



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 23, 2024 – 07:31 AM EDT

PDB ID : 6HEL
Title : Structure of human USP25
Authors : Gersch, M.; Komander, D.
Deposited on : 2018-08-20
Resolution : 2.94 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) : 1.20.1
EDS : 2.37.1
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) : 2.37.1

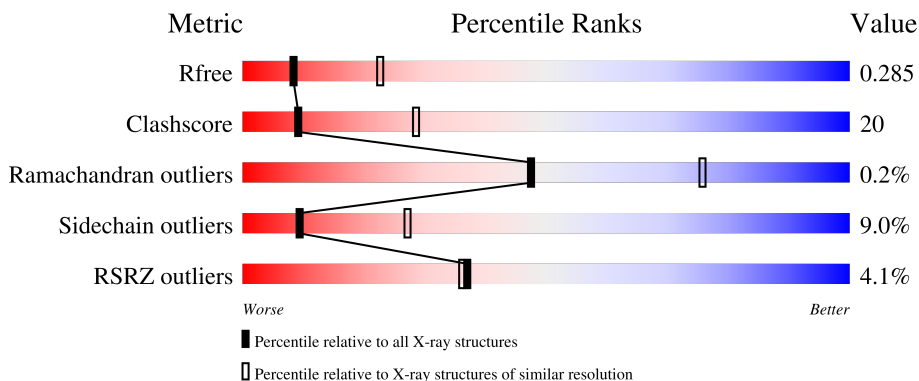
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.94 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	2969 (2.98-2.90)
Clashscore	141614	3218 (2.98-2.90)
Ramachandran outliers	138981	3122 (2.98-2.90)
Sidechain outliers	138945	3124 (2.98-2.90)
RSRZ outliers	127900	2902 (2.98-2.90)

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 $\leq 5\%$. 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	560	 4% 55% 25% 17%
1	B	560	 3% 50% 29% 17%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7163 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 Ubiquitin carboxyl-terminal hydrolase 25.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	465	3570	2292	600	662	16	0	0	1
1	B	463	3577	2300	600	662	15	0	0	1

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	155	GLY	-	expression tag	UNP Q9UHP3
A	156	PRO	-	expression tag	UNP Q9UHP3
B	155	GLY	-	expression tag	UNP Q9UHP3
B	156	PRO	-	expression tag	UNP Q9UHP3

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	7	Total	O	0	0
			7	7		
2	B	9	Total	O	0	0
			9	9		

4 Data and refinement statistics

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, α , β , γ	139.18Å 139.18Å 190.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	59.17 – 2.94 59.17 – 2.94	Depositor EDS
% Data completeness (in resolution range)	54.5 (59.17-2.94) 54.6 (59.17-2.94)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.93 (at 2.96Å)	Xtrriage
Refinement program	PHENIX (1.13_2998), REFMAC	Depositor
R, R_{free}	0.254 , 0.278 0.259 , 0.285	Depositor DCC
R_{free} test set	1037 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	103.0	Xtrriage
Anisotropy	0.002	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 43.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.017 for $-1/2^*h+1/2^*k-1/2^*l, 1/2^*h-1/2^*k-1/2^*l, -h-k$ 0.005 for $-1/2^*h+1/2^*k+1/2^*l, 1/2^*h-1/2^*k+1/2^*l, h+k$ 0.012 for $-1/2^*h-1/2^*k+1/2^*l, -1/2^*h-1/2^*k-1/2^*l, h-k$ 0.013 for $-1/2^*h-1/2^*k-1/2^*l, -1/2^*h-1/2^*k+1/2^*l, -h+k$ 0.428 for $-h, k, -l$	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	7163	wwPDB-VP
Average B, all atoms (Å ²)	78.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.89% 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	0.32	0/3659	0.50	0/4983
1	B	0.31	0/3668	0.52	0/4994
All	All	0.32	0/7327	0.51	0/9977

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3570	0	3206	116	0
1	B	3577	0	3231	171	0
2	A	7	0	0	1	0
2	B	9	0	0	0	0
All	All	7163	0	6437	272	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 20.

