Full wwPDB EM Validation Report ⓘ

Dec 5, 2023 – 02:29 PM EST

PDB ID	:	7RPK
EMDB ID	:	EMD-24617
Title	:	Cryo-EM structure of murine Dispatched in complex with Sonic hedgehog
Authors	:	Asarnow, D.; Wang, Q.; Ding, K.; Cheng, Y.; Beachy, P.A.
Deposited on	:	2021-08-03
Resolution	:	2.70 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:

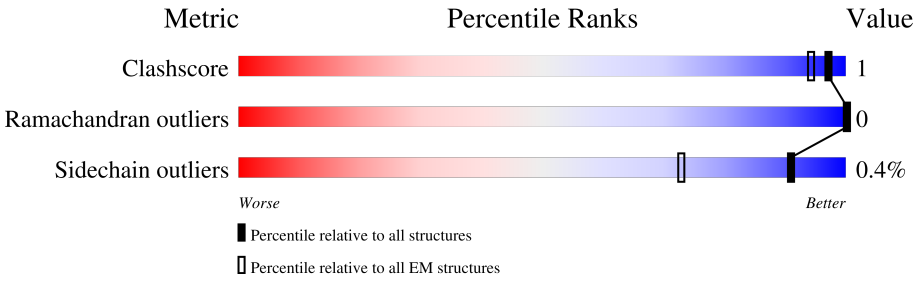
EMDB validation analysis	:	0.0.1.dev70
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

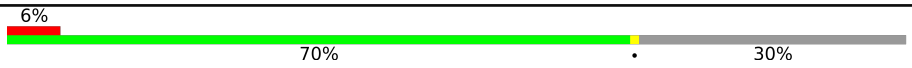
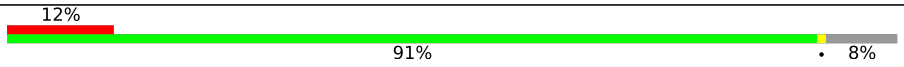
The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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 EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1352	
2	H	164	

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 10018 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Protein dispatched homolog 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	953	7606	4942	1233	1366	65	1	0

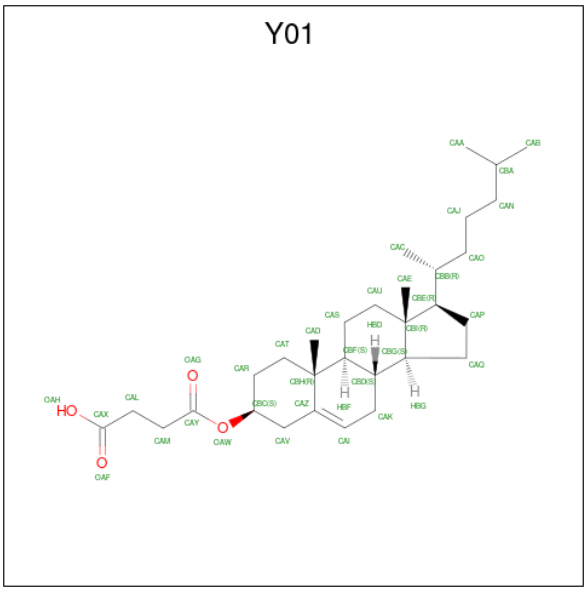
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	170	MET	-	expression tag	UNP Q3TDN0
A	171	ALA	-	expression tag	UNP Q3TDN0

- Molecule 2 is a protein called Sonic hedgehog protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	H	151	1215	760	216	234	5	0	0

- Molecule 3 is CHOLESTEROL HEMISUCCINATE (three-letter code: Y01) (formula: $C_{31}H_{50}O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0

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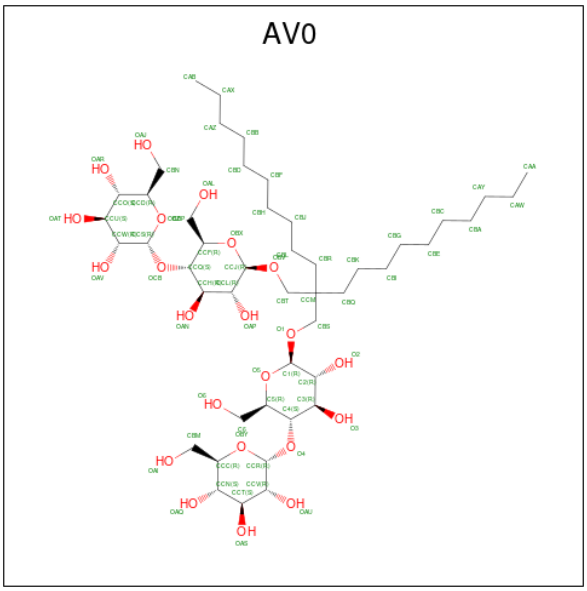
Mol	Chain	Residues	Atoms	AltConf
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0
3	A	1	Total C O 35 31 4	0

- Molecule 4 is Lauryl Maltose Neopentyl Glycol (three-letter code: AV0) (formula: $C_{47}H_{88}O_{22}$) (labeled as "Ligand of Interest" by depositor).

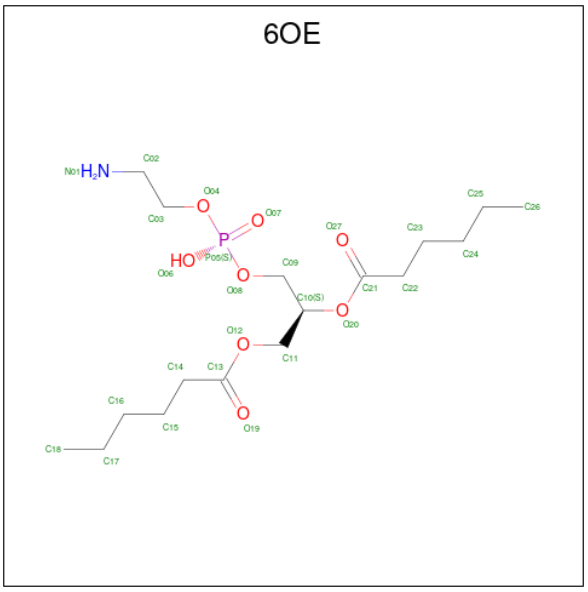


Mol	Chain	Residues	Atoms	AltConf
4	A	1	Total C O 69 47 22	0
4	A	1	Total C O 69 47 22	0

- Molecule 5 is SODIUM ION (three-letter code: NA) (formula: Na) (labeled as "Ligand of Interest" by depositor).

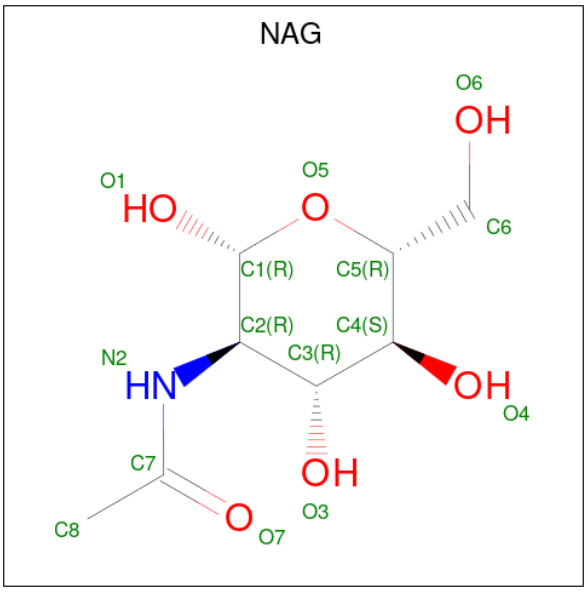
Mol	Chain	Residues	Atoms	AltConf
5	A	2	Total Na 2 2	0

- Molecule 6 is (2S)-3-{[(S)-(2-aminoethoxy)(hydroxy)phosphoryl]oxy}-2-(hexanoyloxy)propyl hexanoate (three-letter code: 6OE) (formula: $C_{17}H_{34}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
6	A	1	Total	C	N	O	P	0
			27	17	1	8	1	

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



Mol	Chain	Residues	Atoms				AltConf
7	A	1	Total	C	N	O	0
			14	8	1	5	
7	A	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms	AltConf
7	A	1	Total C N O 14 8 1 5	0
7	A	1	Total C N O 14 8 1 5	0
7	A	1	Total C N O 14 8 1 5	0

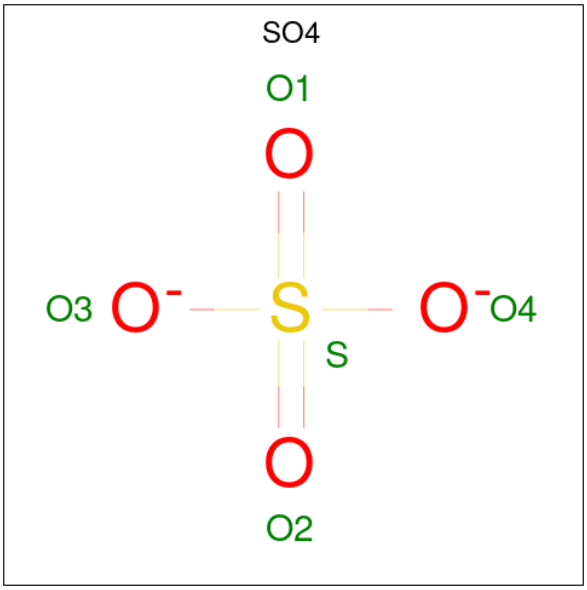
- Molecule 8 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	AltConf
8	H	2	Total Ca 2 2	0

- Molecule 9 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	AltConf
9	H	1	Total Zn 1 1	0

- Molecule 10 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	AltConf
10	H	1	Total O S 5 4 1	0

- Molecule 11 is water.

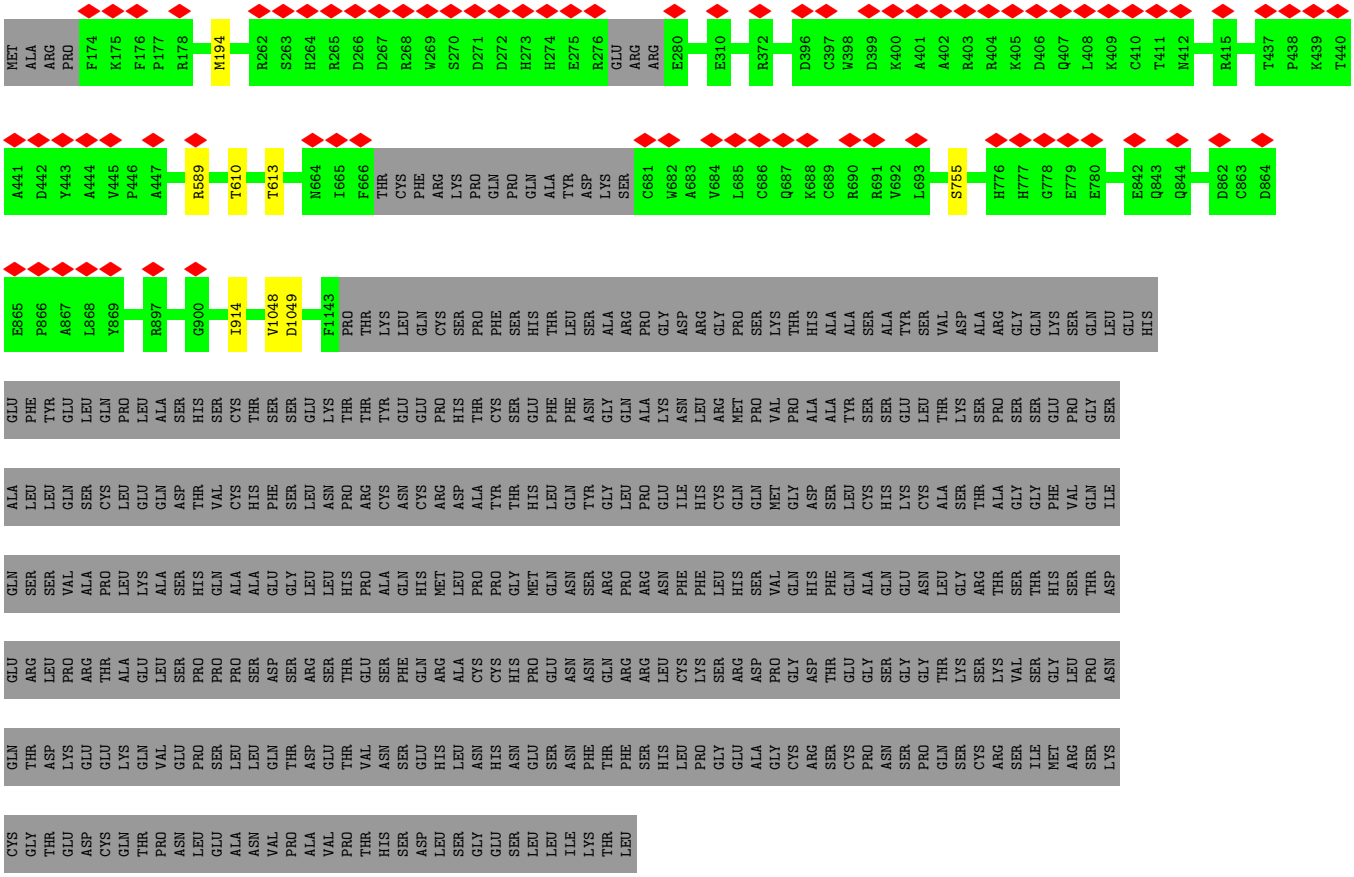
Mol	Chain	Residues	Atoms		AltConf
11	A	42	Total	O	0
			42	42	

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 atom inclusion in map 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 diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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.

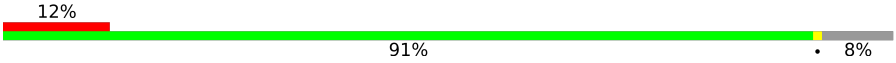
• Molecule 1: Protein dispatched homolog 1

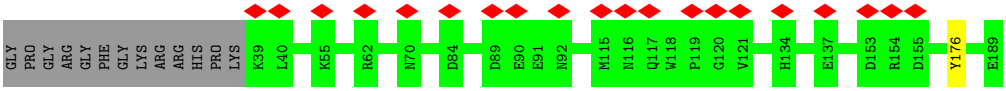
Chain A:



• Molecule 2: Sonic hedgehog protein

Chain H:





4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	204786	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	66.7	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	59880	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	22.779	Depositor
Minimum map value	-14.416	Depositor
Average map value	0.011	Depositor
Map value standard deviation	0.574	Depositor
Recommended contour level	3.0	Depositor
Map size (Å)	240.48, 240.48, 240.48	wwPDB
Map dimensions	288, 288, 288	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.835, 0.835, 0.835	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, AV0, ZN, 6OE, NA, CA, Y01, 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	0.64	0/7810	0.93	0/10620
2	H	0.67	0/1241	1.02	0/1674
All	All	0.65	0/9051	0.94	0/12294

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	7606	0	7492	3	0
2	H	1215	0	1179	0	0
3	A	910	0	1274	9	0
4	A	138	0	0	0	0
5	A	2	0	0	0	0
6	A	27	0	0	0	0
7	A	70	0	65	0	0
8	H	2	0	0	0	0
9	H	1	0	0	0	0
10	H	5	0	0	0	0
11	A	42	0	0	0	0
All	All	10018	0	10010	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)
3:A:2124:Y01:HAC2	3:A:2124:Y01:HAE2	1.88	0.55
3:A:2102:Y01:HAC1	3:A:2102:Y01:HAU2	1.90	0.51
1:A:610:THR:HG22	1:A:1049:ASP:HA	1.92	0.51
1:A:613:THR:HG21	1:A:1048:VAL:HG11	1.94	0.50
3:A:2106:Y01:HAC1	3:A:2106:Y01:HAU2	1.95	0.47
3:A:2118:Y01:HAC1	3:A:2118:Y01:HAU2	1.96	0.47
1:A:914:ILE:HD12	1:A:914:ILE:H	1.82	0.44
3:A:2107:Y01:HAC1	3:A:2107:Y01:HAU2	2.00	0.43
3:A:2112:Y01:HAU2	3:A:2112:Y01:HAC1	2.02	0.41
3:A:2114:Y01:HAC1	3:A:2114:Y01:HAU2	2.02	0.41
3:A:2116:Y01:HAC1	3:A:2116:Y01:HAU2	2.03	0.41
3:A:2126:Y01:HAC1	3:A:2126:Y01:HAU2	2.01	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 PDB entries followed by that with respect to all EM entries.

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	948/1352 (70%)	920 (97%)	28 (3%)	0	100	100
2	H	149/164 (91%)	144 (97%)	5 (3%)	0	100	100
All	All	1097/1516 (72%)	1064 (97%)	33 (3%)	0	100	100

There are no Ramachandran outliers to report.

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 PDB entries followed by that with respect to all EM entries.

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	839/1190 (70%)	836 (100%)	3 (0%)	91 97
2	H	129/138 (94%)	128 (99%)	1 (1%)	81 93
All	All	968/1328 (73%)	964 (100%)	4 (0%)	91 97

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	194	MET
1	A	589	ARG
1	A	755	SER
2	H	176	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1033	ASN
1	A	1135	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 40 ligands modelled in this entry, 5 are monoatomic - leaving 35 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	$\#\|Z\| > 2$
7	NAG	A	2132	1	14,14,15	1.28	2 (14%)	17,19,21	0.86	0
3	Y01	A	2101	-	38,38,38	1.16	2 (5%)	57,57,57	0.91	2 (3%)
3	Y01	A	2111	-	38,38,38	1.22	3 (7%)	57,57,57	0.86	0
3	Y01	A	2116	-	38,38,38	1.21	2 (5%)	57,57,57	0.73	1 (1%)
3	Y01	A	2119	-	38,38,38	1.28	4 (10%)	57,57,57	0.99	2 (3%)
3	Y01	A	2126	-	38,38,38	1.26	4 (10%)	57,57,57	0.88	3 (5%)
3	Y01	A	2115	-	38,38,38	1.32	4 (10%)	57,57,57	1.14	3 (5%)
3	Y01	A	2108	-	38,38,38	1.16	4 (10%)	57,57,57	0.82	2 (3%)
3	Y01	A	2120	-	38,38,38	1.20	5 (13%)	57,57,57	1.09	4 (7%)
3	Y01	A	2123	-	38,38,38	1.20	3 (7%)	57,57,57	0.76	0
10	SO4	H	204	-	4,4,4	0.27	0	6,6,6	0.25	0
3	Y01	A	2103	-	38,38,38	1.20	3 (7%)	57,57,57	0.90	3 (5%)
3	Y01	A	2102	-	38,38,38	1.13	2 (5%)	57,57,57	0.92	1 (1%)
3	Y01	A	2122	-	38,38,38	1.26	3 (7%)	57,57,57	0.95	2 (3%)
4	AV0	A	2128	-	72,72,72	1.08	4 (5%)	96,98,98	0.75	2 (2%)
3	Y01	A	2112	-	38,38,38	1.10	2 (5%)	57,57,57	0.81	2 (3%)
7	NAG	A	2136	1	14,14,15	1.28	2 (14%)	17,19,21	0.72	0
7	NAG	A	2133	1	14,14,15	1.26	2 (14%)	17,19,21	0.88	0
3	Y01	A	2106	-	38,38,38	1.09	2 (5%)	57,57,57	0.73	0
3	Y01	A	2125	-	38,38,38	1.22	4 (10%)	57,57,57	0.71	0
3	Y01	A	2104	-	38,38,38	1.16	4 (10%)	57,57,57	1.24	3 (5%)
7	NAG	A	2135	1	14,14,15	1.27	2 (14%)	17,19,21	0.94	1 (5%)
3	Y01	A	2113	-	38,38,38	1.27	4 (10%)	57,57,57	0.93	3 (5%)
3	Y01	A	2121	-	38,38,38	1.21	3 (7%)	57,57,57	0.78	1 (1%)
4	AV0	A	2127	-	72,72,72	1.05	3 (4%)	96,98,98	0.85	3 (3%)
7	NAG	A	2134	1	14,14,15	1.27	2 (14%)	17,19,21	0.86	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\|>2$	Counts	RMSZ	$\#\|Z\|>2$
3	Y01	A	2109	-	38,38,38	1.31	5 (13%)	57,57,57	1.16	6 (10%)
3	Y01	A	2118	-	38,38,38	1.20	3 (7%)	57,57,57	0.92	2 (3%)
3	Y01	A	2110	-	38,38,38	1.25	4 (10%)	57,57,57	0.90	1 (1%)
3	Y01	A	2114	-	38,38,38	1.22	4 (10%)	57,57,57	0.91	3 (5%)
3	Y01	A	2117	-	38,38,38	1.25	3 (7%)	57,57,57	0.94	2 (3%)
3	Y01	A	2105	-	38,38,38	1.20	3 (7%)	57,57,57	0.95	3 (5%)
3	Y01	A	2107	-	38,38,38	1.25	3 (7%)	57,57,57	1.05	2 (3%)
6	6OE	A	2131	-	26,26,26	0.82	0	29,31,31	0.42	0
3	Y01	A	2124	-	38,38,38	1.26	5 (13%)	57,57,57	0.76	2 (3%)

