



Full wwPDB EM Validation Report ⓘ

Jan 14, 2024 – 12:12 AM JST

PDB ID : 8IYL
EMDB ID : EMD-35825
Title : Tail tip conformation 2 of phage lambda tail
Authors : Wang, J.W.; Wang, C.
Deposited on : 2023-04-05
Resolution : 3.00 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

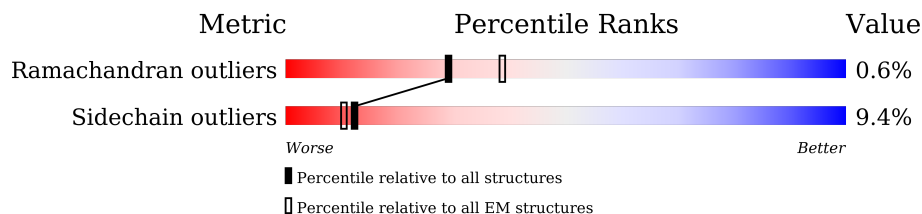
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.00 Å.

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



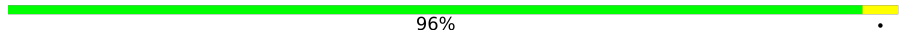
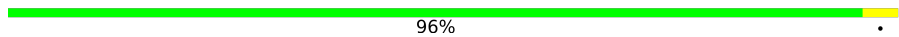
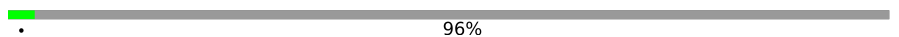
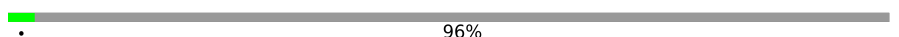






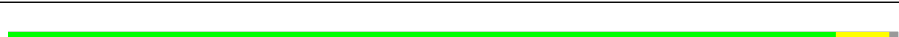


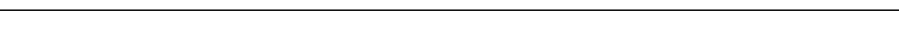
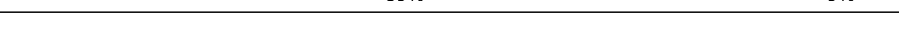
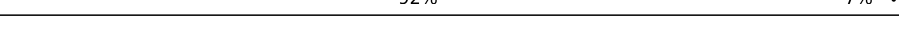
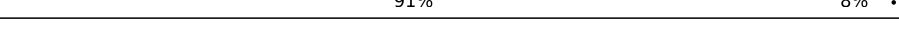
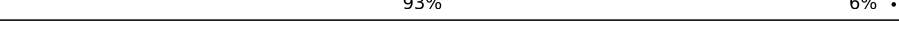
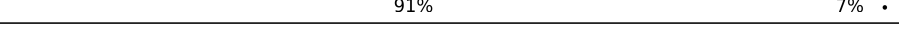
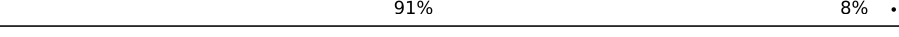
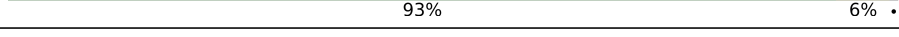
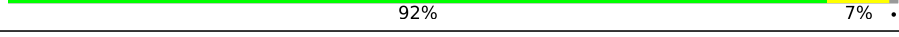

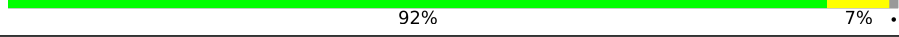

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	D	109	
1	F	109	
1	M	109	
1	X	109	
1	Z	109	
1	m	109	
2	E	1132	
2	J	1132	
2	Y	1132	
3	G	232	

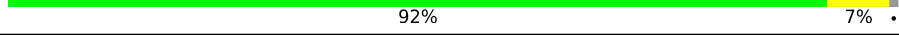
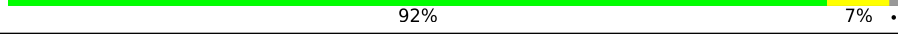
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Mol	Chain	Length	Quality of chain
3	L	232	 96%
3	d	232	 96%
4	H	853	 96%
4	K	853	 96%
4	e	853	 96%
5	I	223	 49% 45%
5	N	223	 48% 45%
5	f	223	 47% 45%
6	A	246	 88% 11%
6	B	246	 91% 8%
6	C	246	 93% 6%
6	O	246	 89% 10%
6	P	246	 90% 9%
6	Q	246	 89% 9%
6	R	246	 92% 7%
6	S	246	 91% 8%
6	T	246	 93% 6%
6	U	246	 91% 7%
6	V	246	 91% 8%
6	W	246	 93% 6%
6	a	246	 92% 7%
6	b	246	 91% 8%
6	c	246	 92% 7%
6	g	246	 91% 7%
6	h	246	 93% 6%

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Mol	Chain	Length	Quality of chain
6	i	246	 90% 9%
6	j	246	 91% 7%
6	k	246	 91% 7%
6	l	246	 90% 9%
6	n	246	 93% 6%
6	o	246	 92% 7%
6	v	246	 92% 7%

2 Entry composition [i](#)

There are 7 unique types of molecules in this entry. The entry contains 77370 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Tail tip protein M.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	M	109	884	569	154	157	4	0	0
1	m	109	884	569	154	157	4	0	0
1	D	109	884	569	154	157	4	0	0
1	F	109	884	569	154	157	4	0	0
1	X	109	884	569	154	157	4	0	0
1	Z	109	884	569	154	157	4	0	0

- Molecule 2 is a protein called Tip attachment protein J.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	J	861	6720	4212	1171	1317	20	0	0
2	E	861	6720	4212	1171	1317	20	0	0
2	Y	861	6720	4212	1171	1317	20	0	0

- Molecule 3 is a protein called Tail tip protein L.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	L	232	1801	1117	309	362	13	0	0
3	G	232	1801	1117	309	362	13	0	0
3	d	232	1801	1117	309	362	13	0	0

- Molecule 4 is a protein called Tape measure protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	H	33	Total	C	N	O	S	0	0
			250	154	47	47	2		
4	K	33	Total	C	N	O	S	0	0
			250	154	47	47	2		
4	e	33	Total	C	N	O	S	0	0
			250	154	47	47	2		

- Molecule 5 is a protein called Tail tip assembly protein I.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	122	Total	C	N	O	S	0	0
			865	544	151	165	5		
5	N	122	Total	C	N	O	S	0	0
			865	544	151	165	5		
5	f	122	Total	C	N	O	S	0	0
			865	544	151	165	5		

- Molecule 6 is a protein called Tail tube protein.

