



# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 4, 2023 – 02:32 PM JST

PDB ID : 8W52  
Title : p17 protein structure of HIV2 when OLA1 existing  
Authors : Dang, L.L.  
Deposited on : 2023-08-25  
Resolution : 2.38 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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 : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.35  
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

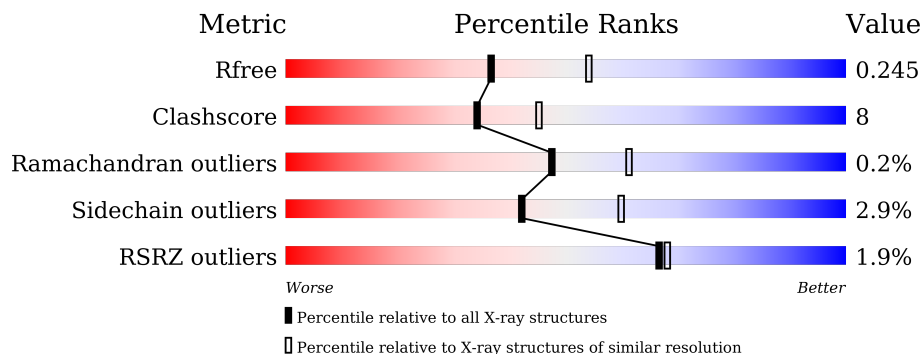
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.38 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	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

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  $\geq 3$ , 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	135	 2% 66% 16% 18%
1	B	135	 69% 13% 18%
1	C	135	 6% 59% 20% 19%
1	D	135	 2% 56% 24% 21%
1	E	135	 % 64% 18% 18%
1	F	135	 67% 13% 18%

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Mol	Chain	Length	Quality of chain
1	G	135	<p>%</p> <p>64% 14% 21%</p>
1	H	135	<p>%</p> <p>61% 19% 21%</p>
1	I	135	<p>%</p> <p>54% 24% 22%</p>
1	J	135	<p>%</p> <p>53% 21% 24%</p>
1	K	135	<p>%</p> <p>67% 12% 20%</p>
1	L	135	<p>%</p> <p>65% 13% 21%</p>
1	M	135	<p>2%</p> <p>55% 21% 24%</p>
1	N	135	<p>%</p> <p>61% 15% 22%</p>
1	O	135	<p>%</p> <p>59% 19% 20%</p>
1	P	135	<p>4%</p> <p>61% 17% 21%</p>

## 2 Entry composition

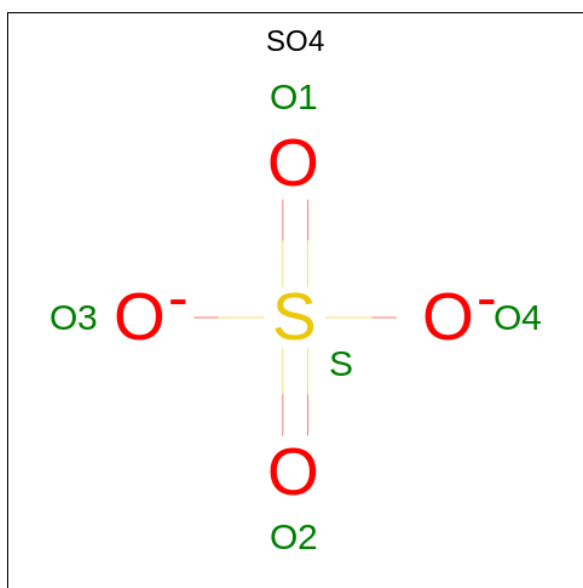
There are 3 unique types of molecules in this entry. The entry contains 14103 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Gag polyprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	111	Total 879	C 556	N 161	O 159	S 3	0	0	0
1	B	111	Total 879	C 556	N 161	O 159	S 3	0	0	0
1	C	109	Total 868	C 550	N 159	O 156	S 3	0	0	0
1	D	107	Total 854	C 542	N 157	O 152	S 3	0	0	0
1	E	111	Total 879	C 556	N 161	O 159	S 3	0	0	0
1	F	111	Total 879	C 556	N 161	O 159	S 3	0	0	0
1	G	106	Total 842	C 535	N 152	O 152	S 3	0	0	0
1	H	107	Total 849	C 540	N 153	O 153	S 3	0	0	0
1	I	105	Total 838	C 534	N 151	O 150	S 3	0	0	0
1	J	102	Total 817	C 521	N 148	O 145	S 3	0	0	0
1	K	108	Total 859	C 545	N 155	O 156	S 3	0	0	0
1	L	106	Total 845	C 538	N 152	O 152	S 3	0	0	0
1	M	103	Total 823	C 524	N 149	O 147	S 3	0	0	0
1	N	105	Total 838	C 534	N 151	O 150	S 3	0	0	0
1	O	108	Total 864	C 548	N 158	O 155	S 3	0	0	0
1	P	107	Total 854	C 542	N 157	O 152	S 3	0	0	0

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	G	1	Total	O	S	0	0
			5	4	1		
2	H	1	Total	O	S	0	0
			5	4	1		
2	I	1	Total	O	S	0	0
			5	4	1		
2	I	1	Total	O	S	0	0
			5	4	1		
2	J	1	Total	O	S	0	0
			5	4	1		
2	J	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	K	1	Total	O	S	0	0
			5	4	1		
2	K	1	Total	O	S	0	0
			5	4	1		
2	L	1	Total	O	S	0	0
			5	4	1		
2	L	1	Total	O	S	0	0
			5	4	1		
2	L	1	Total	O	S	0	0
			5	4	1		
2	N	1	Total	O	S	0	0
			5	4	1		
2	P	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	17	Total	O	0	0
			17	17		
3	B	29	Total	O	0	0
			29	29		
3	C	10	Total	O	0	0
			10	10		
3	D	17	Total	O	0	0
			17	17		
3	E	24	Total	O	0	0
			24	24		
3	F	28	Total	O	0	0
			28	28		
3	G	22	Total	O	0	0
			22	22		
3	H	28	Total	O	0	0
			28	28		
3	I	25	Total	O	0	0
			25	25		
3	J	19	Total	O	0	0
			19	19		
3	K	25	Total	O	0	0
			25	25		
3	L	17	Total	O	0	0
			17	17		

