



Full wwPDB EM Validation Report ⓘ

Apr 27, 2026 – 02:22 pm BST

PDB ID : 9TAM / pdb_00009tam
EMDB ID : EMD-55751
Title : E. coli Complex I D79N NuoA mutant purified in LMNG
Authors : Beghiah, A.; Kovalova, T.; Kaila, V.
Deposited on : 2025-11-18
Resolution : 2.96 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:

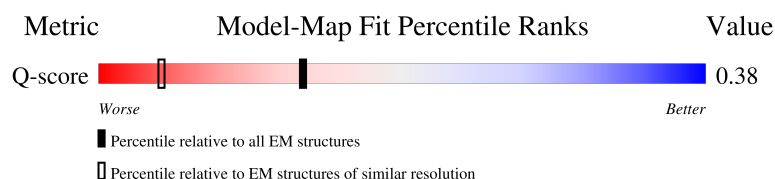
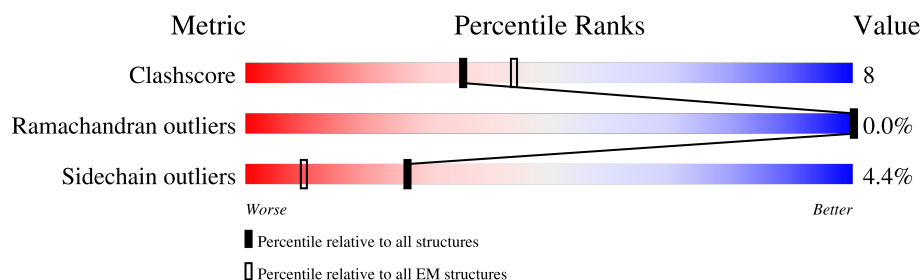
EMDB validation analysis : 0.0.1.dev132
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
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:
ELECTRON MICROSCOPY

The reported resolution of this entry is 2.96 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.





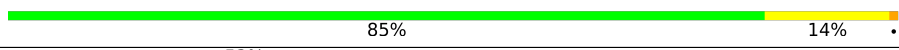




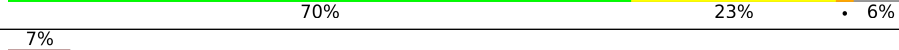
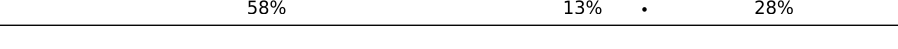
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	13155 (2.46 - 3.46)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	C	600	<div> <div>9%</div> <div>81%</div> <div>16%</div> <div>..</div> </div>
2	E	166	<div> <div>5%</div> <div>84%</div> <div>10%</div> <div>6%</div> </div>
3	F	461	<div> <div>8%</div> <div>80%</div> <div>15%</div> <div>5%</div> </div>
4	G	910	<div> <div>88%</div> <div>11%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
5	I	180	
6	J	184	
7	K	100	
8	L	613	
9	M	509	
10	N	485	
11	B	220	
12	H	325	
13	A	147	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
15	SF4	F	501	-	-	X	-

2 Entry composition

There are 21 unique types of molecules in this entry. The entry contains 38164 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 NADH-quinone oxidoreductase subunit C/D.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	589	Total	C	N	O	S	0	0
			4760	3049	828	859	24		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	1	MET	-	initiating methionine	UNP P33599
C	2	VAL	-	expression tag	UNP P33599
C	3	ASN	-	expression tag	UNP P33599
C	4	ASN	-	expression tag	UNP P33599

- Molecule 2 is a protein called NADH-quinone oxidoreductase subunit E.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	156	Total	C	N	O	S	0	0
			1220	768	215	229	8		

- Molecule 3 is a protein called NADH-quinone oxidoreductase subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	F	439	Total	C	N	O	S	0	0
			3407	2162	596	629	20		

There are 17 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-15	MET	-	initiating methionine	UNP P31979
F	-14	ARG	-	expression tag	UNP P31979
F	-13	GLY	-	expression tag	UNP P31979
F	-12	SER	-	expression tag	UNP P31979
F	-11	HIS	-	expression tag	UNP P31979
F	-10	HIS	-	expression tag	UNP P31979
F	-9	HIS	-	expression tag	UNP P31979

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-8	HIS	-	expression tag	UNP P31979
F	-7	HIS	-	expression tag	UNP P31979
F	-6	HIS	-	expression tag	UNP P31979
F	-5	THR	-	expression tag	UNP P31979
F	-4	ASP	-	expression tag	UNP P31979
F	-3	PRO	-	expression tag	UNP P31979
F	-2	ALA	-	expression tag	UNP P31979
F	-1	LEU	-	expression tag	UNP P31979
F	0	ARG	-	expression tag	UNP P31979
F	1	ALA	-	expression tag	UNP P31979

- Molecule 4 is a protein called NADH-quinone oxidoreductase subunit G.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	905	Total	C	N	O	S	0	0
			7027	4392	1269	1329	37		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	1	MET	-	initiating methionine	UNP P33602
G	2	LEU	-	expression tag	UNP P33602

- Molecule 5 is a protein called NADH-quinone oxidoreductase subunit I.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	149	Total	C	N	O	S	0	0
			1185	752	196	224	13		

- Molecule 6 is a protein called NADH-quinone oxidoreductase subunit J.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	J	163	Total	C	N	O	S	0	0
			1237	830	192	208	7		

- Molecule 7 is a protein called NADH-quinone oxidoreductase subunit K.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	K	100	Total	C	N	O	S	0	0
			760	494	132	129	5		

- Molecule 8 is a protein called NADH-quinone oxidoreductase subunit L.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	L	613	Total	C	N	O	S	0	0
			4685	3113	753	787	32		

- Molecule 9 is a protein called NADH-quinone oxidoreductase subunit M.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	M	504	Total	C	N	O	S	0	0
			3953	2661	617	646	29		

- Molecule 10 is a protein called NADH-quinone oxidoreductase subunit N.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	N	485	Total	C	N	O	S	0	0
			3673	2448	582	623	20		

- Molecule 11 is a protein called NADH-quinone oxidoreductase subunit B.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	B	201	Total	C	N	O	S	0	0
			1601	1014	278	293	16		

- Molecule 12 is a protein called NADH-quinone oxidoreductase subunit H.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	H	307	Total	C	N	O	S	0	0
			2402	1615	371	398	18		

- Molecule 13 is a protein called NADH-quinone oxidoreductase subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	A	106	Total	C	N	O	S	0	0
			832	567	129	132	4		

There is a discrepancy between the modelled and reference sequences:

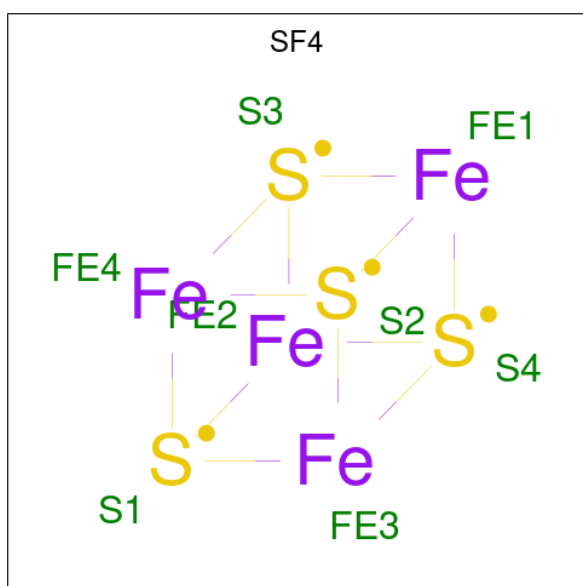
Chain	Residue	Modelled	Actual	Comment	Reference
A	79	ASN	ASP	conflict	UNP P0AFC3

- Molecule 14 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula: Fe₂S₂).



Mol	Chain	Residues	Atoms			AltConf
14	E	1	Total	Fe	S	0
			4	2	2	
14	G	1	Total	Fe	S	0
			4	2	2	

- Molecule 15 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4).



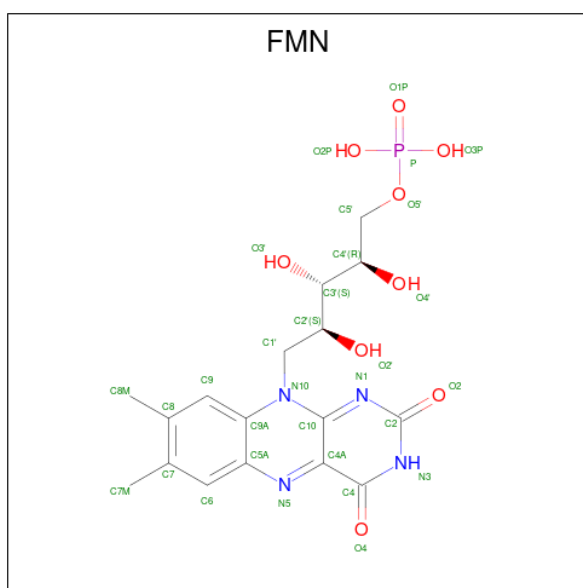
Mol	Chain	Residues	Atoms			AltConf
15	F	1	Total	Fe	S	0
			8	4	4	
15	G	1	Total	Fe	S	0
			8	4	4	

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Mol	Chain	Residues	Atoms			AltConf
15	G	1	Total	Fe	S	0
			8	4	4	
15	G	1	Total	Fe	S	0
			8	4	4	
15	I	1	Total	Fe	S	0
			8	4	4	
15	I	1	Total	Fe	S	0
			8	4	4	
15	B	1	Total	Fe	S	0
			8	4	4	

- Molecule 16 is FLAVIN MONONUCLEOTIDE (CCD ID: FMN) (formula: $C_{17}H_{21}N_4O_9P$).



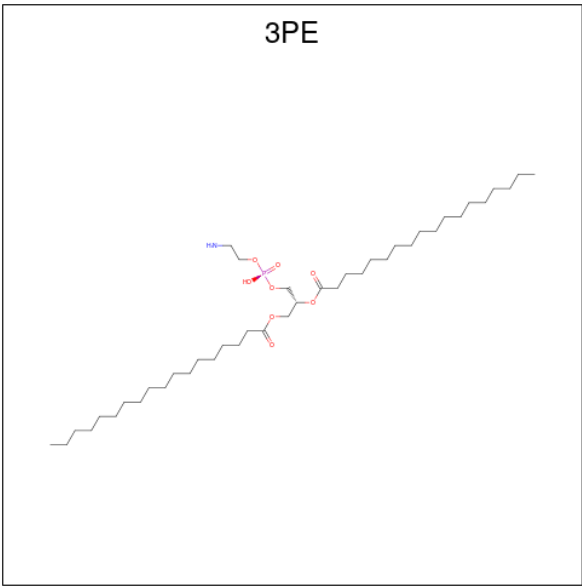
Mol	Chain	Residues	Atoms					AltConf
16	F	1	Total	C	N	O	P	0
			31	17	4	9	1	

- Molecule 17 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
17	G	2	Total	Ca	0
			2	2	
17	I	1	Total	Ca	0
			1	1	

- Molecule 18 is 1,2-Distearoyl-sn-glycerophosphoethanolamine (CCD ID: 3PE) (formula:

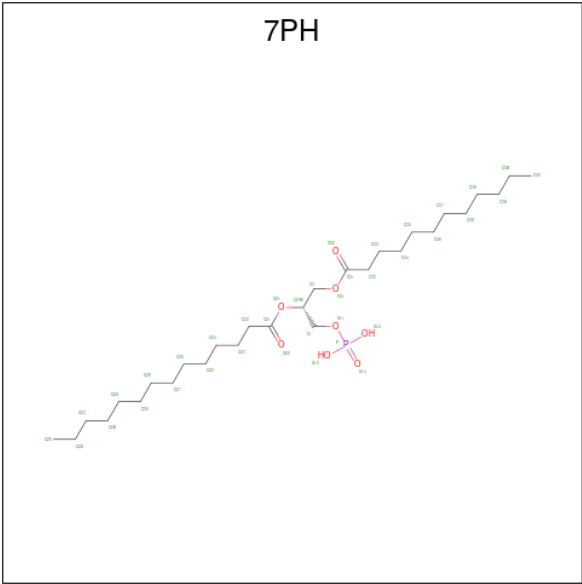
C₄₁H₈₂NO₈P).



Mol	Chain	Residues	Atoms					AltConf
18	J	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	L	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	L	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	L	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	M	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	N	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	N	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	N	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	N	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	H	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	H	1	Total	C	N	O	P	0
			51	41	1	8	1	
18	A	1	Total	C	N	O	P	0
			51	41	1	8	1	

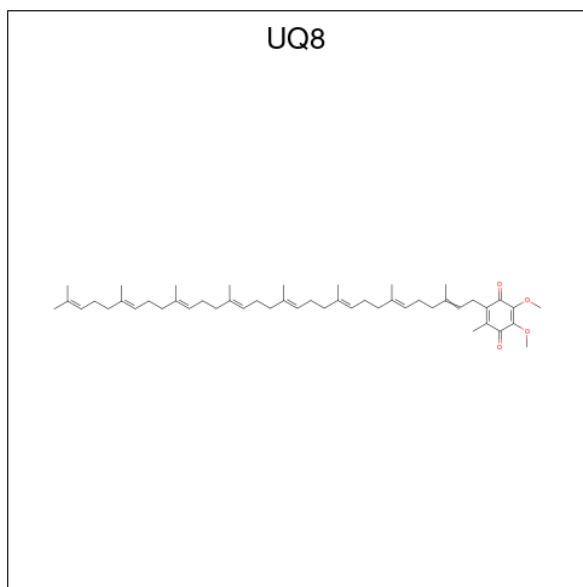
- Molecule 19 is (1R)-2-(dodecanoyloxy)-1-[(phosphonooxy)methyl]ethyl tetradecanoate

(CCD ID: 7PH) (formula: C₂₉H₅₇O₈P).



Mol	Chain	Residues	Atoms				AltConf
19	J	1	Total	C	O	P	0
			38	29	8	1	
19	J	1	Total	C	O	P	0
			38	29	8	1	
19	M	1	Total	C	O	P	0
			38	29	8	1	
19	M	1	Total	C	O	P	0
			38	29	8	1	
19	H	1	Total	C	O	P	0
			38	29	8	1	

- Molecule 20 is Ubiquinone-8 (CCD ID: UQ8) (formula: C₄₉H₇₄O₄) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms			AltConf
20	N	1	Total	C	O	0
			53	49	4	
20	N	1	Total	C	O	0
			53	49	4	

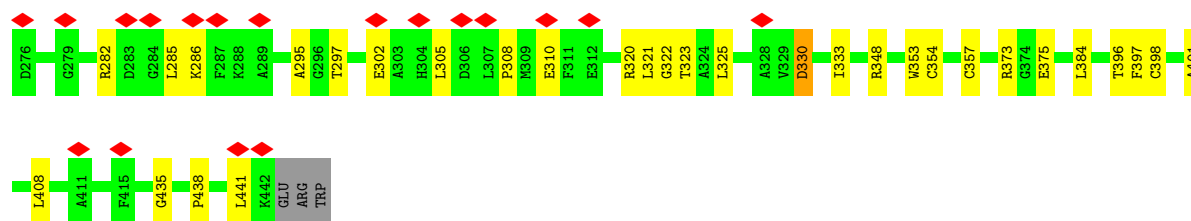
- Molecule 21 is water.

Mol	Chain	Residues	Atoms		AltConf
21	C	52	Total	O	0
			52	52	
21	E	6	Total	O	0
			6	6	
21	F	16	Total	O	0
			16	16	
21	G	98	Total	O	0
			98	98	
21	I	34	Total	O	0
			34	34	
21	J	20	Total	O	0
			20	20	
21	K	15	Total	O	0
			15	15	
21	L	26	Total	O	0
			26	26	
21	M	12	Total	O	0
			12	12	
21	N	59	Total	O	0
			59	59	

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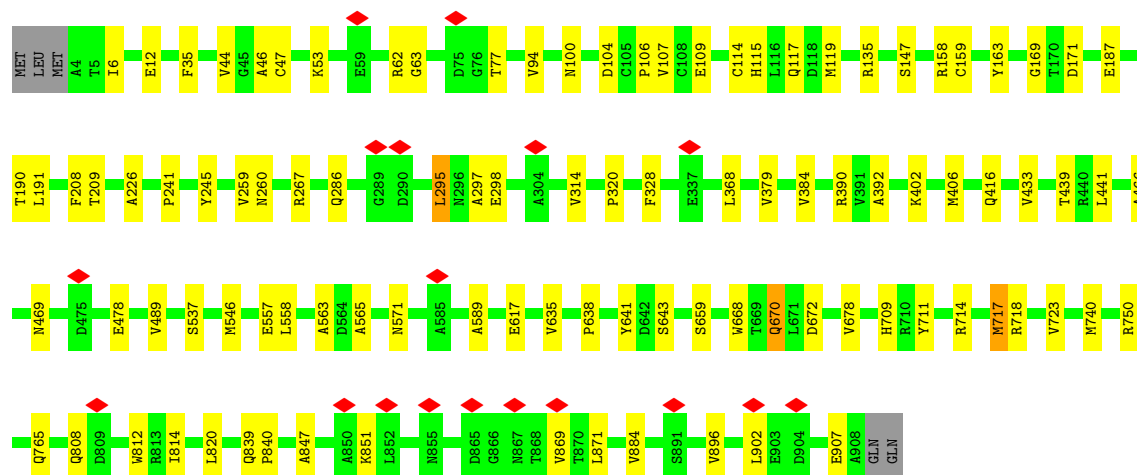
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Mol	Chain	Residues	Atoms		AltConf
21	B	28	Total 28	O 28	0
21	H	41	Total 41	O 41	0
21	A	9	Total 9	O 9	0



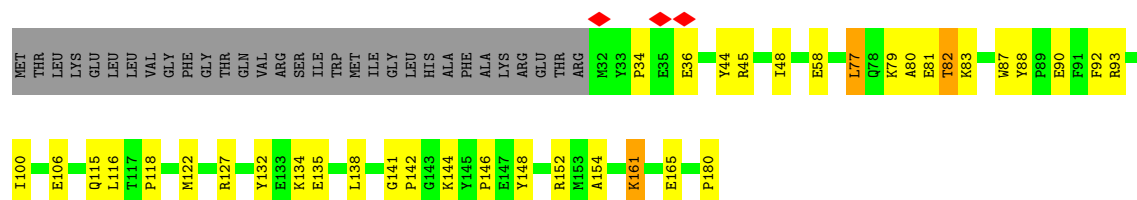
• Molecule 4: NADH-quinone oxidoreductase subunit G

Chain G: 88% 11%



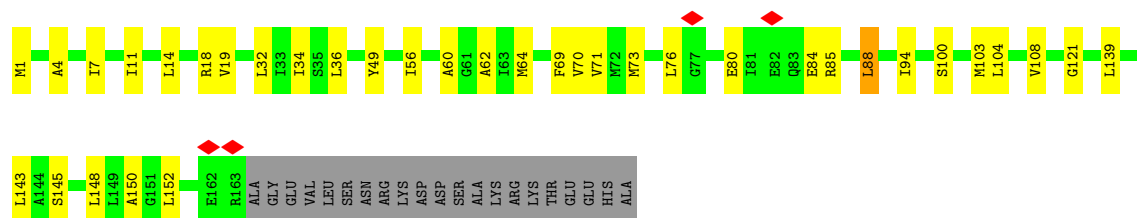
• Molecule 5: NADH-quinone oxidoreductase subunit I

Chain I: 62% 19% 17%




• Molecule 6: NADH-quinone oxidoreductase subunit J

Chain J: 69% 19% 11%




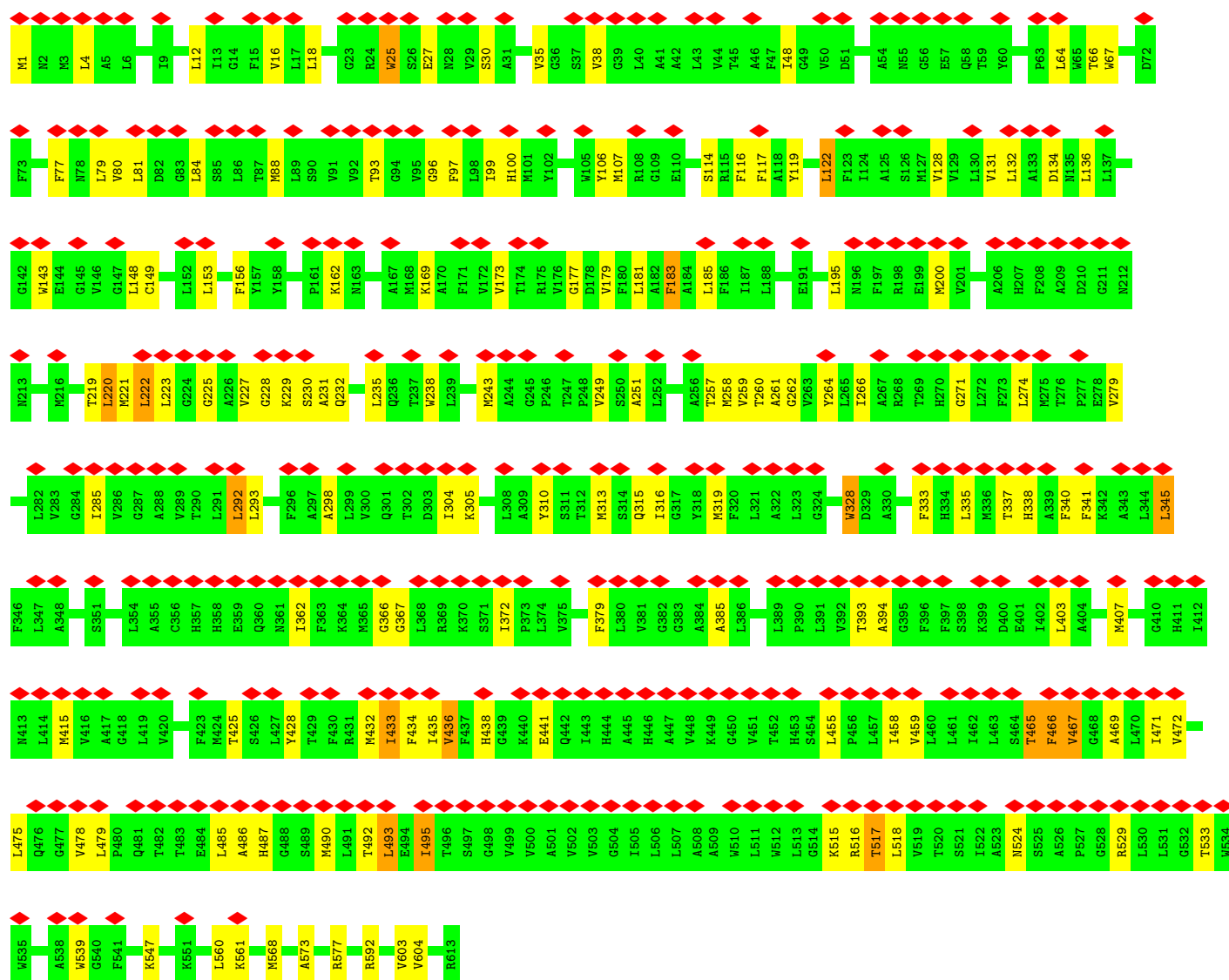
• Molecule 7: NADH-quinone oxidoreductase subunit K

Chain K:  85% 14% .




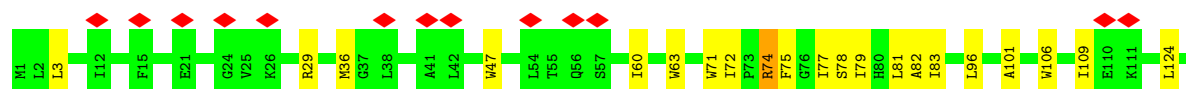
• Molecule 8: NADH-quinone oxidoreductase subunit L

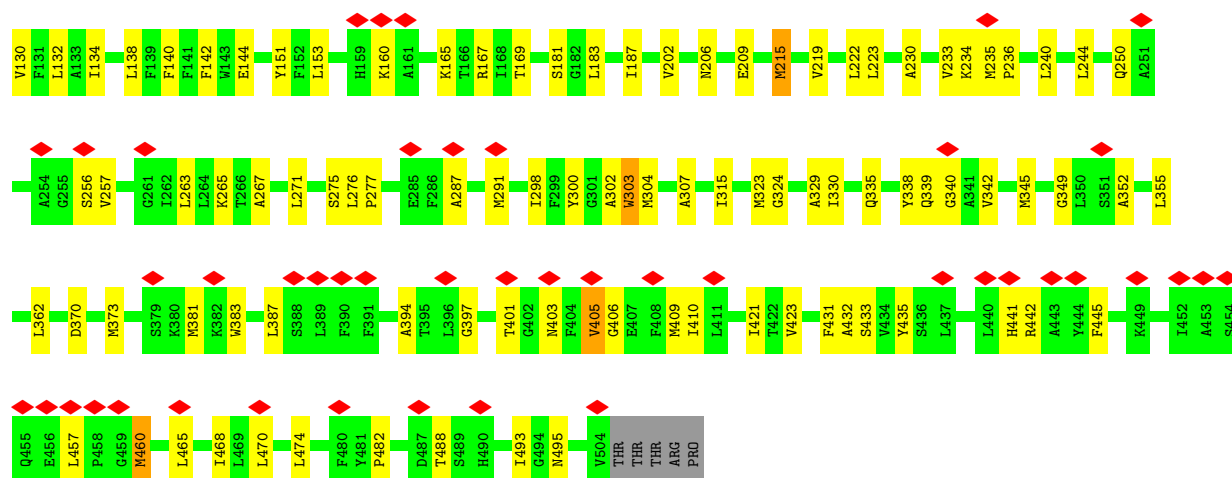
Chain L:  53% 75% 23% .



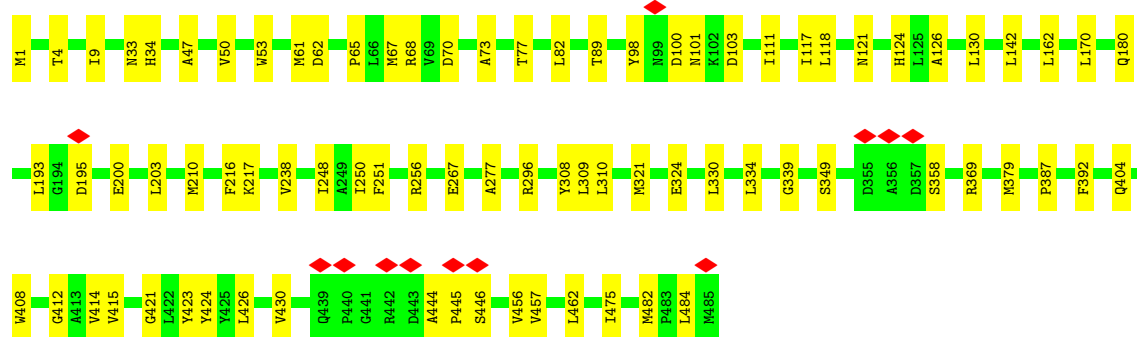
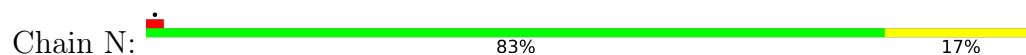
• Molecule 9: NADH-quinone oxidoreductase subunit M

Chain M:  11% 76% 22% ..

