Full wwPDB EM Validation Report ⓘ

Jun 9, 2025 – 11:02 AM EDT

PDB ID	:	9CAE / pdb_00009cae
EMDB ID	:	EMD-45388
Title	:	Cryo-EM structure of the reconstituted RuvBL lobe of the human TIP60 complex (composite structure)
Authors	:	Louder, R.K.; Park, G.; Patel, A.B.
Deposited on	:	2024-06-17
Resolution	:	3.07 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:

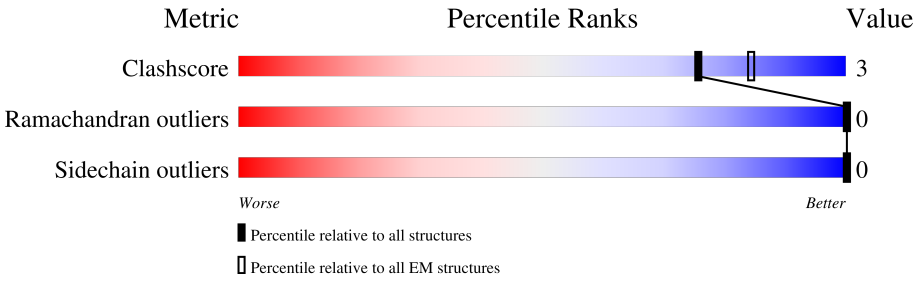
EMDB validation analysis	:	0.0.1.dev118
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0rc1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

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 3.07 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.



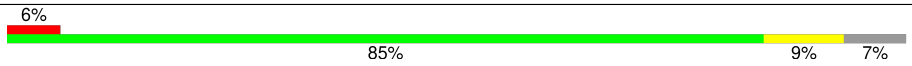
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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

Mol	Chain	Length	Quality of chain
1	A	2841	5% 19% 79%
2	B	364	20% 5% 75%
3	C	263	5% 33% 65%
4	E	456	6% 88% 5% 7%
4	G	456	6% 87% 7% 6%
4	I	456	8% 86% 7% 7%
5	F	857	46% 49%
5	H	857	46% 50%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
5	J	857	
6	L	375	
7	M	429	
8	N	467	

2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 34005 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 E1A-binding protein p400,E1A-binding protein p400/Haloalkane dehalogenase chimera.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	607	Total	C	N	O	S	0	0
			4975	3163	890	898	24		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	657	MET	-	initiating methionine	UNP Q96L91
A	2844	ALA	THR	conflict	UNP Q96L91

- Molecule 2 is a protein called Vacuolar protein sorting-associated protein 72 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	90	Total	C	N	O	S	0	0
			721	469	126	124	2		

- Molecule 3 is a protein called Enhancer of polycomb homolog 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	93	Total	C	N	O	S	0	0
			769	485	154	127	3		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	358	MET	-	initiating methionine	UNP Q9H2F5

- Molecule 4 is a protein called RuvB-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	422	Total	C	N	O	S	0	0
			3249	2050	559	625	15		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	429	Total	C	N	O	S	0	0
			3308	2086	567	639	16		
4	I	425	Total	C	N	O	S	0	0
			3269	2060	562	631	16		

- Molecule 5 is a protein called RuvB-like 2,RuvB-like 2/Maltose/maltodextrin-binding periplasmic protein chimera.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	435	Total	C	N	O	S	0	0
			3381	2113	593	659	16		
5	H	428	Total	C	N	O	S	0	0
			3327	2082	582	647	16		
5	J	412	Total	C	N	O	S	0	0
			3198	1999	558	626	15		

- Molecule 6 is a protein called Actin, cytoplasmic 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	L	357	Total	C	N	O	S	0	0
			2786	1769	465	532	20		

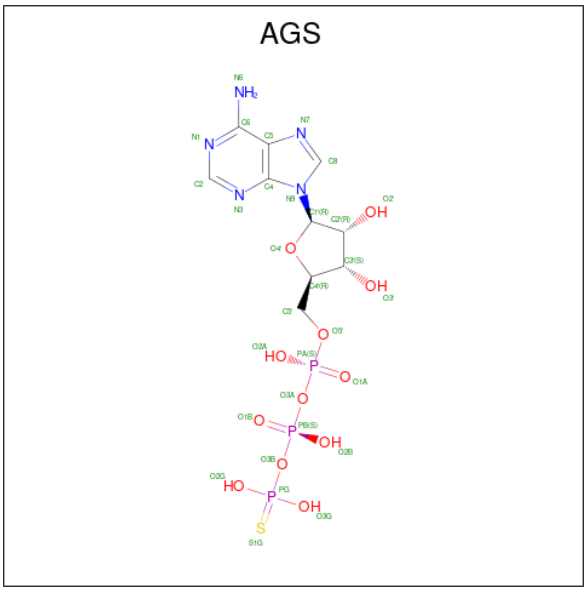
- Molecule 7 is a protein called Actin-like protein 6A.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	M	401	Total	C	N	O	S	0	0
			3138	1987	532	595	24		

- Molecule 8 is a protein called DNA methyltransferase 1-associated protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	N	190	Total	C	N	O	S	0	0
			1628	1040	297	288	3		

- Molecule 9 is PHOSPHOTHIOPHOSPHORIC ACID-ADENYLATE ESTER (CCD ID: AGS) (formula: $C_{10}H_{16}N_5O_{12}P_3S$).



Mol	Chain	Residues	Atoms						AltConf
9	E	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	F	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	G	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	H	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	I	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	J	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	L	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	
9	M	1	Total	C	N	O	P	S	0
			31	10	5	12	3	1	

- Molecule 10 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
10	E	1	Total	Mg	0
			1	1	
10	F	1	Total	Mg	0
			1	1	
10	G	1	Total	Mg	0
			1	1	
10	H	1	Total	Mg	0
			1	1	

Continued on next page...

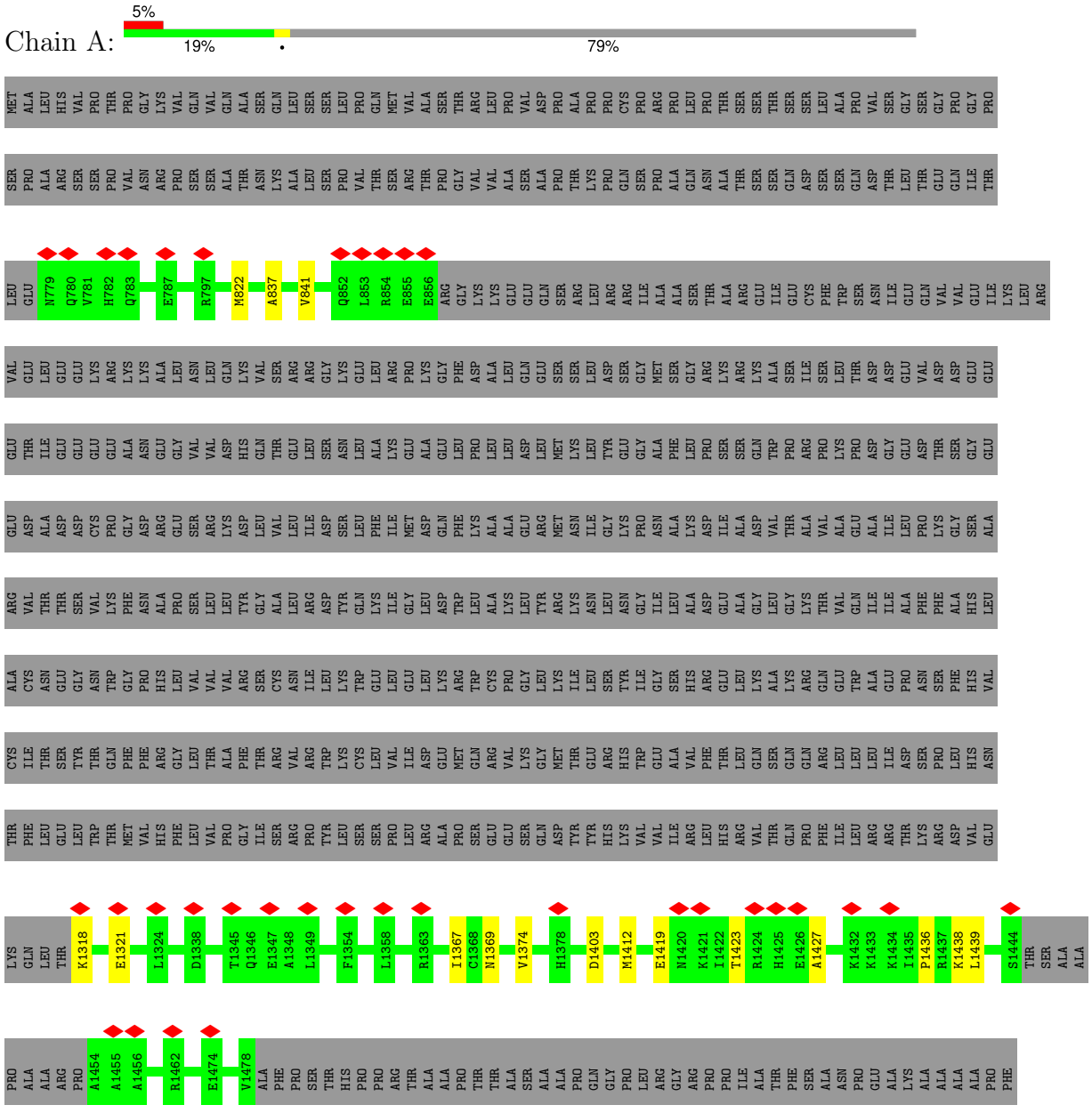
Continued from previous page...

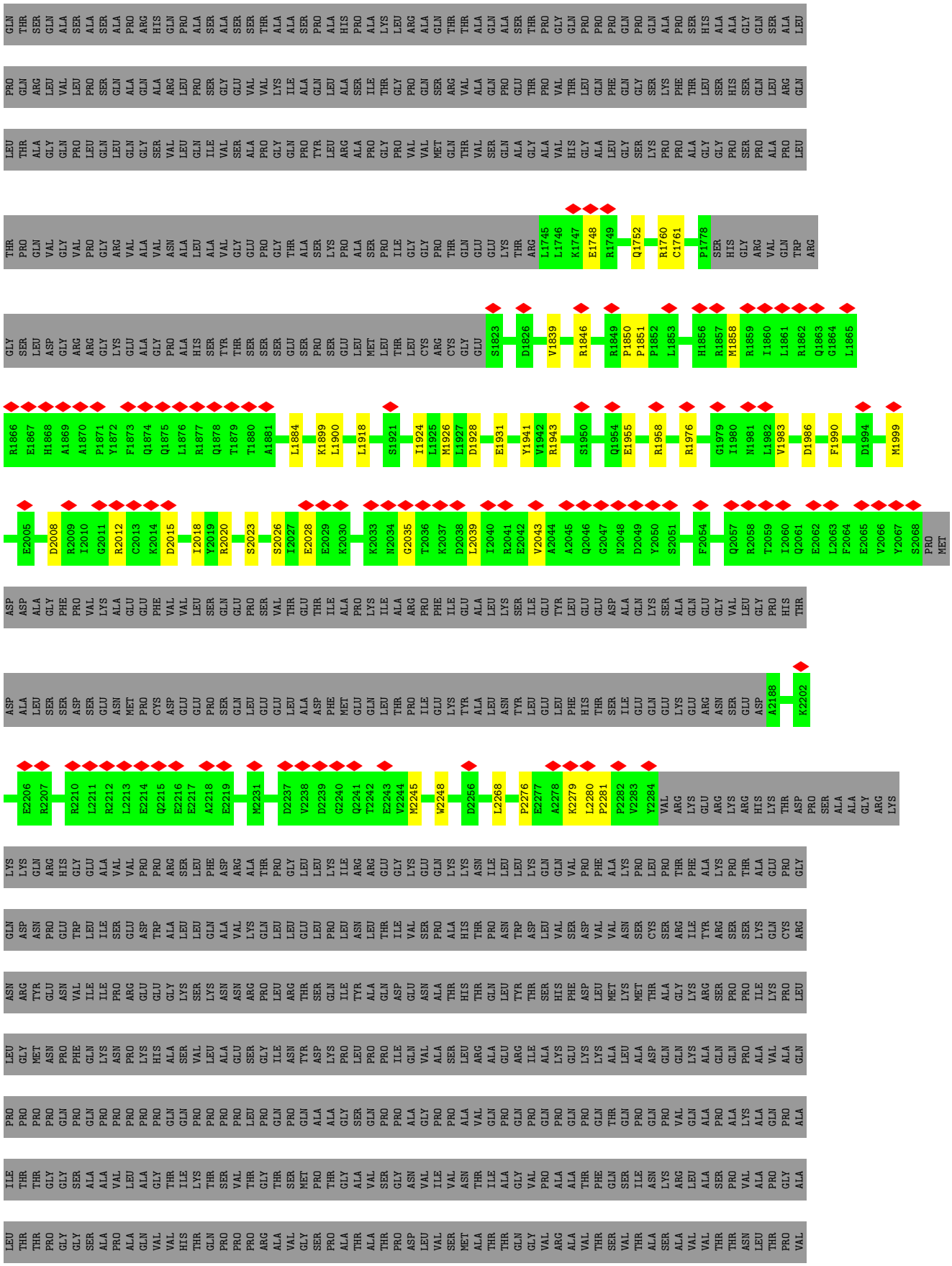
Mol	Chain	Residues	Atoms	AltConf
10	I	1	Total Mg 1 1	0
10	J	1	Total Mg 1 1	0
10	L	1	Total Mg 1 1	0
10	M	1	Total Mg 1 1	0

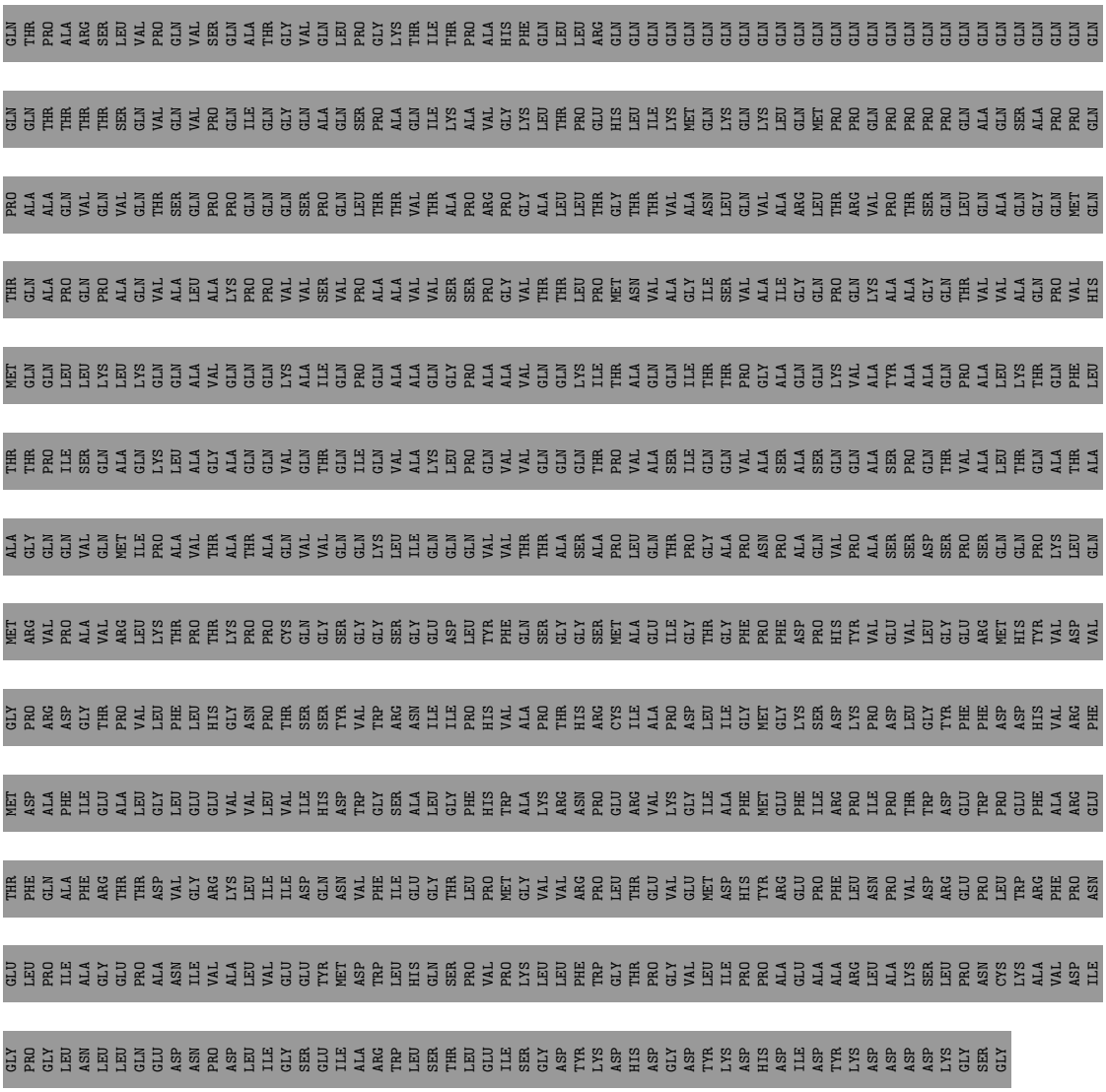
3 Residue-property plots (i)

