wwPDB EM Validation Summary Report (i)

Nov 12, 2024 – 12:33 AM EST

PDB ID	:	8TW6
EMDB ID	:	EMD-41660
Title	:	TCR in nanodisc ND-II
Authors	:	Notti, R.Q.; Walz, T.
Deposited on	:	2023-08-20
Resolution	:	3.10 Å(reported)

This is a wwPDB EM Validation Summary 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 (i) 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 (i)) were used in the production of this report:

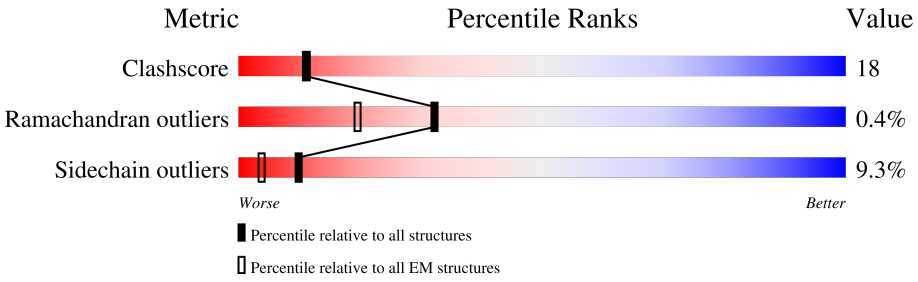
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4.02b-467
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 Å.

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



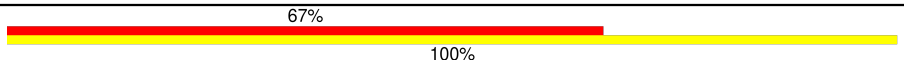
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	X	412	96%
1	Y	412	95%
2	A	274	44% 24% 28%
3	B	556	23% 15% 61%
4	E	207	7% 36% 12% 51%
4	F	207	35% 12% 53%
5	D	171	25% 18% 53%
6	G	190	6% 29% 17% 52%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
7	C	3	

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 6242 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 T-cell surface glycoprotein CD3 zeta chain, GFP fusion protein,GFP.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	Y	20	Total	C	N	O	S	0	0
			153	109	20	23	1		
1	X	15	Total	C	N	O	S	0	0
			117	82	15	19	1		

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Y	165	ALA	-	linker	UNP P20963
Y	166	SER	-	linker	UNP P20963
Y	167	LEU	-	linker	UNP P20963
Y	168	GLU	-	linker	UNP P20963
Y	169	VAL	-	linker	UNP P20963
Y	170	LEU	-	linker	UNP P20963
Y	171	PHE	-	linker	UNP P20963
Y	172	GLN	-	linker	UNP P20963
Y	173	GLY	-	linker	UNP P20963
Y	174	PRO	-	linker	UNP P20963
X	165	ALA	-	linker	UNP P20963
X	166	SER	-	linker	UNP P20963
X	167	LEU	-	linker	UNP P20963
X	168	GLU	-	linker	UNP P20963
X	169	VAL	-	linker	UNP P20963
X	170	LEU	-	linker	UNP P20963
X	171	PHE	-	linker	UNP P20963
X	172	GLN	-	linker	UNP P20963
X	173	GLY	-	linker	UNP P20963
X	174	PRO	-	linker	UNP P20963

- Molecule 2 is a protein called TCR alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	196	Total	C	N	O	S	0	0
			1442	916	231	289	6		

- Molecule 3 is a protein called T cell receptor beta variable 6-5,T cell receptor beta chain MC.7.G5,MCHERRY.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	B	219	Total	C	N	O	S	0	0
			1645	1051	282	303	9		

There are 23 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	115	VAL	-	linker	UNP A0A0K0K1A5
B	116	GLY	-	linker	UNP A0A0K0K1A5
B	117	ASN	-	linker	UNP A0A0K0K1A5
B	118	THR	-	linker	UNP A0A0K0K1A5
B	119	GLY	-	linker	UNP A0A0K0K1A5
B	120	GLU	-	linker	UNP A0A0K0K1A5
B	121	LEU	-	linker	UNP A0A0K0K1A5
B	122	PHE	-	linker	UNP A0A0K0K1A5
B	123	PHE	-	linker	UNP A0A0K0K1A5
B	124	GLY	-	linker	UNP A0A0K0K1A5
B	125	GLU	-	linker	UNP A0A0K0K1A5
B	126	GLY	-	linker	UNP A0A0K0K1A5
B	127	SER	-	linker	UNP A0A0K0K1A5
B	312	ALA	-	linker	UNP P0DTU4
B	313	SER	-	linker	UNP P0DTU4
B	314	LEU	-	linker	UNP P0DTU4
B	315	GLU	-	linker	UNP P0DTU4
B	316	VAL	-	linker	UNP P0DTU4
B	317	LEU	-	linker	UNP P0DTU4
B	318	PHE	-	linker	UNP P0DTU4
B	319	GLN	-	linker	UNP P0DTU4
B	320	GLY	-	linker	UNP P0DTU4
B	321	PRO	-	linker	UNP P0DTU4

- Molecule 4 is a protein called T-cell surface glycoprotein CD3 epsilon chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	102	Total	C	N	O	S	0	0
			755	479	122	146	8		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf	Trace
4	F	98	Total	C	N	O	S	0	0
			720	461	115	137	7		

- Molecule 5 is a protein called T-cell surface glycoprotein CD3 delta chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	D	80	Total	C	N	O	S	0	0
			594	370	100	119	5		

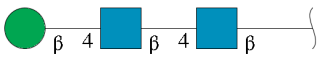
- Molecule 6 is a protein called T-cell surface glycoprotein CD3 gamma chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	G	91	Total	C	N	O	S	0	0
			707	454	120	126	7		

There are 8 discrepancies between the modelled and reference sequences:

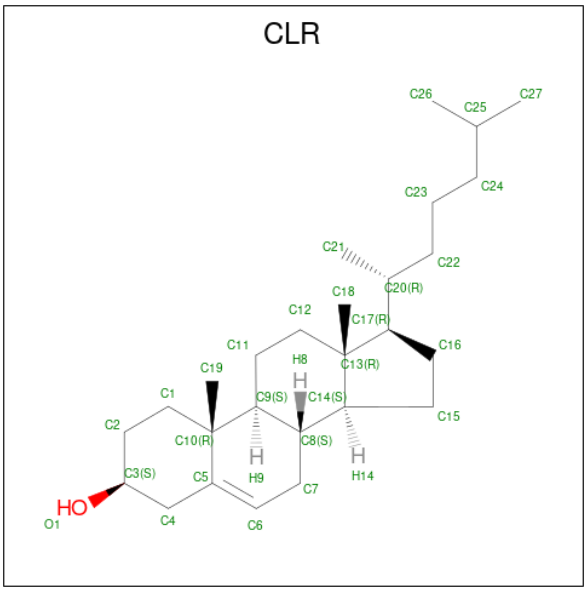
Chain	Residue	Modelled	Actual	Comment	Reference
G	183	HIS	-	expression tag	UNP P09693
G	184	HIS	-	expression tag	UNP P09693
G	185	HIS	-	expression tag	UNP P09693
G	186	HIS	-	expression tag	UNP P09693
G	187	HIS	-	expression tag	UNP P09693
G	188	HIS	-	expression tag	UNP P09693
G	189	HIS	-	expression tag	UNP P09693
G	190	HIS	-	expression tag	UNP P09693

- Molecule 7 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.



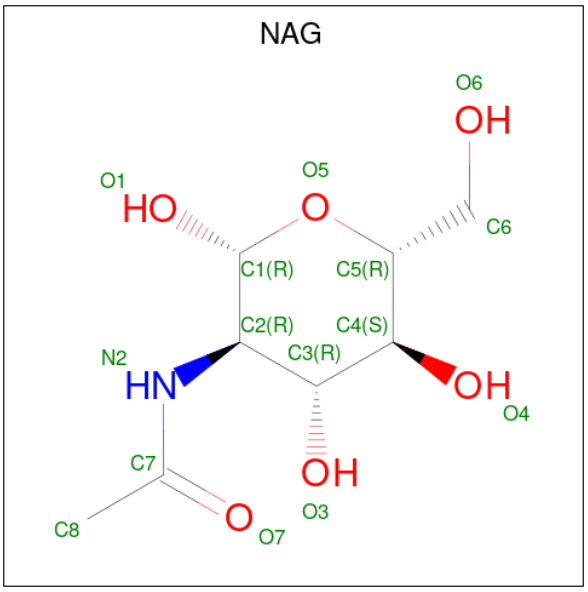
Mol	Chain	Residues	Atoms				AltConf	Trace
7	C	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 8 is CHOLESTEROL (three-letter code: CLR) (formula: $C_{27}H_{46}O$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	AltConf
8	Y	1	Total C O 28 27 1	0
8	B	1	Total C O 28 27 1	0

