



Full wwPDB EM Validation Report ⓘ

Dec 2, 2025 – 01:05 am GMT

PDB ID : 8RAS / pdb_00008ras
EMDB ID : EMD-19023
Title : Plastid-encoded RNA polymerase transcription elongation complex
Authors : Webster, M.W.; Pramanick, I.; Vergara-Cruces, A.
Deposited on : 2023-12-01
Resolution : 2.62 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:

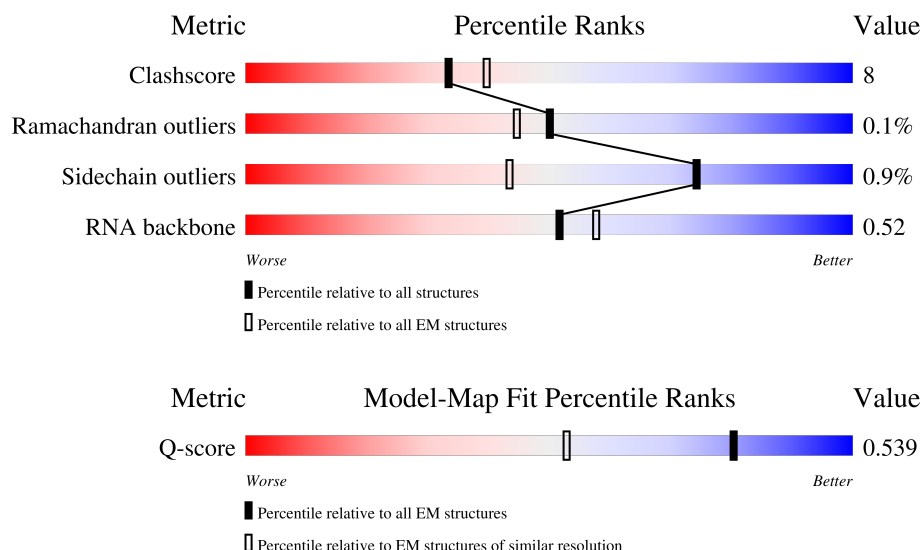
EMDB validation analysis : 0.0.1.dev129
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up 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) : 2.46

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 2.62 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	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
RNA backbone	6643	2191	-
Q-score	-	25397	8810 (2.12 - 3.12)

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	A	327	
1	B	327	
2	C	1072	

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Mol	Chain	Length	Quality of chain
3	D	680	
4	E	1373	
5	F	911	
6	G	862	
7	H	675	
8	I	263	
9	J	529	
10	K	460	
11	L	483	
12	M	334	
13	N	297	
14	O	185	
14	P	185	
15	Q	768	
16	R	162	
17	S	611	
18	T	140	
19	X	81	
20	Y	81	
21	Z	40	

2 Entry composition [i](#)

There are 26 unique types of molecules in this entry. The entry contains 57315 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 DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	301	Total	C	N	O	S	0	0
			2449	1571	422	446	10		
1	B	216	Total	C	N	O	S	0	0
			1722	1091	302	321	8		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	67	PHE	SER	conflict	UNP A0A6C0M610
B	67	PHE	SER	conflict	UNP A0A6C0M610

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	726	Total	C	N	O	S	0	0
			5772	3672	1019	1060	21		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	113	PHE	SER	conflict	UNP A0A6C0M5W1
C	657	VAL	ILE	conflict	UNP A0A6C0M5W1

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	585	Total	C	N	O	S	0	0
			4787	3078	847	839	23		

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit beta''.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	912	Total	C	N	O	S	0	0
			7308	4683	1294	1305	26		

- Molecule 5 is a protein called PAP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	568	Total	C	N	O	S	0	0
			4593	2907	810	849	27		

- Molecule 6 is a protein called PAP2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	G	385	Total	C	N	O	S	0	0
			3040	1918	518	583	21		

- Molecule 7 is a protein called PAP3.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	H	440	Total	C	N	O	S	0	0
			3701	2369	643	676	13		

- Molecule 8 is a protein called PAP4.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	I	215	Total	C	N	O	S	0	0
			1771	1141	300	324	6		

- Molecule 9 is a protein called PAP5.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	J	234	Total	C	N	O	S	0	0
			1970	1247	350	363	10		

- Molecule 10 is a protein called PAP6.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	K	374	Total	C	N	O	S	0	0
			3022	1933	510	564	15		

- Molecule 11 is a protein called PAP7.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	L	408	Total	C	N	O	S	0	0
			3348	2153	572	603	20		

- Molecule 12 is a protein called PAP8.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	M	204	Total	C	N	O	S	0	0
			1714	1085	299	323	7		

- Molecule 13 is a protein called PAP9.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	215	Total	C	N	O	S	0	0
			1759	1132	300	323	4		

- Molecule 14 is a protein called PAP10.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O	114	Total	C	N	O	S	0	0
			923	588	148	178	9		
14	P	108	Total	C	N	O	S	0	0
			865	550	139	167	9		

- Molecule 15 is a protein called PAP11.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	Q	220	Total	C	N	O	S	0	0
			1740	1082	307	341	10		

- Molecule 16 is a protein called PAP12.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	R	114	Total	C	N	O	S	0	0
			944	596	167	178	3		

- Molecule 17 is a protein called FLN2.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	S	386	Total	C	N	O	S	0	0
			3056	1941	516	578	21		

- Molecule 18 is a protein called PTAC18.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	T	104	Total	C	N	O	S	0	0
			881	572	148	157	4		

- Molecule 19 is a DNA chain called DNA (81-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
19	X	31	Total	C	N	O	P	0	0
			638	304	122	182	30		

- Molecule 20 is a DNA chain called DNA (81-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
20	Y	40	Total	C	N	O	P	0	0
			813	386	145	242	40		

- Molecule 21 is a RNA chain called RNA (40-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
21	Z	10	Total	C	N	O	P	0	0
			215	95	40	70	10		

- Molecule 22 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
22	D	1	Total	Mg	0
			1	1	

- Molecule 23 is ZINC ION (CCD ID: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
23	E	1	Total	Zn	0
			1	1	

- Molecule 24 is FE (III) ION (CCD ID: FE) (formula: Fe) (labeled as "Ligand of Interest" by depositor).

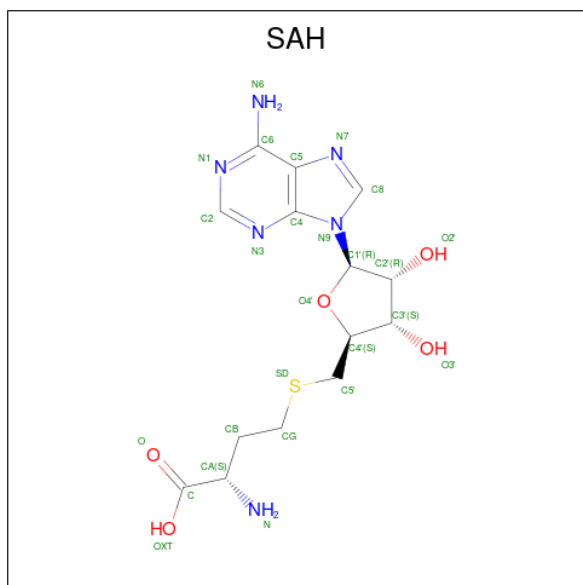
Mol	Chain	Residues	Atoms		AltConf
24	I	1	Total	Fe	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
24	N	1	Total	Fe	0
			1	1	

- Molecule 25 is S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula: $C_{14}H_{20}N_6O_5S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
25	L	1	Total	C	N	O	S	0
			26	14	6	5	1	

- Molecule 26 is water.

Mol	Chain	Residues	Atoms		AltConf
26	A	18	Total	O	0
			18	18	
26	B	12	Total	O	0
			12	12	
26	C	54	Total	O	0
			54	54	
26	D	18	Total	O	0
			18	18	
26	E	24	Total	O	0
			24	24	
26	F	2	Total	O	0
			2	2	
26	H	6	Total	O	0
			6	6	

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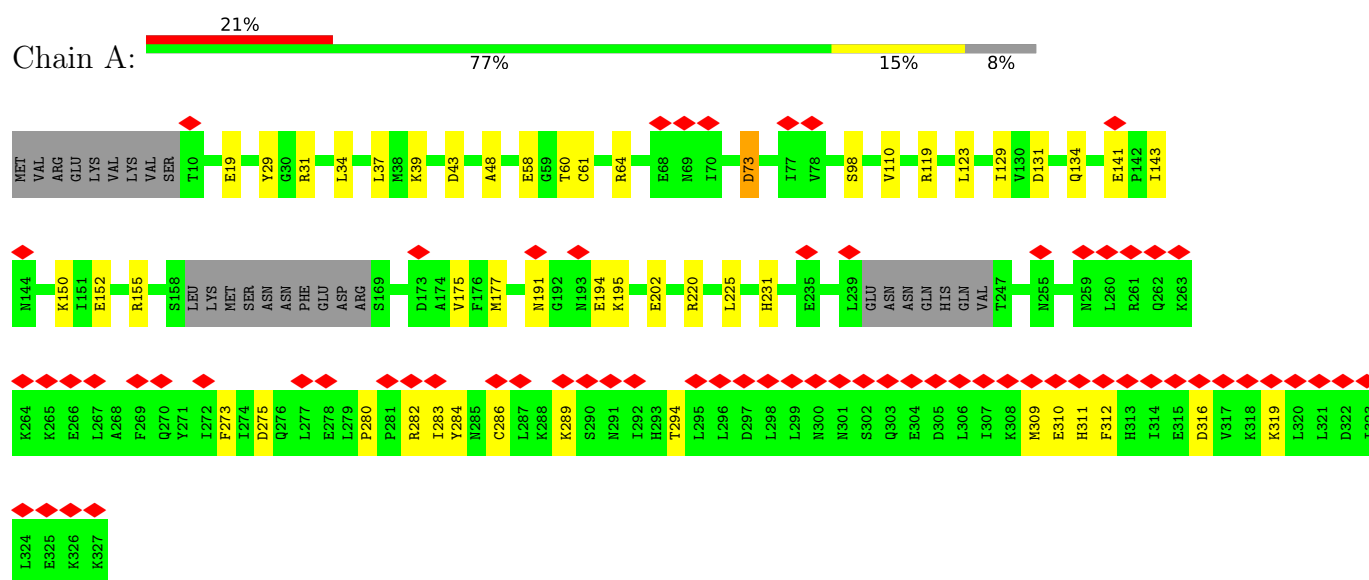
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Mol	Chain	Residues	Atoms		AltConf
26	I	3	Total 3	O 3	0
26	J	32	Total 32	O 32	0
26	K	17	Total 17	O 17	0
26	L	19	Total 19	O 19	0
26	M	15	Total 15	O 15	0
26	N	4	Total 4	O 4	0
26	O	2	Total 2	O 2	0
26	P	2	Total 2	O 2	0
26	R	3	Total 3	O 3	0
26	S	23	Total 23	O 23	0

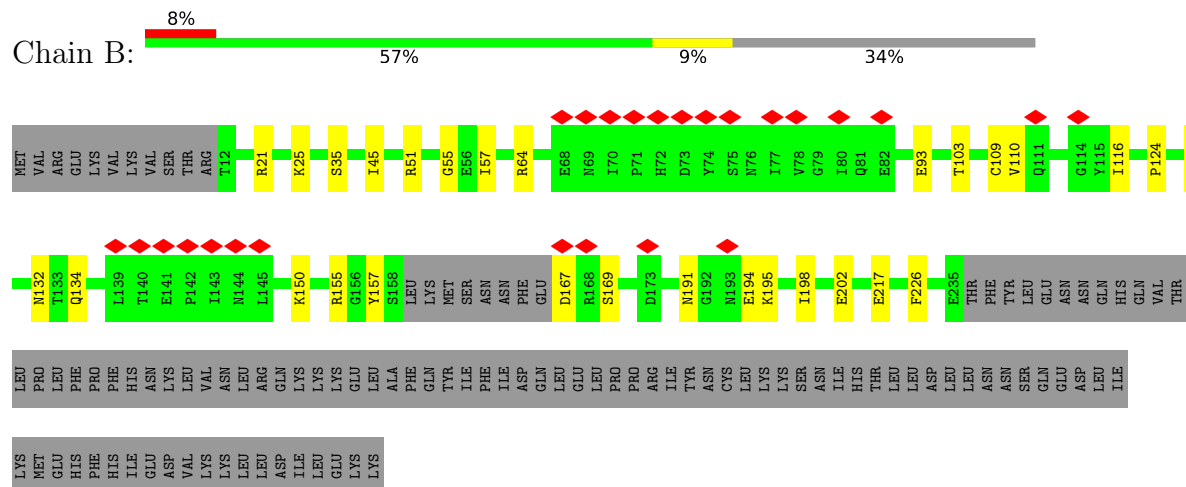
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). 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: DNA-directed RNA polymerase subunit alpha

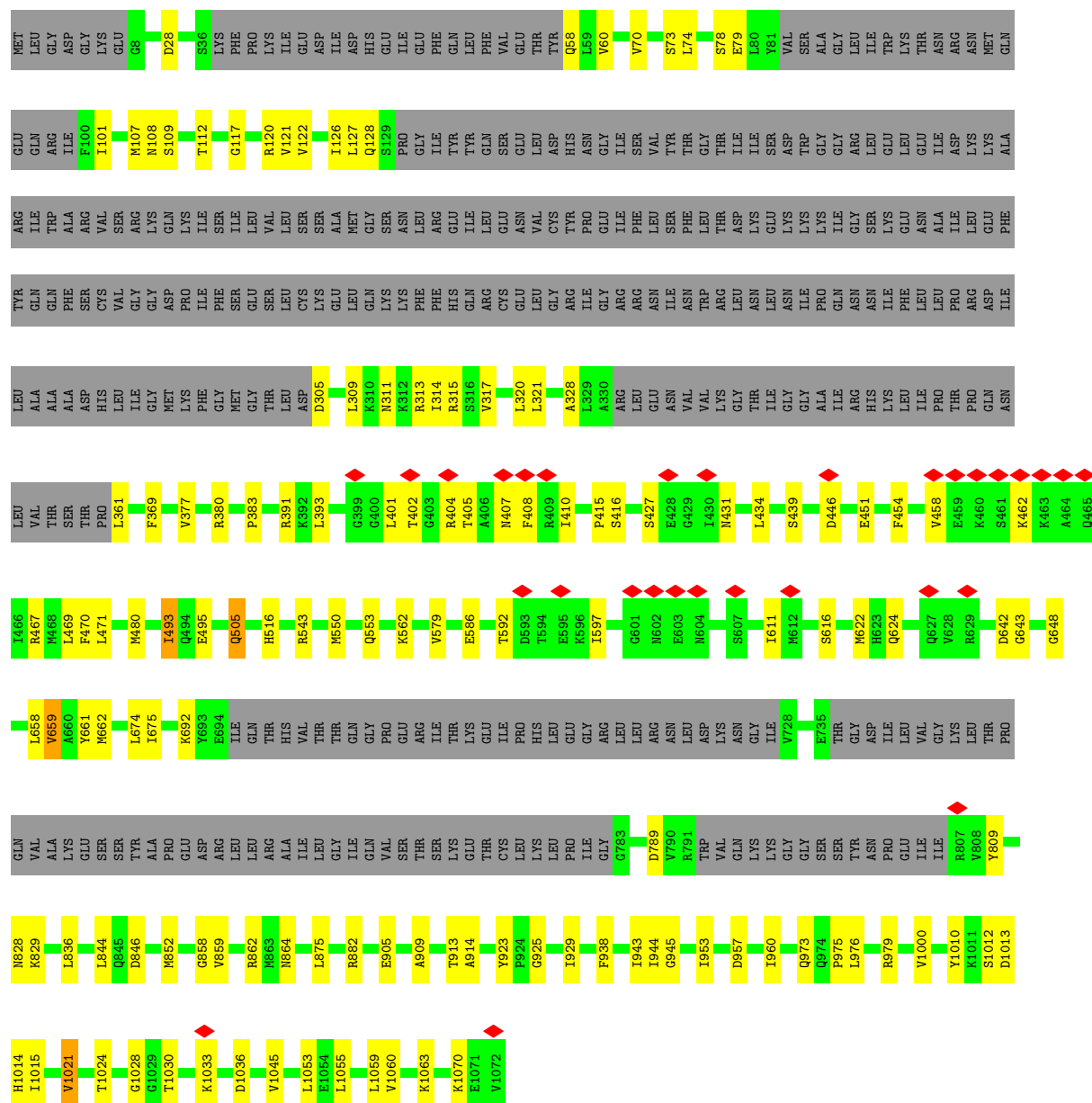


- Molecule 1: DNA-directed RNA polymerase subunit alpha

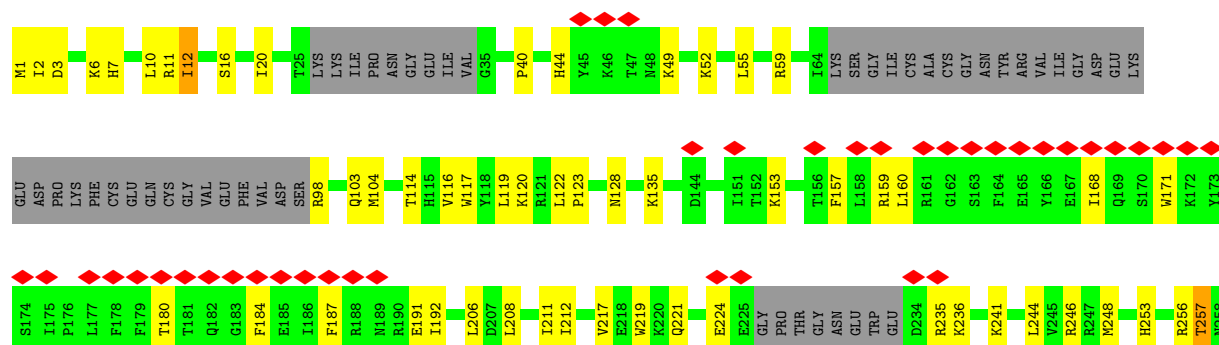


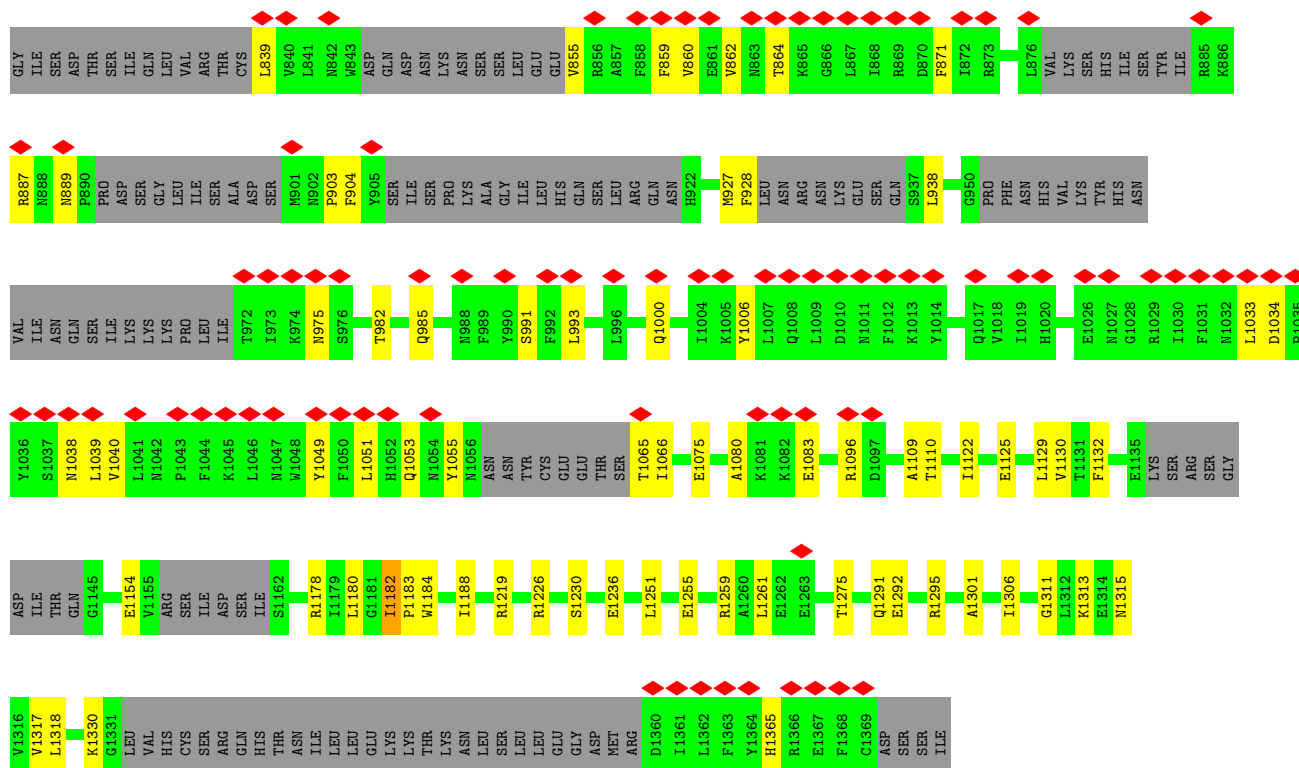
- Molecule 2: DNA-directed RNA polymerase subunit beta