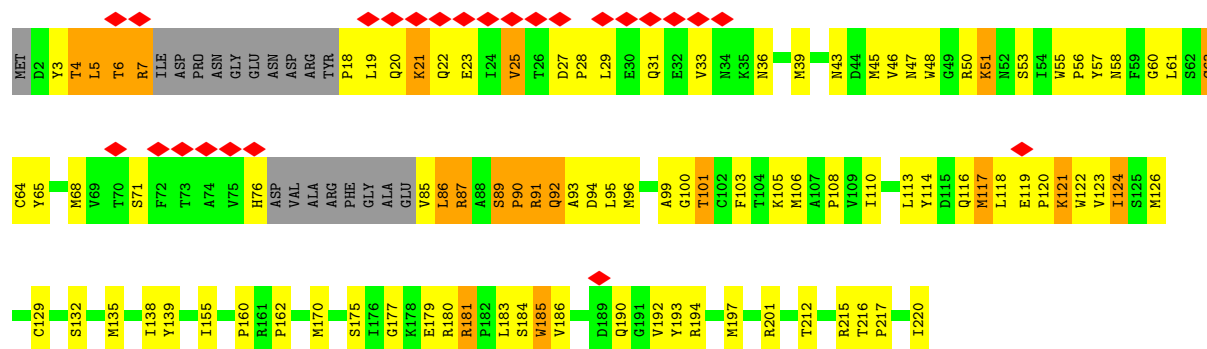




• Molecule 10: NADH-quinone oxidoreductase subunit N

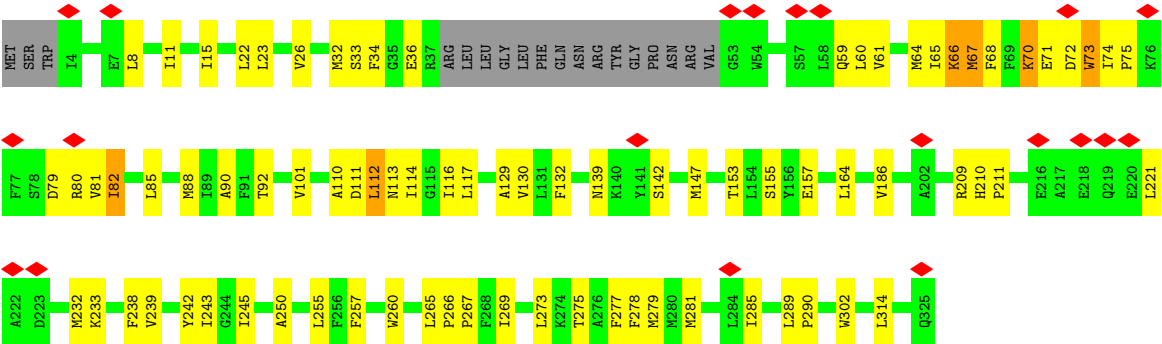


• Molecule 11: NADH-quinone oxidoreductase subunit B

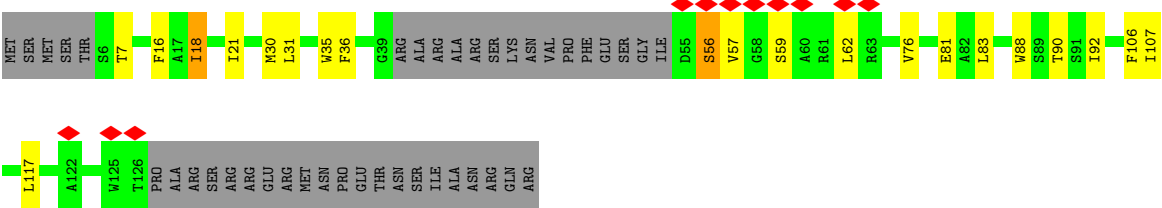


• Molecule 12: NADH-quinone oxidoreductase subunit H





• Molecule 13: NADH-quinone oxidoreductase subunit A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	86927	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	3.258	Depositor
Minimum map value	-1.653	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.051	Depositor
Recommended contour level	0.28	Depositor
Map size (Å)	585.75, 585.75, 585.75	wwPDB
Map dimensions	710, 710, 710	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.825, 0.825, 0.825	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: CA, 7PH, UQ8, SF4, FMN, 3PE, FES

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	C	0.21	0/4891	0.35	0/6637
2	E	0.18	0/1248	0.32	0/1691
3	F	0.18	0/3486	0.32	0/4713
4	G	0.21	0/7178	0.33	0/9733
5	I	0.30	0/1214	0.44	0/1642
6	J	0.13	0/1263	0.26	0/1722
7	K	0.18	0/769	0.30	0/1040
8	L	0.31	0/4806	0.50	0/6549
9	M	0.20	0/4074	0.35	0/5546
10	N	0.22	0/3764	0.40	0/5138
11	B	0.54	0/1634	0.70	0/2211
12	H	0.31	0/2472	0.44	0/3364
13	A	0.25	0/856	0.34	0/1164
All	All	0.25	0/37655	0.40	0/51150

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	C	4760	0	4677	60	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	E	1220	0	1191	10	0
3	F	3407	0	3375	40	0
4	G	7027	0	6835	50	0
5	I	1185	0	1145	37	0
6	J	1237	0	1310	31	0
7	K	760	0	817	13	0
8	L	4685	0	4831	97	0
9	M	3953	0	4053	73	0
10	N	3673	0	3836	54	0
11	B	1601	0	1595	93	0
12	H	2402	0	2448	62	0
13	A	832	0	842	23	0
14	E	4	0	0	0	0
14	G	4	0	0	0	0
15	B	8	0	0	1	0
15	F	8	0	0	2	0
15	G	24	0	0	0	0
15	I	16	0	0	0	0
16	F	31	0	19	0	0
17	G	2	0	0	0	0
17	I	1	0	0	0	0
18	A	51	0	82	2	0
18	H	102	0	164	6	0
18	J	51	0	82	7	0
18	L	153	0	246	7	0
18	M	51	0	82	2	0
18	N	204	0	328	17	0
19	H	38	0	55	1	0
19	J	76	0	110	3	0
19	M	76	0	110	6	0
20	N	106	0	148	8	0
21	A	9	0	0	0	0
21	B	28	0	0	0	0
21	C	52	0	0	0	0
21	E	6	0	0	0	0
21	F	16	0	0	0	0
21	G	98	0	0	0	0
21	H	41	0	0	0	0
21	I	34	0	0	0	0
21	J	20	0	0	0	0
21	K	15	0	0	0	0
21	L	26	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
21	M	12	0	0	0	0
21	N	59	0	0	1	0
All	All	38164	0	38381	595	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 8.

