W O R L D W I D E
wwPDB
PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

May 22, 2020 – 03:22 am BST

PDB ID	:	1XB4
Title	:	Crystal structure of subunit VPS25 of the endosomal trafficking complex ESCRT-II
Authors	:	Weissenhorn, W.; Wernimont, A.K.
Deposited on	:	2004-08-27
Resolution	:	3.10 Å(reported)

The following versions of software and data (see references (1)) 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 (i)

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

The reported resolution of this entry is 3.10 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.
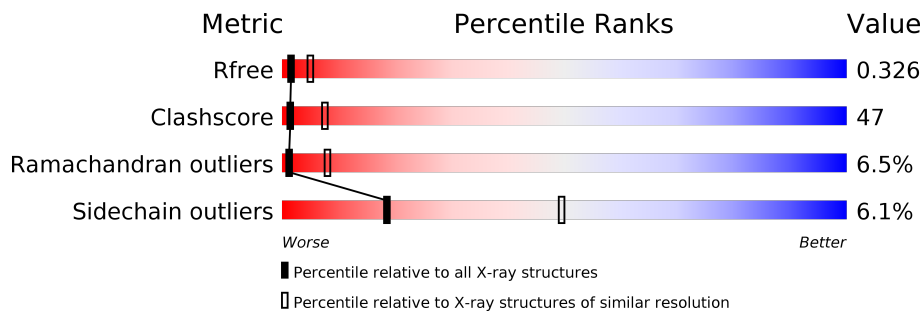
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1094 (3.10-3.10)
Clashscore	141614	1184 (3.10-3.10)
Ramachandran outliers	138981	1141 (3.10-3.10)
Sidechain outliers	138945	1141 (3.10-3.10)

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 <=5%

Mol	Chain	Length	Quality of chain
1	A	202	39%　42%　7%　11%
1	B	202	32%　49%　8%　11%
1	C	202	31%　50%　8%　11%
1	D	202	21%　44%　10%　·　24%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 5773 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 Hypothetical 23.6 kDa protein in YUH1-URA8 intergenic region.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	180	Total	C	N	O	S	0	0	0
			1492	955	250	279	8			
1	B	179	Total	C	N	O	S	0	0	0
			1482	948	248	278	8			
1	C	180	Total	C	N	O	S	0	0	0
			1492	954	251	279	8			
1	D	154	Total	C	N	O	S	0	0	0
			1291	844	209	230	8			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	5	Total	O	0	0
			5	5		
2	B	2	Total	O	0	0
			2	2		
2	C	7	Total	O	0	0
			7	7		
2	D	2	Total	O	0	0
			2	2		

3 Residue-property plots ⓘ

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. 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. 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: Hypothetical 23.6 kDa protein in YUH1-URA8 intergenic region

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- Molecule 1: Hypothetical 23.6 kDa protein in YUH1-URA8 intergenic region

E140 D141 S142 G143 K144 L145 N146 Q147 T150 L151 Y152 E153 L154 S155 GLU GLY ASP E159 T160 V161 N162 W163 E164 F165 H166 R167 M168 L172 L173 Y174 Y175 C176 L177 K178 P179 L180 C181 D182 R183 N184 R185 A186 K190 D191 E192 N193 D194 K195 V196 I197 A198 I199 K200 V201 VAL

• Molecule 1: Hypothetical 23.6 kDa protein in YUH1-URA8 intergenic region

Chain D:

21%   44%   10% ·   24%

MET S2 A3 L4 P5 P6 V7 Y8 S9 F10 P11 P12 L13 Y14 T15 R16 Q17 P18 ASN SER LEU T22 R23 R24 Q25 Q26 I27 S28 T29 W30 I31 D32 I33 I34 Y37 C38 K39 T40 K41 K42 I43 W44 Y45 M46 S47 V48 T51 V52 I53 N54 ASP ASN GLU LEU ASP SER GLY SER

THR ASP ASN ASP SER LYS LYS ILE SER LYS N74 L75 F76 N77 N78 I81 S84 Q87 V88 F89 I90 D91 E92 I93 C103 L104 P105 I106 ASP GLN SER GLY ARG ARG SER ASN THR THR THR ARG Y121 F122 I123 L124 W125 K126 S127 L128 D129 S130 W131 A132 S133

