



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2018 – 08:30 am GMT

PDB ID : 4QWL  
Title : yCP beta5-A50V mutant in complex with carfilzomib  
Authors : Huber, E.M.; Heinemeyer, W.; Groll, M.  
Deposited on : 2014-07-16  
Resolution : 2.60 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.7.3 (157068), CSD as539be (2018)  
Xtriage (Phenix) : 1.13  
EDS : trunk31020  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Refmac : 5.8.0158  
CCP4 : 7.0 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk31020

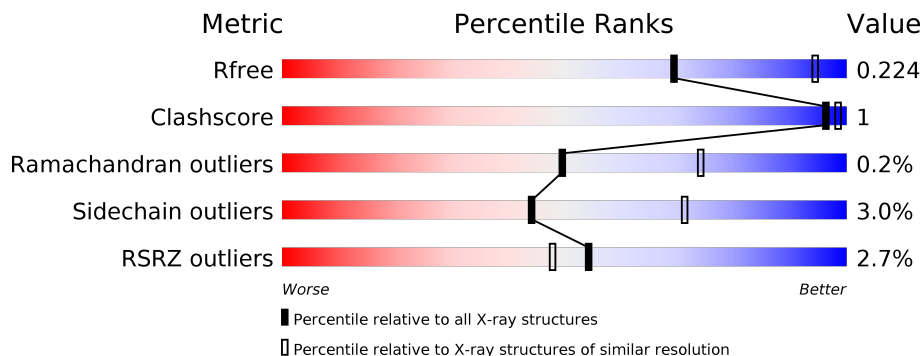
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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))
$R_{free}$	111664	2767 (2.60-2.60)
Clashscore	122126	3110 (2.60-2.60)
Ramachandran outliers	120053	3062 (2.60-2.60)
Sidechain outliers	120020	3062 (2.60-2.60)
RSRZ outliers	108989	2706 (2.60-2.60)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	<p>3% 98%</p>
1	O	250	<p>4% 99%</p>
2	B	258	<p>5% 90% 5%</p>
2	P	258	<p>4% 90% 5%</p>
3	C	254	<p>6% 90% 6%</p>
3	Q	254	<p>10% 89% 6%</p>

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Mol	Chain	Length	Quality of chain
4	D	260	
4	R	260	
5	E	234	
5	S	234	
6	F	288	
6	T	288	
7	G	252	
7	U	252	
8	H	232	
8	V	232	
9	I	205	
9	W	205	
10	J	198	
10	X	198	
11	K	212	
11	Y	212	
12	L	222	
12	Z	222	
13	M	246	
13	a	246	
14	N	196	
14	b	196	

## 2 Entry composition

There are 19 unique types of molecules in this entry. The entry contains 50299 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 1915	C 1219	N 315	O 377	S 4	0	0	0
1	O	250	Total 1915	C 1219	N 315	O 377	S 4	0	0	0

- 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 1904	C 1201	N 321	O 379	S 3	0	0	0
2	P	244	Total 1904	C 1201	N 321	O 379	S 3	0	0	0

- 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 1881	C 1176	N 329	O 372	S 4	0	0	0
3	Q	240	Total 1881	C 1176	N 329	O 372	S 4	0	0	0

- 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 1813	C 1136	N 304	O 366	S 7	0	0	0
4	R	235	Total 1813	C 1136	N 304	O 366	S 7	0	0	0

- 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 1906	C 1214	N 320	O 364	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	222	Total 1684	C 1061	N 293	O 323	S 7	0	0	0
8	V	222	Total 1684	C 1061	N 293	O 323	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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
11	K	212	1646	1047	280	312	7	0	0	0
11	Y	212	1646	1047	280	312	7	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	50	VAL	ALA	ENGINEERED MUTATION	UNP P30656
Y	50	VAL	ALA	ENGINEERED MUTATION	UNP P30656

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

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

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

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

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

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

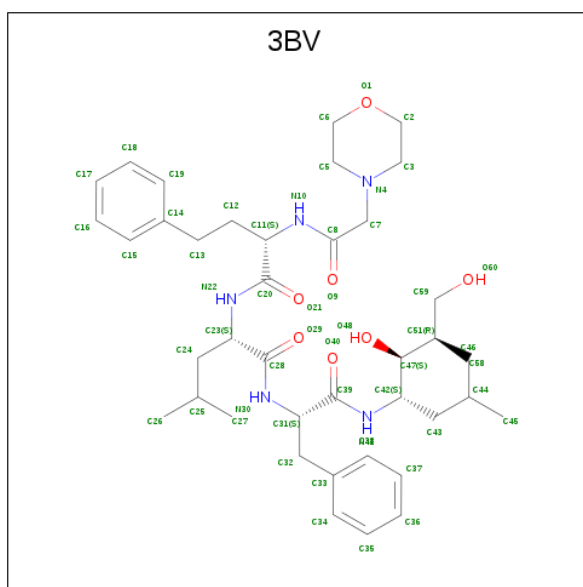
- Molecule 15 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

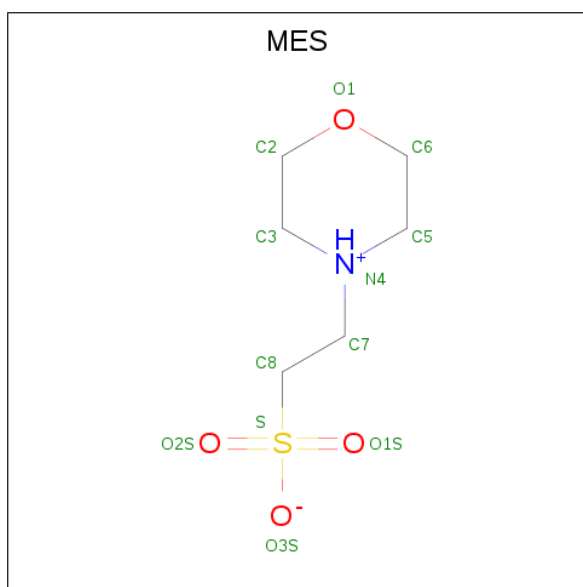
- Molecule 17 is N-{(2S)-2-[(morpholin-4-ylacetyl)amino]-4-phenylbutanoyl}-L-leucyl-N-[(2R,3S,4S)-1,3-dihydroxy-2,6-dimethylheptan-4-yl]-L-phenylalaninamide (three-letter code: 3BV) (formula: C<sub>40</sub>H<sub>61</sub>N<sub>5</sub>O<sub>7</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
17	H	1	Total	C	N	O	0	0
			52	40	5	7		
17	K	1	Total	C	N	O	0	0
			52	40	5	7		
17	N	1	Total	C	N	O	0	0
			52	40	5	7		
17	V	1	Total	C	N	O	0	0
			52	40	5	7		
17	Y	1	Total	C	N	O	0	0
			52	40	5	7		
17	b	1	Total	C	N	O	0	0
			52	40	5	7		

- Molecule 18 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).





Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
18	K	1	12	6	1	4	1	0	0
18	X	1	12	6	1	4	1	0	0

- Molecule 19 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
19	A	26	Total	O	0	0
			26	26		
19	B	22	Total	O	0	0
			22	22		
19	C	19	Total	O	0	0
			19	19		
19	D	19	Total	O	0	0
			19	19		
19	E	6	Total	O	0	0
			6	6		
19	F	14	Total	O	0	0
			14	14		
19	G	33	Total	O	0	0
			33	33		
19	H	24	Total	O	0	0
			24	24		
19	I	22	Total	O	0	0
			22	22		
19	J	31	Total	O	0	0
			31	31		

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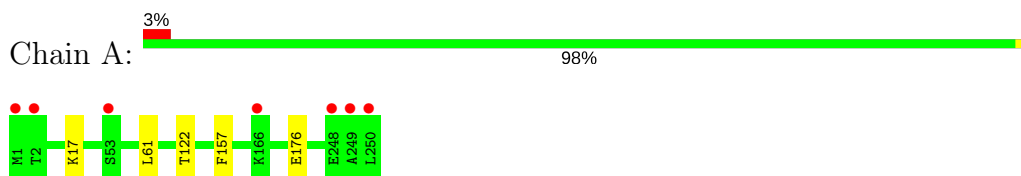
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
19	K	47	Total 47	O 47	0	0
19	L	29	Total 29	O 29	0	0
19	M	33	Total 33	O 33	0	0
19	N	28	Total 28	O 28	0	0
19	O	14	Total 14	O 14	0	0
19	P	22	Total 22	O 22	0	0
19	Q	16	Total 16	O 16	0	0
19	R	5	Total 5	O 5	0	0
19	S	6	Total 6	O 6	0	0
19	T	16	Total 16	O 16	0	0
19	U	25	Total 25	O 25	0	0
19	V	25	Total 25	O 25	0	0
19	W	26	Total 26	O 26	0	0
19	X	31	Total 31	O 31	0	0
19	Y	23	Total 23	O 23	0	0
19	Z	25	Total 25	O 25	0	0
19	a	34	Total 34	O 34	0	0
19	b	31	Total 31	O 31	0	0

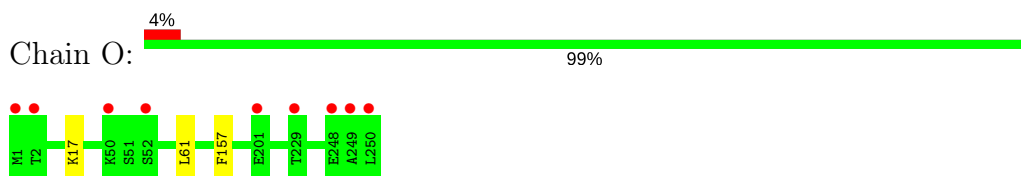
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

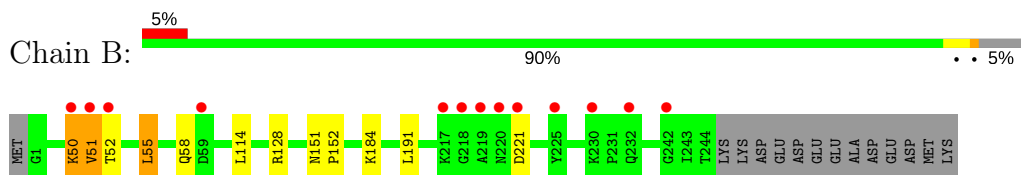
- Molecule 1: Proteasome subunit alpha type-2



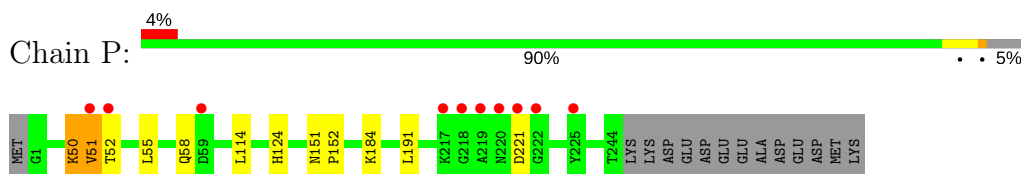
- Molecule 1: Proteasome subunit alpha type-2



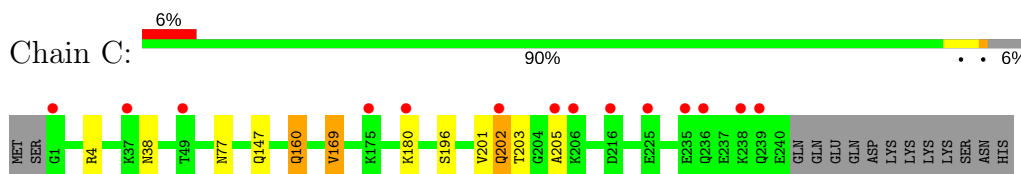
- Molecule 2: Proteasome subunit alpha type-3



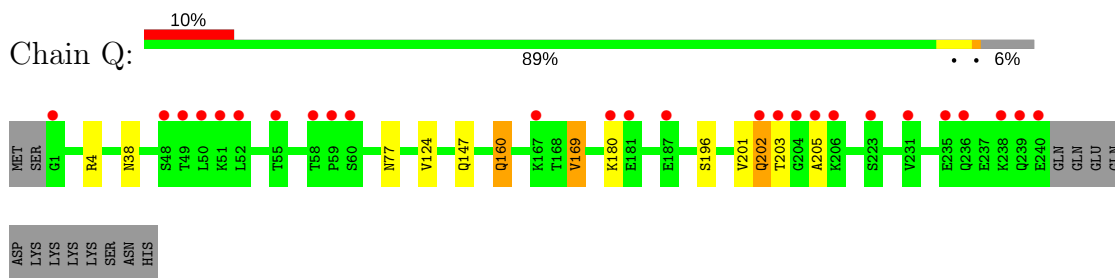
- Molecule 2: Proteasome subunit alpha type-3



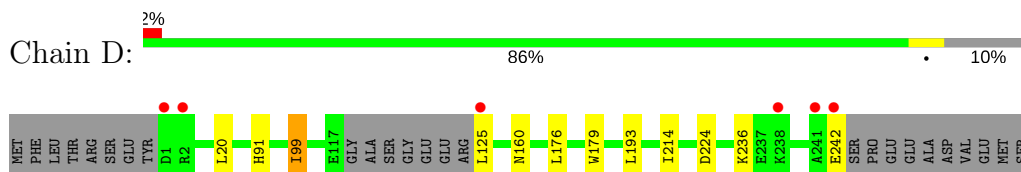
- Molecule 3: Proteasome subunit alpha type-4



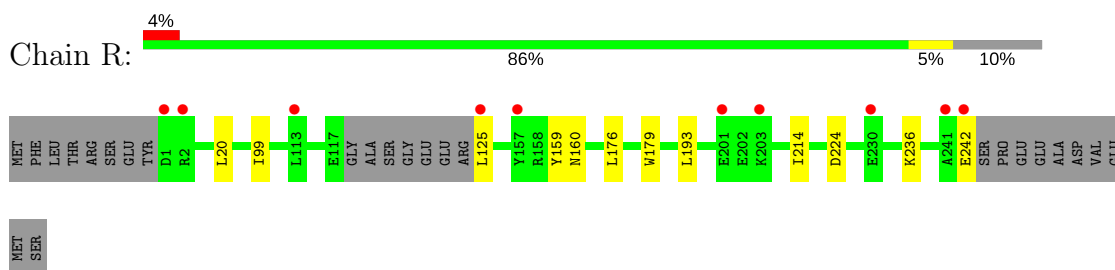
- Molecule 3: Proteasome subunit alpha type-4



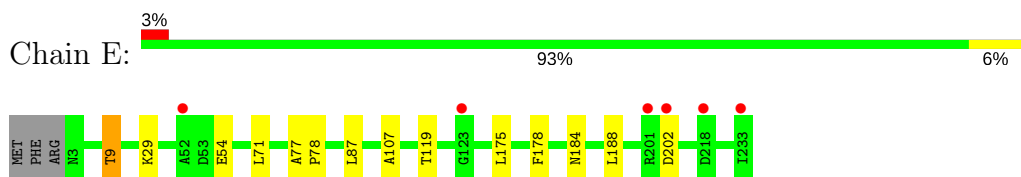
- Molecule 4: Proteasome subunit alpha type-5



