



## Full wwPDB EM Validation Report ⓘ

Nov 12, 2024 – 06:49 AM JST

PDB ID : 8XL0  
EMDB ID : EMD-38433  
Title : Citrate-induced filament of human acetyl-coenzyme A carboxylase 1 (ACC1-citrate)  
Authors : Zhou, F.Y.; Zhang, Y.Y.; Zhou, Q.; Hu, Q.  
Deposited on : 2023-12-25  
Resolution : 4.14 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](mailto: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>.

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

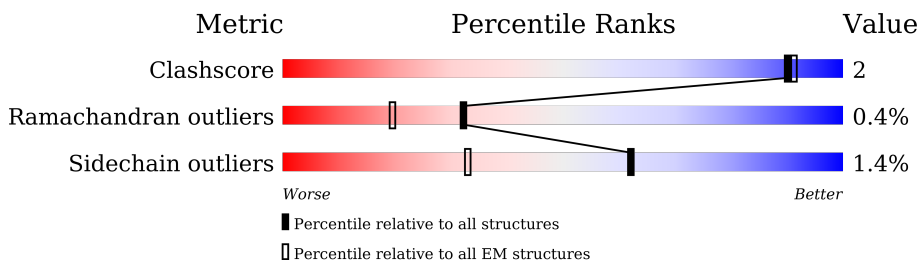
EMDB validation analysis : 0.0.1.dev113  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

# 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 4.14 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2346	
1	B	2346	
1	C	2346	
1	D	2346	
1	E	2346	
1	F	2346	

## 2 Entry composition [i](#)

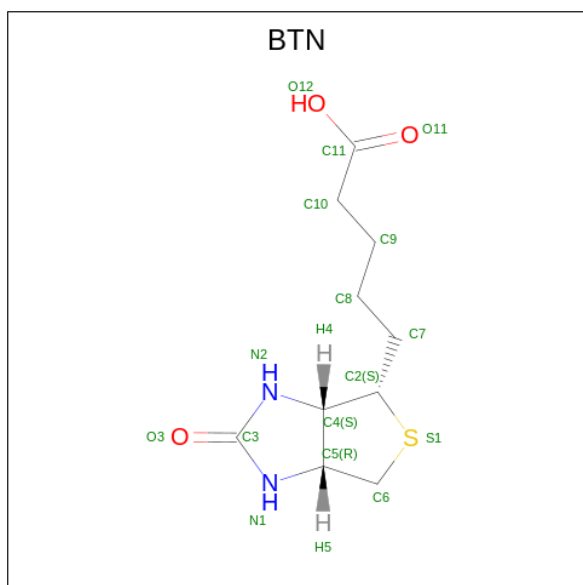
There are 2 unique types of molecules in this entry. The entry contains 93175 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Acetyl-CoA carboxylase 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2146	Total 17120	C 10879	N 2976	O 3166	S 99	0	0
1	B	2146	Total 17120	C 10879	N 2976	O 3166	S 99	0	0
1	C	2146	Total 17120	C 10879	N 2976	O 3166	S 99	0	0
1	D	2146	Total 17120	C 10879	N 2976	O 3166	S 99	0	0
1	E	1819	Total 14435	C 9170	N 2503	O 2676	S 86	0	0
1	F	1289	Total 10185	C 6478	N 1764	O 1890	S 53	0	0

- Molecule 2 is BIOTIN (three-letter code: BTN) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>2</sub>O<sub>3</sub>S) (labeled as "Ligand of Interest" by depositor).

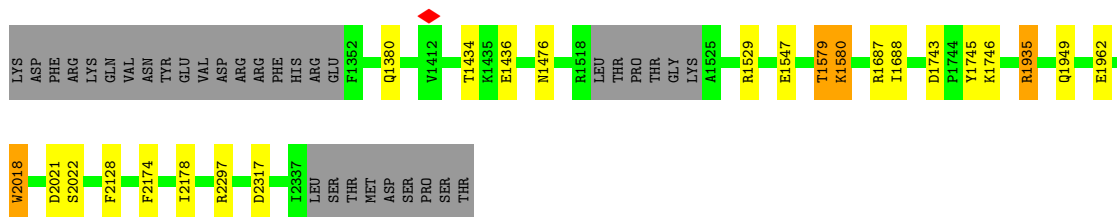


<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>					<b>AltConf</b>
2	A	1	Total 15	C 10	N 2	O 2	S 1	0
2	B	1	Total 15	C 10	N 2	O 2	S 1	0
2	C	1	Total 15	C 10	N 2	O 2	S 1	0
2	D	1	Total 15	C 10	N 2	O 2	S 1	0
2	E	1	Total 15	C 10	N 2	O 2	S 1	0

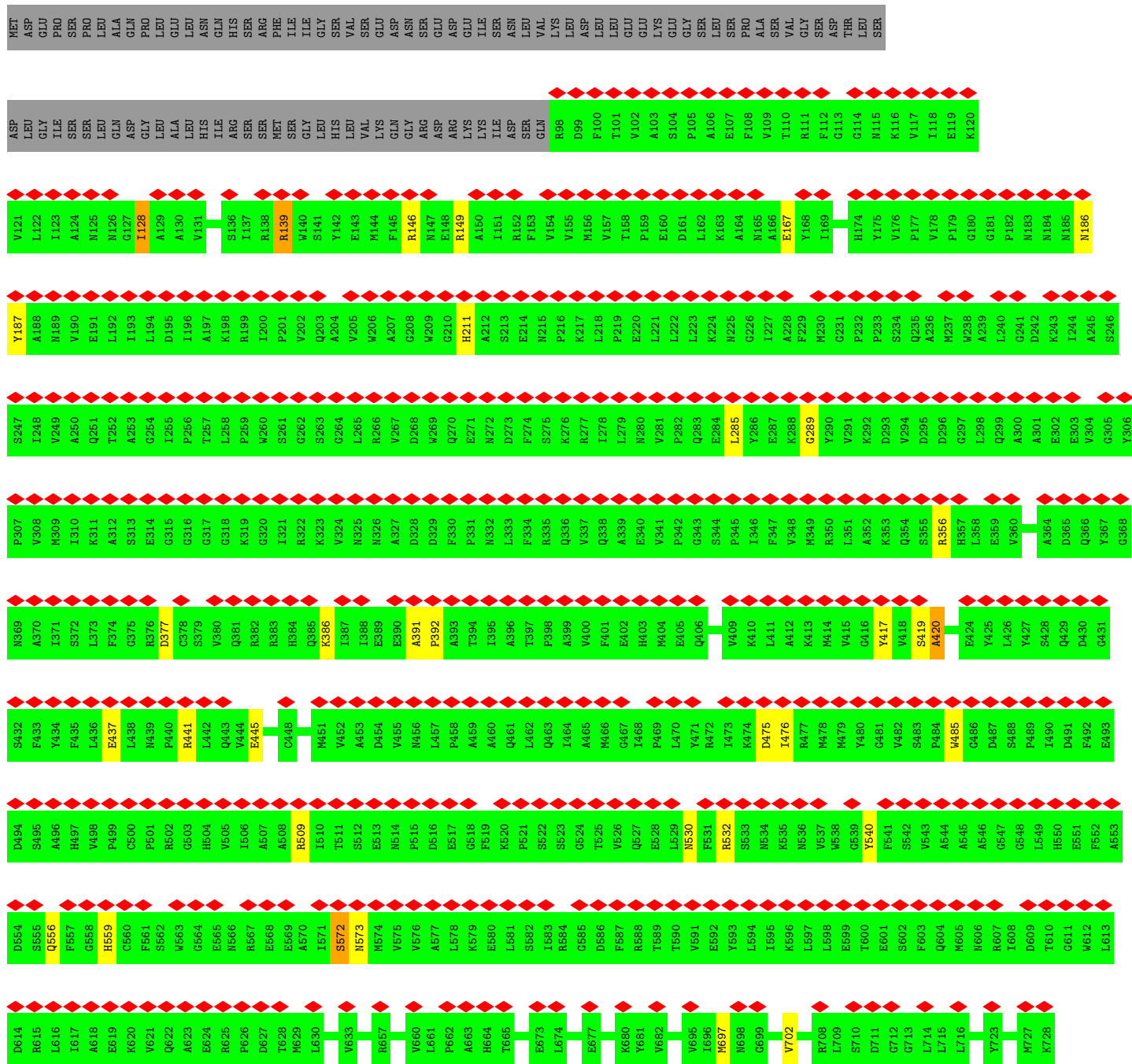
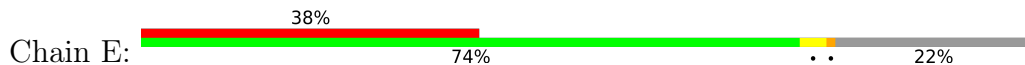