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

• Molecule 1: E1A-binding protein p400,E1A-binding protein p400/Haloalkane dehalogenase chimera

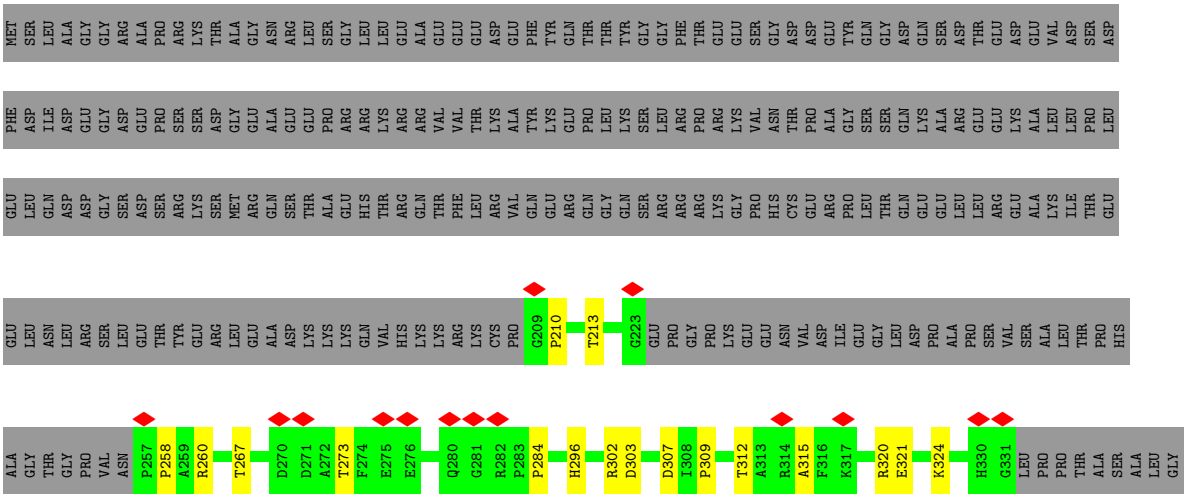



GLN THR SER GLN ALA SER ALA SER ALA PRO ARG HIS GLN PRO ALA SER ALA SER SER THR ALA ALA SER PRO ALA HIS PRO ALA LYS LEU ARG ALA GLN THR THR ALA GLN ALA SER THR PRO GLY GLN PRO PRO PRO GLN PRO GLN GLN ALA PRO SER HIS ALA ALA GLY GLN SER
PRO GLN ARG LEU VAL LEU PRO SER GLN ALA GLN GLN ALA ARG LEU PRO SER GLY GLU VAL VAL LYS ILE ALA GLN ALA GLN PRO SER VAL ALA SER GLY VAL ALA GLN PRO GLU THR PRO VAL THR LEU GLN PHE GLN GLY SER LYS PRO PHE THR LEU SER HIS SER GLN LEU ARG GLN
LEU THR ALA GLY GLN PRO LEU GLN LEU GLN GLY SER VAL LEU GLN ILE VAL SER ALA PRO TYR LEU ARG ALA PRO GLY PRO VAL VAL MET GLN THR VAL SER GLN PRO GLN ALA GLY ALA VAL HIS GLY ALA LEU GLY SER LYS PRO PRO SER PRO ALA PRO LEU
THR PRO GLN VAL GLY VAL PRO GLY ARG VAL ALA ALA VAL ASN ALA LEU ALA VAL GLY GLU PRO GLY THR ALA SER LYS PRO ALA SER PRO ILE GLY GLY PRO THR GLN GLU GLU LYS THR ARG L1745 L1746 K1747 E1748 R1749 Q1752 R1760 C1761 P1778 SER HIS GLY ARG VAL GLN TRP ARG
GLY SER LEU ASP GLY ARG GLY LYS GLU ALA GLY PRO ALA HIS SER TYR THR SER SER SER GLU SER PRO SER GLU LEU MET LEU THR LEU CYS ARG CYS GLY GLU S1823 D1826 V1839 R1846 R1849 P1850 P1851 P1852 L1853 H1856 R1857 M1858 R1859 I1860 L1861 R1862 Q1863 G1864 L1865
R1866 E1867 H1868 A1869 A1870 P1871 Y1872 F1873 Q1874 Q1875 L1876 R1877 Q1878 T1879 T1880 A1881 L1884 K1899 L1900 L1918 S1921 I1924 L1925 M1926 L1927 D1928 E1931 Y1941 V1942 R1943 S1950 Q1954 E1955 R1958 R1976 G1979 I1980 N1981 L1982 V1983 D1986 F1990 D1994 M1999
E2005 D2008 R2009 I2010 G2011 R2012 C2013 K2014 D2015 I2018 Y2019 R2020 S2023 S2026 T2027 E2028 E2029 K2030 K2033 N2034 G2035 T2036 K2037 D2038 L2039 I2040 R2041 E2042 V2043 A2044 A2045 Q2046 G2047 N2048 D2049 Y2050 S2051 F2054 Q2057 R2058 T2059 I2060 Q2061 E2062 L2063 P2064 E2065 V2066 Y2067 S2068 PRO MET
ASP ASP ALA GLY PHE PRO VAL LYS ALA GLU GLU PHE VAL VAL LEU SER GLN GLU PRO SER VAL THR GLU THR ILE ALA PRO LYS ILE ALA ARG PRO PHE ILE GLU GLU ALA LEU LYS SER ILE GLU TYR LEU GLU GLU ASP ALA GLN LYS SER ALA GLN GLU GLY VAL LEU GLY PRO HIS THR
ASP ALA LEU SER SER ASP SER GLU ASN MET PRO CYS ASP GLU GLU PRO SER GLN LEU GLU GLU LEU ALA ASP PHE MET GLU GLN LEU THR PRO ILE GLU LYS TYR ALA LEU ASN TYR LEU GLU LEU PHE HIS THR SER ILE GLU GLN GLU LYS GLU ARG ASN SER GLU ASP A2188 K2202
E2206 R2207 R2210 L2211 R2212 L2213 E2214 Q2215 E2216 E2217 A2218 E2219 M2231 D2237 V2238 D2239 G2240 Q2241 T2242 E2243 V2244 M2245 W2248 D2256 L2268 P2276 E2277 A2278 K2279 L2280 P2281 P2282 V2283 Y2284 VAL ARG LYS GLU ARG LYS ARG HIS LYS THR ASP PRO SER ALA ALA GLY ARG LYS
LYS LYS GLN ARG HIS GLY GLU ALA VAL PRO PRO ARG SER LEU PHE ASP ARG ALA THR PRO GLY LEU LEU LYS ILE ARG ARG GLU GLY LYS GLU GLN LYS LYS ASN ILE LEU LEU LYS GLN VAL PRO PHE ALA ALA LYS PRO LEU PRO THR PHE ALA LYS PRO THR ALA GLU PRO GLY
GLN ASP ASN PRO GLU TRP LEU ILE SER GLU ASP TRP ALA LEU LEU GLN ALA VAL LYS GLN LEU LEU GLU LEU PRO LEU ASN LEU THR ILE VAL SER PRO ALA HIS THR PRO ASN TRP ASP LEU VAL SER ASP VAL VAL ASN SER CYS SER ARG ILE TYR ARG SER SER LYS GLN CYS ARG
ASN ARG TYR GLU ASN VAL ILE ILE PRO ARG GLU GLU GLY LYS SER LYS SER ARG PRO LEU ARG THR SER GLN ILE TYR ALA GLN PRO ASP GLU ASN ALA THR HIS THR THR PRO GLN LEU TYR THR SER HIS PHE ASP LEU MET LYS MET THR ALA GLY LYS ARG SER PRO PRO ILE LYS PRO LEU
LEU GLY MET ASN PRO PHE GLN LYS HIS ALA SER VAL LEU ALA GLU SER GLY ILE ASN TYR ASP LYS PRO LEU PRO PRO ILE GLN VAL ALA SER LEU ARG ALA GLU ARG ILE ALA LYS GLU LYS LYS ALA LEU ALA ASP LEU GLN GLN VAL ALA GLY PRO GLN ALA ALA GLN GLN PRO ALA VAL ALA
PRO PRO PRO PRO GLN PRO GLN PRO PRO PRO PRO PRO PRO GLN ALA GLY PRO PRO ALA VAL GLN PRO GLN PRO GLN PRO THR GLN PRO GLN PRO VAL GLN ALA PRO ALA LYS ALA GLN PRO ALA
ILE THR THR GLY GLY SER ALA ALA VAL LEU ALA ALA GLY THR ILE LYS THR SER VAL THR GLY GLY THR SER SER MET PRO THR GLY ALA ALA THR PHE GLN SER SER ILE ASN LYS ARG LEU ALA LEU ALA SER PRO VAL PRO ALA
LEU THR THR PRO GLY GLY GLN VAL VAL HIS THR GLN PRO PRO ARG ALA ALA VAL GLY SER PRO ALA THR ALA THR PRO ASP LEU VAL ILE SER VAL ARG ALA VAL THR THR GLN GLY VAL ARG ALA VAL THR ALA SER ALA VAL THR ASN LEU THR PRO VAL

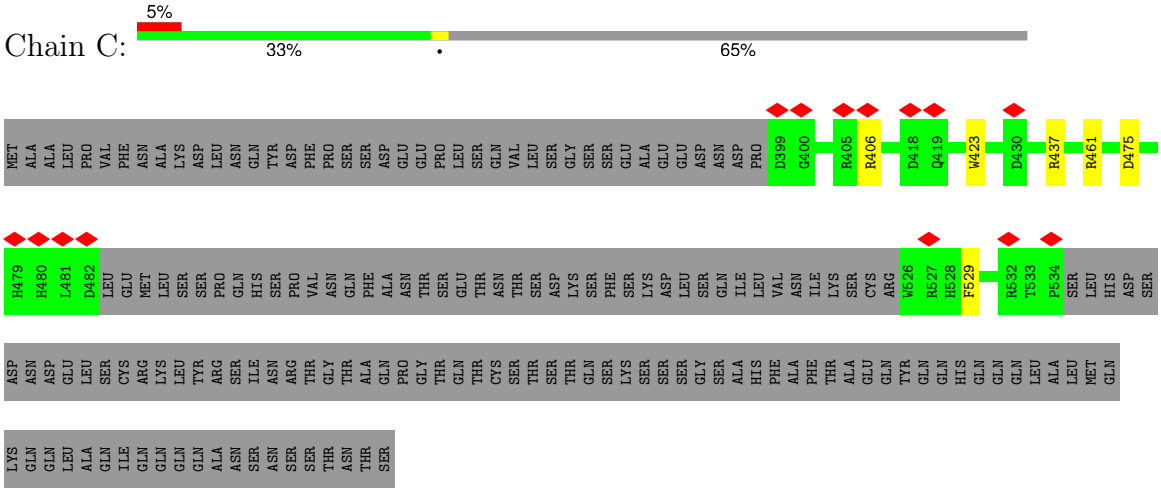


• Molecule 2: Vacuolar protein sorting-associated protein 72 homolog

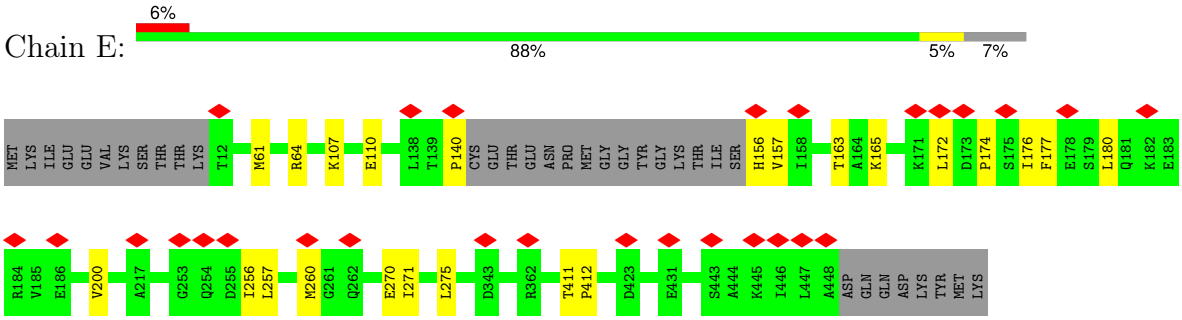
Chain B:



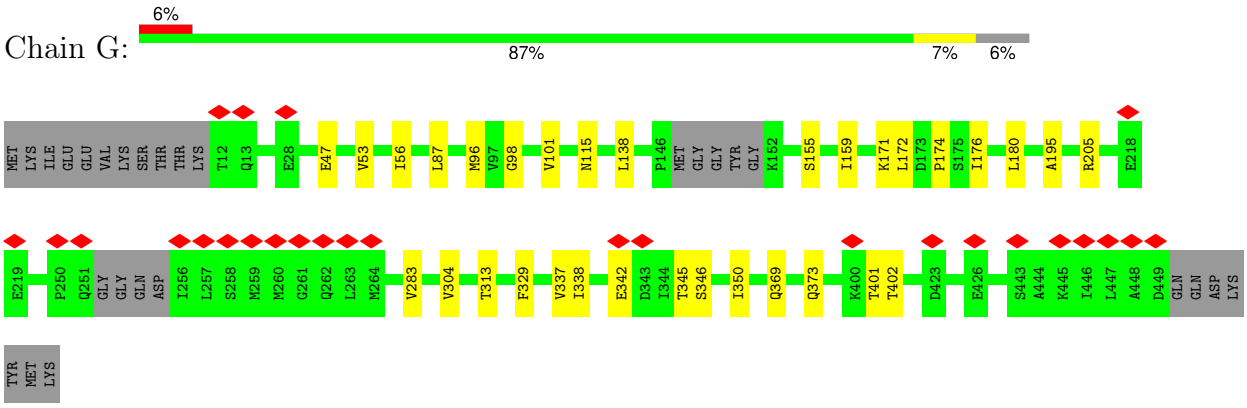
• Molecule 3: Enhancer of polycomb homolog 1



