wwPDB X-ray Structure Validation Summary Report (i)

Jun 11, 2024 – 10:04 PM EDT

PDB ID	:	6NAW
Title	:	Crystal structure of Neisseria meningitidis ClpP E58A activated mutant
Authors	:	Mabanglo, M.F.; Houry, W.A.
Deposited on	:	2018-12-06
Resolution	:	2.40 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) 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 (i)) were used in the production of this report:

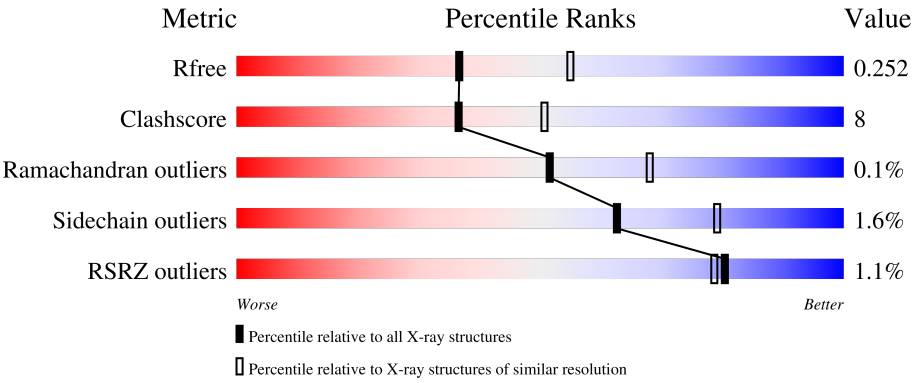
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	217	64% 18% 18%
1	B	217	% 64% 18% 18%
1	C	217	67% 12% • 19%
1	D	217	67% 16% 18%
1	E	217	64% 16% • 18%

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Mol	Chain	Length	Quality of chain
1	F	217	2% 73% 9% 18%
1	G	217	2% 72% 12% 16%
1	H	217	% 71% 12% 17%
1	I	217	% 67% 14% 18%
1	J	217	66% 16% 17%
1	K	217	2% 68% 15% 16%
1	L	217	65% 16% 19%
1	M	217	70% 12% 18%
1	N	217	65% 16% 19%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 20353 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 ATP-dependent Clp protease proteolytic subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	177	Total	C	N	O	S	0	0	0
			1384	876	236	264	8			
1	B	178	Total	C	N	O	S	0	0	0
			1392	882	237	265	8			
1	C	175	Total	C	N	O	S	0	0	0
			1363	859	234	262	8			
1	D	179	Total	C	N	O	S	0	0	0
			1396	884	238	266	8			
1	E	177	Total	C	N	O	S	0	0	0
			1380	875	233	264	8			
1	F	179	Total	C	N	O	S	0	0	0
			1396	884	238	266	8			
1	G	183	Total	C	N	O	S	0	0	0
			1420	898	242	272	8			
1	H	180	Total	C	N	O	S	0	0	0
			1399	884	239	268	8			
1	I	178	Total	C	N	O	S	0	0	0
			1388	878	237	265	8			
1	J	180	Total	C	N	O	S	0	0	0
			1399	884	239	268	8			
1	K	183	Total	C	N	O	S	0	0	0
			1416	894	242	272	8			
1	L	175	Total	C	N	O	S	0	0	0
			1363	859	234	262	8			
1	M	178	Total	C	N	O	S	0	0	0
			1391	881	237	265	8			
1	N	176	Total	C	N	O	S	0	0	0
			1371	865	235	263	8			

There are 196 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	HIS	-	expression tag	UNP I4E574

