



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 22, 2024 – 01:21 PM EDT

PDB ID : 6EHJ  
Title : Human N-myristoyltransferase (NMT1) with Myristoyl-CoA and peptide bound  
Authors : Perez-Dorado, I.; Ritzefeld, M.; Tate, E.W.  
Deposited on : 2017-09-13  
Resolution : 2.10 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 1.20.1  
EDS : 2.37.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

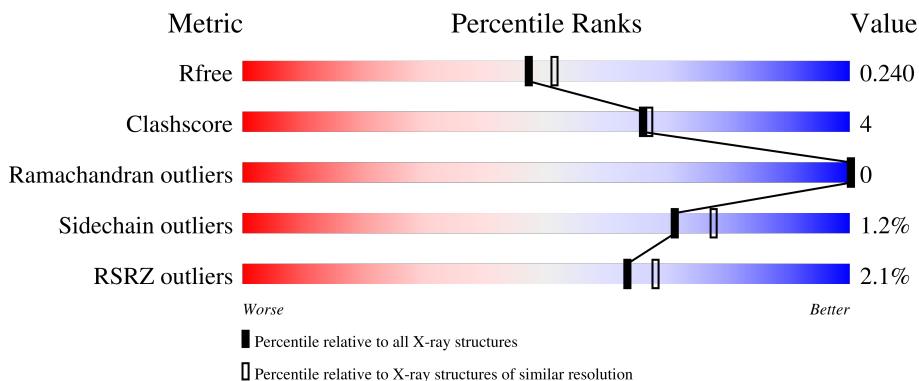
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	391	
1	B	391	

## 2 Entry composition i

There are 11 unique types of molecules in this entry. The entry contains 6609 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.

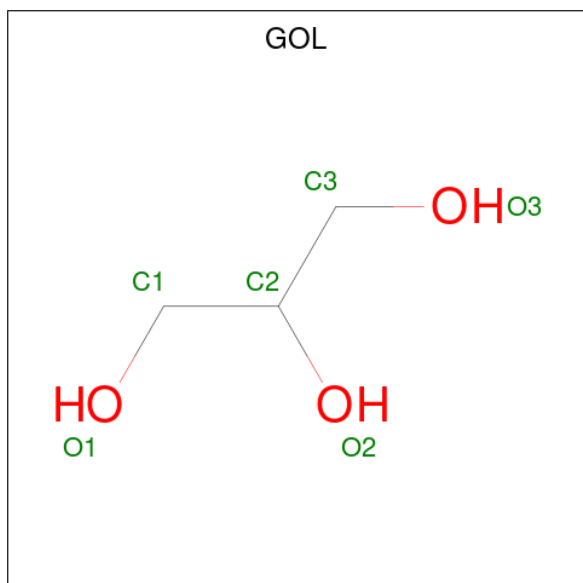
- Molecule 1 is a protein called Glycylpeptide N-tetradecanoyltransferase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	371	2979	1944	495	526	14	0	0	0
1	B	376	3003	1953	496	539	15	0	0	0

There are 6 discrepancies between the modelled and reference sequences:

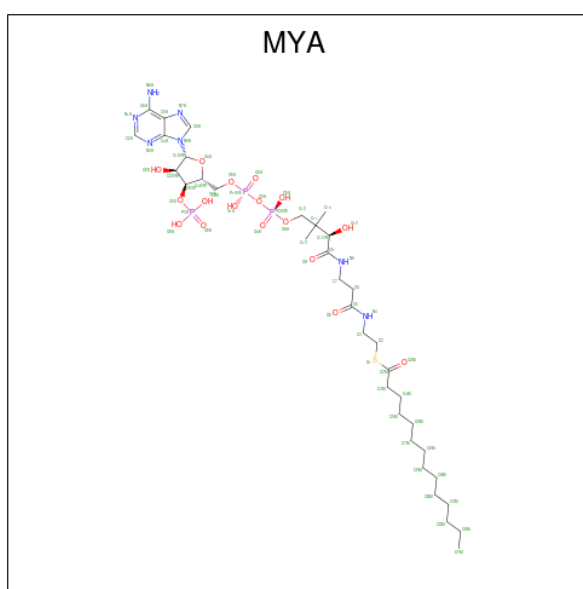
Chain	Residue	Modelled	Actual	Comment	Reference
A	106	GLY	-	expression tag	UNP P30419
A	107	PRO	-	expression tag	UNP P30419
A	108	HIS	-	expression tag	UNP P30419
B	106	GLY	-	expression tag	UNP P30419
B	107	PRO	-	expression tag	UNP P30419
B	108	HIS	-	expression tag	UNP P30419

- Molecule 2 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



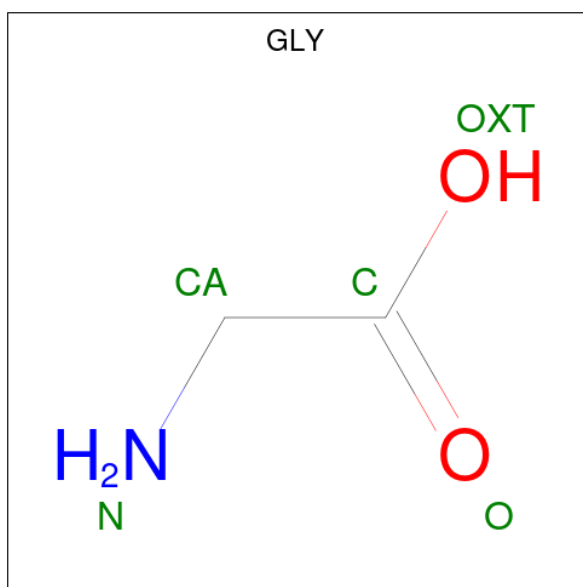
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			6	3	3		
2	A	1	Total	C	O	0	0
			6	3	3		
2	B	1	Total	C	O	0	0
			6	3	3		
2	B	1	Total	C	O	0	0
			6	3	3		

- Molecule 3 is TETRADECANOYL-COA (three-letter code: MYA) (formula:  $C_{35}H_{62}N_7O_{17}P_3S$ ) (labeled as "Ligand of Interest" by depositor).