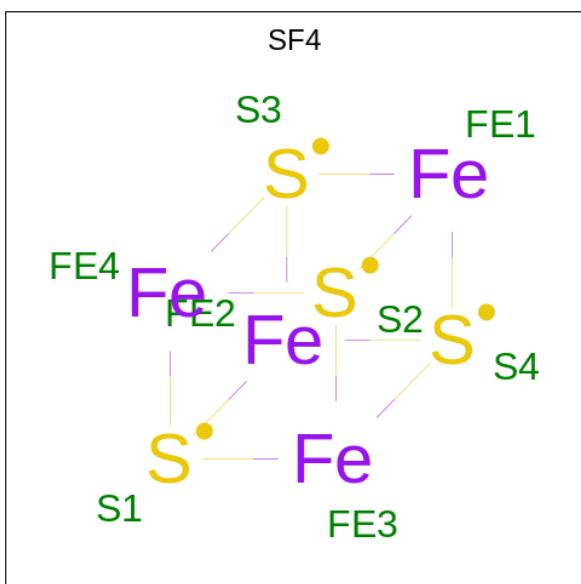
Mol	Chain	Residues	Atoms					AltConf	Trace
6	V	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	v	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	B	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	b	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	A	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	a	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	C	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	c	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	O	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	P	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	Q	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	R	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		

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Mol	Chain	Residues	Atoms					AltConf	Trace
6	S	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	T	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	U	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	W	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	g	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	h	243	Total	C	N	O	S	0	0
			1792	1119	302	366	5		
6	i	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	j	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	k	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	l	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	n	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		
6	o	244	Total	C	N	O	S	0	0
			1799	1124	303	367	5		

- Molecule 7 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe₄S₄) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
7	L	1	Total 8	Fe 4	S 4	0
7	G	1	Total 8	Fe 4	S 4	0
7	d	1	Total 8	Fe 4	S 4	0

3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. 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. 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: Tail tip protein M

Chain M:  90% 10%



- Molecule 1: Tail tip protein M

Chain m:  95% 5%



- Molecule 1: Tail tip protein M

Chain D:  92% 8%



- Molecule 1: Tail tip protein M

Chain F:  95% 5%



- Molecule 1: Tail tip protein M

Chain X:  87% 13%

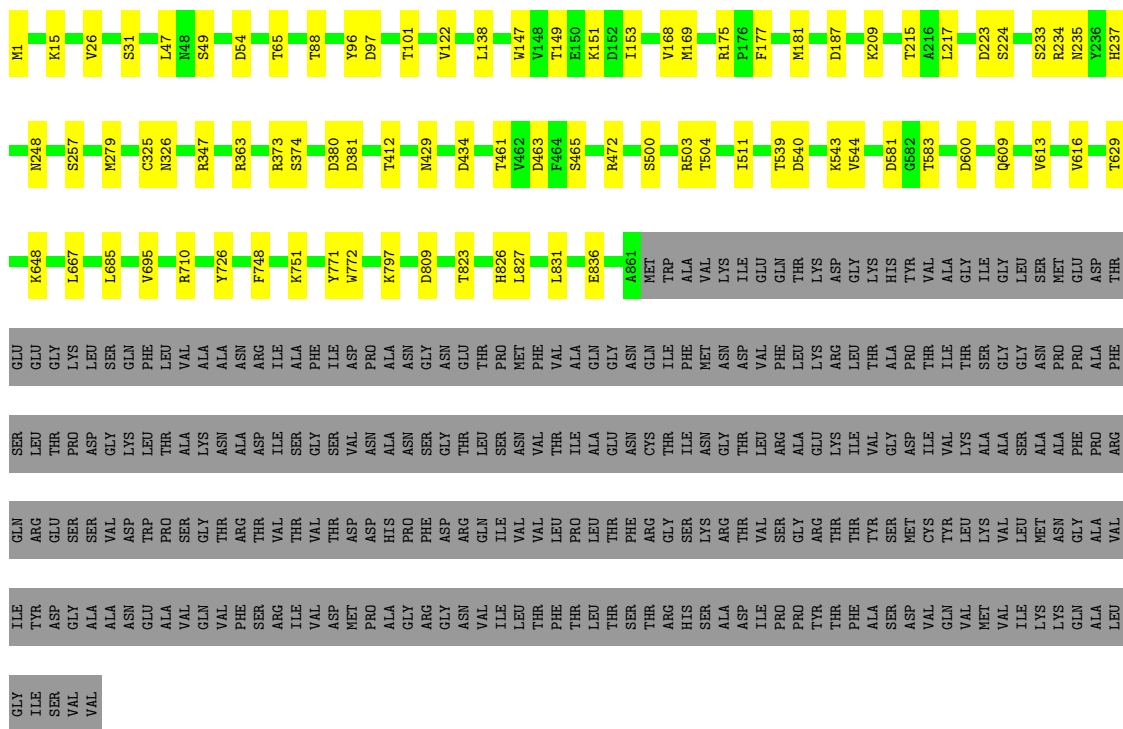


- Molecule 1: Tail tip protein M

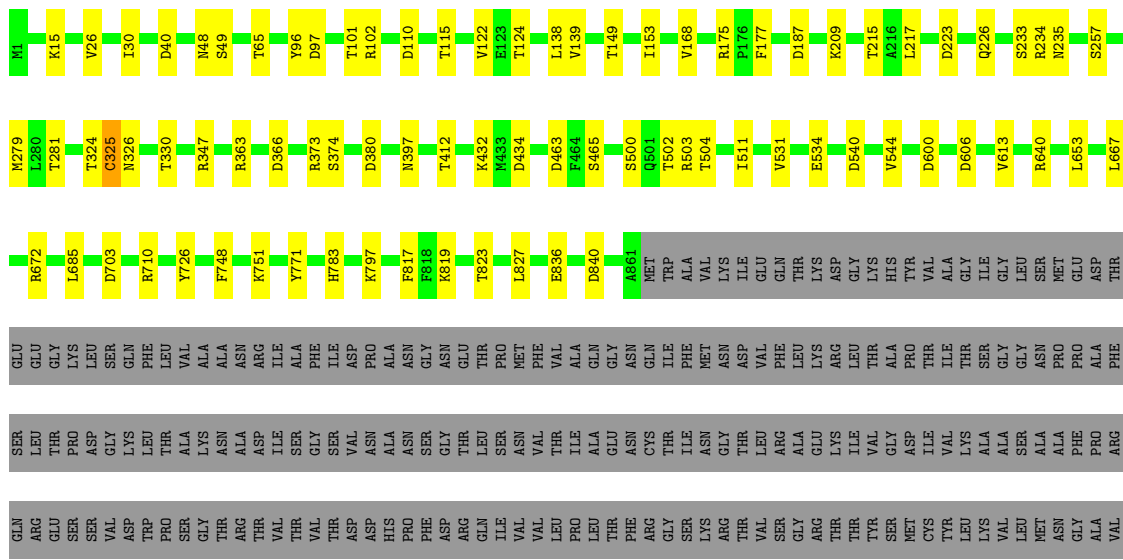
Chain Z:  93% 7%

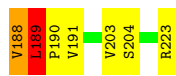
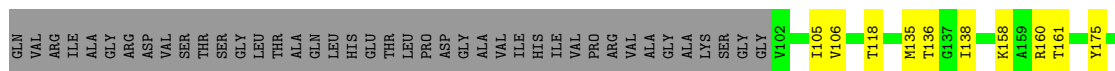