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-11	HIS	-	expression tag	UNP I4E574
A	-10	HIS	-	expression tag	UNP I4E574
A	-9	HIS	-	expression tag	UNP I4E574
A	-8	HIS	-	expression tag	UNP I4E574
A	-7	HIS	-	expression tag	UNP I4E574
A	-6	GLU	-	expression tag	UNP I4E574
A	-5	ASN	-	expression tag	UNP I4E574
A	-4	LEU	-	expression tag	UNP I4E574
A	-3	TYR	-	expression tag	UNP I4E574
A	-2	PHE	-	expression tag	UNP I4E574
A	-1	GLN	-	expression tag	UNP I4E574
A	0	GLY	-	expression tag	UNP I4E574
A	58	ALA	GLU	engineered mutation	UNP I4E574
B	-12	HIS	-	expression tag	UNP I4E574
B	-11	HIS	-	expression tag	UNP I4E574
B	-10	HIS	-	expression tag	UNP I4E574
B	-9	HIS	-	expression tag	UNP I4E574
B	-8	HIS	-	expression tag	UNP I4E574
B	-7	HIS	-	expression tag	UNP I4E574
B	-6	GLU	-	expression tag	UNP I4E574
B	-5	ASN	-	expression tag	UNP I4E574
B	-4	LEU	-	expression tag	UNP I4E574
B	-3	TYR	-	expression tag	UNP I4E574
B	-2	PHE	-	expression tag	UNP I4E574
B	-1	GLN	-	expression tag	UNP I4E574
B	0	GLY	-	expression tag	UNP I4E574
B	58	ALA	GLU	engineered mutation	UNP I4E574
C	-12	HIS	-	expression tag	UNP I4E574
C	-11	HIS	-	expression tag	UNP I4E574
C	-10	HIS	-	expression tag	UNP I4E574
C	-9	HIS	-	expression tag	UNP I4E574
C	-8	HIS	-	expression tag	UNP I4E574
C	-7	HIS	-	expression tag	UNP I4E574
C	-6	GLU	-	expression tag	UNP I4E574
C	-5	ASN	-	expression tag	UNP I4E574
C	-4	LEU	-	expression tag	UNP I4E574
C	-3	TYR	-	expression tag	UNP I4E574
C	-2	PHE	-	expression tag	UNP I4E574
C	-1	GLN	-	expression tag	UNP I4E574
C	0	GLY	-	expression tag	UNP I4E574
C	58	ALA	GLU	engineered mutation	UNP I4E574
D	-12	HIS	-	expression tag	UNP I4E574

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-11	HIS	-	expression tag	UNP I4E574
D	-10	HIS	-	expression tag	UNP I4E574
D	-9	HIS	-	expression tag	UNP I4E574
D	-8	HIS	-	expression tag	UNP I4E574
D	-7	HIS	-	expression tag	UNP I4E574
D	-6	GLU	-	expression tag	UNP I4E574
D	-5	ASN	-	expression tag	UNP I4E574
D	-4	LEU	-	expression tag	UNP I4E574
D	-3	TYR	-	expression tag	UNP I4E574
D	-2	PHE	-	expression tag	UNP I4E574
D	-1	GLN	-	expression tag	UNP I4E574
D	0	GLY	-	expression tag	UNP I4E574
D	58	ALA	GLU	engineered mutation	UNP I4E574
E	-12	HIS	-	expression tag	UNP I4E574
E	-11	HIS	-	expression tag	UNP I4E574
E	-10	HIS	-	expression tag	UNP I4E574
E	-9	HIS	-	expression tag	UNP I4E574
E	-8	HIS	-	expression tag	UNP I4E574
E	-7	HIS	-	expression tag	UNP I4E574
E	-6	GLU	-	expression tag	UNP I4E574
E	-5	ASN	-	expression tag	UNP I4E574
E	-4	LEU	-	expression tag	UNP I4E574
E	-3	TYR	-	expression tag	UNP I4E574
E	-2	PHE	-	expression tag	UNP I4E574
E	-1	GLN	-	expression tag	UNP I4E574
E	0	GLY	-	expression tag	UNP I4E574
E	58	ALA	GLU	engineered mutation	UNP I4E574
F	-12	HIS	-	expression tag	UNP I4E574
F	-11	HIS	-	expression tag	UNP I4E574
F	-10	HIS	-	expression tag	UNP I4E574
F	-9	HIS	-	expression tag	UNP I4E574
F	-8	HIS	-	expression tag	UNP I4E574
F	-7	HIS	-	expression tag	UNP I4E574
F	-6	GLU	-	expression tag	UNP I4E574
F	-5	ASN	-	expression tag	UNP I4E574
F	-4	LEU	-	expression tag	UNP I4E574
F	-3	TYR	-	expression tag	UNP I4E574
F	-2	PHE	-	expression tag	UNP I4E574
F	-1	GLN	-	expression tag	UNP I4E574
F	0	GLY	-	expression tag	UNP I4E574
F	58	ALA	GLU	engineered mutation	UNP I4E574
G	-12	HIS	-	expression tag	UNP I4E574

