



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 29, 2020 – 03:51 PM BST

PDB ID : 6E1R  
Title : Crystal structure of the Acinetobacter phage vB\_ApiP\_P1 tailspike protein  
Authors : Plattner, M.; Shneider, M.M.; Oliveira, H.; Azeredo, J.; Leiman, P.G.  
Deposited on : 2018-07-10  
Resolution : 2.69 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 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)  
Xtriage (Phenix) : 1.13  
EDS : 2.13  
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) : 2.13

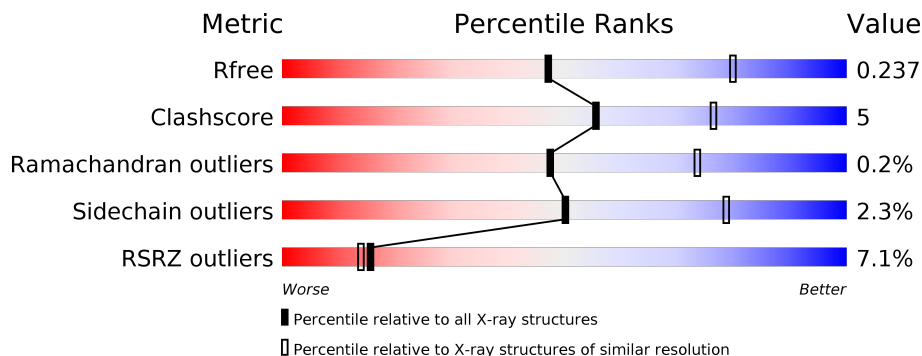
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.69 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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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 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	554	 2% 86% 12% ..
1	B	554	 2% 85% 12% ..
1	C	554	 2% 86% 11% ..
1	D	554	 11% 84% 13% ..
1	E	554	 12% 83% 15% .
1	F	554	 12% 82% 15% ..

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:

<b>Mol</b>	<b>Type</b>	<b>Chain</b>	<b>Res</b>	<b>Chirality</b>	<b>Geometry</b>	<b>Clashes</b>	<b>Electron density</b>
3	NA	B	801	-	-	-	X

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 25193 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 Tailspike protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	S				Se
1	A	544	4053	2550	682	799	11	11	0	0	0
1	B	543	4045	2544	681	798	11	11	0	0	0
1	C	544	4053	2550	682	799	11	11	0	0	0
1	D	544	4053	2550	682	799	11	11	0	0	0
1	E	544	4053	2550	682	799	11	11	0	0	0
1	F	544	4053	2550	682	799	11	11	0	0	0

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Cl	0	0
			1	1		
2	C	1	Total	Cl	0	0
			1	1		
2	F	1	Total	Cl	0	0
			1	1		

- Molecule 3 is SODIUM ION (three-letter code: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Na	0	0
			1	1		
3	D	1	Total	Na	0	0
			1	1		
3	C	1	Total	Na	0	0
			1	1		

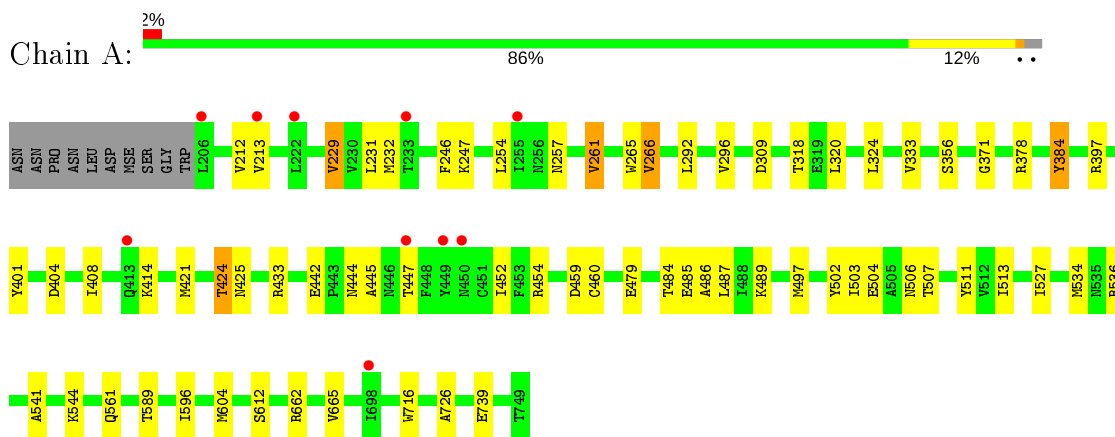
- Molecule 4 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
4	A	211	Total 211	O 211	0	0
4	B	183	Total 183	O 183	0	0
4	C	204	Total 204	O 204	0	0
4	D	119	Total 119	O 119	0	0
4	E	73	Total 73	O 73	0	0
4	F	87	Total 87	O 87	0	0

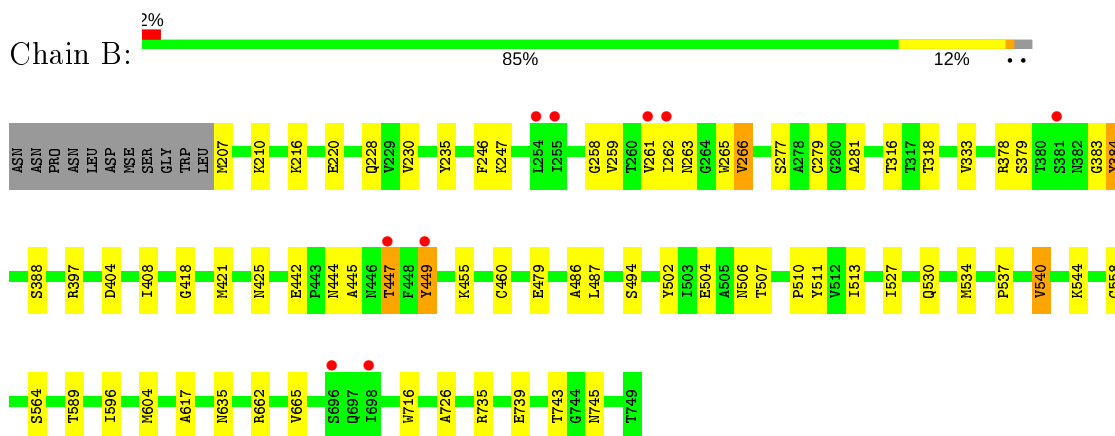
### 3 Residue-property plots [i](#)

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.