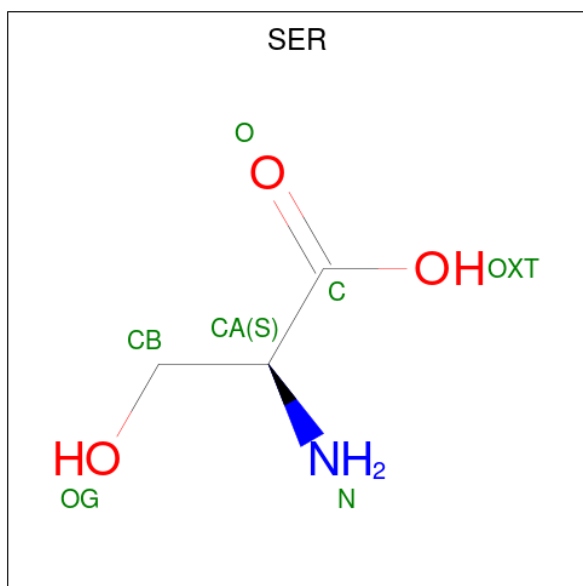
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
3	A	1	Total	C	N	O	P	S	0	1
			63	35	7	17	3	1		

- Molecule 4 is GLYCINE (three-letter code: GLY) (formula:  $C_2H_5NO_2$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
4	A	1	8	4	2	2	0	1
4	B	1	4	2	1	1	0	0

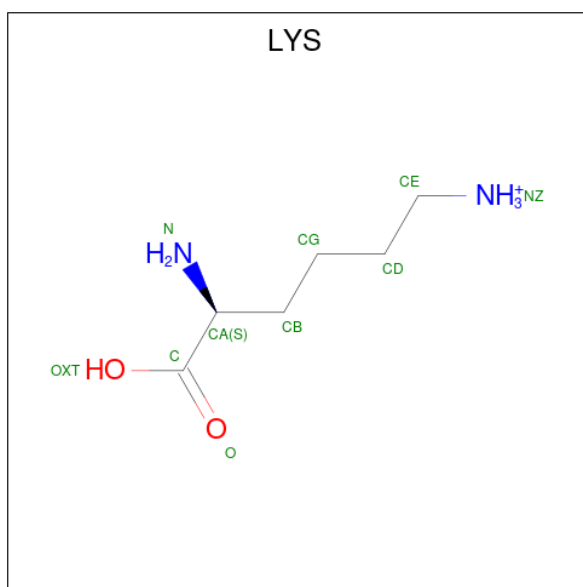
- Molecule 5 is SERINE (three-letter code: SER) (formula:  $C_3H_7NO_3$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
5	A	1	12	6	2	4	0	1
5	A	1	12	6	2	4	0	1

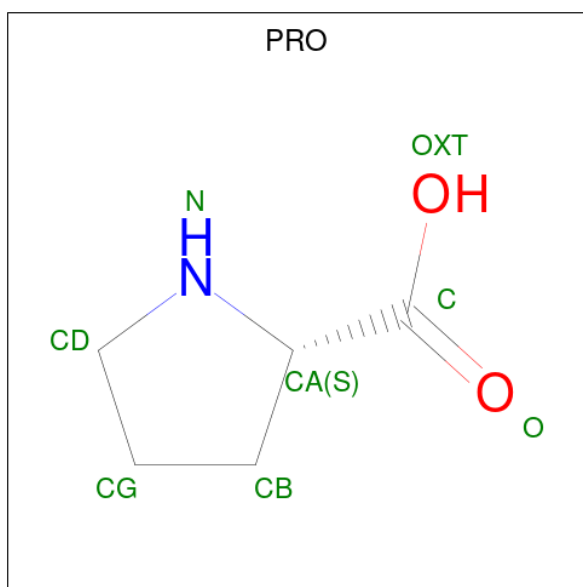
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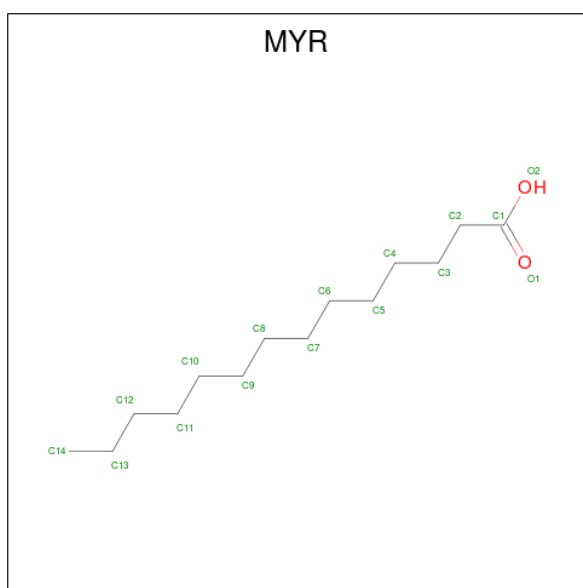
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
7	A	1	18	12	4	2	0	1
7	A	1	18	12	4	2	0	1
7	A	1	20	12	4	4	0	1
7	B	1	9	6	2	1	0	0
7	B	1	9	6	2	1	0	0
7	B	1	10	6	2	2	0	0

- Molecule 8 is PROLINE (three-letter code: PRO) (formula: C<sub>5</sub>H<sub>9</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	A	1	Total	C	N	O	0	1
			14	10	2	2		
8	B	1	Total	C	N	O	0	0
			7	5	1	1		

