



Full wwPDB EM Validation Report ⓘ

Nov 28, 2023 – 02:42 AM EST

PDB ID : 8FWG
EMDB ID : EMD-29504
Title : Structure of neck and portal vertex of Agrobacterium phage Milano, C5 symmetry
Authors : Sonani, R.R.; Wang, F.; Esteves, N.C.; Kelly, R.J.; Sebastian, A.; Kreutzberger, M.A.B.; Leiman, P.G.; Scharf, B.E.; Egelman, E.H.
Deposited on : 2023-01-22
Resolution : 3.45 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

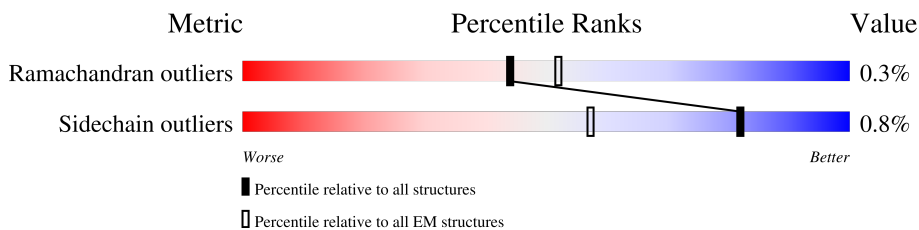
EMDB validation analysis : 0.0.1.dev70
MolProbity : 4.02b-467
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

1 Overall quality at a glance

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

The reported resolution of this entry is 3.45 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)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	a1	38	71% 26%
1	a2	38	71% 26%
1	a5	38	68% 5% 26%
1	a6	38	71% 26%
1	a7	38	71% 26%
1	b1	38	74% 26%
1	b2	38	74% 26%
1	b5	38	74% 26%
1	b6	38	74% 26%



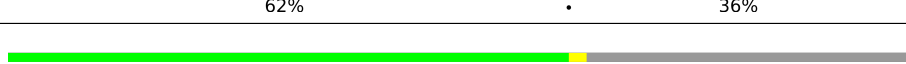
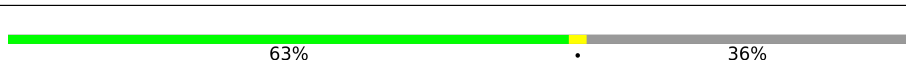


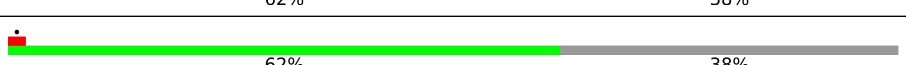

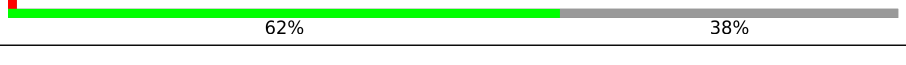




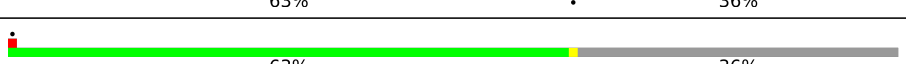

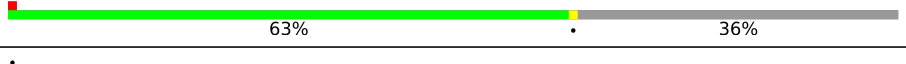

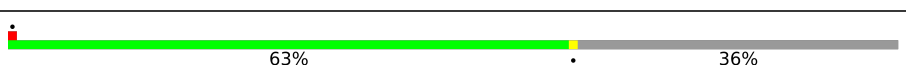





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Mol	Chain	Length	Quality of chain
1	b7	38	74% 26%
1	c	38	87% 11%
1	d	38	89% 11%
1	d1	38	89% 11%
1	d2	38	89% 11%
1	d5	38	89% 11%
1	d6	38	89% 11%
1	d7	38	89% 11%
1	e	38	87% 11%
1	e1	38	74% 26%
1	e2	38	74% 26%
1	e5	38	74% 26%
1	e6	38	74% 26%
1	e7	38	74% 26%
1	f	38	89% 11%
1	g	38	89% 11%
2	f1	217	9% 91%
2	f2	217	9% 91%
2	f5	217	9% 91%
2	f6	217	9% 91%
2	f7	217	9% 91%
3	g1	465	64% 36%
3	g2	465	63% 36%
3	g5	465	64% 36%
3	g6	465	64% 36%


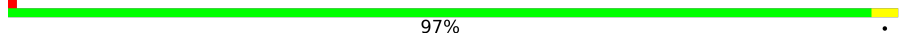
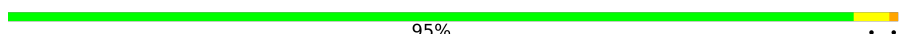
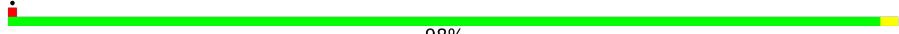


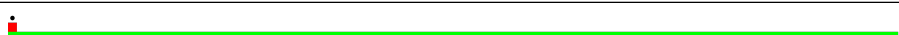
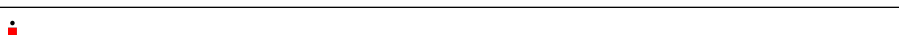
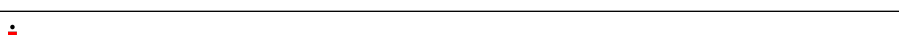
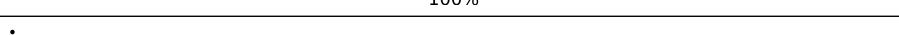
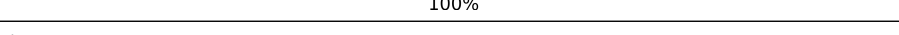
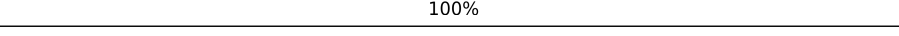

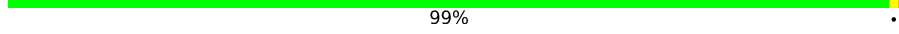
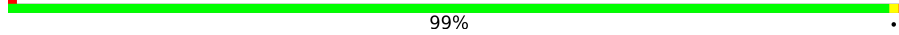
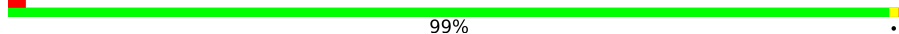
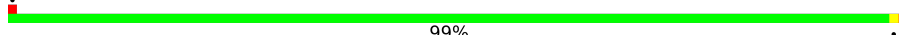
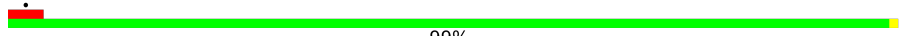





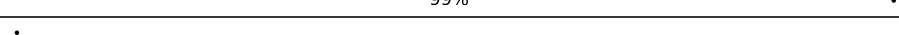
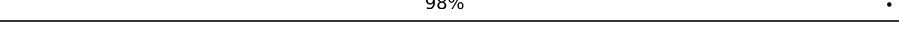
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Mol	Chain	Length	Quality of chain
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3	h1	465	
3	h2	465	
3	h5	465	
3	h6	465	
3	h7	465	
3	k1	465	
3	k2	465	
3	k5	465	
3	k6	465	
3	k7	465	
3	n1	465	
3	n2	465	
3	n5	465	
3	n6	465	
3	n7	465	
3	o1	465	
3	o2	465	
3	o5	465	
3	o6	465	
3	o7	465	
3	r1	465	
3	r2	465	
3	r5	465	
3	r6	465	

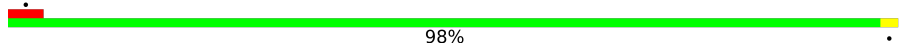
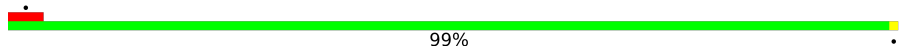
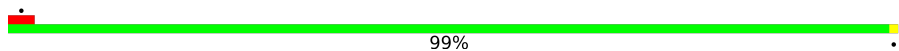
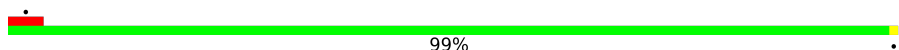
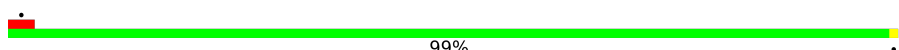
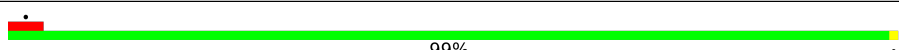
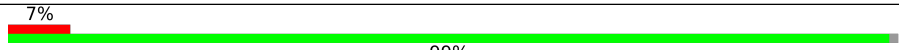

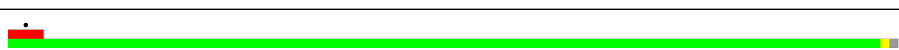
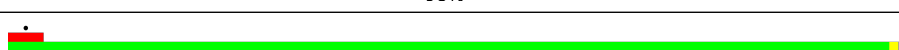
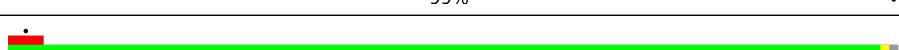
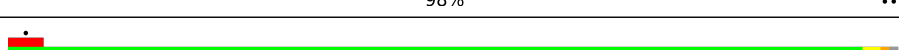
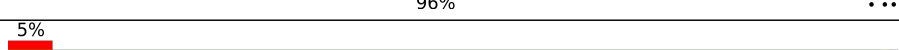
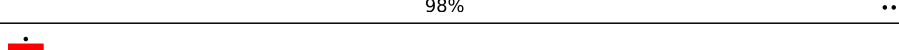
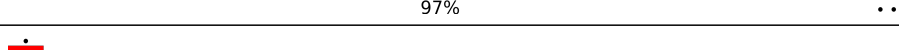
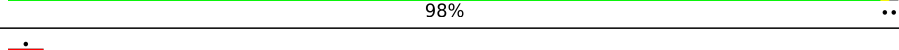
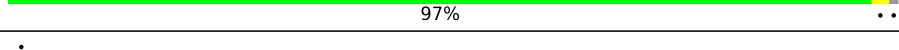
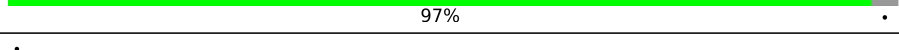
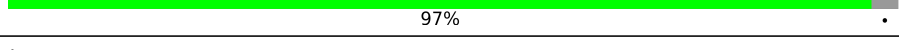
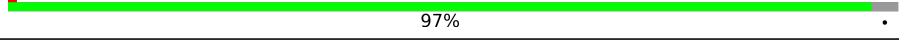
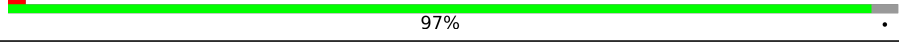
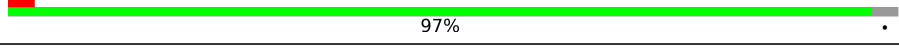
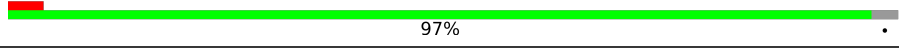
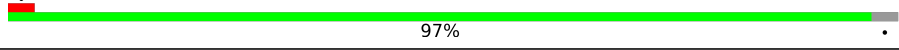
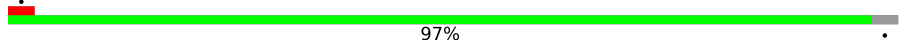
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Mol	Chain	Length	Quality of chain
3	r7	465	 62% 36%
4	l1	137	 97%
4	l2	137	 95%
4	l5	137	 98%
4	l6	137	 98%
4	l7	137	 98%
4	m1	137	 100%
4	m2	137	 100%
4	m5	137	 100%
4	m6	137	 100%
4	m7	137	 100%
4	p1	137	 99%
4	p2	137	 99%
4	p5	137	 99%
4	p6	137	 99%
4	p7	137	 99%
4	q1	137	 99%
4	q2	137	 99%
4	q5	137	 99%
4	q6	137	 99%
4	q7	137	 99%
4	s1	137	 99%
4	s2	137	 98%
4	s5	137	 99%
4	s6	137	 98%

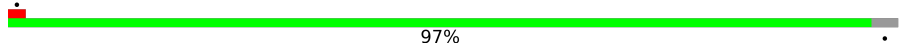
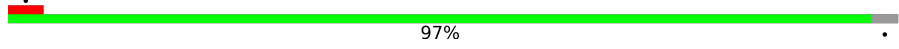
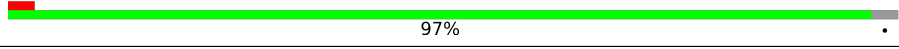
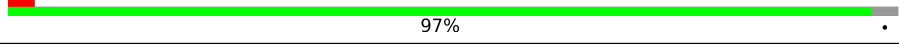
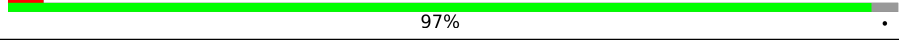
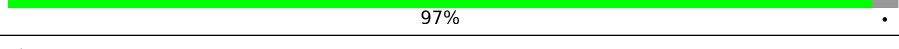
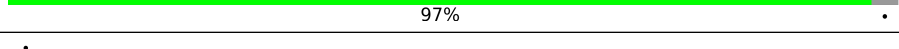
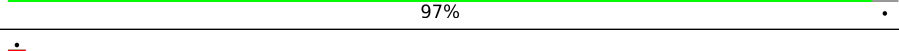
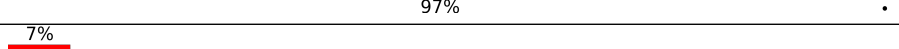
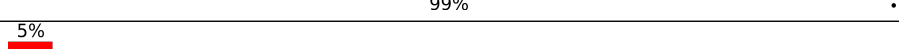
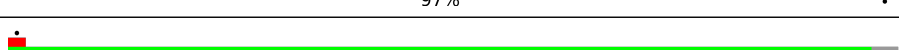
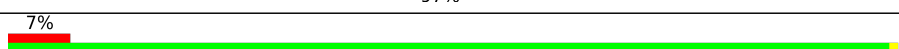
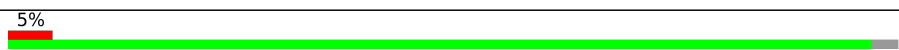
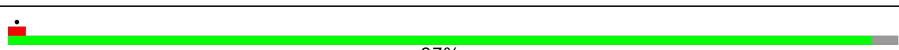
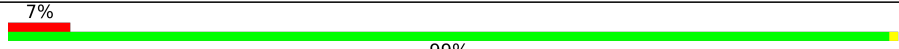


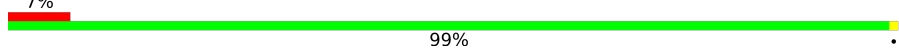
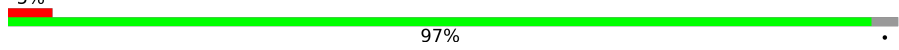
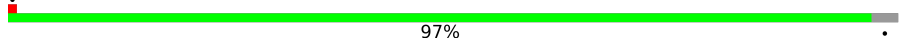
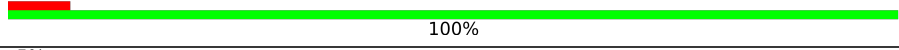
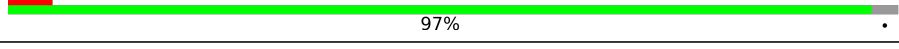
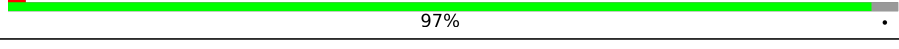
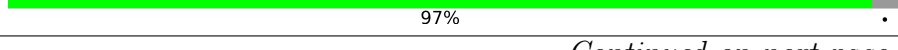

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Mol	Chain	Length	Quality of chain
4	s7	137	 98%
4	t1	137	 99%
4	t2	137	 99%
4	t5	137	 99%
4	t6	137	 99%
4	t7	137	 99%
4	u1	137	 99%
4	u2	137	 98%
4	u5	137	 98%
4	u6	137	 99%
4	u7	137	 98%
4	v1	137	 96%
4	v2	137	 98%
4	v5	137	 97%
4	v6	137	 98%
4	v7	137	 97%
5	03	230	 97%
5	13	230	 97%
5	23	230	 97%
5	33	230	 97%
5	43	230	 97%
5	53	230	 97%
5	63	230	 97%
5	73	230	 97%
5	83	230	 97%

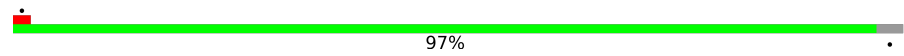
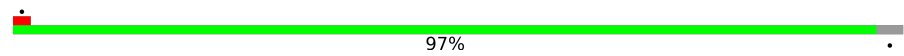
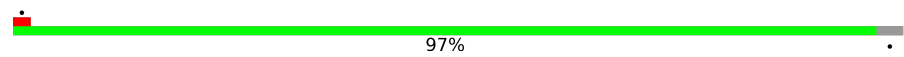
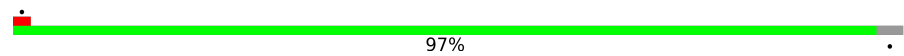
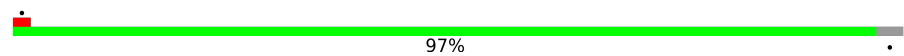
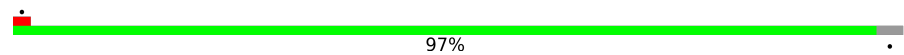
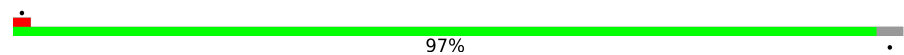
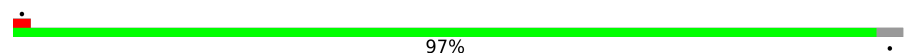
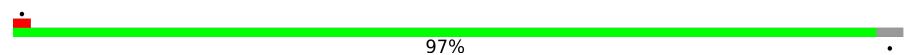
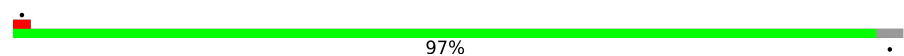
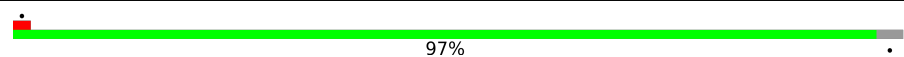
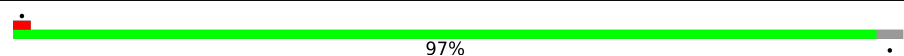
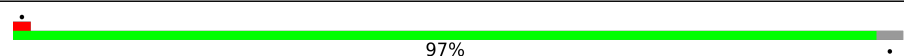
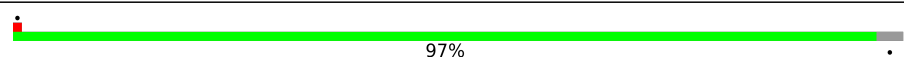
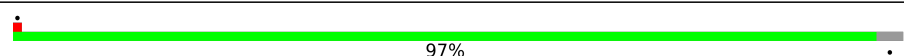
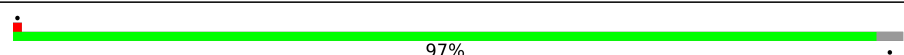
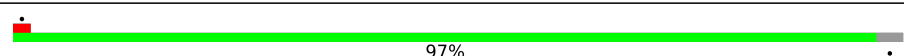
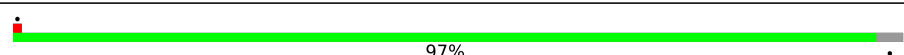
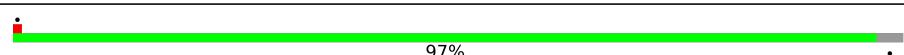
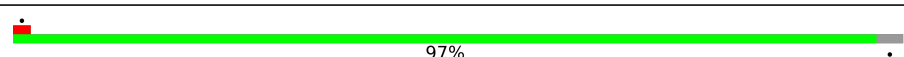
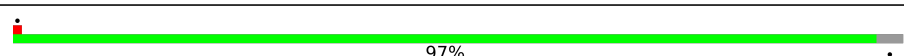
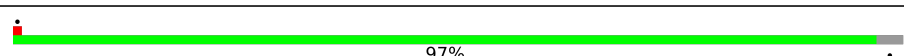
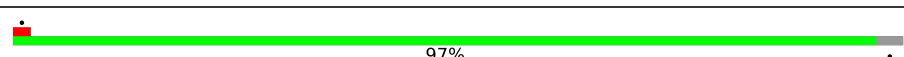
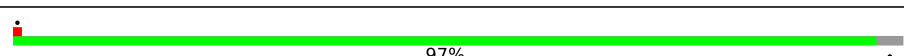
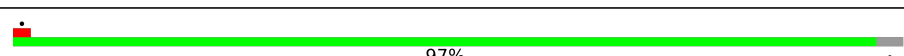
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Mol	Chain	Length	Quality of chain
5	93	230	 97%
5	A3	230	 97%
5	B3	230	 97%
5	C3	230	 97%
5	D3	230	 97%
5	E3	230	 97%
5	F3	230	 97%
5	G3	230	 97%
5	J3	230	 97%
5	K3	230	 99%
5	L3	230	 97%
5	M3	230	 97%
5	N3	230	 99%
5	O3	230	 97%
5	P3	230	 97%
5	Q3	230	 99%
5	R3	230	 97%
5	S3	230	 97%
5	T3	230	 99%
5	U3	230	 97%
5	V3	230	 97%
5	W3	230	 100%
5	X3	230	 97%
5	Y3	230	 97%
5	Z3	230	 97%

