Full wwPDB X-ray Structure Validation Report ⓘ

Dec 16, 2023 – 10:19 pm GMT

PDB ID : 2XWU
Title : CRYSTAL STRUCTURE OF IMPORTIN 13 - UBC9 COMPLEX
Authors : Gruenwald, M.; Bono, F.
Deposited on : 2010-11-05
Resolution : 2.80 Å(reported)

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

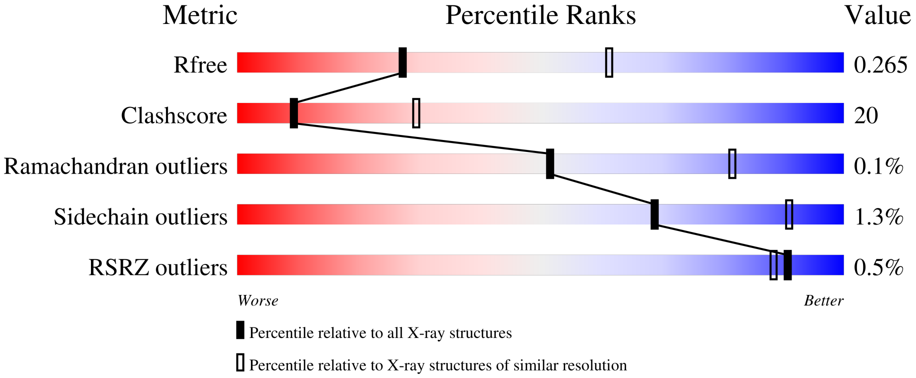
MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation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

1 Overall quality at a glance ⓘ

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

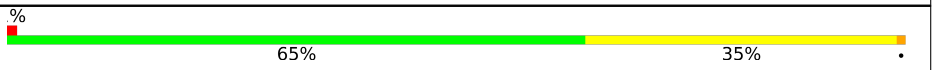
The reported resolution of this entry is 2.80 Å.

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	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	158	
2	B	963	

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 8134 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 SUMO-CONJUGATING ENZYME UBC9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	158	1226	787	210	221	8	0	0	0

- Molecule 2 is a protein called IMPORTIN13.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	911	6872	4458	1132	1239	43	0	0	1

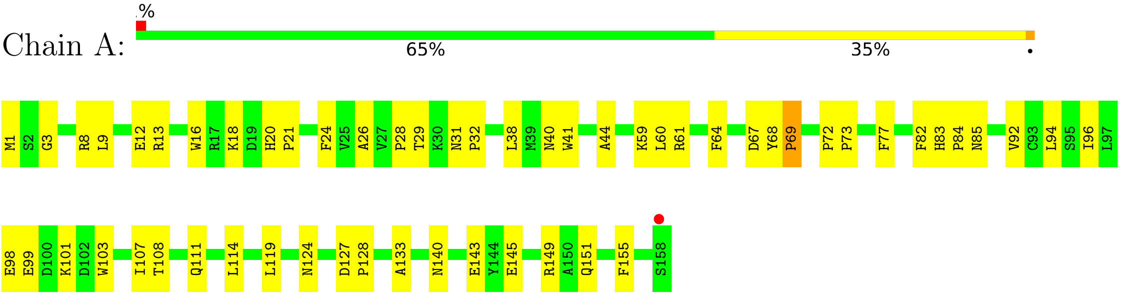
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	5	5	5	0	0
3	B	31	31	31	0	0

