Full wwPDB EM Validation Report ⓘ

May 11, 2026 – 10:35 pm BST

PDB ID	:	9TIR / pdb_00009tir
EMDB ID	:	EMD-55967
Title	:	Phage 812 baseplate in the post-contraction state (C6)
Authors	:	Binovsky, J.; Plevka, P.
Deposited on	:	2025-12-05
Resolution	:	4.40 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

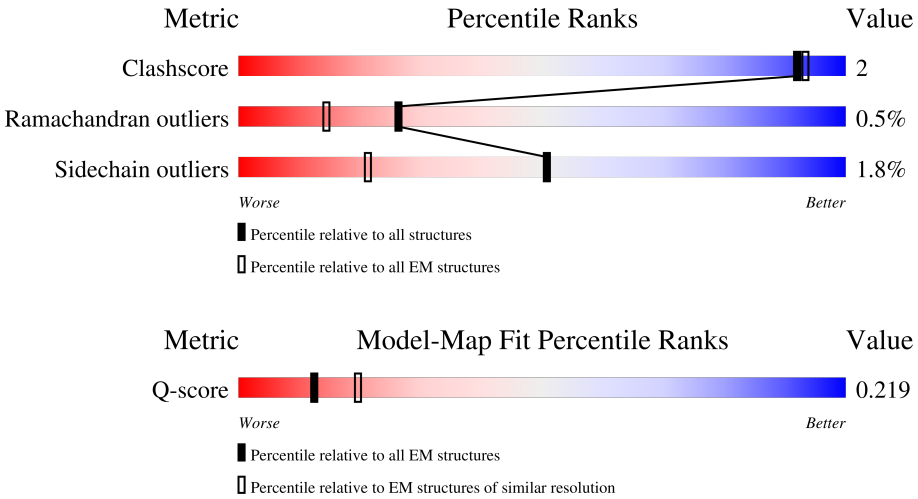
EMDB validation analysis	:	0.0.1.dev132
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.40 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	3132 (3.91 - 4.90)

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	234	95% ·
2	B	348	97% ·
2	C	348	95% 5%
3	D	1019	· 39% 5% · 55%

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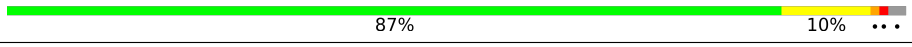
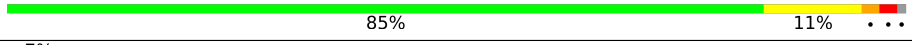
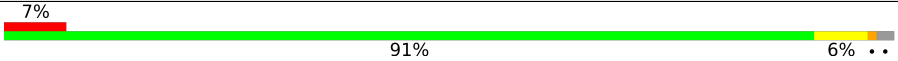
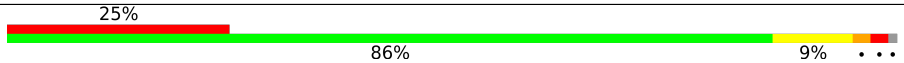
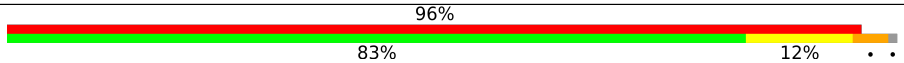
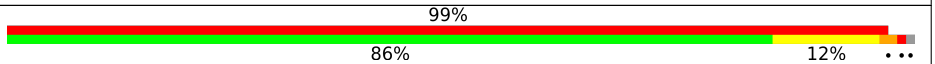
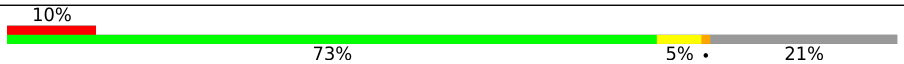
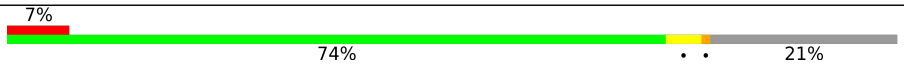
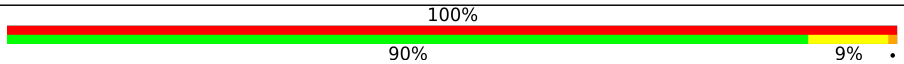
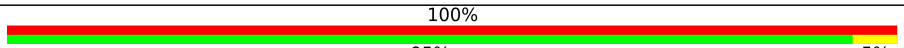
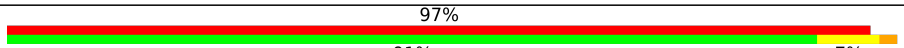
Mol	Chain	Length	Quality of chain
4	E	173	
4	F	173	
4	G	173	
4	H	173	
4	I	173	
4	J	173	
5	K	1152	
5	L	1152	
5	M	1152	
5	N	1152	
5	O	1152	
5	P	1152	
6	Q	458	
6	R	458	
6	S	458	
7	T	587	
7	U	587	
7	V	587	
7	W	587	
7	X	587	
7	Y	587	

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 98678 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 ORF61.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	234	Total	C	N	O	S	0	0
			1871	1174	314	377	6		

- Molecule 2 is a protein called ORF62.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	348	Total	C	N	O	S	0	0
			2760	1734	459	560	7		
2	C	347	Total	C	N	O	S	0	0
			2752	1729	458	559	6		

- Molecule 3 is a protein called ORF63.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	457	Total	C	N	O	S	0	0
			3769	2412	610	738	9		

- Molecule 4 is a protein called ORF64.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	170	Total	C	N	O	S	0	0
			1336	849	219	267	1		
4	F	172	Total	C	N	O	S	0	0
			1349	858	221	269	1		
4	G	170	Total	C	N	O	S	0	0
			1336	849	219	267	1		
4	H	172	Total	C	N	O	S	0	0
			1349	858	221	269	1		
4	I	172	Total	C	N	O	S	0	0
			1349	858	221	269	1		
4	J	172	Total	C	N	O	S	0	0
			1349	858	221	269	1		

- Molecule 5 is a protein called ORF65.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	K	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		
5	L	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		
5	M	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		
5	N	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		
5	O	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		
5	P	908	Total	C	N	O	S	0	0
			7166	4511	1184	1453	18		

- Molecule 6 is a protein called ORF68.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	Q	458	Total	C	N	O	S	0	0
			3548	2224	592	719	13		
6	R	458	Total	C	N	O	S	0	0
			3548	2224	592	719	13		
6	S	458	Total	C	N	O	S	0	0
			3548	2224	592	719	13		

- Molecule 7 is a protein called ORF49.

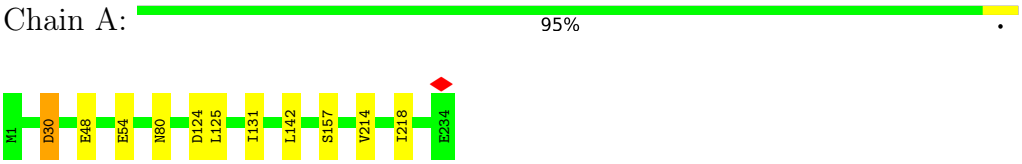
Mol	Chain	Residues	Atoms					AltConf	Trace
7	T	540	Total	C	N	O	S	0	0
			4213	2653	714	839	7		
7	U	553	Total	C	N	O	S	0	0
			4321	2723	734	857	7		
7	V	553	Total	C	N	O	S	0	0
			4321	2723	734	857	7		
7	W	553	Total	C	N	O	S	0	0
			4321	2723	734	857	7		
7	X	553	Total	C	N	O	S	0	0
			4321	2723	734	857	7		
7	Y	553	Total	C	N	O	S	0	0
			4321	2723	734	857	7		

3 Residue-property plots (i)

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

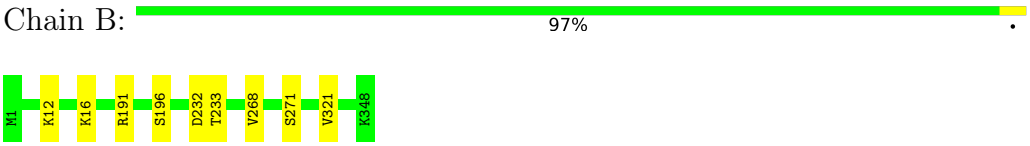
- Molecule 1: ORF61

Chain A:



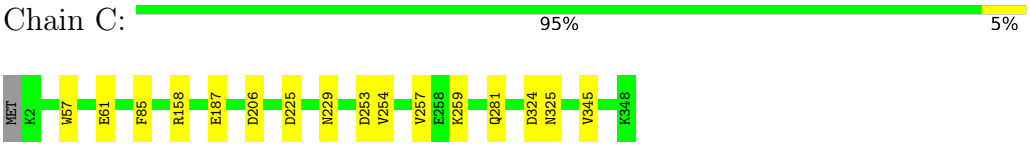
- Molecule 2: ORF62

Chain B:



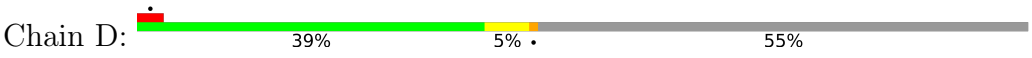
- Molecule 2: ORF62

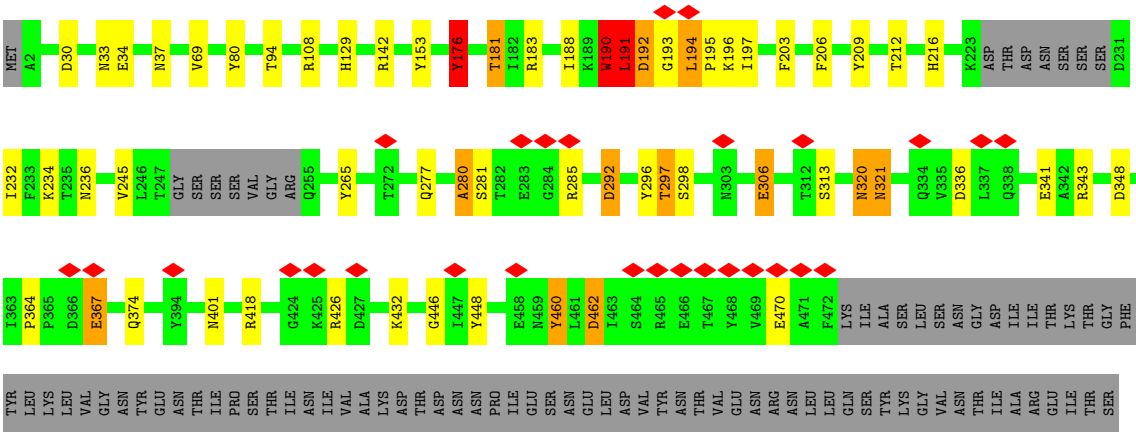
Chain C:

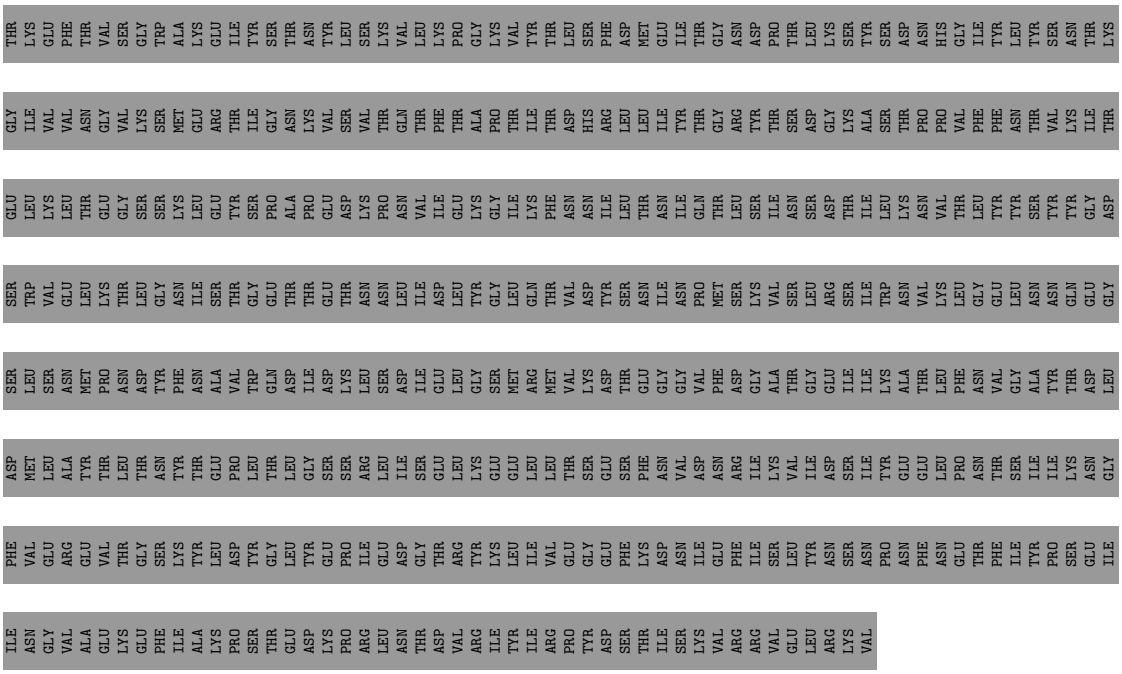


- Molecule 3: ORF63

Chain D:

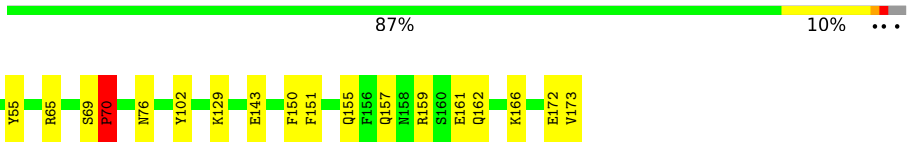






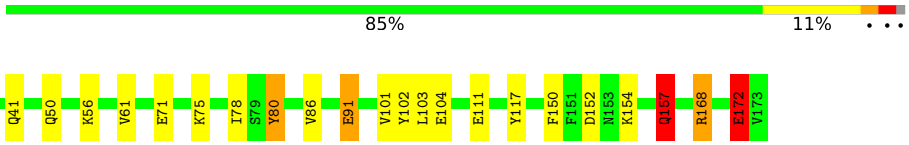
- Molecule 4: ORF64

Chain E:



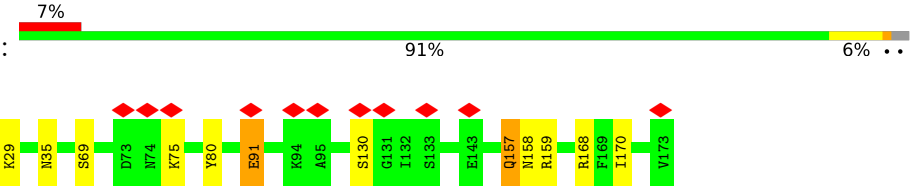
- Molecule 4: ORF64

Chain F:



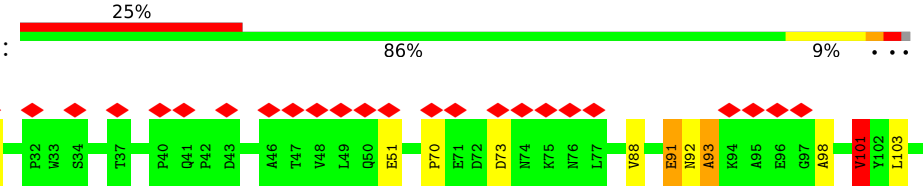
- Molecule 4: ORF64

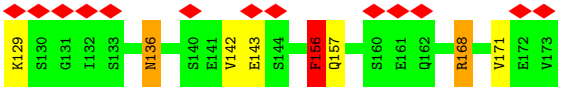
Chain G:



- Molecule 4: ORF64

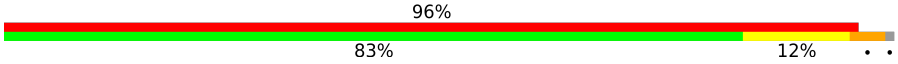
Chain H:

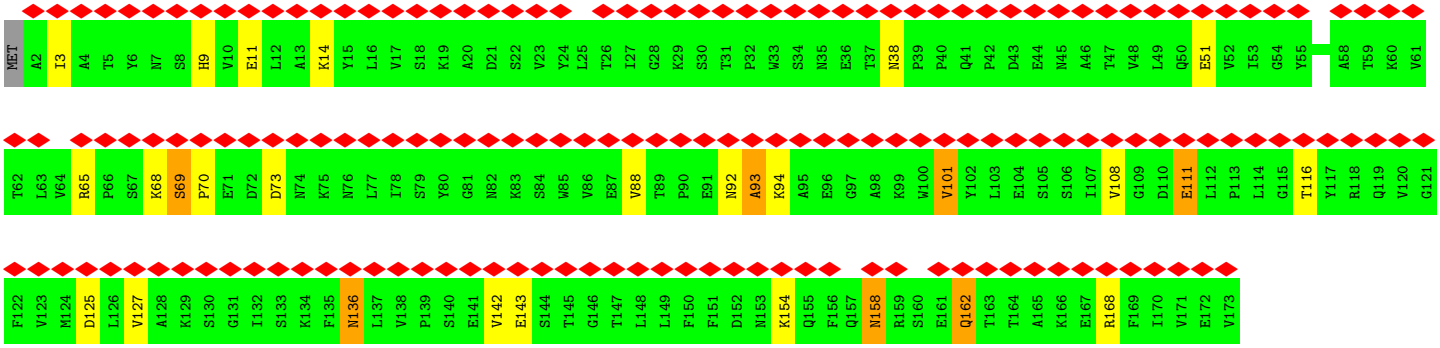




• Molecule 4: ORF64

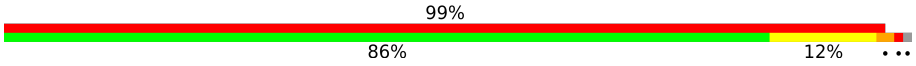
Chain I:

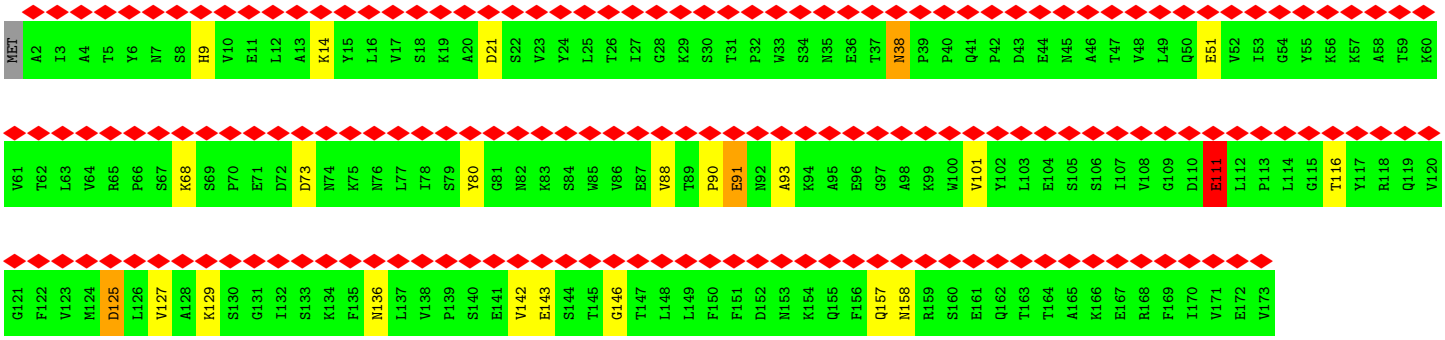




• Molecule 4: ORF64

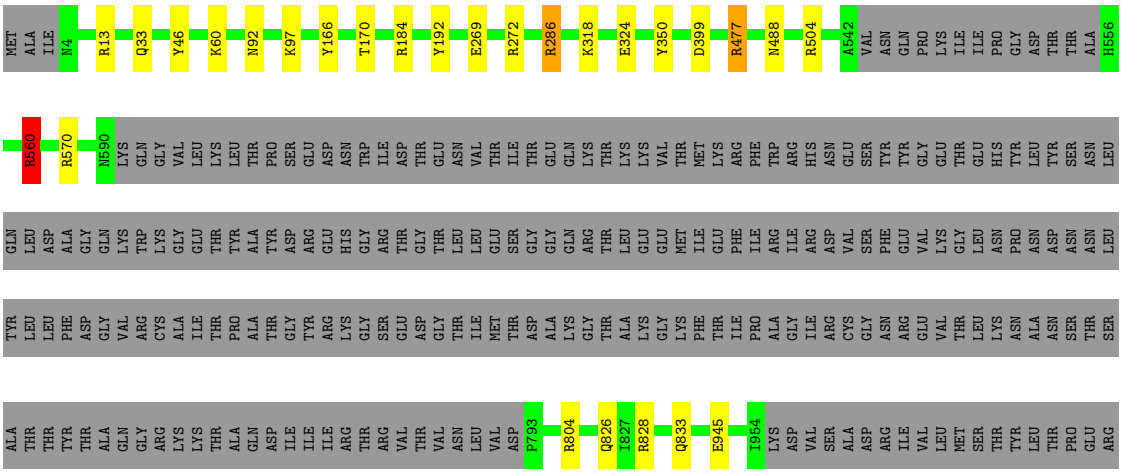
Chain J:

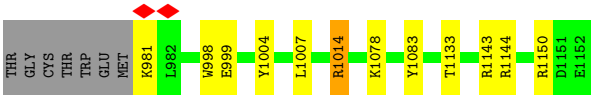




• Molecule 5: ORF65

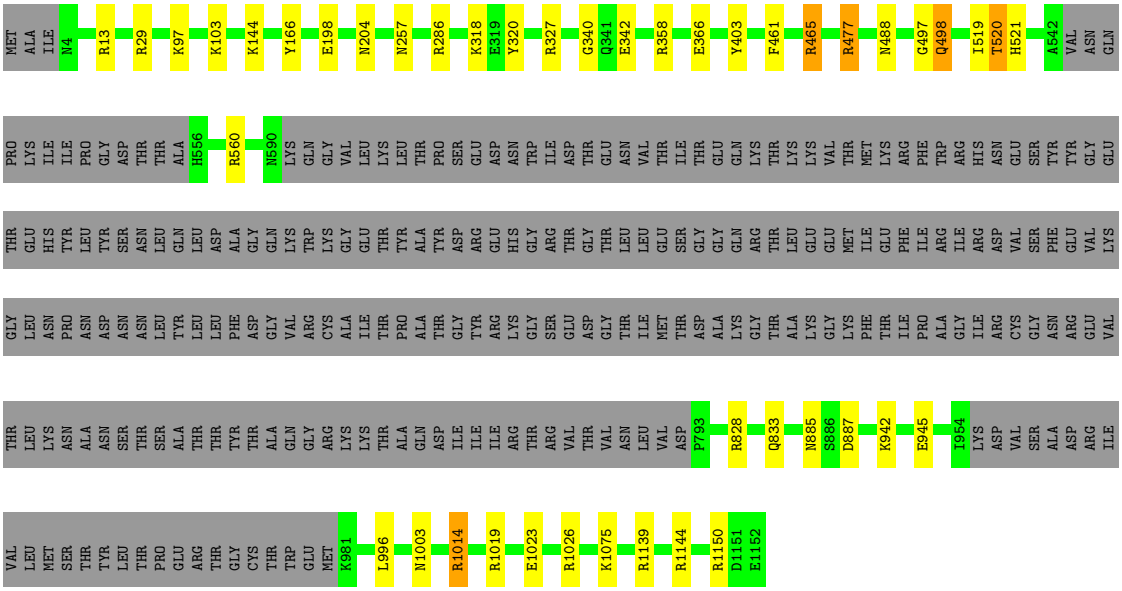
Chain K:





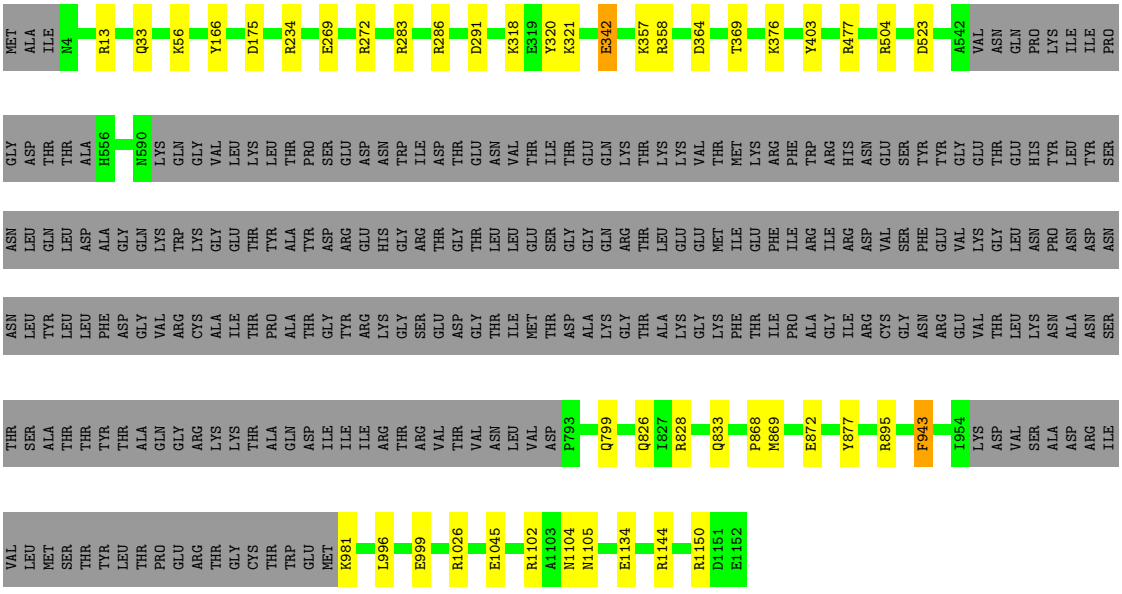
• Molecule 5: ORF65

Chain L:



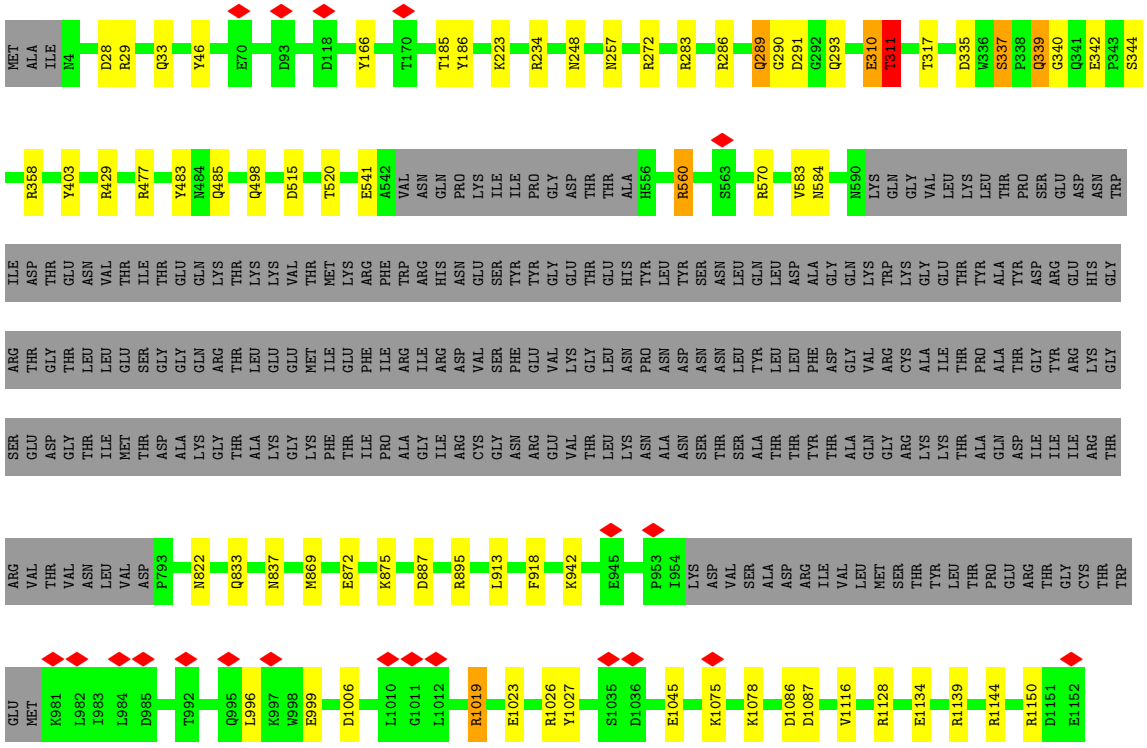
• Molecule 5: ORF65

Chain M:



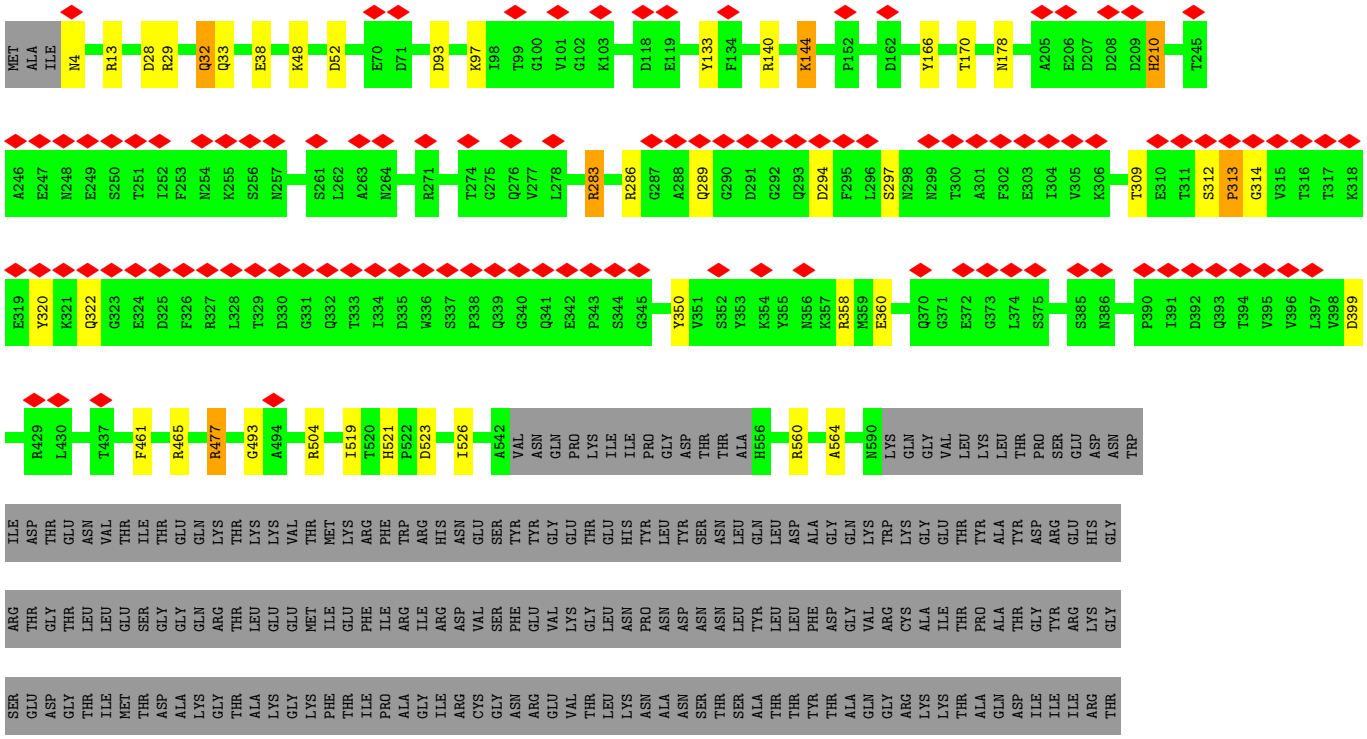
• Molecule 5: ORF65

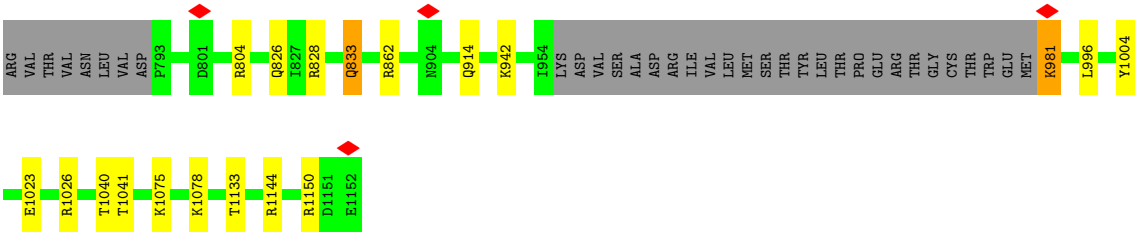
Chain N:



• Molecule 5: ORF65

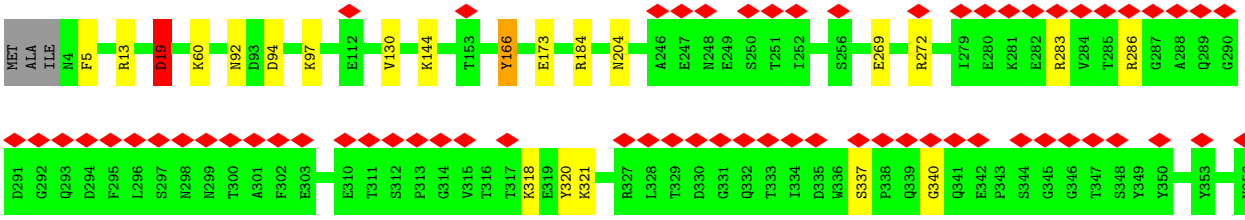
Chain O:

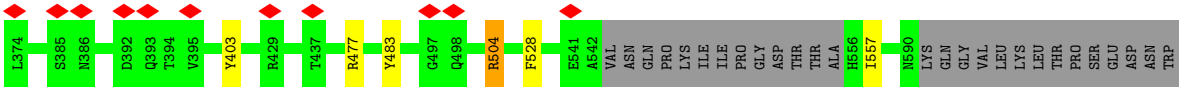


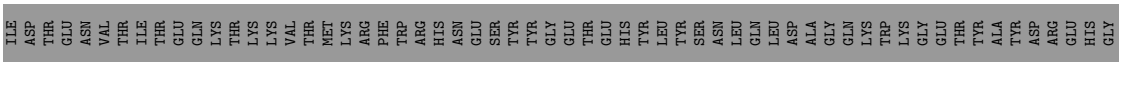


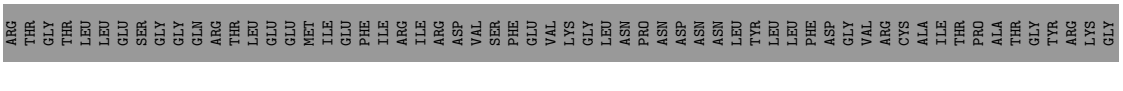
• Molecule 5: ORF65

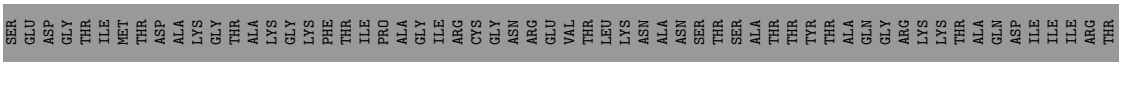
Chain P:

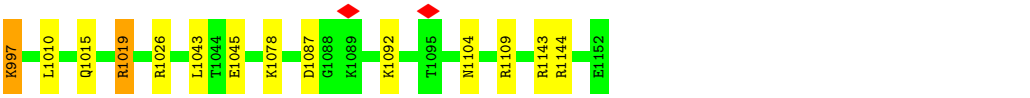






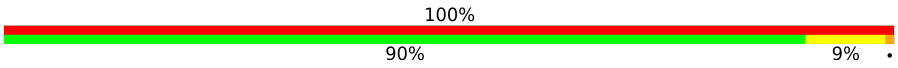


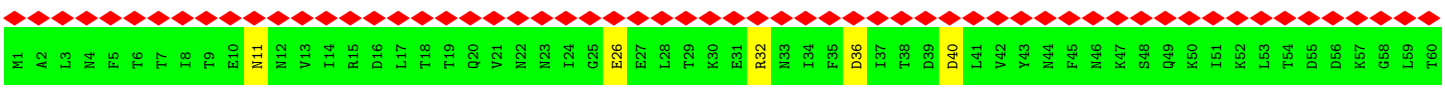


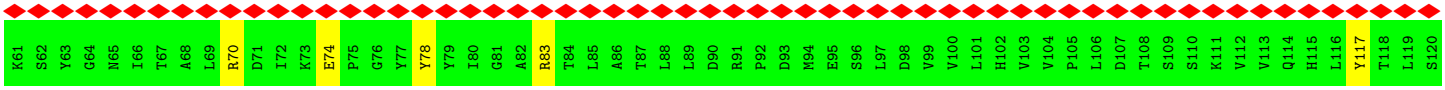


• Molecule 6: ORF68

Chain Q:







T121 N122 N123 N124 Q125 I126 K127 M128 L129 Y130 R131 F132 V133 S134 G135 N136 S137 S138 S139 E140 W141 Q142 F143 I144 Q145 G146 L147 P148 S149 N150 K151 N152 A153 V154 I155 S156 G157 T158 N159 I160 L161 D162 I163 A164 S165 P166 G167 V168 Y169 F170 V171 M172 G173 M174 T175 G176 G177 M178 P179 S180

G181 V182 S183 S184 G185 F186 L187 D188 L189 S190 V191 D192 A193 N194 D195 N196 R197 L198 A199 R200 L201 T202 D203 A204 E205 T206 G207 K208 E209 Y210 T211 S212 I213 K214 K215 P216 T217 G218 T219 Y220 T221 A222 W223 K224 K225 E226 F227 E228 P229 K230 D231 M232 E233 K234 Y235 L236 L237 S238 S239 I240

R241 D242 D243 G244 S245 A246 S247 F248 P249 L250 L251 V252 Y253 T254 S255 D256 S257 K258 T259 F260 Q261 Q262 A263 I264 I265 D266 H267 I268 D269 R270 T271 G272 Q273 T274 T275 F276 T277 F278 Y279 V280 Q281 G282 G283 V284 S285 G286 S287 P288 M289 S290 N291 S292 C293 R294 G295 L296 F297 M298 S299 D300

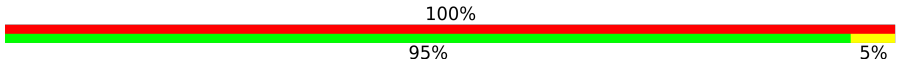
T301 P302 N303 T304 S305 S306 L307 H308 G309 V310 Y311 N312 A313 I314 G315 T316 D317 G318 R319 N320 V321 T322 G323 S324 V325 V326 G327 S328 N329 W330 T331 S332 P333 K334 T335 S336 P337 S338 H339 K340 E341 L342 W343 T344 G345 A346 Q347 S348 F349 L350 S351 T352 G353 T354 T355 K356 N357 L358 S359 D360

D361 I362 S363 N364 Y365 S366 Y367 V368 E369 V370 Y371 T372 T373 H374 K375 T376 T377 E378 K379 T380 K381 G382 N383 D384 N385 T386 G387 T388 I389 C390 H391 K392 F393 Y394 L395 D396 G397 S398 G399 T400 Y401 V402 C403 S404 G405 T406 F407 V408 S409 G410 D411 R412 T413 D414 T415 K416 P417 P418 I419 T420

E421 F422 Y423 R424 V425 G426 V427 S428 F429 K430 G431 S432 T433 W434 T435 L436 V437 D438 S439 A440 V441 Q442 N443 S444 K445 T446 Q447 Y448 V449 T450 R451 I452 I453 G454 I455 N456 M457 P458

- Molecule 6: ORF68

Chain R:



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K61 S62 Y63 G64 N65 I66 T67 A68 L69 R70 D71 I72 K73 E74 P75 G76 Y77 Y78 Y79 I80 G81 A82 R83 T84 L85 A86 T87 L88 L89 D90 R91 P92 D93 M94 E95 S96 L97 D98 V99 V100 L101 H102 V103 V104 P105 L106 D107 T108 S109 S110 K111 V112 V113 Q114 H115 L116 Y117 T118 L119 S120

