Full wwPDB X-ray Structure Validation Report ⓘ

Oct 7, 2023 – 01:57 PM EDT

PDB ID	:	6DEQ
Title	:	Crystal structure of Candida albicans acetohydroxyacid synthase in complex with the herbicide penoxsulam
Authors	:	Garcia, M.D.; Guddat, L.W.
Deposited on	:	2018-05-12
Resolution	:	2.13 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:

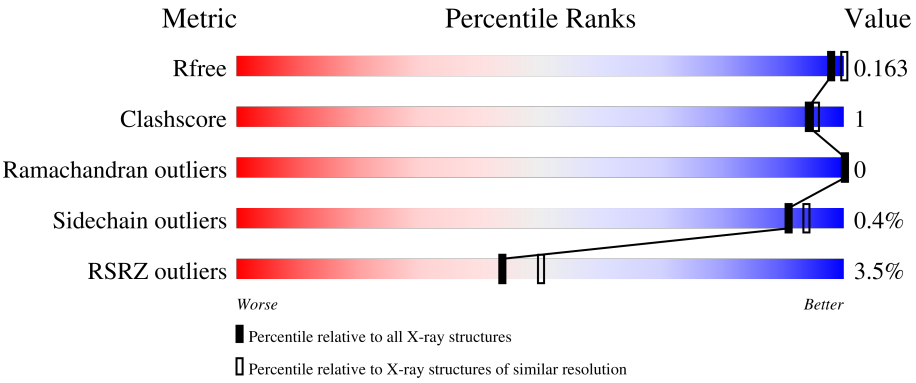
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.13 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	6241 (2.14-2.10)
Clashscore	141614	6778 (2.14-2.10)
Ramachandran outliers	138981	6705 (2.14-2.10)
Sidechain outliers	138945	6706 (2.14-2.10)
RSRZ outliers	127900	6112 (2.14-2.10)

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 <=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	682	3% 85% · 12%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 5473 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 Acetolactate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	601	4626	2938	784	881	23	0	13	0

There are 45 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	2	MET	-	initiating methionine	UNP A0A1D8PJF9
A	3	HIS	-	expression tag	UNP A0A1D8PJF9
A	4	HIS	-	expression tag	UNP A0A1D8PJF9
A	5	HIS	-	expression tag	UNP A0A1D8PJF9
A	6	HIS	-	expression tag	UNP A0A1D8PJF9
A	7	HIS	-	expression tag	UNP A0A1D8PJF9
A	8	HIS	-	expression tag	UNP A0A1D8PJF9
A	9	SER	-	expression tag	UNP A0A1D8PJF9
A	10	SER	-	expression tag	UNP A0A1D8PJF9
A	11	GLY	-	expression tag	UNP A0A1D8PJF9
A	12	LEU	-	expression tag	UNP A0A1D8PJF9
A	13	VAL	-	expression tag	UNP A0A1D8PJF9
A	14	PRO	-	expression tag	UNP A0A1D8PJF9
A	15	ARG	-	expression tag	UNP A0A1D8PJF9
A	16	GLY	-	expression tag	UNP A0A1D8PJF9
A	17	SER	-	expression tag	UNP A0A1D8PJF9
A	18	GLY	-	expression tag	UNP A0A1D8PJF9
A	19	MET	-	expression tag	UNP A0A1D8PJF9
A	20	LYS	-	expression tag	UNP A0A1D8PJF9
A	21	GLU	-	expression tag	UNP A0A1D8PJF9
A	22	THR	-	expression tag	UNP A0A1D8PJF9
A	23	ALA	-	expression tag	UNP A0A1D8PJF9
A	24	ALA	-	expression tag	UNP A0A1D8PJF9
A	25	ALA	-	expression tag	UNP A0A1D8PJF9
A	26	LYS	-	expression tag	UNP A0A1D8PJF9
A	27	PHE	-	expression tag	UNP A0A1D8PJF9
A	28	GLU	-	expression tag	UNP A0A1D8PJF9

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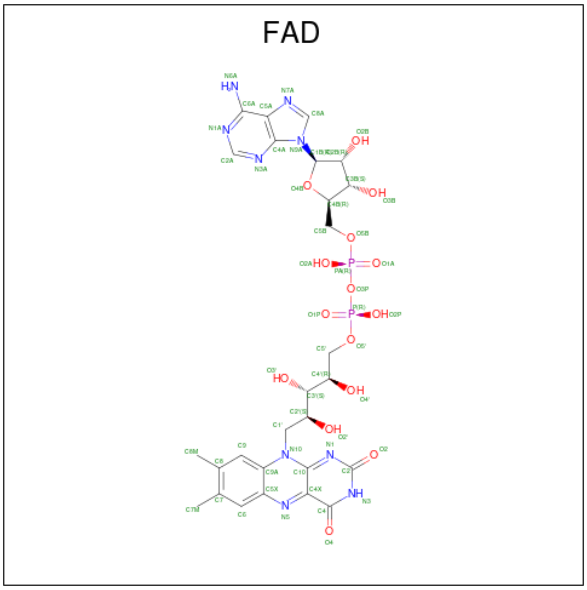
Chain	Residue	Modelled	Actual	Comment	Reference
A	29	ARG	-	expression tag	UNP A0A1D8PJF9
A	30	GLN	-	expression tag	UNP A0A1D8PJF9
A	31	HIS	-	expression tag	UNP A0A1D8PJF9
A	32	MET	-	expression tag	UNP A0A1D8PJF9
A	33	ASP	-	expression tag	UNP A0A1D8PJF9
A	34	SER	-	expression tag	UNP A0A1D8PJF9
A	35	PRO	-	expression tag	UNP A0A1D8PJF9
A	36	ASP	-	expression tag	UNP A0A1D8PJF9
A	37	LEU	-	expression tag	UNP A0A1D8PJF9
A	38	GLY	-	expression tag	UNP A0A1D8PJF9
A	39	THR	-	expression tag	UNP A0A1D8PJF9
A	40	ASP	-	expression tag	UNP A0A1D8PJF9
A	41	ASP	-	expression tag	UNP A0A1D8PJF9
A	42	ASP	-	expression tag	UNP A0A1D8PJF9
A	43	ASP	-	expression tag	UNP A0A1D8PJF9
A	44	LYS	-	expression tag	UNP A0A1D8PJF9
A	45	ALA	-	expression tag	UNP A0A1D8PJF9
A	46	MET	-	expression tag	UNP A0A1D8PJF9

