



Full wwPDB EM Validation Report ⓘ

Nov 12, 2022 – 01:09 PM EST

PDB ID : 6UM1
EMDB ID : EMD-20815
Title : Structure of M-6-P/IGFII Receptor at pH 4.5
Authors : Wang, R.; Qi, X.; Li, X.
Deposited on : 2019-10-08
Resolution : 3.46 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.dev43
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.31.2

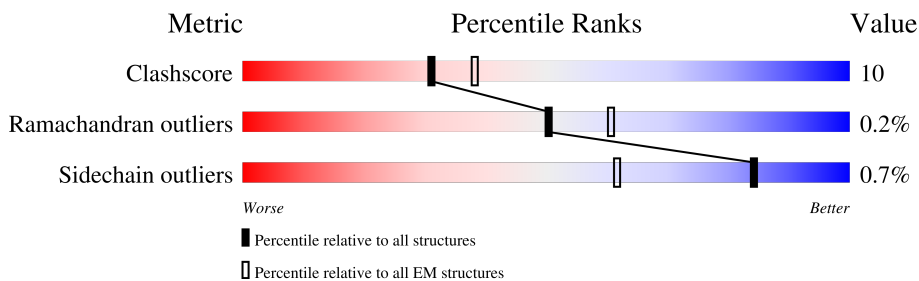
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.46 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	2499	
2	B	2	
3	C	3	

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	NAG	A	2508	-	-	X	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 17134 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 Cation-independent mannose-6-phosphate receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	2208	17025	10631	2916	3342	136	0	0

- Molecule 2 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



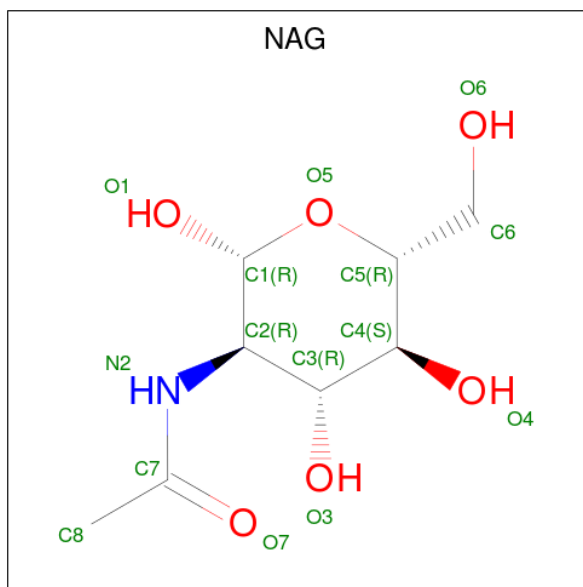
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
2	B	2	28	16	2	10	0	0

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	3	39	22	2	15	0	0

- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).

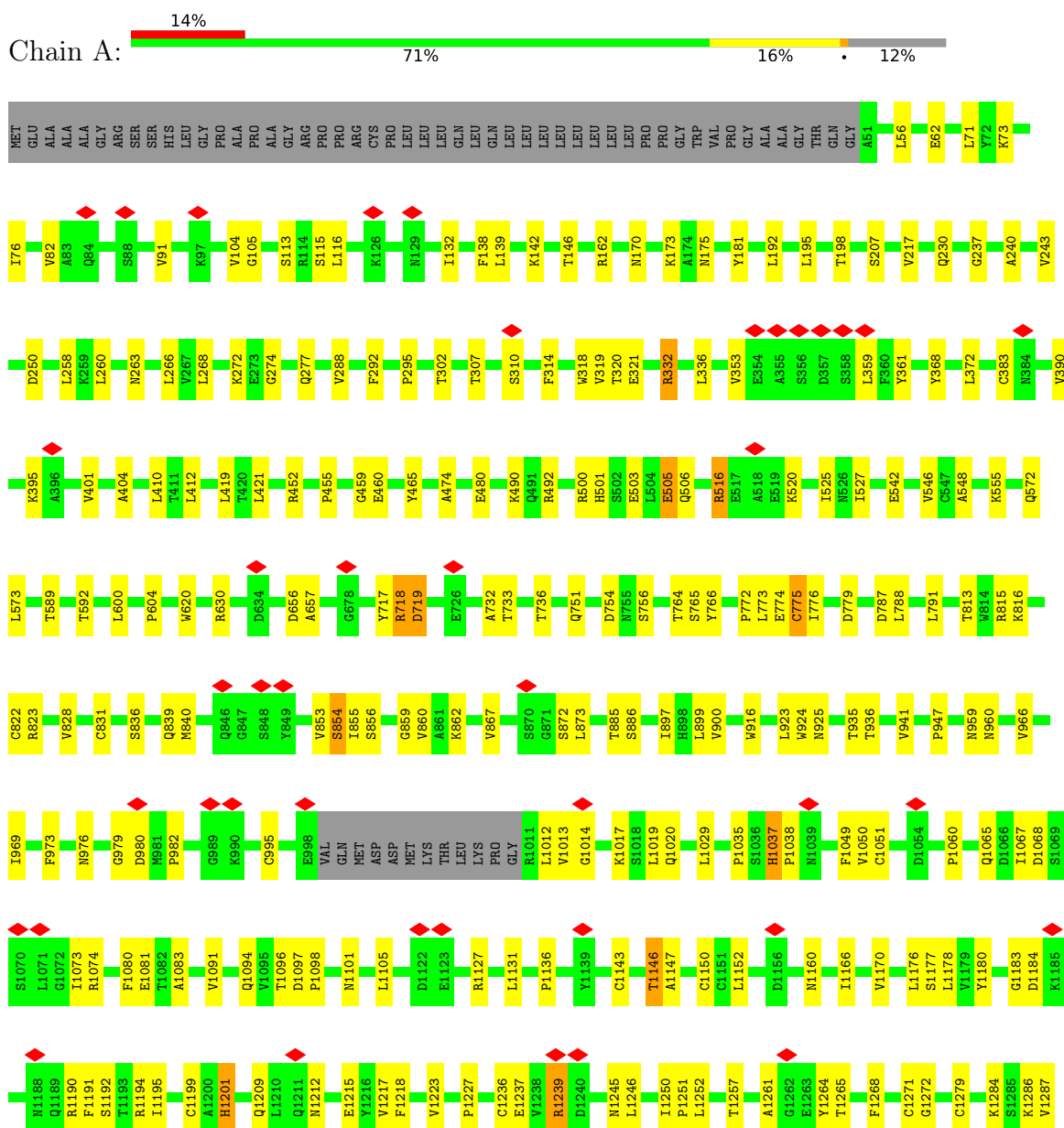


Mol	Chain	Residues	Atoms				AltConf
			Total	C	N	O	
4	A	1	Total	C	N	O	0
			42	24	3	15	
4	A	1	Total	C	N	O	0
			42	24	3	15	
4	A	1	Total	C	N	O	0
			42	24	3	15	

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: Cation-independent mannose-6-phosphate receptor



LEU	L2260	F2195	C2134	V2065	R1982	L1883	F1796	P1697	V1572	I1288
VAL	V2261	A2196	ALA	L2066	K2000	D1884	V1803	D1698	F1576	S1289
PRO	K2262	C2197	VAL	G2067	V2006	Q1888	D1806	P1706	T1579	C1290
THR	D2263	S2198	PRO	L2068	K2007	D1889	D1811	L1707	H1411	S1291
ALA	G2264	G2199	GLN	L2074	Q2008	E1890	G1812	L1413	Y1412	Q1292
CYS	I2265	A2200	GLU	D2075	H2009	L1894	H1811	I1414	I1414	R1295
PRO	P2266	S2201	VAL	V2076	R2010	C1902	G1813	H1415	H1416	G1296
LEU	E2267	I2202	GLN	V2077	T2011	P1903	SER	V1423	F1300	F1300
THR	F2268	Q2203	LEU	D2078	L2014	P1904	THR	A1424	Q1301	Q1301
LEU	S2269	Q2204	R2080	D2079	R2015	P1904	ASP	G1425	K1302	K1302
LEU	H2270	Q2204	V2081	D2080	R2016	P1904	THR	S1426	V1303	V1303
LEU	E2271	R2214	I2082	R2081	L2017	E1907	ASP	A1427	A1304	A1304
THR	T2272	A2273	V2083	V2082	L2017	G1909	THR	D1428	F1307	F1307
GLY	A2273	T2149	T2084	I2082	L2017	G1909	GLN	C1429	L1311	L1311
VAL	D2274	N2150	Y2085	V2083	L2017	G1909	LEU	V1435	E1314	E1314
ARG	C2275	P2151	Y2086	T2084	L2017	G1909	LEU	V1435	N1315	N1315
ASP	Q2276	A2152	S2086	Y2085	L2017	G1909	TYR	V1435	G1316	G1316
ASP	Q2276	A2152	S2086	Y2085	L2017	G1909	TYR	V1435	V1317	V1317
VAL	Y2277	M2153	K2087	G2088	L2020	K1921	ASN	P1438	L1318	L1318
VAL	L2278	F2212	G2087	G2088	T2021	S1922	ASN	G1439	M1321	M1321
GLY	F2279	S2213	H2089	G2088	G2022	Y1923	LEU	G1440	Y1322	Y1322
ARG	F2279	S2213	H2089	G2088	G2022	Y1923	LEU	P1441	T1323	T1323
ARG	S2280	R2214	G2091	Y2090	W2024	S1927	S1927	P1441	Q1347	Q1347
LEU	W2281	K2215	C2091	Y2090	W2024	S1927	S1927	P1441	V1350	V1350
THR	S2281	K2215	C2091	Y2090	W2024	S1927	S1927	P1441	F1351	F1351
THR	S2281	K2215	C2091	Y2090	W2024	S1927	S1927	P1441	L1352	L1352
ASN	S2284	G2217	G2092	D2093	F2026	V1927	V1845	Q1457	T1355	T1355
GLY	A2285	T2218	D2093	D2093	F2026	V1927	V1845	Q1457	S1356	S1356
PRO	L2289	S2219	H2094	H2094	N2029	V1928	V1845	Q1457	L1361	L1361
ALA	G2290	N2220	N2094	N2094	N2029	V1928	V1845	Q1457	F1362	F1362
ALA	A2291	Q2221	T2096	T2096	N2029	V1928	V1845	Q1457	E1363	E1363
GLY	GLY	T2222	K2165	K2165	N2029	V1928	V1845	Q1457	M1364	M1364
ASP	ASP	A2223	F2167	F2167	N2029	V1928	V1845	Q1457	Y1368	Y1368
PRO	PRO	Y2224	S2168	S2168	N2029	V1928	V1845	Q1457	P1372	P1372
ALA	ALA	Y2225	A2169	A2169	N2029	V1928	V1845	Q1457	G1385	G1385
ALA	ALA	Y2226	S2170	S2170	N2029	V1928	V1845	Q1457	F1386	F1386
ALA	ALA	Q2227	E2102	E2102	N2029	V1928	V1845	Q1457	T1387	T1387
THR	THR	Q2228	L2103	L2103	N2029	V1928	V1845	Q1457	L1393	L1393
THR	THR	G2229	T2104	T2104	N2029	V1928	V1845	Q1457	Y1396	Y1396
THR	THR	F2230	C2105	C2105	N2029	V1928	V1845	Q1457	A1402	A1402
GLU	GLU	T2236	A2106	A2106	N2029	V1928	V1845	Q1457		
GLU	GLU	S2237	T2108	T2108	N2029	V1928	V1845	Q1457		
GLU	GLU	S2238	V2109	V2109	N2029	V1928	V1845	Q1457		
GLU	GLU	S2239	G2110	G2110	N2029	V1928	V1845	Q1457		
GLU	GLU	K2240	R2111	R2111	N2029	V1928	V1845	Q1457		
GLU	GLU	C2241	P2112	P2112	N2029	V1928	V1845	Q1457		
GLU	GLU	G2242	S2113	S2113	N2029	V1928	V1845	Q1457		
GLU	GLU	K2243	T2114	T2114	N2029	V1928	V1845	Q1457		
GLU	GLU	D2244	T2115	T2115	N2029	V1928	V1845	Q1457		
GLU	GLU	K2245	R2116	R2116	N2029	V1928	V1845	Q1457		
GLU	GLU	T2246	F2117	F2117	N2029	V1928	V1845	Q1457		
GLU	GLU	K2247	D2118	D2118	N2029	V1928	V1845	Q1457		
GLU	GLU	S2248	V2119	V2119	N2029	V1928	V1845	Q1457		
GLU	GLU	V2249	D2120	D2120	N2029	V1928	V1845	Q1457		
GLU	GLU	S2250	S2121	S2121	N2029	V1928	V1845	Q1457		
GLU	GLU	F2253	H2125	H2125	N2029	V1928	V1845	Q1457		
GLU	GLU	F2254	F2126	F2126	N2029	V1928	V1845	Q1457		
GLU	GLU	F2255	G2061	G2061	N2029	V1928	V1845	Q1457		
GLU	GLU	H2256	E2062	E2062	N2029	V1928	V1845	Q1457		
GLU	GLU	C2257	W2128	W2128	N2029	V1928	V1845	Q1457		
GLU	GLU	D2258	D2129	D2129	N2029	V1928	V1845	Q1457		
GLU	GLU	P2259	S2130	S2130	N2029	V1928	V1845	Q1457		

