



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 15, 2017 – 03:11 am GMT

PDB ID : 3WCL  
Title : The complex structure of HsSQS wtih ligand,BPH1344  
Authors : Shang, N.; Li, Q.; Ko, T.P.; Chan, H.C.; Huang, C.H.; Ren, F.; Zheng, Y.;  
Zhu, Z.; Chen, C.C.; Guo, R.T.  
Deposited on : 2013-05-28  
Resolution : 2.24 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

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : trunk28620  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : recalc28949

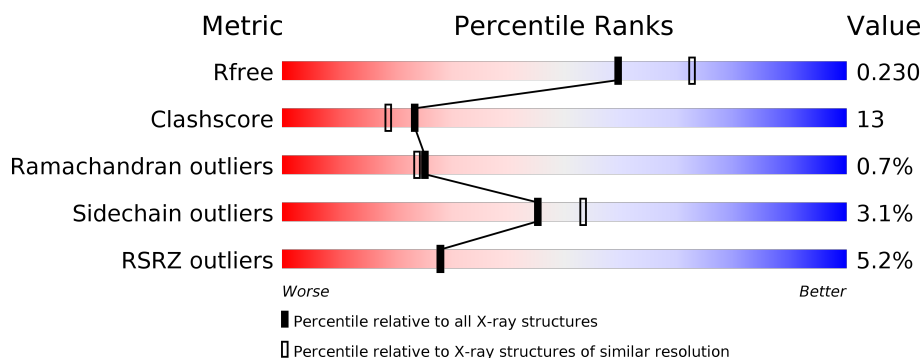
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.24 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))
$R_{free}$	100719	1804 (2.26-2.22)
Clashscore	112137	1957 (2.26-2.22)
Ramachandran outliers	110173	1916 (2.26-2.22)
Sidechain outliers	110143	1917 (2.26-2.22)
RSRZ outliers	101464	1809 (2.26-2.22)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	360	<div> <div>4%</div> <div> <div></div> <div>74%</div> <div>18%</div> <div>• 7%</div> </div> </div>
1	B	360	<div> <div>4%</div> <div> <div></div> <div>72%</div> <div>19%</div> <div>• 7%</div> </div> </div>
1	C	360	<div> <div>3%</div> <div> <div></div> <div>71%</div> <div>20%</div> <div>• 7%</div> </div> </div>
1	D	360	<div> <div>6%</div> <div> <div></div> <div>66%</div> <div>26%</div> <div>• 7%</div> </div> </div>
1	E	360	<div> <div>4%</div> <div> <div></div> <div>68%</div> <div>23%</div> <div>• 7%</div> </div> </div>
1	F	360	<div> <div>8%</div> <div> <div></div> <div>64%</div> <div>25%</div> <div>• 7%</div> </div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	BH3	A	401	-	-	-	X

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 17580 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 Squalene synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			
1	B	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			
1	C	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			
1	D	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			
1	E	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			
1	F	334	Total	C	N	O	S	0	0	0
			2696	1717	458	503	18			

There are 144 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	11	MET	-	EXPRESSION TAG	UNP P37268
A	12	GLY	-	EXPRESSION TAG	UNP P37268
A	13	SER	-	EXPRESSION TAG	UNP P37268
A	14	SER	-	EXPRESSION TAG	UNP P37268
A	15	HIS	-	EXPRESSION TAG	UNP P37268
A	16	HIS	-	EXPRESSION TAG	UNP P37268
A	17	HIS	-	EXPRESSION TAG	UNP P37268
A	18	HIS	-	EXPRESSION TAG	UNP P37268
A	19	HIS	-	EXPRESSION TAG	UNP P37268
A	20	HIS	-	EXPRESSION TAG	UNP P37268
A	21	SER	-	EXPRESSION TAG	UNP P37268
A	22	SER	-	EXPRESSION TAG	UNP P37268
A	23	GLY	-	EXPRESSION TAG	UNP P37268
A	24	LEU	-	EXPRESSION TAG	UNP P37268
A	25	VAL	-	EXPRESSION TAG	UNP P37268
A	26	PRO	-	EXPRESSION TAG	UNP P37268
A	27	ARG	-	EXPRESSION TAG	UNP P37268

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Chain	Residue	Modelled	Actual	Comment	Reference
A	28	GLY	-	EXPRESSION TAG	UNP P37268
A	29	SER	-	EXPRESSION TAG	UNP P37268
A	30	HIS	-	EXPRESSION TAG	UNP P37268
A	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
A	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
A	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268
A	353	ASN	ASP	SEE REMARK 999	UNP P37268
B	11	MET	-	EXPRESSION TAG	UNP P37268
B	12	GLY	-	EXPRESSION TAG	UNP P37268
B	13	SER	-	EXPRESSION TAG	UNP P37268
B	14	SER	-	EXPRESSION TAG	UNP P37268
B	15	HIS	-	EXPRESSION TAG	UNP P37268
B	16	HIS	-	EXPRESSION TAG	UNP P37268
B	17	HIS	-	EXPRESSION TAG	UNP P37268
B	18	HIS	-	EXPRESSION TAG	UNP P37268
B	19	HIS	-	EXPRESSION TAG	UNP P37268
B	20	HIS	-	EXPRESSION TAG	UNP P37268
B	21	SER	-	EXPRESSION TAG	UNP P37268
B	22	SER	-	EXPRESSION TAG	UNP P37268
B	23	GLY	-	EXPRESSION TAG	UNP P37268
B	24	LEU	-	EXPRESSION TAG	UNP P37268
B	25	VAL	-	EXPRESSION TAG	UNP P37268
B	26	PRO	-	EXPRESSION TAG	UNP P37268
B	27	ARG	-	EXPRESSION TAG	UNP P37268
B	28	GLY	-	EXPRESSION TAG	UNP P37268
B	29	SER	-	EXPRESSION TAG	UNP P37268
B	30	HIS	-	EXPRESSION TAG	UNP P37268
B	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
B	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
B	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268
B	353	ASN	ASP	SEE REMARK 999	UNP P37268
C	11	MET	-	EXPRESSION TAG	UNP P37268
C	12	GLY	-	EXPRESSION TAG	UNP P37268
C	13	SER	-	EXPRESSION TAG	UNP P37268
C	14	SER	-	EXPRESSION TAG	UNP P37268
C	15	HIS	-	EXPRESSION TAG	UNP P37268
C	16	HIS	-	EXPRESSION TAG	UNP P37268
C	17	HIS	-	EXPRESSION TAG	UNP P37268
C	18	HIS	-	EXPRESSION TAG	UNP P37268
C	19	HIS	-	EXPRESSION TAG	UNP P37268
C	20	HIS	-	EXPRESSION TAG	UNP P37268
C	21	SER	-	EXPRESSION TAG	UNP P37268

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Chain	Residue	Modelled	Actual	Comment	Reference
C	22	SER	-	EXPRESSION TAG	UNP P37268
C	23	GLY	-	EXPRESSION TAG	UNP P37268
C	24	LEU	-	EXPRESSION TAG	UNP P37268
C	25	VAL	-	EXPRESSION TAG	UNP P37268
C	26	PRO	-	EXPRESSION TAG	UNP P37268
C	27	ARG	-	EXPRESSION TAG	UNP P37268
C	28	GLY	-	EXPRESSION TAG	UNP P37268
C	29	SER	-	EXPRESSION TAG	UNP P37268
C	30	HIS	-	EXPRESSION TAG	UNP P37268
C	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
C	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
C	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268
C	353	ASN	ASP	SEE REMARK 999	UNP P37268
D	11	MET	-	EXPRESSION TAG	UNP P37268
D	12	GLY	-	EXPRESSION TAG	UNP P37268
D	13	SER	-	EXPRESSION TAG	UNP P37268
D	14	SER	-	EXPRESSION TAG	UNP P37268
D	15	HIS	-	EXPRESSION TAG	UNP P37268
D	16	HIS	-	EXPRESSION TAG	UNP P37268
D	17	HIS	-	EXPRESSION TAG	UNP P37268
D	18	HIS	-	EXPRESSION TAG	UNP P37268
D	19	HIS	-	EXPRESSION TAG	UNP P37268
D	20	HIS	-	EXPRESSION TAG	UNP P37268
D	21	SER	-	EXPRESSION TAG	UNP P37268
D	22	SER	-	EXPRESSION TAG	UNP P37268
D	23	GLY	-	EXPRESSION TAG	UNP P37268
D	24	LEU	-	EXPRESSION TAG	UNP P37268
D	25	VAL	-	EXPRESSION TAG	UNP P37268
D	26	PRO	-	EXPRESSION TAG	UNP P37268
D	27	ARG	-	EXPRESSION TAG	UNP P37268
D	28	GLY	-	EXPRESSION TAG	UNP P37268
D	29	SER	-	EXPRESSION TAG	UNP P37268
D	30	HIS	-	EXPRESSION TAG	UNP P37268
D	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
D	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
D	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268
D	353	ASN	ASP	SEE REMARK 999	UNP P37268
E	11	MET	-	EXPRESSION TAG	UNP P37268
E	12	GLY	-	EXPRESSION TAG	UNP P37268
E	13	SER	-	EXPRESSION TAG	UNP P37268
E	14	SER	-	EXPRESSION TAG	UNP P37268
E	15	HIS	-	EXPRESSION TAG	UNP P37268

