



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 5, 2026 – 08:20 PM UTC

PDB ID : 5E0S / pdb_00005e0s
Title : crystal structure of the active form of the proteolytic complex clpP1 and clpP2
Authors : LI, M.; Wlodawer, A.; Maurizi, M.
Deposited on : 2015-09-29
Resolution : 2.90 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 ⓘ 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:

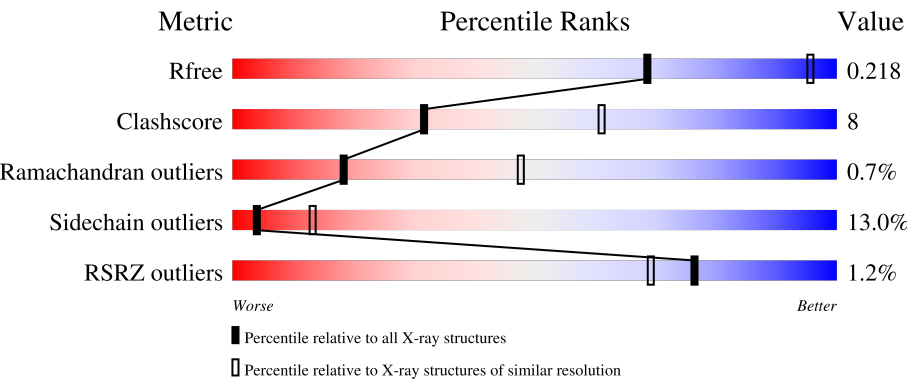
MolProbity	:	4-5-2 with Phenix2.0
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)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

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.90 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.



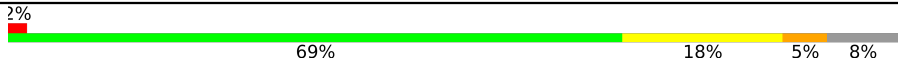
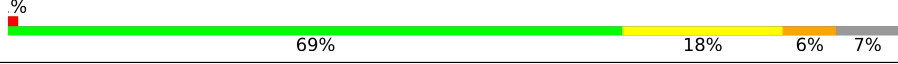
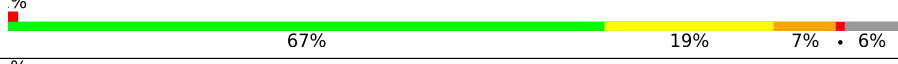
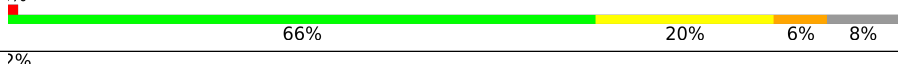
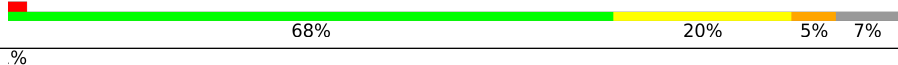
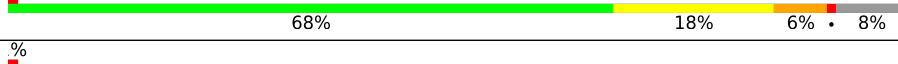
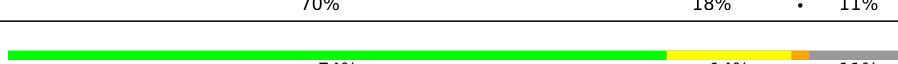
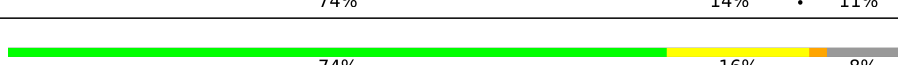
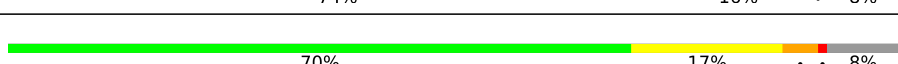
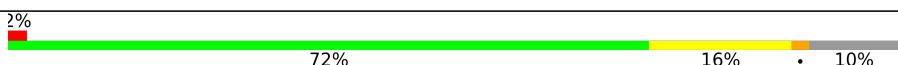
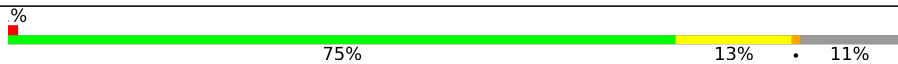
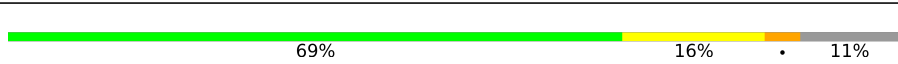
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	2481 (2.90-2.90)
Clashscore	190562	2690 (2.90-2.90)
Ramachandran outliers	187476	2623 (2.90-2.90)
Sidechain outliers	187428	2625 (2.90-2.90)
RSRZ outliers	180081	2481 (2.90-2.90)

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 $\leq 5\%$. 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	214	% 68%19%6%8%
1	B	214	2% 71%16%7%6%
1	C	214	% 66%20%5%8%
1	D	214	% 70%15%7%8%
1	E	214	72%15%5%7%

