WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Jan 7, 2025 – 03:30 pm GMT

PDB ID	:	9GAT
EMDB ID	:	EMD-51188
Title	:	CryoEM structure of the antiparallel double-stranded influenza A RNP-like particle with a 18-mer RNA.
Authors	:	Chenavier, F.; Ruigrok, R.W.H.; Schoehn, G.; Ballandras-Colas, A.; Crepin, T.
Deposited on	:	2024-07-29
Resolution	:	3.20 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 (i) 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 (i)) were used in the production of this report:

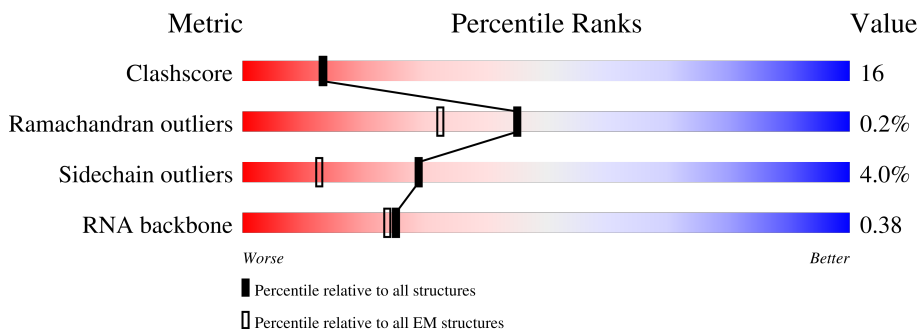|		
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

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 3.20 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.
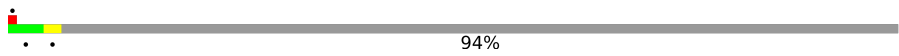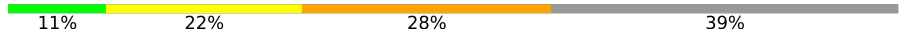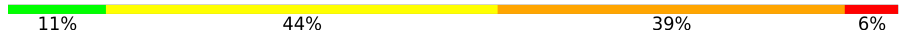
Metric	Percentile Ranks	Value
Clashscore		16
Ramachandran outliers		0.2%
Sidechain outliers		4.0%
RNA backbone		0.38

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures
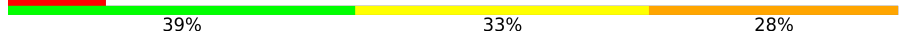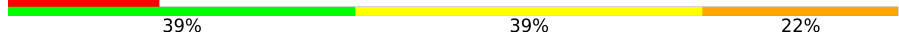
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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 <=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	494	54% 31% • 13%
1	B	494	54% 35% • 8%
1	C	494	55% 34% • 8%
1	D	494	95%
1	I	494	5% 72% 15% • 12%
1	J	494	76% 17% • 6%
1	K	494	8% 76% 17% • 6%

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Mol	Chain	Length	Quality of chain
1	L	494	94%
2	E	18	11% 22% 28% 39%
2	F	18	17% 44% 33% 6%
2	G	18	11% 44% 39% 6%
2	H	18	6% 22% 11% 61%
2	M	18	17% 28% 17% 17% 39%
2	N	18	11% 39% 33% 28%
2	O	18	17% 39% 39% 22%
2	P	18	17% 22% 61%

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 24208 atoms, of which 10 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 Nucleoprotein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	L	28	Total	C	N	O	S	0	0
			219	140	38	40	1		
1	D	26	Total	C	N	O	S	0	0
			206	133	36	36	1		
1	K	462	Total	C	N	O	S	0	0
			3666	2271	686	683	26		
1	J	462	Total	C	N	O	S	0	0
			3666	2271	686	683	26		
1	I	434	Total	C	N	O	S	0	0
			3447	2131	648	643	25		
1	B	454	Total	C	N	O	S	0	0
			3606	2239	676	666	25		
1	A	428	Total	C	N	O	S	0	0
			3400	2106	640	630	24		
1	C	454	Total	C	N	O	S	0	0
			3606	2239	676	666	25		

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	13	HIS	-	expression tag	UNP Q1K9H2
L	14	MET	-	expression tag	UNP Q1K9H2
L	499	LEU	-	expression tag	UNP Q1K9H2
L	500	GLU	-	expression tag	UNP Q1K9H2
L	501	HIS	-	expression tag	UNP Q1K9H2
L	502	HIS	-	expression tag	UNP Q1K9H2
L	503	HIS	-	expression tag	UNP Q1K9H2
L	504	HIS	-	expression tag	UNP Q1K9H2
L	505	HIS	-	expression tag	UNP Q1K9H2
L	506	HIS	-	expression tag	UNP Q1K9H2
D	13	HIS	-	expression tag	UNP Q1K9H2
D	14	MET	-	expression tag	UNP Q1K9H2
D	499	LEU	-	expression tag	UNP Q1K9H2
D	500	GLU	-	expression tag	UNP Q1K9H2

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Chain	Residue	Modelled	Actual	Comment	Reference
D	501	HIS	-	expression tag	UNP Q1K9H2
D	502	HIS	-	expression tag	UNP Q1K9H2
D	503	HIS	-	expression tag	UNP Q1K9H2
D	504	HIS	-	expression tag	UNP Q1K9H2
D	505	HIS	-	expression tag	UNP Q1K9H2
D	506	HIS	-	expression tag	UNP Q1K9H2
K	13	HIS	-	expression tag	UNP Q1K9H2
K	14	MET	-	expression tag	UNP Q1K9H2
K	499	LEU	-	expression tag	UNP Q1K9H2
K	500	GLU	-	expression tag	UNP Q1K9H2
K	501	HIS	-	expression tag	UNP Q1K9H2
K	502	HIS	-	expression tag	UNP Q1K9H2
K	503	HIS	-	expression tag	UNP Q1K9H2
K	504	HIS	-	expression tag	UNP Q1K9H2
K	505	HIS	-	expression tag	UNP Q1K9H2
K	506	HIS	-	expression tag	UNP Q1K9H2
J	13	HIS	-	expression tag	UNP Q1K9H2
J	14	MET	-	expression tag	UNP Q1K9H2
J	499	LEU	-	expression tag	UNP Q1K9H2
J	500	GLU	-	expression tag	UNP Q1K9H2
J	501	HIS	-	expression tag	UNP Q1K9H2
J	502	HIS	-	expression tag	UNP Q1K9H2
J	503	HIS	-	expression tag	UNP Q1K9H2
J	504	HIS	-	expression tag	UNP Q1K9H2
J	505	HIS	-	expression tag	UNP Q1K9H2
J	506	HIS	-	expression tag	UNP Q1K9H2
I	13	HIS	-	expression tag	UNP Q1K9H2
I	14	MET	-	expression tag	UNP Q1K9H2
I	499	LEU	-	expression tag	UNP Q1K9H2
I	500	GLU	-	expression tag	UNP Q1K9H2
I	501	HIS	-	expression tag	UNP Q1K9H2
I	502	HIS	-	expression tag	UNP Q1K9H2
I	503	HIS	-	expression tag	UNP Q1K9H2
I	504	HIS	-	expression tag	UNP Q1K9H2
I	505	HIS	-	expression tag	UNP Q1K9H2
I	506	HIS	-	expression tag	UNP Q1K9H2
B	13	HIS	-	expression tag	UNP Q1K9H2
B	14	MET	-	expression tag	UNP Q1K9H2
B	499	LEU	-	expression tag	UNP Q1K9H2
B	500	GLU	-	expression tag	UNP Q1K9H2
B	501	HIS	-	expression tag	UNP Q1K9H2
B	502	HIS	-	expression tag	UNP Q1K9H2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	503	HIS	-	expression tag	UNP Q1K9H2
B	504	HIS	-	expression tag	UNP Q1K9H2
B	505	HIS	-	expression tag	UNP Q1K9H2
B	506	HIS	-	expression tag	UNP Q1K9H2
A	13	HIS	-	expression tag	UNP Q1K9H2
A	14	MET	-	expression tag	UNP Q1K9H2
A	499	LEU	-	expression tag	UNP Q1K9H2
A	500	GLU	-	expression tag	UNP Q1K9H2
A	501	HIS	-	expression tag	UNP Q1K9H2
A	502	HIS	-	expression tag	UNP Q1K9H2
A	503	HIS	-	expression tag	UNP Q1K9H2
A	504	HIS	-	expression tag	UNP Q1K9H2
A	505	HIS	-	expression tag	UNP Q1K9H2
A	506	HIS	-	expression tag	UNP Q1K9H2
C	13	HIS	-	expression tag	UNP Q1K9H2
C	14	MET	-	expression tag	UNP Q1K9H2
C	499	LEU	-	expression tag	UNP Q1K9H2
C	500	GLU	-	expression tag	UNP Q1K9H2
C	501	HIS	-	expression tag	UNP Q1K9H2
C	502	HIS	-	expression tag	UNP Q1K9H2
C	503	HIS	-	expression tag	UNP Q1K9H2
C	504	HIS	-	expression tag	UNP Q1K9H2
C	505	HIS	-	expression tag	UNP Q1K9H2
C	506	HIS	-	expression tag	UNP Q1K9H2

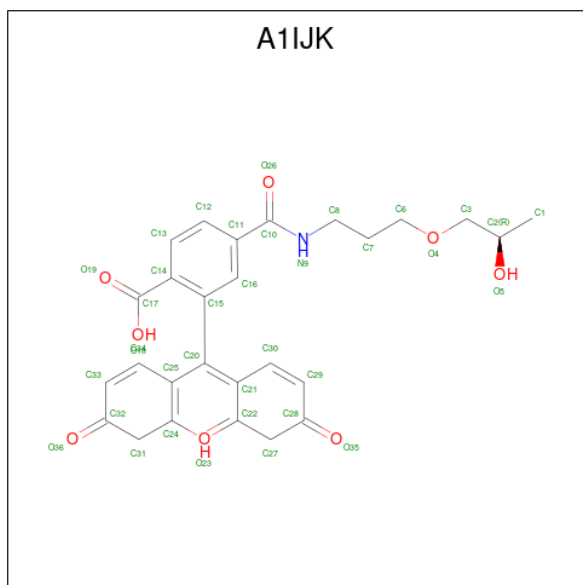- Molecule 2 is a RNA chain called RNA (5'-P(UC)9-FAM3').

Mol	Chain	Residues	Atoms					AltConf	Trace
2	O	18	Total 361	C 162	N 45	O 136	P 18	0	0
2	P	7	Total 141	C 63	N 17	O 54	P 7	0	0
2	M	11	Total 220	C 99	N 28	O 82	P 11	0	0
2	N	18	Total 361	C 162	N 45	O 136	P 18	0	0
2	E	11	Total 220	C 99	N 28	O 82	P 11	0	0
2	F	18	Total 361	C 162	N 45	O 136	P 18	0	0
2	G	18	Total 361	C 162	N 45	O 136	P 18	0	0

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Mol	Chain	Residues	Atoms						AltConf	Trace
2	H	7	Total	C	H	N	O	P	0	0
			151	63	10	17	54	7		

- Molecule 3 is 2-[3,6-bis(oxidanylidene)-4,5-dihydroxanthen-9-yl]-4-[3-[(2R)-2-oxidanylpropo xy]propylcarbamoyl]benzoic acid (three-letter code: A1IJK) (formula: $C_{27}H_{27}NO_8$).
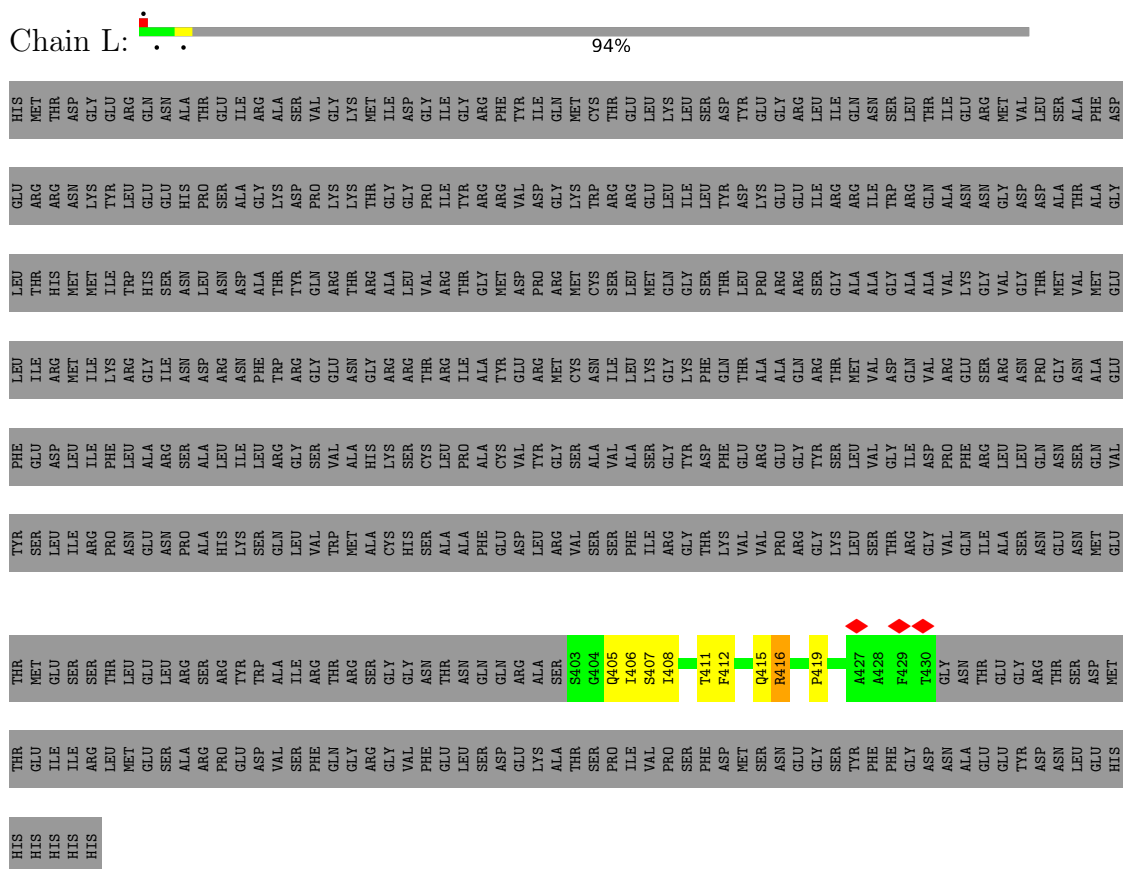

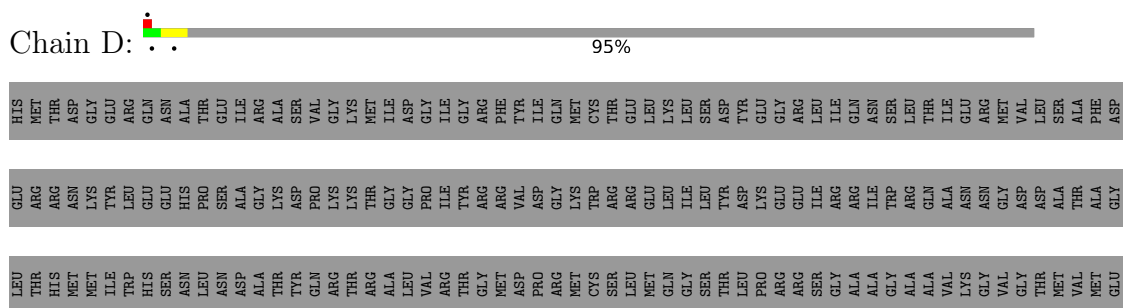| Mol	Chain	Residues	Atoms				AltConf
3	O	1	Total	C	N	O	0
			36	27	1	8	
3	M	1	Total	C	N	O	0
			36	27	1	8	
3	N	1	Total	C	N	O	0
			36	27	1	8	
3	E	1	Total	C	N	O	0
			36	27	1	8	
3	F	1	Total	C	N	O	0
			36	27	1	8	
3	G	1	Total	C	N	O	0
			36	27	1	8	

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.
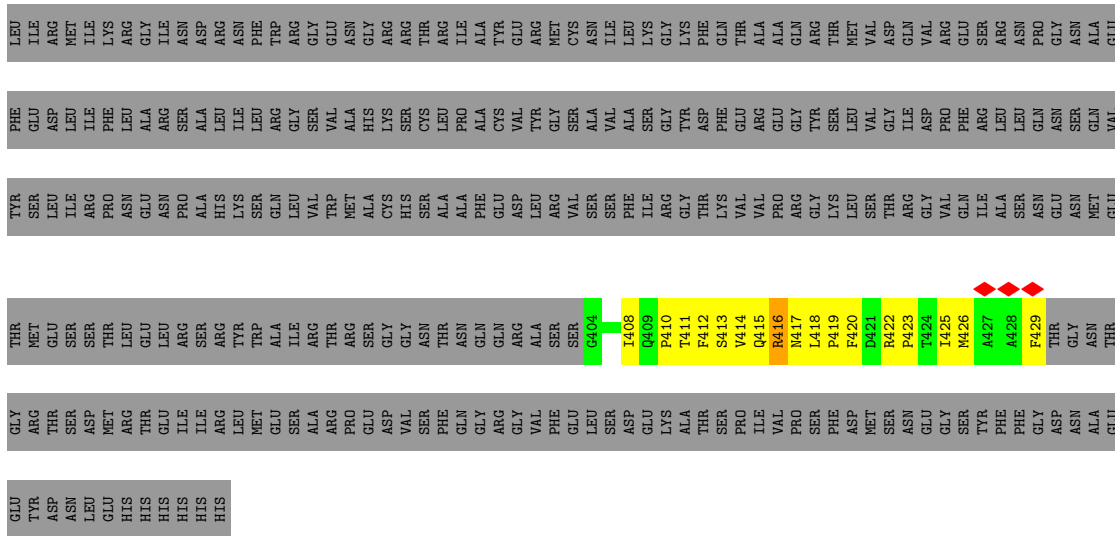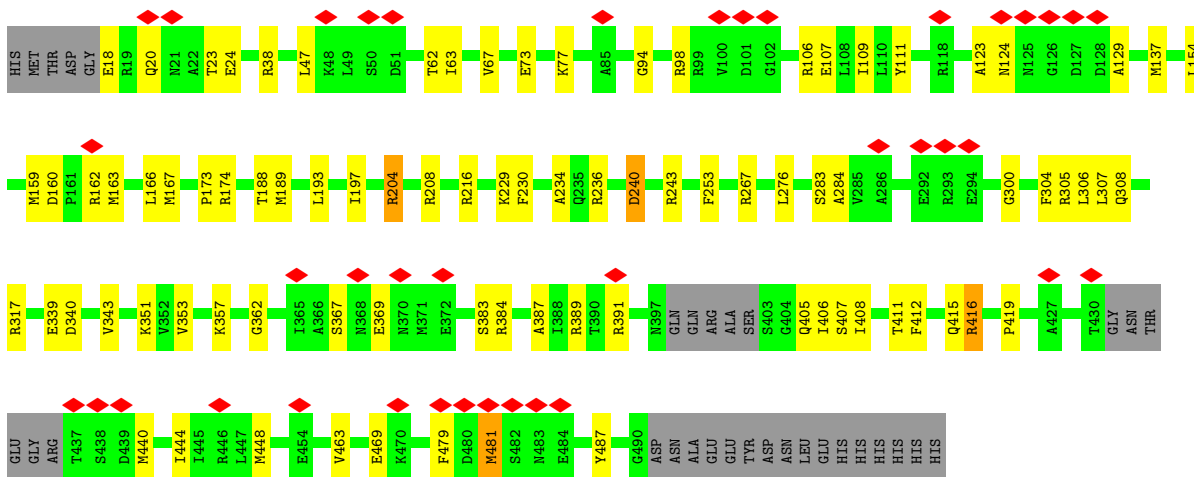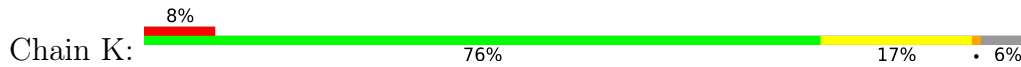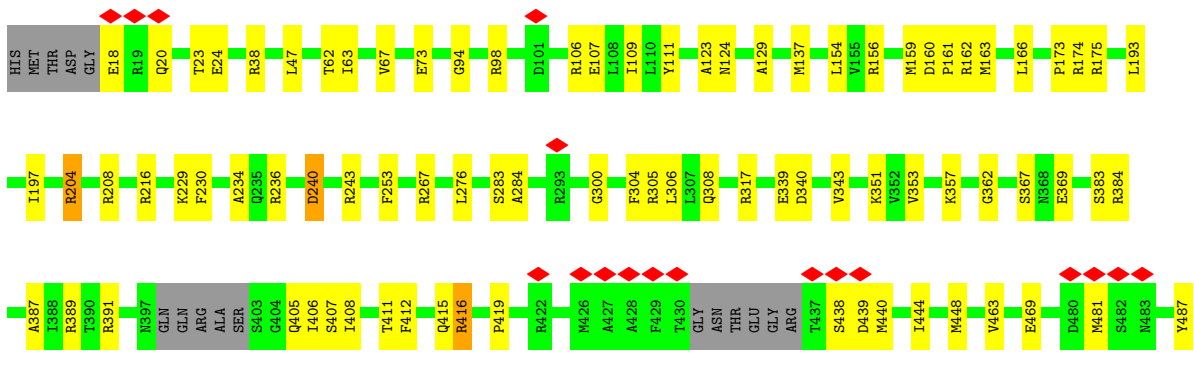
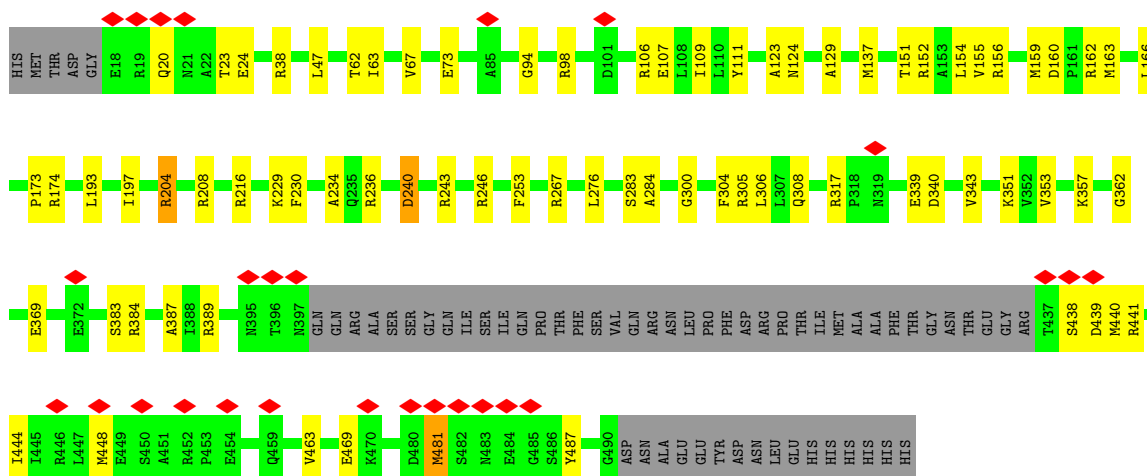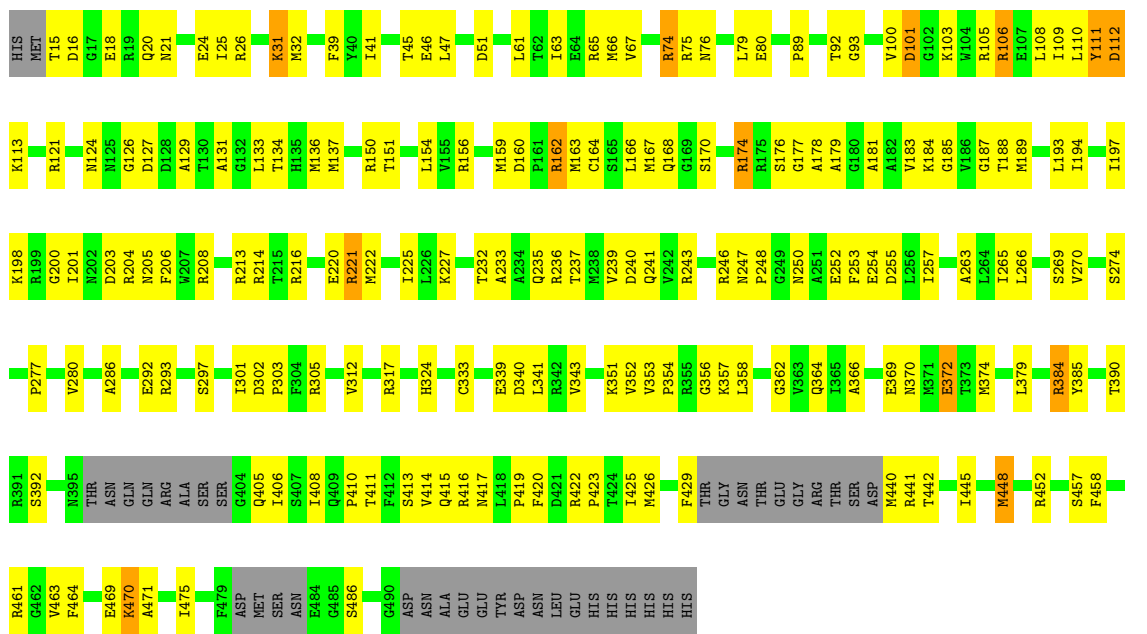• Molecule 1: Nucleoprotein