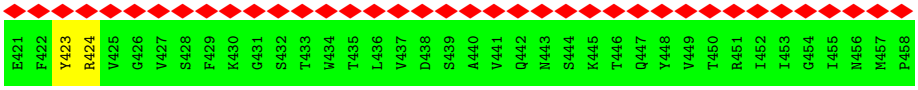
T121 N122 N123 N124 Q125 I126 K127 M128 L129 Y130 R131 F132 V133 S134 G135 N136 S137 S138 S139 E140 W141 Q142 F143 I144 Q145 G146 L147 P148 S149 N150 K151 N152 A153 V154 I155 S156 G157 T158 N159 I160 L161 D162 I163 A164 S165 P166 G167 V168 Y169 F170 V171 M172 G173 M174 T175 G176 G177 M178 P179 S180

G181 V182 S183 S184 G185 F186 L187 D188 L189 S190 V191 D192 A193 N194 D195 N196 R197 L198 A199 R200 L201 T202 D203 A204 E205 T206 G207 K208 E209 Y210 T211 S212 I213 K214 K215 P216 T217 G218 T219 Y220 T221 A222 W223 K224 K225 E226 F227 E228 P229 K230 D231 M232 E233 K234 Y235 L236 L237 S238 S239 I240

R241 D242 D243 G244 S245 A246 S247 F248 P249 L250 L251 V252 Y253 T254 S255 D256 S257 K258 T259 F260 Q261 Q262 A263 I264 I265 D266 H267 I268 D269 R270 T271 G272 Q273 T274 T275 F276 T277 F278 Y279 V280 Q281 G282 G283 V284 S285 G286 S287 P288 M289 S290 N291 S292 C293 R294 G295 L296 F297 M298 S299 D300

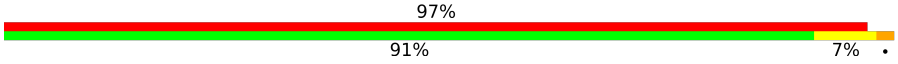
T301 P302 N303 T304 S305 S306 L307 H308 G309 V310 Y311 N312 A313 I314 G315 T316 D317 G318 R319 N320 V321 T322 G323 S324 V325 V326 G327 S328 N329 W330 T331 S332 P333 K334 T335 S336 P337 S338 H339 K340 E341 L342 W343 T344 G345 A346 Q347 S348 F349 L350 S351 T352 G353 T354 T355 K356 N357 L358 S359 D360

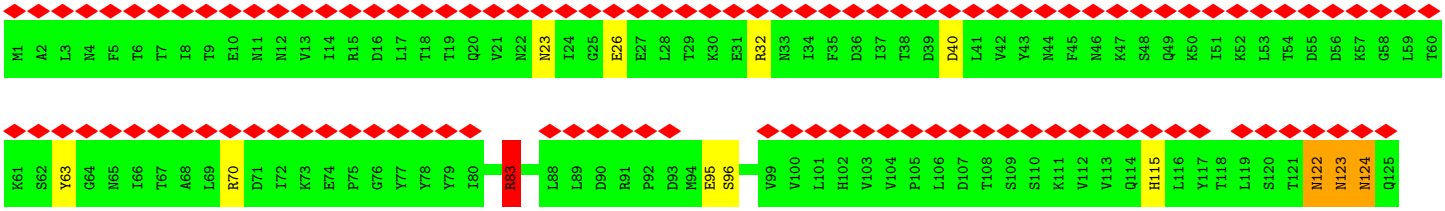
D361 I362 S363 N364 Y365 S366 Y367 V368 E369 V370 Y371 T372 T373 H374 K375 T376 T377 E378 K379 T380 K381 G382 N383 D384 N385 T386 G387 T388 I389 C390 H391 K392 F393 Y394 L395 D396 G397 S398 G399 T400 Y401 V402 C403 S404 G405 T406 F407 V408 S409 G410 D411 R412 T413 D414 T415 K416 P417 P418 I419 T420



• Molecule 6: ORF68

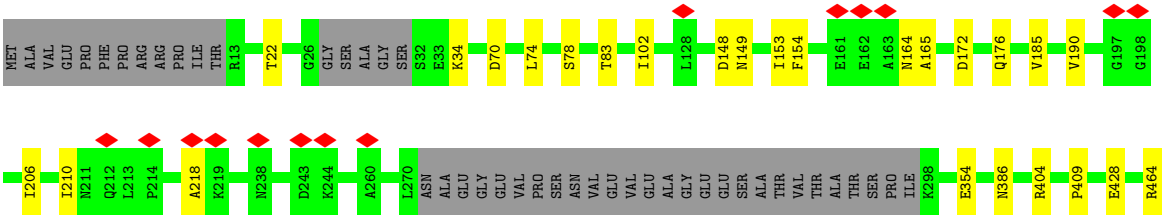
Chain S:





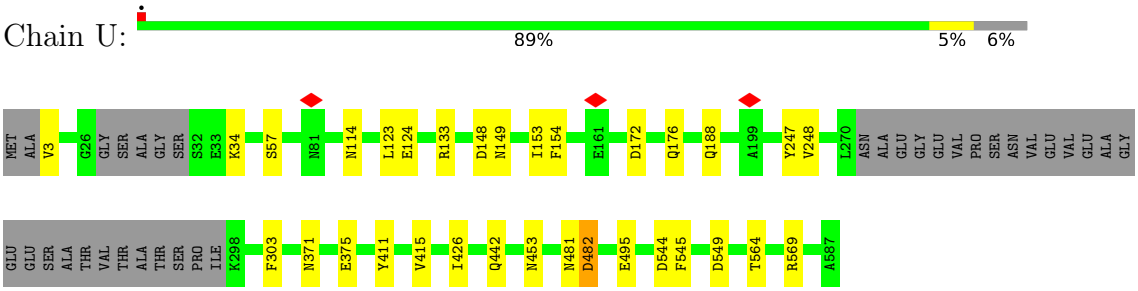
• Molecule 7: ORF49

Chain T:



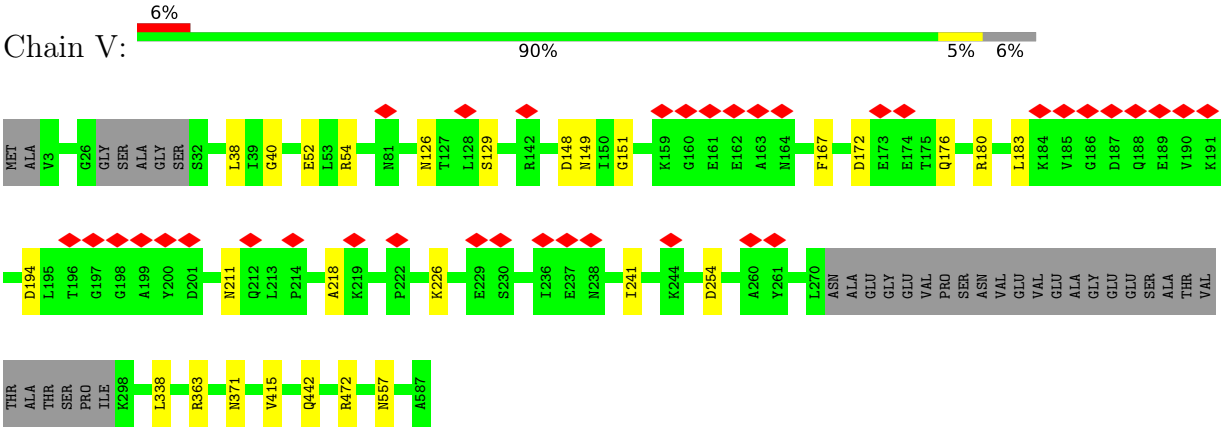
• Molecule 7: ORF49

Chain U:



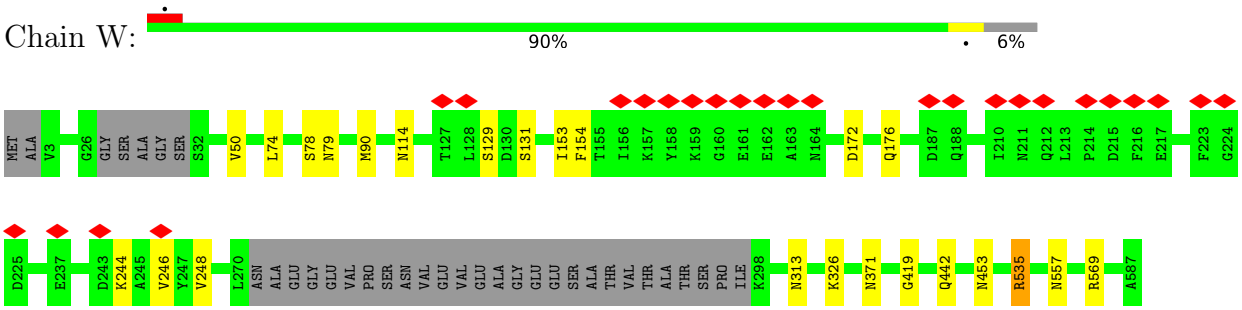
• Molecule 7: ORF49

Chain V:



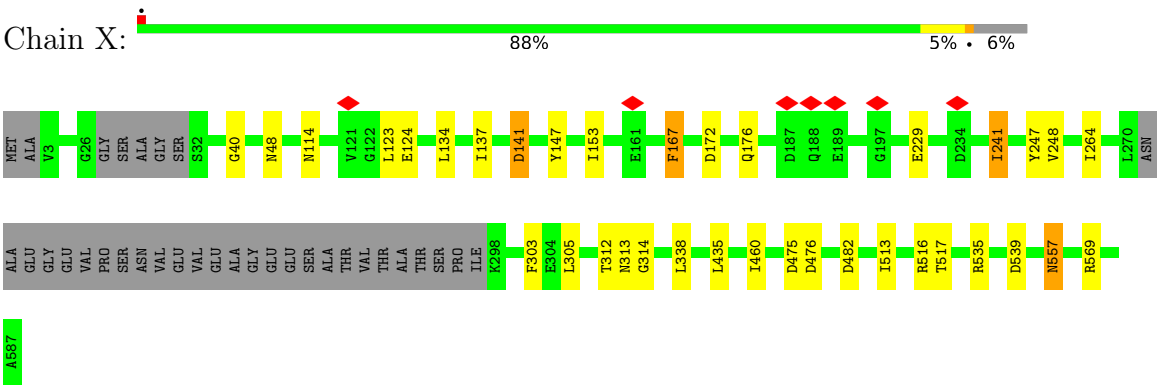
• Molecule 7: ORF49

Chain W:



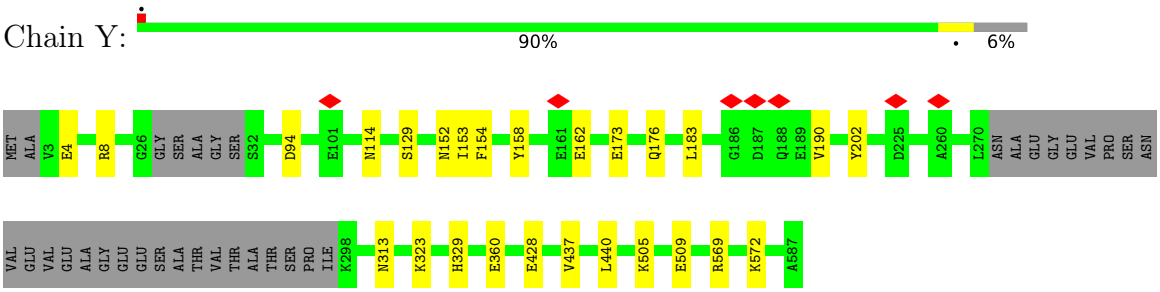
• Molecule 7: ORF49

Chain X:



• Molecule 7: ORF49

Chain Y:


90%
6%
MET ALA V3 E4 R8 G26 GLY SER ALA GLY SER S32 D94 E101 N114 S129 N152 I153 F154 Y158 E161 E162 E173 Q176 L183 G186 D187 Q188 E189 V190 Y202 D225 A260 L270 ASN ALA GLU GLY GLU VAL PRO SER ASN
VAL GLU VAL GLU ALA GLY GLU GLU SER ALA THR VAL THR ALA THR SER PRO ILE K298 N313 K323 H329 E360 E428 V437 L440 K505 E509 R569 K572 A587

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C6	Depositor
Number of particles used	21264	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	42	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	130000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.110	Depositor
Minimum map value	-0.043	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	1352.9601, 1352.9601, 1352.9601	wwPDB
Map dimensions	640, 640, 640	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.114, 2.114, 2.114	Depositor

5 Model quality

5.1 Standard geometry

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	0.23	0/1902	0.49	0/2572
2	B	0.41	0/2803	0.74	0/3794
2	C	0.21	0/2795	0.44	0/3784
3	D	0.70	1/3852 (0.0%)	1.30	30/5218 (0.6%)
4	E	0.72	0/1364	1.40	7/1854 (0.4%)
4	F	0.79	0/1377	1.44	7/1872 (0.4%)
4	G	0.72	0/1364	1.36	5/1854 (0.3%)
4	H	0.72	0/1377	1.39	8/1872 (0.4%)
4	I	0.73	0/1377	1.41	11/1872 (0.6%)
4	J	0.75	0/1377	1.42	6/1872 (0.3%)
5	K	0.71	0/7308	1.26	17/9911 (0.2%)
5	L	0.71	0/7308	1.27	18/9911 (0.2%)
5	M	0.71	0/7308	1.25	16/9911 (0.2%)
5	N	0.71	0/7308	1.28	29/9911 (0.3%)
5	O	0.75	0/7308	1.31	27/9911 (0.3%)
5	P	0.72	0/7308	1.29	23/9911 (0.2%)
6	Q	0.77	0/3619	1.34	18/4913 (0.4%)
6	R	0.76	0/3619	1.29	13/4913 (0.3%)
6	S	0.78	0/3619	1.34	17/4913 (0.3%)
7	T	0.24	0/4280	0.48	0/5777
7	U	0.33	0/4392	0.63	0/5930
7	V	0.35	0/4392	0.64	1/5930 (0.0%)
7	W	0.32	0/4392	0.62	1/5930 (0.0%)
7	X	0.28	0/4392	0.56	0/5930
7	Y	0.21	0/4392	0.45	0/5930
All	All	0.62	1/100533 (0.0%)	1.11	254/136196 (0.2%)

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.

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Mol	Chain	#Chirality outliers	#Planarity outliers

Mol	Chain	#Chirality outliers	#Planarity outliers
3	D	0	7
4	E	0	2
4	F	0	3
4	G	0	2
4	H	0	1
4	I	0	1
4	J	0	1
5	K	0	10
5	L	0	6
5	M	0	7
5	N	0	8
5	O	0	13
5	P	0	5
6	Q	0	7
6	R	0	6
6	S	0	7
7	V	0	1
7	W	0	1
All	All	0	88

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	364	PRO	CA-C	5.34	1.54	1.51

All (254) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	S	227	PHE	N-CA-C	11.22	126.72	108.55
3	D	462	ASP	CA-CB-CG	11.11	123.71	112.60
3	D	191	LEU	N-CA-C	10.90	125.94	112.87
5	N	311	THR	CA-CB-CG2	9.89	127.31	110.50
3	D	280	ALA	CB-CA-C	9.55	131.02	110.19
6	Q	231	ASP	CA-CB-CG	9.24	121.84	112.60
4	E	69	SER	CA-C-N	9.22	131.37	119.84
4	E	69	SER	C-N-CA	9.22	131.37	119.84
4	E	70	PRO	CA-N-CD	-8.90	99.54	112.00
5	L	1144	ARG	NE-CZ-NH2	8.74	127.07	119.20
5	N	1144	ARG	NE-CZ-NH2	8.64	126.97	119.20
6	Q	266	ASP	CA-CB-CG	8.06	120.67	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	K	1144	ARG	NE-CZ-NH2	8.05	126.44	119.20
5	O	1144	ARG	NE-CZ-NH2	7.93	126.34	119.20
5	O	477	ARG	NE-CZ-NH2	7.91	126.32	119.20
5	M	1144	ARG	NE-CZ-NH2	7.70	126.13	119.20
6	S	83	ARG	NE-CZ-NH2	7.54	125.99	119.20
3	D	94	THR	O-C-N	-7.54	114.66	123.25
5	P	1144	ARG	NE-CZ-NH2	7.50	125.95	119.20
6	Q	136	ASN	N-CA-C	7.44	122.39	113.16
6	S	122	ASN	CA-CB-CG	7.43	120.03	112.60
5	L	520	THR	OG1-CB-CG2	-7.41	94.49	109.30
4	I	136	ASN	CA-CB-CG	7.40	120.00	112.60
3	D	94	THR	CA-C-N	7.38	130.18	120.28
3	D	94	THR	C-N-CA	7.38	130.18	120.28
4	H	21	ASP	CA-CB-CG	-7.30	105.30	112.60
5	P	477	ARG	NE-CZ-NH2	7.24	125.72	119.20
6	S	200	ARG	NE-CZ-NH2	7.21	125.69	119.20
5	L	29	ARG	NE-CZ-NH2	7.15	125.63	119.20
3	D	292	ASP	CA-CB-CG	7.11	119.71	112.60
6	R	266	ASP	CA-CB-CG	7.11	119.71	112.60
4	I	111	GLU	CB-CG-CD	7.04	124.56	112.60
5	N	310	GLU	CB-CA-C	7.04	123.19	114.40
6	S	267	HIS	CB-CG-CD2	-7.04	122.05	131.20
6	Q	200	ARG	NE-CZ-NH2	7.00	125.50	119.20
5	O	399	ASP	CA-CB-CG	6.97	119.57	112.60
3	D	321	ASN	OD1-CG-ND2	-6.92	115.67	122.60
4	F	157	GLN	OE1-CD-NE2	-6.90	115.70	122.60
6	S	123	ASN	CA-CB-CG	-6.90	105.70	112.60
3	D	181	THR	CA-CB-OG1	6.86	119.90	109.60
5	P	528	PHE	CA-CB-CG	6.82	120.62	113.80
5	N	311	THR	OG1-CB-CG2	-6.73	95.83	109.30
4	H	136	ASN	CA-CB-CG	6.73	119.33	112.60
5	M	477	ARG	NE-CZ-NH2	6.70	125.23	119.20
5	M	504	ARG	NE-CZ-NH2	6.67	125.20	119.20
5	L	477	ARG	NE-CZ-NH2	6.66	125.19	119.20
3	D	192	ASP	CB-CA-C	6.65	121.51	111.80
5	L	286	ARG	NE-CZ-NH2	6.59	125.13	119.20
5	N	429	ARG	NE-CZ-NH2	6.58	125.12	119.20
4	E	9	HIS	CB-CG-CD2	-6.57	122.66	131.20
3	D	194	LEU	CA-C-N	6.56	126.69	119.87
3	D	194	LEU	C-N-CA	6.56	126.69	119.87
3	D	297	THR	CA-C-N	6.54	131.81	120.68
3	D	297	THR	C-N-CA	6.54	131.81	120.68