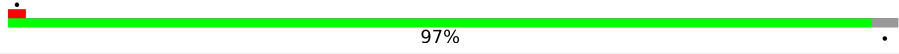

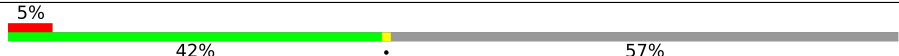
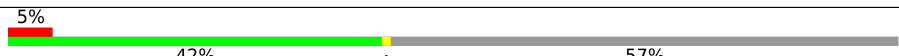
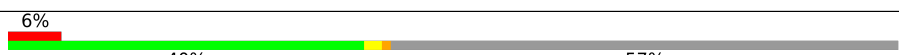

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Mol	Chain	Length	Quality of chain
5	a3	230	
5	b3	230	
5	c3	230	
5	d3	230	
5	e3	230	
5	f3	230	
5	g3	230	
5	h3	230	
5	i3	230	
5	j3	230	
5	k3	230	
5	l3	230	
5	m3	230	
5	n3	230	
5	o3	230	
5	p3	230	
5	q3	230	
5	r3	230	
5	s3	230	
5	t3	230	
5	u3	230	
5	v3	230	
5	w3	230	
5	x3	230	
5	y3	230	

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Mol	Chain	Length	Quality of chain
5	z3	230	 97%
6	A4	202	 43% 57%
6	B4	202	 42% 57%
6	C4	202	 42% 57%
6	D4	202	 40% 57%
6	E4	202	 42% 57%

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 221120 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 Linking protein 2, gp128.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	a1	28	209	131	40	33	5	0	0
1	b1	28	209	131	40	33	5	0	0
1	d1	34	246	155	46	40	5	0	0
1	e1	28	209	131	40	33	5	0	0
1	a2	28	209	131	40	33	5	0	0
1	b2	28	209	131	40	33	5	0	0
1	d2	34	246	155	46	40	5	0	0
1	e2	28	209	131	40	33	5	0	0
1	a5	28	209	131	40	33	5	0	0
1	b5	28	209	131	40	33	5	0	0
1	d5	34	246	155	46	40	5	0	0
1	e5	28	209	131	40	33	5	0	0
1	a6	28	209	131	40	33	5	0	0
1	b6	28	209	131	40	33	5	0	0
1	d6	34	246	155	46	40	5	0	0
1	e6	28	209	131	40	33	5	0	0
1	a7	28	209	131	40	33	5	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
1	b7	28	Total	C	N	O	S	0	0
			209	131	40	33	5		
1	d7	34	Total	C	N	O	S	0	0
			246	155	46	40	5		
1	e7	28	Total	C	N	O	S	0	0
			209	131	40	33	5		
1	c	34	Total	C	N	O	S	0	0
			246	155	46	40	5		
1	d	34	Total	C	N	O	S	0	0
			246	155	46	40	5		
1	e	34	Total	C	N	O	S	0	0
			246	155	46	40	5		
1	f	34	Total	C	N	O	S	0	0
			246	155	46	40	5		
1	g	34	Total	C	N	O	S	0	0
			246	155	46	40	5		

- Molecule 2 is a protein called Linking protein 1, gp16.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	f1	20	Total	C	N	O	S	0	0
			140	88	27	23	2		
2	f2	20	Total	C	N	O	S	0	0
			140	88	27	23	2		
2	f5	20	Total	C	N	O	S	0	0
			140	88	27	23	2		
2	f6	20	Total	C	N	O	S	0	0
			140	88	27	23	2		
2	f7	20	Total	C	N	O	S	0	0
			140	88	27	23	2		

- Molecule 3 is a protein called Major capsid protein, gp9.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	g1	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	h1	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	k1	288	Total	C	N	O	S	0	0
			2257	1430	386	425	16		
3	n1	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		

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Mol	Chain	Residues	Atoms					AltConf	Trace
3	o1	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	r1	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	g2	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	h2	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	k2	288	Total	C	N	O	S	0	0
			2257	1430	386	425	16		
3	n2	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	o2	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	r2	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	g5	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	h5	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	k5	288	Total	C	N	O	S	0	0
			2257	1430	386	425	16		
3	n5	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	o5	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	r5	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	g6	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	h6	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	k6	288	Total	C	N	O	S	0	0
			2257	1430	386	425	16		
3	n6	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	o6	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	r6	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	g7	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		

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Mol	Chain	Residues	Atoms					AltConf	Trace
3	h7	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	k7	288	Total	C	N	O	S	0	0
			2257	1430	386	425	16		
3	n7	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	o7	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		
3	r7	299	Total	C	N	O	S	0	0
			2337	1483	397	441	16		

- Molecule 4 is a protein called Minor capsid protein, gp10.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	l1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	m1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	p1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	q1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	s1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	t1	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	u1	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	v1	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	l2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	m2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	p2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	q2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	s2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	t2	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		

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Mol	Chain	Residues	Atoms					AltConf	Trace
4	u2	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	v2	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	l5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	m5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	p5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	q5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	s5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	t5	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	u5	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	v5	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	l6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	m6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	p6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	q6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	s6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	t6	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	u6	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	v6	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	l7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	m7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	p7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		

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Mol	Chain	Residues	Atoms					AltConf	Trace
4	q7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	s7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	t7	137	Total	C	N	O	S	0	0
			1023	655	160	201	7		
4	u7	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		
4	v7	136	Total	C	N	O	S	0	0
			1011	649	156	199	7		

- Molecule 5 is a protein called Collar sheath protein, gp13.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	J3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	K3	230	Total	C	N	O	S	0	0
			1723	1090	287	337	9		
5	L3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	M3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	N3	230	Total	C	N	O	S	0	0
			1723	1090	287	337	9		
5	O3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	P3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	Q3	230	Total	C	N	O	S	0	0
			1723	1090	287	337	9		
5	R3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	S3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	T3	230	Total	C	N	O	S	0	0
			1723	1090	287	337	9		
5	U3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	V3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	W3	230	Total	C	N	O	S	0	0
			1723	1090	287	337	9		

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Mol	Chain	Residues	Atoms					AltConf	Trace
5	X3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	Y3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	Z3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	a3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	b3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	c3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	d3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	e3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	f3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	g3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	h3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	i3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	j3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	k3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	l3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	m3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	n3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	o3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	p3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	q3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	r3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
5	s3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	t3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	u3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	v3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	w3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	x3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	y3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	z3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	13	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	23	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	33	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	43	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	53	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	63	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	73	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	83	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	93	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	03	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	A3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	B3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0
5	C3	223	Total 1679	C 1065	N 279	O 327	S 8	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
5	D3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	E3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	F3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		
5	G3	223	Total	C	N	O	S	0	0
			1679	1065	279	327	8		

- Molecule 6 is a protein called Neck 1 protein, gp14.

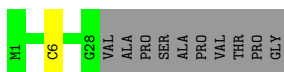
Mol	Chain	Residues	Atoms					AltConf	Trace
6	A4	87	Total	C	N	O	S	0	0
			671	429	120	118	4		
6	B4	87	Total	C	N	O	S	0	0
			671	429	120	118	4		
6	C4	87	Total	C	N	O	S	0	0
			671	429	120	118	4		
6	D4	87	Total	C	N	O	S	0	0
			671	429	120	118	4		
6	E4	87	Total	C	N	O	S	0	0
			671	429	120	118	4		

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.

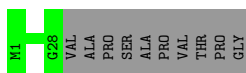
- Molecule 1: Linking protein 2, gp128

Chain a1:  71% 26%



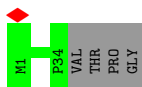
- Molecule 1: Linking protein 2, gp128

Chain b1:  74% 26%



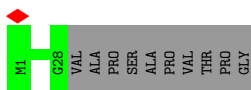
- Molecule 1: Linking protein 2, gp128

Chain d1:  89% 11%



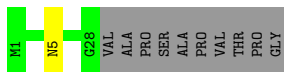
- Molecule 1: Linking protein 2, gp128

Chain e1:  74% 26%

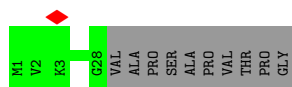
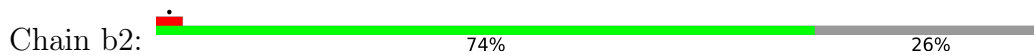


- Molecule 1: Linking protein 2, gp128

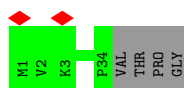
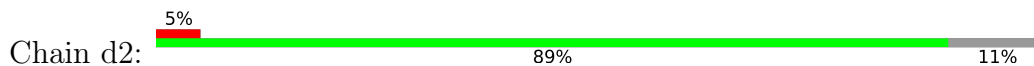
Chain a2:  71% 26%



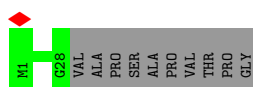
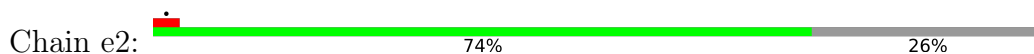
- Molecule 1: Linking protein 2, gp128



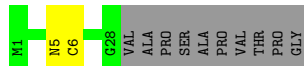
• Molecule 1: Linking protein 2, gp128



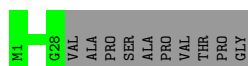
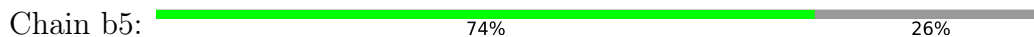
• Molecule 1: Linking protein 2, gp128



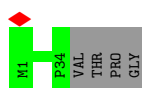
• Molecule 1: Linking protein 2, gp128



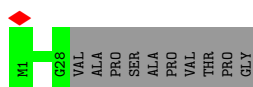
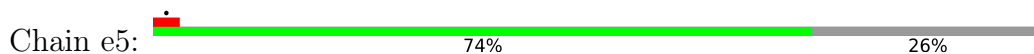
• Molecule 1: Linking protein 2, gp128



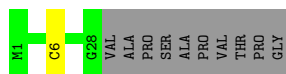
• Molecule 1: Linking protein 2, gp128



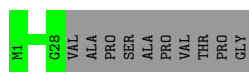
• Molecule 1: Linking protein 2, gp128



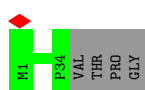
- Molecule 1: Linking protein 2, gp128



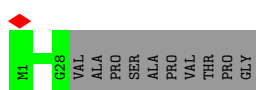
- Molecule 1: Linking protein 2, gp128



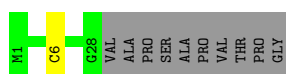
- Molecule 1: Linking protein 2, gp128



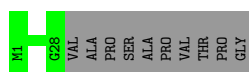
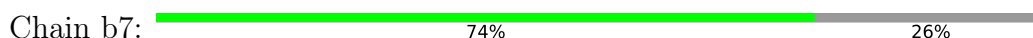
- Molecule 1: Linking protein 2, gp128



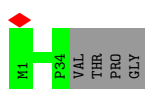
- Molecule 1: Linking protein 2, gp128



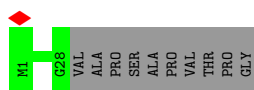
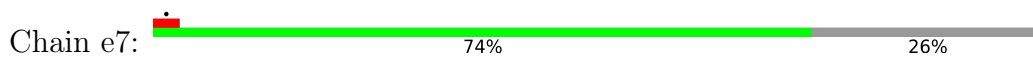
- Molecule 1: Linking protein 2, gp128



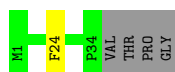
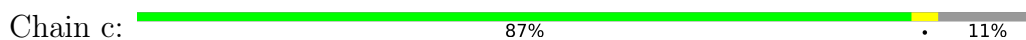
- Molecule 1: Linking protein 2, gp128



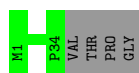
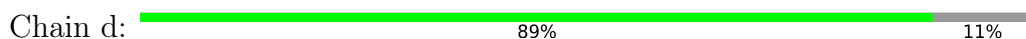
- Molecule 1: Linking protein 2, gp128



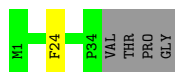
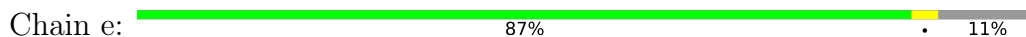
- Molecule 1: Linking protein 2, gp128



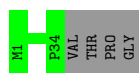
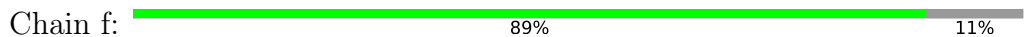
- Molecule 1: Linking protein 2, gp128



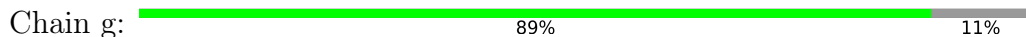
- Molecule 1: Linking protein 2, gp128



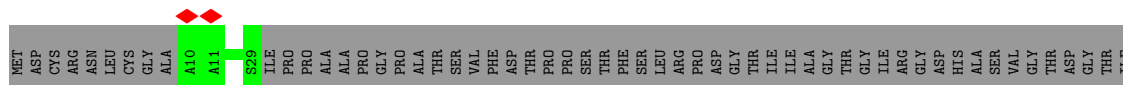
- Molecule 1: Linking protein 2, gp128



- Molecule 1: Linking protein 2, gp128



- Molecule 2: Linking protein 1, gp16



TYR
LYS
ALA
THR
GLY
LEU
VAL
SER
SER
ILE
SER
SER
THR
VAL
ASP

• Molecule 2: Linking protein 1, gp16

Chain f7:  9% 91%

MET
ASP
CYS
ARG
ASN
LEU
CYS
GLY
ALA
A10
A11
V28
S29
PRO
PRO
ALA
ALA
PRO
GLY
ALA
ALA
THR
SER
VAL
PHE
GLY
THR
THR
PRO
PRO
SER
SER
THR
PHE
SER
GLY
VAL
LEU
ARG
PRO
ASP
GLY
THR
ILE
ILE
ALA
GLY
THR
GLY
ILE
ARG
TYR
GLY
ASP
HIS
VAL
SER
GLY
VAL
THR
GLY
THR

ILE
GLU
MET
PHE
ILE
VAL
PRO
PHE
ILE
GLY
ASP
VAL
THR
GLY
SER
GLY
LEU
THR
HIS
PRO
TYR
VAL
ALA
ASP
SER
GLY
THR
TRP
SER
ASP
HIS
VAL
VAL
VAL
TYR
ASN
GLN
ASP
THR
THR
THR
PHE
HIS
GLY
THR
VAL
VAL
ASN
GLN
THR
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VAL
ARG
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TRP
PHE
GLU
MET
THR
THR
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TYR
PRO
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GLU
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ALA

GLY
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TYR
PRO
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ILE
MET
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ASN
GLY
ALA

ARG
TYR
LYS
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THR
GLY
LEU
VAL
SER
SER
SER
ILE
SER
ILE
ILE
THR
VAL
VAL
TYR
ALA
ASP

• Molecule 3: Major capsid protein, gp9

Chain g1:  64% 36%

MET
ALA
ASN
LYS
GLU
THR
GLY
SER
LEU
ASN
GLY
LEU
ASP
ASP
ILE
HIS
SER
ASP
ILE
ILE
GLU
GLY
LEU
SER
ALA
ALA
HIS
HIS
VAL
VAL
VAL
VAL
LEU
SER
MET
LEU
SER
SER
GLY
THR
PHE
PHE
THR
THR
GLY
GLU
SER
ARG
SER
LEU
ALA
VAL
VAL
ARG
LYS
MET
LEU
ALA
ALA
GLY
VAL
ASP
GLY
SER
THR
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASP
HIS
THR
THR
ALA
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ARG
LYS
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GLY
VAL
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LEU
LYS
ASP
ASN
ASN
ASP
ALA
ILE
ILE
ARG
PHE
GLY
LYS
ASP
ASP
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ALA
ASP
ALA
ALA
LYS

THR
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GLU
TYR
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THR
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SER
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SER
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GLY
THR
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASP
HIS
THR
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ARG
SER
LEU
ALA
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ARG
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MET
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GLY
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VAL
VAL
LEU
LYS
ASP
ASP
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THR
THR
ALA
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ARG
LYS
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASN
ASN
ASP
ALA
ILE
ILE
ARG
PHE
GLY
LYS
ASP
ASP
MET
HIS
ALA
ALA
SER
SER
PHE
ARG
LYS
VAL
VAL
ALA
ALA
LYS

I393
F403
I464
GLY

• Molecule 3: Major capsid protein, gp9

Chain h1:  63% 36%

MET
ALA
ASN
LYS
GLU
THR
GLY
SER
LEU
ASN
GLY
VAL
ASP
HIS
SER
ASP
ILE
ILE
HIS
THR
THR
GLY
GLU
SER
ARG
SER
LEU
ALA
VAL
VAL
ARG
LYS
MET
LEU
SER
SER
GLY
THR
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASP
HIS
THR
THR
ALA
ALA
ARG
LYS
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASN
ASN
ASP
ALA
ILE
ILE
ARG
PHE
GLY
LYS
ASP
ASP
MET
HIS
ALA
ALA
SER
SER
PHE
ARG
LYS
VAL
VAL
ALA
ALA
LYS

THR
LYS
GLU
TYR
ALA
THR
GLY
SER
LEU
ASN
GLY
VAL
ASP
HIS
SER
ASP
ILE
ILE
HIS
THR
THR
GLY
GLU
SER
ARG
SER
LEU
ALA
VAL
VAL
ARG
LYS
MET
LEU
SER
SER
GLY
THR
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASP
HIS
THR
THR
ALA
ALA
ARG
LYS
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASN
ASN
ASP
ALA
ILE
ILE
ARG
PHE
GLY
LYS
ASP
ASP
MET
HIS
ALA
ALA
SER
SER
PHE
ARG
LYS
VAL
VAL
ALA
ALA
LYS

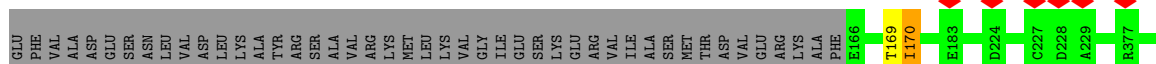
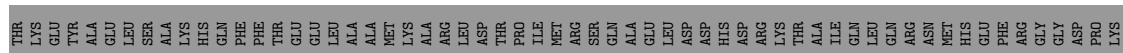
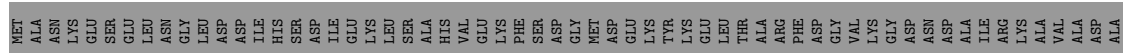
GLU
PHE
VAL
ALA
ASP
GLY
SER
ASN
LEU
ASN
VAL
VAL
ASP
HIS
GLN
PHE
PHE
THR
THR
GLY
GLU
SER
ARG
SER
LEU
ALA
VAL
VAL
ARG
LYS
MET
LEU
SER
SER
GLY
THR
PHE
GLY
VAL
VAL
LEU
LYS
ASP
ASP
HIS
THR
THR
ALA
ALA
ARG
LYS
PHE
GLY
VAL
VAL
LEU
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ASN
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ALA
ILE
ILE
ARG
PHE
GLY
LYS
ASP
ASP
MET
HIS
ALA
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SER
SER
PHE
ARG
LYS
VAL
VAL
ALA
ALA
LYS

C455
I464
GLY

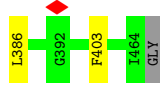
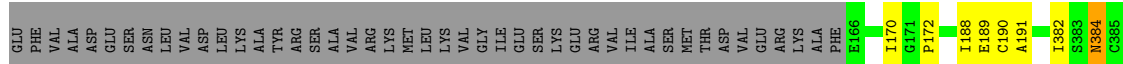
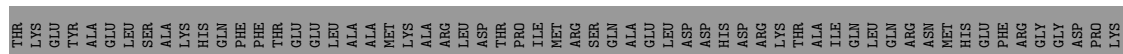
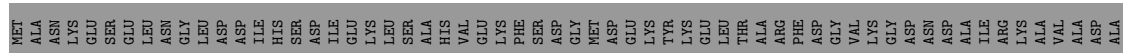
• Molecule 3: Major capsid protein, gp9



