



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:33 PM UTC

PDB ID : 3KZW / pdb_00003kzw
Title : Crystal structure of cytosol aminopeptidase from Staphylococcus aureus COL
Authors : Hattne, J.; Dubrovska, I.; Halavaty, A.; Minasov, G.; Scott, P.; Shuvalova, L.; Winsor, J.; Otwinowski, Z.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on : 2009-12-08
Resolution : 2.70 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 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
Mogul : 2022.3.0, CSD as543be (2022)
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

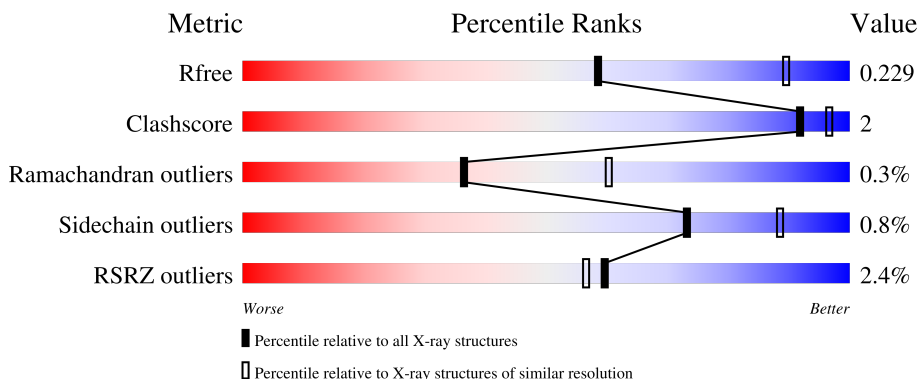
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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.



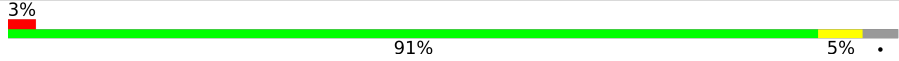
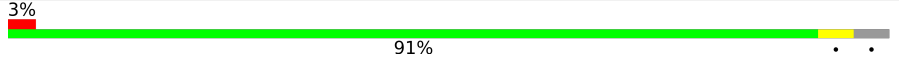
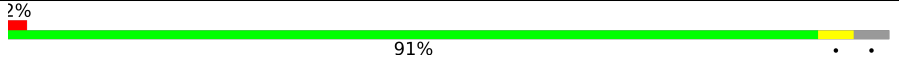
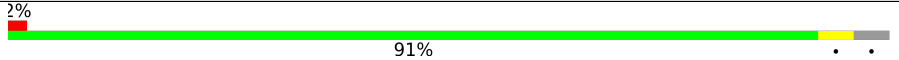
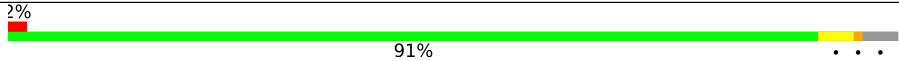
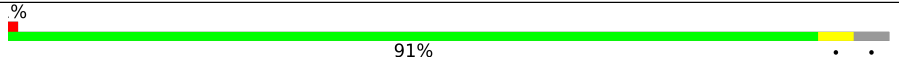
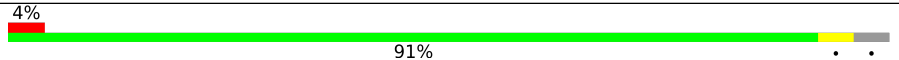
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3538 (2.70-2.70)
Clashscore	190562	3843 (2.70-2.70)
Ramachandran outliers	187476	3778 (2.70-2.70)
Sidechain outliers	187428	3778 (2.70-2.70)
RSRZ outliers	180081	3538 (2.70-2.70)

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	515	 3% 92% 5% .
1	B	515	 2% 91% 5% .
1	C	515	 % 90% 5% .
1	D	515	 2% 90% 5% .
1	E	515	 2% 90% 6% .

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Mol	Chain	Length	Quality of chain
1	F	515	 3% 91% 5% .
1	G	515	 3% 91% . .
1	H	515	 2% 91% . .
1	I	515	 2% 91% . .
1	J	515	 2% 91% . . .
1	K	515	 % 91% . .
1	L	515	 4% 91% . .

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 46710 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 Cytosol aminopeptidase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	494	3826	2428	639	742	17	0	0	0
1	B	494	3826	2428	639	742	17	0	0	0
1	C	494	3826	2428	639	742	17	0	0	0
1	D	494	3826	2428	639	742	17	0	0	0
1	E	494	3826	2428	639	742	17	0	0	0
1	F	494	3826	2428	639	742	17	0	0	0
1	G	494	3826	2428	639	742	17	0	0	0
1	H	494	3826	2428	639	742	17	0	0	0
1	I	494	3826	2428	639	742	17	0	0	0
1	J	494	3826	2428	639	742	17	0	0	0
1	K	494	3826	2428	639	742	17	0	0	0
1	L	493	3820	2425	638	740	17	0	0	0