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Mol	Chain	Length	Quality of chain
1	F	214	
1	G	214	
1	a	214	
1	b	214	
1	c	214	
1	d	214	
1	e	214	
1	f	214	
1	g	214	
2	H	200	
2	I	200	
2	J	200	
2	K	200	
2	L	200	
2	M	200	
2	N	200	
2	h	200	
2	i	200	
2	j	200	
2	k	200	
2	l	200	
2	m	200	
2	n	200	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 40670 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 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	B	201	Total	C	N	O	S	0	0	0
			1546	972	263	303	8			
1	C	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	D	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	E	199	Total	C	N	O	S	0	0	0
			1534	965	261	300	8			
1	F	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	G	196	Total	C	N	O	S	0	0	0
			1514	954	257	295	8			
1	a	198	Total	C	N	O	S	0	0	0
			1525	960	259	298	8			
1	b	201	Total	C	N	O	S	0	0	0
			1546	972	263	303	8			
1	c	198	Total	C	N	O	S	0	0	0
			1525	960	259	298	8			
1	d	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	e	199	Total	C	N	O	S	0	0	0
			1534	965	261	300	8			
1	f	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			
1	g	197	Total	C	N	O	S	0	0	0
			1520	957	258	297	8			

- Molecule 2 is a protein called ATP-dependent Clp protease proteolytic subunit 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	186	Total	C	N	O	S	0	0	0
			1417	892	242	273	10			
2	I	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	J	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	K	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	L	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	M	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	N	184	Total	C	N	O	S	0	0	0
			1400	883	238	270	9			
2	h	183	Total	C	N	O	S	0	0	0
			1391	878	237	267	9			
2	i	181	Total	C	N	O	S	0	0	0
			1379	872	234	264	9			
2	j	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	k	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	l	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	m	178	Total	C	N	O	S	0	0	0
			1357	858	229	261	9			
2	n	184	Total	C	N	O	S	0	0	0
			1400	883	238	270	9			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total	O	0	0
			5	5		
3	B	5	Total	O	0	0
			5	5		
3	C	2	Total	O	0	0
			2	2		
3	E	1	Total	O	0	0
			1	1		
3	G	3	Total	O	0	0
			3	3		
3	H	4	Total	O	0	0
			4	4		

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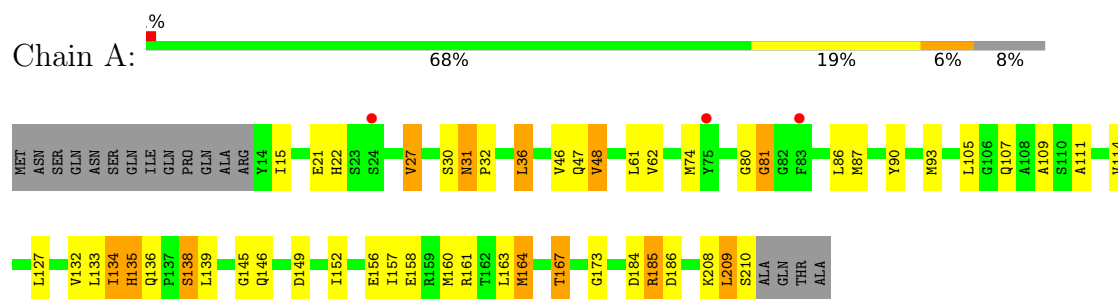
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	I	1	Total O 1 1	0	0
3	J	1	Total O 1 1	0	0
3	K	2	Total O 2 2	0	0
3	L	2	Total O 2 2	0	0
3	N	4	Total O 4 4	0	0
3	a	8	Total O 8 8	0	0
3	b	11	Total O 11 11	0	0
3	c	9	Total O 9 9	0	0
3	d	5	Total O 5 5	0	0
3	e	1	Total O 1 1	0	0
3	g	8	Total O 8 8	0	0
3	h	5	Total O 5 5	0	0
3	i	5	Total O 5 5	0	0
3	j	4	Total O 4 4	0	0
3	k	2	Total O 2 2	0	0
3	l	1	Total O 1 1	0	0
3	m	7	Total O 7 7	0	0
3	n	10	Total O 10 10	0	0

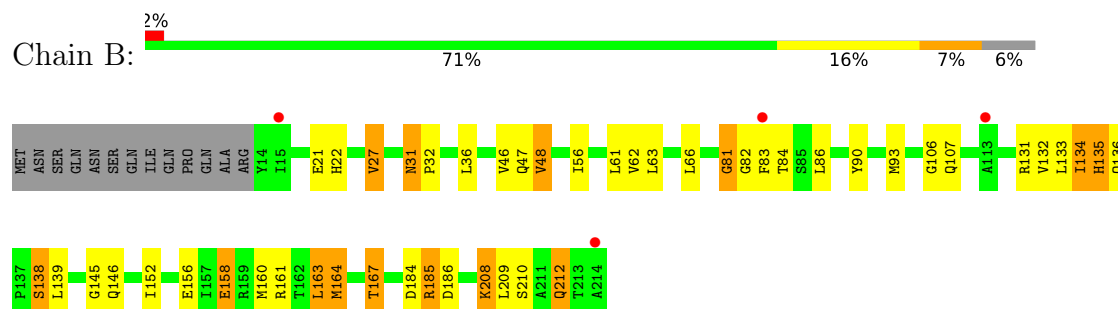
3 Residue-property plots

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.

