



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2025 – 04:07 am BST

PDB ID : 6SMP / pdb_00006smp
Title : AntDE:AntF (holo): type II PKS acyl-carrier protein in complex with its ketosynthase bound to the hexaketide
Authors : Braeuer, A.; Zhou, Q.; Grammbitter, G.L.C.; Schmalhofer, M.; Ruehl, M.; Kaila, V.R.I.; Bode, H.; Groll, M.
Deposited on : 2019-08-22
Resolution : 2.90 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	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
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)	:	2.46

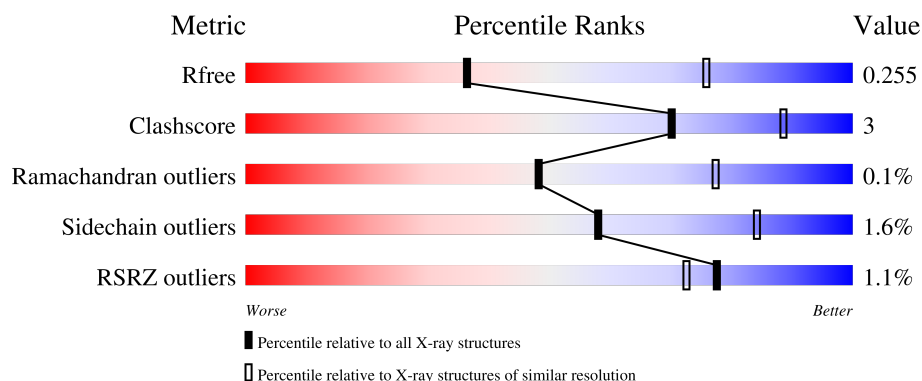
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 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}	164625	2335 (2.90-2.90)
Clashscore	180529	2564 (2.90-2.90)
Ramachandran outliers	177936	2514 (2.90-2.90)
Sidechain outliers	177891	2516 (2.90-2.90)
RSRZ outliers	164620	2337 (2.90-2.90)

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	97	71% 26%
1	D	97	4% 71% 26%
1	G	97	4% 72% 26%
1	J	97	4% 69% 26%

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Mol	Chain	Length	Quality of chain
2	B	443	86% 7% • 6%
2	E	443	84% 9% • 6%
2	H	443	2% 84% 8% • 7%
2	K	443	82% 9% • 8%
3	C	371	% 88% 6% 6%
3	F	371	% 89% • 6%
3	I	371	% 87% 6% 6%
3	L	371	% 87% 6% • 6%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 25701 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 Acyl carrier protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	72	Total	C	N	O	S	0	0	0
			569	362	88	117	2			
1	D	72	Total	C	N	O	S	0	0	0
			569	362	88	117	2			
1	G	72	Total	C	N	O	S	0	0	0
			569	362	88	117	2			
1	J	72	Total	C	N	O	S	0	0	0
			569	362	88	117	2			

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-14	GLY	-	expression tag	UNP A0A2S8QL96
A	-13	SER	-	expression tag	UNP A0A2S8QL96
A	-12	SER	-	expression tag	UNP A0A2S8QL96
A	-11	HIS	-	expression tag	UNP A0A2S8QL96
A	-10	HIS	-	expression tag	UNP A0A2S8QL96
A	-9	HIS	-	expression tag	UNP A0A2S8QL96
A	-8	HIS	-	expression tag	UNP A0A2S8QL96
A	-7	HIS	-	expression tag	UNP A0A2S8QL96
A	-6	HIS	-	expression tag	UNP A0A2S8QL96
A	-5	SER	-	expression tag	UNP A0A2S8QL96
A	-4	GLY	-	expression tag	UNP A0A2S8QL96
A	-3	ASP	-	expression tag	UNP A0A2S8QL96
A	-2	PRO	-	expression tag	UNP A0A2S8QL96
A	-1	ALA	-	expression tag	UNP A0A2S8QL96
A	0	SER	-	expression tag	UNP A0A2S8QL96
D	-14	GLY	-	expression tag	UNP A0A2S8QL96
D	-13	SER	-	expression tag	UNP A0A2S8QL96
D	-12	SER	-	expression tag	UNP A0A2S8QL96
D	-11	HIS	-	expression tag	UNP A0A2S8QL96
D	-10	HIS	-	expression tag	UNP A0A2S8QL96
D	-9	HIS	-	expression tag	UNP A0A2S8QL96

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-8	HIS	-	expression tag	UNP A0A2S8QL96
D	-7	HIS	-	expression tag	UNP A0A2S8QL96
D	-6	HIS	-	expression tag	UNP A0A2S8QL96
D	-5	SER	-	expression tag	UNP A0A2S8QL96
D	-4	GLY	-	expression tag	UNP A0A2S8QL96
D	-3	ASP	-	expression tag	UNP A0A2S8QL96
D	-2	PRO	-	expression tag	UNP A0A2S8QL96
D	-1	ALA	-	expression tag	UNP A0A2S8QL96
D	0	SER	-	expression tag	UNP A0A2S8QL96
G	-14	GLY	-	expression tag	UNP A0A2S8QL96
G	-13	SER	-	expression tag	UNP A0A2S8QL96
G	-12	SER	-	expression tag	UNP A0A2S8QL96
G	-11	HIS	-	expression tag	UNP A0A2S8QL96
G	-10	HIS	-	expression tag	UNP A0A2S8QL96
G	-9	HIS	-	expression tag	UNP A0A2S8QL96
G	-8	HIS	-	expression tag	UNP A0A2S8QL96
G	-7	HIS	-	expression tag	UNP A0A2S8QL96
G	-6	HIS	-	expression tag	UNP A0A2S8QL96
G	-5	SER	-	expression tag	UNP A0A2S8QL96
G	-4	GLY	-	expression tag	UNP A0A2S8QL96
G	-3	ASP	-	expression tag	UNP A0A2S8QL96
G	-2	PRO	-	expression tag	UNP A0A2S8QL96
G	-1	ALA	-	expression tag	UNP A0A2S8QL96
G	0	SER	-	expression tag	UNP A0A2S8QL96
J	-14	GLY	-	expression tag	UNP A0A2S8QL96
J	-13	SER	-	expression tag	UNP A0A2S8QL96
J	-12	SER	-	expression tag	UNP A0A2S8QL96
J	-11	HIS	-	expression tag	UNP A0A2S8QL96
J	-10	HIS	-	expression tag	UNP A0A2S8QL96
J	-9	HIS	-	expression tag	UNP A0A2S8QL96
J	-8	HIS	-	expression tag	UNP A0A2S8QL96
J	-7	HIS	-	expression tag	UNP A0A2S8QL96
J	-6	HIS	-	expression tag	UNP A0A2S8QL96
J	-5	SER	-	expression tag	UNP A0A2S8QL96
J	-4	GLY	-	expression tag	UNP A0A2S8QL96
J	-3	ASP	-	expression tag	UNP A0A2S8QL96
J	-2	PRO	-	expression tag	UNP A0A2S8QL96
J	-1	ALA	-	expression tag	UNP A0A2S8QL96
J	0	SER	-	expression tag	UNP A0A2S8QL96

- Molecule 2 is a protein called PKS_KS domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	417	Total 3127	C 1955	N 540	O 611	S 21	0	0	0
2	E	417	Total 3127	C 1955	N 540	O 611	S 21	0	0	0
2	H	413	Total 3094	C 1930	N 536	O 607	S 21	0	0	0
2	K	409	Total 3062	C 1913	N 531	O 597	S 21	0	0	0

There are 60 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	GLY	-	expression tag	UNP Q7MZT3
B	-13	SER	-	expression tag	UNP Q7MZT3
B	-12	SER	-	expression tag	UNP Q7MZT3
B	-11	HIS	-	expression tag	UNP Q7MZT3
B	-10	HIS	-	expression tag	UNP Q7MZT3
B	-9	HIS	-	expression tag	UNP Q7MZT3
B	-8	HIS	-	expression tag	UNP Q7MZT3
B	-7	HIS	-	expression tag	UNP Q7MZT3
B	-6	HIS	-	expression tag	UNP Q7MZT3
B	-5	SER	-	expression tag	UNP Q7MZT3
B	-4	GLY	-	expression tag	UNP Q7MZT3
B	-3	ASP	-	expression tag	UNP Q7MZT3
B	-2	PRO	-	expression tag	UNP Q7MZT3
B	-1	ALA	-	expression tag	UNP Q7MZT3
B	0	SER	-	expression tag	UNP Q7MZT3
E	-14	GLY	-	expression tag	UNP Q7MZT3
E	-13	SER	-	expression tag	UNP Q7MZT3
E	-12	SER	-	expression tag	UNP Q7MZT3
E	-11	HIS	-	expression tag	UNP Q7MZT3
E	-10	HIS	-	expression tag	UNP Q7MZT3
E	-9	HIS	-	expression tag	UNP Q7MZT3
E	-8	HIS	-	expression tag	UNP Q7MZT3
E	-7	HIS	-	expression tag	UNP Q7MZT3
E	-6	HIS	-	expression tag	UNP Q7MZT3
E	-5	SER	-	expression tag	UNP Q7MZT3
E	-4	GLY	-	expression tag	UNP Q7MZT3
E	-3	ASP	-	expression tag	UNP Q7MZT3
E	-2	PRO	-	expression tag	UNP Q7MZT3
E	-1	ALA	-	expression tag	UNP Q7MZT3
E	0	SER	-	expression tag	UNP Q7MZT3
H	-14	GLY	-	expression tag	UNP Q7MZT3

