



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 9, 2026 – 11:02 PM UTC

PDB ID : 3IQE / pdb_00003iqe
Title : Structure of F420 dependent methylene-tetrahydromethanopterin dehydrogenase in complex with methylene-tetrahydromethanopterin and coenzyme F420
Authors : Ceh, K.E.; Demmer, U.; Warkentin, E.; Moll, J.; Thauer, R.K.; Shima, S.; Ermler, U.
Deposited on : 2009-08-20
Resolution : 1.80 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](#) ①) 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

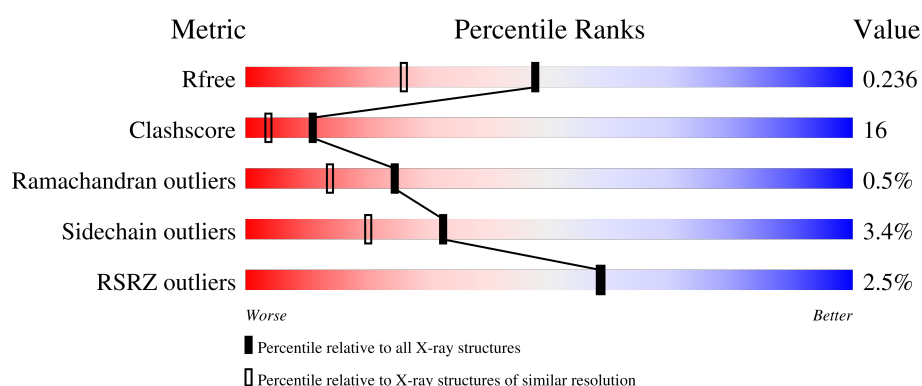
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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	283	2% 77% 20% .
1	B	283	2% 75% 23% .
1	C	283	2% 78% 20% .
1	D	283	4% 78% 19% ..
1	E	283	2% 74% 23% .

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Mol	Chain	Length	Quality of chain
1	F	283	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	H4M	A	284	X	-	-	-

2 Entry composition ⓘ

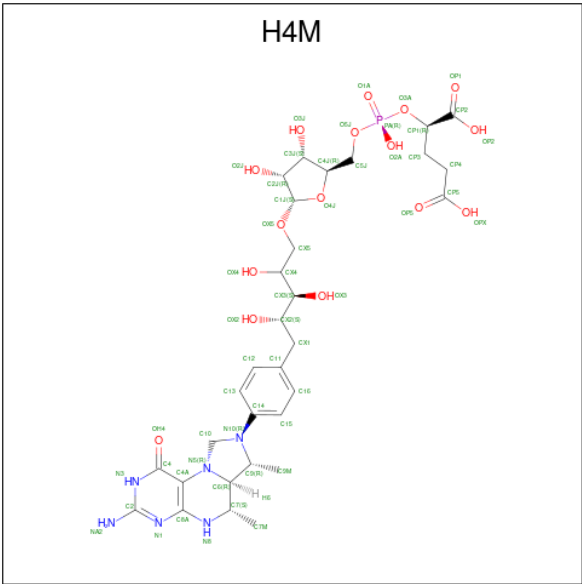
There are 6 unique types of molecules in this entry. The entry contains 14210 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 F420-dependent methylenetetrahydromethanopterin dehydrogenase.

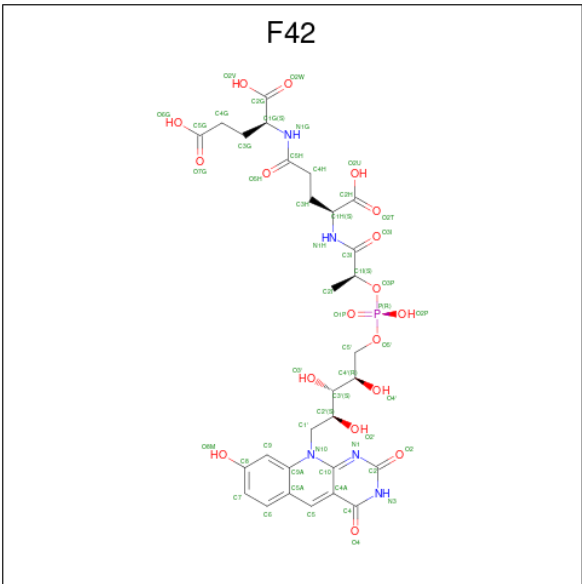
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	282	Total	C	N	O	S	0	1	0
			2187	1373	357	437	20			
1	B	282	Total	C	N	O	S	0	1	0
			2190	1373	358	440	19			
1	C	282	Total	C	N	O	S	0	2	0
			2196	1378	359	439	20			
1	D	282	Total	C	N	O	S	0	0	0
			2182	1369	357	437	19			
1	E	282	Total	C	N	O	S	0	0	0
			2182	1369	357	437	19			
1	F	282	Total	C	N	O	S	0	0	0
			2182	1369	357	437	19			

- Molecule 2 is 5,10-DIMETHYLENE TETRAHYDROMETHANOPTERIN (CCD ID: H4M) (formula: C₃₁H₄₅N₆O₁₆P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			45	26	6	12	1		
2	B	1	Total	C	N	O	P	0	0
			45	26	6	12	1		
2	C	1	Total	C	N	O	P	0	0
			45	26	6	12	1		
2	D	1	Total	C	N	O	P	0	0
			45	26	6	12	1		
2	E	1	Total	C	N	O	P	0	0
			45	26	6	12	1		
2	F	1	Total	C	N	O	P	0	0
			45	26	6	12	1		

- Molecule 3 is COENZYME F420 (CCD ID: F42) (formula: C₂₉H₃₆N₅O₁₈P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			30	16	3	10	1		
3	B	1	Total	C	N	O	P	0	0
			30	16	3	10	1		
3	C	1	Total	C	N	O	P	0	0
			30	16	3	10	1		
3	D	1	Total	C	N	O	P	0	0
			30	16	3	10	1		
3	E	1	Total	C	N	O	P	0	0
			30	16	3	10	1		
3	F	1	Total	C	N	O	P	0	0
			30	16	3	10	1		

- Molecule 4 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	2	Total 2	Ca 2	0	0
4	C	1	Total 1	Ca 1	0	0
4	D	1	Total 1	Ca 1	0	0

- Molecule 5 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	C	1	Total 1	Na 1	0	0
5	D	1	Total 1	Na 1	0	0
5	E	1	Total 1	Na 1	0	0

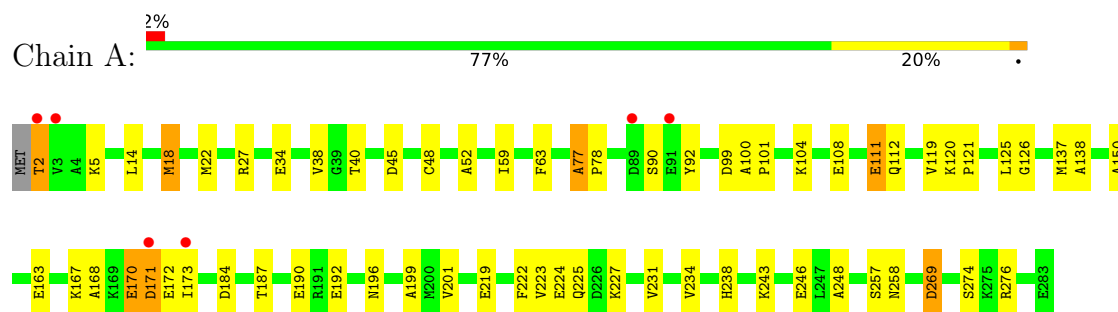
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	85	Total 85	O 85	0	0
6	B	115	Total 115	O 115	0	0
6	C	107	Total 107	O 107	0	0
6	D	106	Total 106	O 106	0	0
6	E	109	Total 109	O 109	0	0
6	F	112	Total 112	O 112	0	0

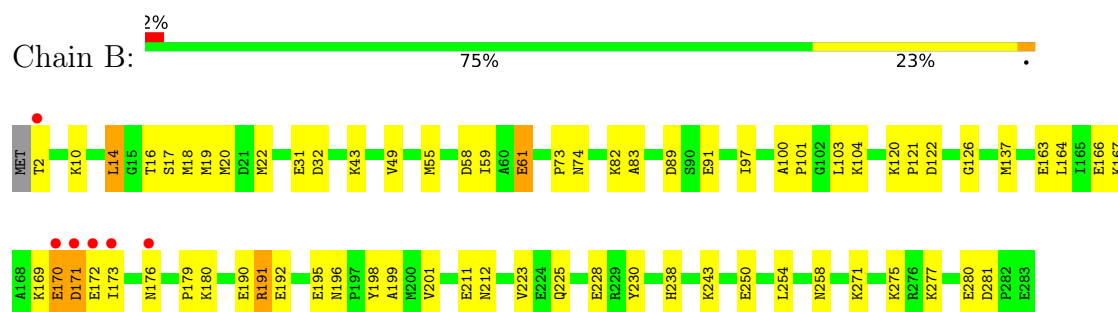
3 Residue-property plots [i](#)

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.

