Full wwPDB EM Validation Report ⓘ

Dec 1, 2025 – 02:14 PM JST

PDB ID	:	8ZSI / pdb_00008zsi
EMDB ID	:	EMD-60416
Title	:	CryoEM Helical Structure of HAM-SIR2 with dITP and NAD fragment
Authors	:	Hao, F.; Eddie, T.; Bin, W.; Min, L.
Deposited on	:	2024-06-05
Resolution	:	3.10 Å(reported)

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

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

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

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

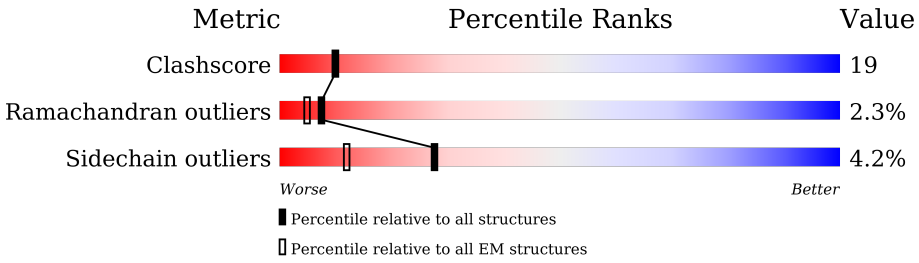
EMDB validation analysis	:	0.0.1.dev129
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

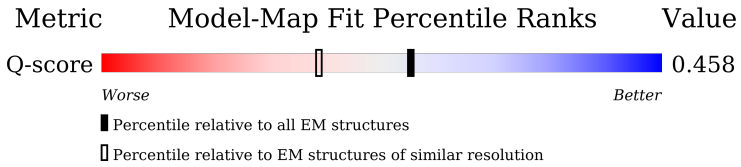
1 Overall quality at a glance

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

The reported resolution of this entry is 3.10 Å.

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





Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14724 (2.60 - 3.60)

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	184	34% 83% 15%
1	B	184	34% 85% 14%
1	C	184	35% 82% 17%
1	D	184	34% 85% 15%

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Mol	Chain	Length	Quality of chain
2	E	264	51% 43% 6%
2	F	264	48% 43% 8%
2	G	264	51% 42% 6%
2	H	264	52% 40% 8%

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

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	NAD	H	1001	-	-	X	-

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 14740 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.

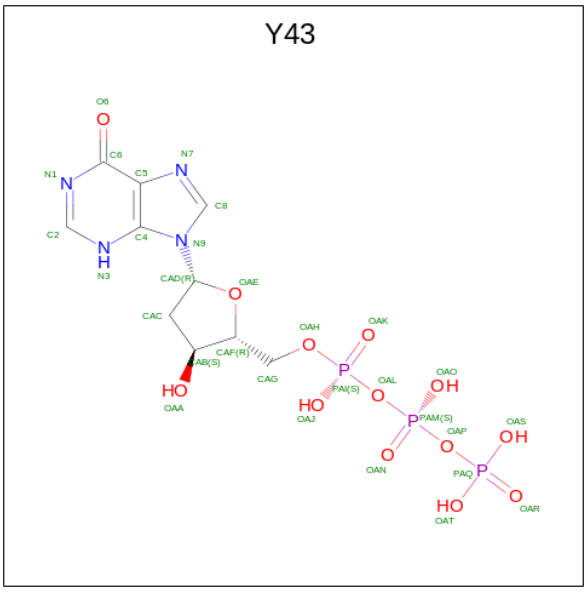
- Molecule 1 is a protein called Non-canonical purine NTP pyrophosphatase.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	184	Total	C	N	O	S	0	0
			1473	946	249	272	6		
1	B	184	Total	C	N	O	S	0	0
			1473	946	249	272	6		
1	C	184	Total	C	N	O	S	0	0
			1473	946	249	272	6		
1	D	184	Total	C	N	O	S	0	0
			1473	946	249	272	6		

- Molecule 2 is a protein called Sir2 family NAD-dependent protein deacetylase.

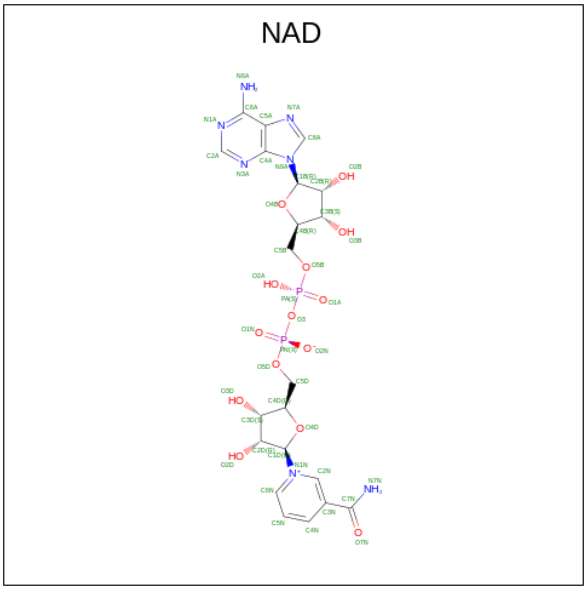
Mol	Chain	Residues	Atoms					AltConf	Trace
2	E	264	Total	C	N	O	S	0	0
			2160	1400	346	409	5		
2	F	264	Total	C	N	O	S	0	0
			2160	1400	346	409	5		
2	G	264	Total	C	N	O	S	0	0
			2160	1400	346	409	5		
2	H	264	Total	C	N	O	S	0	0
			2160	1400	346	409	5		

- Molecule 3 is 2'-deoxyinosine 5'-triphosphate (CCD ID: Y43) (formula: $C_{10}H_{15}N_4O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
3	A	1	Total	C	N	O	P	0
			30	10	4	13	3	
3	B	1	Total	C	N	O	P	0
			30	10	4	13	3	
3	C	1	Total	C	N	O	P	0
			30	10	4	13	3	
3	D	1	Total	C	N	O	P	0
			30	10	4	13	3	

- Molecule 4 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (CCD ID: NAD) (formula: $C_{21}H_{27}N_7O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).



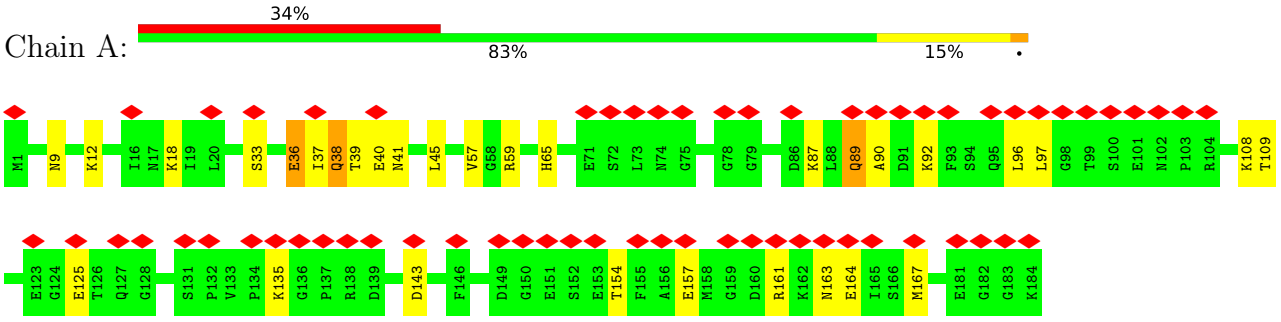
Mol	Chain	Residues	Atoms					AltConf
4	E	1	Total	C	N	O	P	0
			44	21	7	14	2	
4	H	1	Total	C	N	O	P	0
			44	21	7	14	2	

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.

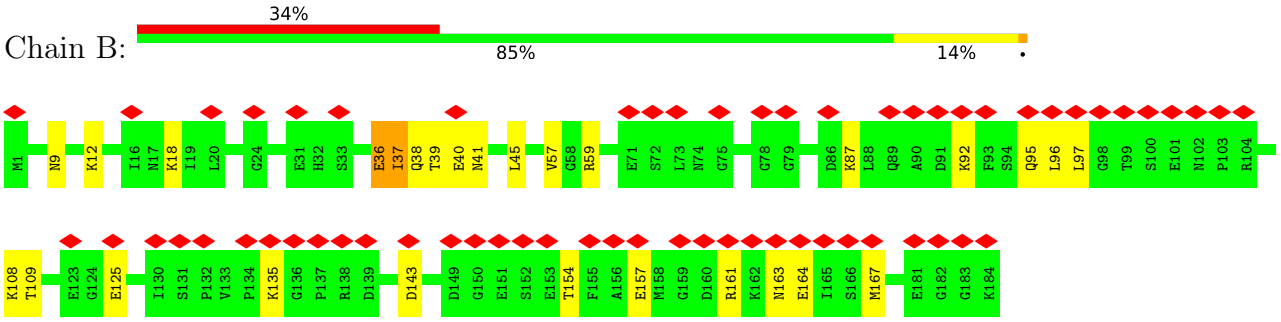
• Molecule 1: Non-canonical purine NTP pyrophosphatase

Chain A:



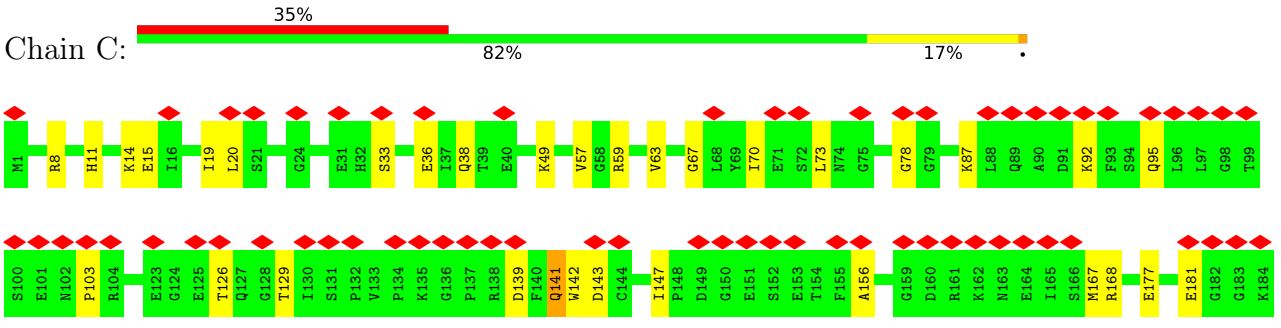
• Molecule 1: Non-canonical purine NTP pyrophosphatase

Chain B:



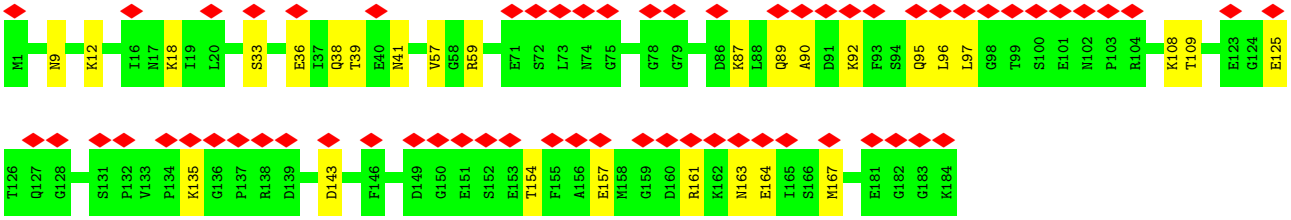
• Molecule 1: Non-canonical purine NTP pyrophosphatase

Chain C:



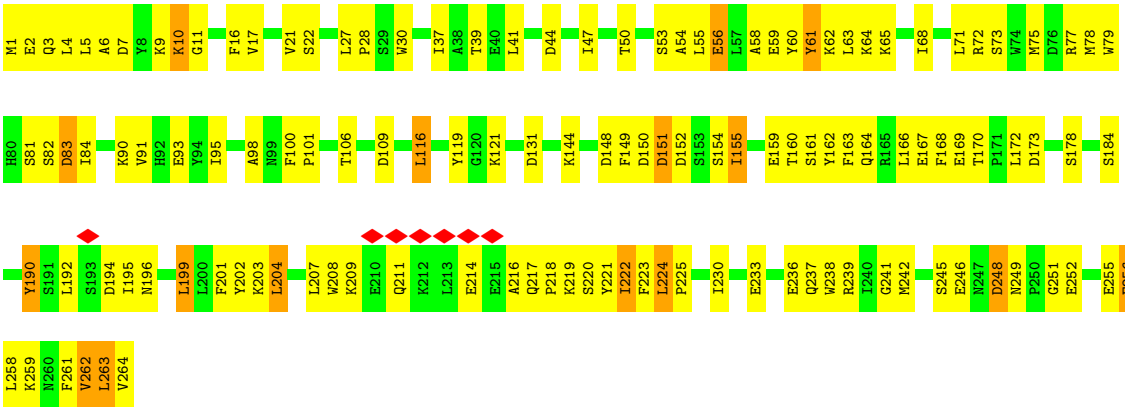
• Molecule 1: Non-canonical purine NTP pyrophosphatase

Chain D:



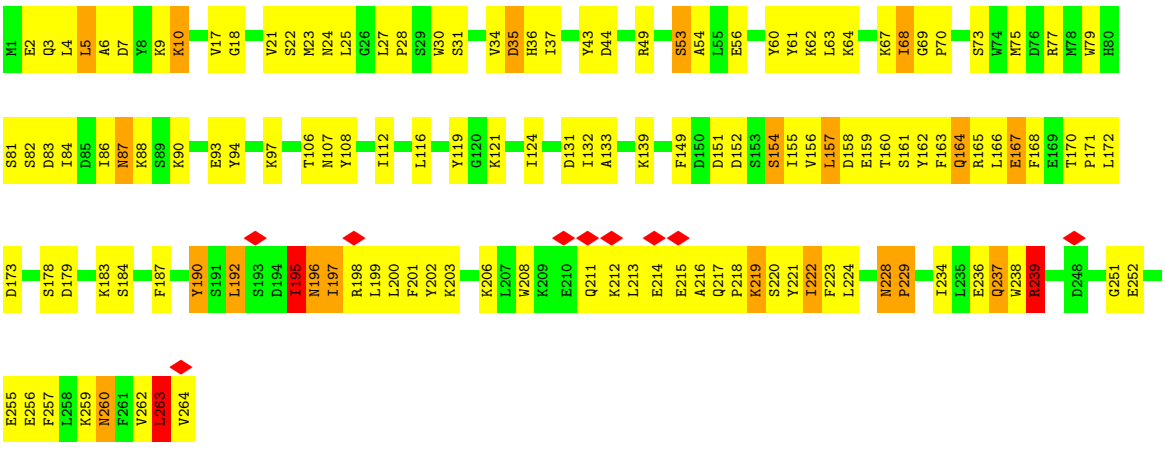
• Molecule 2: Sir2 family NAD-dependent protein deacetylase

Chain E:



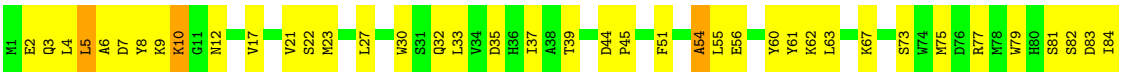
• Molecule 2: Sir2 family NAD-dependent protein deacetylase

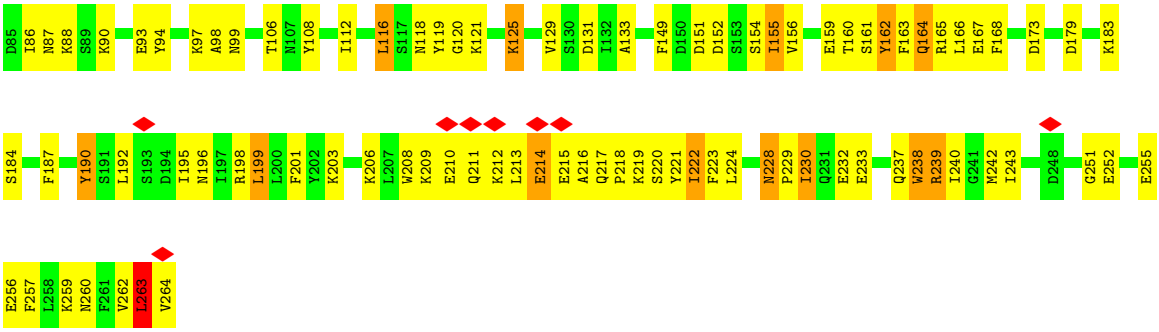
Chain F:



• Molecule 2: Sir2 family NAD-dependent protein deacetylase

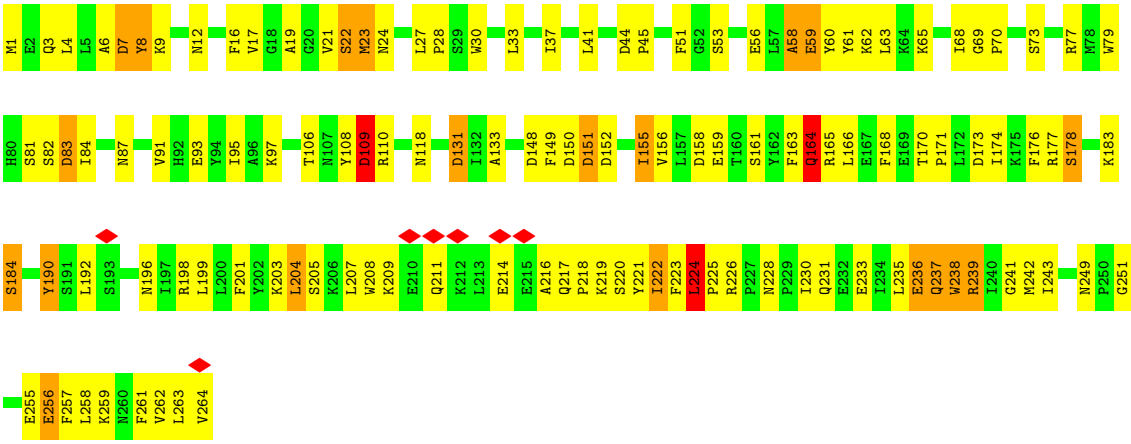
Chain G:





• Molecule 2: Sir2 family NAD-dependent protein deacetylase

Chain H:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	HELICAL	Depositor
Imposed symmetry	HELICAL, twist=80.62°, rise=48.69 Å, axial sym=D2	Depositor
Number of segments used	188609	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.016	Depositor
Minimum map value	-0.005	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.0045	Depositor
Map size (Å)	248.32, 248.32, 248.32	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.97, 0.97, 0.97	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: Y43, NAD

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	0.28	0/1503	0.66	1/2018 (0.0%)
1	B	0.28	0/1503	0.66	0/2018
1	C	0.29	0/1503	0.71	2/2018 (0.1%)
1	D	0.28	0/1503	0.65	0/2018
2	E	0.93	0/2211	0.93	8/2989 (0.3%)
2	F	0.89	0/2211	0.94	7/2989 (0.2%)
2	G	0.90	0/2211	0.96	5/2989 (0.2%)
2	H	0.92	0/2211	0.95	7/2989 (0.2%)
All	All	0.72	0/14856	0.84	30/20028 (0.1%)

There are no bond length outliers.

