



## Full wwPDB EM Validation Report ⓘ

Nov 19, 2022 – 11:26 pm GMT

PDB ID : 6FF4  
EMDB ID : EMD-4255  
Title : human Bact spliceosome core structure  
Authors : Haselbach, D.; Komarov, I.; Agafonov, D.; Hartmuth, K.; Graf, B.; Kastner, B.; Luehrmann, R.; Stark, H.  
Deposited on : 2018-01-03  
Resolution : 3.40 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

---

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

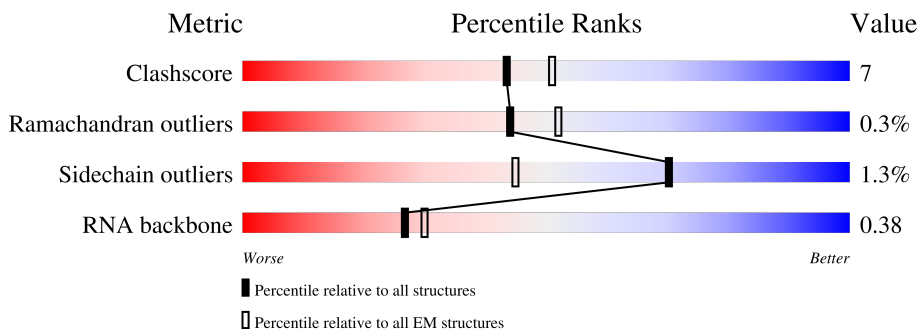
EMDB validation analysis : 0.0.1.dev43  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

# 1 Overall quality at a glance

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

The reported resolution of this entry is 3.40 Å.

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



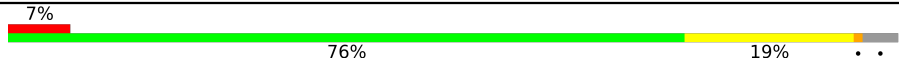
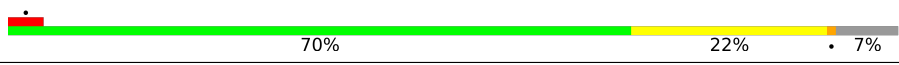
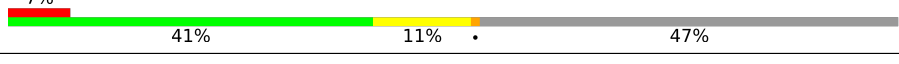
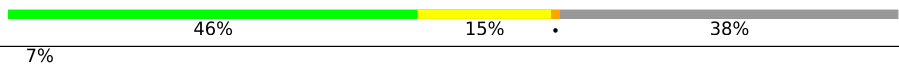



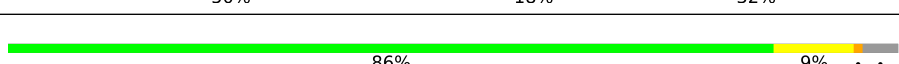
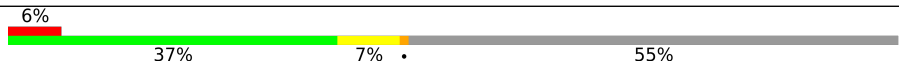
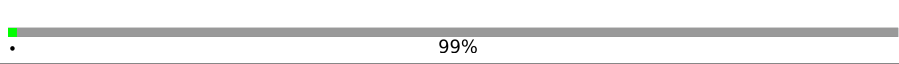


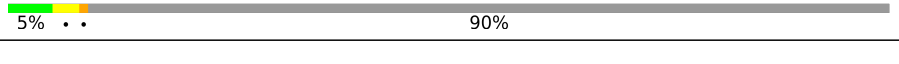

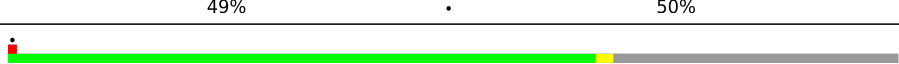
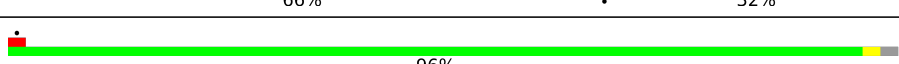
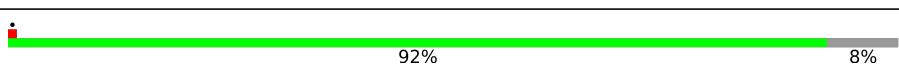
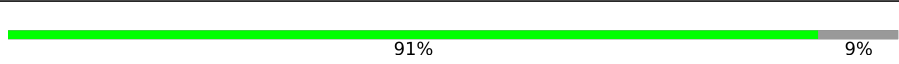


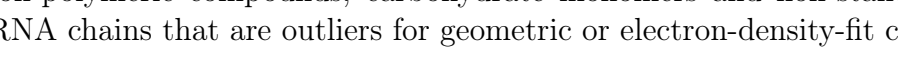
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826
RNA backbone	4643	859

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  $\geq 3$ , 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	1	322	31% 7% 62%
2	2	188	19% 10% 68%
3	3	619	16% 81%
4	5	116	21% 29% 8% 40%
5	6	107	41% 38% 8% 11%
6	7	464	17% 80%
7	8	895	15% 84%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
8	A	2335	
9	B	972	
10	C	536	
11	D	514	
12	E	579	
13	L	802	
14	O	848	
15	P	420	
16	Q	144	
17	R	229	
18	S	2752	
19	V	166	
20	Y	904	
21	Z	478	
22	s	472	
23	t	343	
24	u	1304	
25	v	1217	
26	x	86	
27	y	110	
28	z	125	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
30	IHP	A	3001	-	-	X	-

## 2 Entry composition

There are 32 unique types of molecules in this entry. The entry contains 72392 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 RNA-binding motif protein, X-linked 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	1	122	981	623	168	187	3	0	0

- Molecule 2 is a RNA chain called U2 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	2	60	1262	565	207	430	60	0	0

- Molecule 3 is a protein called BUD13 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	3	118	981	609	185	182	5	0	0

- Molecule 4 is a RNA chain called U5 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	5	70	1470	659	243	498	70	0	0

- Molecule 5 is a RNA chain called U6 snRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	6	95	2035	910	377	653	95	0	0

- Molecule 6 is a protein called Splicing factor 3A subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	7	93	733	444	145	140	4	0	0

- Molecule 7 is a protein called Splicing factor 3B subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	8	144	1211	776	219	210	6	0	0

- Molecule 8 is a protein called Pre-mRNA-processing-splicing factor 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	A	2238	18569	11953	3245	3290	81	0	0

- Molecule 9 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	B	902	7137	4566	1187	1349	35	0	0

- Molecule 10 is a protein called SNW domain-containing protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	C	286	2287	1427	419	429	12	0	0

- Molecule 11 is a protein called Pleiotropic regulator 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	D	320	2517	1588	457	464	8	0	0

- Molecule 12 is a protein called Pre-mRNA-processing factor 17.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	E	130	1054	664	175	211	4	0	0

- Molecule 13 is a protein called Cell division cycle 5-like protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	L	103	858	548	157	149	4	0	0

- Molecule 14 is a protein called Crooked neck-like protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	O	253	Total	C	N	O	S	0	0
			2235	1433	399	397	6		

- Molecule 15 is a protein called Pre-mRNA-splicing factor RBM22.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	P	286	Total	C	N	O	S	0	0
			2305	1447	411	427	20		

- Molecule 16 is a protein called Protein BUD31 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	Q	138	Total	C	N	O	S	0	0
			1153	728	212	203	10		

- Molecule 17 is a protein called Spliceosome-associated protein CWC15 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	R	102	Total	C	N	O	S	0	0
			869	532	169	166	2		

- Molecule 18 is a protein called Serine/arginine repetitive matrix protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	S	34	Total	C	N	O	S	0	0
			261	158	56	46	1		

- Molecule 19 is a protein called Peptidyl-prolyl cis-trans isomerase-like 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	V	159	Total	C	N	O	S	0	0
			1236	787	215	227	7		

- Molecule 20 is a protein called Serine/arginine repetitive matrix protein 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
20	Y	95	Total	C	N	O	S	0	0
			762	494	121	142	5		

- Molecule 21 is a RNA chain called pre mRNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
21	Z	48	1013	454	173	338	48	0	0

- Molecule 22 is a protein called Peptidyl-prolyl cis-trans isomerase CWC27 homolog.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
22	s	175	1377	869	240	263	5	0	0

- Molecule 23 is a protein called RING finger protein 113A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
23	t	172	1415	880	257	267	11	0	0

- Molecule 24 is a protein called Splicing factor 3B subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
24	u	881	7013	4496	1201	1274	42	0	0

- Molecule 25 is a protein called Splicing factor 3B subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
25	v	1189	9315	5908	1586	1776	45	0	0

- Molecule 26 is a protein called Splicing factor 3B subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
26	x	79	656	415	115	120	6	0	0

- Molecule 27 is a protein called PHD finger-like domain-containing protein 5A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
27	y	100	766	473	135	145	13	0	0

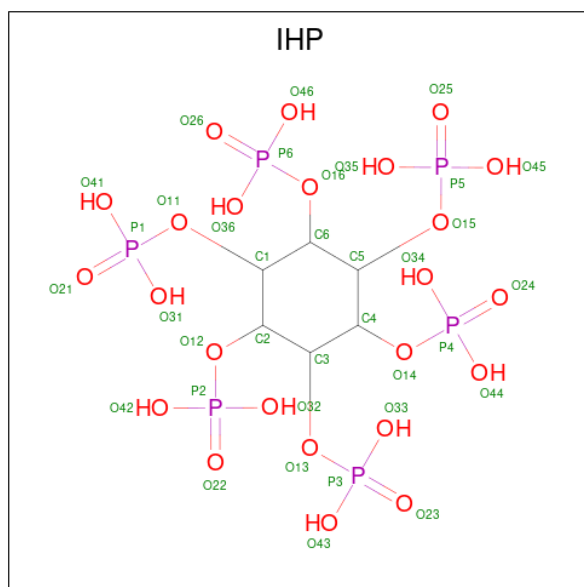
- Molecule 28 is a protein called Splicing factor 3B subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
28	z	101	839	538	146	151	4	0	0

- Molecule 29 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
29	6	4	4	4	0

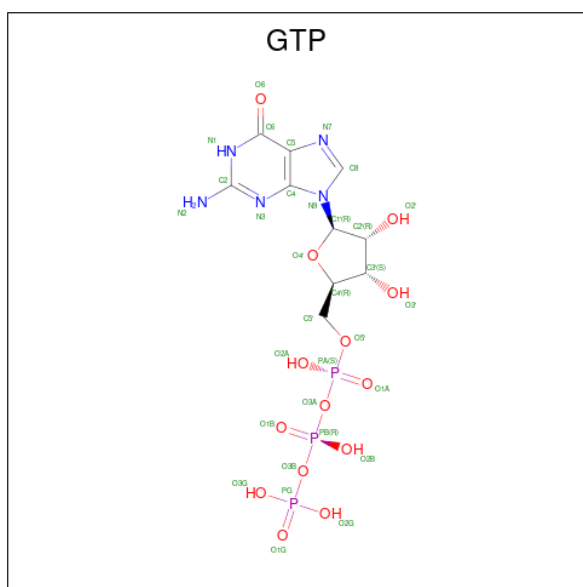
- Molecule 30 is INOSITOL HEXAKISPHOSPHATE (three-letter code: IHP) (formula: C<sub>6</sub>H<sub>18</sub>O<sub>24</sub>P<sub>6</sub>).



Mol	Chain	Residues	Atoms				AltConf
			Total	C	O	P	
30	A	1	36	6	24	6	0

- Molecule 31 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>14</sub>P<sub>3</sub>).





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

- Molecule 32 is ZINC ION (three-letter code: ZN) (formula: Zn).

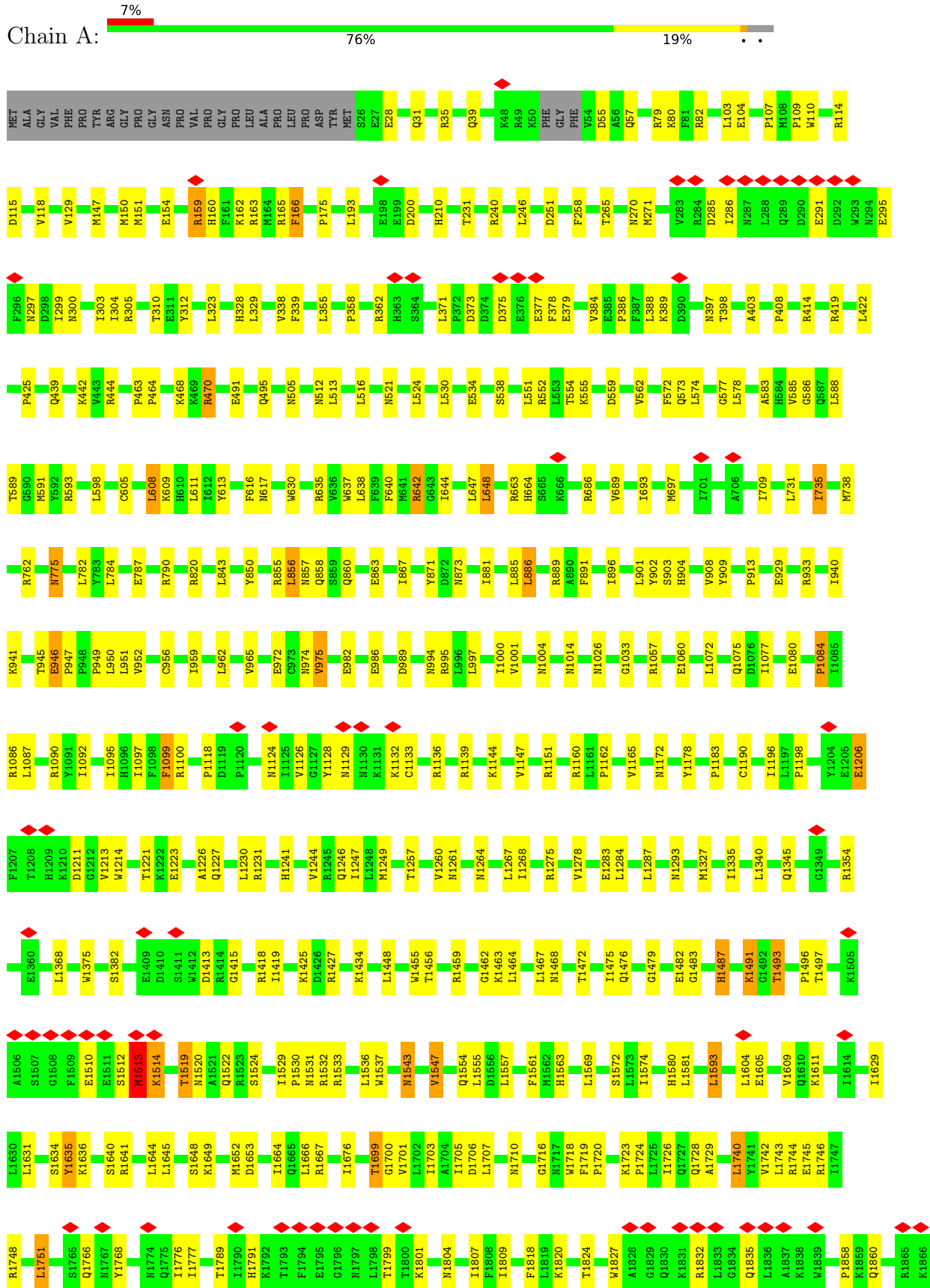
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
32	P	3	3	3	0
32	Q	3	3	3	0
32	t	1	1	1	0
32	y	3	3	3	0

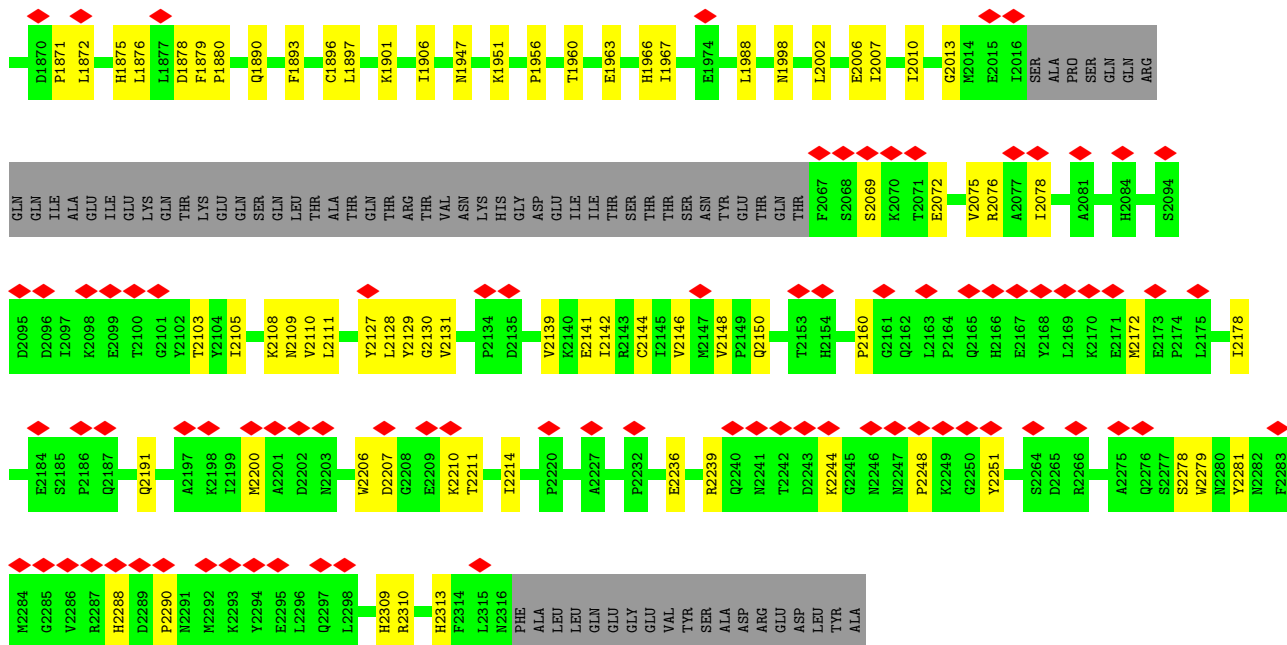




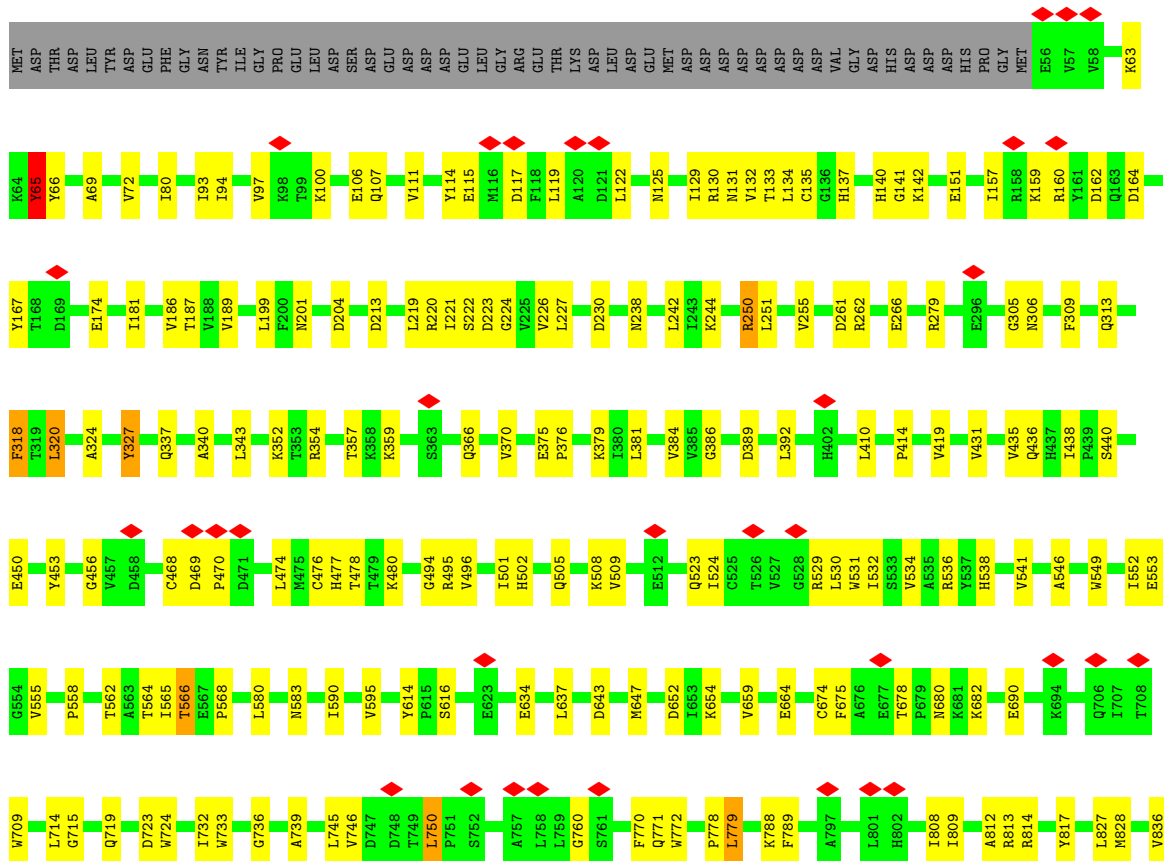


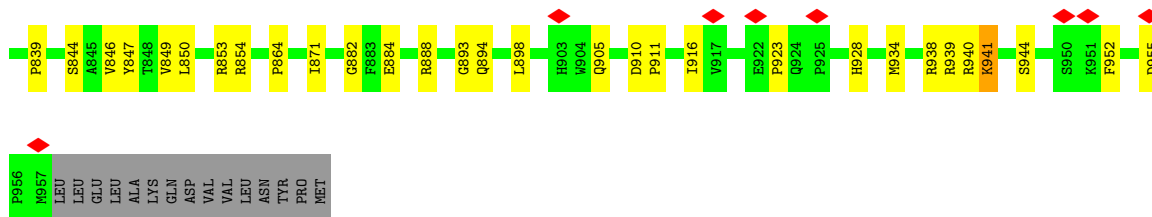
• Molecule 8: Pre-mRNA-processing-splicing factor 8