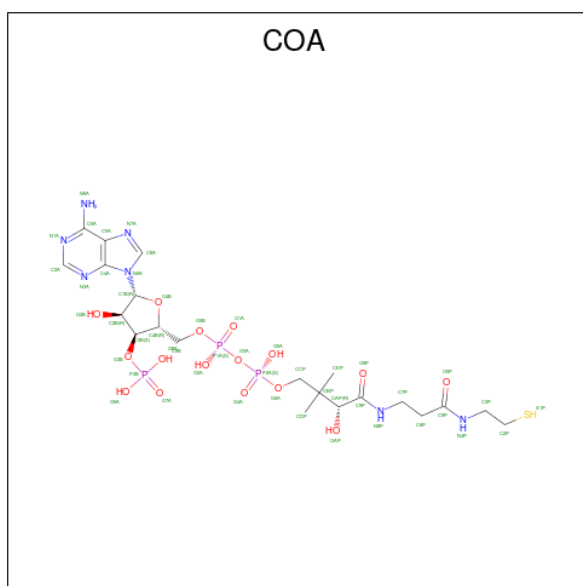
- Molecule 9 is MYRISTIC ACID (three-letter code: MYR) (formula:  $C_{14}H_{28}O_2$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
9	A	1	Total	C	O	0	1
			15	14	1		
9	B	1	Total	C	O	0	0
			15	14	1		



- Molecule 10 is COENZYME A (three-letter code: COA) (formula:  $C_{21}H_{36}N_7O_{16}P_3S$ ).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	N	O	P			S
10	A	1	48	21	7	16	3	1	0	1
10	B	1	48	21	7	16	3	1	0	0

- Molecule 11 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
11	A	128	Total O 128 128	0	0
11	B	109	Total O 109 109	0	0



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	80.25Å 177.54Å 58.14Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.08 – 2.10 47.08 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.7 (47.08-2.10) 99.8 (47.08-2.10)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.59 (at 2.10Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.184 , 0.239 0.187 , 0.240	Depositor DCC
$R_{free}$ test set	2484 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	32.4	Xtrriage
Anisotropy	0.465	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 47.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	6609	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 24.09 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.1042e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: COA, MYR, GOL, MYA

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	0.42	0/3062	0.56	0/4166
1	B	0.38	0/3090	0.52	0/4215
All	All	0.40	0/6152	0.54	0/8381

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	2979	0	2940	28	0
1	B	3003	0	2916	20	0
2	A	12	0	16	1	0
2	B	12	0	16	2	0
3	A	63	0	58	0	0
4	A	8	0	4	2	0
4	B	4	0	2	0	0
5	A	24	0	20	0	0
5	B	12	0	10	0	0
6	A	16	0	12	0	0
6	B	8	0	6	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	56	0	78	2	0
7	B	28	0	39	0	0
8	A	14	0	14	0	0
8	B	7	0	7	0	0
9	A	15	0	27	0	0
9	B	15	0	27	0	0
10	A	48	0	32	0	0
10	B	48	0	32	1	0
11	A	128	0	0	2	0
11	B	109	0	0	1	0
All	All	6609	0	6256	50	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 4.

All (50) 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)
10:B:503:COA:N6A	10:B:503:COA:S1P	2.55	0.74
1:B:417:LYS:HG2	1:B:447:PHE:HA	1.73	0.69
1:A:417:LYS:HG2	1:A:447:PHE:HA	1.75	0.69
1:B:458:ASN:HA	1:B:461:PHE:CE2	2.33	0.64
1:A:126:PRO:HG2	2:A:502:GOL:H2	1.81	0.62
1:A:295:ARG:HH12	7:A:511[B]:LYS:NZ	1.99	0.60
1:B:189:ARG:NH2	1:B:408:MET:SD	2.76	0.59
1:A:145:ILE:HD12	1:A:272:HIS:HB3	1.84	0.59
1:A:191:ASP:HB2	1:A:406:THR:HG23	1.85	0.58
1:A:170:LYS:HA	1:A:173:TYR:CE2	2.40	0.57
1:A:458:ASN:HA	1:A:461:PHE:CE2	2.42	0.54
1:B:496:GLN:HE22	2:B:502:GOL:H11	1.73	0.54
1:B:195:GLU:HB3	1:B:381:ILE:HD11	1.90	0.52
1:B:319:THR:HG22	1:B:321:GLN:H	1.75	0.52
1:A:251:HIS:HB3	1:A:254:LEU:HD13	1.91	0.52
1:B:145:ILE:HD12	1:B:272:HIS:HB3	1.93	0.51
1:A:115:ARG:NH1	1:A:116:SER:O	2.44	0.51
1:A:121:ASP:OD1	11:A:601:HOH:O	2.20	0.50
1:B:475:GLN:HB2	1:B:477:TYR:CE2	2.47	0.50
1:B:156:PHE:CE1	1:B:216:VAL:HG12	2.47	0.49
1:A:251:HIS:CE1	1:A:253:LYS:HG2	2.47	0.49
1:A:177:ASN:ND2	11:A:603:HOH:O	2.34	0.49
1:A:126:PRO:HG3	1:A:482:LYS:HG3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:295:ARG:NH1	1:A:470:GLY:O	2.47	0.48
1:B:319:THR:HG22	1:B:321:GLN:N	2.29	0.47
1:B:306:LEU:HD23	1:B:416:LEU:HD11	1.97	0.46
1:B:119:PHE:CD1	1:B:261:PRO:HB3	2.51	0.46
1:A:115:ARG:HD3	1:A:116:SER:H	1.81	0.45
1:A:115:ARG:HD3	1:A:116:SER:N	2.32	0.44
1:A:266:GLU:O	1:A:270:ARG:HG3	2.18	0.44
1:B:167:GLY:O	1:B:171:GLU:HG3	2.18	0.44
1:A:234:HIS:NE2	1:A:236:TYR:O	2.51	0.44
1:B:295:ARG:NH1	1:B:470:GLY:O	2.47	0.43
1:A:389:ASN:OD1	1:A:393:GLU:HG2	2.19	0.43
1:A:170:LYS:HA	1:A:173:TYR:CD2	2.54	0.43
1:A:338:LEU:HD21	1:A:441:LEU:HD11	2.01	0.43
7:A:507[B]:LYS:HD2	7:A:507[B]:LYS:HA	1.85	0.42
1:A:246:ASN:OD1	4:A:504[A]:GLY:HA2	2.18	0.42
1:B:266:GLU:O	1:B:270:ARG:HG3	2.18	0.42
1:A:226:ILE:HG22	1:A:263:LEU:HD22	2.02	0.42
1:A:287:LEU:O	1:A:290:PRO:HD3	2.19	0.42
1:A:246:ASN:OD1	4:A:504[B]:GLY:HA2	2.20	0.42
1:A:399:SER:OG	1:A:422:PHE:HB3	2.21	0.41
1:B:305:LYS:O	1:B:309:VAL:HG22	2.21	0.41
1:B:209:GLN:HG3	11:B:694:HOH:O	2.20	0.41
1:B:244:GLU:OE2	2:B:502:GOL:H31	2.20	0.41
1:A:244:GLU:HG2	1:A:280:VAL:CG1	2.51	0.40
1:B:288:PRO:HA	1:B:289:LYS:HA	1.92	0.40
1:A:306:LEU:CD2	1:A:416:LEU:HD11	2.52	0.40
1:B:426:HIS:HB2	1:B:429:THR:O	2.22	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	363/391 (93%)	351 (97%)	12 (3%)	0	100	100
1	B	372/391 (95%)	363 (98%)	9 (2%)	0	100	100
All	All	735/782 (94%)	714 (97%)	21 (3%)	0	100	100