L134 I135 L136 Q137 W138 F139 GLU ASP SER G143 K144 L145 N146 Q147 V148 I149 T150 L151 Y152 E153 L154 S155 GLU GLY ASP GLU THR V161 N162 W163 E164 F165 H166 R167 M168 P169 E170 S171 L172 L173 Y174 Y175 C176 L177 K178 P179 L180 C181 D182 R183 N184 ARG ALA T187 M188 L189 K190 D191 E192 N193

D194 K195 V196 I197 A198 I199 K200 V201 VAL

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	53.36Å 123.66Å 140.30Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	25.00 – 3.10 29.31 – 3.05	Depositor EDS
% Data completeness (in resolution range)	93.7 (25.00-3.10) 93.7 (29.31-3.05)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$<I/\sigma(I)>$ [1]	4.03 (at 3.05Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.327 , 0.327 0.273 , 0.326	Depositor DCC
R_{free} test set	895 reflections (4.88%)	wwPDB-VP
Wilson B-factor (Å^2)	74.0	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.24 , 74.8	EDS
L-test for twinning[2]	$<|L|> = 0.49$, $<L^2> = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.87	EDS
Total number of atoms	5773	wwPDB-VP
Average B, all atoms (Å^2)	51.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.27% 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 (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	0.48	0/1525	0.69	1/2066 (0.0%)
1	B	0.43	0/1516	0.67	1/2055 (0.0%)
1	C	0.46	0/1526	0.70	3/2070 (0.1%)
1	D	0.42	0/1321	0.65	0/1787
All	All	0.45	0/5888	0.68	5/7978 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	120	ARG	NE-CZ-NH1	-7.04	116.78	120.30
1	C	120	ARG	NE-CZ-NH2	6.97	123.79	120.30
1	A	182	ASP	N-CA-C	-6.08	94.60	111.00
1	B	182	ASP	N-CA-C	-5.89	95.10	111.00
1	C	182	ASP	N-CA-C	-5.83	95.26	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	1492	0	1479	110	0
1	B	1482	0	1468	123	0
1	C	1492	0	1474	132	0
1	D	1291	0	1290	165	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	5	0	0	1	0
2	B	2	0	0	0	0
2	C	7	0	0	1	0
2	D	2	0	0	1	0
All	All	5773	0	5711	514	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 47.

The worst 5 of 514 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:B:146:ASN:HA	1:B:202:VAL:HG22	1.35	1.07
1:C:104:LEU:HB3	1:C:122:PHE:HB3	1.45	0.97
1:D:37:TYR:HE1	1:D:41:LYS:HD2	1.31	0.95
1:C:74:ASN:ND2	1:C:76:PHE:H	1.66	0.93
1:A:73:LYS:N	1:A:73:LYS:HZ2	1.66	0.91

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	172/202 (85%)	140 (81%)	23 (13%)	9 (5%)	2	12
1	B	173/202 (86%)	137 (79%)	25 (14%)	11 (6%)	1	8
1	C	174/202 (86%)	142 (82%)	22 (13%)	10 (6%)	1	10
1	D	140/202 (69%)	97 (69%)	30 (21%)	13 (9%)	0	3
All	All	659/808 (82%)	516 (78%)	100 (15%)	43 (6%)	1	8

5 of 43 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	19	ASN
1	A	109	SER
1	A	145	LEU
1	B	19	ASN
1	B	116	THR

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	171/192 (89%)	161 (94%)	10 (6%)	20	51
1	B	170/192 (88%)	159 (94%)	11 (6%)	17	47
1	C	171/192 (89%)	165 (96%)	6 (4%)	36	68
1	D	148/192 (77%)	135 (91%)	13 (9%)	10	36
All	All	660/768 (86%)	620 (94%)	40 (6%)	18	49

5 of 40 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	141	ASP
1	C	118	THR
1	D	175	TYR
1	B	180	LEU
1	C	122	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	56	ASN
1	C	74	ASN
1	D	74	ASN
1	C	25	GLN
1	D	25	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 carbohydrates 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 (i)

6.1 Protein, DNA and RNA chains (i)

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates (i)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands (i)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers (i)

Unable to reproduce the depositors R factor - this section is therefore empty.