All (595) 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)
8:L:219:THR:HA	8:L:222:LEU:HD23	1.59	0.84
8:L:230:SER:HB3	8:L:232:GLN:HE21	1.42	0.82
8:L:153:LEU:HB3	8:L:249:VAL:HG21	1.62	0.82
1:C:216:MET:HG3	13:A:62:LEU:HD11	1.61	0.81
11:B:56:PRO:HB3	11:B:95:LEU:HD23	1.63	0.81
9:M:329:ALA:HB2	9:M:410:ILE:HG23	1.65	0.78
9:M:370:ASP:HB3	9:M:373:MET:HG2	1.63	0.77
11:B:21:LYS:HE3	11:B:23:GLU:HB2	1.67	0.77
8:L:229:LYS:HB3	8:L:261:ALA:HB3	1.66	0.76
11:B:126:MET:HB2	11:B:155:ILE:HD12	1.68	0.76
9:M:36:MET:HE2	9:M:124:LEU:HD13	1.67	0.76
11:B:5:LEU:HD22	11:B:6:THR:H	1.51	0.75
1:C:399:LEU:HD22	1:C:468:MET:SD	2.26	0.75
8:L:434:PHE:HA	8:L:438:HIS:HB2	1.69	0.75
8:L:293:LEU:HG	8:L:539:TRP:CD1	2.21	0.75
10:N:217:LYS:HB3	10:N:250:ILE:HD13	1.69	0.75
9:M:47:TRP:HE1	9:M:488:THR:HG21	1.52	0.74
12:H:15:ILE:HG23	13:A:18:ILE:HG21	1.68	0.73
11:B:3:TYR:HB3	11:B:193:TYR:HD2	1.53	0.73
18:N:503:3PE:H2C1	20:N:505:UQ8:H16	1.71	0.72
10:N:50:VAL:HG21	18:N:503:3PE:H2C2	1.71	0.72
11:B:43:ASN:HA	11:B:183:LEU:HD11	1.71	0.72
3:F:348:ARG:HD2	5:I:180:PRO:HB2	1.73	0.71
3:F:398:CYS:SG	15:F:501:SF4:FE3	1.82	0.70
11:B:120:PRO:HB2	12:H:70:LYS:HD2	1.74	0.70
1:C:200:LYS:HG3	1:C:201:PRO:HD3	1.73	0.70
12:H:73:TRP:CZ2	12:H:75:PRO:HA	2.26	0.69
1:C:195:GLU:HG2	1:C:197:LEU:HG	1.74	0.69
8:L:403:LEU:HB3	8:L:493:LEU:HD11	1.74	0.69
5:I:79:LYS:NZ	5:I:81:GLU:HG3	2.08	0.69
11:B:51:LYS:HE2	11:B:177:GLY:HA2	1.75	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:B:53:SER:HB3	12:H:66:LYS:HG2	1.75	0.68
6:J:100:SER:HB3	7:K:16:VAL:HG13	1.74	0.68
10:N:248:ILE:HG12	10:N:330:LEU:HD22	1.73	0.68
8:L:220:LEU:HA	8:L:223:LEU:HD12	1.76	0.67
18:N:502:3PE:C2I	18:N:503:3PE:H3F2	2.25	0.67
11:B:55:TRP:HE3	11:B:92:GLN:O	1.77	0.67
3:F:39:ARG:HA	3:F:161:MET:HE1	1.76	0.67
5:I:79:LYS:HE2	5:I:81:GLU:HG3	1.75	0.67
5:I:79:LYS:CE	5:I:81:GLU:HG3	2.25	0.67
5:I:79:LYS:HZ1	5:I:81:GLU:CD	2.01	0.67
1:C:223:ASN:HB3	1:C:230:ALA:H	1.61	0.66
5:I:79:LYS:HZ3	5:I:81:GLU:HG3	1.60	0.66
5:I:92:PHE:HB3	5:I:134:LYS:HG3	1.77	0.66
9:M:315:ILE:HG12	9:M:355:LEU:HD12	1.78	0.66
3:F:297:THR:HG22	3:F:320:ARG:HB3	1.77	0.66
9:M:72:ILE:HB	9:M:77:ILE:HB	1.76	0.66
6:J:49:TYR:HE2	12:H:113:ASN:HD22	1.44	0.66
9:M:432:ALA:HA	9:M:435:TYR:CE2	2.30	0.65
12:H:275:THR:HG22	12:H:279:MET:HE3	1.76	0.65
9:M:181:SER:HB3	9:M:230:ALA:HA	1.78	0.65
10:N:180:GLN:HG3	10:N:200:GLU:HG2	1.78	0.65
4:G:245:TYR:HE1	4:G:717:MET:HG2	1.62	0.64
9:M:441:HIS:HA	9:M:445:PHE:HB2	1.79	0.64
11:B:29:LEU:H	11:B:180:ARG:HH21	1.46	0.64
2:E:105:ILE:HG21	2:E:153:LEU:HD13	1.80	0.64
6:J:143:LEU:HD13	10:N:118:LEU:HD22	1.78	0.64
8:L:337:THR:HG23	8:L:338:HIS:HD2	1.63	0.64
8:L:435:ILE:HG23	8:L:516:ARG:HH21	1.62	0.64
6:J:150:ALA:HB2	10:N:111:ILE:HG21	1.81	0.63
4:G:259:VAL:HG12	4:G:260:ASN:H	1.64	0.63
6:J:104:LEU:HB2	7:K:16:VAL:HG21	1.81	0.63
5:I:79:LYS:NZ	5:I:81:GLU:CD	2.56	0.62
9:M:387:LEU:HD13	9:M:468:ILE:HG21	1.81	0.62
9:M:383:TRP:HB2	9:M:460:MET:SD	2.39	0.62
13:A:21:ILE:HD11	18:A:201:3PE:H2E1	1.81	0.62
8:L:64:LEU:HB2	8:L:77:PHE:HB3	1.82	0.62
8:L:362:ILE:HG21	8:L:432:MET:HG3	1.81	0.62
6:J:34:ILE:HD11	19:J:203:7PH:H28A	1.81	0.62
9:M:236:PRO:HG3	9:M:244:LEU:HD22	1.82	0.62
1:C:221:GLY:HA2	1:C:232:ARG:HA	1.81	0.61
8:L:183:PHE:HB3	8:L:221:MET:SD	2.40	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:216:MET:HE3	13:A:62:LEU:HD21	1.82	0.61
6:J:4:ALA:HB2	18:J:201:3PE:H352	1.82	0.61
8:L:106:TYR:HE2	8:L:107:MET:HE2	1.65	0.61
12:H:36:GLU:OE2	12:H:209:ARG:NH1	2.27	0.61
12:H:67:MET:HG2	12:H:232:MET:HG2	1.81	0.61
8:L:84:LEU:HD13	8:L:475:LEU:HD21	1.82	0.61
18:N:503:3PE:H2E1	20:N:505:UQ8:H15A	1.83	0.61
11:B:48:TRP:HA	11:B:51:LYS:HD2	1.83	0.61
11:B:50:ARG:HH12	11:B:181:ARG:HG3	1.66	0.60
8:L:394:ALA:HB2	8:L:466:PHE:HA	1.82	0.60
3:F:136:TYR:HB3	3:F:139:ALA:HB3	1.82	0.60
8:L:328:TRP:HB3	8:L:479:LEU:HD11	1.83	0.60
8:L:84:LEU:O	8:L:88:MET:HG2	2.01	0.60
12:H:210:HIS:CG	12:H:211:PRO:HA	2.36	0.60
12:H:314:LEU:HD13	13:A:107:ILE:HD12	1.83	0.59
8:L:259:VAL:HG22	8:L:316:ILE:HD13	1.83	0.59
6:J:85:ARG:HB3	6:J:88:LEU:HD23	1.84	0.59
8:L:367:GLY:HA3	8:L:441:GLU:HA	1.83	0.59
9:M:339:GLN:HG2	9:M:493:ILE:HG21	1.84	0.59
11:B:119:GLU:HB2	11:B:120:PRO:HD3	1.85	0.59
1:C:216:MET:CG	13:A:62:LEU:HD11	2.30	0.59
1:C:506:GLU:HG2	3:F:438:PRO:HA	1.84	0.59
10:N:89:THR:HG21	10:N:456:VAL:HG21	1.84	0.59
10:N:124:HIS:HD2	10:N:126:ALA:H	1.49	0.59
18:N:502:3PE:H2I1	18:N:503:3PE:H3F2	1.84	0.58
8:L:298:ALA:HB2	8:L:310:TYR:HB3	1.86	0.58
8:L:492:THR:HA	8:L:495:ILE:HB	1.86	0.58
9:M:29:ARG:NH1	9:M:106:TRP:O	2.37	0.58
10:N:248:ILE:HD11	10:N:334:LEU:HB2	1.86	0.58
11:B:53:SER:O	12:H:66:LYS:HD3	2.04	0.58
9:M:406:GLY:O	9:M:410:ILE:HG13	2.03	0.58
10:N:421:GLY:HA2	10:N:424:TYR:CE2	2.39	0.57
9:M:291:MET:HB3	9:M:421:ILE:HG21	1.85	0.57
11:B:36:ASN:HA	11:B:39:MET:HG2	1.85	0.57
3:F:302:GLU:HG2	3:F:305:LEU:HD12	1.86	0.57
9:M:381:MET:HE3	9:M:457:LEU:HD13	1.85	0.57
12:H:155:SER:HG	12:H:302:TRP:CD1	2.23	0.57
9:M:79:ILE:HA	9:M:138:LEU:HD22	1.86	0.57
3:F:16:ARG:HG2	3:F:32:LYS:HD2	1.86	0.57
6:J:56:ILE:HA	6:J:60:ALA:HB3	1.86	0.57
10:N:77:THR:HG23	10:N:117:ILE:HG12	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:B:61:LEU:HB2	11:B:100:GLY:HA3	1.86	0.57
10:N:9:ILE:HD12	10:N:9:ILE:H	1.69	0.57
12:H:66:LYS:HG3	12:H:67:MET:N	2.19	0.57
5:I:82:THR:HG23	5:I:88:TYR:CE2	2.40	0.56
11:B:95:LEU:HD11	11:B:124:ILE:HG13	1.86	0.56
8:L:604:VAL:HG21	18:L:703:3PE:H2H2	1.86	0.56
11:B:117:MET:HB2	11:B:121:LYS:HD3	1.88	0.56
8:L:219:THR:HG21	8:L:279:VAL:HG21	1.86	0.56
4:G:711:TYR:HB3	4:G:740:MET:HE3	1.88	0.56
8:L:524:ASN:O	8:L:529:ARG:NH2	2.38	0.56
9:M:263:LEU:HD21	9:M:352:ALA:HB3	1.88	0.56
1:C:202:GLU:HB3	1:C:204:TRP:CD1	2.41	0.56
8:L:333:PHE:HZ	8:L:469:ALA:HA	1.71	0.56
8:L:455:LEU:O	8:L:459:VAL:HG13	2.05	0.56
18:N:502:3PE:H3F2	18:N:503:3PE:H3A2	1.88	0.56
1:C:435:ASP:HB3	1:C:456:VAL:HG11	1.88	0.56
3:F:73:TRP:CD1	3:F:215:CYS:HG	2.23	0.56
8:L:366:GLY:HA2	8:L:436:VAL:HA	1.87	0.56
18:L:703:3PE:H2H1	18:N:504:3PE:H3A1	1.86	0.56
1:C:33:PHE:HE1	1:C:59:GLU:HG2	1.71	0.55
1:C:209:GLY:H	1:C:215:PHE:HD2	1.54	0.55
9:M:74:ARG:HG3	10:N:475:ILE:HG21	1.88	0.55
3:F:57:ALA:HB2	3:F:233:VAL:HG22	1.89	0.55
1:C:223:ASN:HB2	1:C:231:PHE:H	1.71	0.55
8:L:385:ALA:HA	8:L:393:THR:HG21	1.87	0.55
9:M:187:ILE:HD11	10:N:415:VAL:HG21	1.88	0.55
9:M:215:MET:HE1	9:M:223:LEU:HD12	1.88	0.55
11:B:21:LYS:HZ2	11:B:22:GLN:H	1.54	0.55
3:F:330:ASP:OD2	3:F:333:ILE:HG12	2.07	0.55
8:L:136:LEU:HD12	8:L:185:LEU:HD11	1.89	0.55
5:I:79:LYS:NZ	5:I:81:GLU:CG	2.69	0.55
9:M:234:LYS:HB3	9:M:267:ALA:HB2	1.88	0.55
12:H:82:ILE:HG23	12:H:132:PHE:HB3	1.89	0.55
1:C:492:PRO:HG3	3:F:441:LEU:HA	1.87	0.54
10:N:47:ALA:HB2	20:N:505:UQ8:H20B	1.88	0.54
4:G:320:PRO:HB2	4:G:537:SER:HB2	1.89	0.54
9:M:397:GLY:HA2	9:M:403:ASN:HB2	1.89	0.54
4:G:159:CYS:HB3	4:G:208:PHE:HE2	1.71	0.54
10:N:70:ASP:OD1	10:N:256:ARG:NH2	2.41	0.54
12:H:64:MET:HE1	12:H:232:MET:HE1	1.89	0.54
12:H:64:MET:CE	12:H:232:MET:HE1	2.36	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:H:111:ASP:HB2	18:H:401:3PE:H112	1.88	0.54
1:C:395:GLU:HA	1:C:399:LEU:HG	1.89	0.54
8:L:96:GLY:O	8:L:99:ILE:HG22	2.07	0.54
9:M:151:TYR:CE2	10:N:426:LEU:HD12	2.43	0.54
12:H:265:LEU:HD12	12:H:266:PRO:HD2	1.89	0.54
2:E:125:ARG:HG3	2:E:126:PHE:CD1	2.42	0.54
12:H:32:MET:HG2	12:H:242:TYR:HD2	1.73	0.54
3:F:373:ARG:HB2	3:F:375:GLU:HG3	1.89	0.54
11:B:126:MET:HG3	11:B:160:PRO:HG2	1.90	0.54
6:J:150:ALA:HB2	10:N:111:ILE:HD13	1.89	0.53
12:H:68:PHE:CZ	13:A:30:MET:HG3	2.43	0.53
8:L:119:TYR:HB3	8:L:153:LEU:HG	1.91	0.53
11:B:86:LEU:O	11:B:87:ARG:C	2.51	0.53
11:B:61:LEU:HD21	11:B:110:ILE:HD11	1.91	0.53
8:L:561:LYS:HD2	9:M:307:ALA:HB1	1.90	0.53
11:B:27:ASP:HB3	11:B:180:ARG:HH22	1.74	0.53
4:G:328:PHE:CG	4:G:678:VAL:HG22	2.44	0.52
10:N:170:LEU:HD12	10:N:210:MET:HG2	1.90	0.52
12:H:74:ILE:HD12	12:H:80:ARG:HG2	1.91	0.52
11:B:101:THR:HA	11:B:129:CYS:HB3	1.92	0.52
12:H:110:ALA:HB2	13:A:16:PHE:HB2	1.91	0.52
1:C:468:MET:O	1:C:472:GLU:HG2	2.09	0.52
12:H:164:LEU:HD22	12:H:255:LEU:HD13	1.92	0.52
1:C:345:LYS:HZ2	1:C:386:TRP:CD1	2.28	0.52
3:F:18:ARG:HE	3:F:22:GLN:HB2	1.75	0.52
1:C:516:ILE:HG23	4:G:117:GLN:HG2	1.91	0.52
3:F:348:ARG:CD	5:I:180:PRO:HB2	2.40	0.52
4:G:439:THR:HG22	4:G:441:LEU:H	1.74	0.52
9:M:144:GLU:HB2	10:N:387:PRO:HG2	1.91	0.52
8:L:425:THR:HA	8:L:428:TYR:CE2	2.44	0.52
3:F:397:PHE:HB3	15:F:501:SF4:S2	2.50	0.51
4:G:267:ARG:HB2	4:G:820:LEU:HG	1.91	0.51
8:L:18:LEU:HD21	8:L:117:PHE:HB3	1.91	0.51
11:B:60:GLY:HA3	11:B:65:TYR:CG	2.45	0.51
5:I:106:GLU:HG3	5:I:115:GLN:HA	1.91	0.51
6:J:62:ALA:HB1	13:A:76:VAL:HG22	1.92	0.51
12:H:60:LEU:O	12:H:64:MET:HG2	2.11	0.51
12:H:139:ASN:HB3	12:H:142:SER:HB2	1.93	0.51
2:E:113:LEU:HB3	2:E:115:ILE:HG12	1.91	0.51
6:J:103:MET:HB2	8:L:603:VAL:HG22	1.93	0.51
10:N:1:MET:HE3	10:N:65:PRO:HG3	1.91	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:L:4:LEU:HD21	8:L:81:LEU:HD22	1.93	0.51
10:N:446:SER:O	20:N:506:UQ8:H43	2.10	0.51
3:F:282:ARG:HB2	3:F:285:LEU:HD12	1.91	0.51
8:L:407:MET:HE2	8:L:407:MET:HA	1.92	0.51
8:L:407:MET:HE3	8:L:415:MET:HB2	1.93	0.51
3:F:357:CYS:HB2	3:F:401:ALA:HB2	1.91	0.51
6:J:70:VAL:HG11	7:K:77:LEU:HD22	1.92	0.51
9:M:187:ILE:HD11	10:N:415:VAL:CG2	2.41	0.51
1:C:77:LEU:HB3	1:C:137:TYR:HB3	1.93	0.51
1:C:187:LYS:HG3	11:B:108:PRO:HB3	1.92	0.51
4:G:466:ALA:HB3	4:G:489:VAL:HG21	1.92	0.51
12:H:73:TRP:CH2	12:H:75:PRO:HA	2.46	0.51
12:H:112:LEU:HD11	18:H:401:3PE:H322	1.91	0.51
5:I:48:ILE:HG12	5:I:116:LEU:HG	1.93	0.50
10:N:482:MET:HE2	10:N:482:MET:HA	1.94	0.50
4:G:617:GLU:HG2	4:G:638:PRO:HG3	1.94	0.50
5:I:92:PHE:CB	5:I:134:LYS:HG3	2.40	0.50
8:L:529:ARG:O	8:L:533:THR:HG22	2.12	0.50
5:I:142:PRO:HB2	5:I:146:PRO:HA	1.94	0.50
8:L:471:ILE:HG22	8:L:472:VAL:N	2.27	0.50
9:M:340:GLY:HA3	9:M:409:MET:HB2	1.94	0.50
4:G:557:GLU:HG2	4:G:563:ALA:HB2	1.93	0.50
6:J:1:MET:HE3	7:K:2:ILE:HD12	1.93	0.50
9:M:235:MET:HG2	9:M:323:MET:HG3	1.93	0.50
11:B:5:LEU:HB2	11:B:23:GLU:O	2.11	0.50
4:G:226:ALA:HB3	4:G:635:VAL:HG22	1.92	0.50
9:M:470:LEU:O	9:M:474:LEU:HG	2.12	0.50
10:N:98:TYR:CE2	10:N:100:ASP:HB3	2.46	0.50
10:N:339:GLY:HA3	10:N:379:MET:HE2	1.94	0.50
11:B:46:VAL:HG21	11:B:183:LEU:HD13	1.94	0.50
4:G:709:HIS:CD2	4:G:709:HIS:H	2.29	0.50
8:L:271:GLY:HA2	8:L:274:LEU:HB2	1.93	0.50
11:B:5:LEU:HD22	11:B:6:THR:N	2.25	0.50
1:C:381:ARG:NH2	1:C:385:ASP:OD1	2.43	0.50
5:I:45:ARG:HB3	5:I:116:LEU:HD22	1.94	0.50
11:B:31:GLN:HG3	11:B:33:VAL:HG22	1.94	0.50
9:M:3:LEU:HD11	9:M:83:ILE:HG13	1.94	0.50
11:B:6:THR:HG23	11:B:192:VAL:H	1.77	0.50
3:F:116:MET:HG2	3:F:222:LEU:HD13	1.94	0.49
12:H:269:ILE:O	12:H:273:LEU:HG	2.12	0.49
11:B:46:VAL:HG11	11:B:183:LEU:HD22	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:B:60:GLY:HA3	11:B:65:TYR:CD2	2.47	0.49
4:G:884:VAL:HG21	4:G:902:LEU:HD22	1.94	0.49
8:L:235:LEU:HD21	18:M:601:3PE:H2C2	1.94	0.49
18:L:701:3PE:H222	10:N:423:TYR:CE1	2.47	0.49
8:L:333:PHE:CZ	8:L:469:ALA:HA	2.47	0.49
9:M:206:ASN:HB3	9:M:209:GLU:HG2	1.94	0.49
13:A:88:TRP:O	13:A:92:ILE:HG13	2.12	0.49
1:C:80:MET:HE1	1:C:549:THR:HG21	1.95	0.49
6:J:80:GLU:O	6:J:84:GLU:HG3	2.12	0.49
8:L:80:VAL:HB	8:L:134:ASP:HB3	1.94	0.49
3:F:320:ARG:HG2	3:F:322:GLY:H	1.77	0.49
4:G:558:LEU:HD22	4:G:589:ALA:HB2	1.95	0.49
8:L:515:LYS:HG3	8:L:517:THR:HG23	1.94	0.49
11:B:185:TRP:HZ3	13:A:36:PHE:CD1	2.30	0.49
6:J:32:LEU:HD22	7:K:33:ILE:HG23	1.93	0.49
8:L:313:MET:O	8:L:316:ILE:HG22	2.13	0.49
11:B:7:ARG:O	11:B:20:GLN:HB3	2.12	0.49
11:B:50:ARG:NH1	11:B:181:ARG:HG3	2.28	0.49
4:G:670:GLN:HE22	4:G:672:ASP:HB2	1.78	0.49
12:H:153:THR:O	12:H:157:GLU:HB2	2.13	0.49
5:I:44:TYR:HD2	5:I:118:PRO:HA	1.78	0.49
8:L:169:LYS:O	8:L:173:VAL:HG23	2.13	0.49
2:E:125:ARG:HG3	2:E:126:PHE:HD1	1.77	0.48
4:G:62:ARG:HG3	4:G:63:GLY:H	1.78	0.48
9:M:287:ALA:O	9:M:291:MET:HG3	2.12	0.48
8:L:560:LEU:HD22	9:M:303:TRP:HB3	1.95	0.48
13:A:88:TRP:CE2	13:A:92:ILE:HG12	2.48	0.48
10:N:277:ALA:HB2	10:N:310:LEU:HD23	1.95	0.48
1:C:39:THR:HB	1:C:51:TRP:HB2	1.95	0.48
11:B:7:ARG:HE	11:B:20:GLN:CD	2.21	0.48
12:H:101:VAL:HG11	12:H:250:ALA:HB1	1.94	0.48
1:C:515:LEU:HD21	4:G:106:PRO:HD3	1.94	0.48
5:I:144:LYS:HD2	11:B:217:PRO:HG3	1.94	0.48
9:M:342:VAL:O	9:M:345:MET:HG2	2.14	0.48
1:C:196:ALA:C	1:C:197:LEU:HD12	2.38	0.48
8:L:337:THR:HA	8:L:340:PHE:CZ	2.49	0.48
8:L:433:ILE:C	8:L:435:ILE:H	2.21	0.48
18:L:703:3PE:H3F1	10:N:412:GLY:HA3	1.96	0.48
4:G:163:TYR:CD1	4:G:169:GLY:HA3	2.49	0.48
12:H:85:LEU:HD12	12:H:88:MET:HE3	1.95	0.48
10:N:53:TRP:CE2	18:N:503:3PE:H221	2.48	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:94:MET:HE1	3:F:176:GLY:HA2	1.94	0.48
9:M:276:LEU:HB2	9:M:277:PRO:HD3	1.95	0.48
1:C:381:ARG:HD2	1:C:485:LEU:HD21	1.96	0.47
6:J:1:MET:HE1	6:J:121:GLY:HA3	1.95	0.47
9:M:101:ALA:HB1	9:M:256:SER:HB3	1.95	0.47
8:L:177:GLY:O	8:L:225:GLY:HA2	2.14	0.47
9:M:72:ILE:HD12	9:M:77:ILE:HG21	1.96	0.47
9:M:300:TYR:O	9:M:304:MET:HG2	2.13	0.47
9:M:460:MET:SD	9:M:465:LEU:HG	2.54	0.47
4:G:379:VAL:HB	4:G:433:VAL:HG12	1.96	0.47
8:L:292:LEU:HD13	8:L:292:LEU:HA	1.72	0.47
9:M:302:ALA:HB1	9:M:431:PHE:HB3	1.96	0.47
8:L:455:LEU:O	8:L:458:ILE:HG13	2.13	0.47
11:B:118:LEU:HB2	12:H:70:LYS:HZ3	1.79	0.47
6:J:11:ILE:HG21	18:J:201:3PE:H2F2	1.96	0.47
8:L:128:VAL:HA	8:L:131:VAL:HG22	1.96	0.47
8:L:243:MET:HE2	8:L:243:MET:HA	1.95	0.47
9:M:263:LEU:HD22	9:M:349:GLY:HA2	1.97	0.47
20:N:506:UQ8:H7	20:N:506:UQ8:H10	1.42	0.47
9:M:338:TYR:HB3	9:M:493:ILE:HD12	1.97	0.47
11:B:48:TRP:HZ3	12:H:61:VAL:HG12	1.80	0.47
11:B:114:TYR:HA	11:B:117:MET:HG3	1.97	0.47
1:C:565:SER:HB3	1:C:593:PHE:HB2	1.97	0.47
4:G:115:HIS:CE1	4:G:119:MET:HE3	2.49	0.47
5:I:79:LYS:NZ	5:I:81:GLU:OE2	2.38	0.47
6:J:73:MET:HG3	12:H:147:MET:HE2	1.96	0.47
9:M:130:VAL:HG23	9:M:142:PHE:HB3	1.97	0.47
3:F:310:GLU:C	3:F:321:LEU:HD22	2.39	0.47
18:J:201:3PE:H2A2	18:H:401:3PE:H352	1.97	0.47
8:L:1:MET:HA	8:L:48:ILE:HG23	1.97	0.47
8:L:136:LEU:HB2	8:L:195:LEU:HB3	1.96	0.47
1:C:126:THR:HG23	1:C:128:THR:HG23	1.97	0.47
6:J:34:ILE:HG12	18:J:201:3PE:H2I2	1.97	0.47
8:L:122:LEU:HB3	8:L:149:CYS:SG	2.55	0.47
10:N:82:LEU:HD22	20:N:506:UQ8:H10A	1.96	0.47
12:H:74:ILE:HG21	12:H:80:ARG:HE	1.80	0.47
6:J:104:LEU:O	6:J:108:VAL:HG13	2.15	0.47
6:J:139:LEU:HD13	10:N:67:MET:SD	2.54	0.47
11:B:53:SER:CB	12:H:66:LYS:HG2	2.43	0.47
11:B:43:ASN:CA	11:B:183:LEU:HD11	2.41	0.46
11:B:90:PRO:HB3	11:B:117:MET:HG2	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:L:471:ILE:CG2	8:L:472:VAL:N	2.78	0.46
8:L:573:ALA:HB2	18:L:701:3PE:H381	1.97	0.46
9:M:160:LYS:HE2	9:M:160:LYS:HB2	1.56	0.46
9:M:394:ALA:HB2	9:M:401:THR:HG21	1.98	0.46
18:N:502:3PE:H362	18:N:502:3PE:H3C1	1.97	0.46
11:B:51:LYS:CE	11:B:177:GLY:HA2	2.43	0.46
9:M:63:TRP:CD2	9:M:82:ALA:HB1	2.51	0.46
11:B:113:LEU:HD23	11:B:116:GLN:HE22	1.80	0.46
11:B:117:MET:HE3	11:B:117:MET:HB3	1.71	0.46
6:J:145:SER:HB3	13:A:106:PHE:CE1	2.51	0.46
8:L:106:TYR:CE2	8:L:107:MET:HE2	2.48	0.46
12:H:33:SER:HB2	12:H:238:PHE:CE2	2.50	0.46
3:F:384:LEU:HD22	3:F:408:LEU:HD21	1.98	0.46
4:G:286:GLN:HB2	4:G:295:LEU:HD11	1.98	0.46
6:J:19:VAL:HG11	7:K:37:ILE:HD11	1.98	0.46
8:L:143:TRP:CZ2	8:L:229:LYS:HB2	2.51	0.46
11:B:185:TRP:HZ3	13:A:36:PHE:HD1	1.64	0.46
11:B:58:ASN:HB3	11:B:65:TYR:HE1	1.80	0.46
12:H:11:ILE:O	12:H:15:ILE:HG13	2.15	0.46
9:M:219:VAL:HG22	19:M:603:7PH:C21	2.46	0.46
12:H:22:LEU:O	12:H:26:VAL:HG23	2.15	0.46
12:H:33:SER:HA	12:H:242:TYR:CE2	2.51	0.46
1:C:277:TYR:HB2	1:C:358:MET:HE2	1.98	0.46
6:J:152:LEU:HD11	13:A:117:LEU:HD11	1.98	0.46
5:I:79:LYS:HE3	5:I:87:TRP:CE2	2.51	0.45
5:I:100:ILE:HG21	11:B:135:MET:HB3	1.98	0.45
4:G:297:ALA:HB1	4:G:668:TRP:CH2	2.51	0.45
9:M:183:LEU:O	9:M:187:ILE:HG13	2.16	0.45
19:M:602:7PH:H26	19:M:602:7PH:H23A	1.56	0.45
12:H:114:ILE:HB	12:H:117:LEU:HB2	1.96	0.45
1:C:211:GLU:HB2	1:C:215:PHE:HZ	1.80	0.45
11:B:28:PRO:HD2	11:B:180:ARG:NH2	2.31	0.45
5:I:154:ALA:O	5:I:161:LYS:NZ	2.50	0.45
18:N:503:3PE:H262	18:N:503:3PE:H292	1.52	0.45
11:B:23:GLU:CD	11:B:25:VAL:HG22	2.42	0.45
12:H:72:ASP:HB2	12:H:233:LYS:HE2	1.98	0.45
1:C:69:LYS:HG2	1:C:106:ASP:HB3	1.97	0.45
4:G:114:CYS:HB3	4:G:117:GLN:HB2	1.98	0.45
10:N:73:ALA:HB1	10:N:121:ASN:OD1	2.17	0.45
3:F:183:GLU:HG3	3:F:216:VAL:HB	1.98	0.45
4:G:847:ALA:O	4:G:851:LYS:HG3	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:M:222:LEU:HB3	19:M:603:7PH:H25A	1.98	0.45
10:N:50:VAL:HG13	18:N:503:3PE:H251	1.99	0.45
5:I:79:LYS:CE	5:I:81:GLU:CG	2.94	0.45
9:M:298:ILE:HG13	9:M:324:GLY:HA3	1.99	0.45
1:C:212:ASN:HB2	1:C:215:PHE:CE1	2.51	0.45
1:C:183:PHE:HB3	1:C:185:LEU:HG	1.99	0.45
5:I:58:GLU:HG2	5:I:138:LEU:HD21	1.99	0.45
6:J:148:LEU:HD13	13:A:81:GLU:HG3	1.98	0.45
19:M:603:7PH:H23	10:N:408:TRP:CZ2	2.52	0.45
11:B:28:PRO:HG3	11:B:193:TYR:CG	2.52	0.45
5:I:127:ARG:NH1	11:B:132:SER:HB3	2.33	0.44
8:L:162:LYS:HE3	8:L:162:LYS:HB2	1.55	0.44
9:M:165:LYS:HA	9:M:165:LYS:HD3	1.63	0.44
9:M:167:ARG:HA	9:M:250:GLN:HG3	1.99	0.44
18:N:503:3PE:H2D1	18:N:503:3PE:H2G1	1.75	0.44
11:B:118:LEU:O	11:B:119:GLU:C	2.59	0.44
12:H:15:ILE:HD13	13:A:18:ILE:HG12	1.97	0.44
12:H:34:PHE:CE1	12:H:59:GLN:HG2	2.52	0.44
4:G:35:PHE:HB2	4:G:47:CYS:SG	2.57	0.44
10:N:68:ARG:HD3	10:N:484:LEU:HB3	1.98	0.44
5:I:77:LEU:HD22	5:I:92:PHE:CE2	2.52	0.44
18:J:201:3PE:H252	18:H:401:3PE:H262	1.98	0.44
8:L:231:ALA:HB2	8:L:238:TRP:NE1	2.32	0.44
10:N:251:PHE:CZ	10:N:309:LEU:HB3	2.53	0.44
18:N:501:3PE:H2H1	18:N:501:3PE:H3C2	1.98	0.44
11:B:48:TRP:CZ3	12:H:61:VAL:HG12	2.53	0.44
11:B:89:SER:O	11:B:90:PRO:C	2.60	0.44
11:B:113:LEU:HD23	11:B:116:GLN:NE2	2.31	0.44
8:L:38:VAL:HG21	8:L:100:HIS:CD2	2.52	0.44
8:L:181:LEU:HB2	8:L:225:GLY:HA3	1.98	0.44
10:N:321:MET:HG2	10:N:404:GLN:HE22	1.83	0.44
4:G:402:LYS:O	4:G:406:MET:HG3	2.17	0.44
5:I:132:TYR:CZ	11:B:201:ARG:HG3	2.52	0.44
20:N:505:UQ8:H10	20:N:505:UQ8:H7A	1.40	0.44
13:A:56:SER:O	13:A:57:VAL:C	2.61	0.44
1:C:94:ALA:HB2	1:C:116:ALA:HB1	2.00	0.44
3:F:308:PRO:HB2	3:F:310:GLU:HG3	2.00	0.44
8:L:116:PHE:HB2	8:L:156:PHE:CE1	2.53	0.44
8:L:177:GLY:HA3	8:L:228:GLY:HA3	1.99	0.44
10:N:162:LEU:HB3	10:N:216:PHE:CE1	2.53	0.44
12:H:260:TRP:HB2	12:H:267:PRO:HB2	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:55:LYS:HA	3:F:70:GLY:HA3	1.99	0.44
5:I:34:PRO:HG3	11:B:170:MET:HE1	1.99	0.44
19:J:202:7PH:H39	19:J:202:7PH:H36	1.77	0.44
8:L:88:MET:HE1	8:L:264:TYR:CE1	2.53	0.44
9:M:234:LYS:HB2	9:M:234:LYS:HE3	1.75	0.44
9:M:235:MET:HB3	9:M:267:ALA:HB3	2.00	0.44
3:F:8:PRO:HG3	3:F:15:TRP:CD2	2.52	0.44
6:J:70:VAL:HG21	7:K:77:LEU:HB3	1.99	0.44
10:N:61:MET:HE2	10:N:61:MET:HB3	1.90	0.44
11:B:120:PRO:CB	12:H:70:LYS:HD2	2.45	0.44
4:G:158:ARG:HH12	4:G:765:GLN:HE22	1.64	0.44
1:C:414:TYR:HB2	1:C:418:GLU:HB2	1.99	0.43
4:G:390:ARG:HD2	4:G:390:ARG:HA	1.83	0.43
8:L:183:PHE:CZ	9:M:423:VAL:HA	2.53	0.43
11:B:4:THR:O	11:B:193:TYR:HA	2.18	0.43
5:I:93:ARG:HA	5:I:132:TYR:O	2.17	0.43
9:M:60:ILE:HG13	9:M:495:ASN:HB3	2.00	0.43
9:M:71:TRP:H	9:M:78:SER:HA	1.83	0.43
9:M:140:PHE:HE2	10:N:392:PHE:CZ	2.36	0.43
19:M:603:7PH:H32	19:M:603:7PH:H3	1.73	0.43
11:B:29:LEU:HG	11:B:180:ARG:HE	1.83	0.43
1:C:13:PRO:O	1:C:18:ARG:NH2	2.51	0.43
18:J:201:3PE:H3D2	18:H:401:3PE:H2B2	2.00	0.43
9:M:3:LEU:HG	9:M:83:ILE:HD11	2.00	0.43
10:N:50:VAL:HG23	18:N:503:3PE:H2E2	1.99	0.43
11:B:175:SER:HA	11:B:197:MET:SD	2.58	0.43
4:G:104:ASP:OD1	5:I:154:ALA:HB1	2.19	0.43
5:I:80:ALA:HB2	5:I:90:GLU:HB2	2.00	0.43
9:M:271:LEU:HD22	9:M:330:ILE:HG21	1.99	0.43
1:C:237:LEU:O	1:C:238:ASP:C	2.62	0.43
4:G:109:GLU:HB2	4:G:209:THR:HG21	2.01	0.43
19:M:602:7PH:H27A	19:M:602:7PH:H2A	1.76	0.43
11:B:87:ARG:H	11:B:87:ARG:HG2	1.48	0.43
1:C:157:ARG:NH2	1:C:166:GLY:O	2.44	0.43
1:C:310:LEU:HD23	1:C:310:LEU:HA	1.93	0.43
1:C:570:GLN:O	1:C:573:PRO:HD2	2.19	0.43
9:M:81:LEU:HD13	9:M:132:LEU:HD23	2.01	0.43
11:B:68:MET:H	11:B:68:MET:HG2	1.56	0.43
11:B:96:MET:HB3	11:B:123:VAL:HG22	2.01	0.43
13:A:35:TRP:HD1	13:A:36:PHE:CG	2.36	0.43
1:C:188:ALA:HA	1:C:191:ASP:HB3	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:302:ARG:NH1	1:C:489:PRO:O	2.43	0.43
4:G:808:GLN:H	4:G:808:GLN:HG3	1.66	0.43
13:A:31:LEU:HD23	13:A:31:LEU:HA	1.82	0.43
1:C:341:THR:HB	1:C:390:ARG:HH12	1.83	0.43
8:L:285:ILE:HD12	8:L:285:ILE:HA	1.85	0.43
12:H:242:TYR:O	12:H:245:ILE:HG22	2.19	0.43
1:C:389:LYS:HE2	1:C:389:LYS:HB3	1.84	0.43
3:F:177:ARG:HA	3:F:177:ARG:HD3	1.69	0.43
4:G:147:SER:O	4:G:208:PHE:HA	2.19	0.43
5:I:79:LYS:HZ3	5:I:81:GLU:CG	2.30	0.43
7:K:98:MET:HB3	10:N:296:ARG:HH12	1.84	0.43
9:M:153:LEU:HD13	9:M:257:VAL:HG22	2.01	0.43
9:M:362:LEU:HD12	9:M:381:MET:HE1	1.99	0.43
9:M:442:ARG:HE	18:M:601:3PE:H111	1.83	0.43
11:B:21:LYS:HZ2	11:B:22:GLN:N	2.16	0.43
11:B:57:TYR:N	11:B:95:LEU:O	2.52	0.43
12:H:257:PHE:CE1	12:H:278:PHE:HZ	2.37	0.43
1:C:252:HIS:NE2	11:B:106:MET:HE1	2.34	0.42
1:C:345:LYS:HE2	1:C:345:LYS:HB3	1.78	0.42
3:F:96:PRO:HB2	3:F:295:ALA:HB2	2.01	0.42
6:J:7:ILE:HG21	18:A:201:3PE:H3B1	2.01	0.42
1:C:168:PRO:HA	1:C:173:TYR:CD1	2.54	0.42
4:G:368:LEU:HD21	4:G:390:ARG:HB3	2.00	0.42
10:N:200:GLU:HG3	10:N:203:LEU:H	1.84	0.42
11:B:25:VAL:HB	11:B:193:TYR:HE2	1.84	0.42
11:B:91:ARG:C	11:B:93:ALA:H	2.27	0.42
11:B:94:ASP:O	11:B:122:TRP:HE3	2.01	0.42
11:B:120:PRO:HB2	12:H:70:LYS:CD	2.47	0.42
12:H:242:TYR:HA	12:H:245:ILE:HG22	2.01	0.42
3:F:85:ARG:HG2	3:F:213:PRO:HG2	2.01	0.42
9:M:470:LEU:HD12	9:M:470:LEU:HA	1.89	0.42
12:H:80:ARG:O	12:H:81:VAL:C	2.62	0.42
3:F:200:LYS:HE3	3:F:200:LYS:HB2	1.86	0.42
4:G:546:MET:HE2	4:G:546:MET:HB3	1.98	0.42
8:L:262:GLY:O	8:L:266:ILE:HG12	2.19	0.42
8:L:469:ALA:C	8:L:471:ILE:N	2.75	0.42
9:M:271:LEU:HA	9:M:275:SER:HB3	2.01	0.42
4:G:384:VAL:HG23	4:G:392:ALA:HB2	2.02	0.42
9:M:405:VAL:HG21	9:M:482:PRO:HG3	2.01	0.42
10:N:33:ASN:O	10:N:34:HIS:C	2.62	0.42
1:C:277:TYR:CG	11:B:63:CYS:HB3	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:116:LYS:HD3	2:E:116:LYS:HA	1.87	0.42
3:F:354:CYS:HA	4:G:46:ALA:O	2.20	0.42
4:G:714:ARG:HD2	4:G:740:MET:HE1	2.02	0.42
19:J:202:7PH:H39A	19:J:202:7PH:H2CA	2.01	0.42
8:L:466:PHE:CD1	8:L:466:PHE:N	2.88	0.42
10:N:53:TRP:CZ2	18:N:503:3PE:H31	2.54	0.42
10:N:217:LYS:HA	10:N:217:LYS:HD3	1.91	0.42
11:B:46:VAL:HA	12:H:65:ILE:CG2	2.49	0.42
11:B:71:SER:HB3	11:B:162:PRO:HB3	2.02	0.42
1:C:96:PHE:HB2	1:C:122:LEU:HD21	2.02	0.42
1:C:161:PRO:HG3	11:B:105:LYS:HG2	2.02	0.42
7:K:92:ILE:HD12	7:K:92:ILE:HA	1.88	0.42
12:H:32:MET:HG2	12:H:242:TYR:CD2	2.52	0.42
13:A:57:VAL:C	13:A:59:SER:H	2.27	0.42
2:E:138:ASP:OD1	2:E:139:LYS:HG3	2.20	0.42
1:C:359:HIS:HE1	15:B:301:SF4:S1	2.43	0.42
3:F:93:GLU:O	3:F:133:ARG:NH1	2.53	0.42
3:F:271:ARG:NH2	3:F:302:GLU:OE2	2.45	0.42
5:I:161:LYS:HB3	5:I:161:LYS:HE3	1.37	0.42
6:J:71:VAL:O	6:J:76:LEU:HB2	2.20	0.42
8:L:99:ILE:HD11	8:L:251:ALA:HB3	2.02	0.42
8:L:305:LYS:HA	8:L:305:LYS:HD3	1.73	0.42
10:N:308:TYR:CD1	10:N:414:VAL:HG22	2.55	0.42
11:B:181:ARG:H	11:B:181:ARG:HG2	1.63	0.42
19:H:403:7PH:H22	19:H:403:7PH:H2	1.76	0.42
8:L:35:VAL:HG13	8:L:97:PHE:HE1	1.84	0.41
18:L:701:3PE:H322	18:L:701:3PE:H352	1.86	0.41
9:M:338:TYR:HB2	9:M:493:ILE:HG23	2.02	0.41
7:K:43:ALA:HB1	7:K:62:TYR:CD1	2.55	0.41
10:N:444:ALA:N	10:N:445:PRO:HD3	2.35	0.41
11:B:89:SER:O	11:B:93:ALA:N	2.52	0.41
1:C:216:MET:CE	13:A:62:LEU:HD21	2.49	0.41
2:E:96:VAL:HG11	2:E:137:CYS:HB3	2.02	0.41
2:E:97:CYS:SG	2:E:141:PRO:HA	2.60	0.41
8:L:67:TRP:HB2	8:L:77:PHE:HD1	1.85	0.41
8:L:394:ALA:CB	8:L:466:PHE:HA	2.49	0.41
8:L:469:ALA:C	8:L:471:ILE:H	2.28	0.41
11:B:90:PRO:HG2	11:B:116:GLN:NE2	2.34	0.41
11:B:101:THR:HB	11:B:103:PHE:CZ	2.56	0.41
3:F:249:LEU:HD13	3:F:261:LEU:HD21	2.02	0.41
5:I:122:MET:HE2	5:I:122:MET:HB3	1.96	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:K:26:ARG:HA	8:L:592:ARG:HD3	2.01	0.41
8:L:341:PHE:O	8:L:345:LEU:HD12	2.20	0.41
8:L:568:MET:HE3	8:L:568:MET:HB2	1.90	0.41
10:N:100:ASP:CG	10:N:101:ASN:H	2.28	0.41
10:N:267:GLU:HG3	21:N:652:HOH:O	2.20	0.41
4:G:171:ASP:OD2	4:G:191:LEU:HA	2.20	0.41
8:L:465:THR:C	8:L:467:VAL:H	2.28	0.41
11:B:215:ARG:H	11:B:215:ARG:HG3	1.73	0.41
1:C:73:MET:HE2	1:C:103:ILE:HD12	2.03	0.41
1:C:387:MET:HE3	1:C:478:LEU:HD11	2.01	0.41
3:F:88:LEU:HB2	3:F:216:VAL:HG22	2.02	0.41
6:J:14:LEU:O	6:J:18:ARG:HG2	2.21	0.41
8:L:257:THR:O	8:L:258:MET:HB3	2.20	0.41
20:N:505:UQ8:H17	20:N:505:UQ8:H20	1.67	0.41
12:H:289:LEU:HD12	12:H:290:PRO:HD2	2.01	0.41
3:F:89:CYS:HB3	3:F:130:ILE:HA	2.02	0.41
8:L:394:ALA:CA	8:L:466:PHE:HA	2.50	0.41
8:L:487:HIS:O	8:L:490:MET:HG3	2.20	0.41
10:N:50:VAL:CG2	18:N:503:3PE:H2E2	2.51	0.41
18:N:503:3PE:H231	18:N:503:3PE:H261	1.46	0.41
11:B:29:LEU:HD23	11:B:29:LEU:HA	1.92	0.41
1:C:78:HIS:HD1	1:C:79:GLY:H	1.68	0.41
7:K:61:MET:HE3	7:K:61:MET:HB3	1.91	0.41
8:L:25:TRP:CD1	8:L:30:SER:HG	2.39	0.41
8:L:316:ILE:HD12	8:L:319:MET:HE1	2.02	0.41
1:C:47:VAL:HG11	1:C:110:ASP:HB2	2.03	0.41
1:C:340:PHE:HZ	11:B:76:HIS:HD2	1.69	0.41
2:E:97:CYS:HB3	2:E:102:TYR:HB3	2.03	0.41
3:F:98:THR:HA	3:F:325:LEU:HD22	2.03	0.41
3:F:353:TRP:HZ2	4:G:44:VAL:HB	1.86	0.41
3:F:435:GLY:HA2	11:B:216:THR:HB	2.03	0.41
4:G:6:ILE:HG22	4:G:77:THR:HB	2.03	0.41
4:G:100:ASN:HB3	4:G:135:ARG:HG3	2.02	0.41
4:G:245:TYR:HA	4:G:641:TYR:CZ	2.56	0.41
8:L:260:THR:HB	8:L:335:LEU:HD11	2.01	0.41
8:L:577:ARG:HD3	18:L:701:3PE:C21	2.50	0.41
9:M:335:GLN:HG2	9:M:493:ILE:HG22	2.02	0.41
11:B:181:ARG:HE	11:B:181:ARG:HB3	1.68	0.41
12:H:79:ASP:OD1	12:H:81:VAL:HB	2.21	0.41
2:E:158:ILE:HD13	2:E:158:ILE:HA	1.84	0.41
8:L:465:THR:C	8:L:467:VAL:N	2.79	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:N:142:LEU:O	10:N:238:VAL:HG21	2.21	0.41
11:B:138:ILE:HG13	11:B:139:TYR:H	1.85	0.41
4:G:163:TYR:CE1	4:G:169:GLY:HA3	2.56	0.40
4:G:241:PRO:HB2	4:G:635:VAL:HG21	2.02	0.40
4:G:814:ILE:HD11	4:G:902:LEU:HD13	2.03	0.40
4:G:840:PRO:HB2	4:G:871:LEU:HD23	2.04	0.40
7:K:85:ARG:HD2	13:A:57:VAL:CG2	2.50	0.40
9:M:233:VAL:HG23	9:M:240:LEU:HD13	2.03	0.40
11:B:47:ASN:O	11:B:51:LYS:HE3	2.20	0.40
12:H:90:ALA:HB2	12:H:129:ALA:HB1	2.03	0.40
12:H:281:MET:O	12:H:285:ILE:HG23	2.20	0.40
5:I:141:GLY:HA3	11:B:212:THR:HA	2.02	0.40
18:J:201:3PE:H262	18:J:201:3PE:H291	1.81	0.40
8:L:485:LEU:HD23	8:L:486:ALA:N	2.36	0.40
4:G:812:TRP:HB3	4:G:884:VAL:HG13	2.03	0.40
6:J:32:LEU:O	6:J:36:LEU:HG	2.22	0.40
8:L:12:LEU:O	8:L:16:VAL:HG13	2.21	0.40
9:M:134:ILE:HD12	9:M:134:ILE:HA	1.93	0.40
11:B:64:CYS:HB3	11:B:99:ALA:HB1	2.03	0.40
12:H:116:ILE:HD12	12:H:116:ILE:HA	1.96	0.40
12:H:277:PHE:O	12:H:281:MET:HG2	2.21	0.40
1:C:391:LEU:HD21	1:C:475:ARG:HG3	2.02	0.40
1:C:509:LEU:HB3	5:I:148:TYR:CZ	2.57	0.40
4:G:314:VAL:HG22	4:G:565:ALA:HB3	2.04	0.40
5:I:152:ARG:NH1	5:I:165:GLU:O	2.41	0.40
8:L:79:LEU:HG	8:L:132:LEU:HB3	2.02	0.40
11:B:192:VAL:HG12	11:B:194:ARG:HD3	2.03	0.40
12:H:239:VAL:O	12:H:243:ILE:HG13	2.22	0.40
8:L:475:LEU:HD23	8:L:478:VAL:HG23	2.02	0.40
10:N:130:LEU:HD12	10:N:130:LEU:HA	1.95	0.40
12:H:92:THR:HB	18:H:401:3PE:H3G1	2.03	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 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	C	587/600 (98%)	556 (95%)	31 (5%)	0	100	100
2	E	154/166 (93%)	152 (99%)	2 (1%)	0	100	100
3	F	437/461 (95%)	428 (98%)	9 (2%)	0	100	100
4	G	903/910 (99%)	875 (97%)	28 (3%)	0	100	100
5	I	147/180 (82%)	144 (98%)	3 (2%)	0	100	100
6	J	161/184 (88%)	159 (99%)	2 (1%)	0	100	100
7	K	98/100 (98%)	96 (98%)	2 (2%)	0	100	100
8	L	611/613 (100%)	572 (94%)	39 (6%)	0	100	100
9	M	502/509 (99%)	484 (96%)	18 (4%)	0	100	100
10	N	483/485 (100%)	472 (98%)	10 (2%)	1 (0%)	43	66
11	B	195/220 (89%)	170 (87%)	25 (13%)	0	100	100
12	H	303/325 (93%)	287 (95%)	16 (5%)	0	100	100
13	A	102/147 (69%)	98 (96%)	4 (4%)	0	100	100
All	All	4683/4900 (96%)	4493 (96%)	189 (4%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	N	349	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 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	C	509/519 (98%)	487 (96%)	22 (4%)	26	52
2	E	129/139 (93%)	126 (98%)	3 (2%)	44	67
3	F	353/372 (95%)	343 (97%)	10 (3%)	38	62
4	G	733/738 (99%)	710 (97%)	23 (3%)	35	59