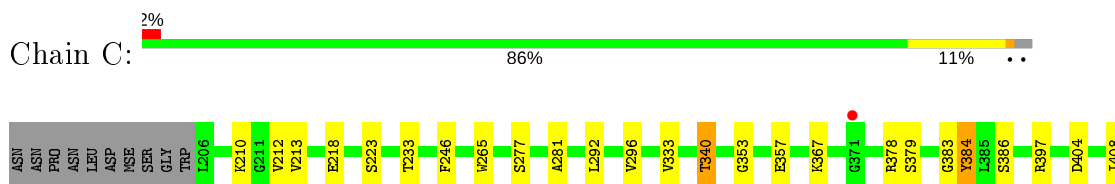
- Molecule 1: Tailspike protein

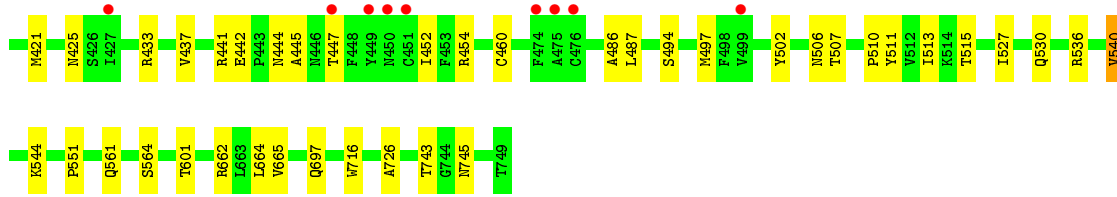


- Molecule 1: Tailspike protein

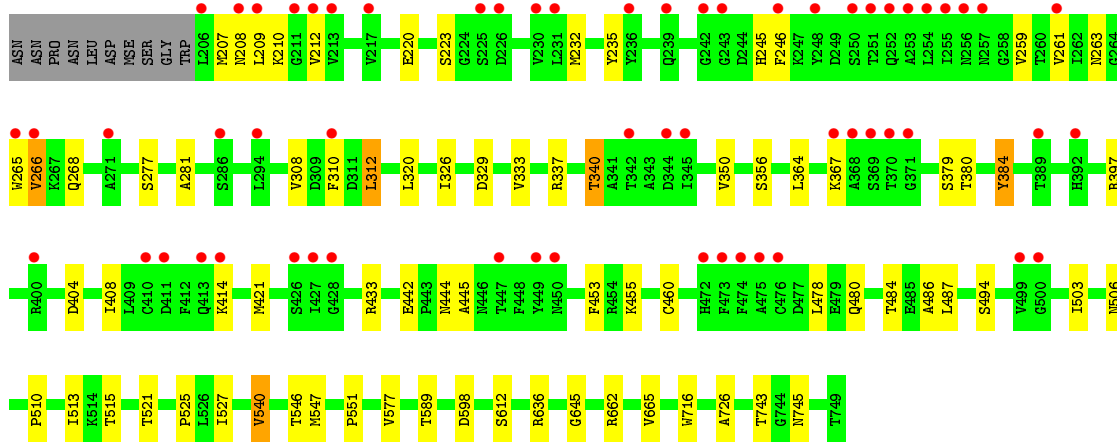
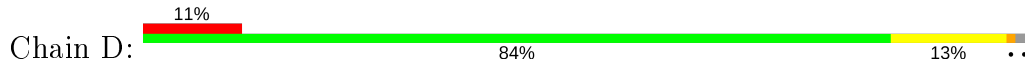


- Molecule 1: Tailspike protein

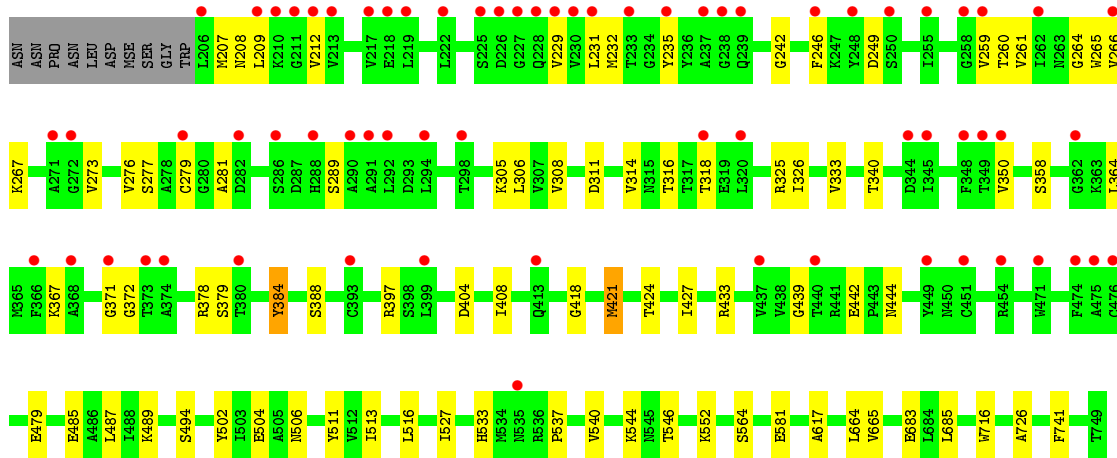
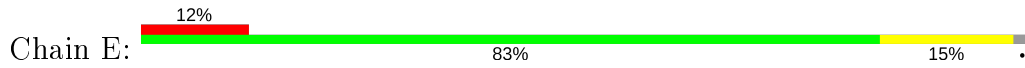