All (272) 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:467:SER:CB	1:A:468:PRO:HD3	1.42	1.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:468:PRO:HA	1:B:534:HIS:NE2	1.33	1.40
1:A:467:SER:CB	1:A:468:PRO:CD	2.01	1.31
1:B:334:HIS:CG	1:B:403:ARG:HH22	1.66	1.13
1:B:468:PRO:CA	1:B:534:HIS:NE2	2.22	1.02
1:B:458:PHE:HE1	1:B:535:PRO:O	1.43	0.98
1:B:334:HIS:CG	1:B:403:ARG:NH2	2.37	0.91
1:A:293:ASN:OD1	1:A:294:PRO:HD2	1.70	0.91
1:B:334:HIS:ND1	1:B:403:ARG:NH2	2.20	0.88
1:A:467:SER:CB	1:A:468:PRO:HD2	2.04	0.87
1:B:400:TYR:HE1	1:B:590:PRO:HB3	1.41	0.85
1:B:458:PHE:CE1	1:B:535:PRO:O	2.30	0.84
1:B:545:LEU:HD12	1:B:545:LEU:O	1.87	0.75
1:B:169:VAL:HG11	1:B:232:LEU:HB3	1.68	0.74
1:A:551:CYS:HA	1:A:554:ARG:HH11	1.51	0.74
1:B:400:TYR:CE1	1:B:590:PRO:HB3	2.23	0.73
1:B:667:PHE:HD1	1:B:669:LYS:H	1.37	0.73
1:A:237:ARG:NH2	1:A:699:GLU:OE2	2.23	0.72
1:B:468:PRO:HA	1:B:534:HIS:CE1	2.21	0.72
1:B:196:LEU:HD21	1:B:294:PRO:HB2	1.72	0.71
1:B:536:ALA:HB1	1:B:537:PRO:HD2	1.73	0.71
1:A:218:ASN:N	1:A:218:ASN:OD1	2.24	0.71
1:B:623:TYR:CD2	1:B:628:VAL:HG12	2.25	0.70
1:A:293:ASN:HB3	1:A:296:VAL:HG22	1.71	0.70
1:B:592:ARG:NH1	1:B:657:ASP:OD2	2.24	0.70
1:B:682:PRO:HG2	1:B:685:LEU:HD23	1.74	0.70
1:B:392:LYS:HA	1:B:642:GLY:HA3	1.73	0.69
1:A:539:HIS:O	1:B:554:ARG:NH2	2.24	0.69
1:A:403:ARG:O	1:A:412:THR:HG21	1.93	0.68
1:B:200:TYR:H	1:B:226:ARG:HH12	1.42	0.68
1:A:287:ASP:O	1:A:292:LYS:N	2.27	0.67
1:B:689:VAL:O	1:B:693:ASN:ND2	2.28	0.67
1:A:682:PRO:HD2	1:A:685:LEU:HD23	1.77	0.66
1:B:378:GLU:HG3	1:B:389:ILE:HD13	1.77	0.66
1:B:596:VAL:HG21	1:B:636:LEU:HD21	1.78	0.66
1:B:540:ILE:C	1:B:540:ILE:HD12	2.16	0.65
1:A:470:ASP:CB	1:B:432:ARG:HH22	2.09	0.65
1:A:158:PRO:HG3	1:A:699:GLU:HG2	1.79	0.65
1:A:558:GLU:OE1	1:B:539:HIS:HE1	1.80	0.65
1:B:169:VAL:HG11	1:B:232:LEU:HA	1.78	0.64
1:A:592:ARG:NH1	1:A:657:ASP:OD2	2.31	0.64
1:B:468:PRO:CA	1:B:534:HIS:CE1	2.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:169:VAL:HG11	1:B:232:LEU:CB	2.29	0.63
1:A:322:GLN:HA	1:A:371:THR:O	1.99	0.63
1:B:228:LEU:O	1:B:232:LEU:CG	2.47	0.63
1:A:411:ILE:H	1:A:411:ILE:HD12	1.64	0.62
1:B:231:LEU:O	1:B:235:THR:HG22	1.99	0.62
1:A:402:ASP:OD1	1:A:588:GLN:N	2.33	0.62
1:A:161:ARG:NH1	1:A:699:GLU:OE1	2.32	0.61
1:B:197:VAL:HG12	1:B:278:PHE:HZ	1.66	0.61
1:A:309:LEU:HD23	1:A:309:LEU:H	1.66	0.60
1:B:678:ILE:HD12	1:B:678:ILE:H	1.66	0.60
1:A:306:VAL:HG13	1:A:359:GLN:HA	1.84	0.60