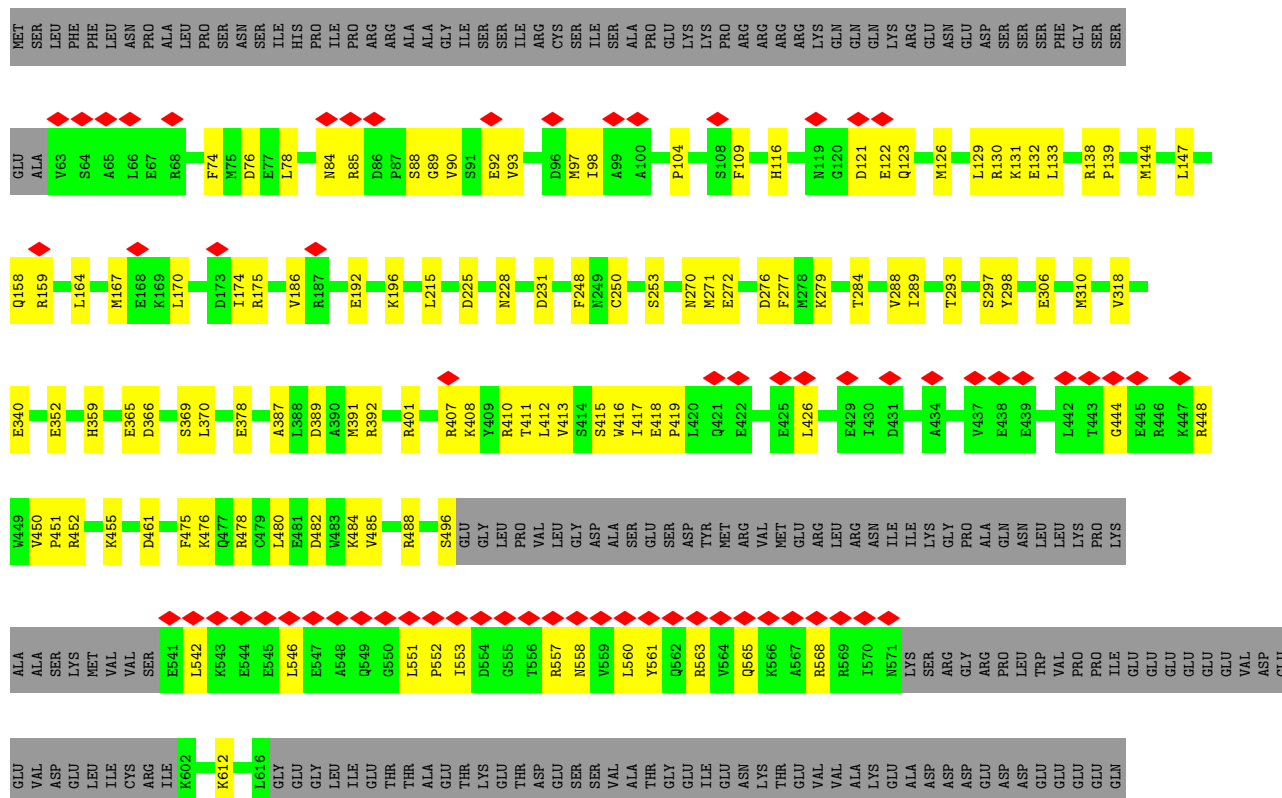


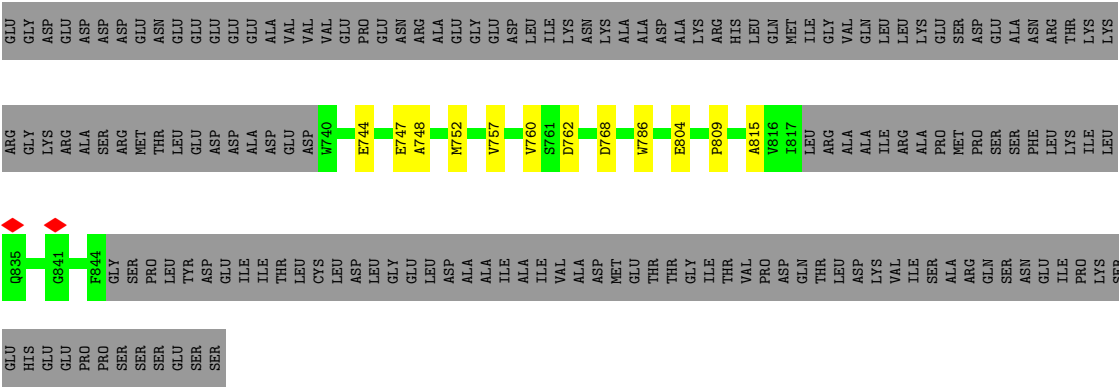
• Molecule 3: DNA-directed RNA polymerase subunit beta'



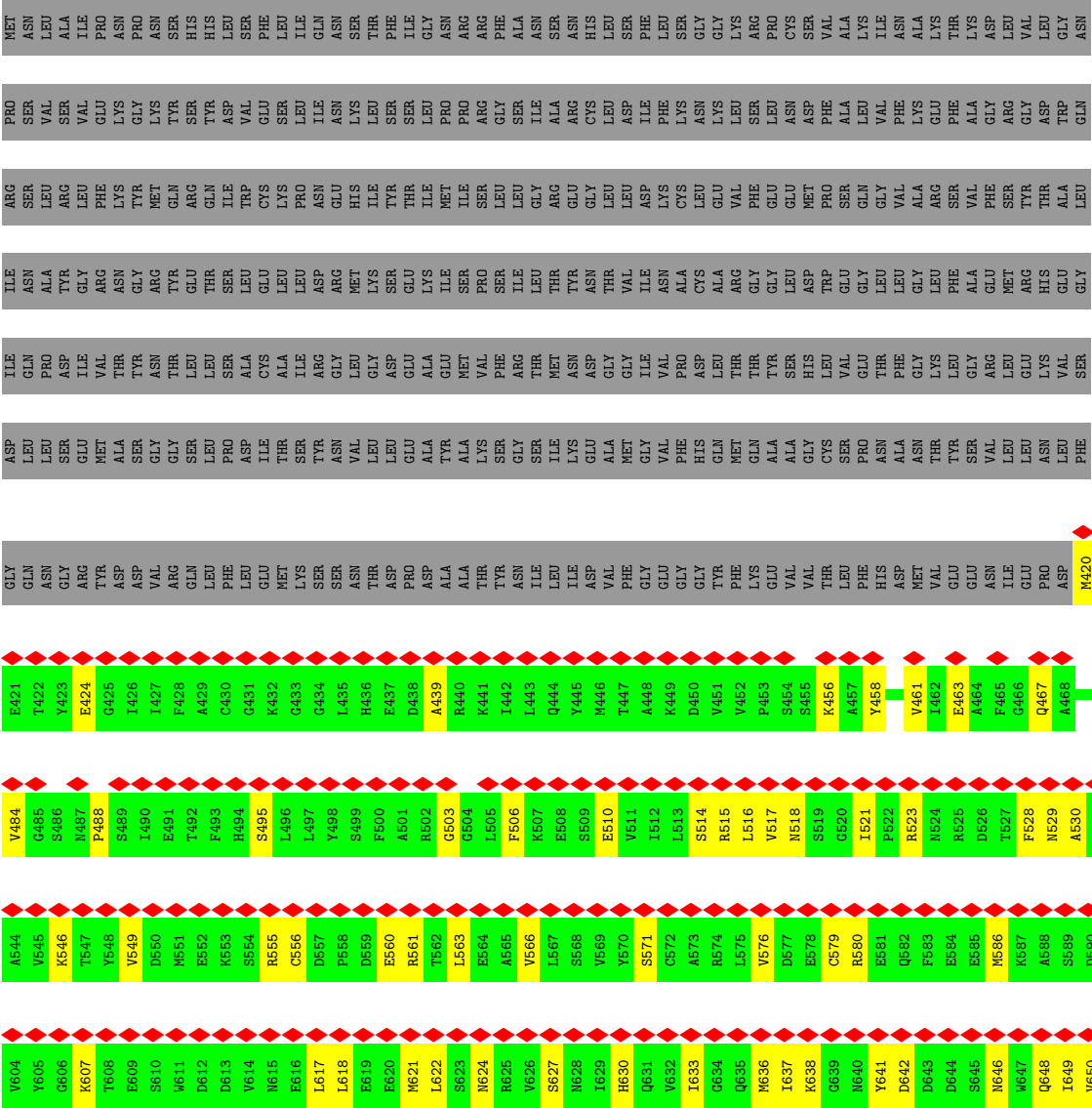
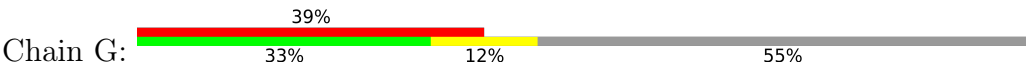


