



# wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 23, 2021 – 09:37 AM EDT

PDB ID : 5REQ  
Title : Methylmalonyl-CoA MUTASE, Y89F Mutant, substrate complex  
Authors : Evans, P.R.; Thomae, N.H.  
Deposited on : 1998-08-03  
Resolution : 2.20 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

---

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.23.2  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.23.2

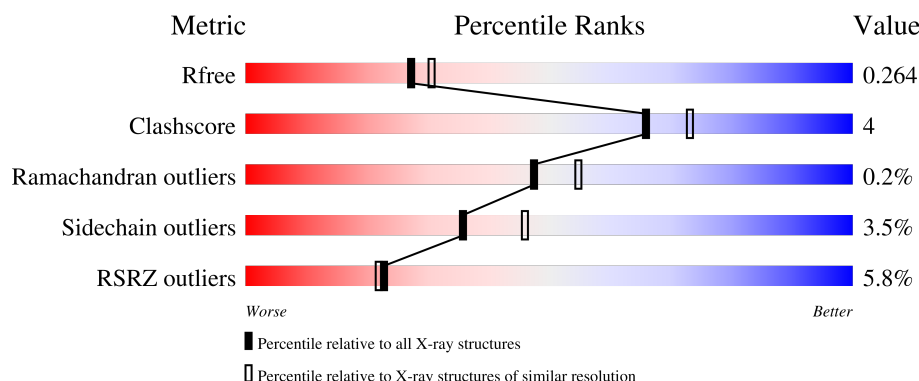
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.20 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	727	<div> <div>2%</div> <div>84%</div> <div>14%</div> <div>.</div> </div>
1	C	727	<div> <div>5%</div> <div>84%</div> <div>14%</div> <div>.</div> </div>
2	B	637	<div> <div>6%</div> <div>83%</div> <div>13%</div> <div>..</div> </div>
2	D	637	<div> <div>10%</div> <div>84%</div> <div>11%</div> <div>..</div> </div>

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
6	GOL	B	3002	-	-	-	X
6	GOL	D	3004	-	-	-	X

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 22112 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 PROTEIN (METHYLMALONYL-COA MUTASE ALPHA-SUBUNIT).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	725	Total	C	N	O	S	0	0	0
			5574	3526	966	1058	24			
1	C	725	Total	C	N	O	S	0	0	0
			5574	3526	966	1058	24			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	89	PHE	TYR	engineered mutation	UNP P11653
C	89	PHE	TYR	engineered mutation	UNP P11653

- Molecule 2 is a protein called PROTEIN (METHYLMALONYL-COA MUTASE BETA-SUBUNIT).

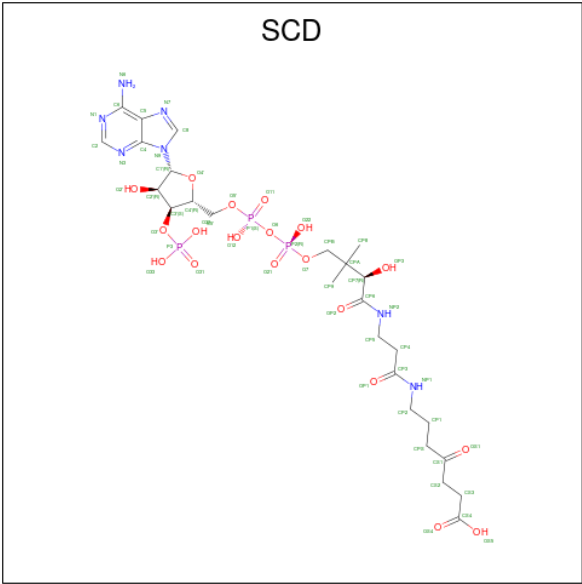
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	619	Total	C	N	O	S	0	0	0
			4722	2976	821	912	13			
2	D	619	Total	C	N	O	S	0	0	0
			4722	2976	821	912	13			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	203	GLY	ALA	SEE REMARK 999	UNP P11652
D	203	GLY	ALA	SEE REMARK 999	UNP P11652
B	330	GLU	ASP	SEE REMARK 999	UNP P11652
D	330	GLU	ASP	SEE REMARK 999	UNP P11652
B	331	LEU	VAL	SEE REMARK 999	UNP P11652
D	331	LEU	VAL	SEE REMARK 999	UNP P11652

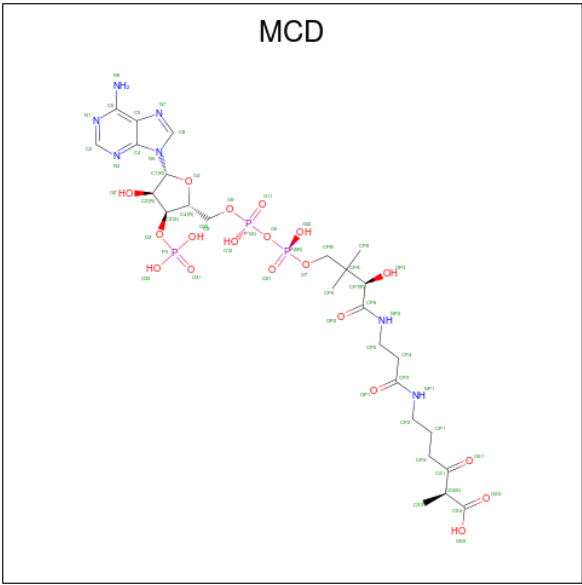
- Molecule 3 is SUCCINYL(CARBADETHIA)-COENZYME A (three-letter code: SCD)

(formula: C<sub>26</sub>H<sub>42</sub>N<sub>7</sub>O<sub>19</sub>P<sub>3</sub>).