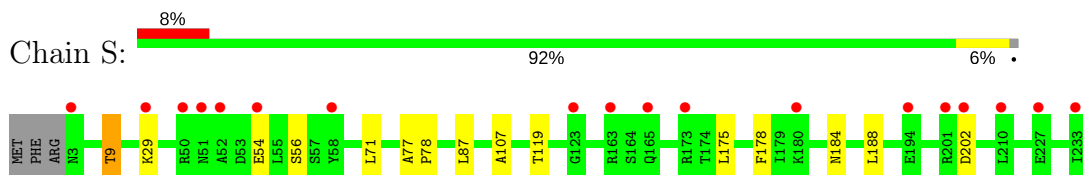
- Molecule 4: Proteasome subunit alpha type-5



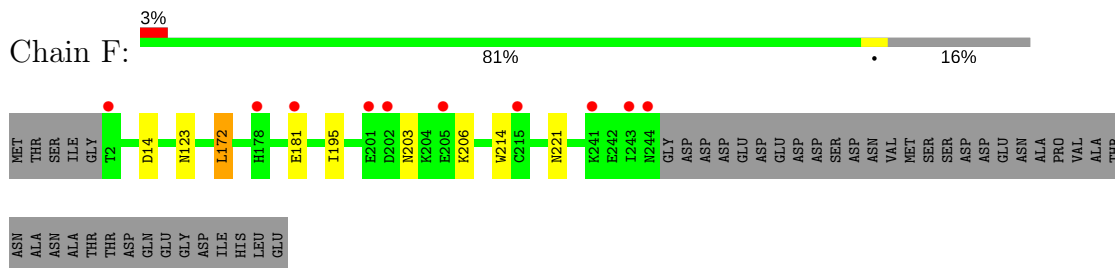
- Molecule 5: Proteasome subunit alpha type-6



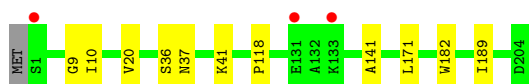
- Molecule 5: Proteasome subunit alpha type-6



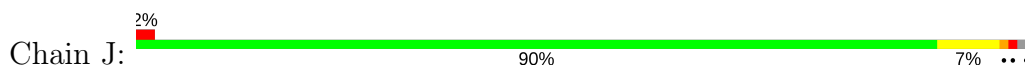
- Molecule 6: Probable proteasome subunit alpha type-7



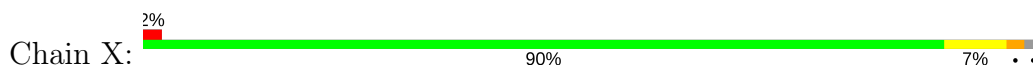




- Molecule 10: Proteasome subunit beta type-4



- Molecule 10: Proteasome subunit beta type-4



- Molecule 11: Proteasome subunit beta type-5



- Molecule 11: Proteasome subunit beta type-5



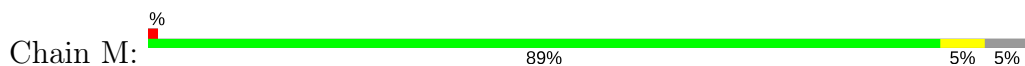
- Molecule 12: Proteasome subunit beta type-6

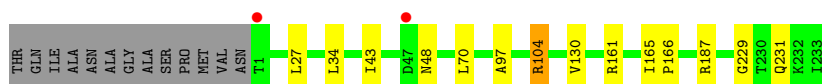


- Molecule 12: Proteasome subunit beta type-6

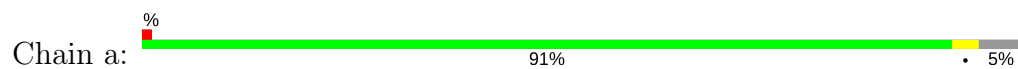


- Molecule 13: Proteasome subunit beta type-7

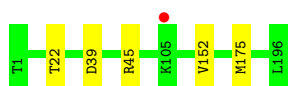




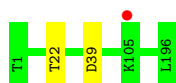
- Molecule 13: Proteasome subunit beta type-7



- 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, $\alpha$ , $\beta$ , $\gamma$	134.48Å 300.28Å 143.96Å 90.00° 112.71° 90.00°	Depositor
Resolution (Å)	15.00 – 2.60 15.00 – 2.60	Depositor EDS
% Data completeness (in resolution range)	98.4 (15.00-2.60) 98.4 (15.00-2.60)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.09 (at 2.61Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.193 , 0.219 0.200 , 0.224	Depositor DCC
$R_{free}$ test set	15715 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	49.1	Xtrriage
Anisotropy	0.130	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 44.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	50299	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	61.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.39% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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: MG, 3BV, MES, CL

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	0.46	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	0.50	0/2586
3	Q	0.27	0/1910	0.50	0/2586
4	D	0.27	0/1837	0.47	0/2475
4	R	0.27	0/1837	0.46	0/2475
5	E	0.27	0/1800	0.46	0/2433
5	S	0.27	0/1800	0.47	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	0/1944	0.46	0/2632
8	H	0.25	0/1715	0.46	0/2326
8	V	0.25	0/1715	0.46	0/2326
9	I	0.27	0/1611	0.47	0/2174
9	W	0.27	0/1611	0.47	0/2174
10	J	0.27	0/1589	0.51	1/2142 (0.0%)
10	X	0.28	0/1589	0.48	0/2142
11	K	0.26	0/1683	0.48	0/2277
11	Y	0.26	0/1683	0.48	0/2277
12	L	0.27	0/1795	0.47	0/2420
12	Z	0.27	0/1795	0.47	0/2420
13	M	0.28	0/1855	0.51	0/2514
13	a	0.27	0/1855	0.51	0/2514
14	N	0.26	0/1541	0.47	0/2087
14	b	0.26	0/1541	0.47	0/2087
All	All	0.27	0/50197	0.48	1/67872 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	J	23	ARG	NE-CZ-NH1	-5.30	117.65	120.30