1:B:519:HIS:NE2	1:B:525:SER:HB3	2.17	0.60
1:A:275:GLU:HB3	1:A:295:MET:HE3	1.84	0.59
1:A:555:TRP:NE1	1:B:539:HIS:NE2	2.49	0.59
1:B:587:ILE:O	1:B:587:ILE:HG22	2.00	0.59
1:B:200:TYR:O	1:B:226:ARG:NH1	2.35	0.59
1:B:303:PHE:O	1:B:317:THR:HA	2.02	0.59
1:B:392:LYS:NZ	1:B:644:TYR:OH	2.23	0.59
1:B:534:HIS:N	1:B:535:PRO:HD2	2.18	0.59
1:B:306:VAL:CG1	1:B:360:GLU:H	2.15	0.59
1:A:684:ASP:OD2	1:A:684:ASP:N	2.35	0.59
1:B:622:LYS:HB3	1:B:629:THR:HG23	1.85	0.58
1:B:169:VAL:HG11	1:B:232:LEU:CA	2.34	0.58
1:A:558:GLU:OE1	1:B:539:HIS:CE1	2.57	0.58
1:B:169:VAL:CG1	1:B:232:LEU:HB3	2.34	0.57
1:B:174:VAL:H	1:B:177:THR:HG22	1.68	0.57
1:B:619:ARG:NH1	1:B:631:SER:O	2.37	0.57
1:A:250:LYS:O	1:A:250:LYS:HG2	2.04	0.57
1:B:302:ARG:HA	1:B:318:GLU:O	2.04	0.57
1:B:540:ILE:O	1:B:540:ILE:HG23	2.04	0.57
1:B:633:TRP:O	1:B:637:VAL:HG13	2.05	0.57
1:B:271:LEU:O	1:B:275:GLU:HG2	2.04	0.56
1:A:426:LEU:HD11	1:A:570:ILE:HG23	1.87	0.56
1:B:611:TYR:CG	1:B:636:LEU:HD23	2.40	0.56
1:A:247:GLU:OE2	1:A:247:GLU:HA	2.03	0.56
1:B:298:LEU:HA	1:B:368:PRO:HD2	1.88	0.56
1:B:416:ARG:O	1:B:419:ILE:HG12	2.05	0.56
1:B:190:LEU:HD21	1:B:369:VAL:HG11	1.88	0.56
1:B:302:ARG:N	1:B:320:PHE:HE2	2.02	0.56
1:B:368:PRO:O	1:B:591:TYR:HE2	1.88	0.56
1:B:302:ARG:CG	1:B:317:THR:HB	2.36	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:558:GLU:CD	1:B:539:HIS:HE1	2.09	0.55
1:B:411:ILE:O	1:B:415:LYS:N	2.38	0.55
1:B:668:ASN:ND2	1:B:671:THR:OG1	2.33	0.55
1:B:169:VAL:HG21	1:B:235:THR:CG2	2.36	0.55
1:A:416:ARG:O	1:A:419:ILE:HG12	2.06	0.55
1:A:551:CYS:HA	1:A:554:ARG:NH1	2.21	0.55
1:B:628:VAL:O	1:B:628:VAL:HG23	2.07	0.55
1:A:275:GLU:HB3	1:A:295:MET:CE	2.37	0.54
1:B:334:HIS:CD2	1:B:403:ARG:HH22	2.22	0.54
1:A:327:VAL:HG21	1:A:376:ARG:HG2	1.89	0.54
1:B:188:PHE:HB2	1:B:229:PHE:CE1	2.43	0.54
1:A:235:THR:OG1	1:A:237:ARG:HG3	2.07	0.53
1:A:439:TYR:CG	1:A:448:LEU:HD12	2.44	0.53
1:B:306:VAL:HG13	1:B:359:GLN:HA	1.90	0.53
1:A:220:PRO:O	1:A:223:ARG:HG3	2.08	0.53
1:A:656:ASN:OD1	1:A:658:LYS:N	2.38	0.53
1:B:463:PRO:CG	1:B:540:ILE:HG21	2.38	0.53
1:A:320:PHE:CG	1:A:320:PHE:O	2.62	0.53
1:B:158:PRO:HD2	1:B:161:ARG:HB3	1.91	0.53
1:B:637:VAL:O	1:B:641:PHE:HB2	2.09	0.53
1:B:426:LEU:HD21	1:B:570:ILE:HG23	1.92	0.52
1:A:448:LEU:HD22	1:A:559:ILE:HG13	1.92	0.52
1:A:572:ARG:O	1:A:576:THR:HG23	2.09	0.52
1:B:323:TYR:HD1	1:B:324:PRO:HD2	1.74	0.52
1:A:406:HIS:O	1:A:406:HIS:ND1	2.43	0.52