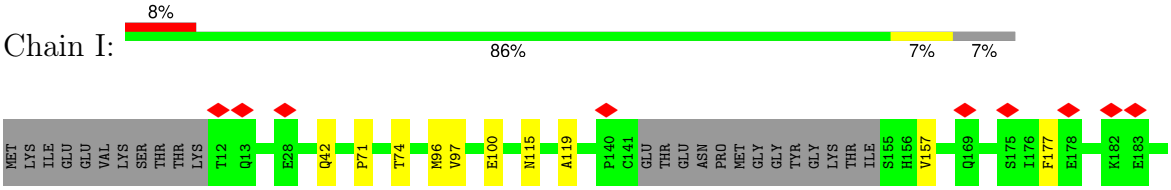
• Molecule 4: RuvB-like 1

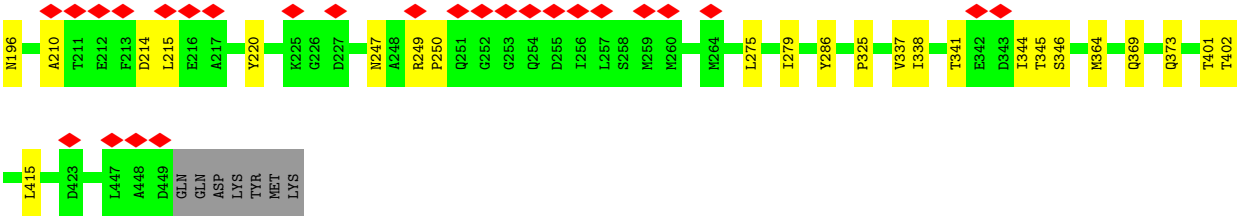


• Molecule 4: RuvB-like 1



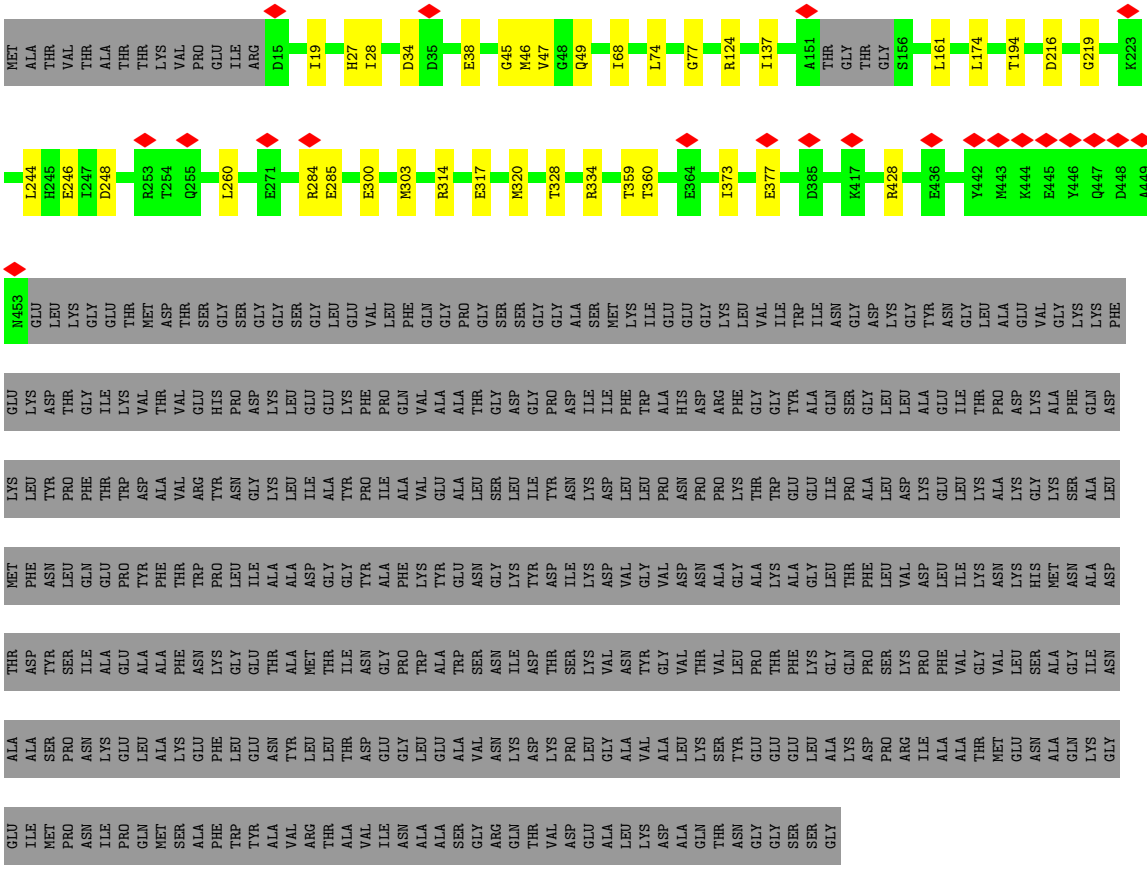
• Molecule 4: RuvB-like 1





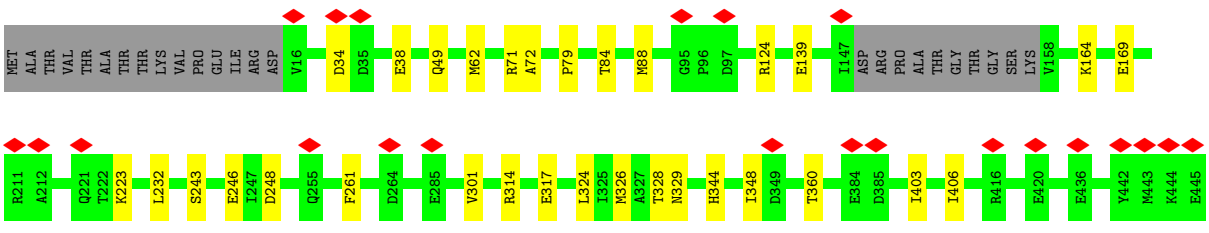
• Molecule 5: RuvB-like 2,RuvB-like 2/Maltose/maltodextrin-binding periplasmic protein chimera

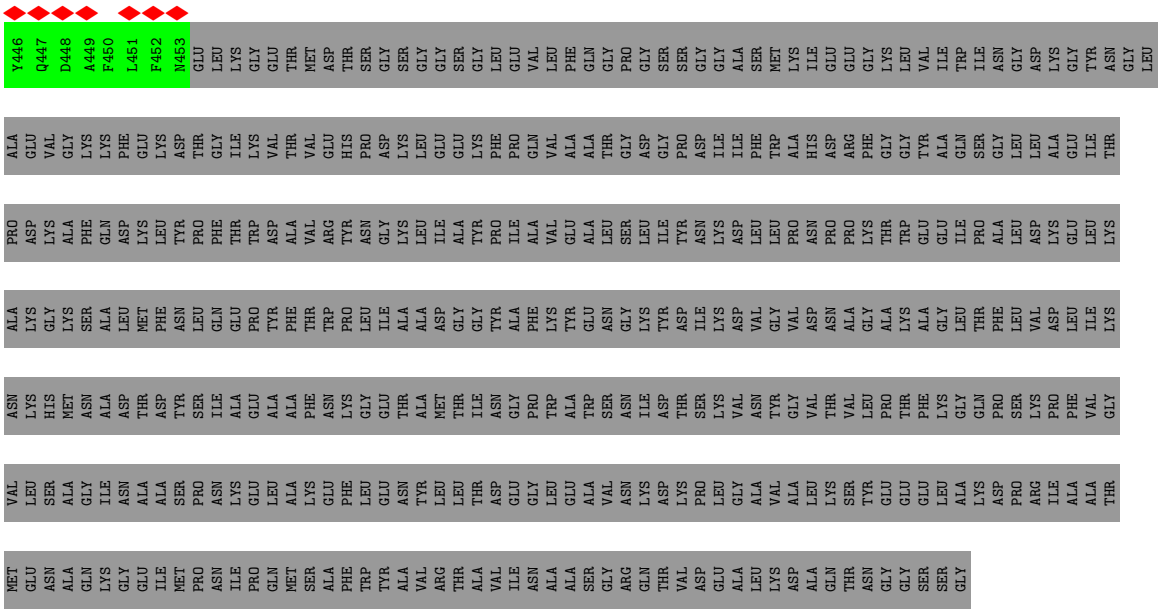
Chain F:



• Molecule 5: RuvB-like 2,RuvB-like 2/Maltose/maltodextrin-binding periplasmic protein chimera

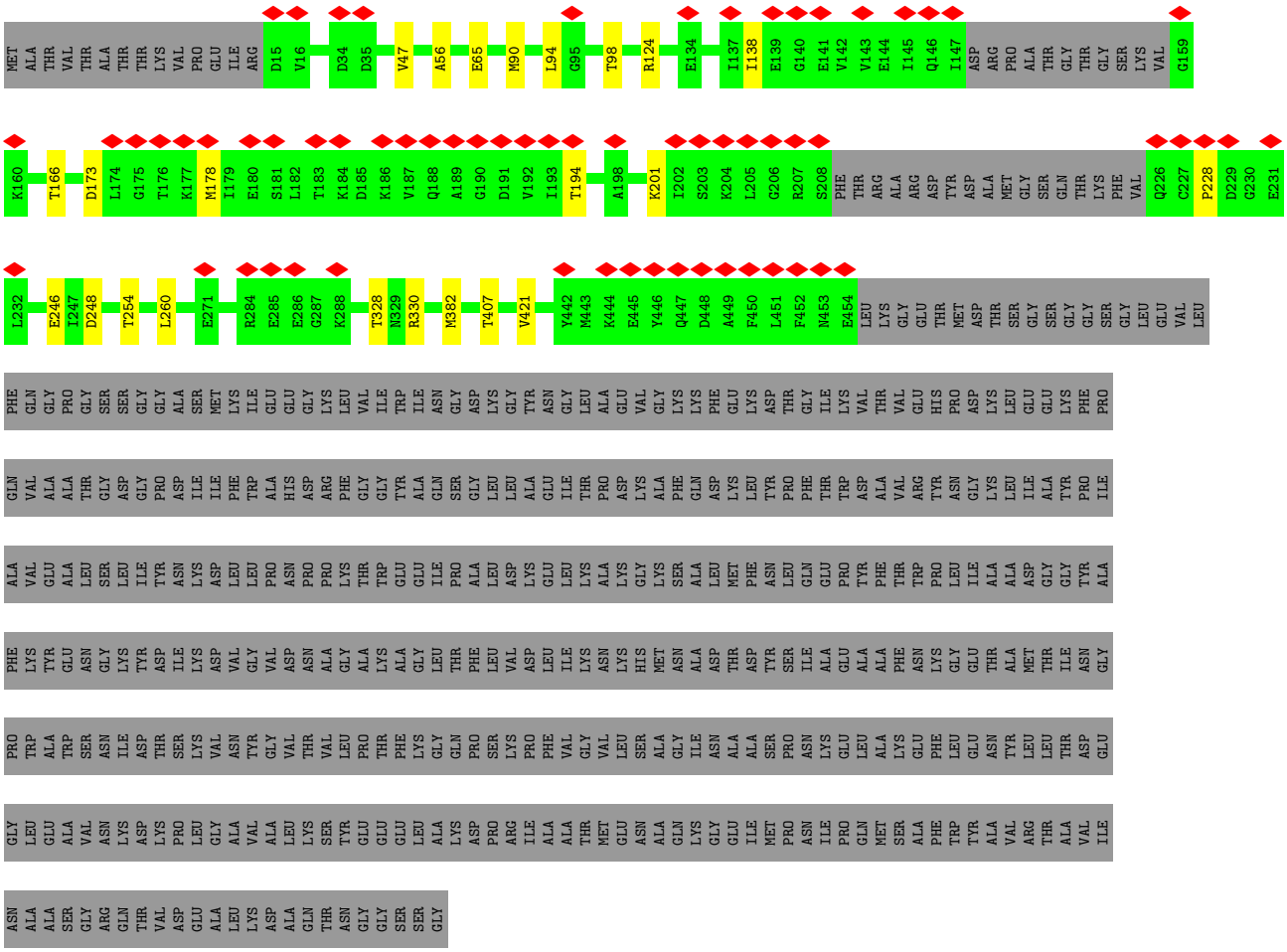
Chain H:





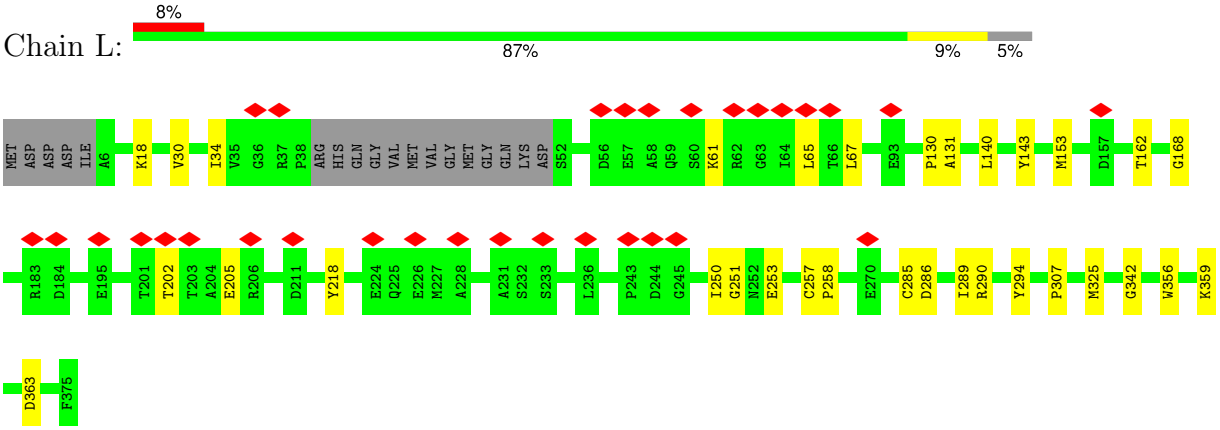
• Molecule 5: RuvB-like 2,RuvB-like 2/Maltose/maltodextrin-binding periplasmic protein chimera

Chain J:



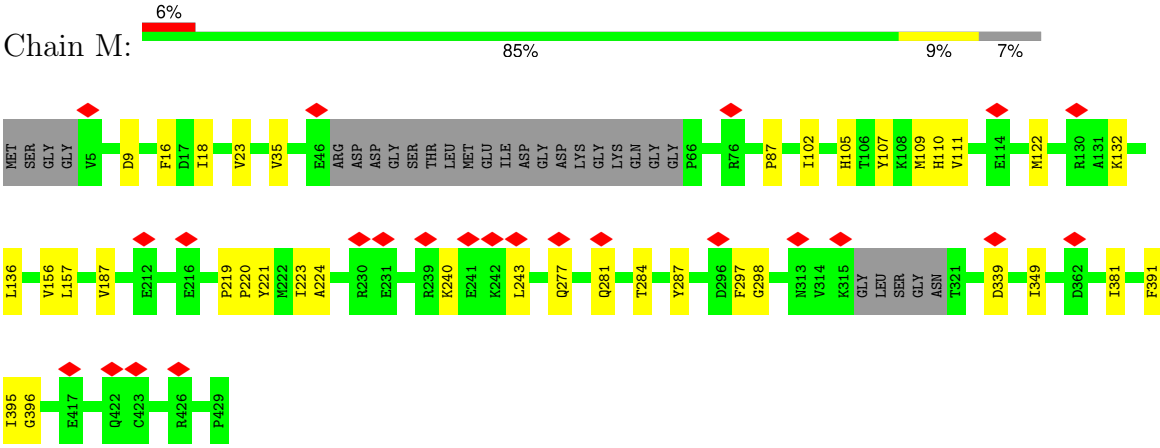
• Molecule 6: Actin, cytoplasmic 1

Chain L:



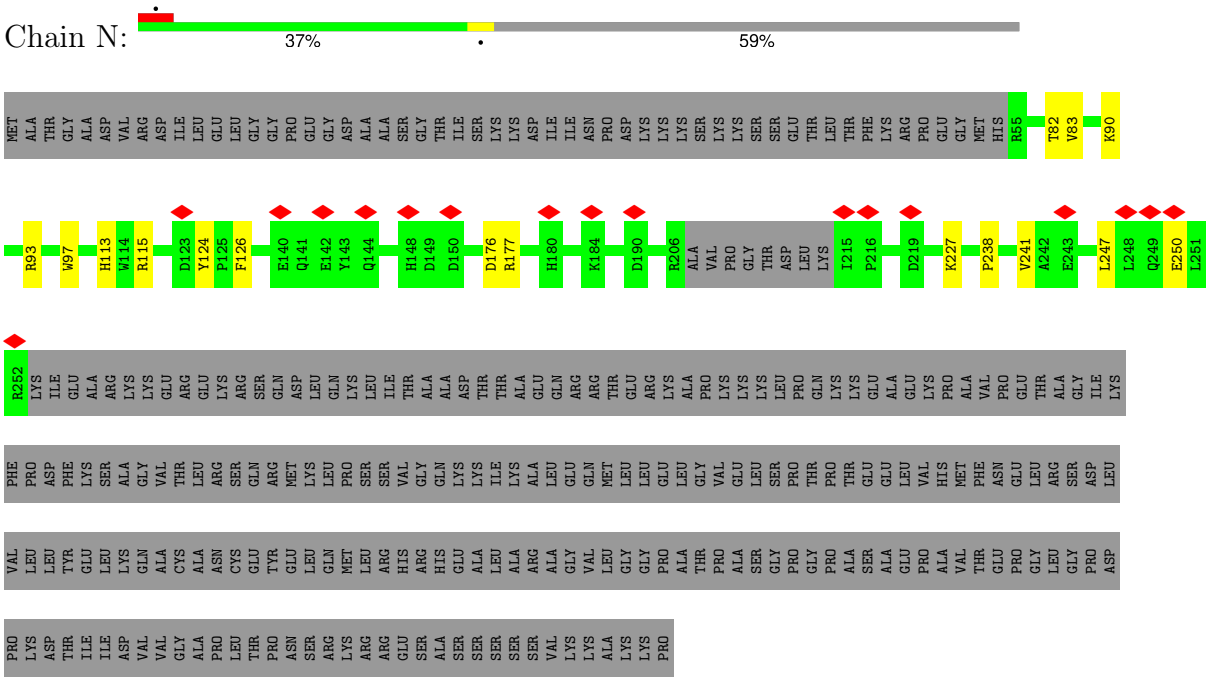
• Molecule 7: Actin-like protein 6A

Chain M:



• Molecule 8: DNA methyltransferase 1-associated protein 1

Chain N:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	45284	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	Not provided	
Image detector	TFS FALCON 4i (4k x 4k)	Depositor
Maximum map value	2.313	Depositor
Minimum map value	-0.112	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.023	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	348.48, 348.48, 348.48	wwPDB
Map dimensions	480, 480, 480	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.726, 0.726, 0.726	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.15	0/5076	0.35	0/6861
2	B	0.14	0/746	0.28	0/1020
3	C	0.12	0/795	0.33	0/1076
4	E	0.14	0/3291	0.30	0/4436
4	G	0.15	0/3350	0.36	0/4516
4	I	0.14	0/3311	0.35	0/4463
5	F	0.16	0/3420	0.33	0/4603
5	H	0.15	0/3365	0.32	0/4529
5	J	0.15	0/3232	0.34	0/4349
6	L	0.14	0/2847	0.32	0/3858
7	M	0.13	0/3209	0.26	0/4351
8	N	0.13	0/1673	0.33	0/2255
All	All	0.14	0/34315	0.33	0/46317

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

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	4975	0	5048	43	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	721	0	719	11	0
3	C	769	0	732	6	0
4	E	3249	0	3360	15	0
4	G	3308	0	3418	22	0
4	I	3269	0	3374	20	0
5	F	3381	0	3450	24	0
5	H	3327	0	3399	18	0
5	J	3198	0	3267	15	0
6	L	2786	0	2757	20	0
7	M	3138	0	3079	24	0
8	N	1628	0	1589	11	0
9	E	31	0	12	2	0
9	F	31	0	12	2	0
9	G	31	0	12	0	0
9	H	31	0	12	1	0
9	I	31	0	12	1	0
9	J	31	0	12	1	0
9	L	31	0	12	0	0
9	M	31	0	12	0	0
10	E	1	0	0	0	0
10	F	1	0	0	0	0
10	G	1	0	0	0	0
10	H	1	0	0	0	0
10	I	1	0	0	0	0
10	J	1	0	0	0	0
10	L	1	0	0	0	0
10	M	1	0	0	0	0
All	All	34005	0	34288	201	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 3.

All (201) 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)
6:L:34:ILE:HD11	6:L:67:LEU:HB3	1.65	0.77
7:M:16:PHE:HB2	7:M:122:MET:HG2	1.68	0.74
4:G:96:MET:SD	4:G:115:ASN:ND2	2.60	0.74
1:A:841:VAL:HG21	6:L:168:GLY:HA3	1.69	0.73
1:A:1369:ASN:HB3	1:A:1926:MET:HE3	1.73	0.69
4:I:215:LEU:HG	5:J:178:MET:HE3	1.75	0.68

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:56:ILE:HD13	4:G:87:LEU:HD11	1.74	0.68
5:J:124:ARG:NE	5:J:248:ASP:OD2	2.24	0.68
1:A:841:VAL:HG22	6:L:143:TYR:HE1	1.60	0.67
4:I:96:MET:SD	4:I:115:ASN:ND2	2.68	0.67
9:I:501:AGS:H8	9:I:501:AGS:H5'1	1.78	0.66
5:H:301:VAL:HG21	5:H:326:MET:HE3	1.77	0.66
1:A:1436:PRO:HG2	1:A:1439:LEU:HD13	1.80	0.64
2:B:312:THR:HG23	2:B:315:ALA:H	1.63	0.62
1:A:1367:ILE:HG13	1:A:1374:VAL:HG21	1.80	0.62
5:H:124:ARG:NE	5:H:248:ASP:OD2	2.32	0.62
4:E:271:ILE:HG23	4:E:275:LEU:HD23	1.82	0.61
9:E:501:AGS:H8	9:E:501:AGS:H5'1	1.81	0.61
7:M:349:ILE:HG12	7:M:381:ILE:HD12	1.82	0.61
7:M:339:ASP:OD2	8:N:227:LYS:NZ	2.33	0.61
5:F:244:LEU:HD11	5:F:320:MET:HE3	1.81	0.61
2:B:321:GLU:HG2	2:B:324:LYS:HE3	1.82	0.61
7:M:18:ILE:HG23	7:M:23:VAL:HG22	1.83	0.60
4:E:163:THR:HG23	4:E:165:LYS:H	1.67	0.60
1:A:1976:ARG:NH2	1:A:1999:MET:SD	2.75	0.59
7:M:87:PRO:HG3	7:M:102:ILE:HD12	1.83	0.59
6:L:18:LYS:HG3	6:L:30:VAL:HG22	1.83	0.59
1:A:1990:PHE:HB2	1:A:2020:ARG:HD3	1.85	0.59
7:M:122:MET:HE1	7:M:136:LEU:HD11	1.85	0.58
5:F:124:ARG:NE	5:F:248:ASP:OD2	2.35	0.58
1:A:1858:MET:HE1	5:J:254:THR:HG23	1.86	0.57
2:B:210:PRO:HB3	2:B:273:THR:HG21	1.85	0.57
9:H:901:AGS:H5'1	9:H:901:AGS:H8	1.86	0.57
1:A:841:VAL:HG22	6:L:143:TYR:CE1	2.39	0.57
5:H:79:PRO:HG3	5:H:329:ASN:HD22	1.70	0.56
1:A:1928:ASP:OD1	1:A:1943:ARG:NH1	2.38	0.55
7:M:284:THR:HG22	7:M:298:GLY:HA2	1.87	0.55
4:G:172:LEU:HD13	4:G:176:ILE:HD13	1.88	0.55
7:M:220:PRO:HA	7:M:223:ILE:HD12	1.89	0.55
1:A:841:VAL:HG21	6:L:168:GLY:CA	2.36	0.55
7:M:18:ILE:HG12	7:M:23:VAL:HG13	1.89	0.55
1:A:1760:ARG:NH2	4:I:196:ASN:O	2.40	0.55
8:N:113:HIS:HB3	8:N:115:ARG:HG2	1.88	0.54
5:F:74:LEU:HD11	5:F:328:THR:HG22	1.90	0.54
4:I:119:ALA:HB3	4:I:325:PRO:HG3	1.89	0.54
1:A:2280:LEU:HD12	1:A:2281:PRO:HD2	1.88	0.54
6:L:285:CYS:HB3	6:L:289:ILE:HD11	1.88	0.54

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:M:107:TYR:HA	7:M:111:VAL:HB	1.90	0.54
2:B:258:PRO:O	2:B:260:ARG:NH1	2.41	0.53
6:L:153:MET:HG2	6:L:162:THR:HG22	1.89	0.53
1:A:1761:CYS:HB3	5:H:223:LYS:HE3	1.90	0.53
7:M:394:TRP:HE3	7:M:395:ILE:HD13	1.73	0.53
4:G:401:THR:OG1	4:G:402:THR:N	2.41	0.52
2:B:296:HIS:HD2	8:N:90:LYS:HE2	1.73	0.52
5:F:314:ARG:NH1	5:F:317:GLU:OE1	2.43	0.52
5:H:403:ILE:HA	5:H:406:ILE:HD12	1.92	0.52
4:E:180:LEU:HD23	4:E:200:VAL:HG11	1.90	0.52
1:A:1403:ASP:N	1:A:1403:ASP:OD1	2.43	0.52
5:J:382:MET:HG2	5:J:421:VAL:HB	1.91	0.52
1:A:1846:ARG:HH22	5:J:201:LYS:HZ2	1.58	0.51
5:H:49:GLN:NE2	5:H:360:THR:O	2.43	0.51
4:E:411:THR:HG21	5:F:68:ILE:HG13	1.90	0.51
5:J:94:LEU:HD21	5:J:98:THR:HB	1.92	0.51
1:A:1931:GLU:HB2	1:A:1941:TYR:CZ	2.46	0.51
1:A:1419:GLU:N	1:A:1419:GLU:OE1	2.44	0.51
5:F:284:ARG:NH1	5:F:285:GLU:OE2	2.40	0.50
5:F:161:LEU:HB2	5:F:174:LEU:HD11	1.91	0.50
4:E:140:PRO:HA	4:E:157:VAL:HG12	1.92	0.50
5:J:56:ALA:HB1	5:J:90:MET:HE2	1.92	0.50
8:N:238:PRO:HA	8:N:241:VAL:HG12	1.92	0.50
9:F:901:AGS:O2B	9:F:901:AGS:O1A	2.29	0.50
5:H:62:MET:HE1	5:H:71:ARG:HG2	1.94	0.50
1:A:2035:GLY:O	1:A:2039:LEU:HG	2.12	0.49
4:I:157:VAL:HG21	4:I:177:PHE:HB2	1.94	0.49
4:I:415:LEU:HD11	5:J:65:GLU:OE1	2.12	0.49
4:E:61:MET:HG3	5:J:407:THR:HG21	1.94	0.49
7:M:156:VAL:HG23	7:M:187:VAL:HG23	1.95	0.49
5:J:328:THR:HG22	5:J:330:ARG:H	1.78	0.49
2:B:302:ARG:HA	2:B:309:PRO:HA	1.94	0.49
2:B:284:PRO:HG2	4:G:205:ARG:HH22	1.78	0.48
5:J:246:GLU:HA	5:J:260:LEU:HD21	1.96	0.48
4:I:247:ASN:HD22	4:I:279:ILE:HD11	1.78	0.48
5:F:27:HIS:HB3	5:F:377:GLU:HG3	1.96	0.48
5:H:328:THR:HG21	5:H:344:HIS:HB3	1.96	0.48
4:E:157:VAL:HG11	4:E:177:PHE:CD1	2.49	0.48
5:F:451:LEU:HD22	5:H:348:ILE:HD11	1.96	0.47
5:F:246:GLU:HA	5:F:260:LEU:HD21	1.96	0.47
8:N:124:TYR:CE2	8:N:126:PHE:HB2	2.49	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:428:ARG:NH2	4:G:47:GLU:OE1	2.38	0.47
6:L:286:ASP:O	6:L:290:ARG:HG3	2.15	0.47
5:H:164:LYS:HB2	5:H:169:GLU:HG2	1.97	0.47
5:H:261:PHE:HD1	4:I:275:LEU:HD13	1.80	0.47
7:M:391:PHE:O	7:M:395:ILE:HG12	2.14	0.47
1:A:2280:LEU:HG	3:C:406:ARG:HD2	1.97	0.47
9:E:501:AGS:O1B	9:E:501:AGS:O2A	2.33	0.47
6:L:218:TYR:HA	6:L:307:PRO:HD2	1.97	0.47
7:M:9:ASP:OD1	8:N:115:ARG:NH2	2.43	0.47
1:A:1918:LEU:HD11	1:A:1983:VAL:HG11	1.97	0.46
1:A:1955:GLU:OE1	1:A:1958:ARG:NH1	2.48	0.46
4:E:107:LYS:HE2	4:E:110:GLU:HG2	1.96	0.46
5:F:34:ASP:OD1	5:F:38:GLU:N	2.47	0.46
1:A:1318:LYS:N	1:A:2015:ASP:OD1	2.49	0.46
4:E:156:HIS:N	4:E:174:PRO:HG3	2.31	0.46
7:M:157:LEU:O	7:M:396:GLY:HA3	2.16	0.46
7:M:240:LYS:HB2	7:M:243:LEU:HD11	1.98	0.46
4:I:97:VAL:HG12	4:I:100:GLU:HG3	1.98	0.46
5:J:166:THR:HG23	5:J:228:PRO:O	2.16	0.46
7:M:105:HIS:CE1	7:M:109:MET:HG3	2.50	0.45
5:H:243:SER:N	5:H:246:GLU:OE1	2.48	0.45
5:F:303:MET:SD	4:G:313:THR:HG21	2.57	0.45
8:N:247:LEU:HA	8:N:250:GLU:HG2	1.99	0.45
5:H:84:THR:O	5:H:88:MET:HG2	2.17	0.45
4:I:210:ALA:HA	4:I:220:TYR:CZ	2.52	0.45
5:F:219:GLY:H	4:G:195:ALA:HB1	1.82	0.45
7:M:132:LYS:HE2	7:M:132:LYS:HB2	1.85	0.45
2:B:260:ARG:HG3	2:B:260:ARG:HH11	1.82	0.45
7:M:224:ALA:HB2	7:M:240:LYS:HA	1.97	0.45
4:G:304:VAL:HG21	4:G:329:PHE:CD1	2.52	0.45
4:G:338:ILE:HD11	4:G:346:SER:HB2	1.99	0.45
4:I:341:THR:HG21	4:I:344:ILE:HD12	1.98	0.45
6:L:131:ALA:HB1	6:L:356:TRP:HB3	1.98	0.45
1:A:822:MET:HE1	3:C:461:ARG:HD3	1.99	0.44
4:I:214:ASP:HB2	5:J:173:ASP:H	1.82	0.44
4:I:338:ILE:HD11	4:I:346:SER:HB2	1.99	0.44
5:F:216:ASP:OD2	4:G:171:LYS:N	2.43	0.44
8:N:82:THR:HG23	8:N:83:VAL:HG13	2.00	0.44
5:H:34:ASP:OD1	5:H:38:GLU:N	2.50	0.44
4:E:411:THR:OG1	4:E:412:PRO:HD3	2.18	0.44
1:A:1839:VAL:HG21	1:A:1884:LEU:HD22	1.99	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:G:369:GLN:O	4:G:373:GLN:HG3	2.17	0.44
5:H:314:ARG:NH1	5:H:317:GLU:OE1	2.47	0.44
6:L:363:ASP:OD2	8:N:93:ARG:NH2	2.43	0.44
3:C:475:ASP:OD1	3:C:475:ASP:N	2.50	0.44
8:N:97:TRP:HA	8:N:113:HIS:O	2.17	0.44
1:A:1423:THR:O	1:A:1427:ALA:N	2.44	0.43
1:A:2039:LEU:O	1:A:2043:VAL:HG23	2.18	0.43
1:A:2276:PRO:HG2	1:A:2279:LYS:HG2	2.01	0.43
4:I:369:GLN:O	4:I:373:GLN:HG3	2.18	0.43
1:A:837:ALA:O	1:A:841:VAL:HG23	2.18	0.43
1:A:1321:GLU:HG2	1:A:2018:ILE:HD11	2.00	0.43
4:G:337:VAL:HA	4:G:345:THR:HA	2.00	0.43
5:F:137:ILE:HG23	5:F:194:THR:HG23	2.01	0.43
5:F:300:GLU:CD	4:G:313:THR:HB	2.44	0.43
4:G:53:VAL:HA	4:G:56:ILE:HD12	2.01	0.43
4:E:256:ILE:HG23	4:E:257:LEU:HD12	2.00	0.43
5:F:45:GLY:HA2	5:F:373:ILE:HD13	2.01	0.43
1:A:2008:ASP:OD1	1:A:2012:ARG:NE	2.51	0.42
6:L:130:PRO:HA	6:L:359:LYS:HD2	2.01	0.42
6:L:294:TYR:CD2	6:L:325:MET:HG2	2.55	0.42
2:B:303:ASP:OD2	2:B:320:ARG:NH1	2.48	0.42
4:G:155:SER:C	4:G:174:PRO:HG3	2.44	0.42
5:F:77:GLY:HA3	5:F:359:THR:OG1	2.19	0.42
6:L:257:CYS:HB3	6:L:258:PRO:HD3	2.01	0.42
1:A:1412:MET:HB2	4:I:286:TYR:CZ	2.54	0.42
4:E:64:ARG:HA	4:E:64:ARG:HD3	1.85	0.42
5:F:47:VAL:O	9:F:901:AGS:N6	2.52	0.42
5:H:139:GLU:O	5:H:232:LEU:HD23	2.20	0.42
4:I:71:PRO:HD2	4:I:74:THR:HG21	2.01	0.42
1:A:2245:MET:HE3	3:C:529:PHE:CD2	2.53	0.42
5:F:49:GLN:NE2	5:F:360:THR:O	2.49	0.42
7:M:277:GLN:O	7:M:281:GLN:HG2	2.19	0.42
1:A:2023:SER:HB3	1:A:2026:SER:OG	2.20	0.42
4:I:42:GLN:HE22	4:I:364:MET:H	1.67	0.42
6:L:251:GLY:C	6:L:253:GLU:H	2.28	0.42
7:M:394:TRP:CE3	7:M:395:ILE:HD13	2.54	0.42
2:B:213:THR:HB	2:B:267:THR:HB	2.02	0.41
4:E:110:GLU:HG3	4:E:270:GLU:HA	2.02	0.41
4:I:249:ARG:HG2	4:I:250:PRO:HD2	2.02	0.41
4:I:401:THR:OG1	4:I:402:THR:N	2.38	0.41
5:F:334:ARG:NH2	4:G:342:GLU:OE1	2.42	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:L:140:LEU:O	6:L:342:GLY:HA3	2.21	0.41
8:N:176:ASP:OD2	8:N:177:ARG:NH1	2.54	0.41
1:A:1438:LYS:HA	1:A:1438:LYS:HD3	1.95	0.41
5:F:28:ILE:HG23	5:F:46:MET:HE2	2.03	0.41
1:A:2268:LEU:HD11	3:C:423:TRP:CH2	2.54	0.41
4:G:159:ILE:HD11	4:G:180:LEU:HD11	2.03	0.41
1:A:1748:GLU:HG3	1:A:1752:GLN:HE21	1.85	0.41
1:A:1899:LYS:HZ1	1:A:2028:GLU:CD	2.27	0.41
6:L:250:ILE:O	6:L:250:ILE:HG13	2.20	0.41
1:A:1986:ASP:OD1	1:A:1986:ASP:N	2.53	0.41
2:B:302:ARG:NH1	2:B:307:ASP:OD1	2.48	0.41
5:H:62:MET:HE2	5:H:62:MET:HB3	1.88	0.41
6:L:61:LYS:HE3	6:L:65:LEU:HD11	2.02	0.41
1:A:1900:LEU:HD23	1:A:1900:LEU:HA	1.93	0.40
1:A:1924:ILE:HG23	1:A:1943:ARG:NH2	2.35	0.40
5:F:19:ILE:HD11	4:G:283:VAL:HG11	2.03	0.40
4:G:98:GLY:O	4:G:101:VAL:HG22	2.21	0.40
4:I:337:VAL:HG22	4:I:345:THR:HG22	2.03	0.40
6:L:202:THR:OG1	6:L:205:GLU:OE1	2.24	0.40
7:M:287:TYR:HB3	7:M:297:PHE:HE2	1.86	0.40
4:E:172:LEU:HD13	4:E:176:ILE:HG21	2.03	0.40
4:G:346:SER:OG	4:G:350:ILE:O	2.39	0.40
1:A:2248:TRP:CD1	3:C:437:ARG:HD3	2.57	0.40
4:E:256:ILE:O	4:E:260:MET:HG2	2.22	0.40
4:G:138:LEU:HD23	4:G:159:ILE:HG12	2.03	0.40
5:J:47:VAL:O	9:J:901:AGS:N6	2.53	0.40
7:M:219:PRO:HB2	7:M:221:TYR:CD1	2.57	0.40
1:A:1850:PRO:HA	1:A:1851:PRO:HD3	1.91	0.40
5:H:72:ALA:HA	5:H:324:LEU:O	2.22	0.40
5:J:138:ILE:O	5:J:194:THR:HA	2.22	0.40
7:M:35:VAL:HG21	7:M:110:HIS:CG	2.56	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	595/2841 (21%)	586 (98%)	9 (2%)	0	100	100
2	B	86/364 (24%)	85 (99%)	1 (1%)	0	100	100
3	C	89/263 (34%)	85 (96%)	4 (4%)	0	100	100
4	E	418/456 (92%)	415 (99%)	3 (1%)	0	100	100
4	G	423/456 (93%)	414 (98%)	9 (2%)	0	100	100
4	I	421/456 (92%)	417 (99%)	4 (1%)	0	100	100
5	F	431/857 (50%)	420 (97%)	11 (3%)	0	100	100
5	H	424/857 (50%)	415 (98%)	9 (2%)	0	100	100
5	J	406/857 (47%)	397 (98%)	9 (2%)	0	100	100
6	L	353/375 (94%)	349 (99%)	4 (1%)	0	100	100
7	M	395/429 (92%)	392 (99%)	3 (1%)	0	100	100
8	N	186/467 (40%)	183 (98%)	3 (2%)	0	100	100
All	All	4227/8678 (49%)	4158 (98%)	69 (2%)	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	543/2411 (22%)	543 (100%)	0	100	100
2	B	78/312 (25%)	78 (100%)	0	100	100
3	C	78/232 (34%)	78 (100%)	0	100	100
4	E	356/387 (92%)	356 (100%)	0	100	100
4	G	365/387 (94%)	365 (100%)	0	100	100
4	I	359/387 (93%)	359 (100%)	0	100	100
5	F	367/699 (52%)	367 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	H	361/699 (52%)	361 (100%)	0	100	100
5	J	348/699 (50%)	348 (100%)	0	100	100
6	L	303/318 (95%)	303 (100%)	0	100	100
7	M	345/364 (95%)	345 (100%)	0	100	100
8	N	170/400 (42%)	170 (100%)	0	100	100
All	All	3673/7295 (50%)	3673 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1425	HIS
1	A	1752	GLN
1	A	1875	GLN
1	A	1974	HIS
4	E	44	ASN
5	F	146	GLN
5	F	453	ASN
4	G	34	GLN
4	G	44	ASN
4	G	203	GLN
4	G	348	HIS
4	G	373	GLN
5	H	233	GLN
5	H	245	HIS
5	H	422	GLN
5	H	453	ASN
4	I	408	GLN
5	J	313	ASN
5	J	369	GLN
5	J	422	GLN
6	L	128	ASN
8	N	222	HIS