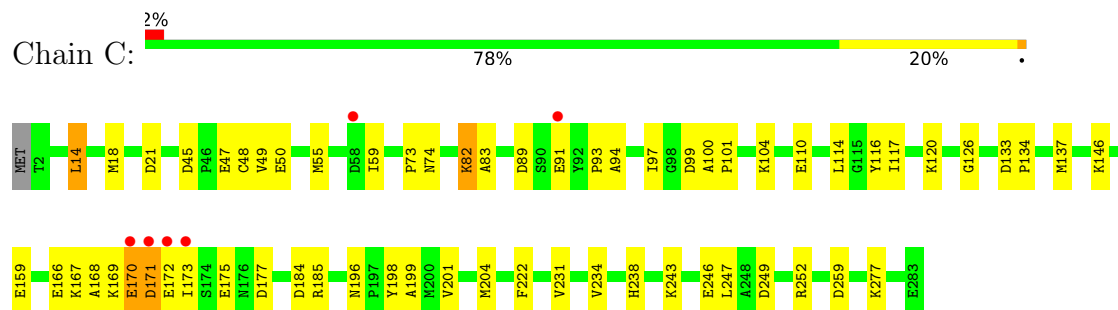
- Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase



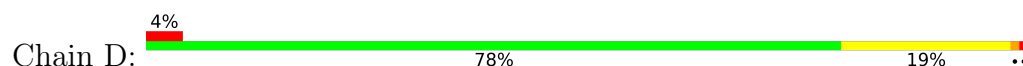
- Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase

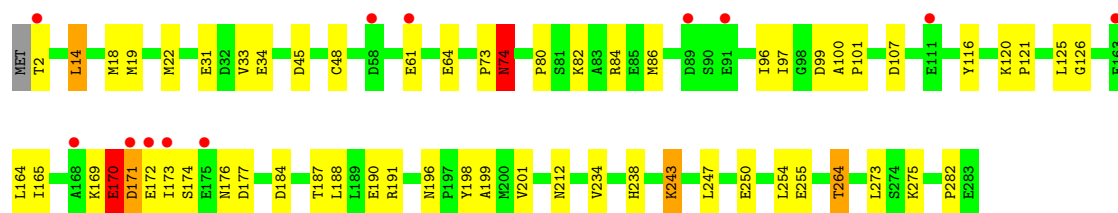


- Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase

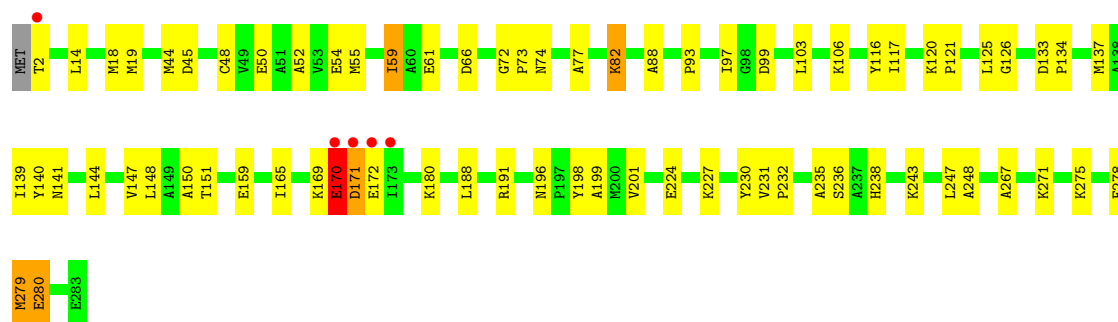
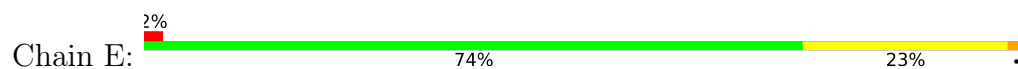


- Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase

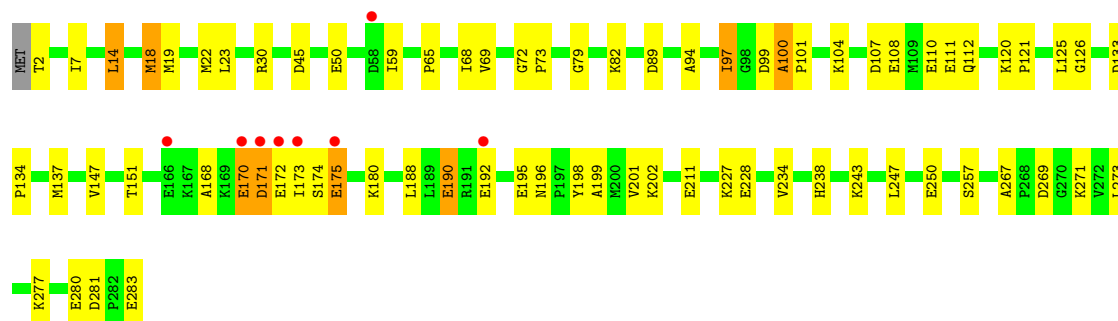
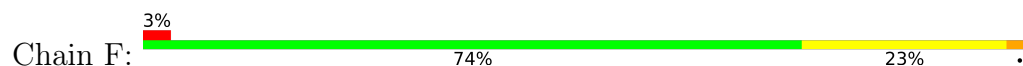




● Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase



● Molecule 1: F420-dependent methylenetetrahydromethanopterin dehydrogenase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	61.15Å 165.54Å 93.55Å 90.00° 99.14° 90.00°	Depositor
Resolution (Å)	92.45 – 1.80 92.36 – 1.80	Depositor EDS
% Data completeness (in resolution range)	95.7 (92.45-1.80) 95.7 (92.36-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.98 (at 1.79Å)	Xtriage
Refinement program	REFMAC 5.5.0066	Depositor
R, R_{free}	0.190 , 0.228 0.198 , 0.236	Depositor DCC
R_{free} test set	8157 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	23.2	Xtriage
Anisotropy	0.313	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 33.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	14210	wwPDB-VP
Average B, all atoms (Å ²)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.94% 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: F42, CA, H4M, NA

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	0.83	0/2223	1.00	6/2999 (0.2%)
1	B	0.93	0/2223	1.05	4/3000 (0.1%)
1	C	0.88	1/2232 (0.0%)	1.00	2/3011 (0.1%)
1	D	0.86	0/2215	1.02	7/2989 (0.2%)
1	E	0.90	0/2215	1.04	5/2989 (0.2%)
1	F	0.92	0/2215	1.04	6/2989 (0.2%)
All	All	0.89	1/13323 (0.0%)	1.02	30/17977 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	231	VAL	CA-C	5.19	1.57	1.52

The worst 5 of 30 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	72	GLY	CA-C-N	9.96	130.06	119.90
1	E	72	GLY	C-N-CA	9.96	130.06	119.90
1	D	264	THR	CA-C-N	8.62	128.56	119.85
1	D	264	THR	C-N-CA	8.62	128.56	119.85
1	A	77	ALA	CA-C-N	6.91	126.42	119.24

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	2187	0	2166	78	3
1	B	2190	0	2160	80	3
1	C	2196	0	2173	77	1
1	D	2182	0	2157	68	0
1	E	2182	0	2157	72	2
1	F	2182	0	2157	84	0
2	A	45	0	36	9	0
2	B	45	0	37	5	0
2	C	45	0	37	6	0
2	D	45	0	37	10	0
2	E	45	0	37	7	0
2	F	45	0	37	7	0
3	A	30	0	15	8	0
3	B	30	0	15	12	0
3	C	30	0	16	10	0
3	D	30	0	15	7	0
3	E	30	0	15	7	0
3	F	30	0	16	9	0
4	B	2	0	0	0	1
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
5	E	1	0	0	0	0
6	A	85	0	0	10	1
6	B	115	0	0	15	0
6	C	107	0	0	10	0
6	D	106	0	0	5	2
6	E	109	0	0	7	0
6	F	112	0	0	20	3
All	All	14210	0	13283	440	8

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 16.

The worst 5 of 440 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)
2:A:284:H4M:H16	3:A:285:F42:C5	1.62	1.29

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:284:H4M:H16	3:D:285:F42:C5	1.65	1.23
2:F:284:H4M:H16	3:F:285:F42:C5	1.69	1.21
1:F:171:ASP:HB2	6:F:371:HOH:O	1.41	1.21
1:B:18:MET:HE3	1:F:22:MET:HE1	1.24	1.19

The worst 5 of 8 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:2:THR:CG2	6:A:289:HOH:O[2_556]	1.51	0.69
1:E:50:GLU:OE2	4:B:286:CA:CA[1_454]	1.54	0.66
1:A:34:GLU:OE1	6:F:379:HOH:O[2_546]	1.85	0.35
1:C:89:ASP:OD1	6:D:309:HOH:O[2_555]	1.89	0.31
1:A:34:GLU:OE2	6:F:379:HOH:O[2_546]	1.93	0.27

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	281/283 (99%)	271 (96%)	9 (3%)	1 (0%)	30	19
1	B	281/283 (99%)	269 (96%)	11 (4%)	1 (0%)	30	19
1	C	282/283 (100%)	270 (96%)	11 (4%)	1 (0%)	30	19
1	D	280/283 (99%)	272 (97%)	6 (2%)	2 (1%)	18	8
1	E	280/283 (99%)	268 (96%)	10 (4%)	2 (1%)	18	8
1	F	280/283 (99%)	271 (97%)	8 (3%)	1 (0%)	30	19
All	All	1684/1698 (99%)	1621 (96%)	55 (3%)	8 (0%)	24	14

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	171	ASP
1	B	171	ASP
1	C	171	ASP
1	D	171	ASP
1	E	171	ASP

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	234/234 (100%)	226 (97%)	8 (3%)	32	20
1	B	234/234 (100%)	223 (95%)	11 (5%)	23	11
1	C	235/234 (100%)	230 (98%)	5 (2%)	47	36
1	D	233/234 (100%)	226 (97%)	7 (3%)	36	24
1	E	233/234 (100%)	225 (97%)	8 (3%)	32	20
1	F	233/234 (100%)	223 (96%)	10 (4%)	26	13
All	All	1402/1404 (100%)	1353 (96%)	49 (4%)	32	19

5 of 49 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	97	ILE
1	E	170	GLU
1	D	170	GLU
1	E	59	ILE
1	E	279	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 20 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	258	ASN
1	F	196	ASN
1	F	258	ASN
1	F	238	HIS