Chain L:

• Molecule 1: Nucleoprotein

Chain D:

LEU ILE ARG MET ILE LYS ARG GLY ILE ASN ASP ARG ASN PHE TRP ARG GLY GLU ASN GLY ARG ARG THR ARG ILE ALA TYR GLU MET CYS ASN ILE LEU LYS GLY LYS PHE GLN THR ALA ALA GLN ARG THR MET VAL ASP GLN VAL ARG GLU SER ARG ASN PRO GLY ASN ALA GLU

PHE GLU ASP LEU ILE PHE LEU ALA ARG SER ALA LEU ILE LEU ARG GLY SER VAL ALA HIS LYS SER CYS LEU PRO ALA CYS VAL TYR GLY SER ALA VAL ALA SER GLY TYR ASP PHE GLU ARG GLU GLY TYR SER LEU VAL GLY ILE ASP PRO PHE ARG LEU LEU GLN ASN SER GLN VAL

TYR SER LEU ARG PRO GLU ASN ASN GLU HIS SER GLN VAL TRP MET ALA CYS HIS SER ALA ALA PHE GLU ASP LEU ARG VAL SER SER PHE ILE ARG GLY THR LYS VAL VAL PRO ARG GLY LYS LEU SER THR ARG GLY VAL GLN ILE ALA SER ASN ASN MET GLU

THR MET GLU SER THR THR LEU GLU LEU ARG SER ARG TYR ALA ILE ARG THR ARG SER GLY GLY ASN THR ASN GLN GLN ARG ALA SER SER G404 I408 Q409 P410 T411 F412 S413 V414 Q415 R416 N417 L418 P419 F420 D421 R422 P423 T424 I425 M426 A427 A428 F429 THR GLY ASN THR GLU

GLY ARG THR SER ASP MET ARG THR GLU ILE ARG ASP LEU MET GLU SER ALA ARG PRO GLU ASP VAL SER PHE GLN GLY ARG GLY VAL PHE GLU LEU SER ASP GLU LYS ALA THR SER PRO ILE VAL PRO SER PHE ASP MET SER ASN GLU GLY SER TYR PHE PHE GLY ASP ASN ALA GLU

GLU TYR ASP ASN LEU GLU GLU HIS HIS HIS HIS HIS

• Molecule 1: Nucleoprotein

8%

Chain K: 76% 17% · 6%

HIS MET THR ASP GLY E18 R19 Q20 N21 A22 T23 E24 R38 L47 K48 L49 S50 D51 T62 I63 V67 E73 K77 A85 G94 R98 R99 V100 D101 G102 R106 E107 L108 I109 L110 Y111 R118 A123 N124 N125 G126 D127 D128 A129 M137 L154

M159 D160 P161 R162 M163 L166 M167 P173 R174 T188 M189 L193 I197 R204 R208 R216 K229 F230 A234 Q235 R236 D240 R243 F253 R267 L276 S283 A284 V285 A286 E292 R293 E294 G300 F304 R305 L306 L307 Q308

R317 E339 D340 V343 K351 V352 V353 K357 G362 I365 A366 S367 N368 E369 N370 M371 E372 S383 R384 A387 I388 R389 T390 R391 N397 GLN ARG ALA SER S403 G404 Q405 I406 S407 I408 T411 F412 Q415 R416 P419 A427 T430 GLY ASN THR

GLU GLY ARG T437 S438 D439 M440 I444 I445 R446 L447 M448 E454 V463 E469 K470 F479 D480 M481 S482 N483 E484 Y487 G490 ASP ASN ALA GLU GLU TYR ASP ASN LEU GLU GLU HIS HIS HIS HIS HIS

• Molecule 1: Nucleoprotein

·

Chain J: 76% 17% · 6%

HIS MET THR ASP GLY E18 R19 Q20 T23 E24 R38 L47 T62 I63 V67 E73 G94 R98 D101 R106 E107 L108 I109 L110 Y111 A123 N124 A129 M137 L154 V155 R156 M159 D160 P161 R162 M163 L166 P173 R174 R175 L193

I197 R204 R208 R216 K229 F230 A234 Q235 R236 D240 R243 F253 R267 L276 S283 A284 R293 G300 F304 R305 L306 L307 Q308 R317 E339 D340 V343 K351 V352 V353 K357 G362 S367 N368 E369 S383 R384

A387 I388 R389 T390 R391 N397 GLN ARG ALA SER S403 G404 Q405 I406 S407 I408 T411 F412 Q415 R416 P419 R422 M426 A427 A428 F429 T430 GLY ASN THR GLU GLY ARG T437 S438 D439 M440 I444 M448 V463 E469 D480 M481 S482 N483 Y487

G490 ASP ASN ALA GLU GLU TYR ASP ASN LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Nucleoprotein

Chain I:

5%

72% 15% • 12%

HIS MET THR ASP GLY E18 R19 Q20 N21 A22 T23 E24 R38 L47 T62 I63 V67 E73 A85 G94 R98 D101 R106 E107 L108 I109 L110 Y111 A123 N124 A129 M137 T151 R152 A153 L154 V155 R156 M159 D160 P161 R162 M163 L166

P173 R174 L193 I197 R204 R208 R216 K229 F230 R236 A234 Q235 R236 D240 R243 R246 F253 R267 L276 S283 A284 G300 F304 R305 L306 L307 Q308 R317 P318 N319 E339 D340 V343 K351 V352 V353 K357 G362

E369 E372 S383 R384 A387 I388 R389 N395 T396 N397 GLN GLN ARG ALA SER SER GLY GLN ILE ILE SER ILE GLN PRO THR PHE SER VAL GLN ARG ASN LEU PRO PHE ASP ARG PRO THR ILE MET ALA ALA PHE THR GLY ASN THR GLU GLY ARG T437 S438 D439 M440 R441

I444 I445 R446 L447 M448 E449 S450 A451 R452 P453 E454 Q459 V463 E469 K470 D480 M481 S482 N483 E484 G485 S486 Y487 G490 ASP ASN ALA GLU GLU TYR ASP ASN LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Nucleoprotein

Chain B:

54% 35% • 8%

HIS MET T15 D16 G17 E18 R19 Q20 N21 E24 I25 R26 K31 M32 F39 Y40 I41 T45 E46 L47 D51 L61 T62 I63 E64 R65 M66 V67 R74 R75 N76 L79 E80 P89 T92 G93 V100 D101 G102 K103 W104 R105 R106 E107 L108 I109 L110 Y111 D112

K113 R121 N124 N125 G126 D127 D128 A129 A131 T130 G132 L133 T134 H135 M136 M137 R150 T151 L154 V155 R156 M159 D160 P161 R162 M163 C164 S165 L166 M167 Q168 G169 S170 R174 R175 S176 G177 A178 A179 G180 A181 A182 V183 K184 G185 V186 G187 T188 M189 L193 I194 I197

K198 R199 G200 I201 N202 D203 R204 N205 F206 W207 R208 R213 R214 T215 R216 E220 R221 M222 I225 L226 K227 T232 A233 A234 Q235 R236 T237 M238 V239 D240 Q241 V242 R243 R246 N247 P248 G249 N250 A251 E252 F253 E254 D255 L256 I257 A263 L264 I265 L266 S269 V270 S274

P277 V280 A286 E292 R293 S297 I301 D302 P303 F304 R305 V312 R317 H324 C333 E339 D340 L341 R342 V343 K351 V352 V353 P354 R355 G356 K357 L358 G362 V363 Q364 I365 A366 E369 N370 M371 E372 T373 M374 L379 R384 Y385 T390

R391 S392 N395 THR ASN GLN GLN ARG ALA SER SER G404 Q405 I406 S407 I408 Q409 P410 T411 F412 S413 V414 Q415 R416 N417 L418 P419 F420 D421 R422 P423 T424 I425 M426 F429 THR GLY ASN THR GLU GLY ARG THR SER ASP M440 R441 T442 I445 M448 R452 S457 F458

R461 G462 V463 F464 E469 K470 A471 I475 F479 ASP MET SER ASN E484 G485 S486 G490 ASP ASN ALA GLU GLU TYR ASP ASN LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Nucleoprotein

Chain A:

54% 31% • 13%

• Molecule 1: Nucleoprotein

Chain C:

55%   34%   8%

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain O:

17%

39%   39%   22%

• Molecule 2: RNA (5'-P(UC)9-FAM3')
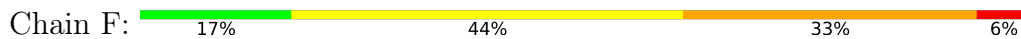
Chain P:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain M:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain N:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain E:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain F:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain G:

• Molecule 2: RNA (5'-P(UC)9-FAM3')

Chain H:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=56.13°, rise=27.3 Å, axial sym=C1	Depositor
Number of segments used	343311	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS GLACIOS	Depositor
Voltage (kV)	200	Depositor
Electron dose $(e^-/\text{Å}^2)$	53	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	36000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.952	Depositor
Minimum map value	-0.400	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.153	Depositor
Map size (Å)	458.0, 458.0, 458.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.145, 1.145, 1.145	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: A1IJK

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	0.26	0/3457	0.53	0/4642
1	B	0.26	0/3668	0.53	0/4928
1	C	0.26	0/3668	0.53	0/4928
1	D	0.27	0/211	0.54	0/286
1	I	0.28	0/3505	0.54	0/4709
1	J	0.28	0/3729	0.54	0/5013
1	K	0.28	0/3729	0.54	0/5013
1	L	0.30	0/224	0.59	0/304
2	E	0.27	0/241	0.72	0/370
2	F	0.62	1/396 (0.3%)	0.89	2/608 (0.3%)
2	G	0.62	1/396 (0.3%)	0.89	2/608 (0.3%)
2	H	0.90	1/154 (0.6%)	0.69	0/234
2	M	0.29	0/241	0.92	2/370 (0.5%)
2	N	0.69	1/396 (0.3%)	1.00	2/608 (0.3%)
2	O	0.71	1/396 (0.3%)	0.99	1/608 (0.2%)
2	P	0.96	1/154 (0.6%)	0.96	0/234
All	All	0.33	6/24565 (0.0%)	0.59	9/33463 (0.0%)

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	1	U	OP3-P	-10.84	1.48	1.61
2	P	1	U	OP3-P	-10.71	1.48	1.61
2	O	1	U	OP3-P	-10.71	1.48	1.61
2	N	1	U	OP3-P	-10.68	1.48	1.61
2	F	1	U	OP3-P	-10.68	1.48	1.61
2	G	1	U	OP3-P	-10.67	1.48	1.61

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	F	17	U	P-O3'-C3'	-10.45	107.16	119.70
2	G	17	U	P-O3'-C3'	-10.42	107.19	119.70
2	F	17	U	OP1-P-O3'	7.20	121.03	105.20
2	G	17	U	OP1-P-O3'	7.18	121.00	105.20
2	O	13	U	C2-N1-C1'	5.84	124.71	117.70
2	M	13	U	C2-N1-C1'	5.82	124.69	117.70
2	N	13	U	C2-N1-C1'	5.80	124.67	117.70
2	N	13	U	N1-C2-O2	5.07	126.35	122.80
2	M	13	U	N1-C2-O2	5.04	126.33	122.80

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3400	0	3386	178	0
1	B	3606	0	3592	212	0
1	C	3606	0	3592	199	0
1	D	206	0	206	20	0
1	I	3447	0	3426	71	0
1	J	3666	0	3644	93	0
1	K	3666	0	3644	72	0
1	L	219	0	218	9	0
2	E	220	0	116	9	0
2	F	361	0	189	23	0
2	G	361	0	189	27	0
2	H	141	10	74	7	0
2	M	220	0	116	2	0
2	N	361	0	189	6	0
2	O	361	0	189	5	0
2	P	141	0	74	1	0
3	E	36	0	0	1	0
3	F	36	0	0	2	0
3	G	36	0	0	8	0
3	M	36	0	0	0	0
3	N	36	0	0	0	0

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W O R L D W I D E
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PROTEIN DATA BANK

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	O	36	0	0	0	0
All	All	24198	10	22844	753	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 16.

All (753) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:204:ARG:HH21	1:C:127:ASP:CA	1.20	1.54
1:I:204:ARG:NH2	1:C:127:ASP:HA	1.09	1.39
1:J:438:SER:HB3	1:A:247:ASN:CB	1.77	1.15
3:G:601:A1IJK:C6	1:I:246:ARG:HH12	1.63	1.11
1:J:18:GLU:HG2	1:I:156:ARG:NH2	1.63	1.10
1:J:439:ASP:CB	1:A:246:ARG:HB3	1.82	1.10
1:J:204:ARG:NH2	1:B:127:ASP:HA	1.65	1.09
1:J:438:SER:HB3	1:A:247:ASN:HB2	1.32	1.08
1:I:208:ARG:NH2	1:C:126:GLY:O	1.86	1.07
1:J:204:ARG:HH21	1:B:127:ASP:CA	1.67	1.06
1:J:204:ARG:HH21	1:B:127:ASP:HA	0.90	1.04
1:K:204:ARG:HH21	1:A:127:ASP:HA	1.20	1.04
1:J:439:ASP:HB3	1:A:246:ARG:HB3	1.12	1.04
1:C:189:MET:HE3	1:C:225:ILE:HG13	1.43	0.99
2:F:18:C:H1'	1:B:74:ARG:HD3	1.43	0.99
1:B:189:MET:HE3	1:B:225:ILE:HG13	1.44	0.99
1:C:440:MET:HG3	1:C:441:ARG:H	1.27	0.98
1:J:18:GLU:CG	1:I:156:ARG:HH22	1.77	0.98
2:G:18:C:H1'	1:C:74:ARG:HD3	1.44	0.98
1:J:18:GLU:HG2	1:I:156:ARG:HH22	0.83	0.97
3:G:601:A1IJK:C6	1:I:246:ARG:NH1	2.28	0.97
1:B:440:MET:HG3	1:B:441:ARG:H	1.27	0.96
1:I:204:ARG:NH2	1:C:127:ASP:CA	1.93	0.96
1:K:204:ARG:NH2	1:A:127:ASP:HA	1.80	0.96
1:K:18:GLU:HG2	1:J:156:ARG:HH22	1.31	0.94
1:K:18:GLU:HG2	1:J:156:ARG:HH12	1.28	0.94
1:J:439:ASP:HB3	1:A:246:ARG:CB	1.97	0.94
1:B:340:ASP:HB3	1:B:343:VAL:HG12	1.50	0.92
1:C:340:ASP:HB3	1:C:343:VAL:HG12	1.50	0.91
1:K:18:GLU:HG2	1:J:156:ARG:NH1	1.85	0.89
1:K:18:GLU:HG2	1:J:156:ARG:NH2	1.87	0.88
1:B:425:ILE:HD13	1:A:265:ILE:HD11	1.56	0.87

