



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 07:55 AM UTC

PDB ID : 6ROP / pdb_00006rop
Title : KS-MAT DI-DOMAIN OF MOUSE FAS WITH OCTANOYL COA
Authors : Paithankar, K.S.; Rittner, A.; Grininger, M.
Deposited on : 2019-05-13
Resolution : 2.70 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

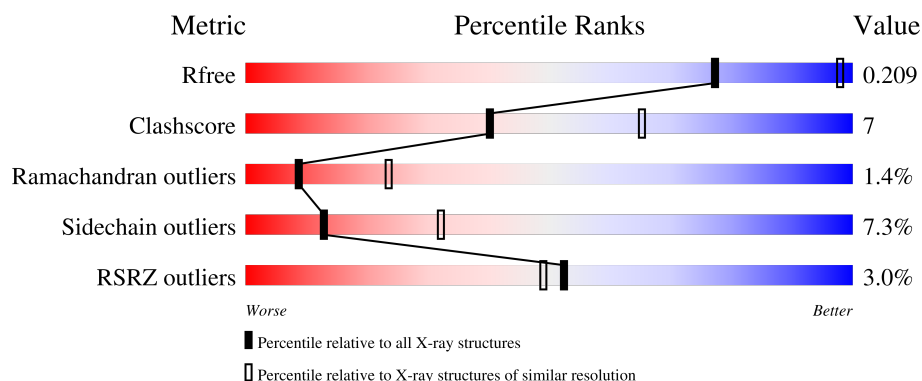
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3538 (2.70-2.70)
Clashscore	190562	3843 (2.70-2.70)
Ramachandran outliers	187476	3778 (2.70-2.70)
Sidechain outliers	187428	3778 (2.70-2.70)
RSRZ outliers	180081	3538 (2.70-2.70)

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

Mol	Chain	Length	Quality of chain
1	A	852	<div> <div>%</div> <div> <div></div> <div>82%</div> <div>17%</div> <div>.</div> </div> </div>
1	B	852	<div> <div>4%</div> <div> <div></div> <div>74%</div> <div>21%</div> <div>..</div> </div> </div>
1	C	852	<div> <div>6%</div> <div> <div></div> <div>76%</div> <div>21%</div> <div>..</div> </div> </div>
1	D	852	<div> <div>%</div> <div> <div></div> <div>80%</div> <div>19%</div> <div>.</div> </div> </div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 25764 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.

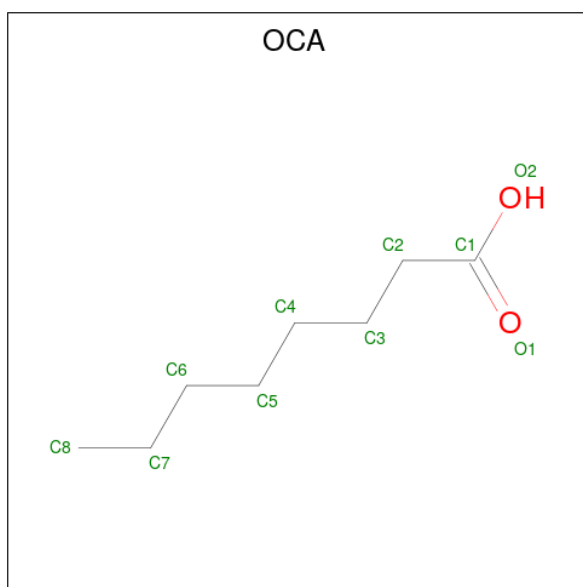
- Molecule 1 is a protein called Fatty acid synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	852	Total	C	N	O	S	0	0	0
			6477	4094	1137	1214	32			
1	B	831	Total	C	N	O	S	0	0	0
			6295	3978	1102	1184	31			
1	C	847	Total	C	N	O	S	0	0	0
			6413	4051	1125	1207	30			
1	D	852	Total	C	N	O	S	0	0	0
			6477	4094	1137	1214	32			

There are 4 discrepancies between the modelled and reference sequences:

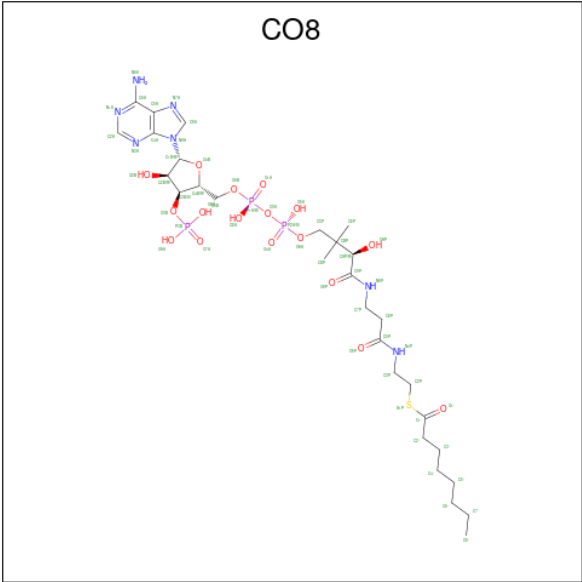
Chain	Residue	Modelled	Actual	Comment	Reference
A	1	SER	-	expression tag	UNP P19096
B	1	SER	-	expression tag	UNP P19096
C	1	SER	-	expression tag	UNP P19096
D	1	SER	-	expression tag	UNP P19096

- Molecule 2 is OCTANOIC ACID (CAPRYLIC ACID) (CCD ID: OCA) (formula: $C_8H_{16}O_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			9	8	1		
2	B	1	Total	C	O	0	0
			9	8	1		
2	C	1	Total	C	O	0	0
			9	8	1		
2	D	1	Total	C	O	0	0
			9	8	1		
2	D	1	Total	C	O	0	0
			9	8	1		

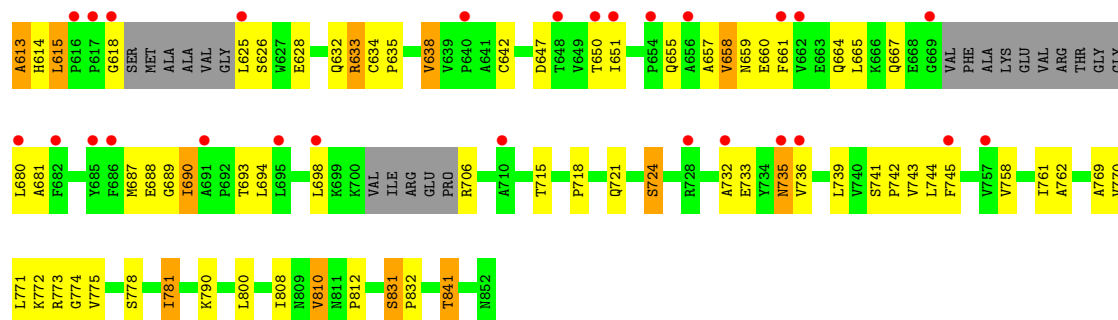
- Molecule 3 is OCTANOYL-COENZYME A (CCD ID: CO8) (formula: $C_{29}H_{50}N_7O_{17}P_3S$) (labeled as "Ligand of Interest" by depositor).



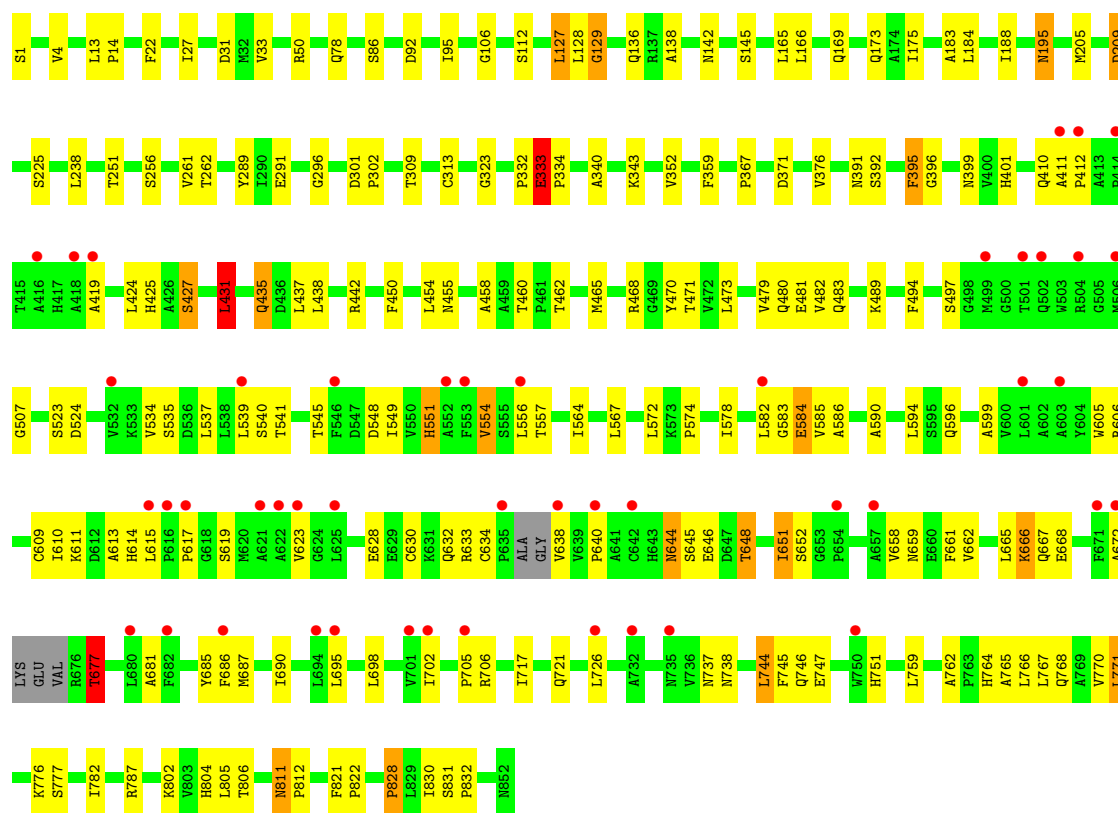
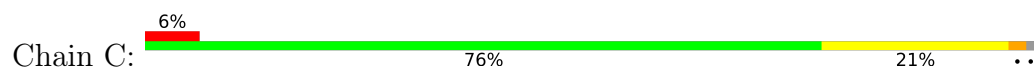
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	D	1	Total	C	N	O	P	S	0	0
			57	29	7	17	3	1		

- Molecule 1: Fatty acid synthase

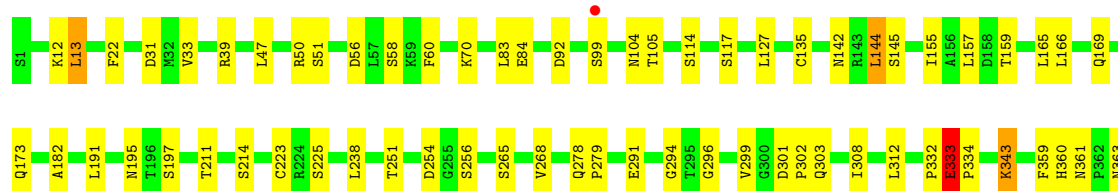
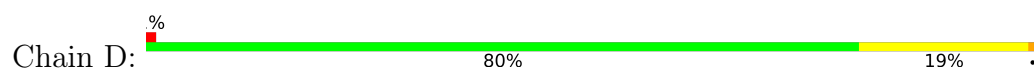