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	103	PRO	CA-N-CD	-12.26	94.83	112.00
2	H	59	GLU	N-CA-C	-10.33	99.83	111.82
2	E	195	ILE	N-CA-C	-7.99	105.53	113.20
2	G	55	LEU	N-CA-C	-7.66	104.03	113.15
2	H	224	LEU	N-CA-C	-7.17	101.70	110.31
2	F	196	ASN	N-CA-C	-7.02	102.69	112.45
2	G	230	ILE	N-CA-C	6.96	117.10	110.42
2	G	199	LEU	N-CA-C	-6.91	105.48	114.04
2	E	59	GLU	N-CA-C	-6.29	105.09	112.89
2	F	35	ASP	N-CA-C	-6.18	103.85	111.33
2	G	230	ILE	CB-CA-C	-6.10	104.17	111.97
2	F	179	ASP	N-CA-C	-6.04	105.86	113.72
2	E	224	LEU	N-CA-C	-5.84	101.46	110.58
2	E	167	GLU	N-CA-C	-5.81	105.97	114.39
1	C	141	GLN	CB-CA-C	-5.77	109.90	116.54
2	H	19	ALA	N-CA-C	5.73	118.30	111.71

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	H	178	SER	N-CA-C	-5.71	106.10	114.39
2	F	154	SER	N-CA-C	-5.68	105.63	113.18
2	H	230	ILE	CB-CA-C	-5.63	104.49	111.70
2	H	236	GLU	N-CA-C	-5.40	107.23	113.88
2	H	237	GLN	N-CA-C	-5.35	104.69	111.11
2	E	230	ILE	CB-CA-C	-5.25	104.98	111.70
2	F	197	ILE	CB-CA-C	-5.24	105.07	112.14
2	F	219	LYS	N-CA-C	5.14	117.35	109.07
2	G	179	ASP	N-CA-C	-5.12	107.06	113.72
2	E	178	SER	N-CA-C	-5.08	107.02	114.39
2	E	190	TYR	N-CA-C	5.05	117.05	110.53
2	E	50	THR	N-CA-C	-5.04	105.23	113.19
2	F	195	ILE	N-CA-C	5.02	119.78	109.34
1	A	89	GLN	CB-CA-C	-5.00	109.83	115.79

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1473	0	1494	29	0
1	B	1473	0	1494	26	0
1	C	1473	0	1494	19	0
1	D	1473	0	1494	21	0
2	E	2160	0	2148	101	0
2	F	2160	0	2148	139	0
2	G	2160	0	2148	111	0
2	H	2160	0	2148	135	0
3	A	30	0	0	1	0
3	B	30	0	0	1	0
3	C	30	0	0	0	0
3	D	30	0	0	1	0
4	E	44	0	26	0	0
4	H	44	0	26	23	0
All	All	14740	0	14620	562	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 19.

