



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 3, 2024 – 03:46 am GMT

PDB ID : 5DKJ
Title : Yeast 20S proteasome in complex with octreotide-PI
Authors : Beck, P.; Cui, H.; Groll, M.
Deposited on : 2015-09-03
Resolution : 2.80 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp>

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:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

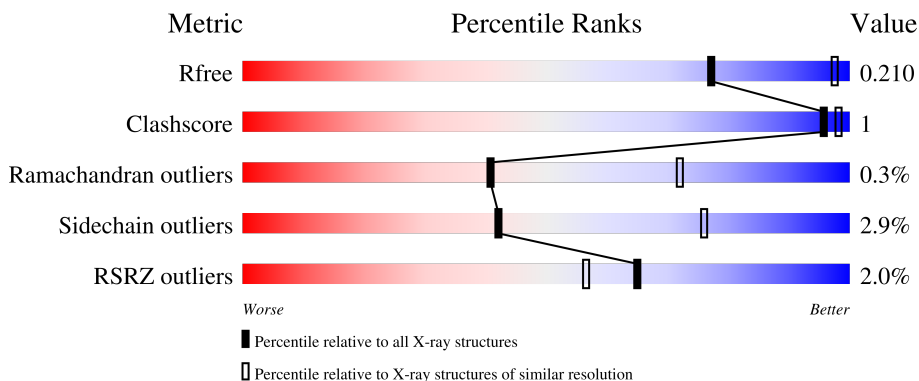
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	250	 2% 98%
1	O	250	 % 98%
2	B	258	 3% 90% 5%
2	P	258	 3% 90% 5%
3	C	254	 5% 88% 6% 6%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	Q	254	 6% 88% 6% • 6%
4	D	260	 86% • • 10%
4	R	260	 2% 86% • 10%
5	E	234	 3% 95% • •
5	S	234	 % 95% • •
6	F	288	 % 83% • 16%
6	T	288	 3% 82% • 16%
7	G	252	 % 90% 5% •
7	U	252	 2% 90% 6% •
8	H	232	 2% 93% • •
8	V	232	 3% 93% • •
9	I	205	 94% 6%
9	W	205	 95% 5%
10	J	198	 % 91% 7% • •
10	X	198	 % 91% 7% • •
11	K	212	 % 93% 7%
11	Y	212	 % 92% 8%
12	L	222	 2% 95% •
12	Z	222	 4% 95% 5%
13	M	246	 % 89% 5% 5%
13	a	246	 % 92% • 5%
14	N	196	 95% 5% •
14	b	196	 % 97% •

2 Entry composition

There are 18 unique types of molecules in this entry. The entry contains 49867 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	250	Total	C	N	O	S	0	0	0
			1915	1219	315	377	4			
1	O	250	Total	C	N	O	S	0	0	0
			1915	1219	315	377	4			

- Molecule 2 is a protein called Proteasome subunit alpha type-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	244	Total	C	N	O	S	0	0	0
			1904	1201	321	379	3			
2	P	244	Total	C	N	O	S	0	0	0
			1904	1201	321	379	3			

- Molecule 3 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	240	Total	C	N	O	S	0	0	0
			1881	1176	329	372	4			
3	Q	240	Total	C	N	O	S	0	0	0
			1881	1176	329	372	4			

- Molecule 4 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	235	Total	C	N	O	S	0	0	0
			1813	1136	304	366	7			
4	R	235	Total	C	N	O	S	0	0	0
			1813	1136	304	366	7			

- Molecule 5 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	E	231	Total 1773	C 1114	N 307	O 348	S 4	0	0	0
5	S	231	Total 1773	C 1114	N 307	O 348	S 4	0	0	0

- Molecule 6 is a protein called Probable proteasome subunit alpha type-7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
6	F	243	Total 1892	C 1203	N 329	O 356	S 4	0	0	0
6	T	243	Total 1892	C 1203	N 329	O 356	S 4	0	0	0

- Molecule 7 is a protein called Proteasome subunit alpha type-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
7	G	241	Total 1907	C 1214	N 320	O 365	S 8	0	0	0
7	U	241	Total 1907	C 1214	N 320	O 365	S 8	0	0	0

- Molecule 8 is a protein called Proteasome subunit beta type-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
8	H	226	Total 1719	C 1082	N 298	O 332	S 7	0	0	0
8	V	226	Total 1719	C 1082	N 298	O 332	S 7	0	0	0

- Molecule 9 is a protein called Proteasome subunit beta type-3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
9	I	204	Total 1581	C 1010	N 258	O 305	S 8	0	0	0
9	W	204	Total 1581	C 1010	N 258	O 305	S 8	0	0	0

- Molecule 10 is a protein called Proteasome subunit beta type-4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
10	J	195	Total 1561	C 992	N 264	O 299	S 6	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
10	X	195	Total	C	N	O	S	0	0	0
			1561	992	264	299	6			

- Molecule 11 is a protein called Proteasome subunit beta type-5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
11	K	212	Total	C	N	O	S	0	0	0
			1644	1045	280	312	7			
11	Y	212	Total	C	N	O	S	0	0	0
			1644	1045	280	312	7			

- Molecule 12 is a protein called Proteasome subunit beta type-6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
12	L	222	Total	C	N	O	S	0	0	0
			1757	1115	303	335	4			
12	Z	222	Total	C	N	O	S	0	0	0
			1757	1115	303	335	4			

- Molecule 13 is a protein called Proteasome subunit beta type-7.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	M	233	Total	C	N	O	S	0	0	0
			1824	1154	312	351	7			
13	a	233	Total	C	N	O	S	0	0	0
			1824	1154	312	351	7			

- Molecule 14 is a protein called Proteasome subunit beta type-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
14	N	196	Total	C	N	O	S	0	0	0
			1512	955	250	300	7			
14	b	196	Total	C	N	O	S	0	0	0
			1512	955	250	300	7			

- Molecule 15 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
15	G	1	Total	Mg	0	0
			1	1		
15	I	2	Total	Mg	0	0
			2	2		

Continued on next page...

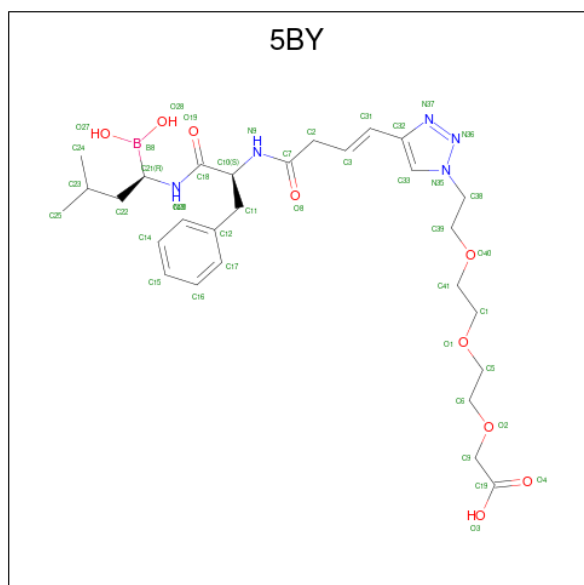
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
15	J	1	Total Mg 1 1	0	0
15	K	1	Total Mg 1 1	0	0
15	L	1	Total Mg 1 1	0	0
15	N	1	Total Mg 1 1	0	0
15	Z	1	Total Mg 1 1	0	0

- Molecule 16 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
16	G	1	Total Cl 1 1	0	0
16	N	1	Total Cl 1 1	0	0
16	U	1	Total Cl 1 1	0	0
16	b	1	Total Cl 1 1	0	0

- Molecule 17 is {2-[2-(2-{4-[(1E)-4-{{(2S)-1-{{(1R)-1-(dihydroxyboranyl)-3-methylbutyl]amino}-1-oxo-3-phenylpropan-2-yl]amino}-4-oxobut-1-en-1-yl]-1H-1,2,3-triazol-1-yl}ethoxy)ethoxy]ethoxy}acetic acid (three-letter code: 5BY) (formula: C₂₈H₄₂BN₅O₉).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
17	H	1	Total 34	B 1	C 23	N 5	O 5	0	0
17	K	1	Total 34	B 1	C 23	N 5	O 5	0	0
17	N	1	Total 34	B 1	C 23	N 5	O 5	0	0
17	V	1	Total 34	B 1	C 23	N 5	O 5	0	0
17	Y	1	Total 34	B 1	C 23	N 5	O 5	0	0
17	b	1	Total 34	B 1	C 23	N 5	O 5	0	0

- Molecule 18 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
18	A	7	Total 7	O 7	0	0
18	B	14	Total 14	O 14	0	0
18	C	6	Total 6	O 6	0	0
18	D	6	Total 6	O 6	0	0
18	E	14	Total 14	O 14	0	0
18	F	8	Total 8	O 8	0	0
18	G	10	Total 10	O 10	0	0
18	H	10	Total 10	O 10	0	0
18	I	14	Total 14	O 14	0	0
18	J	8	Total 8	O 8	0	0
18	K	10	Total 10	O 10	0	0
18	L	14	Total 14	O 14	0	0
18	M	17	Total 17	O 17	0	0
18	N	7	Total 7	O 7	0	0

Continued on next page...

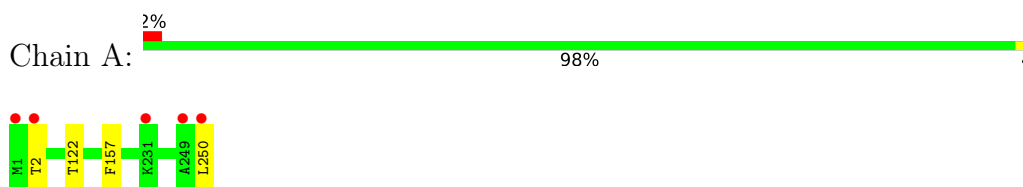
Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
18	O	5	Total O 5 5	0	0
18	P	8	Total O 8 8	0	0
18	Q	6	Total O 6 6	0	0
18	R	8	Total O 8 8	0	0
18	S	11	Total O 11 11	0	0
18	T	10	Total O 10 10	0	0
18	U	8	Total O 8 8	0	0
18	V	7	Total O 7 7	0	0
18	W	10	Total O 10 10	0	0
18	X	14	Total O 14 14	0	0
18	Y	13	Total O 13 13	0	0
18	Z	13	Total O 13 13	0	0
18	a	18	Total O 18 18	0	0
18	b	9	Total O 9 9	0	0

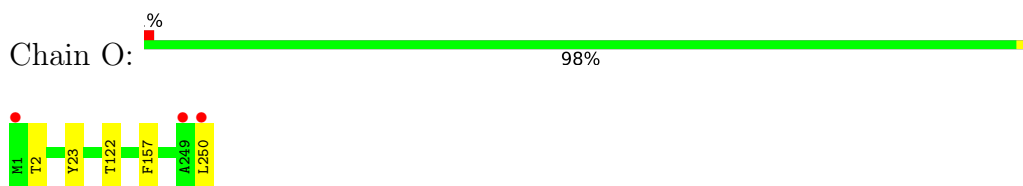
3 Residue-property plots [i](#)

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 electron 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 dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). 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.