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Mol	Chain	Res	Type
1	B	238	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 19 ligands modelled in this entry, 7 are monoatomic - leaving 12 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	H4M	B	284	-	47,49,58	0.90	3 (6%)	58,74,86	1.78	12 (20%)
3	F42	D	285	-	32,32,55	1.34	4 (12%)	44,48,79	1.69	5 (11%)
3	F42	B	285	-	32,32,55	1.27	4 (12%)	44,48,79	1.45	7 (15%)
2	H4M	D	284	-	47,49,58	0.74	1 (2%)	58,74,86	1.47	9 (15%)
3	F42	A	285	-	32,32,55	1.36	3 (9%)	44,48,79	1.44	5 (11%)
2	H4M	A	284	-	47,49,58	0.89	1 (2%)	58,74,86	2.33	15 (25%)
2	H4M	F	284	-	47,49,58	1.10	4 (8%)	58,74,86	1.75	9 (15%)
3	F42	E	285	-	32,32,55	1.46	4 (12%)	44,48,79	1.56	9 (20%)
2	H4M	C	284	-	47,49,58	0.87	2 (4%)	58,74,86	1.60	9 (15%)
3	F42	C	285	-	32,32,55	1.18	4 (12%)	44,48,79	1.52	6 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	F42	F	285	-	32,32,55	1.29	4 (12%)	44,48,79	1.65	8 (18%)
2	H4M	E	284	-	47,49,58	0.82	1 (2%)	58,74,86	1.60	11 (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	H4M	B	284	-	-	6/27/71/85	0/5/5/5
3	F42	D	285	-	-	5/18/18/53	0/3/3/3
3	F42	B	285	-	-	6/18/18/53	0/3/3/3
2	H4M	D	284	-	-	7/27/71/85	0/5/5/5
3	F42	A	285	-	-	3/18/18/53	0/3/3/3
2	H4M	A	284	-	1/1/13/17	7/27/71/85	0/5/5/5
2	H4M	F	284	-	-	2/27/71/85	0/5/5/5
3	F42	E	285	-	-	7/18/18/53	0/3/3/3
2	H4M	C	284	-	-	5/27/71/85	0/5/5/5
3	F42	C	285	-	-	13/18/18/53	0/3/3/3
3	F42	F	285	-	-	0/18/18/53	0/3/3/3
2	H4M	E	284	-	-	5/27/71/85	0/5/5/5

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	285	F42	C9A-N10	-4.58	1.33	1.41
3	E	285	F42	C9A-N10	-4.38	1.33	1.41
3	F	285	F42	C9A-N10	-3.91	1.34	1.41
3	D	285	F42	C9A-N10	-3.73	1.34	1.41
2	F	284	H4M	C8A-N8	3.61	1.39	1.35

The worst 5 of 105 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	284	H4M	CX4-CX3-CX2	-9.36	97.99	113.57
3	D	285	F42	C5A-C5-C4A	-7.37	114.86	122.06
3	A	285	F42	C5A-C5-C4A	-6.26	115.94	122.06
2	A	284	H4M	CX5-CX4-CX3	6.01	123.56	112.22
3	C	285	F42	C5A-C5-C4A	-5.82	116.37	122.06

All (1) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	A	284	H4M	CX4

5 of 66 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	284	H4M	OX3-CX3-CX4-CX5
2	A	284	H4M	C5J-O5J-PA-O2A
2	A	284	H4M	C5J-O5J-PA-O3A
2	B	284	H4M	O4J-C1J-OX5-CX5
2	B	284	H4M	C2J-C1J-OX5-CX5

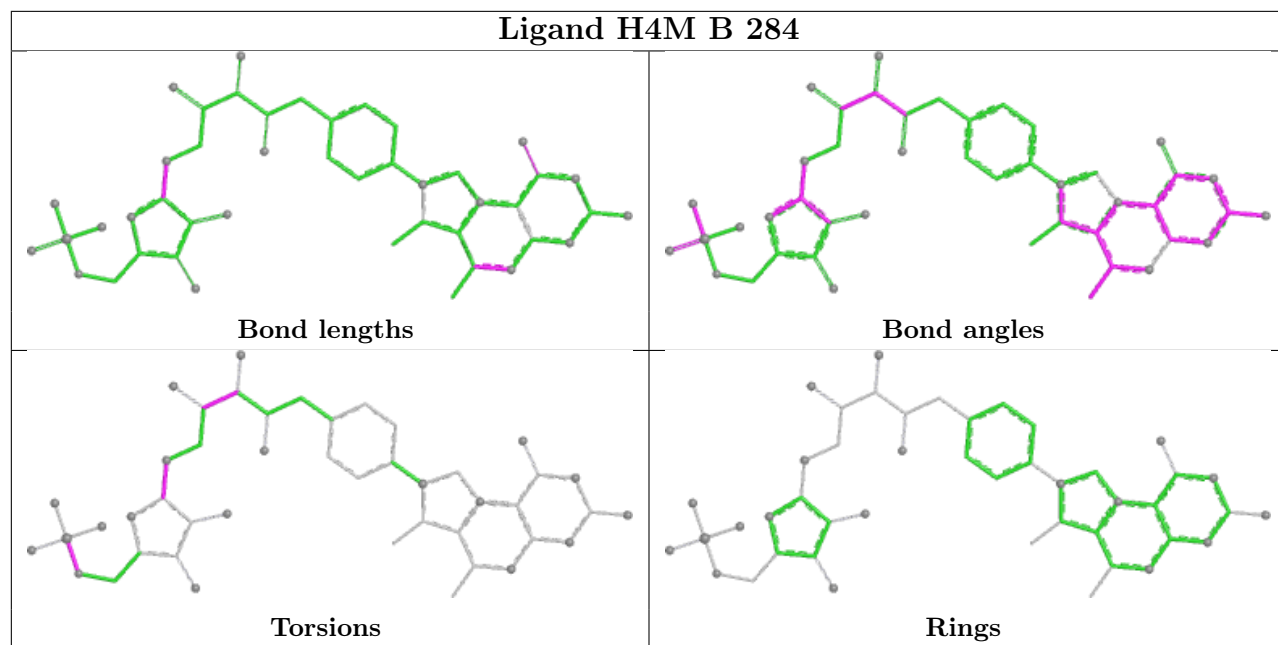
There are no ring outliers.

12 monomers are involved in 69 short contacts:

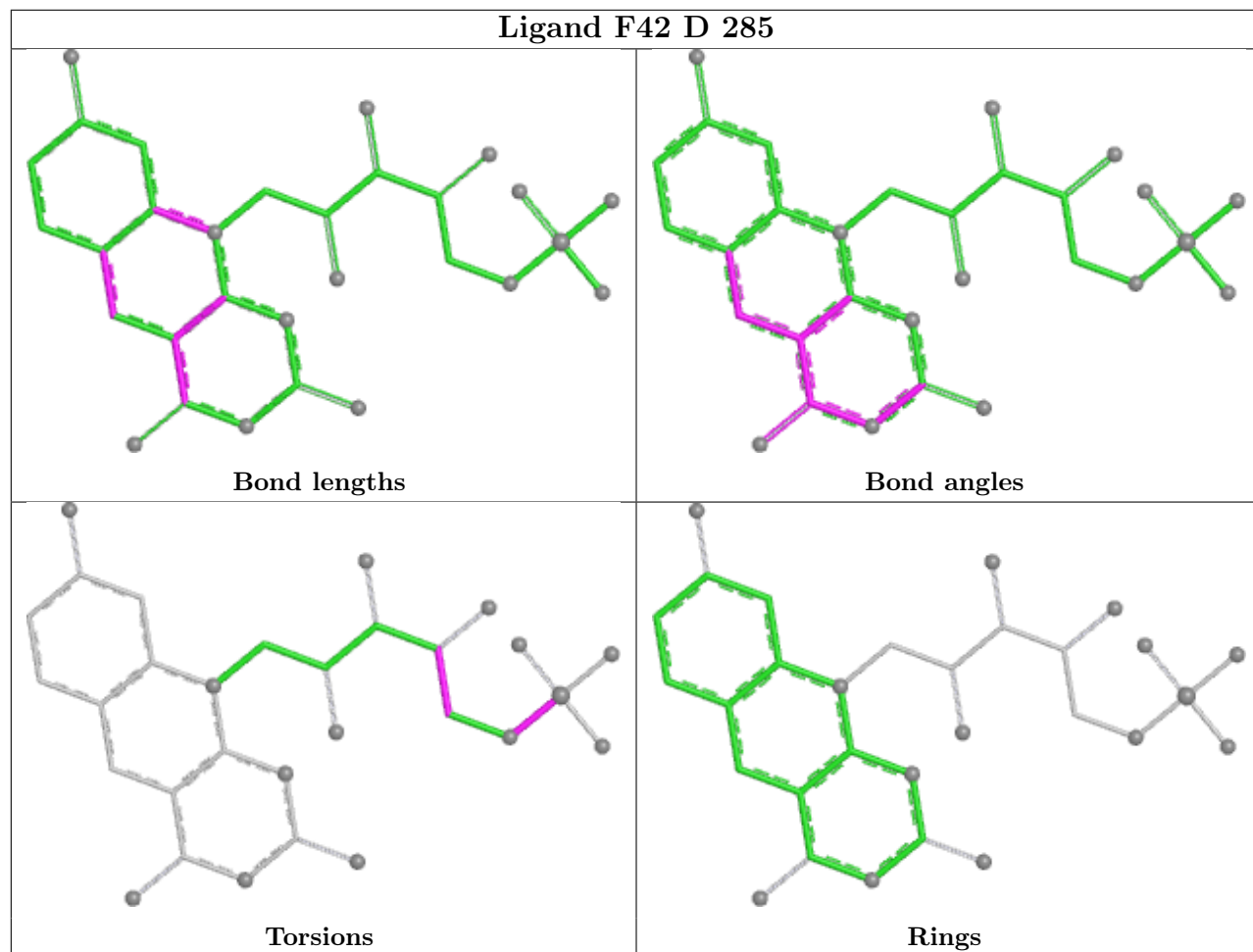
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	284	H4M	5	0
3	D	285	F42	7	0
3	B	285	F42	12	0
2	D	284	H4M	10	0
3	A	285	F42	8	0
2	A	284	H4M	9	0
2	F	284	H4M	7	0
3	E	285	F42	7	0
2	C	284	H4M	6	0
3	C	285	F42	10	0
3	F	285	F42	9	0
2	E	284	H4M	7	0

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.

