



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 15, 2023 – 05:01 AM EDT

PDB ID : 4RUR
Title : Yeast 20S proteasome in complex with the alkaloid indolo-phakellin (4)
Authors : Beck, P.; Lansdell, T.A.; Hewlett, N.M.; Tepe, J.J.; Groll, M.
Deposited on : 2014-11-21
Resolution : 2.50 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35.1
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) : 2.35.1

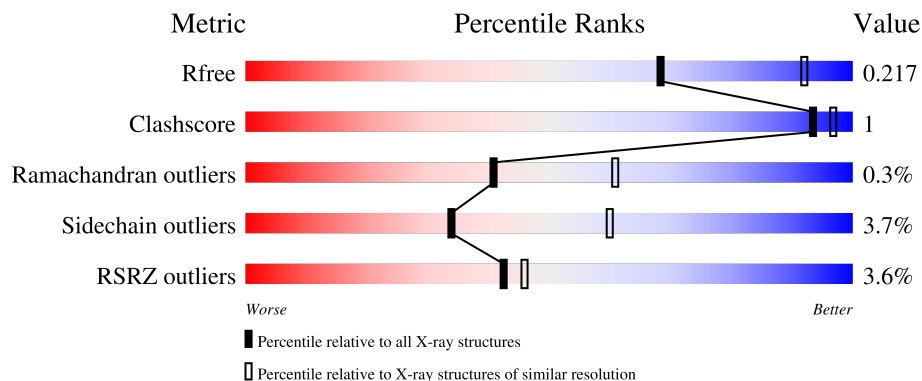
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 98%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">98%</p>
1	O	250	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 96%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 1%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">96%</p>
2	B	258	<div style="display: flex; align-items: center;"> <div style="width: 4%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 86%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">86% 8% • 5%</p>
2	P	258	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 85%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">85% 9% • 5%</p>
3	C	254	<div style="display: flex; align-items: center;"> <div style="width: 8%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 85%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 8%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">85% 8% • 6%</p>

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
3	Q	254	11% 85% 8% • 6%
4	D	260	2% 85% • • 10%
4	R	260	2% 85% 5% • 10%
5	E	234	6% 92% 6% •
5	S	234	7% 91% 7% •
6	F	288	3% 80% • 16%
6	T	288	5% 81% • 16%
7	G	252	3% 89% 6% •
7	U	252	4% 89% 6% •
8	H	232	6% 94% • •
8	V	232	4% 94% • •
9	I	205	% 93% 6%
9	W	205	2% 93% 6%
10	J	198	2% 91% 7% • •
10	X	198	2% 91% 7% • •
11	K	212	% 92% 6% •
11	Y	212	% 92% 6% •
12	L	222	% 97% •
12	Z	222	2% 98% •
13	M	246	% 90% 5% 5%
13	a	246	% 92% • 5%
14	N	196	% 95% • •
14	b	196	% 98% •

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
15	MG	Z	302	-	-	-	X

2 Entry composition

There are 17 unique types of molecules in this entry. The entry contains 50389 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).

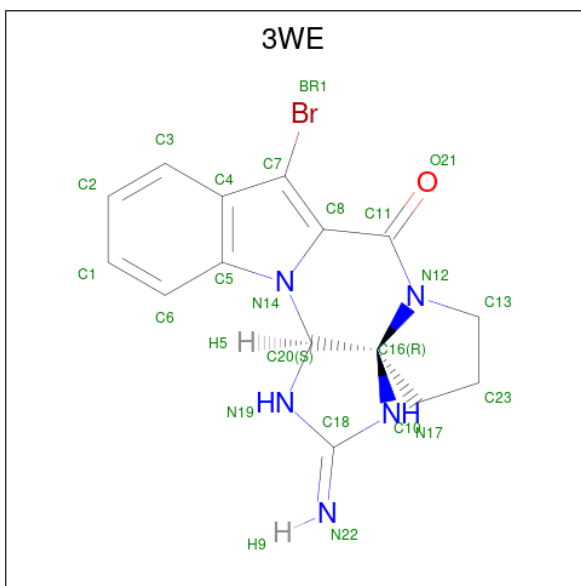
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
15	G	1	Total	Mg	0	0
			1	1		
15	I	1	Total	Mg	0	0
			1	1		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
15	K	1	Total Mg 1 1	0	0
15	N	2	Total Mg 2 2	0	0
15	V	1	Total Mg 1 1	0	0
15	W	1	Total Mg 1 1	0	0
15	Y	1	Total Mg 1 1	0	0
15	Z	1	Total Mg 1 1	0	0

- Molecule 16 is (2E,3aR,14aS)-9-bromo-2-imino-1,2,3,5,6,14a-hexahydro-4H,8H-imidazo[4',5':5,6]pyrrolo[1',2':4,5]pyrazino[1,2-a]indol-8-one (three-letter code: 3WE) (formula: C₁₅H₁₄BrN₅O).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
16	L	1	Total Br C N O 22 1 15 5 1	0	0
16	Z	1	Total Br C N O 22 1 15 5 1	0	0

- Molecule 17 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
17	A	44	Total O 44 44	0	0
17	B	30	Total O 30 30	0	0
17	C	30	Total O 30 30	0	0
17	D	20	Total O 20 20	0	0
17	E	13	Total O 13 13	0	0
17	F	38	Total O 38 38	0	0
17	G	45	Total O 45 45	0	0
17	H	35	Total O 35 35	0	0
17	I	49	Total O 49 49	0	0
17	J	46	Total O 46 46	0	0
17	K	35	Total O 35 35	0	0
17	L	43	Total O 43 43	0	0
17	M	51	Total O 51 51	0	0
17	N	38	Total O 38 38	0	0
17	O	26	Total O 26 26	0	0
17	P	21	Total O 21 21	0	0
17	Q	25	Total O 25 25	0	0
17	R	20	Total O 20 20	0	0
17	S	11	Total O 11 11	0	0
17	T	28	Total O 28 28	0	0
17	U	43	Total O 43 43	0	0
17	V	31	Total O 31 31	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
17	W	44	Total O 44 44	0	0
17	X	34	Total O 34 34	0	0
17	Y	39	Total O 39 39	0	0
17	Z	36	Total O 36 36	0	0
17	a	53	Total O 53 53	0	0
17	b	42	Total O 42 42	0	0

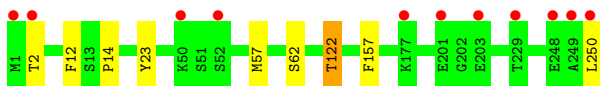
3 Residue-property plots i

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.

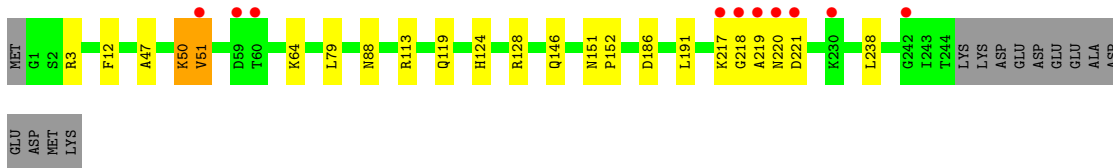
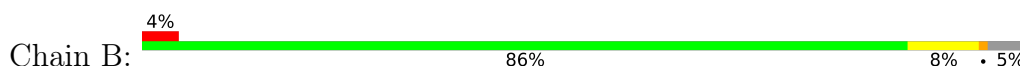
- Molecule 1: Proteasome subunit alpha type-2



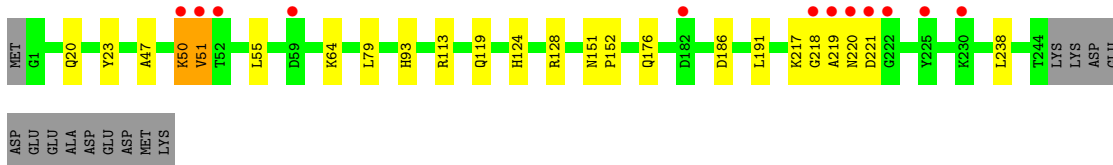
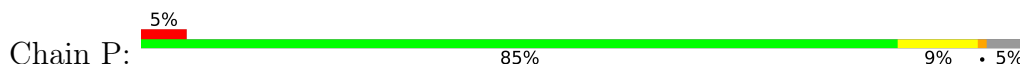
- Molecule 1: Proteasome subunit alpha type-2



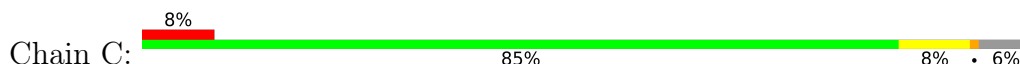
- Molecule 2: Proteasome subunit alpha type-3

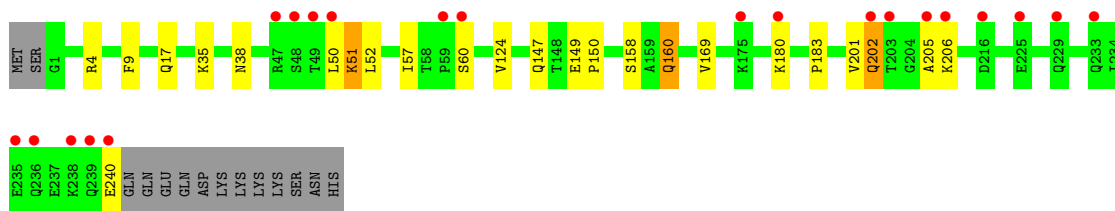


- Molecule 2: Proteasome subunit alpha type-3

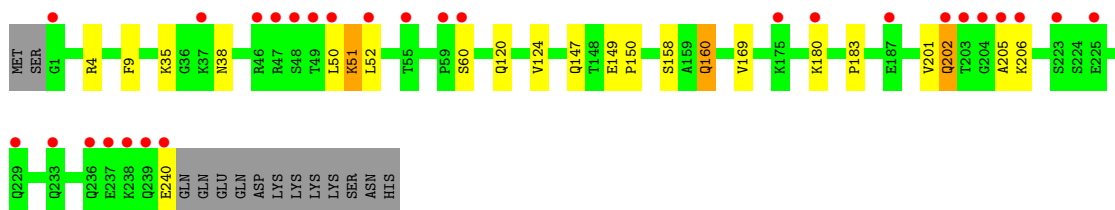
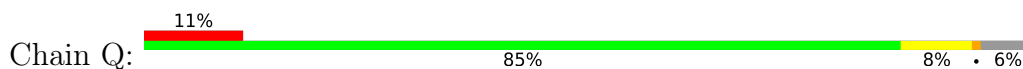


