



Full wwPDB X-ray Structure Validation Report ⓘ

May 25, 2020 – 08:06 am BST

PDB ID : 6SUQ
Title : Crystal Structure of TcdB2-TccC3-TEV
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Deposited on : 2019-09-16
Resolution : 3.70 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 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 : 2.11
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

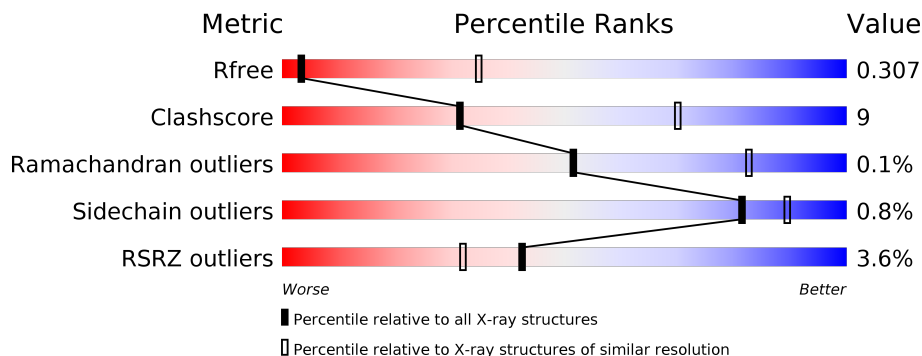
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.70 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	1049 (3.88-3.52)
Clashscore	141614	1027 (3.86-3.54)
Ramachandran outliers	138981	1069 (3.88-3.52)
Sidechain outliers	138945	1065 (3.88-3.52)
RSRZ outliers	127900	1578 (3.90-3.50)

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 $\leq 5\%$. 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	2410	

2 Entry composition i

There is only 1 type of molecule in this entry. The entry contains 17025 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 TcdB2,TccC3,Genome polyprotein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	2134	17025	10667	3024	3300	34	0	0	0

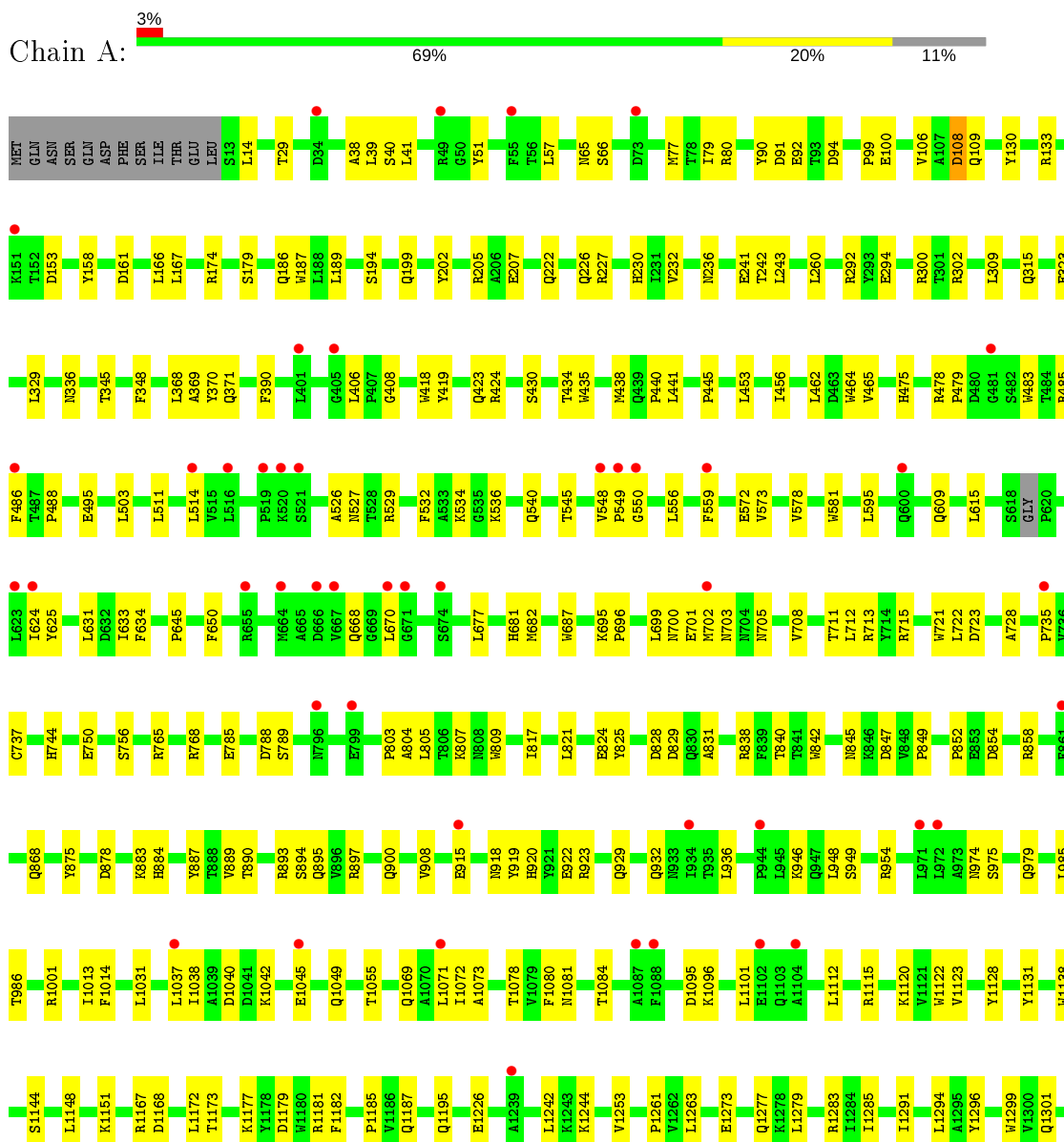
There are 21 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1475	PRO	-	linker	UNP Q8GF99
A	1476	GLY	-	linker	UNP Q8GF99
A	1477	SER	-	linker	UNP Q8GF99
A	1478	ARG	-	linker	UNP Q8GF99
A	1479	PRO	-	linker	UNP Q8GF99
A	2160	GLU	-	linker	UNP Q8GF97
A	2161	PHE	-	linker	UNP Q8GF97
A	2380	VAL	SER	conflict	UNP P04517
A	2398	ARG	-	expression tag	UNP P04517
A	2399	ARG	-	expression tag	UNP P04517
A	2400	ARG	-	expression tag	UNP P04517
A	2401	ARG	-	expression tag	UNP P04517
A	2402	ARG	-	expression tag	UNP P04517
A	2403	LEU	-	expression tag	UNP P04517
A	2404	GLU	-	expression tag	UNP P04517
A	2405	HIS	-	expression tag	UNP P04517
A	2406	HIS	-	expression tag	UNP P04517
A	2407	HIS	-	expression tag	UNP P04517
A	2408	HIS	-	expression tag	UNP P04517
A	2409	HIS	-	expression tag	UNP P04517
A	2410	HIS	-	expression tag	UNP P04517