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	O	32	GLN	N-CA-C	6.51	119.66	109.96
5	O	210	HIS	CB-CG-CD2	-6.44	122.82	131.20
7	W	535	ARG	NE-CZ-NH2	6.43	124.98	119.20
5	M	272	ARG	NE-CZ-NH2	6.40	124.96	119.20
5	P	321	LYS	CB-CG-CD	-6.40	96.58	111.30
5	L	1026	ARG	NE-CZ-NH2	6.39	124.95	119.20
5	O	804	ARG	NE-CZ-NH2	6.36	124.93	119.20
6	S	451	ARG	NE-CZ-NH2	6.36	124.92	119.20
5	M	286	ARG	NE-CZ-NH2	6.35	124.91	119.20
3	D	108	ARG	NE-CZ-NH2	6.30	124.87	119.20
5	O	1023	GLU	CB-CG-CD	-6.29	101.91	112.60
5	L	1023	GLU	CB-CG-CD	-6.28	101.93	112.60
5	P	184	ARG	NE-CZ-NH2	6.23	124.81	119.20
5	N	477	ARG	NE-CZ-NH2	6.22	124.80	119.20
5	P	1019	ARG	NE-CZ-NH2	6.21	124.79	119.20
6	S	23	ASN	CA-CB-CG	6.20	118.80	112.60
4	G	130	SER	N-CA-C	6.19	118.82	111.33
6	S	384	ASP	CA-CB-CG	6.18	118.78	112.60
5	P	996	LEU	CA-C-N	6.17	131.26	121.44
5	P	996	LEU	C-N-CA	6.17	131.26	121.44
5	P	321	LYS	CG-CD-CE	6.16	125.47	111.30
5	N	29	ARG	NE-CZ-NH2	6.14	124.73	119.20
4	I	158	ASN	OD1-CG-ND2	-6.12	116.47	122.60
3	D	190	TRP	CA-CB-CG	6.11	125.22	113.60
4	F	168	ARG	NE-CZ-NH2	6.10	124.69	119.20
6	Q	424	ARG	NE-CZ-NH2	6.07	124.66	119.20
5	P	895	ARG	NE-CZ-NH2	6.07	124.66	119.20
3	D	336	ASP	CA-CB-CG	-6.02	106.58	112.60
5	L	1150	ARG	NE-CZ-NH2	5.99	124.59	119.20
5	N	1026	ARG	NE-CZ-NH2	5.99	124.59	119.20
6	Q	319	ARG	NE-CZ-NH2	5.99	124.59	119.20
3	D	129	HIS	CB-CG-CD2	-5.98	123.43	131.20
5	K	286	ARG	NE-CZ-NH2	5.97	124.58	119.20
5	P	286	ARG	NE-CZ-NH2	5.97	124.58	119.20
6	S	424	ARG	NE-CZ-NH2	5.97	124.58	119.20
4	E	70	PRO	N-CA-C	5.96	124.75	112.47
6	Q	273	GLN	OE1-CD-NE2	-5.96	116.64	122.60
3	D	364	PRO	N-CA-CB	5.94	106.52	103.19
4	I	9	HIS	CA-CB-CG	5.91	119.71	113.80
5	P	1019	ARG	NE-CZ-NH1	-5.91	115.59	121.50
4	H	101	VAL	CA-CB-CG1	5.91	120.45	110.40
5	P	1104	ASN	CA-CB-CG	5.91	118.51	112.60

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	S	266	ASP	CA-CB-CG	5.91	118.51	112.60
5	K	504	ARG	NE-CZ-NH2	5.90	124.51	119.20
5	L	465	ARG	CD-NE-CZ	5.89	132.65	124.40
5	O	32	GLN	OE1-CD-NE2	-5.89	116.71	122.60
5	P	504	ARG	NE-CZ-NH2	5.89	124.50	119.20
4	F	9	HIS	CA-CB-CG	5.88	119.68	113.80
6	R	424	ARG	NE-CZ-NH2	5.88	124.49	119.20
4	G	157	GLN	OE1-CD-NE2	-5.86	116.74	122.60
5	K	477	ARG	NE-CZ-NH2	5.84	124.46	119.20
6	S	124	ASN	CA-CB-CG	5.84	118.44	112.60
5	K	804	ARG	NE-CZ-NH2	5.83	124.45	119.20
6	R	361	ASP	CA-CB-CG	-5.82	106.78	112.60
3	D	374	GLN	OE1-CD-NE2	-5.80	116.80	122.60
5	N	286	ARG	NE-CZ-NH2	5.80	124.42	119.20
6	Q	414	ASP	CA-CB-CG	5.79	118.39	112.60
5	K	826	GLN	OE1-CD-NE2	-5.78	116.82	122.60
5	M	321	LYS	CG-CD-CE	5.78	124.59	111.30
5	N	570	ARG	NE-CZ-NH2	5.78	124.40	119.20
6	Q	267	HIS	CB-CG-CD2	-5.76	123.71	131.20
3	D	183	ARG	NE-CZ-NH2	5.76	124.39	119.20
5	K	1143	ARG	NE-CZ-NH2	5.75	124.37	119.20
4	H	111	GLU	CB-CG-CD	5.73	122.34	112.60
5	O	914	GLN	OE1-CD-NE2	-5.72	116.88	122.60
6	Q	227	PHE	CA-CB-CG	-5.72	108.08	113.80
6	S	361	ASP	CA-CB-CG	-5.72	106.88	112.60
5	L	1019	ARG	NE-CZ-NH1	-5.72	115.78	121.50
5	M	826	GLN	OE1-CD-NE2	-5.71	116.89	122.60
4	J	21	ASP	CA-CB-CG	-5.71	106.89	112.60
5	M	868	PRO	N-CA-CB	5.67	106.10	102.92
5	O	13	ARG	NE-CZ-NH2	5.63	124.27	119.20
7	V	472	ARG	NE-CZ-NH2	5.63	124.27	119.20
6	Q	74	GLU	CB-CG-CD	-5.62	103.06	112.60
6	S	131	ARG	NE-CZ-NH2	5.60	124.24	119.20
3	D	192	ASP	CA-CB-CG	-5.59	107.00	112.60
3	D	343	ARG	NE-CZ-NH2	5.59	124.24	119.20
5	O	828	ARG	NE-CZ-NH1	-5.59	115.91	121.50
4	E	65	ARG	NE-CZ-NH2	5.58	124.23	119.20
6	Q	131	ARG	NE-CZ-NH2	5.58	124.22	119.20
4	J	38	ASN	CA-CB-CG	5.56	118.16	112.60
3	D	401	ASN	CA-CB-CG	-5.56	107.04	112.60
5	N	1023	GLU	CB-CG-CD	-5.55	103.16	112.60
5	M	321	LYS	CB-CG-CD	-5.55	98.53	111.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	142	ARG	NE-CZ-NH2	5.55	124.20	119.20
5	M	342	GLU	O-C-N	-5.55	118.16	121.71
6	R	424	ARG	CD-NE-CZ	5.54	132.16	124.40
5	O	826	GLN	OE1-CD-NE2	-5.54	117.06	122.60
5	N	918	PHE	CA-CB-CG	5.53	119.33	113.80
6	R	417	PRO	N-CA-CB	5.53	106.10	103.22
5	M	799	GLN	OE1-CD-NE2	-5.52	117.08	122.60
5	M	895	ARG	NE-CZ-NH2	5.51	124.16	119.20
5	N	272	ARG	NE-CZ-NH2	5.51	124.16	119.20
5	N	887	ASP	CA-CB-CG	-5.50	107.09	112.60
5	N	485	GLN	OE1-CD-NE2	-5.50	117.10	122.60
5	P	204	ASN	CA-CB-CG	5.50	118.10	112.60
5	N	1019	ARG	NE-CZ-NH2	5.49	124.14	119.20
4	G	35	ASN	OD1-CG-ND2	-5.49	117.11	122.60
5	O	564	ALA	CA-C-N	5.49	125.10	119.56
5	O	564	ALA	C-N-CA	5.49	125.10	119.56
5	M	1026	ARG	NE-CZ-NH2	5.48	124.13	119.20
5	K	1150	ARG	NE-CZ-NH2	5.46	124.11	119.20
5	P	822	ASN	OD1-CG-ND2	-5.46	117.14	122.60
3	D	181	THR	OG1-CB-CG2	5.44	120.19	109.30
5	P	1109	ARG	NE-CZ-NH2	5.43	124.09	119.20
5	K	13	ARG	NE-CZ-NH2	5.42	124.08	119.20
6	R	320	ASN	OD1-CG-ND2	-5.42	117.18	122.60
5	L	461	PHE	CA-CB-CG	5.42	119.22	113.80
5	L	833	GLN	OE1-CD-NE2	-5.41	117.19	122.60
5	O	1150	ARG	NE-CZ-NH2	5.41	124.07	119.20
5	K	184	ARG	NE-CZ-NH2	5.41	124.07	119.20
5	M	828	ARG	NE-CZ-NH1	-5.40	116.10	121.50
5	O	140	ARG	NE-CZ-NH2	5.40	124.06	119.20
5	M	1150	ARG	NE-CZ-NH2	5.39	124.05	119.20
5	N	358	ARG	NE-CZ-NH2	5.35	124.02	119.20
5	K	828	ARG	NE-CZ-NH1	-5.35	116.15	121.50
6	S	197	ARG	NE-CZ-NH2	5.34	124.00	119.20
3	D	190	TRP	CB-CG-CD1	-5.33	118.90	126.90
6	Q	162	ASP	CA-CB-CG	5.33	117.93	112.60
6	R	35	PHE	CA-CB-CG	5.33	119.13	113.80
4	G	28	GLY	CA-C-N	5.32	131.71	121.54
4	G	28	GLY	C-N-CA	5.32	131.71	121.54
5	N	289	GLN	CA-C-N	5.32	125.16	120.10
5	N	289	GLN	C-N-CA	5.32	125.16	120.10
6	Q	248	PHE	CA-CB-CG	5.32	119.12	113.80
5	O	358	ARG	NE-CZ-NH2	5.31	123.98	119.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	J	21	ASP	N-CA-C	5.29	119.00	112.54
4	H	93	ALA	CA-C-N	5.29	127.63	120.38
4	H	93	ALA	C-N-CA	5.29	127.63	120.38
5	P	19	ASP	CA-CB-CG	5.29	117.89	112.60
5	K	560	ARG	NE-CZ-NH2	5.29	123.96	119.20
6	S	241	ARG	NE-CZ-NH2	5.28	123.95	119.20
5	K	488	ASN	OD1-CG-ND2	-5.25	117.35	122.60
4	I	65	ARG	NE-CZ-NH1	-5.24	116.26	121.50
6	S	32	ARG	NE-CZ-NH2	5.24	123.91	119.20
5	K	399	ASP	CA-CB-CG	5.23	117.83	112.60
4	J	111	GLU	CB-CG-CD	5.22	121.48	112.60
6	R	384	ASP	CA-CB-CG	5.22	117.82	112.60
5	K	92	ASN	OD1-CG-ND2	-5.22	117.38	122.60
5	L	488	ASN	OD1-CG-ND2	-5.21	117.39	122.60
5	N	310	GLU	CA-C-N	5.21	131.50	121.54
5	N	310	GLU	C-N-CA	5.21	131.50	121.54
5	L	498	GLN	OE1-CD-NE2	-5.21	117.39	122.60
6	R	32	ARG	NE-CZ-NH2	5.19	123.87	119.20
4	E	162	GLN	OE1-CD-NE2	-5.18	117.42	122.60
5	K	1014	ARG	CD-NE-CZ	5.18	131.66	124.40
5	L	204	ASN	CA-CB-CG	5.18	117.78	112.60
4	I	111	GLU	CA-C-N	5.18	134.44	121.80
4	I	111	GLU	C-N-CA	5.18	134.44	121.80
5	N	895	ARG	NE-CZ-NH2	5.16	123.85	119.20
4	I	158	ASN	N-CA-C	5.16	117.69	111.40
5	L	828	ARG	NE-CZ-NH1	-5.16	116.34	121.50
5	P	272	ARG	CD-NE-CZ	5.16	131.62	124.40
5	N	335	ASP	CA-CB-CG	5.15	117.75	112.60
5	L	1014	ARG	NE-CZ-NH2	5.14	123.83	119.20
3	D	367	GLU	CB-CG-CD	-5.13	103.88	112.60
6	Q	384	ASP	CA-CB-CG	5.13	117.73	112.60
5	N	293	GLN	OE1-CD-NE2	-5.13	117.47	122.60
5	N	837	ASN	CA-CB-CG	5.13	117.73	112.60
5	M	234	ARG	NE-CZ-NH2	5.12	123.81	119.20
5	O	312	SER	CA-C-N	5.12	126.24	119.84
5	O	312	SER	C-N-CA	5.12	126.24	119.84
4	F	168	ARG	CD-NE-CZ	5.11	131.55	124.40
4	F	172	GLU	CB-CG-CD	5.11	121.28	112.60
5	O	289	GLN	CA-C-N	5.11	125.19	120.34
5	O	289	GLN	C-N-CA	5.11	125.19	120.34
4	F	50	GLN	OE1-CD-NE2	-5.10	117.50	122.60
5	P	868	PRO	N-CA-CB	5.10	105.78	102.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	K	833	GLN	OE1-CD-NE2	-5.10	117.50	122.60
5	O	862	ARG	NE-CZ-NH2	5.10	123.79	119.20
5	P	1015	GLN	OE1-CD-NE2	-5.09	117.51	122.60
5	O	833	GLN	OE1-CD-NE2	-5.09	117.51	122.60
4	H	156	PHE	CA-CB-CG	5.08	118.88	113.80
6	R	339	HIS	CB-CG-CD2	-5.08	124.59	131.20
5	N	1150	ARG	NE-CZ-NH2	5.08	123.77	119.20
4	I	101	VAL	CA-CB-CG1	5.07	119.03	110.40
6	Q	451	ARG	NE-CZ-NH2	5.07	123.77	119.20
5	N	234	ARG	NE-CZ-NH2	5.07	123.76	119.20
6	R	40	ASP	CA-CB-CG	5.07	117.67	112.60
3	D	341	GLU	CB-CG-CD	-5.07	103.99	112.60
3	D	348	ASP	CA-CB-CG	5.06	117.66	112.60
5	O	521	HIS	CB-CG-CD2	-5.06	124.62	131.20
5	N	1006	ASP	CA-CB-CG	5.06	117.66	112.60
5	P	822	ASN	CA-CB-CG	5.06	117.66	112.60
6	Q	11	ASN	OD1-CG-ND2	-5.06	117.54	122.60
6	R	131	ARG	NE-CZ-NH2	5.05	123.75	119.20
5	L	521	HIS	CB-CG-CD2	-5.05	124.63	131.20
4	J	9	HIS	CB-CG-CD2	-5.05	124.63	131.20
4	H	103	LEU	N-CA-CB	-5.05	103.08	110.86
5	N	498	GLN	OE1-CD-NE2	-5.04	117.56	122.60
6	Q	36	ASP	CA-CB-CG	5.04	117.64	112.60
5	P	166	TYR	N-CA-C	5.03	116.85	111.36
4	J	136	ASN	CA-CB-CG	5.03	117.63	112.60
4	I	136	ASN	OD1-CG-ND2	-5.02	117.58	122.60
4	I	69	SER	N-CA-C	5.02	120.90	109.81
5	O	178	ASN	CA-CB-CG	-5.02	107.58	112.60
4	F	86	VAL	N-CA-C	5.01	115.70	108.48
5	O	38	GLU	CA-C-N	5.01	127.30	120.54
5	O	38	GLU	C-N-CA	5.01	127.30	120.54
6	R	23	ASN	CA-CB-CG	5.00	117.60	112.60

There are no chirality outliers.

All (88) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	D	176	TYR	Sidechain
3	D	203	PHE	Sidechain
3	D	216	HIS	Sidechain
3	D	418	ARG	Sidechain
3	D	426	ARG	Sidechain

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Mol	Chain	Res	Type	Group
3	D	448	TYR	Sidechain
3	D	460	TYR	Sidechain
4	E	102	TYR	Sidechain
4	E	55	TYR	Sidechain
4	F	102	TYR	Sidechain
4	F	117	TYR	Sidechain
4	F	80	TYR	Sidechain
4	G	168	ARG	Sidechain
4	G	80	TYR	Sidechain
4	H	168	ARG	Sidechain
4	I	168	ARG	Sidechain
4	J	80	TYR	Sidechain
5	K	1004	TYR	Sidechain
5	K	1014	ARG	Sidechain
5	K	1083	TYR	Sidechain
5	K	166	TYR	Sidechain
5	K	192	TYR	Sidechain
5	K	286	ARG	Sidechain
5	K	350	TYR	Sidechain
5	K	46	TYR	Sidechain
5	K	477	ARG	Sidechain
5	K	570	ARG	Sidechain
5	L	1139	ARG	Sidechain
5	L	13	ARG	Sidechain
5	L	166	TYR	Sidechain
5	L	327	ARG	Sidechain
5	L	403	TYR	Sidechain
5	L	477	ARG	Sidechain
5	M	13	ARG	Sidechain
5	M	166	TYR	Sidechain
5	M	283	ARG	Sidechain
5	M	403	TYR	Sidechain
5	M	523	ASP	Sidechain
5	M	872	GLU	Sidechain
5	M	943	PHE	Sidechain
5	N	1019	ARG	Sidechain
5	N	1027	TYR	Sidechain
5	N	1128	ARG	Sidechain
5	N	1139	ARG	Sidechain
5	N	166	TYR	Sidechain
5	N	403	TYR	Sidechain
5	N	46	TYR	Sidechain

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Mol	Chain	Res	Type	Group
5	N	560	ARG	Sidechain
5	O	1004	TYR	Sidechain
5	O	1026	ARG	Sidechain
5	O	1041	THR	Peptide
5	O	133	TYR	Sidechain
5	O	166	TYR	Sidechain
5	O	210	HIS	Sidechain
5	O	286	ARG	Sidechain
5	O	29	ARG	Sidechain
5	O	350	TYR	Sidechain
5	O	465	ARG	Sidechain
5	O	477	ARG	Sidechain
5	O	523	ASP	Sidechain
5	O	560	ARG	Sidechain
5	P	1019	ARG	Sidechain
5	P	13	ARG	Sidechain
5	P	166	TYR	Sidechain
5	P	403	TYR	Sidechain
5	P	5	PHE	Sidechain
6	Q	117	TYR	Sidechain
6	Q	220	TYR	Sidechain
6	Q	365	TYR	Sidechain
6	Q	367	TYR	Sidechain
6	Q	401	TYR	Sidechain
6	Q	423	TYR	Sidechain
6	Q	78	TYR	Sidechain
6	R	220	TYR	Sidechain
6	R	365	TYR	Sidechain
6	R	367	TYR	Sidechain
6	R	401	TYR	Sidechain
6	R	423	TYR	Sidechain
6	R	79	TYR	Sidechain
6	S	115	HIS	Sidechain
6	S	200	ARG	Sidechain
6	S	235	TYR	Sidechain
6	S	365	TYR	Sidechain
6	S	394	TYR	Sidechain
6	S	412	ARG	Sidechain
6	S	63	TYR	Sidechain
7	V	363	ARG	Sidechain
7	W	535	ARG	Sidechain

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	1871	0	1828	9	0
2	B	2760	0	2729	6	0
2	C	2752	0	2717	8	0
3	D	3769	0	3640	64	0
4	E	1336	0	1323	14	0
4	F	1349	0	1339	26	0
4	G	1336	0	1323	5	0
4	H	1349	0	1339	7	0
4	I	1349	0	1339	5	0
4	J	1349	0	1339	6	0
5	K	7166	0	6971	6	0
5	L	7166	0	6971	16	0
5	M	7166	0	6971	16	0
5	N	7166	0	6971	30	0
5	O	7166	0	6971	24	0
5	P	7166	0	6971	23	0
6	Q	3548	0	3468	9	0
6	R	3548	0	3468	3	0
6	S	3548	0	3468	23	0
7	T	4213	0	4167	21	0
7	U	4321	0	4280	17	0
7	V	4321	0	4280	16	0
7	W	4321	0	4280	14	0
7	X	4321	0	4280	22	0
7	Y	4321	0	4280	14	0
All	All	98678	0	96713	295	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 2.