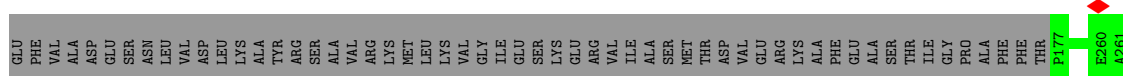
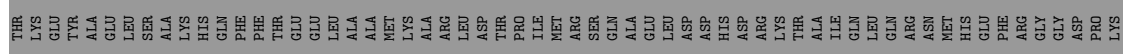
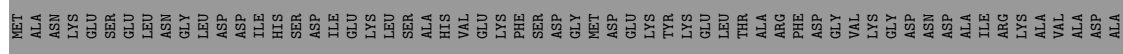
• Molecule 3: Major capsid protein, gp9

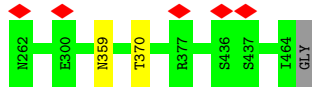


• Molecule 3: Major capsid protein, gp9

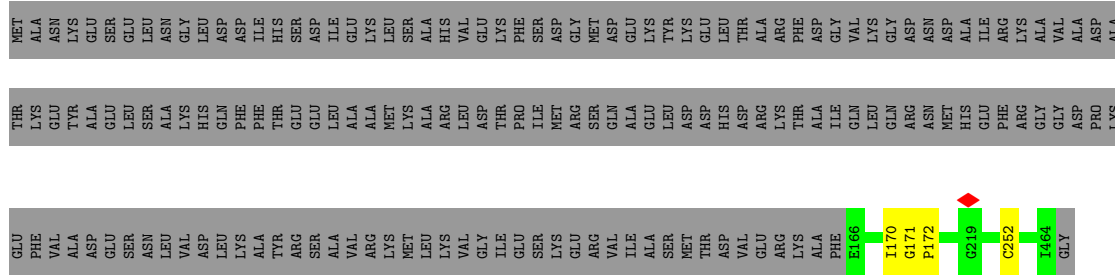


• Molecule 3: Major capsid protein, gp9

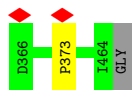
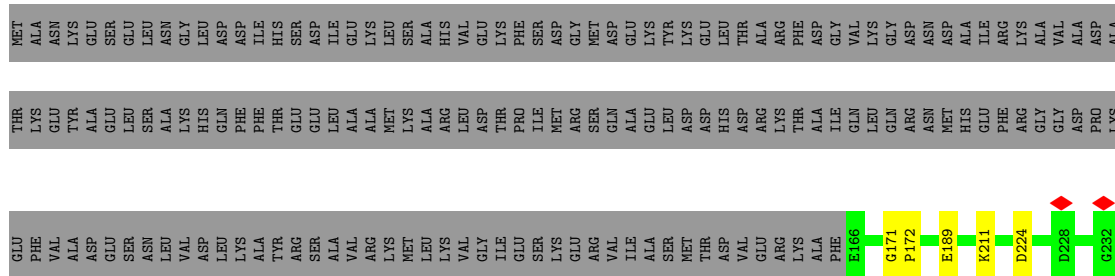
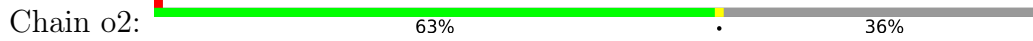




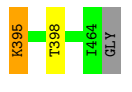
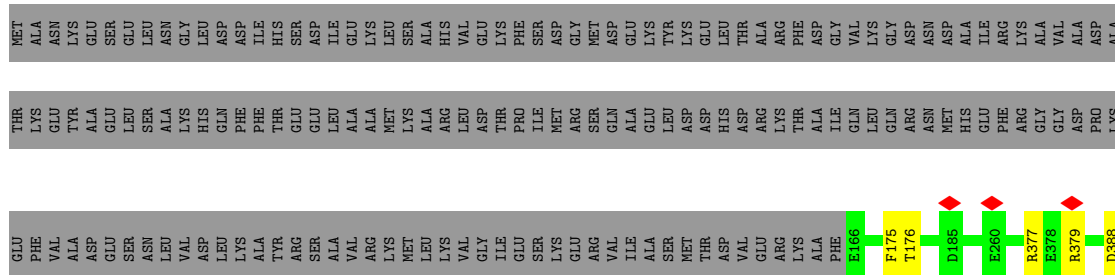
• Molecule 3: Major capsid protein, gp9



• Molecule 3: Major capsid protein, gp9



• Molecule 3: Major capsid protein, gp9



• Molecule 3: Major capsid protein, gp9

Chain g5:  64% 36%

MET ALA ASN ALA LYS GLU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

THR LYS GLU TYR ALA GLU LEU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

GLU PHE VAL ASP SER ASN LEU VAL ASP LEU LYS ALA ILE VAL ASP LEU MET
E166 P172 E183 D224 C227 D228 A229 R377 N393

I464
GLY

- Molecule 3: Major capsid protein, gp9

Chain h5:  63% 36%

MET ALA ASN ALA LYS GLU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

THR LYS GLU TYR ALA GLU LEU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

GLU PHE VAL ASP SER ASN LEU VAL ASP LEU LYS ALA ILE VAL ASP LEU MET
E166 I170 G171 P172 C190 Y221 N364 E385 L386 G392

F403 C455 I464
GLY

- Molecule 3: Major capsid protein, gp9

Chain k5:  62% 38%

MET ALA ASN ALA LYS GLU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

THR LYS GLU TYR ALA GLU LEU SER LEU MET
THR LYS GLU TYR ALA GLU LEU SER LEU MET

GLU PHE VAL ASP SER ASN LEU VAL ASP LEU LYS ALA ILE VAL ASP LEU MET
E260 A261 N262 E300 G436 S436 S437 I464 K256

E260 A261 N262 E300 G436 S436 S437 I464
GLY

- Molecule 3: Major capsid protein, gp9

Chain n5:  64% 36%

MET	ALA	ASN	LYS	GLU	TYR	LYS	ALA	GLU	SER	GLU	LEU	ASN	GLY	LEU	HIS	ASP	GLN	GLY	ASP	ILE	HIS	THR	GLU	SER	GLU	LEU	ALA	GLY	LEU	ALA	LYS	VAL	GLY	ASP	THR	PHE	LEU	LEU	GLU	LEU	ASP	VAL	GLN	GLY	VAL	GLN	GLY	ASP	ASN	ASP	ALA	ALA	ASP	ASP	GLY	VAL	VAL	ASP	PRO	GLY	LYS
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• Molecule 3: Major capsid protein, gp9



MET	ALA	ASN	LYS	GLU	TYR	LYS	ALA	GLU	SER	GLU	LEU	ASN	GLY	LEU	HIS	ASP	GLN	GLY	ASP	ILE	HIS	THR	GLU	SER	GLU	LEU	ALA	GLY	LEU	ALA	LYS	VAL	GLY	ASP	THR	PHE	LEU	LEU	GLU	LEU	ASP	VAL	GLN	GLY	VAL	GLN	GLY	ASP	ASN	ASP	ALA	ALA	ASP	ASP	GLY	VAL	VAL	ASP	PRO	GLY	LYS
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• Molecule 3: Major capsid protein, gp9

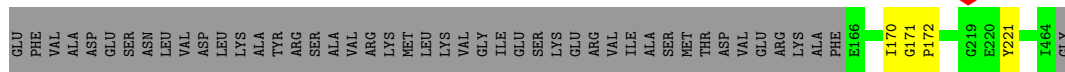


MET	ALA	ASN	LYS	GLU	TYR	LYS	ALA	GLU	SER	GLU	LEU	ASN	GLY	LEU	HIS	ASP	GLN	GLY	ASP	ILE	HIS	THR	GLU	SER	GLU	LEU	ALA	GLY	LEU	ALA	LYS	VAL	GLY	ASP	THR	PHE	LEU	LEU	GLU	LEU	ASP	VAL	GLN	GLY	VAL	GLN	GLY	ASP	ASN	ASP	ALA	ALA	ASP	ASP	GLY	VAL	VAL	ASP	PRO	GLY	LYS
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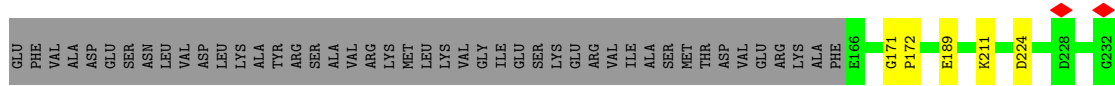
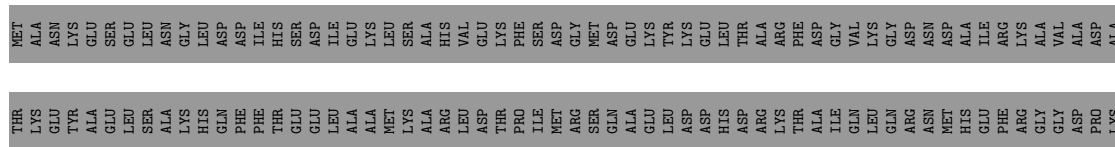
• Molecule 3: Major capsid protein, gp9



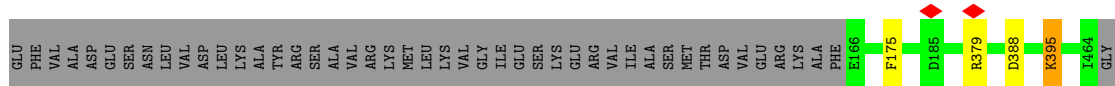
MET	ALA	ASN	LYS	GLU	TYR	LYS	ALA	GLU	SER	GLU	LEU	ASN	GLY	LEU	HIS	ASP	GLN	GLY	ASP	ILE	HIS	THR	GLU	SER	GLU	LEU	ALA	GLY	LEU	ALA	LYS	VAL	GLY	ASP	THR	PHE	LEU	LEU	GLU	LEU	ASP	VAL	GLN	GLY	VAL	GLN	GLY	ASP	ASN	ASP	ALA	ALA	ASP	ASP	GLY	VAL	VAL	ASP	PRO	GLY	LYS
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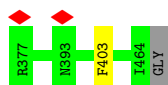
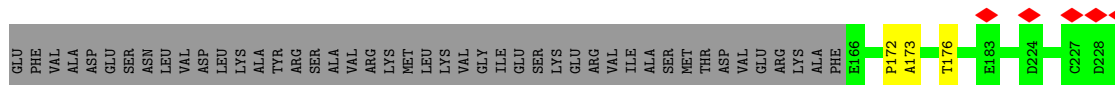
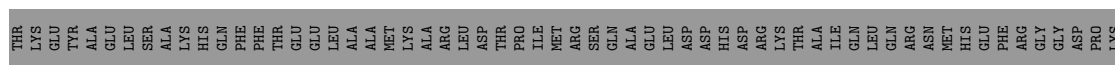
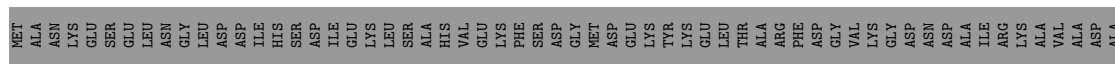
• Molecule 3: Major capsid protein, gp9



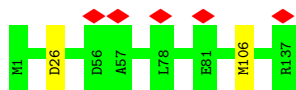
• Molecule 3: Major capsid protein, gp9



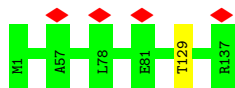
• Molecule 3: Major capsid protein, gp9



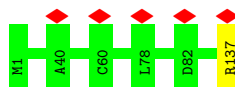
• Molecule 3: Major capsid protein, gp9



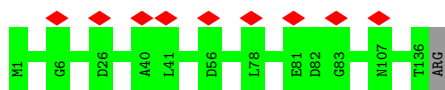
- Molecule 4: Minor capsid protein, gp10



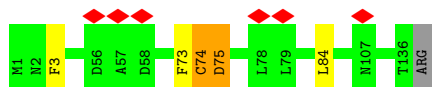
- Molecule 4: Minor capsid protein, gp10



- Molecule 4: Minor capsid protein, gp10



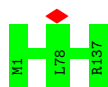
- Molecule 4: Minor capsid protein, gp10



- Molecule 4: Minor capsid protein, gp10

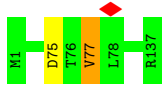


- Molecule 4: Minor capsid protein, gp10



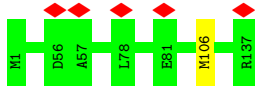
- Molecule 4: Minor capsid protein, gp10

Chain p2:  99%



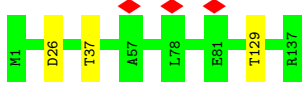
- Molecule 4: Minor capsid protein, gp10

Chain q2:  99%



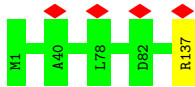
- Molecule 4: Minor capsid protein, gp10

Chain s2:  98%



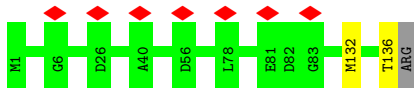
- Molecule 4: Minor capsid protein, gp10

Chain t2:  99%



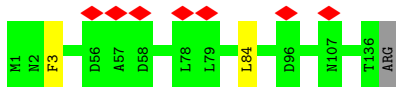
- Molecule 4: Minor capsid protein, gp10

Chain u2:  98%



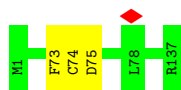
- Molecule 4: Minor capsid protein, gp10

Chain v2:  98%

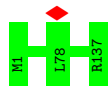


- Molecule 4: Minor capsid protein, gp10

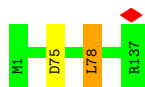
Chain l5:  98%



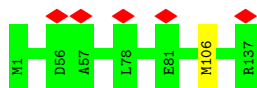
- Molecule 4: Minor capsid protein, gp10



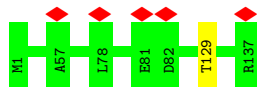
- Molecule 4: Minor capsid protein, gp10



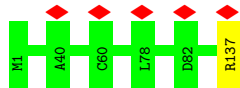
- Molecule 4: Minor capsid protein, gp10



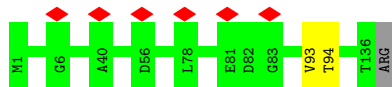
- Molecule 4: Minor capsid protein, gp10



- Molecule 4: Minor capsid protein, gp10

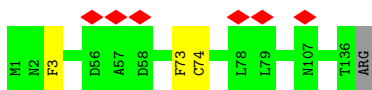


- Molecule 4: Minor capsid protein, gp10



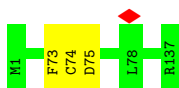
- Molecule 4: Minor capsid protein, gp10

Chain v5:  97%



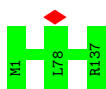
- Molecule 4: Minor capsid protein, gp10

Chain l6:  98%



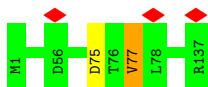
- Molecule 4: Minor capsid protein, gp10

Chain m6:  100%



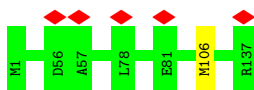
- Molecule 4: Minor capsid protein, gp10

Chain p6:  99%



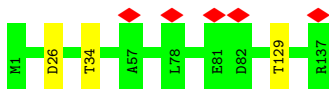
- Molecule 4: Minor capsid protein, gp10

Chain q6:  99%



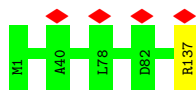
- Molecule 4: Minor capsid protein, gp10

Chain s6:  98%

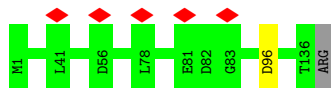


- Molecule 4: Minor capsid protein, gp10

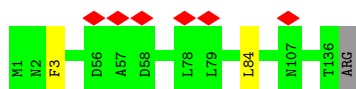
Chain t6:  99%



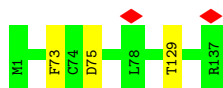
- Molecule 4: Minor capsid protein, gp10



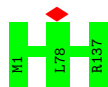
- Molecule 4: Minor capsid protein, gp10



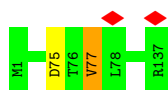
- Molecule 4: Minor capsid protein, gp10



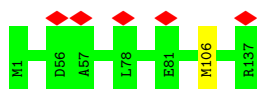
- Molecule 4: Minor capsid protein, gp10



- Molecule 4: Minor capsid protein, gp10

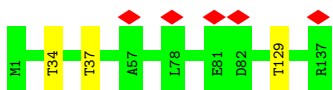


- Molecule 4: Minor capsid protein, gp10



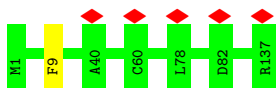
- Molecule 4: Minor capsid protein, gp10

Chain s7:  98%



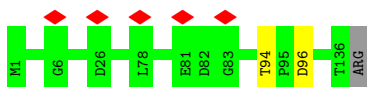
• Molecule 4: Minor capsid protein, gp10

Chain t7:  99%



• Molecule 4: Minor capsid protein, gp10

Chain u7:  98%



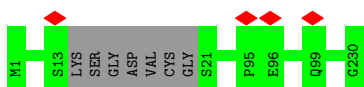
• Molecule 4: Minor capsid protein, gp10

Chain v7:  97%



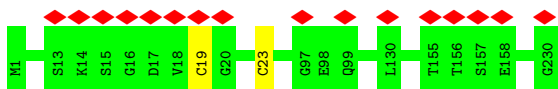
• Molecule 5: Collar sheath protein, gp13

Chain J3:  97%



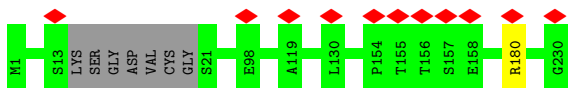
• Molecule 5: Collar sheath protein, gp13

Chain K3:  99%



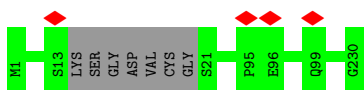
• Molecule 5: Collar sheath protein, gp13

Chain L3:  97%



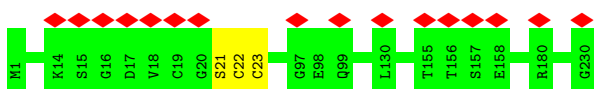
- Molecule 5: Collar sheath protein, gp13

Chain M3:  97%



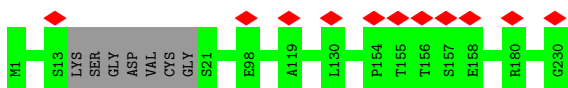
- Molecule 5: Collar sheath protein, gp13

Chain N3:  99%



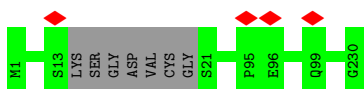
- Molecule 5: Collar sheath protein, gp13

Chain O3:  97%



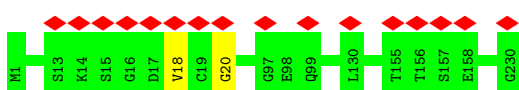
- Molecule 5: Collar sheath protein, gp13

Chain P3:  97%



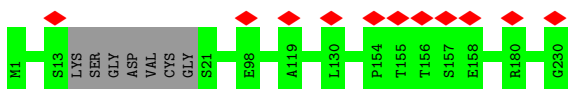
- Molecule 5: Collar sheath protein, gp13

Chain Q3:  99%



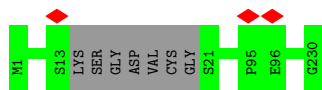
- Molecule 5: Collar sheath protein, gp13

Chain R3:  97%

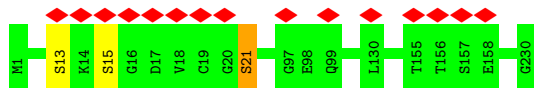


- Molecule 5: Collar sheath protein, gp13

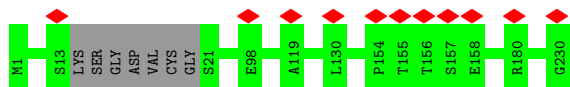
Chain S3:  97%



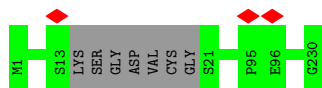
- Molecule 5: Collar sheath protein, gp13



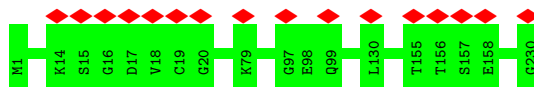
- Molecule 5: Collar sheath protein, gp13