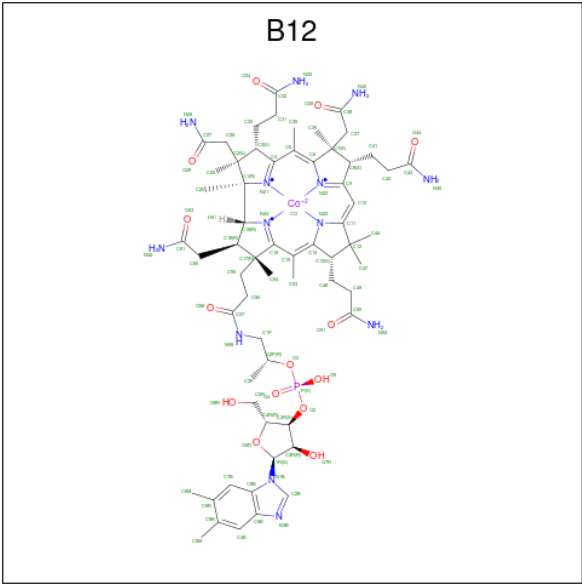
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	1
			55	26	7	19	3		
3	C	1	Total	C	N	O	P	0	1
			55	26	7	19	3		

- Molecule 4 is METHYLMALONYL(CARBADETHIA)-COENZYME A (three-letter code: MCD) (formula: C<sub>26</sub>H<sub>42</sub>N<sub>7</sub>O<sub>19</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	1
			55	26	7	19	3		
4	C	1	Total	C	N	O	P	0	1
			55	26	7	19	3		

- Molecule 5 is COBALAMIN (three-letter code: B12) (formula: C<sub>62</sub>H<sub>89</sub>CoN<sub>13</sub>O<sub>14</sub>P).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
5	A	1	Total	C	Co	N	O	P	0	0
			91	62	1	13	14	1		
5	C	1	Total	C	Co	N	O	P	0	0
			91	62	1	13	14	1		

- Molecule 6 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



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

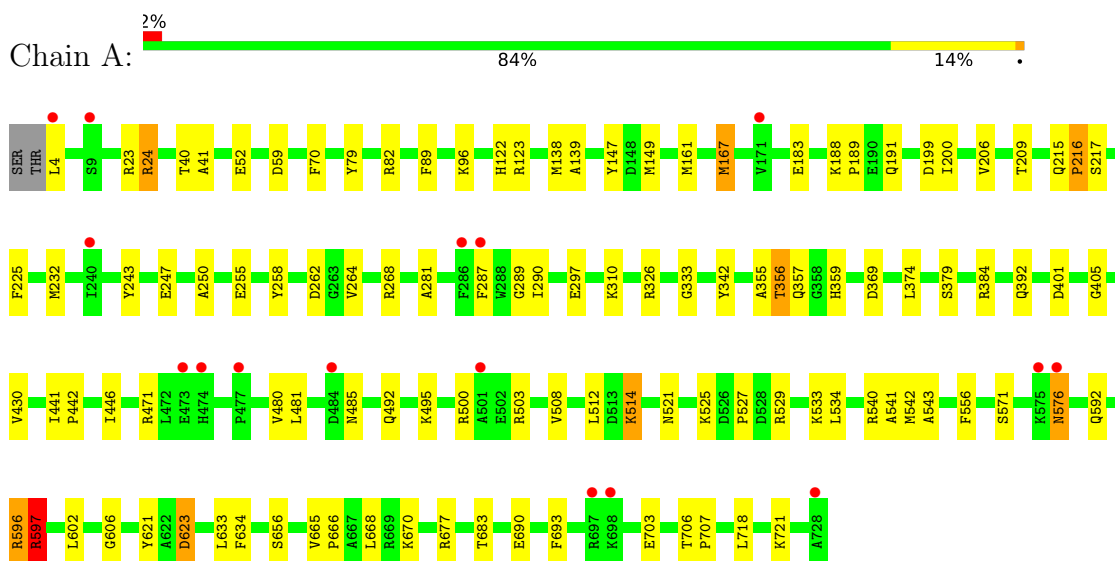
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	356	Total	O	0	0
			356	356		
7	B	192	Total	O	0	0
			192	192		
7	C	353	Total	O	0	0
			353	353		
7	D	193	Total	O	0	0
			193	193		

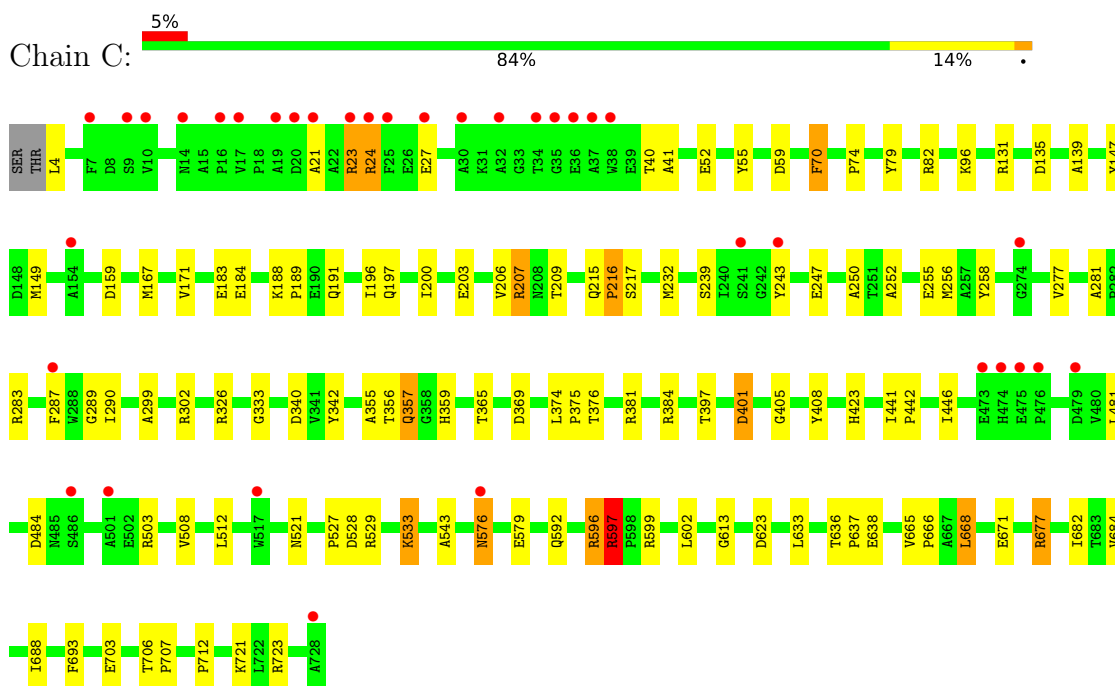
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: PROTEIN (METHYLMALONYL-COA MUTASE ALPHA-SUBUNIT)