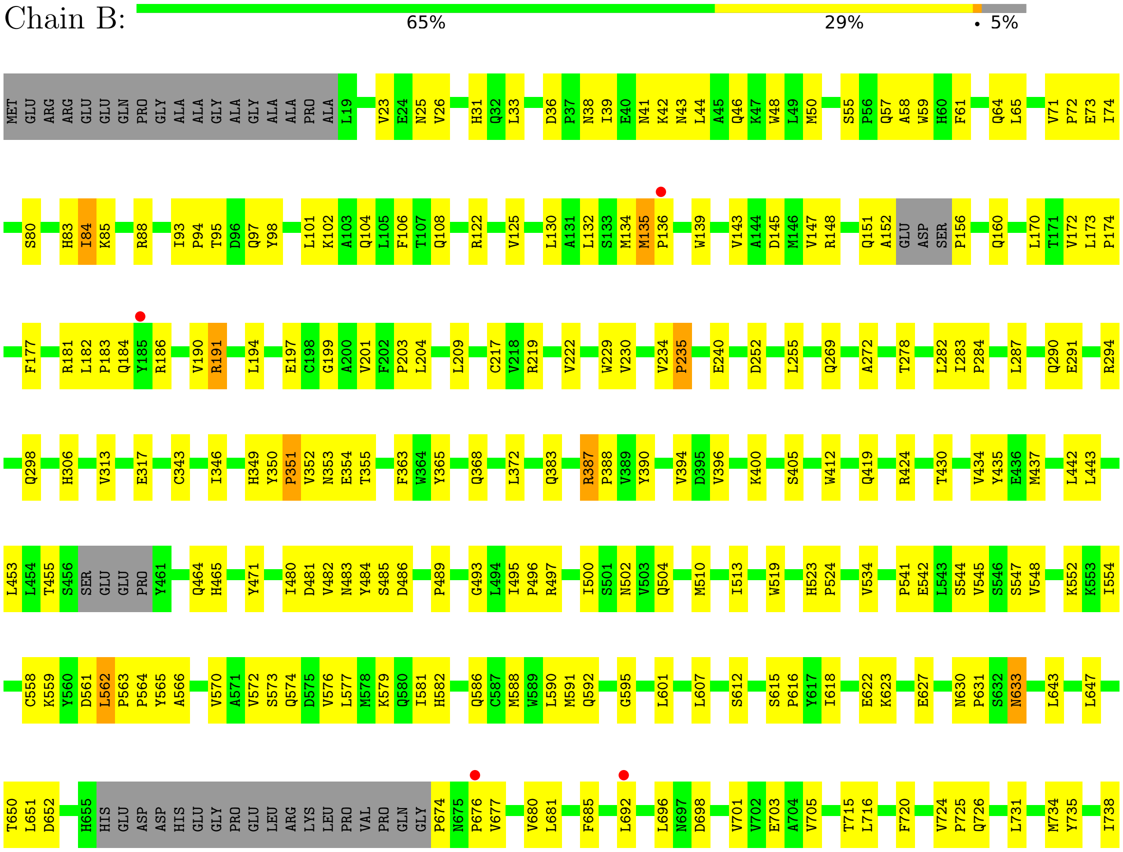
3 Residue-property plots

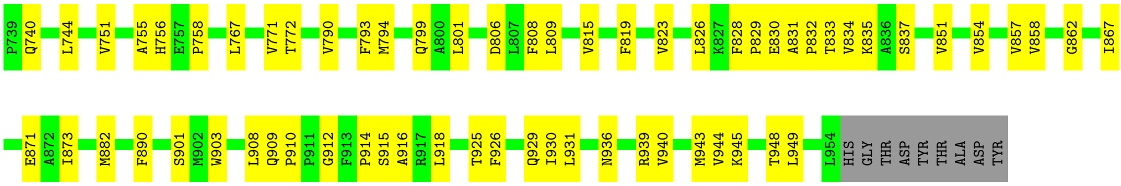
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: SUMO-CONJUGATING ENZYME UBC9



- Molecule 2: IMPORTIN13




P739
Q740
L744
V751
A755
H756
E757
P758
L767
V771
T772
V790
F793
M794
Q799
A800
L801
D806
L807
F808
L809
V815
F819
V823
L826
K827
F828
P829
E830
A831
P832
T833
V834
K835
A836
S837
V851
V854
V857
V858
G862
I867
E871
A872
I873
M882
F890
S901
M902
W903
L908
Q909
P910
P911
G912
F913
P914
S915
A916
R917
L918
T925
F926
Q929
I930
L931
N936
R939
V940
M943
V944
K945
T948
L949
L954
HIS
GLY
THR
ASP
TYR
THR
ALA
ASP
TYR

4 Data and refinement statistics

Property	**Value**	**Source**
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	68.70Å 126.80Å 184.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.17 – 2.80 45.17 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.4 (45.17-2.80) 99.5 (45.17-2.80)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.61 (at 2.81Å)	Xtriage
Refinement program	CNS 1.2	Depositor
R, R_{free}	0.226 , 0.268 0.225 , 0.265	Depositor DCC
R_{free} test set	2004 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	63.9	Xtriage
Anisotropy	0.024	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 60.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	8134	wwPDB-VP
Average B, all atoms (Å^2)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.74% 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 ⓘ

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	0.47	0/1263	0.67	0/1722
2	B	0.51	2/7026 (0.0%)	0.67	1/9605 (0.0%)
All	All	0.51	2/8289 (0.0%)	0.67	1/11327 (0.0%)

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
2	B	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	565	TYR	CD1-CE1	-10.55	1.23	1.39
2	B	565	TYR	CD2-CE2	-10.50	1.23	1.39

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	156	PRO	N-CA-CB	6.17	110.70	103.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	365	TYR	Sidechain
2	B	484	TYR	Sidechain