All (295) 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)
5:O:314:GLY:CA	6:S:122:ASN:HD21	1.27	1.44
5:O:314:GLY:CA	6:S:122:ASN:ND2	2.01	1.24

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:280:ALA:HB3	5:P:130:VAL:HG21	1.31	1.08
5:O:314:GLY:N	6:S:122:ASN:ND2	2.07	1.00
5:O:314:GLY:HA3	6:S:122:ASN:HD21	0.87	1.00
5:O:314:GLY:HA3	6:S:122:ASN:ND2	1.69	0.99
3:D:280:ALA:HB3	5:P:130:VAL:CG2	1.92	0.97
5:K:272:ARG:NH1	5:N:248:ASN:OD1	2.00	0.94
3:D:192:ASP:HA	4:E:173:VAL:CB	1.98	0.93
3:D:192:ASP:HA	4:E:173:VAL:HB	1.50	0.91
3:D:245:VAL:HB	5:O:28:ASP:HA	1.58	0.84
3:D:192:ASP:CA	4:E:173:VAL:HB	2.10	0.80
3:D:192:ASP:HA	4:E:173:VAL:CG1	2.11	0.79
5:M:1105:ASN:HB2	5:N:291:ASP:CG	2.10	0.76
3:D:280:ALA:C	5:P:130:VAL:HG11	2.12	0.75
3:D:33:ASN:OD1	3:D:37:ASN:ND2	2.20	0.74
2:B:191:ARG:NH1	2:C:187:GLU:OE1	2.21	0.74
5:O:314:GLY:HA2	6:S:122:ASN:HD21	1.48	0.74
3:D:191:LEU:HD22	3:D:195:PRO:HD3	1.72	0.72
5:L:520:THR:HA	5:N:311:THR:HA	1.73	0.71
3:D:245:VAL:CB	5:O:28:ASP:HA	2.21	0.70
3:D:196:LYS:HB2	4:F:172:GLU:CG	2.22	0.70
3:D:190:TRP:CH2	4:F:9:HIS:HA	2.28	0.69
3:D:280:ALA:CB	5:P:130:VAL:CG2	2.70	0.68
2:C:85:PHE:O	2:C:158:ARG:NH2	2.26	0.68
7:V:557:ASN:OD1	7:W:569:ARG:NH2	2.25	0.68
3:D:192:ASP:HA	4:E:173:VAL:HG11	1.74	0.68
3:D:280:ALA:HB1	5:P:130:VAL:HB	1.77	0.67
3:D:281:SER:HB2	5:P:130:VAL:HG12	1.75	0.67
3:D:196:LYS:HB2	4:F:172:GLU:CB	2.25	0.66
3:D:196:LYS:HB2	4:F:172:GLU:HG2	1.77	0.66
4:G:91:GLU:CD	4:G:91:GLU:H	2.04	0.66
7:U:371:ASN:OD1	7:U:442:GLN:NE2	2.29	0.65
3:D:188:ILE:HG12	4:F:2:ALA:HB3	1.77	0.65
3:D:192:ASP:H	4:E:173:VAL:CG2	2.10	0.64
3:D:280:ALA:CB	5:P:130:VAL:HB	2.28	0.64
5:M:1105:ASN:CB	5:N:291:ASP:CG	2.71	0.64
7:T:557:ASN:OD1	7:U:569:ARG:NH2	2.31	0.64
7:X:141:ASP:N	7:X:141:ASP:OD1	2.27	0.64
4:F:157:GLN:HG2	4:G:158:ASN:HB3	1.81	0.63
5:L:318:LYS:HE3	5:L:320:TYR:CE2	2.34	0.63
3:D:197:ILE:HG21	4:F:150:PHE:CD1	2.34	0.63
5:O:314:GLY:HA2	6:S:122:ASN:ND2	2.08	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:M:943:PHE:CE2	5:N:339:GLN:HG3	2.35	0.62
7:W:371:ASN:OD1	7:W:442:GLN:NE2	2.33	0.62
3:D:196:LYS:HG3	4:F:172:GLU:HG3	1.82	0.62
7:X:124:GLU:OE1	7:X:124:GLU:N	2.33	0.61
3:D:280:ALA:CB	5:P:130:VAL:CB	2.78	0.61
7:Y:329:HIS:ND1	7:Y:360:GLU:OE2	2.35	0.60
7:X:516:ARG:NH1	7:Y:428:GLU:OE2	2.35	0.59
7:Y:129:SER:O	7:Y:152:ASN:ND2	2.35	0.59
5:M:1104:ASN:HA	5:N:290:GLY:HA3	1.83	0.59
2:C:57:TRP:NE1	2:C:61:GLU:OE1	2.35	0.59
3:D:191:LEU:HD22	3:D:195:PRO:CD	2.32	0.59
3:D:191:LEU:CD2	3:D:195:PRO:HD3	2.32	0.58
5:O:283:ARG:HD3	6:S:96:SER:O	2.02	0.58
7:W:74:LEU:O	7:W:78:SER:N	2.37	0.58
3:D:280:ALA:C	5:P:130:VAL:CG1	2.76	0.58
7:T:70:ASP:OD1	7:T:404:ARG:NH1	2.36	0.58
5:M:1104:ASN:HA	5:N:290:GLY:CA	2.34	0.58
7:T:386:ASN:O	7:T:479:THR:OG1	2.22	0.58
3:D:191:LEU:CD2	3:D:195:PRO:CD	2.82	0.58
2:B:12:LYS:NZ	3:D:34:GLU:OE2	2.36	0.58
1:A:80:ASN:ND2	7:T:83:THR:OG1	2.37	0.57
3:D:281:SER:CB	5:P:130:VAL:HG12	2.34	0.57
5:M:318:LYS:HE3	5:M:320:TYR:CE2	2.39	0.57
7:Y:4:GLU:OE2	7:Y:8:ARG:NH2	2.38	0.57
3:D:188:ILE:CG1	4:F:2:ALA:HB3	2.35	0.56
7:Y:94:ASP:OD1	7:Y:323:LYS:NZ	2.38	0.56
5:M:1105:ASN:HB2	5:N:291:ASP:OD1	2.06	0.56
7:Y:158:TYR:OH	7:Y:162:GLU:N	2.38	0.55
5:L:519:ILE:HG13	5:N:311:THR:HG22	1.88	0.55
3:D:192:ASP:CA	4:E:173:VAL:CB	2.73	0.55
1:A:131:ILE:HG21	7:T:22:THR:HG23	1.89	0.55
4:F:157:GLN:NE2	4:G:157:GLN:HE21	2.04	0.55
3:D:196:LYS:CA	4:F:172:GLU:HB3	2.37	0.54
7:U:482:ASP:OD1	7:U:482:ASP:N	2.39	0.54
5:M:1102:ARG:HH21	5:N:289:GLN:NE2	2.06	0.54
7:U:172:ASP:O	7:U:176:GLN:N	2.40	0.54
7:X:535:ARG:NH1	7:X:539:ASP:OD2	2.41	0.53
7:V:371:ASN:OD1	7:V:442:GLN:NE2	2.41	0.53
7:X:229:GLU:OE1	7:X:229:GLU:N	2.41	0.53
7:Y:153:ILE:HG23	7:Y:154:PHE:HD1	1.74	0.53
3:D:193:GLY:C	3:D:194:LEU:HG	2.34	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:M:1105:ASN:HB2	5:N:291:ASP:CB	2.39	0.53
7:W:153:ILE:HG23	7:W:154:PHE:HD1	1.72	0.53
4:F:91:GLU:CD	4:F:91:GLU:H	2.17	0.53
7:T:148:ASP:OD1	7:T:149:ASN:N	2.41	0.53
5:N:483:TYR:CE1	5:P:504:ARG:HD3	2.44	0.53
7:T:172:ASP:O	7:T:176:GLN:N	2.40	0.53
7:V:148:ASP:OD1	7:V:149:ASN:N	2.42	0.53
7:W:557:ASN:OD1	7:X:569:ARG:NH2	2.42	0.52
7:T:517:THR:N	7:U:569:ARG:O	2.41	0.52
7:W:153:ILE:HG22	7:W:248:VAL:O	2.09	0.52
7:T:164:ASN:OD1	7:T:165:ALA:N	2.42	0.52
7:T:153:ILE:HG23	7:T:154:PHE:CD1	2.44	0.51
7:T:206:ILE:HG22	7:T:210:ILE:CD1	2.39	0.51
7:T:34:LYS:NZ	7:T:495:GLU:OE2	2.31	0.51
7:V:167:PHE:HD1	7:V:241:ILE:HD11	1.75	0.51
5:O:309:THR:HG23	5:O:320:TYR:CE1	2.46	0.51
7:T:464:ARG:O	7:T:466:ARG:NH2	2.43	0.51
5:L:498:GLN:HA	5:N:344:SER:HA	1.91	0.51
5:O:283:ARG:CB	6:S:96:SER:O	2.59	0.51
3:D:196:LYS:HB2	4:F:172:GLU:HB2	1.91	0.51
4:H:157:GLN:HA	4:I:158:ASN:HD22	1.75	0.51
4:I:116:THR:HG22	4:I:158:ASN:HA	1.93	0.50
2:B:232:ASP:OD1	2:B:233:THR:N	2.44	0.50
5:L:520:THR:HA	5:N:311:THR:CA	2.42	0.50
5:M:357:LYS:HZ3	5:M:364:ASP:CG	2.19	0.50
5:P:1026:ARG:HG3	5:P:1026:ARG:HH21	1.76	0.50
6:R:168:VAL:HG11	6:S:190:SER:OG	2.11	0.50
6:S:209:GLU:HB3	6:S:226:GLU:HG2	1.94	0.50
7:X:513:ILE:HG23	7:Y:572:LYS:HA	1.92	0.50
5:L:520:THR:CA	5:N:311:THR:HA	2.42	0.49
7:W:172:ASP:O	7:W:176:GLN:N	2.42	0.49
3:D:196:LYS:C	4:F:172:GLU:HB3	2.37	0.49
3:D:153:TYR:CE2	4:E:155:GLN:HB2	2.47	0.49
5:N:291:ASP:OD1	5:N:337:SER:HA	2.11	0.49
5:L:497:GLY:CA	5:N:344:SER:OG	2.61	0.49
1:A:30:ASP:OD1	1:A:30:ASP:N	2.45	0.49
5:N:560:ARG:HH21	5:N:560:ARG:HA	1.78	0.49
7:U:123:LEU:HD12	7:U:303:PHE:CE2	2.47	0.49
4:H:101:VAL:HB	4:H:171:VAL:CG2	2.42	0.49
1:A:124:ASP:OD1	1:A:125:LEU:N	2.46	0.49
5:O:283:ARG:CG	6:S:96:SER:O	2.61	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:Q:233:GLU:HG2	6:Q:240:ILE:HD12	1.94	0.49
7:W:50:VAL:HG22	7:W:90:MET:HE3	1.95	0.49
2:B:16:LYS:NZ	3:D:30:ASP:OD2	2.45	0.49
1:A:131:ILE:HG21	7:T:22:THR:CG2	2.44	0.48
7:U:148:ASP:OD1	7:U:149:ASN:N	2.46	0.48
5:P:318:LYS:HE3	5:P:320:TYR:CD2	2.47	0.48
2:B:191:ARG:O	2:B:196:SER:OG	2.30	0.48
4:J:129:LYS:HE3	4:J:142:VAL:O	2.13	0.48
7:T:509:GLU:HA	7:T:513:ILE:HD12	1.95	0.48
7:U:124:GLU:O	7:U:133:ARG:N	2.47	0.48
7:W:90:MET:HE1	7:W:326:LYS:HB2	1.96	0.48
7:T:206:ILE:HG22	7:T:210:ILE:HD11	1.95	0.48
3:D:206:PHE:CZ	4:G:170:ILE:HD13	2.49	0.48
7:W:114:ASN:N	7:W:313:ASN:OD1	2.47	0.48
7:X:557:ASN:OD1	7:X:557:ASN:N	2.47	0.48
5:N:872:GLU:OE2	5:N:875:LYS:HE2	2.13	0.48
3:D:306:GLU:CD	3:D:432:LYS:HZ3	2.22	0.47
7:X:123:LEU:HD12	7:X:303:PHE:CE2	2.49	0.47
3:D:192:ASP:N	4:E:173:VAL:HB	2.28	0.47
1:A:142:LEU:O	1:A:157:SER:OG	2.31	0.47
3:D:320:ASN:C	3:D:321:ASN:HD22	2.21	0.47
5:M:943:PHE:CD2	5:N:339:GLN:HG3	2.49	0.47
5:K:998:TRP:CD1	5:K:999:GLU:H	2.32	0.47
4:E:172:GLU:C	4:E:173:VAL:HG22	2.40	0.47
6:Q:225:LYS:HG2	6:Q:228:GLU:HB2	1.96	0.47
7:X:517:THR:N	7:Y:569:ARG:O	2.45	0.47
7:V:151:GLY:O	7:V:226:LYS:NZ	2.36	0.47
7:X:40:GLY:HA3	7:X:338:LEU:HD12	1.97	0.47
7:V:167:PHE:CB	7:V:183:LEU:HD23	2.45	0.47
1:A:54:GLU:OE1	1:A:54:GLU:N	2.42	0.46
7:X:475:ASP:OD1	7:X:476:ASP:N	2.45	0.46
5:M:1105:ASN:HB2	5:N:291:ASP:HB2	1.97	0.46
7:X:435:LEU:HD22	7:X:460:ILE:HD13	1.96	0.46
4:J:116:THR:HG22	4:J:158:ASN:HA	1.98	0.46
4:H:91:GLU:H	4:H:91:GLU:CD	2.24	0.46
5:O:144:LYS:HE3	5:P:19:ASP:HB2	1.96	0.46
7:V:211:ASN:ND2	7:V:218:ALA:O	2.48	0.46
7:X:482:ASP:N	7:X:482:ASP:OD1	2.49	0.46
3:D:196:LYS:CB	4:F:172:GLU:CG	2.91	0.46
7:T:516:ARG:NH1	7:U:426:ILE:O	2.49	0.46
5:O:313:PRO:C	6:S:122:ASN:ND2	2.70	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:225:ASP:OD1	2:C:229:ASN:N	2.49	0.46
3:D:296:TYR:C	3:D:298:SER:H	2.24	0.46
5:L:885:ASN:HD21	5:L:887:ASP:HB3	1.80	0.46
5:O:309:THR:HG23	5:O:320:TYR:CD1	2.51	0.46
7:X:312:THR:HG22	7:X:314:GLY:H	1.81	0.46
3:D:153:TYR:CZ	4:E:155:GLN:HB2	2.51	0.45
3:D:460:TYR:CE2	4:I:162:GLN:HA	2.51	0.45
3:D:190:TRP:CH2	4:F:12:LEU:HB2	2.50	0.45
7:W:153:ILE:HG23	7:W:154:PHE:CD1	2.50	0.45
5:P:318:LYS:HE3	5:P:320:TYR:CE2	2.52	0.45
5:P:995:GLN:C	5:P:997:LYS:H	2.24	0.45
7:V:126:ASN:ND2	7:V:129:SER:OG	2.46	0.45
7:X:172:ASP:O	7:X:176:GLN:N	2.42	0.45
6:Q:213:ILE:HD13	6:Q:215:LYS:HE3	1.97	0.45
7:U:375:GLU:OE1	7:U:375:GLU:N	2.47	0.45
3:D:280:ALA:O	5:P:130:VAL:HG11	2.16	0.45
4:J:91:GLU:N	4:J:91:GLU:CD	2.75	0.45
2:C:324:ASP:OD1	2:C:325:ASN:N	2.49	0.45
6:S:123:ASN:HA	6:S:126:ILE:HG22	1.99	0.45
7:V:167:PHE:CD1	7:V:241:ILE:HD11	2.52	0.45
4:F:61:VAL:HG12	4:F:103:LEU:HA	1.98	0.45
7:V:40:GLY:HA3	7:V:338:LEU:HD12	1.99	0.45
7:W:129:SER:OG	7:W:131:SER:OG	2.33	0.45
3:D:153:TYR:CZ	3:D:181:THR:HB	2.52	0.45
4:H:101:VAL:HB	4:H:171:VAL:HG22	1.99	0.45
3:D:69:VAL:O	3:D:80:TYR:OH	2.34	0.45
7:V:180:ARG:NE	7:V:194:ASP:OD1	2.42	0.44
4:H:129:LYS:HE3	4:H:142:VAL:O	2.17	0.44
5:N:291:ASP:CG	5:N:337:SER:HA	2.43	0.44
7:T:74:LEU:O	7:T:78:SER:N	2.50	0.44
5:L:996:LEU:CD1	5:L:996:LEU:H	2.30	0.44
6:R:144:ILE:HG22	6:S:144:ILE:HD12	1.99	0.44
7:Y:114:ASN:OD1	7:Y:313:ASN:N	2.49	0.44
7:Y:183:LEU:O	7:Y:190:VAL:N	2.48	0.44
4:F:56:LYS:HZ2	4:F:111:GLU:CD	2.26	0.44
5:L:520:THR:HG22	5:N:310:GLU:O	2.18	0.44
6:Q:123:ASN:HA	6:Q:126:ILE:HG22	2.00	0.44
7:X:114:ASN:OD1	7:X:313:ASN:N	2.51	0.44
4:J:14:LYS:HE2	4:J:90:PRO:O	2.18	0.44
7:X:153:ILE:HG22	7:X:248:VAL:O	2.18	0.44
7:X:312:THR:HG22	7:X:314:GLY:N	2.32	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:F:104:GLU:CD	4:F:168:ARG:HE	2.25	0.44
5:N:186:TYR:CE1	5:N:223:LYS:HE2	2.53	0.44
5:K:560:ARG:HE	5:K:560:ARG:HA	1.82	0.43
7:T:577:SER:C	7:T:578:LEU:HD12	2.43	0.43
7:X:134:LEU:N	7:X:147:TYR:O	2.51	0.43
4:F:157:GLN:CD	4:G:158:ASN:H	2.26	0.43
5:L:996:LEU:H	5:L:996:LEU:HD12	1.82	0.43
7:W:79:ASN:ND2	7:W:419:GLY:O	2.50	0.43
3:D:190:TRP:HZ3	4:F:9:HIS:CG	2.37	0.43
5:L:497:GLY:HA2	5:N:344:SER:OG	2.17	0.43
6:Q:198:LEU:HD22	6:S:202:THR:HB	2.00	0.43
6:S:209:GLU:H	6:S:226:GLU:CD	2.26	0.43
3:D:209:TYR:CE1	3:D:446:GLY:HA2	2.54	0.43
4:F:152:ASP:CG	4:F:154:LYS:HZ3	2.27	0.43
6:Q:381:LYS:HZ2	6:Q:411:ASP:CG	2.25	0.43
5:L:318:LYS:HE3	5:L:320:TYR:CZ	2.54	0.43
1:A:214:VAL:HG12	1:A:218:ILE:HD12	2.00	0.43
5:K:318:LYS:NZ	5:P:802:GLU:OE2	2.42	0.43
7:U:153:ILE:HG22	7:U:248:VAL:O	2.19	0.43
7:X:137:ILE:HD12	7:X:305:LEU:HD21	2.01	0.43
7:V:52:GLU:OE2	7:V:54:ARG:NE	2.51	0.42
5:O:981:LYS:HZ3	5:O:981:LYS:N	2.17	0.42
7:T:210:ILE:HG21	7:T:218:ALA:HB2	2.00	0.42
3:D:176:TYR:OH	3:D:181:THR:HG21	2.19	0.42
7:T:185:VAL:HG23	7:T:190:VAL:CG2	2.48	0.42
4:I:14:LYS:HE2	4:I:93:ALA:HB3	2.01	0.42
7:V:226:LYS:HZ2	7:V:254:ASP:CG	2.27	0.42
1:A:48:GLU:OE1	1:A:48:GLU:N	2.52	0.42
2:C:253:ASP:OD1	2:C:254:VAL:N	2.52	0.42
5:K:60:LYS:HE3	5:K:60:LYS:H	1.85	0.42
7:U:544:ASP:OD1	7:U:545:PHE:N	2.52	0.42
7:V:38:LEU:HD21	7:V:415:VAL:HG13	2.01	0.42
3:D:196:LYS:CB	4:F:172:GLU:CB	2.96	0.42
3:D:245:VAL:HB	5:O:28:ASP:CA	2.40	0.42
5:O:297:SER:CB	6:S:83:ARG:HG2	2.50	0.42
4:E:129:LYS:HE3	4:E:143:GLU:HA	2.02	0.42
5:L:497:GLY:C	5:N:344:SER:OG	2.62	0.42
5:P:92:ASN:HD22	5:P:94:ASP:HB2	1.85	0.42
3:D:232:ILE:O	3:D:234:LYS:HE2	2.19	0.42
7:U:34:LYS:NZ	7:U:495:GLU:OE2	2.36	0.42
5:P:60:LYS:HE2	5:P:173:GLU:OE1	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:W:244:LYS:O	7:W:246:VAL:HG23	2.20	0.42
7:Y:505:LYS:NZ	7:Y:509:GLU:OE2	2.52	0.42
5:M:869:MET:HE1	5:M:877:TYR:CE1	2.55	0.41
6:Q:190:SER:HB3	6:S:186:PHE:CD1	2.54	0.41
7:U:153:ILE:HG23	7:U:154:PHE:CD1	2.54	0.41
7:X:167:PHE:HB3	7:X:241:ILE:HD11	2.02	0.41
3:D:265:TYR:CE2	3:D:285:ARG:HB3	2.55	0.41
4:J:129:LYS:HE3	4:J:142:VAL:C	2.45	0.41
5:L:497:GLY:HA2	5:N:344:SER:CB	2.50	0.41
5:N:483:TYR:CD1	5:P:504:ARG:HD3	2.55	0.41
7:V:172:ASP:O	7:V:176:GLN:N	2.52	0.41
3:D:196:LYS:N	4:F:172:GLU:HB3	2.35	0.41
7:U:549:ASP:OD2	7:U:564:THR:OG1	2.33	0.41
2:C:281:GLN:NE2	2:C:345:VAL:O	2.51	0.41
3:D:245:VAL:CG1	5:O:28:ASP:HA	2.50	0.41
2:B:268:VAL:HG23	2:B:321:VAL:HG22	2.01	0.41
3:D:192:ASP:N	4:E:173:VAL:CG2	2.82	0.41
4:H:156:PHE:CD1	4:H:156:PHE:N	2.89	0.41
4:I:11:GLU:OE2	4:I:94:LYS:HE3	2.19	0.41
7:U:411:TYR:O	7:U:415:VAL:HG23	2.21	0.41
4:E:172:GLU:HB2	4:E:173:VAL:HG22	2.03	0.41
5:O:504:ARG:HD3	5:P:483:TYR:CE2	2.56	0.41
2:C:257:VAL:O	2:C:259:LYS:N	2.54	0.41
5:O:48:LYS:HE2	5:O:52:ASP:OD2	2.20	0.41
6:R:240:ILE:HG12	6:S:235:TYR:CD1	2.56	0.41
3:D:196:LYS:C	4:F:172:GLU:CB	2.94	0.41
3:D:462:ASP:CB	4:H:168:ARG:HH22	2.34	0.41
5:O:996:LEU:CD1	5:O:996:LEU:H	2.34	0.41
7:U:188:GLN:N	7:U:188:GLN:OE1	2.54	0.41
4:F:157:GLN:HE21	4:F:157:GLN:HB3	1.75	0.41
4:J:125:ASP:O	4:J:146:GLY:HA3	2.22	0.41
5:K:324:GLU:OE2	5:P:942:LYS:NZ	2.54	0.41
5:N:311:THR:HG23	5:N:317:THR:OG1	2.21	0.41
7:Y:173:GLU:O	7:Y:176:GLN:NE2	2.54	0.41
5:M:369:THR:HG21	5:M:376:LYS:HE3	2.02	0.40
6:Q:402:VAL:HG13	6:Q:424:ARG:HD2	2.01	0.40
3:D:196:LYS:O	3:D:197:ILE:HG23	2.21	0.40
5:M:999:GLU:H	5:M:999:GLU:CD	2.29	0.40
5:N:999:GLU:H	5:N:999:GLU:CD	2.29	0.40
5:O:283:ARG:CD	6:S:96:SER:O	2.69	0.40
6:Q:342:LEU:HB3	6:Q:358:LEU:HD22	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:V:167:PHE:HB2	7:V:183:LEU:HD23	2.03	0.40
5:L:996:LEU:HD12	5:L:996:LEU:N	2.36	0.40
7:Y:437:VAL:HG11	7:Y:440:LEU:HD21	2.04	0.40
5:M:56:LYS:HE3	5:M:175:ASP:HB2	2.04	0.40
6:S:130:TYR:HE1	6:S:144:ILE:HD11	1.87	0.40
6:S:214:LYS:HE2	6:S:218:GLY:O	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	232/234 (99%)	223 (96%)	9 (4%)	0	100	100
2	B	346/348 (99%)	341 (99%)	5 (1%)	0	100	100
2	C	345/348 (99%)	339 (98%)	6 (2%)	0	100	100
3	D	451/1019 (44%)	407 (90%)	41 (9%)	3 (1%)	18	55
4	E	168/173 (97%)	156 (93%)	9 (5%)	3 (2%)	6	33
4	F	170/173 (98%)	160 (94%)	10 (6%)	0	100	100
4	G	168/173 (97%)	156 (93%)	9 (5%)	3 (2%)	6	33
4	H	170/173 (98%)	152 (89%)	11 (6%)	7 (4%)	2	18
4	I	170/173 (98%)	152 (89%)	13 (8%)	5 (3%)	3	23
4	J	170/173 (98%)	156 (92%)	10 (6%)	4 (2%)	4	27
5	K	900/1152 (78%)	851 (95%)	49 (5%)	0	100	100
5	L	900/1152 (78%)	846 (94%)	52 (6%)	2 (0%)	43	77
5	M	900/1152 (78%)	856 (95%)	43 (5%)	1 (0%)	48	83
5	N	900/1152 (78%)	845 (94%)	46 (5%)	9 (1%)	12	47
5	O	900/1152 (78%)	834 (93%)	58 (6%)	8 (1%)	14	49

