Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2025 – 01:06 am BST

PDB ID	:	6G8N / pdb_00006g8n
Title	:	Yeast 20S proteasome in complex with Cystargolide B Derivative 2
Authors	:	Groll, M.; Tello-Aburto, R.
Deposited on	:	2018-04-09
Resolution	:	3.00 Å(reported)

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

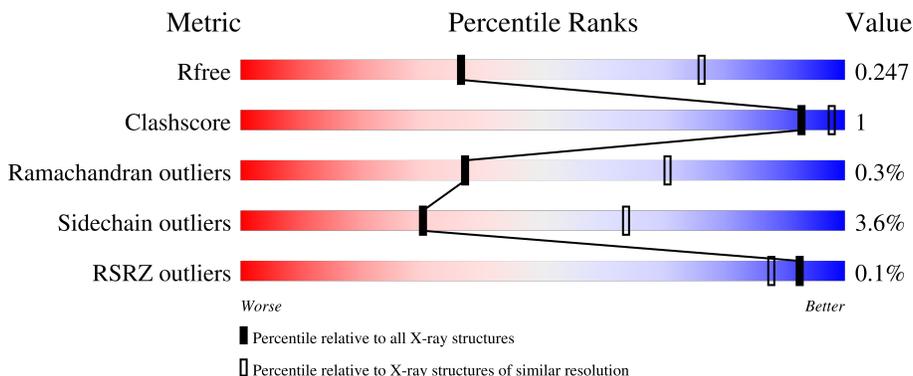|		
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

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	Percentile Ranks	Value
Rfree		0.247
Clashscore		1
Ramachandran outliers		0.3%
Sidechain outliers		3.6%
RSRZ outliers		0.1%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (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 <=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	96% •
1	O	250	96% •
2	B	258	87% 7% • 5%
2	P	258	88% 6% • 5%
3	C	254	87% 6% • 6%

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Mol	Chain	Length	Quality of chain
3	Q	254	87%　6%　6%
4	D	260	85%　5%　10%
4	R	260	85%　5%　10%
5	E	234	94%
5	S	234	94%
6	F	288	82%　16%
6	T	288	82%　16%
7	G	252	90%　5%
7	U	252	90%　5%
8	H	232	90%　7%
8	V	232	89%　7%
9	I	205	95%
9	W	205	96%
10	J	198	%　94%
10	X	198	%　94%
11	K	212	92%　8%
11	Y	212	92%　8%
12	L	222	95%　5%
12	Z	222	94%　6%
13	M	246	89%　7%
13	a	246	90%　6%
14	N	196	91%　9%
14	b	196	90%　9%

2 Entry composition ⓘ

There are 17 unique types of molecules in this entry. The entry contains 49531 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
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
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
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
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
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
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
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
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
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
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
10	X	195	Total 1561	C 992	N 264	O 299	S 6	0	0	0

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

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

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

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

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
13	M	229	Total 1790	C 1133	N 306	O 344	S 7	0	0	0
13	a	232	Total 1815	C 1148	N 311	O 349	S 7	0	0	0

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

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

- Molecule 15 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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

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

- Molecule 16 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

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

- Molecule 17 is (2 {S},3 {S})-3-methyl-2-[(1 {R})-2-[[(2 {S})-3-methyl-1-[[(2 {S})-3-methyl-1-oxidanylidene-1-phenylmethoxy-butan-2-yl] amino]-1-oxidanylidene-butan-2-yl]amino]-1-oxidanyl-2-oxidanylidene-ethyl]pentanoic acid (CCD ID: EQB) (formula: $C_{25}H_{38}N_2O_7$).
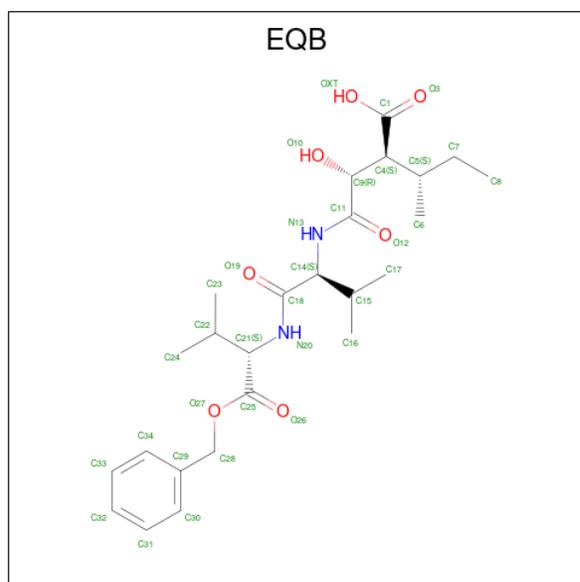
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
17	H	1	Total 33	C 25	N 2	O 6	0	0
17	K	1	Total 33	C 25	N 2	O 6	0	0
17	N	1	Total 33	C 25	N 2	O 6	0	0
17	V	1	Total 33	C 25	N 2	O 6	0	0
17	Y	1	Total 33	C 25	N 2	O 6	0	0
17	b	1	Total 33	C 25	N 2	O 6	0	0

3 Residue-property plots ⓘ

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

Chain A:

• Molecule 1: Proteasome subunit alpha type-2

Chain O:
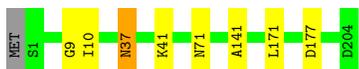

• Molecule 2: Proteasome subunit alpha type-3

Chain B:

• Molecule 2: Proteasome subunit alpha type-3

Chain P:

• Molecule 3: Proteasome subunit alpha type-4

Chain C:

• Molecule 3: Proteasome subunit alpha type-4

Chain Q:

MET SER G1 R4 K35 N38 L50 K51 L52 V124 Q147 S158 A159 Q160 V169 K180 P183 S196 V201 Q202 A205 E240 GLN GLN GLU GLN ASP LYS LYS LYS LYS SER ASN HIS

• Molecule 4: Proteasome subunit alpha type-5

Chain D: 85%   5%   10%

MET PHE LEU THR ARG SER GLU TYR D1 Q15 L20 L40 L51 V60 A88 I99 E117 GLY ALA SER GLY GLU GLU ARG L125 N160 L176 W179 L193 I214 L235 K236 E242 SER PRO GLU GLU ALA ASP VAL GLU MET SER

• Molecule 4: Proteasome subunit alpha type-5

Chain R: 85%   5%   10%

MET PHE LEU THR ARG SER GLU TYR D1 L20 L40 L51 V60 I99 E117 GLY ALA SER GLY GLU GLU ARG L125 N160 L176 W179 L193 I214 L235 K236 E242 SER PRO GLU GLU ALA ASP VAL GLU MET SER

• Molecule 5: Proteasome subunit alpha type-6

Chain E: 94%

MET PHE ARG N3 N4 T9 F12 K29 L55 L71 L87 N92 A107 N118 L188 I233

• Molecule 5: Proteasome subunit alpha type-6

Chain S: 94%

MET PHE ARG N3 N4 T9 F12 K29 L55 L71 L87 N92 A107 N118 L188 I233

• Molecule 6: Probable proteasome subunit alpha type-7

Chain F: 82%   16%

MET THR SER ILE GLY T2 Q19 N123 S124 L172 E181 E201 D202 N221 Q240 N244 GLY ASP ASP ASP GLU ASP ASP GLU ASP ASP SER ASP ASN VAL MET SER SER ASP ASP GLU ASN ALA PRO VAL ALA THR ASN ALA ASN ALA THR ASP GLN GLU GLY ASP

ILE HIS LEU GLU

• Molecule 6: Probable proteasome subunit alpha type-7

Chain T: 82%   16%

MET THR SER ILE GLY T2 Q19 N123 S124 L172 E181 E201 N221 Q240 N244 GLY ASP ASP ASP GLU ASP GLU ASP ASP SER ASP ASN VAL MET SER SER ASP ASP GLU ASN ALA PRO VAL ALA THR ASN ALA ASN ALA THR THR ASP GLN GLU GLY ASP ILE

HIS LEU GLU

• Molecule 7: Proteasome subunit alpha type-1

Chain G:

• Molecule 7: Proteasome subunit alpha type-1

Chain U:

• Molecule 8: Proteasome subunit beta type-2

Chain H:

• Molecule 8: Proteasome subunit beta type-2

Chain V:

• Molecule 9: Proteasome subunit beta type-3

Chain I:

• Molecule 9: Proteasome subunit beta type-3

Chain W:

• Molecule 10: Proteasome subunit beta type-4

Chain J:

• Molecule 10: Proteasome subunit beta type-4

Chain X:

• Molecule 11: Proteasome subunit beta type-5

Chain K:

• Molecule 11: Proteasome subunit beta type-5

Chain Y:

• Molecule 12: Proteasome subunit beta type-6

Chain L:

• Molecule 12: Proteasome subunit beta type-6

Chain Z:

• Molecule 13: Proteasome subunit beta type-7

Chain M:

• Molecule 13: Proteasome subunit beta type-7

Chain a:

• Molecule 14: Proteasome subunit beta type-1

Chain N:

91%   9%

T1 S2 I3 K9 A16 T20 T35 R36 W42 S46 K83 D104 K107 V119 G128 F133 V152 Q161 M175 L196

• Molecule 14: Proteasome subunit beta type-1

Chain b:

90%   9%

T1 S2 I3 K9 T20 T35 R36 W42 S46 K83 I98 D104 K107 V119 A127 G128 T132 G136 V152 M175 L196
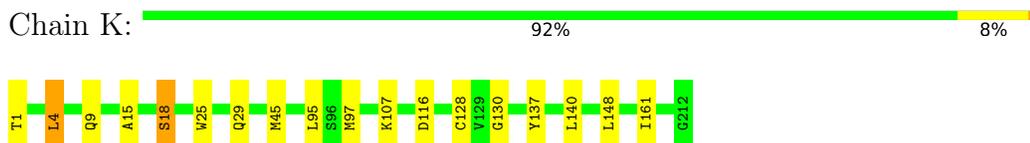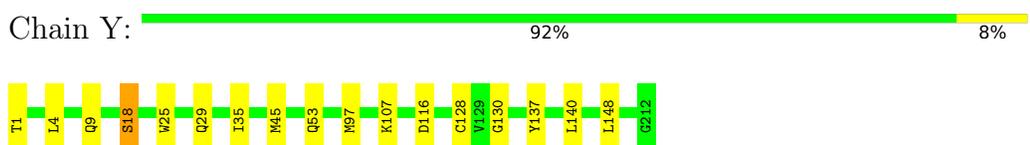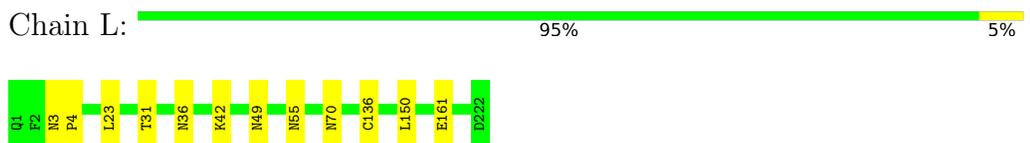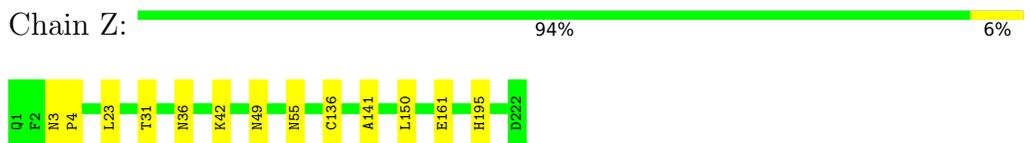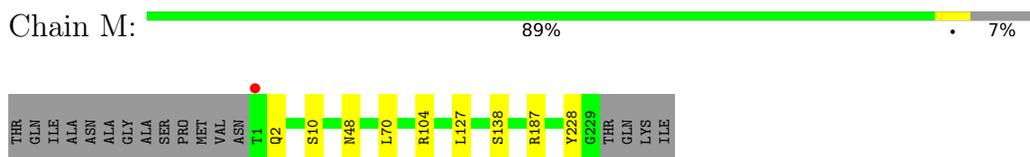
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	136.22Å　302.72Å　143.97Å 90.00°　112.82°　90.00°	Depositor
Resolution (Å)	15.00 – 3.00 15.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	94.2 (15.00-3.00) 94.2 (15.00-3.00)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.99 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.8.0158	Depositor
R, R_{free}	0.182　,　0.238 0.196　,　0.247	Depositor DCC
R_{free} test set	10072 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	71.6	Xtriage
Anisotropy	0.264	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 58.8	EDS
L-test for twinning[2]	$< |L| > = 0.51, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	49531	wwPDB-VP
Average B, all atoms (Å^2)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.75% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: EQB, MG, 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	0.56	0/1952	0.81	0/2642
1	O	0.56	0/1952	0.80	0/2642
2	B	0.58	0/1934	0.81	0/2618
2	P	0.58	0/1934	0.81	0/2618
3	C	0.56	0/1910	0.82	1/2586 (0.0%)
3	Q	0.55	0/1910	0.83	1/2586 (0.0%)
4	D	0.55	0/1837	0.81	0/2475
4	R	0.54	0/1837	0.80	0/2475
5	E	0.56	0/1800	0.78	0/2433
5	S	0.55	0/1800	0.78	0/2433
6	F	0.56	0/1932	0.81	0/2609
6	T	0.55	0/1932	0.82	0/2609
7	G	0.54	0/1945	0.80	1/2634 (0.0%)
7	U	0.55	0/1945	0.80	1/2634 (0.0%)
8	H	0.58	0/1750	0.85	2/2373 (0.1%)
8	V	0.58	0/1750	0.86	3/2373 (0.1%)
9	I	0.54	0/1611	0.79	0/2174
9	W	0.54	0/1611	0.79	0/2174
10	J	0.55	0/1589	0.79	0/2142
10	X	0.55	0/1589	0.79	0/2142
11	K	0.57	0/1681	0.83	0/2274
11	Y	0.54	0/1681	0.81	0/2274
12	L	0.54	0/1795	0.77	0/2420
12	Z	0.54	0/1795	0.77	0/2420
13	M	0.55	0/1821	0.81	1/2470 (0.0%)
13	a	0.56	0/1846	0.81	1/2503 (0.0%)
14	N	0.55	0/1541	0.80	0/2087
14	b	0.56	0/1541	0.81	0/2087
All	All	0.55	0/50221	0.81	11/67907 (0.0%)

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
8	V	55	VAL	CG1-CB-CG2	-9.54	89.81	110.80
8	V	55	VAL	CA-CB-CG1	9.35	126.30	110.40
8	H	55	VAL	CG1-CB-CG2	-8.81	91.42	110.80
8	H	55	VAL	CA-CB-CG2	7.49	123.12	110.40
3	Q	201	VAL	N-CA-C	7.07	117.17	110.53
8	V	55	VAL	N-CA-CB	6.42	120.21	110.58
3	C	201	VAL	N-CA-C	6.41	117.19	110.72
13	a	10	SER	N-CA-C	5.60	118.60	110.42
13	M	10	SER	N-CA-C	5.58	118.56	110.42
7	U	223	LYS	N-CA-C	5.16	116.91	108.55
7	G	223	LYS	N-CA-C	5.03	116.69	108.55

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	3	0
2	B	1904	0	1904	8	0
2	P	1904	0	1904	6	0
3	C	1881	0	1895	7	0
3	Q	1881	0	1895	6	0
4	D	1813	0	1797	3	0
4	R	1813	0	1797	1	0
5	E	1773	0	1775	4	0
5	S	1773	0	1775	3	0
6	F	1892	0	1883	3	0
6	T	1892	0	1883	3	0
7	G	1907	0	1901	3	0
7	U	1907	0	1901	3	0
8	H	1719	0	1718	9	0
8	V	1719	0	1718	15	0
9	I	1581	0	1574	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
9	W	1581	0	1574	6	0
10	J	1561	0	1569	2	0
10	X	1561	0	1569	2	0
11	K	1644	0	1594	11	0
11	Y	1644	0	1594	5	0
12	L	1757	0	1711	5	0
12	Z	1757	0	1711	5	0
13	M	1790	0	1793	2	0
13	a	1815	0	1821	2	0
14	N	1512	0	1480	12	0
14	b	1512	0	1480	12	0
15	G	1	0	0	0	0
15	I	1	0	0	0	0
15	K	1	0	0	0	0
15	N	1	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	G	1	0	0	0	0
16	U	1	0	0	0	0
17	H	33	0	0	4	0
17	K	33	0	0	3	0
17	N	33	0	0	4	0
17	V	33	0	0	6	0
17	Y	33	0	0	2	0
17	b	33	0	0	4	0
All	All	49531	0	49074	138	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 (138) 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:3:ILE:HG13	8:H:99:ILE:HD12	1.62	0.79
11:K:4:LEU:HD22	11:K:4:LEU:O	1.83	0.79
14:N:1:THR:O	14:N:128:GLY:HA3	1.88	0.74
8:V:3:ILE:HD11	8:V:127:LEU:HB3	1.74	0.70
12:L:31:THR:HG23	12:L:36:ASN:HD21	1.56	0.69
12:Z:31:THR:HG23	12:Z:36:ASN:HD21	1.57	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Q:160:GLN:HE21	3:Q:160:GLN:HA	1.59	0.67
14:b:46:SER:HA	17:b:201:EQB:O3	1.95	0.67
14:N:46:SER:HA	17:N:201:EQB:O3	1.95	0.65
8:V:46:ALA:HA	17:V:301:EQB:O3	1.97	0.65
3:C:160:GLN:HE21	3:C:160:GLN:HA	1.61	0.65
8:H:1:THR:OG1	17:H:301:EQB:O10	2.10	0.63
14:N:35:THR:HG21	13:a:228:TYR:HE2	1.64	0.62
11:K:4:LEU:CD1	11:K:161:ILE:HD11	2.32	0.60
7:U:23:PHE:O	7:U:26:THR:HB	2.01	0.60
8:V:1:THR:OG1	17:V:301:EQB:O10	2.17	0.59
11:Y:1:THR:O	11:Y:130:GLY:HA3	2.01	0.59
14:b:3:ILE:HG13	14:b:98:ILE:HD12	1.83	0.59
7:G:23:PHE:O	7:G:26:THR:HB	2.01	0.59
11:K:4:LEU:HD22	11:K:4:LEU:C	2.28	0.59
1:O:12:PHE:H	2:P:20:GLN:HE22	1.51	0.58
6:F:123:ASN:HD22	6:F:124:SER:N	2.02	0.57
8:V:1:THR:HG21	17:V:301:EQB:O3	2.04	0.57
8:V:46:ALA:HA	17:V:301:EQB:C6	2.33	0.57
8:H:1:THR:HG21	17:H:301:EQB:O3	2.04	0.57
11:Y:1:THR:HG21	17:Y:301:EQB:O3	2.05	0.56
14:b:152:VAL:HA	14:b:175:MET:HE1	1.86	0.56
11:K:1:THR:HG21	17:K:301:EQB:O3	2.05	0.56
14:N:152:VAL:HA	14:N:175:MET:HE1	1.88	0.55
8:V:33:LYS:HG2	17:V:301:EQB:C8	2.37	0.54
6:T:123:ASN:HD22	6:T:124:SER:N	2.06	0.54
13:M:228:TYR:HE2	14:b:35:THR:HG21	1.72	0.54
11:K:4:LEU:HD13	11:K:15:ALA:O	2.07	0.53
14:N:20:THR:CG2	17:N:201:EQB:C23	2.86	0.53
14:N:20:THR:HG22	17:N:201:EQB:C23	2.38	0.53
14:N:36:ARG:HG3	14:N:42:TRP:CE2	2.44	0.52
5:S:12:PHE:H	6:T:19:GLN:HE22	1.55	0.52
17:Y:301:EQB:N20	17:Y:301:EQB:C16	2.73	0.51
14:N:1:THR:HG21	17:N:201:EQB:O3	2.11	0.51
14:b:36:ARG:HG3	14:b:42:TRP:CE2	2.46	0.51
10:J:16:ALA:HB2	10:J:161:LEU:HD21	1.93	0.50
14:b:20:THR:HG22	17:b:201:EQB:C23	2.41	0.50
11:K:4:LEU:C	11:K:4:LEU:CD2	2.85	0.50
5:E:118:ASN:HD22	5:E:118:ASN:N	2.09	0.50
9:W:37:ASN:C	9:W:37:ASN:HD22	2.20	0.49
12:Z:31:THR:CG2	12:Z:36:ASN:HD21	2.26	0.49
9:I:9:GLY:HA3	9:I:41:LYS:HE2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:12:PHE:H	2:B:20:GLN:HE22	1.61	0.48
2:B:95:GLN:HE22	9:I:71:ASN:HD22	1.61	0.48
6:T:123:ASN:HD22	6:T:123:ASN:C	2.21	0.48
9:W:9:GLY:HA3	9:W:41:LYS:HE2	1.95	0.48
2:P:124:HIS:HB3	3:Q:124:VAL:HG12	1.96	0.48
5:S:118:ASN:N	5:S:118:ASN:HD22	2.11	0.48
8:V:46:ALA:CA	17:V:301:EQB:O3	2.62	0.47
5:S:87:LEU:HD21	5:S:107:ALA:HB1	1.96	0.47
10:X:16:ALA:HB2	10:X:161:LEU:HD21	1.95	0.47
14:b:1:THR:O	14:b:128:GLY:HA3	2.13	0.47
6:F:123:ASN:HD22	6:F:123:ASN:C	2.21	0.47
12:L:31:THR:CG2	12:L:36:ASN:HD21	2.26	0.47
3:C:38:ASN:C	3:C:38:ASN:HD22	2.23	0.46
8:V:3:ILE:HD11	8:V:127:LEU:CB	2.44	0.46
14:b:3:ILE:HD11	14:b:127:ALA:HB3	1.96	0.46
5:E:87:LEU:HD21	5:E:107:ALA:HB1	1.96	0.46
7:G:73:VAL:HG12	7:G:133:THR:HB	1.97	0.46
3:Q:38:ASN:HD22	3:Q:38:ASN:C	2.23	0.46
8:H:113:ILE:HB	8:H:119:THR:HG22	1.98	0.46
8:H:3:ILE:HD11	8:H:127:LEU:HB3	1.97	0.46
11:K:4:LEU:CD1	11:K:161:ILE:CD1	2.93	0.45
8:V:113:ILE:HB	8:V:119:THR:HG22	1.98	0.45
11:K:4:LEU:HD13	11:K:161:ILE:HD11	1.98	0.45
11:K:1:THR:O	11:K:130:GLY:HA3	2.16	0.45
7:U:73:VAL:HG12	7:U:133:THR:HB	1.98	0.45
2:B:12:PHE:H	3:C:17:GLN:HE22	1.64	0.44
4:D:160:ASN:HB3	4:D:179:TRP:CE2	2.52	0.44
5:E:12:PHE:H	6:F:19:GLN:HE22	1.63	0.44
8:V:51:ASP:O	8:V:55:VAL:HG12	2.17	0.44
2:P:95:GLN:HE22	9:W:71:ASN:HD22	1.66	0.44
1:A:64:VAL:HG11	1:A:212:ALA:HB3	2.00	0.44
2:B:95:GLN:NE2	9:I:71:ASN:HD22	2.15	0.44
2:B:124:HIS:HB3	3:C:124:VAL:HG12	2.00	0.44
9:I:37:ASN:C	9:I:37:ASN:HD22	2.26	0.44
12:Z:42:LYS:HD2	12:Z:55:ASN:HD22	1.83	0.44
4:R:160:ASN:HB3	4:R:179:TRP:CE2	2.53	0.43
8:V:80:LEU:HD13	8:V:119:THR:HG21	2.00	0.43
11:K:18:SER:OG	11:K:29:GLN:O	2.37	0.43
7:G:167:GLN:HE21	7:G:171:THR:HG23	1.83	0.43
8:H:19:ARG:NH1	8:H:169:SER:O	2.51	0.43
7:U:167:GLN:HE21	7:U:171:THR:HG23	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:H:301:EQB:N13	17:H:301:EQB:C1	2.82	0.43
9:I:141:ALA:HB2	9:I:177:ASP:HB2	2.00	0.43
1:O:64:VAL:HG11	1:O:212:ALA:HB3	2.01	0.43
9:W:141:ALA:HB2	9:W:177:ASP:HB2	2.01	0.43
2:P:50:LYS:O	2:P:51:VAL:C	2.62	0.42
2:B:95:GLN:HE22	2:B:98:LEU:HD23	1.83	0.42
14:b:1:THR:HG22	14:b:3:ILE:HG23	2.01	0.42
12:L:42:LYS:HD2	12:L:55:ASN:HD22	1.84	0.42
8:V:19:ARG:NH1	8:V:169:SER:O	2.52	0.42
11:Y:18:SER:OG	11:Y:29:GLN:O	2.38	0.42
17:b:201:EQB:C30	17:b:201:EQB:C25	2.98	0.42
14:N:83:LYS:HG3	14:N:119:VAL:CG2	2.50	0.42
14:N:133:PHE:HA	14:b:132:THR:O	2.19	0.42
5:E:92:ASN:HD21	12:L:70:ASN:HD21	1.66	0.42
9:W:10:ILE:HG21	9:W:141:ALA:HB3	2.02	0.42
3:C:201:VAL:O	3:C:202:GLN:CB	2.68	0.42
11:K:128:CYS:HB2	11:K:137:TYR:CE2	2.54	0.42
14:N:3:ILE:HG22	14:N:16:ALA:CB	2.49	0.42
12:Z:141:ALA:HB1	12:Z:195:HIS:NE2	2.35	0.42
2:B:50:LYS:O	2:B:51:VAL:C	2.63	0.41
3:C:9:PHE:H	4:D:15:GLN:HE22	1.68	0.41
8:V:3:ILE:O	8:V:126:SER:HA	2.19	0.41
14:N:161:GLN:HE21	14:b:136:GLY:HA2	1.84	0.41
17:K:301:EQB:C11	17:K:301:EQB:C6	2.97	0.41
8:V:3:ILE:HG12	8:V:127:LEU:O	2.21	0.41
11:Y:128:CYS:HB2	11:Y:137:TYR:CE2	2.56	0.41
12:Z:3:ASN:HD22	12:Z:4:PRO:HD2	1.86	0.41
13:M:127:LEU:O	13:M:138:SER:OG	2.31	0.41
14:b:83:LYS:HG3	14:b:119:VAL:CG2	2.51	0.41
1:O:75:TYR:HB3	1:O:82:TYR:CD1	2.56	0.41
8:V:14:ILE:HG22	8:V:176:CYS:HB3	2.03	0.41
13:a:128:ARG:HH11	13:a:138:SER:HB2	1.86	0.41
2:B:47:ALA:HB1	2:B:64:LYS:HD2	2.02	0.41
10:J:3:ILE:HG23	10:J:18:SER:HB3	2.02	0.41
2:P:47:ALA:HB1	2:P:64:LYS:HD2	2.03	0.41
2:P:95:GLN:NE2	9:W:71:ASN:HD22	2.18	0.41
3:Q:51:LYS:O	3:Q:52:LEU:HB2	2.20	0.41
8:H:46:ALA:HA	17:H:301:EQB:O3	2.21	0.41
17:b:201:EQB:C6	17:b:201:EQB:C11	2.99	0.41
9:I:146:PHE:O	9:I:150:GLU:HB2	2.22	0.40
17:K:301:EQB:N20	17:K:301:EQB:C16	2.83	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:Q:35:LYS:HG2	3:Q:158:SER:O	2.21	0.40
3:C:35:LYS:HG2	3:C:158:SER:O	2.21	0.40
8:H:55:VAL:HG12	8:H:56:THR:N	2.36	0.40
12:L:3:ASN:HD22	12:L:4:PRO:HD2	1.85	0.40
3:Q:169:VAL:HG23	3:Q:196:SER:HB2	2.03	0.40
4:D:88:ALA:HA	4:D:99:ILE:HG21	2.02	0.40
8:H:51:ASP:O	8:H:55:VAL:HB	2.21	0.40
10:X:3:ILE:HG23	10:X:18:SER:HB3	2.02	0.40
11:Y:35:ILE:HD13	11:Y:53:GLN:HA	2.03	0.40