There are 288 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-23	MET	-	expression tag	UNP Q5HHE3
A	-22	HIS	-	expression tag	UNP Q5HHE3
A	-21	HIS	-	expression tag	UNP Q5HHE3
A	-20	HIS	-	expression tag	UNP Q5HHE3
A	-19	HIS	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	HIS	-	expression tag	UNP Q5HHE3
A	-17	HIS	-	expression tag	UNP Q5HHE3
A	-16	SER	-	expression tag	UNP Q5HHE3
A	-15	SER	-	expression tag	UNP Q5HHE3
A	-14	GLY	-	expression tag	UNP Q5HHE3
A	-13	VAL	-	expression tag	UNP Q5HHE3
A	-12	ASP	-	expression tag	UNP Q5HHE3
A	-11	LEU	-	expression tag	UNP Q5HHE3
A	-10	GLY	-	expression tag	UNP Q5HHE3
A	-9	THR	-	expression tag	UNP Q5HHE3
A	-8	GLU	-	expression tag	UNP Q5HHE3
A	-7	ASN	-	expression tag	UNP Q5HHE3
A	-6	LEU	-	expression tag	UNP Q5HHE3
A	-5	TYR	-	expression tag	UNP Q5HHE3
A	-4	PHE	-	expression tag	UNP Q5HHE3
A	-3	GLN	-	expression tag	UNP Q5HHE3
A	-2	SER	-	expression tag	UNP Q5HHE3
A	-1	ASN	-	expression tag	UNP Q5HHE3
A	0	ALA	-	expression tag	UNP Q5HHE3
B	-23	MET	-	expression tag	UNP Q5HHE3
B	-22	HIS	-	expression tag	UNP Q5HHE3
B	-21	HIS	-	expression tag	UNP Q5HHE3
B	-20	HIS	-	expression tag	UNP Q5HHE3
B	-19	HIS	-	expression tag	UNP Q5HHE3
B	-18	HIS	-	expression tag	UNP Q5HHE3
B	-17	HIS	-	expression tag	UNP Q5HHE3
B	-16	SER	-	expression tag	UNP Q5HHE3
B	-15	SER	-	expression tag	UNP Q5HHE3
B	-14	GLY	-	expression tag	UNP Q5HHE3
B	-13	VAL	-	expression tag	UNP Q5HHE3
B	-12	ASP	-	expression tag	UNP Q5HHE3
B	-11	LEU	-	expression tag	UNP Q5HHE3
B	-10	GLY	-	expression tag	UNP Q5HHE3
B	-9	THR	-	expression tag	UNP Q5HHE3
B	-8	GLU	-	expression tag	UNP Q5HHE3
B	-7	ASN	-	expression tag	UNP Q5HHE3
B	-6	LEU	-	expression tag	UNP Q5HHE3
B	-5	TYR	-	expression tag	UNP Q5HHE3
B	-4	PHE	-	expression tag	UNP Q5HHE3
B	-3	GLN	-	expression tag	UNP Q5HHE3
B	-2	SER	-	expression tag	UNP Q5HHE3
B	-1	ASN	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
B	0	ALA	-	expression tag	UNP Q5HHE3
C	-23	MET	-	expression tag	UNP Q5HHE3
C	-22	HIS	-	expression tag	UNP Q5HHE3
C	-21	HIS	-	expression tag	UNP Q5HHE3
C	-20	HIS	-	expression tag	UNP Q5HHE3
C	-19	HIS	-	expression tag	UNP Q5HHE3
C	-18	HIS	-	expression tag	UNP Q5HHE3
C	-17	HIS	-	expression tag	UNP Q5HHE3
C	-16	SER	-	expression tag	UNP Q5HHE3
C	-15	SER	-	expression tag	UNP Q5HHE3
C	-14	GLY	-	expression tag	UNP Q5HHE3
C	-13	VAL	-	expression tag	UNP Q5HHE3
C	-12	ASP	-	expression tag	UNP Q5HHE3
C	-11	LEU	-	expression tag	UNP Q5HHE3
C	-10	GLY	-	expression tag	UNP Q5HHE3
C	-9	THR	-	expression tag	UNP Q5HHE3
C	-8	GLU	-	expression tag	UNP Q5HHE3
C	-7	ASN	-	expression tag	UNP Q5HHE3
C	-6	LEU	-	expression tag	UNP Q5HHE3
C	-5	TYR	-	expression tag	UNP Q5HHE3
C	-4	PHE	-	expression tag	UNP Q5HHE3
C	-3	GLN	-	expression tag	UNP Q5HHE3
C	-2	SER	-	expression tag	UNP Q5HHE3
C	-1	ASN	-	expression tag	UNP Q5HHE3
C	0	ALA	-	expression tag	UNP Q5HHE3
D	-23	MET	-	expression tag	UNP Q5HHE3
D	-22	HIS	-	expression tag	UNP Q5HHE3
D	-21	HIS	-	expression tag	UNP Q5HHE3
D	-20	HIS	-	expression tag	UNP Q5HHE3
D	-19	HIS	-	expression tag	UNP Q5HHE3
D	-18	HIS	-	expression tag	UNP Q5HHE3
D	-17	HIS	-	expression tag	UNP Q5HHE3
D	-16	SER	-	expression tag	UNP Q5HHE3
D	-15	SER	-	expression tag	UNP Q5HHE3
D	-14	GLY	-	expression tag	UNP Q5HHE3
D	-13	VAL	-	expression tag	UNP Q5HHE3
D	-12	ASP	-	expression tag	UNP Q5HHE3
D	-11	LEU	-	expression tag	UNP Q5HHE3
D	-10	GLY	-	expression tag	UNP Q5HHE3
D	-9	THR	-	expression tag	UNP Q5HHE3
D	-8	GLU	-	expression tag	UNP Q5HHE3
D	-7	ASN	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-6	LEU	-	expression tag	UNP Q5HHE3
D	-5	TYR	-	expression tag	UNP Q5HHE3
D	-4	PHE	-	expression tag	UNP Q5HHE3
D	-3	GLN	-	expression tag	UNP Q5HHE3
D	-2	SER	-	expression tag	UNP Q5HHE3
D	-1	ASN	-	expression tag	UNP Q5HHE3
D	0	ALA	-	expression tag	UNP Q5HHE3
E	-23	MET	-	expression tag	UNP Q5HHE3
E	-22	HIS	-	expression tag	UNP Q5HHE3
E	-21	HIS	-	expression tag	UNP Q5HHE3
E	-20	HIS	-	expression tag	UNP Q5HHE3
E	-19	HIS	-	expression tag	UNP Q5HHE3
E	-18	HIS	-	expression tag	UNP Q5HHE3
E	-17	HIS	-	expression tag	UNP Q5HHE3
E	-16	SER	-	expression tag	UNP Q5HHE3
E	-15	SER	-	expression tag	UNP Q5HHE3
E	-14	GLY	-	expression tag	UNP Q5HHE3
E	-13	VAL	-	expression tag	UNP Q5HHE3
E	-12	ASP	-	expression tag	UNP Q5HHE3
E	-11	LEU	-	expression tag	UNP Q5HHE3
E	-10	GLY	-	expression tag	UNP Q5HHE3
E	-9	THR	-	expression tag	UNP Q5HHE3
E	-8	GLU	-	expression tag	UNP Q5HHE3
E	-7	ASN	-	expression tag	UNP Q5HHE3
E	-6	LEU	-	expression tag	UNP Q5HHE3
E	-5	TYR	-	expression tag	UNP Q5HHE3
E	-4	PHE	-	expression tag	UNP Q5HHE3
E	-3	GLN	-	expression tag	UNP Q5HHE3
E	-2	SER	-	expression tag	UNP Q5HHE3
E	-1	ASN	-	expression tag	UNP Q5HHE3
E	0	ALA	-	expression tag	UNP Q5HHE3
F	-23	MET	-	expression tag	UNP Q5HHE3
F	-22	HIS	-	expression tag	UNP Q5HHE3
F	-21	HIS	-	expression tag	UNP Q5HHE3
F	-20	HIS	-	expression tag	UNP Q5HHE3
F	-19	HIS	-	expression tag	UNP Q5HHE3
F	-18	HIS	-	expression tag	UNP Q5HHE3
F	-17	HIS	-	expression tag	UNP Q5HHE3
F	-16	SER	-	expression tag	UNP Q5HHE3
F	-15	SER	-	expression tag	UNP Q5HHE3
F	-14	GLY	-	expression tag	UNP Q5HHE3
F	-13	VAL	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-12	ASP	-	expression tag	UNP Q5HHE3
F	-11	LEU	-	expression tag	UNP Q5HHE3
F	-10	GLY	-	expression tag	UNP Q5HHE3
F	-9	THR	-	expression tag	UNP Q5HHE3
F	-8	GLU	-	expression tag	UNP Q5HHE3
F	-7	ASN	-	expression tag	UNP Q5HHE3
F	-6	LEU	-	expression tag	UNP Q5HHE3
F	-5	TYR	-	expression tag	UNP Q5HHE3
F	-4	PHE	-	expression tag	UNP Q5HHE3
F	-3	GLN	-	expression tag	UNP Q5HHE3
F	-2	SER	-	expression tag	UNP Q5HHE3
F	-1	ASN	-	expression tag	UNP Q5HHE3
F	0	ALA	-	expression tag	UNP Q5HHE3
G	-23	MET	-	expression tag	UNP Q5HHE3
G	-22	HIS	-	expression tag	UNP Q5HHE3
G	-21	HIS	-	expression tag	UNP Q5HHE3
G	-20	HIS	-	expression tag	UNP Q5HHE3
G	-19	HIS	-	expression tag	UNP Q5HHE3
G	-18	HIS	-	expression tag	UNP Q5HHE3
G	-17	HIS	-	expression tag	UNP Q5HHE3
G	-16	SER	-	expression tag	UNP Q5HHE3
G	-15	SER	-	expression tag	UNP Q5HHE3
G	-14	GLY	-	expression tag	UNP Q5HHE3
G	-13	VAL	-	expression tag	UNP Q5HHE3
G	-12	ASP	-	expression tag	UNP Q5HHE3
G	-11	LEU	-	expression tag	UNP Q5HHE3
G	-10	GLY	-	expression tag	UNP Q5HHE3
G	-9	THR	-	expression tag	UNP Q5HHE3
G	-8	GLU	-	expression tag	UNP Q5HHE3
G	-7	ASN	-	expression tag	UNP Q5HHE3
G	-6	LEU	-	expression tag	UNP Q5HHE3
G	-5	TYR	-	expression tag	UNP Q5HHE3
G	-4	PHE	-	expression tag	UNP Q5HHE3
G	-3	GLN	-	expression tag	UNP Q5HHE3
G	-2	SER	-	expression tag	UNP Q5HHE3
G	-1	ASN	-	expression tag	UNP Q5HHE3
G	0	ALA	-	expression tag	UNP Q5HHE3
H	-23	MET	-	expression tag	UNP Q5HHE3
H	-22	HIS	-	expression tag	UNP Q5HHE3
H	-21	HIS	-	expression tag	UNP Q5HHE3
H	-20	HIS	-	expression tag	UNP Q5HHE3
H	-19	HIS	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
H	-18	HIS	-	expression tag	UNP Q5HHE3
H	-17	HIS	-	expression tag	UNP Q5HHE3
H	-16	SER	-	expression tag	UNP Q5HHE3
H	-15	SER	-	expression tag	UNP Q5HHE3
H	-14	GLY	-	expression tag	UNP Q5HHE3
H	-13	VAL	-	expression tag	UNP Q5HHE3
H	-12	ASP	-	expression tag	UNP Q5HHE3
H	-11	LEU	-	expression tag	UNP Q5HHE3
H	-10	GLY	-	expression tag	UNP Q5HHE3
H	-9	THR	-	expression tag	UNP Q5HHE3
H	-8	GLU	-	expression tag	UNP Q5HHE3
H	-7	ASN	-	expression tag	UNP Q5HHE3
H	-6	LEU	-	expression tag	UNP Q5HHE3
H	-5	TYR	-	expression tag	UNP Q5HHE3
H	-4	PHE	-	expression tag	UNP Q5HHE3
H	-3	GLN	-	expression tag	UNP Q5HHE3
H	-2	SER	-	expression tag	UNP Q5HHE3
H	-1	ASN	-	expression tag	UNP Q5HHE3
H	0	ALA	-	expression tag	UNP Q5HHE3
I	-23	MET	-	expression tag	UNP Q5HHE3
I	-22	HIS	-	expression tag	UNP Q5HHE3
I	-21	HIS	-	expression tag	UNP Q5HHE3
I	-20	HIS	-	expression tag	UNP Q5HHE3
I	-19	HIS	-	expression tag	UNP Q5HHE3
I	-18	HIS	-	expression tag	UNP Q5HHE3
I	-17	HIS	-	expression tag	UNP Q5HHE3
I	-16	SER	-	expression tag	UNP Q5HHE3
I	-15	SER	-	expression tag	UNP Q5HHE3
I	-14	GLY	-	expression tag	UNP Q5HHE3
I	-13	VAL	-	expression tag	UNP Q5HHE3
I	-12	ASP	-	expression tag	UNP Q5HHE3
I	-11	LEU	-	expression tag	UNP Q5HHE3
I	-10	GLY	-	expression tag	UNP Q5HHE3
I	-9	THR	-	expression tag	UNP Q5HHE3
I	-8	GLU	-	expression tag	UNP Q5HHE3
I	-7	ASN	-	expression tag	UNP Q5HHE3
I	-6	LEU	-	expression tag	UNP Q5HHE3
I	-5	TYR	-	expression tag	UNP Q5HHE3
I	-4	PHE	-	expression tag	UNP Q5HHE3
I	-3	GLN	-	expression tag	UNP Q5HHE3
I	-2	SER	-	expression tag	UNP Q5HHE3
I	-1	ASN	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
I	0	ALA	-	expression tag	UNP Q5HHE3
J	-23	MET	-	expression tag	UNP Q5HHE3
J	-22	HIS	-	expression tag	UNP Q5HHE3
J	-21	HIS	-	expression tag	UNP Q5HHE3
J	-20	HIS	-	expression tag	UNP Q5HHE3
J	-19	HIS	-	expression tag	UNP Q5HHE3
J	-18	HIS	-	expression tag	UNP Q5HHE3
J	-17	HIS	-	expression tag	UNP Q5HHE3
J	-16	SER	-	expression tag	UNP Q5HHE3
J	-15	SER	-	expression tag	UNP Q5HHE3
J	-14	GLY	-	expression tag	UNP Q5HHE3
J	-13	VAL	-	expression tag	UNP Q5HHE3
J	-12	ASP	-	expression tag	UNP Q5HHE3
J	-11	LEU	-	expression tag	UNP Q5HHE3
J	-10	GLY	-	expression tag	UNP Q5HHE3
J	-9	THR	-	expression tag	UNP Q5HHE3
J	-8	GLU	-	expression tag	UNP Q5HHE3
J	-7	ASN	-	expression tag	UNP Q5HHE3
J	-6	LEU	-	expression tag	UNP Q5HHE3
J	-5	TYR	-	expression tag	UNP Q5HHE3
J	-4	PHE	-	expression tag	UNP Q5HHE3
J	-3	GLN	-	expression tag	UNP Q5HHE3
J	-2	SER	-	expression tag	UNP Q5HHE3
J	-1	ASN	-	expression tag	UNP Q5HHE3
J	0	ALA	-	expression tag	UNP Q5HHE3
K	-23	MET	-	expression tag	UNP Q5HHE3
K	-22	HIS	-	expression tag	UNP Q5HHE3
K	-21	HIS	-	expression tag	UNP Q5HHE3
K	-20	HIS	-	expression tag	UNP Q5HHE3
K	-19	HIS	-	expression tag	UNP Q5HHE3
K	-18	HIS	-	expression tag	UNP Q5HHE3
K	-17	HIS	-	expression tag	UNP Q5HHE3
K	-16	SER	-	expression tag	UNP Q5HHE3
K	-15	SER	-	expression tag	UNP Q5HHE3
K	-14	GLY	-	expression tag	UNP Q5HHE3
K	-13	VAL	-	expression tag	UNP Q5HHE3
K	-12	ASP	-	expression tag	UNP Q5HHE3
K	-11	LEU	-	expression tag	UNP Q5HHE3
K	-10	GLY	-	expression tag	UNP Q5HHE3
K	-9	THR	-	expression tag	UNP Q5HHE3
K	-8	GLU	-	expression tag	UNP Q5HHE3
K	-7	ASN	-	expression tag	UNP Q5HHE3