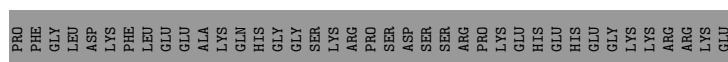
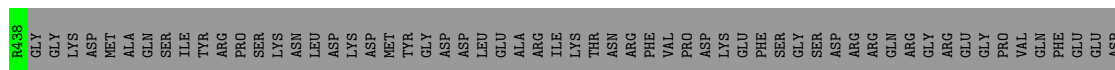
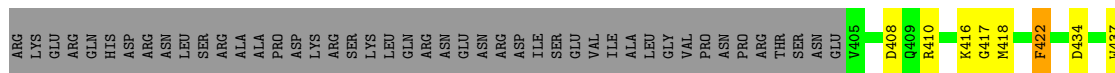
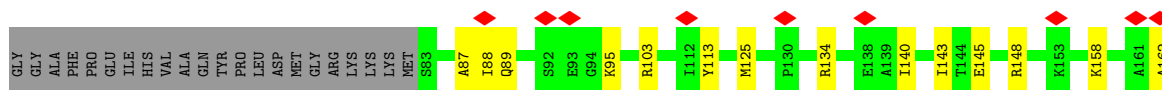
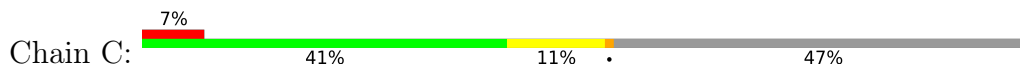


• Molecule 9: 116 kDa U5 small nuclear ribonucleoprotein component

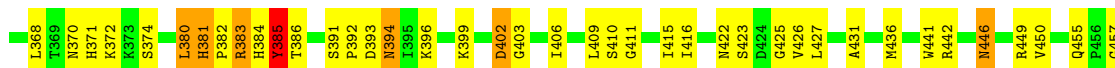
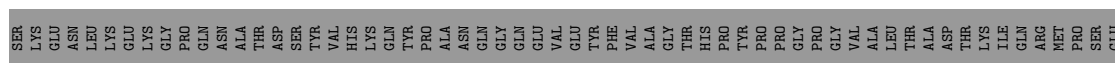
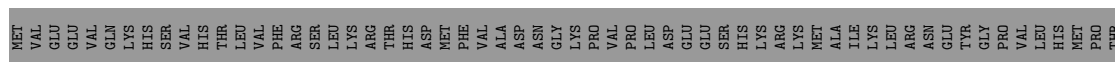


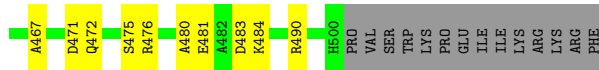


• Molecule 10: SNW domain-containing protein 1

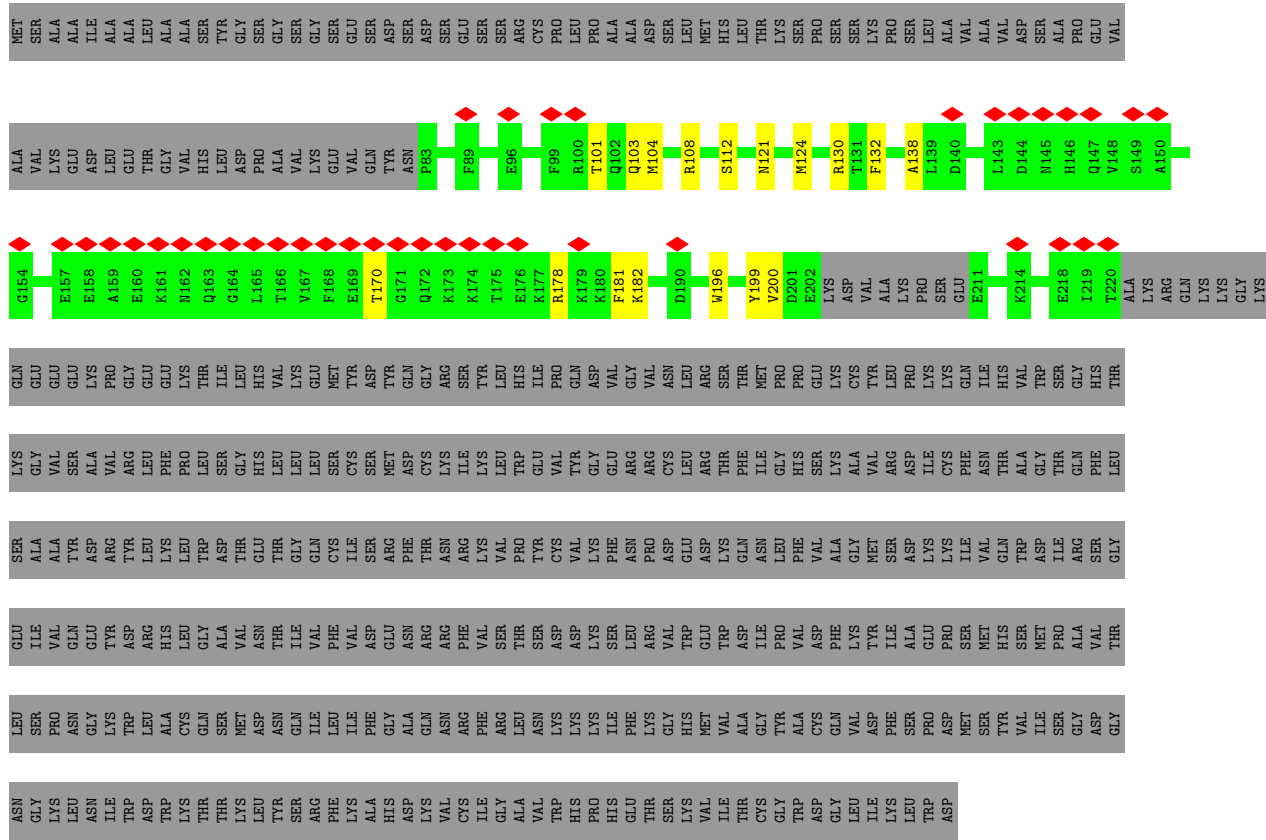


• Molecule 11: Pleiotropic regulator 1

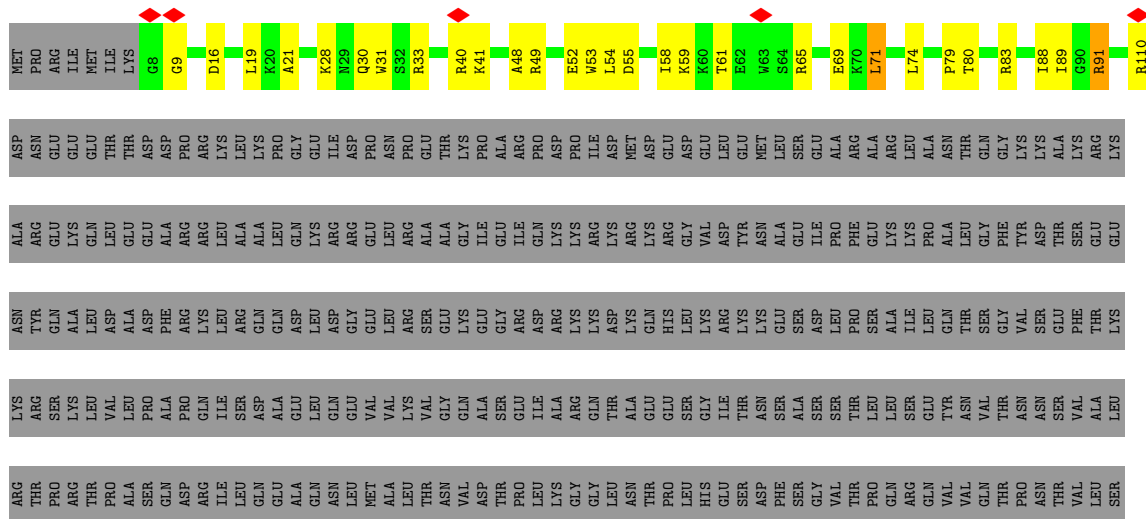




• Molecule 12: Pre-mRNA-processing factor 17



• Molecule 13: Cell division cycle 5-like protein







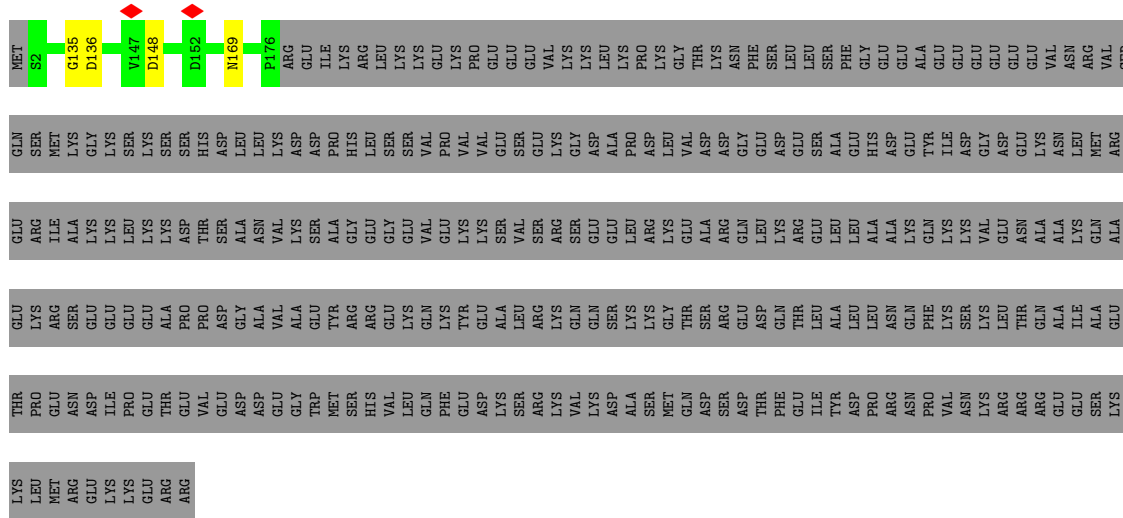




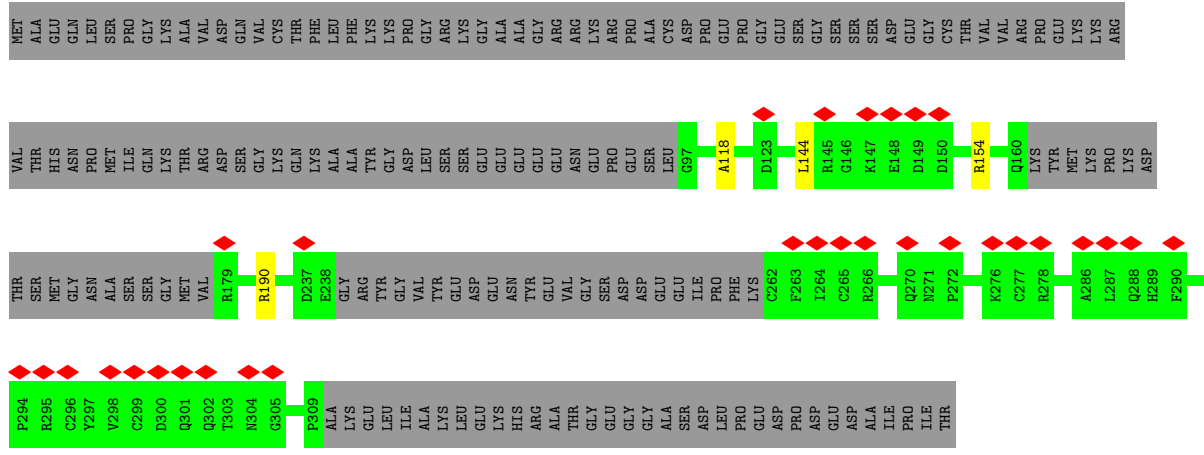




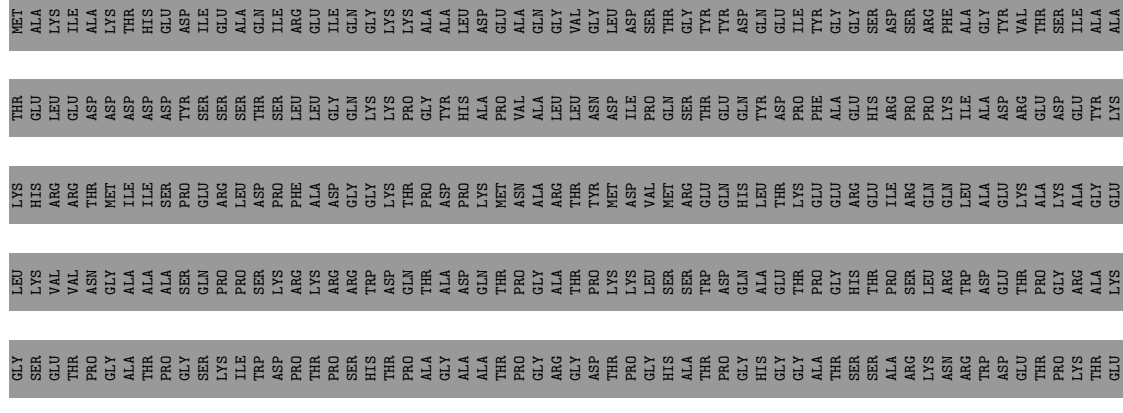


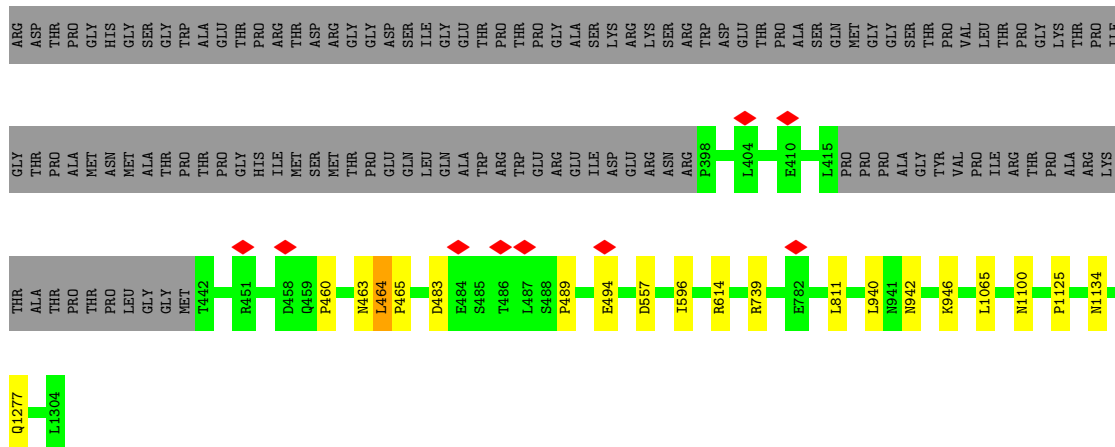


• Molecule 23: RING finger protein 113A

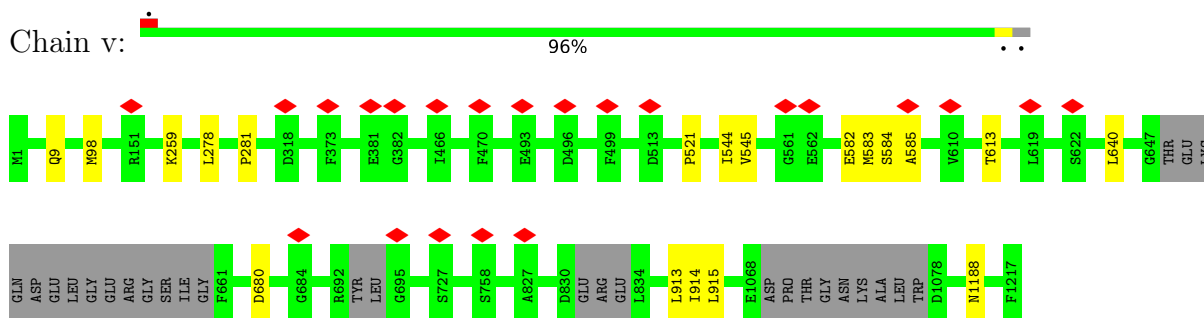


• Molecule 24: Splicing factor 3B subunit 1

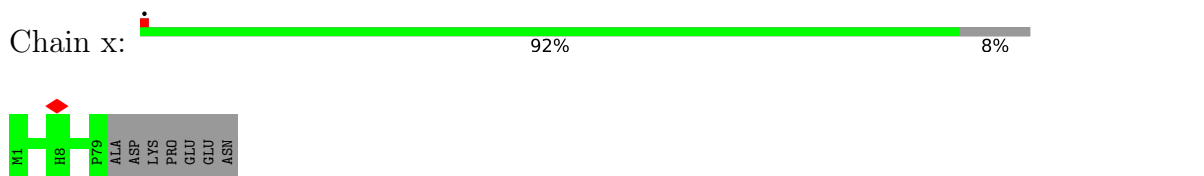




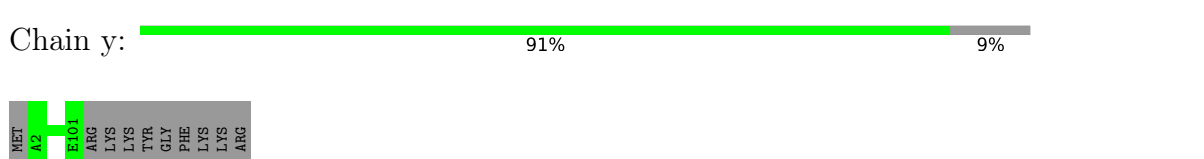
• Molecule 25: Splicing factor 3B subunit 3