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
7	NAG	A	2132	1	-	0/6/23/26	0/1/1/1
3	Y01	A	2101	-	-	7/19/77/77	0/4/4/4
3	Y01	A	2111	-	-	8/19/77/77	0/4/4/4
3	Y01	A	2116	-	-	5/19/77/77	0/4/4/4
3	Y01	A	2119	-	-	8/19/77/77	0/4/4/4
3	Y01	A	2126	-	-	7/19/77/77	0/4/4/4
3	Y01	A	2115	-	-	12/19/77/77	0/4/4/4
3	Y01	A	2108	-	-	5/19/77/77	0/4/4/4
3	Y01	A	2120	-	-	9/19/77/77	0/4/4/4
3	Y01	A	2123	-	-	4/19/77/77	0/4/4/4
3	Y01	A	2103	-	-	5/19/77/77	0/4/4/4
3	Y01	A	2102	-	-	2/19/77/77	0/4/4/4
3	Y01	A	2122	-	-	7/19/77/77	0/4/4/4
4	AV0	A	2128	-	-	17/50/130/130	0/4/4/4
3	Y01	A	2112	-	-	7/19/77/77	0/4/4/4
7	NAG	A	2136	1	-	0/6/23/26	0/1/1/1
7	NAG	A	2133	1	-	0/6/23/26	0/1/1/1
3	Y01	A	2106	-	-	2/19/77/77	0/4/4/4
3	Y01	A	2125	-	-	3/19/77/77	0/4/4/4
3	Y01	A	2104	-	-	11/19/77/77	0/4/4/4
7	NAG	A	2135	1	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	Y01	A	2113	-	-	4/19/77/77	0/4/4/4
3	Y01	A	2121	-	-	7/19/77/77	0/4/4/4
4	AV0	A	2127	-	-	6/50/130/130	0/4/4/4
7	NAG	A	2134	1	-	0/6/23/26	0/1/1/1
3	Y01	A	2109	-	-	7/19/77/77	0/4/4/4
3	Y01	A	2118	-	-	11/19/77/77	0/4/4/4
3	Y01	A	2110	-	-	5/19/77/77	0/4/4/4
3	Y01	A	2114	-	-	6/19/77/77	0/4/4/4
3	Y01	A	2117	-	-	7/19/77/77	0/4/4/4
3	Y01	A	2105	-	-	7/19/77/77	0/4/4/4
3	Y01	A	2107	-	-	4/19/77/77	0/4/4/4
6	6OE	A	2131	-	-	1/30/30/30	-
3	Y01	A	2124	-	-	7/19/77/77	0/4/4/4

All (105) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2115	Y01	CBB-CBE	3.60	1.60	1.54
4	A	2128	AV0	O1-C1	3.08	1.45	1.40
3	A	2105	Y01	CAS-CBF	2.82	1.58	1.53
3	A	2126	Y01	CAS-CBF	2.81	1.58	1.53
3	A	2107	Y01	CAS-CBF	2.77	1.58	1.53
3	A	2119	Y01	CAS-CBF	2.76	1.58	1.53
7	A	2136	NAG	O5-C5	2.72	1.49	1.43
3	A	2110	Y01	CAS-CBF	2.71	1.58	1.53
4	A	2127	AV0	O1-C1	2.70	1.44	1.40
4	A	2128	AV0	CBS-CCM	2.69	1.59	1.53
7	A	2133	NAG	O5-C5	2.69	1.48	1.43
3	A	2117	Y01	CBB-CBE	2.67	1.59	1.54
3	A	2124	Y01	OAH-CAX	-2.67	1.21	1.30
3	A	2111	Y01	CAS-CBF	2.65	1.58	1.53
7	A	2132	NAG	O5-C5	2.63	1.48	1.43
3	A	2115	Y01	OAH-CAX	-2.62	1.21	1.30
3	A	2117	Y01	CAS-CBF	2.61	1.58	1.53
3	A	2102	Y01	OAH-CAX	-2.60	1.22	1.30
7	A	2134	NAG	O5-C5	2.59	1.48	1.43
3	A	2106	Y01	OAH-CAX	-2.57	1.22	1.30
3	A	2112	Y01	OAH-CAX	-2.57	1.22	1.30
3	A	2120	Y01	CBB-CBE	2.57	1.58	1.54
3	A	2121	Y01	CAS-CBF	2.57	1.58	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2113	Y01	CAS-CBF	2.56	1.58	1.53
3	A	2119	Y01	OAH-CAX	-2.56	1.22	1.30
3	A	2118	Y01	OAH-CAX	-2.55	1.22	1.30
3	A	2111	Y01	OAH-CAX	-2.55	1.22	1.30
3	A	2107	Y01	OAH-CAX	-2.55	1.22	1.30
4	A	2128	AV0	CBQ-CCM	2.54	1.59	1.54
3	A	2110	Y01	OAH-CAX	-2.54	1.22	1.30
3	A	2109	Y01	OAH-CAX	-2.54	1.22	1.30
3	A	2108	Y01	OAH-CAX	-2.53	1.22	1.30
3	A	2122	Y01	OAH-CAX	-2.53	1.22	1.30
3	A	2124	Y01	CAS-CBF	2.52	1.58	1.53
3	A	2125	Y01	OAH-CAX	-2.52	1.22	1.30
3	A	2117	Y01	OAH-CAX	-2.52	1.22	1.30
3	A	2122	Y01	CAS-CBF	2.51	1.58	1.53
3	A	2114	Y01	OAH-CAX	-2.50	1.22	1.30
3	A	2126	Y01	OAH-CAX	-2.50	1.22	1.30
3	A	2105	Y01	OAH-CAX	-2.49	1.22	1.30
3	A	2121	Y01	OAH-CAX	-2.49	1.22	1.30
4	A	2128	AV0	CBR-CCM	2.49	1.58	1.54
3	A	2101	Y01	OAH-CAX	-2.49	1.22	1.30
3	A	2120	Y01	OAH-CAX	-2.48	1.22	1.30
3	A	2104	Y01	OAH-CAX	-2.48	1.22	1.30
3	A	2113	Y01	CBB-CBE	2.47	1.58	1.54
3	A	2113	Y01	OAH-CAX	-2.47	1.22	1.30
3	A	2103	Y01	OAH-CAX	-2.46	1.22	1.30
3	A	2123	Y01	OAH-CAX	-2.45	1.22	1.30
3	A	2116	Y01	OAH-CAX	-2.44	1.22	1.30
3	A	2101	Y01	CAS-CBF	2.44	1.57	1.53
3	A	2104	Y01	CBB-CBE	2.41	1.58	1.54
3	A	2125	Y01	CBB-CBE	2.41	1.58	1.54
3	A	2124	Y01	CBB-CBE	2.40	1.58	1.54
3	A	2125	Y01	CAS-CBF	2.40	1.57	1.53
3	A	2102	Y01	CBB-CBE	2.39	1.58	1.54
3	A	2114	Y01	CAS-CBF	2.39	1.57	1.53
7	A	2135	NAG	O5-C5	2.39	1.48	1.43
3	A	2112	Y01	CAS-CBF	2.39	1.57	1.53
3	A	2114	Y01	CBB-CBE	2.38	1.58	1.54
3	A	2108	Y01	CBB-CBE	2.38	1.58	1.54
3	A	2120	Y01	CAS-CBF	2.38	1.57	1.53
3	A	2116	Y01	CAS-CBF	2.37	1.57	1.53
3	A	2109	Y01	CBB-CBE	2.35	1.58	1.54
3	A	2126	Y01	CBB-CBE	2.33	1.58	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	2109	Y01	CAS-CBF	2.33	1.57	1.53
3	A	2105	Y01	CBB-CBE	2.32	1.58	1.54
3	A	2115	Y01	CAS-CBF	2.32	1.57	1.53
3	A	2106	Y01	CBB-CBE	2.32	1.58	1.54
3	A	2110	Y01	CBB-CBE	2.31	1.58	1.54
3	A	2111	Y01	CBB-CBE	2.29	1.58	1.54
7	A	2135	NAG	C1-C2	2.27	1.55	1.52
3	A	2103	Y01	CAS-CBF	2.24	1.57	1.53
3	A	2119	Y01	CBB-CBE	2.24	1.58	1.54
3	A	2123	Y01	CAS-CBF	2.22	1.57	1.53
3	A	2121	Y01	CBB-CBE	2.21	1.58	1.54
3	A	2104	Y01	CAE-CBI	2.18	1.58	1.54
3	A	2113	Y01	CAE-CBI	2.17	1.58	1.54
3	A	2115	Y01	CAE-CBI	2.17	1.58	1.54
3	A	2120	Y01	CAE-CBI	2.16	1.58	1.54
3	A	2122	Y01	CBB-CBE	2.16	1.58	1.54
4	A	2127	AV0	OBV-CCJ	2.13	1.43	1.40
3	A	2104	Y01	CAS-CBF	2.12	1.57	1.53
3	A	2109	Y01	CAR-CBC	2.10	1.56	1.51
3	A	2118	Y01	CBB-CBE	2.07	1.58	1.54
3	A	2108	Y01	CAS-CBF	2.07	1.57	1.53
7	A	2134	NAG	O5-C1	2.07	1.47	1.43
3	A	2123	Y01	CBB-CBE	2.07	1.58	1.54
3	A	2125	Y01	CAE-CBI	2.06	1.57	1.54
3	A	2109	Y01	CBD-CBF	2.06	1.57	1.53
3	A	2103	Y01	CBB-CBE	2.05	1.58	1.54
3	A	2119	Y01	CAE-CBI	2.05	1.57	1.54
3	A	2124	Y01	CBH-CBF	2.05	1.59	1.56
7	A	2133	NAG	C1-C2	2.05	1.55	1.52
4	A	2127	AV0	C1-C2	2.04	1.58	1.52
3	A	2108	Y01	CAE-CBI	2.03	1.57	1.54
3	A	2118	Y01	CAE-CBI	2.03	1.57	1.54
7	A	2132	NAG	C1-C2	2.03	1.55	1.52
3	A	2107	Y01	CBB-CBE	2.03	1.57	1.54
3	A	2114	Y01	CAE-CBI	2.03	1.57	1.54
3	A	2120	Y01	CBD-CBF	2.03	1.57	1.53
3	A	2124	Y01	CBD-CBF	2.03	1.57	1.53
7	A	2136	NAG	O5-C1	2.02	1.46	1.43
3	A	2110	Y01	CAE-CBI	2.01	1.57	1.54
3	A	2126	Y01	CBH-CBF	2.01	1.59	1.56

All (60) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	2104	Y01	CAP-CBE-CBB	5.95	121.36	112.15
3	A	2120	Y01	CAP-CBE-CBB	4.83	119.62	112.15
3	A	2104	Y01	CAO-CBB-CBE	3.78	118.10	110.28
4	A	2127	AV0	CCR-OBY-CCC	3.78	121.11	113.69
3	A	2115	Y01	CAO-CBB-CBE	3.67	117.87	110.28
3	A	2122	Y01	CBC-OAW-CAY	3.56	126.57	117.79
3	A	2119	Y01	CBC-OAW-CAY	3.47	126.34	117.79
3	A	2113	Y01	CAC-CBB-CAO	-3.22	105.31	110.36
3	A	2104	Y01	CBI-CBE-CBB	-3.11	114.62	119.49
3	A	2109	Y01	CBC-OAW-CAY	3.07	125.36	117.79
3	A	2118	Y01	CBC-OAW-CAY	2.87	124.86	117.79
3	A	2108	Y01	CBC-OAW-CAY	2.84	124.77	117.79
3	A	2115	Y01	CAS-CBF-CBD	2.82	115.81	111.75
3	A	2122	Y01	CBC-CAV-CAZ	2.81	115.88	111.52
3	A	2113	Y01	CBC-OAW-CAY	2.80	124.69	117.79
3	A	2102	Y01	CAS-CBF-CBD	2.75	115.71	111.75
3	A	2109	Y01	CBC-CAV-CAZ	2.72	115.75	111.52
3	A	2119	Y01	OAW-CAY-CAM	2.72	117.37	111.50
3	A	2110	Y01	CBC-OAW-CAY	2.71	124.46	117.79
4	A	2128	AV0	C1-O5-C5	2.71	119.00	113.69
3	A	2117	Y01	CBC-OAW-CAY	2.70	124.43	117.79
3	A	2120	Y01	CAO-CBB-CBE	2.70	115.86	110.28
3	A	2117	Y01	CAO-CBB-CBE	2.69	115.84	110.28
3	A	2103	Y01	CBC-OAW-CAY	2.66	124.35	117.79
3	A	2105	Y01	CAC-CBB-CBE	-2.62	108.90	112.92
3	A	2114	Y01	CBC-OAW-CAY	2.62	124.23	117.79
3	A	2105	Y01	CAO-CBB-CBE	2.60	115.66	110.28
3	A	2112	Y01	CBC-OAW-CAY	2.60	124.20	117.79
3	A	2103	Y01	CAK-CBD-CBF	2.59	112.86	109.71
3	A	2101	Y01	CBC-OAW-CAY	2.59	124.17	117.79
7	A	2135	NAG	C1-O5-C5	2.57	115.68	112.19
3	A	2107	Y01	CBC-OAW-CAY	2.57	124.12	117.79
3	A	2120	Y01	CBI-CBE-CBB	-2.56	115.48	119.49
3	A	2108	Y01	OAW-CBC-CAV	2.54	113.33	108.12
3	A	2121	Y01	CBC-OAW-CAY	2.54	124.05	117.79
3	A	2105	Y01	CAP-CBE-CBB	2.53	116.06	112.15
3	A	2126	Y01	CBC-OAW-CAY	2.51	123.97	117.79
7	A	2134	NAG	C1-O5-C5	2.47	115.54	112.19
4	A	2127	AV0	O1-C1-C2	2.47	112.15	108.30
3	A	2118	Y01	OAW-CAY-CAM	2.45	116.79	111.50
3	A	2109	Y01	CAT-CAR-CBC	2.38	114.38	110.33
3	A	2116	Y01	CBC-OAW-CAY	2.35	123.58	117.79
3	A	2112	Y01	OAW-CBC-CAV	2.32	112.87	108.12

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	2127	AV0	O4-CCR-OBY	-2.30	104.25	110.67
3	A	2124	Y01	CAC-CBB-CBE	2.29	116.43	112.92
3	A	2109	Y01	CBF-CBH-CAZ	-2.26	106.11	109.65
3	A	2115	Y01	CBC-OAW-CAY	2.26	123.36	117.79
3	A	2120	Y01	CAS-CBF-CBD	2.25	115.00	111.75
3	A	2101	Y01	CAR-CBC-CAV	2.25	114.34	110.99
3	A	2103	Y01	CBF-CBD-CBG	-2.18	106.17	109.09
3	A	2126	Y01	CAO-CBB-CBE	2.18	114.79	110.28
3	A	2124	Y01	CBI-CBE-CBB	2.15	122.85	119.49
3	A	2114	Y01	CAS-CBF-CBD	2.14	114.84	111.75
3	A	2109	Y01	CBH-CBF-CBD	-2.13	109.54	112.73
3	A	2107	Y01	CAO-CBB-CBE	2.09	114.60	110.28
4	A	2128	AV0	CBS-O1-C1	2.09	118.79	113.36
3	A	2113	Y01	CAO-CBB-CBE	2.05	114.52	110.28
3	A	2109	Y01	OAW-CAY-CAM	2.03	115.88	111.50
3	A	2126	Y01	OAW-CAY-CAM	2.03	115.88	111.50
3	A	2114	Y01	CAO-CBB-CBE	2.02	114.45	110.28

There are no chirality outliers.

All (191) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	2104	Y01	CAO-CBB-CBE-CAP
3	A	2104	Y01	OAG-CAY-OAW-CBC
3	A	2104	Y01	CAM-CAY-OAW-CBC
3	A	2107	Y01	OAG-CAY-OAW-CBC
3	A	2107	Y01	CAM-CAY-OAW-CBC
3	A	2109	Y01	OAG-CAY-OAW-CBC
3	A	2109	Y01	CAM-CAY-OAW-CBC
3	A	2110	Y01	OAG-CAY-OAW-CBC
3	A	2110	Y01	CAM-CAY-OAW-CBC
3	A	2111	Y01	OAG-CAY-OAW-CBC
3	A	2111	Y01	CAM-CAY-OAW-CBC
3	A	2114	Y01	OAG-CAY-OAW-CBC
3	A	2114	Y01	CAM-CAY-OAW-CBC
3	A	2115	Y01	CAO-CBB-CBE-CBI
3	A	2115	Y01	OAG-CAY-OAW-CBC
3	A	2115	Y01	CAM-CAY-OAW-CBC
3	A	2116	Y01	OAG-CAY-OAW-CBC
3	A	2116	Y01	CAM-CAY-OAW-CBC
3	A	2118	Y01	OAG-CAY-OAW-CBC
3	A	2118	Y01	CAM-CAY-OAW-CBC

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Mol	Chain	Res	Type	Atoms
3	A	2119	Y01	OAG-CAY-OAW-CBC
3	A	2119	Y01	CAM-CAY-OAW-CBC
3	A	2120	Y01	CAO-CBB-CBE-CAP
3	A	2120	Y01	CAC-CBB-CBE-CBI
3	A	2122	Y01	OAG-CAY-OAW-CBC
3	A	2122	Y01	CAM-CAY-OAW-CBC
3	A	2126	Y01	OAG-CAY-OAW-CBC
3	A	2126	Y01	CAM-CAY-OAW-CBC
4	A	2127	AV0	O5-C1-O1-CBS
4	A	2128	AV0	C2-C1-O1-CBS
4	A	2128	AV0	O5-C1-O1-CBS
4	A	2128	AV0	CBL-CBR-CCM-CBQ
4	A	2128	AV0	CBL-CBR-CCM-CBS
4	A	2128	AV0	CBL-CBR-CCM-CBT
4	A	2128	AV0	O1-CBS-CCM-CBQ
4	A	2128	AV0	O1-CBS-CCM-CBR
3	A	2104	Y01	CAC-CBB-CBE-CAP
3	A	2120	Y01	CAC-CBB-CBE-CAP
3	A	2104	Y01	CAC-CBB-CBE-CBI
3	A	2124	Y01	CAO-CBB-CBE-CAP
3	A	2104	Y01	CAO-CBB-CBE-CBI
3	A	2120	Y01	CAO-CBB-CBE-CBI
3	A	2112	Y01	CAR-CBC-OAW-CAY
3	A	2113	Y01	CAV-CBC-OAW-CAY
3	A	2115	Y01	CAC-CBB-CBE-CAP
3	A	2115	Y01	CAO-CBB-CBE-CAP
3	A	2115	Y01	CAC-CBB-CBE-CBI
4	A	2128	AV0	O1-CBS-CCM-CBT
3	A	2115	Y01	CAJ-CAO-CBB-CAC
3	A	2120	Y01	CAJ-CAO-CBB-CBE
3	A	2103	Y01	CAJ-CAO-CBB-CAC
3	A	2124	Y01	CAC-CBB-CBE-CAP
3	A	2103	Y01	CAJ-CAO-CBB-CBE
3	A	2124	Y01	CAO-CBB-CBE-CBI
3	A	2122	Y01	CAV-CBC-OAW-CAY
3	A	2118	Y01	CAX-CAL-CAM-CAY
3	A	2104	Y01	CAJ-CAO-CBB-CBE
3	A	2116	Y01	CAJ-CAO-CBB-CBE
3	A	2120	Y01	CAJ-CAO-CBB-CAC
3	A	2119	Y01	CAN-CAJ-CAO-CBB
3	A	2105	Y01	CAO-CBB-CBE-CBI
3	A	2103	Y01	CAO-CAJ-CAN-CBA

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Mol	Chain	Res	Type	Atoms
3	A	2116	Y01	CAJ-CAO-CBB-CAC
3	A	2113	Y01	CAO-CAJ-CAN-CBA
3	A	2112	Y01	CAJ-CAO-CBB-CBE
4	A	2127	AV0	CBI-CBK-CBQ-CCM
3	A	2112	Y01	CAJ-CAO-CBB-CAC
3	A	2105	Y01	CAC-CBB-CBE-CBI
3	A	2103	Y01	CAR-CBC-OAW-CAY
3	A	2105	Y01	CAC-CBB-CBE-CAP
3	A	2108	Y01	CAR-CBC-OAW-CAY
3	A	2111	Y01	CAJ-CAO-CBB-CBE
3	A	2118	Y01	CAJ-CAN-CBA-CAB
3	A	2118	Y01	CAO-CAJ-CAN-CBA
3	A	2101	Y01	CAR-CBC-OAW-CAY
3	A	2118	Y01	CAJ-CAN-CBA-CAA
3	A	2117	Y01	CAV-CBC-OAW-CAY
3	A	2121	Y01	CAR-CBC-OAW-CAY
3	A	2122	Y01	CAR-CBC-OAW-CAY
3	A	2119	Y01	CAJ-CAO-CBB-CBE
3	A	2124	Y01	CAJ-CAO-CBB-CAC
4	A	2127	AV0	C2-C1-O1-CBS
3	A	2115	Y01	CAJ-CAO-CBB-CBE
4	A	2128	AV0	C5-C4-O4-CCR
3	A	2118	Y01	CAV-CBC-OAW-CAY
3	A	2104	Y01	CAO-CAJ-CAN-CBA
4	A	2128	AV0	O5-C5-C6-O6
4	A	2128	AV0	C3-C4-O4-CCR
3	A	2105	Y01	CAJ-CAO-CBB-CAC
4	A	2127	AV0	CBH-CBJ-CBL-CBR
3	A	2112	Y01	CAM-CAY-OAW-CBC
3	A	2126	Y01	CAJ-CAN-CBA-CAB
3	A	2117	Y01	CAR-CBC-OAW-CAY
3	A	2105	Y01	CAJ-CAO-CBB-CBE
3	A	2111	Y01	CAJ-CAO-CBB-CAC
3	A	2114	Y01	CAJ-CAN-CBA-CAB
3	A	2123	Y01	CAJ-CAN-CBA-CAB
3	A	2107	Y01	CAN-CAJ-CAO-CBB
3	A	2117	Y01	CAO-CBB-CBE-CBI
3	A	2121	Y01	CAJ-CAO-CBB-CBE
3	A	2120	Y01	CAN-CAJ-CAO-CBB
3	A	2126	Y01	CAJ-CAN-CBA-CAA
4	A	2127	AV0	CCF-CCQ-OCB-CCS
3	A	2117	Y01	CAO-CBB-CBE-CAP