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	1226	0	1165	53	0
2	B	6872	0	6671	269	0
3	A	5	0	0	0	0
3	B	31	0	0	2	0
All	All	8134	0	7836	316	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 (316) 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)
2:B:383:GLN:HE21	2:B:387:ARG:HG3	1.07	1.13
1:A:18:LYS:HD3	2:B:317:GLU:HG2	1.27	1.12
2:B:186:ARG:HH12	2:B:190:VAL:HG23	1.23	1.01
2:B:623:LYS:O	2:B:627:GLU:HG3	1.65	0.97
2:B:125:VAL:HG22	2:B:172:VAL:HG11	1.47	0.96
2:B:186:ARG:NH1	2:B:190:VAL:HG23	1.80	0.95
1:A:85:ASN:HD22	1:A:119:LEU:HD11	1.25	0.95
2:B:173:LEU:HB3	2:B:174:PRO:HD3	1.48	0.95
2:B:873:ILE:HA	2:B:882:MET:HE1	1.50	0.92
2:B:230:VAL:HG13	2:B:269:GLN:HE21	1.35	0.92
2:B:183:PRO:HD2	2:B:186:ARG:HB3	1.52	0.91
1:A:85:ASN:HD21	1:A:124:ASN:H	1.15	0.90
1:A:85:ASN:ND2	1:A:119:LEU:HD11	1.88	0.89
2:B:349:HIS:H	2:B:353:ASN:HD22	1.16	0.89
2:B:383:GLN:NE2	2:B:387:ARG:HG3	1.87	0.89
2:B:209:LEU:HD11	2:B:222:VAL:HG11	1.56	0.86
2:B:562:LEU:N	2:B:563:PRO:CD	2.40	0.85
1:A:18:LYS:CD	2:B:317:GLU:HG2	2.07	0.84
2:B:143:VAL:O	2:B:147:VAL:HG23	1.78	0.84
2:B:209:LEU:CD1	2:B:222:VAL:HG11	2.07	0.83
2:B:562:LEU:N	2:B:563:PRO:HD3	1.94	0.83
2:B:343:CYS:HA	2:B:346:ILE:HG13	1.59	0.82
2:B:480:ILE:HG22	2:B:481:ASP:O	1.81	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:685:PHE:CZ	2:B:726:GLN:HB3	2.16	0.80
2:B:500:ILE:HG22	2:B:500:ILE:O	1.82	0.80
2:B:652:ASP:HA	2:B:715:THR:HG23	1.64	0.80
2:B:724:VAL:HB	2:B:725:PRO:HD3	1.63	0.79
2:B:135:MET:HB2	2:B:136:PRO:HA	1.63	0.79
2:B:566:ALA:O	2:B:570:VAL:HG23	1.82	0.79
2:B:926:PHE:CZ	2:B:930:ILE:HD11	2.16	0.79
2:B:125:VAL:HG22	2:B:172:VAL:CG1	2.13	0.78
2:B:716:LEU:HD12	2:B:720:PHE:HD1	1.50	0.77
2:B:541:PRO:HD3	2:B:581:ILE:HG23	1.67	0.75
2:B:815:VAL:HG12	2:B:857:VAL:HG21	1.68	0.75
2:B:102:LYS:HG2	2:B:106:PHE:HE1	1.51	0.75
2:B:676:PRO:O	2:B:680:VAL:HG23	1.85	0.75
2:B:873:ILE:HG12	2:B:882:MET:HE3	1.70	0.72
2:B:186:ARG:HH12	2:B:190:VAL:CG2	2.02	0.72
2:B:219:ARG:HD3	2:B:255:LEU:HD21	1.72	0.72
1:A:13:ARG:NH1	1:A:28:PRO:HD2	2.05	0.71
2:B:486:ASP:O	2:B:489:PRO:HD2	1.89	0.71
2:B:93:ILE:HD13	2:B:101:LEU:HD22	1.72	0.71
2:B:573:SER:HB3	2:B:590:LEU:HD21	1.73	0.71
1:A:13:ARG:HH12	1:A:28:PRO:HD2	1.55	0.70
2:B:502:ASN:ND2	2:B:504:GLN:H	1.89	0.70
2:B:125:VAL:CG2	2:B:172:VAL:HG11	2.22	0.69
2:B:390:TYR:O	2:B:394:VAL:HG23	1.93	0.69
2:B:819:PHE:O	2:B:823:VAL:HG23	1.91	0.69
2:B:744:LEU:HD23	2:B:771:VAL:HG11	1.74	0.68
2:B:343:CYS:HA	2:B:346:ILE:CG1	2.23	0.68
2:B:576:VAL:HG11	2:B:582:HIS:CE1	2.29	0.68
2:B:851:VAL:HG13	2:B:854:VAL:HB	1.76	0.68
1:A:85:ASN:ND2	1:A:124:ASN:H	1.91	0.68
1:A:40:ASN:HD21	1:A:61:ARG:NH1	1.91	0.68
2:B:495:ILE:HB	2:B:496:PRO:HD3	1.75	0.68
2:B:23:VAL:HG21	2:B:64:GLN:CB	2.24	0.67
2:B:102:LYS:HG2	2:B:106:PHE:CE1	2.28	0.67
1:A:94:LEU:HD13	1:A:119:LEU:HD22	1.77	0.66
2:B:240:GLU:HG2	2:B:278:THR:HG23	1.77	0.66
2:B:794:MET:HE3	2:B:837:SER:HA	1.77	0.66
2:B:799:GLN:HE21	2:B:799:GLN:HA	1.60	0.66
2:B:209:LEU:HD11	2:B:222:VAL:CG1	2.25	0.65
2:B:724:VAL:HB	2:B:725:PRO:CD	2.26	0.65
2:B:502:ASN:ND2	2:B:504:GLN:HB3	2.11	0.64