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	I	128/154 (83%)	122 (95%)	6 (5%)	23	49
6	J	129/146 (88%)	125 (97%)	4 (3%)	35	59
7	K	79/79 (100%)	75 (95%)	4 (5%)	21	47
8	L	485/485 (100%)	455 (94%)	30 (6%)	16	39
9	M	413/418 (99%)	401 (97%)	12 (3%)	37	61
10	N	385/385 (100%)	374 (97%)	11 (3%)	37	61
11	B	177/192 (92%)	148 (84%)	29 (16%)	2	7
12	H	253/269 (94%)	241 (95%)	12 (5%)	23	49
13	A	83/119 (70%)	78 (94%)	5 (6%)	17	40
All	All	3856/4015 (96%)	3685 (96%)	171 (4%)	27	51

All (171) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	110	ASP
1	C	126	THR
1	C	156	ARG
1	C	186	THR
1	C	190	GLN
1	C	194	MET
1	C	200	LYS
1	C	210	THR
1	C	216	MET
1	C	218	LEU
1	C	237	LEU
1	C	238	ASP
1	C	276	GLU
1	C	328	GLN
1	C	345	LYS
1	C	377	ASP
1	C	403	ILE
1	C	404	LEU
1	C	506	GLU
1	C	513	GLU
1	C	569	LEU
1	C	595	MET
2	E	13	GLU
2	E	156	GLU
2	E	158	ILE

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Mol	Chain	Res	Type
3	F	53	GLN
3	F	56	ASP
3	F	94	MET
3	F	233	VAL
3	F	252	PHE
3	F	269	THR
3	F	286	LYS
3	F	323	THR
3	F	330	ASP
3	F	396	THR
4	G	12	GLU
4	G	53	LYS
4	G	94	VAL
4	G	107	VAL
4	G	187	GLU
4	G	190	THR
4	G	295	LEU
4	G	298	GLU
4	G	416	GLN
4	G	469	ASN
4	G	478	GLU
4	G	571	ASN
4	G	643	SER
4	G	659	SER
4	G	670	GLN
4	G	717	MET
4	G	718	ARG
4	G	723	VAL
4	G	750	ARG
4	G	839	GLN
4	G	869	VAL
4	G	896	VAL
4	G	907	GLU
5	I	36	GLU
5	I	77	LEU
5	I	82	THR
5	I	83	LYS
5	I	135	GLU
5	I	161	LYS
6	J	64	MET
6	J	69	PHE
6	J	88	LEU

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Mol	Chain	Res	Type
6	J	94	ILE
7	K	10	LEU
7	K	16	VAL
7	K	44	LEU
7	K	95	VAL
8	L	25	TRP
8	L	27	GLU
8	L	66	THR
8	L	93	THR
8	L	114	SER
8	L	122	LEU
8	L	148	LEU
8	L	179	VAL
8	L	183	PHE
8	L	200	MET
8	L	220	LEU
8	L	222	LEU
8	L	227	VAL
8	L	292	LEU
8	L	304	ILE
8	L	315	GLN
8	L	328	TRP
8	L	345	LEU
8	L	372	ILE
8	L	379	PHE
8	L	433	ILE
8	L	436	VAL
8	L	465	THR
8	L	466	PHE
8	L	467	VAL
8	L	493	LEU
8	L	495	ILE
8	L	517	THR
8	L	518	LEU
8	L	547	LYS
9	M	74	ARG
9	M	75	PHE
9	M	96	LEU
9	M	109	ILE
9	M	169	THR
9	M	202	VAL
9	M	215	MET

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Mol	Chain	Res	Type
9	M	265	LYS
9	M	303	TRP
9	M	405	VAL
9	M	433	SER
9	M	460	MET
10	N	4	THR
10	N	62	ASP
10	N	103	ASP
10	N	193	LEU
10	N	195	ASP
10	N	324	GLU
10	N	358	SER
10	N	369	ARG
10	N	430	VAL
10	N	457	VAL
10	N	462	LEU
11	B	4	THR
11	B	5	LEU
11	B	6	THR
11	B	7	ARG
11	B	18	PRO
11	B	19	LEU
11	B	21	LYS
11	B	25	VAL
11	B	45	MET
11	B	51	LYS
11	B	63	CYS
11	B	85	VAL
11	B	86	LEU
11	B	87	ARG
11	B	89	SER
11	B	90	PRO
11	B	91	ARG
11	B	92	GLN
11	B	101	THR
11	B	117	MET
11	B	121	LYS
11	B	124	ILE
11	B	179	GLU
11	B	181	ARG
11	B	184	SER
11	B	185	TRP

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Mol	Chain	Res	Type
11	B	186	VAL
11	B	190	GLN
11	B	220	ILE
12	H	8	LEU
12	H	23	LEU
12	H	66	LYS
12	H	67	MET
12	H	70	LYS
12	H	71	GLU
12	H	73	TRP
12	H	82	ILE
12	H	112	LEU
12	H	130	VAL
12	H	186	VAL
12	H	221	LEU
13	A	7	THR
13	A	18	ILE
13	A	56	SER
13	A	83	LEU
13	A	90	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	359	HIS
4	G	54	GLN
4	G	137	HIS
4	G	883	GLN
8	L	78	ASN
8	L	212	ASN
8	L	281	HIS
8	L	315	GLN
8	L	361	ASN
8	L	409	ASN
8	L	411	HIS
9	M	281	ASN
10	N	149	GLN
10	N	291	GLN
10	N	404	GLN
11	B	36	ASN
11	B	47	ASN
11	B	52	ASN

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Mol	Chain	Res	Type
11	B	111	GLN
11	B	116	GLN
12	H	113	ASN
12	H	152	GLN
12	H	208	HIS
13	A	13	HIS

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](#)

Of 32 ligands modelled in this entry, 3 are monoatomic - leaving 29 for Mogul analysis.

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	$\# Z > 2$
18	3PE	M	601	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)
18	3PE	A	201	-	50,50,50	0.51	0	53,55,55	0.51	1 (1%)
14	FES	E	201	-	0,4,4	-	-	-	-	-
18	3PE	L	702	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)
15	SF4	I	202	5	0,12,12	-	-	-	-	-
18	3PE	J	201	-	50,50,50	0.51	0	53,55,55	0.52	1 (1%)
15	SF4	G	1001	4	0,12,12	-	-	-	-	-

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
18	3PE	H	401	-	50,50,50	0.51	0	53,55,55	0.53	1 (1%)
20	UQ8	N	506	-	53,53,53	0.68	0	64,67,67	1.63	12 (18%)
19	7PH	M	603	-	37,37,37	1.39	3 (8%)	41,42,42	1.20	3 (7%)
15	SF4	F	501	3	0,12,12	-	-	-	-	-
15	SF4	B	301	11	0,12,12	-	-	-	-	-
18	3PE	N	503	-	50,50,50	0.29	0	53,55,55	0.33	0
19	7PH	J	202	-	37,37,37	1.39	3 (8%)	41,42,42	1.22	3 (7%)
19	7PH	M	602	-	37,37,37	1.39	3 (8%)	41,42,42	1.21	4 (9%)
18	3PE	L	703	-	50,50,50	0.52	0	53,55,55	0.50	1 (1%)
14	FES	G	1004	-	0,4,4	-	-	-	-	-
16	FMN	F	502	-	33,33,33	1.08	2 (6%)	48,50,50	1.20	7 (14%)
15	SF4	G	1003	4	0,12,12	-	-	-	-	-
19	7PH	J	203	-	37,37,37	1.39	3 (8%)	41,42,42	1.20	4 (9%)
18	3PE	N	502	-	50,50,50	0.52	0	53,55,55	0.51	1 (1%)
15	SF4	I	201	5	0,12,12	-	-	-	-	-
18	3PE	H	402	-	50,50,50	0.51	0	53,55,55	0.52	1 (1%)
15	SF4	G	1002	4	0,12,12	-	-	-	-	-
18	3PE	N	501	-	50,50,50	0.51	0	53,55,55	0.57	2 (3%)
18	3PE	L	701	-	50,50,50	0.51	0	53,55,55	0.52	1 (1%)
20	UQ8	N	505	-	53,53,53	0.68	0	64,67,67	1.64	11 (17%)
18	3PE	N	504	-	50,50,50	0.51	0	53,55,55	0.52	1 (1%)
19	7PH	H	403	-	37,37,37	1.40	3 (8%)	41,42,42	1.20	3 (7%)

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
18	3PE	M	601	-	-	8/54/54/54	-
18	3PE	A	201	-	-	8/54/54/54	-
14	FES	E	201	-	-	-	0/1/1/1
18	3PE	L	702	-	-	9/54/54/54	-
15	SF4	I	202	5	-	-	0/6/5/5
18	3PE	J	201	-	-	17/54/54/54	-
15	SF4	G	1001	4	-	-	0/6/5/5
18	3PE	H	401	-	-	20/54/54/54	-
20	UQ8	N	506	-	-	9/51/75/75	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
19	7PH	M	603	-	-	20/39/39/39	-
15	SF4	F	501	3	-	-	0/6/5/5
15	SF4	B	301	11	-	-	0/6/5/5
18	3PE	N	503	-	-	31/54/54/54	-
19	7PH	J	202	-	-	22/39/39/39	-
19	7PH	M	602	-	-	22/39/39/39	-
18	3PE	L	703	-	-	10/54/54/54	-
14	FES	G	1004	-	-	-	0/1/1/1
16	FMN	F	502	-	-	3/18/18/18	0/3/3/3
15	SF4	G	1003	4	-	-	0/6/5/5
19	7PH	J	203	-	-	22/39/39/39	-
18	3PE	N	502	-	-	16/54/54/54	-
15	SF4	I	201	5	-	-	0/6/5/5
18	3PE	H	402	-	-	10/54/54/54	-
15	SF4	G	1002	4	-	-	0/6/5/5
18	3PE	N	501	-	-	14/54/54/54	-
18	3PE	L	701	-	-	12/54/54/54	-
20	UQ8	N	505	-	-	14/51/75/75	0/1/1/1
18	3PE	N	504	-	-	5/54/54/54	-
19	7PH	H	403	-	-	22/39/39/39	-

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	H	403	7PH	P-O11	7.14	1.83	1.60
19	J	203	7PH	P-O11	7.12	1.83	1.60
19	J	202	7PH	P-O11	7.11	1.83	1.60
19	M	603	7PH	P-O11	7.09	1.83	1.60
19	M	602	7PH	P-O11	7.08	1.83	1.60
16	F	502	FMN	C4A-N5	3.77	1.38	1.30
19	M	602	7PH	O11-C1	-2.66	1.34	1.44
19	H	403	7PH	O11-C1	-2.66	1.34	1.44
19	J	202	7PH	O11-C1	-2.65	1.34	1.44
19	J	203	7PH	O11-C1	-2.65	1.34	1.44
19	M	603	7PH	O11-C1	-2.64	1.34	1.44
16	F	502	FMN	C10-N1	2.44	1.38	1.33
19	J	202	7PH	C1-C2	2.11	1.57	1.50
19	J	203	7PH	C1-C2	2.06	1.57	1.50
19	H	403	7PH	C1-C2	2.06	1.57	1.50

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
19	M	602	7PH	C1-C2	2.04	1.56	1.50
19	M	603	7PH	C1-C2	2.02	1.56	1.50

All (59) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
20	N	505	UQ8	C7-C8-C9	-6.28	116.33	126.79
20	N	506	UQ8	C7-C8-C9	-6.18	116.51	126.79
20	N	505	UQ8	C6-C1-C2	4.64	122.85	119.18
20	N	506	UQ8	C6-C1-C2	4.44	122.69	119.18
20	N	505	UQ8	C17-C18-C19	-3.16	120.06	127.66
20	N	505	UQ8	C1-C6-C5	3.13	122.54	119.58
20	N	505	UQ8	C40-C39-C41	3.12	120.52	115.27
16	F	502	FMN	C4-N3-C2	-3.09	119.92	125.64
19	M	603	7PH	O11-P-O14	-3.06	97.88	106.47
20	N	506	UQ8	C40-C39-C41	3.06	120.42	115.27
19	J	202	7PH	O11-P-O14	-3.05	97.91	106.47
19	M	602	7PH	O11-P-O14	-3.05	97.91	106.47
19	H	403	7PH	O11-P-O14	-3.05	97.92	106.47
19	J	203	7PH	O11-P-O14	-3.01	98.04	106.47
20	N	506	UQ8	C1-C6-C5	2.96	122.38	119.58
20	N	506	UQ8	C17-C18-C19	-2.87	120.74	127.66
19	H	403	7PH	O13-P-O11	-2.76	99.38	106.73
19	J	203	7PH	O13-P-O11	-2.76	99.39	106.73
19	J	202	7PH	O13-P-O11	-2.76	99.40	106.73
19	M	602	7PH	O13-P-O11	-2.75	99.41	106.73
19	M	603	7PH	O13-P-O11	-2.75	99.42	106.73
16	F	502	FMN	C4A-C4-N3	2.67	119.96	113.19
20	N	506	UQ8	C7-C6-C5	-2.61	115.34	118.48
16	F	502	FMN	C4A-C10-N10	2.59	120.26	116.48
16	F	502	FMN	O4-C4-C4A	-2.54	119.85	126.60
20	N	505	UQ8	C12-C13-C14	-2.54	121.55	127.66
20	N	506	UQ8	C12-C13-C14	-2.49	121.65	127.66
19	M	603	7PH	O13-P-O12	2.49	117.14	107.64
19	H	403	7PH	O13-P-O12	2.48	117.12	107.64
19	J	202	7PH	O13-P-O12	2.48	117.10	107.64
19	M	602	7PH	O13-P-O12	2.47	117.07	107.64
19	J	203	7PH	O13-P-O12	2.46	117.02	107.64
20	N	506	UQ8	C10-C9-C11	2.40	119.31	115.27
18	H	402	3PE	O12-P-O14	2.39	124.05	112.24
18	L	701	3PE	O12-P-O14	2.39	124.05	112.24
18	M	601	3PE	O12-P-O14	2.35	123.84	112.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
18	H	401	3PE	O12-P-O14	2.34	123.80	112.24
16	F	502	FMN	C10-C4A-N5	-2.31	119.95	124.86
18	N	504	3PE	O12-P-O14	2.29	123.58	112.24
18	L	703	3PE	O12-P-O14	2.29	123.57	112.24
20	N	505	UQ8	C37-C38-C39	-2.28	122.16	127.66
20	N	505	UQ8	C10-C9-C11	2.28	119.10	115.27
18	A	201	3PE	O12-P-O14	2.27	123.46	112.24
18	N	502	3PE	O12-P-O14	2.26	123.41	112.24
18	J	201	3PE	O12-P-O14	2.26	123.39	112.24
18	L	702	3PE	O12-P-O14	2.25	123.38	112.24
18	N	501	3PE	O12-P-O14	2.25	123.36	112.24
20	N	505	UQ8	C41-C39-C38	-2.25	116.57	121.12
18	N	501	3PE	C2-O21-C21	2.18	123.16	117.79
20	N	505	UQ8	C8-C7-C6	2.18	117.92	112.05
16	F	502	FMN	C4A-C10-N1	-2.16	119.72	124.73
16	F	502	FMN	C9A-C5A-N5	-2.16	120.09	122.43
19	J	203	7PH	O31-C3-C2	-2.10	102.33	108.43
19	M	602	7PH	O31-C3-C2	-2.08	102.37	108.43
20	N	506	UQ8	C41-C39-C38	-2.08	116.91	121.12
20	N	506	UQ8	C37-C38-C39	-2.07	122.68	127.66
20	N	506	UQ8	C3M-O3-C3	-2.06	109.17	116.47
20	N	506	UQ8	C8-C7-C6	2.05	117.56	112.05
20	N	505	UQ8	C3M-O3-C3	-2.02	109.32	116.47

There are no chirality outliers.

All (294) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
18	J	201	3PE	C11-O13-P-O12
18	J	201	3PE	C12-C11-O13-P
18	J	201	3PE	O13-C11-C12-N
18	L	701	3PE	C11-O13-P-O14
18	L	701	3PE	O13-C11-C12-N
18	L	702	3PE	O13-C11-C12-N
18	M	601	3PE	C11-O13-P-O12
18	M	601	3PE	C22-C21-O21-C2
18	N	501	3PE	C11-O13-P-O12
18	N	501	3PE	O13-C11-C12-N
18	N	502	3PE	C11-O13-P-O12
18	N	502	3PE	C12-C11-O13-P
18	N	502	3PE	O13-C11-C12-N
18	N	503	3PE	C11-O13-P-O11

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Mol	Chain	Res	Type	Atoms
18	N	503	3PE	C22-C21-O21-C2
18	N	504	3PE	C11-O13-P-O12
18	H	401	3PE	C11-O13-P-O12
18	H	401	3PE	C12-C11-O13-P
18	H	401	3PE	O13-C11-C12-N
18	H	402	3PE	C11-O13-P-O14
18	H	402	3PE	O13-C11-C12-N
18	H	402	3PE	C22-C21-O21-C2
18	A	201	3PE	C22-C21-O21-C2
19	J	202	7PH	C1-O11-P-O12
19	J	202	7PH	C1-O11-P-O13
19	J	202	7PH	C1-O11-P-O14
19	J	202	7PH	C22-C21-O21-C2
19	J	203	7PH	O22-C21-O21-C2
19	J	203	7PH	C22-C21-O21-C2
19	M	602	7PH	C1-O11-P-O12
19	M	602	7PH	C1-O11-P-O13
19	M	603	7PH	C1-O11-P-O12
19	M	603	7PH	C1-O11-P-O13
19	M	603	7PH	C1-O11-P-O14
19	M	603	7PH	O11-C1-C2-O21
19	H	403	7PH	C1-O11-P-O12
19	H	403	7PH	C1-O11-P-O13
19	H	403	7PH	C1-O11-P-O14
19	H	403	7PH	O22-C21-O21-C2
20	N	506	UQ8	C30-C29-C31-C32
20	N	506	UQ8	C28-C29-C31-C32
19	M	603	7PH	O32-C31-O31-C3
19	M	603	7PH	C32-C31-O31-C3
18	H	402	3PE	O32-C31-O31-C3
18	A	201	3PE	O32-C31-O31-C3
18	M	601	3PE	O22-C21-O21-C2
18	N	503	3PE	O22-C21-O21-C2
18	H	402	3PE	O22-C21-O21-C2
18	A	201	3PE	O22-C21-O21-C2
19	J	202	7PH	O22-C21-O21-C2
18	H	402	3PE	C32-C31-O31-C3
18	A	201	3PE	C32-C31-O31-C3
19	H	403	7PH	C22-C21-O21-C2
18	L	702	3PE	C32-C31-O31-C3
18	N	502	3PE	C22-C21-O21-C2
18	N	503	3PE	C26-C27-C28-C29

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Mol	Chain	Res	Type	Atoms
18	N	503	3PE	C23-C24-C25-C26
19	M	603	7PH	C27-C28-C29-C2A
20	N	505	UQ8	C24-C26-C27-C28
20	N	506	UQ8	C39-C41-C42-C43
20	N	506	UQ8	C14-C16-C17-C18
18	L	702	3PE	O32-C31-O31-C3
18	N	502	3PE	O22-C21-O21-C2
19	J	203	7PH	C31-C32-C33-C34
19	M	602	7PH	C27-C28-C29-C2A
18	N	503	3PE	C2D-C2E-C2F-C2G
18	N	503	3PE	C32-C31-O31-C3
19	M	602	7PH	C21-C22-C23-C24
19	H	403	7PH	C21-C22-C23-C24
18	N	503	3PE	C21-C22-C23-C24
19	H	403	7PH	C31-C32-C33-C34
18	N	503	3PE	C38-C39-C3A-C3B
20	N	505	UQ8	C39-C41-C42-C43
20	N	506	UQ8	C29-C31-C32-C33
20	N	506	UQ8	C24-C26-C27-C28
18	N	503	3PE	O32-C31-O31-C3
18	J	201	3PE	C11-O13-P-O11
18	M	601	3PE	C1-O11-P-O13
18	M	601	3PE	C11-O13-P-O11
18	N	501	3PE	C11-O13-P-O11
18	N	502	3PE	C11-O13-P-O11
18	N	504	3PE	C11-O13-P-O11
18	H	401	3PE	C1-O11-P-O13
18	H	401	3PE	C11-O13-P-O11
19	M	602	7PH	C23-C24-C25-C26
19	J	202	7PH	C21-C22-C23-C24
18	N	503	3PE	C28-C29-C2A-C2B
19	H	403	7PH	C27-C28-C29-C2A
18	N	501	3PE	C22-C21-O21-C2
18	L	703	3PE	C26-C27-C28-C29
18	N	502	3PE	C38-C39-C3A-C3B
18	N	504	3PE	C24-C25-C26-C27
18	N	504	3PE	C2A-C2B-C2C-C2D
19	M	602	7PH	C38-C39-C3A-C3B
19	H	403	7PH	C22-C23-C24-C25
19	H	403	7PH	C25-C26-C27-C28
18	L	703	3PE	C2C-C2D-C2E-C2F
18	H	401	3PE	C3E-C3F-C3G-C3H