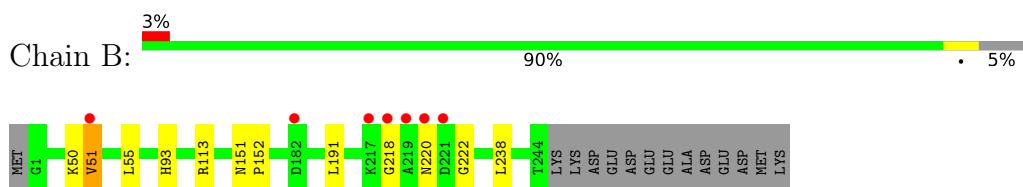
- Molecule 1: Proteasome subunit alpha type-2



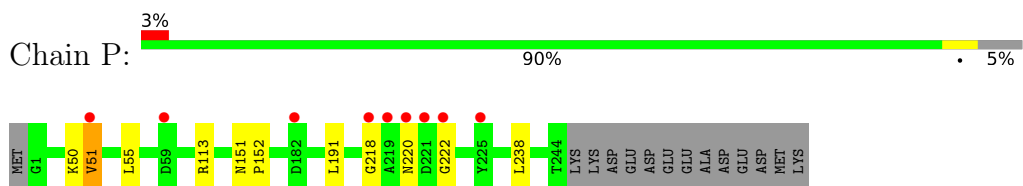
- Molecule 1: Proteasome subunit alpha type-2



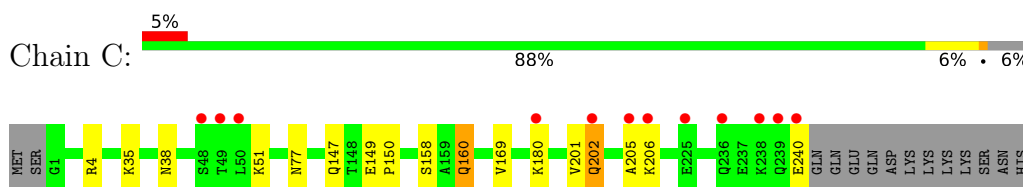
- Molecule 2: Proteasome subunit alpha type-3



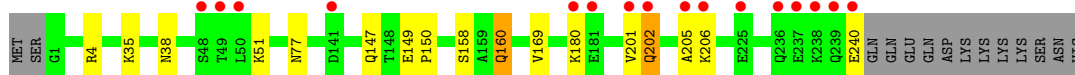
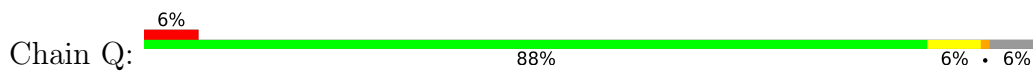
- Molecule 2: Proteasome subunit alpha type-3



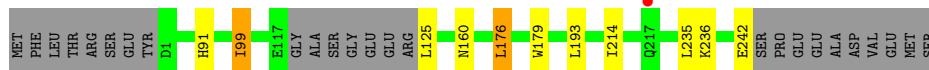
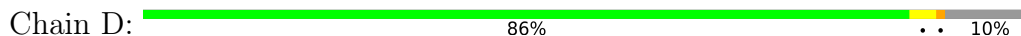
- Molecule 3: Proteasome subunit alpha type-4



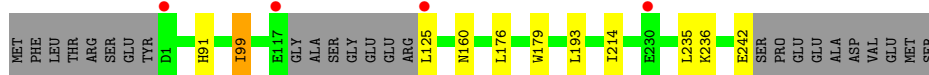
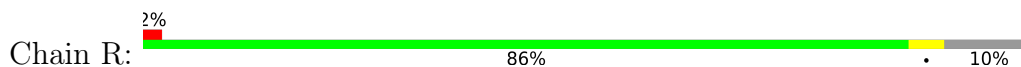
- Molecule 3: Proteasome subunit alpha type-4



• Molecule 4: Proteasome subunit alpha type-5



• Molecule 4: Proteasome subunit alpha type-5



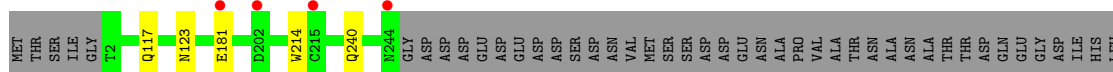
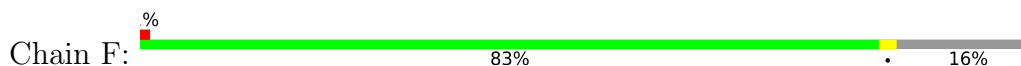
• Molecule 5: Proteasome subunit alpha type-6



• Molecule 5: Proteasome subunit alpha type-6

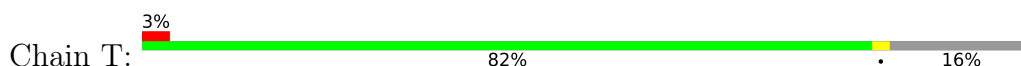


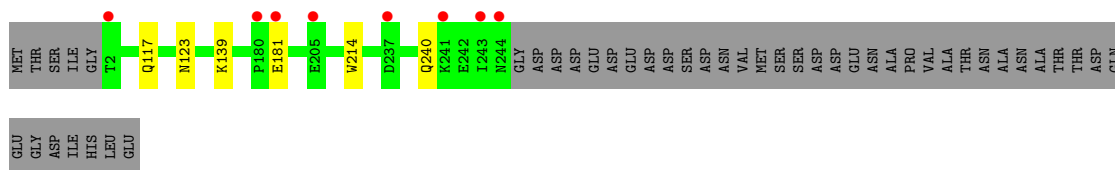
• Molecule 6: Probable proteasome subunit alpha type-7



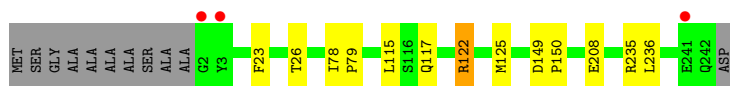
GLU

• Molecule 6: Probable proteasome subunit alpha type-7

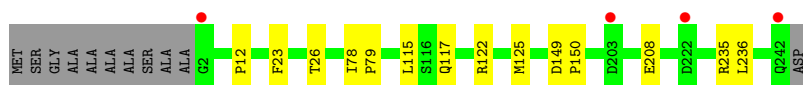
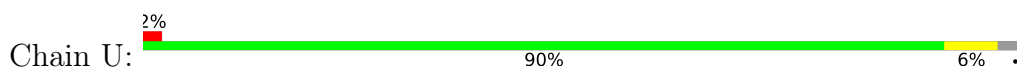




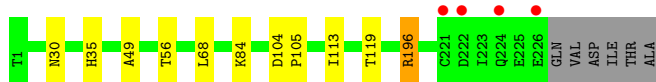
• Molecule 7: Proteasome subunit alpha type-1



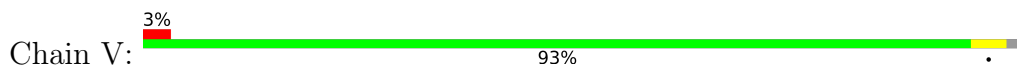
• Molecule 7: Proteasome subunit alpha type-1



• Molecule 8: Proteasome subunit beta type-2



• Molecule 8: Proteasome subunit beta type-2



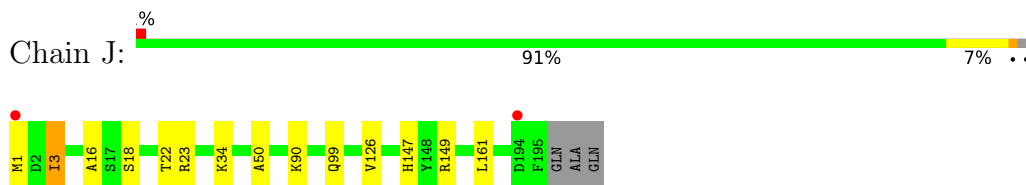
• Molecule 9: Proteasome subunit beta type-3



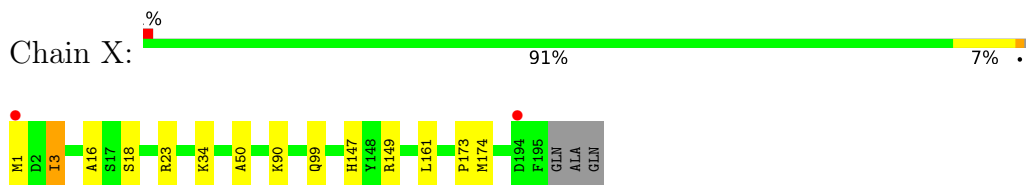
• Molecule 9: Proteasome subunit beta type-3



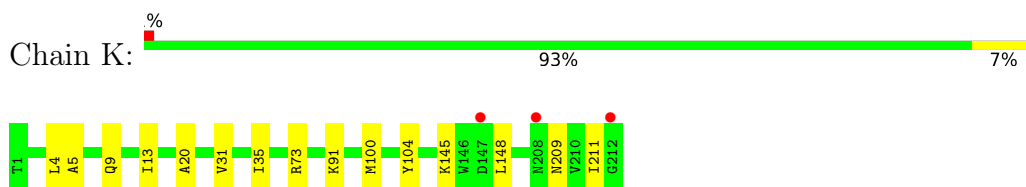
- Molecule 10: Proteasome subunit beta type-4



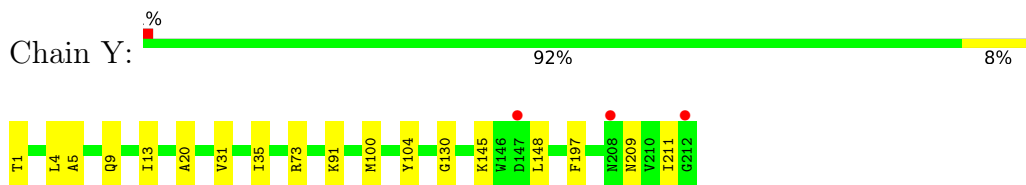
- Molecule 10: Proteasome subunit beta type-4



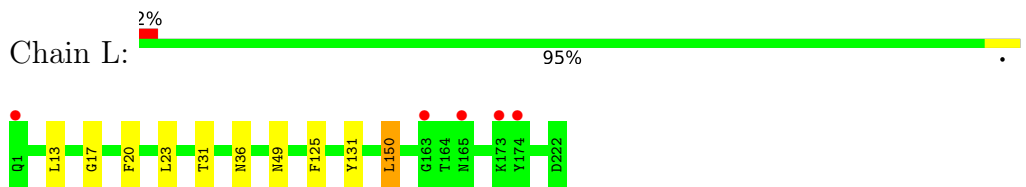
- Molecule 11: Proteasome subunit beta type-5



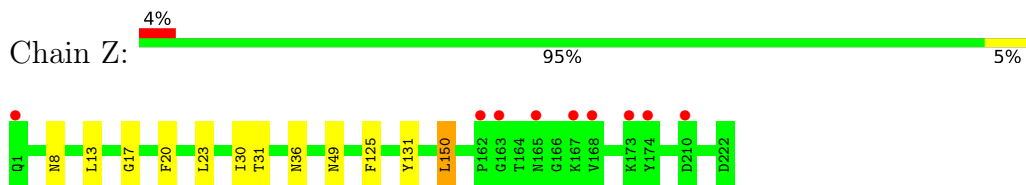
- Molecule 11: Proteasome subunit beta type-5



