



Full wwPDB EM Validation Report ⓘ

Jan 8, 2024 – 07:13 pm GMT

PDB ID : 8PV8
EMDB ID : EMD-17957
Title : Chaetomium thermophilum pre-60S State 4 - post-5S rotation with Rix1 complex without Foot - composite structure
Authors : Thoms, M.; Cheng, J.; Denk, T.; Berninghausen, O.; Beckmann, R.
Deposited on : 2023-07-17
Resolution : 2.91 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev70
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.9
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

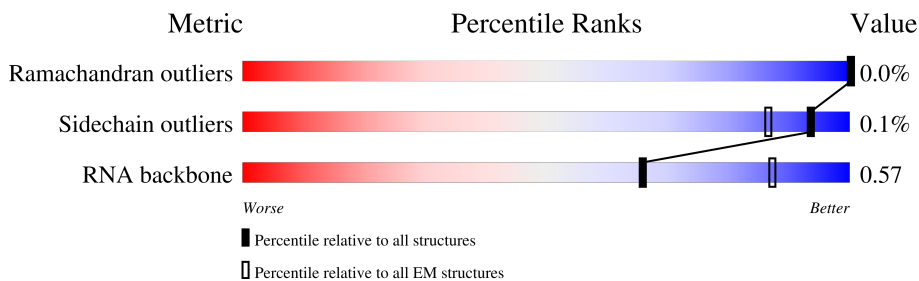
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.91 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.





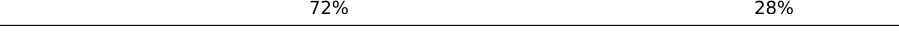
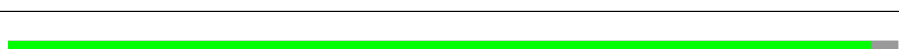
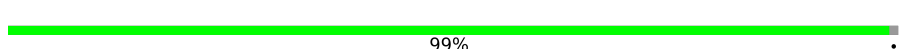
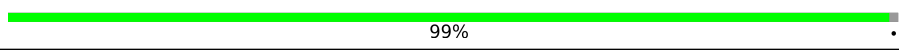
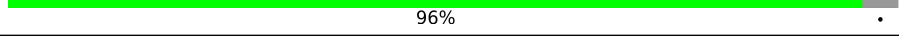
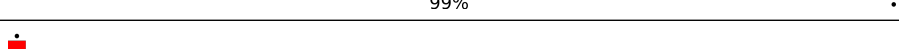

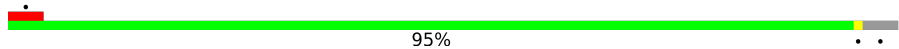
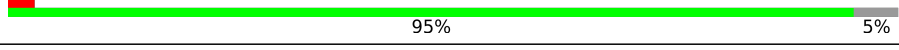
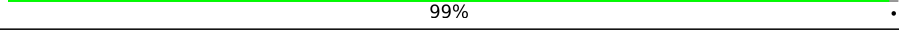
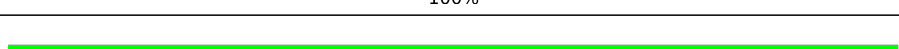
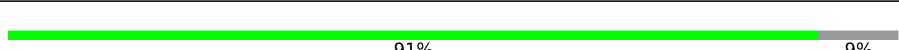

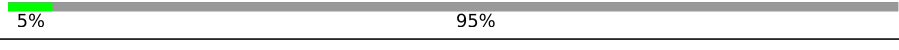
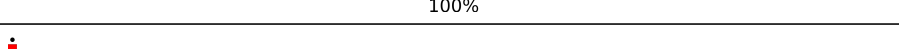


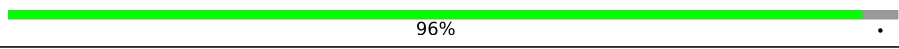
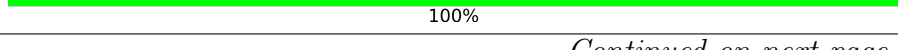



Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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	C1	3342	74% 17% 8%
2	C2	156	82% 14%
3	CF	270	90% 9%
4	CH	661	95% 5%
5	CK	261	89% 11%
6	CL	558	14% 86%
7	CN	246	100%
8	CO	120	52% 48%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
9	CQ	225	 81% 19%
10	Cb	117	 85% 14%
11	Cd	627	 72% 28%
12	Cz	123	 83% 16%
13	LA	254	 97%
14	LB	392	 99%
15	LC	365	 99%
16	LE	200	 96%
17	LF	249	 99%
18	LG	262	 90% 10%
19	LH	192	 99%
20	LK	165	 95%
21	LL	213	 95% 5%
22	LM	142	 99%
23	LN	203	 100%
24	LO	204	 100%
25	LP	187	 91% 9%
26	LQ	213	 69% 31%
27	LR	2898	 5% 95%
28	LS	174	 100%
29	LU	127	 81% 17%
30	LV	139	 97%
31	LX	156	 78% 22%
32	LY	138	 96%
33	LZ	135	100%



Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
34	La	149	72% 28%
35	Lc	108	88% 12%
36	Ld	120	92% 8%
37	Le	131	96%
38	Lf	109	99%
39	Lg	119	97%
40	Lh	935	13% 87%
41	Li	110	92% 8%
42	Lj	95	93% 7%
43	Lk	81	94% 6%
44	Ll	51	98%
45	Lp	92	99%
46	CT	437	89% 10%
46	CU	437	90% 10%
47	CV	781	70% 30%
47	CW	781	70% 30%
48	CS	338	91% 9%
49	CR	767	67% 33%
50	Lt	217	98%
51	Ch	517	75% 25%
52	LJ	173	97%
53	LD	304	98%
54	C4	119	74% 22%
55	Lq	147	94% 5%
56	LT	160	88% 12%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
57	Lb	65	
58	Lr	25	

2 Entry composition [i](#)

There are 62 unique types of molecules in this entry. The entry contains 163368 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 RNA chain called 26S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	C1	3085	66031	29491	11948	21507	3085	0	0

- Molecule 2 is a RNA chain called 5.8S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	C2	150	3196	1429	572	1045	150	0	0

- Molecule 3 is a protein called Large ribosomal subunit protein uL10.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	CF	245	1934	1215	350	360	9	0	0

- Molecule 4 is a protein called Nucleolar GTP-binding protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	CH	627	5061	3180	924	938	19	0	0

- Molecule 5 is a protein called Ribosome biogenesis protein NSA2 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	CK	233	1878	1183	363	328	4	0	0

- Molecule 6 is a protein called Putative GTP binding protein.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
6	CL	79	618	386	124	108	0	0

- Molecule 7 is a protein called Eukaryotic translation initiation factor 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	CN	246	1850	1154	322	368	6	0	0

- Molecule 8 is a protein called DUF2423 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	CO	62	468	290	94	82	2	0	0

- Molecule 9 is a protein called Ribosome biogenesis protein RLP24.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	CQ	183	1476	923	304	239	10	0	0

- Molecule 10 is a protein called Zinc finger domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	Cb	101	830	517	161	148	4	0	0

- Molecule 11 is a protein called Nucleolar GTP-binding protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	Cd	451	3614	2301	660	642	11	0	0

- Molecule 12 is a protein called rRNA-processing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	Cz	103	884	548	183	149	4	0	0

- Molecule 13 is a protein called 60S ribosomal protein L2-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	LA	247	1878	1175	374	326	3	0	0

- Molecule 14 is a protein called 60S ribosomal protein L3-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
14	LB	388	3097	1969	578	537	13	0	0

- Molecule 15 is a protein called 60S ribosomal protein L4-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
15	LC	363	2745	1734	524	478	9	0	0

- Molecule 16 is a protein called 60S ribosomal protein L6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
16	LE	191	1470	941	267	259	3	0	0

- Molecule 17 is a protein called 60S ribosomal protein L7-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
17	LF	248	2023	1297	377	346	3	0	0

- Molecule 18 is a protein called 60S ribosomal protein L8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
18	LG	235	1880	1204	348	323	5	0	0

- Molecule 19 is a protein called 60S ribosomal protein L9-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
19	LH	190	1495	949	268	272	6	0	0

- Molecule 20 is a protein called 60S ribosomal protein L12-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
20	LK	158	1184	743	215	224	2	0	0

- Molecule 21 is a protein called 60S ribosomal protein L13.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
21	LL	203	1587	989	325	271	2	0	0

- Molecule 22 is a protein called 60S ribosomal protein L14-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	LM	141	1126	714	216	195	1	0	0

- Molecule 23 is a protein called Ribosomal protein L15.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	LN	202	1704	1062	360	278	4	0	0

- Molecule 24 is a protein called 60S ribosomal protein L16-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	LO	203	1611	1034	305	267	5	0	0

- Molecule 25 is a protein called 60S ribosomal protein l17-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	LP	171	1343	834	274	232	3	0	0

- Molecule 26 is a protein called Ribosomal protein L18-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	LQ	146	1156	730	228	196	2	0	0

- Molecule 27 is a protein called Ribosomal protein L19.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	LR	155	1241	772	262	203	4	0	0

- Molecule 28 is a protein called 60S ribosomal protein L20.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	LS	174	1430	920	267	238	5	0	0

- Molecule 29 is a protein called 60S ribosomal protein L22-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
29	LU	105	838	542	144	151	1	0	0

- Molecule 30 is a protein called 60S ribosomal protein l23-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
30	LV	135	991	630	184	170	7	0	0

- Molecule 31 is a protein called 60S ribosomal protein L25-like protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
31	LX	121	962	617	174	171	0	0

- Molecule 32 is a protein called 60S ribosomal protein L26-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
32	LY	133	1056	658	213	183	2	0	0

- Molecule 33 is a protein called 60S ribosomal protein L27.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
33	LZ	135	1102	707	203	188	4	0	0

- Molecule 34 is a protein called 60S ribosomal protein L28-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
34	La	108	872	556	168	147	1	0	0

- Molecule 35 is a protein called 60S ribosomal protein l30-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
35	Lc	95	705	449	122	129	5	0	0

- Molecule 36 is a protein called Putative 60S ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
36	Ld	110	875	555	171	148	1	0	0

- Molecule 37 is a protein called 60S ribosomal protein L32-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
37	Le	126	1017	640	208	163	6	0	0

- Molecule 38 is a protein called 60S ribosomal protein l33-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
38	Lf	108	862	546	171	144	1	0	0

- Molecule 39 is a protein called Ribosomal protein l34-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
39	Lg	115	885	552	181	148	4	0	0

- Molecule 40 is a protein called dolichyl-diphosphooligosaccharide--protein glycotransferase.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
40	Lh	122	1003	637	198	168	0	0

- Molecule 41 is a protein called 60S ribosomal protein L36.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
41	Li	101	821	506	178	136	1	0	0

- Molecule 42 is a protein called Ribosomal protein L37.

Mol	Chain	Residues	Atoms					AltConf	Trace
42	Lj	88	Total	C	N	O	S	0	0
			698	427	154	112	5		

- Molecule 43 is a protein called 60S ribosomal protein L38-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
43	Lk	76	Total	C	N	O	S	0	0
			624	394	119	109	2		

- Molecule 44 is a protein called Ribosomal protein eL39.

Mol	Chain	Residues	Atoms				AltConf	Trace
44	Ll	50	Total	C	N	O	0	0
			436	275	97	64		

- Molecule 45 is a protein called 60S ribosomal protein L43-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
45	Lp	91	Total	C	N	O	S	0	0
			694	428	138	122	6		

- Molecule 46 is a protein called Pre-rRNA-processing protein IPI3.

Mol	Chain	Residues	Atoms					AltConf	Trace
46	CT	393	Total	C	N	O	S	0	0
			2938	1863	492	566	17		
46	CU	393	Total	C	N	O	S	0	0
			2950	1871	494	568	17		

- Molecule 47 is a protein called Pre-rRNA-processing protein RIX1.

Mol	Chain	Residues	Atoms					AltConf	Trace
47	CW	550	Total	C	N	O	S	0	0
			4204	2685	729	776	14		
47	CV	550	Total	C	N	O	S	0	0
			4217	2691	735	777	14		

- Molecule 48 is a protein called Pre-rRNA-processing protein IPI1.

Mol	Chain	Residues	Atoms					AltConf	Trace
48	CS	307	Total	C	N	O	S	0	0
			2391	1520	418	446	7		

- Molecule 49 is a protein called Protein SDA1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
49	CR	516	3844	2445	683	703	13	0	0

- Molecule 50 is a protein called Ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
50	Lt	214	1660	1056	296	300	8	0	0

- Molecule 51 is a protein called Ribosome assembly protein 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
51	Ch	389	3050	1916	568	557	9	1	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
Ch	117	ASP	GLU	engineered mutation	UNP G0SC29

- Molecule 52 is a protein called Putative ribosomal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
52	LJ	168	1367	854	266	241	6	0	0

- Molecule 53 is a protein called 60S ribosomal protein l5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
53	LD	298	2366	1496	424	443	3	0	0

- Molecule 54 is a RNA chain called 5S rRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
54	C4	115	2451	1093	438	805	115	0	0

- Molecule 55 is a protein called Putative 60S ribosomal protein.

Mol	Chain	Residues	Atoms			AltConf	Trace	
			Total	C	N			O
55	Lq	139	1061	666	207	188	0	0

- Molecule 56 is a protein called 60S ribosomal protein l21-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
56	LT	141	1124	712	215	195	2	0	0

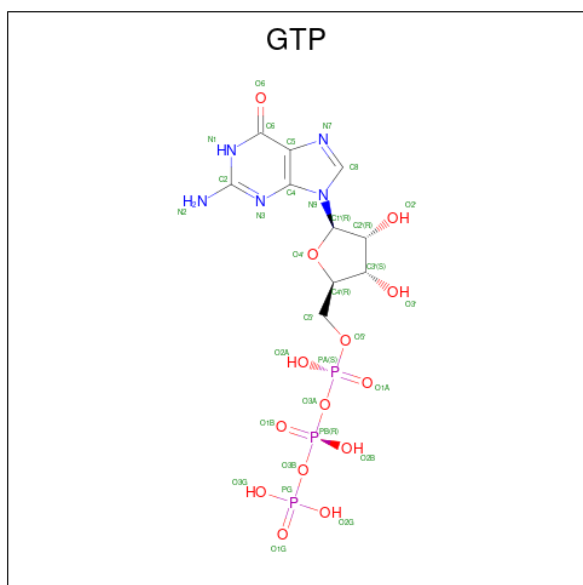
- Molecule 57 is a protein called 60S ribosomal protein L29.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
57	Lb	36	280	175	60	45	0	0

- Molecule 58 is a protein called 60S ribosomal protein L41-A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
58	Lr	15	138	86	35	16	1	0	0

- Molecule 59 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
59	CH	1	32	10	5	14	3	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
59	Cd	1	32	10	5	14	3	0

- Molecule 60 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
60	CH	1	1	1	0
60	Cd	2	2	2	0

- Molecule 61 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
61	CQ	1	1	1	0
61	Cb	1	1	1	0
61	Lg	1	1	1	0
61	Lj	1	1	1	0
61	Lp	1	1	1	0

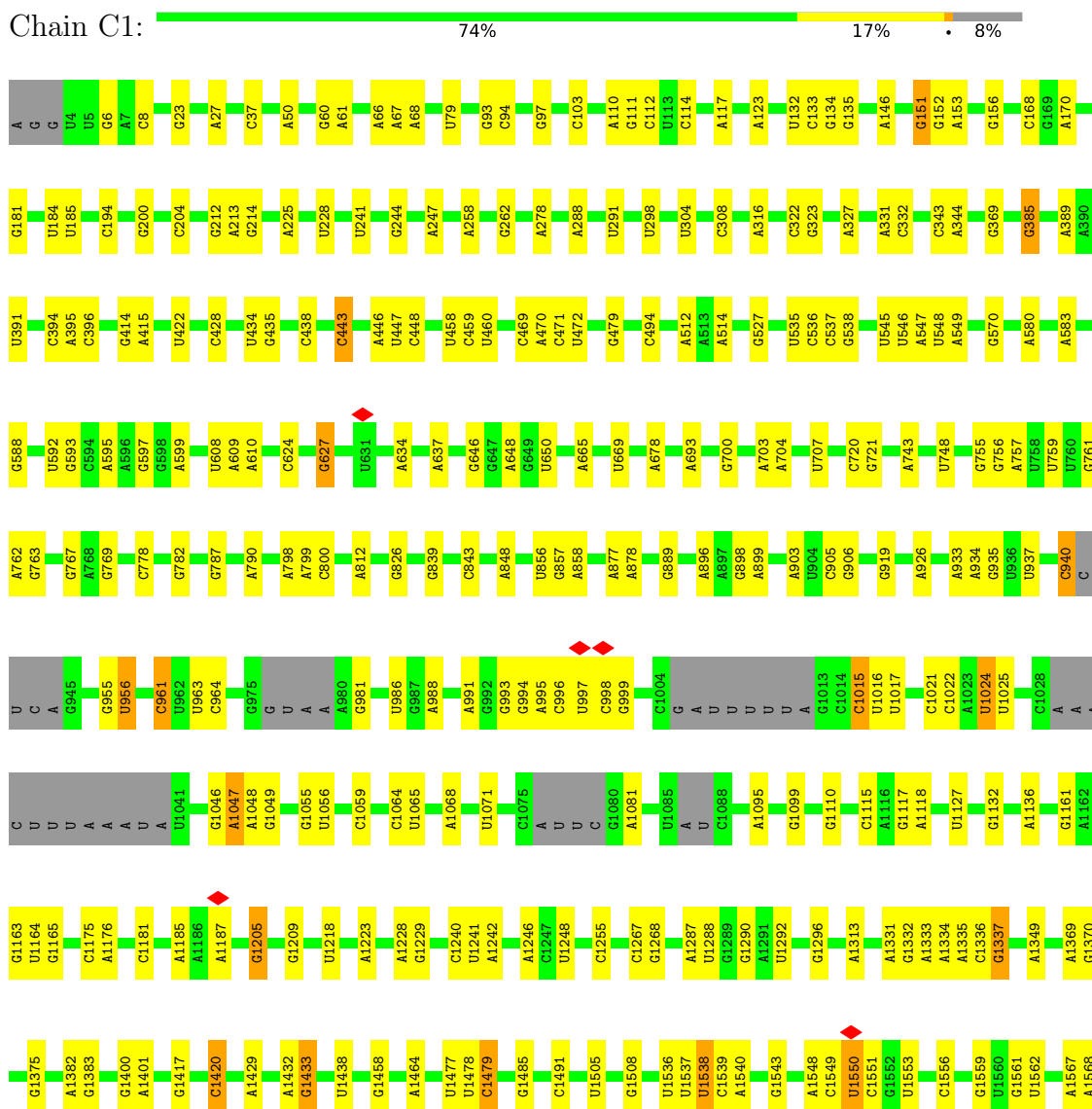
- Molecule 62 is water.