● Molecule 2: Tip attachment protein J



● Molecule 2: Tip attachment protein J





• Molecule 6: Tail tube protein



• Molecule 6: Tail tube protein



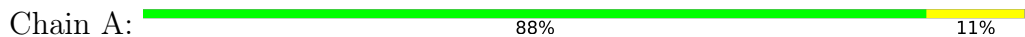
• Molecule 6: Tail tube protein



• Molecule 6: Tail tube protein



• Molecule 6: Tail tube protein



• Molecule 6: Tail tube protein




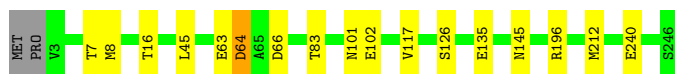
• Molecule 6: Tail tube protein

Chain C:  93% 6%




• Molecule 6: Tail tube protein

Chain c:  92% 7%




• Molecule 6: Tail tube protein

Chain O:  89% 10%




• Molecule 6: Tail tube protein

Chain P:  90% 9%



• Molecule 6: Tail tube protein

Chain Q:  89% 9%




• Molecule 6: Tail tube protein

Chain R:  92% 7%



• Molecule 6: Tail tube protein

Chain S:  91% 8%




• Molecule 6: Tail tube protein

Chain T:  93% 6%



• Molecule 6: Tail tube protein

Chain U:  91% 7%




• Molecule 6: Tail tube protein

Chain W:  93% 6%



• Molecule 6: Tail tube protein

Chain g:  91% 7%




• Molecule 6: Tail tube protein

Chain h:  93% 6%




• Molecule 6: Tail tube protein

Chain i:  90% 9%

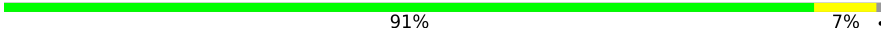


• Molecule 6: Tail tube protein

Chain j:  91% 7%




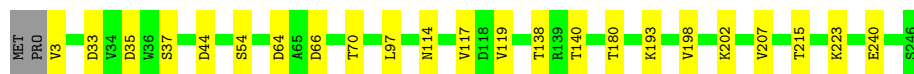
• Molecule 6: Tail tube protein

Chain k:  91% 7%



• Molecule 6: Tail tube protein

Chain l:  90% 9%



• Molecule 6: Tail tube protein

Chain n:  93% 6%



• Molecule 6: Tail tube protein

Chain o:  92% 7%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	54547	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

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: SF4

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	D	0.30	0/909	0.56	0/1231
1	F	0.30	0/909	0.54	0/1231
1	M	0.31	0/909	0.55	0/1231
1	X	0.30	0/909	0.55	0/1231
1	Z	0.30	0/909	0.54	0/1231
1	m	0.30	0/909	0.54	0/1231
2	E	0.27	0/6866	0.54	1/9348 (0.0%)
2	J	0.27	0/6866	0.54	1/9348 (0.0%)
2	Y	0.27	0/6866	0.54	0/9348
3	G	0.29	0/1836	0.50	0/2487
3	L	0.29	0/1836	0.50	0/2487
3	d	0.29	0/1836	0.51	0/2487
4	H	0.29	0/252	0.52	0/335
4	K	0.30	0/252	0.56	0/335
4	e	0.35	0/252	0.57	0/335
5	I	0.29	0/876	0.65	2/1186 (0.2%)
5	N	0.28	0/876	0.65	2/1186 (0.2%)
5	f	0.29	0/876	0.65	2/1186 (0.2%)
6	A	0.28	0/1834	0.56	2/2505 (0.1%)
6	B	0.28	0/1834	0.55	1/2505 (0.0%)
6	C	0.28	0/1834	0.53	0/2505
6	O	0.28	0/1827	0.53	0/2494
6	P	0.28	0/1827	0.51	0/2494
6	Q	0.28	0/1834	0.55	1/2505 (0.0%)
6	R	0.28	0/1834	0.57	2/2505 (0.1%)
6	S	0.28	0/1834	0.56	1/2505 (0.0%)
6	T	0.28	0/1834	0.54	0/2505
6	U	0.26	0/1834	0.54	1/2505 (0.0%)
6	V	0.28	0/1827	0.52	0/2494
6	W	0.27	0/1834	0.55	1/2505 (0.0%)
6	a	0.29	0/1834	0.55	1/2505 (0.0%)
6	b	0.28	0/1834	0.56	2/2505 (0.1%)

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
6	c	0.27	0/1834	0.56	1/2505 (0.0%)
6	g	0.28	0/1827	0.52	0/2494
6	h	0.28	0/1827	0.51	0/2494
6	i	0.28	0/1834	0.55	0/2505
6	j	0.28	0/1834	0.56	2/2505 (0.1%)
6	k	0.29	0/1834	0.56	1/2505 (0.0%)
6	l	0.29	0/1834	0.54	1/2505 (0.0%)
6	n	0.27	0/1834	0.55	0/2505
6	o	0.27	0/1834	0.55	0/2505
6	v	0.28	0/1827	0.51	0/2494
All	All	0.28	0/78918	0.54	25/107508 (0.0%)

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
2	E	0	1
2	J	0	1
2	Y	0	1
5	I	0	1
5	N	0	1
5	f	0	1
All	All	0	6

There are no bond length outliers.

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	f	189	LEU	CA-CB-CG	7.53	132.62	115.30
6	j	212	MET	CA-CB-CG	6.57	124.47	113.30
6	R	212	MET	CA-CB-CG	6.38	124.15	113.30
5	I	189	LEU	C-N-CD	-6.28	106.78	120.60
6	c	64	ASP	CB-CG-OD1	6.04	123.73	118.30
6	W	64	ASP	CB-CG-OD2	6.03	123.73	118.30
6	b	64	ASP	CB-CG-OD2	5.85	123.56	118.30
5	N	189	LEU	C-N-CD	-5.75	107.95	120.60
5	f	189	LEU	C-N-CD	-5.74	107.97	120.60
6	a	64	ASP	CB-CG-OD2	5.68	123.42	118.30
6	Q	64	ASP	CB-CG-OD1	5.61	123.35	118.30
2	J	581	ASP	CB-CG-OD1	5.60	123.34	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	U	64	ASP	CB-CG-OD1	5.49	123.24	118.30
6	j	64	ASP	CB-CG-OD2	5.45	123.20	118.30
6	S	64	ASP	CB-CG-OD1	5.40	123.16	118.30
6	l	44	ASP	CB-CG-OD1	5.32	123.08	118.30
6	b	44	ASP	CB-CG-OD1	5.30	123.07	118.30
2	E	40	ASP	CB-CG-OD2	5.21	122.99	118.30
6	A	64	ASP	CB-CG-OD1	5.20	122.98	118.30
6	R	64	ASP	CB-CG-OD2	5.16	122.94	118.30
6	B	64	ASP	CB-CG-OD1	5.14	122.92	118.30
6	A	57	ASP	CB-CG-OD2	5.09	122.89	118.30
6	k	64	ASP	CB-CG-OD2	5.07	122.86	118.30
5	I	189	LEU	CA-CB-CG	5.06	126.94	115.30
5	N	189	LEU	CA-CB-CG	5.04	126.89	115.30

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	E	175	ARG	Peptide
5	I	189	LEU	Peptide
2	J	175	ARG	Peptide
5	N	189	LEU	Peptide
2	Y	175	ARG	Peptide
5	f	189	LEU	Peptide

