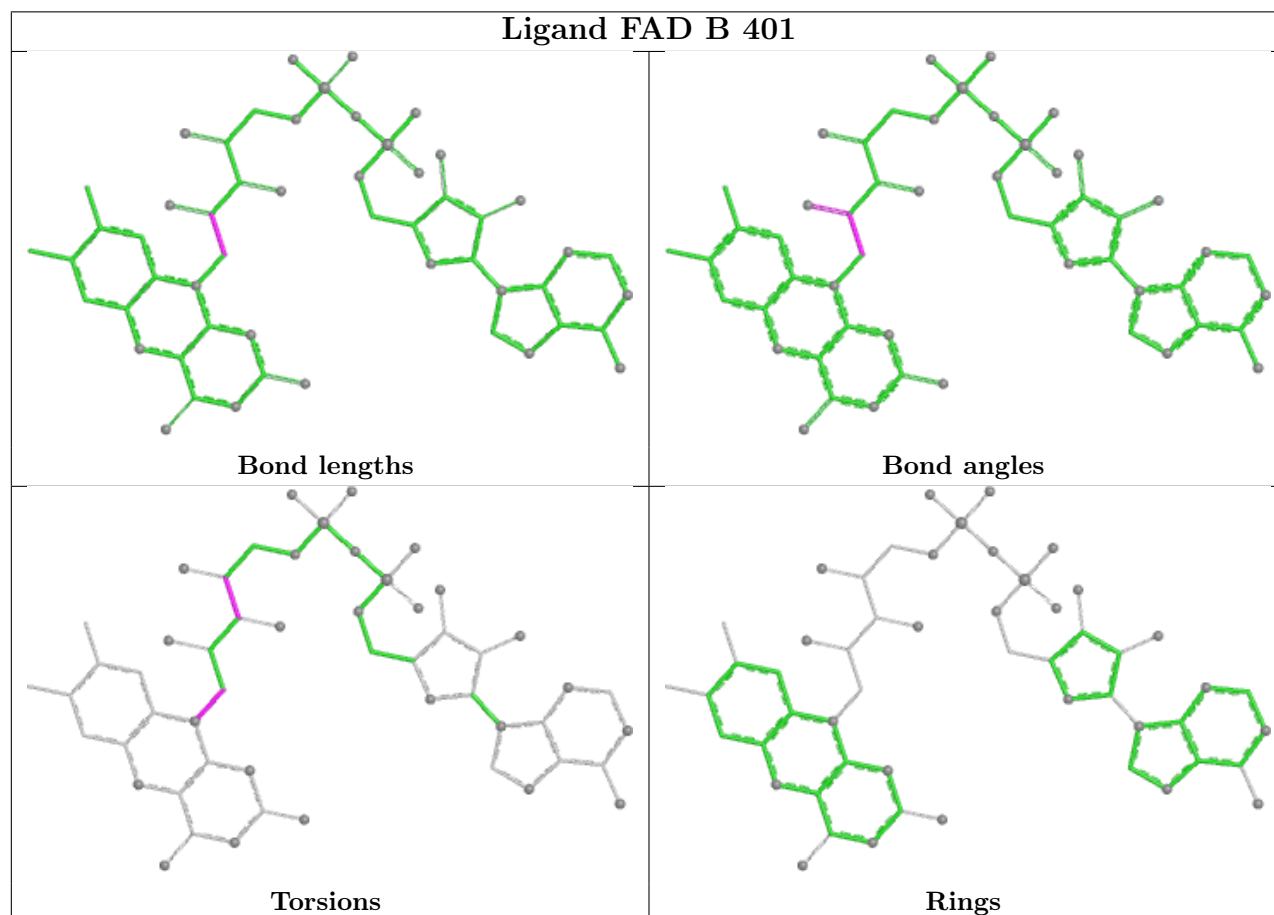
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	401	PGE	3	0
3	B	403	PGE	3	0