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:438:SER:CB	1:A:247:ASN:CB	2.53	0.87
2:G:1:U:N3	1:B:110:LEU:HD21	1.90	0.86
3:G:601:A1IJK:O26	1:I:216:ARG:HG2	1.76	0.85
1:B:79:LEU:HB3	1:B:89:PRO:HB3	1.59	0.85
1:C:79:LEU:HB3	1:C:89:PRO:HB3	1.59	0.85
1:I:204:ARG:NH2	1:C:127:ASP:CB	2.39	0.85
1:A:100:VAL:HB	1:A:105:ARG:NH2	1.92	0.84
1:A:167:MET:HE2	1:A:187:GLY:HA3	1.58	0.83
1:A:384:ARG:HG3	1:A:384:ARG:HH11	1.44	0.83
1:K:18:GLU:CG	1:J:156:ARG:HH22	1.92	0.82
1:A:79:LEU:HB3	1:A:89:PRO:HB3	1.62	0.81
1:J:438:SER:HB2	1:A:247:ASN:HD22	1.46	0.81
1:A:340:ASP:HB3	1:A:343:VAL:HG12	1.61	0.81
1:A:324:HIS:HB3	1:A:358:LEU:HD22	1.63	0.80
1:B:20:GLN:O	1:B:24:GLU:HG2	1.82	0.80
1:A:163:MET:HB2	1:A:166:LEU:HD12	1.61	0.80
1:K:18:GLU:HA	1:J:156:ARG:NH2	1.97	0.79
1:A:440:MET:HG3	1:A:441:ARG:H	1.47	0.79
1:B:340:ASP:HB2	1:C:408:ILE:HD11	1.65	0.79
1:B:408:ILE:HD11	1:A:340:ASP:HB2	1.65	0.79
1:D:408:ILE:HD11	1:C:340:ASP:HB2	1.65	0.79
1:C:20:GLN:O	1:C:24:GLU:HG2	1.82	0.79
1:A:181:ALA:HA	1:A:184:LYS:HD2	1.64	0.78
1:A:189:MET:HE1	1:A:225:ILE:HD11	1.65	0.78
1:B:440:MET:HG3	1:B:441:ARG:N	1.99	0.78
2:G:18:C:H1'	1:C:74:ARG:CD	2.14	0.77
2:F:18:C:H1'	1:B:74:ARG:CD	2.14	0.77
1:B:92:THR:HG23	1:B:113:LYS:HG2	1.66	0.77
1:A:15:THR:HA	1:A:18:GLU:HG3	1.65	0.77
1:K:18:GLU:HG2	1:J:156:ARG:CZ	2.14	0.77
1:C:92:THR:HG23	1:C:113:LYS:HG2	1.66	0.76
1:C:100:VAL:HB	1:C:105:ARG:HH11	1.50	0.76
1:I:208:ARG:CZ	1:C:121:ARG:HD3	2.14	0.76
1:B:100:VAL:HB	1:B:105:ARG:HH11	1.50	0.76
1:B:156:ARG:NH1	1:C:391:ARG:HH12	1.83	0.76
1:D:411:THR:HG22	1:C:339:GLU:HB2	1.67	0.76
1:B:339:GLU:HB2	1:C:411:THR:HG22	1.67	0.76
1:C:440:MET:HG3	1:C:441:ARG:N	1.99	0.76
1:K:18:GLU:CG	1:J:156:ARG:HH12	1.99	0.75
1:B:227:LYS:HB2	1:B:239:VAL:HG11	1.69	0.75
1:C:227:LYS:HB2	1:C:239:VAL:HG11	1.68	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:410:PRO:HA	1:C:339:GLU:OE1	1.88	0.74
1:J:438:SER:CB	1:A:247:ASN:ND2	2.50	0.74
1:K:208:ARG:NH2	1:A:126:GLY:O	2.17	0.74
1:I:439:ASP:HB3	1:B:246:ARG:HB3	1.70	0.74
1:B:339:GLU:OE1	1:C:410:PRO:HA	1.88	0.74
1:C:181:ALA:HA	1:C:184:LYS:HD2	1.69	0.74
1:J:438:SER:HB3	1:A:247:ASN:CG	2.09	0.73
1:A:240:ASP:OD1	1:A:243:ARG:NH2	2.20	0.73
1:B:181:ALA:HA	1:B:184:LYS:HD2	1.69	0.73
1:B:265:ILE:HD11	1:C:425:ILE:HD12	1.70	0.73
1:D:425:ILE:HD12	1:C:265:ILE:HD11	1.70	0.73
1:A:137:MET:HE1	1:A:176:SER:HB3	1.69	0.73
1:J:208:ARG:NH2	1:B:126:GLY:O	2.12	0.72
1:B:137:MET:CE	1:B:176:SER:HB3	2.18	0.72
1:K:340:ASP:HB3	1:K:343:VAL:HG12	1.72	0.72
1:B:193:LEU:HD21	1:B:222:MET:HG3	1.71	0.72
1:C:137:MET:CE	1:C:176:SER:HB3	2.18	0.72
2:N:7:U:H5'	1:I:152:ARG:HH21	1.55	0.72
1:I:340:ASP:HB3	1:I:343:VAL:HG12	1.72	0.72
1:J:438:SER:CB	1:A:247:ASN:HD22	2.02	0.71
1:C:193:LEU:HD21	1:C:222:MET:HG3	1.70	0.71
1:J:340:ASP:HB3	1:J:343:VAL:HG12	1.72	0.71
1:B:248:PRO:HA	1:B:252:GLU:OE2	1.90	0.71
1:C:384:ARG:NH2	1:C:385:TYR:OH	2.24	0.71
1:A:93:GLY:HA3	1:A:109:ILE:O	1.92	0.70
1:I:204:ARG:NE	1:C:126:GLY:O	2.23	0.70
2:H:2:C:H2'	2:H:3:U:C6	2.27	0.70
1:J:438:SER:CB	1:A:247:ASN:HB2	2.17	0.70
1:B:384:ARG:NH2	1:B:385:TYR:OH	2.24	0.70
1:A:43:MET:HE2	1:A:63:ILE:HG23	1.74	0.69
1:K:18:GLU:CB	1:J:156:ARG:HH22	2.04	0.69
1:C:248:PRO:HA	1:C:252:GLU:OE2	1.90	0.69
1:C:440:MET:CG	1:C:441:ARG:H	2.01	0.69
1:A:375:GLU:N	1:A:375:GLU:OE1	2.25	0.69
1:C:41:ILE:HD11	1:C:286:ALA:HB2	1.75	0.69
1:B:324:HIS:HB3	1:B:358:LEU:HD22	1.75	0.68
1:A:19:ARG:HG3	1:A:20:GLN:N	2.08	0.68
1:C:324:HIS:HB3	1:C:358:LEU:HD22	1.75	0.68
1:A:385:TYR:HB3	1:A:463:VAL:CG1	2.24	0.68
1:B:41:ILE:HD11	1:B:286:ALA:HB2	1.75	0.67
1:A:213:ARG:HB2	1:A:213:ARG:CZ	2.23	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:18:C:OP2	1:I:174:ARG:NH1	2.28	0.67
1:I:137:MET:HE3	1:I:173:PRO:HG2	1.76	0.66
2:N:18:C:OP2	1:J:174:ARG:NH1	2.28	0.66
1:A:317:ARG:NH2	1:A:362:GLY:O	2.28	0.66
1:C:216:ARG:O	1:C:220:GLU:HG2	1.96	0.66
1:B:216:ARG:O	1:B:220:GLU:HG2	1.96	0.66
2:F:16:C:H1'	1:B:174:ARG:HD2	1.77	0.66
1:B:440:MET:CG	1:B:441:ARG:H	2.01	0.66
1:C:317:ARG:NH2	1:C:362:GLY:O	2.29	0.66
1:B:408:ILE:CD1	1:A:340:ASP:HB2	2.26	0.66
1:C:92:THR:HG23	1:C:113:LYS:CG	2.25	0.66
1:C:93:GLY:HA3	1:C:109:ILE:O	1.96	0.66
1:B:92:THR:HG23	1:B:113:LYS:CG	2.25	0.66
1:I:444:ILE:O	1:I:448:MET:HG3	1.96	0.66
1:B:317:ARG:NH2	1:B:362:GLY:O	2.29	0.66
1:A:160:ASP:OD1	1:A:162:ARG:HG3	1.96	0.66
1:A:220:GLU:OE2	1:A:243:ARG:HD2	1.96	0.66
1:J:444:ILE:O	1:J:448:MET:HG3	1.96	0.65
1:A:339:GLU:HG3	1:A:340:ASP:N	2.12	0.65
2:O:18:C:OP2	1:K:174:ARG:NH1	2.28	0.65
2:G:16:C:H1'	1:C:174:ARG:HD2	1.77	0.65
2:H:1:U:N3	1:C:110:LEU:HD21	2.11	0.65
1:A:269:SER:HB2	1:A:391:ARG:O	1.97	0.65
1:B:93:GLY:HA3	1:B:109:ILE:O	1.96	0.65
1:K:18:GLU:HA	1:J:156:ARG:HH22	1.62	0.65
1:C:353:VAL:HG12	1:C:357:LYS:HB2	1.78	0.65
1:B:15:THR:HG22	1:B:16:ASP:H	1.62	0.64
1:B:156:ARG:HH12	1:C:391:ARG:HH12	1.43	0.64
1:C:441:ARG:O	1:C:445:ILE:HG13	1.97	0.64
1:B:166:LEU:HB3	1:B:187:GLY:H	1.62	0.64
1:A:214:ARG:O	1:A:217:ILE:HG13	1.97	0.64
1:C:46:GLU:HG2	1:C:111:TYR:OH	1.97	0.64
1:K:137:MET:HE3	1:K:173:PRO:HG2	1.77	0.64
1:B:220:GLU:OE2	1:B:243:ARG:HG3	1.98	0.64
1:B:353:VAL:HG12	1:B:357:LYS:HB2	1.78	0.64
1:C:15:THR:HG22	1:C:16:ASP:H	1.62	0.64
1:K:444:ILE:O	1:K:448:MET:HG3	1.96	0.64
1:B:441:ARG:O	1:B:445:ILE:HG13	1.97	0.64
1:B:340:ASP:CB	1:C:408:ILE:HD11	2.28	0.64
1:C:166:LEU:HB3	1:C:187:GLY:H	1.62	0.64
1:C:216:ARG:O	1:C:216:ARG:HD2	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:240:ASP:O	1:A:244:GLU:HG2	1.98	0.63
2:O:15:U:OP1	1:K:174:ARG:NH2	2.31	0.63
2:N:15:U:OP1	1:J:174:ARG:NH2	2.31	0.63
1:B:216:ARG:O	1:B:216:ARG:HD2	1.97	0.63
2:N:8:C:H1'	1:J:391:ARG:HB3	1.81	0.63
1:B:46:GLU:HG2	1:B:111:TYR:OH	1.97	0.63
1:B:458:PHE:HB2	1:C:414:VAL:O	1.99	0.63
1:C:220:GLU:OE2	1:C:243:ARG:HG3	1.98	0.63
1:D:408:ILE:HD11	1:C:340:ASP:CB	2.28	0.63
1:D:414:VAL:O	1:C:458:PHE:HB2	1.99	0.63
1:B:250:ASN:O	1:B:254:GLU:HG2	1.98	0.63
1:A:384:ARG:HG3	1:A:384:ARG:NH1	2.14	0.62
2:M:15:U:OP1	1:I:174:ARG:NH2	2.31	0.62
1:A:193:LEU:HD21	1:A:222:MET:HG3	1.80	0.62
1:A:340:ASP:OD1	1:A:486:SER:HB2	1.99	0.62
1:D:416:ARG:HD3	1:D:418:LEU:HD23	1.82	0.62
1:C:92:THR:CG2	1:C:113:LYS:HE3	2.29	0.62
2:E:15:U:O4'	1:A:130:THR:HG21	1.99	0.62
1:C:100:VAL:HB	1:C:105:ARG:NH1	2.14	0.62
1:A:61:LEU:O	1:A:65:ARG:HG3	1.99	0.62
1:B:92:THR:CG2	1:B:113:LYS:HE3	2.29	0.62
1:A:127:ASP:OD1	1:A:128:ASP:N	2.32	0.62
1:C:250:ASN:O	1:C:254:GLU:HG2	1.98	0.62
1:A:440:MET:HG3	1:A:441:ARG:N	2.15	0.61
1:I:204:ARG:HH22	1:C:127:ASP:HA	1.51	0.61
1:B:416:ARG:HG2	1:B:416:ARG:HH11	1.64	0.61
1:D:408:ILE:HD11	1:C:340:ASP:CA	2.30	0.61
1:J:230:PHE:O	1:J:236:ARG:NH1	2.34	0.61
1:B:340:ASP:HB2	1:C:408:ILE:CD1	2.29	0.61
1:B:340:ASP:CA	1:C:408:ILE:HD11	2.30	0.61
1:I:230:PHE:O	1:I:236:ARG:NH1	2.34	0.61
1:B:189:MET:CE	1:B:225:ILE:HG13	2.27	0.61
1:A:21:ASN:O	1:A:25:ILE:HG12	2.00	0.61
1:D:408:ILE:CD1	1:C:340:ASP:HB2	2.29	0.61
1:A:53:GLU:OE1	1:A:98:ARG:HG3	2.01	0.61
1:B:100:VAL:HB	1:B:105:ARG:NH1	2.14	0.61
1:A:20:GLN:OE1	1:A:20:GLN:HA	2.01	0.61
1:B:415:GLN:HG3	1:B:415:GLN:O	2.00	0.60
1:K:230:PHE:O	1:K:236:ARG:NH1	2.34	0.60
1:A:63:ILE:O	1:A:67:VAL:HG23	2.01	0.60
1:C:416:ARG:HD3	1:C:418:LEU:HD23	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:18:C:H1'	1:A:74:ARG:HG3	1.83	0.60
1:J:38:ARG:NH1	1:J:123:ALA:O	2.27	0.60
1:J:204:ARG:HH21	1:B:127:ASP:CB	2.14	0.60
1:A:441:ARG:O	1:A:445:ILE:HG13	2.01	0.60
1:C:205:ASN:HA	1:C:208:ARG:NH2	2.17	0.60
1:C:194:ILE:O	1:C:198:LYS:HG2	2.02	0.60
1:B:194:ILE:O	1:B:198:LYS:HG2	2.02	0.59
1:A:221:ARG:HB3	1:A:221:ARG:NH1	2.16	0.59
1:B:205:ASN:HA	1:B:208:ARG:NH2	2.17	0.59
1:K:305:ARG:NH1	1:K:469:GLU:OE1	2.36	0.59
1:J:439:ASP:OD2	1:A:246:ARG:NH2	2.33	0.59
1:J:305:ARG:NH1	1:J:469:GLU:OE1	2.36	0.59
1:B:92:THR:CG2	1:B:113:LYS:HG2	2.32	0.59
2:F:12:C:H42	2:F:14:C:H41	1.50	0.59
1:K:18:GLU:CA	1:J:156:ARG:HH22	2.16	0.59
2:G:12:C:H42	2:G:14:C:H41	1.50	0.59
1:A:106:ARG:NH1	1:A:367:SER:HA	2.18	0.59
1:K:63:ILE:O	1:K:67:VAL:HG23	2.03	0.58
1:K:204:ARG:HH21	1:A:127:ASP:CA	2.04	0.58
1:B:167:MET:HA	1:B:167:MET:CE	2.33	0.58
1:B:413:SER:OG	1:A:390:THR:HG22	2.03	0.58
1:C:92:THR:CG2	1:C:113:LYS:HG2	2.32	0.58
1:I:305:ARG:NH1	1:I:469:GLU:OE1	2.36	0.58
1:C:167:MET:HA	1:C:167:MET:CE	2.34	0.58
2:G:2:C:H2'	2:G:3:U:C6	2.39	0.58
1:J:63:ILE:O	1:J:67:VAL:HG23	2.03	0.58
1:A:137:MET:CE	1:A:176:SER:HB3	2.33	0.58
1:B:198:LYS:HB3	1:B:198:LYS:HZ3	1.67	0.58
1:C:66:MET:SD	1:C:93:GLY:HA2	2.44	0.58
2:F:2:C:H2'	2:F:3:U:C6	2.39	0.58
1:I:63:ILE:O	1:I:67:VAL:HG23	2.03	0.58
1:B:317:ARG:NH1	1:B:369:GLU:OE2	2.36	0.58
1:C:137:MET:HE1	1:C:176:SER:HB3	1.84	0.58
1:C:317:ARG:NH1	1:C:369:GLU:OE2	2.36	0.58
1:A:317:ARG:NH1	1:A:369:GLU:OE2	2.37	0.57
1:C:340:ASP:OD1	1:C:486:SER:HB2	2.05	0.57
1:B:166:LEU:HD11	1:B:263:ALA:HB3	1.86	0.57
1:J:204:ARG:NH2	1:B:127:ASP:CB	2.67	0.57
1:A:341:LEU:HD12	1:A:352:VAL:O	2.05	0.57
1:B:66:MET:SD	1:B:93:GLY:HA2	2.44	0.57
1:A:372:GLU:O	1:A:372:GLU:HG3	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:166:LEU:HD11	1:C:263:ALA:HB3	1.86	0.57
1:B:208:ARG:HH11	1:B:208:ARG:HB2	1.69	0.57
1:B:425:ILE:CD1	1:A:265:ILE:HD11	2.33	0.57
1:A:43:MET:CE	1:A:63:ILE:HG23	2.33	0.57
3:G:601:A1IJK:O26	1:I:216:ARG:CG	2.51	0.56
1:I:38:ARG:NH1	1:I:123:ALA:O	2.27	0.56
2:H:5:U:O4	1:C:356:GLY:HA2	2.05	0.56
1:B:237:THR:O	1:B:241:GLN:HG3	2.06	0.56
1:B:340:ASP:OD1	1:B:486:SER:HB2	2.05	0.56
1:C:208:ARG:HH11	1:C:208:ARG:HB2	1.69	0.56
1:I:204:ARG:HH21	1:C:127:ASP:HA	0.48	0.56
1:B:372:GLU:HG3	1:B:372:GLU:O	2.06	0.56
1:J:204:ARG:NH2	1:B:127:ASP:CA	2.46	0.56
1:A:216:ARG:HD2	1:A:216:ARG:O	2.06	0.56
1:C:133:LEU:HA	1:C:136:MET:HE2	1.88	0.56
1:C:159:MET:HG2	1:C:257:ILE:CD1	2.36	0.56
1:A:197:ILE:HD11	1:A:219:TYR:HE2	1.71	0.56
2:G:1:U:C2	1:B:110:LEU:HD21	2.41	0.56
1:B:137:MET:HE1	1:B:176:SER:HB3	1.86	0.56
1:C:372:GLU:O	1:C:372:GLU:HG3	2.06	0.56
1:C:21:ASN:O	1:C:25:ILE:HG12	2.06	0.55
1:C:227:LYS:CB	1:C:239:VAL:HG11	2.36	0.55
1:J:438:SER:CB	1:A:247:ASN:HB3	2.35	0.55
1:B:340:ASP:HB3	1:B:343:VAL:CG1	2.29	0.55
1:C:340:ASP:HB3	1:C:343:VAL:CG1	2.29	0.55
1:B:159:MET:HG2	1:B:257:ILE:CD1	2.36	0.55
1:B:236:ARG:O	1:B:239:VAL:HG12	2.06	0.55
1:C:65:ARG:HD2	1:C:364:GLN:HE22	1.71	0.55
2:G:1:U:C4	1:B:110:LEU:HD21	2.41	0.55
1:B:208:ARG:HB2	1:B:208:ARG:NH1	2.21	0.55
1:A:250:ASN:C	1:A:250:ASN:HD22	2.08	0.55
1:C:351:LYS:NZ	1:C:351:LYS:HB3	2.22	0.55
1:B:351:LYS:HB3	1:B:351:LYS:HZ1	1.72	0.55
1:B:408:ILE:HD11	1:A:340:ASP:N	2.20	0.55
1:A:104:TRP:C	1:A:371:MET:HE3	2.26	0.55
1:K:38:ARG:NH1	1:K:123:ALA:O	2.27	0.55
1:K:304:PHE:HE2	1:K:389:ARG:HH12	1.54	0.55
1:B:227:LYS:CB	1:B:239:VAL:HG11	2.36	0.55
1:B:426:MET:HE1	1:A:449:GLU:HG2	1.88	0.55
1:C:168:GLN:O	1:C:188:THR:HG21	2.07	0.55
1:J:304:PHE:HE2	1:J:389:ARG:HH12	1.54	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:237:THR:O	1:C:241:GLN:HG3	2.06	0.55
1:B:65:ARG:HD2	1:B:364:GLN:HE22	1.71	0.55
1:B:339:GLU:HG3	1:B:340:ASP:N	2.22	0.55
1:I:304:PHE:HE2	1:I:389:ARG:HH12	1.54	0.55
1:B:408:ILE:HD11	1:A:340:ASP:CB	2.36	0.55
1:B:351:LYS:HB3	1:B:351:LYS:NZ	2.22	0.55
1:B:406:ILE:HG21	1:A:162:ARG:HE	1.72	0.55
1:B:417:ASN:O	1:B:419:PRO:HD3	2.06	0.55
2:H:1:U:C2	1:C:110:LEU:HD21	2.42	0.54
1:B:21:ASN:O	1:B:25:ILE:HG12	2.06	0.54
1:B:168:GLN:O	1:B:188:THR:HG21	2.07	0.54
1:C:160:ASP:O	1:C:163:MET:HG2	2.07	0.54
1:C:208:ARG:HB2	1:C:208:ARG:NH1	2.21	0.54
1:J:137:MET:HE3	1:J:173:PRO:HG2	1.88	0.54
1:K:240:ASP:OD1	1:K:243:ARG:NH2	2.41	0.54
1:D:413:SER:OG	1:C:390:THR:HG22	2.07	0.54
1:C:227:LYS:HB2	1:C:239:VAL:CG1	2.38	0.54
1:C:174:ARG:O	1:C:174:ARG:HG2	2.06	0.54
1:C:236:ARG:O	1:C:239:VAL:HG12	2.06	0.54
2:G:18:C:C1'	1:C:74:ARG:HD3	2.28	0.54
1:K:193:LEU:O	1:K:197:ILE:HG12	2.08	0.54
1:J:20:GLN:O	1:J:24:GLU:HG2	2.08	0.54
1:B:160:ASP:O	1:B:163:MET:HG2	2.07	0.54
1:A:370:ASN:OD1	1:A:370:ASN:O	2.26	0.54
1:K:20:GLN:O	1:K:24:GLU:HG2	2.08	0.54
1:B:174:ARG:O	1:B:174:ARG:HG2	2.06	0.54
1:K:47:LEU:O	1:K:98:ARG:NH2	2.41	0.54
1:I:240:ASP:OD1	1:I:243:ARG:NH2	2.41	0.54
1:A:137:MET:HE3	1:A:173:PRO:HG2	1.89	0.54
1:C:339:GLU:HG3	1:C:340:ASP:N	2.22	0.54
1:B:197:ILE:O	1:B:201:ILE:HG12	2.08	0.54
1:B:420:PHE:CD2	1:A:265:ILE:HD12	2.43	0.54
1:C:15:THR:O	1:C:16:ASP:HB3	2.08	0.54
1:C:370:ASN:OD1	1:C:372:GLU:HB3	2.08	0.54
1:I:20:GLN:O	1:I:24:GLU:HG2	2.08	0.53
1:K:416:ARG:NH1	1:J:339:GLU:OE2	2.41	0.53
1:B:61:LEU:O	1:B:65:ARG:HG3	2.08	0.53
1:B:227:LYS:HB2	1:B:239:VAL:CG1	2.38	0.53
1:C:197:ILE:O	1:C:201:ILE:HG12	2.08	0.53
1:J:439:ASP:HB2	1:A:246:ARG:HB3	1.84	0.53
1:B:15:THR:O	1:B:16:ASP:HB3	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133:LEU:HA	1:B:136:MET:HE2	1.89	0.53
1:B:390:THR:HG22	1:C:413:SER:OG	2.07	0.53
1:A:79:LEU:HB3	1:A:89:PRO:CB	2.36	0.53
1:J:416:ARG:NH1	1:I:339:GLU:OE2	2.41	0.53
1:I:193:LEU:O	1:I:197:ILE:HG12	2.08	0.53
1:B:317:ARG:HA	1:B:374:MET:HE3	1.89	0.53
1:C:124:ASN:HD22	1:C:129:ALA:HB3	1.73	0.53
1:C:198:LYS:HZ3	1:C:198:LYS:HB3	1.72	0.53
2:H:3:U:H2'	2:H:4:C:C6	2.43	0.53
1:J:240:ASP:OD1	1:J:243:ARG:NH2	2.41	0.53
1:I:204:ARG:HH21	1:C:127:ASP:CB	2.00	0.53
1:A:15:THR:HG22	1:A:16:ASP:H	1.72	0.53
1:C:61:LEU:O	1:C:65:ARG:HG3	2.08	0.53
1:L:416:ARG:NH1	1:K:339:GLU:OE2	2.41	0.53
1:C:193:LEU:HD23	1:C:222:MET:SD	2.49	0.53
1:I:384:ARG:HG2	1:I:384:ARG:HH11	1.74	0.53
1:C:189:MET:CE	1:C:225:ILE:HG13	2.27	0.53
1:B:193:LEU:HD23	1:B:222:MET:SD	2.49	0.53
1:A:168:GLN:O	1:A:188:THR:HG21	2.09	0.53
2:E:9:U:N3	1:A:461:ARG:HG3	2.23	0.53
1:D:425:ILE:CD1	1:C:265:ILE:HD11	2.38	0.53
1:B:340:ASP:N	1:C:408:ILE:HD11	2.24	0.53
1:K:406:ILE:HD11	1:J:162:ARG:HD2	1.91	0.52
1:A:221:ARG:CB	1:A:221:ARG:HH11	2.22	0.52
1:L:411:THR:N	1:K:339:GLU:OE1	2.40	0.52
1:B:124:ASN:HD22	1:B:129:ALA:HB3	1.73	0.52
1:B:265:ILE:HD11	1:C:425:ILE:CD1	2.38	0.52
2:F:18:C:C1'	1:B:74:ARG:HD3	2.28	0.52
1:J:193:LEU:O	1:J:197:ILE:HG12	2.08	0.52
1:J:407:SER:OG	1:I:267:ARG:NH1	2.42	0.52
1:B:370:ASN:OD1	1:B:372:GLU:HB3	2.08	0.52
1:C:76:ASN:ND2	1:C:113:LYS:HE2	2.24	0.52
2:F:8:C:C5	1:B:392:SER:HB2	2.44	0.52
2:G:15:U:H3'	2:G:15:U:O2	2.09	0.52
1:J:384:ARG:HG2	1:J:384:ARG:HH11	1.74	0.52
2:G:8:C:C5	1:C:392:SER:HB2	2.44	0.52
1:L:406:ILE:HD11	1:K:162:ARG:HD2	1.91	0.52
1:L:407:SER:OG	1:K:267:ARG:NH1	2.42	0.52
1:D:408:ILE:HD11	1:C:340:ASP:N	2.24	0.52
1:B:76:ASN:ND2	1:B:113:LYS:HE2	2.25	0.52
1:B:167:MET:HA	1:B:167:MET:HE2	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:18:C:H1'	1:A:74:ARG:CG	2.40	0.52
1:D:422:ARG:HB3	1:D:423:PRO:HD3	1.91	0.52
1:K:407:SER:OG	1:J:267:ARG:NH1	2.42	0.52
1:I:47:LEU:O	1:I:98:ARG:NH2	2.41	0.52
1:A:124:ASN:ND2	1:A:129:ALA:HB3	2.24	0.52
2:F:15:U:H3'	2:F:15:U:O2	2.09	0.52
2:F:18:C:H1'	1:B:74:ARG:CG	2.40	0.52
2:F:5:U:O4	1:A:356:GLY:HA2	2.09	0.52
1:B:293:ARG:HG3	1:B:293:ARG:HH11	1.75	0.52
1:J:406:ILE:HD11	1:I:162:ARG:HD2	1.91	0.51
1:A:213:ARG:O	1:A:217:ILE:HG23	2.10	0.51
1:K:384:ARG:HH11	1:K:384:ARG:HG2	1.74	0.51
2:F:9:U:N3	1:B:461:ARG:HG2	2.25	0.51
1:J:387:ALA:HB2	1:J:463:VAL:HG12	1.92	0.51
1:C:353:VAL:CG1	1:C:357:LYS:HB2	2.41	0.51
1:C:422:ARG:HB3	1:C:423:PRO:HD3	1.91	0.51
1:L:412:PHE:O	1:L:416:ARG:NH2	2.41	0.51
1:A:193:LEU:CD2	1:A:222:MET:HG3	2.41	0.51
1:A:221:ARG:NH1	1:A:221:ARG:CB	2.73	0.51
2:E:8:C:C5	1:A:392:SER:HB2	2.45	0.51
1:I:98:ARG:NH1	1:I:107:GLU:OE1	2.44	0.51
1:J:47:LEU:O	1:J:98:ARG:NH2	2.41	0.51
1:C:32:MET:CE	1:C:131:ALA:HB1	2.41	0.51
2:G:9:U:N3	1:C:461:ARG:HG2	2.25	0.51
1:K:98:ARG:NH1	1:K:107:GLU:OE1	2.44	0.51
1:A:39:PHE:CE2	1:A:67:VAL:HG21	2.46	0.51
1:A:15:THR:O	1:A:16:ASP:HB3	2.11	0.51
1:C:293:ARG:HG3	1:C:293:ARG:HH11	1.75	0.51
2:O:8:C:H1'	1:K:391:ARG:HB3	1.93	0.50
1:J:98:ARG:NH1	1:J:107:GLU:OE1	2.44	0.50
1:J:412:PHE:O	1:J:416:ARG:NH2	2.41	0.50
1:B:201:ILE:HD13	1:B:201:ILE:N	2.25	0.50
1:B:416:ARG:HG2	1:B:416:ARG:NH1	2.26	0.50
1:C:167:MET:HA	1:C:167:MET:HE2	1.94	0.50