All (562) 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)
2:F:192:LEU:CD2	2:F:224:LEU:HD11	1.31	1.59
2:F:192:LEU:HD23	2:F:224:LEU:CD1	1.72	1.18
2:F:192:LEU:CD2	2:F:224:LEU:CD1	2.26	1.11
2:F:192:LEU:HD21	2:F:224:LEU:HD11	1.18	1.09
2:F:192:LEU:HD23	2:F:224:LEU:HD11	1.04	1.03
2:H:30:TRP:CE2	4:H:1001:NAD:C2N	2.42	1.02
2:H:30:TRP:CD1	4:H:1001:NAD:C4N	2.46	0.98
2:H:30:TRP:CG	4:H:1001:NAD:C3N	2.50	0.95
2:H:219:LYS:HA	2:H:239:ARG:HH21	1.33	0.94
2:H:30:TRP:HB2	4:H:1001:NAD:C7N	2.04	0.88
2:H:30:TRP:CD2	4:H:1001:NAD:C2N	2.58	0.87
2:E:218:PRO:O	2:E:239:ARG:HG2	1.76	0.85
1:A:40:GLU:OE2	1:B:87:LYS:HE3	1.78	0.82
1:C:38:GLN:HG2	1:D:38:GLN:HG2	1.61	0.82
2:G:161:SER:HA	2:G:164:GLN:HE22	1.45	0.81
2:F:161:SER:HA	2:F:164:GLN:HE22	1.44	0.80
2:H:4:LEU:HB2	2:H:221:TYR:CZ	2.17	0.80
2:F:7:ASP:HA	2:F:10:LYS:HD3	1.64	0.78
2:H:192:LEU:HB2	2:H:231:GLN:HE22	1.49	0.77
2:H:30:TRP:CD1	4:H:1001:NAD:C3N	2.67	0.77
2:H:219:LYS:HA	2:H:239:ARG:NH2	2.01	0.76
2:F:195:ILE:HG22	2:F:198:ARG:CD	2.15	0.76
2:H:184:SER:HB3	2:H:219:LYS:O	1.86	0.76
2:H:192:LEU:CB	2:H:231:GLN:HE22	1.98	0.76
2:H:30:TRP:CD1	4:H:1001:NAD:C5N	2.69	0.75
2:G:219:LYS:HA	2:G:239:ARG:HD3	1.68	0.75
2:H:17:VAL:HG13	2:H:21:VAL:HG21	1.69	0.74
2:F:195:ILE:HG22	2:F:198:ARG:HD2	1.68	0.74
1:A:87:LYS:HE3	1:B:40:GLU:OE2	1.87	0.74
2:E:161:SER:C	2:E:163:PHE:H	1.94	0.74
2:F:228:ASN:C	2:F:228:ASN:HD22	1.96	0.73
2:H:161:SER:HA	2:H:164:GLN:NE2	2.02	0.73
2:F:192:LEU:HD21	2:F:224:LEU:CD1	2.07	0.73
2:H:30:TRP:HB2	4:H:1001:NAD:O7N	1.89	0.72
2:F:234:ILE:O	2:F:237:GLN:HG3	1.89	0.72
2:E:27:LEU:HD13	2:E:79:TRP:HD1	1.54	0.72
2:F:37:ILE:HG23	2:F:61:TYR:CD1	2.25	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:30:TRP:CD2	4:H:1001:NAD:C3N	2.74	0.71
2:H:1:MET:HE1	2:H:257:PHE:HE1	1.55	0.71
2:F:228:ASN:HD22	2:F:229:PRO:N	1.88	0.70
1:C:38:GLN:CG	1:D:38:GLN:HG2	2.21	0.70
2:H:37:ILE:HG23	2:H:61:TYR:HD1	1.55	0.70
2:E:17:VAL:HG13	2:E:21:VAL:HG21	1.73	0.70
2:F:238:TRP:O	2:F:239:ARG:HB2	1.90	0.70
2:H:30:TRP:CG	4:H:1001:NAD:C7N	2.74	0.70
2:H:27:LEU:HD13	2:H:79:TRP:HD1	1.56	0.69
2:G:12:ASN:HA	2:G:183:LYS:HE3	1.74	0.69
2:E:214:GLU:CD	2:E:214:GLU:H	2.01	0.69
2:G:208:TRP:CZ3	2:G:216:ALA:HB3	2.28	0.69
2:H:30:TRP:NE1	4:H:1001:NAD:C6N	2.56	0.69
2:H:259:LYS:HA	2:H:262:VAL:HG12	1.75	0.69
2:E:262:VAL:O	2:E:263:LEU:C	2.36	0.68
2:H:163:PHE:C	2:H:165:ARG:N	2.48	0.68
2:F:163:PHE:O	2:F:164:GLN:C	2.36	0.67
2:G:37:ILE:HG23	2:G:61:TYR:CD1	2.29	0.67
2:H:192:LEU:HD11	2:H:222:ILE:HD13	1.76	0.67
2:H:161:SER:C	2:H:163:PHE:H	2.00	0.67
2:E:4:LEU:HB2	2:E:221:TYR:CZ	2.29	0.67
2:G:199:LEU:O	2:G:203:LYS:HD3	1.94	0.67
2:F:53:SER:OG	2:F:56:GLU:HG2	1.95	0.67
2:E:192:LEU:HD23	2:E:224:LEU:HD11	1.77	0.66
2:G:154:SER:O	2:G:155:ILE:C	2.39	0.66
2:F:4:LEU:HB2	2:F:221:TYR:CZ	2.31	0.66
2:H:163:PHE:O	2:H:165:ARG:N	2.28	0.66
2:H:30:TRP:CB	4:H:1001:NAD:C7N	2.74	0.66
2:E:37:ILE:HG23	2:E:61:TYR:CD1	2.31	0.65
2:H:37:ILE:HG23	2:H:61:TYR:CD1	2.31	0.65
2:G:17:VAL:HG13	2:G:21:VAL:HG21	1.79	0.65
2:G:54:ALA:C	2:G:56:GLU:H	2.05	0.65
1:C:177:GLU:O	1:C:181:GLU:HB3	1.96	0.65
2:G:262:VAL:O	2:G:263:LEU:C	2.40	0.65
2:F:17:VAL:HG13	2:F:21:VAL:HG21	1.77	0.65
2:H:22:SER:O	2:H:24:ASN:N	2.30	0.65
2:F:131:ASP:C	2:F:133:ALA:H	2.04	0.65
2:H:163:PHE:C	2:H:165:ARG:H	2.04	0.64
2:E:4:LEU:HB2	2:E:221:TYR:CE2	2.32	0.64
2:G:27:LEU:HD13	2:G:79:TRP:HD1	1.62	0.64
2:E:259:LYS:HA	2:E:262:VAL:HG12	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:37:ILE:HG23	2:E:61:TYR:HD1	1.61	0.64
2:G:4:LEU:HB2	2:G:221:TYR:CZ	2.32	0.64
2:G:168:PHE:HA	2:G:173:ASP:OD2	1.98	0.63
2:F:263:LEU:O	2:F:264:VAL:C	2.42	0.63
2:G:263:LEU:O	2:G:264:VAL:C	2.41	0.63
2:H:27:LEU:HD13	2:H:79:TRP:CD1	2.33	0.63
2:G:7:ASP:HA	2:G:10:LYS:HG3	1.81	0.62
2:E:168:PHE:HZ	2:E:199:LEU:HD21	1.63	0.62
2:G:4:LEU:HB2	2:G:221:TYR:CE2	2.35	0.62
2:E:27:LEU:HD13	2:E:79:TRP:CD1	2.34	0.62
2:G:8:TYR:OH	2:G:99:ASN:N	2.31	0.62
2:G:259:LYS:HD2	2:G:262:VAL:HG11	1.82	0.62
2:G:8:TYR:OH	2:G:98:ALA:HB1	2.00	0.61
2:H:22:SER:O	2:H:23:MET:C	2.42	0.61
2:F:262:VAL:O	2:F:263:LEU:C	2.42	0.61
2:E:219:LYS:HD2	2:E:239:ARG:HG3	1.83	0.61
2:G:206:LYS:O	2:G:210:GLU:HG3	2.00	0.61
2:E:168:PHE:HA	2:E:173:ASP:OD2	2.00	0.61
2:E:199:LEU:O	2:E:203:LYS:HD3	2.01	0.61
2:H:60:TYR:O	2:H:61:TYR:C	2.44	0.61
2:G:73:SER:O	2:G:77:ARG:HG3	2.01	0.60
2:G:87:ASN:HB2	2:G:88:LYS:HE3	1.83	0.60
2:F:73:SER:O	2:F:77:ARG:HG3	2.01	0.60
2:H:192:LEU:HD13	2:H:235:LEU:HD11	1.80	0.60
2:F:37:ILE:HG23	2:F:61:TYR:HD1	1.64	0.60
2:F:195:ILE:HG22	2:F:198:ARG:HD3	1.84	0.60
2:E:219:LYS:CD	2:E:239:ARG:HG3	2.32	0.60
2:F:27:LEU:HD13	2:F:79:TRP:HD1	1.67	0.60
2:E:1:MET:HE3	2:E:5:LEU:HD21	1.84	0.59
2:E:161:SER:C	2:E:163:PHE:N	2.60	0.59
2:F:198:ARG:HE	2:F:238:TRP:HH2	1.50	0.59
2:F:161:SER:C	2:F:163:PHE:H	2.10	0.59
2:G:211:GLN:O	2:G:212:LYS:HB2	2.01	0.59
2:G:3:GLN:O	2:G:6:ALA:HB3	2.02	0.59
2:G:5:LEU:O	2:G:9:LYS:HG3	2.03	0.59
2:H:208:TRP:CZ3	2:H:216:ALA:HB3	2.38	0.58
2:F:90:LYS:HG3	2:F:94:TYR:CZ	2.37	0.58
2:E:194:ASP:HB3	2:E:196:ASN:OD1	2.02	0.58
2:H:30:TRP:CD2	4:H:1001:NAD:H2N	2.37	0.58
2:H:199:LEU:O	2:H:203:LYS:HD3	2.03	0.58
2:G:159:GLU:O	2:G:160:THR:C	2.45	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:4:LEU:HB2	2:H:221:TYR:CE2	2.38	0.58
2:F:168:PHE:HA	2:F:173:ASP:OD2	2.03	0.58
2:F:219:LYS:HE3	2:F:221:TYR:OH	2.03	0.57
2:F:154:SER:O	2:F:155:ILE:C	2.46	0.57
2:H:151:ASP:OD1	2:H:152:ASP:N	2.37	0.57
2:E:41:LEU:HD21	2:E:65:LYS:HE2	1.85	0.57
2:G:161:SER:C	2:G:163:PHE:H	2.11	0.57
2:E:263:LEU:O	2:E:264:VAL:C	2.47	0.57
2:F:259:LYS:HD2	2:F:262:VAL:HG11	1.86	0.57
2:F:4:LEU:HB2	2:F:221:TYR:CE2	2.40	0.57
1:A:37:ILE:HD11	1:A:45:LEU:HA	1.85	0.57
2:F:208:TRP:CZ3	2:F:216:ALA:HB3	2.39	0.57
2:G:62:LYS:O	2:G:63:LEU:C	2.45	0.57
2:G:90:LYS:HG3	2:G:94:TYR:CZ	2.40	0.57
2:H:192:LEU:CB	2:H:231:GLN:NE2	2.67	0.57
2:H:262:VAL:O	2:H:263:LEU:C	2.48	0.57
2:E:44:ASP:OD1	2:E:47:ILE:HB	2.05	0.56
2:E:154:SER:O	2:E:155:ILE:C	2.47	0.56
2:F:3:GLN:O	2:F:6:ALA:HB3	2.05	0.56
2:E:2:GLU:CD	2:E:2:GLU:H	2.13	0.56
2:G:163:PHE:O	2:G:164:GLN:C	2.47	0.56
2:H:87:ASN:ND2	2:H:118:ASN:HD21	2.03	0.56
1:C:36:GLU:HG3	1:C:49:LYS:HD3	1.88	0.56
2:F:60:TYR:O	2:F:61:TYR:C	2.49	0.56
2:E:75:MET:HE3	2:E:149:PHE:CE1	2.40	0.56
2:G:7:ASP:HA	2:G:10:LYS:CG	2.36	0.56
1:A:135:LYS:HE3	1:A:154:THR:HG23	1.88	0.55
2:F:34:VAL:O	2:F:35:ASP:C	2.49	0.55
2:G:216:ALA:O	2:G:217:GLN:C	2.49	0.55
1:D:167:MET:HE3	1:D:167:MET:H	1.72	0.55
2:H:168:PHE:HA	2:H:173:ASP:OD2	2.07	0.55
2:H:251:GLY:O	2:H:255:GLU:HG3	2.07	0.55
2:H:263:LEU:O	2:H:264:VAL:HB	2.06	0.55
1:B:135:LYS:HE3	1:B:154:THR:HG23	1.88	0.55
2:F:161:SER:HA	2:F:164:GLN:NE2	2.18	0.55
2:H:163:PHE:O	2:H:164:GLN:C	2.50	0.55
2:F:163:PHE:O	2:F:165:ARG:N	2.40	0.55
2:G:160:THR:HG22	2:G:164:GLN:OE1	2.06	0.55
2:G:259:LYS:HA	2:G:262:VAL:HG12	1.88	0.55
2:G:27:LEU:HD13	2:G:79:TRP:CD1	2.42	0.54
2:G:252:GLU:O	2:G:256:GLU:HG3	2.07	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:135:LYS:HE3	1:D:154:THR:HG23	1.88	0.54
2:H:7:ASP:C	2:H:9:LYS:H	2.16	0.54
1:B:109:THR:HG23	1:B:167:MET:HG2	1.89	0.54
2:E:30:TRP:HE1	2:E:54:ALA:HB1	1.72	0.54
2:E:208:TRP:CZ3	2:E:216:ALA:HB3	2.42	0.54
2:E:78:MET:HE2	2:E:78:MET:HA	1.90	0.54
2:G:183:LYS:N	2:G:218:PRO:HG2	2.22	0.54
1:A:109:THR:HG23	1:A:167:MET:HG2	1.89	0.54
1:A:167:MET:HE3	1:A:167:MET:H	1.72	0.54
2:F:22:SER:HB3	2:F:27:LEU:HD12	1.88	0.54
2:F:252:GLU:O	2:F:256:GLU:HG3	2.08	0.54
2:H:30:TRP:NE1	4:H:1001:NAD:C5N	2.71	0.54
2:F:75:MET:HE3	2:F:149:PHE:CE1	2.43	0.54
2:F:159:GLU:O	2:F:160:THR:C	2.48	0.54
1:B:167:MET:HE3	1:B:167:MET:H	1.72	0.53
1:D:109:THR:HG23	1:D:167:MET:HG2	1.89	0.53
2:E:208:TRP:CG	2:E:217:GLN:HB2	2.42	0.53
2:F:199:LEU:O	2:F:203:LYS:HD3	2.08	0.53
2:E:4:LEU:HD13	2:E:221:TYR:CE2	2.44	0.53
2:E:207:LEU:O	2:E:211:GLN:HG2	2.07	0.53
2:G:213:LEU:O	2:G:214:GLU:C	2.49	0.53
2:G:54:ALA:C	2:G:56:GLU:N	2.65	0.53
1:A:135:LYS:NZ	1:A:157:GLU:OE1	2.41	0.53
2:F:214:GLU:H	2:F:214:GLU:CD	2.17	0.53
2:G:60:TYR:O	2:G:61:TYR:C	2.50	0.53
1:A:40:GLU:OE2	1:B:87:LYS:CE	2.53	0.53
2:E:60:TYR:O	2:E:61:TYR:C	2.48	0.52
2:H:3:GLN:O	2:H:6:ALA:HB3	2.08	0.52
2:E:73:SER:O	2:E:77:ARG:HG3	2.10	0.52
2:F:160:THR:HG22	2:F:164:GLN:OE1	2.08	0.52
2:E:4:LEU:HD13	2:E:221:TYR:CD2	2.44	0.52
2:H:12:ASN:OD1	2:H:183:LYS:HE2	2.10	0.52
2:H:73:SER:O	2:H:77:ARG:HG3	2.10	0.52
2:H:192:LEU:HB3	2:H:231:GLN:HE22	1.75	0.52
2:E:116:LEU:HD13	2:E:121:LYS:HD3	1.91	0.52
2:F:219:LYS:HA	2:F:239:ARG:NH2	2.25	0.52
2:H:222:ILE:HG23	2:H:222:ILE:O	2.10	0.52
2:E:168:PHE:CZ	2:E:199:LEU:HD21	2.45	0.52
2:G:86:ILE:O	2:G:88:LYS:N	2.43	0.51
2:H:207:LEU:O	2:H:211:GLN:HG2	2.10	0.51
2:H:216:ALA:O	2:H:217:GLN:C	2.52	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:51:PHE:HB3	2:H:228:ASN:HD21	1.75	0.51
2:H:161:SER:C	2:H:163:PHE:N	2.66	0.51
2:H:204:LEU:O	2:H:207:LEU:HB3	2.11	0.51
2:E:209:LYS:HA	2:E:214:GLU:HG3	1.92	0.51
2:F:116:LEU:CD1	2:F:121:LYS:HD3	2.41	0.51
1:D:135:LYS:NZ	1:D:157:GLU:OE1	2.41	0.51
2:E:170:THR:HG22	2:E:172:LEU:H	1.74	0.51
2:G:208:TRP:O	2:G:212:LYS:N	2.43	0.51
2:H:198:ARG:HE	2:H:238:TRP:HH2	1.58	0.51
2:F:131:ASP:C	2:F:133:ALA:N	2.64	0.51
1:B:135:LYS:NZ	1:B:157:GLU:OE1	2.41	0.51
2:G:239:ARG:HB2	2:G:239:ARG:HH11	1.76	0.51
2:F:106:THR:HG21	2:F:190:TYR:OH	2.10	0.51
2:H:163:PHE:O	2:H:166:LEU:N	2.43	0.51
2:G:238:TRP:O	2:G:239:ARG:C	2.54	0.51
2:H:56:GLU:C	2:H:58:ALA:H	2.19	0.51
2:E:151:ASP:OD1	2:E:152:ASP:N	2.44	0.50
2:E:249:ASN:HB3	2:E:252:GLU:HB2	1.93	0.50
1:A:18:LYS:HE3	1:A:163:ASN:HD21	1.76	0.50
2:G:116:LEU:HD13	2:G:121:LYS:HD3	1.92	0.50
2:G:210:GLU:O	2:G:212:LYS:HE2	2.10	0.50
2:H:7:ASP:O	2:H:9:LYS:N	2.45	0.50
1:B:18:LYS:HE3	1:B:163:ASN:HD21	1.76	0.50
2:G:195:ILE:HA	2:G:198:ARG:HG3	1.93	0.50
2:H:7:ASP:C	2:H:9:LYS:N	2.68	0.50
2:H:30:TRP:CE2	4:H:1001:NAD:H2N	2.37	0.50
2:H:192:LEU:HB3	2:H:231:GLN:NE2	2.27	0.50
2:F:60:TYR:CZ	2:F:64:LYS:HD3	2.47	0.50
2:H:209:LYS:HA	2:H:214:GLU:HG2	1.92	0.50
1:A:36:GLU:HG2	1:A:65:HIS:CE1	2.46	0.50
1:B:37:ILE:HD11	1:B:45:LEU:HA	1.93	0.50
2:F:198:ARG:HB3	2:F:238:TRP:CZ3	2.47	0.50
2:G:228:ASN:OD1	2:H:51:PHE:HD1	1.95	0.50
2:H:68:ILE:O	2:H:68:ILE:HG12	2.12	0.50
2:F:68:ILE:O	2:F:69:GLY:C	2.54	0.50
2:G:151:ASP:OD1	2:G:152:ASP:N	2.44	0.50
2:E:61:TYR:O	2:E:62:LYS:C	2.52	0.49
2:G:5:LEU:O	2:G:5:LEU:HD13	2.12	0.49
2:G:106:THR:HG21	2:G:190:TYR:OH	2.12	0.49
2:G:116:LEU:CD1	2:G:121:LYS:HD3	2.42	0.49
2:G:209:LYS:O	2:G:212:LYS:HG3	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:68:ILE:HG12	2:E:68:ILE:O	2.11	0.49
2:E:251:GLY:O	2:E:255:GLU:HG3	2.13	0.49
2:F:216:ALA:O	2:F:217:GLN:C	2.53	0.49
1:D:18:LYS:HE3	1:D:163:ASN:HD21	1.76	0.49
2:G:161:SER:HA	2:G:164:GLN:NE2	2.22	0.49
2:H:219:LYS:HZ1	2:H:241:GLY:N	2.10	0.49
1:C:49:LYS:HG2	1:C:63:VAL:HG11	1.94	0.49
2:E:5:LEU:O	2:E:9:LYS:HG2	2.13	0.49
2:G:22:SER:HB3	2:G:27:LEU:HD12	1.93	0.49
2:E:201:PHE:C	2:E:203:LYS:N	2.71	0.49
2:G:17:VAL:CG1	2:G:21:VAL:HG21	2.42	0.49
2:H:176:PHE:C	2:H:178:SER:H	2.20	0.49
2:E:17:VAL:CG1	2:E:21:VAL:HG21	2.40	0.49
2:F:219:LYS:HA	2:F:239:ARG:HH21	1.77	0.49
2:H:62:LYS:O	2:H:63:LEU:C	2.53	0.48
2:E:220:SER:O	2:E:221:TYR:CG	2.66	0.48
2:F:222:ILE:HG23	2:F:222:ILE:O	2.12	0.48
2:G:112:ILE:O	2:G:116:LEU:HD23	2.13	0.48
2:F:234:ILE:HD12	2:F:234:ILE:H	1.79	0.48
2:H:22:SER:OG	2:H:23:MET:N	2.44	0.48
2:H:219:LYS:NZ	2:H:241:GLY:N	2.61	0.48
2:E:62:LYS:O	2:E:63:LEU:C	2.55	0.48
2:E:238:TRP:CH2	2:F:159:GLU:OE2	2.67	0.48
2:F:208:TRP:CE2	2:F:217:GLN:HA	2.48	0.48
2:G:238:TRP:O	2:G:240:ILE:N	2.46	0.48
2:H:30:TRP:NE1	4:H:1001:NAD:C2N	2.76	0.48
1:B:57:VAL:HG12	1:B:59:ARG:H	1.79	0.48
2:F:198:ARG:HB3	2:F:238:TRP:CH2	2.48	0.48
2:G:223:PHE:O	2:G:224:LEU:HD23	2.14	0.48
1:D:57:VAL:HG12	1:D:59:ARG:H	1.79	0.48
2:E:201:PHE:O	2:E:202:TYR:C	2.52	0.48
2:F:215:GLU:CD	2:F:215:GLU:H	2.22	0.48
2:G:97:LYS:HE3	2:G:119:TYR:HB3	1.96	0.48
2:H:61:TYR:O	2:H:62:LYS:C	2.55	0.48
2:H:256:GLU:C	2:H:258:LEU:N	2.71	0.48
2:E:71:LEU:O	2:E:72:ARG:C	2.55	0.48
2:G:87:ASN:ND2	2:G:118:ASN:OD1	2.46	0.48
1:C:19:ILE:HG22	1:C:20:LEU:HD22	1.95	0.48
2:G:131:ASP:C	2:G:133:ALA:H	2.22	0.48
2:F:228:ASN:C	2:F:228:ASN:ND2	2.65	0.47
1:A:57:VAL:HG12	1:A:59:ARG:H	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:208:TRP:CZ2	2:F:217:GLN:HA	2.48	0.47
2:G:228:ASN:C	2:G:228:ASN:HD22	2.22	0.47