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Chain	Residue	Modelled	Actual	Comment	Reference
K	-6	LEU	-	expression tag	UNP Q5HHE3
K	-5	TYR	-	expression tag	UNP Q5HHE3
K	-4	PHE	-	expression tag	UNP Q5HHE3
K	-3	GLN	-	expression tag	UNP Q5HHE3
K	-2	SER	-	expression tag	UNP Q5HHE3
K	-1	ASN	-	expression tag	UNP Q5HHE3
K	0	ALA	-	expression tag	UNP Q5HHE3
L	-23	MET	-	expression tag	UNP Q5HHE3
L	-22	HIS	-	expression tag	UNP Q5HHE3
L	-21	HIS	-	expression tag	UNP Q5HHE3
L	-20	HIS	-	expression tag	UNP Q5HHE3
L	-19	HIS	-	expression tag	UNP Q5HHE3
L	-18	HIS	-	expression tag	UNP Q5HHE3
L	-17	HIS	-	expression tag	UNP Q5HHE3
L	-16	SER	-	expression tag	UNP Q5HHE3
L	-15	SER	-	expression tag	UNP Q5HHE3
L	-14	GLY	-	expression tag	UNP Q5HHE3
L	-13	VAL	-	expression tag	UNP Q5HHE3
L	-12	ASP	-	expression tag	UNP Q5HHE3
L	-11	LEU	-	expression tag	UNP Q5HHE3
L	-10	GLY	-	expression tag	UNP Q5HHE3
L	-9	THR	-	expression tag	UNP Q5HHE3
L	-8	GLU	-	expression tag	UNP Q5HHE3
L	-7	ASN	-	expression tag	UNP Q5HHE3
L	-6	LEU	-	expression tag	UNP Q5HHE3
L	-5	TYR	-	expression tag	UNP Q5HHE3
L	-4	PHE	-	expression tag	UNP Q5HHE3
L	-3	GLN	-	expression tag	UNP Q5HHE3
L	-2	SER	-	expression tag	UNP Q5HHE3
L	-1	ASN	-	expression tag	UNP Q5HHE3
L	0	ALA	-	expression tag	UNP Q5HHE3

- Molecule 2 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	5	Total Cl 5 5	0	0
2	B	6	Total Cl 6 6	0	0
2	C	6	Total Cl 6 6	0	0
2	D	6	Total Cl 6 6	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	E	6	Total 6	Cl 6	0	0
2	F	5	Total 5	Cl 5	0	0
2	G	5	Total 5	Cl 5	0	0
2	H	6	Total 6	Cl 6	0	0
2	I	6	Total 6	Cl 6	0	0
2	J	5	Total 5	Cl 5	0	0
2	K	6	Total 6	Cl 6	0	0
2	L	5	Total 5	Cl 5	0	0

- Molecule 3 is SODIUM ION (CCD ID: NA) (formula: Na).

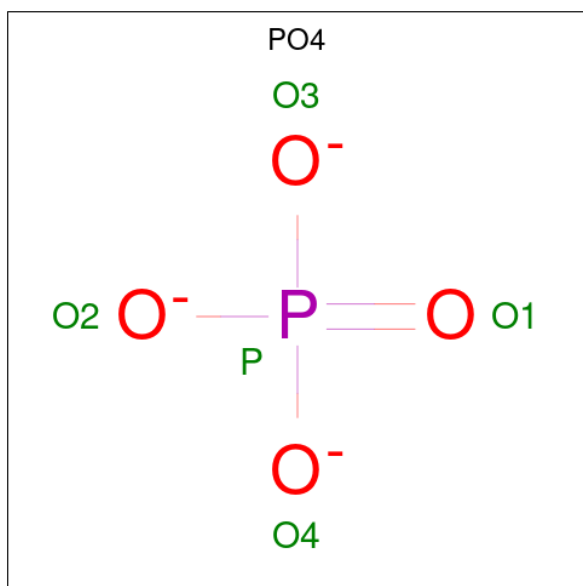
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total 2	Na 2	0	0
3	B	1	Total 1	Na 1	0	0
3	C	1	Total 1	Na 1	0	0
3	D	2	Total 2	Na 2	0	0
3	E	2	Total 2	Na 2	0	0
3	F	1	Total 1	Na 1	0	0
3	G	2	Total 2	Na 2	0	0
3	H	2	Total 2	Na 2	0	0
3	I	1	Total 1	Na 1	0	0
3	J	1	Total 1	Na 1	0	0
3	K	2	Total 2	Na 2	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	L	2	Total	Na	0	0
			2	2		

- Molecule 4 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	O	P	0	0
			5	4	1		
4	D	1	Total	O	P	0	0
			5	4	1		
4	G	1	Total	O	P	0	0
			5	4	1		
4	J	1	Total	O	P	0	0
			5	4	1		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	72	Total	O	0	0
			72	72		
5	B	60	Total	O	0	0
			60	60		
5	C	81	Total	O	0	0
			81	81		
5	D	82	Total	O	0	0
			82	82		

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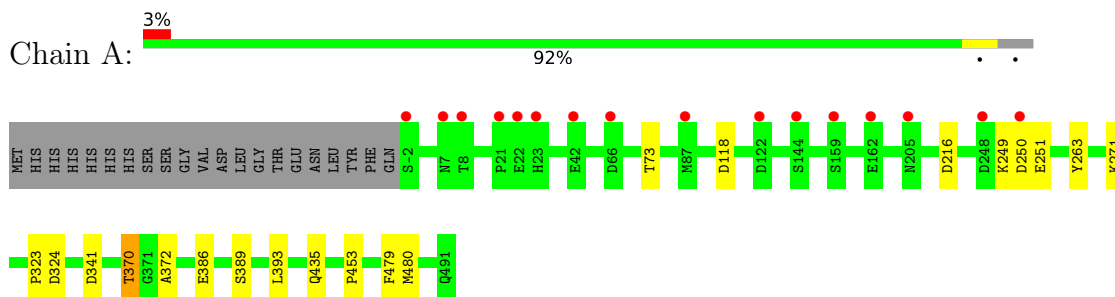
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	E	74	Total 74	O 74	0	0
5	F	68	Total 68	O 68	0	0
5	G	34	Total 34	O 34	0	0
5	H	51	Total 51	O 51	0	0
5	I	43	Total 43	O 43	0	0
5	J	39	Total 39	O 39	0	0
5	K	49	Total 49	O 49	0	0
5	L	45	Total 45	O 45	0	0