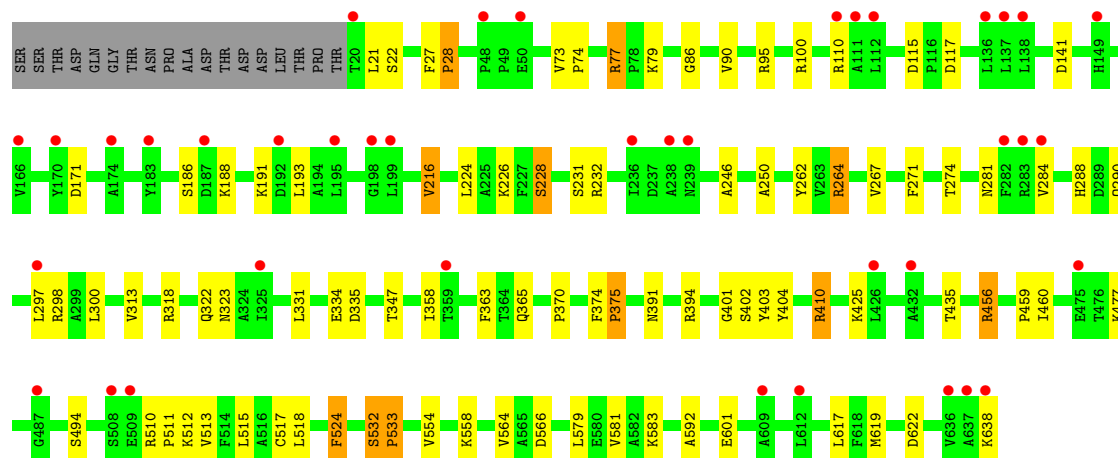
- Molecule 1: PROTEIN (METHYLMALONYL-COA MUTASE ALPHA-SUBUNIT)






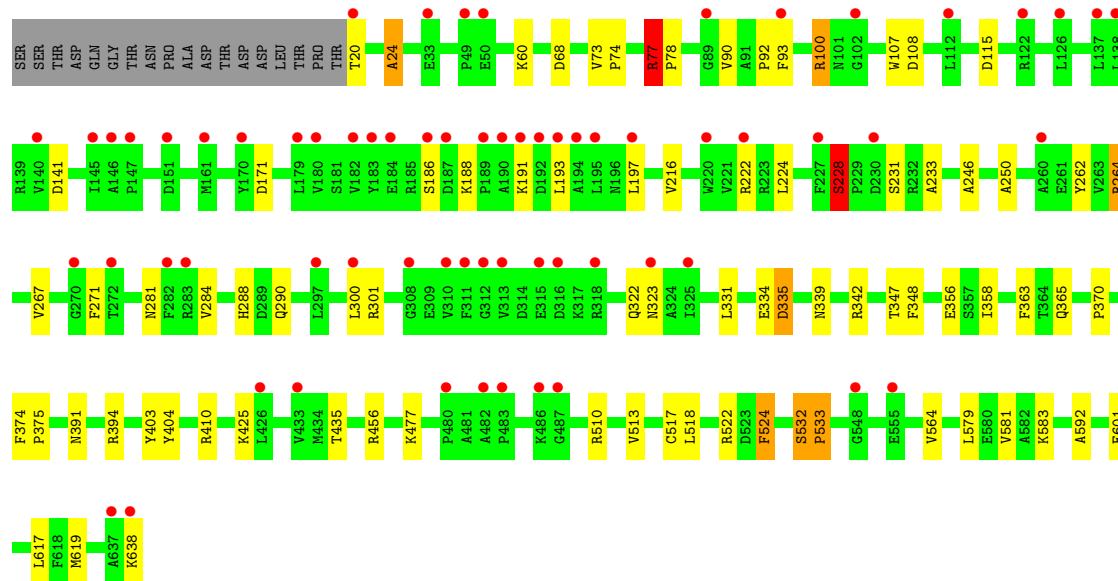
● Molecule 2: PROTEIN (METHYLMALONYL-COA MUTASE BETA-SUBUNIT)

Chain B:  6% 83% 13% ..



● Molecule 2: PROTEIN (METHYLMALONYL-COA MUTASE BETA-SUBUNIT)

Chain D:  10% 84% 11% ..



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	120.20Å 161.89Å 88.70Å 90.00° 104.88° 90.00°	Depositor
Resolution (Å)	20.00 – 2.20 32.62 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.9 (20.00-2.20) 99.9 (32.62-2.20)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.88 (at 2.20Å)	Xtriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.246 , 0.292 0.230 , 0.264	Depositor DCC
$R_{free}$ test set	8387 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	34.4	Xtriage
Anisotropy	0.333	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 49.1	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	22112	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.66% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SCD, B12, GOL, MCD

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	0.49	0/5691	1.54	49/7728 (0.6%)
1	C	0.50	0/5691	1.55	61/7728 (0.8%)
2	B	0.45	0/4812	1.42	37/6533 (0.6%)
2	D	0.44	0/4812	1.41	27/6533 (0.4%)
All	All	0.47	0/21006	1.49	174/28522 (0.6%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	9
1	C	0	12
2	B	0	2
2	D	0	4
All	All	0	27

There are no bond length outliers.

The worst 5 of 174 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	23	ARG	CD-NE-CZ	18.94	150.12	123.60
1	C	597	ARG	NE-CZ-NH1	13.00	126.80	120.30
1	C	384	ARG	CD-NE-CZ	12.95	141.72	123.60
2	B	77	ARG	CD-NE-CZ	12.60	141.24	123.60
2	D	77	ARG	CD-NE-CZ	11.89	140.24	123.60

There are no chirality outliers.

5 of 27 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	167	MET	Mainchain
1	A	183	GLU	Mainchain
1	A	281	ALA	Mainchain
1	A	40	THR	Mainchain
1	A	70	PHE	Mainchain

## 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	5574	0	5486	37	2
1	C	5574	0	5486	40	0
2	B	4722	0	4642	31	0
2	D	4722	0	4642	33	2
3	A	55	0	37	2	0
3	C	55	0	37	1	0
4	A	55	0	37	3	0
4	C	55	0	37	2	0
5	A	91	0	88	17	0
5	C	91	0	88	16	0
6	B	12	0	16	1	0
6	D	12	0	16	3	0
7	A	356	0	0	0	0
7	B	192	0	0	1	0
7	C	353	0	0	4	0
7	D	193	0	0	0	0
All	All	22112	0	20612	166	2

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 4.

