Full wwPDB X-ray Structure Validation Report ⓘ

Mar 18, 2024 – 11:47 AM JST

PDB ID	:	5YIM
Title	:	Structure of a Legionella effector
Authors	:	Feng, Y.; Dong, Y.; Wang, W.
Deposited on	:	2017-10-05
Resolution	:	3.39 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 ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

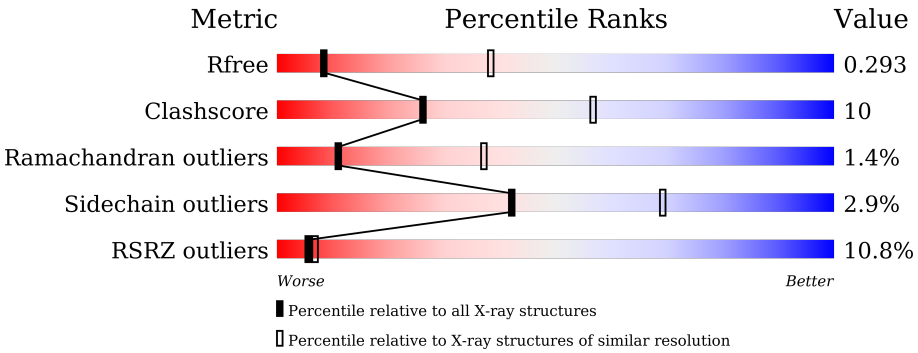
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 3.39 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	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RSRZ outliers	127900	2173 (3.50-3.30)

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

Mol	Chain	Length	Quality of chain
1	A	960	7% 74% 22%
1	C	960	14% 67% 26% 7%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 14128 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 SdeA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	933	Total	C	N	O	S	0	0	0
			7297	4572	1283	1414	28			
1	C	896	Total	C	N	O	S	0	0	0
			6831	4275	1204	1325	27			

There are 2 discrepancies between the modelled and reference sequences:

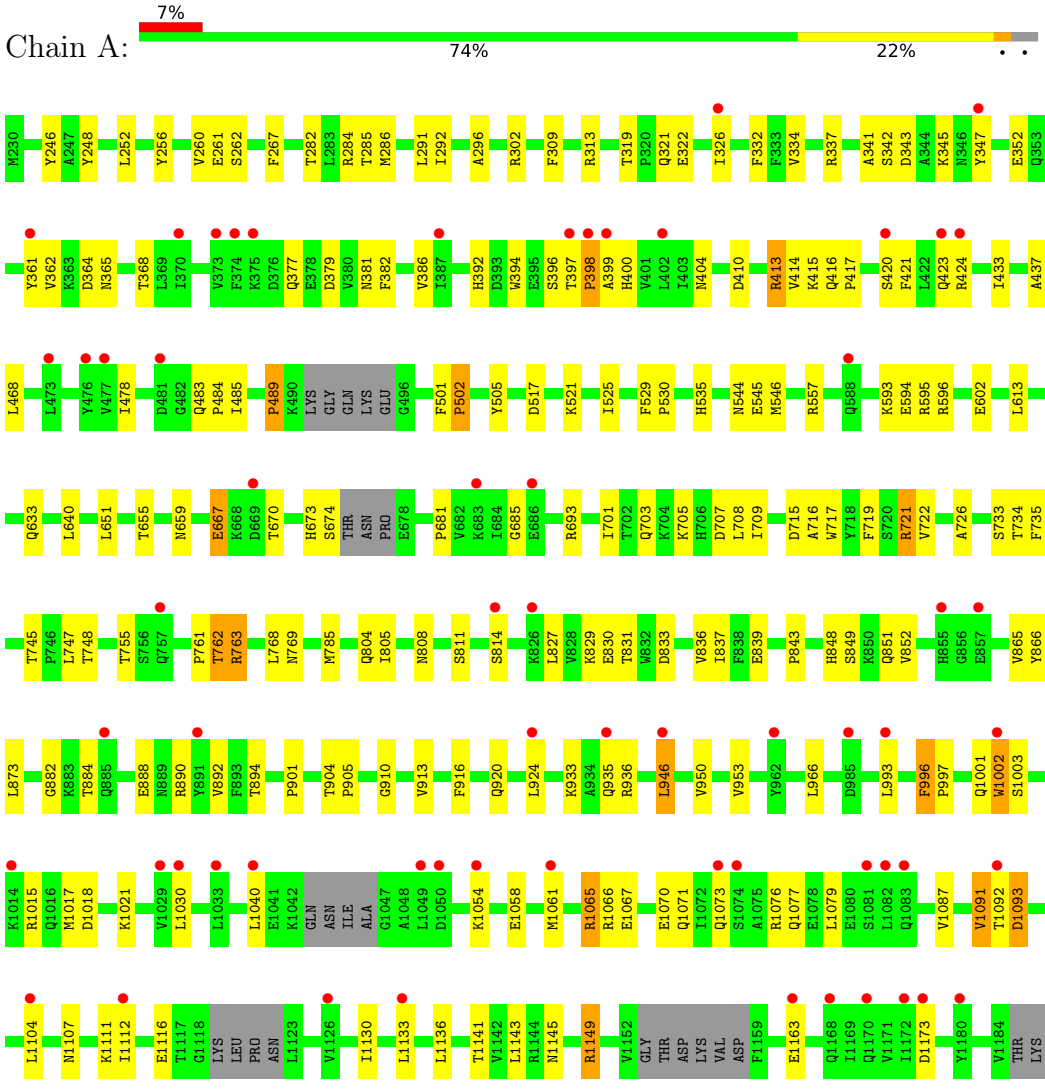
Chain	Residue	Modelled	Actual	Comment	Reference
A	230	MET	-	expression tag	UNP Q6RCR0
C	230	MET	-	expression tag	UNP Q6RCR0

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.