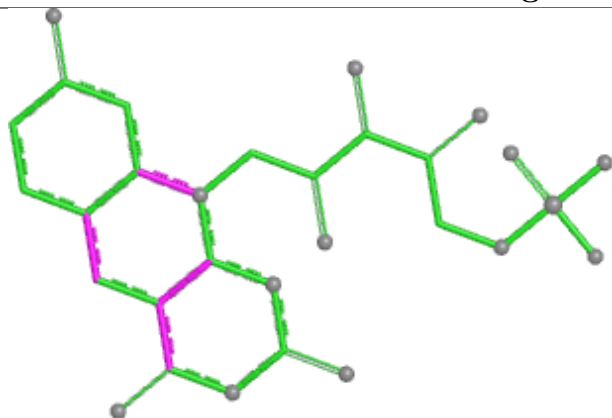
Ligand H4M B 284



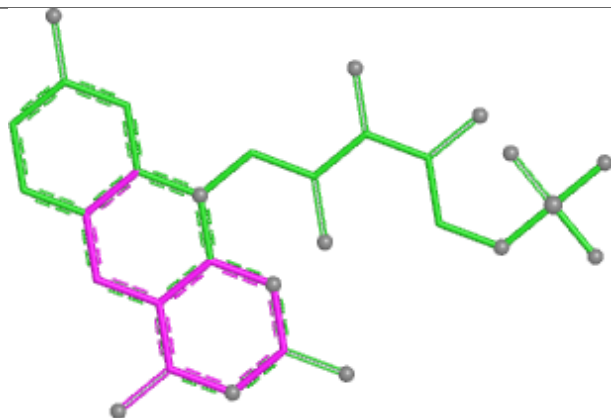
Ligand F42 D 285



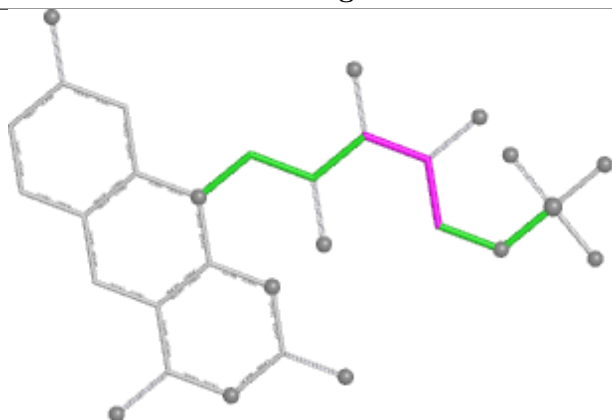
Ligand F42 B 285



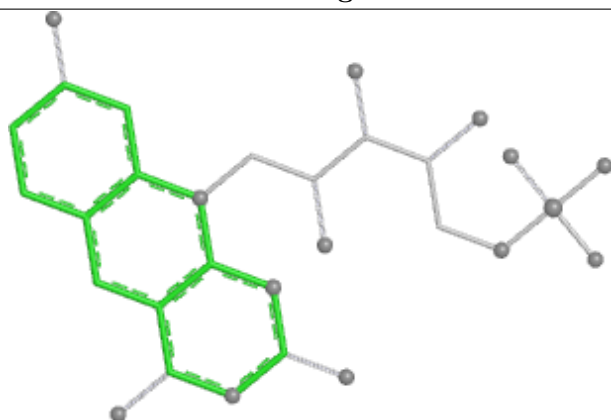
Bond lengths



Bond angles

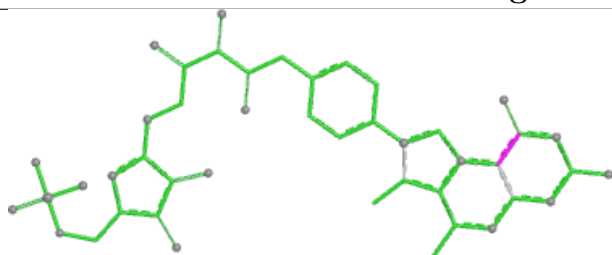


Torsions

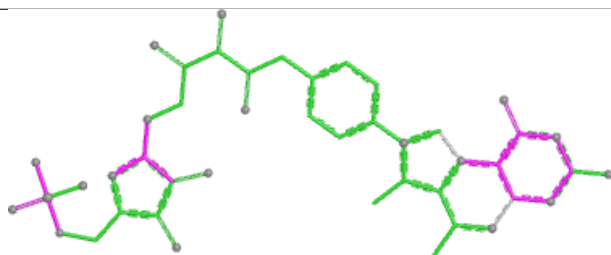


Rings

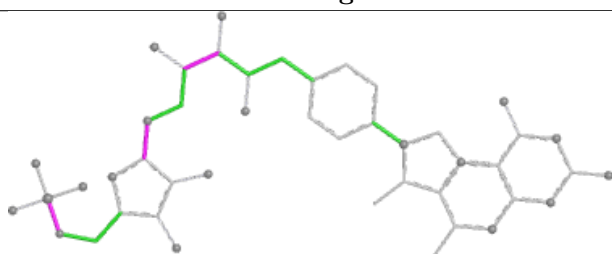
Ligand H4M D 284



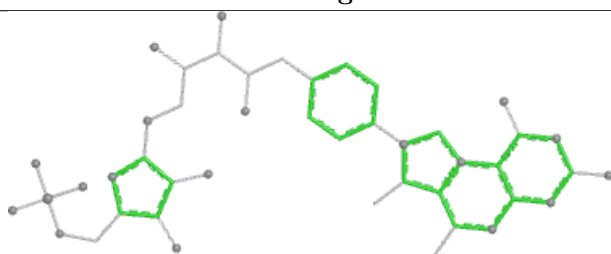
Bond lengths



Bond angles

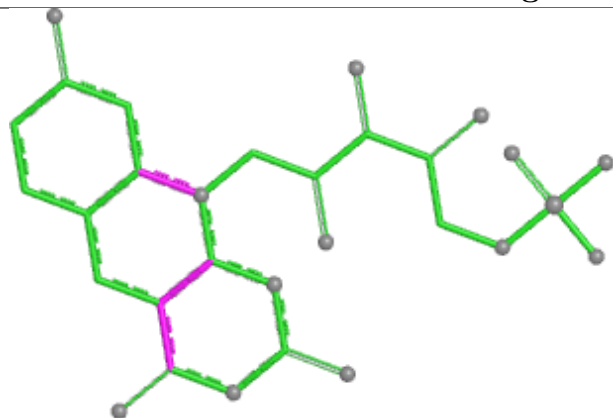


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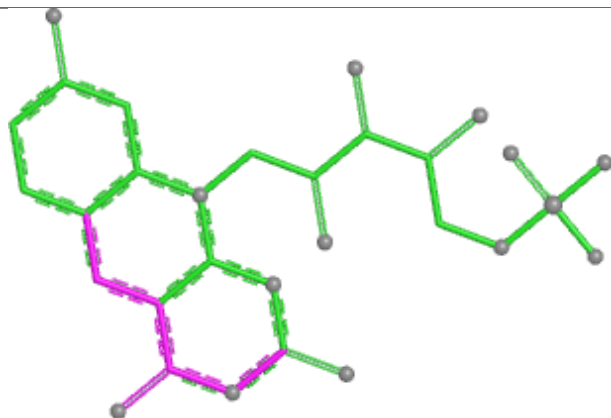


Rings

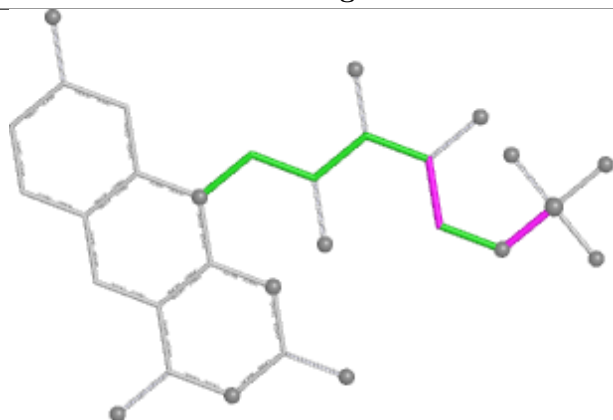
Ligand F42 A 285



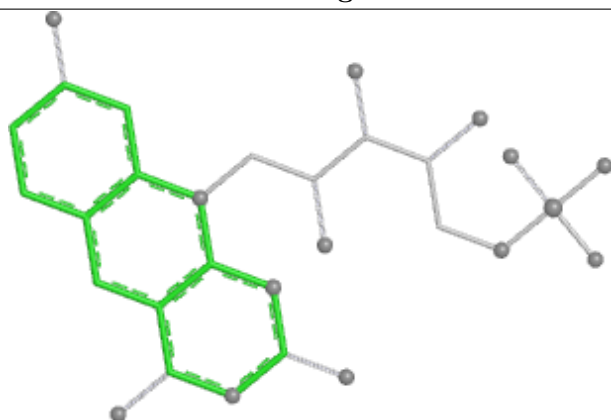
Bond lengths



Bond angles

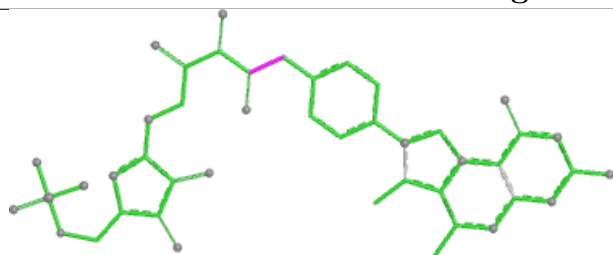


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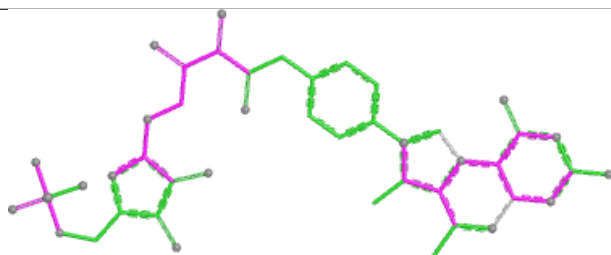


