



wwPDB X-ray Structure Validation Summary Report ⓘ

Oct 8, 2023 – 03:30 AM EDT

PDB ID : 4QUX
Title : yCP beta5-A49T-mutant
Authors : Huber, E.M.; Heinemeyer, W.; Groll, M.
Deposited on : 2014-07-14
Resolution : 3.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary 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
Xtriage (Phenix) : 1.13
EDS : 2.35.1
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

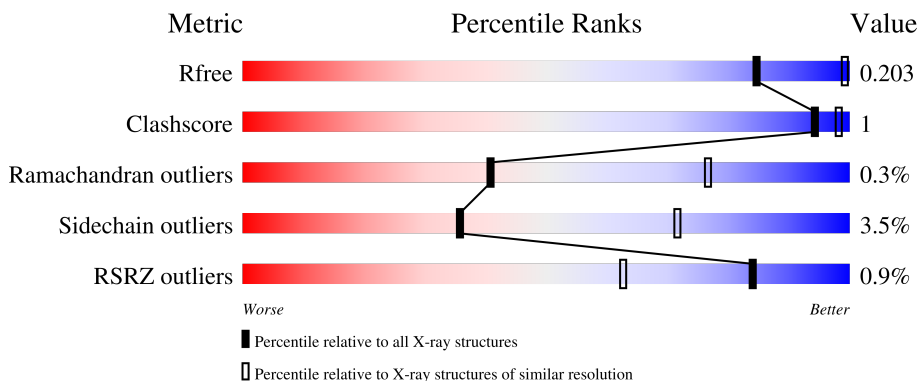
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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	 98%
1	O	250	 98%
2	B	258	 86% 8% 5%
2	P	258	 86% 8% 5% 3%
3	C	254	 86% 7% 6% 2%

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Mol	Chain	Length	Quality of chain
3	Q	254	2% 86% 7% 6%
4	D	260	85% 10%
4	R	260	85% 5% 10%
5	E	234	93% 6%
5	S	234	93% 6%
6	F	288	% 80% 5% 16%
6	T	288	% 80% 5% 16%
7	G	252	90% 6%
7	U	252	90% 6%
8	H	232	3% 92% 6%
8	V	232	3% 91% 6%
9	I	205	94% 6%
9	W	205	% 95% 5%
10	J	198	% 92% 6%
10	X	198	% 91% 6%
11	K	212	90% 8%
11	Y	212	91% 7%
12	L	222	96%
12	Z	222	97%
13	M	246	91% 5%
13	a	246	92% 5%
14	N	196	% 95%
14	b	196	% 98%

2 Entry composition [i](#)

There are 16 unique types of molecules in this entry. The entry contains 49639 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
5	E	231	Total	C	N	O	S	0	0	0
			1773	1114	307	348	4			
5	S	231	Total	C	N	O	S	0	0	0
			1773	1114	307	348	4			

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

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

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

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

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

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

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

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

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

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

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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	1046	280	313	7	0	0	0
11	Y	212	1646	1046	280	313	7	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
K	49	THR	ALA	engineered mutation	UNP P30656
Y	49	THR	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	I	1	Total Mg 1 1	0	0
15	J	1	Total Mg 1 1	0	0
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	Y	1	Total Mg 1 1	0	0
15	Z	1	Total Mg 1 1	0	0

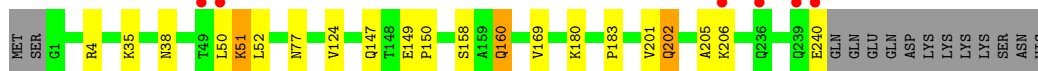
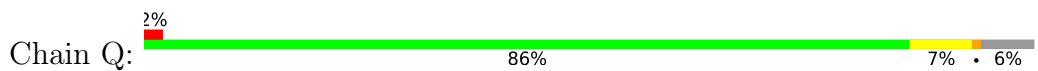
- Molecule 16 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
16	A	4	Total O 4 4	0	0
16	B	14	Total O 14 14	0	0
16	C	4	Total O 4 4	0	0
16	D	4	Total O 4 4	0	0
16	E	7	Total O 7 7	0	0
16	F	7	Total O 7 7	0	0
16	G	7	Total O 7 7	0	0
16	H	17	Total O 17 17	0	0
16	I	6	Total O 6 6	0	0
16	J	8	Total O 8 8	0	0
16	K	11	Total O 11 11	0	0
16	L	12	Total O 12 12	0	0

