



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 6, 2026 – 10:17 AM UTC

PDB ID : 1SB3 / pdb_00001sb3
Title : Structure of 4-hydroxybenzoyl-CoA reductase from *Thauera aromatica*
Authors : Unciuleac, M.; Warkentin, E.; Page, C.C.; Boll, M.; Ermler, U.
Deposited on : 2004-02-10
Resolution : 2.20 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

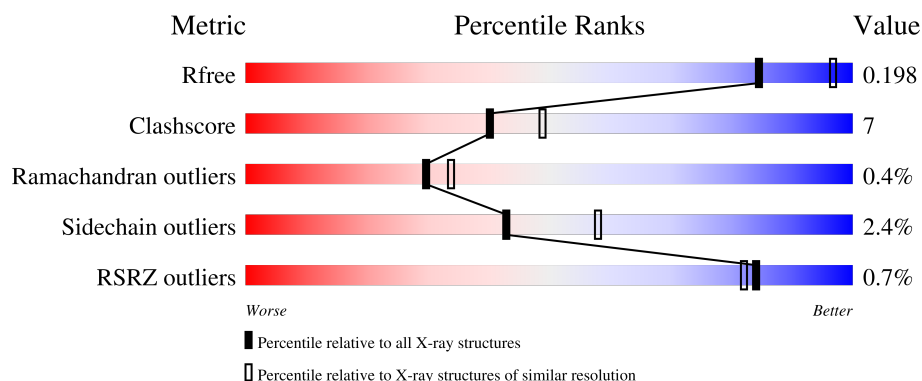
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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}	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (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 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	769	% 82% 15% ..
1	D	769	% 81% 16% ..
2	B	324	% 85% 13% .
2	E	324	% 82% 16% .
3	C	161	% 83% 14% .

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Mol	Chain	Length	Quality of chain
3	F	161	76% 20% ••

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 19897 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 4-hydroxybenzoyl-CoA reductase alpha subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	761	Total	C	N	O	S	0	0	0
			5716	3618	984	1085	29			
1	D	760	Total	C	N	O	S	0	0	0
			5710	3615	983	1083	29			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	251	ALA	GLY	see remark 999	UNP O33819
D	251	ALA	GLY	see remark 999	UNP O33819

- Molecule 2 is a protein called 4-hydroxybenzoyl-CoA reductase beta subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	323	Total	C	N	O	S	0	0	0
			2407	1508	441	450	8			
2	E	323	Total	C	N	O	S	0	0	0
			2407	1508	441	450	8			

- Molecule 3 is a protein called 4-hydroxybenzoyl-CoA reductase gamma subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	161	Total	C	N	O	S	0	0	0
			1193	732	218	230	13			
3	F	157	Total	C	N	O	S	0	0	0
			1163	716	211	223	13			

There are 6 discrepancies between the modelled and reference sequences:

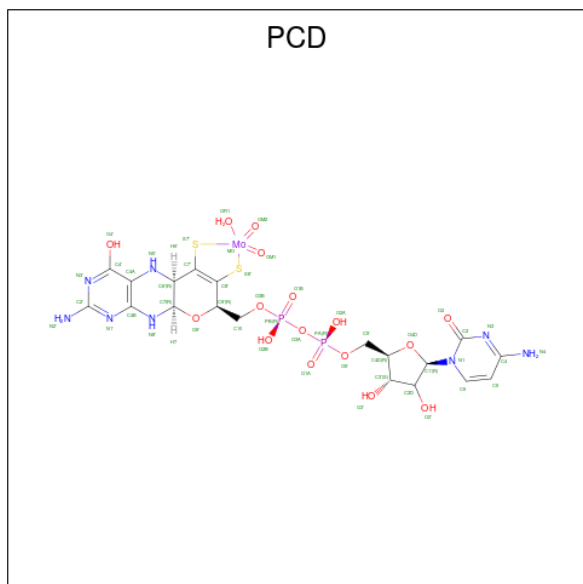
Chain	Residue	Modelled	Actual	Comment	Reference
C	142	LYS	ARG	see remark 999	UNP O33818
C	143	ILE	SER	see remark 999	UNP O33818

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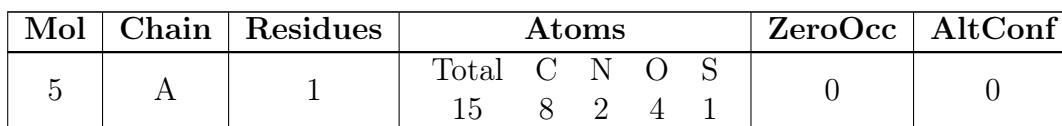
Chain	Residue	Modelled	Actual	Comment	Reference
C	144	ILE	SER	see remark 999	UNP O33818
F	142	LYS	ARG	see remark 999	UNP O33818
F	143	ILE	SER	see remark 999	UNP O33818
F	144	ILE	SER	see remark 999	UNP O33818

- Molecule 4 is (MOLYBDOPTERIN-CYTOSINE DINUCLEOTIDE-S,S)-DIOXO-AQUA-MOLYBDENUM(V) (CCD ID: PCD) (formula: $C_{19}H_{26}MoN_8O_{16}P_2S_2$).



Mol	Chain	Residues	Atoms							ZeroOcc	AltConf
4	A	1	Total	C	Mo	N	O	P	S	0	0
			48	19	1	8	16	2	2		
4	D	1	Total	C	Mo	N	O	P	S	0	0
			48	19	1	8	16	2	2		

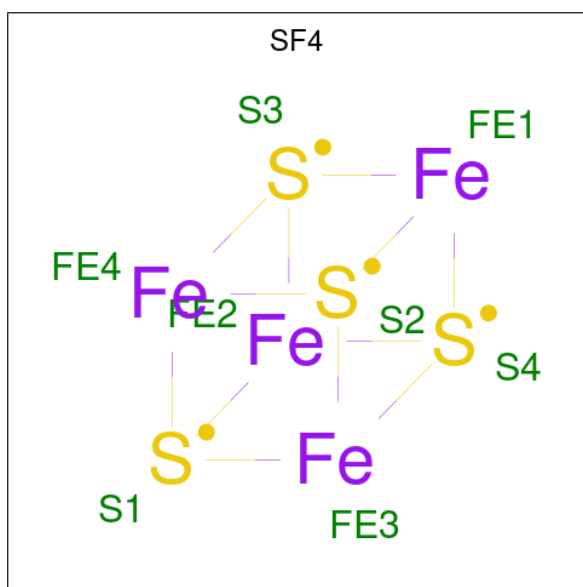
- Molecule 5 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (CCD ID: EPE) (formula: $C_8H_{18}N_2O_4S$).