• Molecule 1: Fatty acid synthase



• Molecule 1: Fatty acid synthase





4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α , β , γ	147.44Å 354.11Å 218.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.00 – 2.70 48.00 – 2.70	Depositor EDS
% Data completeness (in resolution range)	98.2 (48.00-2.70) 98.2 (48.00-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.59 (at 2.69Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.184 , 0.233 (Not available) , 0.209	Depositor DCC
R_{free} test set	7707 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å ²)	68.4	Xtriage
Anisotropy	0.113	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 42.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	25764	wwPDB-VP
Average B, all atoms (Å ²)	86.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.98% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: OCA, CO8

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	1.04	0/6624	1.43	13/9009 (0.1%)
1	B	1.06	2/6437 (0.0%)	1.44	7/8758 (0.1%)
1	C	1.07	1/6556 (0.0%)	1.43	7/8920 (0.1%)
1	D	1.05	0/6624	1.45	12/9009 (0.1%)
All	All	1.05	3/26241 (0.0%)	1.44	39/35696 (0.1%)

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	B	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	706	ARG	CZ-NH2	-8.83	1.22	1.33
1	B	598	GLU	CD-OE1	5.65	1.36	1.25
1	C	717	ILE	N-CA	5.32	1.50	1.45

All (39) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	333	GLU	CB-CA-C	6.63	123.23	110.17
1	D	211	THR	CA-CB-OG1	-6.49	99.86	109.60
1	C	371	ASP	CA-CB-CG	6.42	119.02	112.60
1	B	333	GLU	CB-CA-C	6.39	122.75	110.17
1	A	331	HIS	CB-CA-C	6.07	116.18	110.17
1	B	221	GLY	CA-C-O	-5.99	117.25	122.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	333	GLU	CB-CA-C	5.83	121.65	110.17
1	D	734	TYR	O-C-N	5.76	128.22	122.12
1	A	209	ASP	CA-CB-CG	5.70	118.30	112.60
1	B	841	THR	CB-CA-C	5.54	119.01	110.14
1	B	285	GLU	CB-CG-CD	5.52	121.99	112.60
1	C	333	GLU	CB-CA-C	5.52	121.04	110.17
1	A	235	LYS	CA-C-O	-5.47	115.60	121.56
1	B	724	SER	CA-C-N	5.46	127.53	120.44
1	B	724	SER	C-N-CA	5.46	127.53	120.44
1	D	568	THR	N-CA-C	-5.43	105.39	112.23
1	D	737	ASN	CA-C-N	5.37	127.79	120.54
1	D	737	ASN	C-N-CA	5.37	127.79	120.54
1	D	490	ARG	CB-CA-C	5.36	115.80	110.33
1	A	222	TYR	CB-CA-C	5.34	119.32	109.71
1	D	557	THR	CB-CA-C	5.31	119.88	110.85
1	A	827	THR	CB-CA-C	5.27	117.56	109.50
1	D	360	HIS	CB-CA-C	5.26	119.15	110.83
1	A	301	ASP	CA-CB-CG	5.26	117.86	112.60
1	D	395	PHE	CA-CB-CG	5.21	119.01	113.80
1	C	209	ASP	CA-CB-CG	5.21	117.81	112.60
1	C	431	LEU	CA-C-N	5.20	127.25	120.28
1	C	431	LEU	C-N-CA	5.20	127.25	120.28
1	A	313	CYS	CA-C-N	5.14	127.89	120.38
1	A	313	CYS	C-N-CA	5.14	127.89	120.38
1	A	617	PRO	CA-C-N	5.11	126.72	122.17
1	A	617	PRO	C-N-CA	5.11	126.72	122.17
1	D	773	ARG	CA-C-N	5.11	125.62	120.00
1	D	773	ARG	C-N-CA	5.11	125.62	120.00
1	B	21	GLU	N-CA-C	-5.10	105.72	111.28
1	C	685	TYR	CA-C-N	5.04	127.29	120.38
1	C	685	TYR	C-N-CA	5.04	127.29	120.38
1	A	475	VAL	CA-C-N	5.01	127.30	120.54
1	A	475	VAL	C-N-CA	5.01	127.30	120.54

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	598	GLU	Sidechain

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	6477	0	6460	67	0
1	B	6295	0	6228	88	0
1	C	6413	0	6372	103	0
1	D	6477	0	6459	83	0
2	A	9	0	15	0	0
2	B	9	0	15	0	0
2	C	9	0	15	1	0
2	D	18	0	30	2	0
3	D	57	0	46	5	0
All	All	25764	0	25640	339	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 7.

