



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 07:32 PM UTC

PDB ID : 3BG6 / pdb_00003bg6
Title : Pyranose 2-oxidase from Trametes multicolor, E542K mutant
Authors : Tan, T.C.; Divne, C.
Deposited on : 2007-11-26
Resolution : 1.70 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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

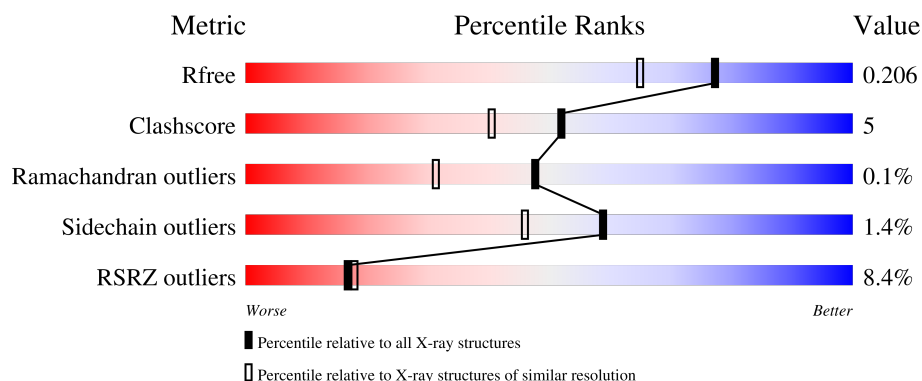
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.70 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	5551 (1.70-1.70)
Clashscore	190562	5924 (1.70-1.70)
Ramachandran outliers	187476	5846 (1.70-1.70)
Sidechain outliers	187428	5846 (1.70-1.70)
RSRZ outliers	180081	5554 (1.70-1.70)

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	623	7% 83% 8% 7%
1	B	623	6% 85% 7% 7%
1	C	623	10% 84% 8% 7%
1	D	623	7% 85% 7% 7%
1	E	623	8% 83% 9% 7%

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Mol	Chain	Length	Quality of chain
1	F	623	11% 84% 8% • 7%
1	G	623	7% 84% 8% • 7%
1	H	623	6% 83% 9% • 7%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 39362 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 Pyranose oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	B	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	C	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	D	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	E	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	F	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	G	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			
1	H	577	Total	C	N	O	S	0	0	0
			4549	2873	779	872	25			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	542	LYS	GLU	engineered mutation	UNP Q7ZA32
B	542	LYS	GLU	engineered mutation	UNP Q7ZA32
C	542	LYS	GLU	engineered mutation	UNP Q7ZA32
D	542	LYS	GLU	engineered mutation	UNP Q7ZA32
E	542	LYS	GLU	engineered mutation	UNP Q7ZA32
F	542	LYS	GLU	engineered mutation	UNP Q7ZA32
G	542	LYS	GLU	engineered mutation	UNP Q7ZA32
H	542	LYS	GLU	engineered mutation	UNP Q7ZA32

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



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	C	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	D	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	E	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	F	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	G	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	H	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	359	Total	O	0	0
			359	359		
3	B	373	Total	O	0	0
			373	373		
3	C	267	Total	O	0	0
			267	267		
3	D	314	Total	O	0	0
			314	314		

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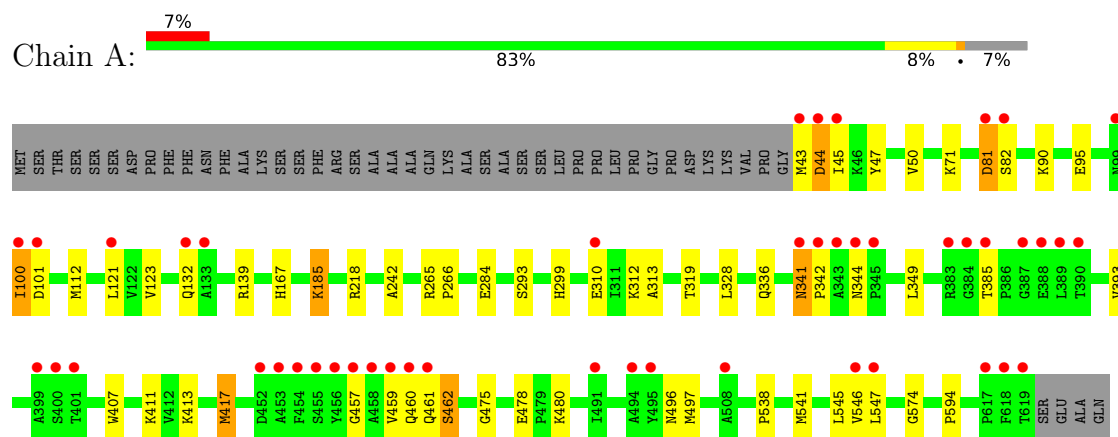
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	E	301	Total 301	O 301	0	0
3	F	262	Total 262	O 262	0	0
3	G	315	Total 315	O 315	0	0
3	H	355	Total 355	O 355	0	0

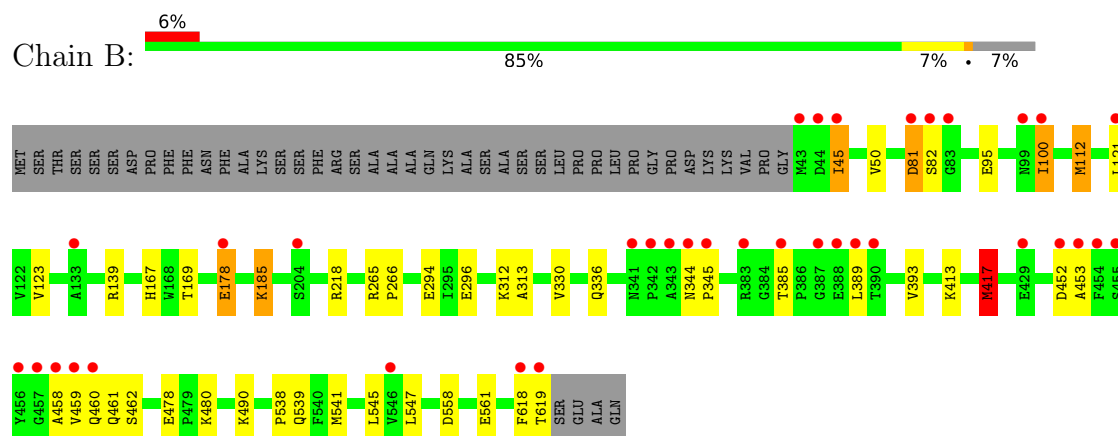
3 Residue-property plots [i](#)

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.