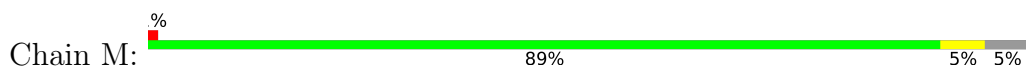
- Molecule 12: Proteasome subunit beta type-6

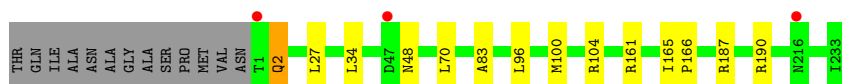


- Molecule 12: Proteasome subunit beta type-6

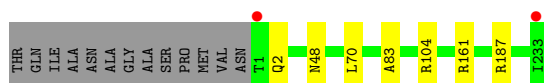
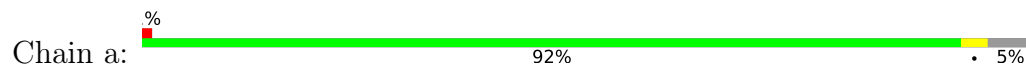


- Molecule 13: Proteasome subunit beta type-7





- Molecule 13: Proteasome subunit beta type-7



- Molecule 14: Proteasome subunit beta type-1



- Molecule 14: Proteasome subunit beta type-1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	136.67Å 299.71Å 145.43Å 90.00° 113.16° 90.00°	Depositor
Resolution (Å)	15.00 – 2.80 15.00 – 2.80	Depositor EDS
% Data completeness (in resolution range)	98.0 (15.00-2.80) 98.0 (15.00-2.80)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.76 (at 2.81Å)	Xtrriage
Refinement program	REFMAC 5.7.0032	Depositor
R, R_{free}	0.190 , 0.210 0.192 , 0.210	Depositor DCC
R_{free} test set	12808 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	59.3	Xtrriage
Anisotropy	0.019	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 36.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	49867	wwPDB-VP
Average B, all atoms (Å ²)	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.08% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CL, 5BY, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.27	0/1952	0.46	0/2642
1	O	0.26	0/1952	0.46	0/2642
2	B	0.27	0/1934	0.48	0/2618
2	P	0.27	0/1934	0.48	0/2618
3	C	0.27	0/1910	0.49	0/2586
3	Q	0.27	0/1910	0.49	0/2586
4	D	0.26	0/1837	0.46	0/2475
4	R	0.26	0/1837	0.46	0/2475
5	E	0.26	0/1800	0.46	0/2433
5	S	0.26	0/1800	0.46	0/2433
6	F	0.27	0/1932	0.44	0/2609
6	T	0.27	0/1932	0.44	0/2609
7	G	0.27	0/1945	0.46	0/2634
7	U	0.27	0/1945	0.46	0/2634
8	H	0.30	0/1750	0.51	0/2373
8	V	0.26	0/1750	0.50	0/2373
9	I	0.26	0/1611	0.50	0/2174
9	W	0.26	0/1611	0.50	0/2174
10	J	0.26	0/1589	0.50	0/2142
10	X	0.26	0/1589	0.49	0/2142
11	K	0.25	0/1681	0.51	0/2274
11	Y	0.26	0/1681	0.52	0/2274
12	L	0.29	0/1795	0.51	0/2420
12	Z	0.28	0/1795	0.51	0/2420
13	M	0.26	0/1855	0.53	0/2514
13	a	0.26	0/1855	0.53	0/2514
14	N	0.26	0/1541	0.49	0/2087
14	b	0.25	0/1541	0.49	0/2087
All	All	0.27	0/50264	0.49	0/67962

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [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	A	1915	0	1929	0	0
1	O	1915	0	1929	1	0
2	B	1904	0	1904	3	0
2	P	1904	0	1904	4	0
3	C	1881	0	1895	5	0
3	Q	1881	0	1895	5	0
4	D	1813	0	1797	3	0
4	R	1813	0	1797	2	0
5	E	1773	0	1775	2	0
5	S	1773	0	1775	1	0
6	F	1892	0	1883	0	0
6	T	1892	0	1883	0	0
7	G	1907	0	1901	4	0
7	U	1907	0	1901	4	0
8	H	1719	0	1718	8	0
8	V	1719	0	1718	8	0
9	I	1581	0	1574	7	0
9	W	1581	0	1574	5	0
10	J	1561	0	1569	6	0
10	X	1561	0	1569	6	0
11	K	1644	0	1594	6	0
11	Y	1644	0	1594	8	0
12	L	1757	0	1711	5	0
12	Z	1757	0	1711	6	0
13	M	1824	0	1832	4	0
13	a	1824	0	1832	0	0
14	N	1512	0	1480	3	0
14	b	1512	0	1480	0	0
15	G	1	0	0	0	0
15	I	2	0	0	0	0
15	J	1	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
15	K	1	0	0	0	0
15	L	1	0	0	0	0
15	N	1	0	0	0	0
15	Z	1	0	0	0	0
16	G	1	0	0	0	0
16	N	1	0	0	0	0
16	U	1	0	0	0	0
16	b	1	0	0	0	0
17	H	34	0	31	1	0
17	K	34	0	31	0	0
17	N	34	0	31	0	0
17	V	34	0	31	1	0
17	Y	34	0	31	0	0
17	b	34	0	31	0	0
18	A	7	0	0	0	0
18	B	14	0	0	1	0
18	C	6	0	0	0	0
18	D	6	0	0	0	0
18	E	14	0	0	0	0
18	F	8	0	0	0	0
18	G	10	0	0	1	0
18	H	10	0	0	0	0
18	I	14	0	0	0	0
18	J	8	0	0	0	0
18	K	10	0	0	0	0
18	L	14	0	0	0	0
18	M	17	0	0	1	0
18	N	7	0	0	0	0
18	O	5	0	0	0	0
18	P	8	0	0	0	0
18	Q	6	0	0	0	0
18	R	8	0	0	0	0
18	S	11	0	0	0	0
18	T	10	0	0	0	0
18	U	8	0	0	0	0
18	V	7	0	0	1	0
18	W	10	0	0	0	0
18	X	14	0	0	1	0
18	Y	13	0	0	0	0
18	Z	13	0	0	0	0
18	a	18	0	0	0	0
18	b	9	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	49867	0	49310	94	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 1.

All (94) 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)
11:K:209:ASN:O	9:W:38:LYS:NZ	2.16	0.78
9:I:38:LYS:NZ	11:Y:209:ASN:O	2.17	0.78
11:K:73:ARG:NH2	11:K:104:TYR:O	2.30	0.64
11:Y:73:ARG:NH2	11:Y:104:TYR:O	2.31	0.62
17:V:301:5BY:C41	18:V:405:HOH:O	2.51	0.59
8:V:35:HIS:HB3	8:V:56:THR:HG21	1.85	0.58
2:B:93:HIS:HB3	18:B:301:HOH:O	2.04	0.58
12:L:31:THR:HG23	12:L:36:ASN:HD21	1.69	0.57
8:H:35:HIS:HB3	8:H:56:THR:HG21	1.85	0.56
11:K:145:LYS:HB2	11:K:148:LEU:HD13	1.88	0.56
11:Y:145:LYS:HB2	11:Y:148:LEU:HD13	1.88	0.56
8:V:35:HIS:CB	8:V:56:THR:HG21	2.36	0.56
12:Z:31:THR:HG23	12:Z:36:ASN:HD21	1.69	0.56
8:H:35:HIS:CB	8:H:56:THR:HG21	2.36	0.55
13:M:2:GLN:NE2	18:M:301:HOH:O	2.39	0.55
14:N:152:VAL:HA	14:N:175:MET:HE1	1.90	0.54
10:J:16:ALA:HB2	10:J:161:LEU:HD21	1.92	0.52
11:Y:1:THR:O	11:Y:130:GLY:HA3	2.09	0.52
11:Y:20:ALA:HB2	11:Y:31:VAL:HG21	1.92	0.51
3:Q:201:VAL:O	3:Q:202:GLN:CB	2.58	0.51
10:X:16:ALA:HB2	10:X:161:LEU:HD21	1.92	0.51
3:C:201:VAL:O	3:C:202:GLN:CB	2.58	0.51
11:K:20:ALA:HB2	11:K:31:VAL:HG21	1.92	0.50
10:X:50:ALA:O	11:Y:91:LYS:NZ	2.44	0.50
7:G:23:PHE:O	7:G:26:THR:HB	2.13	0.49
9:I:36:SER:HB2	10:J:126:VAL:HG11	1.94	0.48
7:U:23:PHE:O	7:U:26:THR:HB	2.13	0.48
8:H:196:ARG:NH2	9:I:150:GLU:O	2.47	0.48
10:J:50:ALA:O	11:K:91:LYS:NZ	2.47	0.47
10:J:1:MET:HG2	10:J:34:LYS:HE3	1.95	0.47
10:X:1:MET:HG2	10:X:34:LYS:HE3	1.95	0.47
8:V:104:ASP:HB2	8:V:105:PRO:HD2	1.97	0.46
14:N:176:VAL:HG12	14:N:178:LEU:HD13	1.98	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:I:10:ILE:HG21	9:I:141:ALA:HB3	1.98	0.45
8:H:104:ASP:HB2	8:H:105:PRO:HD2	1.96	0.45
13:M:96:LEU:O	13:M:100:MET:HG2	2.17	0.45
12:L:13:LEU:CD1	12:L:150:LEU:HD21	2.46	0.45
12:Z:13:LEU:CD1	12:Z:150:LEU:HD21	2.46	0.45
9:W:10:ILE:HG21	9:W:141:ALA:HB3	1.98	0.45
3:C:201:VAL:O	3:C:202:GLN:HB3	2.17	0.45
3:Q:201:VAL:O	3:Q:202:GLN:HB3	2.17	0.44
2:B:50:LYS:O	2:B:51:VAL:C	2.56	0.44
9:I:20:VAL:HG13	9:I:118:PRO:HB3	1.98	0.44
7:G:122:ARG:HD2	18:G:407:HOH:O	2.16	0.44
11:K:5:ALA:HA	11:K:13:ILE:O	2.18	0.44
2:P:50:LYS:O	2:P:51:VAL:C	2.55	0.44
9:W:20:VAL:HG13	9:W:118:PRO:HB3	1.99	0.44
10:X:174:MET:HB2	18:X:209:HOH:O	2.18	0.44
8:H:196:ARG:NH2	9:I:150:GLU:HG3	2.33	0.44
3:C:35:LYS:HG2	3:C:158:SER:O	2.17	0.43
14:N:83:LYS:HG3	14:N:119:VAL:CG2	2.48	0.43
11:Y:5:ALA:HA	11:Y:13:ILE:O	2.18	0.43
4:D:160:ASN:HB3	4:D:179:TRP:CE2	2.54	0.43
4:R:160:ASN:HB3	4:R:179:TRP:CE2	2.54	0.43
7:G:78:ILE:N	7:G:79:PRO:CD	2.82	0.43
7:U:78:ILE:N	7:U:79:PRO:CD	2.82	0.42
3:Q:35:LYS:HG2	3:Q:158:SER:O	2.19	0.42
10:J:3:ILE:HG23	10:J:18:SER:HB3	2.02	0.42
12:Z:125:PHE:CD2	12:Z:131:TYR:HB3	2.55	0.42
2:P:50:LYS:HD3	2:P:50:LYS:HA	1.90	0.42
2:B:151:ASN:HB2	2:B:152:PRO:CD	2.49	0.42
13:M:27:LEU:HD21	13:M:34:LEU:HD22	2.01	0.42
2:P:151:ASN:HB2	2:P:152:PRO:CD	2.49	0.42
7:G:149:ASP:HB2	7:G:150:PRO:CD	2.50	0.42
8:H:49:ALA:HA	17:H:301:5BY:H8	2.02	0.42
8:V:196:ARG:NH2	9:W:150:GLU:O	2.53	0.42
12:Z:17:GLY:HA3	12:Z:20:PHE:CE1	2.55	0.42
12:L:17:GLY:HA3	12:L:20:PHE:CE1	2.55	0.42
7:U:149:ASP:HB2	7:U:150:PRO:CD	2.50	0.42
10:X:3:ILE:HG23	10:X:18:SER:HB3	2.02	0.42
3:C:160:GLN:HE21	3:C:160:GLN:HA	1.85	0.41
5:S:77:ALA:N	5:S:78:PRO:CD	2.84	0.41
10:J:22:THR:HG21	10:X:173:PRO:HB3	2.03	0.41
5:E:77:ALA:N	5:E:78:PRO:CD	2.84	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:Z:13:LEU:HD11	12:Z:150:LEU:HD21	2.02	0.41
8:H:84:LYS:HE2	8:H:119:THR:HG23	2.02	0.41
3:Q:160:GLN:HE21	3:Q:160:GLN:HA	1.85	0.41
8:V:84:LYS:HE2	8:V:119:THR:HG23	2.03	0.41
9:I:203:GLN:HG3	11:Y:197:PHE:CE2	2.56	0.41
12:L:125:PHE:CD2	12:L:131:TYR:HB3	2.55	0.41
12:L:13:LEU:HD11	12:L:150:LEU:HD21	2.02	0.41
13:M:165:ILE:HB	13:M:166:PRO:HD3	2.03	0.41
3:Q:149:GLU:HB2	3:Q:150:PRO:HD2	2.03	0.41
4:D:91:HIS:CD2	4:D:99:ILE:HG22	2.56	0.41
1:O:23:TYR:CD1	7:U:12:PRO:HA	2.56	0.41
8:V:113:ILE:HG12	8:V:119:THR:HG22	2.03	0.41
12:Z:8:ASN:HA	12:Z:30:ILE:O	2.20	0.41
8:H:113:ILE:HG12	8:H:119:THR:HG22	2.03	0.41
8:V:196:ARG:NH2	9:W:150:GLU:HG3	2.36	0.41
3:C:149:GLU:HB2	3:C:150:PRO:HD2	2.03	0.40
2:P:151:ASN:HB2	2:P:152:PRO:HD2	2.04	0.40
8:V:80:LEU:HD12	8:V:113:ILE:HD11	2.03	0.40
4:R:91:HIS:CD2	4:R:99:ILE:HG22	2.56	0.40
4:D:176:LEU:HD22	5:E:55:LEU:CD2	2.51	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 X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	248/250 (99%)	239 (96%)	8 (3%)	1 (0%)	34 66
1	O	248/250 (99%)	239 (96%)	8 (3%)	1 (0%)	34 66
2	B	242/258 (94%)	233 (96%)	5 (2%)	4 (2%)	9 29
2	P	242/258 (94%)	232 (96%)	6 (2%)	4 (2%)	9 29