The worst 5 of 166 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)
5:A:1800:B12:H531	5:A:1800:B12:H552	1.46	0.96
5:A:1800:B12:H421	5:A:1800:B12:H363	1.46	0.95
1:C:21:ALA:HB3	7:C:4310:HOH:O	1.72	0.89

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:357:GLN:HE22	2:B:290:GLN:HE22	1.24	0.85
5:C:2800:B12:H552	5:C:2800:B12:H531	1.64	0.80

All (2) 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:A:670:LYS:NZ	2:D:20:THR:OG1[2_646]	1.69	0.51
1:A:670:LYS:CD	2:D:20:THR:O[2_646]	2.02	0.18

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	723/727 (99%)	695 (96%)	27 (4%)	1 (0%)	51	60
1	C	723/727 (99%)	693 (96%)	29 (4%)	1 (0%)	51	60
2	B	617/637 (97%)	594 (96%)	21 (3%)	2 (0%)	41	46
2	D	617/637 (97%)	596 (97%)	19 (3%)	2 (0%)	41	46
All	All	2680/2728 (98%)	2578 (96%)	96 (4%)	6 (0%)	47	55

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	576	ASN
2	D	171	ASP
1	A	576	ASN
2	B	171	ASP
2	D	228	SER

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	573/590 (97%)	555 (97%)	18 (3%)	40	51
1	C	573/590 (97%)	562 (98%)	11 (2%)	57	71
2	B	481/509 (94%)	458 (95%)	23 (5%)	25	32
2	D	481/509 (94%)	460 (96%)	21 (4%)	28	35
All	All	2108/2198 (96%)	2035 (96%)	73 (4%)	36	46

5 of 73 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	D	191	LYS
2	D	619	MET
2	D	216	VAL
2	D	410	ARG
2	B	191	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 25 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	246	GLN
1	C	454	GLN
2	D	391	ASN
1	C	385	ASN
1	C	492	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

10 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z  > 2$	Counts	RMSZ	# $ Z  > 2$
3	SCD	C	2801[A]	-	46,57,57	1.10	4 (8%)	59,84,84	1.48	8 (13%)
6	GOL	D	3003	-	5,5,5	0.21	0	5,5,5	0.41	0
4	MCD	A	1802[B]	-	46,57,57	1.17	3 (6%)	56,85,85	1.52	10 (17%)
6	GOL	D	3004	-	5,5,5	0.29	0	5,5,5	0.62	0
6	GOL	B	3001	-	5,5,5	0.22	0	5,5,5	0.33	0
4	MCD	C	2802[B]	-	46,57,57	1.14	3 (6%)	56,85,85	1.48	9 (16%)
5	B12	A	1800	1	80,101,101	1.30	4 (5%)	101,166,166	1.74	24 (23%)
5	B12	C	2800	1	80,101,101	1.36	4 (5%)	101,166,166	1.67	21 (20%)
3	SCD	A	1801[A]	-	46,57,57	1.14	3 (6%)	59,84,84	1.53	11 (18%)
6	GOL	B	3002	-	5,5,5	0.29	0	5,5,5	0.90	0

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
3	SCD	C	2801[A]	-	-	4/50/72/72	0/3/3/3
6	GOL	D	3003	-	-	4/4/4/4	-
4	MCD	A	1802[B]	-	-	4/51/75/75	0/3/3/3
6	GOL	D	3004	-	-	2/4/4/4	-
6	GOL	B	3001	-	-	4/4/4/4	-
4	MCD	C	2802[B]	-	-	2/51/75/75	0/3/3/3
5	B12	A	1800	1	-	7/51/223/223	0/3/11/11

Continued on next page...

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	B12	C	2800	1	-	6/51/223/223	0/3/11/11
3	SCD	A	1801[A]	-	-	3/50/72/72	0/3/3/3
6	GOL	B	3002	-	-	2/4/4/4	-

The worst 5 of 21 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	2800	B12	CO-N21	-8.71	1.67	1.89
5	A	1800	B12	CO-N21	-8.09	1.69	1.89
4	A	1802[B]	MCD	CP2-NP1	3.61	1.54	1.46
3	A	1801[A]	SCD	CP2-NP1	3.57	1.54	1.46
4	A	1802[B]	MCD	CP5-NP2	3.45	1.54	1.46

The worst 5 of 83 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	1800	B12	C16-C15-C14	-6.67	113.86	124.27
5	C	2800	B12	C16-C15-C14	-5.84	115.16	124.27
5	A	1800	B12	C7B-C8B-C9B	5.65	126.13	120.54
5	C	2800	B12	C7B-C8B-C9B	4.99	125.48	120.54
3	C	2801[A]	SCD	CP8-CPA-CPB	4.73	115.95	108.23

There are no chirality outliers.

5 of 38 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	2801[A]	SCD	P1-O6-P2-O7
4	A	1802[B]	MCD	P1-O6-P2-O7
4	C	2802[B]	MCD	P1-O6-P2-O7
6	B	3001	GOL	O1-C1-C2-C3
6	B	3001	GOL	C1-C2-C3-O3

There are no ring outliers.

8 monomers are involved in 45 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	2801[A]	SCD	1	0
4	A	1802[B]	MCD	3	0
6	D	3004	GOL	3	0
4	C	2802[B]	MCD	2	0