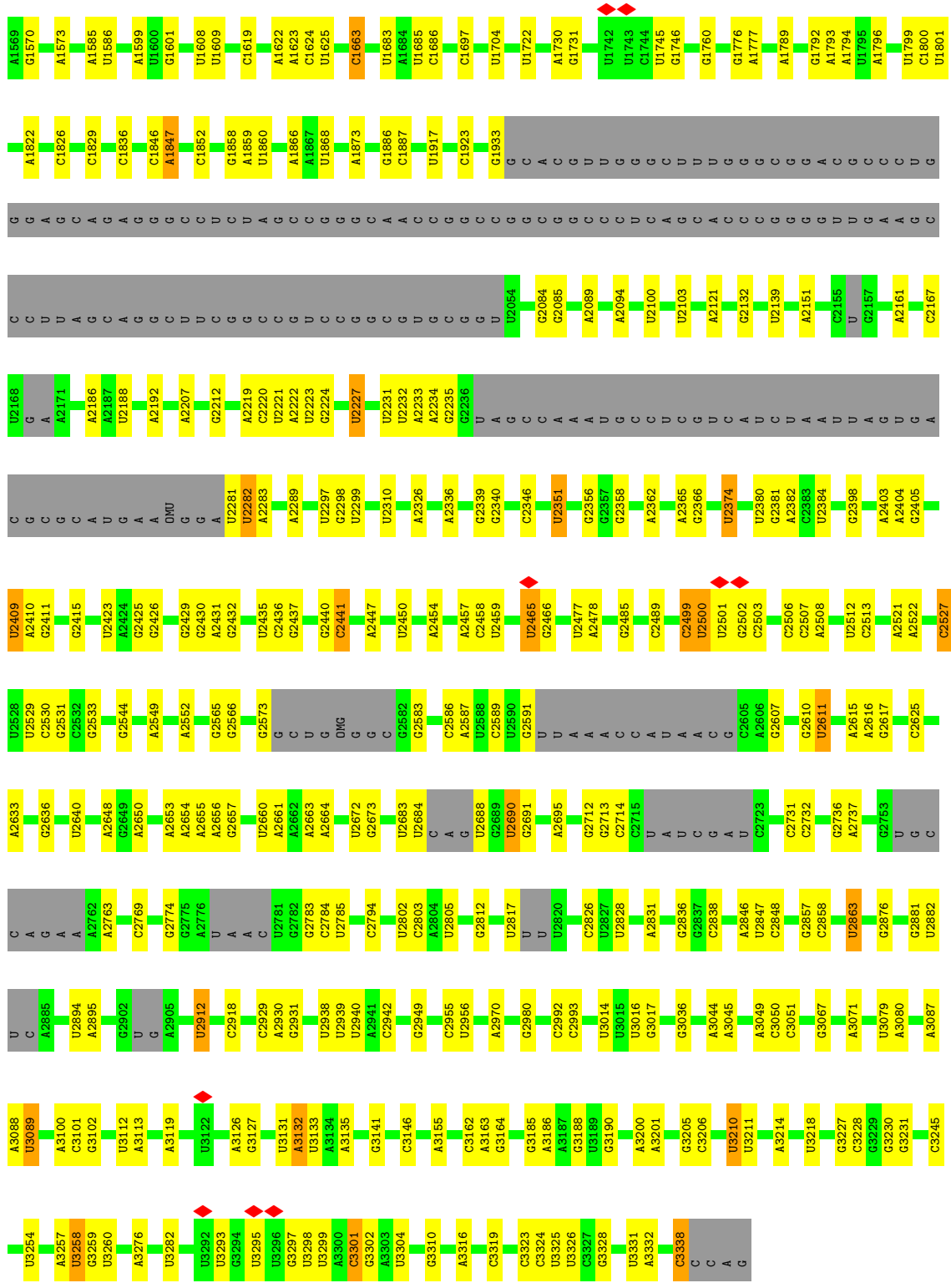
Mol	Chain	Residues	Atoms		AltConf
			Total	O	
62	C1	1	1	1	0
62	CH	1	1	1	0
62	Cd	2	2	2	0

3 Residue-property plots [i](#)

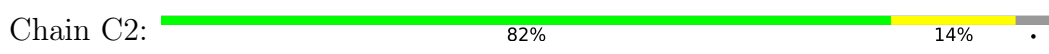
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: 26S rRNA





• Molecule 2: 5.8S rRNA



LYS
MET
GLU
ALA

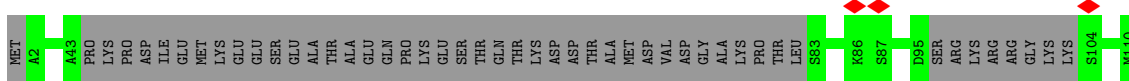
- Molecule 7: Eukaryotic translation initiation factor 6

Chain CN:  100%

There are no outlier residues recorded for this chain.


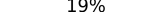
- Molecule 8: DUF2423 domain-containing protein

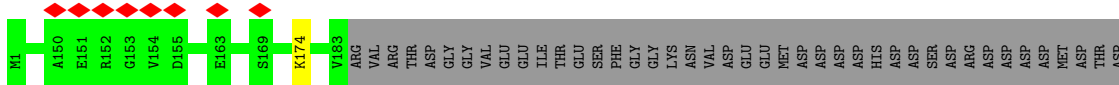
Chain CO:  52%  48%




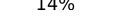
LYS
GLY
PRO
LYS
ARG
ASN
ASN
LEU
LEU
LYS

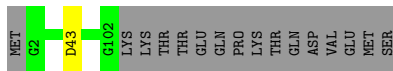
- Molecule 9: Ribosome biogenesis protein RLP24

Chain CQ:  81%  19%



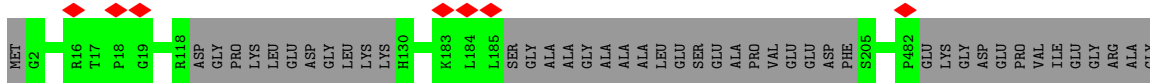
- Molecule 10: Zinc finger domain-containing protein

Chain Cb:  85%  14%



- Molecule 11: Nucleolar GTP-binding protein 2

Chain Cd:  72%  28%




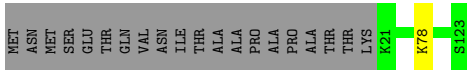
ARG
LEU
GLY
GLU
MET
PRO
LYS
LYS
ARG
LYS
ARG
LYS
ARG
ASP
GLY
GLU
THR
LEU
SER
VAL
ALA
ASP
THR
ALA
GLY
ALA
ALA
PRO
GLY
ASP
SER
ASP
GLU
LEU
VAL
PHE
SER
SER
PHE
SER
SER
LYS
GLY
ASP
ASP
ASP
ASP
ASP
PRO
VAL
GLU
SER
SER
GLU
PHE
SER
SER
SER
LYS
GLY
ASP
ASP
ASP
ASP
ASP
PRO
VAL
ILE
GLY
PHE
SER
SER
SER
VAL
VAL
GLY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

VAL
GLY
LYS
GLU
ALA
GLN
LYS
ASP
SER
SER
ALA
PRO
ASP
MET
ILE
PRO
LEU
SER
VAL
GLY
THR
SER
SER
ASP
GLU
ASP
ASP
TYR
ASN
GLU
GLY
ASP
ASP
GLY
GLY
GLY
GLY
SER
SER
SER
GLU
ASP
GLY
SER
ASP
MET
SER
SER
SER
ASN
PHE
SER
ILE
GLY
ASP
ALA
SER
SER
SER
ILE
GLY
SER
VAL
SER
SER
VAL
GLY
VAL
SER

GLU
PRO
SER
PRO
PRO
LYS
ARG
ARG
LYS
LYS
ALA
ALA
ARG

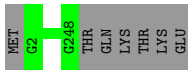
- Molecule 12: rRNA-processing protein

Chain Cz:  83% 16%



- Molecule 13: 60S ribosomal protein L2-like protein

Chain LA:  97%



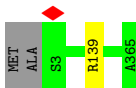
- Molecule 14: 60S ribosomal protein L3-like protein

Chain LB:  99%



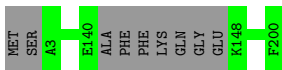
- Molecule 15: 60S ribosomal protein L4-like protein

Chain LC:  99%



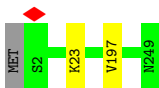
- Molecule 16: 60S ribosomal protein L6

Chain LE:  96%



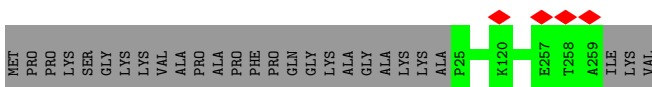
- Molecule 17: 60S ribosomal protein l7-like protein

Chain LF:  99%



- Molecule 18: 60S ribosomal protein L8

Chain LG:  90% 10%



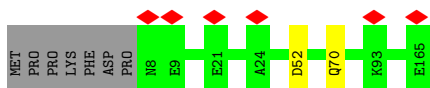
- Molecule 19: 60S ribosomal protein l9-like protein

Chain LH:  99%



- Molecule 20: 60S ribosomal protein L12-like protein

Chain LK:  95%



- Molecule 21: 60S ribosomal protein L13

Chain LL:  95% 5%



- Molecule 22: 60S ribosomal protein L14-like protein

Chain LM:  99%



- Molecule 23: Ribosomal protein L15

Chain LN:  100%



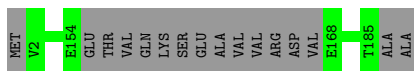
- Molecule 24: 60S ribosomal protein L16-like protein

Chain LO:  100%

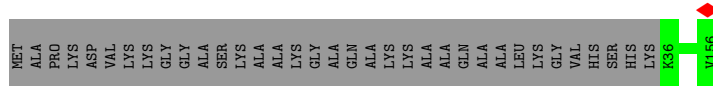
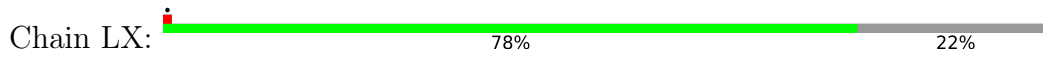


- Molecule 25: 60S ribosomal protein l17-like protein

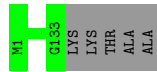
Chain LP:  91% 9%



- Molecule 26: Ribosomal protein L18-like protein



- Molecule 32: 60S ribosomal protein L26-like protein

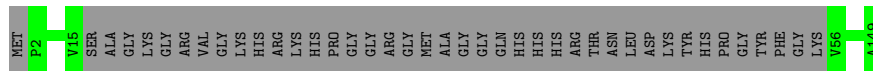


- Molecule 33: 60S ribosomal protein L27

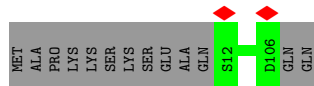
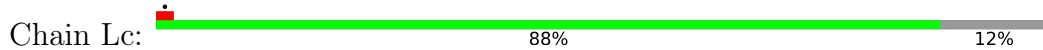


There are no outlier residues recorded for this chain.

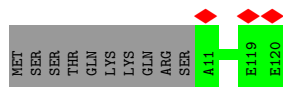
- Molecule 34: 60S ribosomal protein L28-like protein



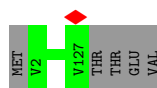
- Molecule 35: 60S ribosomal protein l30-like protein



- Molecule 36: Putative 60S ribosomal protein



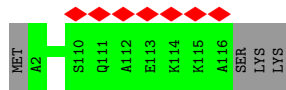
- Molecule 37: 60S ribosomal protein L32-like protein



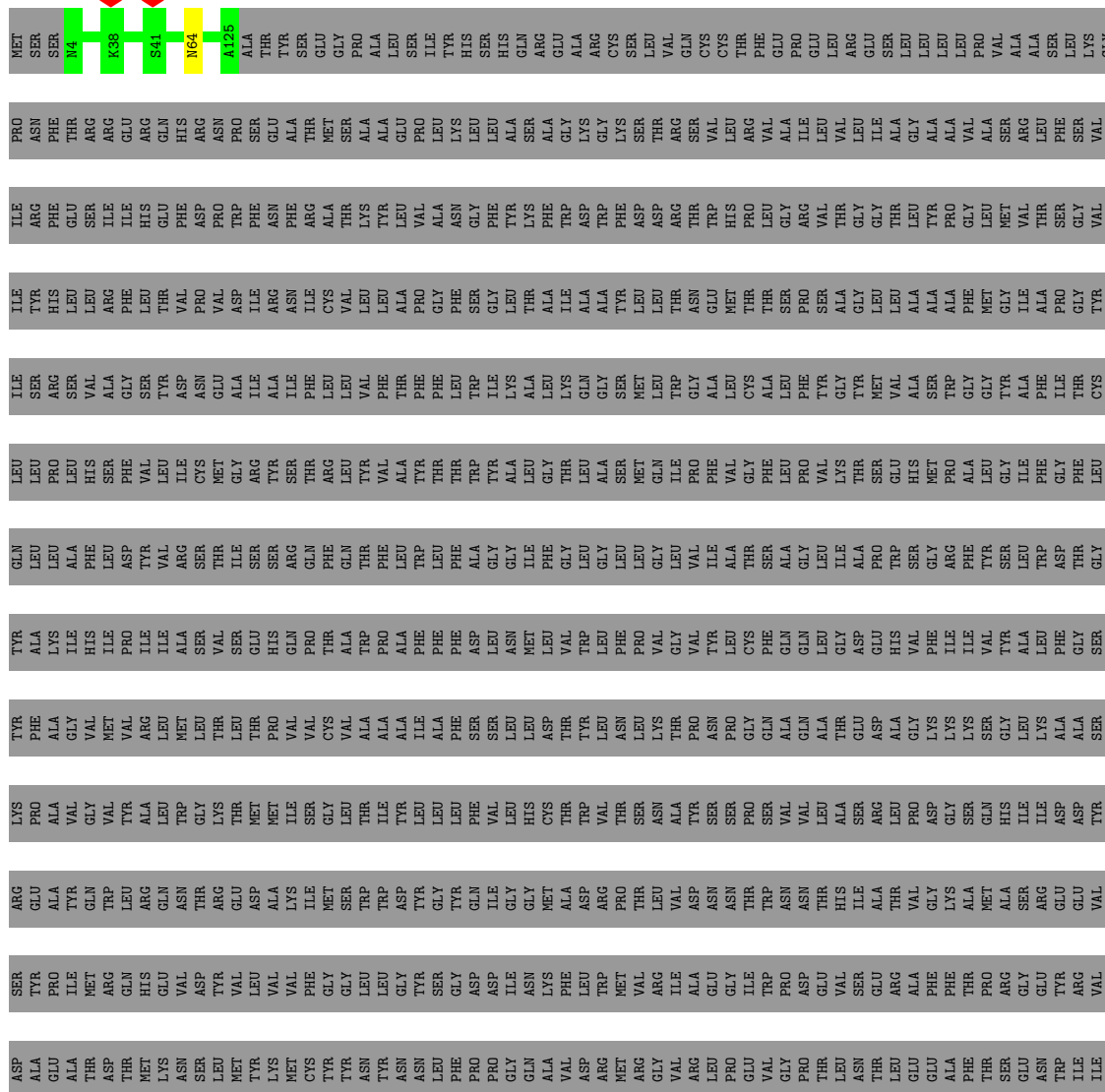
- Molecule 38: 60S ribosomal protein l33-like protein



- Molecule 39: Ribosomal protein l34-like protein

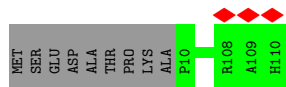
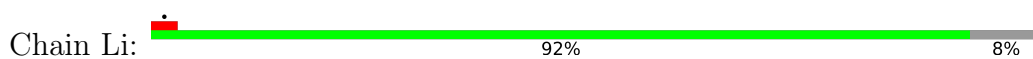


- Molecule 40: dolichyl-diphosphooligosaccharide--protein glycotransferase



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

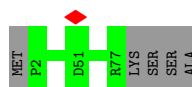
- Molecule 41: 60S ribosomal protein L36



- Molecule 42: Ribosomal protein L37



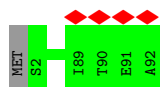
- Molecule 43: 60S ribosomal protein L38-like protein