There are no Ramachandran outliers to report.

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

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	322/355 (91%)	320 (99%)	2 (1%)	86	90
1	B	323/355 (91%)	317 (98%)	6 (2%)	57	63
All	All	645/710 (91%)	637 (99%)	8 (1%)	71	77

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	299	ARG
1	A	455	LEU
1	B	115	ARG
1	B	116	SER
1	B	146	ARG
1	B	299	ARG
1	B	324	MET
1	B	455	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	186	ASN

### 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](#)

33 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
5	SER	A	508[A]	-	4,5,6	0.63	0	1,5,7	0.62	0
6	ASN	B	507	-	6,7,8	0.56	0	4,8,10	0.11	0
7	LYS	A	507[A]	-	7,8,9	0.64	0	3,8,10	0.40	0
6	ASN	A	506[A]	-	6,7,8	0.62	0	4,8,10	0.19	0
5	SER	A	505[A]	-	4,5,6	0.76	0	1,5,7	0.01	0
8	PRO	A	510[B]	-	6,7,8	0.62	0	7,8,10	1.46	2 (28%)
7	LYS	A	509[B]	-	7,8,9	0.54	0	3,8,10	0.20	0
9	MYR	B	504	4	13,14,15	0.42	0	12,13,15	0.59	0
7	LYS	B	508	-	7,8,9	0.61	0	3,8,10	0.30	0
4	GLY	A	504[A]	3	3,3,4	0.65	0	1,2,4	0.73	0
7	LYS	A	511[A]	-	8,9,9	0.87	1 (12%)	7,10,10	1.03	1 (14%)
8	PRO	B	511	-	6,7,8	0.65	0	7,8,10	0.96	0
2	GOL	B	501	-	5,5,5	1.22	0	5,5,5	0.99	0
10	COA	A	513[C]	-	43,50,50	0.73	0	56,75,75	0.86	2 (3%)
5	SER	A	508[B]	-	4,5,6	0.70	0	1,5,7	0.14	0
7	LYS	A	507[B]	-	7,8,9	0.50	0	3,8,10	0.15	0
5	SER	B	509	-	4,5,6	0.76	0	1,5,7	0.46	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
6	ASN	A	506[B]	-	6,7,8	0.54	0	4,8,10	0.45	0
9	MYR	A	512[B]	4	13,14,15	0.30	0	12,13,15	0.30	0
2	GOL	A	501	-	5,5,5	0.71	0	5,5,5	1.43	1 (20%)
5	SER	A	505[B]	-	4,5,6	0.71	0	1,5,7	0.19	0
4	GLY	A	504[B]	9	3,3,4	0.71	0	1,2,4	0.64	0
2	GOL	A	502	-	5,5,5	1.43	1 (20%)	5,5,5	1.00	0
7	LYS	A	511[B]	-	8,9,9	0.73	1 (12%)	7,10,10	0.35	0
10	COA	B	503	-	43,50,50	0.71	0	56,75,75	0.99	4 (7%)
7	LYS	B	510	-	7,8,9	0.60	0	3,8,10	0.48	0
7	LYS	B	512	-	8,9,9	0.89	1 (12%)	7,10,10	1.02	1 (14%)
3	MYA	A	503[A]	4	59,65,65	0.96	3 (5%)	72,91,91	1.72	8 (11%)
2	GOL	B	502	-	5,5,5	1.38	1 (20%)	5,5,5	0.76	0
8	PRO	A	510[A]	-	6,7,8	0.60	0	7,8,10	1.18	0
5	SER	B	506	-	4,5,6	0.65	0	1,5,7	0.29	0
4	GLY	B	505	9	3,3,4	0.72	0	1,2,4	0.70	0
7	LYS	A	509[A]	-	7,8,9	0.47	0	3,8,10	0.53	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
5	SER	A	508[A]	-	-	2/2/4/6	-
6	ASN	B	507	-	-	0/5/6/8	-
7	LYS	A	507[A]	-	-	1/6/7/9	-
6	ASN	A	506[A]	-	-	0/5/6/8	-
5	SER	A	505[A]	-	-	0/2/4/6	-
8	PRO	A	510[B]	-	-	0/0/9/11	0/1/1/1
7	LYS	A	509[B]	-	-	0/6/7/9	-
9	MYR	B	504	4	-	2/12/12/13	-
7	LYS	B	508	-	-	1/6/7/9	-
4	GLY	A	504[A]	3	-	0/0/1/2	-
7	LYS	A	511[A]	-	-	3/9/9/9	-
8	PRO	B	511	-	-	0/0/9/11	0/1/1/1
2	GOL	B	501	-	-	2/4/4/4	-
10	COA	A	513[C]	-	-	2/44/64/64	0/3/3/3
5	SER	A	508[B]	-	-	2/2/4/6	-
7	LYS	A	507[B]	-	-	1/6/7/9	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	SER	B	509	-	-	2/2/4/6	-
6	ASN	A	506[B]	-	-	0/5/6/8	-
9	MYR	A	512[B]	4	-	0/12/12/13	-
2	GOL	A	501	-	-	4/4/4/4	-
5	SER	A	505[B]	-	-	0/2/4/6	-
4	GLY	A	504[B]	9	-	0/0/1/2	-
2	GOL	A	502	-	-	3/4/4/4	-
7	LYS	A	511[B]	-	-	3/9/9/9	-
10	COA	B	503	-	-	2/44/64/64	0/3/3/3
7	LYS	B	510	-	-	0/6/7/9	-
7	LYS	B	512	-	-	0/9/9/9	-
3	MYA	A	503[A]	4	-	3/60/80/80	0/3/3/3
2	GOL	B	502	-	-	1/4/4/4	-
8	PRO	A	510[A]	-	-	0/0/9/11	0/1/1/1
5	SER	B	506	-	-	0/2/4/6	-
4	GLY	B	505	9	-	0/0/1/2	-
7	LYS	A	509[A]	-	-	0/6/7/9	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	503[A]	MYA	C2M-S1	-4.17	1.66	1.76
2	B	502	GOL	C1-C2	2.49	1.61	1.51
7	A	511[A]	LYS	OXT-C	-2.32	1.23	1.30
7	B	512	LYS	OXT-C	-2.27	1.23	1.30
3	A	503[A]	MYA	O4X-C1X	2.19	1.43	1.40
2	A	502	GOL	C3-C2	2.16	1.60	1.51
3	A	503[A]	MYA	P1A-O3A	2.03	1.61	1.59
7	A	511[B]	LYS	OXT-C	-2.02	1.24	1.30