2:G:18:C:H1'	1:C:74:ARG:CG	2.40	0.50
1:C:470:LYS:NZ	1:C:470:LYS:HB3	2.27	0.50
1:D:420:PHE:CD2	1:C:265:ILE:HD12	2.47	0.50
1:K:412:PHE:O	1:K:416:ARG:NH2	2.41	0.50
1:J:438:SER:HB3	1:A:247:ASN:ND2	2.23	0.50
1:I:387:ALA:HB2	1:I:463:VAL:HG12	1.92	0.50
1:C:106:ARG:O	1:C:106:ARG:HG2	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:201:ILE:N	1:C:201:ILE:HD13	2.25	0.50
1:C:317:ARG:HA	1:C:374:MET:HE3	1.92	0.50
1:D:411:THR:HG22	1:C:339:GLU:CB	2.40	0.50
1:A:113:LYS:O	1:A:117:ARG:HG3	2.11	0.50
1:C:63:ILE:O	1:C:67:VAL:HG23	2.12	0.50
1:A:154:LEU:HD21	1:A:167:MET:HE3	1.94	0.50
1:A:324:HIS:CB	1:A:358:LEU:HD22	2.36	0.50
1:A:463:VAL:O	1:A:475:ILE:HB	2.12	0.50
1:C:339:GLU:OE2	1:C:343:VAL:HG11	2.12	0.50
1:K:387:ALA:HB2	1:K:463:VAL:HG12	1.92	0.50
1:J:411:THR:N	1:I:339:GLU:OE1	2.40	0.50
1:I:154:LEU:HD23	1:I:159:MET:HE2	1.93	0.50
2:G:2:C:O2'	2:G:3:U:H5'	2.12	0.50
1:K:154:LEU:HD23	1:K:159:MET:HE2	1.93	0.50
1:B:32:MET:CE	1:B:131:ALA:HB1	2.41	0.50
1:B:106:ARG:O	1:B:106:ARG:HG2	2.11	0.50
1:B:265:ILE:HD12	1:C:420:PHE:CD2	2.47	0.50
1:B:470:LYS:NZ	1:B:470:LYS:HB3	2.27	0.50
2:G:6:C:H4'	1:B:151:THR:CG2	2.42	0.50
1:B:339:GLU:OE2	1:B:343:VAL:HG11	2.12	0.50
1:B:353:VAL:CG1	1:B:357:LYS:HB2	2.41	0.50
1:C:39:PHE:CE2	1:C:67:VAL:HG21	2.47	0.50
1:C:341:LEU:HD12	1:C:352:VAL:O	2.12	0.50
2:F:2:C:O2'	2:F:3:U:H5'	2.12	0.49
1:C:463:VAL:O	1:C:475:ILE:HB	2.12	0.49
1:B:415:GLN:O	1:B:415:GLN:CG	2.59	0.49
1:A:353:VAL:HG12	1:A:357:LYS:HB2	1.93	0.49
1:A:385:TYR:HB3	1:A:463:VAL:HG12	1.93	0.49
1:C:366:ALA:HB3	1:C:369:GLU:HG3	1.95	0.49
1:B:39:PHE:CE2	1:B:67:VAL:HG21	2.47	0.49
1:C:133:LEU:HD23	1:C:136:MET:HE1	1.95	0.49
1:B:63:ILE:O	1:B:67:VAL:HG23	2.12	0.49
1:B:341:LEU:HD12	1:B:352:VAL:O	2.12	0.49
1:A:213:ARG:HB2	1:A:213:ARG:NH1	2.27	0.49
1:B:339:GLU:CB	1:C:411:THR:HG22	2.40	0.49
1:C:177:GLY:O	1:C:179:ALA:N	2.45	0.49
2:E:12:C:H1'	2:E:13:U:O5'	2.12	0.49
1:J:154:LEU:HD23	1:J:159:MET:HE2	1.94	0.49
1:A:183:VAL:HG12	1:A:183:VAL:O	2.11	0.49
1:C:150:ARG:HD3	1:C:170:SER:OG	2.13	0.49
1:B:47:LEU:HD21	1:B:109:ILE:HG21	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:205:ASN:OD1	1:B:205:ASN:O	2.31	0.49
1:B:463:VAL:O	1:B:475:ILE:HB	2.12	0.49
1:A:440:MET:CG	1:A:441:ARG:H	2.17	0.49
1:B:366:ALA:HB3	1:B:369:GLU:HG3	1.94	0.48
1:B:414:VAL:O	1:A:458:PHE:HB2	2.13	0.48
1:B:470:LYS:HB3	1:B:470:LYS:HZ3	1.78	0.48
1:J:438:SER:HB2	1:A:247:ASN:ND2	2.18	0.48
1:B:177:GLY:O	1:B:179:ALA:N	2.45	0.48
1:C:205:ASN:OD1	1:C:205:ASN:O	2.31	0.48
1:B:150:ARG:HD3	1:B:170:SER:OG	2.13	0.48
1:C:235:GLN:HE22	1:C:266:LEU:HB2	1.78	0.48
2:F:11:U:N3	1:B:18:GLU:OE1	2.43	0.48
1:I:441:ARG:NH2	1:B:213:ARG:HH21	2.12	0.48
1:A:443:GLU:CD	1:A:446:ARG:HH21	2.17	0.48
1:C:47:LEU:HD21	1:C:109:ILE:HG21	1.94	0.48
1:K:308:GLN:NE2	1:K:383:SER:O	2.47	0.48
1:K:411:THR:N	1:J:339:GLU:OE1	2.40	0.48
1:D:417:ASN:O	1:D:419:PRO:HD3	2.14	0.48
1:B:235:GLN:HE22	1:B:266:LEU:HB2	1.78	0.48
1:B:312:VAL:HG12	1:B:379:LEU:HD12	1.95	0.48
2:G:11:U:N3	1:C:18:GLU:OE1	2.43	0.48
1:B:221:ARG:O	1:B:225:ILE:HG23	2.14	0.47
1:B:353:VAL:CG1	1:B:354:PRO:HD2	2.44	0.47
1:A:353:VAL:HG12	1:A:354:PRO:HD2	1.95	0.47
1:I:284:ALA:HB2	1:I:306:LEU:HD11	1.96	0.47
1:I:308:GLN:NE2	1:I:383:SER:O	2.47	0.47
1:B:189:MET:HE3	1:B:225:ILE:CG1	2.31	0.47
1:A:353:VAL:CG1	1:A:354:PRO:HD2	2.44	0.47
1:A:444:ILE:O	1:A:448:MET:HG2	2.15	0.47
1:C:221:ARG:O	1:C:225:ILE:HG23	2.14	0.47
2:G:3:U:O2'	2:G:4:C:H5'	2.14	0.47
2:H:6:C:H4'	1:C:151:THR:CG2	2.44	0.47
1:C:312:VAL:HG12	1:C:379:LEU:HD12	1.95	0.47
1:C:417:ASN:O	1:C:419:PRO:HD3	2.14	0.47
1:J:308:GLN:NE2	1:J:383:SER:O	2.47	0.47
1:A:177:GLY:O	1:A:179:ALA:N	2.47	0.47
1:A:189:MET:CE	1:A:225:ILE:HD11	2.40	0.47
1:A:303:PRO:HG2	1:A:389:ARG:NH2	2.29	0.47
2:F:9:U:O2'	1:A:152:ARG:NH1	2.48	0.47
1:J:216:ARG:NH2	1:J:243:ARG:O	2.47	0.47
1:B:208:ARG:NH1	1:B:208:ARG:CB	2.78	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:134:THR:HA	1:C:137:MET:HE2	1.97	0.47
2:H:6:C:H4'	1:C:151:THR:HG22	1.97	0.47
1:I:216:ARG:NH2	1:I:243:ARG:O	2.47	0.47
1:C:353:VAL:HG12	1:C:354:PRO:HD2	1.96	0.47
1:C:353:VAL:CG1	1:C:354:PRO:HD2	2.44	0.47
2:E:12:C:C4	1:A:25:ILE:HD12	2.50	0.47
3:E:601:A1IJK:C8	1:K:216:ARG:HG2	2.44	0.47
2:F:3:U:O2'	2:F:4:C:H5'	2.14	0.47
1:J:234:ALA:HA	1:J:440:MET:HE2	1.97	0.47
1:I:234:ALA:HA	1:I:440:MET:HE2	1.97	0.47
1:B:353:VAL:HG12	1:B:354:PRO:HD2	1.96	0.47
1:B:408:ILE:HD11	1:A:340:ASP:CA	2.45	0.47
1:B:429:PHE:HE2	1:A:448:MET:CE	2.27	0.47
1:C:208:ARG:NH1	1:C:208:ARG:CB	2.78	0.47
1:K:20:GLN:O	1:K:23:THR:HG22	2.15	0.47
1:B:133:LEU:HD23	1:B:136:MET:HE1	1.96	0.47
1:C:92:THR:HG21	1:C:113:LYS:HE3	1.97	0.47
1:J:284:ALA:HB2	1:J:306:LEU:HD11	1.96	0.47
1:A:221:ARG:O	1:A:225:ILE:HG23	2.15	0.47
2:G:5:U:O4	1:B:356:GLY:HA2	2.15	0.47
1:A:152:ARG:O	1:A:156:ARG:HB2	2.15	0.47
1:A:174:ARG:NH1	1:A:174:ARG:HB2	2.30	0.47
1:K:216:ARG:NH2	1:K:243:ARG:O	2.47	0.46
1:A:284:ALA:HB2	1:A:306:LEU:HD11	1.97	0.46
1:J:300:GLY:O	1:J:389:ARG:NH2	2.48	0.46
1:C:101:ASP:OD1	1:C:101:ASP:C	2.53	0.46
1:K:479:PHE:HA	1:K:481:MET:HE1	1.98	0.46
1:I:300:GLY:O	1:I:389:ARG:NH2	2.48	0.46
1:A:188:THR:O	1:A:192:GLU:HG3	2.15	0.46
2:G:1:U:O2	1:B:108:LEU:HD21	2.15	0.46
1:K:234:ALA:HA	1:K:440:MET:HE2	1.98	0.46
1:B:39:PHE:CZ	1:B:67:VAL:HG22	2.51	0.46
1:B:410:PRO:HA	1:A:339:GLU:OE1	2.15	0.46
1:A:59:ASN:O	1:A:63:ILE:HG13	2.16	0.46
1:D:411:THR:HG23	1:D:412:PHE:CD2	2.50	0.46
1:B:41:ILE:O	1:B:45:THR:HG23	2.16	0.46
1:B:101:ASP:C	1:B:101:ASP:OD1	2.53	0.46
1:C:470:LYS:HB3	1:C:470:LYS:HZ3	1.80	0.46
1:K:284:ALA:HB2	1:K:306:LEU:HD11	1.96	0.46
1:J:20:GLN:O	1:J:23:THR:HG22	2.15	0.46
1:A:217:ILE:HD12	1:A:217:ILE:C	2.36	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:304:PHE:CD2	1:A:386:TRP:HB2	2.50	0.46
1:C:41:ILE:O	1:C:45:THR:HG23	2.16	0.46
1:B:92:THR:HG21	1:B:113:LYS:HE3	1.97	0.46
2:F:12:C:N4	2:F:13:U:O2	2.49	0.46
1:I:20:GLN:O	1:I:23:THR:HG22	2.15	0.46
1:K:300:GLY:O	1:K:389:ARG:NH2	2.48	0.46
1:B:370:ASN:OD1	1:B:370:ASN:C	2.54	0.46
1:B:426:MET:CE	1:A:449:GLU:HG2	2.45	0.46
1:A:189:MET:O	1:A:193:LEU:HG	2.16	0.46
1:C:370:ASN:OD1	1:C:370:ASN:C	2.54	0.46
1:B:200:GLY:HA2	1:B:206:PHE:HB3	1.97	0.45
1:C:39:PHE:CZ	1:C:67:VAL:HG22	2.51	0.45
1:C:166:LEU:HB3	1:C:187:GLY:N	2.30	0.45
1:B:406:ILE:CG2	1:A:162:ARG:HE	2.30	0.45
1:C:15:THR:HG22	1:C:16:ASP:N	2.29	0.45
1:C:411:THR:HG23	1:C:412:PHE:CD2	2.50	0.45
2:F:3:U:H2'	2:F:4:C:C6	2.51	0.45
1:A:100:VAL:HB	1:A:105:ARG:HH22	1.76	0.45
1:A:198:LYS:HE3	1:A:253:PHE:HE2	1.80	0.45
1:A:236:ARG:O	1:A:239:VAL:HG12	2.16	0.45
2:G:17:U:OP2	1:C:221:ARG:NH2	2.48	0.45
1:A:46:GLU:OE2	1:A:111:TYR:CE1	2.69	0.45
1:C:193:LEU:CD2	1:C:222:MET:HG3	2.44	0.45
1:J:384:ARG:HG2	1:J:384:ARG:NH1	2.32	0.45
1:B:133:LEU:HA	1:B:136:MET:CE	2.46	0.45
1:B:305:ARG:NH1	1:B:469:GLU:OE2	2.47	0.45
1:B:425:ILE:HD13	1:A:265:ILE:CD1	2.37	0.45
1:C:305:ARG:NH1	1:C:469:GLU:OE2	2.47	0.45
1:B:302:ASP:HB2	1:B:303:PRO:HD3	1.99	0.45
1:B:426:MET:CE	1:A:449:GLU:HA	2.47	0.45
1:A:15:THR:HG22	1:A:16:ASP:N	2.31	0.45
1:A:53:GLU:O	1:A:59:ASN:ND2	2.48	0.45
1:A:167:MET:HE2	1:A:187:GLY:CA	2.40	0.45
1:C:133:LEU:HA	1:C:136:MET:CE	2.46	0.45
2:G:12:C:N4	2:G:13:U:O2	2.49	0.45
1:K:317:ARG:NH1	1:K:369:GLU:OE2	2.50	0.45
1:K:408:ILE:HG13	1:K:419:PRO:HD2	1.99	0.45
1:B:166:LEU:HB3	1:B:187:GLY:N	2.30	0.45
1:A:39:PHE:CZ	1:A:67:VAL:CG2	3.00	0.45
1:C:302:ASP:HB2	1:C:303:PRO:HD3	1.99	0.45
2:G:3:U:H2'	2:G:4:C:C6	2.51	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:408:ILE:HG13	1:J:419:PRO:HD2	1.99	0.45
1:I:384:ARG:HG2	1:I:384:ARG:NH1	2.32	0.45
1:C:200:GLY:HA2	1:C:206:PHE:HB3	1.97	0.45
2:N:7:U:H5"	2:N:8:C:H5	1.81	0.45
1:B:193:LEU:CD2	1:B:222:MET:HG3	2.44	0.45
1:A:55:ARG:O	1:A:312:VAL:HG23	2.17	0.45
1:C:183:VAL:HG12	1:C:183:VAL:O	2.17	0.45
1:I:439:ASP:CB	1:B:246:ARG:HB3	2.42	0.44
1:B:183:VAL:O	1:B:183:VAL:HG12	2.17	0.44
1:C:112:ASP:OD1	1:C:112:ASP:N	2.50	0.44
1:B:15:THR:HG22	1:B:16:ASP:N	2.29	0.44
1:B:112:ASP:N	1:B:112:ASP:OD1	2.50	0.44
1:A:18:GLU:OE2	1:A:18:GLU:C	2.55	0.44
1:C:415:GLN:CG	1:C:415:GLN:O	2.65	0.44
1:J:317:ARG:NH1	1:J:369:GLU:OE2	2.50	0.44
1:A:39:PHE:CE1	1:A:43:MET:HG3	2.53	0.44
1:A:448:MET:HG2	1:A:448:MET:H	1.56	0.44
1:C:40:TYR:OH	1:C:54:GLY:O	2.27	0.44
2:F:17:U:OP2	1:B:221:ARG:NH2	2.48	0.44
1:D:415:GLN:O	1:D:415:GLN:CG	2.65	0.44
1:B:32:MET:HE2	1:B:131:ALA:HB1	1.98	0.44
1:B:154:LEU:CD2	1:B:159:MET:HE2	2.47	0.44
1:A:141:SER:OG	1:A:169:GLY:HA2	2.18	0.44
1:A:183:VAL:CG2	1:A:273:LYS:HD2	2.48	0.44
1:I:317:ARG:NH1	1:I:369:GLU:OE2	2.50	0.44
1:B:297:SER:O	1:B:303:PRO:HD3	2.18	0.44
1:A:77:LYS:HD2	1:A:77:LYS:HA	1.80	0.44
1:C:297:SER:O	1:C:303:PRO:HD3	2.18	0.44
1:K:384:ARG:HG2	1:K:384:ARG:NH1	2.32	0.44
1:J:109:ILE:HD12	1:J:109:ILE:O	2.18	0.44
1:I:109:ILE:HD12	1:I:109:ILE:O	2.17	0.44
1:B:410:PRO:HA	1:B:416:ARG:HH21	1.83	0.44
1:I:204:ARG:NH2	1:C:127:ASP:HB2	2.31	0.44
1:I:353:VAL:CG1	1:I:357:LYS:HB2	2.48	0.44
1:B:134:THR:HA	1:B:137:MET:HE2	1.99	0.44
1:A:24:GLU:OE1	1:A:24:GLU:HA	2.18	0.44
1:A:317:ARG:O	1:A:320:GLU:HB2	2.18	0.44
1:A:331:MET:HB3	1:A:331:MET:HE3	1.65	0.44
1:A:384:ARG:NH1	1:A:384:ARG:CG	2.80	0.44
1:J:353:VAL:CG1	1:J:357:LYS:HB2	2.48	0.44
1:A:39:PHE:CZ	1:A:67:VAL:HG21	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:109:ILE:HD13	1:A:109:ILE:HA	1.83	0.43
1:K:189:MET:HE3	1:K:189:MET:HB3	1.89	0.43
1:J:208:ARG:CZ	1:B:121:ARG:HD3	2.48	0.43
1:B:31:LYS:HB2	1:B:292:GLU:OE1	2.19	0.43
1:B:189:MET:HE1	1:B:225:ILE:CD1	2.48	0.43
1:B:411:THR:N	1:A:339:GLU:OE1	2.49	0.43
1:L:408:ILE:HG13	1:L:419:PRO:HD2	1.99	0.43
1:K:276:LEU:HD12	1:K:306:LEU:HD23	2.00	0.43
1:K:317:ARG:NH2	1:K:362:GLY:O	2.49	0.43
1:A:99:ARG:HD3	1:A:104:TRP:CZ2	2.53	0.43
1:K:109:ILE:HD12	1:K:109:ILE:O	2.18	0.43
1:B:205:ASN:HA	1:B:208:ARG:HH22	1.83	0.43
1:B:277:PRO:HG2	1:B:280:VAL:HG23	2.00	0.43
1:C:464:PHE:CD2	1:C:471:ALA:HA	2.53	0.43
2:E:12:C:H1'	2:E:13:U:P	2.57	0.43
1:K:353:VAL:CG1	1:K:357:LYS:HB2	2.48	0.43
1:A:60:SER:O	1:A:64:GLU:HG3	2.18	0.43
1:B:216:ARG:HD2	1:B:220:GLU:HG2	2.01	0.43
1:C:31:LYS:HB2	1:C:292:GLU:OE1	2.18	0.43
1:C:189:MET:HE3	1:C:225:ILE:CG1	2.30	0.43
1:C:216:ARG:HD2	1:C:220:GLU:HG2	2.01	0.43
2:G:11:U:H4'	1:C:25:ILE:HG13	2.01	0.43
1:K:167:MET:HE3	1:K:188:THR:HG22	2.00	0.43
1:J:276:LEU:HD12	1:J:306:LEU:HD23	2.00	0.43
1:B:464:PHE:CD2	1:B:471:ALA:HA	2.53	0.43
1:K:351:LYS:NZ	1:K:351:LYS:HB3	2.33	0.43
1:C:277:PRO:HG2	1:C:280:VAL:HG23	2.00	0.43
2:F:11:U:H4'	1:B:25:ILE:HG13	2.01	0.43
1:K:124:ASN:ND2	1:K:129:ALA:HB3	2.34	0.43
1:B:384:ARG:HH11	1:B:384:ARG:CG	2.32	0.43
1:L:416:ARG:HH12	1:K:339:GLU:CD	2.22	0.42
2:O:7:U:C4	1:J:161:PRO:HG3	2.54	0.42
2:G:13:U:HO2'	2:G:14:C:H6	1.65	0.42
1:K:307:LEU:HD23	1:K:307:LEU:HA	1.91	0.42
1:J:124:ASN:ND2	1:J:129:ALA:HB3	2.34	0.42
1:J:351:LYS:NZ	1:J:351:LYS:HB3	2.33	0.42
1:I:276:LEU:HD12	1:I:306:LEU:HD23	2.00	0.42
1:B:405:GLN:N	1:A:489:PHE:O	2.46	0.42
1:A:385:TYR:HB3	1:A:463:VAL:HG11	1.97	0.42
1:B:324:HIS:CB	1:B:358:LEU:HD22	2.47	0.42
1:C:189:MET:HE1	1:C:225:ILE:CD1	2.49	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:62:THR:HG23	1:K:94:GLY:HA3	2.01	0.42
1:K:416:ARG:HH12	1:J:339:GLU:CD	2.22	0.42
1:B:248:PRO:HA	1:B:252:GLU:CD	2.40	0.42
1:A:143:LEU:HA	1:A:332:ALA:CB	2.50	0.42
1:A:252:GLU:OE1	1:A:252:GLU:N	2.39	0.42
1:C:248:PRO:HA	1:C:252:GLU:CD	2.40	0.42
1:I:204:ARG:HE	1:C:126:GLY:C	2.20	0.42
1:C:384:ARG:HH11	1:C:384:ARG:CG	2.32	0.42
3:F:601:A1IJK:C20	3:F:601:A1IJK:O18	2.68	0.42
3:G:601:A1IJK:O26	1:I:216:ARG:CB	2.68	0.42
1:J:62:THR:HG23	1:J:94:GLY:HA3	2.01	0.42
1:B:39:PHE:CZ	1:B:67:VAL:CG2	3.03	0.42
1:A:451:ALA:O	1:A:452:ARG:HD3	2.19	0.42
1:C:16:ASP:OD1	1:C:16:ASP:O	2.37	0.42
2:F:18:C:P	1:B:214:ARG:HH21	2.42	0.42
3:G:601:A1IJK:C20	3:G:601:A1IJK:O18	2.68	0.42
1:I:351:LYS:NZ	1:I:351:LYS:HB3	2.33	0.42
1:B:448:MET:HE1	1:C:429:PHE:CZ	2.55	0.42
1:A:32:MET:CE	1:A:131:ALA:HB1	2.50	0.42
2:F:13:U:HO2'	2:F:14:C:H6	1.65	0.42
1:J:216:ARG:HA	1:J:216:ARG:HD2	1.92	0.42
1:J:317:ARG:NH2	1:J:362:GLY:O	2.49	0.42
1:B:16:ASP:OD1	1:B:16:ASP:O	2.37	0.42
1:B:422:ARG:HB3	1:B:423:PRO:HD3	2.01	0.42
1:A:174:ARG:HB2	1:A:174:ARG:HH11	1.84	0.42
1:C:233:ALA:O	1:C:237:THR:HG23	2.20	0.42
1:C:301:ILE:HG12	1:C:301:ILE:O	2.19	0.42
1:L:415:GLN:O	1:L:416:ARG:O	2.38	0.42
1:B:233:ALA:O	1:B:237:THR:HG23	2.20	0.42
1:B:301:ILE:HG12	1:B:301:ILE:O	2.19	0.42
1:K:163:MET:HB2	1:K:166:LEU:HD12	2.02	0.42
1:J:416:ARG:HH12	1:I:339:GLU:CD	2.22	0.42
1:B:184:LYS:HB3	1:B:184:LYS:HE3	1.87	0.42
2:N:7:U:H1'	1:I:155:VAL:HG21	2.02	0.42
1:J:405:GLN:HB3	1:I:487:TYR:HB3	2.01	0.42
1:B:76:ASN:HD21	1:B:113:LYS:HE2	1.85	0.42
1:C:76:ASN:HD21	1:C:113:LYS:HE2	1.84	0.42
1:C:293:ARG:HG3	1:C:293:ARG:NH1	2.35	0.42
2:G:18:C:P	1:C:214:ARG:HH21	2.42	0.41
1:A:124:ASN:HD22	1:A:129:ALA:HB3	1.85	0.41
1:A:221:ARG:HH11	1:A:221:ARG:HB2	1.84	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:15:THR:HA	1:C:18:GLU:HG3	2.02	0.41
1:D:429:PHE:CZ	1:C:448:MET:HE1	2.55	0.41
1:A:16:ASP:OD1	1:A:16:ASP:O	2.38	0.41
1:I:62:THR:HG23	1:I:94:GLY:HA3	2.01	0.41
1:I:124:ASN:ND2	1:I:129:ALA:HB3	2.34	0.41
1:C:39:PHE:CZ	1:C:67:VAL:CG2	3.03	0.41
1:C:160:ASP:OD2	1:C:162:ARG:HB2	2.21	0.41
1:L:405:GLN:HB3	1:K:487:TYR:HB3	2.01	0.41
1:J:137:MET:CE	1:J:173:PRO:HG2	2.51	0.41
1:I:216:ARG:HA	1:I:216:ARG:HD2	1.92	0.41
1:A:181:ALA:HB1	1:A:225:ILE:HD12	2.01	0.41
1:K:415:GLN:O	1:K:416:ARG:O	2.38	0.41
1:J:415:GLN:O	1:J:416:ARG:O	2.38	0.41
1:I:163:MET:HB2	1:I:166:LEU:HD12	2.02	0.41
1:B:274:SER:HA	1:B:333:CYS:O	2.21	0.41
1:A:259:LEU:HD23	1:A:259:LEU:HA	1.92	0.41
1:B:15:THR:HA	1:B:18:GLU:HG3	2.02	0.41
1:A:238:MET:CE	1:A:444:ILE:HD12	2.49	0.41
3:G:601:A1IJK:C7	1:I:246:ARG:NH1	2.83	0.41
1:I:351:LYS:HB3	1:I:351:LYS:HZ1	1.85	0.41
1:A:143:LEU:HA	1:A:332:ALA:HB1	2.02	0.41
1:A:340:ASP:HB3	1:A:343:VAL:CG1	2.41	0.41
1:C:211:ASN:OD1	1:C:214:ARG:HD3	2.21	0.41
2:O:3:U:OP1	1:J:367:SER:N	2.48	0.41
2:P:3:U:OP1	1:K:367:SER:N	2.48	0.41
2:G:1:U:OP3	1:B:75:ARG:NH2	2.48	0.41
1:J:163:MET:HB2	1:J:166:LEU:HD12	2.02	0.41
1:I:317:ARG:NH2	1:I:362:GLY:O	2.49	0.41
1:B:440:MET:HE2	1:B:442:THR:H	1.86	0.41
1:A:150:ARG:HD3	1:A:170:SER:OG	2.20	0.41
1:A:151:THR:O	1:A:155:VAL:HG12	2.21	0.41
1:K:405:GLN:HB3	1:J:487:TYR:HB3	2.01	0.41
1:I:481:MET:H	1:I:481:MET:HE3	1.85	0.41
1:B:160:ASP:OD2	1:B:162:ARG:HB2	2.21	0.41
1:B:214:ARG:HH11	1:B:214:ARG:HG2	1.86	0.41
1:B:293:ARG:HG3	1:B:293:ARG:NH1	2.35	0.41
1:A:159:MET:HB3	1:A:163:MET:CE	2.51	0.41
1:C:53:GLU:H	1:C:53:GLU:HG3	1.72	0.41
1:C:274:SER:HA	1:C:333:CYS:O	2.21	0.41
1:I:438:SER:HB2	1:B:247:ASN:HD22	1.86	0.41
1:B:80:GLU:HA	1:B:89:PRO:HG3	2.04	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:80:GLU:HA	1:C:89:PRO:HG3	2.03	0.41
1:C:217:ILE:O	1:C:217:ILE:HD12	2.21	0.41
2:E:12:C:C1'	2:E:13:U:P	3.09	0.40
1:J:137:MET:HE3	1:J:175:ARG:HG3	2.03	0.40
1:B:232:THR:HG21	1:B:266:LEU:HD13	2.03	0.40
1:A:152:ARG:HA	1:A:155:VAL:HG12	2.03	0.40
1:A:200:GLY:HA2	1:A:206:PHE:HB3	2.03	0.40
1:A:235:GLN:HG2	1:A:259:LEU:CD2	2.51	0.40
1:C:32:MET:HE1	1:C:131:ALA:HB1	2.03	0.40
1:C:214:ARG:HG2	1:C:214:ARG:HH11	1.87	0.40
1:D:426:MET:HE1	1:C:449:GLU:HA	2.04	0.40
1:B:216:ARG:HE	1:B:220:GLU:CD	2.24	0.40
1:A:252:GLU:O	1:A:255:ASP:OD1	2.39	0.40
1:C:464:PHE:CD1	1:C:464:PHE:N	2.90	0.40
2:F:16:C:H1'	1:B:174:ARG:CD	2.49	0.40
1:K:77:LYS:HE2	1:K:77:LYS:HB2	1.94	0.40
1:B:203:ASP:OD1	1:B:205:ASN:HB3	2.22	0.40
2:G:18:C:H3'	3:G:601:A1IJK:C3	2.51	0.40
1:B:185:GLY:HA2	1:B:270:VAL:HG22	2.03	0.40
1:C:185:GLY:HA2	1:C:270:VAL:HG22	2.03	0.40
1:C:440:MET:HE2	1:C:442:THR:H	1.86	0.40
2:F:18:C:H3'	3:F:601:A1IJK:C3	2.52	0.40
1:I:151:THR:HA	1:I:154:LEU:HD12	2.04	0.40
1:A:100:VAL:O	1:A:101:ASP:HB2	2.22	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	422/494 (85%)	410 (97%)	11 (3%)	1 (0%)	44	75