There are no symmetry-related clashes.

5.3   Torsion angles   ⓘ

5.3.1   Protein backbone   ⓘ

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%)	240 (97%)	7 (3%)	1 (0%)	30	66
1	O	248/250 (99%)	239 (96%)	8 (3%)	1 (0%)	30	66
2	B	242/258 (94%)	233 (96%)	5 (2%)	4 (2%)	7	33
2	P	242/258 (94%)	233 (96%)	5 (2%)	4 (2%)	7	33
3	C	238/254 (94%)	232 (98%)	3 (1%)	3 (1%)	10	39
3	Q	238/254 (94%)	233 (98%)	2 (1%)	3 (1%)	10	39
4	D	231/260 (89%)	226 (98%)	5 (2%)	0	100	100
4	R	231/260 (89%)	226 (98%)	5 (2%)	0	100	100
5	E	229/234 (98%)	220 (96%)	9 (4%)	0	100	100
5	S	229/234 (98%)	219 (96%)	10 (4%)	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%)	237 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	U	239/252 (95%)	236 (99%)	3 (1%)	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
9	I	202/205 (98%)	193 (96%)	9 (4%)	0	100	100
9	W	202/205 (98%)	193 (96%)	9 (4%)	0	100	100
10	J	193/198 (98%)	187 (97%)	6 (3%)	0	100	100
10	X	193/198 (98%)	186 (96%)	7 (4%)	0	100	100
11	K	210/212 (99%)	208 (99%)	2 (1%)	0	100	100
11	Y	210/212 (99%)	207 (99%)	3 (1%)	0	100	100
12	L	220/222 (99%)	214 (97%)	6 (3%)	0	100	100
12	Z	220/222 (99%)	214 (97%)	6 (3%)	0	100	100
13	M	227/246 (92%)	219 (96%)	8 (4%)	0	100	100
13	a	230/246 (94%)	221 (96%)	8 (4%)	1 (0%)	30	66
14	N	194/196 (99%)	191 (98%)	3 (2%)	0	100	100
14	b	194/196 (99%)	190 (98%)	4 (2%)	0	100	100
All	All	6279/6614 (95%)	6109 (97%)	153 (2%)	17 (0%)	37	70

All (17) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	2	THR
2	B	51	VAL
2	B	221	ASP
3	C	202	GLN
1	O	2	THR
2	P	51	VAL
2	P	221	ASP
3	Q	202	GLN
2	B	218	GLY
2	B	220	ASN
2	P	218	GLY
2	P	220	ASN
3	C	205	ALA
3	Q	205	ALA
3	C	183	PRO
3	Q	183	PRO
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%)	203 (97%)	6 (3%)	37	70
1	O	209/209 (100%)	204 (98%)	5 (2%)	44	74
2	B	203/216 (94%)	195 (96%)	8 (4%)	27	61
2	P	203/216 (94%)	195 (96%)	8 (4%)	27	61
3	C	212/226 (94%)	202 (95%)	10 (5%)	22	56
3	Q	212/226 (94%)	203 (96%)	9 (4%)	25	59
4	D	194/215 (90%)	183 (94%)	11 (6%)	17	49
4	R	194/215 (90%)	183 (94%)	11 (6%)	17	49
5	E	190/193 (98%)	182 (96%)	8 (4%)	25	59
5	S	190/193 (98%)	182 (96%)	8 (4%)	25	59
6	F	201/239 (84%)	195 (97%)	6 (3%)	36	69
6	T	201/239 (84%)	195 (97%)	6 (3%)	36	69
7	G	206/210 (98%)	198 (96%)	8 (4%)	27	61
7	U	206/210 (98%)	199 (97%)	7 (3%)	32	66
8	H	185/190 (97%)	177 (96%)	8 (4%)	25	58
8	V	185/190 (97%)	176 (95%)	9 (5%)	21	54
9	I	172/173 (99%)	170 (99%)	2 (1%)	67	86
9	W	172/173 (99%)	170 (99%)	2 (1%)	67	86
10	J	173/175 (99%)	168 (97%)	5 (3%)	37	70
10	X	173/175 (99%)	168 (97%)	5 (3%)	37	70
11	K	169/169 (100%)	158 (94%)	11 (6%)	14	43
11	Y	169/169 (100%)	159 (94%)	10 (6%)	16	47
12	L	185/185 (100%)	180 (97%)	5 (3%)	40	71
12	Z	185/185 (100%)	180 (97%)	5 (3%)	40	71
13	M	195/208 (94%)	190 (97%)	5 (3%)	41	72
13	a	198/208 (95%)	193 (98%)	5 (2%)	42	73