- Molecule 2: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain B:  100%

MAG1
MAG2

- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:  33% 67%

MAG1
MAG2
BMA3

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	128789	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	80	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.137	Depositor
Minimum map value	-0.096	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.0145	Depositor
Map size (\AA)	280.0, 280.0, 280.0	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.0, 1.0, 1.0	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, BMA

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	0.69	0/17415	0.87	7/23648 (0.0%)

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	20

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	656	ASP	CB-CA-C	-8.75	92.90	110.40
1	A	1425	GLY	N-CA-C	-8.25	92.48	113.10
1	A	1037	HIS	C-N-CD	-6.15	107.07	120.60
1	A	1914	PHE	CB-CA-C	6.07	122.53	110.40
1	A	1423	GLN	N-CA-C	-5.92	95.00	111.00
1	A	1239	ARG	NE-CZ-NH2	-5.44	117.58	120.30
1	A	791	LEU	CB-CA-C	-5.34	100.05	110.20

There are no chirality outliers.

All (20) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	1035	PRO	Peptide
1	A	1037	HIS	Mainchain
1	A	1051	CYS	Peptide

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Mol	Chain	Res	Type	Group
1	A	1180	TYR	Peptide
1	A	1199	CYS	Peptide
1	A	1201	HIS	Peptide
1	A	1272	GLY	Peptide
1	A	1304	ALA	Peptide
1	A	1576	PHE	Peptide
1	A	1656	GLU	Peptide
1	A	1766	ASN	Peptide
1	A	1914	PHE	Peptide
1	A	2186	LEU	Peptide
1	A	310	SER	Peptide
1	A	505	GLU	Peptide
1	A	813	THR	Peptide
1	A	823	ARG	Peptide
1	A	854	SER	Peptide
1	A	855	ILE	Peptide
1	A	995	CYS	Peptide

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	17025	0	16238	323	0
2	B	28	0	25	0	0
3	C	39	0	34	0	0
4	A	42	0	37	8	0
All	All	17134	0	16334	323	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 (323) 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:1239:ARG:NH2	1:A:1424:ALA:HB2	1.59	1.17
1:A:718:ARG:HB3	1:A:732:ALA:HB1	1.28	1.13