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)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 16 ligands modelled in this entry, 8 are monoatomic - leaving 8 for Mogul analysis.

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	$\#\|Z\| > 2$
9	AGS	M	501	10	28,33,33	0.82	1 (3%)	31,52,52	0.92	2 (6%)
9	AGS	L	401	10	28,33,33	0.84	1 (3%)	31,52,52	0.95	2 (6%)
9	AGS	E	501	10	28,33,33	0.81	1 (3%)	31,52,52	0.88	2 (6%)
9	AGS	F	901	10	28,33,33	0.88	1 (3%)	31,52,52	0.99	2 (6%)
9	AGS	I	501	10	28,33,33	0.89	1 (3%)	31,52,52	0.92	2 (6%)
9	AGS	J	901	10	28,33,33	0.84	1 (3%)	31,52,52	0.93	2 (6%)
9	AGS	G	501	10	28,33,33	0.82	1 (3%)	31,52,52	1.03	2 (6%)
9	AGS	H	901	10	28,33,33	0.86	0	31,52,52	1.09	2 (6%)

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
9	AGS	M	501	10	-	2/17/38/38	0/3/3/3
9	AGS	L	401	10	-	11/17/38/38	0/3/3/3
9	AGS	E	501	10	-	5/17/38/38	0/3/3/3
9	AGS	F	901	10	-	7/17/38/38	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	AGS	I	501	10	-	4/17/38/38	0/3/3/3
9	AGS	J	901	10	-	5/17/38/38	0/3/3/3
9	AGS	G	501	10	-	3/17/38/38	0/3/3/3
9	AGS	H	901	10	-	4/17/38/38	0/3/3/3

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	J	901	AGS	PG-S1G	2.20	1.95	1.90
9	E	501	AGS	PG-S1G	2.16	1.95	1.90
9	F	901	AGS	PG-S1G	2.15	1.95	1.90
9	I	501	AGS	PG-S1G	2.13	1.95	1.90
9	M	501	AGS	PG-S1G	2.10	1.95	1.90
9	L	401	AGS	PG-S1G	2.04	1.95	1.90
9	G	501	AGS	PG-S1G	2.01	1.95	1.90

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	F	901	AGS	PB-O3B-PG	-3.70	119.63	133.17
9	L	401	AGS	PB-O3B-PG	-3.57	120.11	133.17
9	M	501	AGS	PB-O3B-PG	-3.41	120.67	133.17
9	J	901	AGS	PB-O3B-PG	-3.37	120.85	133.17
9	H	901	AGS	PB-O3B-PG	-3.30	121.10	133.17
9	I	501	AGS	PB-O3B-PG	-3.15	121.63	133.17
9	G	501	AGS	PB-O3B-PG	-3.03	122.07	133.17
9	E	501	AGS	PB-O3B-PG	-2.89	122.59	133.17
9	L	401	AGS	C5-C6-N6	2.32	123.85	120.31
9	M	501	AGS	C5-C6-N6	2.30	123.81	120.31
9	J	901	AGS	C5-C6-N6	2.29	123.81	120.31
9	E	501	AGS	C5-C6-N6	2.29	123.80	120.31
9	G	501	AGS	C5-C6-N6	2.28	123.79	120.31
9	I	501	AGS	C5-C6-N6	2.27	123.76	120.31
9	F	901	AGS	C5-C6-N6	2.26	123.75	120.31
9	H	901	AGS	C5-C6-N6	2.25	123.74	120.31

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	F	901	AGS	C5'-O5'-PA-O1A
9	F	901	AGS	C5'-O5'-PA-O3A
9	J	901	AGS	C5'-O5'-PA-O2A
9	L	401	AGS	PB-O3B-PG-O2G
9	L	401	AGS	PB-O3B-PG-O3G
9	L	401	AGS	C5'-O5'-PA-O1A
9	L	401	AGS	C5'-O5'-PA-O2A
9	L	401	AGS	C5'-O5'-PA-O3A
9	M	501	AGS	PB-O3B-PG-O2G
9	M	501	AGS	C5'-O5'-PA-O1A
9	E	501	AGS	O4'-C4'-C5'-O5'
9	F	901	AGS	O4'-C4'-C5'-O5'
9	F	901	AGS	C3'-C4'-C5'-O5'
9	I	501	AGS	O4'-C4'-C5'-O5'
9	L	401	AGS	PG-O3B-PB-O1B
9	L	401	AGS	O4'-C4'-C5'-O5'
9	L	401	AGS	C3'-C4'-C5'-O5'
9	G	501	AGS	PA-O3A-PB-O2B
9	J	901	AGS	PA-O3A-PB-O1B
9	L	401	AGS	PB-O3A-PA-O2A
9	E	501	AGS	C3'-C4'-C5'-O5'
9	F	901	AGS	C5'-O5'-PA-O2A
9	J	901	AGS	C5'-O5'-PA-O1A
9	J	901	AGS	C5'-O5'-PA-O3A
9	F	901	AGS	PA-O3A-PB-O2B
9	H	901	AGS	PA-O3A-PB-O1B
9	H	901	AGS	PG-O3B-PB-O2B
9	G	501	AGS	C4'-C5'-O5'-PA
9	L	401	AGS	C4'-C5'-O5'-PA
9	I	501	AGS	C3'-C4'-C5'-O5'
9	E	501	AGS	PG-O3B-PB-O2B
9	H	901	AGS	PG-O3B-PB-O1B
9	E	501	AGS	PA-O3A-PB-O1B
9	G	501	AGS	PA-O3A-PB-O1B
9	H	901	AGS	PA-O3A-PB-O2B
9	L	401	AGS	PB-O3A-PA-O1A
9	E	501	AGS	PA-O3A-PB-O2B
9	F	901	AGS	PA-O3A-PB-O1B
9	I	501	AGS	PA-O3A-PB-O1B
9	I	501	AGS	PB-O3A-PA-O2A
9	J	901	AGS	PA-O3A-PB-O2B

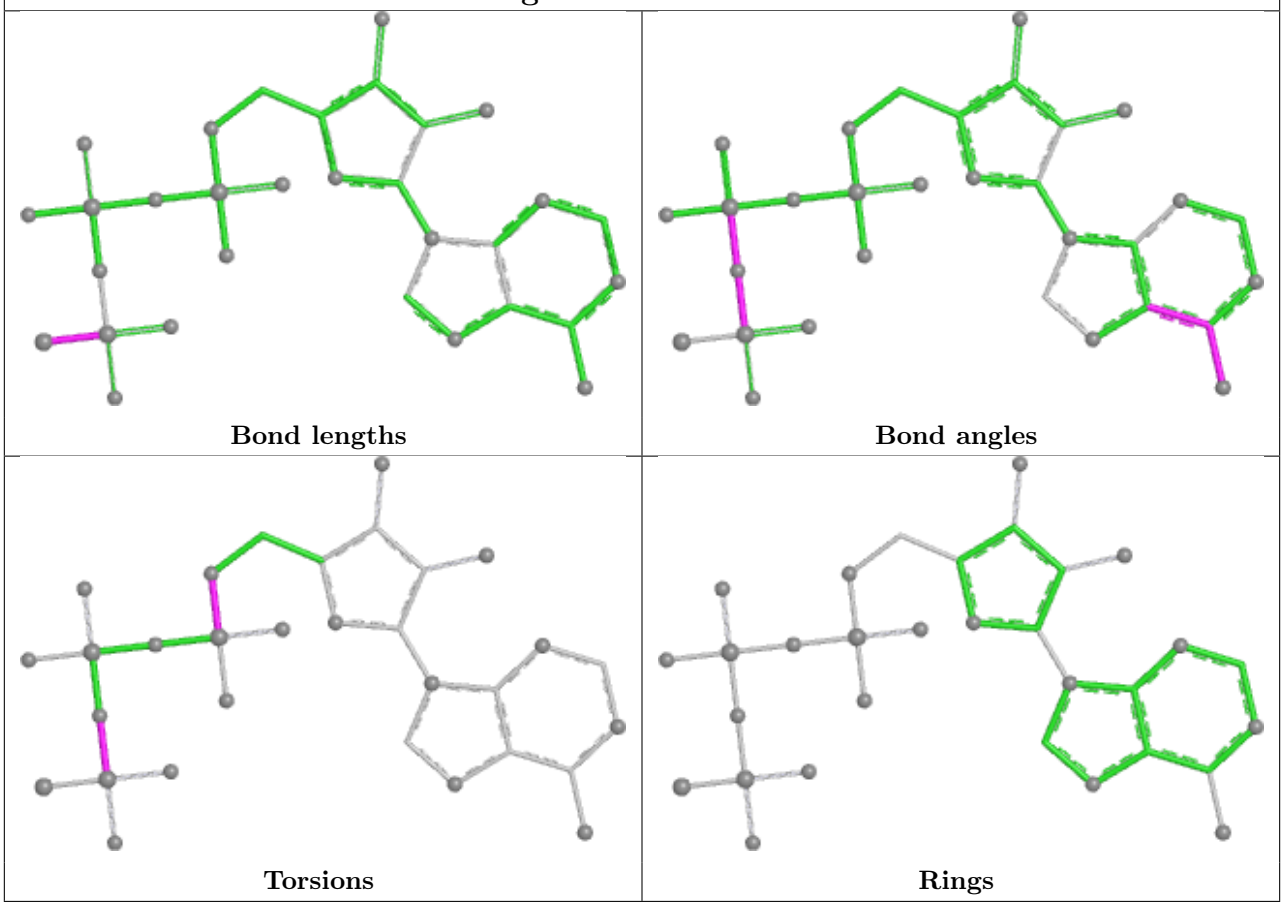
There are no ring outliers.