All (339) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:771:LEU:O	1:A:775:VAL:HG22	1.78	0.83
1:C:195:ASN:N	1:C:195:ASN:HD22	1.78	0.78
1:B:661:PHE:HA	1:B:664:GLN:HE21	1.51	0.76
1:D:391:ASN:OD1	1:D:401:HIS:HD2	1.71	0.74
1:C:136:GLN:HE22	1:C:138:ALA:HB3	1.53	0.74
1:B:31:ASP:OD2	1:B:50:ARG:NH2	2.21	0.73
1:A:438:LEU:HD22	1:A:471:THR:HG22	1.71	0.72
1:B:425:HIS:H	1:B:455:ASN:HD21	1.37	0.72
1:A:524:ASP:OD1	1:A:534:VAL:N	2.22	0.72
1:C:537:LEU:O	1:C:540:SER:HB2	1.89	0.72
1:D:425:HIS:H	1:D:455:ASN:ND2	1.88	0.71
1:D:506:MET:HE2	1:D:763:PRO:HB2	1.73	0.70
1:A:661:PHE:O	1:A:665:LEU:HB2	1.91	0.69
1:C:127:LEU:C	1:C:127:LEU:HD12	2.16	0.69
1:C:169:GLN:NE2	1:C:173:GLN:HE21	1.91	0.69
1:D:502:GLN:HA	1:D:506:MET:HE1	1.74	0.69
1:C:142:ASN:HD22	1:D:396:GLY:HA3	1.58	0.68
1:D:768:GLN:HE22	1:D:783:PRO:HD3	1.59	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:68:HIS:HB2	1:B:71:GLN:HE22	1.59	0.66
1:A:159:THR:HG21	1:A:166:LEU:HD22	1.77	0.66
1:B:391:ASN:OD1	1:B:401:HIS:HD2	1.78	0.66
1:D:506:MET:HE2	1:D:763:PRO:CB	2.27	0.65
1:B:608:GLN:HA	1:B:608:GLN:HE21	1.61	0.65
3:D:903:CO8:H132	3:D:903:CO8:O9P	1.94	0.65
1:C:442:ARG:NH1	1:C:480:GLN:OE1	2.28	0.65
1:C:195:ASN:HD22	1:C:195:ASN:H	1.46	0.64
1:D:39:ARG:HD2	1:D:191:LEU:O	1.97	0.64
1:C:438:LEU:HD22	1:C:471:THR:HG22	1.78	0.64
1:C:396:GLY:HA3	1:D:142:ASN:HD22	1.63	0.63
1:C:169:GLN:HE21	1:C:173:GLN:HE21	1.47	0.62
1:A:468:ARG:HD3	1:A:804:HIS:CE1	2.34	0.62
1:C:78:GLN:HG2	1:C:188:ILE:HB	1.81	0.62
1:B:4:VAL:HG22	1:B:175:ILE:HG22	1.81	0.62
1:B:169:GLN:HE21	1:B:173:GLN:HE21	1.46	0.62
1:A:503:TRP:CZ2	1:A:506:MET:HA	2.36	0.61
1:B:127:LEU:C	1:B:127:LEU:HD12	2.26	0.61
1:A:610:ILE:HA	1:A:690:ILE:HD11	1.82	0.61
1:C:460:THR:HG21	1:C:465:MET:HG3	1.82	0.60
1:C:468:ARG:HD3	1:C:804:HIS:CE1	2.36	0.60
1:D:493:TRP:CE3	1:D:576:GLY:HA3	2.37	0.60
1:C:659:ASN:HA	1:C:662:VAL:HG22	1.83	0.60
1:A:158:ASP:OD2	1:B:136:GLN:NE2	2.33	0.59
1:D:425:HIS:H	1:D:455:ASN:HD21	1.48	0.59
1:D:821:PHE:HA	1:D:822:PRO:C	2.27	0.59
1:B:658:VAL:O	1:B:660:GLU:N	2.30	0.59
1:C:431:LEU:CD2	1:C:435:GLN:HE22	2.15	0.59
1:A:127:LEU:C	1:A:127:LEU:HD12	2.27	0.58
1:B:609:CYS:O	1:B:613:ALA:HB3	2.03	0.58
1:B:94:GLY:O	1:B:240:ARG:NH1	2.37	0.58
1:B:119:ALA:O	1:B:122:ARG:NH1	2.36	0.58
1:B:23:TRP:CE2	1:B:350:HIS:CD2	2.91	0.58
1:D:308:ILE:HG23	1:D:312:LEU:HD12	1.84	0.58
1:B:68:HIS:HB2	1:B:71:GLN:NE2	2.18	0.58
1:C:450:PHE:CE1	1:C:828:PRO:HB2	2.39	0.58
1:B:360:HIS:C	1:B:361:ASN:HD22	2.10	0.58
1:A:23:TRP:HB2	1:A:346:LEU:HD13	1.86	0.58
1:B:495:ILE:O	1:B:495:ILE:HG22	2.02	0.58
1:D:502:GLN:HA	1:D:506:MET:CE	2.33	0.57
1:D:127:LEU:HD12	1:D:127:LEU:C	2.29	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:291:GLU:HG2	1:A:340:ALA:HB1	1.86	0.57
1:A:667:GLN:O	1:A:668:GLU:HB2	2.03	0.57
1:C:136:GLN:HE22	1:C:138:ALA:CB	2.16	0.57
1:A:450:PHE:CE2	1:A:454:LEU:HD11	2.39	0.57
1:C:424:LEU:HA	1:C:455:ASN:HD21	1.70	0.57
1:D:157:LEU:HD13	1:D:166:LEU:HD23	1.87	0.57
1:D:686:PHE:CD1	1:D:740:VAL:HG11	2.40	0.57
1:A:254:ASP:HA	1:A:268:VAL:HG11	1.88	0.56
1:B:290:ILE:HG23	1:B:322:ILE:HG13	1.88	0.56
1:C:537:LEU:O	1:C:540:SER:CB	2.55	0.55
1:D:159:THR:HG21	1:D:166:LEU:HD22	1.88	0.55
1:C:425:HIS:H	1:C:455:ASN:ND2	2.04	0.55
1:C:767:LEU:HA	1:C:770:VAL:HG22	1.89	0.55
1:B:744:LEU:HG	1:B:744:LEU:O	2.06	0.55
1:B:497:SER:HB2	1:B:762:ALA:HB2	1.89	0.55
1:B:698:LEU:HB3	1:B:732:ALA:HB1	1.89	0.54
1:A:627:TRP:CE3	1:A:643:HIS:HB2	2.42	0.54
1:A:548:ASP:C	1:A:548:ASP:OD1	2.50	0.54
1:B:169:GLN:NE2	1:B:173:GLN:HE21	2.05	0.54
1:B:241:ARG:HD2	1:B:243:TYR:CE2	2.42	0.54
1:C:261:VAL:HG13	1:C:262:THR:HG23	1.90	0.54
1:A:333:GLU:CB	1:A:334:PRO:CD	2.86	0.54
1:B:586:ALA:O	1:B:589:TYR:N	2.40	0.54
1:B:291:GLU:HG2	1:B:340:ALA:HB1	1.89	0.54
1:D:117:SER:HB3	1:D:135:CYS:HB3	1.90	0.53
1:D:768:GLN:NE2	1:D:783:PRO:HD3	2.22	0.53
1:C:391:ASN:OD1	1:C:401:HIS:HD2	1.91	0.53
1:C:634:CYS:HB3	1:C:661:PHE:CE2	2.43	0.53
1:C:470:TYR:CE1	1:C:481:GLU:HB2	2.44	0.53
1:B:251:THR:HA	1:B:399:ASN:O	2.08	0.53
1:B:638:VAL:HB	1:B:658:VAL:HG22	1.91	0.53
1:C:494:PHE:CD2	1:C:574:PRO:HB3	2.43	0.53
1:B:769:ALA:O	1:B:772:LYS:HE3	2.08	0.53
1:C:450:PHE:CD1	1:C:828:PRO:HB2	2.44	0.53
1:C:567:LEU:O	1:C:572:LEU:HB2	2.08	0.53
1:C:687:MET:HE2	1:C:687:MET:HA	1.89	0.53
1:D:251:THR:HA	1:D:399:ASN:O	2.09	0.53
1:B:439:GLU:OE2	1:B:443:GLN:NE2	2.42	0.53
1:B:9:MET:HE2	1:B:243:TYR:CE1	2.44	0.53
1:A:486:SER:O	1:A:487:THR:HB	2.09	0.52
1:C:582:LEU:O	1:C:585:VAL:HG12	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:694:LEU:HD13	1:B:736:VAL:HG12	1.90	0.52
1:B:216:ASP:OD2	1:B:218:SER:OG	2.28	0.52
1:C:13:LEU:HD13	1:C:22:PHE:CD2	2.45	0.52
1:D:507:GLY:O	1:D:511:MET:HG2	2.10	0.52
1:B:613:ALA:O	1:B:615:LEU:HD23	2.09	0.52
1:C:359:PHE:CZ	1:C:376:VAL:HG21	2.45	0.52
1:A:81:LEU:O	1:A:85:VAL:HG23	2.10	0.51
1:C:609:CYS:O	1:C:613:ALA:HB3	2.10	0.51
1:B:425:HIS:H	1:B:455:ASN:ND2	2.06	0.51
1:C:764:HIS:CD2	1:C:787:ARG:HB3	2.46	0.51
1:A:14:PRO:HA	1:A:53:LYS:O	2.11	0.51
1:C:427:SER:OG	1:C:458:ALA:O	2.28	0.51
1:A:691:ALA:HB3	1:A:692:PRO:HD3	1.92	0.51
1:C:165:LEU:HD22	1:C:392:SER:HB2	1.92	0.51
1:C:309:THR:O	1:C:313:CYS:HB2	2.11	0.51
3:D:903:CO8:H71	3:D:903:CO8:OAP	2.11	0.51
1:A:645:SER:HA	1:A:746:GLN:HE21	1.75	0.51
1:C:205:MET:HE1	1:C:395:PHE:HD2	1.75	0.51
1:D:157:LEU:C	1:D:157:LEU:HD12	2.36	0.51
1:C:634:CYS:SG	1:C:638:VAL:O	2.67	0.50
1:B:503:TRP:CH2	1:B:506:MET:HA	2.46	0.50
1:C:658:VAL:O	1:C:662:VAL:HG13	2.11	0.50
1:A:296:GLY:HA2	1:A:301:ASP:OD2	2.11	0.50
1:C:195:ASN:H	1:C:195:ASN:ND2	2.07	0.50
2:D:902:OCA:H21	3:D:903:CO8:H3'1	1.94	0.50
1:D:831:SER:OG	1:D:832:PRO:HD3	2.11	0.50
1:B:18:ASN:CG	1:B:832:PRO:HB3	2.37	0.50
1:C:31:ASP:OD2	1:C:50:ARG:NH2	2.44	0.50
1:C:291:GLU:HG2	1:C:340:ALA:HB1	1.94	0.49
1:D:359:PHE:CZ	1:D:376:VAL:HG21	2.47	0.49
1:C:13:LEU:HD13	1:C:22:PHE:CG	2.48	0.49
1:D:588:GLY:HA2	1:D:712:TRP:CZ3	2.48	0.49
1:D:663:GLU:O	1:D:667:GLN:HG2	2.13	0.49
1:D:831:SER:N	1:D:832:PRO:CD	2.76	0.49
1:A:764:HIS:HD2	1:A:787:ARG:H	1.60	0.49
1:B:511:MET:HE2	1:B:539:LEU:HD13	1.94	0.49
1:D:453:MET:HE1	1:D:827:THR:HG21	1.94	0.49
1:D:493:TRP:CZ3	1:D:576:GLY:HA3	2.48	0.49
1:C:640:PRO:HA	1:C:651:ILE:HG22	1.95	0.49
1:D:492:LEU:HD22	1:D:572:LEU:HD22	1.94	0.49
1:B:425:HIS:HE1	1:B:810:VAL:HB	1.77	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:580:HIS:HB2	1:B:745:PHE:HE2	1.78	0.49
1:C:301:ASP:HB2	1:C:302:PRO:HD3	1.94	0.49
1:A:132:MET:HE3	1:B:200:PHE:CZ	2.48	0.48
1:A:438:LEU:HD22	1:A:471:THR:CG2	2.43	0.48
1:B:528:LYS:N	1:B:529:PRO:CD	2.76	0.48
1:B:721:GLN:O	1:B:724:SER:HB3	2.13	0.48
1:B:618:GLY:HA3	1:B:681:ALA:HB2	1.94	0.48
1:B:638:VAL:HG13	1:B:638:VAL:O	2.13	0.48
1:A:627:TRP:CZ3	1:A:640:PRO:HB2	2.48	0.48
1:B:65:PHE:HA	1:B:147:PHE:CE1	2.47	0.48
1:D:291:GLU:OE1	1:D:343:LYS:HE2	2.14	0.48
1:A:193:LYS:HG3	1:A:850:PHE:CG	2.49	0.48
1:A:547:ASP:OD1	1:A:676:ARG:NH2	2.46	0.48
1:B:420:LEU:HD21	1:B:512:ARG:HB3	1.95	0.48
1:D:497:SER:HB2	1:D:762:ALA:HB2	1.95	0.48
1:C:425:HIS:H	1:C:455:ASN:HD21	1.61	0.48
1:C:136:GLN:NE2	1:C:138:ALA:HB3	2.25	0.48
1:C:225:SER:O	1:C:332:PRO:HA	2.14	0.48
1:C:584:GLU:OE1	1:C:738:ASN:ND2	2.46	0.47
1:C:811:ASN:O	1:C:811:ASN:CG	2.57	0.47
1:D:333:GLU:CB	1:D:334:PRO:CD	2.92	0.47
1:D:425:HIS:N	1:D:455:ASN:HD21	2.11	0.47
1:D:800:LEU:O	1:D:803:VAL:HB	2.14	0.47
1:B:580:HIS:HB2	1:B:745:PHE:CE2	2.49	0.47
1:C:92:ASP:HA	1:C:830:ILE:HB	1.96	0.47
1:C:802:LYS:O	1:C:806:THR:HG23	2.14	0.47
1:A:289:TYR:OH	1:A:343:LYS:HE3	2.15	0.47
1:B:528:LYS:HG3	1:B:529:PRO:HD3	1.97	0.47
1:C:606:ARG:O	1:C:610:ILE:HD13	2.15	0.47
1:C:166:LEU:HD21	1:D:155:ILE:HG12	1.97	0.47
1:B:293:HIS:O	1:B:326:LYS:HD2	2.14	0.47