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Mol	Chain	Res	Type	Atoms
18	N	501	3PE	O22-C21-O21-C2
18	L	701	3PE	C33-C34-C35-C36
19	J	203	7PH	C37-C38-C39-C3A
18	N	501	3PE	C3D-C3E-C3F-C3G
18	H	401	3PE	C3C-C3D-C3E-C3F
18	M	601	3PE	C38-C39-C3A-C3B
18	J	201	3PE	C22-C23-C24-C25
18	N	503	3PE	C33-C34-C35-C36
19	J	203	7PH	C29-C2A-C2B-C2C
18	J	201	3PE	C2E-C2F-C2G-C2H
19	J	202	7PH	C25-C26-C27-C28
18	H	402	3PE	C2B-C2C-C2D-C2E
19	J	203	7PH	C25-C26-C27-C28
19	M	602	7PH	C32-C33-C34-C35
19	M	603	7PH	C25-C26-C27-C28
19	J	202	7PH	C37-C38-C39-C3A
19	J	203	7PH	C27-C28-C29-C2A
18	N	503	3PE	C39-C3A-C3B-C3C
19	J	202	7PH	C27-C28-C29-C2A
19	M	603	7PH	C37-C38-C39-C3A
19	J	203	7PH	C21-C22-C23-C24
18	H	401	3PE	C37-C38-C39-C3A
19	J	202	7PH	C32-C33-C34-C35
18	N	503	3PE	C22-C23-C24-C25
19	M	602	7PH	C22-C23-C24-C25
18	H	401	3PE	C21-C22-C23-C24
18	N	502	3PE	C36-C37-C38-C39
19	J	202	7PH	C26-C27-C28-C29
19	J	203	7PH	C32-C31-O31-C3
18	N	501	3PE	C24-C25-C26-C27
19	J	202	7PH	C32-C31-O31-C3
19	H	403	7PH	C32-C33-C34-C35
18	N	503	3PE	C27-C28-C29-C2A
18	N	503	3PE	C36-C37-C38-C39
19	H	403	7PH	C37-C38-C39-C3A
19	J	203	7PH	C26-C27-C28-C29
19	H	403	7PH	C33-C34-C35-C36
19	M	602	7PH	C37-C38-C39-C3A
19	J	203	7PH	C33-C34-C35-C36
19	H	403	7PH	C2A-C2B-C2C-C2D
18	N	503	3PE	C24-C25-C26-C27
19	M	603	7PH	C33-C34-C35-C36

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Mol	Chain	Res	Type	Atoms
18	L	701	3PE	C11-O13-P-O11
18	H	402	3PE	C11-O13-P-O11
19	J	203	7PH	O32-C31-O31-C3
19	J	203	7PH	O11-C1-C2-C3
19	M	603	7PH	O11-C1-C2-C3
19	M	603	7PH	C26-C27-C28-C29
18	N	503	3PE	C35-C36-C37-C38
19	J	203	7PH	C32-C33-C34-C35
18	N	503	3PE	C2C-C2D-C2E-C2F
19	J	202	7PH	C34-C35-C36-C37
18	H	401	3PE	C1-C2-C3-O31
19	J	203	7PH	C1-C2-C3-O31
19	H	403	7PH	C1-C2-C3-O31
18	H	401	3PE	C38-C39-C3A-C3B
18	N	501	3PE	C2D-C2E-C2F-C2G
19	J	202	7PH	O32-C31-O31-C3
20	N	505	UQ8	C12-C11-C9-C10
19	M	603	7PH	C21-C22-C23-C24
19	J	203	7PH	C38-C39-C3A-C3B
18	N	503	3PE	C2F-C2G-C2H-C2I
19	M	602	7PH	C1-O11-P-O14
18	N	503	3PE	C29-C2A-C2B-C2C
20	N	505	UQ8	C12-C11-C9-C8
18	N	501	3PE	C2C-C2D-C2E-C2F
19	H	403	7PH	C26-C27-C28-C29
19	J	203	7PH	C2A-C2B-C2C-C2D
19	H	403	7PH	C24-C25-C26-C27
19	H	403	7PH	O11-C1-C2-C3
18	N	503	3PE	C2B-C2C-C2D-C2E
16	F	502	FMN	O2'-C2'-C3'-C4'
19	M	602	7PH	C32-C31-O31-C3
18	L	701	3PE	C39-C3A-C3B-C3C
18	J	201	3PE	C1-C2-C3-O31
19	M	602	7PH	C1-C2-C3-O31
18	J	201	3PE	C27-C28-C29-C2A
18	A	201	3PE	C27-C28-C29-C2A
19	J	202	7PH	C33-C34-C35-C36
19	M	602	7PH	C34-C35-C36-C37
18	N	501	3PE	C3A-C3B-C3C-C3D
19	J	203	7PH	O11-C1-C2-O21
19	M	603	7PH	O21-C2-C3-O31
20	N	506	UQ8	C34-C36-C37-C38

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Mol	Chain	Res	Type	Atoms
18	N	502	3PE	C33-C34-C35-C36
18	N	502	3PE	C2-C1-O11-P
18	L	703	3PE	C27-C28-C29-C2A
19	M	602	7PH	C2B-C2C-C2D-C2E
18	L	701	3PE	C32-C33-C34-C35
19	M	602	7PH	O11-C1-C2-C3
18	N	503	3PE	C37-C38-C39-C3A
19	J	202	7PH	C22-C23-C24-C25
18	H	401	3PE	C22-C23-C24-C25
18	H	401	3PE	C33-C34-C35-C36
19	J	203	7PH	C23-C24-C25-C26
18	L	703	3PE	C24-C25-C26-C27
19	M	603	7PH	C1-C2-C3-O31
19	J	202	7PH	C2A-C2B-C2C-C2D
19	M	602	7PH	O32-C31-O31-C3
19	H	403	7PH	C29-C2A-C2B-C2C
18	H	401	3PE	O21-C2-C3-O31
19	H	403	7PH	O21-C2-C3-O31
18	A	201	3PE	C29-C2A-C2B-C2C
19	M	603	7PH	C34-C35-C36-C37
18	L	701	3PE	C34-C35-C36-C37
19	J	203	7PH	C39-C3A-C3B-C3C
19	M	603	7PH	C2B-C2C-C2D-C2E
18	L	701	3PE	C32-C31-O31-C3
18	L	702	3PE	C11-O13-P-O11
18	M	601	3PE	C1-O11-P-O14
18	N	503	3PE	C1-O11-P-O12
18	N	503	3PE	C11-O13-P-O12
18	H	401	3PE	C1-O11-P-O14
18	L	703	3PE	C31-C32-C33-C34
18	N	503	3PE	O11-C1-C2-C3
19	J	202	7PH	O11-C1-C2-C3
19	J	202	7PH	O11-C1-C2-O21
19	M	602	7PH	O21-C2-C3-O31
18	J	201	3PE	C2D-C2E-C2F-C2G
18	N	502	3PE	C37-C38-C39-C3A
20	N	505	UQ8	C40-C39-C41-C42
18	J	201	3PE	C3B-C3C-C3D-C3E
18	L	701	3PE	O32-C31-O31-C3
20	N	505	UQ8	C30-C29-C31-C32
18	N	501	3PE	C3-C2-O21-C21
19	J	202	7PH	C1-C2-O21-C21

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Mol	Chain	Res	Type	Atoms
19	J	202	7PH	C38-C39-C3A-C3B
18	L	703	3PE	O22-C21-O21-C2
18	L	703	3PE	C22-C21-O21-C2
19	J	203	7PH	O21-C2-C3-O31
18	A	201	3PE	C1-O11-P-O13
19	M	603	7PH	C29-C2A-C2B-C2C
18	N	503	3PE	C25-C26-C27-C28
19	M	602	7PH	C2A-C2B-C2C-C2D
18	N	503	3PE	C2-C1-O11-P
18	J	201	3PE	C23-C24-C25-C26
16	F	502	FMN	O2'-C2'-C3'-O3'
18	L	701	3PE	C2A-C2B-C2C-C2D
18	H	401	3PE	O11-C1-C2-C3
18	J	201	3PE	O11-C1-C2-O21
19	H	403	7PH	O11-C1-C2-O21
18	N	501	3PE	C25-C26-C27-C28
18	N	502	3PE	C2A-C2B-C2C-C2D
19	M	603	7PH	C39-C3A-C3B-C3C
19	M	602	7PH	C24-C25-C26-C27
18	J	201	3PE	C32-C33-C34-C35
19	M	602	7PH	C39-C3A-C3B-C3C
18	N	501	3PE	C35-C36-C37-C38
18	N	504	3PE	C2-C1-O11-P
20	N	505	UQ8	C28-C29-C31-C32
20	N	505	UQ8	C20-C19-C21-C22
18	J	201	3PE	C37-C38-C39-C3A
18	L	701	3PE	C36-C37-C38-C39
18	N	502	3PE	C2B-C2C-C2D-C2E
18	J	201	3PE	C2B-C2C-C2D-C2E
20	N	505	UQ8	C38-C39-C41-C42
18	H	401	3PE	O11-C1-C2-O21
19	M	602	7PH	O11-C1-C2-O21
19	J	203	7PH	C36-C37-C38-C39
20	N	506	UQ8	C9-C11-C12-C13
20	N	505	UQ8	C18-C19-C21-C22
18	N	501	3PE	C2B-C2C-C2D-C2E
20	N	506	UQ8	C25-C24-C26-C27
19	M	603	7PH	C2A-C2B-C2C-C2D
18	L	703	3PE	O31-C31-C32-C33
18	L	702	3PE	C3A-C3B-C3C-C3D
19	M	602	7PH	C25-C26-C27-C28
20	N	505	UQ8	C5-C4-O4-C4M

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Mol	Chain	Res	Type	Atoms
18	N	502	3PE	O11-C1-C2-O21
18	N	503	3PE	O31-C31-C32-C33
18	H	401	3PE	C32-C33-C34-C35
18	H	401	3PE	C26-C27-C28-C29
18	L	702	3PE	O21-C21-C22-C23
18	H	401	3PE	C23-C24-C25-C26
18	N	502	3PE	C3C-C3D-C3E-C3F
19	J	202	7PH	C39-C3A-C3B-C3C
18	H	402	3PE	C39-C3A-C3B-C3C
18	L	703	3PE	O32-C31-C32-C33
18	A	201	3PE	C37-C38-C39-C3A
18	L	703	3PE	C23-C24-C25-C26
18	L	701	3PE	C11-O13-P-O12
18	L	702	3PE	C11-O13-P-O12
18	N	503	3PE	C1-O11-P-O14
18	H	402	3PE	C11-O13-P-O12
20	N	505	UQ8	C9-C11-C12-C13
18	J	201	3PE	C3F-C3G-C3H-C3I
18	N	502	3PE	C28-C29-C2A-C2B
20	N	505	UQ8	C15-C14-C16-C17
18	L	702	3PE	O22-C21-C22-C23
18	N	503	3PE	O32-C31-C32-C33
18	J	201	3PE	C26-C27-C28-C29
19	H	403	7PH	O21-C21-C22-C23
18	M	601	3PE	O21-C21-C22-C23
16	F	502	FMN	N10-C1'-C2'-O2'
18	L	702	3PE	C36-C37-C38-C39
20	N	505	UQ8	C29-C31-C32-C33

There are no ring outliers.

19 monomers are involved in 56 short contacts:

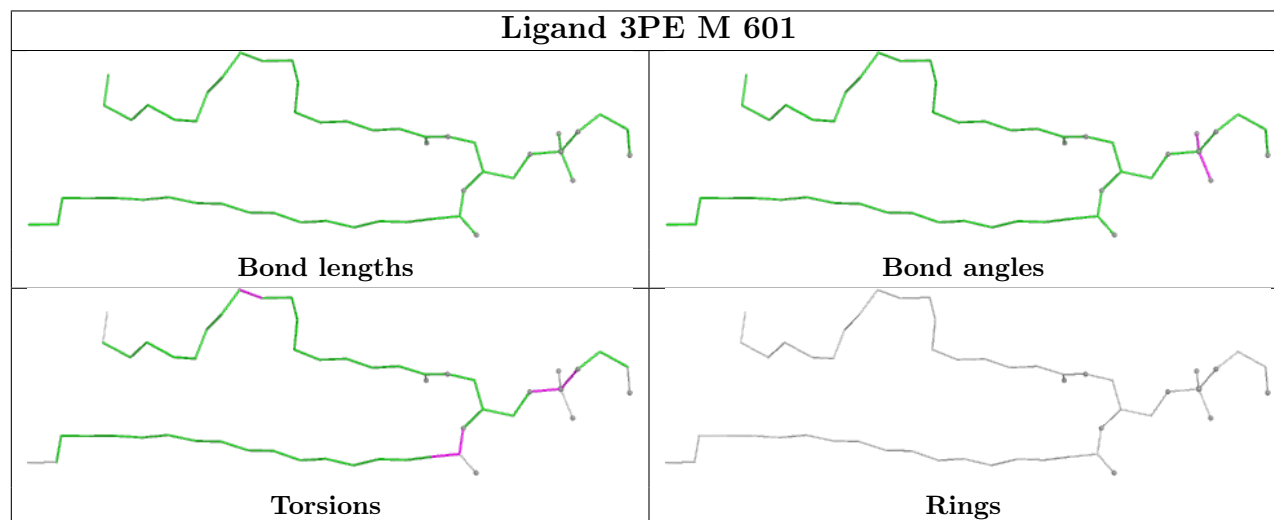
Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	M	601	3PE	2	0
18	A	201	3PE	2	0
18	J	201	3PE	7	0
18	H	401	3PE	6	0
20	N	506	UQ8	3	0
19	M	603	7PH	4	0
15	F	501	SF4	2	0
15	B	301	SF4	1	0
18	N	503	3PE	14	0

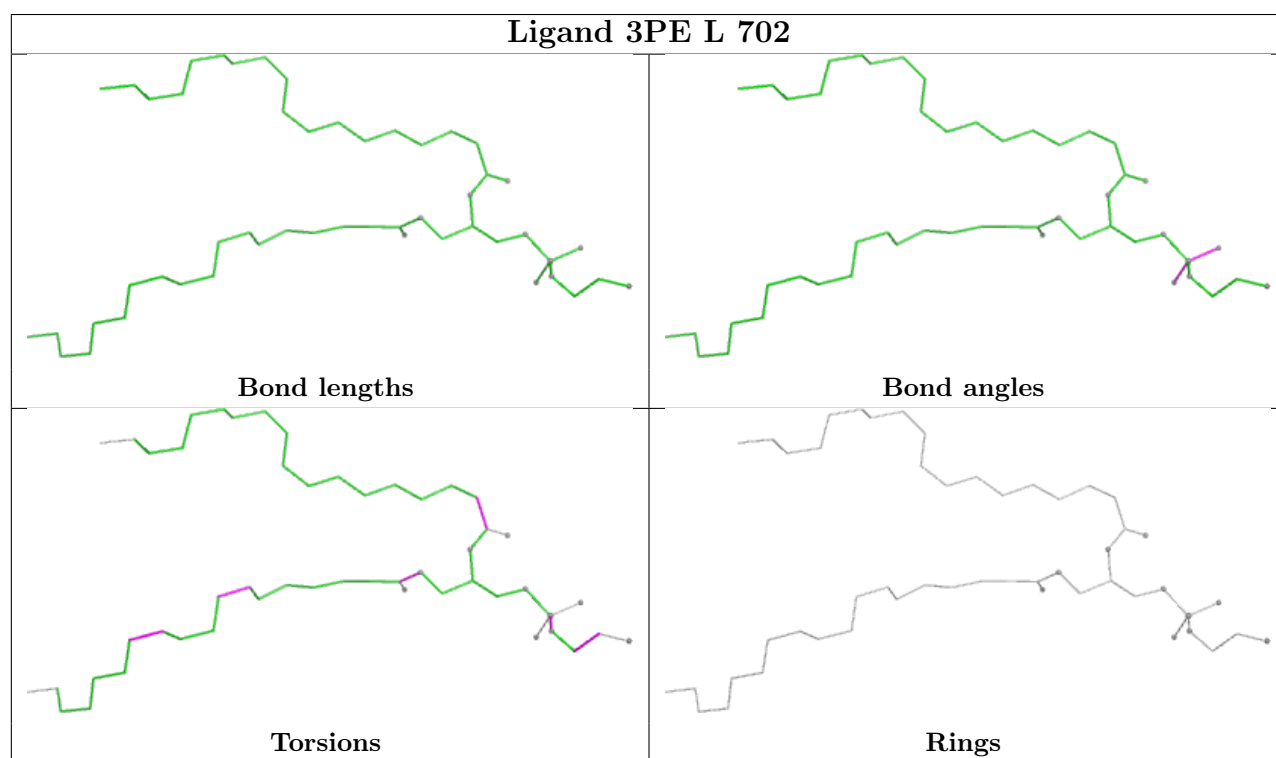
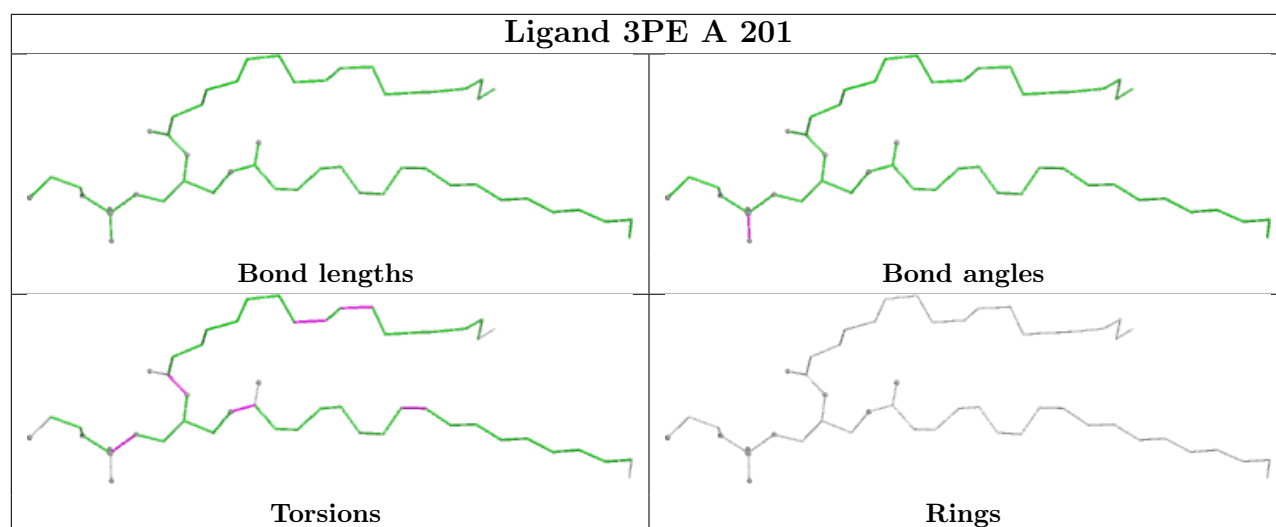
Continued on next page...

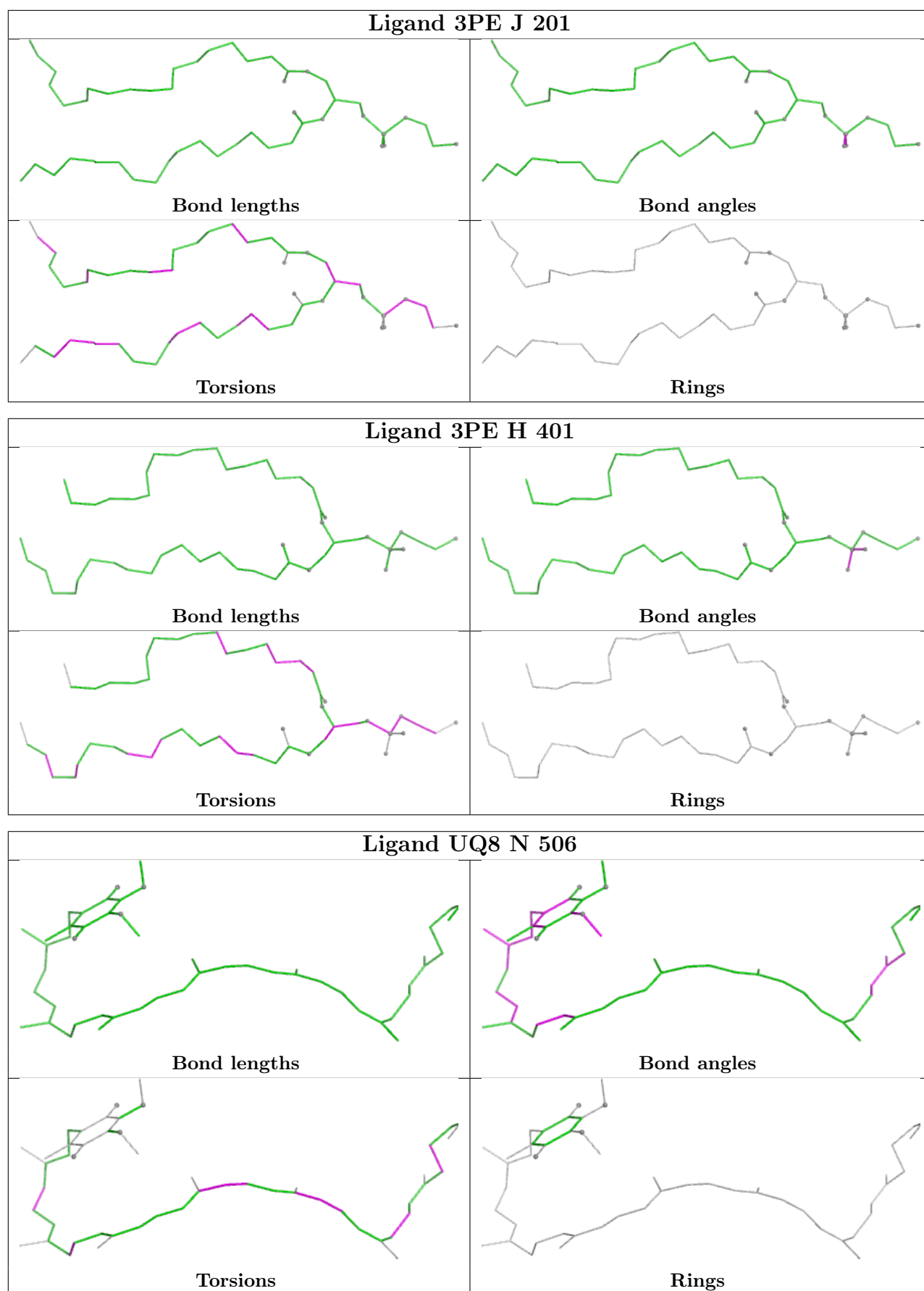
Continued from previous page...

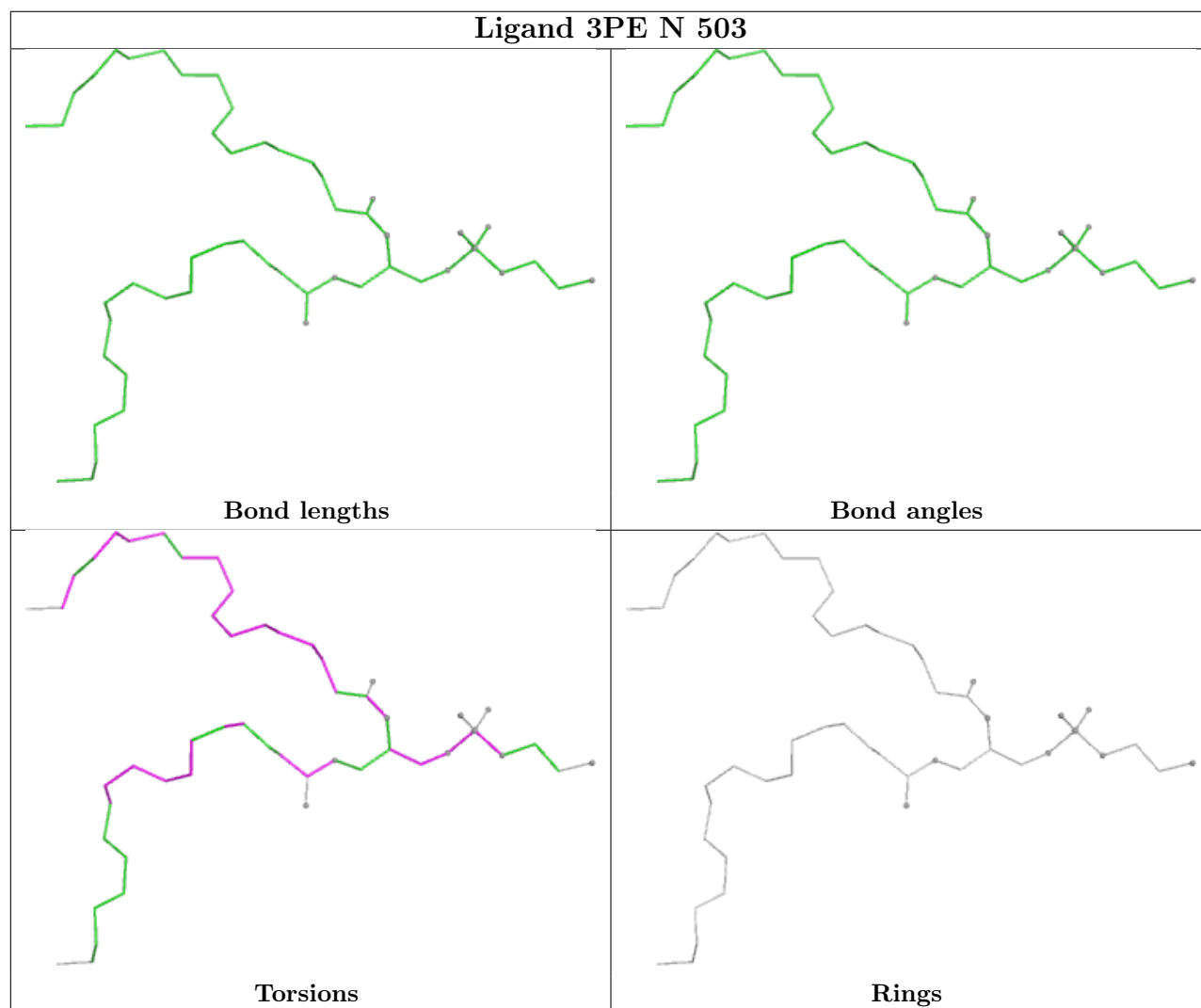
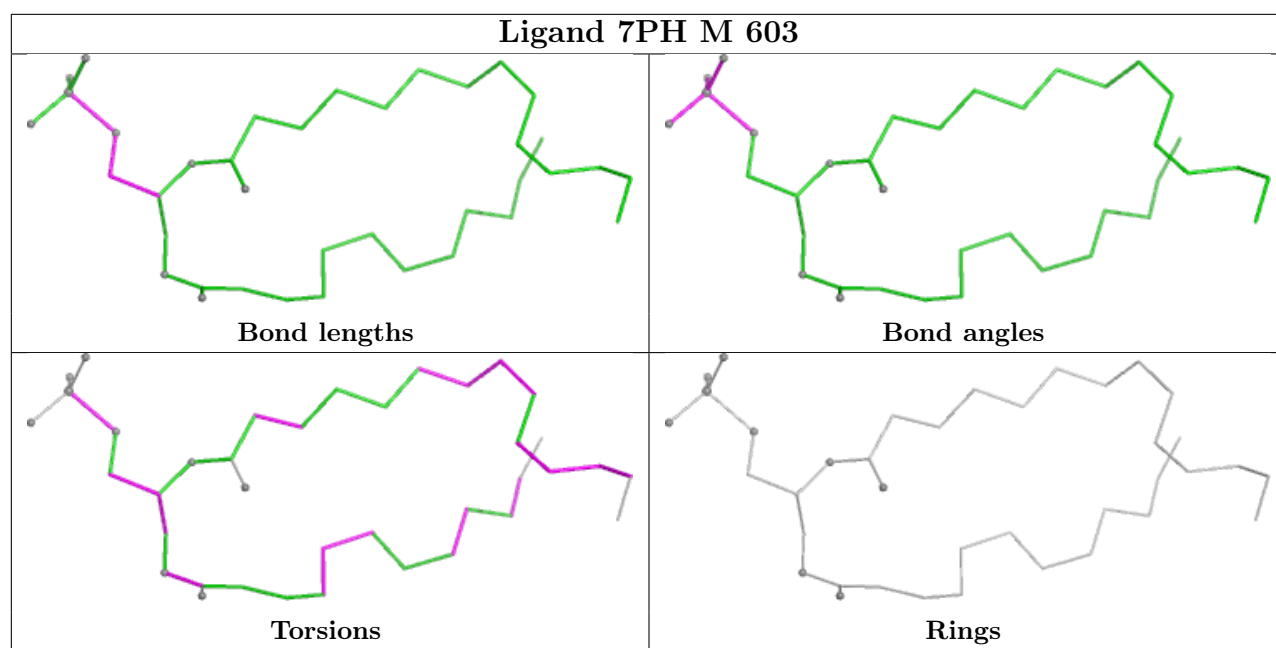
Mol	Chain	Res	Type	Clashes	Symm-Clashes
19	J	202	7PH	2	0
19	M	602	7PH	2	0
18	L	703	3PE	3	0
19	J	203	7PH	1	0
18	N	502	3PE	4	0
18	N	501	3PE	1	0
18	L	701	3PE	4	0
20	N	505	UQ8	5	0
18	N	504	3PE	1	0
19	H	403	7PH	1	0

