Full wwPDB X-ray Structure Validation Report ⓘ

Aug 20, 2020 – 05:09 PM BST

PDB ID	:	5JHC
Title	:	Crystal structure of the self-assembled propeptides from Ape1
Authors	:	Yamasaki, A.; Noda, N.N.
Deposited on	:	2016-04-20
Resolution	:	3.40 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 following versions of software and data (see references ⓘ) were used in the production of this report:

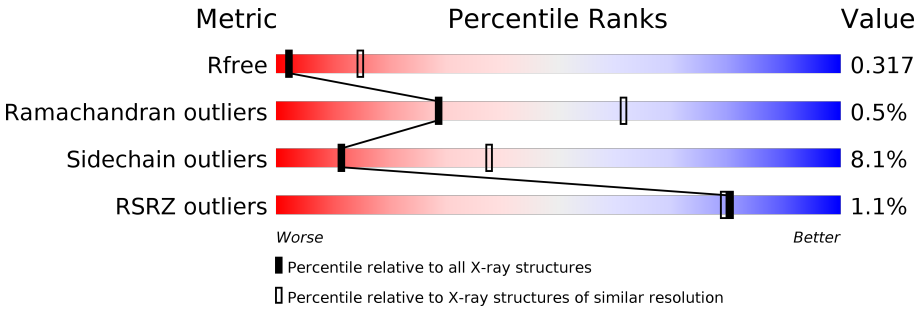
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.13
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.13

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 3.40 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	1026 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RSRZ outliers	127900	2173 (3.50-3.30)

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% 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	24	100%
1	B	24	96% .
1	C	24	92% 8%
1	D	24	79% 13% 8%
1	E	24	96% .
1	F	24	92% 8%
1	G	24	92% 8%

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Mol	Chain	Length	Quality of chain
1	H	24	4% 88% 8%
1	I	24	92% 8%
1	J	24	96%
1	K	24	92% 8%
1	L	24	8% 88% 13%
1	M	24	96%
1	N	24	100%
1	O	24	92% 8%
1	P	24	96%
1	Q	24	8% 96%
1	R	24	88% 13%
1	S	24	88% 13%
1	T	24	100%
1	U	24	88% 13%
1	V	24	96%
1	W	24	96%
1	X	24	96%
1	Y	24	79% 17%
1	Z	24	4% 58% 42%
1	a	24	92%
1	b	24	4% 96%
1	c	24	92% 8%
1	d	24	92% 8%
1	e	24	96%
1	f	24	92% 8%

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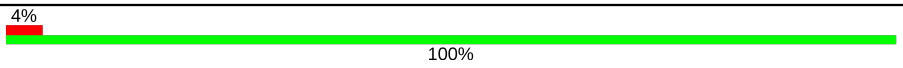
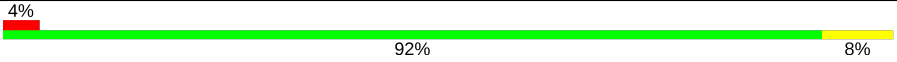
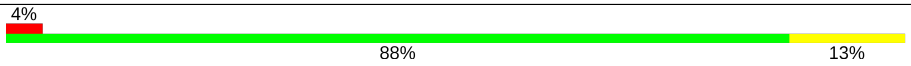
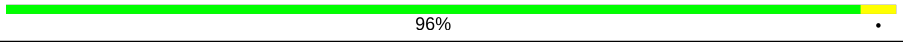
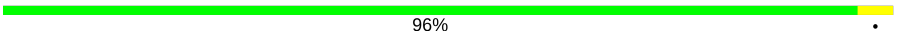
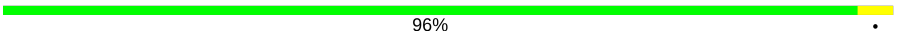
Mol	Chain	Length	Quality of chain
1	g	24	
1	h	24	
1	i	24	
1	j	24	
1	k	24	
1	l	24	
1	m	24	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6607 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 Vacuolar aminopeptidase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	24	Total	C	N	O	S	0	0	0
			173	111	28	33	1			
1	C	24	Total	C	N	O	S	0	0	0
			158	100	25	32	1			
1	E	24	Total	C	N	O	S	0	0	0
			172	110	26	34	2			
1	G	24	Total	C	N	O	S	0	0	0
			179	111	28	38	2			
1	I	24	Total	C	N	O	S	0	0	0
			173	109	27	35	2			
1	K	24	Total	C	N	O	S	0	0	0
			189	118	29	40	2			
1	M	24	Total	C	N	O	S	0	0	0
			186	117	31	36	2			
1	O	24	Total	C	N	O	S	0	0	0
			170	106	26	37	1			
1	Q	24	Total	C	N	O	S	0	0	0
			185	116	28	40	1			
1	S	24	Total	C	N	O	S	0	0	0
			162	103	27	31	1			
1	U	24	Total	C	N	O	S	0	0	0
			186	117	31	36	2			
1	W	24	Total	C	N	O	S	0	0	0
			180	115	29	34	2			
1	Y	20	Total	C	N	O	S	0	0	0
			116	73	21	21	1			
1	B	24	Total	C	N	O	S	0	0	0
			167	104	27	35	1			
1	a	23	Total	C	N	O		0	0	0
			156	99	25	32				
1	b	23	Total	C	N	O	S	0	0	0
			151	95	24	31	1			