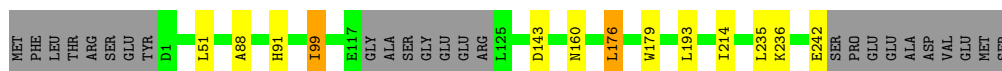
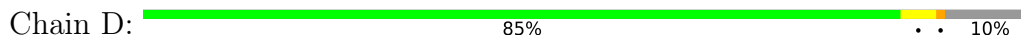
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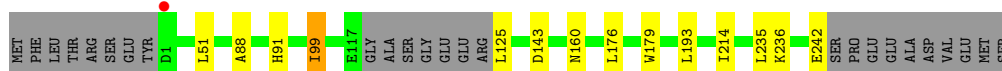
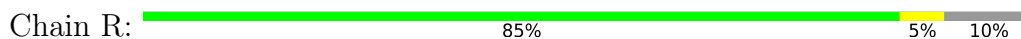
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
16	M	18	Total O 18 18	0	0
16	N	14	Total O 14 14	0	0
16	O	6	Total O 6 6	0	0
16	P	11	Total O 11 11	0	0
16	Q	9	Total O 9 9	0	0
16	R	4	Total O 4 4	0	0
16	S	5	Total O 5 5	0	0
16	T	8	Total O 8 8	0	0
16	U	5	Total O 5 5	0	0
16	V	14	Total O 14 14	0	0
16	W	5	Total O 5 5	0	0
16	X	7	Total O 7 7	0	0
16	Y	14	Total O 14 14	0	0
16	Z	12	Total O 12 12	0	0
16	a	13	Total O 13 13	0	0
16	b	14	Total O 14 14	0	0



● Molecule 4: Proteasome subunit alpha type-5



● Molecule 4: Proteasome subunit alpha type-5



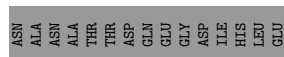
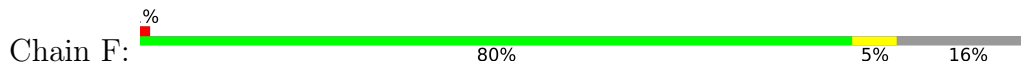
● Molecule 5: Proteasome subunit alpha type-6



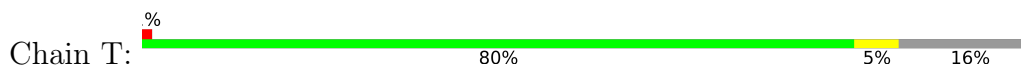
● Molecule 5: Proteasome subunit alpha type-6

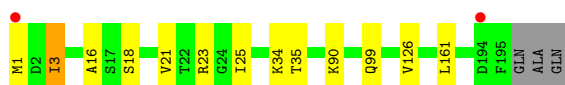
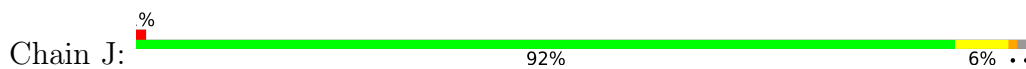


● Molecule 6: Probable proteasome subunit alpha type-7

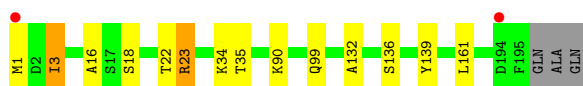
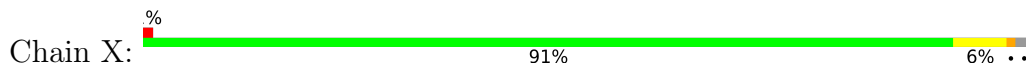


● Molecule 6: Probable proteasome subunit alpha type-7

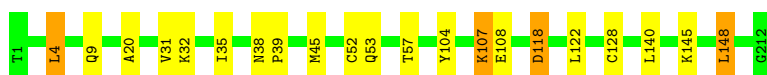
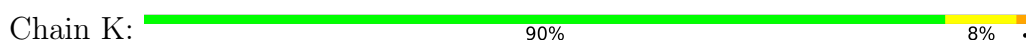




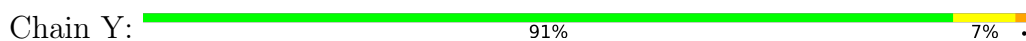
- Molecule 10: Proteasome subunit beta type-4



