



Full wwPDB EM Validation Report ⓘ

Mar 2, 2024 – 11:48 PM EST

PDB ID : 8TN9
EMDB ID : EMD-41411
Title : Structural architecture of the acidic region of the B domain of coagulation factor V
Authors : Mohammed, B.M.; Basore, K.; Summers, B.; Pelc, L.A.; Di Cera, E.
Deposited on : 2023-08-01
Resolution : 3.05 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.dev70
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

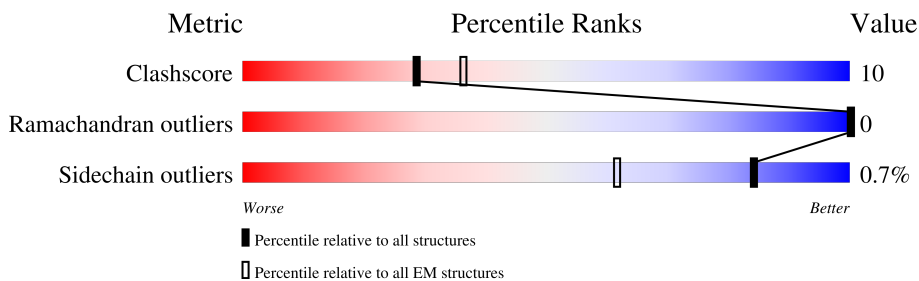
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.05 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	2196	

2 Entry composition [i](#)

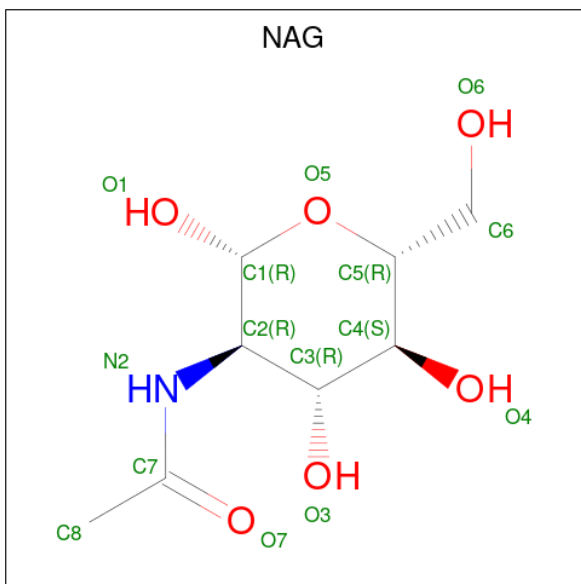
There are 2 unique types of molecules in this entry. The entry contains 11145 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Coagulation factor V.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1368	11089	7046	1887	2102	54	0	0

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).

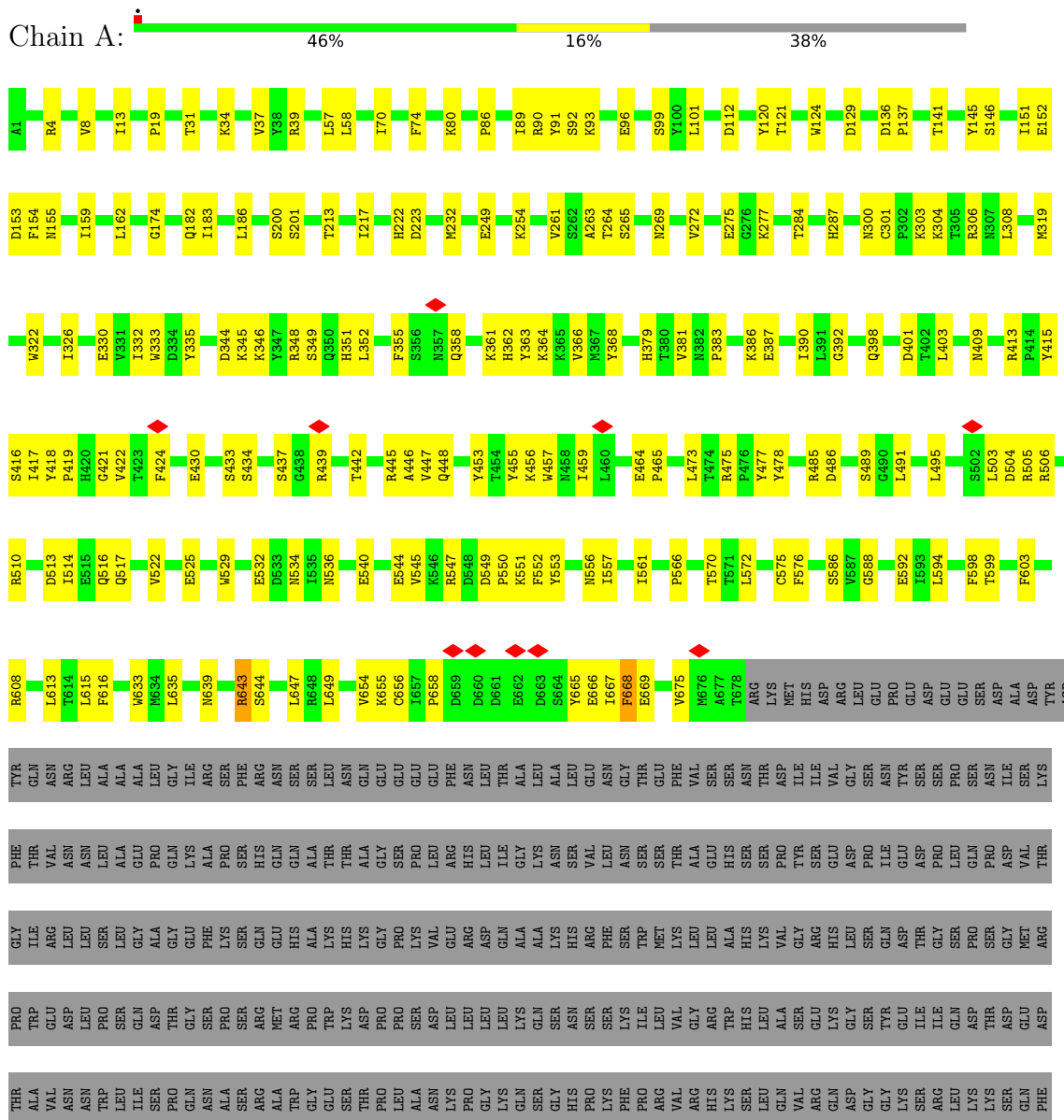


Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0
2	A	1	14	8	1	5	0

3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

● Molecule 1: Coagulation factor V



E2189	Y2067	Y2068	E2069	P2070	F2071	R2074	L2075	N2076	A2077	V2081	W2084	W2094	L2095	L2099	K2103	I2109	Q2111	G2112	C2113	K2114	S2118	E2119	S2124	S2130	W2136	Y2139	R2140	I2149	K2157	G2158	H2159	V2160	K2161	N2165	P2166	I2176	P2177	I2184	A2185	L2186	R2187	L2188						
	W1920	S1921	V1922	L1925	F1929	A1930	S1931	K1932	P1933	W1934	D1938	M1939	Q1940	I1944	I1948	Q1949	T1950	Q1951	E1964	S1970	S1971	N1972	N1982	S1983	T1984	R1985	N1986	V1987	D2005	P2006	V2009	R2019	L2028	Q2031	V2035	N2036	C2043	I2049	T2054	T2055	A2056							
	S1769	K1772	I1780	M1781	Y1785	S1786	E1796	R1799	I1805	Q1809	D1810	H1811	H1812	I1813	H1817	M1824	G1825	L1831	W1834	P1838	A1848	W1853	L1855	L1856	E1859	P1871	I1874	M1875	M1881	L1885	S1886	T1887	Q1894	S1898	A1909	N1912												
	D1579	V1590	K1594	Y1595	L1596	R1603	R1606	Y1609	E1610	L1613	L1616	G1617	P1618	K1633	E1650	T1657	S1662	P1663	F1666	N1670	A1511	E1512	P1517	Y1518	K1523	R1527	W1542	Y1543	L1544	R1545	S1546	M1547	M1548	G1549	E1559	V1569	T1573	D1574	I1575									
	THR	LEU	LEU	PRO	PRO	ASP	LEU	THR	LEU	LEU	THR	LEU	THR	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	
	PRO	ASP	THR	THR	GLU	LEU	MET	PRO	LEU	ASP	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU
	ASN	LEU	PRO	SER	ALA	LEU	GLY	GLN	ASP	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	
	SER	HIS	THR	THR	LEU	ASP	PHE	LEU	ASP	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU
	HIS	ARG	SER	SER	PRO	ASP	GLU	LEU	THR	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU
	LEU	PRO	SER	SER	THR	MET	ARG	LEU	THR	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU
	LEU	ILE	LEU	THR	ARG	LEU	LYS	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	680564	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	66	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	105000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	62.988	Depositor
Minimum map value	-30.495	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	1.000	Depositor
Recommended contour level	2.65	Depositor
Map size (\AA)	281.6, 281.6, 281.6	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.1, 1.1, 1.1	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: NAG

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	0.27	0/11384	0.52	0/15428

There are no bond length outliers.

There are no bond angle outliers.

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	11089	0	10732	226	0
2	A	56	0	52	1	0
All	All	11145	0	10784	227	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 10.

