Full wwPDB X-ray Structure Validation Report ⓘ

May 27, 2026 – 12:06 PM EDT

PDB ID	:	9ZBE / pdb_00009zbe
Title	:	Revised structure of a complex between the SNARE Nyv1 and the HOPS Vps33-Vps16 subcomplex
Authors	:	Stanton, A.E.; Jeffrey, P.D.; Baker, R.W.; Hughson, F.M.
Deposited on	:	2025-11-20
Resolution	:	3.05 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:

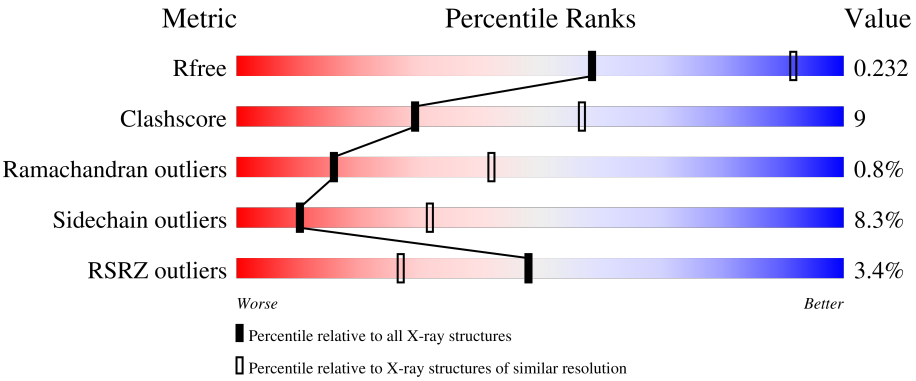
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 3.05 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}	180053	2469 (3.10-3.02)
Clashscore	190562	2569 (3.10-3.02)
Ramachandran outliers	187476	2424 (3.10-3.02)
Sidechain outliers	187428	2423 (3.10-3.02)
RSRZ outliers	180081	2469 (3.10-3.02)

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	669	2% 68% 21% • 9%
2	B	229	% 66% 24% • 10%
3	C	67	19% 37% 16% • 43%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 6758 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 SM Protein Vps33.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	609	Total	C	N	O	S	0	0	0
			4805	3042	849	903	11			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP G0SCM5

- Molecule 2 is a protein called Vps16.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	207	Total	C	N	O	S	0	0	0
			1657	1046	294	312	5			

- Molecule 3 is a protein called Nyv1 SNARE motif.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	38	Total	C	N	O	S	0	0	0
			287	175	55	56	1			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	146	GLY	-	expression tag	UNP G0S5G3
C	147	SER	-	expression tag	UNP G0S5G3

