



# wwPDB X-ray Structure Validation Summary Report ⓘ

May 18, 2020 – 07:10 am BST

PDB ID : 1W7P  
Title : The crystal structure of endosomal complex ESCRT-II  
(VPS22/VPS25/VPS36)  
Authors : Teo, H.; Perisic, O.; Gonzalez, B.; Williams, R.L.  
Deposited on : 2004-09-07  
Resolution : 3.60 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto: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.

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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

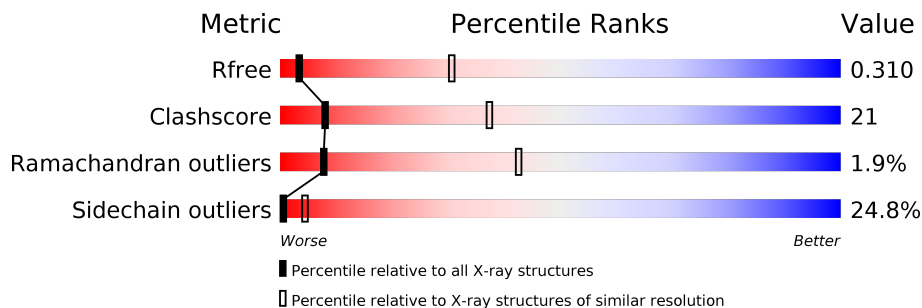
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.60 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	1257 (3.70-3.50)
Clashscore	141614	1353 (3.70-3.50)
Ramachandran outliers	138981	1307 (3.70-3.50)
Sidechain outliers	138945	1307 (3.70-3.50)

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  $\geq 3$ , 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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	A	233	52% (green), 33% (yellow), 7% (orange), 9% (grey)
2	B	202	38% (green), 40% (yellow), 12% (orange), 10% (grey)
2	C	202	38% (green), 39% (yellow), 11% (orange), 10% (grey)
3	D	566	15% (green), 12% (yellow), 70% (grey)

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6134 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 VPS22, YPL002C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	213	1732	1108	290	323	11	0	0	0

- Molecule 2 is a protein called VPS25, YJR102C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	182	1504	959	252	284	9	0	0	0
2	C	182	1504	959	252	284	9	0	0	0

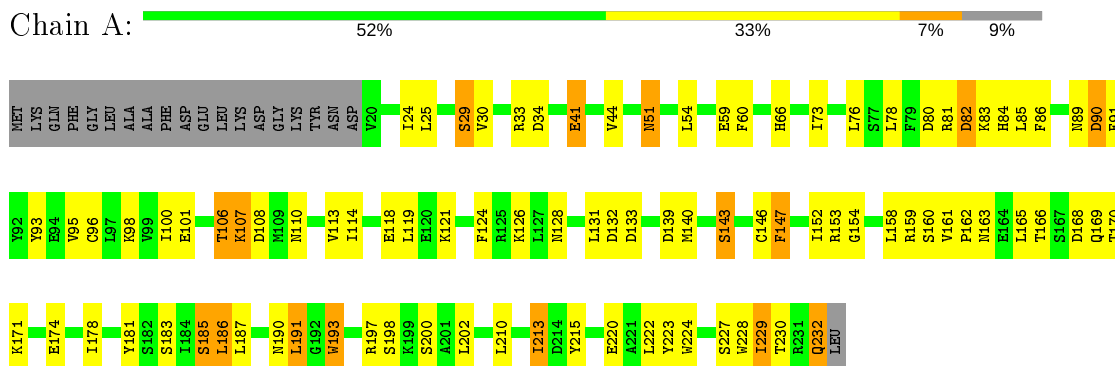
- Molecule 3 is a protein called VPS36P, YLR417W.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	171	1394	891	226	268	9	0	0	0

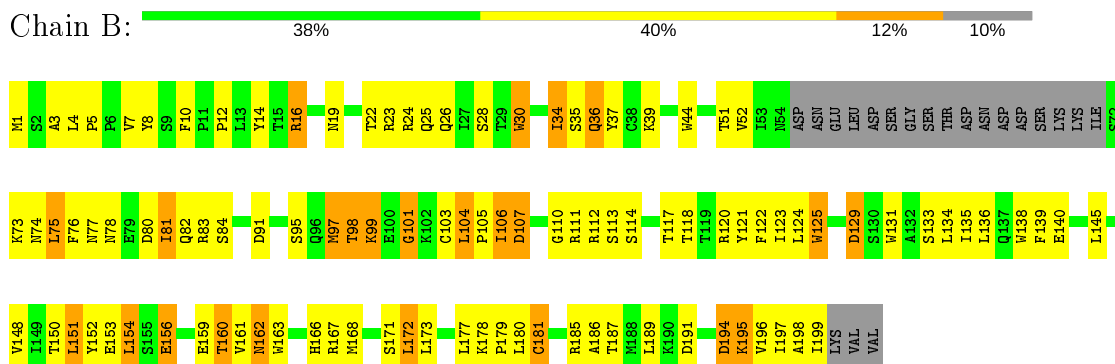
### 3 Residue-property plots

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.