• Molecule 5: PAP1

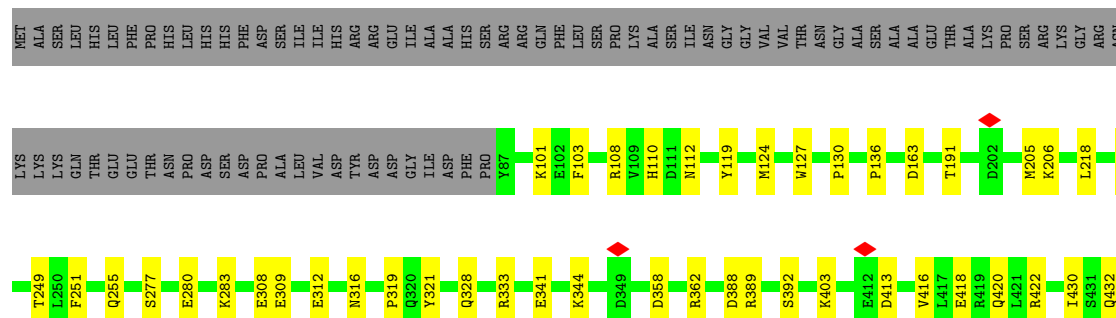




• Molecule 6: PAP2

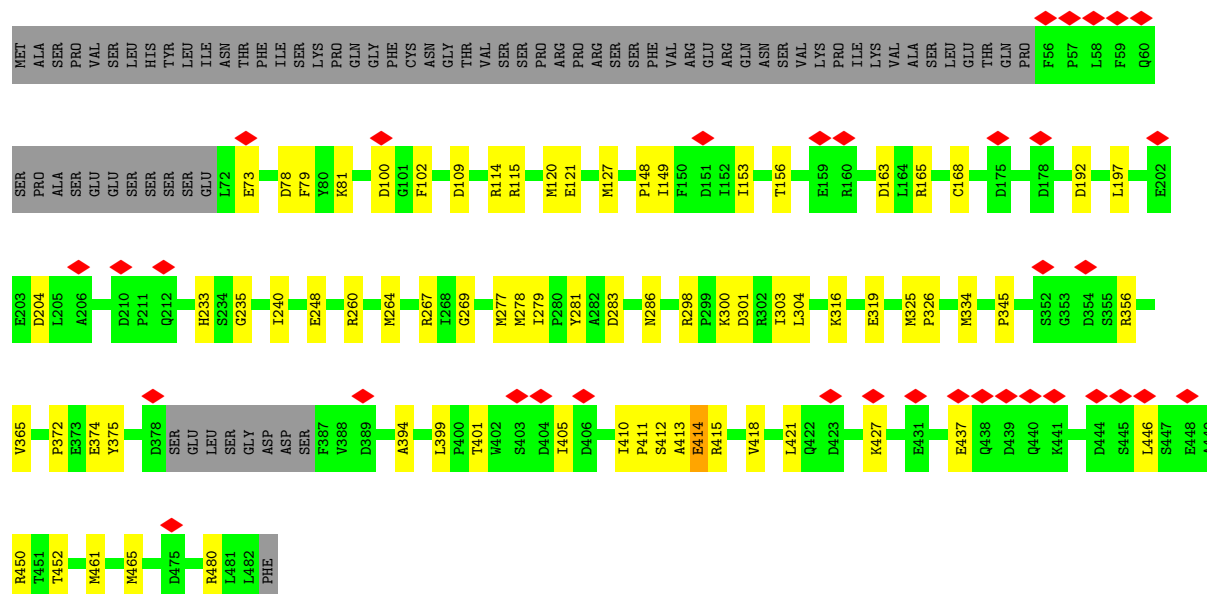




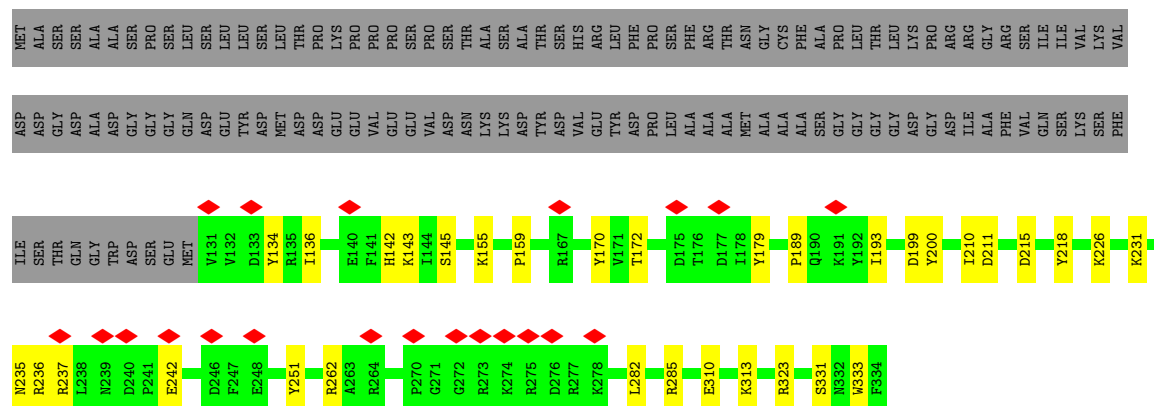




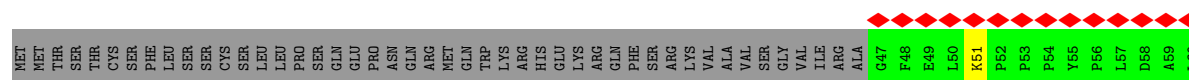
• Molecule 11: PAP7

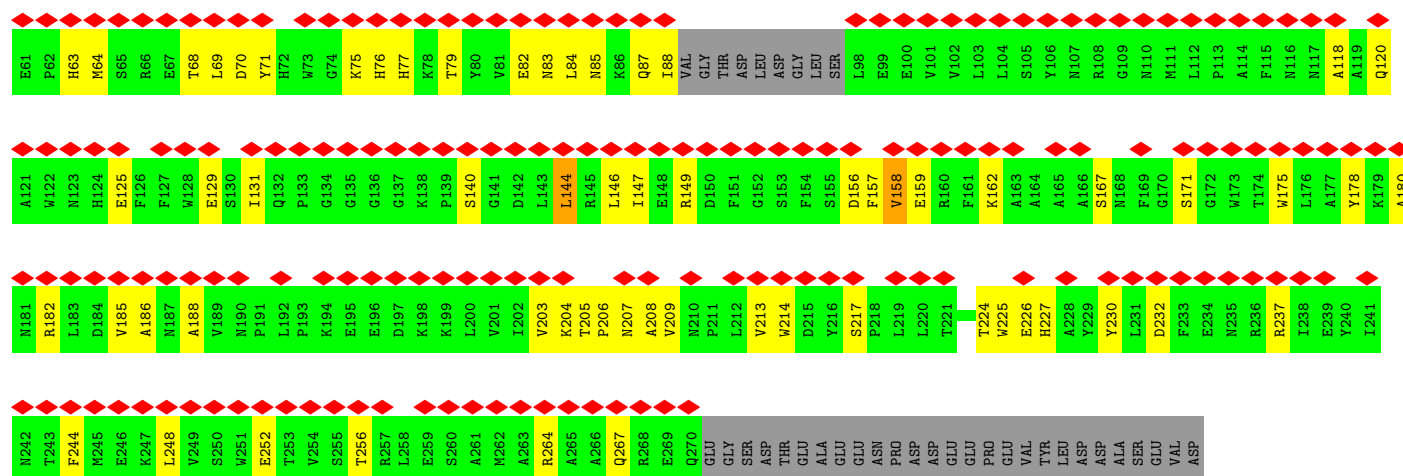


• Molecule 12: PAP8

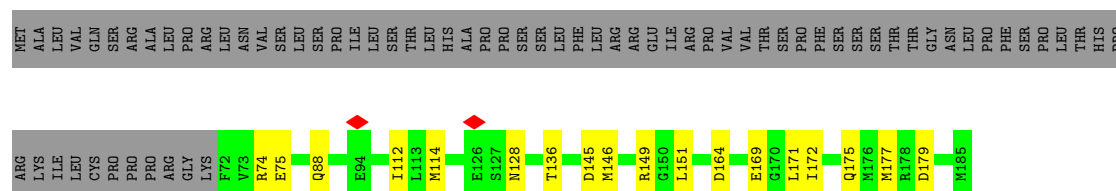


• Molecule 13: PAP9

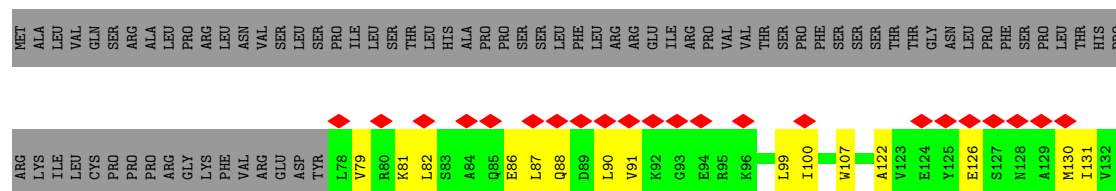




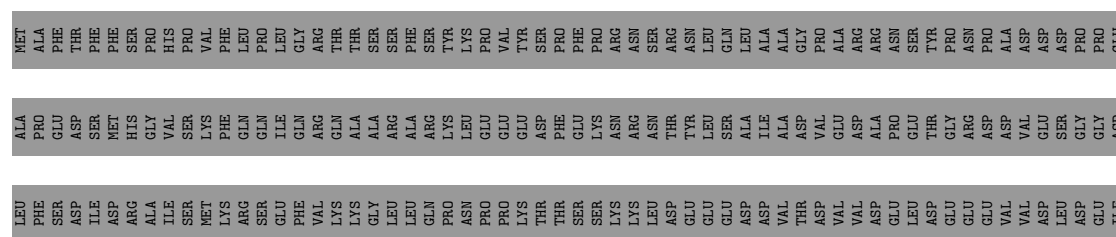
• Molecule 14: PAP10



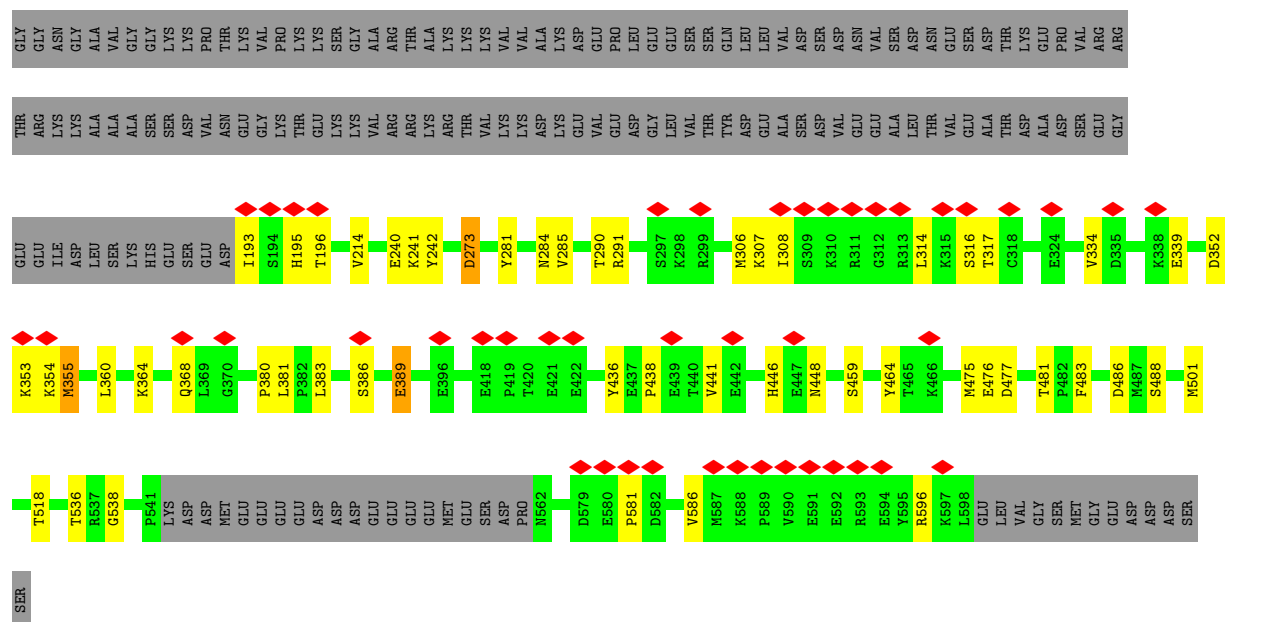
• Molecule 14: PAP10



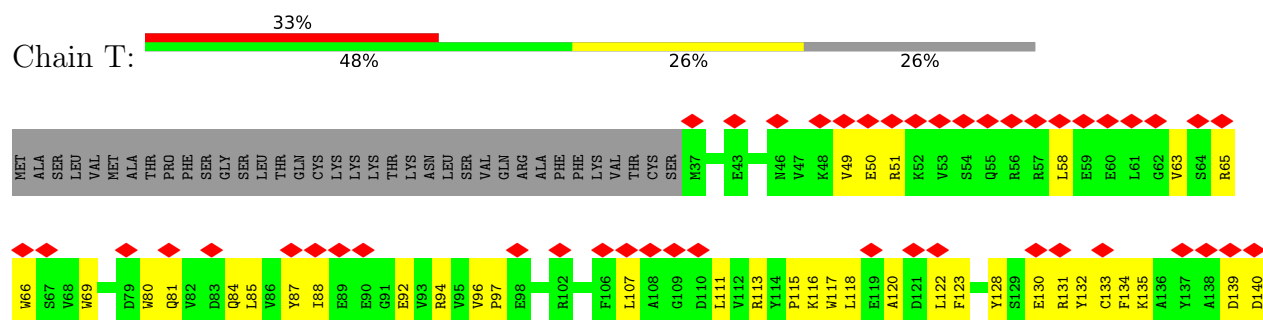
• Molecule 15: PAP11



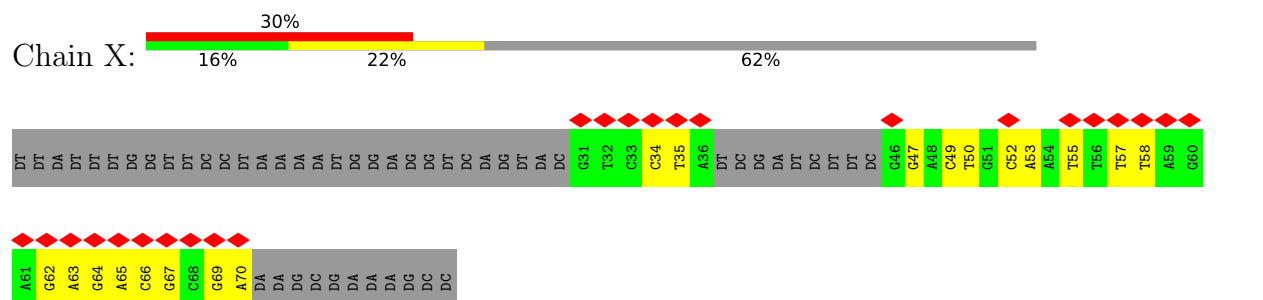




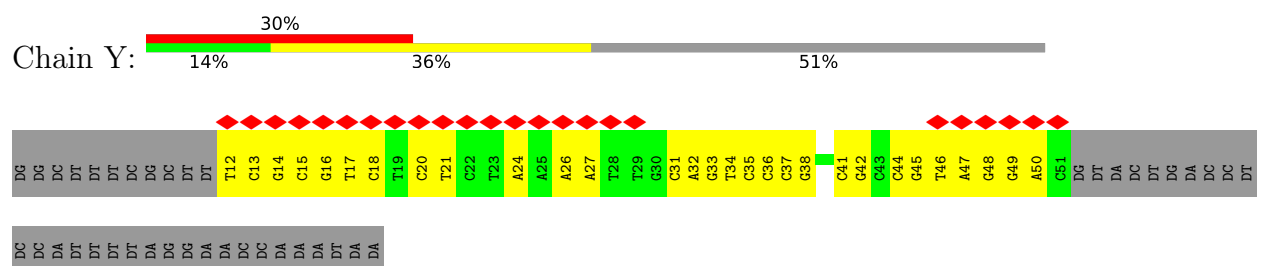
- Molecule 18: PTAC18



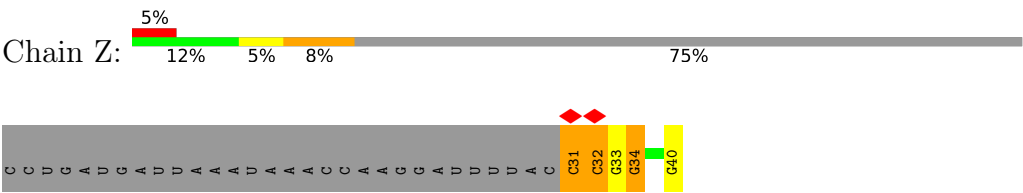
- Molecule 19: DNA (81-MER)



- Molecule 20: DNA (81-MER)



● Molecule 21: RNA (40-MER)



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	417374	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40.48	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	5.127	Depositor
Minimum map value	-0.951	Depositor
Average map value	0.140	Depositor
Map value standard deviation	0.155	Depositor
Recommended contour level	0.8	Depositor
Map size (Å)	300.0, 300.0, 300.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.5, 0.5, 0.5	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SAH, ZN, MG, FE

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.11	0/2498	0.26	0/3377
1	B	0.12	0/1755	0.30	0/2378
2	C	0.12	0/5887	0.28	0/7943
3	D	0.12	0/4894	0.28	0/6612
4	E	0.10	0/7449	0.25	0/10057
5	F	0.12	0/4689	0.29	0/6328
6	G	0.11	0/3095	0.33	0/4175
7	H	0.11	0/3809	0.27	0/5147
8	I	0.11	0/1825	0.28	0/2481
9	J	0.11	0/2021	0.27	0/2724
10	K	0.12	0/3100	0.26	0/4204
11	L	0.10	0/3436	0.23	0/4650
12	M	0.09	0/1756	0.23	0/2378
13	N	0.09	0/1812	0.26	0/2464
14	O	0.10	0/939	0.21	0/1268
14	P	0.11	0/879	0.28	0/1187
15	Q	0.11	0/1771	0.31	0/2392
16	R	0.10	0/960	0.23	0/1285
17	S	0.10	0/3123	0.26	0/4226
18	T	0.12	0/906	0.34	0/1225
19	X	0.17	0/716	0.35	0/1102
20	Y	0.17	0/909	0.37	0/1399
21	Z	0.11	0/239	0.30	0/371
All	All	0.11	0/58468	0.28	0/79373

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
4	E	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	E	1182	ILE	Peptide