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Mol	Chain	Res	Type	Atoms
3	A	2123	Y01	CAN-CAJ-CAO-CBB
4	A	2127	AV0	CCH-CCQ-OCB-CCS
3	A	2108	Y01	CAV-CBC-OAW-CAY
3	A	2114	Y01	CAJ-CAN-CBA-CAA
3	A	2108	Y01	CAJ-CAN-CBA-CAB
3	A	2123	Y01	CAJ-CAN-CBA-CAA
3	A	2101	Y01	CAC-CBB-CBE-CBI
4	A	2128	AV0	CCM-CBS-O1-C1
3	A	2113	Y01	CAJ-CAO-CBB-CAC
3	A	2101	Y01	CAO-CBB-CBE-CAP
4	A	2128	AV0	OBX-CCJ-OBV-CBT
6	A	2131	6OE	C03-O04-P05-O08
3	A	2125	Y01	CAN-CAJ-CAO-CBB
3	A	2101	Y01	CAO-CBB-CBE-CBI
3	A	2118	Y01	CAM-CAL-CAX-OAF
3	A	2123	Y01	CAJ-CAO-CBB-CAC
3	A	2125	Y01	CAM-CAL-CAX-OAH
3	A	2103	Y01	CAV-CBC-OAW-CAY
3	A	2101	Y01	CAC-CBB-CBE-CAP
3	A	2122	Y01	CAM-CAL-CAX-OAF
3	A	2121	Y01	CAV-CBC-OAW-CAY
3	A	2106	Y01	CAM-CAL-CAX-OAH
3	A	2108	Y01	CAJ-CAN-CBA-CAA
3	A	2126	Y01	CAM-CAL-CAX-OAF
3	A	2102	Y01	CAM-CAL-CAX-OAH
3	A	2126	Y01	CAM-CAL-CAX-OAH
3	A	2112	Y01	CAM-CAL-CAX-OAF
3	A	2102	Y01	CAM-CAL-CAX-OAF
3	A	2117	Y01	CAM-CAL-CAX-OAF
3	A	2115	Y01	CAV-CBC-OAW-CAY
3	A	2120	Y01	CAM-CAL-CAX-OAH
3	A	2120	Y01	CAM-CAL-CAX-OAF
3	A	2122	Y01	CAM-CAL-CAX-OAH
3	A	2125	Y01	CAM-CAL-CAX-OAF
4	A	2128	AV0	CBD-CBF-CBH-CBJ
3	A	2105	Y01	CAM-CAL-CAX-OAF
3	A	2118	Y01	CAR-CBC-OAW-CAY
3	A	2101	Y01	CAV-CBC-OAW-CAY
3	A	2104	Y01	CAV-CBC-OAW-CAY
3	A	2109	Y01	CAJ-CAN-CBA-CAB
3	A	2117	Y01	CAC-CBB-CBE-CBI
3	A	2106	Y01	CAM-CAL-CAX-OAF

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Mol	Chain	Res	Type	Atoms
3	A	2111	Y01	CAM-CAL-CAX-OAH
3	A	2105	Y01	CAM-CAL-CAX-OAH
3	A	2117	Y01	CAM-CAL-CAX-OAH
3	A	2121	Y01	CAM-CAL-CAX-OAH
3	A	2121	Y01	CAM-CAL-CAX-OAF
4	A	2128	AV0	CBA-CBC-CBE-CBG
3	A	2112	Y01	CAM-CAL-CAX-OAH
3	A	2119	Y01	CAM-CAL-CAX-OAF
3	A	2115	Y01	CAM-CAL-CAX-OAH
3	A	2114	Y01	CAM-CAL-CAX-OAF
3	A	2119	Y01	CAM-CAL-CAX-OAH
3	A	2124	Y01	CAL-CAM-CAY-OAW
3	A	2119	Y01	CAL-CAM-CAY-OAW
3	A	2108	Y01	CAO-CAJ-CAN-CBA
3	A	2114	Y01	CAM-CAL-CAX-OAH
3	A	2122	Y01	CAO-CAJ-CAN-CBA
3	A	2110	Y01	CAM-CAL-CAX-OAF
3	A	2115	Y01	CAR-CBC-OAW-CAY
3	A	2121	Y01	CAL-CAM-CAY-OAW
3	A	2111	Y01	CAL-CAM-CAY-OAW
3	A	2111	Y01	CAM-CAL-CAX-OAF
3	A	2115	Y01	CAM-CAL-CAX-OAF
3	A	2118	Y01	CAM-CAL-CAX-OAH
3	A	2110	Y01	CAM-CAL-CAX-OAH
4	A	2128	AV0	CBF-CBH-CBJ-CBL
3	A	2109	Y01	CAM-CAL-CAX-OAH
3	A	2109	Y01	CAJ-CAN-CBA-CAA
3	A	2126	Y01	CAL-CAM-CAY-OAG
3	A	2124	Y01	CAM-CAL-CAX-OAF
3	A	2110	Y01	CAJ-CAO-CBB-CAC
3	A	2119	Y01	CAL-CAM-CAY-OAG
3	A	2121	Y01	CAL-CAM-CAY-OAG
3	A	2104	Y01	CAM-CAL-CAX-OAH
3	A	2112	Y01	CAV-CBC-OAW-CAY
4	A	2128	AV0	CCL-CCJ-OBV-CBT
3	A	2107	Y01	CAM-CAL-CAX-OAH
3	A	2124	Y01	CAM-CAL-CAX-OAH
3	A	2111	Y01	CAX-CAL-CAM-CAY
3	A	2104	Y01	CAM-CAL-CAX-OAF
3	A	2109	Y01	CAO-CAJ-CAN-CBA
3	A	2109	Y01	CAN-CAJ-CAO-CBB
3	A	2118	Y01	CAN-CAJ-CAO-CBB

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Mol	Chain	Res	Type	Atoms
3	A	2113	Y01	CAN-CAJ-CAO-CBB
3	A	2116	Y01	CAV-CBC-OAW-CAY
3	A	2101	Y01	CAM-CAL-CAX-OAF

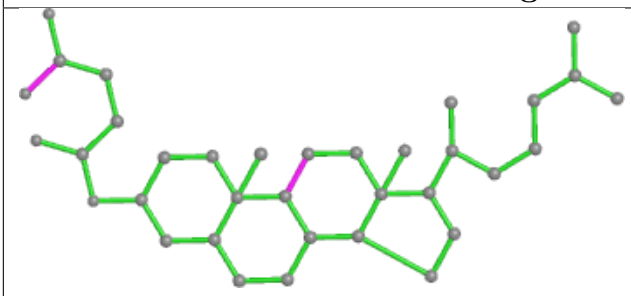
There are no ring outliers.

9 monomers are involved in 9 short contacts:

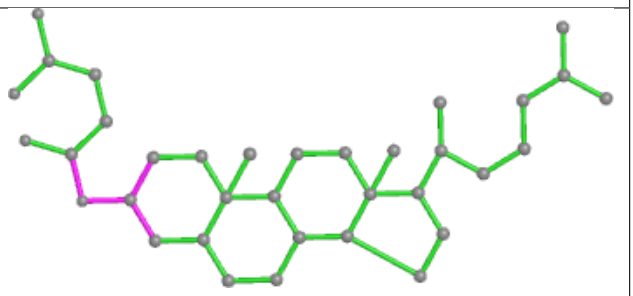
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	2116	Y01	1	0
3	A	2126	Y01	1	0
3	A	2102	Y01	1	0
3	A	2112	Y01	1	0
3	A	2106	Y01	1	0
3	A	2118	Y01	1	0
3	A	2114	Y01	1	0
3	A	2107	Y01	1	0
3	A	2124	Y01	1	0

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 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.

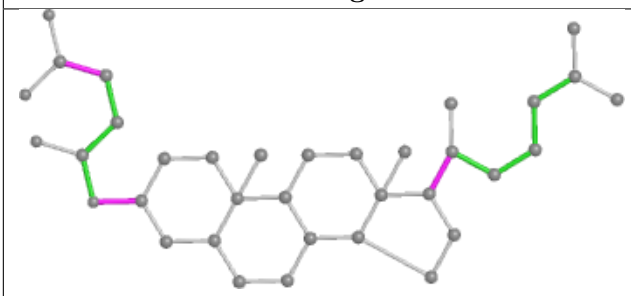
Ligand Y01 A 2101



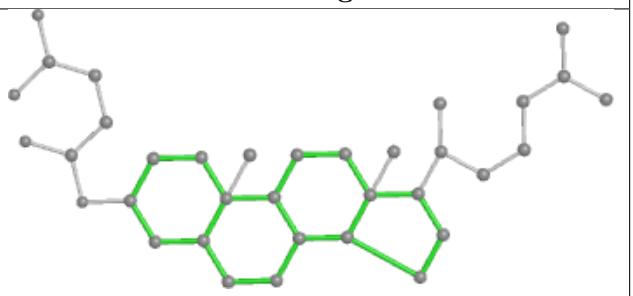
Bond lengths



Bond angles

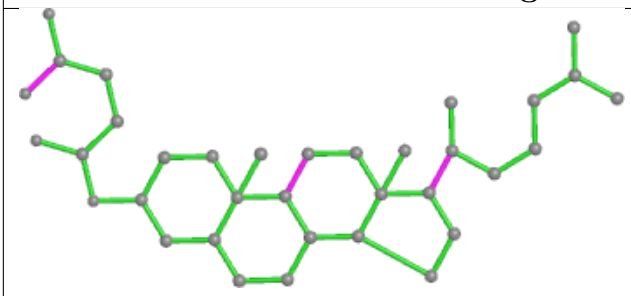


Torsions

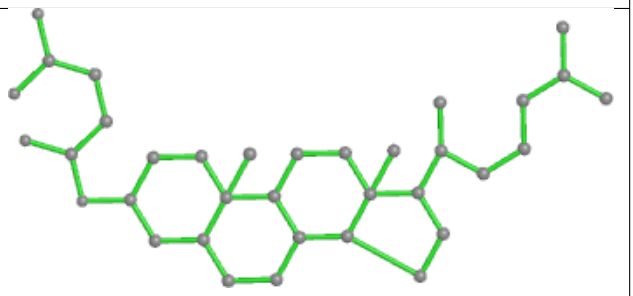


Rings

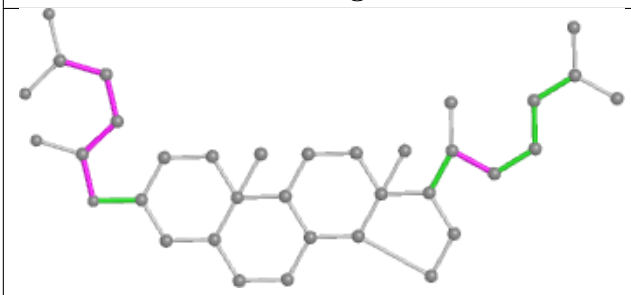
Ligand Y01 A 2111



Bond lengths



Bond angles



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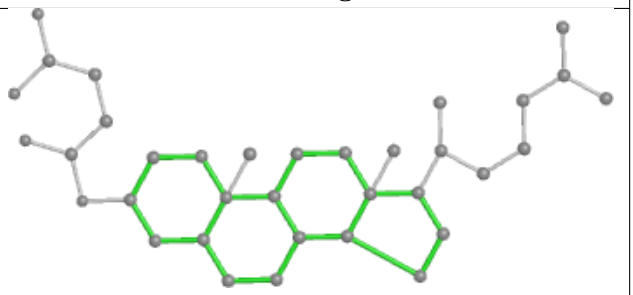
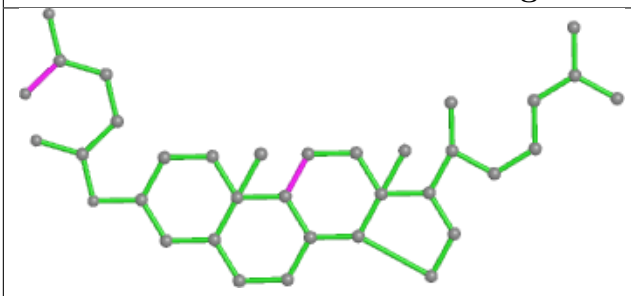
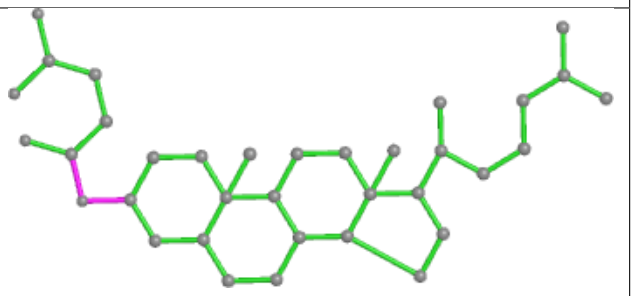


Rings

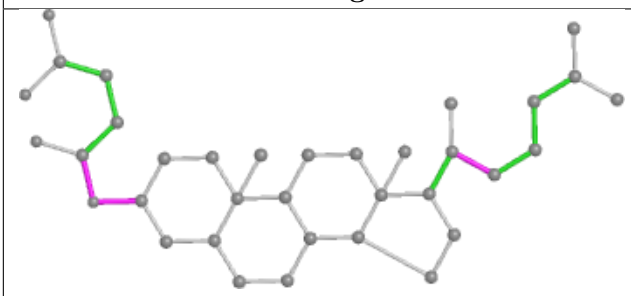
Ligand Y01 A 2116



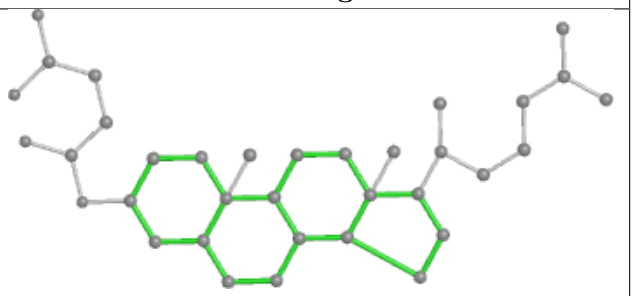
Bond lengths



Bond angles

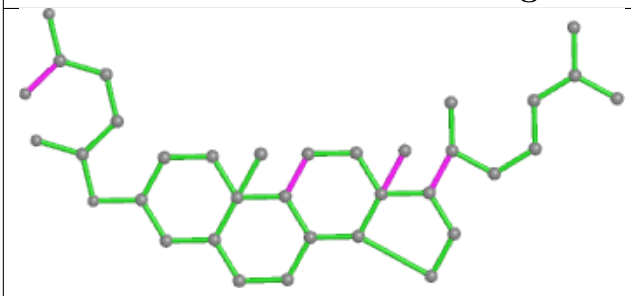


Torsions

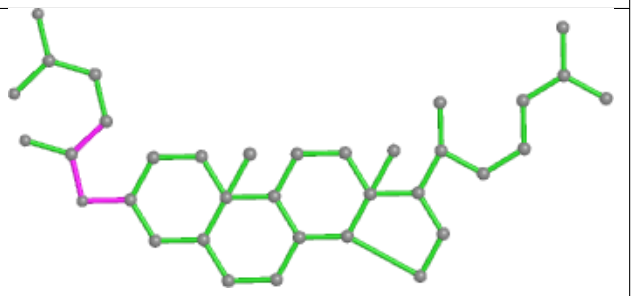


Rings

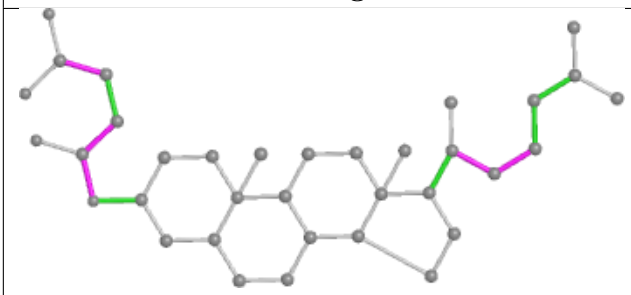
Ligand Y01 A 2119



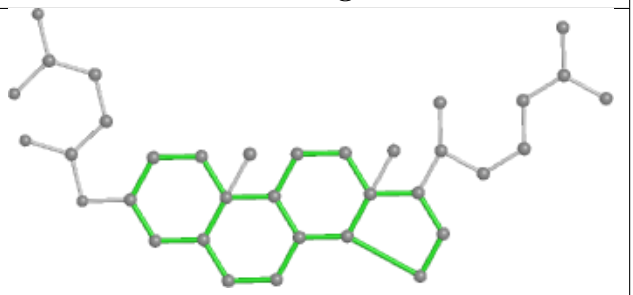
Bond lengths



Bond angles

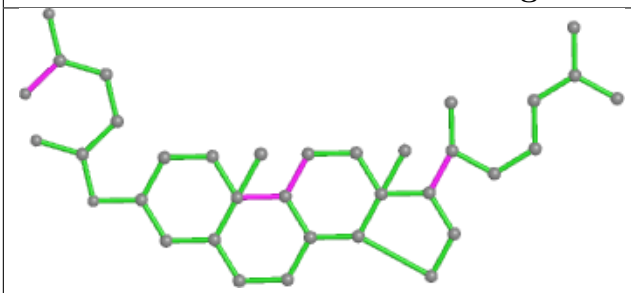


Torsions

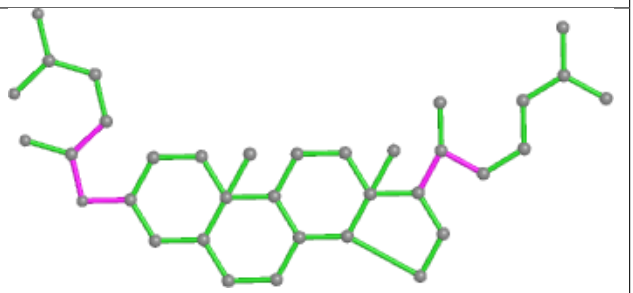


Rings

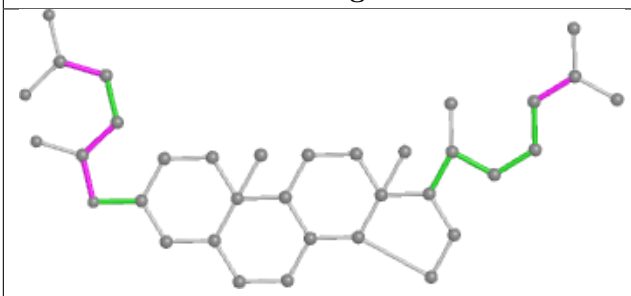
Ligand Y01 A 2126



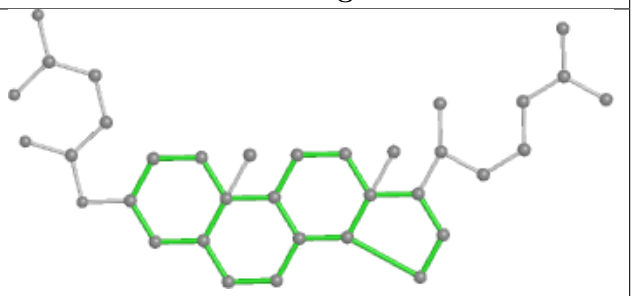
Bond lengths



Bond angles

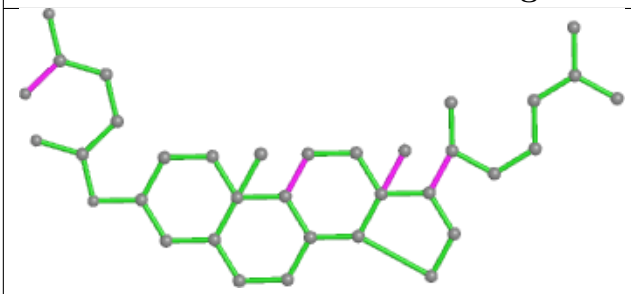


Torsions



Rings

Ligand Y01 A 2115



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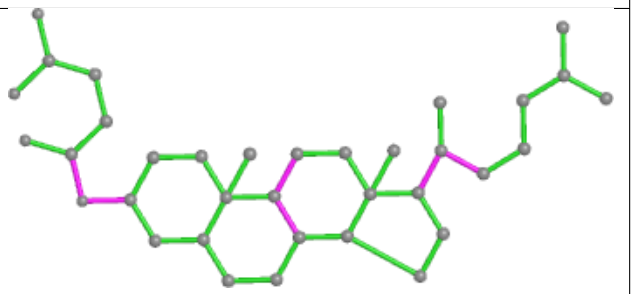
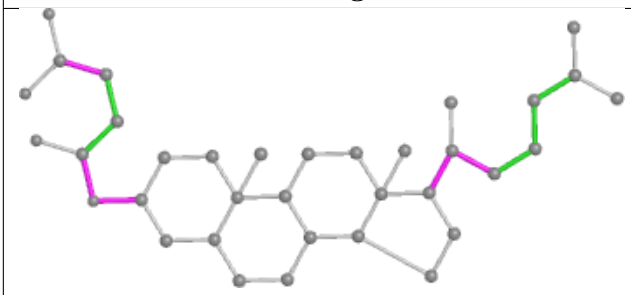