1:B:334:HIS:CE1	1:B:403:ARG:NH2	2.78	0.52
1:B:163:ARG:HB2	1:B:237:ARG:C	2.29	0.52
1:A:432:ARG:NH2	1:B:469:VAL:HA	2.25	0.51
1:B:306:VAL:O	1:B:359:GLN:HB2	2.10	0.51
1:B:403:ARG:O	1:B:412:THR:HG21	2.11	0.51
1:B:197:VAL:HG12	1:B:278:PHE:CZ	2.46	0.51
1:A:306:VAL:CG1	1:A:360:GLU:H	2.24	0.51
1:B:684:ASP:OD2	1:B:684:ASP:N	2.41	0.51
1:A:366:LEU:HD13	1:A:591:TYR:OH	2.10	0.50
1:A:555:TRP:CD1	1:B:539:HIS:NE2	2.80	0.50
1:A:660:GLN:O	1:A:664:GLN:HG2	2.11	0.50
1:B:640:SER:OG	1:B:649:ALA:HB2	2.12	0.50
1:A:470:ASP:CB	1:B:432:ARG:NH2	2.74	0.50
1:A:457:GLU:OE2	1:B:441:SER:OG	2.22	0.50
1:B:376:ARG:O	1:B:389:ILE:HG12	2.12	0.50
1:B:226:ARG:HE	1:B:685:LEU:HD21	1.77	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:303:PHE:CE2	1:B:320:PHE:HB3	2.46	0.50
1:B:521:PRO:HB2	1:B:522:PHE:CD2	2.46	0.50
1:B:306:VAL:HG22	1:B:307:GLY:H	1.75	0.50
1:B:226:ARG:NE	1:B:685:LEU:HD21	2.27	0.49
1:A:554:ARG:HG3	1:B:539:HIS:NE2	2.27	0.49
1:B:370:LEU:HD23	1:B:401:LEU:HD11	1.94	0.49
1:B:406:HIS:ND1	1:B:406:HIS:O	2.44	0.49
1:A:296:VAL:HA	1:A:300:TYR:CD1	2.47	0.49
1:A:302:ARG:HA	1:A:318:GLU:O	2.12	0.49
1:A:551:CYS:CA	1:A:554:ARG:HH11	2.22	0.49
1:B:612:ILE:HG12	1:B:623:TYR:CE1	2.48	0.49
1:B:296:VAL:HA	1:B:300:TYR:CD1	2.47	0.49
1:B:293:ASN:HB3	1:B:296:VAL:HG22	1.93	0.48
1:B:611:TYR:OH	1:B:639:ASP:OD1	2.30	0.48
1:B:538:ARG:HG3	1:B:539:HIS:ND1	2.28	0.48
1:B:685:LEU:O	1:B:689:VAL:HG23	2.14	0.48
1:A:272:ASP:HA	1:A:275:GLU:OE2	2.12	0.48
1:A:615:HIS:HE1	1:A:655:ILE:HD11	1.79	0.48
1:B:575:ARG:O	1:B:579:LEU:HG	2.13	0.48
1:A:250:LYS:NZ	1:A:250:LYS:CB	2.74	0.48
1:A:408:ASN:OD1	1:A:408:ASN:N	2.46	0.48
1:B:192:GLU:HB2	1:B:662:LEU:HA	1.96	0.48
1:B:298:LEU:O	1:B:369:VAL:HG22	2.13	0.48
1:A:593:LEU:HD13	1:A:654:TYR:CZ	2.49	0.48
1:A:168:PRO:HB2	1:A:628:VAL:HG11	1.96	0.48
1:B:397:GLN:HG2	1:B:633:TRP:CZ3	2.49	0.47
1:B:194:ARG:HA	1:B:197:VAL:HG22	1.96	0.47
1:B:306:VAL:HG12	1:B:360:GLU:H	1.80	0.47
1:B:668:ASN:HD22	1:B:674:PRO:N	2.12	0.47
1:B:303:PHE:CE2	1:B:318:GLU:HB2	2.50	0.47
1:A:665:GLU:HB3	1:A:675:LEU:CB	2.45	0.47
1:B:341:MET:O	1:B:360:GLU:HA	2.14	0.47
1:B:221:PHE:HB2	1:B:248:ILE:CG2	2.44	0.47
1:A:265:GLU:OE2	1:A:265:GLU:HA	2.15	0.47
1:B:462:LYS:O	1:B:536:ALA:CB	2.63	0.47
1:A:448:LEU:O	1:A:451:VAL:HG22	2.15	0.46
1:B:293:ASN:O	1:B:297:GLU:HG2	2.15	0.46
1:A:558:GLU:OE2	1:B:539:HIS:HE1	1.97	0.46
1:A:228:LEU:O	1:A:232:LEU:HG	2.16	0.46
1:A:296:VAL:HA	1:A:300:TYR:HD1	1.80	0.46