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



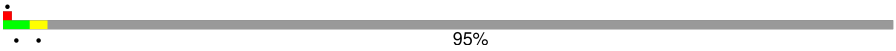
Mol	Chain	Residues	Atoms	AltConf
9	G	1	Total C N O 14 8 1 5	0

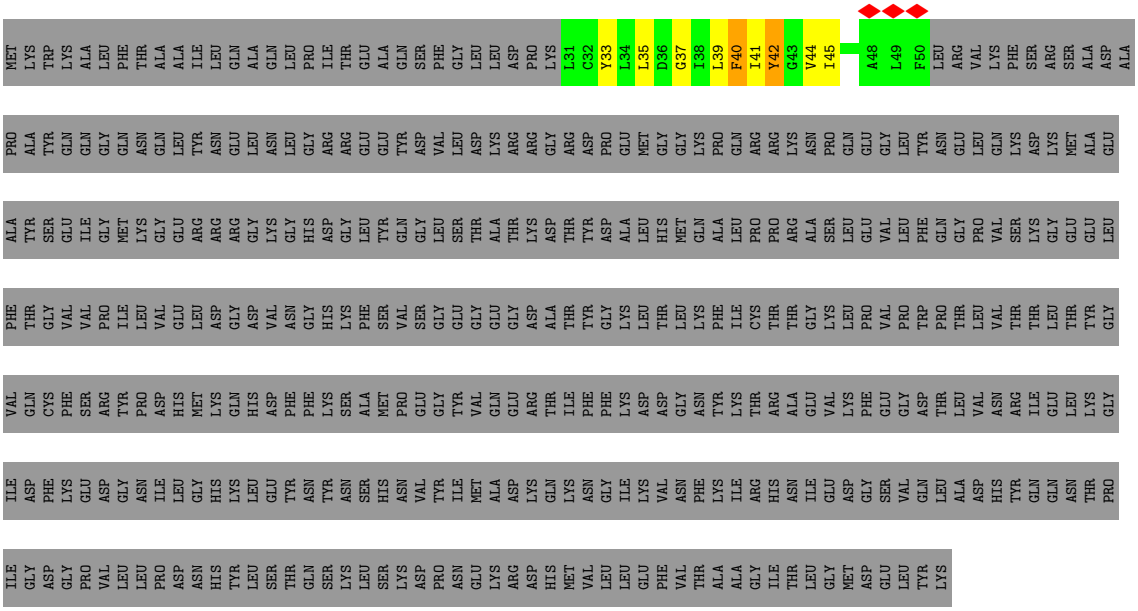
3 Residue-property plots (i)

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: T-cell surface glycoprotein CD3 zeta chain, GFP fusion protein,GFP

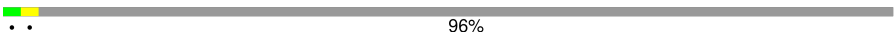
Chain Y:

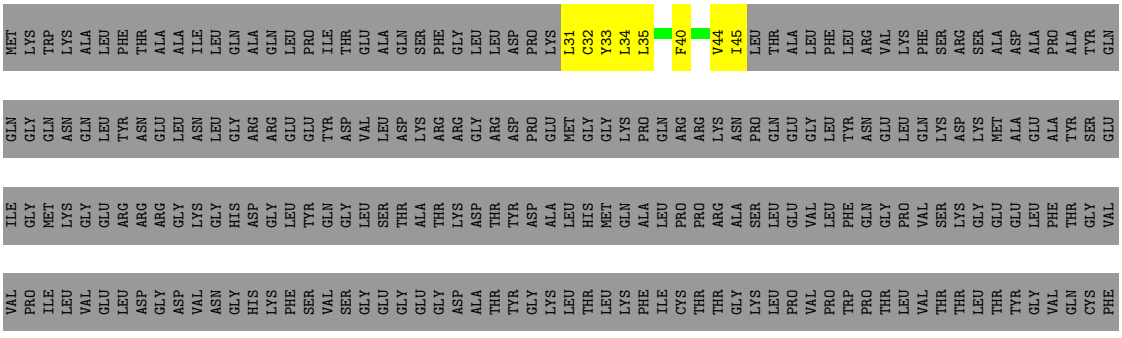


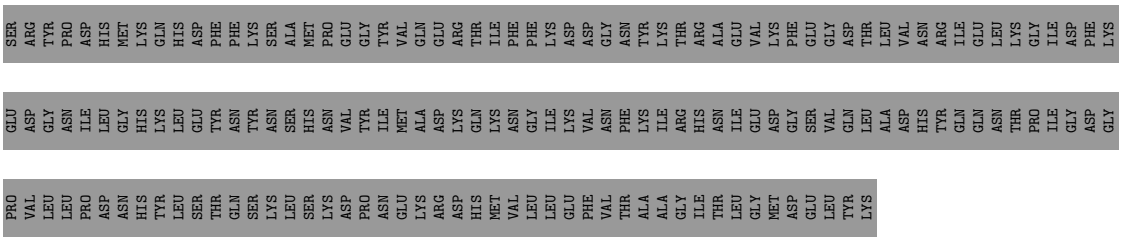


• Molecule 1: T-cell surface glycoprotein CD3 zeta chain, GFP fusion protein,GFP

Chain X:

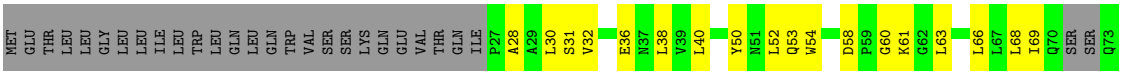


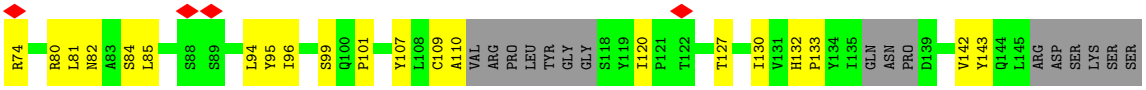


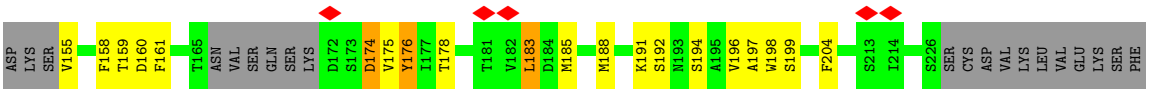


• Molecule 2: TCR alpha

Chain A:

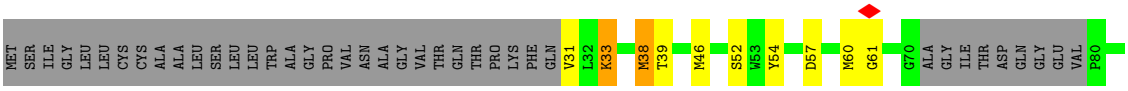


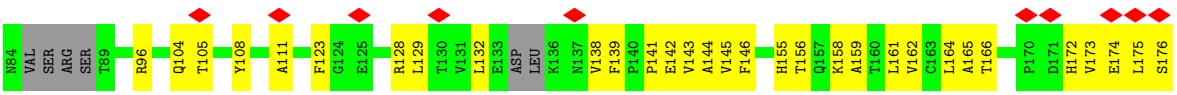


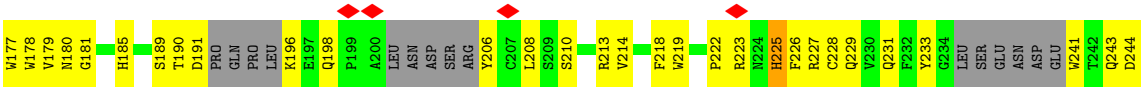


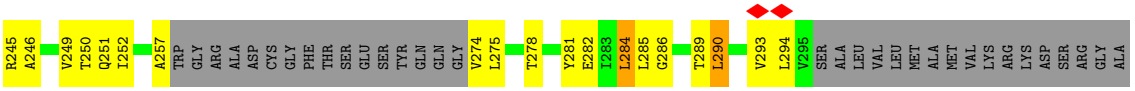
• Molecule 3: T cell receptor beta variable 6-5,T cell receptor beta chain MC.7.G5,MCHERRY

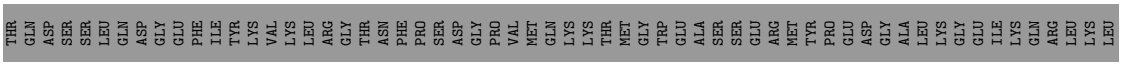
Chain B:

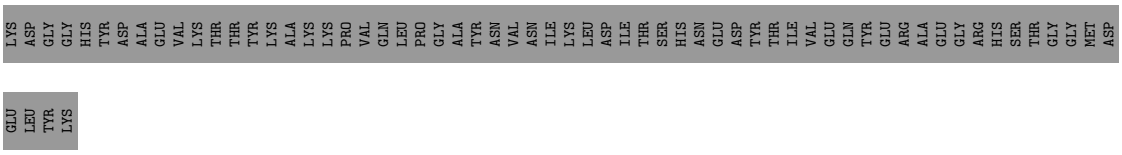






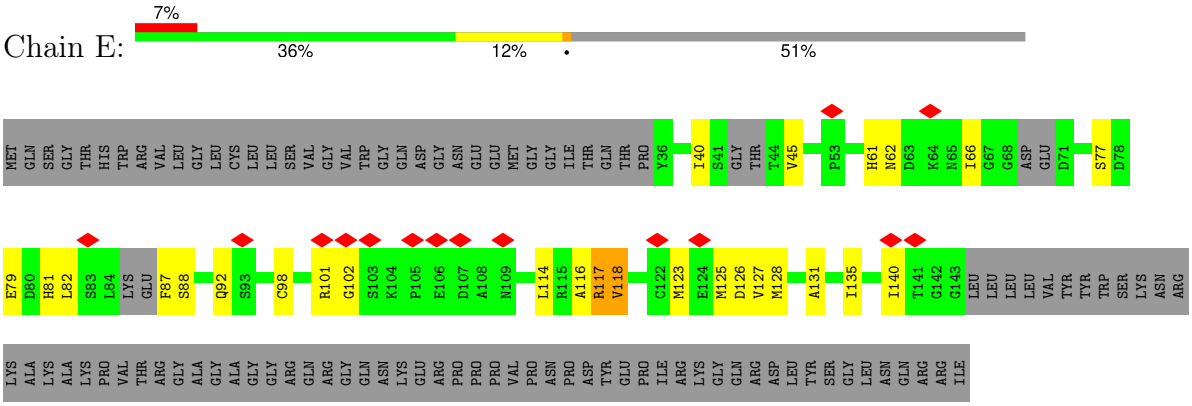






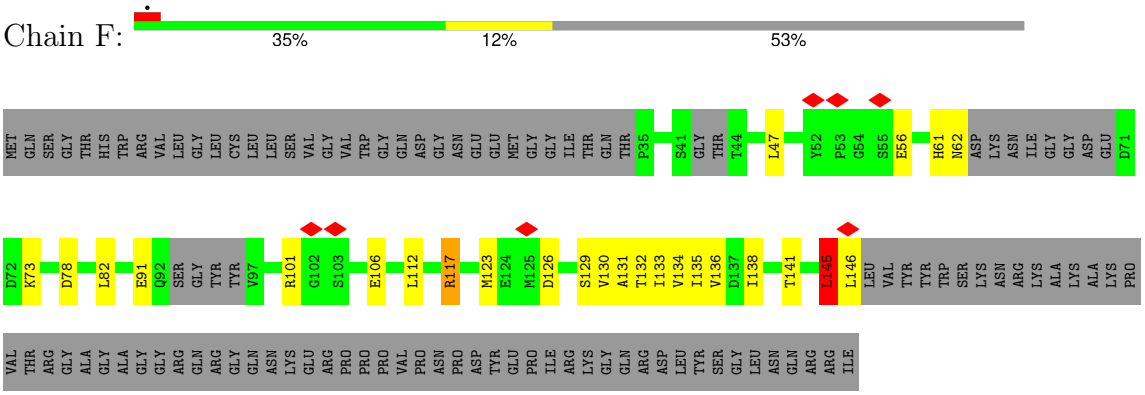
• Molecule 4: T-cell surface glycoprotein CD3 epsilon chain

Chain E:



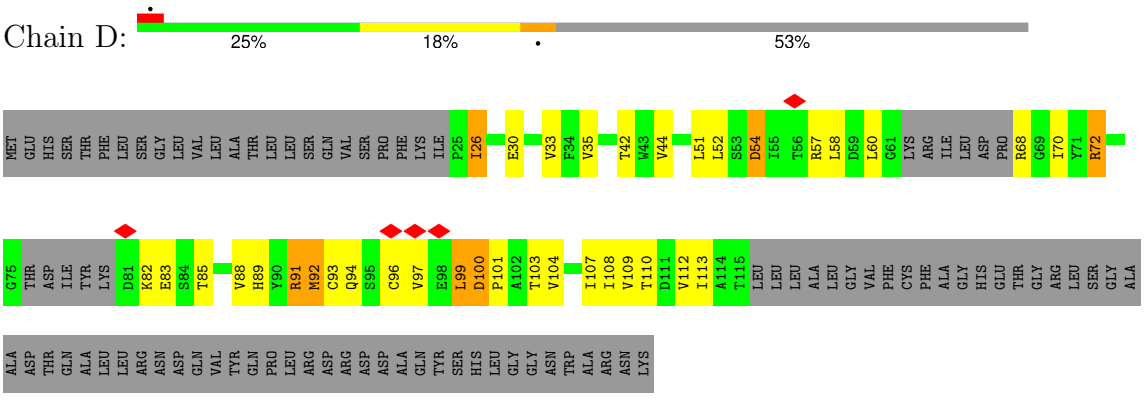
• Molecule 4: T-cell surface glycoprotein CD3 epsilon chain

Chain F:



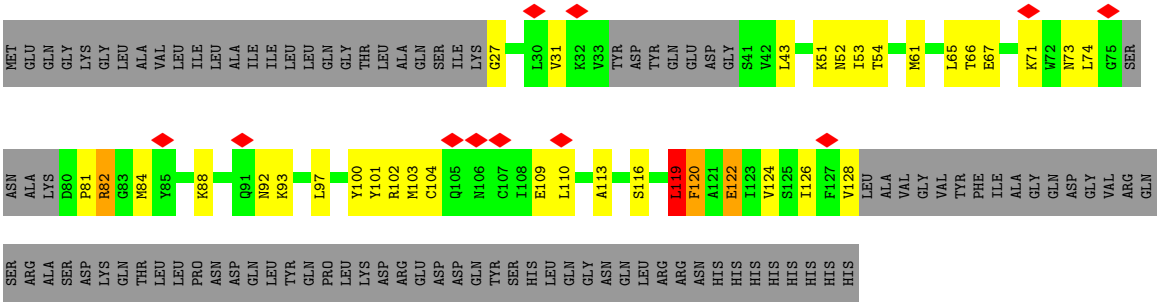
• Molecule 5: T-cell surface glycoprotein CD3 delta chain

Chain D:



• Molecule 6: T-cell surface glycoprotein CD3 gamma chain

Chain G:



• Molecule 7: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	797000	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 ($e^-/Å^2$)	57	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	64000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.770	Depositor
Minimum map value	-0.666	Depositor
Average map value	-0.002	Depositor
Map value standard deviation	0.036	Depositor
Recommended contour level	0.3	Depositor
Map size (Å)	324.0, 324.0, 324.0	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BMA, NAG, CLR

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	X	0.31	0/119	0.76	0/161
1	Y	0.31	0/156	0.89	0/212
2	A	0.26	0/1468	0.54	0/1997
3	B	0.26	0/1682	0.57	1/2286 (0.0%)
4	E	0.25	0/768	0.54	0/1044
4	F	0.24	0/732	0.51	2/994 (0.2%)
5	D	0.28	0/599	0.58	0/813
6	G	0.28	0/719	0.64	1/963 (0.1%)
All	All	0.26	0/6243	0.58	4/8470 (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
3	B	0	1
5	D	0	1
All	All	0	2

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
6	G	119	LEU	CA-CB-CG	6.96	131.31	115.30
3	B	290	LEU	CA-CB-CG	5.72	128.46	115.30
4	F	146	LEU	CA-CB-CG	5.64	128.26	115.30
4	F	145	LEU	CA-CB-CG	5.52	127.99	115.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	B	174	GLU	Peptide
5	D	91	ARG	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	X	117	0	117	4	0
1	Y	153	0	158	12	0
2	A	1442	0	1320	58	0
3	B	1645	0	1529	72	0
4	E	755	0	675	16	0
4	F	720	0	656	19	0
5	D	594	0	569	31	0
6	G	707	0	696	30	0
7	C	39	0	34	0	0
8	B	28	0	46	1	0
8	Y	28	0	46	7	0
9	G	14	0	13	0	0
All	All	6242	0	5859	217	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 18.