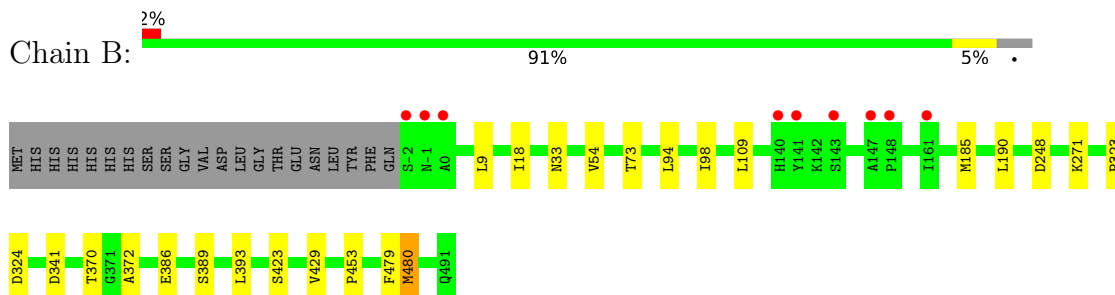
3 Residue-property plots [i](#)

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.

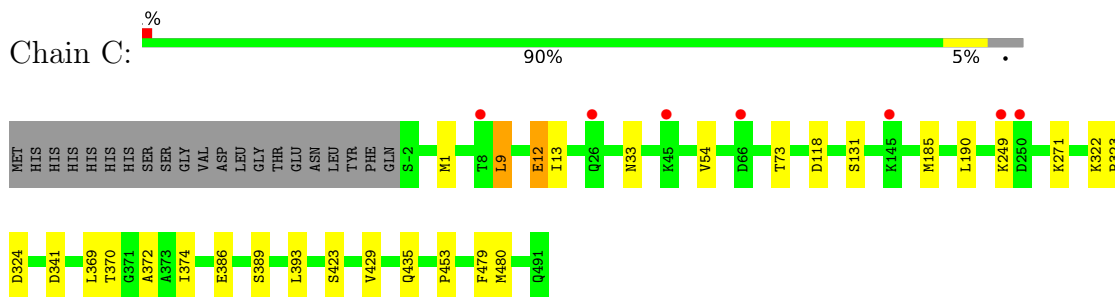
- Molecule 1: Cytosol aminopeptidase



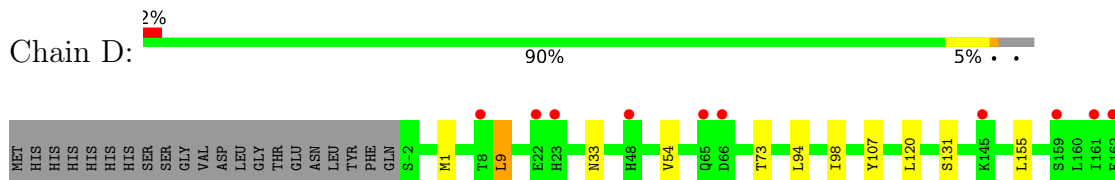
- Molecule 1: Cytosol aminopeptidase

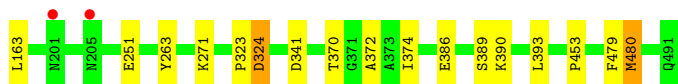


- Molecule 1: Cytosol aminopeptidase

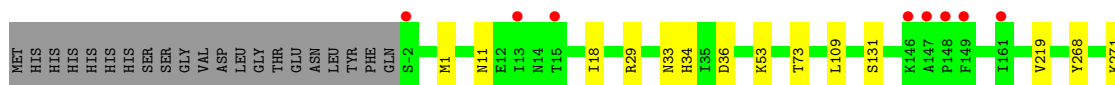


- Molecule 1: Cytosol aminopeptidase

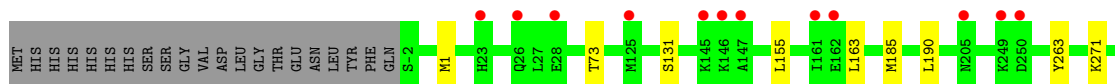




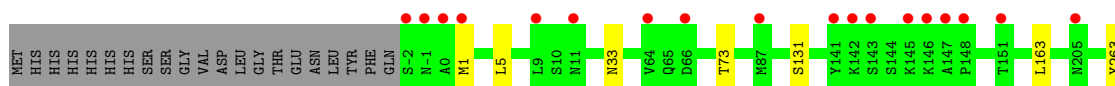
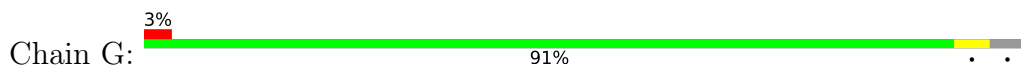
• Molecule 1: Cytosol aminopeptidase



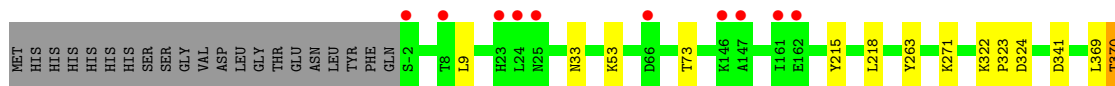
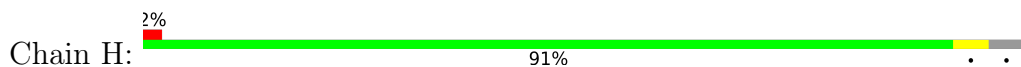
• Molecule 1: Cytosol aminopeptidase



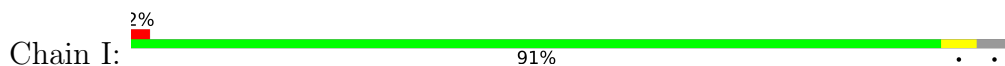
• Molecule 1: Cytosol aminopeptidase

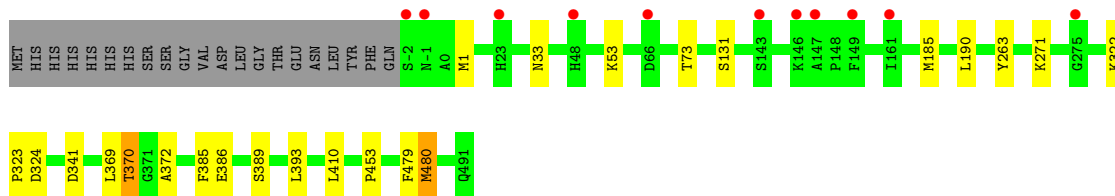


• Molecule 1: Cytosol aminopeptidase

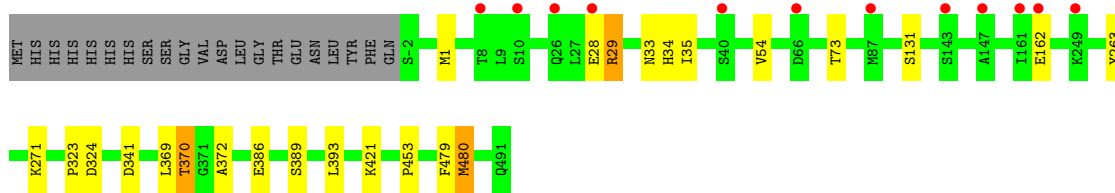
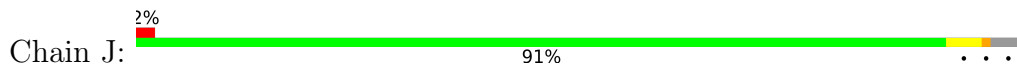


• Molecule 1: Cytosol aminopeptidase

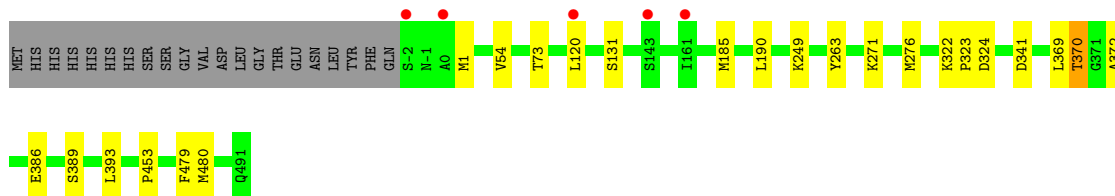




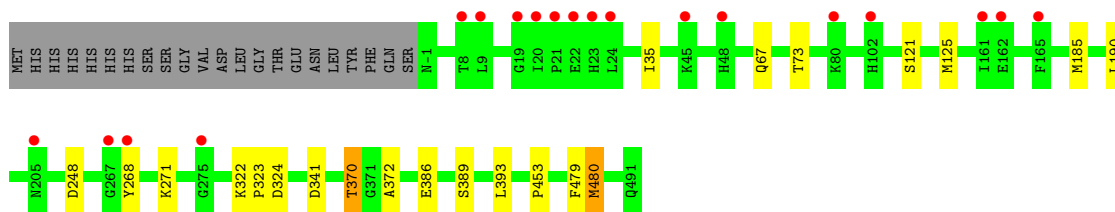
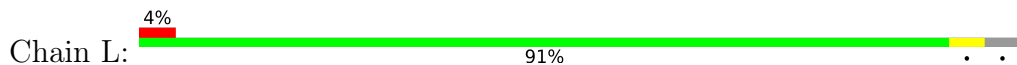
● Molecule 1: Cytosol aminopeptidase