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
5	P	900/1152 (78%)	842 (94%)	52 (6%)	6 (1%)	18 55
6	Q	456/458 (100%)	431 (94%)	23 (5%)	2 (0%)	30 66
6	R	456/458 (100%)	431 (94%)	25 (6%)	0	100 100
6	S	456/458 (100%)	428 (94%)	26 (6%)	2 (0%)	30 66
7	T	534/587 (91%)	502 (94%)	31 (6%)	1 (0%)	43 77
7	U	547/587 (93%)	516 (94%)	31 (6%)	0	100 100
7	V	547/587 (93%)	521 (95%)	26 (5%)	0	100 100
7	W	547/587 (93%)	524 (96%)	23 (4%)	0	100 100
7	X	547/587 (93%)	526 (96%)	21 (4%)	0	100 100
7	Y	547/587 (93%)	522 (95%)	25 (5%)	0	100 100
All	All	12427/14795 (84%)	11717 (94%)	654 (5%)	56 (0%)	26 62

All (56) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	70	PRO
4	H	93	ALA
4	I	93	ALA
4	J	93	ALA
4	J	111	GLU
6	Q	227	PHE
6	S	157	GLY
3	D	190	TRP
4	E	161	GLU
4	G	29	LYS
4	J	73	ASP
5	N	311	THR
5	N	913	LEU
5	O	313	PRO
5	O	360	GLU
5	P	996	LEU
4	E	76	ASN
4	H	92	ASN
4	H	98	ALA
4	I	92	ASN
5	M	996	LEU
5	N	869	MET
5	N	996	LEU

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Mol	Chain	Res	Type
5	N	1116	VAL
5	O	461	PHE
5	O	519	ILE
6	S	83	ARG
3	D	297	THR
3	D	313	SER
4	G	159	ARG
4	H	73	ASP
4	H	111	GLU
4	H	156	PHE
4	I	70	PRO
5	P	1010	LEU
4	G	69	SER
4	I	69	SER
4	I	73	ASP
4	J	143	GLU
5	L	1003	ASN
5	N	28	ASP
5	N	340	GLY
5	O	93	ASP
5	O	833	GLN
5	O	1040	THR
5	P	340	GLY
6	Q	432	SER
4	H	70	PRO
5	N	337	SER
5	O	493	GLY
5	P	1043	LEU
5	L	340	GLY
5	P	557	ILE
7	T	409	PRO
5	N	583	VAL
5	P	337	SER

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	209/209 (100%)	208 (100%)	1 (0%)	81 81
2	B	311/311 (100%)	310 (100%)	1 (0%)	86 84
2	C	310/311 (100%)	309 (100%)	1 (0%)	86 84
3	D	417/928 (45%)	406 (97%)	11 (3%)	40 60
4	E	151/153 (99%)	144 (95%)	7 (5%)	24 46
4	F	152/153 (99%)	142 (93%)	10 (7%)	15 37
4	G	151/153 (99%)	149 (99%)	2 (1%)	61 72
4	H	152/153 (99%)	141 (93%)	11 (7%)	13 35
4	I	152/153 (99%)	137 (90%)	15 (10%)	7 24
4	J	152/153 (99%)	142 (93%)	10 (7%)	15 37
5	K	800/1010 (79%)	790 (99%)	10 (1%)	61 72
5	L	800/1010 (79%)	786 (98%)	14 (2%)	51 67
5	M	800/1010 (79%)	791 (99%)	9 (1%)	65 74
5	N	800/1010 (79%)	781 (98%)	19 (2%)	43 63
5	O	800/1010 (79%)	785 (98%)	15 (2%)	50 66
5	P	800/1010 (79%)	781 (98%)	19 (2%)	43 63
6	Q	405/405 (100%)	396 (98%)	9 (2%)	45 64
6	R	405/405 (100%)	400 (99%)	5 (1%)	63 73
6	S	405/405 (100%)	394 (97%)	11 (3%)	39 59
7	T	459/495 (93%)	456 (99%)	3 (1%)	76 79
7	U	471/495 (95%)	464 (98%)	7 (2%)	57 70
7	V	471/495 (95%)	471 (100%)	0	100 100
7	W	471/495 (95%)	470 (100%)	1 (0%)	87 85
7	X	471/495 (95%)	464 (98%)	7 (2%)	57 70
7	Y	471/495 (95%)	470 (100%)	1 (0%)	87 85
All	All	10986/12922 (85%)	10787 (98%)	199 (2%)	51 67

All (199) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	30	ASP
2	B	271	SER
2	C	206	ASP
3	D	176	TYR

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Mol	Chain	Res	Type
3	D	190	TRP
3	D	191	LEU
3	D	212	THR
3	D	236	ASN
3	D	277	GLN
3	D	292	ASP
3	D	306	GLU
3	D	320	ASN
3	D	367	GLU
3	D	470	GLU
4	E	9	HIS
4	E	70	PRO
4	E	150	PHE
4	E	151	PHE
4	E	157	GLN
4	E	159	ARG
4	E	166	LYS
4	F	9	HIS
4	F	41	GLN
4	F	71	GLU
4	F	75	LYS
4	F	78	ILE
4	F	80	TYR
4	F	91	GLU
4	F	101	VAL
4	F	157	GLN
4	F	172	GLU
4	G	75	LYS
4	G	91	GLU
4	H	11	GLU
4	H	51	GLU
4	H	88	VAL
4	H	91	GLU
4	H	101	VAL
4	H	111	GLU
4	H	125	ASP
4	H	126	LEU
4	H	136	ASN
4	H	143	GLU
4	H	156	PHE
4	I	3	ILE
4	I	38	ASN

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Mol	Chain	Res	Type
4	I	51	GLU
4	I	68	LYS
4	I	88	VAL
4	I	101	VAL
4	I	108	VAL
4	I	111	GLU
4	I	125	ASP
4	I	127	VAL
4	I	136	ASN
4	I	142	VAL
4	I	143	GLU
4	I	154	LYS
4	I	162	GLN
4	J	38	ASN
4	J	51	GLU
4	J	68	LYS
4	J	88	VAL
4	J	91	GLU
4	J	101	VAL
4	J	111	GLU
4	J	125	ASP
4	J	127	VAL
4	J	157	GLN
5	K	33	GLN
5	K	97	LYS
5	K	170	THR
5	K	269	GLU
5	K	560	ARG
5	K	945	GLU
5	K	981	LYS
5	K	1007	LEU
5	K	1078	LYS
5	K	1133	THR
5	L	97	LYS
5	L	103	LYS
5	L	144	LYS
5	L	198	GLU
5	L	257	ASN
5	L	342	GLU
5	L	358	ARG
5	L	366	GLU
5	L	465	ARG

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Mol	Chain	Res	Type
5	L	560	ARG
5	L	942	LYS
5	L	945	GLU
5	L	1014	ARG
5	L	1075	LYS
5	M	33	GLN
5	M	269	GLU
5	M	291	ASP
5	M	342	GLU
5	M	358	ARG
5	M	833	GLN
5	M	981	LYS
5	M	1045	GLU
5	M	1134	GLU
5	N	33	GLN
5	N	185	THR
5	N	257	ASN
5	N	283	ARG
5	N	339	GLN
5	N	342	GLU
5	N	515	ASP
5	N	520	THR
5	N	541	GLU
5	N	584	ASN
5	N	822	ASN
5	N	833	GLN
5	N	942	LYS
5	N	1045	GLU
5	N	1075	LYS
5	N	1078	LYS
5	N	1086	ASP
5	N	1087	ASP
5	N	1134	GLU
5	O	4	ASN
5	O	32	GLN
5	O	33	GLN
5	O	97	LYS
5	O	144	LYS
5	O	170	THR
5	O	283	ARG
5	O	294	ASP
5	O	322	GLN

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Mol	Chain	Res	Type
5	O	526	ILE
5	O	942	LYS
5	O	981	LYS
5	O	1075	LYS
5	O	1078	LYS
5	O	1133	THR
5	P	19	ASP
5	P	97	LYS
5	P	144	LYS
5	P	269	GLU
5	P	283	ARG
5	P	822	ASN
5	P	861	THR
5	P	869	MET
5	P	884	GLU
5	P	892	VAL
5	P	981	LYS
5	P	987	MET
5	P	995	GLN
5	P	997	LYS
5	P	1045	GLU
5	P	1078	LYS
5	P	1087	ASP
5	P	1092	LYS
5	P	1143	ARG
6	Q	26	GLU
6	Q	32	ARG
6	Q	40	ASP
6	Q	70	ARG
6	Q	83	ARG
6	Q	192	ASP
6	Q	225	LYS
6	Q	231	ASP
6	Q	414	ASP
6	R	10	GLU
6	R	70	ARG
6	R	192	ASP
6	R	209	GLU
6	R	320	ASN
6	S	26	GLU
6	S	40	ASP
6	S	70	ARG

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Mol	Chain	Res	Type
6	S	83	ARG
6	S	95	GLU
6	S	124	ASN
6	S	192	ASP
6	S	224	LYS
6	S	226	GLU
6	S	227	PHE
6	S	356	LYS
7	T	102	ILE
7	T	354	GLU
7	T	428	GLU
7	U	3	VAL
7	U	57	SER
7	U	114	ASN
7	U	247	TYR
7	U	453	ASN
7	U	481	ASN
7	U	482	ASP
7	W	453	ASN
7	X	48	ASN
7	X	141	ASP
7	X	167	PHE
7	X	241	ILE
7	X	247	TYR
7	X	264	ILE
7	X	557	ASN
7	Y	202	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (108) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	80	ASN
2	B	111	GLN
3	D	268	ASN
3	D	277	GLN
3	D	303	ASN
3	D	321	ASN
4	E	76	ASN
4	E	82	ASN
4	E	92	ASN
4	E	162	GLN
4	F	50	GLN

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Mol	Chain	Res	Type
4	F	158	ASN
4	G	157	GLN
4	H	153	ASN
4	I	7	ASN
4	I	38	ASN
4	I	45	ASN
4	I	158	ASN
4	J	45	ASN
4	J	153	ASN
4	J	157	GLN
5	K	248	ASN
5	K	258	ASN
5	K	264	ASN
5	K	276	GLN
5	K	293	GLN
5	K	332	GLN
5	K	393	GLN
5	K	576	GLN
5	K	837	ASN
5	K	910	ASN
5	K	1003	ASN
5	K	1105	ASN
5	L	49	ASN
5	L	92	ASN
5	L	248	ASN
5	L	258	ASN
5	L	441	ASN
5	L	443	GLN
5	L	576	GLN
5	L	590	ASN
5	L	799	GLN
5	L	885	ASN
5	L	910	ASN
5	L	1126	GLN
5	M	92	ASN
5	M	254	ASN
5	M	258	ASN
5	M	393	GLN
5	M	799	GLN
5	M	833	GLN
5	M	910	ASN
5	N	195	ASN

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Mol	Chain	Res	Type
5	N	257	ASN
5	N	276	GLN
5	N	289	GLN
5	N	339	GLN
5	N	356	ASN
5	N	441	ASN
5	N	799	GLN
5	N	833	GLN
5	N	944	ASN
5	N	995	GLN
5	O	195	ASN
5	O	254	ASN
5	O	276	GLN
5	O	356	ASN
5	O	393	GLN
5	O	443	GLN
5	O	499	ASN
5	O	576	GLN
5	O	590	ASN
5	O	1003	ASN
5	O	1105	ASN
5	P	92	ASN
5	P	126	GLN
5	P	386	ASN
5	P	441	ASN
5	P	556	HIS
5	P	590	ASN
5	P	822	ASN
5	P	914	GLN
6	Q	23	ASN
6	Q	320	ASN
6	R	20	GLN
6	S	20	GLN
6	S	102	HIS
6	S	122	ASN
6	S	267	HIS
7	T	269	GLN
7	T	342	GLN
7	T	376	GLN
7	T	543	GLN
7	U	407	HIS
7	U	497	ASN

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Mol	Chain	Res	Type
7	U	543	GLN
7	V	126	ASN
7	V	269	GLN
7	X	120	GLN
7	X	171	HIS
7	X	204	ASN
7	X	258	GLN
7	X	262	ASN
7	X	540	ASN
7	Y	120	GLN
7	Y	204	ASN
7	Y	262	ASN
7	Y	465	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

There are no ligands in this entry.

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.

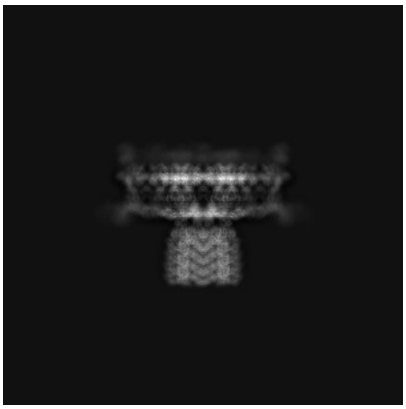
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-55967. These allow visual inspection of the internal detail of the map and identification of artifacts.