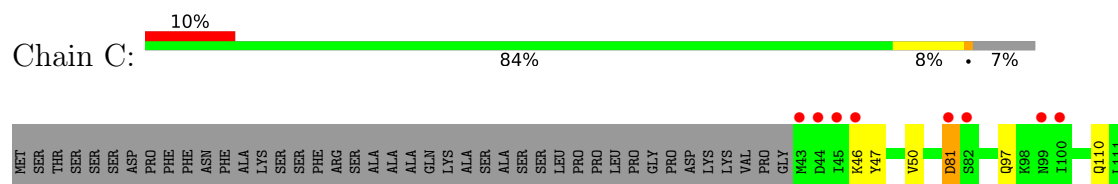
- Molecule 1: Pyranose oxidase

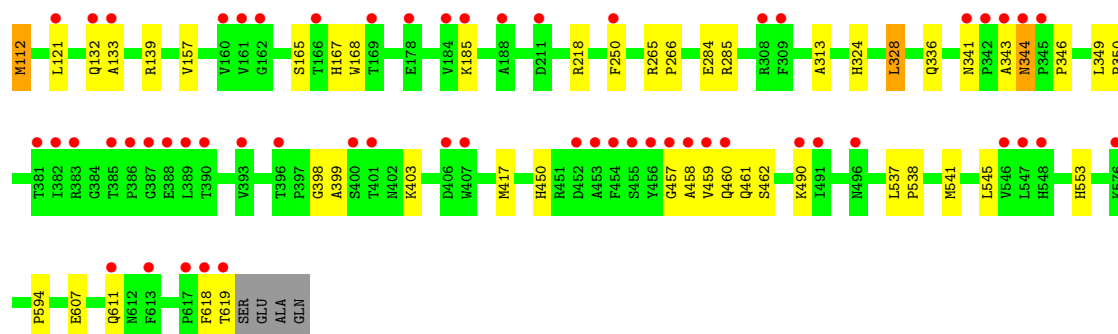


- Molecule 1: Pyranose oxidase

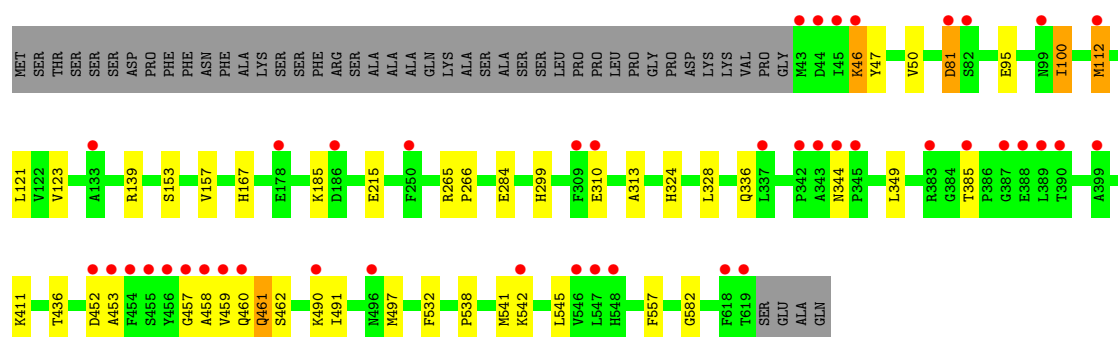
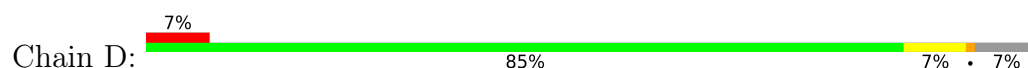


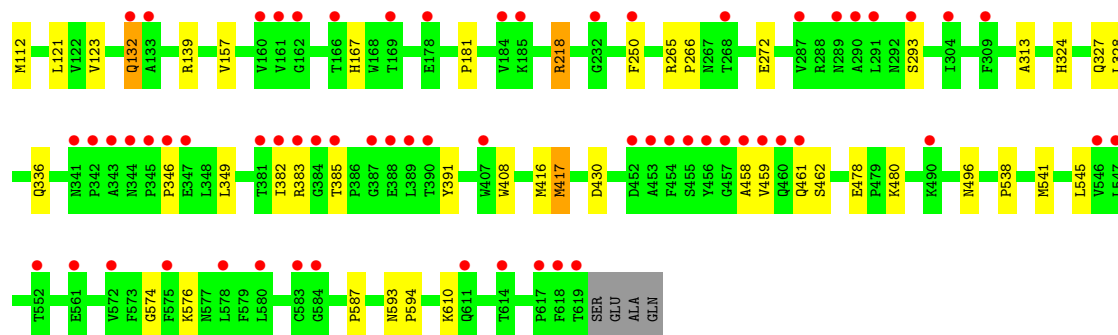
- Molecule 1: Pyranose oxidase



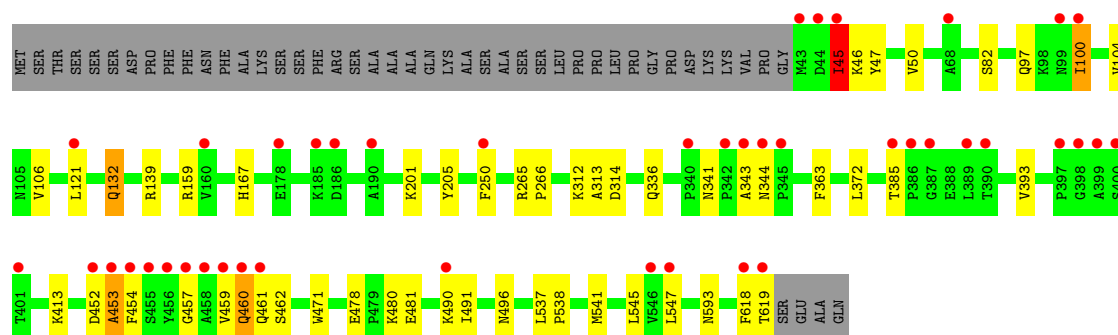
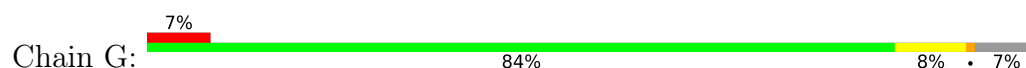


• Molecule 1: Pyranose oxidase

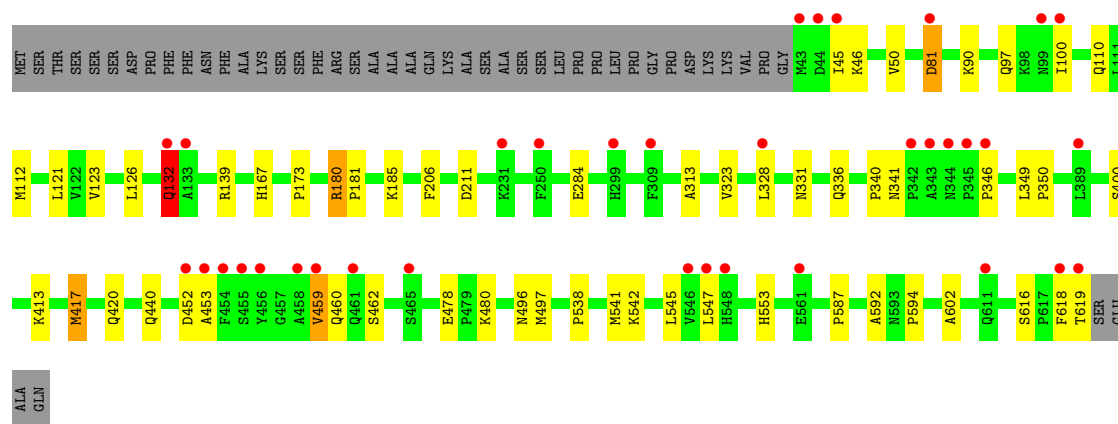
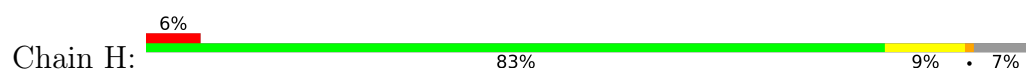