1:B:541:THR:OG1	1:B:542:ASP:N	2.43	0.47
1:C:765:ALA:HB1	1:C:768:GLN:HG2	1.96	0.47
1:C:666:LYS:HD2	1:C:672:ALA:HB2	1.97	0.47
1:C:767:LEU:O	1:C:771:LEU:HB2	2.14	0.47
1:D:545:THR:HG23	1:D:546:PHE:CD2	2.50	0.47
1:A:821:PHE:HA	1:A:822:PRO:C	2.40	0.47
1:C:564:ILE:HD13	1:C:590:ALA:HB2	1.97	0.47
1:C:610:ILE:N	1:C:610:ILE:HD12	2.30	0.47
1:A:756:ALA:O	1:A:779:CYS:HA	2.15	0.47
1:B:758:VAL:CG2	1:B:781:ILE:HA	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:92:ASP:HA	1:D:830:ILE:HB	1.96	0.47
1:B:642:CYS:HB2	1:B:650:THR:CG2	2.44	0.46
1:C:128:LEU:O	1:C:129:GLY:C	2.57	0.46
1:C:821:PHE:HA	1:C:822:PRO:C	2.41	0.46
1:D:506:MET:HE2	1:D:763:PRO:CG	2.45	0.46
1:C:50:ARG:HD3	1:C:209:ASP:O	2.15	0.46
1:A:293:HIS:CD2	1:A:295:THR:HG23	2.50	0.46
1:C:343:LYS:C	1:C:343:LYS:HD2	2.41	0.46
1:D:56:ASP:OD1	1:D:58:SER:N	2.41	0.46
1:A:47:LEU:HD22	1:A:197:SER:HB3	1.98	0.46
1:C:333:GLU:CB	1:C:334:PRO:CD	2.93	0.46
1:A:497:SER:HB2	1:A:762:ALA:HB2	1.98	0.46
1:D:165:LEU:HD22	1:D:392:SER:HB2	1.97	0.46
1:A:453:MET:HE2	1:A:823:ALA:HB2	1.98	0.46
1:C:127:LEU:C	1:C:127:LEU:CD1	2.87	0.45
1:C:594:LEU:HB3	1:C:599:ALA:HB2	1.98	0.45
3:D:903:CO8:N3A	3:D:903:CO8:H2B	2.31	0.45
1:D:296:GLY:HA2	1:D:301:ASP:OD2	2.16	0.45
1:D:511:MET:HE3	1:D:517:ARG:HG3	1.97	0.45
1:A:13:LEU:HD13	1:A:22:PHE:CD2	2.51	0.45
1:B:715:THR:HA	1:B:744:LEU:HD23	1.99	0.45
1:D:265:SER:OG	1:D:268:VAL:HG23	2.17	0.45
1:B:277:TYR:CE1	1:B:403:ILE:HD11	2.50	0.45
1:B:698:LEU:HD13	1:B:735:ASN:HD21	1.82	0.45
1:D:13:LEU:HD13	1:D:22:PHE:CD2	2.51	0.45
1:A:490:ARG:NH2	1:A:780:THR:OG1	2.43	0.45
1:A:622:ALA:O	1:A:672:ALA:HA	2.17	0.45
1:C:410:GLN:O	1:C:412:PRO:HD3	2.17	0.45
1:C:431:LEU:HD21	1:C:435:GLN:HE22	1.81	0.45
1:B:333:GLU:HB2	1:B:334:PRO:HD2	1.97	0.45
1:B:494:PHE:CE2	1:B:574:PRO:HG3	2.52	0.45
1:D:60:PHE:HA	1:D:84:GLU:OE2	2.17	0.45
1:B:687:MET:O	1:B:689:GLY:N	2.50	0.44
1:C:483:GLN:HE21	1:C:805:LEU:CD2	2.30	0.44
1:D:549:ILE:HD12	1:D:680:LEU:HD22	1.99	0.44
1:B:309:THR:O	1:B:313:CYS:HB2	2.17	0.44
1:C:633:ARG:O	1:C:661:PHE:CZ	2.70	0.44
1:D:593:CYS:O	1:D:706:ARG:HD2	2.16	0.44
1:A:489:LYS:HE3	1:A:489:LYS:HA	1.98	0.44
1:A:627:TRP:HB2	1:A:643:HIS:NE2	2.33	0.44
1:A:680:LEU:HD22	1:A:687:MET:HE1	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:582:LEU:O	1:B:583:GLY:C	2.60	0.44
1:B:635:PRO:HD2	1:B:661:PHE:CE2	2.52	0.44
1:B:333:GLU:CB	1:B:334:PRO:CD	2.96	0.44
1:A:852:ASN:C	1:A:852:ASN:HD22	2.25	0.44
1:B:361:ASN:HD22	1:B:361:ASN:N	2.14	0.44
1:B:553:PHE:O	1:B:582:LEU:HD21	2.18	0.44
1:B:800:LEU:HD22	1:B:810:VAL:HG11	1.99	0.44
1:C:605:TRP:HA	1:C:605:TRP:CE3	2.53	0.44
1:D:667:GLN:HA	1:D:667:GLN:HE21	1.83	0.44
1:A:78:GLN:HB3	1:A:188:ILE:HD12	1.99	0.44
1:A:396:GLY:HA3	1:B:142:ASN:HD22	1.83	0.44
1:A:417:HIS:O	1:A:420:LEU:HD22	2.18	0.44
1:A:290:ILE:HG23	1:A:322:ILE:HG13	2.00	0.43
1:B:549:ILE:O	1:B:553:PHE:HB2	2.17	0.43
1:B:681:ALA:O	1:B:687:MET:HE3	2.18	0.43
1:B:800:LEU:HD23	1:B:800:LEU:HA	1.83	0.43
1:C:86:SER:HB3	1:C:184:LEU:HD21	1.99	0.43
1:C:652:SER:OG	1:C:681:ALA:HB1	2.18	0.43
1:C:744:LEU:HD12	1:C:747:GLU:HG2	2.00	0.43
1:B:432:GLU:H	1:B:432:GLU:CD	2.24	0.43
1:C:4:VAL:HG22	1:C:175:ILE:HG22	2.01	0.43
1:B:608:GLN:HA	1:B:608:GLN:NE2	2.31	0.43
1:D:12:LYS:C	1:D:13:LEU:HG	2.41	0.43
1:D:648:THR:OG1	3:D:903:CO8:N1A	2.47	0.43
1:B:157:LEU:HD13	1:B:166:LEU:HD23	1.99	0.43
1:B:560:GLN:HG2	1:B:761:ILE:HG22	2.01	0.43
1:A:252:ASN:ND2	1:A:272:LEU:HB2	2.33	0.43
1:D:301:ASP:HB2	1:D:302:PRO:HD3	2.01	0.43
1:D:628:GLU:HA	1:D:628:GLU:OE1	2.18	0.43
1:A:487:THR:HG22	1:A:488:ASN:N	2.34	0.43
1:C:548:ASP:O	1:C:551:HIS:N	2.52	0.43
1:C:630:CYS:SG	1:C:640:PRO:HG3	2.59	0.43
1:D:13:LEU:HD13	1:D:22:PHE:CE2	2.53	0.43
1:B:78:GLN:HG3	1:B:190:LEU:HD12	2.00	0.43
1:C:524:ASP:OD1	1:C:534:VAL:HG22	2.19	0.43
1:D:453:MET:HE2	1:D:823:ALA:HB2	2.00	0.43
1:B:523:SER:OG	1:B:561:ILE:HD11	2.19	0.43
1:B:741:SER:HB3	1:B:742:PRO:HD2	2.00	0.43
1:B:831:SER:N	1:B:832:PRO:CD	2.82	0.43
1:C:644:ASN:HB2	1:C:648:THR:O	2.19	0.43
1:D:105:THR:HA	1:D:182:ALA:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:278:GLN:HB2	1:D:279:PRO:HD3	2.01	0.42
1:A:534:VAL:O	1:A:538:LEU:HG	2.18	0.42
1:B:425:HIS:CE1	1:B:812:PRO:HD3	2.54	0.42
1:C:610:ILE:N	1:C:610:ILE:CD1	2.82	0.42
1:C:831:SER:N	1:C:832:PRO:CD	2.81	0.42
1:C:677:THR:O	1:C:677:THR:OG1	2.35	0.42
1:D:493:TRP:CD2	1:D:576:GLY:HA3	2.54	0.42
1:A:60:PHE:O	1:A:62:ALA:N	2.53	0.42
1:C:33:VAL:CG1	1:C:50:ARG:HB3	2.49	0.42
1:C:551:HIS:O	1:C:554:VAL:HG12	2.19	0.42
1:A:831:SER:N	1:A:832:PRO:CD	2.82	0.42
1:B:62:ALA:HB1	1:B:67:VAL:O	2.19	0.42
1:B:86:SER:HB3	1:B:184:LEU:HD21	2.00	0.42
1:B:470:TYR:CE1	1:B:481:GLU:HB2	2.54	0.42
1:A:621:ALA:HA	1:A:674:GLU:HA	2.01	0.42
1:B:359:PHE:CZ	1:B:376:VAL:HG21	2.55	0.42
1:B:635:PRO:O	1:B:638:VAL:HG12	2.20	0.42
1:C:333:GLU:HB2	1:C:334:PRO:HD2	2.01	0.42
1:C:702:ILE:HG22	1:C:705:PRO:HG3	2.01	0.42
1:D:691:ALA:HB3	1:D:692:PRO:CD	2.49	0.42
1:D:513:LEU:O	1:D:514:ASP:C	2.63	0.42
1:A:225:SER:O	1:A:332:PRO:HA	2.19	0.42
1:A:485:VAL:CG1	1:A:486:SER:H	2.33	0.42
1:C:112:SER:HB3	2:C:901:OCA:H61	2.02	0.42
1:C:251:THR:HA	1:C:399:ASN:O	2.20	0.42
1:A:92:ASP:HA	1:A:830:ILE:HB	2.01	0.41
1:C:615:LEU:HD21	1:C:686:PHE:CD2	2.55	0.41
1:D:437:LEU:HD22	1:D:454:LEU:HD22	2.02	0.41
1:B:65:PHE:O	1:B:67:VAL:HG23	2.19	0.41
1:B:321:LEU:HD23	1:B:375:GLN:HB3	2.02	0.41
1:D:559:ILE:HG21	1:D:763:PRO:HB3	2.02	0.41
1:C:296:GLY:HA2	1:C:301:ASP:OD2	2.20	0.41
1:C:659:ASN:CA	1:C:662:VAL:HG22	2.50	0.41
1:D:500:GLY:O	1:D:766:LEU:HD22	2.20	0.41
1:D:641:ALA:HB1	2:D:902:OCA:C5	2.51	0.41
1:B:87:TYR:CE1	1:B:97:PRO:HG2	2.55	0.41
1:D:83:LEU:HD23	1:D:144:LEU:HD12	2.03	0.41
1:D:225:SER:O	1:D:332:PRO:HA	2.20	0.41
1:A:431:LEU:HD12	1:A:482:VAL:HG11	2.02	0.41
1:A:627:TRP:CZ3	1:A:643:HIS:HB2	2.56	0.41
1:C:497:SER:HB2	1:C:762:ALA:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:759:LEU:HD23	1:C:782:ILE:HB	2.02	0.41
1:A:800:LEU:HA	1:A:800:LEU:HD23	1.81	0.41
1:C:106:GLY:O	1:C:183:ALA:HA	2.20	0.41
1:C:437:LEU:HD22	1:C:454:LEU:HD22	2.02	0.41
1:C:583:GLY:O	1:C:586:ALA:N	2.52	0.41
1:C:726:LEU:HD21	1:C:737:ASN:OD1	2.21	0.41
1:D:299:VAL:O	1:D:303:GLN:HG2	2.20	0.41
1:A:627:TRP:HB2	1:A:643:HIS:CE1	2.55	0.41
1:B:528:LYS:H	1:B:529:PRO:CD	2.33	0.41
1:D:501:THR:HG22	1:D:766:LEU:HB2	2.03	0.41
1:D:561:ILE:HG21	1:D:596:GLN:HG3	2.03	0.41
1:D:254:ASP:HA	1:D:268:VAL:HG11	2.03	0.41
1:D:642:CYS:HB2	1:D:650:THR:HB	2.02	0.41
1:D:752:ILE:HA	1:D:753:PRO:HD3	1.89	0.41
1:A:719:GLU:HA	1:A:722:TRP:CE2	2.56	0.41
1:D:31:ASP:OD2	1:D:50:ARG:NH2	2.48	0.41
1:D:33:VAL:CG1	1:D:50:ARG:HB3	2.51	0.41
1:C:425:HIS:CE1	1:C:812:PRO:HG3	2.56	0.40
1:D:302:PRO:HG3	1:D:363:ASN:ND2	2.36	0.40
1:D:421:PRO:HB2	1:D:797:LEU:HD12	2.02	0.40
1:A:424:LEU:CD2	1:A:441:GLY:HA3	2.51	0.40
1:A:530:LEU:HG	1:A:604:TYR:CE2	2.56	0.40
1:D:51:SER:HA	1:D:223:CYS:SG	2.60	0.40
1:A:652:SER:HB2	1:A:681:ALA:HB1	2.03	0.40
1:C:745:PHE:CZ	1:C:767:LEU:HD23	2.57	0.40
1:D:47:LEU:HD22	1:D:197:SER:HB3	2.02	0.40
1:D:549:ILE:CD1	1:D:680:LEU:HD22	2.52	0.40
1:C:585:VAL:HG13	1:C:586:ALA:N	2.36	0.40
1:D:169:GLN:HE21	1:D:173:GLN:HE21	1.69	0.40
1:D:493:TRP:CD2	1:D:752:ILE:HG12	2.56	0.40
1:D:585:VAL:HG12	1:D:599:ALA:HB1	2.02	0.40
1:A:609:CYS:O	1:A:690:ILE:HD11	2.22	0.40
1:A:644:ASN:HD22	1:A:648:THR:HG22	1.86	0.40
1:C:289:TYR:OH	1:C:323:GLY:HA3	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	850/852 (100%)	792 (93%)	52 (6%)	6 (1%)	18	41
1	B	823/852 (97%)	729 (89%)	74 (9%)	20 (2%)	4	12
1	C	841/852 (99%)	727 (86%)	100 (12%)	14 (2%)	7	19
1	D	850/852 (100%)	806 (95%)	36 (4%)	8 (1%)	14	35
All	All	3364/3408 (99%)	3054 (91%)	262 (8%)	48 (1%)	9	23

