



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 22, 2024 – 07:34 PM EDT

PDB ID : 6H3O  
Title : Alcohol oxidase from Phanerochaete chrysosporium mutant F101S  
Authors : Nguyen, Q.-T.; Romero, E.; Dijkman, W.P.; de Vasconcellos, S.P.; Binda, C.;  
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Deposited on : 2018-07-19  
Resolution : 2.50 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 1.20.1  
EDS : 2.37.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

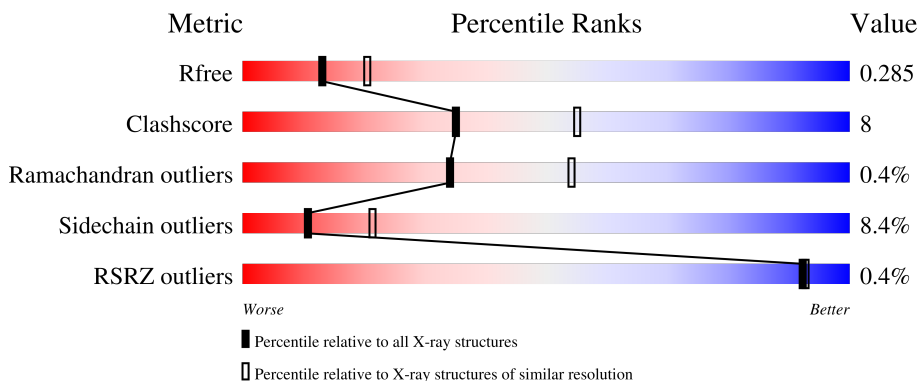
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.50 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))
$R_{free}$	130704	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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  $\geq 3$ , 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	651	
1	B	651	
1	C	651	
1	D	651	
1	E	651	

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Mol	Chain	Length	Quality of chain
1	F	651	 78% 18% •
1	G	651	 76% 20% •
1	H	651	 76% 20% •

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 41785 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.

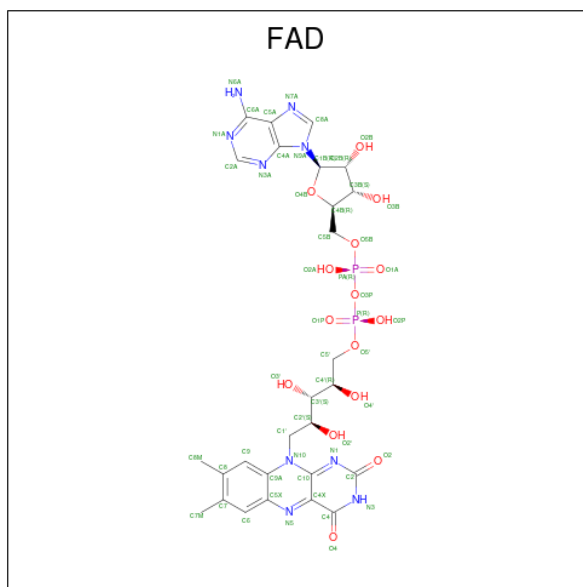
- Molecule 1 is a protein called Alcohol oxidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	649	5095	3200	904	966	25	0	1	0
1	B	647	5067	3184	896	962	25	0	0	0
1	C	648	5078	3190	900	963	25	0	0	0
1	D	649	5088	3196	903	964	25	0	0	0
1	E	648	5078	3190	900	963	25	0	0	0
1	F	650	5092	3198	904	965	25	0	0	0
1	G	648	5078	3190	900	963	25	0	0	0
1	H	648	5078	3190	900	963	25	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	101	SER	PHE	engineered mutation	UNP T2M2J4
B	101	SER	PHE	engineered mutation	UNP T2M2J4
C	101	SER	PHE	engineered mutation	UNP T2M2J4
D	101	SER	PHE	engineered mutation	UNP T2M2J4
E	101	SER	PHE	engineered mutation	UNP T2M2J4
F	101	SER	PHE	engineered mutation	UNP T2M2J4
G	101	SER	PHE	engineered mutation	UNP T2M2J4
H	101	SER	PHE	engineered mutation	UNP T2M2J4

- 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	Total 53	27	9	15	2	0	0
2	B	1	Total 53	27	9	15	2	0	0
2	C	1	Total 53	27	9	15	2	0	0
2	D	1	Total 53	27	9	15	2	0	0
2	E	1	Total 53	27	9	15	2	0	0
2	F	1	Total 53	27	9	15	2	0	0
2	G	1	Total 53	27	9	15	2	0	0
2	H	1	Total 53	27	9	15	2	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total C O 6 3 3	0	0
3	H	1	Total C O 6 3 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	75	Total O 75 75	0	0
4	B	112	Total O 112 112	0	0
4	C	95	Total O 95 95	0	0
4	D	111	Total O 111 111	0	0
4	E	49	Total O 49 49	0	0
4	F	78	Total O 78 78	0	0
4	G	72	Total O 72 72	0	0
4	H	103	Total O 103 103	0	0

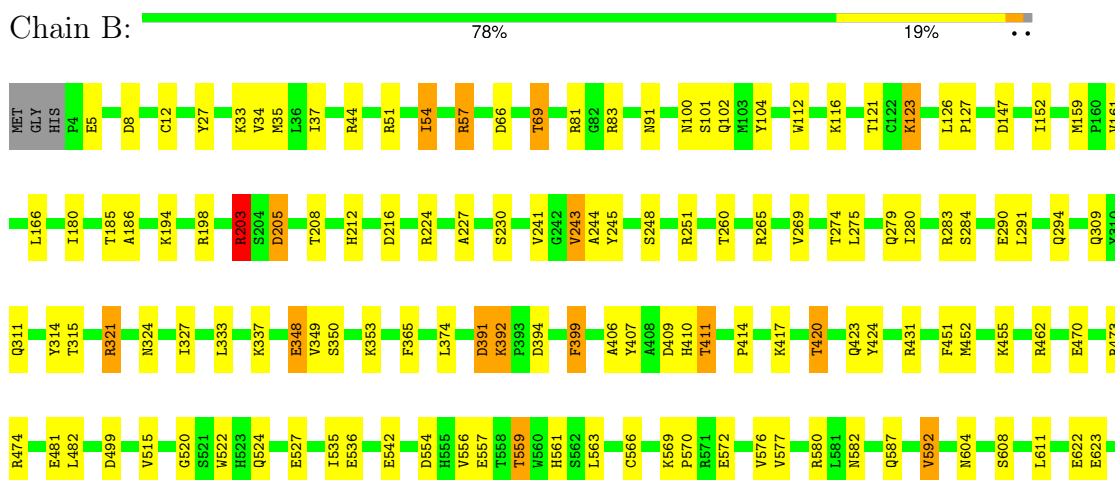
### 3 Residue-property plots [i](#)

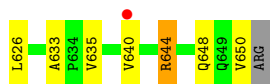
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Alcohol oxidase