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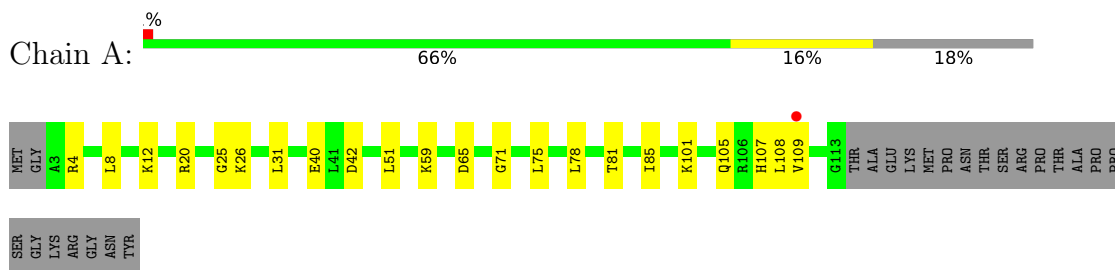
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<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
3	M	14	Total O 14 14	0	0
3	N	27	Total O 27 27	0	0
3	O	21	Total O 21 21	0	0
3	P	13	Total O 13 13	0	0

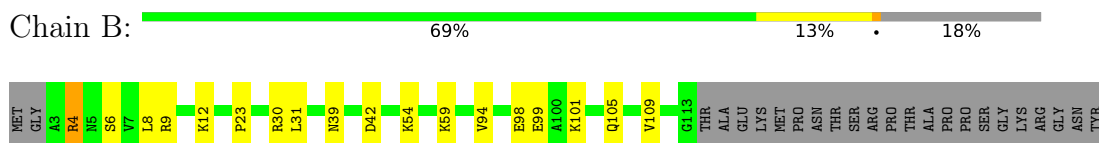
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