1:B:298:LEU:O	1:B:367:PRO:HB2	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:572:ARG:O	1:B:576:THR:HG23	2.15	0.46
1:A:239:TYR:CG	1:A:626:ILE:HG13	2.51	0.46
1:B:239:TYR:CG	1:B:626:ILE:HG13	2.50	0.46
1:B:668:ASN:OD1	1:B:670:GLU:N	2.47	0.46
1:B:591:TYR:CZ	1:B:656:ASN:HB2	2.50	0.46
1:B:439:TYR:CG	1:B:448:LEU:HD12	2.51	0.46
1:B:413:ARG:HA	1:B:416:ARG:HB2	1.97	0.45
1:A:379:PHE:HA	1:A:386:PRO:HA	1.98	0.45
1:B:412:THR:O	1:B:416:ARG:N	2.37	0.45
1:A:623:TYR:CD2	1:A:628:VAL:HG22	2.51	0.45
1:B:306:VAL:HG22	1:B:307:GLY:N	2.31	0.45
1:A:266:PHE:HD1	1:A:266:PHE:HA	1.67	0.45
1:A:548:LEU:HD23	1:A:548:LEU:HA	1.77	0.45
1:A:200:TYR:CE2	1:A:222:MET:HG2	2.51	0.45
1:B:634:GLU:HA	1:B:637:VAL:HG22	1.98	0.45
1:A:298:LEU:O	1:A:367:PRO:HB2	2.17	0.45
1:A:561:ASN:HA	1:A:564:ARG:HG2	1.98	0.45
1:B:302:ARG:N	1:B:320:PHE:CE2	2.84	0.45
1:B:545:LEU:HD12	1:B:545:LEU:C	2.33	0.45
1:B:637:VAL:HA	1:B:641:PHE:CD2	2.51	0.45
1:A:596:VAL:HG21	1:A:636:LEU:HD21	1.99	0.45
1:A:169:VAL:HG22	1:A:239:TYR:HA	1.99	0.45
1:A:227:TYR:HD2	1:A:688:PHE:HD1	1.65	0.44
1:B:403:ARG:HD2	1:B:404:TYR:CZ	2.52	0.44
1:B:638:ARG:O	1:B:644:TYR:HB2	2.17	0.44
1:A:337:LEU:HD23	1:A:337:LEU:HA	1.77	0.44
1:A:613:PHE:CE1	1:A:618:SER:HA	2.52	0.44
1:B:634:GLU:O	1:B:637:VAL:HG22	2.17	0.44
1:A:306:VAL:HA	1:A:314:PHE:O	2.17	0.44
1:B:637:VAL:HG12	1:B:641:PHE:CE2	2.51	0.44
1:A:573:ILE:O	1:A:577:ILE:HG13	2.17	0.44
1:A:419:ILE:HA	1:A:422:LEU:HB2	1.99	0.44
1:B:360:GLU:HG3	1:B:362:TRP:HE1	1.82	0.44
1:A:597:LEU:HD13	1:A:651:CYS:HB3	2.00	0.44
1:B:237:ARG:HE	1:B:696:PHE:CB	2.30	0.44
1:A:303:PHE:CE2	1:A:320:PHE:HB3	2.53	0.44
1:B:686:ARG:O	1:B:690:GLU:HG3	2.17	0.44
1:B:427:THR:O	1:B:431:GLN:HG3	2.18	0.43
1:A:223:ARG:O	1:A:227:TYR:HD1	2.00	0.43
1:A:535:PRO:HG3	1:B:435:ARG:HB3	1.99	0.43
1:B:360:GLU:HG3	1:B:362:TRP:NE1	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:193:PHE:HE1	1:A:295:MET:SD	2.40	0.43
1:B:656:ASN:OD1	1:B:658:LYS:N	2.49	0.43
1:A:685:LEU:HD21	2:A:803:HOH:O	2.17	0.43
1:A:394:GLU:HA	1:A:641:PHE:CE1	2.54	0.43
1:A:519:HIS:NE2	1:A:525:SER:HB3	2.34	0.43
1:A:369:VAL:HG22	1:A:655:ILE:HG22	2.01	0.43
1:A:171:LEU:HD12	1:A:181:SER:HA	2.00	0.43
1:A:534:HIS:N	1:A:535:PRO:HD2	2.34	0.43
1:B:231:LEU:O	1:B:235:THR:CG2	2.66	0.43
1:B:323:TYR:OH	1:B:341:MET:HG2	2.19	0.43
1:A:683:PRO:HA	1:A:686:ARG:HB3	2.01	0.42
1:B:376:ARG:HD2	1:B:389:ILE:O	2.19	0.42