• Molecule 1: Pyranose oxidase



• Molecule 1: Pyranose oxidase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	168.86Å 103.75Å 169.33Å 90.00° 106.31° 90.00°	Depositor
Resolution (Å)	40.00 – 1.70 40.00 – 1.70	Depositor EDS
% Data completeness (in resolution range)	98.3 (40.00-1.70) 98.3 (40.00-1.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.07 (at 1.70Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.166 , 0.198 0.177 , 0.206	Depositor DCC
R_{free} test set	6061 reflections (0.99%)	wwPDB-VP
Wilson B-factor (Å ²)	17.8	Xtriage
Anisotropy	0.134	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 41.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.014 for l,-k,h	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	39362	wwPDB-VP
Average B, all atoms (Å ²)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.65% 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

5.1 Standard geometry

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

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	1.27	12/4665 (0.3%)	1.09	9/6342 (0.1%)
1	B	1.29	7/4665 (0.2%)	1.09	8/6342 (0.1%)
1	C	1.10	7/4665 (0.2%)	1.01	5/6342 (0.1%)
1	D	1.16	5/4665 (0.1%)	1.05	6/6342 (0.1%)
1	E	1.14	8/4665 (0.2%)	1.02	5/6342 (0.1%)
1	F	1.13	4/4665 (0.1%)	1.04	6/6342 (0.1%)
1	G	1.18	4/4665 (0.1%)	1.07	5/6342 (0.1%)
1	H	1.25	9/4665 (0.2%)	1.10	11/6342 (0.2%)
All	All	1.19	56/37320 (0.2%)	1.06	55/50736 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	D	0	1
All	All	0	2

The worst 5 of 56 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	291	LEU	CG-CD1	14.09	1.99	1.52
1	B	81	ASP	CA-C	9.78	1.65	1.52
1	C	81	ASP	CA-C	9.14	1.65	1.52
1	B	82	SER	N-CA	9.02	1.56	1.46
1	D	81	ASP	CA-C	8.19	1.63	1.52

The worst 5 of 55 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	139	ARG	NE-CZ-NH2	-11.97	108.43	119.20
1	B	139	ARG	NE-CZ-NH2	-9.69	110.48	119.20
1	D	139	ARG	NE-CZ-NH2	-8.91	111.18	119.20
1	H	139	ARG	NE-CZ-NH2	-8.73	111.34	119.20
1	A	139	ARG	NE-CZ-NH2	-8.67	111.40	119.20

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	43	MET	Peptide
1	D	436	THR	Peptide

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	4549	0	4402	50	0
1	B	4549	0	4402	49	0
1	C	4549	0	4402	48	0
1	D	4549	0	4402	46	0
1	E	4549	0	4402	52	0
1	F	4549	0	4402	47	0
1	G	4549	0	4402	52	0
1	H	4549	0	4402	46	0
2	A	53	0	30	11	0
2	B	53	0	31	12	0
2	C	53	0	29	4	0
2	D	53	0	31	7	0
2	E	53	0	30	5	0
2	F	53	0	29	8	0
2	G	53	0	31	13	0
2	H	53	0	30	5	0
3	A	359	0	0	4	0
3	B	373	0	0	5	0
3	C	267	0	0	3	0
3	D	314	0	0	1	0
3	E	301	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	262	0	0	5	0
3	G	315	0	0	6	0
3	H	355	0	0	4	0
All	All	39362	0	35457	360	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 5.

The worst 5 of 360 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:D:167:HIS:HE2	2:D:801:FAD:C8M	0.96	1.56
1:B:167:HIS:HE2	2:B:801:FAD:C8M	0.92	1.55
1:G:167:HIS:HE2	2:G:801:FAD:C8M	0.90	1.51
1:A:167:HIS:HE2	2:A:801:FAD:C8M	0.89	1.51
1:F:167:HIS:HE2	2:F:801:FAD:C8M	0.88	1.51

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	575/623 (92%)	557 (97%)	17 (3%)	1 (0%)	43	28
1	B	575/623 (92%)	555 (96%)	18 (3%)	2 (0%)	36	22
1	C	575/623 (92%)	561 (98%)	14 (2%)	0	100	100
1	D	575/623 (92%)	560 (97%)	15 (3%)	0	100	100
1	E	575/623 (92%)	558 (97%)	17 (3%)	0	100	100
1	F	575/623 (92%)	562 (98%)	13 (2%)	0	100	100
1	G	575/623 (92%)	558 (97%)	15 (3%)	2 (0%)	36	22

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	H	575/623 (92%)	557 (97%)	18 (3%)	0	100	100
All	All	4600/4984 (92%)	4468 (97%)	127 (3%)	5 (0%)	48	31

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	389	LEU
1	G	453	ALA
1	A	44	ASP
1	B	461	GLN
1	G	45	ILE

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	505/542 (93%)	498 (99%)	7 (1%)	59	46
1	B	505/542 (93%)	495 (98%)	10 (2%)	48	32
1	C	505/542 (93%)	499 (99%)	6 (1%)	63	51
1	D	505/542 (93%)	502 (99%)	3 (1%)	78	72
1	E	505/542 (93%)	499 (99%)	6 (1%)	63	51
1	F	505/542 (93%)	494 (98%)	11 (2%)	45	29
1	G	505/542 (93%)	499 (99%)	6 (1%)	63	51
1	H	505/542 (93%)	496 (98%)	9 (2%)	51	36
All	All	4040/4336 (93%)	3982 (99%)	58 (1%)	59	46

5 of 58 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	E	291	LEU
1	H	417	MET
1	F	272	GLU

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Mol	Chain	Res	Type
1	H	413	LYS
1	H	100	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 69 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	419	HIS
1	G	461	GLN
1	H	276	ASN
1	D	108	GLN
1	D	105	ASN

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](#)