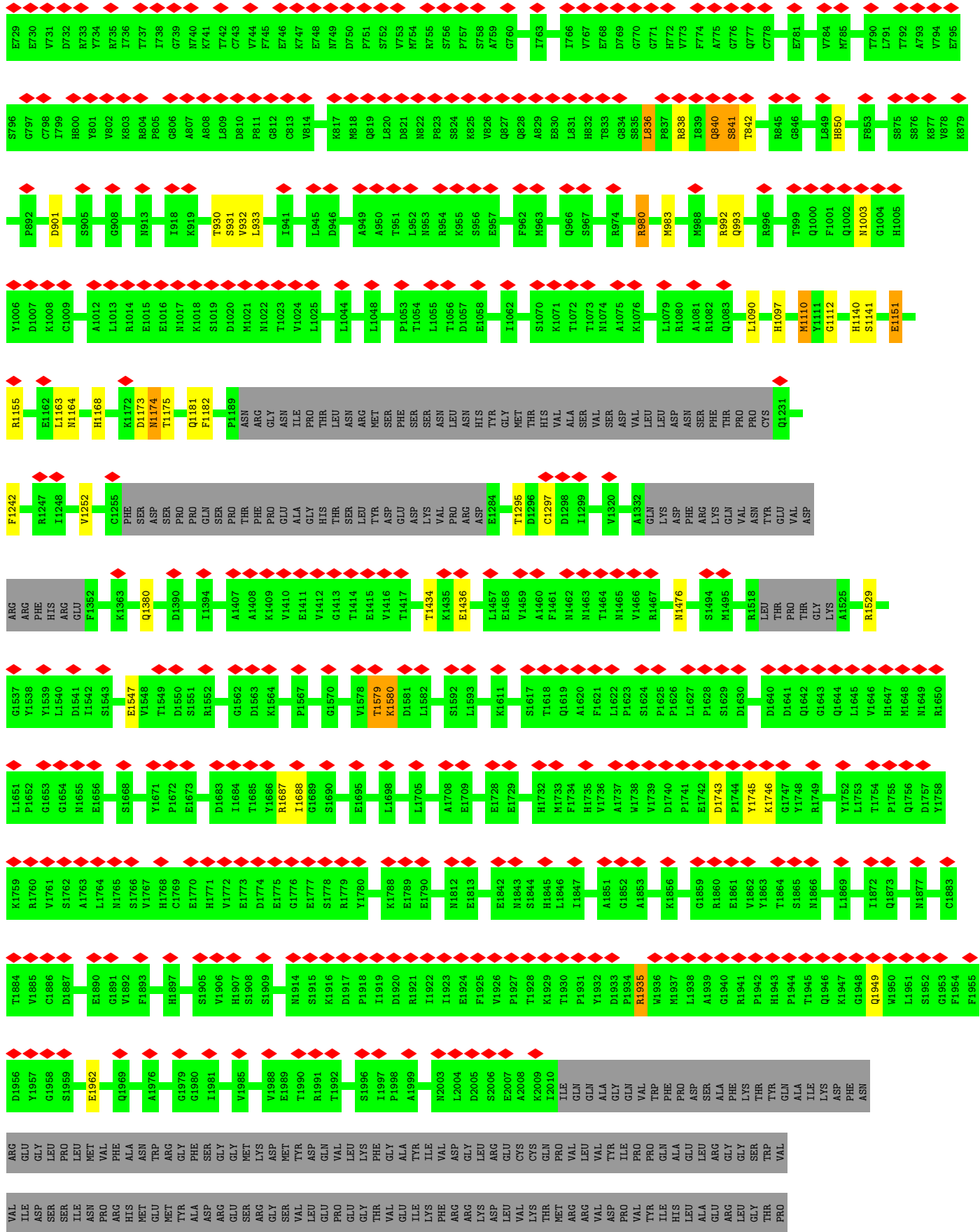




• Molecule 1: Acetyl-CoA carboxylase 1











E1728	E1729	I1730	R1731	H1732	M1733	F1734	H1735	V1736	A1737	M1738	V1739	D1740	P1741	E1742	D1743	P1744	Y1745	K1746	G1747	Y1748	R1749	Y1750	L1751	Y1752	L1753	T1754	P1755	Q1756	D1757	Y1758	K1759	R1760	V1761	S1762	A1763	L1764	M1765	S1766	V1767	H1768	C1769	E1770	H1771	V1772	E1773	D1774	E1775	G1776	E1777	S1778	R1779	Y1780	K1781	I1782	T1783	D1784	I1785	G1787											
K1788	E1789	E1790	G1791	I1792	G1793	P1794	R1798	G1799	A1810	E1813	L1819	V1820	T1821	C1822	R1823	Y1824	Q1840	V1841	E1842	N1843	S1844	H1845	A1851	G1852	A1853	L1854	N1855	K1856	V1857	L1858	G1859	R1860	E1861	T1864	S1865	N1866	N1867	Q1868	L1869	I1872	Q1873	T1884	V1885	C1886	D1887	F1888	E1890	G1891	V1892																				
F1893	K1904	H1907	S1908	L1913	M1914	S1915	K1916	D1917	P1918	I1919	D1920	R1921	I1922	I1923	E1924	F1925	V1926	P1927	T1928	K1929	T1930	P1931	Y1932	D1933	P1934	R1935	W1936	M1937	L1938	A1939	G1940	R1941	P1942	H1943	P1944	T1945	Q1946	K1947	G1948	Q1949	W1950	L1951	S1952	G1953	F1954	Y1957	E1962	L1978	G1979	G1984	E1989																		
T1990	R1991	N2003	L2004	D2005	S2006	E2007	A2008	K2009	I2010	I2011	Q2012	Q2013	A2014	Q2015	Q2016	V2017	W2018	D2021	S2022	E2036	M2041	A2044	K2054	Q2059	V2068	D2069	G2070	C2075	I2082	P2083	P2084	Q2085	A2086	S2092	W2101	P2102	R2103	D2110	R2111	V2117	L2118	E2121	G2122	T2123																									
I2126	K2127	F2128	R2129	R2130	K2131	D2132	L2133	V2134	K2135	P2142	V2143	Y2144	I2145	H2146	L2147	A2148	E2149	R2150	L2151	G2152	T2153	P2154	E2155	L2156	S2157	T2158	A2159	E2160	R2161	K2162	E2163	L2168	K2169	E2170	F2174	P2177	L2178	Q2181	T2192	P2193	G2194	Q2197	E2198	K2199	S2203	D2204	I2205	L2206	D2207	W2208																			
K2209	T2210	S2211	F2214	F2215	Y2216	W2217	R2218	L2219	R2220	R2221	HIS	L2222	L2223	VAL	L2224	E2225	D2226	L2227	W2228	K2229	K2230	K2231	R2232	H2233	N2234	A2235	N2236	P2237	GLU	LEU	THR	ASP	GLY	GLN	ALA	ILE	ASN	PRO	GLU	ALA	VAL	LEU	ARG	ASP	TRP	PHE	VAL	GLU	VAL	GLU	THR	GLY	HIS	VAL	LEU	PRO	ALA	THR											
GLN	ARG	ALA	GLU	TRP	LEU	GLU	LYS	GLN	LEU	THR	THR	GLU	GLU	ASP	GLY	VAL	HIS	SER	L2222	SER	L2223	VAL	ILE	GLU	ASN	L2227	ILE	LYS	CYS	ILE	SER	K2231	ARG	ASP	TYR	VAL	LEU	LYS	GLN	ILE	ARG	SER	LEU	VAL	GLN	GLY	ALA	ILE	ASN	PRO	GLU	VAL	LEU	ARG	ASP	TRP	PHE	VAL	GLU	VAL	GLU	THR	GLY	HIS	VAL	LEU	PRO	ALA	THR

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	36041	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.719	Depositor
Minimum map value	-0.669	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.047	Depositor
Recommended contour level	0.2	Depositor
Map size (Å)	525.72235, 525.72235, 525.72235	wwPDB
Map dimensions	488, 488, 488	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.0773, 1.0773, 1.0773	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

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	0.49	1/17490 (0.0%)	0.59	0/23691
1	B	0.49	1/17490 (0.0%)	0.58	0/23691
1	C	0.49	1/17490 (0.0%)	0.59	0/23691
1	D	0.49	1/17490 (0.0%)	0.58	0/23691
1	E	0.49	0/14745	0.59	0/19979
1	F	0.55	1/10423 (0.0%)	0.60	0/14139
All	All	0.50	5/95128 (0.0%)	0.59	0/128882

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	4
1	B	0	4
1	C	0	4
1	D	0	4
1	E	0	4
1	F	0	2
All	All	0	22

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	2018	TRP	C-N	-5.87	1.20	1.34
1	F	2018	TRP	C-N	-5.87	1.20	1.34
1	B	2018	TRP	C-N	-5.83	1.20	1.34
1	A	2018	TRP	C-N	-5.42	1.21	1.34
1	C	2018	TRP	C-N	-5.41	1.21	1.34

There are no bond angle outliers.

There are no chirality outliers.

All (22) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1140	HIS	Peptide
1	A	1579	THR	Mainchain
1	A	1687	ARG	Peptide
1	A	419	SER	Mainchain
1	B	1140	HIS	Peptide
1	B	1579	THR	Mainchain
1	B	1687	ARG	Peptide
1	B	419	SER	Mainchain
1	C	1140	HIS	Peptide
1	C	1579	THR	Mainchain
1	C	1687	ARG	Peptide
1	C	419	SER	Mainchain
1	D	1140	HIS	Peptide
1	D	1579	THR	Mainchain
1	D	1687	ARG	Peptide
1	D	419	SER	Mainchain
1	E	1140	HIS	Peptide
1	E	1579	THR	Mainchain
1	E	1687	ARG	Peptide
1	E	419	SER	Mainchain
1	F	1687	ARG	Peptide
1	F	419	SER	Mainchain