- Molecule 3: Proteasome subunit alpha type-4

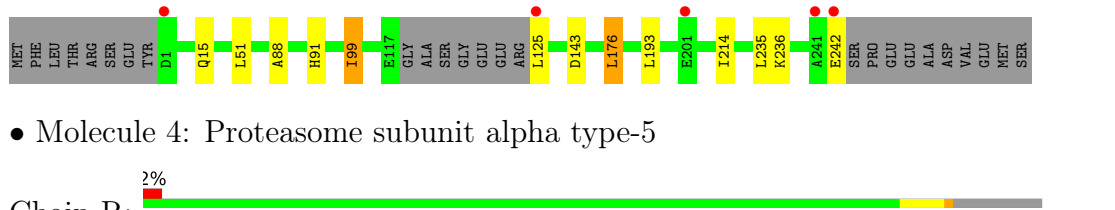
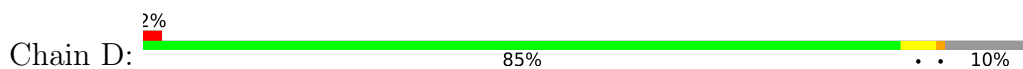




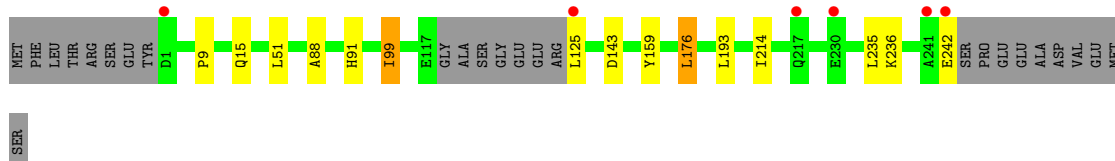
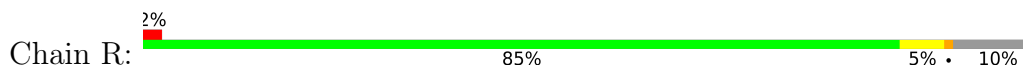
• Molecule 3: Proteasome subunit alpha type-4



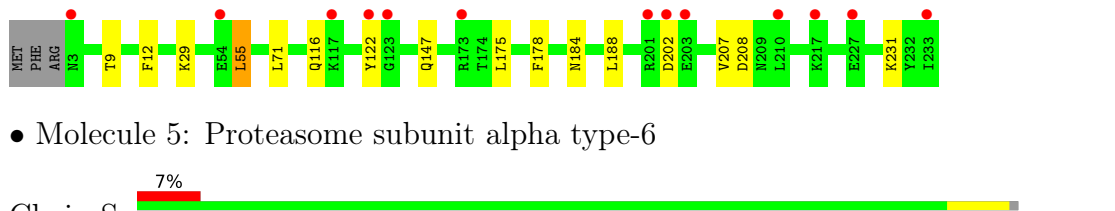
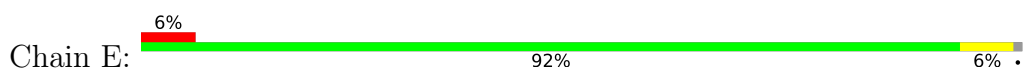
• Molecule 4: Proteasome subunit alpha type-5



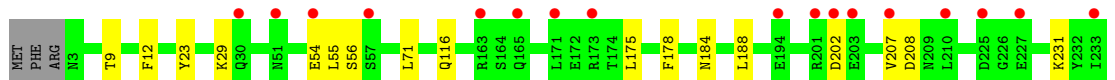
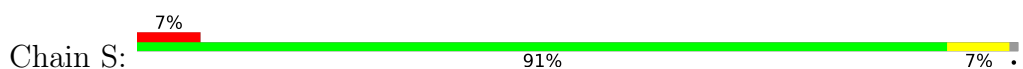
• Molecule 4: Proteasome subunit alpha type-5



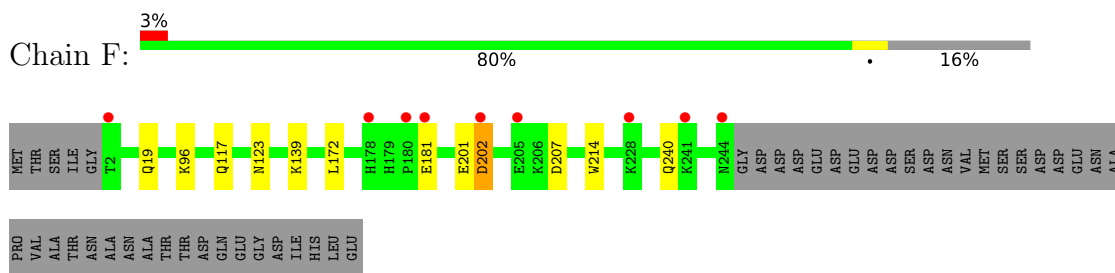
• Molecule 5: Proteasome subunit alpha type-6



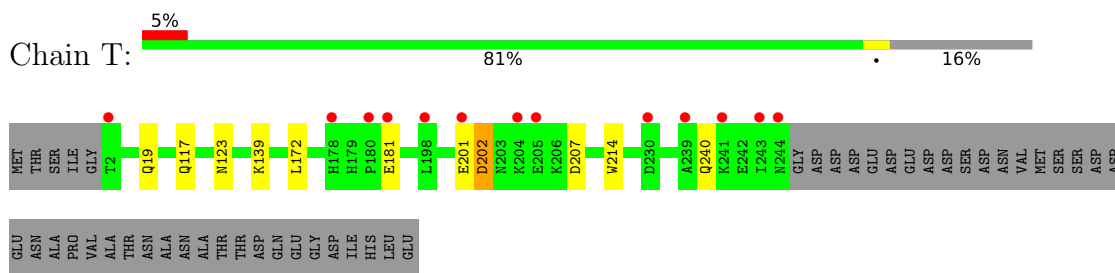
• Molecule 5: Proteasome subunit alpha type-6



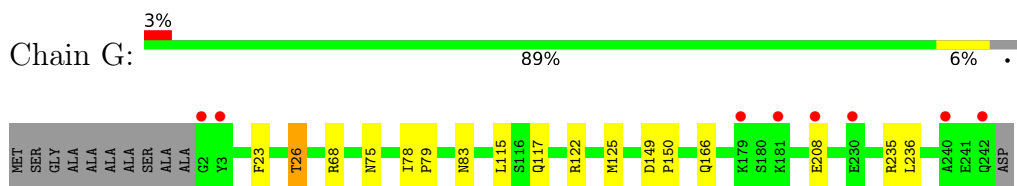
Molecule 6: Probable proteasome subunit alpha type-7



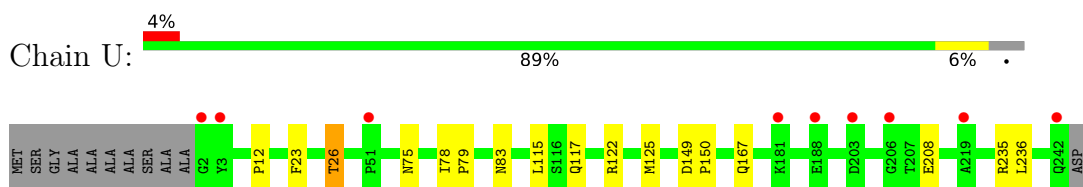
Molecule 6: Probable proteasome subunit alpha type-7



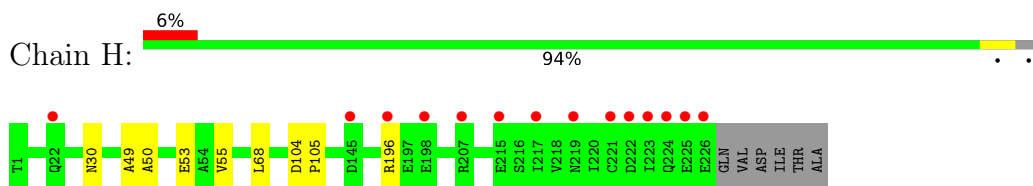
Molecule 7: Proteasome subunit alpha type-1



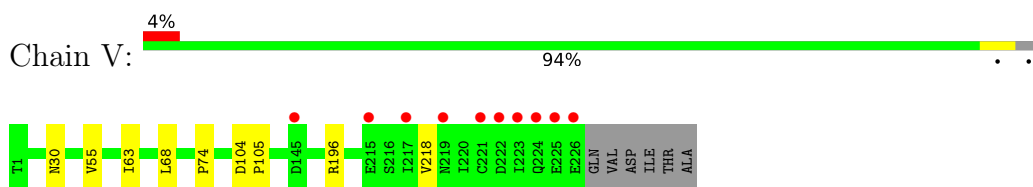
Molecule 7: Proteasome subunit alpha type-1