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf	Trace
1	D	22	Total C N O S 152 97 27 27 1	0	0	0
1	F	24	Total C N O 172 108 29 35	0	0	0
1	c	24	Total C N O S 166 105 26 34 1	0	0	0
1	H	23	Total C N O S 181 115 27 38 1	0	0	0
1	d	24	Total C N O S 172 111 28 31 2	0	0	0
1	J	24	Total C N O 176 111 30 35	0	0	0
1	e	24	Total C N O S 179 112 30 35 2	0	0	0
1	L	24	Total C N O S 191 120 31 39 1	0	0	0
1	f	24	Total C N O S 173 110 29 32 2	0	0	0
1	N	24	Total C N O S 180 112 31 36 1	0	0	0
1	g	24	Total C N O S 164 105 25 32 2	0	0	0
1	P	23	Total C N O S 177 113 28 35 1	0	0	0
1	h	24	Total C N O S 177 112 30 34 1	0	0	0
1	R	24	Total C N O S 182 116 31 33 2	0	0	0
1	i	24	Total C N O S 173 109 26 37 1	0	0	0
1	T	24	Total C N O S 182 116 31 33 2	0	0	0
1	j	24	Total C N O S 186 117 31 36 2	0	0	0
1	V	24	Total C N O S 177 110 27 38 2	0	0	0
1	k	24	Total C N O S 176 112 28 34 2	0	0	0
1	X	24	Total C N O S 173 109 28 35 1	0	0	0
1	l	24	Total C N O S 184 116 28 38 2	0	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	Z	14	Total	C	N	O	0	0	0
			89	55	16	18			
1	m	22	Total	C	N	O	0	0	0
			122	76	22	24			

There are 117 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P14904
A	0	PRO	-	expression tag	UNP P14904
A	22	LEU	PRO	engineered mutation	UNP P14904
C	-1	GLY	-	expression tag	UNP P14904
C	0	PRO	-	expression tag	UNP P14904
C	22	LEU	PRO	engineered mutation	UNP P14904
E	-1	GLY	-	expression tag	UNP P14904
E	0	PRO	-	expression tag	UNP P14904
E	22	LEU	PRO	engineered mutation	UNP P14904
G	-1	GLY	-	expression tag	UNP P14904
G	0	PRO	-	expression tag	UNP P14904
G	22	LEU	PRO	engineered mutation	UNP P14904
I	-1	GLY	-	expression tag	UNP P14904
I	0	PRO	-	expression tag	UNP P14904
I	22	LEU	PRO	engineered mutation	UNP P14904
K	-1	GLY	-	expression tag	UNP P14904
K	0	PRO	-	expression tag	UNP P14904
K	22	LEU	PRO	engineered mutation	UNP P14904
M	-1	GLY	-	expression tag	UNP P14904
M	0	PRO	-	expression tag	UNP P14904
M	22	LEU	PRO	engineered mutation	UNP P14904
O	-1	GLY	-	expression tag	UNP P14904
O	0	PRO	-	expression tag	UNP P14904
O	22	LEU	PRO	engineered mutation	UNP P14904
Q	-1	GLY	-	expression tag	UNP P14904
Q	0	PRO	-	expression tag	UNP P14904
Q	22	LEU	PRO	engineered mutation	UNP P14904
S	-1	GLY	-	expression tag	UNP P14904
S	0	PRO	-	expression tag	UNP P14904
S	22	LEU	PRO	engineered mutation	UNP P14904
U	-1	GLY	-	expression tag	UNP P14904
U	0	PRO	-	expression tag	UNP P14904
U	22	LEU	PRO	engineered mutation	UNP P14904
W	-1	GLY	-	expression tag	UNP P14904