## 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	17120	0	17047	48	0
1	B	17120	0	17046	83	0
1	C	17120	0	17047	71	0
1	D	17120	0	17046	73	0
1	E	14435	0	14365	79	0
1	F	10185	0	10085	20	0
2	A	15	0	15	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	15	0	15	1	0
2	C	15	0	15	0	0
2	D	15	0	15	0	0
2	E	15	0	15	0	0
All	All	93175	0	92711	290	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 (290) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:930:THR:HG22	1:E:1168:HIS:HB2	1.23	1.10
1:D:1168:HIS:HB2	1:E:930:THR:HG22	1.44	0.99
1:B:1168:HIS:HB2	1:C:930:THR:HG22	1.51	0.92
1:B:930:THR:HG22	1:C:1168:HIS:HB2	1.49	0.92
1:B:933:LEU:HG	1:C:1151:GLU:OE1	1.72	0.89
1:B:1110:MET:HG2	1:C:980:ARG:HH22	1.40	0.84
1:E:840:GLN:O	1:E:841:SER:HB3	1.78	0.83
1:B:1168:HIS:HD2	1:B:1178:VAL:HG22	1.43	0.83
1:B:931:SER:HA	1:C:1168:HIS:ND1	1.96	0.80
1:B:1110:MET:HB3	1:C:980:ARG:NH2	1.97	0.80
1:D:980:ARG:HD2	1:E:1112:GLY:O	1.83	0.79
1:B:931:SER:HA	1:C:1168:HIS:CE1	2.20	0.77
1:D:933:LEU:HG	1:E:1151:GLU:OE1	1.88	0.74
1:A:702:VAL:HB	1:A:836:LEU:HD12	1.70	0.74
1:B:697:MET:HB3	1:B:836:LEU:CD2	2.18	0.73
1:B:836:LEU:N	1:B:836:LEU:HD23	2.03	0.73
1:D:980:ARG:NH2	1:E:1110:MET:HB3	2.04	0.73
1:E:836:LEU:HD23	1:E:836:LEU:N	2.03	0.73
1:B:930:THR:O	1:C:1168:HIS:ND1	2.20	0.73
1:B:838:ARG:HG2	1:B:838:ARG:O	1.89	0.72
1:B:1168:HIS:HD2	1:B:1178:VAL:CG2	2.02	0.72
1:C:139:ARG:NH1	1:D:573:ASN:OD1	2.23	0.71
1:E:139:ARG:NH1	1:F:573:ASN:OD1	2.23	0.71
1:A:139:ARG:NH1	1:B:573:ASN:OD1	2.23	0.71
1:B:931:SER:HA	1:C:1168:HIS:HD1	1.52	0.71
1:E:573:ASN:OD1	1:F:139:ARG:NH1	2.24	0.71
1:B:1110:MET:CG	1:C:980:ARG:HH22	2.04	0.70
1:C:573:ASN:OD1	1:D:139:ARG:NH1	2.24	0.70
1:A:573:ASN:OD1	1:B:139:ARG:NH1	2.24	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:1110:MET:HG2	1:E:980:ARG:NH2	2.06	0.70
1:B:697:MET:HB3	1:B:836:LEU:HD21	1.74	0.70
1:E:838:ARG:O	1:E:838:ARG:HG3	1.90	0.70
1:E:1743:ASP:OD2	1:E:1746:LYS:NZ	2.25	0.69
1:C:1743:ASP:OD2	1:C:1746:LYS:NZ	2.25	0.69
1:D:930:THR:CG2	1:E:1168:HIS:HB2	2.15	0.68
1:B:930:THR:O	1:C:1168:HIS:HB2	1.93	0.68
1:D:1743:ASP:OD2	1:D:1746:LYS:NZ	2.26	0.68
1:F:1743:ASP:OD2	1:F:1746:LYS:NZ	2.26	0.68
1:A:1743:ASP:OD2	1:A:1746:LYS:NZ	2.25	0.68
1:B:1743:ASP:OD2	1:B:1746:LYS:NZ	2.26	0.67
1:D:931:SER:HA	1:E:1168:HIS:ND1	2.09	0.67
1:D:931:SER:HA	1:E:1168:HIS:HD1	1.58	0.67
1:B:1151:GLU:OE1	1:C:933:LEU:HG	1.93	0.67
1:D:1935:ARG:NH1	1:D:1962:GLU:OE1	2.28	0.67
1:D:697:MET:HB3	1:D:836:LEU:CD2	2.25	0.67
1:B:1935:ARG:NH1	1:B:1962:GLU:OE1	2.28	0.67
1:E:836:LEU:HD23	1:E:836:LEU:H	1.58	0.67
1:F:1935:ARG:NH1	1:F:1962:GLU:OE1	2.28	0.67
1:D:980:ARG:HH22	1:E:1110:MET:HG2	1.62	0.65
1:B:1110:MET:HB3	1:C:980:ARG:HH22	1.59	0.65
1:C:837:PRO:O	1:C:838:ARG:HB3	1.97	0.65
1:D:391:ALA:HB3	1:D:392:PRO:HD3	1.79	0.65
1:E:980:ARG:HH11	1:E:983:MET:CE	2.10	0.64
1:F:391:ALA:HB3	1:F:392:PRO:HD3	1.79	0.64
1:B:391:ALA:HB3	1:B:392:PRO:HD3	1.79	0.64
1:E:697:MET:HB3	1:E:836:LEU:CD2	2.26	0.64
1:A:391:ALA:HB3	1:A:392:PRO:HD3	1.80	0.64
1:B:836:LEU:HD23	1:B:836:LEU:H	1.61	0.64
1:E:391:ALA:HB3	1:E:392:PRO:HD3	1.80	0.64
1:A:1935:ARG:NH1	1:A:1962:GLU:OE1	2.31	0.64
1:D:980:ARG:CD	1:E:1112:GLY:O	2.46	0.64
1:D:931:SER:HA	1:E:1168:HIS:CE1	2.32	0.63
1:D:980:ARG:HH22	1:E:1110:MET:HB3	1.61	0.63
1:D:1151:GLU:OE1	1:E:933:LEU:HG	1.99	0.63
1:D:697:MET:HB3	1:D:836:LEU:HD21	1.81	0.63
1:E:1935:ARG:NH1	1:E:1962:GLU:OE1	2.31	0.63
1:C:1935:ARG:NH1	1:C:1962:GLU:OE1	2.31	0.62
1:C:391:ALA:HB3	1:C:392:PRO:HD3	1.80	0.62
1:B:1151:GLU:OE2	1:C:931:SER:HB2	2.01	0.61
1:D:930:THR:HG21	1:E:1168:HIS:O	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:838:ARG:N	1:A:838:ARG:HD3	2.16	0.60
1:B:836:LEU:O	1:B:837:PRO:O	2.19	0.60
1:D:1168:HIS:HD1	1:E:931:SER:HA	1.66	0.60
1:B:933:LEU:CG	1:C:1151:GLU:OE1	2.49	0.60
1:F:128:ILE:HD11	1:F:556:GLN:O	2.02	0.60
1:B:1110:MET:CB	1:C:980:ARG:HH22	2.15	0.60
1:D:933:LEU:HD12	1:E:1155:ARG:NE	2.17	0.60
1:B:1168:HIS:CD2	1:B:1178:VAL:HG22	2.32	0.59
1:D:128:ILE:HD11	1:D:556:GLN:O	2.02	0.59
1:D:1110:MET:HG2	1:E:980:ARG:HH22	1.67	0.59
1:D:186:ASN:OD1	1:D:187:TYR:N	2.36	0.59
1:A:838:ARG:HH21	1:A:838:ARG:HG3	1.67	0.58
1:B:128:ILE:HD11	1:B:556:GLN:O	2.02	0.58
1:F:186:ASN:OD1	1:F:187:TYR:N	2.36	0.58
1:B:186:ASN:OD1	1:B:187:TYR:N	2.36	0.58
1:C:186:ASN:OD1	1:C:187:TYR:N	2.37	0.58
1:A:186:ASN:OD1	1:A:187:TYR:N	2.37	0.57
1:D:836:LEU:HD23	1:D:836:LEU:H	1.69	0.57
1:E:186:ASN:OD1	1:E:187:TYR:N	2.37	0.57
1:A:128:ILE:HD11	1:A:556:GLN:O	2.05	0.57
1:A:356:ARG:NH1	1:A:377:ASP:OD2	2.38	0.57
1:E:1579:THR:O	1:E:1579:THR:OG1	2.21	0.57
1:D:1168:HIS:ND1	1:E:931:SER:HA	2.20	0.56
1:D:932:VAL:CG2	1:E:1151:GLU:OE1	2.53	0.56
1:E:356:ARG:NH1	1:E:377:ASP:OD2	2.38	0.56
1:E:386:LYS:NZ	1:E:445:GLU:OE2	2.38	0.56
1:C:356:ARG:NH1	1:C:377:ASP:OD2	2.38	0.56
1:C:128:ILE:HD11	1:C:556:GLN:O	2.05	0.56
1:E:285:LEU:O	1:E:289:GLY:N	2.38	0.56
1:A:386:LYS:NZ	1:A:445:GLU:OE2	2.38	0.56
1:A:702:VAL:HB	1:A:836:LEU:CD1	2.36	0.56
1:C:386:LYS:NZ	1:C:445:GLU:OE2	2.38	0.56
1:D:930:THR:O	1:E:1168:HIS:ND1	2.37	0.56
1:E:128:ILE:HD11	1:E:556:GLN:O	2.05	0.55
1:D:932:VAL:HG22	1:E:1151:GLU:OE1	2.06	0.55
1:A:837:PRO:O	1:A:838:ARG:HB3	2.06	0.55
1:A:167:GLU:OE2	1:B:532:ARG:NH1	2.40	0.55
1:C:167:GLU:OE2	1:D:532:ARG:NH1	2.40	0.55
1:E:167:GLU:OE2	1:F:532:ARG:NH1	2.40	0.55
1:E:980:ARG:HH11	1:E:983:MET:HE1	1.70	0.55
1:A:285:LEU:O	1:A:289:GLY:N	2.38	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:980:ARG:HH21	1:B:980:ARG:CG	2.19	0.55
1:B:285:LEU:O	1:B:289:GLY:N	2.40	0.54
1:E:697:MET:HB3	1:E:836:LEU:HD21	1.89	0.54
1:C:285:LEU:O	1:C:289:GLY:N	2.38	0.54
1:C:836:LEU:O	1:C:837:PRO:O	2.26	0.54
1:E:980:ARG:NH1	1:E:983:MET:CE	2.70	0.54
1:B:837:PRO:O	1:B:838:ARG:HB3	2.07	0.53
1:B:980:ARG:NH2	1:C:1110:MET:HB3	2.23	0.53
1:B:931:SER:CA	1:C:1168:HIS:HD1	2.21	0.53
1:D:785:MET:O	1:D:786:LYS:HB2	2.09	0.53
1:A:1174:ASN:OD1	1:A:1174:ASN:N	2.42	0.53
1:B:838:ARG:C	1:B:839:ILE:HG13	2.29	0.53
1:F:285:LEU:O	1:F:289:GLY:N	2.40	0.53
1:C:1174:ASN:N	1:C:1174:ASN:OD1	2.42	0.52
1:D:1110:MET:HG2	1:E:980:ARG:CZ	2.39	0.52
1:E:1174:ASN:N	1:E:1174:ASN:OD1	2.42	0.52
1:D:285:LEU:O	1:D:289:GLY:N	2.40	0.52
1:D:980:ARG:HH22	1:E:1110:MET:CG	2.23	0.51
1:A:702:VAL:HG12	1:A:836:LEU:HD13	1.92	0.51
1:B:785:MET:O	1:B:786:LYS:HB2	2.09	0.51
1:D:1168:HIS:CE1	1:E:931:SER:HA	2.46	0.51
1:F:386:LYS:NZ	1:F:445:GLU:OE2	2.43	0.51
1:A:850:HIS:NE2	1:A:901:ASP:OD2	2.43	0.51
1:E:850:HIS:NE2	1:E:901:ASP:OD2	2.42	0.51
1:B:1174:ASN:OD1	1:B:1174:ASN:N	2.44	0.51
1:B:930:THR:O	1:C:1168:HIS:CB	2.59	0.51
1:D:386:LYS:NZ	1:D:445:GLU:OE2	2.43	0.51
1:D:1174:ASN:OD1	1:D:1174:ASN:N	2.44	0.51
1:B:850:HIS:NE2	1:B:901:ASP:OD2	2.44	0.51
1:B:386:LYS:NZ	1:B:445:GLU:OE2	2.43	0.50
1:B:475:ASP:OD1	1:B:476:ILE:N	2.45	0.50
1:F:2021:ASP:OD1	1:F:2022:SER:N	2.44	0.50
1:A:128:ILE:HD11	1:A:556:GLN:HG3	1.93	0.50
1:A:702:VAL:CG1	1:A:836:LEU:HD13	2.42	0.50
1:D:2021:ASP:OD1	1:D:2022:SER:N	2.44	0.50
1:E:128:ILE:HD11	1:E:556:GLN:HG3	1.94	0.50
1:F:475:ASP:OD1	1:F:476:ILE:N	2.45	0.49
1:B:2021:ASP:OD1	1:B:2022:SER:N	2.44	0.49
1:B:1579:THR:O	1:B:1579:THR:OG1	2.21	0.49
1:C:532:ARG:NH1	1:D:167:GLU:OE2	2.45	0.49
1:F:128:ILE:HD11	1:F:556:GLN:HG3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:475:ASP:OD1	1:D:476:ILE:N	2.45	0.49
1:D:980:ARG:HH22	1:E:1110:MET:CB	2.24	0.49
1:C:128:ILE:HD11	1:C:556:GLN:HG3	1.94	0.49
1:B:718:TYR:OH	1:B:837:PRO:HG2	2.13	0.49
1:E:532:ARG:NH1	1:F:167:GLU:OE2	2.45	0.49
1:A:702:VAL:HG12	1:A:836:LEU:CD1	2.43	0.49
1:B:128:ILE:HD11	1:B:556:GLN:HG3	1.95	0.49
1:A:532:ARG:NH1	1:B:167:GLU:OE2	2.45	0.49
1:D:850:HIS:NE2	1:D:901:ASP:OD2	2.44	0.48
1:E:1380:GLN:O	1:E:1476:ASN:ND2	2.46	0.48
1:B:356:ARG:NH1	1:B:377:ASP:OD2	2.46	0.48
1:C:1380:GLN:O	1:C:1476:ASN:ND2	2.46	0.48
1:C:2317:ASP:OD2	1:D:2297:ARG:NH2	2.46	0.48
1:A:1003:ASN:O	1:A:1003:ASN:ND2	2.46	0.48
1:B:702:VAL:HG12	1:B:836:LEU:HD12	1.94	0.48
1:D:128:ILE:HD11	1:D:556:GLN:HG3	1.95	0.48
1:B:930:THR:CG2	1:C:1168:HIS:HB2	2.33	0.48
1:C:1295:THR:O	1:C:1297:CYS:N	2.47	0.48
1:D:836:LEU:HD23	1:D:836:LEU:N	2.27	0.48
1:A:2317:ASP:OD2	1:B:2297:ARG:NH2	2.46	0.48
1:D:356:ARG:NH1	1:D:377:ASP:OD2	2.47	0.48
1:E:1745:TYR:OH	1:F:2174:PHE:O	2.30	0.48
1:A:702:VAL:CG1	1:A:836:LEU:CD1	2.92	0.48
1:A:139:ARG:NH2	1:B:572:SER:OG	2.47	0.48
1:A:2174:PHE:O	1:B:1745:TYR:OH	2.31	0.48
1:C:139:ARG:NH2	1:D:572:SER:OG	2.47	0.48
1:D:1175:THR:HG21	1:D:1252:VAL:HG12	1.96	0.48
1:E:697:MET:HB3	1:E:836:LEU:HD22	1.95	0.48
1:A:1579:THR:O	1:A:1579:THR:OG1	2.21	0.47
1:F:356:ARG:NH1	1:F:377:ASP:OD2	2.47	0.47
1:A:1745:TYR:OH	1:B:2174:PHE:O	2.30	0.47
1:D:509:ARG:HB2	1:D:556:GLN:OE1	2.15	0.47
1:E:139:ARG:NH2	1:F:572:SER:OG	2.47	0.47
1:D:980:ARG:CG	1:D:980:ARG:HH21	2.26	0.47
1:C:1003:ASN:O	1:C:1003:ASN:ND2	2.46	0.47
1:C:1579:THR:O	1:C:1579:THR:OG1	2.21	0.47
1:C:2021:ASP:OD1	1:C:2022:SER:N	2.47	0.47
1:D:930:THR:HG22	1:E:1168:HIS:CB	2.17	0.47
1:B:509:ARG:HB2	1:B:556:GLN:OE1	2.15	0.47
1:B:980:ARG:CG	1:B:980:ARG:NH2	2.76	0.47
1:B:838:ARG:O	1:B:839:ILE:CG1	2.63	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1295:THR:O	1:A:1297:CYS:N	2.47	0.47
1:C:850:HIS:NE2	1:C:901:ASP:OD2	2.43	0.47
1:F:509:ARG:HB2	1:F:556:GLN:OE1	2.15	0.47
1:B:1175:THR:HG21	1:B:1252:VAL:HG12	1.96	0.46
1:A:2021:ASP:OD1	1:A:2022:SER:N	2.47	0.46
1:B:697:MET:HB3	1:B:836:LEU:HD22	1.94	0.46
1:B:1003:ASN:O	1:B:1003:ASN:ND2	2.48	0.46
1:E:841:SER:O	1:E:842:THR:OG1	2.30	0.46
1:C:2297:ARG:NH2	1:D:2317:ASP:OD2	2.47	0.46
1:D:932:VAL:HG22	1:E:1151:GLU:CD	2.35	0.46
1:E:836:LEU:H	1:E:836:LEU:CD2	2.22	0.46
1:A:475:ASP:OD1	1:A:476:ILE:N	2.49	0.46
1:A:2297:ARG:NH2	1:B:2317:ASP:OD2	2.47	0.46
1:C:1745:TYR:OH	1:D:2174:PHE:O	2.30	0.46
1:B:1168:HIS:HB2	1:C:930:THR:CG2	2.34	0.45
1:E:1434:THR:HG22	1:E:1436:GLU:H	1.81	0.45
1:D:1380:GLN:O	1:D:1476:ASN:ND2	2.48	0.45
1:D:1579:THR:O	1:D:1579:THR:OG1	2.21	0.45
1:E:417:TYR:OH	1:E:420:ALA:O	2.23	0.45
1:E:1003:ASN:O	1:E:1003:ASN:ND2	2.46	0.45
1:A:1434:THR:HG22	1:A:1436:GLU:H	1.81	0.45
1:C:475:ASP:OD1	1:C:476:ILE:N	2.49	0.45
1:E:475:ASP:OD1	1:E:476:ILE:N	2.49	0.45
1:D:1003:ASN:ND2	1:D:1003:ASN:O	2.49	0.45
1:B:930:THR:HG22	1:C:1168:HIS:CB	2.34	0.45
1:D:1168:HIS:O	1:E:930:THR:HG21	2.16	0.45
1:A:1380:GLN:O	1:A:1476:ASN:ND2	2.46	0.45
1:C:2174:PHE:O	1:D:1745:TYR:OH	2.31	0.45
1:C:128:ILE:HG22	1:C:540:TYR:CE2	2.52	0.44
1:E:1175:THR:HG21	1:E:1252:VAL:HG12	1.99	0.44
1:A:128:ILE:HG22	1:A:540:TYR:CE2	2.52	0.44
1:C:391:ALA:HB3	1:C:392:PRO:CD	2.47	0.44
1:E:128:ILE:HG22	1:E:540:TYR:CE2	2.52	0.44
1:B:1380:GLN:O	1:B:1476:ASN:ND2	2.48	0.44
1:E:1295:THR:O	1:E:1297:CYS:N	2.47	0.44
1:B:930:THR:O	1:C:1168:HIS:CG	2.71	0.44
1:B:980:ARG:HH22	1:C:1110:MET:HB3	1.83	0.44
1:A:391:ALA:HB3	1:A:392:PRO:CD	2.47	0.44
1:B:1168:HIS:CD2	1:B:1178:VAL:CG2	2.91	0.44
1:C:836:LEU:H	1:C:836:LEU:HG	1.55	0.44
1:A:1175:THR:HG21	1:A:1252:VAL:HG12	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:1175:THR:HG21	1:C:1252:VAL:HG12	1.99	0.44
1:A:2110:ASP:OD1	1:A:2111:ARG:N	2.46	0.43
1:C:1434:THR:HG22	1:C:1436:GLU:H	1.81	0.43
1:A:1579:THR:O	1:A:1580:LYS:O	2.37	0.43
1:C:1163:LEU:HD23	1:C:1182:PHE:HB3	2.00	0.43
1:C:1579:THR:O	1:C:1580:LYS:O	2.36	0.43
1:E:391:ALA:HB3	1:E:392:PRO:CD	2.47	0.43
1:A:1163:LEU:HD23	1:A:1182:PHE:HB3	2.00	0.43
1:B:838:ARG:O	1:B:839:ILE:HG13	2.18	0.43
1:B:838:ARG:HH21	1:B:838:ARG:HG3	1.82	0.43
1:B:980:ARG:HD2	1:C:1112:GLY:O	2.18	0.43
1:D:1295:THR:O	1:D:1297:CYS:N	2.48	0.43
1:E:1579:THR:O	1:E:1580:LYS:O	2.36	0.43
1:A:509:ARG:HB2	1:A:556:GLN:OE1	2.19	0.42
1:A:1173:ASP:N	1:A:1173:ASP:OD1	2.53	0.42
1:B:1579:THR:O	1:B:1580:LYS:O	2.36	0.42
1:E:509:ARG:HB2	1:E:556:GLN:OE1	2.19	0.42
1:D:1579:THR:O	1:D:1580:LYS:O	2.36	0.42
1:E:572:SER:OG	1:F:139:ARG:NH2	2.53	0.42
1:E:1163:LEU:HD23	1:E:1182:PHE:HB3	2.00	0.42
1:B:1163:LEU:HD23	1:B:1182:PHE:HB3	2.01	0.42
1:B:1434:THR:HG22	1:B:1436:GLU:H	1.84	0.42
1:C:2110:ASP:OD1	1:C:2111:ARG:N	2.46	0.42
1:D:1163:LEU:HD23	1:D:1182:PHE:HB3	2.01	0.42
1:A:572:SER:OG	1:B:139:ARG:NH2	2.53	0.42
1:D:1434:THR:HG22	1:D:1436:GLU:H	1.84	0.42
1:B:836:LEU:O	1:B:837:PRO:C	2.58	0.42
1:C:572:SER:OG	1:D:139:ARG:NH2	2.53	0.41
1:C:702:VAL:CG1	1:C:836:LEU:HD13	2.49	0.41
1:C:509:ARG:HB2	1:C:556:GLN:OE1	2.19	0.41
1:E:980:ARG:NH1	1:E:983:MET:HE2	2.35	0.41
1:C:1173:ASP:N	1:C:1173:ASP:OD1	2.52	0.41
1:B:1295:THR:O	1:B:1297:CYS:N	2.48	0.41
1:C:980:ARG:HE	1:C:984:LYS:HE3	1.84	0.41
1:E:1164:ASN:ND2	1:E:1181:GLN:O	2.53	0.41
1:E:1173:ASP:N	1:E:1173:ASP:OD1	2.53	0.41
1:A:1164:ASN:ND2	1:A:1181:GLN:O	2.53	0.41
1:C:697:MET:HB3	1:C:836:LEU:HD23	2.02	0.41
1:D:128:ILE:HG22	1:D:540:TYR:CE2	2.56	0.41
1:E:702:VAL:HG12	1:E:836:LEU:HD12	2.01	0.41
1:A:1529:ARG:NH1	1:A:1547:GLU:OE2	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:980:ARG:HH21	1:B:980:ARG:HG3	1.85	0.41
1:C:1529:ARG:NH1	1:C:1547:GLU:OE2	2.54	0.41
1:F:128:ILE:HG22	1:F:540:TYR:CE2	2.56	0.41
1:B:128:ILE:HG22	1:B:540:TYR:CE2	2.56	0.41
1:A:838:ARG:HH21	1:A:838:ARG:CG	2.33	0.41
1:C:1164:ASN:ND2	1:C:1181:GLN:O	2.53	0.41
1:E:1529:ARG:NH1	1:E:1547:GLU:OE2	2.54	0.41
2:B:2401:BTN:H92	2:B:2401:BTN:H2	1.93	0.41
1:D:841:SER:O	1:D:842:THR:OG1	2.31	0.41
1:D:1173:ASP:N	1:D:1173:ASP:OD1	2.54	0.40
1:B:933:LEU:CD1	1:C:1151:GLU:OE1	2.69	0.40
1:D:1110:MET:HG2	1:E:980:ARG:NH1	2.36	0.40
1:D:1151:GLU:OE1	1:E:932:VAL:CG2	2.69	0.40
1:B:1168:HIS:ND1	1:C:931:SER:HA	2.37	0.40
1:D:1529:ARG:NH1	1:D:1547:GLU:OE2	2.55	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	2136/2346 (91%)	2005 (94%)	122 (6%)	9 (0%)	30	67
1	B	2136/2346 (91%)	1998 (94%)	130 (6%)	8 (0%)	30	67
1	C	2136/2346 (91%)	2004 (94%)	123 (6%)	9 (0%)	30	67
1	D	2136/2346 (91%)	2000 (94%)	129 (6%)	7 (0%)	37	71
1	E	1809/2346 (77%)	1691 (94%)	110 (6%)	8 (0%)	30	67
1	F	1285/2346 (55%)	1226 (95%)	57 (4%)	2 (0%)	44	77
All	All	11638/14076 (83%)	10924 (94%)	671 (6%)	43 (0%)	32	67