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	C	238/254 (94%)	233 (98%)	3 (1%)	2 (1%)	19	49
3	Q	238/254 (94%)	233 (98%)	3 (1%)	2 (1%)	19	49
4	D	231/260 (89%)	229 (99%)	2 (1%)	0	100	100
4	R	231/260 (89%)	229 (99%)	2 (1%)	0	100	100
5	E	229/234 (98%)	223 (97%)	6 (3%)	0	100	100
5	S	229/234 (98%)	223 (97%)	6 (3%)	0	100	100
6	F	241/288 (84%)	239 (99%)	2 (1%)	0	100	100
6	T	241/288 (84%)	239 (99%)	2 (1%)	0	100	100
7	G	239/252 (95%)	237 (99%)	2 (1%)	0	100	100
7	U	239/252 (95%)	237 (99%)	2 (1%)	0	100	100
8	H	224/232 (97%)	220 (98%)	4 (2%)	0	100	100
8	V	224/232 (97%)	219 (98%)	5 (2%)	0	100	100
9	I	202/205 (98%)	196 (97%)	6 (3%)	0	100	100
9	W	202/205 (98%)	196 (97%)	6 (3%)	0	100	100
10	J	193/198 (98%)	190 (98%)	3 (2%)	0	100	100
10	X	193/198 (98%)	190 (98%)	3 (2%)	0	100	100
11	K	210/212 (99%)	205 (98%)	5 (2%)	0	100	100
11	Y	210/212 (99%)	205 (98%)	5 (2%)	0	100	100
12	L	220/222 (99%)	216 (98%)	4 (2%)	0	100	100
12	Z	220/222 (99%)	216 (98%)	4 (2%)	0	100	100
13	M	231/246 (94%)	221 (96%)	9 (4%)	1 (0%)	34	66
13	a	231/246 (94%)	221 (96%)	9 (4%)	1 (0%)	34	66
14	N	194/196 (99%)	188 (97%)	6 (3%)	0	100	100
14	b	194/196 (99%)	188 (97%)	6 (3%)	0	100	100
All	All	6284/6614 (95%)	6136 (98%)	132 (2%)	16 (0%)	41	72

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	51	VAL
3	C	202	GLN
2	P	51	VAL
3	Q	202	GLN
1	A	2	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	B	218	GLY
2	B	222	GLY
1	O	2	THR
2	P	218	GLY
2	P	222	GLY
2	B	220	ASN
2	P	220	ASN
3	C	205	ALA
13	M	83	ALA
3	Q	205	ALA
13	a	83	ALA

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 X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	209/209 (100%)	206 (99%)	3 (1%)	67	90
1	O	209/209 (100%)	206 (99%)	3 (1%)	67	90
2	B	203/216 (94%)	199 (98%)	4 (2%)	55	84
2	P	203/216 (94%)	199 (98%)	4 (2%)	55	84
3	C	212/226 (94%)	202 (95%)	10 (5%)	26	59
3	Q	212/226 (94%)	202 (95%)	10 (5%)	26	59
4	D	194/215 (90%)	186 (96%)	8 (4%)	30	64
4	R	194/215 (90%)	186 (96%)	8 (4%)	30	64
5	E	190/193 (98%)	184 (97%)	6 (3%)	39	73
5	S	190/193 (98%)	184 (97%)	6 (3%)	39	73
6	F	201/239 (84%)	196 (98%)	5 (2%)	47	80
6	T	201/239 (84%)	195 (97%)	6 (3%)	41	75
7	G	206/210 (98%)	199 (97%)	7 (3%)	37	71
7	U	206/210 (98%)	199 (97%)	7 (3%)	37	71
8	H	185/190 (97%)	182 (98%)	3 (2%)	62	88

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	V	185/190 (97%)	182 (98%)	3 (2%)	62	88
9	I	172/173 (99%)	168 (98%)	4 (2%)	50	82
9	W	172/173 (99%)	168 (98%)	4 (2%)	50	82
10	J	173/175 (99%)	167 (96%)	6 (4%)	36	70
10	X	173/175 (99%)	167 (96%)	6 (4%)	36	70
11	K	169/169 (100%)	164 (97%)	5 (3%)	41	75
11	Y	169/169 (100%)	164 (97%)	5 (3%)	41	75
12	L	185/185 (100%)	182 (98%)	3 (2%)	62	88
12	Z	185/185 (100%)	182 (98%)	3 (2%)	62	88
13	M	199/208 (96%)	192 (96%)	7 (4%)	36	70
13	a	199/208 (96%)	193 (97%)	6 (3%)	41	75
14	N	162/162 (100%)	157 (97%)	5 (3%)	40	74
14	b	162/162 (100%)	157 (97%)	5 (3%)	40	74
All	All	5320/5540 (96%)	5168 (97%)	152 (3%)	42	76

All (152) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	122	THR
1	A	157	PHE
1	A	250	LEU
2	B	55	LEU
2	B	113	ARG
2	B	191	LEU
2	B	238	LEU
3	C	4	ARG
3	C	38	ASN
3	C	51	LYS
3	C	77	ASN
3	C	147	GLN
3	C	160	GLN
3	C	169	VAL
3	C	180	LYS
3	C	206	LYS
3	C	240	GLU
4	D	99	ILE
4	D	125	LEU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
4	D	176	LEU
4	D	193	LEU
4	D	214	ILE
4	D	235	LEU
4	D	236	LYS
4	D	242	GLU
5	E	9	THR
5	E	29	LYS
5	E	71	LEU
5	E	184	ASN
5	E	188	LEU
5	E	202	ASP
6	F	117	GLN
6	F	123	ASN
6	F	181	GLU
6	F	214	TRP
6	F	240	GLN
7	G	115	LEU
7	G	117	GLN
7	G	122	ARG
7	G	125	MET
7	G	208	GLU
7	G	235	ARG
7	G	236	LEU
8	H	30	ASN
8	H	68	LEU
8	H	196	ARG
9	I	37	ASN
9	I	126	ILE
9	I	171	LEU
9	I	182	TRP
10	J	3	ILE
10	J	23	ARG
10	J	90	LYS
10	J	99	GLN
10	J	147	HIS
10	J	149	ARG
11	K	4	LEU
11	K	9	GLN
11	K	35	ILE
11	K	100	MET
11	K	211	ILE