All (48) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	333	GLU
1	A	487	THR
1	A	668	GLU
1	B	333	GLU
1	B	614	HIS
1	B	638	VAL
1	B	658	VAL
1	B	659	ASN
1	C	333	GLU
1	C	419	ALA
1	C	677	THR
1	D	333	GLU
1	D	514	ASP
1	D	789	HIS
1	A	779	CYS
1	B	548	ASP
1	B	583	GLY
1	B	657	ALA
1	B	688	GLU
1	B	690	ILE
1	C	541	THR
1	D	294	GLY

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Mol	Chain	Res	Type
1	D	673	LYS
1	B	633	ARG
1	C	584	GLU
1	C	644	ASN
1	A	217	ASP
1	B	607	GLY
1	B	718	PRO
1	C	617	PRO
1	D	581	SER
1	B	60	PHE
1	B	647	ASP
1	B	774	GLY
1	C	129	GLY
1	C	411	ALA
1	C	551	HIS
1	C	614	HIS
1	D	513	LEU
1	D	644	ASN
1	B	529	PRO
1	B	613	ALA
1	C	507	GLY
1	A	635	PRO
1	C	482	VAL
1	C	549	ILE
1	B	531	GLY
1	B	527	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	702/702 (100%)	663 (94%)	39 (6%)	19	44
1	B	679/702 (97%)	616 (91%)	63 (9%)	8	21
1	C	693/702 (99%)	637 (92%)	56 (8%)	11	27
1	D	702/702 (100%)	657 (94%)	45 (6%)	16	38

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	2776/2808 (99%)	2573 (93%)	203 (7%)	13	32

All (203) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	122	ARG
1	A	144	LEU
1	A	157	LEU
1	A	176	ARG
1	A	195	ASN
1	A	231	VAL
1	A	236	LYS
1	A	256	SER
1	A	271	GLN
1	A	298	LYS
1	A	343	LYS
1	A	357	LEU
1	A	395	PHE
1	A	398	SER
1	A	415	THR
1	A	471	THR
1	A	473	LEU
1	A	487	THR
1	A	521	LEU
1	A	530	LEU
1	A	543	GLU
1	A	573	LYS
1	A	582	LEU
1	A	611	LYS
1	A	623	VAL
1	A	634	CYS
1	A	648	THR
1	A	658	VAL
1	A	664	GLN
1	A	668	GLU
1	A	671	PHE
1	A	674	GLU
1	A	693	THR
1	A	731	SER
1	A	771	LEU
1	A	772	LYS
1	A	777	SER

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Mol	Chain	Res	Type
1	A	781	ILE
1	A	852	ASN
1	B	56	ASP
1	B	117	SER
1	B	122	ARG
1	B	144	LEU
1	B	157	LEU
1	B	218	SER
1	B	231	VAL
1	B	256	SER
1	B	298	LYS
1	B	305	LEU
1	B	343	LYS
1	B	366	ILE
1	B	371	ASP
1	B	379	ARG
1	B	384	ARG
1	B	395	PHE
1	B	415	THR
1	B	417	HIS
1	B	452	SER
1	B	455	ASN
1	B	457	ILE
1	B	462	THR
1	B	479	VAL
1	B	480	GLN
1	B	502	GLN
1	B	510	LEU
1	B	530	LEU
1	B	533	LYS
1	B	536	ASP
1	B	537	LEU
1	B	542	ASP
1	B	556	LEU
1	B	606	ARG
1	B	608	GLN
1	B	615	LEU
1	B	625	LEU
1	B	626	SER
1	B	628	GLU
1	B	632	GLN
1	B	633	ARG

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Mol	Chain	Res	Type
1	B	634	CYS
1	B	651	ILE
1	B	655	GLN
1	B	665	LEU
1	B	667	GLN
1	B	680	LEU
1	B	690	ILE
1	B	693	THR
1	B	733	GLU
1	B	735	ASN
1	B	739	LEU
1	B	743	VAL
1	B	770	VAL
1	B	771	LEU
1	B	773	ARG
1	B	775	VAL
1	B	778	SER
1	B	781	ILE
1	B	790	LYS
1	B	808	ILE
1	B	810	VAL
1	B	831	SER
1	B	841	THR
1	C	1	SER
1	C	14	PRO
1	C	27	ILE
1	C	95	ILE
1	C	127	LEU
1	C	145	SER
1	C	195	ASN
1	C	238	LEU
1	C	256	SER
1	C	352	VAL
1	C	367	PRO
1	C	395	PHE
1	C	427	SER
1	C	431	LEU
1	C	435	GLN
1	C	462	THR
1	C	473	LEU
1	C	479	VAL
1	C	489	LYS

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Mol	Chain	Res	Type
1	C	523	SER
1	C	535	SER
1	C	539	LEU
1	C	545	THR
1	C	554	VAL
1	C	556	LEU
1	C	557	THR
1	C	578	ILE
1	C	596	GLN
1	C	611	LYS
1	C	619	SER
1	C	623	VAL
1	C	628	GLU
1	C	632	GLN
1	C	645	SER
1	C	646	GLU
1	C	648	THR
1	C	651	ILE
1	C	665	LEU
1	C	666	LYS
1	C	667	GLN
1	C	668	GLU
1	C	677	THR
1	C	690	ILE
1	C	695	LEU
1	C	698	LEU
1	C	706	ARG
1	C	721	GLN
1	C	744	LEU
1	C	746	GLN
1	C	751	HIS
1	C	766	LEU
1	C	771	LEU
1	C	776	LYS
1	C	777	SER
1	C	811	ASN
1	C	828	PRO
1	D	13	LEU
1	D	70	LYS
1	D	99	SER
1	D	104	ASN
1	D	114	SER

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Mol	Chain	Res	Type
1	D	144	LEU
1	D	145	SER
1	D	195	ASN
1	D	214	SER
1	D	238	LEU
1	D	256	SER
1	D	343	LYS
1	D	361	ASN
1	D	379	ARG
1	D	392	SER
1	D	395	PHE
1	D	398	SER
1	D	452	SER
1	D	482	VAL
1	D	485	VAL
1	D	486	SER
1	D	530	LEU
1	D	532	VAL
1	D	538	LEU
1	D	556	LEU
1	D	557	THR
1	D	595	SER
1	D	625	LEU
1	D	630	CYS
1	D	632	GLN
1	D	634	CYS
1	D	649	VAL
1	D	660	GLU
1	D	662	VAL
1	D	666	LYS
1	D	692	PRO
1	D	695	LEU
1	D	714	SER
1	D	721	GLN
1	D	725	SER
1	D	731	SER
1	D	738	ASN
1	D	777	SER
1	D	786	LYS
1	D	790	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (67) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	358	HIS
1	A	399	ASN
1	A	425	HIS
1	A	644	ASN
1	A	664	GLN
1	A	746	GLN
1	A	764	HIS
1	A	852	ASN
1	B	68	HIS
1	B	71	GLN
1	B	78	GLN
1	B	104	ASN
1	B	169	GLN
1	B	170	ASN
1	B	328	ASN
1	B	350	HIS
1	B	360	HIS
1	B	361	ASN
1	B	399	ASN
1	B	401	HIS
1	B	422	HIS
1	B	425	HIS
1	B	455	ASN
1	B	608	GLN
1	B	664	GLN
1	B	735	ASN
1	B	738	ASN
1	B	799	ASN
1	C	73	HIS
1	C	136	GLN
1	C	142	ASN
1	C	170	ASN
1	C	173	GLN
1	C	195	ASN
1	C	399	ASN
1	C	401	HIS
1	C	410	GLN
1	C	422	HIS
1	C	435	GLN
1	C	455	ASN
1	C	483	GLN
1	C	502	GLN
1	C	655	GLN

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Mol	Chain	Res	Type
1	C	721	GLN
1	C	735	ASN
1	C	737	ASN
1	C	746	GLN
1	C	755	HIS
1	C	799	ASN
1	C	804	HIS
1	D	78	GLN
1	D	104	ASN
1	D	142	ASN
1	D	169	GLN
1	D	199	GLN
1	D	293	HIS
1	D	328	ASN
1	D	350	HIS
1	D	358	HIS
1	D	361	ASN
1	D	401	HIS
1	D	422	HIS
1	D	455	ASN
1	D	483	GLN
1	D	608	GLN
1	D	667	GLN
1	D	768	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 oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

6 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	$\# Z > 2$
2	OCA	D	902	1	7,8,9	0.39	0	6,7,9	0.41	0
2	OCA	C	901	1	7,8,9	0.40	0	6,7,9	0.44	0
2	OCA	B	901	1	7,8,9	0.39	0	6,7,9	0.47	0
2	OCA	A	901	1	7,8,9	0.33	0	6,7,9	0.44	0
3	CO8	D	903	-	57,59,59	0.48	0	79,85,85	0.87	3 (3%)
2	OCA	D	901	1	7,8,9	0.48	0	6,7,9	0.28	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
2	OCA	D	902	1	-	4/6/6/7	-
2	OCA	C	901	1	-	2/6/6/7	-
2	OCA	B	901	1	-	3/6/6/7	-
2	OCA	A	901	1	-	4/6/6/7	-
3	CO8	D	903	-	-	27/58/74/74	0/3/3/3
2	OCA	D	901	1	-	4/6/6/7	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	903	CO8	P3B-O3B-C3B	-3.74	113.45	123.43
3	D	903	CO8	C7P-C6P-C5P	2.78	117.03	112.39
3	D	903	CO8	C7P-N8P-C9P	2.22	126.54	122.55

There are no chirality outliers.