- # FAD

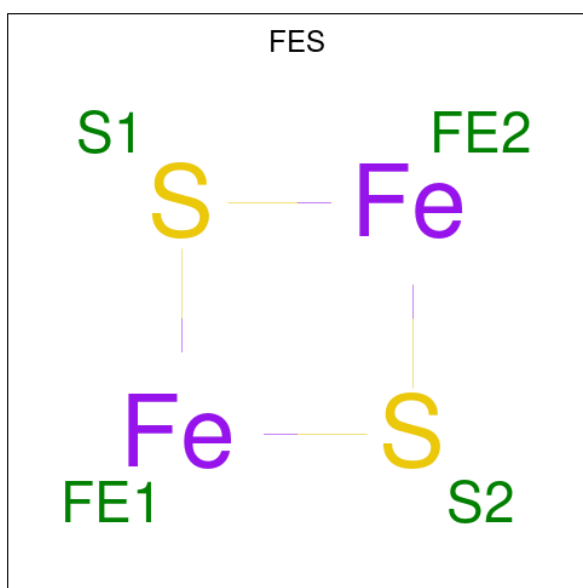
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
6	B	1	Total 53	C 27	N 9	O 15	P 2	0	0
6	E	1	Total 53	C 27	N 9	O 15	P 2	0	0

- 



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	B	1	Total	Fe	S	0	0
			8	4	4		
7	E	1	Total	Fe	S	0	0
			8	4	4		

- Molecule 8 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe_2S_2).



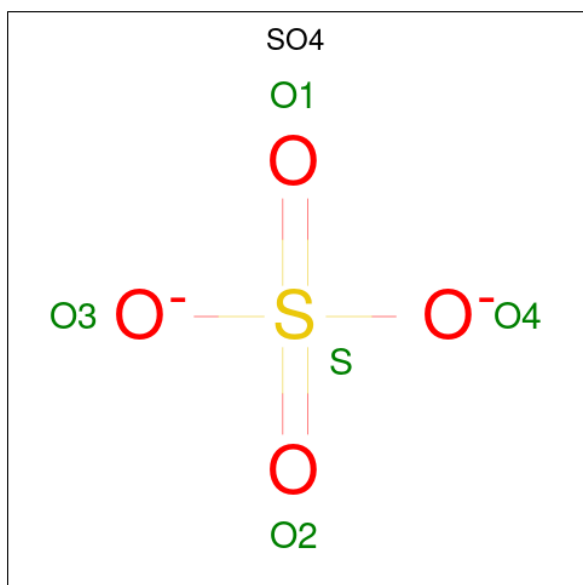
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	C	1	Total	Fe	S	0	0
			4	2	2		
8	C	1	Total	Fe	S	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
8	F	1	Total	Fe	S	0	0
			4	2	2		
8	F	1	Total	Fe	S	0	0
			4	2	2		

- Molecule 9 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	D	1	Total	O	S	0	0
			5	4	1		
9	E	1	Total	O	S	0	0
			5	4	1		

- Molecule 10 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	A	319	Total	O	0	0
			319	319		
10	B	115	Total	O	0	0
			115	115		
10	C	103	Total	O	0	0
			103	103		
10	D	319	Total	O	0	0
			319	319		
10	E	96	Total	O	0	0
			96	96		

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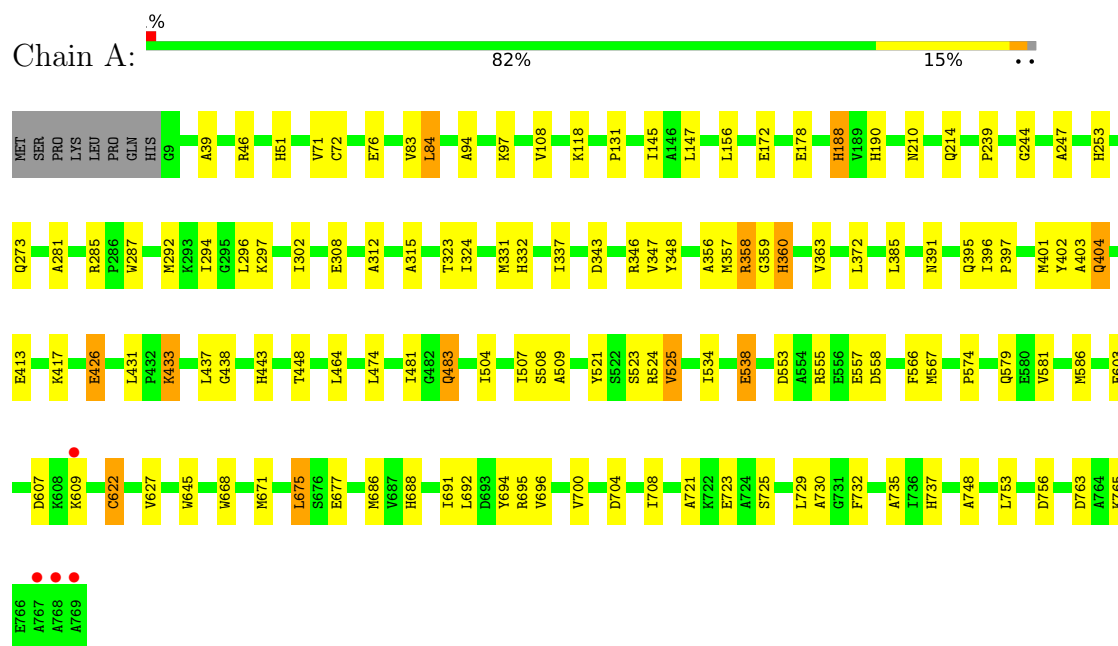
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	F	90	Total	O	0	0
			90	90		