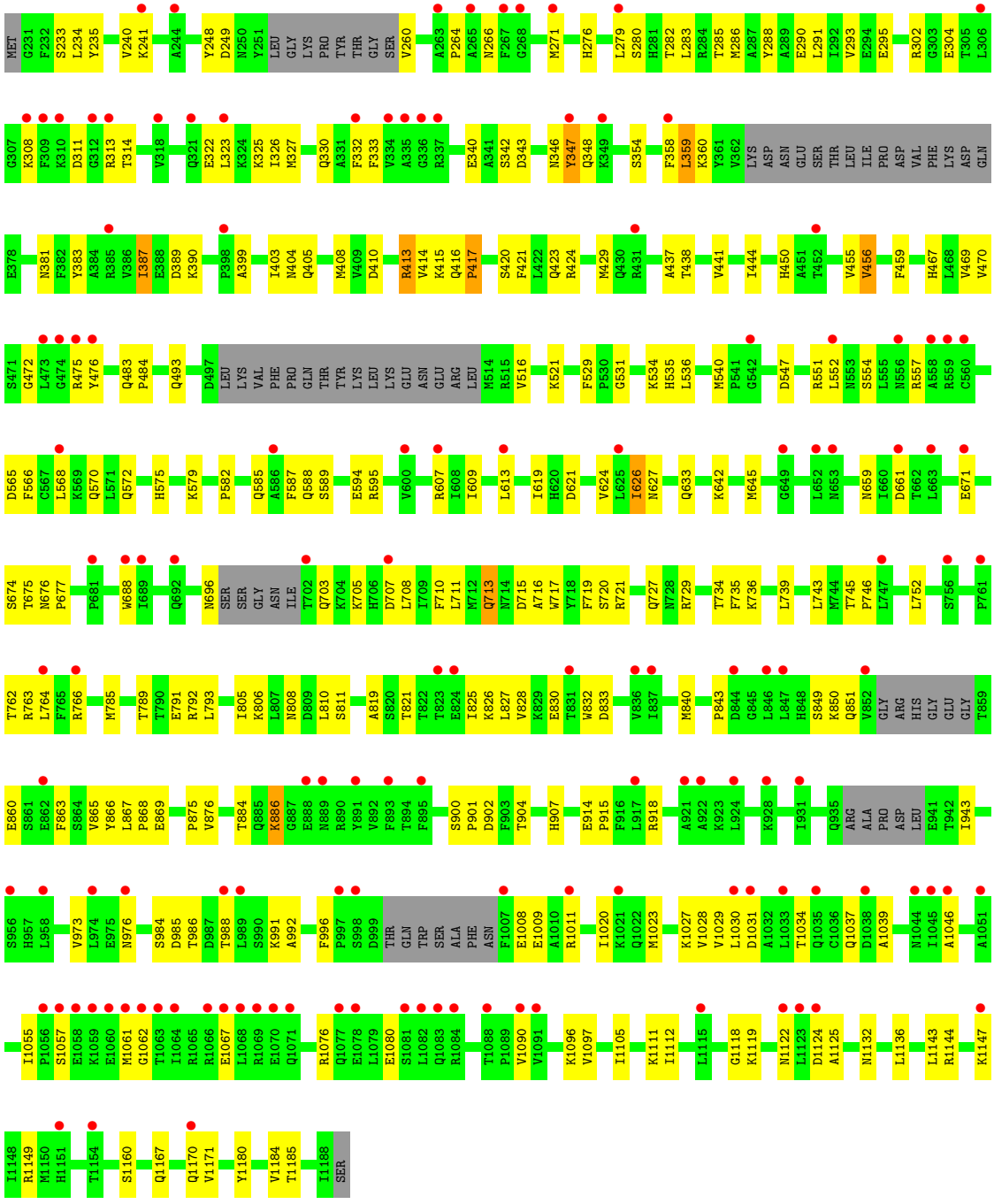
• Molecule 1: SdeA

Chain A:



• Molecule 1: SdeA

Chain C:


MET G231 F232 S233 L234 Y235 V240 K241 A244 Y248 D249 N250 Y251 LEU GLY LYS PRO TYR THR GLY SER V260 A263 P264 A265 N266 F267 G268 M271 H276 L279 S280 H281 T282 L283 R284 T285 M286 A287 Y288 A289 E290 L291 I292 V293 E294 E295 R302 G303 E304 T305 L306
G307 K308 F309 K310 D311 G312 R313 T314 V318 Q321 E322 L323 K324 K325 I326 M327 Q330 A331 F332 F333 V334 A335 G336 R337 E340 A341 S342 D343 N346 Y347 Q348 K349 S354 F358 L359 K360 Y361 V362 LYS ASP ASN GLU SER THR LEU ILE PRO ASP VAL PHE LYS ASP GLN
E378 N381 F382 Y383 A384 R385 V386 I387 E388 D389 K390 P398 A399 I403 N404 Q405 M408 V409 D410 R413 V414 K415 Q416 P417 S420 F421 L422 Q423 R424 M429 Q430 R431 A437 T438 V441 I444 H450 A451 T452 V455 V456 F459 H467 L468 V469 V470
S471 G472 L473 G474 R475 Y476 Q483 P484 Q493 D497 LEU LYS VAL PHE PRO GLN THR TYR LYS LEU LYS GLU ASN GLU ARG LEU M514 R515 V516 K521 F529 P530 G531 K534 H535 L536 M540 P541 G542 D547 R551 L552 N553 S554 L555 N556 R557 A558 R559 C560
D565 F566 C567 L568 K569 Q570 L571 Q572 H575 K579 P582 Q585 A586 F587 Q588 S589 E594 R595 V600 R607 I608 I609 L613 I619 H620 D621 V624 L625 I626 N627 Q633 K642 M645 G649 L652 N653 N659 L660 D661 T662 L663 E671
S674 T675 N676 P677 P681 W688 I689 Q692 N696 SER SER GLY ASN ILE T702 Q703 K704 K705 H706 D707 L708 I709 F710 L711 W712 Q713 N714 D715 A716 W717 Y718 F719 S720 R721 Q727 N728 R729 T734 F735 K736 L739 L743 W744 T745 P746 L747 L752 S756 P761
T762 R763 L764 F765 R766 M785 T789 T790 E791 R792 L793 I805 K806 L807 N808 D809 L810 S811 A819 S820 T821 T822 T823 E824 I825 K826 L827 V828 K829 E830 T831 W832 D833 V836 I837 M840 P843 D844 G845 L846 L847 H848 S849 K850 Q851 V852 GLY ARG HIS GLY GLU GLY T859
E860 S861 E862 F863 S864 V865 Y866 L867 P868 E869 P875 V876 T884 Q885 K886 G887 E888 N889 R890 Y891 V892 F893 T894 F895 S900 P901 D902 F903 T904 H907 E914 P915 F916 L917 R918 A921 A922 K923 L924 K928 I931 Q935 ARG ALA PRO ASP LEU E941 T942 I943
S956 H957 L958 V973 L974 E975 N976 S984 D985 T986 D987 T988 L989 S990 K991 A992 F996 P997 S998 D999 THR GLN TRP SER ALA PHE ASN F1007 E1008 E1009 A1010 R1011 I1020 K1021 Q1022 M1023 K1027 V1028 V1029 L1030 D1031 A1032 L1033 T1034 Q1035 C1036 Q1037 D1038 A1039 N1044 I1045 A1046 A1051
I1055 P1056 S1057 E1058 K1059 E1060 M1061 G1062 T1063 I1064 R1065 R1066 E1067 L1068 R1069 E1070 Q1071 R1076 Q1077 E1078 L1079 E1080 S1081 L1082 Q1083 R1084 T1088 P1089 V1090 V1091 K1096 V1097 I1105 K1111 I1112 L1115 G1118 K1119 N1122 L1123 D1124 A1125 N1132 L1136 L1143 R1144 K1147
I1148 R1149 M1150 H1151 T1154 S1160 Q1167 Q1170 V1171 Y1180 V1184 T1185 I1188 SER