- 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
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

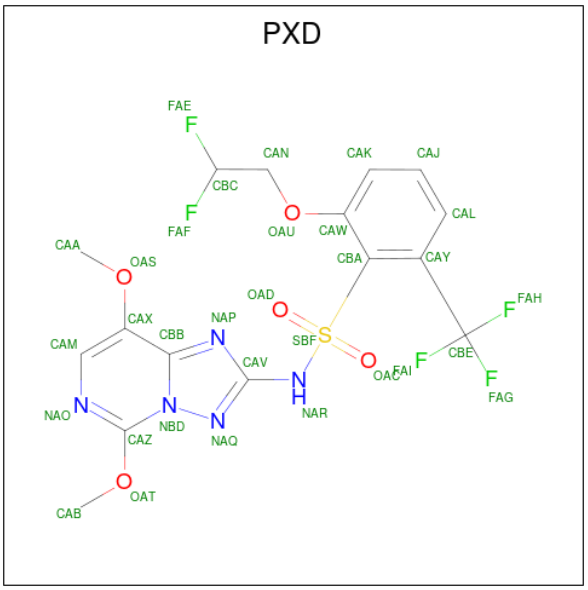
- Molecule 3 is POTASSIUM ION (three-letter code: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total K 1 1	0	0

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

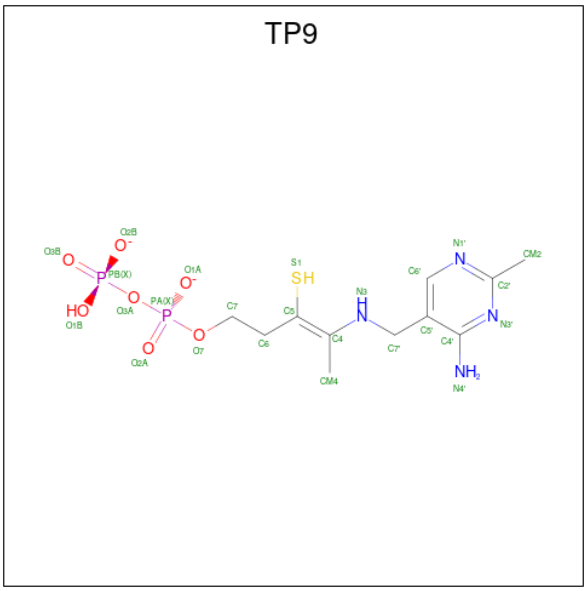
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Mg 1 1	0	0

- Molecule 5 is 2-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (three-letter code: PXD) (formula: $C_{16}H_{14}F_5N_5O_5S$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
5	A	1	Total 64	C 32	F 10	N 10	O 10	S 2	0	1

- Molecule 6 is (3Z)-4-{[(4-AMINO-2-METHYLPYRIMIDIN-5-YL)METHYL]AMINO}-3-MERCAPTOPENT-3-EN-1-YL TRIHYDROGEN DIPHOSPHATE (three-letter code: TP9) (formula: $C_{11}H_{18}N_4O_7P_2S$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
6	A	1	Total	C	N	O	P	S	0	0
			25	11	4	7	2	1		

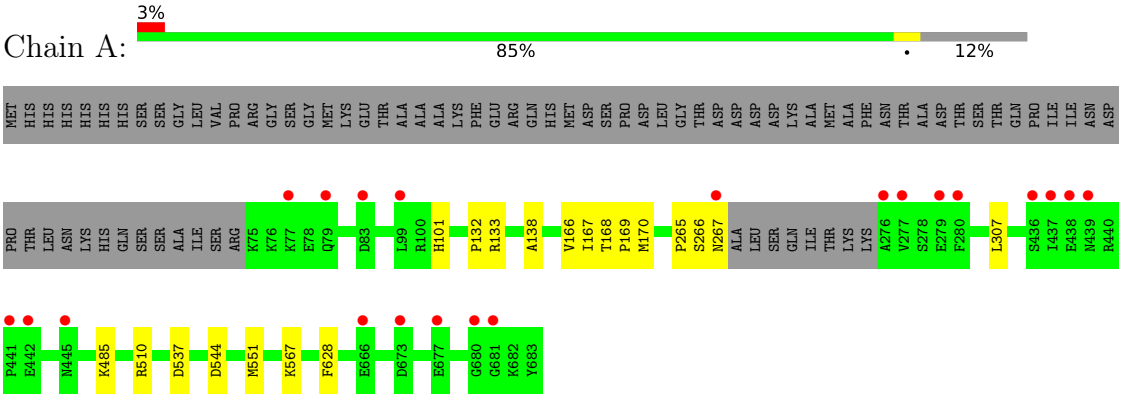
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	703	Total	O	0	0
			703	703		