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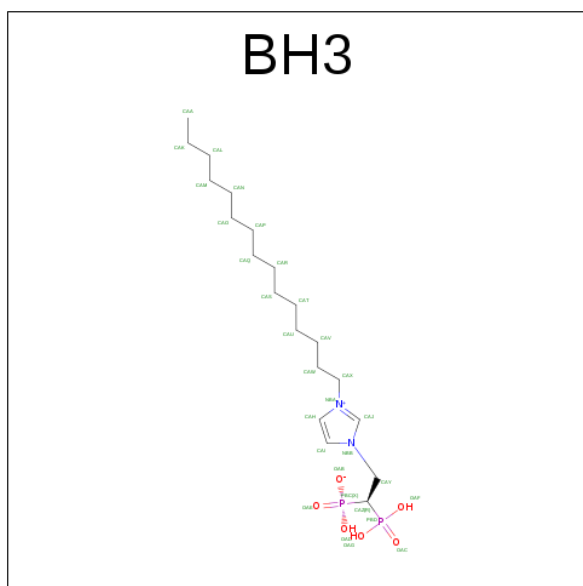
Chain	Residue	Modelled	Actual	Comment	Reference
E	16	HIS	-	EXPRESSION TAG	UNP P37268
E	17	HIS	-	EXPRESSION TAG	UNP P37268
E	18	HIS	-	EXPRESSION TAG	UNP P37268
E	19	HIS	-	EXPRESSION TAG	UNP P37268
E	20	HIS	-	EXPRESSION TAG	UNP P37268
E	21	SER	-	EXPRESSION TAG	UNP P37268
E	22	SER	-	EXPRESSION TAG	UNP P37268
E	23	GLY	-	EXPRESSION TAG	UNP P37268
E	24	LEU	-	EXPRESSION TAG	UNP P37268
E	25	VAL	-	EXPRESSION TAG	UNP P37268
E	26	PRO	-	EXPRESSION TAG	UNP P37268
E	27	ARG	-	EXPRESSION TAG	UNP P37268
E	28	GLY	-	EXPRESSION TAG	UNP P37268
E	29	SER	-	EXPRESSION TAG	UNP P37268
E	30	HIS	-	EXPRESSION TAG	UNP P37268
E	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
E	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
E	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268
E	353	ASN	ASP	SEE REMARK 999	UNP P37268
F	11	MET	-	EXPRESSION TAG	UNP P37268
F	12	GLY	-	EXPRESSION TAG	UNP P37268
F	13	SER	-	EXPRESSION TAG	UNP P37268
F	14	SER	-	EXPRESSION TAG	UNP P37268
F	15	HIS	-	EXPRESSION TAG	UNP P37268
F	16	HIS	-	EXPRESSION TAG	UNP P37268
F	17	HIS	-	EXPRESSION TAG	UNP P37268
F	18	HIS	-	EXPRESSION TAG	UNP P37268
F	19	HIS	-	EXPRESSION TAG	UNP P37268
F	20	HIS	-	EXPRESSION TAG	UNP P37268
F	21	SER	-	EXPRESSION TAG	UNP P37268
F	22	SER	-	EXPRESSION TAG	UNP P37268
F	23	GLY	-	EXPRESSION TAG	UNP P37268
F	24	LEU	-	EXPRESSION TAG	UNP P37268
F	25	VAL	-	EXPRESSION TAG	UNP P37268
F	26	PRO	-	EXPRESSION TAG	UNP P37268
F	27	ARG	-	EXPRESSION TAG	UNP P37268
F	28	GLY	-	EXPRESSION TAG	UNP P37268
F	29	SER	-	EXPRESSION TAG	UNP P37268
F	30	HIS	-	EXPRESSION TAG	UNP P37268
F	248	LEU	LYS	ENGINEERED MUTATION	UNP P37268
F	315	LEU	LYS	ENGINEERED MUTATION	UNP P37268
F	318	LEU	LYS	ENGINEERED MUTATION	UNP P37268

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Chain	Residue	Modelled	Actual	Comment	Reference
F	353	ASN	ASP	SEE REMARK 999	UNP P37268

- Molecule 2 is HYDROGEN [(1R)-2-(3-PENTADECYL-1H-IMIDAZOL-3-IUM-1-YL)-1-PHOSPHONOETHYL]PHOSPHONATE (three-letter code: BH3) (formula: C<sub>20</sub>H<sub>40</sub>N<sub>2</sub>O<sub>6</sub>P<sub>2</sub>).



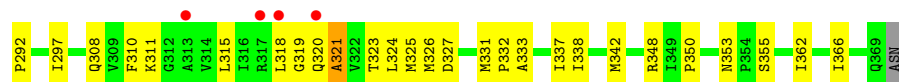
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			30	20	2	6	2		

- Molecule 3 is water.

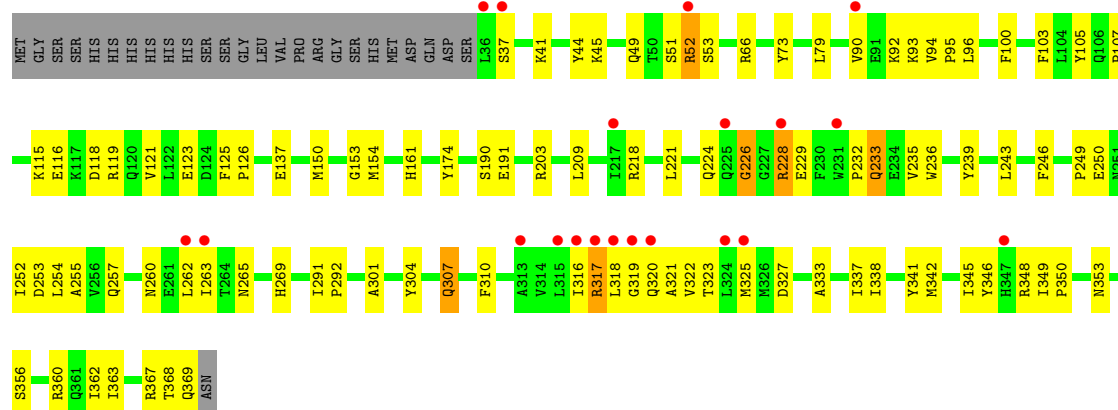
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	284	Total	O	0	0
			284	284		
3	B	285	Total	O	0	0
			285	285		
3	C	285	Total	O	0	0
			285	285		
3	D	201	Total	O	0	0
			201	201		
3	E	157	Total	O	0	0
			157	157		
3	F	162	Total	O	0	0
			162	162		