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	107/109 (98%)	94 (88%)	13 (12%)	0	100	100
1	F	107/109 (98%)	93 (87%)	13 (12%)	1 (1%)	17	55
1	M	107/109 (98%)	94 (88%)	13 (12%)	0	100	100
1	X	107/109 (98%)	94 (88%)	13 (12%)	0	100	100
1	Z	107/109 (98%)	95 (89%)	11 (10%)	1 (1%)	17	55
1	m	107/109 (98%)	92 (86%)	14 (13%)	1 (1%)	17	55
2	E	859/1132 (76%)	780 (91%)	75 (9%)	4 (0%)	29	68
2	J	859/1132 (76%)	773 (90%)	82 (10%)	4 (0%)	29	68
2	Y	859/1132 (76%)	775 (90%)	81 (9%)	3 (0%)	41	76
3	G	230/232 (99%)	222 (96%)	8 (4%)	0	100	100
3	L	230/232 (99%)	222 (96%)	8 (4%)	0	100	100
3	d	230/232 (99%)	224 (97%)	6 (3%)	0	100	100
4	H	31/853 (4%)	25 (81%)	6 (19%)	0	100	100
4	K	31/853 (4%)	25 (81%)	6 (19%)	0	100	100
4	e	31/853 (4%)	26 (84%)	5 (16%)	0	100	100
5	I	120/223 (54%)	97 (81%)	17 (14%)	6 (5%)	2	12
5	N	120/223 (54%)	97 (81%)	17 (14%)	6 (5%)	2	12
5	f	120/223 (54%)	97 (81%)	17 (14%)	6 (5%)	2	12
6	A	242/246 (98%)	225 (93%)	14 (6%)	3 (1%)	13	48
6	B	242/246 (98%)	223 (92%)	18 (7%)	1 (0%)	34	72
6	C	242/246 (98%)	224 (93%)	16 (7%)	2 (1%)	19	57
6	O	241/246 (98%)	227 (94%)	13 (5%)	1 (0%)	34	72
6	P	241/246 (98%)	229 (95%)	12 (5%)	0	100	100
6	Q	242/246 (98%)	223 (92%)	18 (7%)	1 (0%)	34	72
6	R	242/246 (98%)	228 (94%)	13 (5%)	1 (0%)	34	72
6	S	242/246 (98%)	224 (93%)	15 (6%)	3 (1%)	13	48
6	T	242/246 (98%)	231 (96%)	10 (4%)	1 (0%)	34	72
6	U	242/246 (98%)	225 (93%)	14 (6%)	3 (1%)	13	48
6	V	241/246 (98%)	228 (95%)	12 (5%)	1 (0%)	34	72
6	W	242/246 (98%)	228 (94%)	14 (6%)	0	100	100
6	a	242/246 (98%)	232 (96%)	9 (4%)	1 (0%)	34	72
6	b	242/246 (98%)	230 (95%)	11 (4%)	1 (0%)	34	72

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	c	242/246 (98%)	230 (95%)	12 (5%)	0	100	100
6	g	241/246 (98%)	229 (95%)	11 (5%)	1 (0%)	34	72
6	h	241/246 (98%)	228 (95%)	13 (5%)	0	100	100
6	i	242/246 (98%)	224 (93%)	17 (7%)	1 (0%)	34	72
6	j	242/246 (98%)	229 (95%)	12 (5%)	1 (0%)	34	72
6	k	242/246 (98%)	224 (93%)	15 (6%)	3 (1%)	13	48
6	l	242/246 (98%)	230 (95%)	11 (4%)	1 (0%)	34	72
6	n	242/246 (98%)	225 (93%)	15 (6%)	2 (1%)	19	57
6	o	242/246 (98%)	229 (95%)	12 (5%)	1 (0%)	34	72
6	v	241/246 (98%)	228 (95%)	13 (5%)	0	100	100
All	All	10164/13878 (73%)	9378 (92%)	725 (7%)	61 (1%)	29	64

All (61) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	I	105	ILE
5	I	188	VAL
5	I	190	PRO
6	V	158	VAL
6	B	158	VAL
6	A	158	VAL
6	C	158	VAL
5	N	105	ILE
5	N	188	VAL
5	N	190	PRO
6	O	158	VAL
6	Q	158	VAL
6	S	158	VAL
6	U	158	VAL
5	f	105	ILE
5	f	188	VAL
5	f	190	PRO
6	g	158	VAL
6	i	158	VAL
6	k	158	VAL
6	n	158	VAL
2	J	101	THR
2	E	101	THR

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Mol	Chain	Res	Type
2	J	326	ASN
2	E	326	ASN
6	R	64	ASP
6	S	161	ALA
2	Y	101	THR
2	Y	326	ASN
6	k	161	ALA
6	l	64	ASP
5	I	189	LEU
6	a	64	ASP
5	N	189	LEU
6	T	64	ASP
6	j	64	ASP
1	m	39	ALA
5	I	106	VAL
6	A	64	ASP
6	C	161	ALA
1	F	39	ALA
5	N	106	VAL
5	N	138	ILE
5	f	106	VAL
5	f	138	ILE
5	f	189	LEU
6	k	64	ASP
6	b	64	ASP
6	A	161	ALA
2	E	325	CYS
6	S	64	ASP
6	U	64	ASP
6	U	161	ALA
1	Z	39	ALA
6	n	161	ALA
6	o	64	ASP
2	J	613	VAL
2	E	613	VAL
2	Y	613	VAL
5	I	138	ILE
2	J	616	VAL

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	96/96 (100%)	87 (91%)	9 (9%)	8	32
1	F	96/96 (100%)	92 (96%)	4 (4%)	30	66
1	M	96/96 (100%)	85 (88%)	11 (12%)	5	24
1	X	96/96 (100%)	82 (85%)	14 (15%)	3	15
1	Z	96/96 (100%)	89 (93%)	7 (7%)	14	44
1	m	96/96 (100%)	92 (96%)	4 (4%)	30	66
2	E	734/958 (77%)	658 (90%)	76 (10%)	7	27
2	J	734/958 (77%)	657 (90%)	77 (10%)	7	27
2	Y	734/958 (77%)	653 (89%)	81 (11%)	6	25
3	G	198/198 (100%)	187 (94%)	11 (6%)	21	56
3	L	198/198 (100%)	188 (95%)	10 (5%)	24	60
3	d	198/198 (100%)	189 (96%)	9 (4%)	27	64
4	H	24/648 (4%)	20 (83%)	4 (17%)	2	11
4	K	24/648 (4%)	20 (83%)	4 (17%)	2	11
4	e	24/648 (4%)	19 (79%)	5 (21%)	1	5
5	I	86/162 (53%)	79 (92%)	7 (8%)	11	40
5	N	86/162 (53%)	78 (91%)	8 (9%)	9	33
5	f	86/162 (53%)	74 (86%)	12 (14%)	3	16
6	A	194/196 (99%)	170 (88%)	24 (12%)	4	20
6	B	194/196 (99%)	176 (91%)	18 (9%)	9	33
6	C	194/196 (99%)	181 (93%)	13 (7%)	16	49
6	O	193/196 (98%)	170 (88%)	23 (12%)	5	22
6	P	193/196 (98%)	172 (89%)	21 (11%)	6	25
6	Q	194/196 (99%)	171 (88%)	23 (12%)	5	22
6	R	194/196 (99%)	177 (91%)	17 (9%)	10	36
6	S	194/196 (99%)	176 (91%)	18 (9%)	9	33