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	8	Total	O	0	0
			8	8		

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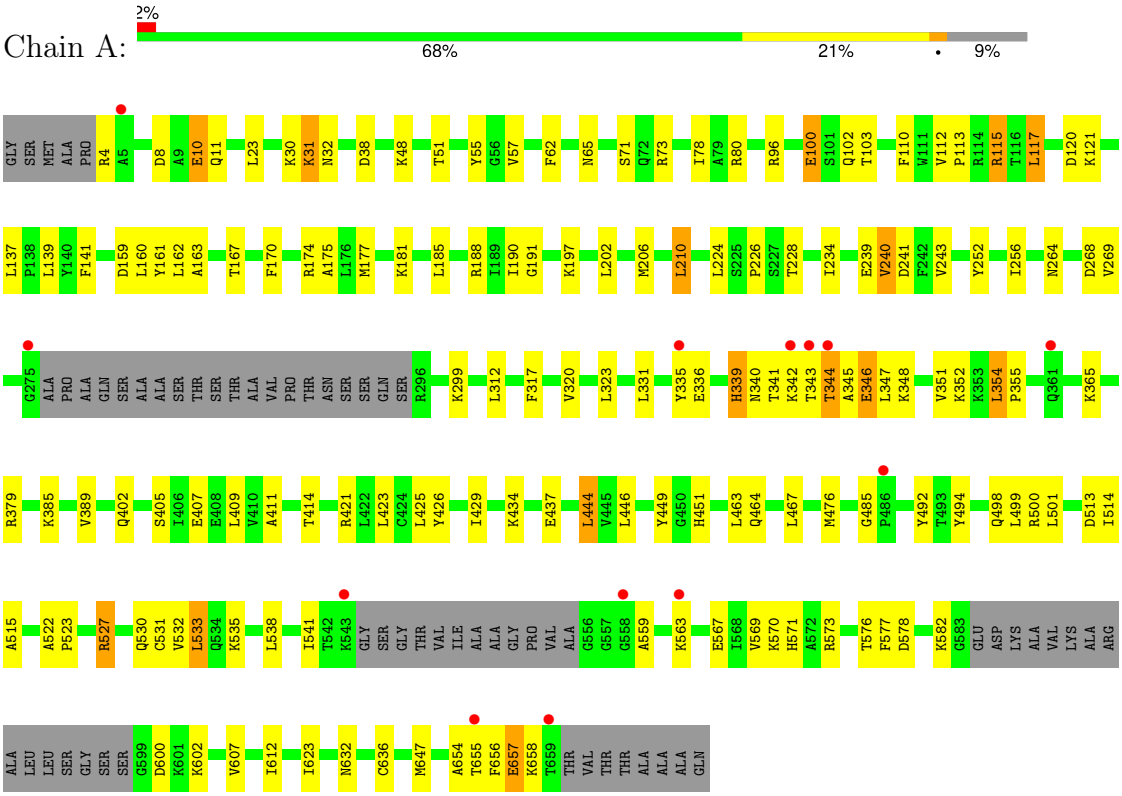
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total O 1 1	0	0

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.

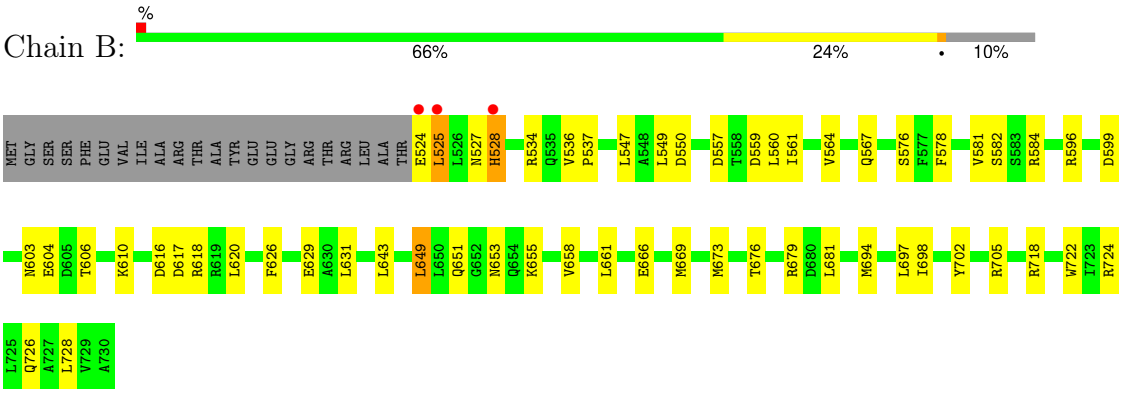
• Molecule 1: SM Protein Vps33

Chain A:



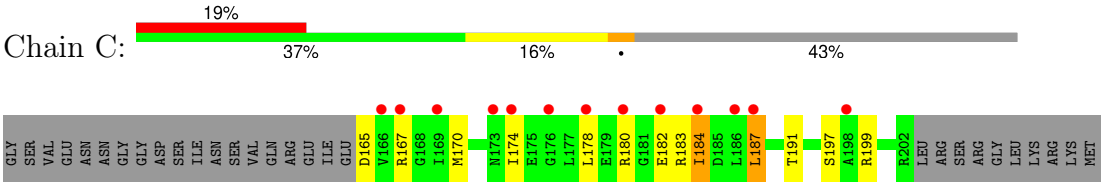
• Molecule 2: Vps16

Chain B:



• Molecule 3: Nyv1 SNARE motif

Chain C:


19%
37%
16%
43%
GLY SER VAL GLU ASN ASN GLY GLY ASP SER ILE ASN SER VAL GLN ARG GLU ILE GLU D165 V166 R167 G168 I169 M170 M173 I174 E175 G176 L177 L178 E179 R180 G181 E182 R183 I184 D185 L186 L187 T191 S197 A198 R199 R202 LEU ARG SER ARG GLY LEU LYS ARG LYS MET

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	101.03Å 258.94Å 75.27Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.47 – 3.05 49.47 – 3.05	Depositor EDS
% Data completeness (in resolution range)	96.9 (49.47-3.05) 95.6 (49.47-3.05)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.44 (at 3.07Å)	Xtriage
Refinement program	PHENIX 1.17_3644	Depositor
R, R_{free}	0.184 , 0.224 0.186 , 0.232	Depositor DCC
R_{free} test set	1945 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	77.7	Xtriage
Anisotropy	0.758	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 93.8	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	0.96	EDS
Total number of atoms	6758	wwPDB-VP
Average B, all atoms (Å^2)	116.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.78% 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	0.35	0/4880	0.57	0/6581
2	B	0.39	0/1683	0.60	0/2268
3	C	0.23	0/287	0.46	0/382
All	All	0.36	0/6850	0.57	0/9231

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

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	4805	0	4868	91	0
2	B	1657	0	1673	30	0
3	C	287	0	284	9	2
4	A	8	0	0	0	0
4	B	1	0	0	0	0
All	All	6758	0	6825	117	2