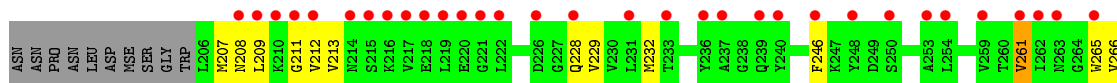
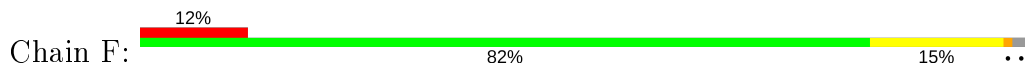
• Molecule 1: Tailspike protein

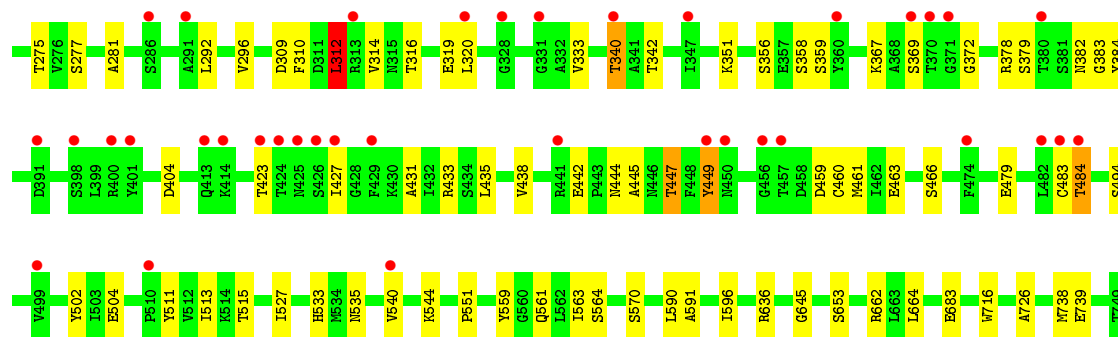


• Molecule 1: Tailspike protein



• Molecule 1: Tailspike protein







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	81.12Å 90.02Å 508.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.12 – 2.69 49.12 – 2.69	Depositor EDS
% Data completeness (in resolution range)	99.1 (49.12-2.69) 99.5 (49.12-2.69)	Depositor EDS
$R_{merge}$	0.16	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.09 (at 2.69Å)	Xtrriage
Refinement program	PHENIX (dev_3092: ???)	Depositor
R, $R_{free}$	0.200 , 0.237 0.199 , 0.237	Depositor DCC
$R_{free}$ test set	3641 reflections (3.50%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	43.8	Xtrriage
Anisotropy	1.012	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 51.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	25193	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	62.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.92% 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: NA, 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	0.25	0/4119	0.47	0/5571
1	B	0.25	0/4112	0.47	0/5563
1	C	0.25	0/4119	0.47	0/5571
1	D	0.25	0/4119	0.48	0/5571
1	E	0.25	0/4119	0.48	0/5571
1	F	0.25	0/4119	0.48	1/5571 (0.0%)
All	All	0.25	0/24707	0.47	1/33418 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	312	LEU	CA-CB-CG	5.32	127.55	115.30

There are no chirality outliers.

There are no planarity outliers.

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

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4053	0	3966	41	0
1	B	4045	0	3955	41	0
1	C	4053	0	3966	38	0
1	D	4053	0	3966	48	0

*Continued on next page...*

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	4053	0	3966	51	0
1	F	4053	0	3966	57	0
2	A	1	0	0	0	0
2	C	1	0	0	1	0
2	F	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	A	211	0	0	0	0
4	B	183	0	0	0	0
4	C	204	0	0	3	0
4	D	119	0	0	0	0
4	E	73	0	0	3	0
4	F	87	0	0	6	0
All	All	25193	0	23785	244	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 5.

All (244) 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:494:SER:HG	1:F:533:HIS:HD1	1.30	0.79
1:C:397:ARG:HD2	1:C:421:MSE:HE3	1.64	0.79
1:C:340:THR:HG23	1:C:367:LYS:HB2	1.66	0.78
1:A:397:ARG:HD2	1:A:421:MSE:HE3	1.67	0.77
1:E:533:HIS:HD1	1:F:494:SER:HG	1.34	0.75
1:D:397:ARG:HB3	1:D:421:MSE:HE3	1.68	0.74
1:E:397:ARG:HE	1:E:421:MSE:HE3	1.53	0.73
1:B:397:ARG:NH1	1:B:418:GLY:O	2.22	0.73
1:D:232:MSE:HE2	1:D:235:TYR:HA	1.72	0.72
1:F:423:THR:O	4:F:901:HOH:O	2.09	0.70
1:A:229:VAL:HG21	1:C:233:THR:HG21	1.72	0.70
2:C:802:CL:CL	4:C:949:HOH:O	2.45	0.70
1:F:207:MSE:HE1	1:F:229:VAL:H	1.57	0.69
1:D:210:LYS:NZ	1:D:223:SER:O	2.28	0.67
1:E:340:THR:HG22	1:E:367:LYS:HB2	1.78	0.65
1:F:459:ASP:O	4:F:902:HOH:O	2.13	0.65
1:D:220:GLU:HB2	1:D:263:ASN:HD22	1.61	0.65
1:D:320:LEU:HD12	1:D:356:SER:HB3	1.78	0.65
1:D:340:THR:HG23	1:D:367:LYS:HB2	1.79	0.65

Continued on next page...