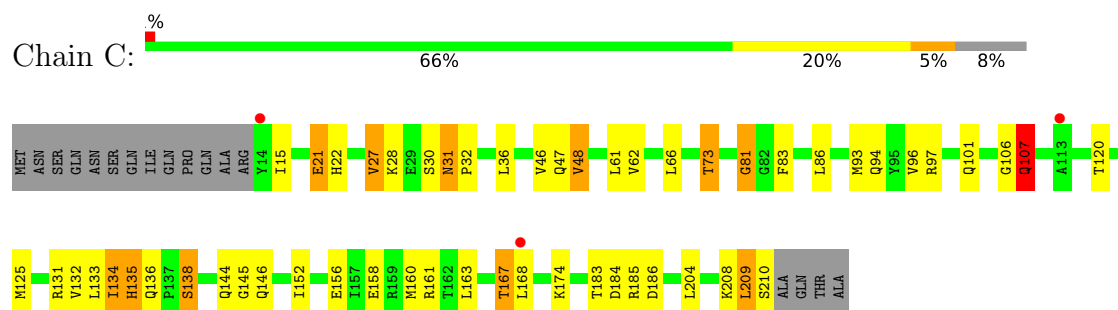
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

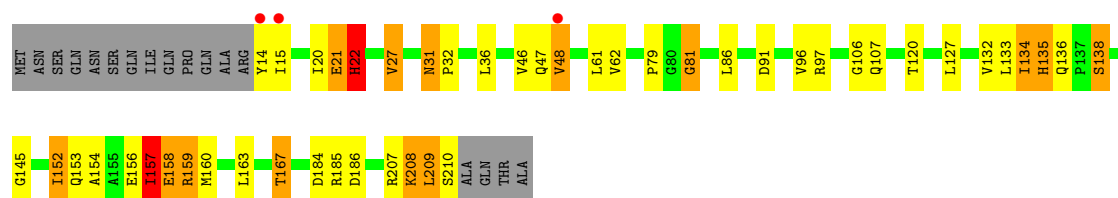


- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



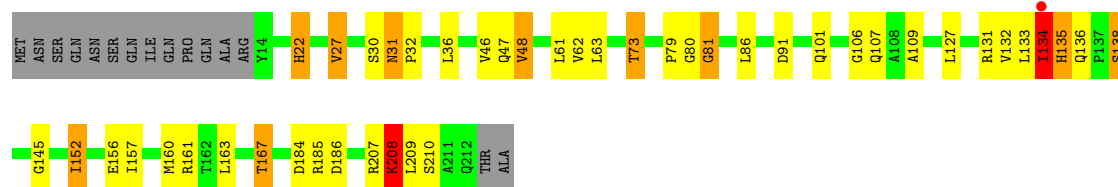
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2





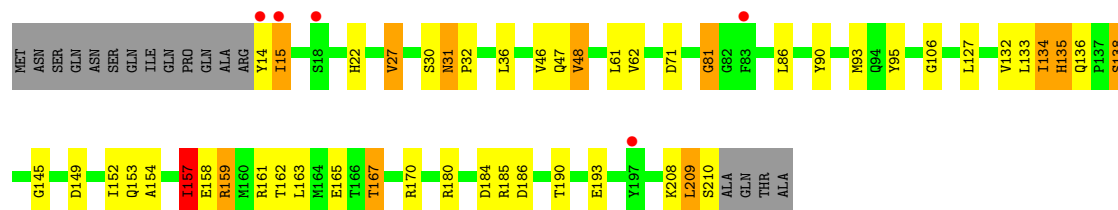
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

Chain E: 72% 15% 5% 7%



- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

Chain F: 2% 69% 18% 5% 8%



- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

Chain G: % 71% 14% 7% 8%

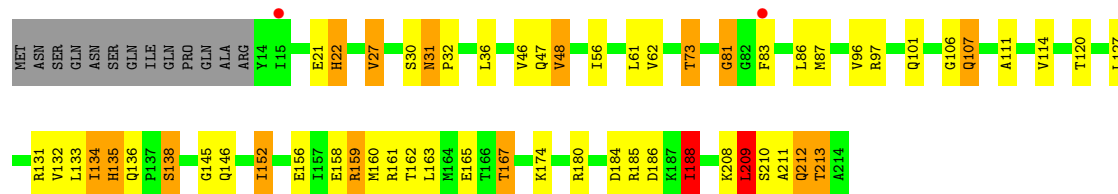


- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2

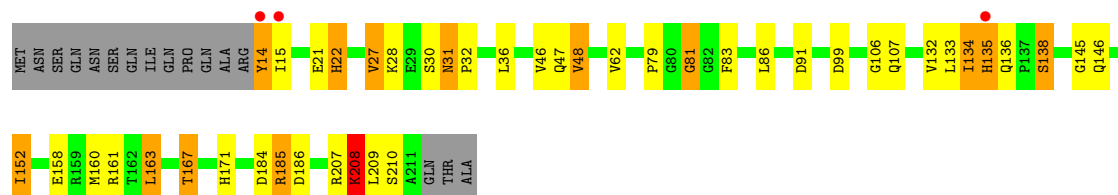
Chain a: % 69% 18% 6% 7%



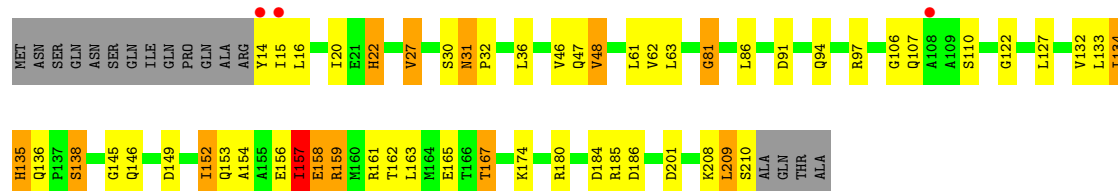
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