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
14	N	162/162 (100%)	158 (98%)	4 (2%)	42	73
14	b	162/162 (100%)	158 (98%)	4 (2%)	42	73
All	All	5315/5540 (96%)	5124 (96%)	191 (4%)	30	64

All (191) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	59	GLU
1	A	122	THR
1	A	157	PHE
1	A	201	GLU
1	A	250	LEU
2	B	50	LYS
2	B	55	LEU
2	B	58	GLN
2	B	79	LEU
2	B	102	ASN
2	B	113	ARG
2	B	191	LEU
2	B	238	LEU
3	C	4	ARG
3	C	38	ASN
3	C	49	THR
3	C	50	LEU
3	C	51	LYS
3	C	147	GLN
3	C	160	GLN
3	C	169	VAL
3	C	180	LYS
3	C	240	GLU
4	D	20	LEU
4	D	40	LEU
4	D	51	LEU
4	D	60	VAL
4	D	99	ILE
4	D	176	LEU
4	D	193	LEU
4	D	214	ILE
4	D	235	LEU
4	D	236	LYS

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Mol	Chain	Res	Type
4	D	242	GLU
5	E	4	ASN
5	E	9	THR
5	E	29	LYS
5	E	55	LEU
5	E	71	LEU
5	E	92	ASN
5	E	118	ASN
5	E	188	LEU
6	F	123	ASN
6	F	172	LEU
6	F	181	GLU
6	F	201	GLU
6	F	221	ASN
6	F	240	GLN
7	G	13	GLU
7	G	26	THR
7	G	83	ASN
7	G	115	LEU
7	G	122	ARG
7	G	125	MET
7	G	235	ARG
7	G	236	LEU
8	H	14	ILE
8	H	31	CYS
8	H	34	LEU
8	H	55	VAL
8	H	68	LEU
8	H	127	LEU
8	H	144	GLN
8	H	196	ARG
9	I	37	ASN
9	I	171	LEU
10	J	3	ILE
10	J	17	SER
10	J	35	THR
10	J	90	LYS
10	J	99	GLN
11	K	4	LEU
11	K	9	GLN
11	K	18	SER
11	K	25	TRP

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Mol	Chain	Res	Type
11	K	45	MET
11	K	95	LEU
11	K	97	MET
11	K	107	LYS
11	K	116	ASP
11	K	140	LEU
11	K	148	LEU
12	L	23	LEU
12	L	49	ASN
12	L	136	CYS
12	L	150	LEU
12	L	161	GLU
13	M	2	GLN
13	M	48	ASN
13	M	70	LEU
13	M	104	ARG
13	M	187	ARG
14	N	9	LYS
14	N	104	ASP
14	N	107	LYS
14	N	119	VAL
1	O	1	MET
1	O	59	GLU
1	O	122	THR
1	O	157	PHE
1	O	250	LEU
2	P	50	LYS
2	P	55	LEU
2	P	58	GLN
2	P	79	LEU
2	P	102	ASN
2	P	113	ARG
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	147	GLN
3	Q	160	GLN
3	Q	169	VAL
3	Q	180	LYS

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Mol	Chain	Res	Type
3	Q	240	GLU
4	R	20	LEU
4	R	40	LEU
4	R	51	LEU
4	R	60	VAL
4	R	99	ILE
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	4	ASN
5	S	9	THR
5	S	29	LYS
5	S	55	LEU
5	S	71	LEU
5	S	92	ASN
5	S	118	ASN
5	S	188	LEU
6	T	123	ASN
6	T	172	LEU
6	T	181	GLU
6	T	201	GLU
6	T	221	ASN
6	T	240	GLN
7	U	13	GLU
7	U	26	THR
7	U	115	LEU
7	U	122	ARG
7	U	125	MET
7	U	235	ARG
7	U	236	LEU
8	V	14	ILE
8	V	31	CYS
8	V	34	LEU
8	V	55	VAL
8	V	68	LEU
8	V	80	LEU
8	V	127	LEU
8	V	144	GLN
8	V	196	ARG

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Mol	Chain	Res	Type
9	W	37	ASN
9	W	171	LEU
10	X	3	ILE
10	X	17	SER
10	X	35	THR
10	X	90	LYS
10	X	99	GLN
11	Y	4	LEU
11	Y	9	GLN
11	Y	18	SER
11	Y	25	TRP
11	Y	45	MET
11	Y	97	MET
11	Y	107	LYS
11	Y	116	ASP
11	Y	140	LEU
11	Y	148	LEU
12	Z	23	LEU
12	Z	49	ASN
12	Z	136	CYS
12	Z	150	LEU
12	Z	161	GLU
13	a	2	GLN
13	a	48	ASN
13	a	70	LEU
13	a	104	ARG
13	a	187	ARG
14	b	9	LYS
14	b	104	ASP
14	b	107	LYS
14	b	119	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (157) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	149	GLN
2	B	20	GLN
2	B	95	GLN
2	B	119	GLN
2	B	123	GLN
2	B	124	HIS
2	B	155	ASN

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Mol	Chain	Res	Type
2	B	176	GLN
2	B	220	ASN
2	B	232	GLN
3	C	17	GLN
3	C	38	ASN
3	C	77	ASN
3	C	147	GLN
3	C	160	GLN
3	C	176	ASN
3	C	233	GLN
4	D	15	GLN
4	D	91	HIS
4	D	146	GLN
4	D	225	ASN
5	E	68	HIS
5	E	99	ASN
5	E	116	GLN
5	E	118	ASN
5	E	120	GLN
5	E	184	ASN
6	F	19	GLN
6	F	86	ASN
6	F	123	ASN
6	F	191	GLN
6	F	203	ASN
6	F	240	GLN
7	G	6	HIS
7	G	114	ASN
7	G	117	GLN
7	G	121	GLN
7	G	166	GLN
7	G	167	GLN
7	G	175	ASN
8	H	9	ASN
8	H	22	GLN
8	H	30	ASN
8	H	165	ASN
8	H	189	ASN
9	I	37	ASN
9	I	44	HIS
9	I	88	GLN
9	I	168	GLN

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Mol	Chain	Res	Type
9	I	203	GLN
10	J	10	GLN
10	J	37	GLN
10	J	55	GLN
10	J	63	ASN
11	K	9	GLN
11	K	85	ASN
11	K	143	ASN
11	K	176	ASN
11	K	208	ASN
12	L	1	GLN
12	L	3	ASN
12	L	36	ASN
12	L	49	ASN
12	L	55	ASN
12	L	70	ASN
12	L	152	ASN
12	L	153	GLN
12	L	155	ASN
12	L	158	ASN
12	L	159	GLN
12	L	197	GLN
13	M	2	GLN
13	M	48	ASN
13	M	102	GLN
13	M	149	HIS
13	M	179	ASN
13	M	194	ASN
13	M	213	GLN
14	N	141	ASN
14	N	161	GLN
2	P	20	GLN
2	P	95	GLN
2	P	119	GLN
2	P	123	GLN
2	P	124	HIS
2	P	176	GLN
3	Q	17	GLN
3	Q	38	ASN
3	Q	77	ASN
3	Q	147	GLN
3	Q	160	GLN

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Mol	Chain	Res	Type
3	Q	233	GLN
4	R	15	GLN
4	R	91	HIS
4	R	146	GLN
4	R	207	ASN
4	R	225	ASN
5	S	68	HIS
5	S	99	ASN
5	S	116	GLN
5	S	118	ASN
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	203	ASN
6	T	240	GLN
7	U	83	ASN
7	U	114	ASN
7	U	117	GLN
7	U	121	GLN
7	U	166	GLN
7	U	167	GLN
7	U	175	ASN
8	V	9	ASN
8	V	22	GLN
8	V	30	ASN
8	V	165	ASN
8	V	189	ASN
8	V	200	GLN
9	W	37	ASN
9	W	44	HIS
9	W	88	GLN
9	W	203	GLN
10	X	10	GLN
10	X	37	GLN
10	X	55	GLN
10	X	63	ASN
11	Y	9	GLN

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Mol	Chain	Res	Type
11	Y	85	ASN
11	Y	133	GLN
11	Y	176	ASN
11	Y	208	ASN
12	Z	1	GLN
12	Z	3	ASN
12	Z	29	ASN
12	Z	36	ASN
12	Z	49	ASN
12	Z	55	ASN
12	Z	70	ASN
12	Z	152	ASN
12	Z	153	GLN
12	Z	155	ASN
12	Z	158	ASN
12	Z	159	GLN
12	Z	197	GLN
13	a	48	ASN
13	a	102	GLN
13	a	149	HIS
13	a	194	ASN
13	a	213	GLN
14	b	141	ASN
14	b	161	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 16 ligands modelled in this entry, 10 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
17	EQB	K	301	-	33,33,34	1.17	3 (9%)	40,44,46	1.04	3 (7%)
17	EQB	b	201	-	33,33,34	1.33	4 (12%)	40,44,46	1.48	7 (17%)
17	EQB	Y	301	-	33,33,34	1.02	2 (6%)	40,44,46	1.18	5 (12%)
17	EQB	H	301	-	33,33,34	1.56	3 (9%)	40,44,46	1.10	3 (7%)
17	EQB	V	301	-	33,33,34	1.22	2 (6%)	40,44,46	1.28	4 (10%)
17	EQB	N	201	-	33,33,34	1.16	2 (6%)	40,44,46	1.44	10 (25%)

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	EQB	K	301	-	-	7/45/45/47	0/1/1/1
17	EQB	b	201	-	-	6/45/45/47	0/1/1/1
17	EQB	Y	301	-	-	3/45/45/47	0/1/1/1
17	EQB	H	301	-	-	2/45/45/47	0/1/1/1
17	EQB	V	301	-	-	6/45/45/47	0/1/1/1
17	EQB	N	201	-	-	8/45/45/47	0/1/1/1

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	V	301	EQB	C28-C29	-5.05	1.38	1.50
17	N	201	EQB	C28-C29	-4.83	1.39	1.50
17	b	201	EQB	C28-C29	-4.78	1.39	1.50
17	H	301	EQB	C28-C29	-4.65	1.39	1.50
17	K	301	EQB	C28-C29	-4.18	1.40	1.50
17	H	301	EQB	C4-C9	-4.17	1.50	1.54
17	H	301	EQB	C4-C5	-4.06	1.49	1.55
17	Y	301	EQB	C28-C29	-3.51	1.42	1.50
17	K	301	EQB	C4-C5	-3.14	1.50	1.55

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
17	b	201	EQB	C4-C5	-3.02	1.50	1.55
17	Y	301	EQB	C4-C5	-2.64	1.51	1.55
17	b	201	EQB	C4-C9	-2.45	1.52	1.54
17	K	301	EQB	C4-C9	-2.44	1.52	1.54
17	N	201	EQB	C4-C9	-2.35	1.52	1.54
17	V	301	EQB	O27-C28	-2.17	1.41	1.45
17	b	201	EQB	C9-C11	-2.12	1.48	1.52