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:208:ASN:HA	1:F:211:GLY:HA2	1.79	0.65
1:E:439:GLY:N	1:E:442:GLU:OE2	2.30	0.64
1:E:397:ARG:NH1	1:E:418:GLY:O	2.31	0.64
1:E:261:VAL:HG12	1:E:266:VAL:HG12	1.79	0.64
1:F:340:THR:HG23	1:F:367:LYS:HB2	1.79	0.63
1:C:421:MSE:HE2	1:C:425:ASN:HB3	1.80	0.63
1:C:353:GLY:HA2	1:C:441:ARG:HH21	1.64	0.63
1:E:232:MSE:HE2	1:E:235:TYR:HA	1.80	0.63
1:A:320:LEU:HD22	1:A:356:SER:HB3	1.79	0.62
1:C:404:ASP:OD2	1:C:433:ARG:NH2	2.33	0.61
1:D:453:PHE:HB2	1:D:478:LEU:HD13	1.82	0.61
1:A:739:GLU:OE1	1:B:745:ASN:ND2	2.34	0.60
1:B:397:ARG:HE	1:B:421:MSE:HE3	1.68	0.59
1:A:378:ARG:NH1	1:A:404:ASP:OD2	2.36	0.59
1:E:267:LYS:NZ	4:E:801:HOH:O	2.36	0.58
1:D:494:SER:OG	1:F:533:HIS:ND1	2.27	0.58
1:A:212:VAL:HG12	1:A:231:LEU:HB3	1.85	0.58
1:C:210:LYS:NZ	1:C:223:SER:O	2.37	0.58
1:B:662:ARG:HG2	1:B:743:THR:HB	1.85	0.57
1:F:442:GLU:OE1	1:F:442:GLU:N	2.37	0.57
1:C:384:TYR:OH	1:C:442:GLU:N	2.37	0.57
1:F:378:ARG:NH1	1:F:404:ASP:OD2	2.38	0.57
1:B:207:MSE:HE1	1:B:228:GLN:HA	1.87	0.57
1:E:246:PHE:HB3	1:E:265:TRP:HB3	1.86	0.57
1:D:414:LYS:NZ	1:E:388:SER:O	2.36	0.56
1:F:404:ASP:OD2	1:F:433:ARG:NH2	2.37	0.56
1:A:254:LEU:HB2	1:D:521:THR:HG23	1.88	0.56
1:D:277:SER:HA	1:D:281:ALA:HB3	1.88	0.56
1:F:484:THR:N	4:F:902:HOH:O	2.38	0.55
1:C:536:ARG:NH1	1:C:561:GLN:OE1	2.39	0.55
1:F:379:SER:HB3	1:F:383:GLY:N	2.22	0.55
1:B:378:ARG:NH1	1:B:404:ASP:OD2	2.40	0.55
1:A:662:ARG:HH21	1:C:664:LEU:HB2	1.72	0.55
1:A:536:ARG:NH1	1:A:561:GLN:OE1	2.40	0.54
1:D:404:ASP:OD2	1:D:433:ARG:NH2	2.40	0.54
1:C:277:SER:HA	1:C:281:ALA:HB3	1.90	0.54
1:F:460:CYS:SG	1:F:463:GLU:HB2	2.48	0.54
1:F:653:SER:OG	4:F:903:HOH:O	2.18	0.54
1:E:277:SER:HA	1:E:281:ALA:HB3	1.90	0.54
1:D:662:ARG:HG2	1:D:743:THR:HB	1.89	0.53
1:F:372:GLY:O	1:F:427:ILE:HD11	2.09	0.53

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:510:PRO:HA	1:C:540:VAL:HG23	1.90	0.53
1:E:485:GLU:OE1	1:E:489:LYS:NZ	2.25	0.53
1:B:216:LYS:HG3	1:B:262:ILE:HD13	1.91	0.53
1:C:213:VAL:HG13	1:C:218:GLU:HB3	1.91	0.53
1:E:404:ASP:OD2	1:E:433:ARG:NH2	2.42	0.53
1:D:745:ASN:ND2	1:F:739:GLU:OE1	2.42	0.52
1:F:277:SER:HA	1:F:281:ALA:HB3	1.91	0.52
1:C:397:ARG:HB3	1:C:421:MSE:HG3	1.92	0.52
1:E:259:VAL:HG22	1:E:279:CYS:HA	1.91	0.51
1:A:247:LYS:O	1:A:266:VAL:HG23	2.11	0.51
1:B:277:SER:HA	1:B:281:ALA:HB3	1.93	0.51
1:B:421:MSE:HE2	1:B:425:ASN:HB3	1.93	0.51
1:D:208:ASN:OD1	1:D:209:LEU:N	2.42	0.51
1:B:739:GLU:OE2	1:C:745:ASN:ND2	2.44	0.51
1:B:510:PRO:HA	1:B:540:VAL:HG23	1.94	0.50
1:A:421:MSE:HE2	1:A:425:ASN:HB3	1.92	0.50
1:A:397:ARG:HB3	1:A:421:MSE:HG3	1.93	0.50
1:D:212:VAL:N	1:E:207:MSE:O	2.39	0.50
1:F:208:ASN:OD1	1:F:209:LEU:N	2.45	0.50
1:C:662:ARG:HG2	1:C:743:THR:HB	1.92	0.50
1:E:249:ASP:N	1:E:264:GLY:O	2.45	0.50
1:E:716:TRP:CZ3	1:E:726:ALA:HB2	2.47	0.49
1:B:384:TYR:OH	1:B:442:GLU:N	2.45	0.49
1:A:513:ILE:HD13	1:A:527:ILE:HD13	1.94	0.49
1:D:662:ARG:HH22	1:F:664:LEU:HB2	1.77	0.49
1:C:540:VAL:C	1:C:564:SER:HB2	2.33	0.49
1:E:260:THR:O	1:E:267:LYS:N	2.40	0.49
1:E:511:TYR:CD1	1:E:544:LYS:HB2	2.48	0.49
1:A:384:TYR:OH	1:A:442:GLU:N	2.46	0.49
1:B:716:TRP:CZ3	1:B:726:ALA:HB2	2.48	0.49
1:A:596:ILE:HD11	1:A:604:MSE:HG3	1.95	0.48
1:B:247:LYS:O	1:B:266:VAL:HG23	2.14	0.48
1:F:320:LEU:HD22	1:F:356:SER:HB3	1.94	0.48
1:A:309:ASP:N	1:A:309:ASP:OD1	2.42	0.48
1:A:292:LEU:O	1:A:296:VAL:HG23	2.13	0.48
1:A:665:VAL:HG11	1:A:716:TRP:CH2	2.48	0.48
1:D:665:VAL:HG11	1:D:716:TRP:CH2	2.49	0.48
1:D:662:ARG:NH2	1:F:683:GLU:OE1	2.46	0.47
1:D:636:ARG:NH1	1:D:645:GLY:O	2.43	0.47
1:E:208:ASN:OD1	1:E:209:LEU:N	2.43	0.47
1:E:665:VAL:HG11	1:E:716:TRP:CH2	2.49	0.47