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	A	2449	0	2490	36	0
1	B	1722	0	1726	23	0
2	C	5772	0	5790	93	0
3	D	4787	0	4863	100	0
4	E	7308	0	7386	116	0
5	F	4593	0	4529	92	0
6	G	3040	0	2986	61	0
7	H	3701	0	3579	93	0
8	I	1771	0	1696	47	0
9	J	1970	0	1923	31	0
10	K	3022	0	2962	32	0
11	L	3348	0	3304	49	0
12	M	1714	0	1679	24	0
13	N	1759	0	1688	42	0
14	O	923	0	917	15	0
14	P	865	0	867	18	0
15	Q	1740	0	1685	56	0
16	R	944	0	935	21	0
17	S	3056	0	3042	40	0
18	T	881	0	860	34	0
19	X	638	0	351	15	0
20	Y	813	0	450	31	0
21	Z	215	0	110	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
22	D	1	0	0	0	0
23	E	1	0	0	0	0
24	I	1	0	0	0	0
24	N	1	0	0	0	0
25	L	26	0	19	2	0
26	A	18	0	0	0	0
26	B	12	0	0	0	0
26	C	54	0	0	0	0
26	D	18	0	0	1	0
26	E	24	0	0	1	0
26	F	2	0	0	0	0
26	H	6	0	0	0	0
26	I	3	0	0	0	0
26	J	32	0	0	1	0
26	K	17	0	0	0	0
26	L	19	0	0	0	0
26	M	15	0	0	0	0
26	N	4	0	0	0	0
26	O	2	0	0	0	0
26	P	2	0	0	0	0
26	R	3	0	0	0	0
26	S	23	0	0	0	0
All	All	57315	0	55837	913	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 (913) 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)
3:D:668:ALA:HA	16:R:71:GLN:HE22	1.38	0.87
3:D:384:ILE:HD11	3:D:495:MET:HB2	1.64	0.79
13:N:64:MET:HG2	13:N:69:LEU:HG	1.65	0.79
5:F:74:PHE:HD1	5:F:97:MET:HG2	1.50	0.76
18:T:58:LEU:HD22	18:T:63:VAL:HG11	1.68	0.76
4:E:887:ARG:NH2	7:H:523:GLU:OE2	2.19	0.75
17:S:481:THR:HG22	17:S:483:PHE:H	1.52	0.75
7:H:519:ARG:NH2	18:T:130:GLU:OE2	2.21	0.73
4:E:455:ASP:HB2	4:E:474:SER:HB2	1.71	0.73
4:E:1096:ARG:HH21	7:H:283:THR:HG22	1.54	0.72
17:S:353:LYS:HD2	17:S:354:LYS:H	1.55	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
14:P:136:THR:HG21	17:S:381:LEU:HD21	1.73	0.70
3:D:128:ASN:HD21	3:D:246:ARG:HH11	1.40	0.69
20:Y:15:DC:H2''	20:Y:16:DG:C8	2.27	0.69
7:H:196:ARG:NH2	8:I:132:GLU:OE2	2.25	0.69
1:A:60:THR:HG21	1:A:98:SER:HB3	1.73	0.69
4:E:224:ARG:NH2	5:F:762:ASP:OD2	2.25	0.69
7:H:527:LEU:O	7:H:531:ILE:HD12	1.92	0.68
5:F:175:ARG:NH1	11:L:374:GLU:OE2	2.26	0.68
10:K:309:GLU:OE1	10:K:309:GLU:N	2.26	0.68
3:D:455:ALA:HB1	20:Y:38:DG:H1'	1.76	0.68
2:C:108:ASN:OD1	2:C:109:SER:N	2.26	0.67
11:L:461:MET:O	11:L:465:MET:HG3	1.95	0.67
5:F:98:ILE:O	6:G:791:ARG:NH1	2.24	0.67
18:T:80:TRP:O	18:T:117:TRP:N	2.28	0.67
3:D:12:ILE:HD13	4:E:1301:ALA:HA	1.77	0.66
4:E:208:GLU:OE1	4:E:1313:LYS:NZ	2.25	0.66
16:R:70:GLU:OE1	16:R:73:ARG:NH2	2.25	0.66
6:G:503:GLY:HA2	6:G:715:ARG:HG2	1.78	0.65
17:S:273:ASP:OD1	17:S:273:ASP:N	2.24	0.65
13:N:182:ARG:NH1	13:N:188:ALA:O	2.29	0.65
18:T:50:GLU:HB3	18:T:111:LEU:HB3	1.78	0.65
5:F:752:MET:HB3	5:F:757:VAL:HB	1.79	0.65
4:E:1182:ILE:O	4:E:1184:TRP:N	2.30	0.65
5:F:413:VAL:HG21	5:F:809:PRO:HB3	1.79	0.65
4:E:98:ARG:NH2	7:H:103:GLU:OE1	2.30	0.64
5:F:387:ALA:O	5:F:391:MET:HG3	1.98	0.64
18:T:66:TRP:O	18:T:131:ARG:NH2	2.30	0.64
13:N:51:LYS:NZ	13:N:129:GLU:OE2	2.29	0.64
10:K:430:ILE:HG13	10:K:450:LEU:HD22	1.79	0.64
4:E:209:VAL:HG13	4:E:210:VAL:HG13	1.80	0.64
9:J:330:LYS:O	9:J:334:GLU:HG3	1.96	0.64
9:J:415:ASN:HB3	9:J:418:SER:HB2	1.80	0.64
20:Y:20:DC:H2''	20:Y:21:DT:H5'	1.80	0.63
1:A:286:CYS:HA	1:A:289:LYS:HZ2	1.62	0.63
2:C:407:ASN:OD1	2:C:408:PHE:N	2.31	0.63
4:E:985:GLN:OE1	8:I:53:LYS:NZ	2.31	0.63
10:K:205:MET:HB2	14:O:88:GLN:HG2	1.80	0.63
4:E:290:PRO:O	4:E:1226:ARG:NH1	2.32	0.63
7:H:399:SER:HB3	7:H:517:TRP:HD1	1.64	0.62
17:S:291:ARG:NH2	17:S:339:GLU:OE1	2.31	0.62
4:E:1038:ASN:HB2	4:E:1051:LEU:HB2	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:78:LEU:HB2	5:F:93:VAL:HG11	1.82	0.62
6:G:785:THR:OG1	6:G:788:ASN:O	2.18	0.62
4:E:98:ARG:NH1	4:E:375:ARG:O	2.33	0.62
18:T:49:VAL:HG11	18:T:51:ARG:HH21	1.65	0.62
1:A:73:ASP:N	1:A:73:ASP:OD1	2.33	0.62
3:D:302:ARG:HD3	3:D:327:LEU:HB3	1.83	0.61
4:E:102:GLU:OE1	4:E:376:HIS:NE2	2.31	0.61
2:C:659:VAL:HG22	2:C:852:MET:HB2	1.83	0.61
13:N:217:SER:OG	13:N:264:ARG:NH2	2.33	0.61
1:B:202:GLU:OE2	16:R:73:ARG:NH2	2.27	0.61
6:G:586:MET:HE1	6:G:593:PRO:HB3	1.82	0.61
15:Q:625:GLU:HB2	15:Q:628:LYS:HE3	1.82	0.61
16:R:75:ILE:HG23	16:R:80:LYS:HB2	1.82	0.61
4:E:150:ARG:NH1	26:E:8104:HOH:O	2.34	0.61
15:Q:759:GLU:OE2	15:Q:763:ARG:NH2	2.34	0.61
17:S:284:ASN:ND2	17:S:290:THR:OG1	2.34	0.61
13:N:244:PHE:HA	13:N:248:LEU:HD12	1.83	0.60
4:E:63:LEU:HD11	9:J:285:ARG:HD2	1.83	0.60
15:Q:584:GLN:HG2	15:Q:586:PHE:H	1.66	0.60
1:B:57:ILE:HG12	1:B:217:GLU:HG2	1.84	0.60
2:C:451:GLU:HB3	2:C:470:PHE:HB3	1.83	0.60
2:C:611:ILE:H	2:C:624:GLN:HE21	1.48	0.60
2:C:960:ILE:HG21	3:D:474:ARG:HD3	1.82	0.60
4:E:1034:ASP:HB2	4:E:1039:LEU:HD12	1.84	0.60
5:F:542:LEU:HB3	5:F:560:LEU:HD21	1.83	0.60
7:H:73:ARG:NH2	8:I:257:GLU:OE1	2.34	0.60
5:F:138:ARG:NH2	5:F:170:LEU:O	2.34	0.60
13:N:83:ASN:O	13:N:87:GLN:HG2	2.01	0.60
6:G:571:SER:O	6:G:607:LYS:NZ	2.34	0.60
15:Q:673:TYR:CZ	15:Q:693:LEU:HB3	2.37	0.60
18:T:92:GLU:HG3	18:T:107:LEU:HD13	1.83	0.60
19:X:66:DC:H2''	19:X:67:DG:N7	2.16	0.60
11:L:356:ARG:NH2	11:L:401:THR:O	2.35	0.60
18:T:97:PRO:HA	18:T:120:ALA:HA	1.83	0.60
1:B:194:GLU:OE2	1:B:194:GLU:N	2.34	0.60
19:X:49:DC:H2'	19:X:50:DT:H71	1.84	0.59
1:B:93:GLU:O	1:B:134:GLN:NE2	2.34	0.59
7:H:81:TRP:O	7:H:308:ASN:ND2	2.35	0.59
5:F:116:HIS:ND1	5:F:121:ASP:OD2	2.35	0.59
5:F:352:GLU:OE2	5:F:352:GLU:N	2.35	0.59
14:P:99:LEU:HD13	14:P:130:MET:HE3	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:Q:660:ASP:HB2	15:Q:670:MET:HG3	1.84	0.59
19:X:65:DA:H61	20:Y:17:DT:H3	1.51	0.59
20:Y:49:DG:H2"	20:Y:50:DA:N7	2.18	0.59
13:N:167:SER:OG	13:N:204:LYS:NZ	2.34	0.59
15:Q:659:LEU:HG	15:Q:693:LEU:HD11	1.85	0.59
1:A:282:ARG:NH1	1:A:311:HIS:O	2.35	0.59
4:E:111:LEU:HB2	4:E:144:HIS:HE1	1.68	0.59
1:A:309:MET:HE3	1:A:310:GLU:O	2.03	0.59
2:C:973:GLN:HG3	2:C:1015:ILE:HD11	1.85	0.59
3:D:10:LEU:HD21	4:E:1318:LEU:HD11	1.85	0.59
5:F:557:ARG:NH1	20:Y:12:DT:OP2	2.36	0.59
11:L:298:ARG:NH1	11:L:301:ASP:OD2	2.36	0.58
1:A:39:LYS:O	1:B:155:ARG:NH2	2.31	0.58
2:C:957:ASP:OD1	3:D:474:ARG:NH1	2.36	0.58
5:F:289:ILE:O	5:F:293:THR:HG23	2.03	0.58
10:K:388:ASP:HB2	10:K:435:ILE:HD13	1.85	0.58
11:L:73:GLU:OE2	16:R:48:ARG:NH2	2.36	0.58
11:L:279:ILE:HD13	11:L:304:LEU:HD22	1.85	0.58
1:A:286:CYS:HA	1:A:289:LYS:NZ	2.18	0.58
11:L:414:GLU:O	11:L:418:VAL:HG13	2.03	0.58
14:O:175:GLN:NE2	14:O:179:ASP:OD1	2.36	0.58
2:C:844:LEU:HD22	2:C:944:ILE:HD13	1.86	0.58
5:F:225:ASP:OD2	5:F:228:ASN:ND2	2.37	0.58
7:H:471:GLU:N	7:H:471:GLU:OE2	2.34	0.58
17:S:380:PRO:HD2	17:S:383:LEU:HD22	1.86	0.58
5:F:552:PRO:HG2	5:F:563:ARG:HD3	1.85	0.58
9:J:375:LYS:NZ	9:J:377:ASP:OD2	2.34	0.58
15:Q:539:GLY:HA2	15:Q:609:LEU:HD21	1.86	0.58
15:Q:673:TYR:OH	15:Q:693:LEU:N	2.37	0.58
3:D:206:LEU:HD22	3:D:211:ILE:HD11	1.84	0.58
10:K:239:GLU:OE2	14:O:149:ARG:NH1	2.37	0.58
5:F:748:ALA:O	5:F:752:MET:HG3	2.04	0.58
3:D:11:ARG:HB3	4:E:1306:ILE:HG12	1.85	0.57
4:E:82:LEU:HD21	4:E:96:LYS:HA	1.85	0.57
9:J:326:GLU:O	9:J:330:LYS:HG3	2.03	0.57
2:C:661:TYR:HB2	2:C:943:ILE:HG23	1.85	0.57
8:I:129:PHE:HD2	8:I:209:ASN:HB2	1.69	0.57
12:M:172:THR:HG22	12:M:179:TYR:HA	1.86	0.57
4:E:415:TYR:HB2	9:J:227:THR:HG21	1.85	0.57
2:C:543:ARG:CZ	2:C:862:ARG:HG3	2.35	0.57
7:H:205:ASP:OD1	7:H:207:LYS:NZ	2.38	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:391:ARG:NH2	2:C:439:SER:O	2.38	0.57
5:F:546:LEU:HB3	5:F:551:LEU:HD23	1.86	0.57
3:D:2:ILE:HA	5:F:270:ASN:HD21	1.70	0.57
8:I:89:GLN:OE1	8:I:120:ASN:ND2	2.32	0.57
13:N:71:TYR:CE1	13:N:75:LYS:HD3	2.40	0.57
15:Q:647:SER:O	15:Q:697:ARG:NH1	2.37	0.57
3:D:236:LYS:HE3	20:Y:24:DA:H2'	1.86	0.57
15:Q:696:VAL:HG22	15:Q:698:ARG:H	1.69	0.57
17:S:353:LYS:HD2	17:S:354:LYS:N	2.20	0.57
3:D:504:GLU:CD	3:D:504:GLU:H	2.13	0.57
6:G:439:ALA:HB1	6:G:461:VAL:HG12	1.86	0.57
6:G:774:LEU:HD13	6:G:792:ILE:HG21	1.87	0.57
2:C:328:ALA:HB1	2:C:361:LEU:HD12	1.87	0.57
4:E:569:LEU:HD13	7:H:412:VAL:HG12	1.85	0.56
6:G:637:ILE:O	6:G:684:ARG:NH1	2.38	0.56
17:S:308:ILE:HG21	17:S:314:LEU:HD23	1.87	0.56
2:C:126:ILE:HD11	2:C:393:LEU:HB3	1.87	0.56
15:Q:620:CYS:HB2	15:Q:662:MET:HE1	1.87	0.56
20:Y:41:DC:H2'	20:Y:42:DG:H8	1.71	0.56
6:G:597:CYS:SG	6:G:598:TYR:N	2.78	0.56
9:J:367:ARG:NH2	26:J:606:HOH:O	2.37	0.56
15:Q:607:ARG:HH21	15:Q:611:PRO:HD2	1.69	0.56
6:G:633:ILE:HA	6:G:636:MET:HG3	1.87	0.56
13:N:140:SER:HA	13:N:144:LEU:HD12	1.88	0.56
14:P:122:ALA:HB2	14:P:131:ILE:HD12	1.88	0.56
1:A:225:LEU:HD22	1:B:45:ILE:HD11	1.87	0.56
3:D:259:ILE:O	5:F:455:LYS:NZ	2.29	0.56
12:M:210:ILE:HG23	12:M:215:ASP:HB2	1.87	0.56
15:Q:675:LYS:HE3	15:Q:675:LYS:HA	1.88	0.56
2:C:427:SER:OG	2:C:431:ASN:O	2.24	0.56
4:E:609:PHE:HB2	4:E:855:VAL:HB	1.87	0.56
6:G:642:ASP:OD2	6:G:684:ARG:NH2	2.38	0.55
8:I:148:GLU:HA	8:I:151:GLU:HG2	1.87	0.55
19:X:34:DC:H2'	19:X:35:DT:H5'	1.86	0.55
2:C:1013:ASP:OD2	3:D:374:LYS:NZ	2.38	0.55
4:E:161:ILE:HD12	4:E:180:ILE:HG23	1.89	0.55
4:E:796:LEU:H	7:H:604:TYR:HH	1.54	0.55
8:I:180:VAL:HG12	8:I:206:PRO:HA	1.88	0.55
1:B:103:THR:HG21	1:B:150:LYS:HE3	1.87	0.55
2:C:383:PRO:HG3	2:C:579:VAL:HG21	1.88	0.55
8:I:126:ASN:HD21	8:I:198:ASN:HB3	1.71	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:214:VAL:HA	7:H:217:MET:HG2	1.88	0.55
7:H:276:MET:HB2	7:H:327:ILE:HD12	1.89	0.55
2:C:305:ASP:O	2:C:311:ASN:ND2	2.39	0.55
5:F:131:LYS:NZ	6:G:472:GLU:OE1	2.40	0.55
7:H:301:GLY:HA3	7:H:342:LEU:HD11	1.89	0.55
17:S:364:LYS:O	17:S:368:GLN:HG3	2.07	0.55
3:D:510:ARG:O	3:D:510:ARG:NH1	2.38	0.55
3:D:669:ILE:HD12	4:E:7:LEU:HD11	1.89	0.55
4:E:927:MET:HE2	4:E:938:LEU:HD12	1.89	0.55
4:E:1178:ARG:NH1	5:F:496:SER:OG	2.40	0.55
8:I:58:PRO:HG2	8:I:61:ALA:HB2	1.88	0.55
14:P:88:GLN:HE21	17:S:314:LEU:CD1	2.20	0.55
2:C:112:THR:HG22	2:C:121:VAL:HG22	1.88	0.54
2:C:402:THR:H	2:C:405:THR:HB	1.72	0.54
2:C:1013:ASP:OD1	2:C:1013:ASP:N	2.36	0.54
15:Q:680:ASP:HB2	15:Q:761:PRO:HG3	1.89	0.54
4:E:1110:THR:HG22	7:H:99:LEU:HD13	1.89	0.54
3:D:542:LEU:HD13	4:E:49:GLN:HG3	1.89	0.54
2:C:446:ASP:OD1	2:C:446:ASP:N	2.41	0.54
3:D:40:PRO:O	3:D:297:ARG:NH1	2.41	0.54
4:E:982:THR:HB	7:H:166:ILE:HD12	1.89	0.54
5:F:306:GLU:O	5:F:310:MET:HG3	2.07	0.54
6:G:691:GLU:HA	6:G:694:LYS:HE3	1.90	0.54
15:Q:354:THR:HG23	15:Q:573:VAL:HG21	1.88	0.54
15:Q:602:LEU:O	15:Q:606:VAL:HG23	2.07	0.54
5:F:378:GLU:HB3	5:F:478:ARG:HH21	1.70	0.54
18:T:81:GLN:O	18:T:116:LYS:NZ	2.31	0.54
3:D:624:TYR:HB3	12:M:282:LEU:HB3	1.90	0.54
7:H:408:TRP:O	7:H:412:VAL:HG22	2.07	0.54
15:Q:713:MET:HE1	15:Q:715:VAL:HG23	1.88	0.54
2:C:480:MET:H	2:C:516:HIS:HD2	1.54	0.54
7:H:125:LYS:NZ	9:J:231:ASP:OD2	2.31	0.54
8:I:59:LEU:HD23	8:I:71:LEU:HB3	1.90	0.54
2:C:493:ILE:HD12	2:C:495:GLU:H	1.73	0.54
7:H:518:ARG:HH12	18:T:69:TRP:HD1	1.54	0.53
13:N:185:VAL:HG23	13:N:188:ALA:HB2	1.89	0.53
8:I:182:LYS:HD3	8:I:189:GLU:HB2	1.90	0.53
8:I:213:TRP:O	8:I:216:SER:OG	2.23	0.53
1:B:167:ASP:OD1	1:B:167:ASP:N	2.41	0.53
4:E:864:THR:HG21	7:H:413:ALA:HB1	1.90	0.53
5:F:74:PHE:CD1	5:F:97:MET:HG2	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:J:259:PHE:O	9:J:263:MET:HG3	2.08	0.53
2:C:1063:LYS:NZ	5:F:231:ASP:OD1	2.30	0.53
7:H:399:SER:HB3	7:H:517:TRP:CD1	2.42	0.53
14:O:164:ASP:OD1	14:O:164:ASP:N	2.42	0.53
2:C:70:VAL:HA	2:C:117:GLY:HA2	1.90	0.53
2:C:960:ILE:O	2:C:979:ARG:NH1	2.42	0.53
1:A:282:ARG:HG3	17:S:196:THR:HG21	1.89	0.53
3:D:669:ILE:HG21	4:E:5:ALA:HB2	1.90	0.53
4:E:271:ILE:HG22	12:M:211:ASP:OD1	2.09	0.53
4:E:1033:LEU:HD23	4:E:1039:LEU:HD13	1.89	0.53
5:F:407:ARG:NH2	15:Q:669:THR:OG1	2.41	0.53
10:K:251:PHE:O	10:K:255:GLN:HG3	2.08	0.53
2:C:415:PRO:HG2	2:C:505:GLN:HG3	1.91	0.53
5:F:109:PHE:HB3	5:F:132:GLU:OE1	2.09	0.53
5:F:565:GLN:NE2	19:X:65:DA:OP1	2.42	0.53
13:N:175:TRP:HB2	13:N:203:VAL:HG23	1.89	0.53
15:Q:637:THR:O	15:Q:689:HIS:ND1	2.35	0.53
20:Y:31:DC:H2"	20:Y:32:DA:C8	2.44	0.53
2:C:642:ASP:OD2	2:C:648:GLY:N	2.34	0.53
4:E:352:GLU:N	4:E:352:GLU:OE1	2.42	0.53
4:E:1188:ILE:HG23	5:F:752:MET:HE1	1.90	0.53
13:N:147:ILE:HD11	13:N:157:PHE:CD2	2.43	0.53
15:Q:698:ARG:O	15:Q:702:ARG:HG2	2.09	0.53
17:S:306:MET:HE3	17:S:316:SER:HB2	1.90	0.53
5:F:89:GLY:O	5:F:93:VAL:HG23	2.09	0.53
5:F:416:TRP:HB2	5:F:475:PHE:H	1.74	0.53
13:N:70:ASP:OD1	13:N:71:TYR:N	2.42	0.53
14:P:150:GLY:O	14:P:153:THR:OG1	2.27	0.53
20:Y:13:DC:H2"	20:Y:14:DG:C8	2.43	0.53
4:E:1311:GLY:O	4:E:1315:ASN:ND2	2.42	0.53
18:T:135:LYS:HE2	18:T:140:ASP:HB2	1.91	0.53
6:G:602:LEU:HB3	6:G:679:LEU:HD11	1.90	0.52
6:G:624:ASN:HD21	6:G:627:SER:HB3	1.74	0.52
1:B:35:SER:HB3	1:B:198:ILE:HG23	1.91	0.52
3:D:20:ILE:HD13	3:D:270:PRO:HD3	1.92	0.52
3:D:244:LEU:O	3:D:248:MET:HG2	2.09	0.52
15:Q:741:ARG:O	15:Q:741:ARG:NH1	2.42	0.52
3:D:599:ASP:OD2	3:D:599:ASP:N	2.42	0.52
5:F:744:GLU:HB3	5:F:747:GLU:HB2	1.90	0.52
18:T:63:VAL:HG22	18:T:131:ARG:HD3	1.91	0.52
2:C:929:ILE:HG13	2:C:938:PHE:HD2	1.74	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:196:ARG:NH1	8:I:54:THR:O	2.40	0.52
2:C:458:VAL:HG21	2:C:462:LYS:HD3	1.90	0.52
5:F:410:ARG:NH2	5:F:419:PRO:O	2.40	0.52
14:O:114:MET:HE2	14:O:171:LEU:HD23	1.91	0.52
20:Y:31:DC:H2''	20:Y:32:DA:H5'	1.92	0.52
3:D:98:ARG:HD3	3:D:98:ARG:N	2.25	0.52
7:H:534:ARG:O	7:H:538:GLY:N	2.42	0.52
21:Z:32:C:H2'	21:Z:33:G:C8	2.44	0.52
1:A:48:ALA:HB3	1:B:226:PHE:HZ	1.75	0.52
7:H:522:GLU:HG3	18:T:134:PHE:CD2	2.45	0.51
8:I:180:VAL:HG11	8:I:199:PRO:HG2	1.92	0.51
5:F:448:ARG:NH1	15:Q:661:ASP:OD2	2.44	0.51
4:E:573:ARG:NH2	7:H:513:ASP:OD2	2.39	0.51
5:F:93:VAL:O	5:F:97:MET:HG3	2.10	0.51
17:S:352:ASP:HB3	17:S:355:MET:HB2	1.93	0.51
15:Q:750:LEU:HG	15:Q:757:THR:HG21	1.93	0.51
3:D:184:PHE:HA	3:D:187:PHE:CE2	2.45	0.51
4:E:153:MET:HG3	4:E:180:ILE:HG22	1.93	0.51
5:F:411:THR:O	5:F:415:SER:OG	2.25	0.51
10:K:277:SER:OG	10:K:280:GLU:OE1	2.16	0.51
4:E:369:VAL:HB	4:E:381:PHE:HB3	1.92	0.51
5:F:76:ASP:HA	11:L:411:PRO:HD2	1.92	0.51
6:G:624:ASN:ND2	6:G:630:HIS:HB2	2.25	0.51
3:D:135:LYS:NZ	19:X:55:DT:H5'	2.25	0.51
11:L:300:LYS:HD2	16:R:91:LEU:HA	1.91	0.51
15:Q:702:ARG:HD2	15:Q:743:ALA:HB2	1.93	0.51
4:E:1065:THR:OG1	4:E:1066:ILE:N	2.30	0.51
3:D:306:LEU:HD13	3:D:324:GLN:HB3	1.92	0.50
3:D:459:HIS:CD2	3:D:461:LEU:HB2	2.46	0.50
5:F:186:VAL:HG11	5:F:215:LEU:HD21	1.93	0.50
13:N:146:LEU:HD11	13:N:149:ARG:HH21	1.77	0.50
3:D:295:LEU:HD13	3:D:335:LEU:HA	1.92	0.50
3:D:619:PRO:HG3	3:D:634:TYR:CZ	2.46	0.50
10:K:341:GLU:HA	10:K:344:LYS:HE2	1.94	0.50
11:L:399:LEU:HD22	11:L:421:LEU:HD13	1.93	0.50
3:D:236:LYS:NZ	20:Y:24:DA:OP2	2.45	0.50
5:F:89:GLY:HA2	5:F:92:GLU:HG3	1.93	0.50
14:P:90:LEU:HD12	14:P:99:LEU:HD22	1.93	0.50
20:Y:31:DC:H2''	20:Y:32:DA:H8	1.76	0.50
2:C:828:ASN:OD1	2:C:828:ASN:N	2.43	0.50
3:D:527:PRO:HB2	3:D:530:VAL:HG23	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:76:ASP:OD2	11:L:412:SER:OG	2.24	0.50
6:G:561:ARG:HH22	6:G:667:ARG:HD3	1.76	0.50
7:H:233:VAL:HG22	7:H:268:GLU:HG3	1.94	0.50
13:N:120:GLN:HG2	13:N:208:ALA:HB2	1.92	0.50
11:L:121:GLU:OE2	11:L:298:ARG:NH2	2.40	0.50
11:L:233:HIS:CD2	11:L:235:GLY:H	2.29	0.50
2:C:562:LYS:NZ	9:J:400:ALA:O	2.45	0.50
2:C:675:ILE:HG22	2:C:852:MET:HG2	1.93	0.50
4:E:268:ASP:OD1	4:E:268:ASP:N	2.45	0.50
20:Y:41:DC:H2'	20:Y:42:DG:C8	2.46	0.50
7:H:395:GLU:O	7:H:524:ARG:NH1	2.37	0.50
8:I:185:GLU:HG2	8:I:187:ARG:HH21	1.75	0.50
4:E:102:GLU:OE2	4:E:375:ARG:NH2	2.43	0.49
9:J:208:LYS:HD3	9:J:208:LYS:C	2.37	0.49
3:D:293:ASN:O	3:D:297:ARG:HG3	2.11	0.49
11:L:267:ARG:NH1	11:L:269:GLY:O	2.46	0.49
4:E:860:VAL:O	4:E:871:PHE:N	2.44	0.49
4:E:1295:ARG:HH21	20:Y:33:DG:H5'	1.76	0.49
9:J:284:TYR:O	9:J:288:ARG:HB3	2.12	0.49
19:X:65:DA:H1'	19:X:66:DC:H5'	1.95	0.49
3:D:334:THR:HG23	3:D:338:ASN:ND2	2.28	0.49
6:G:618:LEU:HA	6:G:621:MET:HB3	1.93	0.49
6:G:649:ILE:HA	6:G:652:TYR:CD2	2.46	0.49
1:A:283:ILE:HG23	1:A:312:PHE:HE1	1.77	0.49
6:G:555:ARG:HG3	6:G:556:CYS:N	2.27	0.49
9:J:415:ASN:HD22	9:J:416:MET:N	2.11	0.49
12:M:199:ASP:OD1	12:M:199:ASP:N	2.42	0.49
15:Q:642:VAL:HG22	15:Q:690:ARG:HB2	1.94	0.49
16:R:85:ASP:HB3	16:R:133:VAL:HG21	1.95	0.49
17:S:486:ASP:OD1	17:S:488:SER:OG	2.23	0.49
5:F:126:MET:HE3	5:F:159:ARG:NH1	2.27	0.49
5:F:365:GLU:OE1	5:F:370:LEU:HG	2.13	0.49
7:H:331:ARG:NH1	7:H:341:GLU:OE1	2.41	0.49
9:J:251:ARG:NH1	9:J:276:PRO:O	2.46	0.49
11:L:446:LEU:O	16:R:38:ARG:NH2	2.46	0.49
21:Z:33:G:H2'	21:Z:34:G:H8	1.77	0.49
2:C:789:ASP:HB3	2:C:809:TYR:HD1	1.76	0.49
3:D:235:ARG:HD2	20:Y:26:DA:C8	2.47	0.49
9:J:186:PHE:CG	12:M:262:ARG:HD3	2.48	0.49
11:L:277:MET:HE2	11:L:279:ILE:HD11	1.93	0.49
18:T:135:LYS:HB3	18:T:135:LYS:HE3	1.56	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
20:Y:13:DC:H2''	20:Y:14:DG:H8	1.78	0.49
5:F:123:GLN:CD	5:F:123:GLN:H	2.21	0.49
7:H:350:ASP:O	8:I:254:ASN:ND2	2.46	0.49
8:I:189:GLU:OE2	8:I:189:GLU:HA	2.13	0.49
20:Y:17:DT:H2''	20:Y:18:DC:H5	1.78	0.49
1:A:152:GLU:OE1	1:A:152:GLU:N	2.46	0.48
3:D:503:LEU:HD11	16:R:111:VAL:HG21	1.94	0.48
12:M:200:TYR:HB3	12:M:226:LYS:HB2	1.95	0.48
15:Q:695:ASP:OD2	15:Q:695:ASP:N	2.44	0.48
18:T:80:TRP:CH2	18:T:122:LEU:HD21	2.48	0.48
7:H:67:THR:N	7:H:70:GLU:OE2	2.46	0.48
14:P:126:GLU:OE2	14:P:126:GLU:N	2.24	0.48
3:D:546:THR:HG21	3:D:601:PRO:HB3	1.95	0.48
4:E:37:HIS:HD1	16:R:80:LYS:NZ	2.10	0.48
13:N:171:SER:HB3	13:N:225:TRP:CE2	2.48	0.48
20:Y:36:DC:H2'	20:Y:37:DC:C6	2.48	0.48
2:C:401:LEU:HD11	2:C:434:LEU:HD22	1.95	0.48
7:H:207:LYS:HD2	7:H:211:ASP:HB3	1.96	0.48
7:H:371:PRO:HA	7:H:374:ILE:HD12	1.95	0.48
11:L:163:ASP:OD1	11:L:163:ASP:N	2.45	0.48
1:A:110:VAL:HG12	17:S:596:ARG:HG3	1.94	0.48
3:D:548:ARG:HH22	12:M:313:LYS:HE3	1.77	0.48
4:E:444:SER:OG	4:E:446:SER:O	2.31	0.48
5:F:74:PHE:HZ	6:G:708:VAL:HG23	1.78	0.48
15:Q:614:ILE:HG23	15:Q:713:MET:SD	2.54	0.48
17:S:501:MET:HB2	17:S:518:THR:HG23	1.94	0.48
20:Y:34:DT:H2'	20:Y:35:DC:C6	2.48	0.48
2:C:579:VAL:HG12	2:C:643:GLY:HA3	1.96	0.48
2:C:909:ALA:O	2:C:913:THR:OG1	2.27	0.48
7:H:405:ASP:OD1	7:H:405:ASP:N	2.47	0.48
7:H:515:LEU:O	7:H:518:ARG:HD3	2.13	0.48
11:L:437:GLU:H	11:L:437:GLU:CD	2.21	0.48
20:Y:26:DA:H2''	20:Y:27:DA:C8	2.49	0.48
2:C:1055:LEU:HD11	3:D:10:LEU:HD13	1.95	0.48
10:K:392:SER:OG	10:K:432:GLN:HG3	2.14	0.48
15:Q:685:LEU:HD11	15:Q:691:LEU:HB2	1.96	0.48
2:C:60:VAL:HG12	2:C:79:GLU:HB2	1.96	0.48
7:H:480:GLU:OE2	7:H:503:LEU:HD22	2.13	0.48
7:H:516:HIS:O	7:H:519:ARG:HB2	2.14	0.48
11:L:286:ASN:ND2	11:L:319:GLU:OE2	2.32	0.48
17:S:436:TYR:O	17:S:464:TYR:OH	2.31	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:1024:THR:O	2:C:1028:GLY:N	2.45	0.48
3:D:641:ARG:NH1	12:M:199:ASP:OD1	2.39	0.48
6:G:596:MET:HE1	6:G:668:PHE:HA	1.96	0.48
7:H:137:GLU:O	7:H:141:LYS:N	2.47	0.48
7:H:508:GLU:O	7:H:511:GLU:HG2	2.13	0.48
11:L:248:GLU:N	11:L:248:GLU:OE1	2.46	0.48
14:O:74:ARG:NH1	14:O:75:GLU:OE2	2.47	0.48
15:Q:606:VAL:HG11	15:Q:713:MET:HE3	1.96	0.48
20:Y:47:DA:H2''	20:Y:48:DG:H5'	1.96	0.48
17:S:241:LYS:HB3	17:S:241:LYS:HE2	1.63	0.48
3:D:553:ASN:ND2	26:D:805:HOH:O	2.44	0.47
8:I:145:GLY:H	8:I:243:MET:HE1	1.79	0.47
17:S:459:SER:OG	17:S:476:GLU:OE1	2.27	0.47
4:E:88:TYR:CE1	4:E:1075:GLU:HG2	2.49	0.47
2:C:120:ARG:HD2	2:C:369:PHE:HB3	1.96	0.47
4:E:903:PRO:HB2	18:T:94:ARG:HD3	1.96	0.47
4:E:1040:VAL:HG23	4:E:1049:TYR:CE2	2.49	0.47
5:F:78:LEU:HG	5:F:90:VAL:HG13	1.95	0.47
5:F:426:LEU:HD13	5:F:815:ALA:HB2	1.97	0.47
9:J:216:ILE:HD11	12:M:323:ARG:HH12	1.80	0.47
11:L:233:HIS:HD2	11:L:235:GLY:H	1.63	0.47
3:D:3:ASP:H	5:F:270:ASN:ND2	2.12	0.47
4:E:15:ASP:OD2	4:E:17:THR:OG1	2.33	0.47
4:E:458:HIS:HE1	7:H:81:TRP:CE2	2.32	0.47
8:I:230:ASN:OD1	8:I:234:ASN:ND2	2.47	0.47
1:A:29:TYR:OH	1:A:202:GLU:OE2	2.27	0.47
4:E:1109:ALA:HA	4:E:1132:PHE:HZ	1.80	0.47
5:F:565:GLN:OE1	5:F:568:ARG:NH2	2.47	0.47
9:J:331:HIS:NE2	9:J:337:GLU:OE1	2.40	0.47
20:Y:46:DT:O3'	20:Y:47:DA:H8	1.95	0.47
1:B:124:PRO:HG2	1:B:127:VAL:HG21	1.96	0.47
2:C:586:GLU:OE2	14:O:74:ARG:NH2	2.47	0.47
4:E:975:ASN:HA	4:E:1049:TYR:HD1	1.78	0.47
4:E:1154:GLU:OE2	4:E:1275:THR:OG1	2.32	0.47
6:G:463:GLU:HB3	6:G:495:SER:HB3	1.96	0.47
6:G:641:TYR:HA	6:G:646:ASN:HB3	1.97	0.47
11:L:156:THR:OG1	11:L:165:ARG:NH1	2.46	0.47
11:L:365:VAL:HG13	11:L:480:ARG:HE	1.79	0.47
13:N:149:ARG:O	18:T:65:ARG:NH2	2.47	0.47
17:S:240:GLU:H	17:S:240:GLU:CD	2.22	0.47
18:T:88:ILE:HD13	18:T:128:TYR:CE1	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:21:ARG:NH2	16:R:69:GLU:OE2	2.46	0.47
7:H:217:MET:HB3	7:H:219:LEU:HG	1.97	0.47
7:H:518:ARG:HH22	18:T:69:TRP:HB2	1.80	0.47
17:S:386:SER:O	17:S:389:GLU:HG3	2.15	0.47
4:E:975:ASN:HA	4:E:1049:TYR:CD1	2.50	0.47
6:G:458:TYR:HE2	6:G:484:VAL:HG21	1.80	0.47
8:I:79:HIS:NE2	8:I:128:ASP:OD1	2.47	0.47
10:K:119:TYR:HB2	14:O:112:ILE:HG23	1.95	0.47
10:K:206:LYS:HG2	14:O:145:ASP:HB3	1.97	0.47
14:P:82:LEU:HD13	14:P:86:GLU:OE2	2.14	0.47
1:A:231:HIS:HE1	17:S:536:THR:HG23	1.79	0.47
2:C:864:ASN:OD1	2:C:864:ASN:N	2.48	0.47
3:D:180:THR:OG1	15:Q:698:ARG:NH2	2.47	0.47
4:E:442:ILE:HB	4:E:1130:VAL:HG12	1.96	0.47
10:K:358:ASP:HB3	10:K:362:ARG:HB2	1.97	0.47
11:L:334:MET:HE3	11:L:334:MET:HB3	1.81	0.47
15:Q:584:GLN:NE2	15:Q:586:PHE:O	2.40	0.47
1:B:194:GLU:C	1:B:195:LYS:HD2	2.39	0.46
7:H:180:ARG:HD2	7:H:180:ARG:HA	1.65	0.46
8:I:144:LYS:HB2	8:I:243:MET:HE1	1.97	0.46
11:L:120:MET:HE1	11:L:281:TYR:HB3	1.97	0.46
15:Q:685:LEU:HD22	15:Q:689:HIS:HB2	1.96	0.46
3:D:208:LEU:O	3:D:212:ILE:HG13	2.15	0.46
5:F:297:SER:OG	5:F:298:TYR:N	2.48	0.46
7:H:519:ARG:HA	7:H:519:ARG:HD3	1.71	0.46
10:K:413:ASP:HB3	10:K:416:VAL:HB	1.97	0.46
13:N:84:LEU:HD22	13:N:118:ALA:HA	1.97	0.46
13:N:213:VAL:HG23	13:N:214:TRP:CD1	2.50	0.46
2:C:317:VAL:HG22	2:C:321:LEU:HG	1.97	0.46
7:H:518:ARG:HH12	18:T:69:TRP:CD1	2.32	0.46
9:J:297:GLN:OE1	9:J:300:ARG:NH1	2.48	0.46
19:X:66:DC:H2''	19:X:67:DG:C8	2.51	0.46
3:D:533:GLN:HA	4:E:136:ALA:HB1	1.97	0.46
11:L:109:ASP:OD1	11:L:316:LYS:N	2.46	0.46
15:Q:696:VAL:HG13	15:Q:699:VAL:HG12	1.97	0.46
