Full wwPDB X-ray Structure Validation Report (i)

May 22, 2020 – 02:50 pm BST

PDB ID	:	1UK2
Title	:	Crystal structure of SARS Coronavirus Main Proteinase (3CLpro) At pH8.0
Authors	:	Yang, H.; Yang, M.; Liu, Y.; Bartlam, M.; Ding, Y.; Lou, Z.; Sun, L.; Zhou, Z.; Ye, S.; Anand, K.; Pang, H.; Gao, G.F.; Hilgenfeld, R.; Rao, Z.
Deposited on	:	2003-08-14
Resolution	:	2.20 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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

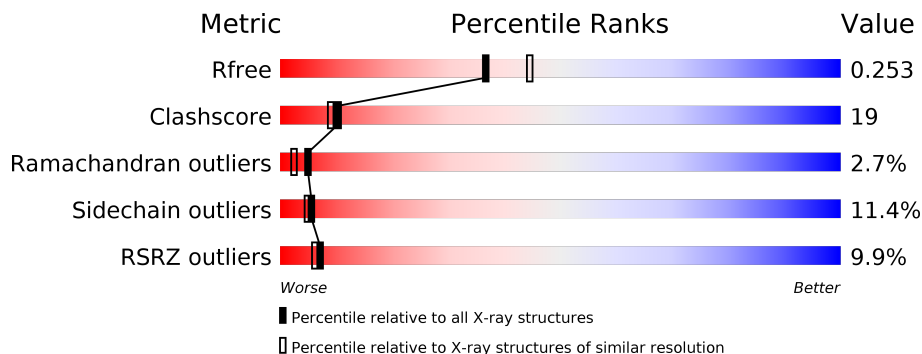|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.11
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.253
Clashscore		19
Ramachandran outliers		2.7%
Sidechain outliers		11.4%
RSRZ outliers		9.9%

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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 >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	306	10% 67% 23% 8% ··
1	B	306	9% 66% 27% 6% ·

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 4752 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 3C-LIKE PROTEINASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	302	Total 2336	C 1476	N 400	O 438	S 22	0	0	0
1	B	302	Total 2336	C 1476	N 400	O 438	S 22	0	0	0

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	41	Total 41	O 41	0	0
2	B	39	Total 39	O 39	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA 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 anno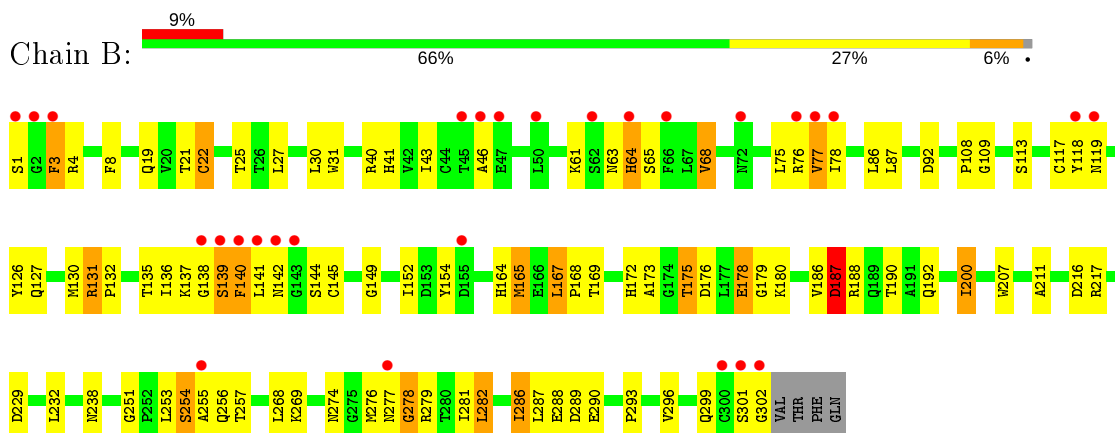tated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 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: 3C-LIKE PROTEINASE

Chain A:

10%
67%   23%   8%

Chain residues (Chain A): S1 G2 F3 R4 K5 Q19 C22 G23 L27 N28 G29 L30 R40 I43 C44 T45 A46 E47 D48 M49 L50 N51 P52 N53 Y54 E55 D56 I59 R60 K61 H64 S65 F66 V77 L86 N95 T98 K102 P108 S113 C117 Y118 N119 G120 S121

Y126 Q127 C128 A129 M130 R131 T135 I136 K137 G138 S139 F140 L141 N142 G143 S144 C145 G146 S147 V148 G149 F150 N151 I152 D153 Y154 D155 C156 V157 S158 F159 L167 P168 H172 L177 E178 G179 V186 D187 R188 Q189 T190 A191 Q192 D197 I200 N221 R222 F223 T224 T225

T226 L227 N228 D229 Q256 L268 K269 E270 N274 N277 G278 L282 T285 I286 L287 E288 D289 E290 D295 V296 V297 R298 Q299 C300 S301 G302 VAL THR PHE GLN

- Molecule 1: 3C-LIKE PROTEINASE

Chain B:

9%
66%   27%   6%

Chain residues (Chain B): S1 G2 F3 R4 F8 Q19 V20 T21 C22 T25 T26 L27 L30 W31 R40 H41 V42 I43 C44 T45 A46 E47 L50 K61 S62 N63 H64 S65 F66 L67 V68 N72 L75 R76 V77 I78 L86 L87 D92 P108 G109 S113 C117 Y118 N119

Y126 Q127 M130 R131 P132 T135 I136 K137 G138 S139 F140 L141 N142 G143 S144 C145 G149 I152 D153 Y154 D155 H164 M165 E166 L167 P168 T169 H172 A173 G174 T175 D176 L177 E178 G179 K180 V186 D187 R188 Q189 T190 A191 Q192 I200 W207 A211 D216 R217

D229 L232 N238 G251 P252 L253 S254 A255 Q256 T257 L268 K269 N274 G275 M276 N277 G278 R279 T280 I281 L282 I286 L287 E288 D289 E290 P293 V296 Q299 C300 S301 G302 VAL THR PHE GLN

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	49.48Å 97.43Å 67.53Å 90.00° 101.70° 90.00°	Depositor
Resolution (Å)	50.00 – 2.20 48.46 – 2.21	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.20) 93.8 (48.46-2.21)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	3.49 (at 2.20Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.226 , 0.253 0.225 , 0.253	Depositor DCC
R_{free} test set	1551 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å^2)	25.1	Xtriage
Anisotropy	0.497	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 58.2	EDS
L-test for twinning[2]	$<|L|> = 0.48$, $<L^2> = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	4752	wwPDB-VP
Average B, all atoms (Å^2)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.62% of the height of the origin peak. No significant pseudotranslation is detected.*

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

5 Model quality (i)

5.1 Standard geometry (i)

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	0.97	1/2388 (0.0%)	1.10	10/3244 (0.3%)
1	B	0.94	1/2388 (0.0%)	1.09	4/3244 (0.1%)
All	All	0.95	2/4776 (0.0%)	1.09	14/6488 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	44	CYS	CB-SG	-7.62	1.69	1.82
1	B	145	CYS	CB-SG	-6.36	1.71	1.82

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	141	LEU	CA-CB-CG	9.67	137.54	115.30
1	A	147	SER	N-CA-C	-7.18	91.61	111.00
1	A	301	SER	N-CA-C	-6.22	94.20	111.00
1	A	188	ARG	NE-CZ-NH2	-5.97	117.31	120.30
1	B	302	GLY	N-CA-C	-5.72	98.80	113.10
1	A	44	CYS	CB-CA-C	-5.63	99.14	110.40
1	A	302	GLY	N-CA-C	5.58	127.05	113.10
1	A	5	LYS	N-CA-C	-5.41	96.39	111.00
1	A	52	PRO	N-CA-C	5.39	126.11	112.10
1	B	140	PHE	CB-CG-CD2	-5.39	117.03	120.80
1	A	197	ASP	CB-CG-OD1	-5.38	113.46	118.30
1	B	190	THR	N-CA-C	-5.20	96.97	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	224	THR	N-CA-C	5.18	124.99	111.00
1	B	145	CYS	N-CA-CB	-5.04	101.53	110.60

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	118	TYR	Sidechain

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	2336	0	2289	106	0
1	B	2336	0	2289	93	0
2	A	41	0	0	5	0
2	B	39	0	0	1	0
All	All	4752	0	4578	173	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 19.