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	139.65Å 295.43Å 194.61Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.39 105.92 – 3.39	Depositor EDS
% Data completeness (in resolution range)	99.1 (50.00-3.39) 99.5 (105.92-3.39)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.66 (at 3.41Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.251 , 0.287 0.260 , 0.293	Depositor DCC
R_{free} test set	2818 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å^2)	125.3	Xtriage
Anisotropy	0.202	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 111.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	14128	wwPDB-VP
Average B, all atoms (Å^2)	132.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.85% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

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	0.28	0/7419	0.50	4/10012 (0.0%)
1	C	0.26	0/6936	0.49	0/9381
All	All	0.27	0/14355	0.49	4/19393 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	489	PRO	N-CA-CB	6.19	110.73	103.30
1	A	484	PRO	N-CA-CB	6.16	110.69	103.30
1	A	502	PRO	N-CA-CB	5.87	110.34	103.30
1	A	867	LEU	CA-CB-CG	5.09	127.01	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	7297	0	7103	134	0
1	C	6831	0	6555	158	0
All	All	14128	0	13658	290	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 10.

All (290) 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:755:THR:HG21	1:A:851:GLN:HE21	1.33	0.93
1:A:1130:ILE:HA	1:A:1133:LEU:HD12	1.63	0.81
1:C:826:LYS:H	1:C:828:VAL:HG23	1.46	0.79
1:C:424:ARG:HB2	1:C:470:VAL:HG11	1.65	0.79
1:A:910:GLY:HA2	1:A:913:VAL:HG12	1.63	0.78
1:A:1091:VAL:HG12	1:A:1092:THR:H	1.51	0.76
1:C:674:SER:O	1:C:721:ARG:NH2	2.18	0.74
1:C:626:ILE:HG23	1:C:627:ASN:H	1.54	0.73
1:A:829:LYS:HG2	1:A:830:GLU:HG3	1.71	0.73
1:C:727:GLN:OE1	1:C:729:ARG:NH1	2.22	0.72
1:C:266:ASN:HB3	1:C:271:MET:HA	1.71	0.72
1:C:313:ARG:NH1	1:C:322:GLU:OE1	2.22	0.71
1:C:766:ARG:NH2	1:C:840:MET:SD	2.62	0.71
1:A:423:GLN:HE22	1:A:525:ILE:HD12	1.55	0.71
1:C:806:LYS:NZ	1:C:902:ASP:O	2.22	0.70
1:C:943:ILE:HG12	1:C:1020:ILE:HG12	1.72	0.70
1:A:837:ILE:HB	1:A:892:VAL:HG12	1.73	0.70
1:C:785:MET:HE3	1:C:805:ILE:HG23	1.73	0.70
1:A:827:LEU:HB2	1:A:831:THR:HG22	1.73	0.69
1:A:377:GLN:O	1:A:381:ASN:ND2	2.20	0.69
1:A:768:LEU:HB2	1:A:836:VAL:HG23	1.75	0.69
1:A:546:MET:HG3	1:C:455:VAL:HG11	1.76	0.68
1:C:716:ALA:HA	1:C:719:PHE:CE2	2.29	0.68
1:A:248:TYR:HA	1:A:252:LEU:HB2	1.77	0.67
1:C:413:ARG:HG2	1:C:414:VAL:HG13	1.74	0.67
1:C:346:ASN:O	1:C:348:GLN:N	2.29	0.66
1:C:613:LEU:O	1:C:659:ASN:ND2	2.29	0.66
1:C:676:ASN:OD1	1:C:720:SER:OG	2.14	0.66
1:C:1112:ILE:HG12	1:C:1136:LEU:HD13	1.78	0.65
1:A:413:ARG:HD3	1:A:414:VAL:HG13	1.79	0.64
1:A:485:ILE:HA	1:A:501:PHE:H	1.62	0.63
1:C:417:PRO:HD2	1:C:421:PHE:HE2	1.63	0.63
1:C:914:GLU:OE2	1:C:918:ARG:NH2	2.32	0.63
1:A:1093:ASP:HB3	1:A:1096:LYS:HB3	1.81	0.63
1:C:985:ASP:O	1:C:986:THR:OG1	2.17	0.62
1:C:833:ASP:OD1	1:C:884:THR:OG1	2.17	0.62
1:A:904:THR:O	1:A:1149:ARG:NH1	2.32	0.61
1:A:849:SER:HB3	1:A:865:VAL:HG22	1.83	0.60
1:C:901:PRO:O	1:C:1149:ARG:NH2	2.34	0.60
1:A:1011:ARG:HH21	1:A:1015:ARG:HH22	1.47	0.60
1:A:721:ARG:NH1	1:A:733:SER:HB3	2.17	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:364:ASP:OD1	1:A:365:ASN:N	2.35	0.60
1:A:827:LEU:HD22	1:A:831:THR:HA	1.82	0.60
1:C:976:ASN:HB2	1:C:991:LYS:HD2	1.83	0.60
1:A:1058:GLU:OE2	1:A:1071:GLN:NE2	2.35	0.59
1:C:661:ASP:HA	1:C:688:TRP:HZ3	1.66	0.59
1:C:1119:LYS:HB3	1:C:1125:ALA:HB1	1.83	0.59
1:C:291:LEU:HD11	1:C:444:ILE:HD12	1.84	0.59
1:C:671:GLU:HG2	1:C:734:THR:HG21	1.84	0.58