5 monomers are involved in 7 short contacts:

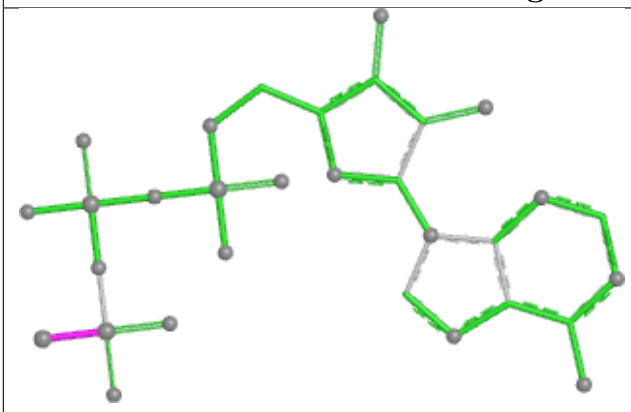
Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	E	501	AGS	2	0
9	F	901	AGS	2	0
9	I	501	AGS	1	0
9	J	901	AGS	1	0
9	H	901	AGS	1	0

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

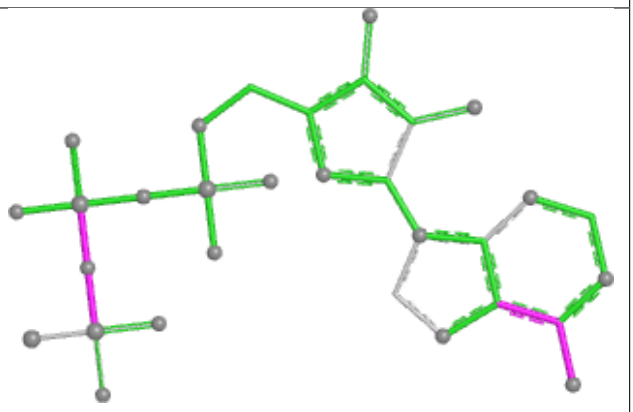
Ligand AGS M 501



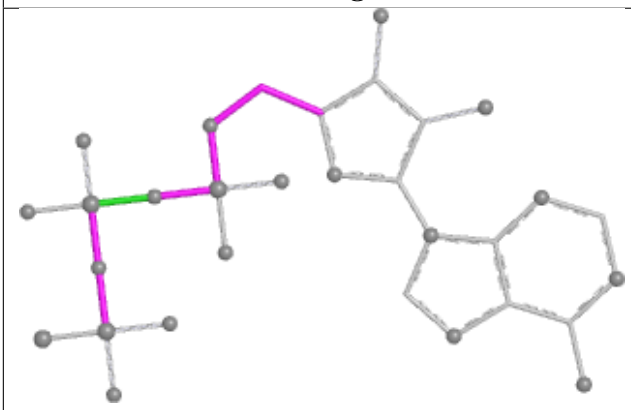
Ligand AGS L 401



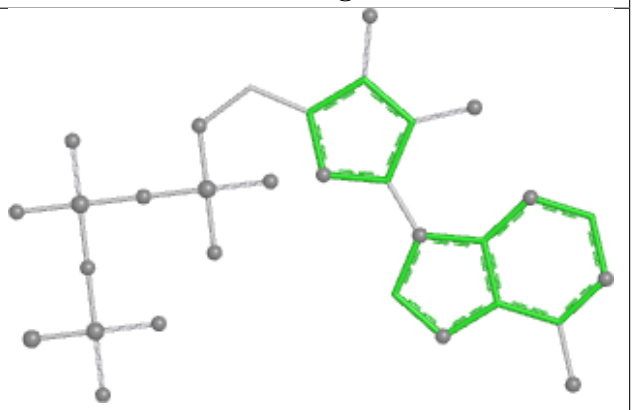
Bond lengths



Bond angles

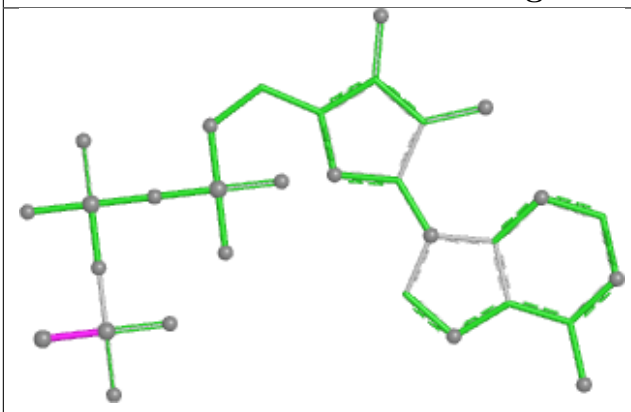


Torsions

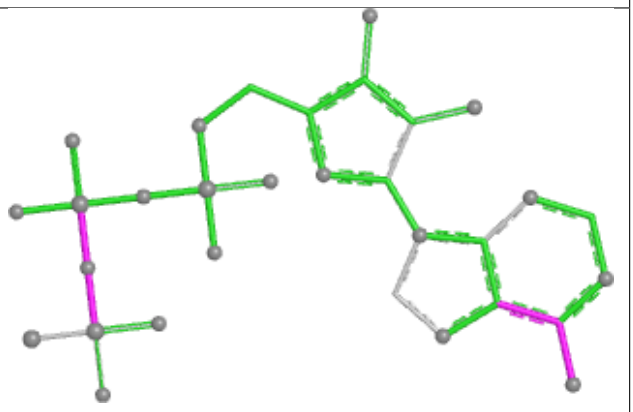


Rings

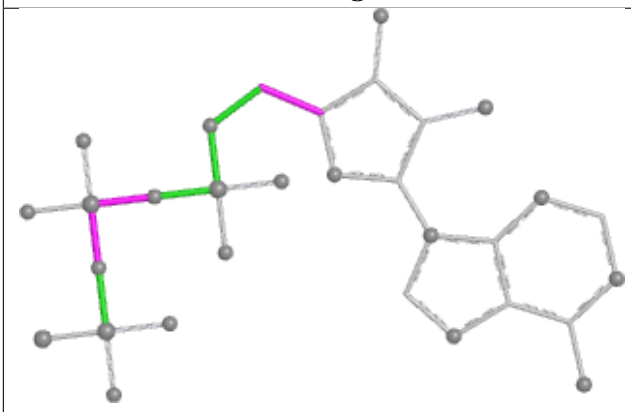
Ligand AGS E 501



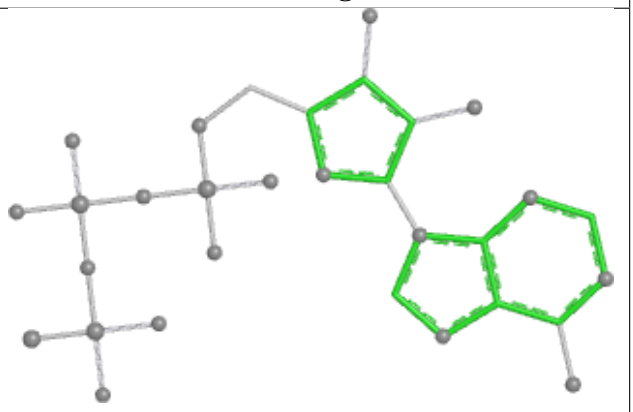
Bond lengths



Bond angles

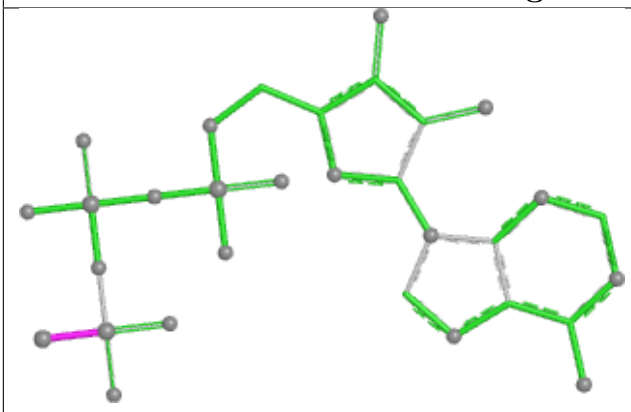


Torsions

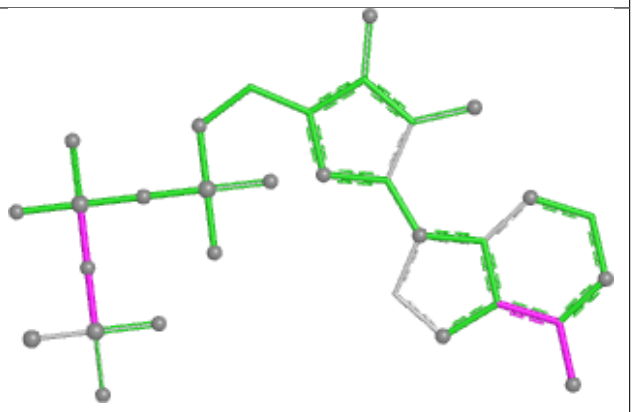


Rings

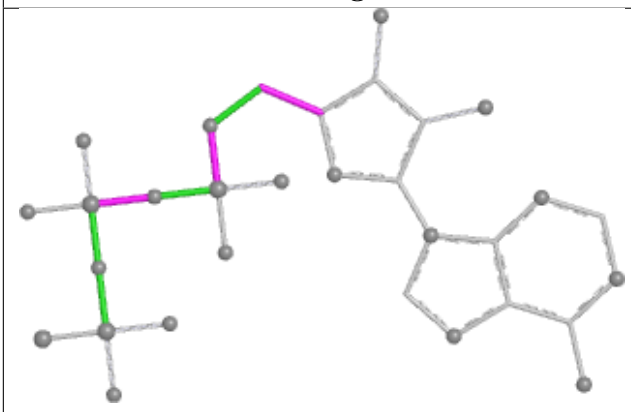
Ligand AGS F 901



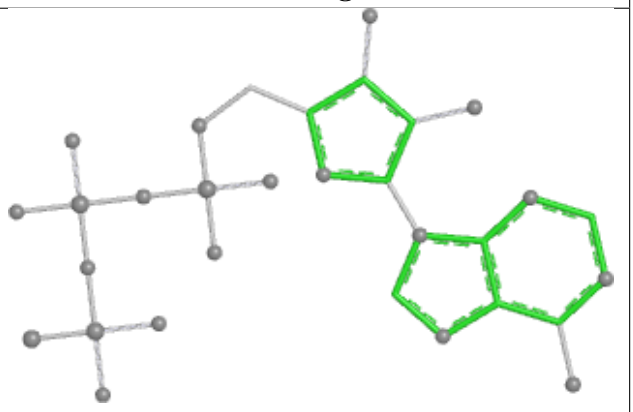
Bond lengths



Bond angles

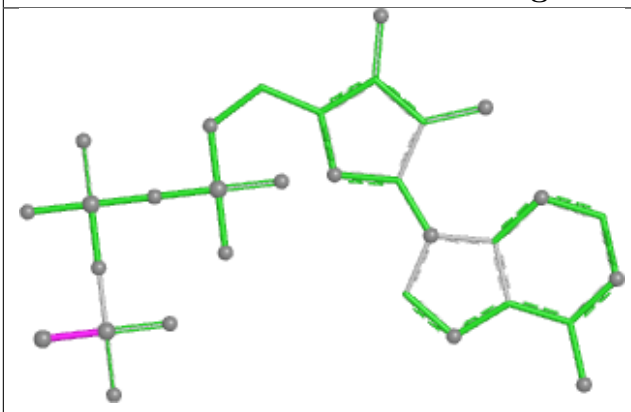


Torsions

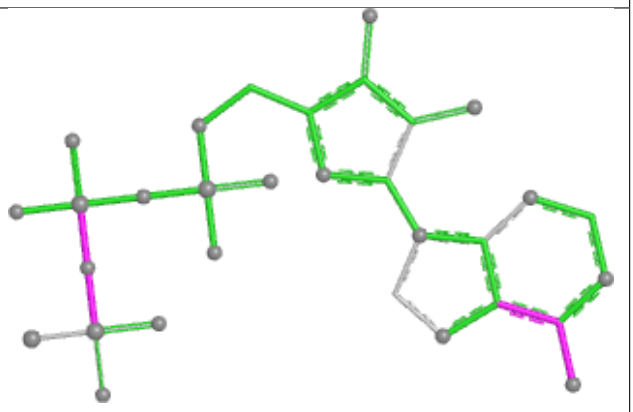


Rings

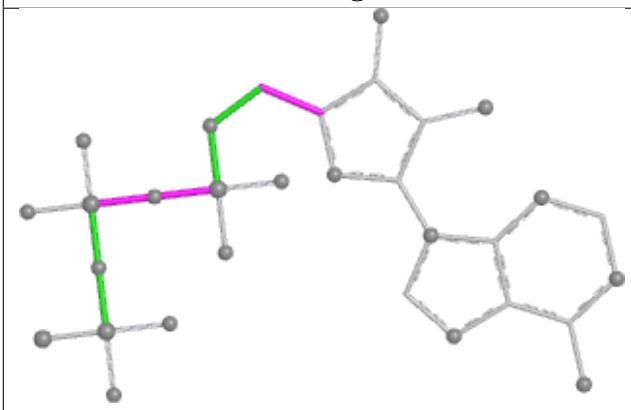
Ligand AGS I 501



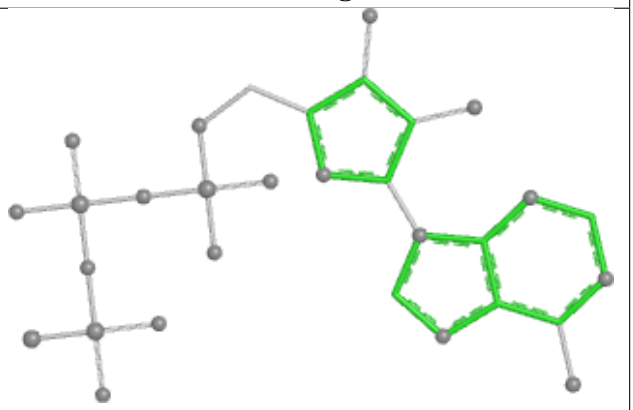
Bond lengths



Bond angles

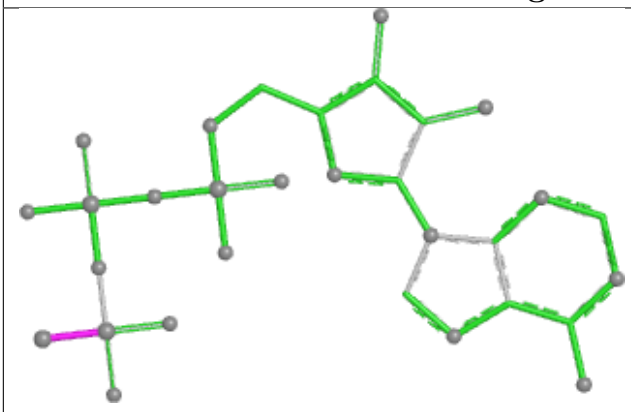


Torsions

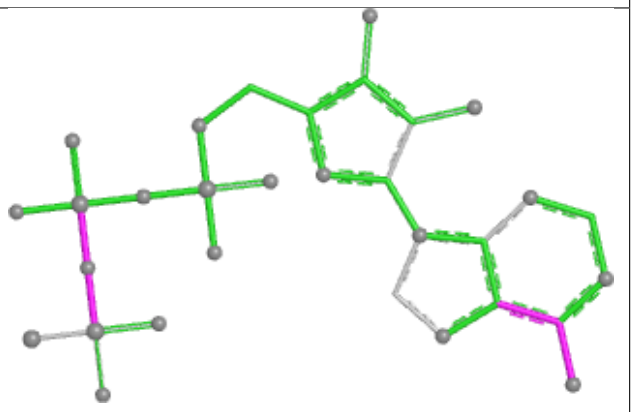


Rings

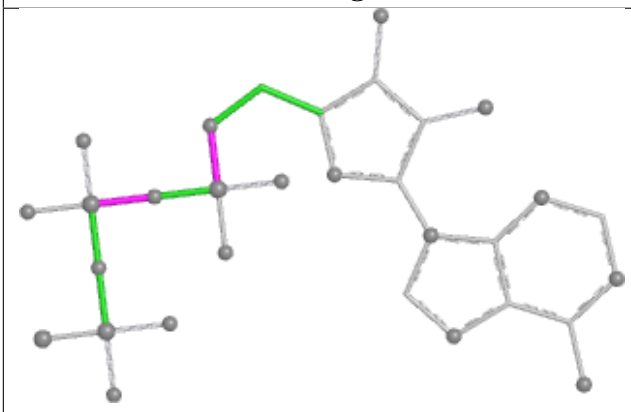
Ligand AGS J 901



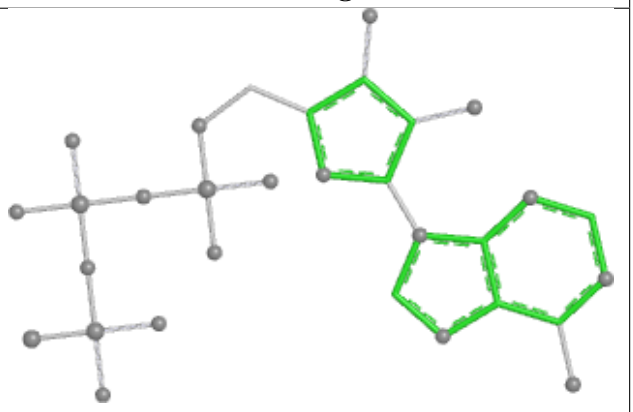
Bond lengths



Bond angles

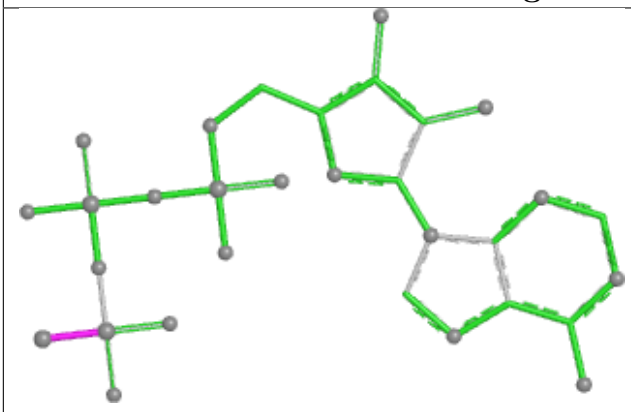


Torsions

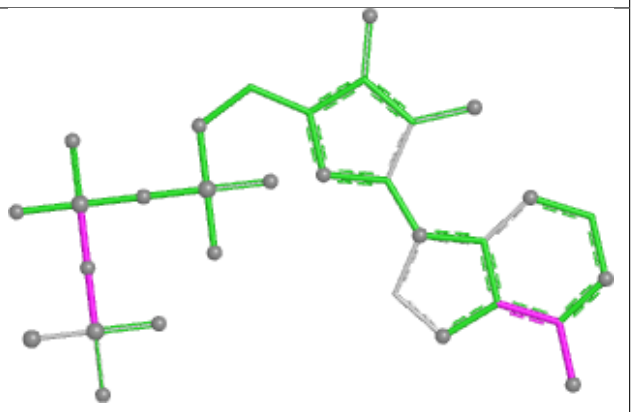


Rings

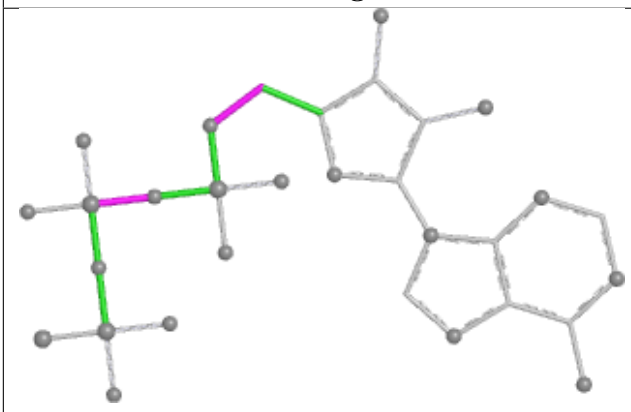