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Chain	Residue	Modelled	Actual	Comment	Reference
W	0	PRO	-	expression tag	UNP P14904
W	22	LEU	PRO	engineered mutation	UNP P14904
Y	-1	GLY	-	expression tag	UNP P14904
Y	0	PRO	-	expression tag	UNP P14904
Y	22	LEU	PRO	engineered mutation	UNP P14904
B	-1	GLY	-	expression tag	UNP P14904
B	0	PRO	-	expression tag	UNP P14904
B	22	LEU	PRO	engineered mutation	UNP P14904
a	-1	GLY	-	expression tag	UNP P14904
a	0	PRO	-	expression tag	UNP P14904
a	22	LEU	PRO	engineered mutation	UNP P14904
b	-1	GLY	-	expression tag	UNP P14904
b	0	PRO	-	expression tag	UNP P14904
b	22	LEU	PRO	engineered mutation	UNP P14904
D	-1	GLY	-	expression tag	UNP P14904
D	0	PRO	-	expression tag	UNP P14904
D	22	LEU	PRO	engineered mutation	UNP P14904
F	-1	GLY	-	expression tag	UNP P14904
F	0	PRO	-	expression tag	UNP P14904
F	22	LEU	PRO	engineered mutation	UNP P14904
c	-1	GLY	-	expression tag	UNP P14904
c	0	PRO	-	expression tag	UNP P14904
c	22	LEU	PRO	engineered mutation	UNP P14904
H	-1	GLY	-	expression tag	UNP P14904
H	0	PRO	-	expression tag	UNP P14904
H	22	LEU	PRO	engineered mutation	UNP P14904
d	-1	GLY	-	expression tag	UNP P14904
d	0	PRO	-	expression tag	UNP P14904
d	22	LEU	PRO	engineered mutation	UNP P14904
J	-1	GLY	-	expression tag	UNP P14904
J	0	PRO	-	expression tag	UNP P14904
J	22	LEU	PRO	engineered mutation	UNP P14904
e	-1	GLY	-	expression tag	UNP P14904
e	0	PRO	-	expression tag	UNP P14904
e	22	LEU	PRO	engineered mutation	UNP P14904
L	-1	GLY	-	expression tag	UNP P14904
L	0	PRO	-	expression tag	UNP P14904
L	22	LEU	PRO	engineered mutation	UNP P14904
f	-1	GLY	-	expression tag	UNP P14904
f	0	PRO	-	expression tag	UNP P14904
f	22	LEU	PRO	engineered mutation	UNP P14904
N	-1	GLY	-	expression tag	UNP P14904

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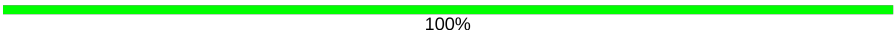
Chain	Residue	Modelled	Actual	Comment	Reference
N	0	PRO	-	expression tag	UNP P14904
N	22	LEU	PRO	engineered mutation	UNP P14904
g	-1	GLY	-	expression tag	UNP P14904
g	0	PRO	-	expression tag	UNP P14904
g	22	LEU	PRO	engineered mutation	UNP P14904
P	-1	GLY	-	expression tag	UNP P14904
P	0	PRO	-	expression tag	UNP P14904
P	22	LEU	PRO	engineered mutation	UNP P14904
h	-1	GLY	-	expression tag	UNP P14904
h	0	PRO	-	expression tag	UNP P14904
h	22	LEU	PRO	engineered mutation	UNP P14904
R	-1	GLY	-	expression tag	UNP P14904
R	0	PRO	-	expression tag	UNP P14904
R	22	LEU	PRO	engineered mutation	UNP P14904
i	-1	GLY	-	expression tag	UNP P14904
i	0	PRO	-	expression tag	UNP P14904
i	22	LEU	PRO	engineered mutation	UNP P14904
T	-1	GLY	-	expression tag	UNP P14904
T	0	PRO	-	expression tag	UNP P14904
T	22	LEU	PRO	engineered mutation	UNP P14904
j	-1	GLY	-	expression tag	UNP P14904
j	0	PRO	-	expression tag	UNP P14904
j	22	LEU	PRO	engineered mutation	UNP P14904
V	-1	GLY	-	expression tag	UNP P14904
V	0	PRO	-	expression tag	UNP P14904
V	22	LEU	PRO	engineered mutation	UNP P14904
k	-1	GLY	-	expression tag	UNP P14904
k	0	PRO	-	expression tag	UNP P14904
k	22	LEU	PRO	engineered mutation	UNP P14904
X	-1	GLY	-	expression tag	UNP P14904
X	0	PRO	-	expression tag	UNP P14904
X	22	LEU	PRO	engineered mutation	UNP P14904
l	-1	GLY	-	expression tag	UNP P14904
l	0	PRO	-	expression tag	UNP P14904
l	22	LEU	PRO	engineered mutation	UNP P14904
Z	-1	GLY	-	expression tag	UNP P14904
Z	0	PRO	-	expression tag	UNP P14904
Z	22	LEU	PRO	engineered mutation	UNP P14904
m	-1	GLY	-	expression tag	UNP P14904
m	0	PRO	-	expression tag	UNP P14904
m	22	LEU	PRO	engineered mutation	UNP P14904