1:C:404:ASN:OD1	1:C:405:GLN:N	2.36	0.58
1:C:469:VAL:HG23	1:C:475:ARG:HA	1.86	0.58
1:A:1040:LEU:HD21	1:A:1077:GLN:HE22	1.68	0.58
1:C:308:LYS:HG2	1:C:314:THR:HB	1.86	0.58
1:A:1141:THR:O	1:A:1145:ASN:ND2	2.36	0.57
1:C:420:SER:HB3	1:C:467:HIS:CD2	2.41	0.56
1:A:613:LEU:HD21	1:A:747:LEU:HD11	1.87	0.56
1:A:1001:GLN:O	1:A:1003:SER:N	2.35	0.56
1:C:589:SER:HB2	1:C:900:SER:HA	1.86	0.56
1:A:670:THR:HB	1:A:681:PRO:HB2	1.89	0.55
1:C:607:ARG:NH1	1:C:1076:ARG:O	2.37	0.55
1:A:769:ASN:ND2	1:A:833:ASP:O	2.32	0.55
1:A:716:ALA:HA	1:A:719:PHE:CE2	2.41	0.55
1:A:309:PHE:CZ	1:A:397:THR:HA	2.42	0.55
1:C:582:PRO:HA	1:C:585:GLN:HE21	1.70	0.55
1:C:283:LEU:HD22	1:C:568:LEU:HD21	1.89	0.55
1:C:483:GLN:N	1:C:483:GLN:OE1	2.35	0.55
1:C:293:VAL:HG21	1:C:323:LEU:HD12	1.89	0.54
1:A:415:LYS:HD3	1:A:421:PHE:CE1	2.43	0.54
1:C:1031:ASP:O	1:C:1034:THR:OG1	2.21	0.54
1:C:675:THR:HB	1:C:717:TRP:HA	1.90	0.54
1:A:1104:LEU:HB3	1:A:1143:LEU:HD21	1.89	0.54
1:A:1054:LYS:NZ	1:A:1073:GLN:HG2	2.23	0.54
1:C:884:THR:HG23	1:C:886:LYS:H	1.73	0.54
1:A:593:LYS:O	1:A:593:LYS:NZ	2.32	0.54
1:A:1002:TRP:HH2	1:A:1017:MET:HG2	1.73	0.54
1:C:992:ALA:HB2	1:C:1028:VAL:HG11	1.89	0.54
1:A:313:ARG:HH22	1:A:398:PRO:HG3	1.74	0.53
1:A:1076:ARG:HA	1:A:1079:LEU:HD12	1.90	0.53
1:C:399:ALA:O	1:C:403:ILE:HG22	2.08	0.53
1:C:1144:ARG:NH2	1:C:1167:GLN:OE1	2.41	0.53
1:A:993:LEU:HA	1:A:996:PHE:HD2	1.73	0.53
1:A:1112:ILE:HG12	1:A:1136:LEU:HD13	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:ARG:HH12	1:A:437:ALA:HB2	1.75	0.52
1:C:414:VAL:HG23	1:C:415:LYS:HE2	1.91	0.52
1:C:417:PRO:HD2	1:C:421:PHE:CE2	2.43	0.52
1:C:675:THR:OG1	1:C:677:PRO:HD2	2.08	0.52
1:C:1029:VAL:HG22	1:C:1057:SER:HB2	1.91	0.52
1:C:830:GLU:HG3	1:C:832:TRP:HD1	1.73	0.52
1:A:703:GLN:NE2	1:A:707:ASP:OD1	2.43	0.52
1:A:1107:ASN:HD21	1:A:1111:LYS:HE2	1.74	0.52
1:A:342:SER:OG	1:A:343:ASP:N	2.43	0.52
1:A:924:LEU:HG	1:A:1073:GLN:OE1	2.10	0.51
1:C:1105:ILE:HA	1:C:1143:LEU:HD21	1.92	0.51
1:A:640:LEU:HD13	1:A:726:ALA:HA	1.92	0.51
1:C:764:LEU:HG	1:C:821:THR:HB	1.91	0.51
1:C:240:VAL:HG11	1:C:327:MET:HE2	1.92	0.51
1:A:655:THR:O	1:A:659:ASN:ND2	2.43	0.51
1:C:330:GLN:HG3	1:C:403:ILE:HD13	1.92	0.51
1:A:309:PHE:CE1	1:A:397:THR:HA	2.46	0.51
1:A:839:GLU:HB3	1:A:894:THR:HG22	1.93	0.51
1:C:342:SER:OG	1:C:343:ASP:N	2.43	0.51
1:A:352:GLU:HB3	1:A:355:ARG:HH21	1.75	0.51
1:C:241:LYS:HE3	1:C:565:ASP:HB3	1.93	0.51
1:C:358:PHE:O	1:C:360:LYS:N	2.43	0.51
1:A:267:PHE:CE2	1:A:557:ARG:HG2	2.46	0.50
1:A:358:PHE:O	1:A:362:VAL:HG23	2.11	0.50
1:A:394:TRP:HE1	1:A:404:ASN:HD22	1.60	0.50
1:C:762:THR:HG22	1:C:843:PRO:HA	1.93	0.50
1:A:291:LEU:HD11	1:A:444:ILE:HD12	1.93	0.50
1:C:661:ASP:HA	1:C:688:TRP:CZ3	2.43	0.50
1:C:260:VAL:HG12	1:C:340:GLU:H	1.77	0.50
1:A:708:LEU:HG	1:A:748:THR:HG22	1.94	0.50
1:C:588:GLN:HG3	1:C:1096:LYS:HE2	1.94	0.50
1:A:673:HIS:CG	1:A:674:SER:H	2.30	0.49
1:C:381:ASN:HB2	1:C:383:TYR:CE2	2.47	0.49
1:A:424:ARG:NH1	1:A:468:LEU:O	2.45	0.49
1:A:667:GLU:O	1:A:685:GLY:HA3	2.12	0.49
1:C:302:ARG:NH1	1:C:304:GLU:OE1	2.45	0.49
1:A:256:TYR:HD2	1:A:262:SER:HB2	1.77	0.49
1:A:260:VAL:O	1:A:262:SER:N	2.45	0.49
1:C:607:ARG:NH1	1:C:1080:GLU:HB2	2.28	0.49
1:C:984:SER:OG	1:C:985:ASP:N	2.45	0.49
1:A:382:PHE:O	1:A:386:VAL:HG23	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:596:ARG:NH2	1:A:602:GLU:OE1	2.44	0.49
1:A:884:THR:HG22	1:A:888:GLU:O	2.13	0.49
1:C:282:THR:O	1:C:286:MET:HG3	2.13	0.49
1:C:459:PHE:HB3	1:C:536:LEU:CB	2.43	0.49
1:C:707:ASP:OD1	1:C:708:LEU:N	2.45	0.49
1:C:710:PHE:HA	1:C:713:GLN:HB2	1.95	0.49
1:A:595:ARG:NH1	1:A:866:TYR:O	2.46	0.49
1:A:709:ILE:HG22	1:A:852:VAL:HG13	1.94	0.49