All (173) 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:A:226:THR:HG22	1:A:229:ASP:H	1.17	1.10
1:A:4:ARG:HH11	1:B:138:GLY:HA2	1.14	1.08
1:A:139:SER:HB2	1:B:4:ARG:H	1.23	1.03
1:A:139:SER:HB2	1:B:4:ARG:N	1.73	1.02
1:A:45:THR:HG23	1:A:48:ASP:H	1.31	0.93
1:A:22:CYS:SG	1:A:61:LYS:NZ	2.43	0.90
1:A:139:SER:CB	1:B:4:ARG:HB3	2.06	0.85
1:A:4:ARG:NH1	1:B:138:GLY:HA2	1.92	0.85
1:A:1:SER:HB3	2:A:331:HOH:O	1.76	0.84
1:A:2:GLY:O	1:A:282:LEU:HD22	1.77	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:152:ILE:HD12	1:A:157:VAL:HG22	1.59	0.83
1:B:229:ASP:OD2	1:B:269:LYS:NZ	2.11	0.82
1:A:4:ARG:HG3	1:B:138:GLY:HA2	1.62	0.81
1:A:4:ARG:HH11	1:B:138:GLY:CA	1.93	0.81
1:B:109:GLY:HA2	1:B:200:ILE:HD12	1.66	0.78
1:B:139:SER:HA	1:B:172:HIS:HE1	1.49	0.77
1:A:108:PRO:HA	1:A:130:MET:HG2	1.67	0.77
1:B:64:HIS:H	1:B:64:HIS:CD2	2.04	0.76
1:B:269:LYS:HD3	2:B:343:HOH:O	1.86	0.75
1:A:226:THR:CG2	1:A:229:ASP:H	1.98	0.75
1:B:68:VAL:CG2	1:B:75:LEU:HB2	2.18	0.73
1:A:4:ARG:NH1	1:B:138:GLY:CA	2.52	0.72
1:B:3:PHE:HB2	1:B:282:LEU:HG	1.71	0.72
1:A:118:TYR:HA	1:A:143:GLY:O	1.91	0.70
1:B:140:PHE:C	1:B:142:ASN:H	1.94	0.70
1:A:139:SER:HB3	1:B:4:ARG:HB3	1.73	0.70
1:A:186:VAL:H	1:A:192:GLN:HE22	1.40	0.70
1:B:164:HIS:CD2	1:B:175:THR:HB	2.26	0.69
1:A:139:SER:HB2	1:B:4:ARG:CB	2.23	0.69
1:B:164:HIS:NE2	1:B:175:THR:HB	2.07	0.68
1:A:139:SER:HB2	1:B:4:ARG:HB3	1.74	0.68
1:A:137:LYS:NZ	1:A:197:ASP:OD1	2.23	0.68
1:A:118:TYR:O	1:A:118:TYR:CG	2.48	0.67
1:A:139:SER:O	1:A:140:PHE:HD1	1.79	0.66
1:A:224:THR:HG22	2:A:329:HOH:O	1.95	0.66
1:B:64:HIS:CD2	1:B:64:HIS:N	2.62	0.66
1:A:300:CYS:SG	1:A:300:CYS:O	2.54	0.66
1:A:55:GLU:O	1:A:59:ILE:HG12	1.96	0.66
1:A:224:THR:CG2	2:A:329:HOH:O	2.45	0.64
1:A:22:CYS:SG	1:A:61:LYS:CE	2.86	0.64
1:A:295:ASP:OD1	1:A:298:ARG:NH2	2.31	0.64
1:A:118:TYR:O	1:A:118:TYR:CD1	2.51	0.63
1:B:86:LEU:HG	1:B:179:GLY:HA2	1.80	0.63
1:A:139:SER:C	1:A:140:PHE:HD1	2.02	0.63
1:A:277:ASN:HD22	1:A:277:ASN:H	1.44	0.63
1:A:144:SER:O	1:A:147:SER:HB3	1.98	0.63
1:A:52:PRO:O	1:A:188:ARG:NH2	2.31	0.62
1:B:277:ASN:O	1:B:278:GLY:O	2.18	0.62
1:A:28:ASN:ND2	1:A:117:CYS:HB2	2.16	0.61
1:A:139:SER:HB2	1:B:4:ARG:CA	2.30	0.61
1:A:226:THR:HG21	1:A:229:ASP:OD1	2.00	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:ARG:NH1	1:B:138:GLY:N	2.49	0.60
1:B:186:VAL:H	1:B:192:GLN:HE22	1.48	0.60
1:A:286:ILE:HD13	2:A:322:HOH:O	2.01	0.60
1:B:286:ILE:N	1:B:286:ILE:HD13	2.17	0.60
1:A:299:GLN:HB3	1:B:141:LEU:CD1	2.32	0.59
1:A:102:LYS:HE3	1:A:156:CYS:SG	2.43	0.59
1:A:131:ARG:HH11	1:A:137:LYS:HZ2	1.49	0.59