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:276:VAL:HG22	1:E:306:LEU:HD11	1.96	0.47
1:C:378:ARG:NH1	1:C:404:ASP:OD2	2.47	0.47
1:A:401:TYR:OH	1:A:433:ARG:NH2	2.48	0.47
1:D:350:VAL:HB	1:D:379:SER:HA	1.97	0.47
1:F:636:ARG:NH1	1:F:645:GLY:O	2.43	0.47
1:D:212:VAL:HG11	1:E:229:VAL:HG21	1.97	0.46
1:A:503:ILE:HD12	1:A:534:MSE:HE3	1.98	0.46
1:B:259:VAL:HG22	1:B:279:CYS:HA	1.97	0.46
1:B:596:ILE:HD11	1:B:604:MSE:HG3	1.97	0.46
1:E:540:VAL:C	1:E:564:SER:HB2	2.35	0.46
1:C:665:VAL:HG11	1:C:716:TRP:CH2	2.51	0.46
1:F:309:ASP:N	4:F:906:HOH:O	2.49	0.46
1:A:460:CYS:HA	1:A:486:ALA:O	2.16	0.46
1:C:292:LEU:O	1:C:296:VAL:HG23	2.15	0.46
1:E:326:ILE:HG12	1:E:364:LEU:HD11	1.97	0.46
1:F:431:ALA:HB2	1:F:461:MSE:HE3	1.98	0.46
1:A:213:VAL:HG23	1:A:232:MSE:HG3	1.97	0.46
1:D:310:PHE:O	1:D:312:LEU:HD13	2.16	0.46
1:F:246:PHE:HB3	1:F:265:TRP:HB3	1.97	0.46
1:F:309:ASP:N	1:F:309:ASP:OD1	2.42	0.45
1:E:552:LYS:HB3	1:E:581:GLU:HB2	1.98	0.45
1:B:397:ARG:NE	1:B:421:MSE:HE3	2.32	0.45
1:D:408:ILE:HA	1:D:444:ASN:O	2.16	0.45
1:F:379:SER:HB3	1:F:383:GLY:H	1.80	0.45
1:D:326:ILE:HG12	1:D:364:LEU:HD11	1.97	0.45
1:B:540:VAL:C	1:B:564:SER:HB2	2.37	0.45
1:F:213:VAL:HG23	1:F:232:MSE:HG3	1.98	0.45
1:F:292:LEU:O	1:F:296:VAL:HG23	2.17	0.45
1:A:485:GLU:OE1	1:A:489:LYS:NZ	2.44	0.45
1:A:414:LYS:NZ	1:B:388:SER:O	2.42	0.45
1:A:408:ILE:HA	1:A:444:ASN:O	2.17	0.45
1:A:487:LEU:HD11	1:A:506:ASN:ND2	2.32	0.45
1:D:246:PHE:HB3	1:D:265:TRP:HB3	1.99	0.45
1:E:276:VAL:HG21	1:E:308:VAL:HG22	1.97	0.45
1:A:511:TYR:CD1	1:A:544:LYS:HB2	2.52	0.44
1:F:662:ARG:HD3	1:F:683:GLU:OE2	2.17	0.44
1:E:212:VAL:HG22	1:E:231:LEU:HB3	1.98	0.44
1:B:513:ILE:HD13	1:B:527:ILE:HD13	1.98	0.44
1:B:379:SER:HB3	1:B:383:GLY:N	2.33	0.44
1:B:502:TYR:CE1	1:C:445:ALA:HB2	2.53	0.44
1:D:515:THR:HG21	1:D:551:PRO:HD3	2.00	0.44