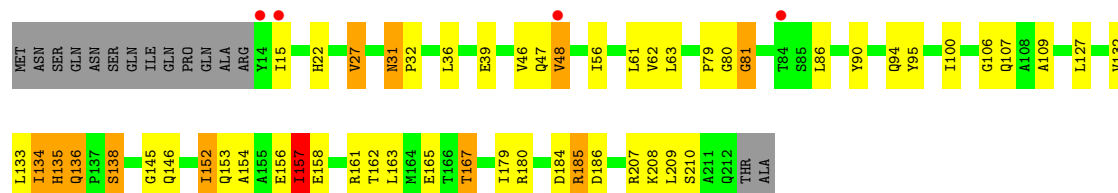
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



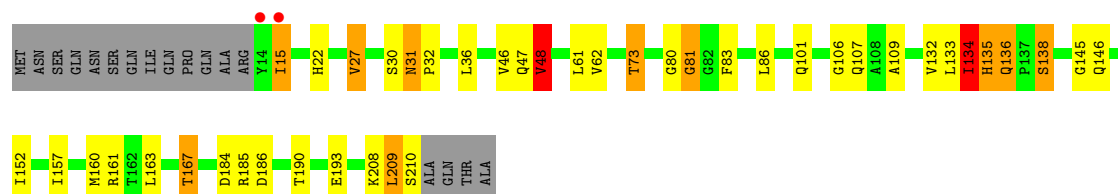
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



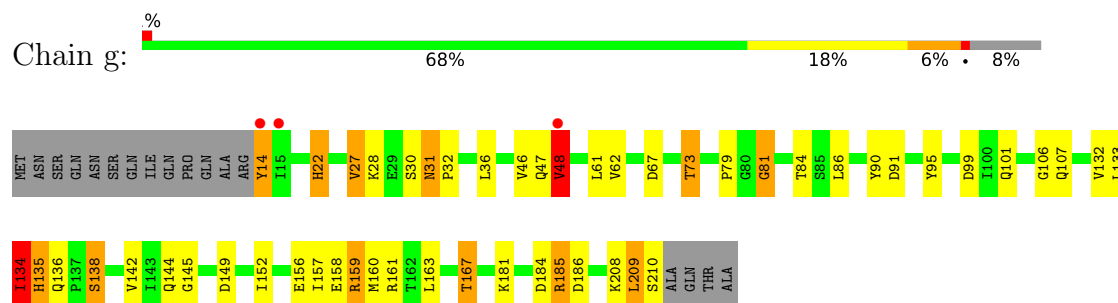
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



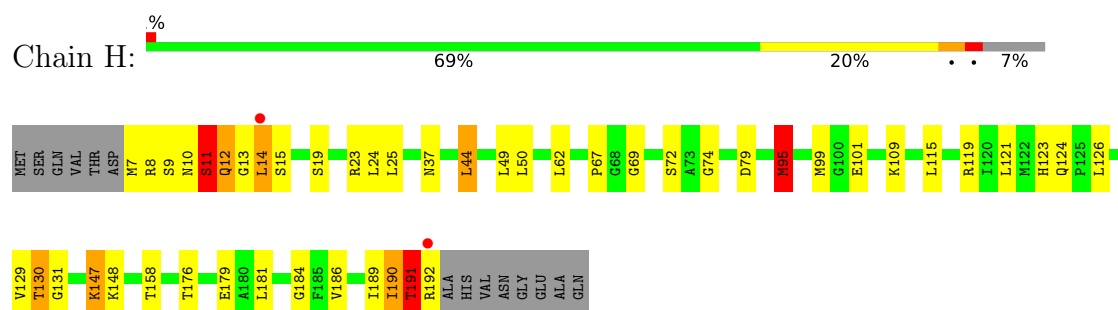
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



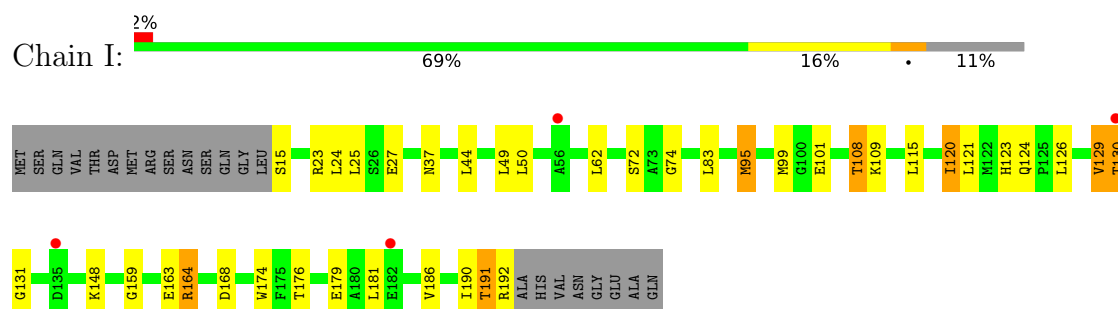
- Molecule 1: ATP-dependent Clp protease proteolytic subunit 2