All (227) 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:A:101:LEU:HD21	1:A:1574:ASP:HA	1.58	0.85
1:A:349:SER:HB2	1:A:351:HIS:HD2	1.48	0.79

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:99:SER:HB2	1:A:112:ASP:HB3	1.65	0.78
1:A:31:THR:O	1:A:201:SER:OG	2.02	0.77
1:A:549:ASP:CB	1:A:553:TYR:H	1.98	0.76
1:A:2043:GLY:HA3	1:A:2049:ILE:HG12	1.68	0.73
1:A:592:GLU:HG3	1:A:1809:GLN:HB3	1.72	0.72
1:A:355:PHE:HA	1:A:361:LYS:HA	1.71	0.71
1:A:549:ASP:HB2	1:A:552:PHE:N	2.05	0.71
1:A:4:ARG:HB2	1:A:70:ILE:HG22	1.75	0.69
1:A:2094:TRP:HB3	1:A:2176:ILE:HG13	1.75	0.68
1:A:1894:GLN:HG2	1:A:1940:GLN:HE22	1.57	0.68
1:A:301:CYS:HB2	1:A:304:LYS:HB2	1.77	0.67
1:A:419:PRO:HB2	1:A:422:VAL:HB	1.75	0.67
1:A:421:GLY:HA3	1:A:475:ARG:HD2	1.77	0.66
1:A:2054:ILE:HD11	1:A:2071:PHE:HA	1.77	0.66
1:A:1912:ASN:O	1:A:1951:GLN:NE2	2.29	0.66
1:A:1657:THR:HB	1:A:1670:ASN:HB3	1.79	0.65
1:A:446:ALA:O	1:A:448:GLN:NE2	2.30	0.64
1:A:1932:LYS:HD2	1:A:1933:PRO:HD2	1.79	0.64
1:A:549:ASP:HB2	1:A:552:PHE:H	1.63	0.63
1:A:1739:ARG:NH1	1:A:1796:GLU:OE2	2.32	0.62
1:A:58:LEU:HD13	1:A:186:LEU:HD22	1.80	0.62
1:A:572:LEU:HA	1:A:1510:TYR:CE2	2.34	0.62
1:A:1970:SER:OG	1:A:1972:ASN:O	2.12	0.61
1:A:658:PRO:HG2	1:A:1517:PRO:HB2	1.81	0.61
1:A:654:VAL:HG11	1:A:1518:TYR:HB2	1.82	0.60
1:A:422:VAL:HG21	1:A:495:LEU:HD21	1.84	0.60
1:A:2075:LEU:O	1:A:2111:GLN:NE2	2.34	0.59
1:A:89:ILE:HG21	1:A:124:TRP:HB3	1.84	0.59
1:A:1732:SER:HB3	1:A:1984:THR:HG22	1.85	0.59
1:A:2113:CYS:HA	1:A:2187:ARG:HH21	1.68	0.59
1:A:447:VAL:HB	1:A:453:TYR:HE1	1.68	0.58
1:A:386:LYS:O	1:A:387:GLU:HG3	2.03	0.58
1:A:418:TYR:N	1:A:478:TYR:O	2.23	0.57
1:A:249:GLU:HB3	1:A:269:ASN:HB2	1.87	0.57
1:A:261:VAL:O	1:A:264:THR:OG1	2.19	0.57
1:A:362:HIS:O	1:A:362:HIS:ND1	2.38	0.56
1:A:667:ILE:HG12	1:A:668:PHE:H	1.69	0.56
1:A:346:LYS:HE3	1:A:379:HIS:CD2	2.40	0.56
1:A:1925:LEU:HD12	1:A:1932:LYS:HD3	1.88	0.56
1:A:1559:GLU:OE2	1:A:1595:TYR:OH	2.17	0.55
1:A:1909:ALA:HB2	1:A:1920:TRP:HB2	1.89	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:19:PRO:HD3	1:A:213:THR:HG21	1.88	0.55
1:A:424:PHE:HZ	1:A:459:ILE:HD12	1.72	0.55
1:A:525:GLU:HB2	1:A:556:ASN:HB3	1.87	0.55
1:A:1544:LEU:HD13	1:A:1549:GLY:HA2	1.89	0.55
1:A:1729:HIS:HB3	1:A:1732:SER:O	2.07	0.55
1:A:437:SER:HB3	1:A:442:THR:H	1.71	0.54
1:A:1527:ARG:HG2	1:A:1542:TRP:HD1	1.70	0.54
1:A:1875:MET:HG2	1:A:1944:ILE:HD13	1.88	0.54
1:A:409:ASN:HB2	1:A:447:VAL:HG13	1.89	0.54
1:A:598:PHE:CE1	1:A:635:LEU:HD12	2.42	0.54
1:A:2186:LEU:HD21	1:A:2188:LEU:HD23	1.89	0.54
1:A:37:VAL:HG11	1:A:57:LEU:HD22	1.89	0.54
1:A:2114:LYS:HA	1:A:2157:LYS:HZ1	1.73	0.54
2:A:2201:NAG:H83	2:A:2201:NAG:H3	1.89	0.54
1:A:344:ASP:OD1	1:A:345:LYS:N	2.41	0.54
1:A:1848:ALA:HB1	1:A:1874:ILE:HD13	1.90	0.54
1:A:2109:ILE:HG12	1:A:2189:GLU:HB3	1.89	0.54
1:A:2005:ASP:HB2	1:A:2006:PRO:HD3	1.89	0.53
1:A:398:GLN:HB2	1:A:503:LEU:HD21	1.89	0.53
1:A:306:ARG:HG3	1:A:308:LEU:H	1.74	0.53
1:A:2165:ASN:HB3	1:A:2166:PRO:HD3	1.91	0.53
1:A:522:VAL:H	1:A:588:GLY:HA3	1.72	0.53
1:A:275:GLU:OE1	1:A:300:ASN:N	2.42	0.52
1:A:1559:GLU:OE1	1:A:1603:ARG:NH1	2.43	0.52
1:A:1740:GLU:OE2	1:A:1799:ARG:NH1	2.42	0.52
1:A:31:THR:OG1	1:A:200:SER:O	2.27	0.52
1:A:1579:ASP:OD1	1:A:1579:ASP:N	2.43	0.52
1:A:1898:SER:HB2	1:A:1934:TRP:CE2	2.44	0.52
1:A:333:TRP:CD1	1:A:390:ILE:HD11	2.45	0.52
1:A:363:TYR:HA	1:A:534:ASN:HD21	1.75	0.52
1:A:254:LYS:HB2	1:A:464:GLU:O	2.10	0.51
1:A:532:GLU:OE1	1:A:532:GLU:N	2.33	0.51
1:A:2177:PRO:HG3	1:A:2184:ILE:HG21	1.92	0.51
1:A:576:PHE:N	1:A:654:VAL:O	2.44	0.51
1:A:2077:ALA:HB3	1:A:2081:VAL:HG23	1.91	0.51
1:A:413:ARG:HD2	1:A:529:TRP:CD1	2.45	0.51
1:A:2067:TYR:HB3	1:A:2069:GLU:HG2	1.91	0.51
1:A:151:ILE:O	1:A:155:ASN:ND2	2.41	0.51
1:A:1986:ASN:OD1	1:A:1987:VAL:N	2.44	0.51
1:A:667:ILE:O	1:A:668:PHE:C	2.49	0.50
1:A:1898:SER:HB3	1:A:1933:PRO:HA	1.93	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:322:TRP:CD1	1:A:505:ARG:HD2	2.47	0.50
1:A:599:THR:HG1	1:A:633:TRP:HB3	1.77	0.50
1:A:2056:ALA:HB2	1:A:2095:LEU:HD12	1.92	0.50
1:A:566:PRO:HG2	1:A:647:LEU:HA	1.94	0.50
1:A:576:PHE:HB2	1:A:655:LYS:HA	1.94	0.50
1:A:1948:ILE:HG12	1:A:1950:THR:HG23	1.94	0.50
1:A:504:ASP:O	1:A:506:ARG:NH1	2.45	0.49
1:A:223:ASP:H	1:A:272:VAL:HB	1.76	0.49
1:A:643:ARG:NH1	1:A:644:SER:OG	2.45	0.49
1:A:1712:ILE:HG12	1:A:1805:ILE:HG21	1.92	0.49
1:A:2049:ILE:O	1:A:2074:ARG:NH2	2.45	0.49
1:A:549:ASP:CG	1:A:553:TYR:H	2.16	0.49
1:A:277:LYS:HE2	1:A:439:ARG:HG2	1.95	0.49
1:A:570:THR:HG23	1:A:1510:TYR:HD2	1.77	0.49
1:A:1691:GLU:N	1:A:1691:GLU:OE1	2.46	0.49
1:A:39:ARG:HH11	1:A:39:ARG:HG2	1.77	0.48
1:A:1938:ASP:OD1	1:A:1939:MET:N	2.46	0.48
1:A:352:LEU:HD12	1:A:358:GLN:HB2	1.95	0.48
1:A:1527:ARG:HG2	1:A:1542:TRP:CD1	2.49	0.48
1:A:665:TYR:HD1	1:A:667:ILE:O	1.96	0.48
1:A:1944:ILE:HG12	1:A:2009:VAL:HG12	1.96	0.48
1:A:2124:SER:HB2	1:A:2149:ILE:HG23	1.95	0.48
1:A:1887:THR:HB	1:A:2159:HIS:CG	2.49	0.48
1:A:415:TYR:CD1	1:A:491:LEU:HD11	2.49	0.47
1:A:430:GLU:HB2	1:A:433:SER:HB2	1.96	0.47
1:A:1594:LYS:HD2	1:A:1618:PRO:HB3	1.96	0.47
1:A:1609:TYR:HE2	1:A:1982:ASN:HB2	1.79	0.47
1:A:598:PHE:CD1	1:A:603:PHE:HE1	2.33	0.47
1:A:2099:LEU:HD13	1:A:2103:LYS:HD2	1.96	0.47
1:A:1546:SER:OG	1:A:1547:ASN:N	2.46	0.47