Bond angles



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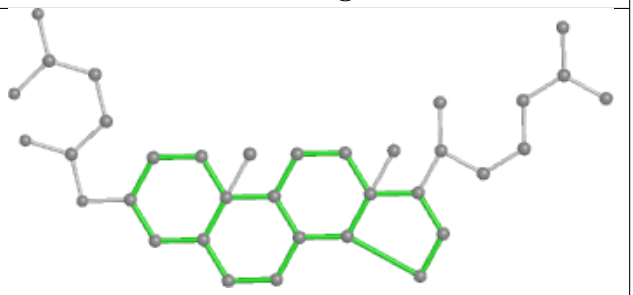
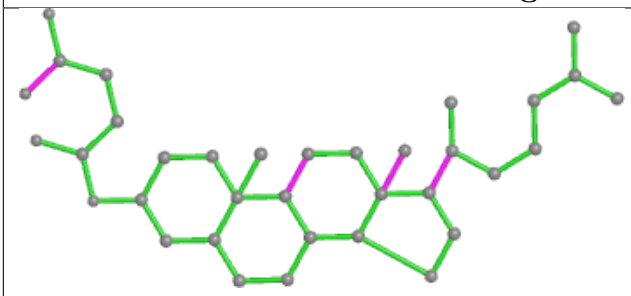


Rings

Ligand Y01 A 2108



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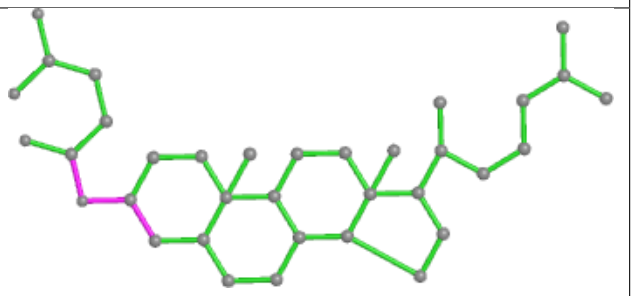
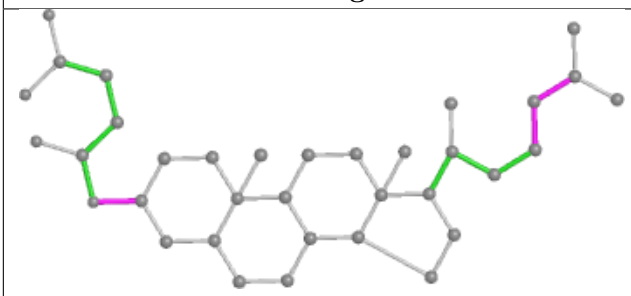
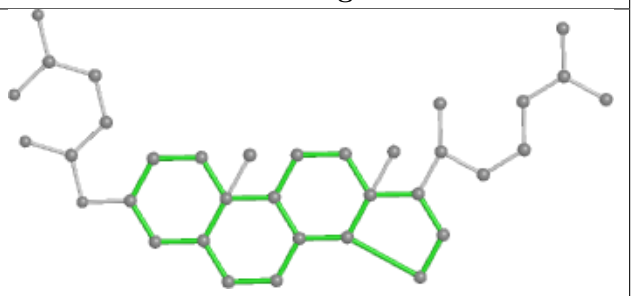


Bond angles

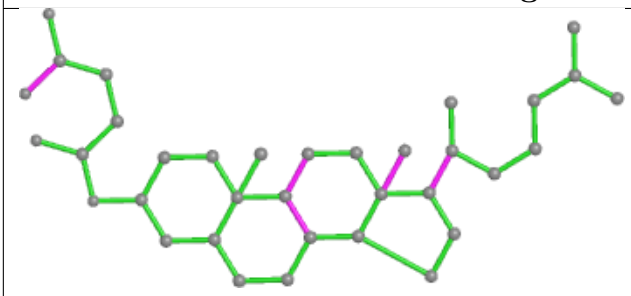


Torsions

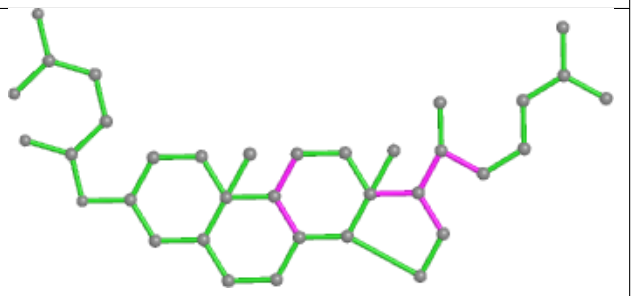


Rings

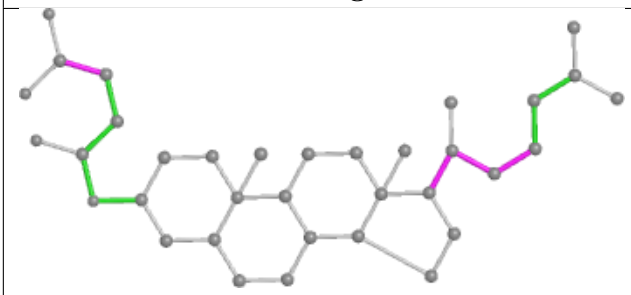
Ligand Y01 A 2120



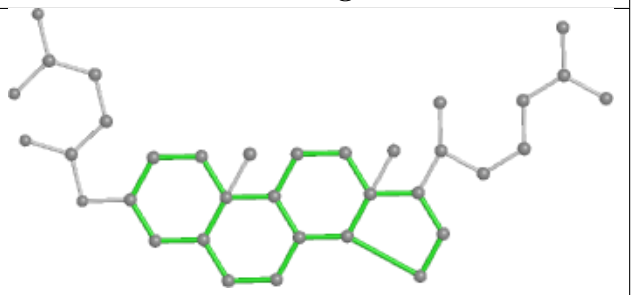
Bond lengths



Bond angles

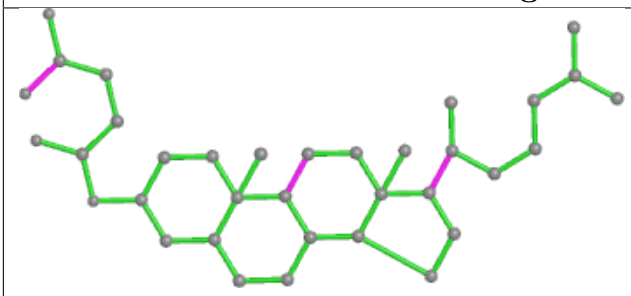


Torsions

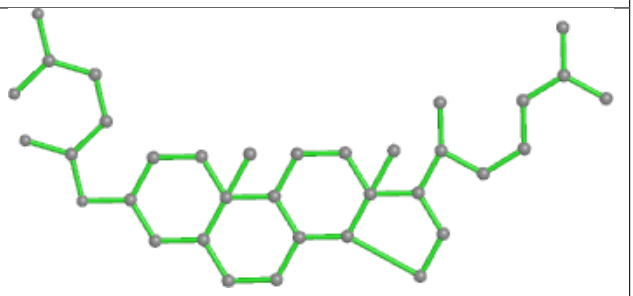


Rings

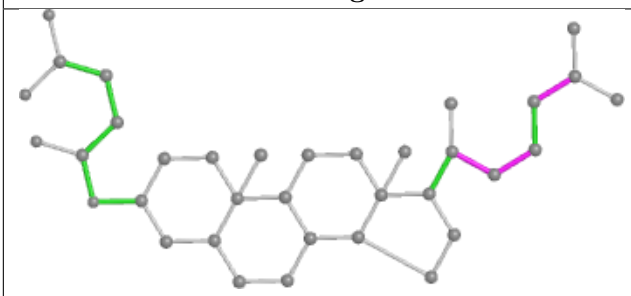
Ligand Y01 A 2123



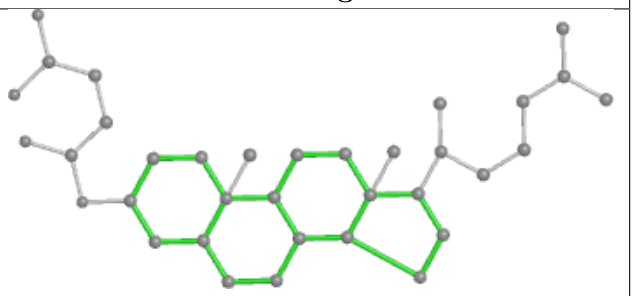
Bond lengths



Bond angles

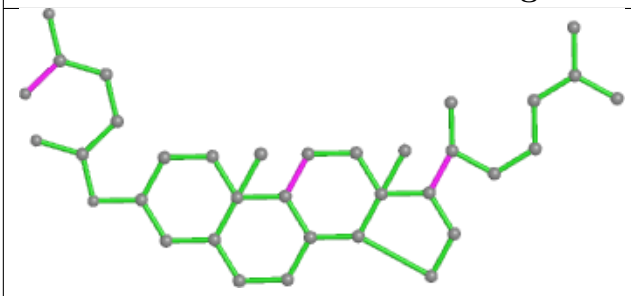


Torsions

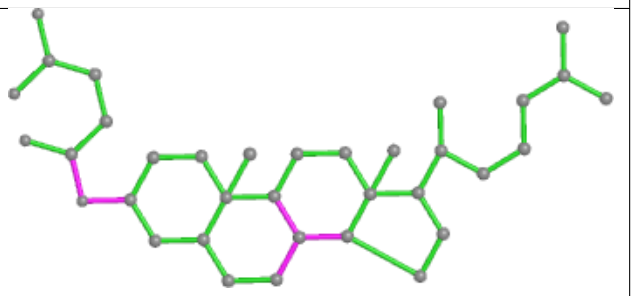


Rings

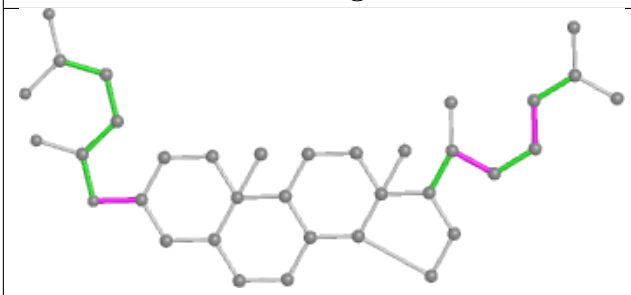
Ligand Y01 A 2103



Bond lengths



Bond angles



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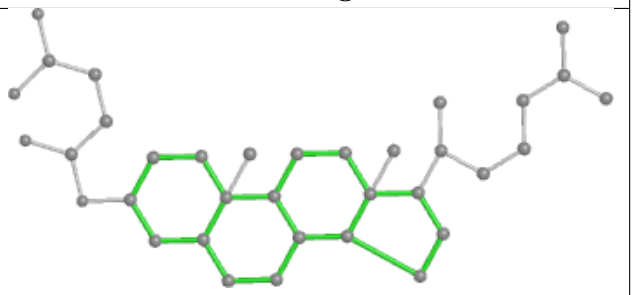
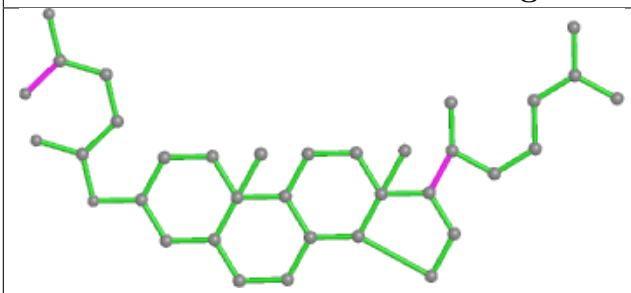
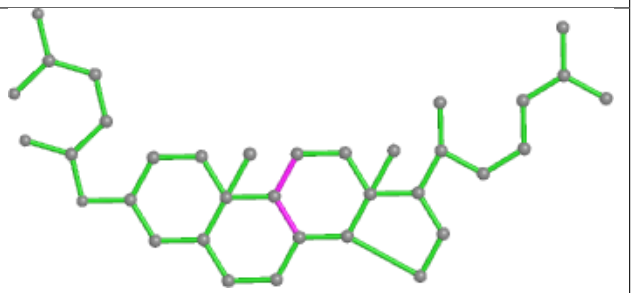


Rings

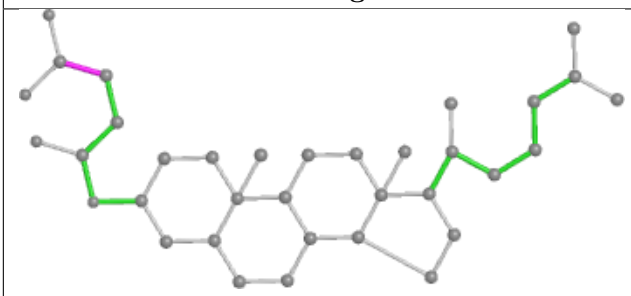
Ligand Y01 A 2102



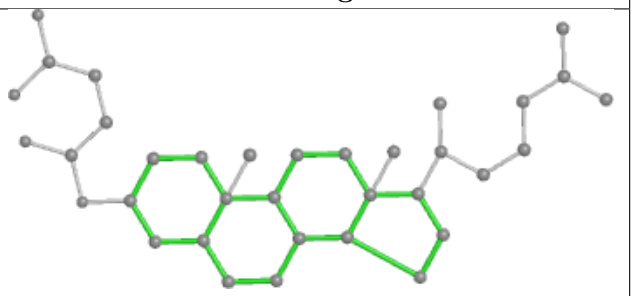
Bond lengths



Bond angles

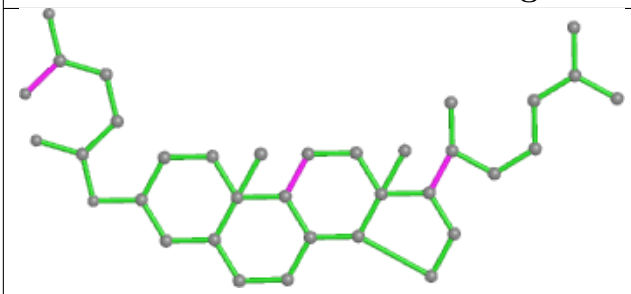


Torsions

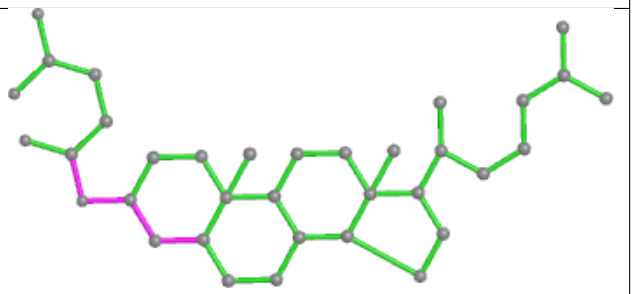


Rings

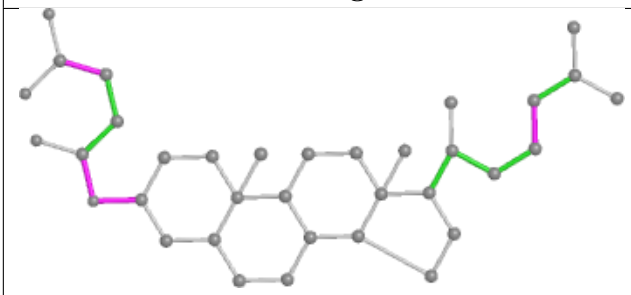
Ligand Y01 A 2122



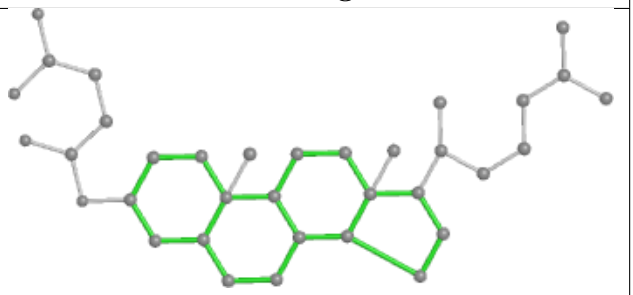
Bond lengths



Bond angles

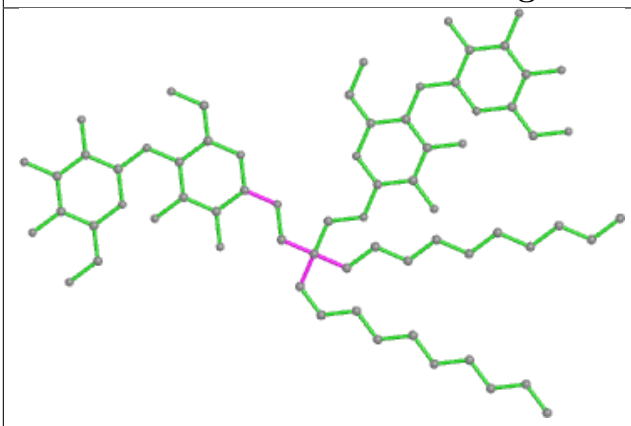


Torsions



Rings

Ligand AV0 A 2128



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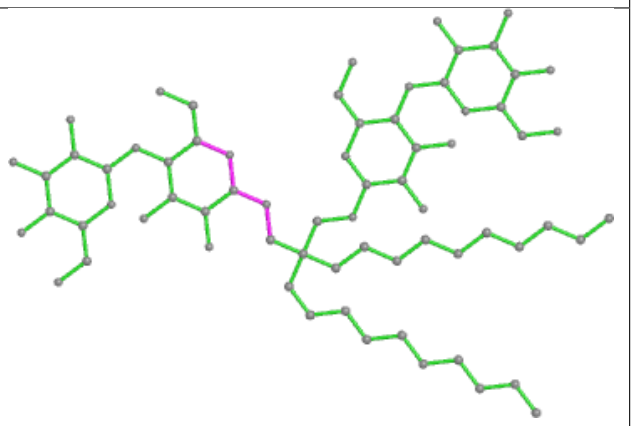
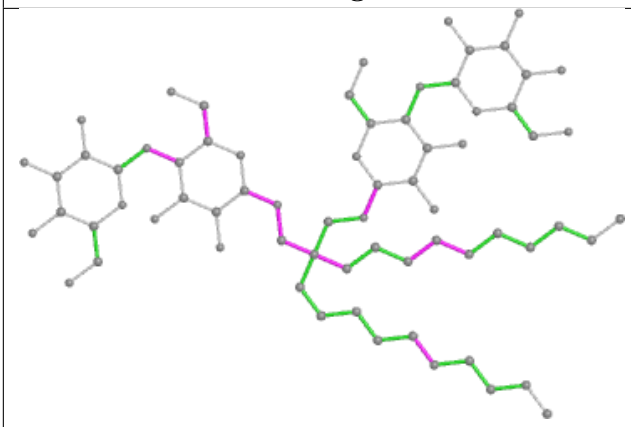
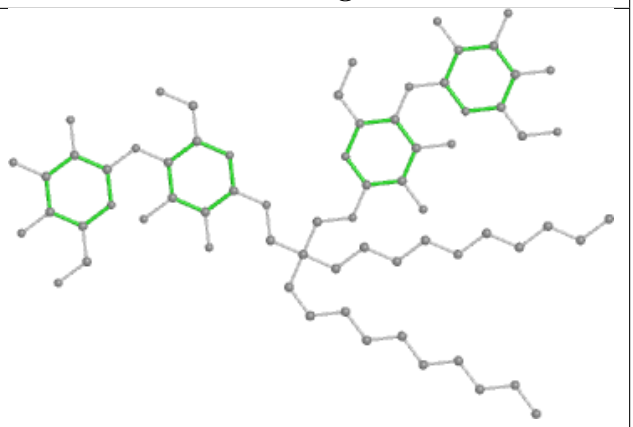