8 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	$\# Z > 2$
2	FAD	A	801	1	58,58,58	1.54	11 (18%)	85,89,89	1.87	22 (25%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	FAD	D	801	1	58,58,58	1.53	6 (10%)	85,89,89	2.19	29 (34%)
2	FAD	C	801	1	58,58,58	1.69	12 (20%)	85,89,89	2.28	28 (32%)
2	FAD	B	801	1	58,58,58	1.64	10 (17%)	85,89,89	2.27	26 (30%)
2	FAD	H	801	1	58,58,58	1.39	7 (12%)	85,89,89	2.01	21 (24%)
2	FAD	F	801	1	58,58,58	1.60	9 (15%)	85,89,89	2.07	22 (25%)
2	FAD	G	801	1	58,58,58	1.31	8 (13%)	85,89,89	1.88	22 (25%)
2	FAD	E	801	1	58,58,58	1.69	12 (20%)	85,89,89	1.95	21 (24%)

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
2	FAD	A	801	1	-	2/34/50/50	0/6/6/6
2	FAD	D	801	1	-	3/34/50/50	0/6/6/6
2	FAD	C	801	1	-	2/34/50/50	0/6/6/6
2	FAD	B	801	1	-	1/34/50/50	0/6/6/6
2	FAD	H	801	1	-	1/34/50/50	0/6/6/6
2	FAD	F	801	1	-	3/34/50/50	0/6/6/6
2	FAD	G	801	1	-	2/34/50/50	0/6/6/6
2	FAD	E	801	1	-	0/34/50/50	0/6/6/6

The worst 5 of 75 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	801	FAD	P-O3P	6.73	1.66	1.59
2	F	801	FAD	PA-O3P	6.56	1.66	1.59
2	C	801	FAD	PA-O3P	5.59	1.65	1.59
2	E	801	FAD	PA-O3P	5.00	1.64	1.59
2	E	801	FAD	P-O3P	4.71	1.64	1.59

The worst 5 of 191 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	801	FAD	C4A-N9A-C8A	8.76	114.94	105.74
2	D	801	FAD	C4A-N9A-C8A	7.02	113.11	105.74
2	F	801	FAD	C4A-N9A-C8A	6.98	113.06	105.74
2	B	801	FAD	N3A-C2A-N1A	-6.72	118.41	128.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	801	FAD	N9A-C8A-N7A	-6.60	104.58	113.94

There are no chirality outliers.

5 of 14 torsion outliers are listed below:

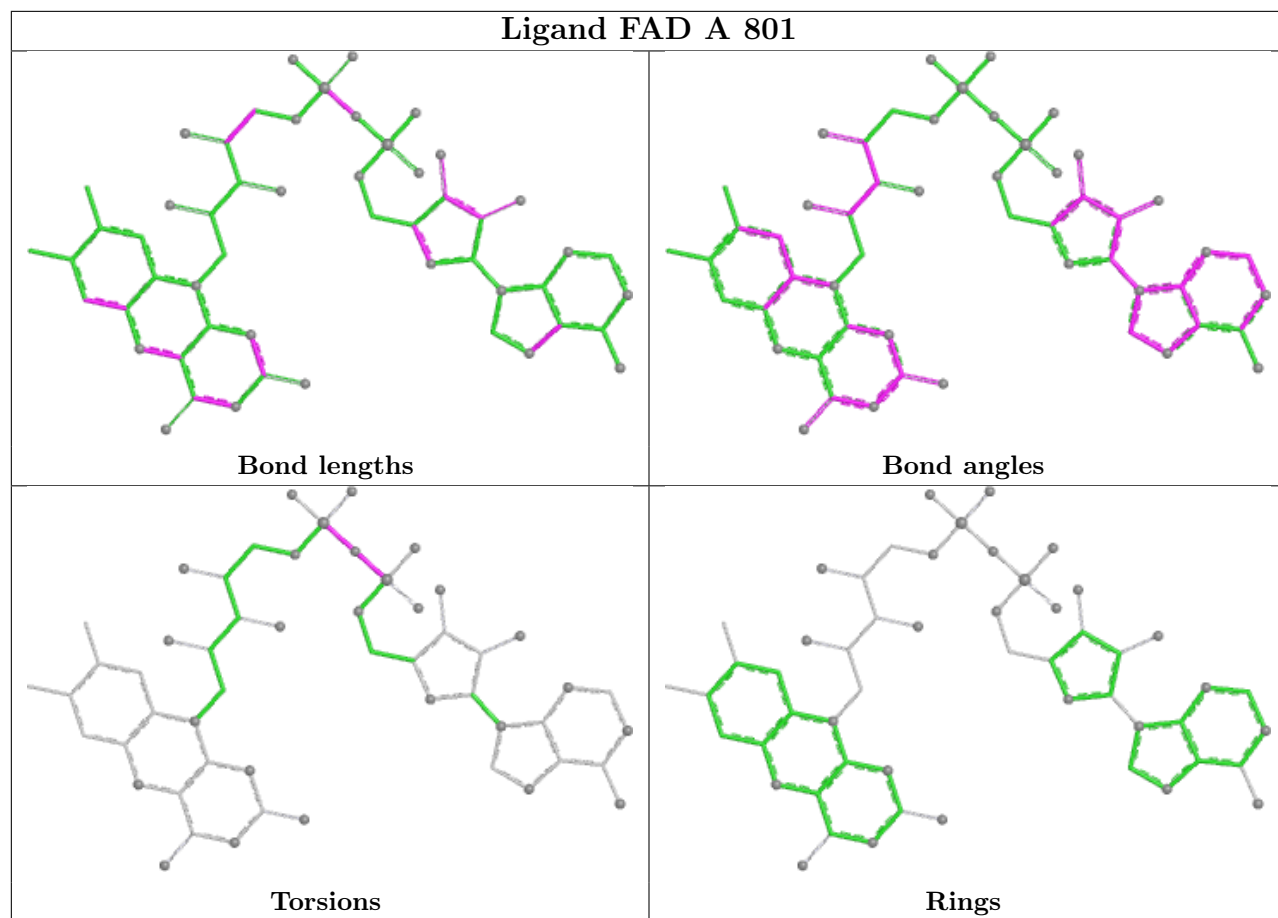
Mol	Chain	Res	Type	Atoms
2	A	801	FAD	PA-O3P-P-O5'
2	D	801	FAD	PA-O3P-P-O5'
2	F	801	FAD	PA-O3P-P-O5'
2	B	801	FAD	PA-O3P-P-O5'
2	C	801	FAD	PA-O3P-P-O5'

There are no ring outliers.