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Atom-1	**Atom-2**	**Interatomic distance (Å)**	**Clash overlap (Å)**
2:B:574:GLN:HE22	2:B:612:SER:HB3	1.62	0.64
2:B:751:VAL:O	2:B:755:ALA:HB2	1.96	0.64
2:B:38:ASN:HD22	2:B:41:ASN:ND2	1.95	0.64
2:B:177:PHE:CZ	2:B:191:ARG:HG2	2.32	0.64
2:B:368:GLN:O	2:B:372:LEU:HD22	1.98	0.62
2:B:563:PRO:HB2	2:B:564:PRO:HD3	1.81	0.62
2:B:586:GLN:N	2:B:586:GLN:OE1	2.33	0.62
2:B:873:ILE:HA	2:B:882:MET:CE	2.26	0.62
1:A:85:ASN:HD21	1:A:124:ASN:N	1.93	0.61
2:B:94:PRO:HG2	2:B:97:GLN:HG2	1.81	0.61
2:B:130:LEU:C	2:B:130:LEU:HD23	2.20	0.61
2:B:630:ASN:HB3	2:B:631:PRO:HD2	1.82	0.61
2:B:618:ILE:O	2:B:622:GLU:HG3	2.01	0.61
2:B:630:ASN:HB2	2:B:633:ASN:HB2	1.83	0.61
2:B:738:ILE:HG23	2:B:738:ILE:O	2.01	0.60
2:B:387:ARG:N	2:B:388:PRO:CD	2.65	0.60
2:B:183:PRO:HD2	2:B:186:ARG:CB	2.28	0.60
2:B:799:GLN:HA	2:B:799:GLN:NE2	2.17	0.59
2:B:387:ARG:N	2:B:388:PRO:HD2	2.17	0.59
2:B:485:SER:O	2:B:489:PRO:HD3	2.03	0.59
2:B:744:LEU:HD23	2:B:771:VAL:CG1	2.33	0.59
1:A:64:PHE:CD2	1:A:73:PRO:HB3	2.38	0.59
1:A:21:PRO:HB2	1:A:24:PHE:CD1	2.38	0.59
2:B:652:ASP:HA	2:B:715:THR:CG2	2.32	0.58
1:A:127:ASP:HB2	3:B:2001:HOH:O	2.03	0.58
1:A:140:ASN:ND2	1:A:143:GLU:HB2	2.19	0.58
2:B:570:VAL:O	2:B:574:GLN:HG3	2.03	0.58
2:B:731:LEU:HA	2:B:734:MET:HE3	1.84	0.58
2:B:510:MET:HE2	2:B:547:SER:HA	1.86	0.58
2:B:343:CYS:CA	2:B:346:ILE:HG13	2.33	0.57
2:B:545:VAL:HG22	2:B:586:GLN:HE21	1.69	0.57
2:B:209:LEU:HD13	2:B:222:VAL:HG11	1.86	0.57
2:B:524:PRO:HG3	2:B:561:ASP:OD2	2.04	0.57
2:B:368:GLN:HA	2:B:437:MET:HE3	1.87	0.57
2:B:186:ARG:NH1	2:B:190:VAL:CG2	2.63	0.57
2:B:510:MET:HE1	2:B:534:VAL:HA	1.87	0.57
2:B:930:ILE:HA	2:B:943:MET:HE1	1.85	0.57
2:B:46:GLN:O	2:B:50:MET:HG3	2.05	0.57
2:B:294:ARG:O	2:B:298:GLN:HG3	2.05	0.57
2:B:58:ALA:HA	2:B:61:PHE:CE2	2.40	0.56
2:B:692:LEU:O	2:B:696:LEU:HB2	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:80:SER:HA	2:B:122:ARG:HD2	1.86	0.56
2:B:201:VAL:HG21	2:B:229:TRP:CZ2	2.40	0.56
2:B:55:SER:HB2	2:B:57:GLN:OE1	2.06	0.56
2:B:130:LEU:HD21	2:B:134:MET:SD	2.45	0.56
2:B:651:LEU:O	2:B:715:THR:HG21	2.06	0.56
1:A:72:PRO:HD2	1:A:99:GLU:HB2	1.89	0.55
1:A:72:PRO:HB3	1:A:103:TRP:CD2	2.41	0.55
2:B:677:VAL:HB	2:B:716:LEU:HD21	1.87	0.55
2:B:562:LEU:H	2:B:563:PRO:HD3	1.69	0.55
1:A:108:THR:OG1	1:A:111:GLN:HG3	2.07	0.55
2:B:73:GLU:H	2:B:73:GLU:CD	2.09	0.55
2:B:862:GLY:HA3	2:B:903:TRP:CH2	2.42	0.55
2:B:519:TRP:O	2:B:523:HIS:HD2	1.90	0.54
2:B:71:VAL:HG22	2:B:74:ILE:HD12	1.89	0.54
2:B:867:ILE:O	2:B:871:GLU:HG3	2.08	0.54
2:B:317:GLU:OE1	2:B:363:PHE:HA	2.07	0.54
2:B:794:MET:CE	2:B:837:SER:HA	2.37	0.54
2:B:561:ASP:C	2:B:563:PRO:HD2	2.28	0.54
2:B:801:LEU:HG	2:B:808:PHE:CE1	2.43	0.54
1:A:18:LYS:HG3	2:B:313:VAL:HG12	1.90	0.54
2:B:677:VAL:O	2:B:681:LEU:HG	2.07	0.54
2:B:23:VAL:CG2	2:B:64:GLN:HB2	2.37	0.54