1:B:462:LYS:HE3	1:B:530:ASP:O	2.19	0.42
1:A:394:GLU:HG2	1:A:641:PHE:CE1	2.54	0.42
1:A:425:TYR:HE1	1:A:429:LEU:HD11	1.85	0.42
1:A:538:ARG:HH12	1:B:562:ASP:CG	2.22	0.42
1:B:591:TYR:CE2	1:B:656:ASN:HB2	2.54	0.42
1:A:191:LEU:HD23	1:A:665:GLU:HG2	2.00	0.42
1:A:276:ASP:O	1:A:280:MET:HG3	2.19	0.42
1:A:551:CYS:HB2	1:A:555:TRP:CZ3	2.54	0.42
1:B:324:PRO:HA	1:B:373:GLU:HB3	2.00	0.42
1:B:551:CYS:HB3	1:B:555:TRP:CZ3	2.54	0.42
1:A:227:TYR:HD2	1:A:688:PHE:CD1	2.38	0.42
1:B:296:VAL:HA	1:B:300:TYR:HD1	1.85	0.42
1:B:448:LEU:O	1:B:451:VAL:HG22	2.19	0.42
1:B:683:PRO:HA	1:B:686:ARG:HB3	2.01	0.42
1:A:270:LEU:O	1:A:274:LEU:HG	2.19	0.42
1:A:611:TYR:OH	1:A:639:ASP:OD1	2.27	0.42
1:B:425:TYR:HE1	1:B:429:LEU:HD11	1.84	0.42
1:B:171:LEU:HD12	1:B:181:SER:HA	2.02	0.42
1:B:193:PHE:O	1:B:197:VAL:HG13	2.19	0.42
1:B:158:PRO:HB2	1:B:159:TYR:H	1.61	0.42
1:B:163:ARG:HB2	1:B:237:ARG:O	2.20	0.42
1:A:394:GLU:HG2	1:A:641:PHE:HE1	1.85	0.41
1:B:468:PRO:HB3	1:B:534:HIS:CE1	2.54	0.41
1:B:306:VAL:HG11	1:B:360:GLU:HG2	2.01	0.41
1:B:228:LEU:HD12	1:B:228:LEU:HA	1.90	0.41
1:B:270:LEU:HG	1:B:271:LEU:HD13	2.02	0.41
1:A:240:VAL:HG22	1:A:241:ASP:H	1.85	0.41
1:A:408:ASN:HB3	1:A:586:MET:HE1	2.03	0.41
1:A:541:THR:O	1:A:544:GLU:HG2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:611:TYR:CG	1:A:636:LEU:HD23	2.55	0.41
1:B:306:VAL:CG2	1:B:307:GLY:H	2.33	0.41
1:A:196:LEU:HD21	1:A:294:PRO:HB2	2.02	0.41
1:B:193:PHE:HE1	1:B:295:MET:SD	2.44	0.41
1:B:221:PHE:HB2	1:B:248:ILE:HG21	2.01	0.41
1:B:320:PHE:O	1:B:320:PHE:CD1	2.73	0.41
1:B:462:LYS:CE	1:B:530:ASP:O	2.68	0.41
1:B:380:ASN:O	1:B:384:GLY:N	2.52	0.41
1:B:440:GLY:O	1:B:445:ARG:NH1	2.54	0.41
1:B:463:PRO:HG3	1:B:540:ILE:HG21	2.02	0.41
1:B:582:SER:O	1:B:582:SER:OG	2.38	0.41
1:A:589:VAL:HG13	1:A:589:VAL:O	2.20	0.41
1:A:674:PRO:HB2	1:A:675:LEU:H	1.68	0.41
1:B:191:LEU:CD2	1:B:663:ILE:O	2.69	0.41
1:B:597:LEU:HD13	1:B:651:CYS:HB3	2.02	0.41
1:A:552:LEU:HD23	1:A:552:LEU:HA	1.83	0.40
1:A:188:PHE:HB2	1:A:229:PHE:CE1	2.55	0.40
1:A:554:ARG:HG3	1:B:539:HIS:HE2	1.85	0.40
1:A:667:PHE:HA	1:A:674:PRO:HA	2.03	0.40
1:A:693:ASN:O	1:A:697:GLU:HG2	2.21	0.40
1:B:392:LYS:O	1:B:392:LYS:HG3	2.21	0.40
1:B:403:ARG:HD2	1:B:404:TYR:CE2	2.56	0.40
1:B:638:ARG:HA	1:B:644:TYR:HD1	1.87	0.40
1:A:638:ARG:HA	1:A:644:TYR:HD1	1.86	0.40
1:B:200:TYR:CE2	1:B:222:MET: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	451/560 (80%)	433 (96%)	17 (4%)	1 (0%)	47 76