All (43) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	841	SER
1	A	1580	LYS
1	B	837	PRO
1	B	1580	LYS
1	C	837	PRO
1	C	841	SER
1	C	1580	LYS
1	D	1580	LYS
1	E	840	GLN
1	E	841	SER
1	E	1580	LYS
1	A	1242	PHE
1	A	1688	ILE
1	B	839	ILE
1	B	1242	PHE
1	B	1688	ILE
1	C	838	ARG
1	C	1242	PHE
1	C	1688	ILE
1	D	841	SER
1	D	1242	PHE
1	D	1688	ILE
1	E	1242	PHE
1	E	1688	ILE
1	F	1688	ILE
1	A	838	ARG
1	A	1141	SER
1	B	838	ARG
1	B	1141	SER
1	C	1141	SER
1	D	839	ILE
1	D	1141	SER
1	E	1141	SER
1	A	837	PRO
1	A	1949	GLN
1	B	1949	GLN
1	C	1949	GLN
1	D	1949	GLN
1	E	1949	GLN
1	F	1949	GLN
1	E	420	ALA
1	C	839	ILE
1	A	839	ILE



### 5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	1873/2057 (91%)	1846 (99%)	27 (1%)	62	75
1	B	1873/2057 (91%)	1845 (98%)	28 (2%)	60	75
1	C	1873/2057 (91%)	1847 (99%)	26 (1%)	62	75
1	D	1873/2057 (91%)	1847 (99%)	26 (1%)	62	75
1	E	1581/2057 (77%)	1560 (99%)	21 (1%)	65	77
1	F	1101/2057 (54%)	1085 (98%)	16 (2%)	60	75
All	All	10174/12342 (82%)	10030 (99%)	144 (1%)	62	75

All (144) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	128	ILE
1	A	139	ARG
1	A	146	ARG
1	A	149	ARG
1	A	211	HIS
1	A	437	GLU
1	A	441	ARG
1	A	485	TRP
1	A	530	ASN
1	A	559	HIS
1	A	572	SER
1	A	836	LEU
1	A	838	ARG
1	A	840	GLN
1	A	841	SER
1	A	980	ARG
1	A	992	ARG
1	A	993	GLN
1	A	1090	LEU
1	A	1097	HIS
1	A	1110	MET
1	A	1151	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	1174	ASN
1	A	1935	ARG
1	A	2018	TRP
1	A	2128	PHE
1	A	2178	ILE
1	B	128	ILE
1	B	139	ARG
1	B	146	ARG
1	B	149	ARG
1	B	174	HIS
1	B	211	HIS
1	B	437	GLU
1	B	441	ARG
1	B	485	TRP
1	B	530	ASN
1	B	559	HIS
1	B	572	SER
1	B	836	LEU
1	B	838	ARG
1	B	840	GLN
1	B	931	SER
1	B	980	ARG
1	B	992	ARG
1	B	993	GLN
1	B	1090	LEU
1	B	1097	HIS
1	B	1110	MET
1	B	1151	GLU
1	B	1174	ASN
1	B	1935	ARG
1	B	2018	TRP
1	B	2128	PHE
1	B	2178	ILE
1	C	128	ILE
1	C	139	ARG
1	C	146	ARG
1	C	149	ARG
1	C	211	HIS
1	C	437	GLU
1	C	441	ARG
1	C	485	TRP
1	C	530	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	C	559	HIS
1	C	572	SER
1	C	836	LEU
1	C	838	ARG
1	C	840	GLN
1	C	980	ARG
1	C	992	ARG
1	C	993	GLN
1	C	1090	LEU
1	C	1097	HIS
1	C	1110	MET
1	C	1151	GLU
1	C	1174	ASN
1	C	1935	ARG
1	C	2018	TRP
1	C	2128	PHE
1	C	2178	ILE
1	D	128	ILE
1	D	139	ARG
1	D	146	ARG
1	D	149	ARG
1	D	174	HIS
1	D	211	HIS
1	D	437	GLU
1	D	441	ARG
1	D	485	TRP
1	D	530	ASN
1	D	559	HIS
1	D	572	SER
1	D	836	LEU
1	D	931	SER
1	D	980	ARG
1	D	992	ARG
1	D	993	GLN
1	D	1090	LEU
1	D	1097	HIS
1	D	1110	MET
1	D	1151	GLU
1	D	1174	ASN
1	D	1935	ARG
1	D	2018	TRP
1	D	2128	PHE

*Continued on next page...*

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	D	2178	ILE
1	E	128	ILE
1	E	139	ARG
1	E	146	ARG
1	E	149	ARG
1	E	211	HIS
1	E	437	GLU
1	E	441	ARG
1	E	485	TRP
1	E	530	ASN
1	E	559	HIS
1	E	572	SER
1	E	836	LEU
1	E	980	ARG
1	E	992	ARG
1	E	993	GLN
1	E	1090	LEU
1	E	1097	HIS
1	E	1110	MET
1	E	1151	GLU
1	E	1174	ASN
1	E	1935	ARG
1	F	128	ILE
1	F	139	ARG
1	F	146	ARG
1	F	149	ARG
1	F	174	HIS
1	F	211	HIS
1	F	437	GLU
1	F	441	ARG
1	F	485	TRP
1	F	530	ASN
1	F	559	HIS
1	F	572	SER
1	F	1935	ARG
1	F	2018	TRP
1	F	2128	PHE
1	F	2178	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1164	ASN
1	A	1398	ASN
1	B	1168	HIS
1	B	1398	ASN
1	B	2285	HIS
1	C	1164	ASN
1	C	1398	ASN
1	D	1398	ASN
1	D	2285	HIS
1	E	1164	ASN
1	E	1398	ASN

### 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](#)

5 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	$\# Z  > 2$
2	BTN	A	2401	1	16,16,17	1.16	1 (6%)	21,21,23	1.78	4 (19%)
2	BTN	D	2401	1	16,16,17	1.16	1 (6%)	21,21,23	1.77	5 (23%)
2	BTN	B	2401	1	16,16,17	1.15	1 (6%)	21,21,23	1.77	5 (23%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	BTN	C	2401	1	16,16,17	1.16	1 (6%)	21,21,23	1.78	4 (19%)
2	BTN	E	2401	1	16,16,17	1.17	1 (6%)	21,21,23	1.78	4 (19%)

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
2	BTN	A	2401	1	-	0/5/27/28	0/2/2/2
2	BTN	D	2401	1	-	0/5/27/28	0/2/2/2
2	BTN	B	2401	1	-	0/5/27/28	0/2/2/2
2	BTN	C	2401	1	-	0/5/27/28	0/2/2/2
2	BTN	E	2401	1	-	0/5/27/28	0/2/2/2

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	2401	BTN	C2-S1	-3.61	1.76	1.82
2	A	2401	BTN	C2-S1	-3.60	1.76	1.82
2	C	2401	BTN	C2-S1	-3.56	1.76	1.82
2	B	2401	BTN	C2-S1	-3.53	1.77	1.82
2	D	2401	BTN	C2-S1	-3.53	1.77	1.82

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2401	BTN	C4-C2-S1	3.64	108.67	105.20
2	C	2401	BTN	C4-C2-S1	3.64	108.67	105.20
2	E	2401	BTN	C4-C2-S1	3.63	108.66	105.20
2	B	2401	BTN	C4-C2-S1	3.55	108.58	105.20
2	D	2401	BTN	C4-C2-S1	3.54	108.58	105.20
2	C	2401	BTN	C6-C5-C4	3.38	111.59	108.66
2	A	2401	BTN	C6-C5-C4	3.37	111.58	108.66
2	E	2401	BTN	C6-C5-C4	3.32	111.54	108.66
2	A	2401	BTN	C6-S1-C2	3.29	96.65	89.89
2	E	2401	BTN	C6-S1-C2	3.29	96.65	89.89
2	C	2401	BTN	C6-S1-C2	3.28	96.63	89.89
2	D	2401	BTN	C6-S1-C2	3.27	96.60	89.89
2	B	2401	BTN	C6-S1-C2	3.27	96.60	89.89
2	D	2401	BTN	C6-C5-C4	3.23	111.46	108.66
2	B	2401	BTN	C5-C6-S1	3.23	109.07	106.31

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2401	BTN	C6-C5-C4	3.21	111.44	108.66
2	D	2401	BTN	C5-C6-S1	3.20	109.05	106.31
2	A	2401	BTN	C5-C6-S1	3.17	109.02	106.31
2	E	2401	BTN	C5-C6-S1	3.15	109.01	106.31
2	C	2401	BTN	C5-C6-S1	3.15	109.00	106.31
2	B	2401	BTN	N2-C3-N1	2.00	110.64	108.76
2	D	2401	BTN	N2-C3-N1	2.00	110.64	108.76

There are no chirality outliers.