3 Residue-property plots [i](#)

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 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: TcdB2,TccC3,Genome polyprotein



4 Data and refinement statistics

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	234.43Å 234.43Å 143.19Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	47.73 – 3.70 49.18 – 3.70	Depositor EDS
% Data completeness (in resolution range)	99.9 (47.73-3.70) 100.0 (49.18-3.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.01 (at 3.67Å)	Xtrriage
Refinement program	PHENIX 1.16-3549	Depositor
R, R_{free}	0.269 , 0.302 0.286 , 0.307	Depositor DCC
R_{free} test set	2431 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	130.9	Xtrriage
Anisotropy	0.362	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 96.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	0.196 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	17025	wwPDB-VP
Average B, all atoms (Å ²)	135.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.12% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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](#)

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	0.26	0/17444	0.46	2/23779 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	1407	LEU	CA-CB-CG	6.46	130.16	115.30
1	A	1407	LEU	CB-CG-CD2	-6.00	100.80	111.00

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	17025	0	16395	302	0
All	All	17025	0	16395	302	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 9.

All (302) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (\AA)	Clash overlap (\AA)
1:A:1330:ARG:HD3	1:A:1335:PRO:HB3	1.62	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:371:GLN:HB3	1:A:696:PRO:HA	1.66	0.76
1:A:534:LYS:HD3	1:A:536:LYS:HD3	1.71	0.72
1:A:668:GLN:HB3	1:A:670:LEU:HD13	1.73	0.70
1:A:91:ASP:OD1	1:A:92:GLU:N	2.23	0.70
1:A:232:VAL:HB	1:A:260:LEU:HB3	1.74	0.69
1:A:700:ASN:HA	1:A:712:LEU:HB2	1.74	0.68
1:A:556:LEU:HB3	1:A:573:VAL:HB	1.75	0.67
1:A:2005:GLU:HB2	1:A:2021:VAL:HB	1.77	0.67
1:A:1948:ASN:HB2	1:A:1952:GLU:HB2	1.77	0.66
1:A:838:ARG:NH1	1:A:895:GLN:OE1	2.27	0.66
1:A:133:ARG:HA	1:A:908:VAL:HG22	1.78	0.66
1:A:915:GLU:OE2	1:A:932:GLN:NE2	2.28	0.66
1:A:1244:LYS:HZ3	1:A:1335:PRO:HD2	1.61	0.65
1:A:1148:LEU:HG	1:A:1582:ILE:HD11	1.78	0.65
1:A:1389:ARG:HB3	1:A:1402:TYR:HB2	1.79	0.65
1:A:456:ILE:HD11	1:A:464:TRP:HE1	1.62	0.64
1:A:1628:ARG:HB2	1:A:1651:TYR:HB2	1.79	0.64
1:A:529:ARG:CZ	1:A:548:VAL:HG11	2.28	0.64
1:A:1069:GLN:OE1	1:A:1069:GLN:N	2.31	0.64