17:S:281:TYR:O	17:S:285:VAL:HG22	2.16	0.46
20:Y:26:DA:H2''	20:Y:27:DA:H5'	1.96	0.46
2:C:407:ASN:HB3	2:C:410:ILE:HG13	1.96	0.46
13:N:146:LEU:HD12	13:N:146:LEU:HA	1.79	0.46
15:Q:661:ASP:O	15:Q:664:SER:OG	2.31	0.46
1:A:43:ASP:HB2	1:B:51:ARG:HH21	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:64:ARG:HB3	1:B:150:LYS:HB2	1.98	0.46
3:D:153:LYS:HG2	5:F:451:PRO:HB2	1.98	0.46
3:D:191:GLU:OE1	3:D:191:GLU:N	2.49	0.46
3:D:621:GLU:OE1	12:M:285:ARG:NH1	2.47	0.46
4:E:493:ILE:O	7:H:380:ARG:NH1	2.49	0.46
14:P:79:VAL:HG12	14:P:133:LYS:HG2	1.97	0.46
16:R:85:ASP:OD2	16:R:144:TYR:OH	2.29	0.46
1:B:110:VAL:HG21	1:B:116:ILE:HG12	1.97	0.46
2:C:882:ARG:NH1	2:C:905:GLU:OE1	2.47	0.46
2:C:1033:LYS:HB2	2:C:1033:LYS:HE2	1.79	0.46
3:D:298:ARG:NE	3:D:345:MET:HE1	2.31	0.46
3:D:306:LEU:HD21	3:D:325:GLU:HG2	1.97	0.46
16:R:82:MET:HE1	16:R:126:PHE:CE1	2.50	0.46
3:D:298:ARG:HH11	3:D:298:ARG:HB3	1.81	0.46
4:E:804:GLU:OE2	7:H:399:SER:N	2.41	0.46
15:Q:707:MET:HA	15:Q:707:MET:HE2	1.97	0.46
2:C:58:GLN:N	2:C:58:GLN:OE1	2.49	0.46
4:E:407:PHE:HE2	4:E:426:ARG:HD3	1.81	0.46
8:I:86:LEU:HD22	8:I:121:ALA:HA	1.98	0.46
9:J:405:ARG:O	10:K:119:TYR:OH	2.27	0.46
1:A:58:GLU:HG2	1:A:155:ARG:HB3	1.98	0.45
2:C:1060:VAL:HB	3:D:7:HIS:HB2	1.98	0.45
3:D:298:ARG:HB3	3:D:298:ARG:NH1	2.31	0.45
7:H:170:ASP:OD1	7:H:170:ASP:N	2.42	0.45
7:H:398:LEU:O	7:H:520:SER:OG	2.32	0.45
7:H:518:ARG:HA	7:H:521:LEU:CD2	2.46	0.45
2:C:1014:HIS:CE1	2:C:1036:ASP:HB2	2.51	0.45
3:D:371:LEU:HD13	4:E:1317:VAL:HG13	1.97	0.45
4:E:458:HIS:N	7:H:68:GLU:OE2	2.31	0.45
5:F:401:ARG:NH2	5:F:461:ASP:O	2.49	0.45
6:G:515:ARG:HA	6:G:518:ASN:HD21	1.81	0.45
6:G:712:ASP:OD1	6:G:714:HIS:ND1	2.33	0.45
7:H:531:ILE:HG23	7:H:535:GLN:OE1	2.16	0.45
9:J:277:THR:OG1	12:M:331:SER:OG	2.28	0.45
15:Q:628:LYS:HD2	15:Q:632:MET:HE1	1.97	0.45
4:E:394:GLU:HG2	9:J:224:ILE:HD11	1.98	0.45
5:F:129:LEU:HD22	5:F:147:LEU:HD13	1.97	0.45
5:F:448:ARG:CZ	15:Q:657:ASP:HB3	2.46	0.45
5:F:488:ARG:HA	5:F:488:ARG:HD3	1.75	0.45
19:X:52:DC:H2''	19:X:53:DA:C8	2.51	0.45
20:Y:33:DG:H2'	20:Y:34:DT:C6	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:93:ALA:HB1	4:E:440:LYS:HE2	1.98	0.45
5:F:167:MET:HE3	5:F:167:MET:HB2	1.78	0.45
6:G:467:GLN:O	6:G:715:ARG:NH1	2.46	0.45
7:H:164:ARG:HG2	7:H:166:ILE:HG13	1.98	0.45
9:J:257:THR:HG23	9:J:276:PRO:HG2	1.96	0.45
10:K:416:VAL:O	10:K:420:GLN:HG2	2.16	0.45
11:L:260:ARG:HB2	11:L:278:MET:HE1	1.98	0.45
11:L:372:PRO:HA	11:L:375:TYR:CZ	2.52	0.45
3:D:103:GLN:NE2	3:D:104:MET:O	2.46	0.45
3:D:135:LYS:HZ1	19:X:55:DT:H5'	1.80	0.45
6:G:529:ASN:OD1	6:G:530:ALA:N	2.50	0.45
6:G:560:GLU:OE1	6:G:591:ILE:HD12	2.16	0.45
8:I:65:TYR:O	8:I:221:TYR:OH	2.29	0.45
10:K:101:LYS:HB3	10:K:101:LYS:HE2	1.82	0.45
10:K:312:GLU:OE1	10:K:316:ASN:ND2	2.49	0.45
20:Y:36:DC:H2'	20:Y:37:DC:H6	1.81	0.45
2:C:128:GLN:NE2	2:C:311:ASN:O	2.49	0.45
2:C:1010:TYR:CD1	2:C:1021:VAL:HG21	2.51	0.45
8:I:105:ILE:HD13	8:I:198:ASN:HD21	1.82	0.45
13:N:226:GLU:O	13:N:230:TYR:HB2	2.16	0.45
17:S:354:LYS:HD2	17:S:354:LYS:HA	1.81	0.45
3:D:55:LEU:HD21	3:D:296:TYR:HB3	1.97	0.45
3:D:458:LEU:HB3	4:E:330:GLU:HG2	1.99	0.45
4:E:115:MET:HE2	4:E:115:MET:HB3	1.84	0.45
5:F:250:CYS:O	5:F:253:SER:OG	2.30	0.45
6:G:598:TYR:O	6:G:602:LEU:HG	2.16	0.45
7:H:133:ILE:HB	7:H:137:GLU:OE2	2.17	0.45
11:L:114:ARG:HH21	11:L:115:ARG:NH1	2.14	0.45
11:L:427:LYS:HE3	11:L:427:LYS:HB3	1.63	0.45
2:C:454:PHE:CD2	2:C:471:LEU:HD22	2.52	0.45
2:C:480:MET:H	2:C:516:HIS:CD2	2.34	0.45
2:C:1053:LEU:HD11	3:D:117:TRP:HZ3	1.81	0.45
5:F:167:MET:HB3	5:F:174:ILE:HG22	1.99	0.45
6:G:533:GLU:HA	6:G:536:LYS:HB3	1.97	0.45
11:L:410:ILE:HD12	11:L:413:ALA:H	1.82	0.45
14:P:149:ARG:NH2	14:P:169:GLU:OE1	2.42	0.45
18:T:80:TRP:CZ3	18:T:120:ALA:HB3	2.52	0.45
1:A:273:PHE:HA	1:A:294:THR:HA	1.98	0.45
3:D:52:LYS:NZ	3:D:59:ARG:HE	2.15	0.45
4:E:104:TRP:CD1	4:E:164:PRO:HG3	2.51	0.45
6:G:514:SER:O	6:G:517:VAL:HG12	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:134:THR:HG22	7:H:137:GLU:HG3	1.99	0.45
2:C:28:ASP:OD1	9:J:425:LYS:HE2	2.17	0.45
2:C:975:PRO:HD3	2:C:1012:SER:O	2.16	0.45
3:D:446:GLN:O	16:R:123:LYS:NZ	2.37	0.45
4:E:121:MET:HE3	4:E:121:MET:HB3	1.79	0.45
4:E:1226:ARG:O	4:E:1230:SER:HB3	2.16	0.45
10:K:163:ASP:OD1	10:K:191:THR:OG1	2.29	0.45
11:L:149:ILE:HD11	11:L:168:CYS:HB3	1.97	0.45
11:L:260:ARG:NH1	25:L:8001:SAH:SD	2.90	0.45
17:S:360:LEU:HD12	17:S:364:LYS:HE2	1.98	0.45
17:S:581:PRO:HA	17:S:586:VAL:HG11	1.99	0.45
2:C:875:LEU:HB2	2:C:945:GLY:HA2	1.99	0.44
2:C:1055:LEU:HD13	3:D:12:ILE:HG23	1.99	0.44
3:D:526:ASP:HB3	4:E:20:LYS:HE2	1.99	0.44
4:E:296:THR:HG21	4:E:1230:SER:HB2	1.98	0.44
6:G:563:LEU:HA	6:G:566:VAL:HG12	1.98	0.44
11:L:450:ARG:H	11:L:450:ARG:HG3	1.63	0.44
12:M:236:ARG:NH1	12:M:242:GLU:O	2.49	0.44
2:C:380:ARG:CZ	2:C:622:MET:HE1	2.47	0.44
3:D:334:THR:HG23	3:D:338:ASN:HD21	1.83	0.44
4:E:304:TYR:O	4:E:1219:ARG:HD3	2.17	0.44
5:F:452:ARG:HA	5:F:452:ARG:HD3	1.66	0.44
5:F:768:ASP:OD1	5:F:768:ASP:N	2.40	0.44
17:S:446:HIS:ND1	17:S:448:ASN:OD1	2.49	0.44
5:F:88:SER:O	5:F:92:GLU:HG3	2.16	0.44
5:F:144:MET:HB3	5:F:167:MET:HE2	1.99	0.44
7:H:519:ARG:HH21	18:T:69:TRP:HB2	1.82	0.44
18:T:96:VAL:HB	18:T:123:PHE:HE2	1.82	0.44
1:B:64:ARG:NH1	1:B:169:SER:OG	2.40	0.44
4:E:1291:GLN:C	4:E:1292:GLU:HG2	2.42	0.44
8:I:208:ILE:HD13	8:I:208:ILE:HA	1.84	0.44
9:J:212:PRO:HA	12:M:333:TRP:O	2.16	0.44
9:J:358:MET:O	9:J:361:THR:OG1	2.36	0.44
11:L:325:MET:HA	11:L:326:PRO:HD3	1.85	0.44
12:M:193:ILE:HG22	12:M:231:LYS:HZ3	1.81	0.44
19:X:57:DT:H2'	19:X:58:DT:C6	2.51	0.44
2:C:107:MET:HE1	2:C:317:VAL:HG11	2.00	0.44
3:D:16:SER:HB3	3:D:263:TRP:CZ2	2.53	0.44
4:E:575:ASN:HD21	4:E:807:ASN:HB2	1.81	0.44
4:E:616:ALA:HB3	4:E:839:LEU:HD12	1.99	0.44
6:G:755:LEU:HB3	6:G:761:ALA:HB2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:167:PRO:HG2	7:H:186:ILE:HG23	2.00	0.44
7:H:414:GLU:HG3	7:H:472:LEU:HD22	2.00	0.44
8:I:79:HIS:CD2	8:I:131:TRP:HE1	2.36	0.44
8:I:218:TYR:HA	8:I:222:LYS:HA	2.00	0.44
15:Q:617:VAL:HG22	15:Q:644:MET:HB2	1.99	0.44
17:S:307:LYS:O	17:S:317:THR:OG1	2.29	0.44
6:G:516:LEU:HD13	6:G:521:ILE:HD12	1.99	0.44
10:K:136:PRO:HD2	10:K:389:ARG:O	2.18	0.44
11:L:204:ASP:OD2	11:L:452:THR:OG1	2.36	0.44
7:H:247:TYR:HB3	7:H:365:ARG:HH12	1.82	0.44
15:Q:713:MET:CE	15:Q:715:VAL:HG23	2.48	0.44
1:A:34:LEU:HD23	1:A:37:LEU:HD11	1.99	0.44
1:A:39:LYS:HB2	1:A:195:LYS:HG3	1.99	0.44
1:A:123:LEU:HD11	1:A:129:ILE:HG12	2.00	0.44
1:A:150:LYS:HD3	1:A:150:LYS:HA	1.87	0.44
6:G:523:ARG:H	6:G:523:ARG:HD2	1.81	0.44
6:G:648:GLN:O	6:G:651:GLU:HG2	2.18	0.44
8:I:150:ILE:HD13	8:I:150:ILE:HA	1.91	0.44
10:K:333:ARG:NH1	10:K:358:ASP:OD2	2.38	0.44
13:N:68:THR:OG1	13:N:232:ASP:OD1	2.29	0.44
14:O:172:ILE:HD11	14:O:177:MET:HG2	2.00	0.44
2:C:404:ARG:HD3	2:C:404:ARG:HA	1.78	0.44
2:C:550:MET:SD	2:C:829:LYS:HB3	2.58	0.44
2:C:858:GLY:O	2:C:862:ARG:HB2	2.18	0.44
3:D:122:LEU:HD13	3:D:123:PRO:HA	2.00	0.44
9:J:416:MET:HE3	9:J:416:MET:HA	2.00	0.44
13:N:144:LEU:O	13:N:147:ILE:HG22	2.17	0.44
16:R:46:TRP:O	16:R:48:ARG:NH1	2.51	0.44
2:C:662:MET:HE3	2:C:662:MET:HB2	1.91	0.43
4:E:269:LEU:HD23	4:E:269:LEU:HA	1.87	0.43
5:F:359:HIS:ND1	5:F:366:ASP:OD1	2.51	0.43
14:P:87:LEU:HD22	14:P:134:VAL:HG21	2.00	0.43
2:C:692:LYS:HB3	2:C:692:LYS:HE2	1.64	0.43
5:F:276:ASP:OD2	5:F:277:PHE:N	2.51	0.43
5:F:417:ILE:HG22	5:F:418:GLU:H	1.83	0.43
7:H:519:ARG:NH1	18:T:132:TYR:CD1	2.85	0.43
12:M:143:LYS:NZ	12:M:145:SER:OG	2.51	0.43
12:M:189:PRO:HG3	12:M:251:TYR:OH	2.17	0.43
14:P:81:LYS:HB2	14:P:133:LYS:HE2	2.00	0.43
18:T:84:GLN:HB2	18:T:134:PHE:CD1	2.52	0.43
1:A:280:PRO:HG2	1:A:283:ILE:HG12	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:1059:LEU:HG	2:C:1070:LYS:HD3	2.01	0.43
3:D:44:HIS:HB2	3:D:49:LYS:H	1.83	0.43
3:D:455:ALA:HB3	3:D:456:PRO:HD3	2.00	0.43
4:E:360:GLY:HA2	9:J:224:ILE:HD13	2.00	0.43
4:E:475:HIS:ND1	7:H:96:ARG:HD2	2.33	0.43
4:E:1000:GLN:HB3	7:H:154:ASP:OD1	2.19	0.43
10:K:457:PRO:HA	10:K:460:TRP:CE2	2.53	0.43
13:N:205:THR:HB	13:N:209:VAL:HB	1.99	0.43
13:N:224:THR:HB	13:N:237:ARG:HH21	1.83	0.43
15:Q:659:LEU:HD12	15:Q:659:LEU:HA	1.89	0.43
1:A:316:ASP:HA	1:A:319:LYS:HG2	1.99	0.43
2:C:674:LEU:HD11	2:C:836:LEU:HG	2.00	0.43
3:D:666:GLU:O	3:D:670:GLN:HG2	2.18	0.43
4:E:1365:HIS:O	5:F:133:LEU:HB3	2.18	0.43
5:F:104:PRO:HB2	5:F:109:PHE:CE1	2.53	0.43
6:G:424:GLU:HG2	6:G:456:LYS:HD2	2.00	0.43
14:P:107:TRP:HZ3	17:S:214:VAL:HG11	1.82	0.43
6:G:674:ASP:HA	6:G:719:GLY:HA3	2.00	0.43
7:H:372:ASP:O	7:H:375:ARG:HG3	2.18	0.43
8:I:148:GLU:OE1	8:I:148:GLU:N	2.42	0.43
12:M:159:PRO:HG2	12:M:237:ARG:HH22	1.83	0.43
1:A:191:ASN:OD1	1:A:191:ASN:N	2.49	0.43
1:A:194:GLU:O	1:A:195:LYS:HG2	2.18	0.43
2:C:925:GLY:O	2:C:943:ILE:HD12	2.19	0.43
3:D:114:THR:HG21	3:D:119:LEU:HD22	2.01	0.43
6:G:603:SER:HB3	6:G:678:TRP:HE3	1.84	0.43
18:T:80:TRP:HH2	18:T:122:LEU:HD21	1.84	0.43
3:D:355:SER:O	3:D:359:VAL:HG13	2.19	0.43
4:E:571:LYS:NZ	4:E:800:ASP:OD1	2.51	0.43
4:E:928:PHE:HZ	4:E:1122:ILE:HD11	1.83	0.43
4:E:1180:LEU:HD13	4:E:1188:ILE:HD12	2.01	0.43
5:F:476:LYS:HG3	5:F:786:TRP:CD2	2.54	0.43
6:G:546:LYS:O	6:G:549:VAL:HG12	2.18	0.43
7:H:188:GLU:HB3	7:H:221:ARG:HE	1.83	0.43
10:K:283:LYS:HD3	10:K:283:LYS:N	2.32	0.43
15:Q:723:SER:O	15:Q:723:SER:OG	2.30	0.43
17:S:475:MET:HE3	17:S:475:MET:HB3	1.97	0.43
2:C:859:VAL:HB	4:E:57:LEU:HD23	2.01	0.43
3:D:253:HIS:O	3:D:257:THR:OG1	2.32	0.43
4:E:439:ARG:HE	4:E:439:ARG:HB2	1.58	0.43
4:E:991:SER:OG	4:E:993:LEU:O	2.30	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:H:315:HIS:O	7:H:318:ARG:NH2	2.51	0.43
7:H:353:ILE:O	8:I:254:ASN:ND2	2.52	0.43
14:P:100:ILE:HD12	14:P:131:ILE:HG12	2.01	0.43
15:Q:659:LEU:HA	15:Q:662:MET:HG2	2.01	0.43
20:Y:49:DG:H2''	20:Y:50:DA:C5	2.54	0.43
1:A:19:GLU:OE1	1:A:31:ARG:NH1	2.46	0.43
2:C:122:VAL:HG13	2:C:320:LEU:HD12	2.00	0.43
13:N:252:GLU:O	13:N:256:THR:HG23	2.18	0.43
14:P:88:GLN:HE21	17:S:314:LEU:HD12	1.83	0.43
15:Q:749:GLU:HA	15:Q:752:GLN:HG3	2.01	0.43
18:T:85:LEU:HD12	18:T:85:LEU:H	1.84	0.43
2:C:101:ILE:HG22	2:C:361:LEU:HD22	2.01	0.43
2:C:914:ALA:HB3	9:J:356:ARG:HH21	1.83	0.43
2:C:1000:VAL:HG12	3:D:508:GLU:HB3	2.00	0.43
4:E:1053:GLN:C	4:E:1055:TYR:H	2.27	0.43
6:G:745:LEU:HD13	6:G:793:MET:SD	2.59	0.43
7:H:76:TRP:CZ2	7:H:308:ASN:HB3	2.54	0.43
10:K:110:HIS:CD2	10:K:130:PRO:HB3	2.54	0.43
10:K:124:MET:HA	10:K:127:TRP:CE2	2.53	0.43
11:L:283:ASP:OD1	11:L:283:ASP:N	2.45	0.43
1:A:220:ARG:NH2	17:S:477:ASP:O	2.35	0.42
20:Y:44:DC:H2''	20:Y:45:DG:O4'	2.19	0.42
21:Z:33:G:H2'	21:Z:34:G:C8	2.53	0.42
1:A:175:VAL:HG13	1:A:177:MET:HE3	2.00	0.42
3:D:114:THR:HA	3:D:265:VAL:HA	2.01	0.42
3:D:219:TRP:CD1	3:D:241:LYS:HG2	2.53	0.42
3:D:256:ARG:HA	3:D:256:ARG:HD2	1.83	0.42
3:D:668:ALA:HA	16:R:71:GLN:NE2	2.18	0.42
4:E:70:TRP:CZ2	9:J:278:LEU:HD12	2.54	0.42
4:E:859:PHE:HB2	7:H:462:LYS:HA	2.00	0.42
5:F:98:ILE:HD13	5:F:98:ILE:HA	1.86	0.42
7:H:284:THR:HB	7:H:292:PHE:HB2	2.01	0.42
7:H:532:SER:HB3	13:N:214:TRP:HE1	1.83	0.42
12:M:193:ILE:HA	12:M:235:ASN:HD21	1.83	0.42
13:N:85:ASN:HA	13:N:88:ILE:HG12	2.01	0.42
18:T:85:LEU:HA	18:T:113:ARG:HA	2.00	0.42
1:A:43:ASP:OD1	1:A:43:ASP:N	2.52	0.42
1:B:55:GLY:HA3	1:B:157:TYR:CE2	2.54	0.42
3:D:6:LYS:HB2	4:E:1330:LYS:HD2	2.01	0.42
3:D:609:ASP:OD2	12:M:218:TYR:OH	2.35	0.42
4:E:1236:GLU:H	4:E:1236:GLU:HG2	1.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:192:GLU:OE2	5:F:192:GLU:N	2.51	0.42
7:H:535:GLN:NE2	7:H:541:LEU:HD11	2.34	0.42
8:I:142:PRO:HB3	8:I:239:TRP:CG	2.54	0.42
8:I:174:SER:HB2	8:I:213:TRP:CD2	2.54	0.42
10:K:403:LYS:HA	10:K:403:LYS:HD3	1.73	0.42
11:L:78:ASP:HA	11:L:81:LYS:HB2	2.01	0.42
2:C:592:THR:HG22	2:C:597:ILE:HG12	2.01	0.42
5:F:444:GLY:HA2	15:Q:626:ARG:NH2	2.34	0.42
5:F:558:ASN:HA	5:F:561:TYR:CD2	2.54	0.42
6:G:617:LEU:HD23	6:G:617:LEU:HA	1.88	0.42
11:L:114:ARG:HH21	11:L:115:ARG:HH12	1.66	0.42
11:L:345:PRO:HA	11:L:394:ALA:HB2	2.01	0.42
15:Q:614:ILE:O	15:Q:640:SER:OG	2.31	0.42
15:Q:624:ASN:C	15:Q:625:GLU:HG3	2.44	0.42
17:S:438:PRO:HA	17:S:441:VAL:HG22	2.01	0.42
18:T:63:VAL:HG21	18:T:87:TYR:HD2	1.83	0.42
2:C:458:VAL:HG12	2:C:467:ARG:NH2	2.34	0.42
3:D:160:LEU:HD13	3:D:192:ILE:HD11	2.01	0.42
3:D:168:ILE:HG22	3:D:171:TRP:H	1.84	0.42
7:H:370:ASN:HD22	7:H:373:GLU:HG3	1.83	0.42
14:O:136:THR:HG21	14:O:151:LEU:HD21	2.00	0.42
17:S:242:TYR:OH	17:S:476:GLU:OE2	2.32	0.42
1:A:64:ARG:HB3	1:A:150:LYS:HB2	2.01	0.42
3:D:221:GLN:O	3:D:224:GLU:HG2	2.20	0.42
4:E:254:ASP:OD1	4:E:265:ARG:N	2.48	0.42
4:E:273:LEU:HD23	4:E:273:LEU:HA	1.88	0.42
4:E:904:PHE:CE1	18:T:94:ARG:HD2	2.55	0.42
5:F:480:LEU:HD11	5:F:484:LYS:HE3	2.02	0.42
6:G:478:PHE:O	6:G:481:MET:HB2	2.20	0.42
7:H:137:GLU:HA	7:H:140:ALA:HB3	2.01	0.42
9:J:415:ASN:HD22	9:J:416:MET:H	1.66	0.42
15:Q:755:ILE:HG23	15:Q:764:LEU:HD22	2.01	0.42
2:C:127:LEU:HD21	2:C:315:ARG:HD2	2.02	0.42
2:C:553:GLN:HB3	2:C:953:ILE:HG12	2.02	0.42
3:D:386:VAL:HB	3:D:490:PHE:CE2	2.55	0.42
5:F:158:GLN:OE1	5:F:158:GLN:HA	2.20	0.42
6:G:463:GLU:O	6:G:467:GLN:HG2	2.19	0.42
6:G:688:VAL:HA	6:G:691:GLU:HG3	2.01	0.42
8:I:161:ARG:NH1	8:I:234:ASN:OD1	2.49	0.42
8:I:214:GLU:O	8:I:218:TYR:HB2	2.20	0.42
11:L:100:ASP:OD1	11:L:100:ASP:N	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:N:79:THR:HA	13:N:82:GLU:CD	2.45	0.42
1:A:141:GLU:O	1:A:143:ILE:HD12	2.20	0.42
2:C:73:SER:HA	2:C:117:GLY:HA3	2.02	0.42
3:D:128:ASN:HD21	3:D:246:ARG:NH1	2.10	0.42
5:F:122:GLU:HG2	5:F:159:ARG:HH12	1.85	0.42
5:F:164:LEU:HD22	5:F:174:ILE:HB	2.01	0.42
6:G:420:MET:SD	6:G:456:LYS:NZ	2.91	0.42
6:G:650:VAL:HA	6:G:653:VAL:HG12	2.01	0.42
8:I:223:ASN:HB3	13:N:76:HIS:NE2	2.35	0.42
15:Q:635:ILE:HA	15:Q:638:GLU:HG2	2.01	0.42
16:R:38:ARG:HG2	16:R:44:ARG:HA	2.01	0.42
1:A:131:ASP:HB3	1:A:134:GLN:HG3	2.02	0.42
2:C:943:ILE:HG22	4:E:56:SER:OG	2.20	0.42
4:E:1080:ALA:HB3	4:E:1083:GLU:HG3	2.01	0.42
5:F:284:THR:O	5:F:288:VAL:HG23	2.20	0.42
7:H:252:TYR:HB2	10:K:321:TYR:CE2	2.55	0.42
7:H:536:ALA:HB3	13:N:206:PRO:HG2	2.02	0.42
10:K:103:PHE:CE1	14:O:169:GLU:HB3	2.55	0.42
10:K:108:ARG:NH2	10:K:308:GLU:OE2	2.48	0.42
10:K:319:PRO:HG3	10:K:328:GLN:NE2	2.34	0.42
11:L:127:MET:HE2	11:L:279:ILE:HG23	2.01	0.42
2:C:313:ARG:C	2:C:314:ILE:HD13	2.45	0.42
2:C:380:ARG:HB2	2:C:616:SER:HB2	2.01	0.42
2:C:789:ASP:HB3	2:C:809:TYR:CD1	2.55	0.42
7:H:70:GLU:H	7:H:70:GLU:HG3	1.74	0.42
7:H:74:ARG:NH1	7:H:74:ARG:HB2	2.35	0.42
8:I:128:ASP:OD1	8:I:128:ASP:N	2.52	0.42
1:B:132:ASN:OD1	1:B:132:ASN:N	2.46	0.41
1:B:191:ASN:HB3	16:R:155:GLY:O	2.19	0.41
5:F:132:GLU:HG2	5:F:139:PRO:HB3	2.00	0.41
5:F:196:LYS:HE3	5:F:196:LYS:HB3	1.69	0.41
5:F:752:MET:HE3	5:F:752:MET:HB2	1.93	0.41
6:G:618:LEU:HD13	6:G:638:LYS:HE2	2.01	0.41
11:L:148:PRO:HG2	11:L:240:ILE:HD11	2.02	0.41
13:N:156:ASP:O	13:N:159:GLU:HG3	2.20	0.41
4:E:1006:TYR:CE1	8:I:246:MET:HE2	2.55	0.41
7:H:519:ARG:HH21	18:T:69:TRP:CB	2.32	0.41
13:N:77:HIS:CE1	13:N:125:GLU:HG2	2.56	0.41
13:N:158:VAL:HG22	13:N:162:LYS:HE2	2.02	0.41
14:P:88:GLN:HE21	17:S:314:LEU:HD13	1.85	0.41
15:Q:746:TYR:CE2	15:Q:749:GLU:HG2	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
19:X:63:DA:H2''	19:X:64:DG:N7	2.36	0.41
1:A:119:ARG:HH11	1:A:119:ARG:HG2	1.84	0.41
4:E:574:ARG:NH2	7:H:398:LEU:HD13	2.35	0.41
4:E:1125:GLU:CD	4:E:1125:GLU:H	2.27	0.41
5:F:389:ASP:OD1	5:F:392:ARG:NH2	2.53	0.41
6:G:576:VAL:O	6:G:580:ARG:HG2	2.20	0.41
6:G:594:SER:C	6:G:630:HIS:HE1	2.28	0.41
6:G:700:GLU:OE1	6:G:715:ARG:NH2	2.50	0.41
7:H:397:LEU:HB3	7:H:520:SER:HB3	2.02	0.41
8:I:168:ALA:HB2	8:I:177:VAL:HG21	2.02	0.41
11:L:79:PHE:O	11:L:281:TYR:OH	2.20	0.41
1:A:275:ASP:OD2	1:A:284:TYR:OH	2.36	0.41
1:A:282:ARG:HB2	17:S:193:ILE:HG21	2.02	0.41
2:C:1045:VAL:HG22	2:C:1055:LEU:HD23	2.02	0.41
5:F:612:LYS:HE3	5:F:760:VAL:HB	2.02	0.41
6:G:528:PHE:O	6:G:532:ILE:HG12	2.20	0.41
8:I:149:GLN:HG3	8:I:246:MET:HE1	2.03	0.41
10:K:218:LEU:O	10:K:249:THR:OG1	2.32	0.41
12:M:200:TYR:N	12:M:226:LYS:O	2.52	0.41
15:Q:573:VAL:HA	15:Q:574:PRO:HD3	1.91	0.41
15:Q:618:ILE:HD12	15:Q:618:ILE:N	2.36	0.41
1:B:55:GLY:HA3	1:B:157:TYR:CZ	2.56	0.41
2:C:309:LEU:HB2	2:C:416:SER:HB2	2.01	0.41
4:E:37:HIS:NE2	16:R:75:ILE:HD11	2.34	0.41
7:H:188:GLU:HG2	7:H:221:ARG:HH21	1.85	0.41
7:H:260:LYS:HB2	7:H:260:LYS:HE2	1.80	0.41
7:H:318:ARG:HG2	7:H:321:MET:HE3	2.02	0.41
13:N:131:ILE:HG22	13:N:248:LEU:HB3	2.02	0.41
17:S:195:HIS:CD2	17:S:195:HIS:H	2.38	0.41
17:S:481:THR:HG21	17:S:538:GLY:O	2.21	0.41
1:B:25:LYS:HD2	1:B:25:LYS:N	2.35	0.41
3:D:382:SER:OG	3:D:474:ARG:O	2.37	0.41
3:D:536:LEU:HD12	3:D:536:LEU:HA	1.88	0.41
4:E:1261:LEU:HD22	5:F:340:GLU:HG3	2.03	0.41
5:F:272:GLU:O	5:F:279:LYS:NZ	2.41	0.41
6:G:798:GLN:O	6:G:801:GLN:NE2	2.54	0.41
13:N:131:ILE:HA	13:N:248:LEU:O	2.20	0.41
14:O:171:LEU:HD23	14:O:171:LEU:HA	1.95	0.41
18:T:115:PRO:HD2	18:T:118:LEU:HD22	2.02	0.41
1:B:21:ARG:HH12	16:R:69:GLU:HG2	1.86	0.41
3:D:157:PHE:CE2	15:Q:699:VAL:HG21	2.55	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:654:THR:OG1	3:D:655:THR:N	2.51	0.41
4:E:805:LYS:NZ	13:N:186:ALA:O	2.50	0.41
4:E:1259:ARG:NH1	5:F:762:ASP:O	2.51	0.41
5:F:444:GLY:HA2	15:Q:626:ARG:HH21	1.86	0.41
6:G:521:ILE:H	6:G:521:ILE:HG13	1.62	0.41
6:G:742:LEU:HD12	6:G:743:PRO:HD2	2.03	0.41
7:H:504:ARG:HD2	7:H:504:ARG:O	2.21	0.41
11:L:153:ILE:HG23	11:L:165:ARG:HG2	2.03	0.41
14:O:146:MET:HE3	14:O:146:MET:HB3	1.88	0.41
19:X:69:DG:H2'	19:X:70:DA:C8	2.55	0.41
3:D:405:LEU:HD23	3:D:499:VAL:HG23	2.02	0.41
3:D:436:ILE:HD12	3:D:436:ILE:HA	1.92	0.41
3:D:493:ASP:OD1	3:D:493:ASP:N	2.54	0.41
4:E:1051:LEU:HD23	4:E:1051:LEU:HA	1.89	0.41
7:H:236:ASN:CG	7:H:239:ARG:HH12	2.28	0.41
9:J:359:MET:HE2	9:J:359:MET:HB3	2.00	0.41
2:C:844:LEU:HB2	2:C:846:ASP:OD1	2.20	0.41
3:D:206:LEU:HD23	3:D:206:LEU:HA	1.89	0.41
3:D:609:ASP:OD1	3:D:611:ARG:NH2	2.42	0.41
4:E:862:VAL:HG21	7:H:412:VAL:HG21	2.02	0.41
4:E:1365:HIS:CE1	5:F:130:ARG:HG2	2.55	0.41
5:F:248:PHE:HB3	5:F:271:MET:SD	2.60	0.41
6:G:618:LEU:O	6:G:622:LEU:HG	2.21	0.41
8:I:166:ASN:O	8:I:170:THR:OG1	2.32	0.41
10:K:110:HIS:CE1	10:K:112:ASN:HB3	2.56	0.41
10:K:418:GLU:O	10:K:422:ARG:HG3	2.21	0.41
11:L:197:LEU:HD11	11:L:334:MET:HE3	2.02	0.41
12:M:142:HIS:CE1	12:M:155:LYS:HD3	2.56	0.41
13:N:178:TYR:CE2	13:N:180:ALA:HB2	2.56	0.41
20:Y:20:DC:H2'	20:Y:21:DT:H71	2.03	0.41
4:E:357:PRO:HG2	4:E:358:TYR:CE1	2.56	0.41
4:E:359:ASN:OD1	4:E:418:SER:N	2.54	0.41
6:G:481:MET:HE1	6:G:488:PRO:HA	2.03	0.41
7:H:273:TYR:OH	8:I:98:GLY:O	2.31	0.41
7:H:536:ALA:O	13:N:207:ASN:ND2	2.53	0.41
13:N:264:ARG:O	13:N:267:GLN:HG2	2.21	0.41
14:P:176:MET:HE2	14:P:176:MET:HB3	1.81	0.41
4:E:478:ILE:HD11	4:E:1129:LEU:HD13	2.03	0.40
6:G:555:ARG:HE	6:G:556:CYS:H	1.69	0.40
8:I:218:TYR:O	8:I:222:LYS:HG3	2.20	0.40
8:I:218:TYR:CZ	13:N:227:HIS:HB2	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
16:R:45:ILE:O	16:R:45:ILE:HG13	2.21	0.40
19:X:47:DG:OP1	19:X:47:DG:H8	2.04	0.40
2:C:74:LEU:O	2:C:117:GLY:N	2.50	0.40
2:C:658:LEU:HD21	2:C:844:LEU:HD11	2.04	0.40
4:E:574:ARG:HH21	7:H:398:LEU:HD13	1.87	0.40
4:E:1251:LEU:O	4:E:1255:GLU:HG3	2.21	0.40
5:F:84:ASN:HA	5:F:85:ARG:HH21	1.86	0.40
7:H:137:GLU:HG3	7:H:137:GLU:H	1.69	0.40
8:I:110:ASN:HB3	8:I:113:ASN:O	2.21	0.40
12:M:134:TYR:OH	12:M:170:TYR:OH	2.28	0.40
13:N:204:LYS:HE2	18:T:139:ASP:HA	2.02	0.40
15:Q:590:VAL:HG21	15:Q:737:ARG:HG3	2.03	0.40
19:X:62:DG:H2''	19:X:63:DA:C8	2.56	0.40
20:Y:37:DC:H2'	20:Y:38:DG:C8	2.56	0.40
3:D:159:ARG:HD3	15:Q:763:ARG:HD3	2.03	0.40
3:D:322:MET:SD	3:D:322:MET:C	3.05	0.40
4:E:306:ARG:HA	4:E:313:LEU:HA	2.03	0.40
5:F:482:ASP:HA	5:F:485:VAL:HG22	2.03	0.40
7:H:189:ALA:HB2	7:H:221:ARG:HD3	2.04	0.40
8:I:106:LYS:HG2	8:I:201:VAL:HA	2.03	0.40
11:L:102:PHE:N	25:L:8001:SAH:OXT	2.38	0.40
11:L:264:MET:HE2	11:L:264:MET:HB2	1.94	0.40
18:T:116:LYS:HE3	18:T:117:TRP:CE2	2.57	0.40
2:C:309:LEU:HD23	2:C:309:LEU:HA	1.85	0.40
2:C:829:LYS:NZ	21:Z:40:G:OP1	2.41	0.40
3:D:548:ARG:HH21	12:M:310:GLU:HG2	1.86	0.40
5:F:366:ASP:OD2	5:F:369:SER:OG	2.35	0.40
6:G:506:PHE:O	6:G:510:GLU:HG3	2.22	0.40
8:I:201:VAL:HG23	8:I:202:TRP:CD2	2.56	0.40
14:O:128:ASN:OD1	14:O:128:ASN:N	2.54	0.40
14:P:91:VAL:HG11	17:S:314:LEU:HD21	2.03	0.40
2:C:60:VAL:O	2:C:78:SER:HB2	2.22	0.40
2:C:976:LEU:HD11	21:Z:31:C:N3	2.35	0.40
3:D:120:LYS:HE2	3:D:341:ARG:HA	2.02	0.40
3:D:382:SER:HB2	3:D:401:ILE:HD11	2.04	0.40
4:E:889:ASN:OD1	4:E:889:ASN:C	2.64	0.40
5:F:407:ARG:HG3	5:F:408:LYS:HD3	2.03	0.40
7:H:73:ARG:HA	8:I:260:ILE:HD13	2.04	0.40
11:L:411:PRO:O	11:L:415:ARG:HG2	2.21	0.40
15:Q:615:ILE:HA	15:Q:642:VAL:O	2.21	0.40
20:Y:48:DG:H2''	20:Y:49:DG:C8	2.56	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	A	295/327 (90%)	287 (97%)	8 (3%)	0	100	100
1	B	212/327 (65%)	206 (97%)	6 (3%)	0	100	100
2	C	710/1072 (66%)	689 (97%)	20 (3%)	1 (0%)	48	70
3	D	571/680 (84%)	554 (97%)	17 (3%)	0	100	100
4	E	874/1373 (64%)	842 (96%)	31 (4%)	1 (0%)	48	70
5	F	558/911 (61%)	535 (96%)	22 (4%)	1 (0%)	44	65
6	G	379/862 (44%)	367 (97%)	12 (3%)	0	100	100
7	H	432/675 (64%)	423 (98%)	9 (2%)	0	100	100
8	I	213/263 (81%)	204 (96%)	9 (4%)	0	100	100
9	J	230/529 (44%)	225 (98%)	5 (2%)	0	100	100
10	K	372/460 (81%)	363 (98%)	9 (2%)	0	100	100
11	L	402/483 (83%)	392 (98%)	9 (2%)	1 (0%)	44	65
12	M	202/334 (60%)	199 (98%)	3 (2%)	0	100	100
13	N	211/297 (71%)	204 (97%)	7 (3%)	0	100	100
14	O	112/185 (60%)	110 (98%)	2 (2%)	0	100	100
14	P	106/185 (57%)	105 (99%)	1 (1%)	0	100	100
15	Q	214/768 (28%)	202 (94%)	12 (6%)	0	100	100
16	R	108/162 (67%)	107 (99%)	1 (1%)	0	100	100
17	S	382/611 (62%)	367 (96%)	15 (4%)	0	100	100
18	T	102/140 (73%)	96 (94%)	6 (6%)	0	100	100
All	All	6685/10644 (63%)	6477 (97%)	204 (3%)	4 (0%)	50	70