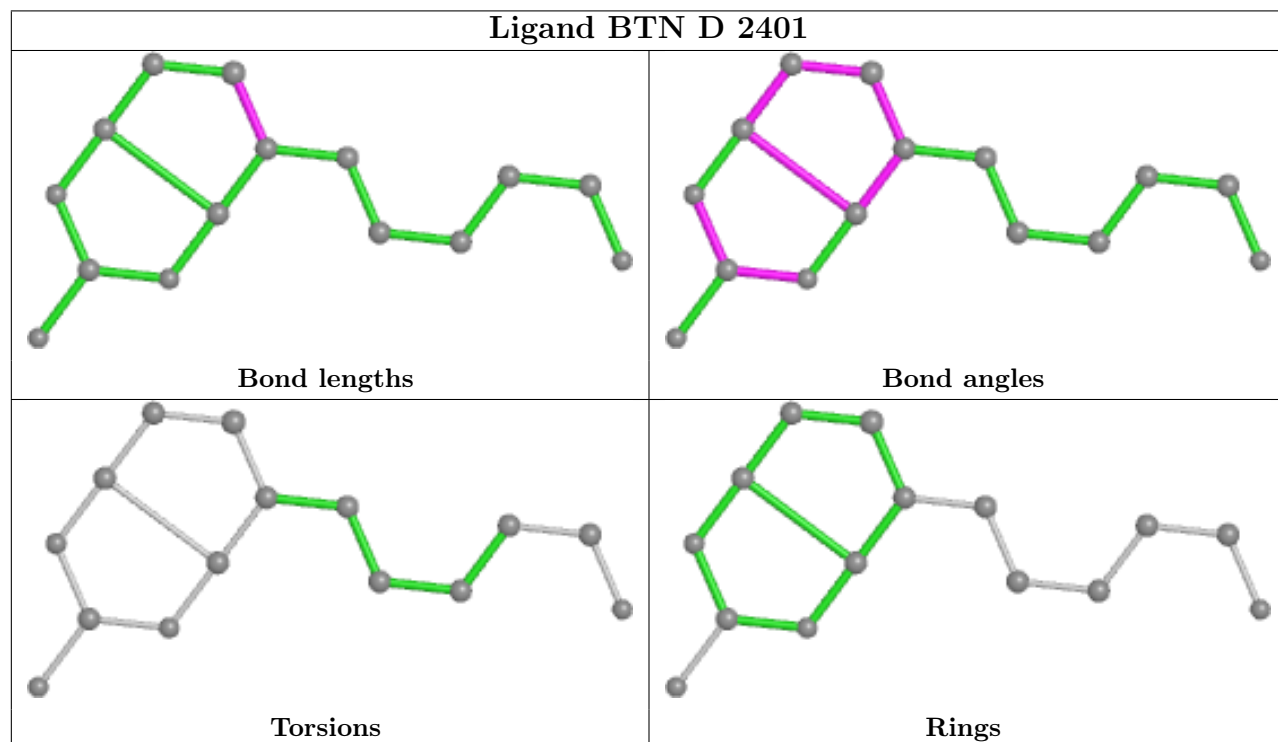
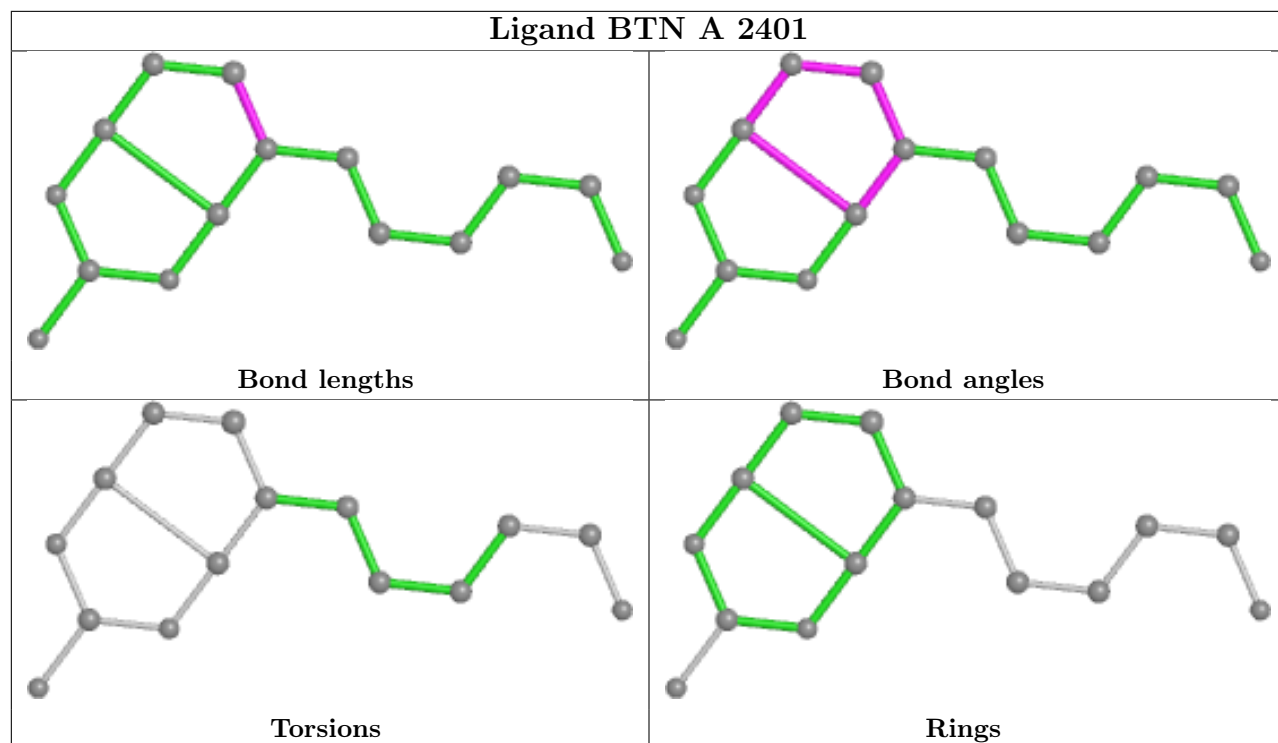
There are no torsion outliers.

There are no ring outliers.

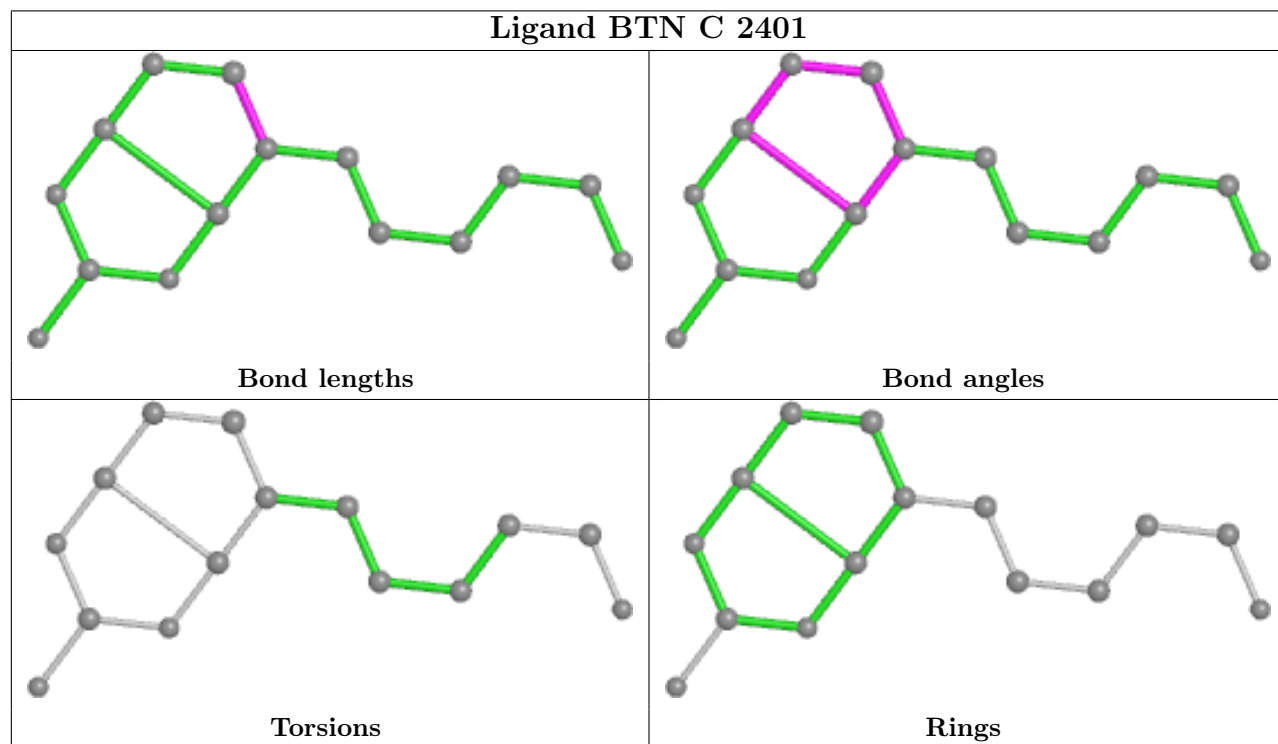
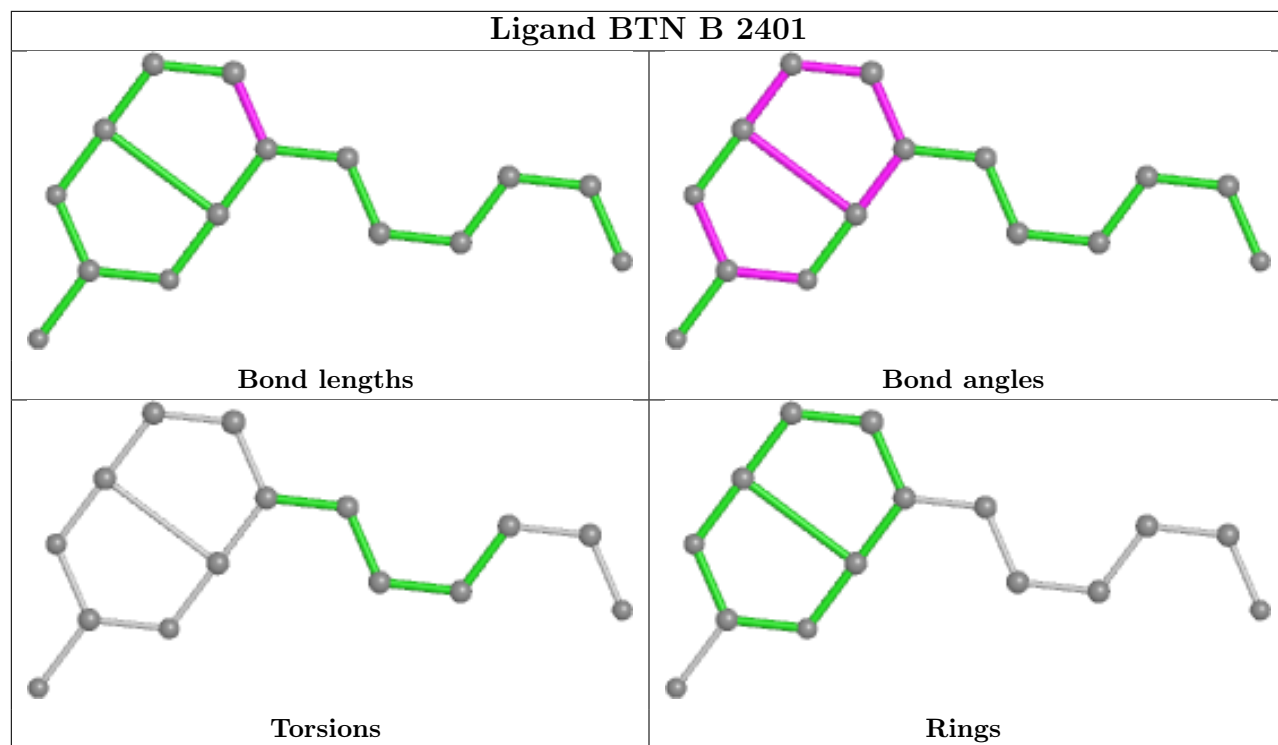
1 monomer is involved in 1 short contact:

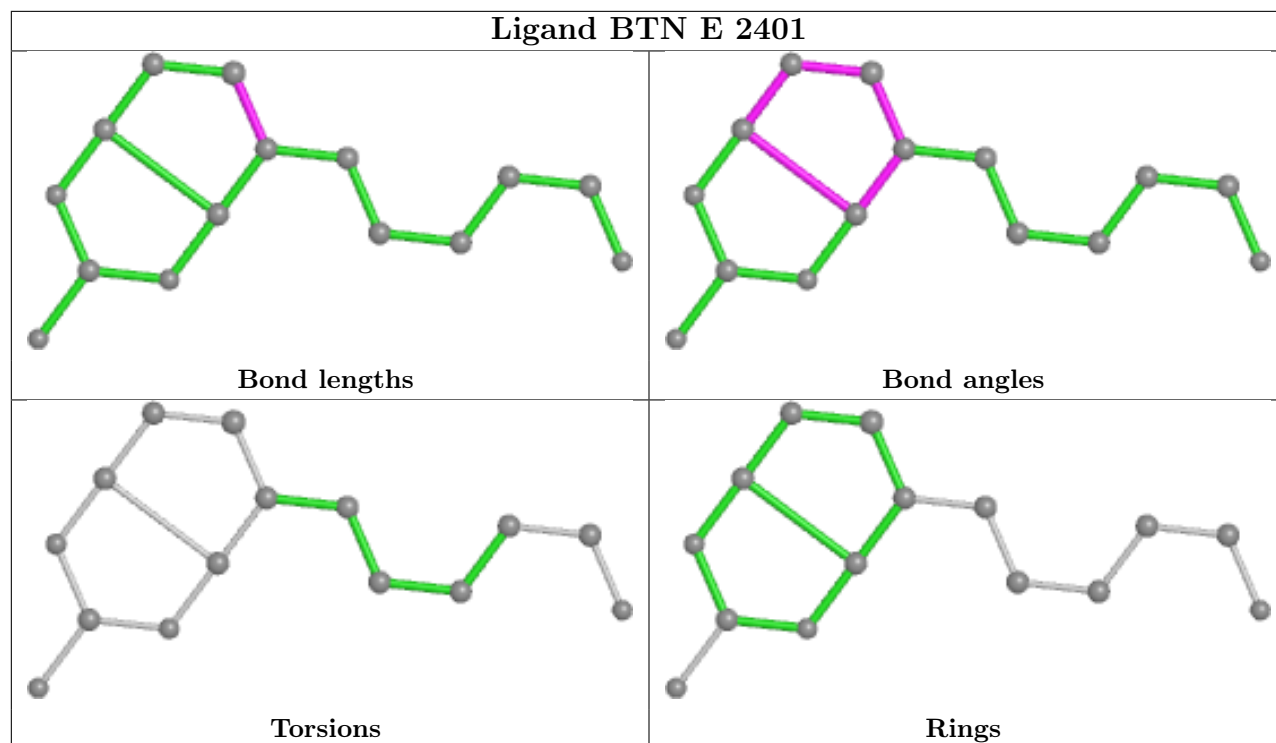
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2401	BTN	1	0

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









## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

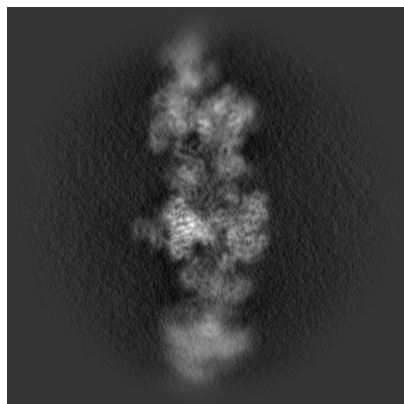
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-38433. These allow visual inspection of the internal detail of the map and identification of artifacts.