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	446/494 (90%)	428 (96%)	17 (4%)	1 (0%)	44	75
1	C	446/494 (90%)	429 (96%)	16 (4%)	1 (0%)	44	75
1	D	24/494 (5%)	22 (92%)	2 (8%)	0	100	100
1	I	430/494 (87%)	417 (97%)	13 (3%)	0	100	100
1	J	456/494 (92%)	441 (97%)	14 (3%)	1 (0%)	44	75
1	K	456/494 (92%)	441 (97%)	14 (3%)	1 (0%)	44	75
1	L	26/494 (5%)	24 (92%)	1 (4%)	1 (4%)	2	18
All	All	2706/3952 (68%)	2612 (96%)	88 (3%)	6 (0%)	45	75

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	416	ARG
1	K	416	ARG
1	J	416	ARG
1	B	178	ALA
1	A	178	ALA
1	C	178	ALA

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	361/420 (86%)	346 (96%)	15 (4%)	25	58
1	B	384/420 (91%)	360 (94%)	24 (6%)	15	46
1	C	384/420 (91%)	360 (94%)	24 (6%)	15	46
1	D	23/420 (6%)	22 (96%)	1 (4%)	25	57
1	I	368/420 (88%)	358 (97%)	10 (3%)	40	69
1	J	393/420 (94%)	383 (98%)	10 (2%)	42	71
1	K	393/420 (94%)	383 (98%)	10 (2%)	42	71
1	L	25/420 (6%)	25 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
All	All	2331/3360 (69%)	2237 (96%)	94 (4%)	29	59

All (94) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	416	ARG
1	K	73	GLU
1	K	106	ARG
1	K	111	TYR
1	K	160	ASP
1	K	204	ARG
1	K	229	LYS
1	K	240	ASP
1	K	253	PHE
1	K	283	SER
1	K	481	MET
1	J	73	GLU
1	J	106	ARG
1	J	111	TYR
1	J	160	ASP
1	J	204	ARG
1	J	229	LYS
1	J	240	ASP
1	J	253	PHE
1	J	283	SER
1	J	481	MET
1	I	73	GLU
1	I	106	ARG
1	I	111	TYR
1	I	160	ASP
1	I	204	ARG
1	I	229	LYS
1	I	240	ASP
1	I	253	PHE
1	I	283	SER
1	I	481	MET
1	B	26	ARG
1	B	31	LYS
1	B	51	ASP
1	B	74	ARG
1	B	101	ASP
1	B	103	LYS

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Mol	Chain	Res	Type
1	B	106	ARG
1	B	111	TYR
1	B	112	ASP
1	B	162	ARG
1	B	164	CYS
1	B	174	ARG
1	B	204	ARG
1	B	221	ARG
1	B	240	ASP
1	B	253	PHE
1	B	255	ASP
1	B	269	SER
1	B	372	GLU
1	B	384	ARG
1	B	448	MET
1	B	452	ARG
1	B	457	SER
1	B	470	LYS
1	A	18	GLU
1	A	26	ARG
1	A	46	GLU
1	A	48	LYS
1	A	112	ASP
1	A	136	MET
1	A	163	MET
1	A	199	ARG
1	A	206	PHE
1	A	213	ARG
1	A	250	ASN
1	A	305	ARG
1	A	448	MET
1	A	461	ARG
1	A	464	PHE
1	C	26	ARG
1	C	31	LYS
1	C	74	ARG
1	C	101	ASP
1	C	103	LYS
1	C	106	ARG
1	C	111	TYR
1	C	112	ASP
1	C	162	ARG

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Mol	Chain	Res	Type
1	C	164	CYS
1	C	174	ARG
1	C	204	ARG
1	C	221	ARG
1	C	240	ASP
1	C	253	PHE
1	C	255	ASP
1	C	269	SER
1	C	372	GLU
1	C	384	ARG
1	C	416	ARG
1	C	448	MET
1	C	452	ARG
1	C	457	SER
1	C	470	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	247	ASN
1	B	364	GLN
1	B	405	GLN
1	A	247	ASN
1	C	364	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	E	10/18 (55%)	8 (80%)	1 (10%)
2	F	17/18 (94%)	7 (41%)	0
2	G	17/18 (94%)	7 (41%)	0
2	H	6/18 (33%)	1 (16%)	0
2	M	10/18 (55%)	6 (60%)	0
2	N	17/18 (94%)	10 (58%)	0
2	O	17/18 (94%)	7 (41%)	1 (5%)
2	P	6/18 (33%)	2 (33%)	0
All	All	100/144 (69%)	48 (48%)	2 (2%)

All (48) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	O	5	U
2	O	12	C
2	O	13	U
2	O	14	C
2	O	15	U
2	O	17	U
2	O	18	C
2	P	5	U
2	P	7	U
2	M	12	C
2	M	13	U
2	M	14	C
2	M	15	U
2	M	17	U
2	M	18	C
2	N	5	U
2	N	7	U
2	N	8	C
2	N	9	U
2	N	12	C
2	N	13	U
2	N	14	C
2	N	15	U
2	N	17	U
2	N	18	C
2	E	9	U
2	E	10	C
2	E	12	C
2	E	13	U
2	E	14	C
2	E	15	U
2	E	17	U
2	E	18	C
2	F	5	U
2	F	9	U
2	F	12	C
2	F	13	U
2	F	15	U
2	F	17	U
2	F	18	C
2	G	5	U
2	G	9	U
2	G	12	C

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Mol	Chain	Res	Type
2	G	13	U
2	G	15	U
2	G	17	U
2	G	18	C
2	H	5	U

All (2) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	O	8	C
2	E	12	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 ⓘ

6 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
3	A1IJK	N	101	2	34,39,39	1.40	9 (26%)	44,55,55	0.88	2 (4%)
3	A1IJK	O	101	2	34,39,39	1.40	9 (26%)	44,55,55	0.88	2 (4%)
3	A1IJK	G	601	2	34,39,39	1.41	9 (26%)	44,55,55	0.82	1 (2%)
3	A1IJK	M	101	2	34,39,39	1.40	9 (26%)	44,55,55	0.88	2 (4%)
3	A1IJK	F	601	2	34,39,39	1.41	9 (26%)	44,55,55	0.82	1 (2%)
3	A1IJK	E	601	2	34,39,39	1.41	9 (26%)	44,55,55	0.85	2 (4%)

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
3	A1IJK	N	101	2	-	0/21/59/59	0/4/4/4
3	A1IJK	O	101	2	-	0/21/59/59	0/4/4/4
3	A1IJK	G	601	2	-	1/21/59/59	0/4/4/4
3	A1IJK	M	101	2	-	0/21/59/59	0/4/4/4
3	A1IJK	F	601	2	-	1/21/59/59	0/4/4/4
3	A1IJK	E	601	2	-	3/21/59/59	0/4/4/4