Bond angles

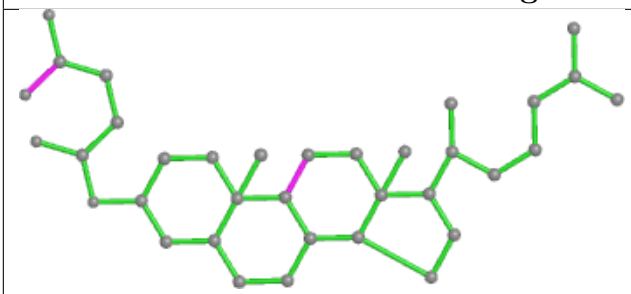


Torsions

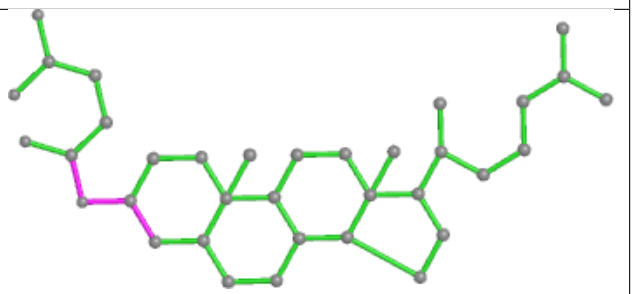


Rings

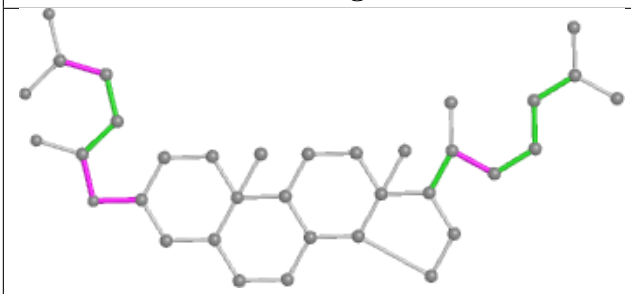
Ligand Y01 A 2112



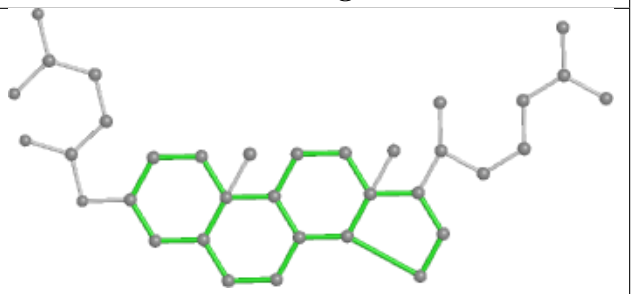
Bond lengths



Bond angles

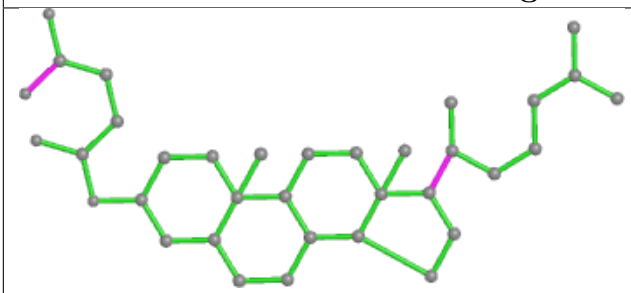


Torsions

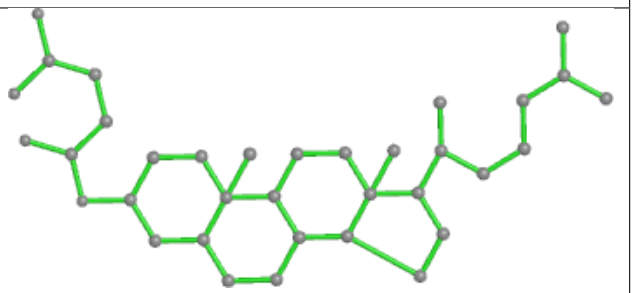


Rings

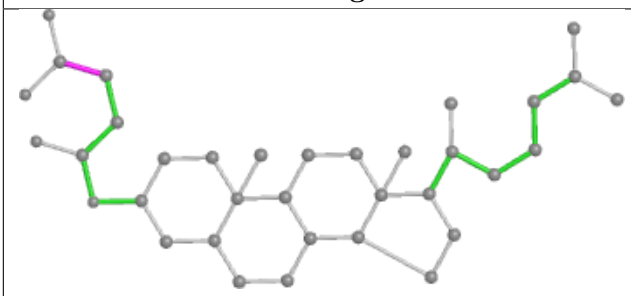
Ligand Y01 A 2106



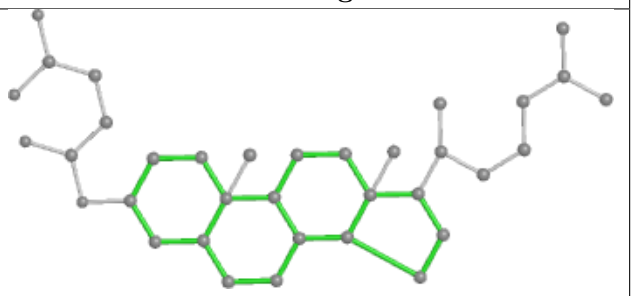
Bond lengths



Bond angles

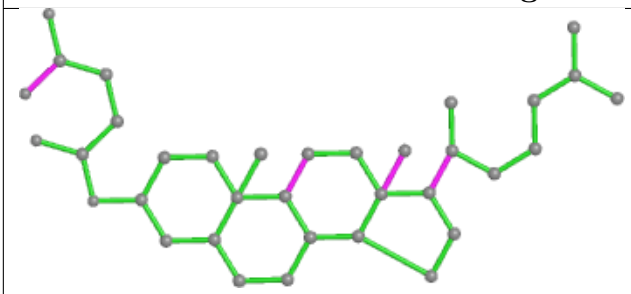


Torsions

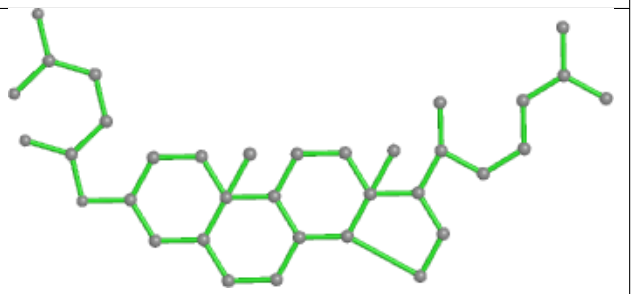


Rings

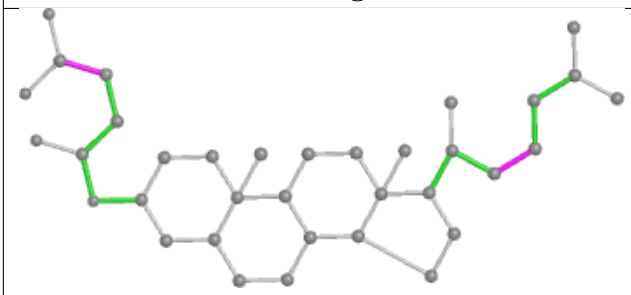
Ligand Y01 A 2125



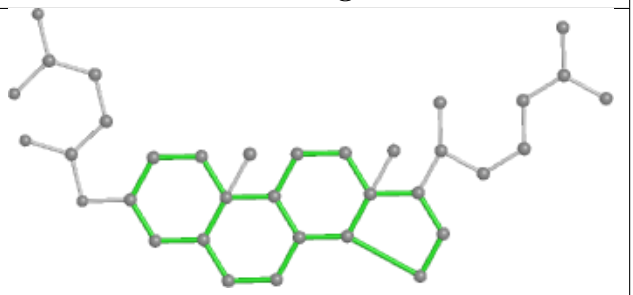
Bond lengths



Bond angles

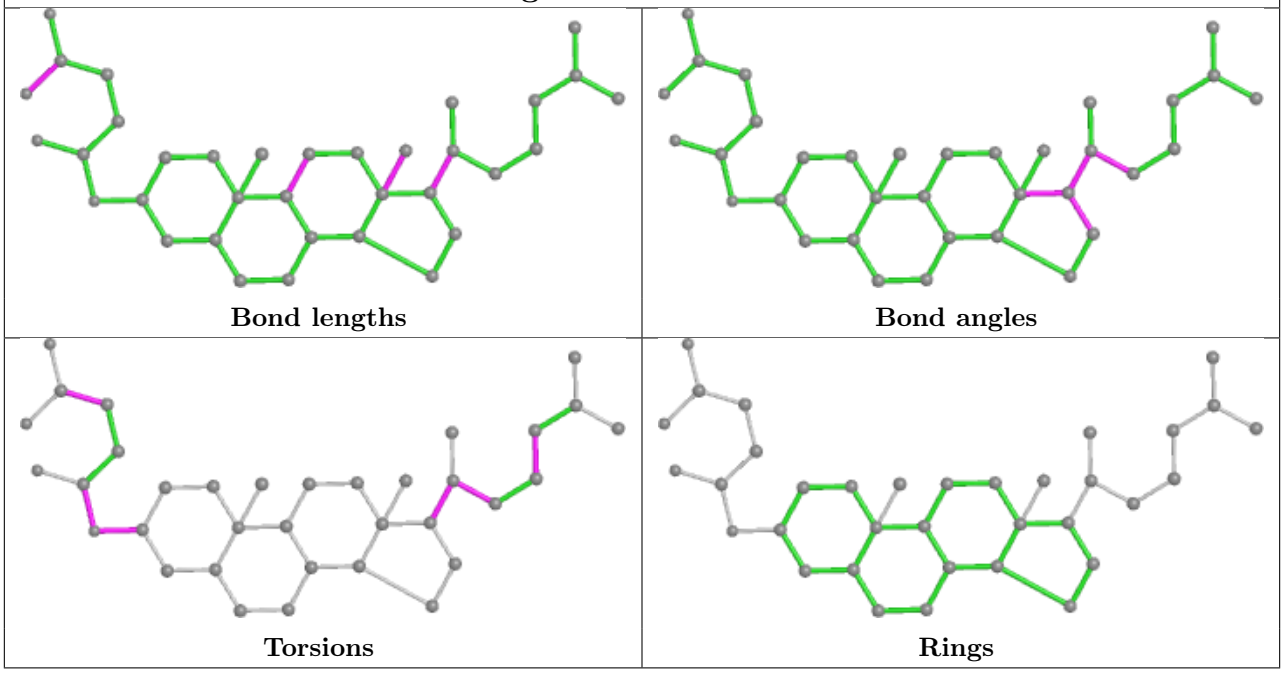


Torsions

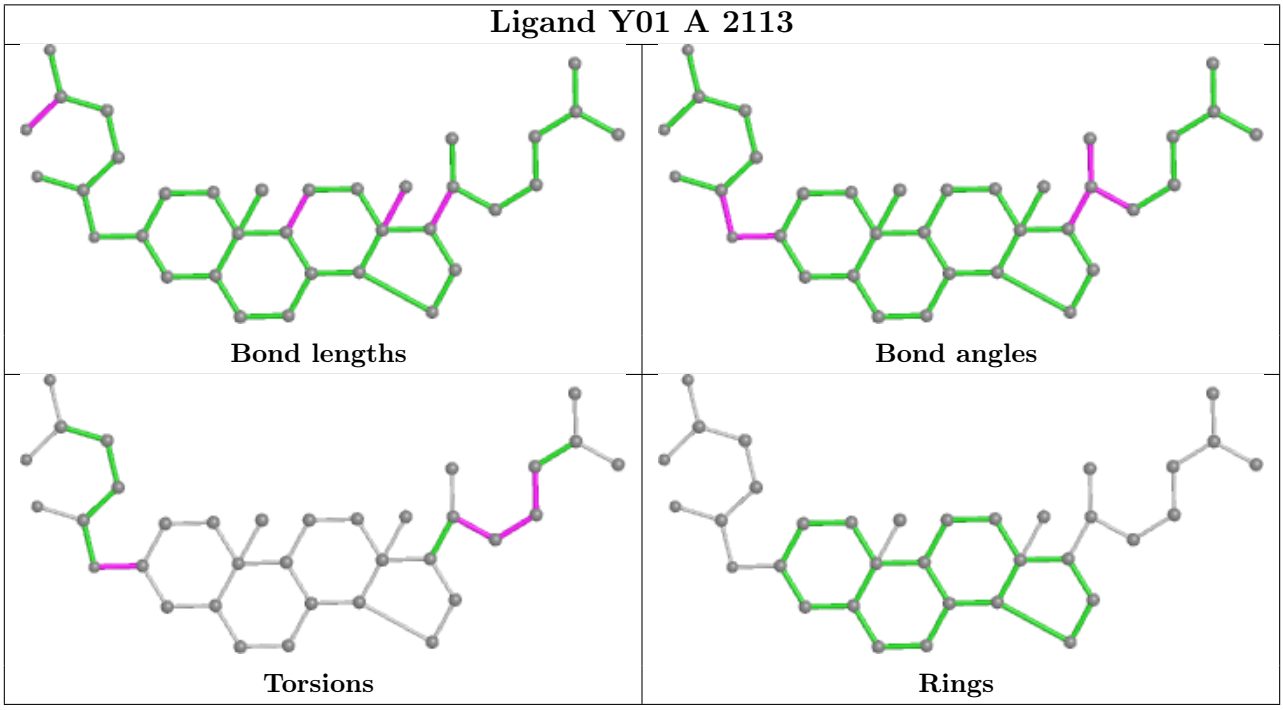


Rings

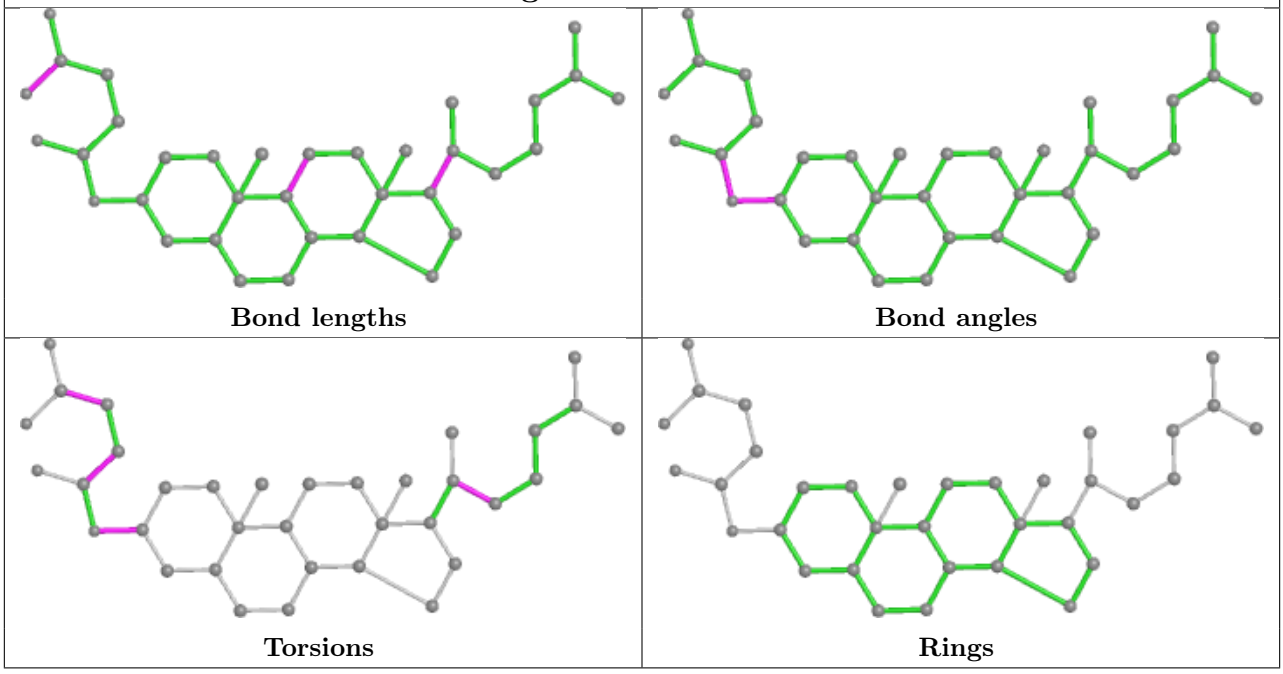
Ligand Y01 A 2104



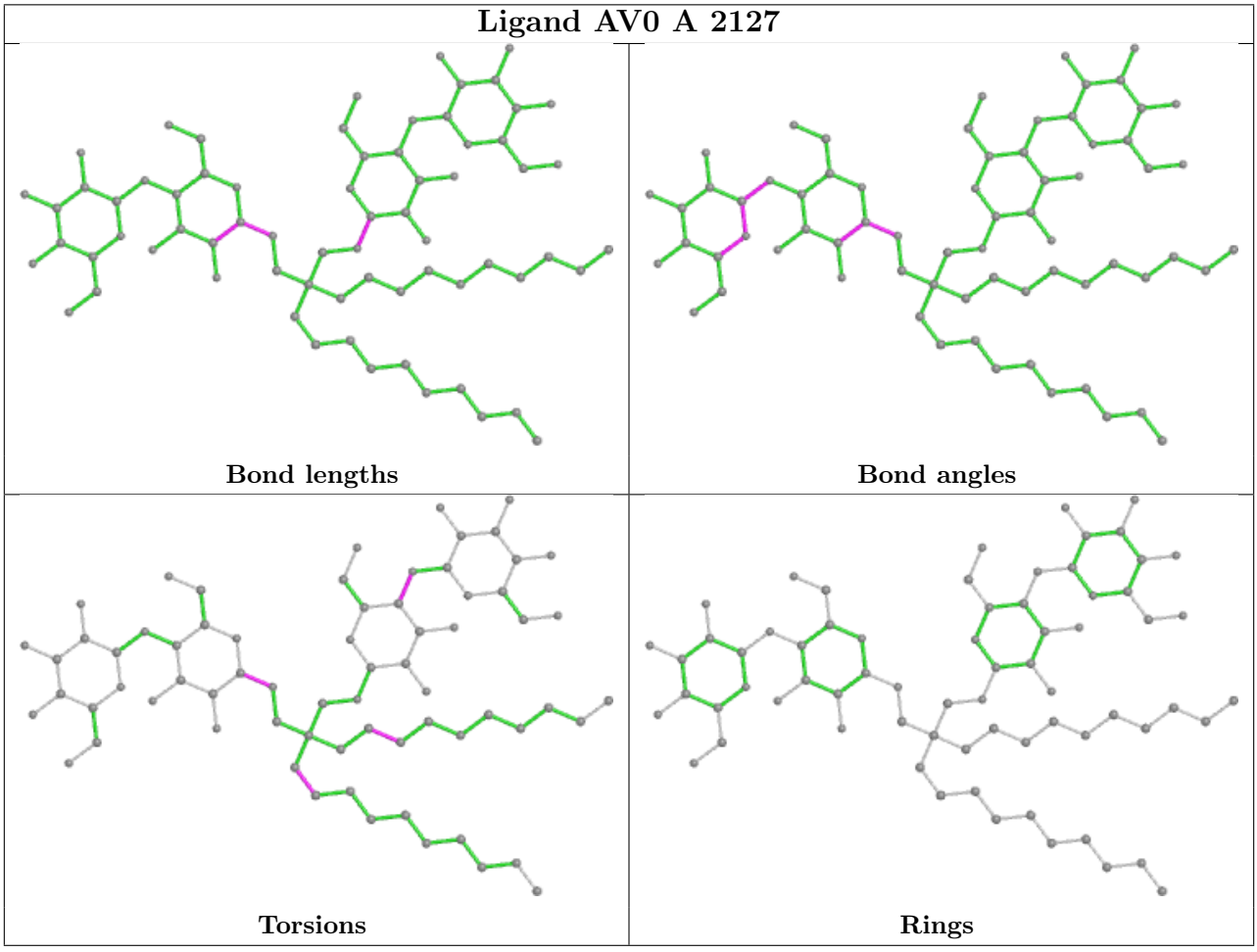
Ligand Y01 A 2113



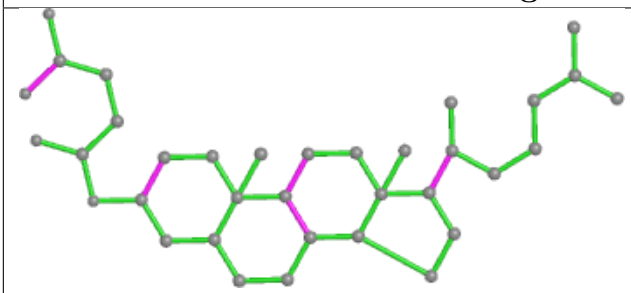
Ligand Y01 A 2121



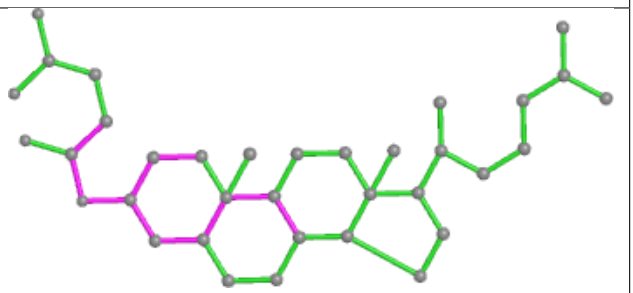
Ligand AV0 A 2127



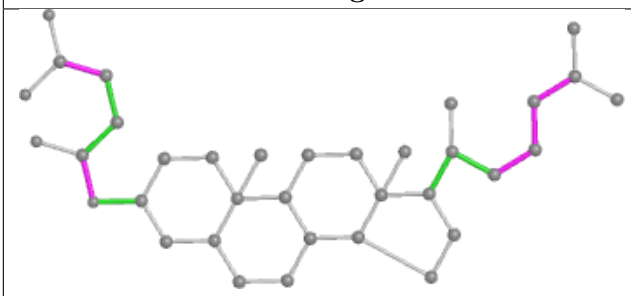
Ligand Y01 A 2109



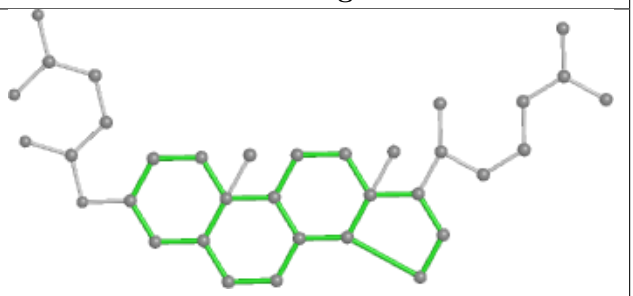
Bond lengths



Bond angles

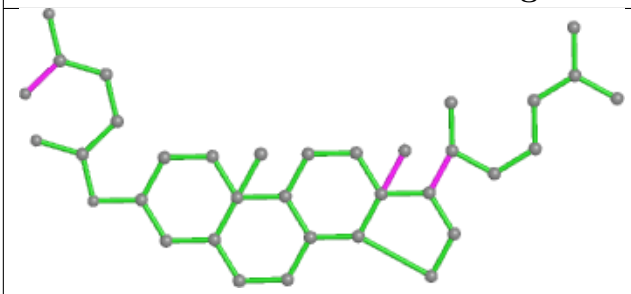


Torsions

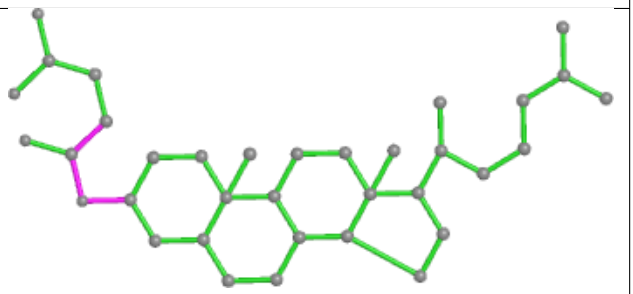


Rings

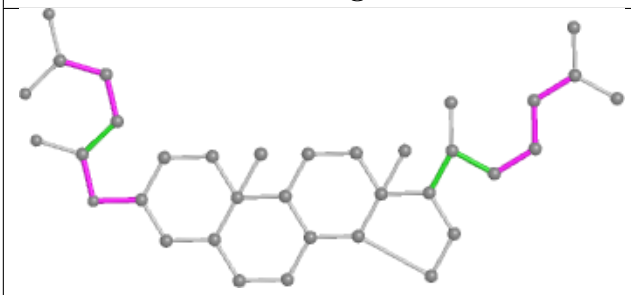
Ligand Y01 A 2118



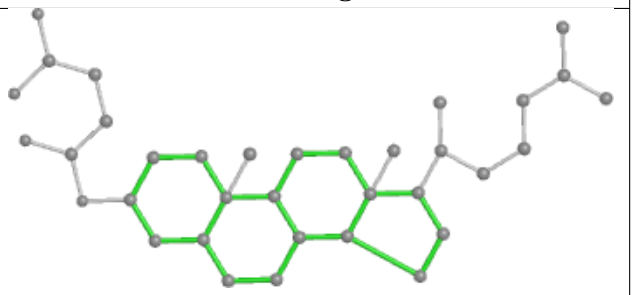