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	F	553	ILE
2	C	1030	THR
11	L	405	ILE
4	E	1183	PRO

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	A	275/301 (91%)	273 (99%)	2 (1%)	81	92
1	B	191/301 (64%)	190 (100%)	1 (0%)	86	95
2	C	626/931 (67%)	619 (99%)	7 (1%)	70	86
3	D	524/608 (86%)	518 (99%)	6 (1%)	70	86
4	E	805/1230 (65%)	800 (99%)	5 (1%)	84	94
5	F	484/782 (62%)	480 (99%)	4 (1%)	79	91
6	G	331/740 (45%)	326 (98%)	5 (2%)	60	80
7	H	394/609 (65%)	388 (98%)	6 (2%)	60	80
8	I	187/230 (81%)	186 (100%)	1 (0%)	86	95
9	J	212/469 (45%)	210 (99%)	2 (1%)	75	89
10	K	329/401 (82%)	329 (100%)	0	100	100
11	L	362/431 (84%)	359 (99%)	3 (1%)	79	91
12	M	195/299 (65%)	194 (100%)	1 (0%)	86	95
13	N	185/259 (71%)	182 (98%)	3 (2%)	58	78
14	O	103/169 (61%)	103 (100%)	0	100	100
14	P	97/169 (57%)	97 (100%)	0	100	100
15	Q	190/661 (29%)	185 (97%)	5 (3%)	41	66
16	R	101/144 (70%)	101 (100%)	0	100	100
17	S	336/532 (63%)	332 (99%)	4 (1%)	67	84
18	T	93/126 (74%)	92 (99%)	1 (1%)	70	86
All	All	6020/9392 (64%)	5964 (99%)	56 (1%)	74	89