Molecule 8: Proteasome subunit beta type-2



Molecule 8: Proteasome subunit beta type-2



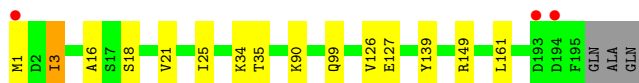
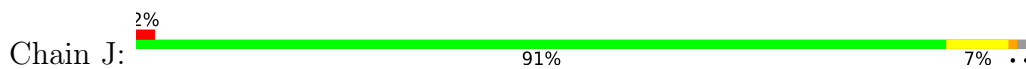
Molecule 9: Proteasome subunit beta type-3



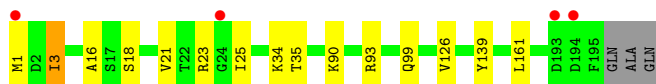
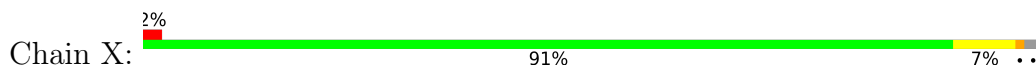
- Molecule 9: Proteasome subunit beta type-3



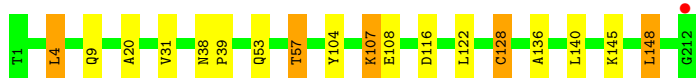
- Molecule 10: Proteasome subunit beta type-4



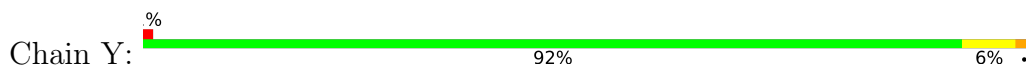
- Molecule 10: Proteasome subunit beta type-4



- Molecule 11: Proteasome subunit beta type-5



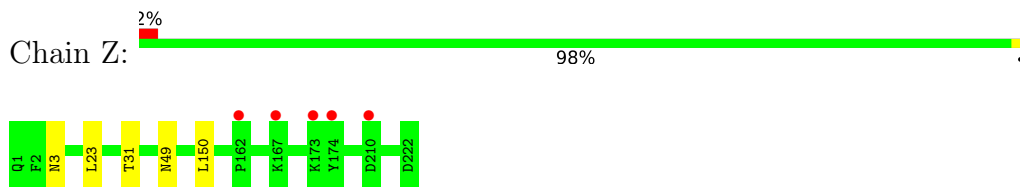
- Molecule 11: Proteasome subunit beta type-5



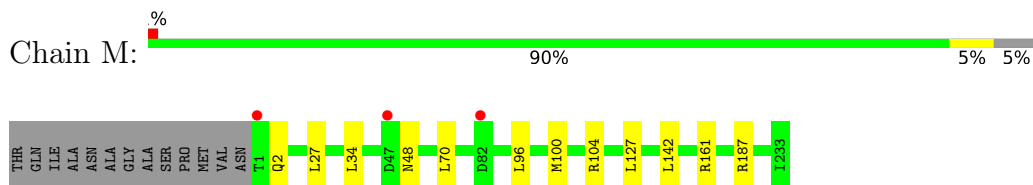
- Molecule 12: Proteasome subunit beta type-6



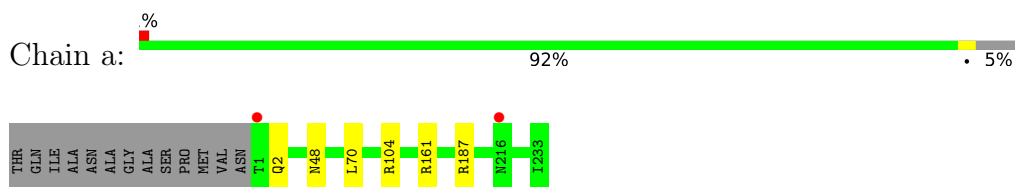
- Molecule 12: Proteasome subunit beta type-6



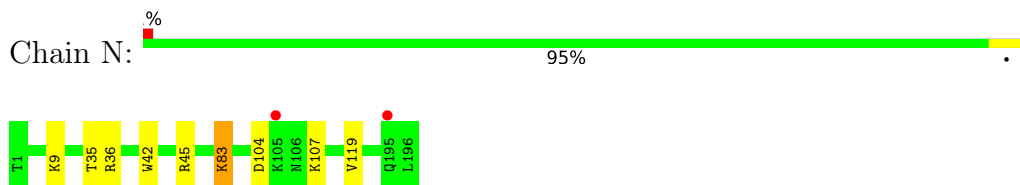
- Molecule 13: Proteasome subunit beta type-7



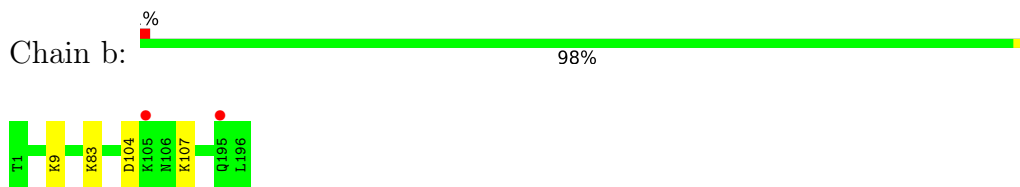
- Molecule 13: Proteasome subunit beta type-7



- 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	136.08Å 300.88Å 145.99Å 90.00° 113.11° 90.00°	Depositor
Resolution (Å)	15.00 – 2.50 15.00 – 2.50	Depositor EDS
% Data completeness (in resolution range)	98.8 (15.00-2.50) 98.8 (15.00-2.50)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.69 (at 2.51Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.190 , 0.213 0.196 , 0.217	Depositor DCC
R_{free} test set	18230 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	50.4	Xtrriage
Anisotropy	0.077	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 40.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	50389	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.27% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 3WE, 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	0.47	0/2642
1	O	0.27	0/1952	0.47	0/2642
2	B	0.28	0/1934	0.50	0/2618
2	P	0.28	0/1934	0.50	0/2618
3	C	0.28	0/1910	0.51	0/2586
3	Q	0.28	0/1910	0.51	0/2586
4	D	0.27	0/1837	0.48	0/2475
4	R	0.27	0/1837	0.48	0/2475
5	E	0.27	0/1800	0.47	0/2433
5	S	0.27	0/1800	0.48	0/2433
6	F	0.27	0/1932	0.45	0/2609
6	T	0.27	0/1932	0.45	0/2609
7	G	0.27	0/1945	0.47	0/2634
7	U	0.27	0/1945	0.47	0/2634
8	H	0.31	0/1750	0.47	0/2373
8	V	0.28	0/1750	0.47	0/2373
9	I	0.28	0/1611	0.48	0/2174
9	W	0.28	0/1611	0.48	0/2174
10	J	0.27	0/1589	0.48	0/2142
10	X	0.27	0/1589	0.48	0/2142
11	K	0.27	0/1681	0.49	1/2274 (0.0%)
11	Y	0.26	0/1681	0.49	1/2274 (0.0%)
12	L	0.27	0/1795	0.48	0/2420
12	Z	0.27	0/1795	0.48	0/2420
13	M	0.28	0/1855	0.51	0/2514
13	a	0.28	0/1855	0.51	0/2514
14	N	0.26	0/1541	0.48	0/2087
14	b	0.26	0/1541	0.47	0/2087
All	All	0.27	0/50264	0.48	2/67962 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	K	4	LEU	CA-CB-CG	5.03	126.87	115.30
11	Y	4	LEU	CA-CB-CG	5.03	126.87	115.30