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:577:VAL:HG21	1:D:598:ASP:HB2	1.99	0.44
1:E:513:ILE:HD13	1:E:527:ILE:HD13	1.99	0.44
1:F:483:CYS:HB3	4:F:902:HOH:O	2.17	0.44
1:C:246:PHE:HB3	1:C:265:TRP:HB3	2.00	0.44
1:C:437:VAL:N	1:C:441:ARG:O	2.43	0.43
1:D:513:ILE:HD13	1:D:527:ILE:HD13	1.99	0.43
1:F:207:MSE:HE1	1:F:228:GLN:HA	2.00	0.43
1:F:535:ASN:HA	1:F:561:GLN:H	1.83	0.43
1:F:342:THR:HA	1:F:369:SER:HB3	1.99	0.43
1:A:612:SER:HA	1:B:617:ALA:O	2.18	0.43
1:B:408:ILE:HA	1:B:444:ASN:O	2.18	0.43
1:F:540:VAL:C	1:F:564:SER:HB2	2.39	0.43
1:C:511:TYR:CD1	1:C:544:LYS:HB2	2.53	0.43
1:C:697:GLN:NE2	4:C:913:HOH:O	2.51	0.43
1:D:716:TRP:CZ3	1:D:726:ALA:HB2	2.53	0.43
1:E:664:LEU:HB3	1:E:741:PHE:HB2	1.99	0.43
1:F:515:THR:HG21	1:F:551:PRO:HG3	2.00	0.43
1:C:379:SER:HB3	1:C:383:GLY:N	2.33	0.43
1:D:384:TYR:OH	1:D:442:GLU:N	2.51	0.43
1:D:510:PRO:HA	1:D:540:VAL:HG23	1.99	0.43
1:E:371:GLY:HA3	1:E:424:THR:O	2.18	0.43
1:E:384:TYR:OH	1:E:442:GLU:N	2.52	0.43
1:E:397:ARG:HB2	1:E:421:MSE:HG3	2.00	0.43
1:A:246:PHE:HB3	1:A:265:TRP:HB3	2.00	0.43
1:C:716:TRP:CZ3	1:C:726:ALA:HB2	2.54	0.43
1:E:408:ILE:HA	1:E:444:ASN:O	2.18	0.43
1:E:506:ASN:HB2	1:E:537:PRO:O	2.18	0.43
1:F:716:TRP:CZ3	1:F:726:ALA:HB2	2.54	0.43
1:B:506:ASN:HB2	1:B:537:PRO:O	2.19	0.43
1:E:289:SER:HA	1:E:314:VAL:HG22	2.00	0.43
1:F:382:ASN:ND2	1:F:435:LEU:O	2.52	0.43
1:B:397:ARG:NH1	1:B:455:LYS:HD2	2.33	0.43
1:D:460:CYS:HA	1:D:486:ALA:O	2.19	0.43
1:F:590:LEU:HD21	1:F:596:ILE:HG23	2.00	0.43
1:A:257:ASN:HD21	1:A:261:VAL:HG23	1.83	0.42
1:B:210:LYS:HB3	1:B:230:VAL:HG12	2.00	0.42
1:B:460:CYS:HA	1:B:486:ALA:O	2.19	0.42
1:C:357:GLU:HG3	1:C:386:SER:HB3	2.00	0.42
1:A:479:GLU:HA	1:A:504:GLU:O	2.18	0.42
1:B:447:THR:HB	1:B:449:TYR:HE1	1.83	0.42
1:E:305:LYS:HG2	1:E:306:LEU:N	2.33	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:502:TYR:CE1	1:B:445:ALA:HB2	2.54	0.42
1:B:665:VAL:HG11	1:B:716:TRP:CH2	2.54	0.42
1:F:310:PHE:O	1:F:312:LEU:HD13	2.20	0.42
1:F:319:GLU:HB3	1:F:351:LYS:HZ1	1.84	0.42
1:B:246:PHE:HB3	1:B:265:TRP:HB3	2.00	0.42
1:D:207:MSE:HB2	1:F:212:VAL:H	1.85	0.42
1:D:245:HIS:HB2	1:D:268:GLN:HB2	2.01	0.42
1:F:563:ILE:HG22	1:F:591:ALA:HB3	2.01	0.42
1:A:459:ASP:HA	1:A:484:THR:OG1	2.20	0.42
1:F:447:THR:HB	1:F:449:TYR:HE2	1.83	0.42
1:A:371:GLY:HA3	1:A:424:THR:O	2.19	0.42
1:B:635:ASN:OD1	1:B:735:ARG:NH1	2.53	0.42
1:C:408:ILE:HA	1:C:444:ASN:O	2.19	0.42
1:D:445:ALA:HB2	1:F:502:TYR:CE1	2.55	0.42
1:B:479:GLU:HA	1:B:504:GLU:O	2.20	0.42
1:A:296:VAL:HG13	1:A:324:LEU:HD13	2.02	0.42
1:D:612:SER:HA	1:E:617:ALA:O	2.20	0.42
1:F:438:VAL:HG22	1:F:466:SER:HA	2.01	0.42
1:E:502:TYR:CE2	1:F:445:ALA:HB2	2.55	0.42
1:D:261:VAL:HG22	1:D:266:VAL:HG13	2.01	0.41
1:F:513:ILE:HD13	1:F:527:ILE:HD13	2.00	0.41
1:B:487:LEU:HD11	1:B:506:ASN:ND2	2.35	0.41
1:E:311:ASP:HB3	4:E:826:HOH:O	2.20	0.41
1:E:479:GLU:HA	1:E:504:GLU:O	2.20	0.41
1:C:487:LEU:HD11	1:C:506:ASN:ND2	2.35	0.41
1:E:502:TYR:OH	1:F:444:ASN:HB3	2.20	0.41
1:A:511:TYR:HA	1:A:541:ALA:O	2.20	0.41
1:B:216:LYS:HE3	1:B:258:GLY:HA2	2.03	0.41
1:B:220:GLU:HB2	1:B:263:ASN:HD22	1.86	0.41
1:E:487:LEU:HD11	1:E:506:ASN:ND2	2.36	0.41
1:E:516:LEU:HD23	1:E:546:THR:HG21	2.03	0.41
1:E:683:GLU:OE2	1:F:662:ARG:NE	2.53	0.41
1:E:350:VAL:HB	1:E:379:SER:HA	2.03	0.41
1:C:515:THR:HG23	4:C:906:HOH:O	2.20	0.41
1:D:308:VAL:HG12	1:D:337:ARG:HD2	2.03	0.41
1:A:212:VAL:HG21	1:B:207:MSE:HE2	2.03	0.41
1:B:511:TYR:CD1	1:B:544:LYS:HB2	2.56	0.41
1:E:305:LYS:HE2	1:E:325:ARG:NH2	2.36	0.41
1:A:716:TRP:CZ3	1:A:726:ALA:HB2	2.56	0.40
1:A:445:ALA:HB2	1:C:502:TYR:CE1	2.55	0.40
1:D:525:PRO:HG3	1:F:559:TYR:HB2	2.02	0.40

*Continued on next page...*



Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:372:GLY:O	1:E:427:ILE:HD12	2.21	0.40
1:C:452:ILE:HG21	1:C:454:ARG:NH1	2.35	0.40
1:D:478:LEU:O	1:D:503:ILE:HA	2.21	0.40
1:D:455:LYS:HE3	1:D:480:GLN:HB3	2.02	0.40
1:D:444:ASN:HB3	1:F:502:TYR:OH	2.21	0.40
1:A:452:ILE:HG21	1:A:454:ARG:NH1	2.36	0.40
1:A:497:MSE:SE	1:C:530:GLN:HG2	2.71	0.40
1:C:460:CYS:HA	1:C:486:ALA:O	2.20	0.40
1:D:487:LEU:HD11	1:D:506:ASN:ND2	2.37	0.40
1:E:685:LEU:HD23	1:E:685:LEU:HA	1.95	0.40
1:F:511:TYR:CD1	1:F:544:LYS:HB2	2.56	0.40
1:B:534:MSE:HE3	1:B:558:CYS:SG	2.61	0.40
1:D:329:ASP:O	1:E:305:LYS:N	2.52	0.40
1:E:242:GLY:O	4:E:801:HOH:O	2.22	0.40
1:D:662:ARG:NH1	1:F:662:ARG:HH21	2.19	0.40
1:B:530:GLN:HG2	1:C:497:MSE:SE	2.71	0.40
1:C:513:ILE:HD13	1:C:527:ILE:HD13	2.03	0.40
1:C:515:THR:HG21	1:C:551:PRO:HG3	2.04	0.40
1:F:261:VAL:HG13	1:F:266:VAL:HG22	2.03	0.40
1:F:479:GLU:HA	1:F:504:GLU:O	2.22	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	542/554 (98%)	521 (96%)	20 (4%)	1 (0%)	47 73
1	B	541/554 (98%)	521 (96%)	19 (4%)	1 (0%)	47 73
1	C	542/554 (98%)	522 (96%)	19 (4%)	1 (0%)	47 73
1	D	542/554 (98%)	521 (96%)	20 (4%)	1 (0%)	47 73