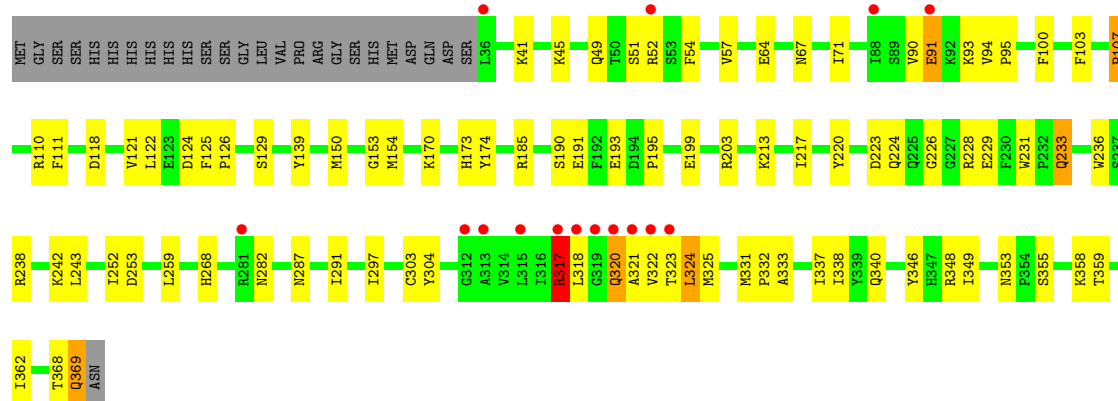




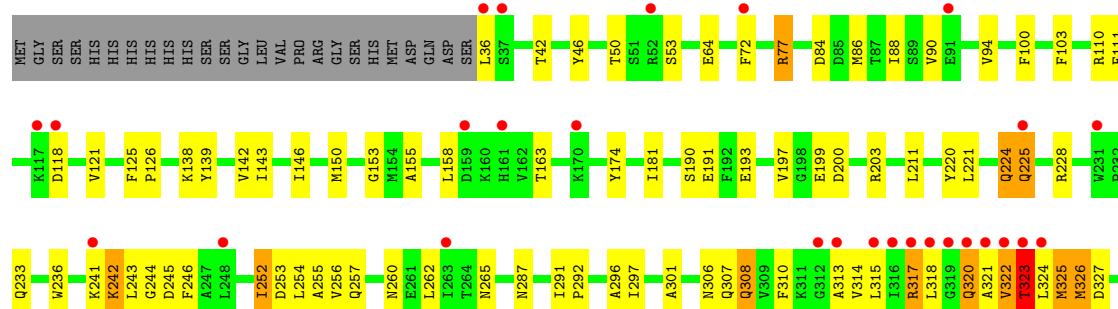
• Molecule 1: Squalene synthase

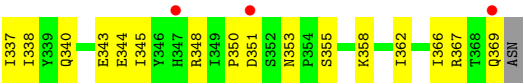


• Molecule 1: Squalene synthase



• Molecule 1: Squalene synthase





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	85.25Å 153.30Å 90.93Å 90.00° 91.47° 90.00°	Depositor
Resolution (Å)	25.00 – 2.24 25.00 – 2.24	Depositor EDS
% Data completeness (in resolution range)	(Not available) (25.00-2.24) 95.1 (25.00-2.24)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	6.06 (at 2.24Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, $R_{free}$	0.188 , 0.229 0.189 , 0.230	Depositor DCC
$R_{free}$ test set	5365 reflections (5.04%)	DCC
Wilson B-factor (Å <sup>2</sup> )	29.8	Xtriage
Anisotropy	0.624	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 49.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.029 for h,-k,-l	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	17580	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	43.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.18% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: BH3

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	0.36	0/2751	0.57	0/3724
1	B	0.35	0/2751	0.54	0/3724
1	C	0.35	0/2751	0.54	0/3724
1	D	0.34	0/2751	0.52	0/3724
1	E	0.32	0/2751	0.52	0/3724
1	F	0.31	0/2751	0.52	0/3724
All	All	0.34	0/16506	0.54	0/22344

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	2696	0	2676	63	0
1	B	2696	0	2676	67	0
1	C	2696	0	2676	60	0
1	D	2696	0	2676	73	0
1	E	2696	0	2676	71	0
1	F	2696	0	2676	94	0
2	A	30	0	40	13	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	284	0	0	3	0
3	B	285	0	0	5	0
3	C	285	0	0	2	0
3	D	201	0	0	2	0
3	E	157	0	0	7	0
3	F	162	0	0	6	0
All	All	17580	0	16096	411	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 13.