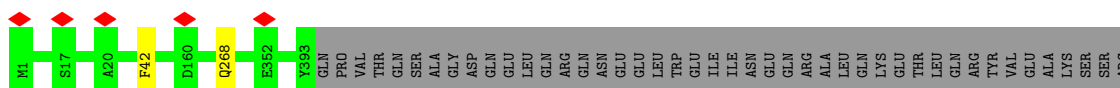
- Molecule 44: Ribosomal protein eL39



- Molecule 45: 60S ribosomal protein L43-like protein

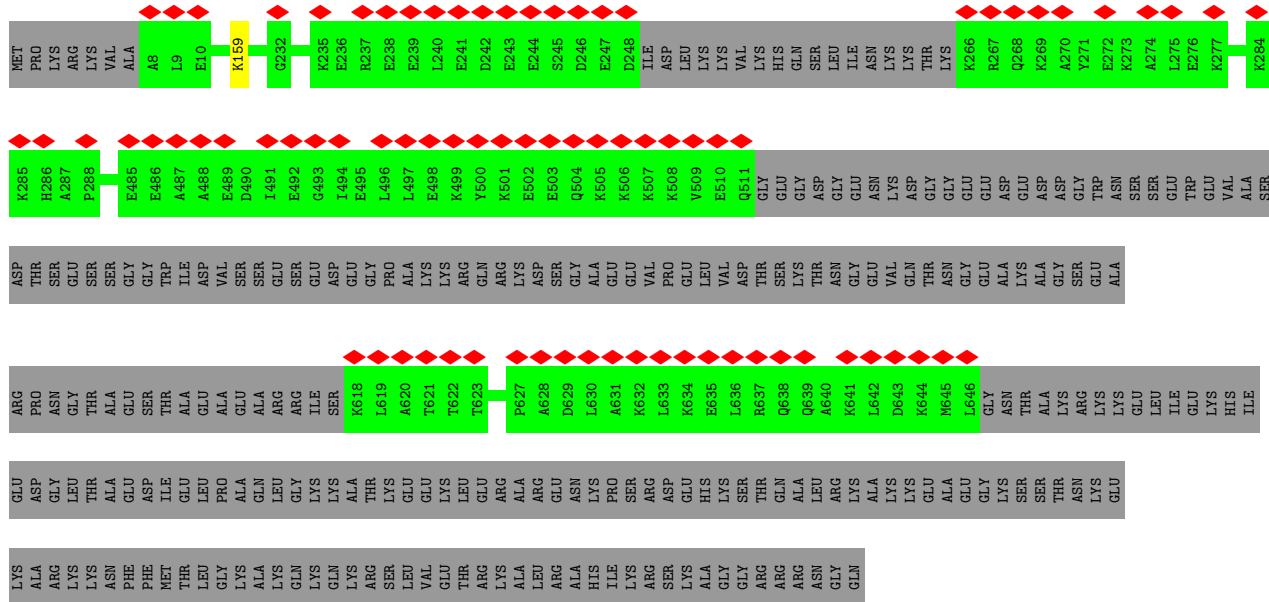


- Molecule 46: Pre-rRNA-processing protein IPI3

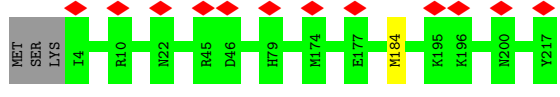


- Molecule 46: Pre-rRNA-processing protein IPI3

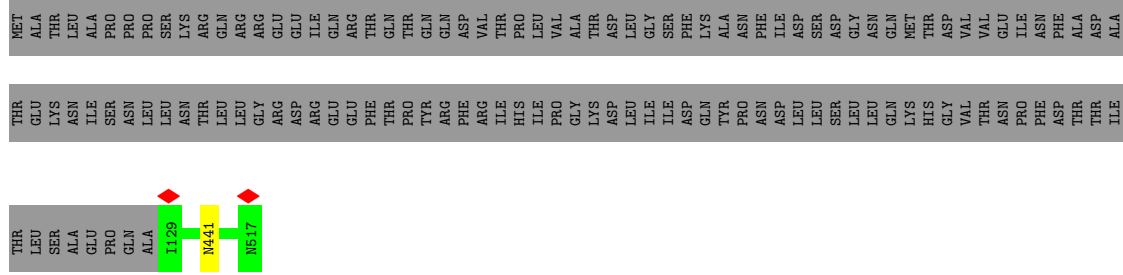
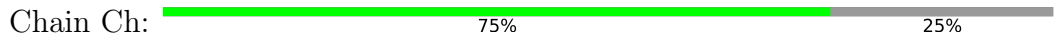




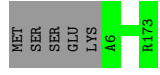
• Molecule 50: Ribosomal protein



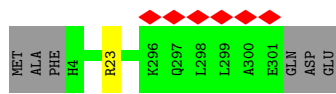
• Molecule 51: Ribosome assembly protein 4



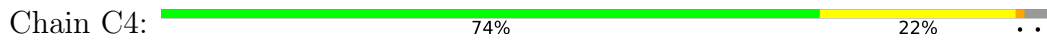
• Molecule 52: Putative ribosomal protein



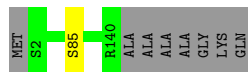
• Molecule 53: 60S ribosomal protein 15-like protein



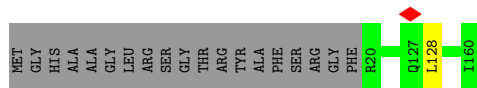
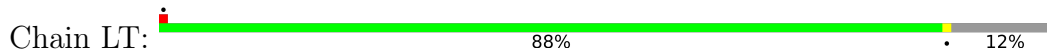
• Molecule 54: 5S rRNA



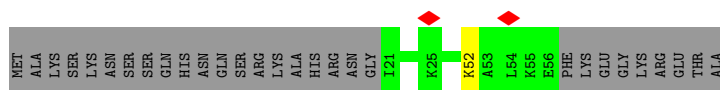
• Molecule 55: Putative 60S ribosomal protein



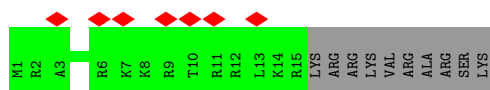
• Molecule 56: 60S ribosomal protein l21-like protein



• Molecule 57: 60S ribosomal protein L29



• Molecule 58: 60S ribosomal protein L41-A



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21061	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	46	Depositor
Minimum defocus (nm)	400	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	5.451	Depositor
Minimum map value	-0.169	Depositor
Average map value	0.016	Depositor
Map value standard deviation	0.134	Depositor
Recommended contour level	0.5	Depositor
Map size (Å)	522.5, 522.5, 522.5	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.045, 1.045, 1.045	Depositor

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: OMC, MG, OMG, GTP, OMU, A2M, ZN

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	C1	0.27	0/73080	0.90	89/113915 (0.1%)
2	C2	0.26	0/3573	0.88	3/5563 (0.1%)
3	CF	0.27	0/1972	0.57	1/2660 (0.0%)
4	CH	0.27	0/5145	0.55	1/6923 (0.0%)
5	CK	0.26	0/1913	0.54	0/2571
6	CL	0.26	0/627	0.54	0/839
7	CN	0.26	0/1875	0.54	0/2552
8	CO	0.25	0/470	0.50	0/619
9	CQ	0.29	0/1500	0.63	0/1995
10	Cb	0.25	0/845	0.58	1/1128 (0.1%)
11	Cd	0.26	0/3691	0.53	0/4975
12	Cz	0.28	0/892	0.58	0/1167
13	LA	0.26	0/1917	0.58	0/2580
14	LB	0.26	0/3165	0.54	0/4250
15	LC	0.26	0/2802	0.52	0/3778
16	LE	0.27	0/1497	0.55	0/2018
17	LF	0.28	0/2061	0.54	0/2765
18	LG	0.26	0/1909	0.53	0/2556
19	LH	0.26	0/1515	0.51	0/2037
20	LK	0.31	0/1198	0.62	1/1611 (0.1%)
21	LL	0.26	0/1614	0.59	1/2168 (0.0%)
22	LM	0.26	0/1145	0.56	0/1539
23	LN	0.26	0/1741	0.60	0/2332
24	LO	0.28	0/1645	0.54	0/2205
25	LP	0.25	0/1364	0.57	0/1835
26	LQ	0.26	0/1170	0.56	0/1573
27	LR	0.27	0/1260	0.56	0/1683
28	LS	0.26	0/1465	0.55	0/1970
29	LU	0.29	0/851	0.56	0/1143
30	LV	0.28	0/1009	0.55	0/1357
31	LX	0.26	0/978	0.56	0/1320
32	LY	0.26	0/1070	0.58	0/1432

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
33	LZ	0.28	0/1125	0.55	0/1508
34	La	0.29	0/892	0.57	0/1200
35	Lc	0.26	0/714	0.51	0/960
36	Ld	0.25	0/889	0.56	0/1192
37	Le	0.26	0/1035	0.58	0/1379
38	Lf	0.26	0/883	0.56	0/1187
39	Lg	0.25	0/898	0.60	0/1207
40	Lh	0.28	0/1014	0.57	0/1349
41	Li	0.30	0/828	0.63	0/1092
42	Lj	0.26	0/712	0.61	0/944
43	Lk	0.27	0/632	0.61	0/842
44	Ll	0.24	0/446	0.59	0/593
45	Lp	0.26	0/702	0.64	0/935
46	CT	0.27	0/3006	0.55	0/4110
46	CU	0.28	0/3018	0.56	1/4125 (0.0%)
47	CV	0.27	0/4312	0.54	1/5897 (0.0%)
47	CW	0.29	0/4299	0.55	1/5882 (0.0%)
48	CS	0.26	0/2442	0.53	0/3315
49	CR	0.27	0/3912	0.49	0/5320
50	Lt	0.30	0/1684	0.57	1/2266 (0.0%)
51	Ch	0.25	0/3137	0.58	0/4262
52	LJ	0.27	0/1389	0.59	0/1856
53	LD	0.26	0/2412	0.53	0/3247
54	C4	0.29	0/2737	1.01	12/4262 (0.3%)
55	Lq	0.27	0/1079	0.55	0/1454
56	LT	0.29	0/1146	0.60	1/1546 (0.1%)
57	Lb	0.25	0/287	0.56	0/384
58	Lr	0.23	0/139	0.67	0/179
All	All	0.27	0/172728	0.75	114/249552 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
46	CT	0	1

There are no bond length outliers.

All (114) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	1550	U	N1-C2-O2	9.25	129.27	122.80
1	C1	1562	U	C2-N1-C1'	9.16	128.69	117.70
1	C1	1478	U	C2-N1-C1'	9.08	128.60	117.70
1	C1	1550	U	C2-N1-C1'	8.76	128.21	117.70
1	C1	1562	U	N1-C2-O2	8.61	128.83	122.80
1	C1	1538	U	N1-C2-O2	8.54	128.78	122.80
1	C1	1538	U	N3-C2-O2	-8.42	116.31	122.20
1	C1	1550	U	N3-C2-O2	-8.27	116.41	122.20
1	C1	2441	C	N1-C2-O2	8.00	123.70	118.90
1	C1	1562	U	N3-C2-O2	-7.89	116.68	122.20
1	C1	1478	U	N1-C2-O2	7.73	128.21	122.80
1	C1	1538	U	C2-N1-C1'	7.55	126.77	117.70
54	C4	50	U	N1-C2-O2	7.33	127.93	122.80
54	C4	103	U	C2-N1-C1'	7.14	126.27	117.70
1	C1	1478	U	N3-C2-O2	-7.11	117.23	122.20
54	C4	50	U	N3-C2-O2	-6.86	117.40	122.20
1	C1	3089	U	C2-N1-C1'	6.78	125.83	117.70
21	LL	27	ASP	CB-CG-OD1	6.71	124.34	118.30
1	C1	103	C	N1-C2-O2	6.66	122.90	118.90
1	C1	2586	C	C2-N1-C1'	6.60	126.06	118.80
4	CH	361	LEU	CB-CG-CD2	6.58	122.18	111.00
54	C4	103	U	N1-C2-O2	6.57	127.40	122.80
1	C1	3016	U	C2-N1-C1'	6.53	125.54	117.70
50	Lt	184	MET	CG-SD-CE	-6.41	89.95	100.20
1	C1	2441	C	C2-N1-C1'	6.38	125.81	118.80
47	CV	298	ASP	CB-CG-OD1	6.36	124.02	118.30
1	C1	2282	U	P-O3'-C3'	6.32	127.29	119.70
1	C1	2611	U	C2-N1-C1'	6.28	125.24	117.70
1	C1	2499	C	N1-C2-O2	6.28	122.67	118.90
1	C1	1479	C	C2-N1-C1'	6.26	125.69	118.80
1	C1	3258	U	P-O3'-C3'	6.26	127.22	119.70
1	C1	3016	U	N1-C2-O2	6.17	127.12	122.80
1	C1	1478	U	C6-N1-C1'	-6.16	112.58	121.20
1	C1	2409	U	N3-C2-O2	-6.15	117.89	122.20
1	C1	8	C	C2-N1-C1'	6.11	125.52	118.80
1	C1	2499	C	C2-N1-C1'	6.10	125.51	118.80
1	C1	1337	G	C4-N9-C1'	6.09	134.41	126.50
1	C1	2441	C	N3-C2-O2	-6.09	117.64	121.90
3	CF	111	ASP	CB-CG-OD1	6.08	123.78	118.30
1	C1	2794	C	C2-N1-C1'	6.07	125.48	118.80
54	C4	42	C	N1-C2-O2	6.03	122.52	118.90
1	C1	2220	C	C2-N1-C1'	6.02	125.42	118.80
1	C1	114	C	C2-N1-C1'	5.99	125.39	118.80

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2500	U	C2-N1-C1'	5.99	124.88	117.70
54	C4	50	U	C2-N1-C1'	5.96	124.85	117.70
1	C1	1562	U	C6-N1-C1'	-5.94	112.89	121.20
1	C1	2281	U	C2-N1-C1'	5.89	124.77	117.70
1	C1	79	U	N3-C2-O2	-5.88	118.08	122.20
1	C1	1205	G	O4'-C1'-N9	5.88	112.90	108.20
1	C1	443	C	C2-N1-C1'	5.78	125.16	118.80
54	C4	103	U	N3-C2-O2	-5.77	118.16	122.20
2	C2	100	U	C2-N1-C1'	5.76	124.61	117.70
1	C1	2220	C	N1-C2-O2	5.74	122.34	118.90
1	C1	2611	U	N3-C2-O2	-5.72	118.19	122.20
1	C1	3338	C	C2-N1-C1'	5.72	125.09	118.80
1	C1	2500	U	N1-C2-O2	5.70	126.79	122.80
54	C4	77	U	N1-C2-O2	5.69	126.78	122.80
1	C1	2409	U	N1-C2-O2	5.66	126.76	122.80
1	C1	961	C	C2-N1-C1'	5.66	125.02	118.80
1	C1	3338	C	N1-C2-O2	5.64	122.29	118.90
1	C1	2611	U	N1-C2-O2	5.64	126.75	122.80
1	C1	37	C	N1-C2-O2	5.63	122.28	118.90
1	C1	1015	C	C2-N1-C1'	5.62	124.98	118.80
1	C1	1550	U	C6-N1-C1'	-5.61	113.34	121.20
1	C1	956	U	C2-N1-C1'	5.60	124.42	117.70
1	C1	168	C	C2-N1-C1'	5.60	124.96	118.80
1	C1	438	C	C2-N1-C1'	5.59	124.95	118.80
47	CW	8	ARG	CG-CD-NE	5.57	123.50	111.80
1	C1	3016	U	N3-C2-O2	-5.57	118.30	122.20
2	C2	64	U	N3-C2-O2	-5.52	118.33	122.20
1	C1	103	C	N3-C2-O2	-5.51	118.04	121.90
1	C1	2100	U	C2-N1-C1'	5.51	124.31	117.70
1	C1	1024	U	C2-N1-C1'	5.46	124.26	117.70
1	C1	2465	U	C2-N1-C1'	5.44	124.23	117.70
1	C1	428	C	C2-N1-C1'	5.42	124.77	118.80
2	C2	113	U	C2-N1-C1'	5.42	124.21	117.70
54	C4	77	U	N3-C2-O2	-5.42	118.41	122.20
1	C1	1852	C	N1-C2-O2	5.41	122.14	118.90
1	C1	1337	G	C8-N9-C1'	-5.39	120.00	127.00
1	C1	2863	U	C2-N1-C1'	5.38	124.16	117.70
1	C1	2992	C	N1-C2-O2	5.38	122.13	118.90
1	C1	2227	U	C2-N1-C1'	5.38	124.15	117.70
1	C1	2441	C	C6-N1-C2	-5.37	118.15	120.30
1	C1	3301	C	P-O3'-C3'	5.36	126.13	119.70
1	C1	151	G	P-O3'-C3'	5.35	126.12	119.70

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2500	U	N3-C2-O2	-5.34	118.46	122.20
54	C4	105	C	C2-N1-C1'	5.34	124.67	118.80
56	LT	128	LEU	CA-CB-CG	5.33	127.57	115.30
1	C1	1550	U	C5-C6-N1	5.33	125.36	122.70
1	C1	103	C	C2-N1-C1'	5.31	124.64	118.80
1	C1	940	C	C2-N1-C1'	5.29	124.61	118.80
1	C1	2374	U	N3-C2-O2	-5.28	118.51	122.20
46	CU	157	LEU	CA-CB-CG	5.26	127.40	115.30
1	C1	1562	U	C5-C6-N1	5.26	125.33	122.70
1	C1	1047	A	P-O3'-C3'	5.25	126.01	119.70
20	LK	52	ASP	CB-CG-OD2	5.22	123.00	118.30
1	C1	3210	U	P-O3'-C3'	5.20	125.94	119.70
1	C1	2527	C	N1-C2-O2	5.20	122.02	118.90
1	C1	2912	U	C2-N1-C1'	5.16	123.90	117.70
1	C1	2499	C	C5-C6-N1	5.16	123.58	121.00
1	C1	2441	C	C5-C6-N1	5.13	123.57	121.00
1	C1	3089	U	N1-C2-O2	5.13	126.39	122.80
10	Cb	43	ASP	C-N-CA	5.13	134.52	121.70
1	C1	1663	C	N1-C2-O2	5.12	121.97	118.90
54	C4	26	C	N1-C2-O2	5.12	121.97	118.90
1	C1	3132	A	P-O3'-C3'	5.12	125.84	119.70
1	C1	1337	G	N3-C4-N9	5.12	129.07	126.00
1	C1	168	C	N1-C2-O2	5.11	121.96	118.90
1	C1	2465	U	N1-C2-O2	5.09	126.37	122.80
1	C1	2993	C	N1-C2-O2	5.08	121.95	118.90
54	C4	95	C	C2-N1-C1'	5.07	124.38	118.80
1	C1	2351	U	N3-C2-O2	-5.07	118.65	122.20
1	C1	1686	C	N1-C2-O2	5.07	121.94	118.90
1	C1	1508	G	C4-N9-C1'	5.01	133.02	126.50