1:A:1168:ASP:OD1	1:A:1172:LEU:N	2.31	0.64
1:A:1952:GLU:HB3	1:A:1974:TYR:CE2	2.32	0.64
1:A:1912:ASN:O	1:A:2125:ARG:NH2	2.32	0.63
1:A:1040:ASP:O	1:A:1115:ARG:NH1	2.32	0.63
1:A:1945:LEU:HD22	1:A:1956:VAL:HG22	1.81	0.62
1:A:1049:GLN:HG3	1:A:1112:LEU:HD22	1.81	0.62
1:A:1632:ALA:HB2	1:A:1648:VAL:HG13	1.80	0.62
1:A:828:ASP:HB3	1:A:831:ALA:HB2	1.80	0.62
1:A:1590:VAL:HG22	1:A:1596:ILE:HG12	1.81	0.62
1:A:369:ALA:HB2	1:A:1294:LEU:HD11	1.80	0.61
1:A:1187:GLN:OE1	1:A:1195:GLN:NE2	2.33	0.61
1:A:167:LEU:HA	1:A:189:LEU:HA	1.83	0.61
1:A:1803:GLU:HB2	1:A:1812:SER:HB3	1.83	0.61
1:A:424:ARG:NH1	1:A:430:SER:O	2.33	0.61
1:A:1958:LEU:HD21	1:A:2109:THR:HG22	1.82	0.61
1:A:578:VAL:HB	1:A:595:LEU:HB2	1.81	0.61
1:A:1823:TRP:HZ2	1:A:2085:LEU:HD21	1.66	0.61
1:A:2122:TRP:HD1	1:A:2123:ILE:HG23	1.65	0.61
1:A:1952:GLU:HB3	1:A:1974:TYR:HE2	1.65	0.61
1:A:1486:LYS:HA	1:A:1489:GLN:HG3	1.82	0.61
1:A:1500:ARG:NH1	1:A:1528:ASP:O	2.33	0.60
1:A:1764:GLU:OE1	1:A:1766:HIS:NE2	2.33	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1244:LYS:NZ	1:A:1335:PRO:HD2	2.15	0.60
1:A:1429:HIS:ND1	1:A:1437:GLU:OE2	2.35	0.59
1:A:189:LEU:HD11	1:A:202:TYR:CD2	2.36	0.59
1:A:2044:ASP:OD2	1:A:2090:ASN:ND2	2.35	0.59
1:A:756:SER:O	1:A:1419:ARG:NH1	2.35	0.59
1:A:708:VAL:HG23	1:A:1348:GLY:HA3	1.84	0.59
1:A:1253:VAL:HB	1:A:1324:LEU:HB3	1.84	0.58
1:A:529:ARG:HE	1:A:532:PHE:HE2	1.51	0.58
1:A:1144:SER:HB2	1:A:1151:LYS:HG2	1.85	0.58
1:A:948:LEU:HD11	1:A:985:LEU:HB3	1.85	0.58
1:A:1069:GLN:HG2	1:A:1138:TRP:CE2	2.39	0.58
1:A:189:LEU:HD11	1:A:202:TYR:CE2	2.38	0.58
1:A:624:ILE:HG13	1:A:633:ILE:HG23	1.86	0.58
1:A:1975:SER:OG	1:A:1977:ASP:OD1	2.22	0.57
1:A:495:GLU:HG2	1:A:503:LEU:HD22	1.86	0.57
1:A:1784:ILE:O	1:A:1802:TYR:N	2.36	0.57
1:A:1382:ASN:HB2	1:A:1384:TRP:CD1	2.39	0.57
1:A:1763:ARG:HH21	1:A:1771:ILE:HD13	1.71	0.56
1:A:77:MET:HB3	1:A:189:LEU:HD23	1.87	0.56
1:A:29:THR:HB	1:A:38:ALA:HB3	1.88	0.56
1:A:765:ARG:HB3	1:A:785:GLU:HB3	1.88	0.56
1:A:90:TYR:N	1:A:94:ASP:OD2	2.39	0.56
1:A:1167:ARG:HG2	1:A:1173:THR:HG22	1.87	0.56
1:A:789:SER:HA	1:A:803:PRO:HB3	1.87	0.55
1:A:1072:ILE:O	1:A:1131:TYR:OH	2.20	0.55
1:A:1882:ASP:OD1	1:A:1883:ARG:N	2.39	0.55
1:A:1244:LYS:NZ	1:A:1337:GLN:OE1	2.39	0.55
1:A:1849:GLU:OE1	1:A:1892:HIS:NE2	2.33	0.55
1:A:445:PRO:HB3	1:A:486:PHE:HZ	1.72	0.55
1:A:1662:LEU:HD23	1:A:1668:VAL:HA	1.87	0.55
1:A:166:LEU:HB2	1:A:243:LEU:HD13	1.89	0.55
1:A:464:TRP:CE3	1:A:488:PRO:HA	2.42	0.54
1:A:615:LEU:HD11	1:A:624:ILE:HD11	1.89	0.54
1:A:1953:LEU:O	1:A:1974:TYR:OH	2.19	0.54
1:A:179:SER:OG	1:A:222:GLN:OE1	2.24	0.54