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 (117) 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:341:THR:HB	1:A:346:GLU:HB2	1.68	0.75
1:A:177:MET:HE3	1:A:206:MET:HB2	1.70	0.72
1:A:347:LEU:HB3	3:C:174:ILE:HD11	1.71	0.72
1:A:343:THR:O	1:A:345:ALA:N	2.24	0.71
1:A:654:ALA:HB1	2:B:631:LEU:HB3	1.74	0.69
1:A:385:LYS:HE3	1:A:405:SER:HB3	1.73	0.69
1:A:499:LEU:O	1:A:527:ARG:HD2	1.92	0.69
1:A:32:ASN:ND2	1:A:71:SER:OG	2.24	0.68
1:A:335:TYR:HE1	3:C:178:LEU:HD13	1.59	0.66
1:A:188:ARG:NH1	1:A:578:ASP:OD2	2.29	0.65
1:A:607:VAL:HG22	1:A:636:CYS:HB2	1.78	0.65
1:A:32:ASN:HD21	1:A:71:SER:HG	1.45	0.64
1:A:181:LYS:HA	1:A:224:LEU:HD11	1.80	0.63
1:A:654:ALA:HB3	2:B:631:LEU:HD13	1.80	0.63
1:A:181:LYS:HE2	1:A:210:LEU:HD11	1.83	0.60
2:B:599:ASP:HB2	2:B:603:ASN:HB2	1.84	0.60
1:A:312:LEU:HD22	1:A:320:VAL:HG13	1.85	0.59
1:A:342:LYS:HE2	3:C:167:ARG:HD3	1.84	0.59
1:A:185:LEU:HB2	1:A:226:PRO:HA	1.85	0.59
1:A:161:TYR:CE1	1:A:239:GLU:HB3	2.38	0.58
1:A:336:GLU:OE2	1:A:339:HIS:NE2	2.35	0.58
1:A:344:THR:O	1:A:348:LYS:N	2.37	0.58
1:A:655:THR:OG1	1:A:657:GLU:OE2	2.22	0.58
1:A:535:LYS:NZ	1:A:563:LYS:O	2.37	0.57
1:A:365:LYS:HG3	3:C:187:LEU:HD21	1.85	0.57
2:B:557:ASP:HB3	2:B:560:LEU:HB2	1.86	0.57
1:A:344:THR:N	3:C:170:MET:SD	2.71	0.56
1:A:655:THR:HG23	1:A:657:GLU:H	1.72	0.55
1:A:385:LYS:O	1:A:389:VAL:HG23	2.06	0.55
1:A:240:VAL:HG23	1:A:573:ARG:HB3	1.88	0.55
1:A:389:VAL:HG13	1:A:402:GLN:HB3	1.89	0.53
1:A:159:ASP:O	1:A:163:ALA:HB3	2.08	0.53
1:A:407:GLU:HA	1:A:444:LEU:HD11	1.91	0.52
1:A:191:GLY:HA3	1:A:577:PHE:CZ	2.44	0.52
1:A:31:LYS:NZ	1:A:55:TYR:O	2.42	0.52
1:A:351:VAL:O	1:A:354:LEU:HB2	2.11	0.51
2:B:525:LEU:O	2:B:528:HIS:HB2	2.11	0.51
1:A:31:LYS:O	1:A:57:VAL:HA	2.12	0.50
1:A:446:LEU:HD22	1:A:451:HIS:HA	1.92	0.50
1:A:476:MET:HE2	1:A:492:TYR:H	1.77	0.50
1:A:252:TYR:O	1:A:256:ILE:HG13	2.11	0.50
1:A:243:VAL:HG13	1:A:425:LEU:HD11	1.92	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:698:ILE:HD13	2:B:724:ARG:HD3	1.94	0.49
1:A:500:ARG:O	1:A:527:ARG:NH1	2.45	0.49
1:A:348:LYS:O	1:A:352:LYS:HG2	2.12	0.49
1:A:177:MET:HG2	1:A:206:MET:HE2	1.94	0.49
1:A:530:GLN:NE2	1:A:623:ILE:HD11	2.28	0.48
1:A:202:LEU:O	1:A:206:MET:HG3	2.14	0.48
1:A:241:ASP:HA	1:A:492:TYR:OH	2.14	0.48
1:A:137:LEU:HG	1:A:139:LEU:HG	1.96	0.47
1:A:464:GLN:HA	1:A:467:LEU:HD21	1.97	0.47
1:A:252:TYR:CZ	1:A:256:ILE:HD11	2.50	0.47
2:B:596:ARG:HA	2:B:604:GLU:HG2	1.97	0.47
1:A:351:VAL:HA	1:A:354:LEU:HD22	1.97	0.47
2:B:724:ARG:O	2:B:728:LEU:HG	2.15	0.47
2:B:697:LEU:HD13	2:B:705:ARG:HB3	1.96	0.46
1:A:385:LYS:HB3	1:A:409:LEU:HD21	1.98	0.46
1:A:48:LYS:HB2	1:A:51:THR:OG1	2.15	0.46
1:A:190:ILE:O	1:A:234:ILE:HA	2.15	0.46