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	1	0
1	O	1915	0	1929	5	0
2	B	1904	0	1904	12	0
2	P	1904	0	1904	11	0
3	C	1881	0	1895	9	0
3	Q	1881	0	1895	9	0
4	D	1813	0	1797	6	0
4	R	1813	0	1797	9	0
5	E	1773	0	1775	5	0
5	S	1773	0	1775	5	0
6	F	1892	0	1883	3	0
6	T	1892	0	1883	2	0
7	G	1907	0	1901	5	0
7	U	1907	0	1901	5	0
8	H	1719	0	1719	4	0
8	V	1719	0	1719	4	0
9	I	1581	0	1574	7	0
9	W	1581	0	1574	7	0
10	J	1561	0	1569	9	0
10	X	1561	0	1569	9	0
11	K	1644	0	1595	7	0
11	Y	1644	0	1595	7	0
12	L	1757	0	1711	2	0
12	Z	1757	0	1711	0	0
13	M	1824	0	1832	3	0
13	a	1824	0	1832	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
14	N	1512	0	1481	6	0
14	b	1512	0	1481	0	0
15	G	1	0	0	0	0
15	I	1	0	0	0	0
15	K	1	0	0	0	0
15	N	2	0	0	0	0
15	V	1	0	0	0	0
15	W	1	0	0	0	0
15	Y	1	0	0	0	0
15	Z	1	0	0	0	0
16	L	22	0	13	0	0
16	Z	22	0	13	0	0
17	A	44	0	0	0	0
17	B	30	0	0	1	0
17	C	30	0	0	0	0
17	D	20	0	0	0	0
17	E	13	0	0	1	0
17	F	38	0	0	1	0
17	G	45	0	0	1	0
17	H	35	0	0	0	0
17	I	49	0	0	0	0
17	J	46	0	0	2	0
17	K	35	0	0	0	0
17	L	43	0	0	2	0
17	M	51	0	0	0	0
17	N	38	0	0	1	0
17	O	26	0	0	0	0
17	P	21	0	0	1	0
17	Q	25	0	0	1	0
17	R	20	0	0	1	0
17	S	11	0	0	0	0
17	T	28	0	0	0	0
17	U	43	0	0	2	0
17	V	31	0	0	0	0
17	W	44	0	0	0	0
17	X	34	0	0	2	0
17	Y	39	0	0	0	0
17	Z	36	0	0	0	0
17	a	53	0	0	0	0
17	b	42	0	0	0	0
All	All	50389	0	49156	124	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 (124) 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)
7:G:166:GLN:NE2	17:G:427:HOH:O	2.26	0.67
12:L:165:ASN:ND2	17:L:435:HOH:O	2.30	0.64
7:G:68:ARG:HH12	14:N:36:ARG:HH22	1.47	0.62
10:X:23:ARG:NE	17:X:214:HOH:O	2.36	0.59
14:N:35:THR:HG21	14:N:45:ARG:HE	1.69	0.57
12:L:165:ASN:CG	17:L:435:HOH:O	2.43	0.56
14:N:35:THR:HG22	17:N:324:HOH:O	2.06	0.54
2:P:217:LYS:C	2:P:219:ALA:H	2.12	0.54
1:O:23:TYR:CD1	7:U:12:PRO:HA	2.43	0.53
2:B:12:PHE:H	3:C:17:GLN:HE22	1.54	0.53
5:E:147:GLN:NE2	17:E:310:HOH:O	2.41	0.52
2:B:217:LYS:C	2:B:219:ALA:H	2.12	0.52
10:X:21:VAL:HG11	11:Y:122:LEU:HD11	1.92	0.52
3:Q:201:VAL:O	3:Q:202:GLN:CB	2.58	0.51
3:C:201:VAL:O	3:C:202:GLN:CB	2.58	0.51
3:Q:51:LYS:O	3:Q:52:LEU:HB2	2.10	0.51
5:E:12:PHE:H	6:F:19:GLN:HE22	1.57	0.51
2:B:3:ARG:HB3	5:E:122:TYR:OH	2.10	0.51
3:C:51:LYS:O	3:C:52:LEU:HB2	2.10	0.51
10:J:16:ALA:HB2	10:J:161:LEU:HD21	1.93	0.50
10:J:21:VAL:HG11	11:K:122:LEU:HD11	1.93	0.50
10:J:25:ILE:O	10:X:139:TYR:OH	2.30	0.50
8:H:49:ALA:O	8:H:53:GLU:HG3	2.12	0.50
4:R:99:ILE:HG23	17:R:302:HOH:O	2.11	0.50
9:I:36:SER:HB2	10:J:126:VAL:HG11	1.93	0.50
5:S:12:PHE:H	6:T:19:GLN:HE22	1.59	0.50
2:B:88:ASN:OD1	17:B:325:HOH:O	2.20	0.50
14:N:83:LYS:HG3	14:N:119:VAL:CG2	2.42	0.49
10:X:16:ALA:HB2	10:X:161:LEU:HD21	1.93	0.49
6:F:96:LYS:NZ	17:F:337:HOH:O	2.44	0.49
3:C:160:GLN:HE21	3:C:160:GLN:HA	1.78	0.49
7:G:23:PHE:O	7:G:26:THR:HB	2.13	0.48
1:O:122:THR:HG22	2:P:128:ARG:HH21	1.78	0.48
7:U:23:PHE:O	7:U:26:THR:HB	2.14	0.48
10:J:149:ARG:NH2	17:J:222:HOH:O	2.46	0.48
7:U:167:GLN:NE2	17:U:335:HOH:O	2.40	0.48
9:I:9:GLY:HA3	9:I:41:LYS:HE2	1.96	0.48
10:J:127:GLU:OE2	17:J:211:HOH:O	2.20	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Q:160:GLN:HE21	3:Q:160:GLN:HA	1.78	0.47
4:R:159:TYR:CE2	5:S:56:SER:HB3	2.50	0.47
10:X:1:MET:HG2	10:X:34:LYS:HE3	1.96	0.47
2:P:47:ALA:HB1	2:P:64:LYS:HD2	1.97	0.47
9:I:10:ILE:HG21	9:I:141:ALA:HB3	1.97	0.46
1:O:57:MET:HE1	17:U:315:HOH:O	2.15	0.46
9:W:9:GLY:HA3	9:W:41:LYS:HE2	1.96	0.46
11:Y:53:GLN:O	11:Y:57:THR:OG1	2.33	0.46
2:B:47:ALA:HB1	2:B:64:LYS:HD2	1.97	0.46
4:R:91:HIS:HB3	4:R:99:ILE:HG22	1.98	0.46
1:A:122:THR:HG22	2:B:128:ARG:HH21	1.81	0.45
9:W:10:ILE:HG21	9:W:141:ALA:HB3	1.97	0.45
4:D:176:LEU:HD22	5:E:55:LEU:CD2	2.46	0.45
11:K:107:LYS:HG3	11:K:108:GLU:HG3	1.98	0.45
3:Q:35:LYS:HG2	3:Q:158:SER:O	2.16	0.45
2:B:50:LYS:HD3	2:B:50:LYS:HA	1.86	0.45
3:C:35:LYS:HG2	3:C:158:SER:O	2.16	0.45
4:D:91:HIS:HB3	4:D:99:ILE:HG22	1.98	0.45
11:K:128:CYS:SG	11:K:136:ALA:HB3	2.57	0.45
11:Y:128:CYS:SG	11:Y:136:ALA:HB3	2.56	0.45
11:K:53:GLN:O	11:K:57:THR:OG1	2.33	0.45
11:Y:107:LYS:HG3	11:Y:108:GLU:HG3	1.98	0.45
8:V:104:ASP:HB2	8:V:105:PRO:HD2	1.99	0.45
3:C:149:GLU:HB2	3:C:150:PRO:HD2	2.00	0.44
4:R:91:HIS:HB3	4:R:99:ILE:CG2	2.47	0.44
10:J:1:MET:HG2	10:J:34:LYS:HE3	1.97	0.44
14:N:35:THR:CG2	14:N:45:ARG:HE	2.31	0.44
8:H:104:ASP:HB2	8:H:105:PRO:HD2	1.99	0.44
4:D:91:HIS:HB3	4:D:99:ILE:CG2	2.47	0.44
3:Q:149:GLU:HB2	3:Q:150:PRO:HD2	1.99	0.44
14:N:36:ARG:HG3	14:N:42:TRP:CE2	2.52	0.44
2:P:151:ASN:HB2	2:P:152:PRO:CD	2.48	0.44
2:B:151:ASN:HB2	2:B:152:PRO:CD	2.48	0.43
2:B:146:GLN:HG2	3:C:57:ILE:HG21	1.99	0.43
11:K:145:LYS:HB2	11:K:148:LEU:HD13	2.00	0.43
2:P:93:HIS:CD2	17:P:304:HOH:O	2.71	0.43
9:I:20:VAL:HG13	9:I:118:PRO:HB3	2.01	0.43
8:H:50:ALA:CB	9:I:126:ILE:HG23	2.49	0.43
4:R:176:LEU:HD11	5:S:54:GLU:HB2	2.00	0.43
13:M:127:LEU:HG	13:M:142:LEU:HD12	2.01	0.43
11:Y:145:LYS:HB2	11:Y:148:LEU:HD13	2.00	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:M:96:LEU:O	13:M:100:MET:HG2	2.19	0.42
10:J:139:TYR:OH	10:X:25:ILE:O	2.38	0.42
11:K:38:ASN:HB2	11:K:39:PRO:CD	2.49	0.42
8:V:218:VAL:CG2	9:W:196:LYS:HB2	2.49	0.42
9:W:20:VAL:HG13	9:W:118:PRO:HB3	2.01	0.42
8:H:104:ASP:HB2	8:H:105:PRO:CD	2.49	0.42
7:U:78:ILE:N	7:U:79:PRO:CD	2.83	0.42
8:V:104:ASP:HB2	8:V:105:PRO:CD	2.49	0.42
9:I:101:PRO:HB3	9:I:126:ILE:HD12	2.02	0.42
6:F:202:ASP:OD1	6:F:202:ASP:N	2.53	0.42
1:O:12:PHE:H	2:P:20:GLN:HE22	1.67	0.42
1:O:14:PRO:HA	2:P:23:TYR:CD1	2.55	0.42
9:W:101:PRO:HB3	9:W:126:ILE:HD12	2.02	0.42
10:X:3:ILE:HG23	10:X:18:SER:HB3	2.01	0.42
11:Y:38:ASN:HB2	11:Y:39:PRO:CD	2.49	0.42
2:B:124:HIS:HB3	3:C:124:VAL:HG12	2.02	0.42
2:P:151:ASN:HB2	2:P:152:PRO:HD2	2.02	0.42
9:W:98:ARG:O	9:W:126:ILE:HD11	2.20	0.42
7:G:78:ILE:N	7:G:79:PRO:CD	2.83	0.41
10:J:3:ILE:HG23	10:J:18:SER:HB3	2.01	0.41
5:E:175:LEU:HA	5:E:178:PHE:CE2	2.56	0.41
9:I:98:ARG:O	9:I:126:ILE:HD11	2.20	0.41
4:D:88:ALA:HA	4:D:99:ILE:HG21	2.03	0.41
13:M:27:LEU:HD21	13:M:34:LEU:HD22	2.02	0.41
11:Y:20:ALA:HB2	11:Y:31:VAL:HG21	2.03	0.41
2:P:176:GLN:HG3	3:Q:52:LEU:HD13	2.03	0.41
2:B:151:ASN:HB2	2:B:152:PRO:HD2	2.02	0.41
4:R:88:ALA:HA	4:R:99:ILE:HG21	2.03	0.41
4:R:91:HIS:CD2	4:R:99:ILE:HG22	2.56	0.41
5:S:175:LEU:HA	5:S:178:PHE:CE2	2.55	0.41
6:T:202:ASP:OD1	6:T:202:ASP:N	2.54	0.41
11:K:20:ALA:HB2	11:K:31:VAL:HG21	2.03	0.41
3:Q:9:PHE:H	4:R:15:GLN:HE22	1.69	0.41
4:R:9:PRO:HA	5:S:23:TYR:CD1	2.56	0.41
2:P:124:HIS:HB3	3:Q:124:VAL:HG12	2.03	0.41
3:Q:120:GLN:NE2	17:Q:317:HOH:O	2.54	0.41
2:P:50:LYS:O	2:P:51:VAL:C	2.59	0.40
8:V:63:ILE:HG23	8:V:74:PRO:HB3	2.04	0.40
4:D:91:HIS:CD2	4:D:99:ILE:HG22	2.57	0.40
7:G:149:ASP:HB2	7:G:150:PRO:CD	2.52	0.40
2:B:50:LYS:O	2:B:51:VAL:C	2.59	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:U:149:ASP:HB2	7:U:150:PRO:CD	2.52	0.40
9:W:36:SER:HB2	10:X:126:VAL:HG11	2.03	0.40
3:C:9:PHE:H	4:D:15:GLN:HE22	1.69	0.40
10:X:93:ARG:NH1	17:X:207:HOH:O	2.53	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	54
1	O	248/250 (99%)	239 (96%)	8 (3%)	1 (0%)	34	54
2	B	242/258 (94%)	236 (98%)	2 (1%)	4 (2%)	9	16
2	P	242/258 (94%)	235 (97%)	3 (1%)	4 (2%)	9	16
3	C	238/254 (94%)	232 (98%)	3 (1%)	3 (1%)	12	21
3	Q	238/254 (94%)	232 (98%)	3 (1%)	3 (1%)	12	21
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%)	222 (97%)	7 (3%)	0	100	100
5	S	229/234 (98%)	223 (97%)	6 (3%)	0	100	100
6	F	241/288 (84%)	238 (99%)	3 (1%)	0	100	100
6	T	241/288 (84%)	238 (99%)	3 (1%)	0	100	100
7	G	239/252 (95%)	238 (100%)	1 (0%)	0	100	100
7	U	239/252 (95%)	239 (100%)	0	0	100	100
8	H	224/232 (97%)	218 (97%)	6 (3%)	0	100	100
8	V	224/232 (97%)	218 (97%)	6 (3%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
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%)	188 (97%)	5 (3%)	0	100	100
10	X	193/198 (98%)	188 (97%)	5 (3%)	0	100	100
11	K	210/212 (99%)	206 (98%)	4 (2%)	0	100	100
11	Y	210/212 (99%)	206 (98%)	4 (2%)	0	100	100
12	L	220/222 (99%)	215 (98%)	5 (2%)	0	100	100
12	Z	220/222 (99%)	215 (98%)	5 (2%)	0	100	100
13	M	231/246 (94%)	223 (96%)	8 (4%)	0	100	100
13	a	231/246 (94%)	223 (96%)	8 (4%)	0	100	100
14	N	194/196 (99%)	189 (97%)	5 (3%)	0	100	100
14	b	194/196 (99%)	190 (98%)	4 (2%)	0	100	100
All	All	6284/6614 (95%)	6140 (98%)	128 (2%)	16 (0%)	41	61