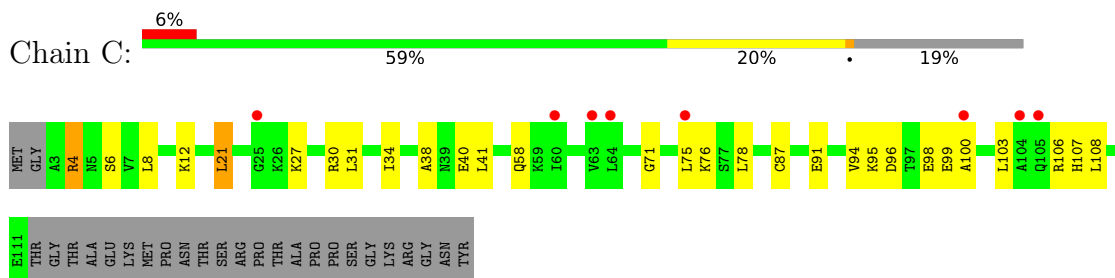
- Molecule 1: Gag polyprotein



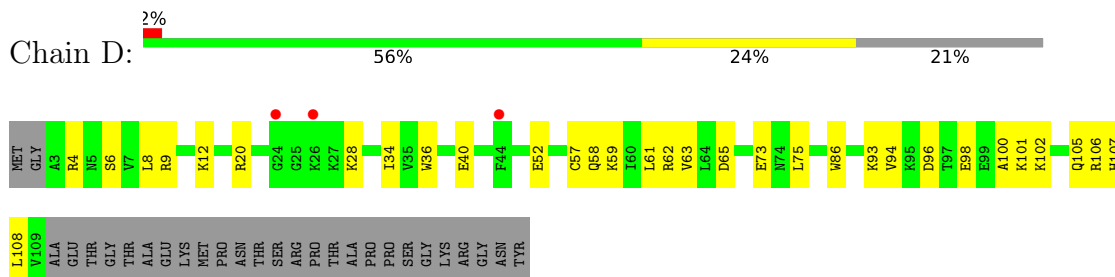
- Molecule 1: Gag polyprotein



- Molecule 1: Gag polyprotein



- Molecule 1: Gag polyprotein



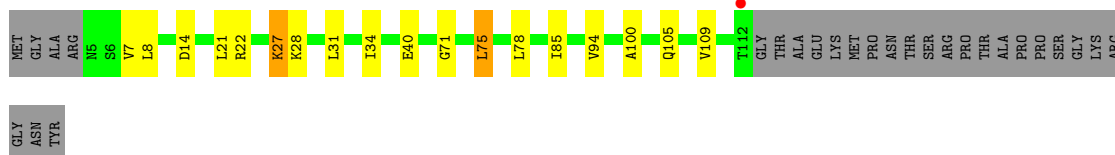
- Molecule 1: Gag polyprotein



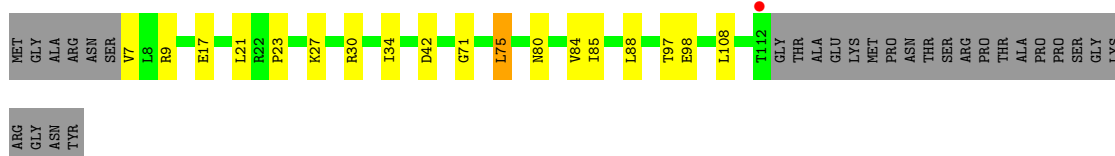




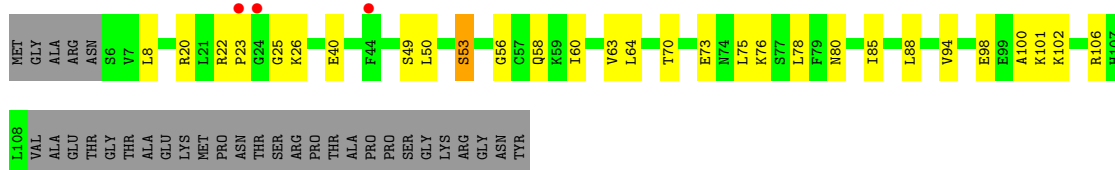
• Molecule 1: Gag polyprotein



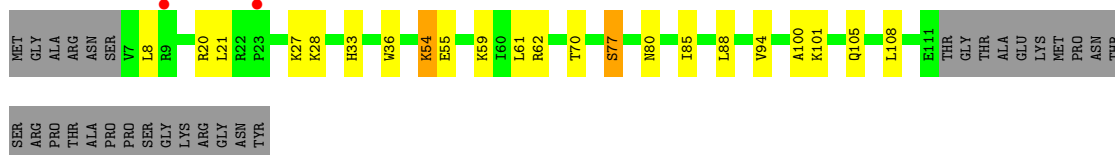
• Molecule 1: Gag polyprotein



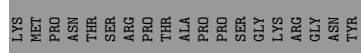
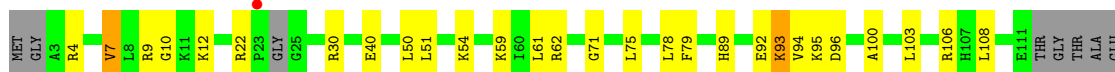
• Molecule 1: Gag polyprotein



• Molecule 1: Gag polyprotein



• Molecule 1: Gag polyprotein



- Molecule 1: Gag polyprotein



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	123.78Å 123.78Å 108.77Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.19 – 2.38 46.19 – 2.38	Depositor EDS
% Data completeness (in resolution range)	99.8 (46.19-2.38) 99.8 (46.19-2.38)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	4.47 (at 2.39Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487, PHENIX 1.20.1_4487	Depositor
R, $R_{free}$	0.210 , 0.248 0.211 , 0.245	Depositor DCC
$R_{free}$ test set	3371 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	38.5	Xtrriage
Anisotropy	0.551	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 36.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.487 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	14103	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	45.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 75.96 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.1429e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: SO4

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	0.23	0/891	0.45	0/1194
1	B	0.23	0/891	0.45	0/1194
1	C	0.24	0/880	0.50	0/1179
1	D	0.24	0/866	0.48	0/1160
1	E	0.23	0/891	0.46	0/1194
1	F	0.23	0/891	0.45	0/1194
1	G	0.24	0/854	0.47	0/1144
1	H	0.24	0/861	0.46	0/1154
1	I	0.24	0/850	0.45	0/1139
1	J	0.26	0/829	0.48	0/1110
1	K	0.23	0/871	0.45	0/1168
1	L	0.24	0/857	0.45	0/1149
1	M	0.24	0/835	0.47	0/1118
1	N	0.24	0/850	0.48	0/1139
1	O	0.25	0/875	0.46	0/1171
1	P	0.24	0/866	0.47	0/1160
All	All	0.24	0/13858	0.46	0/18567

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	879	0	926	13	0
1	B	879	0	926	12	0
1	C	868	0	916	16	0
1	D	854	0	905	18	0
1	E	879	0	926	19	0
1	F	879	0	926	14	0
1	G	842	0	888	16	0
1	H	849	0	897	20	0
1	I	838	0	887	21	0
1	J	817	0	867	21	0
1	K	859	0	905	11	0
1	L	845	0	894	12	0
1	M	823	0	872	15	0
1	N	838	0	887	15	0
1	O	864	0	912	20	0
1	P	854	0	905	13	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	5	0	0	0	0
2	E	10	0	0	0	0
2	G	5	0	0	0	0
2	H	5	0	0	0	0
2	I	10	0	0	1	0
2	J	10	0	0	0	0
2	K	10	0	0	0	0
2	L	15	0	0	1	0
2	N	5	0	0	0	0
2	P	5	0	0	0	0
3	A	17	0	0	1	0
3	B	29	0	0	2	0
3	C	10	0	0	0	0
3	D	17	0	0	1	0
3	E	24	0	0	3	0
3	F	28	0	0	2	0
3	G	22	0	0	0	0
3	H	28	0	0	3	0
3	I	25	0	0	3	0
3	J	19	0	0	0	0
3	K	25	0	0	1	0
3	L	17	0	0	3	0
3	M	14	0	0	1	0
3	N	27	0	0	0	0
3	O	21	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	P	13	0	0	0	0
All	All	14103	0	14439	238	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 8.