1:A:371:GLN:OE1	1:A:700:ASN:ND2	2.41	0.54
1:A:1915:VAL:HB	1:A:1919:LEU:HD12	1.89	0.54
1:A:418:TRP:HB3	1:A:438:MET:HB2	1.88	0.54
1:A:526:ALA:HB2	1:A:549:PRO:HG2	1.90	0.54
1:A:2122:TRP:CD1	1:A:2123:ILE:HG23	2.44	0.53
1:A:883:LYS:HA	1:A:923:ARG:HH21	1.72	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1385:ALA:HB2	1:A:1406:PHE:CE2	2.43	0.53
1:A:1359:HIS:HB2	1:A:1383:ARG:HB2	1.89	0.53
1:A:1529:ILE:HG13	1:A:1530:HIS:HD2	1.74	0.53
1:A:985:LEU:HB2	1:A:1014:PHE:HB2	1.90	0.53
1:A:478:ARG:NH2	1:A:550:GLY:O	2.41	0.53
1:A:1823:TRP:HB3	1:A:1826:GLN:HG3	1.89	0.53
1:A:1680:GLN:O	1:A:1973:ARG:NH2	2.41	0.53
1:A:949:SER:HB2	1:A:986:THR:HB	1.91	0.53
1:A:936:LEU:HB2	1:A:946:LYS:HB2	1.91	0.53
1:A:1409:ASP:OD1	1:A:1411:ARG:N	2.29	0.53
1:A:1525:HIS:HB3	1:A:1533:LEU:HD11	1.91	0.53
1:A:2041:LYS:NZ	1:A:2045:ILE:O	2.37	0.53
1:A:79:ILE:HG23	1:A:187:TRP:HB2	1.90	0.53
1:A:1329:ASP:OD1	1:A:1337:GLN:HA	2.09	0.52
1:A:368:LEU:HD22	1:A:702:MET:HG2	1.91	0.52
1:A:1494:VAL:HB	1:A:1507:ILE:HB	1.91	0.52
1:A:2089:ARG:NE	1:A:2093:GLU:OE2	2.42	0.52
1:A:475:HIS:HB2	1:A:527:ASN:HD21	1.74	0.52
1:A:1409:ASP:OD1	1:A:1410:TRP:N	2.43	0.52
1:A:453:LEU:HG	1:A:465:VAL:HG22	1.91	0.52
1:A:1380:THR:HG21	1:A:1408:ASN:HB3	1.92	0.52
1:A:153:ASP:O	1:A:174:ARG:NH1	2.42	0.52
1:A:1992:ASN:OD1	1:A:1992:ASN:N	2.43	0.52
1:A:1373:LEU:HD13	1:A:1407:LEU:HD21	1.92	0.51
1:A:1405:TYR:CD2	1:A:1407:LEU:HD13	2.45	0.51
1:A:464:TRP:HE3	1:A:488:PRO:HA	1.75	0.51
1:A:1735:ASN:HA	1:A:1753:LEU:HB3	1.91	0.51
1:A:2101:TYR:HB3	1:A:2112:TYR:CZ	2.46	0.51
1:A:1301:GLN:O	1:A:1304:LYS:HG3	2.11	0.51
1:A:1335:PRO:HG2	1:A:1337:GLN:HB2	1.92	0.51
1:A:1724:GLN:NE2	1:A:2023:THR:O	2.43	0.51
1:A:1430:VAL:HB	1:A:1439:LYS:HB3	1.92	0.50
1:A:161:ASP:N	1:A:161:ASP:OD1	2.42	0.50
1:A:1849:GLU:OE2	1:A:2078:TYR:OH	2.24	0.50
1:A:711:THR:HB	1:A:750:GLU:HB3	1.92	0.50
1:A:883:LYS:HE3	1:A:884:HIS:CE1	2.46	0.50
1:A:1128:TYR:HB2	1:A:1144:SER:HB3	1.94	0.50
1:A:1296:TYR:CE1	1:A:1313:LEU:HG	2.47	0.50
1:A:1330:ARG:HG2	1:A:1331:TYR:H	1.75	0.50
1:A:1080:PHE:HB2	1:A:1122:TRP:HB2	1.94	0.50
1:A:483:TRP:HZ2	1:A:485:ARG:HH21	1.60	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:900:GLN:HG2	1:A:908:VAL:HB	1.93	0.50
1:A:1031:LEU:HB3	1:A:1038:ILE:HD11	1.92	0.50
1:A:1362:GLY:HA3	1:A:1383:ARG:NH1	2.27	0.50
1:A:419:TYR:HB2	1:A:441:LEU:HD11	1.94	0.50
1:A:2005:GLU:OE1	1:A:2007:ARG:NH1	2.45	0.49
1:A:1365:ARG:HB2	1:A:1407:LEU:CD1	2.42	0.49
1:A:77:MET:HB3	1:A:189:LEU:CD2	2.42	0.49
1:A:14:LEU:HD21	1:A:1185:PRO:HD2	1.95	0.49
1:A:768:ARG:NH1	1:A:824:GLU:OE2	2.46	0.49