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	542/554 (98%)	519 (96%)	21 (4%)	2 (0%)	34	60
1	F	542/554 (98%)	520 (96%)	20 (4%)	2 (0%)	34	60
All	All	3251/3324 (98%)	3124 (96%)	119 (4%)	8 (0%)	47	73

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	333	VAL
1	B	333	VAL
1	C	333	VAL
1	D	333	VAL
1	E	333	VAL
1	F	333	VAL
1	E	358	SER
1	F	358	SER

### 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	438/435 (101%)	429 (98%)	9 (2%)	53	80
1	B	437/435 (100%)	425 (97%)	12 (3%)	44	74
1	C	438/435 (101%)	430 (98%)	8 (2%)	59	83
1	D	438/435 (101%)	427 (98%)	11 (2%)	47	76
1	E	438/435 (101%)	431 (98%)	7 (2%)	62	85
1	F	438/435 (101%)	425 (97%)	13 (3%)	41	70
All	All	2627/2610 (101%)	2567 (98%)	60 (2%)	50	78

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	229	VAL
1	A	261	VAL

Continued on next page...

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	266	VAL
1	A	318	THR
1	A	384	TYR
1	A	424	THR
1	A	447	THR
1	A	507	THR
1	A	589	THR
1	B	235	TYR
1	B	261	VAL
1	B	266	VAL
1	B	316	THR
1	B	318	THR
1	B	384	TYR
1	B	447	THR
1	B	449	TYR
1	B	494	SER
1	B	507	THR
1	B	540	VAL
1	B	589	THR
1	C	212	VAL
1	C	340	THR
1	C	384	TYR
1	C	447	THR
1	C	494	SER
1	C	507	THR
1	C	540	VAL
1	C	601	THR
1	D	259	VAL
1	D	266	VAL
1	D	312	LEU
1	D	340	THR
1	D	380	THR
1	D	384	TYR
1	D	484	THR
1	D	540	VAL
1	D	546	THR
1	D	547	MSE
1	D	589	THR
1	E	273	VAL
1	E	316	THR
1	E	318	THR
1	E	378	ARG

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	E	384	TYR
1	E	421	MSE
1	E	494	SER
1	F	261	VAL
1	F	275	THR
1	F	312	LEU
1	F	314	VAL
1	F	316	THR
1	F	340	THR
1	F	359	SER
1	F	384	TYR
1	F	447	THR
1	F	449	TYR
1	F	484	THR
1	F	570	SER
1	F	738	MSE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	D	263	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](#)

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers

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, 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	533/554 (96%)	0.00	10 (1%) 66 69	29, 42, 68, 180	0
1	B	532/554 (96%)	0.01	9 (1%) 70 72	29, 44, 77, 112	0
1	C	533/554 (96%)	0.06	10 (1%) 66 69	29, 41, 75, 96	0
1	D	533/554 (96%)	0.53	60 (11%) 5 4	33, 71, 135, 207	0
1	E	533/554 (96%)	0.74	68 (12%) 3 3	29, 81, 135, 190	0
1	F	533/554 (96%)	0.64	69 (12%) 3 2	33, 81, 135, 186	0
All	All	3197/3324 (96%)	0.33	226 (7%) 16 14	29, 50, 124, 207	0

All (226) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	212	VAL	9.4
1	A	206	LEU	9.1
1	E	225	SER	8.8
1	F	217	VAL	7.0
1	F	262	ILE	6.5
1	D	217	VAL	5.9
1	D	261	VAL	5.7
1	F	265	TRP	5.6
1	E	229	VAL	5.5
1	E	211	GLY	5.4
1	E	294	LEU	5.3
1	D	250	SER	5.2
1	E	291	ALA	5.2
1	D	248	TYR	5.1
1	E	345	ILE	4.9
1	E	226	ASP	4.9
1	D	310	PHE	4.7
1	E	231	LEU	4.6
1	F	254	LEU	4.6

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	F	221	GLY	4.4
1	D	255	ILE	4.4
1	E	219	LEU	4.2
1	D	252	GLN	4.2
1	D	226	ASP	4.1
1	E	212	VAL	4.1
1	E	246	PHE	4.1
1	F	424	THR	4.1
1	D	251	THR	4.0
1	E	374	ALA	4.0
1	F	231	LEU	4.0
1	E	262	ILE	3.9
1	F	261	VAL	3.9
1	F	263	ASN	3.9
1	F	237	ALA	3.9
1	D	450	ASN	3.8
1	D	254	LEU	3.8
1	D	411	ASP	3.8
1	E	288	HIS	3.7
1	D	499	VAL	3.7
1	E	350	VAL	3.7
1	F	212	VAL	3.6
1	F	236	TYR	3.6
1	F	250	SER	3.6
1	E	237	ALA	3.6
1	D	474	PHE	3.5
1	F	398	SER	3.5
1	F	214	ASN	3.5
1	F	209	LEU	3.5
1	D	209	LEU	3.5
1	A	449	TYR	3.5
1	E	248	TYR	3.5
1	C	427	ILE	3.5
1	F	222	LEU	3.5
1	D	449	TYR	3.5
1	E	218	GLU	3.4
1	E	255	ILE	3.4
1	E	449	TYR	3.4
1	F	233	THR	3.4
1	D	231	LEU	3.4
1	D	211	GLY	3.4
1	F	220	GLU	3.4