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1239:ARG:HH22	1:A:1424:ALA:CB	1.71	1.02
1:A:1663:VAL:HG13	1:A:1670:ILE:HG23	1.44	1.00
1:A:718:ARG:HB3	1:A:732:ALA:CB	1.93	0.98
1:A:1663:VAL:CG1	1:A:1670:ILE:HG23	1.95	0.96
1:A:897:ILE:HG12	1:A:924:TRP:CD1	2.02	0.95
1:A:1414:ILE:HD11	1:A:1494:PRO:CG	1.97	0.95
1:A:764:THR:HG22	1:A:766:TYR:H	1.31	0.93
1:A:1257:THR:HG21	1:A:1364:TRP:HZ2	1.33	0.93
1:A:146:THR:HG21	1:A:181:TYR:HB3	1.53	0.90
1:A:295:PRO:HG2	1:A:501:HIS:CE1	2.07	0.90
1:A:1287:VAL:HG13	1:A:1307:PHE:HB3	1.56	0.87
1:A:1323:THR:HB	4:A:2508:NAG:H62	1.57	0.86
1:A:1321:ASN:OD1	4:A:2508:NAG:C1	2.25	0.84
1:A:600:LEU:HB3	1:A:772:PRO:HB3	1.59	0.84
1:A:764:THR:HG22	1:A:766:TYR:N	1.92	0.83
1:A:1414:ILE:HD11	1:A:1494:PRO:HG3	1.61	0.83
1:A:274:GLY:O	1:A:277:GLN:NE2	2.14	0.81
1:A:1414:ILE:HG22	1:A:1435:VAL:HG23	1.63	0.80
1:A:192:LEU:CD2	1:A:217:VAL:HG11	2.13	0.79
1:A:2053:SER:OG	1:A:2067:GLY:O	2.01	0.78
1:A:718:ARG:CB	1:A:732:ALA:CB	2.61	0.78
1:A:192:LEU:HD22	1:A:217:VAL:HG11	1.65	0.77
1:A:1414:ILE:HD11	1:A:1494:PRO:CB	2.17	0.74
1:A:192:LEU:HD23	1:A:192:LEU:O	1.87	0.72
1:A:1321:ASN:HD21	4:A:2508:NAG:C1	2.02	0.72
1:A:91:VAL:HG13	1:A:104:VAL:HB	1.71	0.71
1:A:897:ILE:CD1	1:A:924:TRP:NE1	2.53	0.71
1:A:754:ASP:CG	1:A:756:SER:OG	2.29	0.71
1:A:1257:THR:HG21	1:A:1364:TRP:CZ2	2.22	0.71
1:A:516:ARG:HB2	1:A:520:LYS:HB3	1.73	0.70
1:A:2272:THR:HB	1:A:2276:GLN:O	1.93	0.67
1:A:1083:ALA:HB1	1:A:1146:THR:HB	1.77	0.67
1:A:1094:GLN:HE22	1:A:1315:ASN:HB2	1.58	0.67
1:A:717:TYR:O	1:A:733:THR:N	2.27	0.67
1:A:1257:THR:CG2	1:A:1364:TRP:HZ2	2.06	0.66
1:A:1195:ILE:HG22	1:A:1218:PHE:HB2	1.77	0.66
1:A:828:VAL:HG23	1:A:831:CYS:SG	2.35	0.66
1:A:1427:ASP:OD1	1:A:1427:ASP:N	2.28	0.66
1:A:2017:LEU:HD22	1:A:2037:LEU:HB2	1.77	0.66
1:A:525:ILE:HD12	1:A:527:ILE:CD1	2.25	0.65
1:A:1287:VAL:CG1	1:A:1307:PHE:HB3	2.27	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1663:VAL:HG13	1:A:1670:ILE:CG2	2.24	0.64
1:A:2053:SER:CB	1:A:2067:GLY:O	2.46	0.64
1:A:321:GLU:HG3	1:A:501:HIS:CE1	2.33	0.64
1:A:718:ARG:CB	1:A:732:ALA:HB2	2.27	0.64
1:A:1321:ASN:ND2	4:A:2508:NAG:C1	2.60	0.64
1:A:2017:LEU:HD12	1:A:2128:TRP:NE1	2.13	0.63
1:A:899:LEU:HA	1:A:924:TRP:HB2	1.80	0.63
1:A:1495:MET:SD	1:A:1888:GLN:NE2	2.72	0.62
1:A:500:ARG:NH2	1:A:506:GLN:O	2.31	0.62
1:A:1742:LEU:HD12	1:A:1748:GLU:O	1.98	0.62
1:A:899:LEU:HG	1:A:924:TRP:HB2	1.79	0.62
1:A:195:LEU:HD21	1:A:320:THR:HG21	1.82	0.61
1:A:773:LEU:HD11	1:A:822:CYS:HB3	1.83	0.61
1:A:718:ARG:HG2	1:A:718:ARG:HH11	1.64	0.61
1:A:1696:SER:OG	1:A:1697:PRO:HD3	2.01	0.61
1:A:288:VAL:HG22	1:A:314:PHE:HB2	1.82	0.60
1:A:1323:THR:CB	4:A:2508:NAG:H62	2.28	0.60
1:A:1350:VAL:CG2	1:A:1363:GLU:HB3	2.32	0.60
1:A:1250:ILE:N	1:A:1251:PRO:HD2	2.16	0.60
1:A:815:ARG:HD2	1:A:839:GLN:HE21	1.66	0.59
1:A:773:LEU:CD1	1:A:822:CYS:HB3	2.33	0.59
1:A:1291:CYS:SG	1:A:1302:LYS:O	2.61	0.59
1:A:897:ILE:HG12	1:A:924:TRP:NE1	2.16	0.59
1:A:146:THR:HG21	1:A:181:TYR:CB	2.31	0.59
1:A:899:LEU:HG	1:A:924:TRP:CD1	2.38	0.59
1:A:959:ASN:HD21	1:A:980:ASP:HB2	1.68	0.59
1:A:1624:ARG:NH1	1:A:1627:VAL:O	2.35	0.59
1:A:966:VAL:HB	1:A:973:PHE:HB2	1.85	0.58
1:A:897:ILE:CG1	1:A:924:TRP:CD1	2.82	0.58
1:A:2090:TYR:HB3	1:A:2092:GLY:O	2.02	0.58
1:A:718:ARG:HA	1:A:732:ALA:HA	1.85	0.58
1:A:525:ILE:HD12	1:A:527:ILE:HD11	1.83	0.57
1:A:773:LEU:HD11	1:A:822:CYS:CB	2.33	0.57
1:A:116:LEU:HD22	1:A:459:GLY:O	2.04	0.57
1:A:525:ILE:HD13	1:A:604:PRO:HG3	1.85	0.57
1:A:1416:VAL:HG12	1:A:1509:TRP:CZ3	2.40	0.57
1:A:295:PRO:HG2	1:A:501:HIS:ND1	2.19	0.57
1:A:718:ARG:HB2	1:A:732:ALA:HB2	1.86	0.57
1:A:1183:GLY:HA3	1:A:1191:PHE:HB2	1.86	0.57
1:A:1663:VAL:HG12	1:A:1670:ILE:O	2.04	0.57
1:A:91:VAL:HG12	1:A:105:GLY:HA3	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:717:TYR:O	1:A:733:THR:O	2.23	0.57
1:A:321:GLU:HG3	1:A:501:HIS:HE1	1.68	0.57
1:A:1494:PRO:HB3	1:A:1509:TRP:CE3	2.40	0.57
1:A:899:LEU:HG	1:A:924:TRP:CG	2.41	0.56
1:A:1287:VAL:HG13	1:A:1287:VAL:O	2.04	0.56
1:A:525:ILE:CD1	1:A:527:ILE:HD11	2.35	0.56
1:A:1759:CYS:HB3	1:A:1761:ALA:O	2.05	0.56
1:A:195:LEU:CD2	1:A:320:THR:HG21	2.35	0.56
1:A:1771:ILE:HG22	1:A:1796:PHE:HB2	1.86	0.56
1:A:899:LEU:HG	1:A:924:TRP:CB	2.35	0.55
1:A:1060:PRO:HA	1:A:1080:PHE:HB3	1.88	0.55
1:A:1597:LEU:HB2	1:A:1621:PHE:HB2	1.87	0.55
1:A:260:LEU:HD23	1:A:260:LEU:O	2.06	0.55
1:A:1321:ASN:CG	4:A:2508:NAG:C1	2.73	0.55
1:A:1318:LEU:HB2	1:A:1340:PHE:HB2	1.89	0.55
1:A:764:THR:HG22	1:A:765:SER:N	2.23	0.54
1:A:1321:ASN:HD21	4:A:2508:NAG:C2	2.19	0.54
1:A:899:LEU:CD1	1:A:924:TRP:CD1	2.91	0.54
1:A:1178:LEU:HB3	1:A:1195:ILE:HG13	1.87	0.54
1:A:2017:LEU:HD12	1:A:2128:TRP:CE2	2.43	0.54
1:A:516:ARG:HB2	1:A:520:LYS:CB	2.38	0.54
1:A:361:TYR:OH	1:A:452:ARG:NH1	2.41	0.54
1:A:1414:ILE:CG2	1:A:1435:VAL:HG23	2.37	0.54
1:A:2268:PHE:HE1	1:A:2277:TYR:HB3	1.73	0.54
1:A:1535:LEU:HD23	1:A:1708:ASN:HD22	1.73	0.53
1:A:1355:THR:HG23	1:A:1356:SER:N	2.24	0.53
1:A:2065:VAL:O	1:A:2089:HIS:HB2	2.09	0.53
1:A:2173:VAL:HG21	1:A:2266:PRO:HG2	1.90	0.53
1:A:935:THR:HG21	1:A:947:PRO:HG3	1.91	0.53
1:A:1019:LEU:HB3	1:A:1029:LEU:HG	1.91	0.53
1:A:885:THR:HG23	1:A:886:SER:O	2.09	0.52
1:A:2053:SER:HB3	1:A:2067:GLY:O	2.09	0.52
1:A:897:ILE:HD13	1:A:924:TRP:NE1	2.25	0.52
1:A:1236:CYS:O	1:A:1311:LEU:HD21	2.09	0.52
1:A:1338:ILE:HG21	1:A:1340:PHE:CZ	2.44	0.52
1:A:816:LYS:HZ2	1:A:1096:THR:HG21	1.74	0.52
1:A:872:SER:HB3	1:A:900:VAL:HG12	1.91	0.52
1:A:1029:LEU:HD13	1:A:1049:PHE:HE1	1.74	0.52
1:A:1875:PHE:HA	1:A:1958:ARG:HB3	1.92	0.51
1:A:525:ILE:HD12	1:A:527:ILE:HD13	1.91	0.51
1:A:969:ILE:HD11	1:A:1065:GLN:HE21	1.75	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1393:LEU:HD11	1:A:1511:THR:HG21	1.92	0.51
1:A:2017:LEU:CD2	1:A:2037:LEU:HB2	2.40	0.51
1:A:1143:CYS:SG	1:A:1160:ASN:ND2	2.83	0.51
1:A:1695:THR:O	1:A:1698:ASP:HB2	2.11	0.51
1:A:1883:LEU:HB3	1:A:1894:LEU:HA	1.93	0.51
1:A:1955:THR:HG22	1:A:1955:THR:O	2.11	0.50
1:A:525:ILE:CD1	1:A:604:PRO:HG3	2.41	0.50
1:A:840:MET:HB3	1:A:853:VAL:HB	1.92	0.50
1:A:460:GLU:HG3	1:A:465:TYR:CE1	2.45	0.50
1:A:1288:ILE:HG23	1:A:1304:ALA:HB2	1.94	0.50
1:A:1416:VAL:CG1	1:A:1509:TRP:CH2	2.95	0.50
1:A:774:GLU:O	1:A:776:ILE:N	2.44	0.50
1:A:542:GLU:OE1	1:A:542:GLU:N	2.39	0.50
1:A:754:ASP:CG	1:A:756:SER:HG	2.15	0.50
1:A:1239:ARG:HH22	1:A:1424:ALA:HB2	0.74	0.50
1:A:1387:THR:HG23	1:A:1517:VAL:HG22	1.93	0.50
1:A:82:VAL:HG13	1:A:82:VAL:O	2.12	0.49
1:A:302:THR:HA	1:A:319:VAL:O	2.11	0.49
1:A:897:ILE:CG1	1:A:924:TRP:NE1	2.76	0.49
1:A:1973:GLY:O	1:A:1974:ARG:NH1	2.45	0.49
1:A:1098:PRO:HD2	1:A:1170:VAL:HG21	1.94	0.49
1:A:1201:HIS:CD2	1:A:1223:VAL:HG21	2.47	0.49
1:A:1201:HIS:CD2	1:A:1396:TYR:CD2	3.01	0.49
1:A:91:VAL:HG13	1:A:104:VAL:CB	2.41	0.49
1:A:1314:GLU:O	1:A:1317:VAL:HG12	2.13	0.49
1:A:1416:VAL:HG13	1:A:1509:TRP:CH2	2.48	0.49
1:A:2216:VAL:HG23	1:A:2275:CYS:O	2.13	0.49
1:A:113:SER:HB2	1:A:116:LEU:HB3	1.95	0.49
1:A:1423:GLN:NE2	1:A:1429:CYS:H	2.11	0.49
1:A:460:GLU:HG3	1:A:465:TYR:HE1	1.77	0.48
1:A:1271:CYS:N	1:A:1322:TYR:OH	2.44	0.48
1:A:751:GLN:OE1	1:A:751:GLN:N	2.46	0.48
1:A:923:LEU:HD22	1:A:1352:LEU:HD11	1.96	0.48
1:A:1252:LEU:HD22	1:A:1364:TRP:HZ3	1.78	0.48
1:A:1416:VAL:CG1	1:A:1509:TRP:CZ3	2.96	0.48
1:A:1657:GLN:HG3	1:A:1706:PRO:HD3	1.96	0.48
1:A:775:CYS:O	1:A:776:ILE:HG12	2.14	0.48
1:A:2083:VAL:HG23	1:A:2101:ILE:HB	1.95	0.48
1:A:1387:THR:HG23	1:A:1517:VAL:CG2	2.44	0.48