1:A:756:SER:HA	1:A:1415:ASN:HD22	1.78	0.49
1:A:804:ALA:HB2	1:A:1433:PRO:HB3	1.95	0.49
1:A:890:THR:HG22	1:A:918:ASN:HA	1.95	0.49
1:A:842:TRP:CZ2	1:A:845:ASN:HA	2.48	0.49
1:A:1790:ARG:NH1	1:A:2069:GLY:O	2.46	0.49
1:A:336:ASN:HB2	1:A:348:PHE:HB3	1.93	0.49
1:A:2022:ILE:HB	1:A:2034:VAL:HB	1.95	0.48
1:A:2049:GLN:OE1	1:A:2051:ARG:NH1	2.43	0.48
1:A:406:LEU:HD12	1:A:722:LEU:HD11	1.95	0.48
1:A:1336:GLU:CD	1:A:1336:GLU:H	2.15	0.48
1:A:1364:ALA:HB1	1:A:1406:PHE:O	2.12	0.48
1:A:2020:GLN:NE2	1:A:2038:GLU:OE2	2.46	0.48
1:A:511:LEU:HD13	1:A:514:LEU:HD21	1.95	0.48
1:A:1013:ILE:HG23	1:A:1045:GLU:HB3	1.95	0.48
1:A:1351:ARG:NH1	1:A:1393:ASP:O	2.45	0.48
1:A:51:TYR:CE2	1:A:194:SER:HB3	2.47	0.48
1:A:974:ASN:O	1:A:1505:ARG:NH1	2.45	0.48
1:A:315:GLN:HB2	1:A:323:GLU:HG3	1.94	0.48
1:A:889:VAL:HB	1:A:919:TYR:HB2	1.95	0.48
1:A:100:GLU:N	1:A:100:GLU:OE2	2.42	0.48
1:A:1931:ASP:OD1	1:A:1935:HIS:N	2.46	0.48
1:A:292:ARG:HB3	1:A:294:GLU:OE1	2.13	0.48
1:A:199:GLN:NE2	1:A:242:THR:O	2.46	0.48
1:A:419:TYR:HB3	1:A:441:LEU:HD21	1.95	0.48
1:A:893:ARG:HB3	1:A:915:GLU:HB3	1.95	0.48
1:A:1616:GLN:HB2	1:A:1623:SER:HA	1.96	0.47
1:A:878:ASP:OD1	1:A:923:ARG:NH2	2.39	0.47
1:A:1715:THR:HA	1:A:1724:GLN:O	2.14	0.47
1:A:1572:ASP:HB2	1:A:2140:LEU:HD12	1.95	0.47
1:A:1078:THR:HG22	1:A:1123:VAL:HG12	1.95	0.47
1:A:1922:ASP:HB3	1:A:1925:GLN:HB2	1.97	0.47
1:A:847:ASP:OD1	1:A:897:ARG:NE	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:423:GLN:N	1:A:434:THR:O	2.47	0.47
1:A:887:TYR:CZ	1:A:923:ARG:HD2	2.49	0.47
1:A:1508:ASP:HB2	1:A:1521:ARG:HB2	1.97	0.47
1:A:1560:ASP:OD1	1:A:1564:ASN:N	2.48	0.47
1:A:106:VAL:HG22	1:A:130:TYR:HE1	1.80	0.47
1:A:807:LYS:HD3	1:A:875:TYR:CE1	2.51	0.46
1:A:462:LEU:H	1:A:462:LEU:HD12	1.80	0.46
1:A:65:ASN:OD1	1:A:66:SER:N	2.49	0.46
1:A:1263:LEU:HD11	1:A:1291:ILE:HD11	1.97	0.46
1:A:1299:TRP:CH2	1:A:1307:PRO:HD2	2.51	0.46
1:A:1905:ILE:HG22	1:A:1914:ALA:HB1	1.98	0.46
1:A:2144:VAL:HG21	1:A:2148:PRO:HA	1.98	0.46
1:A:369:ALA:HB3	1:A:701:GLU:HB3	1.96	0.46
1:A:1037:LEU:HA	1:A:1042:LYS:HZ2	1.80	0.46
1:A:2080:TYR:CD1	1:A:2148:PRO:HG3	2.51	0.46
1:A:920:HIS:HB2	1:A:929:GLN:HB2	1.98	0.46
1:A:57:LEU:HA	1:A:57:LEU:HD12	1.86	0.45
1:A:1319:LEU:HD22	1:A:1412:TYR:H	1.82	0.45
1:A:1425:TYR:CE2	1:A:1778:PRO:HB2	2.51	0.45
1:A:226:GLN:HE21	1:A:227:ARG:H	1.65	0.45
1:A:852:PRO:HB2	1:A:858:ARG:HG2	1.99	0.45
1:A:39:LEU:HD23	1:A:40:SER:N	2.32	0.45
1:A:1359:HIS:HB2	1:A:1383:ARG:CB	2.46	0.45
1:A:1725:ARG:NH1	1:A:1746:GLU:OE2	2.49	0.45
1:A:715:ARG:NH1	1:A:723:ASP:OD2	2.46	0.45
1:A:1612:SER:HB3	1:A:1628:ARG:HD3	1.98	0.45