● Molecule 1: Cytosol aminopeptidase



● Molecule 1: Cytosol aminopeptidase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	143.38Å 154.73Å 340.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	44.62 – 2.70 44.62 – 2.70	Depositor EDS
% Data completeness (in resolution range)	79.2 (44.62-2.70) 79.1 (44.62-2.70)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	0.14	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.81 (at 2.69Å)	Xtrriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.221 , 0.240 (Not available) , 0.229	Depositor DCC
R_{free} test set	8205 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	31.3	Xtrriage
Anisotropy	0.522	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 24.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	46710	wwPDB-VP
Average B, all atoms (Å ²)	4.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 22.11 % 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 6.1001e-03. 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CL, NA, PO4

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	0.42	0/3898	0.74	0/5280
1	B	0.42	0/3898	0.74	1/5280 (0.0%)
1	C	0.42	0/3898	0.74	0/5280
1	D	0.42	0/3898	0.74	0/5280
1	E	0.42	0/3898	0.74	0/5280
1	F	0.41	0/3898	0.75	0/5280
1	G	0.42	0/3898	0.74	0/5280
1	H	0.42	0/3898	0.75	0/5280
1	I	0.42	0/3898	0.74	0/5280
1	J	0.43	0/3898	0.75	0/5280
1	K	0.41	0/3898	0.74	0/5280
1	L	0.41	0/3892	0.74	0/5272
All	All	0.42	0/46770	0.74	1/63352 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	248	ASP	N-CA-C	5.72	116.11	108.38