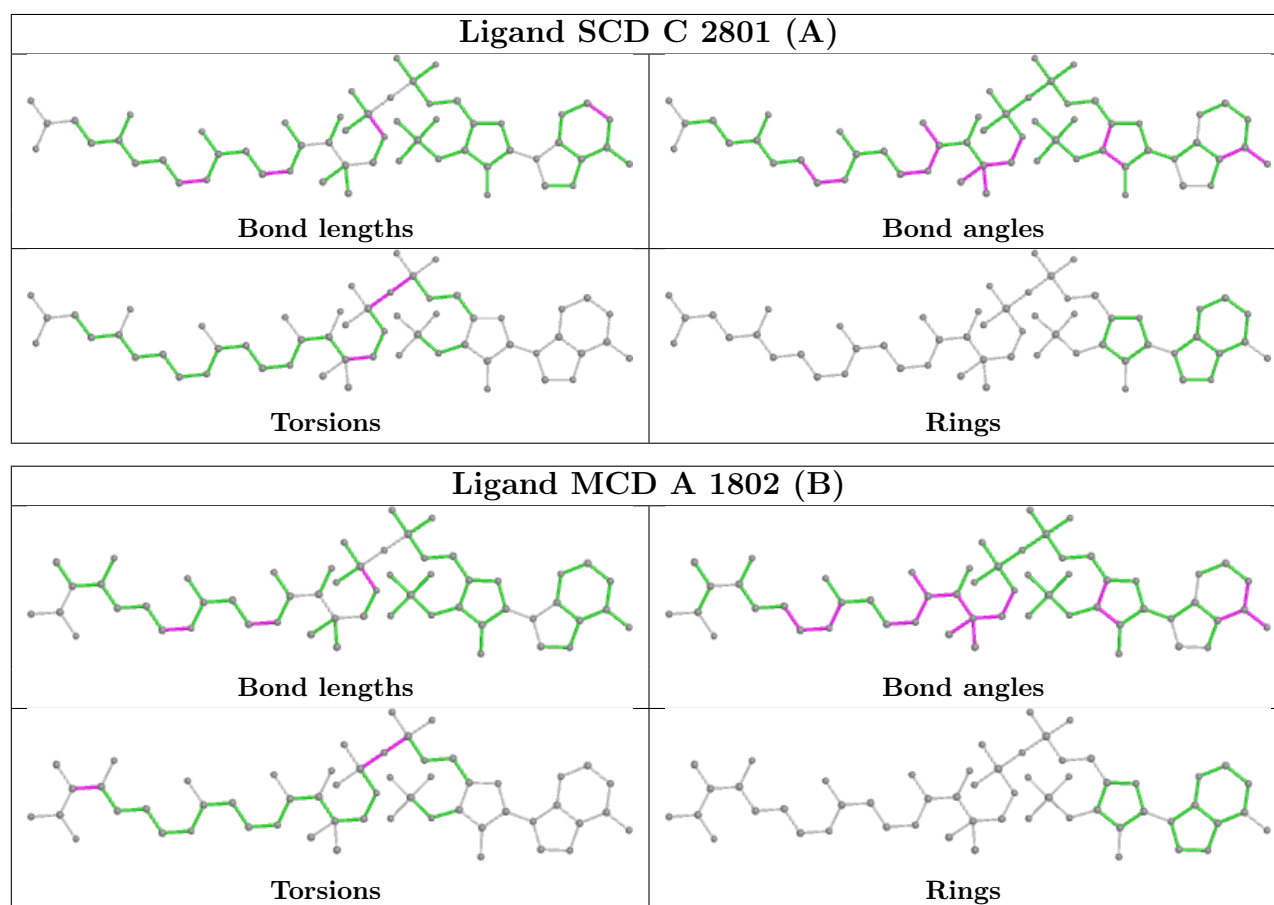
*Continued on next page...*

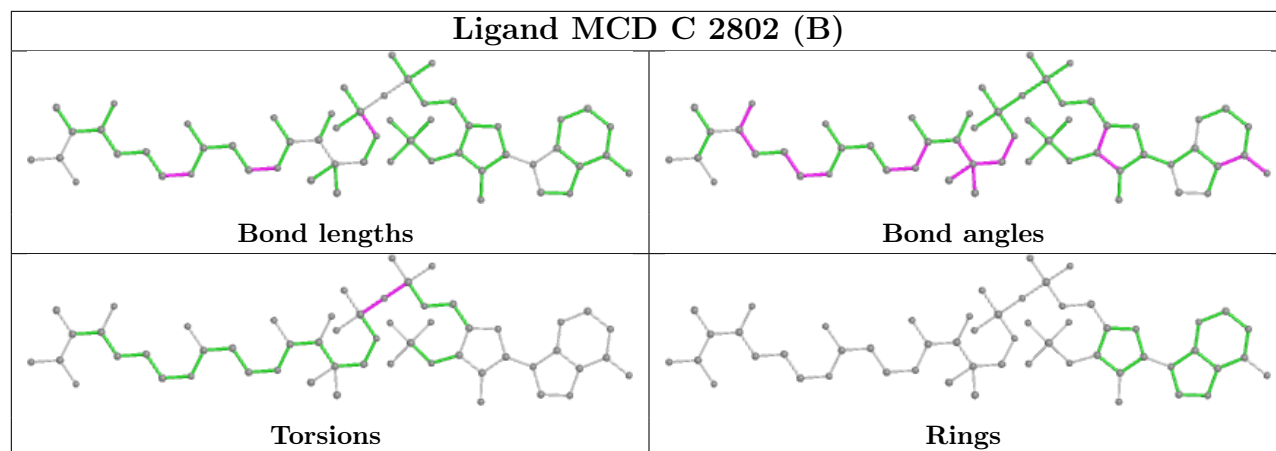
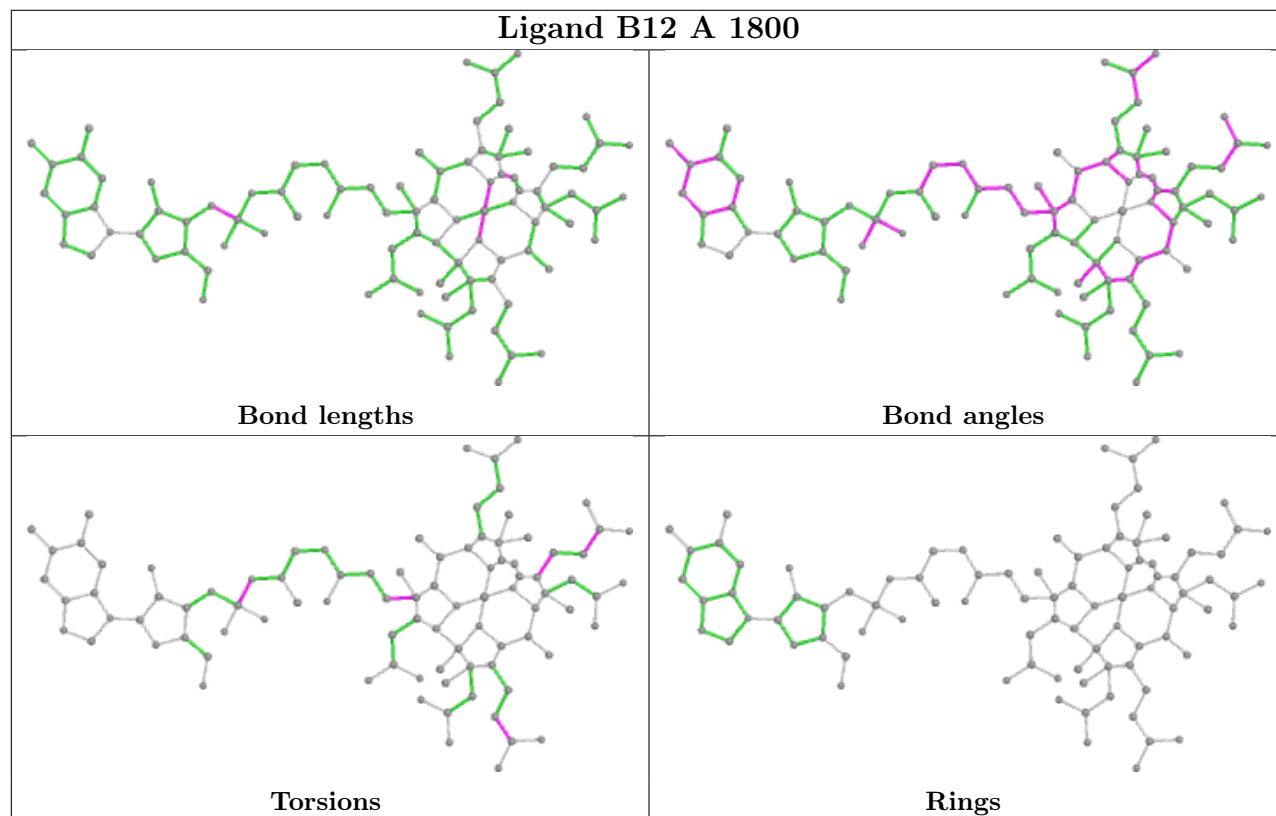