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
6	T	194/196 (99%)	180 (93%)	14 (7%)	14	45
6	U	194/196 (99%)	177 (91%)	17 (9%)	10	36
6	V	193/196 (98%)	175 (91%)	18 (9%)	9	33
6	W	194/196 (99%)	179 (92%)	15 (8%)	13	42
6	a	194/196 (99%)	177 (91%)	17 (9%)	10	36
6	b	194/196 (99%)	173 (89%)	21 (11%)	6	26
6	c	194/196 (99%)	177 (91%)	17 (9%)	10	36
6	g	193/196 (98%)	176 (91%)	17 (9%)	10	36
6	h	193/196 (98%)	178 (92%)	15 (8%)	12	42
6	i	194/196 (99%)	173 (89%)	21 (11%)	6	26
6	j	194/196 (99%)	176 (91%)	18 (9%)	9	33
6	k	194/196 (99%)	178 (92%)	16 (8%)	11	39
6	l	194/196 (99%)	173 (89%)	21 (11%)	6	26
6	n	194/196 (99%)	182 (94%)	12 (6%)	18	52
6	o	194/196 (99%)	177 (91%)	17 (9%)	10	36
6	v	193/196 (98%)	176 (91%)	17 (9%)	10	36
All	All	8352/11178 (75%)	7569 (91%)	783 (9%)	12	32

All (783) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	12	MET
1	M	41	LEU
1	M	47	THR
1	M	49	SER
1	M	50	VAL
1	M	52	ARG
1	M	54	GLU
1	M	64	GLU
1	M	84	VAL
1	M	91	SER
1	M	109	ASN
2	J	1	MET
2	J	15	LYS
2	J	26	VAL
2	J	31	SER

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Mol	Chain	Res	Type
2	J	47	LEU
2	J	49	SER
2	J	54	ASP
2	J	65	THR
2	J	88	THR
2	J	96	TYR
2	J	97	ASP
2	J	122	VAL
2	J	138	LEU
2	J	147	TRP
2	J	149	THR
2	J	151	LYS
2	J	153	ILE
2	J	168	VAL
2	J	169	MET
2	J	177	PHE
2	J	181	MET
2	J	187	ASP
2	J	209	LYS
2	J	215	THR
2	J	217	LEU
2	J	223	ASP
2	J	224	SER
2	J	233	SER
2	J	234	ARG
2	J	235	ASN
2	J	237	HIS
2	J	248	ASN
2	J	257	SER
2	J	279	MET
2	J	325	CYS
2	J	347	ARG
2	J	363	ARG
2	J	373	ARG
2	J	374	SER
2	J	380	ASP
2	J	381	ASP
2	J	412	THR
2	J	429	ASN
2	J	434	ASP
2	J	461	THR
2	J	463	ASP

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Mol	Chain	Res	Type
2	J	465	SER
2	J	472	ARG
2	J	500	SER
2	J	503	ARG
2	J	504	THR
2	J	511	ILE
2	J	539	THR
2	J	540	ASP
2	J	543	LYS
2	J	544	VAL
2	J	583	THR
2	J	600	ASP
2	J	609	GLN
2	J	629	THR
2	J	648	LYS
2	J	667	LEU
2	J	685	LEU
2	J	695	VAL
2	J	710	ARG
2	J	726	TYR
2	J	748	PHE
2	J	751	LYS
2	J	771	TYR
2	J	772	TRP
2	J	797	LYS
2	J	809	ASP
2	J	823	THR
2	J	826	HIS
2	J	827	LEU
2	J	831	LEU
2	J	836	GLU
1	m	13	ASP
1	m	24	ARG
1	m	46	VAL
1	m	74	THR
3	L	1	MET
3	L	78	THR
3	L	120	ASN
3	L	141	SER
3	L	142	GLU
3	L	154	THR
3	L	159	ASP

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Mol	Chain	Res	Type
3	L	171	ASN
3	L	212	CYS
3	L	228	ASN
4	H	824	LYS
4	H	835	ARG
4	H	844	ASP
4	H	849	SER
5	I	105	ILE
5	I	118	THR
5	I	135	MET
5	I	158	LYS
5	I	161	THR
5	I	175	TYR
5	I	207	ILE
6	V	32	SER
6	V	38	ARG
6	V	51	THR
6	V	68	THR
6	V	70	THR
6	V	79	ASP
6	V	83	THR
6	V	90	GLU
6	V	125	SER
6	V	146	VAL
6	V	166	VAL
6	V	174	VAL
6	V	185	PHE
6	V	193	LYS
6	V	195	PHE
6	V	225	ASN
6	V	232	ASN
6	V	235	PHE
6	v	10	VAL
6	v	16	THR
6	v	32	SER
6	v	33	ASP
6	v	61	ASP
6	v	70	THR
6	v	75	LYS
6	v	79	ASP
6	v	90	GLU
6	v	119	VAL

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Mol	Chain	Res	Type
6	v	132	THR
6	v	150	SER
6	v	158	VAL
6	v	171	THR
6	v	179	THR
6	v	191	THR
6	v	223	LYS
6	B	38	ARG
6	B	43	LYS
6	B	54	SER
6	B	63	GLU
6	B	66	ASP
6	B	76	SER
6	B	87	MET
6	B	132	THR
6	B	150	SER
6	B	156	SER
6	B	164	MET
6	B	182	THR
6	B	185	PHE
6	B	199	SER
6	B	208	SER
6	B	212	MET
6	B	213	THR
6	B	232	ASN
6	b	16	THR
6	b	23	SER
6	b	31	LEU
6	b	38	ARG
6	b	43	LYS
6	b	44	ASP
6	b	51	THR
6	b	64	ASP
6	b	70	THR
6	b	81	SER
6	b	84	LEU
6	b	106	ARG
6	b	110	ILE
6	b	134	LYS
6	b	135	GLU
6	b	138	THR
6	b	146	VAL

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Mol	Chain	Res	Type
6	b	164	MET
6	b	185	PHE
6	b	192	ASP
6	b	199	SER
6	A	17	LEU
6	A	37	SER
6	A	38	ARG
6	A	66	ASP
6	A	76	SER
6	A	83	THR
6	A	87	MET
6	A	102	GLU
6	A	125	SER
6	A	127	ILE
6	A	134	LYS
6	A	140	THR
6	A	146	VAL
6	A	148	ARG
6	A	164	MET
6	A	185	PHE
6	A	190	VAL
6	A	191	THR
6	A	195	PHE
6	A	198	VAL
6	A	215	THR
6	A	224	VAL
6	A	232	ASN
6	A	235	PHE
6	a	37	SER
6	a	70	THR
6	a	111	ARG
6	a	114	ASN
6	a	117	VAL
6	a	119	VAL
6	a	126	SER
6	a	132	THR
6	a	138	THR
6	a	155	ARG
6	a	174	VAL
6	a	185	PHE
6	a	193	LYS
6	a	202	LYS