All (54) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	601	A1IJK	C33-C32	-3.75	1.38	1.46
3	E	601	A1IJK	C33-C32	-3.72	1.38	1.46
3	F	601	A1IJK	C33-C32	-3.71	1.38	1.46
3	M	101	A1IJK	C33-C32	-3.66	1.38	1.46
3	O	101	A1IJK	C33-C32	-3.65	1.38	1.46
3	N	101	A1IJK	C33-C32	-3.64	1.38	1.46
3	E	601	A1IJK	C25-C34	-2.51	1.39	1.44
3	M	101	A1IJK	C25-C34	-2.49	1.39	1.44
3	O	101	A1IJK	C25-C34	-2.48	1.39	1.44
3	E	601	A1IJK	C29-C30	2.48	1.38	1.34
3	N	101	A1IJK	C21-C30	-2.47	1.39	1.44
3	O	101	A1IJK	C21-C30	-2.46	1.39	1.44
3	M	101	A1IJK	C21-C30	-2.45	1.39	1.44
3	N	101	A1IJK	C25-C34	-2.45	1.39	1.44
3	F	601	A1IJK	C29-C30	2.43	1.38	1.34
3	G	601	A1IJK	C29-C30	2.42	1.38	1.34
3	G	601	A1IJK	C25-C34	-2.42	1.39	1.44
3	G	601	A1IJK	C25-C20	2.41	1.45	1.41
3	N	101	A1IJK	C25-C20	2.40	1.45	1.41
3	O	101	A1IJK	C25-C20	2.38	1.45	1.41
3	E	601	A1IJK	C21-C20	2.38	1.45	1.41
3	F	601	A1IJK	C25-C34	-2.38	1.39	1.44
3	F	601	A1IJK	C25-C20	2.38	1.45	1.41
3	F	601	A1IJK	C21-C30	-2.35	1.39	1.44
3	M	101	A1IJK	C25-C20	2.35	1.45	1.41
3	G	601	A1IJK	C21-C30	-2.34	1.39	1.44
3	G	601	A1IJK	C21-C20	2.33	1.45	1.41
3	E	601	A1IJK	C21-C30	-2.30	1.40	1.44
3	F	601	A1IJK	C21-C20	2.29	1.45	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	601	A1IJK	C25-C20	2.29	1.45	1.41
3	F	601	A1IJK	O23-C22	2.27	1.38	1.35
3	O	101	A1IJK	O23-C24	2.26	1.38	1.35
3	N	101	A1IJK	O23-C24	2.26	1.38	1.35
3	N	101	A1IJK	C29-C30	2.24	1.38	1.34
3	M	101	A1IJK	O23-C24	2.24	1.38	1.35
3	M	101	A1IJK	O23-C22	2.23	1.38	1.35
3	E	601	A1IJK	O23-C24	2.22	1.38	1.35
3	O	101	A1IJK	O23-C22	2.21	1.38	1.35
3	O	101	A1IJK	C29-C30	2.21	1.38	1.34
3	E	601	A1IJK	O23-C22	2.20	1.38	1.35
3	M	101	A1IJK	C29-C30	2.20	1.38	1.34
3	N	101	A1IJK	O23-C22	2.20	1.38	1.35
3	G	601	A1IJK	O23-C22	2.19	1.38	1.35
3	G	601	A1IJK	O23-C24	2.15	1.38	1.35
3	F	601	A1IJK	O23-C24	2.15	1.38	1.35
3	N	101	A1IJK	C27-C28	2.12	1.45	1.39
3	M	101	A1IJK	C27-C28	2.12	1.45	1.39
3	G	601	A1IJK	C27-C28	2.11	1.45	1.39
3	O	101	A1IJK	C27-C28	2.11	1.45	1.39
3	F	601	A1IJK	C27-C28	2.11	1.45	1.39
3	M	101	A1IJK	C21-C20	2.10	1.45	1.41
3	O	101	A1IJK	C21-C20	2.09	1.45	1.41
3	N	101	A1IJK	C21-C20	2.09	1.45	1.41
3	E	601	A1IJK	C27-C28	2.06	1.45	1.39

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	N	101	A1IJK	C20-C21-C30	-2.36	119.85	124.50
3	O	101	A1IJK	C20-C21-C30	-2.36	119.85	124.50
3	M	101	A1IJK	C20-C21-C30	-2.34	119.89	124.50
3	G	601	A1IJK	C20-C21-C30	-2.14	120.27	124.50
3	F	601	A1IJK	C20-C21-C30	-2.14	120.28	124.50
3	M	101	A1IJK	C15-C20-C21	-2.12	119.90	122.77
3	N	101	A1IJK	C15-C20-C21	-2.10	119.94	122.77
3	O	101	A1IJK	C15-C20-C21	-2.09	119.95	122.77
3	E	601	A1IJK	C20-C25-C34	-2.07	120.42	124.50
3	E	601	A1IJK	C20-C21-C30	-2.06	120.43	124.50

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	601	A1IJK	C6-C7-C8-N9
3	G	601	A1IJK	C6-C7-C8-N9
3	E	601	A1IJK	C7-C8-N9-C10
3	E	601	A1IJK	C11-C10-N9-C8
3	E	601	A1IJK	O26-C10-N9-C8

There are no ring outliers.

3 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	601	A1IJK	8	0
3	F	601	A1IJK	2	0
3	E	601	A1IJK	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 then 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 A1IJK N 101

Bond lengths

Bond angles

Torsions

Rings

Ligand A1IJK O 101

Bond lengths

Bond angles

Torsions

Rings

Ligand A1IJK G 601

Bond lengths

Bond angles

Torsions

Rings

Ligand A1IJK M 101

Bond lengths

Bond angles

Torsions

Rings

Ligand A1IJK F 601

Bond lengths

Bond angles

Torsions

Rings

Ligand A1IJK E 601

Bond lengths

Bond angles

Torsions

Rings
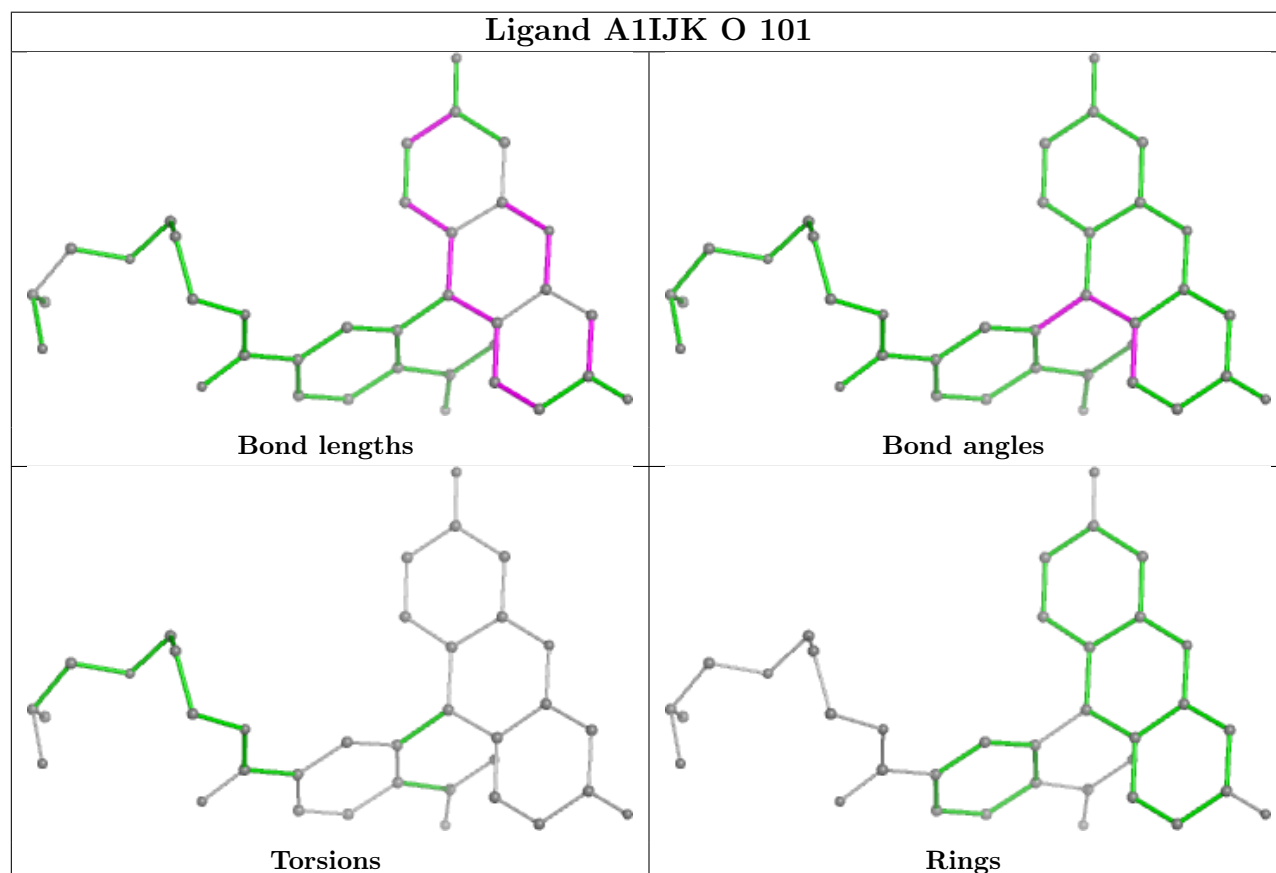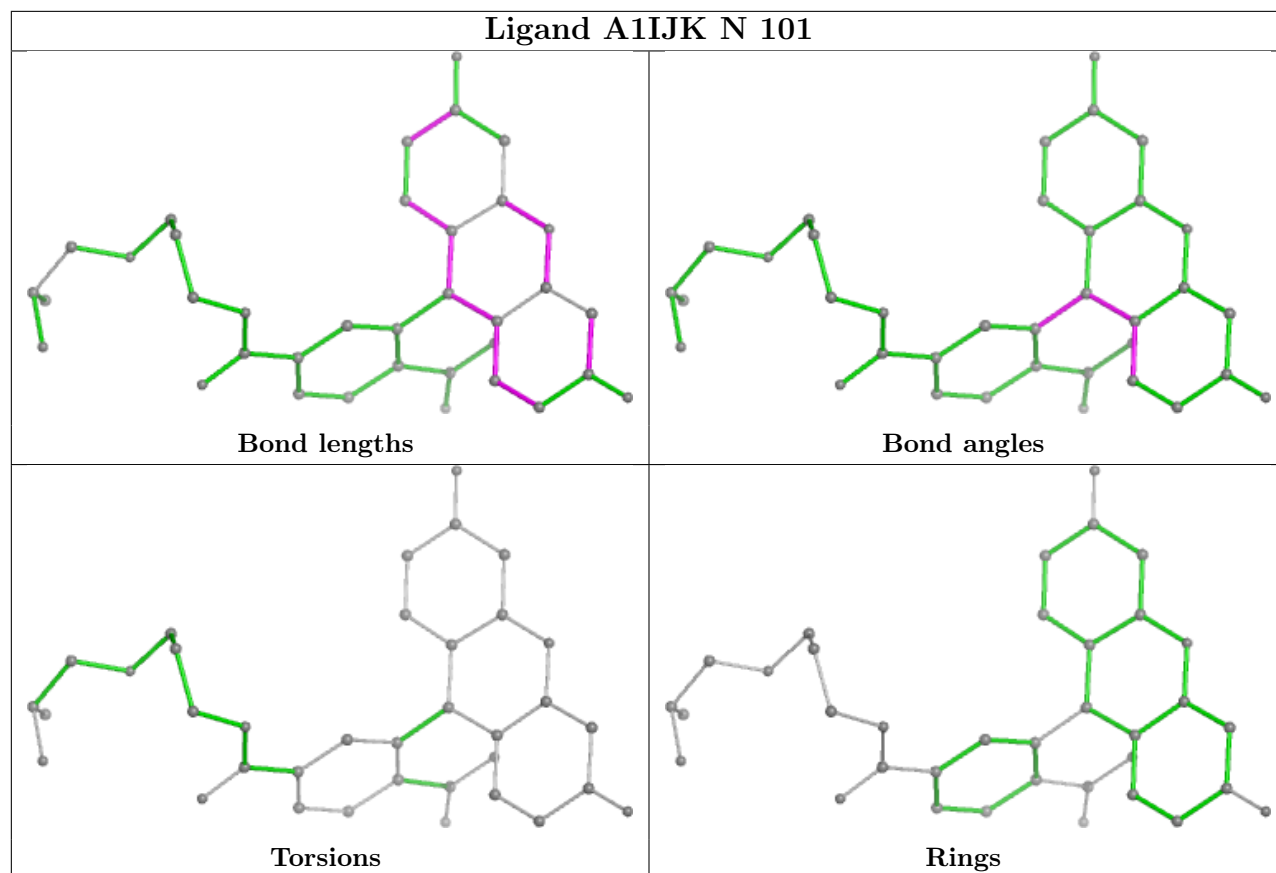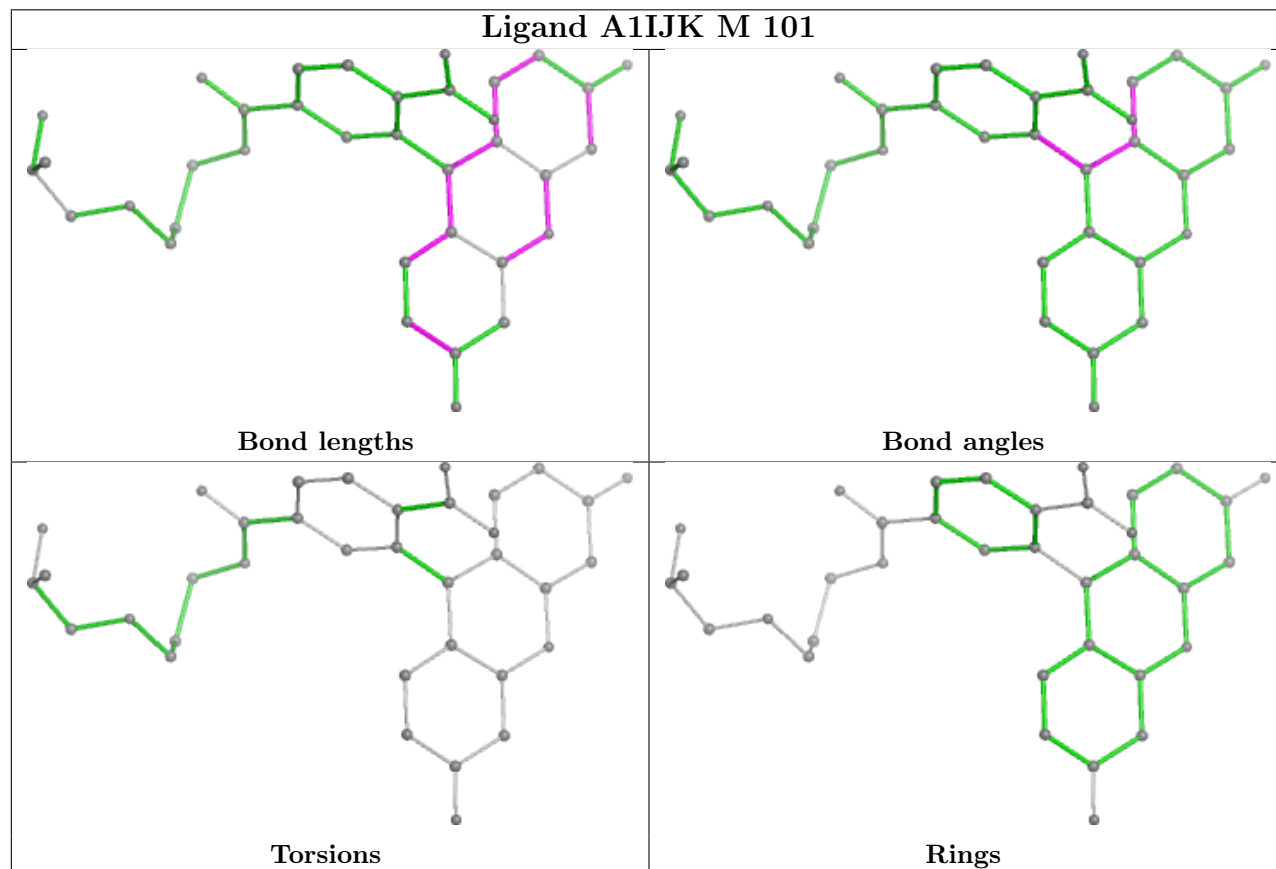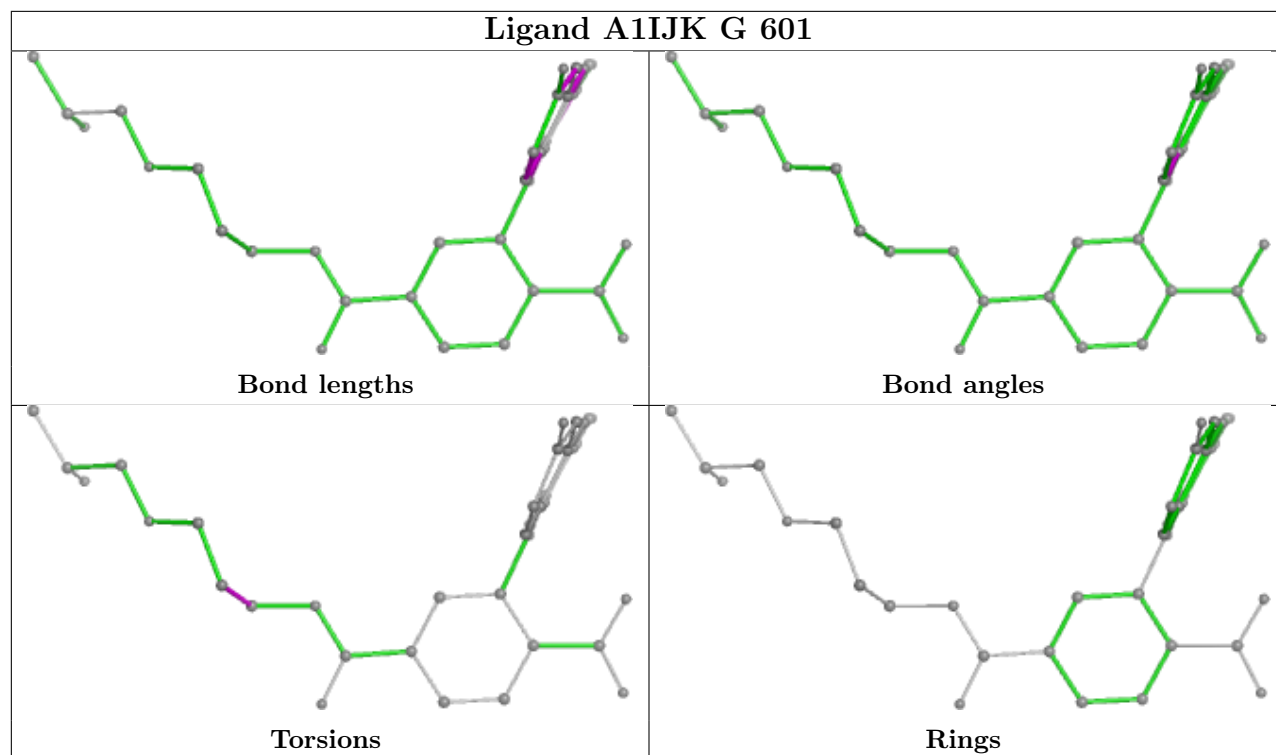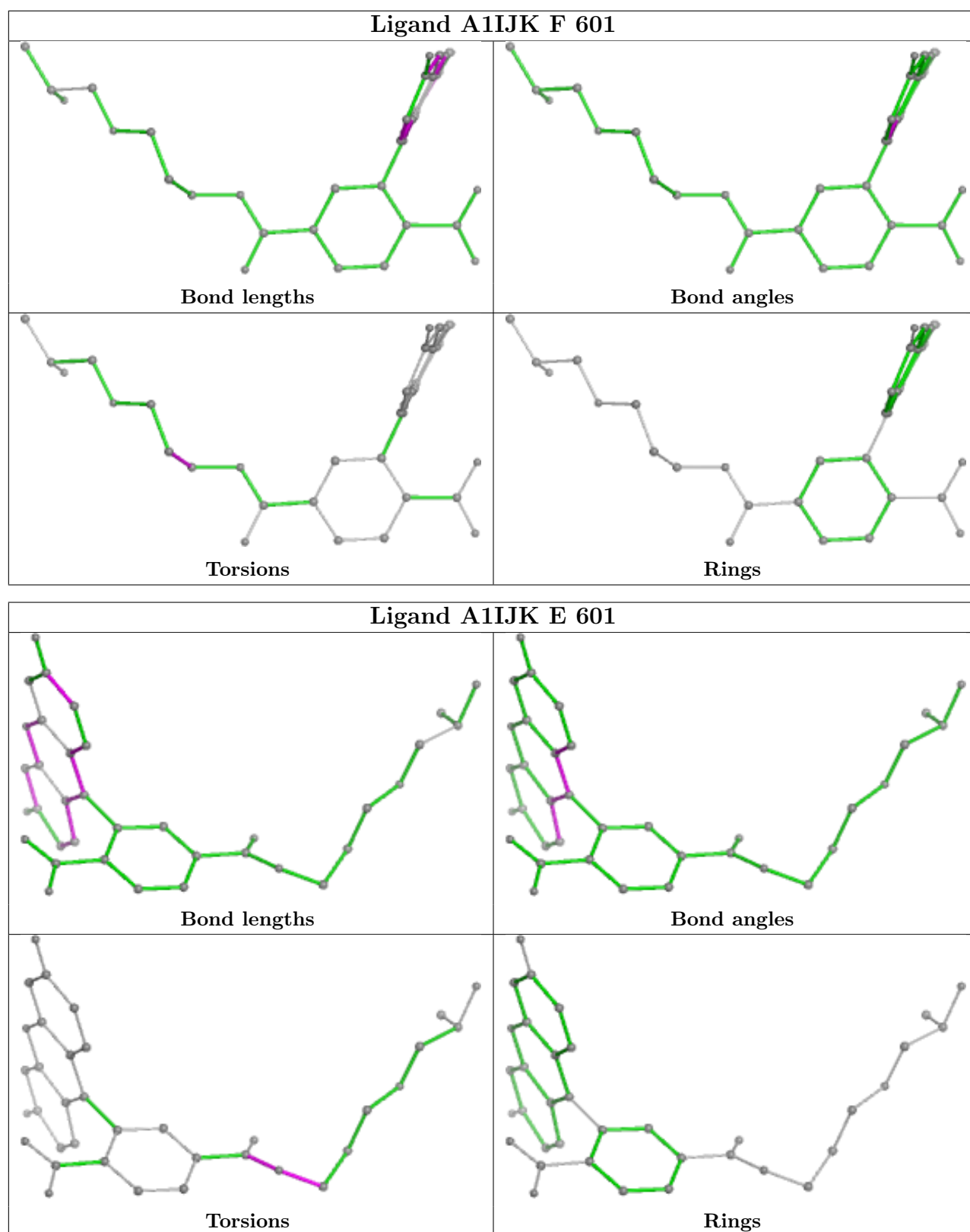
5.7   Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-51188. 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
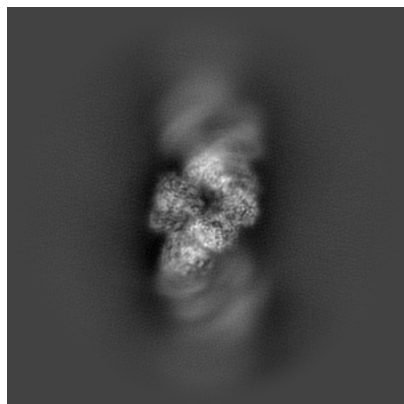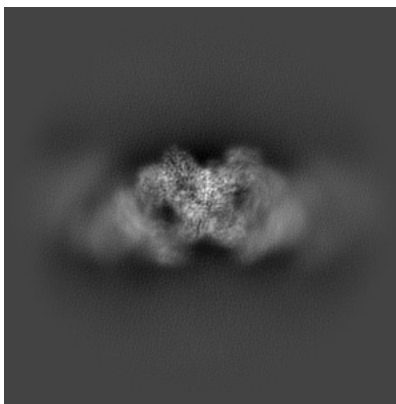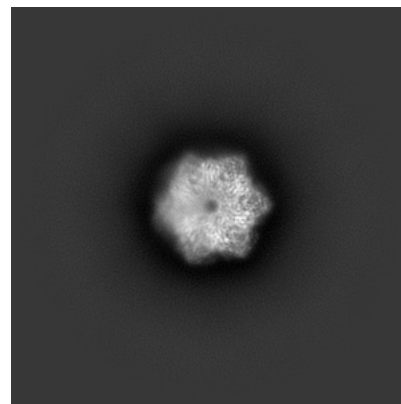
| X | Y | Z |