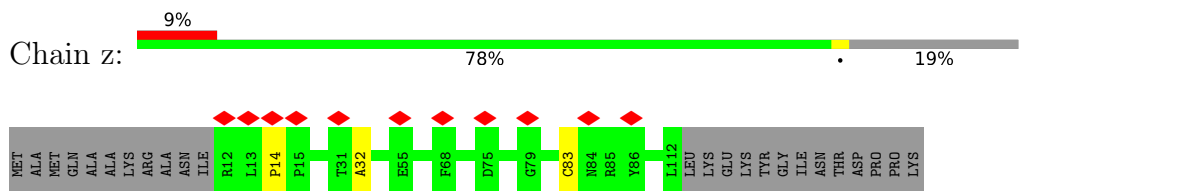
• Molecule 26: Splicing factor 3B subunit 5



• Molecule 27: PHD finger-like domain-containing protein 5A



• Molecule 28: Splicing factor 3B subunit 6





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	17000	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	4500	Depositor
Magnification	59000	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.314	Depositor
Minimum map value	-0.149	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.04	Depositor
Map size ( $\text{\AA}$ )	487.19998, 487.19998, 487.19998	wwPDB
Map dimensions	420, 420, 420	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.16, 1.16, 1.16	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: ZN, MG, GTP, IHP

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	1	0.45	0/999	0.64	0/1347
2	2	0.78	0/1404	1.21	9/2177 (0.4%)
3	3	0.39	0/1002	0.68	1/1341 (0.1%)
4	5	0.97	1/1638 (0.1%)	1.41	32/2545 (1.3%)
5	6	0.91	0/2279	1.20	11/3551 (0.3%)
6	7	0.45	0/744	0.68	1/993 (0.1%)
7	8	0.48	0/1239	0.65	0/1660
8	A	0.59	2/19083 (0.0%)	0.73	14/25888 (0.1%)
9	B	0.44	1/7299 (0.0%)	0.75	7/9917 (0.1%)
10	C	0.47	0/2328	0.70	0/3128
11	D	0.63	0/2584	0.79	3/3522 (0.1%)
12	E	0.35	0/1079	0.65	0/1453
13	L	0.52	0/879	0.71	1/1184 (0.1%)
14	O	0.43	0/2295	0.66	0/3088
15	P	0.41	0/2354	0.70	1/3176 (0.0%)
16	Q	0.50	0/1178	0.73	0/1579
17	R	0.45	0/881	0.76	2/1169 (0.2%)
18	S	0.42	0/265	0.70	0/355
19	V	0.31	0/1268	0.56	0/1714
20	Y	0.37	0/775	0.60	0/1045
21	Z	0.85	0/1129	1.13	5/1752 (0.3%)
22	s	0.48	0/1411	0.68	2/1911 (0.1%)
23	t	0.45	0/1447	0.63	1/1945 (0.1%)
24	u	0.55	0/7147	0.72	3/9675 (0.0%)
25	v	0.49	0/9504	0.68	3/12894 (0.0%)
26	x	0.59	0/675	0.71	0/912
27	y	0.63	0/779	0.60	0/1047
28	z	0.42	1/857 (0.1%)	0.64	0/1157
All	All	0.56	5/74522 (0.0%)	0.78	96/102125 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if

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

Mol	Chain	#Chirality outliers	#Planarity outliers
3	3	0	1
8	A	0	19
9	B	0	8
10	C	0	3
11	D	0	5
13	L	0	1
14	O	0	2
15	P	0	3
22	s	0	1
23	t	0	1
24	u	0	6
25	v	0	5
28	z	0	2
All	All	0	57

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
28	z	14	PRO	C-N	6.42	1.46	1.34
4	5	26	A	N9-C4	-6.39	1.34	1.37
8	A	538	SER	CA-CB	-5.41	1.44	1.52
8	A	166	PHE	CB-CG	-5.07	1.42	1.51
9	B	566	THR	C-N	5.03	1.45	1.34

All (96) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	5	27	U	N1-C2-O2	13.25	132.08	122.80
4	5	27	U	N3-C2-O2	-12.05	113.77	122.20
4	5	27	U	C2-N1-C1'	11.36	131.33	117.70
2	2	23	A	C8-N9-C4	-8.76	102.30	105.80
4	5	36	C	C6-N1-C2	-8.40	116.94	120.30
4	5	36	C	N1-C2-O2	8.32	123.89	118.90
4	5	68	C	C2-N1-C1'	8.22	127.84	118.80
5	6	79	C	C5-C6-N1	7.97	124.98	121.00
5	6	69	A	N7-C8-N9	7.96	117.78	113.80
22	s	136	ASP	CB-CG-OD1	7.90	125.41	118.30
11	D	402	ASP	CB-CG-OD1	7.83	125.35	118.30
4	5	68	C	N1-C2-O2	7.76	123.56	118.90

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
15	P	98	ASP	CB-CG-OD1	7.74	125.27	118.30
5	6	69	A	C5-N7-C8	-7.64	100.08	103.90
4	5	26	A	C8-N9-C4	7.58	108.83	105.80
17	R	202	ASP	CB-CG-OD1	7.53	125.08	118.30
2	2	23	A	N7-C8-N9	7.49	117.54	113.80
4	5	27	U	C5-C6-N1	7.39	126.40	122.70
5	6	79	C	C6-N1-C2	-7.32	117.37	120.30
4	5	36	C	C5-C6-N1	7.29	124.64	121.00
4	5	18	C	C5-C6-N1	7.28	124.64	121.00
2	2	13	C	N1-C2-O2	7.24	123.24	118.90
4	5	27	U	C6-N1-C1'	-7.23	111.08	121.20
8	A	1230	LEU	CB-CG-CD2	-7.07	98.99	111.00
4	5	36	C	N3-C2-O2	-7.05	116.97	121.90
4	5	18	C	N1-C2-O2	6.80	122.98	118.90
17	R	201	VAL	C-N-CA	6.80	138.70	121.70
4	5	36	C	C2-N1-C1'	6.75	126.23	118.80
4	5	26	A	P-O3'-C3'	6.71	127.76	119.70
8	A	608	LEU	CA-CB-CG	6.67	130.65	115.30
2	2	25	G	C8-N9-C4	-6.66	103.74	106.40
24	u	557	ASP	CB-CG-OD1	6.62	124.26	118.30
23	t	144	LEU	CA-CB-CG	6.49	130.22	115.30
8	A	997	LEU	CA-CB-CG	6.48	130.21	115.30
4	5	68	C	N3-C2-O2	-6.43	117.40	121.90
24	u	940	LEU	CA-CB-CG	6.40	130.01	115.30
9	B	750	LEU	CA-CB-CG	6.39	130.00	115.30
8	A	886	LEU	CA-CB-CG	6.33	129.85	115.30
8	A	648	LEU	CA-CB-CG	6.29	129.77	115.30
8	A	323	LEU	CA-CB-CG	6.19	129.53	115.30
9	B	723	ASP	CB-CG-OD1	6.17	123.86	118.30
4	5	68	C	C6-N1-C2	-6.11	117.86	120.30
2	2	3	C	N1-C2-O2	6.10	122.56	118.90
4	5	26	A	C4-C5-C6	-6.07	113.97	117.00
8	A	1593	LEU	CA-CB-CG	6.07	129.25	115.30
4	5	18	C	C6-N1-C2	-5.99	117.90	120.30
2	2	13	C	C2-N1-C1'	5.96	125.36	118.80
25	v	915	LEU	CA-CB-CG	5.93	128.94	115.30
11	D	381	HIS	C-N-CD	-5.87	107.68	120.60
21	Z	395	C	C6-N1-C2	-5.87	117.95	120.30
9	B	343	LEU	CA-CB-CG	5.86	128.79	115.30
8	A	299	ILE	CG1-CB-CG2	-5.82	98.59	111.40
8	A	1645	LEU	CA-CB-CG	5.78	128.60	115.30
4	5	60	G	C8-N9-C4	5.74	108.70	106.40

*Continued on next page...*

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	6	57	U	C2-N1-C1'	5.71	124.55	117.70
24	u	811	LEU	CA-CB-CG	5.70	128.42	115.30
4	5	23	C	C2-N1-C1'	5.70	125.07	118.80
4	5	27	U	C6-N1-C2	-5.70	117.58	121.00
5	6	31	U	N1-C2-O2	5.69	126.78	122.80
4	5	11	U	N1-C2-O2	5.68	126.77	122.80
5	6	80	G	N3-C4-C5	-5.64	125.78	128.60
3	3	501	LEU	CA-CB-CG	5.64	128.26	115.30
13	L	71	LEU	CA-CB-CG	5.56	128.08	115.30
4	5	68	C	C6-N1-C1'	-5.49	114.21	120.80
4	5	13	C	C6-N1-C2	-5.48	118.11	120.30
25	v	915	LEU	CB-CG-CD2	-5.46	101.72	111.00
4	5	11	U	N3-C2-O2	-5.45	118.39	122.20
9	B	381	LEU	CA-CB-CG	5.44	127.81	115.30
5	6	80	G	C2-N3-C4	5.43	114.62	111.90
2	2	25	G	N7-C8-N9	5.43	115.82	113.10
8	A	856	LEU	CA-CB-CG	5.42	127.77	115.30
4	5	11	U	C2-N1-C1'	5.41	124.19	117.70
22	s	135	GLY	C-N-CA	5.37	135.14	121.70
5	6	69	A	C4-C5-N7	5.33	113.37	110.70
4	5	32	C	C6-N1-C2	-5.32	118.17	120.30
8	A	1740	LEU	CA-CB-CG	5.29	127.47	115.30
11	D	261	LEU	CA-CB-CG	5.26	127.39	115.30
4	5	10	U	C2-N1-C1'	5.26	124.01	117.70
2	2	13	C	N3-C2-O2	-5.25	118.23	121.90
8	A	1751	LEU	CB-CG-CD1	-5.24	102.09	111.00
5	6	61	C	C5-C6-N1	5.24	123.62	121.00
8	A	1467	LEU	CA-CB-CG	5.23	127.32	115.30
5	6	31	U	N3-C2-O2	-5.19	118.57	122.20
2	2	3	C	N3-C2-O2	-5.15	118.30	121.90
9	B	850	LEU	CA-CB-CG	5.12	127.08	115.30
21	Z	392	U	N3-C2-O2	-5.10	118.63	122.20
21	Z	395	C	C5-C6-N1	5.09	123.55	121.00
25	v	640	LEU	CA-CB-CG	5.08	127.00	115.30
9	B	65	TYR	CA-CB-CG	5.08	123.04	113.40
8	A	329	LEU	CA-CB-CG	5.06	126.94	115.30
4	5	23	C	N1-C2-O2	5.06	121.94	118.90
4	5	68	C	C5-C6-N1	5.05	123.53	121.00
9	B	779	LEU	CA-CB-CG	5.03	126.87	115.30
21	Z	261	A	P-O3'-C3'	5.02	125.72	119.70
6	7	58	LEU	CA-CB-CG	5.01	126.83	115.30
21	Z	253	A	O4'-C1'-N9	5.00	112.20	108.20

There are no chirality outliers.

All (57) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
3	3	568	GLY	Peptide
8	A	1075	GLN	Peptide
8	A	1183	PRO	Peptide
8	A	1206	GLU	Peptide
8	A	1213	VAL	Peptide
8	A	1491	LYS	Peptide
8	A	1493	THR	Peptide
8	A	1512	SER	Peptide
8	A	1513	MET	Peptide
8	A	1514	LYS	Peptide
8	A	1547	VAL	Peptide
8	A	1593	LEU	Peptide
8	A	1635	TYR	Peptide
8	A	1636	LYS	Peptide
8	A	165	ARG	Peptide
8	A	1699	THR	Peptide
8	A	1719	PHE	Peptide
8	A	175	PRO	Peptide
8	A	210	HIS	Peptide
8	A	521	ASN	Peptide
9	B	318	PHE	Peptide
9	B	352	LYS	Peptide
9	B	438	ILE	Peptide
9	B	440	SER	Peptide
9	B	469	ASP	Peptide
9	B	65	TYR	Peptide
9	B	750	LEU	Peptide
9	B	941	LYS	Peptide
10	C	103	ARG	Peptide
10	C	166	ARG	Peptide
10	C	422	PHE	Peptide
11	D	187	LYS	Peptide
11	D	380	LEU	Peptide
11	D	383	ARG	Peptide
11	D	393	ASP	Peptide
11	D	455	GLN	Peptide
13	L	91	ARG	Peptide
14	O	391	TYR	Peptide
14	O	405	PHE	Peptide
15	P	112	VAL	Peptide

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Group
15	P	113	ASN	Peptide
15	P	276	THR	Peptide
22	s	148	ASP	Peptide
23	t	118	ALA	Peptide
24	u	1125	PRO	Peptide
24	u	460	PRO	Peptide
24	u	463	ASN	Peptide
24	u	464	LEU	Peptide
24	u	483	ASP	Peptide
24	u	494	GLU	Peptide
25	v	259	LYS	Peptide
25	v	544	ILE	Peptide
25	v	582	GLU	Peptide
25	v	584	SER	Peptide
25	v	913	LEU	Peptide
28	z	32	ALA	Peptide
28	z	83	CYS	Peptide

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	1	981	0	976	14	0
2	2	1262	0	640	10	0
3	3	981	0	961	13	0
4	5	1470	0	746	16	0
5	6	2035	0	1028	26	0
6	7	733	0	720	10	0
7	8	1211	0	1248	5	0
8	A	18569	0	18479	286	0
9	B	7137	0	7149	135	0
10	C	2287	0	2314	48	0
11	D	2517	0	2471	49	0
12	E	1054	0	988	10	0
13	L	858	0	868	21	0
14	O	2235	0	2153	29	0
15	P	2305	0	2282	45	0
16	Q	1153	0	1160	9	0

*Continued on next page...*

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
17	R	869	0	855	12	0
18	S	261	0	267	1	0
19	V	1236	0	1210	22	0
20	Y	762	0	779	8	0
21	Z	1013	0	515	16	0
22	s	1377	0	1314	0	0
23	t	1415	0	1337	0	0
24	u	7013	0	7199	0	0
25	v	9315	0	9235	0	0
26	x	656	0	622	0	0
27	y	766	0	738	0	0
28	z	839	0	841	0	0
29	6	4	0	0	0	0
30	A	36	0	6	11	0
31	B	32	0	12	1	0
32	P	3	0	0	0	0
32	Q	3	0	0	0	0
32	t	1	0	0	0	0
32	y	3	0	0	0	0
All	All	72392	0	69113	688	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (688) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:613:TYR:HE2	30:A:3001:IHP:O42	1.25	1.18
8:A:442:LYS:NZ	30:A:3001:IHP:O43	1.76	1.16
8:A:163:ARG:NH2	30:A:3001:IHP:O36	1.84	1.10
8:A:613:TYR:CE2	30:A:3001:IHP:O42	2.16	0.98
2:2:12:G:H1	5:6:86:U:H3	0.91	0.90
8:A:1706:ASP:O	8:A:1710:ASN:HA	1.73	0.89
8:A:613:TYR:CE2	30:A:3001:IHP:H1	2.11	0.85
4:5:24:G:N3	4:5:26:A:N6	2.35	0.75
8:A:1493:THR:HG22	8:A:1744:ARG:HB3	1.69	0.74
15:P:278:GLN:O	15:P:281:GLU:HB3	1.85	0.74
14:O:454:ASN:O	14:O:458:PHE:HB2	1.88	0.73
8:A:1543:ASN:HD21	8:A:1563:HIS:H	1.37	0.71
6:7:6:ARG:NH1	21:Z:243:G:N7	2.40	0.69
9:B:468:CYS:HB2	9:B:546:ALA:H	1.58	0.69

Continued on next page...



Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:B:238:ASN:O	9:B:242:LEU:HB2	1.94	0.68
4:5:27:U:OP1	8:A:635:ARG:NH2	2.27	0.68
8:A:609:LYS:HZ1	30:A:3001:IHP:H4	1.58	0.67
8:A:1160:ARG:HD2	17:R:192:VAL:HG21	1.75	0.67
16:Q:100:LEU:HD11	16:Q:106:ILE:HD11	1.76	0.67
13:L:30:GLN:HE21	13:L:33:ARG:HD2	1.60	0.66
8:A:946:GLU:HB3	8:A:949:PRO:HD2	1.77	0.66
5:6:64:U:OP2	8:A:663:ARG:NH2	2.28	0.65
3:3:566:TYR:HB2	3:3:583:ARG:HA	1.78	0.65
4:5:62:G:N2	4:5:63:A:N7	2.45	0.65
15:P:261:ILE:HG22	15:P:272:ILE:HG22	1.79	0.65
8:A:1519:THR:H	8:A:1522:GLN:HE21	1.43	0.65
9:B:509:VAL:HA	9:B:565:ILE:HG22	1.79	0.65
5:6:19:C:O2'	16:Q:120:ARG:NH1	2.29	0.64
8:A:1963:GLU:OE2	8:A:1966:HIS:ND1	2.31	0.63
9:B:476:CYS:HB2	9:B:496:VAL:HA	1.81	0.63
8:A:1491:LYS:HE2	8:A:1710:ASN:HB3	1.81	0.62
9:B:250:ARG:NH2	9:B:450:GLU:OE1	2.32	0.62
9:B:827:LEU:HD11	9:B:934:MET:HB3	1.80	0.62
15:P:70:VAL:O	15:P:82:GLN:NE2	2.32	0.62
8:A:951:LEU:HD23	8:A:952:VAL:HG13	1.80	0.62
9:B:134:LEU:HB3	9:B:226:VAL:HG13	1.81	0.62
9:B:222:SER:OG	9:B:223:ASP:N	2.33	0.62
12:E:103:GLN:O	12:E:108:ARG:NH2	2.33	0.61
8:A:1745:GLU:HB3	8:A:1748:ARG:HH11	1.66	0.61
8:A:1413:ASP:O	8:A:1418:ARG:NH1	2.31	0.61
9:B:502:HIS:HB2	9:B:505:GLN:HE22	1.64	0.61
9:B:674:CYS:SG	9:B:675:PHE:N	2.73	0.61
9:B:157:ILE:HB	9:B:159:LYS:HG3	1.82	0.61
14:O:431:ARG:HH22	14:O:459:GLU:HA	1.64	0.61
5:6:35:A:N7	21:Z:254:G:N1	2.49	0.61
8:A:889:ARG:NH1	8:A:1004:ASN:O	2.33	0.61
9:B:552:ILE:HD13	9:B:555:VAL:H	1.66	0.61
20:Y:94:ASN:ND2	20:Y:97:ASN:OD1	2.34	0.61
9:B:410:LEU:HD23	9:B:414:PRO:HB2	1.82	0.61
8:A:79:ARG:O	8:A:82:ARG:NH1	2.34	0.60
9:B:888:ARG:HG2	9:B:893:GLY:HA2	1.82	0.60
19:V:81:GLN:HG2	19:V:107:THR:HG23	1.84	0.60
1:1:40:LEU:HD12	1:1:80:CYS:HB3	1.84	0.60
5:6:21:U:H2'	12:E:130:ARG:HE	1.65	0.60
8:A:2127:TYR:HB2	8:A:2146:VAL:HB	1.82	0.60

Continued on next page...