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Mol	Chain	Res	Type
6	a	207	VAL
6	a	212	MET
6	a	215	THR
6	C	11	LYS
6	C	16	THR
6	C	21	LYS
6	C	61	ASP
6	C	79	ASP
6	C	91	GLN
6	C	97	LEU
6	C	116	THR
6	C	141	VAL
6	C	146	VAL
6	C	159	THR
6	C	180	THR
6	C	232	ASN
6	c	7	THR
6	c	8	MET
6	c	16	THR
6	c	45	LEU
6	c	63	GLU
6	c	64	ASP
6	c	66	ASP
6	c	83	THR
6	c	101	ASN
6	c	102	GLU
6	c	117	VAL
6	c	126	SER
6	c	135	GLU
6	c	145	ASN
6	c	196	ARG
6	c	212	MET
6	c	240	GLU
1	D	13	ASP
1	D	43	THR
1	D	46	VAL
1	D	47	THR
1	D	50	VAL
1	D	52	ARG
1	D	54	GLU
1	D	90	SER
1	D	91	SER

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Mol	Chain	Res	Type
2	E	15	LYS
2	E	26	VAL
2	E	30	ILE
2	E	48	ASN
2	E	49	SER
2	E	65	THR
2	E	96	TYR
2	E	97	ASP
2	E	102	ARG
2	E	110	ASP
2	E	115	THR
2	E	122	VAL
2	E	124	THR
2	E	138	LEU
2	E	139	VAL
2	E	149	THR
2	E	153	ILE
2	E	168	VAL
2	E	177	PHE
2	E	187	ASP
2	E	209	LYS
2	E	215	THR
2	E	217	LEU
2	E	223	ASP
2	E	226	GLN
2	E	233	SER
2	E	234	ARG
2	E	235	ASN
2	E	257	SER
2	E	279	MET
2	E	281	THR
2	E	324	THR
2	E	325	CYS
2	E	330	THR
2	E	347	ARG
2	E	363	ARG
2	E	366	ASP
2	E	373	ARG
2	E	374	SER
2	E	380	ASP
2	E	397	ASN
2	E	412	THR

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Mol	Chain	Res	Type
2	E	432	LYS
2	E	434	ASP
2	E	463	ASP
2	E	465	SER
2	E	500	SER
2	E	502	THR
2	E	503	ARG
2	E	504	THR
2	E	511	ILE
2	E	531	VAL
2	E	534	GLU
2	E	540	ASP
2	E	544	VAL
2	E	600	ASP
2	E	606	ASP
2	E	640	ARG
2	E	653	LEU
2	E	667	LEU
2	E	672	ARG
2	E	685	LEU
2	E	703	ASP
2	E	710	ARG
2	E	726	TYR
2	E	748	PHE
2	E	751	LYS
2	E	771	TYR
2	E	783	HIS
2	E	797	LYS
2	E	817	PHE
2	E	819	LYS
2	E	823	THR
2	E	827	LEU
2	E	836	GLU
2	E	840	ASP
1	F	46	VAL
1	F	74	THR
1	F	85	THR
1	F	103	GLU
3	G	1	MET
3	G	9	LEU
3	G	80	THR
3	G	111	ARG

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Mol	Chain	Res	Type
3	G	154	THR
3	G	157	GLU
3	G	159	ASP
3	G	171	ASN
3	G	204	LYS
3	G	212	CYS
3	G	230	LEU
4	K	832	LYS
4	K	835	ARG
4	K	844	ASP
4	K	849	SER
5	N	118	THR
5	N	135	MET
5	N	158	LYS
5	N	161	THR
5	N	175	TYR
5	N	177	SER
5	N	182	MET
5	N	204	SER
6	O	17	LEU
6	O	51	THR
6	O	54	SER
6	O	66	ASP
6	O	68	THR
6	O	70	THR
6	O	83	THR
6	O	106	ARG
6	O	125	SER
6	O	145	ASN
6	O	146	VAL
6	O	164	MET
6	O	166	VAL
6	O	174	VAL
6	O	185	PHE
6	O	193	LYS
6	O	195	PHE
6	O	203	THR
6	O	212	MET
6	O	217	ASN
6	O	225	ASN
6	O	232	ASN
6	O	235	PHE

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Mol	Chain	Res	Type
6	P	31	LEU
6	P	32	SER
6	P	33	ASP
6	P	41	LYS
6	P	56	ASP
6	P	61	ASP
6	P	66	ASP
6	P	70	THR
6	P	79	ASP
6	P	84	LEU
6	P	90	GLU
6	P	97	LEU
6	P	117	VAL
6	P	119	VAL
6	P	132	THR
6	P	150	SER
6	P	158	VAL
6	P	171	THR
6	P	179	THR
6	P	191	THR
6	P	223	LYS
6	Q	38	ARG
6	Q	43	LYS
6	Q	64	ASP
6	Q	66	ASP
6	Q	76	SER
6	Q	87	MET
6	Q	97	LEU
6	Q	119	VAL
6	Q	126	SER
6	Q	132	THR
6	Q	150	SER
6	Q	156	SER
6	Q	164	MET
6	Q	165	THR
6	Q	180	THR
6	Q	181	LEU
6	Q	182	THR
6	Q	185	PHE
6	Q	191	THR
6	Q	198	VAL
6	Q	199	SER

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Mol	Chain	Res	Type
6	Q	212	MET
6	Q	217	ASN
6	R	43	LYS
6	R	44	ASP
6	R	49	GLU
6	R	51	THR
6	R	64	ASP
6	R	70	THR
6	R	81	SER
6	R	84	LEU
6	R	87	MET
6	R	132	THR
6	R	134	LYS
6	R	138	THR
6	R	150	SER
6	R	185	PHE
6	R	192	ASP
6	R	199	SER
6	R	213	THR
6	S	37	SER
6	S	38	ARG
6	S	44	ASP
6	S	76	SER
6	S	83	THR
6	S	125	SER
6	S	134	LYS
6	S	140	THR
6	S	146	VAL
6	S	148	ARG
6	S	164	MET
6	S	185	PHE
6	S	191	THR
6	S	195	PHE
6	S	198	VAL
6	S	215	THR
6	S	230	SER
6	S	235	PHE
6	T	35	ASP
6	T	37	SER
6	T	63	GLU
6	T	70	THR
6	T	84	LEU

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Mol	Chain	Res	Type
6	T	119	VAL
6	T	126	SER
6	T	135	GLU
6	T	140	THR
6	T	180	THR
6	T	202	LYS
6	T	207	VAL
6	T	223	LYS
6	T	240	GLU
6	U	8	MET
6	U	16	THR
6	U	21	LYS
6	U	38	ARG
6	U	61	ASP
6	U	64	ASP
6	U	79	ASP
6	U	83	THR
6	U	116	THR
6	U	132	THR
6	U	141	VAL
6	U	146	VAL
6	U	153	GLU
6	U	159	THR
6	U	164	MET
6	U	165	THR
6	U	232	ASN
6	W	7	THR
6	W	8	MET
6	W	16	THR
6	W	63	GLU
6	W	64	ASP
6	W	66	ASP
6	W	83	THR
6	W	102	GLU
6	W	117	VAL
6	W	126	SER
6	W	132	THR
6	W	135	GLU
6	W	145	ASN
6	W	196	ARG
6	W	212	MET
1	X	1	MET