2:F:2:GLU:N	2:F:2:GLU:OE1	2.42	0.47
2:G:32:GLN:HA	2:G:35:ASP:OD2	2.14	0.47
2:G:75:MET:HE3	2:G:149:PHE:CE1	2.49	0.47
2:H:4:LEU:N	2:H:221:TYR:OH	2.48	0.47
2:H:223:PHE:C	2:H:223:PHE:CD1	2.92	0.47
1:A:89:GLN:HB3	1:A:90:ALA:H	1.61	0.47
2:H:192:LEU:HD12	2:H:224:LEU:HD11	1.96	0.47
2:E:222:ILE:HG23	2:E:222:ILE:O	2.15	0.47
2:F:30:TRP:O	2:F:31:SER:C	2.58	0.47
2:G:81:SER:OG	2:G:82:SER:N	2.48	0.47
2:F:197:ILE:HA	2:F:200:LEU:HD12	1.95	0.47
2:F:201:PHE:C	2:F:203:LYS:N	2.70	0.47
2:H:249:ASN:HB3	2:H:252:GLU:HB2	1.97	0.47
1:C:67:GLY:HA3	1:C:78:GLY:HA2	1.97	0.47
2:E:91:VAL:O	2:E:95:ILE:HG13	2.15	0.47
2:E:192:LEU:CD2	2:E:224:LEU:HD11	2.44	0.47
2:G:161:SER:C	2:G:163:PHE:N	2.73	0.47
2:H:148:ASP:O	2:H:155:ILE:HD11	2.15	0.47
2:G:160:THR:O	2:G:163:PHE:HB2	2.15	0.47
2:H:8:TYR:O	2:H:8:TYR:CG	2.68	0.47
2:E:159:GLU:O	2:E:160:THR:C	2.56	0.47
2:F:81:SER:OG	2:F:82:SER:N	2.48	0.47
2:F:211:GLN:O	2:F:212:LYS:HB2	2.14	0.47
2:G:220:SER:O	2:G:221:TYR:CG	2.68	0.47
2:H:30:TRP:CE2	4:H:1001:NAD:N1N	2.83	0.47
1:A:38:GLN:HG3	1:B:36:GLU:O	2.16	0.46
1:C:126:THR:HG23	1:C:167:MET:HB3	1.96	0.46
1:A:38:GLN:HG2	1:B:38:GLN:HG2	1.96	0.46
2:F:3:GLN:HG2	2:F:219:LYS:CE	2.46	0.46
2:F:27:LEU:HD13	2:F:79:TRP:CD1	2.48	0.46
1:A:38:GLN:HE21	1:B:38:GLN:HG2	1.80	0.46
2:F:208:TRP:HB3	2:F:214:GLU:HA	1.96	0.46
2:G:7:ASP:O	2:G:8:TYR:C	2.57	0.46
1:A:41:ASN:OD1	1:A:41:ASN:N	2.48	0.46
2:E:84:ILE:HD12	2:E:84:ILE:N	2.31	0.46
2:E:208:TRP:CD2	2:E:217:GLN:HB2	2.50	0.46
2:F:163:PHE:O	2:F:166:LEU:HB2	2.16	0.46
2:H:84:ILE:N	2:H:84:ILE:HD12	2.30	0.46
1:A:9:ASN:HD21	3:A:201:Y43:CAC	2.29	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:10:LYS:H	2:E:10:LYS:HD3	1.80	0.46
2:E:248:ASP:N	2:E:248:ASP:OD1	2.48	0.46
2:G:238:TRP:O	2:G:240:ILE:HG13	2.15	0.46
2:H:59:GLU:OE1	2:H:158:ASP:HB2	2.15	0.46
2:E:237:GLN:HE22	2:F:63:LEU:HD21	1.81	0.46
2:F:124:ILE:HD11	2:F:139:LYS:HD2	1.96	0.46
2:G:214:GLU:O	2:G:215:GLU:C	2.59	0.46
2:F:167:GLU:OE1	2:F:167:GLU:N	2.49	0.46
2:F:178:SER:HB2	2:H:174:ILE:HG22	1.96	0.46
2:F:184:SER:OG	2:F:219:LYS:O	2.30	0.46
2:F:260:ASN:OD1	2:F:260:ASN:N	2.47	0.46
2:G:239:ARG:HB2	2:G:239:ARG:NH1	2.29	0.46
2:H:220:SER:O	2:H:221:TYR:CG	2.68	0.46
2:H:44:ASP:O	2:H:45:PRO:C	2.58	0.46
1:D:41:ASN:OD1	1:D:41:ASN:N	2.48	0.46
2:H:30:TRP:CE3	4:H:1001:NAD:N7N	2.84	0.46
2:H:256:GLU:OE1	2:H:257:PHE:N	2.49	0.46
2:E:106:THR:HG21	2:E:190:TYR:OH	2.16	0.46
2:F:112:ILE:O	2:F:116:LEU:HD23	2.16	0.46
2:E:242:MET:HE3	2:E:242:MET:HB2	1.74	0.45
2:G:184:SER:HB3	2:G:219:LYS:O	2.16	0.45
2:H:23:MET:O	2:H:24:ASN:C	2.58	0.45
2:E:245:SER:OG	2:E:246:GLU:N	2.49	0.45
2:E:262:VAL:HG13	2:E:263:LEU:N	2.32	0.45
2:F:259:LYS:HE3	2:F:259:LYS:HB3	1.77	0.45
2:H:263:LEU:H	2:H:263:LEU:HD23	1.81	0.45
1:D:9:ASN:HB2	1:D:12:LYS:HD2	1.98	0.45
1:A:143:ASP:OD1	1:A:143:ASP:N	2.49	0.45
2:H:218:PRO:O	2:H:239:ARG:NH2	2.50	0.45
1:A:96:LEU:HG	1:A:97:LEU:HD12	1.99	0.45
1:B:143:ASP:N	1:B:143:ASP:OD1	2.49	0.45
1:C:15:GLU:OE2	1:C:168:ARG:NH1	2.49	0.45
2:F:18:GLY:C	2:F:107:ASN:HD21	2.25	0.45
2:F:187:PHE:HZ	2:F:201:PHE:CE1	2.35	0.45
2:G:131:ASP:C	2:G:133:ALA:N	2.73	0.45
1:C:129:THR:HB	1:C:147:ILE:HG13	1.98	0.45
2:E:161:SER:O	2:E:163:PHE:N	2.49	0.45
2:F:2:GLU:HG2	2:F:3:GLN:N	2.32	0.45
2:F:161:SER:C	2:F:163:PHE:N	2.71	0.45
2:G:90:LYS:HG3	2:G:94:TYR:CE2	2.52	0.45
2:H:161:SER:HA	2:H:164:GLN:HE22	1.80	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:201:PHE:HE2	2:H:220:SER:HG	1.64	0.45
1:B:9:ASN:HD21	3:B:201:Y43:CAC	2.30	0.45
1:B:96:LEU:HG	1:B:97:LEU:HD12	1.99	0.45
2:F:69:GLY:O	2:F:70:PRO:C	2.60	0.45
2:F:151:ASP:OD1	2:F:152:ASP:N	2.49	0.45
2:G:222:ILE:HG23	2:G:222:ILE:O	2.15	0.45
2:H:30:TRP:HA	2:H:33:LEU:HB3	1.97	0.45
2:H:259:LYS:C	2:H:261:PHE:H	2.25	0.45
1:C:57:VAL:HG12	1:C:59:ARG:H	1.82	0.45
2:F:90:LYS:HG3	2:F:94:TYR:CE2	2.51	0.45
2:G:84:ILE:HD12	2:G:84:ILE:N	2.31	0.45
1:D:87:LYS:HA	1:D:87:LYS:HD3	1.81	0.45
2:E:41:LEU:CD2	2:E:65:LYS:HE2	2.47	0.45
2:F:164:GLN:C	2:F:166:LEU:H	2.25	0.45
2:E:216:ALA:O	2:E:217:GLN:C	2.60	0.44
2:F:84:ILE:N	2:F:84:ILE:HD12	2.32	0.44
2:G:251:GLY:O	2:G:255:GLU:HG3	2.17	0.44
1:A:9:ASN:HB2	1:A:12:LYS:HD2	1.98	0.44
1:B:9:ASN:HB2	1:B:12:LYS:HD2	1.98	0.44
1:D:89:GLN:HB3	1:D:90:ALA:H	1.61	0.44
2:H:83:ASP:OD1	2:H:83:ASP:N	2.49	0.44
2:H:236:GLU:O	2:H:237:GLN:C	2.59	0.44
1:B:39:THR:OG1	1:B:41:ASN:OD1	2.35	0.44
1:D:9:ASN:HD21	3:D:201:Y43:CAC	2.30	0.44
2:E:39:THR:C	2:E:41:LEU:H	2.25	0.44
2:G:2:GLU:HG2	2:G:3:GLN:N	2.32	0.44
1:B:92:LYS:HZ2	1:B:96:LEU:HD22	1.82	0.44
2:F:75:MET:HE1	2:F:157:LEU:HD21	2.00	0.44
2:F:220:SER:O	2:F:221:TYR:CG	2.70	0.44
2:F:256:GLU:O	2:F:257:PHE:C	2.60	0.44
1:A:33:SER:O	1:A:33:SER:OG	2.32	0.44
1:D:92:LYS:HZ2	1:D:96:LEU:HD22	1.82	0.44
2:E:150:ASP:O	2:E:151:ASP:HB2	2.17	0.44
2:E:256:GLU:C	2:E:258:LEU:N	2.75	0.44
2:F:61:TYR:O	2:F:62:LYS:C	2.59	0.44
2:G:232:GLU:HG2	2:G:242:MET:SD	2.58	0.44
1:D:96:LEU:HG	1:D:97:LEU:HD12	1.99	0.44
2:F:93:GLU:HA	2:F:119:TYR:CE2	2.53	0.44
2:E:56:GLU:C	2:E:58:ALA:H	2.26	0.44
2:F:35:ASP:OD1	2:F:49:ARG:NH2	2.50	0.44
2:G:162:TYR:CD2	2:G:162:TYR:O	2.71	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:195:ILE:HG23	4:H:1001:NAD:N6A	2.32	0.44
2:F:25:LEU:HD21	2:F:86:ILE:HD12	2.00	0.44
2:F:251:GLY:O	2:F:255:GLU:HG3	2.17	0.44
1:C:70:ILE:HG22	1:C:73:LEU:H	1.82	0.44
2:H:176:PHE:O	2:H:178:SER:N	2.51	0.44
1:D:33:SER:O	1:D:33:SER:OG	2.32	0.43
2:G:230:ILE:HG23	2:H:60:TYR:CG	2.53	0.43
1:D:143:ASP:OD1	1:D:143:ASP:N	2.49	0.43
2:F:90:LYS:HD2	2:F:90:LYS:HA	1.73	0.43
2:G:125:LYS:NZ	2:G:125:LYS:HB3	2.33	0.43
2:H:4:LEU:HD13	2:H:221:TYR:CE2	2.53	0.43
1:D:39:THR:OG1	1:D:41:ASN:OD1	2.35	0.43
2:F:196:ASN:OD1	2:F:196:ASN:N	2.49	0.43
2:H:81:SER:OG	2:H:82:SER:N	2.52	0.43
2:H:91:VAL:O	2:H:95:ILE:HG13	2.17	0.43
2:E:16:PHE:HE1	2:E:190:TYR:CE1	2.36	0.43
2:E:93:GLU:HA	2:E:119:TYR:CE2	2.53	0.43
2:F:108:TYR:OH	2:F:156:VAL:O	2.31	0.43
2:G:230:ILE:HG23	2:H:60:TYR:CD1	2.53	0.43
2:H:110:ARG:NH2	2:H:150:ASP:OD1	2.48	0.43
2:G:7:ASP:HA	2:G:10:LYS:HD2	2.01	0.43
1:B:41:ASN:OD1	1:B:41:ASN:N	2.48	0.43
1:C:8:ARG:HB2	1:C:33:SER:HA	2.00	0.43
2:E:75:MET:HE3	2:E:149:PHE:HE1	1.84	0.43
2:E:81:SER:OG	2:E:82:SER:N	2.51	0.43
2:F:170:THR:HG22	2:F:172:LEU:H	1.84	0.43
2:F:234:ILE:C	2:F:236:GLU:H	2.27	0.43
2:H:1:MET:HE2	2:H:243:ILE:HD13	1.99	0.43
2:H:30:TRP:CZ2	4:H:1001:NAD:C2N	2.96	0.43
2:H:150:ASP:O	2:H:151:ASP:HB2	2.18	0.43
2:F:228:ASN:HD22	2:F:229:PRO:CD	2.32	0.43
2:G:196:ASN:OD1	2:G:196:ASN:N	2.52	0.43
2:H:106:THR:HG21	2:H:190:TYR:OH	2.19	0.43
2:F:17:VAL:CG1	2:F:21:VAL:HG21	2.45	0.42
2:G:166:LEU:HD23	2:G:166:LEU:HA	1.77	0.42
2:H:41:LEU:HD21	2:H:65:LYS:HE2	2.00	0.42
2:H:233:GLU:N	2:H:233:GLU:OE1	2.52	0.42
2:E:22:SER:HB2	2:E:27:LEU:HD12	2.00	0.42
2:E:28:PRO:HB2	2:E:79:TRP:CH2	2.53	0.42
2:F:93:GLU:O	2:F:97:LYS:HG2	2.19	0.42
2:F:198:ARG:O	2:F:202:TYR:HB3	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:90:LYS:HD3	2:E:90:LYS:HA	1.89	0.42
2:F:5:LEU:HD12	2:F:9:LYS:HE3	2.01	0.42
2:F:192:LEU:HA	2:F:192:LEU:HD13	1.68	0.42
4:H:1001:NAD:H2N	4:H:1001:NAD:H2D	1.82	0.42
2:E:169:GLU:OE1	2:E:169:GLU:HA	2.20	0.42
2:F:160:THR:O	2:F:163:PHE:HB2	2.19	0.42
2:F:211:GLN:HB2	2:F:213:LEU:HG	2.01	0.42
2:G:30:TRP:O	2:G:33:LEU:HB3	2.19	0.42
2:G:30:TRP:CZ2	2:G:54:ALA:HB1	2.54	0.42
2:G:183:LYS:H	2:G:218:PRO:HG2	1.83	0.42
1:A:87:LYS:CE	1:B:40:GLU:OE2	2.62	0.42
2:E:241:GLY:O	2:E:242:MET:HB2	2.20	0.42
2:F:53:SER:OG	2:F:54:ALA:N	2.53	0.42
2:F:132:ILE:HG22	2:F:132:ILE:O	2.19	0.42
2:F:163:PHE:O	2:F:166:LEU:N	2.52	0.42
2:G:129:VAL:HG22	2:G:129:VAL:O	2.20	0.42
2:H:173:ASP:O	2:H:174:ILE:C	2.62	0.42
2:G:7:ASP:C	2:G:9:LYS:N	2.75	0.42
2:H:148:ASP:OD1	2:H:149:PHE:N	2.45	0.42
2:H:170:THR:HG23	2:H:171:PRO:HD2	2.02	0.42
2:H:196:ASN:OD1	2:H:196:ASN:N	2.52	0.42
1:D:161:ARG:HA	1:D:164:GLU:HG3	2.01	0.42
2:E:60:TYR:O	2:E:64:LYS:HG2	2.20	0.42
2:F:108:TYR:OH	2:F:157:LEU:HD13	2.20	0.42
2:F:162:TYR:O	2:F:162:TYR:CD2	2.73	0.42
2:G:187:PHE:HZ	2:G:201:PHE:CE1	2.38	0.42
2:H:208:TRP:CG	2:H:217:GLN:HB2	2.55	0.42
1:A:161:ARG:HA	1:A:164:GLU:HG3	2.01	0.42
2:E:223:PHE:CD1	2:E:223:PHE:C	2.97	0.42
2:E:262:VAL:HG13	2:E:263:LEU:H	1.85	0.42
2:F:223:PHE:O	2:F:224:LEU:HD23	2.18	0.42
1:A:40:GLU:OE1	1:B:87:LYS:NZ	2.53	0.42
2:F:187:PHE:HZ	2:F:201:PHE:HE1	1.66	0.42
2:G:228:ASN:C	2:G:228:ASN:ND2	2.78	0.42
2:G:233:GLU:HG3	2:H:63:LEU:HD13	2.01	0.42
2:G:237:GLN:NE2	2:H:63:LEU:HD22	2.35	0.42
2:E:5:LEU:HD13	2:E:5:LEU:HA	1.94	0.42
2:E:196:ASN:HA	2:E:199:LEU:HD22	2.01	0.42
2:E:259:LYS:C	2:E:261:PHE:H	2.28	0.42
2:F:87:ASN:OD1	2:F:87:ASN:N	2.50	0.42
2:G:108:TYR:OH	2:G:156:VAL:O	2.34	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:92:LYS:HZ2	1:A:96:LEU:HD22	1.84	0.41
1:B:161:ARG:HA	1:B:164:GLU:HG3	2.01	0.41
2:G:163:PHE:O	2:G:165:ARG:N	2.53	0.41
2:H:16:PHE:HE1	2:H:190:TYR:CE2	2.38	0.41
1:A:39:THR:OG1	1:A:41:ASN:OD1	2.35	0.41
2:E:148:ASP:OD1	2:E:149:PHE:N	2.46	0.41
2:G:93:GLU:HA	2:G:119:TYR:CE2	2.55	0.41
2:G:259:LYS:HD2	2:G:262:VAL:CG1	2.48	0.41
2:H:108:TYR:OH	2:H:156:VAL:O	2.33	0.41
1:B:87:LYS:HD3	1:B:87:LYS:HA	1.81	0.41
1:C:139:ASP:OD1	1:C:139:ASP:N	2.53	0.41
2:E:83:ASP:OD1	2:E:83:ASP:N	2.53	0.41
2:F:3:GLN:HG2	2:F:219:LYS:HE2	2.03	0.41
2:F:60:TYR:CE1	2:F:64:LYS:HD3	2.55	0.41
2:F:87:ASN:HB2	2:F:88:LYS:HE3	2.02	0.41
2:H:69:GLY:O	2:H:70:PRO:C	2.60	0.41
2:E:3:GLN:O	2:E:6:ALA:HB3	2.21	0.41
2:F:36:HIS:O	2:F:37:ILE:C	2.64	0.41
2:F:43:TYR:HB3	2:F:44:ASP:H	1.74	0.41
2:G:86:ILE:C	2:G:88:LYS:N	2.77	0.41
2:H:79:TRP:C	2:H:81:SER:H	2.29	0.41
1:C:87:LYS:HD2	1:C:87:LYS:HA	1.78	0.41
1:C:92:LYS:HD2	1:C:95:GLN:HE21	1.86	0.41
2:E:60:TYR:CZ	2:E:64:LYS:HD3	2.56	0.41
2:E:192:LEU:HD13	2:E:192:LEU:HA	1.65	0.41
2:E:204:LEU:O	2:E:207:LEU:HB3	2.21	0.41
2:F:195:ILE:O	2:F:195:ILE:HD12	2.21	0.41
1:B:108:LYS:NZ	1:B:125:GLU:OE1	2.54	0.41
2:E:233:GLU:N	2:E:233:GLU:OE1	2.53	0.41
2:F:159:GLU:HG2	2:F:160:THR:N	2.35	0.41
2:G:35:ASP:O	2:G:39:THR:HG23	2.20	0.41
2:H:30:TRP:CD2	4:H:1001:NAD:C7N	3.04	0.41
2:H:159:GLU:O	2:H:161:SER:N	2.54	0.41
2:H:205:SER:C	2:H:207:LEU:N	2.76	0.41
1:A:39:THR:OG1	1:A:40:GLU:N	2.54	0.41
1:A:87:LYS:HA	1:A:87:LYS:HD3	1.81	0.41
2:G:86:ILE:C	2:G:88:LYS:H	2.27	0.41
2:G:90:LYS:HA	2:G:90:LYS:HD2	1.71	0.41
2:H:30:TRP:CG	4:H:1001:NAD:C4N	2.87	0.41
2:H:231:GLN:O	2:H:242:MET:HE1	2.20	0.41
1:C:143:ASP:HB3	1:C:156:ALA:HB2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:62:LYS:HZ2	2:F:158:ASP:CG	2.28	0.41
2:F:131:ASP:O	2:F:133:ALA:N	2.54	0.41
2:F:184:SER:HG	2:F:219:LYS:C	2.24	0.41
2:G:211:GLN:CB	2:G:213:LEU:HD13	2.51	0.41
2:H:131:ASP:C	2:H:133:ALA:N	2.78	0.41
2:H:131:ASP:OD1	2:H:131:ASP:N	2.52	0.41
2:H:262:VAL:HG13	2:H:263:LEU:N	2.36	0.41
1:A:108:LYS:NZ	1:A:125:GLU:OE1	2.54	0.41
2:F:10:LYS:H	2:F:10:LYS:HG3	1.59	0.41
2:F:183:LYS:N	2:F:218:PRO:HG2	2.36	0.41
1:B:92:LYS:HD2	1:B:95:GLN:HE21	1.86	0.40
1:C:141:GLN:HB3	1:C:142:TRP:H	1.58	0.40
2:F:198:ARG:NE	2:F:238:TRP:CH2	2.88	0.40
2:H:93:GLU:HG3	2:H:97:LYS:HE3	2.02	0.40
2:E:100:PHE:HA	2:E:101:PRO:HD3	1.87	0.40
2:E:144:LYS:HE3	2:E:144:LYS:HB3	1.91	0.40
2:E:166:LEU:HD23	2:E:166:LEU:HA	1.93	0.40
2:F:202:TYR:CZ	2:F:206:LYS:HD2	2.57	0.40
2:G:187:PHE:HZ	2:G:201:PHE:HE1	1.69	0.40
1:D:108:LYS:NZ	1:D:125:GLU:OE1	2.54	0.40
2:F:171:PRO:HG3	2:H:207:LEU:HD21	2.03	0.40
2:G:44:ASP:O	2:G:45:PRO:C	2.65	0.40
1:C:11:HIS:HA	1:C:14:LYS:HE2	2.04	0.40
1:D:92:LYS:HD2	1:D:95:GLN:HE21	1.86	0.40
2:E:248:ASP:O	2:E:249:ASN:C	2.64	0.40
2:F:116:LEU:HD13	2:F:121:LYS:HD3	2.03	0.40
2:F:259:LYS:HA	2:F:262:VAL:HG12	2.03	0.40
2:G:223:PHE:CD1	2:G:223:PHE:C	2.99	0.40
2:H:109:ASP:OD1	2:H:109:ASP:N	2.52	0.40
2:E:54:ALA:O	2:E:55:LEU:C	2.64	0.40
2:E:71:LEU:C	2:E:73:SER:N	2.76	0.40
2:F:201:PHE:C	2:F:203:LYS:H	2.29	0.40
2:F:223:PHE:CD1	2:F:223:PHE:C	2.99	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	182/184 (99%)	170 (93%)	12 (7%)	0	100	100
1	B	182/184 (99%)	171 (94%)	11 (6%)	0	100	100
1	C	182/184 (99%)	170 (93%)	12 (7%)	0	100	100
1	D	182/184 (99%)	171 (94%)	11 (6%)	0	100	100
2	E	262/264 (99%)	216 (82%)	37 (14%)	9 (3%)	3	17
2	F	262/264 (99%)	222 (85%)	34 (13%)	6 (2%)	5	23
2	G	262/264 (99%)	222 (85%)	29 (11%)	11 (4%)	2	13
2	H	262/264 (99%)	213 (81%)	35 (13%)	14 (5%)	1	10
All	All	1776/1792 (99%)	1555 (88%)	181 (10%)	40 (2%)	7	23