6.1.2 Raw map

| X | Y | Z |
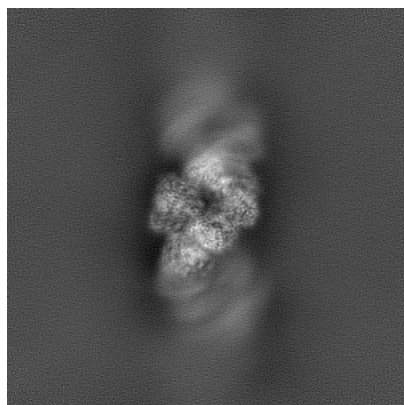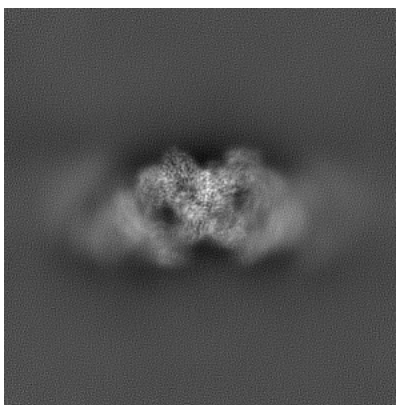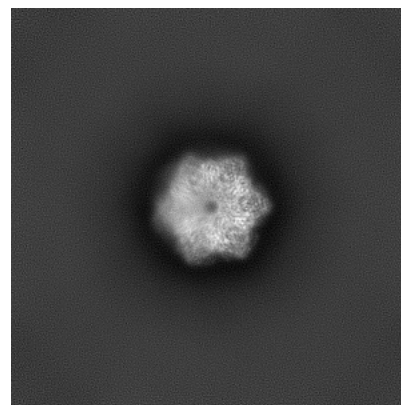
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
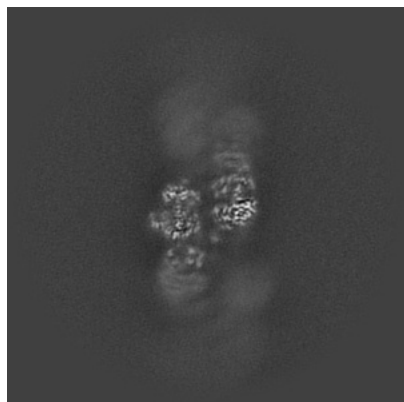
6.2.1 Primary map
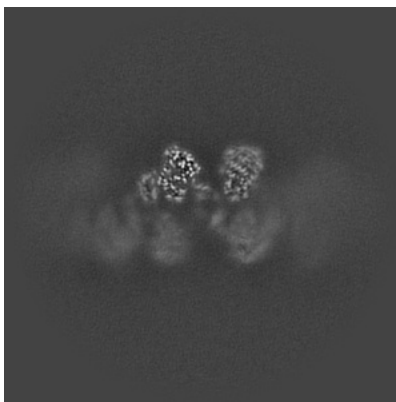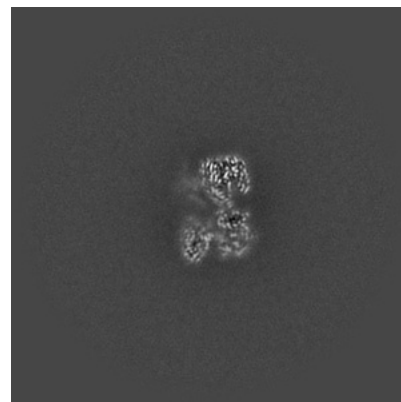
X Index: 200	Y Index: 200	Z Index: 200

6.2.2 Raw map
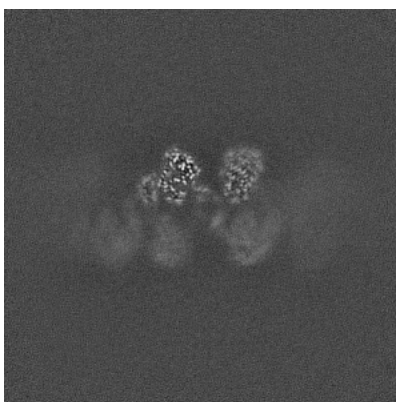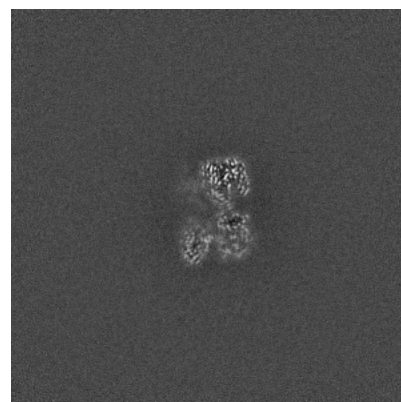
X Index: 200	Y Index: 200	Z Index: 200

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

6.3　Largest variance slices ⓘ
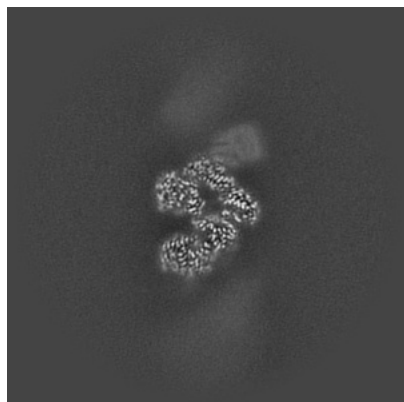
6.3.1　Primary map
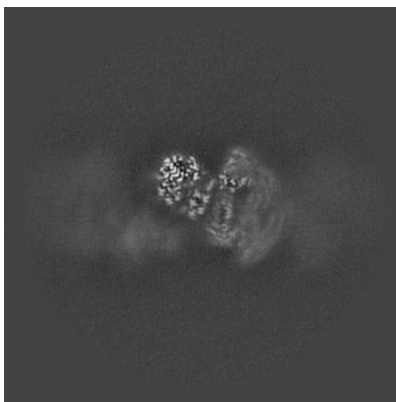
X Index: 225	Y Index: 213	Z Index: 202
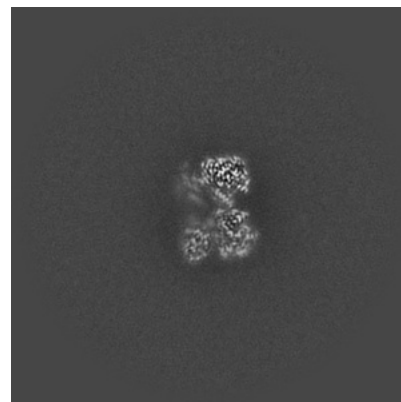
6.3.2　Raw map
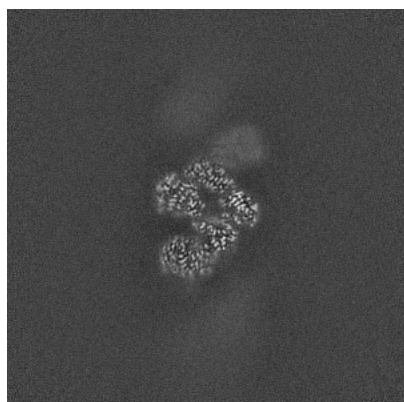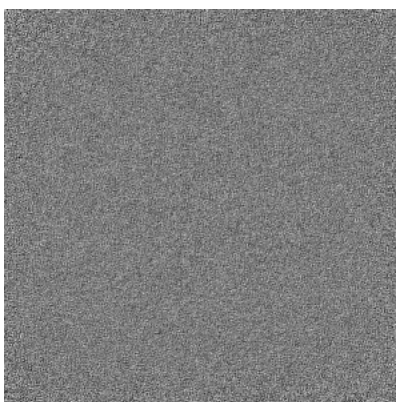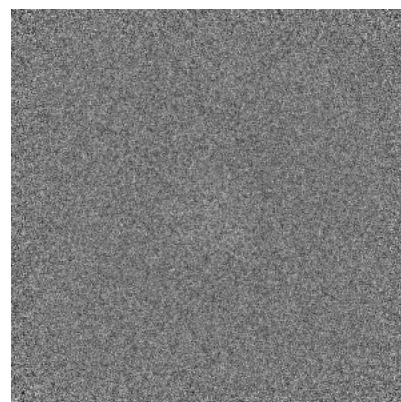
X Index: 224	Y Index: 0	Z Index: 399

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

6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map

X   Y   Z

6.4.2 Raw map

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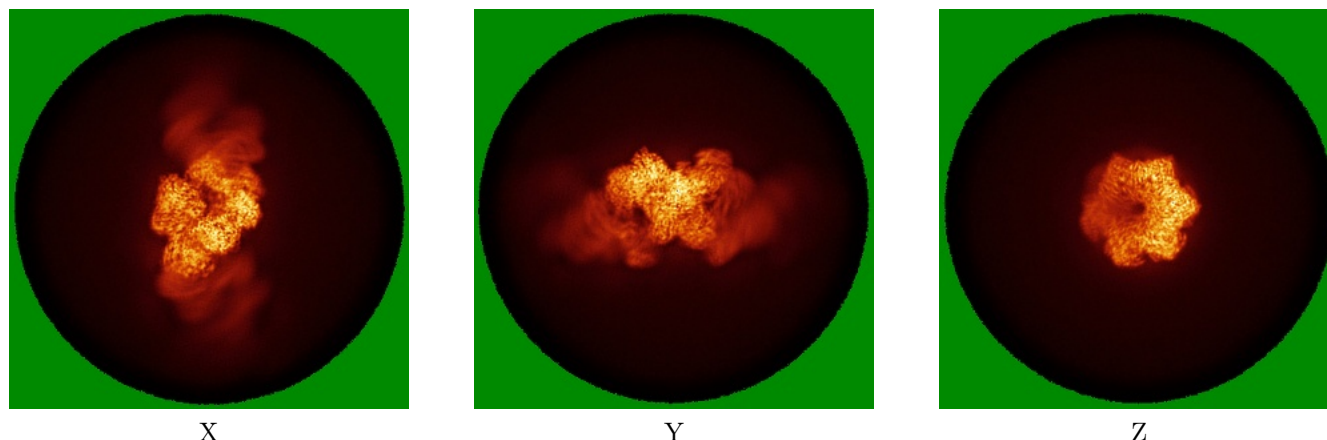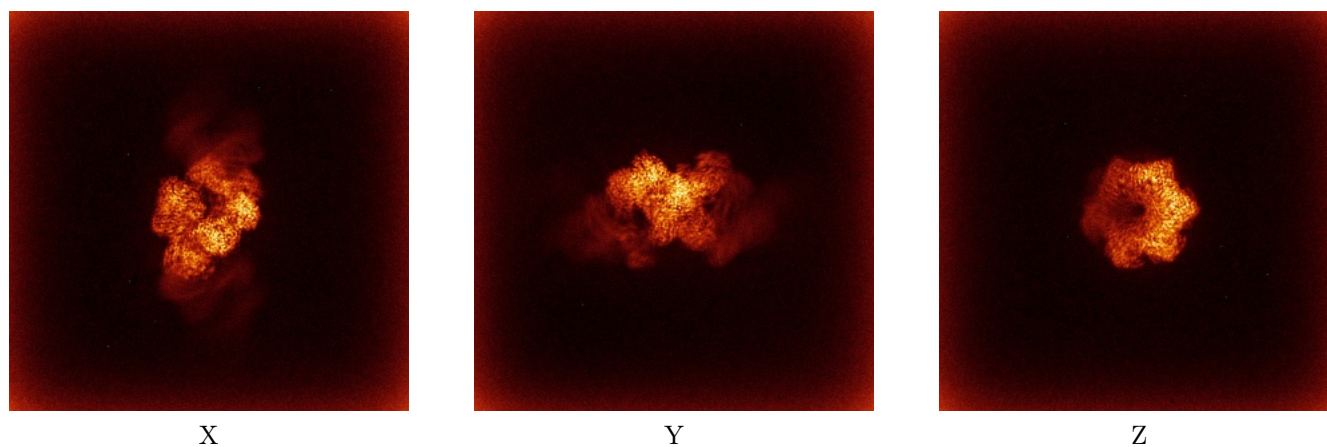
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ
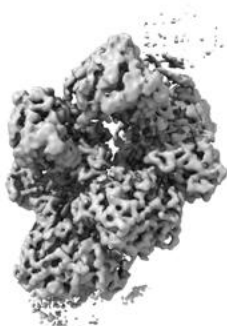
6.5.1 Primary map

| X | Y | Z |
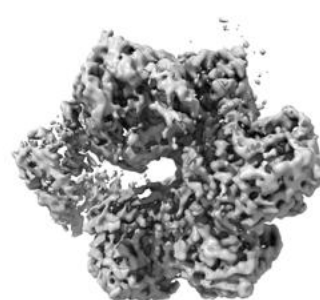
The images above show the 3D surface view of the map at the recommended contour level 0.153. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map
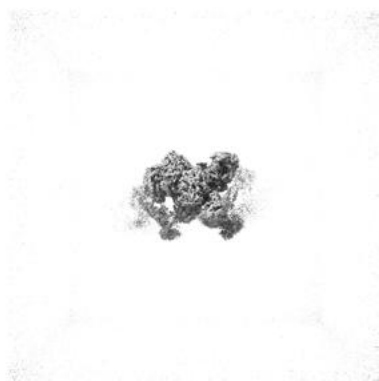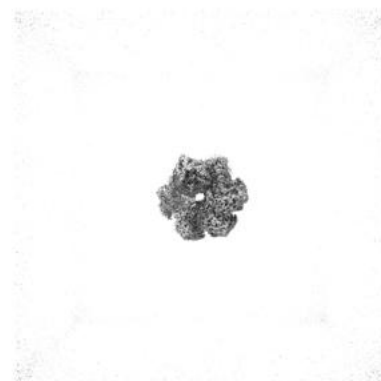
| X | Y | Z |

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 ⓘ

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

A mask typically either:

- Encompasses the whole structure

- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_51188_msk_1.map ⓘ

X　　　　　　　　　　　Y　　　　　　　　　　　Z
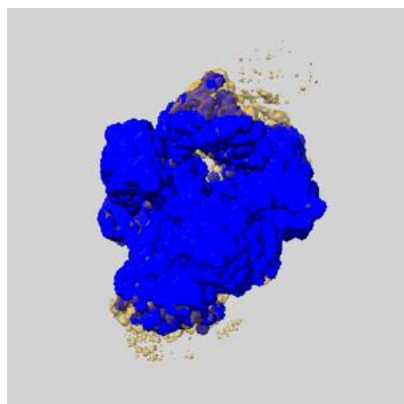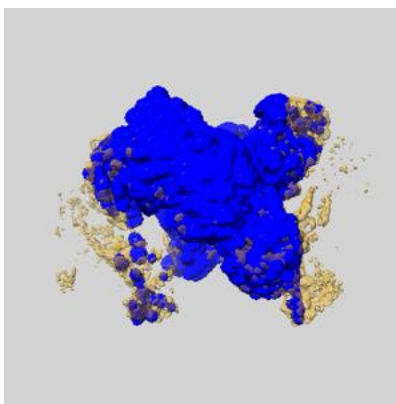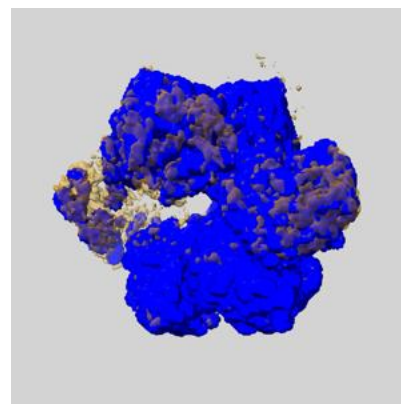
7　Map analysis ⓘ

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

7.1　Map-value distribution ⓘ

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 ⓘ
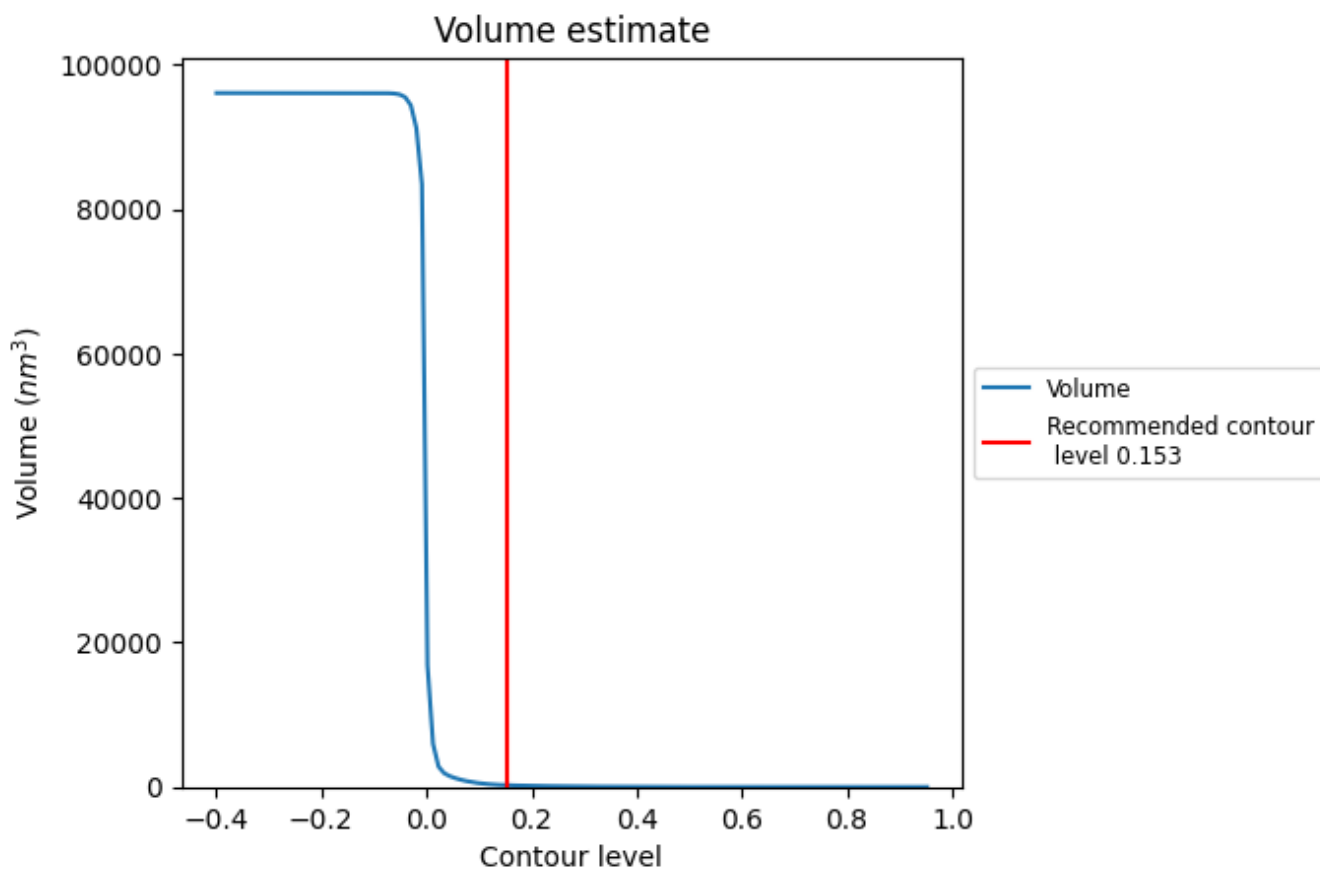
The volume at the recommended contour level is 241 nm³; this corresponds to an approximate mass of 218 kDa.