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Mol	Chain	Res	Type
1	X	24	ARG
1	X	27	ASP
1	X	43	THR
1	X	46	VAL
1	X	47	THR
1	X	50	VAL
1	X	52	ARG
1	X	54	GLU
1	X	60	SER
1	X	90	SER
1	X	91	SER
1	X	95	MET
1	X	103	GLU
2	Y	26	VAL
2	Y	31	SER
2	Y	48	ASN
2	Y	49	SER
2	Y	50	THR
2	Y	51	PRO
2	Y	88	THR
2	Y	97	ASP
2	Y	110	ASP
2	Y	115	THR
2	Y	122	VAL
2	Y	130	ARG
2	Y	138	LEU
2	Y	147	TRP
2	Y	149	THR
2	Y	151	LYS
2	Y	153	ILE
2	Y	167	VAL
2	Y	168	VAL
2	Y	169	MET
2	Y	177	PHE
2	Y	181	MET
2	Y	187	ASP
2	Y	209	LYS
2	Y	215	THR
2	Y	217	LEU
2	Y	223	ASP
2	Y	233	SER
2	Y	234	ARG

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Mol	Chain	Res	Type
2	Y	235	ASN
2	Y	237	HIS
2	Y	239	ARG
2	Y	257	SER
2	Y	279	MET
2	Y	281	THR
2	Y	324	THR
2	Y	325	CYS
2	Y	330	THR
2	Y	333	ARG
2	Y	347	ARG
2	Y	363	ARG
2	Y	366	ASP
2	Y	373	ARG
2	Y	374	SER
2	Y	381	ASP
2	Y	397	ASN
2	Y	412	THR
2	Y	434	ASP
2	Y	458	GLU
2	Y	461	THR
2	Y	463	ASP
2	Y	465	SER
2	Y	469	GLU
2	Y	472	ARG
2	Y	500	SER
2	Y	501	GLN
2	Y	503	ARG
2	Y	504	THR
2	Y	511	ILE
2	Y	531	VAL
2	Y	536	GLN
2	Y	539	THR
2	Y	544	VAL
2	Y	551	ASP
2	Y	574	VAL
2	Y	575	SER
2	Y	600	ASP
2	Y	667	LEU
2	Y	685	LEU
2	Y	703	ASP
2	Y	748	PHE

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Mol	Chain	Res	Type
2	Y	751	LYS
2	Y	771	TYR
2	Y	797	LYS
2	Y	812	GLU
2	Y	823	THR
2	Y	826	HIS
2	Y	827	LEU
2	Y	836	GLU
2	Y	838	THR
2	Y	840	ASP
1	Z	24	ARG
1	Z	46	VAL
1	Z	58	LEU
1	Z	59	GLU
1	Z	74	THR
1	Z	92	ARG
1	Z	106	GLN
3	d	1	MET
3	d	105	ARG
3	d	120	ASN
3	d	141	SER
3	d	142	GLU
3	d	159	ASP
3	d	167	ILE
3	d	171	ASN
3	d	228	ASN
4	e	824	LYS
4	e	832	LYS
4	e	842	MET
4	e	844	ASP
4	e	849	SER
5	f	118	THR
5	f	135	MET
5	f	136	THR
5	f	158	LYS
5	f	160	ARG
5	f	161	THR
5	f	175	TYR
5	f	188	VAL
5	f	191	VAL
5	f	203	VAL
5	f	204	SER

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Mol	Chain	Res	Type
5	f	223	ARG
6	g	38	ARG
6	g	51	THR
6	g	70	THR
6	g	79	ASP
6	g	83	THR
6	g	90	GLU
6	g	106	ARG
6	g	125	SER
6	g	146	VAL
6	g	166	VAL
6	g	174	VAL
6	g	185	PHE
6	g	191	THR
6	g	195	PHE
6	g	203	THR
6	g	225	ASN
6	g	235	PHE
6	h	31	LEU
6	h	56	ASP
6	h	61	ASP
6	h	70	THR
6	h	79	ASP
6	h	84	LEU
6	h	90	GLU
6	h	119	VAL
6	h	132	THR
6	h	150	SER
6	h	158	VAL
6	h	171	THR
6	h	179	THR
6	h	199	SER
6	h	223	LYS
6	i	17	LEU
6	i	38	ARG
6	i	43	LYS
6	i	54	SER
6	i	66	ASP
6	i	76	SER
6	i	84	LEU
6	i	87	MET
6	i	116	THR

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Mol	Chain	Res	Type
6	i	131	VAL
6	i	132	THR
6	i	140	THR
6	i	150	SER
6	i	164	MET
6	i	181	LEU
6	i	182	THR
6	i	183	VAL
6	i	185	PHE
6	i	199	SER
6	i	212	MET
6	i	235	PHE
6	j	23	SER
6	j	54	SER
6	j	63	GLU
6	j	64	ASP
6	j	66	ASP
6	j	74	GLN
6	j	81	SER
6	j	84	LEU
6	j	106	ARG
6	j	125	SER
6	j	132	THR
6	j	134	LYS
6	j	135	GLU
6	j	146	VAL
6	j	150	SER
6	j	185	PHE
6	j	192	ASP
6	j	199	SER
6	k	38	ARG
6	k	66	ASP
6	k	76	SER
6	k	83	THR
6	k	102	GLU
6	k	125	SER
6	k	136	VAL
6	k	146	VAL
6	k	164	MET
6	k	185	PHE
6	k	191	THR
6	k	195	PHE

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Mol	Chain	Res	Type
6	k	198	VAL
6	k	215	THR
6	k	224	VAL
6	k	235	PHE
6	l	3	VAL
6	l	33	ASP
6	l	35	ASP
6	l	37	SER
6	l	54	SER
6	l	66	ASP
6	l	70	THR
6	l	97	LEU
6	l	114	ASN
6	l	117	VAL
6	l	119	VAL
6	l	138	THR
6	l	140	THR
6	l	180	THR
6	l	193	LYS
6	l	198	VAL
6	l	202	LYS
6	l	207	VAL
6	l	215	THR
6	l	223	LYS
6	l	240	GLU
6	n	8	MET
6	n	16	THR
6	n	21	LYS
6	n	83	THR
6	n	101	ASN
6	n	116	THR
6	n	132	THR
6	n	134	LYS
6	n	141	VAL
6	n	146	VAL
6	n	159	THR
6	n	232	ASN
6	o	7	THR
6	o	8	MET
6	o	11	LYS
6	o	16	THR
6	o	63	GLU

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Mol	Chain	Res	Type
6	o	64	ASP
6	o	66	ASP
6	o	83	THR
6	o	90	GLU
6	o	101	ASN
6	o	102	GLU
6	o	117	VAL
6	o	126	SER
6	o	135	GLU
6	o	145	ASN
6	o	196	ARG
6	o	212	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
2	J	75	GLN
2	J	408	ASN
3	L	228	ASN
6	C	94	GLN
6	c	74	GLN
6	c	177	GLN
2	E	75	GLN
2	E	408	ASN
2	E	826	HIS
5	N	169	ASN
6	U	94	GLN
6	W	74	GLN
6	W	91	GLN
6	W	177	GLN
1	X	38	ASN
2	Y	75	GLN
3	d	228	ASN
5	f	169	ASN
6	n	94	GLN
6	o	74	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

3 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	$\# Z > 2$
7	SF4	d	301	3	0,12,12	-	-	-		
7	SF4	L	301	3	0,12,12	-	-	-		
7	SF4	G	301	3	0,12,12	-	-	-		

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
7	SF4	d	301	3	-	-	0/6/5/5
7	SF4	L	301	3	-	-	0/6/5/5
7	SF4	G	301	3	-	-	0/6/5/5

There are no bond length outliers.