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
17	V	301	EQB	O3-C1-C4	-3.94	115.28	125.23
17	N	201	EQB	C22-C21-N20	-3.29	103.30	111.43
17	b	201	EQB	C15-C14-N13	-3.21	103.49	111.43
17	K	301	EQB	O3-C1-C4	-2.89	117.91	125.23
17	V	301	EQB	C6-C5-C4	-2.89	107.68	112.67
17	V	301	EQB	C6-C5-C7	-2.85	104.57	111.78
17	N	201	EQB	C14-C18-N20	-2.80	110.43	116.48
17	H	301	EQB	C15-C14-C18	-2.74	104.52	111.38
17	b	201	EQB	C9-C4-C1	-2.59	105.27	110.65
17	N	201	EQB	C15-C14-C18	-2.52	105.07	111.38
17	Y	301	EQB	C15-C14-C18	-2.45	105.25	111.38
17	Y	301	EQB	O3-C1-C4	-2.43	119.08	125.23
17	N	201	EQB	C9-C4-C1	-2.39	105.70	110.65
17	K	301	EQB	C6-C5-C4	-2.37	108.57	112.67
17	b	201	EQB	O27-C25-C21	2.37	115.13	111.32
17	b	201	EQB	O3-C1-C4	-2.36	119.26	125.23
17	Y	301	EQB	C15-C14-N13	-2.36	105.59	111.43
17	N	201	EQB	O3-C1-C4	-2.35	119.29	125.23
17	N	201	EQB	O27-C25-C21	2.30	115.03	111.32
17	N	201	EQB	C21-N20-C18	2.27	127.67	121.89
17	N	201	EQB	O27-C28-C29	2.26	114.82	109.39
17	Y	301	EQB	O10-C9-C11	-2.23	105.84	110.63
17	N	201	EQB	C18-C14-N13	2.22	116.39	110.36
17	Y	301	EQB	C6-C5-C7	-2.13	106.39	111.78
17	b	201	EQB	C14-C18-N20	-2.09	111.97	116.48
17	H	301	EQB	C24-C22-C21	-2.08	105.28	111.16
17	H	301	EQB	C22-C21-C25	-2.08	105.81	111.56
17	b	201	EQB	C15-C14-C18	-2.07	106.20	111.38
17	V	301	EQB	C21-N20-C18	-2.07	116.62	121.89
17	b	201	EQB	C22-C21-N20	-2.06	106.34	111.43
17	K	301	EQB	C6-C5-C7	-2.05	106.59	111.78

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
17	N	201	EQB	C6-C5-C7	-2.02	106.66	111.78

There are no chirality outliers.

All (32) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
17	K	301	EQB	O3-C1-C4-C5
17	K	301	EQB	O12-C11-C9-O10
17	N	201	EQB	O12-C11-C9-O10
17	N	201	EQB	N13-C11-C9-O10
17	V	301	EQB	C5-C4-C9-O10
17	Y	301	EQB	O12-C11-C9-O10
17	b	201	EQB	O12-C11-C9-C4
17	b	201	EQB	N13-C11-C9-C4
17	b	201	EQB	O12-C11-C9-O10
17	b	201	EQB	N13-C11-C9-O10
17	K	301	EQB	N13-C11-C9-O10
17	Y	301	EQB	N13-C11-C9-O10
17	b	201	EQB	C29-C28-O27-C25
17	V	301	EQB	C9-C4-C5-C7
17	V	301	EQB	O12-C11-C9-O10
17	H	301	EQB	N13-C11-C9-O10
17	K	301	EQB	C5-C4-C9-O10
17	V	301	EQB	O3-C1-C4-C5
17	K	301	EQB	O3-C1-C4-C9
17	K	301	EQB	O12-C11-C9-C4
17	N	201	EQB	O12-C11-C9-C4
17	Y	301	EQB	O12-C11-C9-C4
17	V	301	EQB	N13-C11-C9-O10
17	N	201	EQB	N13-C11-C9-C4
17	H	301	EQB	O12-C11-C9-O10
17	N	201	EQB	N20-C21-C25-O27
17	b	201	EQB	N20-C21-C25-O27
17	K	301	EQB	C22-C21-N20-C18
17	N	201	EQB	C22-C21-C25-O27
17	N	201	EQB	C22-C21-C25-O26
17	N	201	EQB	N20-C21-C25-O26
17	V	301	EQB	C1-C4-C5-C6

There are no ring outliers.

6 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
17	K	301	EQB	3	0
17	b	201	EQB	4	0
17	Y	301	EQB	2	0
17	H	301	EQB	4	0
17	V	301	EQB	6	0
17	N	201	EQB	4	0