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: Vacuolar aminopeptidase 1

Chain A:



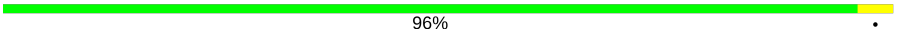
There are no outlier residues recorded for this chain.

- Molecule 1: Vacuolar aminopeptidase 1

Chain C:

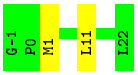
- Molecule 1: Vacuolar aminopeptidase 1

Chain E:



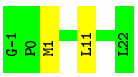
- Molecule 1: Vacuolar aminopeptidase 1

Chain G:



- Molecule 1: Vacuolar aminopeptidase 1

Chain I:

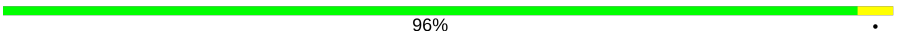


- Molecule 1: Vacuolar aminopeptidase 1

Chain K:

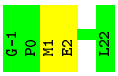
• Molecule 1: Vacuolar aminopeptidase 1

Chain M:



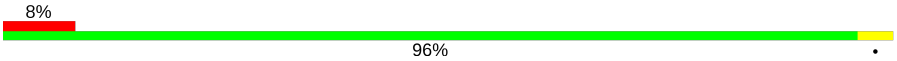
• Molecule 1: Vacuolar aminopeptidase 1

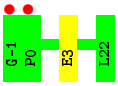
Chain O:



• Molecule 1: Vacuolar aminopeptidase 1

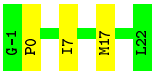
Chain Q:





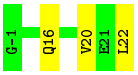
• Molecule 1: Vacuolar aminopeptidase 1

Chain S:



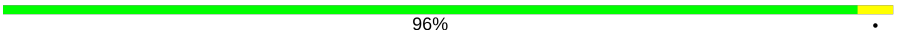
• Molecule 1: Vacuolar aminopeptidase 1

Chain U:



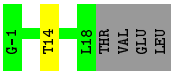
• Molecule 1: Vacuolar aminopeptidase 1

Chain W:



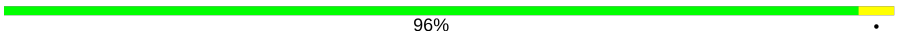
• Molecule 1: Vacuolar aminopeptidase 1

Chain Y:



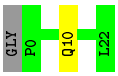
• Molecule 1: Vacuolar aminopeptidase 1

Chain B:



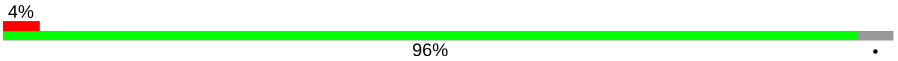
• Molecule 1: Vacuolar aminopeptidase 1

Chain a:



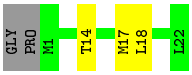
• Molecule 1: Vacuolar aminopeptidase 1

Chain b:



• Molecule 1: Vacuolar aminopeptidase 1

Chain D:

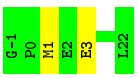


• Molecule 1: Vacuolar aminopeptidase 1

Chain F:

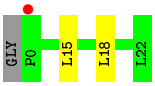
• Molecule 1: Vacuolar aminopeptidase 1

Chain c:



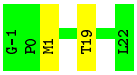
• Molecule 1: Vacuolar aminopeptidase 1

Chain H:



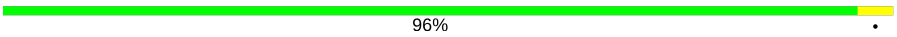
• Molecule 1: Vacuolar aminopeptidase 1

Chain d:



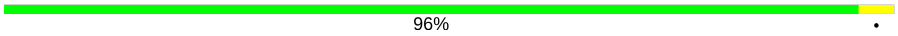
• Molecule 1: Vacuolar aminopeptidase 1

Chain J:



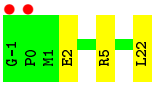
• Molecule 1: Vacuolar aminopeptidase 1

Chain e:



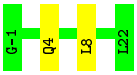
• Molecule 1: Vacuolar aminopeptidase 1

Chain L:



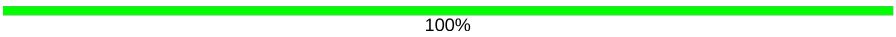
• Molecule 1: Vacuolar aminopeptidase 1

Chain f:



• Molecule 1: Vacuolar aminopeptidase 1

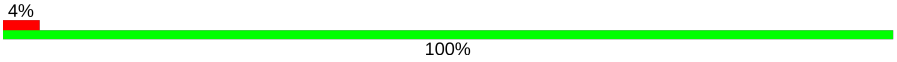
Chain N:



There are no outlier residues recorded for this chain.

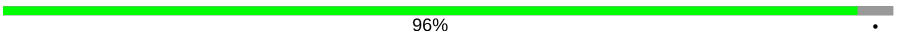
• Molecule 1: Vacuolar aminopeptidase 1

Chain g:



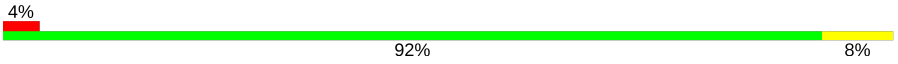
• Molecule 1: Vacuolar aminopeptidase 1

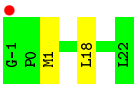
Chain P:



• Molecule 1: Vacuolar aminopeptidase 1

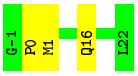
Chain h:





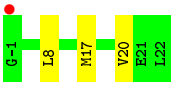
• Molecule 1: Vacuolar aminopeptidase 1

Chain R:



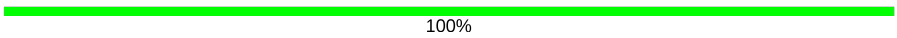
• Molecule 1: Vacuolar aminopeptidase 1

Chain i:



• Molecule 1: Vacuolar aminopeptidase 1

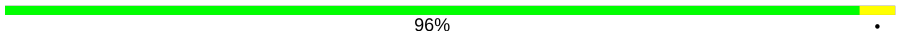
Chain T:



There are no outlier residues recorded for this chain.

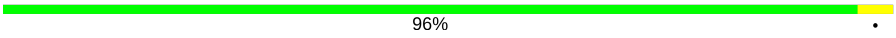
• Molecule 1: Vacuolar aminopeptidase 1

Chain j:



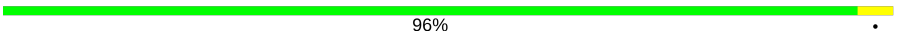
• Molecule 1: Vacuolar aminopeptidase 1

Chain V:



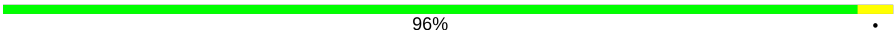
• Molecule 1: Vacuolar aminopeptidase 1

Chain k:



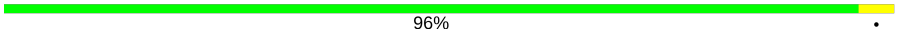
• Molecule 1: Vacuolar aminopeptidase 1

Chain X:



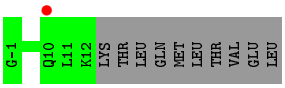
• Molecule 1: Vacuolar aminopeptidase 1

Chain l:



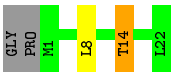
• Molecule 1: Vacuolar aminopeptidase 1

Chain Z:



• Molecule 1: Vacuolar aminopeptidase 1

Chain m:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α, β, γ	248.76Å 248.76Å 164.40Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.52 – 3.40 39.52 – 3.40	Depositor EDS
% Data completeness (in resolution range)	99.6 (39.52-3.40) 99.7 (39.52-3.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.20 (at 3.40Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.276 , 0.311 0.284 , 0.317	Depositor DCC
R_{free} test set	1327 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å^2)	107.1	Xtriage
Anisotropy	0.685	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 101.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	6607	wwPDB-VP
Average B, all atoms (Å^2)	129.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.96% 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	0.51	0/173	0.66	0/232
1	B	0.40	0/167	0.48	0/225
1	C	0.39	0/158	0.54	0/215
1	D	0.43	0/151	0.56	0/204
1	E	0.47	0/172	0.65	0/231
1	F	0.34	0/172	0.54	0/233
1	G	0.46	0/179	0.62	0/239
1	H	0.64	0/181	0.74	0/241
1	I	0.44	0/173	0.68	0/232
1	J	0.41	0/176	0.66	0/237
1	K	0.48	0/189	0.67	0/251
1	L	0.60	0/191	0.79	0/254
1	M	0.52	0/186	0.65	0/248
1	N	0.41	0/180	0.47	0/241
1	O	0.40	0/170	0.61	0/230
1	P	0.61	0/177	0.83	0/236
1	Q	0.43	0/185	0.65	0/248
1	R	0.50	0/182	0.73	0/242
1	S	0.40	0/162	0.51	0/219
1	T	0.57	0/182	0.81	0/242
1	U	0.45	0/186	0.63	0/248
1	V	0.57	0/177	0.72	0/238
1	W	0.50	0/180	0.71	0/240
1	X	0.51	0/173	0.68	0/234
1	Y	0.36	0/116	0.55	0/158
1	Z	0.34	0/89	0.46	0/121
1	a	0.36	0/156	0.41	0/212
1	b	0.35	0/151	0.44	0/205
1	c	0.38	0/166	0.55	0/224
1	d	0.54	0/172	0.74	0/230
1	e	0.41	0/179	0.61	0/239
1	f	0.48	0/173	0.73	0/231
1	g	0.56	0/164	0.77	0/222
1	h	0.39	0/177	0.64	0/237

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	i	0.49	0/173	0.75	0/234
1	j	0.47	0/186	0.61	0/248
1	k	0.53	0/176	0.69	0/236
1	l	0.63	0/184	0.81	0/246
1	m	0.43	0/121	0.50	0/166
All	All	0.48	0/6605	0.65	0/8869

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

Due to software issues we are unable to calculate clashes - this section is therefore empty.

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	22/24 (92%)	22 (100%)	0	0	100 100
1	B	22/24 (92%)	20 (91%)	2 (9%)	0	100 100
1	C	22/24 (92%)	21 (96%)	0	1 (4%)	2 16
1	D	20/24 (83%)	16 (80%)	4 (20%)	0	100 100
1	E	22/24 (92%)	22 (100%)	0	0	100 100
1	F	22/24 (92%)	21 (96%)	1 (4%)	0	100 100
1	G	22/24 (92%)	22 (100%)	0	0	100 100
1	H	21/24 (88%)	21 (100%)	0	0	100 100
1	I	22/24 (92%)	22 (100%)	0	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	J	22/24 (92%)	22 (100%)	0	0	100	100
1	K	22/24 (92%)	22 (100%)	0	0	100	100
1	L	22/24 (92%)	22 (100%)	0	0	100	100
1	M	22/24 (92%)	22 (100%)	0	0	100	100
1	N	22/24 (92%)	20 (91%)	2 (9%)	0	100	100
1	O	22/24 (92%)	22 (100%)	0	0	100	100
1	P	21/24 (88%)	21 (100%)	0	0	100	100
1	Q	22/24 (92%)	22 (100%)	0	0	100	100
1	R	22/24 (92%)	21 (96%)	0	1 (4%)	2	16
1	S	22/24 (92%)	20 (91%)	1 (4%)	1 (4%)	2	16
1	T	22/24 (92%)	22 (100%)	0	0	100	100
1	U	22/24 (92%)	21 (96%)	0	1 (4%)	2	16
1	V	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
1	W	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
1	X	22/24 (92%)	22 (100%)	0	0	100	100
1	Y	18/24 (75%)	18 (100%)	0	0	100	100
1	Z	12/24 (50%)	11 (92%)	1 (8%)	0	100	100
1	a	21/24 (88%)	21 (100%)	0	0	100	100
1	b	21/24 (88%)	20 (95%)	1 (5%)	0	100	100
1	c	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
1	d	22/24 (92%)	22 (100%)	0	0	100	100
1	e	22/24 (92%)	22 (100%)	0	0	100	100
1	f	22/24 (92%)	20 (91%)	2 (9%)	0	100	100
1	g	22/24 (92%)	22 (100%)	0	0	100	100
1	h	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
1	i	22/24 (92%)	22 (100%)	0	0	100	100
1	j	22/24 (92%)	22 (100%)	0	0	100	100
1	k	22/24 (92%)	21 (96%)	1 (4%)	0	100	100
1	l	22/24 (92%)	22 (100%)	0	0	100	100
1	m	20/24 (83%)	20 (100%)	0	0	100	100
All	All	836/936 (89%)	813 (97%)	19 (2%)	4 (0%)	29	61