All (238) 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)
1:O:103:LEU:HA	1:O:106:ARG:HD3	1.60	0.82
1:I:62:ARG:HG3	1:I:108:LEU:HD11	1.61	0.80
1:D:8:LEU:HD12	1:D:34:ILE:HD11	1.67	0.77
1:C:103:LEU:HG	1:C:106:ARG:HH12	1.49	0.76
1:C:71:GLY:HA3	1:C:75:LEU:HD23	1.69	0.74
1:M:22:ARG:HE	1:M:25:GLY:HA3	1.52	0.74
1:E:75:LEU:HD13	1:G:70:THR:HB	1.69	0.73
1:C:8:LEU:HD22	1:C:12:LYS:HB3	1.69	0.73
1:K:7:VAL:HG12	1:K:8:LEU:HD22	1.72	0.72
1:J:75:LEU:HD22	1:N:70:THR:HB	1.71	0.71
1:H:15:GLU:HA	1:H:18:LYS:HD2	1.74	0.69
1:E:30:ARG:HG2	1:E:32:LYS:H	1.57	0.69
1:N:21:LEU:HD12	1:N:27:LYS:HB3	1.73	0.68
1:J:71:GLY:HA3	1:J:75:LEU:HD23	1.76	0.67
1:D:102:LYS:HE3	1:D:106:ARG:HH21	1.58	0.67
1:I:87:CYS:SG	3:I:323:HOH:O	2.52	0.67
1:H:71:GLY:HA3	1:H:75:LEU:HD23	1.75	0.67
1:N:94:VAL:HG11	1:N:100:ALA:HB2	1.76	0.67
1:M:73:GLU:HA	1:M:76:LYS:HB2	1.77	0.66
1:B:8:LEU:HD22	1:B:12:LYS:HB3	1.79	0.64
1:C:94:VAL:HG21	1:C:100:ALA:HB2	1.79	0.64
1:N:61:LEU:HB3	1:N:108:LEU:HD11	1.80	0.64
1:F:67:LEU:HD13	1:H:70:THR:HG21	1.78	0.64
1:H:61:LEU:HB3	1:H:108:LEU:HD11	1.79	0.63
1:E:51:LEU:HD21	1:E:82:VAL:HG22	1.80	0.63
1:B:4:ARG:HD3	1:B:31:LEU:HD22	1.80	0.63
1:D:94:VAL:HG21	1:D:100:ALA:HB2	1.81	0.63
1:D:98:GLU:HA	1:D:101:LYS:HD3	1.80	0.62
1:F:22:ARG:HH12	1:F:27:LYS:HD3	1.66	0.61
1:J:94:VAL:HG21	1:J:100:ALA:HB2	1.81	0.61
1:L:7:VAL:N	3:L:302:HOH:O	2.34	0.60
1:E:28:LYS:NZ	3:E:304:HOH:O	2.33	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:7:VAL:HG12	1:E:8:LEU:HG	1.83	0.60
1:L:30:ARG:NH2	3:L:303:HOH:O	2.35	0.60
1:F:44:PHE:HB2	1:F:46:LEU:HG	1.84	0.59
1:N:8:LEU:HD21	1:N:88:LEU:HD13	1.85	0.59
1:K:94:VAL:HG21	1:K:100:ALA:HB2	1.83	0.59
1:F:93:LYS:NZ	3:F:205:HOH:O	2.36	0.59
1:I:20:ARG:HA	1:I:28:LYS:HA	1.84	0.59
1:D:8:LEU:HD22	1:D:12:LYS:HB3	1.84	0.58
1:A:59:LYS:NZ	1:E:42:ASP:O	2.31	0.58
1:B:101:LYS:NZ	1:H:113:GLY:O	2.35	0.58
1:N:85:ILE:HA	1:N:88:LEU:HD12	1.85	0.58
1:L:7:VAL:N	3:L:305:HOH:O	2.36	0.58
1:E:70:THR:HB	1:G:75:LEU:HD13	1.85	0.57
1:E:101:LYS:NZ	3:E:306:HOH:O	2.38	0.57
1:O:9:ARG:NH1	1:O:10:GLY:H	2.02	0.56
1:J:64:LEU:HB2	1:J:79:PHE:HD2	1.71	0.56
1:O:62:ARG:HG3	1:O:108:LEU:HD11	1.87	0.56
1:F:22:ARG:HE	1:F:25:GLY:HA3	1.71	0.56
1:I:71:GLY:HA3	1:I:75:LEU:HD22	1.88	0.55
1:A:26:LYS:NZ	3:A:303:HOH:O	2.40	0.55
1:O:4:ARG:HH12	1:O:9:ARG:HH11	1.53	0.55
1:H:102:LYS:O	1:H:106:ARG:HB2	2.05	0.55
1:C:4:ARG:HD3	1:C:31:LEU:HD22	1.89	0.55
1:C:8:LEU:HD12	1:C:34:ILE:HD11	1.88	0.55
1:H:95:LYS:N	1:H:99:GLU:OE1	2.28	0.55
1:M:8:LEU:HD21	1:M:88:LEU:HD13	1.88	0.55
1:A:51:LEU:HD22	1:A:85:ILE:HD12	1.90	0.54
1:N:21:LEU:HD21	1:N:33:HIS:CE1	2.42	0.54
1:J:17:GLU:HG3	1:K:31:LEU:HD12	1.90	0.54
1:O:54:LYS:HB3	1:O:89:HIS:HB3	1.90	0.54
1:M:53:SER:HG	1:M:56:GLY:H	1.51	0.54
1:E:5:ASN:O	1:E:9:ARG:HG2	2.08	0.54
1:O:12:LYS:NZ	3:O:203:HOH:O	2.40	0.53
1:F:75:LEU:HD13	1:H:70:THR:HB	1.89	0.53
1:H:40:GLU:HB3	1:H:78:LEU:HD22	1.90	0.53
1:D:4:ARG:NH1	1:D:8:LEU:O	2.42	0.53
1:M:20:ARG:NH2	3:M:205:HOH:O	2.42	0.53
1:C:21:LEU:HD12	1:C:27:LYS:HB3	1.91	0.52
1:C:71:GLY:O	1:C:76:LYS:NZ	2.42	0.52
1:J:27:LYS:H	1:J:27:LYS:HD3	1.74	0.52
1:J:27:LYS:H	1:J:27:LYS:CD	2.23	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:41:LEU:HD23	1:G:78:LEU:HD21	1.91	0.51
1:O:71:GLY:HA3	1:O:75:LEU:HD12	1.92	0.51
1:N:54:LYS:HG3	1:N:55:GLU:N	2.26	0.51
1:K:105:GLN:O	1:K:109:VAL:HG23	2.10	0.51
1:I:27:LYS:NZ	3:I:304:HOH:O	2.34	0.50
1:A:71:GLY:HA3	1:A:75:LEU:HD12	1.93	0.50
1:M:94:VAL:HG21	1:M:100:ALA:HB2	1.92	0.50
1:G:58:GLN:HE22	1:G:108:LEU:HD23	1.76	0.50
1:O:94:VAL:HG21	1:O:100:ALA:N	2.27	0.50
1:P:29:TYR:OH	1:P:97:THR:OG1	2.28	0.50
1:A:8:LEU:HD22	1:A:12:LYS:HB3	1.93	0.50
1:H:28:LYS:NZ	3:H:305:HOH:O	2.40	0.49
1:E:8:LEU:HD12	1:E:34:ILE:HG13	1.94	0.49
1:O:59:LYS:HG3	1:O:62:ARG:HH12	1.76	0.49
1:F:22:ARG:HH21	1:F:26:LYS:H	1.60	0.49
1:O:4:ARG:HH12	1:O:9:ARG:NH1	2.10	0.49
1:F:8:LEU:HD12	1:F:34:ILE:HG13	1.94	0.49
1:O:40:GLU:HB3	1:O:78:LEU:HD22	1.94	0.49
1:A:20:ARG:HD3	1:A:25:GLY:O	2.13	0.49
1:N:59:LYS:HG3	1:N:62:ARG:HH12	1.78	0.49
1:A:108:LEU:HD23	1:G:109:VAL:HG13	1.95	0.49
1:J:22:ARG:HH21	1:J:27:LYS:HB2	1.78	0.49
1:E:50:LEU:HB2	1:E:60:ILE:HD11	1.94	0.48
1:I:23:PRO:HG3	1:I:98:GLU:HG3	1.95	0.48
1:P:40:GLU:HB3	1:P:78:LEU:HD22	1.94	0.48
1:B:6:SER:HA	1:B:9:ARG:HH21	1.79	0.48
1:A:109:VAL:HG23	1:G:109:VAL:HG12	1.95	0.48
1:F:62:ARG:NH1	3:F:206:HOH:O	2.37	0.48
1:P:105:GLN:HA	1:P:108:LEU:HB2	1.94	0.48
1:K:71:GLY:HA3	1:K:75:LEU:HD22	1.96	0.48
1:A:109:VAL:HG13	1:G:106:ARG:HG3	1.96	0.48
1:J:65:ASP:HB3	1:J:66:PRO:HD3	1.95	0.48
1:C:58:GLN:OE1	1:C:107:HIS:ND1	2.39	0.48
1:F:8:LEU:HD22	1:F:12:LYS:HB3	1.95	0.48
1:G:71:GLY:O	1:G:76:LYS:NZ	2.47	0.47
1:N:36:TRP:CH2	1:N:77:SER:HB3	2.48	0.47
1:E:5:ASN:HA	1:E:9:ARG:HD3	1.95	0.47
1:G:21:LEU:HD21	1:G:33:HIS:CE1	2.49	0.47
1:B:39:ASN:ND2	3:B:306:HOH:O	2.48	0.47
1:J:20:ARG:HG3	1:J:95:LYS:O	2.13	0.47
1:B:109:VAL:HG13	1:H:106:ARG:HG3	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:15:GLU:HA	1:I:18:LYS:HE3	1.96	0.47
1:L:23:PRO:HG3	1:L:98:GLU:HB2	1.96	0.47
1:O:62:ARG:NH2	3:O:202:HOH:O	2.45	0.47
1:J:30:ARG:NH2	1:K:28:LYS:HB2	2.30	0.47
1:N:105:GLN:HA	1:N:108:LEU:HB2	1.96	0.47
1:P:8:LEU:HD12	1:P:34:ILE:HD11	1.97	0.47
1:M:22:ARG:HH21	1:M:26:LYS:H	1.61	0.47
1:K:34:ILE:HD12	1:K:85:ILE:HD11	1.96	0.47
1:B:94:VAL:HB	1:B:99:GLU:HB3	1.95	0.47
1:J:32:LYS:H	1:J:32:LYS:HZ3	1.63	0.47
1:C:94:VAL:HG23	1:C:99:GLU:HB3	1.97	0.46
1:M:85:ILE:HA	1:M:88:LEU:HD12	1.97	0.46
1:C:40:GLU:HB3	1:C:78:LEU:HD22	1.96	0.46
1:J:7:VAL:HG12	1:J:8:LEU:HG	1.97	0.46