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	2	0
1	O	1915	0	1929	0	0
2	B	1904	0	1904	4	0
2	P	1904	0	1904	3	0
3	C	1881	0	1895	4	0
3	Q	1881	0	1895	5	0
4	D	1813	0	1797	2	0
4	R	1813	0	1797	2	0
5	E	1773	0	1775	4	0
5	S	1773	0	1775	5	0
6	F	1892	0	1883	1	0
6	T	1892	0	1883	1	0
7	G	1907	0	1901	4	0
7	U	1906	0	1901	4	0
8	H	1684	0	1685	1	0
8	V	1684	0	1685	1	0
9	I	1581	0	1574	3	0
9	W	1581	0	1574	5	0
10	J	1561	0	1569	16	0
10	X	1561	0	1569	10	0
11	K	1646	0	1597	4	0
11	Y	1646	0	1597	7	0
12	L	1757	0	1711	4	0
12	Z	1757	0	1711	5	0
13	M	1824	0	1832	4	0
13	a	1824	0	1832	0	0
14	N	1512	0	1478	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
14	b	1512	0	1478	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	Y	1	0	0	0	0
15	Z	1	0	0	0	0
16	G	1	0	0	0	0
16	N	1	0	0	1	0
16	U	1	0	0	0	0
16	b	1	0	0	0	0
17	H	52	0	59	1	0
17	K	52	0	59	0	0
17	N	52	0	59	1	0
17	V	52	0	59	1	0
17	Y	52	0	59	2	0
17	b	52	0	59	0	0
18	K	12	0	13	0	0
18	X	12	0	13	0	0
19	A	26	0	0	0	0
19	B	22	0	0	0	0
19	C	19	0	0	0	0
19	D	19	0	0	0	0
19	E	6	0	0	0	0
19	F	14	0	0	0	0
19	G	33	0	0	0	0
19	H	24	0	0	0	0
19	I	22	0	0	0	0
19	J	31	0	0	1	0
19	K	47	0	0	0	0
19	L	29	0	0	0	0
19	M	33	0	0	0	0
19	N	28	0	0	0	0
19	O	14	0	0	0	0
19	P	22	0	0	0	0
19	Q	16	0	0	0	0
19	R	5	0	0	0	0
19	S	6	0	0	0	0
19	T	16	0	0	0	0
19	U	25	0	0	0	0
19	V	25	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
19	W	26	0	0	0	0
19	X	31	0	0	1	0
19	Y	23	0	0	1	0
19	Z	25	0	0	0	0
19	a	34	0	0	0	0
19	b	31	0	0	0	0
All	All	50299	0	49440	96	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 (96) 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)
10:J:22:THR:O	10:J:23:ARG:HD2	1.29	1.23
10:J:22:THR:C	10:J:23:ARG:HD2	1.63	1.18
10:J:22:THR:O	10:J:23:ARG:CD	2.14	0.95
10:J:23:ARG:CG	10:J:23:ARG:HH21	2.04	0.70
10:J:23:ARG:HD2	10:J:23:ARG:N	2.00	0.69
10:J:23:ARG:HH21	10:J:23:ARG:HG2	1.60	0.67
12:L:13:LEU:HD13	12:L:150:LEU:HD21	1.79	0.65
12:Z:13:LEU:HD13	12:Z:150:LEU:HD21	1.79	0.64
11:K:100:MET:HE3	11:K:127:PHE:HB2	1.84	0.59
11:Y:100:MET:HE3	11:Y:127:PHE:HB2	1.88	0.56
7:G:23:PHE:O	7:G:26:THR:HB	2.08	0.54
7:U:23:PHE:O	7:U:26:THR:HB	2.07	0.54
11:Y:5:ALA:HB3	11:Y:100:MET:HE2	1.88	0.53
17:Y:301:3BV:H62	17:Y:301:3BV:H55	1.57	0.52
17:V:301:3BV:O48	17:V:301:3BV:O60	2.26	0.52
10:X:67:TYR:CE1	10:X:75:LEU:HD13	2.45	0.52
3:C:169:VAL:HG23	3:C:196:SER:HB2	1.92	0.51
3:Q:169:VAL:HG23	3:Q:196:SER:HB2	1.92	0.51
10:X:16:ALA:HB2	10:X:161:LEU:HD21	1.92	0.51
10:J:67:TYR:CE1	10:J:75:LEU:HD13	2.45	0.51
5:S:87:LEU:HD21	5:S:107:ALA:HB1	1.93	0.51
3:Q:201:VAL:O	3:Q:202:GLN:CB	2.59	0.51
10:J:16:ALA:HB2	10:J:161:LEU:HD21	1.92	0.51
11:K:5:ALA:HB3	11:K:100:MET:HE2	1.92	0.51
3:C:201:VAL:O	3:C:202:GLN:CB	2.59	0.50
5:E:87:LEU:HD21	5:E:107:ALA:HB1	1.93	0.50
3:Q:160:GLN:HA	3:Q:160:GLN:HE21	1.78	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:160:GLN:HA	3:C:160:GLN:HE21	1.78	0.49
10:X:91:SER:HG	10:X:98:TYR:H	1.62	0.47
8:H:104:ASP:HB2	8:H:105:PRO:HD2	1.96	0.47
14:N:152:VAL:HA	14:N:175:MET:HE1	1.96	0.47
10:X:23:ARG:NH2	11:Y:118:ASP:OD2	2.48	0.47
9:I:10:ILE:HG21	9:I:141:ALA:HB3	1.97	0.47
11:K:100:MET:CE	11:K:127:PHE:HB2	2.45	0.47
10:X:36:ARG:NH1	10:X:58:GLU:OE2	2.49	0.46
8:V:104:ASP:HB2	8:V:105:PRO:HD2	1.96	0.46
10:J:93:ARG:NH1	19:J:205:HOH:O	2.48	0.46
11:Y:100:MET:CE	11:Y:127:PHE:HB2	2.45	0.46
10:J:174:MET:HA	10:X:174:MET:HA	1.97	0.46
4:D:160:ASN:HB3	4:D:179:TRP:CE2	2.51	0.46
17:H:301:3BV:O60	17:H:301:3BV:O48	2.27	0.45
9:I:20:VAL:HG13	9:I:118:PRO:HB3	1.99	0.45
4:R:159:TYR:CE2	5:S:56:SER:HB3	2.50	0.45
5:E:9:THR:HG21	5:E:119:THR:HA	1.99	0.45
9:I:9:GLY:HA3	9:I:41:LYS:HE2	1.99	0.45
9:W:10:ILE:HG21	9:W:141:ALA:HB3	1.97	0.45
10:J:91:SER:HG	10:J:98:TYR:H	1.62	0.45
4:R:160:ASN:HB3	4:R:179:TRP:CE2	2.51	0.45
5:S:9:THR:HG21	5:S:119:THR:HA	1.99	0.45
6:F:172:LEU:CD1	6:F:195:ILE:HD13	2.47	0.44
9:W:20:VAL:HG13	9:W:118:PRO:HB3	1.99	0.44
9:W:9:GLY:HA3	9:W:41:LYS:HE2	1.99	0.44
3:C:201:VAL:HG13	3:C:202:GLN:N	2.32	0.44
13:M:165:ILE:HB	13:M:166:PRO:HD3	1.99	0.44
3:Q:201:VAL:HG13	3:Q:202:GLN:N	2.32	0.44
6:T:172:LEU:CD1	6:T:195:ILE:HD13	2.47	0.44
1:A:176:GLU:HG2	2:B:55:LEU:HD13	2.00	0.43
10:J:23:ARG:CD	10:J:23:ARG:N	2.78	0.43
10:J:36:ARG:NH1	10:J:58:GLU:OE2	2.51	0.43
19:Y:419:HOH:O	12:Z:94:GLN:NE2	2.52	0.43
2:P:50:LYS:O	2:P:51:VAL:C	2.57	0.43
11:Y:5:ALA:HB3	11:Y:100:MET:CE	2.49	0.43
7:G:78:ILE:N	7:G:79:PRO:CD	2.82	0.42
13:M:27:LEU:HD21	13:M:34:LEU:HD22	2.00	0.42
14:N:45:ARG:NH2	16:N:204:CL:CL	2.81	0.42
9:W:36:SER:HB2	10:X:126:VAL:HG11	2.01	0.42
12:L:4:PRO:O	13:M:104:ARG:NH1	2.47	0.42
7:U:78:ILE:N	7:U:79:PRO:CD	2.82	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:J:22:THR:O	10:J:23:ARG:NE	2.52	0.42
11:K:5:ALA:HB3	11:K:100:MET:CE	2.49	0.42
7:U:26:THR:HG21	7:U:131:ILE:HD12	2.02	0.42
12:Z:8:ASN:HA	12:Z:30:ILE:O	2.19	0.42
2:P:124:HIS:HB3	3:Q:124:VAL:HG12	2.02	0.42
11:Y:50:VAL:HB	12:Z:130:SER:HB3	2.00	0.42
12:Z:147:MET:N	12:Z:148:PRO:HD2	2.35	0.42
10:J:173:PRO:HB3	10:X:22:THR:HG21	2.02	0.42
12:L:8:ASN:HA	12:L:30:ILE:O	2.20	0.42
2:P:151:ASN:HB2	2:P:152:PRO:CD	2.50	0.42
5:S:77:ALA:N	5:S:78:PRO:CD	2.83	0.41
4:D:91:HIS:HB3	4:D:99:ILE:CG2	2.50	0.41
5:S:175:LEU:HA	5:S:178:PHE:CE2	2.55	0.41
2:B:50:LYS:O	2:B:51:VAL:C	2.58	0.41
5:E:175:LEU:HA	5:E:178:PHE:CE2	2.55	0.41
5:E:77:ALA:N	5:E:78:PRO:CD	2.84	0.41
12:L:147:MET:N	12:L:148:PRO:HD2	2.35	0.41
10:X:93:ARG:NH1	19:X:312:HOH:O	2.53	0.41
7:G:26:THR:HG21	7:G:131:ILE:HD12	2.02	0.41
2:B:151:ASN:HB2	2:B:152:PRO:CD	2.50	0.41
1:A:122:THR:HG22	2:B:128:ARG:HH21	1.86	0.41
11:Y:170:TYR:O	17:Y:301:3BV:H57	2.21	0.41
7:G:149:ASP:HB2	7:G:150:PRO:CD	2.52	0.40
17:N:201:3BV:O48	17:N:201:3BV:O60	2.30	0.40
10:J:22:THR:HG21	10:X:173:PRO:HB3	2.03	0.40
13:M:97:ALA:HA	13:M:130:VAL:HG21	2.04	0.40
7:U:149:ASP:HB2	7:U:150:PRO:CD	2.52	0.40
9:W:20:VAL:HG23	9:W:189:ILE:HB	2.04	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%)	242 (98%)	6 (2%)	0	100	100
1	O	248/250 (99%)	242 (98%)	6 (2%)	0	100	100
2	B	242/258 (94%)	234 (97%)	6 (2%)	2 (1%)	21	42
2	P	242/258 (94%)	233 (96%)	7 (3%)	2 (1%)	21	42
3	C	238/254 (94%)	230 (97%)	6 (2%)	2 (1%)	21	42
3	Q	238/254 (94%)	230 (97%)	6 (2%)	2 (1%)	21	42
4	D	231/260 (89%)	227 (98%)	4 (2%)	0	100	100
4	R	231/260 (89%)	227 (98%)	4 (2%)	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%)	236 (98%)	5 (2%)	0	100	100
6	T	241/288 (84%)	236 (98%)	5 (2%)	0	100	100
7	G	239/252 (95%)	235 (98%)	4 (2%)	0	100	100
7	U	239/252 (95%)	235 (98%)	4 (2%)	0	100	100
8	H	220/232 (95%)	212 (96%)	8 (4%)	0	100	100
8	V	220/232 (95%)	212 (96%)	8 (4%)	0	100	100
9	I	202/205 (98%)	195 (96%)	7 (4%)	0	100	100
9	W	202/205 (98%)	195 (96%)	7 (4%)	0	100	100
10	J	193/198 (98%)	189 (98%)	3 (2%)	1 (0%)	31	56
10	X	193/198 (98%)	189 (98%)	3 (2%)	1 (0%)	31	56
11	K	210/212 (99%)	206 (98%)	4 (2%)	0	100	100
11	Y	210/212 (99%)	207 (99%)	3 (1%)	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%)	222 (96%)	7 (3%)	2 (1%)	19	38
13	a	231/246 (94%)	222 (96%)	7 (3%)	2 (1%)	19	38
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	6276/6614 (95%)	6108 (97%)	154 (2%)	14 (0%)	49	74