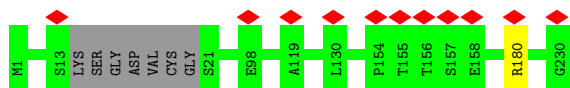
- Molecule 5: Collar sheath protein, gp13



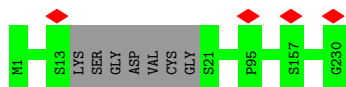
- Molecule 5: Collar sheath protein, gp13



- Molecule 5: Collar sheath protein, gp13

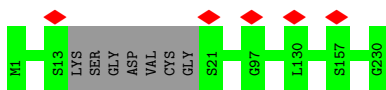


- Molecule 5: Collar sheath protein, gp13



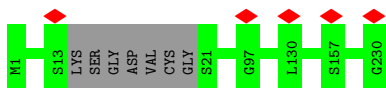
- Molecule 5: Collar sheath protein, gp13

Chain Z3:  97%



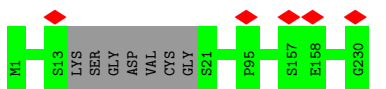
- Molecule 5: Collar sheath protein, gp13

Chain a3:  97%



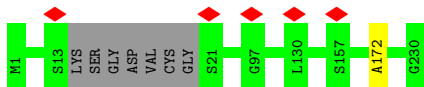
- Molecule 5: Collar sheath protein, gp13

Chain b3:  97%



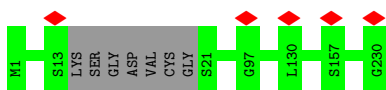
- Molecule 5: Collar sheath protein, gp13

Chain c3:  97%



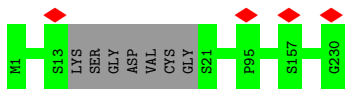
- Molecule 5: Collar sheath protein, gp13

Chain d3:  97%



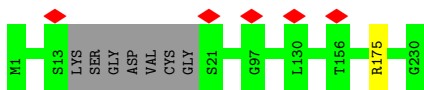
- Molecule 5: Collar sheath protein, gp13

Chain e3:  97%



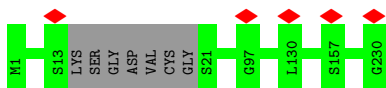
- Molecule 5: Collar sheath protein, gp13

Chain f3:  97%



- Molecule 5: Collar sheath protein, gp13

Chain g3:  97%



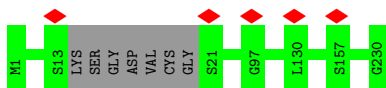
- Molecule 5: Collar sheath protein, gp13

Chain h3:  97%



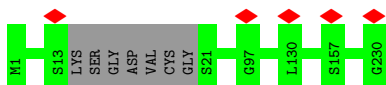
- Molecule 5: Collar sheath protein, gp13

Chain i3:  97%



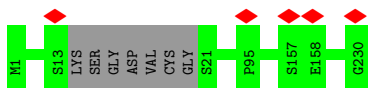
- Molecule 5: Collar sheath protein, gp13

Chain j3:  97%



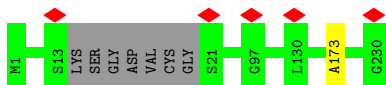
- Molecule 5: Collar sheath protein, gp13

Chain k3:  97%



- Molecule 5: Collar sheath protein, gp13

Chain l3:  97%

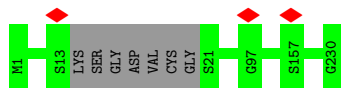


- Molecule 5: Collar sheath protein, gp13

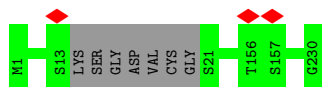
Chain m3:  97%



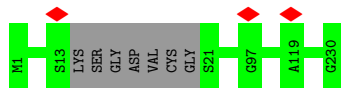
- Molecule 5: Collar sheath protein, gp13



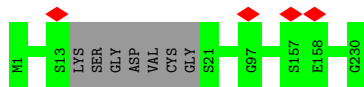
- Molecule 5: Collar sheath protein, gp13



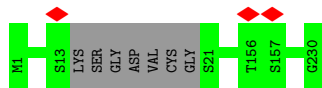
- Molecule 5: Collar sheath protein, gp13



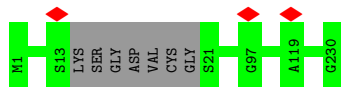
- Molecule 5: Collar sheath protein, gp13



- Molecule 5: Collar sheath protein, gp13

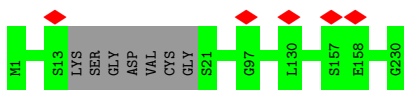


- Molecule 5: Collar sheath protein, gp13



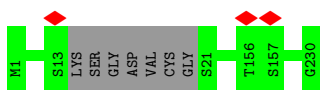
- Molecule 5: Collar sheath protein, gp13

Chain t3:  97%



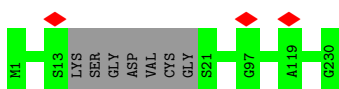
- Molecule 5: Collar sheath protein, gp13

Chain u3:  97%



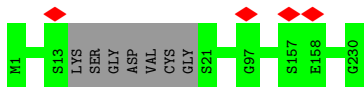
- Molecule 5: Collar sheath protein, gp13

Chain v3:  97%



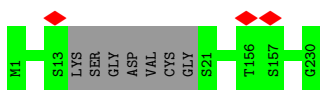
- Molecule 5: Collar sheath protein, gp13

Chain w3:  97%



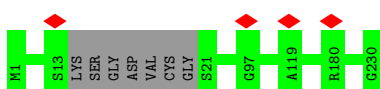
- Molecule 5: Collar sheath protein, gp13

Chain x3:  97%



- Molecule 5: Collar sheath protein, gp13

Chain y3:  97%



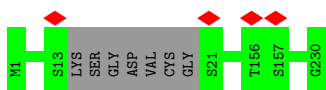
- Molecule 5: Collar sheath protein, gp13

Chain z3:  97%



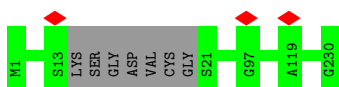
- Molecule 5: Collar sheath protein, gp13

Chain 13:  97%



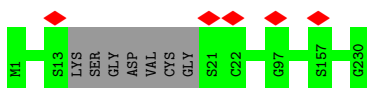
- Molecule 5: Collar sheath protein, gp13

Chain 23:  97%



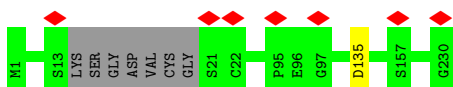
- Molecule 5: Collar sheath protein, gp13

Chain 33:  97%



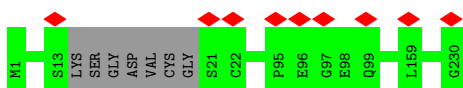
- Molecule 5: Collar sheath protein, gp13

Chain 43:  97%



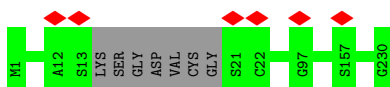
- Molecule 5: Collar sheath protein, gp13

Chain 53:  97%



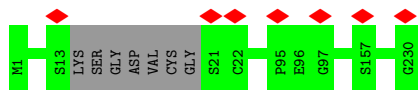
- Molecule 5: Collar sheath protein, gp13

Chain 63:  97%

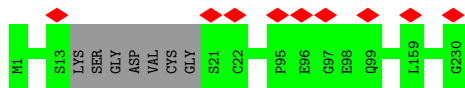


- Molecule 5: Collar sheath protein, gp13

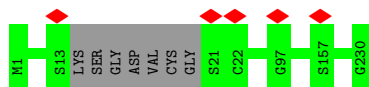
Chain 73:  97%



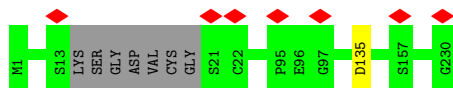
- Molecule 5: Collar sheath protein, gp13



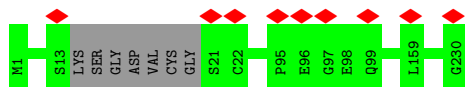
- Molecule 5: Collar sheath protein, gp13



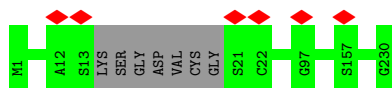
- Molecule 5: Collar sheath protein, gp13



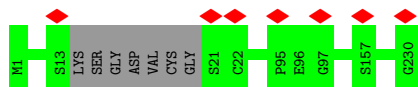
- Molecule 5: Collar sheath protein, gp13



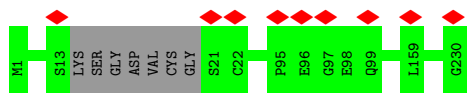
- Molecule 5: Collar sheath protein, gp13



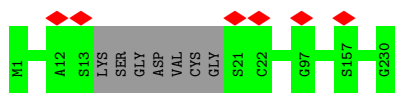
- Molecule 5: Collar sheath protein, gp13



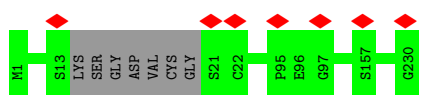
- Molecule 5: Collar sheath protein, gp13



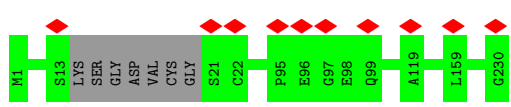
- Molecule 5: Collar sheath protein, gp13



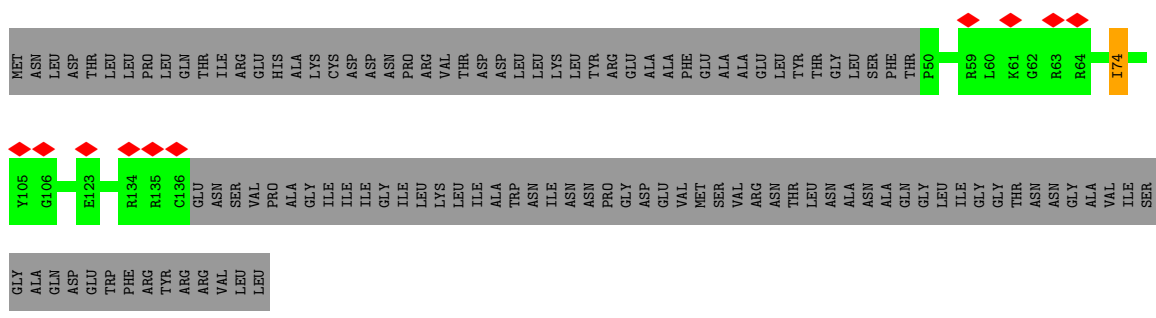
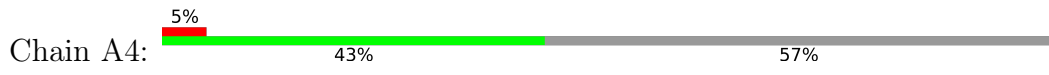
- Molecule 5: Collar sheath protein, gp13



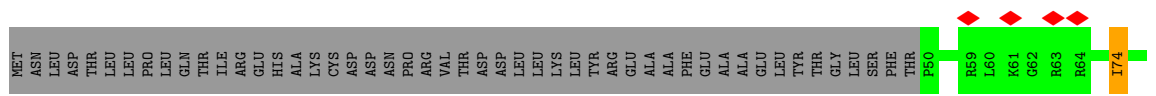
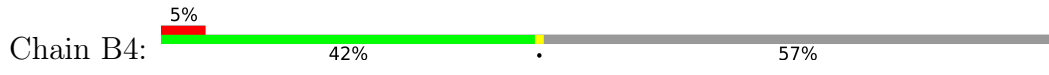
- Molecule 5: Collar sheath protein, gp13



- Molecule 6: Neck 1 protein, gp14



- Molecule 6: Neck 1 protein, gp14



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C5	Depositor
Number of particles used	10086	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 ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.857	Depositor
Minimum map value	-0.549	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.044	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	648.0, 648.0, 648.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.08, 1.08, 1.08	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	a1	0.36	0/213	0.54	0/288
1	a2	0.30	0/213	0.53	0/288
1	a5	0.37	0/213	0.54	0/288
1	a6	0.35	0/213	0.53	0/288
1	a7	0.34	0/213	0.53	0/288
1	b1	0.31	0/213	0.52	0/288
1	b2	0.31	0/213	0.49	0/288
1	b5	0.30	0/213	0.50	0/288
1	b6	0.30	0/213	0.50	0/288
1	b7	0.33	0/213	0.46	0/288
1	c	0.33	0/252	0.55	0/344
1	d	0.37	0/252	0.54	0/344
1	d1	0.31	0/252	0.58	0/344
1	d2	0.31	0/252	0.59	0/344
1	d5	0.31	0/252	0.60	0/344
1	d6	0.30	0/252	0.57	0/344
1	d7	0.31	0/252	0.59	0/344
1	e	0.34	0/252	0.53	0/344
1	e1	0.32	0/213	0.54	0/288
1	e2	0.31	0/213	0.55	0/288
1	e5	0.32	0/213	0.56	0/288
1	e6	0.31	0/213	0.55	0/288
1	e7	0.31	0/213	0.56	0/288
1	f	0.42	0/252	0.57	0/344
1	g	0.44	0/252	0.55	0/344
2	f1	0.39	0/142	0.53	0/192
2	f2	0.38	0/142	0.52	0/192
2	f5	0.41	0/142	0.57	0/192
2	f6	0.38	0/142	0.54	0/192
2	f7	0.39	0/142	0.54	0/192
3	g1	0.33	0/2396	0.49	0/3243
3	g2	0.34	0/2396	0.49	0/3243
3	g5	0.33	0/2396	0.48	0/3243
3	g6	0.34	0/2396	0.49	0/3243

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
3	g7	0.33	0/2396	0.49	0/3243
3	h1	0.38	0/2396	0.53	0/3243
3	h2	0.38	0/2396	0.54	0/3243
3	h5	0.38	0/2396	0.52	0/3243
3	h6	0.38	0/2396	0.52	0/3243
3	h7	0.37	0/2396	0.54	2/3243 (0.1%)
3	k1	0.34	0/2313	0.48	0/3128
3	k2	0.34	0/2313	0.49	0/3128
3	k5	0.34	0/2313	0.49	0/3128
3	k6	0.34	0/2313	0.49	0/3128
3	k7	0.35	0/2313	0.51	0/3128
3	n1	0.35	0/2396	0.52	0/3243
3	n2	0.34	0/2396	0.52	0/3243
3	n5	0.34	0/2396	0.52	0/3243
3	n6	0.34	0/2396	0.51	0/3243
3	n7	0.34	0/2396	0.51	0/3243
3	o1	0.31	0/2396	0.49	0/3243
3	o2	0.31	0/2396	0.48	0/3243
3	o5	0.31	0/2396	0.49	0/3243
3	o6	0.31	0/2396	0.49	0/3243
3	o7	0.31	0/2396	0.48	0/3243
3	r1	0.33	0/2396	0.51	0/3243
3	r2	0.33	0/2396	0.52	1/3243 (0.0%)
3	r5	0.34	0/2396	0.51	0/3243
3	r6	0.33	0/2396	0.52	1/3243 (0.0%)
3	r7	0.34	0/2396	0.52	0/3243
4	l1	0.32	0/1052	0.52	0/1443
4	l2	0.33	0/1052	0.51	0/1443
4	l5	0.33	0/1052	0.51	0/1443
4	l6	0.33	0/1052	0.51	0/1443
4	l7	0.32	0/1052	0.52	0/1443
4	m1	0.34	0/1052	0.50	0/1443
4	m2	0.34	0/1052	0.48	0/1443
4	m5	0.34	0/1052	0.49	0/1443
4	m6	0.34	0/1052	0.50	0/1443
4	m7	0.34	0/1052	0.51	0/1443
4	p1	0.31	0/1052	0.50	0/1443
4	p2	0.31	0/1052	0.51	0/1443
4	p5	0.31	0/1052	0.51	0/1443
4	p6	0.30	0/1052	0.51	0/1443
4	p7	0.31	0/1052	0.52	0/1443
4	q1	0.31	0/1052	0.50	0/1443
4	q2	0.31	0/1052	0.50	0/1443

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
4	q5	0.31	0/1052	0.49	0/1443
4	q6	0.31	0/1052	0.49	0/1443
4	q7	0.31	0/1052	0.49	0/1443
4	s1	0.31	0/1052	0.50	0/1443
4	s2	0.32	0/1052	0.50	0/1443
4	s5	0.31	0/1052	0.49	0/1443
4	s6	0.31	0/1052	0.50	0/1443
4	s7	0.30	0/1052	0.49	0/1443
4	t1	0.29	0/1052	0.50	0/1443
4	t2	0.29	0/1052	0.50	0/1443
4	t5	0.29	0/1052	0.49	0/1443
4	t6	0.30	0/1052	0.47	0/1443
4	t7	0.32	0/1052	0.54	0/1443
4	u1	0.28	0/1040	0.52	0/1429
4	u2	0.30	0/1040	0.53	0/1429
4	u5	0.28	0/1040	0.51	0/1429
4	u6	0.29	0/1040	0.53	0/1429
4	u7	0.28	0/1040	0.52	0/1429
4	v1	0.29	0/1040	0.50	0/1429
4	v2	0.31	0/1040	0.53	0/1429
4	v5	0.30	0/1040	0.51	0/1429
4	v6	0.30	0/1040	0.52	0/1429
4	v7	0.29	0/1040	0.51	0/1429
5	03	0.30	0/1723	0.47	0/2353
5	13	0.33	0/1723	0.48	0/2353
5	23	0.32	0/1723	0.49	0/2353
5	33	0.30	0/1723	0.46	0/2353
5	43	0.30	0/1723	0.46	0/2353
5	53	0.31	0/1723	0.48	0/2353
5	63	0.30	0/1723	0.47	0/2353
5	73	0.30	0/1723	0.46	0/2353
5	83	0.30	0/1723	0.48	0/2353
5	93	0.30	0/1723	0.47	0/2353
5	A3	0.31	0/1723	0.47	0/2353
5	B3	0.30	0/1723	0.47	0/2353
5	C3	0.30	0/1723	0.47	0/2353
5	D3	0.31	0/1723	0.48	0/2353
5	E3	0.30	0/1723	0.47	0/2353
5	F3	0.30	0/1723	0.47	0/2353
5	G3	0.32	0/1723	0.50	0/2353
5	J3	0.35	0/1723	0.47	0/2353
5	K3	0.33	0/1768	0.47	0/2414
5	L3	0.32	0/1723	0.47	0/2353

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
5	M3	0.35	0/1723	0.48	0/2353
5	N3	0.35	0/1768	0.49	0/2414
5	O3	0.32	0/1723	0.47	0/2353
5	P3	0.35	0/1723	0.47	0/2353
5	Q3	0.33	0/1768	0.48	1/2414 (0.0%)
5	R3	0.32	0/1723	0.47	0/2353
5	S3	0.35	0/1723	0.47	0/2353
5	T3	0.34	0/1768	0.49	0/2414
5	U3	0.33	0/1723	0.47	0/2353
5	V3	0.35	0/1723	0.48	0/2353
5	W3	0.33	0/1768	0.50	0/2414
5	X3	0.32	0/1723	0.47	0/2353
5	Y3	0.33	0/1723	0.46	0/2353
5	Z3	0.34	0/1723	0.47	0/2353
5	a3	0.33	0/1723	0.47	0/2353
5	b3	0.34	0/1723	0.47	0/2353
5	c3	0.34	0/1723	0.48	0/2353
5	d3	0.33	0/1723	0.47	0/2353
5	e3	0.34	0/1723	0.47	0/2353
5	f3	0.35	0/1723	0.48	0/2353
5	g3	0.33	0/1723	0.48	0/2353
5	h3	0.33	0/1723	0.46	0/2353
5	i3	0.35	0/1723	0.49	0/2353
5	j3	0.33	0/1723	0.47	0/2353
5	k3	0.34	0/1723	0.47	0/2353
5	l3	0.35	0/1723	0.49	0/2353
5	m3	0.33	0/1723	0.47	0/2353
5	n3	0.33	0/1723	0.47	0/2353
5	o3	0.33	0/1723	0.47	0/2353
5	p3	0.32	0/1723	0.48	0/2353
5	q3	0.33	0/1723	0.47	0/2353
5	r3	0.33	0/1723	0.48	0/2353
5	s3	0.33	0/1723	0.48	0/2353
5	t3	0.33	0/1723	0.47	0/2353
5	u3	0.33	0/1723	0.47	0/2353
5	v3	0.32	0/1723	0.47	0/2353
5	w3	0.33	0/1723	0.46	0/2353
5	x3	0.32	0/1723	0.47	0/2353
5	y3	0.32	0/1723	0.47	0/2353
5	z3	0.33	0/1723	0.47	0/2353
6	A4	0.31	0/689	0.50	0/934
6	B4	0.31	0/689	0.53	0/934
6	C4	0.31	0/689	0.51	0/934