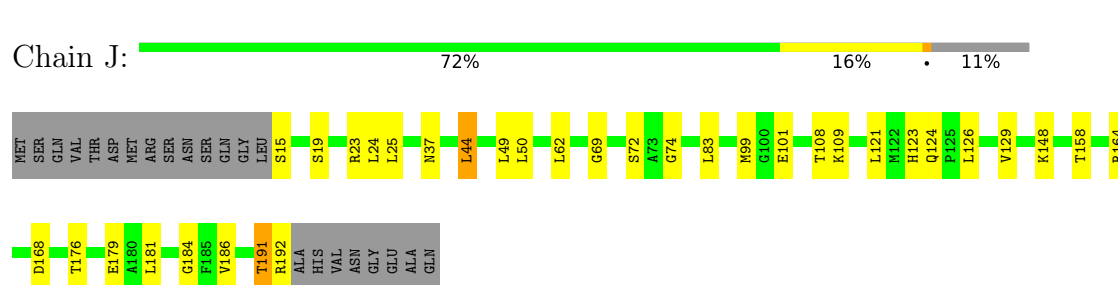
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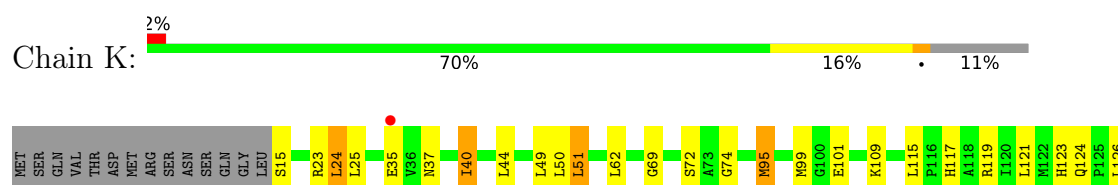
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1



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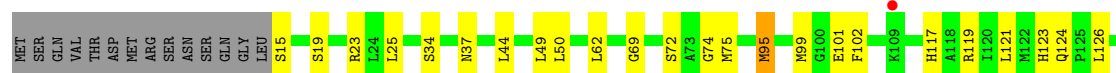
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1



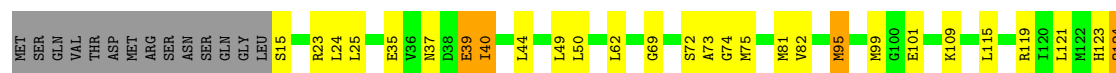
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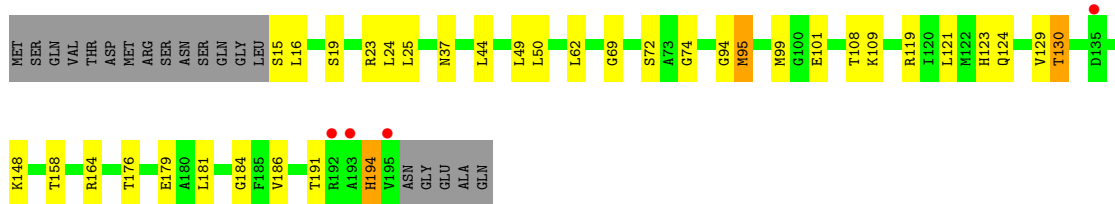


- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

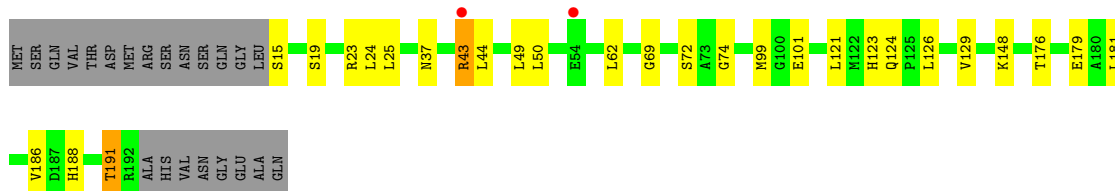
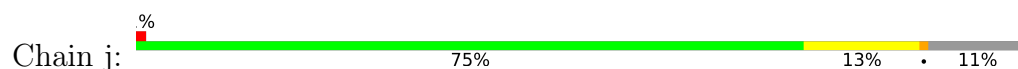


- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

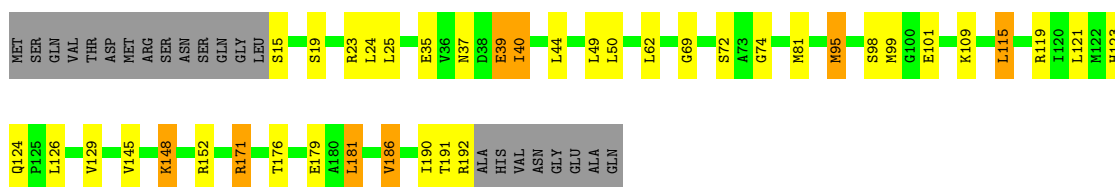




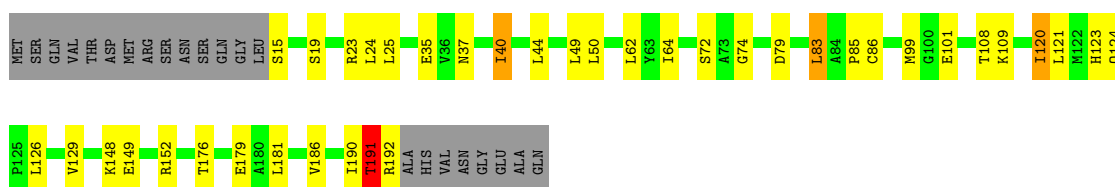
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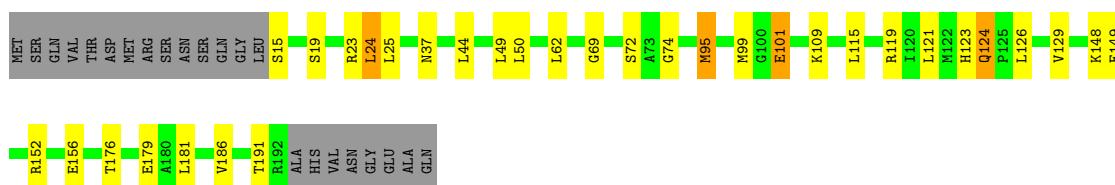
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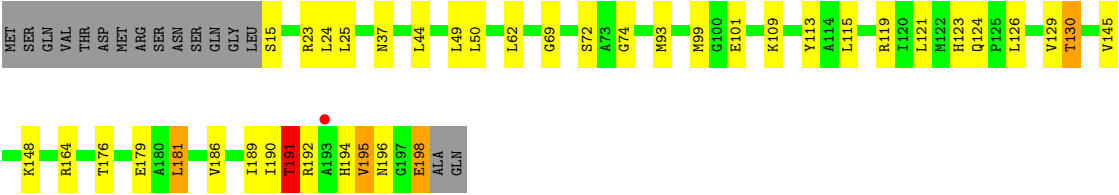
- Molecule 2: ATP-dependent Clp protease proteolytic subunit 1

Chain n:

72%

18%

• 8%



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	205.18Å 183.54Å 188.37Å 90.00° 94.53° 90.00°	Depositor
Resolution (Å)	49.27 – 2.90 49.27 – 2.90	Depositor EDS
% Data completeness (in resolution range)	93.7 (49.27-2.90) 94.8 (49.27-2.90)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.77 (at 2.86Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.204 , 0.236 0.200 , 0.218	Depositor DCC
R_{free} test set	7425 reflections (4.72%)	wwPDB-VP
Wilson B-factor (Å ²)	63.8	Xtriage
Anisotropy	0.347	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 52.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	40670	wwPDB-VP
Average B, all atoms (Å ²)	80.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 36.52 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.9322e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical 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 ⓘ

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	1.22	0/1542	1.30	6/2086 (0.3%)
1	B	1.23	0/1568	1.29	7/2122 (0.3%)
1	C	1.25	0/1542	1.32	7/2086 (0.3%)
1	D	1.28	0/1542	1.34	11/2086 (0.5%)
1	E	1.25	1/1556 (0.1%)	1.29	9/2105 (0.4%)
1	F	1.23	0/1542	1.32	8/2086 (0.4%)
1	G	1.22	0/1536	1.30	8/2078 (0.4%)
1	a	1.29	1/1547 (0.1%)	1.32	7/2093 (0.3%)
1	b	1.31	2/1568 (0.1%)	1.37	16/2122 (0.8%)
1	c	1.29	0/1547	1.33	12/2093 (0.6%)
1	d	1.28	2/1542 (0.1%)	1.35	13/2086 (0.6%)
1	e	1.34	5/1556 (0.3%)	1.39	14/2105 (0.7%)
1	f	1.24	1/1542 (0.1%)	1.31	9/2086 (0.4%)
1	g	1.31	1/1542 (0.1%)	1.34	11/2086 (0.5%)
2	H	1.18	2/1439 (0.1%)	1.28	8/1943 (0.4%)
2	I	1.23	3/1379 (0.2%)	1.31	8/1864 (0.4%)
2	J	1.24	1/1379 (0.1%)	1.24	4/1864 (0.2%)
2	K	1.17	1/1379 (0.1%)	1.22	1/1864 (0.1%)
2	L	1.17	2/1379 (0.1%)	1.20	3/1864 (0.2%)
2	M	1.13	0/1379	1.23	4/1864 (0.2%)
2	N	1.15	1/1423 (0.1%)	1.22	2/1924 (0.1%)
2	h	1.23	2/1414 (0.1%)	1.26	7/1912 (0.4%)
2	i	1.20	2/1402 (0.1%)	1.25	4/1896 (0.2%)
2	j	1.21	1/1379 (0.1%)	1.23	3/1864 (0.2%)
2	k	1.25	2/1379 (0.1%)	1.23	4/1864 (0.2%)
2	l	1.21	1/1379 (0.1%)	1.24	4/1864 (0.2%)
2	m	1.22	0/1379	1.23	3/1864 (0.2%)
2	n	1.22	1/1423 (0.1%)	1.25	5/1924 (0.3%)
All	All	1.24	32/41184 (0.1%)	1.29	198/55695 (0.4%)

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	a	0	1
1	b	0	1
2	H	0	1
2	I	0	1
All	All	0	5

The worst 5 of 32 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	e	94	GLN	CG-CD	-8.23	1.31	1.52
1	b	213	THR	CA-C	8.18	1.63	1.53
1	b	213	THR	CA-CB	7.97	1.63	1.53
1	e	94	GLN	CA-C	-7.21	1.42	1.52
2	h	195	VAL	N-CA	7.04	1.54	1.46

The worst 5 of 198 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	e	94	GLN	CA-CB-CG	-16.12	81.85	114.10
2	I	164	ARG	CB-CG-CD	13.29	141.88	111.30
1	A	105	LEU	N-CA-C	-10.87	91.94	109.76
1	e	31	ASN	CB-CA-C	-10.34	92.17	110.47
2	J	191	THR	N-CA-C	10.21	124.17	108.96