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
46	CT	42	PHE	Peptide

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

5.3.1 Protein backbone

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	
3	CF	243/270 (90%)	238 (98%)	5 (2%)	0	100	100
4	CH	621/661 (94%)	619 (100%)	2 (0%)	0	100	100
5	CK	227/261 (87%)	223 (98%)	4 (2%)	0	100	100
6	CL	77/558 (14%)	76 (99%)	1 (1%)	0	100	100
7	CN	244/246 (99%)	237 (97%)	7 (3%)	0	100	100
8	CO	56/120 (47%)	55 (98%)	1 (2%)	0	100	100
9	CQ	181/225 (80%)	180 (99%)	1 (1%)	0	100	100
10	Cb	99/117 (85%)	97 (98%)	2 (2%)	0	100	100
11	Cd	445/627 (71%)	437 (98%)	8 (2%)	0	100	100
12	Cz	101/123 (82%)	100 (99%)	1 (1%)	0	100	100
13	LA	245/254 (96%)	237 (97%)	8 (3%)	0	100	100
14	LB	386/392 (98%)	383 (99%)	3 (1%)	0	100	100
15	LC	361/365 (99%)	356 (99%)	5 (1%)	0	100	100
16	LE	187/200 (94%)	180 (96%)	7 (4%)	0	100	100
17	LF	246/249 (99%)	242 (98%)	3 (1%)	1 (0%)	34	65
18	LG	233/262 (89%)	230 (99%)	3 (1%)	0	100	100
19	LH	188/192 (98%)	186 (99%)	2 (1%)	0	100	100
20	LK	156/165 (94%)	155 (99%)	1 (1%)	0	100	100
21	LL	201/213 (94%)	200 (100%)	1 (0%)	0	100	100
22	LM	139/142 (98%)	136 (98%)	3 (2%)	0	100	100
23	LN	200/203 (98%)	195 (98%)	5 (2%)	0	100	100
24	LO	201/204 (98%)	198 (98%)	3 (2%)	0	100	100
25	LP	167/187 (89%)	164 (98%)	3 (2%)	0	100	100
26	LQ	142/213 (67%)	139 (98%)	3 (2%)	0	100	100
27	LR	153/2898 (5%)	151 (99%)	2 (1%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
28	LS	172/174 (99%)	169 (98%)	3 (2%)	0	100	100
29	LU	103/127 (81%)	99 (96%)	4 (4%)	0	100	100
30	LV	133/139 (96%)	132 (99%)	1 (1%)	0	100	100
31	LX	119/156 (76%)	118 (99%)	1 (1%)	0	100	100
32	LY	131/138 (95%)	127 (97%)	4 (3%)	0	100	100
33	LZ	133/135 (98%)	129 (97%)	4 (3%)	0	100	100
34	La	104/149 (70%)	101 (97%)	3 (3%)	0	100	100
35	Lc	93/108 (86%)	92 (99%)	1 (1%)	0	100	100
36	Ld	108/120 (90%)	107 (99%)	1 (1%)	0	100	100
37	Le	124/131 (95%)	123 (99%)	1 (1%)	0	100	100
38	Lf	106/109 (97%)	105 (99%)	1 (1%)	0	100	100
39	Lg	113/119 (95%)	112 (99%)	1 (1%)	0	100	100
40	Lh	120/935 (13%)	117 (98%)	3 (2%)	0	100	100
41	Li	99/110 (90%)	99 (100%)	0	0	100	100
42	Lj	86/95 (90%)	85 (99%)	1 (1%)	0	100	100
43	Lk	74/81 (91%)	72 (97%)	2 (3%)	0	100	100
44	Ll	48/51 (94%)	47 (98%)	1 (2%)	0	100	100
45	Lp	89/92 (97%)	88 (99%)	1 (1%)	0	100	100
46	CT	391/437 (90%)	382 (98%)	9 (2%)	0	100	100
46	CU	391/437 (90%)	377 (96%)	14 (4%)	0	100	100
47	CV	544/781 (70%)	537 (99%)	7 (1%)	0	100	100
47	CW	544/781 (70%)	539 (99%)	5 (1%)	0	100	100
48	CS	301/338 (89%)	297 (99%)	4 (1%)	0	100	100
49	CR	510/767 (66%)	506 (99%)	4 (1%)	0	100	100
50	Lt	212/217 (98%)	207 (98%)	5 (2%)	0	100	100
51	Ch	388/517 (75%)	372 (96%)	16 (4%)	0	100	100
52	LJ	166/173 (96%)	166 (100%)	0	0	100	100
53	LD	296/304 (97%)	290 (98%)	6 (2%)	0	100	100
55	Lq	137/147 (93%)	134 (98%)	2 (2%)	1 (1%)	22	53
56	LT	139/160 (87%)	136 (98%)	3 (2%)	0	100	100
57	Lb	34/65 (52%)	34 (100%)	0	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
58	Lr	13/25 (52%)	13 (100%)	0	0	100	100
All	All	11520/17465 (66%)	11326 (98%)	192 (2%)	2 (0%)	100	100

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
55	Lq	85	SER
17	LF	197	VAL

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	CF	212/236 (90%)	212 (100%)	0	100	100
4	CH	548/575 (95%)	548 (100%)	0	100	100
5	CK	203/225 (90%)	203 (100%)	0	100	100
6	CL	60/458 (13%)	60 (100%)	0	100	100
7	CN	204/206 (99%)	204 (100%)	0	100	100
8	CO	48/99 (48%)	48 (100%)	0	100	100
9	CQ	143/192 (74%)	142 (99%)	1 (1%)	84	95
10	Cb	85/101 (84%)	85 (100%)	0	100	100
11	Cd	395/541 (73%)	395 (100%)	0	100	100
12	Cz	91/107 (85%)	90 (99%)	1 (1%)	73	91
13	LA	190/198 (96%)	190 (100%)	0	100	100
14	LB	328/331 (99%)	328 (100%)	0	100	100
15	LC	281/285 (99%)	280 (100%)	1 (0%)	91	97
16	LE	155/166 (93%)	155 (100%)	0	100	100
17	LF	213/215 (99%)	212 (100%)	1 (0%)	88	96
18	LG	197/222 (89%)	197 (100%)	0	100	100
19	LH	167/169 (99%)	167 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
20	LK	127/136 (93%)	126 (99%)	1 (1%)	81	93
21	LL	158/176 (90%)	158 (100%)	0	100	100
22	LM	116/117 (99%)	116 (100%)	0	100	100
23	LN	179/180 (99%)	179 (100%)	0	100	100
24	LO	162/163 (99%)	162 (100%)	0	100	100
25	LP	133/152 (88%)	133 (100%)	0	100	100
26	LQ	124/178 (70%)	124 (100%)	0	100	100
27	LR	125/2396 (5%)	125 (100%)	0	100	100
28	LS	153/154 (99%)	153 (100%)	0	100	100
29	LU	90/108 (83%)	88 (98%)	2 (2%)	52	80
30	LV	98/102 (96%)	98 (100%)	0	100	100
31	LX	107/129 (83%)	107 (100%)	0	100	100
32	LY	116/119 (98%)	116 (100%)	0	100	100
33	LZ	119/121 (98%)	119 (100%)	0	100	100
34	La	93/122 (76%)	93 (100%)	0	100	100
35	Lc	76/88 (86%)	76 (100%)	0	100	100
36	Ld	90/105 (86%)	90 (100%)	0	100	100
37	Le	109/114 (96%)	109 (100%)	0	100	100
38	Lf	89/90 (99%)	89 (100%)	0	100	100
39	Lg	91/102 (89%)	91 (100%)	0	100	100
40	Lh	109/781 (14%)	108 (99%)	1 (1%)	78	92
41	Li	84/93 (90%)	84 (100%)	0	100	100
42	Lj	72/78 (92%)	72 (100%)	0	100	100
43	Lk	71/77 (92%)	71 (100%)	0	100	100
44	Ll	45/46 (98%)	45 (100%)	0	100	100
45	Lp	72/74 (97%)	72 (100%)	0	100	100
46	CT	322/376 (86%)	321 (100%)	1 (0%)	92	98
46	CU	326/376 (87%)	326 (100%)	0	100	100
47	CV	472/675 (70%)	471 (100%)	1 (0%)	93	98
47	CW	469/675 (70%)	469 (100%)	0	100	100
48	CS	260/291 (89%)	260 (100%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
49	CR	374/663 (56%)	373 (100%)	1 (0%)	92	98
50	Lt	186/189 (98%)	186 (100%)	0	100	100
51	Ch	322/436 (74%)	321 (100%)	1 (0%)	92	98
52	LJ	144/150 (96%)	144 (100%)	0	100	100
53	LD	233/253 (92%)	232 (100%)	1 (0%)	91	97
55	Lq	107/112 (96%)	107 (100%)	0	100	100
56	LT	120/135 (89%)	120 (100%)	0	100	100
57	Lb	26/55 (47%)	25 (96%)	1 (4%)	33	65
58	Lr	13/23 (56%)	13 (100%)	0	100	100
All	All	9702/14736 (66%)	9688 (100%)	14 (0%)	93	98

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
9	CQ	174	LYS
12	Cz	78	LYS
15	LC	139	ARG
17	LF	23	LYS
20	LK	70	GLN
29	LU	32	LYS
29	LU	52	ARG
40	Lh	64	ASN
46	CT	268	GLN
49	CR	159	LYS
51	Ch	441	ASN
53	LD	23	ARG
47	CV	138	GLN
57	Lb	52	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
5	CK	53	GLN
5	CK	57	GLN
11	Cd	326	GLN
19	LH	72	GLN
46	CU	63	GLN
52	LJ	96	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	C1	3065/3342 (91%)	562 (18%)	17 (0%)
2	C2	148/156 (94%)	18 (12%)	1 (0%)
54	C4	113/119 (94%)	21 (18%)	0
All	All	3326/3617 (91%)	601 (18%)	18 (0%)

All (601) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	C1	6	G
1	C1	23	G
1	C1	27	A
1	C1	50	A
1	C1	60	G
1	C1	61	A
1	C1	66	A
1	C1	67	A
1	C1	68	A
1	C1	93	G
1	C1	94	C
1	C1	97	G
1	C1	110	A
1	C1	111	G
1	C1	112	C
1	C1	117	A
1	C1	123	A
1	C1	132	U
1	C1	133	C
1	C1	134	G
1	C1	135	G
1	C1	146	A
1	C1	151	G
1	C1	152	G
1	C1	153	A
1	C1	156	G
1	C1	170	A
1	C1	181	G
1	C1	184	U
1	C1	185	U
1	C1	194	C
1	C1	200	G
1	C1	204	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	212	G
1	C1	213	A
1	C1	214	G
1	C1	225	A
1	C1	228	U
1	C1	241	U
1	C1	244	G
1	C1	247	A
1	C1	258	A
1	C1	262	G
1	C1	278	A
1	C1	288	A
1	C1	291	U
1	C1	298	U
1	C1	304	U
1	C1	308	C
1	C1	316	A
1	C1	322	C
1	C1	323	G
1	C1	327	A
1	C1	331	A
1	C1	332	C
1	C1	343	C
1	C1	344	A
1	C1	369	G
1	C1	385	OMG
1	C1	391	U
1	C1	394	C
1	C1	395	A
1	C1	396	C
1	C1	414	G
1	C1	415	A
1	C1	422	U
1	C1	434	U
1	C1	435	G
1	C1	443	C
1	C1	446	A
1	C1	447	U
1	C1	448	C
1	C1	458	U
1	C1	459	C
1	C1	460	U

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	469	C
1	C1	470	A
1	C1	471	C
1	C1	472	U
1	C1	479	G
1	C1	494	C
1	C1	512	A
1	C1	514	A
1	C1	527	G
1	C1	535	U
1	C1	536	C
1	C1	537	C
1	C1	538	G
1	C1	545	U
1	C1	546	U
1	C1	547	A
1	C1	548	U
1	C1	549	A
1	C1	570	G
1	C1	580	A
1	C1	583	A
1	C1	588	G
1	C1	592	U
1	C1	593	G
1	C1	595	A
1	C1	597	G
1	C1	599	A
1	C1	608	U
1	C1	609	A
1	C1	610	A
1	C1	624	C
1	C1	627	OMG
1	C1	634	A
1	C1	648	A
1	C1	650	U
1	C1	665	A
1	C1	669	U
1	C1	678	A
1	C1	693	A
1	C1	700	G
1	C1	703	A
1	C1	704	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	707	U
1	C1	720	C
1	C1	721	G
1	C1	743	A
1	C1	748	U
1	C1	755	G
1	C1	756	G
1	C1	757	A
1	C1	759	U
1	C1	761	G
1	C1	762	A
1	C1	763	G
1	C1	767	G
1	C1	769	G
1	C1	782	G
1	C1	790	A
1	C1	798	A
1	C1	799	A
1	C1	800	C
1	C1	812	A
1	C1	826	G
1	C1	839	G
1	C1	843	C
1	C1	856	U
1	C1	857	G
1	C1	877	A
1	C1	878	A
1	C1	889	G
1	C1	896	A
1	C1	898	G
1	C1	899	A
1	C1	903	A
1	C1	905	C
1	C1	906	G
1	C1	919	G
1	C1	926	A
1	C1	933	A
1	C1	934	A
1	C1	935	G
1	C1	937	U
1	C1	940	C
1	C1	955	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	956	U
1	C1	961	C
1	C1	963	U
1	C1	964	C
1	C1	981	G
1	C1	986	U
1	C1	988	A
1	C1	991	A
1	C1	993	G
1	C1	994	G
1	C1	995	A
1	C1	996	C
1	C1	997	U
1	C1	998	C
1	C1	999	G
1	C1	1015	C
1	C1	1016	U
1	C1	1017	U
1	C1	1021	C
1	C1	1022	C
1	C1	1024	U
1	C1	1025	U
1	C1	1046	G
1	C1	1047	A
1	C1	1048	A
1	C1	1049	G
1	C1	1055	G
1	C1	1056	U
1	C1	1059	C
1	C1	1064	C
1	C1	1065	U
1	C1	1068	A
1	C1	1071	U
1	C1	1081	A
1	C1	1095	A
1	C1	1099	G
1	C1	1110	G
1	C1	1115	C
1	C1	1117	G
1	C1	1118	A
1	C1	1127	U
1	C1	1132	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	1136	A
1	C1	1161	G
1	C1	1163	G
1	C1	1164	U
1	C1	1165	G
1	C1	1175	C
1	C1	1176	A
1	C1	1181	C
1	C1	1185	A
1	C1	1187	A
1	C1	1205	G
1	C1	1209	G
1	C1	1218	U
1	C1	1228	A
1	C1	1229	G
1	C1	1240	C
1	C1	1241	U
1	C1	1242	A
1	C1	1246	A
1	C1	1248	U
1	C1	1255	C
1	C1	1268	G
1	C1	1287	A
1	C1	1288	U
1	C1	1290	G
1	C1	1292	U
1	C1	1296	G
1	C1	1313	A
1	C1	1331	A
1	C1	1332	G
1	C1	1333	A
1	C1	1334	A
1	C1	1335	A
1	C1	1336	C
1	C1	1337	G
1	C1	1349	A
1	C1	1369	A
1	C1	1370	G
1	C1	1375	G
1	C1	1382	A
1	C1	1383	G
1	C1	1400	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	1401	A
1	C1	1417	G
1	C1	1420	OMC
1	C1	1429	A
1	C1	1433	OMG
1	C1	1438	U
1	C1	1458	G
1	C1	1464	A
1	C1	1477	U
1	C1	1479	C
1	C1	1485	G
1	C1	1491	OMC
1	C1	1505	U
1	C1	1536	U
1	C1	1538	U
1	C1	1539	C
1	C1	1540	A
1	C1	1543	G
1	C1	1548	A
1	C1	1549	C
1	C1	1550	U
1	C1	1551	C
1	C1	1553	U
1	C1	1556	C
1	C1	1559	G
1	C1	1561	G
1	C1	1567	A
1	C1	1568	A
1	C1	1570	G
1	C1	1573	A
1	C1	1585	A
1	C1	1586	U
1	C1	1599	A
1	C1	1601	G
1	C1	1608	U
1	C1	1609	U
1	C1	1619	C
1	C1	1622	A
1	C1	1623	A
1	C1	1624	C
1	C1	1625	U
1	C1	1663	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	1683	U
1	C1	1685	U
1	C1	1697	C
1	C1	1704	U
1	C1	1722	U
1	C1	1730	A
1	C1	1731	G
1	C1	1745	U
1	C1	1746	G
1	C1	1760	G
1	C1	1776	G
1	C1	1777	A
1	C1	1789	A
1	C1	1792	G
1	C1	1793	A
1	C1	1794	A
1	C1	1796	A
1	C1	1799	U
1	C1	1800	C
1	C1	1801	U
1	C1	1822	A
1	C1	1826	C
1	C1	1829	C
1	C1	1846	C
1	C1	1847	A2M
1	C1	1858	G
1	C1	1859	A
1	C1	1860	U
1	C1	1866	A
1	C1	1873	A
1	C1	1886	G
1	C1	1887	C
1	C1	1923	C
1	C1	1933	G
1	C1	2084	G
1	C1	2085	G
1	C1	2089	A
1	C1	2094	A
1	C1	2103	U
1	C1	2121	A
1	C1	2132	G
1	C1	2139	U