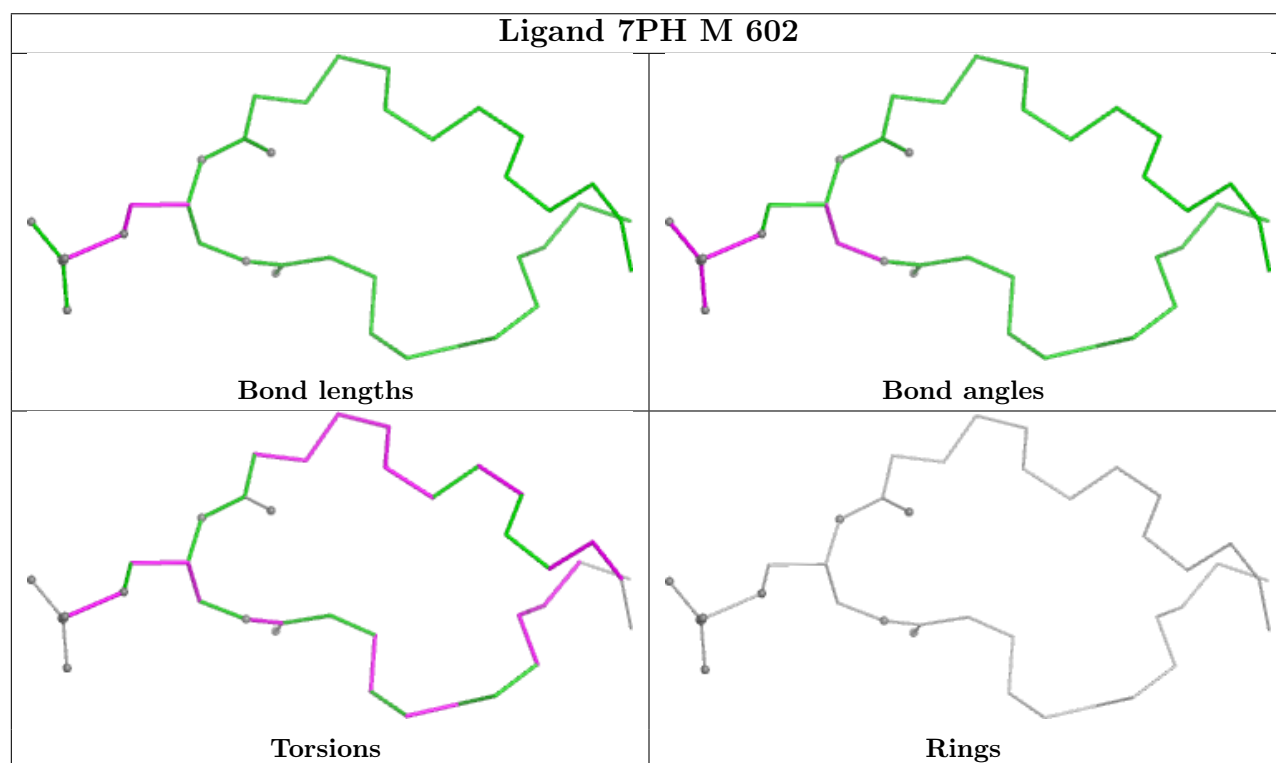
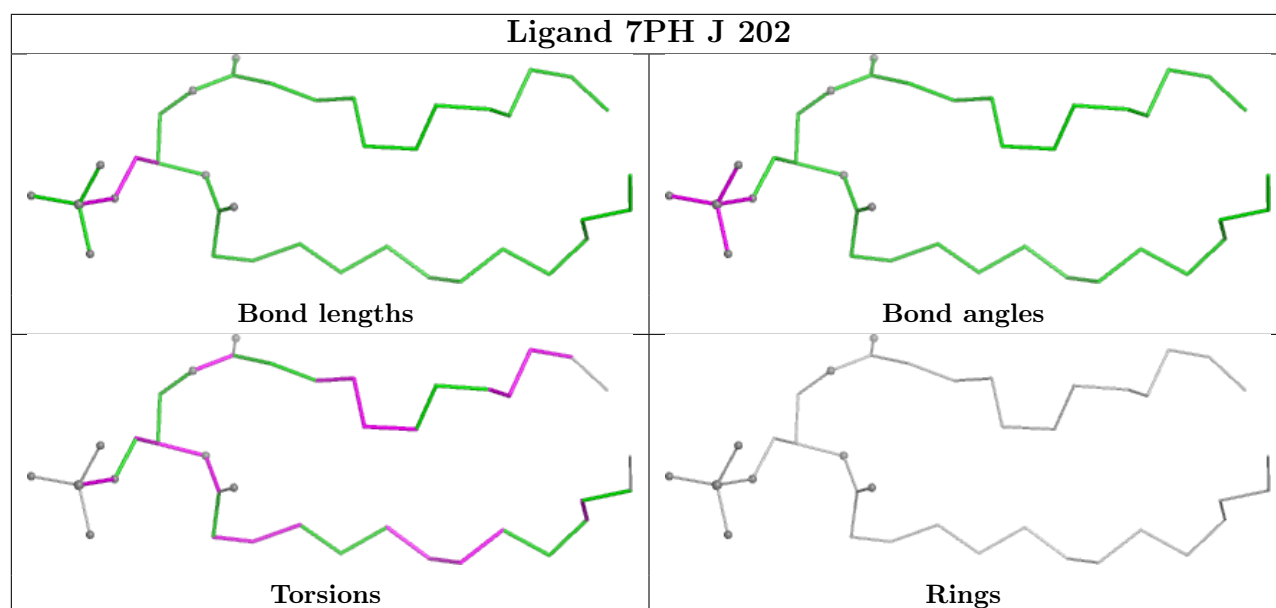
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



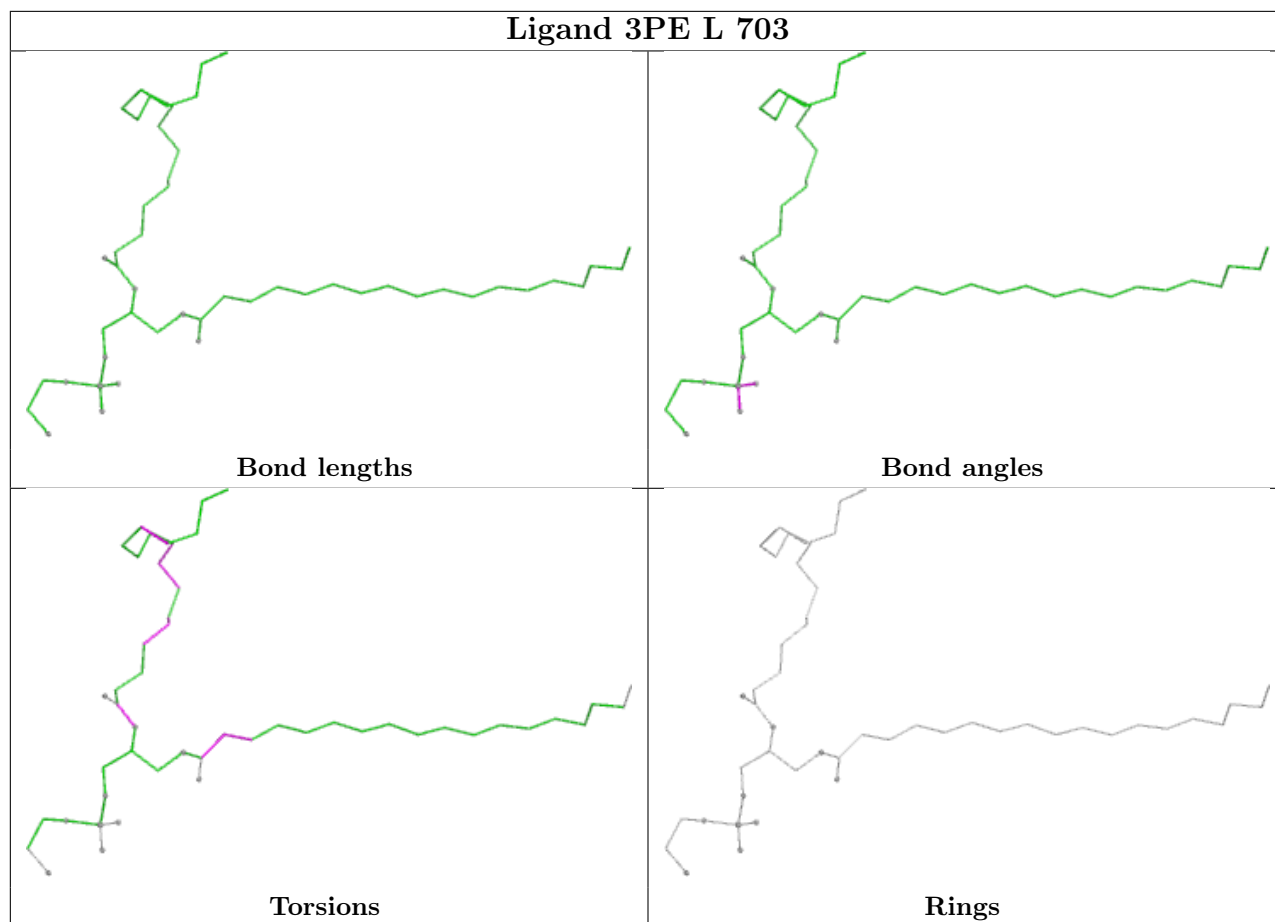




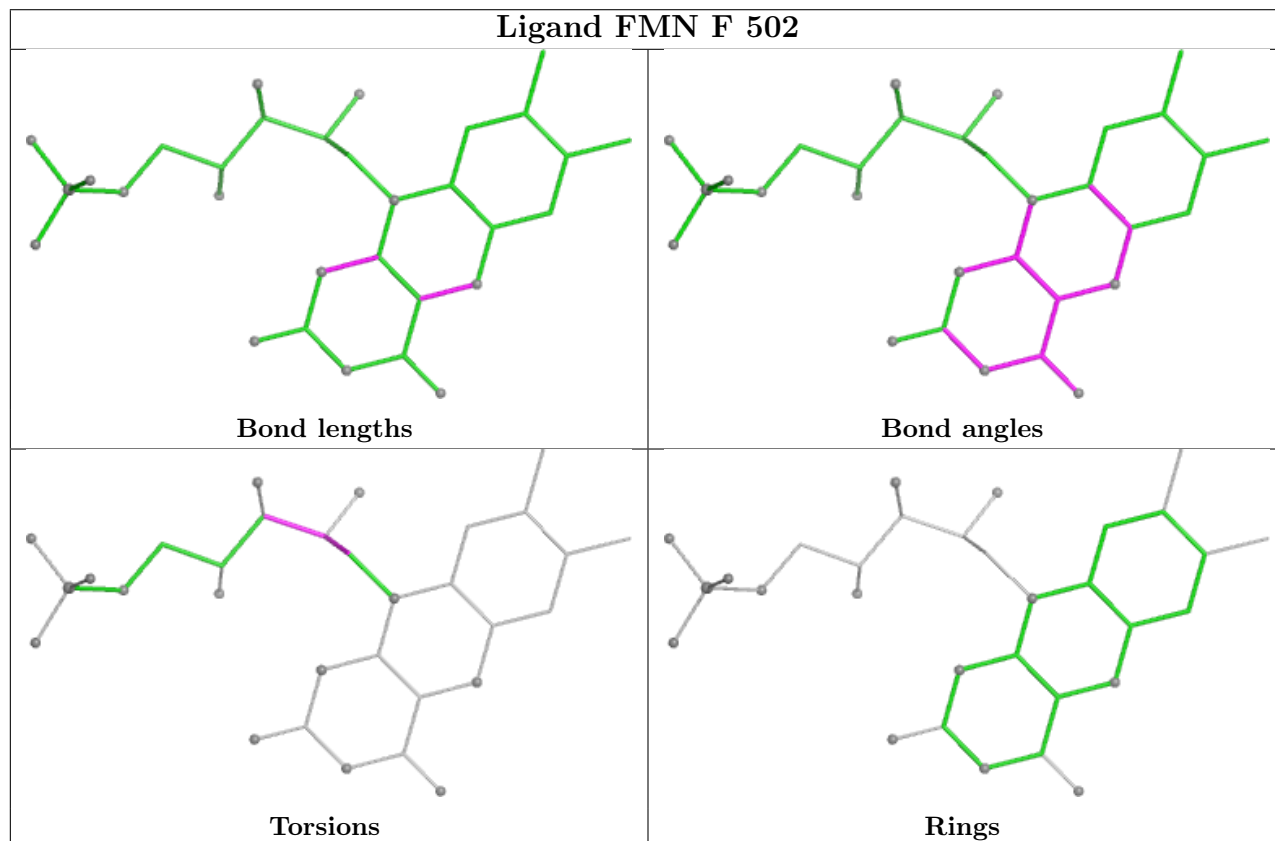


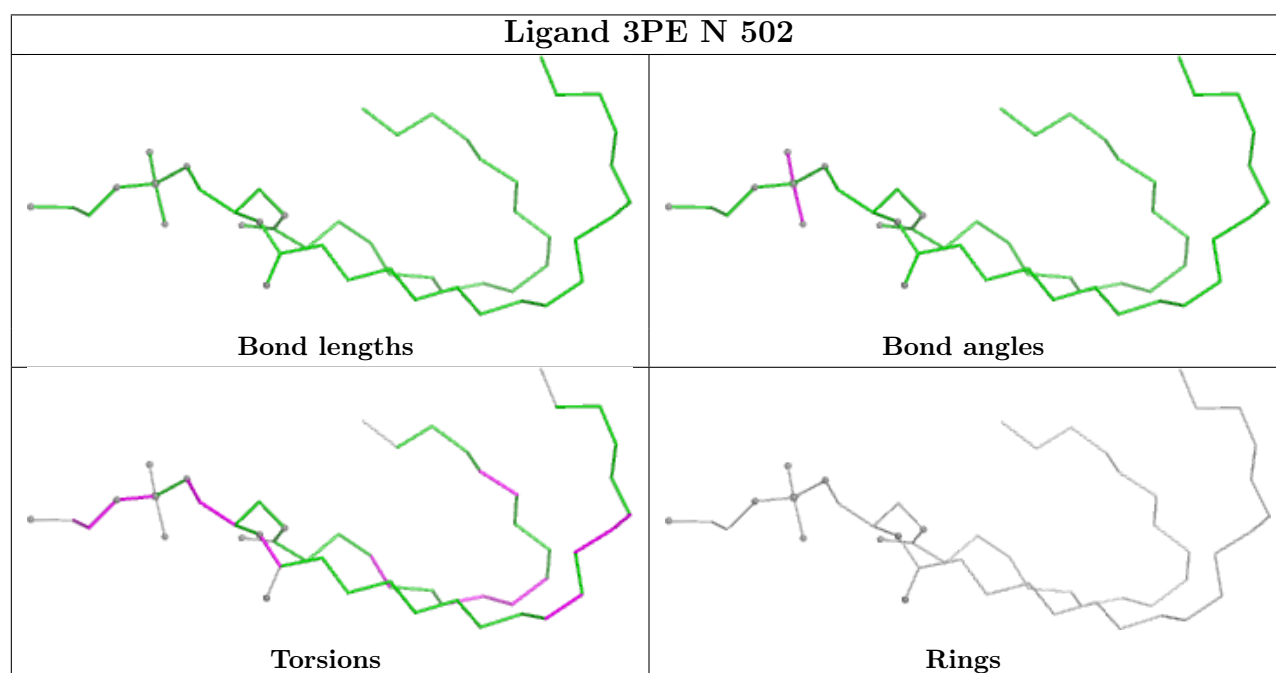
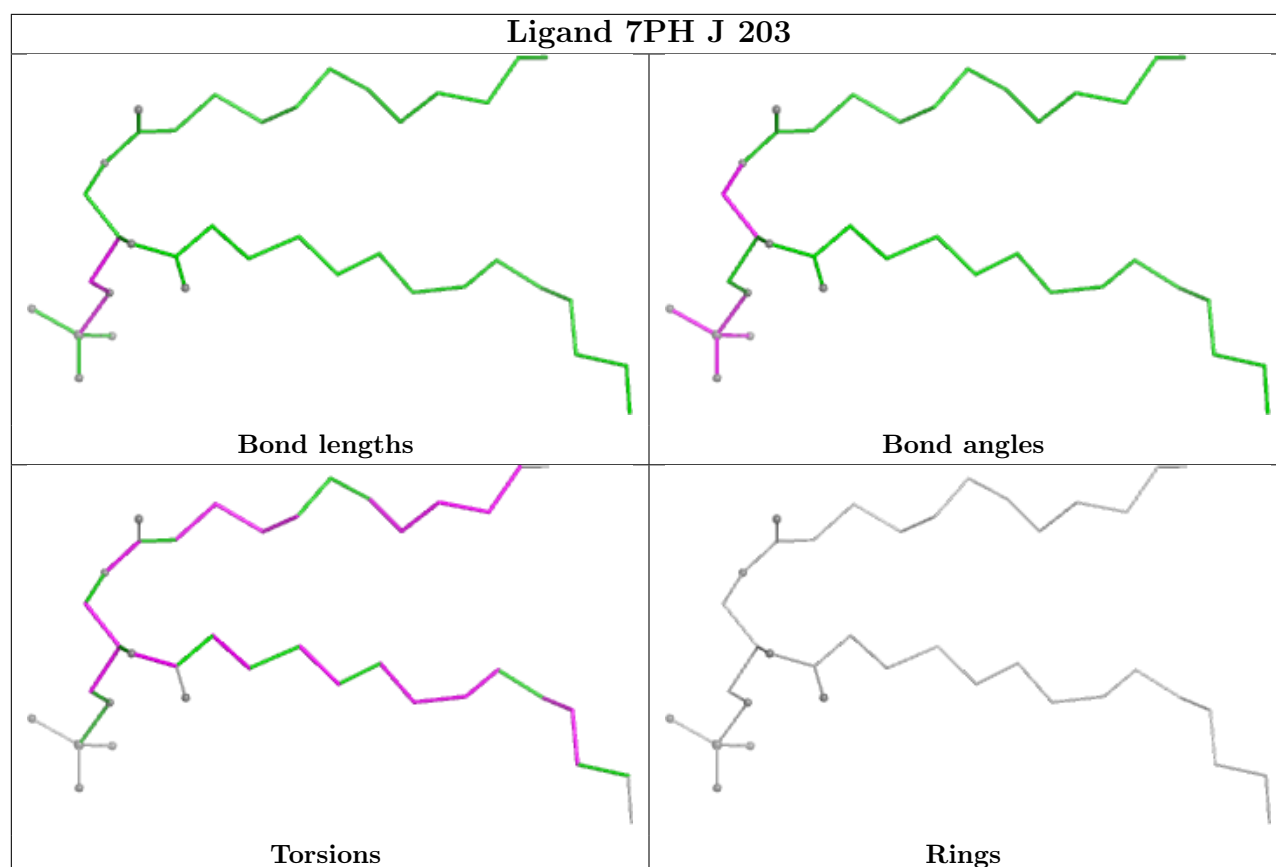