All (44) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	901	OCA	O1-C1-C2-C3
2	C	901	OCA	O1-C1-C2-C3
2	D	901	OCA	O1-C1-C2-C3
3	D	903	CO8	C5B-O5B-P1A-O1A
3	D	903	CO8	C5B-O5B-P1A-O2A
3	D	903	CO8	C5B-O5B-P1A-O3A
3	D	903	CO8	CCP-O6A-P2A-O4A
3	D	903	CO8	N8P-C9P-CAP-OAP
3	D	903	CO8	CAP-C9P-N8P-C7P
3	D	903	CO8	O9P-C9P-N8P-C7P
3	D	903	CO8	S1P-C2P-C3P-N4P
3	D	903	CO8	C3P-C2P-S1P-C1'
3	D	903	CO8	C1'-C2'-C3'-C4'
3	D	903	CO8	O4B-C4B-C5B-O5B
3	D	903	CO8	C3B-C4B-C5B-O5B
2	A	901	OCA	C3-C4-C5-C6
2	D	901	OCA	C3-C4-C5-C6
2	D	901	OCA	C2-C3-C4-C5
3	D	903	CO8	O9P-C9P-CAP-OAP
3	D	903	CO8	C3'-C4'-C5'-C6'
2	A	901	OCA	C5-C6-C7-C8
3	D	903	CO8	O9P-C9P-CAP-CBP
3	D	903	CO8	N8P-C9P-CAP-CBP
2	C	901	OCA	C5-C6-C7-C8
2	A	901	OCA	C2-C3-C4-C5
3	D	903	CO8	S1P-C1'-C2'-C3'
3	D	903	CO8	O1'-C1'-C2'-C3'
2	D	902	OCA	C5-C6-C7-C8
3	D	903	CO8	P2A-O3A-P1A-O5B
2	D	902	OCA	C3-C4-C5-C6
2	D	902	OCA	C4-C5-C6-C7
2	D	902	OCA	C1-C2-C3-C4
3	D	903	CO8	CDP-CBP-CCP-O6A
2	D	901	OCA	C5-C6-C7-C8
3	D	903	CO8	O5P-C5P-N4P-C3P
3	D	903	CO8	OAP-CAP-CBP-CEP
3	D	903	CO8	C2B-C1B-N9A-C4A
2	B	901	OCA	C3-C4-C5-C6
3	D	903	CO8	C2B-C1B-N9A-C8A
3	D	903	CO8	O4B-C1B-N9A-C8A
3	D	903	CO8	OAP-CAP-CBP-CDP
2	B	901	OCA	C1-C2-C3-C4
2	B	901	OCA	C5-C6-C7-C8

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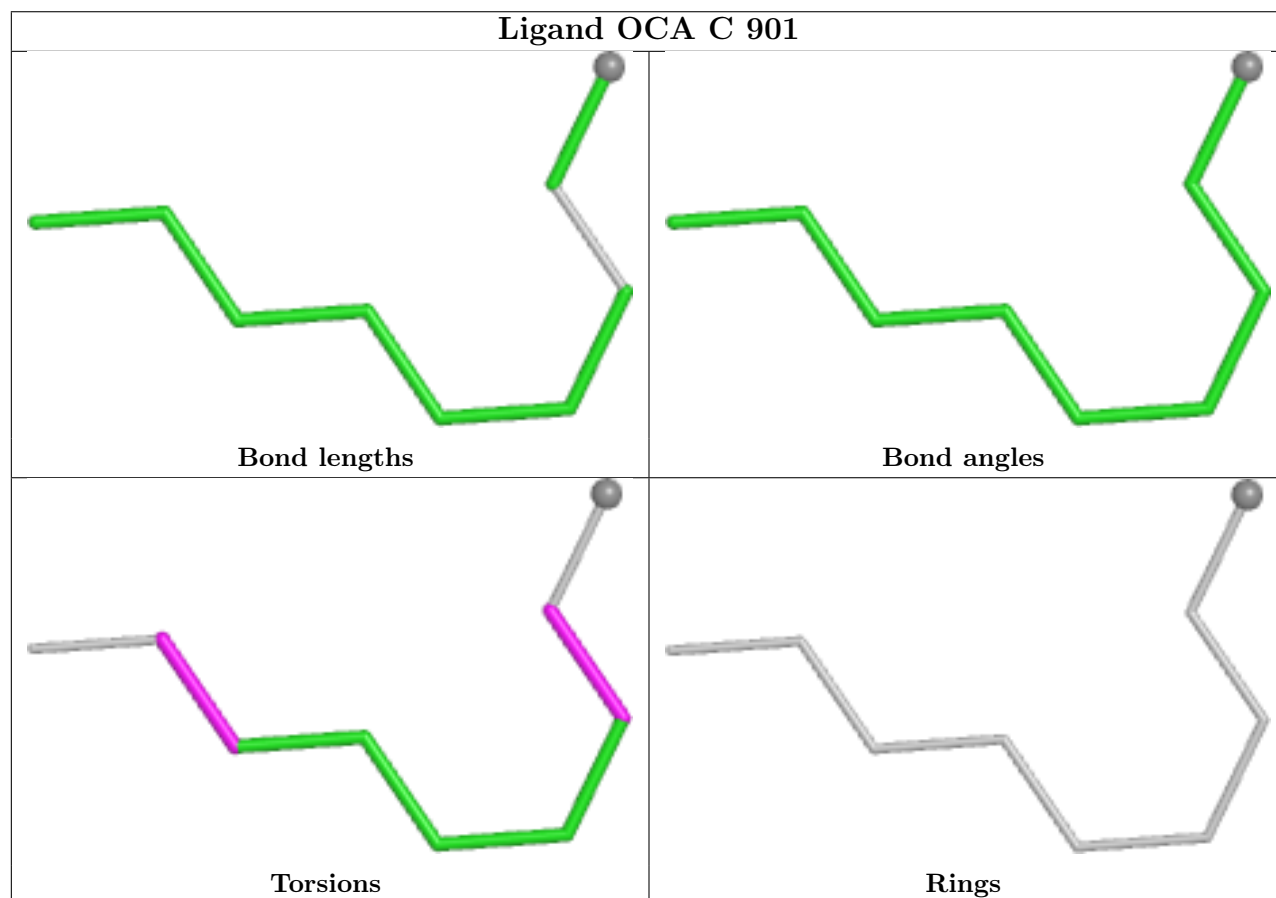
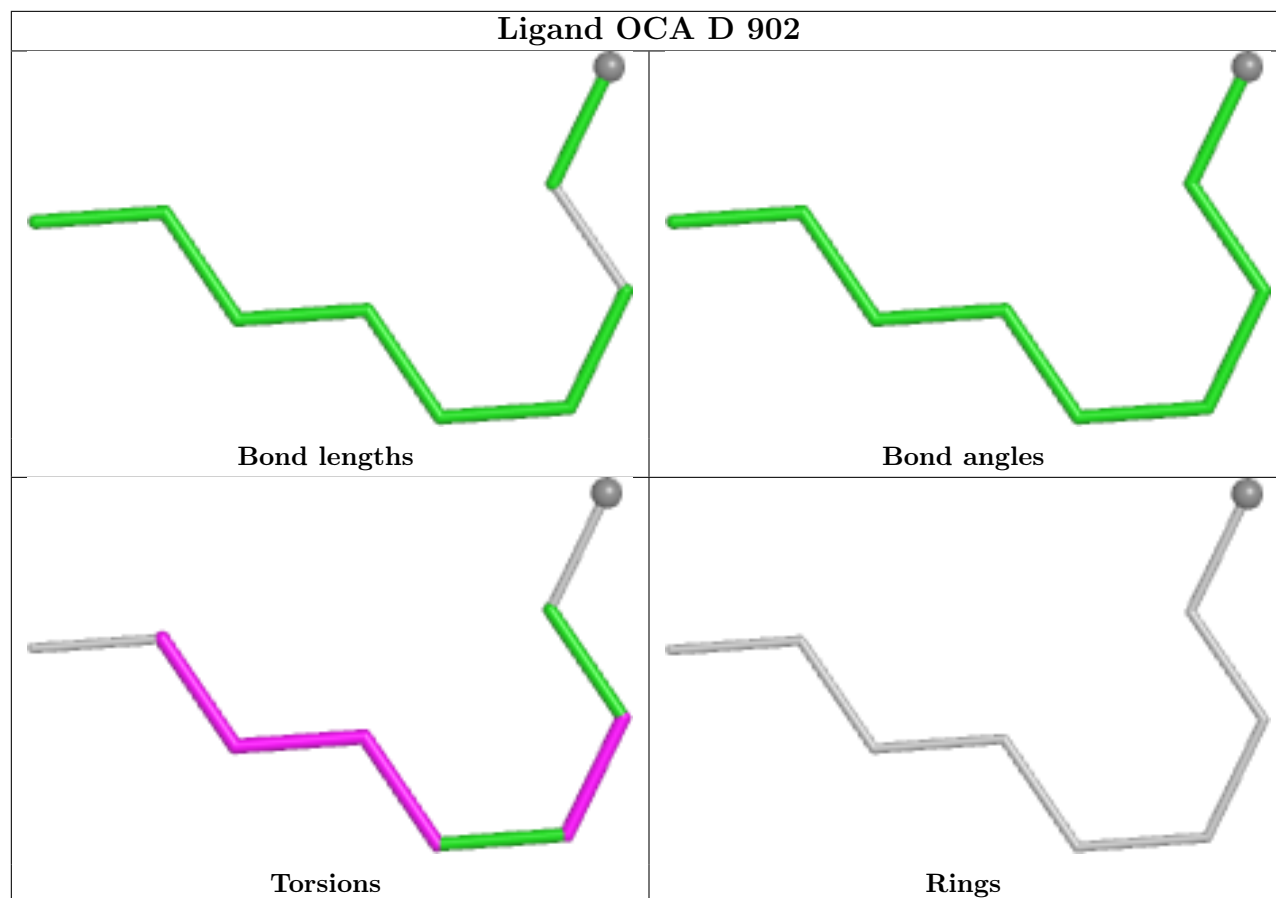
Mol	Chain	Res	Type	Atoms
3	D	903	CO8	C3B-O3B-P3B-O7A