Bond lengths



Bond angles

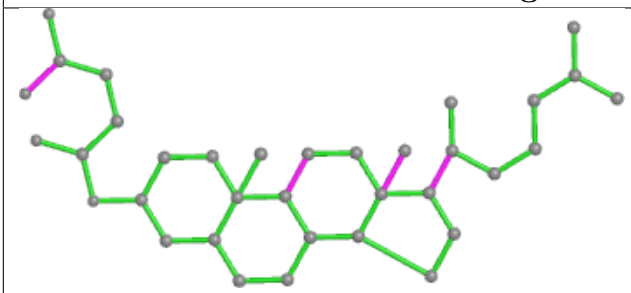


Torsions

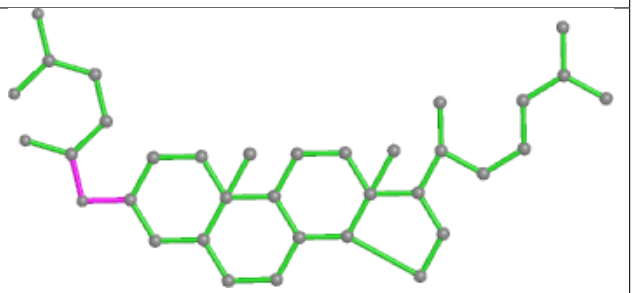


Rings

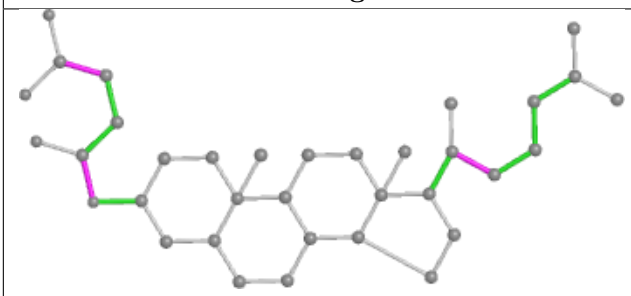
Ligand Y01 A 2110



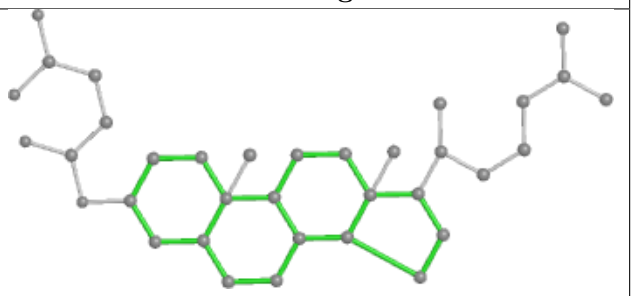
Bond lengths



Bond angles

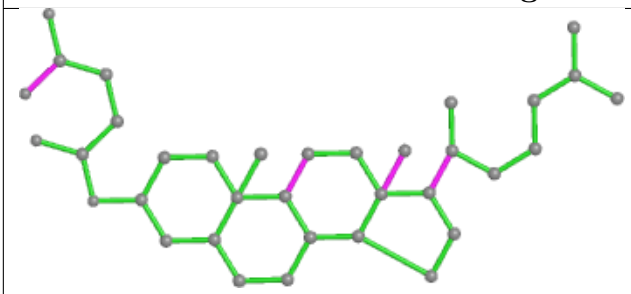


Torsions

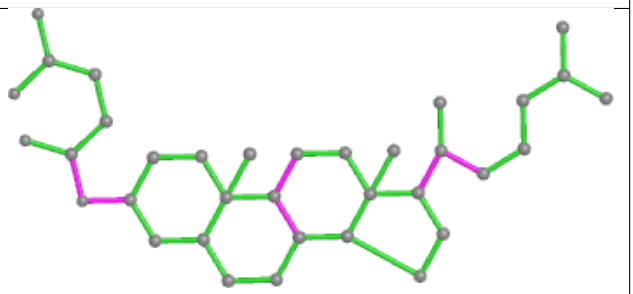


Rings

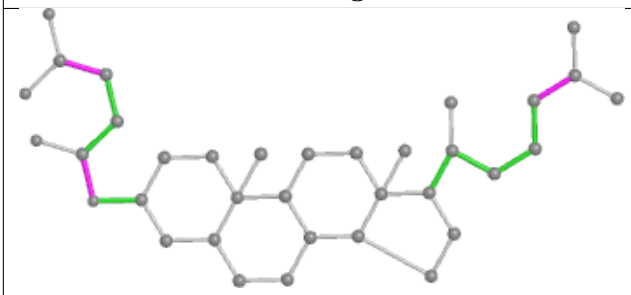
Ligand Y01 A 2114



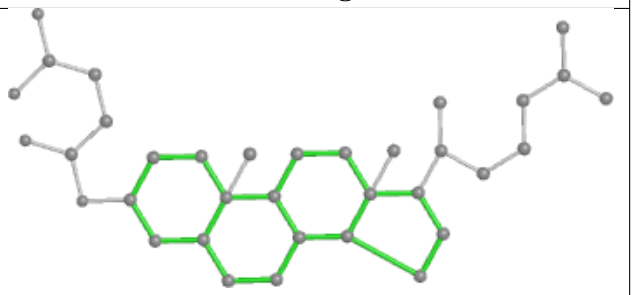
Bond lengths



Bond angles

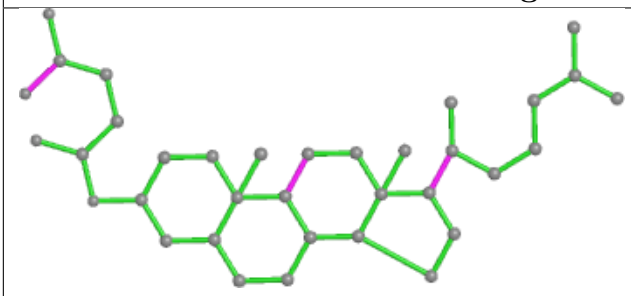


Torsions

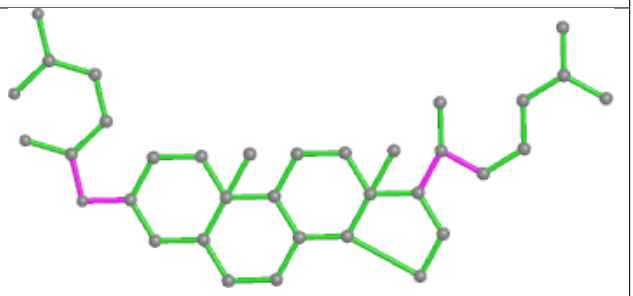


Rings

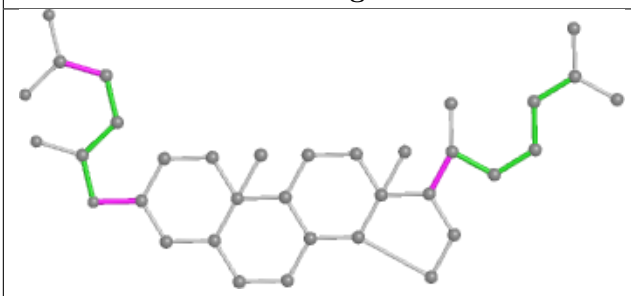
Ligand Y01 A 2117



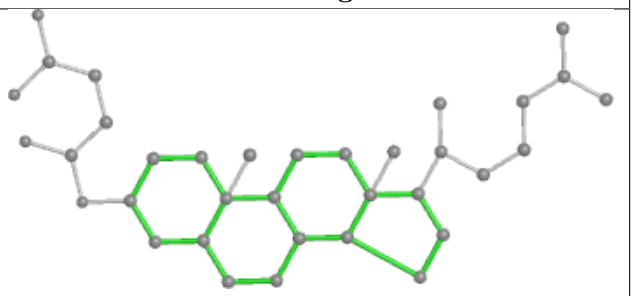
Bond lengths



Bond angles

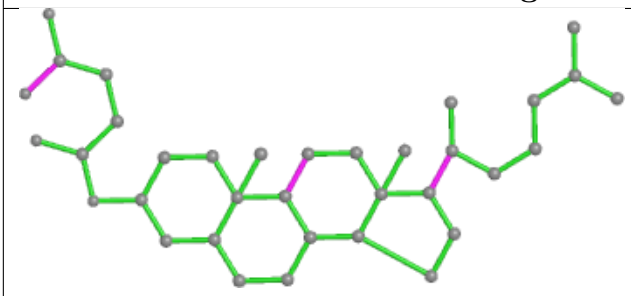


Torsions

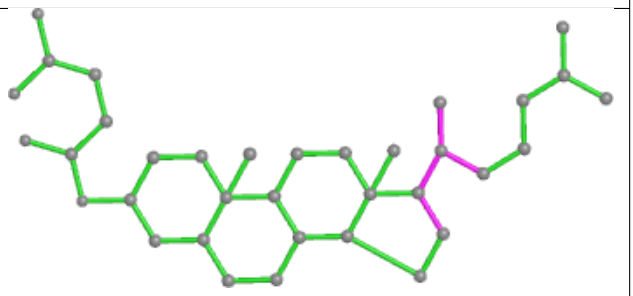


Rings

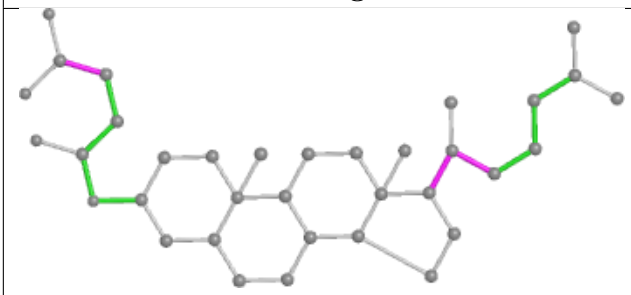
Ligand Y01 A 2105



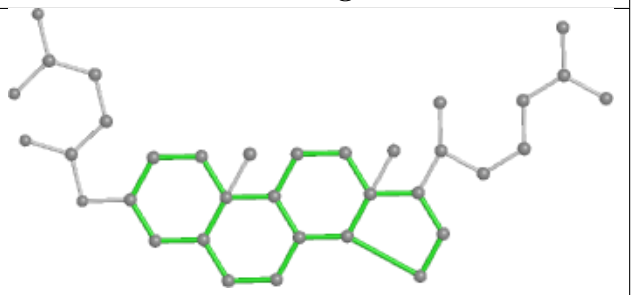
Bond lengths



Bond angles

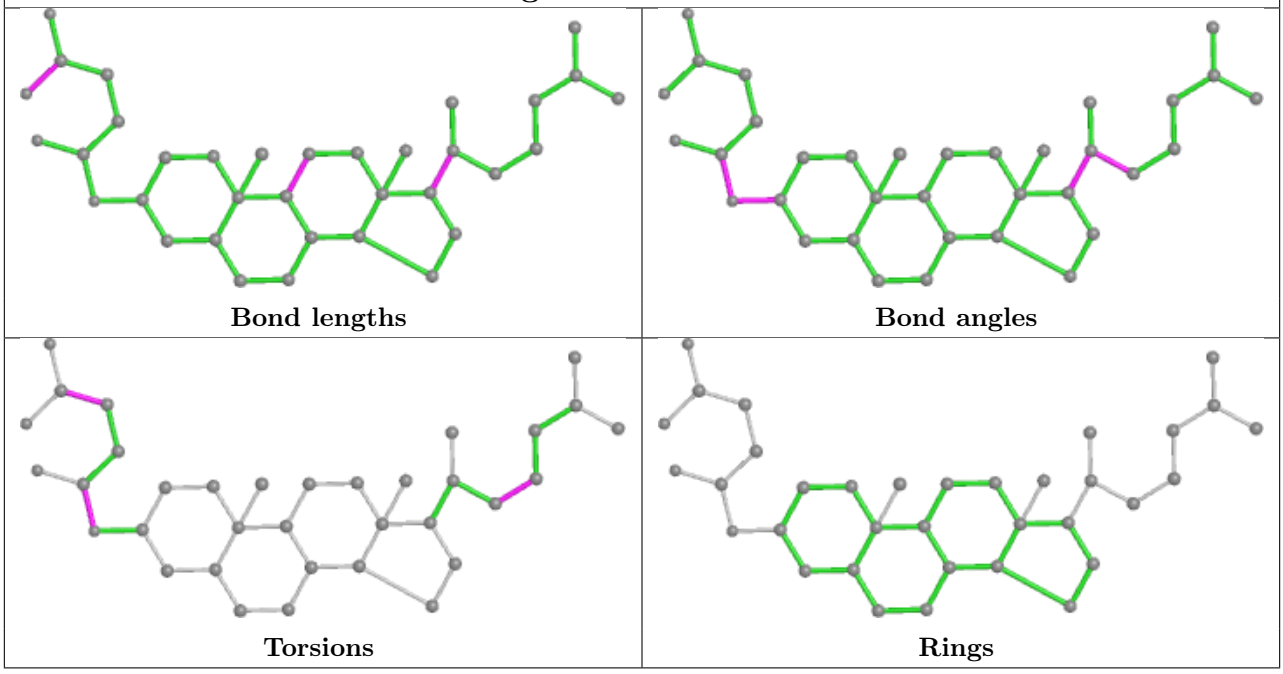


Torsions

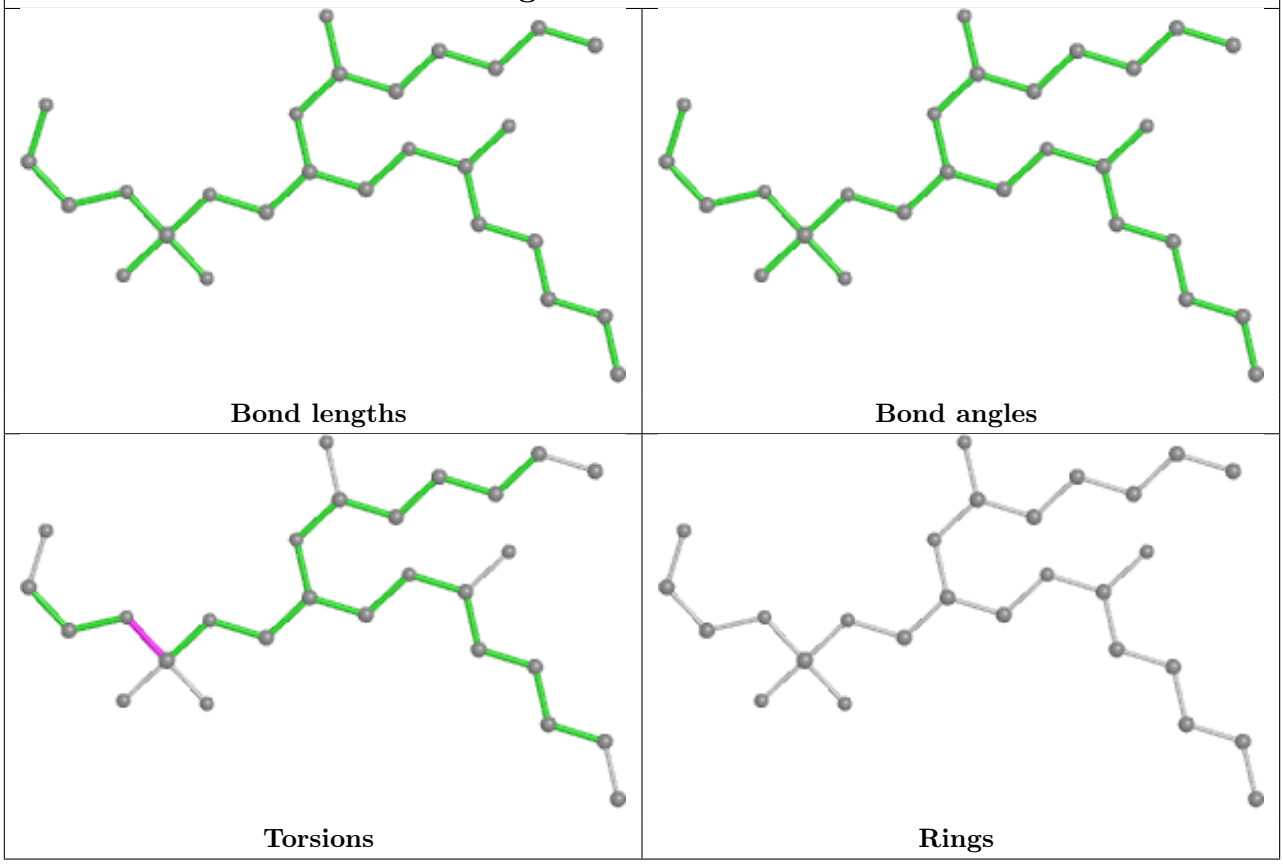


Rings

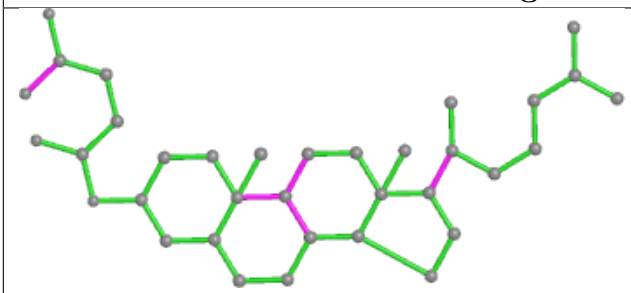
Ligand Y01 A 2107



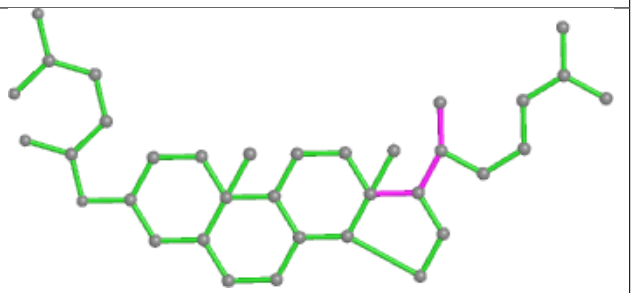
Ligand 6OE A 2131



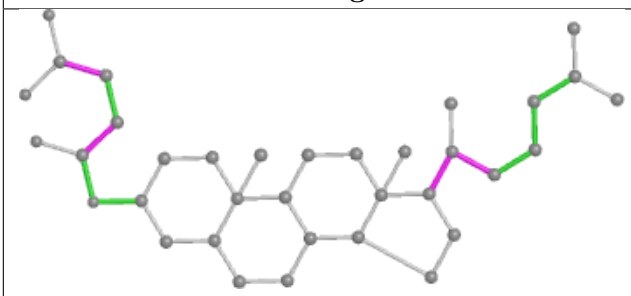
Ligand Y01 A 2124



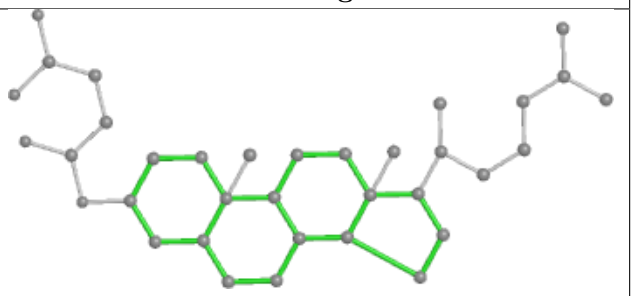
Bond lengths



Bond angles



Torsions



Rings

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.