1:A:1179:ASP:OD2	1:A:1181:ARG:NH2	2.48	0.45
1:A:1261:PRO:HB2	1:A:1291:ILE:HD12	1.99	0.45
1:A:1864:ALA:H	1:A:2087:ALA:HA	1.81	0.45
1:A:572:GLU:HB2	1:A:581:TRP:HZ3	1.79	0.45
1:A:189:LEU:C	1:A:189:LEU:HD12	2.37	0.45
1:A:1939:LEU:HB2	1:A:1945:LEU:HD11	1.99	0.45
1:A:80:ARG:HB3	1:A:186:GLN:HG2	2.00	0.45
1:A:1365:ARG:HB2	1:A:1407:LEU:HD11	1.97	0.44
1:A:345:THR:HB	1:A:370:TYR:CE1	2.53	0.44
1:A:300:ARG:HG2	1:A:302:ARG:HE	1.81	0.44
1:A:1120:LYS:HA	1:A:1120:LYS:HD3	1.72	0.44
1:A:1405:TYR:HD2	1:A:1407:LEU:HD13	1.82	0.44
1:A:1810:VAL:O	1:A:1836:TYR:OH	2.29	0.44
1:A:199:GLN:N	1:A:236:ASN:OD1	2.50	0.44
1:A:1524:ARG:NH2	1:A:1526:GLN:OE1	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:695:LYS:HE3	1:A:744:HIS:NE2	2.32	0.44
1:A:1391:GLU:HB3	1:A:1400:ARG:HB2	2.00	0.44
1:A:1432:ASP:OD1	1:A:1436:ARG:N	2.48	0.44
1:A:2060:SER:HB3	1:A:2101:TYR:HA	1.98	0.44
1:A:540:GLN:HA	1:A:545:THR:HG22	2.00	0.44
1:A:1101:LEU:HA	1:A:1101:LEU:HD23	1.86	0.44
1:A:1801:ARG:HB2	1:A:1814:ARG:HG2	2.00	0.44
1:A:631:LEU:HD23	1:A:650:PHE:HE1	1.83	0.44
1:A:309:LEU:HB3	1:A:329:LEU:HD13	2.00	0.44
1:A:1362:GLY:HA3	1:A:1383:ARG:HH11	1.83	0.43
1:A:1406:PHE:CE1	1:A:1757:ALA:HA	2.52	0.43
1:A:1795:LYS:HA	1:A:1795:LYS:HD2	1.82	0.43
1:A:368:LEU:HB3	1:A:699:LEU:HD11	2.00	0.43
1:A:1177:LYS:HB2	1:A:1187:GLN:HB3	2.00	0.43
1:A:1674:GLN:NE2	1:A:1697:ALA:O	2.38	0.43
1:A:868:GLN:HG2	1:A:894:SER:OG	2.17	0.43
1:A:106:VAL:HG22	1:A:130:TYR:CE1	2.53	0.43
1:A:1761:LYS:HE2	1:A:1761:LYS:HB2	1.80	0.43
1:A:1963:LYS:HA	1:A:1963:LYS:HD3	1.87	0.43
1:A:2048:ASN:ND2	1:A:2048:ASN:O	2.51	0.43
1:A:703:ASN:OD1	1:A:705:ASN:N	2.44	0.43
1:A:1081:ASN:H	1:A:1084:THR:HG1	1.67	0.43
1:A:2134:THR:OG1	1:A:2134:THR:O	2.37	0.43
1:A:41:LEU:HD23	1:A:41:LEU:HA	1.83	0.43
1:A:854:ASP:O	1:A:858:ARG:HG3	2.19	0.43
1:A:1071:LEU:HD11	1:A:1138:TRP:CE3	2.53	0.43
1:A:2099:ILE:HG13	1:A:2099:ILE:H	1.70	0.43
1:A:1510:HIS:HB3	1:A:1519:ASP:HB3	2.00	0.43
1:A:1718:ASP:OD1	1:A:1722:ASN:N	2.42	0.43
1:A:1242:LEU:HA	1:A:1242:LEU:HD23	1.83	0.43
1:A:1597:GLN:NE2	1:A:1615:GLU:OE2	2.51	0.43
1:A:1753:LEU:HD11	1:A:1761:LYS:CD	2.48	0.43
1:A:840:THR:HA	1:A:849:PRO:HA	1.99	0.43
1:A:1496:VAL:HB	1:A:1505:ARG:HB2	2.00	0.42
1:A:529:ARG:NE	1:A:548:VAL:HG11	2.34	0.42
1:A:728:ALA:HB3	1:A:735:PRO:HG3	2.00	0.42
1:A:1429:HIS:HD1	1:A:1437:GLU:CD	2.22	0.42
1:A:2026:GLU:H	1:A:2026:GLU:HG2	1.65	0.42
1:A:681:HIS:CE1	1:A:682:MET:HG3	2.54	0.42
1:A:1055:THR:HB	1:A:1073:ALA:HB2	2.00	0.42
1:A:1226:GLU:OE1	1:A:1226:GLU:N	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:922:GLU:HB2	1:A:1454:PRO:HD3	2.01	0.42