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	51	VAL
2	B	221	ASP
3	C	202	GLN
2	P	51	VAL
2	P	221	ASP
3	Q	202	GLN
1	A	2	THR
2	B	220	ASN
1	O	2	THR
2	P	220	ASN
2	B	218	GLY
2	P	218	GLY
3	C	205	ALA
3	Q	205	ALA
3	C	183	PRO
3	Q	183	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 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%)	205 (98%)	4 (2%)	57 80
1	O	209/209 (100%)	205 (98%)	4 (2%)	57 80
2	B	203/216 (94%)	196 (97%)	7 (3%)	37 63
2	P	203/216 (94%)	195 (96%)	8 (4%)	32 57
3	C	212/226 (94%)	201 (95%)	11 (5%)	23 44
3	Q	212/226 (94%)	201 (95%)	11 (5%)	23 44
4	D	194/215 (90%)	184 (95%)	10 (5%)	23 44
4	R	194/215 (90%)	184 (95%)	10 (5%)	23 44
5	E	190/193 (98%)	179 (94%)	11 (6%)	20 38
5	S	190/193 (98%)	179 (94%)	11 (6%)	20 38
6	F	201/239 (84%)	191 (95%)	10 (5%)	24 46
6	T	201/239 (84%)	191 (95%)	10 (5%)	24 46
7	G	206/210 (98%)	196 (95%)	10 (5%)	25 47
7	U	206/210 (98%)	196 (95%)	10 (5%)	25 47
8	H	185/190 (97%)	181 (98%)	4 (2%)	52 77
8	V	185/190 (97%)	181 (98%)	4 (2%)	52 77
9	I	172/173 (99%)	169 (98%)	3 (2%)	60 82
9	W	172/173 (99%)	170 (99%)	2 (1%)	71 88
10	J	173/175 (99%)	169 (98%)	4 (2%)	50 76
10	X	173/175 (99%)	169 (98%)	4 (2%)	50 76
11	K	169/169 (100%)	160 (95%)	9 (5%)	22 43
11	Y	169/169 (100%)	160 (95%)	9 (5%)	22 43
12	L	185/185 (100%)	180 (97%)	5 (3%)	44 71
12	Z	185/185 (100%)	180 (97%)	5 (3%)	44 71
13	M	199/208 (96%)	193 (97%)	6 (3%)	41 68
13	a	199/208 (96%)	193 (97%)	6 (3%)	41 68

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	N	162/162 (100%)	158 (98%)	4 (2%)	47	73
14	b	162/162 (100%)	158 (98%)	4 (2%)	47	73
All	All	5320/5540 (96%)	5124 (96%)	196 (4%)	34	60

All (196) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62	SER
1	A	122	THR
1	A	157	PHE
1	A	250	LEU
2	B	50	LYS
2	B	79	LEU
2	B	113	ARG
2	B	119	GLN
2	B	186	ASP
2	B	191	LEU
2	B	238	LEU
3	C	4	ARG
3	C	38	ASN
3	C	50	LEU
3	C	51	LYS
3	C	60	SER
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	51	LEU
4	D	99	ILE
4	D	125	LEU
4	D	143	ASP
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

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
5	E	55	LEU
5	E	71	LEU
5	E	116	GLN
5	E	184	ASN
5	E	188	LEU
5	E	202	ASP
5	E	207	VAL
5	E	208	ASP
5	E	231	LYS
6	F	117	GLN
6	F	123	ASN
6	F	139	LYS
6	F	172	LEU
6	F	181	GLU
6	F	201	GLU
6	F	202	ASP
6	F	207	ASP
6	F	214	TRP
6	F	240	GLN
7	G	26	THR
7	G	75	ASN
7	G	83	ASN
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	55	VAL
8	H	68	LEU
8	H	196	ARG
9	I	37	ASN
9	I	171	LEU
9	I	182	TRP
10	J	3	ILE
10	J	35	THR
10	J	90	LYS
10	J	99	GLN
11	K	4	LEU
11	K	9	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
11	K	57	THR
11	K	104	TYR
11	K	107	LYS
11	K	116	ASP
11	K	128	CYS
11	K	140	LEU
11	K	148	LEU
12	L	3	ASN
12	L	23	LEU
12	L	31	THR
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
14	N	9	LYS
14	N	83	LYS
14	N	104	ASP
14	N	107	LYS
1	O	62	SER
1	O	122	THR
1	O	157	PHE
1	O	250	LEU
2	P	50	LYS
2	P	55	LEU
2	P	79	LEU
2	P	113	ARG
2	P	119	GLN
2	P	186	ASP
2	P	191	LEU
2	P	238	LEU
3	Q	4	ARG
3	Q	38	ASN
3	Q	50	LEU
3	Q	51	LYS
3	Q	60	SER
3	Q	147	GLN
3	Q	160	GLN
3	Q	169	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
3	Q	180	LYS
3	Q	206	LYS
3	Q	240	GLU
4	R	51	LEU
4	R	99	ILE
4	R	125	LEU
4	R	143	ASP
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
5	S	55	LEU
5	S	71	LEU
5	S	116	GLN
5	S	184	ASN
5	S	188	LEU
5	S	202	ASP
5	S	207	VAL
5	S	208	ASP
5	S	231	LYS
6	T	117	GLN
6	T	123	ASN
6	T	139	LYS
6	T	172	LEU
6	T	181	GLU
6	T	201	GLU
6	T	202	ASP
6	T	207	ASP
6	T	214	TRP
6	T	240	GLN
7	U	26	THR
7	U	75	ASN
7	U	83	ASN
7	U	115	LEU
7	U	117	GLN
7	U	122	ARG
7	U	125	MET
7	U	208	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
7	U	235	ARG
7	U	236	LEU
8	V	30	ASN
8	V	55	VAL
8	V	68	LEU
8	V	196	ARG
9	W	37	ASN
9	W	171	LEU
10	X	3	ILE
10	X	35	THR
10	X	90	LYS
10	X	99	GLN
11	Y	4	LEU
11	Y	9	GLN
11	Y	57	THR
11	Y	104	TYR
11	Y	107	LYS
11	Y	116	ASP
11	Y	128	CYS
11	Y	140	LEU
11	Y	148	LEU
12	Z	3	ASN
12	Z	23	LEU
12	Z	31	THR
12	Z	49	ASN
12	Z	150	LEU
13	a	2	GLN
13	a	48	ASN
13	a	70	LEU
13	a	104	ARG
13	a	161	ARG
13	a	187	ARG
14	b	9	LYS
14	b	83	LYS
14	b	104	ASP
14	b	107	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (104) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	HIS
2	B	20	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	B	58	GLN
2	B	95	GLN
2	B	119	GLN
2	B	123	GLN
2	B	155	ASN
2	B	176	GLN
3	C	17	GLN
3	C	77	ASN
3	C	116	GLN
3	C	120	GLN
3	C	147	GLN
3	C	160	GLN
4	D	15	GLN
4	D	100	ASN
4	D	146	GLN
4	D	225	ASN
5	E	68	HIS
5	E	92	ASN
5	E	99	ASN
5	E	116	GLN
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
6	F	240	GLN
7	G	30	ASN
7	G	83	ASN
7	G	114	ASN
7	G	117	GLN
7	G	121	GLN
7	G	166	GLN
7	G	167	GLN
8	H	66	HIS
8	H	165	ASN
9	I	37	ASN
10	J	55	GLN
10	J	146	HIS
11	K	85	ASN
11	K	176	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
11	K	190	ASN
11	K	208	ASN
12	L	3	ASN
12	L	49	ASN
12	L	70	ASN
13	M	18	ASN
13	M	48	ASN
13	M	102	GLN
14	N	161	GLN
1	O	94	HIS
2	P	20	GLN
2	P	58	GLN
2	P	95	GLN
2	P	119	GLN
2	P	123	GLN
2	P	176	GLN
3	Q	17	GLN
3	Q	77	ASN
3	Q	116	GLN
3	Q	120	GLN
3	Q	147	GLN
3	Q	160	GLN
4	R	15	GLN
4	R	100	ASN
4	R	146	GLN
4	R	225	ASN
5	S	68	HIS
5	S	92	ASN
5	S	99	ASN
5	S	116	GLN
5	S	120	GLN
5	S	151	ASN
5	S	184	ASN
6	T	19	GLN
6	T	86	ASN
6	T	117	GLN
6	T	123	ASN
6	T	191	GLN
6	T	240	GLN
7	U	30	ASN
7	U	83	ASN
7	U	114	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
7	U	117	GLN
7	U	121	GLN
7	U	166	GLN
7	U	167	GLN
8	V	165	ASN
9	W	37	ASN
10	X	55	GLN
10	X	86	GLN
11	Y	85	ASN
11	Y	176	ASN
11	Y	190	ASN
11	Y	208	ASN
12	Z	3	ASN
12	Z	49	ASN
12	Z	70	ASN
13	a	18	ASN
13	a	48	ASN
13	a	102	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 11 ligands modelled in this entry, 9 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
16	3WE	Z	301	-	21,26,26	2.12	2 (9%)	16,42,42	2.77	6 (37%)
16	3WE	L	301	-	21,26,26	2.13	2 (9%)	16,42,42	2.73	6 (37%)