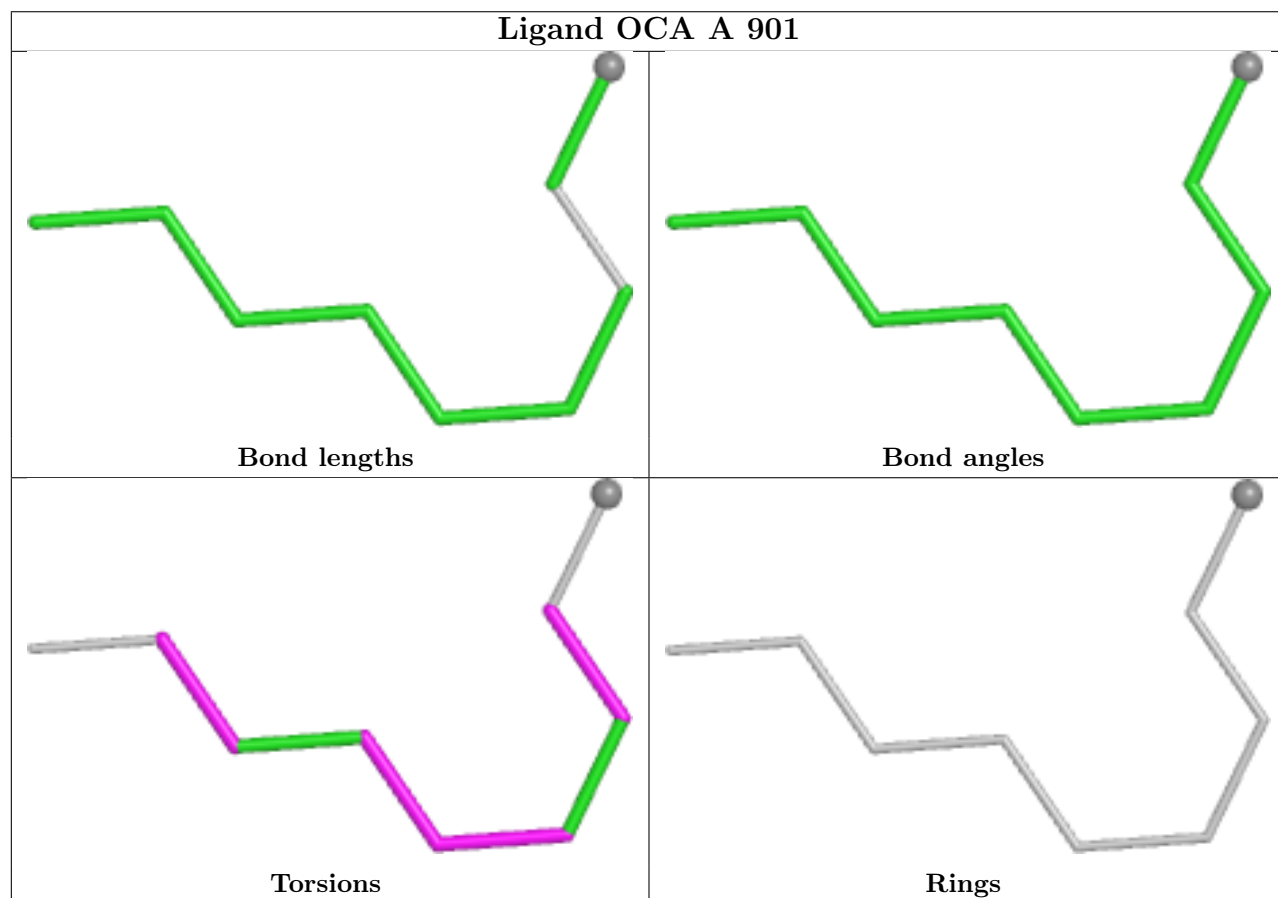
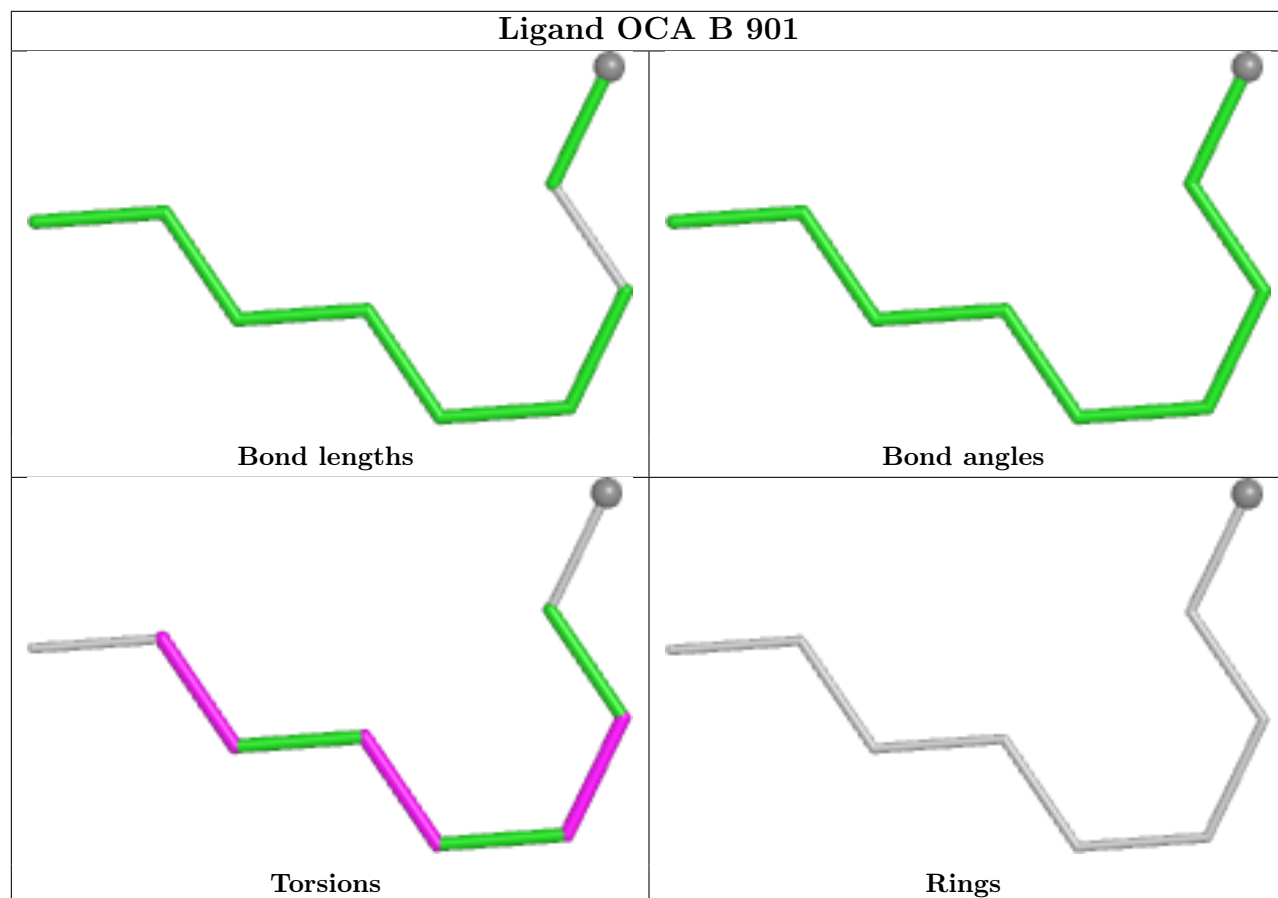
There are no ring outliers.

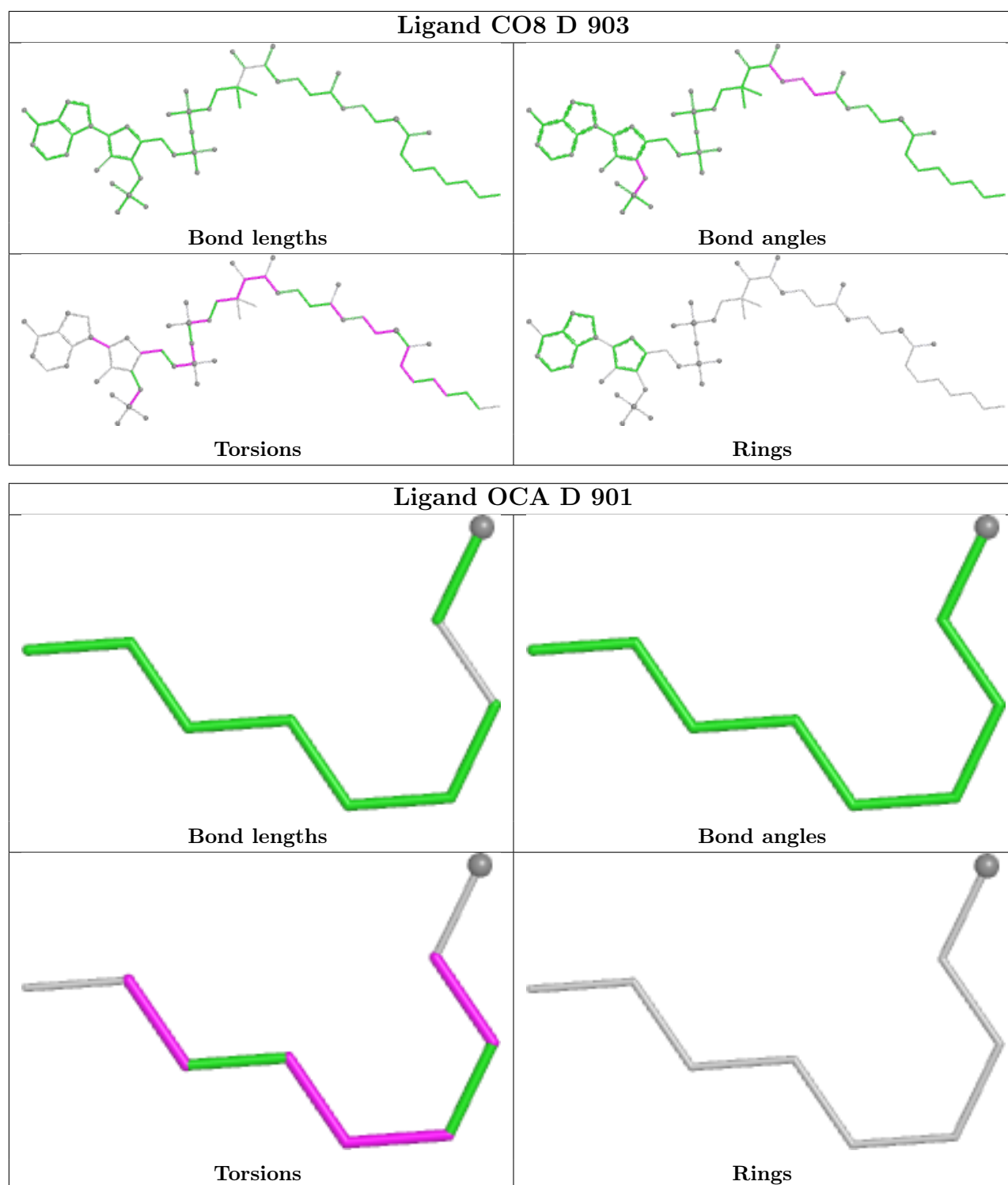
3 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	D	902	OCA	2	0
2	C	901	OCA	1	0
3	D	903	CO8	5	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 ⓘ

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	852/852 (100%)	-0.27	7 (0%) 82 81	43, 69, 118, 198	0
1	B	831/852 (97%)	0.15	38 (4%) 37 34	42, 73, 174, 212	0
1	C	847/852 (99%)	0.15	47 (5%) 30 27	45, 76, 173, 224	0
1	D	852/852 (100%)	-0.18	10 (1%) 76 75	45, 68, 121, 185	0
All	All	3382/3408 (99%)	-0.04	102 (3%) 52 49	42, 71, 161, 224	0