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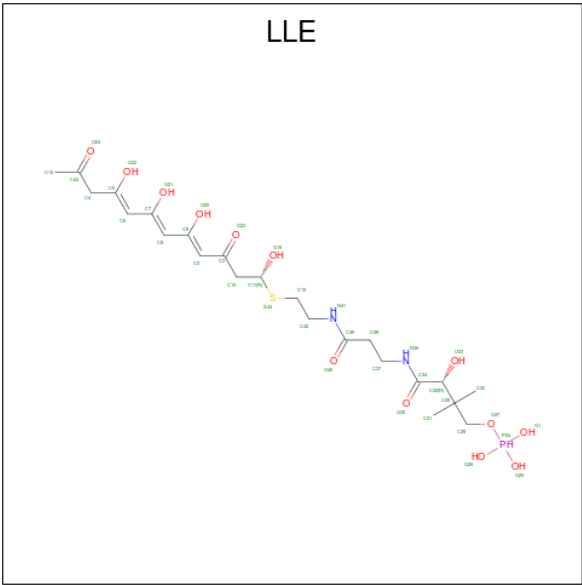
Chain	Residue	Modelled	Actual	Comment	Reference
H	-13	SER	-	expression tag	UNP Q7MZT3
H	-12	SER	-	expression tag	UNP Q7MZT3
H	-11	HIS	-	expression tag	UNP Q7MZT3
H	-10	HIS	-	expression tag	UNP Q7MZT3
H	-9	HIS	-	expression tag	UNP Q7MZT3
H	-8	HIS	-	expression tag	UNP Q7MZT3
H	-7	HIS	-	expression tag	UNP Q7MZT3
H	-6	HIS	-	expression tag	UNP Q7MZT3
H	-5	SER	-	expression tag	UNP Q7MZT3
H	-4	GLY	-	expression tag	UNP Q7MZT3
H	-3	ASP	-	expression tag	UNP Q7MZT3
H	-2	PRO	-	expression tag	UNP Q7MZT3
H	-1	ALA	-	expression tag	UNP Q7MZT3
H	0	SER	-	expression tag	UNP Q7MZT3
K	-14	GLY	-	expression tag	UNP Q7MZT3
K	-13	SER	-	expression tag	UNP Q7MZT3
K	-12	SER	-	expression tag	UNP Q7MZT3
K	-11	HIS	-	expression tag	UNP Q7MZT3
K	-10	HIS	-	expression tag	UNP Q7MZT3
K	-9	HIS	-	expression tag	UNP Q7MZT3
K	-8	HIS	-	expression tag	UNP Q7MZT3
K	-7	HIS	-	expression tag	UNP Q7MZT3
K	-6	HIS	-	expression tag	UNP Q7MZT3
K	-5	SER	-	expression tag	UNP Q7MZT3
K	-4	GLY	-	expression tag	UNP Q7MZT3
K	-3	ASP	-	expression tag	UNP Q7MZT3
K	-2	PRO	-	expression tag	UNP Q7MZT3
K	-1	ALA	-	expression tag	UNP Q7MZT3
K	0	SER	-	expression tag	UNP Q7MZT3

- Molecule 3 is a protein called Ketoacyl_synth_N domain-containing protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	349	Total	C	N	O	S	0	0	0
			2697	1705	459	524	9			
3	F	348	Total	C	N	O	S	0	0	0
			2693	1703	458	523	9			
3	I	348	Total	C	N	O	S	0	0	0
			2691	1702	458	522	9			
3	L	349	Total	C	N	O	S	0	0	0
			2697	1705	459	524	9			

- Molecule 4 is (2 {R})-3,3-dimethyl-2-oxidanyl- {N}-[3-oxidanylidene-3-[2-[(1 {R},4 {Z}),6

{Z},8 {Z})-1,5,7,9-tetrakis(oxidanyl)-3,11-bis(oxidanylidene)dodeca-4,6,8-trienyl]sulfany lethylamino]propyl]-4-[tris(oxidanyl)-\$l^{5}\$-phosphanyl]oxy-butanamide (CCD ID: LLE) (formula: C₂₃H₃₉N₂O₁₃PS).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	S	0	0
			39	23	2	12	1	1		
4	D	1	Total	C	N	O	P	S	0	0
			39	23	2	12	1	1		
4	G	1	Total	C	N	O	P	S	0	0
			39	23	2	12	1	1		
4	J	1	Total	C	N	O	P	S	0	0
			39	23	2	12	1	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	O	0	0
			1	1		
5	B	14	Total	O	0	0
			14	14		
5	C	6	Total	O	0	0
			6	6		
5	D	3	Total	O	0	0
			3	3		
5	E	17	Total	O	0	0
			17	17		
5	F	7	Total	O	0	0
			7	7		

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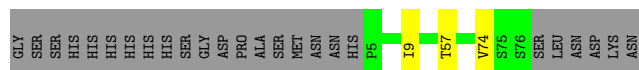
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	G	3	Total 3	O 3	0	0
5	H	8	Total 8	O 8	0	0
5	I	10	Total 10	O 10	0	0
5	J	1	Total 1	O 1	0	0
5	K	5	Total 5	O 5	0	0
5	L	6	Total 6	O 6	0	0

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.

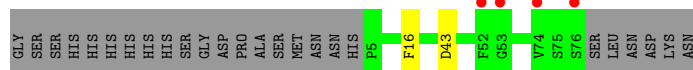
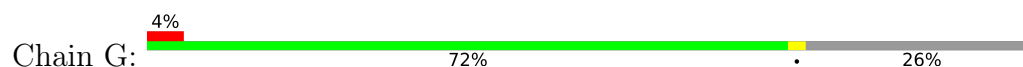
- Molecule 1: Acyl carrier protein



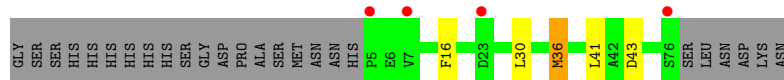
- Molecule 1: Acyl carrier protein



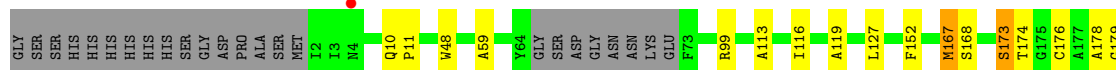
- Molecule 1: Acyl carrier protein



- Molecule 1: Acyl carrier protein



- Molecule 2: PKS KS domain-containing protein





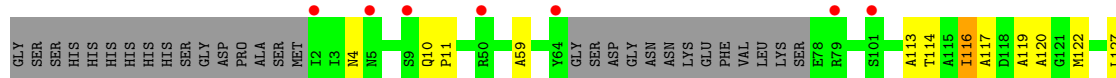
- Molecule 2: PKS_KS domain-containing protein

Chain E: 84% 9% • 6%



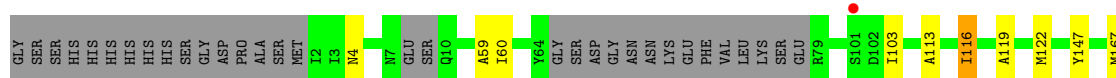
- Molecule 2: PKS_KS domain-containing protein

Chain H: 2% 84% 8% • 7%



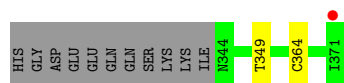
- Molecule 2: PKS_KS domain-containing protein