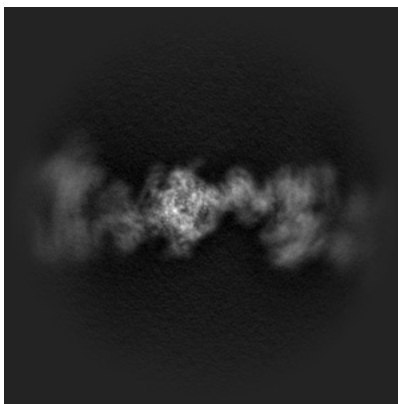
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

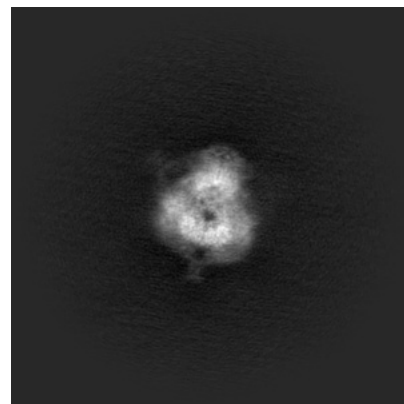
#### 6.1.1 Primary map



X

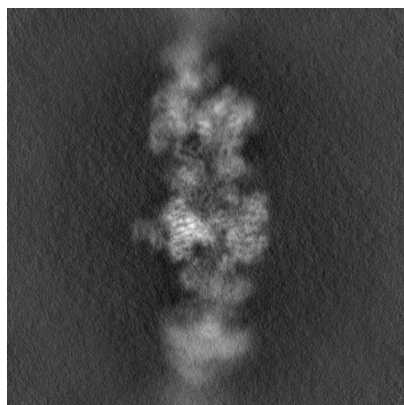


Y

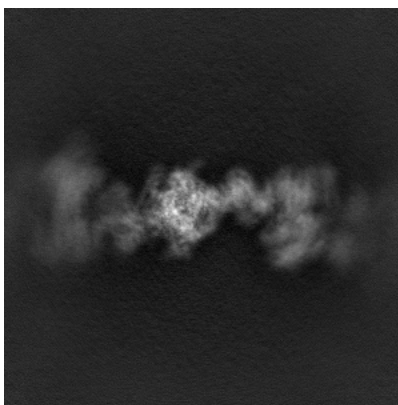


Z

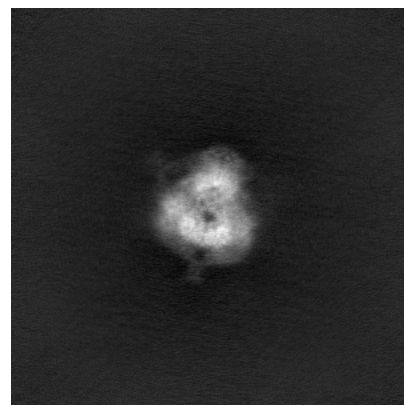
#### 6.1.2 Raw map



X



Y

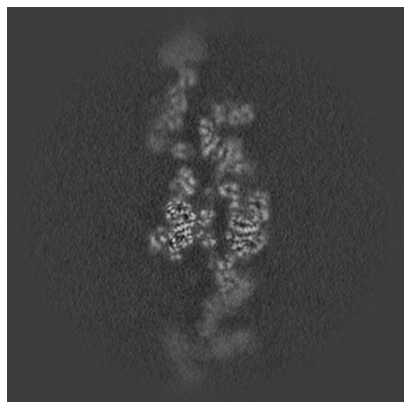


Z

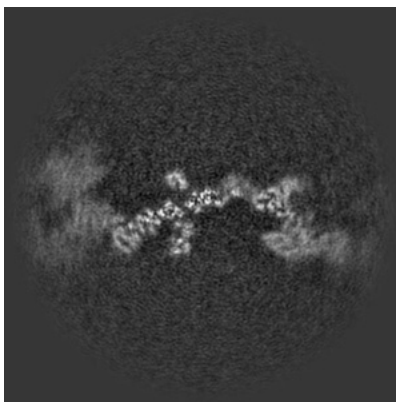
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

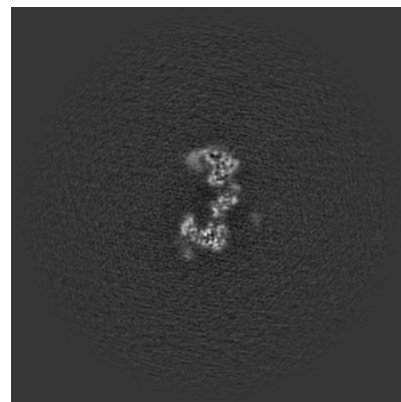
### 6.2.1 Primary map



X Index: 244

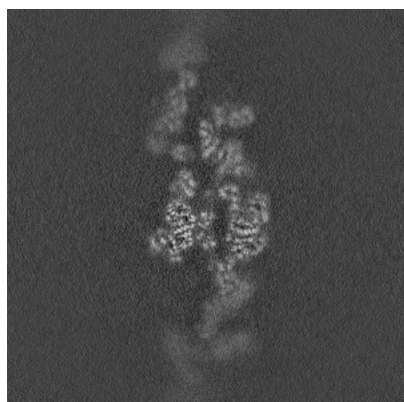


Y Index: 244

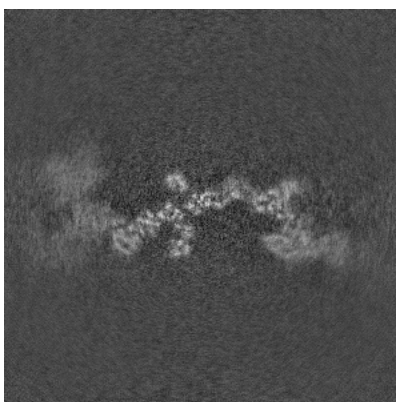


Z Index: 244

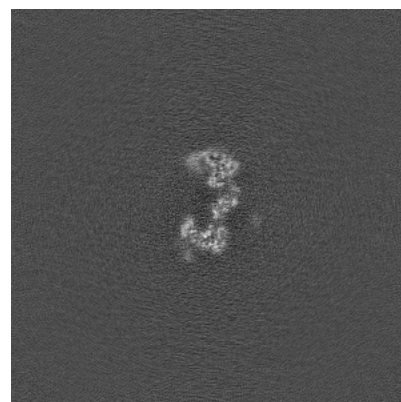
### 6.2.2 Raw map



X Index: 244



Y Index: 244

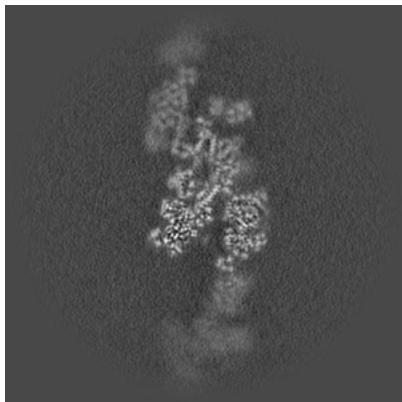


Z Index: 244

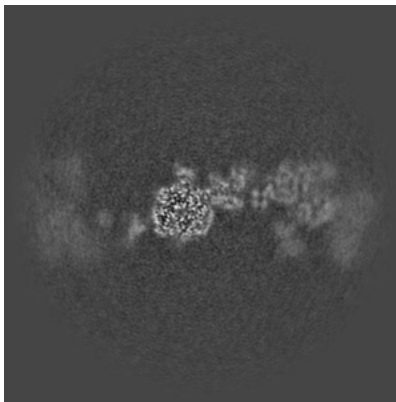
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

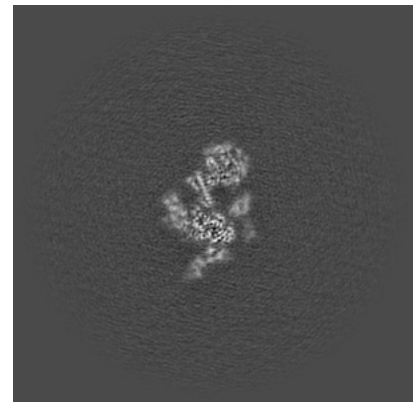
### 6.3.1 Primary map



X Index: 251

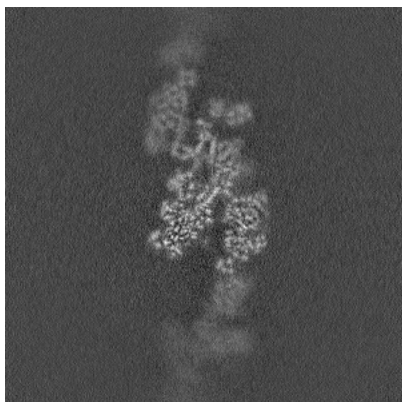


Y Index: 213

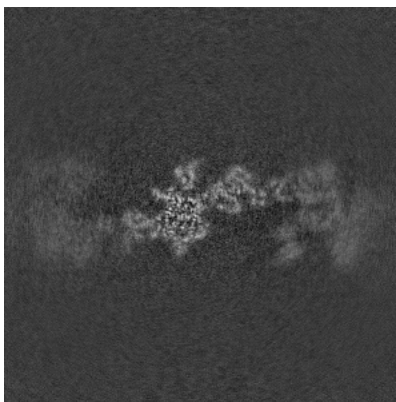


Z Index: 207

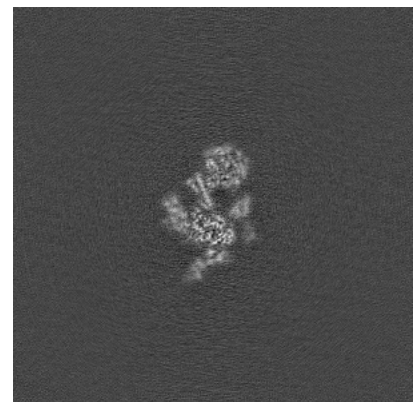
### 6.3.2 Raw map



X Index: 251



Y Index: 220

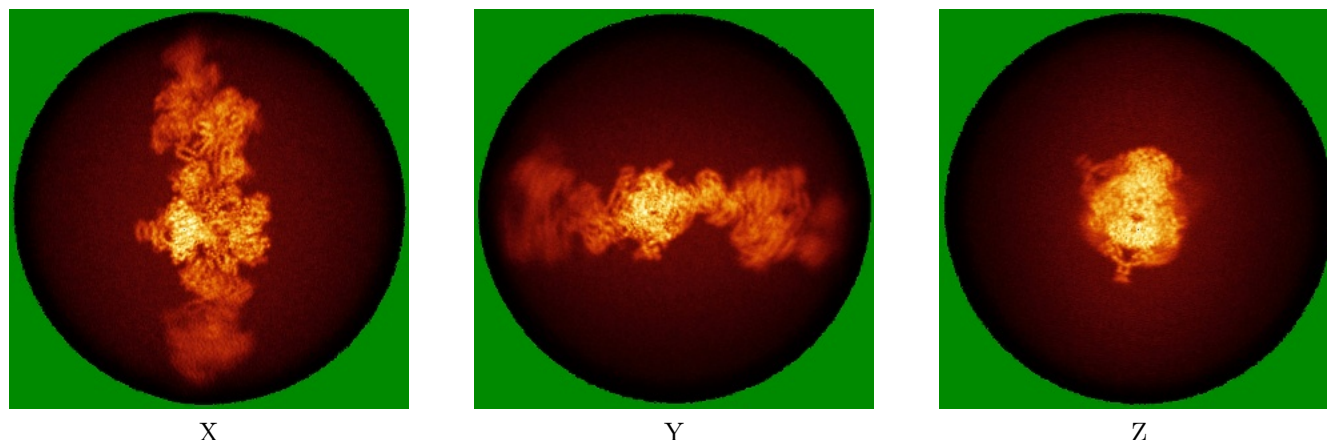


Z Index: 207

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

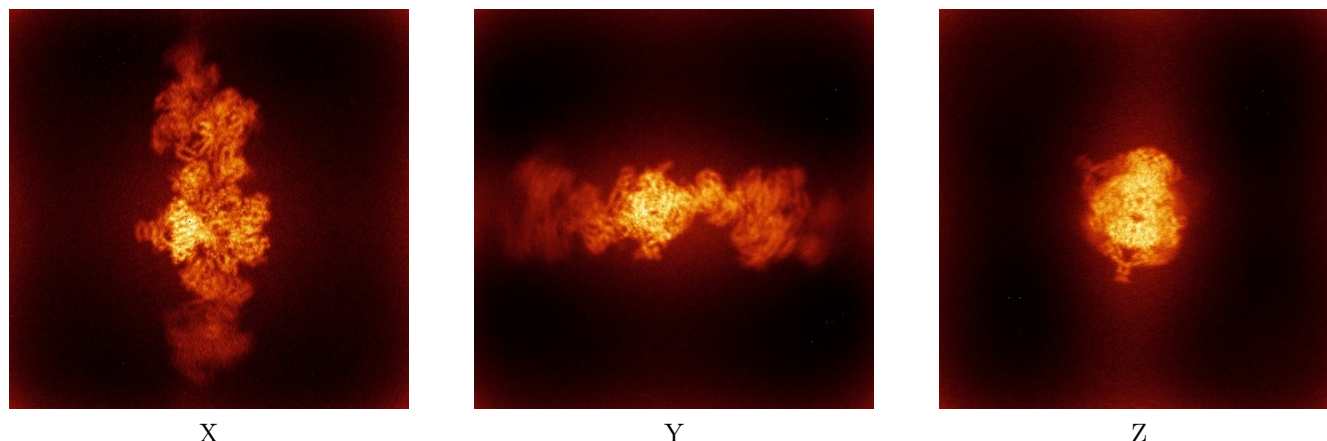


X

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](#)