1:B:175:THR:CG2	1:B:176:ASP:O	2.50	0.59
1:B:135:THR:C	1:B:136:ILE:HD12	2.24	0.58
1:A:152:ILE:CD1	1:A:157:VAL:HG22	2.31	0.58
1:A:86:LEU:HG	1:A:179:GLY:HA2	1.85	0.58
1:A:139:SER:O	1:A:140:PHE:CD1	2.56	0.58
1:B:22:CYS:SG	1:B:61:LYS:CE	2.92	0.58
1:A:277:ASN:HD22	1:A:277:ASN:N	1.97	0.57
1:B:43:ILE:HG22	1:B:61:LYS:HE2	1.86	0.57
1:A:226:THR:HG22	1:A:229:ASP:N	2.02	0.57
1:A:4:ARG:HH12	1:B:138:GLY:N	2.03	0.56
1:A:126:TYR:HH	1:A:140:PHE:HE1	1.54	0.56
1:B:8:PHE:HB3	1:B:152:ILE:HD12	1.86	0.56
1:A:4:ARG:HH12	1:B:137:LYS:C	2.08	0.56
1:A:191:ALA:O	1:A:192:GLN:O	2.24	0.55
1:B:22:CYS:SG	1:B:61:LYS:HE2	2.47	0.55
1:B:132:PRO:HD3	1:B:200:ILE:HD11	1.88	0.55
1:B:68:VAL:HG23	1:B:75:LEU:HB2	1.89	0.54
1:A:22:CYS:SG	1:A:61:LYS:HE3	2.47	0.54
1:B:286:ILE:HD13	1:B:286:ILE:H	1.72	0.54
1:B:22:CYS:SG	1:B:61:LYS:NZ	2.78	0.54
1:B:175:THR:HG22	1:B:176:ASP:O	2.08	0.54
1:B:78:ILE:O	1:B:78:ILE:HG22	2.07	0.54
1:A:135:THR:C	1:A:136:ILE:HD12	2.28	0.54
1:A:302:GLY:O	1:B:118:TYR:CZ	2.62	0.53
1:A:19:GLN:HB3	1:A:120:GLY:HA3	1.90	0.53
1:A:53:ASN:HD22	1:A:53:ASN:C	2.10	0.53
1:A:139:SER:CB	1:B:4:ARG:H	2.09	0.52
1:B:167:LEU:HD21	1:B:173:ALA:HB2	1.92	0.52
1:A:153:ASP:O	1:A:154:TYR:HB2	2.10	0.52
1:A:40:ARG:O	1:A:43:ILE:HG12	2.09	0.52
1:A:151:ASN:O	1:A:152:ILE:HD13	2.10	0.52
1:B:140:PHE:C	1:B:142:ASN:N	2.63	0.51
1:B:288:GLU:OE1	1:B:290:GLU:HB2	2.10	0.51
1:A:48:ASP:O	1:A:50:LEU:N	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:139:SER:HA	1:B:172:HIS:CE1	2.37	0.51
1:A:4:ARG:NH1	1:B:137:LYS:C	2.64	0.51
1:A:140:PHE:O	1:B:1:SER:OG	2.23	0.51
1:B:119:ASN:H	1:B:144:SER:CB	2.24	0.51
1:B:178:GLU:HG2	1:B:180:LYS:NZ	2.26	0.51
1:B:136:ILE:N	1:B:136:ILE:HD12	2.26	0.50
1:B:86:LEU:HG	1:B:179:GLY:CA	2.41	0.50
1:A:139:SER:CB	1:B:4:ARG:CB	2.81	0.50
1:A:131:ARG:NH2	1:A:289:ASP:OD1	2.45	0.50
1:B:277:ASN:O	1:B:278:GLY:C	2.49	0.50
1:A:277:ASN:N	1:A:277:ASN:ND2	2.60	0.50
1:A:3:PHE:CZ	1:A:288:GLU:HG2	2.47	0.49
1:A:131:ARG:HH21	1:A:200:ILE:HG13	1.77	0.49
1:A:51:ASN:HD22	1:A:188:ARG:HE	1.59	0.49
1:B:108:PRO:N	1:B:130:MET:HE3	2.27	0.49
1:A:226:THR:CG2	1:A:229:ASP:OD1	2.60	0.49
1:A:3:PHE:N	1:B:139:SER:HB3	2.28	0.48
1:A:28:ASN:CG	1:A:117:CYS:HB2	2.34	0.48
1:A:139:SER:OG	1:B:299:GLN:NE2	2.47	0.47
1:A:2:GLY:HA3	1:B:139:SER:CB	2.44	0.47
1:B:63:ASN:O	1:B:77:VAL:CG1	2.63	0.47
1:A:131:ARG:HH11	1:A:137:LYS:NZ	2.11	0.47
1:A:44:CYS:SG	1:A:54:TYR:CE2	3.07	0.47
1:A:142:ASN:HB2	2:A:338:HOH:O	2.14	0.47
1:A:140:PHE:HB2	1:A:172:HIS:CE1	2.50	0.47
1:A:43:ILE:HG22	1:A:61:LYS:HE3	1.96	0.47