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3826	0	3811	10	0
1	B	3826	0	3811	12	0
1	C	3826	0	3811	18	0
1	D	3826	0	3811	16	0
1	E	3826	0	3811	17	0
1	F	3826	0	3811	15	0
1	G	3826	0	3811	13	0
1	H	3826	0	3811	12	0
1	I	3826	0	3811	13	0
1	J	3826	0	3810	12	0
1	K	3826	0	3811	14	0
1	L	3820	0	3806	10	0
2	A	5	0	0	0	0
2	B	6	0	0	1	0
2	C	6	0	0	2	0
2	D	6	0	0	1	0
2	E	6	0	0	2	0
2	F	5	0	0	1	0
2	G	5	0	0	1	0
2	H	6	0	0	2	0
2	I	6	0	0	2	0
2	J	5	0	0	2	0
2	K	6	0	0	2	0
2	L	5	0	0	0	0
3	A	2	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	2	0	0	0	0
3	E	2	0	0	0	0
3	F	1	0	0	0	0
3	G	2	0	0	0	0
3	H	2	0	0	0	0
3	I	1	0	0	0	0
3	J	1	0	0	0	0
3	K	2	0	0	0	0
3	L	2	0	0	0	0
4	A	5	0	0	0	0
4	D	5	0	0	0	0
4	G	5	0	0	0	0
4	J	5	0	0	0	0
5	A	72	0	0	0	0
5	B	60	0	0	0	0
5	C	81	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	D	82	0	0	2	0
5	E	74	0	0	1	0
5	F	68	0	0	0	0
5	G	34	0	0	0	0
5	H	51	0	0	0	0
5	I	43	0	0	0	0
5	J	39	0	0	1	0
5	K	49	0	0	0	0
5	L	45	0	0	0	0
All	All	46710	0	45726	149	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (149) 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:C:118:ASP:HB2	5:C:623:HOH:O	1.96	0.65
1:D:323:PRO:O	1:D:324:ASP:HB2	2.04	0.58
1:K:323:PRO:O	1:K:324:ASP:HB2	2.04	0.57
1:C:323:PRO:O	1:C:324:ASP:HB2	2.04	0.57
1:G:323:PRO:O	1:G:324:ASP:HB2	2.04	0.57
1:A:323:PRO:O	1:A:324:ASP:HB2	2.05	0.57
1:B:323:PRO:O	1:B:324:ASP:HB2	2.04	0.57
1:J:323:PRO:O	1:J:324:ASP:HB2	2.05	0.57
1:H:323:PRO:O	1:H:324:ASP:HB2	2.06	0.56
1:E:323:PRO:O	1:E:324:ASP:HB2	2.06	0.56
1:F:323:PRO:O	1:F:324:ASP:HB2	2.06	0.55
1:F:369:LEU:HD22	2:F:495:CL:CL	2.44	0.55
1:I:323:PRO:O	1:I:324:ASP:HB2	2.06	0.55
1:L:323:PRO:O	1:L:324:ASP:HB2	2.06	0.55
1:B:479:PHE:O	1:B:480:MET:HB2	2.09	0.53
1:A:249:LYS:C	1:A:251:GLU:H	2.17	0.52
1:C:12:GLU:HG3	1:C:13:ILE:HG13	1.91	0.52
1:F:389:SER:HB3	1:F:453:PRO:HB3	1.91	0.52
1:D:389:SER:HB3	1:D:453:PRO:HB3	1.92	0.52
1:K:479:PHE:O	1:K:480:MET:HB2	2.09	0.52
1:H:389:SER:HB3	1:H:453:PRO:HB3	1.92	0.51
1:B:370:THR:HG22	1:B:372:ALA:H	1.75	0.51
1:D:390:LYS:HE2	5:D:546:HOH:O	2.10	0.51
1:G:389:SER:HB3	1:G:453:PRO:HB3	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:479:PHE:O	1:C:480:MET:HB2	2.11	0.51
1:I:386:GLU:HB3	1:I:393:LEU:HD22	1.92	0.51
1:K:389:SER:HB3	1:K:453:PRO:HB3	1.93	0.51
1:C:389:SER:HB3	1:C:453:PRO:HB3	1.92	0.51
1:G:479:PHE:O	1:G:480:MET:HB2	2.10	0.51
1:L:386:GLU:HB3	1:L:393:LEU:HD22	1.93	0.51
1:J:479:PHE:O	1:J:480:MET:HB2	2.10	0.51
1:E:386:GLU:HB3	1:E:393:LEU:HD22	1.93	0.51
1:F:479:PHE:O	1:F:480:MET:HB2	2.11	0.51
1:H:386:GLU:HB3	1:H:393:LEU:HD22	1.92	0.51
1:A:370:THR:HG22	1:A:372:ALA:H	1.76	0.51
1:J:386:GLU:HB3	1:J:393:LEU:HD22	1.93	0.51
1:J:389:SER:HB3	1:J:453:PRO:HB3	1.92	0.51
1:C:370:THR:HG22	1:C:372:ALA:H	1.75	0.50
1:B:389:SER:HB3	1:B:453:PRO:HB3	1.93	0.50
1:I:370:THR:HG22	1:I:372:ALA:H	1.76	0.50
1:L:389:SER:HB3	1:L:453:PRO:HB3	1.93	0.50
1:A:479:PHE:O	1:A:480:MET:HB2	2.12	0.50
1:C:54:VAL:HG23	2:C:492:CL:CL	2.48	0.50
1:E:29:ARG:HG2	1:E:36:ASP:OD2	2.11	0.50
1:H:479:PHE:O	1:H:480:MET:HB2	2.11	0.50
1:L:370:THR:HG22	1:L:372:ALA:H	1.77	0.50
1:D:479:PHE:O	1:D:480:MET:HB2	2.10	0.50
1:K:386:GLU:HB3	1:K:393:LEU:HD22	1.93	0.50
1:C:386:GLU:HB3	1:C:393:LEU:HD22	1.94	0.50
1:G:386:GLU:HB3	1:G:393:LEU:HD22	1.94	0.50
1:I:389:SER:HB3	1:I:453:PRO:HB3	1.93	0.50
1:L:479:PHE:O	1:L:480:MET:HB2	2.10	0.50
1:B:386:GLU:HB3	1:B:393:LEU:HD22	1.93	0.49
1:A:386:GLU:HB3	1:A:393:LEU:HD22	1.94	0.49
1:E:389:SER:HB3	1:E:453:PRO:HB3	1.93	0.49
1:B:54:VAL:HG23	2:B:492:CL:CL	2.49	0.49
1:H:370:THR:HG22	1:H:372:ALA:H	1.77	0.49
1:F:386:GLU:HB3	1:F:393:LEU:HD22	1.94	0.49
1:A:389:SER:HB3	1:A:453:PRO:HB3	1.93	0.48
1:D:386:GLU:HB3	1:D:393:LEU:HD22	1.94	0.48
1:E:370:THR:HG22	1:E:372:ALA:H	1.79	0.48
1:D:370:THR:HG22	1:D:372:ALA:H	1.78	0.48
1:J:370:THR:HG22	1:J:372:ALA:H	1.78	0.48
1:F:370:THR:HG22	1:F:372:ALA:H	1.79	0.48
1:K:370:THR:HG22	1:K:372:ALA:H	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:479:PHE:O	1:E:480:MET:HB2	2.13	0.47
1:J:54:VAL:HG23	2:J:492:CL:CL	2.51	0.47
1:I:369:LEU:HD22	2:I:496:CL:CL	2.52	0.47
1:G:370:THR:HG22	1:G:372:ALA:H	1.79	0.47
1:I:479:PHE:O	1:I:480:MET:HB2	2.13	0.47
1:E:369:LEU:HD22	2:E:496:CL:CL	2.52	0.46
1:K:263:TYR:CD2	1:L:322:LYS:HD2	2.50	0.46
1:G:5:LEU:HB2	1:G:163:LEU:HD11	1.98	0.46
1:J:28:GLU:O	1:J:29:ARG:HB3	2.15	0.46
1:K:276:MET:HE1	1:L:268:TYR:HD1	1.81	0.46
1:E:370:THR:HG22	5:E:501:HOH:O	2.17	0.45
1:A:263:TYR:CD2	1:C:322:LYS:HD2	2.51	0.45
1:H:369:LEU:HD22	2:H:496:CL:CL	2.55	0.44
1:G:369:LEU:HD22	2:G:495:CL:CL	2.54	0.44
1:A:271:LYS:NZ	1:A:341:ASP:OD1	2.51	0.44
1:D:54:VAL:HG23	2:D:492:CL:CL	2.55	0.44
1:C:271:LYS:NZ	1:C:341:ASP:OD1	2.51	0.43
1:E:53:LYS:HA	2:E:492:CL:CL	2.55	0.43
1:F:155:LEU:HD12	1:F:163:LEU:HD11	2.01	0.43
1:H:53:LYS:HA	2:H:492:CL:CL	2.55	0.43
1:G:271:LYS:NZ	1:G:341:ASP:OD1	2.52	0.43
1:E:268:TYR:HD1	1:F:276:MET:HE1	1.83	0.43
1:G:263:TYR:CD2	1:H:322:LYS:HD2	2.53	0.43
1:E:322:LYS:HD2	1:F:263:TYR:CD2	2.55	0.42
1:A:323:PRO:O	1:A:324:ASP:CB	2.67	0.42
1:G:323:PRO:O	1:G:324:ASP:CB	2.68	0.42
1:H:263:TYR:CD2	1:I:322:LYS:HD2	2.54	0.42
1:I:271:LYS:NZ	1:I:341:ASP:OD1	2.53	0.42
1:J:369:LEU:HD22	2:J:495:CL:CL	2.56	0.42
1:K:54:VAL:HG23	2:K:492:CL:CL	2.57	0.42
1:L:121:SER:O	1:L:125:MET:HB2	2.20	0.42
1:A:435:GLN:HG3	1:D:374:ILE:HG22	2.02	0.42
1:D:155:LEU:HD12	1:D:163:LEU:HD11	2.02	0.42
1:B:323:PRO:O	1:B:324:ASP:CB	2.68	0.42
1:C:1:MET:HG3	1:C:131:SER:HB2	2.02	0.42
1:B:94:LEU:O	1:B:98:ILE:HG12	2.20	0.41
1:J:421:LYS:HD2	5:J:525:HOH:O	2.20	0.41
1:H:271:LYS:NZ	1:H:341:ASP:OD1	2.52	0.41
1:J:271:LYS:NZ	1:J:341:ASP:OD1	2.52	0.41
1:I:53:LYS:HA	2:I:492:CL:CL	2.57	0.41
1:C:374:ILE:HG22	1:E:435:GLN:HG3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:9:LEU:HA	1:D:107:TYR:OH	2.21	0.41
1:D:323:PRO:O	1:D:324:ASP:CB	2.67	0.41
1:C:323:PRO:O	1:C:324:ASP:CB	2.67	0.41
1:G:322:LYS:HD2	1:I:263:TYR:CD2	2.55	0.41
1:C:9:LEU:H	1:C:9:LEU:HD22	1.84	0.41
1:D:271:LYS:NZ	1:D:341:ASP:OD1	2.53	0.41
1:E:271:LYS:NZ	1:E:341:ASP:OD1	2.53	0.41
1:L:271:LYS:NZ	1:L:341:ASP:OD1	2.54	0.41
1:B:185:MET:HG2	1:B:190:LEU:HB2	2.02	0.41
1:B:271:LYS:NZ	1:B:341:ASP:OD1	2.53	0.41
1:B:423:SER:HB2	1:B:429:VAL:HB	2.03	0.41
1:D:263:TYR:CD2	1:F:322:LYS:HD2	2.56	0.41
1:G:385:PHE:CE2	1:G:410:LEU:HB2	2.56	0.41
1:I:185:MET:HG2	1:I:190:LEU:HB2	2.02	0.41
1:K:185:MET:HG2	1:K:190:LEU:HB2	2.03	0.41
1:K:323:PRO:O	1:K:324:ASP:CB	2.67	0.41
1:L:185:MET:HG2	1:L:190:LEU:HB2	2.03	0.41
1:C:369:LEU:HD22	2:C:496:CL:CL	2.57	0.41
1:D:1:MET:HG3	1:D:131:SER:HB2	2.03	0.41
1:F:385:PHE:CE2	1:F:410:LEU:HB2	2.56	0.41
1:I:385:PHE:CE2	1:I:410:LEU:HB2	2.56	0.41
1:D:370:THR:HG22	5:D:502:HOH:O	2.21	0.40
1:E:1:MET:HG3	1:E:131:SER:HB2	2.03	0.40
1:E:18:ILE:HG12	1:E:109:LEU:HD22	2.04	0.40
1:B:18:ILE:HG12	1:B:109:LEU:HD22	2.03	0.40
1:D:94:LEU:O	1:D:98:ILE:HG12	2.21	0.40
1:E:33:ASN:HB3	1:E:34:HIS:H	1.73	0.40
1:F:271:LYS:NZ	1:F:341:ASP:OD1	2.54	0.40
1:I:1:MET:HG3	1:I:131:SER:HB2	2.03	0.40
1:J:1:MET:HG3	1:J:131:SER:HB2	2.03	0.40
1:G:1:MET:HG3	1:G:131:SER:HB2	2.04	0.40
1:C:423:SER:HB2	1:C:429:VAL:HB	2.03	0.40
1:F:1:MET:HG3	1:F:131:SER:HB2	2.03	0.40
1:F:185:MET:HG2	1:F:190:LEU:HB2	2.03	0.40
1:F:423:SER:HB2	1:F:429:VAL:HB	2.04	0.40
1:K:1:MET:HG3	1:K:131:SER:HB2	2.03	0.40
1:C:185:MET:HG2	1:C:190:LEU:HB2	2.03	0.40
1:C:435:GLN:HG3	1:E:374:ILE:HG22	2.04	0.40
1:H:215:TYR:HA	1:H:218:LEU:HD12	2.02	0.40
1:H:385:PHE:CE2	1:H:410:LEU:HB2	2.56	0.40
1:J:263:TYR:CD2	1:K:322:LYS:HD2	2.57	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:271:LYS:NZ	1:K:341:ASP:OD1	2.55	0.40
1:K:369:LEU:HD22	2:K:496:CL:CL	2.59	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	492/515 (96%)	473 (96%)	18 (4%)	1 (0%)	43 68
1	B	492/515 (96%)	470 (96%)	20 (4%)	2 (0%)	30 54
1	C	492/515 (96%)	469 (95%)	22 (4%)	1 (0%)	43 68
1	D	492/515 (96%)	470 (96%)	18 (4%)	4 (1%)	16 37
1	E	492/515 (96%)	472 (96%)	20 (4%)	0	100 100
1	F	492/515 (96%)	472 (96%)	20 (4%)	0	100 100
1	G	492/515 (96%)	469 (95%)	23 (5%)	0	100 100
1	H	492/515 (96%)	470 (96%)	21 (4%)	1 (0%)	43 68
1	I	492/515 (96%)	470 (96%)	20 (4%)	2 (0%)	30 54
1	J	492/515 (96%)	471 (96%)	17 (4%)	4 (1%)	16 37
1	K	492/515 (96%)	471 (96%)	21 (4%)	0	100 100
1	L	491/515 (95%)	471 (96%)	19 (4%)	1 (0%)	43 68
All	All	5903/6180 (96%)	5648 (96%)	239 (4%)	16 (0%)	36 60

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	J	29	ARG
1	C	33	ASN

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Mol	Chain	Res	Type
1	D	9	LEU
1	A	250	ASP
1	B	33	ASN
1	B	480	MET
1	H	33	ASN
1	I	33	ASN
1	I	480	MET
1	J	33	ASN
1	J	34	HIS
1	D	33	ASN
1	D	324	ASP
1	D	480	MET
1	J	480	MET
1	L	480	MET