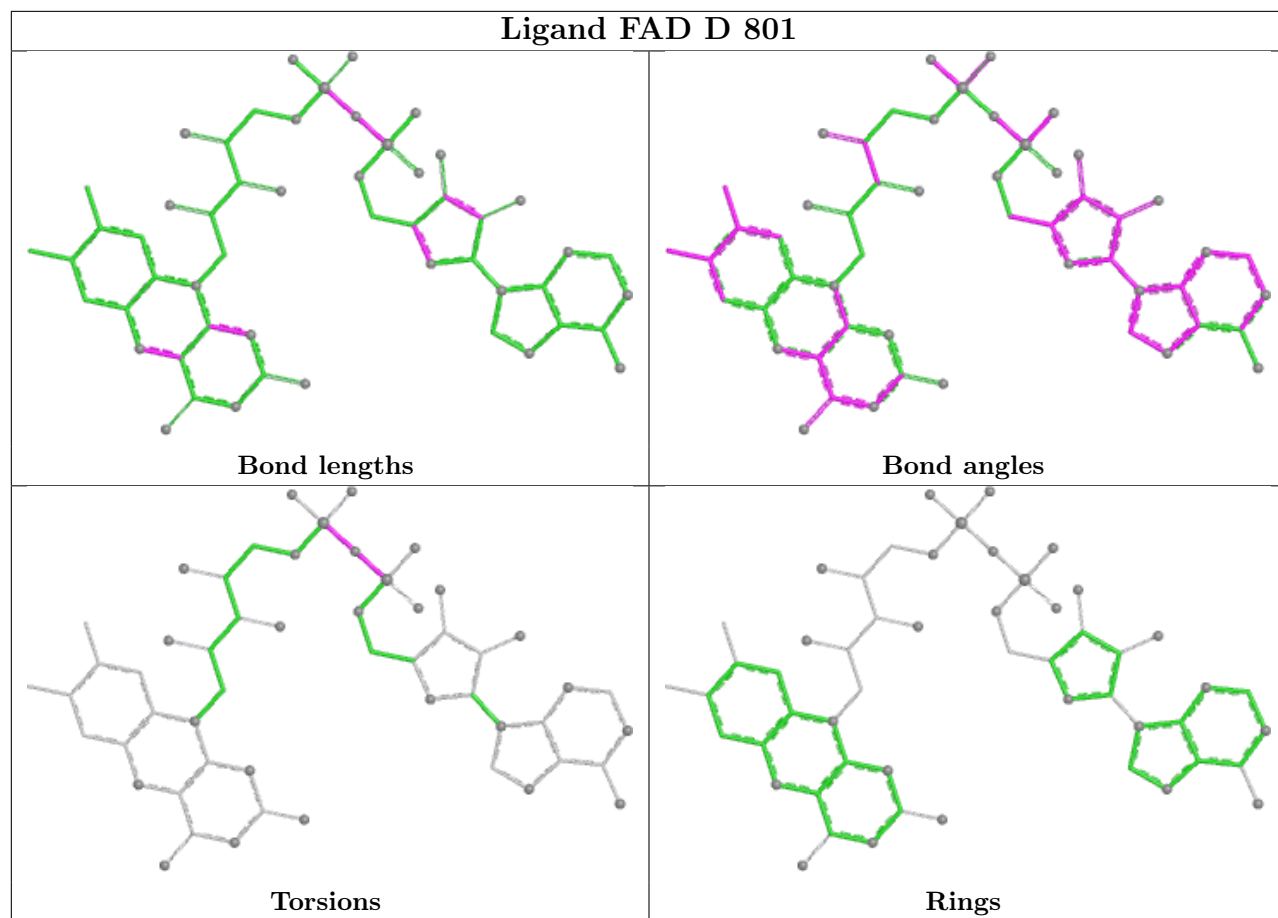
8 monomers are involved in 65 short contacts:

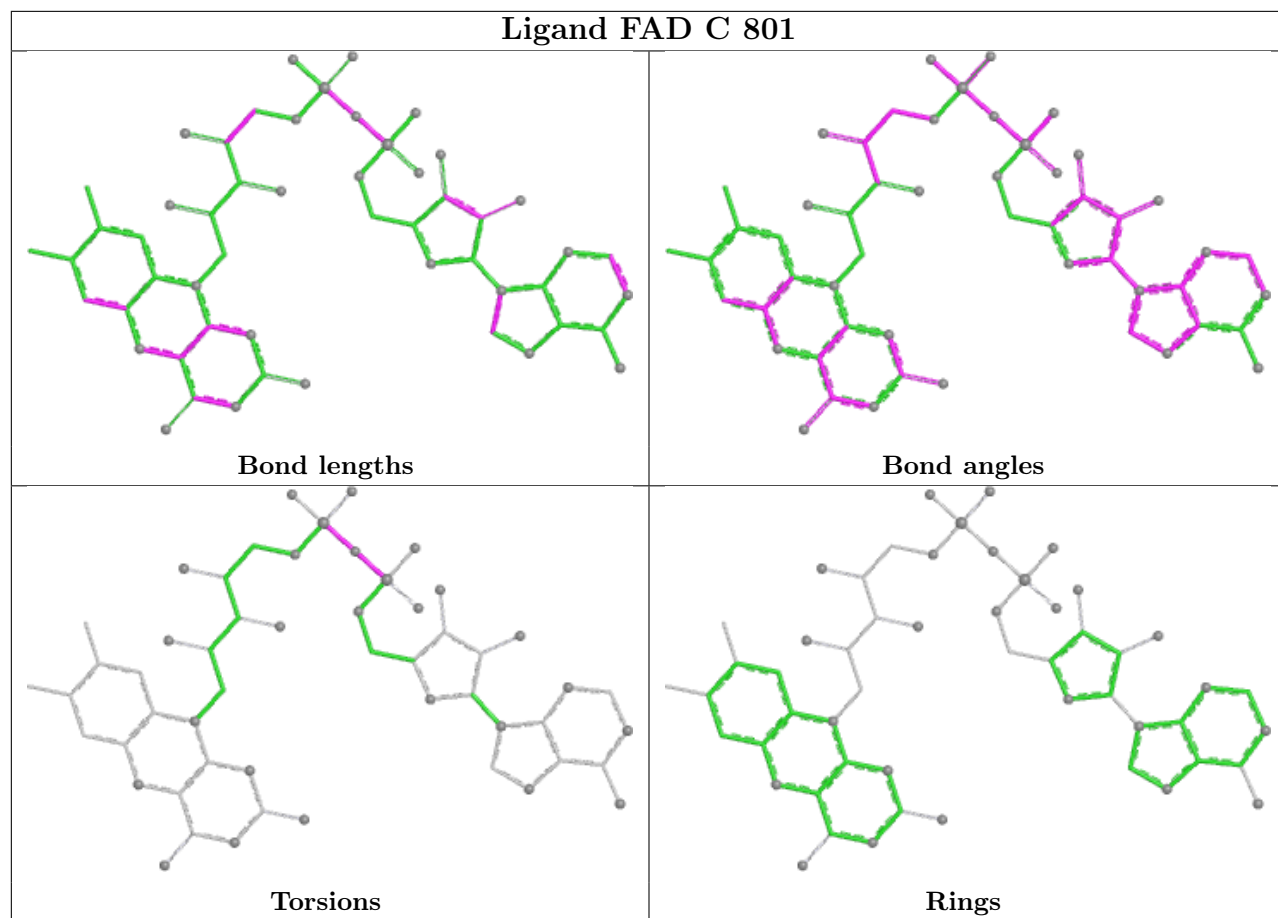
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	FAD	11	0
2	D	801	FAD	7	0
2	C	801	FAD	4	0
2	B	801	FAD	12	0
2	H	801	FAD	5	0
2	F	801	FAD	8	0
2	G	801	FAD	13	0
2	E	801	FAD	5	0