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	449/560 (80%)	428 (95%)	20 (4%)	1 (0%)	47	76
All	All	900/1120 (80%)	861 (96%)	37 (4%)	2 (0%)	47	76

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	467	SER
1	B	590	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	344/507 (68%)	319 (93%)	25 (7%)	14	37
1	B	348/507 (69%)	311 (89%)	37 (11%)	6	19
All	All	692/1014 (68%)	630 (91%)	62 (9%)	9	27

All (62) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	189	ASN
1	A	218	ASN
1	A	223	ARG
1	A	247	GLU
1	A	249	LEU
1	A	250	LYS
1	A	260	GLN
1	A	266	PHE
1	A	275	GLU
1	A	320	PHE
1	A	322	GLN
1	A	323	TYR
1	A	326	GLN
1	A	366	LEU

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Mol	Chain	Res	Type
1	A	406	HIS
1	A	408	ASN
1	A	418	GLU
1	A	554	ARG
1	A	556	ARG
1	A	640	SER
1	A	657	ASP
1	A	666	GLU
1	A	681	LEU
1	A	685	LEU
1	A	686	ARG
1	B	163	ARG
1	B	169	VAL
1	B	189	ASN
1	B	190	LEU
1	B	233	VAL
1	B	243	SER
1	B	248	ILE
1	B	266	PHE
1	B	271	LEU
1	B	275	GLU
1	B	279	GLN
1	B	295	MET
1	B	319	MET
1	B	323	TYR
1	B	327	VAL
1	B	403	ARG
1	B	406	HIS
1	B	409	ARG
1	B	432	ARG
1	B	441	SER
1	B	470	ASP
1	B	519	HIS
1	B	527	ILE
1	B	534	HIS
1	B	539	HIS
1	B	540	ILE
1	B	542	GLU
1	B	556	ARG
1	B	580	MET
1	B	602	GLN
1	B	613	PHE