1:A:631:LEU:HD23	1:A:650:PHE:CE1	2.54	0.42
1:A:765:ARG:NH1	1:A:785:GLU:OE2	2.51	0.42
1:A:77:MET:HG3	1:A:99:PRO:HB3	2.00	0.42
1:A:829:ASP:N	1:A:829:ASP:OD1	2.52	0.42
1:A:1296:TYR:CZ	1:A:1313:LEU:HG	2.54	0.42
1:A:609:GLN:HB2	1:A:625:TYR:CE1	2.54	0.42
1:A:721:TRP:CD2	1:A:737:CYS:HB2	2.55	0.42
1:A:1366:GLN:HG3	1:A:1374:ILE:HB	2.02	0.42
1:A:1959:VAL:O	1:A:1967:ASP:HB3	2.20	0.42
1:A:1955:GLN:OE1	1:A:1969:ARG:HD2	2.20	0.42
1:A:2019:LEU:HD13	1:A:2037:TRP:CE2	2.55	0.42
1:A:1805:ASP:OD1	1:A:1809:ASN:N	2.53	0.41
1:A:1961:ARG:HG3	1:A:1967:ASP:HA	2.02	0.41
1:A:2080:TYR:CE1	1:A:2148:PRO:HG3	2.55	0.41
1:A:1095:ASP:OD1	1:A:1096:LYS:N	2.52	0.41
1:A:1464:ASP:OD1	1:A:1491:THR:HG23	2.20	0.41
1:A:979:GLN:HE22	1:A:1526:GLN:HA	1.85	0.41
1:A:1659:LEU:HD12	1:A:1659:LEU:HA	1.90	0.41
1:A:39:LEU:HD23	1:A:40:SER:H	1.85	0.41
1:A:817:ILE:O	1:A:821:LEU:HG	2.19	0.41
1:A:1279:LEU:HB3	1:A:1285:ILE:HG22	2.02	0.41
1:A:634:PHE:CE1	1:A:645:PRO:HG3	2.55	0.41
1:A:807:LYS:HE2	1:A:809:TRP:CH2	2.56	0.41
1:A:809:TRP:CG	1:A:825:TYR:HE1	2.39	0.41
1:A:1446:TRP:CE2	1:A:1806:PRO:HG3	2.55	0.41
1:A:1273:GLU:O	1:A:1277:GLN:N	2.49	0.41
1:A:677:LEU:HB3	1:A:687:TRP:HB2	2.01	0.41
1:A:1397:GLN:HA	1:A:1398:PRO:HD3	1.96	0.41
1:A:1463:ASN:OD1	1:A:1806:PRO:HB2	2.21	0.41
1:A:205:ARG:HB2	1:A:230:HIS:HB2	2.03	0.41
1:A:529:ARG:HB3	1:A:532:PHE:CZ	2.56	0.41
1:A:1676:LEU:HD23	1:A:1696:LEU:HD23	2.03	0.41
1:A:108:ASP:HB3	1:A:109:GLN:H	1.79	0.41
1:A:158:TYR:O	1:A:1001:ARG:HD3	2.21	0.41
1:A:1649:ARG:HG2	1:A:1658:ARG:HG3	2.03	0.41
1:A:2071:ILE:H	1:A:2071:ILE:HG13	1.69	0.41
1:A:418:TRP:CZ3	1:A:440:PRO:HA	2.56	0.41
1:A:1592:ALA:HB3	1:A:1933:GLY:HA2	2.03	0.41
1:A:1486:LYS:HB3	1:A:1486:LYS:HE2	1.91	0.40
1:A:1425:TYR:CD1	1:A:1779:GLU:HG3	2.55	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:2056:ASN:HB3	1:A:2062:GLN:NE2	2.36	0.40
1:A:1753:LEU:HD11	1:A:1761:LYS:HD3	2.02	0.40
1:A:1627:GLU:HA	1:A:1651:TYR:O	2.22	0.40
1:A:1999:THR:HB	1:A:2006:LEU:HB2	2.04	0.40
1:A:2007:ARG:HB2	1:A:2019:LEU:HB3	2.04	0.40
1:A:1283:ARG:HA	1:A:1283:ARG:HE	1.86	0.40
1:A:495:GLU:N	1:A:495:GLU:OE1	2.38	0.40
1:A:713:ARG:HH22	1:A:750:GLU:HB2	1.86	0.40
1:A:805:LEU:HB3	1:A:875:TYR:HB2	2.03	0.40
1:A:954:ARG:NH1	1:A:975:SER:O	2.53	0.40
1:A:1049:GLN:HG2	1:A:1078:THR:HG23	2.04	0.40
1:A:2042:PRO:HG2	1:A:2045:ILE:HD12	2.02	0.40
1:A:2098:THR:HB	1:A:2105:GLU:HG3	2.03	0.40
1:A:408:GLY:HA2	1:A:435:TRP:HE1	1.86	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	2128/2410 (88%)	2033 (96%)	92 (4%)	3 (0%)	51 83