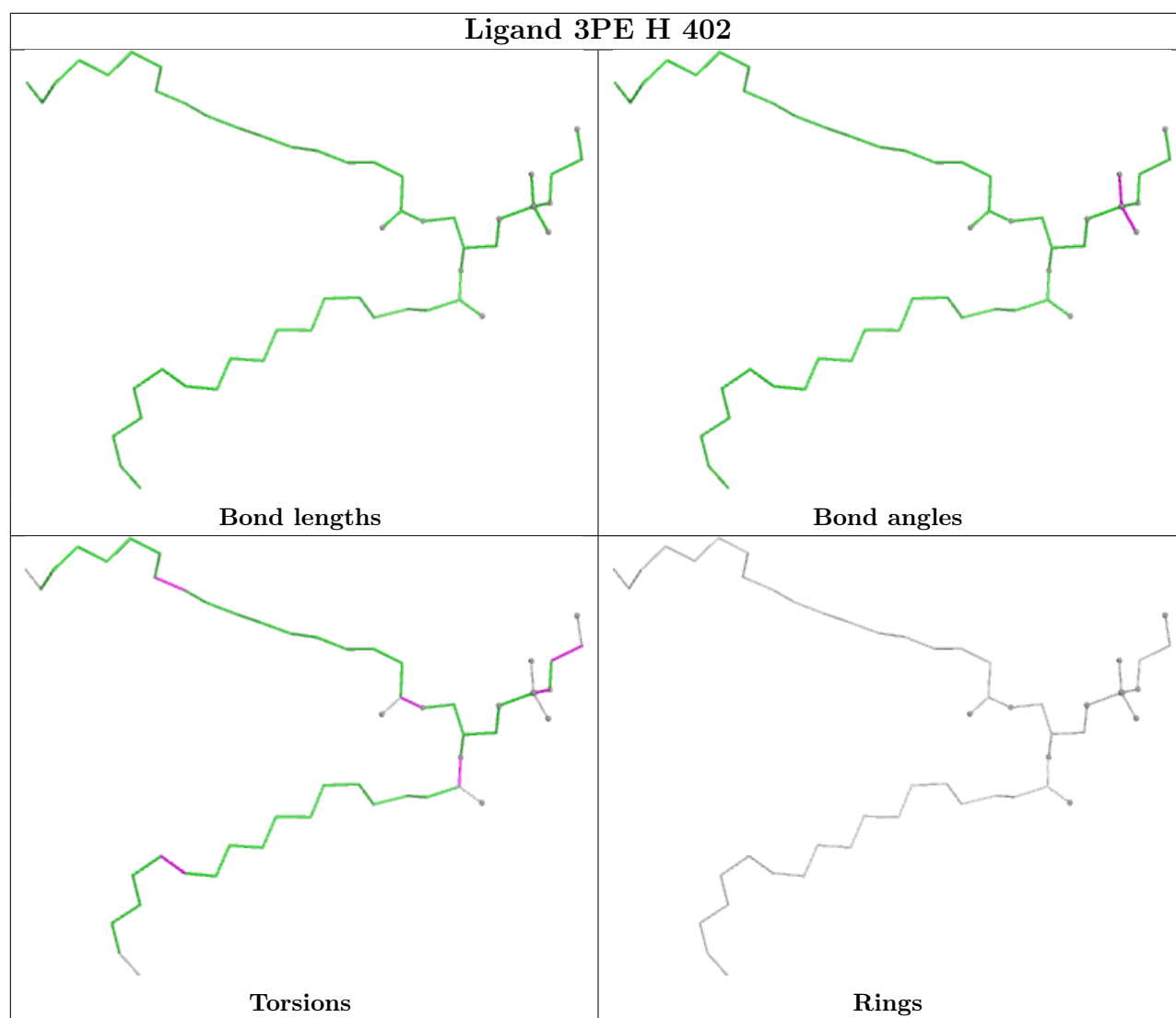
Ligand 3PE L 703

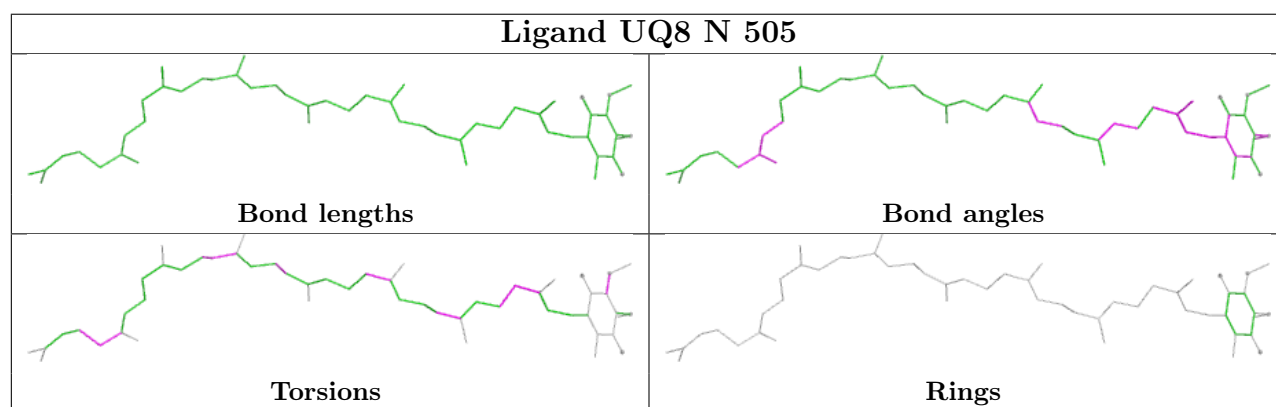
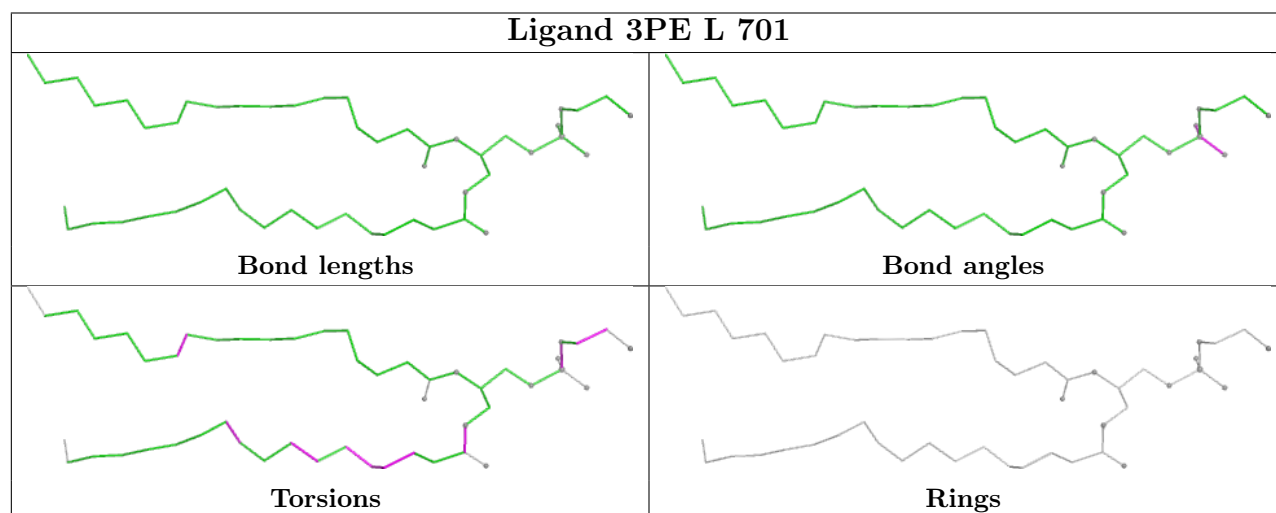
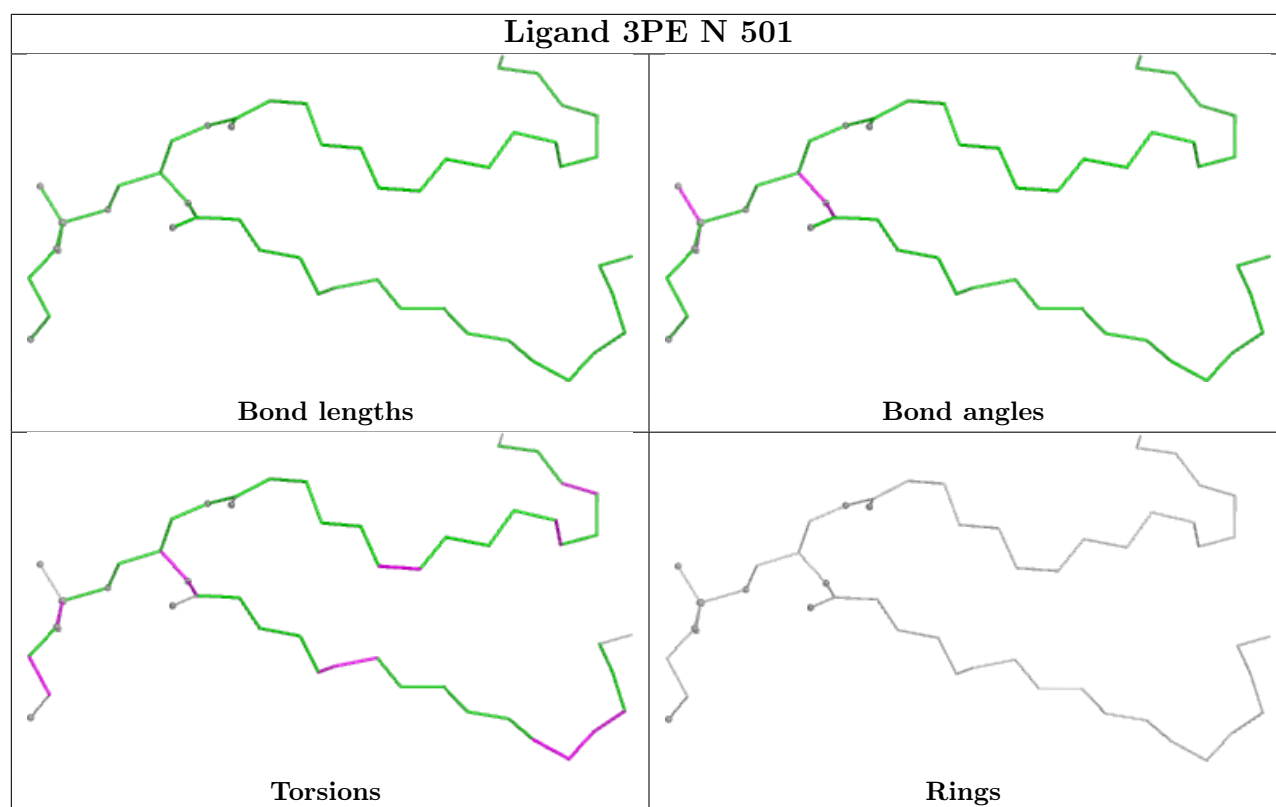


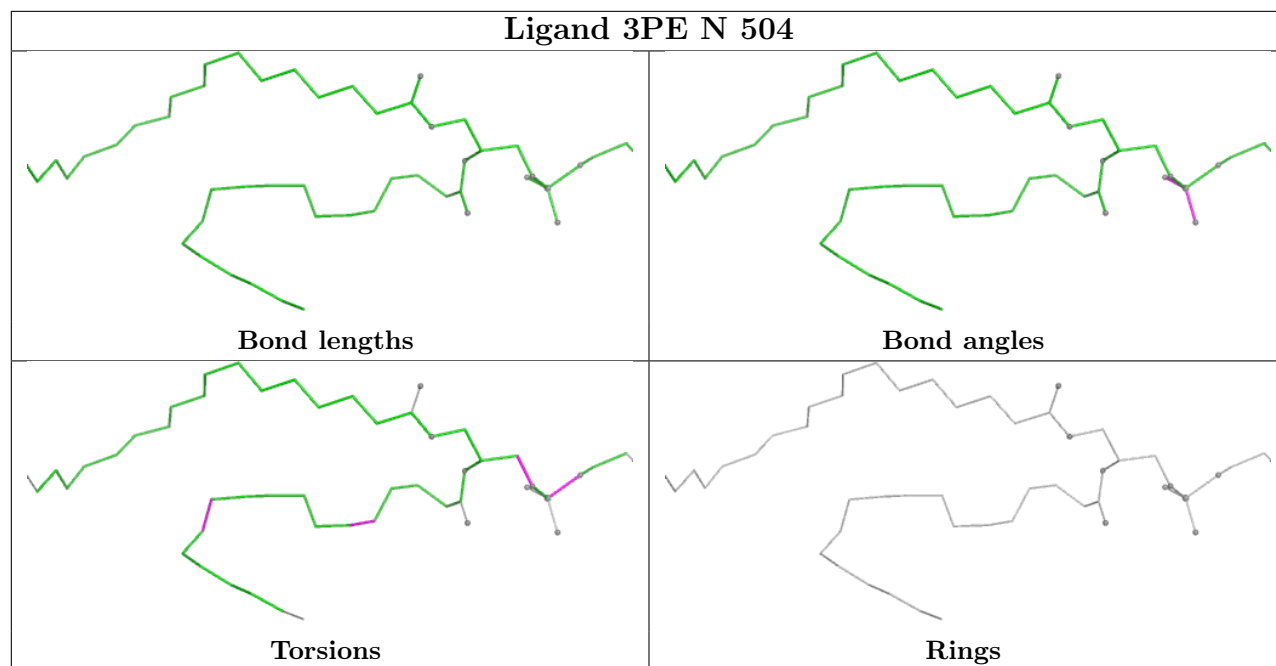
Ligand FMN F 502

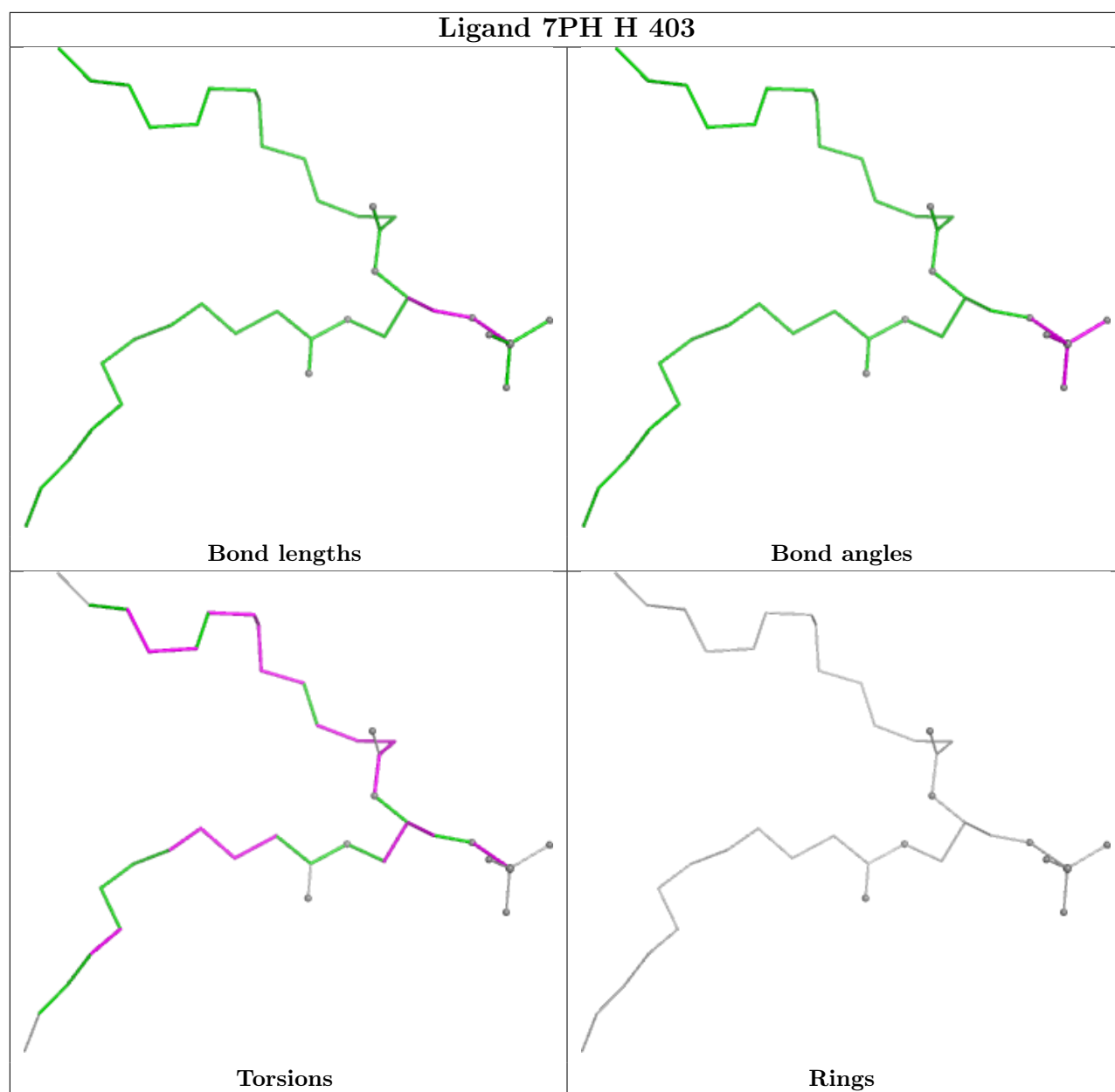












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

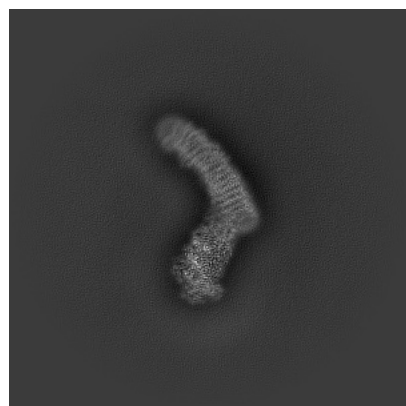
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-55751. These allow visual inspection of the internal detail of the map and identification of artifacts.

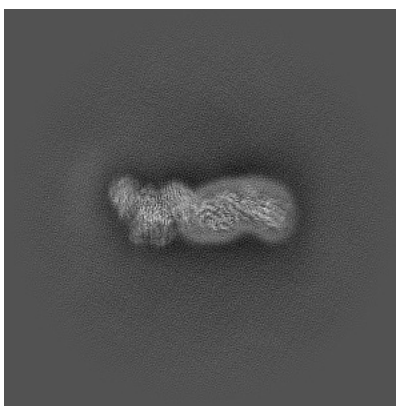
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

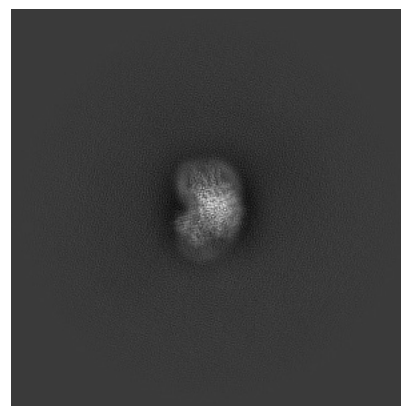
6.1.1 Primary map



X

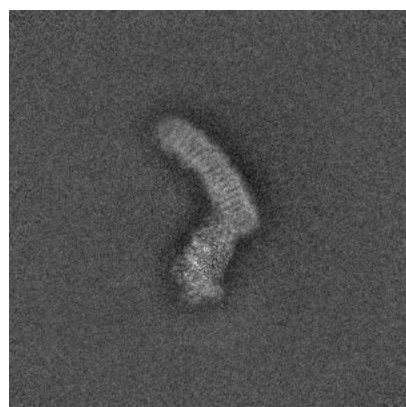


Y

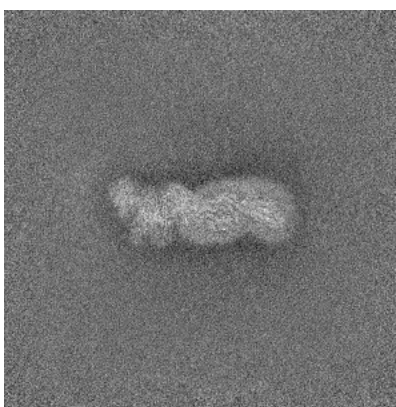


Z

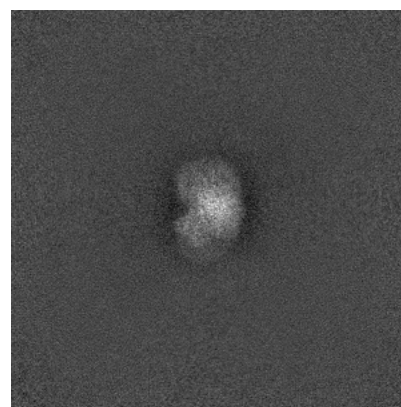
6.1.2 Raw map



X



Y

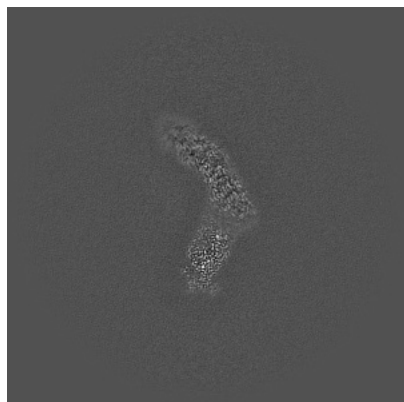


Z

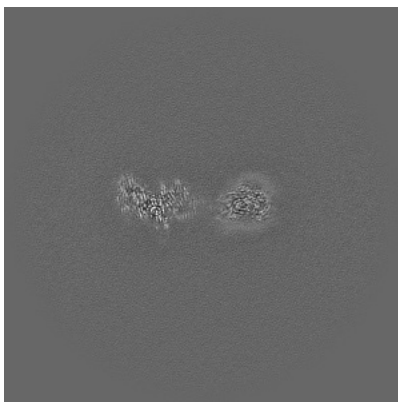
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

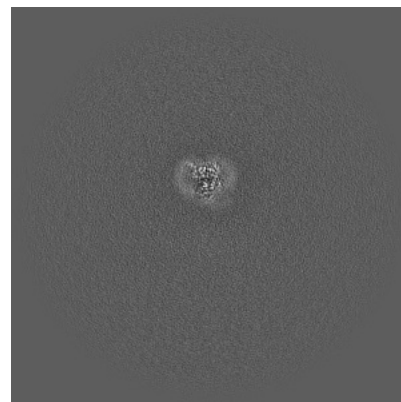
6.2.1 Primary map



X Index: 355



Y Index: 355

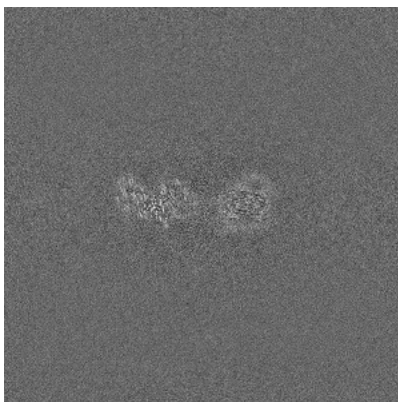


Z Index: 355

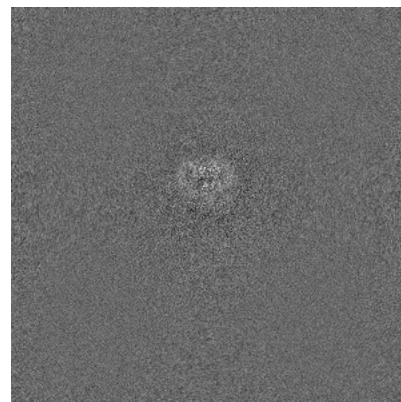
6.2.2 Raw map



X Index: 355



Y Index: 355

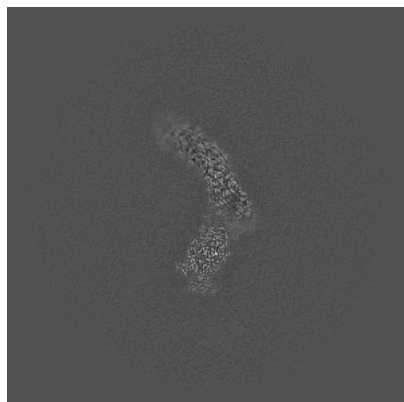


Z Index: 355

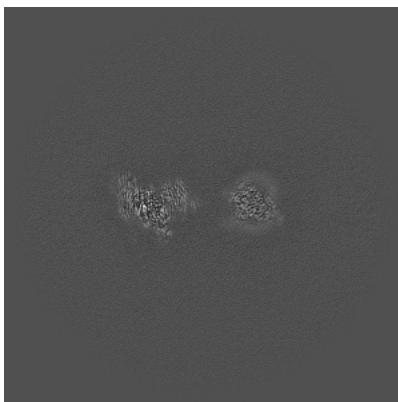
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

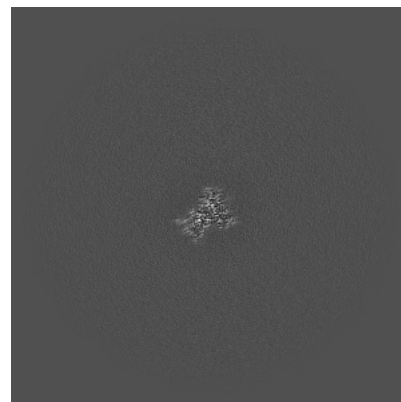
6.3.1 Primary map



X Index: 349

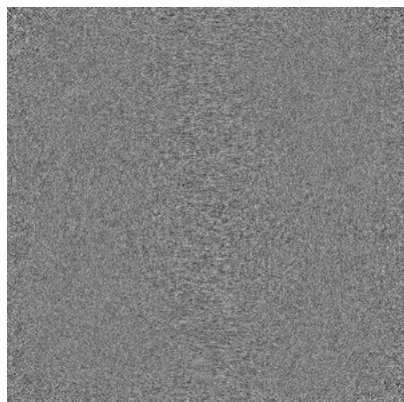


Y Index: 348



Z Index: 260

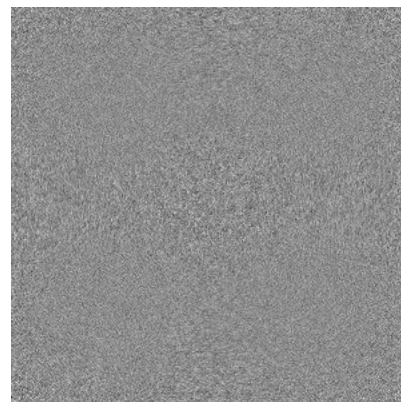
6.3.2 Raw map



X Index: 0



Y Index: 365

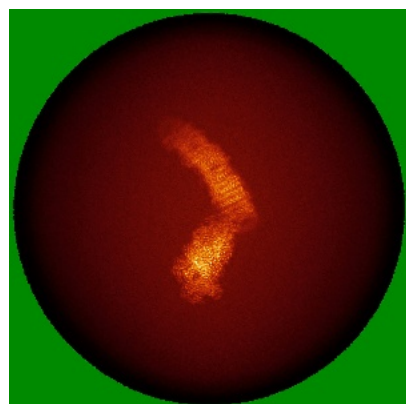


Z Index: 709

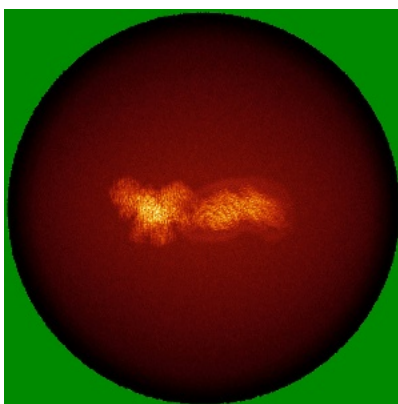
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

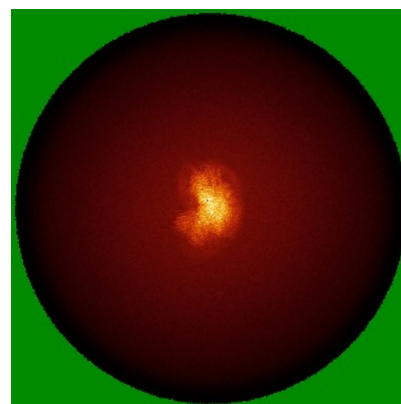
6.4.1 Primary map



X

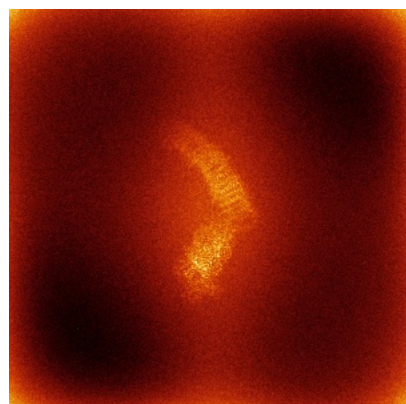


Y

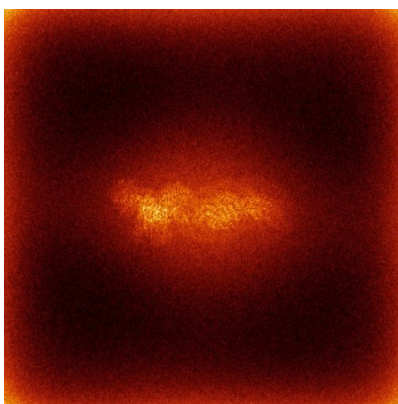


Z

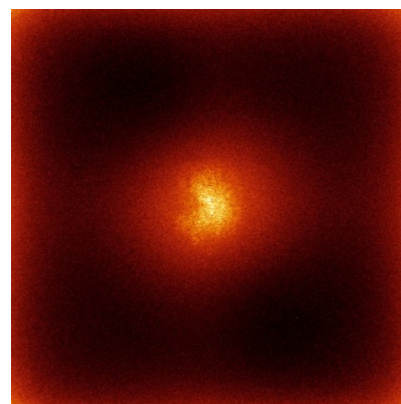
6.4.2 Raw map



X



Y

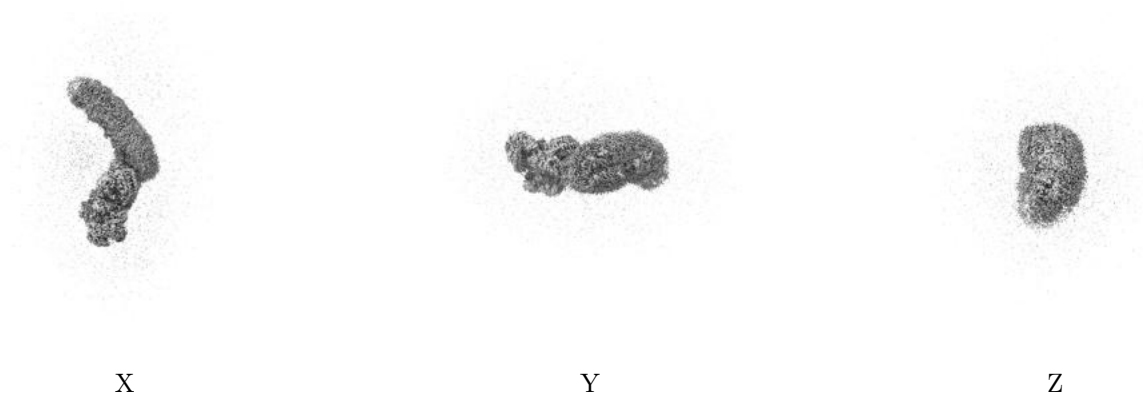


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

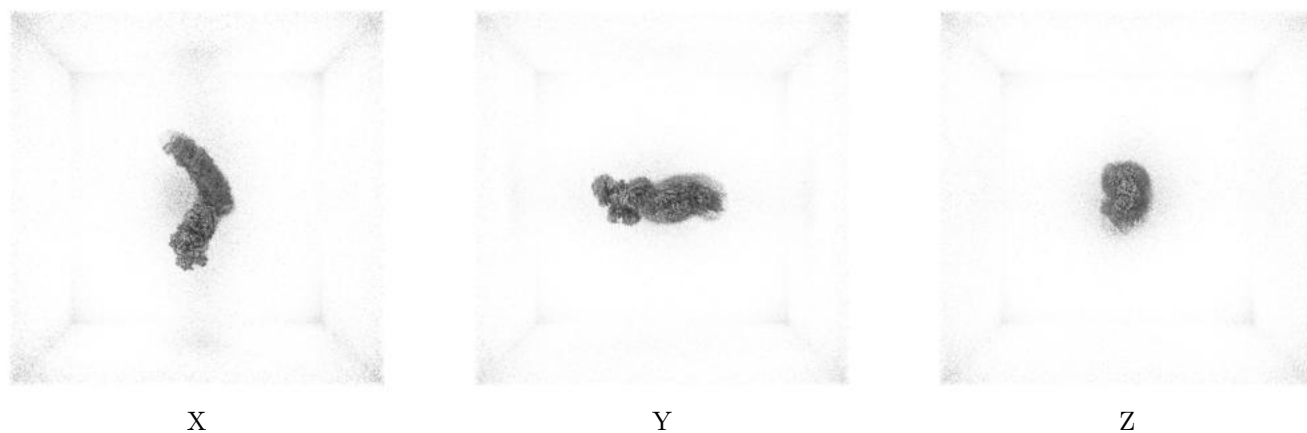
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.28. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