1:A:1425:GLY:C	1:A:1426:SER:O	2.46	0.47
1:A:2110:GLY:HA3	1:A:2129:ASP:HB3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:839:GLN:HB3	1:A:856:SER:HB3	1.95	0.47
1:A:1732:ASP:OD1	1:A:1734:GLY:O	2.33	0.47
1:A:266:LEU:HB2	1:A:292:PHE:HB2	1.96	0.47
1:A:1904:PRO:HG2	1:A:1953:HIS:HA	1.95	0.47
1:A:2101:ILE:HG23	1:A:2126:PHE:HB3	1.96	0.47
1:A:836:SER:N	1:A:859:GLY:O	2.44	0.47
1:A:1201:HIS:NE2	1:A:1396:TYR:HD2	2.12	0.47
1:A:1670:ILE:HD11	1:A:1803:VAL:HA	1.97	0.47
1:A:1131:LEU:HD12	1:A:1150:CYS:HB3	1.96	0.47
1:A:1184:ASP:N	1:A:1190:ARG:O	2.48	0.47
1:A:1830:SER:HB2	1:A:1849:THR:HG23	1.96	0.47
1:A:368:TYR:HA	1:A:395:LYS:HG2	1.97	0.47
1:A:779:ASP:HA	1:A:867:VAL:HG11	1.96	0.47
1:A:1271:CYS:H	1:A:1322:TYR:HH	1.61	0.47
1:A:1013:VAL:HG22	1:A:1014:GLY:O	2.15	0.47
1:A:1201:HIS:CD2	1:A:1223:VAL:CG2	2.98	0.47
1:A:318:TRP:NE1	1:A:320:THR:HG22	2.30	0.46
1:A:490:LYS:O	1:A:492:ARG:NH2	2.46	0.46
1:A:1194:ARG:HB2	1:A:1217:VAL:HG23	1.97	0.46
1:A:1672:LEU:HD12	1:A:1675:LEU:HD12	1.96	0.46
1:A:62:GLU:HG2	1:A:73:LYS:HG2	1.97	0.46
1:A:336:LEU:HD23	1:A:412:LEU:HG	1.98	0.46
1:A:1029:LEU:HD13	1:A:1049:PHE:CE1	2.50	0.46
1:A:1509:TRP:CD1	1:A:1511:THR:HB	2.50	0.46
1:A:1551:TYR:HB3	1:A:1635:LEU:HD23	1.97	0.46
1:A:1569:ALA:O	1:A:1572:VAL:HG12	2.15	0.46
1:A:170:ASN:HB2	1:A:173:LYS:HB2	1.97	0.46
1:A:2266:PRO:HB3	1:A:2281:TRP:CG	2.51	0.46
1:A:372:LEU:HB2	1:A:390:VAL:HG12	1.97	0.46
1:A:1127:ARG:HD2	1:A:1152:LEU:HD21	1.97	0.46
1:A:1067:ILE:HG22	1:A:1074:ARG:HB2	1.97	0.46
1:A:230:GLN:HB2	1:A:243:VAL:HG11	1.96	0.46
1:A:1177:SER:OG	1:A:1194:ARG:NH1	2.48	0.46
1:A:332:ARG:HA	1:A:332:ARG:HD3	1.51	0.46
1:A:1019:LEU:HD22	1:A:1029:LEU:HD11	1.98	0.46
1:A:1091:VAL:HG13	1:A:1166:ILE:HG23	1.98	0.46
1:A:1406:THR:HG23	1:A:1806:ASP:HB2	1.98	0.46
1:A:1689:GLU:HB2	1:A:2225:TYR:HD2	1.82	0.46
1:A:873:LEU:HD12	1:A:873:LEU:O	2.16	0.45
1:A:115:SER:O	1:A:138:PHE:HB2	2.16	0.45
1:A:383:CYS:HA	1:A:401:VAL:HG11	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1355:THR:HG21	1:A:1361:LEU:CD2	2.45	0.45
1:A:1624:ARG:HE	1:A:1650:HIS:HB3	1.80	0.45
1:A:258:LEU:HB3	1:A:268:LEU:HB2	1.98	0.45
1:A:1600:VAL:HA	1:A:1618:VAL:HG12	1.98	0.45
1:A:104:VAL:HG13	1:A:132:ILE:HG22	1.98	0.45
1:A:410:LEU:HD23	1:A:421:LEU:HD11	1.98	0.45
1:A:546:VAL:HG21	1:A:589:THR:HG21	1.97	0.45
1:A:941:VAL:O	1:A:1019:LEU:HD21	2.16	0.45
1:A:1735:ARG:N	1:A:1754:GLU:O	2.46	0.45
1:A:1068:ASP:O	1:A:1073:ILE:O	2.34	0.45
1:A:1268:PHE:HA	1:A:1290:SER:HA	1.99	0.45
1:A:372:LEU:HD11	1:A:455:PRO:HG3	1.98	0.44
1:A:548:ALA:O	1:A:555:LYS:N	2.51	0.44
1:A:2268:PHE:HA	1:A:2279:PHE:CB	2.47	0.44
1:A:1450:ARG:HB2	1:A:1465:VAL:HG22	1.99	0.44
1:A:175:ASN:HD21	1:A:237:GLY:HA2	1.82	0.44
1:A:1402:ALA:HB3	1:A:1412:TYR:HB2	2.00	0.44
1:A:548:ALA:HB3	1:A:555:LYS:HB2	1.99	0.44
1:A:1105:LEU:HD11	1:A:1176:LEU:HD13	1.99	0.44
1:A:1265:THR:OG1	1:A:1295:ARG:NH2	2.50	0.44
1:A:307:THR:HB	1:A:736:THR:HG21	1.99	0.44
1:A:1212:ASN:O	1:A:1215:GLU:HG2	2.18	0.44
1:A:1245:ASN:HD22	1:A:1372:PRO:HD2	1.81	0.44
1:A:764:THR:CG2	1:A:766:TYR:H	2.17	0.44
1:A:1261:ALA:HB3	1:A:1264:TYR:HB2	1.99	0.44
1:A:1696:SER:OG	1:A:2009:HIS:N	2.31	0.44
1:A:1786:LEU:HA	1:A:1796:PHE:HA	1.99	0.44
1:A:1866:LEU:HB3	1:A:1873:ALA:HB3	1.99	0.44
1:A:1773:PHE:HB3	1:A:1803:VAL:HG21	2.00	0.43
1:A:2035:ILE:HA	1:A:2054:VAL:HG22	2.00	0.43
1:A:527:ILE:HD11	1:A:620:TRP:CZ3	2.53	0.43
1:A:1321:ASN:HD21	4:A:2508:NAG:H2	1.81	0.43
1:A:2115:THR:HB	1:A:2125:HIS:C	2.39	0.43
1:A:816:LYS:HE3	1:A:1096:THR:HG21	2.00	0.43
1:A:2120:ASP:OD1	1:A:2121:SER:N	2.52	0.43
1:A:1252:LEU:HD21	1:A:1368:TYR:HE2	1.83	0.43
1:A:1423:GLN:NE2	1:A:1429:CYS:SG	2.87	0.43
1:A:2259:PRO:HA	1:A:2284:SER:HA	2.01	0.43
1:A:916:TRP:CG	1:A:1356:SER:HB3	2.54	0.43
1:A:1292:GLN:HE21	1:A:1302:LYS:HB2	1.83	0.43
1:A:718:ARG:HH11	1:A:718:ARG:CG	2.30	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:899:LEU:HD11	1:A:924:TRP:CD1	2.54	0.43
1:A:1414:ILE:CD1	1:A:1494:PRO:HG3	2.42	0.43
1:A:2081:VAL:HG12	1:A:2103:LEU:HB3	2.00	0.43
1:A:2254:PHE:HE2	1:A:2278:LEU:HD21	1.84	0.43
1:A:207:SER:OG	1:A:630:ARG:NH1	2.51	0.43
1:A:1192:SER:O	1:A:1215:GLU:HA	2.19	0.43
1:A:527:ILE:HD11	1:A:620:TRP:HZ3	1.83	0.43
1:A:776:ILE:HD13	1:A:787:ASP:HA	2.01	0.43
1:A:1314:GLU:HB2	1:A:1317:VAL:HG13	2.01	0.43
1:A:1426:SER:O	1:A:1427:ASP:C	2.57	0.42
1:A:56:LEU:HB3	1:A:76:ILE:HD13	2.00	0.42
1:A:897:ILE:HD11	1:A:924:TRP:CE2	2.54	0.42
1:A:1536:PHE:HB3	1:A:1597:LEU:HD11	2.02	0.42
1:A:1981:VAL:HG22	1:A:1982:ARG:HD2	2.01	0.42
1:A:62:GLU:HB3	1:A:71:LEU:HD11	2.01	0.42
1:A:419:LEU:HD23	1:A:474:ALA:HB1	2.01	0.42
1:A:1209:GLN:HB3	1:A:1217:VAL:HG13	1.99	0.42
1:A:718:ARG:CG	1:A:718:ARG:NH1	2.81	0.42
1:A:897:ILE:CD1	1:A:924:TRP:CE2	3.02	0.42
1:A:1201:HIS:CD2	1:A:1396:TYR:HD2	2.37	0.42
1:A:1411:HIS:O	1:A:1438:LEU:N	2.44	0.42
1:A:1877:ARG:HB3	1:A:1880:SER:HB3	2.01	0.42
1:A:353:VAL:HG21	1:A:359:LEU:O	2.20	0.42
1:A:1517:VAL:HG23	1:A:1517:VAL:O	2.19	0.42
1:A:2241:CYS:HB2	1:A:2275:CYS:HB2	1.89	0.42
1:A:788:LEU:HD11	1:A:873:LEU:CD1	2.50	0.42
1:A:250:ASP:O	1:A:272:LYS:HD3	2.20	0.42
1:A:390:VAL:HG23	1:A:404:ALA:HB3	2.01	0.41
1:A:840:MET:HA	1:A:854:SER:O	2.21	0.41
1:A:979:GLY:HA3	1:A:1017:LYS:HE2	2.01	0.41
1:A:1050:VAL:HG23	1:A:1081:GLU:HG2	2.01	0.41
1:A:1788:ARG:NH2	1:A:1789:THR:O	2.53	0.41
1:A:1284:LYS:HB2	1:A:1286:LYS:HG2	2.02	0.41
1:A:1338:ILE:HG21	1:A:1340:PHE:CE1	2.55	0.41
1:A:1338:ILE:CG2	1:A:1340:PHE:CZ	3.02	0.41
1:A:936:THR:HG22	1:A:1020:GLN:HB3	2.02	0.41
1:A:1012:LEU:HD22	1:A:1013:VAL:HG12	2.01	0.41
1:A:2057:LYS:HA	1:A:2063:VAL:HG13	2.02	0.41
1:A:2214:ARG:HD2	1:A:2214:ARG:HA	1.85	0.41
1:A:503:GLU:HG3	1:A:505:GLU:H	1.86	0.41
1:A:2159:LEU:HG	1:A:2163:TYR:HB2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:240:ALA:HB1	1:A:288:VAL:HG21	2.02	0.41
1:A:2075:ASP:HB3	1:A:2082:ILE:HD12	2.02	0.41
1:A:925:ASN:ND2	1:A:1363:GLU:OE2	2.39	0.41
1:A:1583:VAL:HG21	1:A:1645:LEU:HD12	2.03	0.41
1:A:572:GLN:HG2	1:A:592:THR:HG22	2.01	0.41
1:A:718:ARG:HG2	1:A:718:ARG:NH1	2.33	0.41
1:A:860:VAL:HG13	1:A:862:LYS:HE2	2.03	0.41
1:A:872:SER:CB	1:A:900:VAL:HG12	2.51	0.41
1:A:1136:PRO:HB3	1:A:1147:ALA:HA	2.01	0.41
1:A:1435:VAL:HG21	1:A:1479:THR:HG21	2.02	0.41
1:A:1623:CYS:SG	1:A:1624:ARG:N	2.93	0.41
1:A:1201:HIS:CD2	1:A:1396:TYR:CE2	3.09	0.40
1:A:1686:ASP:HA	1:A:1786:LEU:HB3	2.04	0.40
1:A:1743:ASN:HB2	1:A:1750:TYR:HE2	1.86	0.40
1:A:1067:ILE:HG13	1:A:1067:ILE:O	2.21	0.40
1:A:2185:GLN:NE2	1:A:2188:SER:OG	2.54	0.40
1:A:139:LEU:HB2	1:A:162:ARG:HB3	2.03	0.40
1:A:941:VAL:O	1:A:1019:LEU:CD2	2.70	0.40
1:A:1414:ILE:HD11	1:A:1494:PRO:HB2	2.00	0.40
1:A:1757:THR:HA	1:A:1758:PRO:HD3	1.97	0.40
1:A:1787:LEU:HD13	1:A:2278:LEU:HD21	2.04	0.40
1:A:2103:LEU:HD13	1:A:2128:TRP:HD1	1.87	0.40
1:A:527:ILE:O	1:A:573:LEU:HD21	2.21	0.40
1:A:717:TYR:HD1	1:A:717:TYR:HA	1.65	0.40
1:A:900:VAL:HG11	1:A:1350:VAL:HG21	2.03	0.40
1:A:923:LEU:HD13	1:A:1352:LEU:HD11	2.03	0.40
1:A:1101:ASN:HB3	1:A:1227:PRO:HB3	2.03	0.40
1:A:1237:GLU:HB3	1:A:1246:LEU:HD12	2.03	0.40
1:A:2000:LYS:HD2	1:A:2039:GLN:HA	2.02	0.40
1:A:2010:ARG:HD2	1:A:2134:CYS:HA	2.03	0.40
1:A:142:LYS:HB3	1:A:198:THR:HG21	2.04	0.40
1:A:960:ASN:O	1:A:976:ASN:ND2	2.55	0.40
1:A:980:ASP:O	1:A:982:PRO:HD3	2.21	0.40
1:A:1845:VAL:HG12	1:A:1864:VAL:HG13	2.03	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	2200/2499 (88%)	2044 (93%)	151 (7%)	5 (0%)	47 80