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
6	D4	0.29	0/689	0.50	0/934
6	E4	0.31	0/689	0.53	0/934
All	All	0.33	0/226900	0.49	5/309170 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	r6	388	ASP	CB-CG-OD1	5.26	123.04	118.30
3	h7	189	GLU	N-CA-C	-5.25	96.83	111.00
3	h7	385	CYS	CB-CA-C	-5.15	100.09	110.40
5	Q3	20	GLY	N-CA-C	5.12	125.90	113.10
3	r2	388	ASP	CB-CG-OD1	5.05	122.85	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	a1	26/38 (68%)	24 (92%)	2 (8%)	0	100	100
1	a2	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	a5	26/38 (68%)	24 (92%)	2 (8%)	0	100	100
1	a6	26/38 (68%)	24 (92%)	2 (8%)	0	100	100
1	a7	26/38 (68%)	24 (92%)	2 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	b1	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	b2	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	b5	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	b6	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	b7	26/38 (68%)	25 (96%)	1 (4%)	0	100	100
1	c	32/38 (84%)	29 (91%)	3 (9%)	0	100	100
1	d	32/38 (84%)	29 (91%)	3 (9%)	0	100	100
1	d1	32/38 (84%)	24 (75%)	8 (25%)	0	100	100
1	d2	32/38 (84%)	26 (81%)	6 (19%)	0	100	100
1	d5	32/38 (84%)	25 (78%)	7 (22%)	0	100	100
1	d6	32/38 (84%)	25 (78%)	7 (22%)	0	100	100
1	d7	32/38 (84%)	24 (75%)	8 (25%)	0	100	100
1	e	32/38 (84%)	31 (97%)	1 (3%)	0	100	100
1	e1	26/38 (68%)	19 (73%)	7 (27%)	0	100	100
1	e2	26/38 (68%)	22 (85%)	4 (15%)	0	100	100
1	e5	26/38 (68%)	21 (81%)	5 (19%)	0	100	100
1	e6	26/38 (68%)	19 (73%)	7 (27%)	0	100	100
1	e7	26/38 (68%)	18 (69%)	8 (31%)	0	100	100
1	f	32/38 (84%)	31 (97%)	1 (3%)	0	100	100
1	g	32/38 (84%)	31 (97%)	1 (3%)	0	100	100
2	f1	18/217 (8%)	15 (83%)	3 (17%)	0	100	100
2	f2	18/217 (8%)	16 (89%)	2 (11%)	0	100	100
2	f5	18/217 (8%)	12 (67%)	6 (33%)	0	100	100
2	f6	18/217 (8%)	15 (83%)	3 (17%)	0	100	100
2	f7	18/217 (8%)	16 (89%)	2 (11%)	0	100	100
3	g1	297/465 (64%)	253 (85%)	43 (14%)	1 (0%)	41	75
3	g2	297/465 (64%)	251 (84%)	44 (15%)	2 (1%)	22	60
3	g5	297/465 (64%)	250 (84%)	46 (16%)	1 (0%)	41	75
3	g6	297/465 (64%)	250 (84%)	46 (16%)	1 (0%)	41	75
3	g7	297/465 (64%)	252 (85%)	43 (14%)	2 (1%)	22	60
3	h1	297/465 (64%)	243 (82%)	51 (17%)	3 (1%)	15	52

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	h2	297/465 (64%)	242 (82%)	50 (17%)	5 (2%)	9	40
3	h5	297/465 (64%)	242 (82%)	53 (18%)	2 (1%)	22	60
3	h6	297/465 (64%)	241 (81%)	54 (18%)	2 (1%)	22	60
3	h7	297/465 (64%)	247 (83%)	48 (16%)	2 (1%)	22	60
3	k1	286/465 (62%)	251 (88%)	35 (12%)	0	100	100
3	k2	286/465 (62%)	248 (87%)	37 (13%)	1 (0%)	41	75
3	k5	286/465 (62%)	248 (87%)	38 (13%)	0	100	100
3	k6	286/465 (62%)	251 (88%)	34 (12%)	1 (0%)	41	75
3	k7	286/465 (62%)	249 (87%)	36 (13%)	1 (0%)	41	75
3	n1	297/465 (64%)	247 (83%)	49 (16%)	1 (0%)	41	75
3	n2	297/465 (64%)	243 (82%)	52 (18%)	2 (1%)	22	60
3	n5	297/465 (64%)	245 (82%)	50 (17%)	2 (1%)	22	60
3	n6	297/465 (64%)	246 (83%)	49 (16%)	2 (1%)	22	60
3	n7	297/465 (64%)	249 (84%)	46 (16%)	2 (1%)	22	60
3	o1	297/465 (64%)	248 (84%)	45 (15%)	4 (1%)	12	46
3	o2	297/465 (64%)	245 (82%)	47 (16%)	5 (2%)	9	40
3	o5	297/465 (64%)	245 (82%)	47 (16%)	5 (2%)	9	40
3	o6	297/465 (64%)	242 (82%)	50 (17%)	5 (2%)	9	40
3	o7	297/465 (64%)	248 (84%)	45 (15%)	4 (1%)	12	46
3	r1	297/465 (64%)	254 (86%)	42 (14%)	1 (0%)	41	75
3	r2	297/465 (64%)	251 (84%)	45 (15%)	1 (0%)	41	75
3	r5	297/465 (64%)	250 (84%)	44 (15%)	3 (1%)	15	52
3	r6	297/465 (64%)	252 (85%)	44 (15%)	1 (0%)	41	75
3	r7	297/465 (64%)	255 (86%)	37 (12%)	5 (2%)	9	40
4	l1	135/137 (98%)	119 (88%)	16 (12%)	0	100	100
4	l2	135/137 (98%)	117 (87%)	15 (11%)	3 (2%)	6	35
4	l5	135/137 (98%)	120 (89%)	14 (10%)	1 (1%)	22	60
4	l6	135/137 (98%)	119 (88%)	15 (11%)	1 (1%)	22	60
4	l7	135/137 (98%)	121 (90%)	13 (10%)	1 (1%)	22	60
4	m1	135/137 (98%)	117 (87%)	18 (13%)	0	100	100
4	m2	135/137 (98%)	119 (88%)	16 (12%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	m5	135/137 (98%)	118 (87%)	17 (13%)	0	100	100
4	m6	135/137 (98%)	119 (88%)	16 (12%)	0	100	100
4	m7	135/137 (98%)	117 (87%)	18 (13%)	0	100	100
4	p1	135/137 (98%)	112 (83%)	22 (16%)	1 (1%)	22	60
4	p2	135/137 (98%)	111 (82%)	23 (17%)	1 (1%)	22	60
4	p5	135/137 (98%)	110 (82%)	24 (18%)	1 (1%)	22	60
4	p6	135/137 (98%)	111 (82%)	23 (17%)	1 (1%)	22	60
4	p7	135/137 (98%)	112 (83%)	22 (16%)	1 (1%)	22	60
4	q1	135/137 (98%)	120 (89%)	15 (11%)	0	100	100
4	q2	135/137 (98%)	119 (88%)	16 (12%)	0	100	100
4	q5	135/137 (98%)	117 (87%)	18 (13%)	0	100	100
4	q6	135/137 (98%)	122 (90%)	13 (10%)	0	100	100
4	q7	135/137 (98%)	120 (89%)	15 (11%)	0	100	100
4	s1	135/137 (98%)	125 (93%)	10 (7%)	0	100	100
4	s2	135/137 (98%)	124 (92%)	10 (7%)	1 (1%)	22	60
4	s5	135/137 (98%)	125 (93%)	10 (7%)	0	100	100
4	s6	135/137 (98%)	124 (92%)	10 (7%)	1 (1%)	22	60
4	s7	135/137 (98%)	125 (93%)	10 (7%)	0	100	100
4	t1	135/137 (98%)	121 (90%)	14 (10%)	0	100	100
4	t2	135/137 (98%)	123 (91%)	12 (9%)	0	100	100
4	t5	135/137 (98%)	122 (90%)	13 (10%)	0	100	100
4	t6	135/137 (98%)	124 (92%)	11 (8%)	0	100	100
4	t7	135/137 (98%)	119 (88%)	16 (12%)	0	100	100
4	u1	134/137 (98%)	119 (89%)	15 (11%)	0	100	100
4	u2	134/137 (98%)	118 (88%)	16 (12%)	0	100	100
4	u5	134/137 (98%)	118 (88%)	16 (12%)	0	100	100
4	u6	134/137 (98%)	119 (89%)	15 (11%)	0	100	100
4	u7	134/137 (98%)	119 (89%)	15 (11%)	0	100	100
4	v1	134/137 (98%)	113 (84%)	19 (14%)	2 (2%)	10	43
4	v2	134/137 (98%)	111 (83%)	23 (17%)	0	100	100
4	v5	134/137 (98%)	113 (84%)	21 (16%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
4	v6	134/137 (98%)	114 (85%)	20 (15%)	0	100	100
4	v7	134/137 (98%)	113 (84%)	20 (15%)	1 (1%)	22	60
5	03	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	13	219/230 (95%)	200 (91%)	19 (9%)	0	100	100
5	23	219/230 (95%)	192 (88%)	27 (12%)	0	100	100
5	33	219/230 (95%)	197 (90%)	22 (10%)	0	100	100
5	43	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	53	219/230 (95%)	206 (94%)	13 (6%)	0	100	100
5	63	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	73	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	83	219/230 (95%)	206 (94%)	13 (6%)	0	100	100
5	93	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	A3	219/230 (95%)	202 (92%)	17 (8%)	0	100	100
5	B3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	C3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	D3	219/230 (95%)	204 (93%)	15 (7%)	0	100	100
5	E3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	F3	219/230 (95%)	200 (91%)	19 (9%)	0	100	100
5	G3	219/230 (95%)	203 (93%)	16 (7%)	0	100	100
5	J3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	K3	228/230 (99%)	210 (92%)	18 (8%)	0	100	100
5	L3	219/230 (95%)	200 (91%)	19 (9%)	0	100	100
5	M3	219/230 (95%)	200 (91%)	19 (9%)	0	100	100
5	N3	228/230 (99%)	207 (91%)	20 (9%)	1 (0%)	34	70
5	O3	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	P3	219/230 (95%)	202 (92%)	17 (8%)	0	100	100
5	Q3	228/230 (99%)	206 (90%)	21 (9%)	1 (0%)	34	70
5	R3	219/230 (95%)	203 (93%)	16 (7%)	0	100	100
5	S3	219/230 (95%)	202 (92%)	17 (8%)	0	100	100
5	T3	228/230 (99%)	206 (90%)	20 (9%)	2 (1%)	17	54
5	U3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	V3	219/230 (95%)	202 (92%)	17 (8%)	0	100	100
5	W3	228/230 (99%)	206 (90%)	22 (10%)	0	100	100
5	X3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	Y3	219/230 (95%)	196 (90%)	23 (10%)	0	100	100
5	Z3	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	a3	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	b3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	c3	219/230 (95%)	196 (90%)	22 (10%)	1 (0%)	29	66
5	d3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	e3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	f3	219/230 (95%)	195 (89%)	24 (11%)	0	100	100
5	g3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	h3	219/230 (95%)	196 (90%)	23 (10%)	0	100	100
5	i3	219/230 (95%)	196 (90%)	23 (10%)	0	100	100
5	j3	219/230 (95%)	197 (90%)	22 (10%)	0	100	100
5	k3	219/230 (95%)	198 (90%)	21 (10%)	0	100	100
5	l3	219/230 (95%)	196 (90%)	22 (10%)	1 (0%)	29	66
5	m3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	n3	219/230 (95%)	197 (90%)	22 (10%)	0	100	100
5	o3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	p3	219/230 (95%)	192 (88%)	27 (12%)	0	100	100
5	q3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	r3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	s3	219/230 (95%)	192 (88%)	27 (12%)	0	100	100
5	t3	219/230 (95%)	197 (90%)	22 (10%)	0	100	100
5	u3	219/230 (95%)	201 (92%)	18 (8%)	0	100	100
5	v3	219/230 (95%)	191 (87%)	28 (13%)	0	100	100
5	w3	219/230 (95%)	200 (91%)	19 (9%)	0	100	100
5	x3	219/230 (95%)	199 (91%)	20 (9%)	0	100	100
5	y3	219/230 (95%)	192 (88%)	27 (12%)	0	100	100
5	z3	219/230 (95%)	197 (90%)	22 (10%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	A4	85/202 (42%)	66 (78%)	18 (21%)	1 (1%)	13	48
6	B4	85/202 (42%)	72 (85%)	12 (14%)	1 (1%)	13	48
6	C4	85/202 (42%)	67 (79%)	15 (18%)	3 (4%)	3	26
6	D4	85/202 (42%)	71 (84%)	11 (13%)	3 (4%)	3	26
6	E4	85/202 (42%)	71 (84%)	13 (15%)	1 (1%)	13	48
All	All	28655/36275 (79%)	25176 (88%)	3381 (12%)	98 (0%)	44	75

All (98) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	h1	172	PRO
4	p1	78	LEU
3	g2	457	GLU
3	h2	191	ALA
4	l2	75	ASP
3	o2	172	PRO
5	T3	21	SER
5	c3	172	ALA
6	A4	74	ILE
6	B4	74	ILE
6	C4	74	ILE
6	E4	74	ILE
3	g5	172	PRO
4	l5	75	ASP
4	p5	78	LEU
3	r5	172	PRO
3	g6	170	ILE
4	l6	75	ASP
3	g7	172	PRO
3	h7	172	PRO
3	h7	190	CYS
4	l7	75	ASP
3	r7	172	PRO
3	r1	398	THR
4	v1	74	CYS
4	v1	75	ASP
3	g2	170	ILE
3	h2	384	ASN
4	p2	77	VAL
4	s2	26	ASP

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Mol	Chain	Res	Type
5	N3	21	SER
6	D4	74	ILE
6	D4	122	VAL
6	D4	123	GLU
3	o5	171	GLY
3	h6	191	ALA
3	o6	172	PRO
3	n7	171	GLY
4	v7	75	ASP
3	g1	172	PRO
3	o1	189	GLU
3	n2	172	PRO
3	o2	189	GLU
3	r2	395	LYS
6	C4	134	ARG
3	h5	190	CYS
3	o5	172	PRO
3	o5	189	GLU
3	r5	396	GLY
3	k6	359	ASN
3	n6	171	GLY
3	o6	171	GLY
3	r6	395	LYS
3	g7	173	ALA
3	k7	359	ASN
3	n7	172	PRO
3	o7	189	GLU
4	p7	77	VAL
3	r7	396	GLY
3	h1	189	GLU
3	h1	190	CYS
3	o1	373	PRO
3	h2	172	PRO
3	k2	359	ASN
3	n2	171	GLY
3	o2	373	PRO
5	Q3	18	VAL
5	T3	13	SER
5	l3	173	ALA
3	o5	373	PRO
3	o6	189	GLU
3	o6	373	PRO

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Mol	Chain	Res	Type
4	p6	77	VAL
4	s6	26	ASP
3	o7	224	ASP
3	o7	373	PRO
3	r7	395	LYS
3	n1	172	PRO
3	o1	172	PRO
3	h2	190	CYS
3	o2	171	GLY
3	o2	224	ASP
3	o6	224	ASP
3	o7	172	PRO
3	r7	171	GLY
3	r7	174	PHE
3	o1	224	ASP
3	h2	382	ILE
4	l2	77	VAL
6	C4	133	GLY
3	n5	172	PRO
3	o5	224	ASP
3	h6	171	GLY
3	h5	172	PRO
3	n5	171	GLY
4	l2	83	GLY
3	n6	172	PRO
3	r5	392	GLY

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	a1	25/32 (78%)	24 (96%)	1 (4%)	31	63
1	a2	25/32 (78%)	24 (96%)	1 (4%)	31	63
1	a5	25/32 (78%)	23 (92%)	2 (8%)	12	40
1	a6	25/32 (78%)	24 (96%)	1 (4%)	31	63

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	a7	25/32 (78%)	24 (96%)	1 (4%)	31	63
1	b1	25/32 (78%)	25 (100%)	0	100	100
1	b2	25/32 (78%)	25 (100%)	0	100	100
1	b5	25/32 (78%)	25 (100%)	0	100	100
1	b6	25/32 (78%)	25 (100%)	0	100	100
1	b7	25/32 (78%)	25 (100%)	0	100	100
1	c	29/32 (91%)	28 (97%)	1 (3%)	37	67
1	d	29/32 (91%)	29 (100%)	0	100	100
1	d1	29/32 (91%)	29 (100%)	0	100	100
1	d2	29/32 (91%)	29 (100%)	0	100	100
1	d5	29/32 (91%)	29 (100%)	0	100	100
1	d6	29/32 (91%)	29 (100%)	0	100	100
1	d7	29/32 (91%)	29 (100%)	0	100	100
1	e	29/32 (91%)	28 (97%)	1 (3%)	37	67
1	e1	25/32 (78%)	25 (100%)	0	100	100
1	e2	25/32 (78%)	25 (100%)	0	100	100
1	e5	25/32 (78%)	25 (100%)	0	100	100
1	e6	25/32 (78%)	25 (100%)	0	100	100
1	e7	25/32 (78%)	25 (100%)	0	100	100
1	f	29/32 (91%)	29 (100%)	0	100	100
1	g	29/32 (91%)	29 (100%)	0	100	100
2	f1	15/175 (9%)	15 (100%)	0	100	100
2	f2	15/175 (9%)	15 (100%)	0	100	100
2	f5	15/175 (9%)	15 (100%)	0	100	100
2	f6	15/175 (9%)	15 (100%)	0	100	100
2	f7	15/175 (9%)	15 (100%)	0	100	100
3	g1	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	g2	240/379 (63%)	234 (98%)	6 (2%)	47	75
3	g5	240/379 (63%)	240 (100%)	0	100	100
3	g6	240/379 (63%)	237 (99%)	3 (1%)	69	86
3	g7	240/379 (63%)	238 (99%)	2 (1%)	81	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	h1	240/379 (63%)	234 (98%)	6 (2%)	47	75
3	h2	240/379 (63%)	234 (98%)	6 (2%)	47	75
3	h5	240/379 (63%)	233 (97%)	7 (3%)	42	71
3	h6	240/379 (63%)	234 (98%)	6 (2%)	47	75
3	h7	240/379 (63%)	239 (100%)	1 (0%)	91	97
3	k1	232/379 (61%)	231 (100%)	1 (0%)	91	97
3	k2	232/379 (61%)	231 (100%)	1 (0%)	91	97
3	k5	232/379 (61%)	232 (100%)	0	100	100
3	k6	232/379 (61%)	232 (100%)	0	100	100
3	k7	232/379 (61%)	232 (100%)	0	100	100
3	n1	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	n2	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	n5	240/379 (63%)	239 (100%)	1 (0%)	91	97
3	n6	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	n7	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	o1	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	o2	240/379 (63%)	239 (100%)	1 (0%)	91	97
3	o5	240/379 (63%)	239 (100%)	1 (0%)	91	97
3	o6	240/379 (63%)	239 (100%)	1 (0%)	91	97
3	o7	240/379 (63%)	238 (99%)	2 (1%)	81	92
3	r1	240/379 (63%)	233 (97%)	7 (3%)	42	71
3	r2	240/379 (63%)	234 (98%)	6 (2%)	47	75
3	r5	240/379 (63%)	235 (98%)	5 (2%)	53	78
3	r6	240/379 (63%)	237 (99%)	3 (1%)	69	86
3	r7	240/379 (63%)	233 (97%)	7 (3%)	42	71
4	l1	112/112 (100%)	108 (96%)	4 (4%)	35	66
4	l2	112/112 (100%)	107 (96%)	5 (4%)	27	60
4	l5	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	l6	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	l7	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	m1	112/112 (100%)	112 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	m2	112/112 (100%)	112 (100%)	0	100	100
4	m5	112/112 (100%)	112 (100%)	0	100	100
4	m6	112/112 (100%)	112 (100%)	0	100	100
4	m7	112/112 (100%)	112 (100%)	0	100	100
4	p1	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	p2	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	p5	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	p6	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	p7	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	q1	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	q2	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	q5	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	q6	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	q7	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	s1	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	s2	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	s5	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	s6	112/112 (100%)	110 (98%)	2 (2%)	59	81
4	s7	112/112 (100%)	109 (97%)	3 (3%)	44	73
4	t1	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	t2	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	t5	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	t6	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	t7	112/112 (100%)	111 (99%)	1 (1%)	78	91
4	u1	111/112 (99%)	111 (100%)	0	100	100
4	u2	111/112 (99%)	109 (98%)	2 (2%)	59	81
4	u5	111/112 (99%)	109 (98%)	2 (2%)	59	81
4	u6	111/112 (99%)	110 (99%)	1 (1%)	78	91
4	u7	111/112 (99%)	109 (98%)	2 (2%)	59	81
4	v1	111/112 (99%)	106 (96%)	5 (4%)	27	60
4	v2	111/112 (99%)	109 (98%)	2 (2%)	59	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	v5	111/112 (99%)	108 (97%)	3 (3%)	44	73
4	v6	111/112 (99%)	109 (98%)	2 (2%)	59	81
4	v7	111/112 (99%)	109 (98%)	2 (2%)	59	81
5	03	186/191 (97%)	185 (100%)	1 (0%)	88	95
5	13	186/191 (97%)	186 (100%)	0	100	100
5	23	186/191 (97%)	186 (100%)	0	100	100
5	33	186/191 (97%)	186 (100%)	0	100	100
5	43	186/191 (97%)	185 (100%)	1 (0%)	88	95
5	53	186/191 (97%)	186 (100%)	0	100	100
5	63	186/191 (97%)	186 (100%)	0	100	100
5	73	186/191 (97%)	186 (100%)	0	100	100
5	83	186/191 (97%)	186 (100%)	0	100	100
5	93	186/191 (97%)	186 (100%)	0	100	100
5	A3	186/191 (97%)	186 (100%)	0	100	100
5	B3	186/191 (97%)	186 (100%)	0	100	100
5	C3	186/191 (97%)	186 (100%)	0	100	100
5	D3	186/191 (97%)	186 (100%)	0	100	100
5	E3	186/191 (97%)	186 (100%)	0	100	100
5	F3	186/191 (97%)	186 (100%)	0	100	100
5	G3	186/191 (97%)	186 (100%)	0	100	100
5	J3	186/191 (97%)	186 (100%)	0	100	100
5	K3	191/191 (100%)	189 (99%)	2 (1%)	76	89
5	L3	186/191 (97%)	185 (100%)	1 (0%)	88	95
5	M3	186/191 (97%)	186 (100%)	0	100	100
5	N3	191/191 (100%)	189 (99%)	2 (1%)	76	89
5	O3	186/191 (97%)	186 (100%)	0	100	100
5	P3	186/191 (97%)	186 (100%)	0	100	100
5	Q3	191/191 (100%)	191 (100%)	0	100	100
5	R3	186/191 (97%)	186 (100%)	0	100	100
5	S3	186/191 (97%)	186 (100%)	0	100	100
5	T3	191/191 (100%)	189 (99%)	2 (1%)	76	89