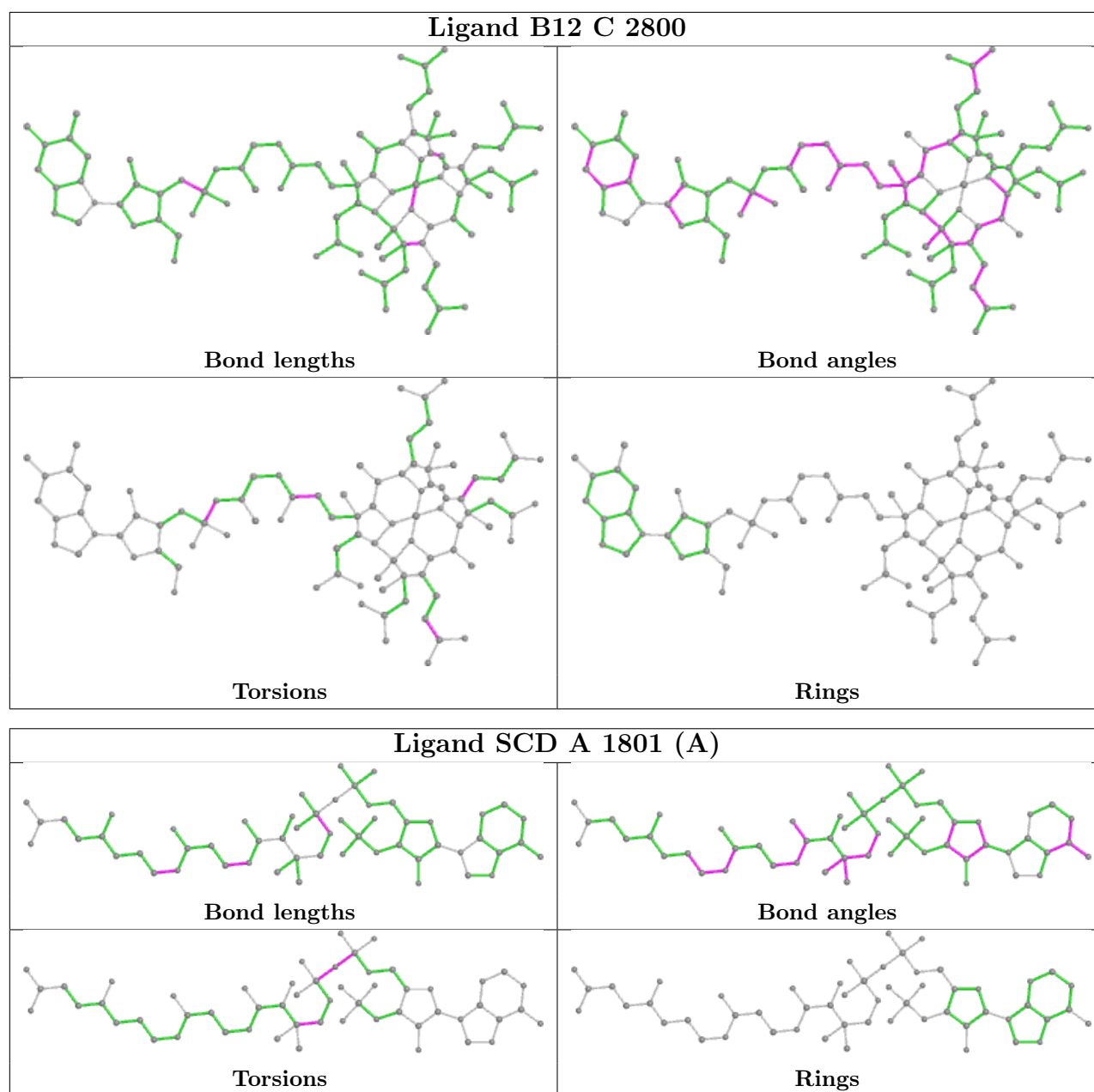
*Continued from previous page...*

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	1800	B12	17	0
5	C	2800	B12	16	0
3	A	1801[A]	SCD	2	0
6	B	3002	GOL	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



**Ligand MCD C 2802 (B)****Ligand B12 A 1800**



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	725/727 (99%)	0.07	16 (2%) 62 59	17, 36, 60, 80	0
1	C	725/727 (99%)	0.27	35 (4%) 30 29	17, 36, 60, 81	0
2	B	619/637 (97%)	0.37	39 (6%) 20 19	24, 49, 73, 89	0
2	D	619/637 (97%)	0.60	66 (10%) 6 5	26, 50, 73, 89	0
All	All	2688/2728 (98%)	0.32	156 (5%) 23 22	17, 42, 70, 89	0