- 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

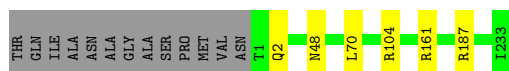


- Molecule 13: Proteasome subunit beta type-7



- Molecule 13: Proteasome subunit beta type-7

Chain a:  92% • 5%



• Molecule 14: Proteasome subunit beta type-1

Chain N:  95% ••



• Molecule 14: Proteasome subunit beta type-1

Chain b:  98% •



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	135.64Å 301.15Å 145.23Å 90.00° 112.89° 90.00°	Depositor
Resolution (Å)	15.00 – 3.00 15.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.5 (15.00-3.00) 99.5 (15.00-3.00)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.75 (at 3.01Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.168 , 0.197 0.174 , 0.203	Depositor DCC
R_{free} test set	10541 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	63.7	Xtrriage
Anisotropy	0.112	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 55.0	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	49639	wwPDB-VP
Average B, all atoms (Å ²)	69.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.44% 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: MG

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.27	0/1952	0.46	0/2642
1	O	0.27	0/1952	0.46	0/2642
2	B	0.28	0/1934	0.50	0/2618
2	P	0.28	0/1934	0.50	0/2618
3	C	0.27	0/1910	0.51	0/2586
3	Q	0.27	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	0.48	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	0/1945	0.47	0/2634
8	H	0.26	0/1750	0.47	0/2373
8	V	0.26	0/1750	0.47	0/2373
9	I	0.27	0/1611	0.48	0/2174
9	W	0.27	0/1611	0.48	0/2174
10	J	0.28	0/1589	0.49	0/2142
10	X	0.30	0/1589	0.49	0/2142
11	K	0.29	0/1683	0.51	1/2277 (0.0%)
11	Y	0.28	0/1683	0.51	0/2277
12	L	0.27	0/1795	0.48	0/2420
12	Z	0.27	0/1795	0.47	0/2420
13	M	0.27	0/1855	0.50	0/2514
13	a	0.27	0/1855	0.50	0/2514
14	N	0.26	0/1541	0.48	0/2087
14	b	0.26	0/1541	0.48	0/2087
All	All	0.27	0/50268	0.48	1/67968 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
11	K	4	LEU	CA-CB-CG	5.01	126.83	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	3	0
2	B	1904	0	1904	9	0
2	P	1904	0	1904	9	0
3	C	1881	0	1895	7	0
3	Q	1881	0	1895	6	0
4	D	1813	0	1797	4	0
4	R	1813	0	1797	3	0
5	E	1773	0	1775	4	0
5	S	1773	0	1775	2	0
6	F	1892	0	1883	4	0
6	T	1892	0	1883	4	0
7	G	1907	0	1901	4	0
7	U	1907	0	1901	4	0
8	H	1719	0	1719	8	0
8	V	1719	0	1719	8	0
9	I	1581	0	1574	6	0
9	W	1581	0	1574	4	0
10	J	1561	0	1569	8	0
10	X	1561	0	1569	10	0
11	K	1646	0	1597	11	0
11	Y	1646	0	1597	10	0
12	L	1757	0	1711	2	0
12	Z	1757	0	1711	1	0
13	M	1824	0	1832	1	0
13	a	1824	0	1832	0	0
14	N	1512	0	1481	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
14	b	1512	0	1481	0	0
15	G	1	0	0	0	0
15	I	1	0	0	0	0
15	J	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	A	4	0	0	0	0
16	B	14	0	0	0	0
16	C	4	0	0	0	0
16	D	4	0	0	0	0
16	E	7	0	0	0	0
16	F	7	0	0	0	0
16	G	7	0	0	0	0
16	H	17	0	0	0	0
16	I	6	0	0	0	0
16	J	8	0	0	0	0
16	K	11	0	0	0	0
16	L	12	0	0	0	0
16	M	18	0	0	0	0
16	N	14	0	0	0	0
16	O	6	0	0	0	0
16	P	11	0	0	2	0
16	Q	9	0	0	0	0
16	R	4	0	0	0	0
16	S	5	0	0	0	0
16	T	8	0	0	0	0
16	U	5	0	0	0	0
16	V	14	0	0	0	0
16	W	5	0	0	0	0
16	X	7	0	0	0	0
16	Y	14	0	0	0	0
16	Z	12	0	0	0	0
16	a	13	0	0	0	0
16	b	14	0	0	0	0
All	All	49639	0	49134	122	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.