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-11	HIS	-	expression tag	UNP I4E574
G	-10	HIS	-	expression tag	UNP I4E574
G	-9	HIS	-	expression tag	UNP I4E574
G	-8	HIS	-	expression tag	UNP I4E574
G	-7	HIS	-	expression tag	UNP I4E574
G	-6	GLU	-	expression tag	UNP I4E574
G	-5	ASN	-	expression tag	UNP I4E574
G	-4	LEU	-	expression tag	UNP I4E574
G	-3	TYR	-	expression tag	UNP I4E574
G	-2	PHE	-	expression tag	UNP I4E574
G	-1	GLN	-	expression tag	UNP I4E574
G	0	GLY	-	expression tag	UNP I4E574
G	58	ALA	GLU	engineered mutation	UNP I4E574
H	-12	HIS	-	expression tag	UNP I4E574
H	-11	HIS	-	expression tag	UNP I4E574
H	-10	HIS	-	expression tag	UNP I4E574
H	-9	HIS	-	expression tag	UNP I4E574
H	-8	HIS	-	expression tag	UNP I4E574
H	-7	HIS	-	expression tag	UNP I4E574
H	-6	GLU	-	expression tag	UNP I4E574
H	-5	ASN	-	expression tag	UNP I4E574
H	-4	LEU	-	expression tag	UNP I4E574
H	-3	TYR	-	expression tag	UNP I4E574
H	-2	PHE	-	expression tag	UNP I4E574
H	-1	GLN	-	expression tag	UNP I4E574
H	0	GLY	-	expression tag	UNP I4E574
H	58	ALA	GLU	engineered mutation	UNP I4E574
I	-12	HIS	-	expression tag	UNP I4E574
I	-11	HIS	-	expression tag	UNP I4E574
I	-10	HIS	-	expression tag	UNP I4E574
I	-9	HIS	-	expression tag	UNP I4E574
I	-8	HIS	-	expression tag	UNP I4E574
I	-7	HIS	-	expression tag	UNP I4E574
I	-6	GLU	-	expression tag	UNP I4E574
I	-5	ASN	-	expression tag	UNP I4E574
I	-4	LEU	-	expression tag	UNP I4E574
I	-3	TYR	-	expression tag	UNP I4E574
I	-2	PHE	-	expression tag	UNP I4E574
I	-1	GLN	-	expression tag	UNP I4E574
I	0	GLY	-	expression tag	UNP I4E574
I	58	ALA	GLU	engineered mutation	UNP I4E574
J	-12	HIS	-	expression tag	UNP I4E574

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Chain	Residue	Modelled	Actual	Comment	Reference
J	-11	HIS	-	expression tag	UNP I4E574
J	-10	HIS	-	expression tag	UNP I4E574
J	-9	HIS	-	expression tag	UNP I4E574
J	-8	HIS	-	expression tag	UNP I4E574
J	-7	HIS	-	expression tag	UNP I4E574
J	-6	GLU	-	expression tag	UNP I4E574
J	-5	ASN	-	expression tag	UNP I4E574
J	-4	LEU	-	expression tag	UNP I4E574
J	-3	TYR	-	expression tag	UNP I4E574
J	-2	PHE	-	expression tag	UNP I4E574
J	-1	GLN	-	expression tag	UNP I4E574
J	0	GLY	-	expression tag	UNP I4E574
J	58	ALA	GLU	engineered mutation	UNP I4E574
K	-12	HIS	-	expression tag	UNP I4E574
K	-11	HIS	-	expression tag	UNP I4E574
K	-10	HIS	-	expression tag	UNP I4E574
K	-9	HIS	-	expression tag	UNP I4E574
K	-8	HIS	-	expression tag	UNP I4E574
K	-7	HIS	-	expression tag	UNP I4E574
K	-6	GLU	-	expression tag	UNP I4E574
K	-5	ASN	-	expression tag	UNP I4E574
K	-4	LEU	-	expression tag	UNP I4E574
K	-3	TYR	-	expression tag	UNP I4E574
K	-2	PHE	-	expression tag	UNP I4E574
K	-1	GLN	-	expression tag	UNP I4E574
K	0	GLY	-	expression tag	UNP I4E574
K	58	ALA	GLU	engineered mutation	UNP I4E574
L	-12	HIS	-	expression tag	UNP I4E574
L	-11	HIS	-	expression tag	UNP I4E574
L	-10	HIS	-	expression tag	UNP I4E574
L	-9	HIS	-	expression tag	UNP I4E574
L	-8	HIS	-	expression tag	UNP I4E574
L	-7	HIS	-	expression tag	UNP I4E574
L	-6	GLU	-	expression tag	UNP I4E574
L	-5	ASN	-	expression tag	UNP I4E574
L	-4	LEU	-	expression tag	UNP I4E574
L	-3	TYR	-	expression tag	UNP I4E574
L	-2	PHE	-	expression tag	UNP I4E574
L	-1	GLN	-	expression tag	UNP I4E574
L	0	GLY	-	expression tag	UNP I4E574
L	58	ALA	GLU	engineered mutation	UNP I4E574
M	-12	HIS	-	expression tag	UNP I4E574