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

Ligand EQB K 301

Bond lengths

Bond angles

Torsions

Rings

Ligand EQB b 201

Bond lengths

Bond angles

Torsions

Rings

Ligand EQB Y 301

Bond lengths

Bond angles

Torsions

Rings

Ligand EQB H 301

Bond lengths

Bond angles

Torsions

Rings

Ligand EQB V 301

Bond lengths

Bond angles

Torsions

Rings

Ligand EQB N 201

Bond lengths

Bond angles

Torsions

Rings
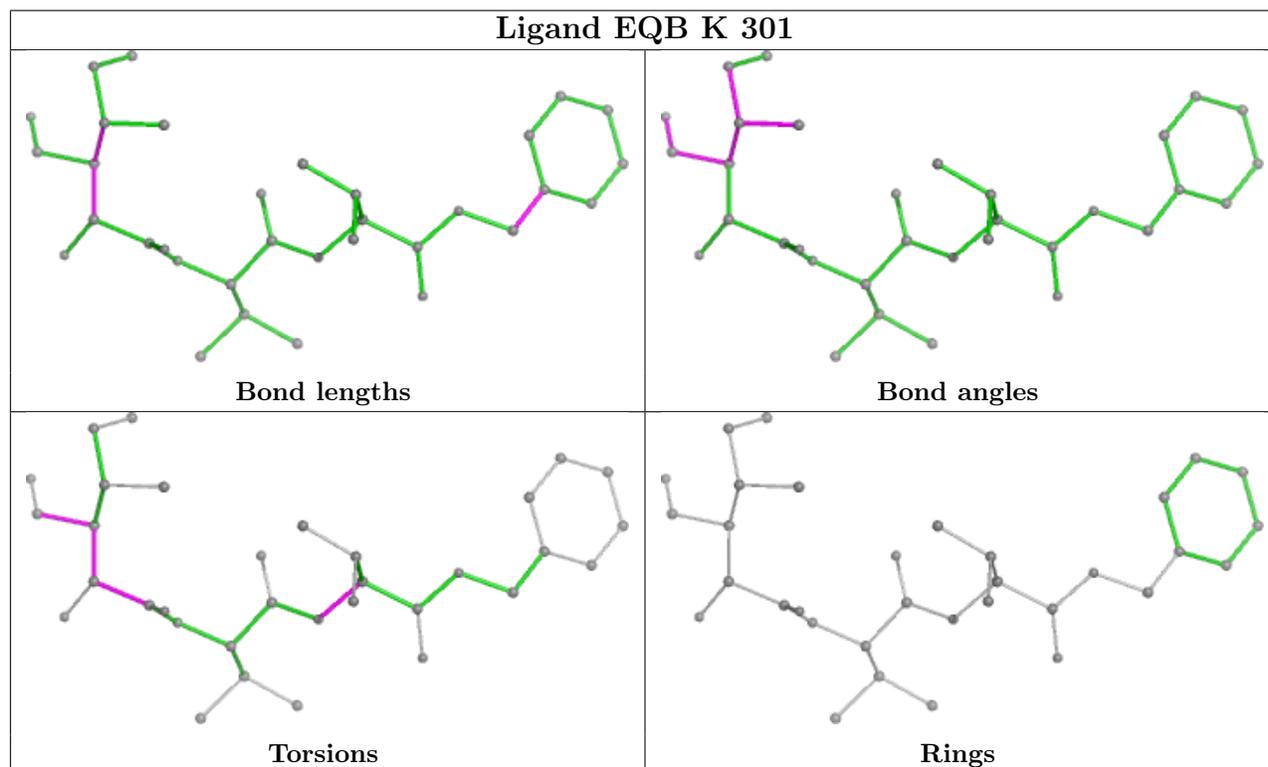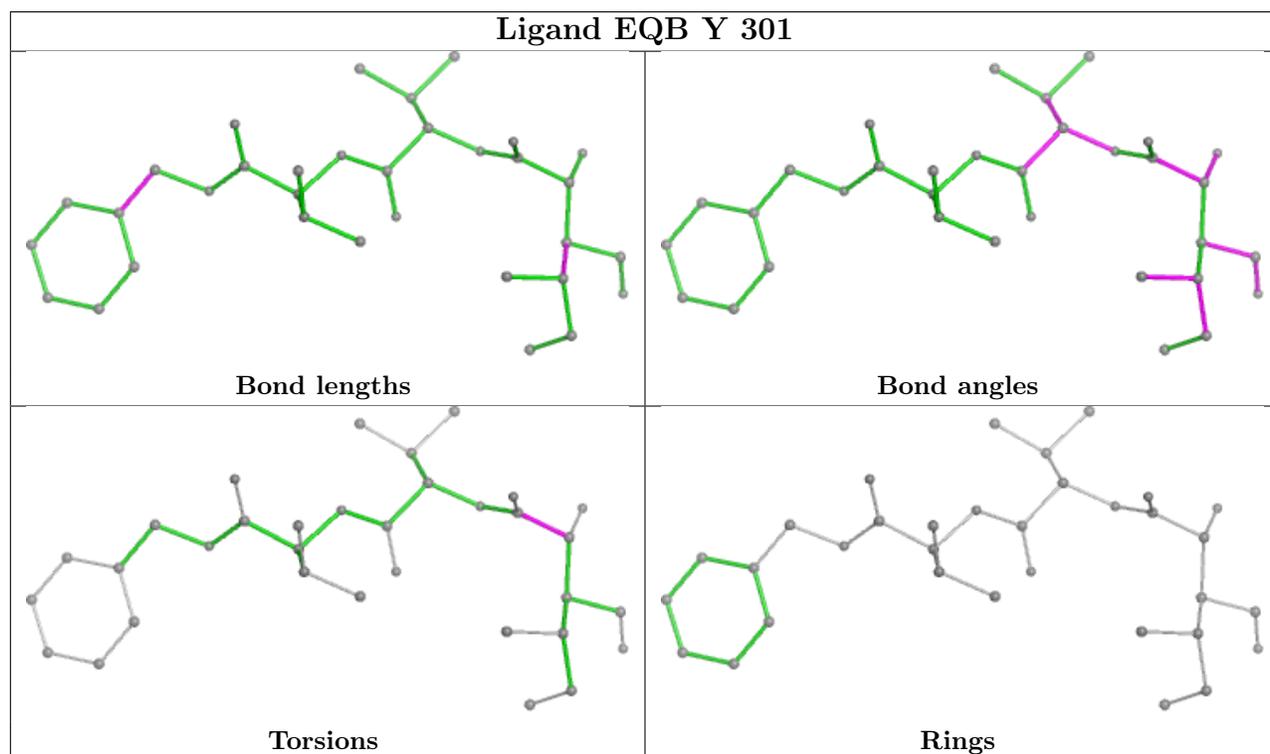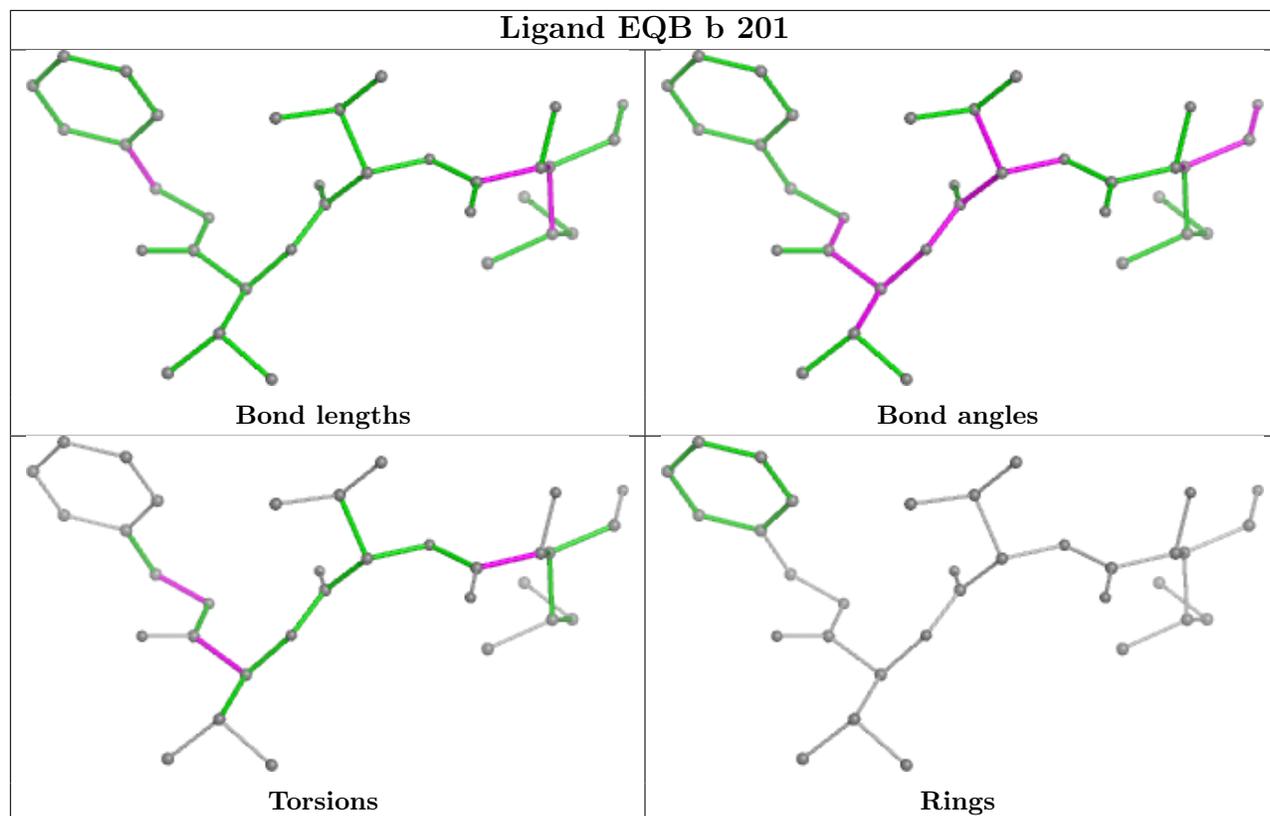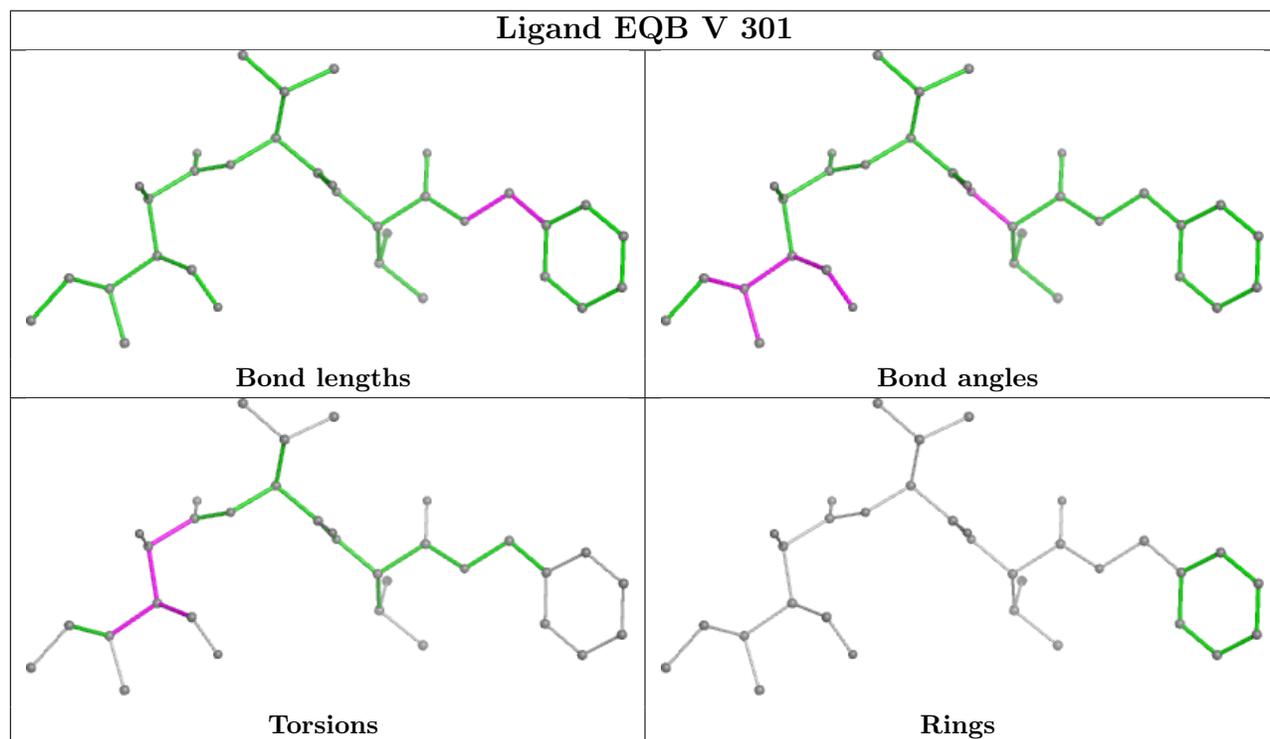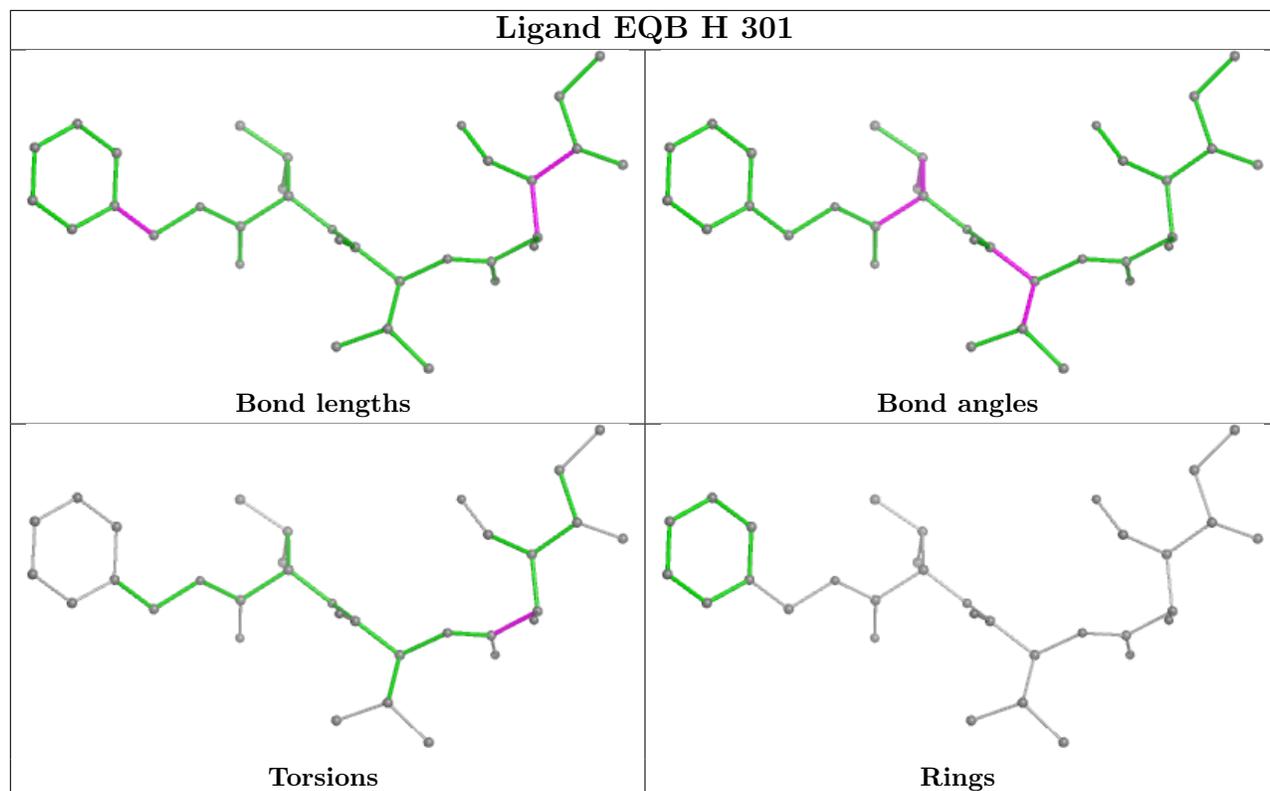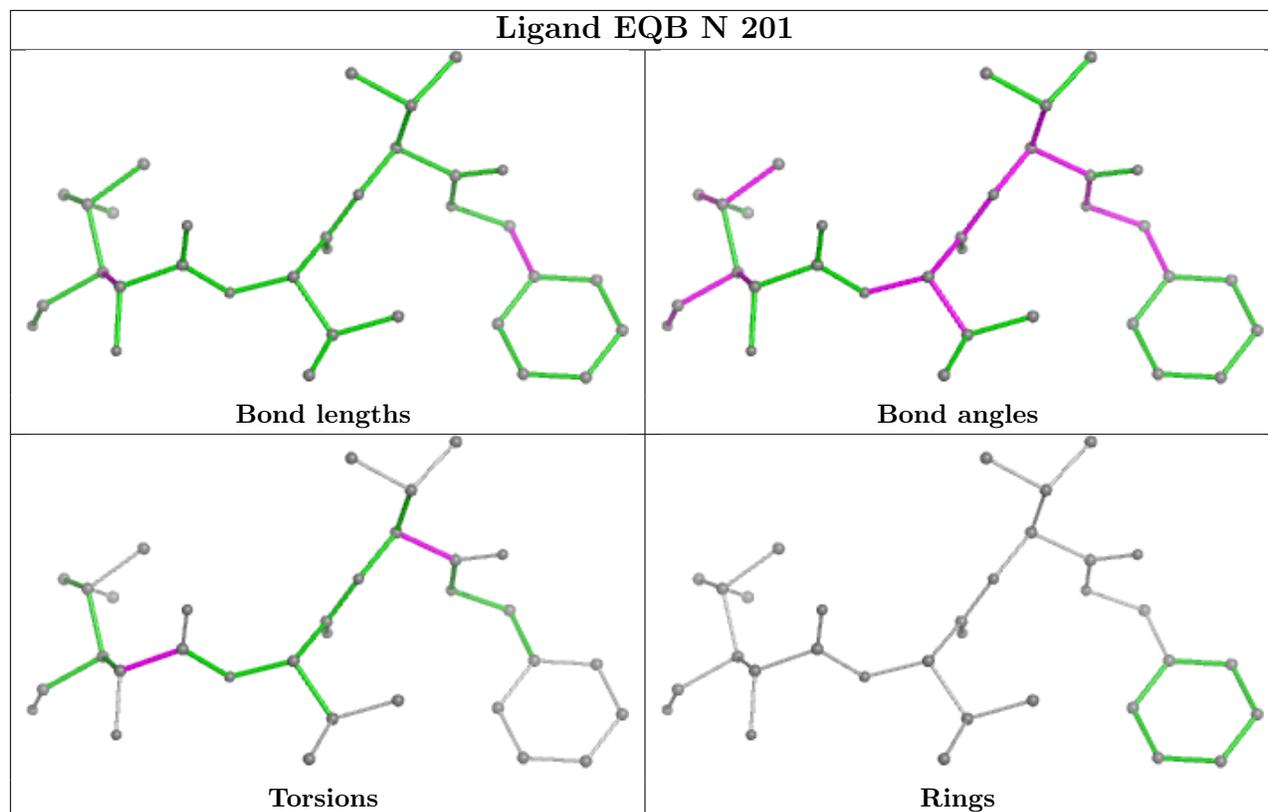
5.7 Other polymers ⓘ