Chain K: 82% 9% • 8%

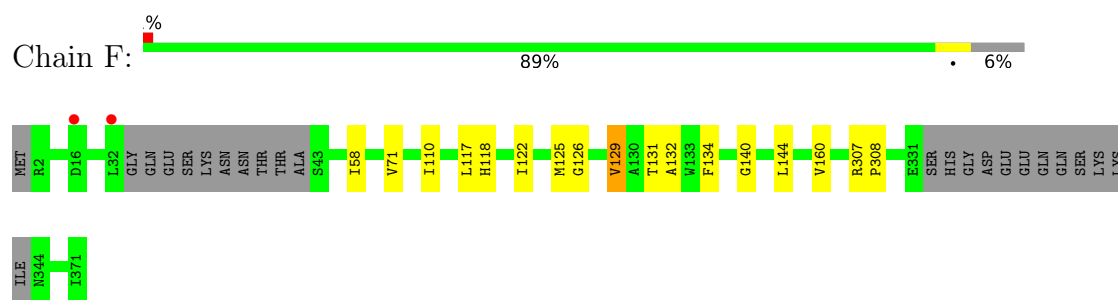


- Molecule 3: Ketoacyl_synth_N domain-containing protein

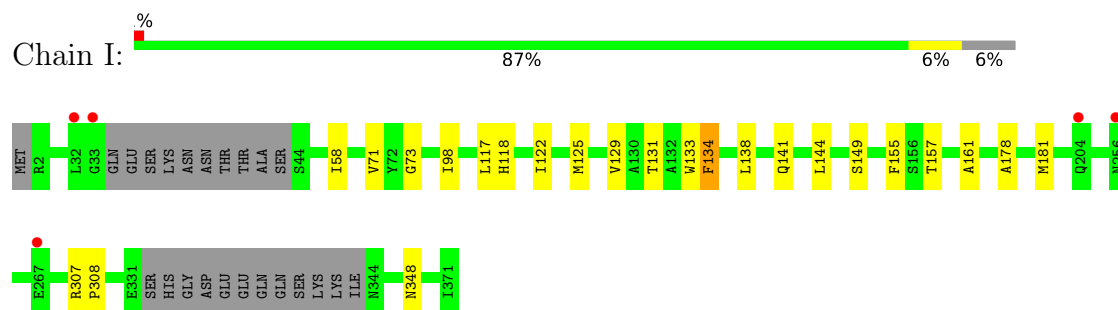
Chain C: 88% 6% 6%



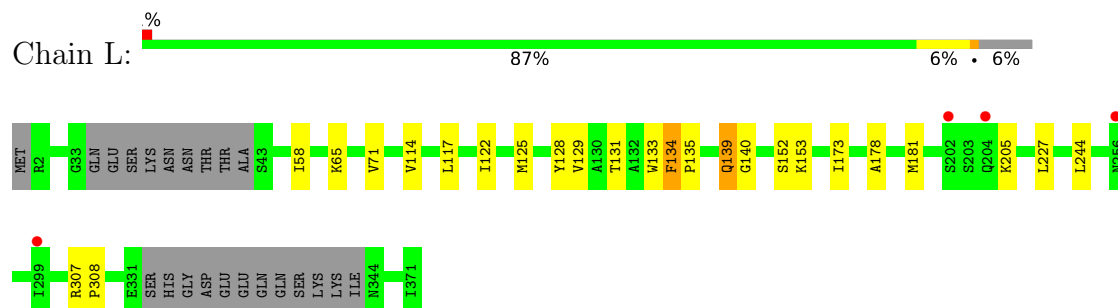
- Molecule 3: Ketoacyl_synth_N domain-containing protein



- Molecule 3: Ketoacyl_synth_N domain-containing protein



- Molecule 3: Ketoacyl synth N domain-containing protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	108.30Å 135.94Å 148.60Å 90.00° 97.14° 90.00°	Depositor
Resolution (Å)	15.00 – 2.90 15.00 – 2.90	Depositor EDS
% Data completeness (in resolution range)	97.2 (15.00-2.90) 97.2 (15.00-2.90)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.30 (at 2.91Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.222 , 0.258 0.219 , 0.255	Depositor DCC
R_{free} test set	4600 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	55.2	Xtriage
Anisotropy	0.476	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 46.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	25701	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.21% 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

5.1 Standard geometry

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

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	0/578	0.91	0/780
1	D	0.49	0/578	0.92	0/780
1	G	0.54	0/578	0.96	0/780
1	J	0.51	0/578	0.95	0/780
2	B	0.69	2/3183 (0.1%)	0.99	3/4306 (0.1%)
2	E	0.69	1/3183 (0.0%)	1.01	8/4306 (0.2%)
2	H	0.68	1/3149 (0.0%)	0.99	6/4261 (0.1%)
2	K	0.65	1/3116 (0.0%)	0.99	1/4215 (0.0%)
3	C	0.51	0/2744	0.88	0/3702
3	F	0.51	0/2740	0.88	2/3697 (0.1%)
3	I	0.57	1/2738 (0.0%)	0.91	0/3694
3	L	0.50	0/2744	0.88	0/3702
All	All	0.60	6/25909 (0.0%)	0.95	20/35003 (0.1%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	98	ILE	C-O	-6.78	1.16	1.24
2	B	173	SER	C-O	-6.15	1.16	1.24
2	E	356	LEU	C-O	-5.13	1.20	1.24
2	K	410	SER	C-O	-5.08	1.17	1.23
2	B	176	CYS	C-O	-5.04	1.17	1.24
2	H	410	SER	C-O	-5.03	1.18	1.23

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	243	PHE	CA-CB-CG	6.98	120.78	113.80
2	E	243	PHE	CA-CB-CG	6.78	120.58	113.80
3	F	134	PHE	CB-CA-C	6.31	119.49	109.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	360	ASN	CB-CA-C	-6.13	100.43	110.85
2	E	174	THR	CA-CB-OG1	-6.03	100.55	109.60
2	K	243	PHE	CA-CB-CG	5.79	119.59	113.80
2	H	120	ALA	CA-C-N	5.39	125.93	120.00
2	H	120	ALA	C-N-CA	5.39	125.93	120.00
2	E	120	ALA	CA-C-N	5.28	125.80	120.00
2	E	120	ALA	C-N-CA	5.28	125.80	120.00
2	B	319	SER	CA-C-N	5.25	131.58	121.54
2	B	319	SER	C-N-CA	5.25	131.58	121.54
2	E	283	MET	N-CA-C	-5.17	107.10	113.41
2	H	413	PHE	CA-C-N	5.15	131.37	121.54
2	H	413	PHE	C-N-CA	5.15	131.37	121.54
2	H	413	PHE	CA-C-O	-5.15	115.95	121.56
2	E	319	SER	CA-C-N	5.13	131.33	121.54
2	E	319	SER	C-N-CA	5.13	131.33	121.54
2	E	320	SER	N-CA-CB	5.11	119.13	110.49
3	F	132	ALA	N-CA-C	5.06	116.60	111.14

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	569	0	551	1	0
1	D	569	0	551	1	0
1	G	569	0	551	1	0
1	J	569	0	551	6	0
2	B	3127	0	3060	29	0
2	E	3127	0	3060	29	0
2	H	3094	0	3019	32	0
2	K	3062	0	2995	36	0
3	C	2697	0	2655	13	0
3	F	2693	0	2652	10	0
3	I	2691	0	2650	21	0
3	L	2697	0	2655	18	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	39	0	0	1	0
4	D	39	0	0	0	0
4	G	39	0	0	0	0
4	J	39	0	0	1	0
5	A	1	0	0	0	0
5	B	14	0	0	0	0
5	C	6	0	0	0	0
5	D	3	0	0	0	0
5	E	17	0	0	0	0
5	F	7	0	0	0	0
5	G	3	0	0	0	0
5	H	8	0	0	0	0
5	I	10	0	0	0	0
5	J	1	0	0	0	0
5	K	5	0	0	0	0
5	L	6	0	0	0	0
All	All	25701	0	24950	167	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 3.