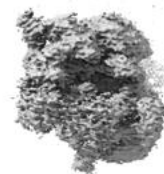
### 6.5.1 Primary map



X



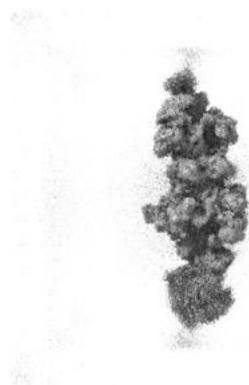
Y



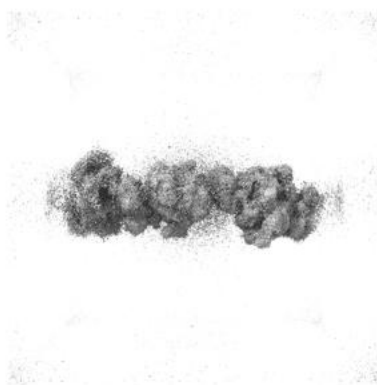
Z

The images above show the 3D surface view of the map at the recommended contour level 0.2. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

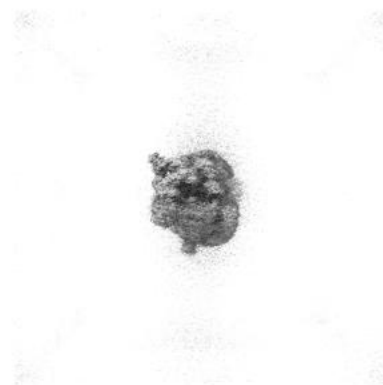
### 6.5.2 Raw map



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.

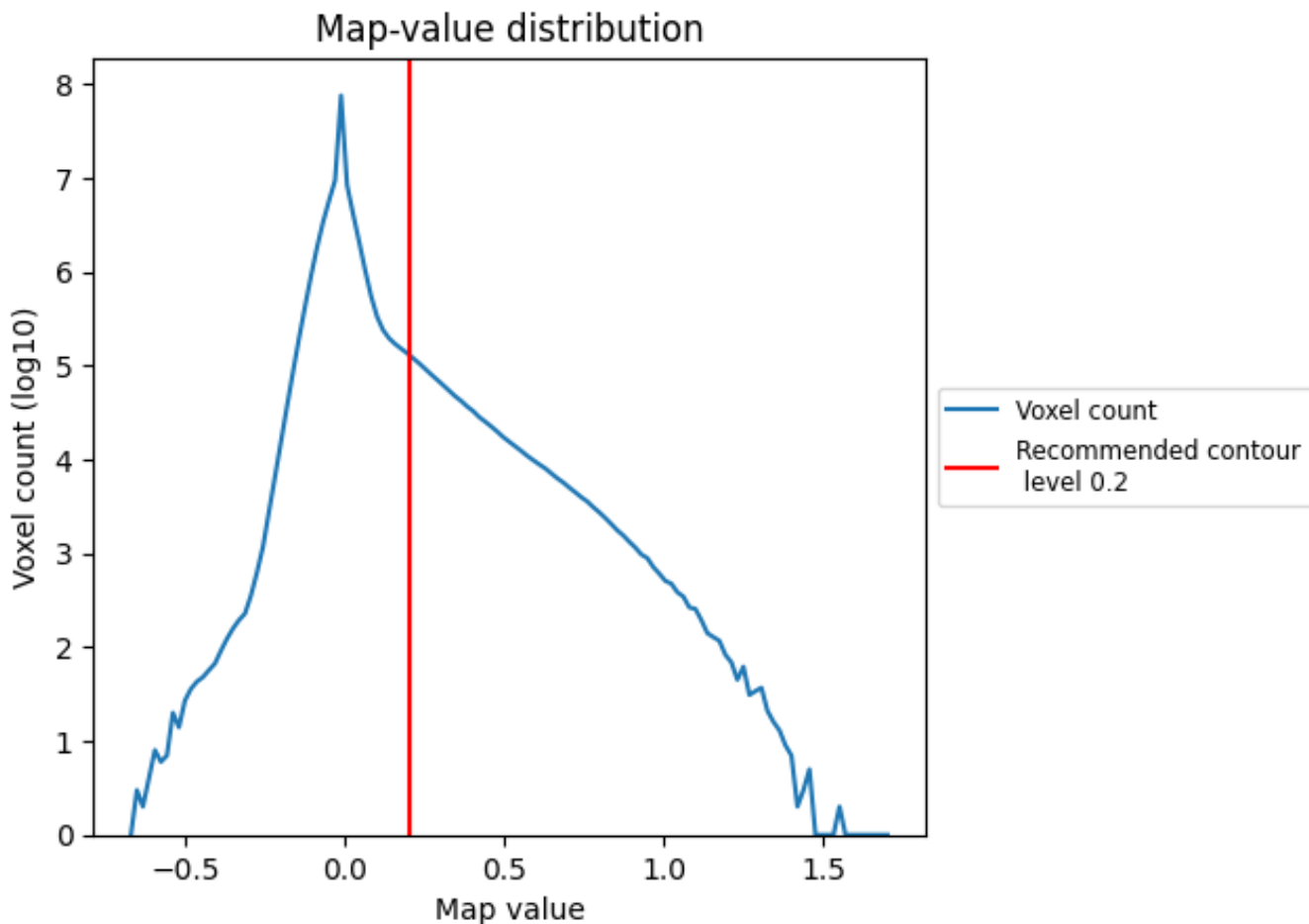
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

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

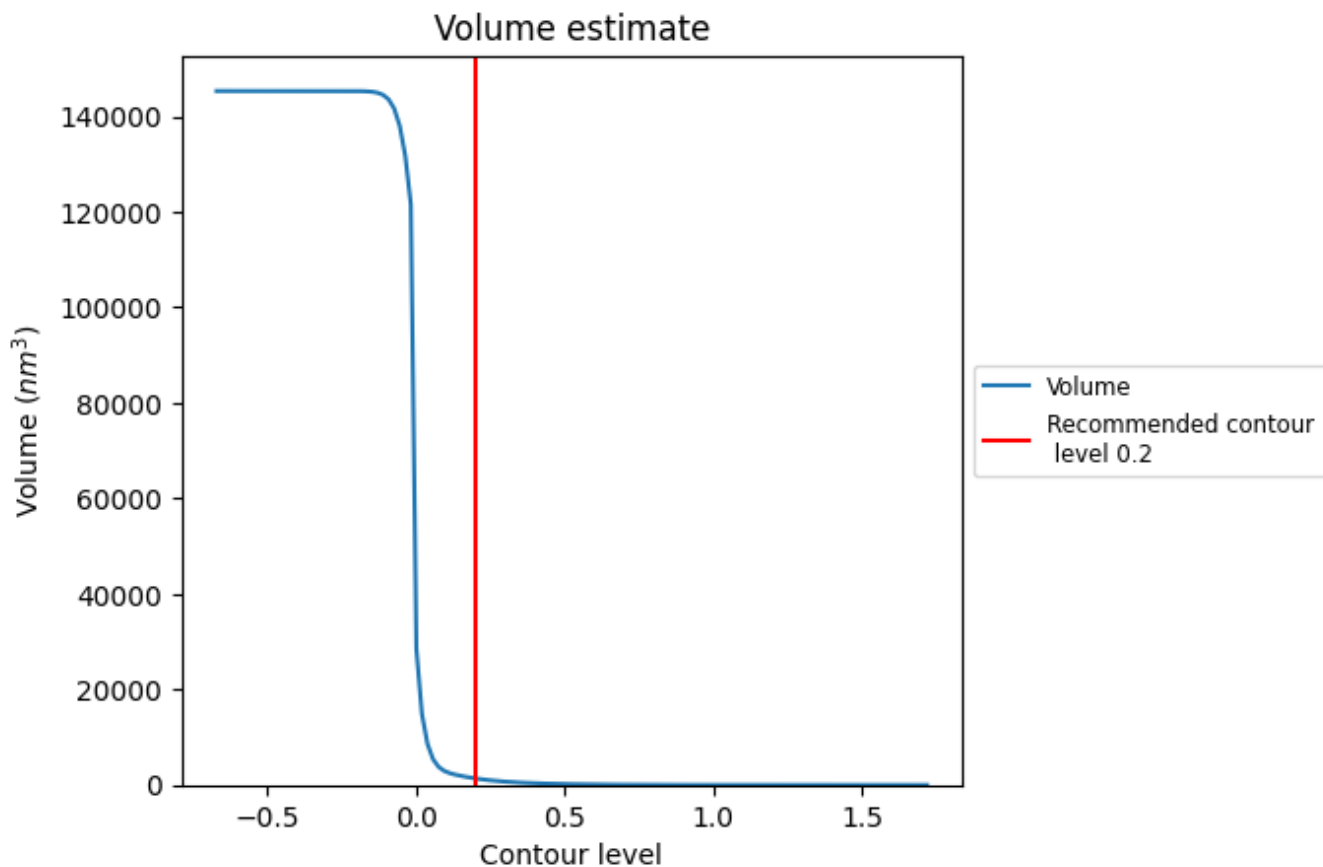
### 7.1 Map-value distribution [i](#)



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



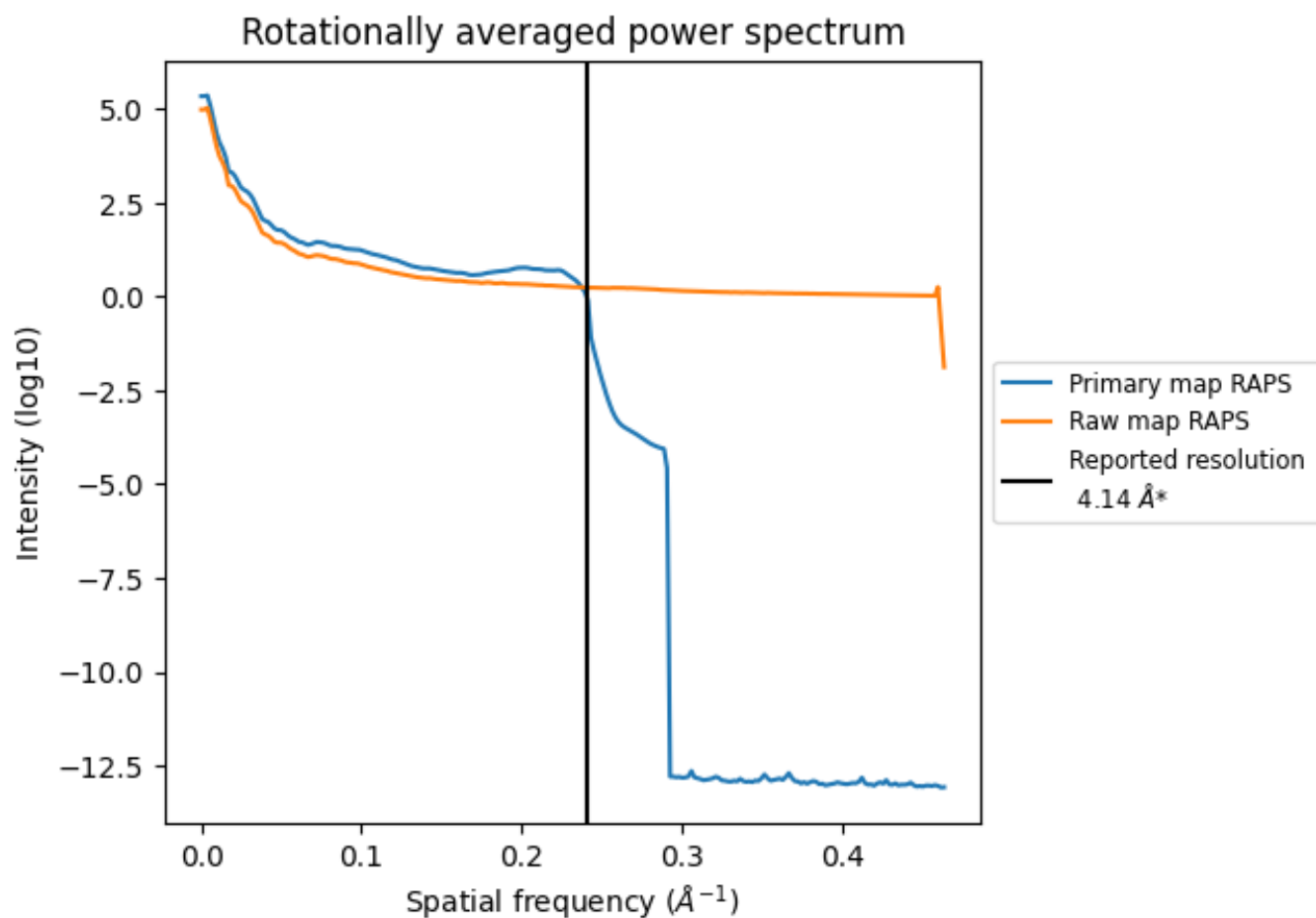
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1379  $\text{nm}^3$ ; this corresponds to an approximate mass of 1246 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](#)