All (411) 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:D:325:MET:HE1	3:E:555:HOH:O	1.34	1.23
1:F:301:ALA:HA	1:F:345:ILE:HD11	1.27	1.12
1:E:229:GLU:HG2	1:E:243:LEU:HD23	1.41	1.01
1:D:325:MET:CE	3:E:555:HOH:O	1.92	0.98
1:F:233:GLN:HA	1:F:236:TRP:NE1	1.83	0.94
1:F:320:GLN:NE2	1:F:322:VAL:H	1.65	0.93
1:D:301:ALA:HA	1:D:345:ILE:HD11	1.53	0.90
1:A:318:LEU:HD11	1:A:324:LEU:HD11	1.50	0.90
1:A:316:ILE:H	1:A:316:ILE:HD13	1.36	0.90
1:B:317:ARG:NH1	1:B:348:ARG:HH12	1.70	0.89
1:D:260:ASN:HD22	1:D:353:ASN:ND2	1.70	0.89
1:B:317:ARG:HH12	1:B:348:ARG:NH1	1.71	0.87
1:A:322:VAL:HB	1:A:340:GLN:HE22	1.38	0.86
1:F:260:ASN:HD22	1:F:353:ASN:ND2	1.73	0.86
1:B:317:ARG:HH12	1:B:348:ARG:HH12	1.20	0.84
1:B:226:GLY:HA3	1:B:228:ARG:HH12	1.42	0.84
1:F:301:ALA:HA	1:F:345:ILE:CD1	2.08	0.83
2:A:401:BH3:H16	3:A:783:HOH:O	1.79	0.83
1:B:326:MET:HE3	1:C:291:ILE:HD11	1.61	0.83
1:A:320:GLN:O	1:A:323:THR:HG22	1.78	0.82
1:F:320:GLN:HE22	1:F:322:VAL:H	1.28	0.81
1:C:323:THR:HG23	1:C:337:ILE:HD12	1.65	0.78
1:D:252:ILE:HD11	1:D:307:GLN:HB3	1.65	0.78
1:D:37:SER:O	1:D:41:LYS:HG3	1.84	0.77
1:B:353:ASN:ND2	1:B:355:SER:H	1.82	0.77
1:E:268:HIS:HA	1:E:362:ILE:HD11	1.65	0.77
1:A:77:ARG:HD2	2:A:401:BH3:H11	1.66	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:45:LYS:O	1:C:49:GLN:HG3	1.84	0.76
1:F:291:ILE:HB	1:F:292:PRO:HD3	1.68	0.76
1:A:213:LYS:O	1:A:217:ILE:HG12	1.86	0.76
1:F:287:ASN:O	1:F:291:ILE:HG12	1.87	0.75
1:B:233:GLN:HA	1:B:236:TRP:NE1	2.01	0.74
1:F:350:PRO:HG2	1:F:353:ASN:HB2	1.70	0.74
1:E:325:MET:O	1:F:327:ASP:HB2	1.88	0.74
1:D:368:THR:O	1:D:369:GLN:HB2	1.86	0.73
1:C:362:ILE:O	1:C:366:ILE:HD13	1.88	0.73
1:F:320:GLN:HE22	1:F:322:VAL:HG23	1.53	0.73
1:C:170:LYS:HD2	1:C:174:TYR:CE2	2.25	0.72
1:B:235:VAL:HA	1:B:238:ARG:HH21	1.55	0.72
1:E:320:GLN:O	1:E:324:LEU:HB2	1.90	0.72
1:D:325:MET:SD	3:E:555:HOH:O	2.39	0.72
1:B:226:GLY:HA3	1:B:228:ARG:NH1	2.04	0.71
1:A:321:ALA:O	1:A:322:VAL:HG23	1.89	0.71
1:D:233:GLN:HA	1:D:236:TRP:NE1	2.05	0.71
1:A:322:VAL:HB	1:A:340:GLN:NE2	2.06	0.70
1:A:353:ASN:ND2	1:A:355:SER:H	1.89	0.70
1:E:353:ASN:ND2	1:E:355:SER:H	1.89	0.70
1:C:297:ILE:CD1	1:C:338:ILE:HG12	2.21	0.70
1:A:326:MET:HA	1:B:327:ASP:HB2	1.75	0.69
1:D:45:LYS:O	1:D:49:GLN:HG3	1.93	0.69
1:C:94:VAL:HB	1:C:95:PRO:HD3	1.74	0.69
1:F:100:PHE:HA	1:F:103:PHE:CD2	2.28	0.69
1:A:315:LEU:HD12	1:A:315:LEU:O	1.92	0.69
1:E:323:THR:HB	1:E:340:GLN:OE1	1.93	0.68
1:E:323:THR:OG1	1:E:337:ILE:HG12	1.93	0.68
1:B:36:LEU:HD12	1:B:36:LEU:N	2.08	0.68
1:D:119:ARG:O	1:D:123:GLU:HG3	1.94	0.68
1:C:353:ASN:ND2	1:C:355:SER:H	1.91	0.68
1:E:45:LYS:O	1:E:49:GLN:HG3	1.93	0.68
1:D:229:GLU:HG3	1:D:243:LEU:HD23	1.76	0.67
1:E:195:PRO:O	1:E:199:GLU:HG3	1.94	0.67
1:D:116:GLU:O	1:D:119:ARG:HD3	1.95	0.67
1:E:94:VAL:HB	1:E:95:PRO:HD3	1.76	0.67
1:C:318:LEU:HD12	1:C:320:GLN:HG3	1.77	0.67
1:E:125:PHE:N	1:E:126:PRO:HD2	2.10	0.67
1:D:94:VAL:HB	1:D:95:PRO:HD3	1.77	0.67
1:E:320:GLN:H	1:E:323:THR:CG2	2.08	0.67
1:F:260:ASN:HD22	1:F:353:ASN:HD22	1.41	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:320:GLN:H	1:E:323:THR:HG23	1.59	0.66
1:E:368:THR:O	1:E:369:GLN:HB2	1.93	0.66
1:B:343:GLU:OE1	1:B:367:ARG:NH2	2.28	0.66
1:F:306:ASN:OD1	1:F:308:GLN:HB2	1.96	0.66
1:D:229:GLU:HG3	1:D:243:LEU:CD2	2.26	0.65
1:B:348:ARG:HH11	1:B:348:ARG:HG3	1.61	0.65
1:F:150:MET:HG3	1:F:174:TYR:O	1.96	0.64
1:B:320:GLN:HB3	1:B:340:GLN:HE22	1.63	0.64
1:D:228:ARG:NH1	1:D:228:ARG:HB2	2.13	0.64
1:C:105:TYR:O	1:C:107:PRO:HD3	1.97	0.64
1:A:211:LEU:HD12	2:A:401:BH3:CAO	2.29	0.63
1:E:100:PHE:HA	1:E:103:PHE:CD2	2.33	0.63
1:D:100:PHE:HA	1:D:103:PHE:CD2	2.34	0.63
1:A:233:GLN:HA	1:A:236:TRP:NE1	2.13	0.63
1:E:118:ASP:O	1:E:121:VAL:HG22	1.97	0.63
1:B:317:ARG:HD2	3:B:555:HOH:O	1.99	0.62
1:F:90:VAL:O	1:F:94:VAL:HG23	1.98	0.62
1:E:57:VAL:HG22	3:E:410:HOH:O	1.99	0.62
1:C:51:SER:HB2	1:C:73:TYR:CE1	2.35	0.62
1:A:347:HIS:HB2	3:B:677:HOH:O	2.00	0.61
1:A:316:ILE:H	1:A:316:ILE:CD1	2.13	0.61
1:D:252:ILE:HD11	1:D:307:GLN:CB	2.30	0.61
1:A:322:VAL:O	1:A:326:MET:HG2	2.00	0.61
1:F:322:VAL:O	1:F:323:THR:HG23	2.01	0.60
1:A:291:ILE:HD11	1:C:326:MET:HE3	1.84	0.60
1:D:327:ASP:HB2	1:F:325:MET:O	2.01	0.60
1:D:150:MET:HG3	1:D:174:TYR:O	2.01	0.60
1:F:236:TRP:CG	1:F:243:LEU:HD13	2.36	0.60
1:E:323:THR:HG21	3:E:556:HOH:O	2.00	0.59
1:A:325:MET:O	1:B:327:ASP:HB2	2.03	0.59
1:B:271:PRO:HG2	3:B:674:HOH:O	2.01	0.59
1:E:64:GLU:HG2	3:E:548:HOH:O	2.03	0.59
1:C:308:GLN:OE1	1:C:311:LYS:HD2	2.03	0.59
1:D:291:ILE:HB	1:D:292:PRO:HD3	1.84	0.59
1:B:320:GLN:HB3	1:B:340:GLN:NE2	2.18	0.59
1:E:233:GLN:HA	1:E:236:TRP:NE1	2.17	0.59