The worst 5 of 217 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)
5:D:35:VAL:HG23	5:D:60:LEU:HD21	1.59	0.82
2:A:101:PRO:HG2	2:A:191:LYS:HG3	1.63	0.81
3:B:223:ARG:HB2	3:B:275:LEU:HD21	1.61	0.79
8:Y:501:CLR:H211	8:Y:501:CLR:H263	1.69	0.74
1:Y:39:LEU:HA	1:Y:42:TYR:HB2	1.69	0.73

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	X	13/412 (3%)	13 (100%)	0	0	100 100
1	Y	18/412 (4%)	18 (100%)	0	0	100 100
2	A	182/274 (66%)	158 (87%)	23 (13%)	1 (0%)	25 58
3	B	203/556 (36%)	183 (90%)	20 (10%)	0	100 100
4	E	94/207 (45%)	82 (87%)	10 (11%)	2 (2%)	5 25
4	F	90/207 (44%)	85 (94%)	5 (6%)	0	100 100
5	D	74/171 (43%)	70 (95%)	4 (5%)	0	100 100
6	G	85/190 (45%)	75 (88%)	10 (12%)	0	100 100
All	All	759/2429 (31%)	684 (90%)	72 (10%)	3 (0%)	32 63

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	118	VAL
2	A	245	PHE
4	E	127	VAL

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	X	12/352 (3%)	8 (67%)	4 (33%)	0 0
1	Y	15/352 (4%)	12 (80%)	3 (20%)	1 4

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	A	151/246 (61%)	137 (91%)	14 (9%)	7 27
3	B	167/471 (36%)	155 (93%)	12 (7%)	12 38
4	E	77/177 (44%)	72 (94%)	5 (6%)	14 41
4	F	73/177 (41%)	69 (94%)	4 (6%)	18 47
5	D	65/147 (44%)	56 (86%)	9 (14%)	3 13
6	G	75/163 (46%)	67 (89%)	8 (11%)	5 21
All	All	635/2085 (30%)	576 (91%)	59 (9%)	10 27

5 of 59 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	B	284	LEU
1	X	32	CYS
4	F	117	ARG
6	G	122	GLU
6	G	74	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	51	ASN
2	A	53	GLN
2	A	246	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

3 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	$\#\|Z\| > 2$
7	NAG	C	1	6,7	14,14,15	0.73	0	17,19,21	1.41	2 (11%)
7	NAG	C	2	7	14,14,15	0.77	0	17,19,21	1.40	4 (23%)
7	BMA	C	3	7	11,11,12	0.84	0	15,15,17	1.85	4 (26%)

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
7	NAG	C	1	6,7	-	3/6/23/26	0/1/1/1
7	NAG	C	2	7	-	0/6/23/26	0/1/1/1
7	BMA	C	3	7	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
7	C	1	NAG	C1-O5-C5	4.08	117.65	112.19
7	C	3	BMA	C1-O5-C5	3.82	117.31	112.19
7	C	3	BMA	C3-C4-C5	3.15	115.94	110.23
7	C	2	NAG	C4-C3-C2	2.64	114.89	111.02
7	C	2	NAG	O4-C4-C3	-2.56	104.34	110.38

There are no chirality outliers.

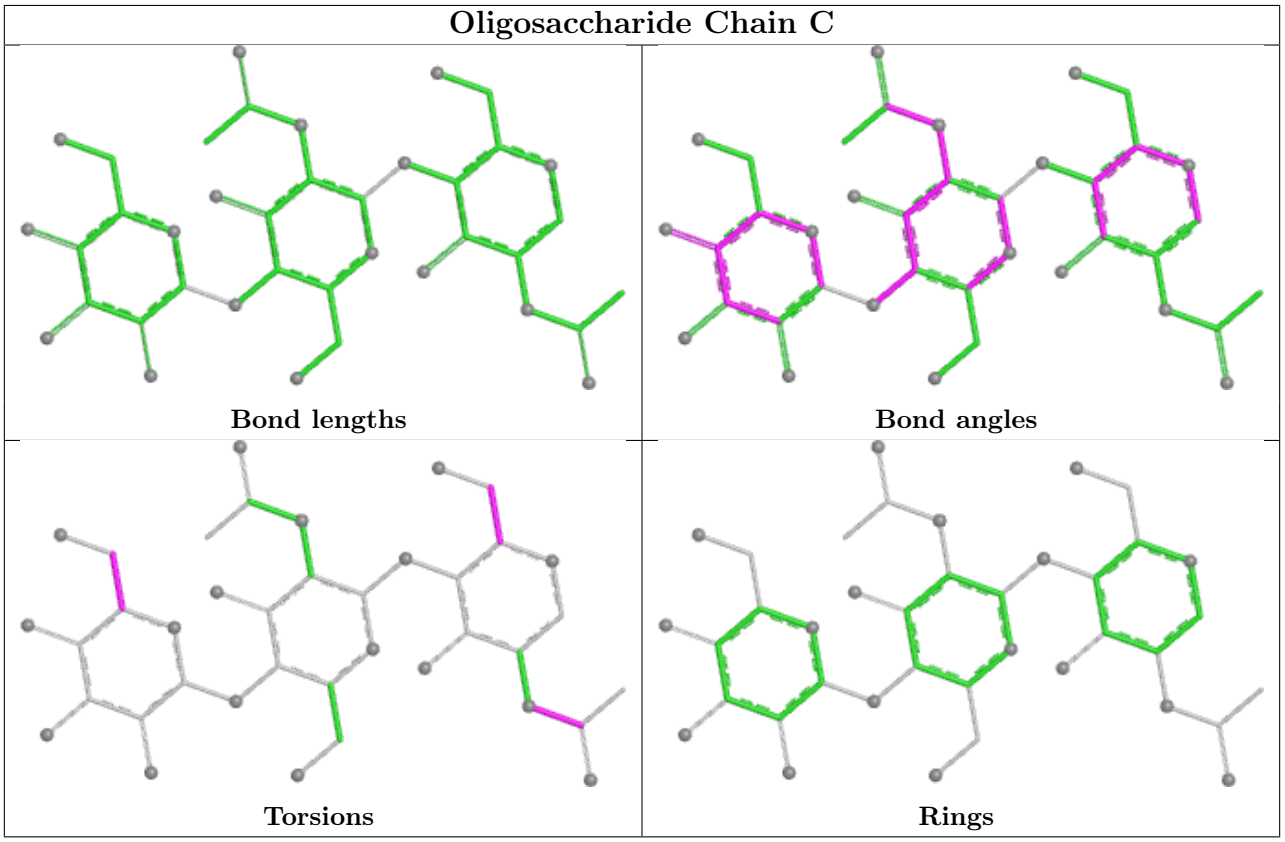
All (5) torsion outliers are listed below:

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

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	$\#\|Z\| > 2$
9	NAG	G	201	6	14,14,15	0.74	0	17,19,21	2.08	3 (17%)
8	CLR	Y	501	-	31,31,31	0.42	0	48,48,48	0.79	1 (2%)
8	CLR	B	601	-	31,31,31	0.40	0	48,48,48	0.68	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
9	NAG	G	201	6	-	2/6/23/26	0/1/1/1
8	CLR	Y	501	-	-	4/10/68/68	0/4/4/4
8	CLR	B	601	-	-	6/10/68/68	0/4/4/4

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	G	201	NAG	C1-O5-C5	7.36	122.05	112.19
9	G	201	NAG	C2-N2-C7	2.40	126.11	122.90
9	G	201	NAG	C3-C4-C5	-2.34	105.99	110.23
8	Y	501	CLR	C17-C13-C14	2.25	102.68	100.10

There are no chirality outliers.

5 of 12 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	B	601	CLR	C17-C20-C22-C23
8	B	601	CLR	C21-C20-C22-C23
9	G	201	NAG	C8-C7-N2-C2
9	G	201	NAG	O7-C7-N2-C2
8	B	601	CLR	C20-C22-C23-C24

There are no ring outliers.