All (40) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	53	SER
2	F	53	SER
2	F	222	ILE
2	G	239	ARG
2	H	23	MET
2	H	53	SER
2	H	222	ILE
2	H	238	TRP
2	E	11	GLY
2	E	162	TYR
2	E	222	ILE
2	E	225	PRO
2	E	263	LEU
2	G	222	ILE
2	H	22	SER
2	H	239	ARG
2	E	98	ALA

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Mol	Chain	Res	Type
2	E	151	ASP
2	F	229	PRO
2	F	263	LEU
2	G	257	PHE
2	G	263	LEU
2	H	109	ASP
2	H	164	GLN
2	H	177	ARG
2	H	225	PRO
2	E	61	TYR
2	F	239	ARG
2	G	54	ALA
2	G	155	ILE
2	G	214	GLU
2	H	58	ALA
2	H	8	TYR
2	H	151	ASP
2	G	162	TYR
2	H	28	PRO
2	F	28	PRO
2	G	120	GLY
2	G	229	PRO
2	G	243	ILE

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	161/161 (100%)	159 (99%)	2 (1%)	67 83
1	B	161/161 (100%)	159 (99%)	2 (1%)	67 83
1	C	161/161 (100%)	161 (100%)	0	100 100
1	D	161/161 (100%)	160 (99%)	1 (1%)	84 91
2	E	239/239 (100%)	223 (93%)	16 (7%)	13 40
2	F	239/239 (100%)	220 (92%)	19 (8%)	10 34

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	G	239/239 (100%)	224 (94%)	15 (6%)	15 42
2	H	239/239 (100%)	227 (95%)	12 (5%)	20 50
All	All	1600/1600 (100%)	1533 (96%)	67 (4%)	27 56

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	GLU
1	A	38	GLN
1	B	36	GLU
1	B	37	ILE
1	D	36	GLU
2	E	7	ASP
2	E	10	LYS
2	E	56	GLU
2	E	83	ASP
2	E	109	ASP
2	E	116	LEU
2	E	131	ASP
2	E	155	ILE
2	E	164	GLN
2	E	184	SER
2	E	199	LEU
2	E	204	LEU
2	E	236	GLU
2	E	248	ASP
2	E	256	GLU
2	E	262	VAL
2	F	5	LEU
2	F	10	LYS
2	F	23	MET
2	F	24	ASN
2	F	67	LYS
2	F	68	ILE
2	F	83	ASP
2	F	87	ASN
2	F	157	LEU
2	F	164	GLN
2	F	167	GLU
2	F	190	TYR
2	F	192	LEU

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Mol	Chain	Res	Type
2	F	195	ILE
2	F	228	ASN
2	F	237	GLN
2	F	239	ARG
2	F	260	ASN
2	F	263	LEU
2	G	5	LEU
2	G	10	LYS
2	G	23	MET
2	G	67	LYS
2	G	83	ASP
2	G	116	LEU
2	G	125	LYS
2	G	164	GLN
2	G	167	GLU
2	G	190	TYR
2	G	192	LEU
2	G	228	ASN
2	G	238	TRP
2	G	260	ASN
2	G	263	LEU
2	H	7	ASP
2	H	83	ASP
2	H	109	ASP
2	H	131	ASP
2	H	155	ILE
2	H	164	GLN
2	H	184	SER
2	H	190	TYR
2	H	204	LEU
2	H	224	LEU
2	H	226	ARG
2	H	256	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (45) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	9	ASN
1	A	38	GLN
1	A	95	GLN
1	A	102	ASN
1	A	127	GLN

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Mol	Chain	Res	Type
1	A	163	ASN
1	B	9	ASN
1	B	95	GLN
1	B	102	ASN
1	B	127	GLN
1	B	163	ASN
1	C	32	HIS
1	C	38	GLN
1	C	95	GLN
1	D	9	ASN
1	D	95	GLN
1	D	102	ASN
1	D	127	GLN
1	D	163	ASN
2	E	87	ASN
2	E	107	ASN
2	E	118	ASN
2	E	164	GLN
2	E	211	GLN
2	E	237	GLN
2	F	24	ASN
2	F	99	ASN
2	F	107	ASN
2	F	118	ASN
2	F	164	GLN
2	F	228	ASN
2	F	231	GLN
2	G	87	ASN
2	G	164	GLN
2	G	228	ASN
2	G	231	GLN
2	G	260	ASN
2	H	3	GLN
2	H	24	ASN
2	H	32	GLN
2	H	107	ASN
2	H	118	ASN
2	H	138	ASN
2	H	211	GLN
2	H	231	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

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	$\#\|Z\| > 2$
4	NAD	E	1001	-	42,48,48	0.66	1 (2%)	50,73,73	0.94	5 (10%)
3	Y43	A	201	-	24,32,32	3.83	8 (33%)	30,50,50	1.18	3 (10%)
3	Y43	B	201	-	24,32,32	3.82	8 (33%)	30,50,50	1.20	3 (10%)
4	NAD	H	1001	-	42,48,48	1.85	4 (9%)	50,73,73	1.87	8 (16%)
3	Y43	D	201	-	24,32,32	3.83	8 (33%)	30,50,50	1.20	3 (10%)
3	Y43	C	201	-	24,32,32	3.85	8 (33%)	30,50,50	1.29	4 (13%)

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
4	NAD	E	1001	-	-	5/26/62/62	0/5/5/5
3	Y43	A	201	-	-	9/18/34/34	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	Y43	B	201	-	-	8/18/34/34	0/3/3/3
4	NAD	H	1001	-	-	7/26/62/62	0/5/5/5
3	Y43	D	201	-	-	8/18/34/34	0/3/3/3
3	Y43	C	201	-	-	10/18/34/34	0/3/3/3

All (37) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	201	Y43	CAC-CAB	-11.60	1.22	1.52
3	A	201	Y43	CAC-CAB	-11.53	1.22	1.52
3	B	201	Y43	CAC-CAB	-11.46	1.22	1.52
3	D	201	Y43	CAC-CAB	-11.42	1.22	1.52
4	H	1001	NAD	O4B-C1B	10.70	1.56	1.41
3	D	201	Y43	O6-C6	9.74	1.40	1.23
3	A	201	Y43	O6-C6	9.73	1.40	1.23
3	B	201	Y43	O6-C6	9.68	1.40	1.23
3	C	201	Y43	O6-C6	9.66	1.40	1.23
3	D	201	Y43	OAE-CAD	-6.59	1.27	1.42
3	C	201	Y43	OAE-CAD	-6.56	1.27	1.42
3	B	201	Y43	OAE-CAD	-6.51	1.27	1.42
3	A	201	Y43	OAE-CAD	-6.46	1.27	1.42
3	D	201	Y43	OAA-CAB	4.77	1.53	1.43
3	A	201	Y43	OAA-CAB	4.76	1.53	1.43
3	C	201	Y43	OAA-CAB	4.74	1.53	1.43
3	B	201	Y43	OAA-CAB	4.68	1.53	1.43
3	C	201	Y43	CAC-CAD	3.67	1.62	1.52
3	D	201	Y43	CAC-CAD	3.66	1.62	1.52
3	B	201	Y43	CAC-CAD	3.63	1.62	1.52
3	A	201	Y43	CAC-CAD	3.61	1.62	1.52
3	C	201	Y43	C5-C6	-3.39	1.40	1.47
3	A	201	Y43	C5-C6	-3.37	1.40	1.47
3	D	201	Y43	C5-C6	-3.34	1.40	1.47
3	B	201	Y43	C5-C6	-3.33	1.40	1.47
3	C	201	Y43	C6-N1	-3.05	1.32	1.38
3	D	201	Y43	C6-N1	-2.97	1.32	1.38
3	A	201	Y43	C6-N1	-2.94	1.32	1.38
3	B	201	Y43	C6-N1	-2.87	1.33	1.38
3	B	201	Y43	CAG-CAF	-2.74	1.43	1.51
3	A	201	Y43	CAG-CAF	-2.70	1.43	1.51
3	C	201	Y43	CAG-CAF	-2.69	1.43	1.51
3	D	201	Y43	CAG-CAF	-2.66	1.43	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	1001	NAD	C5A-C4A	-2.53	1.34	1.40
4	H	1001	NAD	C2B-C1B	-2.17	1.50	1.53
4	E	1001	NAD	C2N-N1N	2.11	1.37	1.35
4	H	1001	NAD	C2N-N1N	2.05	1.37	1.35

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	H	1001	NAD	C1B-N9A-C4A	-8.81	111.17	126.64
4	H	1001	NAD	C2B-C3B-C4B	4.73	111.83	102.64
4	H	1001	NAD	C6N-N1N-C2N	-3.59	118.70	121.97
4	H	1001	NAD	C3N-C2N-N1N	-3.50	117.00	120.43
4	H	1001	NAD	C3D-C2D-C1D	3.35	106.02	100.98
4	H	1001	NAD	O3B-C3B-C4B	-3.18	101.85	111.05
3	B	201	Y43	C8-N7-C5	3.00	108.71	102.99
3	C	201	Y43	C8-N7-C5	3.00	108.71	102.99
3	D	201	Y43	C8-N7-C5	3.00	108.71	102.99
3	C	201	Y43	PAM-OAP-PAQ	-2.99	122.58	132.83
3	A	201	Y43	C8-N7-C5	2.99	108.68	102.99
4	E	1001	NAD	C6N-N1N-C2N	-2.96	119.28	121.97
3	B	201	Y43	PAM-OAP-PAQ	-2.89	122.90	132.83
3	D	201	Y43	PAM-OAP-PAQ	-2.89	122.91	132.83
3	A	201	Y43	PAM-OAP-PAQ	-2.81	123.18	132.83
4	H	1001	NAD	O3B-C3B-C2B	-2.73	103.00	111.82
4	E	1001	NAD	C3D-C2D-C1D	2.57	104.85	100.98
4	E	1001	NAD	O4B-C1B-C2B	-2.47	103.31	106.93
4	E	1001	NAD	C5A-C6A-N6A	2.33	123.89	120.35
3	C	201	Y43	N3-C2-N1	-2.26	120.39	125.84
3	D	201	Y43	N3-C2-N1	-2.13	120.71	125.84
4	H	1001	NAD	O4B-C4B-C3B	-2.13	100.91	105.11
3	B	201	Y43	N3-C2-N1	-2.12	120.75	125.84
4	E	1001	NAD	C3N-C2N-N1N	-2.11	118.36	120.43
3	A	201	Y43	N3-C2-N1	-2.11	120.77	125.84
3	C	201	Y43	PAM-OAL-PAI	-2.02	125.89	132.83

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	201	Y43	CAG-OAH-PAI-OAJ
3	A	201	Y43	CAG-OAH-PAI-OAK
3	B	201	Y43	CAG-OAH-PAI-OAJ

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Mol	Chain	Res	Type	Atoms
3	B	201	Y43	CAG-OAH-PAI-OAK
3	C	201	Y43	CAG-OAH-PAI-OAJ
3	C	201	Y43	CAG-OAH-PAI-OAK
3	C	201	Y43	PAM-OAP-PAQ-OAS
3	C	201	Y43	PAM-OAP-PAQ-OAT
3	D	201	Y43	CAG-OAH-PAI-OAJ
3	D	201	Y43	CAG-OAH-PAI-OAK
4	E	1001	NAD	C2D-C1D-N1N-C2N
4	E	1001	NAD	C2D-C1D-N1N-C6N
4	H	1001	NAD	O4D-C1D-N1N-C2N
4	H	1001	NAD	O4D-C1D-N1N-C6N
4	H	1001	NAD	C2D-C1D-N1N-C6N
3	A	201	Y43	CAB-CAF-CAG-OAH
3	A	201	Y43	OAE-CAF-CAG-OAH
3	B	201	Y43	CAB-CAF-CAG-OAH
3	B	201	Y43	OAE-CAF-CAG-OAH
3	D	201	Y43	CAB-CAF-CAG-OAH
3	D	201	Y43	OAE-CAF-CAG-OAH
4	H	1001	NAD	C3B-C4B-C5B-O5B
4	H	1001	NAD	O4B-C4B-C5B-O5B
3	C	201	Y43	PAI-OAL-PAM-OAN
4	E	1001	NAD	PA-O3-PN-O5D
3	C	201	Y43	CAB-CAF-CAG-OAH
3	C	201	Y43	OAE-CAF-CAG-OAH
3	A	201	Y43	CAG-OAH-PAI-OAL
3	B	201	Y43	CAG-OAH-PAI-OAL
3	C	201	Y43	CAG-OAH-PAI-OAL
3	D	201	Y43	CAG-OAH-PAI-OAL
3	A	201	Y43	PAI-OAL-PAM-OAO
3	B	201	Y43	PAI-OAL-PAM-OAO
3	D	201	Y43	PAI-OAL-PAM-OAO
3	A	201	Y43	CAF-CAG-OAH-PAI
3	B	201	Y43	CAF-CAG-OAH-PAI
3	C	201	Y43	CAF-CAG-OAH-PAI
3	D	201	Y43	CAF-CAG-OAH-PAI
4	E	1001	NAD	O4B-C4B-C5B-O5B
3	C	201	Y43	PAI-OAL-PAM-OAO
4	H	1001	NAD	C2D-C1D-N1N-C2N
3	A	201	Y43	PAI-OAL-PAM-OAN
3	B	201	Y43	PAI-OAL-PAM-OAN
3	D	201	Y43	PAI-OAL-PAM-OAN
4	E	1001	NAD	PA-O3-PN-O1N

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Mol	Chain	Res	Type	Atoms
4	H	1001	NAD	C5D-O5D-PN-O1N
3	A	201	Y43	PAQ-OAP-PAM-OAL

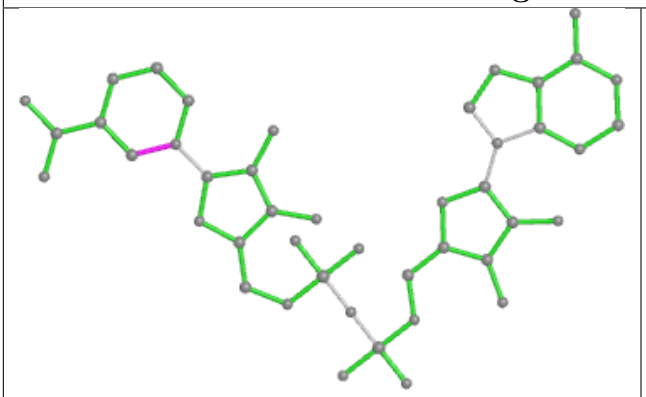
There are no ring outliers.

4 monomers are involved in 26 short contacts:

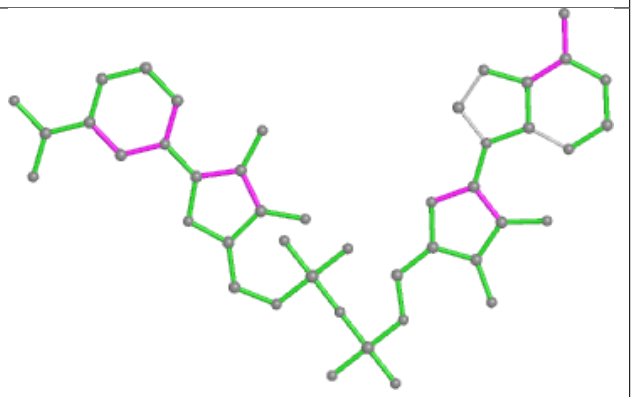
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	201	Y43	1	0
3	B	201	Y43	1	0
4	H	1001	NAD	23	0
3	D	201	Y43	1	0

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.