All (167) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:174:THR:CG2	2:B:416:ILE:HD13	1.90	1.01
2:K:210:LEU:HD12	3:L:125:MET:HE1	1.53	0.89
2:B:174:THR:HG23	2:B:416:ILE:HD13	1.54	0.87
2:B:174:THR:HG23	2:B:416:ILE:CD1	2.06	0.86
2:E:210:LEU:HD12	2:E:210:LEU:O	1.77	0.83
2:H:116:ILE:HD11	2:H:206:PRO:HB3	1.61	0.82
2:B:174:THR:CG2	2:B:416:ILE:CD1	2.59	0.80
2:H:210:LEU:O	2:H:210:LEU:HD12	1.84	0.78
2:K:356:LEU:N	2:K:356:LEU:HD23	2.00	0.77
2:H:114:THR:HG21	2:H:117:ALA:HB2	1.67	0.75
2:H:127:LEU:HD11	3:I:118:HIS:NE2	2.02	0.75
2:E:114:THR:HG21	2:E:117:ALA:HB2	1.69	0.74
2:K:116:ILE:HG22	3:L:133:TRP:CZ3	2.26	0.70
2:K:119:ALA:HA	2:K:122:MET:HE3	1.73	0.70
3:I:138:LEU:O	3:I:138:LEU:HD12	1.91	0.70
2:H:119:ALA:HA	2:H:122:MET:HE3	1.76	0.67
2:H:10:GLN:HG3	2:H:11:PRO:HD2	1.78	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:127:LEU:HD21	3:I:118:HIS:CD2	2.31	0.65
2:H:278:ASN:HB2	3:I:149:SER:HA	1.77	0.65
2:K:282:HIS:ND1	2:K:285:ASP:HB2	2.13	0.64
3:I:117:LEU:HD22	3:I:125:MET:HE3	1.80	0.64
2:E:210:LEU:HD12	2:E:210:LEU:C	2.20	0.63
2:K:218:LEU:HD23	2:K:220:ALA:HB2	1.81	0.62
3:C:125:MET:HE2	3:C:129:VAL:HG21	1.82	0.61
2:B:116:ILE:HD12	2:B:119:ALA:HB3	1.82	0.61
2:K:116:ILE:HG22	3:L:133:TRP:HZ3	1.65	0.61
2:E:282:HIS:CG	2:E:285:ASP:HB2	2.36	0.61
2:E:59:ALA:HB2	2:E:229:GLN:HG3	1.82	0.60
2:E:215:PHE:HB3	2:E:221:LEU:HD13	1.84	0.59
1:J:16:PHE:CZ	1:J:43:ASP:OD1	2.55	0.59
2:E:116:ILE:HD12	2:E:119:ALA:HB3	1.84	0.59
2:B:174:THR:HG22	2:B:174:THR:O	2.01	0.59
2:K:233:THR:HG23	2:K:350:SER:HA	1.84	0.59
2:E:119:ALA:HA	2:E:122:MET:HE3	1.84	0.58
2:H:210:LEU:HD12	2:H:210:LEU:C	2.27	0.57
2:E:127:LEU:HD11	3:F:118:HIS:NE2	2.19	0.57
2:H:116:ILE:HG22	3:I:133:TRP:HZ3	1.70	0.57
2:K:116:ILE:HD11	2:K:206:PRO:HB3	1.88	0.56
2:B:233:THR:O	2:B:233:THR:HG23	2.07	0.55
2:E:344:PRO:HB2	2:E:394:ILE:HD11	1.89	0.55
1:G:16:PHE:HZ	1:G:43:ASP:HB3	1.71	0.55
2:H:335:VAL:HG13	2:H:336:LEU:HG	1.90	0.54
3:F:307:ARG:N	3:F:308:PRO:HD2	2.23	0.54
3:C:307:ARG:N	3:C:308:PRO:HD2	2.22	0.54
3:L:307:ARG:N	3:L:308:PRO:HD2	2.23	0.54
2:H:358:ALA:O	2:H:362:ILE:HG13	2.08	0.53
2:B:10:GLN:HG3	2:B:11:PRO:HD2	1.89	0.53
2:B:59:ALA:HB2	2:B:229:GLN:HG3	1.89	0.53
2:H:127:LEU:HD11	3:I:118:HIS:CD2	2.43	0.53
2:H:174:THR:HB	2:H:416:ILE:HD13	1.89	0.53
2:K:215:PHE:HB3	2:K:221:LEU:HG	1.90	0.53
2:H:282:HIS:ND1	2:H:285:ASP:HB2	2.24	0.53
2:E:233:THR:HG23	2:E:233:THR:O	2.08	0.53
1:A:9:ILE:HD11	1:A:74:VAL:HG11	1.91	0.53
2:K:344:PRO:HB2	2:K:394:ILE:HD11	1.91	0.53
2:K:356:LEU:HD23	2:K:356:LEU:H	1.72	0.52
2:K:210:LEU:CD1	3:L:125:MET:HE1	2.34	0.52
3:C:134:PHE:CE2	3:C:136:ALA:HB3	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:215:PHE:HB3	2:B:221:LEU:HD13	1.90	0.52
2:E:174:THR:HB	2:E:416:ILE:HD13	1.91	0.51
3:F:117:LEU:HD22	3:F:125:MET:HE3	1.91	0.51
1:J:16:PHE:CE2	1:J:43:ASP:OD1	2.63	0.51
2:K:282:HIS:ND1	2:K:285:ASP:CB	2.73	0.51
2:H:214:SER:HB3	3:I:129:VAL:HG12	1.92	0.51
2:K:179:GLY:H	2:K:360:ASN:HD22	1.59	0.51
2:B:174:THR:HG21	2:B:416:ILE:HD13	1.87	0.51
2:K:59:ALA:HB2	2:K:229:GLN:HG3	1.92	0.51
3:I:155:PHE:O	3:I:161:ALA:HB1	2.11	0.50
2:B:344:PRO:HB2	2:B:394:ILE:HD11	1.94	0.50
2:K:414:SER:HB3	3:L:140:GLY:HA3	1.92	0.50
2:H:10:GLN:HG3	2:H:11:PRO:CD	2.40	0.50
3:C:110:ILE:O	3:C:114:VAL:HG23	2.12	0.49
3:C:160:VAL:HG11	3:C:364:CYS:SG	2.52	0.49
2:E:282:HIS:CB	2:E:285:ASP:HB2	2.42	0.49
2:E:283:MET:HG2	3:F:144:LEU:HD11	1.94	0.49
3:I:141:GLN:HA	3:I:141:GLN:OE1	2.13	0.49
4:A:501:LLE:C13	2:B:210:LEU:HD13	2.43	0.48
1:J:30:LEU:HB3	1:J:36:MET:HE2	1.93	0.48
2:B:335:VAL:HG13	2:B:336:LEU:HG	1.95	0.48
2:H:344:PRO:HB2	2:H:394:ILE:HD11	1.95	0.48
2:B:215:PHE:CB	2:B:221:LEU:HD13	2.44	0.48
3:F:126:GLY:O	3:F:129:VAL:HG23	2.14	0.48
1:D:8:LYS:O	1:D:12:ILE:HG12	2.14	0.48
2:E:10:GLN:HG3	2:E:11:PRO:HD2	1.95	0.47
2:B:48:TRP:HZ3	2:B:209:PRO:HG3	1.77	0.47
2:E:414:SER:HB3	3:F:140:GLY:HA3	1.97	0.47
2:K:167:MET:HG3	2:K:168:SER:N	2.28	0.47
2:B:283:MET:HG2	3:C:144:LEU:HD11	1.97	0.47
2:H:114:THR:CG2	2:H:117:ALA:HB2	2.42	0.47
2:K:282:HIS:ND1	2:K:285:ASP:CG	2.73	0.47
2:B:116:ILE:HD12	2:B:119:ALA:CB	2.45	0.46
2:H:216:GLU:HG2	3:I:122:ILE:CD1	2.46	0.46
3:I:178:ALA:HB3	3:I:181:MET:HE2	1.97	0.46
1:J:36:MET:HE1	1:J:41:LEU:HD13	1.97	0.46
3:F:58:ILE:HD12	3:F:71:VAL:HG13	1.98	0.46
2:B:325:ASP:N	2:B:325:ASP:OD1	2.47	0.46
2:H:216:GLU:HG2	3:I:122:ILE:HD12	1.98	0.46
2:B:127:LEU:CD1	3:C:118:HIS:NE2	2.79	0.46
2:K:281:TYR:CD2	2:K:287:PRO:HD3	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:179:GLY:HA3	2:B:360:ASN:HB2	1.97	0.46
2:H:283:MET:HE3	2:H:283:MET:HB3	1.84	0.46
2:B:167:MET:HG3	2:B:168:SER:N	2.31	0.45
2:E:48:TRP:CZ3	2:E:209:PRO:HG3	2.51	0.45
2:E:116:ILE:HD12	2:E:119:ALA:CB	2.47	0.45
2:H:243:PHE:HB3	2:H:319:SER:O	2.16	0.45
1:J:16:PHE:HZ	1:J:43:ASP:OD1	1.99	0.45
2:K:214:SER:HB3	3:L:129:VAL:HG12	1.98	0.45
2:E:335:VAL:HG13	2:E:336:LEU:HG	1.98	0.45
3:C:77:VAL:HG21	3:C:142:LEU:HD22	1.98	0.45
2:E:218:LEU:HD12	2:E:218:LEU:O	2.17	0.45
4:J:501:LLE:C43	2:K:210:LEU:HG	2.47	0.45
2:K:174:THR:O	2:K:174:THR:OG1	2.26	0.45
2:K:356:LEU:N	2:K:356:LEU:CD2	2.73	0.45
2:B:210:LEU:CD2	2:B:210:LEU:C	2.90	0.44
2:K:147:TYR:CE1	3:L:205:LYS:HE2	2.52	0.44
2:B:99:ARG:HB3	2:E:99:ARG:HB3	1.99	0.44
2:E:127:LEU:HD11	3:F:118:HIS:CD2	2.52	0.44
2:K:103:ILE:HG23	2:K:197:ILE:HD12	2.00	0.44
3:L:178:ALA:HB3	3:L:181:MET:HE2	1.99	0.44
2:E:215:PHE:CB	2:E:221:LEU:HD13	2.46	0.44
2:E:216:GLU:HG2	3:F:122:ILE:HD12	1.99	0.44
2:K:216:GLU:HG2	3:L:122:ILE:CD1	2.48	0.44
2:B:127:LEU:HD11	3:C:118:HIS:NE2	2.33	0.44
2:E:414:SER:HB3	3:F:140:GLY:CA	2.48	0.44
3:C:134:PHE:HA	3:C:135:PRO:HD3	1.83	0.43
2:E:113:ALA:HB1	2:E:178:ALA:HB1	1.99	0.43
2:H:356:LEU:HD23	2:H:356:LEU:N	2.33	0.43
3:L:173:ILE:HD11	3:L:181:MET:HB2	2.01	0.43
3:C:58:ILE:HD12	3:C:71:VAL:HG13	2.01	0.43
2:K:233:THR:HB	2:K:244:VAL:CG2	2.48	0.43
2:E:114:THR:CG2	2:E:117:ALA:HB2	2.43	0.43
3:I:307:ARG:N	3:I:308:PRO:CD	2.82	0.43
1:J:30:LEU:CB	1:J:36:MET:HE2	2.49	0.43
3:I:134:PHE:O	3:I:134:PHE:CD1	2.72	0.42
2:H:127:LEU:CD2	3:I:118:HIS:CD2	3.01	0.42
2:B:167:MET:CG	2:B:168:SER:N	2.82	0.42
2:H:215:PHE:CB	2:H:221:LEU:HD13	2.49	0.42
3:L:65:LYS:HG2	3:L:128:TYR:CE2	2.55	0.42
2:K:210:LEU:CD1	3:L:114:VAL:HG22	2.50	0.42
2:E:376:VAL:HG22	2:E:403:ILE:HD11	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:179:GLY:HA3	2:K:360:ASN:HB2	2.02	0.42
2:B:167:MET:HE2	2:B:195:ALA:HB2	2.02	0.42
2:H:214:SER:HB3	3:I:129:VAL:CG1	2.50	0.42
2:H:215:PHE:HB2	2:H:221:LEU:HD13	2.01	0.41
3:I:73:GLY:HA3	3:I:138:LEU:HD21	2.01	0.41
2:E:60:ILE:HD12	2:E:207:LEU:HD13	2.02	0.41
3:I:58:ILE:HD12	3:I:71:VAL:HG13	2.01	0.41
2:B:113:ALA:HB1	2:B:178:ALA:HB1	2.01	0.41
2:H:59:ALA:HB2	2:H:229:GLN:HG3	2.01	0.41
2:H:113:ALA:HB1	2:H:178:ALA:HB1	2.03	0.41
2:K:113:ALA:HB1	2:K:178:ALA:HB1	2.01	0.41
2:K:233:THR:O	2:K:233:THR:CG2	2.68	0.41
2:K:286:LEU:HD12	2:K:324:ASN:HB2	2.02	0.41
2:K:180:LEU:HD12	2:K:410:SER:HB2	2.02	0.41
3:C:276:VAL:HG23	3:C:349:THR:HG21	2.03	0.41
2:B:283:MET:HE3	2:B:283:MET:HB3	1.81	0.41
2:K:113:ALA:HB2	2:K:182:ALA:HB2	2.03	0.41
3:L:152:SER:C	3:L:153:LYS:HD2	2.45	0.41
2:H:167:MET:HE2	2:H:195:ALA:HB2	2.02	0.41
3:L:227:LEU:HD21	3:L:244:LEU:HD13	2.03	0.41
2:K:60:ILE:HD12	2:K:207:LEU:HD13	2.03	0.40
2:H:283:MET:HG2	3:I:144:LEU:HD11	2.02	0.40
3:C:160:VAL:O	3:C:160:VAL:HG12	2.22	0.40
3:I:73:GLY:HA3	3:I:138:LEU:CD2	2.52	0.40
3:L:58:ILE:HD12	3:L:71:VAL:HG13	2.03	0.40
3:L:139:GLN:O	3:L:139:GLN:HG2	2.21	0.40
3:L:134:PHE:HA	3:L:135:PRO:HD3	1.86	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	70/97 (72%)	70 (100%)	0	0	100	100
1	D	70/97 (72%)	68 (97%)	2 (3%)	0	100	100
1	G	70/97 (72%)	70 (100%)	0	0	100	100
1	J	70/97 (72%)	68 (97%)	2 (3%)	0	100	100
2	B	413/443 (93%)	394 (95%)	18 (4%)	1 (0%)	44	73
2	E	413/443 (93%)	391 (95%)	21 (5%)	1 (0%)	44	73
2	H	409/443 (92%)	385 (94%)	24 (6%)	0	100	100
2	K	403/443 (91%)	381 (94%)	22 (6%)	0	100	100
3	C	343/371 (92%)	335 (98%)	8 (2%)	0	100	100
3	F	342/371 (92%)	329 (96%)	13 (4%)	0	100	100
3	I	342/371 (92%)	332 (97%)	10 (3%)	0	100	100
3	L	343/371 (92%)	328 (96%)	15 (4%)	0	100	100
All	All	3288/3644 (90%)	3151 (96%)	135 (4%)	2 (0%)	48	77