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
16	3WE	Z	301	-	-	-	0/4/5/5
16	3WE	L	301	-	-	-	0/4/5/5

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
16	L	301	3WE	C7-C4	6.72	1.50	1.42
16	Z	301	3WE	C7-C4	6.62	1.50	1.42
16	L	301	3WE	C18-N19	-5.06	1.26	1.35
16	Z	301	3WE	C18-N19	-5.05	1.26	1.35

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
16	Z	301	3WE	N17-C18-N19	6.64	116.02	109.20
16	L	301	3WE	N17-C18-N19	6.58	115.95	109.20
16	L	301	3WE	C8-C11-N12	6.24	118.69	113.58
16	Z	301	3WE	C8-C11-N12	6.21	118.67	113.58
16	L	301	3WE	O21-C11-C8	-3.24	120.00	125.33
16	Z	301	3WE	O21-C11-C8	-3.05	120.32	125.33
16	Z	301	3WE	C2-C3-C4	-3.01	116.71	120.89
16	Z	301	3WE	C23-C13-N12	-2.97	100.05	103.30
16	L	301	3WE	C2-C3-C4	-2.94	116.81	120.89
16	L	301	3WE	C23-C13-N12	-2.61	100.44	103.30
16	Z	301	3WE	C5-N14-C20	-2.49	125.16	128.23
16	L	301	3WE	C5-N14-C20	-2.28	125.41	128.23

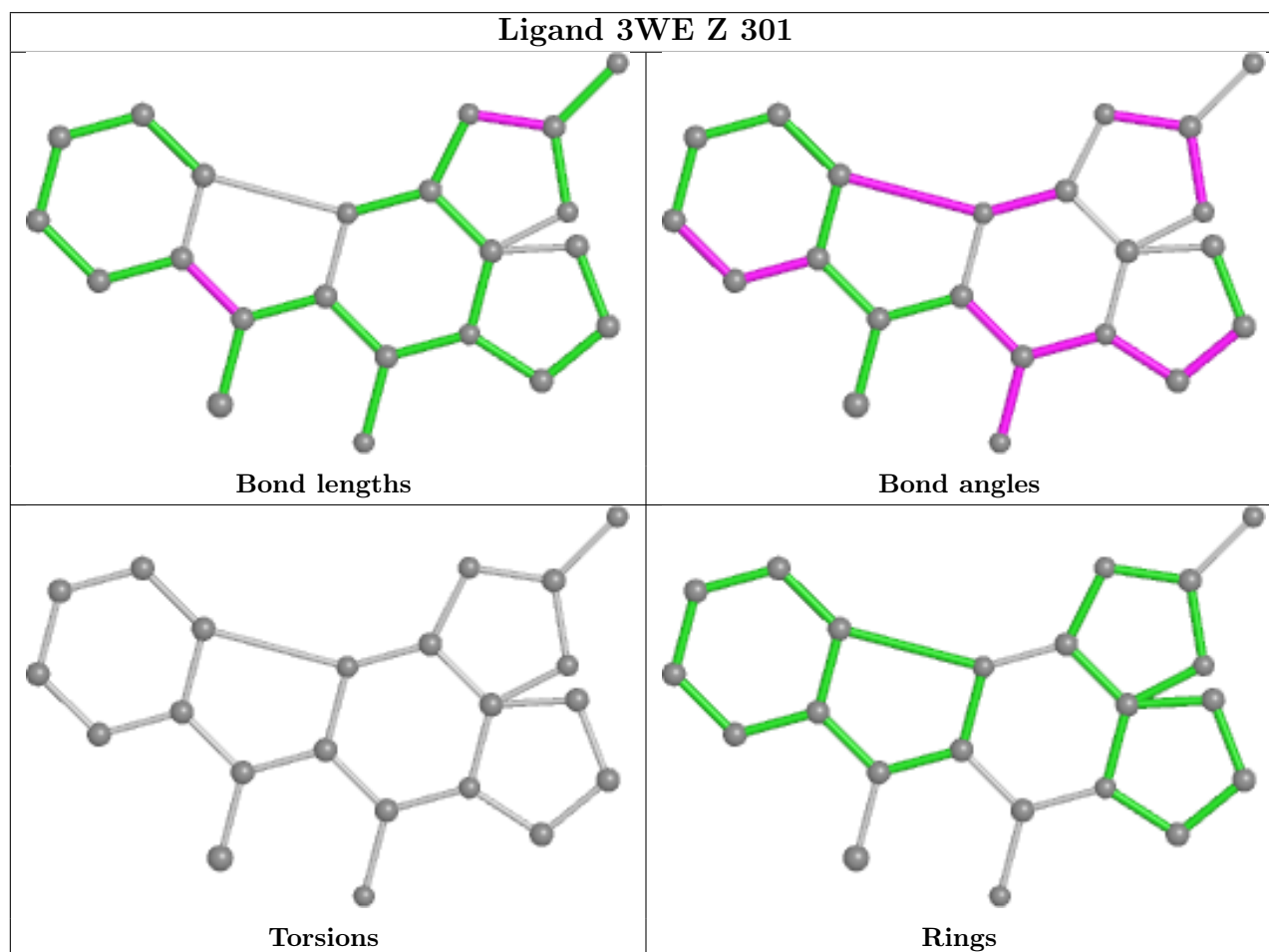
There are no chirality outliers.