1:A:146:SER:OG	1:A:153:ASP:OD2	2.21	0.47
1:A:403:LEU:HD11	1:A:457:TRP:CE3	2.49	0.47
1:A:232:MET:HA	1:A:263:ALA:H	1.79	0.47
1:A:363:TYR:HD1	1:A:534:ASN:HD21	1.61	0.47
1:A:445:ARG:HB3	1:A:453:TYR:CZ	2.49	0.47
1:A:145:TYR:OH	1:A:1859:GLU:OE2	2.29	0.47
1:A:332:ILE:HG22	1:A:348:ARG:HG2	1.97	0.47
1:A:666:GLU:O	1:A:669:GLU:HB3	2.15	0.47
1:A:1811:ILE:HG12	1:A:1838:PRO:HD3	1.98	0.46
1:A:330:GLU:OE2	1:A:364:LYS:HE2	2.15	0.46
1:A:668:PHE:HB3	1:A:1510:TYR:HE1	1.80	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:570:THR:HG21	1:A:1510:TYR:HB3	1.97	0.46
1:A:1548:ASN:OD1	1:A:1549:GLY:N	2.48	0.46
1:A:8:VAL:HG23	1:A:74:PHE:HD1	1.80	0.46
1:A:1780:ILE:HD13	1:A:1856:LEU:HD22	1.97	0.46
1:A:608:ARG:NE	1:A:1691:GLU:OE2	2.48	0.45
1:A:335:TYR:H	1:A:361:LYS:HD2	1.82	0.45
1:A:434:SER:O	1:A:437:SER:OG	2.33	0.45
1:A:1786:SER:HA	1:A:1871:PRO:HD2	1.98	0.45
1:A:2184:ILE:HD12	1:A:2184:ILE:H	1.81	0.45
1:A:455:TYR:O	1:A:456:LYS:HD3	2.16	0.45
1:A:1761:ARG:HD2	1:A:1772:LYS:HE3	1.99	0.45
1:A:183:ILE:HD13	1:A:217:ILE:HG21	1.99	0.45
1:A:419:PRO:CB	1:A:422:VAL:HB	2.45	0.45
1:A:550:PRO:C	1:A:551:LYS:HD3	2.37	0.45
1:A:566:PRO:HG2	1:A:647:LEU:HD23	1.99	0.45
1:A:1922:VAL:HG11	1:A:1933:PRO:HG2	1.99	0.45
1:A:1569:VAL:HG21	1:A:1785:TYR:HB2	1.98	0.45
1:A:381:VAL:HG12	1:A:383:PRO:HD3	1.99	0.45
1:A:473:LEU:HD23	1:A:473:LEU:HA	1.86	0.45
1:A:561:ILE:HG21	1:A:649:LEU:HD11	1.99	0.44
1:A:319:MET:HG2	1:A:401:ASP:HA	1.98	0.44
1:A:1944:ILE:HD11	1:A:2035:VAL:HG23	1.99	0.44
1:A:101:LEU:HD11	1:A:1573:THR:O	2.17	0.44
1:A:557:ILE:HD13	1:A:643:ARG:HH22	1.82	0.44
1:A:1610:GLU:OE1	1:A:1610:GLU:N	2.51	0.44
1:A:34:LYS:O	1:A:34:LYS:HG2	2.17	0.44
1:A:154:PHE:CD1	1:A:159:ILE:HD11	2.52	0.44
1:A:89:ILE:HD11	1:A:162:LEU:HD21	2.00	0.44
1:A:90:ARG:HE	1:A:129:ASP:HB2	1.83	0.44
1:A:516:GLN:HG3	1:A:517:GLN:HG3	1.98	0.44
1:A:1633:LYS:HB2	1:A:1677:SER:HB3	1.98	0.44
1:A:486:ASP:HA	1:A:489:SER:HB2	1.99	0.44
1:A:594:LEU:HA	1:A:639:ASN:OD1	2.18	0.44
1:A:545:VAL:HG22	1:A:547:ARG:HG3	2.00	0.43
1:A:91:TYR:CE1	1:A:96:GLU:HG3	2.53	0.43
1:A:86:PRO:HG3	1:A:124:TRP:CE2	2.54	0.43
1:A:368:TYR:HB2	1:A:392:GLY:HA2	2.00	0.43
1:A:1512:GLU:OE1	1:A:1512:GLU:N	2.51	0.43
1:A:1590:VAL:HG13	1:A:1716:LEU:HG	2.00	0.43
1:A:464:GLU:HB3	1:A:473:LEU:HD12	2.00	0.43
1:A:2186:LEU:HD11	1:A:2188:LEU:HB3	2.00	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:424:PHE:CZ	1:A:459:ILE:HD12	2.53	0.43
1:A:1616:LEU:HD13	1:A:1781:ASN:HD22	1.83	0.43
1:A:1817:HIS:CD2	1:A:1855:LEU:HB3	2.54	0.43
1:A:1596:LEU:H	1:A:1596:LEU:HD23	1.84	0.43
1:A:284:THR:HB	1:A:287:HIS:HB2	1.99	0.43
1:A:1738:MET:HE2	1:A:1799:ARG:HB2	2.00	0.43
1:A:1813:VAL:HG23	1:A:1859:GLU:HB3	2.00	0.43
1:A:1853:TRP:HE1	1:A:2036:ASN:HB3	1.83	0.43
1:A:141:THR:HG23	1:A:265:SER:HB2	2.01	0.42
1:A:13:ILE:O	1:A:34:LYS:HA	2.19	0.42
1:A:1805:ILE:HD13	1:A:1805:ILE:HA	1.91	0.42
1:A:1831:LEU:HD22	1:A:1834:TRP:HE3	1.84	0.42
1:A:333:TRP:HD1	1:A:335:TYR:HD1	1.68	0.42
1:A:86:PRO:HG3	1:A:124:TRP:CZ2	2.54	0.42
1:A:1610:GLU:HB3	1:A:1613:LEU:HD12	2.02	0.42
1:A:326:ILE:HG22	1:A:368:TYR:HB3	2.00	0.42
1:A:362:HIS:O	1:A:362:HIS:CG	2.72	0.42
1:A:174:GLY:O	1:A:182:GLN:NE2	2.48	0.42
1:A:1885:LEU:HD13	1:A:2028:LEU:HD12	2.02	0.42
1:A:477:TYR:CD2	1:A:495:LEU:HD23	2.55	0.42
1:A:510:ARG:HB2	1:A:675:VAL:HG22	2.01	0.42
1:A:1606:ARG:HG3	1:A:1610:GLU:HB2	2.01	0.42
1:A:1663:PRO:HD2	1:A:1666:PHE:HD2	1.85	0.42
1:A:594:LEU:HD22	1:A:615:LEU:HD12	2.01	0.41
1:A:1764:TRP:HB2	1:A:1769:SER:HB3	2.02	0.41
1:A:1938:ASP:OD2	1:A:1940:GLN:NE2	2.54	0.41
1:A:540:GLU:O	1:A:540:GLU:HG2	2.21	0.41
1:A:586:SER:OG	1:A:616:PHE:O	2.38	0.41
1:A:1732:SER:HB2	1:A:1734:MET:SD	2.60	0.41
1:A:366:VAL:HG23	1:A:491:LEU:HG	2.03	0.41
1:A:536:ASN:ND2	1:A:544:GLU:O	2.52	0.41
1:A:92:SER:OG	1:A:93:LYS:N	2.54	0.41
1:A:136:ASP:OD1	1:A:137:PRO:HD2	2.21	0.41
1:A:277:LYS:HZ1	1:A:439:ARG:HE	1.69	0.41
1:A:575:CYS:HB2	1:A:656:CYS:HB3	1.85	0.41
1:A:2130:SER:HB2	1:A:2136:TRP:H	1.85	0.41
1:A:222:HIS:HA	1:A:272:VAL:O	2.21	0.41
1:A:1527:ARG:NE	1:A:1650:GLU:OE1	2.35	0.41
1:A:1964:GLU:OE1	1:A:2019:ARG:NH2	2.53	0.41
1:A:2109:ILE:HG22	1:A:2161:LYS:HA	2.01	0.41
1:A:80:LYS:NZ	1:A:152:GLU:OE2	2.54	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:513:ASP:OD1	1:A:514:ILE:N	2.53	0.41
1:A:536:ASN:HD21	1:A:544:GLU:C	2.24	0.41
1:A:603:PHE:HE2	1:A:613:LEU:HB2	1.84	0.41
1:A:363:TYR:HA	1:A:534:ASN:ND2	2.34	0.41
1:A:413:ARG:HH12	1:A:485:ARG:HG3	1.86	0.41
1:A:464:GLU:N	1:A:465:PRO:HD2	2.35	0.41
1:A:504:ASP:O	1:A:506:ARG:HG2	2.20	0.40
1:A:2055:THR:OG1	1:A:2056:ALA:N	2.53	0.40
1:A:120:TYR:CG	1:A:121:THR:N	2.89	0.40
1:A:416:SER:OG	1:A:417:ILE:N	2.54	0.40
1:A:1662:SER:HB2	1:A:1666:PHE:HB2	2.03	0.40
1:A:1758:LYS:HB2	1:A:1761:ARG:HG3	2.03	0.40
1:A:2113:CYS:HB3	1:A:2185:ALA:HB1	2.02	0.40
1:A:1824:ASN:OD1	1:A:1825:GLY:N	2.49	0.40
1:A:2070:PRO:HD3	1:A:2084:TRP:HZ3	1.86	0.40
1:A:2075:LEU:HD12	1:A:2075:LEU:HA	1.86	0.40
1:A:2118:SER:OG	1:A:2119:GLU:N	2.53	0.40
1:A:2139:TYR:OH	1:A:2166:PRO:HD2	2.20	0.40
1:A:1881:MET:O	1:A:2031:GLN:HA	2.21	0.40
1:A:1929:PHE:CG	1:A:1930:ALA:N	2.90	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	1364/2196 (62%)	1227 (90%)	137 (10%)	0	100 100