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:6:93:G:O2'	14:O:347:HIS:NE2	2.30	0.60
8:A:1080:GLU:O	8:A:1086:ARG:NH1	2.34	0.60
19:V:69:GLY:O	19:V:152:ARG:NH1	2.35	0.60
8:A:1000:ILE:HG13	8:A:1001:VAL:HG23	1.84	0.60
8:A:693:ILE:HG21	8:A:709:ILE:HG21	1.83	0.60
1:1:7:VAL:HG22	1:1:108:ARG:HB3	1.82	0.60
8:A:159:ARG:NH2	8:A:160:HIS:O	2.35	0.60
8:A:491:GLU:OE2	8:A:495:GLN:NE2	2.35	0.59
8:A:1611:LYS:HA	8:A:1629:ILE:HG22	1.83	0.59
8:A:1724:PRO:O	8:A:1728:GLN:NE2	2.35	0.59
10:C:318:GLU:O	10:C:321:GLU:HB2	2.02	0.59
13:L:59:LYS:O	13:L:91:ARG:NH2	2.36	0.59
15:P:262:THR:HG22	15:P:271:PHE:HB2	1.84	0.59
15:P:234:LEU:HD21	15:P:300:VAL:HG13	1.84	0.59
8:A:162:LYS:O	8:A:573:GLN:NE2	2.36	0.59
9:B:186:VAL:HA	9:B:534:VAL:HA	1.85	0.59
8:A:1640:SER:OG	8:A:1641:ARG:N	2.35	0.59
9:B:772:TRP:O	9:B:813:ARG:NH2	2.35	0.59
8:A:686:ARG:HA	8:A:689:VAL:HG12	1.84	0.59
17:R:199:LYS:HB3	17:R:202:ASP:HA	1.84	0.58
20:Y:55:ARG:NH1	20:Y:58:GLU:OE1	2.36	0.58
1:1:37:TRP:HA	1:1:82:LEU:O	2.03	0.58
8:A:80:LYS:NZ	16:Q:37:HIS:O	2.35	0.58
8:A:300:ASN:O	9:B:939:ARG:NH1	2.36	0.58
30:A:3001:IHP:O44	30:A:3001:IHP:H3	2.02	0.58
8:A:940:ILE:HD12	8:A:1090:ARG:HH21	1.67	0.58
8:A:1893:PHE:O	8:A:1896:CYS:HB2	2.03	0.58
15:P:167:PHE:O	15:P:172:GLU:N	2.37	0.58
8:A:2191:GLN:NE2	8:A:2244:LYS:O	2.36	0.58
15:P:227:GLU:HG3	15:P:230:THR:HG22	1.84	0.58
1:1:55:VAL:HG23	3:3:589:ARG:HD3	1.86	0.58
9:B:135:CYS:O	9:B:142:LYS:NZ	2.28	0.58
8:A:974:ASN:HB2	8:A:1178:TYR:HB3	1.84	0.58
3:3:574:ASN:HD21	3:3:580:PRO:HG3	1.68	0.58
9:B:221:ILE:HG23	9:B:495:ARG:HB2	1.86	0.57
15:P:175:ARG:HE	15:P:179:CYS:HA	1.68	0.57
8:A:512:ASN:ND2	21:Z:254:G:O2'	2.35	0.57
2:2:12:G:O6	5:6:86:U:O4	2.23	0.57
8:A:762:ARG:HG3	8:A:903:SER:HB3	1.85	0.57
9:B:141:GLY:N	31:B:1500:GTP:O2B	2.38	0.57
19:V:35:THR:HG22	19:V:82:PHE:HE2	1.70	0.57

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:362:ARG:HH21	9:B:279:ARG:HD3	1.70	0.57
8:A:470:ARG:HE	10:C:166:ARG:HD3	1.69	0.57
8:A:975:VAL:HG13	8:A:1099:PHE:HD2	1.70	0.57
8:A:1956:PRO:HD2	8:A:1960:THR:HG21	1.86	0.57
9:B:678:THR:HG22	9:B:682:LYS:H	1.69	0.57
8:A:1463:LYS:HE3	10:C:434:ASP:HB3	1.87	0.57
8:A:2002:LEU:HD22	8:A:2006:GLU:HG2	1.85	0.57
9:B:366:GLN:HB3	9:B:370:VAL:HG23	1.87	0.57
8:A:787:GLU:OE2	8:A:790:ARG:NH1	2.36	0.56
8:A:909:TYR:HB2	8:A:1033:GLY:HA3	1.87	0.56
8:A:1275:ARG:NH2	8:A:1464:LEU:O	2.38	0.56
9:B:384:VAL:HG23	9:B:392:LEU:HD11	1.86	0.56
17:R:201:VAL:HG21	17:R:205:LYS:HB2	1.86	0.56
9:B:779:LEU:O	9:B:938:ARG:NH1	2.39	0.56
9:B:844:SER:HA	9:B:847:TYR:HD2	1.71	0.56
11:D:381:HIS:ND1	11:D:383:ARG:O	2.38	0.56
15:P:240:GLY:H	15:P:268:GLN:HB3	1.71	0.56
8:A:962:LEU:HB2	8:A:965:VAL:HG22	1.86	0.56
15:P:66:LYS:NZ	21:Z:261:A:OP1	2.39	0.56
8:A:857:ASN:OD1	8:A:858:GLN:N	2.38	0.56
8:A:1133:CYS:SG	8:A:1231:ARG:NE	2.79	0.56
8:A:1418:ARG:HE	8:A:1464:LEU:HD23	1.70	0.56
9:B:230:ASP:OD2	9:B:262:ARG:NH1	2.39	0.56
9:B:100:LYS:NZ	9:B:647:MET:SD	2.76	0.56
15:P:24:CYS:H	15:P:81:CYS:HB2	1.71	0.56
16:Q:139:CYS:SG	16:Q:140:ARG:N	2.79	0.56
5:6:65:G:N7	8:A:663:ARG:NH1	2.51	0.56
8:A:1231:ARG:NH2	8:A:1283:GLU:OE1	2.38	0.56
8:A:1496:PRO:HG2	8:A:1497:THR:HG23	1.88	0.56
9:B:523:GLN:HB3	9:B:558:PRO:HG3	1.87	0.56
15:P:78:LYS:NZ	15:P:203:TYR:OH	2.36	0.56
15:P:163:HIS:HA	15:P:182:ARG:HH21	1.71	0.56
8:A:439:GLN:O	8:A:444:ARG:NH2	2.38	0.55
8:A:1604:LEU:HD23	8:A:1605:GLU:HG3	1.87	0.55
9:B:106:GLU:HG2	9:B:107:GLN:HG2	1.87	0.55
9:B:478:THR:HA	9:B:494:GLY:HA3	1.89	0.55
11:D:220:VAL:HG23	11:D:230:ILE:HG22	1.89	0.55
11:D:370:ASN:HB3	11:D:396:LYS:HE3	1.87	0.55
8:A:1382:SER:HA	8:A:1415:GLY:HA2	1.87	0.55
9:B:94:ILE:HG23	17:R:48:GLN:HG2	1.87	0.55
10:C:238:THR:HG21	10:C:240:LYS:HE3	1.89	0.55

Continued on next page...

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:P:64:ARG:NH2	21:Z:261:A:OP2	2.39	0.55
3:3:559:ASN:ND2	3:3:563:ARG:O	2.35	0.55
9:B:916:ILE:HD11	9:B:928:HIS:HB2	1.88	0.55
10:C:134:ARG:NE	11:D:382:PRO:O	2.36	0.55
2:2:13:C:H1'	2:2:14:C:H5	1.72	0.55
8:A:110:TRP:HD1	8:A:147:MET:HE1	1.72	0.55
5:6:65:G:H21	5:6:69:A:H2	1.53	0.55
8:A:1644:LEU:O	8:A:1723:LYS:NZ	2.40	0.55
15:P:146:MET:HB3	15:P:216:ARG:HH22	1.71	0.55
8:A:1483:GLY:O	8:A:1487:HIS:N	2.31	0.55
8:A:1510:GLU:HG2	8:A:1513:MET:HA	1.88	0.55
19:V:48:TYR:OH	19:V:110:SER:O	2.21	0.55
4:5:36:C:H42	4:5:46:U:H3	1.52	0.55
16:Q:117:CYS:SG	16:Q:118:ILE:N	2.80	0.55
8:A:305:ARG:HH11	9:B:854:ARG:HH22	1.55	0.55
8:A:945:THR:OG1	8:A:946:GLU:N	2.38	0.55
8:A:2278:SER:OG	8:A:2309:HIS:NE2	2.32	0.55
9:B:733:TRP:HB2	9:B:745:LEU:HD11	1.88	0.55
8:A:35:ARG:O	8:A:39:GLN:HB2	2.06	0.55
8:A:200:ASP:OD1	8:A:240:ARG:NH2	2.39	0.55
8:A:1530:PRO:HA	8:A:1533:ARG:HG2	1.90	0.54
11:D:392:PRO:HG3	11:D:415:ILE:HA	1.90	0.54
8:A:358:PRO:O	8:A:362:ARG:NH1	2.40	0.54
8:A:1459:ARG:HD2	10:C:417:GLY:HA3	1.90	0.54
9:B:80:ILE:HD11	11:D:200:ILE:HG12	1.89	0.54
15:P:90:TYR:HB3	15:P:92:LEU:HD13	1.89	0.54
19:V:26:GLU:OE1	19:V:131:ARG:NH2	2.40	0.54
8:A:613:TYR:CZ	30:A:3001:IHP:H1	2.42	0.54
8:A:1124:ASN:OD1	8:A:1129:ASN:ND2	2.41	0.54
8:A:1640:SER:HB3	8:A:1718:TRP:H	1.73	0.54
9:B:160:ARG:NH2	9:B:313:GLN:OE1	2.40	0.54
19:V:25:LEU:HG	19:V:132:VAL:HG12	1.90	0.54
12:E:196:TRP:HA	16:Q:139:CYS:HB3	1.90	0.54
19:V:66:ASP:OD2	19:V:71:GLY:N	2.38	0.54
8:A:881:ILE:O	8:A:885:LEU:HB2	2.06	0.54
9:B:508:LYS:HA	9:B:524:ILE:HG22	1.89	0.54
9:B:595:VAL:HG22	9:B:654:LYS:HG3	1.90	0.54
9:B:719:GLN:NE2	9:B:724:TRP:O	2.41	0.54
8:A:1777:ILE:HG13	8:A:1860:GLN:HB3	1.90	0.54
17:R:64:GLU:HG3	17:R:68:ARG:HE	1.73	0.54
8:A:103:LEU:HB3	8:A:638:LEU:HD11	1.90	0.53

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:1543:ASN:HB2	8:A:1569:LEU:HD21	1.90	0.53
9:B:151:GLU:OE1	9:B:159:LYS:NZ	2.40	0.53
8:A:285:ASP:HB3	8:A:286:ILE:HD12	1.90	0.53
8:A:552:ARG:NH1	8:A:588:LEU:O	2.41	0.53
11:D:422:ASN:OD1	11:D:423:SER:N	2.41	0.53
4:5:28:A:H1'	8:A:642:ARG:HD2	1.90	0.53
8:A:1057:ARG:NH1	8:A:1060:GLU:OE1	2.39	0.53
10:C:165:VAL:HG13	10:C:166:ARG:HE	1.71	0.53
17:R:35:LEU:O	17:R:37:SER:N	2.41	0.53
20:Y:49:LYS:NZ	20:Y:68:ILE:O	2.41	0.53
9:B:187:THR:H	9:B:534:VAL:HG12	1.74	0.53
8:A:1890:GLN:NE2	8:A:2013:GLY:O	2.41	0.53
8:A:1206:GLU:O	8:A:1227:GLN:NE2	2.40	0.53
15:P:261:ILE:HA	15:P:271:PHE:O	2.08	0.53
9:B:220:ARG:HE	9:B:580:LEU:HB3	1.74	0.53
9:B:678:THR:HG23	9:B:680:ASN:H	1.74	0.53
12:E:181:PHE:HD1	12:E:200:VAL:HG22	1.74	0.53
8:A:1519:THR:OG1	8:A:1520:ASN:N	2.42	0.53
9:B:477:HIS:NE2	9:B:562:THR:OG1	2.42	0.53
8:A:28:GLU:OE1	8:A:31:GLN:NE2	2.39	0.53
8:A:379:GLU:HB3	8:A:384:VAL:HG23	1.89	0.53
9:B:133:THR:HG23	9:B:222:SER:HB3	1.90	0.53
11:D:457:GLY:HA3	17:R:212:ASN:H	1.74	0.53
8:A:1124:ASN:O	8:A:1129:ASN:ND2	2.42	0.52
8:A:1491:LYS:HD2	8:A:1744:ARG:HG2	1.90	0.52
8:A:1740:LEU:O	8:A:1744:ARG:NH1	2.42	0.52
10:C:208:GLU:OE1	10:C:211:ARG:NH2	2.42	0.52
8:A:1482:GLU:HG3	8:A:1483:GLY:H	1.73	0.52
8:A:2130:GLY:HA3	8:A:2142:ILE:HA	1.91	0.52
12:E:132:PHE:HB2	12:E:138:ALA:HB2	1.91	0.52
15:P:68:THR:HG23	15:P:82:GLN:HG3	1.90	0.52
3:3:509:GLN:O	3:3:513:ASP:HB2	2.10	0.52
5:6:35:A:N6	21:Z:255:C:O2	2.42	0.52
8:A:2200:MET:HG3	8:A:2206:TRP:HB2	1.91	0.52
11:D:481:GLU:HG3	11:D:483:ASP:H	1.74	0.52
8:A:901:LEU:HB2	8:A:904:HIS:HB3	1.92	0.52
9:B:261:ASP:OD1	9:B:261:ASP:N	2.41	0.52
11:D:436:MET:HG3	11:D:450:VAL:HG13	1.92	0.52
9:B:911:PRO:HB3	9:B:934:MET:HG2	1.91	0.52
12:E:121:ASN:HB3	12:E:124:MET:HG2	1.91	0.52
8:A:1809:ILE:HB	8:A:1818:PHE:HB2	1.91	0.52

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:1876:LEU:HD12	8:A:1879:PHE:HB2	1.91	0.52
15:P:282:VAL:O	15:P:286:LYS:N	2.43	0.52
9:B:474:LEU:HB3	9:B:566:THR:HA	1.91	0.52
15:P:64:ARG:NH1	15:P:161:ARG:O	2.42	0.52
6:7:59:CYS:SG	6:7:72:HIS:NE2	2.72	0.52
8:A:1872:LEU:O	8:A:1876:LEU:HB2	2.09	0.52
8:A:104:GLU:HA	8:A:638:LEU:HD21	1.92	0.51
8:A:1664:ILE:HG22	8:A:1703:ILE:HB	1.92	0.51
8:A:2207:ASP:HB3	8:A:2210:LYS:HB2	1.91	0.51
8:A:422:LEU:HD22	8:A:638:LEU:HD23	1.91	0.51
8:A:2178:ILE:HA	8:A:2214:ILE:O	2.10	0.51
8:A:902:TYR:OH	8:A:1249:MET:SD	2.63	0.51
9:B:181:ILE:HD11	9:B:614:TYR:HE1	1.75	0.51
9:B:508:LYS:HD2	9:B:568:PRO:HA	1.92	0.51
10:C:188:PHE:HB3	15:P:25:GLN:HG2	1.91	0.51
5:6:40:U:H3	21:Z:250:U:H3	1.59	0.51
8:A:1257:THR:O	8:A:1261:ASN:HB2	2.11	0.51
9:B:531:TRP:HE1	9:B:538:HIS:CG	2.28	0.51
10:C:158:LYS:O	10:C:162:ALA:N	2.34	0.51
8:A:1776:ILE:HB	8:A:1858:PRO:HA	1.93	0.51
14:O:343:GLU:O	14:O:347:HIS:ND1	2.44	0.51
11:D:475:SER:OG	11:D:476:ARG:NH2	2.44	0.51
15:P:74:CYS:O	15:P:202:TYR:OH	2.28	0.51
8:A:959:ILE:HG22	8:A:1087:LEU:HD11	1.93	0.51
11:D:416:ILE:HA	11:D:431:ALA:HA	1.93	0.51
11:D:476:ARG:NH1	17:R:67:GLU:OE2	2.42	0.51
14:O:433:ARG:O	14:O:438:TYR:N	2.39	0.51
15:P:259:ARG:HG2	15:P:273:GLN:HB2	1.93	0.51
8:A:586:GLY:H	8:A:589:THR:HG22	1.76	0.51
8:A:613:TYR:O	8:A:617:ASN:ND2	2.43	0.51
10:C:189:ASN:ND2	15:P:30:GLU:O	2.44	0.51
8:A:339:PHE:N	9:B:266:GLU:OE2	2.44	0.51
8:A:1640:SER:HA	8:A:1652:MET:HA	1.93	0.51
11:D:446:ASN:OD1	11:D:449:ARG:NH2	2.44	0.51
8:A:265:THR:OG1	8:A:328:HIS:O	2.29	0.50
8:A:559:ASP:HA	8:A:562:VAL:HG12	1.92	0.50
8:A:1472:THR:HG22	10:C:437:TRP:HZ3	1.76	0.50
8:A:491:GLU:O	8:A:495:GLN:HB2	2.11	0.50
8:A:1609:VAL:HG12	8:A:1631:LEU:HG	1.93	0.50
8:A:2236:GLU:OE1	8:A:2239:ARG:NE	2.40	0.50
10:C:276:GLN:HB2	10:C:279:HIS:HA	1.93	0.50

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:231:THR:OG1	9:B:389:ASP:OD2	2.29	0.50
8:A:1136:ARG:NH1	8:A:1345:GLN:OE1	2.43	0.50
9:B:532:ILE:HG23	9:B:541:VAL:HG21	1.93	0.50
8:A:291:GLU:O	8:A:295:GLU:HB2	2.11	0.50
8:A:994:ASN:HD22	13:L:79:PRO:HG2	1.76	0.50
11:D:230:ILE:HG13	11:D:239:LYS:HB2	1.93	0.50
14:O:343:GLU:OE1	14:O:378:ASN:ND2	2.44	0.50
14:O:451:LEU:O	14:O:455:TYR:N	2.44	0.50
19:V:14:VAL:HB	19:V:25:LEU:HB2	1.92	0.50
8:A:398:THR:HG22	9:B:386:GLY:HA3	1.92	0.50
8:A:551:LEU:HA	8:A:554:THR:HG22	1.93	0.50
9:B:828:MET:HA	9:B:905:GLN:O	2.12	0.50
8:A:1278:VAL:HG23	8:A:1284:LEU:HD22	1.94	0.50
10:C:145:GLU:OE1	10:C:148:ARG:NH1	2.45	0.50
15:P:165:CYS:HB3	15:P:181:TYR:HB2	1.92	0.50
8:A:1241:HIS:HB2	8:A:1287:LEU:HD21	1.92	0.50
10:C:165:VAL:HG22	10:C:166:ARG:HH11	1.76	0.50
1:1:121:SER:OG	1:1:122:GLU:OE1	2.29	0.50
8:A:1901:LYS:HD2	8:A:1967:ILE:HG22	1.94	0.50
9:B:305:GLY:HA3	9:B:436:GLN:HG3	1.94	0.50
10:C:87:ALA:O	10:C:89:GLN:NE2	2.43	0.50
15:P:213:LEU:HA	15:P:216:ARG:HG2	1.93	0.50
9:B:384:VAL:HG21	9:B:419:VAL:HG11	1.94	0.49
6:7:49:ASN:ND2	6:7:53:SER:OG	2.40	0.49
13:L:48:ALA:O	13:L:52:GLU:HB2	2.12	0.49
15:P:159:ARG:NE	21:Z:262:G:OP2	2.38	0.49
8:A:995:ARG:NH2	10:C:295:ASP:OD2	2.45	0.49
8:A:1335:ILE:HD12	8:A:1354:ARG:HH21	1.76	0.49
20:Y:67:VAL:HA	20:Y:70:PHE:HB2	1.94	0.49
8:A:35:ARG:NH2	12:E:170:THR:OG1	2.46	0.49
8:A:775:ASN:O	8:A:775:ASN:ND2	2.43	0.49
13:L:30:GLN:HE21	13:L:33:ARG:HH11	1.61	0.49
14:O:428:GLU:HG3	14:O:431:ARG:HD3	1.94	0.49
9:B:174:GLU:HB3	9:B:181:ILE:HG22	1.95	0.49
9:B:219:LEU:HG	9:B:251:LEU:HD22	1.94	0.49
9:B:739:ALA:H	9:B:771:GLN:HE22	1.60	0.49
12:E:101:THR:HG23	12:E:104:MET:H	1.76	0.49
1:1:38:ILE:HD11	1:1:82:LEU:HD12	1.93	0.49
8:A:303:ILE:HD13	9:B:659:VAL:HG21	1.94	0.49
9:B:134:LEU:HD13	9:B:142:LYS:HB2	1.94	0.49
15:P:294:ASN:ND2	19:V:120:GLN:OE1	2.46	0.49