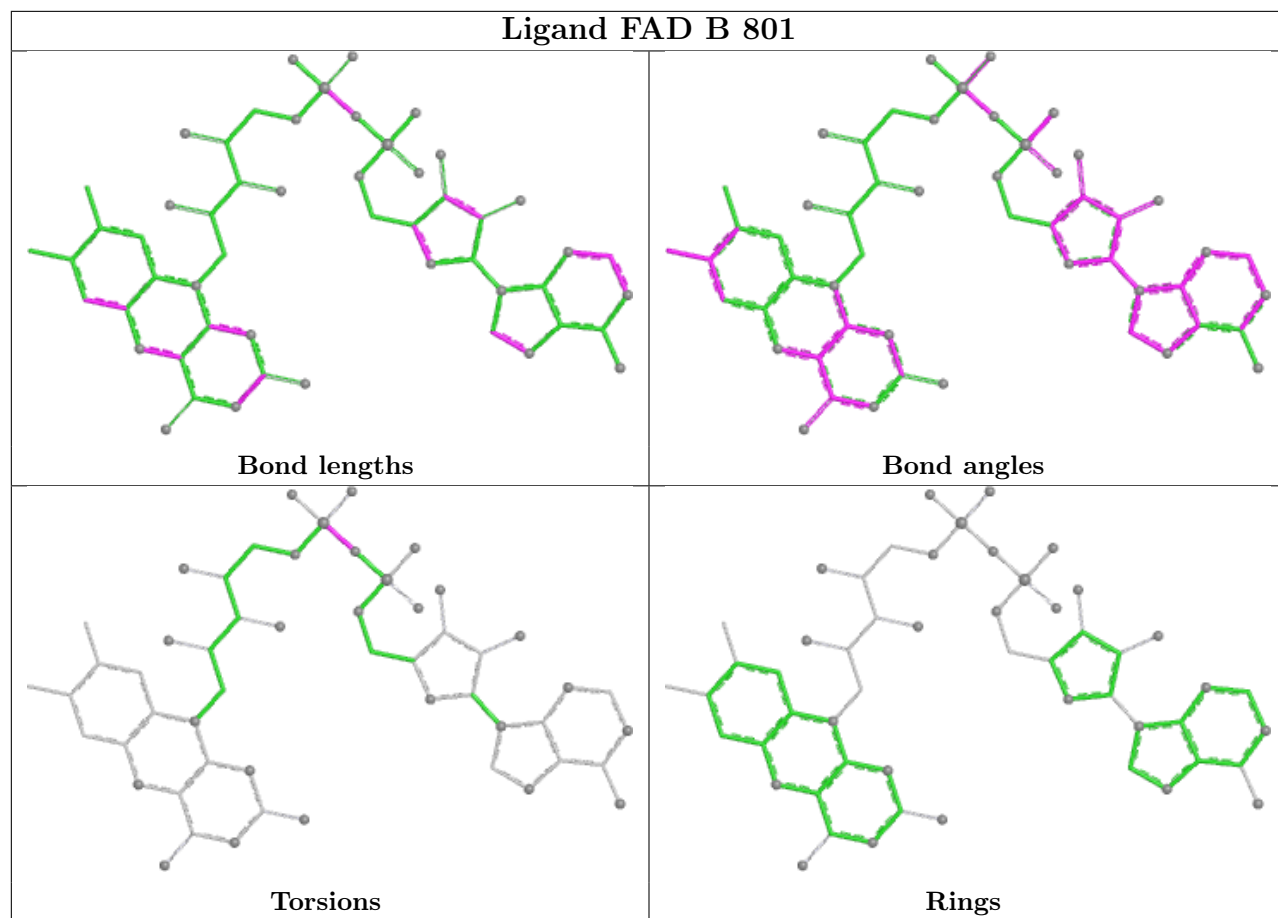
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