There are no Ramachandran outliers to report.

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	1222/1989 (61%)	1213 (99%)	9 (1%)	84 92

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	303	LYS
1	A	643	ARG
1	A	668	PHE
1	A	1523	LYS
1	A	1545	ARG
1	A	1733	ASN
1	A	1734	MET
1	A	1736	MET
1	A	2140	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	351	HIS
1	A	448	GLN
1	A	1815	HIS
1	A	1817	HIS
1	A	1864	GLN
1	A	1913	ASN
1	A	1951	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 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	NAG	A	2201	1	14,14,15	0.47	0	17,19,21	1.38	2 (11%)
2	NAG	A	2204	1	14,14,15	0.26	0	17,19,21	0.45	0
2	NAG	A	2202	1	14,14,15	0.23	0	17,19,21	0.41	0
2	NAG	A	2203	1	14,14,15	0.23	0	17,19,21	0.51	0

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	A	2201	1	-	5/6/23/26	0/1/1/1
2	NAG	A	2204	1	-	0/6/23/26	0/1/1/1
2	NAG	A	2202	1	-	2/6/23/26	0/1/1/1
2	NAG	A	2203	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2201	NAG	C2-N2-C7	4.26	128.97	122.90
2	A	2201	NAG	C1-O5-C5	2.65	115.78	112.19

There are no chirality outliers.

All (10) torsion outliers are listed below:

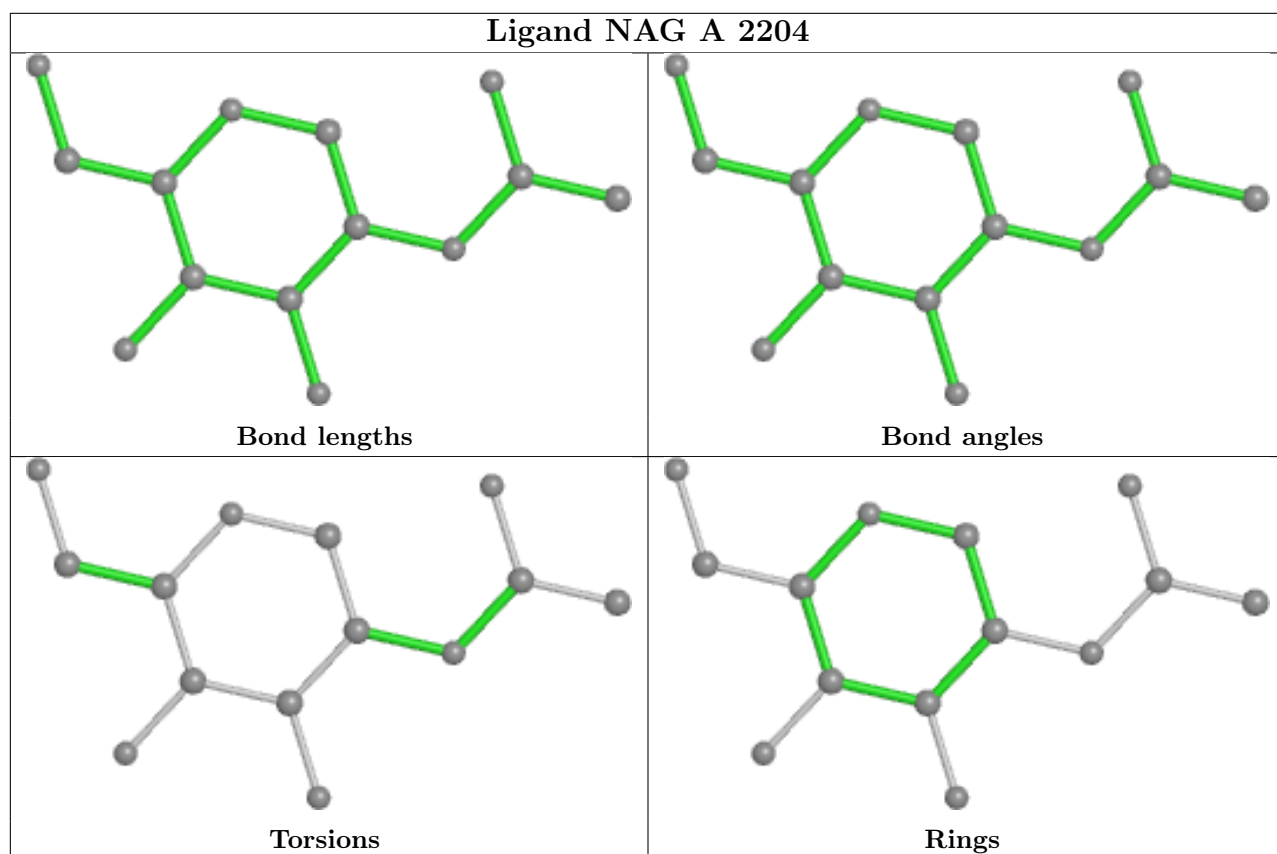
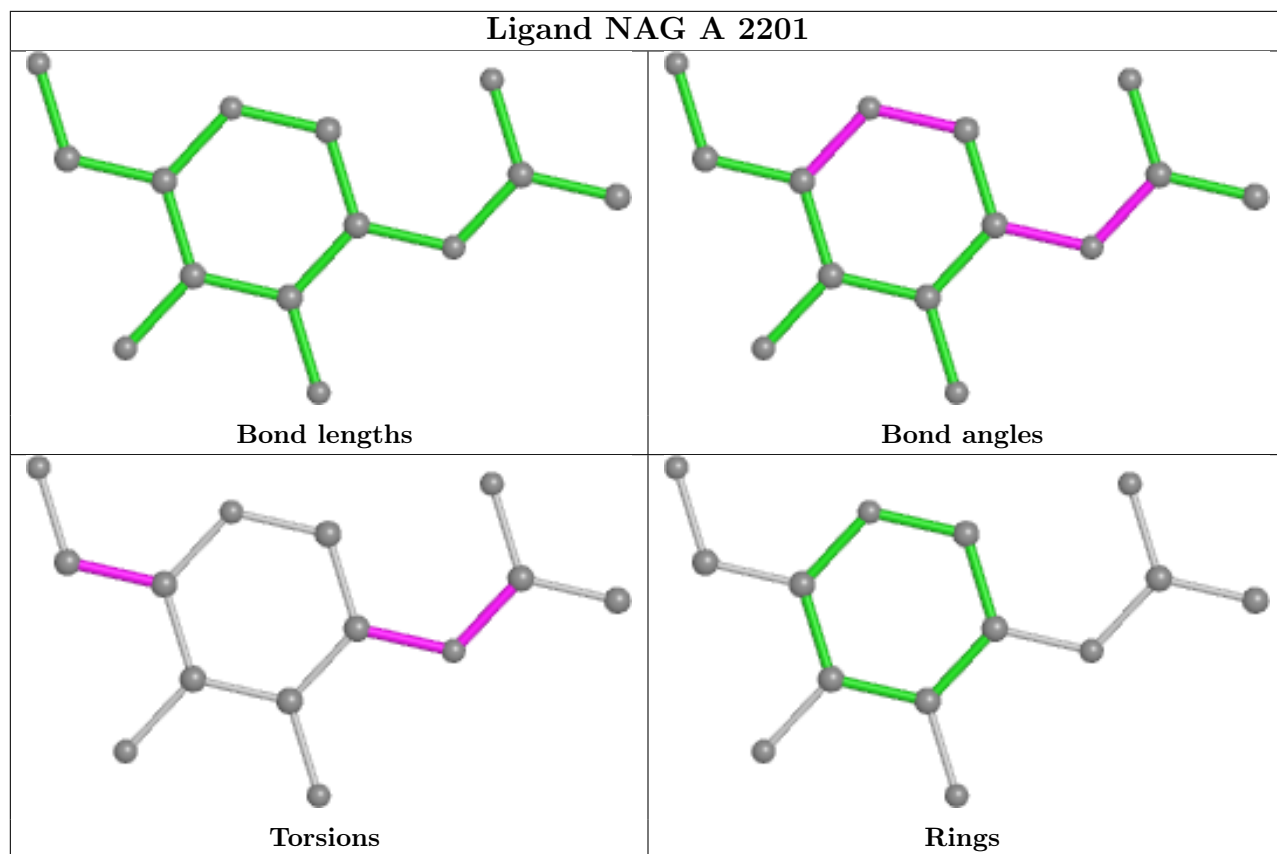
Mol	Chain	Res	Type	Atoms
2	A	2201	NAG	O5-C5-C6-O6
2	A	2202	NAG	O5-C5-C6-O6
2	A	2202	NAG	C4-C5-C6-O6
2	A	2201	NAG	C8-C7-N2-C2
2	A	2201	NAG	O7-C7-N2-C2
2	A	2201	NAG	C4-C5-C6-O6
2	A	2203	NAG	C4-C5-C6-O6
2	A	2203	NAG	O5-C5-C6-O6
2	A	2201	NAG	C3-C2-N2-C7
2	A	2203	NAG	C3-C2-N2-C7