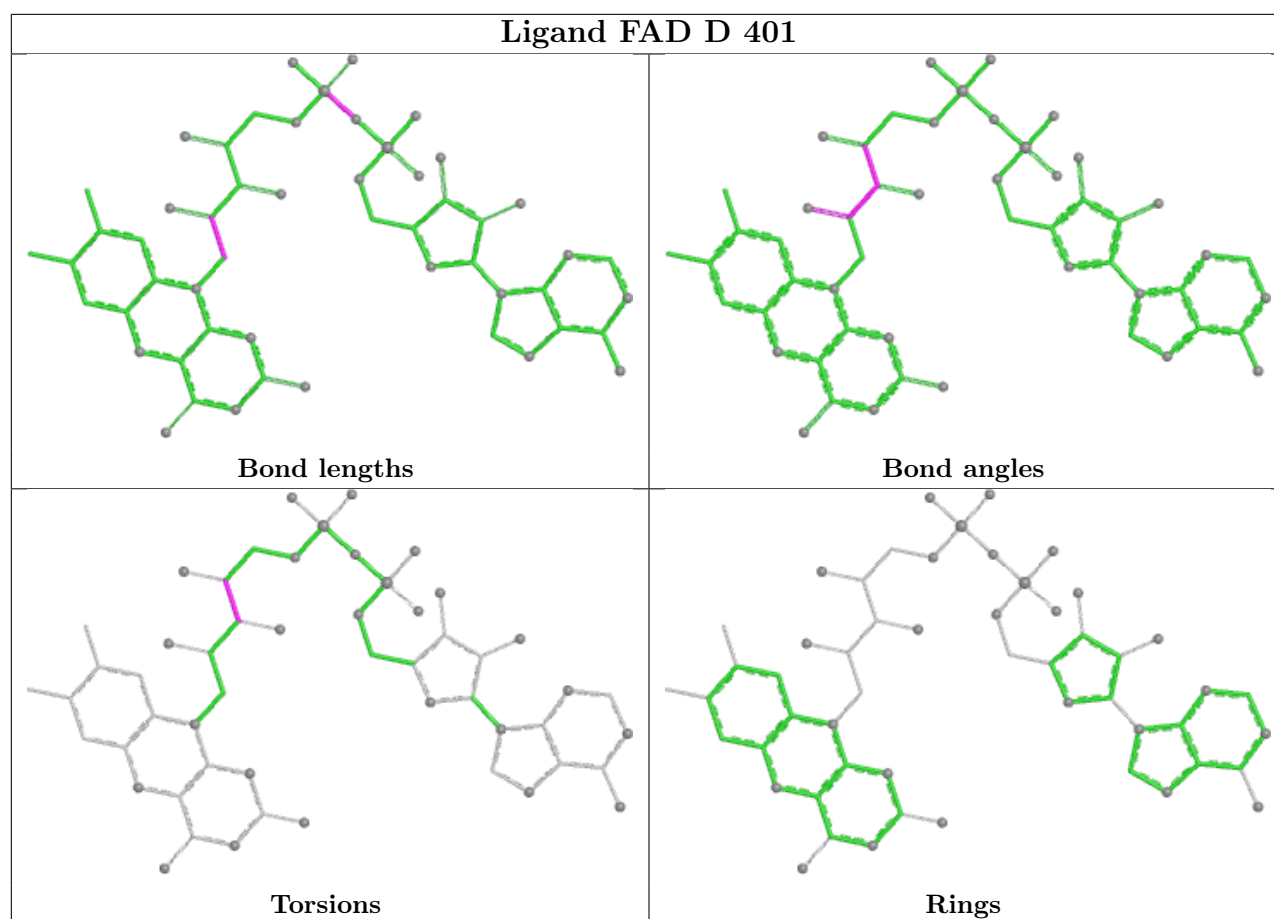
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	C	404	SO4	1	0
4	B	401	FAD	2	0
4	D	401	FAD	1	0

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 [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	363/364 (99%)	-0.54	3 (0%) 82 84	11, 27, 47, 70	6 (1%)
1	C	364/364 (100%)	-0.54	1 (0%) 90 91	12, 27, 50, 74	5 (1%)
2	B	384/407 (94%)	-0.50	0 100 100	11, 28, 52, 85	5 (1%)
2	D	384/407 (94%)	-0.58	1 (0%) 90 91	12, 27, 49, 89	6 (1%)
All	All	1495/1542 (96%)	-0.54	5 (0%) 90 91	11, 27, 50, 89	22 (1%)

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	363	ALA	2.9
2	D	383	ARG	2.3
1	A	1	MET	2.2
1	C	1	MET	2.1
1	A	291	ALA	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.