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:C:183:GLN:NE2	12:E:112:SER:OG	2.46	0.49
8:A:1128:TYR:HB3	8:A:1139:ARG:HD2	1.94	0.49
9:B:652:ASP:N	9:B:652:ASP:OD1	2.46	0.49
10:C:310:ARG:O	10:C:313:ALA:HB3	2.13	0.49
15:P:67:LYS:HG3	15:P:68:THR:H	1.78	0.49
8:A:378:PHE:H	9:B:354:ARG:HH22	1.60	0.49
2:2:43:U:H1'	21:Z:384:G:H22	1.78	0.48
8:A:1745:GLU:HA	8:A:1748:ARG:HE	1.76	0.48
11:D:410:SER:OG	11:D:411:GLY:N	2.45	0.48
4:5:51:A:O2'	4:5:52:U:O5'	2.31	0.48
8:A:377:GLU:H	9:B:354:ARG:HH12	1.61	0.48
8:A:886:LEU:O	8:A:889:ARG:NH2	2.37	0.48
10:C:321:GLU:O	10:C:325:ARG:N	2.46	0.48
11:D:343:PRO:HG3	11:D:356:LEU:HD23	1.95	0.48
15:P:256:GLY:HA3	15:P:274:PHE:HE1	1.77	0.48
19:V:14:VAL:O	19:V:24:VAL:HA	2.14	0.48
8:A:1472:THR:O	8:A:1476:GLN:NE2	2.46	0.48
8:A:1211:ASP:N	8:A:1211:ASP:OD1	2.45	0.48
8:A:1634:SER:OG	8:A:1635:TYR:N	2.47	0.48
10:C:330:LYS:HG3	10:C:333:GLU:HB3	1.95	0.48
8:A:55:ASP:O	16:Q:109:ARG:NH1	2.46	0.48
8:A:2108:LYS:HA	8:A:2111:LEU:HB3	1.95	0.48
8:A:1726:ILE:HA	8:A:1729:ALA:HB3	1.94	0.48
16:Q:102:CYS:SG	16:Q:103:LEU:N	2.87	0.48
1:1:39:PHE:HD1	1:1:81:PHE:HE1	1.60	0.48
8:A:516:LEU:HD13	8:A:524:LEU:HD21	1.95	0.48
11:D:350:HIS:HA	11:D:374:SER:HB2	1.94	0.48
8:A:355:LEU:HA	9:B:864:PRO:HB3	1.96	0.48
9:B:114:TYR:OH	9:B:189:VAL:N	2.38	0.48
9:B:132:VAL:HG12	9:B:224:GLY:HA3	1.95	0.48
5:6:14:C:H2'	5:6:15:A:H8	1.78	0.48
5:6:28:A:N6	21:Z:258:A:O2'	2.36	0.48
8:A:1014:ASN:HA	8:A:1026:ASN:HB3	1.95	0.48
8:A:1537:TRP:HD1	8:A:1751:LEU:HD11	1.78	0.48
8:A:1742:VAL:O	8:A:1746:ARG:HB2	2.14	0.48
13:L:19:LEU:HD23	13:L:54:LEU:HD22	1.96	0.48
14:O:454:ASN:O	14:O:458:PHE:CB	2.61	0.48
20:Y:110:LEU:HA	20:Y:113:GLN:HG2	1.95	0.48
2:2:28:C:H2'	8:A:857:ASN:HD22	1.79	0.48
8:A:850:TYR:OH	8:A:863:GLU:OE1	2.31	0.47
13:L:55:ASP:HB3	13:L:58:ILE:HG13	1.96	0.47

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:608:LEU:O	8:A:611:LEU:HB2	2.14	0.47
8:A:1701:VAL:HA	8:A:1716:GLY:HA3	1.95	0.47
20:Y:51:TRP:HZ3	20:Y:105:LEU:HD23	1.80	0.47
8:A:2248:PRO:HG2	8:A:2251:TYR:HB2	1.96	0.47
1:1:85:GLU:O	3:3:500:GLY:N	2.48	0.47
2:2:41:U:OP1	6:7:72:HIS:ND1	2.48	0.47
4:5:51:A:O2'	4:5:52:U:O4'	2.33	0.47
8:A:952:VAL:O	8:A:956:CYS:N	2.47	0.47
8:A:2072:GLU:HG3	8:A:2076:ARG:HH21	1.79	0.47
9:B:213:ASP:OD2	9:B:616:SER:N	2.43	0.47
8:A:442:LYS:NZ	30:A:3001:IHP:O44	2.43	0.47
8:A:951:LEU:HD12	8:A:1190:CYS:HB3	1.96	0.47
8:A:2105:ILE:HB	8:A:2141:GLU:HG2	1.96	0.47
11:D:297:HIS:HD1	11:D:299:THR:H	1.63	0.47
1:1:101:LYS:HB3	1:1:106:THR:HG22	1.97	0.47
8:A:952:VAL:HG11	8:A:1214:TRP:HE1	1.80	0.47
8:A:1536:LEU:HB2	8:A:1572:SER:HB2	1.96	0.47
4:5:26:A:H4'	8:A:425:PRO:HG3	1.97	0.47
8:A:908:VAL:HG21	8:A:1448:LEU:HG	1.95	0.47
8:A:1897:LEU:HD22	8:A:1906:ILE:HG21	1.96	0.47
9:B:634:GLU:OE2	9:B:882:GLY:N	2.43	0.47
9:B:732:ILE:HG22	9:B:746:VAL:HG22	1.97	0.47
13:L:48:ALA:O	13:L:52:GLU:CB	2.63	0.47
8:A:1221:THR:HG23	8:A:1223:GLU:HG2	1.97	0.47
8:A:1648:SER:OG	8:A:1880:PRO:O	2.29	0.47
8:A:1791:HIS:NE2	8:A:1799:THR:O	2.48	0.47
13:L:71:LEU:HA	13:L:74:LEU:HB3	1.97	0.47
14:O:369:PHE:HE2	14:O:378:ASN:HB3	1.80	0.47
8:A:291:GLU:O	8:A:295:GLU:CB	2.63	0.47
8:A:1519:THR:HG23	8:A:1522:GLN:HE21	1.80	0.47
4:5:9:G:N2	4:5:10:U:O4	2.38	0.47
8:A:782:LEU:HD23	17:R:220:HIS:HE1	1.80	0.47
10:C:303:GLU:O	10:C:307:GLN:NE2	2.48	0.47
14:O:253:GLU:HG3	14:O:285:MET:HG3	1.96	0.47
15:P:101:LEU:HD21	15:P:143:THR:HG22	1.95	0.46
5:6:48:A:N7	10:C:256:ASN:ND2	2.62	0.46
8:A:166:PHE:HZ	8:A:577:GLY:HA2	1.80	0.46
8:A:605:CYS:SG	8:A:637:TRP:NE1	2.87	0.46
10:C:125:MET:O	11:D:442:ARG:NH1	2.47	0.46
2:2:42:G:N2	21:Z:385:U:O2	2.39	0.46
4:5:55:C:O2	8:A:642:ARG:NH1	2.49	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:1084:PRO:HD2	17:R:188:TRP:CD1	2.51	0.46
8:A:1456:THR:HG23	10:C:422:PHE:HE2	1.80	0.46
9:B:119:LEU:HA	9:B:122:LEU:HB2	1.97	0.46
9:B:736:GLY:HA2	9:B:770:PHE:HE2	1.81	0.46
9:B:938:ARG:NH2	9:B:944:SER:O	2.34	0.46
8:A:375:ASP:O	9:B:354:ARG:NH1	2.49	0.46
8:A:386:PRO:HD2	8:A:389:LYS:HZ2	1.80	0.46
8:A:1275:ARG:HB2	8:A:1375:TRP:CD1	2.50	0.46
8:A:1807:ILE:HB	8:A:1820:LYS:HB3	1.96	0.46
10:C:214:ILE:HG21	17:R:26:LEU:HB3	1.98	0.46
10:C:287:LEU:O	10:C:290:ALA:HB3	2.15	0.46
3:3:580:PRO:HG2	3:3:582:TYR:HD1	1.80	0.46
8:A:2131:VAL:HG13	8:A:2172:MET:HG2	1.98	0.46
9:B:115:GLU:HG2	9:B:117:ASP:H	1.81	0.46
9:B:531:TRP:HA	9:B:541:VAL:HB	1.97	0.46
19:V:25:LEU:HD23	19:V:98:LEU:HD22	1.97	0.46
7:8:503:HIS:CD2	7:8:510:TYR:HB2	2.51	0.46
9:B:357:THR:OG1	9:B:359:LYS:O	2.27	0.46
10:C:173:PRO:HB2	10:C:200:VAL:HA	1.98	0.46
11:D:349:SER:OG	11:D:350:HIS:N	2.49	0.46
14:O:385:PHE:O	14:O:390:ALA:N	2.48	0.46
19:V:13:ASN:O	19:V:165:SER:OG	2.34	0.46
8:A:151:MET:HE3	8:A:616:PHE:HZ	1.80	0.46
8:A:941:LYS:HB3	8:A:950:LEU:HD11	1.96	0.46
10:C:181:PRO:HB2	15:P:25:GLN:HE22	1.81	0.46
8:A:593:ARG:NE	21:Z:239:C:OP1	2.41	0.46
9:B:690:GLU:OE2	9:B:788:LYS:NZ	2.38	0.46
8:A:843:LEU:HD22	8:A:867:ILE:HG23	1.97	0.46
8:A:972:GLU:OE1	8:A:1100:ARG:NH2	2.40	0.46
8:A:1072:LEU:HD22	8:A:1087:LEU:HB2	1.97	0.46
8:A:1459:ARG:HD2	10:C:418:MET:H	1.80	0.46
15:P:48:CYS:SG	15:P:119:GLN:NE2	2.88	0.46
6:7:55:GLU:HG2	6:7:62:LEU:HD23	1.98	0.45
8:A:1878:ASP:OD1	8:A:1878:ASP:N	2.49	0.45
9:B:130:ARG:HH12	9:B:435:VAL:HG12	1.80	0.45
15:P:231:ILE:O	15:P:277:ARG:NE	2.36	0.45
19:V:41:GLU:OE2	19:V:44:ARG:NH2	2.35	0.45
8:A:513:LEU:HD23	8:A:516:LEU:HD12	1.98	0.45
9:B:162:ASP:OD1	9:B:162:ASP:N	2.48	0.45
9:B:337:GLN:HA	9:B:340:ALA:HB3	1.98	0.45
9:B:480:LYS:HE2	9:B:480:LYS:HB2	1.83	0.45

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:D:467:ALA:HB3	11:D:480:ALA:HB3	1.99	0.45
14:O:284:GLU:O	14:O:288:LYS:HB2	2.17	0.45
5:6:28:A:H61	21:Z:258:A:HO2'	1.60	0.45
8:A:271:MET:SD	8:A:310:THR:OG1	2.74	0.45
8:A:1244:VAL:HA	8:A:1247:ILE:HG12	1.98	0.45
1:1:53:ILE:O	1:1:57:SER:HB2	2.17	0.45
8:A:1804:ASN:N	8:A:1804:ASN:OD1	2.48	0.45
8:A:2207:ASP:O	8:A:2211:THR:N	2.49	0.45
14:O:391:TYR:HB3	14:O:395:ALA:HB2	1.97	0.45
7:8:462:VAL:O	7:8:466:LYS:HB2	2.17	0.45
8:A:735:ILE:HA	8:A:738:MET:HG2	1.98	0.45
8:A:947:PRO:HG2	8:A:1455:TRP:HB2	1.99	0.45
10:C:434:ASP:OD1	10:C:434:ASP:N	2.47	0.45
10:C:195:ARG:HG3	15:P:32:PRO:HA	1.98	0.45
13:L:61:THR:O	13:L:91:ARG:NH2	2.49	0.45
8:A:555:LYS:NZ	8:A:559:ASP:OD2	2.36	0.45
8:A:1676:ILE:HG21	8:A:1706:ASP:HB2	1.98	0.45
8:A:2148:VAL:HG23	8:A:2150:GLN:HB3	1.99	0.45
9:B:324:ALA:HA	9:B:327:TYR:HB2	1.98	0.45
11:D:394:ASN:ND2	11:D:409:LEU:O	2.50	0.45
8:A:530:LEU:HB3	8:A:534:GLU:HG3	1.98	0.45
8:A:609:LYS:NZ	30:A:3001:IHP:H4	2.31	0.45
8:A:929:GLU:OE2	8:A:933:ARG:NH1	2.50	0.45
10:C:205:ASP:N	10:C:205:ASP:OD1	2.49	0.45
5:6:94:C:H5'	14:O:347:HIS:CD2	2.51	0.45
9:B:164:ASP:N	9:B:164:ASP:OD1	2.47	0.45
11:D:207:VAL:HG22	11:D:480:ALA:HB1	1.99	0.45
3:3:559:ASN:HD21	3:3:583:ARG:HH11	1.65	0.45
8:A:246:LEU:HG	8:A:408:PRO:HG2	1.98	0.45
8:A:982:GLU:OE1	8:A:1172:ASN:ND2	2.48	0.45
8:A:1162:PRO:HG2	8:A:1165:VAL:HG22	1.99	0.45
9:B:137:HIS:HB3	9:B:140:HIS:CD2	2.51	0.45
9:B:836:VAL:HB	9:B:871:ILE:HB	1.98	0.45
9:B:846:VAL:HA	9:B:849:VAL:HG22	1.98	0.45
11:D:210:ILE:HD13	11:D:221:THR:HB	1.98	0.45
9:B:715:GLY:O	9:B:719:GLN:HB2	2.18	0.44
10:C:88:ILE:O	19:V:141:ARG:NH2	2.49	0.44
13:L:89:ILE:HG22	13:L:91:ARG:H	1.81	0.44
15:P:95:GLN:HE22	15:P:206:ASN:HB2	1.83	0.44
19:V:48:TYR:OH	19:V:110:SER:OG	2.28	0.44
19:V:56:ILE:HD12	19:V:153:PRO:HG3	1.98	0.44