2:B:23:VAL:HG21	2:B:64:GLN:HB3	1.89	0.54
2:B:430:THR:O	2:B:434:VAL:HG23	2.08	0.53
2:B:453:LEU:HD12	2:B:465:HIS:ND1	2.23	0.53
2:B:929:GLN:HB3	2:B:943:MET:HE3	1.90	0.53
1:A:20:HIS:O	2:B:306:HIS:HE1	1.91	0.53
1:A:72:PRO:HD3	1:A:103:TRP:CD1	2.44	0.53
2:B:39:ILE:O	2:B:43:ASN:ND2	2.40	0.53
2:B:453:LEU:HD12	2:B:465:HIS:CE1	2.44	0.53
1:A:128:PRO:HG3	2:B:33:LEU:HD11	1.91	0.53
2:B:685:PHE:CE2	2:B:726:GLN:HB3	2.44	0.53
2:B:455:THR:HG22	2:B:497:ARG:HH22	1.73	0.52
2:B:563:PRO:N	2:B:564:PRO:CD	2.73	0.52
2:B:703:GLU:HG3	2:B:740:GLN:OE1	2.08	0.52
1:A:13:ARG:NH1	1:A:28:PRO:CD	2.72	0.52
1:A:107:ILE:HA	1:A:111:GLN:OE1	2.09	0.52
2:B:486:ASP:C	2:B:489:PRO:HD2	2.29	0.52
2:B:835:LYS:NZ	2:B:835:LYS:HB3	2.24	0.52
2:B:485:SER:CB	2:B:519:TRP:HE1	2.23	0.52
2:B:652:ASP:OD1	2:B:652:ASP:O	2.27	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:574:GLN:HE22	2:B:612:SER:CB	2.22	0.52
2:B:806:ASP:OD1	2:B:806:ASP:N	2.42	0.52
2:B:936:ASN:OD1	2:B:939:ARG:N	2.43	0.51
2:B:510:MET:CE	2:B:547:SER:HA	2.40	0.51
1:A:145:GLU:OE2	1:A:149:ARG:NE	2.44	0.51
2:B:576:VAL:HG11	2:B:582:HIS:HE1	1.75	0.51
2:B:278:THR:O	2:B:282:LEU:HD13	2.11	0.51
2:B:23:VAL:HG21	2:B:64:GLN:HB2	1.92	0.51
2:B:493:GLY:O	2:B:496:PRO:HD2	2.11	0.51
2:B:83:HIS:CD2	2:B:125:VAL:HG12	2.45	0.51
1:A:44:ALA:HB2	1:A:59:LYS:HD3	1.93	0.50
2:B:209:LEU:O	2:B:219:ARG:NH2	2.45	0.50
2:B:351:PRO:HA	2:B:354:GLU:O	2.10	0.50
2:B:104:GLN:O	2:B:108:GLN:HG2	2.12	0.50
2:B:80:SER:O	2:B:84:ILE:HD12	2.11	0.50
2:B:651:LEU:O	2:B:651:LEU:HG	2.12	0.50
2:B:349:HIS:H	2:B:353:ASN:ND2	1.98	0.50
2:B:481:ASP:OD1	2:B:482:VAL:N	2.43	0.50
1:A:9:LEU:HD13	1:A:38:LEU:O	2.11	0.50
2:B:912:GLY:HA2	2:B:916:ALA:HA	1.93	0.50
2:B:145:ASP:O	2:B:148:ARG:HG2	2.11	0.49
1:A:40:ASN:HD21	1:A:61:ARG:HH11	1.60	0.49
2:B:945:LYS:O	2:B:949:LEU:HG	2.12	0.49
2:B:579:LYS:HB2	2:B:581:ILE:HG13	1.95	0.49
2:B:744:LEU:CD2	2:B:771:VAL:CG1	2.90	0.49
2:B:278:THR:HG22	2:B:282:LEU:CD1	2.42	0.49
2:B:443:LEU:HD11	2:B:480:ILE:HD13	1.94	0.49
2:B:41:ASN:O	2:B:44:LEU:HB2	2.12	0.49
2:B:65:LEU:HD22	2:B:74:ILE:HG22	1.95	0.49
2:B:563:PRO:CB	2:B:564:PRO:HD3	2.43	0.49
2:B:716:LEU:CD1	2:B:720:PHE:HD1	2.22	0.49
1:A:29:THR:HG21	1:A:40:ASN:ND2	2.27	0.49
2:B:173:LEU:HB3	2:B:174:PRO:CD	2.32	0.49
2:B:561:ASP:C	2:B:563:PRO:CD	2.80	0.49
2:B:830:GLU:O	2:B:834:VAL:HG23	2.12	0.49
2:B:435:TYR:HA	2:B:442:LEU:HD23	1.95	0.49
2:B:349:HIS:N	2:B:353:ASN:HD22	1.98	0.48
2:B:502:ASN:HD22	2:B:504:GLN:HB3	1.77	0.48
1:A:96:ILE:O	1:A:103:TRP:HB2	2.13	0.48
2:B:95:THR:HG22	2:B:98:TYR:CE2	2.49	0.48
2:B:615:SER:N	2:B:616:PRO:HD2	2.29	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:60:LEU:HD12	1:A:60:LEU:C	2.34	0.48
1:A:64:PHE:CE2	1:A:73:PRO:HB3	2.49	0.48
1:A:31:ASN:HB3	1:A:32:PRO:HD2	1.95	0.48
2:B:815:VAL:CG1	2:B:857:VAL:HG21	2.41	0.48