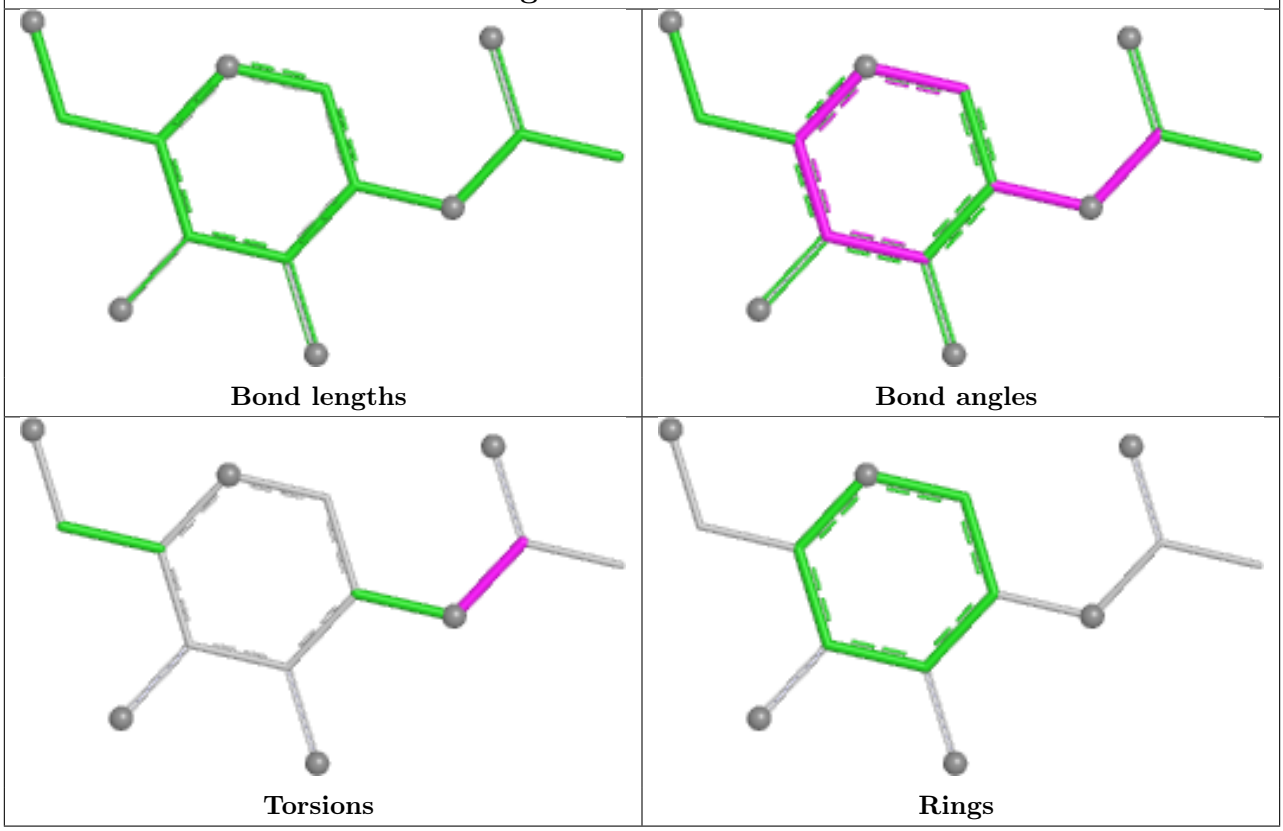
2 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	Y	501	CLR	7	0
8	B	601	CLR	1	0

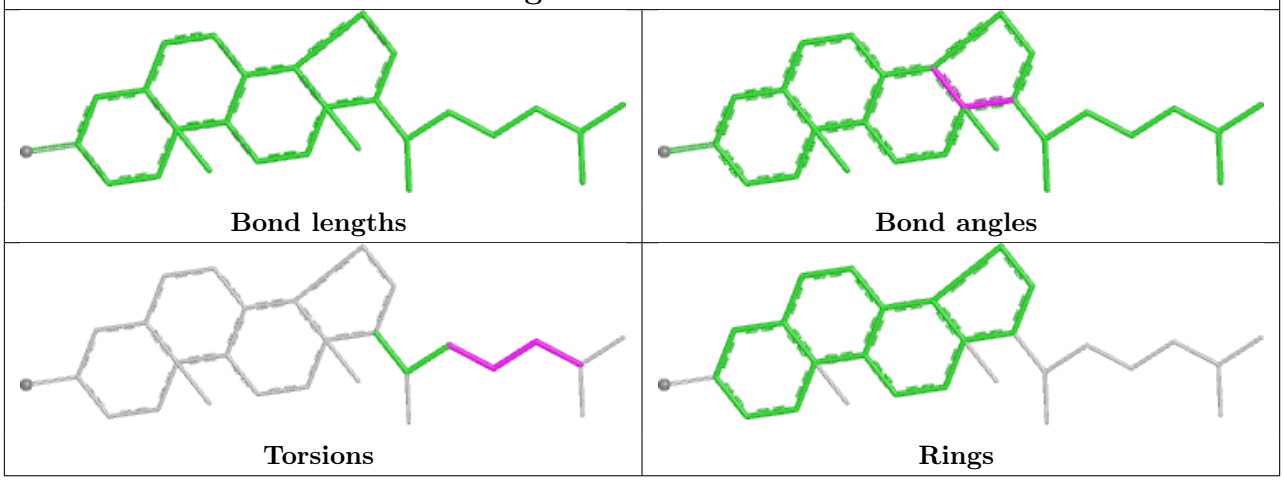
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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

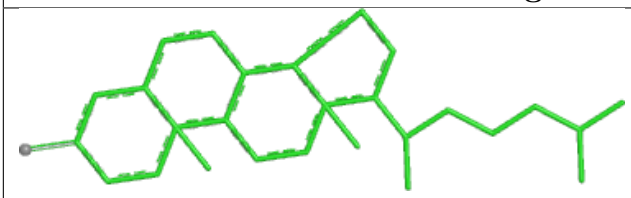
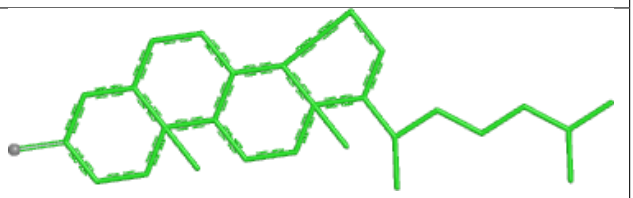
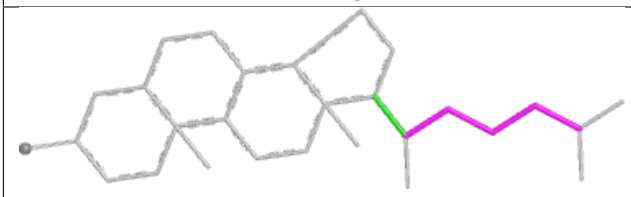
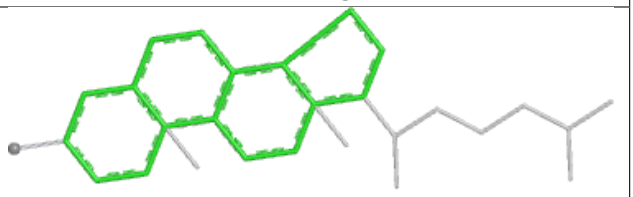
in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand NAG G 201



Ligand CLR Y 501



Ligand CLR B 601	
 Bond lengths	 Bond angles
 Torsions	 Rings

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.

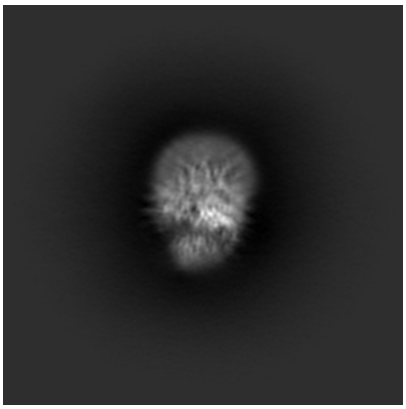
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-41660. These allow visual inspection of the internal detail of the map and identification of artifacts.

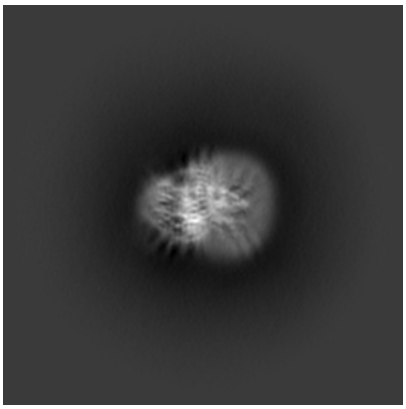
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

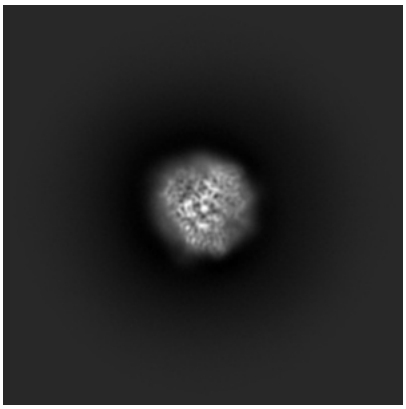
6.1.1 Primary map



X



Y

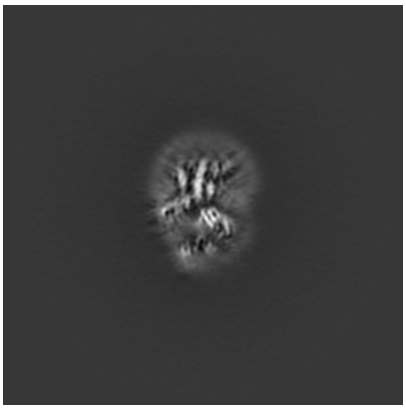


Z

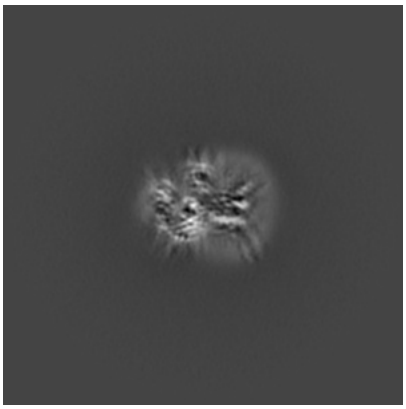
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