1:F:262:LEU:O	1:F:265:ASN:HB3	2.03	0.59
1:F:64:GLU:HG3	3:F:422:HOH:O	2.02	0.59
1:C:150:MET:HG3	1:C:174:TYR:O	2.03	0.58
1:B:319:GLY:HA3	1:B:323:THR:HG21	1.85	0.58
1:E:321:ALA:HA	1:E:324:LEU:HB2	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:326:MET:HA	1:B:327:ASP:CB	2.33	0.58
1:E:268:HIS:CG	1:E:362:ILE:HD12	2.39	0.58
1:F:255:ALA:HB1	1:F:310:PHE:CZ	2.39	0.58
1:F:221:LEU:O	1:F:224:GLN:HB2	2.04	0.58
1:D:368:THR:HG21	1:E:41:LYS:HA	1.86	0.58
1:E:268:HIS:ND1	1:E:362:ILE:HD12	2.18	0.57
1:A:94:VAL:HB	1:A:95:PRO:HD3	1.85	0.57
1:D:301:ALA:CA	1:D:345:ILE:HD11	2.29	0.57
1:A:52:ARG:HG2	2:A:401:BH3:OAB	2.04	0.57
1:E:322:VAL:HG21	1:F:53:SER:O	2.05	0.57
1:F:118:ASP:O	1:F:121:VAL:HG22	2.04	0.57
1:C:348:ARG:O	1:C:350:PRO:HD3	2.05	0.57
1:A:100:PHE:HA	1:A:103:PHE:CD2	2.40	0.57
1:F:343:GLU:CD	1:F:367:ARG:HH21	2.08	0.57
1:C:55:ALA:O	1:C:59:GLN:HG3	2.05	0.57
1:B:322:VAL:HB	1:B:340:GLN:OE1	2.05	0.56
1:F:322:VAL:O	1:F:322:VAL:HG12	2.04	0.56
1:C:195:PRO:O	1:C:199:GLU:HG3	2.06	0.56
1:C:320:GLN:O	1:C:321:ALA:HB3	2.05	0.56
1:D:318:LEU:HD23	1:D:319:GLY:N	2.21	0.56
1:D:233:GLN:HA	1:D:236:TRP:CD1	2.41	0.56
1:E:331:MET:HB3	1:E:332:PRO:HD3	1.87	0.56
1:D:52:ARG:CD	1:D:53:SER:H	2.19	0.55
1:F:163:THR:HA	1:F:233:GLN:HB3	1.89	0.55
1:C:64:GLU:HG3	3:C:429:HOH:O	2.07	0.55
1:F:224:GLN:OE1	1:F:244:GLY:HA2	2.06	0.55
1:B:331:MET:HB3	1:B:332:PRO:HD3	1.88	0.55
1:B:348:ARG:HG3	1:B:348:ARG:NH1	2.21	0.55
1:F:242:LYS:HB2	1:F:245:ASP:OD2	2.07	0.55
1:A:51:SER:HB2	1:A:73:TYR:CZ	2.42	0.55
1:A:51:SER:OG	1:A:54:PHE:HB2	2.07	0.55
1:B:36:LEU:HB2	1:D:137:GLU:OE1	2.07	0.55
1:E:223:ASP:OD1	1:E:228:ARG:NH2	2.40	0.55
1:E:368:THR:HG22	1:F:36:LEU:HD11	1.88	0.55
1:C:262:LEU:O	1:C:265:ASN:HB3	2.07	0.54
1:E:185:ARG:HD2	3:E:438:HOH:O	2.06	0.54
1:F:323:THR:C	1:F:325:MET:H	2.10	0.54
1:C:118:ASP:O	1:C:121:VAL:HG22	2.08	0.54
1:E:368:THR:O	1:E:369:GLN:CB	2.55	0.54
1:F:320:GLN:NE2	1:F:322:VAL:N	2.47	0.54
1:B:353:ASN:HD22	1:B:355:SER:H	1.50	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:314:VAL:HG13	3:F:501:HOH:O	2.06	0.54
1:E:353:ASN:HD22	1:E:355:SER:H	1.55	0.54
1:D:118:ASP:O	1:D:121:VAL:HG22	2.07	0.54
1:A:210:PHE:CZ	1:A:270:ILE:HD11	2.43	0.54
1:D:92:LYS:O	1:D:96:LEU:HG	2.08	0.54
1:C:318:LEU:CD1	1:C:320:GLN:HG3	2.38	0.53
1:D:115:LYS:HD3	3:D:516:HOH:O	2.07	0.53
1:F:211:LEU:HD23	1:F:296:ALA:HB2	1.91	0.53
1:D:356:SER:O	1:D:360:ARG:HG3	2.08	0.53
1:E:91:GLU:CD	1:E:91:GLU:H	2.11	0.53
1:E:333:ALA:O	1:E:337:ILE:HG13	2.09	0.53
1:F:320:GLN:HE22	1:F:322:VAL:CG2	2.19	0.53
2:A:401:BH3:H9	2:A:401:BH3:OAG	2.09	0.53
1:C:315:LEU:O	1:C:315:LEU:HD12	2.08	0.53
1:F:233:GLN:HA	1:F:236:TRP:HE1	1.68	0.53
1:A:211:LEU:HD12	2:A:401:BH3:H29	1.90	0.53
1:F:252:ILE:HD12	1:F:307:GLN:HE21	1.72	0.53
1:F:146:ILE:CG2	1:F:150:MET:HE3	2.39	0.53
1:D:345:ILE:O	1:D:349:ILE:HG13	2.09	0.53
1:F:200:ASP:OD2	1:F:203:ARG:HB2	2.08	0.53
1:F:252:ILE:O	1:F:252:ILE:HD13	2.08	0.53
1:C:297:ILE:HD12	1:C:338:ILE:HG12	1.90	0.53
1:D:348:ARG:O	1:D:350:PRO:HD3	2.09	0.52
1:E:233:GLN:HA	1:E:236:TRP:CE2	2.44	0.52
1:F:233:GLN:HA	1:F:236:TRP:CD1	2.44	0.52
1:F:343:GLU:OE1	1:F:367:ARG:NH2	2.41	0.52
1:B:256:VAL:HG21	1:B:307:GLN:HG2	1.90	0.52
1:F:190:SER:O	1:F:191:GLU:HB2	2.08	0.52
1:C:255:ALA:HB1	1:C:310:PHE:CZ	2.44	0.52
1:D:51:SER:HB2	1:D:73:TYR:CZ	2.45	0.52
1:A:318:LEU:HG	1:A:319:GLY:N	2.25	0.52
1:C:326:MET:HE2	1:C:333:ALA:CB	2.39	0.52
1:F:242:LYS:HE2	3:F:451:HOH:O	2.10	0.52
1:F:317:ARG:HG3	1:F:318:LEU:N	2.25	0.52
1:F:321:ALA:O	1:F:325:MET:HB2	2.09	0.51
1:B:125:PHE:N	1:B:126:PRO:CD	2.73	0.51
1:C:333:ALA:O	1:C:337:ILE:HG12	2.09	0.51
1:E:304:TYR:CE2	1:E:349:ILE:HD13	2.45	0.51
1:A:353:ASN:HD22	1:A:355:SER:H	1.57	0.51
1:E:268:HIS:HA	1:E:362:ILE:CD1	2.38	0.51
1:C:47:LEU:O	1:C:51:SER:HB3	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:50:THR:HB	1:F:77:ARG:HD2	1.93	0.51
1:E:259:LEU:HD21	1:E:303:CYS:O	2.10	0.51
1:C:100:PHE:HA	1:C:103:PHE:CD2	2.45	0.51
1:F:369:GLN:HG3	3:F:531:HOH:O	2.12	0.50
1:B:213:LYS:O	1:B:217:ILE:HG12	2.11	0.50
1:F:88:ILE:HD11	1:F:111:PHE:HZ	1.76	0.50
1:F:314:VAL:HG12	1:F:315:LEU:N	2.27	0.50
1:F:355:SER:HA	1:F:358:LYS:HE2	1.92	0.50
1:A:150:MET:O	1:A:154:MET:HG3	2.11	0.50
1:C:224:GLN:CA	1:C:224:GLN:HE21	2.25	0.50
1:D:255:ALA:HB1	1:D:310:PHE:CZ	2.47	0.50
1:E:111:PHE:HB3	1:E:122:LEU:HB3	1.93	0.50
1:A:326:MET:HA	1:B:327:ASP:OD2	2.12	0.50
1:D:239:TYR:O	1:D:254:LEU:HD13	2.12	0.50
1:A:316:ILE:HG12	1:A:316:ILE:O	2.11	0.49
1:D:125:PHE:N	1:D:126:PRO:CD	2.75	0.49
1:F:72:PHE:CD1	1:F:143:ILE:HG23	2.46	0.49
1:B:262:LEU:O	1:B:265:ASN:HB3	2.11	0.49