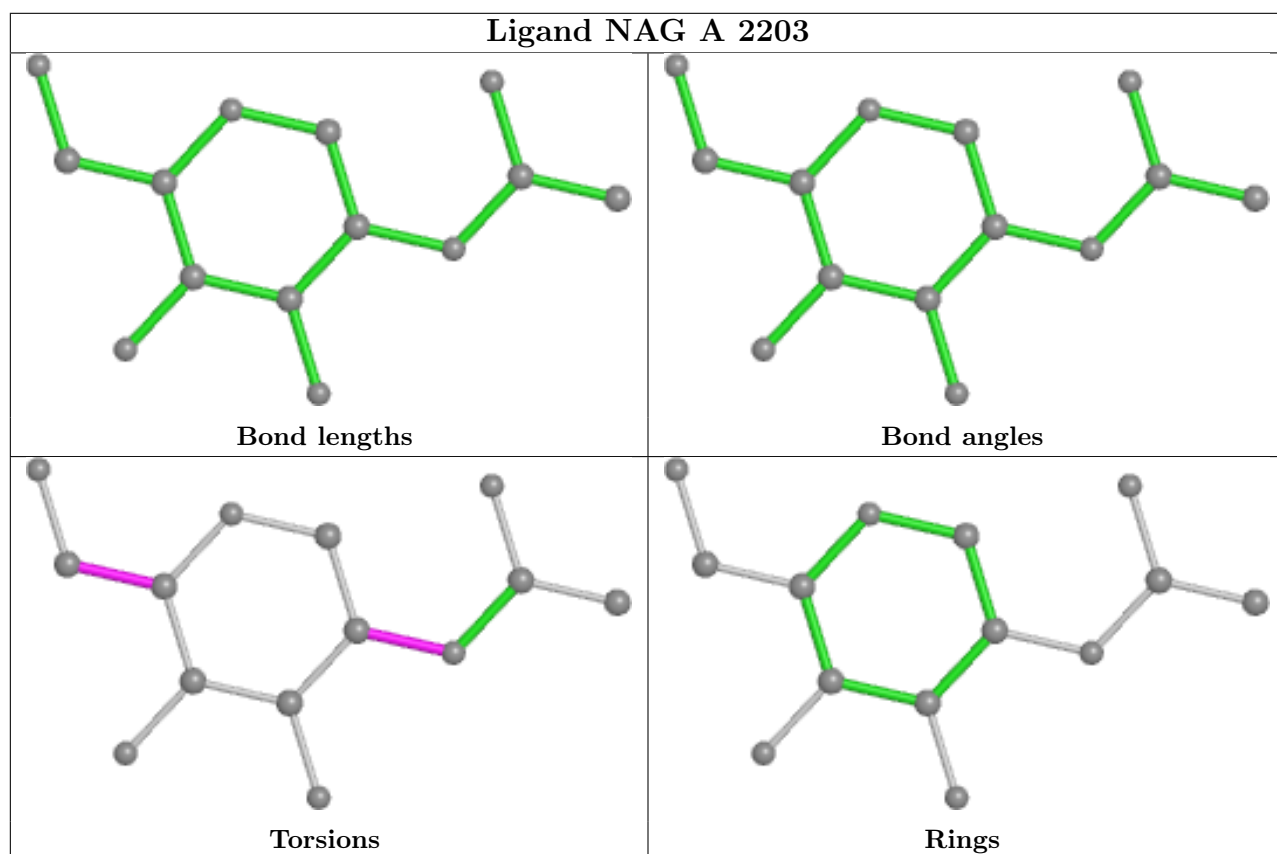
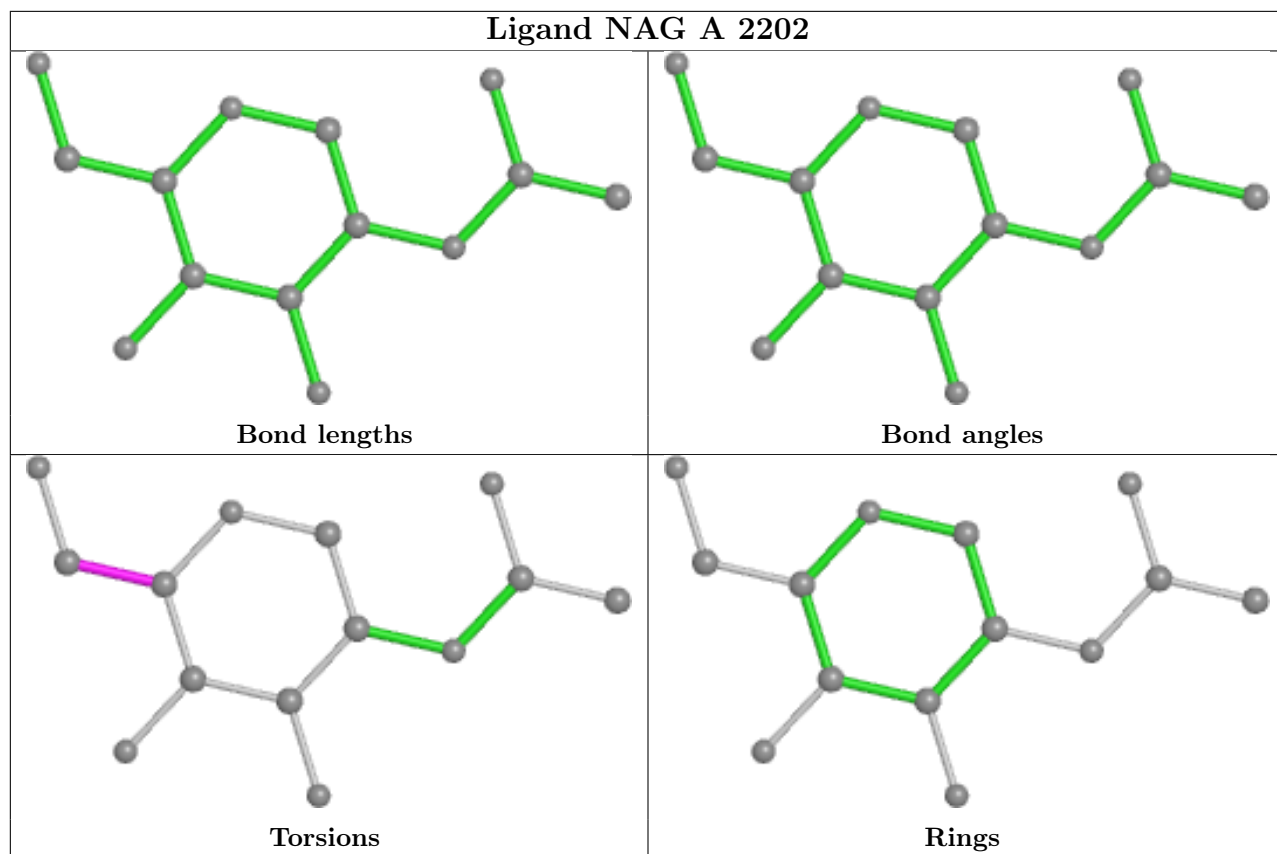
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	2201	NAG	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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

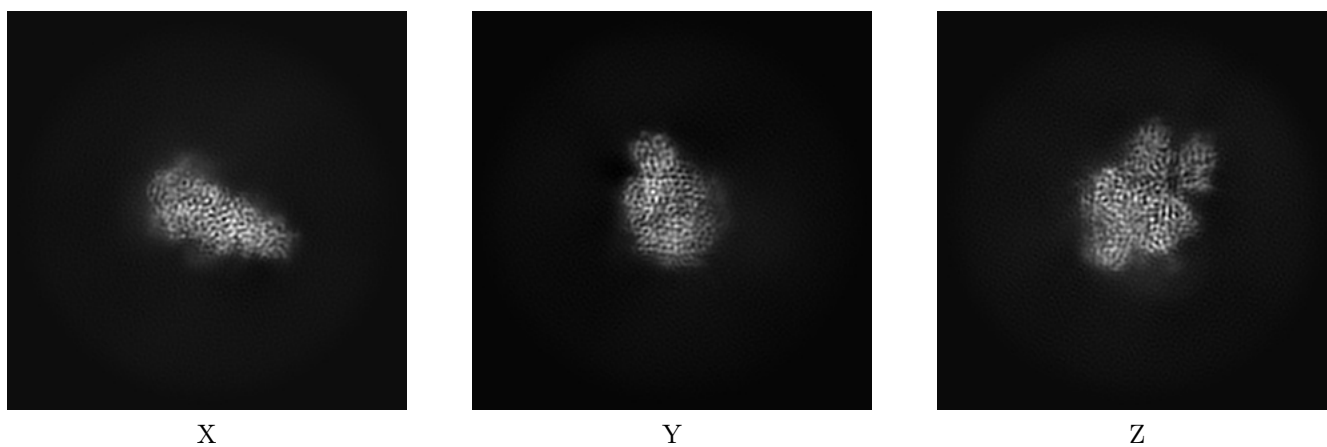
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41411. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections [i](#)

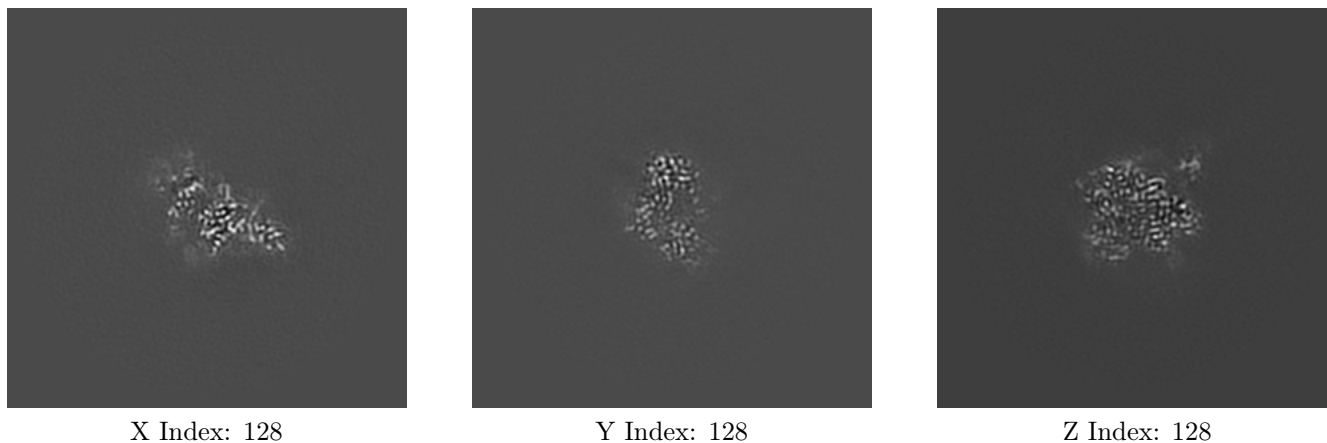
6.1.1 Primary map



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

6.2 Central slices [i](#)

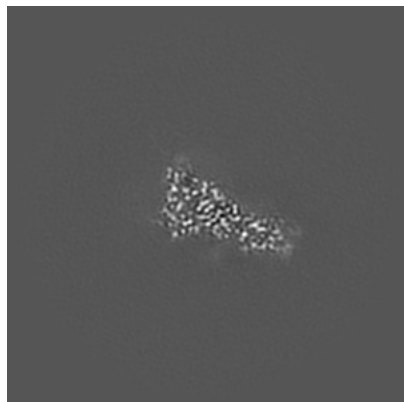
6.2.1 Primary map



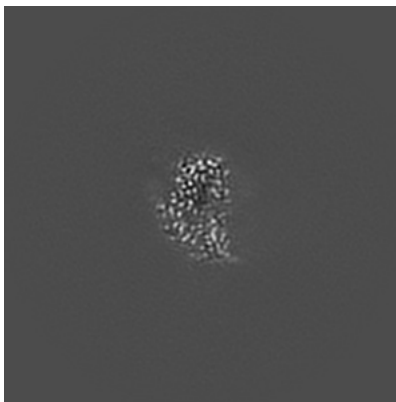
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