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 ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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%)	-0.76	0	100	100	59, 74, 110, 150	0
1	O	250/250 (100%)	-0.72	0	100	100	62, 80, 124, 155	0
2	B	244/258 (94%)	-0.63	0	100	100	59, 82, 133, 196	0
2	P	244/258 (94%)	-0.62	0	100	100	63, 83, 134, 185	0
3	C	240/254 (94%)	-0.68	0	100	100	56, 84, 141, 167	0
3	Q	240/254 (94%)	-0.61	1 (0%)	89	77	65, 94, 171, 191	0
4	D	235/260 (90%)	-0.70	0	100	100	62, 85, 115, 146	0
4	R	235/260 (90%)	-0.62	0	100	100	67, 91, 132, 164	0
5	E	231/234 (98%)	-0.58	0	100	100	67, 88, 126, 156	0
5	S	231/234 (98%)	-0.57	0	100	100	68, 93, 136, 166	0
6	F	243/288 (84%)	-0.68	1 (0%)	89	77	62, 82, 128, 161	0
6	T	243/288 (84%)	-0.67	0	100	100	60, 89, 137, 172	0
7	G	241/252 (95%)	-0.73	0	100	100	59, 78, 114, 153	0
7	U	241/252 (95%)	-0.72	0	100	100	63, 80, 114, 154	0
8	H	226/232 (97%)	-0.68	0	100	100	57, 73, 106, 173	0
8	V	226/232 (97%)	-0.71	1 (0%)	89	77	57, 75, 109, 181	0
9	I	204/205 (99%)	-0.83	0	100	100	52, 69, 94, 122	0
9	W	204/205 (99%)	-0.81	0	100	100	55, 70, 96, 133	0
10	J	195/198 (98%)	-0.84	1 (0%)	87	75	56, 74, 101, 149	0
10	X	195/198 (98%)	-0.80	1 (0%)	87	75	58, 76, 100, 167	0
11	K	212/212 (100%)	-0.85	0	100	100	52, 70, 95, 112	0
11	Y	212/212 (100%)	-0.81	0	100	100	58, 74, 98, 121	0
12	L	222/222 (100%)	-0.74	0	100	100	55, 72, 103, 137	0
12	Z	222/222 (100%)	-0.75	0	100	100	55, 72, 107, 140	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
13	M	229/246 (93%)	-0.74	1 (0%)	89	77	54, 75, 101, 118	0
13	a	232/246 (94%)	-0.79	0	100	100	53, 73, 99, 114	0
14	N	196/196 (100%)	-0.83	0	100	100	57, 70, 97, 129	0
14	b	196/196 (100%)	-0.79	0	100	100	57, 71, 101, 133	0
All	All	6339/6614 (95%)	-0.72	6 (0%)	92	88	52, 78, 124, 196	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	Q	50	LEU	3.3
8	V	223	ILE	2.7
10	X	1	MET	2.4
13	M	1	THR	2.2
10	J	1	MET	2.1
6	F	202	ASP	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 oligosaccharides 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(Å²)	Q<0.9
17	EQB	Y	301	33/34	0.80	0.14	73,85,120,133	0
17	EQB	V	301	33/34	0.87	0.13	57,72,91,99	0
15	MG	I	301	1/1	0.88	0.14	96,96,96,96	0
17	EQB	K	301	33/34	0.88	0.11	65,85,104,117	0
17	EQB	b	201	33/34	0.88	0.12	66,83,101,130	0
17	EQB	N	201	33/34	0.89	0.12	70,82,110,136	0

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
17	EQB	H	301	33/34	0.92	0.11	59,75,96,101	0
15	MG	W	301	1/1	0.93	0.11	84,84,84,84	0
15	MG	Y	302	1/1	0.94	0.09	92,92,92,92	0
15	MG	V	302	1/1	0.95	0.17	105,105,105,105	0
16	CL	G	302	1/1	0.96	0.11	82,82,82,82	0
16	CL	U	301	1/1	0.96	0.07	75,75,75,75	0
15	MG	Z	301	1/1	0.98	0.04	61,61,61,61	0
15	MG	K	302	1/1	0.98	0.06	92,92,92,92	0
15	MG	G	301	1/1	0.98	0.07	83,83,83,83	0
15	MG	N	202	1/1	0.99	0.03	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.
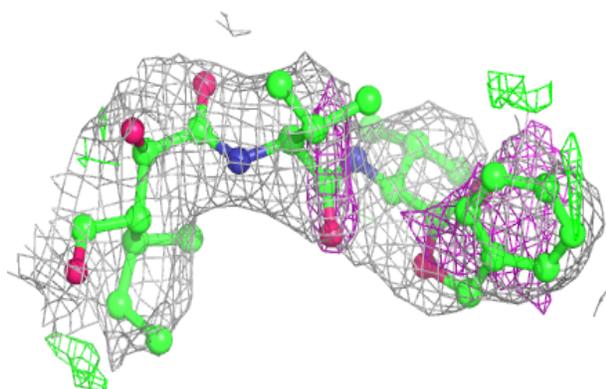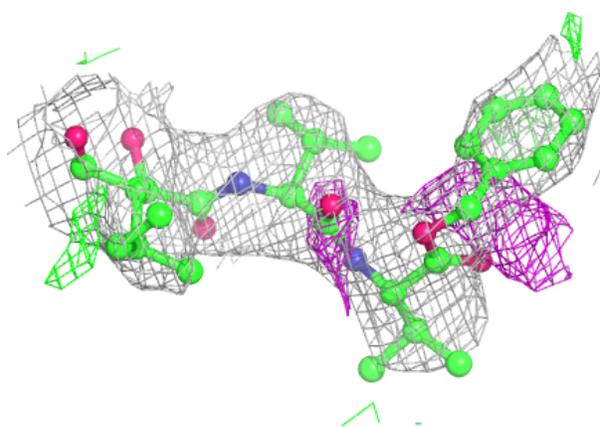