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	F	413	GLN	3.4
1	E	266	VAL	3.3
1	E	292	LEU	3.3
1	F	449	TYR	3.3
1	F	499	VAL	3.3
1	F	320	LEU	3.3
1	E	373	THR	3.3
1	D	213	VAL	3.3
1	D	370	THR	3.3
1	F	426	SER	3.3
1	D	242	GLY	3.2
1	D	447	THR	3.2
1	D	246	PHE	3.2
1	E	213	VAL	3.2
1	D	206	LEU	3.2
1	E	230	VAL	3.2
1	E	290	ALA	3.2
1	F	246	PHE	3.2
1	D	265	TRP	3.1
1	D	500	GLY	3.1
1	D	475	ALA	3.1
1	E	413	GLN	3.1
1	B	254	LEU	3.0
1	F	369	SER	3.0
1	E	206	LEU	3.0
1	F	482	LEU	3.0
1	C	449	TYR	3.0
1	E	259	VAL	3.0
1	F	423	THR	2.9
1	D	476	CYS	2.9
1	E	279	CYS	2.9
1	D	239	GLN	2.9
1	E	399	LEU	2.9
1	C	450	ASN	2.9
1	E	250	SER	2.9
1	F	215	SER	2.9
1	E	366	PHE	2.9
1	F	450	ASN	2.9
1	E	371	GLY	2.9
1	A	447	THR	2.9
1	F	391	ASP	2.9
1	D	236	TYR	2.9

*Continued on next page...*



*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	E	222	LEU	2.8
1	E	227	GLY	2.8
1	D	294	LEU	2.8
1	C	499	VAL	2.8
1	F	340	THR	2.8
1	D	271	ALA	2.8
1	E	235	TYR	2.8
1	F	218	GLU	2.8
1	D	400	ARG	2.8
1	E	475	ALA	2.8
1	C	475	ALA	2.7
1	F	286	SER	2.7
1	E	349	THR	2.7
1	D	257	ASN	2.7
1	E	440	THR	2.7
1	F	427	ILE	2.7
1	D	342	THR	2.7
1	C	476	CYS	2.7
1	F	313	ARG	2.7
1	F	429	PHE	2.7
1	B	262	ILE	2.7
1	D	371	GLY	2.6
1	A	222	LEU	2.6
1	B	698	ILE	2.6
1	D	414	LYS	2.6
1	D	208	ASN	2.6
1	D	369	SER	2.6
1	F	425	ASN	2.6
1	E	282	ASP	2.6
1	F	414	LYS	2.6
1	D	225	SER	2.6
1	E	368	ALA	2.6
1	E	451	CYS	2.6
1	F	210	LYS	2.6
1	D	345	ILE	2.5
1	F	228	GLN	2.5
1	F	291	ALA	2.5
1	E	217	VAL	2.5
1	B	447	THR	2.5
1	E	238	GLY	2.5
1	E	272	GLY	2.5
1	E	233	THR	2.5

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	F	370	THR	2.5
1	E	286	SER	2.5
1	B	255	ILE	2.4
1	F	211	GLY	2.4
1	F	331	GLY	2.4
1	F	371	GLY	2.4
1	F	347	ILE	2.4
1	D	230	VAL	2.4
1	D	266	VAL	2.4
1	E	362	GLY	2.4
1	E	320	LEU	2.4
1	F	380	THR	2.4
1	D	413	GLN	2.4
1	D	367	LYS	2.4
1	E	271	ALA	2.4
1	D	410	CYS	2.4
1	F	240	TYR	2.3
1	E	298	THR	2.3
1	E	471	TRP	2.3
1	F	239	GLN	2.3
1	F	540	VAL	2.3
1	D	243	GLY	2.3
1	E	348	PHE	2.3
1	D	427	ILE	2.3
1	D	473	PHE	2.3
1	E	474	PHE	2.3
1	F	510	PRO	2.3
1	F	400	ARG	2.3
1	F	457	THR	2.3
1	C	451	CYS	2.3
1	D	428	GLY	2.2
1	D	392	HIS	2.2
1	F	248	TYR	2.2
1	B	261	VAL	2.2
1	A	255	ILE	2.2
1	D	286	SER	2.2
1	E	454	ARG	2.2
1	A	233	THR	2.2
1	B	449	TYR	2.2
1	A	213	VAL	2.2
1	B	381	SER	2.2
1	E	318	THR	2.2

*Continued on next page...*

*Continued from previous page...*

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	371	GLY	2.2
1	F	328	GLY	2.2
1	F	456	GLY	2.2
1	F	219	LEU	2.2
1	C	474	PHE	2.2
1	E	535	ASN	2.2
1	E	239	GLN	2.2
1	F	360	TYR	2.2
1	F	226	ASP	2.2
1	A	413	GLN	2.1
1	F	484	THR	2.1
1	D	256	ASN	2.1
1	A	698	ILE	2.1
1	E	209	LEU	2.1
1	F	441	ARG	2.1
1	F	259	VAL	2.1
1	F	401	TYR	2.1
1	F	208	ASN	2.1
1	E	476	CYS	2.1
1	E	210	LYS	2.1
1	F	216	LYS	2.1
1	F	253	ALA	2.1
1	C	447	THR	2.1
1	D	389	THR	2.1
1	E	228	GLN	2.1
1	D	253	ALA	2.1
1	D	368	ALA	2.1
1	D	344	ASP	2.1
1	D	472	HIS	2.1
1	E	437	VAL	2.1
1	F	474	PHE	2.1
1	A	450	ASN	2.0
1	B	696	SER	2.0
1	E	344	ASP	2.0
1	E	380	THR	2.0
1	D	426	SER	2.0
1	E	258	GLY	2.0
1	E	393	CYS	2.0
1	F	483	CYS	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
3	NA	B	801	1/1	0.62	0.44	55,55,55,55	0
3	NA	D	801	1/1	0.69	0.23	50,50,50,50	0
2	CL	C	802	1/1	0.88	0.26	94,94,94,94	0
2	CL	F	801	1/1	0.89	0.13	71,71,71,71	0
2	CL	A	801	1/1	0.92	0.26	58,58,58,58	0
3	NA	C	801	1/1	0.97	0.45	32,32,32,32	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.