2:B:915:SER:HB3	2:B:918:LEU:HG	1.95	0.48
1:A:72:PRO:HB3	1:A:103:TRP:CG	2.49	0.47
2:B:453:LEU:CD1	2:B:465:HIS:ND1	2.77	0.47
2:B:735:TYR:CE2	2:B:771:VAL:HG13	2.49	0.47
2:B:84:ILE:HG23	2:B:88:ARG:HG3	1.95	0.47
2:B:269:GLN:HB2	2:B:272:ALA:HB2	1.96	0.47
2:B:566:ALA:CB	2:B:601:LEU:HD21	2.44	0.47
2:B:595:GLY:HA3	2:B:650:THR:OG1	2.14	0.47
2:B:930:ILE:HG12	2:B:943:MET:HE2	1.96	0.47
2:B:352:VAL:HG21	2:B:412:TRP:CE2	2.50	0.47
2:B:368:GLN:O	2:B:372:LEU:CD2	2.63	0.47
2:B:607:LEU:HG	2:B:676:PRO:HB3	1.96	0.47
2:B:26:VAL:HA	2:B:48:TRP:HZ3	1.79	0.47
2:B:135:MET:CB	2:B:136:PRO:HA	2.33	0.47
2:B:287:LEU:HD22	2:B:290:GLN:NE2	2.30	0.47
2:B:544:SER:OG	2:B:582:HIS:HD2	1.98	0.47
2:B:576:VAL:HG22	2:B:581:ILE:HD12	1.96	0.47
2:B:588:MET:CE	2:B:643:LEU:HD23	2.44	0.47
2:B:925:THR:O	2:B:929:GLN:HG3	2.15	0.47
2:B:291:GLU:OE1	2:B:291:GLU:HA	2.15	0.47
2:B:351:PRO:HB2	2:B:355:THR:HG22	1.96	0.47
2:B:630:ASN:H	2:B:633:ASN:HB3	1.80	0.47
1:A:1:MET:HG3	1:A:3:GLY:H	1.80	0.46
2:B:36:ASP:O	2:B:42:LYS:HE2	2.15	0.46
2:B:59:TRP:NE1	2:B:85:LYS:HE3	2.31	0.46
2:B:652:ASP:CA	2:B:715:THR:HG23	2.41	0.46
2:B:940:VAL:O	2:B:944:VAL:HG23	2.15	0.46
1:A:67:ASP:OD1	1:A:67:ASP:N	2.43	0.46
2:B:313:VAL:O	2:B:317:GLU:HB3	2.16	0.46
1:A:8:ARG:NH1	1:A:69:PRO:HG3	2.30	0.46
1:A:151:GLN:HG2	1:A:155:PHE:CE2	2.50	0.46
2:B:351:PRO:HG3	2:B:419:GLN:OE1	2.15	0.46
2:B:830:GLU:OE1	2:B:830:GLU:N	2.41	0.46
2:B:31:HIS:CE1	2:B:74:ILE:HD11	2.51	0.46
2:B:147:VAL:HG13	2:B:204:LEU:HD22	1.97	0.46
2:B:424:ARG:HB3	2:B:471:TYR:OH	2.16	0.46
2:B:576:VAL:CG1	2:B:582:HIS:CE1	2.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:806:ASP:O	2:B:809:LEU:HB2	2.16	0.46
2:B:173:LEU:CB	2:B:174:PRO:HD3	2.33	0.46
2:B:591:MET:HE3	2:B:647:LEU:HD13	1.97	0.46
2:B:724:VAL:CB	2:B:725:PRO:CD	2.92	0.46
2:B:826:LEU:HD23	2:B:837:SER:HB3	1.98	0.46
1:A:8:ARG:HG3	1:A:68:TYR:HE2	1.80	0.46
2:B:756:HIS:O	2:B:758:PRO:HD3	2.16	0.46
2:B:544:SER:O	2:B:548:VAL:HG23	2.15	0.45
2:B:23:VAL:HG23	2:B:64:GLN:OE1	2.16	0.45
2:B:453:LEU:C	2:B:453:LEU:HD23	2.37	0.45
2:B:283:ILE:N	2:B:284:PRO:HD2	2.31	0.45
2:B:767:LEU:O	2:B:771:VAL:HG23	2.17	0.45
2:B:601:LEU:HD12	2:B:601:LEU:N	2.32	0.45
2:B:26:VAL:HA	2:B:48:TRP:CZ3	2.51	0.45
2:B:170:LEU:HD22	2:B:201:VAL:HG22	1.99	0.45
2:B:405:SER:HA	2:B:464:GLN:NE2	2.32	0.45
2:B:601:LEU:N	2:B:601:LEU:CD1	2.80	0.45
2:B:130:LEU:CD2	2:B:134:MET:SD	3.05	0.44
2:B:394:VAL:HG22	2:B:434:VAL:HG11	1.99	0.44
2:B:483:ASN:O	2:B:483:ASN:OD1	2.36	0.44
2:B:143:VAL:CG2	2:B:197:GLU:HB3	2.46	0.44
1:A:28:PRO:HG3	1:A:41:TRP:CE2	2.52	0.44
2:B:122:ARG:NH1	3:B:2007:HOH:O	2.50	0.44
2:B:234:VAL:HG22	2:B:235:PRO:HD2	1.98	0.44
2:B:160:GLN:NE2	2:B:217:CYS:SG	2.90	0.44
2:B:890:PHE:HD1	2:B:940:VAL:HG21	1.82	0.44
2:B:854:VAL:O	2:B:858:VAL:HG23	2.17	0.44
2:B:102:LYS:CG	2:B:106:PHE:HE1	2.24	0.43