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
12	L	23	LEU
12	L	49	ASN
12	L	150	LEU
13	M	2	GLN
13	M	48	ASN
13	M	70	LEU
13	M	104	ARG
13	M	161	ARG
13	M	187	ARG
13	M	190	ARG
14	N	9	LYS
14	N	36	ARG
14	N	39	ASP
14	N	83	LYS
14	N	104	ASP
1	O	122	THR
1	O	157	PHE
1	O	250	LEU
2	P	55	LEU
2	P	113	ARG
2	P	191	LEU
2	P	238	LEU
3	Q	4	ARG
3	Q	38	ASN
3	Q	51	LYS
3	Q	77	ASN
3	Q	147	GLN
3	Q	160	GLN
3	Q	169	VAL
3	Q	180	LYS
3	Q	206	LYS
3	Q	240	GLU
4	R	99	ILE
4	R	125	LEU
4	R	176	LEU
4	R	193	LEU
4	R	214	ILE
4	R	235	LEU
4	R	236	LYS
4	R	242	GLU
5	S	9	THR
5	S	29	LYS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
5	S	71	LEU
5	S	184	ASN
5	S	188	LEU
5	S	202	ASP
6	T	117	GLN
6	T	123	ASN
6	T	139	LYS
6	T	181	GLU
6	T	214	TRP
6	T	240	GLN
7	U	115	LEU
7	U	117	GLN
7	U	122	ARG
7	U	125	MET
7	U	208	GLU
7	U	235	ARG
7	U	236	LEU
8	V	30	ASN
8	V	68	LEU
8	V	196	ARG
9	W	37	ASN
9	W	126	ILE
9	W	171	LEU
9	W	182	TRP
10	X	3	ILE
10	X	23	ARG
10	X	90	LYS
10	X	99	GLN
10	X	147	HIS
10	X	149	ARG
11	Y	4	LEU
11	Y	9	GLN
11	Y	35	ILE
11	Y	100	MET
11	Y	211	ILE
12	Z	23	LEU
12	Z	49	ASN
12	Z	150	LEU
13	a	2	GLN
13	a	48	ASN
13	a	70	LEU
13	a	104	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
13	a	161	ARG
13	a	187	ARG
14	b	9	LYS
14	b	36	ARG
14	b	39	ASP
14	b	83	LYS
14	b	104	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (78) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	HIS
2	B	58	GLN
2	B	119	GLN
2	B	123	GLN
3	C	77	ASN
3	C	147	GLN
3	C	160	GLN
4	D	91	HIS
4	D	146	GLN
5	E	68	HIS
5	E	92	ASN
5	E	99	ASN
5	E	116	GLN
5	E	118	ASN
5	E	120	GLN
5	E	184	ASN
6	F	19	GLN
6	F	86	ASN
6	F	117	GLN
6	F	123	ASN
6	F	191	GLN
7	G	83	ASN
7	G	114	ASN
7	G	117	GLN
7	G	121	GLN
7	G	166	GLN
8	H	165	ASN
10	J	55	GLN
11	K	9	GLN
11	K	85	ASN
11	K	176	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
11	K	208	ASN
12	L	3	ASN
12	L	49	ASN
12	L	70	ASN
13	M	48	ASN
13	M	102	GLN
13	M	179	ASN
13	M	194	ASN
13	M	213	GLN
14	N	161	GLN
1	O	94	HIS
2	P	20	GLN
2	P	58	GLN
2	P	119	GLN
2	P	123	GLN
3	Q	147	GLN
3	Q	160	GLN
4	R	91	HIS
4	R	146	GLN
5	S	68	HIS
5	S	99	ASN
5	S	116	GLN
5	S	118	ASN
5	S	120	GLN
5	S	184	ASN
6	T	19	GLN
6	T	86	ASN
6	T	117	GLN
6	T	123	ASN
6	T	191	GLN
7	U	83	ASN
7	U	114	ASN
7	U	117	GLN
7	U	121	GLN
7	U	166	GLN
10	X	55	GLN
11	Y	85	ASN
11	Y	176	ASN
11	Y	208	ASN
12	Z	3	ASN
12	Z	49	ASN
12	Z	79	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
13	a	48	ASN
13	a	102	GLN
13	a	194	ASN
13	a	213	GLN
14	b	161	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 18 ligands modelled in this entry, 12 are monoatomic - leaving 6 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	$\# Z > 2$
17	5BY	K	301	11	29,35,44	1.13	2 (6%)	31,45,55	0.80	0
17	5BY	V	301	8	29,35,44	1.25	3 (10%)	31,45,55	1.04	3 (9%)
17	5BY	Y	301	11	29,35,44	1.32	5 (17%)	31,45,55	1.04	3 (9%)
17	5BY	H	301	8	29,35,44	1.41	5 (17%)	31,45,55	1.20	4 (12%)
17	5BY	b	201	14	29,35,44	1.31	5 (17%)	31,45,55	1.11	2 (6%)
17	5BY	N	201	14	29,35,44	1.20	5 (17%)	31,45,55	1.04	2 (6%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
17	5BY	K	301	11	-	3/26/34/43	0/2/2/2
17	5BY	V	301	8	-	3/26/34/43	0/2/2/2
17	5BY	Y	301	11	-	5/26/34/43	0/2/2/2
17	5BY	H	301	8	-	3/26/34/43	0/2/2/2
17	5BY	b	201	14	-	4/26/34/43	0/2/2/2
17	5BY	N	201	14	-	8/26/34/43	0/2/2/2

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	K	301	5BY	N37-N36	4.10	1.41	1.34
17	K	301	5BY	N36-N35	3.77	1.41	1.34
17	b	201	5BY	C33-N35	-3.34	1.31	1.35
17	V	301	5BY	N37-N36	3.22	1.40	1.34
17	H	301	5BY	N36-N35	3.18	1.40	1.34
17	H	301	5BY	N37-N36	3.15	1.40	1.34
17	V	301	5BY	N36-N35	3.14	1.40	1.34
17	Y	301	5BY	N37-N36	2.95	1.39	1.34
17	b	201	5BY	N36-N35	2.85	1.39	1.34
17	H	301	5BY	C33-N35	-2.85	1.32	1.35
17	Y	301	5BY	N36-N35	2.78	1.39	1.34
17	b	201	5BY	N37-N36	2.62	1.39	1.34
17	N	201	5BY	C33-N35	-2.46	1.32	1.35
17	N	201	5BY	O19-C18	-2.38	1.18	1.23
17	H	301	5BY	O19-C18	-2.32	1.18	1.23
17	N	201	5BY	N37-N36	2.31	1.38	1.34
17	Y	301	5BY	C33-N35	-2.29	1.33	1.35
17	b	201	5BY	O19-C18	-2.26	1.18	1.23
17	N	201	5BY	O8-C7	-2.25	1.18	1.23
17	H	301	5BY	O8-C7	-2.25	1.18	1.23
17	V	301	5BY	C33-N35	-2.13	1.33	1.35
17	Y	301	5BY	O19-C18	-2.12	1.19	1.23
17	N	201	5BY	N36-N35	2.12	1.38	1.34
17	Y	301	5BY	O8-C7	-2.10	1.19	1.23
17	b	201	5BY	C2-C7	-2.04	1.48	1.51

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	b	201	5BY	C12-C11-C10	-3.85	102.76	113.39
17	H	301	5BY	C12-C11-C10	-3.39	104.04	113.39
17	Y	301	5BY	C11-C10-N9	-2.95	104.58	110.79
17	Y	301	5BY	C32-C33-N35	-2.77	102.36	106.40
17	V	301	5BY	C32-C33-N35	-2.71	102.45	106.40
17	N	201	5BY	C32-C33-N35	-2.52	102.72	106.40
17	H	301	5BY	C21-C22-C23	-2.51	112.24	115.39
17	V	301	5BY	C21-C22-C23	-2.51	112.25	115.39
17	Y	301	5BY	C21-C22-C23	-2.40	112.38	115.39
17	N	201	5BY	N37-N36-N35	-2.36	105.53	107.31
17	V	301	5BY	C3-C2-C7	-2.33	106.37	112.03
17	H	301	5BY	C32-C33-N35	-2.29	103.06	106.40
17	H	301	5BY	C3-C2-C7	-2.22	106.64	112.03
17	b	201	5BY	C32-C33-N35	-2.10	103.34	106.40

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
17	K	301	5BY	C39-C38-N35-C33
17	K	301	5BY	C39-C38-N35-N36
17	K	301	5BY	N35-C38-C39-O40
17	N	201	5BY	C39-C38-N35-C33
17	N	201	5BY	C39-C38-N35-N36
17	V	301	5BY	N35-C38-C39-O40
17	Y	301	5BY	C39-C38-N35-C33
17	Y	301	5BY	C39-C38-N35-N36
17	Y	301	5BY	N35-C38-C39-O40
17	Y	301	5BY	C38-C39-O40-C41
17	Y	301	5BY	N20-C21-C22-C23
17	b	201	5BY	C2-C7-N9-C10
17	H	301	5BY	C38-C39-O40-C41
17	V	301	5BY	C38-C39-O40-C41
17	b	201	5BY	C38-C39-O40-C41
17	b	201	5BY	O8-C7-N9-C10
17	N	201	5BY	N20-C21-C22-C23
17	N	201	5BY	C38-C39-O40-C41
17	N	201	5BY	N35-C38-C39-O40
17	b	201	5BY	N35-C38-C39-O40
17	H	301	5BY	C21-C22-C23-C25
17	N	201	5BY	C21-C22-C23-C25
17	N	201	5BY	O8-C7-N9-C10
17	H	301	5BY	N20-C21-C22-C23

Continued on next page...

Continued from previous page...

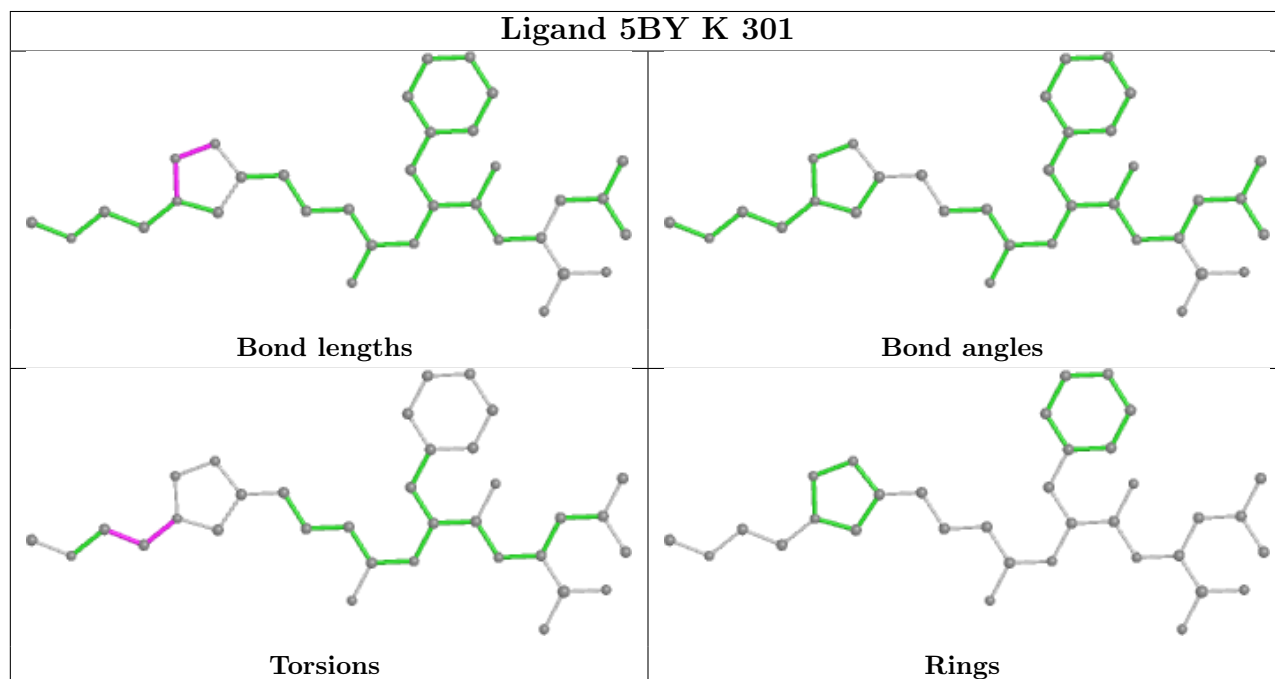
Mol	Chain	Res	Type	Atoms
17	N	201	5BY	C2-C7-N9-C10
17	V	301	5BY	N9-C10-C18-O19