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	51	VAL
3	C	202	GLN
13	M	231	GLN
2	P	51	VAL
3	Q	202	GLN
13	a	231	GLN
10	J	2	ASP
10	X	2	ASP
3	C	205	ALA
3	Q	205	ALA
2	B	221	ASP
2	P	221	ASP
13	M	229	GLY
13	a	229	GLY

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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%)	69	87
1	O	209/209 (100%)	206 (99%)	3 (1%)	69	87
2	B	203/216 (94%)	196 (97%)	7 (3%)	40	67
2	P	203/216 (94%)	196 (97%)	7 (3%)	40	67
3	C	212/226 (94%)	204 (96%)	8 (4%)	36	63
3	Q	212/226 (94%)	204 (96%)	8 (4%)	36	63
4	D	194/215 (90%)	185 (95%)	9 (5%)	29	55
4	R	194/215 (90%)	185 (95%)	9 (5%)	29	55
5	E	190/193 (98%)	183 (96%)	7 (4%)	37	64
5	S	190/193 (98%)	183 (96%)	7 (4%)	37	64
6	F	201/239 (84%)	193 (96%)	8 (4%)	34	61
6	T	201/239 (84%)	193 (96%)	8 (4%)	34	61
7	G	206/210 (98%)	199 (97%)	7 (3%)	40	67
7	U	206/210 (98%)	199 (97%)	7 (3%)	40	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	H	181/190 (95%)	177 (98%)	4 (2%)	55	79
8	V	181/190 (95%)	177 (98%)	4 (2%)	55	79
9	I	172/173 (99%)	169 (98%)	3 (2%)	63	83
9	W	172/173 (99%)	169 (98%)	3 (2%)	63	83
10	J	173/175 (99%)	168 (97%)	5 (3%)	45	72
10	X	173/175 (99%)	168 (97%)	5 (3%)	45	72
11	K	170/170 (100%)	165 (97%)	5 (3%)	45	72
11	Y	170/170 (100%)	165 (97%)	5 (3%)	45	72
12	L	185/185 (100%)	179 (97%)	6 (3%)	42	69
12	Z	185/185 (100%)	179 (97%)	6 (3%)	42	69
13	M	199/208 (96%)	193 (97%)	6 (3%)	44	71
13	a	199/208 (96%)	193 (97%)	6 (3%)	44	71
14	N	162/162 (100%)	160 (99%)	2 (1%)	74	89
14	b	162/162 (100%)	160 (99%)	2 (1%)	74	89
All	All	5314/5542 (96%)	5154 (97%)	160 (3%)	44	71

All (160) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	17	LYS
1	A	61	LEU
1	A	157	PHE
2	B	50	LYS
2	B	52	THR
2	B	55	LEU
2	B	58	GLN
2	B	114	LEU
2	B	184	LYS
2	B	191	LEU
3	C	4	ARG
3	C	38	ASN
3	C	77	ASN
3	C	147	GLN
3	C	160	GLN
3	C	169	VAL
3	C	180	LYS
3	C	203	THR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	D	20	LEU
4	D	99	ILE
4	D	125	LEU
4	D	176	LEU
4	D	193	LEU
4	D	214	ILE
4	D	224	ASP
4	D	236	LYS
4	D	242	GLU
5	E	9	THR
5	E	29	LYS
5	E	54	GLU
5	E	71	LEU
5	E	184	ASN
5	E	188	LEU
5	E	202	ASP
6	F	14	ASP
6	F	123	ASN
6	F	172	LEU
6	F	181	GLU
6	F	203	ASN
6	F	206	LYS
6	F	214	TRP
6	F	221	ASN
7	G	83	ASN
7	G	115	LEU
7	G	125	MET
7	G	166	GLN
7	G	181	LYS
7	G	235	ARG
7	G	236	LEU
8	H	30	ASN
8	H	56	THR
8	H	68	LEU
8	H	196	ARG
9	I	37	ASN
9	I	171	LEU
9	I	182	TRP
10	J	23	ARG
10	J	75	LEU
10	J	78	GLN
10	J	144	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
10	J	174	MET
11	K	4	LEU
11	K	9	GLN
11	K	35	ILE
11	K	106	ARG
11	K	118	ASP
12	L	1	GLN
12	L	23	LEU
12	L	49	ASN
12	L	136	CYS
12	L	150	LEU
12	L	167	LYS
13	M	43	ILE
13	M	48	ASN
13	M	70	LEU
13	M	104	ARG
13	M	161	ARG
13	M	187	ARG
14	N	22	THR
14	N	39	ASP
1	O	17	LYS
1	O	61	LEU
1	O	157	PHE
2	P	50	LYS
2	P	52	THR
2	P	55	LEU
2	P	58	GLN
2	P	114	LEU
2	P	184	LYS
2	P	191	LEU
3	Q	4	ARG
3	Q	38	ASN
3	Q	77	ASN
3	Q	147	GLN
3	Q	160	GLN
3	Q	169	VAL
3	Q	180	LYS
3	Q	203	THR
4	R	20	LEU
4	R	99	ILE
4	R	125	LEU
4	R	176	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
4	R	193	LEU
4	R	214	ILE
4	R	224	ASP
4	R	236	LYS
4	R	242	GLU
5	S	9	THR
5	S	29	LYS
5	S	54	GLU
5	S	71	LEU
5	S	184	ASN
5	S	188	LEU
5	S	202	ASP
6	T	14	ASP
6	T	123	ASN
6	T	172	LEU
6	T	181	GLU
6	T	203	ASN
6	T	206	LYS
6	T	214	TRP
6	T	221	ASN
7	U	83	ASN
7	U	115	LEU
7	U	125	MET
7	U	166	GLN
7	U	181	LYS
7	U	235	ARG
7	U	236	LEU
8	V	30	ASN
8	V	56	THR
8	V	68	LEU
8	V	196	ARG
9	W	37	ASN
9	W	171	LEU
9	W	182	TRP
10	X	23	ARG
10	X	75	LEU
10	X	78	GLN
10	X	144	LEU
10	X	174	MET
11	Y	4	LEU
11	Y	9	GLN
11	Y	35	ILE