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	S	0	PRO
1	R	0	PRO
1	U	20	VAL
1	C	0	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	17/23 (74%)	17 (100%)	0	100 100
1	B	15/23 (65%)	14 (93%)	1 (7%)	16 46
1	C	13/23 (56%)	12 (92%)	1 (8%)	13 40
1	D	13/23 (56%)	10 (77%)	3 (23%)	1 2
1	E	17/23 (74%)	16 (94%)	1 (6%)	19 49
1	F	16/23 (70%)	14 (88%)	2 (12%)	4 17
1	G	18/23 (78%)	16 (89%)	2 (11%)	6 22
1	H	20/23 (87%)	18 (90%)	2 (10%)	7 27
1	I	17/23 (74%)	15 (88%)	2 (12%)	5 19
1	J	17/23 (74%)	16 (94%)	1 (6%)	19 49
1	K	21/23 (91%)	19 (90%)	2 (10%)	8 29
1	L	21/23 (91%)	18 (86%)	3 (14%)	3 13
1	M	20/23 (87%)	19 (95%)	1 (5%)	24 54
1	N	18/23 (78%)	18 (100%)	0	100 100
1	O	16/23 (70%)	14 (88%)	2 (12%)	4 17
1	P	19/23 (83%)	19 (100%)	0	100 100
1	Q	20/23 (87%)	19 (95%)	1 (5%)	24 54
1	R	19/23 (83%)	17 (90%)	2 (10%)	7 25
1	S	14/23 (61%)	12 (86%)	2 (14%)	3 13
1	T	19/23 (83%)	19 (100%)	0	100 100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	U	20/23 (87%)	18 (90%)	2 (10%)	7 27
1	V	18/23 (78%)	17 (94%)	1 (6%)	21 51
1	W	19/23 (83%)	18 (95%)	1 (5%)	22 52
1	X	17/23 (74%)	16 (94%)	1 (6%)	19 49
1	Y	6/23 (26%)	5 (83%)	1 (17%)	2 8
1	Z	6/23 (26%)	6 (100%)	0	100 100
1	a	13/23 (56%)	12 (92%)	1 (8%)	13 40
1	b	12/23 (52%)	12 (100%)	0	100 100
1	c	15/23 (65%)	13 (87%)	2 (13%)	4 15
1	d	17/23 (74%)	15 (88%)	2 (12%)	5 19
1	e	18/23 (78%)	17 (94%)	1 (6%)	21 51
1	f	17/23 (74%)	15 (88%)	2 (12%)	5 19
1	g	15/23 (65%)	15 (100%)	0	100 100
1	h	17/23 (74%)	15 (88%)	2 (12%)	5 19
1	i	17/23 (74%)	14 (82%)	3 (18%)	2 6
1	j	20/23 (87%)	19 (95%)	1 (5%)	24 54
1	k	18/23 (78%)	17 (94%)	1 (6%)	21 51
1	l	20/23 (87%)	19 (95%)	1 (5%)	24 54
1	m	4/23 (17%)	2 (50%)	2 (50%)	0 0
All	All	639/897 (71%)	587 (92%)	52 (8%)	11 38

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	1	MET
1	E	1	MET
1	G	1	MET
1	G	11	LEU
1	I	1	MET
1	I	11	LEU
1	K	1	MET
1	K	17	MET
1	M	1	MET
1	O	1	MET
1	O	2	GLU

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Mol	Chain	Res	Type
1	Q	3	GLU
1	S	7	ILE
1	S	17	MET
1	U	16	GLN
1	U	22	LEU
1	W	7	ILE
1	Y	14	THR
1	B	1	MET
1	a	10	GLN
1	D	14	THR
1	D	17	MET
1	D	18	LEU
1	F	15	LEU
1	F	22	LEU
1	c	1	MET
1	c	3	GLU
1	H	15	LEU
1	H	18	LEU
1	d	1	MET
1	d	19	THR
1	J	8	LEU
1	e	22	LEU
1	L	2	GLU
1	L	5	ARG
1	L	22	LEU
1	f	4	GLN
1	f	8	LEU
1	h	1	MET
1	h	18	LEU
1	R	1	MET
1	R	16	GLN
1	i	8	LEU
1	i	17	MET
1	i	20	VAL
1	j	1	MET
1	V	10	GLN
1	k	1	MET
1	X	21	GLU
1	l	4	GLN
1	m	8	LEU
1	m	14	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such

sidechains are listed below:

Mol	Chain	Res	Type
1	A	16	GLN
1	M	10	GLN
1	a	10	GLN
1	b	10	GLN
1	f	16	GLN
1	P	4	GLN
1	Z	10	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, 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	24/24 (100%)	-0.27	0 100 100	84, 112, 177, 187	0
1	B	24/24 (100%)	-0.37	0 100 100	104, 125, 168, 170	0
1	C	24/24 (100%)	-0.45	0 100 100	131, 182, 261, 271	0
1	D	22/24 (91%)	-0.55	0 100 100	83, 107, 129, 151	0
1	E	24/24 (100%)	-0.24	0 100 100	80, 128, 279, 312	0
1	F	24/24 (100%)	-0.29	0 100 100	93, 137, 176, 204	0
1	G	24/24 (100%)	-0.55	0 100 100	92, 126, 180, 223	0
1	H	23/24 (95%)	0.39	1 (4%) 35 35	67, 91, 128, 303	0
1	I	24/24 (100%)	-0.24	0 100 100	53, 121, 279, 301	0
1	J	24/24 (100%)	-0.38	0 100 100	81, 133, 170, 189	0
1	K	24/24 (100%)	-0.34	0 100 100	90, 117, 150, 202	0
1	L	24/24 (100%)	0.37	2 (8%) 11 13	67, 84, 130, 189	0
1	M	24/24 (100%)	-0.28	0 100 100	77, 97, 165, 201	0
1	N	24/24 (100%)	-0.04	0 100 100	72, 102, 145, 151	0
1	O	24/24 (100%)	-0.36	0 100 100	93, 123, 194, 261	0
1	P	23/24 (95%)	-0.06	0 100 100	72, 95, 120, 246	0
1	Q	24/24 (100%)	-0.01	2 (8%) 11 13	90, 134, 282, 324	0
1	R	24/24 (100%)	-0.20	0 100 100	63, 119, 208, 251	0
1	S	24/24 (100%)	0.18	0 100 100	94, 133, 168, 183	0
1	T	24/24 (100%)	-0.14	0 100 100	64, 93, 203, 250	0
1	U	24/24 (100%)	-0.04	0 100 100	67, 91, 153, 161	0
1	V	24/24 (100%)	-0.57	0 100 100	85, 94, 127, 153	0
1	W	24/24 (100%)	-0.34	0 100 100	55, 81, 142, 180	0
1	X	24/24 (100%)	-0.35	0 100 100	59, 94, 181, 210	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	Y	20/24 (83%)	-0.03	0 100 100	142, 175, 252, 288	0
1	Z	14/24 (58%)	0.91	1 (7%) 16 18	179, 219, 271, 348	0
1	a	23/24 (95%)	-0.44	0 100 100	84, 134, 206, 318	0
1	b	23/24 (95%)	-0.52	1 (4%) 35 35	113, 160, 228, 234	0
1	c	24/24 (100%)	-0.38	0 100 100	85, 123, 301, 310	0
1	d	24/24 (100%)	-0.16	0 100 100	106, 124, 156, 266	0
1	e	24/24 (100%)	-0.24	0 100 100	82, 123, 202, 221	0
1	f	24/24 (100%)	-0.26	0 100 100	72, 108, 230, 242	0
1	g	24/24 (100%)	-0.60	1 (4%) 36 35	87, 104, 212, 259	0
1	h	24/24 (100%)	-0.19	1 (4%) 36 35	81, 123, 192, 261	0
1	i	24/24 (100%)	-0.18	1 (4%) 36 35	105, 128, 168, 184	0
1	j	24/24 (100%)	-0.03	0 100 100	70, 105, 186, 222	0
1	k	24/24 (100%)	-0.52	0 100 100	59, 79, 137, 218	0
1	l	24/24 (100%)	-0.36	0 100 100	63, 74, 98, 120	0
1	m	22/24 (91%)	-0.16	0 100 100	145, 207, 299, 311	0
All	All	914/936 (97%)	-0.23	10 (1%) 80 79	53, 120, 242, 348	0

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	i	-1	GLY	4.8
1	b	0	PRO	3.6
1	L	-1	GLY	3.5
1	g	-1	GLY	3.3
1	Q	-1	GLY	2.9
1	H	0	PRO	2.6
1	L	0	PRO	2.5
1	Z	10	GLN	2.3
1	Q	0	PRO	2.2
1	h	-1	GLY	2.2

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.