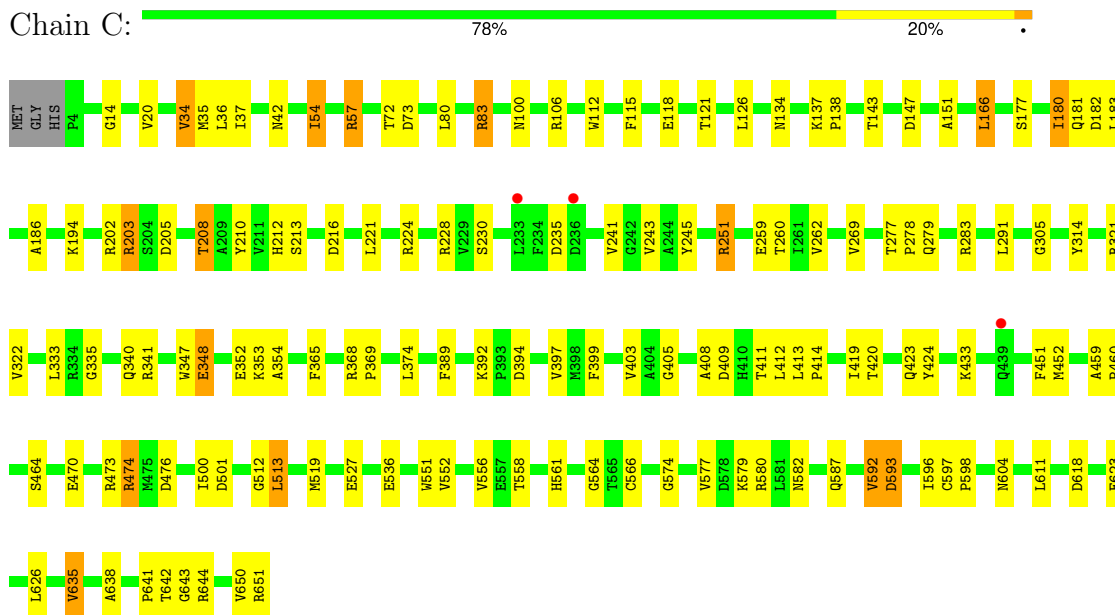
- Molecule 1: Alcohol oxidase





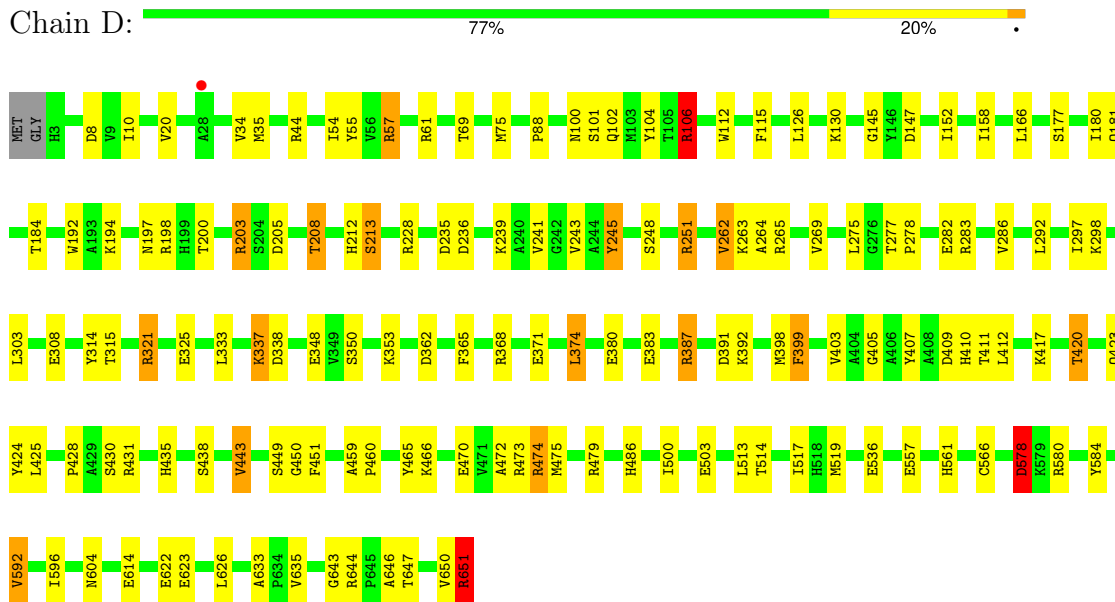
• Molecule 1: Alcohol oxidase

Chain C:



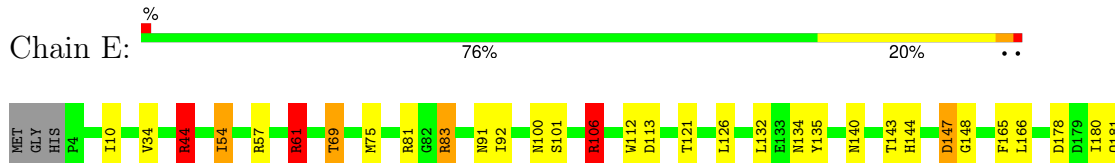
• Molecule 1: Alcohol oxidase

Chain D:

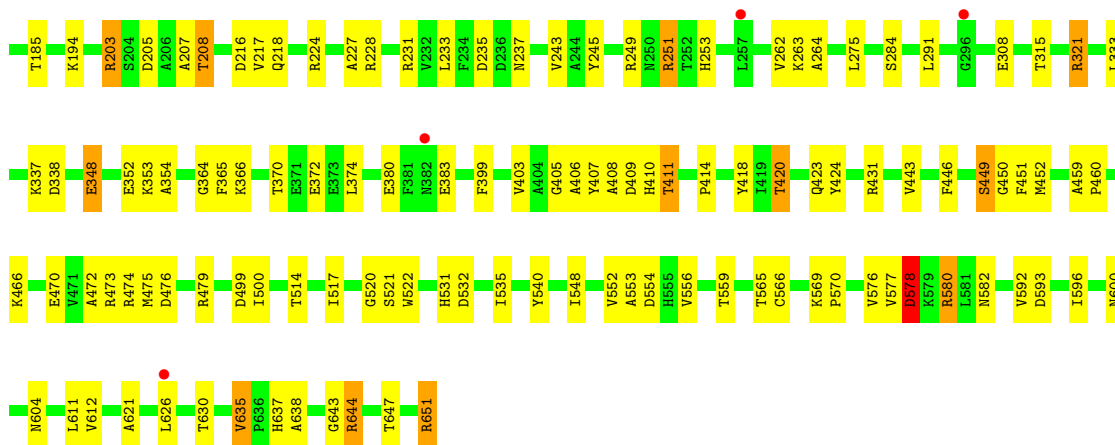


• Molecule 1: Alcohol oxidase

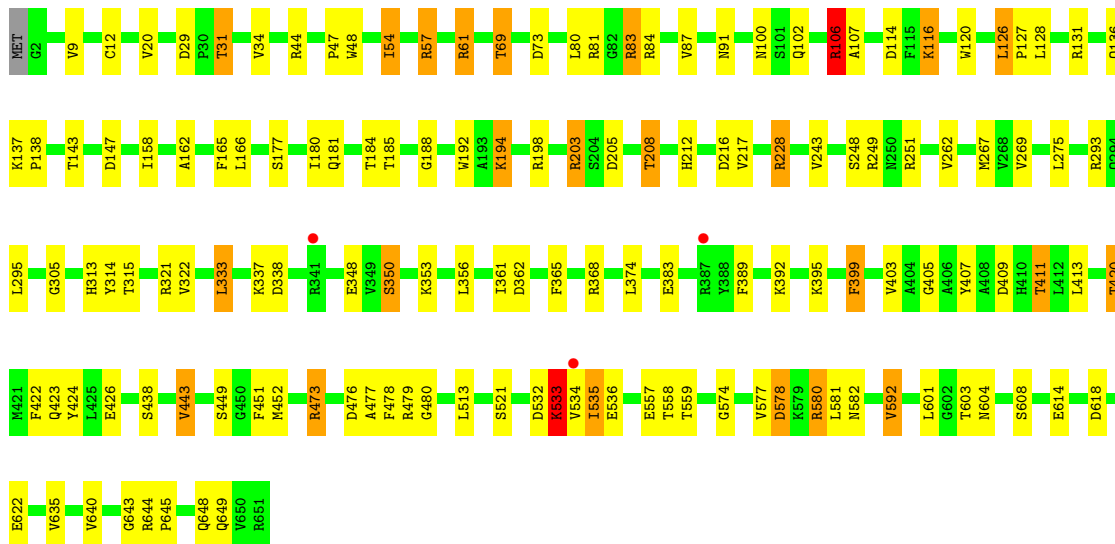
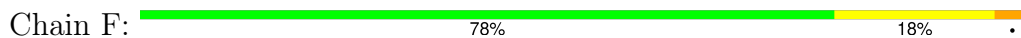
Chain E:



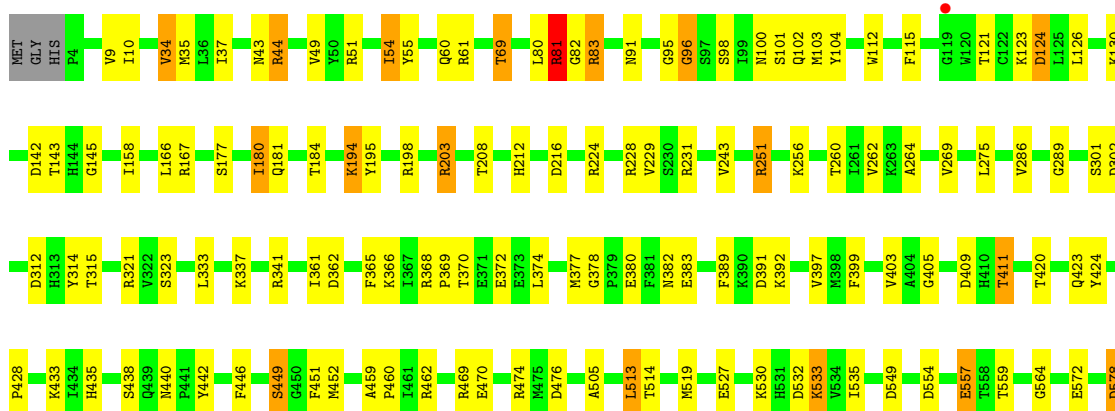




• Molecule 1: Alcohol oxidase

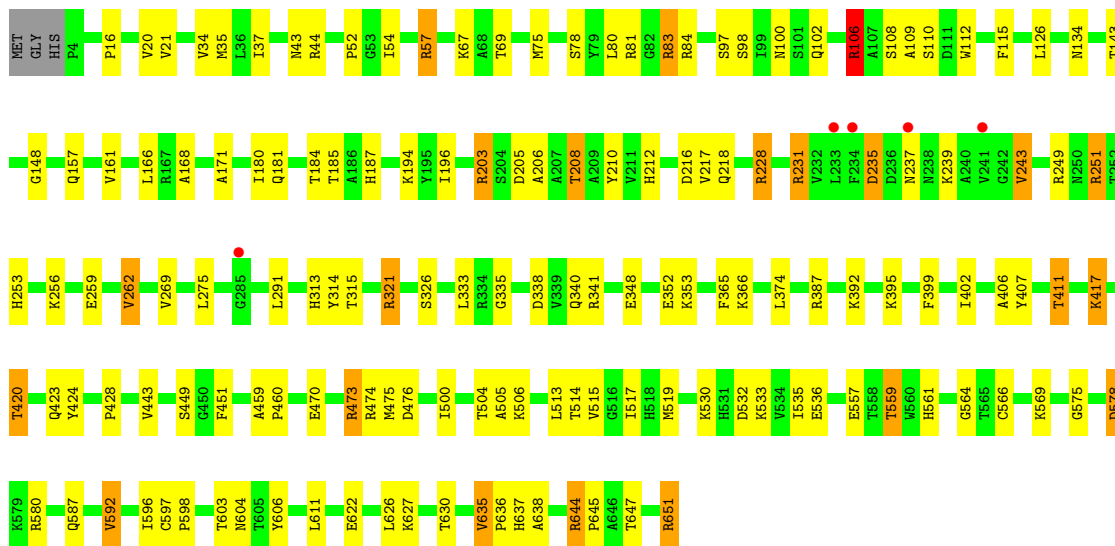
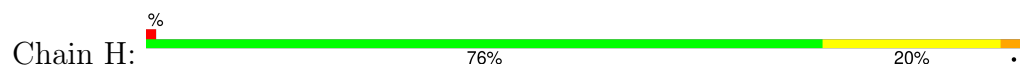