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	212	GLN	Peptide
2	H	13	GLY	Peptide
2	I	191	THR	Peptide
1	a	14	TYR	Peptide
1	b	212	GLN	Peptide

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	1520	0	1529	40	1
1	B	1546	0	1554	39	0
1	C	1520	0	1529	41	0
1	D	1520	0	1529	47	0
1	E	1534	0	1542	35	0
1	F	1520	0	1529	30	0
1	G	1514	0	1524	32	0
1	a	1525	0	1534	45	0
1	b	1546	0	1554	48	0
1	c	1525	0	1534	32	0
1	d	1520	0	1529	37	0
1	e	1534	0	1542	36	0
1	f	1520	0	1529	27	0
1	g	1520	0	1529	38	0
2	H	1417	0	1409	26	0
2	I	1357	0	1349	25	0
2	J	1357	0	1349	8	1
2	K	1357	0	1349	15	0
2	L	1357	0	1349	12	0
2	M	1357	0	1349	7	0
2	N	1400	0	1385	19	0
2	h	1391	0	1379	22	0
2	i	1379	0	1370	9	0
2	j	1357	0	1349	8	0
2	k	1357	0	1349	24	0
2	l	1357	0	1349	22	0
2	m	1357	0	1349	9	0
2	n	1400	0	1385	24	0
3	A	5	0	0	0	0
3	B	5	0	0	3	0
3	C	2	0	0	0	0
3	E	1	0	0	0	0
3	G	3	0	0	0	0
3	H	4	0	0	1	0
3	I	1	0	0	1	0
3	J	1	0	0	0	0
3	K	2	0	0	0	0
3	L	2	0	0	0	0
3	N	4	0	0	0	0
3	a	8	0	0	0	0
3	b	11	0	0	2	0
3	c	9	0	0	0	0
3	d	5	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	e	1	0	0	0	0
3	g	8	0	0	1	0
3	h	5	0	0	2	0
3	i	5	0	0	1	0
3	j	4	0	0	1	0
3	k	2	0	0	0	0
3	l	1	0	0	0	0
3	m	7	0	0	0	0
3	n	10	0	0	3	0
All	All	40670	0	40556	660	1

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 660 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:I:159:GLY:O	2:I:191:THR:HG21	1.29	1.32
2:k:192:ARG:NH2	2:I:85:PRO:C	2.09	1.10
2:k:192:ARG:HH21	2:I:85:PRO:C	1.61	1.08
1:D:159:ARG:HH11	1:D:159:ARG:HG3	1.16	1.07
1:C:96:VAL:O	1:D:208:LYS:HD2	1.58	1.03

All (1) 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:A:173:GLY:O	2:J:164:ARG:NH1[4_556]	2.05	0.15

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	195/214 (91%)	185 (95%)	8 (4%)	2 (1%)	12	39
1	B	199/214 (93%)	188 (94%)	9 (4%)	2 (1%)	12	39
1	C	195/214 (91%)	185 (95%)	7 (4%)	3 (2%)	8	28
1	D	195/214 (91%)	185 (95%)	7 (4%)	3 (2%)	8	28
1	E	197/214 (92%)	187 (95%)	8 (4%)	2 (1%)	12	39
1	F	195/214 (91%)	184 (94%)	8 (4%)	3 (2%)	8	28
1	G	194/214 (91%)	185 (95%)	7 (4%)	2 (1%)	12	39
1	a	196/214 (92%)	187 (95%)	7 (4%)	2 (1%)	12	39
1	b	199/214 (93%)	190 (96%)	7 (4%)	2 (1%)	12	39
1	c	196/214 (92%)	187 (95%)	7 (4%)	2 (1%)	12	39
1	d	195/214 (91%)	185 (95%)	7 (4%)	3 (2%)	8	28
1	e	197/214 (92%)	187 (95%)	8 (4%)	2 (1%)	12	39
1	f	195/214 (91%)	185 (95%)	7 (4%)	3 (2%)	8	28
1	g	195/214 (91%)	184 (94%)	8 (4%)	3 (2%)	8	28
2	H	184/200 (92%)	175 (95%)	8 (4%)	1 (0%)	24	54
2	I	176/200 (88%)	171 (97%)	5 (3%)	0	100	100
2	J	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	K	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	L	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	M	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	N	182/200 (91%)	176 (97%)	6 (3%)	0	100	100
2	h	181/200 (90%)	174 (96%)	6 (3%)	1 (1%)	21	51
2	i	179/200 (90%)	174 (97%)	5 (3%)	0	100	100
2	j	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	k	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	l	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	m	176/200 (88%)	172 (98%)	4 (2%)	0	100	100
2	n	182/200 (91%)	175 (96%)	6 (3%)	1 (0%)	24	54
All	All	5235/5796 (90%)	5025 (96%)	173 (3%)	37 (1%)	18	48

5 of 37 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	h	192	ARG
2	n	195	VAL
1	A	48	VAL
1	B	48	VAL
1	C	48	VAL