1:B:255:ALA:C	1:B:256:GLN:O	2.49	0.47
1:A:28:ASN:OD1	1:A:117:CYS:HB3	2.15	0.46
1:B:175:THR:HG23	1:B:176:ASP:O	2.15	0.46
1:A:270:GLU:HG3	1:A:274:ASN:OD1	2.16	0.46
1:B:276:MET:CE	1:B:281:ILE:HG13	2.46	0.46
1:B:68:VAL:HG22	1:B:75:LEU:HB2	1.96	0.46
1:B:132:PRO:HD3	1:B:200:ILE:CD1	2.45	0.46
1:B:136:ILE:HG22	1:B:138:GLY:H	1.82	0.45
1:A:28:ASN:OD1	1:A:120:GLY:N	2.48	0.45
1:A:44:CYS:SG	1:A:54:TYR:HE2	2.40	0.45
1:B:251:GLY:O	1:B:254:SER:N	2.49	0.45
1:A:128:CYS:HA	1:A:290:GLU:OE1	2.17	0.45
1:B:253:LEU:HD21	1:B:296:VAL:HG12	1.99	0.45
1:B:63:ASN:HB3	1:B:77:VAL:O	2.17	0.45
1:A:51:ASN:ND2	1:A:188:ARG:HH21	2.14	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:131:ARG:NH1	1:A:137:LYS:HZ2	2.13	0.44
1:A:86:LEU:HG	1:A:179:GLY:CA	2.47	0.44
1:A:95:ASN:HB3	1:A:98:THR:OG1	2.17	0.44
1:B:131:ARG:HH22	1:B:289:ASP:CG	2.21	0.44
1:A:3:PHE:H	1:B:139:SER:HB3	1.81	0.44
1:B:19:GLN:O	1:B:68:VAL:HA	2.18	0.44
1:A:221:ASN:HB3	1:A:270:GLU:OE1	2.18	0.43
1:B:117:CYS:O	1:B:144:SER:HB3	2.17	0.43
1:B:127:GLN:HE21	1:B:127:GLN:HA	1.82	0.43
1:B:140:PHE:O	1:B:142:ASN:N	2.48	0.43
1:A:66:PHE:HB2	1:A:77:VAL:HG11	2.01	0.43
1:A:4:ARG:CG	1:A:4:ARG:HH11	2.31	0.43
1:A:148:VAL:HG21	1:A:159:PHE:CD1	2.54	0.43
1:B:21:THR:HA	1:B:25:THR:O	2.20	0.42
1:B:31:TRP:CZ2	1:B:75:LEU:HD21	2.55	0.42
1:B:211:ALA:HA	1:B:282:LEU:HD13	2.01	0.42
1:A:4:ARG:HG3	1:A:4:ARG:HH11	1.85	0.42
1:A:113:SER:O	1:A:149:GLY:HA2	2.20	0.41
1:A:177:LEU:HD13	1:A:177:LEU:HA	1.88	0.41
1:A:296:VAL:O	1:A:300:CYS:HB3	2.20	0.41
1:B:113:SER:O	1:B:149:GLY:HA2	2.20	0.41
1:B:186:VAL:N	1:B:192:GLN:HE22	2.17	0.41
1:A:2:GLY:HA3	1:B:139:SER:HB3	2.03	0.41
1:B:41:HIS:HE1	1:B:164:HIS:O	2.03	0.41
1:A:226:THR:CG2	1:A:228:ASN:HB3	2.51	0.41
1:B:167:LEU:O	1:B:169:THR:N	2.54	0.41
1:A:118:TYR:CD1	1:A:118:TYR:C	2.93	0.41
1:B:253:LEU:HD21	1:B:296:VAL:CG1	2.51	0.41
1:B:137:LYS:O	1:B:139:SER:N	2.54	0.41
1:A:139:SER:C	1:A:140:PHE:CD1	2.90	0.40
1:B:126:TYR:HH	1:B:140:PHE:HE1	1.64	0.40
1:B:232:LEU:O	1:B:232:LEU:HD12	2.20	0.40
1:A:187:ASP:C	1:A:188:ARG:CG	2.89	0.40
1:B:167:LEU:CD2	1:B:173:ALA:HB2	2.51	0.40
1:B:207:TRP:CE2	1:B:288:GLU:HB3	2.56	0.40
1:B:165:MET:HB3	1:B:165:MET:HE3	1.96	0.40
1:A:60:ARG:HH11	1:A:60:ARG:HD3	1.77	0.40
1:B:40:ARG:NE	1:B:187:ASP:OD1	2.38	0.40
1:A:167:LEU:HB3	1:A:168:PRO:HD2	2.04	0.40
1:A:3:PHE:CE2	1:A:288:GLU:HG2	2.57	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	300/306 (98%)	271 (90%)	19 (6%)	10 (3%)	4	2
1	B	300/306 (98%)	275 (92%)	19 (6%)	6 (2%)	7	4
All	All	600/612 (98%)	546 (91%)	38 (6%)	16 (3%)	5	2