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	503[A]	MYA	O2M-C2M-C3M	-10.08	112.35	123.98
3	A	503[A]	MYA	O2M-C2M-S1	-4.91	116.44	122.68
3	A	503[A]	MYA	N3A-C2A-N1A	-4.02	123.22	128.67
10	B	503	COA	N3A-C2A-N1A	-3.91	123.36	128.67
10	A	513[C]	COA	N3A-C2A-N1A	-3.72	123.62	128.67
3	A	503[A]	MYA	C3M-C2M-S1	-3.52	109.20	113.40
2	A	501	GOL	C3-C2-C1	-2.81	101.50	111.80
3	A	503[A]	MYA	C4M-C3M-C2M	2.77	118.37	112.27

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	B	503	COA	P3B-O3B-C3B	-2.71	116.20	123.43
7	B	512	LYS	OXT-C-O	-2.60	118.19	124.08
7	A	511[A]	LYS	OXT-C-O	-2.59	118.20	124.08
3	A	503[A]	MYA	C3-N4-C5	-2.54	118.09	122.82
3	A	503[A]	MYA	C13-C11-C10	2.50	113.03	108.77
10	A	513[C]	COA	C4A-C5A-N7A	-2.38	106.82	109.34
8	A	510[B]	PRO	CD-N-CA	2.28	113.02	107.21
10	B	503	COA	C4A-C5A-N7A	-2.25	106.96	109.34
10	B	503	COA	O6A-CCP-CBP	-2.22	106.98	110.55
8	A	510[B]	PRO	O-C-CA	-2.13	119.29	124.77
3	A	503[A]	MYA	C4A-C5A-N7A	-2.04	107.18	109.34

There are no chirality outliers.

All (34) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	GOL	O1-C1-C2-C3
2	A	502	GOL	C1-C2-C3-O3
3	A	503[A]	MYA	C3-C2-S1-C2M
3	A	503[A]	MYA	C3M-C2M-S1-C2
5	A	508[A]	SER	C-CA-CB-OG
5	A	508[B]	SER	C-CA-CB-OG
5	B	509	SER	N-CA-CB-OG
5	B	509	SER	C-CA-CB-OG
10	A	513[C]	COA	C5B-O5B-P1A-O1A
2	A	501	GOL	C1-C2-C3-O3
2	A	502	GOL	O1-C1-C2-C3
2	B	501	GOL	C1-C2-C3-O3
2	A	501	GOL	O1-C1-C2-O2
2	A	502	GOL	O2-C2-C3-O3
7	A	511[B]	LYS	OXT-C-CA-N
7	A	511[B]	LYS	CE-CD-CG-CB
7	A	511[A]	LYS	OXT-C-CA-N
7	A	511[A]	LYS	O-C-CA-N
7	A	511[B]	LYS	O-C-CA-N
5	A	508[A]	SER	N-CA-CB-OG
5	A	508[B]	SER	N-CA-CB-OG
7	B	508	LYS	CE-CD-CG-CB
7	A	507[A]	LYS	CE-CD-CG-CB
10	B	503	COA	CCP-O6A-P2A-O3A
3	A	503[A]	MYA	C3X-O3X-P3X-O8A
2	A	501	GOL	O2-C2-C3-O3