2:B:588:MET:HE2	2:B:643:LEU:HD23	1.99	0.43
2:B:790:VAL:O	2:B:794:MET:HG2	2.18	0.43
2:B:240:GLU:CG	2:B:278:THR:HG23	2.44	0.43
2:B:93:ILE:HD13	2:B:101:LEU:CD2	2.45	0.43
2:B:240:GLU:HG2	2:B:278:THR:CG2	2.46	0.43
2:B:278:THR:HG22	2:B:282:LEU:HD11	2.01	0.43
2:B:396:VAL:O	2:B:400:LYS:HG2	2.18	0.43
1:A:8:ARG:NE	1:A:12:GLU:OE2	2.49	0.43
2:B:199:GLY:O	2:B:203:PRO:HG2	2.19	0.43
2:B:831:ALA:N	2:B:832:PRO:CD	2.81	0.43
2:B:929:GLN:C	2:B:943:MET:HE1	2.39	0.43
2:B:181:ARG:O	2:B:182:LEU:HD23	2.18	0.43
2:B:685:PHE:CD2	2:B:726:GLN:OE1	2.71	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:68:TYR:CD1	1:A:69:PRO:HA	2.54	0.43
2:B:572:VAL:O	2:B:572:VAL:HG12	2.19	0.43
2:B:698:ASP:HB3	2:B:701:VAL:HB	2.01	0.43
1:A:72:PRO:HD3	1:A:103:TRP:CG	2.54	0.43
2:B:716:LEU:HB2	2:B:720:PHE:HB2	2.01	0.43
2:B:194:LEU:HD12	2:B:194:LEU:HA	1.71	0.42
2:B:901:SER:HA	2:B:931:LEU:CD2	2.49	0.42
1:A:151:GLN:CG	1:A:155:PHE:HE2	2.32	0.42
2:B:143:VAL:HG23	2:B:197:GLU:HB3	2.01	0.42
2:B:828:PHE:HD2	2:B:833:THR:HG21	1.84	0.42
1:A:151:GLN:HG2	1:A:155:PHE:HE2	1.84	0.42
2:B:350:TYR:HA	2:B:351:PRO:HA	1.69	0.42
2:B:455:THR:HG22	2:B:497:ARG:NH2	2.33	0.42
1:A:114:LEU:HA	1:A:114:LEU:HD23	1.78	0.42
1:A:18:LYS:HG3	2:B:313:VAL:CG1	2.48	0.42
2:B:139:TRP:NE1	2:B:145:ASP:OD2	2.43	0.42
2:B:252:ASP:C	2:B:252:ASP:OD1	2.58	0.42
2:B:544:SER:CB	2:B:582:HIS:HD2	2.33	0.42
2:B:558:CYS:O	2:B:559:LYS:C	2.57	0.42
1:A:72:PRO:HB3	1:A:103:TRP:CE3	2.55	0.41
2:B:197:GLU:OE1	2:B:197:GLU:HA	2.20	0.41
2:B:513:ILE:HG22	2:B:554:ILE:HD11	2.01	0.41
2:B:552:LYS:NZ	2:B:592:GLN:OE1	2.43	0.41
2:B:692:LEU:HD11	2:B:705:VAL:HG11	2.01	0.41
2:B:95:THR:HA	2:B:98:TYR:CE2	2.55	0.41
2:B:772:THR:HG23	2:B:793:PHE:HZ	1.85	0.41
2:B:542:GLU:H	2:B:542:GLU:HG2	1.58	0.41
2:B:716:LEU:HD12	2:B:720:PHE:CD1	2.41	0.41
2:B:909:GLN:N	2:B:910:PRO:CD	2.84	0.41
2:B:132:LEU:HA	2:B:135:MET:SD	2.60	0.41
2:B:183:PRO:O	2:B:184:GLN:C	2.58	0.41
2:B:151:GLN:O	2:B:152:ALA:C	2.59	0.41
1:A:77:PHE:CE2	1:A:92:VAL:HG22	2.55	0.41
2:B:929:GLN:O	2:B:943:MET:HE1	2.20	0.41
1:A:83:HIS:HA	1:A:84:PRO:HD3	1.92	0.41
2:B:58:ALA:HA	2:B:61:PHE:CD2	2.56	0.41
2:B:502:ASN:HD22	2:B:504:GLN:H	1.68	0.41
2:B:828:PHE:HA	2:B:829:PRO:HD3	1.88	0.41
2:B:908:LEU:CD2	2:B:914:PRO:HD3	2.51	0.41
2:B:554:ILE:HG22	2:B:562:LEU:HD11	2.03	0.41
2:B:929:GLN:CB	2:B:943:MET:HE3	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:82:PHE:CE1	1:A:133:ALA:HB2	2.56	0.40
2:B:106:PHE:HZ	2:B:139:TRP:CH2	2.39	0.40
2:B:573:SER:O	2:B:577:LEU:HG	2.22	0.40
2:B:945:LYS:O	2:B:948:THR:HG22	2.21	0.40
1:A:16:TRP:CE2	1:A:26:ALA:HB3	2.56	0.40
1:A:98:GLU:HB2	1:A:101:LYS:HB2	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	156/158 (99%)	154 (99%)	2 (1%)	0	100	100
2	B	903/963 (94%)	880 (98%)	22 (2%)	1 (0%)	51	81
All	All	1059/1121 (94%)	1034 (98%)	24 (2%)	1 (0%)	51	81