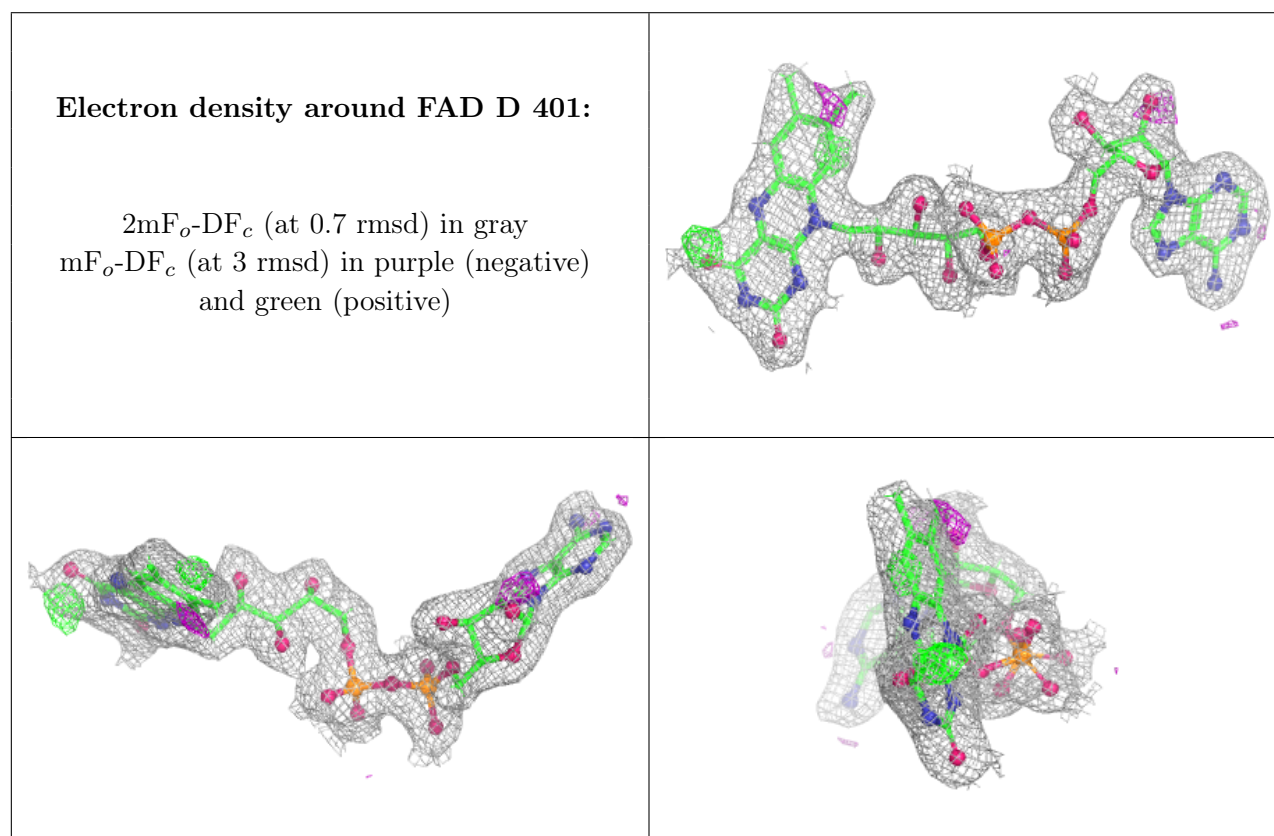
6.4 Ligands [i](#)

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.

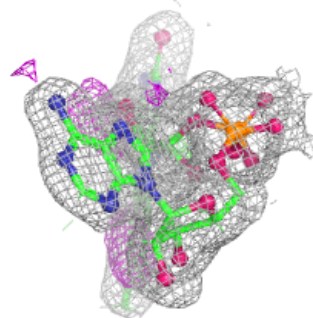
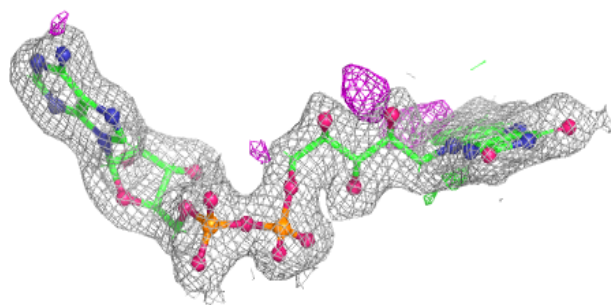
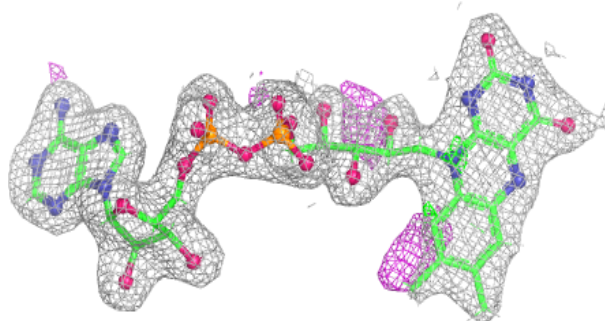
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PGE	A	401	10/10	0.73	0.16	60,72,76,77	24
3	PGE	B	403	10/10	0.85	0.11	48,60,69,69	24
6	MES	B	404	12/12	0.85	0.14	49,64,75,79	25
6	MES	D	404	12/12	0.85	0.15	45,54,61,67	25
3	PGE	D	403	10/10	0.86	0.12	28,37,46,49	24
5	CL	C	402	1/1	0.87	0.14	76,76,76,76	0
7	SO4	C	404	5/5	0.92	0.11	36,41,42,46	5
7	SO4	C	403	5/5	0.93	0.11	44,49,52,55	5
4	FAD	D	401	53/53	0.97	0.06	21,29,53,59	0
4	FAD	B	401	53/53	0.97	0.05	18,29,48,61	0
5	CL	D	402	1/1	0.98	0.09	52,52,52,52	0
5	CL	B	402	1/1	0.99	0.11	51,51,51,51	0
5	CL	C	401	1/1	0.99	0.03	29,29,29,29	1

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 FAD B 401:

$2mF_o - DF_c$ (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.