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: Acetolactate synthase



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 62 2 2	Depositor
Cell constants a, b, c, α, β, γ	176.54Å 176.54Å 177.78Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	44.21 – 2.13 44.21 – 2.13	Depositor EDS
% Data completeness (in resolution range)	99.6 (44.21-2.13) 99.6 (44.21-2.13)	Depositor EDS
R_{merge}	0.19	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.17 (at 2.12Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.142 , 0.161 0.148 , 0.163	Depositor DCC
R_{free} test set	2000 reflections (2.19%)	wwPDB-VP
Wilson B-factor (Å^2)	29.6	Xtriage
Anisotropy	0.314	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 67.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	5473	wwPDB-VP
Average B, all atoms (Å^2)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.42% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 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: TP9, FAD, K, PXD, MG

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	0.26	0/4746	0.44	0/6442

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

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	4626	0	4641	12	0
2	A	53	0	30	0	0
3	A	1	0	0	0	0
4	A	1	0	0	0	0
5	A	64	0	0	0	0
6	A	25	0	17	0	0
7	A	703	0	0	2	0
All	All	5473	0	4688	12	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 1.

All (12) 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:132:PRO:HG3	1:A:138:ALA:HB2	1.88	0.56
1:A:510:ARG:NH1	7:A:812:HOH:O	2.44	0.50
1:A:510:ARG:NH2	7:A:813:HOH:O	2.45	0.49
1:A:167:ILE:HD13	1:A:170:MET:HE3	1.97	0.47
1:A:266:SER:HA	1:A:267:ASN:HA	1.67	0.46
1:A:567:LYS:HB3	1:A:628:PHE:CZ	2.51	0.45
1:A:166[B]:VAL:HG23	1:A:170:MET:HE1	2.02	0.42
1:A:485:LYS:HE2	1:A:537:ASP:O	2.19	0.42
1:A:133:ARG:HD3	1:A:133:ARG:HA	1.83	0.42
1:A:168:THR:HB	1:A:169:PRO:HD3	2.02	0.42
1:A:307:LEU:O	1:A:510:ARG:NH1	2.53	0.41
1:A:101:HIS:CE1	1:A:265:PRO:HB3	2.55	0.41

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	610/682 (89%)	601 (98%)	9 (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	497/563 (88%)	495 (100%)	2 (0%)	91 94

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

Mol	Chain	Res	Type
1	A	544	ASP
1	A	551	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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)

Of 6 ligands modelled in this entry, 2 are monoatomic - leaving 4 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	$\#\|Z\| > 2$
2	FAD	A	701	-	53,58,58	2.11	10 (18%)	68,89,89	1.26	10 (14%)
5	PXD	A	704[A]	-	30,34,34	3.32	10 (33%)	34,51,51	3.43	9 (26%)
5	PXD	A	704[B]	-	30,34,34	3.33	10 (33%)	34,51,51	3.45	11 (32%)
6	TP9	A	705	4	21,25,25	2.25	2 (9%)	28,36,36	1.73	7 (25%)

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	701	-	-	2/30/50/50	0/6/6/6
5	PXD	A	704[A]	-	-	5/24/26/26	0/3/3/3
5	PXD	A	704[B]	-	-	7/24/26/26	0/3/3/3
6	TP9	A	705	4	-	2/17/22/22	0/1/1/1

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	704[B]	PXD	CBB-NAP	11.84	1.44	1.33
5	A	704[A]	PXD	CBB-NAP	11.64	1.44	1.33
2	A	701	FAD	O2'-C2'	-9.77	1.22	1.43
6	A	705	TP9	C4-N3	9.08	1.44	1.32
5	A	704[B]	PXD	OAC-SBF	7.27	1.51	1.43
5	A	704[A]	PXD	OAC-SBF	7.19	1.51	1.43
5	A	704[A]	PXD	CAZ-NAO	5.60	1.42	1.32
5	A	704[A]	PXD	OAT-CAZ	5.57	1.42	1.33
5	A	704[B]	PXD	OAT-CAZ	5.55	1.42	1.33
5	A	704[B]	PXD	CAZ-NAO	5.47	1.42	1.32
2	A	701	FAD	C10-N1	4.95	1.43	1.33
5	A	704[A]	PXD	OAU-CAW	4.69	1.46	1.37
2	A	701	FAD	C4X-N5	4.59	1.39	1.30
5	A	704[B]	PXD	OAU-CAW	4.51	1.46	1.37
2	A	701	FAD	C2B-C1B	-4.21	1.47	1.53
6	A	705	TP9	C4'-N4'	3.42	1.42	1.34
5	A	704[A]	PXD	SBF-NAR	3.11	1.68	1.63
5	A	704[B]	PXD	SBF-NAR	3.07	1.68	1.63
2	A	701	FAD	O4B-C1B	3.05	1.45	1.41
5	A	704[A]	PXD	CAL-CAY	-3.04	1.35	1.39
5	A	704[B]	PXD	CAL-CAY	-2.97	1.35	1.39
5	A	704[B]	PXD	CAJ-CAL	2.85	1.44	1.38
5	A	704[A]	PXD	CAJ-CAL	2.82	1.44	1.38
5	A	704[A]	PXD	CAY-CBA	2.74	1.45	1.41
5	A	704[B]	PXD	CAY-CBA	2.69	1.45	1.41
2	A	701	FAD	C2'-C3'	2.54	1.58	1.53
2	A	701	FAD	O3'-C3'	-2.51	1.37	1.43
2	A	701	FAD	C2-N1	2.46	1.42	1.36
5	A	704[A]	PXD	FAE-CBC	2.45	1.43	1.35
5	A	704[B]	PXD	FAE-CBC	2.42	1.43	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	701	FAD	C1'-N10	-2.24	1.42	1.48
2	A	701	FAD	C1'-C2'	2.12	1.55	1.52

