



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 14, 2026 – 10:55 AM UTC

PDB ID : 1ZYE / pdb\_00001zye  
Title : Crystal structure analysis of Bovine Mitochondrial Peroxiredoxin III  
Authors : Cao, Z.; Roszak, A.W.; Gourlay, L.J.; Lindsay, J.G.; Isaacs, N.W.  
Deposited on : 2005-06-10  
Resolution : 3.30 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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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

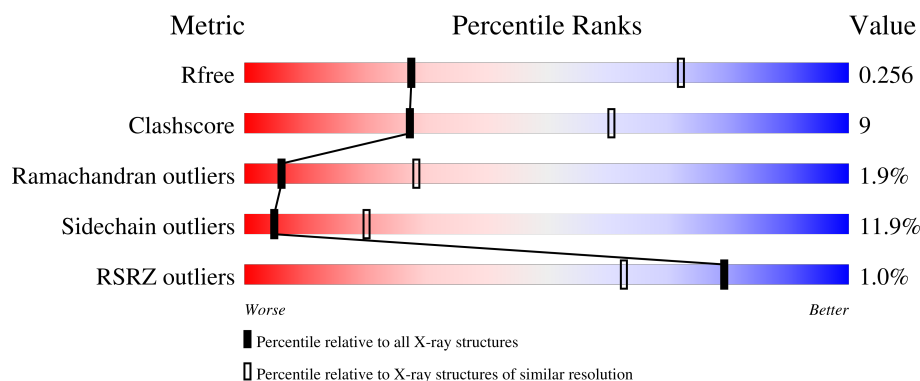
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.30 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	1169 (3.32-3.28)
Clashscore	190562	1209 (3.32-3.28)
Ramachandran outliers	187476	1188 (3.32-3.28)
Sidechain outliers	187428	1187 (3.32-3.28)
RSRZ outliers	180081	1169 (3.32-3.28)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . 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	220	<div> <div>2%</div> <div> <div></div> <div>56%</div> <div>14%</div> <div>•</div> <div>26%</div> </div> </div>
1	B	220	<div> <div>%</div> <div> <div></div> <div>51%</div> <div>16%</div> <div>6%</div> <div>26%</div> </div> </div>
1	C	220	<div> <div></div> <div> <div></div> <div>53%</div> <div>17%</div> <div>••</div> <div>26%</div> </div> </div>
1	D	220	<div> <div>%</div> <div> <div></div> <div>46%</div> <div>21%</div> <div>6%</div> <div>26%</div> </div> </div>
1	E	220	<div> <div></div> <div> <div></div> <div>53%</div> <div>16%</div> <div>••</div> <div>26%</div> </div> </div>

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Mol	Chain	Length	Quality of chain
1	F	220	
1	G	220	
1	H	220	
1	I	220	
1	J	220	
1	K	220	
1	L	220	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 15201 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 Thioredoxin-dependent peroxide reductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	B	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	C	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	D	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	E	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	F	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	G	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	H	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	I	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	J	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	K	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			
1	L	162	Total	C	N	O	S	0	0	0
			1266	824	208	231	3			