• Molecule 1: Alcohol oxidase





- Molecule 1: Alcohol oxidase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	112.07Å 203.55Å 116.01Å 90.00° 104.64° 90.00°	Depositor
Resolution (Å)	49.19 – 2.50 49.14 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.4 (49.19-2.50) 98.4 (49.14-2.50)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.70 (at 2.51Å)	Xtrriage
Refinement program	REFMAC 5.8.0230	Depositor
R, $R_{free}$	0.210 , 0.286 0.214 , 0.285	Depositor DCC
$R_{free}$ test set	8397 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	31.2	Xtrriage
Anisotropy	0.067	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 35.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	0.025 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	41785	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	33.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.94% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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, GOL

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	0.40	0/5220	0.64	0/7088
1	B	0.40	0/5191	0.64	0/7048
1	C	0.40	0/5202	0.64	0/7062
1	D	0.42	0/5213	0.66	1/7078 (0.0%)
1	E	0.39	0/5202	0.64	0/7062
1	F	0.40	0/5217	0.65	0/7083
1	G	0.39	0/5202	0.65	0/7062
1	H	0.40	0/5202	0.65	0/7062
All	All	0.40	0/41649	0.65	1/56545 (0.0%)

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	5
1	B	0	4
1	C	0	5
1	D	0	5
1	E	0	7
1	F	0	9
1	G	0	11
1	H	0	11
All	All	0	57

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	578	ASP	CB-CA-C	-5.72	98.96	110.40

There are no chirality outliers.

5 of 57 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	203	ARG	Sidechain
1	A	224	ARG	Sidechain
1	A	265	ARG	Sidechain
1	A	321	ARG	Sidechain
1	A	571	ARG	Sidechain

## 5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of 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	5095	0	4969	98	0
1	B	5067	0	4944	81	0
1	C	5078	0	4957	92	0
1	D	5088	0	4963	95	0
1	E	5078	0	4957	83	0
1	F	5092	0	4966	91	0
1	G	5078	0	4957	91	0
1	H	5078	0	4957	96	0
2	A	53	0	31	2	0
2	B	53	0	31	3	0
2	C	53	0	31	2	0
2	D	53	0	31	3	0
2	E	53	0	31	2	0
2	F	53	0	31	3	0
2	G	53	0	31	3	0
2	H	53	0	31	3	0
3	B	6	0	8	0	0
3	H	6	0	8	0	0
4	A	75	0	0	3	0
4	B	112	0	0	2	0
4	C	95	0	0	1	0
4	D	111	0	0	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	E	49	0	0	2	0
4	F	78	0	0	2	0
4	G	72	0	0	4	0
4	H	103	0	0	4	0
All	All	41785	0	39934	663	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 8.

The worst 5 of 663 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:410:HIS:ND1	1:H:514:THR:HG21	1.83	0.94
1:F:100:ASN:O	1:F:203:ARG:NH2	2.06	0.89
1:A:228:ARG:NH1	1:A:441:PRO:O	2.05	0.88
1:A:106:ARG:NH1	1:A:181:GLN:O	2.11	0.83
1:G:51:ARG:O	1:G:54:ILE:HD13	1.79	0.83

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	648/651 (100%)	607 (94%)	36 (6%)	5 (1%)	19	35
1	B	645/651 (99%)	604 (94%)	40 (6%)	1 (0%)	47	68
1	C	646/651 (99%)	605 (94%)	38 (6%)	3 (0%)	29	48
1	D	647/651 (99%)	617 (95%)	29 (4%)	1 (0%)	47	68
1	E	646/651 (99%)	614 (95%)	29 (4%)	3 (0%)	29	48
1	F	648/651 (100%)	607 (94%)	39 (6%)	2 (0%)	41	61

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	646/651 (99%)	608 (94%)	35 (5%)	3 (0%)	29	48
1	H	646/651 (99%)	599 (93%)	45 (7%)	2 (0%)	41	61
All	All	5172/5208 (99%)	4861 (94%)	291 (6%)	20 (0%)	34	54

5 of 20 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	578	ASP
1	G	81	ARG
1	A	253	HIS
1	C	593	ASP
1	D	578	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	548/548 (100%)	495 (90%)	53 (10%)	8	16
1	B	545/548 (100%)	498 (91%)	47 (9%)	10	20
1	C	546/548 (100%)	510 (93%)	36 (7%)	16	32
1	D	547/548 (100%)	500 (91%)	47 (9%)	10	20
1	E	546/548 (100%)	498 (91%)	48 (9%)	10	19
1	F	547/548 (100%)	498 (91%)	49 (9%)	9	19
1	G	546/548 (100%)	498 (91%)	48 (9%)	10	19
1	H	546/548 (100%)	505 (92%)	41 (8%)	13	26
All	All	4371/4384 (100%)	4002 (92%)	369 (8%)	11	21

5 of 369 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	31	THR
1	G	126	LEU

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Mol	Chain	Res	Type
1	F	116	LYS
1	F	392	LYS
1	G	337	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 11 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	157	GLN
1	G	324	ASN
1	H	157	GLN
1	G	440	ASN
1	D	439	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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

10 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	G	701	-	54,58,58	1.19	3 (5%)	71,89,89	1.57	14 (19%)



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	GOL	B	702	-	5,5,5	0.69	0	5,5,5	0.74	0
2	FAD	H	701	-	54,58,58	1.29	4 (7%)	71,89,89	1.42	9 (12%)
2	FAD	E	701	-	54,58,58	1.34	5 (9%)	71,89,89	1.35	9 (12%)
2	FAD	B	701	-	54,58,58	1.36	7 (12%)	71,89,89	1.47	13 (18%)
2	FAD	A	701	-	54,58,58	1.37	5 (9%)	71,89,89	1.45	11 (15%)
2	FAD	D	701	-	54,58,58	1.22	2 (3%)	71,89,89	1.76	16 (22%)
3	GOL	H	702	-	5,5,5	0.57	0	5,5,5	0.45	0
2	FAD	C	701	-	54,58,58	1.26	3 (5%)	71,89,89	1.46	9 (12%)
2	FAD	F	701	-	54,58,58	1.34	6 (11%)	71,89,89	1.49	13 (18%)

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	G	701	-	-	6/30/50/50	0/6/6/6
3	GOL	B	702	-	-	3/4/4/4	-
2	FAD	H	701	-	-	2/30/50/50	0/6/6/6
2	FAD	E	701	-	-	5/30/50/50	0/6/6/6
2	FAD	B	701	-	-	6/30/50/50	0/6/6/6
2	FAD	A	701	-	-	7/30/50/50	0/6/6/6
2	FAD	D	701	-	-	6/30/50/50	0/6/6/6
3	GOL	H	702	-	-	2/4/4/4	-
2	FAD	C	701	-	-	5/30/50/50	0/6/6/6
2	FAD	F	701	-	-	6/30/50/50	0/6/6/6

The worst 5 of 35 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	701	FAD	C9A-C5X	5.84	1.50	1.41
2	B	701	FAD	C9A-C5X	5.82	1.50	1.41
2	D	701	FAD	C9A-C5X	5.54	1.50	1.41
2	E	701	FAD	C9A-C5X	5.47	1.50	1.41
2	F	701	FAD	C9A-C5X	5.47	1.50	1.41

The worst 5 of 94 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	701	FAD	O4B-C1B-N9A	-6.11	100.65	108.75
2	A	701	FAD	N3A-C2A-N1A	-5.35	121.42	128.67
2	G	701	FAD	N3A-C2A-N1A	-5.00	121.89	128.67
2	E	701	FAD	N3A-C2A-N1A	-4.92	122.00	128.67
2	D	701	FAD	N3A-C2A-N1A	-4.75	122.22	128.67

There are no chirality outliers.

5 of 48 torsion outliers are listed below:

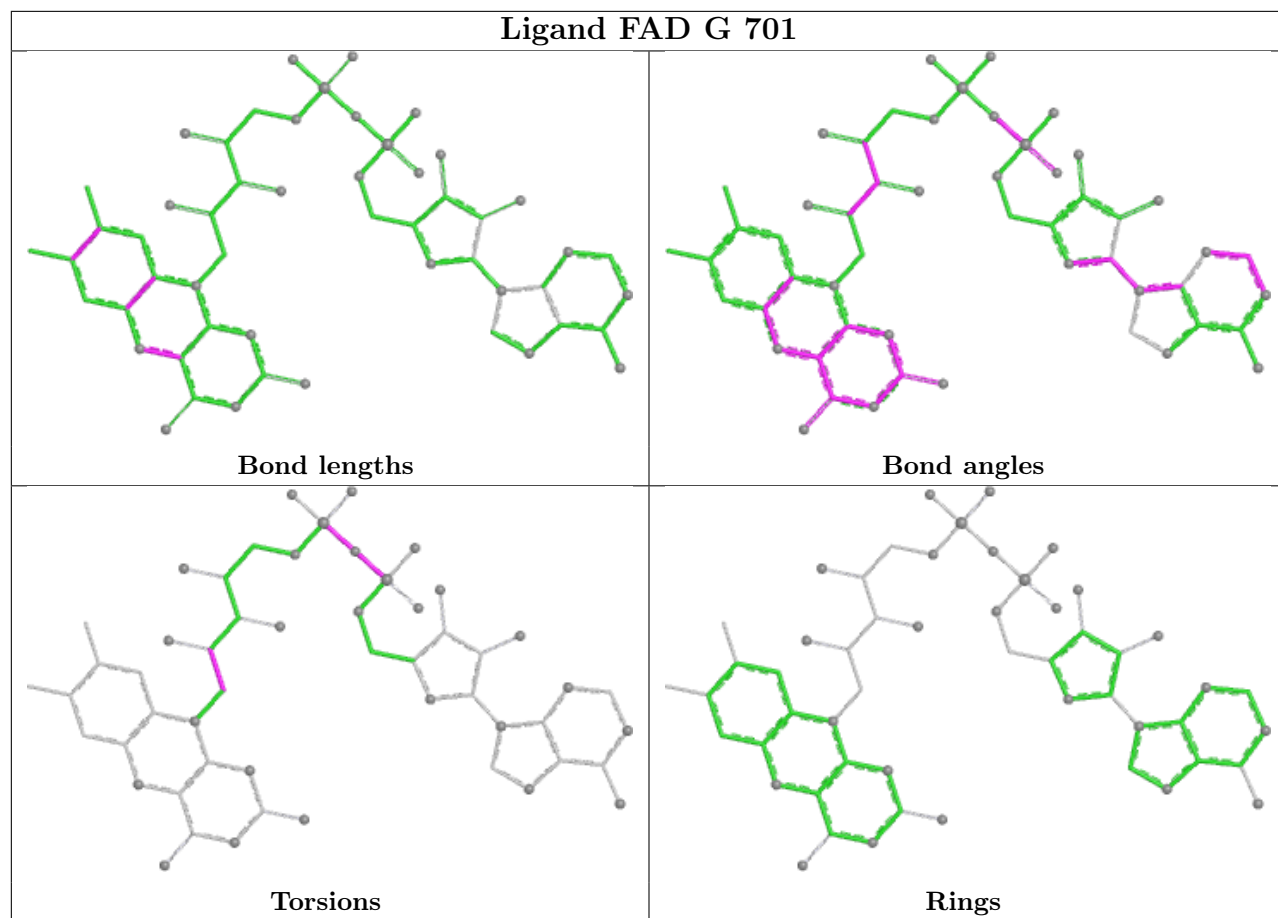
Mol	Chain	Res	Type	Atoms
2	A	701	FAD	C5B-O5B-PA-O1A
2	A	701	FAD	N10-C1'-C2'-O2'
2	B	701	FAD	N10-C1'-C2'-O2'
2	C	701	FAD	N10-C1'-C2'-O2'
2	D	701	FAD	N10-C1'-C2'-O2'

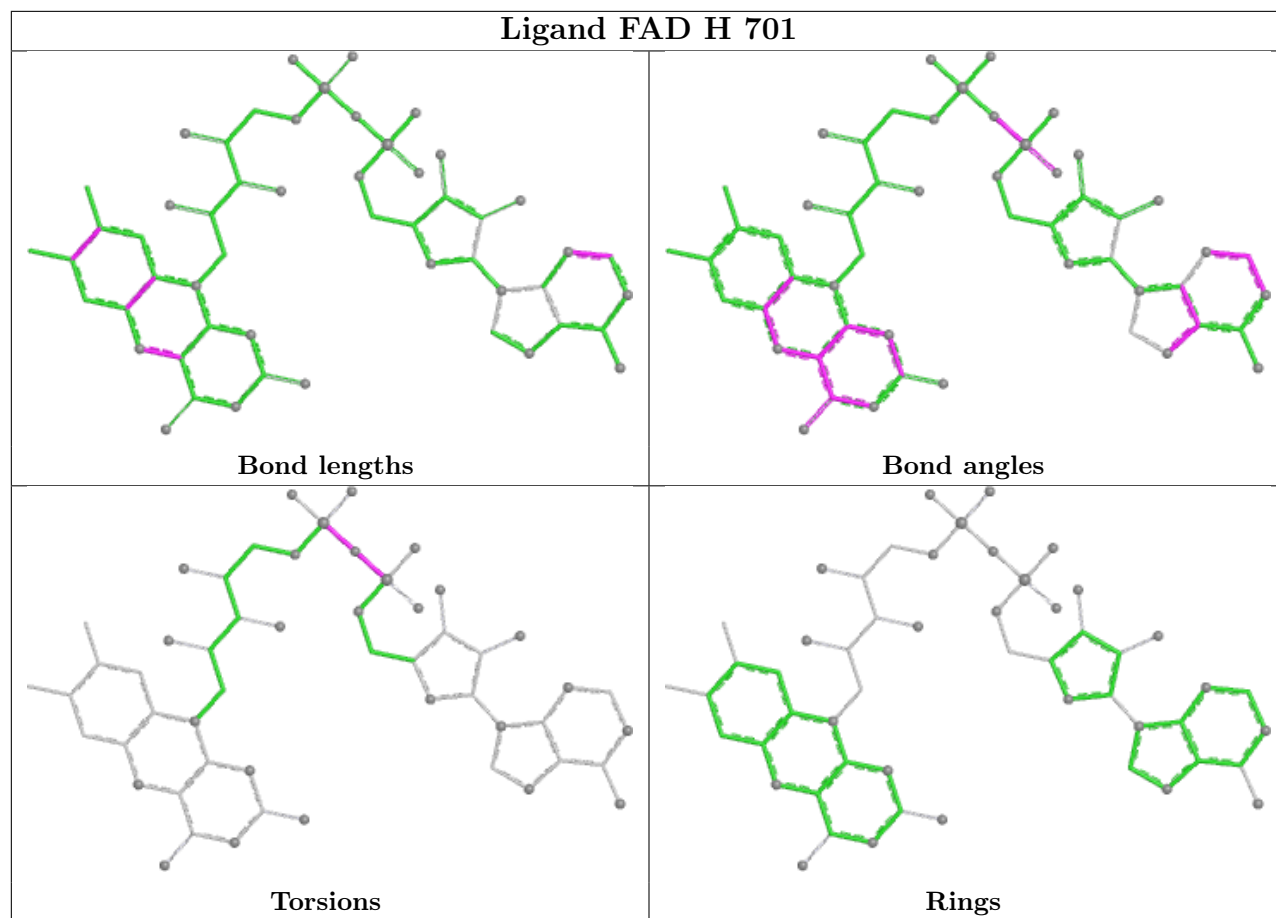
There are no ring outliers.

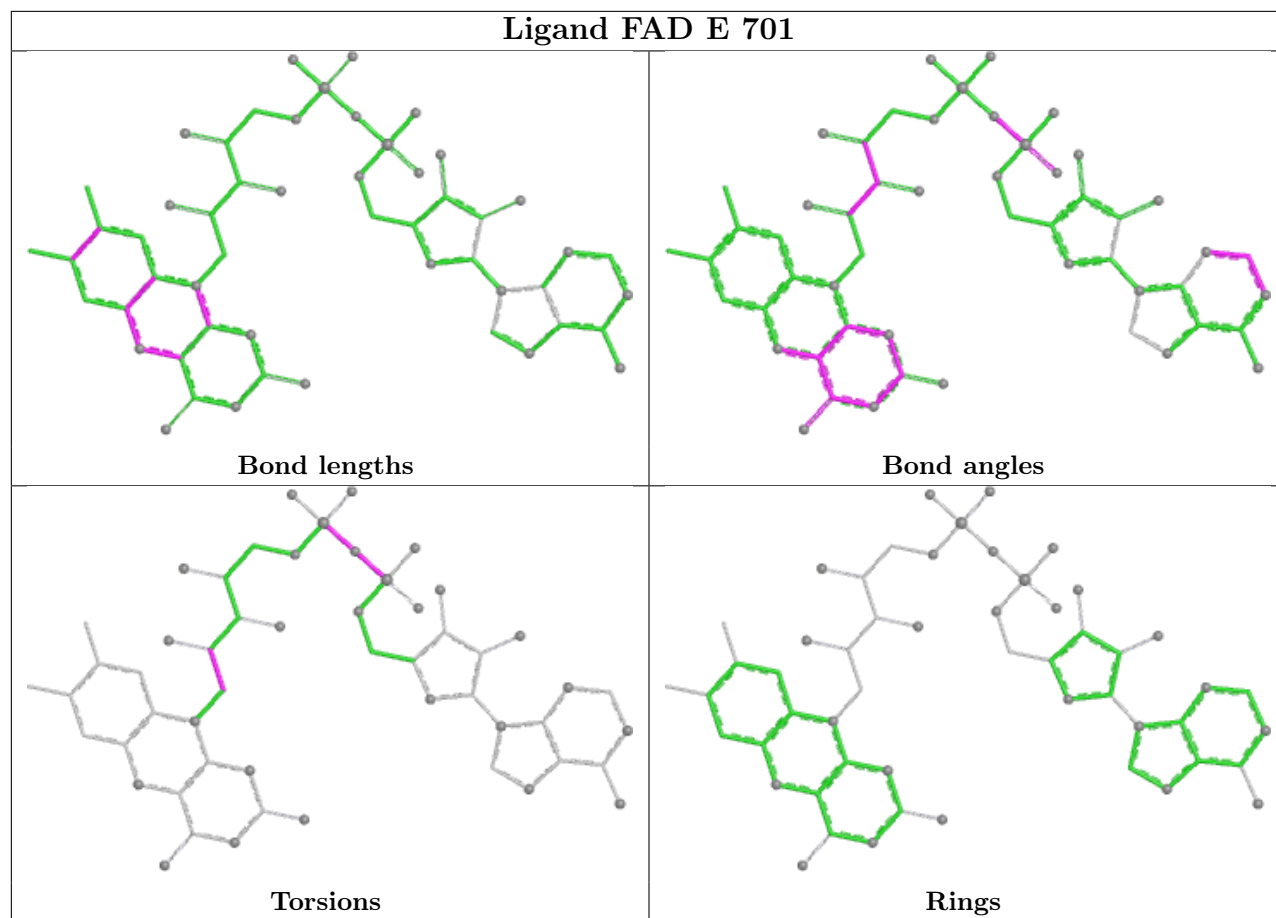
8 monomers are involved in 21 short contacts:

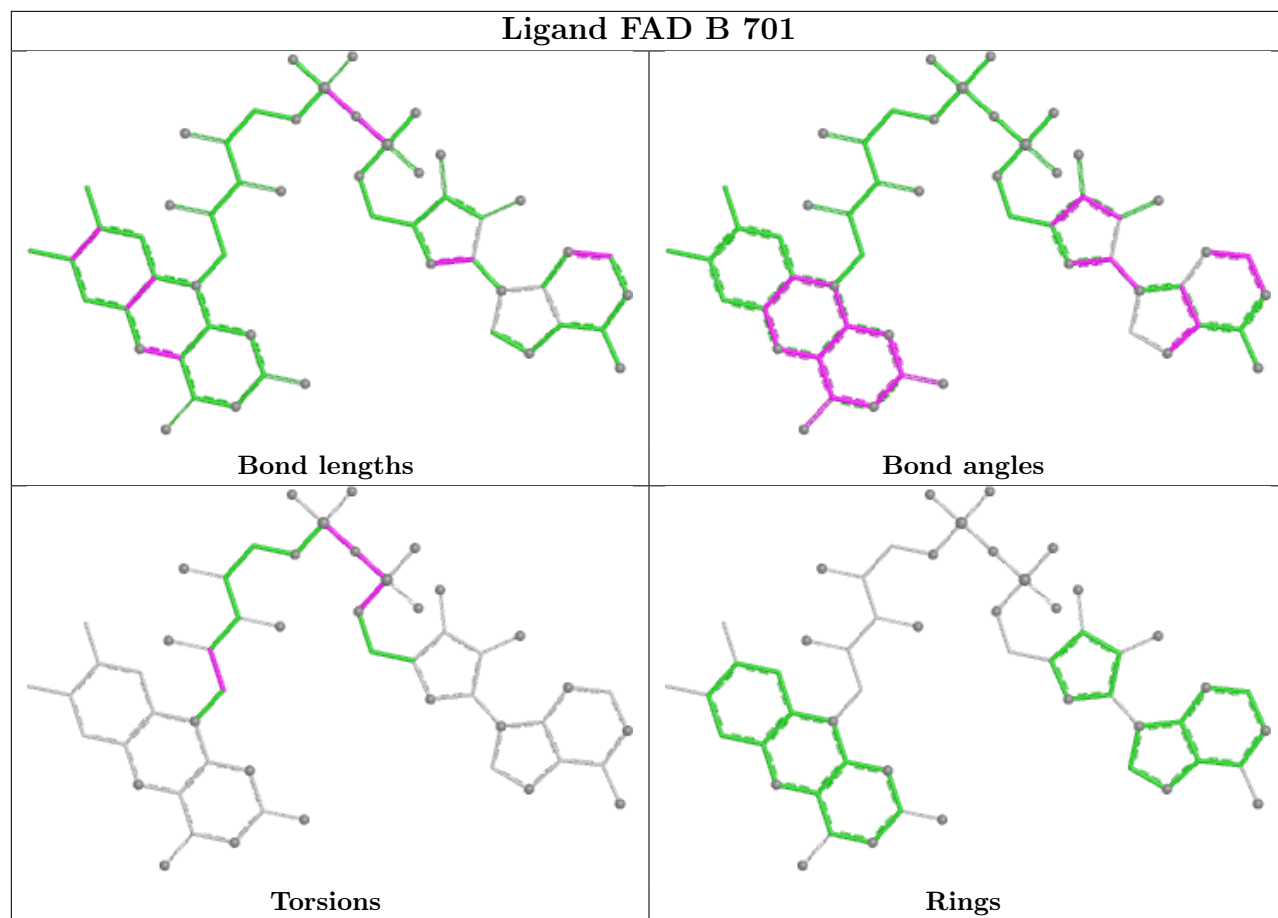
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	701	FAD	3	0
2	H	701	FAD	3	0
2	E	701	FAD	2	0
2	B	701	FAD	3	0
2	A	701	FAD	2	0
2	D	701	FAD	3	0
2	C	701	FAD	2	0
2	F	701	FAD	3	0

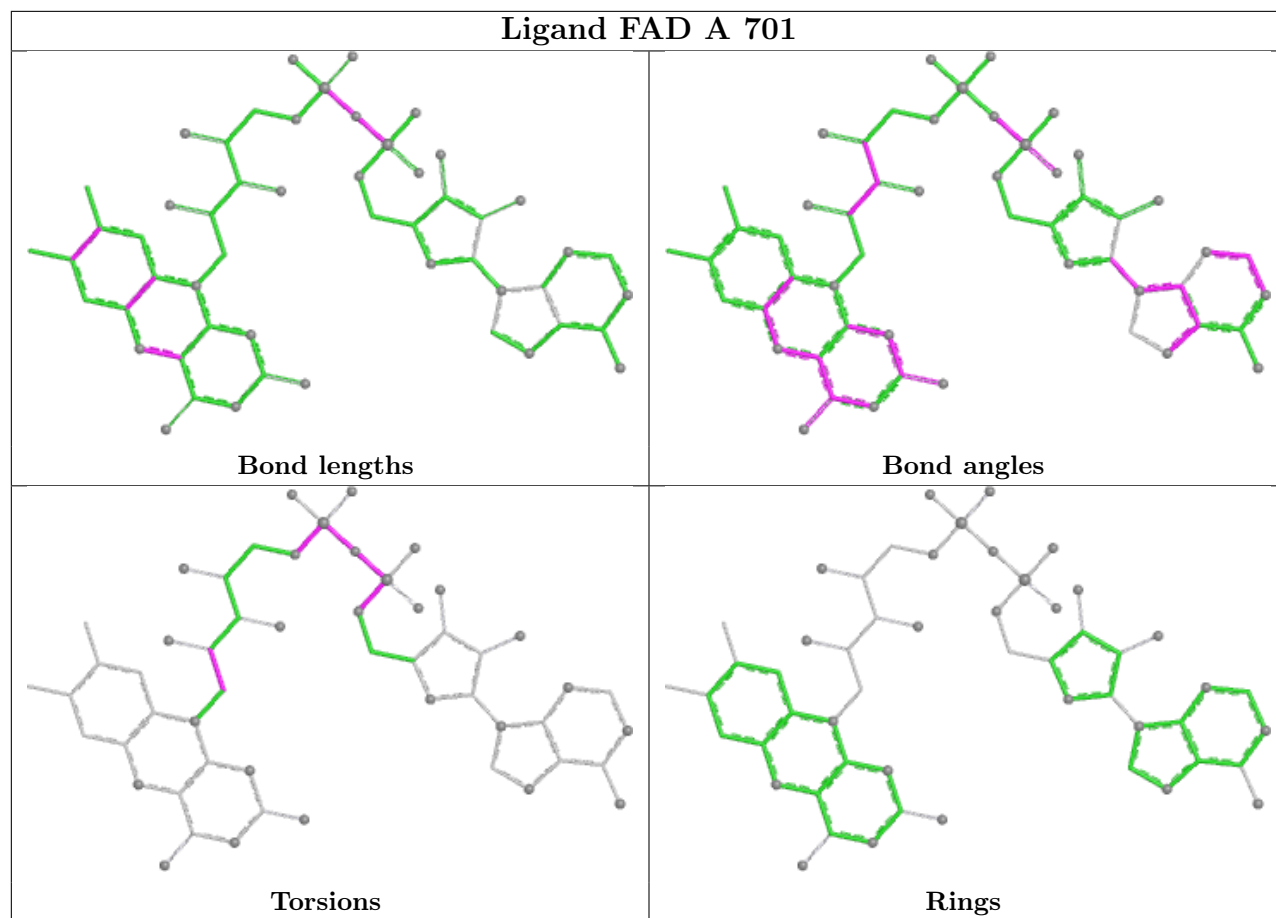
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