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	2151	A
1	C1	2161	A
1	C1	2167	C
1	C1	2186	A
1	C1	2188	U
1	C1	2192	A
1	C1	2207	A
1	C1	2212	G
1	C1	2219	A
1	C1	2221	U
1	C1	2222	A
1	C1	2223	U
1	C1	2224	G
1	C1	2227	U
1	C1	2231	U
1	C1	2232	U
1	C1	2233	A
1	C1	2235	G
1	C1	2283	A
1	C1	2297	U
1	C1	2298	G
1	C1	2299	U
1	C1	2310	U
1	C1	2326	A
1	C1	2336	A
1	C1	2339	G
1	C1	2340	G
1	C1	2346	C
1	C1	2351	U
1	C1	2356	G
1	C1	2362	A
1	C1	2365	A
1	C1	2366	G
1	C1	2374	U
1	C1	2381	G
1	C1	2382	A
1	C1	2398	G
1	C1	2403	A
1	C1	2404	A
1	C1	2405	G
1	C1	2409	U
1	C1	2410	A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	2411	G
1	C1	2415	G
1	C1	2423	U
1	C1	2425	G
1	C1	2426	G
1	C1	2429	G
1	C1	2430	G
1	C1	2431	A
1	C1	2432	G
1	C1	2435	U
1	C1	2436	C
1	C1	2437	G
1	C1	2440	G
1	C1	2441	C
1	C1	2447	A
1	C1	2450	U
1	C1	2454	A
1	C1	2457	A
1	C1	2458	C
1	C1	2459	U
1	C1	2465	U
1	C1	2466	G
1	C1	2477	U
1	C1	2478	A
1	C1	2485	G
1	C1	2489	C
1	C1	2499	C
1	C1	2500	U
1	C1	2501	U
1	C1	2502	G
1	C1	2503	C
1	C1	2506	C
1	C1	2507	C
1	C1	2508	A
1	C1	2512	U
1	C1	2513	C
1	C1	2521	A
1	C1	2522	A
1	C1	2527	C
1	C1	2529	U
1	C1	2530	C
1	C1	2531	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	2533	G
1	C1	2544	G
1	C1	2549	A
1	C1	2552	A
1	C1	2565	G
1	C1	2566	G
1	C1	2573	G
1	C1	2583	G
1	C1	2587	A
1	C1	2589	C
1	C1	2591	G
1	C1	2607	G
1	C1	2610	G
1	C1	2611	U
1	C1	2615	A
1	C1	2616	A
1	C1	2617	G
1	C1	2625	C
1	C1	2633	A
1	C1	2636	G
1	C1	2640	U
1	C1	2648	A
1	C1	2650	A
1	C1	2653	A
1	C1	2654	A
1	C1	2655	A
1	C1	2656	A
1	C1	2657	G
1	C1	2660	U
1	C1	2661	A
1	C1	2663	A
1	C1	2664	A
1	C1	2672	U
1	C1	2673	G
1	C1	2684	U
1	C1	2690	OMU
1	C1	2691	G
1	C1	2695	A
1	C1	2712	G
1	C1	2713	G
1	C1	2714	C
1	C1	2731	C

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	2732	C
1	C1	2736	G
1	C1	2737	A
1	C1	2763	A
1	C1	2769	C
1	C1	2783	G
1	C1	2784	C
1	C1	2785	U
1	C1	2802	U
1	C1	2803	C
1	C1	2805	U
1	C1	2812	G
1	C1	2817	U
1	C1	2826	C
1	C1	2828	U
1	C1	2831	A
1	C1	2836	G
1	C1	2846	A
1	C1	2847	U
1	C1	2848	C
1	C1	2857	G
1	C1	2858	C
1	C1	2863	U
1	C1	2882	U
1	C1	2894	U
1	C1	2895	A
1	C1	2912	U
1	C1	2929	C
1	C1	2930	A
1	C1	2931	G
1	C1	2938	U
1	C1	2939	U
1	C1	2940	U
1	C1	2942	C
1	C1	2949	G
1	C1	2955	C
1	C1	2956	U
1	C1	2970	A
1	C1	2980	G
1	C1	3014	U
1	C1	3017	G
1	C1	3036	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	3044	A
1	C1	3045	A
1	C1	3049	A
1	C1	3050	C
1	C1	3051	C
1	C1	3067	G
1	C1	3071	A
1	C1	3080	A
1	C1	3087	A
1	C1	3088	A
1	C1	3089	U
1	C1	3100	A
1	C1	3101	C
1	C1	3102	G
1	C1	3112	U
1	C1	3113	A
1	C1	3119	A
1	C1	3126	A
1	C1	3127	G
1	C1	3131	U
1	C1	3133	U
1	C1	3135	A
1	C1	3141	G
1	C1	3146	C
1	C1	3155	A
1	C1	3162	C
1	C1	3163	A
1	C1	3164	G
1	C1	3185	G
1	C1	3186	A
1	C1	3188	G
1	C1	3190	G
1	C1	3200	A
1	C1	3201	A
1	C1	3206	C
1	C1	3210	U
1	C1	3211	U
1	C1	3214	A
1	C1	3218	U
1	C1	3227	G
1	C1	3228	C
1	C1	3231	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	3245	C
1	C1	3254	U
1	C1	3257	A
1	C1	3258	U
1	C1	3259	G
1	C1	3260	U
1	C1	3276	A
1	C1	3282	U
1	C1	3293	U
1	C1	3295	U
1	C1	3297	G
1	C1	3299	U
1	C1	3302	G
1	C1	3304	U
1	C1	3310	G
1	C1	3316	A
1	C1	3319	C
1	C1	3323	C
1	C1	3324	C
1	C1	3325	U
1	C1	3326	U
1	C1	3328	G
1	C1	3331	U
1	C1	3332	A
1	C1	3338	C
2	C2	34	U
2	C2	35	C
2	C2	39	G
2	C2	59	A
2	C2	62	A
2	C2	63	G
2	C2	90	U
2	C2	95	G
2	C2	96	A
2	C2	104	A
2	C2	106	C
2	C2	116	G
2	C2	120	G
2	C2	125	U
2	C2	126	A
2	C2	128	U
2	C2	152	G

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	C2	154	C
54	C4	7	G
54	C4	8	A
54	C4	9	C
54	C4	18	G
54	C4	22	A
54	C4	29	G
54	C4	54	U
54	C4	55	A
54	C4	64	A
54	C4	65	G
54	C4	72	G
54	C4	73	U
54	C4	75	A
54	C4	76	G
54	C4	77	U
54	C4	88	G
54	C4	98	G
54	C4	101	A
54	C4	108	G
54	C4	110	U
54	C4	111	G

All (18) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	C1	151	G
1	C1	1021	C
1	C1	1047	A
1	C1	1267	C
1	C1	1537	U
1	C1	2234	A
1	C1	2282	U
1	C1	2409	U
1	C1	2712	G
1	C1	3079	U
1	C1	3132	A
1	C1	3205	G
1	C1	3210	U
1	C1	3230	G
1	C1	3258	U
1	C1	3298	U

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	C1	3301	C
2	C2	127	U

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

32 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# $ Z > 2$	Counts	RMSZ	# $ Z > 2$
1	OMC	C1	1420	1	19,22,23	0.58	0	26,31,34	1.03	1 (3%)
1	OMU	C1	1868	1	19,22,23	3.08	6 (31%)	26,31,34	1.77	5 (19%)
1	OMC	C1	2918	1	19,22,23	0.56	0	26,31,34	0.80	1 (3%)
1	OMG	C1	787	1	18,26,27	1.14	2 (11%)	19,38,41	0.88	1 (5%)
1	A2M	C1	637	1	18,25,26	4.32	9 (50%)	18,36,39	3.84	4 (22%)
1	OMC	C1	778	1	19,22,23	0.58	0	26,31,34	0.91	1 (3%)
1	OMG	C1	385	1	18,26,27	1.12	2 (11%)	19,38,41	0.84	1 (5%)
1	OMG	C1	2358	1	18,26,27	1.13	2 (11%)	19,38,41	0.91	1 (5%)
1	A2M	C1	389	1	18,25,26	4.32	9 (50%)	18,36,39	3.89	4 (22%)
1	OMG	C1	2881	1	18,26,27	1.12	2 (11%)	19,38,41	0.82	1 (5%)
1	OMC	C1	2300	1	19,22,23	0.52	0	26,31,34	0.64	0
1	OMG	C1	1433	1	18,26,27	1.14	2 (11%)	19,38,41	0.84	1 (5%)
1	OMC	C1	1491	1	19,22,23	0.54	0	26,31,34	0.77	0
1	OMU	C1	2688	1	19,22,23	3.12	6 (31%)	26,31,34	1.66	4 (15%)
1	OMU	C1	2380	1	19,22,23	3.06	6 (31%)	26,31,34	1.68	5 (19%)
1	OMU	C1	2683	1	19,22,23	3.08	6 (31%)	26,31,34	1.71	5 (19%)
1	OMG	C1	646	1	18,26,27	1.15	2 (11%)	19,38,41	0.90	2 (10%)
1	OMG	C1	2876	1	18,26,27	1.12	2 (11%)	19,38,41	0.85	1 (5%)
1	OMC	C1	1836	1	19,22,23	0.59	0	26,31,34	0.89	1 (3%)
1	A2M	C1	1847	1	18,25,26	4.35	9 (50%)	18,36,39	3.91	4 (22%)
1	OMC	C1	2838	1	19,22,23	0.59	0	26,31,34	0.96	2 (7%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	A2M	C1	1223	1	18,25,26	4.32	9 (50%)	18,36,39	3.83	4 (22%)
1	OMU	C1	2384	1	19,22,23	3.06	6 (31%)	26,31,34	1.68	4 (15%)
1	A2M	C1	1432	1	18,25,26	4.36	9 (50%)	18,36,39	3.84	4 (22%)
1	OMG	C1	627	1	18,26,27	1.18	2 (11%)	19,38,41	0.85	1 (5%)
1	OMC	C1	1812	1	19,22,23	0.54	0	26,31,34	0.73	0
1	OMU	C1	2690	1	19,22,23	3.19	6 (31%)	26,31,34	1.76	6 (23%)
1	A2M	C1	2289	1	18,25,26	4.36	9 (50%)	18,36,39	3.72	4 (22%)
1	A2M	C1	848	1	18,25,26	4.34	9 (50%)	18,36,39	3.78	4 (22%)
1	OMU	C1	1917	1	19,22,23	3.12	6 (31%)	26,31,34	1.74	5 (19%)
1	A2M	C1	858	1	18,25,26	4.36	9 (50%)	18,36,39	3.84	4 (22%)
1	OMG	C1	2774	1	18,26,27	1.13	2 (11%)	19,38,41	0.85	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	OMC	C1	1420	1	-	1/9/27/28	0/2/2/2
1	OMU	C1	1868	1	-	0/9/27/28	0/2/2/2
1	OMC	C1	2918	1	-	0/9/27/28	0/2/2/2
1	OMG	C1	787	1	-	2/5/27/28	0/3/3/3
1	A2M	C1	637	1	-	1/5/27/28	0/3/3/3
1	OMC	C1	778	1	-	0/9/27/28	0/2/2/2
1	OMG	C1	385	1	-	2/5/27/28	0/3/3/3
1	OMG	C1	2358	1	-	0/5/27/28	0/3/3/3
1	A2M	C1	389	1	-	2/5/27/28	0/3/3/3
1	OMG	C1	2881	1	-	0/5/27/28	0/3/3/3
1	OMC	C1	2300	1	-	0/9/27/28	0/2/2/2
1	OMG	C1	1433	1	-	2/5/27/28	0/3/3/3
1	OMC	C1	1491	1	-	1/9/27/28	0/2/2/2
1	OMU	C1	2688	1	-	3/9/27/28	0/2/2/2
1	OMU	C1	2380	1	-	0/9/27/28	0/2/2/2
1	OMU	C1	2683	1	-	1/9/27/28	0/2/2/2
1	OMG	C1	646	1	-	0/5/27/28	0/3/3/3
1	OMG	C1	2876	1	-	0/5/27/28	0/3/3/3
1	OMC	C1	1836	1	-	0/9/27/28	0/2/2/2
1	A2M	C1	1847	1	-	3/5/27/28	0/3/3/3
1	OMC	C1	2838	1	-	0/9/27/28	0/2/2/2

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	A2M	C1	1223	1	-	2/5/27/28	0/3/3/3
1	OMU	C1	2384	1	-	0/9/27/28	0/2/2/2
1	A2M	C1	1432	1	-	0/5/27/28	0/3/3/3
1	OMG	C1	627	1	-	2/5/27/28	0/3/3/3
1	OMC	C1	1812	1	-	0/9/27/28	0/2/2/2
1	OMU	C1	2690	1	-	3/9/27/28	0/2/2/2
1	A2M	C1	2289	1	-	0/5/27/28	0/3/3/3
1	A2M	C1	848	1	-	1/5/27/28	0/3/3/3
1	OMU	C1	1917	1	-	0/9/27/28	0/2/2/2
1	A2M	C1	858	1	-	0/5/27/28	0/3/3/3
1	OMG	C1	2774	1	-	0/5/27/28	0/3/3/3

All (132) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	2289	A2M	C3'-C2'	-12.78	1.24	1.52
1	C1	858	A2M	C3'-C2'	-12.77	1.24	1.52
1	C1	848	A2M	C3'-C2'	-12.71	1.24	1.52
1	C1	1432	A2M	C3'-C2'	-12.68	1.24	1.52
1	C1	1847	A2M	C3'-C2'	-12.66	1.24	1.52
1	C1	1223	A2M	C3'-C2'	-12.66	1.24	1.52
1	C1	637	A2M	C3'-C2'	-12.62	1.24	1.52
1	C1	389	A2M	C3'-C2'	-12.47	1.25	1.52
1	C1	1847	A2M	O4'-C1'	8.07	1.52	1.41
1	C1	2289	A2M	O4'-C1'	8.04	1.52	1.41
1	C1	858	A2M	O4'-C1'	8.03	1.52	1.41
1	C1	848	A2M	O4'-C1'	8.03	1.52	1.41
1	C1	1432	A2M	O4'-C1'	8.02	1.52	1.41
1	C1	2690	OMU	C2-N1	8.01	1.51	1.38
1	C1	637	A2M	O4'-C1'	7.86	1.52	1.41
1	C1	389	A2M	O4'-C1'	7.79	1.51	1.41
1	C1	1223	A2M	O4'-C1'	7.75	1.51	1.41
1	C1	1917	OMU	C2-N1	7.57	1.50	1.38
1	C1	2688	OMU	C2-N1	7.52	1.50	1.38
1	C1	1868	OMU	C2-N1	7.31	1.50	1.38
1	C1	2690	OMU	C2-N3	7.29	1.51	1.38
1	C1	2384	OMU	C2-N1	7.29	1.50	1.38
1	C1	2380	OMU	C2-N1	7.27	1.50	1.38
1	C1	2683	OMU	C2-N1	7.26	1.50	1.38
1	C1	1917	OMU	C2-N3	7.19	1.50	1.38
1	C1	2688	OMU	C2-N3	7.19	1.50	1.38
1	C1	2384	OMU	C2-N3	7.16	1.50	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	2683	OMU	C2-N3	7.15	1.50	1.38
1	C1	1868	OMU	C2-N3	7.13	1.50	1.38
1	C1	2380	OMU	C2-N3	7.11	1.50	1.38
1	C1	389	A2M	O4'-C4'	-6.72	1.30	1.45
1	C1	1432	A2M	O4'-C4'	-6.53	1.30	1.45
1	C1	1223	A2M	O4'-C4'	-6.52	1.30	1.45
1	C1	637	A2M	O4'-C4'	-6.49	1.30	1.45
1	C1	1847	A2M	O4'-C4'	-6.49	1.30	1.45
1	C1	858	A2M	O4'-C4'	-6.42	1.30	1.45
1	C1	848	A2M	O4'-C4'	-6.38	1.30	1.45
1	C1	2289	A2M	O4'-C4'	-6.38	1.30	1.45
1	C1	2683	OMU	C6-C5	6.27	1.49	1.35
1	C1	2688	OMU	C6-C5	6.25	1.49	1.35
1	C1	1868	OMU	C6-C5	6.22	1.49	1.35
1	C1	2690	OMU	C6-C5	6.20	1.49	1.35
1	C1	1917	OMU	C6-C5	6.20	1.49	1.35
1	C1	2384	OMU	C6-C5	6.16	1.49	1.35
1	C1	2380	OMU	C6-C5	6.13	1.49	1.35
1	C1	1432	A2M	C3'-C4'	5.29	1.66	1.53
1	C1	858	A2M	C3'-C4'	5.29	1.66	1.53
1	C1	2289	A2M	C3'-C4'	5.25	1.66	1.53
1	C1	1223	A2M	C3'-C4'	5.23	1.66	1.53
1	C1	848	A2M	C3'-C4'	5.17	1.66	1.53
1	C1	637	A2M	C3'-C4'	5.16	1.66	1.53
1	C1	389	A2M	C3'-C4'	5.16	1.66	1.53
1	C1	1847	A2M	C3'-C4'	5.15	1.66	1.53
1	C1	1917	OMU	C4-N3	4.31	1.46	1.38
1	C1	2688	OMU	C4-N3	4.31	1.46	1.38
1	C1	2683	OMU	C4-N3	4.26	1.46	1.38
1	C1	2380	OMU	C4-N3	4.25	1.46	1.38
1	C1	2690	OMU	C4-N3	4.25	1.46	1.38
1	C1	1868	OMU	C4-N3	4.22	1.46	1.38
1	C1	2384	OMU	C4-N3	4.19	1.46	1.38
1	C1	389	A2M	O2'-C2'	3.68	1.52	1.42
1	C1	1223	A2M	O2'-C2'	3.49	1.51	1.42
1	C1	858	A2M	O2'-C2'	3.49	1.51	1.42
1	C1	1847	A2M	O2'-C2'	3.49	1.51	1.42
1	C1	637	A2M	O2'-C2'	3.47	1.51	1.42
1	C1	1432	A2M	O2'-C2'	3.46	1.51	1.42
1	C1	2289	A2M	O2'-C2'	3.43	1.51	1.42
1	C1	848	A2M	O2'-C2'	3.43	1.51	1.42
1	C1	1847	A2M	C6-N6	3.16	1.45	1.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	1223	A2M	C6-N6	3.15	1.45	1.34
1	C1	637	A2M	C6-N6	3.14	1.45	1.34
1	C1	848	A2M	C6-N6	3.14	1.45	1.34
1	C1	1432	A2M	C6-N6	3.14	1.45	1.34
1	C1	2289	A2M	C6-N6	3.12	1.45	1.34
1	C1	389	A2M	C6-N6	3.12	1.45	1.34
1	C1	858	A2M	C6-N6	3.08	1.45	1.34
1	C1	627	OMG	C8-N7	-2.96	1.30	1.35
1	C1	646	OMG	C8-N7	-2.93	1.30	1.35
1	C1	1433	OMG	C8-N7	-2.89	1.30	1.35
1	C1	385	OMG	C8-N7	-2.85	1.30	1.35
1	C1	2690	OMU	C6-N1	2.83	1.44	1.38
1	C1	2881	OMG	C8-N7	-2.82	1.30	1.35
1	C1	2774	OMG	C8-N7	-2.81	1.30	1.35
1	C1	2358	OMG	C8-N7	-2.78	1.30	1.35
1	C1	2688	OMU	C6-N1	2.77	1.44	1.38
1	C1	2876	OMG	C8-N7	-2.77	1.30	1.35
1	C1	2289	A2M	C5-C4	-2.76	1.33	1.40
1	C1	2683	OMU	C6-N1	2.76	1.44	1.38
1	C1	848	A2M	C5-C4	-2.75	1.33	1.40
1	C1	1917	OMU	C6-N1	2.74	1.44	1.38
1	C1	787	OMG	C8-N7	-2.73	1.30	1.35
1	C1	1432	A2M	C5-C4	-2.71	1.33	1.40
1	C1	1868	OMU	C6-N1	2.71	1.44	1.38
1	C1	858	A2M	C5-C4	-2.70	1.33	1.40
1	C1	1847	A2M	C5-C4	-2.69	1.33	1.40
1	C1	637	A2M	C5-C4	-2.69	1.33	1.40
1	C1	1223	A2M	C5-C4	-2.68	1.33	1.40
1	C1	2380	OMU	C6-N1	2.66	1.44	1.38
1	C1	389	A2M	C5-C4	-2.65	1.33	1.40
1	C1	2384	OMU	C6-N1	2.65	1.44	1.38
1	C1	627	OMG	C5-C6	-2.47	1.42	1.47
1	C1	646	OMG	C5-C6	-2.43	1.42	1.47
1	C1	2688	OMU	C5-C4	2.37	1.48	1.43
1	C1	1433	OMG	C5-C6	-2.35	1.42	1.47
1	C1	2881	OMG	C5-C6	-2.35	1.42	1.47
1	C1	787	OMG	C5-C6	-2.35	1.42	1.47
1	C1	1868	OMU	C5-C4	2.34	1.48	1.43
1	C1	2774	OMG	C5-C6	-2.33	1.42	1.47
1	C1	2683	OMU	C5-C4	2.33	1.48	1.43
1	C1	2358	OMG	C5-C6	-2.33	1.42	1.47
1	C1	2876	OMG	C5-C6	-2.32	1.42	1.47