All (37) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	704[A]	PXD	OAD-SBF-OAC	-14.90	101.23	119.55
5	A	704[B]	PXD	OAD-SBF-OAC	-14.73	101.44	119.55
5	A	704[A]	PXD	CBA-SBF-NAR	7.46	115.10	106.68
5	A	704[B]	PXD	CBA-SBF-NAR	7.31	114.93	106.68
5	A	704[B]	PXD	OAS-CAX-CBB	5.03	120.19	115.03
5	A	704[B]	PXD	CAB-OAT-CAZ	-4.44	113.57	117.49
5	A	704[A]	PXD	CAB-OAT-CAZ	-4.25	113.73	117.49
2	A	701	FAD	N3A-C2A-N1A	-4.15	122.19	128.68
5	A	704[A]	PXD	OAS-CAX-CBB	4.12	119.25	115.03
6	A	705	TP9	PA-O3A-PB	-3.72	120.07	132.83
5	A	704[A]	PXD	CAV-NAR-SBF	-3.70	120.48	125.71
5	A	704[B]	PXD	CAM-NAO-CAZ	3.58	119.31	114.97
5	A	704[A]	PXD	CAM-NAO-CAZ	3.54	119.27	114.97
6	A	705	TP9	C6'-N1'-C2'	3.49	121.91	115.96
5	A	704[A]	PXD	CAW-CBA-SBF	-3.42	115.11	120.39
5	A	704[B]	PXD	CAW-CBA-SBF	-3.33	115.25	120.39
5	A	704[B]	PXD	CAV-NAR-SBF	-3.20	121.18	125.71
6	A	705	TP9	C5'-C6'-N1'	-3.11	118.63	123.82
2	A	701	FAD	C4A-C5A-N7A	-2.84	106.44	109.40
5	A	704[A]	PXD	FAH-CBE-CAY	-2.83	107.77	112.70
5	A	704[B]	PXD	FAH-CBE-CAY	-2.81	107.81	112.70
6	A	705	TP9	O1B-PB-O3A	2.75	113.87	104.64
2	A	701	FAD	C4-N3-C2	-2.65	120.75	125.64
2	A	701	FAD	C4X-C4-N3	2.64	119.90	113.19
2	A	701	FAD	C4X-C10-N10	2.63	120.33	116.48
6	A	705	TP9	C7'-N3-C4	-2.61	122.38	125.97
2	A	701	FAD	C4-C4X-N5	2.53	121.84	118.23
6	A	705	TP9	CM4-C4-N3	2.49	120.79	118.00
6	A	705	TP9	N1'-C2'-N3'	-2.42	121.37	125.54
2	A	701	FAD	O4-C4-C4X	-2.42	120.19	126.60
5	A	704[B]	PXD	CAY-CBA-SBF	2.41	126.39	120.30
2	A	701	FAD	C10-C4X-N5	-2.38	119.81	124.86
5	A	704[A]	PXD	CAY-CBA-SBF	2.35	126.22	120.30
2	A	701	FAD	C4X-C10-N1	-2.26	119.48	124.73
5	A	704[B]	PXD	CAA-OAS-CAX	-2.09	114.82	117.75
5	A	704[B]	PXD	CAK-CAW-CBA	2.06	121.78	119.04

Continued on next page...

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	701	FAD	C10-N1-C2	2.02	120.93	116.90

There are no chirality outliers.

All (16) torsion outliers are listed below:

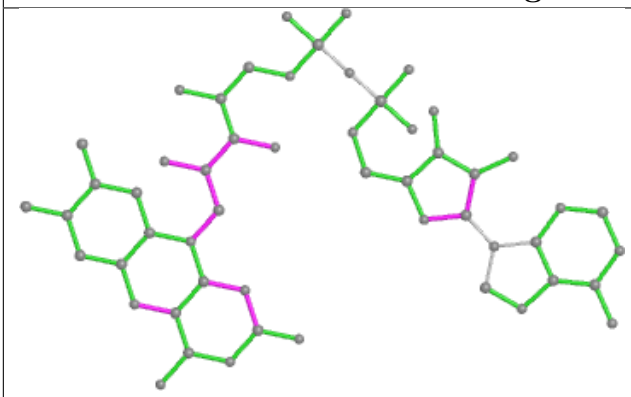
Mol	Chain	Res	Type	Atoms
5	A	704[A]	PXD	CAW-CBA-SBF-NAR
5	A	704[A]	PXD	CAY-CBA-SBF-NAR
5	A	704[A]	PXD	CAV-NAR-SBF-OAC
5	A	704[B]	PXD	CAW-CBA-SBF-NAR
5	A	704[B]	PXD	CAY-CBA-SBF-NAR
5	A	704[B]	PXD	NAO-CAZ-OAT-CAB
6	A	705	TP9	C4-C5-C6-C7
5	A	704[B]	PXD	CAV-NAR-SBF-OAC
6	A	705	TP9	PA-O3A-PB-O3B
5	A	704[B]	PXD	CBA-CAW-OAU-CAN
5	A	704[A]	PXD	OAU-CAN-CBC-FAE
2	A	701	FAD	P-O3P-PA-O5B
5	A	704[B]	PXD	NBD-CAZ-OAT-CAB
5	A	704[B]	PXD	CAK-CAW-OAU-CAN
2	A	701	FAD	O4B-C4B-C5B-O5B
5	A	704[A]	PXD	CBA-CAW-OAU-CAN

There are no ring outliers.