1:D:341:TYR:O	1:D:345:ILE:HD13	2.12	0.49
1:F:320:GLN:O	1:F:324:LEU:HG	2.12	0.49
1:F:84:ASP:HA	1:F:228:ARG:HH21	1.77	0.49
1:C:125:PHE:N	1:C:126:PRO:CD	2.76	0.49
1:D:338:ILE:O	1:D:342:MET:HG2	2.13	0.49
1:F:84:ASP:HA	1:F:228:ARG:NH2	2.28	0.49
1:E:297:ILE:CD1	1:E:338:ILE:HG12	2.43	0.49
1:F:110:ARG:HD3	3:F:426:HOH:O	2.12	0.49
1:E:228:ARG:HG3	1:E:228:ARG:HH11	1.78	0.49
1:D:161:HIS:CD2	1:D:229:GLU:HB3	2.46	0.49
1:F:252:ILE:HG23	1:F:253:ASP:N	2.27	0.49
1:E:297:ILE:HD12	1:E:338:ILE:HG12	1.93	0.49
1:B:252:ILE:HG23	1:B:253:ASP:N	2.28	0.48
1:F:317:ARG:HG3	1:F:318:LEU:H	1.77	0.48
1:A:125:PHE:N	1:A:126:PRO:CD	2.76	0.48
1:B:190:SER:O	1:B:191:GLU:HB2	2.12	0.48
1:C:71:ILE:HD11	1:C:131:GLU:HB3	1.94	0.48
1:D:52:ARG:HD3	1:D:53:SER:H	1.77	0.48
1:E:51:SER:OG	1:E:54:PHE:HB2	2.13	0.48
1:A:316:ILE:N	1:A:316:ILE:HD13	2.17	0.48
1:A:325:MET:C	1:B:327:ASP:HB2	2.32	0.48
1:A:211:LEU:HD12	2:A:401:BH3:H30	1.94	0.48
1:B:150:MET:O	1:B:154:MET:HG3	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:327:ASP:HB2	1:F:326:MET:HA	1.94	0.48
2:A:401:BH3:OAG	2:A:401:BH3:CAI	2.61	0.48
1:B:157:PHE:CE2	1:B:160:LYS:HE3	2.49	0.48
1:B:217:ILE:HD11	1:B:262:LEU:HB3	1.94	0.48
1:E:252:ILE:HG23	1:E:253:ASP:N	2.29	0.48
1:D:320:GLN:H	1:D:323:THR:HB	1.78	0.48
1:F:86:MET:C	1:F:88:ILE:H	2.17	0.48
2:A:401:BH3:H38	3:A:761:HOH:O	2.12	0.48
1:A:71:ILE:HD12	1:A:135:LEU:HD21	1.95	0.48
1:D:228:ARG:CZ	1:D:228:ARG:HB2	2.44	0.48
1:E:64:GLU:HG3	1:E:139:TYR:OH	2.14	0.48
1:F:369:GLN:HG3	1:F:369:GLN:O	2.14	0.48
1:B:185:ARG:HD2	3:B:673:HOH:O	2.14	0.48
1:F:358:LYS:HD2	3:F:477:HOH:O	2.13	0.48
1:A:341:TYR:O	1:A:344:GLU:HB2	2.13	0.48
1:B:287:ASN:O	1:B:291:ILE:HD13	2.14	0.48
1:F:252:ILE:CG2	1:F:253:ASP:N	2.76	0.48
1:E:126:PRO:HA	1:E:129:SER:OG	2.14	0.48
1:C:224:GLN:NE2	1:C:224:GLN:HA	2.29	0.47
1:C:233:GLN:HA	1:C:236:TRP:NE1	2.29	0.47
1:C:150:MET:O	1:C:154:MET:HG3	2.14	0.47
1:E:320:GLN:HB3	1:E:340:GLN:NE2	2.29	0.47
1:B:118:ASP:O	1:B:121:VAL:HG22	2.14	0.47
1:D:190:SER:O	1:D:191:GLU:HB2	2.14	0.47
1:B:368:THR:O	1:B:369:GLN:HB3	2.14	0.47
1:D:246:PHE:CD1	1:D:255:ALA:HA	2.49	0.47
1:F:297:ILE:HD12	1:F:338:ILE:HG12	1.95	0.47
1:B:325:MET:O	1:C:327:ASP:HB2	2.15	0.47
1:D:232:PRO:HG2	1:D:235:VAL:HB	1.97	0.47
1:F:125:PHE:N	1:F:126:PRO:CD	2.78	0.47
1:F:343:GLU:OE1	1:F:367:ARG:NE	2.46	0.47
1:B:368:THR:O	1:B:368:THR:HG22	2.14	0.47
1:B:233:GLN:HA	1:B:236:TRP:CD1	2.50	0.47
1:D:224:GLN:C	1:D:226:GLY:H	2.18	0.46
1:F:252:ILE:HD13	1:F:256:VAL:HG23	1.97	0.46
1:B:94:VAL:HB	1:B:95:PRO:HD3	1.97	0.46
1:E:346:TYR:O	1:E:349:ILE:HG12	2.15	0.46
1:C:196:LEU:HD21	1:C:279:ARG:CZ	2.45	0.46
1:F:323:THR:HG22	1:F:337:ILE:HG12	1.96	0.46
1:B:228:ARG:HG2	1:B:228:ARG:HH11	1.81	0.46
1:D:218:ARG:HG3	1:D:218:ARG:HH21	1.79	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:320:GLN:N	1:D:323:THR:HB	2.31	0.46
1:A:190:SER:O	1:A:191:GLU:HB2	2.14	0.46
1:E:125:PHE:N	1:E:126:PRO:CD	2.77	0.46
1:A:119:ARG:O	1:A:123:GLU:HG3	2.16	0.46
1:D:253:ASP:O	1:D:257:GLN:HG3	2.15	0.46
1:A:318:LEU:HD12	1:A:319:GLY:H	1.80	0.46
1:B:100:PHE:HA	1:B:103:PHE:CD2	2.51	0.46
1:E:153:GLY:HA3	1:E:174:TYR:CG	2.50	0.46
1:E:268:HIS:CE1	1:E:362:ILE:HD12	2.51	0.46
1:A:318:LEU:CG	1:A:319:GLY:N	2.79	0.46
1:B:220:TYR:HB2	1:B:231:TRP:CZ2	2.51	0.46
1:B:343:GLU:OE1	1:C:48:ASN:HB3	2.15	0.46
1:D:316:ILE:HD12	1:D:316:ILE:N	2.31	0.46
1:F:146:ILE:HG22	1:F:150:MET:HE3	1.97	0.46
1:A:76:LEU:HB3	2:A:401:BH3:H18	1.98	0.45
1:B:368:THR:O	1:B:369:GLN:CB	2.64	0.45
1:B:36:LEU:CD1	1:B:36:LEU:N	2.78	0.45
1:C:242:LYS:HB3	1:C:242:LYS:NZ	2.32	0.45
1:E:317:ARG:H	1:E:317:ARG:HG2	1.53	0.45
1:E:90:VAL:O	1:E:94:VAL:HG23	2.16	0.45
1:F:138:LYS:HE3	1:F:139:TYR:CZ	2.51	0.45
1:F:321:ALA:C	1:F:323:THR:H	2.20	0.45
1:B:152:ILE:HD11	3:B:507:HOH:O	2.15	0.45
1:E:358:LYS:HD2	1:E:358:LYS:H	1.80	0.45
1:A:326:MET:CA	1:B:327:ASP:HB2	2.45	0.45
1:E:325:MET:C	1:F:327:ASP:HB2	2.37	0.45
1:A:344:GLU:O	1:A:348:ARG:HG3	2.17	0.45
1:A:327:ASP:HB3	1:C:325:MET:O	2.17	0.45
1:E:67:ASN:O	1:E:71:ILE:HG12	2.17	0.45
1:A:228:ARG:NH1	3:A:731:HOH:O	2.49	0.45
1:A:238:ARG:NH2	1:A:261:GLU:OE2	2.44	0.45
1:B:233:GLN:HE21	1:B:233:GLN:HB3	1.57	0.45
1:C:338:ILE:O	1:C:342:MET:HG2	2.17	0.45
1:C:353:ASN:HD21	1:C:355:SER:HB2	1.81	0.45
1:E:268:HIS:CA	1:E:362:ILE:HD11	2.41	0.45
1:D:333:ALA:O	1:D:337:ILE:HG13	2.17	0.45
1:F:153:GLY:HA3	1:F:174:TYR:CD1	2.52	0.45
1:F:320:GLN:HE22	1:F:322:VAL:N	2.06	0.44
1:B:353:ASN:HD22	1:B:355:SER:N	2.14	0.44
1:C:297:ILE:HD13	1:C:338:ILE:HG12	1.95	0.44
1:D:346:TYR:HA	1:D:349:ILE:CD1	2.47	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:42:THR:HG22	1:F:46:TYR:CE2	2.53	0.44