1:P:20:ARG:HA	1:P:28:LYS:HG2	1.97	0.46
1:O:7:VAL:HG13	1:O:51:LEU:HB3	1.98	0.46
1:H:76:LYS:HE3	1:H:76:LYS:HB2	1.75	0.46
1:D:73:GLU:H	1:D:73:GLU:CD	2.19	0.46
1:J:58:GLN:HG3	1:J:86:TRP:CD1	2.51	0.46
1:B:30:ARG:CZ	1:C:30:ARG:HE	2.28	0.45
1:L:21:LEU:HD12	1:L:27:LYS:HB3	1.97	0.45
1:B:54:LYS:NZ	3:B:305:HOH:O	2.48	0.45
1:I:31:LEU:HD12	1:L:17:GLU:HG3	1.98	0.45
1:C:38:ALA:HA	1:C:41:LEU:HD12	1.98	0.45
1:D:102:LYS:O	1:D:106:ARG:HB2	2.16	0.45
1:O:93:LYS:HD2	1:O:93:LYS:HA	1.71	0.45
1:O:50:LEU:HD22	1:O:59:LYS:HD2	1.99	0.45
1:G:109:VAL:O	1:G:112:THR:HG22	2.16	0.45
1:N:36:TRP:HH2	1:N:77:SER:HB3	1.82	0.45
1:I:76:LYS:NZ	3:I:307:HOH:O	2.49	0.45
1:F:30:ARG:HD2	1:F:32:LYS:HZ2	1.82	0.45
1:L:9:ARG:HB3	2:L:203:SO4:O3	2.17	0.45
1:L:80:ASN:HB3	1:L:97:THR:CG2	2.47	0.45
1:E:67:LEU:HD13	1:G:70:THR:HG21	1.99	0.45
1:F:9:ARG:HG2	1:F:10:GLY:N	2.31	0.45
1:K:21:LEU:HD12	1:K:27:LYS:HB3	1.99	0.45
1:O:92:GLU:HG2	1:O:103:LEU:HD22	1.99	0.45
1:J:63:VAL:HG12	1:J:64:LEU:HD23	1.99	0.44
1:C:96:ASP:OD1	1:C:98:GLU:N	2.51	0.44
1:G:102:LYS:O	1:G:106:ARG:HB2	2.17	0.44
1:H:18:LYS:HA	1:H:28:LYS:HD3	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:59:LYS:HD2	1:J:59:LYS:HA	1.70	0.44
1:I:94:VAL:HG12	1:I:99:GLU:HG2	2.00	0.44
1:D:62:ARG:NH2	3:D:206:HOH:O	2.49	0.44
1:J:26:LYS:O	1:J:28:LYS:HG3	2.17	0.44
1:P:80:ASN:OD1	1:P:101:LYS:HD2	2.17	0.44
1:J:85:ILE:HA	1:J:88:LEU:HD12	1.99	0.44
1:P:54:LYS:HB3	1:P:89:HIS:HB3	2.00	0.44
1:A:4:ARG:HD3	1:A:31:LEU:HD22	1.98	0.43
1:B:23:PRO:HG3	1:B:98:GLU:HB2	2.00	0.43
1:G:40:GLU:HB3	1:G:78:LEU:HD22	1.99	0.43
1:I:40:GLU:HB3	1:I:78:LEU:HD22	2.01	0.43
1:E:30:ARG:HH11	1:E:30:ARG:HB2	1.83	0.43
1:I:61:LEU:HB3	1:I:108:LEU:HD22	2.01	0.43
1:M:40:GLU:HB3	1:M:78:LEU:HD22	2.01	0.43
1:F:25:GLY:C	1:F:26:LYS:HD3	2.39	0.43
1:I:22:ARG:HB2	1:I:25:GLY:HA3	2.01	0.43
1:B:30:ARG:NE	1:C:30:ARG:HE	2.17	0.43
1:I:61:LEU:HD22	1:I:79:PHE:CE2	2.53	0.43
1:A:101:LYS:O	1:A:105:GLN:HB2	2.18	0.43
1:P:23:PRO:HA	1:P:96:ASP:OD2	2.19	0.43
1:P:41:LEU:HD11	1:P:51:LEU:HG	2.01	0.43
1:A:40:GLU:HB3	1:A:78:LEU:HD22	2.00	0.42
1:O:95:LYS:HG3	1:O:96:ASP:OD1	2.19	0.42
1:L:71:GLY:HA3	1:L:75:LEU:HD22	2.01	0.42
1:N:20:ARG:HA	1:N:28:LYS:HA	2.01	0.42
1:D:58:GLN:NE2	1:D:107:HIS:HB3	2.34	0.42
1:J:80:ASN:O	1:J:84:VAL:HG23	2.20	0.42
1:M:102:LYS:O	1:M:106:ARG:HG3	2.19	0.42
1:I:30:ARG:NH2	2:I:201:SO4:S	2.93	0.42
1:B:105:GLN:NE2	3:H:302:HOH:O	2.52	0.42
1:K:40:GLU:HB2	1:K:78:LEU:HD13	2.01	0.42
1:N:80:ASN:OD1	1:N:101:LYS:HD2	2.20	0.42
1:O:61:LEU:HD22	1:O:79:PHE:CE1	2.55	0.42
1:E:9:ARG:HA	1:E:9:ARG:HD2	1.60	0.42
1:J:22:ARG:HH21	1:J:27:LYS:HE3	1.85	0.42
1:I:75:LEU:HD13	1:M:70:THR:HB	2.02	0.42
1:L:84:VAL:O	1:L:88:LEU:HG	2.19	0.42
1:O:4:ARG:HE	1:O:4:ARG:HB3	1.70	0.42
1:D:6:SER:HB3	1:D:52:GLU:OE1	2.20	0.42
1:E:95:LYS:NZ	3:E:311:HOH:O	2.47	0.42
1:H:7:VAL:N	3:H:311:HOH:O	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:50:LEU:HB2	1:M:60:ILE:HD11	2.02	0.41
1:P:21:LEU:HD23	1:P:29:TYR:CE1	2.55	0.41
1:D:65:ASP:OD1	1:D:105:GLN:NE2	2.53	0.41
1:F:50:LEU:HB2	1:F:60:ILE:HD11	2.00	0.41
1:G:84:VAL:O	1:G:88:LEU:HG	2.19	0.41
1:I:19:VAL:HG12	1:I:29:TYR:HD2	1.85	0.41
1:K:40:GLU:HG2	3:K:301:HOH:O	2.19	0.41
1:D:59:LYS:O	1:D:63:VAL:HG23	2.20	0.41
1:I:60:ILE:HG23	1:I:64:LEU:HD23	2.02	0.41
1:J:21:LEU:HD21	1:J:33:HIS:CE1	2.56	0.41
1:K:94:VAL:HG11	1:K:100:ALA:HA	2.03	0.41
1:M:23:PRO:HG3	1:M:98:GLU:HB2	2.02	0.41
1:O:9:ARG:HD2	1:O:9:ARG:HA	1.74	0.41
1:G:71:GLY:HA3	1:G:75:LEU:HD22	2.02	0.41
1:H:55:GLU:OE1	1:H:55:GLU:N	2.49	0.41
1:H:85:ILE:HA	1:H:88:LEU:HD12	2.03	0.41
1:H:80:ASN:OD1	1:H:101:LYS:HD2	2.20	0.41
1:M:80:ASN:OD1	1:M:101:LYS:HD2	2.20	0.41
1:A:81:THR:O	1:A:85:ILE:HG13	2.20	0.41
1:G:17:GLU:O	1:G:28:LYS:HD3	2.21	0.41
1:N:101:LYS:HE3	1:N:101:LYS:HB3	1.78	0.41
1:D:36:TRP:O	1:D:40:GLU:HG2	2.21	0.41
1:D:57:CYS:O	1:D:61:LEU:HG	2.21	0.41
1:H:78:LEU:O	1:H:82:VAL:HG23	2.21	0.41
1:I:51:LEU:HD21	1:I:82:VAL:HG22	2.03	0.41
1:I:102:LYS:O	1:I:106:ARG:HG2	2.20	0.41
1:P:94:VAL:HG21	1:P:100:ALA:HB2	2.02	0.41
1:D:102:LYS:HE3	1:D:106:ARG:NH2	2.29	0.41
1:H:34:ILE:HD12	1:H:85:ILE:HD11	2.03	0.41
1:H:105:GLN:HA	1:H:108:LEU:HB2	2.03	0.41
1:M:63:VAL:HG12	1:M:64:LEU:HD23	2.03	0.41
1:C:87:CYS:O	1:C:91:GLU:N	2.54	0.40
1:E:94:VAL:HG11	1:E:100:ALA:HA	2.02	0.40
1:E:105:GLN:HA	1:E:108:LEU:HB3	2.02	0.40
1:L:34:ILE:HD12	1:L:85:ILE:HD11	2.03	0.40
1:P:58:GLN:OE1	1:P:58:GLN:HA	2.21	0.40
1:I:60:ILE:HG21	1:I:82:VAL:HG21	2.04	0.40
1:P:59:LYS:HG3	1:P:62:ARG:NH2	2.37	0.40
1:D:58:GLN:HG2	1:D:86:TRP:NE1	2.37	0.40
1:L:108:LEU:HD12	1:L:108:LEU:HA	1.92	0.40
1:D:20:ARG:HA	1:D:28:LYS:HA	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:4:ARG:HD3	1:E:31:LEU:HD22	2.03	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	109/135 (81%)	108 (99%)	1 (1%)	0	100	100
1	B	109/135 (81%)	107 (98%)	2 (2%)	0	100	100
1	C	107/135 (79%)	106 (99%)	0	1 (1%)	17	23
1	D	105/135 (78%)	102 (97%)	3 (3%)	0	100	100
1	E	109/135 (81%)	107 (98%)	2 (2%)	0	100	100
1	F	109/135 (81%)	107 (98%)	2 (2%)	0	100	100
1	G	104/135 (77%)	102 (98%)	2 (2%)	0	100	100
1	H	105/135 (78%)	104 (99%)	1 (1%)	0	100	100
1	I	103/135 (76%)	98 (95%)	5 (5%)	0	100	100
1	J	100/135 (74%)	99 (99%)	1 (1%)	0	100	100
1	K	106/135 (78%)	105 (99%)	1 (1%)	0	100	100
1	L	104/135 (77%)	100 (96%)	4 (4%)	0	100	100
1	M	101/135 (75%)	99 (98%)	2 (2%)	0	100	100
1	N	103/135 (76%)	102 (99%)	1 (1%)	0	100	100
1	O	104/135 (77%)	101 (97%)	2 (2%)	1 (1%)	15	21
1	P	105/135 (78%)	103 (98%)	1 (1%)	1 (1%)	15	21
All	All	1683/2160 (78%)	1650 (98%)	30 (2%)	3 (0%)	47	61