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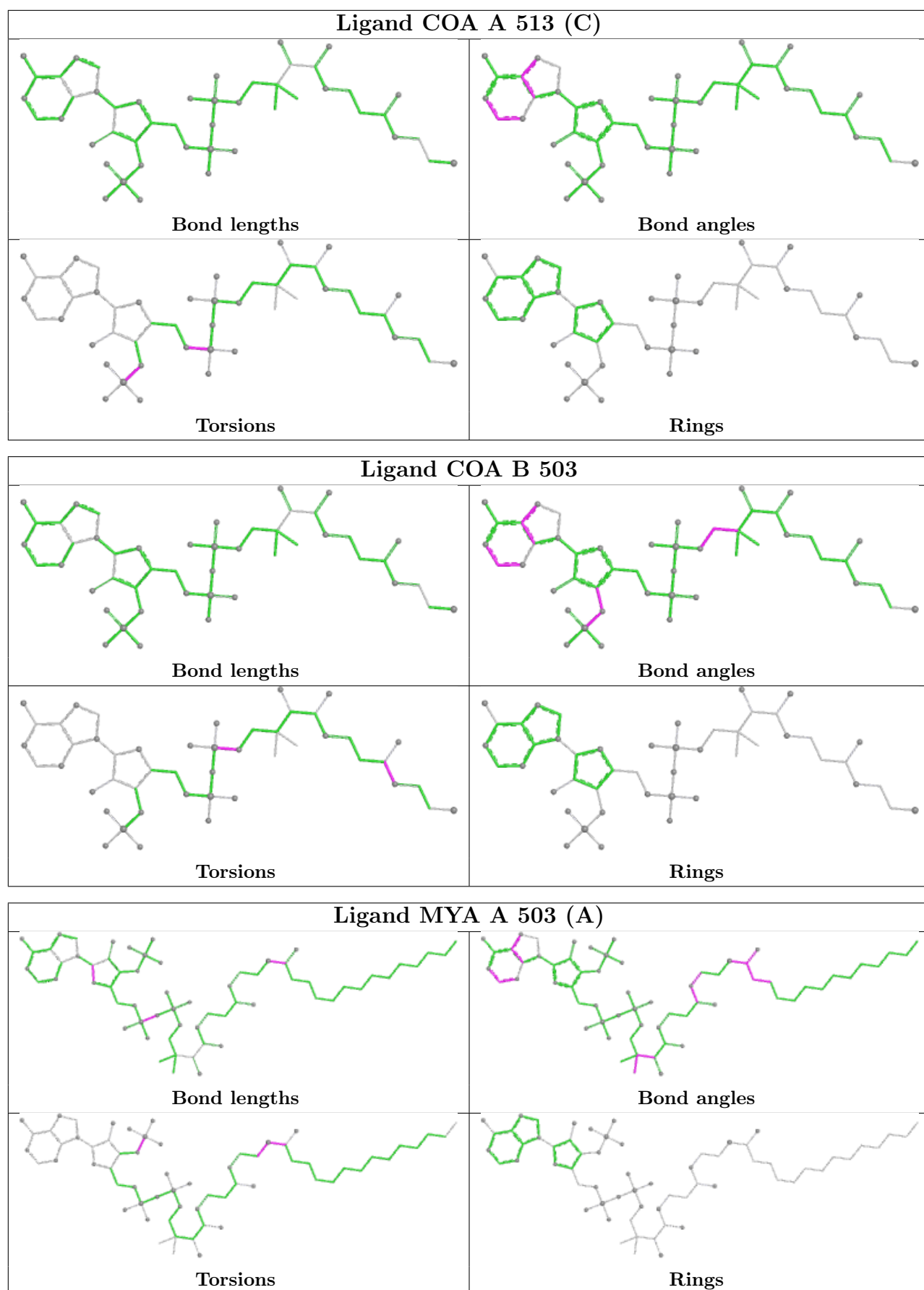
Mol	Chain	Res	Type	Atoms
2	B	501	GOL	O2-C2-C3-O3
7	A	507[B]	LYS	CE-CD-CG-CB
10	A	513[C]	COA	C3B-O3B-P3B-O7A
9	B	504	MYR	C9-C10-C11-C12
10	B	503	COA	O5P-C5P-N4P-C3P
7	A	511[A]	LYS	CE-CD-CG-CB
9	B	504	MYR	C7-C8-C9-C10
2	B	502	GOL	O2-C2-C3-O3

There are no ring outliers.

7 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	504[A]	GLY	1	0
7	A	507[B]	LYS	1	0
4	A	504[B]	GLY	1	0
2	A	502	GOL	1	0
7	A	511[B]	LYS	1	0
10	B	503	COA	1	0
2	B	502	GOL	2	0

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



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	371/391 (94%)	-0.23	6 (1%) 72 75	18, 31, 61, 89	0
1	B	376/391 (96%)	-0.18	10 (2%) 54 60	22, 37, 64, 84	0
All	All	747/782 (95%)	-0.20	16 (2%) 63 68	18, 34, 63, 89	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	116	SER	5.6
1	A	313	HIS	4.7
1	A	314	LEU	4.2
1	A	407	ILE	4.0
1	B	323	THR	3.9
1	A	116	SER	3.6
1	B	129	GLY	3.6
1	B	321	GLN	3.4
1	B	320	MET	3.4
1	A	309	VAL	3.1
1	B	322	ARG	2.9
1	B	319	THR	2.5
1	B	472	GLY	2.4
1	B	115	ARG	2.3
1	B	327	TYR	2.1
1	A	306	LEU	2.0