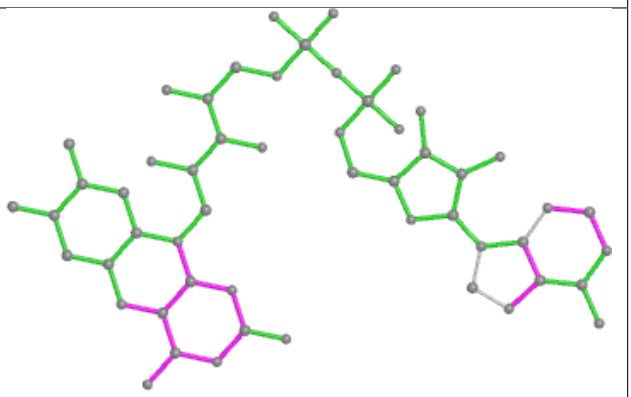
No monomer is involved in short contacts.

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 then 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.

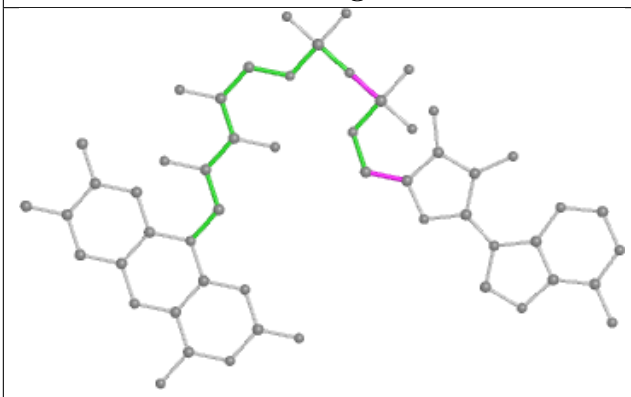
Ligand FAD A 701



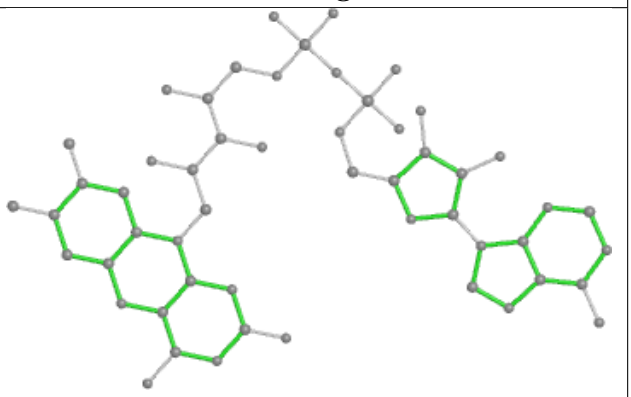
Bond lengths



Bond angles

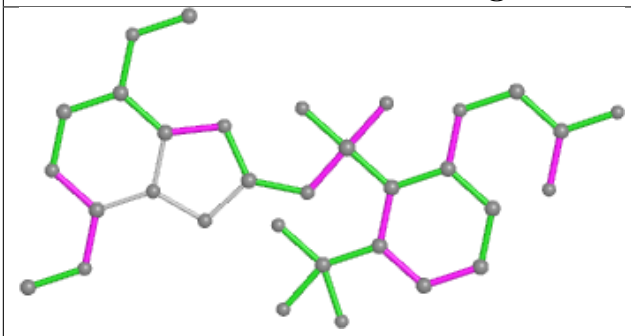


Torsions

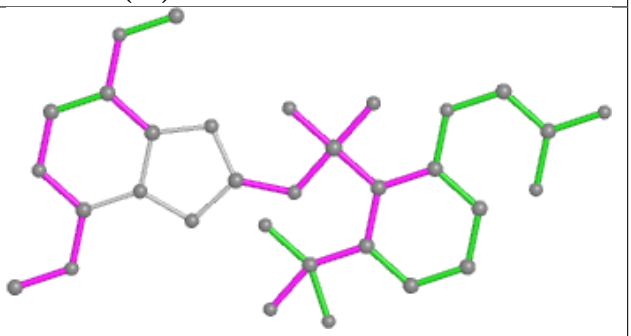


Rings

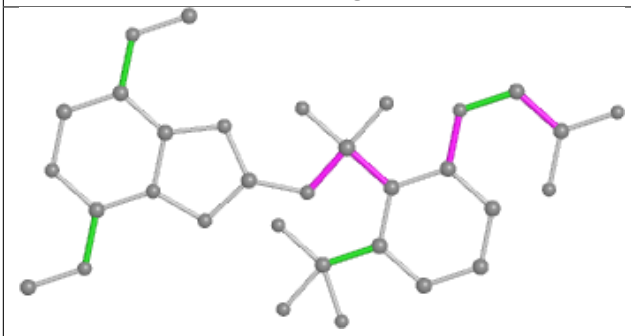
Ligand PXD A 704 (A)