1:A:935:GLN:HE22	1:A:1030:LEU:HD22	1.77	0.49
1:C:1008:GLU:HG3	1:C:1011:ARG:HG3	1.95	0.48
1:A:1054:LYS:HZ3	1:A:1073:GLN:HG2	1.78	0.48
1:C:785:MET:HG2	1:C:805:ILE:HA	1.95	0.48
1:A:478:ILE:HA	1:A:483:GLN:HA	1.94	0.48
1:C:264:PRO:HB2	1:C:271:MET:HB3	1.95	0.48
1:C:291:LEU:HD21	1:C:444:ILE:HB	1.96	0.48
1:C:389:ASP:OD1	1:C:390:LYS:N	2.42	0.48
1:C:645:MET:SD	1:C:746:PRO:HG3	2.54	0.48
1:A:282:THR:O	1:A:285:THR:OG1	2.24	0.48
1:A:705:LYS:O	1:A:709:ILE:HG13	2.13	0.48
1:A:721:ARG:CZ	1:A:733:SER:HB3	2.43	0.48
1:C:438:THR:O	1:C:441:VAL:HG12	2.14	0.48
1:C:444:ILE:HG12	1:C:791:GLU:HG3	1.96	0.48
1:C:595:ARG:NH1	1:C:866:TYR:O	2.45	0.48
1:C:849:SER:HB3	1:C:865:VAL:HB	1.96	0.48
1:A:322:GLU:O	1:A:326:ILE:HG12	2.13	0.47
1:A:593:LYS:HE2	1:A:596:ARG:HA	1.96	0.47
1:A:345:LYS:HA	1:A:347:TYR:CD2	2.48	0.47
1:C:429:MET:SD	1:C:441:VAL:HG11	2.53	0.47
1:C:415:LYS:HB3	1:C:421:PHE:CD2	2.50	0.47
1:A:596:ARG:HG3	1:A:1087:VAL:HG11	1.95	0.47
1:C:633:GLN:HB3	1:C:735:PHE:HD1	1.80	0.47
1:C:1167:GLN:O	1:C:1171:VAL:HG23	2.15	0.47
1:C:808:ASN:O	1:C:810:LEU:N	2.48	0.47
1:A:365:ASN:HB3	1:A:368:THR:HG22	1.96	0.47
1:C:1119:LYS:HD3	1:C:1125:ALA:HB1	1.97	0.46
1:A:319:THR:HG22	1:A:321:GLN:H	1.79	0.46
1:A:920:GLN:HB3	1:A:1073:GLN:NE2	2.29	0.46
1:C:1039:ALA:O	1:C:1046:ALA:HB2	2.15	0.46
1:A:332:PHE:O	1:A:354:SER:HB2	2.16	0.46
1:C:621:ASP:OD1	1:C:621:ASP:N	2.48	0.46
1:A:417:PRO:HD2	1:A:421:PHE:CE2	2.51	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1065:ARG:HG2	1:A:1066:ARG:N	2.31	0.46
1:A:246:TYR:CE2	1:A:361:TYR:HB2	2.51	0.46
1:C:708:LEU:O	1:C:711:LEU:HB3	2.16	0.46
1:C:973:VAL:HA	1:C:976:ASN:HD21	1.81	0.46
1:A:394:TRP:C	1:A:396:SER:H	2.20	0.45
1:C:869:GLU:HG3	1:C:904:THR:HG22	1.98	0.45
1:C:429:MET:HG2	1:C:438:THR:HG22	1.99	0.45
1:C:675:THR:HA	1:C:721:ARG:HG2	1.99	0.45
1:C:752:LEU:HA	1:C:850:LYS:HG3	1.98	0.45
1:C:469:VAL:HG22	1:C:476:TYR:CE2	2.51	0.45
1:C:1030:LEU:O	1:C:1034:THR:HG23	2.16	0.45
1:A:396:SER:HB3	1:A:400:HIS:CG	2.51	0.45
1:A:1067:GLU:O	1:A:1070:GLU:HG3	2.16	0.45
1:A:633:GLN:HB2	1:A:735:PHE:HD1	1.81	0.45
1:A:901:PRO:HG3	1:A:1091:VAL:HG23	1.97	0.45
1:C:288:TYR:HE2	1:C:410:ASP:HB2	1.82	0.45
1:C:642:LYS:HD2	1:C:907:HIS:CG	2.52	0.45
1:C:867:LEU:HD12	1:C:868:PRO:HD2	1.99	0.45
1:A:1011:ARG:HE	1:A:1015:ARG:NH2	2.14	0.45
1:A:377:GLN:HG2	1:A:381:ASN:HD21	1.81	0.45
1:A:785:MET:HG2	1:A:805:ILE:HA	1.98	0.45
1:C:743:LEU:O	1:C:746:PRO:HD2	2.17	0.45
1:A:804:GLN:O	1:A:808:ASN:ND2	2.42	0.45
1:A:361:TYR:O	1:A:361:TYR:CG	2.70	0.44
1:A:722:VAL:HG22	1:A:741:THR:HG22	1.98	0.44
1:C:624:VAL:HG23	1:C:735:PHE:HZ	1.81	0.44
1:C:248:TYR:CD1	1:C:279:LEU:HD23	2.51	0.44
1:C:785:MET:HE1	1:C:875:PRO:HD2	1.98	0.44
1:A:953:VAL:HG21	1:A:966:LEU:HD12	2.00	0.44
1:C:851:GLN:HB3	1:C:863:PHE:CE2	2.52	0.44
1:C:333:PHE:HE1	1:C:389:ASP:HB2	1.83	0.44
1:A:623:HIS:CD2	1:A:630:LYS:HG3	2.53	0.44
1:C:467:HIS:HB2	1:C:516:VAL:HA	2.00	0.44
1:C:529:PHE:CE2	1:C:531:GLY:HA3	2.52	0.44
1:C:575:HIS:ND1	1:C:579:LYS:HE3	2.33	0.44
1:C:381:ASN:HB2	1:C:383:TYR:CD2	2.53	0.44
1:C:1020:ILE:HD12	1:C:1020:ILE:HA	1.80	0.44
1:C:1027:LYS:O	1:C:1030:LEU:HG	2.17	0.44
1:C:810:LEU:O	1:C:811:SER:OG	2.35	0.44
1:C:459:PHE:HB3	1:C:536:LEU:HB2	2.00	0.44
1:C:988:THR:HG21	1:C:1031:ASP:OD2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:619:ILE:O	1:C:619:ILE:HG13	2.15	0.43
1:A:386:VAL:HG11	1:A:399:ALA:HB1	1.99	0.43
1:C:1180:TYR:O	1:C:1184:VAL:HG23	2.19	0.43
1:A:673:HIS:CG	1:A:674:SER:N	2.87	0.43
1:C:521:LYS:HB3	1:C:521:LYS:HE2	1.74	0.43
1:A:924:LEU:HG	1:A:1073:GLN:CD	2.39	0.43
1:C:582:PRO:HB2	1:C:789:THR:HG23	1.99	0.43
1:C:943:ILE:HD11	1:C:1023:MET:HE1	2.01	0.43