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	U3	186/191 (97%)	186 (100%)	0	100	100
5	V3	186/191 (97%)	186 (100%)	0	100	100
5	W3	191/191 (100%)	191 (100%)	0	100	100
5	X3	186/191 (97%)	185 (100%)	1 (0%)	88	95
5	Y3	186/191 (97%)	186 (100%)	0	100	100
5	Z3	186/191 (97%)	186 (100%)	0	100	100
5	a3	186/191 (97%)	186 (100%)	0	100	100
5	b3	186/191 (97%)	186 (100%)	0	100	100
5	c3	186/191 (97%)	186 (100%)	0	100	100
5	d3	186/191 (97%)	186 (100%)	0	100	100
5	e3	186/191 (97%)	186 (100%)	0	100	100
5	f3	186/191 (97%)	185 (100%)	1 (0%)	88	95
5	g3	186/191 (97%)	186 (100%)	0	100	100
5	h3	186/191 (97%)	186 (100%)	0	100	100
5	i3	186/191 (97%)	186 (100%)	0	100	100
5	j3	186/191 (97%)	186 (100%)	0	100	100
5	k3	186/191 (97%)	186 (100%)	0	100	100
5	l3	186/191 (97%)	186 (100%)	0	100	100
5	m3	186/191 (97%)	186 (100%)	0	100	100
5	n3	186/191 (97%)	186 (100%)	0	100	100
5	o3	186/191 (97%)	186 (100%)	0	100	100
5	p3	186/191 (97%)	186 (100%)	0	100	100
5	q3	186/191 (97%)	186 (100%)	0	100	100
5	r3	186/191 (97%)	186 (100%)	0	100	100
5	s3	186/191 (97%)	186 (100%)	0	100	100
5	t3	186/191 (97%)	186 (100%)	0	100	100
5	u3	186/191 (97%)	186 (100%)	0	100	100
5	v3	186/191 (97%)	186 (100%)	0	100	100
5	w3	186/191 (97%)	186 (100%)	0	100	100
5	x3	186/191 (97%)	186 (100%)	0	100	100
5	y3	186/191 (97%)	186 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	z3	186/191 (97%)	186 (100%)	0	100	100
6	A4	73/168 (44%)	72 (99%)	1 (1%)	67	85
6	B4	73/168 (44%)	70 (96%)	3 (4%)	30	62
6	C4	73/168 (44%)	72 (99%)	1 (1%)	67	85
6	D4	73/168 (44%)	68 (93%)	5 (7%)	16	47
6	E4	73/168 (44%)	71 (97%)	2 (3%)	44	73
All	All	23920/29825 (80%)	23738 (99%)	182 (1%)	82	92

All (182) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	a1	6	CYS
3	g1	170	ILE
3	g1	403	PHE
3	h1	170	ILE
3	h1	188	ILE
3	h1	190	CYS
3	h1	386	LEU
3	h1	403	PHE
3	h1	455	CYS
3	k1	370	THR
4	l1	73	PHE
4	l1	74	CYS
4	l1	75	ASP
4	l1	129	THR
3	n1	170	ILE
3	n1	252	CYS
3	o1	170	ILE
3	o1	211	LYS
4	p1	75	ASP
4	p1	78	LEU
4	q1	26	ASP
4	q1	106	MET
3	r1	175	PHE
3	r1	252	CYS
3	r1	377	ARG
3	r1	378	GLU
3	r1	379	ARG
3	r1	395	LYS
3	r1	398	THR

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Mol	Chain	Res	Type
4	s1	129	THR
4	t1	137	ARG
4	v1	3	PHE
4	v1	73	PHE
4	v1	74	CYS
4	v1	75	ASP
4	v1	84	LEU
1	a2	5	ASN
3	g2	169	THR
3	g2	170	ILE
3	g2	403	PHE
3	g2	455	CYS
3	g2	456	CYS
3	g2	457	GLU
3	h2	170	ILE
3	h2	188	ILE
3	h2	189	GLU
3	h2	384	ASN
3	h2	386	LEU
3	h2	403	PHE
3	k2	370	THR
4	l2	73	PHE
4	l2	74	CYS
4	l2	76	THR
4	l2	77	VAL
4	l2	129	THR
3	n2	170	ILE
3	n2	252	CYS
3	o2	211	LYS
4	p2	75	ASP
4	p2	77	VAL
4	q2	106	MET
3	r2	175	PHE
3	r2	176	THR
3	r2	377	ARG
3	r2	379	ARG
3	r2	395	LYS
3	r2	398	THR
4	s2	37	THR
4	s2	129	THR
4	t2	137	ARG
4	u2	132	MET

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Mol	Chain	Res	Type
4	u2	136	THR
4	v2	3	PHE
4	v2	84	LEU
5	K3	19	CYS
5	K3	23	CYS
5	L3	180	ARG
5	N3	22	CYS
5	N3	23	CYS
5	T3	15	SER
5	T3	21	SER
5	X3	180	ARG
5	f3	175	ARG
5	43	135	ASP
5	03	135	ASP
6	A4	74	ILE
6	B4	74	ILE
6	B4	134	ARG
6	B4	135	ARG
6	C4	134	ARG
6	D4	122	VAL
6	D4	123	GLU
6	D4	125	GLN
6	D4	134	ARG
6	D4	136	CYS
6	E4	74	ILE
6	E4	134	ARG
1	a5	5	ASN
1	a5	6	CYS
3	h5	170	ILE
3	h5	190	CYS
3	h5	221	TYR
3	h5	384	ASN
3	h5	386	LEU
3	h5	403	PHE
3	h5	455	CYS
4	l5	73	PHE
4	l5	74	CYS
3	n5	170	ILE
3	o5	211	LYS
4	p5	75	ASP
4	p5	78	LEU
4	q5	106	MET

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Mol	Chain	Res	Type
3	r5	175	PHE
3	r5	176	THR
3	r5	379	ARG
3	r5	395	LYS
3	r5	398	THR
4	s5	129	THR
4	t5	137	ARG
4	u5	93	VAL
4	u5	94	THR
4	v5	3	PHE
4	v5	73	PHE
4	v5	74	CYS
1	a6	6	CYS
3	g6	169	THR
3	g6	170	ILE
3	g6	403	PHE
3	h6	170	ILE
3	h6	188	ILE
3	h6	190	CYS
3	h6	193	LEU
3	h6	385	CYS
3	h6	403	PHE
4	l6	73	PHE
4	l6	74	CYS
3	n6	170	ILE
3	n6	221	TYR
3	o6	211	LYS
4	p6	75	ASP
4	p6	77	VAL
4	q6	106	MET
3	r6	175	PHE
3	r6	379	ARG
3	r6	395	LYS
4	s6	34	THR
4	s6	129	THR
4	t6	137	ARG
4	u6	96	ASP
4	v6	3	PHE
4	v6	84	LEU
1	a7	6	CYS
3	g7	176	THR
3	g7	403	PHE

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Mol	Chain	Res	Type
3	h7	455	CYS
4	l7	73	PHE
4	l7	129	THR
3	n7	221	TYR
3	n7	252	CYS
3	o7	170	ILE
3	o7	211	LYS
4	p7	75	ASP
4	p7	77	VAL
4	q7	106	MET
3	r7	170	ILE
3	r7	175	PHE
3	r7	377	ARG
3	r7	379	ARG
3	r7	395	LYS
3	r7	398	THR
3	r7	460	ARG
4	s7	34	THR
4	s7	37	THR
4	s7	129	THR
4	t7	9	PHE
4	u7	94	THR
4	u7	96	ASP
4	v7	3	PHE
4	v7	74	CYS
1	c	24	PHE
1	e	24	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (260) such sidechains are listed below:

Mol	Chain	Res	Type
3	g1	187	ASN
3	g1	239	HIS
3	g1	359	ASN
3	g1	384	ASN
3	h1	277	HIS
3	h1	280	ASN
3	h1	314	ASN
3	h1	346	GLN
3	h1	347	ASN
3	h1	359	ASN
3	k1	324	GLN

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Mol	Chain	Res	Type
3	k1	359	ASN
3	k1	431	GLN
3	k1	458	HIS
4	l1	122	ASN
4	m1	127	GLN
3	n1	280	ASN
3	n1	283	GLN
3	o1	282	ASN
3	o1	314	ASN
3	o1	346	GLN
3	o1	384	ASN
3	o1	458	HIS
4	p1	2	ASN
4	p1	122	ASN
4	p1	127	GLN
3	r1	254	ASN
3	r1	282	ASN
3	r1	292	ASN
3	r1	359	ASN
3	r1	384	ASN
3	r1	444	GLN
4	t1	52	HIS
4	t1	127	GLN
4	u1	125	ASN
4	v1	127	GLN
1	d2	5	ASN
3	g2	239	HIS
3	g2	359	ASN
3	g2	384	ASN
3	h2	277	HIS
3	h2	280	ASN
3	h2	314	ASN
3	h2	346	GLN
3	h2	359	ASN
3	k2	324	GLN
3	k2	431	GLN
3	k2	458	HIS
4	l2	122	ASN
4	m2	4	ASN
4	m2	127	GLN
3	n2	239	HIS
3	n2	280	ASN

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Mol	Chain	Res	Type
3	n2	359	ASN
3	o2	282	ASN
3	o2	346	GLN
3	o2	384	ASN
3	o2	458	HIS
4	p2	2	ASN
4	p2	4	ASN
4	p2	122	ASN
4	p2	127	GLN
3	r2	254	ASN
3	r2	292	ASN
3	r2	347	ASN
3	r2	384	ASN
4	t2	127	GLN
4	u2	122	ASN
4	u2	125	ASN
4	v2	107	ASN
5	J3	142	ASN
5	K3	218	HIS
5	L3	182	HIS
5	M3	142	ASN
5	N3	108	ASN
5	N3	218	HIS
5	O3	182	HIS
5	P3	142	ASN
5	R3	112	ASN
5	R3	182	HIS
5	S3	142	ASN
5	S3	182	HIS
5	U3	182	HIS
5	V3	142	ASN
5	V3	182	HIS
5	W3	182	HIS
5	X3	112	ASN
5	X3	182	HIS
5	Y3	10	ASN
5	Y3	55	ASN
5	a3	182	HIS
5	b3	55	ASN
5	e3	55	ASN
5	g3	182	HIS
5	h3	55	ASN

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Mol	Chain	Res	Type
5	j3	182	HIS
5	k3	55	ASN
5	m3	99	GLN
5	n3	112	ASN
5	o3	55	ASN
5	o3	108	ASN
5	o3	144	ASN
5	p3	55	ASN
5	p3	120	ASN
5	q3	10	ASN
5	q3	112	ASN
5	r3	108	ASN
5	s3	55	ASN
5	s3	120	ASN
5	s3	218	HIS
5	t3	112	ASN
5	u3	55	ASN
5	u3	108	ASN
5	v3	55	ASN
5	v3	218	HIS
5	w3	112	ASN
5	w3	142	ASN
5	x3	55	ASN
5	x3	108	ASN
5	y3	55	ASN
5	y3	218	HIS
5	z3	112	ASN
5	13	55	ASN
5	13	108	ASN
5	23	55	ASN
5	23	120	ASN
5	43	142	ASN
5	53	55	ASN
5	53	112	ASN
5	53	120	ASN
5	83	55	ASN
5	83	120	ASN
5	83	182	HIS
5	A3	55	ASN
5	A3	144	ASN
5	A3	182	HIS
5	B3	182	HIS

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Mol	Chain	Res	Type
5	D3	55	ASN
5	D3	120	ASN
5	D3	144	ASN
5	F3	112	ASN
5	G3	55	ASN
5	G3	112	ASN
5	G3	120	ASN
5	G3	182	HIS
6	A4	112	GLN
6	B4	112	GLN
6	D4	112	GLN
6	D4	125	GLN
1	d5	5	ASN
3	g5	178	GLN
3	g5	187	ASN
3	g5	239	HIS
3	g5	359	ASN
3	g5	384	ASN
3	h5	277	HIS
3	h5	280	ASN
3	h5	314	ASN
3	h5	346	GLN
3	h5	347	ASN
3	h5	359	ASN
3	k5	324	GLN
3	k5	346	GLN
3	k5	359	ASN
3	k5	431	GLN
3	k5	458	HIS
4	l5	122	ASN
4	m5	127	GLN
3	n5	280	ASN
3	n5	282	ASN
3	n5	283	GLN
3	o5	259	GLN
3	o5	282	ASN
3	o5	346	GLN
3	o5	384	ASN
3	o5	458	HIS
4	p5	2	ASN
4	p5	122	ASN
4	p5	127	GLN

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Mol	Chain	Res	Type
3	r5	282	ASN
3	r5	292	ASN
3	r5	347	ASN
3	r5	359	ASN
3	r5	384	ASN
4	s5	109	GLN
4	t5	127	GLN
4	u5	122	ASN
4	u5	125	ASN
4	v5	30	GLN
4	v5	127	GLN
1	d6	5	ASN
3	g6	187	ASN
3	g6	239	HIS
3	g6	346	GLN
3	g6	384	ASN
3	h6	277	HIS
3	h6	280	ASN
3	h6	282	ASN
3	h6	314	ASN
3	h6	346	GLN
3	h6	359	ASN
3	k6	324	GLN
3	k6	431	GLN
3	k6	458	HIS
4	l6	122	ASN
4	m6	127	GLN
3	n6	280	ASN
3	n6	359	ASN
3	o6	259	GLN
3	o6	346	GLN
3	o6	384	ASN
3	o6	458	HIS
4	p6	122	ASN
4	p6	127	GLN
3	r6	254	ASN
3	r6	292	ASN
3	r6	359	ASN
3	r6	384	ASN
4	s6	109	GLN
4	t6	127	GLN
4	u6	125	ASN

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Mol	Chain	Res	Type
4	v6	107	ASN
1	a7	5	ASN
1	d7	5	ASN
3	g7	187	ASN
3	g7	239	HIS
3	g7	359	ASN
3	g7	384	ASN
3	h7	314	ASN
3	h7	346	GLN
3	h7	359	ASN
3	k7	324	GLN
3	k7	346	GLN
3	k7	431	GLN
3	k7	458	HIS
4	l7	122	ASN
4	m7	127	GLN
3	n7	280	ASN
3	n7	283	GLN
3	n7	359	ASN
3	o7	259	GLN
3	o7	314	ASN
3	o7	346	GLN
3	o7	384	ASN
3	o7	458	HIS
4	p7	2	ASN
4	p7	109	GLN
4	p7	122	ASN
4	p7	127	GLN
3	r7	277	HIS
3	r7	282	ASN
3	r7	347	ASN
3	r7	384	ASN
4	s7	122	ASN
4	t7	127	GLN
4	u7	122	ASN
4	u7	125	ASN
4	v7	48	ASN
4	v7	127	GLN
1	f	11	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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.

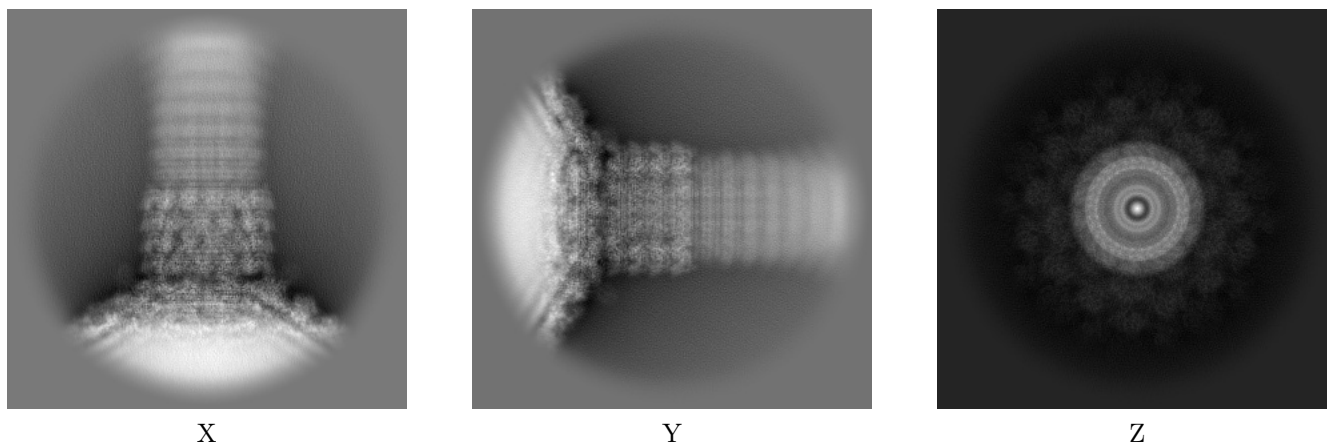
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-29504. These allow visual inspection of the internal detail of the map and identification of artifacts.