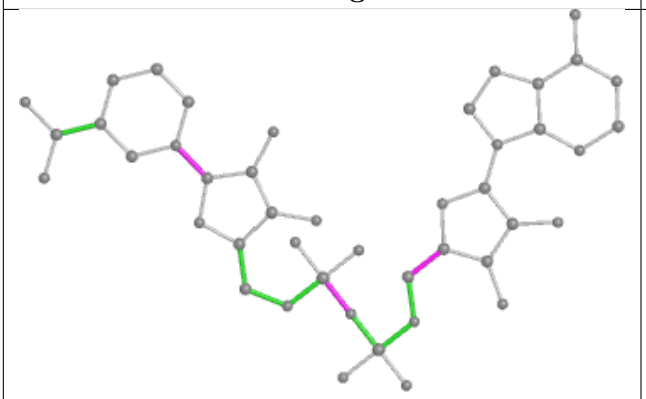
Ligand NAD E 1001



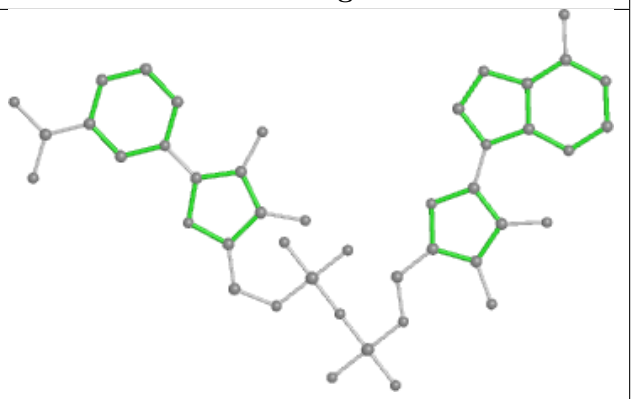
Bond lengths



Bond angles

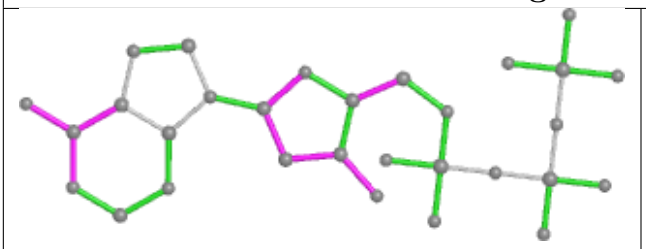


Torsions

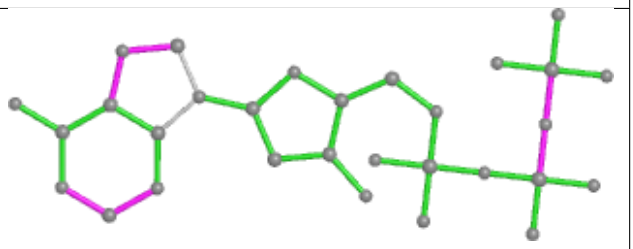


Rings

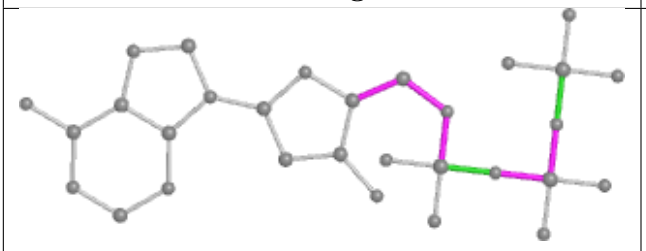
Ligand Y43 A 201



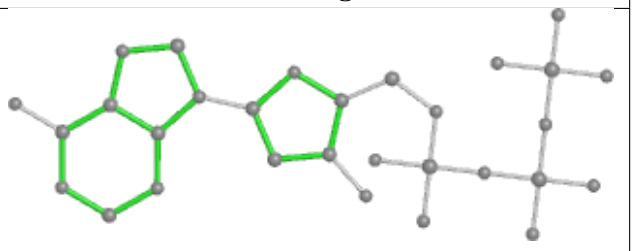
Bond lengths



Bond angles

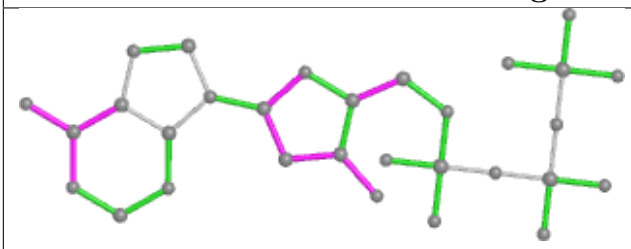


Torsions

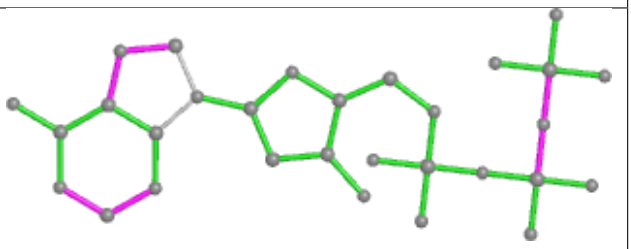


Rings

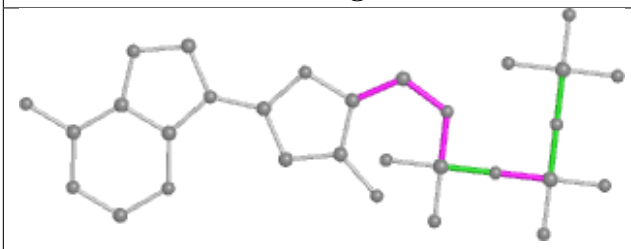
Ligand Y43 B 201



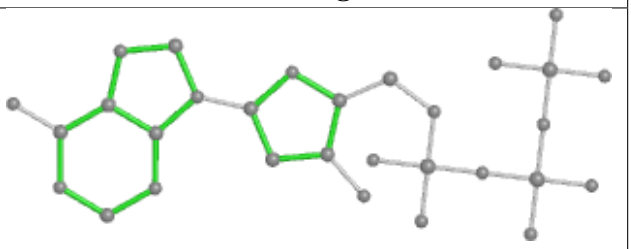
Bond lengths



Bond angles

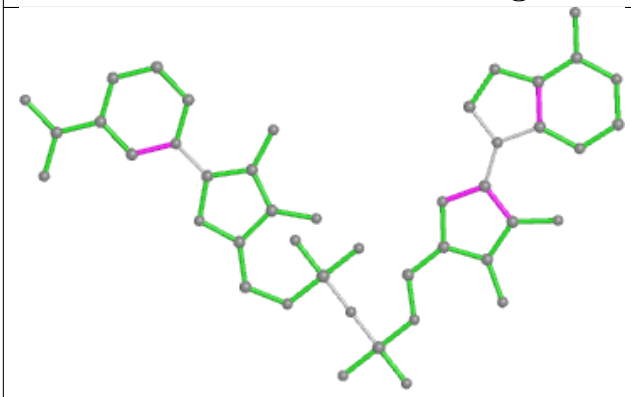


Torsions

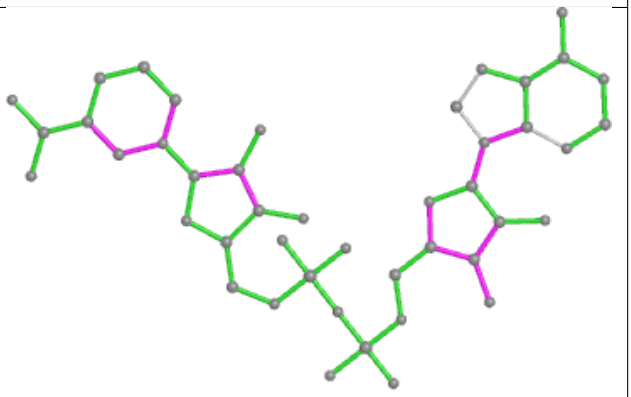


Rings

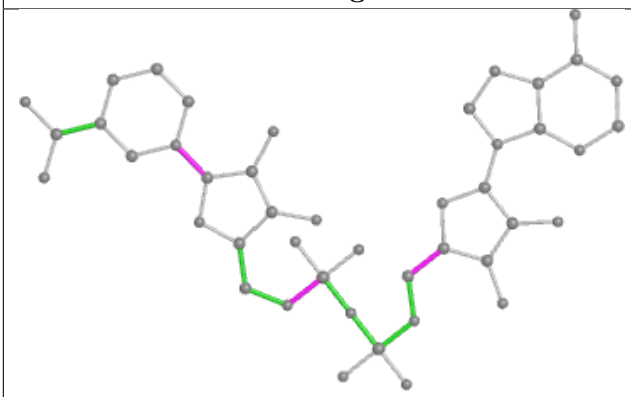
Ligand NAD H 1001



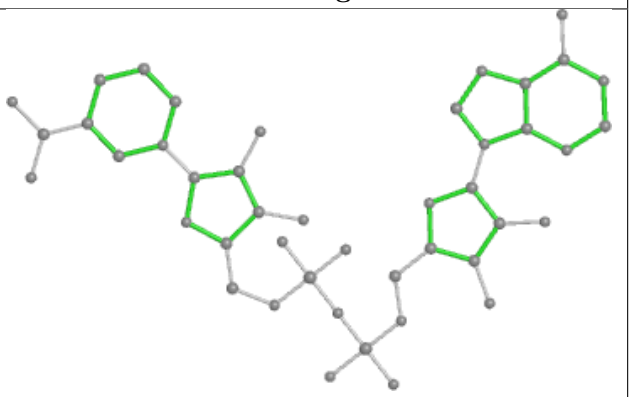
Bond lengths



Bond angles

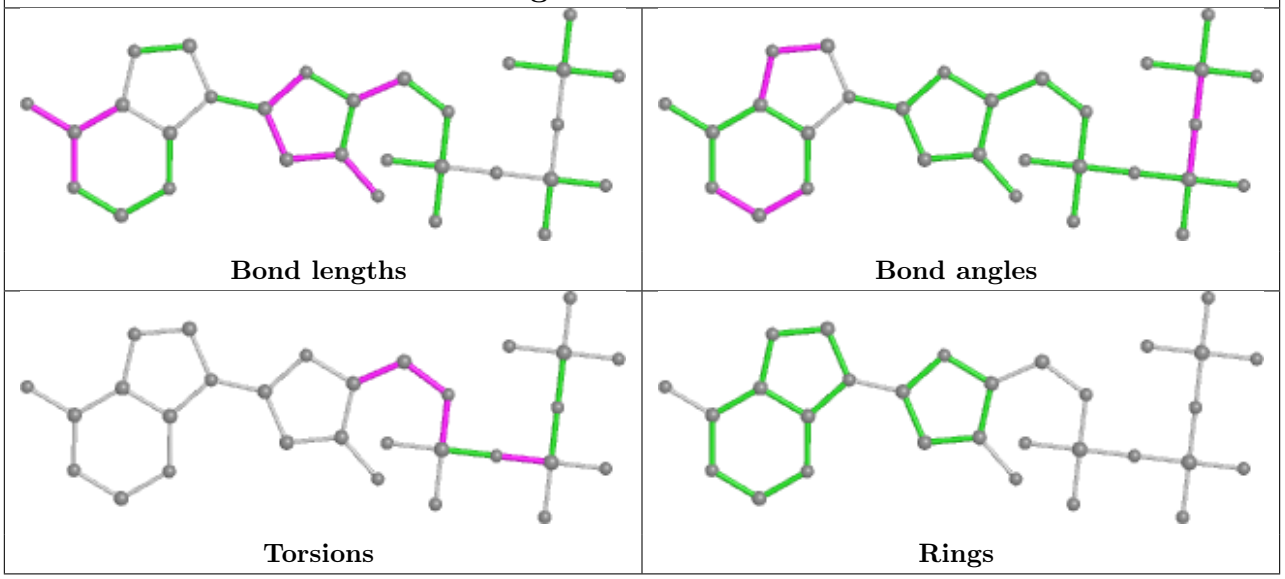


Torsions

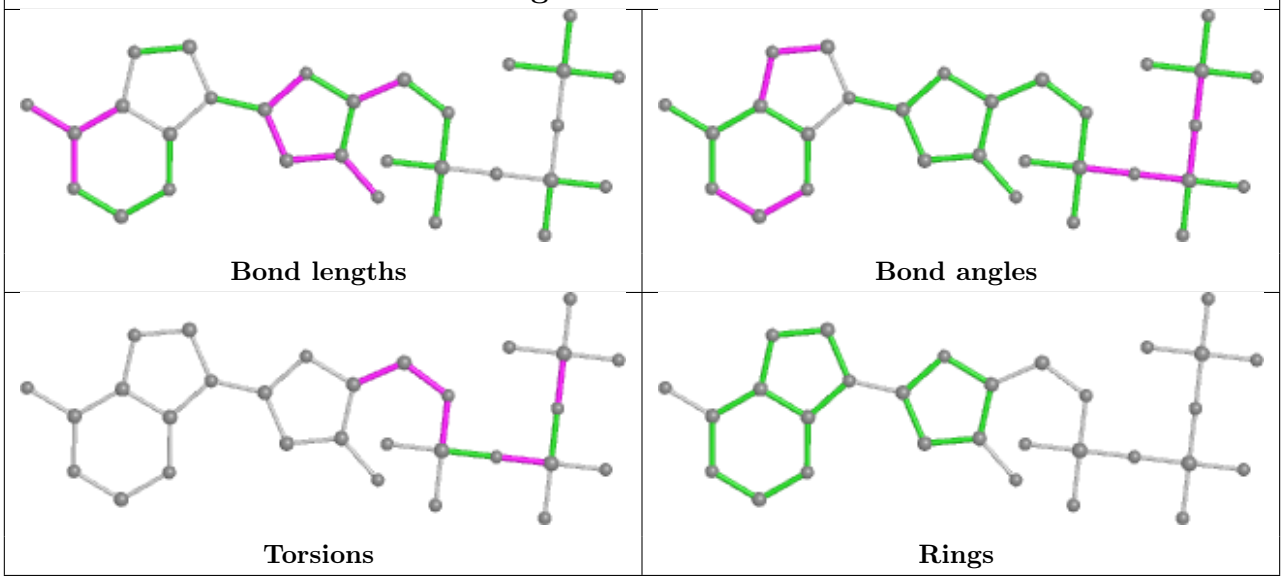


Rings

Ligand Y43 D 201



Ligand Y43 C 201



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

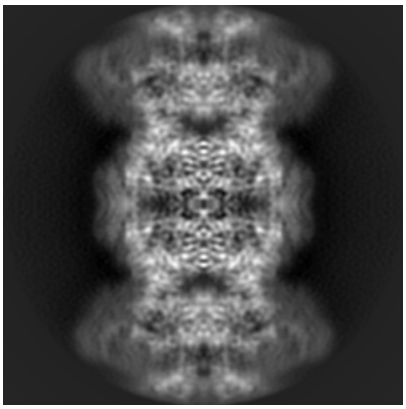
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-60416. These allow visual inspection of the internal detail of the map and identification of artifacts.

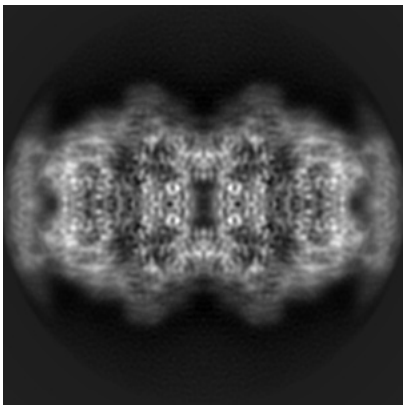
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

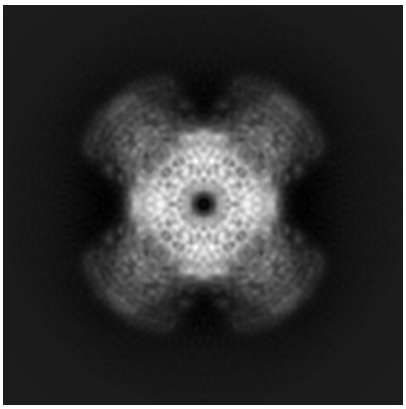
6.1.1 Primary map



X

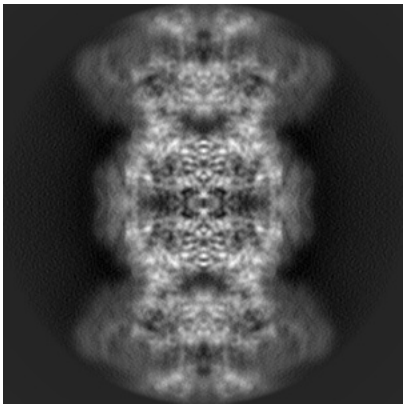


Y

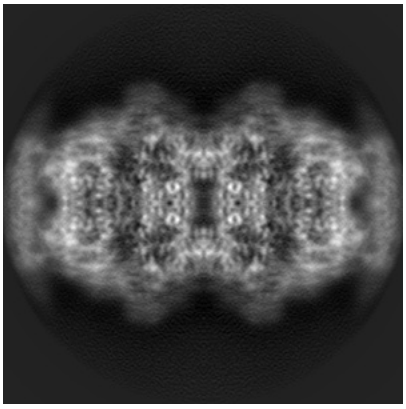


Z

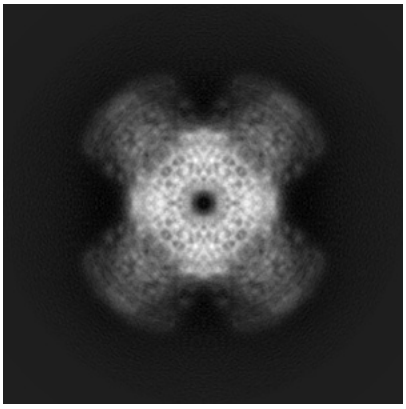
6.1.2 Raw map



X



Y

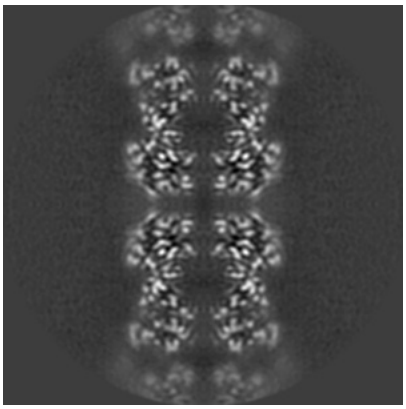


Z

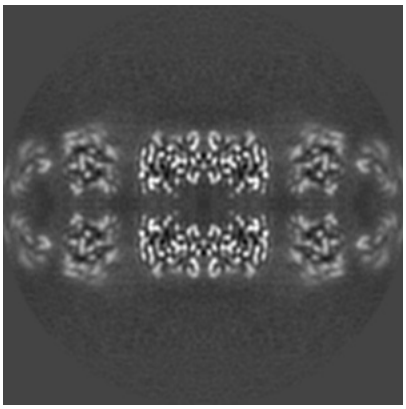
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