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	192	GLN
1	A	300	CYS
1	A	49	MET
1	A	141	LEU
1	A	197	ASP
1	A	224	THR
1	B	278	GLY
1	A	3	PHE
1	A	154	TYR
1	B	187	ASP
1	B	257	THR
1	B	46	ALA
1	A	4	ARG
1	A	118	TYR
1	B	154	TYR
1	B	168	PRO

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	259/263 (98%)	232 (90%)	27 (10%)	7	6
1	B	259/263 (98%)	227 (88%)	32 (12%)	4	4
All	All	518/526 (98%)	459 (89%)	59 (11%)	5	5

All (59) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ARG
1	A	5	LYS
1	A	22	CYS
1	A	27	LEU
1	A	30	LEU
1	A	45	THR
1	A	48	ASP
1	A	49	MET
1	A	53	ASN
1	A	56	ASP
1	A	64	HIS
1	A	77	VAL
1	A	118	TYR
1	A	121	SER
1	A	130	MET
1	A	131	ARG
1	A	153	ASP
1	A	167	LEU
1	A	226	THR
1	A	227	LEU
1	A	228	ASN
1	A	256	GLN
1	A	268	LEU
1	A	285	THR
1	A	286	ILE
1	A	298	ARG
1	A	300	CYS
1	B	3	PHE
1	B	22	CYS
1	B	27	LEU
1	B	30	LEU
1	B	64	HIS
1	B	65	SER
1	B	68	VAL
1	B	76	ARG