Ligand AGS G 501



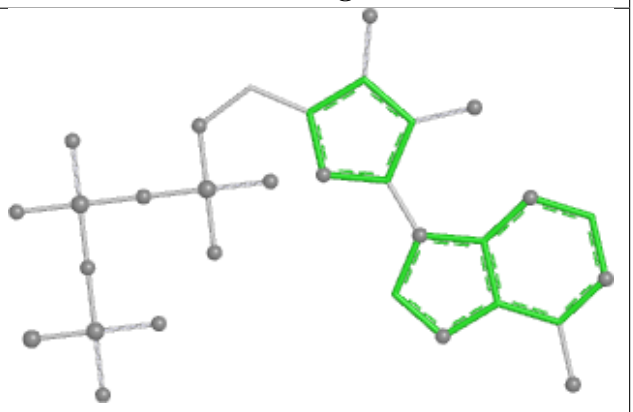
Bond lengths



Bond angles

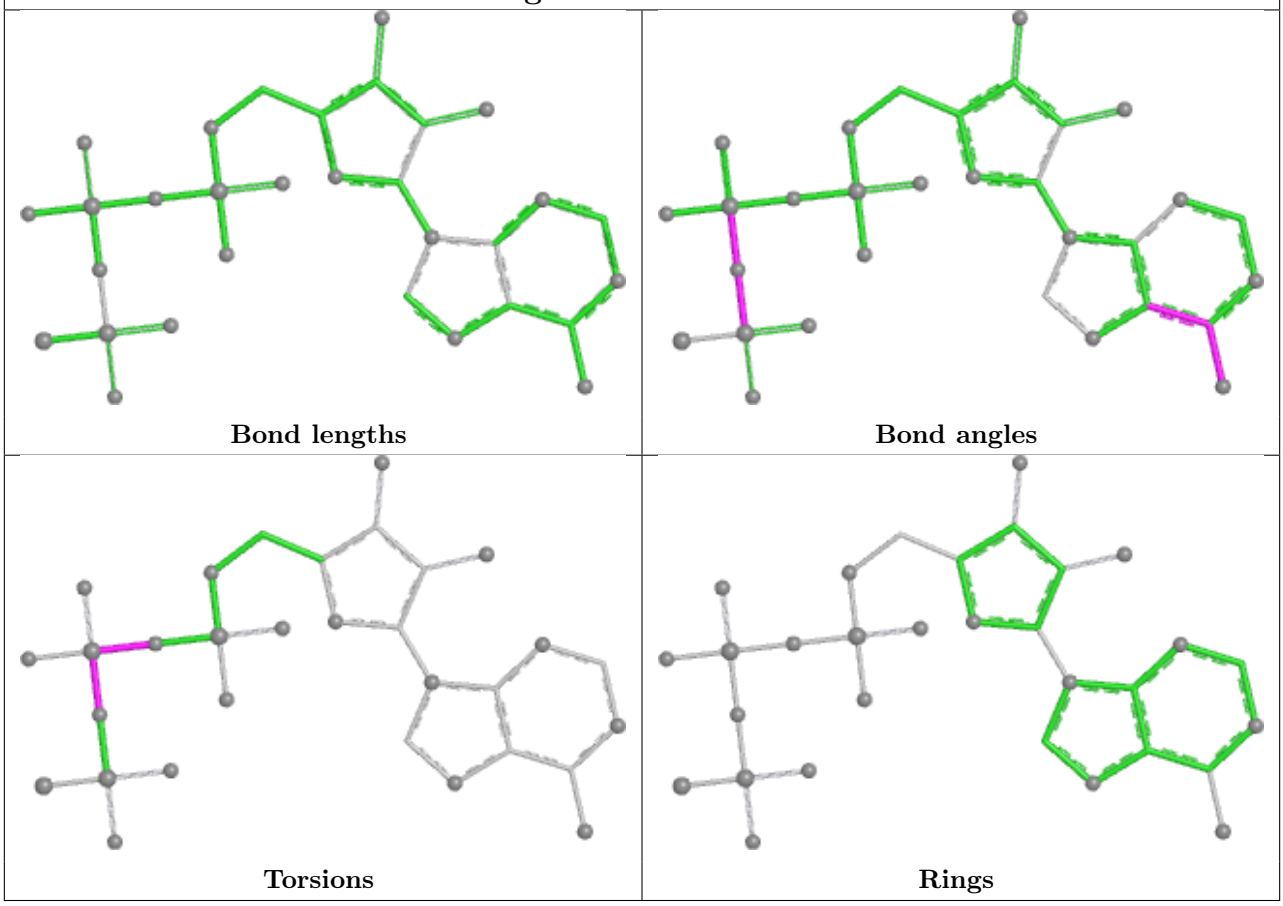


Torsions



Rings

Ligand AGS H 901



5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

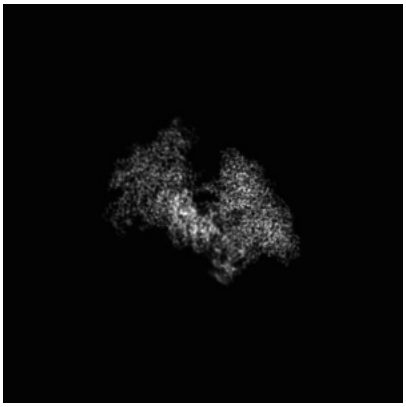
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-45388. These allow visual inspection of the internal detail of the map and identification of artifacts.

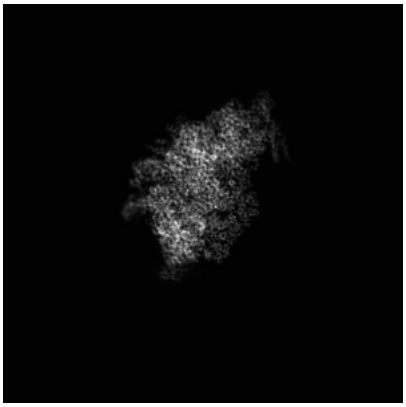
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

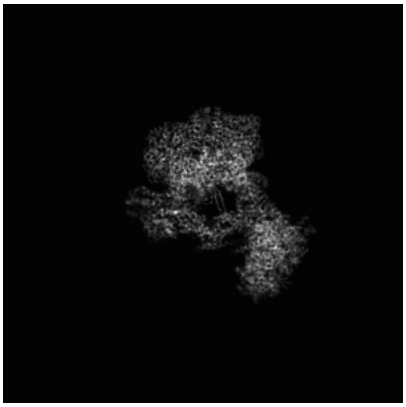
6.1.1 Primary map



X



Y



Z

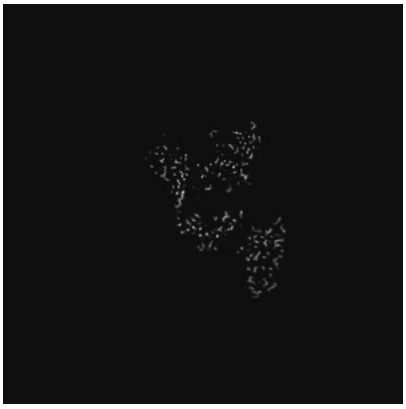
The images above show the map projected in three orthogonal directions.

6.2 Central slices

6.2.1 Primary map

X Index: 240

Y Index: 240



Z Index: 240

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: 296

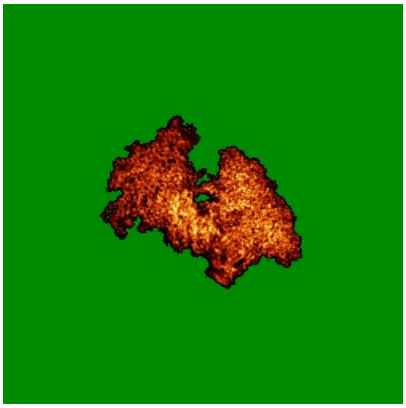
Y Index: 287

Z Index: 232

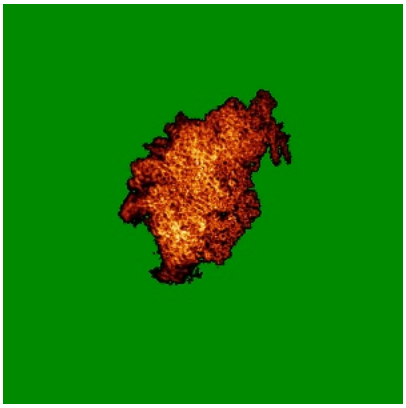
The images above show the largest variance slices of the map in three orthogonal directions.

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

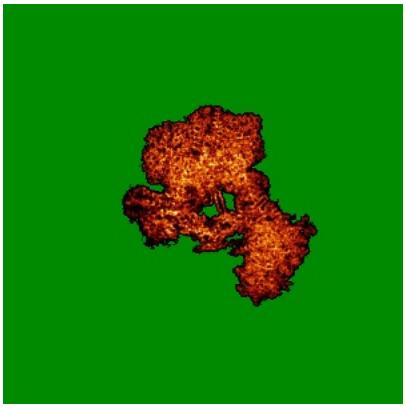
6.4.1 Primary map



X



Y

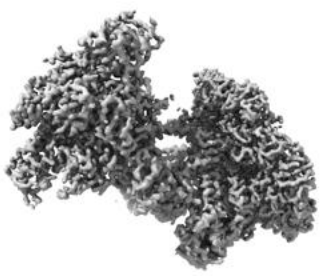


Z

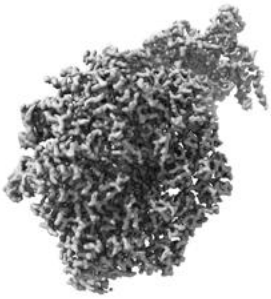
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map



X



Y

Z

The images above show the 3D surface view of the map at the recommended contour level 0.1. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

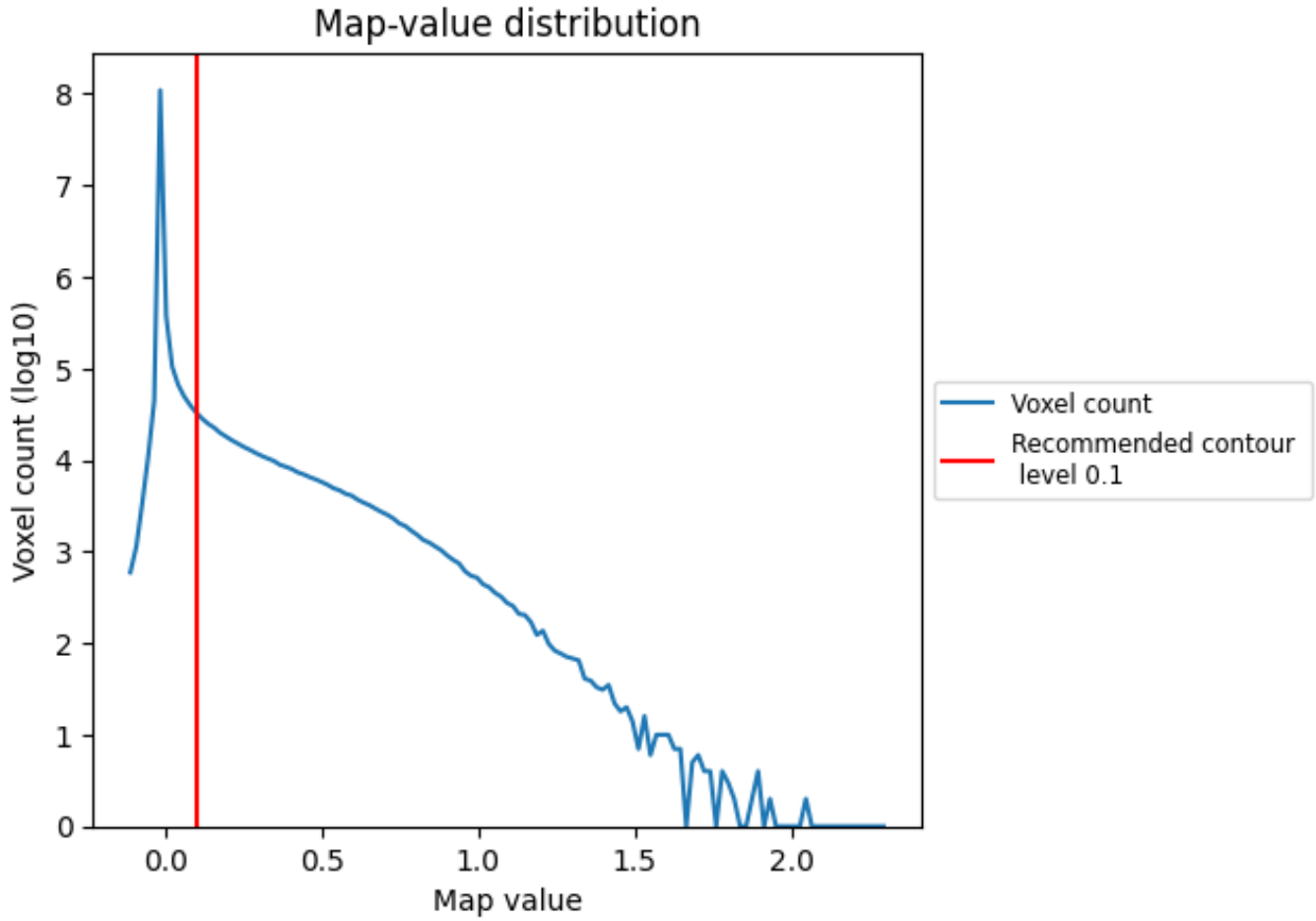
6.6 Mask visualisation (i)