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	263	ASN
1	A	657	ALA
1	A	719	ASP
1	A	1038	PRO
1	A	775	CYS

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	1904/2142 (89%)	1891 (99%)	13 (1%)	84 93

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	332	ARG
1	A	480	GLU
1	A	516	ARG
1	A	718	ARG
1	A	719	ASP
1	A	1097	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	1146	THR
1	A	1279	CYS
1	A	1423	GLN
1	A	1426	SER
1	A	1427	ASP
1	A	1902	CYS
1	A	2083	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	127	GLN
1	A	311	ASN
1	A	348	GLN
1	A	501	HIS
1	A	688	GLN
1	A	801	ASN
1	A	839	GLN
1	A	857	ASN
1	A	909	HIS
1	A	959	ASN
1	A	1039	ASN
1	A	1094	GLN
1	A	1201	HIS
1	A	1292	GLN
1	A	1329	HIS
1	A	1399	ASN
1	A	1567	ASN
1	A	1708	ASN
1	A	1887	HIS
1	A	2064	GLN
1	A	2089	HIS
1	A	2145	ASN
1	A	2153	ASN
1	A	2227	GLN

5.3.3 RNA

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](#)

5 monosaccharides 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	B	1	2,1	14,14,15	0.37	0	17,19,21	0.71	0
2	NAG	B	2	2	14,14,15	0.34	0	17,19,21	0.78	0
3	NAG	C	1	3,1	14,14,15	0.29	0	17,19,21	1.00	1 (5%)
3	NAG	C	2	3	14,14,15	0.31	0	17,19,21	1.05	2 (11%)
3	BMA	C	3	3	11,11,12	0.40	0	15,15,17	0.75	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. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	B	1	2,1	-	0/6/23/26	0/1/1/1
2	NAG	B	2	2	-	0/6/23/26	0/1/1/1
3	NAG	C	1	3,1	-	4/6/23/26	0/1/1/1
3	NAG	C	2	3	-	2/6/23/26	0/1/1/1
3	BMA	C	3	3	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	2	NAG	C8-C7-N2	2.27	119.95	116.10
3	C	1	NAG	C8-C7-N2	2.25	119.90	116.10
3	C	2	NAG	C2-N2-C7	2.23	126.08	122.90

There are no chirality outliers.

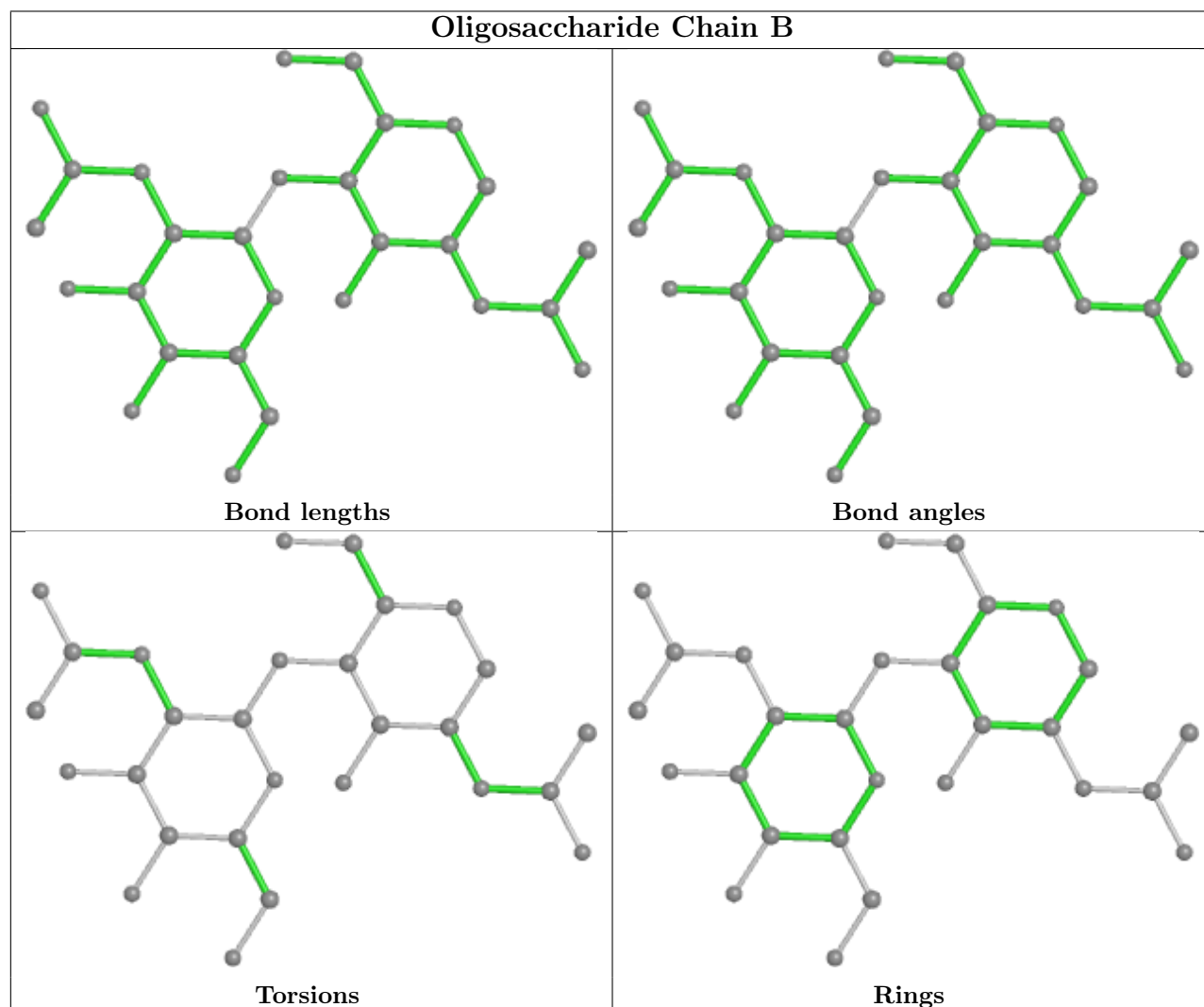
All (6) torsion outliers are listed below:

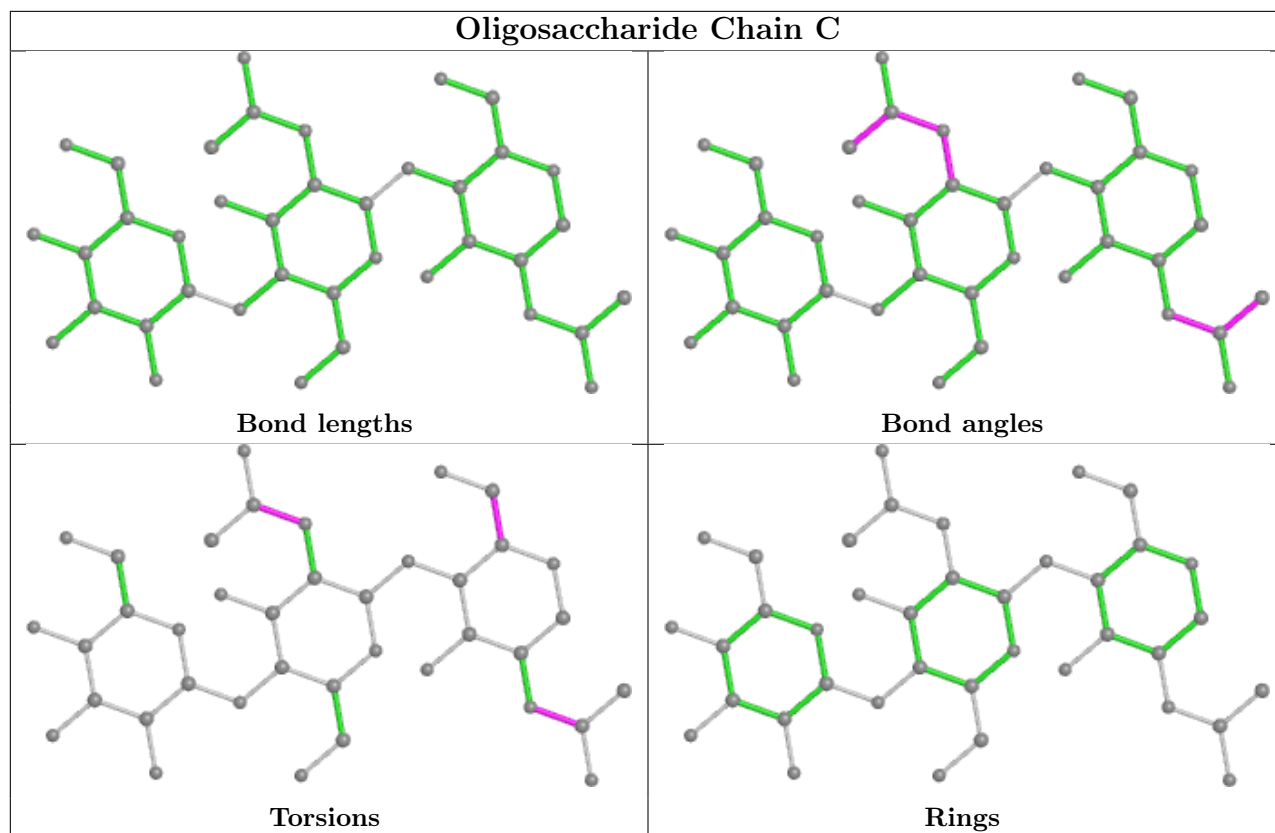
Mol	Chain	Res	Type	Atoms
3	C	1	NAG	O5-C5-C6-O6
3	C	1	NAG	C4-C5-C6-O6
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2
3	C	2	NAG	C8-C7-N2-C2
3	C	2	NAG	O7-C7-N2-C2

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.





5.6 Ligand geometry [i](#)

3 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	NAG	A	2501	1	14,14,15	0.55	0	17,19,21	0.95	1 (5%)
4	NAG	A	2508	-	14,14,15	0.41	0	17,19,21	1.24	2 (11%)
4	NAG	A	2507	1	14,14,15	0.44	0	17,19,21	1.27	3 (17%)

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	NAG	A	2501	1	-	0/6/23/26	0/1/1/1
4	NAG	A	2508	-	-	3/6/23/26	0/1/1/1
4	NAG	A	2507	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	2507	NAG	C1-O5-C5	3.03	116.30	112.19
4	A	2508	NAG	O5-C5-C6	2.75	111.51	107.20
4	A	2508	NAG	C4-C3-C2	-2.44	107.44	111.02
4	A	2507	NAG	O5-C1-C2	-2.38	107.53	111.29
4	A	2507	NAG	C2-N2-C7	2.35	126.25	122.90
4	A	2501	NAG	O5-C1-C2	2.01	114.46	111.29

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	2507	NAG	O5-C5-C6-O6
4	A	2507	NAG	C4-C5-C6-O6
4	A	2508	NAG	C1-C2-N2-C7
4	A	2508	NAG	O5-C5-C6-O6
4	A	2508	NAG	C4-C5-C6-O6
4	A	2507	NAG	C3-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	2508	NAG	8	0

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.

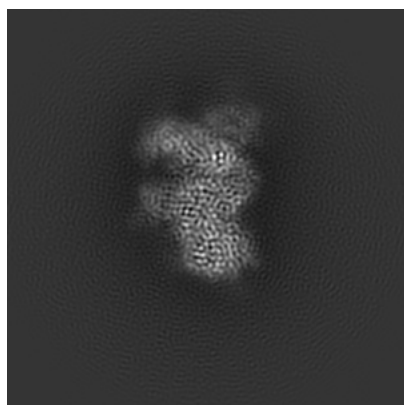
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20815. These allow visual inspection of the internal detail of the map and identification of artifacts.

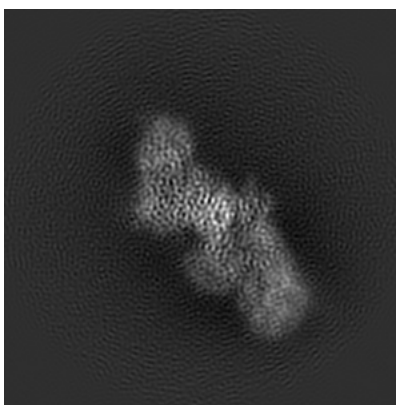
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

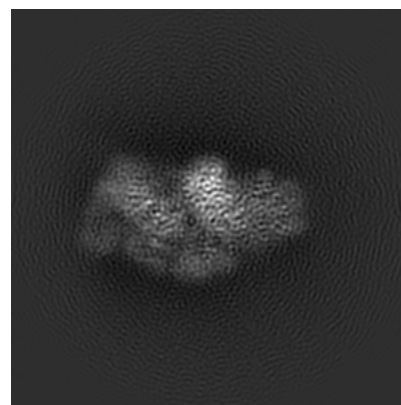
6.1.1 Primary map



X



Y

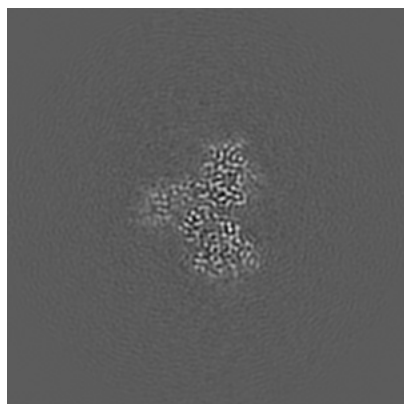


Z

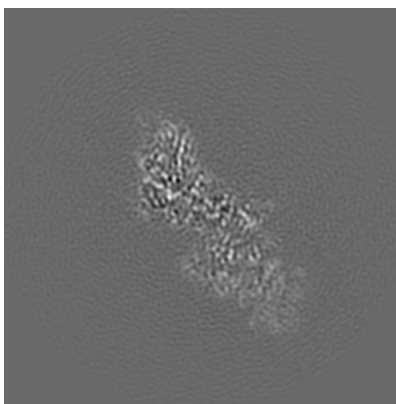
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

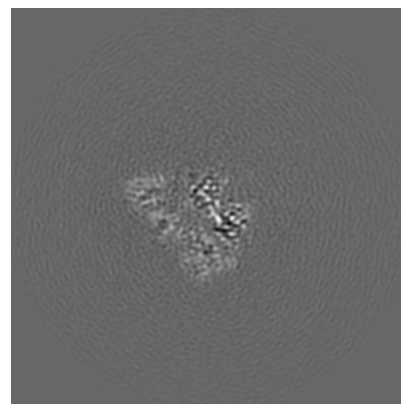
6.2.1 Primary map



X Index: 140



Y Index: 140

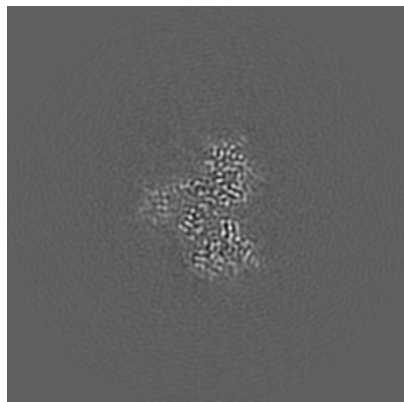


Z Index: 140

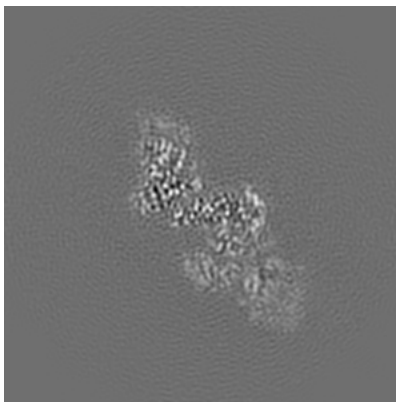
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

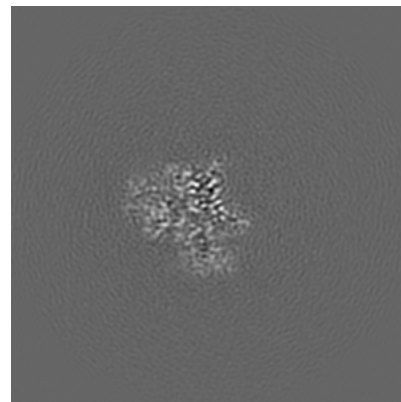
6.3.1 Primary map



X Index: 141



Y Index: 145



Z Index: 149

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

6.4 Orthogonal surface views [i](#)

6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0145. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