1:A:284:ARG:NH1	1:A:410:ASP:OD2	2.52	0.43
1:A:869:GLU:HB2	1:A:905:PRO:HD3	2.00	0.43
1:C:264:PRO:HG2	1:C:271:MET:SD	2.58	0.43
1:C:327:MET:HB3	1:C:327:MET:HE3	1.64	0.43
1:A:933:LYS:HA	1:A:933:LYS:HD3	1.76	0.43
1:C:266:ASN:OD1	1:C:554:SER:OG	2.35	0.43
1:C:470:VAL:O	1:C:472:GLY:N	2.52	0.43
1:C:914:GLU:HB3	1:C:915:PRO:HD3	2.01	0.43
1:A:544:ASN:ND2	1:C:416:GLN:O	2.50	0.43
1:A:882:GLY:O	1:A:890:ARG:HG2	2.18	0.43
1:A:1054:LYS:HZ2	1:A:1077:GLN:HG3	1.83	0.43
1:C:235:TYR:HB2	1:C:572:GLN:HG3	2.01	0.43
1:A:651:LEU:HD23	1:A:651:LEU:HA	1.85	0.42
1:A:1011:ARG:HE	1:A:1015:ARG:HH22	1.66	0.42
1:C:766:ARG:HE	1:C:819:ALA:HB1	1.84	0.42
1:C:404:ASN:OD1	1:C:405:GLN:HG2	2.19	0.42
1:A:296:ALA:HA	1:A:433:ILE:HG23	2.00	0.42
1:A:624:VAL:HG23	1:A:735:PHE:HZ	1.84	0.42
1:A:420:SER:HB3	1:A:467:HIS:CE1	2.54	0.42
1:A:1018:ASP:O	1:A:1021:LYS:HB2	2.19	0.42
1:C:703:GLN:HG2	1:C:705:LYS:HG3	2.01	0.42
1:C:322:GLU:O	1:C:326:ILE:HG13	2.20	0.42
1:C:405:GLN:HA	1:C:408:MET:HG2	2.02	0.42
1:C:282:THR:O	1:C:285:THR:OG1	2.25	0.42
1:C:534:LYS:O	1:C:536:LEU:N	2.51	0.42
1:C:785:MET:CE	1:C:875:PRO:HD2	2.49	0.42
1:A:416:GLN:HB2	1:A:417:PRO:HD3	2.01	0.42
1:C:233:SER:OG	1:C:234:LEU:N	2.53	0.42
1:C:547:ASP:O	1:C:551:ARG:N	2.52	0.42
1:C:566:PHE:O	1:C:570:GLN:HG2	2.20	0.42
1:C:1124:ASP:OD1	1:C:1124:ASP:N	2.39	0.42
1:A:737:GLU:O	1:A:741:THR:HG23	2.19	0.42
1:A:762:THR:HG23	1:A:843:PRO:HA	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1101:TYR:OH	1:A:1163:GLU:OE2	2.21	0.42
1:C:325:LYS:HE3	1:C:387:ILE:HD13	2.02	0.42
1:A:256:TYR:CD2	1:A:262:SER:HB2	2.53	0.42
1:C:279:LEU:HD12	1:C:280:SER:N	2.34	0.42
1:C:311:ASP:OD1	1:C:311:ASP:N	2.47	0.42
1:C:1061:MET:HB3	1:C:1067:GLU:OE2	2.20	0.41
1:C:609:ILE:HG23	1:C:743:LEU:HD22	2.02	0.41
1:A:292:ILE:HG23	1:A:433:ILE:HD11	2.02	0.41
1:A:594:GLU:HB3	1:A:848:HIS:CE1	2.55	0.41
1:A:996:PHE:CD1	1:A:997:PRO:HD2	2.54	0.41
1:C:1147:LYS:NZ	1:C:1160:SER:HA	2.35	0.41
1:A:282:THR:O	1:A:286:MET:HG3	2.19	0.41
1:A:517:ASP:O	1:A:521:LYS:HG3	2.21	0.41
1:C:450:HIS:ND1	1:C:540:MET:SD	2.94	0.41
1:C:1111:LYS:HA	1:C:1111:LYS:HD3	1.85	0.41
1:A:1116:GLU:HG3	1:A:1173:ASP:HB3	2.02	0.41
1:C:450:HIS:NE2	1:C:456:VAL:HG11	2.35	0.41
1:C:739:LEU:O	1:C:743:LEU:HG	2.21	0.41
1:C:745:THR:OG1	1:C:746:PRO:HD3	2.20	0.41
1:A:901:PRO:HA	1:A:904:THR:HG23	2.02	0.41
1:A:1091:VAL:HG12	1:A:1092:THR:N	2.27	0.41
1:C:621:ASP:HA	1:C:736:LYS:HE3	2.03	0.41
1:C:1090:VAL:HG23	1:C:1097:VAL:HG21	2.02	0.41
1:A:415:LYS:HD3	1:A:421:PHE:CD1	2.55	0.41
1:A:946:LEU:O	1:A:950:VAL:HG13	2.20	0.41
1:C:594:GLU:HB3	1:C:595:ARG:H	1.72	0.41
1:A:433:ILE:HG22	1:A:437:ALA:HB3	2.03	0.41
1:C:973:VAL:HA	1:C:976:ASN:ND2	2.35	0.41
1:A:337:ARG:NH1	1:A:341:ALA:HB3	2.37	0.40
1:A:761:PRO:C	1:A:763:ARG:H	2.25	0.40
1:C:283:LEU:HD23	1:C:286:MET:HE3	2.02	0.40
1:C:424:ARG:HD3	1:C:470:VAL:HG13	2.02	0.40
1:A:379:ASP:O	1:A:382:PHE:HB3	2.22	0.40
1:A:529:PHE:CD1	1:A:530:PRO:HD2	2.56	0.40
1:A:916:PHE:CZ	1:A:1076:ARG:HD3	2.56	0.40
1:C:290:GLU:HA	1:C:323:LEU:HD11	2.03	0.40
1:C:619:ILE:HD12	1:C:736:LYS:HE2	2.03	0.40
1:C:1132:ASN:O	1:C:1136:LEU:HG	2.21	0.40
1:A:345:LYS:H	1:A:345:LYS:HG2	1.75	0.40
1:A:673:HIS:ND1	1:A:717:TRP:HA	2.37	0.40
1:A:377:GLN:HG2	1:A:381:ASN:ND2	2.37	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:811:SER:HB2	1:A:873:LEU:HB2	2.03	0.40
1:C:295:GLU:HB3	1:C:437:ALA:HB1	2.03	0.40
1:C:332:PHE:O	1:C:354:SER:HB3	2.21	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	921/960 (96%)	864 (94%)	46 (5%)	11 (1%)	13 41
1	C	880/960 (92%)	803 (91%)	63 (7%)	14 (2%)	9 34
All	All	1801/1920 (94%)	1667 (93%)	109 (6%)	25 (1%)	11 37