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Mol	Chain	Res	Type
11	Y	106	ARG
11	Y	118	ASP
12	Z	1	GLN
12	Z	23	LEU
12	Z	49	ASN
12	Z	136	CYS
12	Z	150	LEU
12	Z	167	LYS
13	a	43	ILE
13	a	48	ASN
13	a	70	LEU
13	a	104	ARG
13	a	161	ARG
13	a	187	ARG
14	b	22	THR
14	b	39	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (77) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	HIS
2	B	20	GLN
2	B	119	GLN
2	B	123	GLN
2	B	176	GLN
3	C	38	ASN
3	C	77	ASN
3	C	147	GLN
3	C	160	GLN
4	D	91	HIS
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	86	ASN
6	F	117	GLN
6	F	123	ASN
6	F	191	GLN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
6	F	240	GLN
7	G	83	ASN
7	G	117	GLN
7	G	121	GLN
9	I	37	ASN
10	J	55	GLN
11	K	85	ASN
11	K	176	ASN
12	L	3	ASN
12	L	70	ASN
12	L	79	HIS
12	L	95	HIS
12	L	158	ASN
13	M	48	ASN
13	M	102	GLN
13	M	194	ASN
13	M	213	GLN
1	O	94	HIS
2	P	119	GLN
2	P	123	GLN
2	P	176	GLN
3	Q	38	ASN
3	Q	147	GLN
3	Q	160	GLN
4	R	15	GLN
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	184	ASN
6	T	86	ASN
6	T	117	GLN
6	T	123	ASN
6	T	191	GLN
6	T	240	GLN
7	U	83	ASN
7	U	117	GLN
7	U	121	GLN
8	V	66	HIS

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Mol	Chain	Res	Type
9	W	203	GLN
10	X	55	GLN
11	Y	85	ASN
11	Y	176	ASN
12	Z	3	ASN
12	Z	70	ASN
12	Z	94	GLN
12	Z	158	ASN
13	a	48	ASN
13	a	102	GLN
13	a	108	ASN
13	a	194	ASN
13	a	213	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 carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

Of 20 ligands modelled in this entry, 12 are monoatomic - leaving 8 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	3BV	H	301	8	54,54,54	1.23	3 (5%)	67,71,71	1.54	9 (13%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
17	3BV	K	301	11	54,54,54	1.20	3 (5%)	67,71,71	1.85	13 (19%)
18	MES	K	303	-	12,12,12	2.24	1 (8%)	14,16,16	1.26	2 (14%)
17	3BV	N	201	14	54,54,54	1.30	4 (7%)	67,71,71	1.52	9 (13%)
17	3BV	V	301	8	54,54,54	1.21	3 (5%)	67,71,71	1.57	10 (14%)
18	MES	X	201	-	12,12,12	2.19	1 (8%)	14,16,16	1.37	2 (14%)
17	3BV	Y	301	11	54,54,54	1.22	3 (5%)	67,71,71	1.84	13 (19%)
17	3BV	b	201	14	54,54,54	1.27	4 (7%)	67,71,71	1.54	9 (13%)

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	3BV	H	301	8	-	0/59/67/67	0/3/3/3
17	3BV	K	301	11	-	0/59/67/67	0/3/3/3
18	MES	K	303	-	-	0/6/14/14	0/1/1/1
17	3BV	N	201	14	-	0/59/67/67	0/3/3/3
17	3BV	V	301	8	-	0/59/67/67	0/3/3/3
18	MES	X	201	-	-	0/6/14/14	0/1/1/1
17	3BV	Y	301	11	-	0/59/67/67	0/3/3/3
17	3BV	b	201	14	-	0/59/67/67	0/3/3/3

All (22) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
18	K	303	MES	C8-S	-7.46	1.66	1.77
18	X	201	MES	C8-S	-7.25	1.67	1.77
17	N	201	3BV	C32-C33	-4.50	1.40	1.51
17	H	301	3BV	C32-C33	-4.49	1.40	1.51
17	b	201	3BV	C32-C33	-4.46	1.40	1.51
17	V	301	3BV	C32-C33	-4.42	1.40	1.51
17	K	301	3BV	C32-C33	-4.40	1.40	1.51
17	Y	301	3BV	C32-C33	-4.39	1.40	1.51
17	Y	301	3BV	C13-C14	-4.07	1.39	1.51
17	K	301	3BV	C13-C14	-4.04	1.40	1.51
17	b	201	3BV	C13-C14	-3.94	1.40	1.51
17	N	201	3BV	C13-C14	-3.86	1.40	1.51
17	H	301	3BV	C13-C14	-3.31	1.42	1.51
17	V	301	3BV	C13-C14	-3.29	1.42	1.51
17	b	201	3BV	C59-C51	2.79	1.56	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	N	201	3BV	C59-C51	2.83	1.56	1.52
17	K	301	3BV	C51-C47	4.76	1.62	1.53
17	Y	301	3BV	C51-C47	4.92	1.62	1.53
17	b	201	3BV	C51-C47	5.13	1.62	1.53
17	V	301	3BV	C51-C47	5.34	1.63	1.53
17	H	301	3BV	C51-C47	5.41	1.63	1.53
17	N	201	3BV	C51-C47	5.54	1.63	1.53