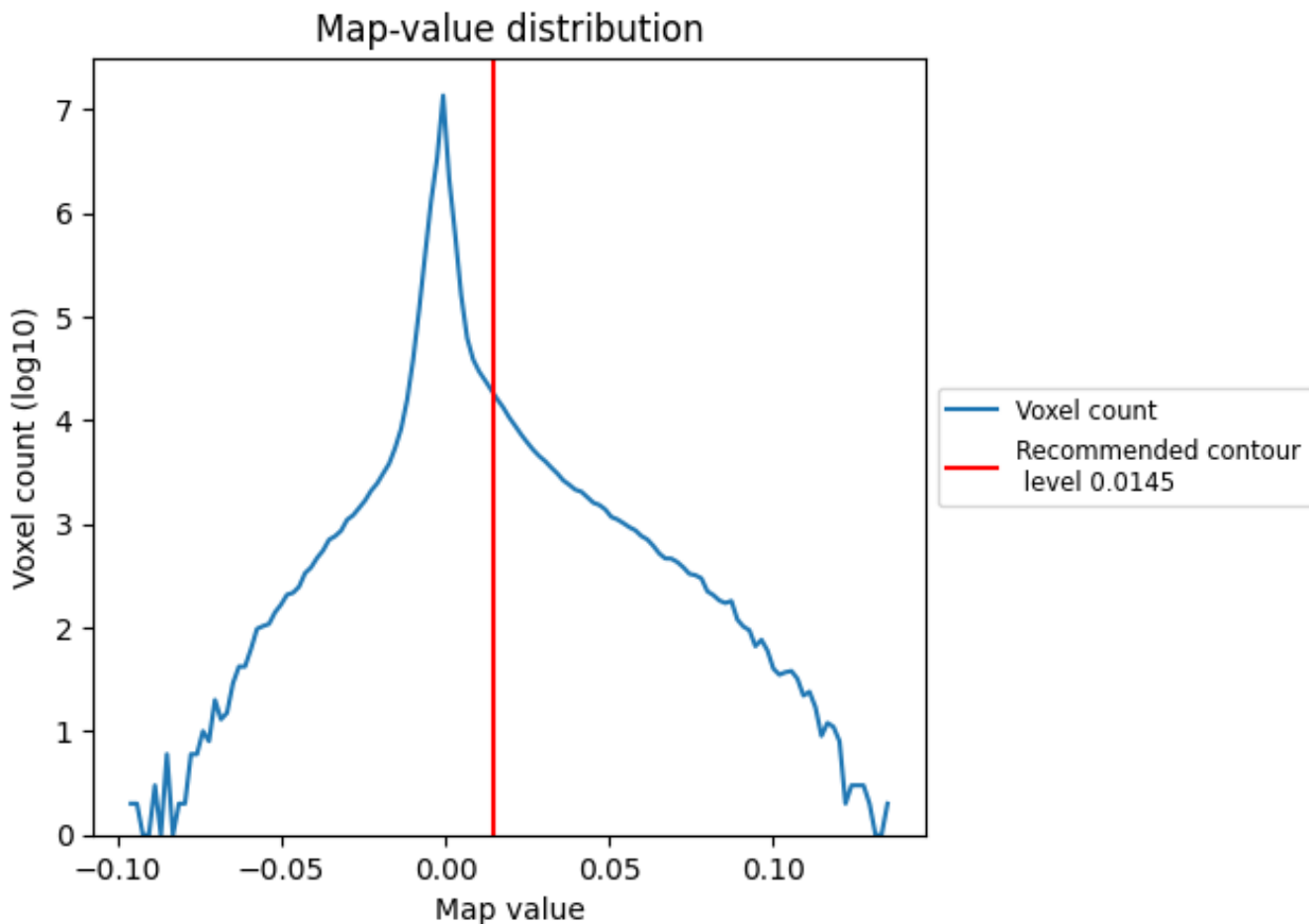
6.5 Mask visualisation

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

7 Map analysis [i](#)

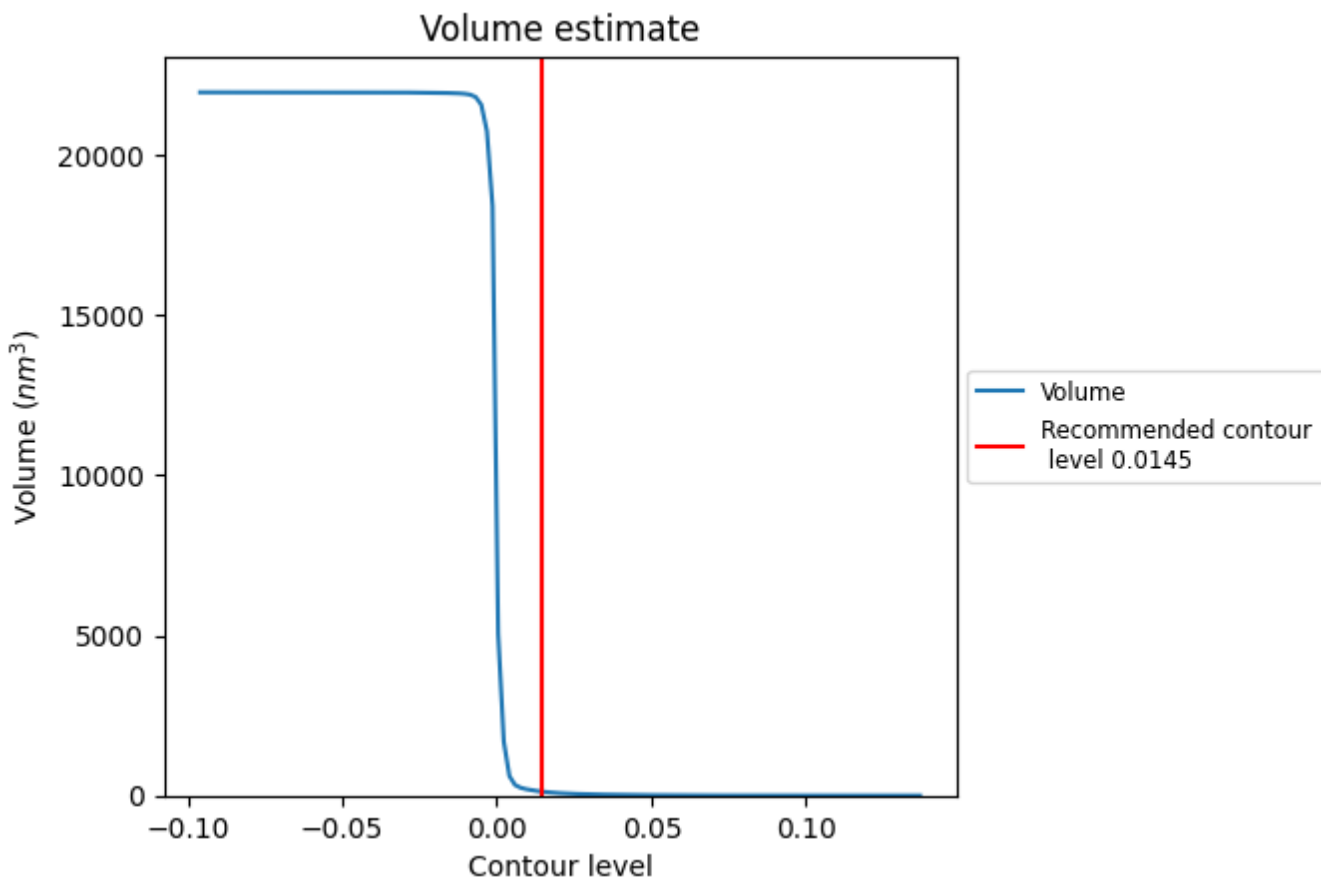
This section contains the results of statistical analysis of the map.

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.

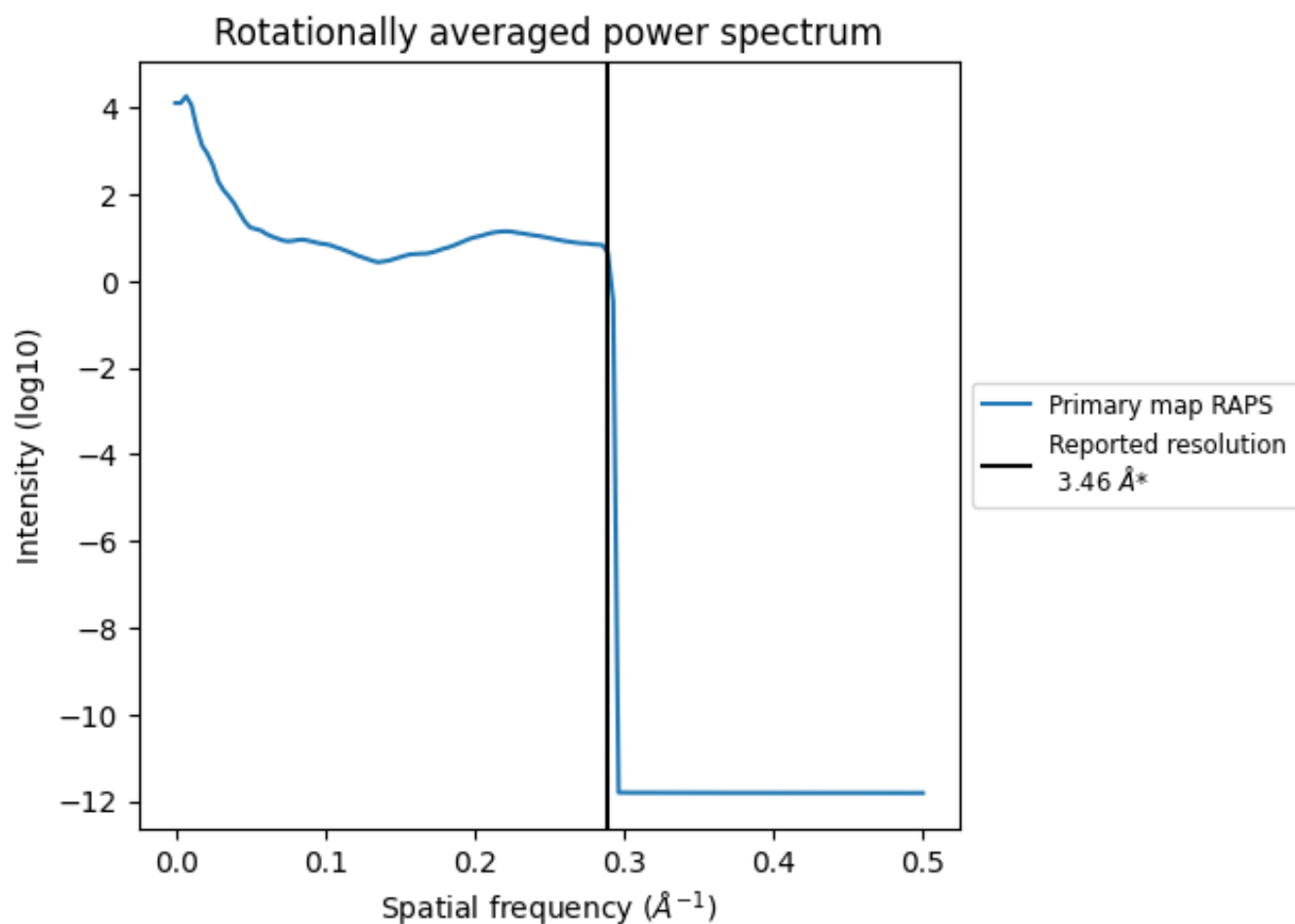
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 124 nm³; this corresponds to an approximate mass of 112 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 0.289 Å⁻¹