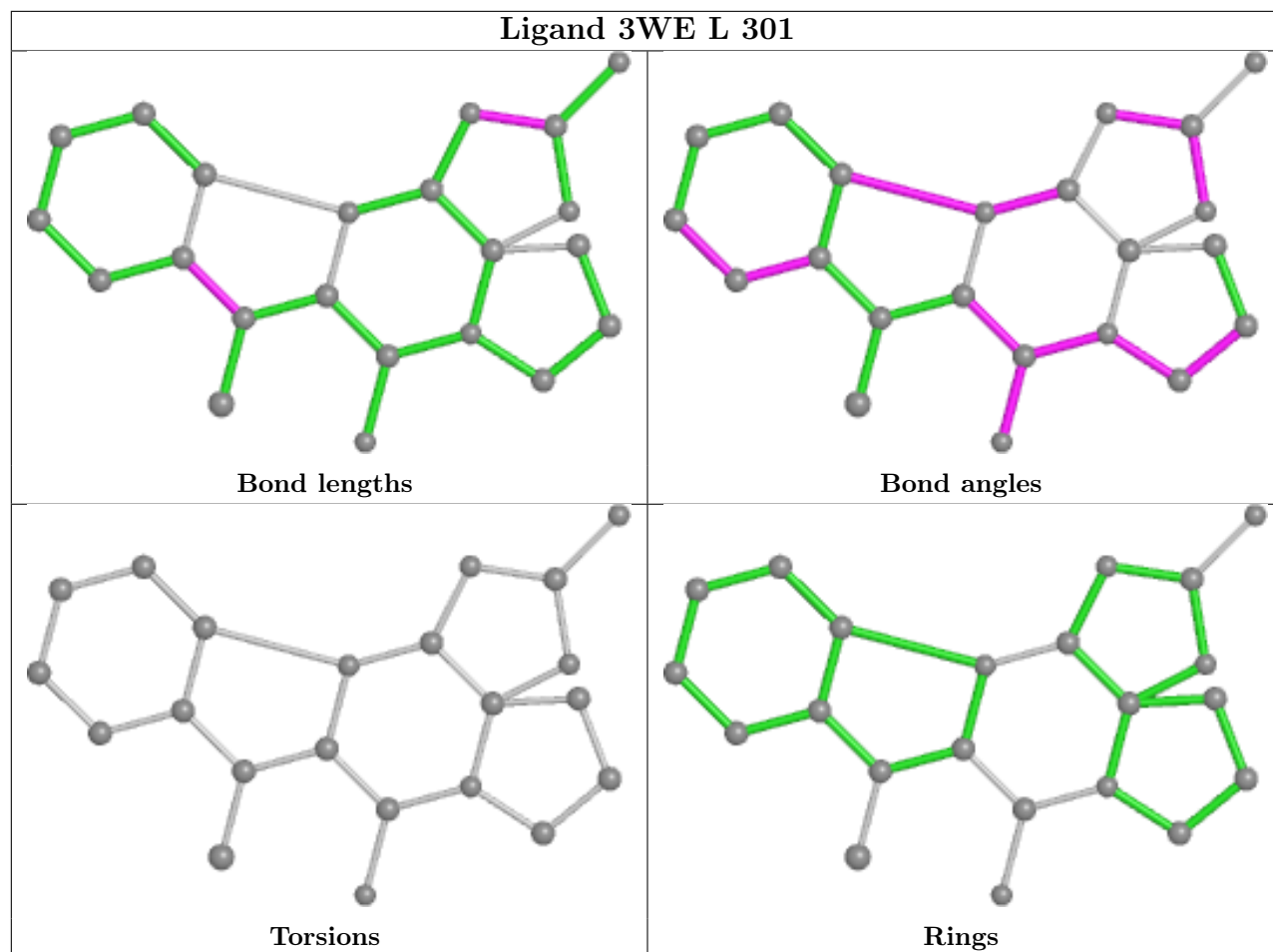
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 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%)	-0.18	10 (4%) 38 41	40, 53, 86, 124	0
1	O	250/250 (100%)	-0.08	11 (4%) 34 37	43, 60, 102, 131	0
2	B	244/258 (94%)	-0.01	10 (4%) 37 40	39, 58, 99, 147	0
2	P	244/258 (94%)	0.07	12 (4%) 29 31	45, 61, 105, 149	0
3	C	240/254 (94%)	0.15	21 (8%) 10 10	39, 62, 124, 149	0
3	Q	240/254 (94%)	0.37	28 (11%) 4 4	41, 71, 150, 176	0
4	D	235/260 (90%)	-0.18	5 (2%) 63 66	43, 63, 96, 136	0
4	R	235/260 (90%)	-0.10	6 (2%) 56 59	45, 66, 102, 137	0
5	E	231/234 (98%)	-0.00	13 (5%) 24 25	46, 66, 104, 150	0
5	S	231/234 (98%)	0.17	17 (7%) 14 15	49, 73, 112, 160	0
6	F	243/288 (84%)	-0.14	9 (3%) 41 45	42, 59, 110, 140	0
6	T	243/288 (84%)	-0.01	13 (5%) 26 28	41, 68, 124, 152	0
7	G	241/252 (95%)	-0.20	8 (3%) 46 50	35, 54, 88, 137	0
7	U	241/252 (95%)	-0.09	9 (3%) 41 45	43, 58, 89, 135	0
8	H	226/232 (97%)	0.07	14 (6%) 20 21	35, 52, 86, 152	0
8	V	226/232 (97%)	0.04	10 (4%) 34 37	41, 54, 86, 157	0
9	I	204/205 (99%)	-0.33	3 (1%) 73 75	36, 48, 77, 98	0
9	W	204/205 (99%)	-0.35	4 (1%) 65 68	39, 51, 80, 104	0
10	J	195/198 (98%)	-0.28	3 (1%) 73 75	37, 51, 76, 129	0
10	X	195/198 (98%)	-0.22	4 (2%) 63 66	37, 52, 76, 140	0
11	K	212/212 (100%)	-0.33	1 (0%) 91 91	34, 50, 71, 90	0
11	Y	212/212 (100%)	-0.31	2 (0%) 84 86	39, 50, 73, 92	0
12	L	222/222 (100%)	-0.27	3 (1%) 75 77	37, 52, 82, 118	0
12	Z	222/222 (100%)	-0.31	5 (2%) 60 63	37, 52, 84, 120	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%)	-0.41	3 (1%) 77 79	36, 52, 73, 91	0
13	a	233/246 (94%)	-0.35	2 (0%) 84 86	36, 50, 72, 90	0
14	N	196/196 (100%)	-0.38	2 (1%) 82 84	38, 48, 75, 104	0
14	b	196/196 (100%)	-0.35	2 (1%) 82 84	38, 49, 75, 109	0
All	All	6344/6614 (95%)	-0.14	230 (3%) 42 46	34, 56, 100, 176	0

All (230) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
10	X	1	MET	10.2
3	Q	49	THR	10.1
3	Q	50	LEU	8.7
3	Q	206	LYS	8.2
2	B	221	ASP	8.0
8	V	221	CYS	7.8
8	V	224	GLN	7.2
8	H	221	CYS	7.0
3	C	49	THR	7.0
8	H	223	ILE	6.5
10	J	1	MET	6.5
2	P	51	VAL	6.5
2	P	219	ALA	6.5
8	V	226	GLU	6.4
2	B	51	VAL	6.1
5	S	202	ASP	6.1
3	C	50	LEU	6.0
2	B	219	ALA	5.9
12	L	174	TYR	5.9
10	X	194	ASP	5.9
2	P	220	ASN	5.7
3	Q	239	GLN	5.7
2	B	218	GLY	5.6
3	C	206	LYS	5.5
2	P	221	ASP	5.5
2	P	59	ASP	5.3
4	R	241	ALA	5.2
9	W	1	SER	5.2
3	Q	236	GLN	5.2
2	P	218	GLY	5.1
3	C	236	GLN	5.1
8	V	223	ILE	5.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
12	Z	174	TYR	5.1
5	E	202	ASP	5.1
7	U	242	GLN	5.0
1	O	1	MET	4.9
6	T	178	HIS	4.9
9	I	1	SER	4.7
1	A	249	ALA	4.7
8	V	222	ASP	4.7
2	B	220	ASN	4.6
1	A	1	MET	4.6
6	F	244	ASN	4.6
8	H	226	GLU	4.6
8	H	222	ASP	4.6
9	I	131	GLU	4.5
1	O	249	ALA	4.5
3	Q	205	ALA	4.5
8	H	224	GLN	4.3
14	b	195	GLN	4.2
2	P	52	THR	4.1
6	F	205	GLU	4.1
3	C	202	GLN	4.0
6	T	243	ILE	3.9
3	Q	202	GLN	3.9
5	S	54	GLU	3.9
1	O	250	LEU	3.9
6	F	178	HIS	3.9
10	J	194	ASP	3.8
1	O	2	THR	3.8
4	R	125	LEU	3.8
1	A	2	THR	3.8
14	b	105	LYS	3.7
3	Q	238	LYS	3.7
9	W	133	LYS	3.7
3	C	205	ALA	3.7
8	V	225	GLU	3.6
3	Q	55	THR	3.6
5	E	122	TYR	3.6
2	P	225	TYR	3.5
3	C	238	LYS	3.5
3	C	240	GLU	3.5
8	H	217	ILE	3.5
3	Q	204	GLY	3.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
9	I	133	LYS	3.5
2	B	217	LYS	3.4
4	R	217	GLN	3.3
6	T	244	ASN	3.3
8	H	215	GLU	3.3
7	G	3	TYR	3.3
6	F	181	GLU	3.3
5	E	233	ILE	3.3
5	S	233	ILE	3.3
13	M	47	ASP	3.2
9	W	192	ASP	3.2
1	O	201	GLU	3.1
3	Q	240	GLU	3.1
3	C	225	GLU	3.1
6	T	181	GLU	3.1
8	H	198	GLU	3.1
1	A	231	LYS	3.1
2	B	60	THR	3.1
3	Q	52	LEU	3.1
3	Q	187	GLU	3.0
2	B	59	ASP	3.0
12	Z	167	LYS	3.0
5	S	227	GLU	3.0
4	D	242	GLU	3.0
3	C	180	LYS	3.0
6	T	180	PRO	3.0
7	G	242	GLN	2.9
8	V	145	ASP	2.9
7	U	206	GLY	2.9
7	U	2	GLY	2.9
1	O	50	LYS	2.9
5	S	194	GLU	2.9
14	N	195	GLN	2.9
3	Q	59	PRO	2.9
10	X	193	ASP	2.9
10	J	193	ASP	2.9
13	a	1	THR	2.9
3	Q	237	GLU	2.8
4	R	1	ASP	2.8
8	V	215	GLU	2.8
3	C	239	GLN	2.8
2	P	50	LYS	2.8