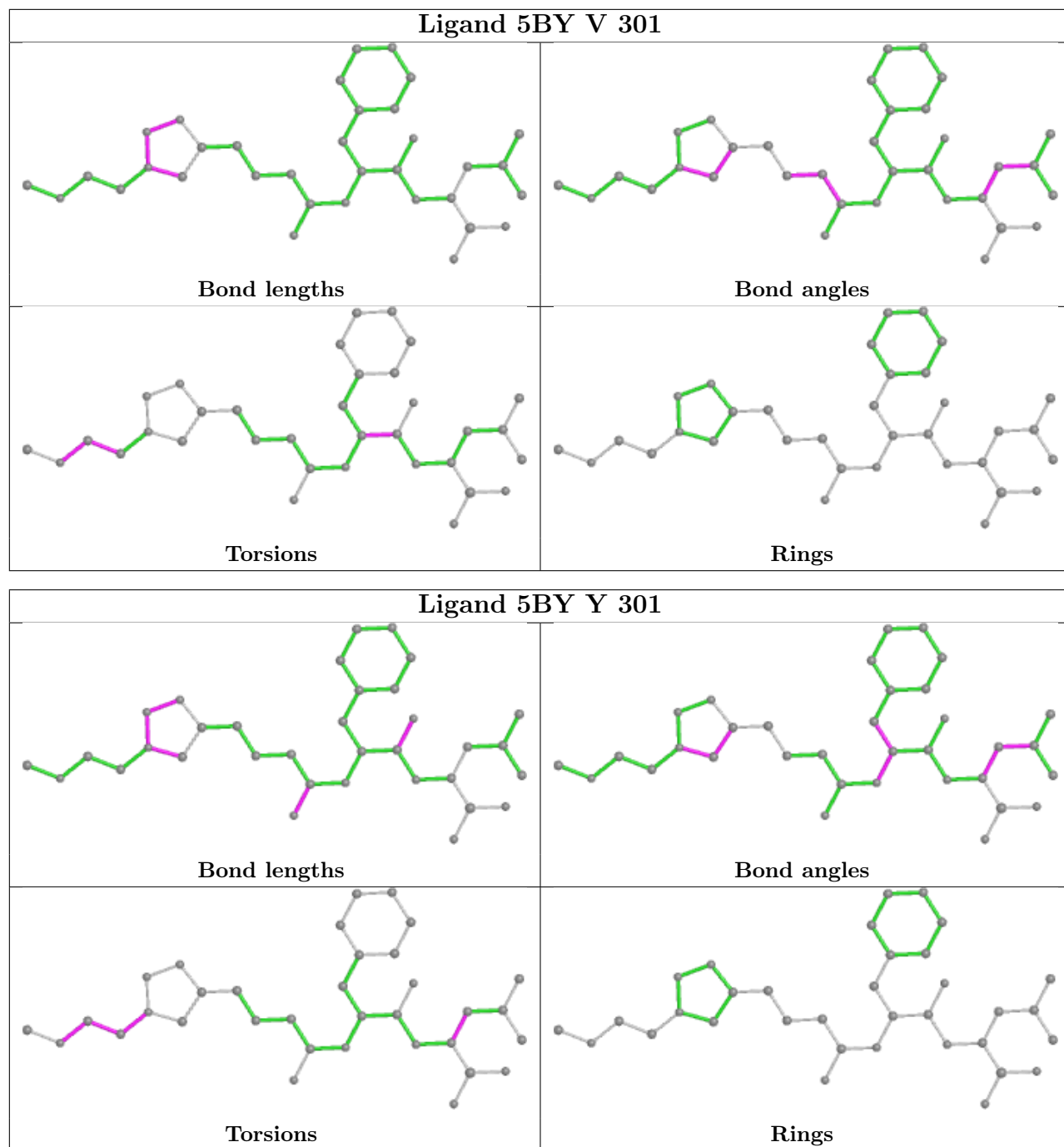
There are no ring outliers.

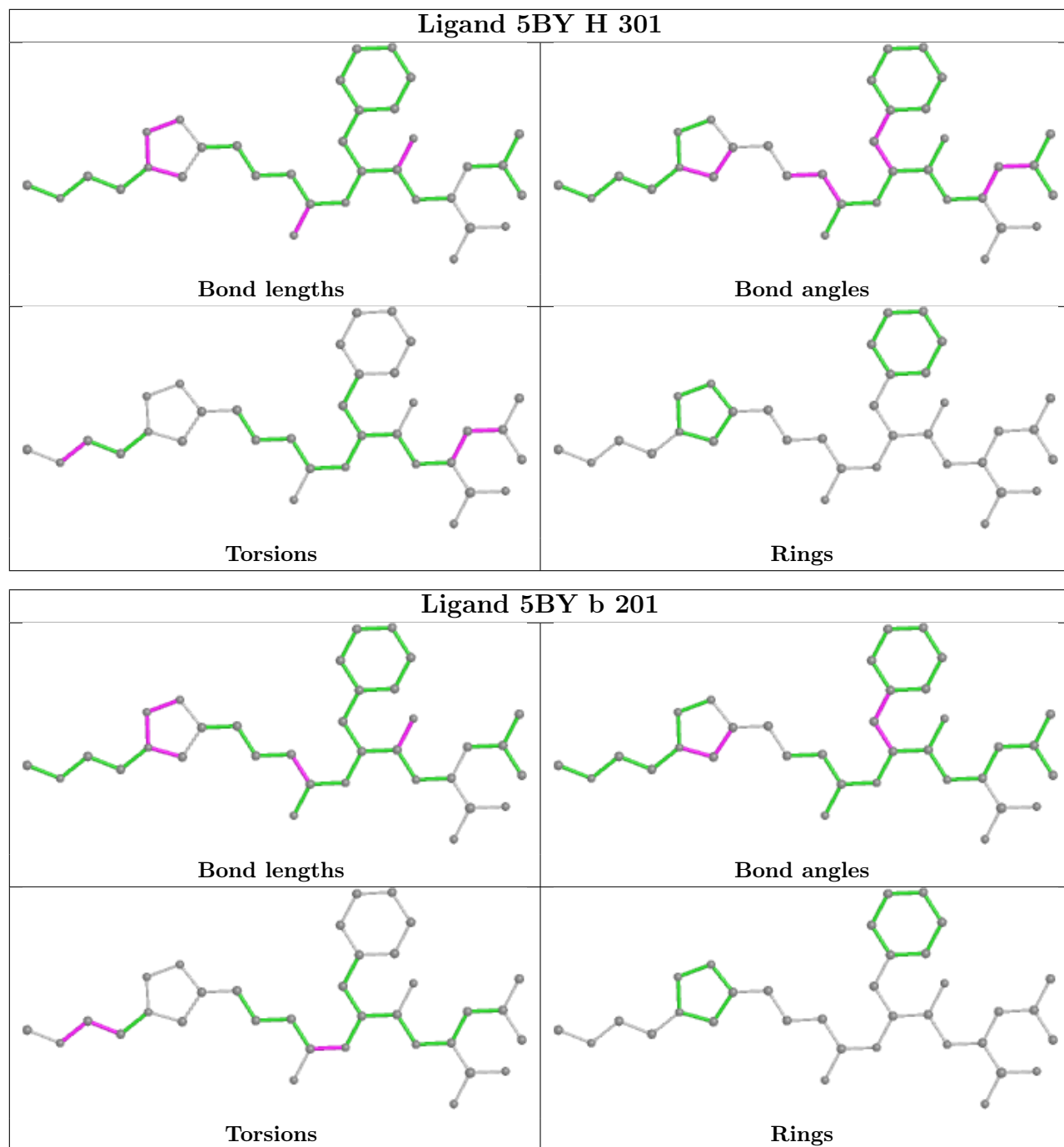
2 monomers are involved in 2 short contacts:

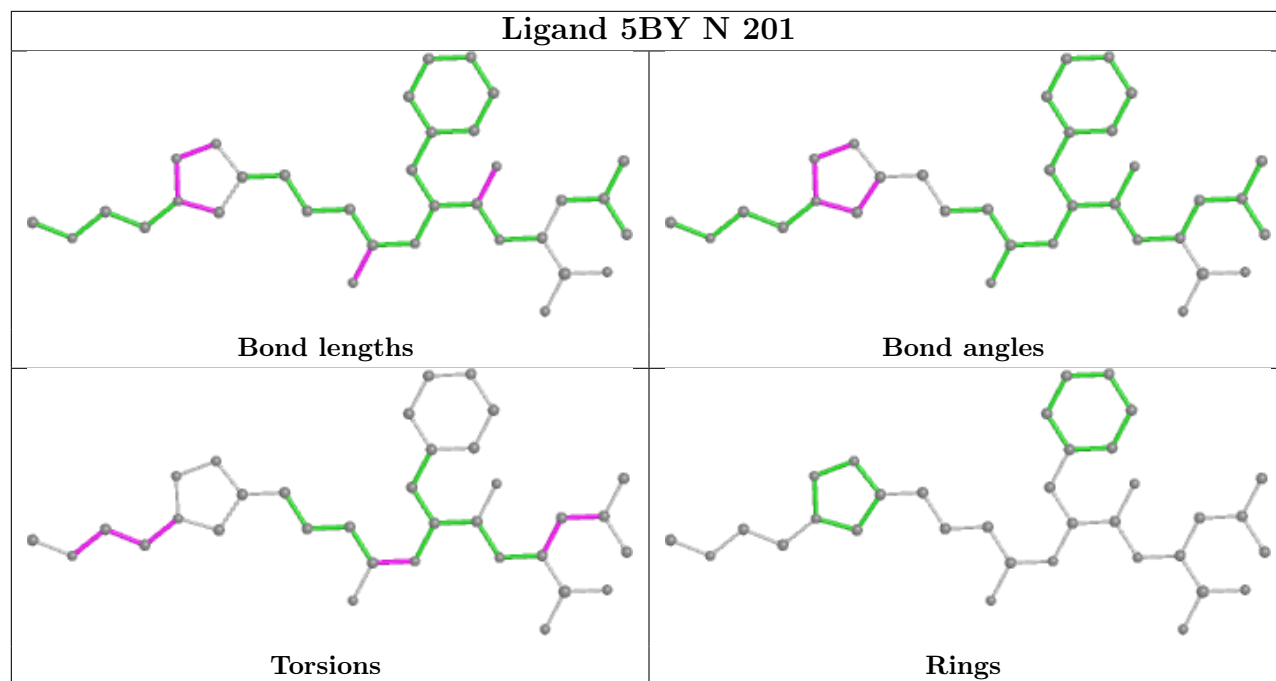
Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	V	301	5BY	1	0
17	H	301	5BY	1	0