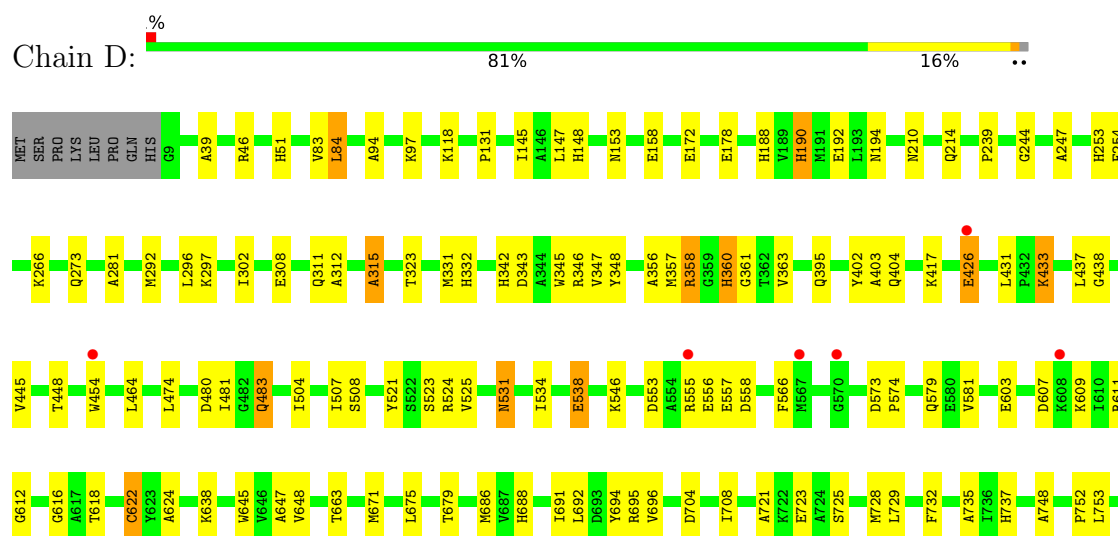
3 Residue-property plots

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: 4-hydroxybenzoyl-CoA reductase alpha subunit

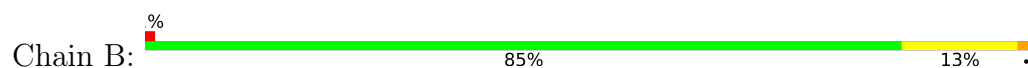


- Molecule 1: 4-hydroxybenzoyl-CoA reductase alpha subunit

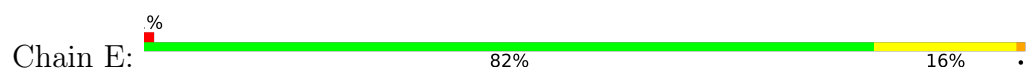




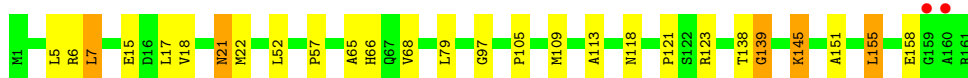
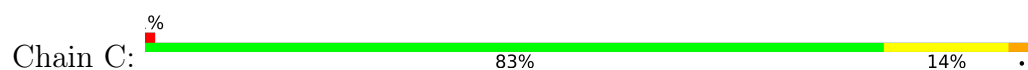
- Molecule 2: 4-hydroxybenzoyl-CoA reductase beta subunit



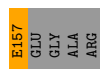
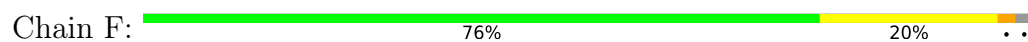
- Molecule 2: 4-hydroxybenzoyl-CoA reductase beta subunit



- Molecule 3: 4-hydroxybenzoyl-CoA reductase gamma subunit



- Molecule 3: 4-hydroxybenzoyl-CoA reductase gamma subunit



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	116.62Å 150.20Å 175.27Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.90 – 2.20 19.90 – 2.20	Depositor EDS
% Data completeness (in resolution range)	96.1 (19.90-2.20) 96.0 (19.90-2.20)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.26 (at 2.21Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.171 , 0.205 0.166 , 0.198	Depositor DCC
R_{free} test set	7543 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å ²)	28.6	Xtriage
Anisotropy	0.514	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 35.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	19897	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.10% 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: FES, SF4, EPE, FAD, PCD, SO4

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	0.70	1/5823 (0.0%)	1.06	32/7903 (0.4%)
1	D	0.69	0/5817	1.06	29/7896 (0.4%)
2	B	0.63	0/2450	1.04	14/3340 (0.4%)
2	E	0.63	0/2450	1.05	13/3340 (0.4%)
3	C	0.76	0/1203	1.07	5/1618 (0.3%)
3	F	0.67	0/1173	1.08	10/1580 (0.6%)
All	All	0.68	1/18916 (0.0%)	1.06	103/25677 (0.4%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	586	MET	SD-CE	-5.68	1.65	1.79

The worst 5 of 103 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	525	VAL	N-CA-C	9.77	119.80	110.42
1	D	331	MET	N-CA-C	-9.76	101.37	113.18
1	A	331	MET	N-CA-C	-9.63	100.95	112.89
1	D	315	ALA	N-CA-C	9.46	124.62	112.89
1	A	695	ARG	N-CA-C	8.90	124.01	108.52

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	5716	0	5769	79	0
1	D	5710	0	5764	78	0
2	B	2407	0	2434	28	0
2	E	2407	0	2434	32	0
3	C	1193	0	1225	19	0
3	F	1163	0	1198	19	0
4	A	48	0	22	7	0
4	D	48	0	22	5	0
5	A	15	0	18	0	0
6	B	53	0	31	1	0
6	E	53	0	31	3	0
7	B	8	0	0	0	0
7	E	8	0	0	0	0
8	C	8	0	0	0	0
8	F	8	0	0	0	0
9	D	5	0	0	0	0
9	E	5	0	0	0	0
10	A	319	0	0	5	0
10	B	115	0	0	1	0
10	C	103	0	0	2	0
10	D	319	0	0	9	0
10	E	96	0	0	2	0
10	F	90	0	0	2	0
All	All	19897	0	18948	248	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