Electron density around EQB Y 301:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
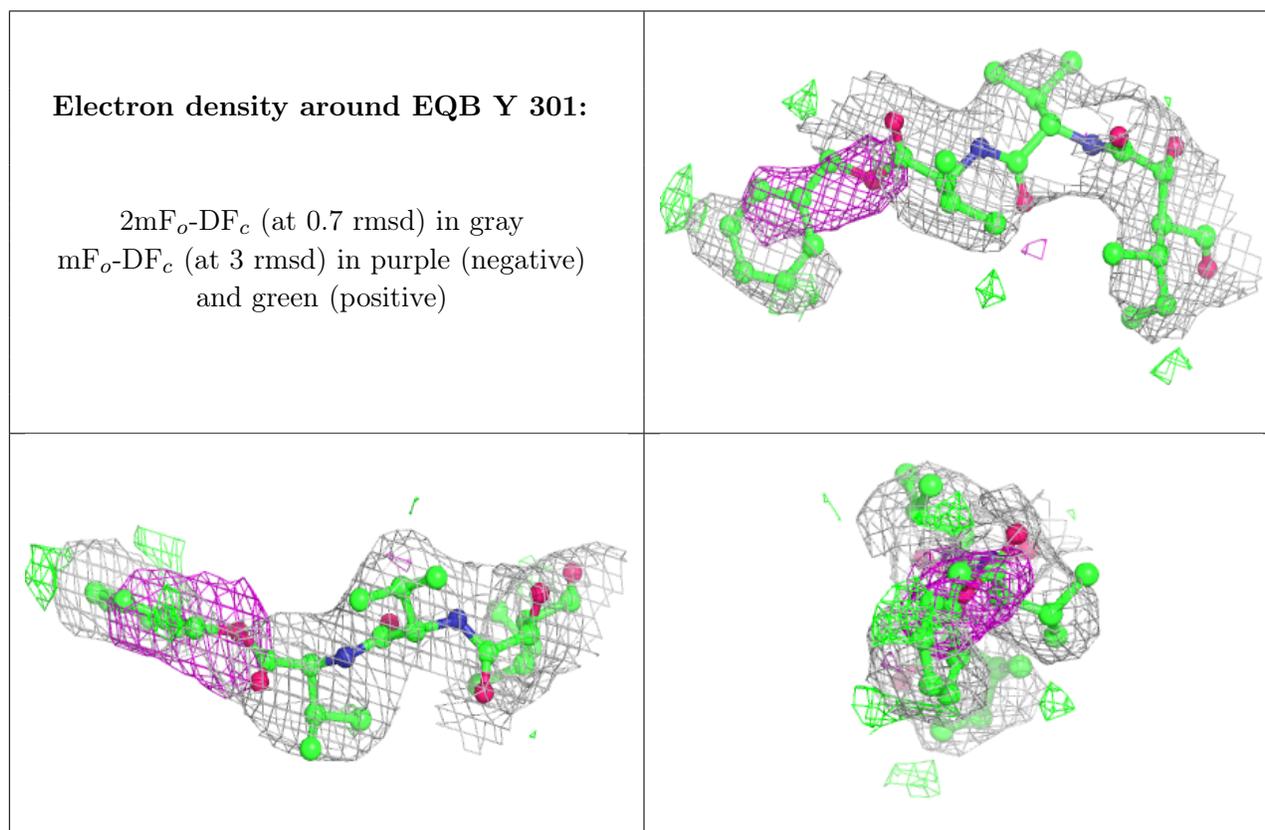
Electron density around EQB V 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
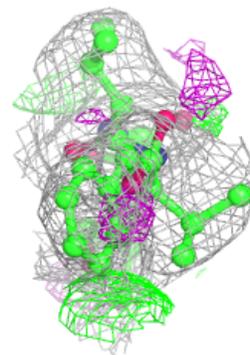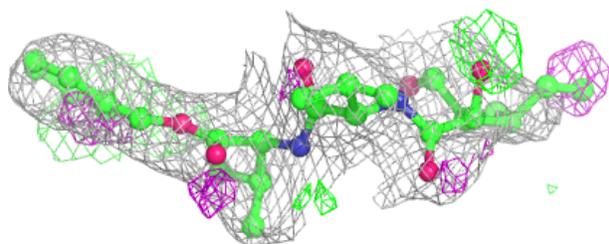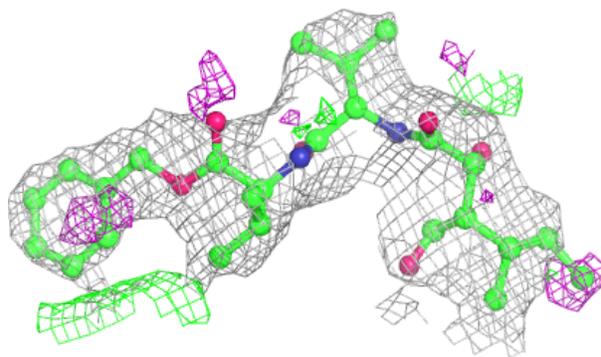
Electron density around EQB K 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
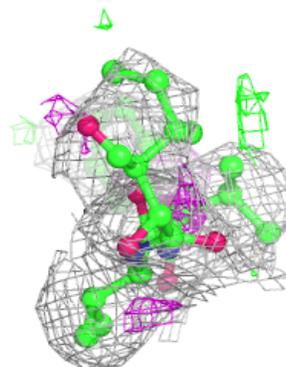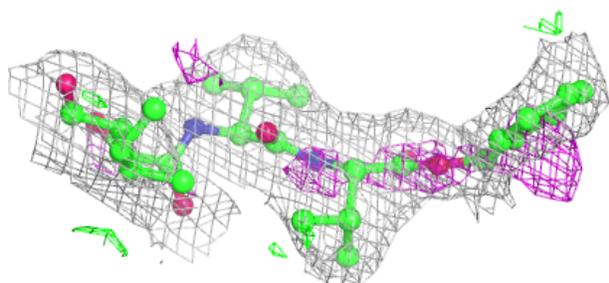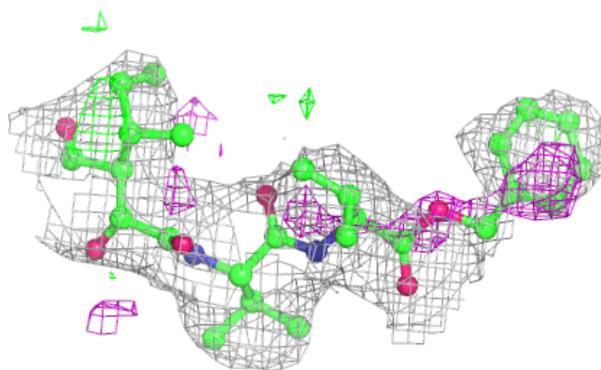
Electron density around EQB b 201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
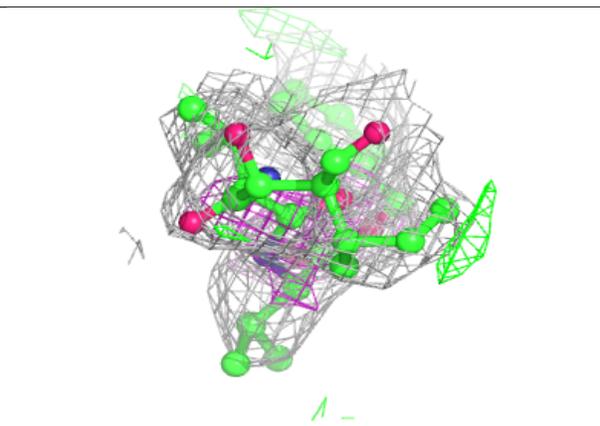
Electron density around EQB N 201:

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

Electron density around EQB H 301:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
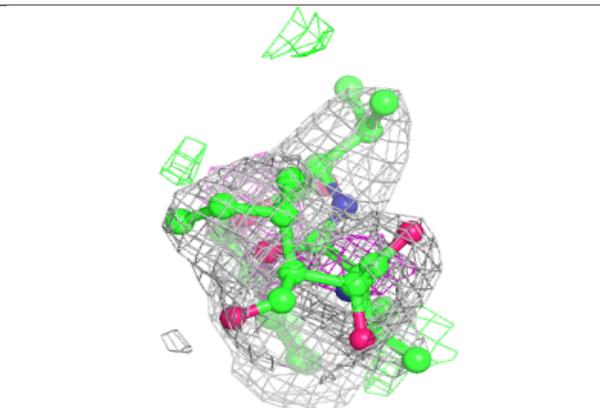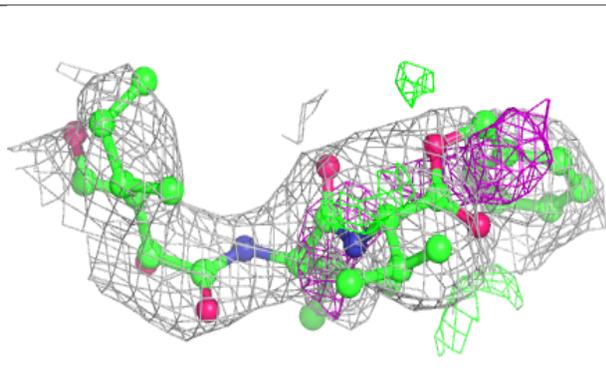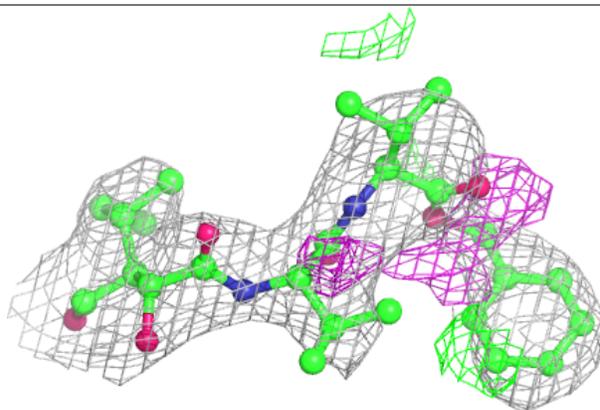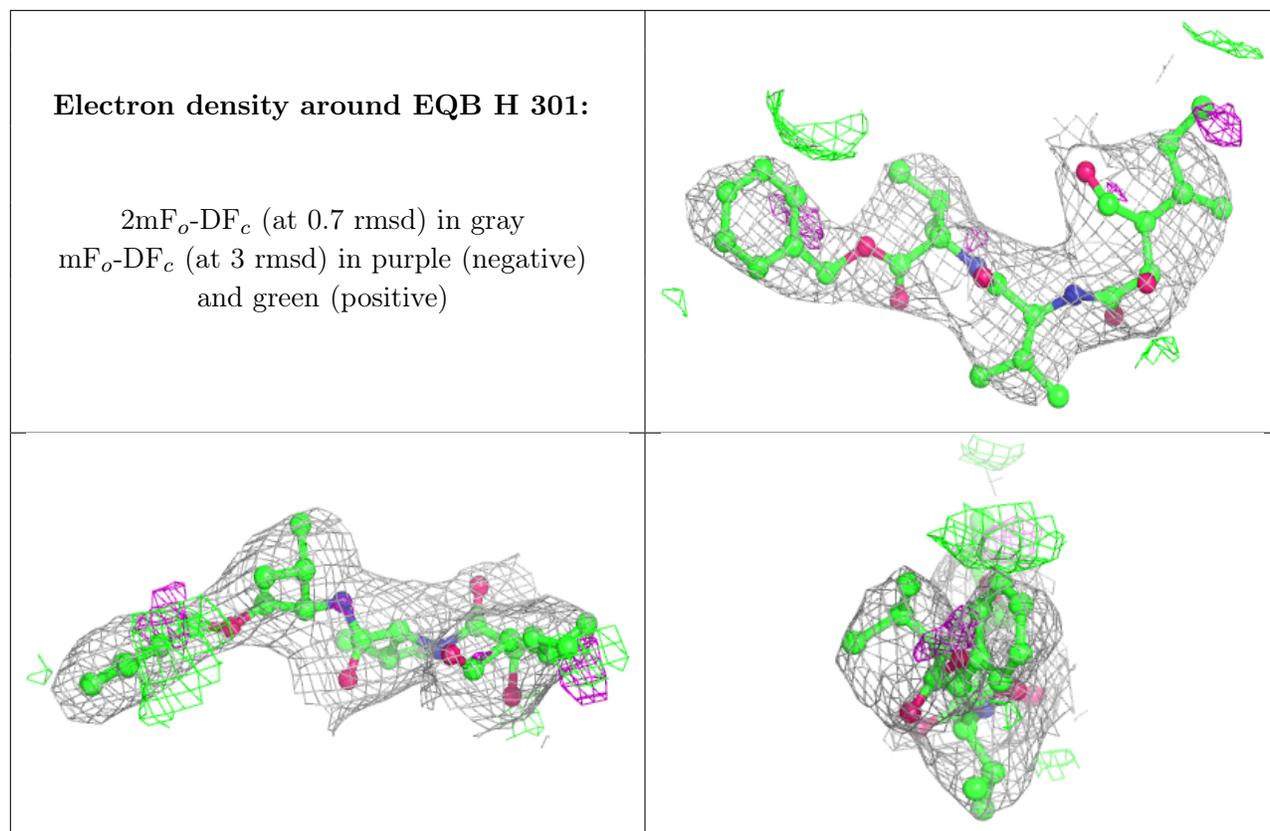
6.5 Other polymers (i)

There are no such residues in this entry.