There are no bond angle outliers.

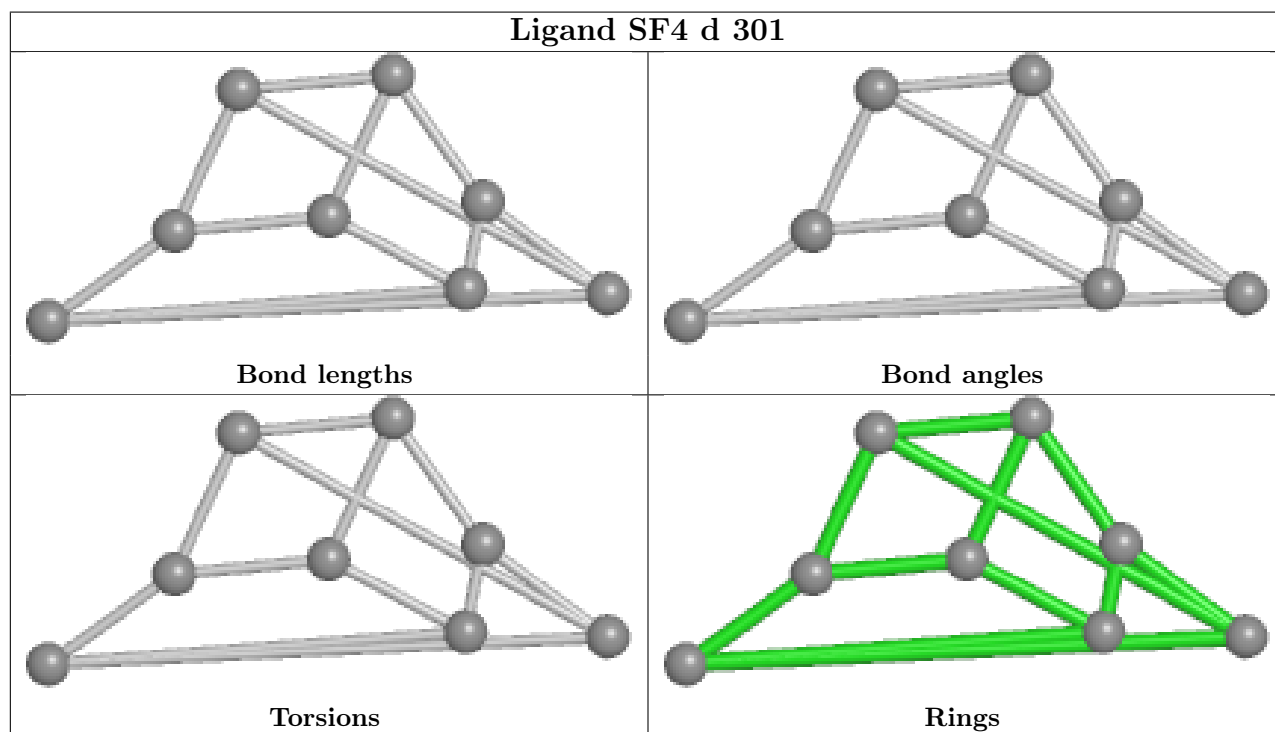
There are no chirality outliers.

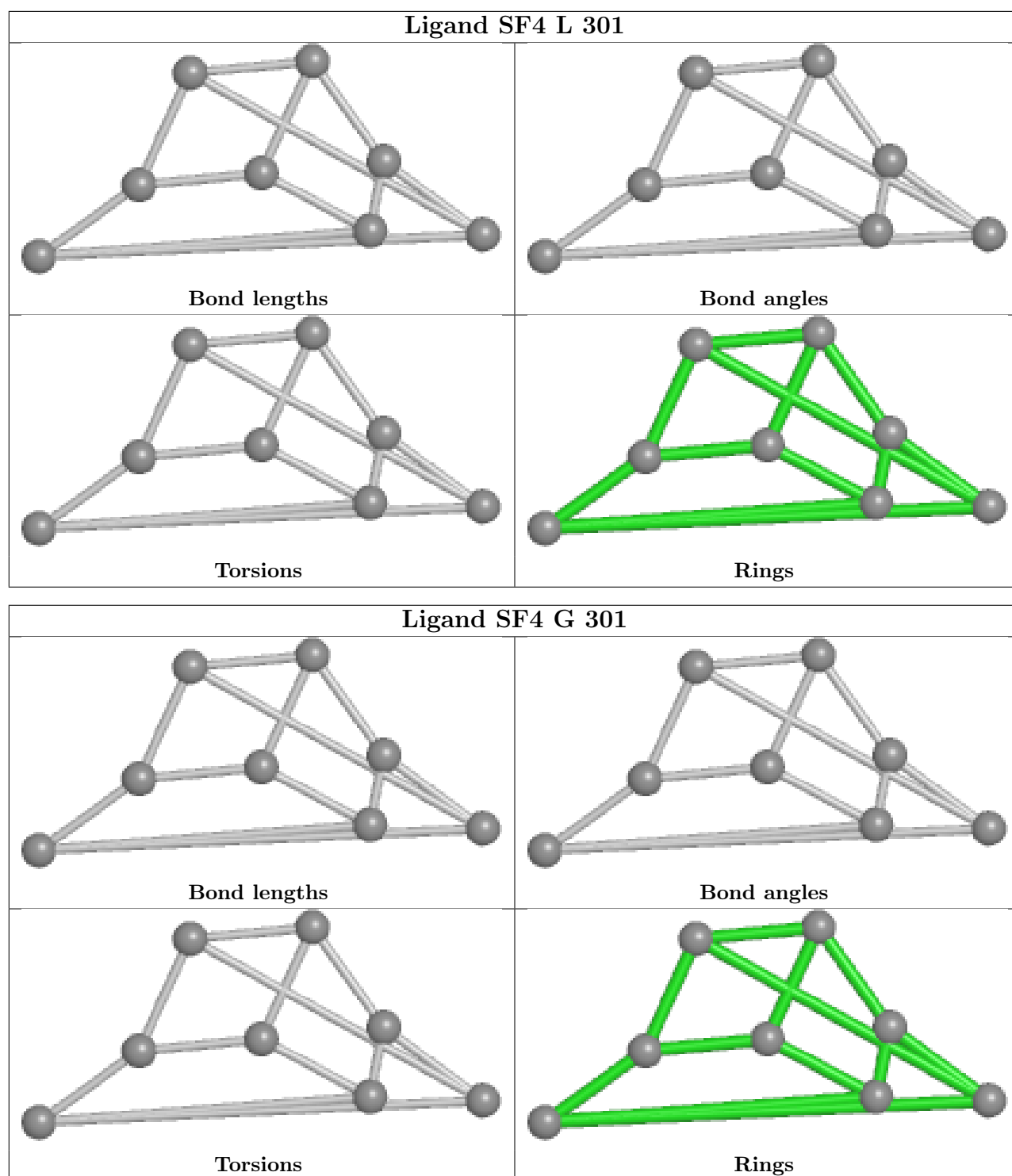
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.