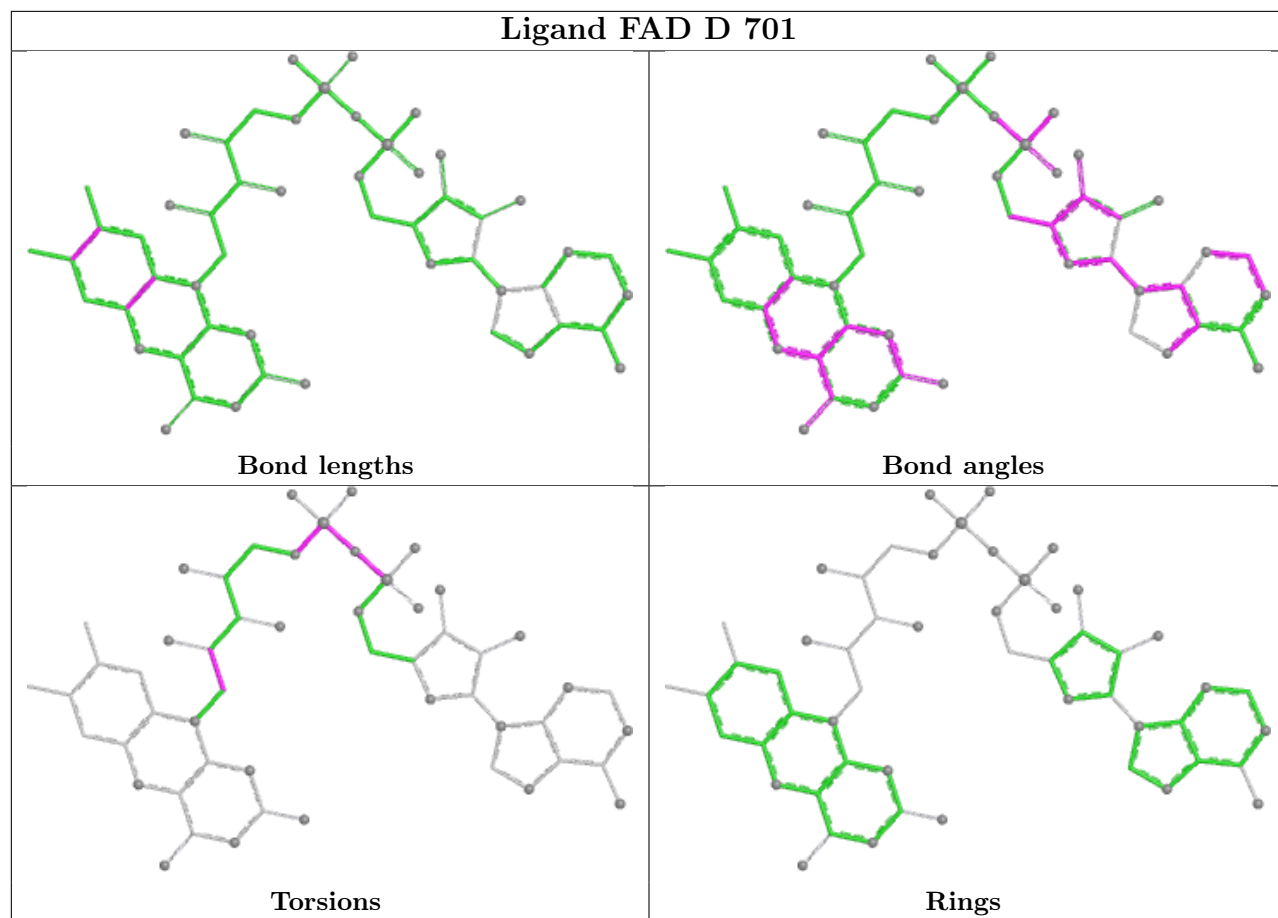




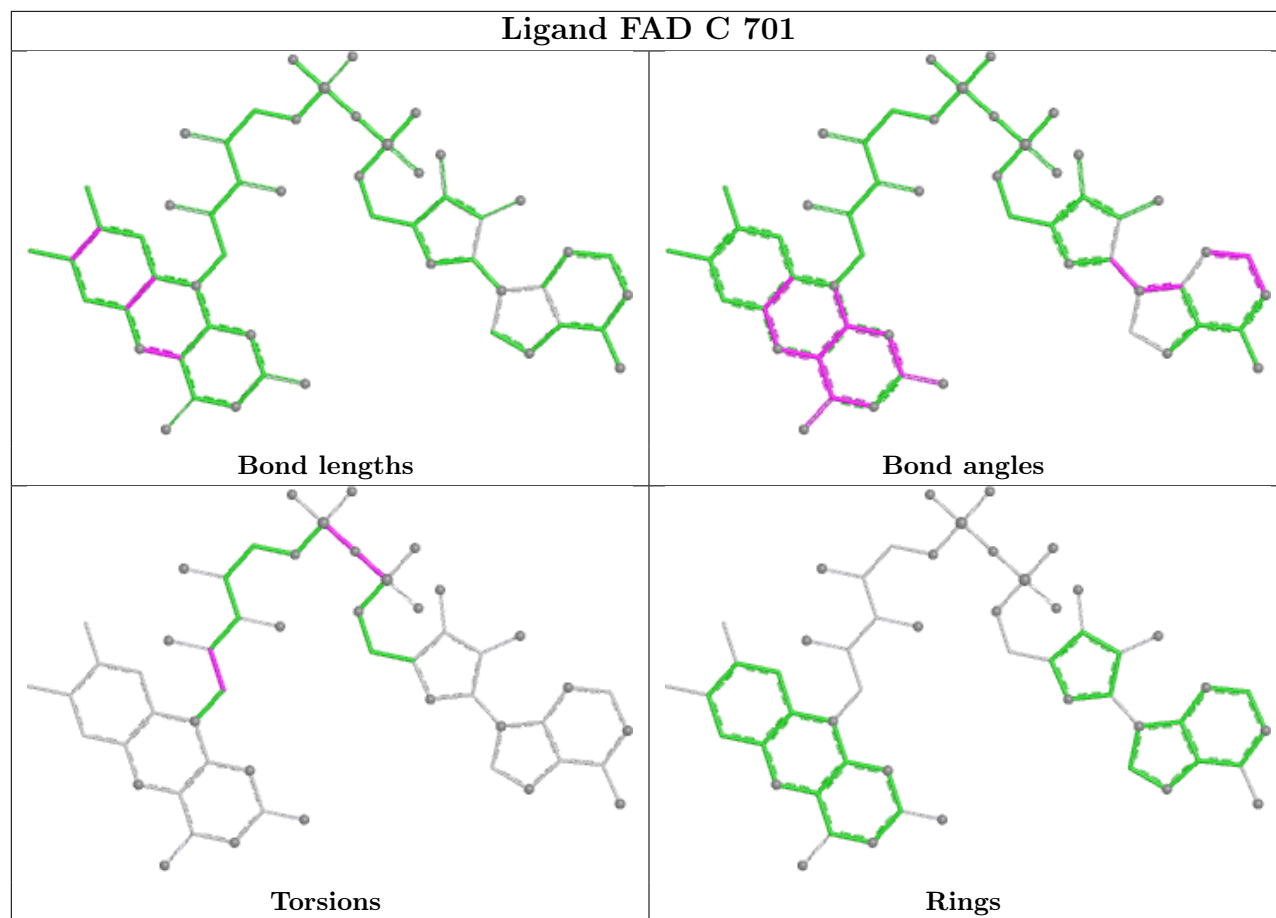


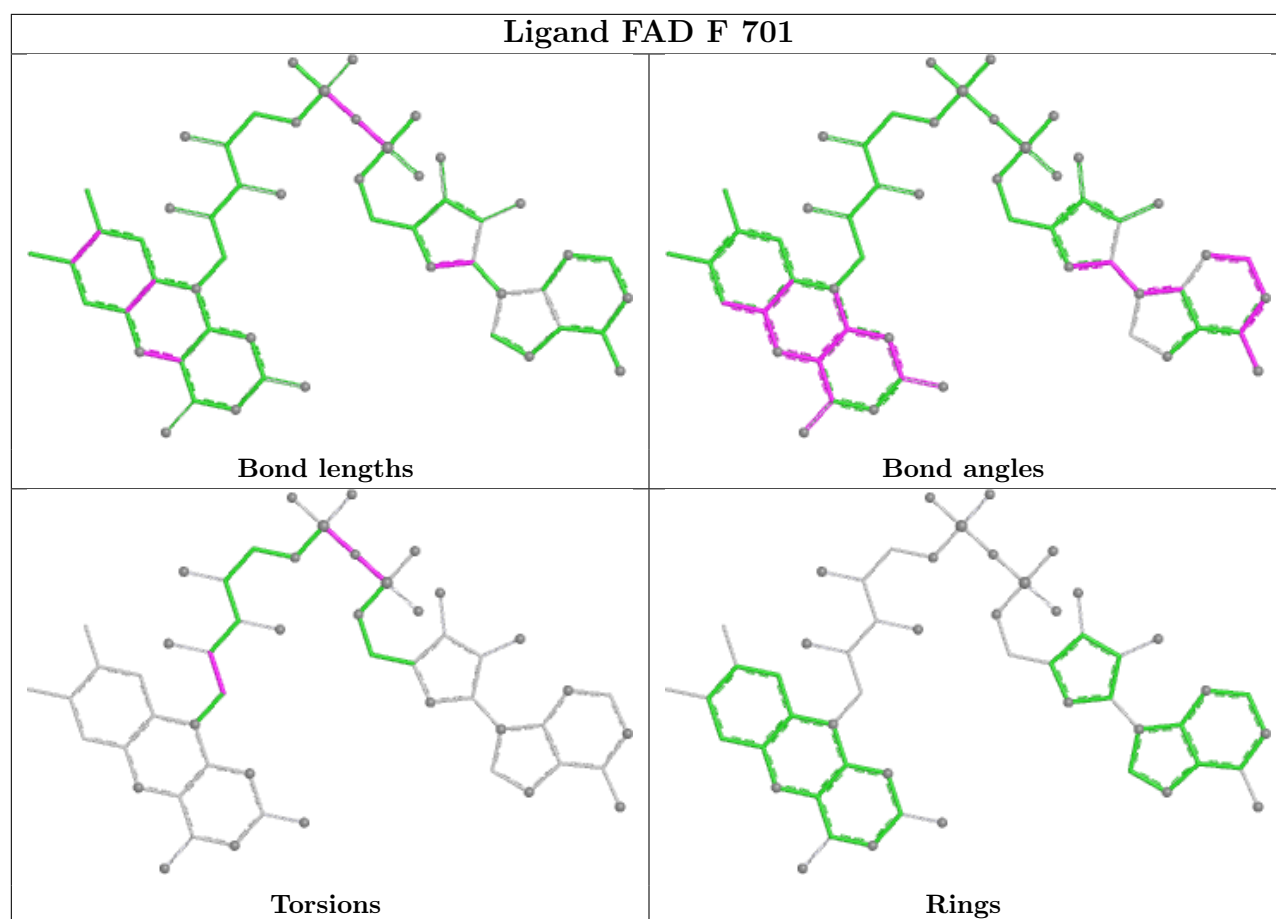












## 5.7 Other polymers [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	649/651 (99%)	-0.18	4 (0%) 89 90	20, 33, 49, 73	0
1	B	647/651 (99%)	-0.19	1 (0%) 95 95	21, 30, 47, 61	0
1	C	648/651 (99%)	-0.13	3 (0%) 91 91	21, 33, 48, 60	0
1	D	649/651 (99%)	-0.19	1 (0%) 95 95	20, 30, 45, 67	0
1	E	648/651 (99%)	0.05	4 (0%) 89 90	22, 36, 52, 68	0
1	F	650/651 (99%)	-0.23	3 (0%) 91 91	22, 32, 49, 73	0
1	G	648/651 (99%)	-0.16	2 (0%) 94 94	20, 33, 51, 66	0
1	H	648/651 (99%)	-0.14	5 (0%) 86 87	20, 32, 48, 72	0
All	All	5187/5208 (99%)	-0.15	23 (0%) 92 93	20, 32, 49, 73	0