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	320	SER
2	B	320	SER

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	64/86 (74%)	63 (98%)	1 (2%)	58	84
1	D	64/86 (74%)	63 (98%)	1 (2%)	58	84
1	G	64/86 (74%)	64 (100%)	0	100	100
1	J	64/86 (74%)	63 (98%)	1 (2%)	58	84
2	B	328/348 (94%)	322 (98%)	6 (2%)	54	82
2	E	328/348 (94%)	321 (98%)	7 (2%)	48	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	H	324/348 (93%)	319 (98%)	5 (2%)	60	85
2	K	320/348 (92%)	315 (98%)	5 (2%)	58	84
3	C	292/312 (94%)	286 (98%)	6 (2%)	48	78
3	F	292/312 (94%)	288 (99%)	4 (1%)	62	86
3	I	291/312 (93%)	287 (99%)	4 (1%)	62	86
3	L	292/312 (94%)	288 (99%)	4 (1%)	62	86
All	All	2723/2984 (91%)	2679 (98%)	44 (2%)	58	84

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	57	THR
2	B	152	PHE
2	B	167	MET
2	B	173	SER
2	B	210	LEU
2	B	212	ILE
2	B	221	LEU
3	C	111	GLU
3	C	117	LEU
3	C	125	MET
3	C	131	THR
3	C	153	LYS
3	C	171	GLU
1	D	5	PRO
2	E	152	PHE
2	E	167	MET
2	E	172	ILE
2	E	173	SER
2	E	210	LEU
2	E	211	SER
2	E	221	LEU
3	F	110	ILE
3	F	129	VAL
3	F	131	THR
3	F	160	VAL
2	H	4	ASN
2	H	116	ILE
2	H	210	LEU
2	H	221	LEU

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Mol	Chain	Res	Type
2	H	319	SER
3	I	131	THR
3	I	134	PHE
3	I	157	THR
3	I	348	ASN
1	J	36	MET
2	K	4	ASN
2	K	116	ILE
2	K	319	SER
2	K	356	LEU
2	K	409	LEU
3	L	117	LEU
3	L	131	THR
3	L	134	PHE
3	L	139	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
1	A	63	HIS
2	B	7	ASN
2	B	34	ASN
2	B	228	ASN
3	C	151	GLN
3	C	196	ASN
3	C	256	ASN
3	C	355	GLN
3	C	359	ASN
1	D	18	ASN
1	D	29	ASN
2	E	34	ASN
2	E	262	GLN
2	E	317	HIS
3	F	139	GLN
3	F	151	GLN
3	F	196	ASN
3	F	256	ASN
3	F	355	GLN
3	F	359	ASN
1	G	18	ASN
2	H	317	HIS

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Mol	Chain	Res	Type
2	H	360	ASN
2	H	397	GLN
3	I	59	ASN
3	I	196	ASN
3	I	232	HIS
3	I	313	GLN
3	I	355	GLN
2	K	4	ASN
2	K	228	ASN
2	K	266	HIS
2	K	324	ASN
2	K	360	ASN
3	L	196	ASN
3	L	256	ASN
3	L	355	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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 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
4	LLE	D	501	1	28,38,39	1.80	5 (17%)	32,50,53	2.32	7 (21%)
4	LLE	J	501	1	28,38,39	1.60	4 (14%)	32,50,53	2.91	8 (25%)
4	LLE	G	501	1	28,38,39	1.89	4 (14%)	32,50,53	2.77	9 (28%)
4	LLE	A	501	1	28,38,39	2.11	6 (21%)	32,50,53	3.75	10 (31%)