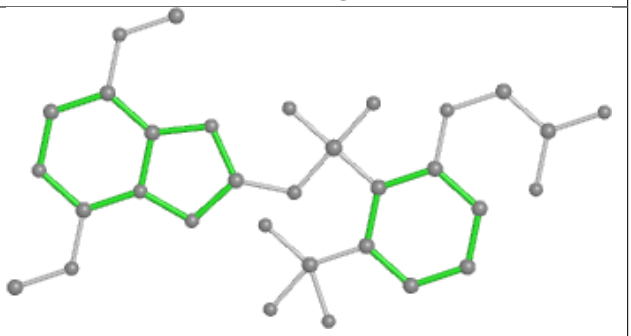
Bond lengths



Bond angles

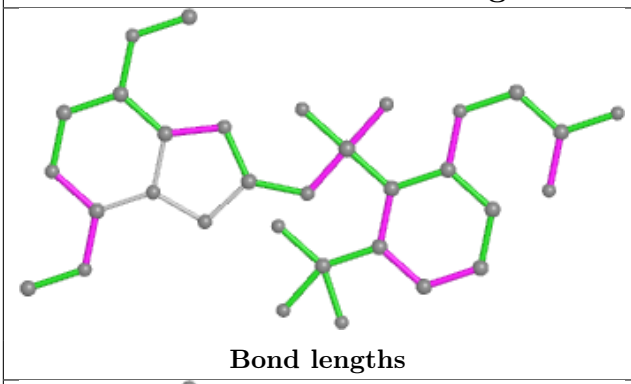


Torsions

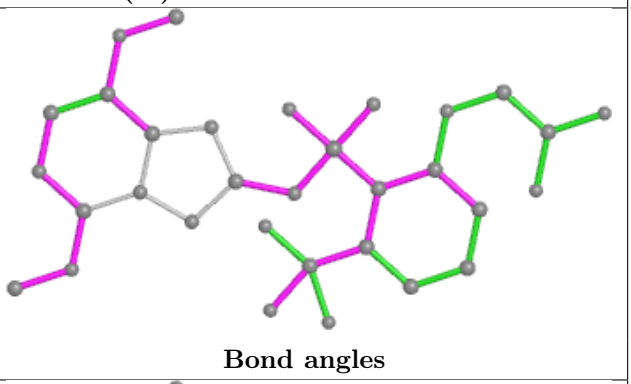


Rings

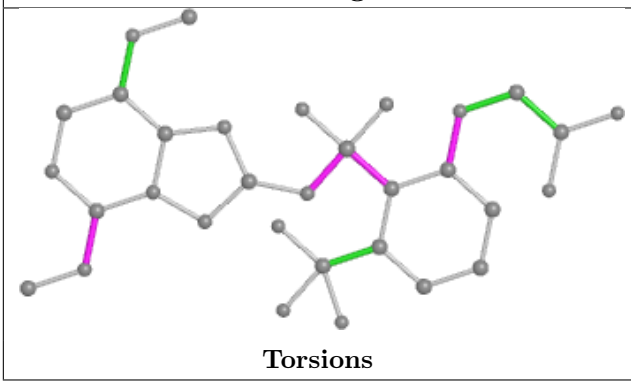
Ligand PXD A 704 (B)



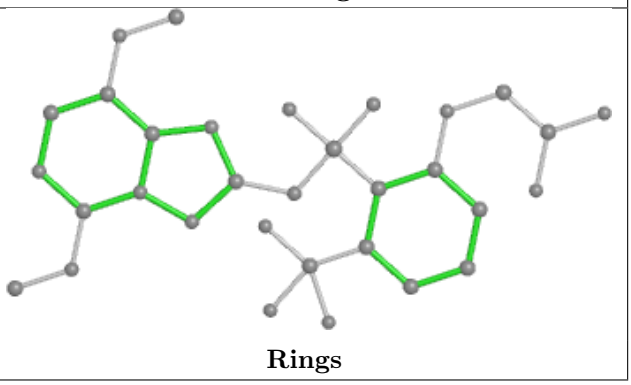
Bond lengths



Bond angles

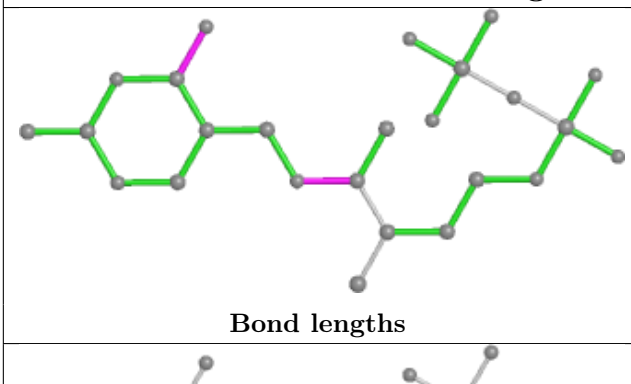


Torsions

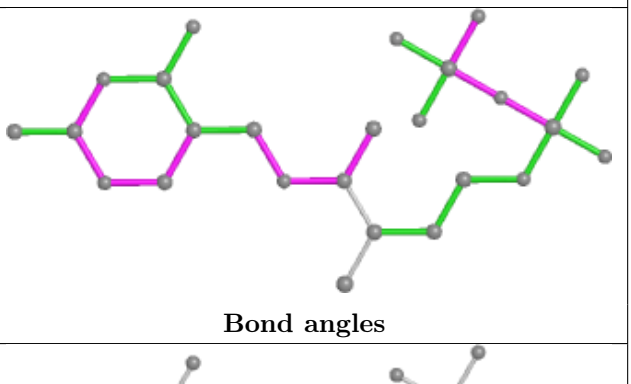


Rings

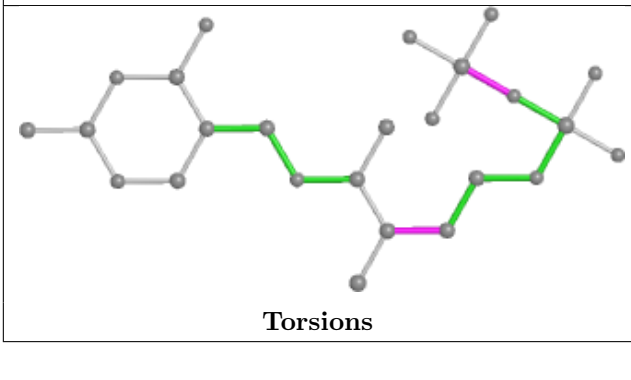
Ligand TP9 A 705



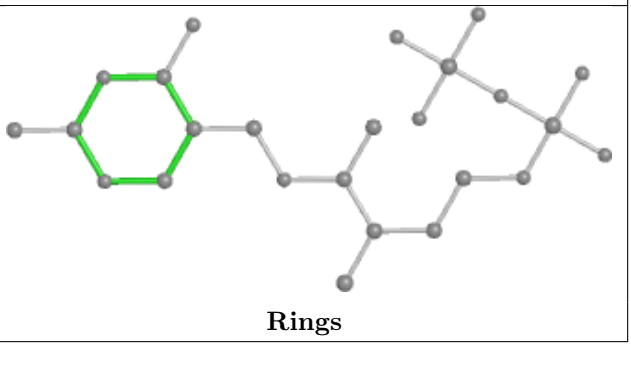
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	601/682 (88%)	-0.37	21 (3%) 44 50	20, 30, 54, 99	0