All (102) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	680	LEU	6.4
1	C	616	PRO	5.6
1	B	500	GLY	5.5
1	C	623	VAL	4.6
1	C	501	THR	4.5
1	A	416	ALA	4.3
1	C	532	VAL	4.3
1	C	682	PHE	4.2
1	C	546	PHE	4.2
1	B	416	ALA	4.1
1	C	418	ALA	4.0
1	C	506	MET	3.8
1	B	499	MET	3.8
1	B	662	VAL	3.7
1	C	657	ALA	3.7
1	B	532	VAL	3.5
1	B	648	THR	3.5
1	A	671	PHE	3.5
1	B	606	ARG	3.5
1	C	556	LEU	3.4
1	C	414	PRO	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	669	GLY	3.3
1	C	635	PRO	3.3
1	B	650	THR	3.3
1	B	654	PRO	3.3
1	C	638	VAL	3.3
1	B	686	PHE	3.2
1	C	412	PRO	3.2
1	C	640	PRO	3.2
1	B	601	LEU	3.2
1	B	698	LEU	3.2
1	C	617	PRO	3.1
1	B	625	LEU	3.1
1	C	680	LEU	3.1
1	C	735	ASN	3.1
1	C	726	LEU	3.0
1	B	656	ALA	3.0
1	B	695	LEU	3.0
1	C	419	ALA	2.9
1	C	601	LEU	2.9
1	B	651	ILE	2.9
1	C	621	ALA	2.9
1	C	732	ALA	2.9
1	C	622	ALA	2.8
1	D	418	ALA	2.8
1	B	682	PHE	2.8
1	B	617	PRO	2.8
1	D	417	HIS	2.8
1	B	736	VAL	2.8
1	B	418	ALA	2.7
1	B	612	ASP	2.7
1	B	691	ALA	2.7
1	C	672	ALA	2.7
1	C	615	LEU	2.7
1	B	616	PRO	2.7
1	C	625	LEU	2.7
1	C	552	ALA	2.6
1	D	539	LEU	2.6
1	B	732	ALA	2.6
1	C	671	PHE	2.6
1	D	99	SER	2.5
1	C	582	LEU	2.5
1	C	553	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	499	MET	2.5
1	C	539	LEU	2.5
1	C	750	TRP	2.5
1	B	685	TYR	2.5
1	B	640	PRO	2.4
1	C	705	PRO	2.4
1	B	661	PHE	2.4
1	A	750	TRP	2.4
1	D	582	LEU	2.4
1	D	528	LYS	2.4
1	C	701	VAL	2.4
1	A	417	HIS	2.3
1	B	757	VAL	2.3
1	B	710	ALA	2.3
1	B	745	PHE	2.3
1	B	549	ILE	2.3
1	A	670	VAL	2.3
1	B	553	PHE	2.3
1	C	416	ALA	2.2
1	C	502	GLN	2.2
1	A	582	LEU	2.2
1	C	695	LEU	2.2
1	C	642	CYS	2.2
1	D	670	VAL	2.2
1	D	395	PHE	2.2
1	D	738	ASN	2.2
1	C	694	LEU	2.2
1	C	411	ALA	2.1
1	D	416	ALA	2.1
1	B	728	ARG	2.1
1	B	508	LEU	2.1
1	B	735	ASN	2.1
1	B	618	GLY	2.1
1	C	686	PHE	2.1
1	C	654	PRO	2.1
1	C	504	ARG	2.0
1	C	603	ALA	2.0
1	C	702	ILE	2.0
1	A	573	LYS	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

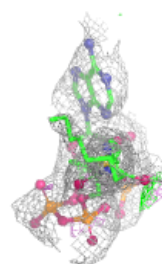
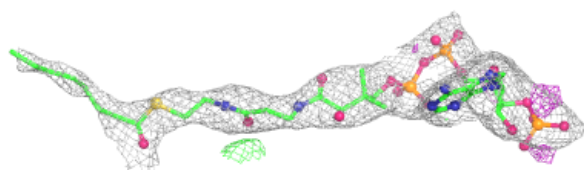
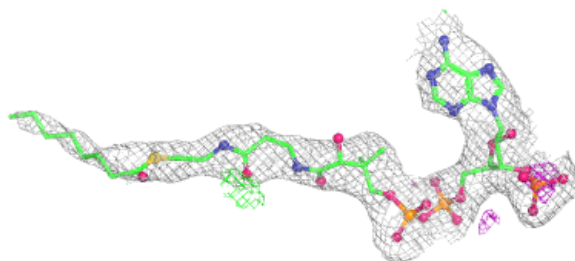
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
3	CO8	D	903	57/57	0.92	0.12	90,126,150,184	0
2	OCA	D	902	9/10	0.94	0.18	85,91,124,156	0
2	OCA	B	901	9/10	0.96	0.13	67,77,89,95	0
2	OCA	A	901	9/10	0.97	0.12	59,62,72,78	0
2	OCA	D	901	9/10	0.97	0.11	61,63,69,74	0
2	OCA	C	901	9/10	0.98	0.10	54,55,67,72	0

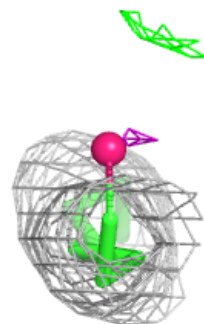
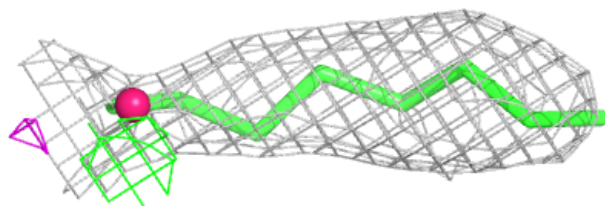
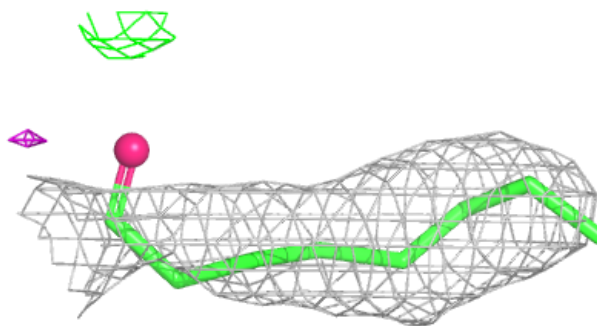
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around CO8 D 903:

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

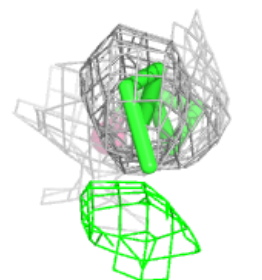
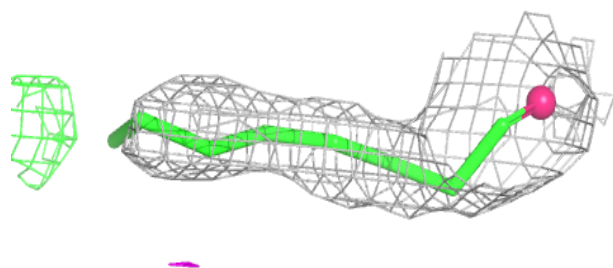
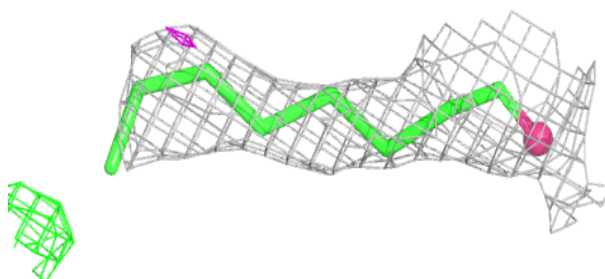
**Electron density around OCA D 902:**

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

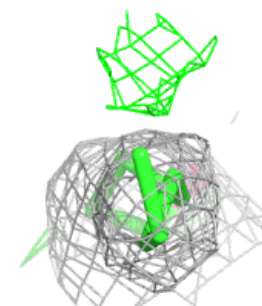
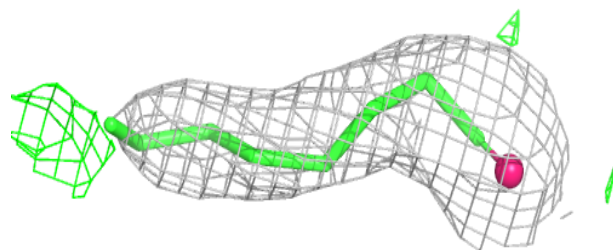
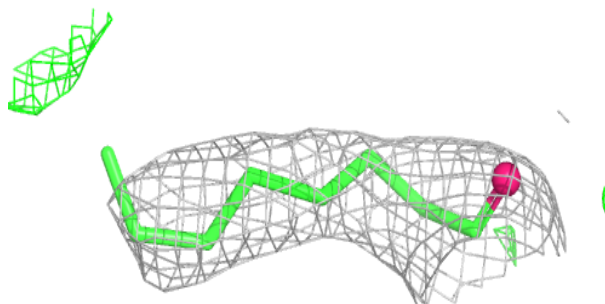


Electron density around OCA B 901:

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

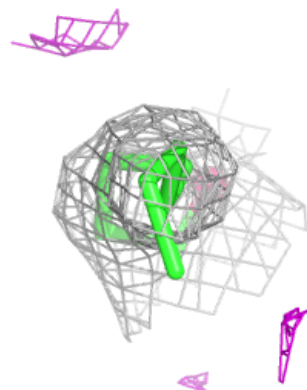
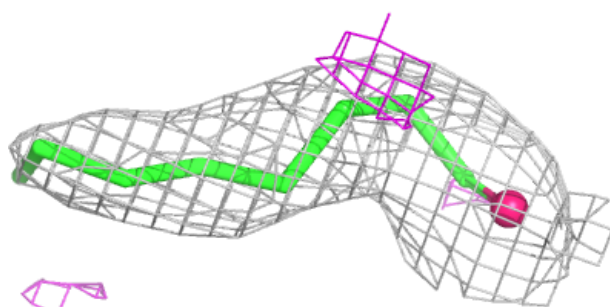
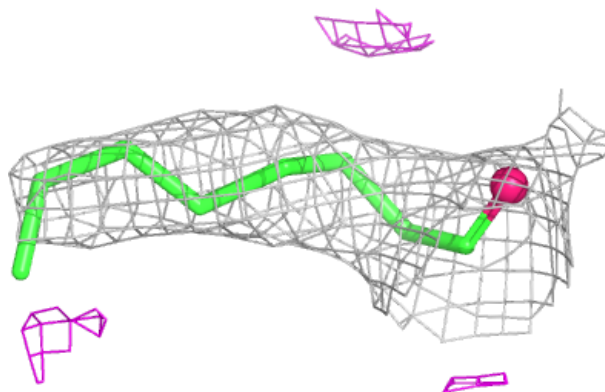
**Electron density around OCA A 901:**

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

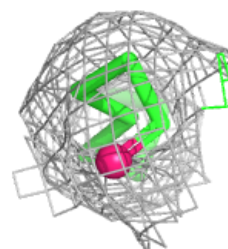
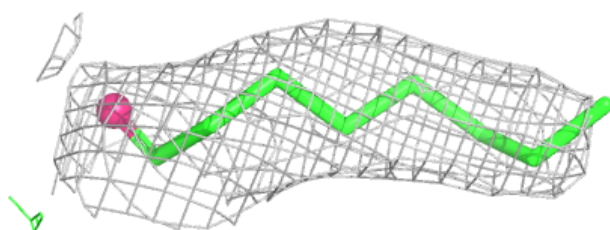
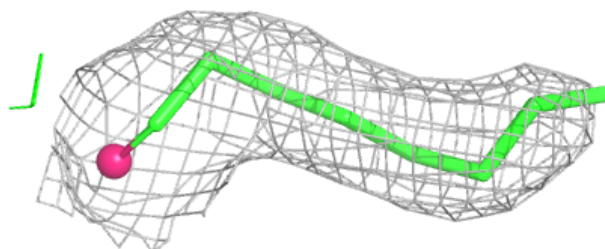


Electron density around OCA D 901:

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

**Electron density around OCA C 901:**

$2mF_o-DF_c$ (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.