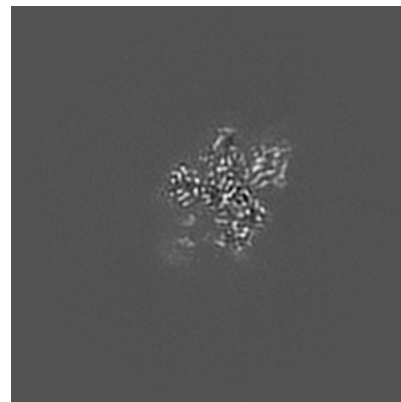
6.3.1 Primary map



X Index: 143



Y Index: 132

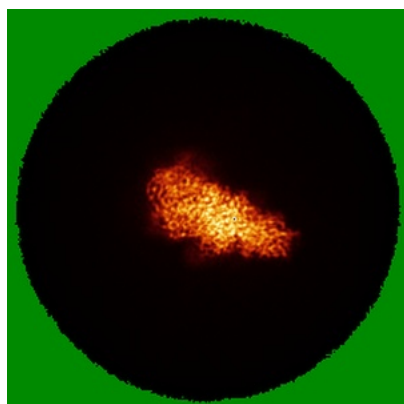


Z Index: 117

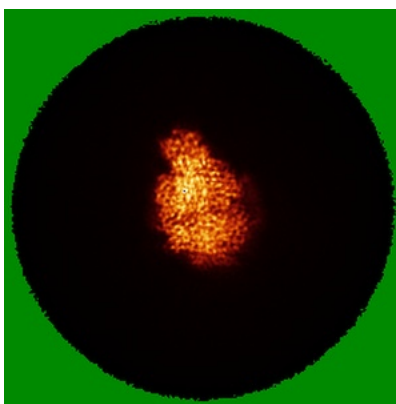
The images above show the largest variance slices of the map in three orthogonal directions.

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

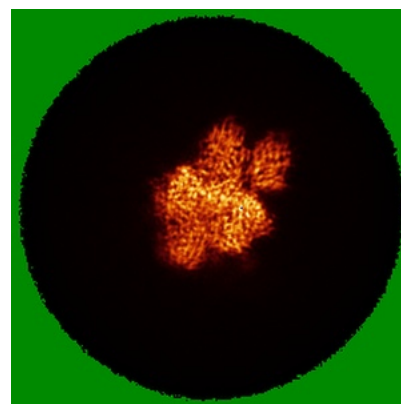
6.4.1 Primary map



X



Y

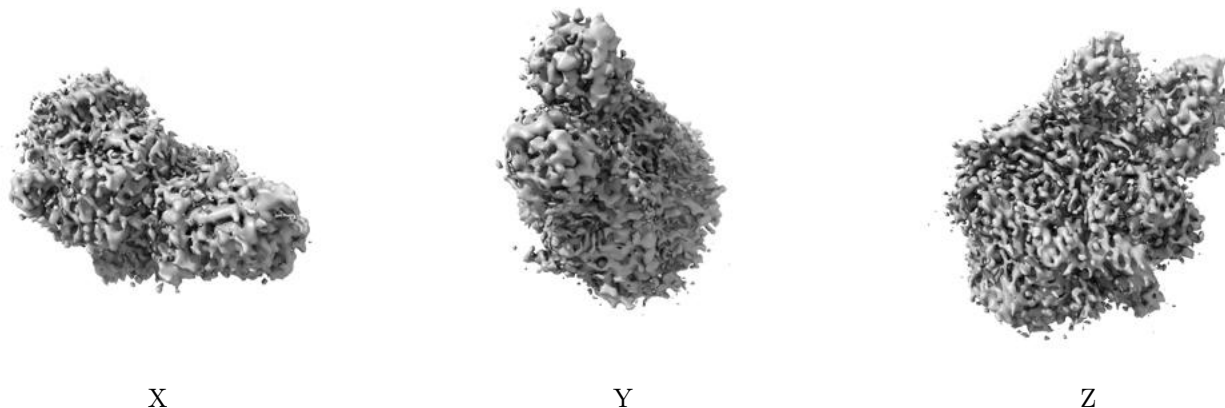


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 2.65. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

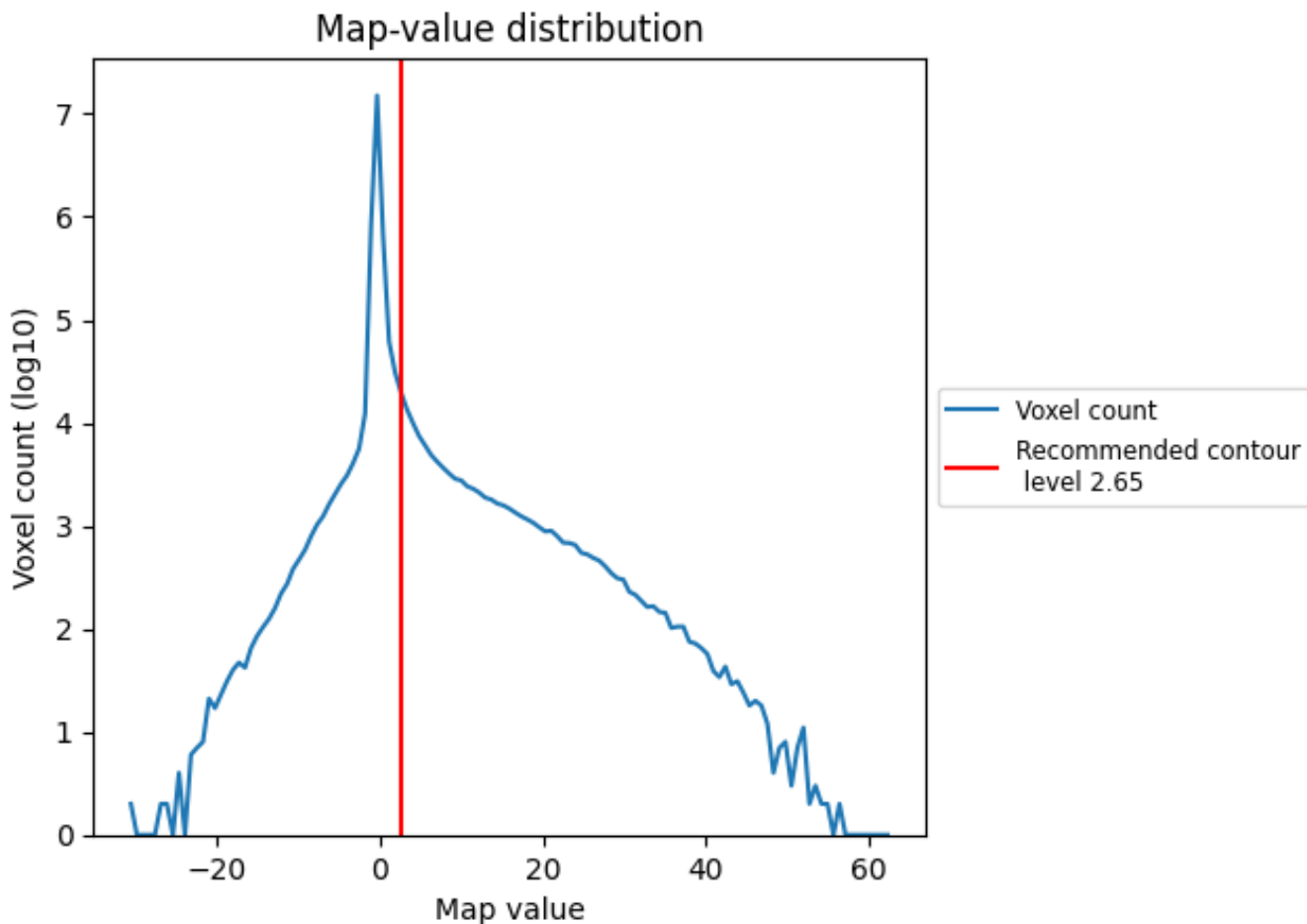
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