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C1	385	OMG	C5-C6	-2.30	1.42	1.47
1	C1	389	A2M	C2-N3	2.25	1.35	1.32
1	C1	2380	OMU	C5-C4	2.25	1.48	1.43
1	C1	2690	OMU	C5-C4	2.23	1.48	1.43
1	C1	637	A2M	C2-N3	2.23	1.35	1.32
1	C1	1432	A2M	C2-N3	2.20	1.35	1.32
1	C1	858	A2M	C2-N3	2.19	1.35	1.32
1	C1	848	A2M	C2-N3	2.18	1.35	1.32
1	C1	1917	OMU	C5-C4	2.18	1.48	1.43
1	C1	1847	A2M	O3'-C3'	2.18	1.48	1.43
1	C1	848	A2M	O3'-C3'	2.16	1.48	1.43
1	C1	2384	OMU	C5-C4	2.16	1.48	1.43
1	C1	1223	A2M	C2-N3	2.16	1.35	1.32
1	C1	1847	A2M	C2-N3	2.15	1.35	1.32
1	C1	858	A2M	O3'-C3'	2.12	1.48	1.43
1	C1	2289	A2M	C2-N3	2.11	1.35	1.32
1	C1	389	A2M	O3'-C3'	2.10	1.47	1.43
1	C1	1223	A2M	O3'-C3'	2.10	1.47	1.43
1	C1	637	A2M	O3'-C3'	2.09	1.47	1.43
1	C1	1432	A2M	O3'-C3'	2.07	1.47	1.43
1	C1	2289	A2M	O3'-C3'	2.05	1.47	1.43

All (82) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	1847	A2M	C1'-N9-C4	10.70	145.44	126.64
1	C1	1432	A2M	C1'-N9-C4	10.68	145.41	126.64
1	C1	389	A2M	C1'-N9-C4	10.64	145.34	126.64
1	C1	637	A2M	C1'-N9-C4	10.46	145.02	126.64
1	C1	858	A2M	C1'-N9-C4	10.40	144.91	126.64
1	C1	1223	A2M	C1'-N9-C4	10.25	144.65	126.64
1	C1	848	A2M	C1'-N9-C4	10.10	144.38	126.64
1	C1	2289	A2M	C1'-N9-C4	9.91	144.05	126.64
1	C1	1223	A2M	C5-C6-N6	9.00	134.03	120.35
1	C1	1847	A2M	C5-C6-N6	9.00	134.02	120.35
1	C1	858	A2M	C5-C6-N6	8.92	133.90	120.35
1	C1	389	A2M	C5-C6-N6	8.90	133.88	120.35
1	C1	848	A2M	C5-C6-N6	8.90	133.87	120.35
1	C1	637	A2M	C5-C6-N6	8.86	133.81	120.35
1	C1	2289	A2M	C5-C6-N6	8.72	133.60	120.35
1	C1	1432	A2M	C5-C6-N6	8.71	133.58	120.35
1	C1	1847	A2M	N6-C6-N1	-6.09	105.94	118.57

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	848	A2M	N6-C6-N1	-6.06	105.99	118.57
1	C1	858	A2M	N6-C6-N1	-6.06	106.00	118.57
1	C1	1223	A2M	N6-C6-N1	-6.00	106.11	118.57
1	C1	389	A2M	N6-C6-N1	-6.00	106.13	118.57
1	C1	637	A2M	N6-C6-N1	-5.99	106.14	118.57
1	C1	1432	A2M	N6-C6-N1	-5.90	106.32	118.57
1	C1	2289	A2M	N6-C6-N1	-5.87	106.39	118.57
1	C1	858	A2M	N3-C2-N1	-5.71	119.75	128.68
1	C1	1847	A2M	N3-C2-N1	-5.68	119.79	128.68
1	C1	2289	A2M	N3-C2-N1	-5.68	119.79	128.68
1	C1	1223	A2M	N3-C2-N1	-5.68	119.81	128.68
1	C1	1432	A2M	N3-C2-N1	-5.67	119.82	128.68
1	C1	637	A2M	N3-C2-N1	-5.61	119.91	128.68
1	C1	848	A2M	N3-C2-N1	-5.58	119.95	128.68
1	C1	389	A2M	N3-C2-N1	-5.58	119.96	128.68
1	C1	1868	OMU	C4-N3-C2	-5.42	119.42	126.58
1	C1	2683	OMU	C4-N3-C2	-5.28	119.62	126.58
1	C1	2380	OMU	C4-N3-C2	-5.13	119.81	126.58
1	C1	2688	OMU	C4-N3-C2	-5.09	119.87	126.58
1	C1	2384	OMU	C4-N3-C2	-5.07	119.89	126.58
1	C1	1917	OMU	C4-N3-C2	-4.93	120.08	126.58
1	C1	2690	OMU	C4-N3-C2	-4.64	120.45	126.58
1	C1	1868	OMU	N3-C2-N1	3.99	120.19	114.89
1	C1	2683	OMU	N3-C2-N1	3.95	120.13	114.89
1	C1	2384	OMU	N3-C2-N1	3.86	120.01	114.89
1	C1	2690	OMU	N3-C2-N1	3.80	119.93	114.89
1	C1	1917	OMU	N3-C2-N1	3.79	119.92	114.89
1	C1	2380	OMU	N3-C2-N1	3.75	119.87	114.89
1	C1	2688	OMU	N3-C2-N1	3.72	119.83	114.89
1	C1	1868	OMU	C5-C4-N3	3.32	119.81	114.84
1	C1	2683	OMU	C5-C4-N3	3.28	119.74	114.84
1	C1	2688	OMU	C5-C4-N3	3.26	119.72	114.84
1	C1	2380	OMU	C5-C4-N3	3.25	119.70	114.84
1	C1	2384	OMU	C5-C4-N3	3.23	119.67	114.84
1	C1	1917	OMU	C5-C4-N3	3.11	119.49	114.84
1	C1	1917	OMU	C1'-N1-C2	3.09	123.17	117.57
1	C1	2690	OMU	C1'-N1-C2	3.01	123.01	117.57
1	C1	2690	OMU	C5-C4-N3	3.00	119.33	114.84
1	C1	1420	OMC	C1'-N1-C2	2.96	125.03	118.42
1	C1	2838	OMC	C1'-N1-C2	2.88	124.86	118.42
1	C1	2380	OMU	O4-C4-C5	-2.88	120.09	125.16
1	C1	1868	OMU	O4-C4-C5	-2.86	120.14	125.16

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C1	2683	OMU	O4-C4-C5	-2.81	120.22	125.16
1	C1	1917	OMU	O4-C4-C5	-2.81	120.22	125.16
1	C1	2384	OMU	O4-C4-C5	-2.80	120.24	125.16
1	C1	2688	OMU	O4-C4-C5	-2.77	120.28	125.16
1	C1	2690	OMU	O4-C4-C5	-2.77	120.28	125.16
1	C1	1836	OMC	C1'-N1-C2	2.62	124.27	118.42
1	C1	778	OMC	C1'-N1-C2	2.60	124.22	118.42
1	C1	646	OMG	O6-C6-C5	2.54	129.33	124.37
1	C1	2358	OMG	O6-C6-C5	2.41	129.08	124.37
1	C1	2683	OMU	O2-C2-N1	-2.36	119.64	122.79
1	C1	2774	OMG	O6-C6-C5	2.36	128.99	124.37
1	C1	2881	OMG	O6-C6-C5	2.36	128.98	124.37
1	C1	1433	OMG	O6-C6-C5	2.36	128.98	124.37
1	C1	2876	OMG	O6-C6-C5	2.34	128.95	124.37
1	C1	385	OMG	O6-C6-C5	2.33	128.93	124.37
1	C1	787	OMG	O6-C6-C5	2.32	128.91	124.37
1	C1	627	OMG	O6-C6-C5	2.30	128.86	124.37
1	C1	1868	OMU	O2-C2-N1	-2.26	119.79	122.79
1	C1	2690	OMU	C6-N1-C2	-2.15	118.24	120.99
1	C1	2380	OMU	O2-C2-N1	-2.11	119.98	122.79
1	C1	2838	OMC	C1'-N1-C6	-2.08	116.30	120.84
1	C1	646	OMG	C5-C6-N1	-2.07	110.30	113.95
1	C1	2918	OMC	C1'-N1-C2	2.04	122.97	118.42

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C1	385	OMG	C3'-C4'-C5'-O5'
1	C1	389	A2M	C1'-C2'-O2'-CM'
1	C1	627	OMG	C3'-C4'-C5'-O5'
1	C1	637	A2M	C1'-C2'-O2'-CM'
1	C1	1223	A2M	C1'-C2'-O2'-CM'
1	C1	1433	OMG	O4'-C4'-C5'-O5'
1	C1	1433	OMG	C3'-C4'-C5'-O5'
1	C1	1847	A2M	C3'-C4'-C5'-O5'
1	C1	2683	OMU	C1'-C2'-O2'-CM2
1	C1	2688	OMU	C3'-C4'-C5'-O5'
1	C1	2688	OMU	O4'-C4'-C5'-O5'
1	C1	2690	OMU	C4'-C5'-O5'-P
1	C1	1847	A2M	O4'-C4'-C5'-O5'
1	C1	385	OMG	O4'-C4'-C5'-O5'

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
1	C1	627	OMG	O4'-C4'-C5'-O5'
1	C1	389	A2M	O4'-C4'-C5'-O5'
1	C1	1223	A2M	O4'-C4'-C5'-O5'
1	C1	1847	A2M	C4'-C5'-O5'-P
1	C1	787	OMG	C3'-C2'-O2'-CM2
1	C1	2690	OMU	C2'-C1'-N1-C6
1	C1	2690	OMU	C2'-C1'-N1-C2
1	C1	787	OMG	C1'-C2'-O2'-CM2
1	C1	2688	OMU	C3'-C2'-O2'-CM2
1	C1	1491	OMC	O4'-C4'-C5'-O5'
1	C1	848	A2M	C3'-C2'-O2'-CM'
1	C1	1420	OMC	O4'-C4'-C5'-O5'

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 8 are monoatomic - leaving 2 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
59	GTP	CH	701	60	26,34,34	1.14	2 (7%)	32,54,54	1.65	7 (21%)
59	GTP	Cd	1000	60	26,34,34	1.15	2 (7%)	32,54,54	1.52	6 (18%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
59	GTP	CH	701	60	-	5/18/38/38	0/3/3/3
59	GTP	Cd	1000	60	-	5/18/38/38	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
59	Cd	1000	GTP	C5-C6	-4.06	1.39	1.47
59	CH	701	GTP	C5-C6	-4.05	1.39	1.47
59	CH	701	GTP	C2-N3	2.14	1.38	1.33
59	Cd	1000	GTP	C2-N3	2.13	1.38	1.33

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
59	CH	701	GTP	PB-O3B-PG	-3.88	119.51	132.83
59	CH	701	GTP	PA-O3A-PB	-3.77	119.88	132.83
59	Cd	1000	GTP	PB-O3B-PG	-3.31	121.48	132.83
59	Cd	1000	GTP	C5-C6-N1	3.20	119.61	113.95
59	CH	701	GTP	C5-C6-N1	3.18	119.56	113.95
59	CH	701	GTP	C3'-C2'-C1'	3.13	105.69	100.98
59	Cd	1000	GTP	C8-N7-C5	3.00	108.71	102.99
59	CH	701	GTP	C8-N7-C5	2.94	108.58	102.99
59	Cd	1000	GTP	C3'-C2'-C1'	2.90	105.35	100.98
59	CH	701	GTP	C2-N1-C6	-2.87	119.82	125.10
59	Cd	1000	GTP	C2-N1-C6	-2.83	119.88	125.10
59	Cd	1000	GTP	O6-C6-C5	-2.15	120.18	124.37
59	CH	701	GTP	O6-C6-C5	-2.13	120.22	124.37

There are no chirality outliers.

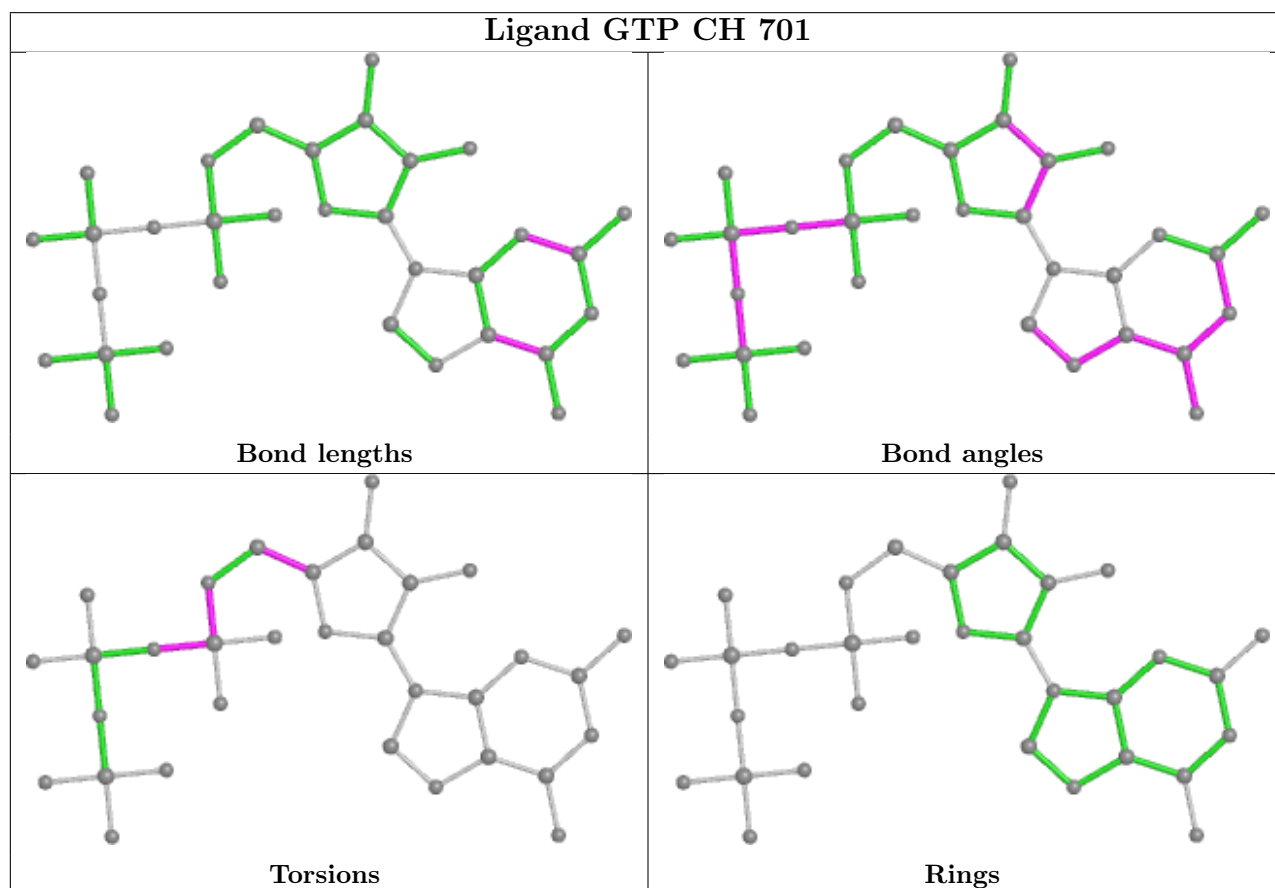
All (10) torsion outliers are listed below:

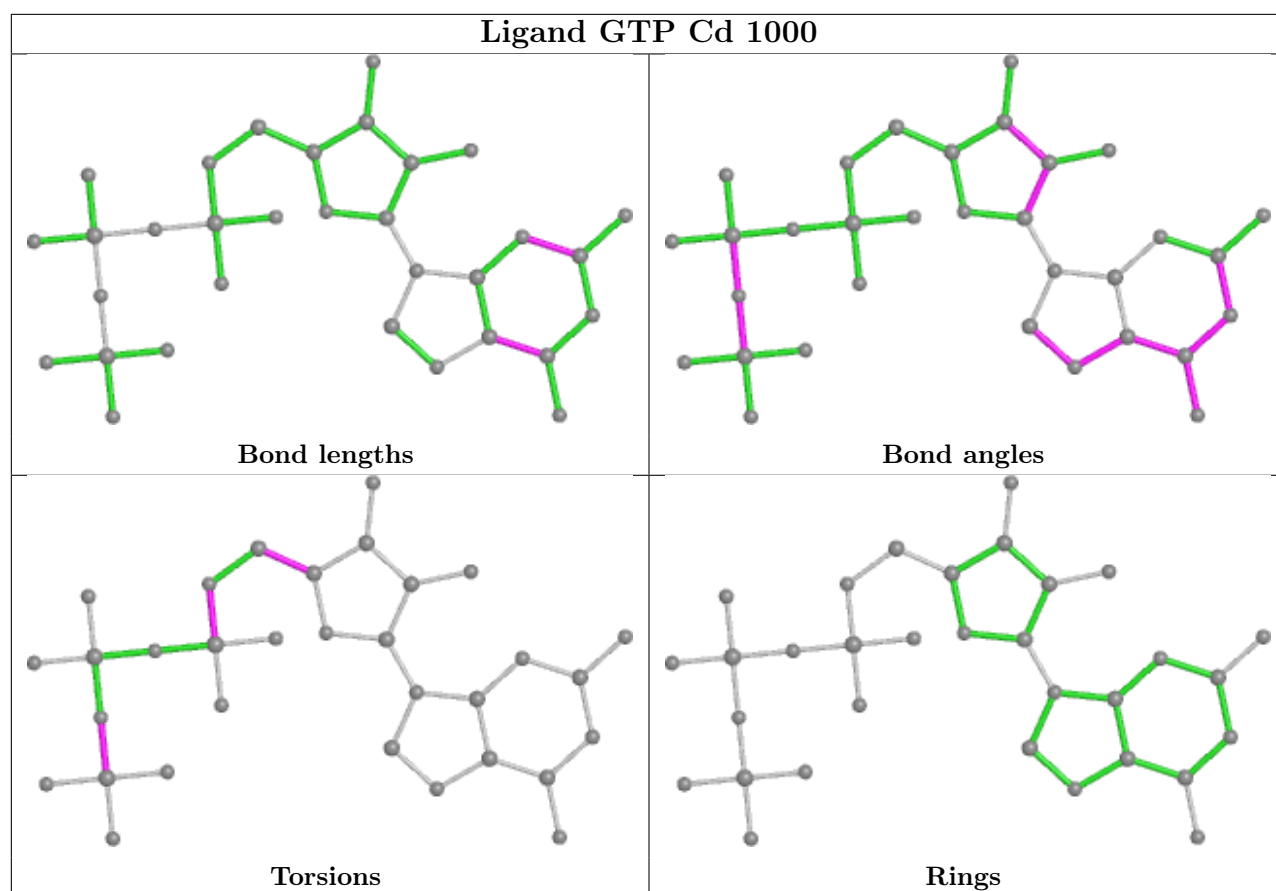
Mol	Chain	Res	Type	Atoms
59	Cd	1000	GTP	C5'-O5'-PA-O1A
59	CH	701	GTP	O4'-C4'-C5'-O5'
59	Cd	1000	GTP	C3'-C4'-C5'-O5'
59	Cd	1000	GTP	O4'-C4'-C5'-O5'
59	Cd	1000	GTP	PB-O3B-PG-O1G
59	CH	701	GTP	PB-O3A-PA-O1A
59	Cd	1000	GTP	C5'-O5'-PA-O3A
59	CH	701	GTP	C3'-C4'-C5'-O5'
59	CH	701	GTP	PB-O3A-PA-O2A
59	CH	701	GTP	C5'-O5'-PA-O1A

There are no ring outliers.

No monomer is involved in short contacts.

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

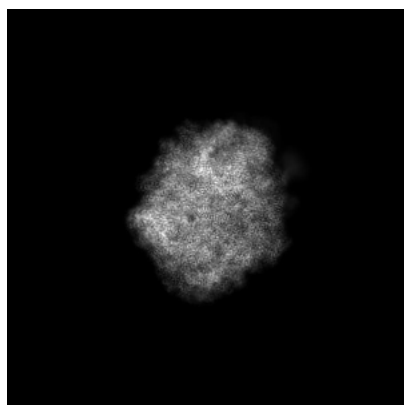
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-17957. These allow visual inspection of the internal detail of the map and identification of artifacts.

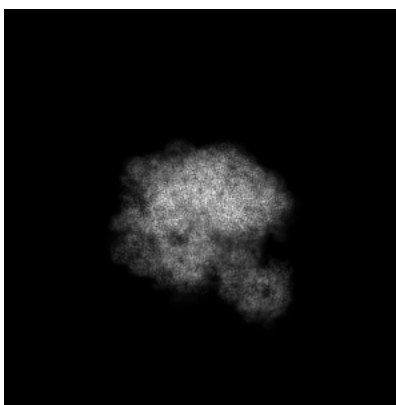
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

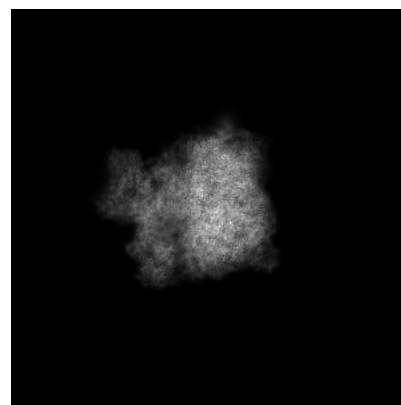
6.1.1 Primary map



X



Y

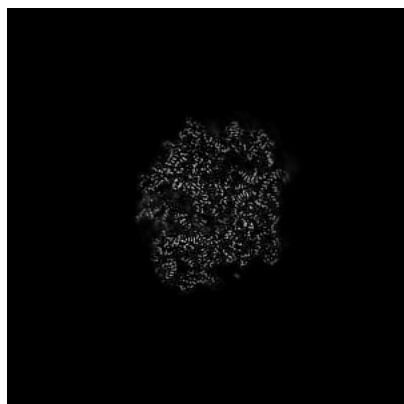


Z

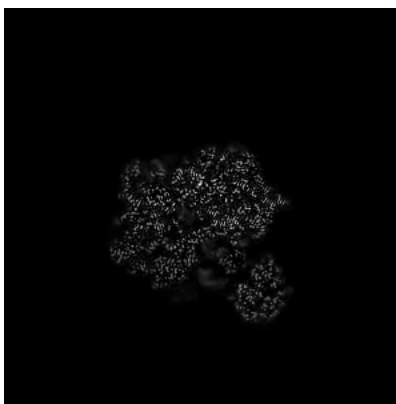
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

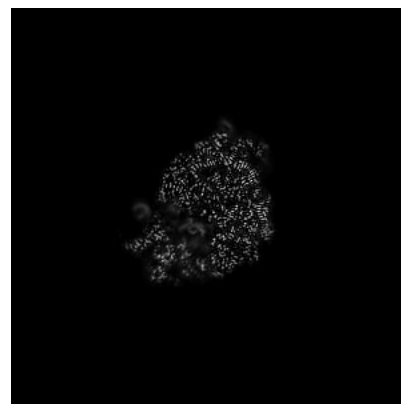
6.2.1 Primary map



X Index: 250



Y Index: 250

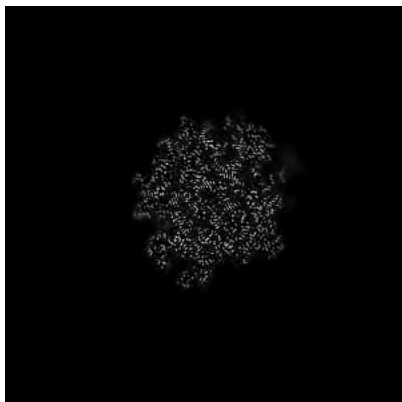


Z Index: 250

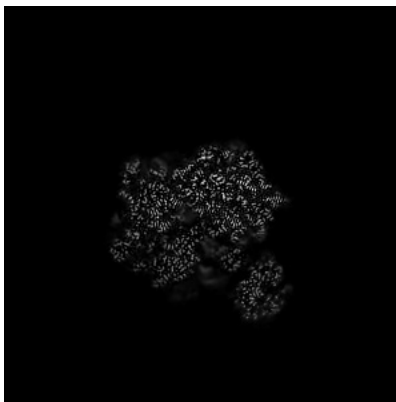
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

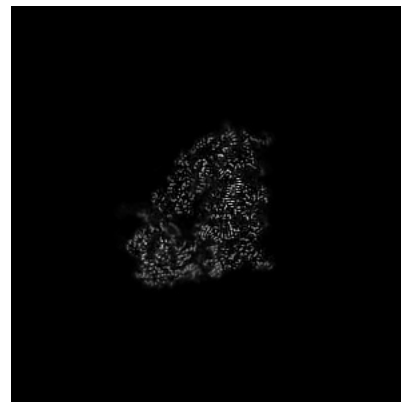
6.3.1 Primary map



X Index: 259



Y Index: 248

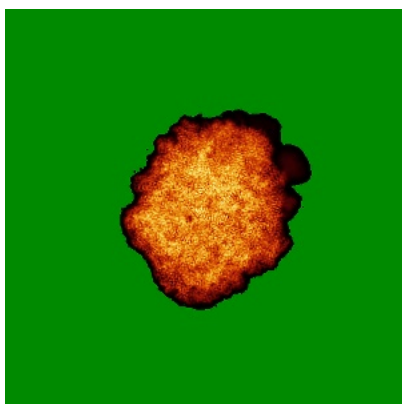


Z Index: 239

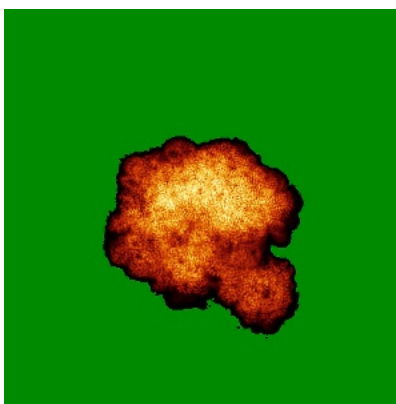
The images above show the largest variance slices of the map in three orthogonal directions.

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

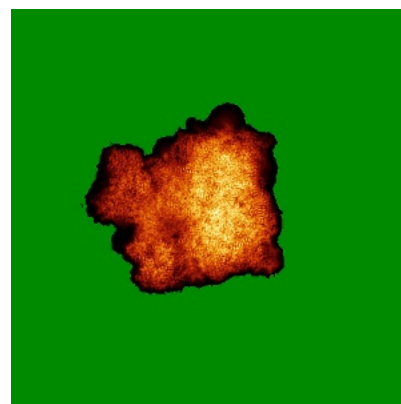
6.4.1 Primary map



X



Y

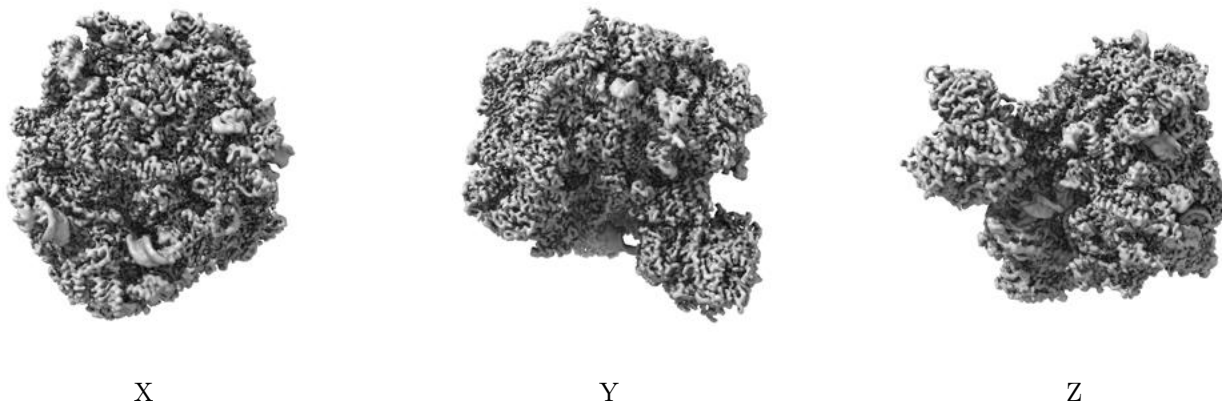


Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

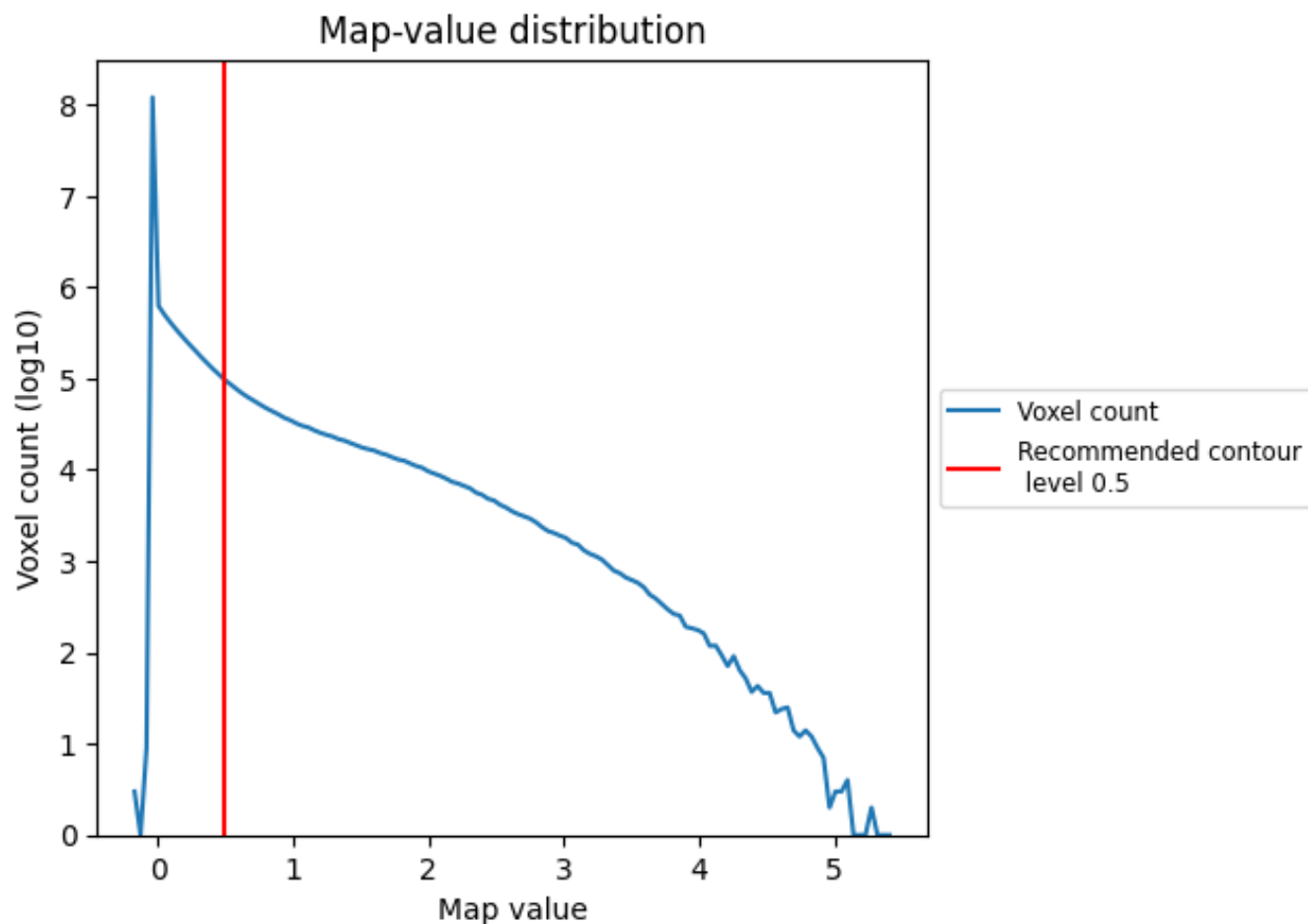
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