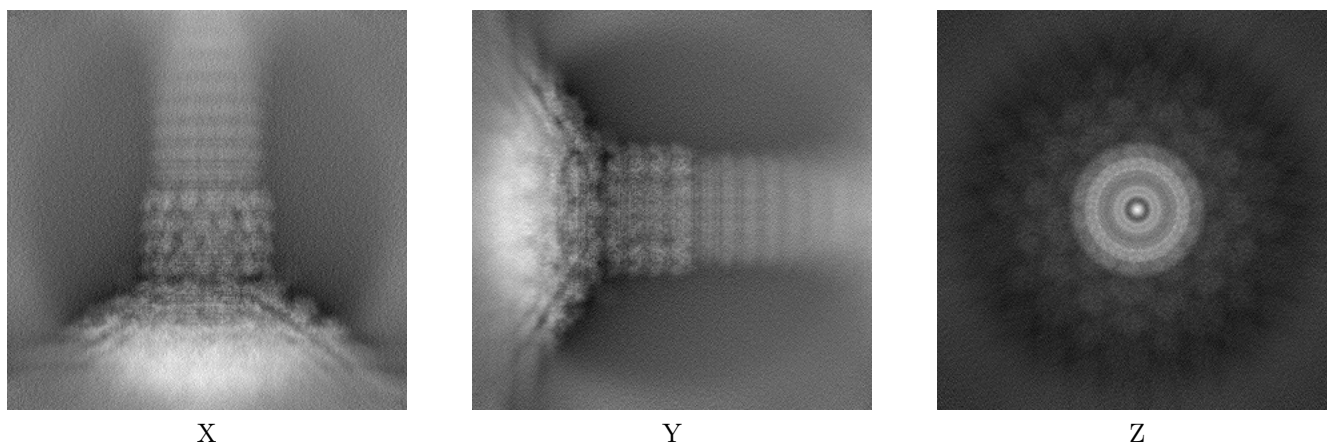
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



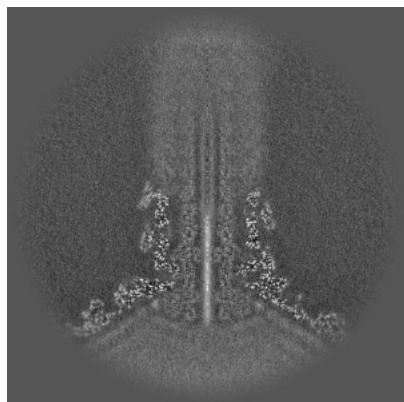
6.1.2 Raw map



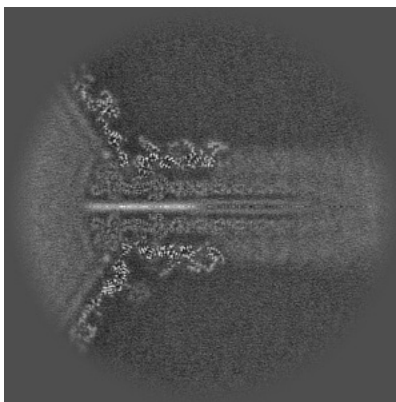
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

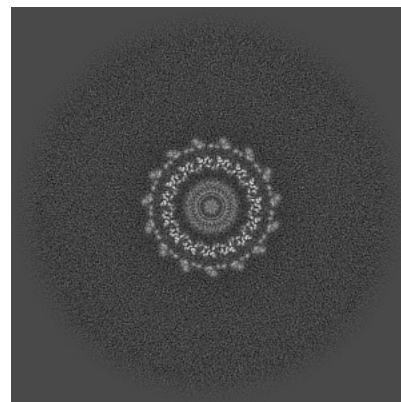
6.2.1 Primary map



X Index: 300

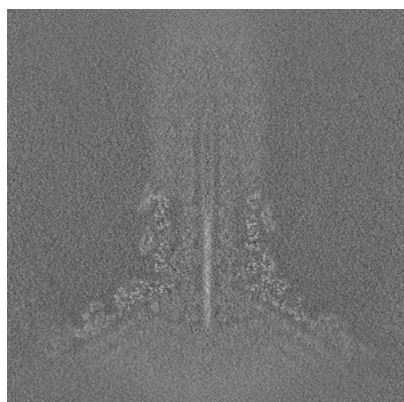


Y Index: 300

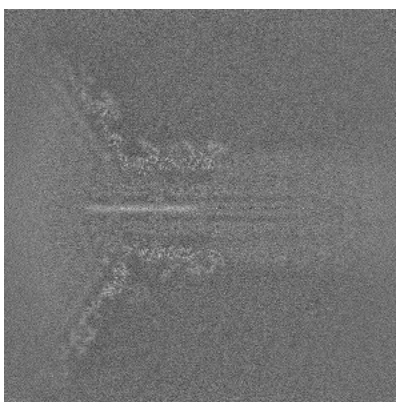


Z Index: 300

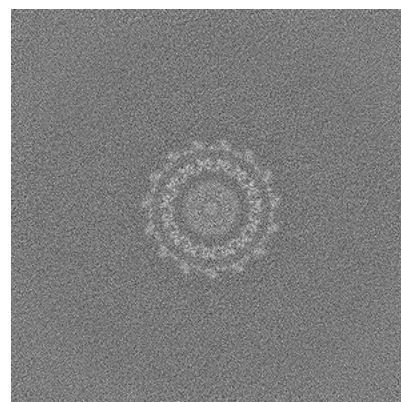
6.2.2 Raw map



X Index: 300



Y Index: 300

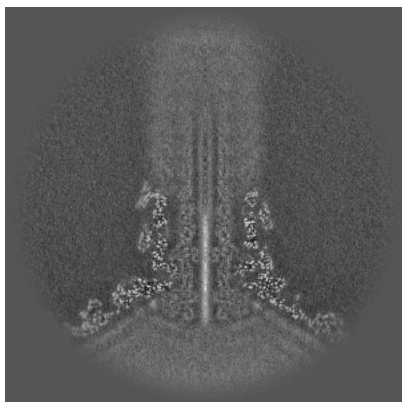


Z Index: 300

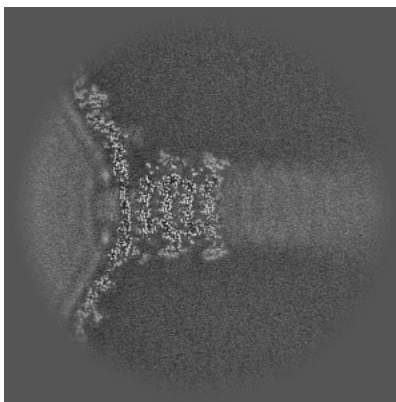
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

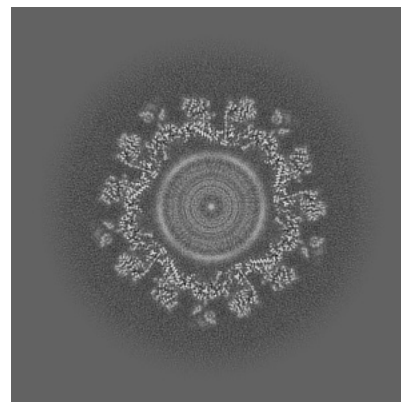
6.3.1 Primary map



X Index: 300

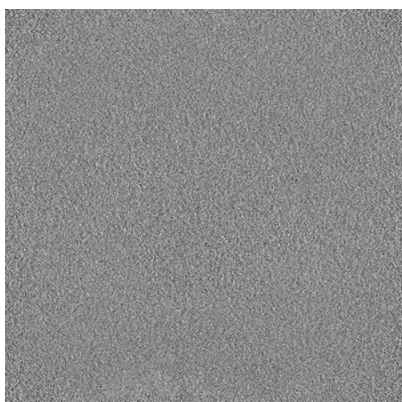


Y Index: 239

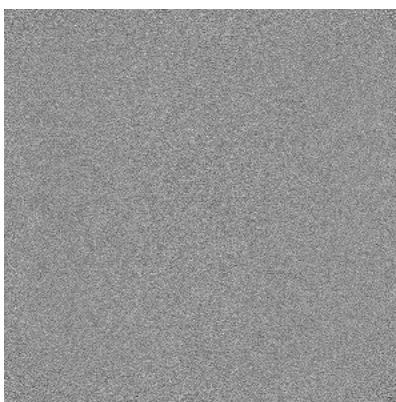


Z Index: 156

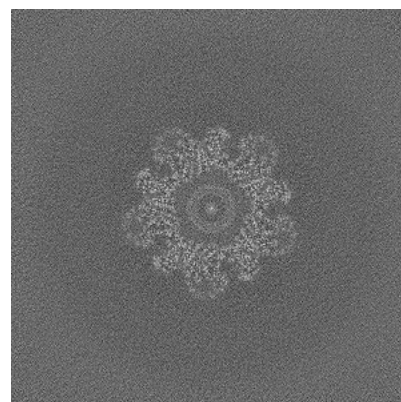
6.3.2 Raw map



X Index: 0



Y Index: 0

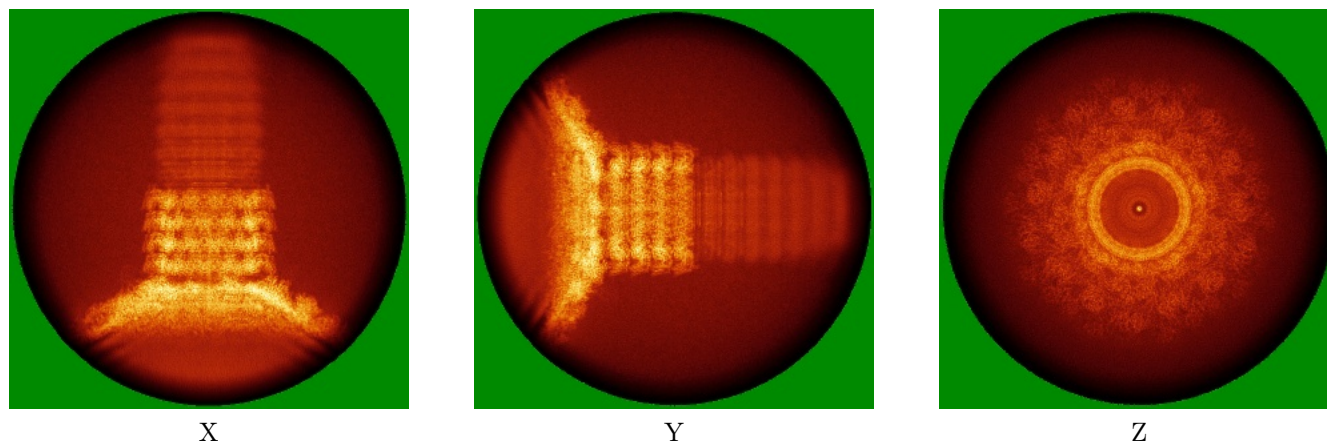


Z Index: 179

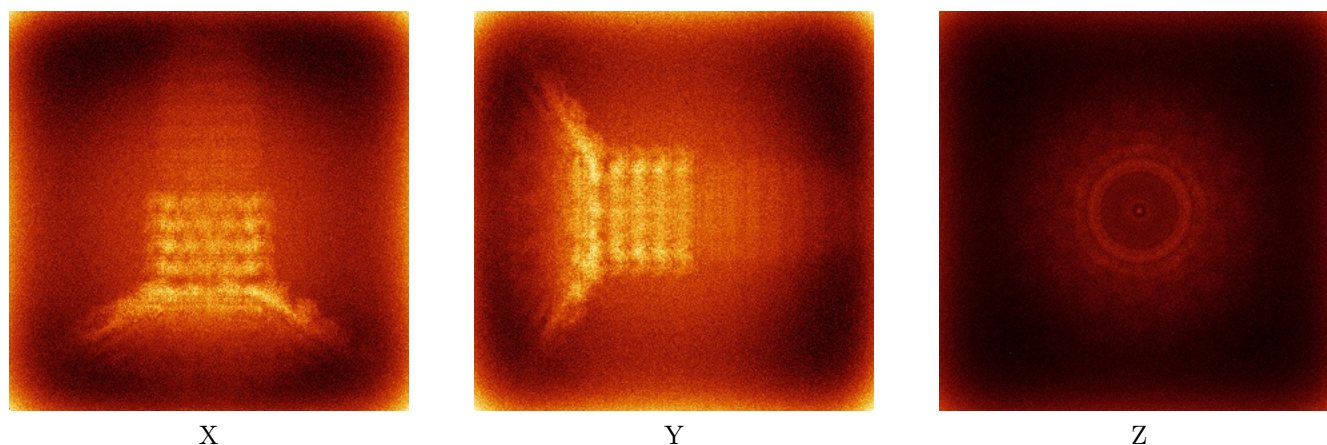
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



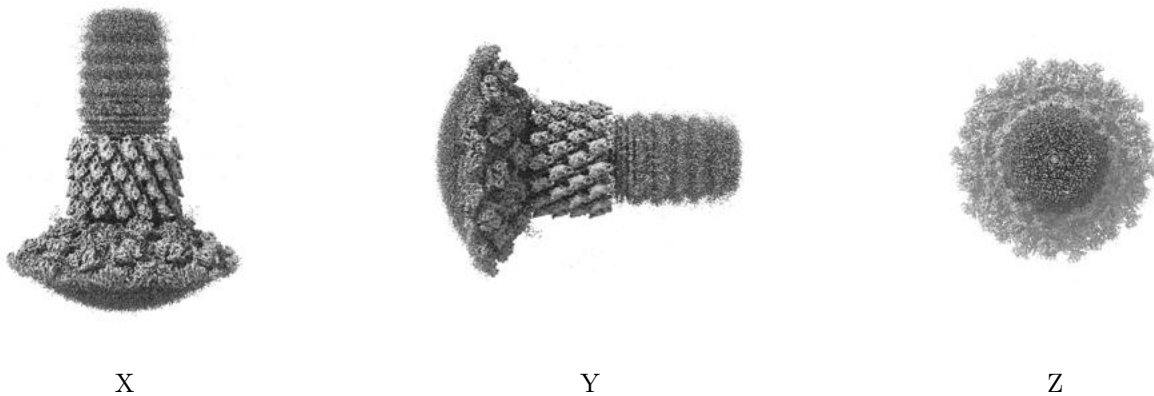
6.4.2 Raw map



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

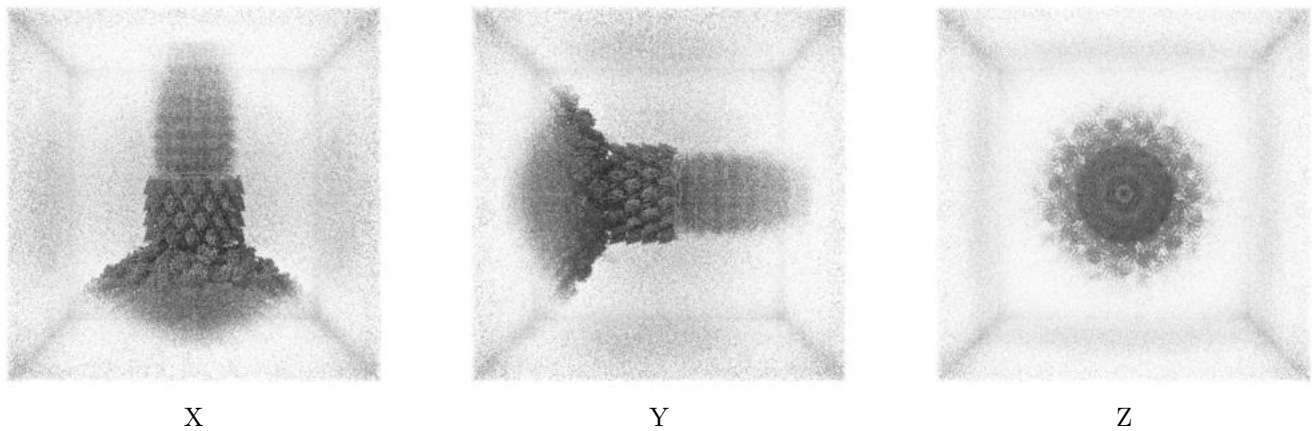
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

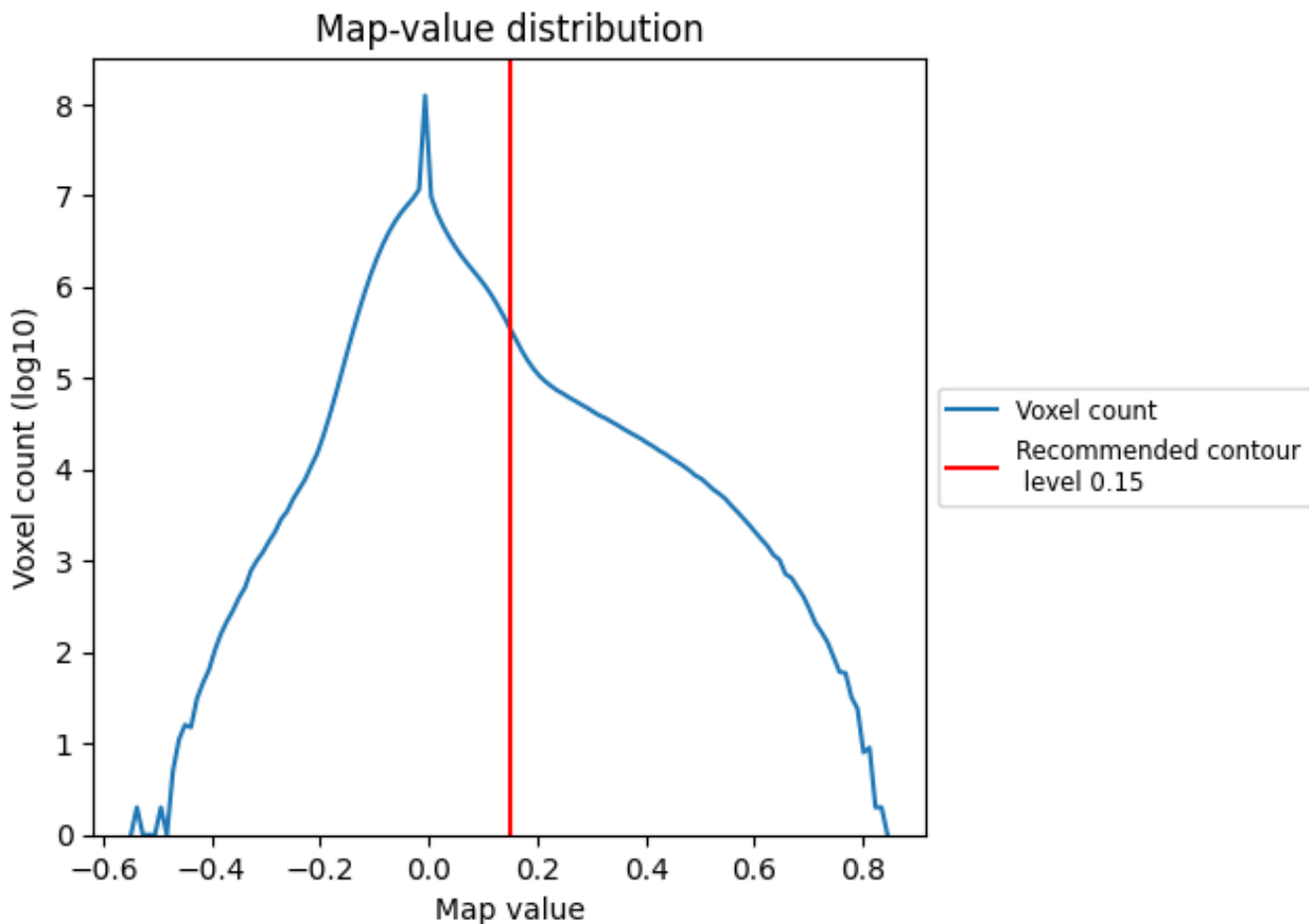
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

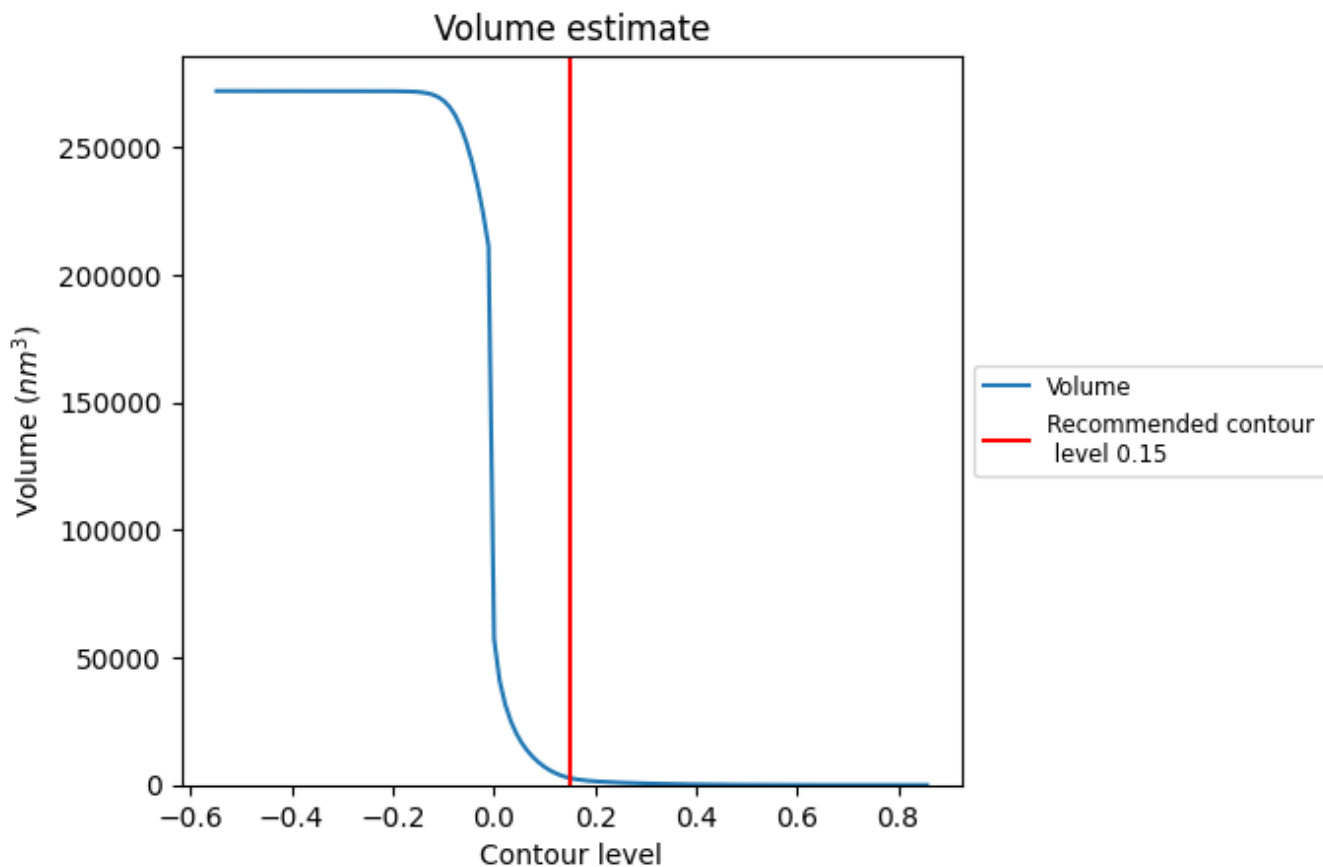
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