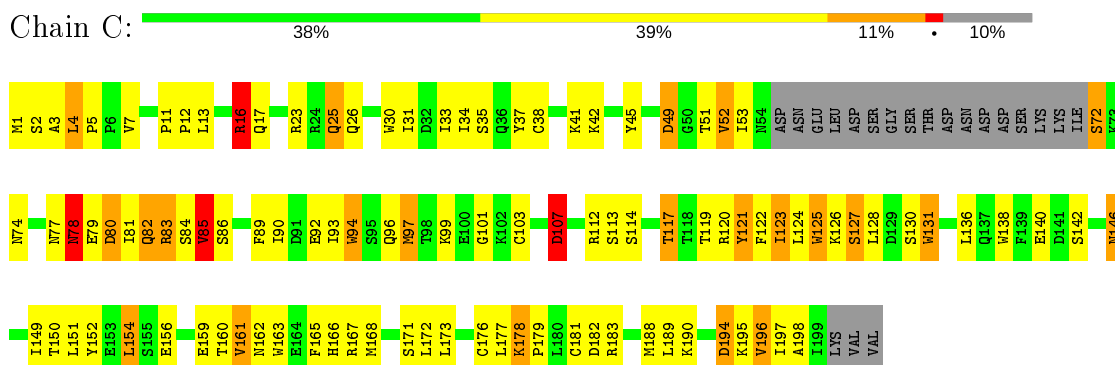
- Molecule 1: VPS22, YPL002C



- Molecule 2: VPS25, YJR102C



- Molecule 2: VPS25, YJR102C





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	149.91Å 149.91Å 186.15Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	92.06 – 3.60 92.11 – 3.60	Depositor EDS
% Data completeness (in resolution range)	99.0 (92.06-3.60) 99.0 (92.11-3.60)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.87 (at 3.58Å)	Xtrriage
Refinement program	REFMAC 5.1.24	Depositor
R, $R_{free}$	0.292 , 0.330 0.272 , 0.310	Depositor DCC
$R_{free}$ test set	1216 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	141.1	Xtrriage
Anisotropy	0.075	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.25 , 101.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.68	EDS
Total number of atoms	6134	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	59.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.01% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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	0.80	0/1764	0.88	6/2372 (0.3%)
2	B	0.68	0/1539	0.91	5/2087 (0.2%)
2	C	0.75	0/1539	0.94	5/2087 (0.2%)
3	D	0.85	0/1416	0.95	4/1908 (0.2%)
All	All	0.77	0/6258	0.92	20/8454 (0.2%)

There are no bond length outliers.

The worst 5 of 20 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	425	ASP	CB-CG-OD2	7.14	124.73	118.30
1	A	168	ASP	CB-CG-OD2	6.91	124.52	118.30
2	C	107	ASP	CB-CG-OD2	6.73	124.36	118.30
3	D	501	ASP	CB-CG-OD2	6.44	124.09	118.30
3	D	510	ASP	CB-CG-OD2	6.43	124.09	118.30

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	1732	0	1741	51	0
2	B	1504	0	1487	80	0
2	C	1504	0	1487	93	0
3	D	1394	0	1406	47	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	6134	0	6121	262	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 21.

The worst 5 of 262 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:C:74:ASN:O	2:C:78:ASN:HB3	1.46	1.16
2:C:94:TRP:CE2	2:C:121:TYR:CD2	2.58	0.92
2:C:122:PHE:CZ	2:C:172:LEU:HD22	2.06	0.90
2:B:186:ALA:HB1	2:B:199:ILE:HA	1.57	0.86
2:C:122:PHE:CE2	2:C:172:LEU:HD22	2.11	0.84

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	211/233 (91%)	188 (89%)	22 (10%)	1 (0%)	29 68
2	B	178/202 (88%)	144 (81%)	28 (16%)	6 (3%)	3 31
2	C	178/202 (88%)	148 (83%)	24 (14%)	6 (3%)	3 31
3	D	169/566 (30%)	145 (86%)	23 (14%)	1 (1%)	25 64
All	All	736/1203 (61%)	625 (85%)	97 (13%)	14 (2%)	8 42

5 of 14 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	16	ARG
2	C	78	ASN

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Mol	Chain	Res	Type
3	D	563	PRO
2	B	81	ILE
2	B	101	GLY

### 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	195/211 (92%)	149 (76%)	46 (24%)	1	5
2	B	173/192 (90%)	134 (78%)	39 (22%)	1	6
2	C	173/192 (90%)	127 (73%)	46 (27%)	0	3
3	D	160/519 (31%)	117 (73%)	43 (27%)	0	3
All	All	701/1114 (63%)	527 (75%)	174 (25%)	0	4

5 of 174 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	171	SER
2	C	78	ASN
3	D	512	LEU
2	B	187	THR
2	C	25	GLN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 17 such sidechains are listed below:

Mol	Chain	Res	Type
2	B	96	GLN
2	B	193	ASN
3	D	403	ASN
2	B	74	ASN
3	D	431	ASN

### 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

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

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

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

### 6.3 Carbohydrates

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

### 6.4 Ligands

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

### 6.5 Other polymers

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