Rings

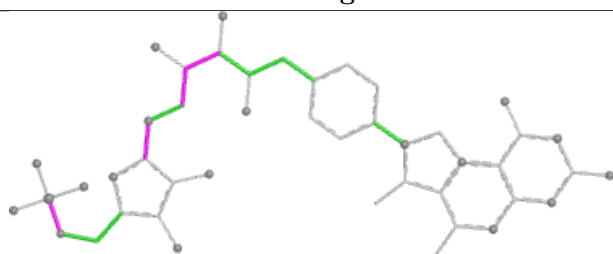
Ligand H4M A 284



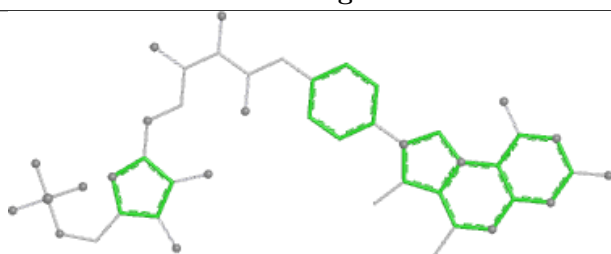
Bond lengths



Bond angles

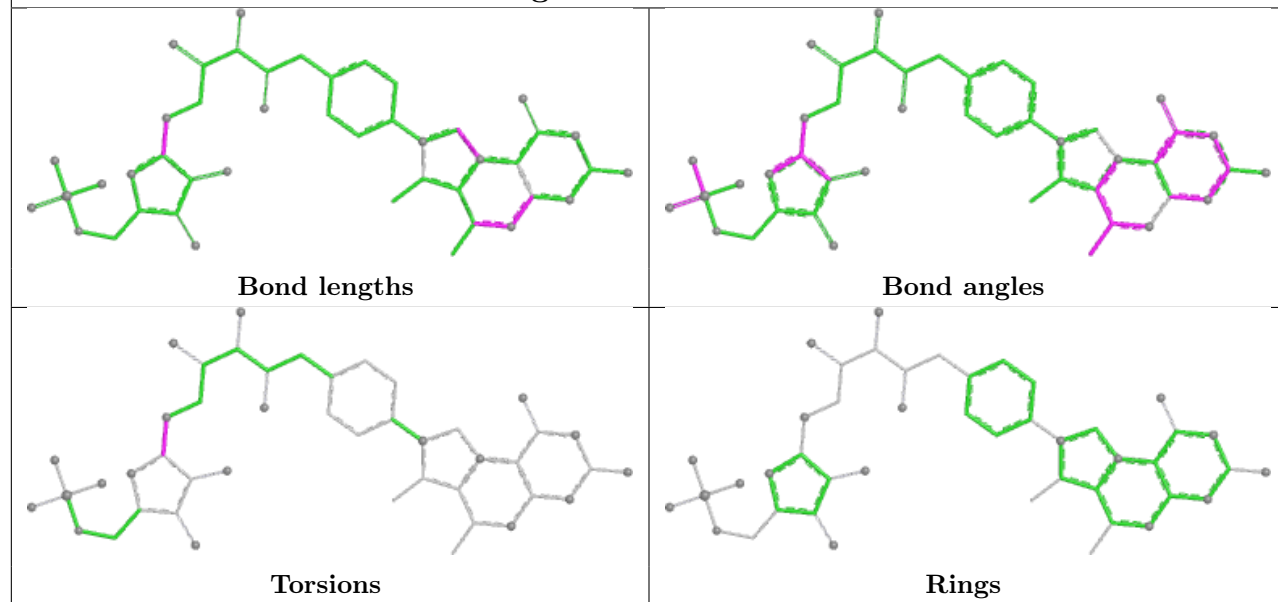


Torsions

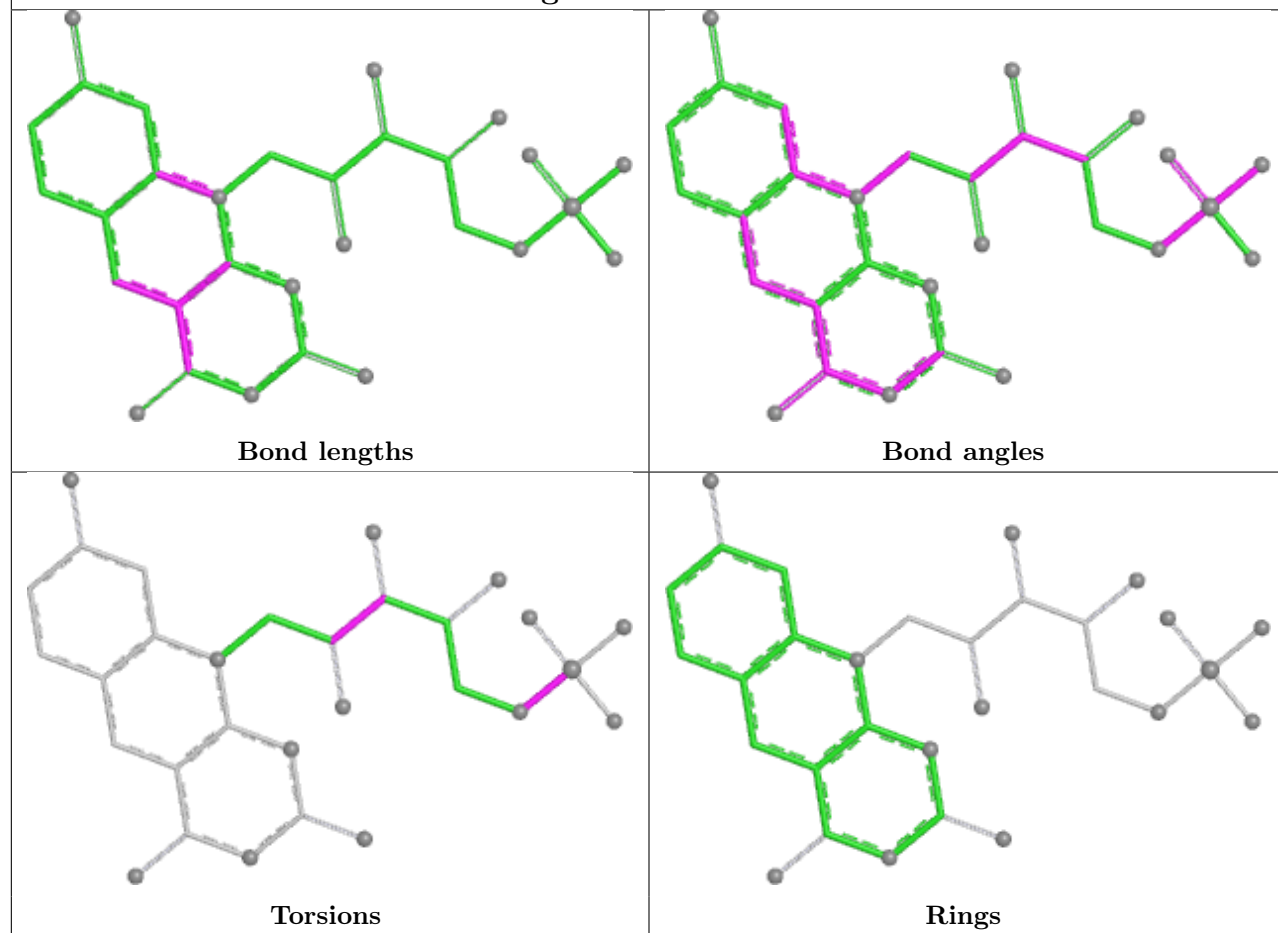


Rings

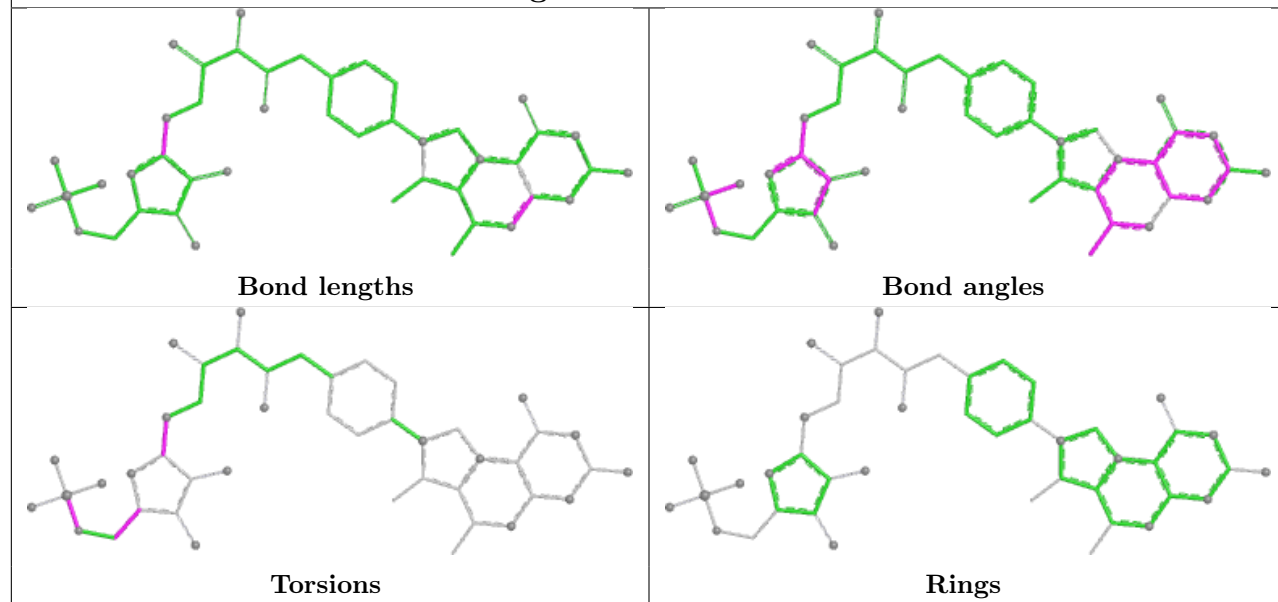
Ligand H4M F 284



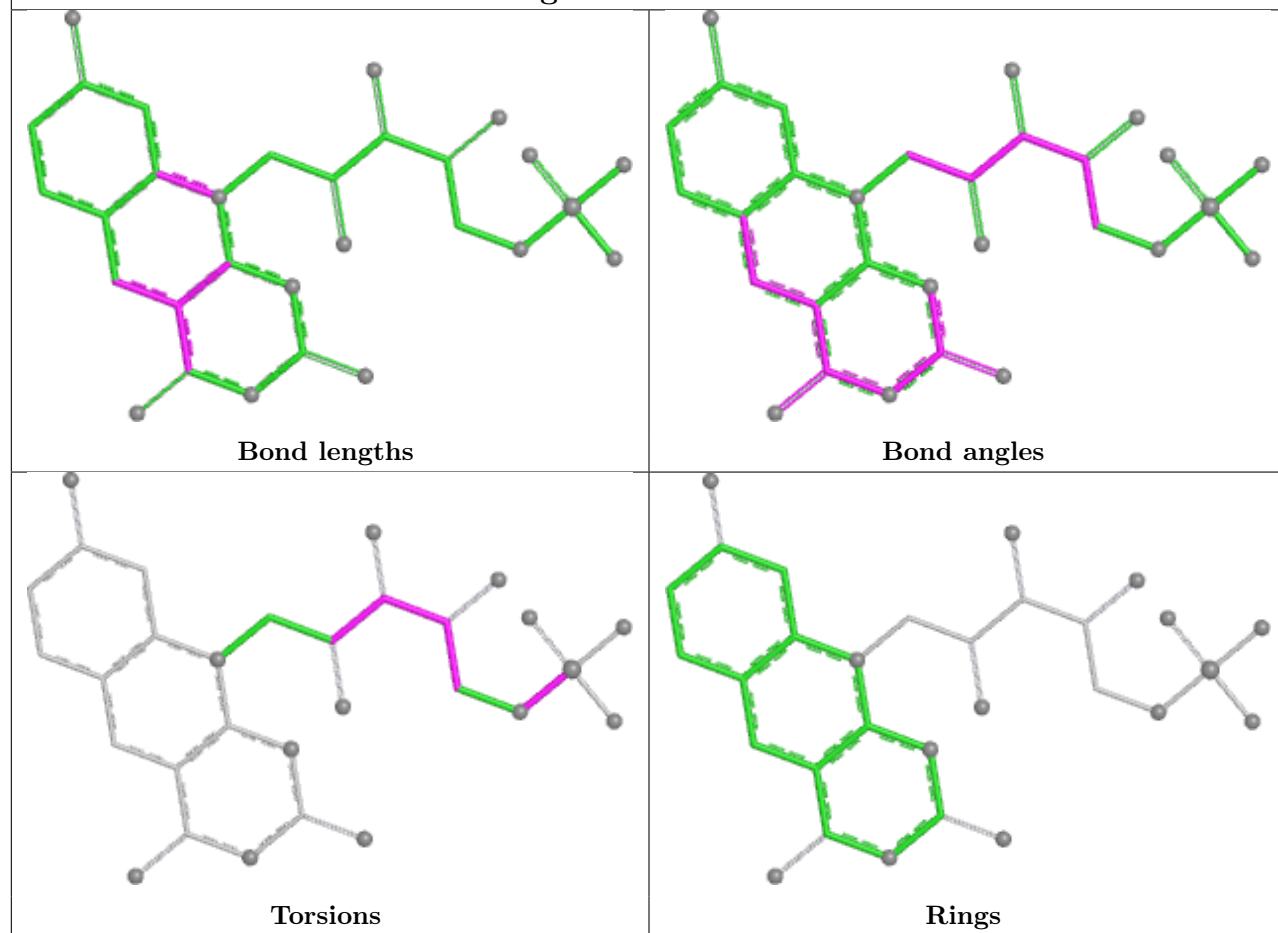
Ligand F42 E 285

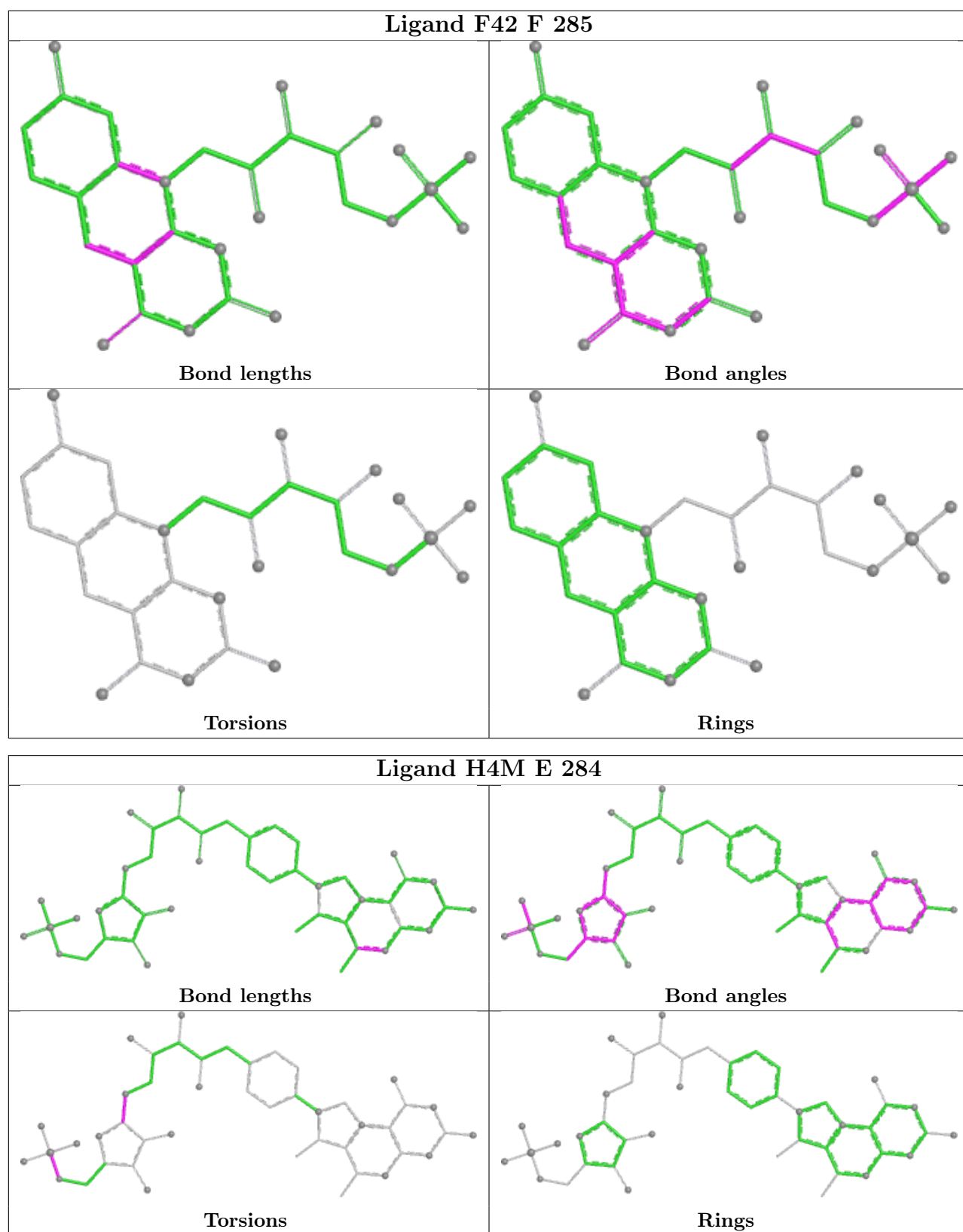


Ligand H4M C 284



Ligand F42 C 285





5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	282/283 (99%)	0.31	6 (2%) 63 64	11, 21, 32, 53	1 (0%)
1	B	282/283 (99%)	0.12	6 (2%) 63 64	13, 21, 31, 53	2 (0%)
1	C	282/283 (99%)	0.16	6 (2%) 63 64	9, 20, 30, 53	3 (1%)
1	D	282/283 (99%)	0.39	12 (4%) 40 39	14, 21, 30, 53	0
1	E	282/283 (99%)	0.08	5 (1%) 67 68	13, 20, 29, 53	1 (0%)
1	F	282/283 (99%)	0.13	8 (2%) 55 55	13, 21, 31, 53	1 (0%)
All	All	1692/1698 (99%)	0.20	43 (2%) 58 58	9, 21, 31, 53	8 (0%)

The worst 5 of 43 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	2	THR	5.9
1	C	173	ILE	5.3
1	D	171	ASP	5.0
1	B	171	ASP	4.7
1	B	170	GLU	4.4