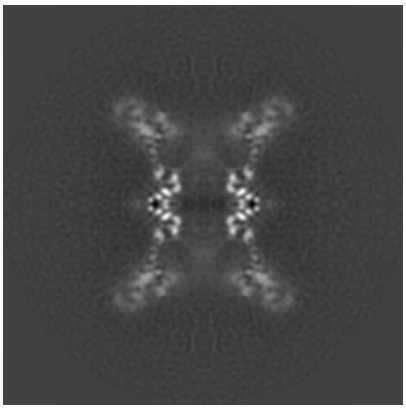
6.2.1 Primary map



X Index: 128

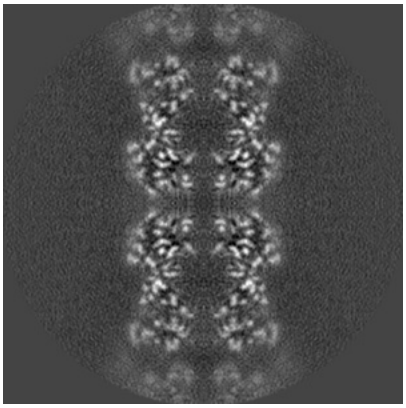


Y Index: 128

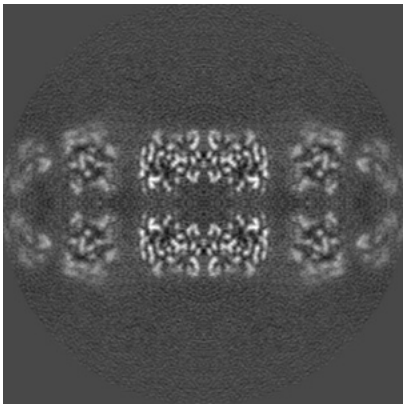


Z Index: 128

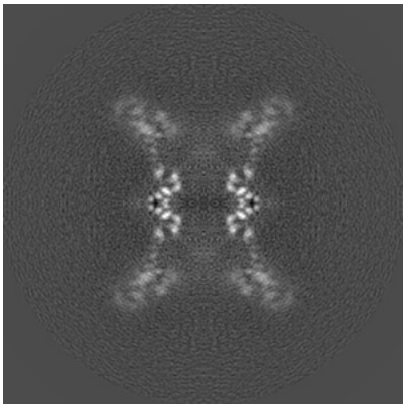
6.2.2 Raw map



X Index: 128



Y Index: 128

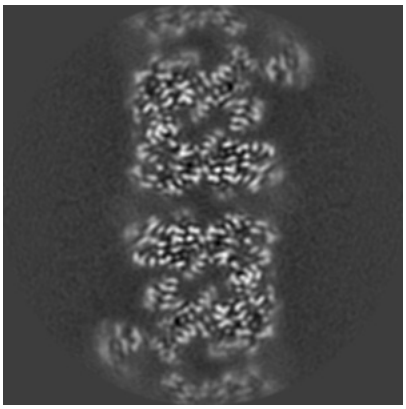


Z Index: 128

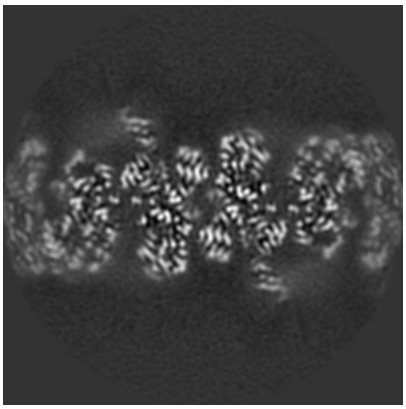
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

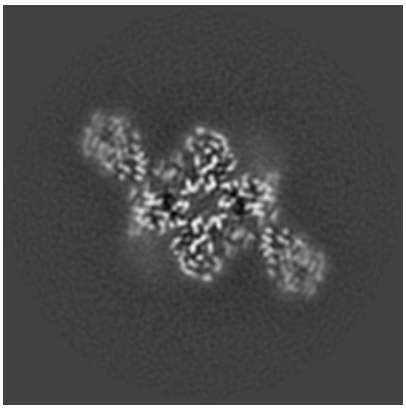
6.3.1 Primary map



X Index: 118

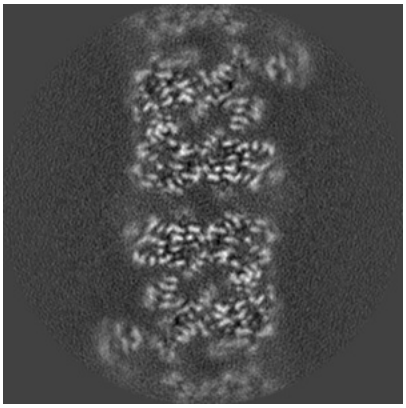


Y Index: 113

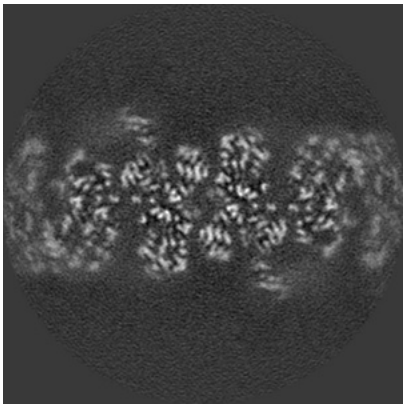


Z Index: 95

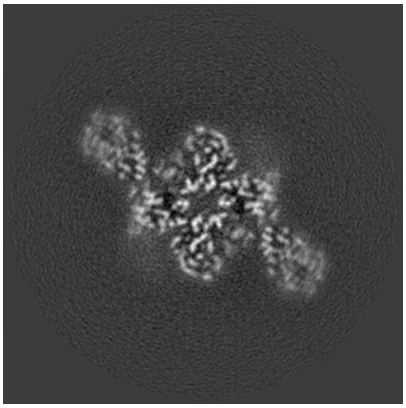
6.3.2 Raw map



X Index: 118



Y Index: 113

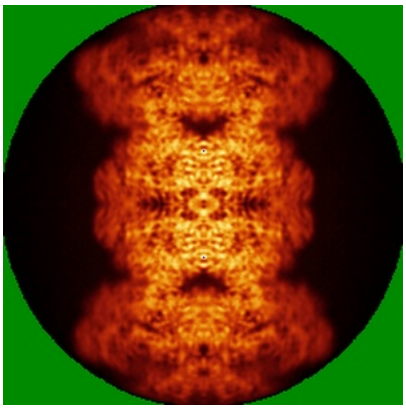


Z Index: 95

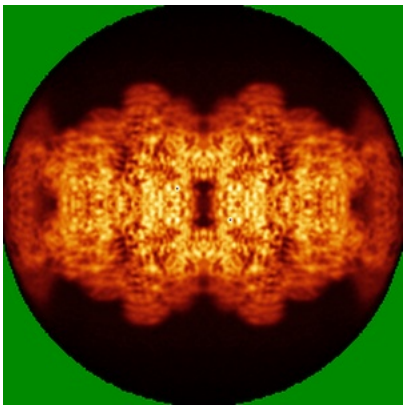
The images above show the largest variance slices of the map in three orthogonal directions.

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

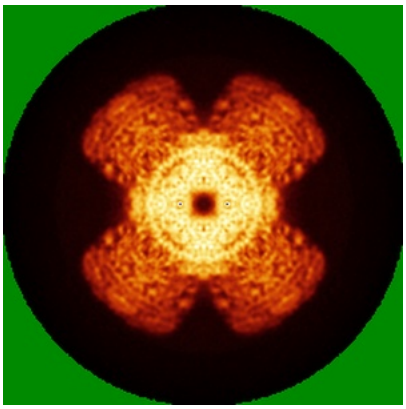
6.4.1 Primary map



X

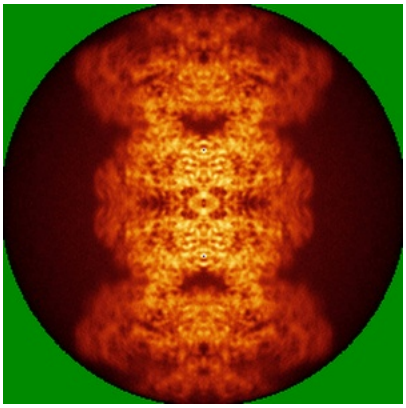


Y

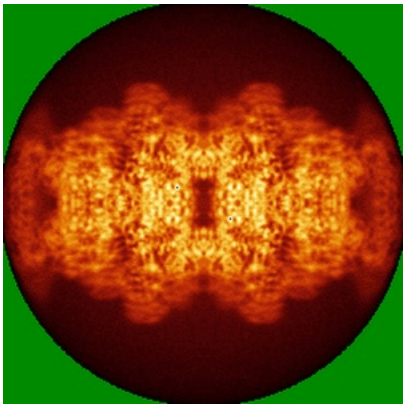


Z

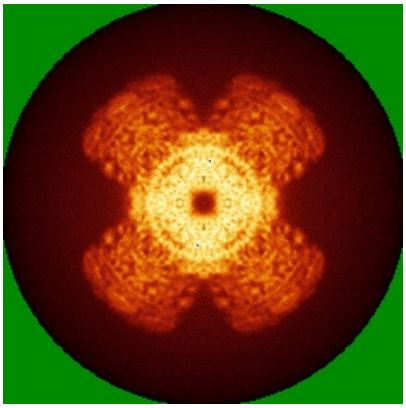
6.4.2 Raw map



X



Y

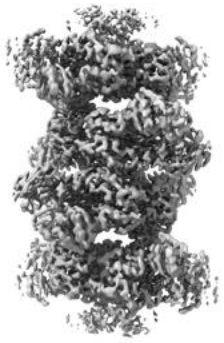


Z

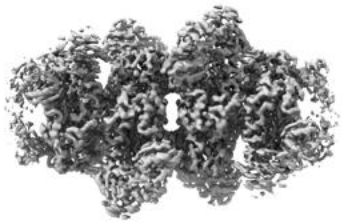
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

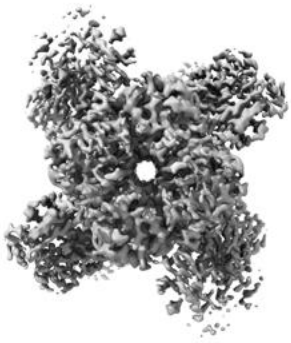
6.5.1 Primary map



X



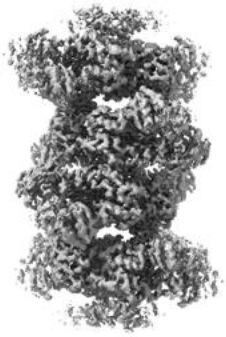
Y



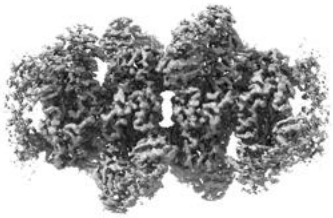
Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

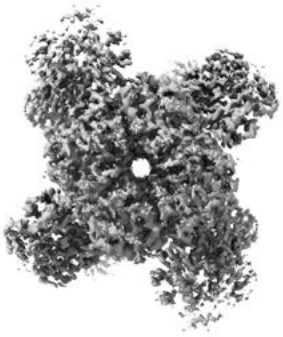
6.5.2 Raw map



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.

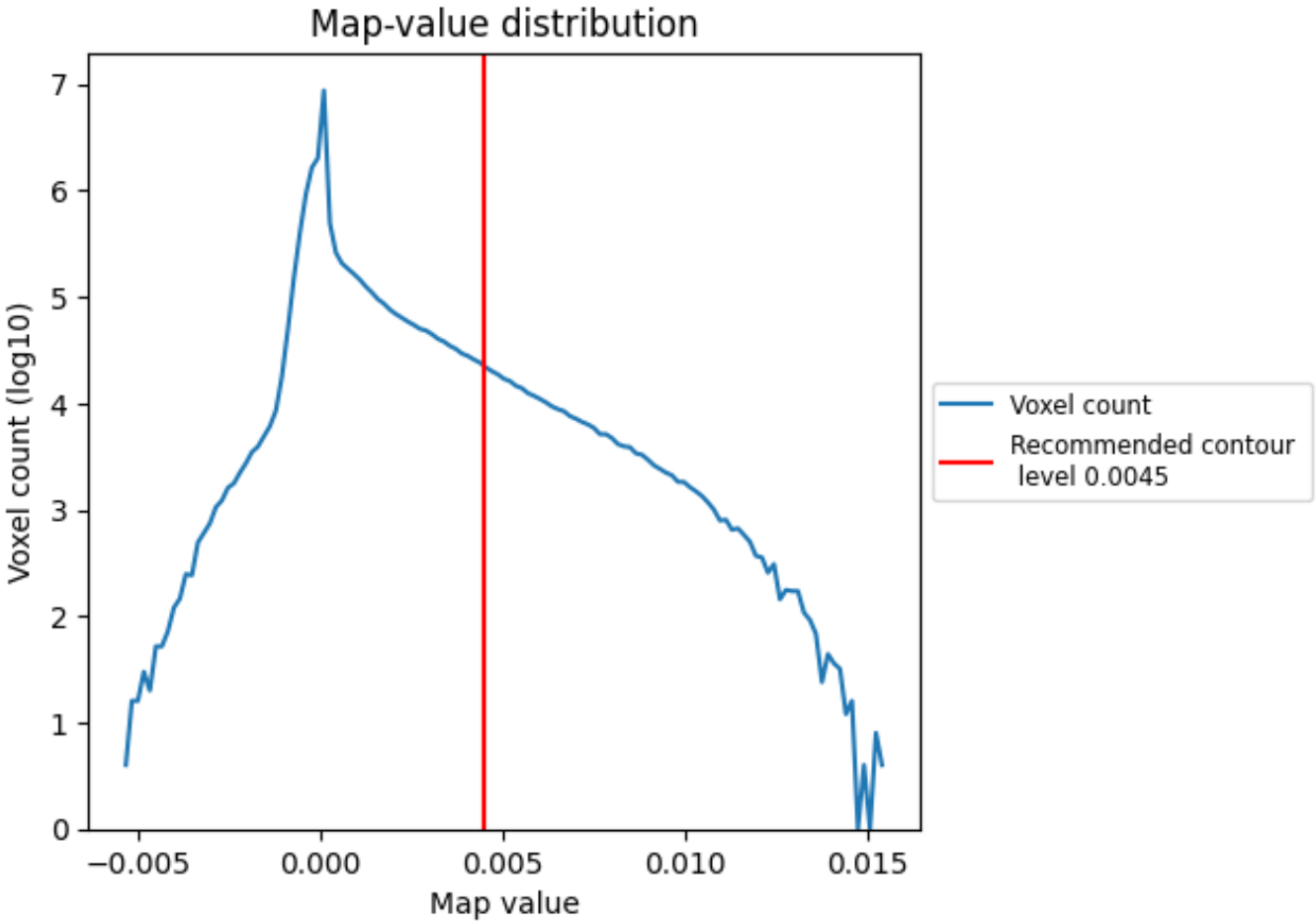
6.6 Mask visualisation (i)

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

7 Map analysis

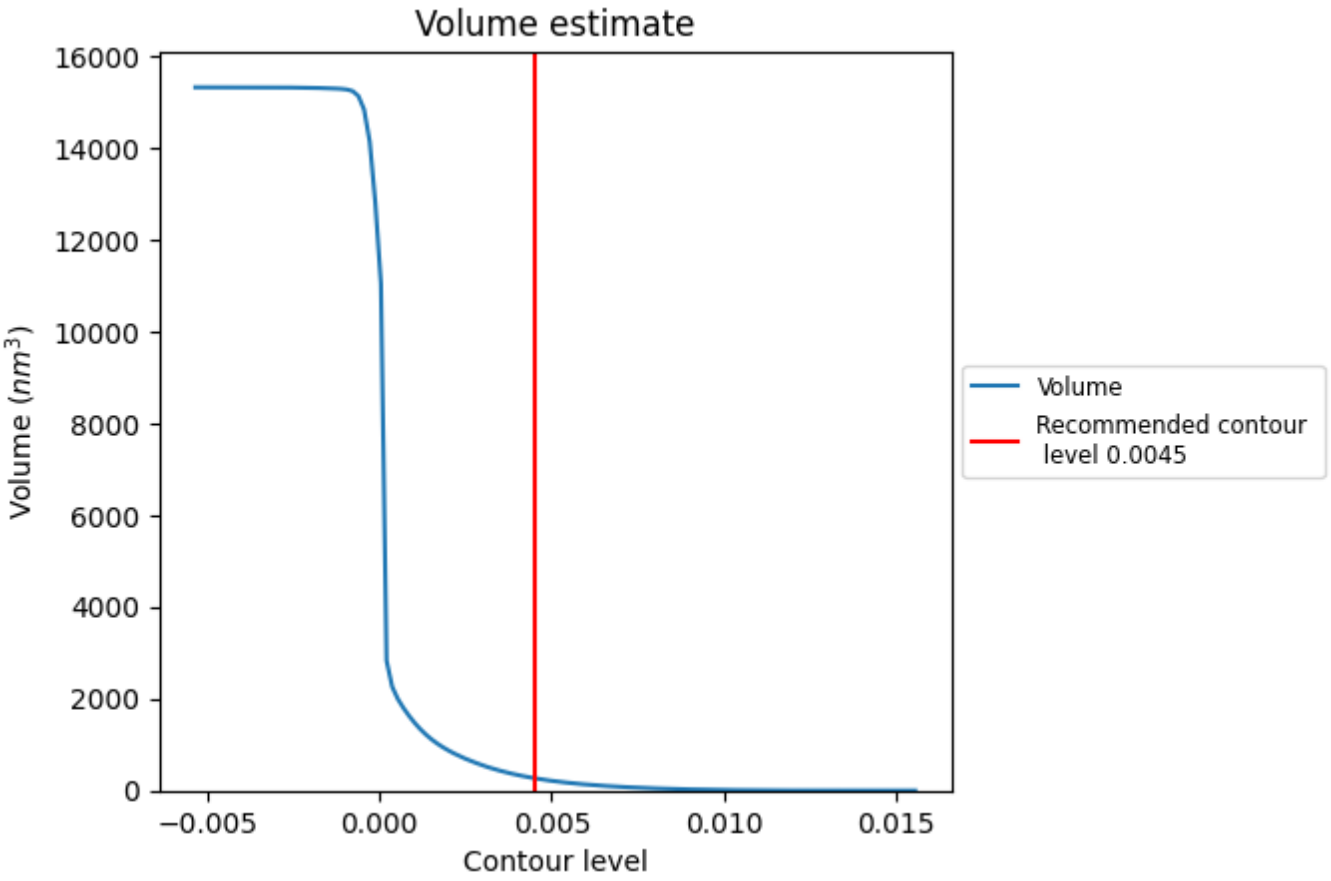
This section contains the results of statistical analysis of the map.