All (21) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	277	VAL	5.6
1	A	267	ASN	3.6
1	A	276	ALA	3.2
1	A	681	GLY	3.2
1	A	99[A]	LEU	3.1
1	A	441	PRO	3.0
1	A	77	LYS	2.9
1	A	279	GLU	2.8
1	A	436[A]	SER	2.7
1	A	442	GLU	2.6
1	A	437	ILE	2.6
1	A	438	GLU	2.6
1	A	280	PHE	2.6
1	A	439	ASN	2.5
1	A	79	GLN	2.4
1	A	677	GLU	2.4
1	A	666	GLU	2.4
1	A	673	ASP	2.3
1	A	680	GLY	2.3
1	A	83	ASP	2.2
1	A	445	ASN	2.1

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 (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

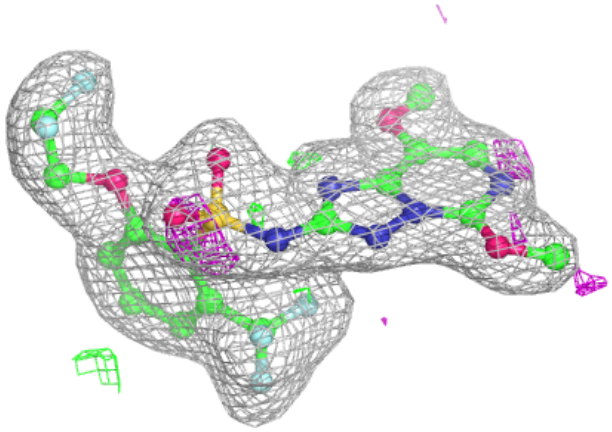
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

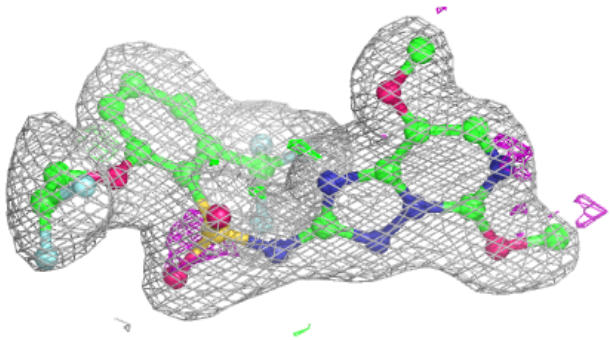
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MG	A	703	1/1	0.96	0.09	20,20,20,20	0
5	PXD	A	704[A]	32/32	0.97	0.10	23,28,33,43	32
5	PXD	A	704[B]	32/32	0.97	0.10	19,28,38,41	32
2	FAD	A	701	53/53	0.98	0.08	16,24,29,31	0
6	TP9	A	705	25/25	0.98	0.12	15,23,28,34	1
3	K	A	702	1/1	0.99	0.07	32,32,32,32	0

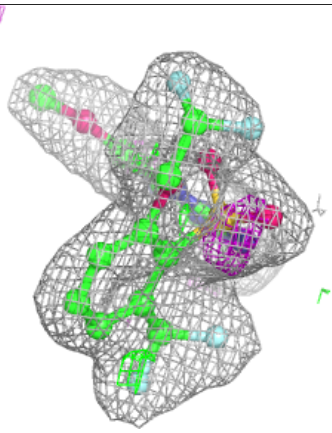
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around PXD A 704 (A):

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

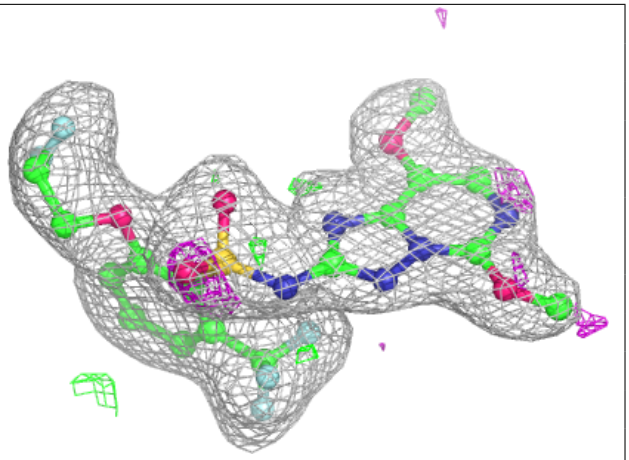


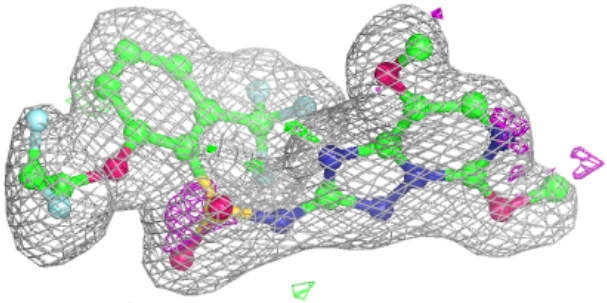


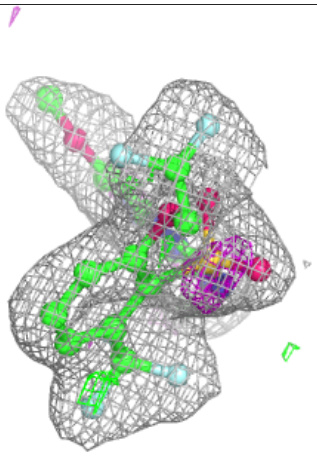


Electron density around PXD A 704 (B):