1:D:362:ILE:HG23	1:D:363:ILE:N	2.32	0.44
1:E:150:MET:O	1:E:154:MET:HG3	2.17	0.44
1:F:220:TYR:CZ	1:F:246:PHE:HB2	2.52	0.44
1:B:344:GLU:O	1:B:348:ARG:HG3	2.18	0.44
1:E:213:LYS:O	1:E:217:ILE:HG13	2.17	0.44
1:B:338:ILE:O	1:B:342:MET:HG2	2.16	0.44
1:D:153:GLY:HA3	1:D:174:TYR:CG	2.53	0.44
1:E:190:SER:O	1:E:191:GLU:HB2	2.18	0.44
1:F:252:ILE:HG23	1:F:253:ASP:OD2	2.17	0.44
1:A:105:TYR:O	1:A:107:PRO:HD3	2.18	0.44
1:C:190:SER:O	1:C:191:GLU:HB2	2.18	0.44
1:B:248:LEU:HB2	1:B:251:ASN:HD22	1.83	0.44
1:C:320:GLN:O	1:C:321:ALA:CB	2.65	0.43
1:C:51:SER:HB2	1:C:73:TYR:CZ	2.52	0.43
1:D:262:LEU:O	1:D:265:ASN:HB3	2.18	0.43
1:D:320:GLN:OE1	1:D:321:ALA:N	2.51	0.43
1:D:52:ARG:HG3	1:D:52:ARG:HH21	1.83	0.43
1:D:105:TYR:O	1:D:107:PRO:HD3	2.18	0.43
1:F:323:THR:HA	1:F:326:MET:HG2	1.99	0.43
1:B:316:ILE:N	1:B:316:ILE:HD12	2.34	0.43
1:B:321:ALA:O	1:B:325:MET:HG2	2.19	0.43
1:F:323:THR:O	1:F:326:MET:O	2.37	0.43
1:A:169:ASP:OD1	1:A:213:LYS:NZ	2.48	0.43
1:F:220:TYR:OH	1:F:246:PHE:HB2	2.19	0.43
1:A:41:LYS:HE3	3:C:679:HOH:O	2.18	0.43
1:A:90:VAL:O	1:A:94:VAL:HG23	2.19	0.43
1:A:107:PRO:O	1:A:126:PRO:HB3	2.19	0.43
1:A:52:ARG:CZ	2:A:401:BH3:OAC	2.67	0.43
1:C:38:SER:HA	1:C:41:LYS:HG3	2.00	0.43
1:D:233:GLN:HB3	1:D:233:GLN:HE21	1.56	0.43
1:C:46:TYR:CE1	1:C:120:GLN:HG3	2.53	0.43
1:E:170:LYS:O	1:E:173:HIS:HB3	2.19	0.43
1:A:52:ARG:NH1	2:A:401:BH3:OAC	2.51	0.42
1:E:287:ASN:O	1:E:291:ILE:HD13	2.19	0.42
1:F:181:ILE:N	1:F:181:ILE:HD12	2.34	0.42
1:A:217:ILE:HD11	1:A:262:LEU:HB3	2.01	0.42
1:E:124:ASP:C	1:E:126:PRO:HD2	2.39	0.42
1:A:153:GLY:HA3	1:A:174:TYR:CG	2.54	0.42
1:F:297:ILE:CD1	1:F:338:ILE:HG12	2.49	0.42
1:A:327:ASP:HB3	1:C:326:MET:HA	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:220:TYR:HB2	1:E:231:TRP:CZ2	2.55	0.42
1:E:224:GLN:C	1:E:226:GLY:H	2.23	0.42
1:F:253:ASP:O	1:F:257:GLN:HG3	2.19	0.42
1:A:353:ASN:HA	1:A:354:PRO:HD3	1.82	0.42
1:F:252:ILE:HD11	1:F:307:GLN:HG2	2.00	0.42
1:B:51:SER:OG	1:B:54:PHE:HB2	2.19	0.42
1:D:209:LEU:HD23	1:D:269:HIS:CE1	2.54	0.42
1:E:193:GLU:OE2	1:E:282:ASN:HB3	2.20	0.42
1:E:317:ARG:HH21	1:E:348:ARG:NH1	2.17	0.42
1:C:291:ILE:HB	1:C:292:PRO:HD3	2.01	0.42
1:C:318:LEU:HD12	1:C:319:GLY:O	2.19	0.42
1:D:250:GLU:OE2	1:D:250:GLU:N	2.49	0.42
1:B:327:ASP:OD2	1:B:329:THR:HG23	2.19	0.42
1:F:110:ARG:HG2	1:F:110:ARG:HH21	1.84	0.42
1:D:137:GLU:HB2	3:D:451:HOH:O	2.19	0.41
1:F:155:ALA:HA	1:F:158:LEU:HG	2.02	0.41
1:F:320:GLN:HE22	1:F:322:VAL:CB	2.32	0.41
1:B:255:ALA:HB1	1:B:310:PHE:CZ	2.54	0.41
1:D:322:VAL:HG13	1:E:291:ILE:HG21	2.01	0.41
1:C:297:ILE:HG23	1:C:342:MET:HE1	2.02	0.41
1:F:362:ILE:O	1:F:366:ILE:HG13	2.21	0.41
1:B:353:ASN:HD22	1:B:356:SER:H	1.67	0.41
1:D:263:ILE:CD1	1:D:304:TYR:HA	2.50	0.41
1:F:142:VAL:O	1:F:146:ILE:HD13	2.19	0.41
1:F:225:GLN:HB2	1:F:225:GLN:HE21	1.49	0.41
1:E:150:MET:HG3	1:E:174:TYR:O	2.20	0.41
1:F:344:GLU:O	1:F:348:ARG:HG3	2.20	0.41
1:B:253:ASP:O	1:B:257:GLN:HG3	2.19	0.41
1:C:319:GLY:O	1:C:324:LEU:HD21	2.20	0.41
1:D:229:GLU:HG3	1:D:243:LEU:HD22	2.03	0.41
1:D:90:VAL:HA	1:D:93:LYS:HB3	2.03	0.41
1:A:233:GLN:HA	1:A:236:TRP:CD1	2.55	0.41
1:C:220:TYR:HB2	1:C:231:TRP:CZ2	2.56	0.41
1:D:79:LEU:HB2	1:D:100:PHE:CE2	2.55	0.41
1:B:327:ASP:OD2	1:B:329:THR:CG2	2.69	0.41
1:A:183:LEU:CD1	2:A:401:BH3:H35	2.51	0.40
1:B:348:ARG:O	1:B:350:PRO:HD3	2.21	0.40
1:C:326:MET:HG3	1:C:337:ILE:HD11	2.03	0.40
1:F:242:LYS:O	1:F:245:ASP:HB2	2.21	0.40
1:A:318:LEU:CG	1:A:319:GLY:H	2.34	0.40
1:B:71:ILE:HD11	1:B:131:GLU:HB3	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:110:ARG:HG3	1:C:110:ARG:HH21	1.85	0.40
1:C:142:VAL:O	1:C:146:ILE:HG12	2.21	0.40
1:C:331:MET:HB3	1:C:332:PRO:HD3	2.03	0.40
1:D:301:ALA:CB	1:D:345:ILE:HD11	2.51	0.40
1:E:349:ILE:HD12	1:E:359:THR:HG21	2.03	0.40
1:A:220:TYR:OH	1:A:246:PHE:HB2	2.20	0.40
1:C:224:GLN:C	1:C:226:GLY:H	2.24	0.40
1:D:150:MET:O	1:D:154:MET:HG3	2.21	0.40
1:D:52:ARG:HD2	1:D:53:SER:H	1.85	0.40
1:C:242:LYS:NZ	1:C:242:LYS:CB	2.84	0.40
1:D:44:TYR:OH	1:D:66:ARG:HG2	2.22	0.40
1:E:304:TYR:CZ	1:E:349:ILE:HD13	2.57	0.40
1:F:193:GLU:HB3	1:F:197:VAL:HG21	2.02	0.40
1:A:248:LEU:HA	1:A:249:PRO:HD3	1.88	0.40
1:E:93:LYS:HB2	1:E:93:LYS:HE3	1.93	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	332/360 (92%)	320 (96%)	9 (3%)	3 (1%)	20	16
1	B	332/360 (92%)	316 (95%)	16 (5%)	0	100	100
1	C	332/360 (92%)	316 (95%)	15 (4%)	1 (0%)	44	49
1	D	332/360 (92%)	312 (94%)	17 (5%)	3 (1%)	20	16
1	E	332/360 (92%)	317 (96%)	12 (4%)	3 (1%)	20	16
1	F	332/360 (92%)	307 (92%)	21 (6%)	4 (1%)	15	10
All	All	1992/2160 (92%)	1888 (95%)	90 (4%)	14 (1%)	25	24