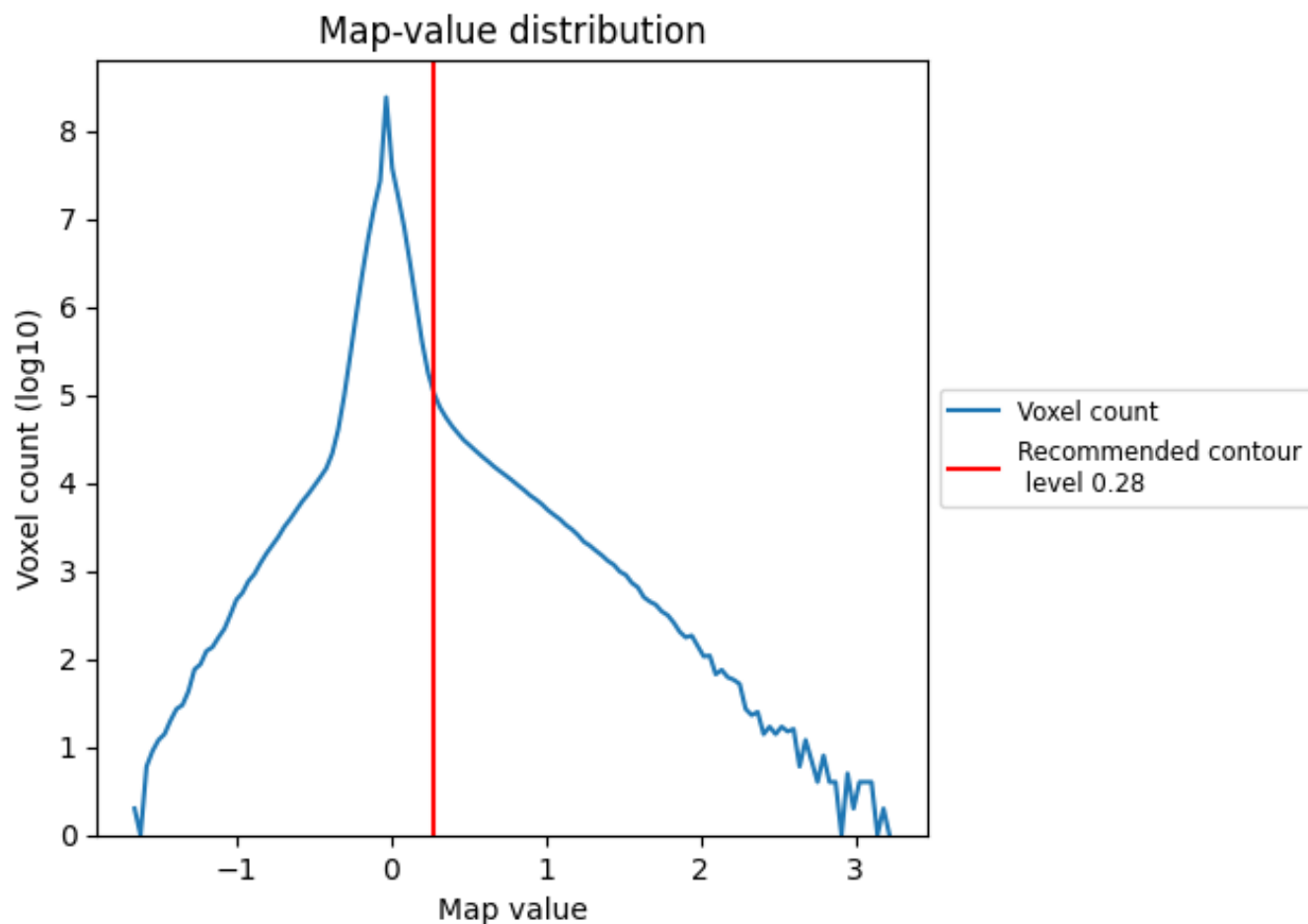
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

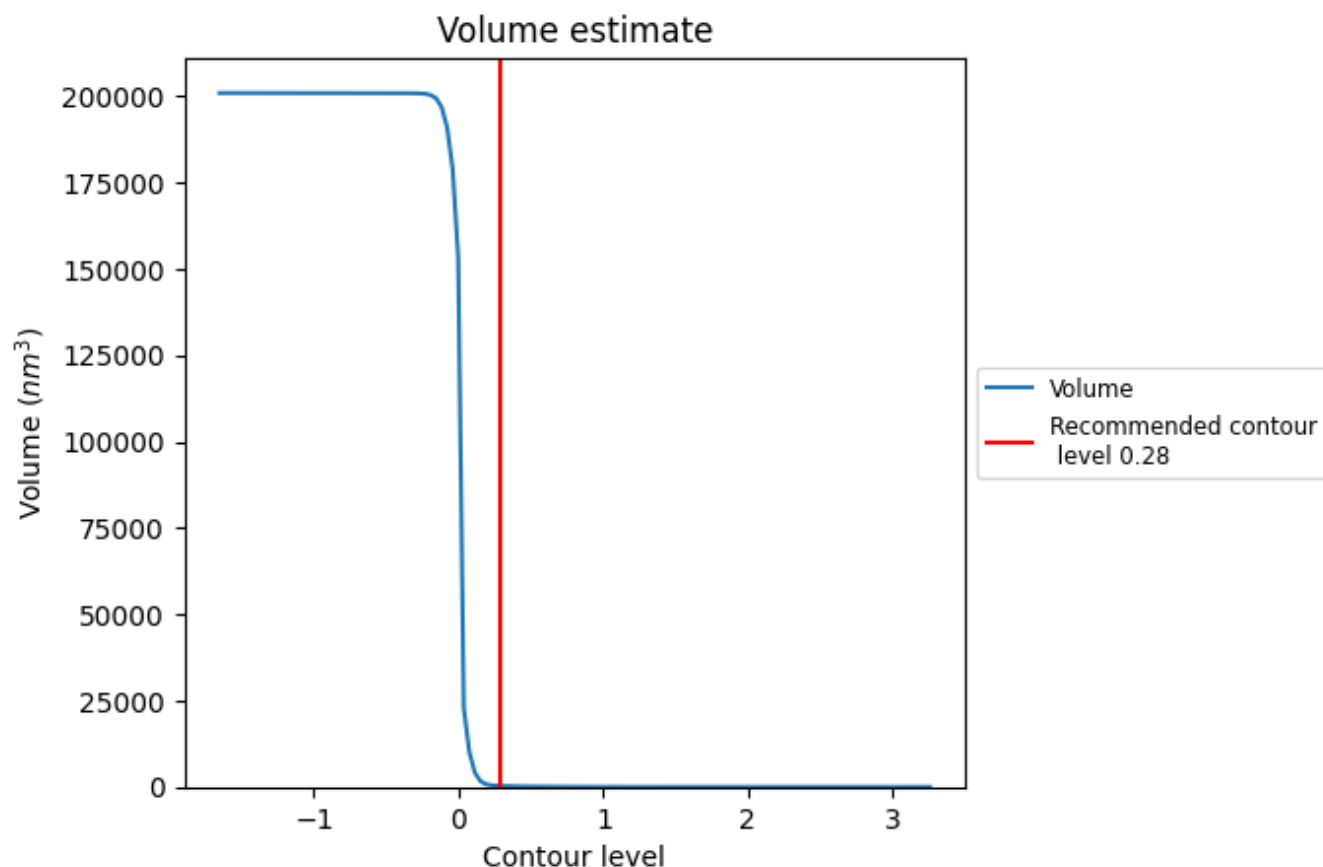
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

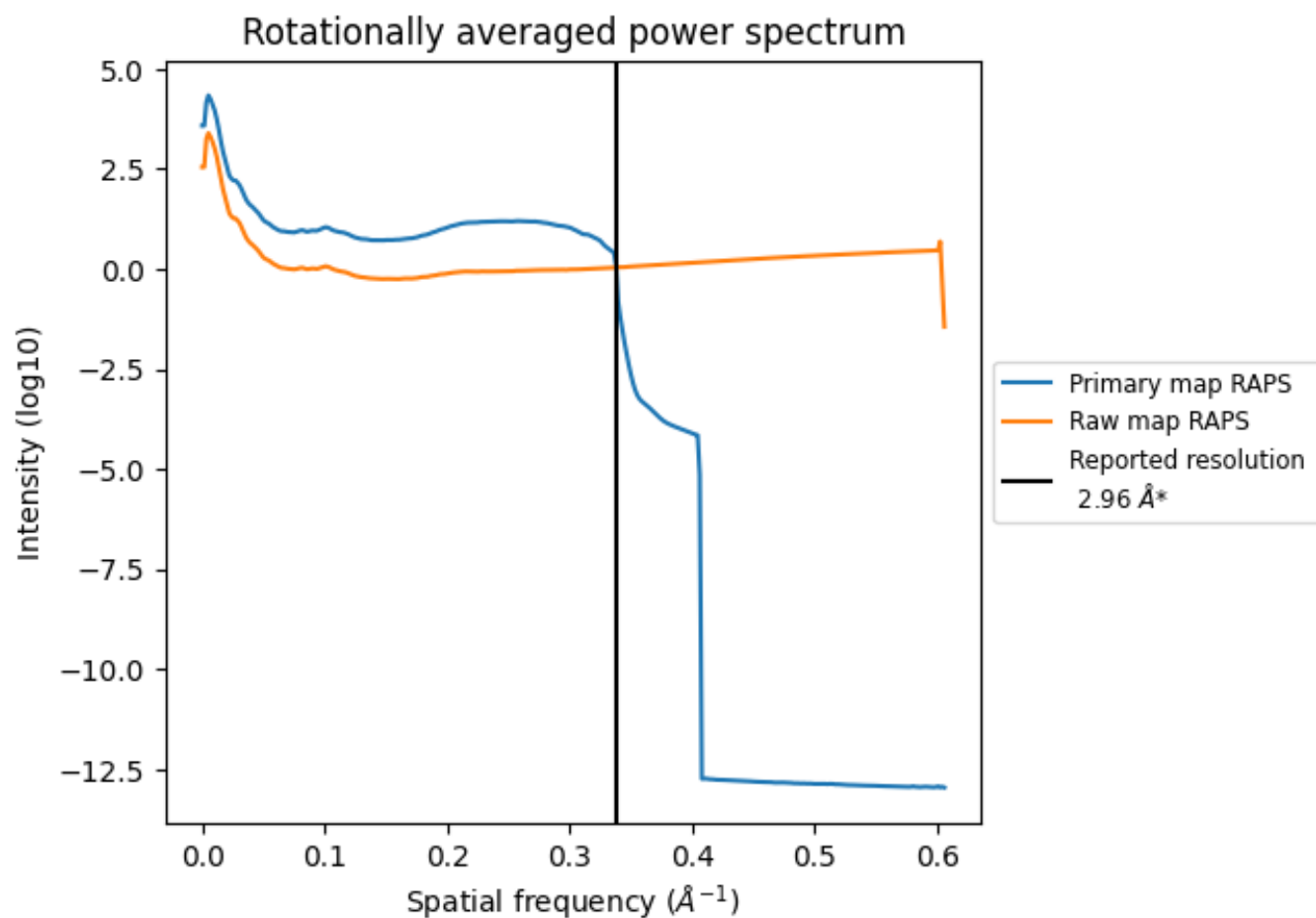
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 316 nm^3 ; this corresponds to an approximate mass of 286 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

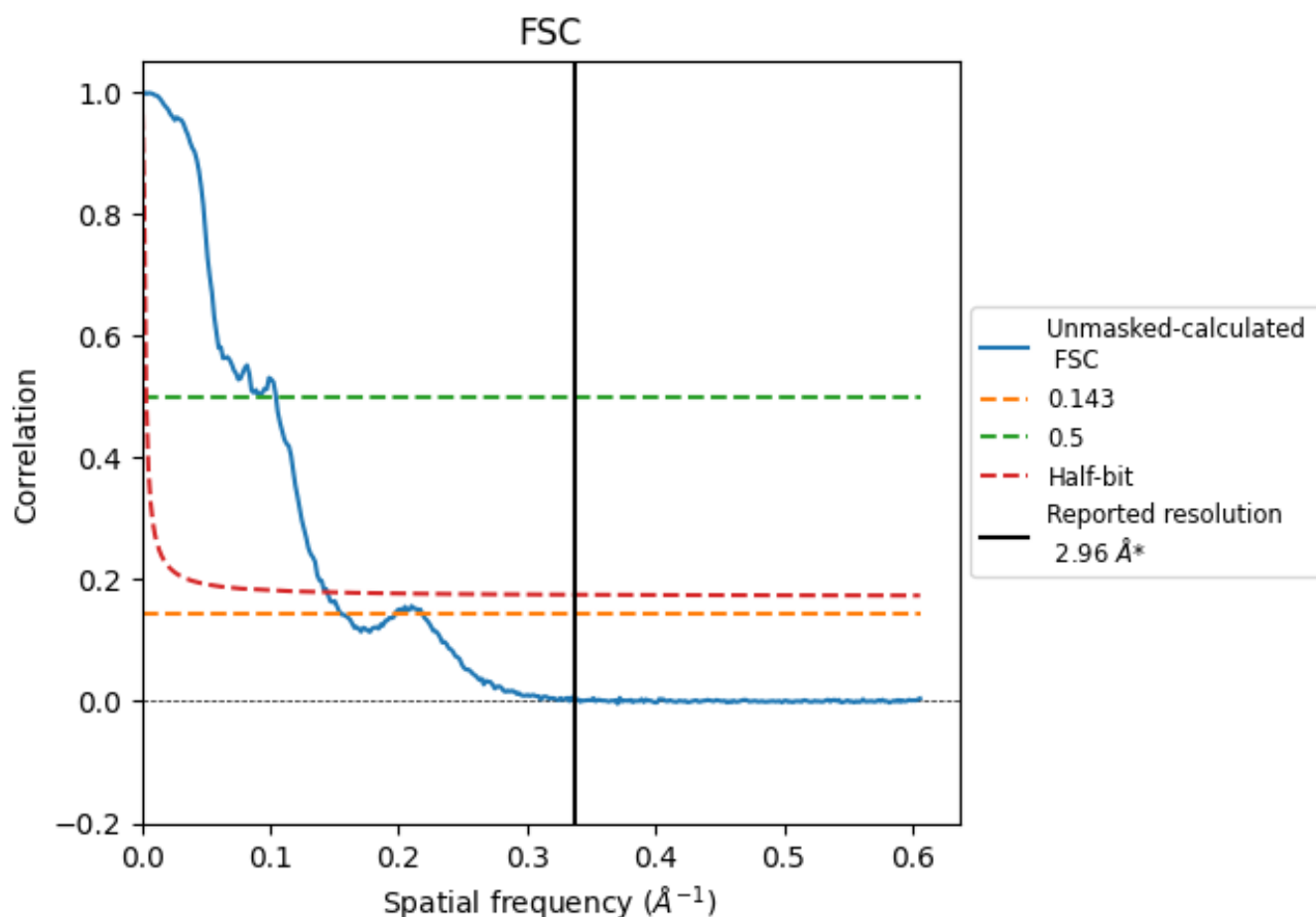


*Reported resolution corresponds to spatial frequency of 0.338 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.338 \AA^{-1}

8.2 Resolution estimates [i](#)

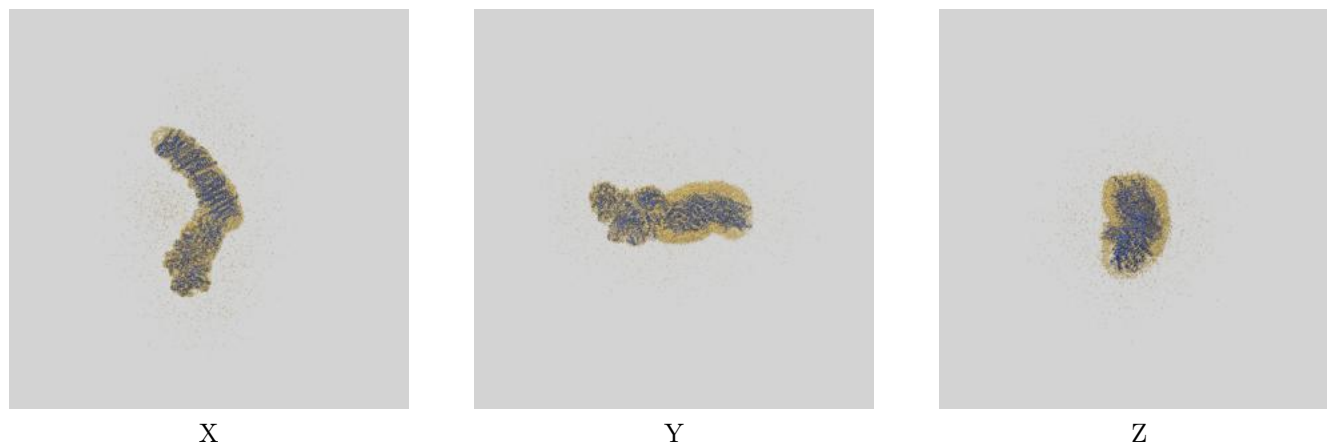
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.96	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	6.45	9.58	6.93

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.45 differs from the reported value 2.96 by more than 10 %

9 Map-model fit [i](#)

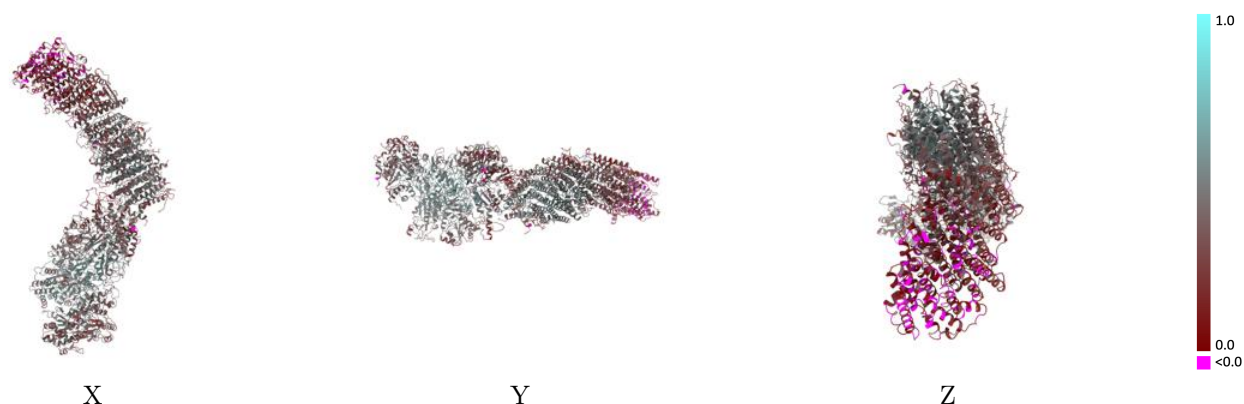
This section contains information regarding the fit between EMDB map EMD-55751 and PDB model 9TAM. Per-residue inclusion information can be found in [section 3](#) on [page 13](#).

9.1 Map-model overlay [i](#)



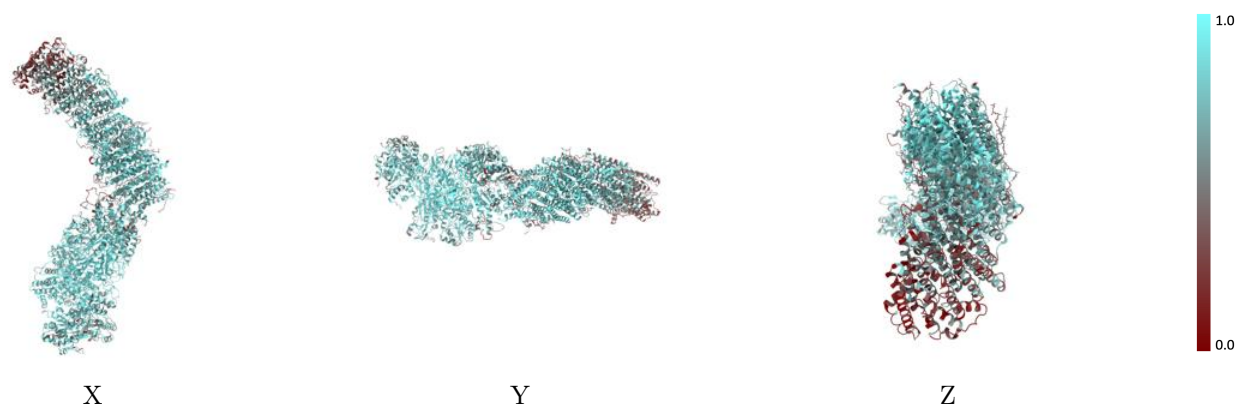
The images above show the 3D surface view of the map at the recommended contour level 0.28 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



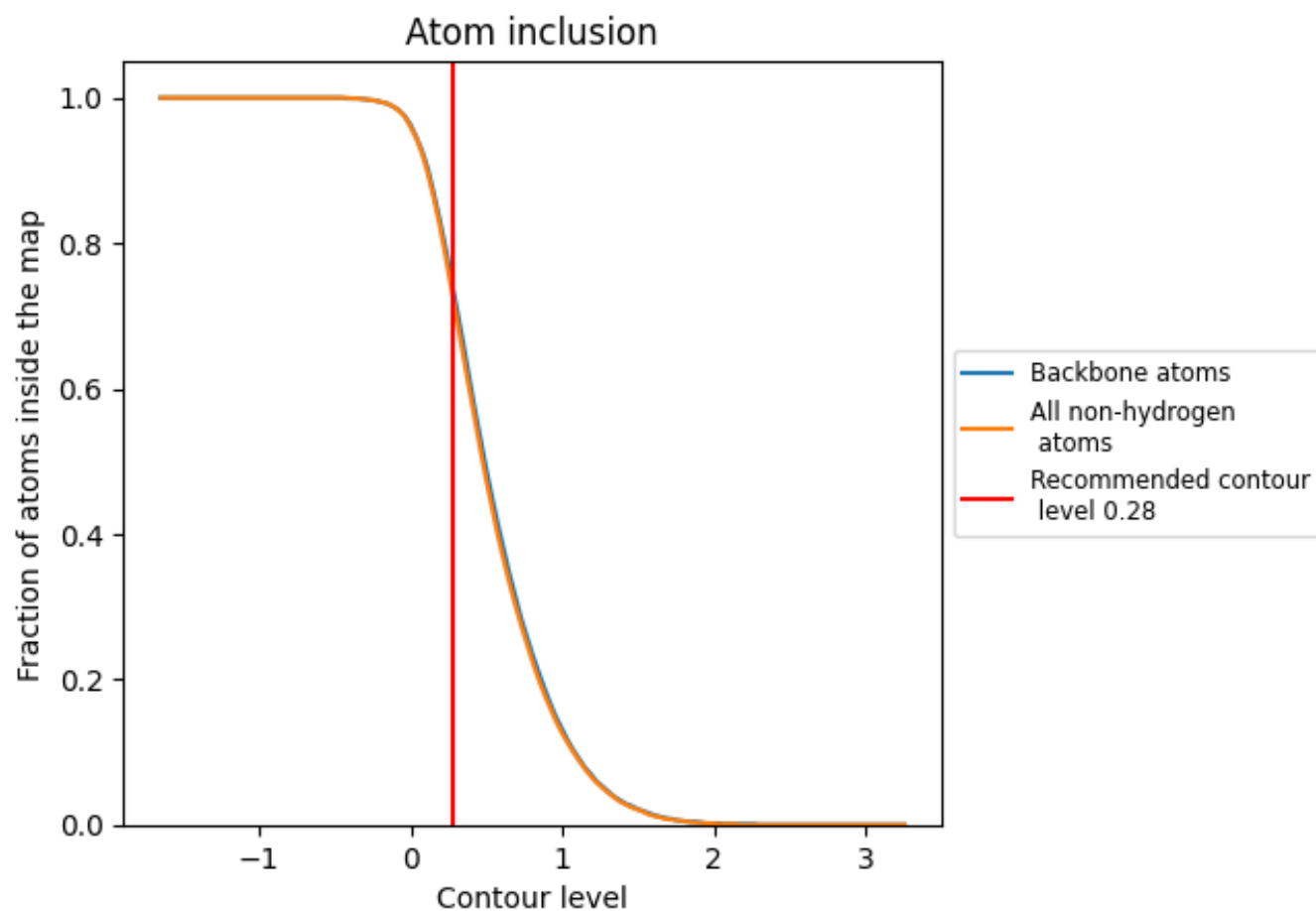
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.28).

9.4 Atom inclusion [i](#)



At the recommended contour level, 73% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.28) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.7210	<div></div> 0.3800
A	<div></div> 0.7470	<div></div> 0.4090
B	<div></div> 0.7320	<div></div> 0.4120
C	<div></div> 0.7390	<div></div> 0.3820
E	<div></div> 0.7600	<div></div> 0.4150
F	<div></div> 0.7380	<div></div> 0.4030
G	<div></div> 0.8480	<div></div> 0.4800
H	<div></div> 0.7470	<div></div> 0.4070
I	<div></div> 0.8760	<div></div> 0.5130
J	<div></div> 0.8150	<div></div> 0.4590
K	<div></div> 0.8850	<div></div> 0.5180
L	<div></div> 0.4080	<div></div> 0.1480
M	<div></div> 0.6600	<div></div> 0.2830
N	<div></div> 0.7940	<div></div> 0.4250

1.0

0.0

<0.0