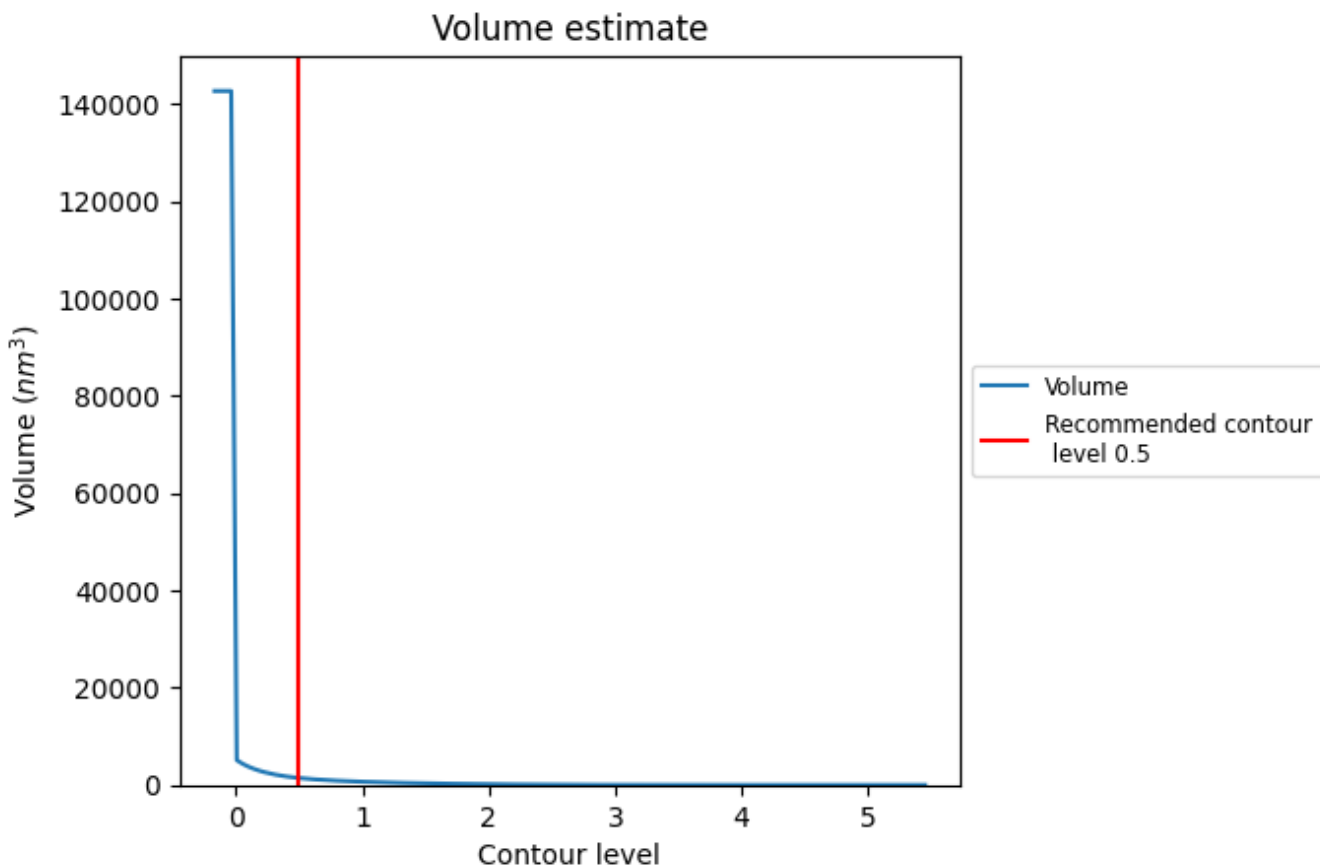
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

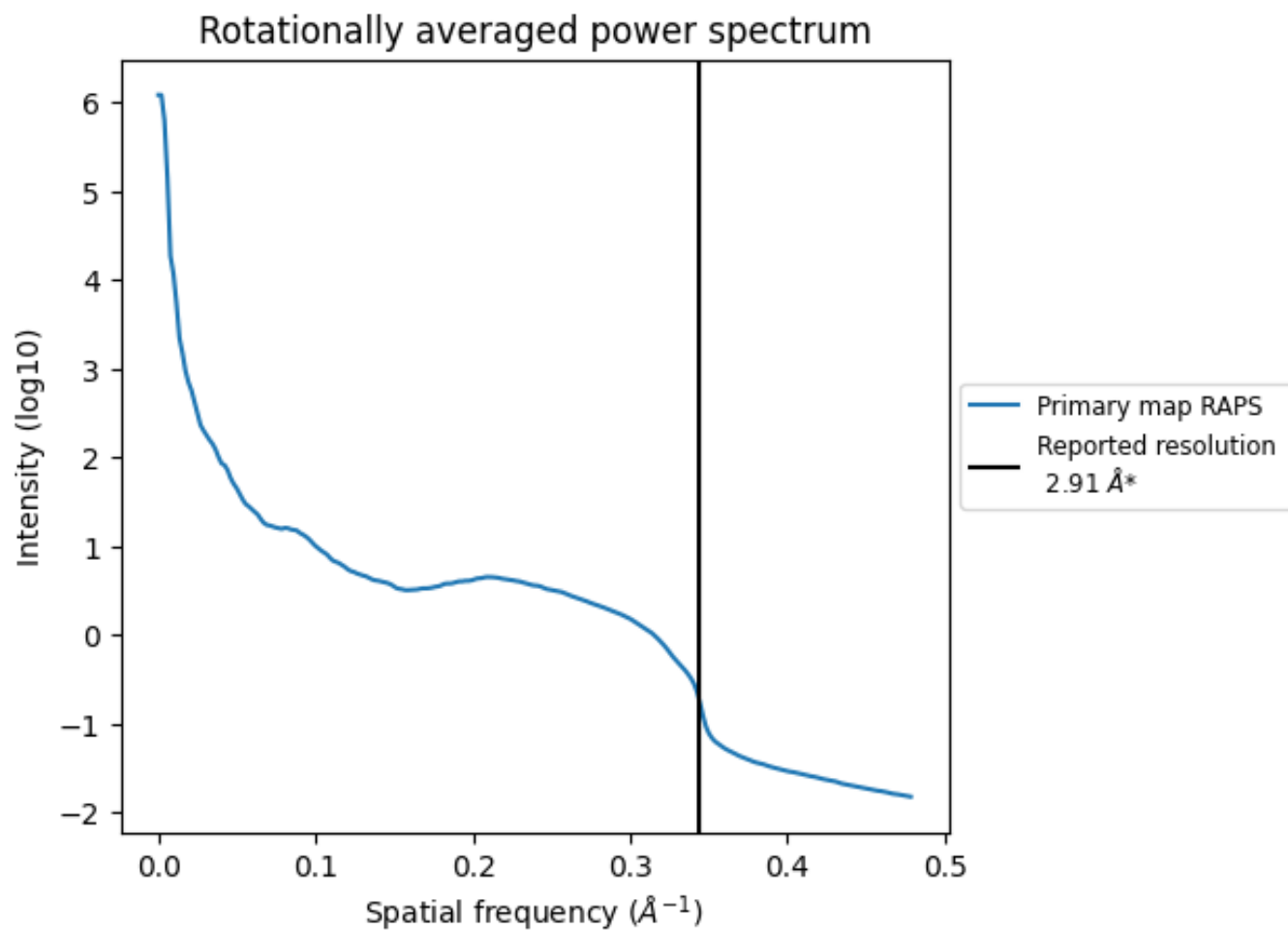
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1429 nm³; this corresponds to an approximate mass of 1291 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 0.344 \AA^{-1}

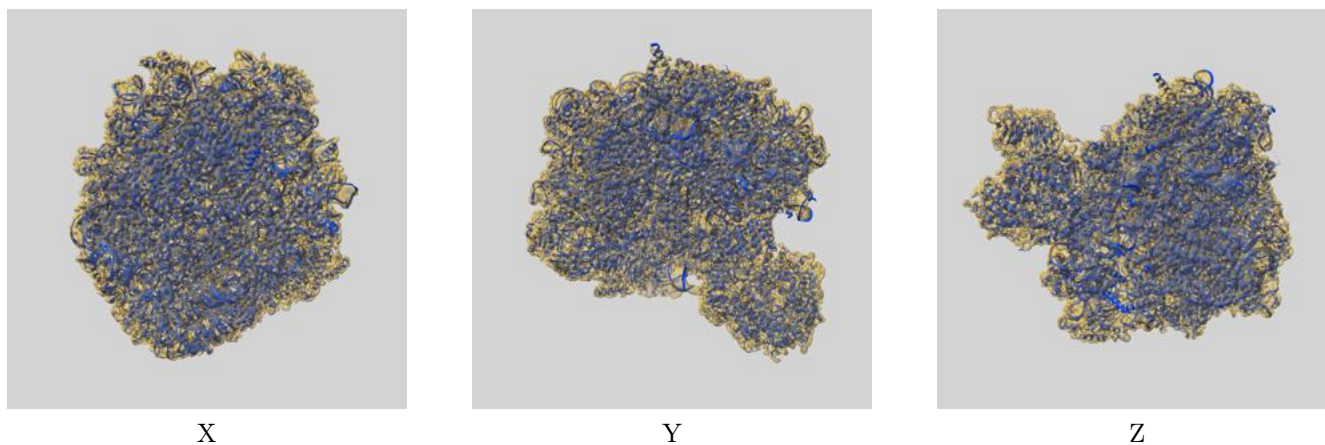
8 Fourier-Shell correlation

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

9 Map-model fit [i](#)

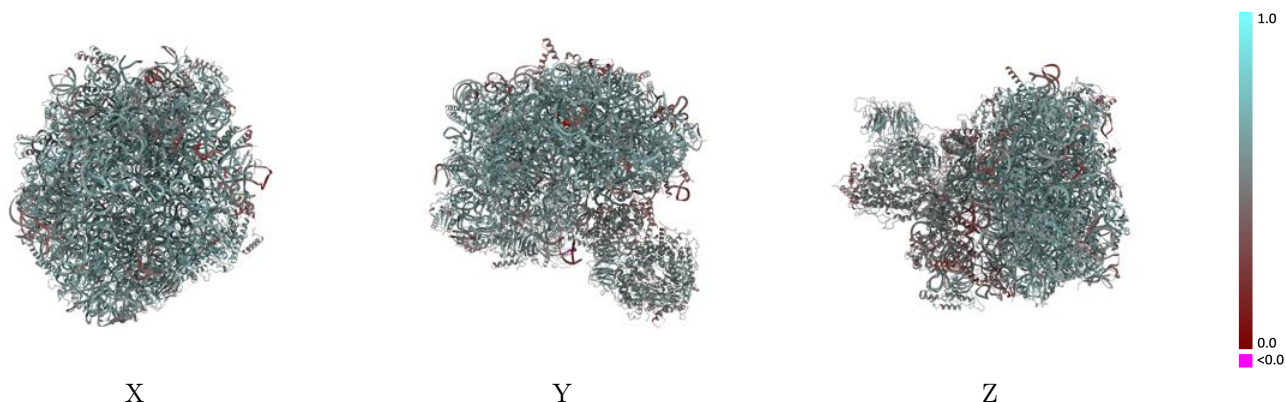
This section contains information regarding the fit between EMDB map EMD-17957 and PDB model 8PV8. Per-residue inclusion information can be found in section 3 on page 16.

9.1 Map-model overlay [i](#)



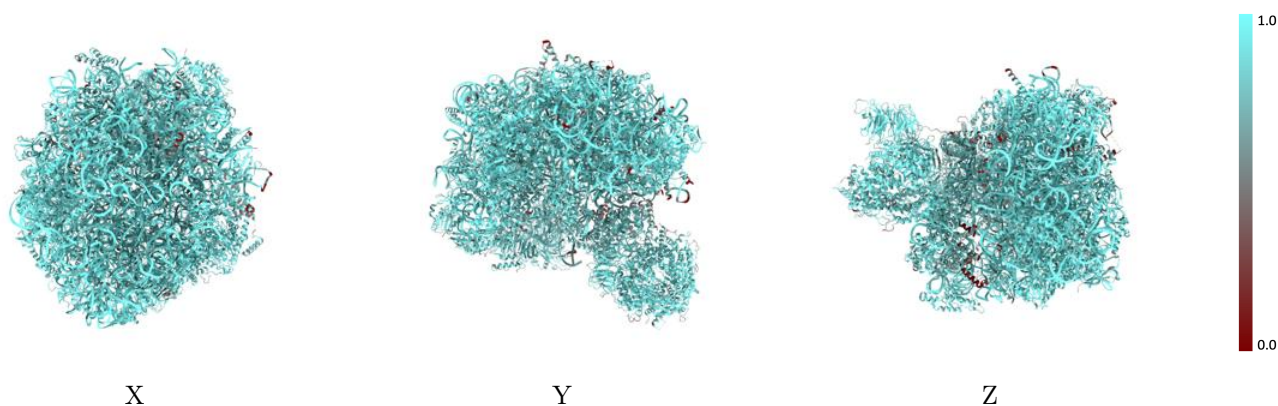
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



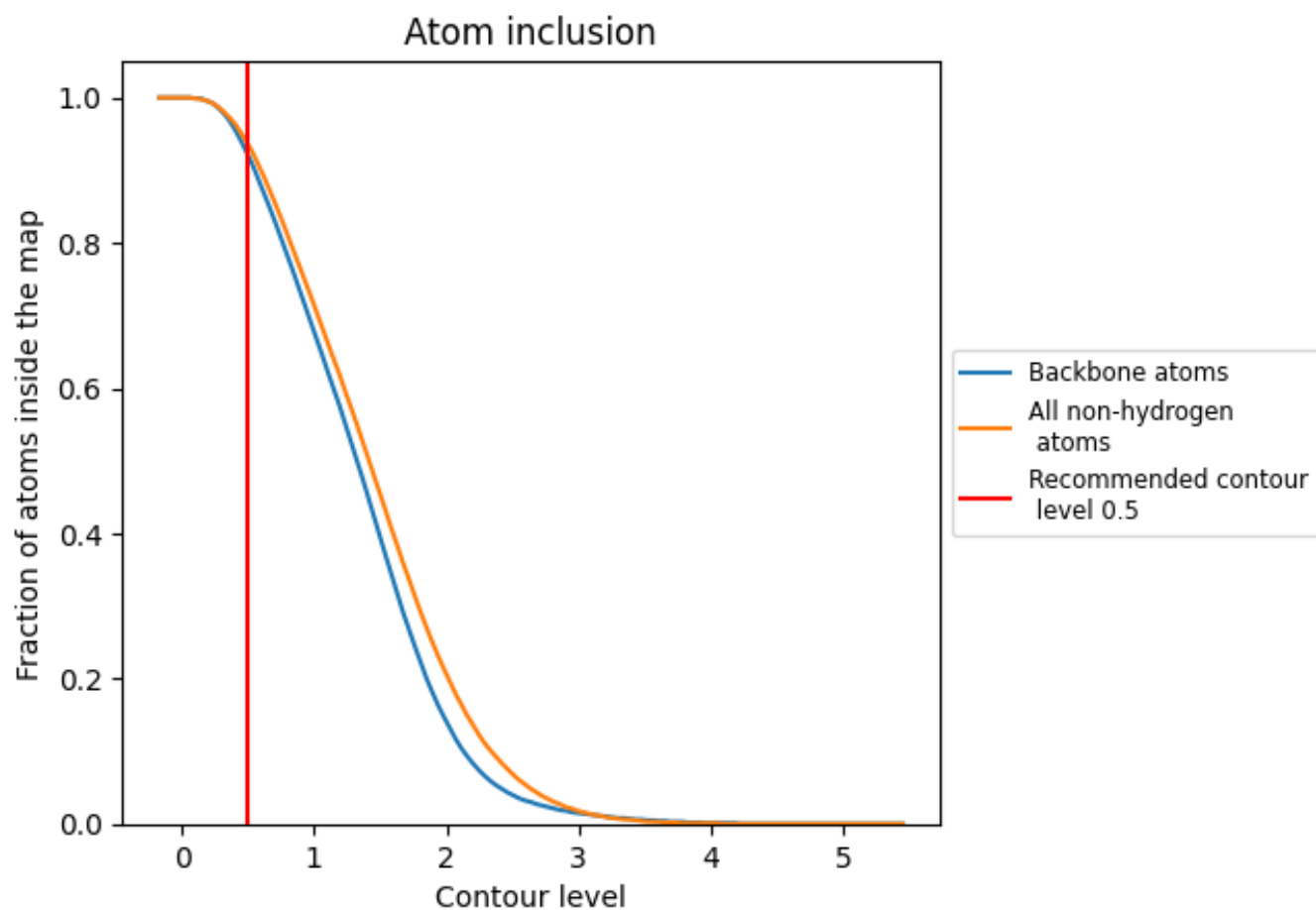
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.5).







































































9.4 Atom inclusion [i](#)



At the recommended contour level, 92% of all backbone atoms, 94% 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 (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9360	 0.5590
C1	 0.9780	 0.5720
C2	 0.9940	 0.6040
C4	 0.9880	 0.5390
CF	 0.8830	 0.5240
CH	 0.8790	 0.5440
CK	 0.9460	 0.5920
CL	 0.8760	 0.5150
CN	 0.9410	 0.5810
CO	 0.8950	 0.5610
CQ	 0.8830	 0.5440
CR	 0.8040	 0.4930
CS	 0.7560	 0.4720
CT	 0.8830	 0.5080
CU	 0.8820	 0.5190
CV	 0.8780	 0.4930
CW	 0.8810	 0.5020
Cb	 0.9300	 0.5660
Cd	 0.8940	 0.5620
Ch	 0.9090	 0.5320
Cz	 0.8690	 0.5170
LA	 0.9730	 0.6160
LB	 0.9710	 0.6150
LC	 0.9580	 0.6020
LD	 0.9230	 0.5160
LE	 0.9160	 0.5510
LF	 0.9500	 0.5860
LG	 0.8940	 0.5530
LH	 0.9240	 0.5770
LJ	 0.9420	 0.5300
LK	 0.8170	 0.4590
LL	 0.9260	 0.5770
LM	 0.9410	 0.5820
LN	 0.9910	 0.6300
LO	 0.9680	 0.6100



Continued on next page...

Continued from previous page...

Chain	Atom inclusion	Q-score
LP	 0.9700	 0.6070
LQ	 0.9610	 0.5980
LR	 0.9390	 0.5820
LS	 0.9620	 0.5980
LT	 0.9160	 0.5000
LU	 0.8970	 0.5210
LV	 0.9630	 0.5920
LX	 0.9160	 0.5680
LY	 0.9350	 0.5790
LZ	 0.9360	 0.5690
La	 0.9470	 0.5910
Lb	 0.7050	 0.3870
Lc	 0.9130	 0.5560
Ld	 0.9330	 0.5980
Le	 0.9630	 0.6130
Lf	 0.9750	 0.6220
Lg	 0.9310	 0.5920
Lh	 0.8940	 0.5410
Li	 0.9350	 0.5610
Lj	 0.9780	 0.6210
Lk	 0.8620	 0.5140
Ll	 0.9760	 0.6230
Lp	 0.9180	 0.5690
Lq	 0.9560	 0.5890
Lr	 0.4250	 0.3730
Lt	 0.7160	 0.3850