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Mol	Chain	Res	Type
1	B	77	VAL
1	B	87	LEU
1	B	92	ASP
1	B	131	ARG
1	B	139	SER
1	B	165	MET
1	B	167	LEU
1	B	175	THR
1	B	178	GLU
1	B	187	ASP
1	B	188	ARG
1	B	200	ILE
1	B	216	ASP
1	B	217	ARG
1	B	238	ASN
1	B	254	SER
1	B	268	LEU
1	B	274	ASN
1	B	279	ARG
1	B	282	LEU
1	B	286	ILE
1	B	287	LEU
1	B	293	PRO
1	B	301	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	51	ASN
1	A	53	ASN
1	A	69	GLN
1	A	134	HIS
1	A	163	HIS
1	A	172	HIS
1	A	192	GLN
1	A	246	HIS
1	A	277	ASN
1	A	299	GLN
1	B	41	HIS
1	B	64	HIS
1	B	69	GLN
1	B	119	ASN

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Mol	Chain	Res	Type
1	B	127	GLN
1	B	134	HIS
1	B	163	HIS
1	B	172	HIS
1	B	192	GLN
1	B	299	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no carbohydrates in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	302/306 (98%)	0.41	32 (10%)	6	5	12, 28, 65, 90	0
1	B	302/306 (98%)	0.48	28 (9%)	8	7	15, 32, 67, 91	0
All	All	604/612 (98%)	0.44	60 (9%)	7	6	12, 31, 67, 91	0

All (60) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	141	LEU	7.3
1	A	50	LEU	7.1
1	A	301	SER	6.3
1	A	45	THR	5.8
1	B	302	GLY	5.8
1	A	222	ARG	5.7
1	A	46	ALA	5.5
1	B	141	LEU	5.3
1	B	76	ARG	4.6
1	A	47	GLU	4.6
1	B	119	ASN	4.6
1	A	140	PHE	4.4
1	A	142	ASN	4.3
1	B	1	SER	4.3
1	A	223	PHE	4.3
1	B	142	ASN	4.2
1	B	301	SER	3.9
1	A	302	GLY	3.9
1	B	300	CYS	3.7
1	B	277	ASN	3.6
1	A	154	TYR	3.6
1	A	118	TYR	3.5
1	A	2	GLY	3.5
1	A	49	MET	3.5

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Mol	Chain	Res	Type	RSRZ
1	A	168	PRO	3.3
1	A	3	PHE	3.3
1	A	119	ASN	3.3
1	B	62	SER	3.2
1	B	140	PHE	3.2
1	B	72	ASN	3.2
1	B	46	ALA	3.2
1	B	64	HIS	3.1
1	B	45	THR	3.1
1	A	278	GLY	3.1
1	B	255	ALA	3.1
1	B	138	GLY	3.0
1	B	118	TYR	3.0
1	A	1	SER	2.9
1	B	139	SER	2.9
1	A	146	GLY	2.8
1	B	78	ILE	2.7
1	A	59	ILE	2.6
1	A	191	ALA	2.5
1	A	145	CYS	2.5
1	A	23	GLY	2.4
1	B	155	ASP	2.4
1	A	64	HIS	2.4
1	B	77	VAL	2.4
1	A	120	GLY	2.3
1	B	2	GLY	2.3
1	B	66	PHE	2.3
1	B	143	GLY	2.2
1	A	60	ARG	2.2
1	A	300	CYS	2.1
1	A	48	ASP	2.1
1	B	50	LEU	2.1
1	B	47	GLU	2.1
1	A	190	THR	2.1
1	A	277	ASN	2.1
1	B	3	PHE	2.1

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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.