All (67) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	Y	301	3BV	C43-C42-N41	-7.27	100.78	110.18
17	K	301	3BV	C43-C42-N41	-7.25	100.81	110.18
17	b	201	3BV	C43-C42-N41	-5.94	102.51	110.18
17	N	201	3BV	C43-C42-N41	-5.86	102.60	110.18
17	H	301	3BV	C43-C42-N41	-5.80	102.68	110.18
17	V	301	3BV	C43-C42-N41	-5.75	102.74	110.18
17	V	301	3BV	C58-C51-C59	-5.38	102.77	109.92
17	H	301	3BV	C58-C51-C59	-5.08	103.17	109.92
17	N	201	3BV	C58-C51-C59	-4.59	103.82	109.92
17	b	201	3BV	C58-C51-C59	-4.48	103.97	109.92
17	Y	301	3BV	C58-C51-C59	-4.39	104.09	109.92
17	K	301	3BV	C58-C51-C59	-4.27	104.25	109.92
17	Y	301	3BV	C6-C5-N4	-4.23	104.27	110.11
17	K	301	3BV	C6-C5-N4	-4.10	104.45	110.11
17	b	201	3BV	O1-C2-C3	-3.75	103.57	111.81
17	H	301	3BV	O1-C6-C5	-3.59	103.92	111.81
17	V	301	3BV	O1-C6-C5	-3.59	103.93	111.81
17	N	201	3BV	O1-C2-C3	-3.57	103.98	111.81
17	K	301	3BV	C33-C32-C31	-3.43	103.86	113.41
17	Y	301	3BV	C33-C32-C31	-3.39	103.96	113.41
17	K	301	3BV	C7-N4-C3	-3.35	105.77	111.11
17	H	301	3BV	C25-C24-C23	-3.35	106.02	115.46
17	b	201	3BV	C13-C12-C11	-3.34	106.41	113.18
17	N	201	3BV	C13-C12-C11	-3.29	106.51	113.18
17	V	301	3BV	C25-C24-C23	-3.27	106.24	115.46
17	Y	301	3BV	C7-N4-C3	-3.27	105.90	111.11
17	V	301	3BV	C33-C32-C31	-3.12	104.73	113.41
17	H	301	3BV	C33-C32-C31	-3.09	104.81	113.41
17	K	301	3BV	O1-C2-C3	-3.06	105.09	111.81
17	H	301	3BV	C13-C12-C11	-2.97	107.16	113.18
17	V	301	3BV	C13-C12-C11	-2.95	107.19	113.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	b	201	3BV	C12-C13-C14	-2.91	102.78	113.19
17	N	201	3BV	C12-C13-C14	-2.90	102.81	113.19
17	Y	301	3BV	C13-C12-C11	-2.87	107.35	113.18
17	b	201	3BV	C33-C32-C31	-2.83	105.55	113.41
17	K	301	3BV	C13-C12-C11	-2.77	107.55	113.18
17	N	201	3BV	C33-C32-C31	-2.76	105.72	113.41
17	Y	301	3BV	O1-C6-C5	-2.70	105.89	111.81
17	b	201	3BV	O1-C6-C5	-2.69	105.90	111.81
17	H	301	3BV	C6-C5-N4	-2.67	106.43	110.11
17	V	301	3BV	C6-C5-N4	-2.63	106.48	110.11
17	Y	301	3BV	O1-C2-C3	-2.62	106.05	111.81
17	K	301	3BV	O1-C6-C5	-2.60	106.11	111.81
17	N	201	3BV	O1-C6-C5	-2.57	106.18	111.81
17	Y	301	3BV	C24-C23-N22	-2.55	104.64	110.57
17	K	301	3BV	C24-C23-N22	-2.53	104.67	110.57
17	V	301	3BV	C2-C3-N4	-2.52	106.63	110.11
17	Y	301	3BV	C39-C31-N30	-2.39	104.64	111.18
17	b	201	3BV	C7-N4-C5	-2.37	107.33	111.11
17	K	301	3BV	C11-C20-N22	-2.37	111.55	116.77
17	K	301	3BV	C39-C31-N30	-2.35	104.75	111.18
17	H	301	3BV	C2-C3-N4	-2.34	106.87	110.11
17	Y	301	3BV	C11-C20-N22	-2.34	111.60	116.77
17	N	201	3BV	C7-N4-C5	-2.34	107.38	111.11
17	V	301	3BV	O60-C59-C51	-2.33	106.65	111.39
17	H	301	3BV	O1-C2-C3	-2.33	106.70	111.81
17	Y	301	3BV	C12-C13-C14	-2.32	104.89	113.19
17	V	301	3BV	O1-C2-C3	-2.30	106.75	111.81
17	K	301	3BV	C12-C13-C14	-2.27	105.07	113.19
17	b	201	3BV	C25-C24-C23	-2.23	109.16	115.46
17	N	201	3BV	C25-C24-C23	-2.23	109.16	115.46
18	K	303	MES	O2S-S-C8	2.02	109.35	106.92
18	X	201	MES	O2S-S-C8	2.36	109.75	106.92
18	K	303	MES	O1S-S-C8	2.76	110.24	106.92
18	X	201	MES	O1S-S-C8	2.97	110.49	106.92
17	Y	301	3BV	C7-N4-C5	5.38	119.69	111.11
17	K	301	3BV	C7-N4-C5	5.46	119.81	111.11

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	H	301	3BV	1	0
17	N	201	3BV	1	0
17	V	301	3BV	1	0
17	Y	301	3BV	2	0

## 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	250/250 (100%)	-0.35	7 (2%) 53 46	37, 52, 93, 143	0
1	O	250/250 (100%)	-0.26	9 (3%) 42 35	41, 59, 105, 144	0
2	B	244/258 (94%)	-0.15	13 (5%) 26 20	36, 57, 109, 166	0
2	P	244/258 (94%)	-0.18	10 (4%) 37 29	39, 60, 106, 160	0
3	C	240/254 (94%)	-0.07	14 (5%) 23 17	36, 61, 123, 162	0
3	Q	240/254 (94%)	0.25	26 (10%) 6 3	44, 81, 168, 213	0
4	D	235/260 (90%)	-0.33	6 (2%) 56 49	40, 60, 91, 140	0
4	R	235/260 (90%)	-0.13	10 (4%) 35 27	47, 67, 113, 172	0
5	E	231/234 (98%)	-0.18	6 (2%) 56 49	40, 64, 106, 151	0
5	S	231/234 (98%)	0.06	18 (7%) 13 9	44, 73, 131, 171	0
6	F	243/288 (84%)	-0.37	10 (4%) 37 29	36, 60, 115, 140	0
6	T	243/288 (84%)	-0.18	11 (4%) 33 26	39, 68, 129, 169	0
7	G	241/252 (95%)	-0.41	4 (1%) 70 65	37, 55, 96, 146	0
7	U	241/252 (95%)	-0.35	4 (1%) 70 65	38, 58, 92, 141	0
8	H	222/232 (95%)	-0.43	2 (0%) 84 81	39, 50, 91, 134	0
8	V	222/232 (95%)	-0.39	2 (0%) 84 81	36, 53, 87, 139	0
9	I	204/205 (99%)	-0.62	3 (1%) 73 69	31, 46, 79, 100	0
9	W	204/205 (99%)	-0.56	3 (1%) 73 69	31, 49, 79, 105	0
10	J	195/198 (98%)	-0.54	3 (1%) 73 69	31, 46, 76, 117	0
10	X	195/198 (98%)	-0.51	3 (1%) 73 69	33, 49, 79, 126	0
11	K	212/212 (100%)	-0.61	0 100 100	31, 47, 77, 90	0
11	Y	212/212 (100%)	-0.56	2 (0%) 84 81	34, 49, 82, 107	0
12	L	222/222 (100%)	-0.61	0 100 100	29, 49, 83, 112	0
12	Z	222/222 (100%)	-0.54	1 (0%) 90 89	32, 51, 85, 107	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
13	M	233/246 (94%)	-0.58	2 (0%) 84 81	29, 48, 71, 83	0
13	a	233/246 (94%)	-0.57	2 (0%) 84 81	31, 49, 74, 88	0
14	N	196/196 (100%)	-0.64	1 (0%) 90 89	30, 45, 73, 99	0
14	b	196/196 (100%)	-0.61	1 (0%) 90 89	32, 45, 77, 103	0
All	All	6336/6614 (95%)	-0.36	173 (2%) 54 48	29, 55, 107, 213	0