All (25) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	261	GLU
1	A	489	PRO
1	A	502	PRO
1	C	347	TYR
1	C	626	ILE
1	A	398	PRO
1	A	505	TYR
1	C	493	GLN
1	C	1118	GLY
1	A	535	HIS
1	C	535	HIS
1	C	715	ASP
1	C	793	LEU
1	C	860	GLU
1	C	1062	GLY

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Mol	Chain	Res	Type
1	C	1122	ASN
1	A	545	GLU
1	A	762	THR
1	A	1093	ASP
1	C	359	LEU
1	A	1061	MET
1	A	1091	VAL
1	C	484	PRO
1	C	825	ILE
1	C	417	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	773/837 (92%)	754 (98%)	19 (2%)	47	72
1	C	702/837 (84%)	678 (97%)	24 (3%)	37	65
All	All	1475/1674 (88%)	1432 (97%)	43 (3%)	42	69

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

Mol	Chain	Res	Type
1	A	334	VAL
1	A	392	HIS
1	A	413	ARG
1	A	667	GLU
1	A	693	ARG
1	A	701	ILE
1	A	715	ASP
1	A	721	ARG
1	A	734	THR
1	A	745	THR
1	A	763	ARG
1	A	814	SER
1	A	936	ARG

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Mol	Chain	Res	Type
1	A	946	LEU
1	A	996	PHE
1	A	1002	TRP
1	A	1065	ARG
1	A	1097	VAL
1	A	1149	ARG
1	C	249	ASP
1	C	276	HIS
1	C	347	TYR
1	C	359	LEU
1	C	387	ILE
1	C	413	ARG
1	C	423	GLN
1	C	456	VAL
1	C	552	LEU
1	C	557	ARG
1	C	587	PHE
1	C	696	ASN
1	C	713	GLN
1	C	763	ARG
1	C	792	ARG
1	C	827	LEU
1	C	876	VAL
1	C	886	LYS
1	C	996	PHE
1	C	1009	GLU
1	C	1037	GLN
1	C	1055	ILE
1	C	1170	GLN
1	C	1185	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	423	GLN
1	A	526	GLN
1	A	851	GLN
1	A	935	GLN
1	A	1077	GLN
1	C	695	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	933/960 (97%)	0.75	63 (6%) 17 19	67, 108, 193, 304	0
1	C	896/960 (93%)	0.88	135 (15%) 2 2	74, 143, 235, 328	0
All	All	1829/1920 (95%)	0.81	198 (10%) 5 7	67, 123, 222, 328	0

All (198) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	1082	LEU	7.0
1	A	985	ASP	6.0
1	C	1045	ILE	6.0
1	C	1060	GLU	5.7
1	C	889	ASN	5.7
1	C	1062	GLY	5.7
1	C	1091	VAL	5.6
1	C	1067	GLU	5.2
1	C	310	LYS	5.1
1	C	988	THR	5.1
1	C	831	THR	5.0
1	C	335	ALA	5.0
1	C	1083	GLN	4.9
1	C	1068	LEU	4.7
1	C	1007	PHE	4.7
1	C	267	PHE	4.6
1	C	1058	GLU	4.6
1	C	241	LYS	4.6
1	C	358	PHE	4.5
1	C	998	SER	4.5
1	C	1078	GLU	4.4
1	C	1057	SER	4.4
1	C	1061	MET	4.3
1	C	976	ASN	4.3