The worst 5 of 248 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:172:GLU:HG2	1:A:297:LYS:NZ	1.85	0.90
1:D:483:GLN:H	1:D:483:GLN:HE21	1.19	0.90
1:D:46:ARG:HH22	1:D:253:HIS:HE1	1.20	0.88
1:D:172:GLU:HG2	1:D:297:LYS:NZ	1.91	0.85
1:A:172:GLU:HG2	1:A:297:LYS:HZ3	1.42	0.84

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	759/769 (99%)	733 (97%)	22 (3%)	4 (0%)	24	27
1	D	758/769 (99%)	731 (96%)	23 (3%)	4 (0%)	24	27
2	B	321/324 (99%)	312 (97%)	9 (3%)	0	100	100
2	E	321/324 (99%)	308 (96%)	13 (4%)	0	100	100
3	C	159/161 (99%)	154 (97%)	5 (3%)	0	100	100
3	F	155/161 (96%)	150 (97%)	4 (3%)	1 (1%)	21	23
All	All	2473/2508 (99%)	2388 (97%)	76 (3%)	9 (0%)	30	34

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	360	HIS
1	A	358	ARG
1	D	358	ARG
1	D	360	HIS
1	D	244	GLY

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	589/597 (99%)	576 (98%)	13 (2%)	45	61
1	D	589/597 (99%)	575 (98%)	14 (2%)	43	58
2	B	242/243 (100%)	236 (98%)	6 (2%)	42	56

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	E	242/243 (100%)	237 (98%)	5 (2%)	47 63
3	C	128/128 (100%)	124 (97%)	4 (3%)	35 48
3	F	126/128 (98%)	122 (97%)	4 (3%)	34 47
All	All	1916/1936 (99%)	1870 (98%)	46 (2%)	43 58

5 of 46 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	483	GLN
1	D	691	ILE
1	D	531	ASN
1	D	557	GLU
2	E	1	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 54 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	148	HIS
1	D	311	GLN
2	E	293	ASN
1	D	188	HIS
1	D	220	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

13 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	PCD	A	1920	-	41,53,53	1.81	7 (17%)	55,86,86	3.97	25 (45%)
4	PCD	D	1921	-	41,53,53	1.62	5 (12%)	55,86,86	3.88	23 (41%)
8	FES	F	1918	3	0,4,4	-	-	-	-	-
9	SO4	E	1113	-	4,4,4	0.35	0	6,6,6	0.17	0
8	FES	F	1917	3	0,4,4	-	-	-	-	-
6	FAD	E	1901	-	58,58,58	2.28	16 (27%)	85,89,89	1.65	16 (18%)
7	SF4	E	1911	2	0,12,12	-	-	-	-	-
9	SO4	D	1112	-	4,4,4	0.26	0	6,6,6	0.15	0
7	SF4	B	1910	2	0,12,12	-	-	-	-	-
8	FES	C	1908	3	0,4,4	-	-	-	-	-
6	FAD	B	1900	-	58,58,58	2.21	15 (25%)	85,89,89	1.58	13 (15%)
8	FES	C	1907	3	0,4,4	-	-	-	-	-
5	EPE	A	1111	-	15,15,15	2.12	5 (33%)	19,20,20	1.93	5 (26%)

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	PCD	A	1920	-	-	2/22/78/78	0/6/6/6
4	PCD	D	1921	-	-	3/22/78/78	0/6/6/6
8	FES	F	1918	3	-	-	0/1/1/1
8	FES	F	1917	3	-	-	0/1/1/1
6	FAD	E	1901	-	-	8/34/50/50	0/6/6/6
7	SF4	E	1911	2	-	-	0/6/5/5
7	SF4	B	1910	2	-	-	0/6/5/5
8	FES	C	1908	3	-	-	0/1/1/1
6	FAD	B	1900	-	-	8/34/50/50	0/6/6/6

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	FES	C	1907	3	-	-	0/1/1/1
5	EPE	A	1111	-	-	4/9/19/19	0/1/1/1

The worst 5 of 48 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	1900	FAD	P-O3P	-9.75	1.49	1.59
6	E	1901	FAD	P-O3P	-9.56	1.49	1.59
6	E	1901	FAD	C1'-C2'	5.63	1.60	1.52
4	A	1920	PCD	C6'-N5'	5.56	1.53	1.45
5	A	1111	EPE	O3S-S	4.96	1.65	1.47

The worst 5 of 82 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	1921	PCD	N2'-C2'-N3'	14.67	139.22	117.22
4	A	1920	PCD	N2'-C2'-N3'	13.95	138.13	117.22
4	D	1921	PCD	N2'-C2'-N1'	-11.33	100.24	117.22
4	A	1920	PCD	N2'-C2'-N1'	-11.08	100.61	117.22
4	A	1920	PCD	C7-C6'-N5'	10.86	118.53	107.87

There are no chirality outliers.

5 of 25 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1920	PCD	C10-O3B-PB-O1B
4	D	1921	PCD	C10-O3B-PB-O1B
5	A	1111	EPE	C10-C9-N1-C2
6	B	1900	FAD	N10-C1'-C2'-O2'
6	B	1900	FAD	N10-C1'-C2'-C3'