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:3:604:LYS:HD3	3:3:605:LYS:HD2	1.99	0.44
9:B:590:ILE:HG12	9:B:637:LEU:HD21	1.99	0.44
16:Q:52:ILE:HA	16:Q:55:GLN:HG2	1.98	0.44
1:1:62:ILE:HG21	1:1:82:LEU:HD22	1.98	0.44
6:7:16:VAL:HG12	8:A:1519:THR:HG22	1.98	0.44
8:A:1871:PRO:O	8:A:1875:HIS:ND1	2.37	0.44
8:A:2310:ARG:HB3	8:A:2313:HIS:HD1	1.83	0.44
9:B:309:PHE:HB2	9:B:318:PHE:CG	2.51	0.44
11:D:352:THR:HA	11:D:374:SER:HA	1.99	0.44
13:L:65:ARG:HH12	13:L:69:GLU:HB3	1.82	0.44
14:O:391:TYR:O	14:O:395:ALA:N	2.44	0.44
11:D:385:TYR:HB3	11:D:386:THR:H	1.65	0.44
8:A:107:PRO:HG3	8:A:114:ARG:HB3	1.99	0.44
8:A:388:LEU:HD22	9:B:379:LYS:HB3	1.99	0.44
8:A:1667:ARG:NH1	8:A:1706:ASP:OD1	2.51	0.44
8:A:2129:TYR:HB2	8:A:2144:CYS:HB3	2.00	0.44
9:B:93:ILE:HG12	11:D:278:ASN:HD21	1.83	0.44
8:A:1198:PRO:HA	8:A:1226:ALA:HA	2.00	0.44
8:A:1666:LEU:HD22	8:A:1707:LEU:HD11	1.99	0.44
14:O:262:ARG:NH2	14:O:291:GLN:HG3	2.33	0.44
6:7:56:CYS:O	6:7:60:LEU:N	2.51	0.44
8:A:1789:THR:HG22	8:A:1801:LYS:HB2	1.98	0.44
13:L:28:LYS:O	13:L:31:TRP:NE1	2.50	0.44
8:A:110:TRP:CD1	8:A:147:MET:HE1	2.52	0.44
8:A:856:LEU:HD23	8:A:857:ASN:H	1.83	0.44
8:A:1418:ARG:HG3	8:A:1462:GLY:HA3	2.00	0.44
8:A:2109:ASN:OD1	8:A:2110:VAL:N	2.46	0.44
9:B:222:SER:HB2	9:B:549:TRP:HZ3	1.83	0.44
19:V:35:THR:HG21	19:V:127:THR:HG21	1.99	0.44
11:D:260:TYR:HB3	11:D:274:ASP:HA	1.98	0.44
1:1:92:LEU:HD11	3:3:576:PHE:HB2	1.99	0.43
2:2:16:U:N3	5:6:82:A:OP1	2.32	0.43
9:B:244:LYS:HD3	9:B:244:LYS:HA	1.77	0.43
10:C:189:ASN:HB3	10:C:192:ALA:HB2	1.99	0.43
9:B:474:LEU:HD11	9:B:501:ILE:HG13	2.00	0.43
9:B:709:TRP:HB2	9:B:714:LEU:HD23	1.99	0.43
11:D:386:THR:HG22	11:D:441:TRP:HZ2	1.82	0.43
20:Y:40:MET:HB2	20:Y:78:LYS:HA	2.00	0.43
5:6:91:A:H2'	5:6:92:A:C8	2.54	0.43
8:A:952:VAL:HG21	8:A:1214:TRP:CZ2	2.53	0.43
8:A:1260:VAL:HG13	8:A:1327:MET:HB3	2.00	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:5:17:U:H2'	4:5:18:C:H6	1.82	0.43
5:6:16:G:OP1	8:A:35:ARG:NH2	2.52	0.43
8:A:1513:MET:HG2	8:A:1514:LYS:H	1.82	0.43
10:C:291:LEU:O	10:C:294:ALA:HB3	2.18	0.43
14:O:423:GLU:HG3	14:O:431:ARG:HB3	2.00	0.43
15:P:167:PHE:O	15:P:173:CYS:N	2.52	0.43
15:P:237:GLY:HA2	15:P:269:CYS:HA	2.00	0.43
6:7:37:THR:HG21	13:L:21:ALA:HB1	2.00	0.43
9:B:320:LEU:H	9:B:320:LEU:HG	1.44	0.43
14:O:341:PRO:HD2	14:O:346:TRP:NE1	2.33	0.43
11:D:471:ASP:OD1	11:D:472:GLN:N	2.51	0.43
8:A:312:TYR:OH	9:B:853:ARG:NH2	2.46	0.43
8:A:856:LEU:H	8:A:860:GLN:HE21	1.66	0.43
9:B:69:ALA:HA	9:B:72:VAL:HG12	2.01	0.43
9:B:808:ILE:O	9:B:812:ALA:N	2.51	0.43
11:D:182:ALA:HB3	11:D:185:MET:HB2	2.01	0.43
5:6:73:A:OP1	5:6:75:G:O2'	2.36	0.43
8:A:1144:LYS:HA	8:A:1147:VAL:HG12	2.00	0.43
8:A:1554:GLN:HA	8:A:1561:PHE:HA	2.01	0.43
8:A:2281:TYR:HD2	8:A:2288:HIS:HD2	1.66	0.43
14:O:384:ARG:HA	14:O:387:GLU:HG2	1.99	0.43
15:P:239:LEU:HG	15:P:243:ILE:HB	2.00	0.43
5:6:29:A:H62	21:Z:258:A:H8	1.66	0.43
8:A:109:PRO:HG3	8:A:630:TRP:HE1	1.83	0.43
8:A:339:PHE:HZ	8:A:403:ALA:HA	1.82	0.43
8:A:820:ARG:HA	8:A:820:ARG:HD3	1.72	0.43
8:A:1160:ARG:HA	17:R:194:PHE:HB2	1.99	0.43
8:A:1267:LEU:HD22	8:A:1368:LEU:HD23	2.01	0.43
9:B:530:LEU:HD22	9:B:552:ILE:HG22	2.01	0.43
9:B:664:GLU:HG2	9:B:827:LEU:HD23	2.00	0.43
9:B:814:ARG:NE	9:B:952:PHE:O	2.52	0.43
10:C:408:ASP:OD2	10:C:410:ARG:NH1	2.52	0.43
11:D:205:GLY:H	11:D:484:LYS:HD2	1.84	0.43
14:O:283:ALA:HA	14:O:298:ILE:HD11	2.01	0.43
19:V:9:TRP:HZ2	19:V:164:PRO:HB2	1.84	0.43
9:B:529:ARG:HD3	9:B:553:GLU:HG3	2.00	0.43
10:C:113:TYR:OH	11:D:402:ASP:O	2.37	0.43
13:L:53:TRP:HD1	13:L:54:LEU:HD12	1.84	0.43
2:2:49:U:H3	2:2:63:G:H1	1.67	0.42
8:A:150:MET:HB2	8:A:193:LEU:HB2	2.00	0.42
8:A:784:LEU:HD21	8:A:896:ILE:HG21	2.00	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:B:122:LEU:HA	9:B:125:ASN:HB3	2.00	0.42
9:B:614:TYR:OH	9:B:643:ASP:OD2	2.28	0.42
9:B:745:LEU:HB3	9:B:789:PHE:CZ	2.54	0.42
12:E:178:ARG:HG2	12:E:199:TYR:CZ	2.54	0.42
21:Z:253:A:O2'	21:Z:254:G:O4'	2.37	0.42
8:A:1676:ILE:HD13	8:A:1706:ASP:HB2	2.01	0.42
8:A:1824:THR:O	8:A:1827:TRP:HB2	2.20	0.42
9:B:227:LEU:HB3	9:B:255:VAL:HG23	2.01	0.42
15:P:66:LYS:HE3	15:P:66:LYS:HB3	1.87	0.42
8:A:856:LEU:N	8:A:860:GLN:HE21	2.17	0.42
8:A:1264:ASN:O	8:A:1268:ILE:HD12	2.19	0.42
8:A:2128:LEU:HB3	8:A:2142:ILE:HD13	2.02	0.42
8:A:2078:ILE:H	8:A:2078:ILE:HG13	1.67	0.42
9:B:477:HIS:HA	9:B:564:THR:HG22	2.01	0.42
9:B:955:ASP:OD1	9:B:955:ASP:N	2.52	0.42
10:C:140:ILE:HA	10:C:143:ILE:HG22	2.00	0.42
13:L:9:GLY:H	13:L:40:ARG:HH12	1.67	0.42
8:A:1652:MET:HE1	8:A:1720:PRO:HA	2.00	0.42
8:A:1699:THR:OG1	8:A:1700:GLY:N	2.53	0.42
9:B:129:ILE:HG22	9:B:199:LEU:HD13	2.02	0.42
9:B:204:ASP:N	9:B:204:ASP:OD1	2.49	0.42
9:B:884:GLU:O	9:B:888:ARG:HB2	2.20	0.42
13:L:16:ASP:OD1	13:L:49:ARG:NE	2.53	0.42
1:1:57:SER:OG	3:3:583:ARG:O	2.32	0.42
8:A:1557:LEU:HD13	8:A:1580:HIS:CD2	2.55	0.42
4:5:9:G:N2	4:5:67:A:H61	2.18	0.42
8:A:414:ARG:NH1	9:B:410:LEU:O	2.52	0.42
8:A:1425:LYS:HB3	10:C:416:LYS:HA	2.02	0.42
8:A:1649:LYS:HE2	8:A:1880:PRO:HB3	2.02	0.42
14:O:264:ILE:O	14:O:268:ALA:HB2	2.20	0.42
15:P:78:LYS:HA	15:P:78:LYS:HD3	1.77	0.42
19:V:87:HIS:CE1	19:V:89:ASP:HB2	2.55	0.42
20:Y:52:ILE:HG21	20:Y:71:ILE:HG12	2.02	0.42
10:C:232:SER:HB2	11:D:372:LYS:NZ	2.34	0.42
14:O:293:ASN:O	14:O:297:ASN:HB2	2.20	0.42
14:O:303:ILE:HD12	14:O:313:TRP:CZ3	2.55	0.42
4:5:29:A:H2'	4:5:30:A:H8	1.84	0.42
8:A:251:ASP:N	8:A:251:ASP:OD1	2.53	0.42
8:A:304:ILE:HG23	9:B:923:PRO:HG3	2.02	0.42
8:A:989:ASP:OD1	8:A:989:ASP:N	2.51	0.42
9:B:160:ARG:HB3	9:B:164:ASP:HA	2.02	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:D:332:ALA:O	11:D:349:SER:OG	2.31	0.42
19:V:66:ASP:OD2	19:V:70:THR:N	2.52	0.42
8:A:463:PRO:HA	8:A:464:PRO:HD3	1.83	0.42
8:A:1126:VAL:HG23	8:A:1151:ARG:HH11	1.84	0.42
11:D:425:GLY:O	11:D:441:TRP:N	2.46	0.42
13:L:49:ARG:HG2	13:L:54:LEU:HD13	2.01	0.42
2:2:17:U:H3	10:C:256:ASN:HA	1.84	0.41
4:5:9:G:O6	4:5:69:A:O2'	2.27	0.41
4:5:26:A:H1'	4:5:27:U:H5'	2.01	0.41
5:6:49:G:O2'	6:7:29:ARG:NH2	2.53	0.41
5:6:91:A:H2'	5:6:92:A:H8	1.85	0.41
8:A:1653:ASP:OD1	8:A:1653:ASP:N	2.52	0.41
9:B:778:PRO:HB3	9:B:817:TYR:CG	2.55	0.41
10:C:255:LYS:HG2	10:C:257:ALA:HB3	2.02	0.41
10:C:320:HIS:O	10:C:324:LEU:N	2.53	0.41
8:A:115:ASP:N	8:A:115:ASP:OD1	2.53	0.41
8:A:664:HIS:NE2	10:C:214:ILE:O	2.52	0.41
8:A:731:LEU:HD11	8:A:735:ILE:HD11	2.02	0.41
8:A:1832:ARG:HB2	8:A:1835:GLN:HB2	2.02	0.41
9:B:130:ARG:NH2	9:B:431:VAL:O	2.52	0.41
7:8:566:ILE:HG23	7:8:567:ASP:H	1.86	0.41
8:A:377:GLU:H	9:B:354:ARG:NH1	2.17	0.41
11:D:399:LYS:HD2	11:D:406:ILE:HD11	2.03	0.41
14:O:300:ASP:OD1	14:O:300:ASP:N	2.53	0.41
7:8:478:HIS:O	7:8:481:THR:OG1	2.32	0.41
8:A:371:LEU:HG	8:A:373:ASP:HB2	2.02	0.41
9:B:453:TYR:HE2	9:B:456:GLY:HA3	1.85	0.41
15:P:264:VAL:HG13	15:P:269:CYS:HB2	2.02	0.41
8:A:583:ALA:HB1	8:A:609:LYS:HD3	2.02	0.41
8:A:790:ARG:NH2	8:A:986:GLU:HB3	2.36	0.41
8:A:1340:LEU:HB2	18:S:5:ILE:HG22	2.02	0.41
8:A:1555:LEU:HD23	8:A:1574:ILE:HD13	2.02	0.41
8:A:1649:LYS:HB2	8:A:1880:PRO:HB3	2.01	0.41
9:B:167:TYR:HB2	9:B:536:ARG:HH11	1.84	0.41
10:C:268:LEU:O	10:C:273:ARG:NH2	2.53	0.41
3:3:579:TRP:HA	3:3:580:PRO:HD3	1.99	0.41
5:6:14:C:H2'	5:6:15:A:C8	2.55	0.41
6:7:7:PRO:HG3	8:A:1524:SER:HB2	2.01	0.41
8:A:397:ASN:OD1	8:A:397:ASN:N	2.52	0.41
8:A:591:MET:HG2	8:A:598:LEU:HD21	2.02	0.41
8:A:863:GLU:HG3	8:A:913:PRO:HB3	2.03	0.41

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:A:1605:GLU:OE2	8:A:1634:SER:N	2.39	0.41
8:A:2278:SER:OG	8:A:2279:TRP:N	2.53	0.41
9:B:129:ILE:HD12	9:B:131:ASN:H	1.86	0.41
9:B:839:PRO:HG2	9:B:894:GLN:HB3	2.03	0.41
11:D:223:SER:HB3	11:D:225:ASP:H	1.85	0.41
11:D:371:HIS:ND1	11:D:391:SER:OG	2.52	0.41
11:D:289:SER:OG	11:D:290:ALA:N	2.54	0.41
15:P:280:ALA:O	15:P:283:ALA:HB3	2.20	0.41
8:A:640:PHE:CE1	8:A:644:ILE:HG13	2.55	0.41
8:A:2160:PRO:HB3	8:A:2290:PRO:HA	2.02	0.41
14:O:317:THR:O	14:O:321:GLU:HG2	2.21	0.41
1:1:97:PHE:HD1	1:1:100:ILE:HD13	1.85	0.41
5:6:45:A:H2'	7:8:554:ARG:HH22	1.85	0.41
8:A:82:ARG:NH2	21:Z:258:A:N1	2.50	0.41
8:A:118:VAL:HA	8:A:129:VAL:HA	2.02	0.41
8:A:1947:ASN:O	8:A:1951:LYS:HB2	2.21	0.41
8:A:2069:SER:HA	8:A:2072:GLU:HG2	2.01	0.41
30:A:3001:IHP:O42	30:A:3001:IHP:P1	2.78	0.41
9:B:898:LEU:HD23	9:B:898:LEU:HA	1.93	0.41
9:B:910:ASP:OD1	9:B:910:ASP:N	2.53	0.41
10:C:113:TYR:OH	11:D:403:GLY:O	2.30	0.41
14:O:276:ILE:H	14:O:276:ILE:HG13	1.69	0.41
14:O:313:TRP:CE3	14:O:336:TRP:HB2	2.56	0.41
15:P:204:GLY:HA2	15:P:205:ILE:HA	1.78	0.41
19:V:58:LYS:HE2	19:V:144:MET:HG2	2.02	0.41
19:V:133:CYS:SG	19:V:134:GLN:N	2.94	0.41
8:A:154:GLU:HG2	8:A:572:PHE:CG	2.56	0.41
8:A:1988:LEU:HD21	8:A:2007:ILE:HG23	2.03	0.41
9:B:238:ASN:O	9:B:242:LEU:CB	2.65	0.41
8:A:891:PHE:O	13:L:83:ARG:NE	2.54	0.40
8:A:1475:ILE:O	8:A:1479:GLY:N	2.51	0.40
9:B:375:GLU:HG3	9:B:376:PRO:HD3	2.02	0.40
11:D:422:ASN:HB3	11:D:426:VAL:HG12	2.02	0.40
13:L:40:ARG:HB3	13:L:41:LYS:HZ2	1.86	0.40
14:O:333:PHE:O	14:O:337:MET:HG2	2.21	0.40
15:P:240:GLY:HA3	15:P:296:ARG:HH12	1.85	0.40
3:3:563:ARG:HA	3:3:564:PRO:HD3	1.93	0.40
4:5:26:A:OP1	8:A:419:ARG:NH1	2.43	0.40
8:A:1705:ILE:HD13	8:A:1705:ILE:HG21	1.88	0.40
8:A:2072:GLU:HA	8:A:2075:VAL:HG22	2.02	0.40
9:B:201:ASN:N	9:B:201:ASN:OD1	2.54	0.40

*Continued on next page...*



Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:6:55:C:OP2	5:6:74:U:O2'	2.31	0.40
8:A:1090:ARG:NH1	8:A:1092:ILE:O	2.54	0.40
8:A:1095:ILE:HD12	8:A:1097:ILE:HD11	2.03	0.40
8:A:1529:ILE:HA	8:A:1532:ARG:HG2	2.02	0.40
8:A:1766:GLN:HG3	8:A:1768:TYR:H	1.85	0.40
8:A:2103:THR:HG23	8:A:2139:VAL:HG23	2.02	0.40
9:B:63:LYS:O	9:B:65:TYR:N	2.51	0.40
11:D:194:TRP:HA	11:D:490:ARG:O	2.21	0.40
11:D:297:HIS:HA	11:D:298:PRO:HD3	1.94	0.40
11:D:301:ASP:OD1	11:D:301:ASP:N	2.48	0.40
8:A:959:ILE:HD11	8:A:1196:ILE:HD13	2.02	0.40
10:C:279:HIS:HB3	13:L:88:ILE:HG12	2.02	0.40
11:D:213:GLU:OE2	11:D:218:TRP:NE1	2.55	0.40
11:D:309:ASP:N	11:D:309:ASP:OD1	2.55	0.40
8:A:362:ARG:HE	9:B:279:ARG:HE	1.68	0.40
9:B:129:ILE:H	9:B:129:ILE:HG13	1.82	0.40
9:B:910:ASP:HA	9:B:911:PRO:HD3	1.94	0.40
11:D:356:LEU:HD13	11:D:368:LEU:HD13	2.03	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	1	120/322 (37%)	105 (88%)	15 (12%)	0	100	100
3	3	116/619 (19%)	93 (80%)	23 (20%)	0	100	100
6	7	91/464 (20%)	85 (93%)	6 (7%)	0	100	100
7	8	142/895 (16%)	122 (86%)	18 (13%)	2 (1%)	11	37
8	A	2232/2335 (96%)	1953 (88%)	274 (12%)	5 (0%)	47	78
9	B	900/972 (93%)	747 (83%)	149 (17%)	4 (0%)	34	67

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
10	C	282/536 (53%)	221 (78%)	61 (22%)	0	100	100
11	D	318/514 (62%)	269 (85%)	47 (15%)	2 (1%)	25	57
12	E	126/579 (22%)	112 (89%)	14 (11%)	0	100	100
13	L	101/802 (13%)	87 (86%)	13 (13%)	1 (1%)	15	46
14	O	251/848 (30%)	219 (87%)	31 (12%)	1 (0%)	34	67
15	P	282/420 (67%)	236 (84%)	45 (16%)	1 (0%)	34	67
16	Q	136/144 (94%)	115 (85%)	21 (15%)	0	100	100
17	R	98/229 (43%)	79 (81%)	19 (19%)	0	100	100
18	S	32/2752 (1%)	24 (75%)	8 (25%)	0	100	100
19	V	157/166 (95%)	148 (94%)	9 (6%)	0	100	100
20	Y	93/904 (10%)	90 (97%)	3 (3%)	0	100	100
22	s	173/472 (37%)	152 (88%)	21 (12%)	0	100	100
23	t	166/343 (48%)	145 (87%)	20 (12%)	1 (1%)	25	57
24	u	877/1304 (67%)	803 (92%)	70 (8%)	4 (0%)	29	61
25	v	1179/1217 (97%)	1022 (87%)	153 (13%)	4 (0%)	41	72
26	x	77/86 (90%)	66 (86%)	11 (14%)	0	100	100
27	y	98/110 (89%)	90 (92%)	8 (8%)	0	100	100
28	z	99/125 (79%)	85 (86%)	14 (14%)	0	100	100
All	All	8146/17158 (48%)	7068 (87%)	1053 (13%)	25 (0%)	44	72

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
11	D	384	HIS
24	u	464	LEU
8	A	1519	THR
11	D	385	TYR
15	P	67	LYS
23	t	154	ARG
7	8	595	LYS
9	B	66	TYR
24	u	465	PRO
24	u	946	LYS
25	v	583	MET
25	v	585	ALA
13	L	80	THR

Continued on next page...

*Continued from previous page...*

Mol	Chain	Res	Type
8	A	1084	PRO
8	A	1419	ILE
9	B	940	ARG
14	O	444	SER
7	8	521	PRO
8	A	1077	ILE
8	A	1118	PRO
9	B	470	PRO
9	B	760	GLY
25	v	281	PRO
25	v	914	ILE
24	u	489	PRO

### 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	1	109/291 (38%)	109 (100%)	0	100	100
3	3	102/545 (19%)	101 (99%)	1 (1%)	76	88
6	7	77/382 (20%)	77 (100%)	0	100	100
7	8	132/776 (17%)	131 (99%)	1 (1%)	81	91
8	A	2026/2108 (96%)	1987 (98%)	39 (2%)	57	78
9	B	802/866 (93%)	793 (99%)	9 (1%)	73	86
10	C	242/459 (53%)	237 (98%)	5 (2%)	53	76
11	D	275/441 (62%)	269 (98%)	6 (2%)	52	75
12	E	111/502 (22%)	110 (99%)	1 (1%)	78	90
13	L	88/709 (12%)	87 (99%)	1 (1%)	73	86
14	O	229/751 (30%)	226 (99%)	3 (1%)	69	84
15	P	254/361 (70%)	251 (99%)	3 (1%)	71	85
16	Q	126/130 (97%)	124 (98%)	2 (2%)	62	81
17	R	94/203 (46%)	91 (97%)	3 (3%)	39	67

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
18	S	27/2432 (1%)	27 (100%)	0	100	100
19	V	129/134 (96%)	129 (100%)	0	100	100
20	Y	86/831 (10%)	84 (98%)	2 (2%)	50	74
22	s	149/416 (36%)	148 (99%)	1 (1%)	84	92
23	t	153/294 (52%)	152 (99%)	1 (1%)	84	92
24	u	763/1104 (69%)	754 (99%)	9 (1%)	71	85
25	v	1028/1051 (98%)	1020 (99%)	8 (1%)	81	91
26	x	71/77 (92%)	71 (100%)	0	100	100
27	y	86/95 (90%)	86 (100%)	0	100	100
28	z	90/109 (83%)	90 (100%)	0	100	100
All	All	7249/15067 (48%)	7154 (99%)	95 (1%)	70	84

All (95) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	3	589	ARG
7	8	600	ARG
8	A	57	GLN
8	A	159	ARG
8	A	258	PHE
8	A	270	ASN
8	A	297	ASN
8	A	338	VAL
8	A	468	LYS
8	A	470	ARG
8	A	505	ASN
8	A	574	LEU
8	A	578	LEU
8	A	585	VAL
8	A	642	ARG
8	A	647	LEU
8	A	648	LEU
8	A	697	MET
8	A	735	ILE
8	A	775	ASN
8	A	855	ARG
8	A	871	TYR
8	A	873	ASN

Continued on next page...