All (173) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	R	241	ALA	8.2
2	B	220	ASN	8.0
1	A	1	MET	7.6
3	Q	49	THR	7.2
3	Q	50	LEU	7.0
3	Q	206	LYS	6.9
5	S	202	ASP	6.7
2	P	219	ALA	6.5
8	V	222	ASP	6.5
1	O	1	MET	6.4
2	B	51	VAL	6.3
2	B	219	ALA	6.3
2	P	220	ASN	6.2
11	Y	212	GLY	5.9
10	X	1	MET	5.8
8	H	221	CYS	5.6
2	B	221	ASP	5.3
2	P	218	GLY	5.2
2	P	51	VAL	5.0
8	H	222	ASP	4.9
8	V	221	CYS	4.9
3	Q	51	LYS	4.7
5	E	202	ASP	4.6
2	P	221	ASP	4.5
3	Q	239	GLN	4.5
2	P	222	GLY	4.4
9	W	1	SER	4.3
4	D	242	GLU	4.3
10	J	1	MET	4.2
13	a	1	THR	4.2
3	Q	240	GLU	4.2
1	O	52	SER	4.2

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	S	54	GLU	4.1
3	Q	238	LYS	4.1
5	S	51	ASN	4.0
3	C	202	GLN	3.9
3	Q	48	SER	3.9
7	U	242	GLN	3.9
3	C	206	LYS	3.8
3	Q	204	GLY	3.8
6	T	2	THR	3.8
9	I	1	SER	3.7
2	P	59	ASP	3.7
5	E	233	ILE	3.7
3	Q	205	ALA	3.7
9	I	131	GLU	3.7
3	C	49	THR	3.6
3	Q	236	GLN	3.5
10	X	194	ASP	3.5
2	B	218	GLY	3.5
5	S	233	ILE	3.4
6	F	243	ILE	3.4
6	F	202	ASP	3.4
3	C	239	GLN	3.3
4	R	242	GLU	3.3
3	C	180	LYS	3.3
3	C	238	LYS	3.2
6	T	181	GLU	3.2
3	C	236	GLN	3.2
1	A	2	THR	3.2
4	R	1	ASP	3.1
1	O	201	GLU	3.1
5	S	173	ARG	3.1
3	C	1	GLY	3.1
9	W	131	GLU	3.1
9	W	133	LYS	3.0
3	Q	202	GLN	3.0
3	Q	235	GLU	3.0
1	O	249	ALA	3.0
6	F	244	ASN	2.9
3	C	235	GLU	2.9
6	F	241	LYS	2.9
3	C	225	GLU	2.9
2	P	225	TYR	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
14	b	105	LYS	2.9
5	S	52	ALA	2.9
6	F	181	GLU	2.8
4	D	241	ALA	2.8
3	Q	55	THR	2.8
6	F	205	GLU	2.8
6	T	205	GLU	2.8
10	X	193	ASP	2.8
5	S	58	TYR	2.7
13	M	1	THR	2.7
1	A	248	GLU	2.7
1	O	2	THR	2.7
11	Y	106	ARG	2.7
6	T	166	GLN	2.7
2	P	52	THR	2.7
4	R	125	LEU	2.6
6	T	244	ASN	2.6
4	R	113	LEU	2.6
3	Q	1	GLY	2.6
6	F	178	HIS	2.6
6	T	243	ILE	2.6
13	M	47	ASP	2.6
4	R	201	GLU	2.5
6	T	229	GLY	2.5
6	F	215	CYS	2.5
7	G	242	GLN	2.5
5	S	194	GLU	2.5
3	Q	60	SER	2.5
1	A	250	LEU	2.5
5	S	50	ARG	2.5
7	U	188	GLU	2.5
1	A	249	ALA	2.5
3	Q	58	THR	2.5
2	B	50	LYS	2.5
3	Q	59	PRO	2.5
1	O	250	LEU	2.5
10	J	194	ASP	2.5
3	C	37	LYS	2.4
10	J	193	ASP	2.4
3	Q	187	GLU	2.4
2	B	242	GLY	2.4
3	Q	167	LYS	2.4

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
5	S	180	LYS	2.4
7	G	68	ARG	2.4
4	D	1	ASP	2.4
5	E	218	ASP	2.4
4	R	203	LYS	2.4
6	T	230	ASP	2.4
1	O	248	GLU	2.4
5	E	201	ARG	2.4
4	D	2	ARG	2.3
6	F	201	GLU	2.3
1	O	50	LYS	2.3
2	B	59	ASP	2.3
9	I	133	LYS	2.3
4	R	230	GLU	2.3
5	S	210	LEU	2.3
14	N	105	LYS	2.3
7	G	222	ASP	2.3
6	T	178	HIS	2.3
4	R	2	ARG	2.3
3	Q	223	SER	2.3
6	T	201	GLU	2.3
5	S	201	ARG	2.3
2	B	217	LYS	2.3
3	Q	52	LEU	2.3
3	Q	203	THR	2.3
4	R	157	TYR	2.3
13	a	69	ASP	2.3
5	S	227	GLU	2.2
1	O	229	THR	2.2
2	B	52	THR	2.2
6	F	2	THR	2.2
5	E	123	GLY	2.2
2	P	217	LYS	2.2
3	C	216	ASP	2.2
3	C	205	ALA	2.2
4	D	238	LYS	2.2
12	Z	210	ASP	2.2
5	S	3	ASN	2.1
3	Q	231	VAL	2.1
5	S	123	GLY	2.1
5	E	52	ALA	2.1
1	A	53	SER	2.1

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Mol	Chain	Res	Type	RSRZ
2	B	230	LYS	2.1
3	Q	181	GLU	2.1
2	B	232	GLN	2.1
7	G	3	TYR	2.1
5	S	163	ARG	2.1
5	S	29	LYS	2.0
2	B	225	TYR	2.0
1	A	166	LYS	2.0
5	S	165	GLN	2.0
3	C	175	LYS	2.0
3	Q	180	LYS	2.0
4	D	125	LEU	2.0
7	U	3	TYR	2.0
6	T	53	LYS	2.0
7	U	51	PRO	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 carbohydrates 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q < 0.9
17	3BV	N	201	52/52	0.82	0.25	32,45,124,129	0
17	3BV	b	201	52/52	0.85	0.22	34,48,125,128	0
17	3BV	H	301	52/52	0.88	0.24	52,59,108,110	0
17	3BV	V	301	52/52	0.88	0.27	50,59,105,112	0
17	3BV	Y	301	52/52	0.89	0.19	33,43,100,107	0
17	3BV	K	301	52/52	0.90	0.19	33,42,101,107	0
15	MG	Z	301	1/1	0.91	0.22	62,62,62,62	0
18	MES	X	201	12/12	0.93	0.24	48,63,67,67	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
18	MES	K	303	12/12	0.94	0.23	47,66,68,69	0
15	MG	N	203	1/1	0.94	0.09	42,42,42,42	0
15	MG	N	202	1/1	0.96	0.10	45,45,45,45	0
15	MG	I	301	1/1	0.97	0.24	69,69,69,69	0
16	CL	N	204	1/1	0.97	0.10	40,40,40,40	0
16	CL	b	202	1/1	0.97	0.09	40,40,40,40	0
15	MG	Y	302	1/1	0.97	0.06	44,44,44,44	0
15	MG	V	302	1/1	0.98	0.06	55,55,55,55	0
15	MG	G	301	1/1	0.98	0.05	43,43,43,43	0
16	CL	U	301	1/1	0.99	0.13	41,41,41,41	0
16	CL	G	302	1/1	0.99	0.08	44,44,44,44	0
15	MG	K	302	1/1	0.99	0.08	49,49,49,49	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.