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Mol	Chain	Res	Type	RSRZ
1	A	1081	SER	4.2
1	C	1090	VAL	4.2
1	C	1082	LEU	4.2
1	A	1061	MET	4.1
1	C	1064	ILE	4.1
1	A	398	PRO	4.1
1	A	935	GLN	4.0
1	C	846	LEU	3.9
1	A	757	GLN	3.9
1	C	692	GLN	3.9
1	C	823	THR	3.9
1	C	917	LEU	3.8
1	A	1083	GLN	3.8
1	A	1092	THR	3.8
1	C	1033	LEU	3.8
1	C	560	CYS	3.7
1	C	265	ALA	3.6
1	C	1063	THR	3.6
1	C	1070	GLU	3.6
1	C	766	ARG	3.6
1	A	1073	GLN	3.5
1	C	756	SER	3.5
1	C	558	ALA	3.4
1	C	306	LEU	3.3
1	C	824	GLU	3.3
1	C	347	TYR	3.2
1	A	481	ASP	3.2
1	A	1170	GLN	3.2
1	A	370	ILE	3.2
1	C	559	ARG	3.2
1	A	1172	ILE	3.2
1	C	1151	HIS	3.2
1	A	477	VAL	3.1
1	C	268	GLY	3.1
1	C	334	VAL	3.1
1	C	893	PHE	3.0
1	C	1059	LYS	3.0
1	A	993	LEU	3.0
1	A	1163	GLU	3.0
1	C	431	ARG	3.0
1	C	844	ASP	3.0
1	C	1011	ARG	3.0

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Mol	Chain	Res	Type	RSRZ
1	C	1122	ASN	3.0
1	C	661	ASP	2.9
1	C	663	LEU	2.9
1	C	312	GLY	2.9
1	C	309	PHE	2.9
1	C	337	ARG	2.9
1	C	837	ILE	2.9
1	C	1038	ASP	2.9
1	A	361	TYR	2.9
1	A	1054	LYS	2.9
1	A	1049	LEU	2.9
1	C	1124	ASP	2.9
1	C	556	ASN	2.8
1	A	399	ALA	2.8
1	A	1050	ASP	2.8
1	C	989	LEU	2.8
1	C	702	THR	2.8
1	A	473	LEU	2.8
1	C	568	LEU	2.8
1	C	1123	LEU	2.7
1	C	997	PRO	2.7
1	C	1035	GLN	2.7
1	A	1040	LEU	2.7
1	C	318	VAL	2.7
1	C	958	LEU	2.7
1	C	852	VAL	2.7
1	A	347	TYR	2.7
1	C	271	MET	2.6
1	C	398	PRO	2.6
1	A	476	TYR	2.6
1	A	1002	TRP	2.6
1	C	1021	LYS	2.6
1	C	922	ALA	2.6
1	C	308	LYS	2.6
1	A	402	LEU	2.6
1	A	683	LYS	2.6
1	C	244	ALA	2.6
1	C	707	ASP	2.6
1	A	1180	TYR	2.6
1	C	681	PRO	2.6
1	C	1084	ARG	2.6
1	C	1069	ARG	2.6

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Mol	Chain	Res	Type	RSRZ
1	A	423	GLN	2.6
1	C	649	GLY	2.6
1	C	1088	THR	2.6
1	C	332	PHE	2.5
1	C	452	THR	2.5
1	C	671	GLU	2.5
1	C	924	LEU	2.5
1	A	885	GLN	2.5
1	C	586	ALA	2.5
1	C	928	LYS	2.5
1	A	1168	GLN	2.5
1	C	921	ALA	2.5
1	C	1031	ASP	2.5
1	C	1046	ALA	2.5
1	C	1170	GLN	2.5
1	A	857	GLU	2.4
1	C	931	ILE	2.4
1	C	1077	GLN	2.4
1	C	1056	PRO	2.4
1	C	974	LEU	2.4
1	C	1051	ALA	2.4
1	C	652	LEU	2.4
1	C	847	LEU	2.4
1	C	613	LEU	2.4
1	C	653	ASN	2.4
1	A	855	HIS	2.4
1	C	607	ARG	2.3
1	C	688	TRP	2.3
1	A	1014	LYS	2.3
1	A	1112	ILE	2.3
1	C	1154	THR	2.3
1	A	1126	VAL	2.3
1	C	473	LEU	2.3
1	A	669	ASP	2.3
1	C	895	PHE	2.3
1	C	313	ARG	2.2
1	A	924	LEU	2.2
1	C	336	GLY	2.2
1	C	956	SER	2.2
1	A	424	ARG	2.2
1	A	946	LEU	2.2
1	C	1081	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	891	TYR	2.2
1	C	1044	ASN	2.2
1	A	1008	GLU	2.2
1	C	888	GLU	2.2
1	A	891	TYR	2.2
1	C	1071	GLN	2.2
1	A	397	THR	2.2
1	A	1173	ASP	2.2
1	C	542	GLY	2.2
1	A	1133	LEU	2.1
1	C	323	LEU	2.1
1	C	1115	LEU	2.1
1	C	600	VAL	2.1
1	C	1147	LYS	2.1
1	A	1033	LEU	2.1
1	A	1074	SER	2.1
1	C	689	ILE	2.1
1	C	836	VAL	2.1
1	C	349	LYS	2.1
1	C	475	ARG	2.1
1	A	962	TYR	2.1
1	A	326	ILE	2.1
1	A	387	ILE	2.1
1	A	1029	VAL	2.1
1	C	385	ARG	2.1
1	C	474	GLY	2.1
1	C	625	LEU	2.1
1	A	420	SER	2.1
1	A	814	SER	2.1
1	C	279	LEU	2.1
1	C	552	LEU	2.1
1	C	321	GLN	2.1
1	C	862	GLU	2.1
1	C	476	TYR	2.0
1	A	1030	LEU	2.0
1	A	588	GLN	2.0
1	A	686	GLU	2.0
1	C	747	LEU	2.0
1	C	764	LEU	2.0
1	C	1030	LEU	2.0
1	A	375	LYS	2.0
1	C	263	ALA	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	1066	ARG	2.0
1	A	826	LYS	2.0
1	A	374	PHE	2.0
1	C	761	PRO	2.0
1	A	373	VAL	2.0
1	A	1104	LEU	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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.