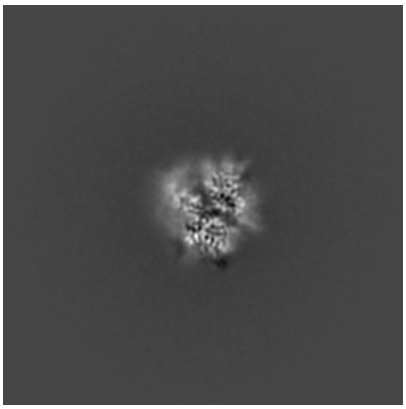
6.2.1 Primary map



X Index: 150



Y Index: 150

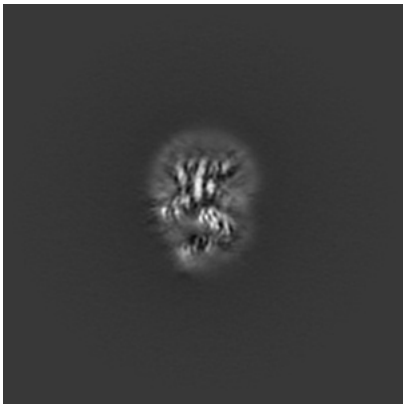


Z Index: 150

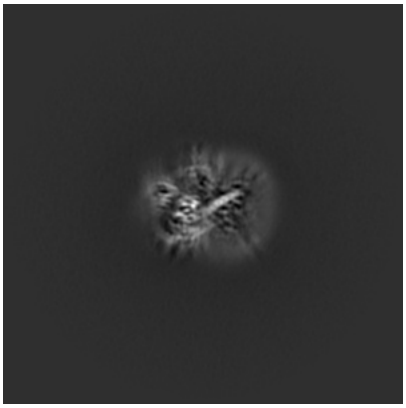
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

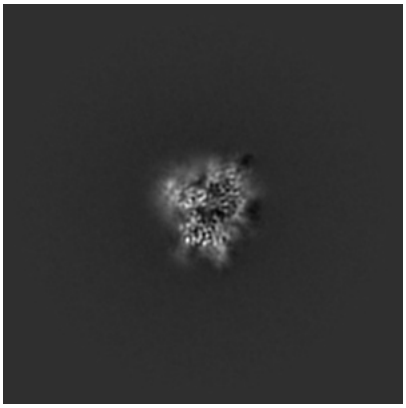
6.3.1 Primary map



X Index: 151



Y Index: 155

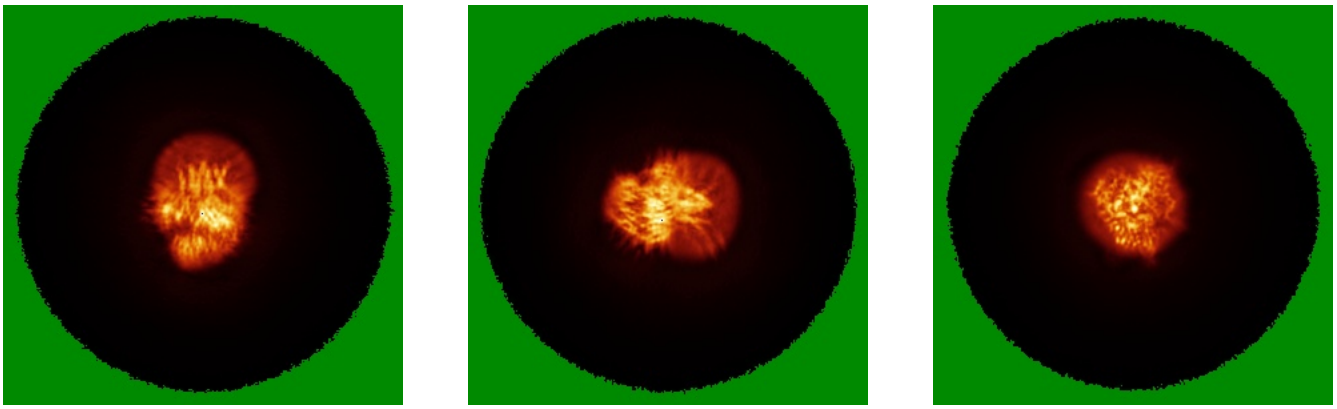


Z Index: 145

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

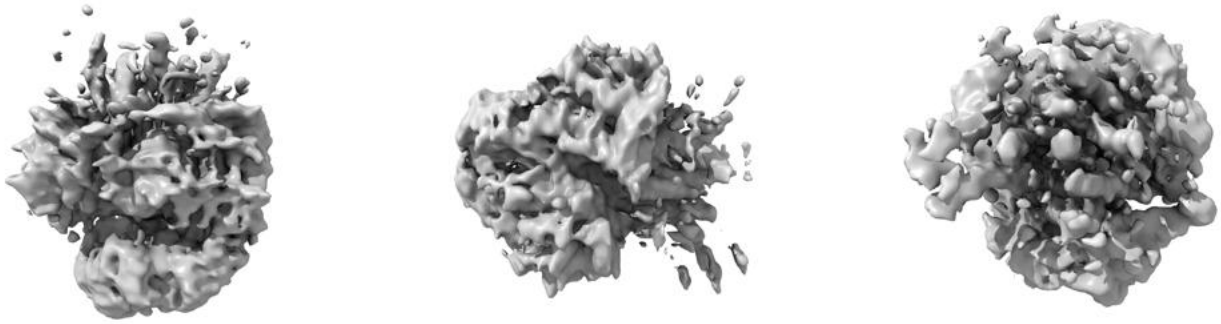


X Y Z

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 0.3. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

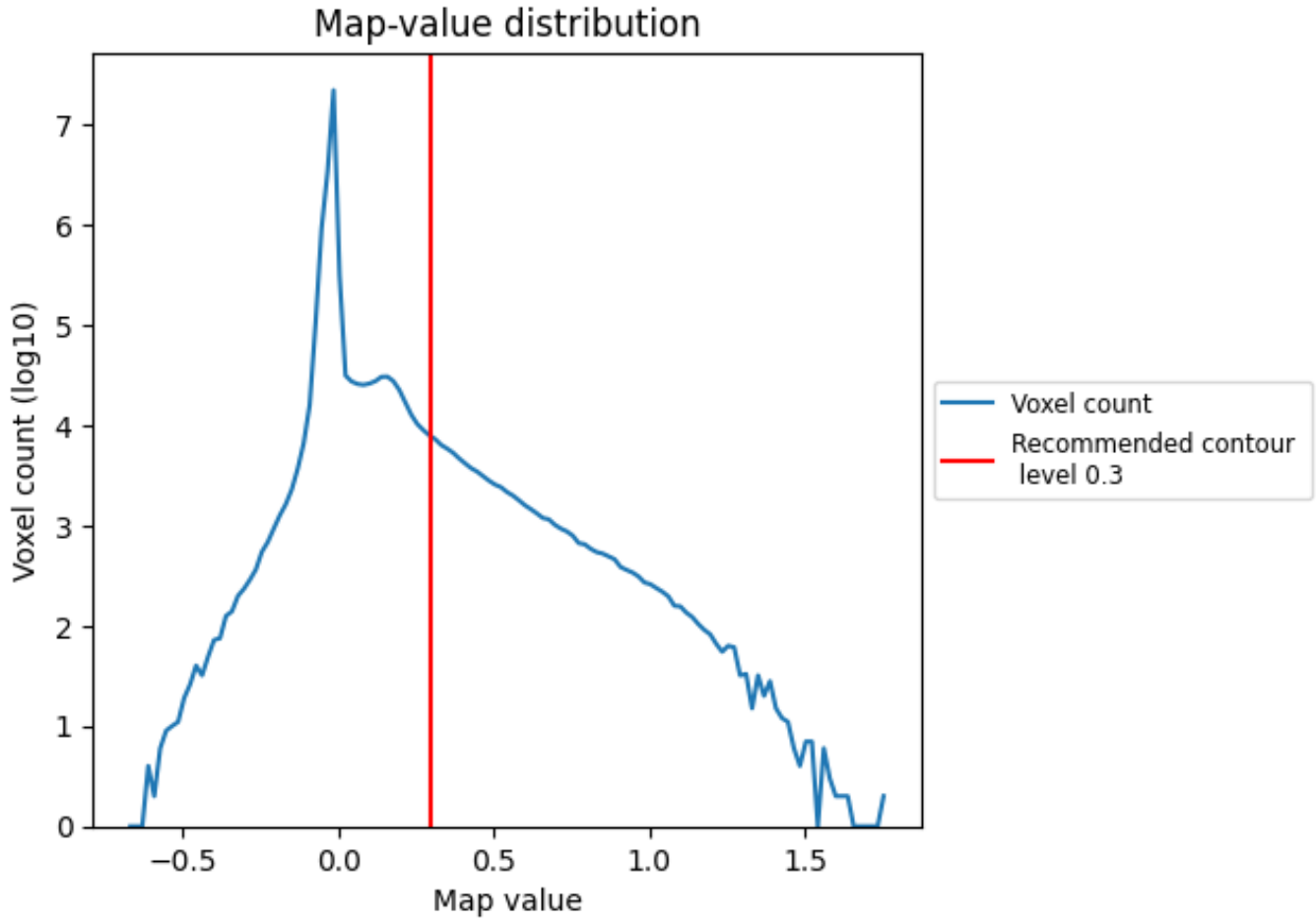
6.6 Mask visualisation (i)