The worst 5 of 156 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	501	ALA	6.5
2	D	183	TYR	6.4
2	D	192	ASP	6.2
1	C	23	ARG	6.1
2	D	20	THR	5.1

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

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

### 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

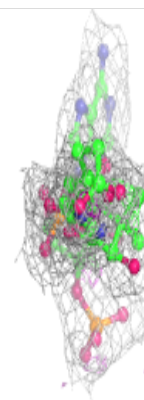
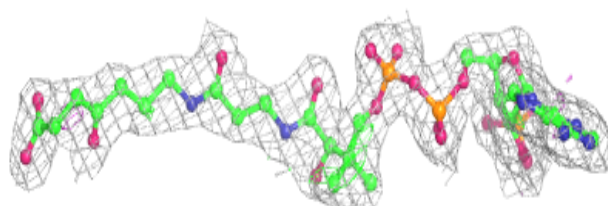
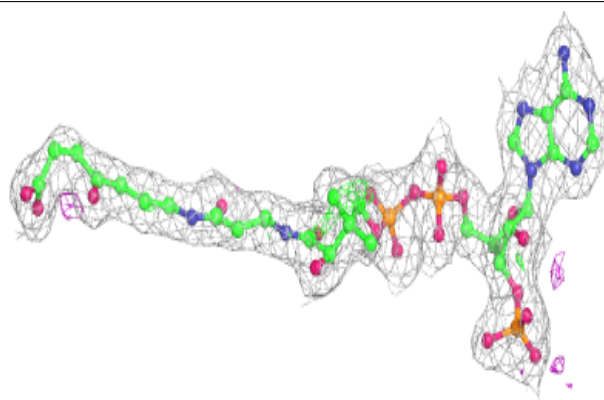
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
6	GOL	D	3003	6/6	0.43	0.24	94,95,95,95	0
6	GOL	D	3004	6/6	0.51	0.52	84,84,85,86	0
6	GOL	B	3001	6/6	0.75	0.15	95,95,95,95	0
6	GOL	B	3002	6/6	0.78	0.42	82,83,84,84	0
3	SCD	C	2801[A]	55/55	0.95	0.14	15,21,27,28	55
4	MCD	C	2802[B]	55/55	0.95	0.14	19,24,35,37	55
3	SCD	A	1801[A]	55/55	0.96	0.13	15,22,26,27	55
5	B12	A	1800	91/91	0.96	0.17	16,27,34,37	0
4	MCD	A	1802[B]	55/55	0.96	0.13	21,24,36,39	55
5	B12	C	2800	91/91	0.97	0.18	18,26,32,36	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.

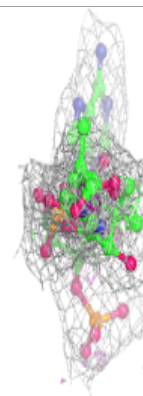
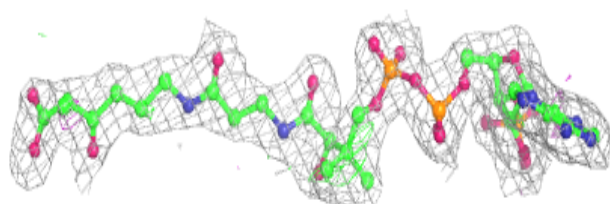
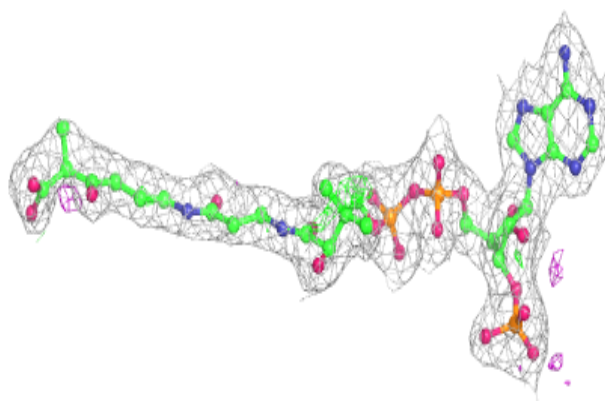
**Electron density around SCD C 2801 (A):**

2mF<sub>o</sub>-DF<sub>c</sub> (at 0.7 rmsd) in gray  
mF<sub>o</sub>-DF<sub>c</sub> (at 3 rmsd) in purple (negative)  
and green (positive)

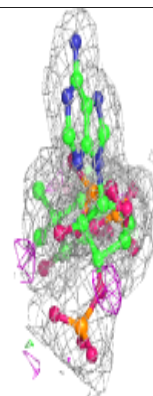
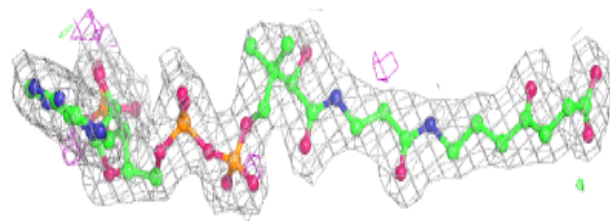
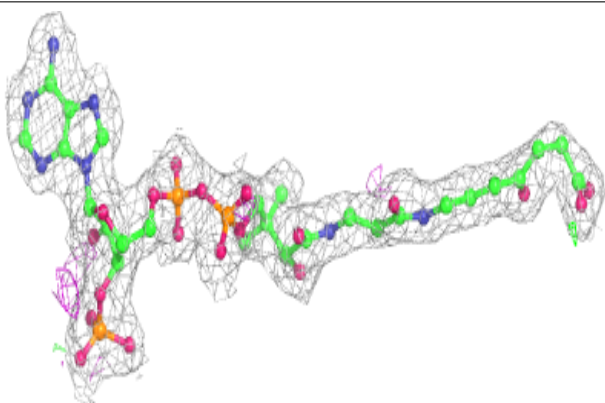