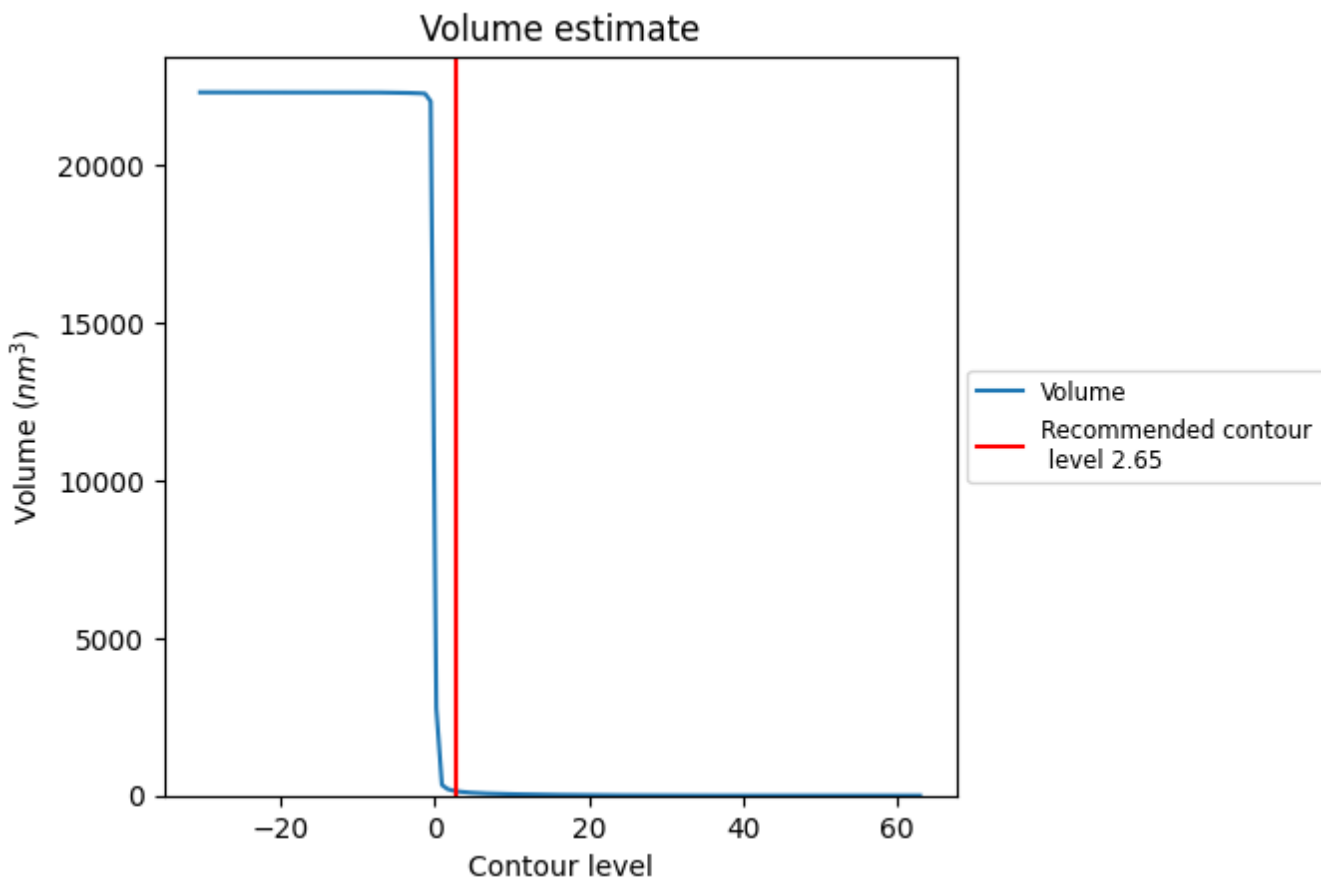
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

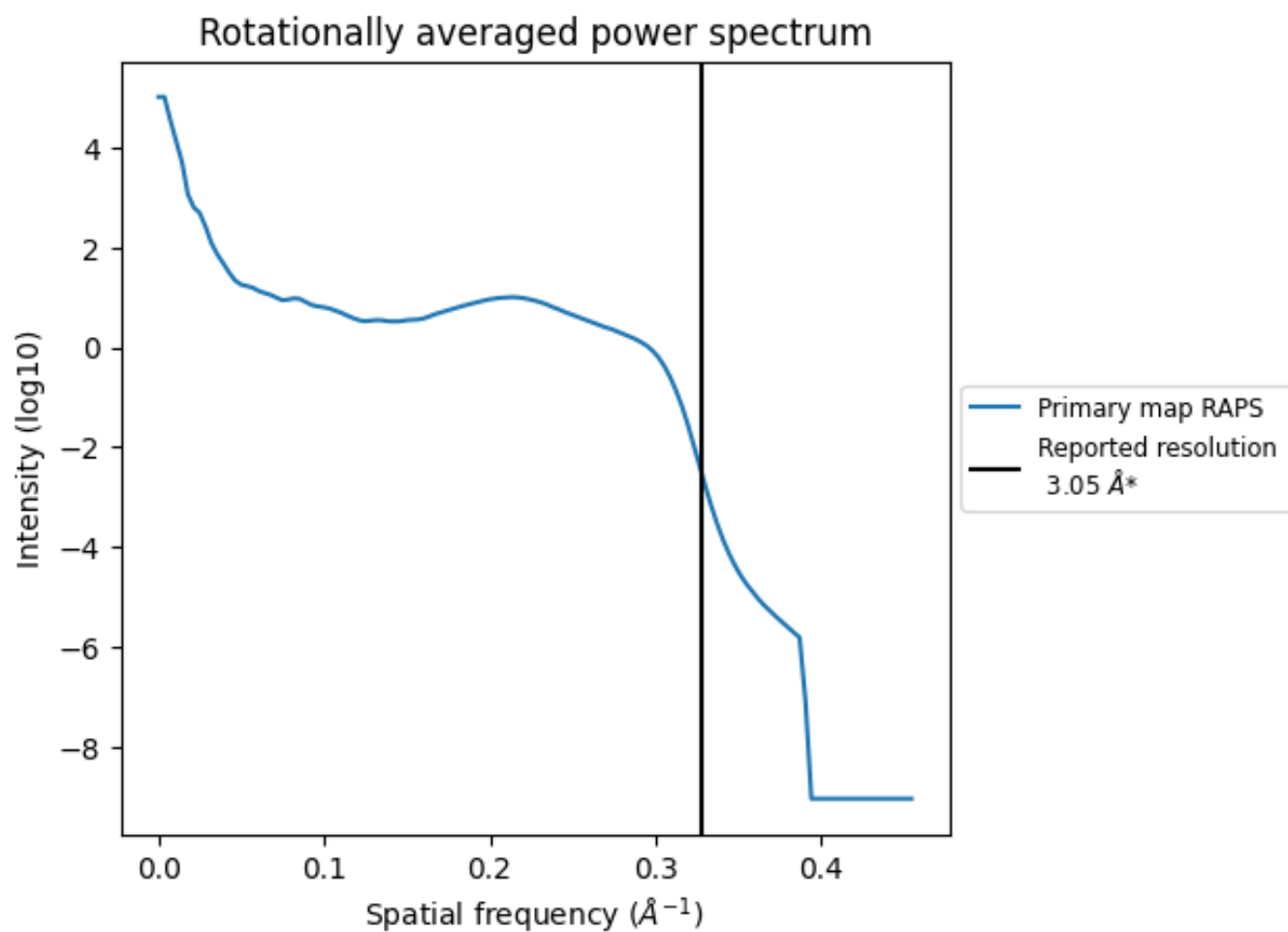
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 146 nm^3 ; this corresponds to an approximate mass of 132 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](#)