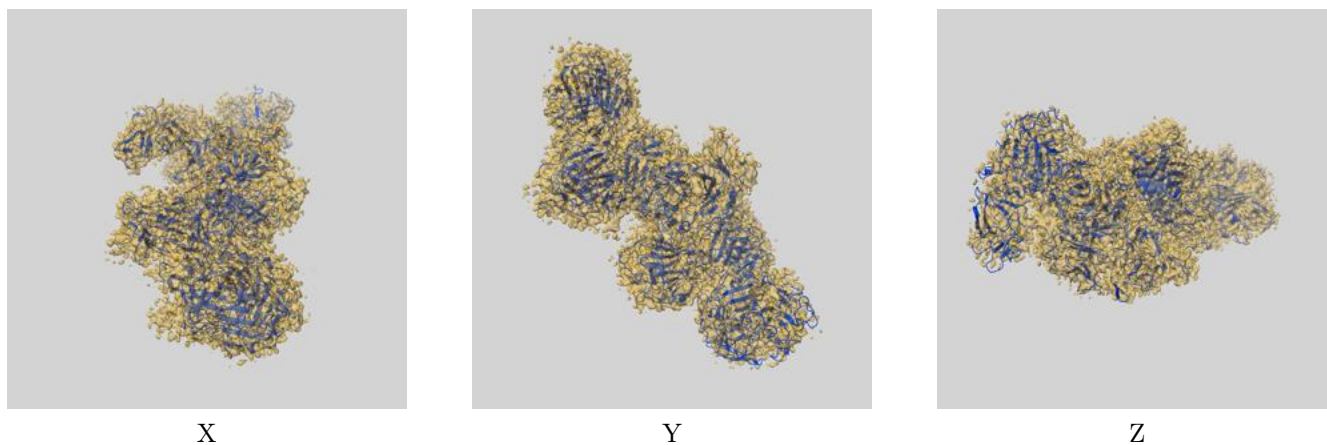
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit [i](#)

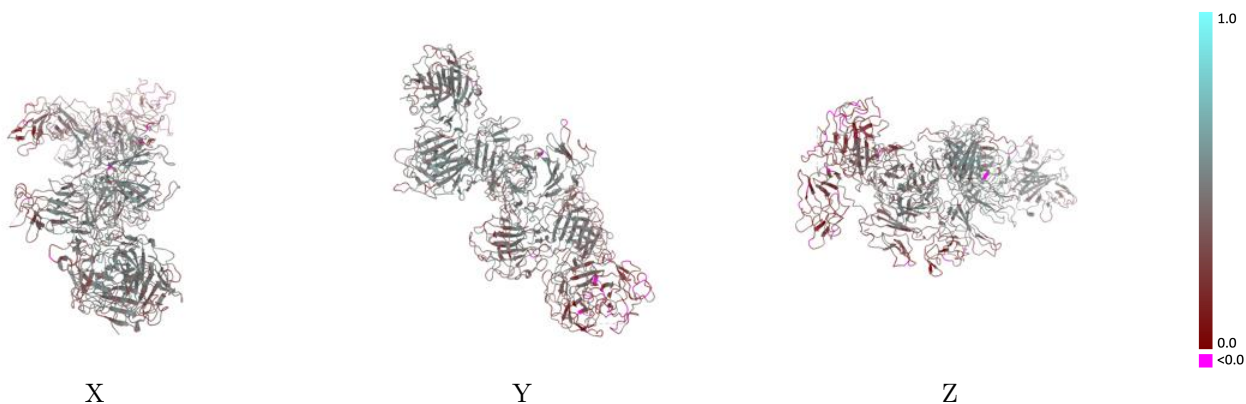
This section contains information regarding the fit between EMDB map EMD-20815 and PDB model 6UM1. Per-residue inclusion information can be found in section 3 on page 5.

9.1 Map-model overlay [i](#)



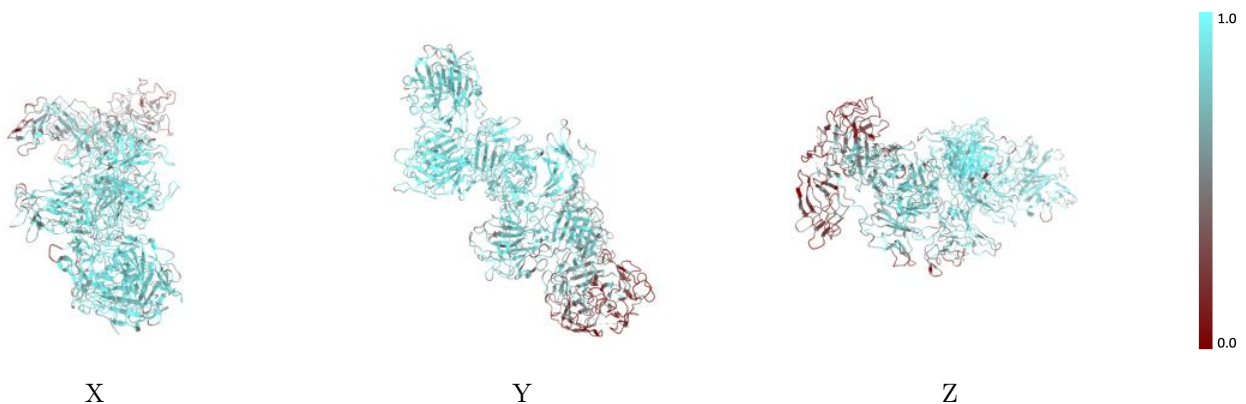
The images above show the 3D surface view of the map at the recommended contour level 0.0145 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



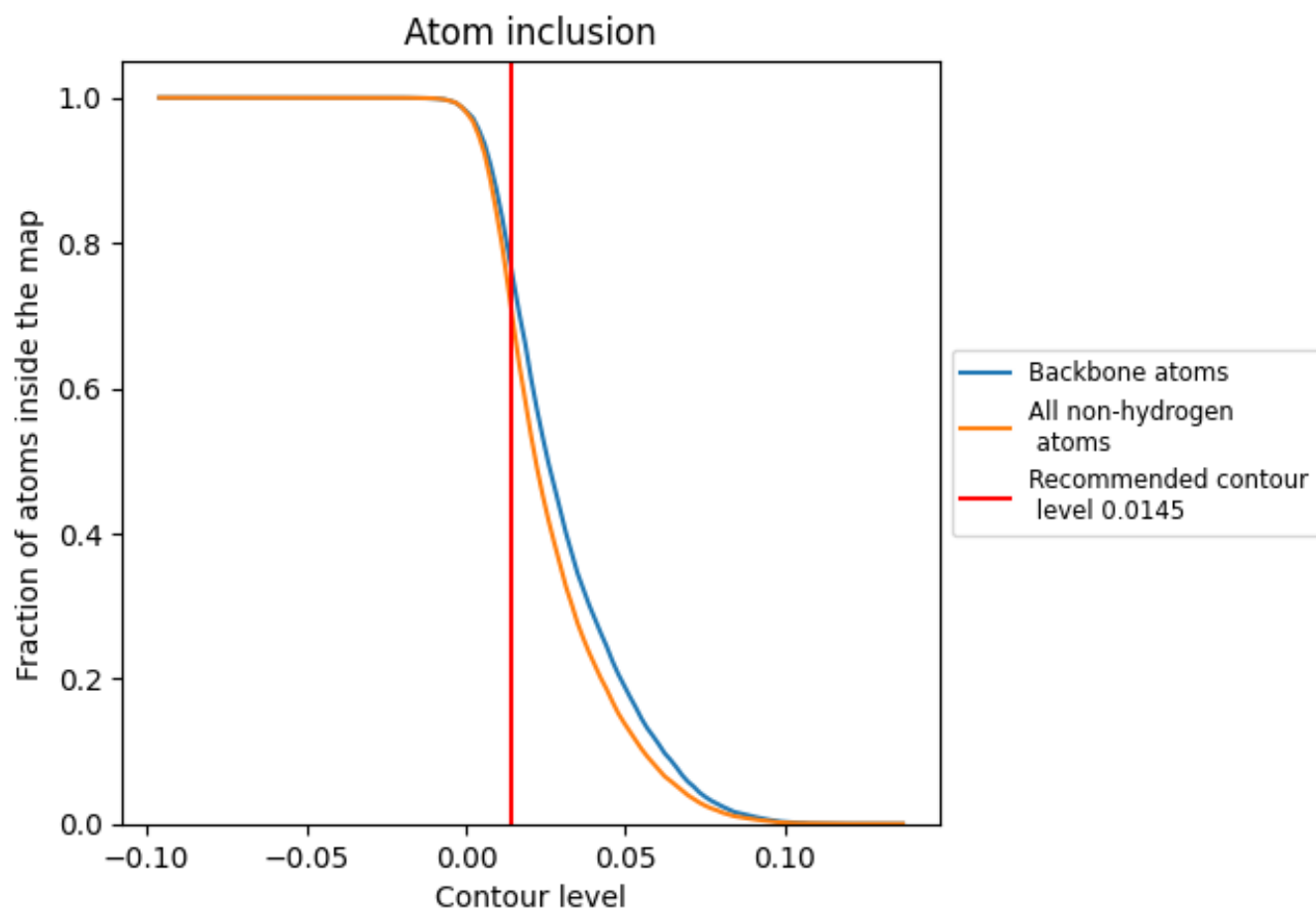
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0145).









9.4 Atom inclusion [i](#)



At the recommended contour level, 76% of all backbone atoms, 70% 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 (0.0145) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6992	 0.4010
A	 0.6997	 0.4010
B	 0.5714	 0.3220
C	 0.5897	 0.3430