All (56) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	61	CYS
1	A	73	ASP
1	B	109	CYS
2	C	377	VAL
2	C	469	LEU
2	C	493	ILE
2	C	505	GLN
2	C	659	VAL
2	C	923	TYR
2	C	1021	VAL
3	D	1	MET
3	D	12	ILE
3	D	116	VAL
3	D	217	VAL
3	D	257	THR
3	D	515	SER
4	E	83	GLU
4	E	318	GLU
4	E	369	VAL
4	E	425	ILE
4	E	502	ILE
5	F	318	VAL
5	F	412	LEU
5	F	450	VAL
5	F	804	GLU
6	G	480	THR
6	G	579	CYS
6	G	708	VAL
6	G	711	VAL
6	G	767	THR
7	H	321	MET
7	H	418	LEU
7	H	516	HIS
7	H	518	ARG
7	H	525	GLU
7	H	535	GLN
8	I	143	ILE
9	J	224	ILE
9	J	335	THR
11	L	192	ASP
11	L	303	ILE
11	L	414	GLU

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Mol	Chain	Res	Type
12	M	136	ILE
13	N	63	HIS
13	N	144	LEU
13	N	158	VAL
15	Q	579	LEU
15	Q	595	THR
15	Q	633	THR
15	Q	669	THR
15	Q	748	ASP
17	S	273	ASP
17	S	334	VAL
17	S	355	MET
17	S	389	GLU
18	T	133	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (110) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	132	ASN
1	A	181	ASN
1	A	193	ASN
1	A	276	GLN
1	A	293	HIS
1	A	303	GLN
1	B	76	ASN
1	B	180	GLN
1	B	184	HIS
1	B	196	GLN
2	C	16	ASN
2	C	58	GLN
2	C	103	ASN
2	C	124	ASN
2	C	307	ASN
2	C	311	ASN
2	C	322	GLN
2	C	324	GLN
2	C	516	HIS
2	C	538	HIS
2	C	542	ASN
2	C	551	GLN
2	C	624	GLN
2	C	867	GLN

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Mol	Chain	Res	Type
2	C	883	HIS
2	C	974	GLN
2	C	1014	HIS
2	C	1057	HIS
2	C	1068	ASN
3	D	44	HIS
3	D	128	ASN
3	D	338	ASN
3	D	350	ASN
3	D	446	GLN
3	D	518	ASN
3	D	607	GLN
3	D	610	GLN
3	D	629	ASN
3	D	636	HIS
3	D	674	GLN
4	E	87	HIS
4	E	118	ASN
4	E	144	HIS
4	E	159	GLN
4	E	310	HIS
4	E	378	HIS
4	E	575	ASN
4	E	807	ASN
4	E	863	ASN
4	E	922	HIS
4	E	1011	ASN
4	E	1038	ASN
4	E	1053	GLN
4	E	1291	GLN
4	E	1315	ASN
4	E	1365	HIS
5	F	270	ASN
5	F	360	ASN
5	F	363	ASN
5	F	788	GLN
6	G	518	ASN
6	G	537	GLN
6	G	582	GLN
6	G	624	ASN
6	G	628	ASN
6	G	648	GLN

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Mol	Chain	Res	Type
6	G	817	ASN
7	H	249	GLN
7	H	322	HIS
7	H	484	HIS
8	I	123	GLN
8	I	126	ASN
8	I	149	GLN
8	I	166	ASN
8	I	215	HIS
8	I	235	HIS
8	I	254	ASN
9	J	340	ASN
9	J	415	ASN
10	K	110	HIS
10	K	112	ASN
10	K	224	ASN
10	K	299	GLN
10	K	328	GLN
10	K	414	GLN
11	L	134	HIS
11	L	220	GLN
11	L	233	HIS
11	L	309	ASN
11	L	323	ASN
11	L	377	HIS
12	M	142	HIS
12	M	190	GLN
13	N	207	ASN
14	O	88	GLN
14	O	147	GLN
14	P	88	GLN
14	P	147	GLN
14	P	175	GLN
15	Q	745	GLN
16	R	71	GLN
16	R	114	ASN
17	S	195	HIS
17	S	277	GLN
17	S	284	ASN
17	S	371	ASN
17	S	469	ASN
17	S	510	ASN

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Mol	Chain	Res	Type
17	S	562	ASN
18	T	55	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
21	Z	10/40 (25%)	2 (20%)	1 (10%)

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
21	Z	32	C
21	Z	34	G

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
21	Z	31	C

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 5 ligands modelled in this entry, 4 are monoatomic - leaving 1 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
25	SAH	L	8001	-	24,28,28	1.21	3 (12%)	25,40,40	1.79	5 (20%)

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
25	SAH	L	8001	-	-	3/11/31/31	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
25	L	8001	SAH	C2-N3	3.93	1.38	1.32
25	L	8001	SAH	C2-N1	2.41	1.38	1.33
25	L	8001	SAH	OXT-C	-2.20	1.23	1.30

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
25	L	8001	SAH	N3-C2-N1	-5.38	120.27	128.68
25	L	8001	SAH	C5'-SD-CG	-3.85	90.72	102.27
25	L	8001	SAH	C3'-C2'-C1'	3.25	105.86	100.98
25	L	8001	SAH	OXT-C-O	-2.69	117.99	124.09
25	L	8001	SAH	OXT-C-CA	2.27	121.12	113.38

There are no chirality outliers.

All (3) torsion outliers are listed below:

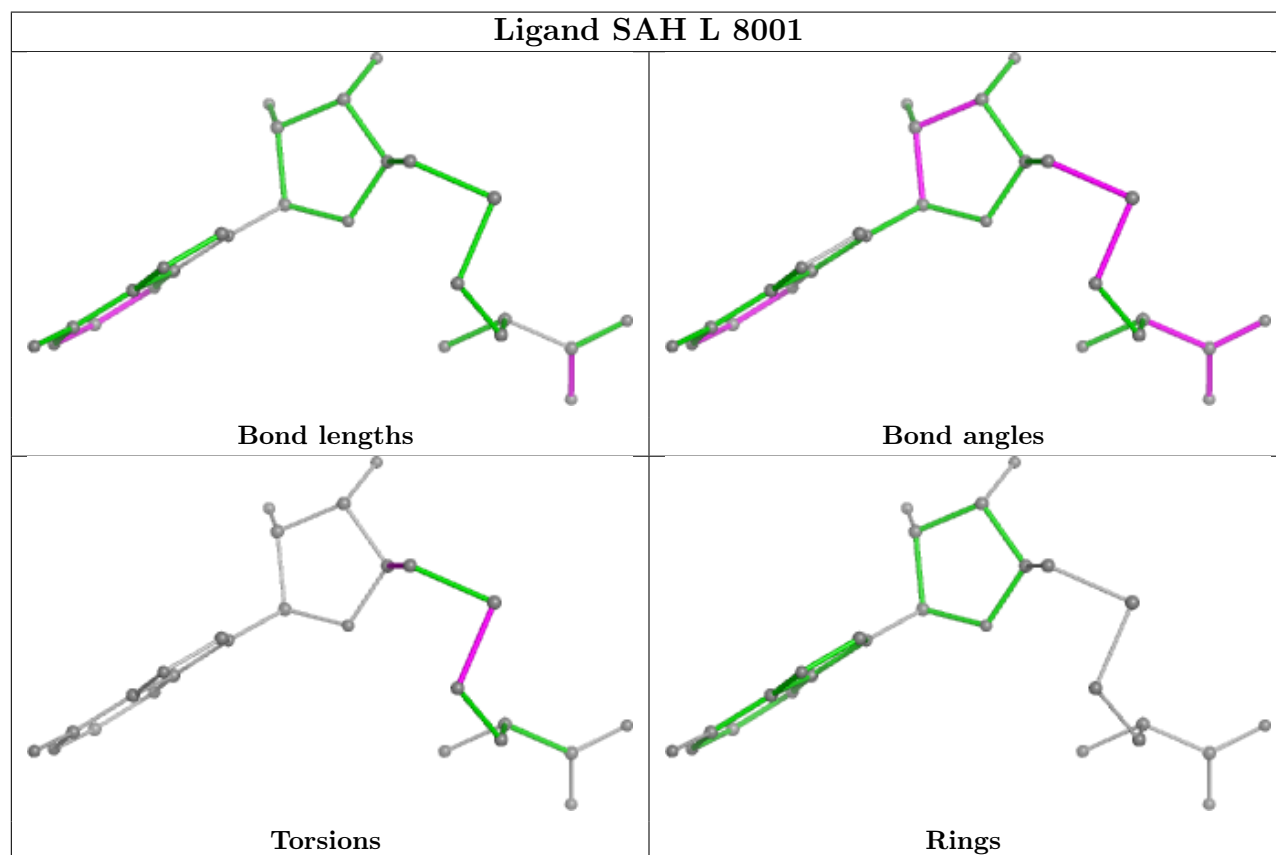
Mol	Chain	Res	Type	Atoms
25	L	8001	SAH	O4'-C4'-C5'-SD
25	L	8001	SAH	C3'-C4'-C5'-SD
25	L	8001	SAH	CB-CG-SD-C5'

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
25	L	8001	SAH	2	0

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



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

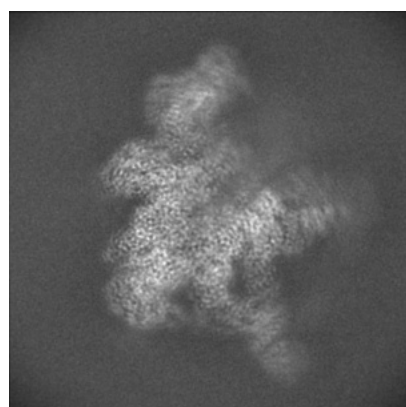
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19023. These allow visual inspection of the internal detail of the map and identification of artifacts.

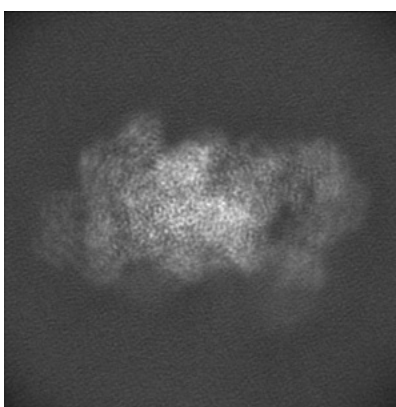
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

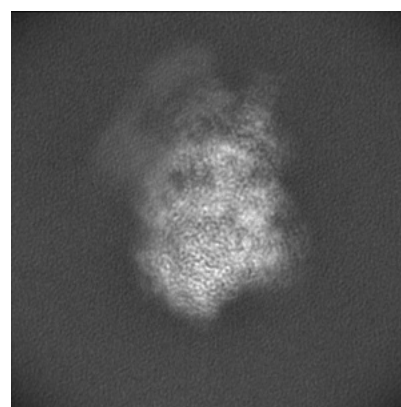
6.1.1 Primary map



X



Y



Z

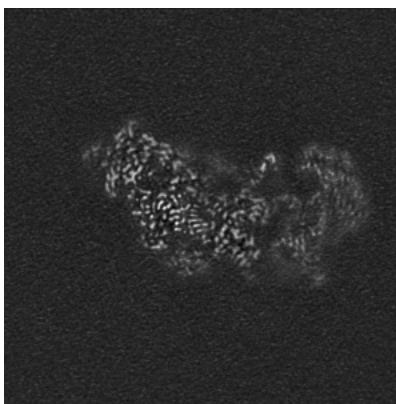
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

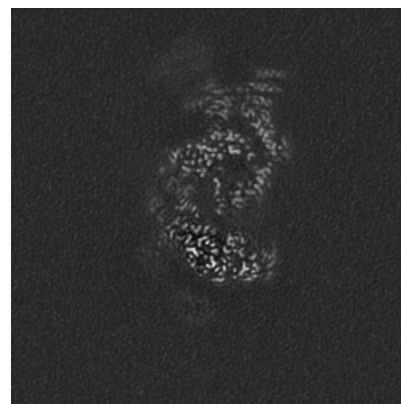
6.2.1 Primary map



X Index: 300



Y Index: 300

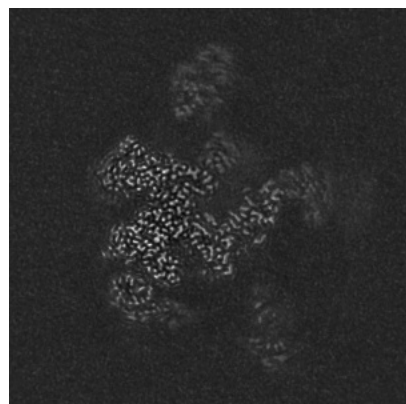


Z Index: 300

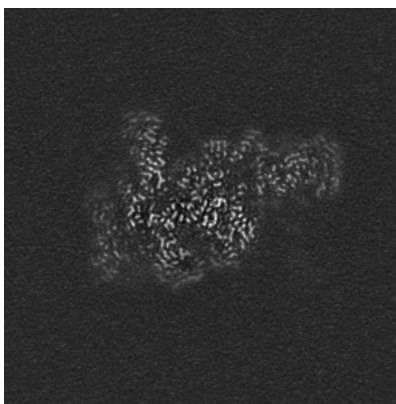
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

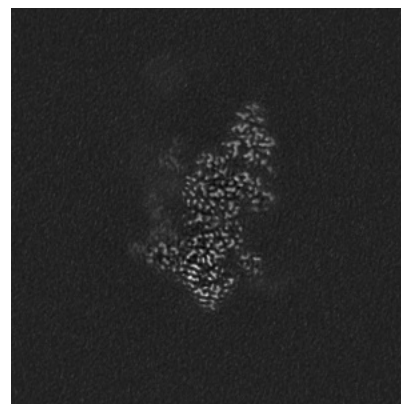
6.3.1 Primary map



X Index: 288



Y Index: 233

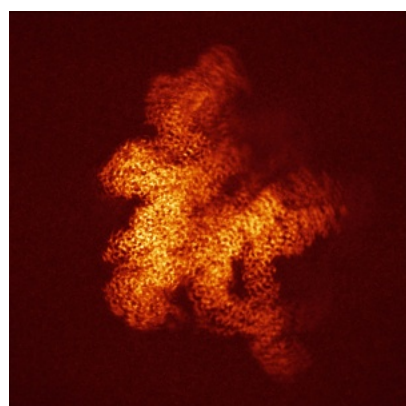


Z Index: 253

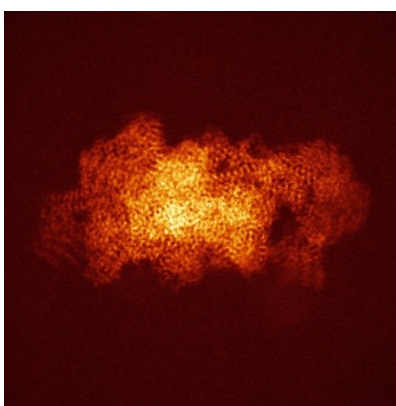
The images above show the largest variance slices of the map in three orthogonal directions.