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	21	LEU
1	P	23	PRO
1	O	7	VAL

### 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	95/114 (83%)	92 (97%)	3 (3%)	39	56
1	B	95/114 (83%)	92 (97%)	3 (3%)	39	56
1	C	94/114 (82%)	90 (96%)	4 (4%)	29	43
1	D	93/114 (82%)	88 (95%)	5 (5%)	22	33
1	E	95/114 (83%)	93 (98%)	2 (2%)	53	70
1	F	95/114 (83%)	92 (97%)	3 (3%)	39	56
1	G	91/114 (80%)	91 (100%)	0	100	100
1	H	92/114 (81%)	92 (100%)	0	100	100
1	I	91/114 (80%)	90 (99%)	1 (1%)	73	86
1	J	89/114 (78%)	84 (94%)	5 (6%)	21	31
1	K	94/114 (82%)	90 (96%)	4 (4%)	29	43
1	L	92/114 (81%)	90 (98%)	2 (2%)	52	69
1	M	90/114 (79%)	86 (96%)	4 (4%)	28	42
1	N	91/114 (80%)	89 (98%)	2 (2%)	52	69
1	O	94/114 (82%)	91 (97%)	3 (3%)	39	56
1	P	93/114 (82%)	91 (98%)	2 (2%)	52	69
All	All	1484/1824 (81%)	1441 (97%)	43 (3%)	42	60