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 ⓘ
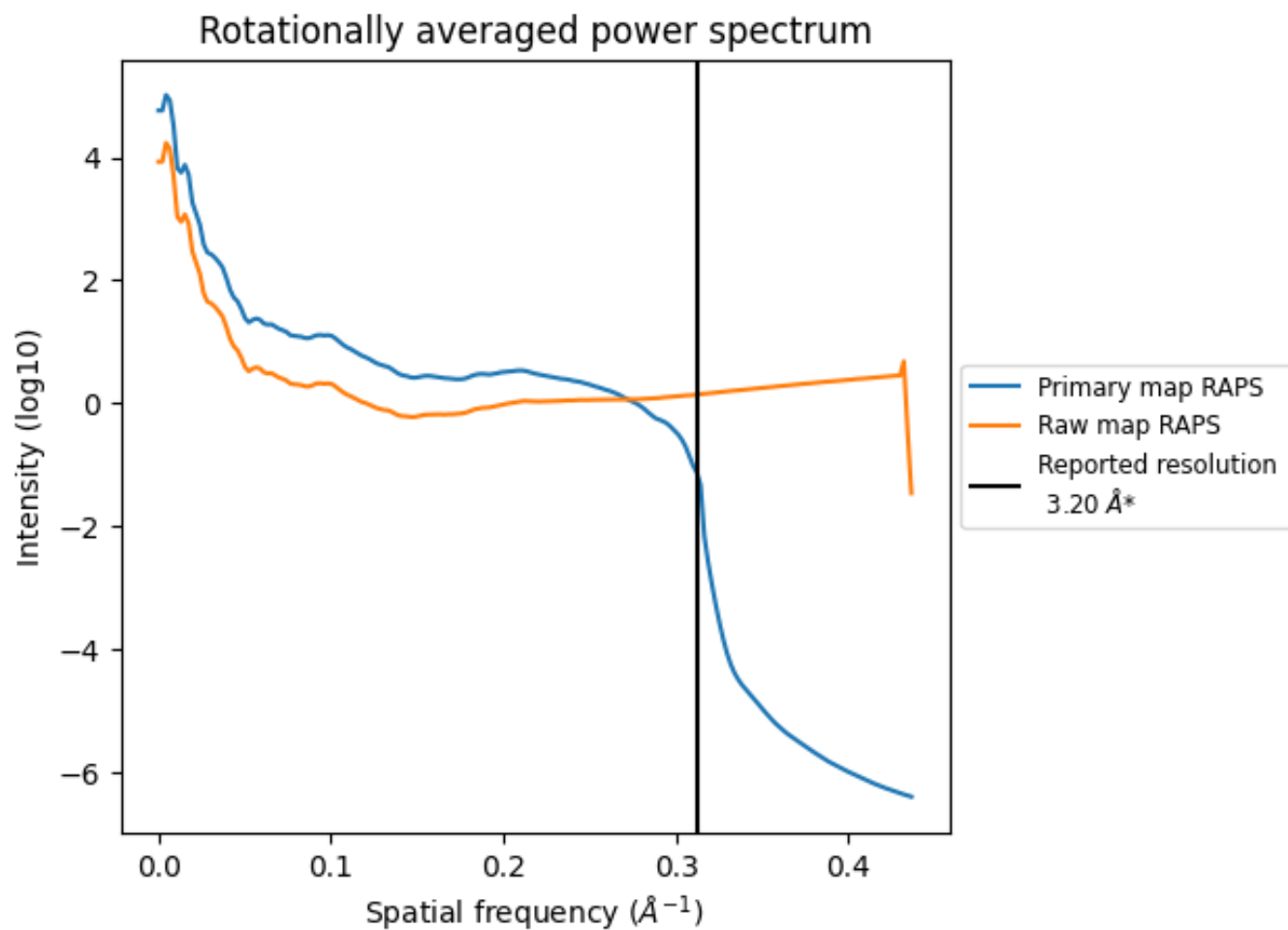
*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

8 Fourier-Shell correlation ⓘ

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 ⓘ
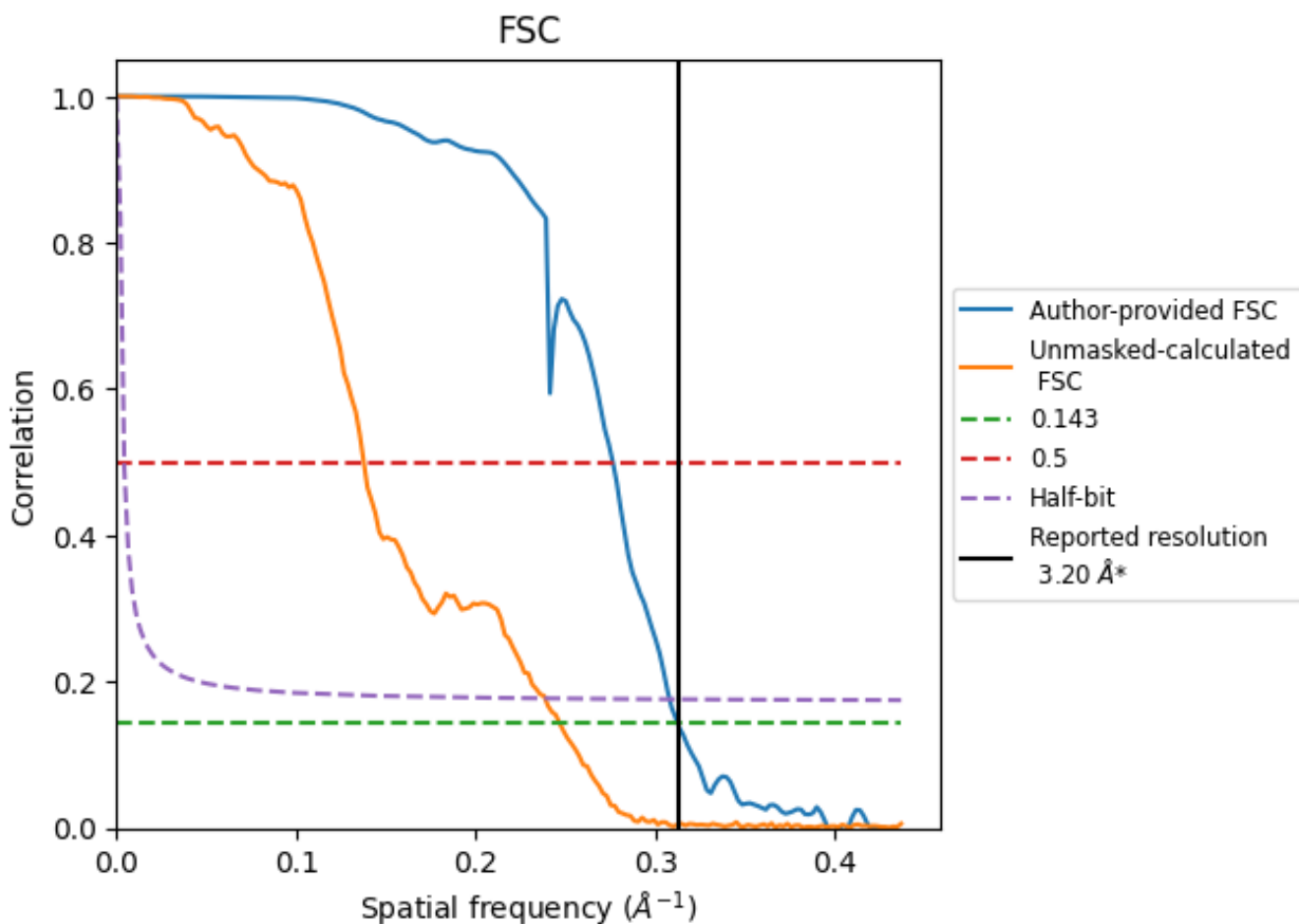
*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.20	3.62	3.25
Unmasked-calculated*	4.05	7.27	4.19

*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 4.05 differs from the reported value 3.2 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-51188 and PDB model 9GAT. Per-residue inclusion information can be found in section 3 on page 8.

9.1 Map-model overlays

9.1.1 Map-model overlay ⓘ

| X | Y | Z |
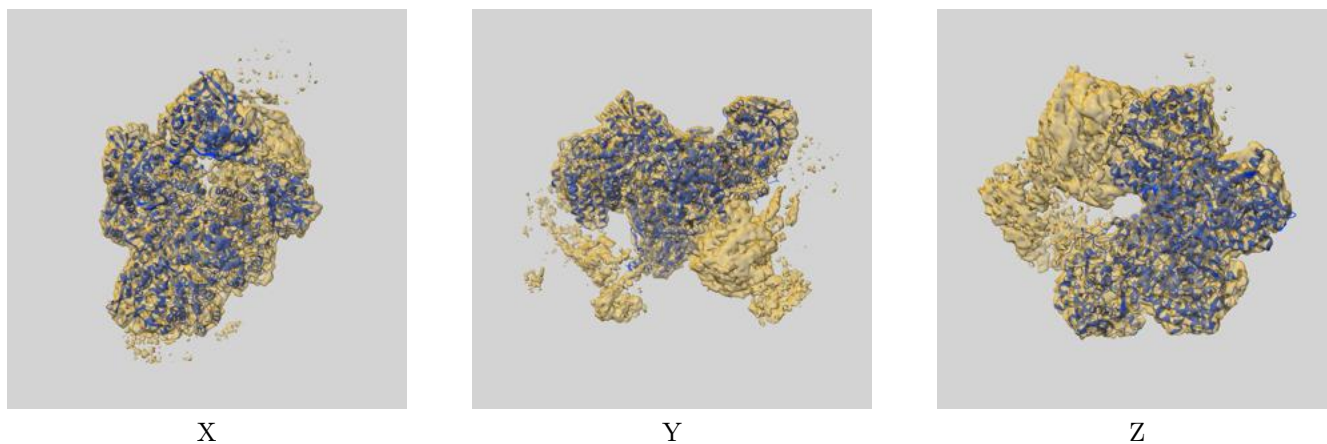
9.1.2 Map-model assembly overlay ⓘ

| X | Y | Z |
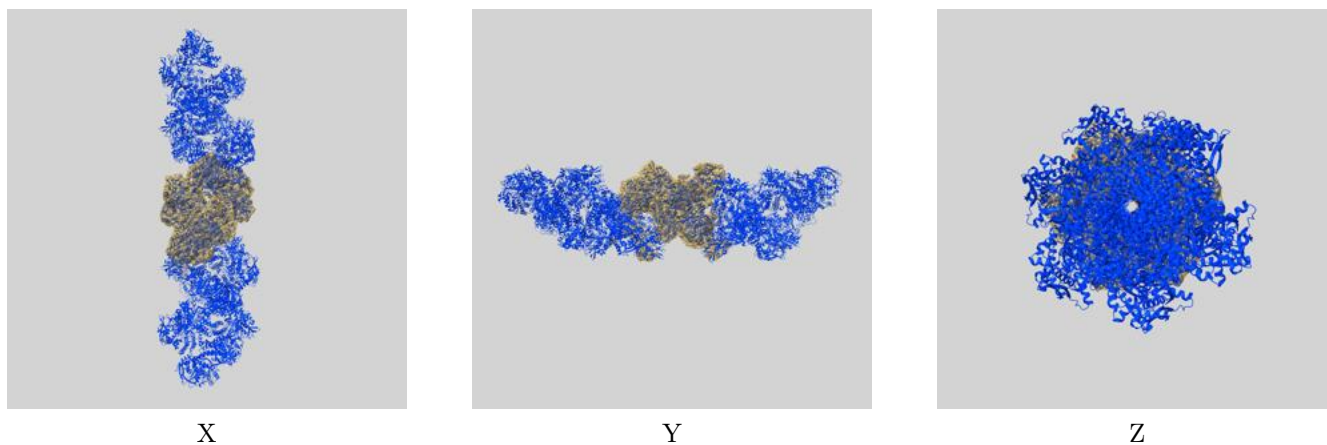
The images above show the 3D surface view of the map at the recommended contour level 0.153 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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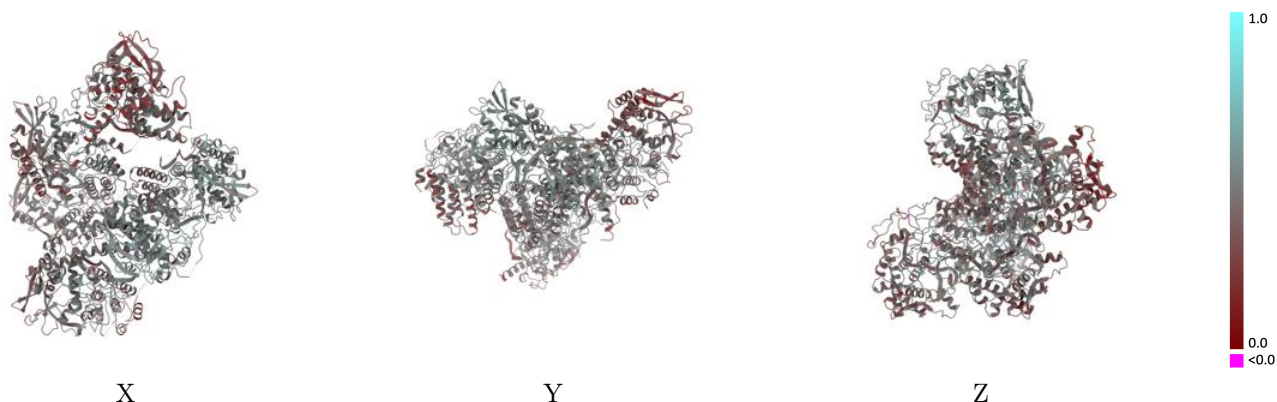
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X   Y   Z
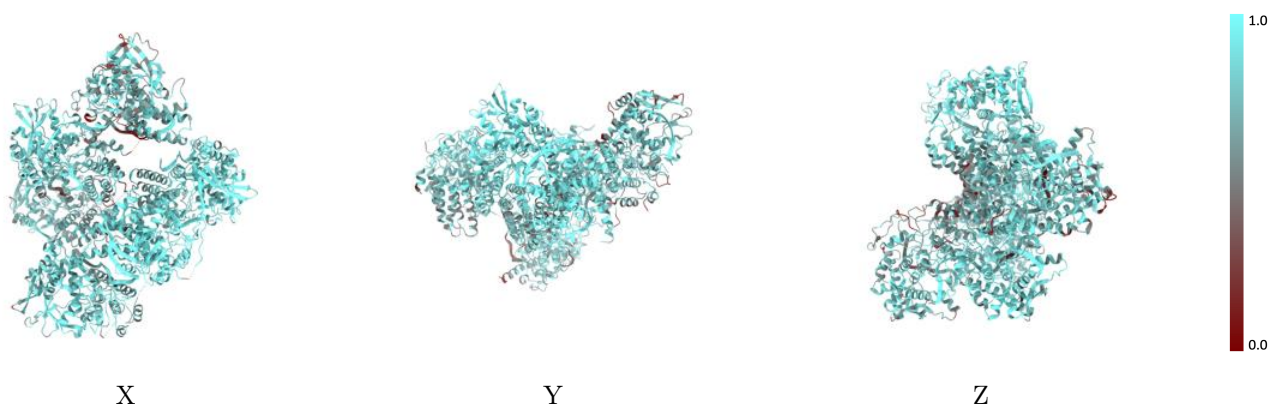
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.153).

9.4 Atom inclusion ⓘ
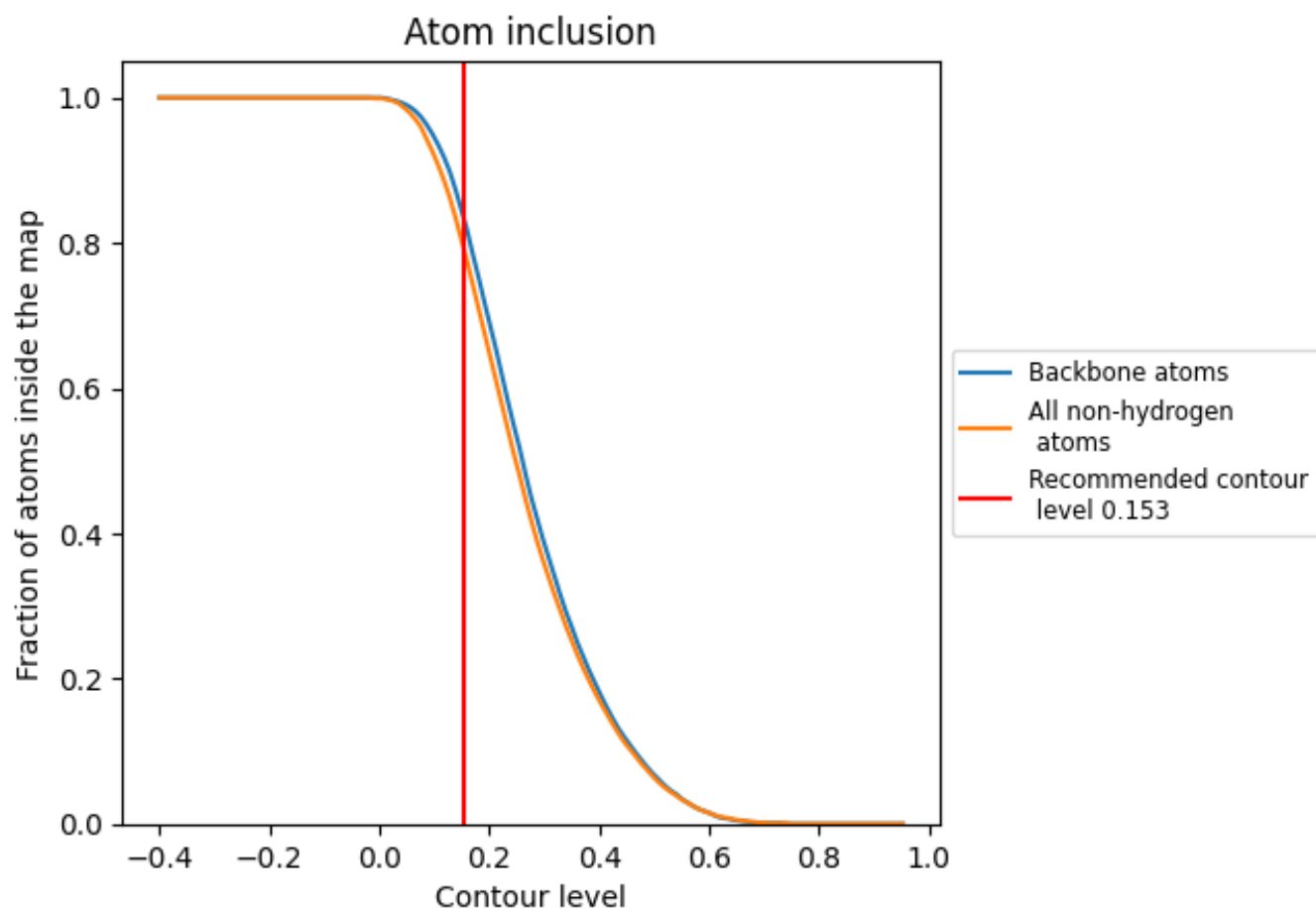
At the recommended contour level, 84% of all backbone atoms, 80% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.153) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7950	0.4370
A	0.8720	0.4780
B	0.8960	0.4890
C	0.8090	0.4300
D	0.8070	0.4300
E	0.8630	0.4640
F	0.9170	0.4850
G	0.8840	0.4680
H	0.9150	0.4500
I	0.7460	0.4060
J	0.8120	0.4360
K	0.7330	0.3960
L	0.7440	0.4370
M	0.5550	0.3130
N	0.7460	0.3950
O	0.6650	0.3810
P	0.8440	0.4010

1.0

0.0
<0.0