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

7 Map analysis

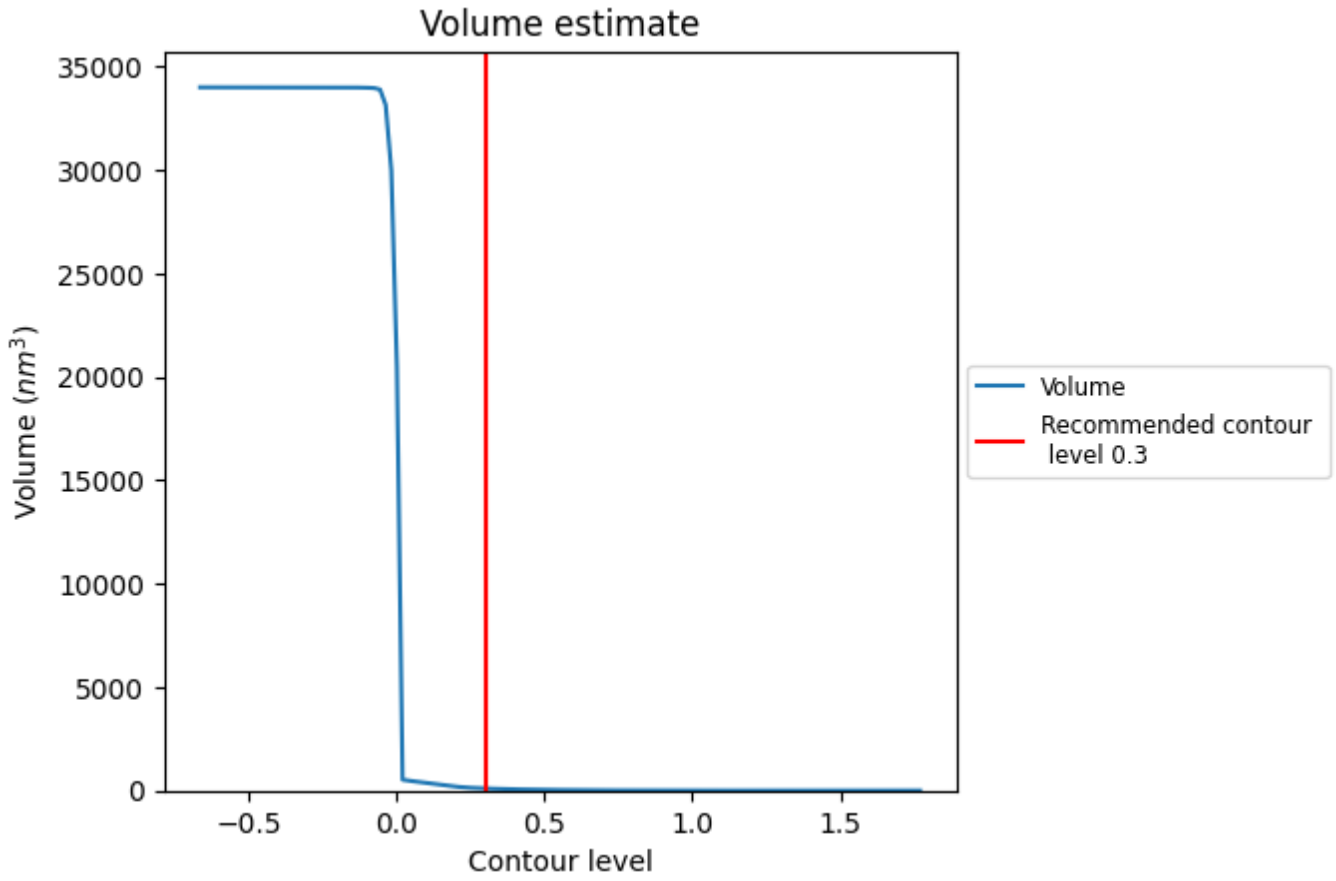
This section contains the results of statistical analysis of the map.

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.

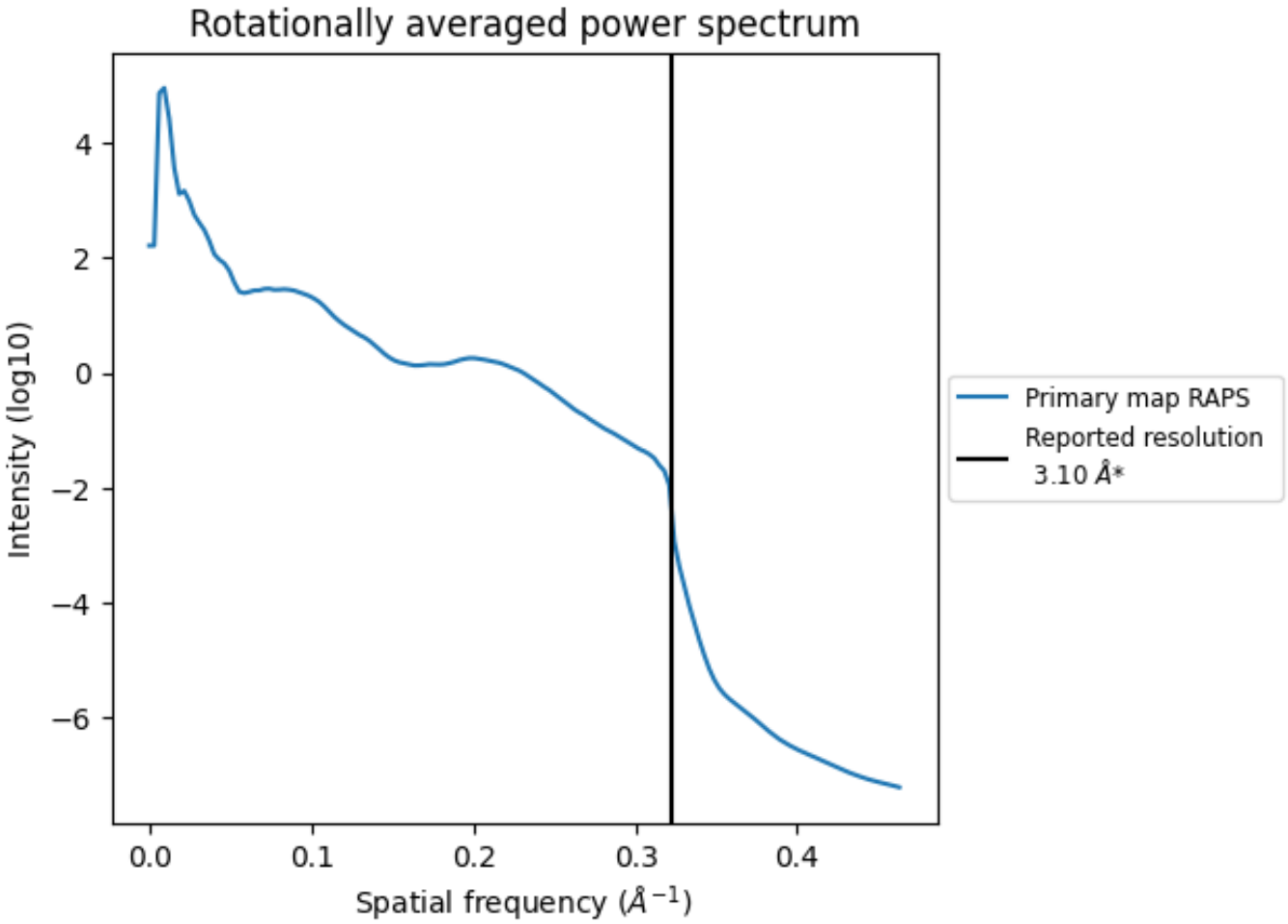
7.2 Volume estimate (i)



The volume at the recommended contour level is 101 nm^3; this corresponds to an approximate mass of 92 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)



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

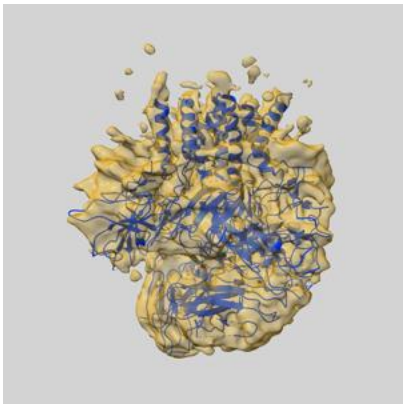
8 Fourier-Shell correlation (i)

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

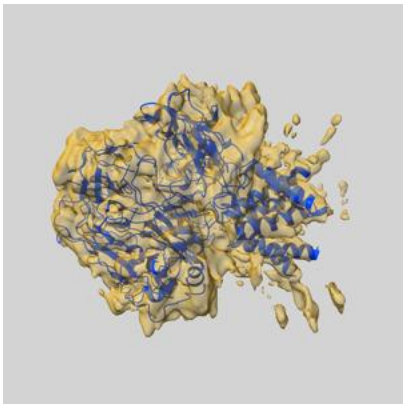
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-41660 and PDB model 8TW6. Per-residue inclusion information can be found in section 3 on page 8.