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	562	LEU

5.3.2 Protein sidechains ⓘ

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	124/137 (90%)	123 (99%)	1 (1%)	81	94
2	B	708/847 (84%)	698 (99%)	10 (1%)	67	90
All	All	832/984 (85%)	821 (99%)	11 (1%)	69	91

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	69	PRO
2	B	25	ASN
2	B	72	PRO
2	B	84	ILE
2	B	135	MET
2	B	191	ARG
2	B	235	PRO
2	B	351	PRO
2	B	387	ARG
2	B	633	ASN
2	B	674	PRO

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

Mol	Chain	Res	Type
1	A	85	ASN
2	B	25	ASN
2	B	38	ASN
2	B	43	ASN
2	B	160	GLN
2	B	269	GLN
2	B	290	GLN
2	B	299	ASN
2	B	306	HIS
2	B	353	ASN
2	B	379	GLN
2	B	383	GLN
2	B	445	ASN
2	B	483	ASN
2	B	502	ASN
2	B	523	HIS
2	B	574	GLN
2	B	582	HIS
2	B	633	ASN

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Mol	Chain	Res	Type
2	B	820	GLN

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, 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	158/158 (100%)	-0.24	1 (0%)	89	86	37, 60, 107, 160	0
2	B	911/963 (94%)	-0.20	4 (0%)	92	91	39, 68, 106, 142	0
All	All	1069/1121 (95%)	-0.20	5 (0%)	91	88	37, 67, 106, 160	0

All (5) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	185	TYR	4.2
2	B	692	LEU	2.7
1	A	158	SER	2.6
2	B	136	PRO	2.3
2	B	676	PRO	2.1

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.