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

6.1 Protein, DNA and RNA chains i

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	250/250 (100%)	-0.43	5 (2%) 65 56	36, 54, 93, 132	0
1	O	250/250 (100%)	-0.41	3 (1%) 79 73	42, 63, 109, 142	0
2	B	244/258 (94%)	-0.31	7 (2%) 51 41	41, 62, 107, 162	0
2	P	244/258 (94%)	-0.27	9 (3%) 41 31	45, 66, 109, 160	0
3	C	240/254 (94%)	-0.24	12 (5%) 28 19	40, 65, 130, 162	0
3	Q	240/254 (94%)	-0.00	16 (6%) 17 10	48, 78, 162, 184	0
4	D	235/260 (90%)	-0.39	1 (0%) 92 91	46, 68, 103, 149	0
4	R	235/260 (90%)	-0.29	4 (1%) 70 63	55, 74, 115, 142	0
5	E	231/234 (98%)	-0.23	6 (2%) 56 46	48, 69, 106, 146	0
5	S	231/234 (98%)	-0.27	3 (1%) 77 72	51, 72, 113, 149	0
6	F	243/288 (84%)	-0.46	4 (1%) 72 66	42, 63, 108, 138	0
6	T	243/288 (84%)	-0.36	8 (3%) 46 36	41, 68, 125, 157	0
7	G	241/252 (95%)	-0.45	3 (1%) 79 73	40, 59, 98, 156	0
7	U	241/252 (95%)	-0.42	4 (1%) 70 63	42, 58, 94, 136	0
8	H	226/232 (97%)	-0.49	4 (1%) 68 61	40, 54, 95, 166	0
8	V	226/232 (97%)	-0.45	7 (3%) 49 39	43, 56, 99, 182	0
9	I	204/205 (99%)	-0.67	1 (0%) 91 88	36, 52, 83, 111	0
9	W	204/205 (99%)	-0.66	1 (0%) 91 88	37, 55, 82, 112	0
10	J	195/198 (98%)	-0.45	2 (1%) 82 77	39, 56, 86, 124	0
10	X	195/198 (98%)	-0.45	2 (1%) 82 77	40, 58, 86, 133	0
11	K	212/212 (100%)	-0.39	3 (1%) 75 70	40, 57, 92, 110	0
11	Y	212/212 (100%)	-0.41	3 (1%) 75 70	41, 57, 97, 115	0
12	L	222/222 (100%)	-0.36	5 (2%) 60 51	39, 59, 111, 149	0
12	Z	222/222 (100%)	-0.38	9 (4%) 37 27	36, 56, 107, 141	0

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
13	M	233/246 (94%)	-0.57	3 (1%) 77 72	37, 56, 83, 104	0
13	a	233/246 (94%)	-0.63	2 (0%) 84 80	37, 54, 77, 95	0
14	N	196/196 (100%)	-0.67	0 100 100	37, 51, 82, 106	0
14	b	196/196 (100%)	-0.64	1 (0%) 91 88	37, 52, 83, 112	0
All	All	6344/6614 (95%)	-0.41	128 (2%) 65 56	36, 61, 107, 184	0

All (128) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
12	L	165	ASN	6.2
10	J	1	MET	6.2
10	X	1	MET	6.0
3	Q	50	LEU	5.9
12	Z	173	LYS	5.4
12	Z	163	GLY	5.4
3	Q	206	LYS	5.4
8	V	224	GLN	5.2
2	B	218	GLY	5.1
2	B	221	ASP	4.9
3	Q	49	THR	4.9
8	V	226	GLU	4.8
2	B	220	ASN	4.8
12	L	174	TYR	4.7
2	P	221	ASP	4.6
5	S	202	ASP	4.5
3	Q	236	GLN	4.5
2	P	51	VAL	4.5
11	K	212	GLY	4.4
12	Z	174	TYR	4.3
3	C	49	THR	4.2
8	V	225	GLU	4.0
8	V	222	ASP	4.0
1	O	249	ALA	3.9
3	Q	202	GLN	3.9
12	Z	165	ASN	3.9
3	C	206	LYS	3.8
5	E	202	ASP	3.8
11	Y	212	GLY	3.8
12	L	1	GLN	3.8
8	H	224	GLN	3.7
9	W	1	SER	3.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	Q	239	GLN	3.7
2	P	220	ASN	3.6
2	P	59	ASP	3.6
1	O	1	MET	3.6
1	A	249	ALA	3.5
8	H	226	GLU	3.5
3	C	239	GLN	3.4
10	X	194	ASP	3.3
6	T	244	ASN	3.3
7	U	242	GLN	3.2
14	b	195	GLN	3.2
2	B	217	LYS	3.2
13	a	1	THR	3.2
1	A	250	LEU	3.2
8	V	221	CYS	3.1
3	Q	240	GLU	3.1
12	L	163	GLY	3.1
3	Q	205	ALA	3.1
1	A	1	MET	3.1
2	P	222	GLY	3.1
10	J	194	ASP	3.1
2	B	51	VAL	3.0
8	H	222	ASP	3.0
12	Z	210	ASP	3.0
7	U	222	ASP	2.9
3	Q	238	LYS	2.9
3	C	238	LYS	2.9
7	G	2	GLY	2.9
3	C	50	LEU	2.9
8	V	223	ILE	2.8
12	L	173	LYS	2.8
3	C	225	GLU	2.8
2	B	182	ASP	2.7
11	K	147	ASP	2.7
7	U	2	GLY	2.7
3	Q	201	VAL	2.6
1	A	2	THR	2.6
3	C	205	ALA	2.6
2	B	219	ALA	2.6
2	P	218	GLY	2.5
9	I	1	SER	2.5
5	S	54	GLU	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	C	202	GLN	2.5
3	Q	141	ASP	2.5
3	Q	237	GLU	2.5
1	O	250	LEU	2.5
3	C	240	GLU	2.4
12	Z	168	VAL	2.4
6	F	202	ASP	2.4
3	C	48	SER	2.4
8	V	145	ASP	2.4
6	T	181	GLU	2.4
3	C	236	GLN	2.4
8	H	221	CYS	2.4
5	E	123	GLY	2.4
4	R	117	GLU	2.3
5	E	54	GLU	2.3
6	T	2	THR	2.3
6	F	244	ASN	2.3
1	A	231	LYS	2.3
11	K	208	ASN	2.3
7	G	3	TYR	2.3
11	Y	147	ASP	2.2
2	P	219	ALA	2.2
2	P	225	TYR	2.2
7	U	203	ASP	2.2
13	M	1	THR	2.2
13	M	47	ASP	2.2
3	Q	48	SER	2.2
3	Q	181	GLU	2.2
6	T	241	LYS	2.2
6	F	181	GLU	2.2
4	D	217	GLN	2.1
5	E	173	ARG	2.1
4	R	1	ASP	2.1
12	Z	1	GLN	2.1
6	F	215	CYS	2.1
12	Z	162	PRO	2.1
6	T	243	ILE	2.1
5	S	203	GLU	2.1
7	G	241	GLU	2.1
5	E	225	ASP	2.1
12	Z	167	LYS	2.1
3	Q	225	GLU	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
6	T	205	GLU	2.1
13	a	233	ILE	2.1
6	T	180	PRO	2.1
13	M	216	ASN	2.1
2	P	182	ASP	2.0
11	Y	208	ASN	2.0
4	R	125	LEU	2.0
4	R	230	GLU	2.0
6	T	237	ASP	2.0
3	C	180	LYS	2.0
5	E	201	ARG	2.0
3	Q	180	LYS	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

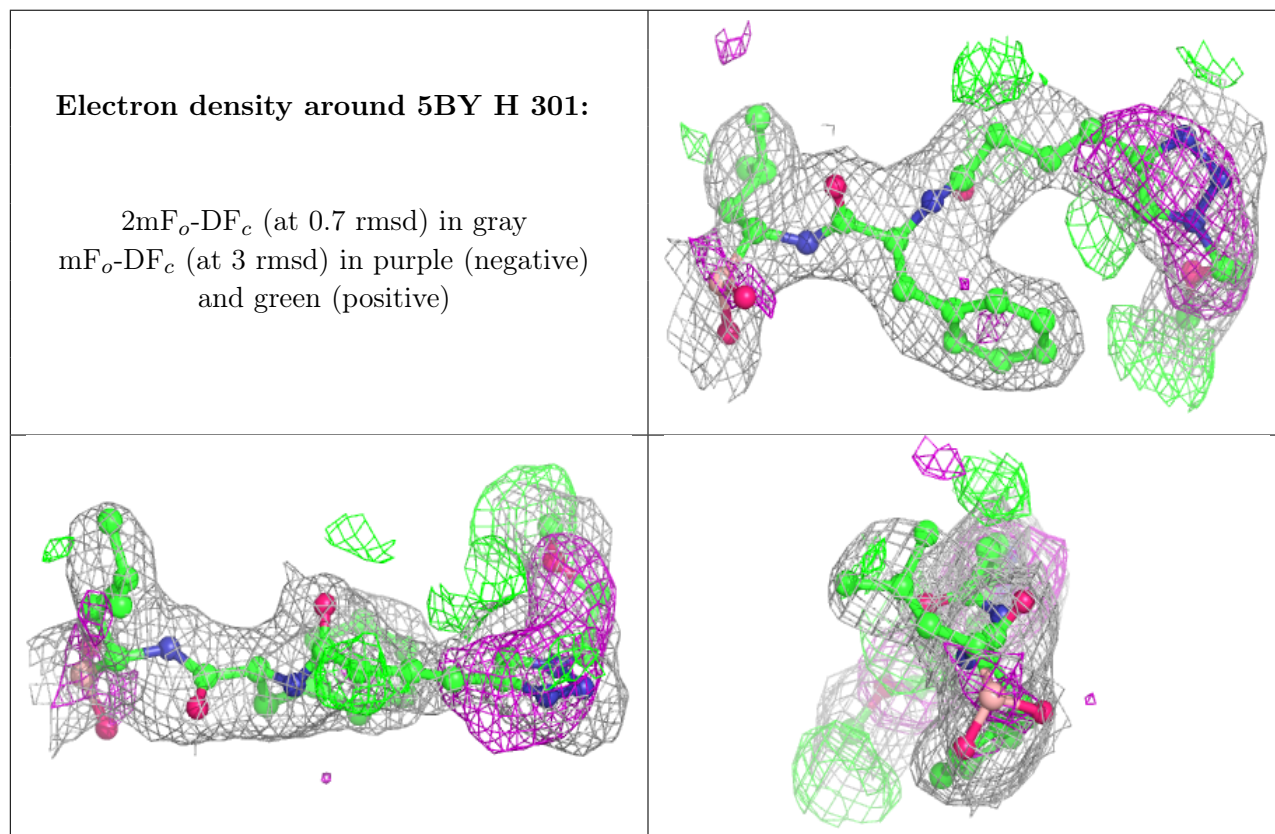
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
17	5BY	H	301	34/43	0.79	0.29	44,50,59,68	0
17	5BY	b	201	34/43	0.79	0.31	30,52,56,58	0
17	5BY	V	301	34/43	0.84	0.28	42,52,60,66	0
17	5BY	K	301	34/43	0.85	0.26	41,51,60,63	0
17	5BY	Y	301	34/43	0.85	0.26	41,50,59,66	0
17	5BY	N	201	34/43	0.85	0.27	40,50,56,59	0
15	MG	I	301	1/1	0.93	0.25	65,65,65,65	0
15	MG	I	302	1/1	0.94	0.06	55,55,55,55	0
16	CL	N	203	1/1	0.94	0.09	53,53,53,53	0
15	MG	Z	301	1/1	0.95	0.21	67,67,67,67	0
15	MG	L	301	1/1	0.96	0.07	67,67,67,67	0

Continued on next page...

Continued from previous page...