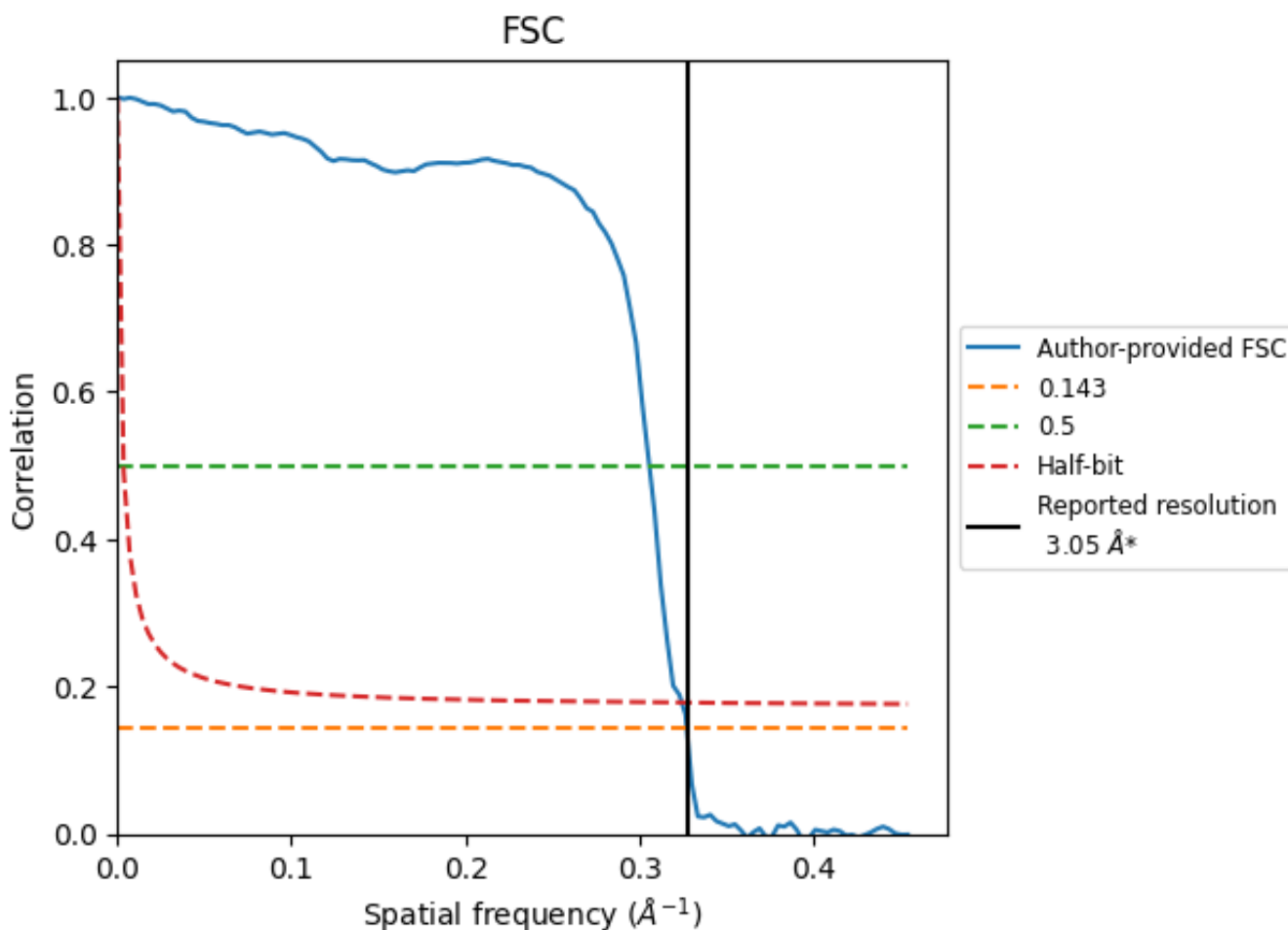


*Reported resolution corresponds to spatial frequency of 0.328 Å⁻¹

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 0.328 Å⁻¹

8.2 Resolution estimates [i](#)

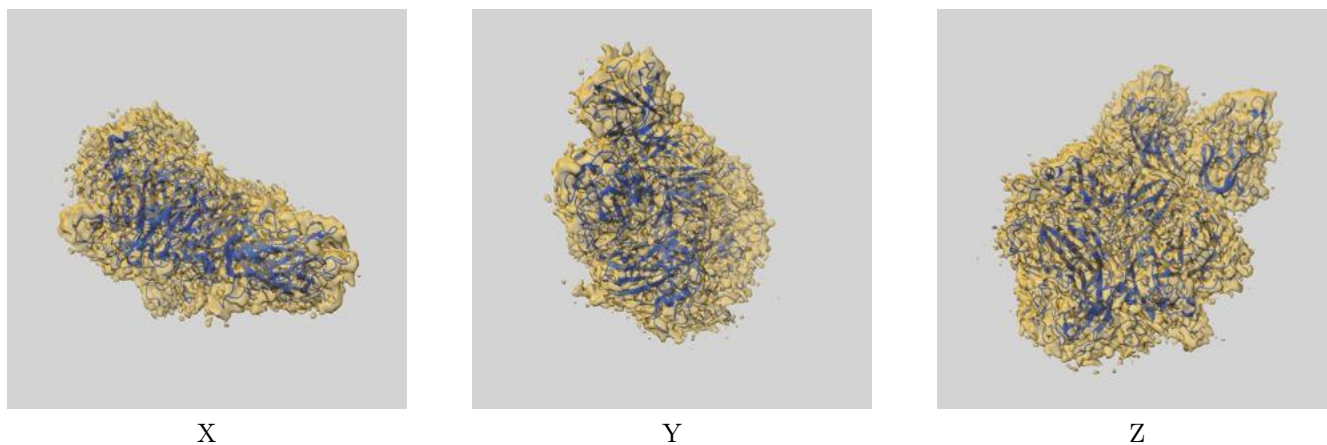
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.05	-	-
Author-provided FSC curve	3.05	3.27	3.08
Unmasked-calculated*	-	-	-

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

9 Map-model fit [i](#)

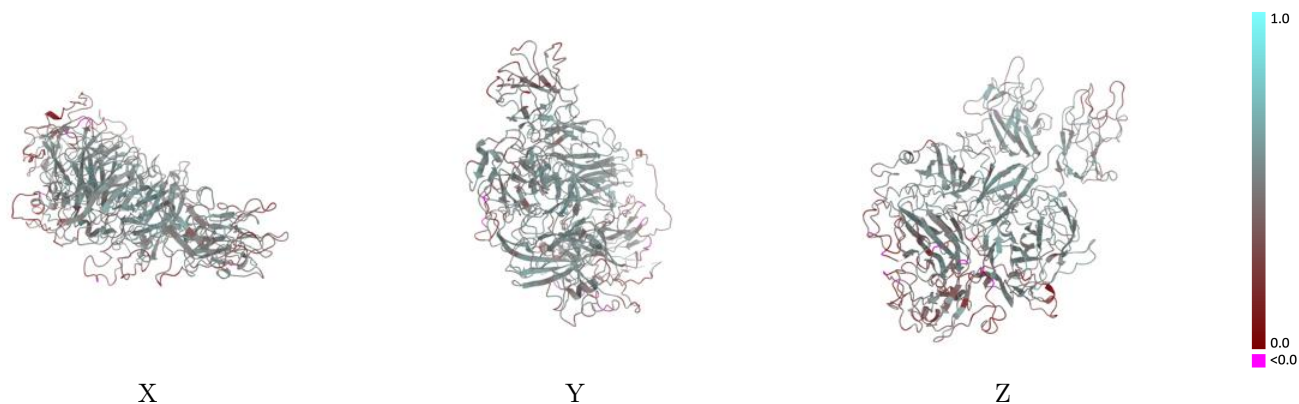
This section contains information regarding the fit between EMDB map EMD-41411 and PDB model 8TN9. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay [i](#)



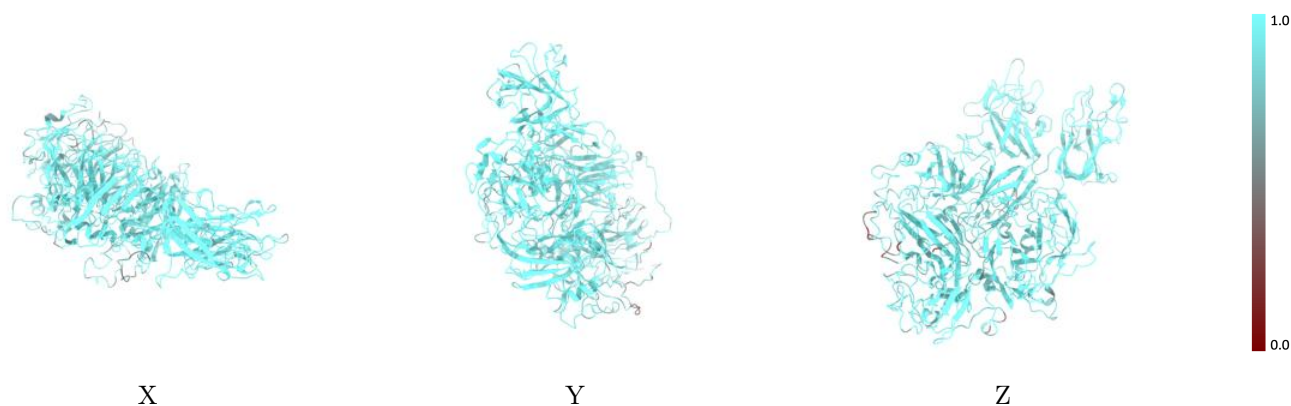
The images above show the 3D surface view of the map at the recommended contour level 2.65 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



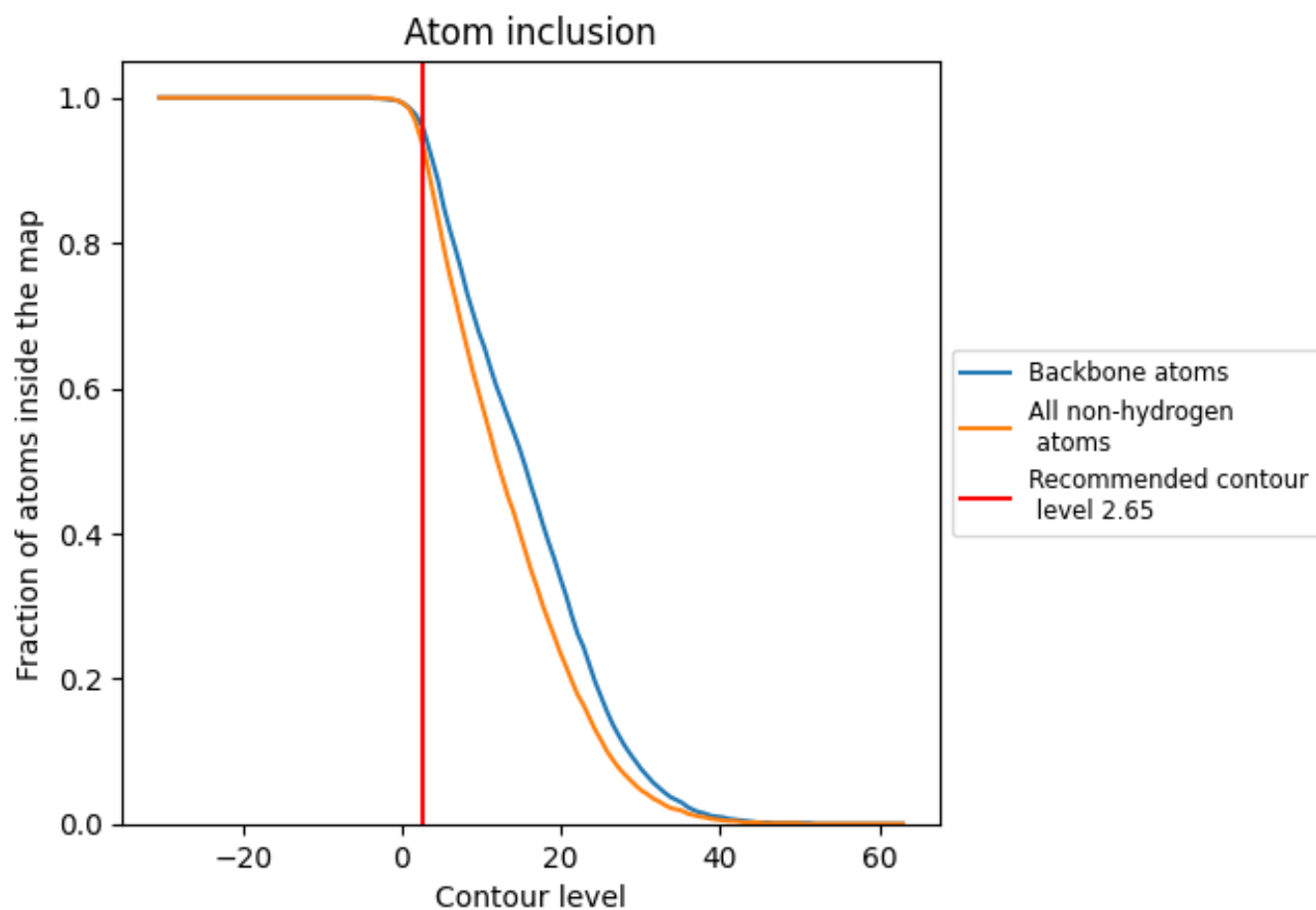
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (2.65).





9.4 Atom inclusion [i](#)



At the recommended contour level, 96% of all backbone atoms, 93% 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 (2.65) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9340	 0.4560
A	 0.9340	 0.4560