All (14) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
1	A	318	LEU
1	A	322	VAL
1	D	317	ARG
1	F	317	ARG
1	A	321	ALA
1	C	321	ALA
1	E	318	LEU
1	F	322	VAL
1	F	313	ALA
1	F	323	THR
1	E	107	PRO
1	E	317	ARG
1	D	249	PRO
1	D	226	GLY

### 5.3.2 Protein sidechains ⓘ

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	297/320 (93%)	290 (98%)	7 (2%)	54	63
1	B	297/320 (93%)	290 (98%)	7 (2%)	54	63
1	C	297/320 (93%)	291 (98%)	6 (2%)	60	69
1	D	297/320 (93%)	289 (97%)	8 (3%)	50	59
1	E	297/320 (93%)	285 (96%)	12 (4%)	36	41
1	F	297/320 (93%)	282 (95%)	15 (5%)	28	28
All	All	1782/1920 (93%)	1727 (97%)	55 (3%)	45	53

All (55) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	36	LEU
1	A	233	GLN
1	A	241	LYS
1	A	252	ILE
1	A	316	ILE

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Mol	Chain	Res	Type
1	A	351	ASP
1	A	369	GLN
1	B	36	LEU
1	B	84	ASP
1	B	110	ARG
1	B	233	GLN
1	B	317	ARG
1	B	351	ASP
1	B	369	GLN
1	C	41	LYS
1	C	52	ARG
1	C	170	LYS
1	C	203	ARG
1	C	224	GLN
1	C	233	GLN
1	D	52	ARG
1	D	203	ARG
1	D	221	LEU
1	D	228	ARG
1	D	233	GLN
1	D	307	GLN
1	D	317	ARG
1	D	367	ARG
1	E	52	ARG
1	E	91	GLU
1	E	107	PRO
1	E	110	ARG
1	E	203	ARG
1	E	233	GLN
1	E	238	ARG
1	E	242	LYS
1	E	317	ARG
1	E	320	GLN
1	E	324	LEU
1	E	369	GLN
1	F	77	ARG
1	F	199	GLU
1	F	224	GLN
1	F	225	GLN
1	F	241	LYS
1	F	242	LYS
1	F	252	ILE

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Mol	Chain	Res	Type
1	F	254	LEU
1	F	308	GLN
1	F	320	GLN
1	F	323	THR
1	F	325	MET
1	F	326	MET
1	F	340	GLN
1	F	351	ASP

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (42) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	225	GLN
1	A	233	GLN
1	A	257	GLN
1	A	320	GLN
1	A	340	GLN
1	A	353	ASN
1	A	361	GLN
1	B	98	HIS
1	B	120	GLN
1	B	225	GLN
1	B	233	GLN
1	B	251	ASN
1	B	293	GLN
1	B	340	GLN
1	B	369	GLN
1	C	225	GLN
1	C	251	ASN
1	C	257	GLN
1	D	161	HIS
1	D	224	GLN
1	D	233	GLN
1	D	257	GLN
1	D	308	GLN
1	D	353	ASN
1	E	48	ASN
1	E	59	GLN
1	E	134	ASN
1	E	225	GLN
1	E	233	GLN
1	E	257	GLN

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Mol	Chain	Res	Type
1	E	293	GLN
1	E	308	GLN
1	F	101	HIS
1	F	224	GLN
1	F	225	GLN
1	F	257	GLN
1	F	293	GLN
1	F	307	GLN
1	F	308	GLN
1	F	320	GLN
1	F	347	HIS
1	F	353	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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is 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	BH3	A	401	-	29,30,30	2.06	7 (24%)	35,39,39	1.00	2 (5%)

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
2	BH3	A	401	-	-	0/27/31/31	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	BH3	PBC-OAB	-3.79	1.48	1.54
2	A	401	BH3	CAI-NBB	-2.34	1.33	1.37
2	A	401	BH3	CAH-NBA	-2.12	1.33	1.37
2	A	401	BH3	PBD-OAG	3.98	1.61	1.54
2	A	401	BH3	PBD-OAF	3.98	1.61	1.54
2	A	401	BH3	PBC-OAD	3.99	1.61	1.54
2	A	401	BH3	PBC-OAE	6.51	1.61	1.49

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	401	BH3	OAD-PBC-OAE	-2.95	105.91	113.41
2	A	401	BH3	OAB-PBC-CAZ	2.15	113.59	106.88

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	BH3	13	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

### 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, 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	334/360 (92%)	-0.24	14 (4%)	37 37	18, 30, 62, 112	0
1	B	334/360 (92%)	-0.06	16 (4%)	31 31	19, 32, 72, 102	0
1	C	334/360 (92%)	-0.15	10 (2%)	51 52	19, 33, 68, 89	0
1	D	334/360 (92%)	-0.02	20 (5%)	23 22	21, 40, 74, 112	0
1	E	334/360 (92%)	0.06	15 (4%)	34 34	28, 44, 74, 108	0
1	F	334/360 (92%)	0.39	30 (8%)	10 10	23, 51, 87, 126	0
All	All	2004/2160 (92%)	-0.00	105 (5%)	28 28	18, 38, 79, 126	0

All (105) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	313	ALA	8.1
1	F	318	LEU	8.1
1	F	315	LEU	7.0
1	F	317	ARG	6.9
1	F	323	THR	6.9
1	B	318	LEU	6.8
1	E	36	LEU	6.5
1	C	36	LEU	6.5
1	A	318	LEU	6.1
1	F	316	ILE	5.8
1	B	320	GLN	5.6
1	A	321	ALA	5.6
1	E	318	LEU	5.5
1	D	36	LEU	5.3
1	A	317	ARG	5.0
1	F	322	VAL	4.7
1	D	318	LEU	4.7
1	A	313	ALA	4.7
1	A	319	GLY	4.6

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Mol	Chain	Res	Type	RSRZ
1	F	312	GLY	4.6
1	C	313	ALA	4.6
1	A	315	LEU	4.5
1	B	313	ALA	4.5
1	F	319	GLY	4.5
1	F	36	LEU	4.5
1	E	317	ARG	4.4
1	E	313	ALA	4.4
1	B	315	LEU	4.4
1	B	248	LEU	4.4
1	D	317	ARG	4.3
1	F	324	LEU	4.2
1	C	320	GLN	4.2
1	A	36	LEU	4.1
1	A	320	GLN	3.9
1	C	318	LEU	3.9
1	A	316	ILE	3.9
1	E	321	ALA	3.7
1	E	323	THR	3.6
1	F	369	GLN	3.5
1	F	320	GLN	3.5
1	D	319	GLY	3.5
1	B	317	ARG	3.4
1	B	316	ILE	3.3
1	E	52	ARG	3.3
1	D	225	GLN	3.3
1	F	321	ALA	3.3
1	B	312	GLY	3.1
1	F	241	LYS	3.1
1	E	319	GLY	3.1
1	B	368	THR	3.1
1	F	225	GLN	3.1
1	A	324	LEU	3.0
1	C	225	GLN	3.0
1	D	37	SER	3.0
1	F	347	HIS	3.0
1	D	347	HIS	3.0
1	C	52	ARG	3.0
1	F	351	ASP	2.9
1	C	317	ARG	2.8
1	B	263	ILE	2.8
1	B	347	HIS	2.7

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Mol	Chain	Res	Type	RSRZ
1	F	117	LYS	2.7
1	F	159	ASP	2.7
1	A	314	VAL	2.7
1	D	263	ILE	2.6
1	E	320	GLN	2.6
1	F	91	GLU	2.5
1	B	259	LEU	2.5
1	B	319	GLY	2.5
1	B	249	PRO	2.5
1	D	313	ALA	2.5
1	F	248	LEU	2.4
1	D	325	MET	2.4
1	A	322	VAL	2.4
1	D	90	VAL	2.4
1	F	118	ASP	2.4
1	C	73	TYR	2.4
1	A	159	ASP	2.4
1	C	37	SER	2.4
1	A	52	ARG	2.3
1	F	52	ARG	2.3
1	E	88	ILE	2.3
1	D	315	LEU	2.3
1	D	52	ARG	2.3
1	D	228	ARG	2.3
1	E	315	LEU	2.3
1	B	241	LYS	2.3
1	F	37	SER	2.3
1	C	228	ARG	2.2
1	B	321	ALA	2.2
1	D	320	GLN	2.2
1	F	231	TRP	2.2
1	F	263	ILE	2.2
1	D	262	LEU	2.2
1	D	324	LEU	2.2
1	D	217	ILE	2.1
1	F	72	PHE	2.1
1	E	281	ARG	2.1
1	E	322	VAL	2.1
1	F	161	HIS	2.1
1	D	316	ILE	2.1
1	E	91	GLU	2.1
1	D	231	TRP	2.1

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Mol	Chain	Res	Type	RSRZ
1	E	312	GLY	2.0
1	F	170	LYS	2.0

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

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

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	BH3	A	401	30/30	0.47	0.47	5.93	48,109,125,125	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.