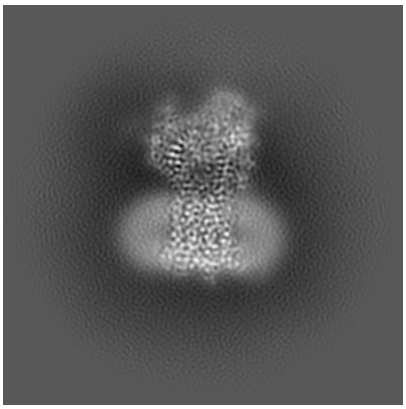
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-24617. These allow visual inspection of the internal detail of the map and identification of artifacts.

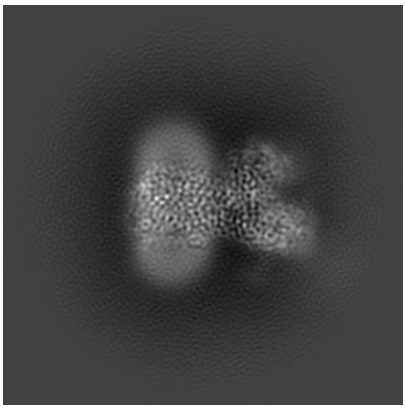
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

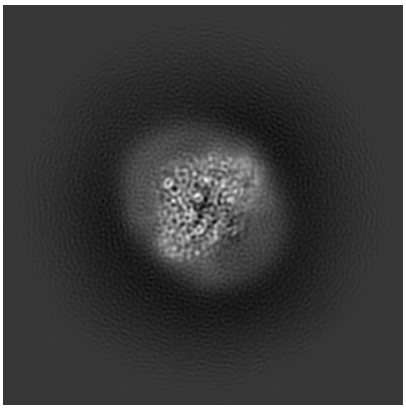
6.1.1 Primary map



X

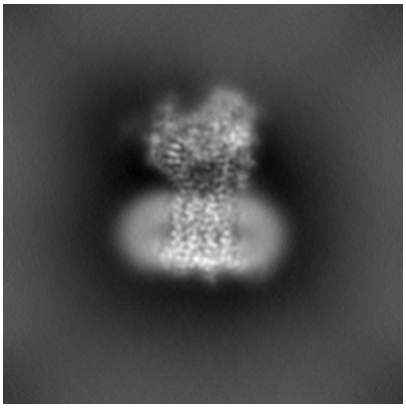


Y

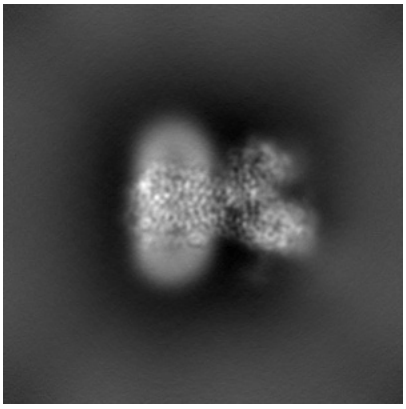


Z

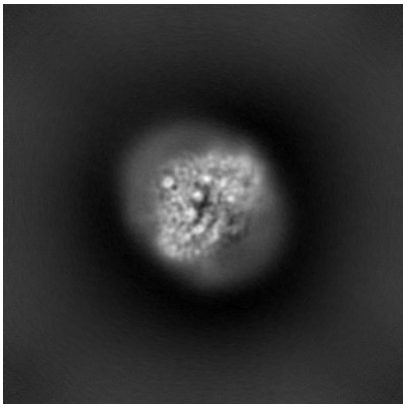
6.1.2 Raw map



X



Y

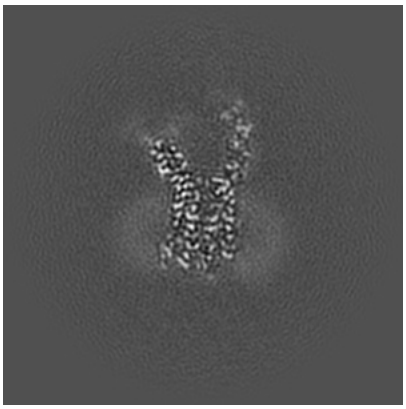


Z

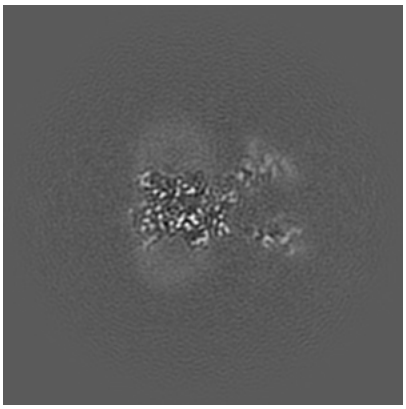
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

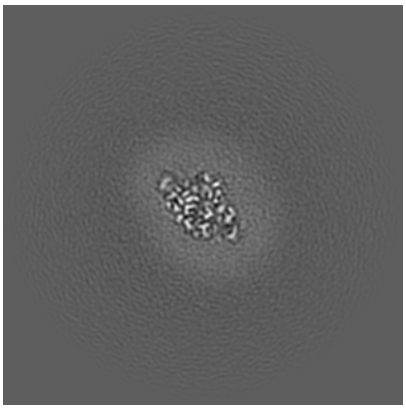
6.2.1 Primary map



X Index: 144

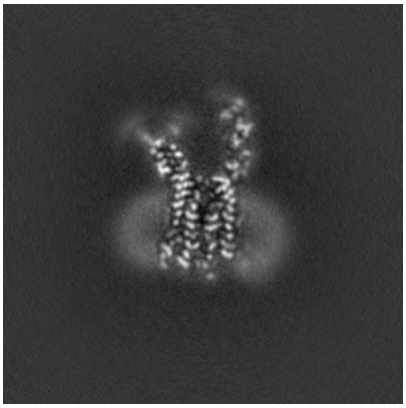


Y Index: 144

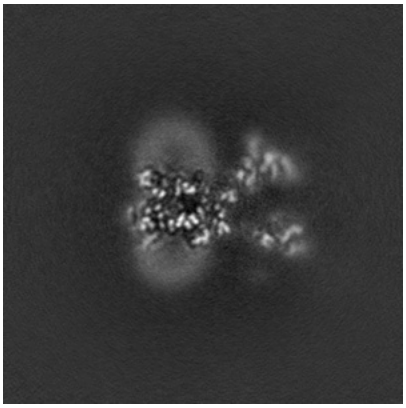


Z Index: 144

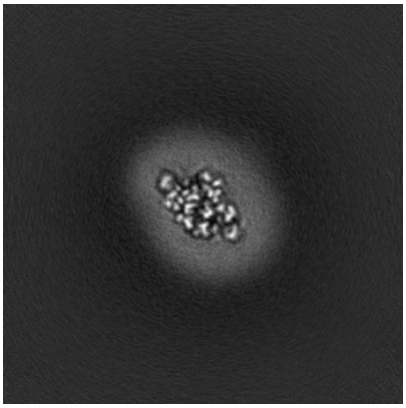
6.2.2 Raw map



X Index: 144



Y Index: 144

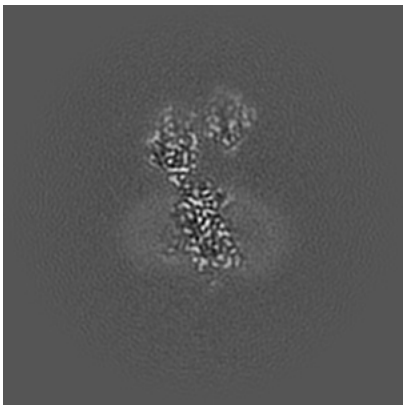


Z Index: 144

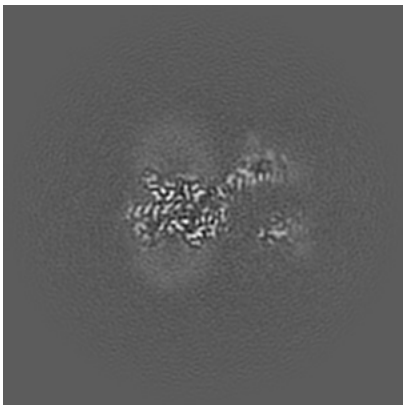
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

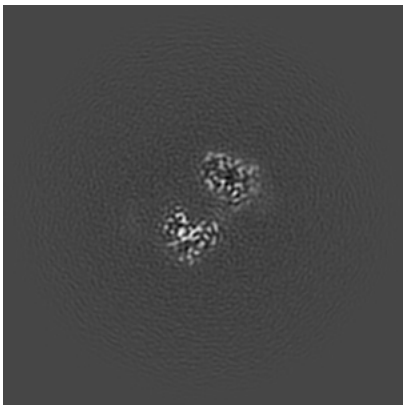
6.3.1 Primary map



X Index: 132

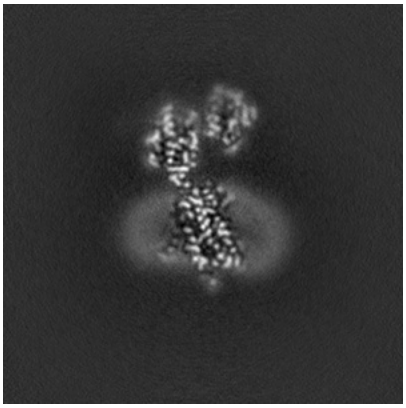


Y Index: 147

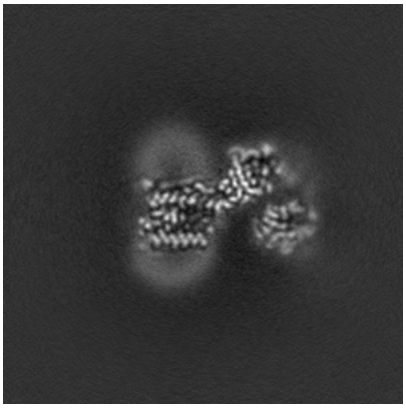


Z Index: 174

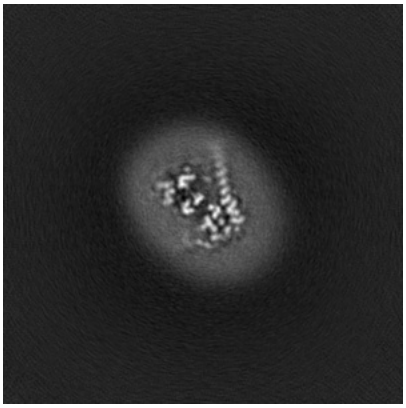
6.3.2 Raw map



X Index: 132



Y Index: 160

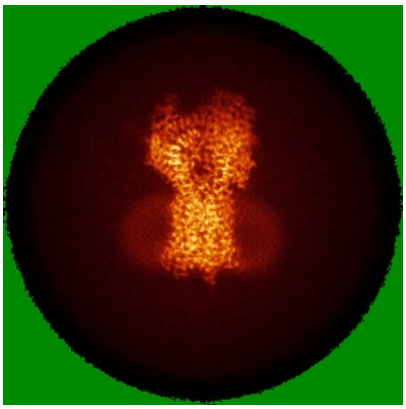


Z Index: 104

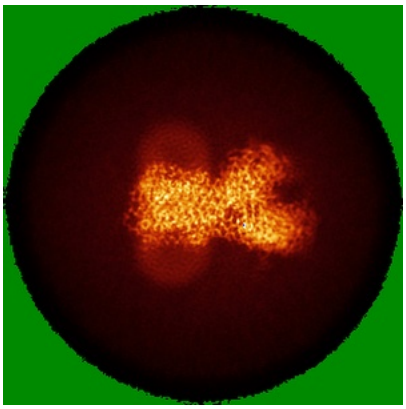
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

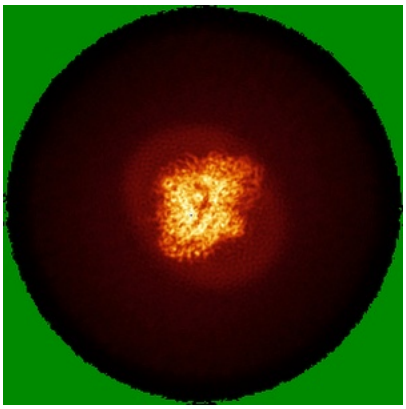
6.4.1 Primary map



X

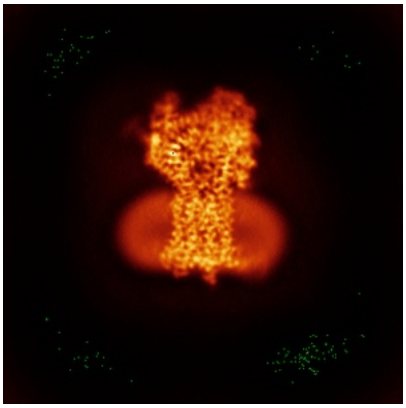


Y

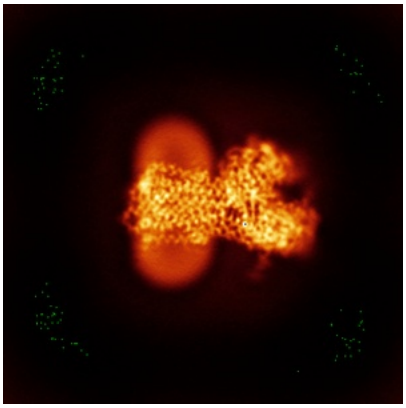


Z

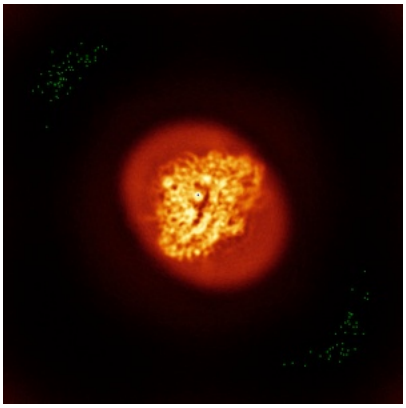
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

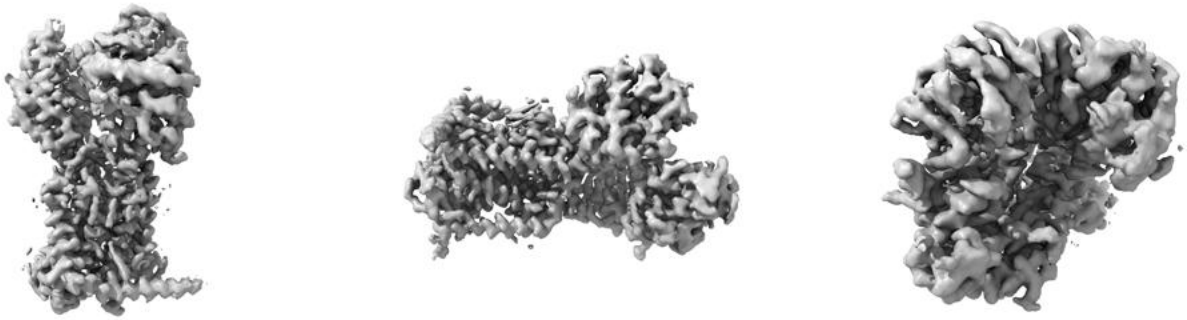
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 3.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

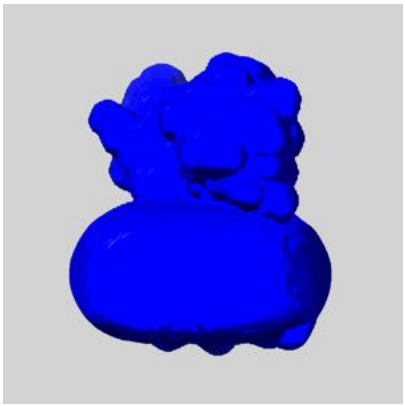
6.6 Mask visualisation

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

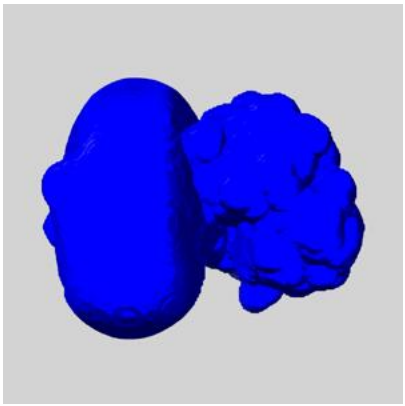
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