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
8	A	946	GLU
8	A	975	VAL
8	A	1099	PHE
8	A	1132	LYS
8	A	1246	GLN
8	A	1293	ASN
8	A	1427	ARG
8	A	1434	LYS
8	A	1468	ASN
8	A	1487	HIS
8	A	1513	MET
8	A	1531	ASN
8	A	1543	ASN
8	A	1547	VAL
8	A	1581	LEU
8	A	1743	LEU
8	A	1998	ASN
8	A	2010	ILE
9	B	97	VAL
9	B	111	VAL
9	B	250	ARG
9	B	306	ASN
9	B	320	LEU
9	B	327	TYR
9	B	583	ASN
9	B	809	ILE
9	B	941	LYS
10	C	95	LYS
10	C	180	THR
10	C	189	ASN
10	C	240	LYS
10	C	312	MET
11	D	187	LYS
11	D	380	LEU
11	D	385	TYR
11	D	394	ASN
11	D	427	LEU
11	D	446	ASN
12	E	182	LYS
13	L	110	ARG
14	O	404	GLU
14	O	425	ASN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
14	O	443	ILE
15	P	120	ASN
15	P	132	ARG
15	P	150	LEU
16	Q	8	ARG
16	Q	102	CYS
17	R	72	ARG
17	R	196	ASN
17	R	199	LYS
20	Y	70	PHE
20	Y	71	ILE
22	s	169	ASN
23	t	190	ARG
24	u	596	ILE
24	u	614	ARG
24	u	739	ARG
24	u	942	ASN
24	u	1065	LEU
24	u	1100	ASN
24	u	1134	ASN
24	u	1209	ASN
24	u	1277	GLN
25	v	9	GLN
25	v	98	MET
25	v	278	LEU
25	v	521	PRO
25	v	545	VAL
25	v	613	THR
25	v	680	ASP
25	v	1188	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (49) such sidechains are listed below:

Mol	Chain	Res	Type
6	7	74	GLN
7	8	579	GLN
7	8	587	HIS
8	A	270	ASN
8	A	325	HIS
8	A	483	GLN
8	A	505	ASN
8	A	512	ASN

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
8	A	860	GLN
8	A	873	ASN
8	A	994	ASN
8	A	1238	GLN
8	A	1399	GLN
8	A	1450	GLN
8	A	1476	GLN
8	A	1522	GLN
8	A	1531	ASN
8	A	1543	ASN
8	A	1728	GLN
8	A	1998	ASN
9	B	583	ASN
9	B	771	GLN
9	B	924	GLN
10	C	183	GLN
10	C	203	GLN
10	C	279	HIS
10	C	307	GLN
11	D	344	GLN
11	D	394	ASN
11	D	408	ASN
13	L	30	GLN
14	O	425	ASN
16	Q	95	GLN
17	R	196	ASN
19	V	134	GLN
22	s	127	HIS
22	s	169	ASN
24	u	832	GLN
24	u	942	ASN
24	u	1091	HIS
24	u	1100	ASN
24	u	1209	ASN
24	u	1252	GLN
25	v	138	GLN
25	v	304	GLN
25	v	885	ASN
25	v	988	ASN
25	v	1188	ASN
28	z	52	ASN

5.3.3 RNA 

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	2	57/188 (30%)	16 (28%)	1 (1%)
21	Z	46/478 (9%)	19 (41%)	1 (2%)
4	5	69/116 (59%)	31 (44%)	1 (1%)
5	6	94/107 (87%)	30 (31%)	1 (1%)
All	All	266/889 (29%)	96 (36%)	4 (1%)

All (96) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	2	13	C
2	2	14	C
2	2	16	U
2	2	18	U
2	2	19	G
2	2	23	A
2	2	24	A
2	2	25	G
2	2	27	U
2	2	30	A
2	2	31	G
2	2	36	G
2	2	37	U
2	2	45	C
2	2	49	U
2	2	50	C
4	5	8	G
4	5	9	G
4	5	10	U
4	5	14	U
4	5	16	U
4	5	17	U
4	5	19	A
4	5	20	G
4	5	21	A
4	5	22	U
4	5	24	G
4	5	26	A
4	5	27	U
4	5	34	U
4	5	35	U
4	5	37	G

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	5	39	C
4	5	40	U
4	5	41	U
4	5	43	U
4	5	44	A
4	5	45	C
4	5	47	A
4	5	52	U
4	5	53	U
4	5	61	A
4	5	62	G
4	5	68	C
4	5	69	A
4	5	72	U
4	5	73	C
5	6	6	C
5	6	7	G
5	6	9	U
5	6	13	G
5	6	21	U
5	6	22	A
5	6	24	A
5	6	25	C
5	6	26	U
5	6	28	A
5	6	29	A
5	6	30	A
5	6	31	U
5	6	34	G
5	6	35	A
5	6	36	A
5	6	44	G
5	6	45	A
5	6	49	G
5	6	54	G
5	6	56	A
5	6	59	G
5	6	69	A
5	6	70	A
5	6	74	U
5	6	78	A
5	6	81	C

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
5	6	82	A
5	6	83	A
5	6	84	A
21	Z	234	G
21	Z	235	C
21	Z	236	C
21	Z	239	C
21	Z	243	G
21	Z	244	U
21	Z	247	G
21	Z	251	C
21	Z	253	A
21	Z	254	G
21	Z	258	A
21	Z	259	C
21	Z	260	A
21	Z	261	A
21	Z	262	G
21	Z	385	U
21	Z	388	U
21	Z	394	A
21	Z	397	U

All (4) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	2	23	A
4	5	26	A
5	6	58	G
21	Z	261	A

#### 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

Of 16 ligands modelled in this entry, 14 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
31	GTP	B	1500	-	26,34,34	1.35	2 (7%)	32,54,54	1.61	8 (25%)
30	IHP	A	3001	-	36,36,36	0.74	0	54,60,60	1.25	3 (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
31	GTP	B	1500	-	-	5/18/38/38	0/3/3/3
30	IHP	A	3001	-	-	3/30/54/54	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
31	B	1500	GTP	C5-C6	-4.69	1.37	1.47
31	B	1500	GTP	C5-C4	-2.29	1.37	1.43

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
31	B	1500	GTP	PB-O3B-PG	-3.95	119.29	132.83
31	B	1500	GTP	C5-C6-N1	3.65	120.39	113.95
31	B	1500	GTP	C2-N1-C6	-3.07	119.45	125.10
30	A	3001	IHP	O12-C2-C1	2.96	115.66	108.69
31	B	1500	GTP	C8-N7-C5	2.91	108.54	102.99
31	B	1500	GTP	C3'-C2'-C1'	2.69	105.02	100.98
31	B	1500	GTP	PA-O3A-PB	-2.65	123.74	132.83
30	A	3001	IHP	C5-C6-C1	2.55	116.00	110.41
30	A	3001	IHP	C4-C3-C2	-2.41	105.14	110.41

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
31	B	1500	GTP	O6-C6-C5	-2.24	120.00	124.37
31	B	1500	GTP	O2G-PG-O3B	2.08	111.62	104.64

There are no chirality outliers.

All (8) torsion outliers are listed below:

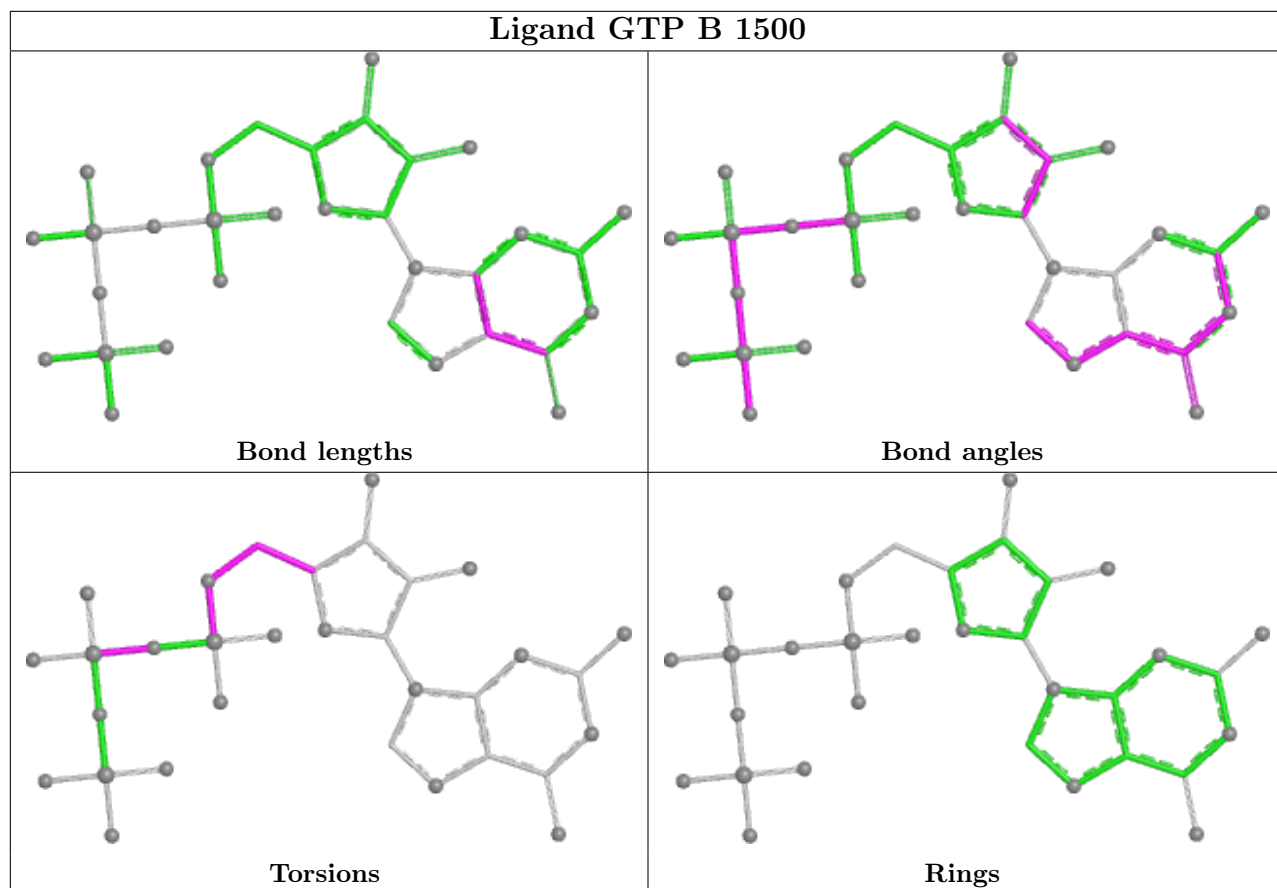
Mol	Chain	Res	Type	Atoms
30	A	3001	IHP	C1-C2-O12-P2
31	B	1500	GTP	C5'-O5'-PA-O3A
31	B	1500	GTP	C5'-O5'-PA-O1A
31	B	1500	GTP	PA-O3A-PB-O1B
31	B	1500	GTP	C4'-C5'-O5'-PA
30	A	3001	IHP	C3-C4-O14-P4
30	A	3001	IHP	C4-O14-P4-O34
31	B	1500	GTP	O4'-C4'-C5'-O5'

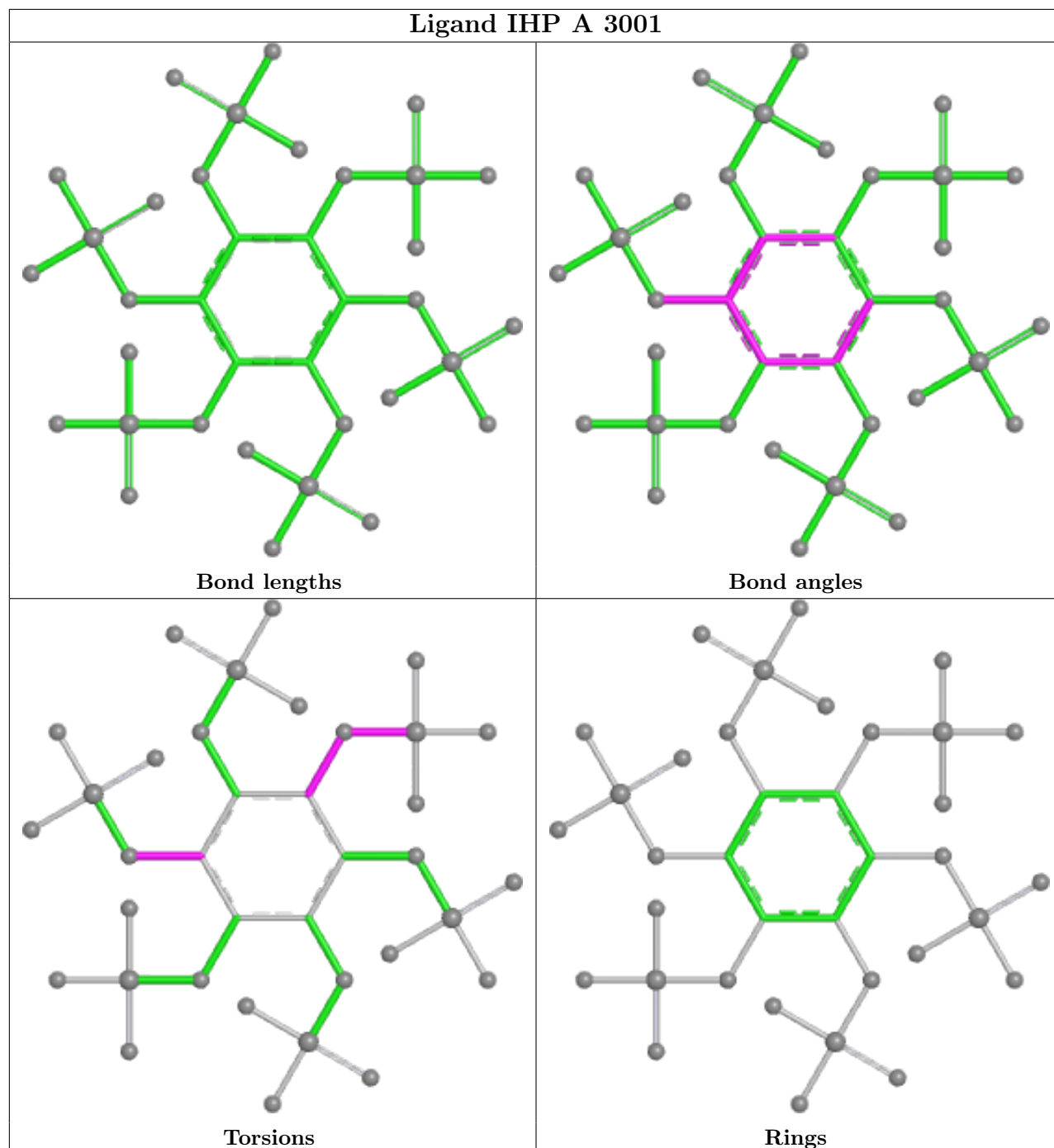
There are no ring outliers.

2 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
31	B	1500	GTP	1	0
30	A	3001	IHP	11	0

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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	2	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	2	59:A	O3'	60:U	P	4.39

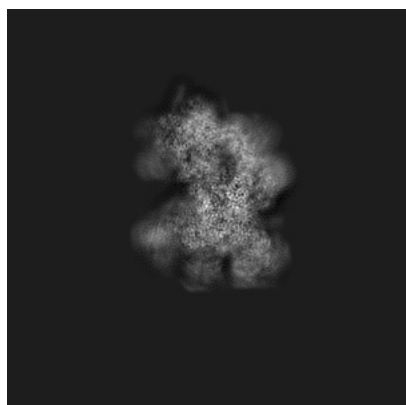
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4255. These allow visual inspection of the internal detail of the map and identification of artifacts.

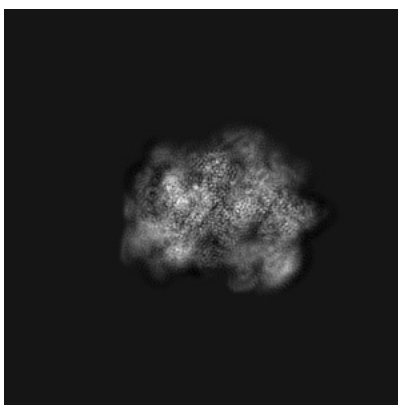
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

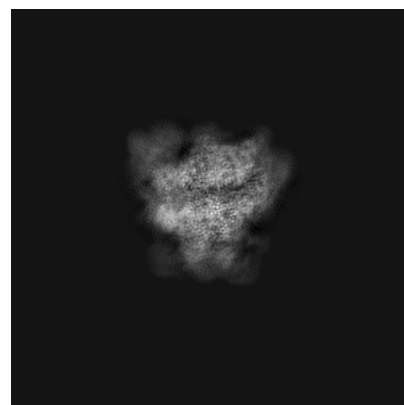
#### 6.1.1 Primary map



X



Y

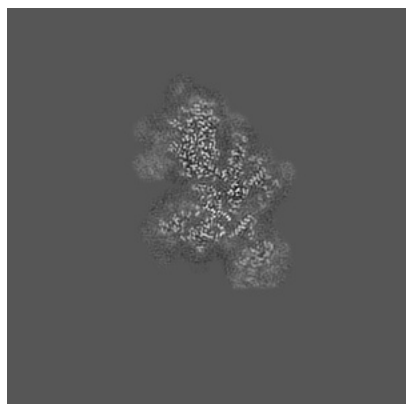


Z

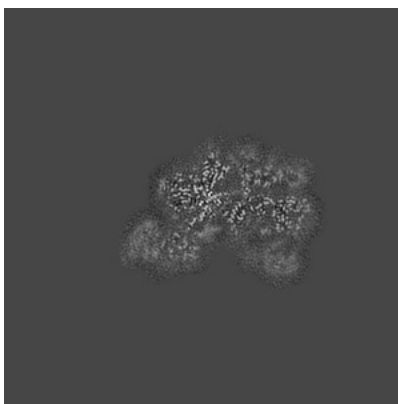
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

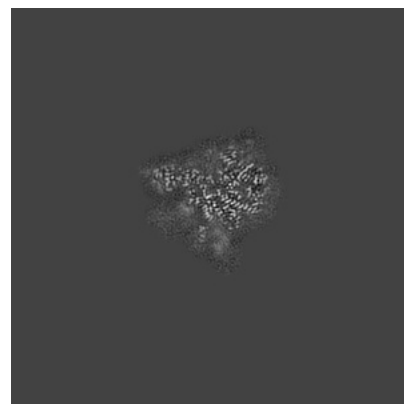
#### 6.2.1 Primary map



X Index: 210



Y Index: 210



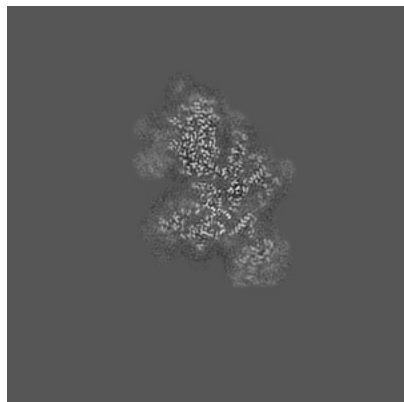
Z Index: 210



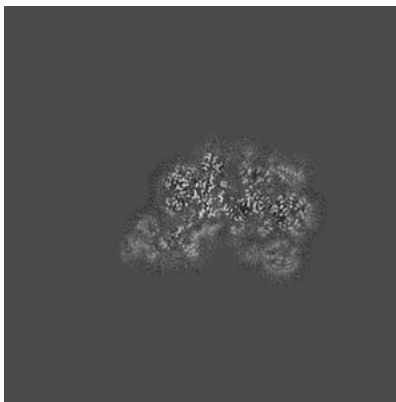
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

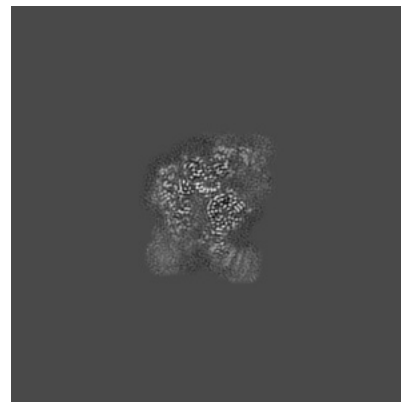
### 6.3.1 Primary map



X Index: 210



Y Index: 207



Z Index: 184

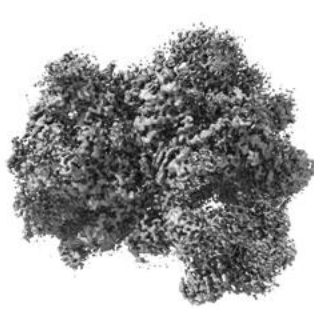
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal surface views [i](#)

### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

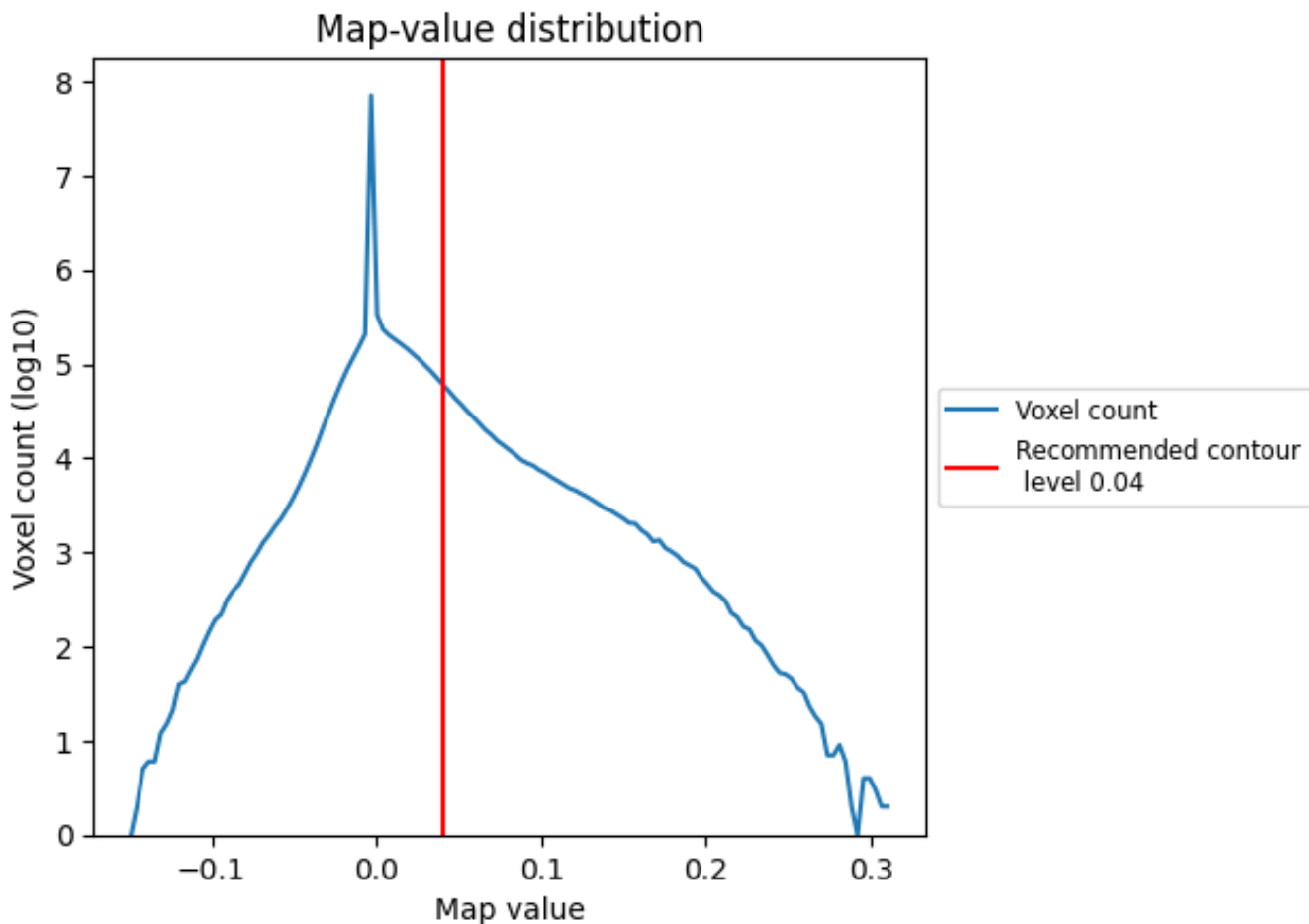
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

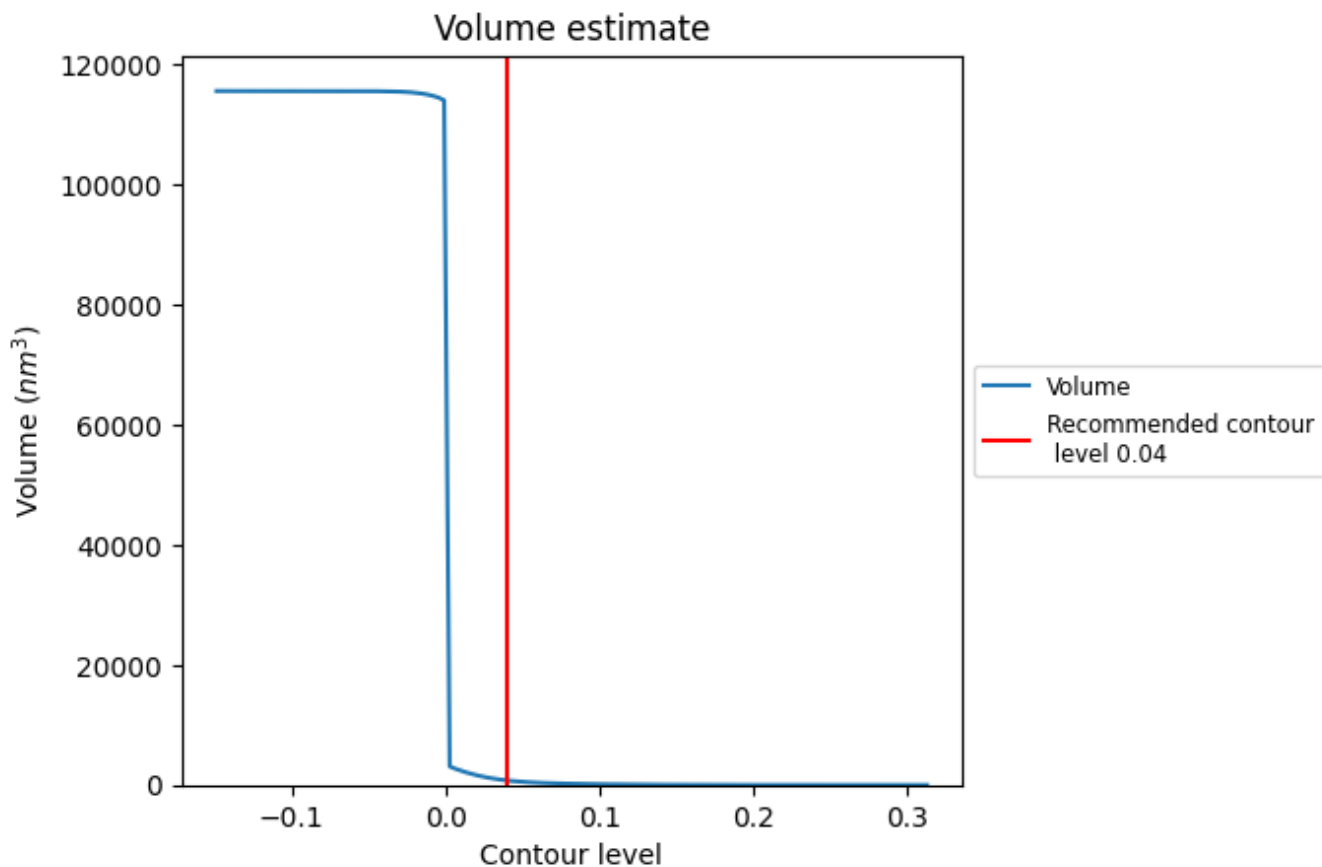
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

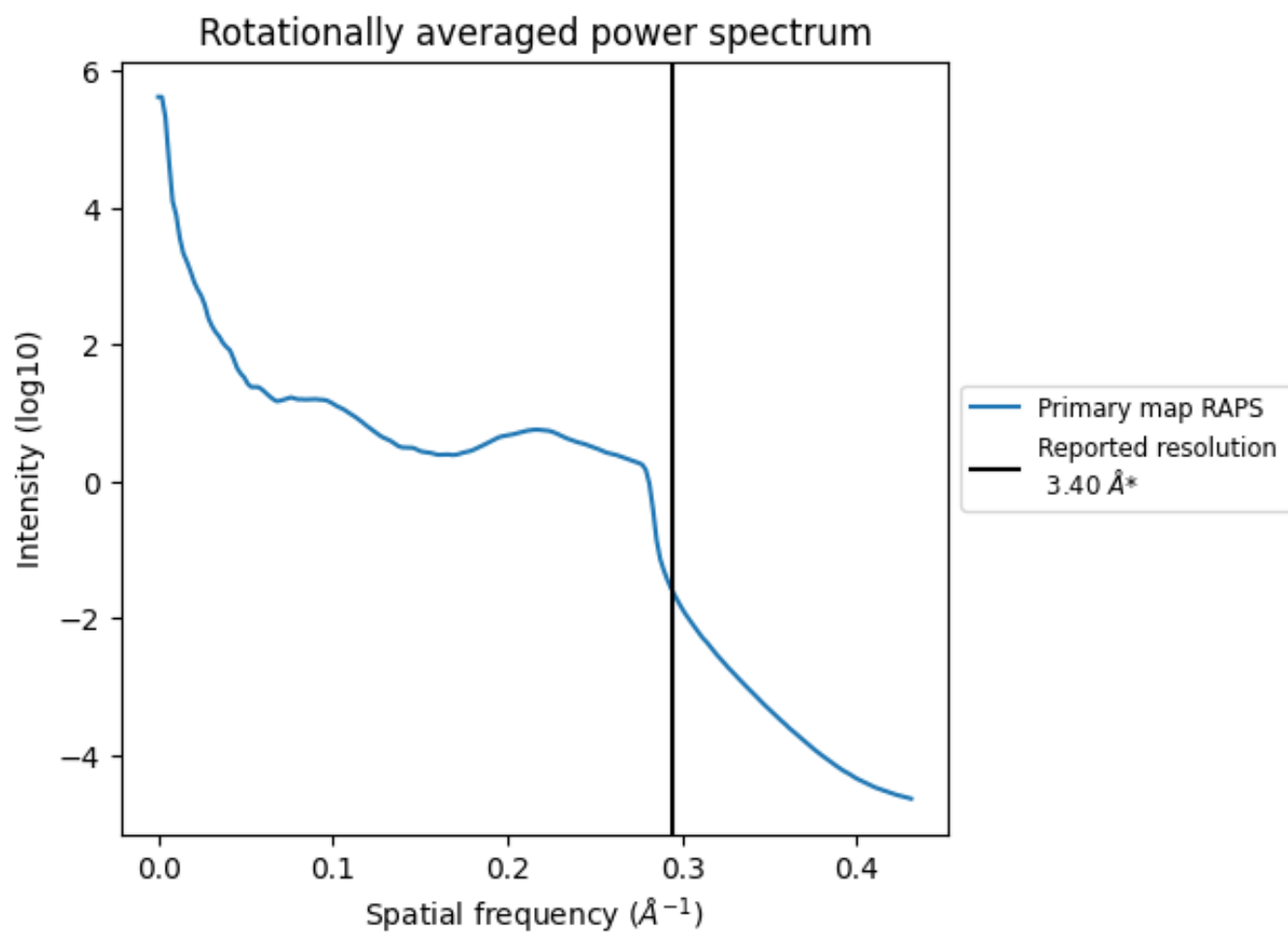
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 759 nm<sup>3</sup>; this corresponds to an approximate mass of 686 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  $0.294 \text{\AA}^{-1}$

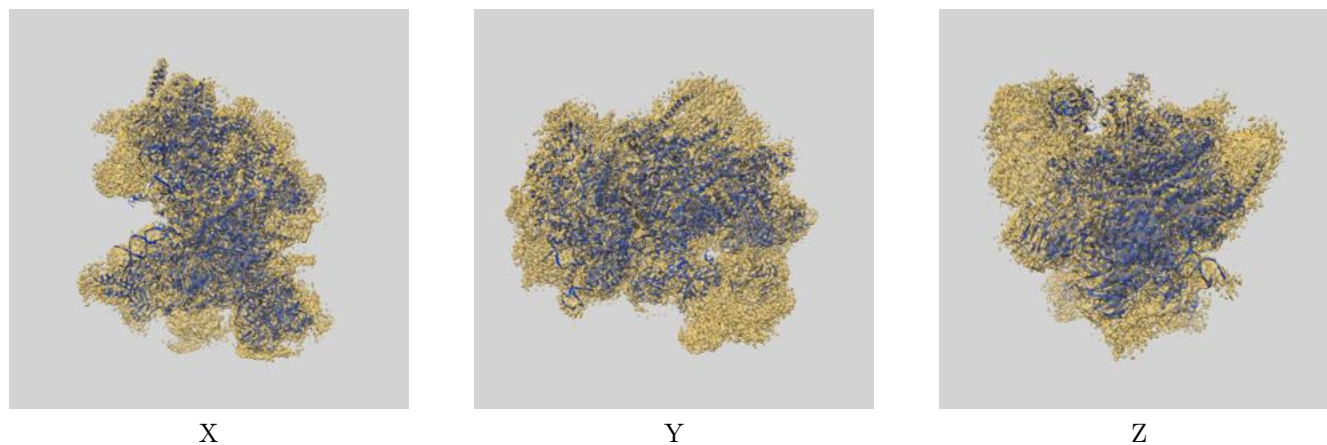
## 8 Fourier-Shell correlation

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

## 9 Map-model fit [i](#)

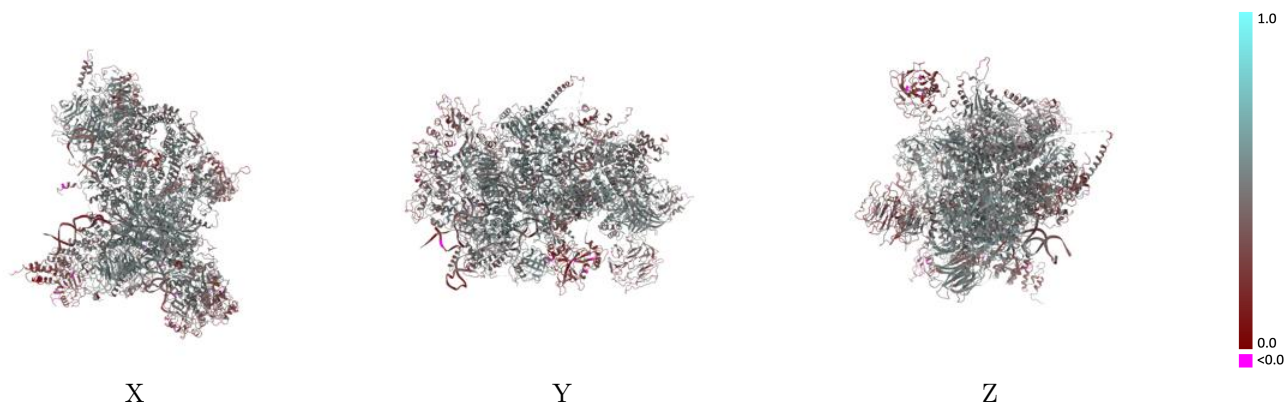
This section contains information regarding the fit between EMDB map EMD-4255 and PDB model 6FF4. Per-residue inclusion information can be found in section 3 on page 10.

### 9.1 Map-model overlay [i](#)



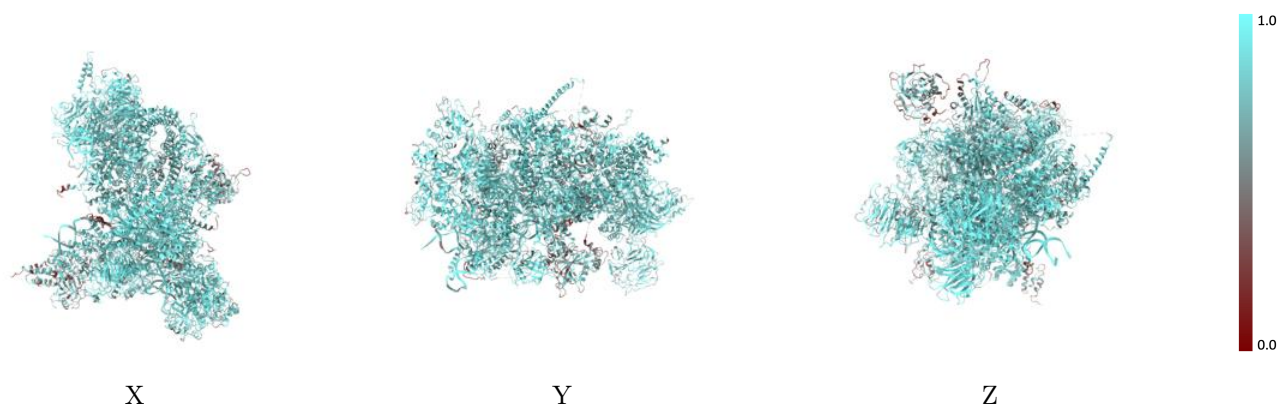
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 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.

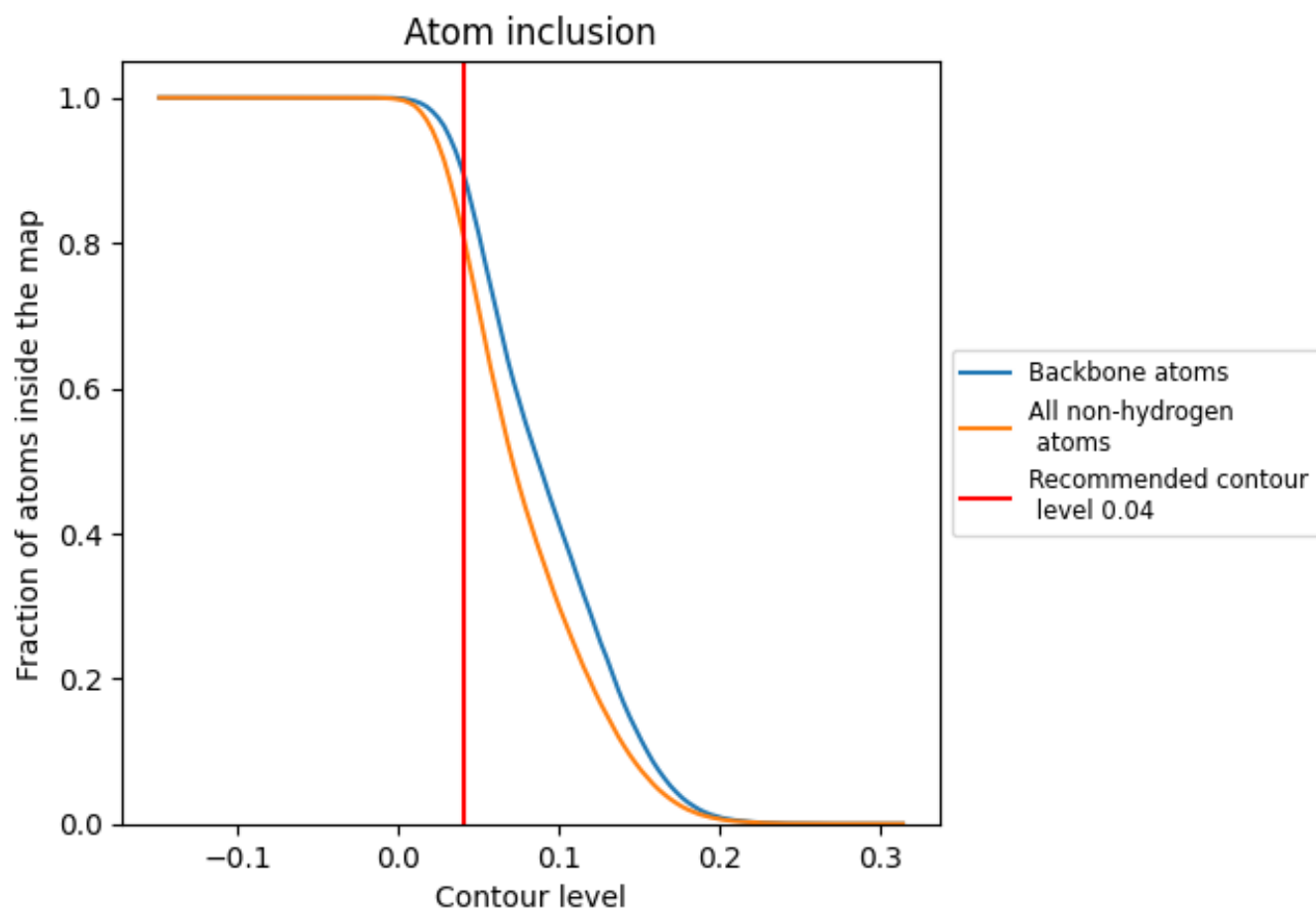
## 9.3 Atom inclusion mapped to coordinate model [i](#)



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 (0.04).





























































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 90% of all backbone atoms, 81% 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 (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8121	 0.4430
1	 0.7838	 0.4600
2	 0.8788	 0.3980
3	 0.6358	 0.3860
5	 0.9211	 0.4110
6	 0.8975	 0.3970
7	 0.7871	 0.4660
8	 0.8411	 0.4890
A	 0.8166	 0.4700
B	 0.7995	 0.4050
C	 0.7263	 0.4190
D	 0.9224	 0.5210
E	 0.6104	 0.3610
L	 0.8223	 0.4690
O	 0.7277	 0.3770
P	 0.6411	 0.3540
Q	 0.8840	 0.4650
R	 0.6961	 0.4550
S	 0.6761	 0.4570
V	 0.6455	 0.2470
Y	 0.7923	 0.3720
Z	 0.9230	 0.4510
s	 0.8795	 0.4940
t	 0.6742	 0.4330
u	 0.8424	 0.4910
v	 0.8661	 0.4530
x	 0.8814	 0.4890
y	 0.8735	 0.5160
z	 0.7088	 0.3410