The worst 5 of 122 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:52:THR:O	8:H:56:THR:HG23	1.60	1.01
8:V:52:THR:O	8:V:56:THR:HG23	1.60	1.00
10:X:22:THR:O	10:X:23:ARG:NH1	2.06	0.89
10:X:23:ARG:HH11	10:X:23:ARG:HA	1.49	0.76
11:Y:45:MET:HG2	11:Y:52:CYS:HB3	1.73	0.69

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	72
1	O	248/250 (99%)	239 (96%)	8 (3%)	1 (0%)	34	72
2	B	242/258 (94%)	233 (96%)	5 (2%)	4 (2%)	9	39
2	P	242/258 (94%)	233 (96%)	5 (2%)	4 (2%)	9	39
3	C	238/254 (94%)	233 (98%)	2 (1%)	3 (1%)	12	45
3	Q	238/254 (94%)	233 (98%)	2 (1%)	3 (1%)	12	45
4	D	231/260 (89%)	228 (99%)	3 (1%)	0	100	100
4	R	231/260 (89%)	228 (99%)	3 (1%)	0	100	100
5	E	229/234 (98%)	221 (96%)	8 (4%)	0	100	100
5	S	229/234 (98%)	221 (96%)	8 (4%)	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%)	236 (99%)	3 (1%)	0	100	100
7	U	239/252 (95%)	236 (99%)	3 (1%)	0	100	100
8	H	224/232 (97%)	217 (97%)	7 (3%)	0	100	100
8	V	224/232 (97%)	218 (97%)	6 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
9	I	202/205 (98%)	194 (96%)	8 (4%)	0	100	100
9	W	202/205 (98%)	195 (96%)	7 (4%)	0	100	100
10	J	193/198 (98%)	189 (98%)	4 (2%)	0	100	100
10	X	193/198 (98%)	189 (98%)	4 (2%)	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%)	224 (97%)	7 (3%)	0	100	100
13	a	231/246 (94%)	224 (97%)	7 (3%)	0	100	100
14	N	194/196 (99%)	190 (98%)	4 (2%)	0	100	100
14	b	194/196 (99%)	190 (98%)	4 (2%)	0	100	100
All	All	6284/6614 (95%)	6124 (98%)	144 (2%)	16 (0%)	41	76

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2	THR
2	B	51	VAL
2	B	222	GLY
3	C	202	GLN
1	O	2	THR

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	209/209 (100%)	206 (99%)	3 (1%)	67	88
1	O	209/209 (100%)	206 (99%)	3 (1%)	67	88
2	B	203/216 (94%)	197 (97%)	6 (3%)	41	75
2	P	203/216 (94%)	197 (97%)	6 (3%)	41	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	C	212/226 (94%)	201 (95%)	11 (5%)	23	59
3	Q	212/226 (94%)	201 (95%)	11 (5%)	23	59
4	D	194/215 (90%)	185 (95%)	9 (5%)	27	64
4	R	194/215 (90%)	184 (95%)	10 (5%)	23	59
5	E	190/193 (98%)	180 (95%)	10 (5%)	22	58
5	S	190/193 (98%)	180 (95%)	10 (5%)	22	58
6	F	201/239 (84%)	191 (95%)	10 (5%)	24	60
6	T	201/239 (84%)	191 (95%)	10 (5%)	24	60
7	G	206/210 (98%)	197 (96%)	9 (4%)	28	65
7	U	206/210 (98%)	197 (96%)	9 (4%)	28	65
8	H	185/190 (97%)	181 (98%)	4 (2%)	52	81
8	V	185/190 (97%)	181 (98%)	4 (2%)	52	81
9	I	172/173 (99%)	170 (99%)	2 (1%)	71	90
9	W	172/173 (99%)	170 (99%)	2 (1%)	71	90
10	J	173/175 (99%)	168 (97%)	5 (3%)	42	76
10	X	173/175 (99%)	168 (97%)	5 (3%)	42	76
11	K	170/170 (100%)	161 (95%)	9 (5%)	22	58
11	Y	170/170 (100%)	161 (95%)	9 (5%)	22	58
12	L	185/185 (100%)	180 (97%)	5 (3%)	44	77
12	Z	185/185 (100%)	180 (97%)	5 (3%)	44	77
13	M	199/208 (96%)	193 (97%)	6 (3%)	41	75
13	a	199/208 (96%)	193 (97%)	6 (3%)	41	75
14	N	162/162 (100%)	158 (98%)	4 (2%)	47	79
14	b	162/162 (100%)	158 (98%)	4 (2%)	47	79
All	All	5322/5542 (96%)	5135 (96%)	187 (4%)	36	71