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Chain	Residue	Modelled	Actual	Comment	Reference
M	-11	HIS	-	expression tag	UNP I4E574
M	-10	HIS	-	expression tag	UNP I4E574
M	-9	HIS	-	expression tag	UNP I4E574
M	-8	HIS	-	expression tag	UNP I4E574
M	-7	HIS	-	expression tag	UNP I4E574
M	-6	GLU	-	expression tag	UNP I4E574
M	-5	ASN	-	expression tag	UNP I4E574
M	-4	LEU	-	expression tag	UNP I4E574
M	-3	TYR	-	expression tag	UNP I4E574
M	-2	PHE	-	expression tag	UNP I4E574
M	-1	GLN	-	expression tag	UNP I4E574
M	0	GLY	-	expression tag	UNP I4E574
M	58	ALA	GLU	engineered mutation	UNP I4E574
N	-12	HIS	-	expression tag	UNP I4E574
N	-11	HIS	-	expression tag	UNP I4E574
N	-10	HIS	-	expression tag	UNP I4E574
N	-9	HIS	-	expression tag	UNP I4E574
N	-8	HIS	-	expression tag	UNP I4E574
N	-7	HIS	-	expression tag	UNP I4E574
N	-6	GLU	-	expression tag	UNP I4E574
N	-5	ASN	-	expression tag	UNP I4E574
N	-4	LEU	-	expression tag	UNP I4E574
N	-3	TYR	-	expression tag	UNP I4E574
N	-2	PHE	-	expression tag	UNP I4E574
N	-1	GLN	-	expression tag	UNP I4E574
N	0	GLY	-	expression tag	UNP I4E574
N	58	ALA	GLU	engineered mutation	UNP I4E574

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	64	Total O 64 64	0	0
2	B	74	Total O 74 74	0	0
2	C	65	Total O 65 65	0	0
2	D	56	Total O 56 56	0	0
2	E	53	Total O 53 53	0	0
2	F	75	Total O 75 75	0	0

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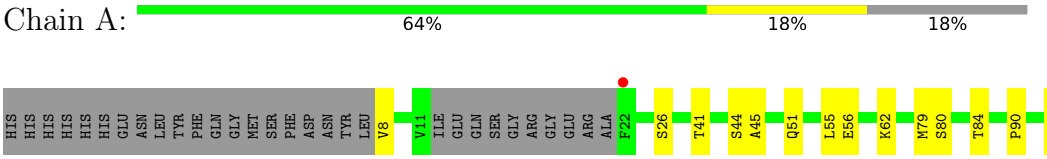
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	G	61	Total O 61 61	0	0
2	H	64	Total O 64 64	0	0
2	I	58	Total O 58 58	0	0
2	J	58	Total O 58 58	0	0
2	K	75	Total O 75 75	0	0
2	L	65	Total O 65 65	0	0
2	M	55	Total O 55 55	0	0
2	N	72	Total O 72 72	0	0

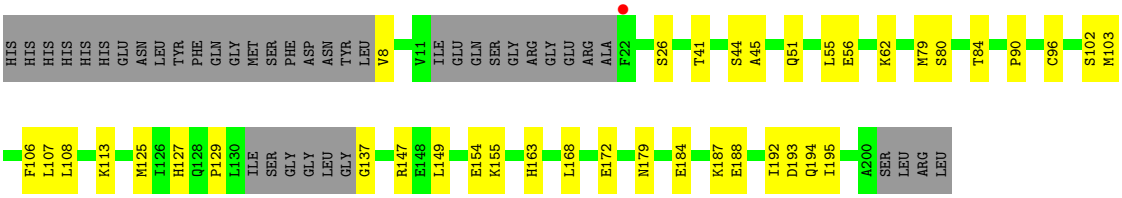
3 Residue-property plots (i)

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: ATP-dependent Clp protease proteolytic subunit

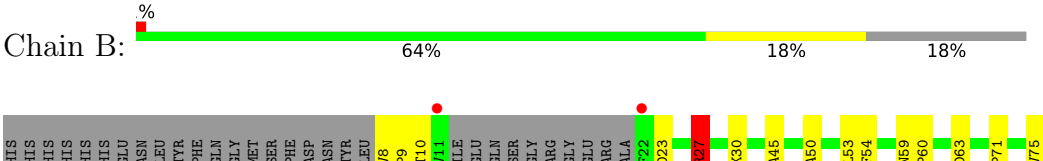
Chain A:

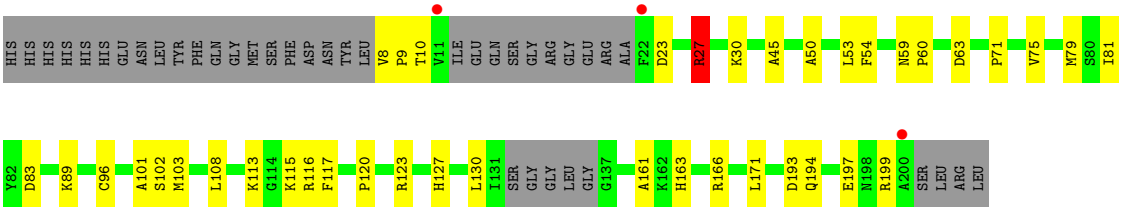




• Molecule 1: ATP-dependent Clp protease proteolytic subunit

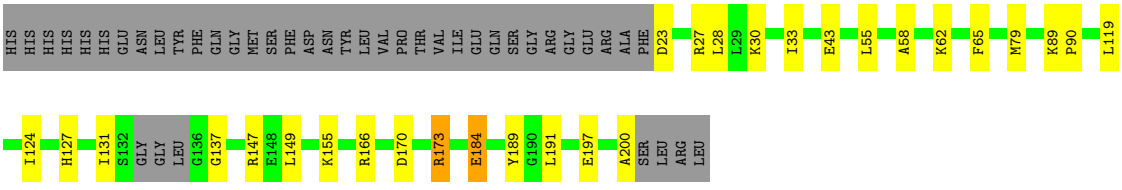
Chain B:





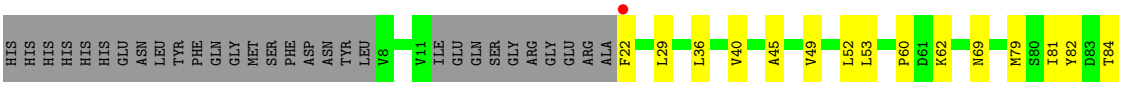
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

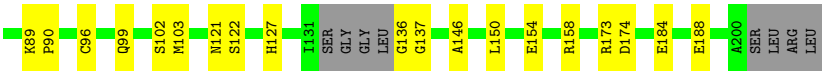
Chain C:



• Molecule 1: ATP-dependent Clp protease proteolytic subunit

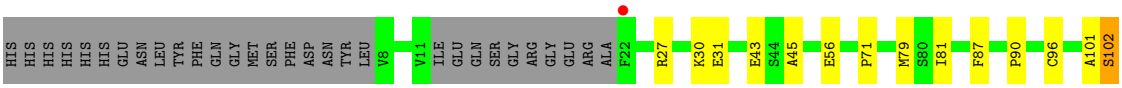
Chain D:





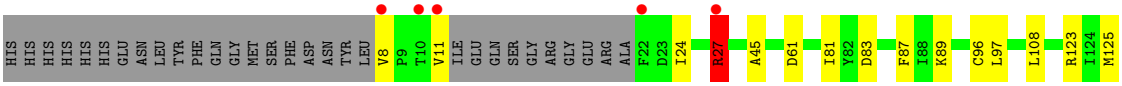
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain E:



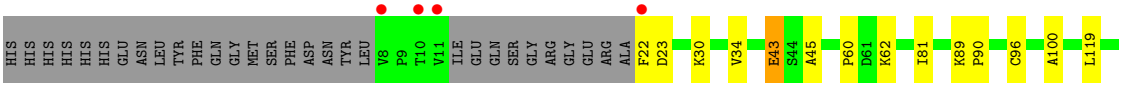
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain F:



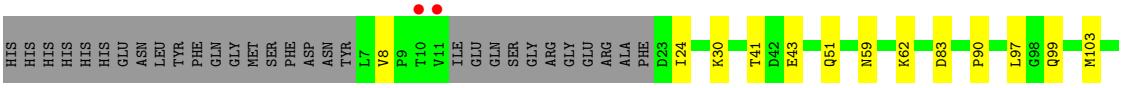
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain G:



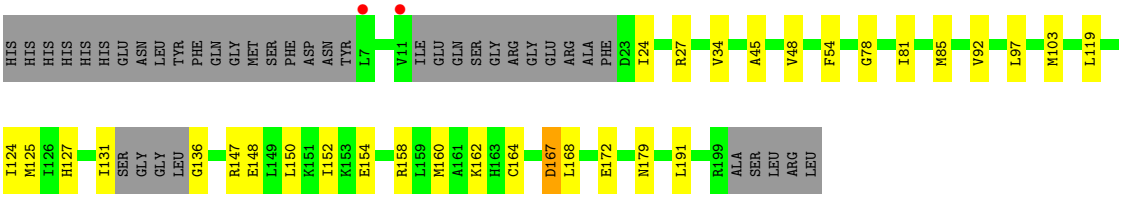
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain H:



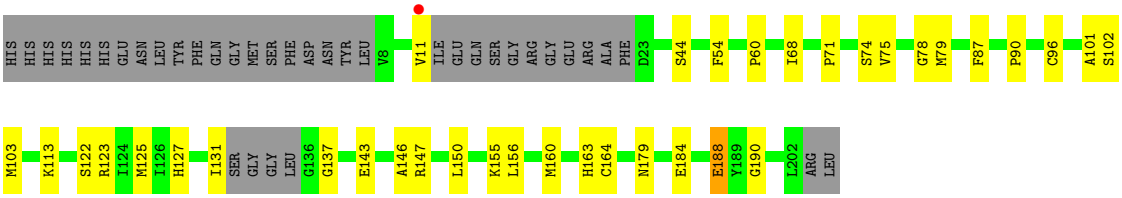
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain I:



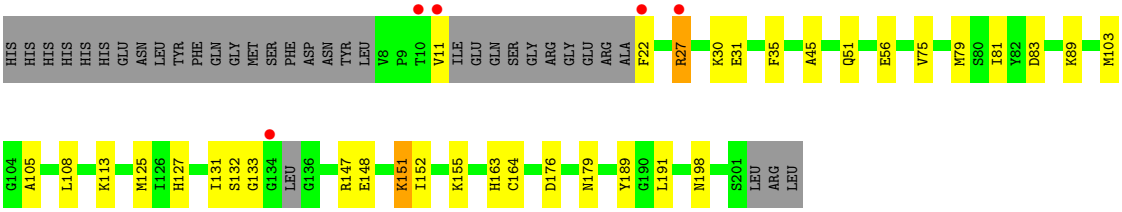
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain J:



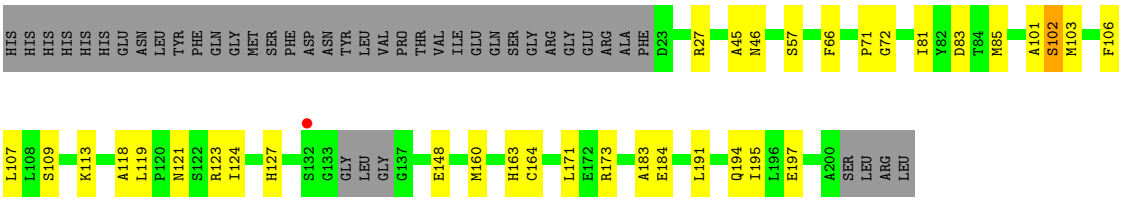
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain K:



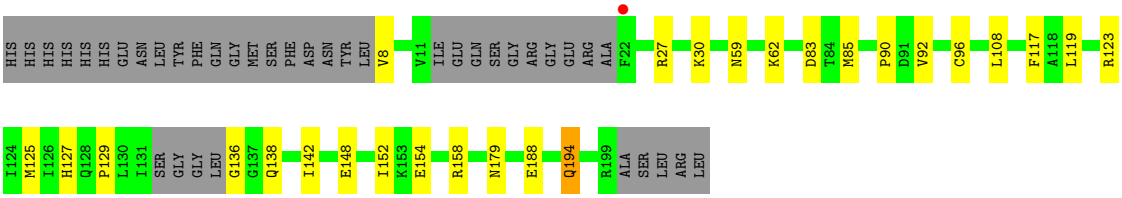
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain L:



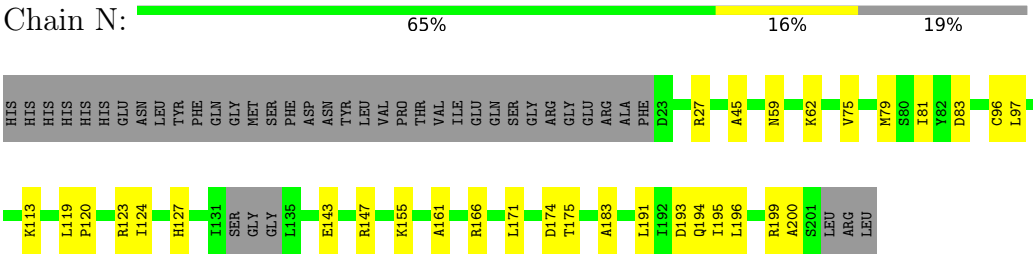
• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain M:



• Molecule 1: ATP-dependent Clp protease proteolytic subunit

Chain N:


65%
16%
19%
HIS HIS HIS HIS HIS GLU ASN LEU TYR PHE GLN GLY MET SER PHE ASP ASN TYR LEU VAL PRO THR VAL ILE GLU GLN SER GLY ARG GLY GLU ARG ALA PHE D23 R27 A45 N59 K62 V75 M79 S80 I81 Y82 D83 C96 L97 S102 M103 L108
K113 L119 P120 R123 I124 H127 T131 SER GLY GLY L135 E143 R147 K155 A161 R166 L171 D174 T175 A183 L191 I192 D193 Q194 I195 L196 R199 A200 S201 LEU ARG LEU

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	98.12Å 119.36Å 127.64Å 90.00° 89.99° 90.00°	Depositor
Resolution (Å)	42.76 – 2.40 42.76 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.8 (42.76-2.40) 99.8 (42.76-2.40)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.79 (at 2.39Å)	Xtriage
Refinement program	PHENIX (1.13_2998)	Depositor
R, R_{free}	0.193 , 0.252 0.193 , 0.252	Depositor DCC
R_{free} test set	1995 reflections (1.73%)	wwPDB-VP
Wilson B-factor (Å^2)	29.9	Xtriage
Anisotropy	0.580	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 36.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	0.469 for h,-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	20353	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.54% 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 (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	0.50	2/1404 (0.1%)	0.68	5/1890 (0.3%)
1	B	0.49	1/1412 (0.1%)	0.93	4/1901 (0.2%)
1	C	0.53	3/1382 (0.2%)	0.75	5/1859 (0.3%)
1	D	0.43	0/1416	0.65	0/1906
1	E	0.46	0/1400	0.70	4/1885 (0.2%)
1	F	0.45	0/1416	0.62	3/1906 (0.2%)
1	G	0.43	1/1440 (0.1%)	0.72	3/1938 (0.2%)
1	H	0.47	0/1418	0.67	2/1909 (0.1%)
1	I	0.46	0/1407	0.66	3/1894 (0.2%)
1	J	0.44	0/1418	0.63	0/1909
1	K	0.46	0/1436	0.74	4/1932 (0.2%)
1	L	0.48	1/1382 (0.1%)	0.68	3/1859 (0.2%)
1	M	0.44	0/1411	0.63	1/1899 (0.1%)
1	N	0.41	0/1390	0.59	0/1870
All	All	0.46	8/19732 (0.0%)	0.69	37/26557 (0.1%)

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
1	B	0	1
1	H	0	1
1	J	0	1
All	All	0	3

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	L	184	GLU	CD-OE2	8.10	1.34	1.25
1	A	154	GLU	CG-CD	6.51	1.61	1.51
1	A	188	GLU	CG-CD	5.95	1.60	1.51

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	30	LYS	CD-CE	5.78	1.65	1.51
1	C	184	GLU	CG-CD	5.48	1.60	1.51

The worst 5 of 37 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	27	ARG	NE-CZ-NH1	17.94	129.27	120.30
1	B	27	ARG	NE-CZ-NH2	-16.58	112.01	120.30
1	B	27	ARG	CG-CD-NE	-11.72	87.18	111.80
1	K	151	LYS	CD-CE-NZ	-10.02	88.65	111.70
1	G	147	ARG	CB-CG-CD	-8.59	89.26	111.60

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	27	ARG	Sidechain
1	H	30	LYS	Peptide
1	J	188	GLU	Sidechain

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	1384	0	1391	27	0
1	B	1392	0	1402	34	0
1	C	1363	0	1370	21	0
1	D	1396	0	1405	22	1
1	E	1380	0	1387	25	0
1	F	1396	0	1405	12	0
1	G	1420	0	1429	18	0
1	H	1399	0	1412	18	0
1	I	1388	0	1402	26	0
1	J	1399	0	1412	29	1
1	K	1416	0	1421	28	0
1	L	1363	0	1370	28	0
1	M	1391	0	1400	19	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	N	1371	0	1381	31	0
2	A	64	0	0	13	1
2	B	74	0	0	14	0
2	C	65	0	0	5	0
2	D	56	0	0	11	0
2	E	53	0	0	2	0
2	F	75	0	0	1	0
2	G	61	0	0	7	0
2	H	64	0	0	4	0
2	I	58	0	0	10	0
2	J	58	0	0	10	0
2	K	75	0	0	14	0
2	L	65	0	0	13	0
2	M	55	0	0	4	0
2	N	72	0	0	15	0
All	All	20353	0	19587	309	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 8.