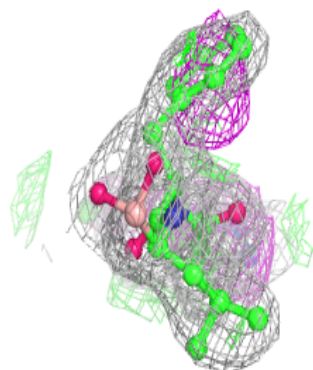
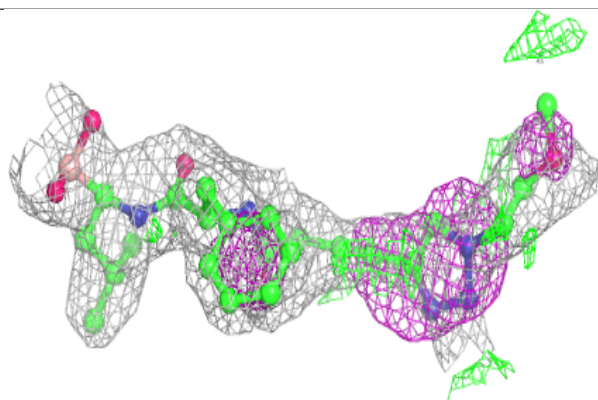
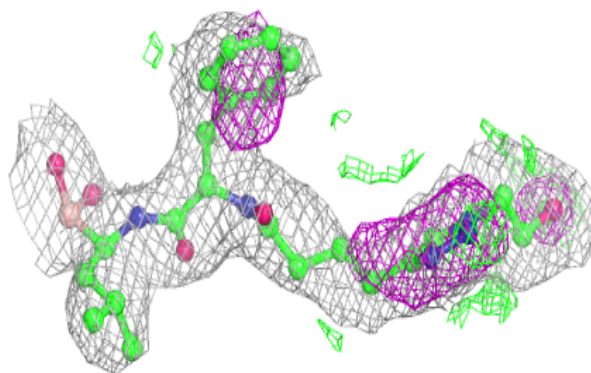
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
16	CL	b	202	1/1	0.96	0.16	65,65,65,65	0
15	MG	J	201	1/1	0.97	0.22	49,49,49,49	0
15	MG	K	302	1/1	0.98	0.06	60,60,60,60	0
15	MG	G	301	1/1	0.98	0.05	53,53,53,53	0
15	MG	N	202	1/1	0.98	0.10	52,52,52,52	0
16	CL	U	301	1/1	0.99	0.16	47,47,47,47	0
16	CL	G	302	1/1	0.99	0.18	45,45,45,45	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

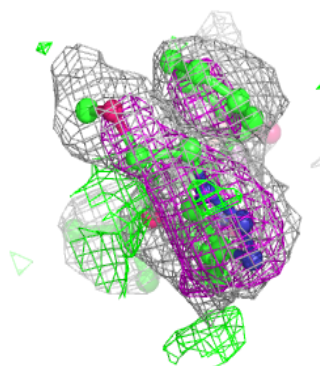
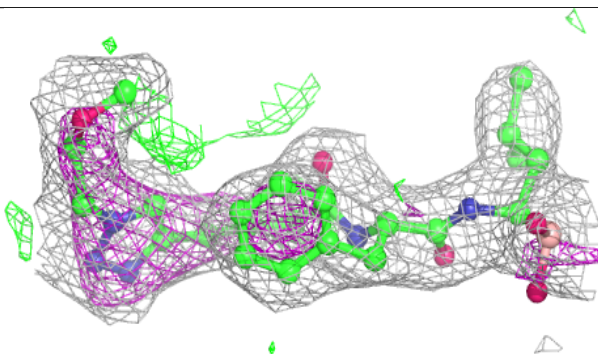
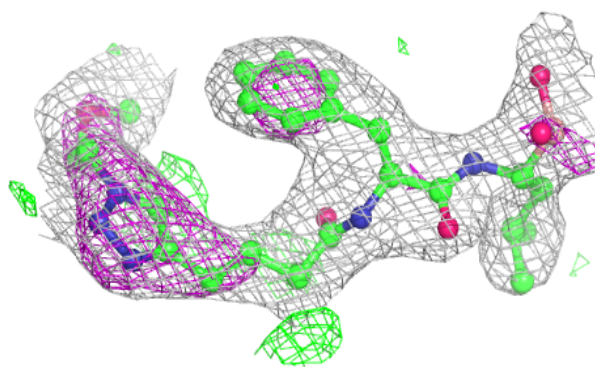


Electron density around 5BY b 201:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

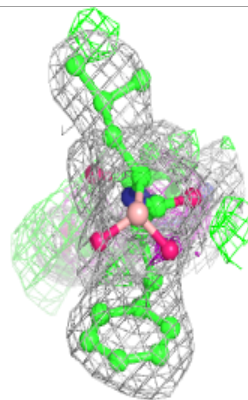
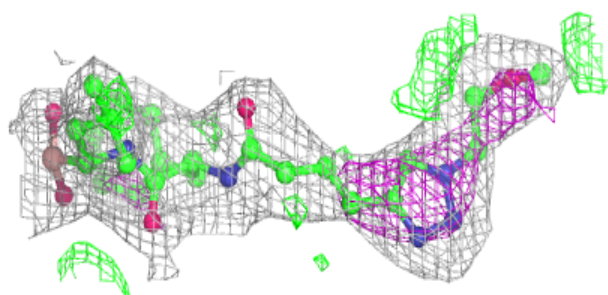
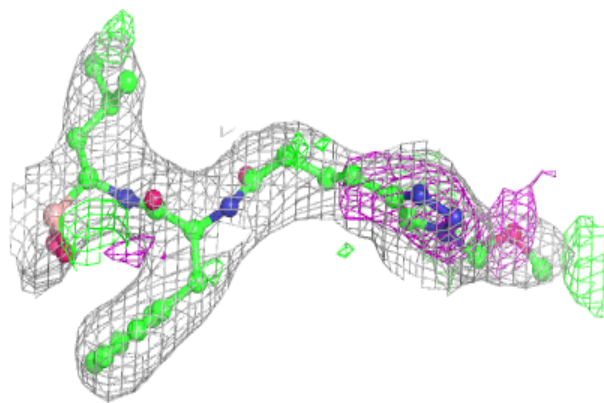
**Electron density around 5BY V 301:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

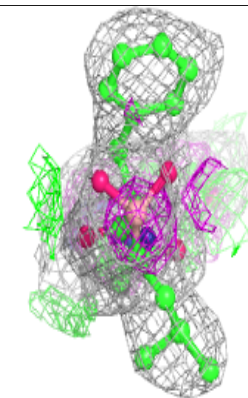
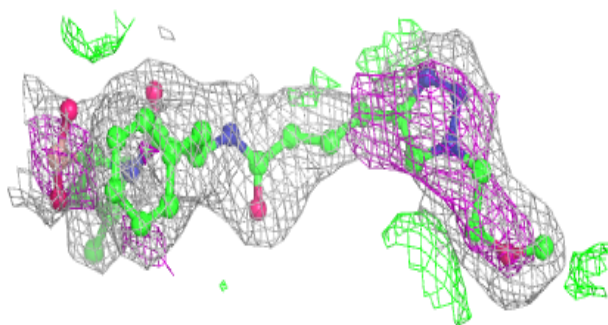
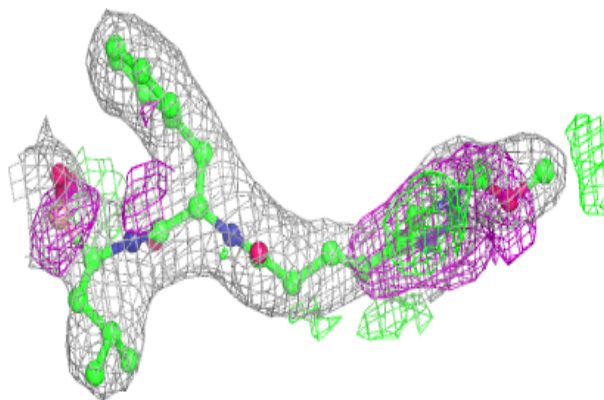


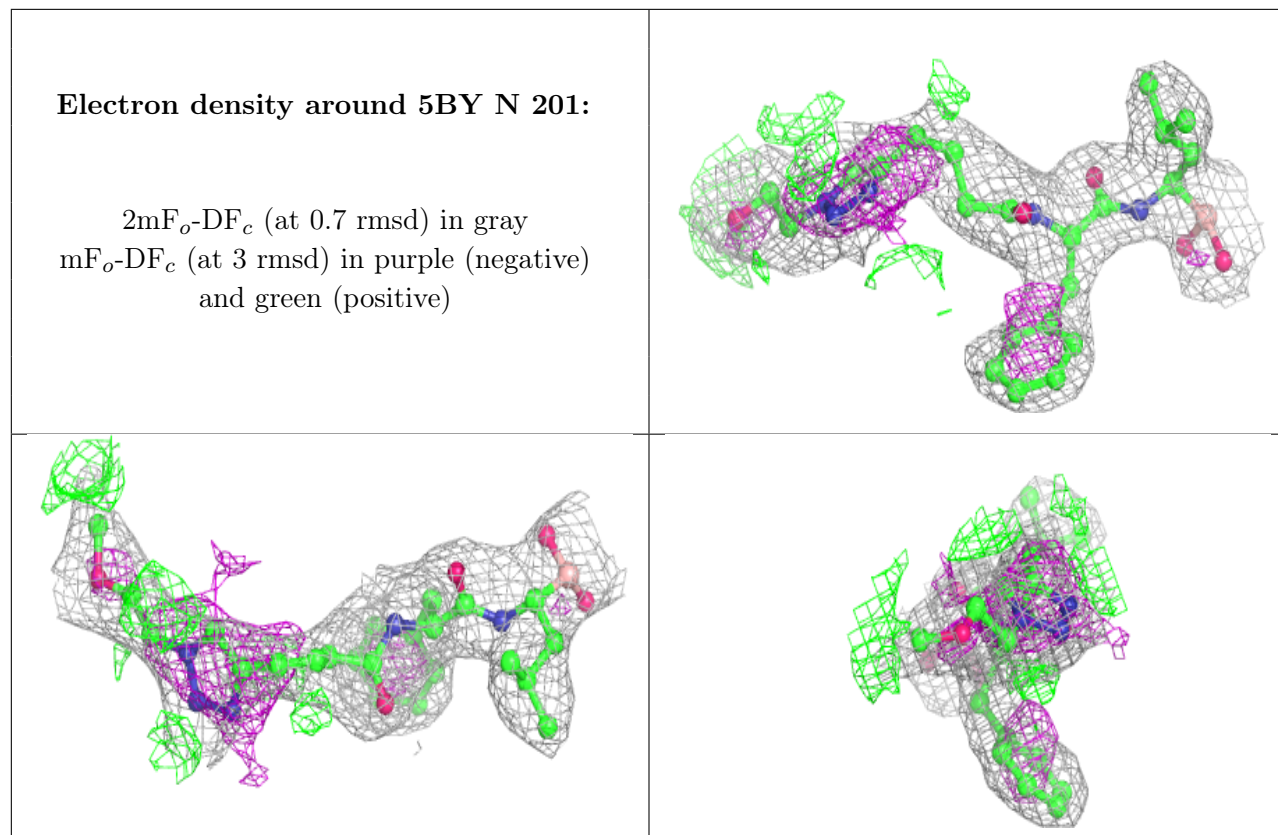
Electron density around 5BY K 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

**Electron density around 5BY Y 301:**

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.5 Other polymers [i](#)

There are no such residues in this entry.