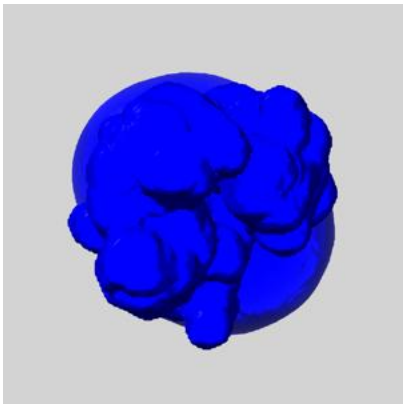
6.6.1 emd_24617_msk_1.map



X

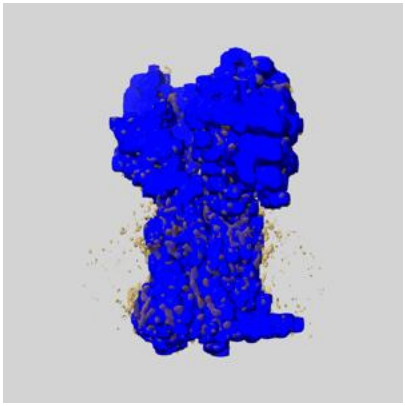


Y

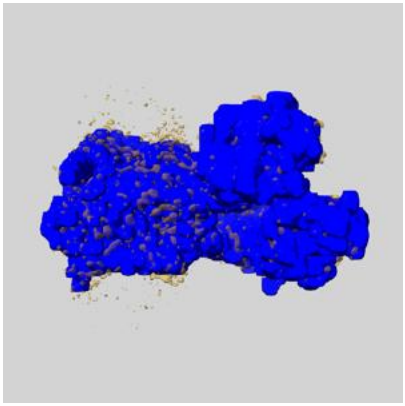


Z

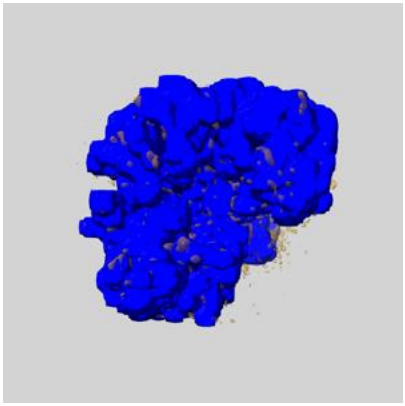
6.6.2 emd_24617_msk_2.map



X



Y

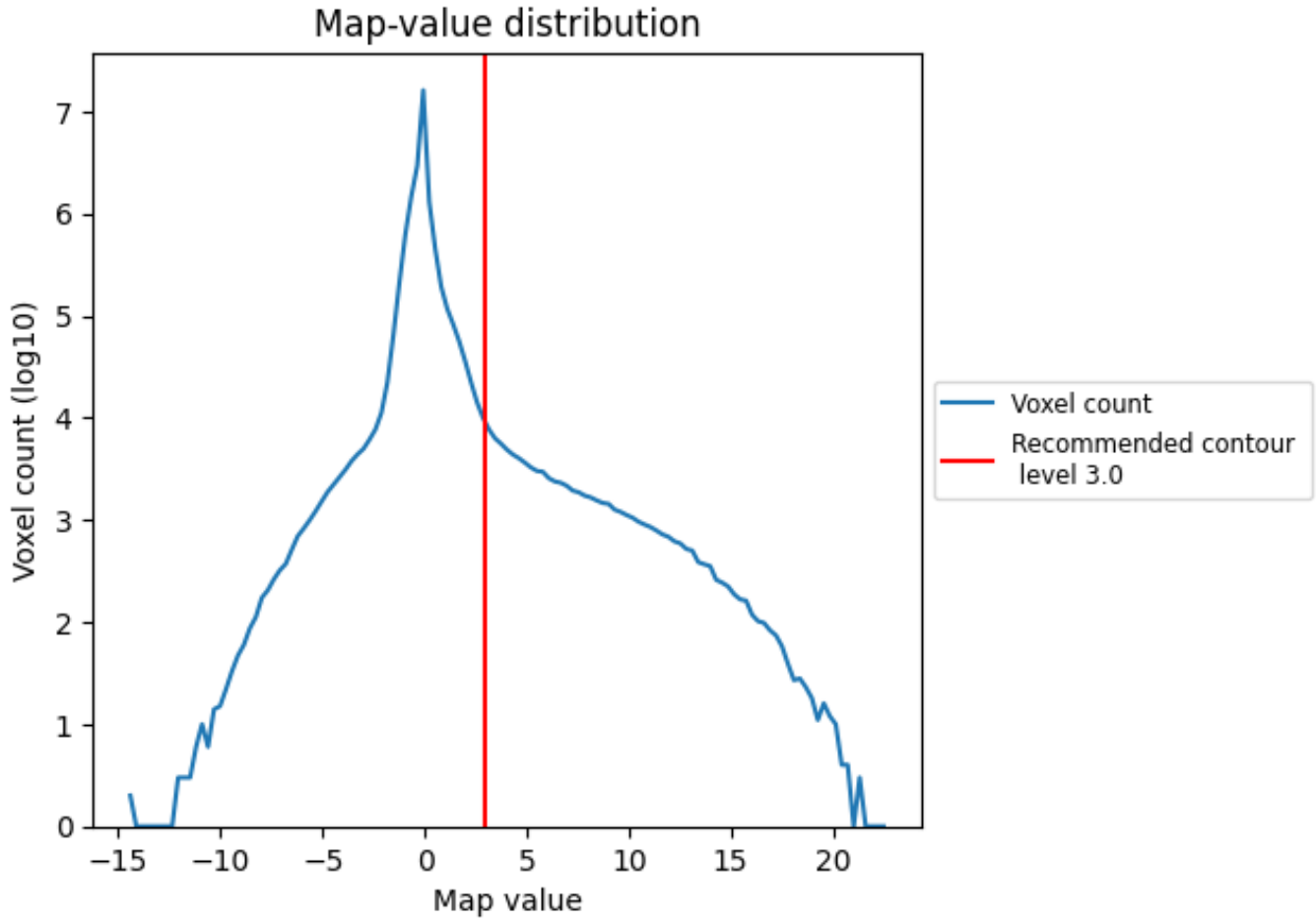


Z

7 Map analysis

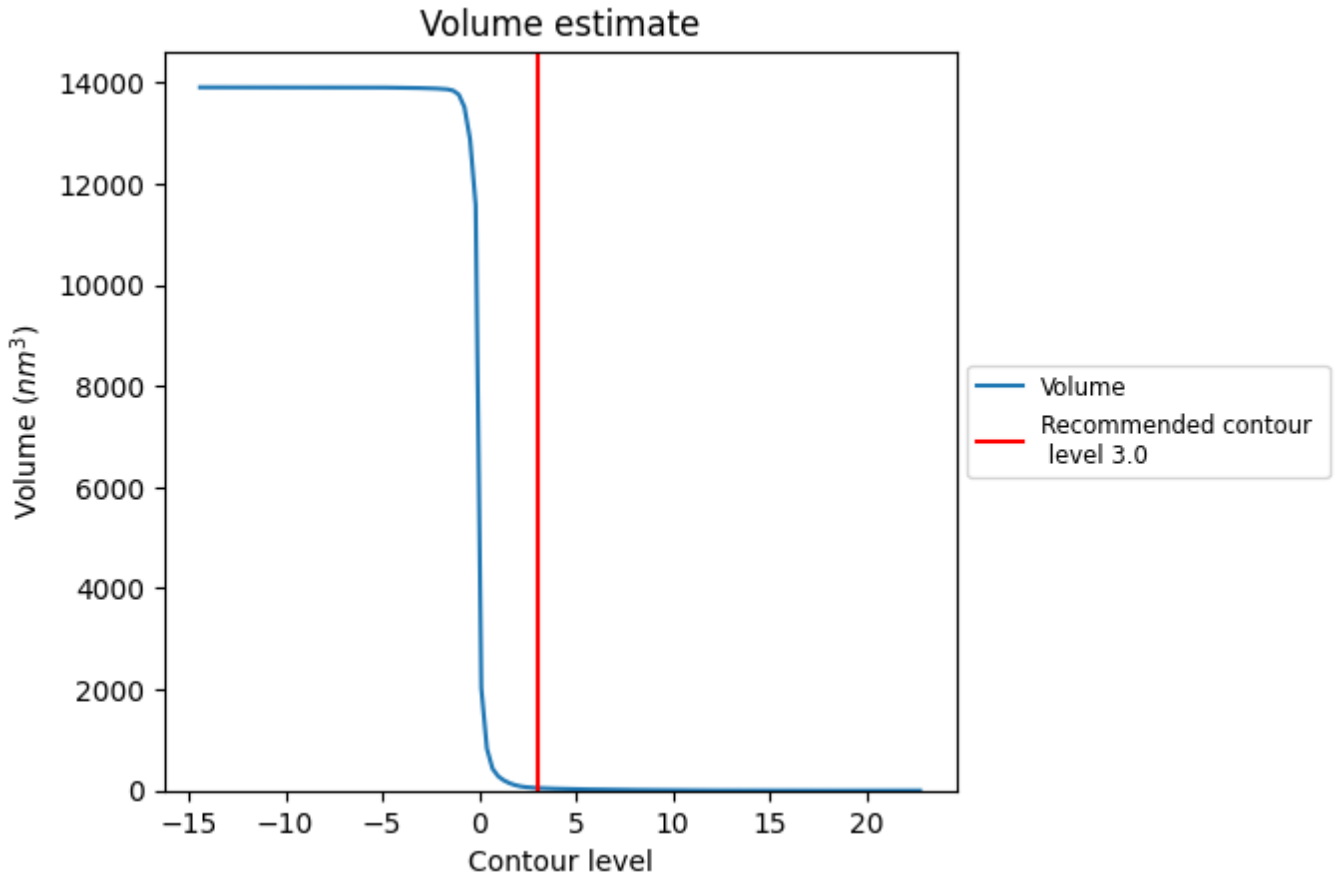
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

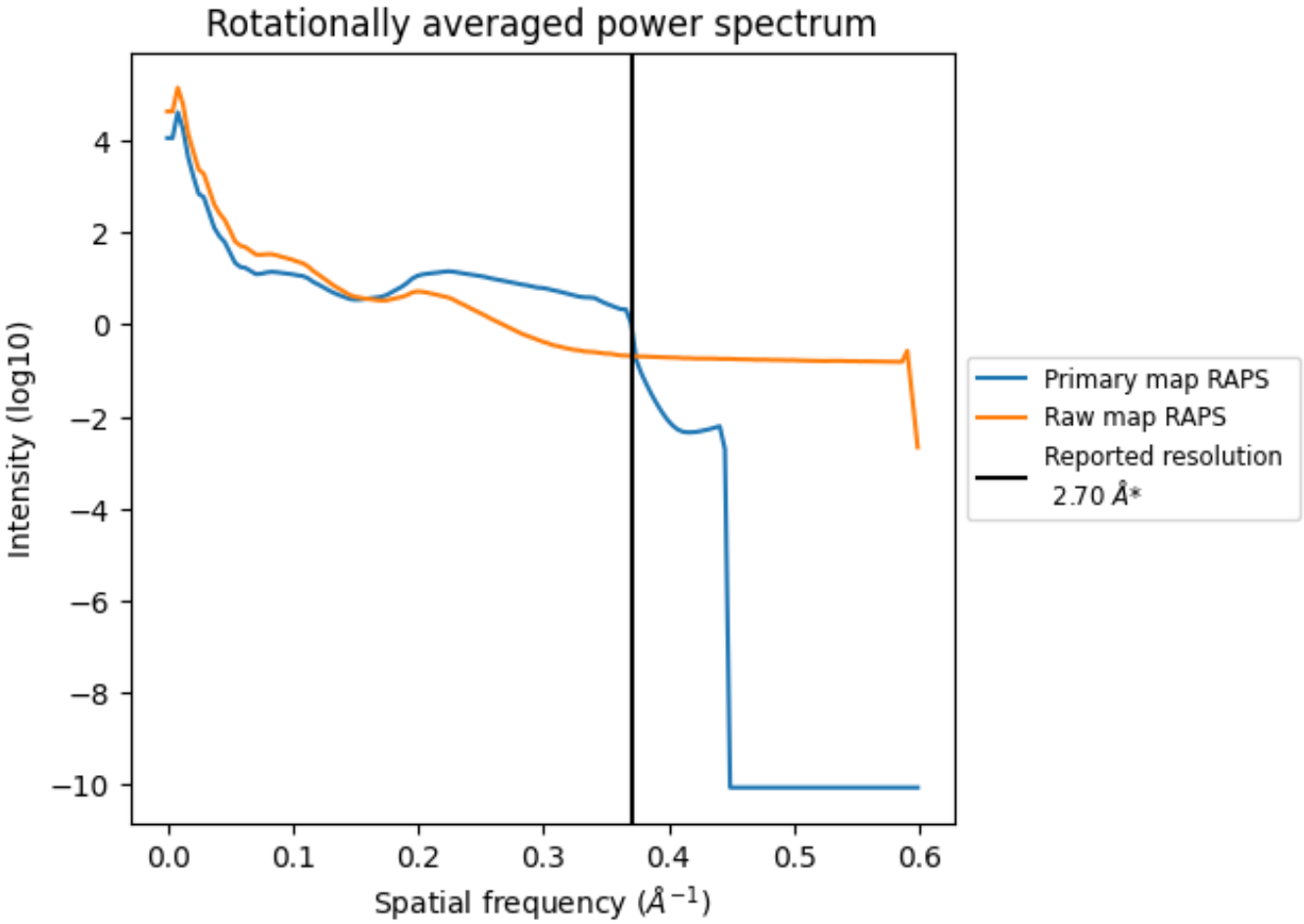
7.2 Volume estimate



The volume at the recommended contour level is 50 nm^3; this corresponds to an approximate mass of 46 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)

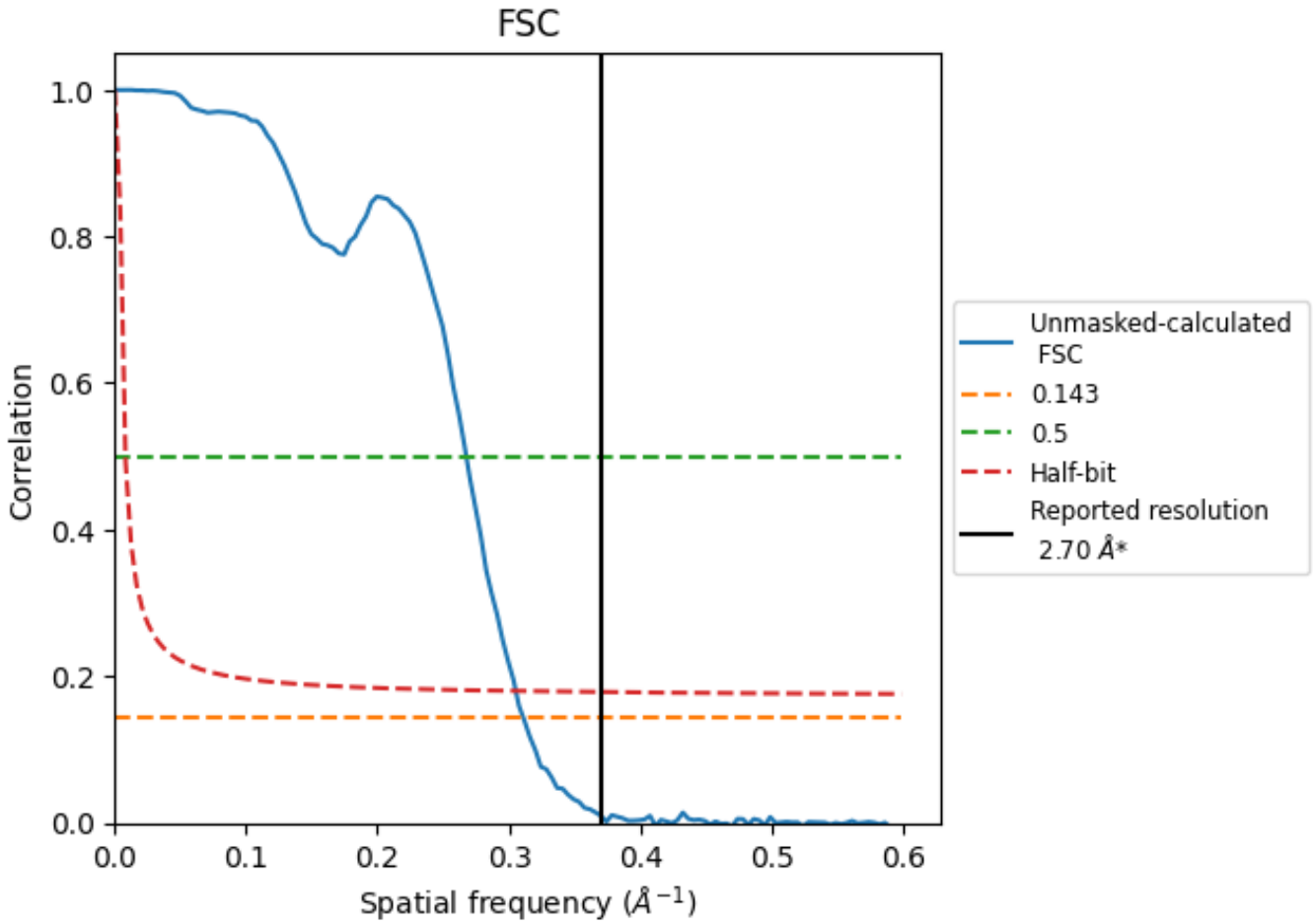


*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC



*Reported resolution corresponds to spatial frequency of 0.370 Å^{-1}

8.2 Resolution estimates (i)

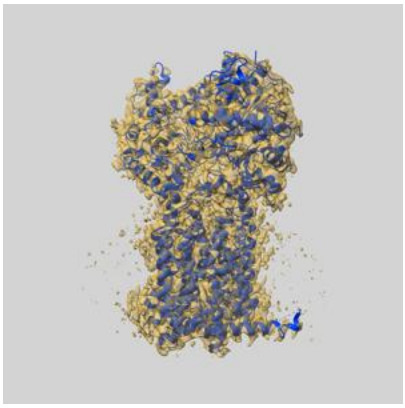
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.22	3.74	3.28

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.22 differs from the reported value 2.7 by more than 10 %

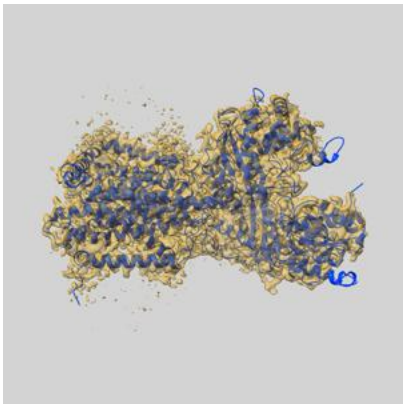
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-24617 and PDB model 7RPK. Per-residue inclusion information can be found in section 3 on page 9.

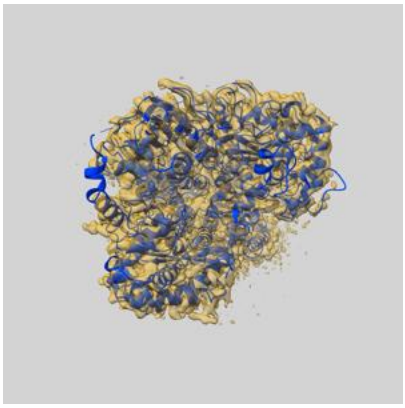
9.1 Map-model overlay



X



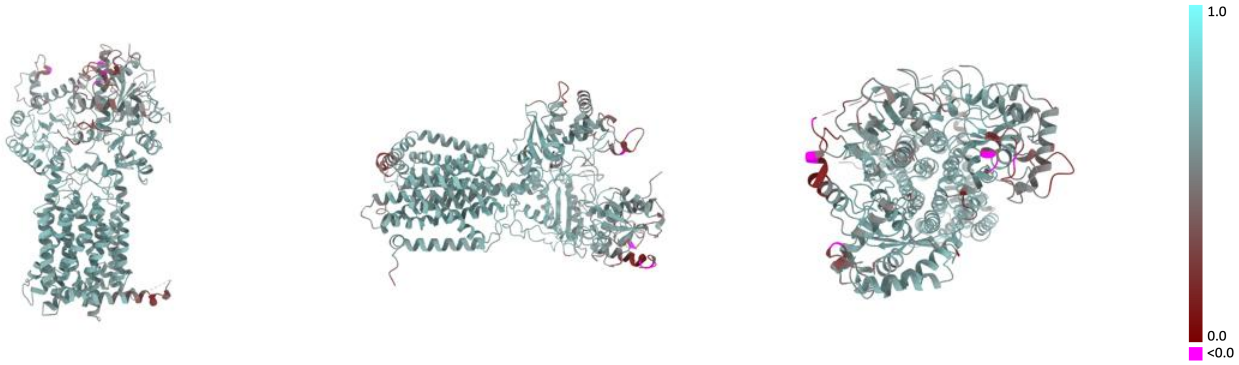
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 3.0 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

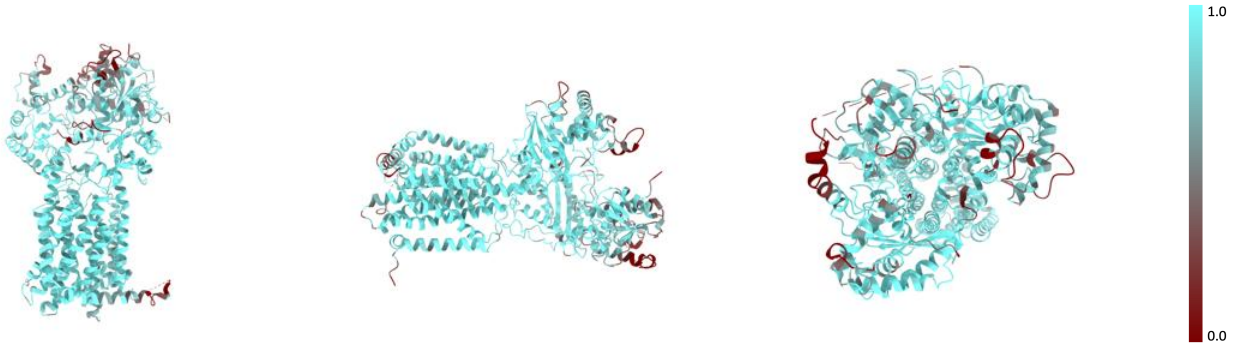
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

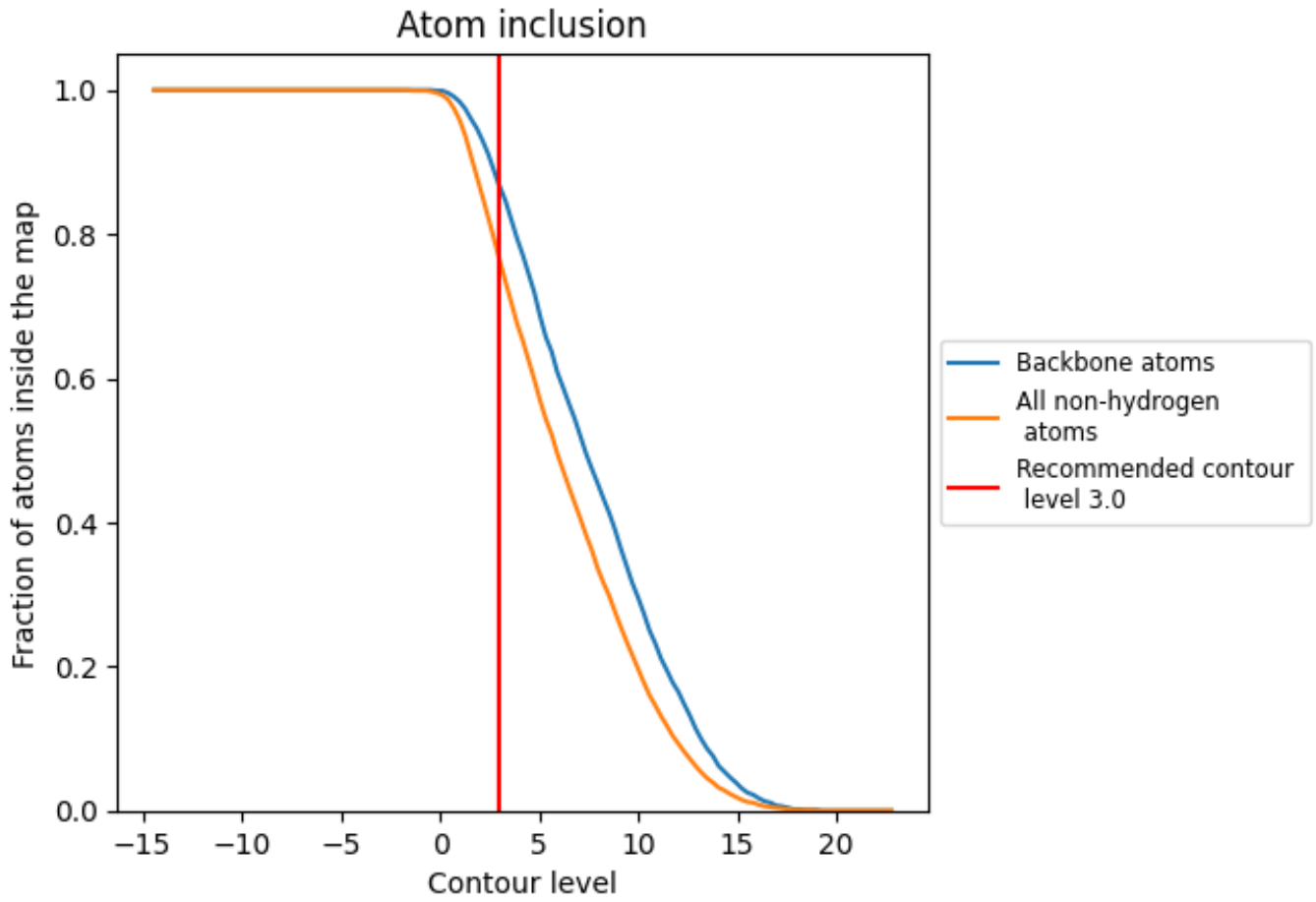
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (3.0).

9.4 Atom inclusion (i)



At the recommended contour level, 87% of all backbone atoms, 76% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (3.0) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7640	0.5470
A	0.7710	0.5480
H	0.7260	0.5360