5 of 187 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	R	125	LEU
7	U	26	THR
4	R	214	ILE
5	S	207	VAL
7	U	235	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 108 such sidechains are listed below:

Mol	Chain	Res	Type
2	P	58	GLN
5	S	68	HIS
12	Z	70	ASN
2	P	119	GLN
3	Q	147	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 9 ligands modelled in this entry, 9 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

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%)	-0.66	2 (0%) 86 65	46, 60, 99, 135	0
1	O	250/250 (100%)	-0.61	1 (0%) 92 79	50, 68, 114, 144	0
2	B	244/258 (94%)	-0.62	3 (1%) 79 54	43, 65, 108, 161	0
2	P	244/258 (94%)	-0.60	7 (2%) 51 23	50, 68, 108, 159	0
3	C	240/254 (94%)	-0.51	5 (2%) 63 34	47, 70, 128, 154	0
3	Q	240/254 (94%)	-0.40	6 (2%) 57 29	55, 81, 157, 186	0
4	D	235/260 (90%)	-0.65	0 100 100	52, 71, 102, 139	0
4	R	235/260 (90%)	-0.58	1 (0%) 92 79	52, 76, 116, 147	0
5	E	231/234 (98%)	-0.61	1 (0%) 92 79	52, 74, 111, 149	0
5	S	231/234 (98%)	-0.54	1 (0%) 92 79	54, 80, 119, 163	0
6	F	243/288 (84%)	-0.67	2 (0%) 86 65	48, 68, 117, 142	0
6	T	243/288 (84%)	-0.61	3 (1%) 79 54	49, 79, 133, 165	0
7	G	241/252 (95%)	-0.72	0 100 100	42, 63, 99, 144	0
7	U	241/252 (95%)	-0.64	0 100 100	49, 68, 104, 147	0
8	H	226/232 (97%)	-0.63	6 (2%) 54 26	40, 59, 92, 162	0
8	V	226/232 (97%)	-0.61	6 (2%) 54 26	46, 61, 89, 170	0
9	I	204/205 (99%)	-0.82	0 100 100	41, 57, 85, 113	0
9	W	204/205 (99%)	-0.79	2 (0%) 82 59	42, 58, 92, 118	0
10	J	195/198 (98%)	-0.76	2 (1%) 82 59	42, 57, 83, 134	0
10	X	195/198 (98%)	-0.76	2 (1%) 82 59	42, 59, 84, 143	0
11	K	212/212 (100%)	-0.77	0 100 100	38, 57, 80, 99	0
11	Y	212/212 (100%)	-0.77	1 (0%) 91 75	43, 58, 82, 101	0
12	L	222/222 (100%)	-0.76	1 (0%) 91 75	42, 60, 93, 133	0
12	Z	222/222 (100%)	-0.76	1 (0%) 91 75	42, 61, 95, 127	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9	
13	M	233/246 (94%)	-0.82	0	100 100	39, 59, 81, 103	0
13	a	233/246 (94%)	-0.79	0	100 100	40, 60, 81, 105	0
14	N	196/196 (100%)	-0.83	1 (0%)	91 75	41, 54, 84, 109	0
14	b	196/196 (100%)	-0.82	1 (0%)	91 75	42, 55, 84, 116	0
All	All	6344/6614 (95%)	-0.68	55 (0%)	84 63	38, 64, 109, 186	0

The worst 5 of 55 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
8	V	224	GLN	6.1
3	Q	49	THR	5.4
8	V	222	ASP	4.6
8	V	226	GLU	4.3
2	P	51	VAL	4.2

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
15	MG	J	201	1/1	0.96	0.33	68,68,68,68	0
15	MG	Z	301	1/1	0.96	0.11	55,55,55,55	0
15	MG	K	301	1/1	0.97	0.09	48,48,48,48	0
15	MG	N	201	1/1	0.97	0.11	49,49,49,49	0
15	MG	N	202	1/1	0.97	0.25	54,54,54,54	0
15	MG	G	301	1/1	0.97	0.05	63,63,63,63	0
15	MG	Y	301	1/1	0.98	0.09	55,55,55,55	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
15	MG	I	301	1/1	0.98	0.44	72,72,72,72	0
15	MG	V	301	1/1	0.99	0.08	72,72,72,72	0

6.5 Other polymers [i](#)

There are no such residues in this entry.