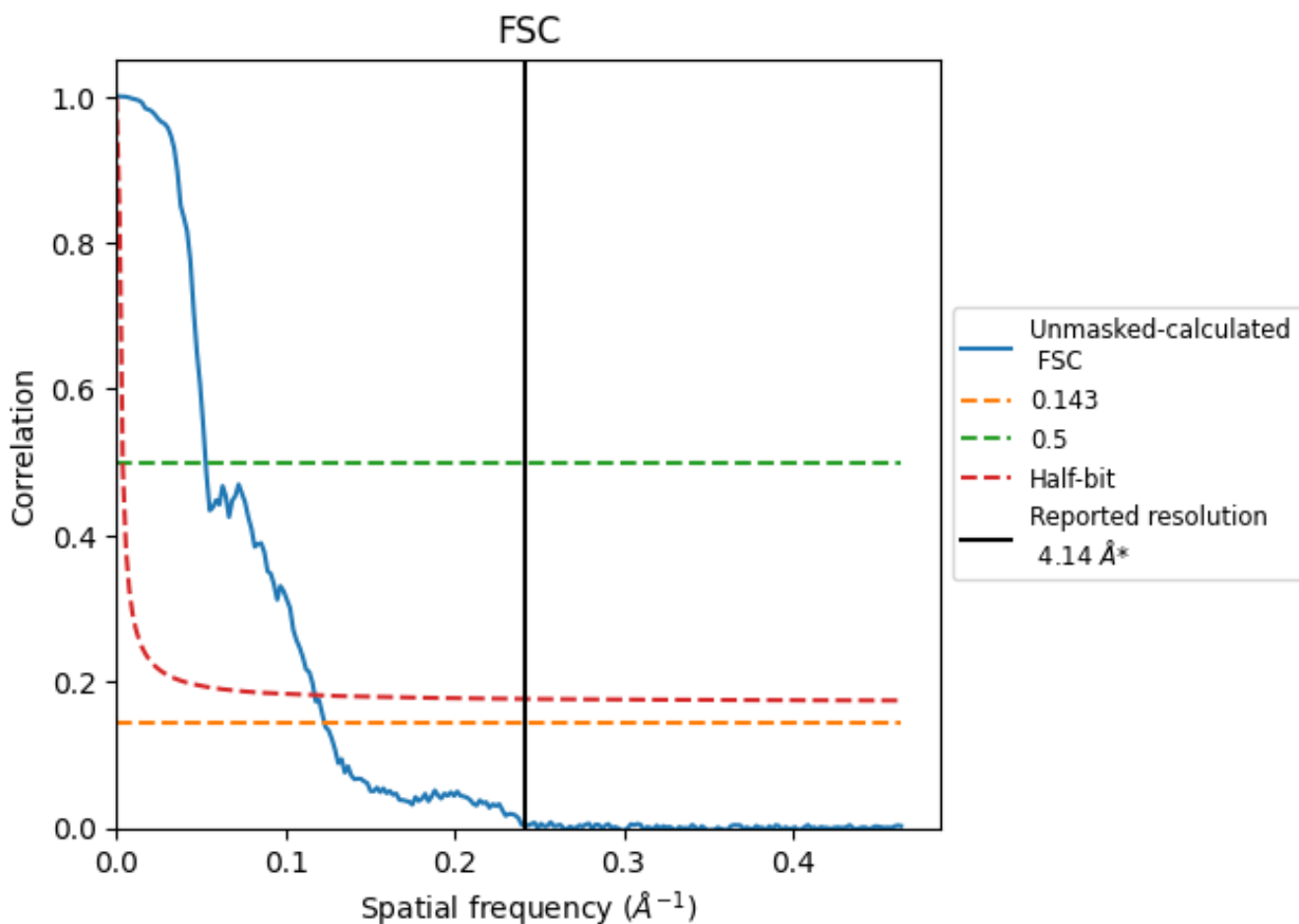


\*Reported resolution corresponds to spatial frequency of 0.242 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.242  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

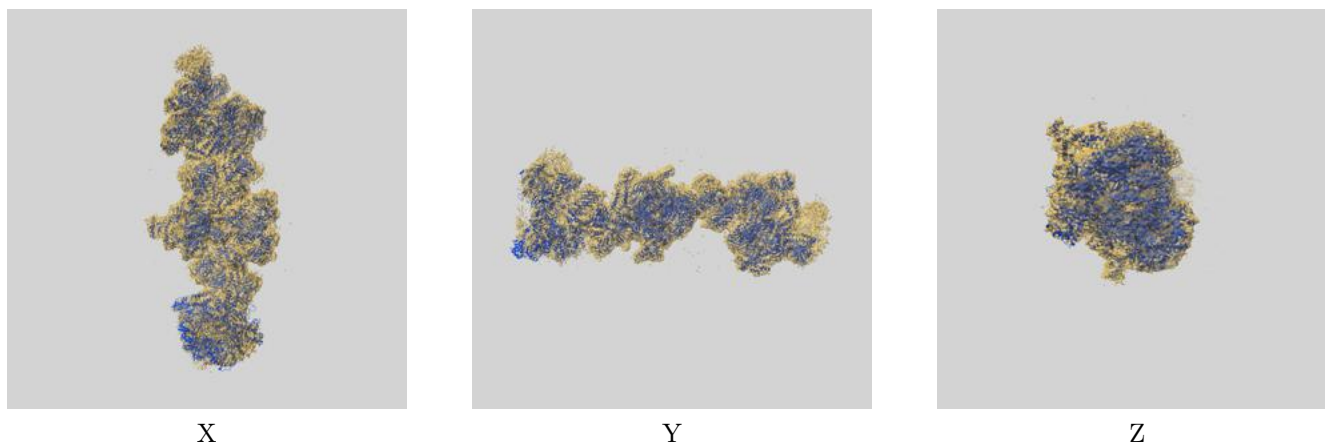
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.14	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	8.12	18.94	8.53

\*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 8.12 differs from the reported value 4.14 by more than 10 %

## 9 Map-model fit [i](#)

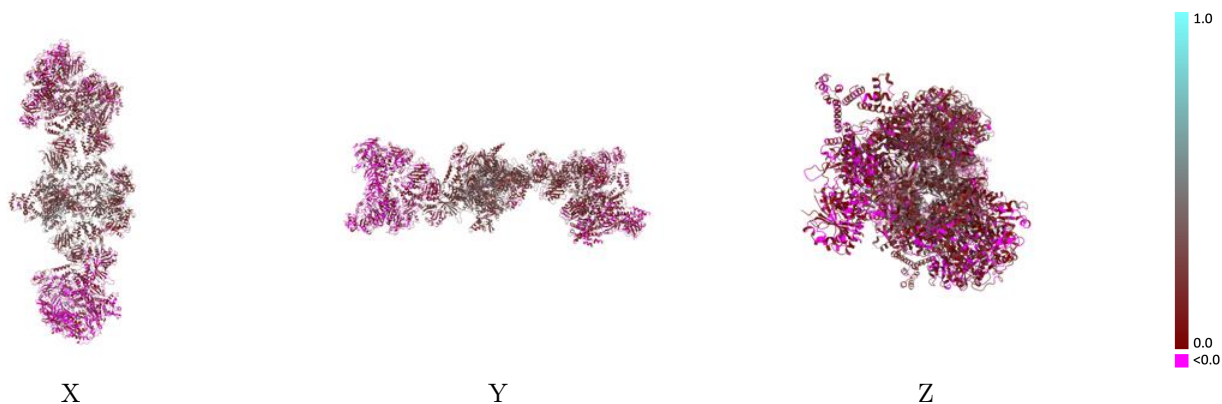
This section contains information regarding the fit between EMDB map EMD-38433 and PDB model 8XL0. Per-residue inclusion information can be found in section [3](#) on page [5](#).

### 9.1 Map-model overlay [i](#)



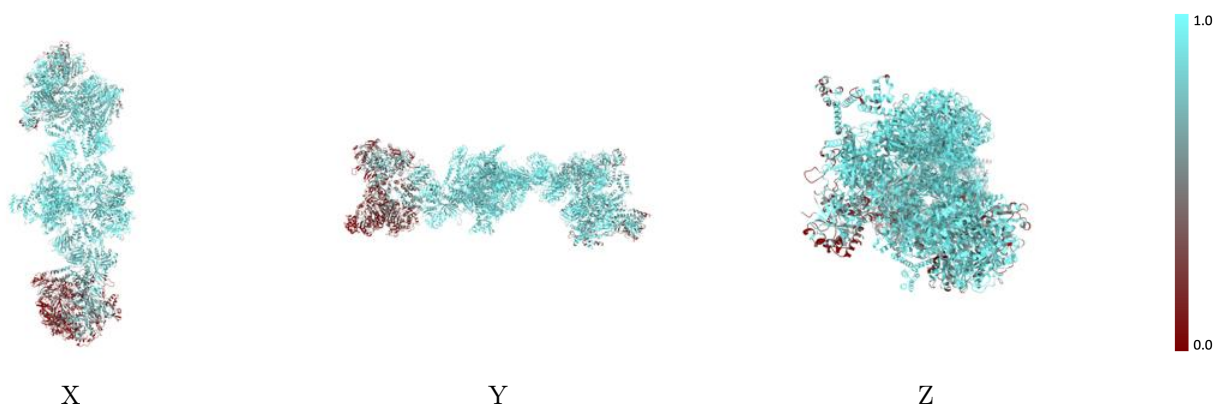
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



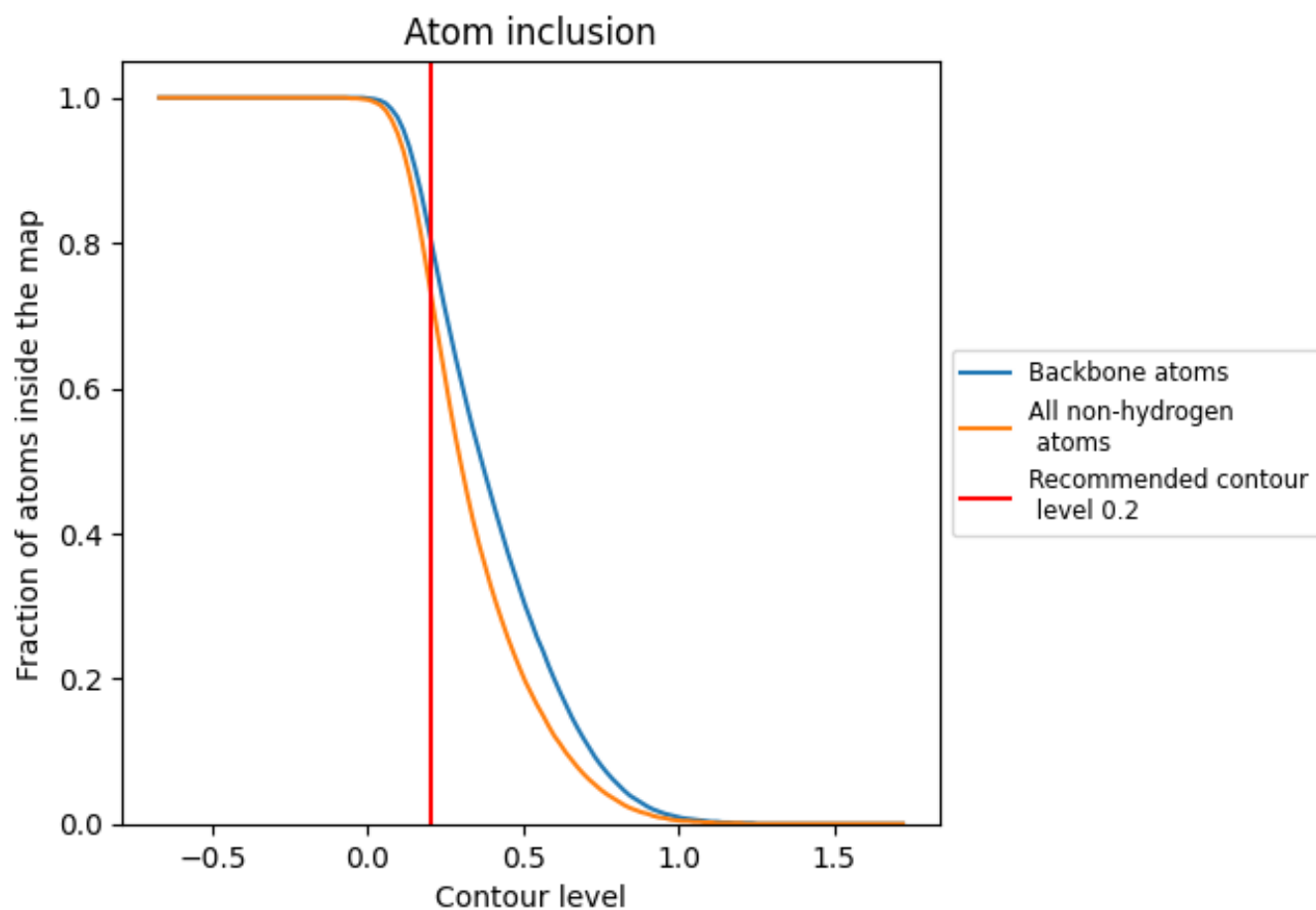
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.2).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 74% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary [i](#)

The table lists the average atom inclusion at the recommended contour level (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7380	 0.1620
A	 0.7650	 0.1060
B	 0.8510	 0.1530
C	 0.9280	 0.2830
D	 0.9210	 0.2770
E	 0.4450	 0.0520
F	 0.2890	 0.0270