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

7 Map analysis

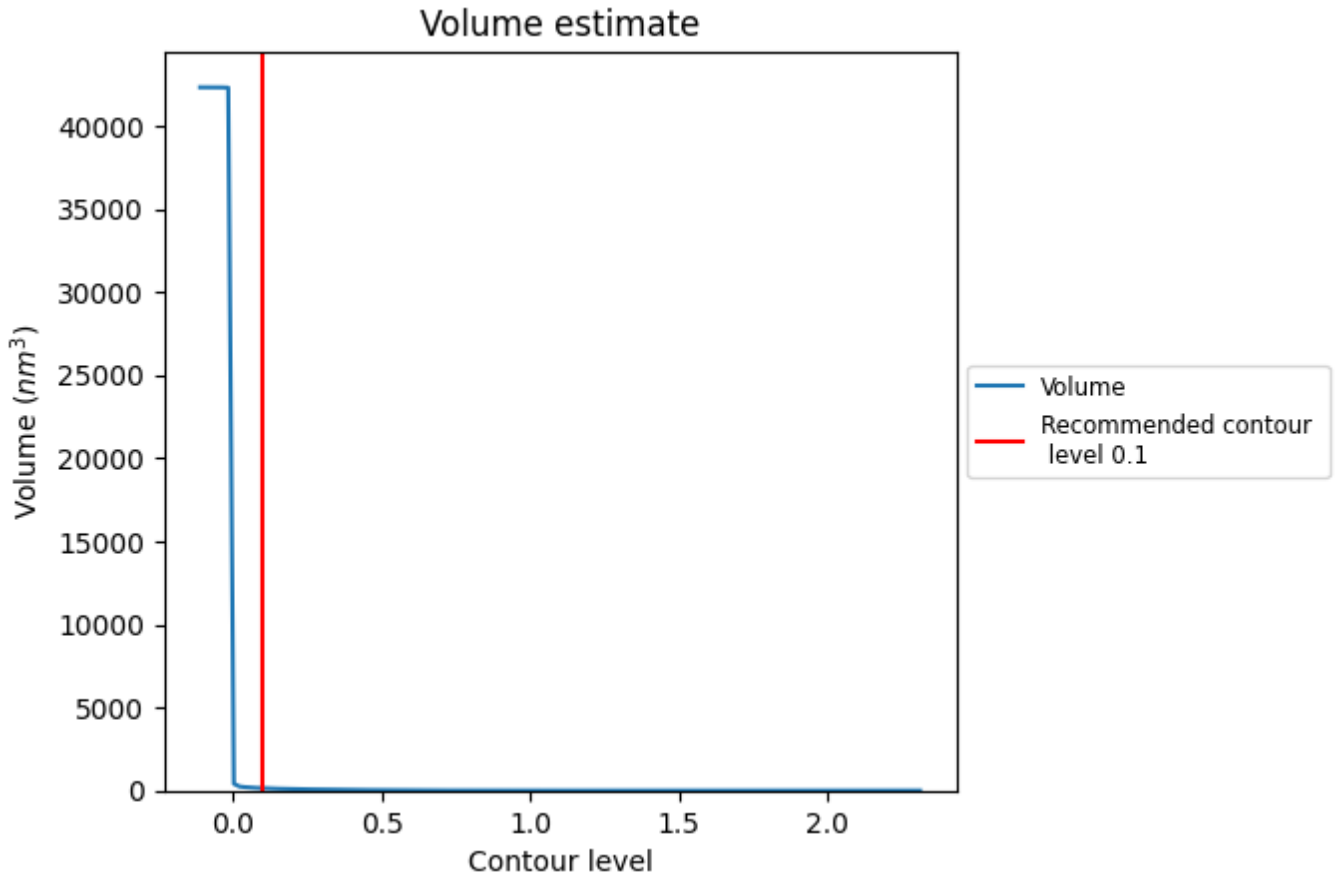
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

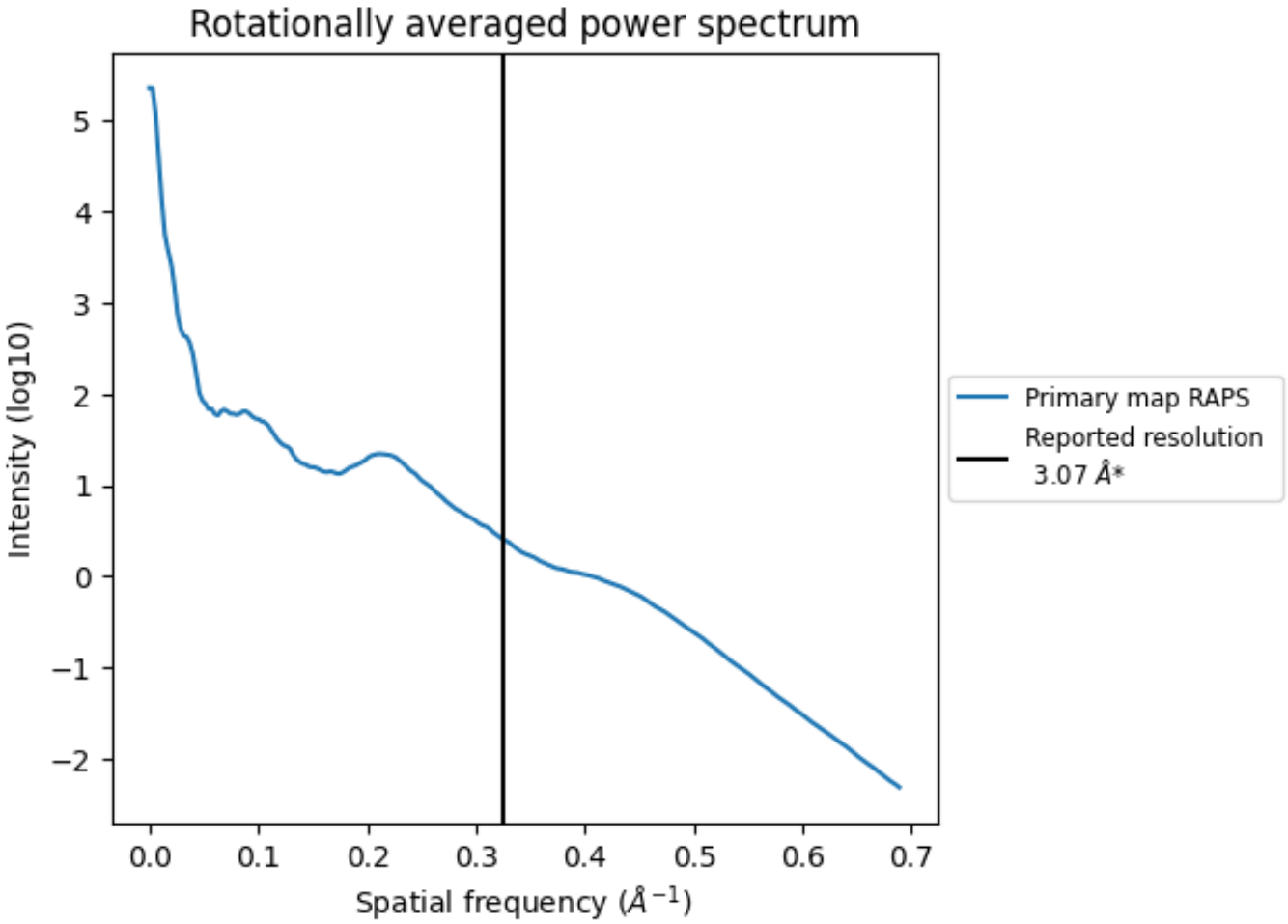
7.2 Volume estimate



The volume at the recommended contour level is 141 nm^3; this corresponds to an approximate mass of 127 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 0.326 Å^{-1}

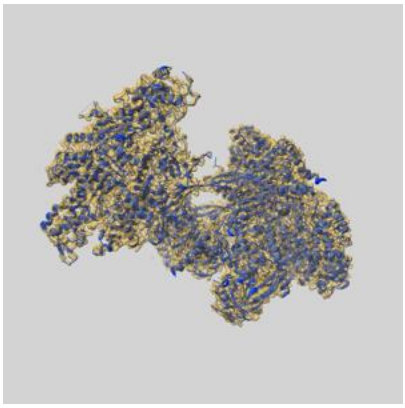
8 Fourier-Shell correlation (i)

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

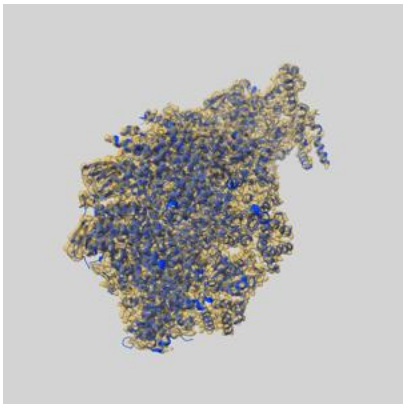
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-45388 and PDB model 9CAE. Per-residue inclusion information can be found in section 3 on page 8.

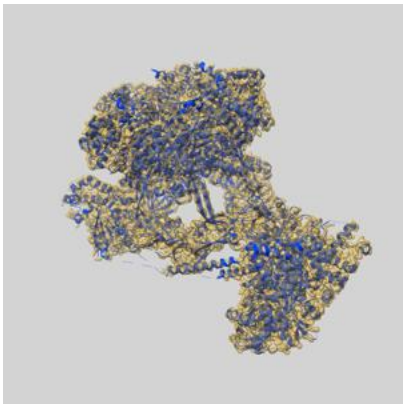
9.1 Map-model overlay



X



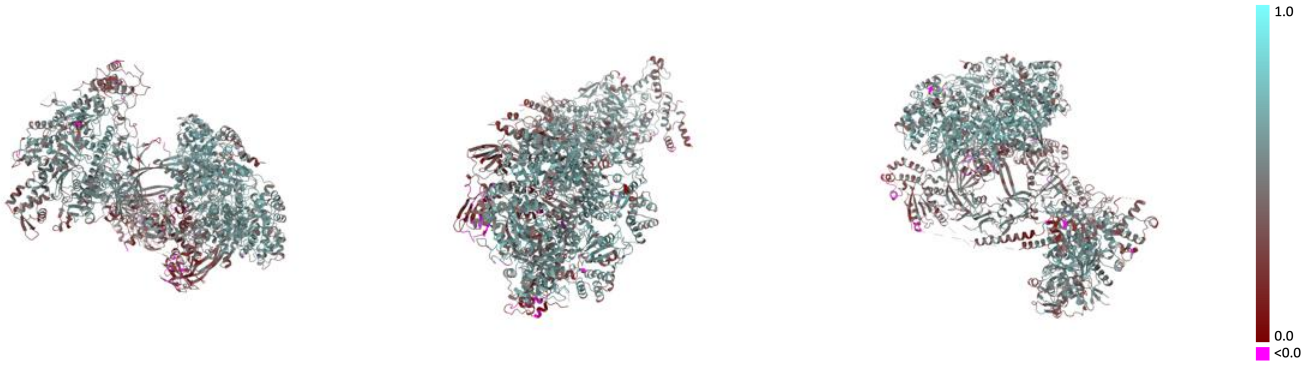
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

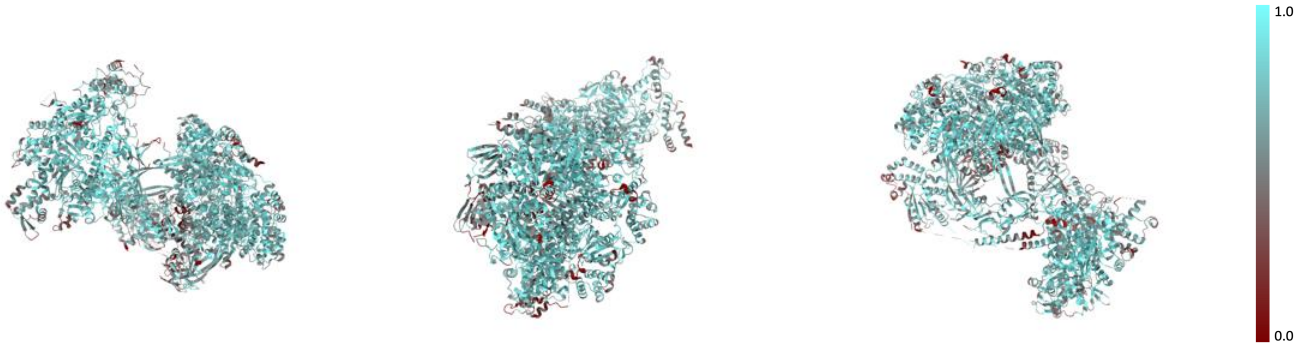
9.2 Q-score mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

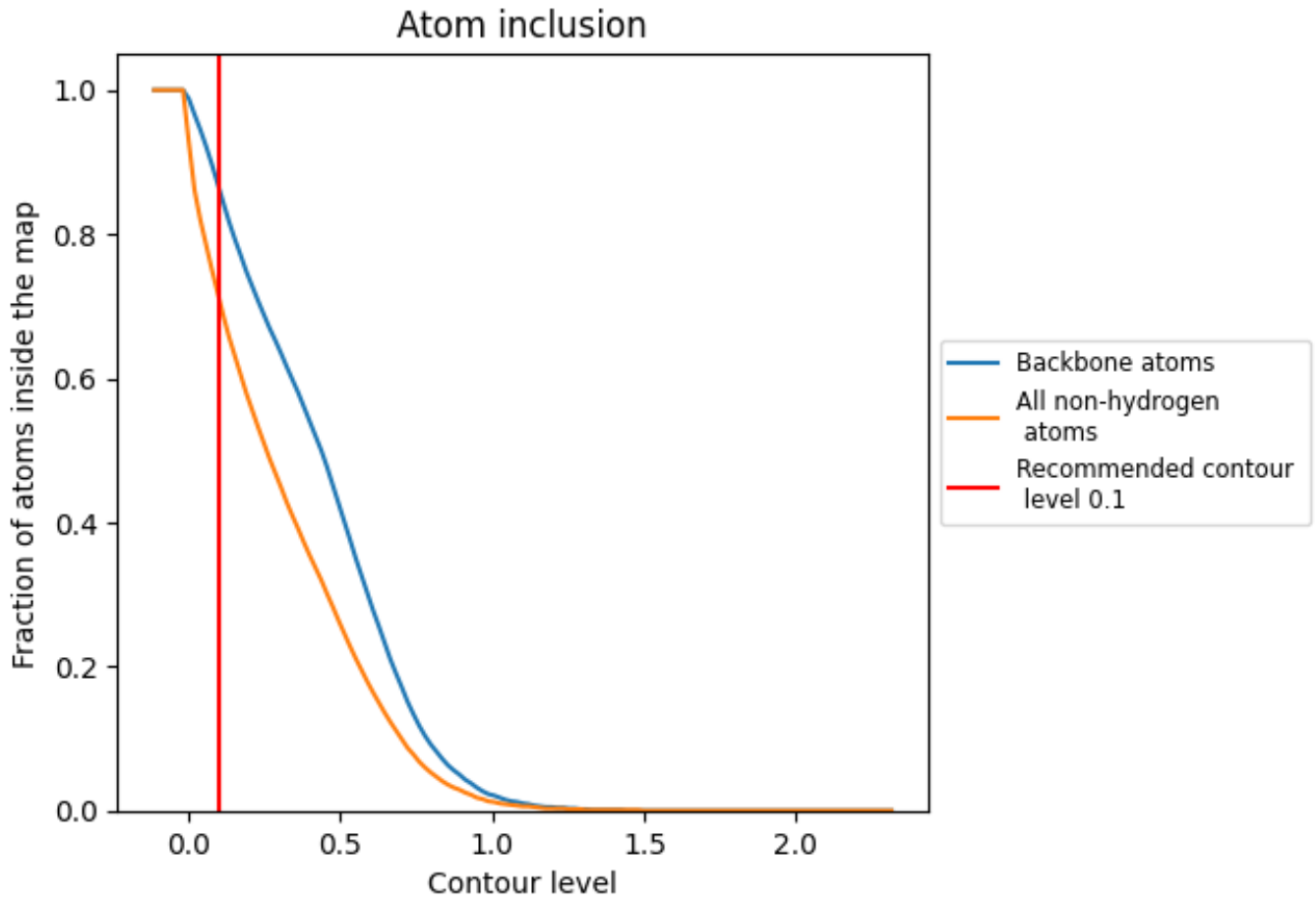
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.1).

9.4 Atom inclusion (i)



At the recommended contour level, 87% of all backbone atoms, 71% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7130	0.4900
A	0.6120	0.3560
B	0.7110	0.4320
C	0.7240	0.5040
E	0.7340	0.5270
F	0.7440	0.5350
G	0.7440	0.5420
H	0.7440	0.5330
I	0.7250	0.5030
J	0.6780	0.4830
L	0.7360	0.4970
M	0.7560	0.5190
N	0.6950	0.4640