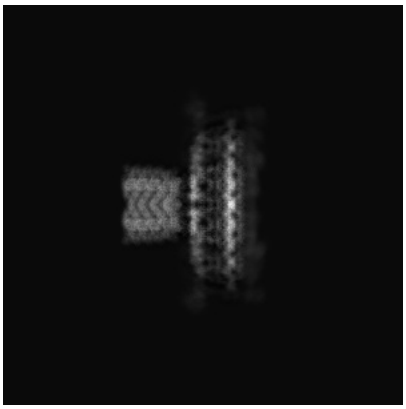
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

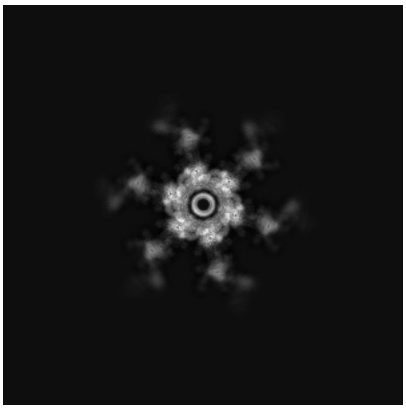
6.1.1 Primary map



X

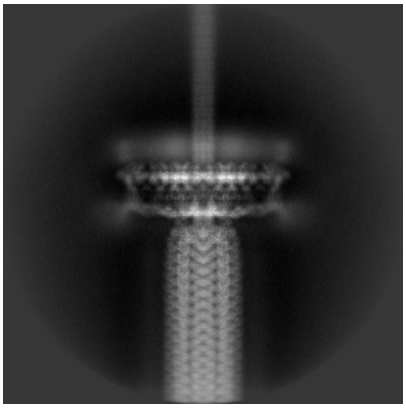


Y

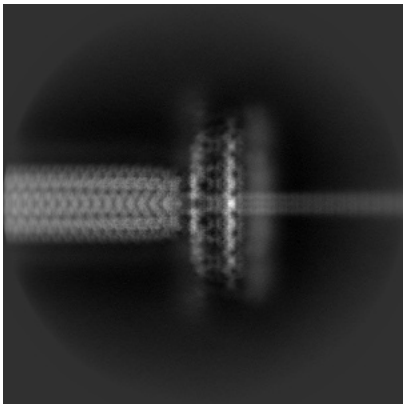


Z

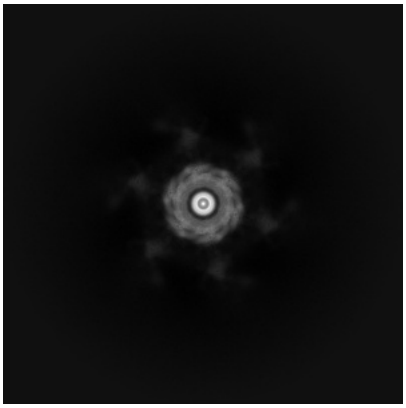
6.1.2 Raw map



X



Y

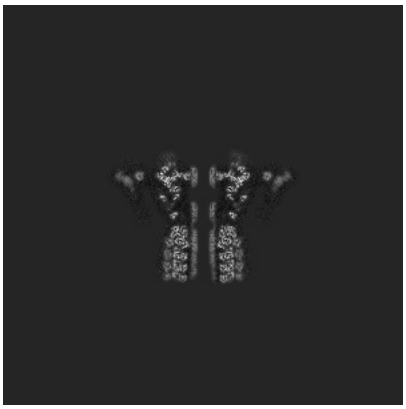


Z

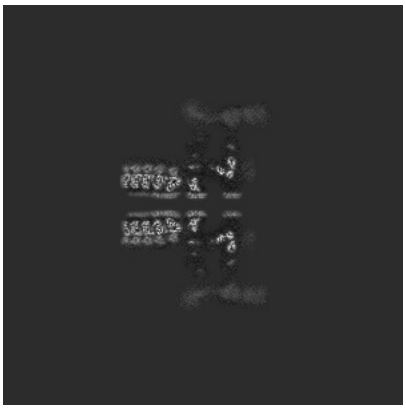
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

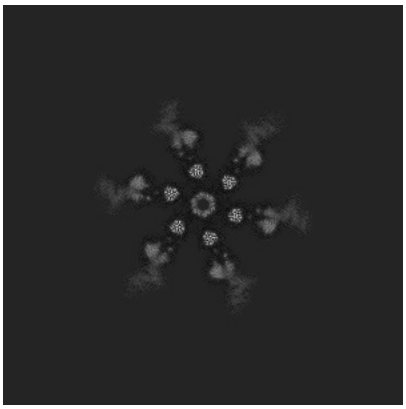
6.2.1 Primary map



X Index: 320

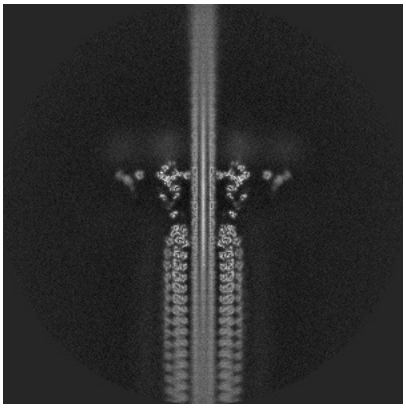


Y Index: 320

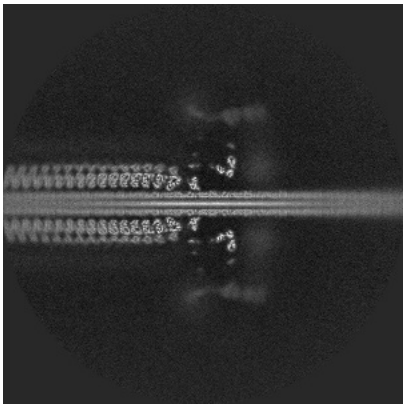


Z Index: 320

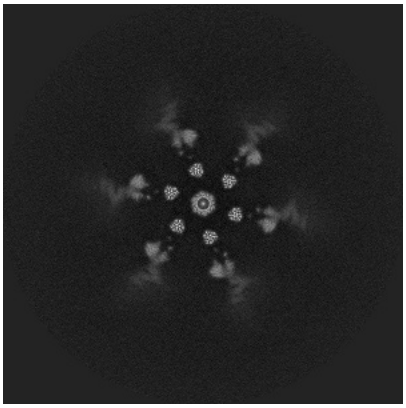
6.2.2 Raw map



X Index: 320



Y Index: 320

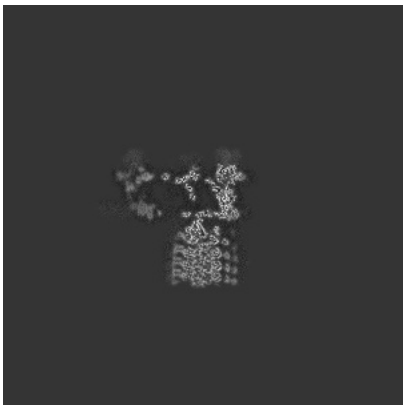


Z Index: 320

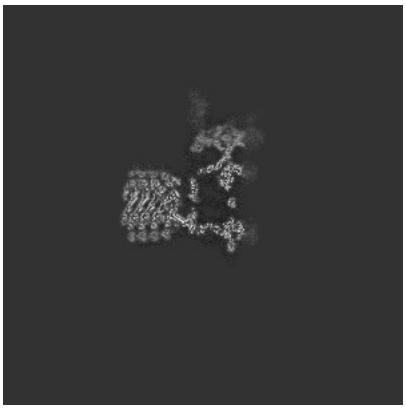
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

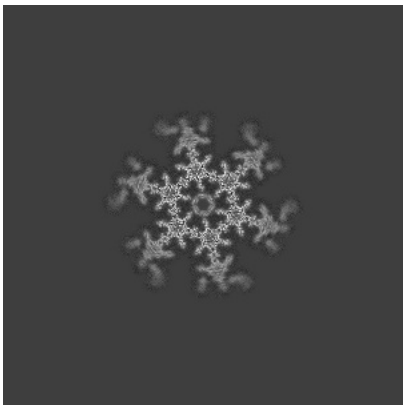
6.3.1 Primary map



X Index: 357

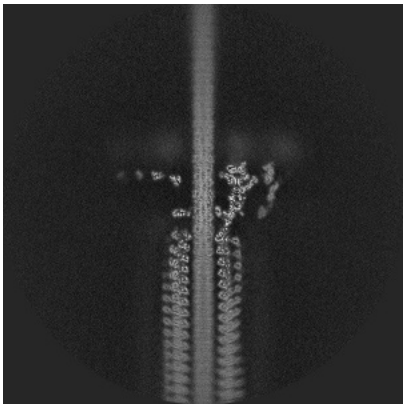


Y Index: 292

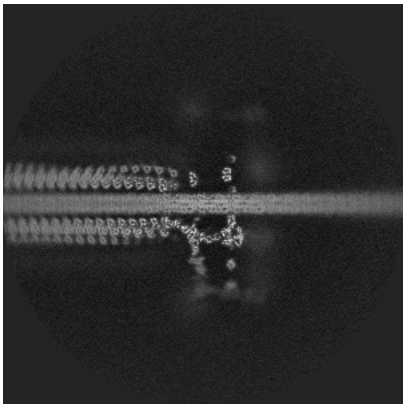


Z Index: 361

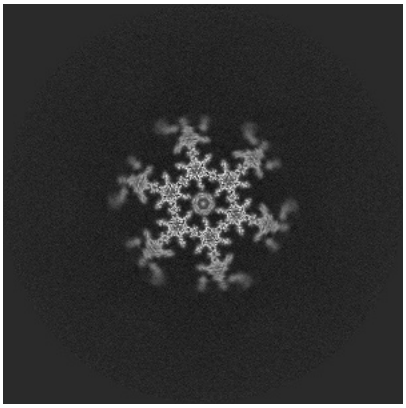
6.3.2 Raw map



X Index: 310



Y Index: 330

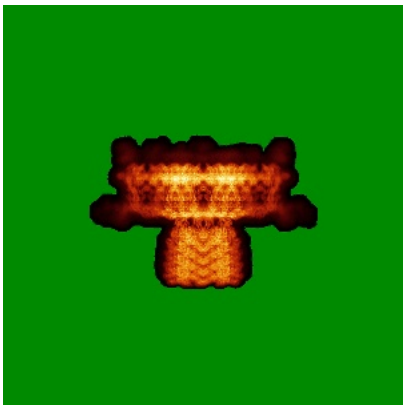


Z Index: 361

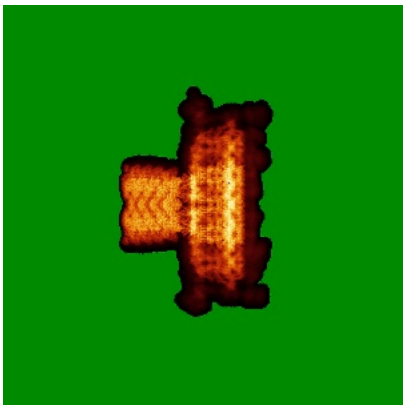
The images above show the largest variance slices of the map in three orthogonal directions.

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

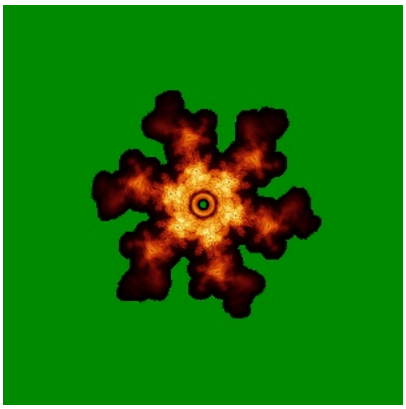
6.4.1 Primary map



X

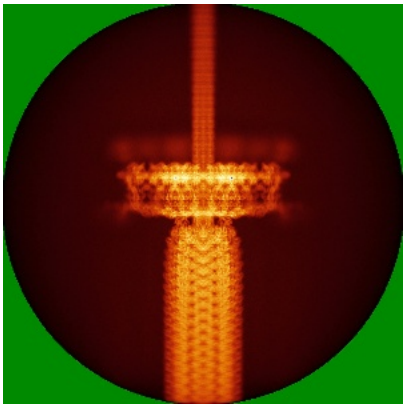


Y

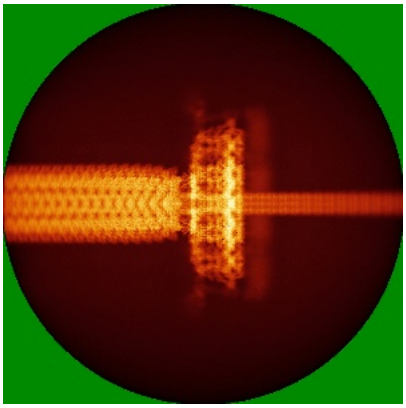


Z

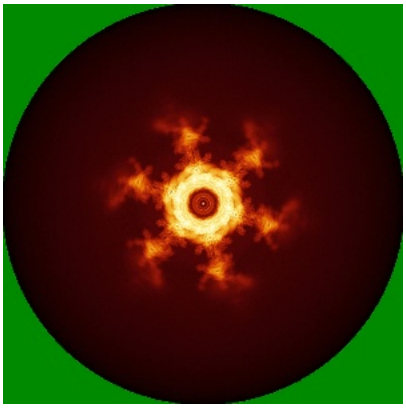
6.4.2 Raw map



X



Y

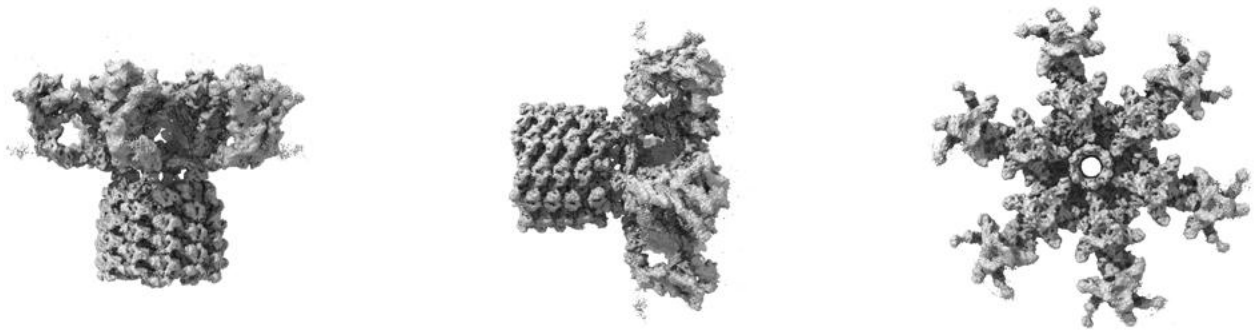


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.02. 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.

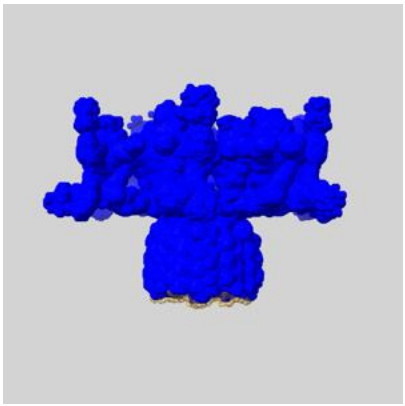
6.6 Mask visualisation (i)

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

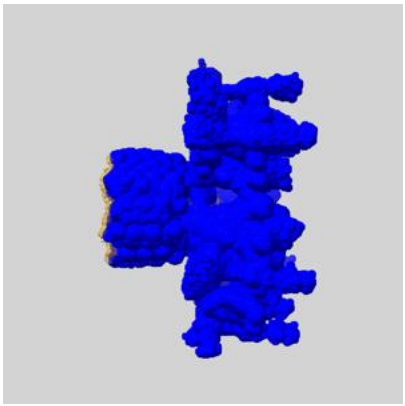
A mask typically either:

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

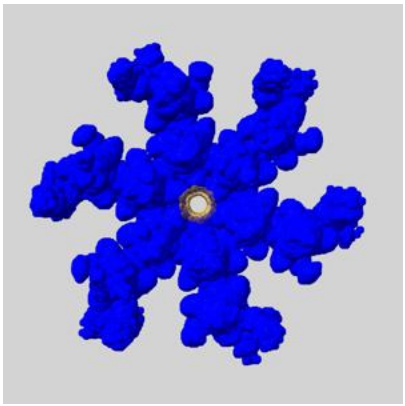
6.6.1 emd_55967_msk_1.map (i)



X



Y

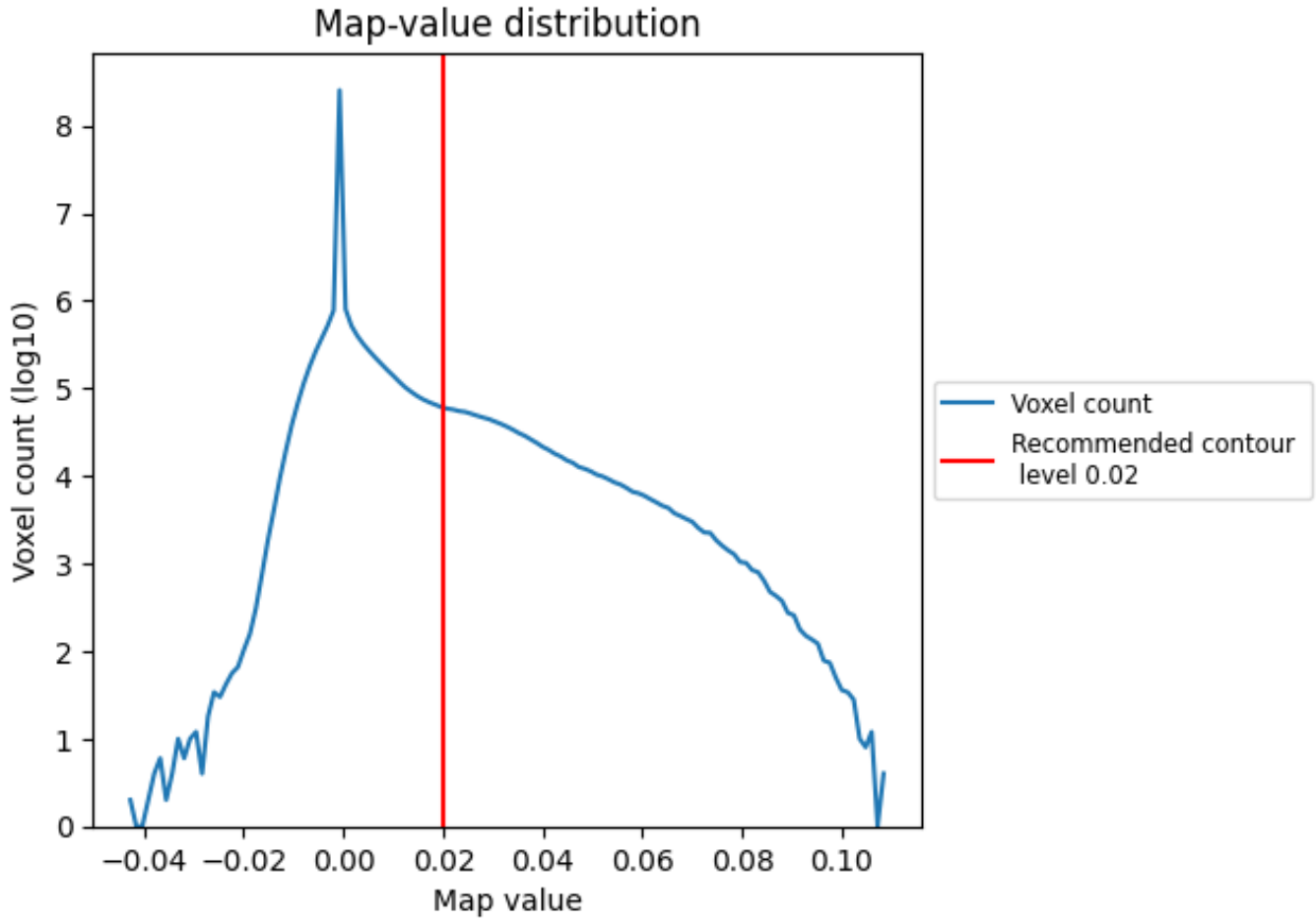


Z

7 Map analysis

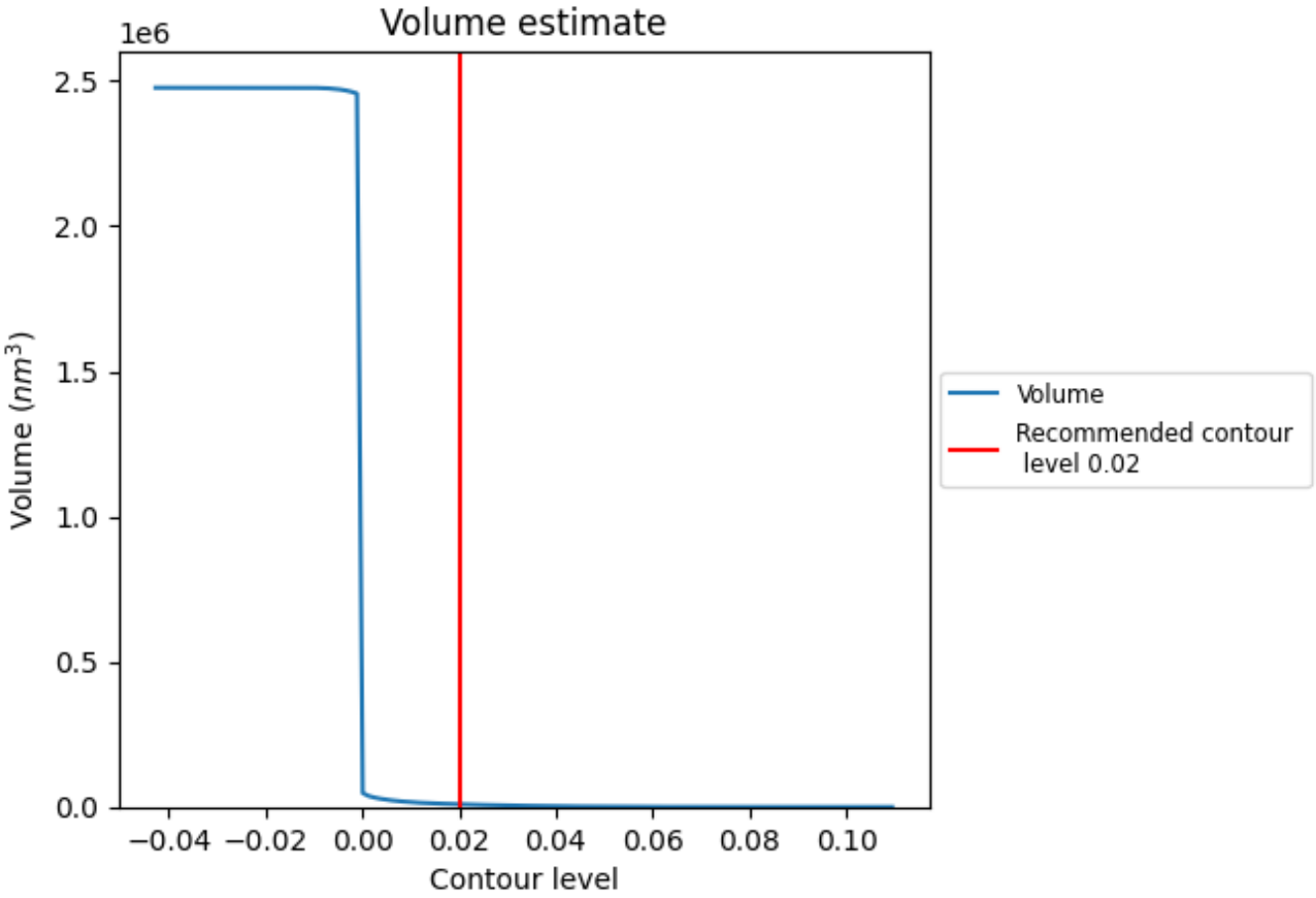
This section contains the results of statistical analysis of the map.