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	422/441 (96%)	418 (99%)	4 (1%)	70 87
1	B	422/441 (96%)	420 (100%)	2 (0%)	81 92
1	C	422/441 (96%)	418 (99%)	4 (1%)	70 87
1	D	422/441 (96%)	419 (99%)	3 (1%)	76 90
1	E	422/441 (96%)	419 (99%)	3 (1%)	76 90
1	F	422/441 (96%)	420 (100%)	2 (0%)	81 92
1	G	422/441 (96%)	419 (99%)	3 (1%)	76 90
1	H	422/441 (96%)	419 (99%)	3 (1%)	76 90
1	I	422/441 (96%)	420 (100%)	2 (0%)	81 92
1	J	422/441 (96%)	418 (99%)	4 (1%)	70 87
1	K	422/441 (96%)	418 (99%)	4 (1%)	70 87
1	L	421/441 (96%)	416 (99%)	5 (1%)	63 84
All	All	5063/5292 (96%)	5024 (99%)	39 (1%)	73 88

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	73	THR
1	A	118	ASP
1	A	216	ASP
1	A	370	THR
1	B	9	LEU
1	B	73	THR
1	C	9	LEU
1	C	12	GLU
1	C	73	THR
1	C	249	LYS
1	D	73	THR
1	D	120	LEU
1	D	251	GLU
1	E	11	ASN
1	E	73	THR
1	E	219	VAL
1	F	73	THR
1	F	370	THR
1	G	33	ASN
1	G	73	THR
1	G	370	THR
1	H	9	LEU
1	H	73	THR
1	H	370	THR
1	I	73	THR
1	I	370	THR
1	J	35	ILE
1	J	73	THR
1	J	162	GLU
1	J	370	THR
1	K	73	THR
1	K	120	LEU
1	K	249	LYS
1	K	370	THR
1	L	35	ILE
1	L	67	GLN
1	L	73	THR
1	L	248	ASP
1	L	370	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (110) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	34	HIS
1	A	85	GLN
1	A	177	ASN
1	A	357	GLN
1	A	388	ASN
1	A	394	ASN
1	A	435	GLN
1	A	486	GLN
1	A	490	GLN
1	A	491	GLN
1	B	47	GLN
1	B	85	GLN
1	B	357	GLN
1	B	435	GLN
1	B	486	GLN
1	B	490	GLN
1	B	491	GLN
1	C	47	GLN
1	C	65	GLN
1	C	177	ASN
1	C	357	GLN
1	C	388	ASN
1	C	486	GLN
1	C	490	GLN
1	C	491	GLN
1	D	47	GLN
1	D	85	GLN
1	D	177	ASN
1	D	394	ASN
1	D	486	GLN
1	D	490	GLN
1	D	491	GLN
1	E	11	ASN
1	E	23	HIS
1	E	34	HIS
1	E	47	GLN
1	E	65	GLN
1	E	177	ASN
1	E	435	GLN
1	E	486	GLN
1	E	490	GLN
1	E	491	GLN
1	F	65	GLN

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Mol	Chain	Res	Type
1	F	85	GLN
1	F	177	ASN
1	F	435	GLN
1	F	486	GLN
1	F	490	GLN
1	F	491	GLN
1	G	33	ASN
1	G	34	HIS
1	G	65	GLN
1	G	85	GLN
1	G	177	ASN
1	G	304	ASN
1	G	435	GLN
1	G	486	GLN
1	G	490	GLN
1	G	491	GLN
1	H	6	ASN
1	H	33	ASN
1	H	65	GLN
1	H	67	GLN
1	H	85	GLN
1	H	177	ASN
1	H	357	GLN
1	H	451	GLN
1	H	486	GLN
1	H	490	GLN
1	H	491	GLN
1	I	47	GLN
1	I	65	GLN
1	I	67	GLN
1	I	85	GLN
1	I	177	ASN
1	I	357	GLN
1	I	435	GLN
1	I	486	GLN
1	I	490	GLN
1	I	491	GLN
1	J	6	ASN
1	J	7	ASN
1	J	85	GLN
1	J	119	GLN
1	J	304	ASN

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Mol	Chain	Res	Type
1	J	357	GLN
1	J	435	GLN
1	J	486	GLN
1	J	490	GLN
1	J	491	GLN
1	K	65	GLN
1	K	67	GLN
1	K	177	ASN
1	K	274	ASN
1	K	357	GLN
1	K	388	ASN
1	K	486	GLN
1	K	490	GLN
1	K	491	GLN
1	L	33	ASN
1	L	67	GLN
1	L	85	GLN
1	L	119	GLN
1	L	167	HIS
1	L	177	ASN
1	L	357	GLN
1	L	435	GLN
1	L	486	GLN
1	L	490	GLN
1	L	491	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 90 ligands modelled in this entry, 86 are monoatomic - leaving 4 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
4	PO4	A	499	-	4,4,4	1.08	0	6,6,6	0.56	0
4	PO4	D	500	-	4,4,4	1.09	0	6,6,6	0.59	0
4	PO4	J	498	-	4,4,4	1.00	0	6,6,6	0.59	0
4	PO4	G	499	-	4,4,4	1.07	0	6,6,6	0.48	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	494/515 (95%)	-0.03	16 (3%) 50 46	2, 3, 15, 18	0
1	B	494/515 (95%)	0.01	9 (1%) 67 65	3, 3, 15, 18	0
1	C	494/515 (95%)	-0.04	7 (1%) 73 72	2, 3, 15, 18	0
1	D	494/515 (95%)	0.04	12 (2%) 59 56	3, 3, 15, 18	0
1	E	494/515 (95%)	-0.01	8 (1%) 70 68	3, 3, 15, 18	0
1	F	494/515 (95%)	0.05	13 (2%) 57 54	3, 3, 15, 18	0
1	G	494/515 (95%)	0.16	18 (3%) 46 42	3, 3, 15, 18	0
1	H	494/515 (95%)	-0.00	10 (2%) 65 62	3, 3, 15, 19	0
1	I	494/515 (95%)	0.28	11 (2%) 62 59	3, 3, 15, 17	0
1	J	494/515 (95%)	0.20	12 (2%) 59 56	3, 3, 15, 18	0
1	K	494/515 (95%)	-0.03	5 (1%) 79 78	3, 3, 15, 18	0
1	L	493/515 (95%)	0.31	19 (3%) 43 39	3, 3, 15, 18	0
All	All	5927/6180 (95%)	0.08	140 (2%) 59 56	2, 3, 15, 19	0

All (140) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	-2	SER	5.5
1	B	-2	SER	5.1
1	K	-2	SER	5.1
1	D	66	ASP	5.0
1	J	8	THR	4.5
1	G	143	SER	4.3
1	L	23	HIS	4.3
1	B	0	ALA	4.1
1	J	28	GLU	3.9
1	D	145	LYS	3.9
1	G	0	ALA	3.6

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Mol	Chain	Res	Type	RSRZ
1	A	87	MET	3.6
1	G	147	ALA	3.6
1	A	-2	SER	3.6
1	F	145	LYS	3.5
1	B	-1	ASN	3.5
1	L	9	LEU	3.4
1	F	249	LYS	3.4
1	A	205	ASN	3.4
1	L	22	GLU	3.3
1	I	66	ASP	3.3
1	A	162	GLU	3.2
1	F	161	ILE	3.2
1	K	161	ILE	3.2
1	G	87	MET	3.1
1	H	66	ASP	3.1
1	I	-2	SER	3.1
1	I	146	LYS	3.1
1	D	22	GLU	3.1
1	E	-2	SER	3.1
1	L	24	LEU	3.0
1	A	23	HIS	3.0
1	G	66	ASP	3.0
1	J	162	GLU	3.0
1	D	8	THR	3.0
1	L	165	PHE	3.0
1	E	161	ILE	3.0
1	I	161	ILE	3.0
1	L	267	GLY	3.0
1	F	147	ALA	2.9
1	G	9	LEU	2.9
1	A	21	PRO	2.9
1	G	141	TYR	2.9
1	F	28	GLU	2.8
1	A	159	SER	2.8
1	D	159	SER	2.8
1	E	147	ALA	2.8
1	G	151	THR	2.8
1	A	144	SER	2.8
1	I	149	PHE	2.8
1	L	48	HIS	2.7
1	D	23	HIS	2.7
1	I	147	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	147	ALA	2.7
1	C	250	ASP	2.7
1	F	162	GLU	2.7
1	F	125	MET	2.6
1	L	80	LYS	2.6
1	K	143	SER	2.6
1	C	8	THR	2.6
1	E	149	PHE	2.6
1	H	-2	SER	2.6
1	G	145	LYS	2.6
1	L	205	ASN	2.6
1	L	8	THR	2.5
1	A	250	ASP	2.5
1	J	10	SER	2.5
1	C	249	LYS	2.5
1	F	205	ASN	2.5
1	C	66	ASP	2.5
1	G	146	LYS	2.5
1	J	249	LYS	2.5
1	H	23	HIS	2.5
1	E	146	LYS	2.5
1	I	48	HIS	2.5
1	A	7	ASN	2.4
1	L	162	GLU	2.4
1	C	145	LYS	2.4
1	E	13	ILE	2.4
1	L	20	ILE	2.4
1	L	161	ILE	2.4
1	A	248	ASP	2.4
1	D	162	GLU	2.4
1	B	143	SER	2.4
1	F	250	ASP	2.4
1	L	19	GLY	2.4
1	D	205	ASN	2.3
1	G	205	ASN	2.3
1	J	40	SER	2.3
1	J	143	SER	2.3
1	B	148	PRO	2.3
1	K	120	LEU	2.3
1	A	8	THR	2.3
1	C	26	GLN	2.3
1	G	-1	ASN	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	66	ASP	2.3
1	G	148	PRO	2.3
1	H	147	ALA	2.3
1	A	22	GLU	2.3
1	G	11	ASN	2.3
1	F	146	LYS	2.2
1	F	274	ASN	2.2
1	I	-1	ASN	2.2
1	D	161	ILE	2.2
1	H	146	LYS	2.2
1	I	275	GLY	2.2
1	D	48	HIS	2.2
1	G	1	MET	2.2
1	E	15	THR	2.2
1	B	161	ILE	2.2
1	H	162	GLU	2.2
1	B	141	TYR	2.2
1	C	45	LYS	2.2
1	A	122	ASP	2.2
1	G	64	VAL	2.2
1	L	21	PRO	2.1
1	F	23	HIS	2.1
1	K	0	ALA	2.1
1	A	42	GLU	2.1
1	J	87	MET	2.1
1	H	25	ASN	2.1
1	L	268	TYR	2.1
1	L	275	GLY	2.1
1	J	161	ILE	2.1
1	J	147	ALA	2.1
1	G	142	LYS	2.1
1	L	45	LYS	2.1
1	H	8	THR	2.1
1	F	26	GLN	2.1
1	H	161	ILE	2.1
1	E	148	PRO	2.0
1	D	65	GLN	2.0
1	H	24	LEU	2.0
1	J	26	GLN	2.0
1	D	201	ASN	2.0
1	J	66	ASP	2.0
1	I	143	SER	2.0