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
4	LLE	D	501	1	-	15/46/49/50	-
4	LLE	J	501	1	-	12/46/49/50	-
4	LLE	G	501	1	-	13/46/49/50	-
4	LLE	A	501	1	-	16/46/49/50	-

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	501	LLE	C12-S44	-6.04	1.73	1.81
4	A	501	LLE	C2-C9	-5.82	1.28	1.38
4	A	501	LLE	C8-C7	-5.80	1.28	1.38
4	D	501	LLE	C12-S44	-5.29	1.74	1.81
4	J	501	LLE	C12-S44	-5.22	1.74	1.81
4	A	501	LLE	C12-S44	-4.72	1.75	1.81
4	G	501	LLE	C2-C9	-4.61	1.30	1.38
4	J	501	LLE	C8-C7	-3.96	1.31	1.38
4	G	501	LLE	C8-C7	-3.79	1.31	1.38
4	D	501	LLE	C8-C7	-3.58	1.32	1.38
4	D	501	LLE	C2-C9	-3.35	1.32	1.38
4	D	501	LLE	P24-O27	-3.27	1.53	1.62
4	A	501	LLE	P24-O27	-2.93	1.54	1.62
4	J	501	LLE	C2-C9	-2.90	1.33	1.38
4	G	501	LLE	P24-O27	-2.45	1.55	1.62
4	J	501	LLE	P24-O27	-2.37	1.56	1.62
4	D	501	LLE	O35-C34	-2.30	1.18	1.23
4	A	501	LLE	C6-C5	-2.04	1.30	1.34
4	A	501	LLE	C10-C3	-2.02	1.48	1.51

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	501	LLE	C12-S44-C11	12.77	124.41	100.16
4	A	501	LLE	C8-C9-C2	-12.55	106.88	122.13
4	G	501	LLE	C8-C9-C2	-11.57	108.08	122.13
4	J	501	LLE	C12-S44-C11	11.23	121.48	100.16
4	D	501	LLE	C8-C9-C2	-8.24	112.12	122.13
4	A	501	LLE	C6-C7-C8	-7.18	113.41	122.13
4	J	501	LLE	C8-C9-C2	-5.53	115.42	122.13
4	G	501	LLE	C12-S44-C11	5.21	110.06	100.16
4	J	501	LLE	O22-C5-C6	-4.79	117.88	122.28
4	D	501	LLE	O21-C7-C8	-4.76	116.96	121.06
4	D	501	LLE	C12-S44-C11	4.69	109.06	100.16
4	G	501	LLE	C31-C29-C28	4.11	114.93	108.23
4	J	501	LLE	O20-C9-C2	4.11	124.61	121.06
4	J	501	LLE	C6-C7-C8	-4.04	117.22	122.13
4	J	501	LLE	C31-C29-C28	3.98	114.72	108.23
4	D	501	LLE	C31-C29-C28	3.95	114.67	108.23
4	G	501	LLE	C6-C7-C8	-3.57	117.79	122.13
4	A	501	LLE	C12-C42-N41	3.34	119.43	112.42
4	A	501	LLE	C31-C29-C28	3.23	113.50	108.23
4	A	501	LLE	O21-C7-C8	3.20	123.83	121.06
4	J	501	LLE	C12-C42-N41	3.13	118.99	112.42
4	G	501	LLE	O33-C32-C29	-3.07	103.03	110.25
4	J	501	LLE	O33-C32-C29	-2.94	103.33	110.25
4	A	501	LLE	O33-C32-C29	-2.94	103.33	110.25
4	A	501	LLE	O23-C3-C10	2.83	124.46	120.76
4	D	501	LLE	O33-C32-C29	-2.83	103.59	110.25
4	G	501	LLE	O23-C3-C10	2.80	124.42	120.76
4	G	501	LLE	O21-C7-C8	-2.50	118.91	121.06
4	G	501	LLE	C42-N41-C39	-2.49	118.22	122.84
4	D	501	LLE	C37-C38-C39	-2.43	108.31	112.36
4	G	501	LLE	O22-C5-C6	-2.33	120.14	122.28
4	A	501	LLE	O20-C9-C2	2.23	122.99	121.06
4	A	501	LLE	O22-C5-C6	-2.16	120.30	122.28
4	D	501	LLE	C42-N41-C39	-2.16	118.83	122.84

There are no chirality outliers.

All (56) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	501	LLE	C43-C4-C5-C6
4	A	501	LLE	C43-C4-C5-O22
4	A	501	LLE	C5-C6-C7-C8
4	A	501	LLE	C5-C6-C7-O21

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Mol	Chain	Res	Type	Atoms
4	A	501	LLE	C7-C8-C9-O20
4	A	501	LLE	C3-C10-C11-S44
4	A	501	LLE	C3-C10-C11-O19
4	A	501	LLE	O27-C28-C29-C32
4	A	501	LLE	C38-C39-N41-C42
4	D	501	LLE	C43-C4-C5-C6
4	D	501	LLE	C43-C4-C5-O22
4	D	501	LLE	C5-C4-C43-C13
4	D	501	LLE	C5-C4-C43-O24
4	D	501	LLE	C5-C6-C7-C8
4	D	501	LLE	C5-C6-C7-O21
4	D	501	LLE	C7-C8-C9-C2
4	D	501	LLE	C7-C8-C9-O20
4	D	501	LLE	O27-C28-C29-C30
4	D	501	LLE	O27-C28-C29-C31
4	D	501	LLE	O27-C28-C29-C32
4	D	501	LLE	C38-C39-N41-C42
4	D	501	LLE	S44-C12-C42-N41
4	G	501	LLE	C43-C4-C5-C6
4	G	501	LLE	C43-C4-C5-O22
4	G	501	LLE	C5-C4-C43-C13
4	G	501	LLE	C5-C4-C43-O24
4	G	501	LLE	C5-C6-C7-O21
4	G	501	LLE	C7-C8-C9-C2
4	G	501	LLE	C7-C8-C9-O20
4	G	501	LLE	O27-C28-C29-C30
4	G	501	LLE	O27-C28-C29-C31
4	G	501	LLE	O27-C28-C29-C32
4	G	501	LLE	C38-C39-N41-C42
4	G	501	LLE	S44-C12-C42-N41
4	J	501	LLE	C43-C4-C5-C6
4	J	501	LLE	C7-C8-C9-O20
4	J	501	LLE	C3-C10-C11-O19
4	J	501	LLE	O27-C28-C29-C30
4	J	501	LLE	O27-C28-C29-C31
4	J	501	LLE	O27-C28-C29-C32
4	J	501	LLE	C38-C39-N41-C42
4	A	501	LLE	O40-C39-N41-C42
4	D	501	LLE	O40-C39-N41-C42
4	G	501	LLE	O40-C39-N41-C42
4	J	501	LLE	O40-C39-N41-C42
4	A	501	LLE	O27-C28-C29-C30