### 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(Å <sup>2</sup> )	Q<0.9
7	LYS	A	509[A]	9/10	0.84	0.28	48,54,62,67	9
7	LYS	A	509[B]	9/10	0.84	0.28	48,54,62,67	9
7	LYS	A	511[A]	10/10	0.84	0.35	54,58,61,61	10
7	LYS	A	511[B]	10/10	0.84	0.35	54,58,61,61	10
5	SER	A	505[A]	6/7	0.85	0.21	50,51,53,56	6
5	SER	A	505[B]	6/7	0.85	0.21	50,51,53,56	6
3	MYA	A	503[A]	63/63	0.86	0.17	18,49,58,62	63
2	GOL	B	502	6/6	0.87	0.14	36,43,52,53	0
8	PRO	A	510[A]	7/8	0.87	0.29	52,54,57,57	7
8	PRO	A	510[B]	7/8	0.87	0.29	52,54,57,57	7
5	SER	B	506	6/7	0.88	0.14	40,46,52,60	0
7	LYS	B	512	10/10	0.88	0.32	50,60,76,83	0
7	LYS	A	507[A]	9/10	0.88	0.22	55,56,58,60	9
7	LYS	A	507[B]	9/10	0.88	0.22	55,56,59,61	9
6	ASN	A	506[B]	8/9	0.89	0.23	50,55,57,59	8
6	ASN	A	506[A]	8/9	0.89	0.23	51,55,57,58	8
10	COA	B	503	48/48	0.90	0.14	36,57,76,80	0
5	SER	A	508[A]	6/7	0.91	0.18	49,51,53,58	6
6	ASN	B	507	8/9	0.91	0.10	46,50,53,60	0
10	COA	A	513[C]	48/48	0.91	0.18	41,52,59,62	48
5	SER	A	508[B]	6/7	0.91	0.18	49,51,53,58	6
4	GLY	A	504[A]	4/5	0.92	0.24	42,45,45,48	4
5	SER	B	509	6/7	0.92	0.08	40,44,50,55	0
9	MYR	A	512[B]	15/16	0.92	0.13	18,24,36,40	15
4	GLY	A	504[B]	4/5	0.92	0.24	42,45,45,48	4
2	GOL	A	501	6/6	0.92	0.11	28,39,43,46	0
7	LYS	B	508	9/10	0.93	0.10	44,48,53,55	0
7	LYS	B	510	9/10	0.93	0.14	45,47,53,62	0
8	PRO	B	511	7/8	0.94	0.15	42,45,50,53	0
2	GOL	A	502	6/6	0.95	0.10	22,29,31,40	0
9	MYR	B	504	15/16	0.95	0.12	23,29,35,37	0
2	GOL	B	501	6/6	0.96	0.10	31,34,41,46	0

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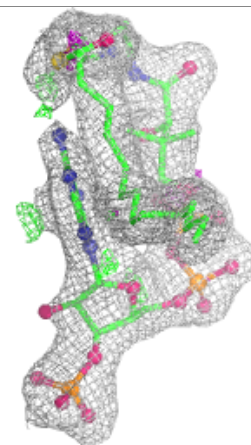
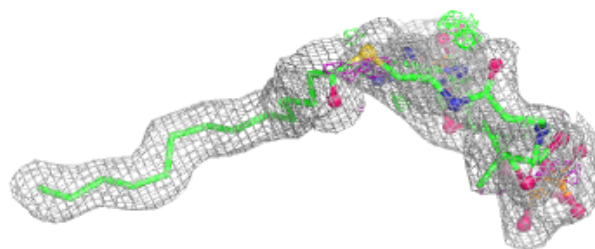
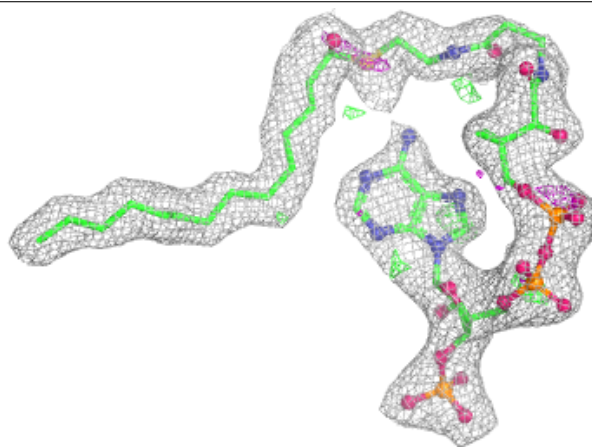
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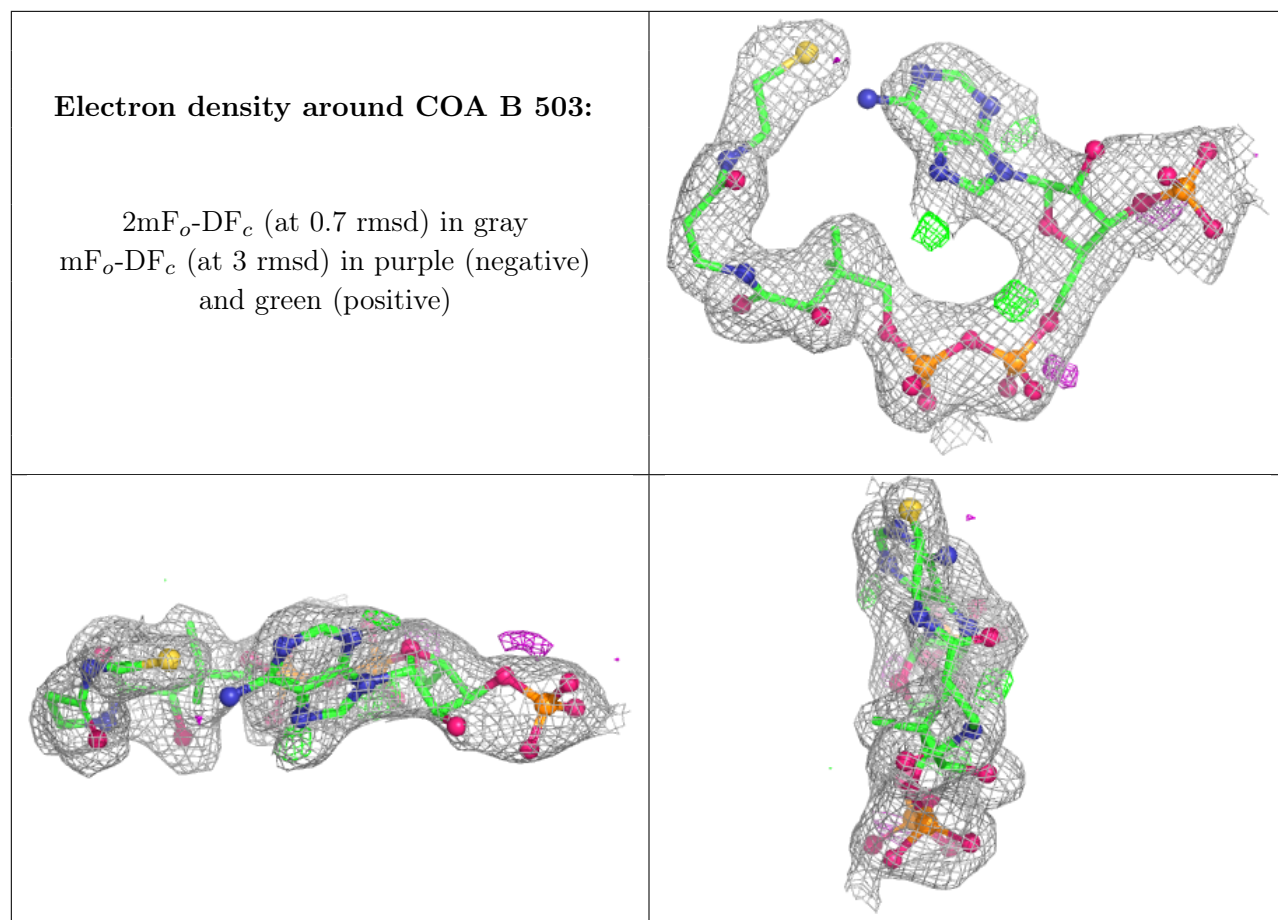
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	GLY	B	505	4/5	0.97	0.08	31,38,43,45	0