1:A:532:VAL:HG12	1:A:533:LEU:HD13	1.98	0.46
2:B:557:ASP:O	2:B:561:ILE:HG13	2.15	0.46
2:B:536:VAL:HB	2:B:537:PRO:HD3	1.97	0.46
1:A:268:ASP:OD1	1:A:299:LYS:HG2	2.16	0.46
1:A:115:ARG:HE	1:A:120:ASP:CG	2.24	0.45
1:A:379:ARG:NH2	3:C:197:SER:HB2	2.31	0.45
1:A:78:ILE:HG12	1:A:110:PHE:HB2	1.98	0.45
1:A:96:ARG:O	1:A:100:GLU:HB2	2.16	0.45
1:A:513:ASP:OD1	1:A:527:ARG:NH2	2.50	0.45
1:A:112:VAL:HA	1:A:113:PRO:HA	1.69	0.45
1:A:426:TYR:OH	1:A:437:GLU:OE2	2.29	0.45
2:B:616:ASP:O	2:B:618:ARG:HG3	2.16	0.45
1:A:141:PHE:CE2	1:A:175:ALA:HB1	2.52	0.44
1:A:379:ARG:HH22	3:C:197:SER:HB2	1.81	0.44
1:A:515:ALA:HB2	1:A:522:ALA:HB2	2.00	0.44
2:B:681:LEU:HD22	2:B:702:TYR:CE2	2.52	0.44
1:A:446:LEU:HD23	1:A:446:LEU:HA	1.74	0.44
2:B:606:THR:HG21	2:B:629:GLU:OE2	2.17	0.44
2:B:626:PHE:HE2	2:B:649:LEU:HD13	1.83	0.44
1:A:121:LYS:HB2	1:A:121:LYS:HE3	1.76	0.44
1:A:656:PHE:CZ	2:B:643:LEU:HD11	2.53	0.44
1:A:188:ARG:HH11	1:A:578:ASP:CG	2.26	0.43
1:A:317:PHE:HA	1:A:320:VAL:HG23	2.00	0.43
1:A:170:PHE:CE2	1:A:174:ARG:HD2	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:669:MET:O	2:B:673:MET:HG3	2.19	0.43
1:A:224:LEU:HD23	1:A:224:LEU:HA	1.79	0.43
1:A:411:ALA:HB1	2:B:722:TRP:HB2	2.01	0.43
1:A:531:CYS:O	1:A:535:LYS:HG2	2.19	0.43
1:A:494:TYR:CE2	1:A:498:GLN:HG3	2.53	0.43
1:A:501:LEU:HD22	1:A:522:ALA:O	2.19	0.43
1:A:569:VAL:C	1:A:571:HIS:H	2.25	0.43
2:B:694:MET:O	2:B:698:ILE:HG13	2.18	0.43
2:B:550:ASP:OD1	2:B:584:ARG:NH1	2.52	0.43
2:B:578:PHE:O	2:B:582:SER:HB3	2.19	0.42
1:A:354:LEU:N	1:A:355:PRO:HD2	2.35	0.42
2:B:525:LEU:HD12	2:B:525:LEU:HA	1.82	0.42
2:B:606:THR:HG22	2:B:610:LYS:HE3	2.01	0.42
1:A:8:ASP:OD1	1:A:10:GLU:HB2	2.19	0.42
1:A:569:VAL:C	1:A:571:HIS:N	2.78	0.42
2:B:722:TRP:O	2:B:726:GLN:HG3	2.20	0.42
1:A:514:ILE:HD12	1:A:523:PRO:HD2	2.02	0.41
2:B:718:ARG:O	2:B:722:TRP:HD1	2.03	0.41
1:A:335:TYR:CE1	3:C:178:LEU:HD13	2.48	0.41
1:A:421:ARG:HG3	1:A:647:MET:HG3	2.02	0.41
2:B:676:THR:HA	2:B:679:ARG:NH2	2.36	0.41
2:B:549:LEU:HA	2:B:564:VAL:HG11	2.02	0.41
2:B:549:LEU:HD23	2:B:584:ARG:HD2	2.02	0.41
1:A:117:LEU:H	2:B:559:ASP:CG	2.26	0.41
1:A:331:LEU:HD23	1:A:331:LEU:HA	1.82	0.41
1:A:62:PHE:HB2	1:A:65:ASN:ND2	2.36	0.41
1:A:423:LEU:HD23	1:A:423:LEU:HA	1.78	0.41
1:A:112:VAL:HG22	1:A:137:LEU:HB3	2.02	0.41
1:A:414:THR:O	1:A:449:TYR:OH	2.30	0.41
3:C:182:GLU:O	3:C:184:ILE:HG12	2.21	0.41
1:A:228:THR:O	1:A:602:LYS:HE3	2.21	0.40
1:A:162:LEU:HD13	1:A:463:LEU:HG	2.02	0.40
2:B:661:LEU:HA	2:B:661:LEU:HD23	1.83	0.40
1:A:174:ARG:HA	1:A:206:MET:HE1	2.03	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:165:ASP:OD2	3:C:183:ARG:CB[2_555]	1.53	0.67
3:C:165:ASP:CB	3:C:183:ARG:N[2_555]	2.07	0.13