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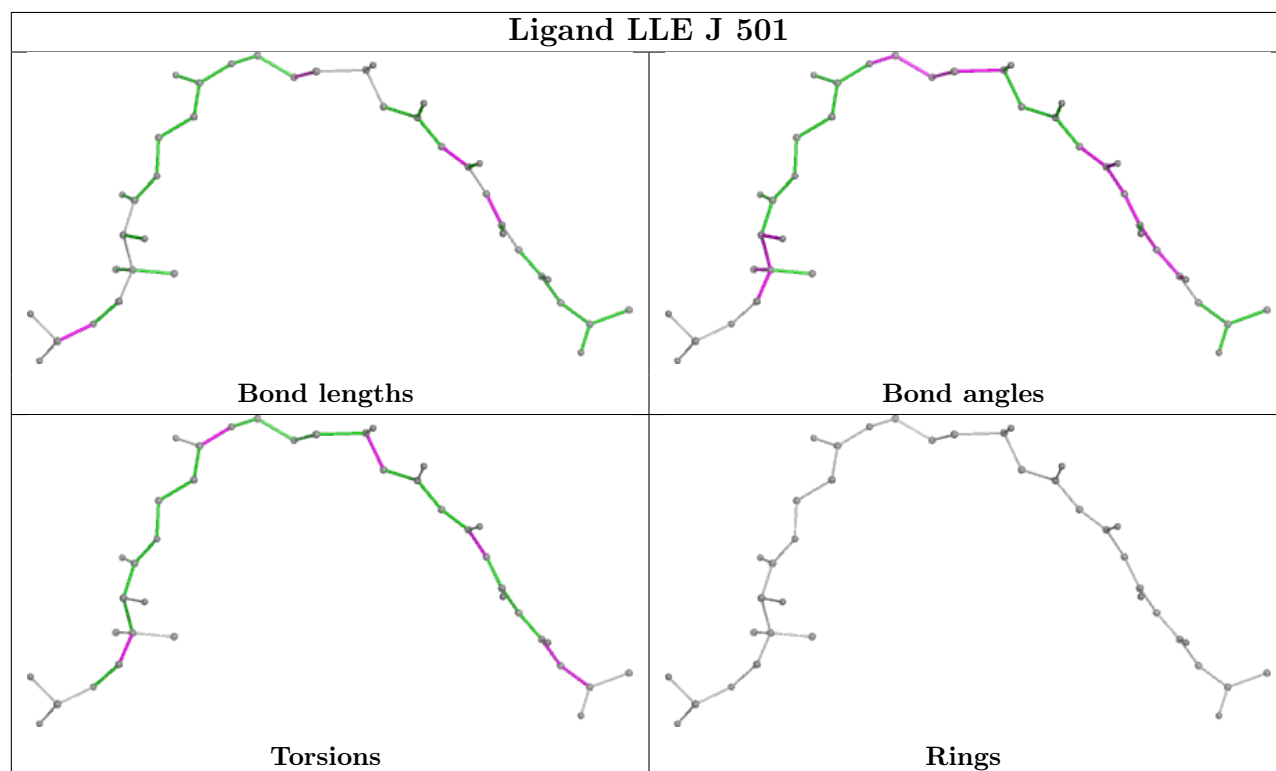
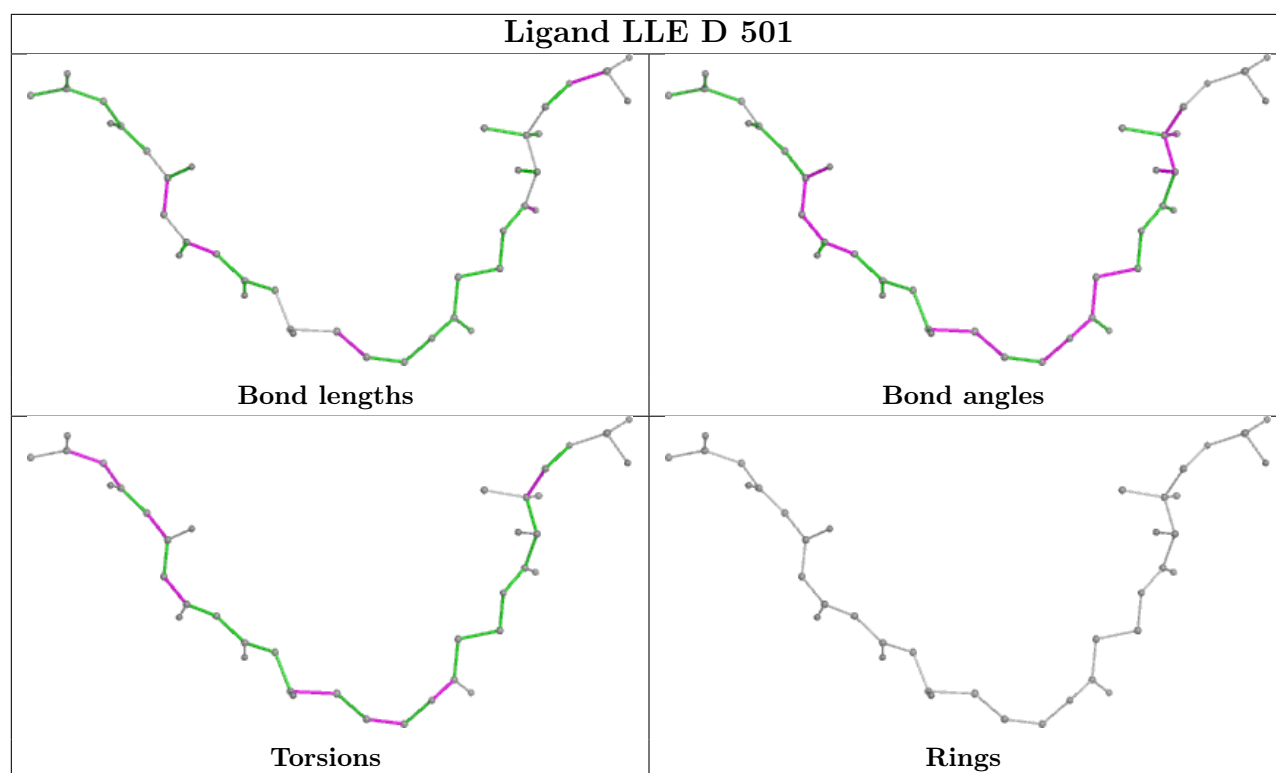
Mol	Chain	Res	Type	Atoms
4	A	501	LLE	O27-C28-C29-C31
4	A	501	LLE	C42-C12-S44-C11
4	A	501	LLE	C5-C4-C43-C13
4	A	501	LLE	C5-C4-C43-O24
4	J	501	LLE	C5-C4-C43-C13
4	J	501	LLE	C5-C4-C43-O24
4	J	501	LLE	C3-C10-C11-S44
4	J	501	LLE	C7-C8-C9-C2
4	A	501	LLE	C10-C11-S44-C12
4	D	501	LLE	C10-C11-S44-C12

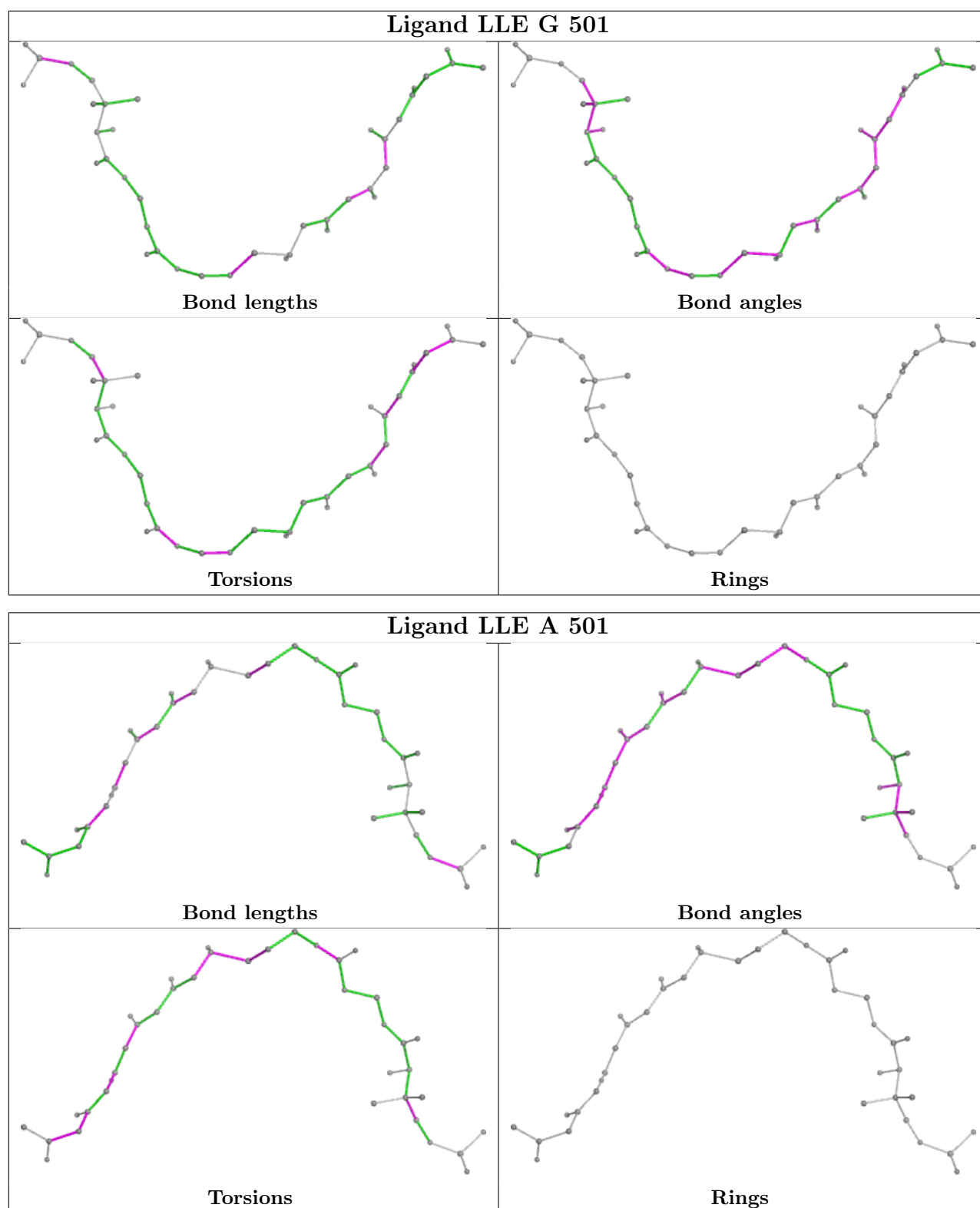
There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	J	501	LLE	1	0
4	A	501	LLE	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.