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

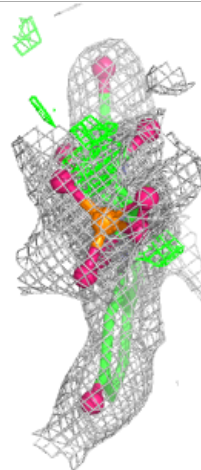
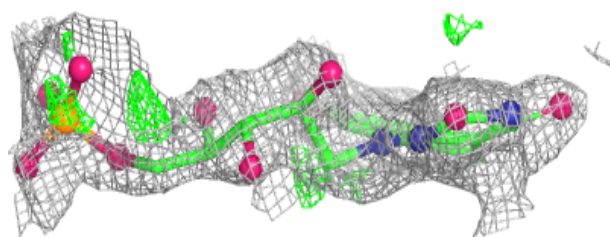
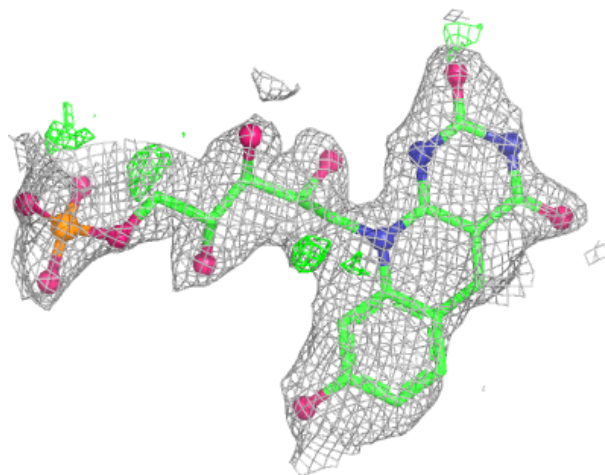
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	F42	A	285	30/53	0.79	0.16	29,32,48,49	30
3	F42	E	285	30/53	0.79	0.14	27,36,55,57	30
3	F42	C	285	30/53	0.81	0.15	28,33,54,54	30
5	NA	E	286	1/1	0.82	0.25	42,42,42,42	0
3	F42	F	285	30/53	0.83	0.12	23,29,50,51	30
3	F42	B	285	30/53	0.83	0.13	24,28,48,50	30
3	F42	D	285	30/53	0.84	0.14	29,33,49,50	30
5	NA	C	287	1/1	0.87	0.11	42,42,42,42	0
4	CA	B	287	1/1	0.87	0.10	60,60,60,60	0
5	NA	D	287	1/1	0.91	0.14	39,39,39,39	0
2	H4M	A	284	45/54	0.91	0.09	25,31,54,55	0
2	H4M	B	284	45/54	0.92	0.08	21,26,55,56	0
2	H4M	E	284	45/54	0.92	0.09	20,27,51,52	0
2	H4M	C	284	45/54	0.93	0.08	21,26,50,53	0
2	H4M	F	284	45/54	0.93	0.08	20,24,47,50	0
2	H4M	D	284	45/54	0.93	0.08	20,28,53,55	0
4	CA	D	286	1/1	0.95	0.06	36,36,36,36	0
4	CA	B	286	1/1	0.99	0.03	23,23,23,23	0
4	CA	C	286	1/1	0.99	0.03	25,25,25,25	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.

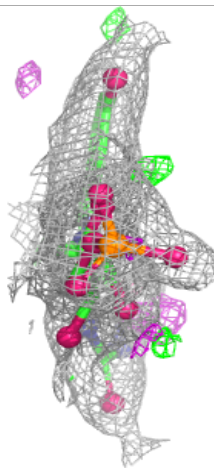
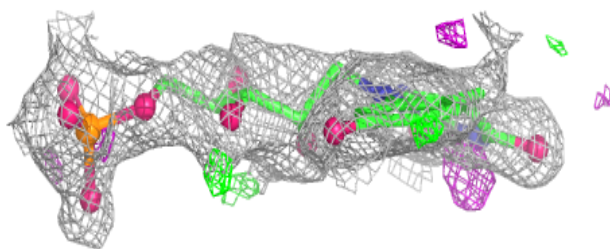
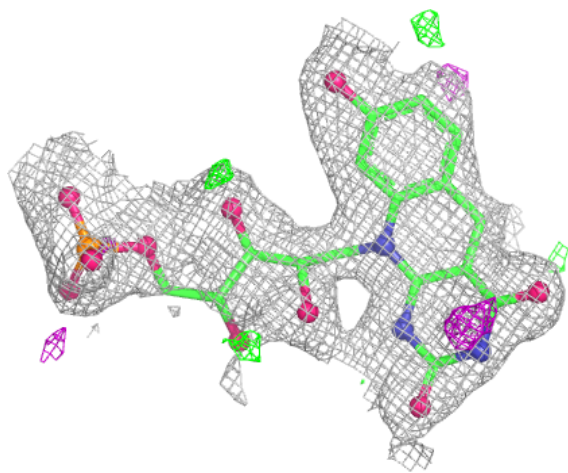
Electron density around F42 A 285:

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



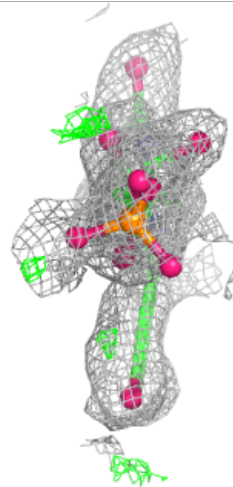
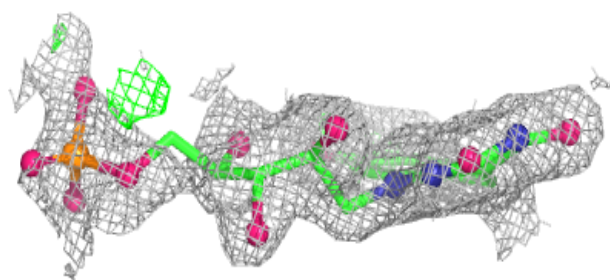
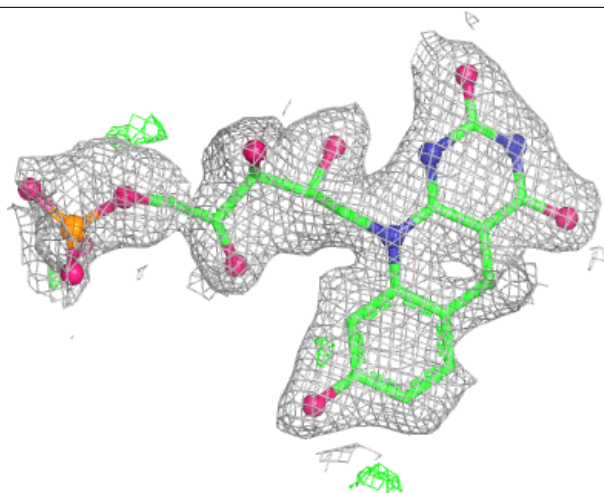
Electron density around F42 E 285:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



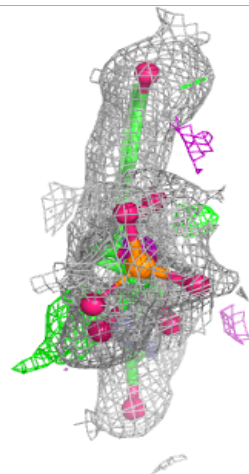
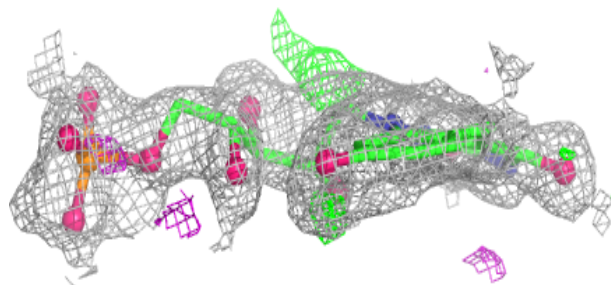
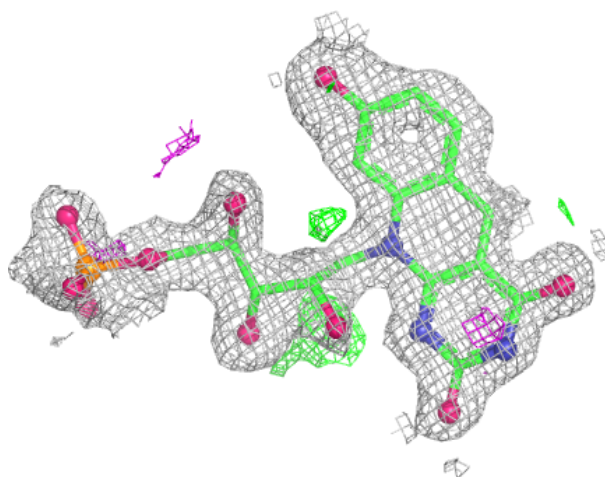
Electron density around F42 C 285:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



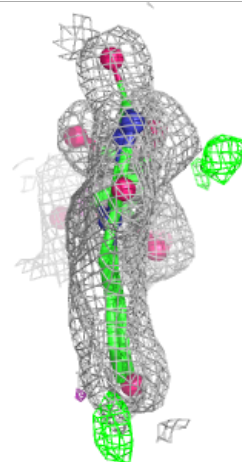
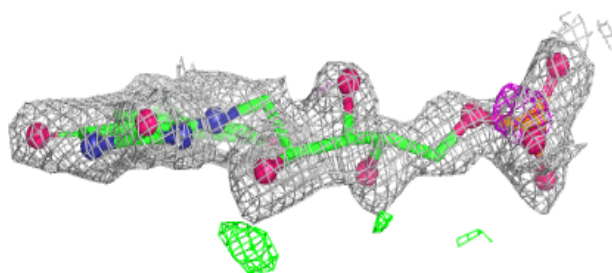
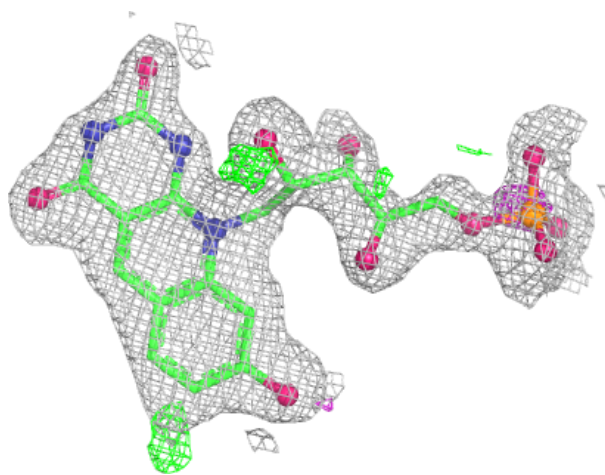
Electron density around F42 F 285:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