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1335	PRO
1	A	2154	PRO
1	A	479	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	1842/2095 (88%)	1828 (99%)	14 (1%)	81 89

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	108	ASP
1	A	207	GLU
1	A	241	GLU
1	A	390	PHE
1	A	559	PHE
1	A	788	ASP
1	A	1182	PHE
1	A	1382	ASN
1	A	1422	LYS
1	A	1427	ASP
1	A	1575	ARG
1	A	1848	ARG
1	A	1974	TYR
1	A	2033	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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

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, 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(Å ²)	Q<0.9
1	A	2134/2410 (88%)	0.20	77 (3%) 42 32	94, 130, 186, 267	0

All (77) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	670	LEU	6.8
1	A	1315	ASN	6.2
1	A	548	VAL	5.2
1	A	2023	THR	4.8
1	A	1419	ARG	4.6
1	A	486	PHE	4.4
1	A	1468	GLU	4.1
1	A	520	LYS	3.8
1	A	549	PRO	3.8
1	A	671	GLY	3.7
1	A	1310	ILE	3.6
1	A	1765	GLU	3.5
1	A	796	ASN	3.4
1	A	1701	TYR	3.4
1	A	55	PHE	3.4
1	A	674	SER	3.3
1	A	1981	MET	3.2
1	A	1939	LEU	3.2
1	A	550	GLY	3.2
1	A	799	GLU	3.1
1	A	521	SER	3.0
1	A	1678	ASP	3.0
1	A	1071	LEU	2.9
1	A	600	GLN	2.8
1	A	915	GLU	2.8
1	A	1239	ALA	2.8
1	A	664	MET	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	1999	THR	2.8
1	A	1654	ALA	2.8
1	A	1313	LEU	2.7
1	A	667	VAL	2.7
1	A	1314	ASN	2.6
1	A	1582	ILE	2.6
1	A	702	MET	2.6
1	A	1104	ALA	2.6
1	A	151	LYS	2.6
1	A	514	LEU	2.5
1	A	2076	GLU	2.5
1	A	666	ASP	2.5
1	A	655	ARG	2.5
1	A	1427	ASP	2.5
1	A	1860	PHE	2.5
1	A	1087	ALA	2.5
1	A	559	PHE	2.5
1	A	2027	ALA	2.5
1	A	2051	ARG	2.4
1	A	405	GLY	2.4
1	A	516	LEU	2.4
1	A	73	ASP	2.3
1	A	1037	LEU	2.3
1	A	1673	SER	2.3
1	A	623	LEU	2.3
1	A	34	ASP	2.3
1	A	2050	LEU	2.3
1	A	971	LEU	2.3
1	A	2004	LEU	2.3
1	A	1530	HIS	2.2
1	A	1392	TYR	2.2
1	A	1842	LEU	2.2
1	A	944	PRO	2.2
1	A	1045	GLU	2.2
1	A	2028	GLY	2.2
1	A	861	PHE	2.2
1	A	1700	ILE	2.2
1	A	1723	ILE	2.1
1	A	624	ILE	2.1
1	A	1102	GLU	2.1
1	A	1088	PHE	2.1
1	A	2015	THR	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	1373	LEU	2.1
1	A	519	PRO	2.0
1	A	481	GLY	2.0
1	A	49	ARG	2.0
1	A	934	ILE	2.0
1	A	401	LEU	2.0
1	A	735	PRO	2.0
1	A	972	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 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.