5.3.2 Protein sidechains ⓘ

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	164/178 (92%)	147 (90%)	17 (10%)	7	23
1	B	166/178 (93%)	148 (89%)	18 (11%)	6	21
1	C	164/178 (92%)	142 (87%)	22 (13%)	4	12
1	D	164/178 (92%)	146 (89%)	18 (11%)	6	20
1	E	165/178 (93%)	150 (91%)	15 (9%)	9	28
1	F	164/178 (92%)	143 (87%)	21 (13%)	4	14
1	G	163/178 (92%)	146 (90%)	17 (10%)	7	23
1	a	164/178 (92%)	147 (90%)	17 (10%)	7	23
1	b	166/178 (93%)	147 (89%)	19 (11%)	5	18
1	c	164/178 (92%)	146 (89%)	18 (11%)	6	20
1	d	164/178 (92%)	144 (88%)	20 (12%)	5	16
1	e	165/178 (93%)	148 (90%)	17 (10%)	7	23
1	f	164/178 (92%)	146 (89%)	18 (11%)	6	20
1	g	164/178 (92%)	144 (88%)	20 (12%)	5	16
2	H	146/157 (93%)	119 (82%)	27 (18%)	1	5
2	I	139/157 (88%)	121 (87%)	18 (13%)	4	13
2	J	139/157 (88%)	119 (86%)	20 (14%)	3	11
2	K	139/157 (88%)	116 (84%)	23 (16%)	2	8
2	L	139/157 (88%)	116 (84%)	23 (16%)	2	8
2	M	139/157 (88%)	119 (86%)	20 (14%)	3	11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	N	143/157 (91%)	125 (87%)	18 (13%)	4	14
2	h	142/157 (90%)	119 (84%)	23 (16%)	2	8
2	i	141/157 (90%)	119 (84%)	22 (16%)	2	9
2	j	139/157 (88%)	122 (88%)	17 (12%)	5	16
2	k	139/157 (88%)	117 (84%)	22 (16%)	2	8
2	l	139/157 (88%)	117 (84%)	22 (16%)	2	8
2	m	139/157 (88%)	116 (84%)	23 (16%)	2	8
2	n	143/157 (91%)	122 (85%)	21 (15%)	3	10
All	All	4267/4690 (91%)	3711 (87%)	556 (13%)	4	13

5 of 556 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	j	129	VAL
2	k	49	LEU
2	j	121	LEU
2	m	50	LEU
2	K	23	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 110 such sidechains are listed below:

Mol	Chain	Res	Type
1	a	135	HIS
1	d	136	GLN
2	n	123	HIS
2	k	123	HIS
1	a	144	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 [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, 95th 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	197/214 (92%)	0.01	3 (1%) 72 64	61, 81, 123, 146	0
1	B	201/214 (93%)	-0.01	4 (1%) 65 56	59, 80, 122, 149	0
1	C	197/214 (92%)	-0.03	3 (1%) 72 64	55, 77, 115, 138	0
1	D	197/214 (92%)	-0.03	3 (1%) 72 64	54, 77, 112, 149	0
1	E	199/214 (92%)	-0.10	1 (0%) 87 83	63, 83, 114, 133	0
1	F	197/214 (92%)	0.05	5 (2%) 58 48	69, 94, 121, 144	0
1	G	196/214 (91%)	0.00	3 (1%) 72 64	63, 90, 126, 148	0
1	a	198/214 (92%)	-0.01	2 (1%) 79 73	52, 72, 111, 128	0
1	b	201/214 (93%)	-0.07	2 (0%) 79 73	51, 71, 108, 128	0
1	c	198/214 (92%)	-0.12	3 (1%) 72 64	51, 75, 113, 132	0
1	d	197/214 (92%)	-0.07	3 (1%) 72 64	49, 71, 109, 139	0
1	e	199/214 (92%)	-0.12	4 (2%) 65 56	51, 71, 110, 139	0
1	f	197/214 (92%)	-0.04	2 (1%) 79 73	53, 74, 108, 133	0
1	g	197/214 (92%)	-0.14	3 (1%) 72 64	52, 73, 106, 132	0
2	H	186/200 (93%)	-0.03	2 (1%) 78 71	60, 75, 117, 174	0
2	I	178/200 (89%)	-0.08	4 (2%) 62 53	54, 68, 99, 124	0
2	J	178/200 (89%)	-0.14	0 100 100	53, 68, 99, 114	0
2	K	178/200 (89%)	-0.12	3 (1%) 69 61	58, 77, 107, 182	0
2	L	178/200 (89%)	0.00	3 (1%) 69 61	66, 86, 112, 139	0
2	M	178/200 (89%)	0.07	0 100 100	72, 89, 112, 130	0
2	N	184/200 (92%)	-0.07	1 (0%) 87 83	64, 82, 111, 164	0
2	h	183/200 (91%)	-0.13	1 (0%) 87 83	50, 67, 102, 188	0
2	i	181/200 (90%)	-0.14	4 (2%) 62 53	55, 71, 107, 194	0
2	j	178/200 (89%)	-0.14	2 (1%) 78 71	54, 69, 102, 136	0

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
2	k	178/200 (89%)	-0.21	0 100 100	52, 67, 97, 164	0
2	l	178/200 (89%)	-0.27	0 100 100	53, 66, 93, 127	0
2	m	178/200 (89%)	-0.35	0 100 100	50, 63, 94, 131	0
2	n	184/200 (92%)	-0.29	1 (0%) 87 83	50, 65, 100, 176	0
All	All	5291/5796 (91%)	-0.09	62 (1%) 76 69	49, 75, 112, 194	0

The worst 5 of 62 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	c	14	TYR	3.6
2	i	195	VAL	3.4
1	f	14	TYR	3.2
1	c	15	ILE	3.1
1	B	214	ALA	3.1

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.