**Electron density around MCD C 2802 (B):**

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

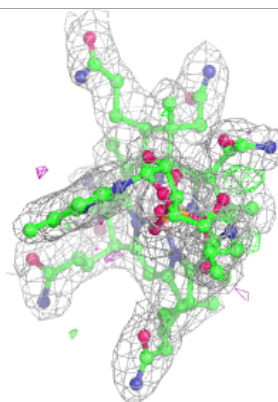
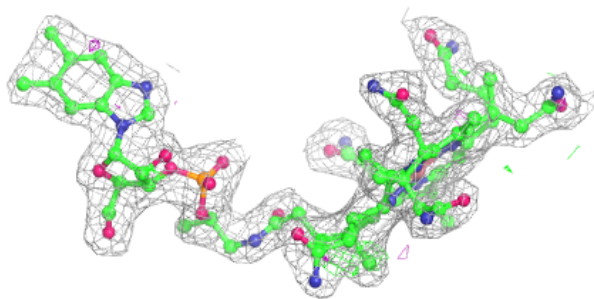
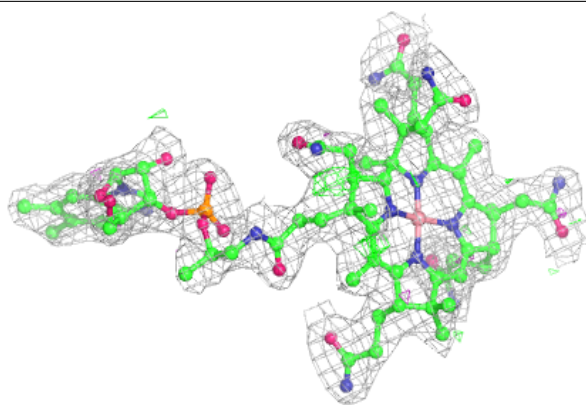
**Electron density around SCD A 1801 (A):**

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

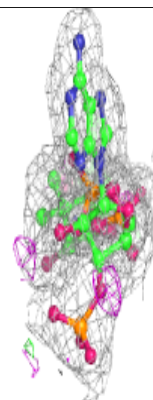
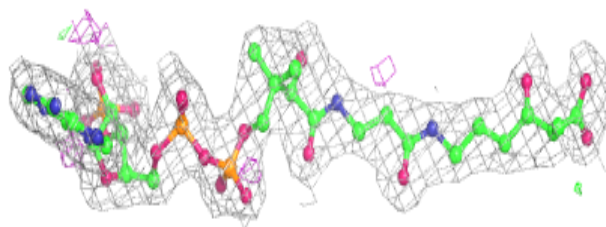
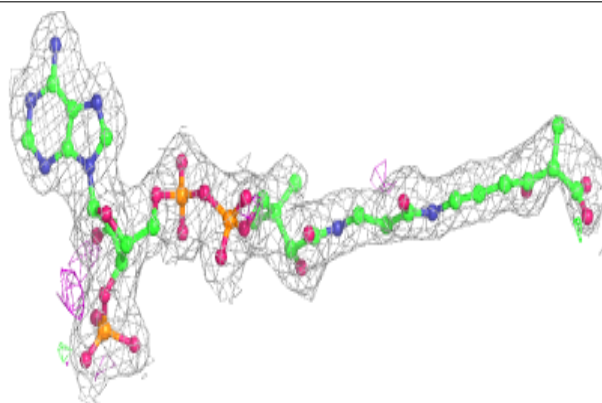


**Electron density around B12 A 1800:**

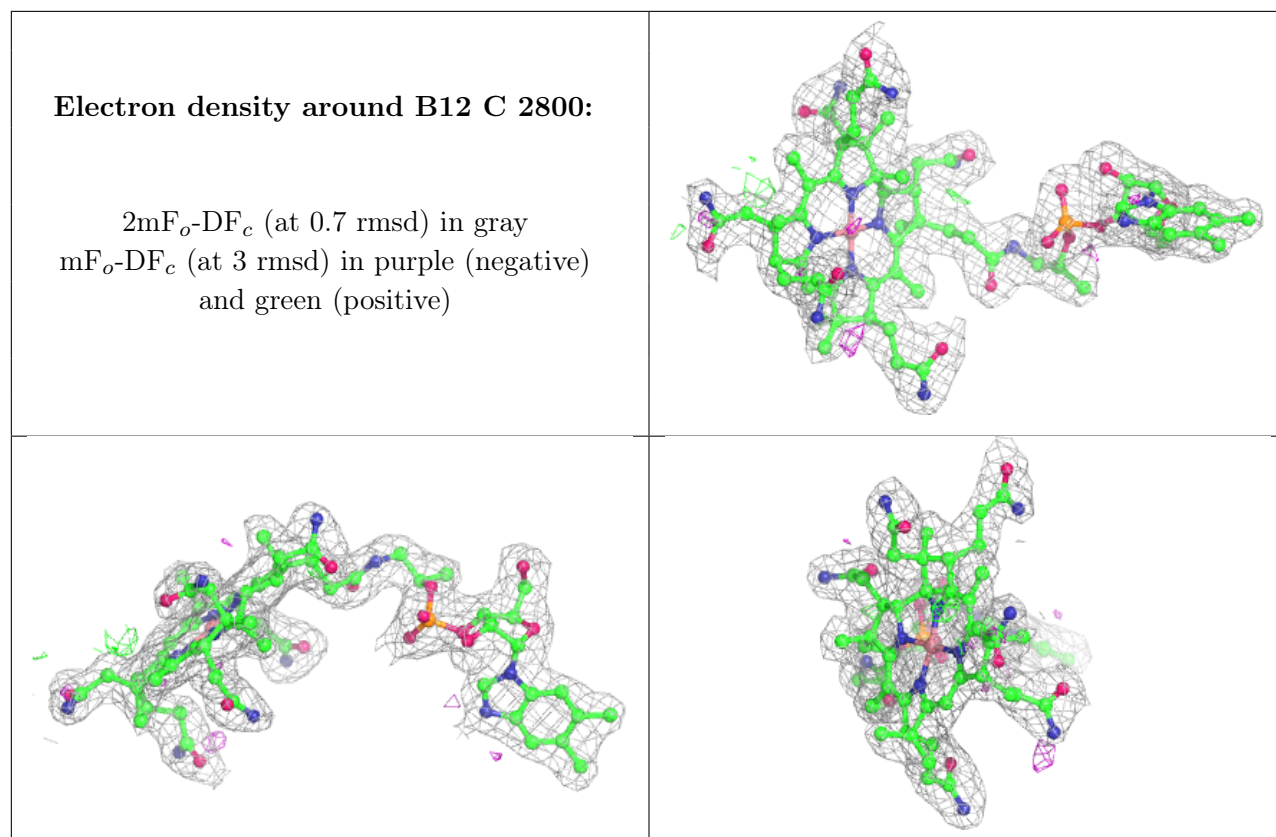
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around MCD A 1802 (B):**

$2mF_o-DF_c$  (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.