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Mol	Chain	Res	Type	RSRZ
1	B	140	HIS	2.0
1	I	23	HIS	2.0
1	L	102	HIS	2.0

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](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	NA	L	498	1/1	0.11	0.30	40,40,40,40	0
3	NA	H	499	1/1	0.51	0.27	48,48,48,48	0
3	NA	A	498	1/1	0.55	0.14	21,21,21,21	0
3	NA	D	499	1/1	0.66	0.19	18,18,18,18	0
3	NA	F	497	1/1	0.71	0.20	38,38,38,38	0
3	NA	J	497	1/1	0.73	0.11	41,41,41,41	0
3	NA	E	499	1/1	0.75	0.26	38,38,38,38	0
2	CL	F	496	1/1	0.77	0.17	67,67,67,67	0
3	NA	K	499	1/1	0.77	0.10	28,28,28,28	0
2	CL	D	493	1/1	0.77	0.15	58,58,58,58	0
3	NA	G	498	1/1	0.78	0.14	43,43,43,43	0
2	CL	I	492	1/1	0.79	0.14	60,60,60,60	0
2	CL	B	497	1/1	0.80	0.14	59,59,59,59	0
3	NA	D	498	1/1	0.81	0.10	21,21,21,21	0
3	NA	B	498	1/1	0.82	0.21	40,40,40,40	0
2	CL	J	492	1/1	0.82	0.16	82,82,82,82	0
3	NA	I	498	1/1	0.83	0.14	41,41,41,41	0
3	NA	K	498	1/1	0.84	0.08	42,42,42,42	0
2	CL	J	496	1/1	0.84	0.15	62,62,62,62	0
3	NA	G	497	1/1	0.84	0.14	43,43,43,43	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	CL	K	497	1/1	0.85	0.16	48,48,48,48	0
2	CL	H	492	1/1	0.85	0.12	59,59,59,59	0
3	NA	L	497	1/1	0.85	0.11	40,40,40,40	0
2	CL	C	492	1/1	0.85	0.15	60,60,60,60	0
2	CL	I	493	1/1	0.86	0.14	79,79,79,79	0
2	CL	D	494	1/1	0.86	0.16	52,52,52,52	0
2	CL	L	493	1/1	0.86	0.16	57,57,57,57	0
2	CL	L	496	1/1	0.87	0.18	69,69,69,69	0
2	CL	G	494	1/1	0.87	0.18	76,76,76,76	0
2	CL	G	496	1/1	0.87	0.12	66,66,66,66	0
2	CL	B	492	1/1	0.87	0.18	58,58,58,58	0
2	CL	F	494	1/1	0.88	0.19	62,62,62,62	0
2	CL	H	497	1/1	0.89	0.12	67,67,67,67	0
2	CL	J	494	1/1	0.89	0.17	60,60,60,60	0
2	CL	G	493	1/1	0.89	0.16	53,53,53,53	0
2	CL	D	497	1/1	0.89	0.16	53,53,53,53	0
3	NA	E	498	1/1	0.89	0.09	30,30,30,30	0
2	CL	L	492	1/1	0.89	0.09	51,51,51,51	0
2	CL	I	494	1/1	0.89	0.12	56,56,56,56	0
2	CL	I	495	1/1	0.89	0.12	65,65,65,65	0
2	CL	D	495	1/1	0.90	0.12	51,51,51,51	0
3	NA	A	497	1/1	0.90	0.07	29,29,29,29	0
2	CL	I	497	1/1	0.90	0.14	71,71,71,71	0
2	CL	B	493	1/1	0.91	0.13	60,60,60,60	0
2	CL	G	492	1/1	0.91	0.11	76,76,76,76	0
2	CL	B	495	1/1	0.91	0.19	52,52,52,52	0
2	CL	K	493	1/1	0.91	0.08	38,38,38,38	0
2	CL	A	493	1/1	0.91	0.14	41,41,41,41	0
4	PO4	J	498	5/5	0.91	0.10	52,52,52,53	0
2	CL	H	494	1/1	0.92	0.12	50,50,50,50	0
2	CL	L	494	1/1	0.92	0.12	52,52,52,52	0
2	CL	D	492	1/1	0.92	0.07	46,46,46,46	0
2	CL	E	493	1/1	0.92	0.07	54,54,54,54	0
2	CL	K	495	1/1	0.92	0.13	64,64,64,64	0
2	CL	A	492	1/1	0.92	0.08	31,31,31,31	0
2	CL	J	493	1/1	0.92	0.07	53,53,53,53	0
2	CL	K	492	1/1	0.93	0.09	44,44,44,44	0
2	CL	H	493	1/1	0.93	0.09	45,45,45,45	0
2	CL	L	495	1/1	0.93	0.05	30,30,30,30	0
2	CL	K	494	1/1	0.93	0.21	55,55,55,55	0
2	CL	G	495	1/1	0.93	0.10	36,36,36,36	0
2	CL	C	494	1/1	0.93	0.15	43,43,43,43	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	CL	B	494	1/1	0.93	0.11	44,44,44,44	0
3	NA	H	498	1/1	0.93	0.06	28,28,28,28	0
2	CL	C	495	1/1	0.94	0.12	47,47,47,47	0
3	NA	C	498	1/1	0.94	0.04	23,23,23,23	0
2	CL	H	495	1/1	0.94	0.13	65,65,65,65	0
2	CL	C	497	1/1	0.94	0.15	52,52,52,52	0
2	CL	A	496	1/1	0.94	0.13	49,49,49,49	0
2	CL	E	494	1/1	0.94	0.18	45,45,45,45	0
2	CL	F	492	1/1	0.94	0.07	41,41,41,41	0
2	CL	C	493	1/1	0.94	0.09	45,45,45,45	0
2	CL	A	494	1/1	0.94	0.12	57,57,57,57	0
2	CL	E	492	1/1	0.95	0.05	48,48,48,48	0
2	CL	E	497	1/1	0.95	0.13	51,51,51,51	0
2	CL	C	496	1/1	0.95	0.06	21,21,21,21	0
2	CL	K	496	1/1	0.96	0.05	23,23,23,23	0
2	CL	J	495	1/1	0.96	0.07	38,38,38,38	0
4	PO4	G	499	5/5	0.96	0.09	40,40,40,40	0
2	CL	I	496	1/1	0.96	0.07	35,35,35,35	0
2	CL	E	496	1/1	0.97	0.05	17,17,17,17	0
4	PO4	A	499	5/5	0.97	0.07	32,32,32,32	0
2	CL	F	493	1/1	0.97	0.15	43,43,43,43	0
2	CL	E	495	1/1	0.97	0.17	57,57,57,57	0
4	PO4	D	500	5/5	0.98	0.07	24,24,25,25	0
2	CL	H	496	1/1	0.98	0.07	32,32,32,32	0
2	CL	B	496	1/1	0.98	0.04	25,25,25,25	0
2	CL	A	495	1/1	0.99	0.03	17,17,17,17	0
2	CL	D	496	1/1	0.99	0.03	14,14,14,14	0
2	CL	F	495	1/1	0.99	0.04	26,26,26,26	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.