All (43) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	42	ASP
1	A	65	ASP

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Mol	Chain	Res	Type
1	A	107	HIS
1	B	4	ARG
1	B	42	ASP
1	B	59	LYS
1	C	4	ARG
1	C	6	SER
1	C	95	LYS
1	C	108	LEU
1	D	9	ARG
1	D	75	LEU
1	D	93	LYS
1	D	96	ASP
1	D	108	LEU
1	E	26	LYS
1	E	75	LEU
1	F	30	ARG
1	F	44	PHE
1	F	77	SER
1	I	92	GLU
1	J	21	LEU
1	J	27	LYS
1	J	77	SER
1	J	80	ASN
1	J	96	ASP
1	K	14	ASP
1	K	22	ARG
1	K	27	LYS
1	K	75	LEU
1	L	42	ASP
1	L	75	LEU
1	M	49	SER
1	M	53	SER
1	M	58	GLN
1	M	75	LEU
1	N	54	LYS
1	N	77	SER
1	O	22	ARG
1	O	30	ARG
1	O	93	LYS
1	P	6	SER
1	P	58	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such

sidechains are listed below:

Mol	Chain	Res	Type
1	G	58	GLN
1	J	80	ASN
1	N	58	GLN
1	N	105	GLN
1	O	5	ASN

### 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](#)

20 ligands are modelled in this entry.