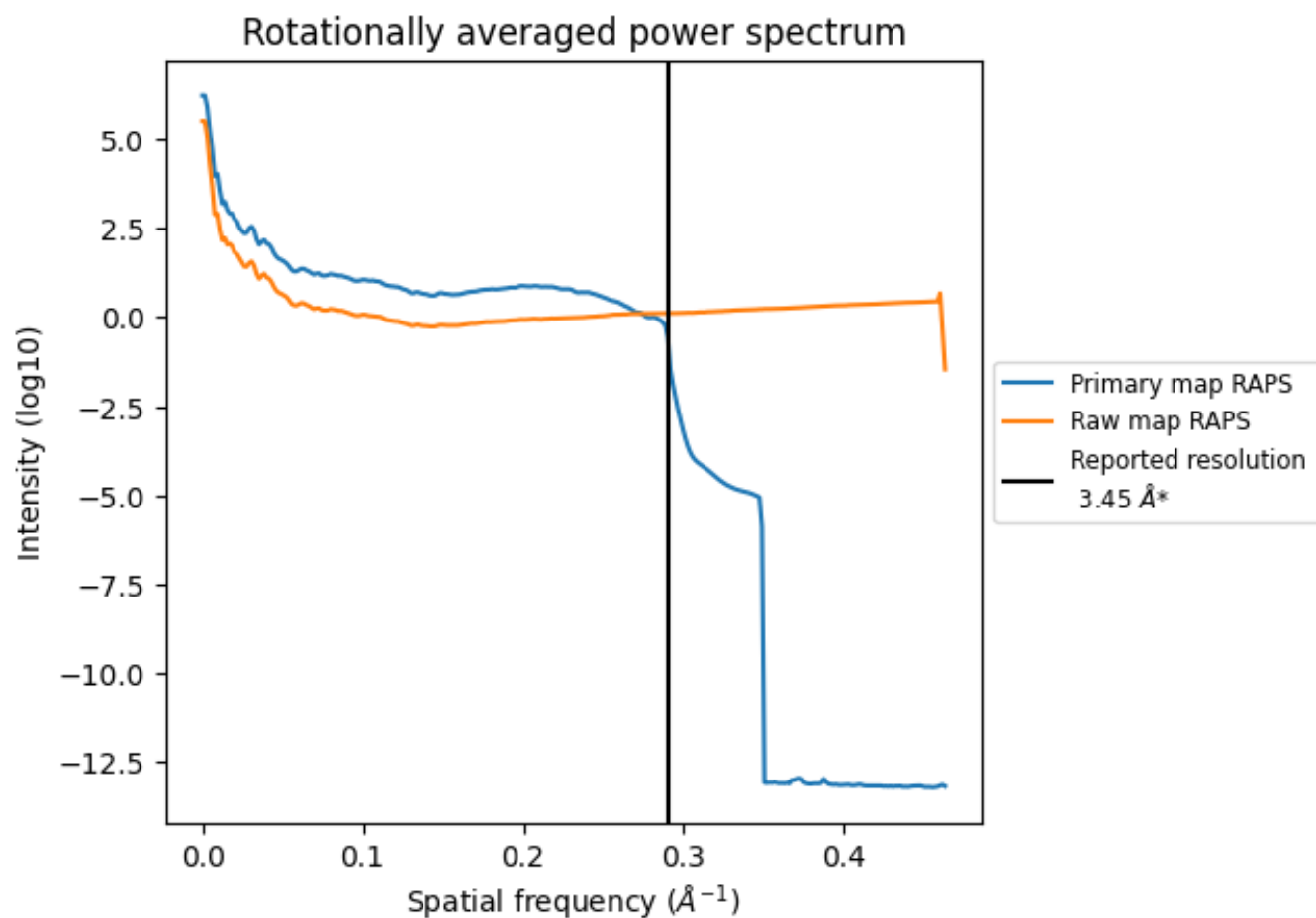
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 2752 nm^3 ; this corresponds to an approximate mass of 2486 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](#)

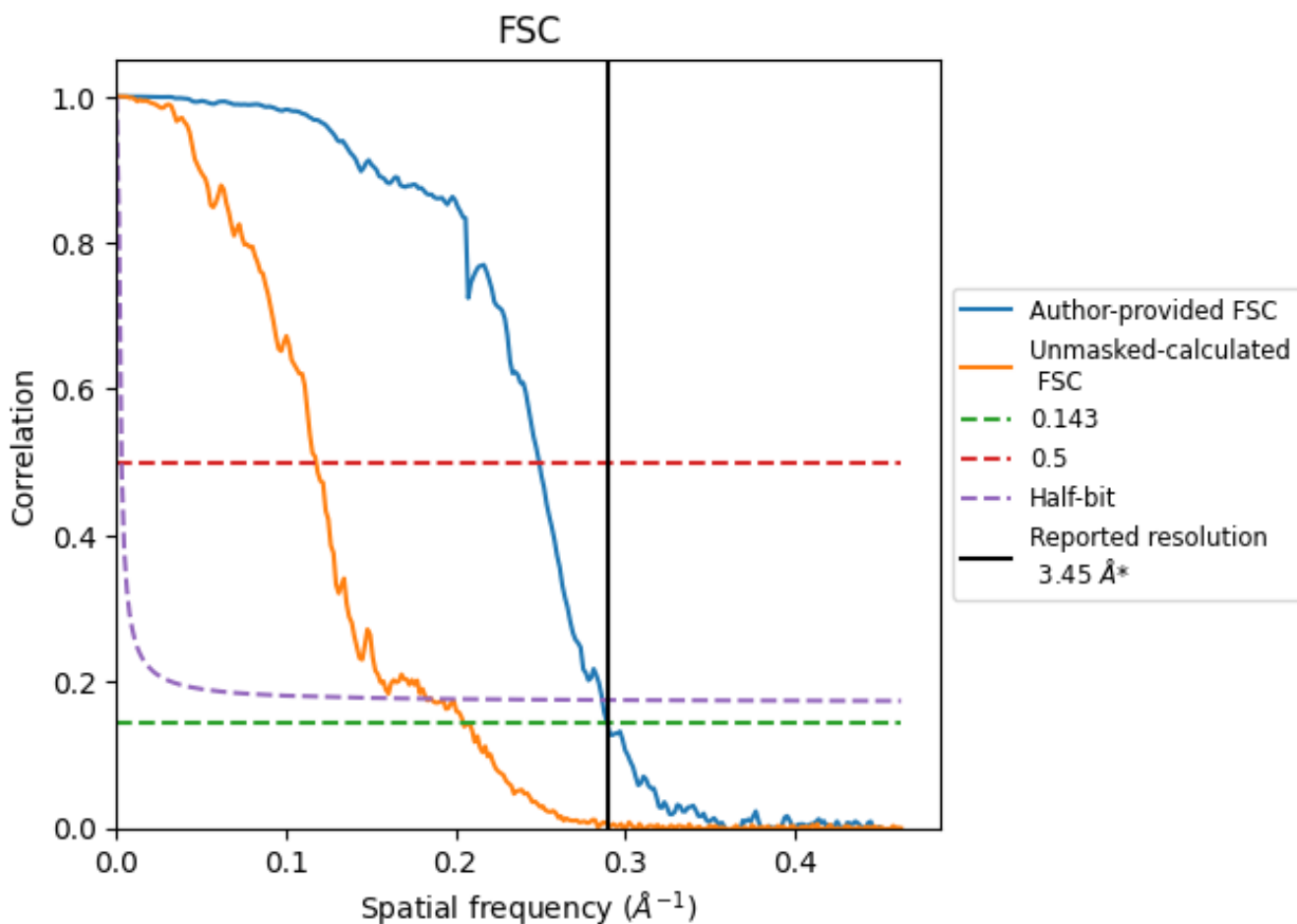


*Reported resolution corresponds to spatial frequency of 0.290 Å⁻¹

8 Fourier-Shell correlation [i](#)

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

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.290 Å⁻¹

8.2 Resolution estimates [i](#)

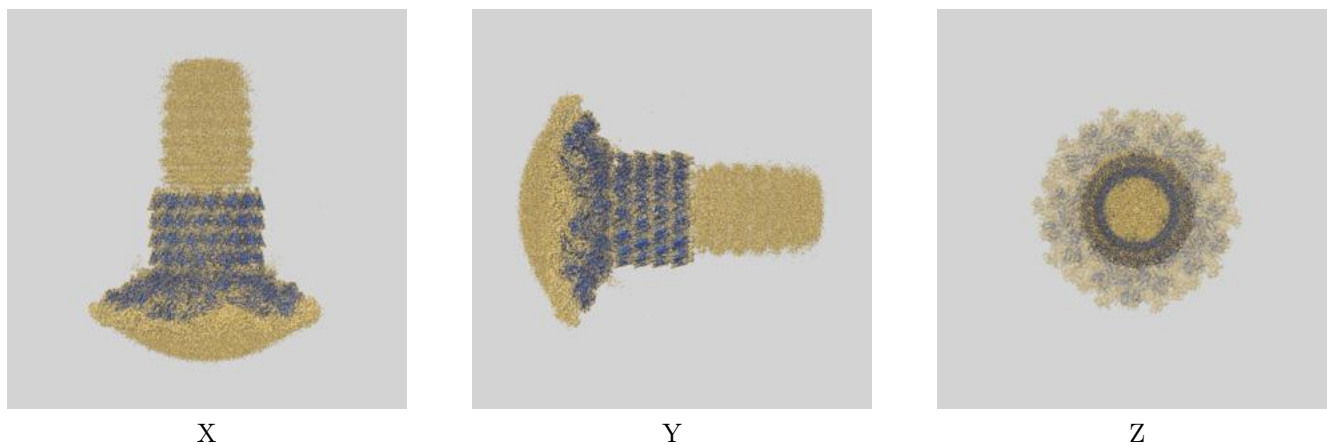
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.45	-	-
Author-provided FSC curve	3.45	4.01	3.49
Unmasked-calculated*	4.89	8.49	5.46

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.89 differs from the reported value 3.45 by more than 10 %

9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-29504 and PDB model 8FWG. Per-residue inclusion information can be found in section 3 on page 19.

9.1 Map-model overlay [i](#)

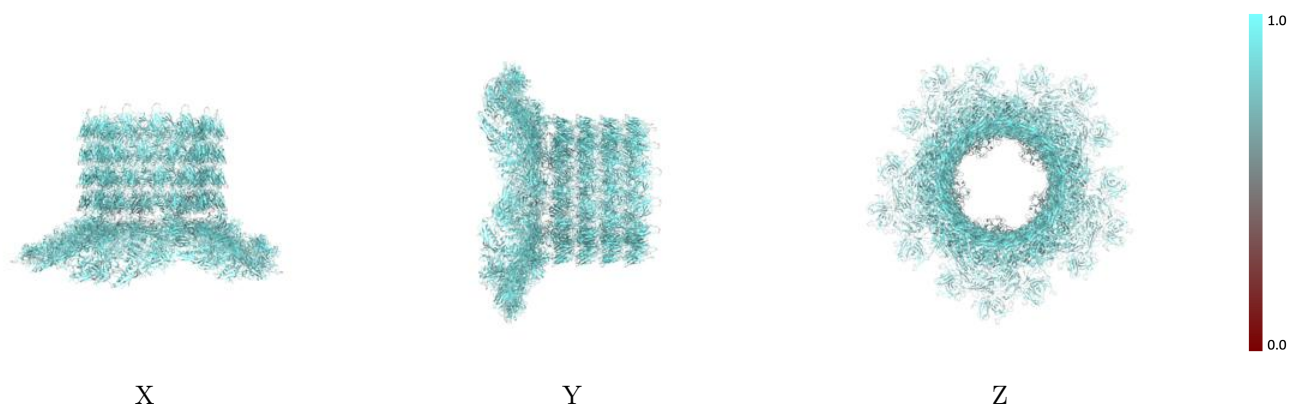


The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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

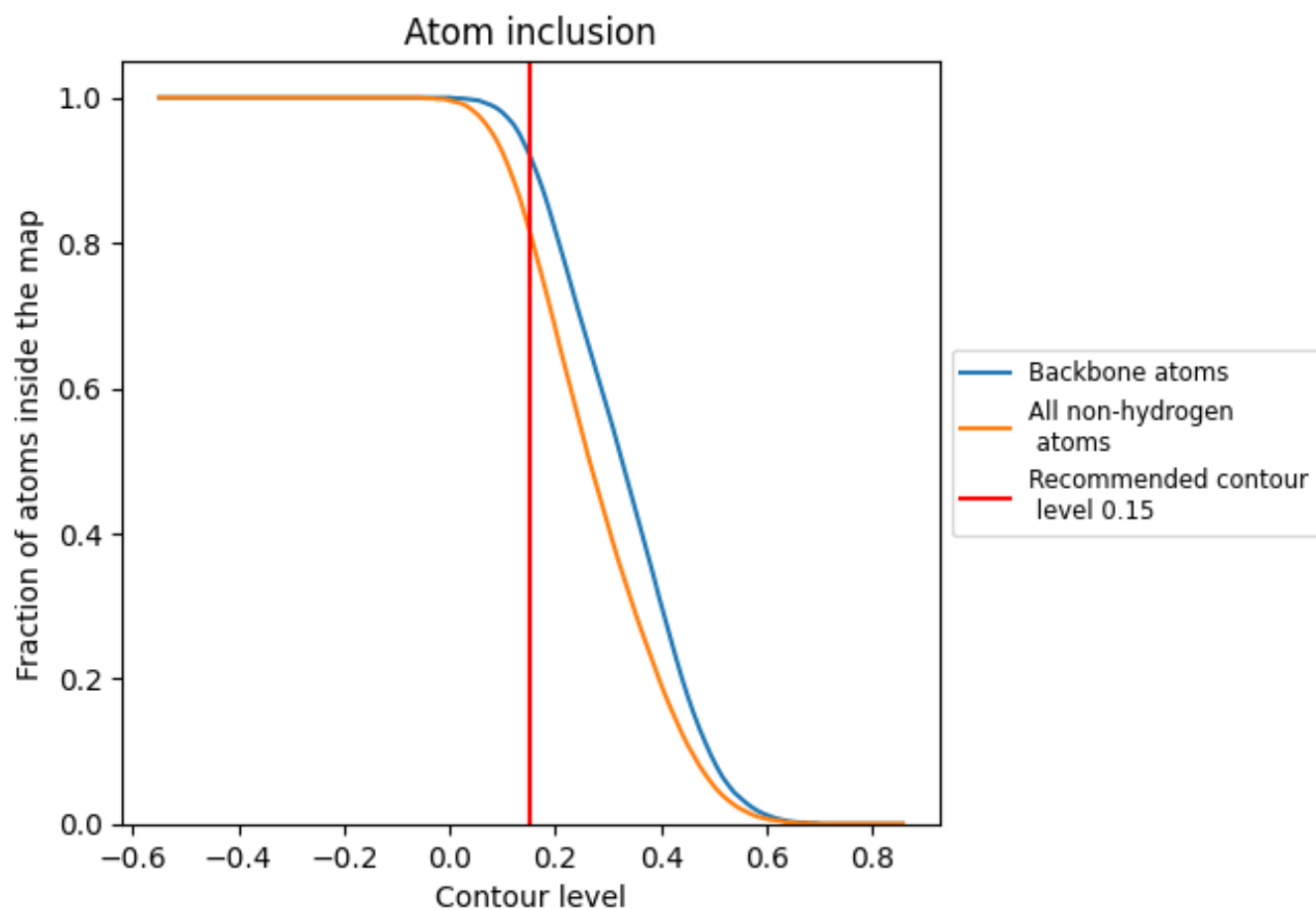
This section was not generated.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.15).




































9.4 Atom inclusion [i](#)



At the recommended contour level, 92% 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 (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion
All	 0.8190
03	 0.8310
13	 0.8610
23	 0.8580
33	 0.8270
43	 0.8280
53	 0.8440
63	 0.8330
73	 0.8290
83	 0.8360
93	 0.8310
A3	 0.8390
A4	 0.6250
B3	 0.8320
B4	 0.6270
C3	 0.8310
C4	 0.6300
D3	 0.8390
D4	 0.6040
E3	 0.8300
E4	 0.6220
F3	 0.8330
G3	 0.8220
J3	 0.8550
K3	 0.8010
L3	 0.8050
M3	 0.8470
N3	 0.7990
O3	 0.8050
P3	 0.8560
Q3	 0.8060
R3	 0.8100
S3	 0.8590
T3	 0.8070
U3	 0.8020













































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Chain	Atom inclusion
V3	0.8560
W3	0.7950
X3	0.8100
Y3	0.8490
Z3	0.8550
a1	0.8330
a2	0.8370
a3	0.8420
a5	0.8330
a6	0.8180
a7	0.8470
b1	0.7680
b2	0.7540
b3	0.8500
b5	0.7830
b6	0.7680
b7	0.7730
c	0.8000
c3	0.8480
d	0.7920
d1	0.8000
d2	0.7790
d3	0.8500
d5	0.7920
d6	0.7870
d7	0.7920
e	0.7960
e1	0.7390
e2	0.7630
e3	0.8520
e5	0.7630
e6	0.7490
e7	0.7590
f	0.8000
f1	0.6990
f2	0.7130
f3	0.8480
f5	0.6990
f6	0.7130
f7	0.7060
g	0.7960
g1	0.8200











































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Chain	Atom inclusion
g2	 0.8250
g3	 0.8450
g5	 0.8200
g6	 0.8240
g7	 0.8190
h1	 0.8380
h2	 0.8410
h3	 0.8480
h5	 0.8410
h6	 0.8420
h7	 0.8400
i3	 0.8530
j3	 0.8500
k1	 0.8150
k2	 0.8170
k3	 0.8480
k5	 0.8160
k6	 0.8160
k7	 0.8140
l1	 0.8530
l2	 0.8540
l3	 0.8530
l5	 0.8530
l6	 0.8570
l7	 0.8490
m1	 0.8420
m2	 0.8430
m3	 0.8490
m5	 0.8450
m6	 0.8510
m7	 0.8500
n1	 0.8400
n2	 0.8390
n3	 0.8620
n5	 0.8410
n6	 0.8450
n7	 0.8410
o1	 0.8010
o2	 0.8030
o3	 0.8650
o5	 0.8000
o6	 0.8040






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Chain	Atom inclusion
o7	 0.7990
p1	 0.8030
p2	 0.8030
p3	 0.8550
p5	 0.8050
p6	 0.8010
p7	 0.8030
q1	 0.7660
q2	 0.7640
q3	 0.8590
q5	 0.7620
q6	 0.7580
q7	 0.7680
r1	 0.8030
r2	 0.8010
r3	 0.8630
r5	 0.8090
r6	 0.8110
r7	 0.8060
s1	 0.7940
s2	 0.7970
s3	 0.8550
s5	 0.7940
s6	 0.7950
s7	 0.7930
t1	 0.7860
t2	 0.7860
t3	 0.8590
t5	 0.7880
t6	 0.7850
t7	 0.7730
u1	 0.7160
u2	 0.7170
u3	 0.8660
u5	 0.7180
u6	 0.7170
u7	 0.7190
v1	 0.7040
v2	 0.7160
v3	 0.8600
v5	 0.7180
v6	 0.7090

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Chain	Atom inclusion
v7	 0.6980
w3	 0.8670
x3	 0.8640
y3	 0.8530
z3	 0.8630