The worst 5 of 309 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:M:152:ILE:HD11	1:N:123:ARG:NH2	1.71	1.06
1:J:74:SER:O	2:J:301:HOH:O	1.76	1.04
1:M:152:ILE:HD11	1:N:123:ARG:HH21	1.23	1.02
1:C:55:LEU:O	2:C:301:HOH:O	1.78	1.00
1:A:137:GLY:N	2:A:302:HOH:O	1.97	0.97

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)
1:J:188:GLU:OE2	1:M:188:GLU:OE2[1_655]	2.11	0.09
1:D:158:ARG:NH2	2:A:349:HOH:O[1_655]	2.18	0.02

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	171/217 (79%)	167 (98%)	4 (2%)	0	100	100
1	B	172/217 (79%)	169 (98%)	3 (2%)	0	100	100
1	C	171/217 (79%)	167 (98%)	4 (2%)	0	100	100
1	D	173/217 (80%)	170 (98%)	3 (2%)	0	100	100
1	E	171/217 (79%)	168 (98%)	3 (2%)	0	100	100
1	F	173/217 (80%)	170 (98%)	3 (2%)	0	100	100
1	G	177/217 (82%)	173 (98%)	4 (2%)	0	100	100
1	H	174/217 (80%)	170 (98%)	4 (2%)	0	100	100
1	I	172/217 (79%)	169 (98%)	3 (2%)	0	100	100
1	J	174/217 (80%)	171 (98%)	3 (2%)	0	100	100
1	K	177/217 (82%)	171 (97%)	5 (3%)	1 (1%)	25	36
1	L	171/217 (79%)	168 (98%)	3 (2%)	0	100	100
1	M	172/217 (79%)	169 (98%)	3 (2%)	0	100	100
1	N	172/217 (79%)	167 (97%)	4 (2%)	1 (1%)	25	36
All	All	2420/3038 (80%)	2369 (98%)	49 (2%)	2 (0%)	51	68

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	N	200	ALA
1	K	133	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	151/184 (82%)	150 (99%)	1 (1%)	84 92
1	B	152/184 (83%)	149 (98%)	3 (2%)	55 74
1	C	148/184 (80%)	145 (98%)	3 (2%)	55 74
1	D	152/184 (83%)	150 (99%)	2 (1%)	69 84
1	E	151/184 (82%)	148 (98%)	3 (2%)	55 74
1	F	152/184 (83%)	149 (98%)	3 (2%)	55 74
1	G	155/184 (84%)	153 (99%)	2 (1%)	69 84
1	H	153/184 (83%)	152 (99%)	1 (1%)	84 92
1	I	152/184 (83%)	149 (98%)	3 (2%)	55 74
1	J	153/184 (83%)	151 (99%)	2 (1%)	69 84
1	K	154/184 (84%)	151 (98%)	3 (2%)	57 75
1	L	148/184 (80%)	145 (98%)	3 (2%)	55 74
1	M	152/184 (83%)	150 (99%)	2 (1%)	69 84
1	N	149/184 (81%)	146 (98%)	3 (2%)	55 74
All	All	2122/2576 (82%)	2088 (98%)	34 (2%)	62 79

5 of 34 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	127	HIS
1	M	30	LYS
1	N	102	SER
1	F	27	ARG
1	E	127	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	M	46	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 monosaccharides 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	177/217 (81%)	-0.45	1 (0%) 89 88	22, 31, 55, 71	0
1	B	178/217 (82%)	-0.43	3 (1%) 70 68	22, 30, 58, 95	0
1	C	175/217 (80%)	-0.49	0 100 100	24, 31, 55, 81	0
1	D	179/217 (82%)	-0.43	1 (0%) 89 88	23, 33, 56, 79	0
1	E	177/217 (81%)	-0.41	1 (0%) 89 88	25, 35, 62, 104	0
1	F	179/217 (82%)	-0.36	5 (2%) 53 51	24, 32, 60, 84	0
1	G	183/217 (84%)	-0.37	4 (2%) 62 60	22, 31, 63, 108	0
1	H	180/217 (82%)	-0.41	2 (1%) 80 79	22, 32, 59, 94	0
1	I	178/217 (82%)	-0.43	2 (1%) 80 79	23, 32, 56, 80	0
1	J	180/217 (82%)	-0.42	1 (0%) 89 88	25, 35, 63, 91	0
1	K	183/217 (84%)	-0.32	5 (2%) 54 52	23, 32, 64, 127	0
1	L	175/217 (80%)	-0.48	1 (0%) 89 88	23, 31, 56, 95	0
1	M	178/217 (82%)	-0.46	1 (0%) 89 88	21, 31, 56, 93	0
1	N	176/217 (81%)	-0.48	0 100 100	22, 30, 52, 75	0
All	All	2498/3038 (82%)	-0.42	27 (1%) 80 79	21, 32, 60, 127	0

The worst 5 of 27 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	11	VAL	6.9
1	E	22	PHE	6.4
1	B	11	VAL	5.2
1	K	22	PHE	4.3
1	F	11	VAL	4.1

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 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.