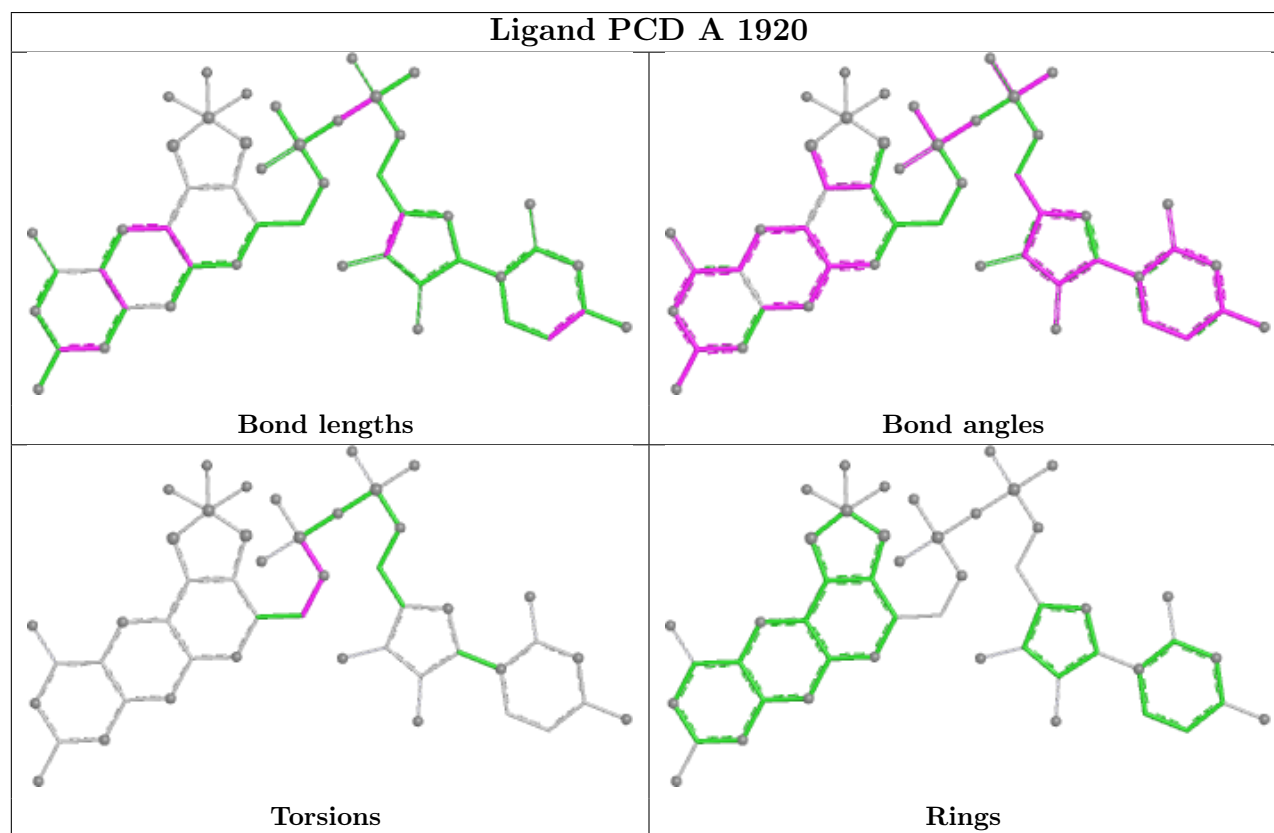
There are no ring outliers.

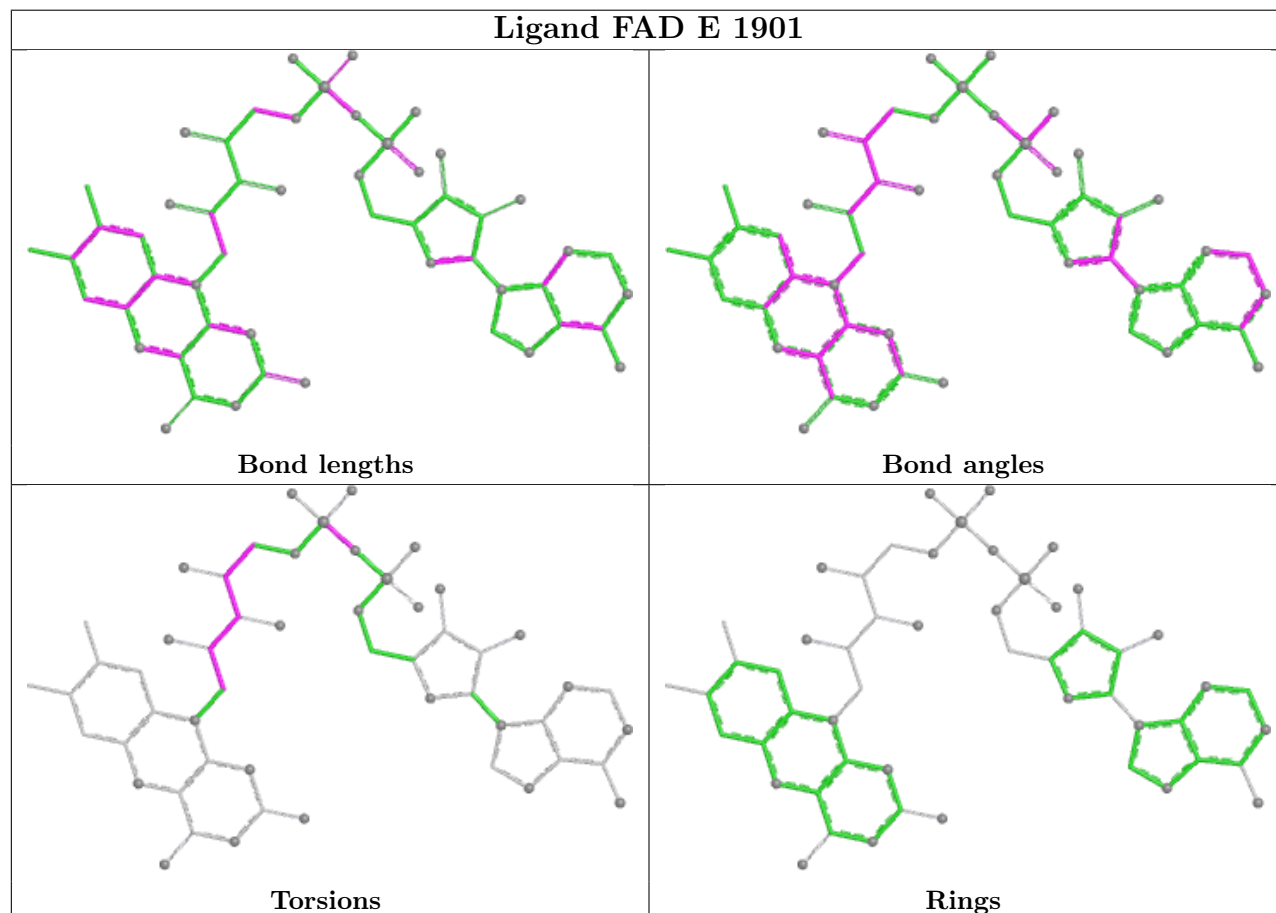
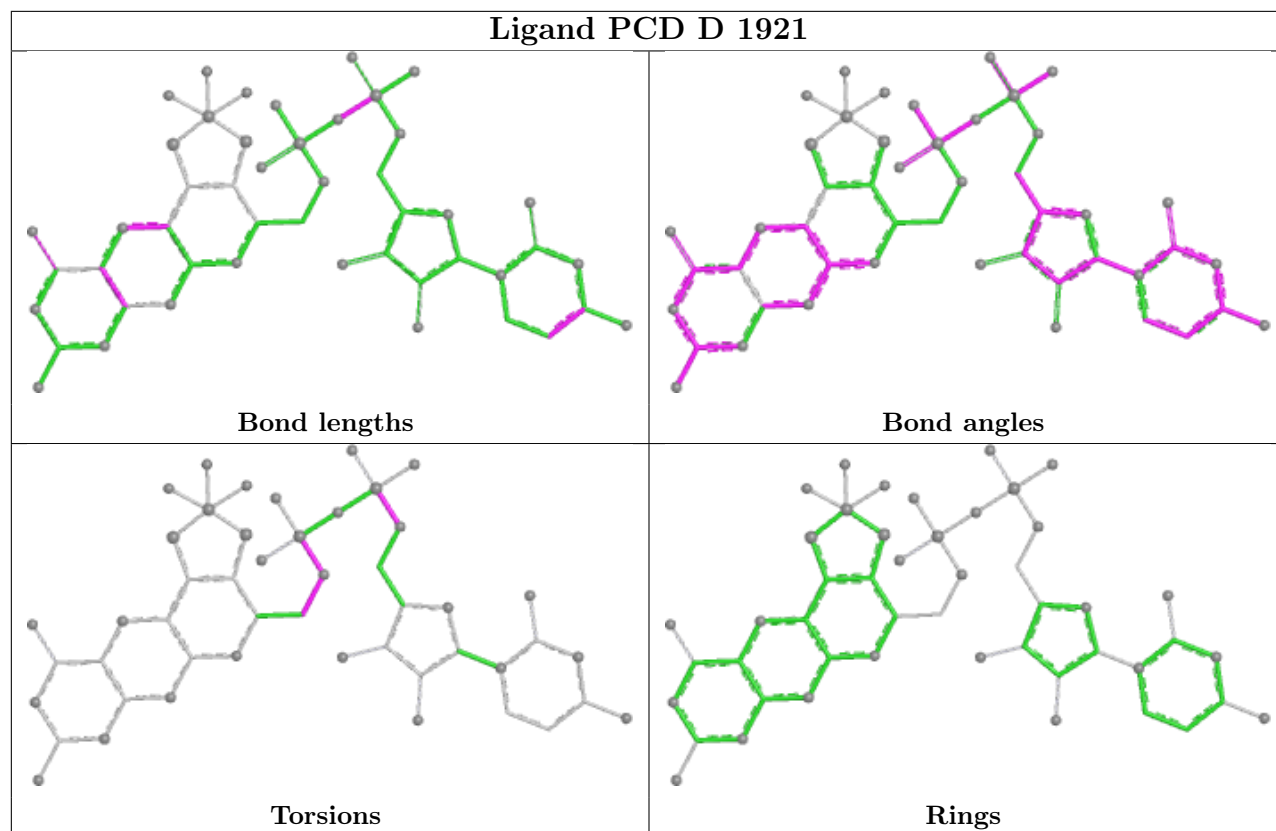
4 monomers are involved in 16 short contacts:

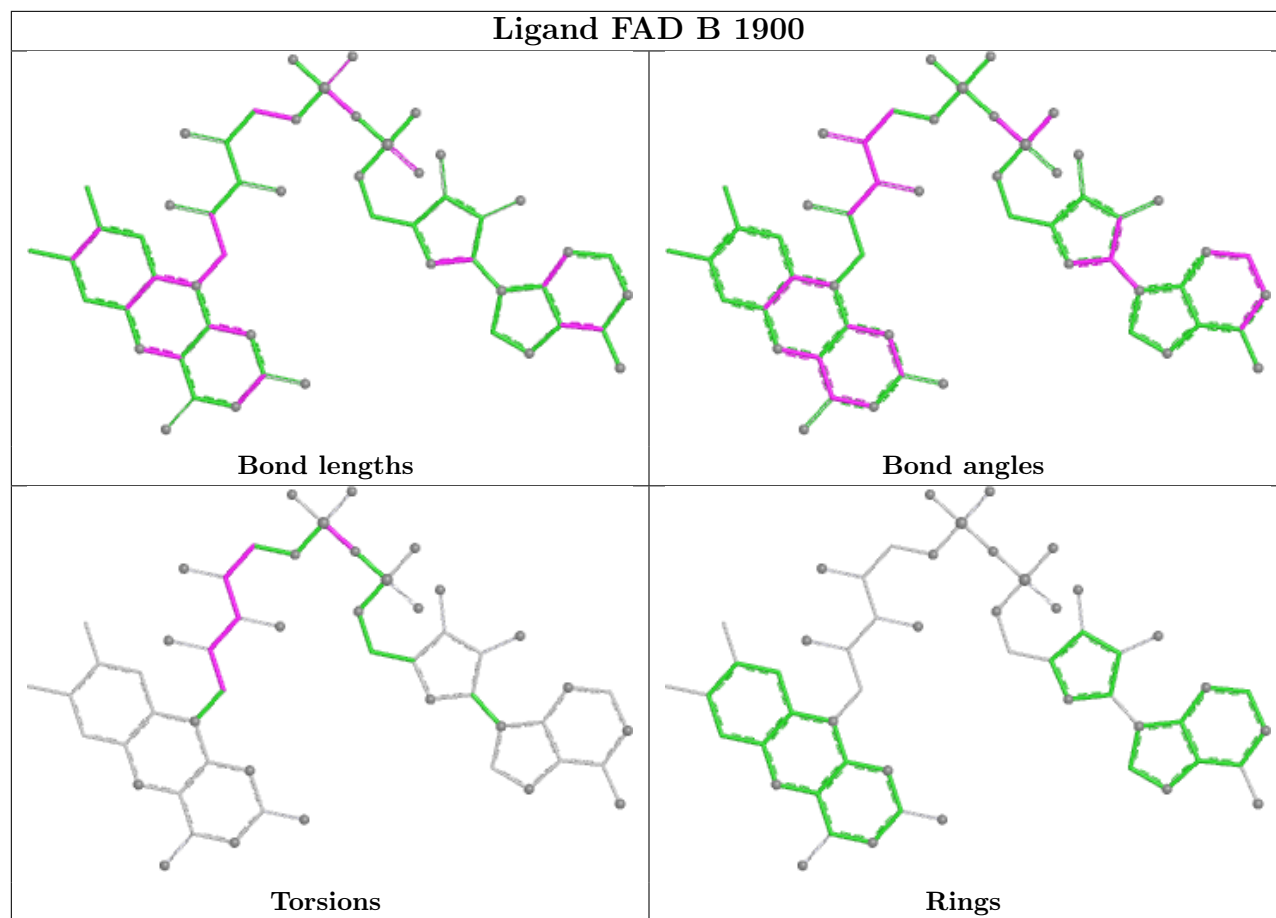
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	1920	PCD	7	0
4	D	1921	PCD	5	0
6	E	1901	FAD	3	0
6	B	1900	FAD	1	0