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
6	T	204	LYS	2.8
7	U	188	GLU	2.8
6	T	230	ASP	2.8
3	Q	37	LYS	2.8
3	Q	225	GLU	2.8
3	C	47	ARG	2.8
7	U	181	LYS	2.7
3	C	203	THR	2.7
3	Q	223	SER	2.7
7	U	51	PRO	2.7
5	S	201	ARG	2.7
2	P	222	GLY	2.7
3	C	235	GLU	2.7
1	A	229	THR	2.7
3	Q	203	THR	2.7
1	A	201	GLU	2.7
5	E	54	GLU	2.7
5	S	57	SER	2.7
6	T	201	GLU	2.7
6	F	202	ASP	2.7
4	D	241	ALA	2.6
6	T	241	LYS	2.6
1	O	248	GLU	2.6
5	S	173	ARG	2.6
2	B	242	GLY	2.6
8	V	219	ASN	2.6
5	E	173	ARG	2.6
8	H	219	ASN	2.6
4	D	125	LEU	2.6
5	E	227	GLU	2.6
2	P	230	LYS	2.6
3	C	216	ASP	2.6
5	E	217	LYS	2.6
1	A	248	GLU	2.6
6	T	205	GLU	2.6
4	D	1	ASP	2.5
11	Y	212	GLY	2.5
7	U	3	TYR	2.5
7	G	230	GLU	2.5
4	R	242	GLU	2.5
4	R	230	GLU	2.5
3	Q	180	LYS	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
3	C	175	LYS	2.4
8	H	196	ARG	2.4
3	C	48	SER	2.4
3	Q	48	SER	2.4
6	F	180	PRO	2.4
3	Q	60	SER	2.4
9	W	131	GLU	2.4
3	Q	175	LYS	2.4
3	Q	229	GLN	2.4
5	S	30	GLN	2.4
1	A	250	LEU	2.4
1	A	54	PRO	2.4
12	Z	162	PRO	2.4
5	E	201	ARG	2.4
4	D	201	GLU	2.4
7	G	208	GLU	2.3
5	E	210	LEU	2.3
8	V	217	ILE	2.3
5	E	203	GLU	2.3
14	N	105	LYS	2.3
5	S	51	ASN	2.3
13	a	216	ASN	2.3
5	E	123	GLY	2.3
6	T	198	LEU	2.3
6	F	228	LYS	2.3
10	X	24	GLY	2.3
8	H	207	ARG	2.2
3	Q	1	GLY	2.2
13	M	82	ASP	2.2
5	E	3	ASN	2.2
1	O	52	SER	2.2
5	S	165	GLN	2.2
2	P	182	ASP	2.2
6	F	2	THR	2.2
8	H	22	GLN	2.2
5	S	210	LEU	2.2
7	G	179	LYS	2.2
5	S	163	ARG	2.2
5	S	203	GLU	2.2
8	H	145	ASP	2.2
11	Y	106	ARG	2.1
1	O	203	GLU	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	O	229	THR	2.1
6	T	239	ALA	2.1
1	A	203	GLU	2.1
2	B	230	LYS	2.1
3	Q	233	GLN	2.1
3	C	60	SER	2.1
6	F	241	LYS	2.1
7	U	203	ASP	2.1
7	G	240	ALA	2.1
7	U	219	ALA	2.1
3	Q	46	ARG	2.1
6	T	2	THR	2.1
3	C	233	GLN	2.1
12	L	1	GLN	2.1
8	H	225	GLU	2.1
5	S	207	VAL	2.1
13	M	1	THR	2.1
3	C	229	GLN	2.1
11	K	212	GLY	2.1
3	Q	47	ARG	2.1
7	G	181	LYS	2.1
3	C	59	PRO	2.0
7	G	2	GLY	2.0
12	Z	210	ASP	2.0
1	O	177	LYS	2.0
5	S	171	LEU	2.0
5	S	225	ASP	2.0
5	E	117	LYS	2.0
12	L	172	LEU	2.0
12	Z	173	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

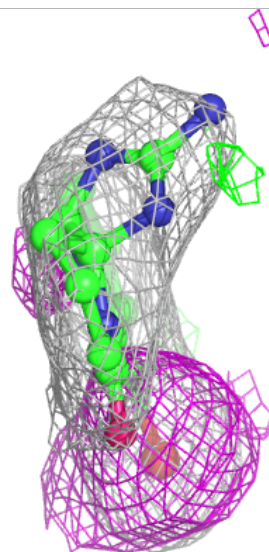
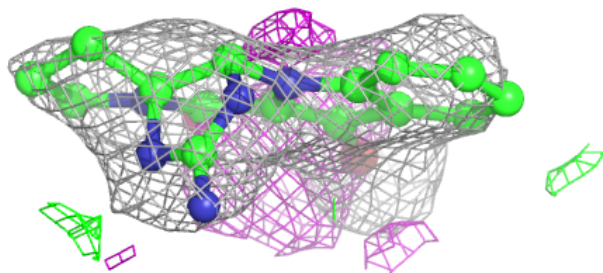
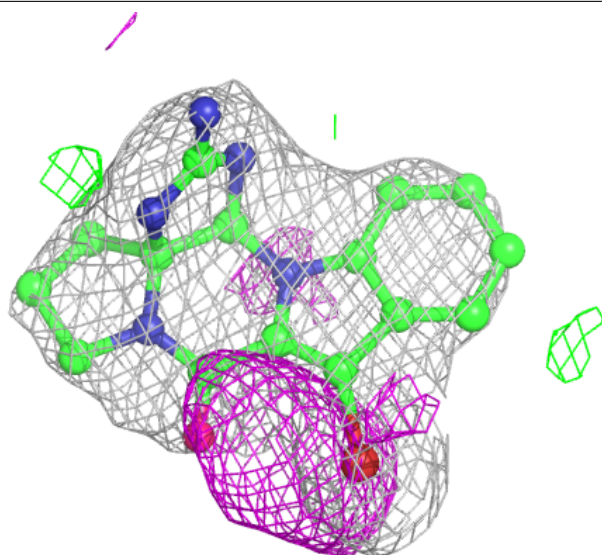
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

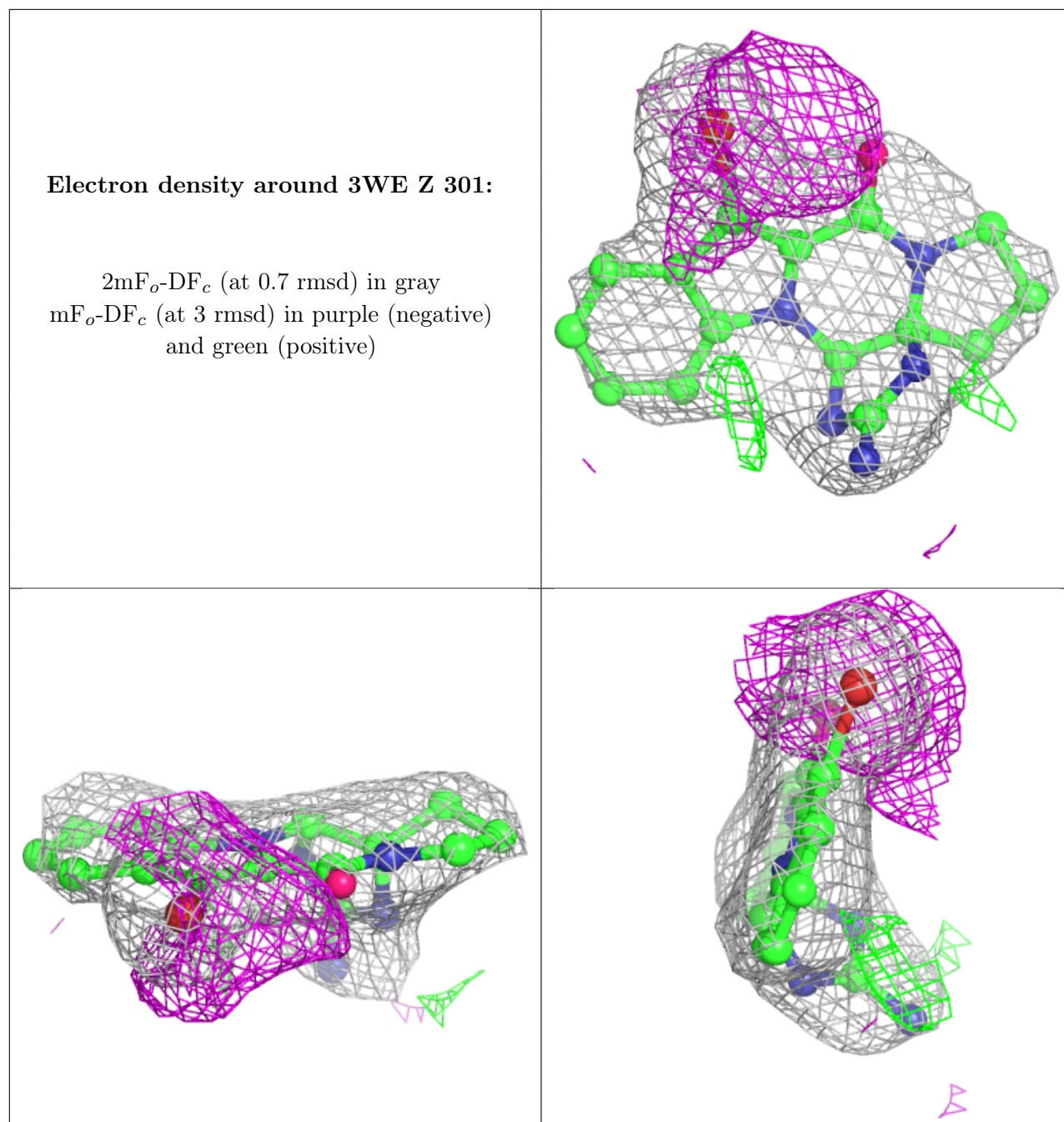
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
15	MG	N	201	1/1	0.47	0.36	65,65,65,65	0
15	MG	G	301	1/1	0.70	0.14	66,66,66,66	0
15	MG	Z	302	1/1	0.73	0.45	101,101,101,101	0
15	MG	N	202	1/1	0.80	0.20	73,73,73,73	0
16	3WE	L	301	22/22	0.83	0.24	73,89,98,115	0
16	3WE	Z	301	22/22	0.85	0.22	73,84,97,120	0
15	MG	W	301	1/1	0.92	0.06	64,64,64,64	0
15	MG	K	301	1/1	0.94	0.08	53,53,53,53	0
15	MG	I	301	1/1	0.97	0.08	70,70,70,70	0
15	MG	Y	301	1/1	0.99	0.11	49,49,49,49	0
15	MG	V	301	1/1	0.99	0.05	55,55,55,55	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 3WE L 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.