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	601/669 (90%)	558 (93%)	38 (6%)	5 (1%)	16 42
2	B	205/229 (90%)	193 (94%)	11 (5%)	1 (0%)	24 52
3	C	36/67 (54%)	29 (81%)	6 (17%)	1 (3%)	4 16
All	All	842/965 (87%)	780 (93%)	55 (6%)	7 (1%)	16 42

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	344	THR
3	C	180	ARG
1	A	340	ASN
1	A	485	GLY
1	A	559	ALA
1	A	657	GLU
2	B	653	ASN

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	520/564 (92%)	480 (92%)	40 (8%)	12 35
2	B	177/194 (91%)	161 (91%)	16 (9%)	9 29
3	C	29/57 (51%)	25 (86%)	4 (14%)	3 13
All	All	726/815 (89%)	666 (92%)	60 (8%)	10 32

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	ARG
1	A	10	GLU
1	A	11	GLN
1	A	23	LEU
1	A	30	LYS
1	A	31	LYS
1	A	38	ASP
1	A	73	ARG
1	A	80	ARG
1	A	100	GLU
1	A	102	GLN
1	A	103	THR
1	A	115	ARG
1	A	117	LEU
1	A	160	LEU
1	A	167	THR
1	A	197	LYS
1	A	210	LEU
1	A	240	VAL
1	A	264	ASN
1	A	269	VAL
1	A	323	LEU
1	A	339	HIS
1	A	346	GLU
1	A	354	LEU
1	A	429	ILE
1	A	434	LYS
1	A	444	LEU
1	A	527	ARG
1	A	533	LEU
1	A	538	LEU
1	A	541	ILE
1	A	567	GLU
1	A	570	LYS
1	A	576	THR
1	A	582	LYS
1	A	600	ASP
1	A	612	ILE
1	A	632	ASN
1	A	658	LYS
2	B	524	GLU
2	B	525	LEU

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Mol	Chain	Res	Type
2	B	527	ASN
2	B	528	HIS
2	B	534	ARG
2	B	547	LEU
2	B	567	GLN
2	B	576	SER
2	B	581	VAL
2	B	617	ASP
2	B	620	LEU
2	B	649	LEU
2	B	651	GLN
2	B	655	LYS
2	B	658	VAL
2	B	666	GLU
3	C	184	ILE
3	C	187	LEU
3	C	191	THR
3	C	199	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	65	ASN
1	A	72	GLN
1	A	249	GLN
1	A	263	GLN
1	A	392	ASN
1	A	458	HIS
1	A	459	ASN
1	A	581	GLN
2	B	535	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides 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, 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	609/669 (91%)	-0.32	13 (2%) 63 40	54, 101, 212, 286	0
2	B	207/229 (90%)	-0.40	3 (1%) 73 51	69, 94, 155, 221	0
3	C	38/67 (56%)	1.76	13 (34%) 1 0	77, 162, 247, 277	18 (47%)
All	All	854/965 (88%)	-0.24	29 (3%) 48 27	54, 98, 212, 286	18 (2%)

All (29) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	166	VAL	7.3
3	C	182	GLU	4.3
3	C	173	ASN	3.8
1	A	655	THR	3.6
3	C	167	ARG	3.5
3	C	184	ILE	3.5
1	A	543	LYS	3.2
1	A	659	THR	2.9
2	B	524	GLU	2.9
1	A	343	THR	2.8
3	C	176	GLY	2.8
1	A	335	TYR	2.8
3	C	180	ARG	2.7
1	A	558	GLY	2.6
3	C	174	ILE	2.6
1	A	275	GLY	2.5
3	C	187	LEU	2.5
3	C	178	LEU	2.4
3	C	169	ILE	2.4
1	A	342	LYS	2.4
3	C	186	LEU	2.3
2	B	525	LEU	2.3
1	A	361	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
2	B	528	HIS	2.2
3	C	198	ALA	2.2
1	A	486	PRO	2.2
1	A	5	ALA	2.1
1	A	344	THR	2.1
1	A	563	LYS	2.1

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides 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.