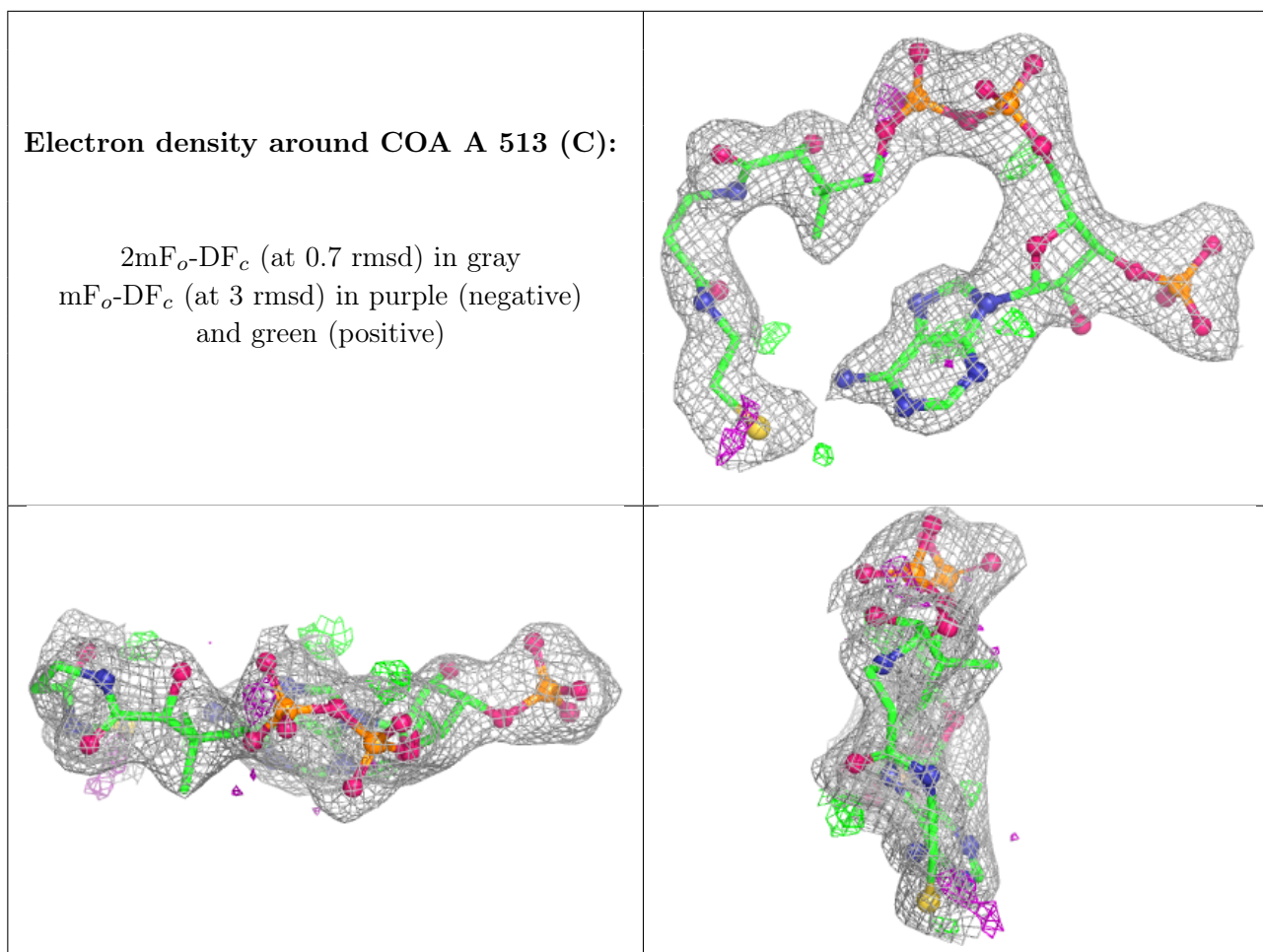
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around MYA A 503 (A):**

$2mF_o-DF_c$  (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.