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	761/769 (98%)	-0.55	4 (0%) 87 85	18, 30, 55, 100	0
1	D	760/769 (98%)	-0.57	7 (0%) 81 79	16, 29, 57, 92	0
2	B	323/324 (99%)	-0.42	3 (0%) 81 79	21, 34, 59, 78	0
2	E	323/324 (99%)	-0.23	2 (0%) 85 83	21, 37, 61, 80	0
3	C	161/161 (100%)	-0.86	2 (1%) 76 74	17, 24, 46, 74	0
3	F	157/161 (97%)	-0.78	0 100 100	19, 26, 41, 103	0
All	All	2485/2508 (99%)	-0.54	18 (0%) 84 82	16, 31, 57, 103	0

The worst 5 of 18 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	768	ALA	5.1
1	A	769	ALA	3.2
2	E	66	ALA	3.2
2	E	323	ALA	3.2
3	C	160	ALA	2.7

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

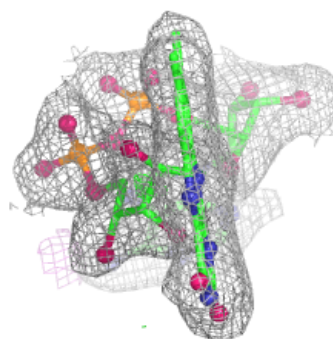
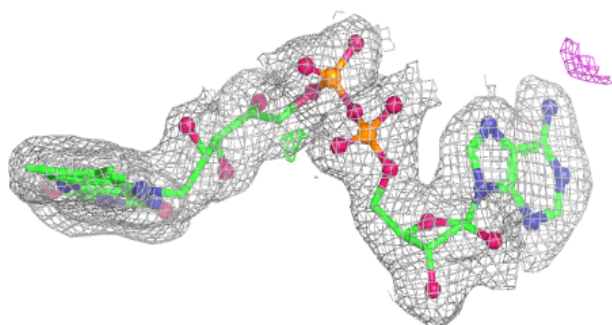
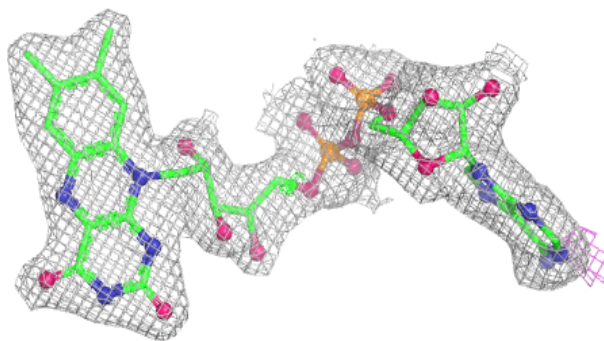
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
9	SO4	E	1113	5/5	0.91	0.19	41,43,46,46	5
5	EPE	A	1111	15/15	0.92	0.13	39,43,53,61	15
9	SO4	D	1112	5/5	0.95	0.19	49,49,52,53	5
6	FAD	E	1901	53/53	0.97	0.05	23,29,32,35	0
6	FAD	B	1900	53/53	0.98	0.05	18,24,29,33	0
7	SF4	B	1910	8/8	0.99	0.02	28,29,29,30	0
7	SF4	E	1911	8/8	0.99	0.02	26,29,29,29	0
8	FES	C	1907	4/4	0.99	0.02	15,18,19,21	0
4	PCD	D	1921	48/48	0.99	0.04	18,24,29,33	0
4	PCD	A	1920	48/48	0.99	0.04	17,24,28,37	0
8	FES	F	1918	4/4	1.00	0.02	23,24,24,24	0
8	FES	C	1908	4/4	1.00	0.02	20,20,22,23	0
8	FES	F	1917	4/4	1.00	0.02	19,21,23,23	0

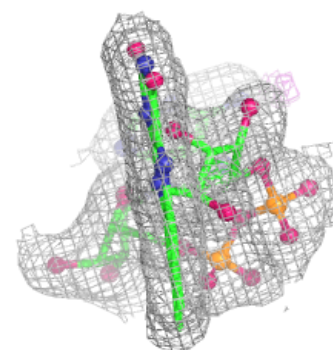
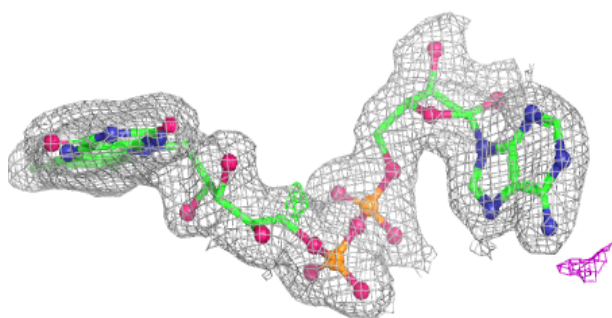
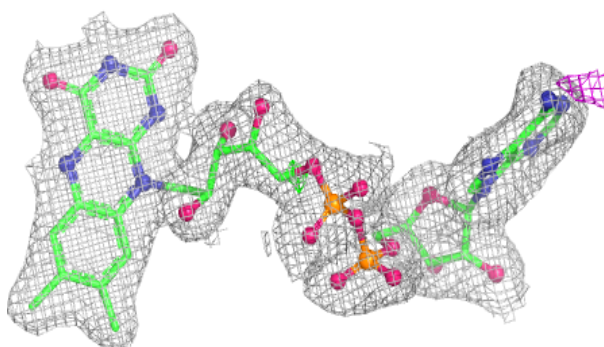
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around FAD E 1901:

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

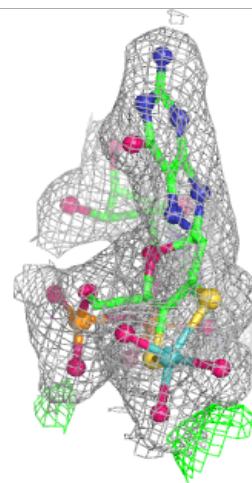
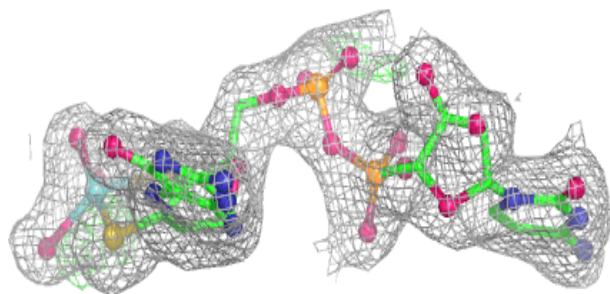
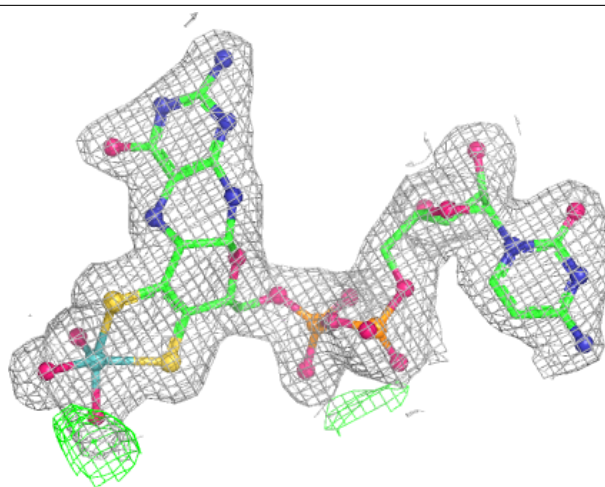
**Electron density around FAD B 1900:**

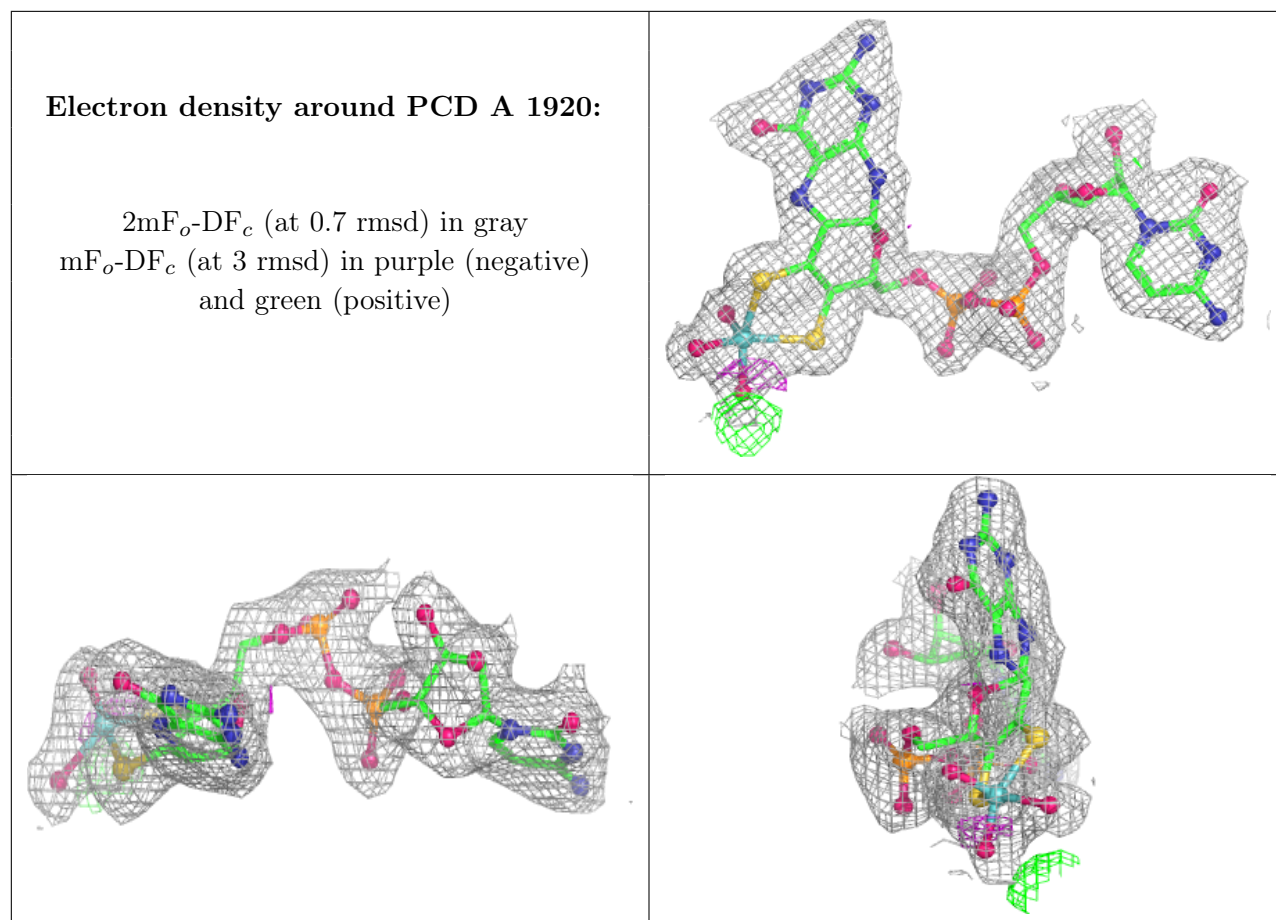
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around PCD D 1921:

$2mF_o-DF_c$ (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.