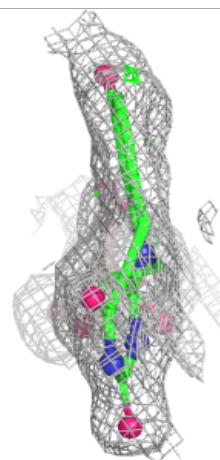
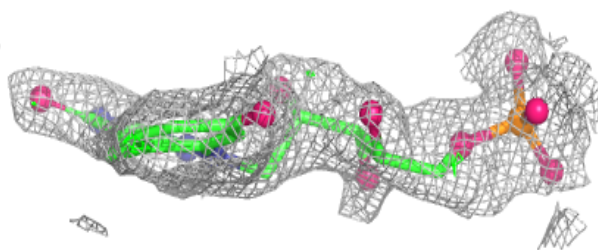
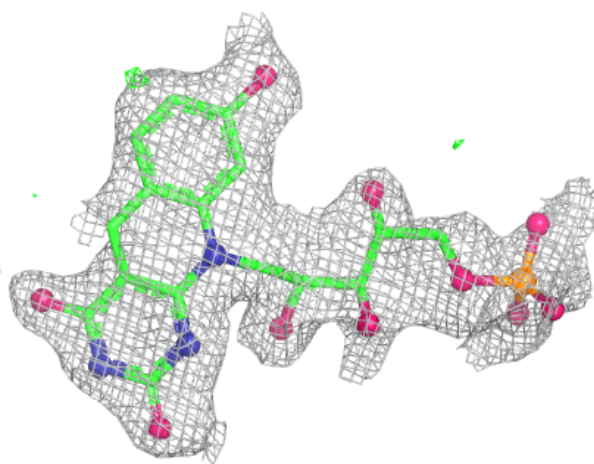
Electron density around F42 B 285:

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and green (positive)



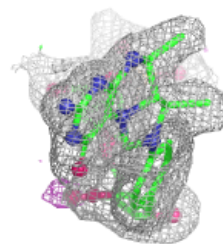
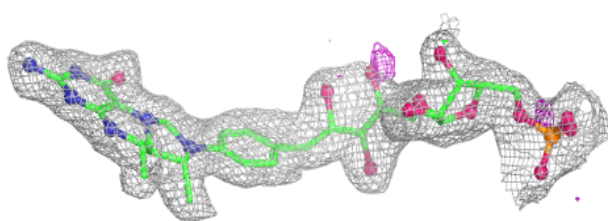
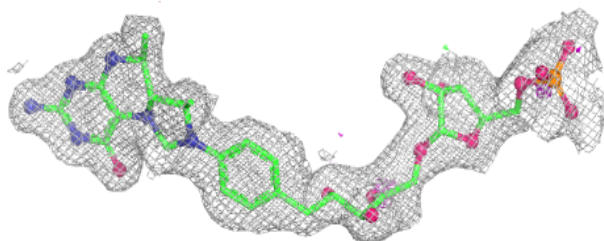
Electron density around F42 D 285:

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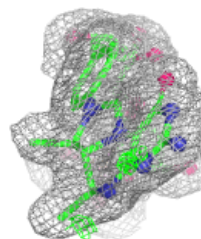
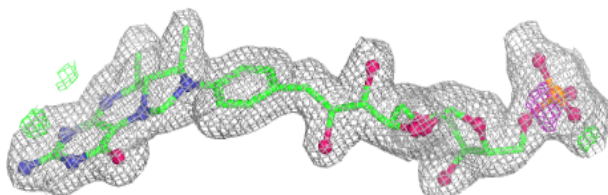
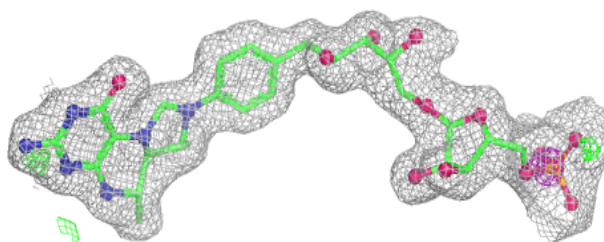


Electron density around H4M A 284:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

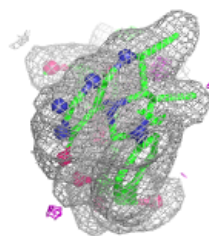
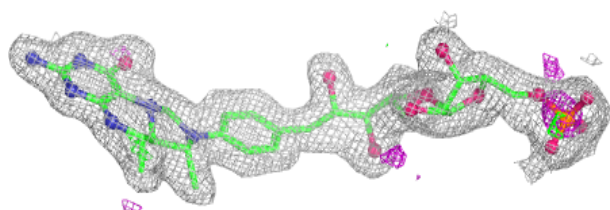
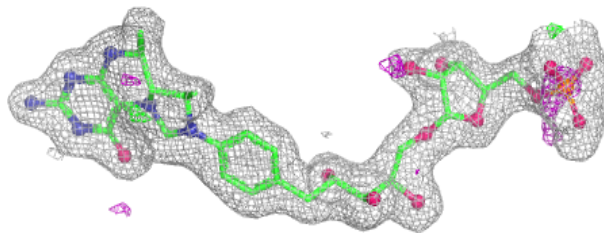
**Electron density around H4M B 284:**

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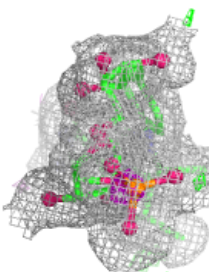
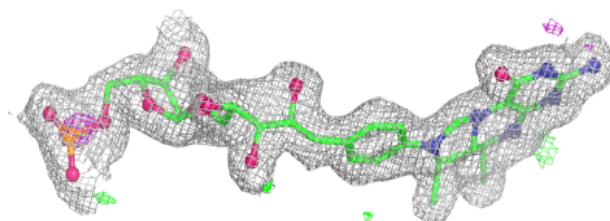
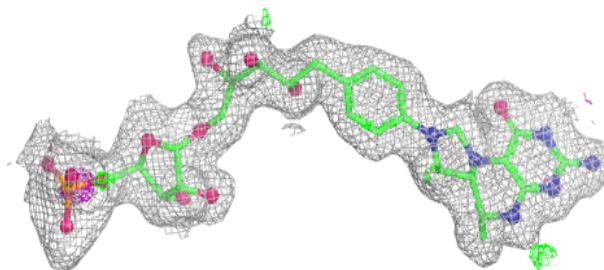


Electron density around H4M E 284:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

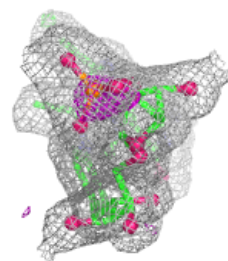
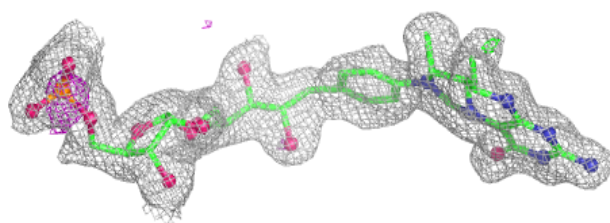
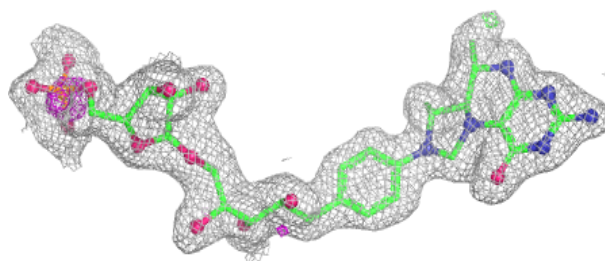
**Electron density around H4M C 284:**

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

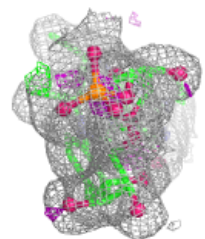
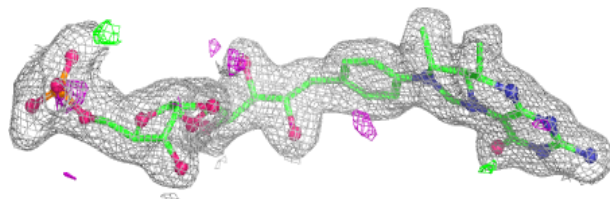
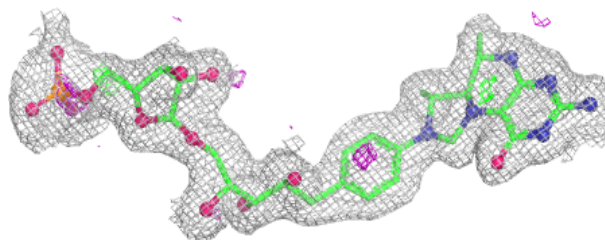


Electron density around H4M F 284:

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

**Electron density around H4M D 284:**

$2mF_o-DF_c$ (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.