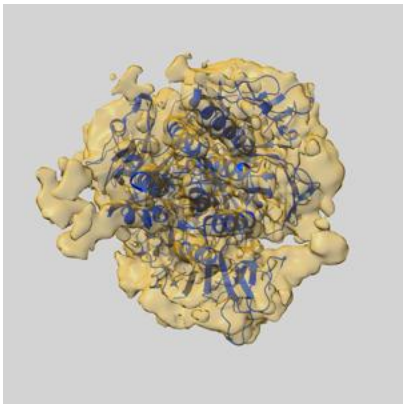
9.1 Map-model overlay



X



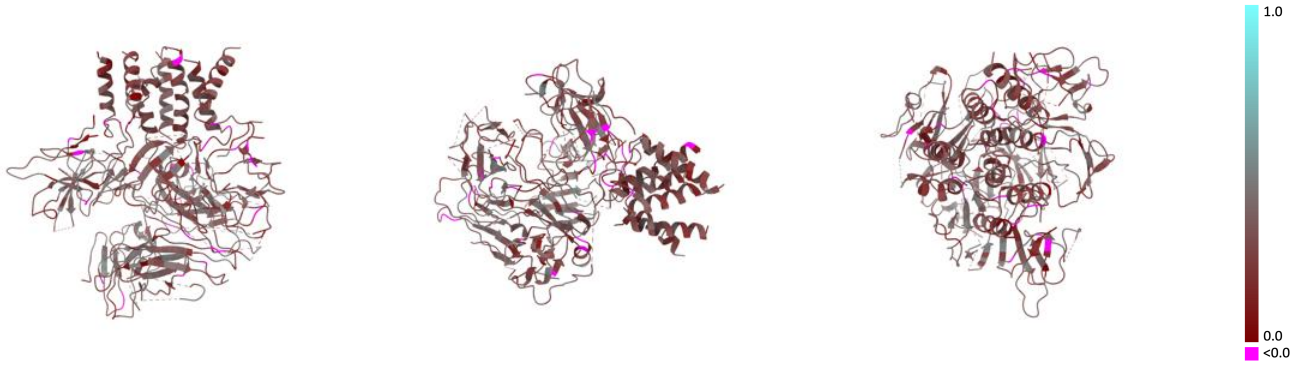
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.3 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.

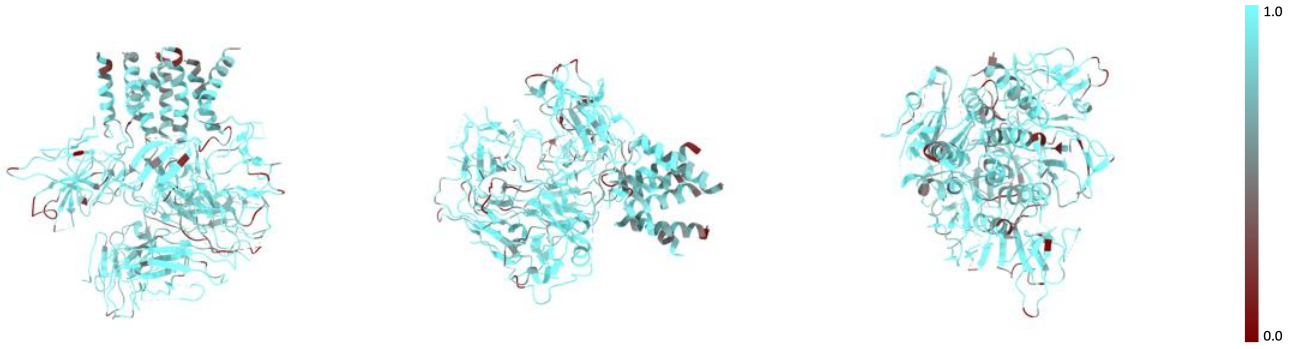
9.2 Q-score mapped to coordinate model



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.

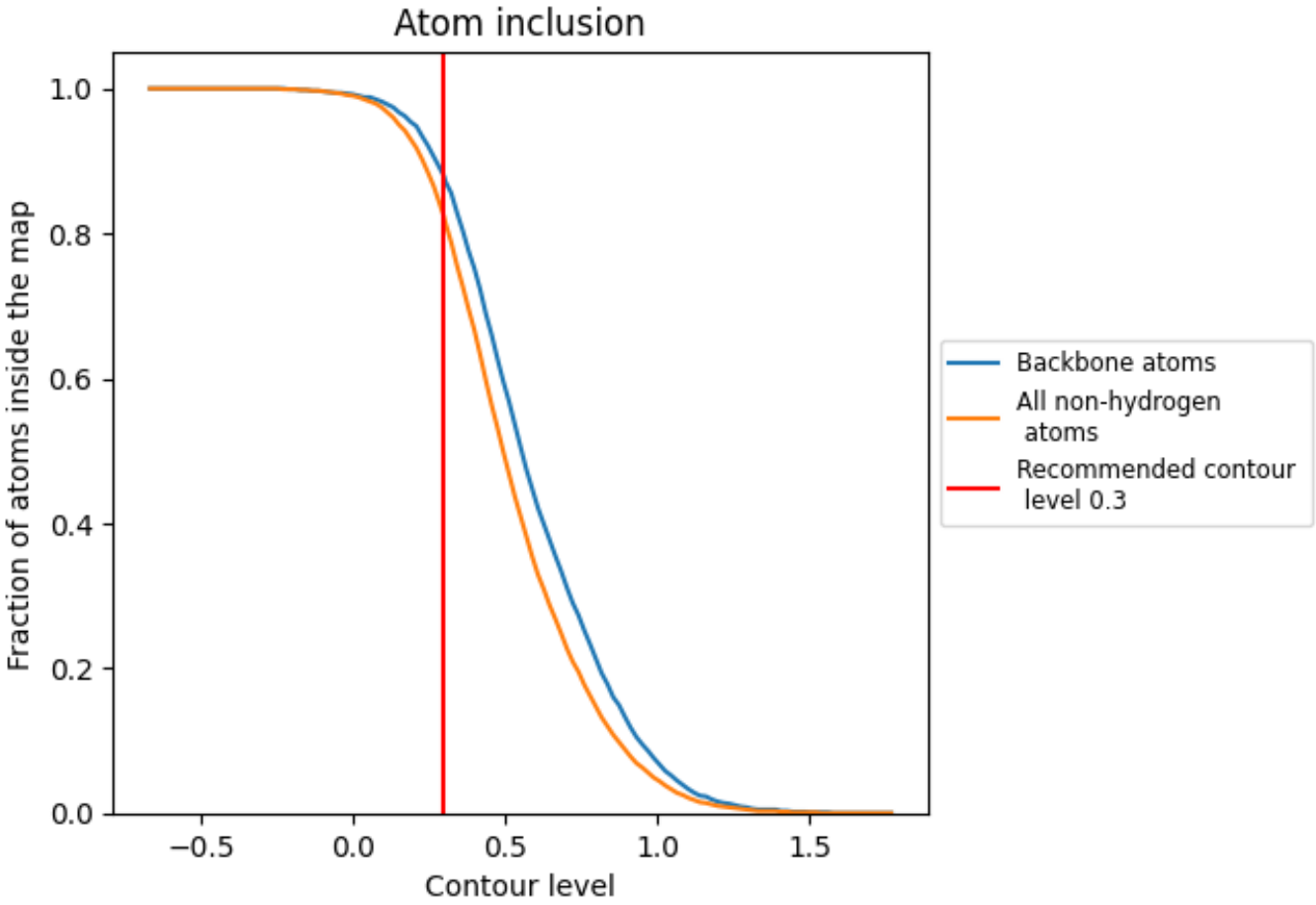
9.3 Atom inclusion mapped to coordinate model



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 (0.3).

9.4 Atom inclusion (i)



At the recommended contour level, 88% of all backbone atoms, 82% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.3) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8230	0.3060
A	0.8580	0.3230
B	0.8610	0.3110
C	0.3590	0.3000
D	0.8440	0.3290
E	0.7820	0.2910
F	0.8430	0.2840
G	0.7610	0.2910
X	0.7390	0.2410
Y	0.6150	0.2870