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

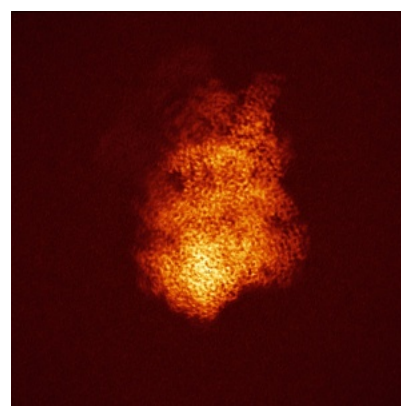
6.4.1 Primary map



X



Y

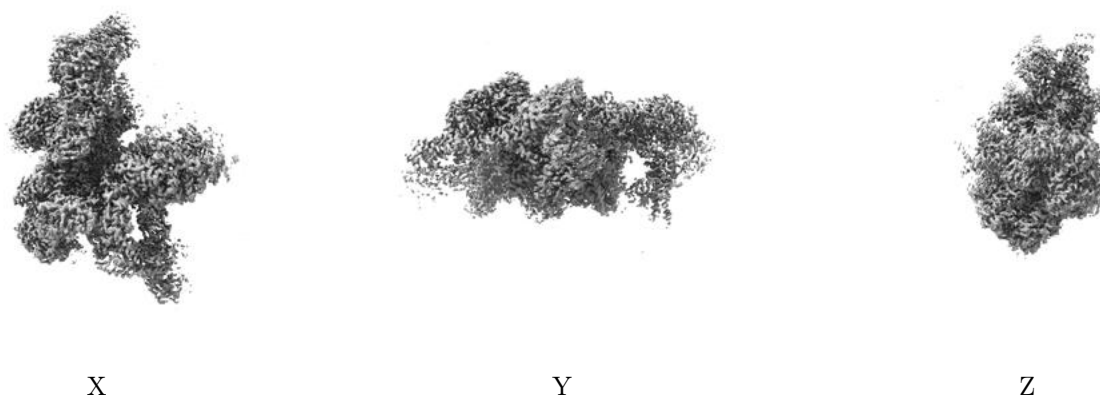


Z

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 0.8. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

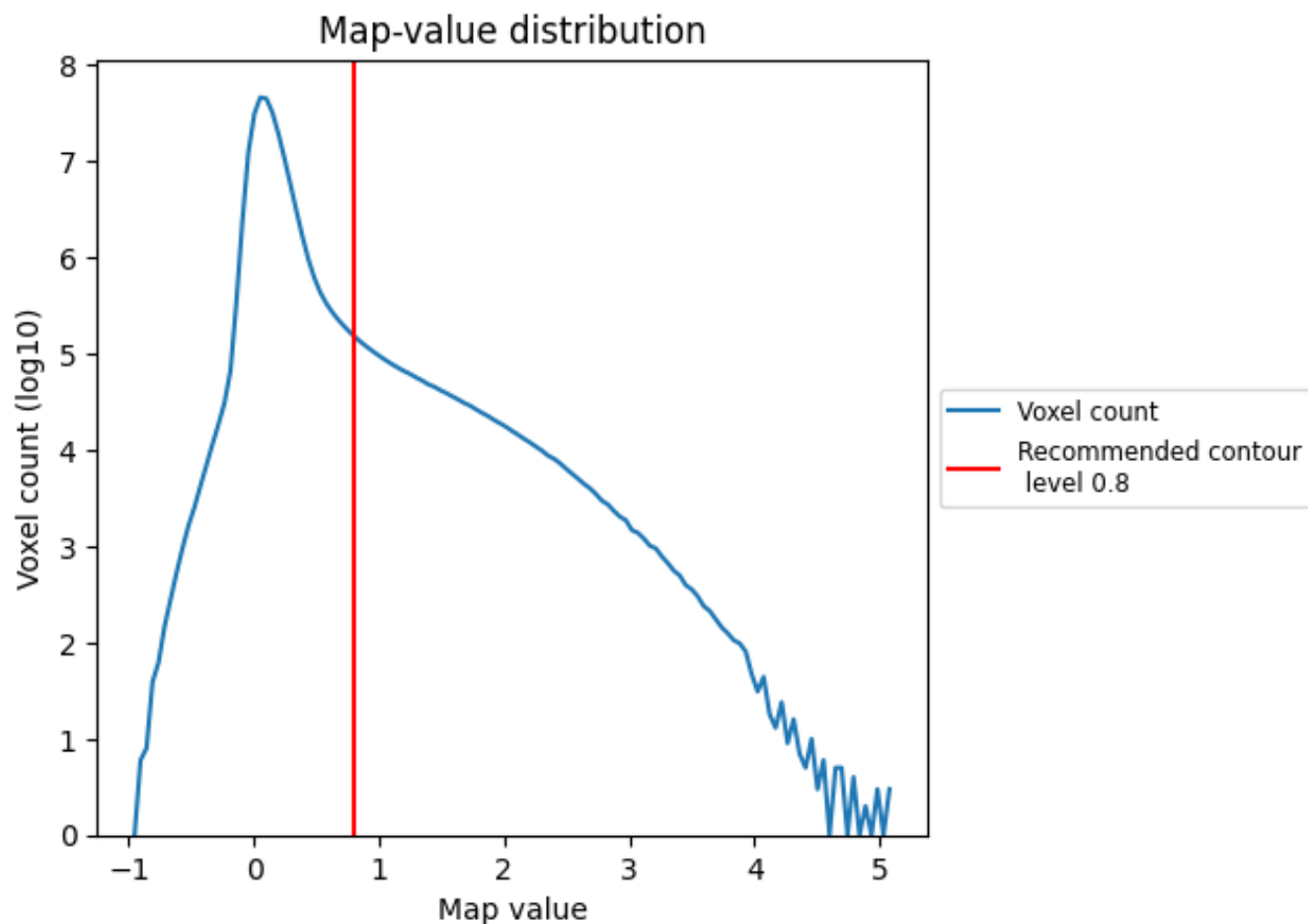
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

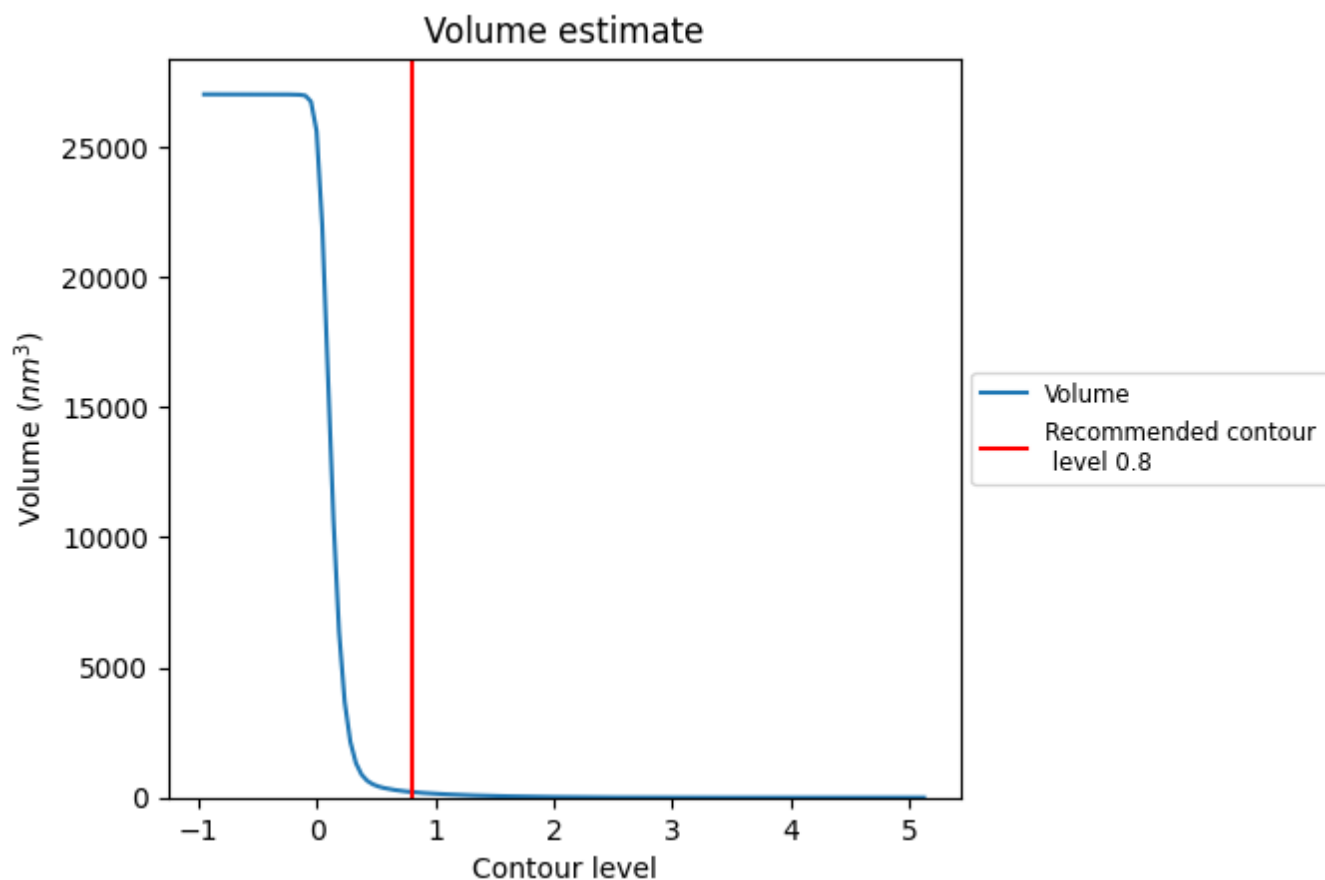
This section contains the results of statistical analysis of the map.

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.

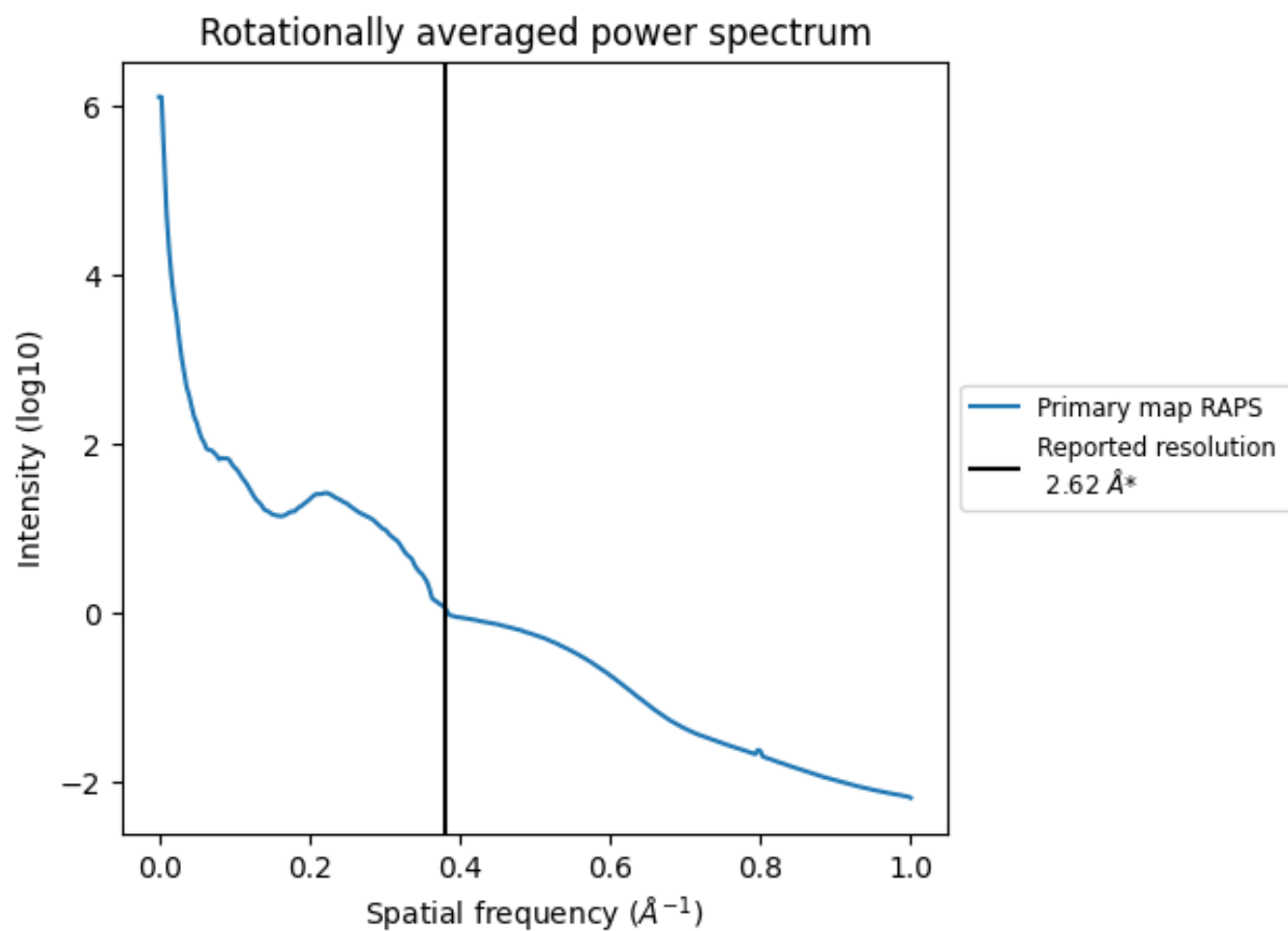
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 214 nm³; this corresponds to an approximate mass of 193 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 0.382 Å⁻¹

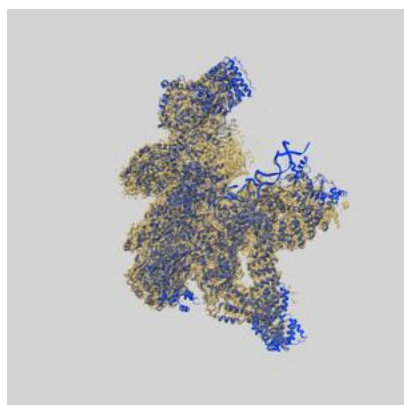
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

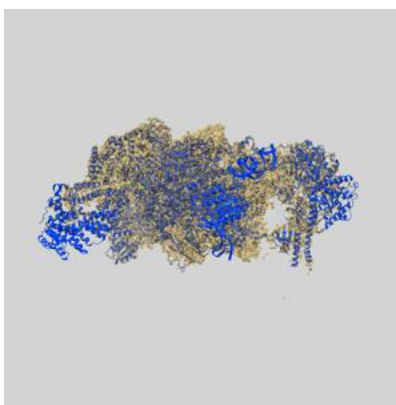
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-19023 and PDB model 8RAS. Per-residue inclusion information can be found in [section 3](#) on [page 10](#).

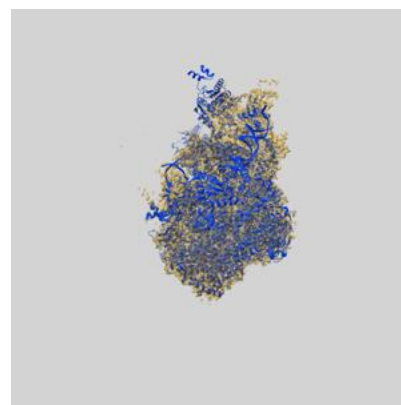
9.1 Map-model overlay [i](#)



X



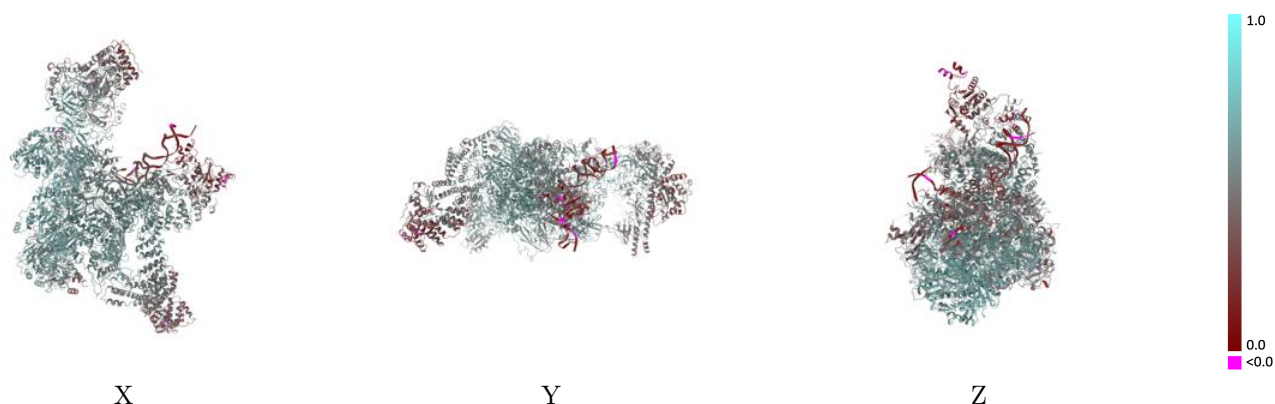
Y



Z

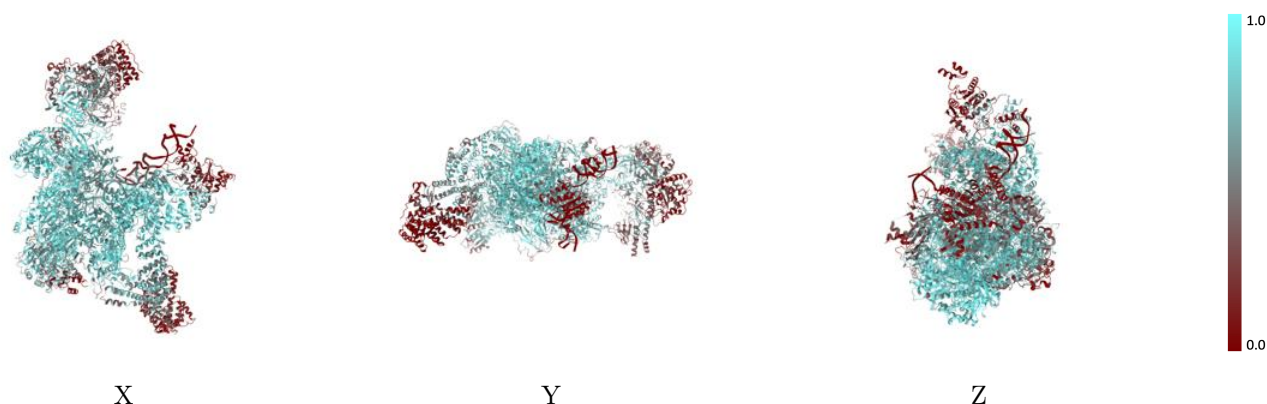
The images above show the 3D surface view of the map at the recommended contour level 0.8 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



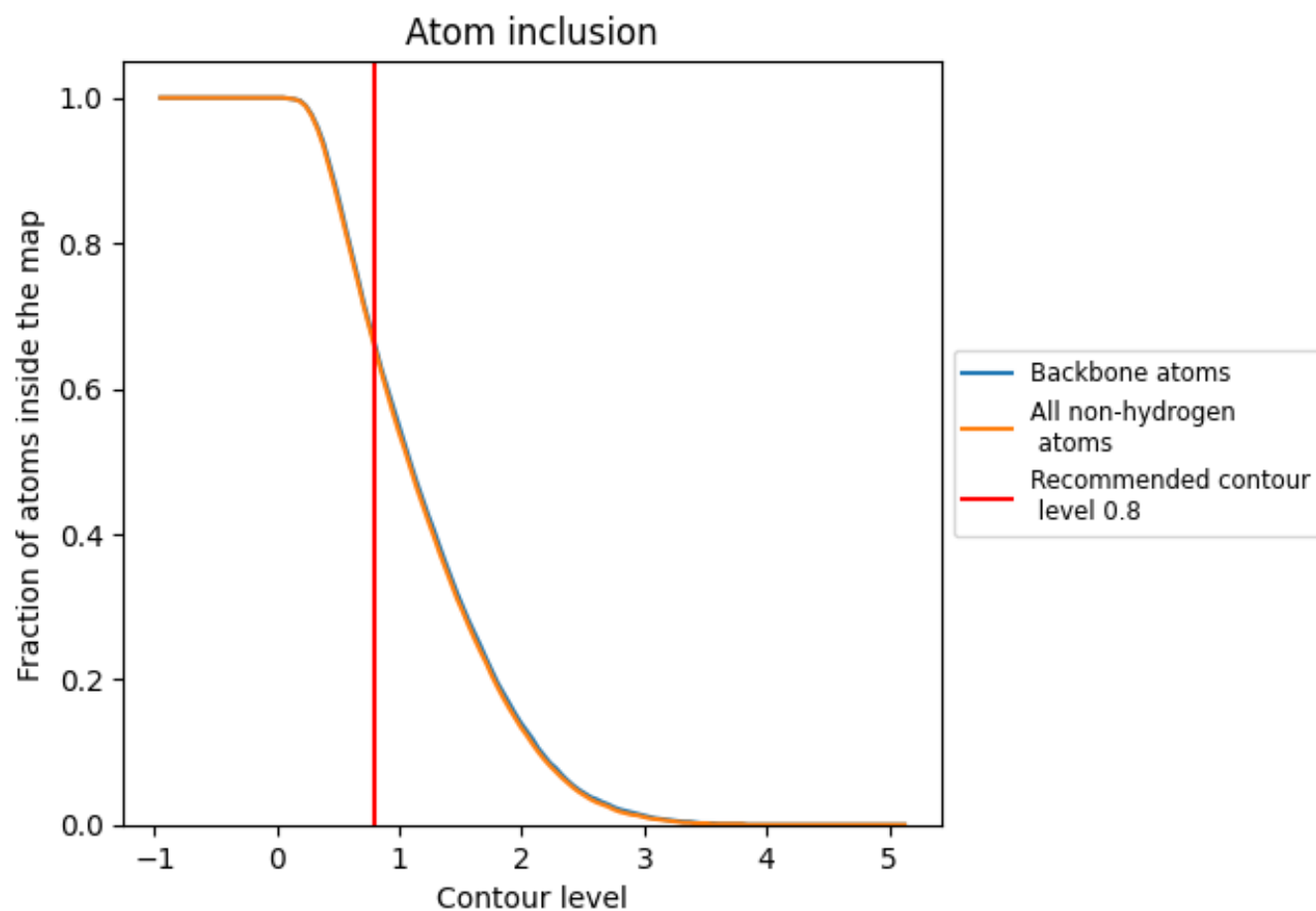
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.8).

9.4 Atom inclusion [i](#)



At the recommended contour level, 66% of all backbone atoms, 66% 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 (0.8) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6550	 0.5390
A	 0.6730	 0.5750
B	 0.7620	 0.6040
C	 0.8390	 0.6080
D	 0.7920	 0.5650
E	 0.7150	 0.5640
F	 0.7320	 0.5230
G	 0.1440	 0.3750
H	 0.5770	 0.5250
I	 0.4930	 0.5020
J	 0.8690	 0.6380
K	 0.8930	 0.6430
L	 0.7520	 0.5560
M	 0.7220	 0.5800
N	 0.1500	 0.3750
O	 0.8670	 0.6220
P	 0.5610	 0.5510
Q	 0.1670	 0.2750
R	 0.7820	 0.5880
S	 0.7650	 0.6100
T	 0.4640	 0.4750
X	 0.1720	 0.2430
Y	 0.3460	 0.3310
Z	 0.6330	 0.4900