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.

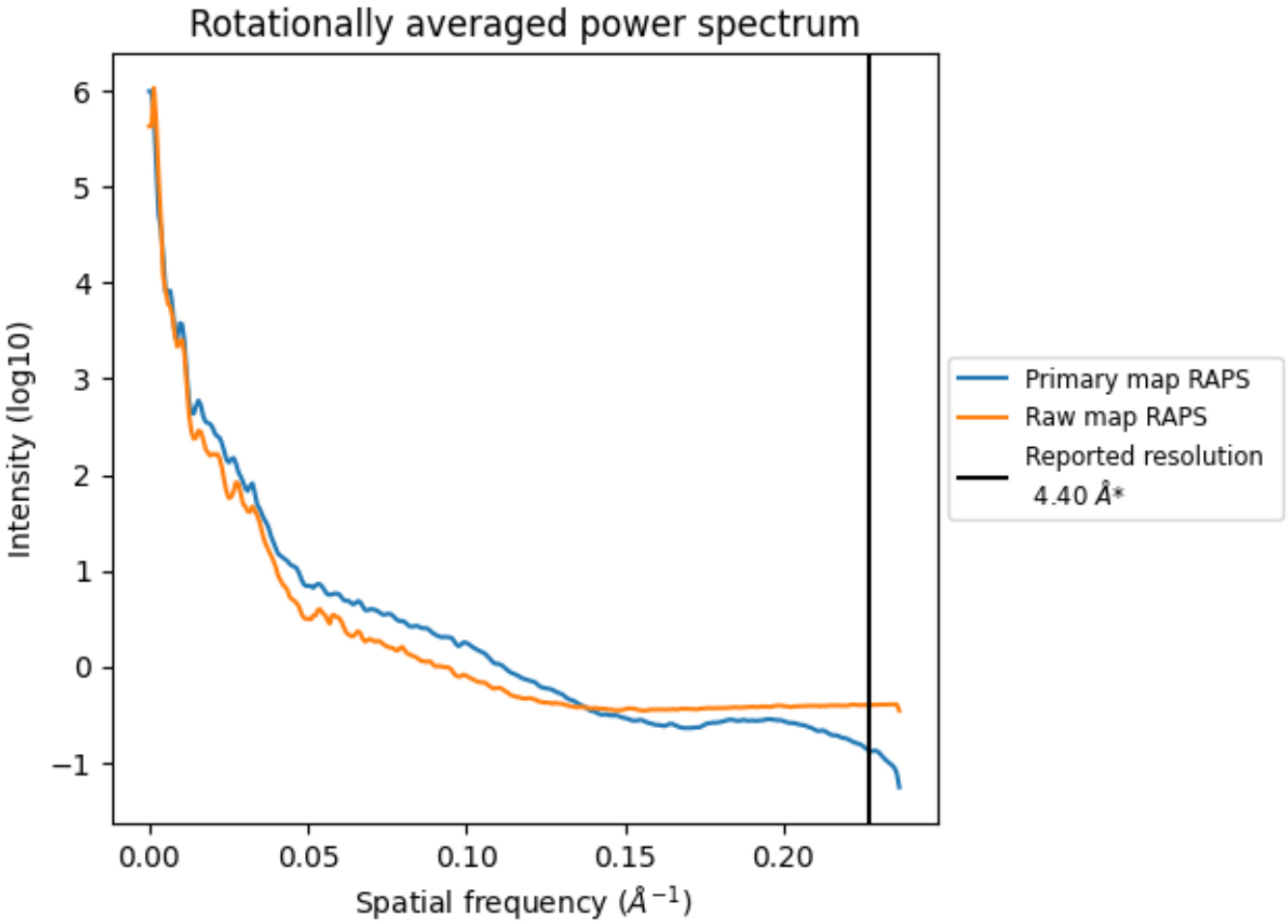
7.2 Volume estimate (i)



The volume at the recommended contour level is 9334 nm^3; this corresponds to an approximate mass of 8431 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 (i)

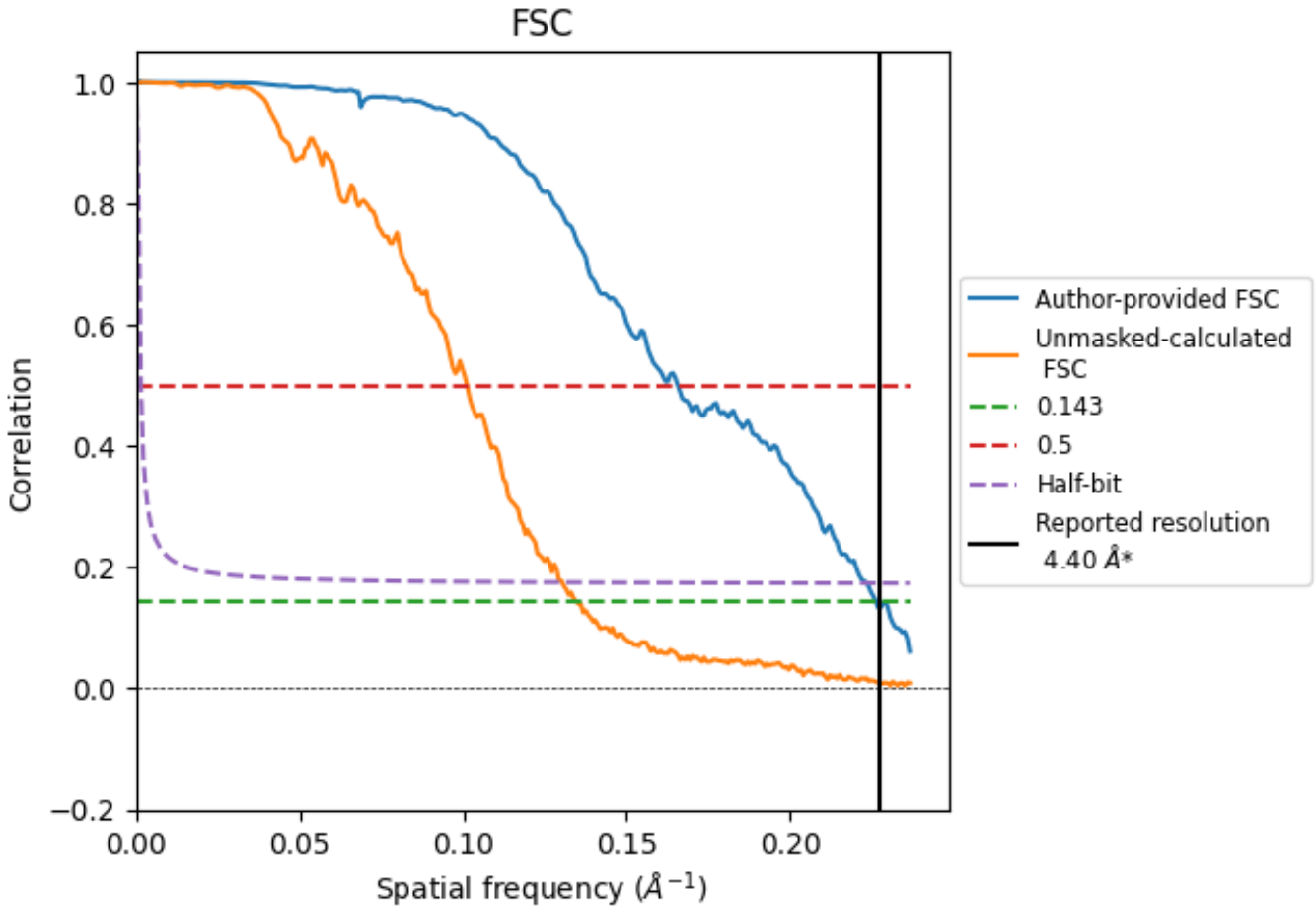


*Reported resolution corresponds to spatial frequency of 0.227 Å^{-1}

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 0.227 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.40	-	-
Author-provided FSC curve	4.42	6.04	4.48
Unmasked-calculated*	7.43	9.88	7.67

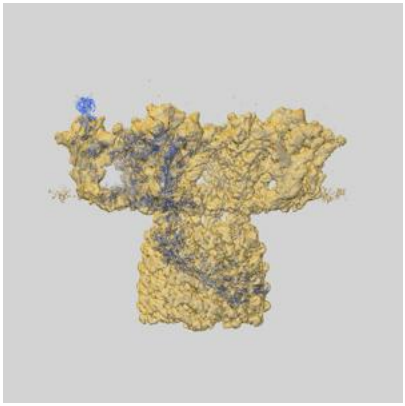
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.43 differs from the reported value 4.4 by more than 10 %

9 Map-model fit

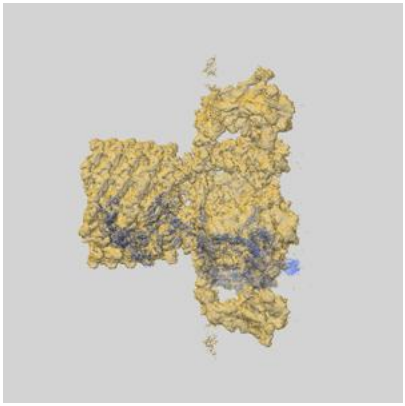
This section contains information regarding the fit between EMDB map EMD-55967 and PDB model 9TIR. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlays

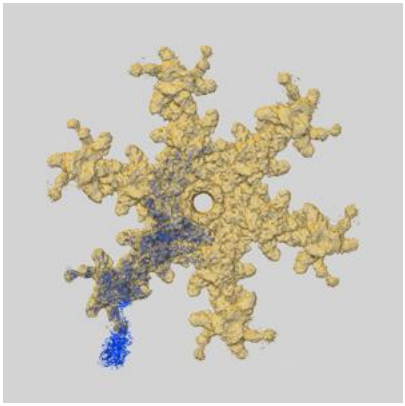
9.1.1 Map-model overlay



X

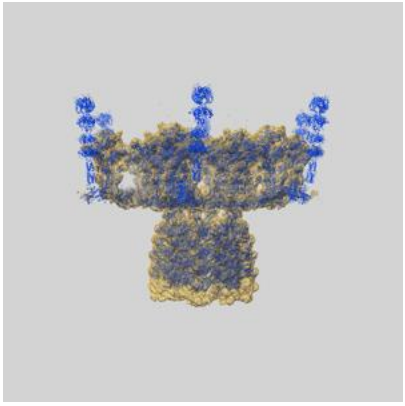


Y

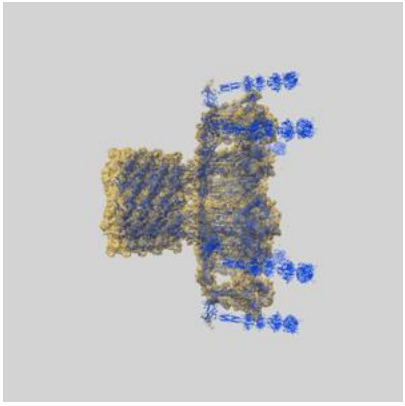


Z

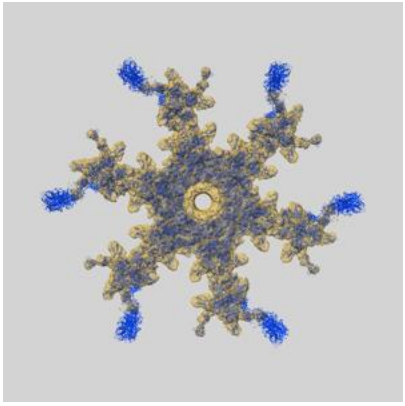
9.1.2 Map-model assembly overlay



X



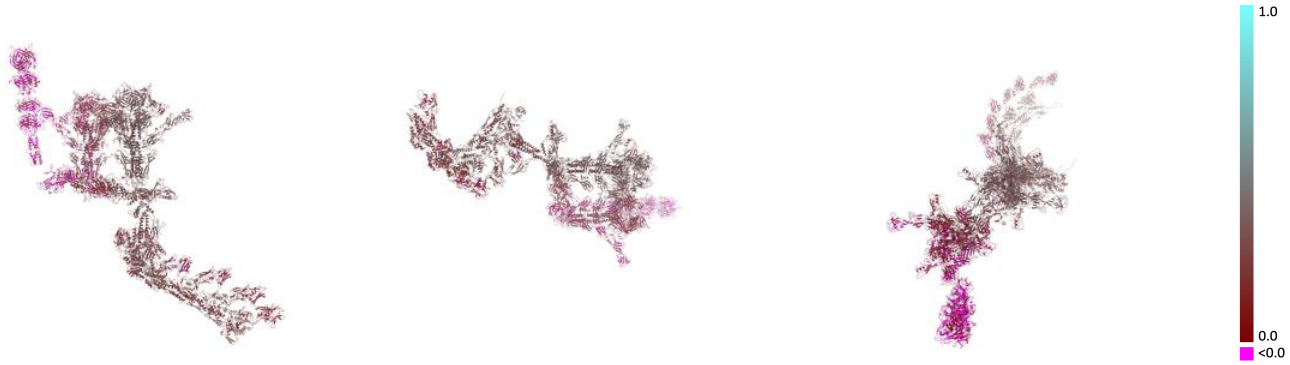
Y



Z

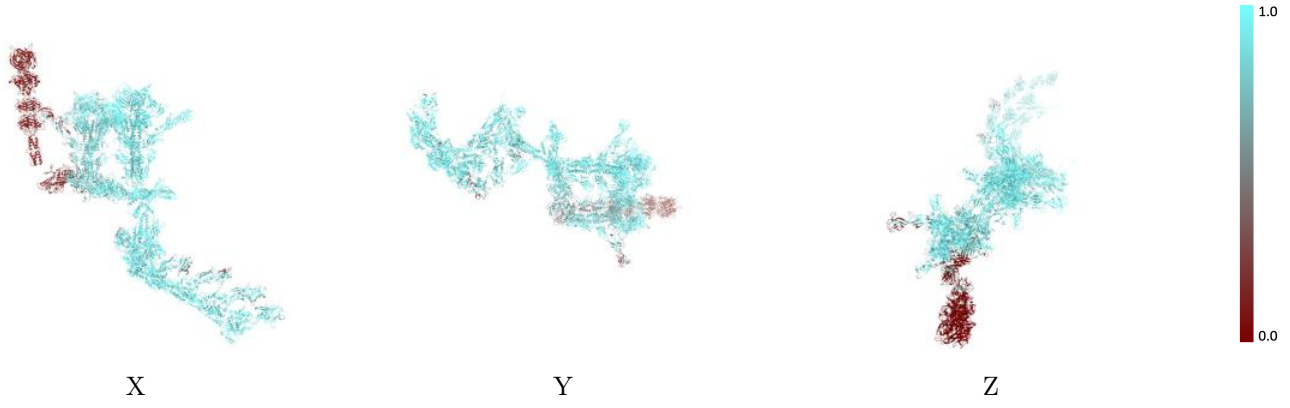
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model (i)



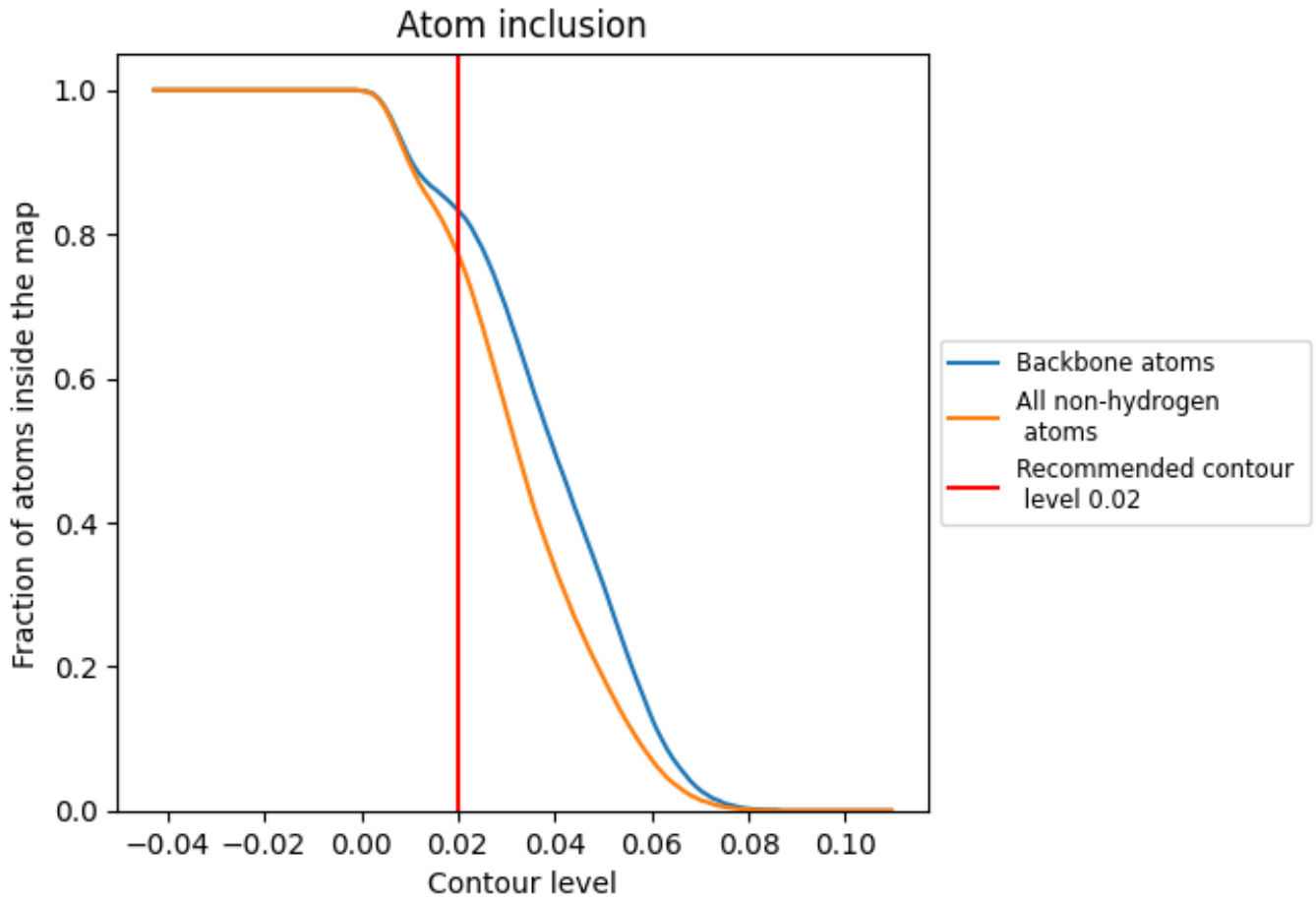
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.02).

9.4 Atom inclusion (i)



At the recommended contour level, 83% of all backbone atoms, 77% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7730	0.2190
A	0.9240	0.3200
B	0.9360	0.3200
C	0.9410	0.3320
D	0.8400	0.2060
E	0.9410	0.2920
F	0.9340	0.2140
G	0.8070	0.1600
H	0.6440	0.1270
I	0.0440	0.0340
J	0.0110	0.0390
K	0.9480	0.3330
L	0.9500	0.3430
M	0.9510	0.3430
N	0.9100	0.1620
O	0.8080	0.1270
P	0.8560	0.1270
Q	0.0000	0.0220
R	0.0000	0.0190
S	0.0220	0.0100
T	0.8820	0.2860
U	0.9050	0.2850
V	0.8640	0.2520
W	0.8640	0.2540
X	0.8870	0.2560
Y	0.8940	0.2520