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

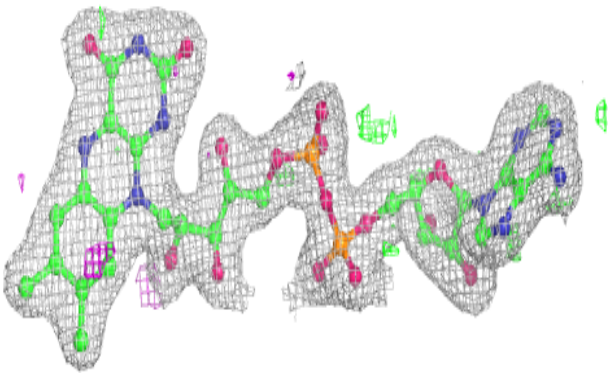


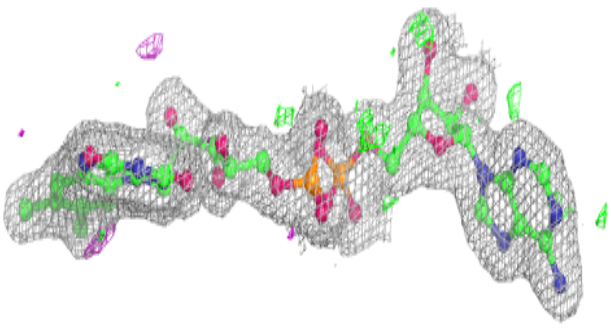


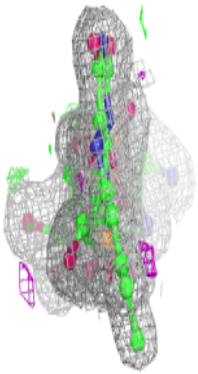


Electron density around FAD A 701:

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

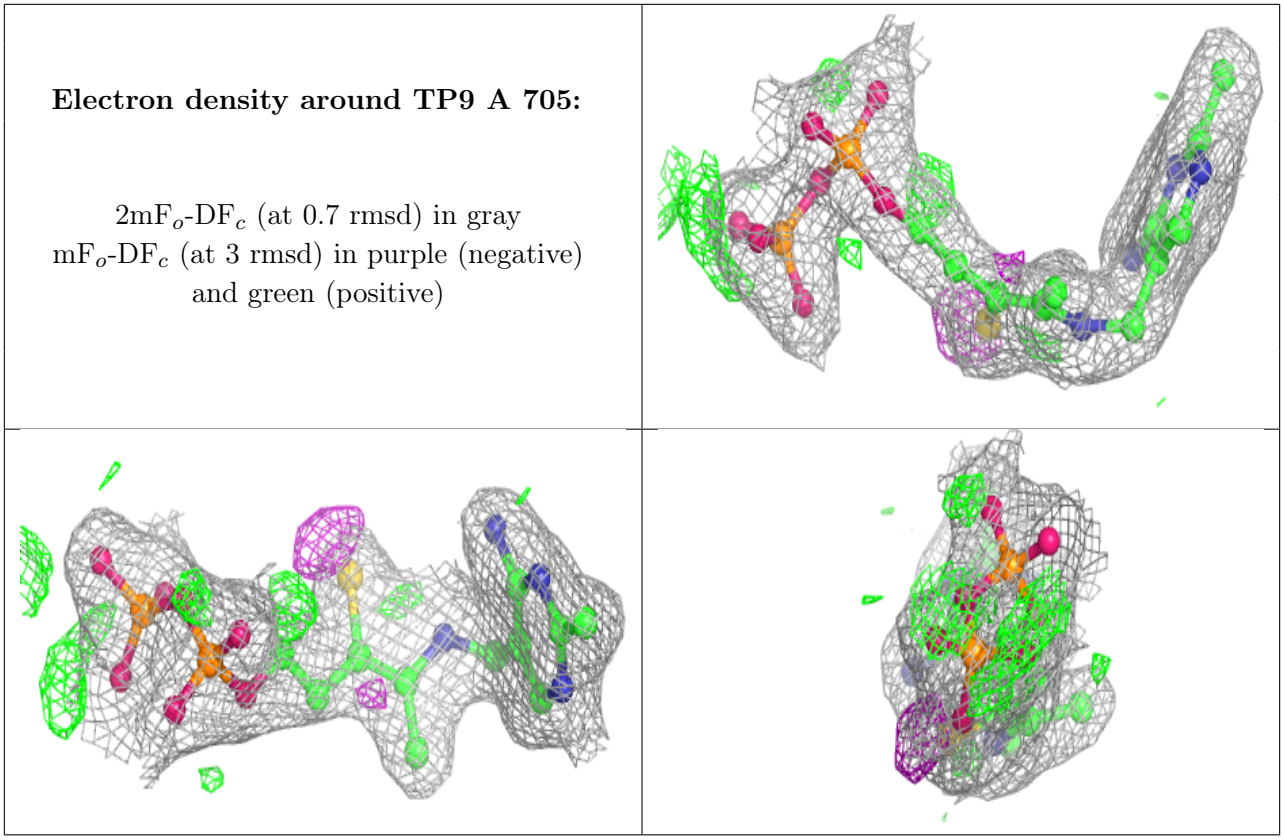






Electron density around TP9 A 705:

$2mF_o$-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.