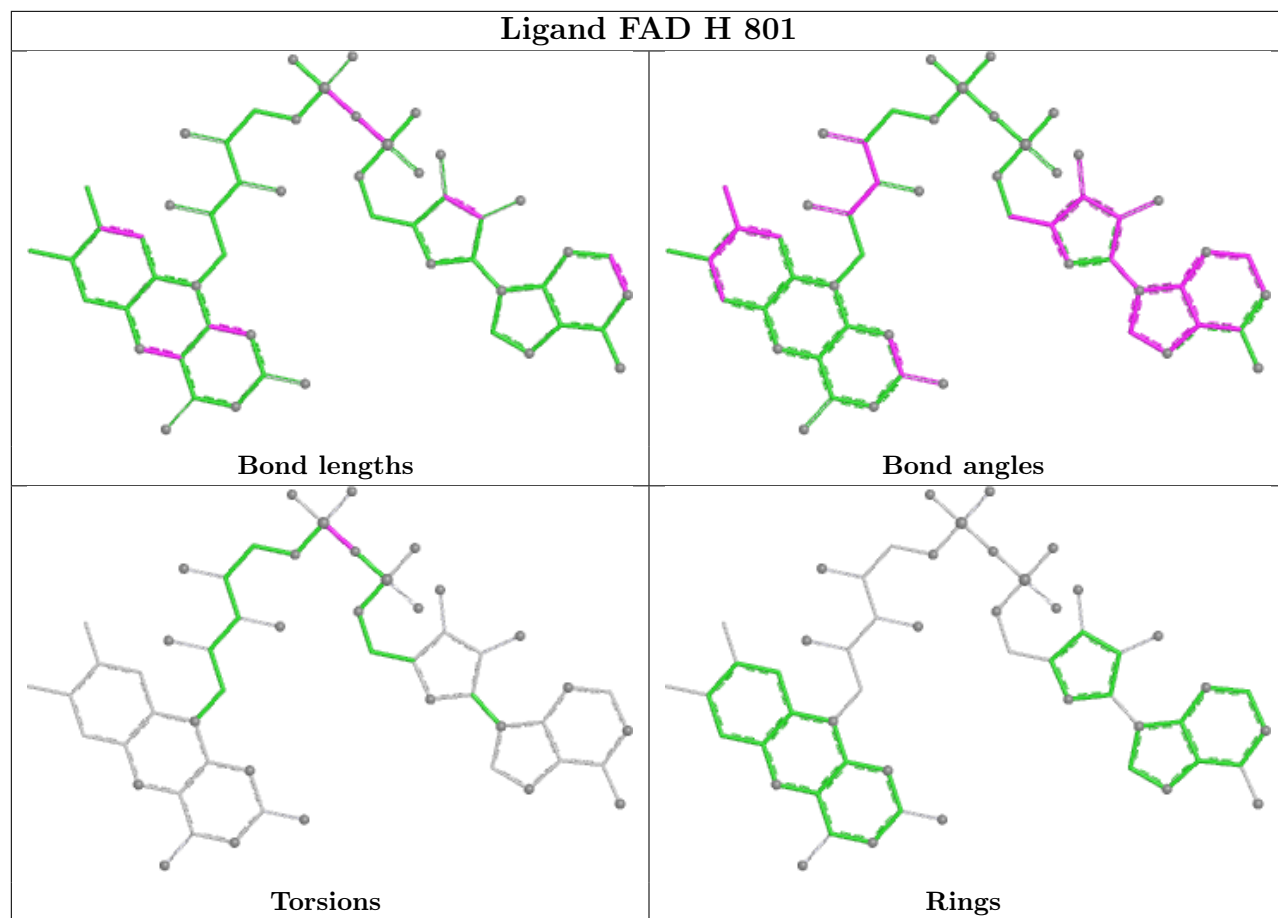


Ligand FAD D 801

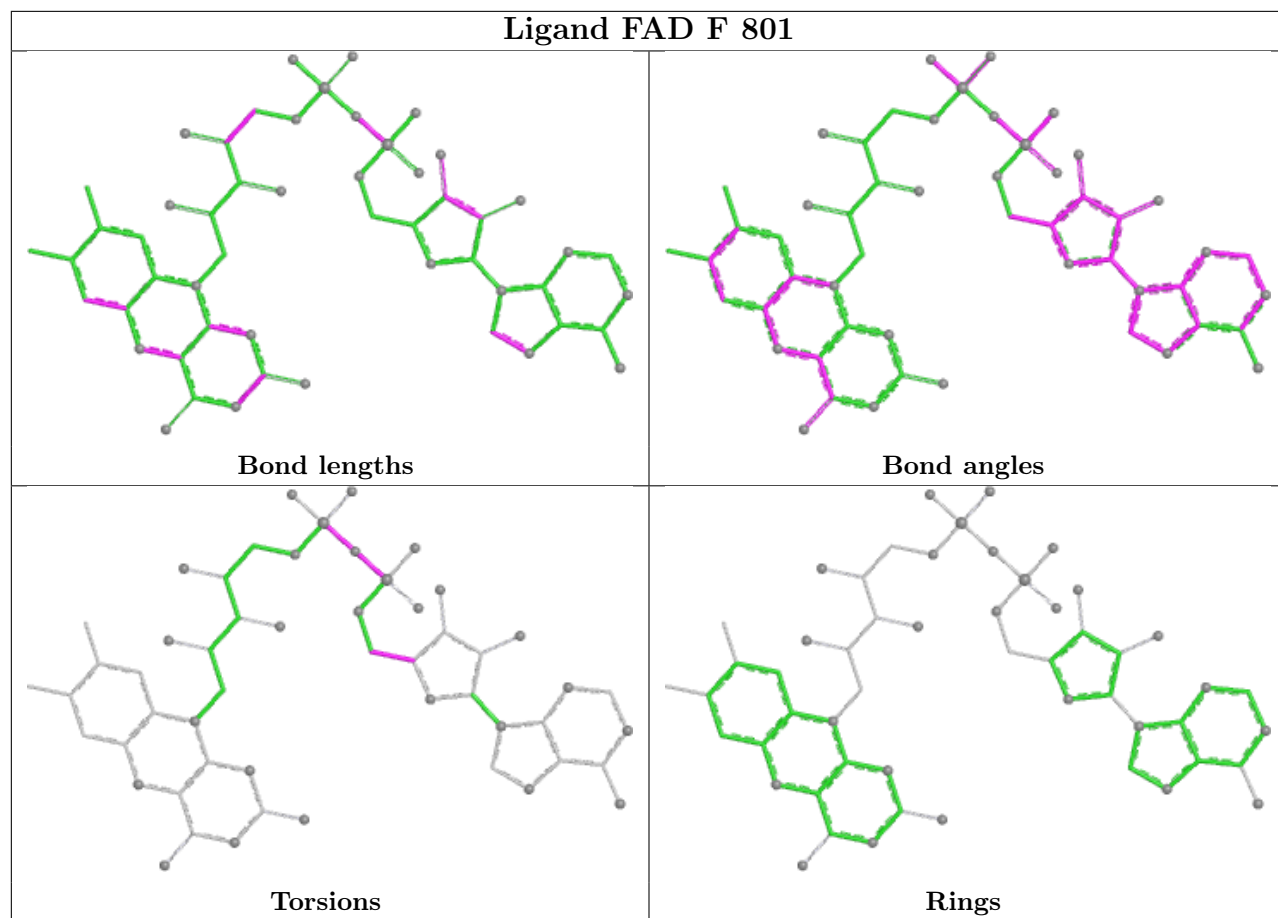


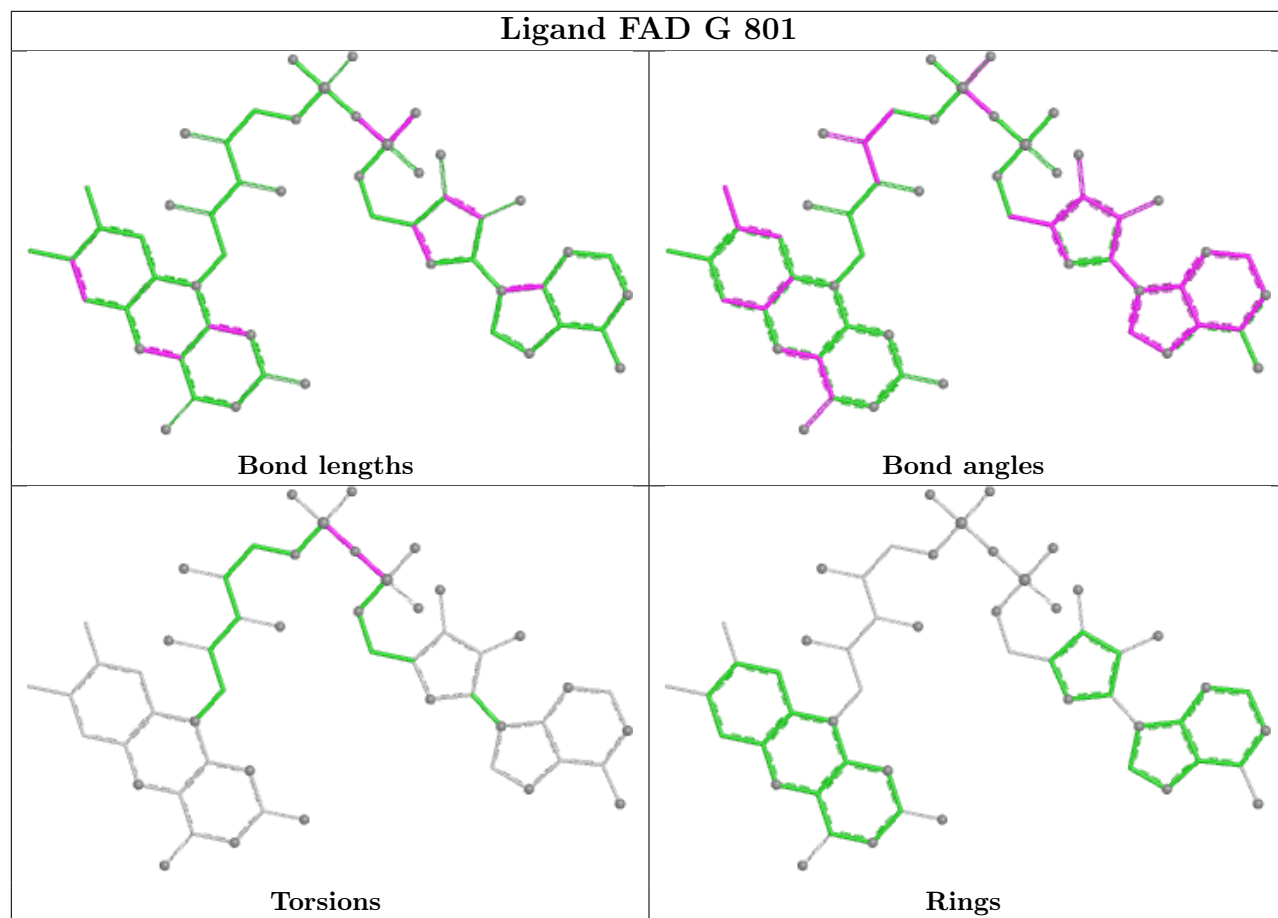


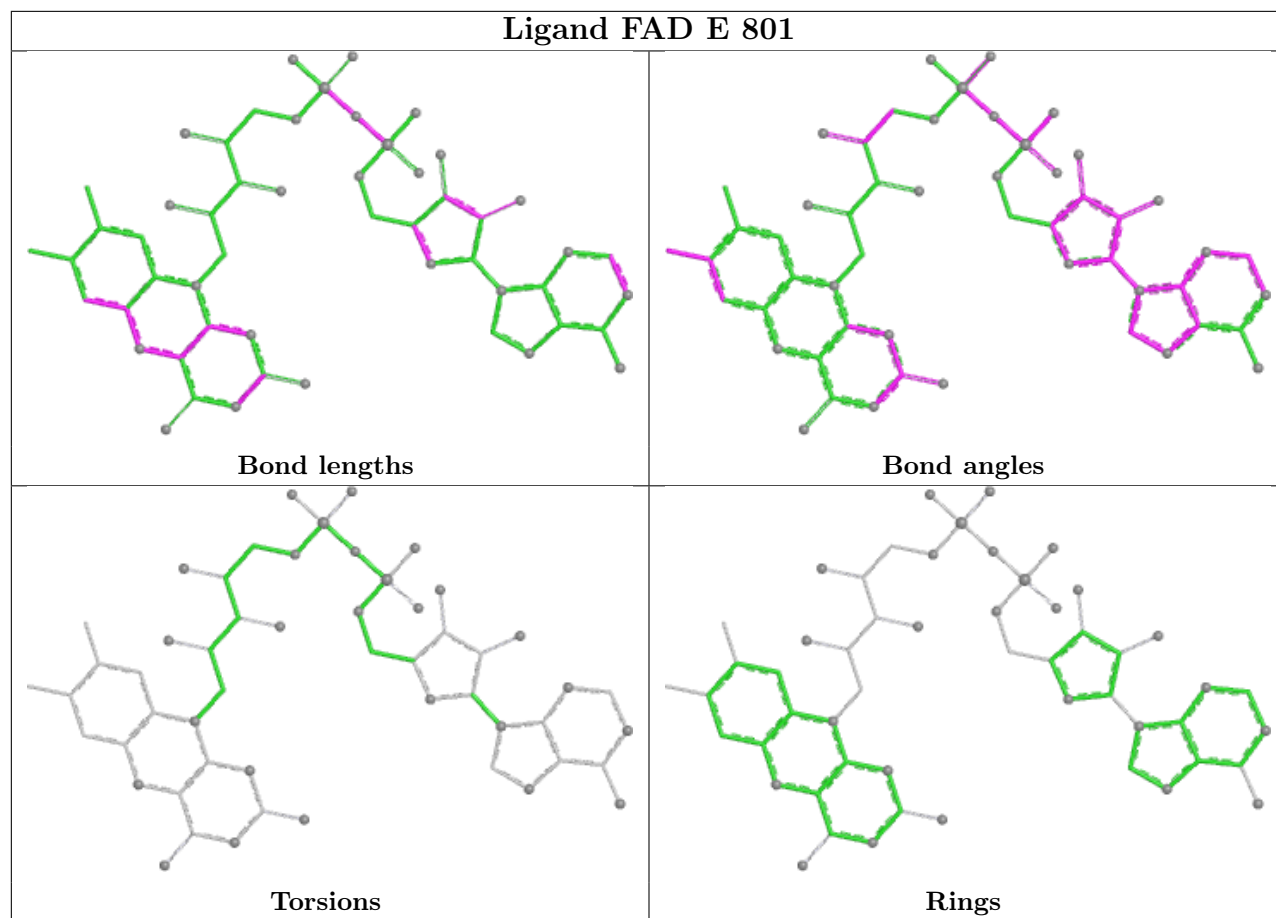




Ligand FAD F 801







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, 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	577/623 (92%)	0.44	46 (7%) 18 19	15, 21, 40, 56	0
1	B	577/623 (92%)	0.38	36 (6%) 26 29	17, 22, 39, 65	0
1	C	577/623 (92%)	0.91	65 (11%) 10 10	20, 27, 45, 65	0
1	D	577/623 (92%)	0.64	43 (7%) 20 22	19, 25, 41, 62	0
1	E	577/623 (92%)	0.67	50 (8%) 16 17	18, 26, 42, 63	0
1	F	577/623 (92%)	0.92	70 (12%) 8 8	19, 27, 42, 64	0
1	G	577/623 (92%)	0.59	43 (7%) 20 22	18, 24, 42, 59	0
1	H	577/623 (92%)	0.48	35 (6%) 27 29	18, 23, 38, 61	0
All	All	4616/4984 (92%)	0.63	388 (8%) 17 18	15, 25, 42, 65	0

The worst 5 of 388 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	619	THR	10.1
1	B	45	ILE	9.2
1	A	459	VAL	9.2
1	D	459	VAL	8.6
1	E	619	THR	8.5

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 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($\text{\AA}^2$)	Q<0.9
2	FAD	C	801	53/53	0.95	0.08	7,16,21,24	0
2	FAD	E	801	53/53	0.96	0.07	14,18,21,22	0
2	FAD	D	801	53/53	0.97	0.06	14,17,20,20	0
2	FAD	B	801	53/53	0.97	0.07	10,15,17,21	0
2	FAD	F	801	53/53	0.97	0.06	16,19,21,22	0
2	FAD	A	801	53/53	0.98	0.06	12,17,21,23	0
2	FAD	G	801	53/53	0.98	0.05	14,18,20,21	0
2	FAD	H	801	53/53	0.98	0.05	11,15,18,19	0

6.5 Other polymers [i](#)

There are no such residues in this entry.