5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

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	72/97 (74%)	0.27	0 100 100	57, 89, 106, 113	0
1	D	72/97 (74%)	0.46	4 (5%) 31 27	59, 104, 127, 139	0
1	G	72/97 (74%)	0.50	4 (5%) 31 27	55, 103, 139, 146	0
1	J	72/97 (74%)	0.56	4 (5%) 31 27	68, 109, 137, 141	0
2	B	417/443 (94%)	-0.26	1 (0%) 92 91	29, 43, 82, 105	0
2	E	417/443 (94%)	-0.29	2 (0%) 87 84	28, 44, 79, 97	0
2	H	413/443 (93%)	-0.22	7 (1%) 69 63	31, 50, 82, 105	0
2	K	409/443 (92%)	-0.06	1 (0%) 92 91	39, 64, 101, 121	0
3	C	349/371 (94%)	-0.15	3 (0%) 81 76	30, 56, 82, 109	0
3	F	348/371 (93%)	-0.07	2 (0%) 85 82	36, 62, 89, 117	0
3	I	348/371 (93%)	-0.11	5 (1%) 73 68	30, 56, 82, 104	0
3	L	349/371 (94%)	0.10	4 (1%) 77 72	39, 65, 96, 114	0
All	All	3338/3644 (91%)	-0.09	37 (1%) 77 72	28, 56, 103, 146	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	L	202	SER	5.0
3	C	202	SER	4.9
1	J	23	ASP	3.2
3	I	267	GLU	2.9
1	G	52	PHE	2.7
1	D	15	LEU	2.6
2	H	79	ARG	2.5
2	H	101	SER	2.5
3	L	204	GLN	2.5
1	J	7	VAL	2.5
1	D	28	ALA	2.5

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Mol	Chain	Res	Type	RSRZ
3	I	256	ASN	2.4
2	H	9	SER	2.4
2	H	64	TYR	2.3
3	F	32	LEU	2.3
3	L	256	ASN	2.3
2	H	2	ILE	2.3
3	F	16	ASP	2.3
3	L	299	ILE	2.3
1	G	76	SER	2.3
2	K	101	SER	2.3
1	J	5	PRO	2.3
1	G	74	VAL	2.2
1	D	57	THR	2.2
1	G	53	GLY	2.2
2	B	4	ASN	2.2
3	I	32	LEU	2.2
2	E	4	ASN	2.1
3	C	16	ASP	2.1
2	E	388	ASP	2.1
1	D	76	SER	2.1
3	I	204	GLN	2.1
2	H	5	ASN	2.1
3	I	33	GLY	2.1
3	C	371	ILE	2.0
2	H	50	ARG	2.0
1	J	76	SER	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](#)

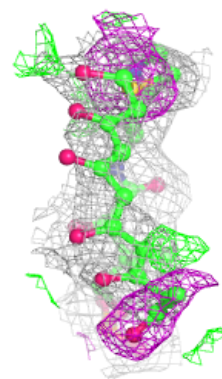
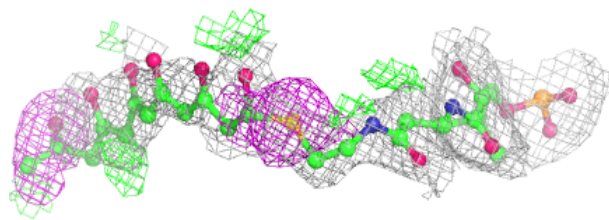
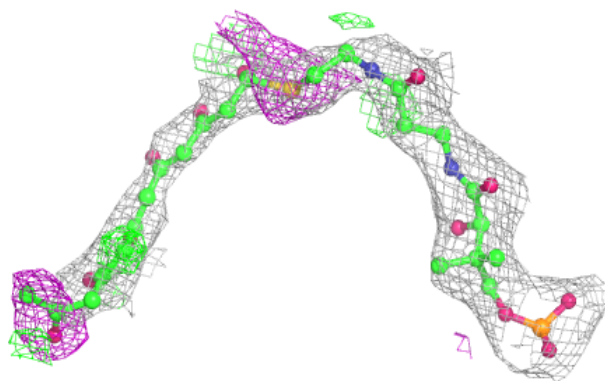
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	LLE	A	501	39/40	0.79	0.16	38,48,55,56	15
4	LLE	J	501	39/40	0.80	0.15	42,52,59,60	15
4	LLE	G	501	39/40	0.86	0.13	39,44,51,52	15
4	LLE	D	501	39/40	0.88	0.13	35,45,54,56	15

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.

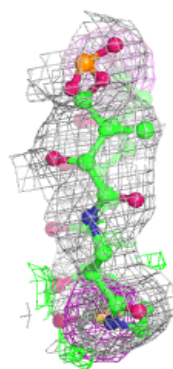
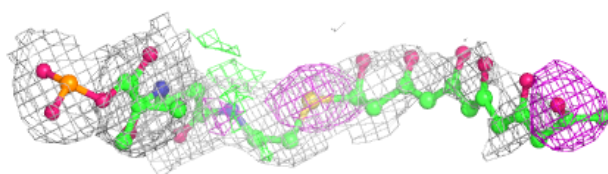
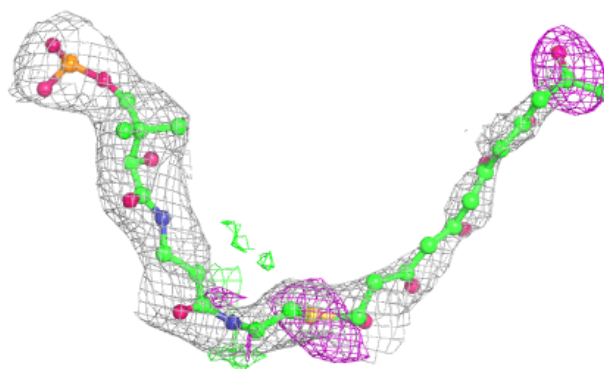
Electron density around LLE A 501:

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

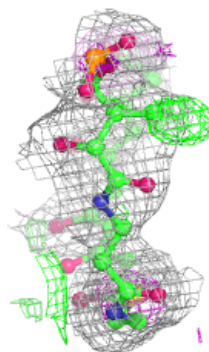
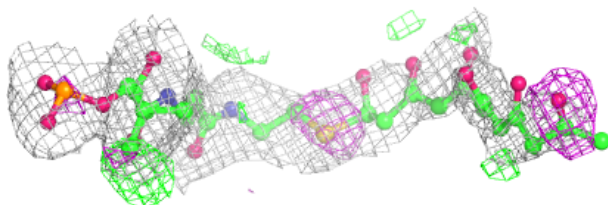
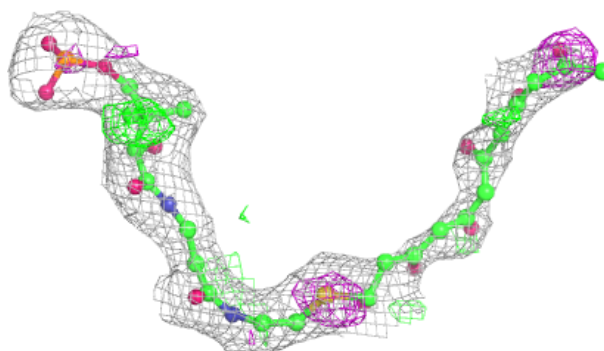


Electron density around LLE J 501:

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

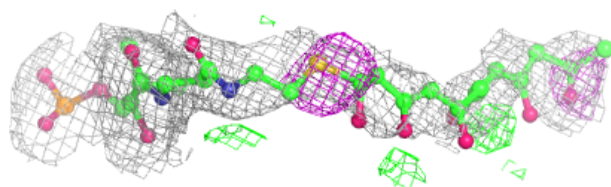
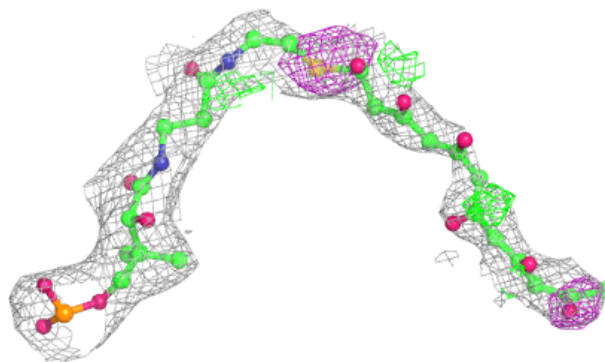
**Electron density around LLE G 501:**

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



Electron density around LLE D 501:

$2mF_o-DF_c$ (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.