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Mol	Chain	Res	Type
1	B	621	MET
1	B	629	THR
1	B	657	ASP
1	B	667	PHE
1	B	681	LEU
1	B	688	PHE

Sometimes 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 monosaccharides 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	465/560 (83%)	0.24	21 (4%) 33 32	39, 77, 114, 144	0
1	B	463/560 (82%)	0.22	17 (3%) 41 40	36, 78, 111, 136	0
All	All	928/1120 (82%)	0.23	38 (4%) 37 36	36, 78, 112, 144	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	530	ASP	4.4
1	A	626	ILE	4.3
1	A	221	PHE	4.2
1	B	465	CYS	3.8
1	A	261	GLN	3.6
1	B	184	ILE	3.6
1	B	521	PRO	3.4
1	A	531	LEU	3.3
1	A	530	ASP	3.2
1	B	522	PHE	3.2
1	B	221	PHE	3.2
1	A	227	TYR	3.2
1	A	603	ALA	2.9
1	B	227	TYR	2.9
1	A	260	GLN	2.8
1	A	193	PHE	2.8
1	A	169	VAL	2.8
1	A	184	ILE	2.8
1	A	377	PHE	2.8
1	B	552	LEU	2.7
1	B	180	PHE	2.6
1	A	521	PRO	2.5
1	A	187	LEU	2.5
1	A	529	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	193	PHE	2.5
1	B	626	ILE	2.4
1	B	169	VAL	2.4
1	A	374	LEU	2.4
1	A	304	LEU	2.4
1	A	672	GLY	2.3
1	B	300	TYR	2.2
1	A	300	TYR	2.1
1	B	187	LEU	2.1
1	B	652	LEU	2.1
1	B	650	TYR	2.1
1	B	299	PHE	2.1
1	A	366	LEU	2.0
1	A	225	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.