The worst 5 of 23 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	640	VAL	3.7
1	C	233	LEU	3.0
1	A	641	PRO	2.8
1	E	626	LEU	2.7
1	F	387	ARG	2.6

### 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](#)

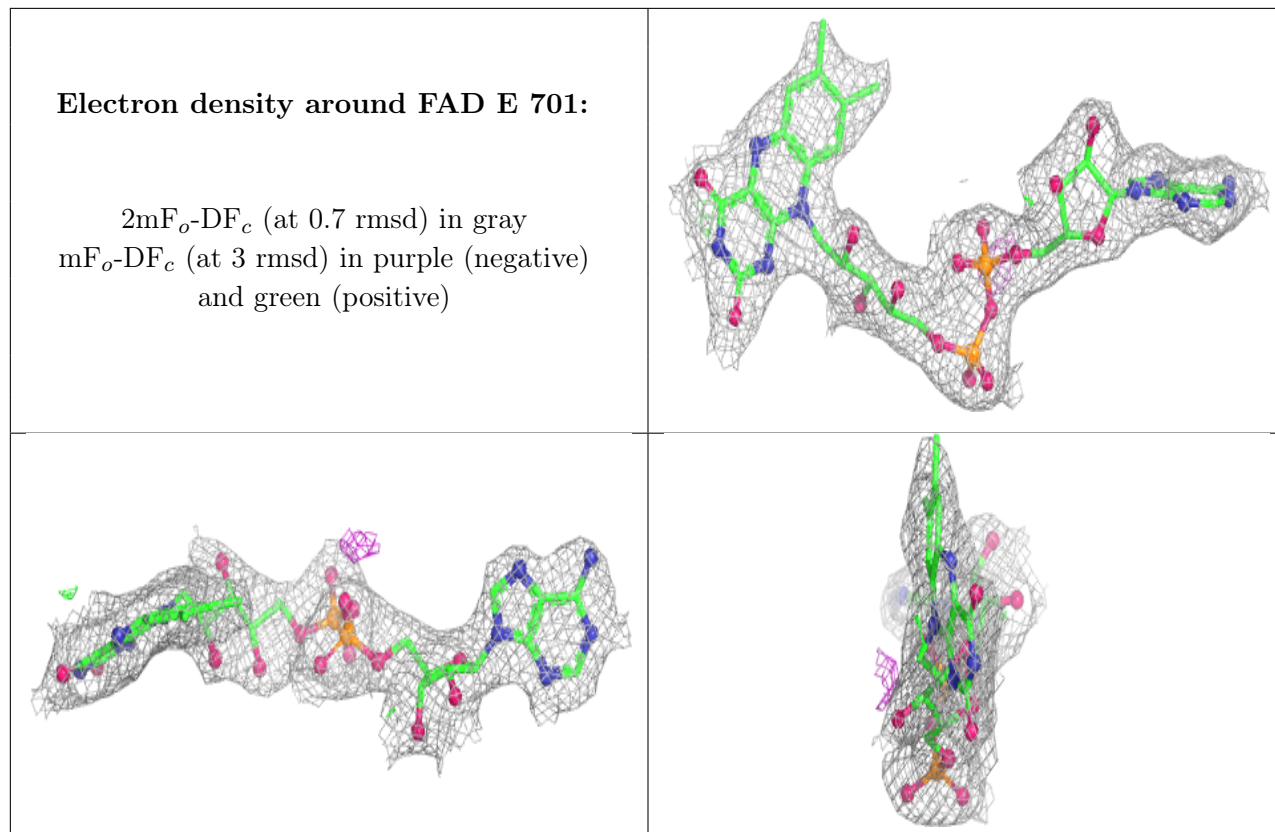
There are no monosaccharides in this entry.

## 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, 95<sup>th</sup> 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.

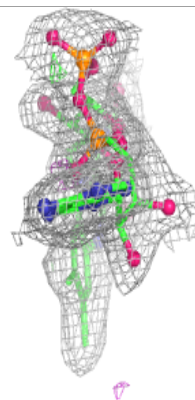
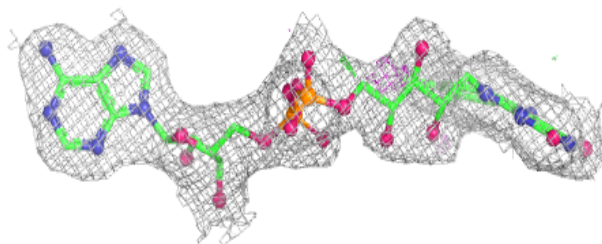
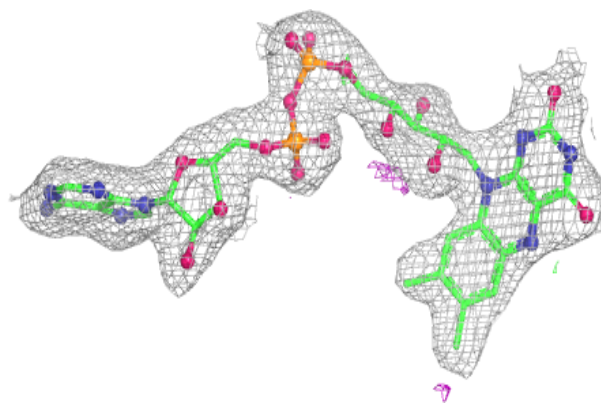
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	GOL	B	702	6/6	0.80	0.20	30,31,32,32	0
3	GOL	H	702	6/6	0.80	0.24	30,30,32,32	0
2	FAD	E	701	53/53	0.95	0.17	30,37,40,42	0
2	FAD	A	701	53/53	0.96	0.13	23,28,32,35	0
2	FAD	G	701	53/53	0.96	0.12	28,32,37,38	0
2	FAD	H	701	53/53	0.96	0.14	29,31,36,37	0
2	FAD	C	701	53/53	0.96	0.15	29,34,45,46	0
2	FAD	D	701	53/53	0.96	0.14	18,22,30,33	0
2	FAD	B	701	53/53	0.97	0.12	21,26,29,32	0
2	FAD	F	701	53/53	0.97	0.12	23,26,31,32	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.

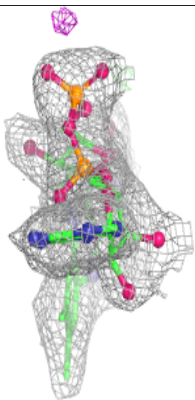
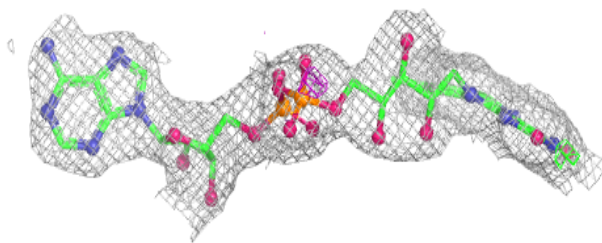
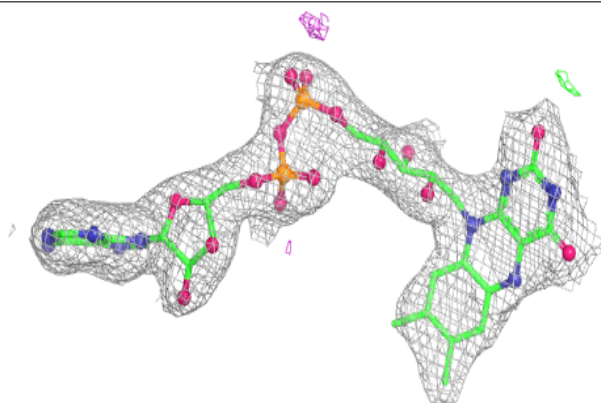