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.

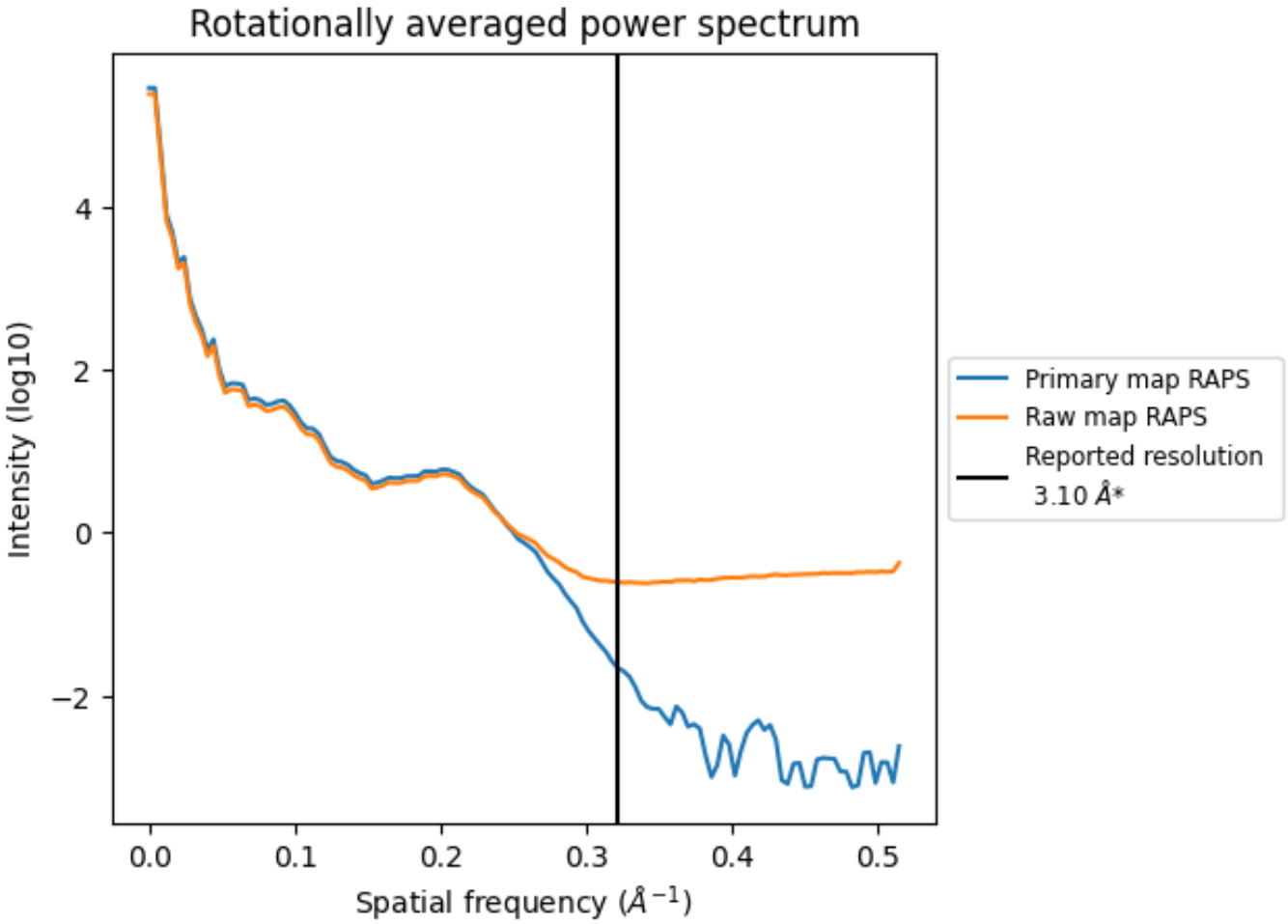
7.2 Volume estimate



The volume at the recommended contour level is 269 nm^3; this corresponds to an approximate mass of 243 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)

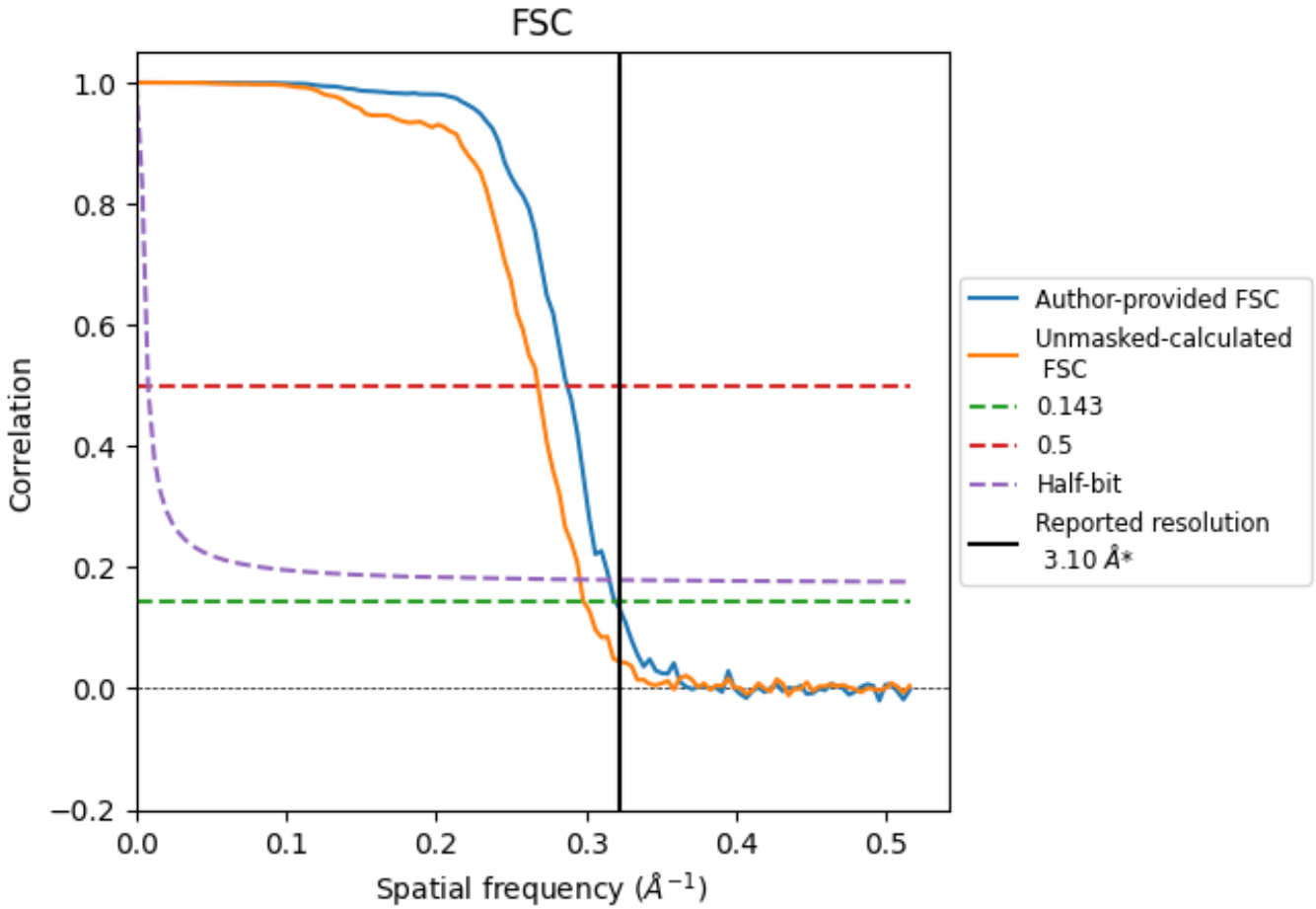


*Reported resolution corresponds to spatial frequency of 0.323 $Å^{-1}$

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 0.323 Å^{-1}

8.2 Resolution estimates (i)

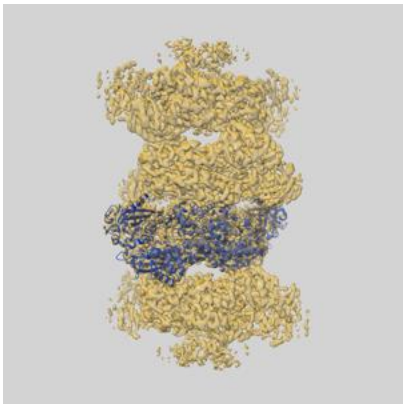
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	3.13	3.48	3.17
Unmasked-calculated*	3.35	3.74	3.38

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

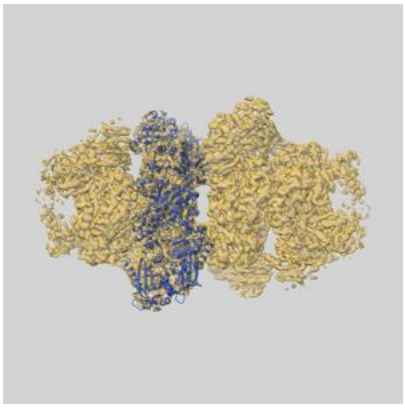
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-60416 and PDB model 8ZSI. Per-residue inclusion information can be found in section 3 on page 7.

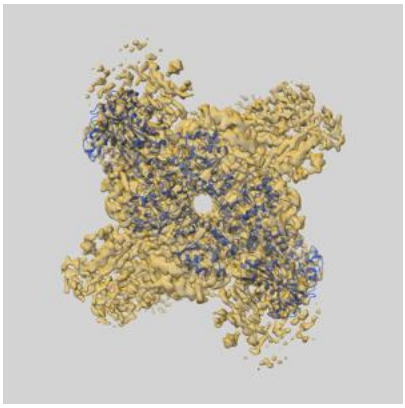
9.1 Map-model overlay



X



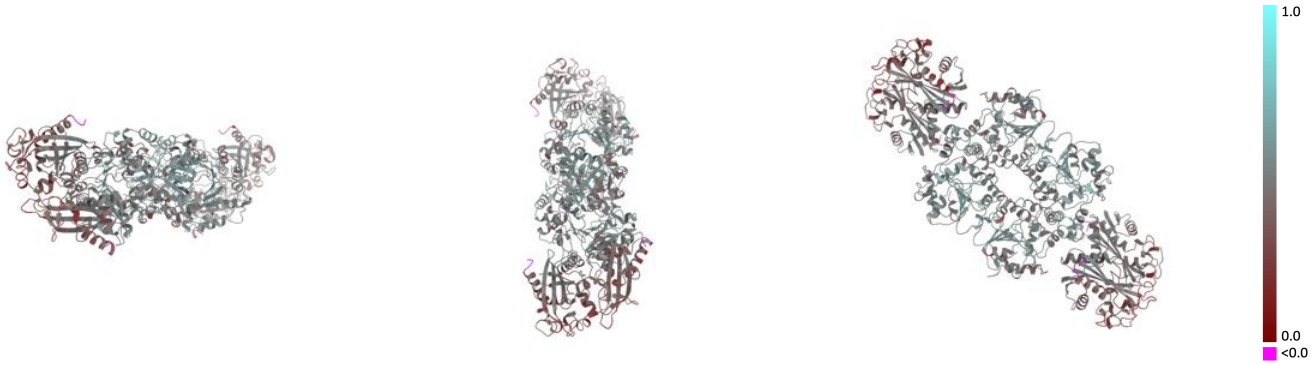
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0045 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.

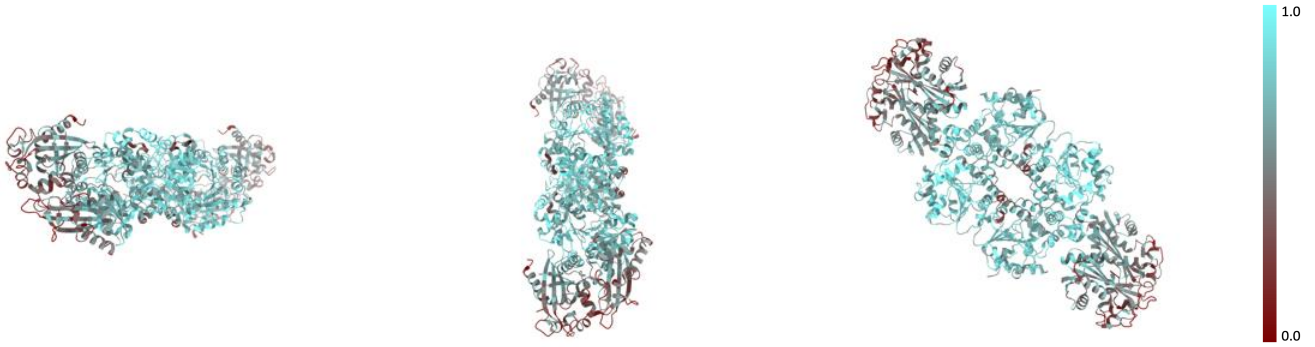
9.2 Q-score mapped to coordinate model (i)



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.

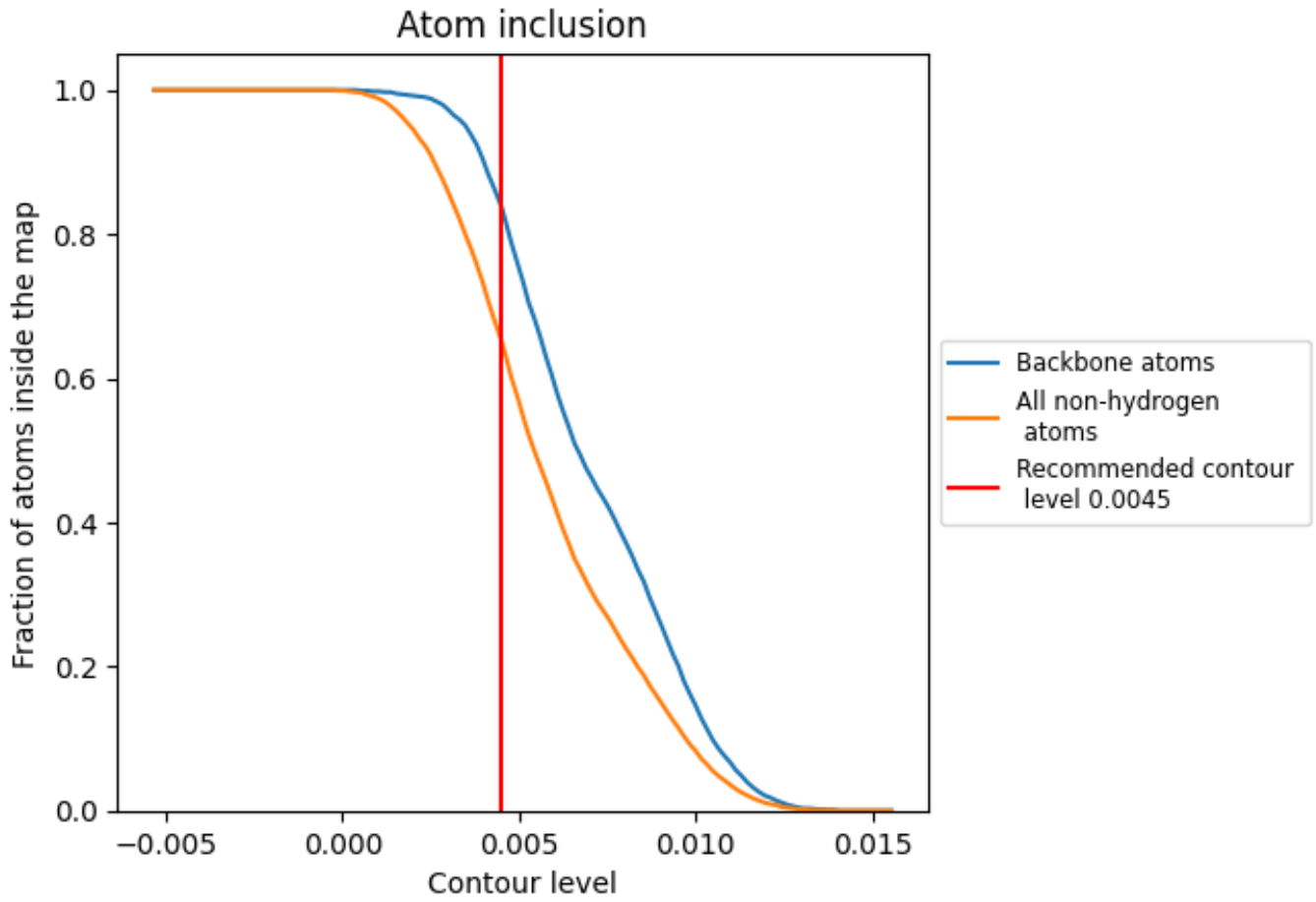
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0045).

9.4 Atom inclusion (i)



At the recommended contour level, 84% of all backbone atoms, 65% 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 (0.0045) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6520	0.4580
A	0.4830	0.3920
B	0.4790	0.3880
C	0.4670	0.3850
D	0.4840	0.3910
E	0.7740	0.5050
F	0.7730	0.5030
G	0.7700	0.5050
H	0.7730	0.5060