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	$\# Z  > 2$
2	SO4	K	202	-	4,4,4	0.13	0	6,6,6	0.04	0
2	SO4	P	201	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	A	202	-	4,4,4	0.14	0	6,6,6	0.06	0
2	SO4	I	202	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	E	201	-	4,4,4	0.14	0	6,6,6	0.06	0
2	SO4	N	201	-	4,4,4	0.15	0	6,6,6	0.05	0
2	SO4	C	201	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	A	201	-	4,4,4	0.14	0	6,6,6	0.05	0



Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	SO4	J	202	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	L	202	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	L	201	-	4,4,4	0.14	0	6,6,6	0.04	0
2	SO4	B	202	-	4,4,4	0.14	0	6,6,6	0.06	0
2	SO4	K	201	-	4,4,4	0.14	0	6,6,6	0.05	0
2	SO4	G	201	-	4,4,4	0.14	0	6,6,6	0.04	0
2	SO4	H	201	-	4,4,4	0.14	0	6,6,6	0.04	0
2	SO4	E	202	-	4,4,4	0.14	0	6,6,6	0.04	0
2	SO4	L	203	-	4,4,4	0.15	0	6,6,6	0.09	0
2	SO4	I	201	-	4,4,4	0.15	0	6,6,6	0.05	0
2	SO4	B	201	-	4,4,4	0.14	0	6,6,6	0.06	0
2	SO4	J	201	-	4,4,4	0.14	0	6,6,6	0.04	0

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.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	L	203	SO4	1	0
2	I	201	SO4	1	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	111/135 (82%)	-0.19	1 (0%) 84 84	20, 40, 56, 62	0
1	B	111/135 (82%)	-0.30	0 100 100	22, 39, 57, 63	0
1	C	109/135 (80%)	0.34	8 (7%) 15 16	32, 50, 67, 84	0
1	D	107/135 (79%)	0.17	3 (2%) 53 55	28, 48, 70, 86	0
1	E	111/135 (82%)	-0.17	1 (0%) 84 84	24, 39, 60, 77	0
1	F	111/135 (82%)	-0.17	0 100 100	24, 38, 58, 75	0
1	G	106/135 (78%)	-0.21	1 (0%) 84 84	25, 38, 61, 99	0
1	H	107/135 (79%)	-0.17	2 (1%) 66 68	26, 39, 60, 98	0
1	I	105/135 (77%)	0.20	2 (1%) 66 68	30, 49, 66, 84	0
1	J	102/135 (75%)	0.23	0 100 100	30, 48, 73, 87	0
1	K	108/135 (80%)	-0.16	1 (0%) 84 84	26, 40, 60, 75	0
1	L	106/135 (78%)	-0.20	1 (0%) 84 84	24, 42, 61, 86	0
1	M	103/135 (76%)	0.23	3 (2%) 51 53	27, 48, 69, 96	0
1	N	105/135 (77%)	0.12	2 (1%) 66 68	25, 46, 70, 90	0
1	O	108/135 (80%)	0.40	1 (0%) 84 84	30, 52, 74, 88	0
1	P	107/135 (79%)	0.35	6 (5%) 24 27	31, 51, 72, 83	0
All	All	1717/2160 (79%)	0.03	32 (1%) 66 68	20, 44, 66, 99	0

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	112	THR	4.5
1	C	75	LEU	3.9
1	P	26	LYS	3.4
1	C	100	ALA	3.3
1	D	44	PHE	3.1

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Mol	Chain	Res	Type	RSRZ
1	C	63	VAL	3.0
1	P	68	VAL	3.0
1	E	113	GLY	2.9
1	P	3	ALA	2.8
1	M	44	PHE	2.7
1	P	24	GLY	2.7
1	C	64	LEU	2.7
1	C	25	GLY	2.7
1	G	113	GLY	2.6
1	K	112	THR	2.6
1	D	26	LYS	2.6
1	I	109	VAL	2.6
1	P	107	HIS	2.6
1	O	23	PRO	2.5
1	M	24	GLY	2.4
1	A	109	VAL	2.4
1	N	9	ARG	2.3
1	M	23	PRO	2.3
1	D	24	GLY	2.3
1	C	60	ILE	2.3
1	P	109	VAL	2.3
1	N	23	PRO	2.3
1	H	110	ALA	2.2
1	I	66	PRO	2.1
1	C	104	ALA	2.0
1	C	105	GLN	2.0
1	H	9	ARG	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 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
2	SO4	C	201	5/5	0.88	0.21	67,70,91,130	0
2	SO4	I	202	5/5	0.92	0.11	43,61,71,90	0
2	SO4	P	201	5/5	0.92	0.19	76,89,102,105	0
2	SO4	L	203	5/5	0.94	0.12	77,91,103,108	0
2	SO4	J	201	5/5	0.94	0.11	38,42,57,79	0
2	SO4	E	202	5/5	0.95	0.21	73,85,97,98	0
2	SO4	L	201	5/5	0.95	0.12	30,37,58,82	0
2	SO4	N	201	5/5	0.96	0.12	40,47,54,71	0
2	SO4	K	201	5/5	0.97	0.12	39,39,55,60	0
2	SO4	H	201	5/5	0.97	0.10	39,42,64,76	0
2	SO4	I	201	5/5	0.97	0.10	45,50,56,70	0
2	SO4	E	201	5/5	0.97	0.12	34,48,58,69	0
2	SO4	G	201	5/5	0.97	0.08	38,44,55,64	0
2	SO4	A	201	5/5	0.98	0.12	35,50,76,76	0
2	SO4	J	202	5/5	0.98	0.09	35,38,46,49	0
2	SO4	L	202	5/5	0.98	0.11	27,39,55,61	0
2	SO4	B	202	5/5	0.99	0.11	18,43,58,69	0
2	SO4	A	202	5/5	0.99	0.12	21,28,57,62	0
2	SO4	K	202	5/5	0.99	0.09	16,33,57,66	0
2	SO4	B	201	5/5	0.99	0.10	20,42,54,74	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.