**Electron density around FAD A 701:**

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

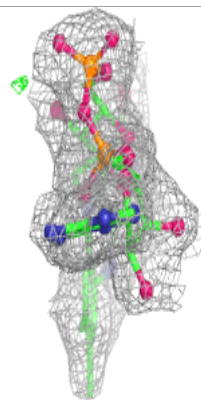
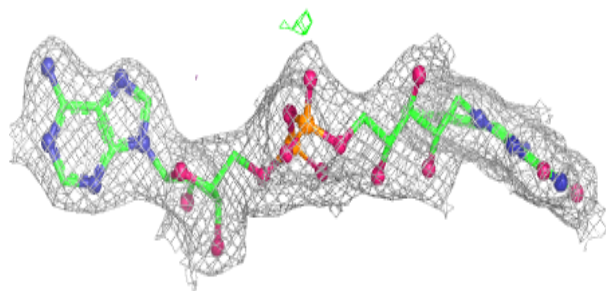
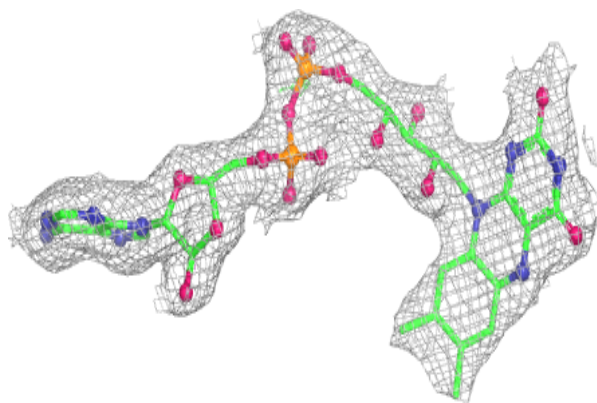
**Electron density around FAD G 701:**

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

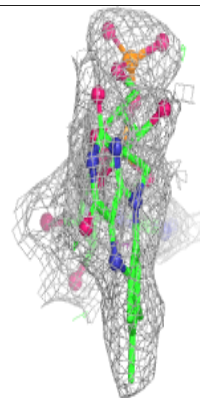
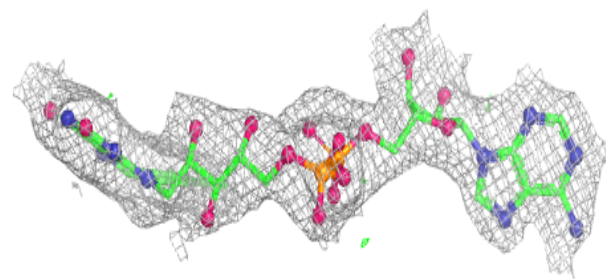
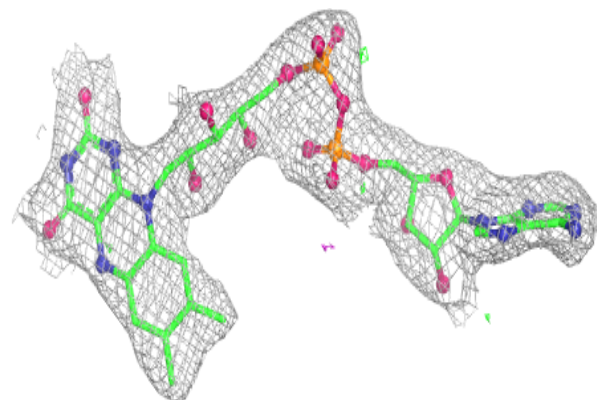


**Electron density around FAD H 701:**

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

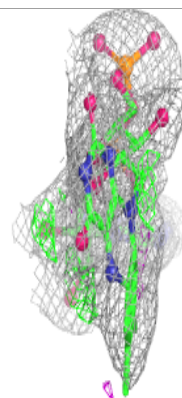
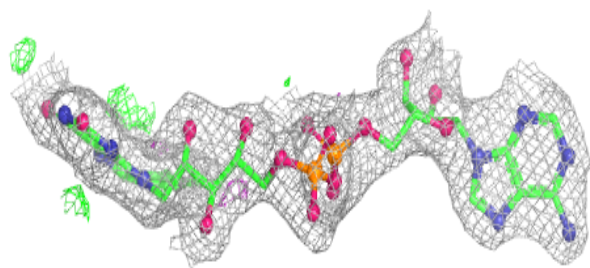
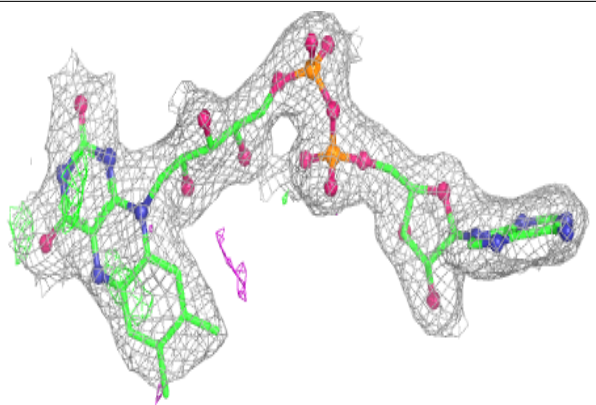
**Electron density around FAD C 701:**

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

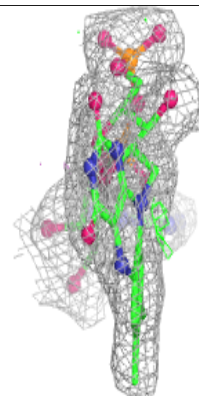
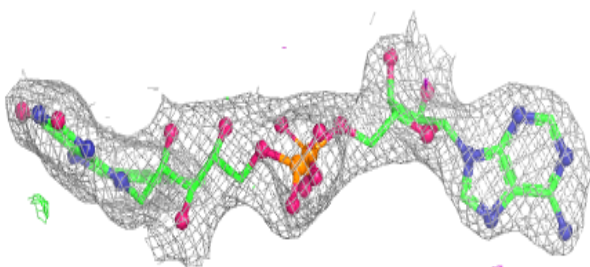
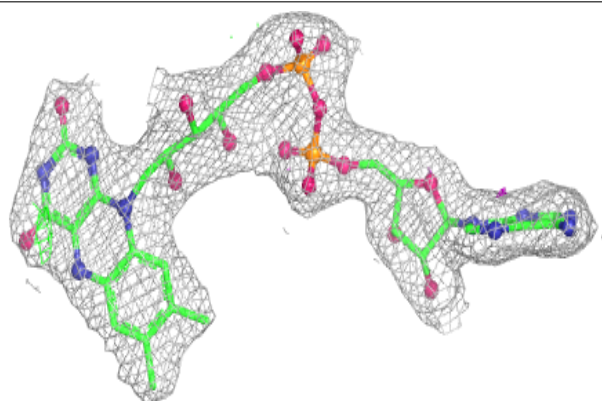


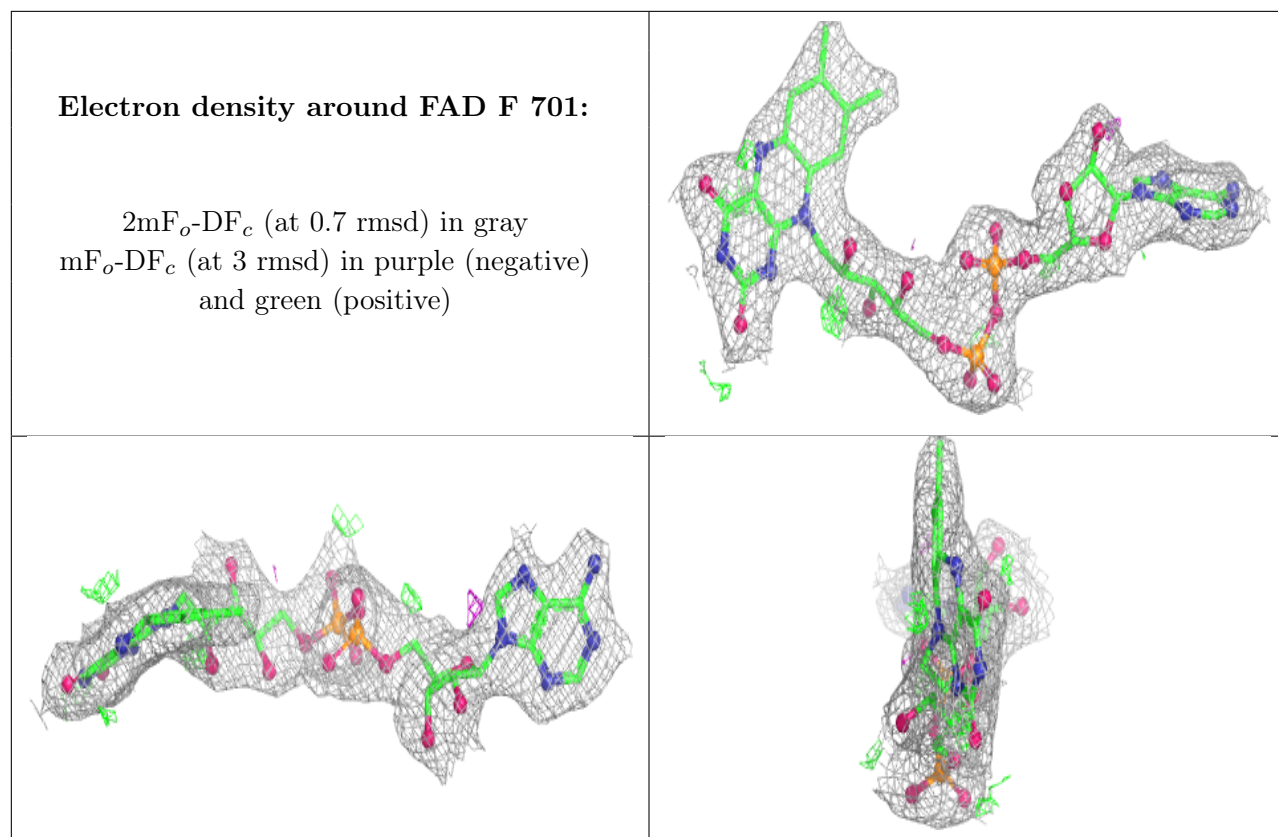
**Electron density around FAD D 701:**

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

**Electron density around FAD B 701:**

$2mF_o-DF_c$  (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.