There are 312 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-24	MET	-	expression tag	UNP P35705
A	-23	GLY	-	expression tag	UNP P35705
A	-22	SER	-	expression tag	UNP P35705
A	-21	SER	-	expression tag	UNP P35705
A	-20	HIS	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	HIS	-	expression tag	UNP P35705
A	-18	HIS	-	expression tag	UNP P35705
A	-17	HIS	-	expression tag	UNP P35705
A	-16	HIS	-	expression tag	UNP P35705
A	-15	HIS	-	expression tag	UNP P35705
A	-14	SER	-	expression tag	UNP P35705
A	-13	SER	-	expression tag	UNP P35705
A	-12	GLY	-	expression tag	UNP P35705
A	-11	LEU	-	expression tag	UNP P35705
A	-10	VAL	-	expression tag	UNP P35705
A	-9	PRO	-	expression tag	UNP P35705
A	-8	ARG	-	expression tag	UNP P35705
A	-7	GLY	-	expression tag	UNP P35705
A	-6	SER	-	expression tag	UNP P35705
A	-5	HIS	-	expression tag	UNP P35705
A	-4	MET	-	expression tag	UNP P35705
A	-3	LEU	-	expression tag	UNP P35705
A	-2	GLU	-	expression tag	UNP P35705
A	-1	ASP	-	expression tag	UNP P35705
A	0	PRO	-	expression tag	UNP P35705
A	168	SER	CYS	engineered mutation	UNP P35705
B	-24	MET	-	expression tag	UNP P35705
B	-23	GLY	-	expression tag	UNP P35705
B	-22	SER	-	expression tag	UNP P35705
B	-21	SER	-	expression tag	UNP P35705
B	-20	HIS	-	expression tag	UNP P35705
B	-19	HIS	-	expression tag	UNP P35705
B	-18	HIS	-	expression tag	UNP P35705
B	-17	HIS	-	expression tag	UNP P35705
B	-16	HIS	-	expression tag	UNP P35705
B	-15	HIS	-	expression tag	UNP P35705
B	-14	SER	-	expression tag	UNP P35705
B	-13	SER	-	expression tag	UNP P35705
B	-12	GLY	-	expression tag	UNP P35705
B	-11	LEU	-	expression tag	UNP P35705
B	-10	VAL	-	expression tag	UNP P35705
B	-9	PRO	-	expression tag	UNP P35705
B	-8	ARG	-	expression tag	UNP P35705
B	-7	GLY	-	expression tag	UNP P35705
B	-6	SER	-	expression tag	UNP P35705
B	-5	HIS	-	expression tag	UNP P35705
B	-4	MET	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	LEU	-	expression tag	UNP P35705
B	-2	GLU	-	expression tag	UNP P35705
B	-1	ASP	-	expression tag	UNP P35705
B	0	PRO	-	expression tag	UNP P35705
B	168	SER	CYS	engineered mutation	UNP P35705
C	-24	MET	-	expression tag	UNP P35705
C	-23	GLY	-	expression tag	UNP P35705
C	-22	SER	-	expression tag	UNP P35705
C	-21	SER	-	expression tag	UNP P35705
C	-20	HIS	-	expression tag	UNP P35705
C	-19	HIS	-	expression tag	UNP P35705
C	-18	HIS	-	expression tag	UNP P35705
C	-17	HIS	-	expression tag	UNP P35705
C	-16	HIS	-	expression tag	UNP P35705
C	-15	HIS	-	expression tag	UNP P35705
C	-14	SER	-	expression tag	UNP P35705
C	-13	SER	-	expression tag	UNP P35705
C	-12	GLY	-	expression tag	UNP P35705
C	-11	LEU	-	expression tag	UNP P35705
C	-10	VAL	-	expression tag	UNP P35705
C	-9	PRO	-	expression tag	UNP P35705
C	-8	ARG	-	expression tag	UNP P35705
C	-7	GLY	-	expression tag	UNP P35705
C	-6	SER	-	expression tag	UNP P35705
C	-5	HIS	-	expression tag	UNP P35705
C	-4	MET	-	expression tag	UNP P35705
C	-3	LEU	-	expression tag	UNP P35705
C	-2	GLU	-	expression tag	UNP P35705
C	-1	ASP	-	expression tag	UNP P35705
C	0	PRO	-	expression tag	UNP P35705
C	168	SER	CYS	engineered mutation	UNP P35705
D	-24	MET	-	expression tag	UNP P35705
D	-23	GLY	-	expression tag	UNP P35705
D	-22	SER	-	expression tag	UNP P35705
D	-21	SER	-	expression tag	UNP P35705
D	-20	HIS	-	expression tag	UNP P35705
D	-19	HIS	-	expression tag	UNP P35705
D	-18	HIS	-	expression tag	UNP P35705
D	-17	HIS	-	expression tag	UNP P35705
D	-16	HIS	-	expression tag	UNP P35705
D	-15	HIS	-	expression tag	UNP P35705
D	-14	SER	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-13	SER	-	expression tag	UNP P35705
D	-12	GLY	-	expression tag	UNP P35705
D	-11	LEU	-	expression tag	UNP P35705
D	-10	VAL	-	expression tag	UNP P35705
D	-9	PRO	-	expression tag	UNP P35705
D	-8	ARG	-	expression tag	UNP P35705
D	-7	GLY	-	expression tag	UNP P35705
D	-6	SER	-	expression tag	UNP P35705
D	-5	HIS	-	expression tag	UNP P35705
D	-4	MET	-	expression tag	UNP P35705
D	-3	LEU	-	expression tag	UNP P35705
D	-2	GLU	-	expression tag	UNP P35705
D	-1	ASP	-	expression tag	UNP P35705
D	0	PRO	-	expression tag	UNP P35705
D	168	SER	CYS	engineered mutation	UNP P35705
E	-24	MET	-	expression tag	UNP P35705
E	-23	GLY	-	expression tag	UNP P35705
E	-22	SER	-	expression tag	UNP P35705
E	-21	SER	-	expression tag	UNP P35705
E	-20	HIS	-	expression tag	UNP P35705
E	-19	HIS	-	expression tag	UNP P35705
E	-18	HIS	-	expression tag	UNP P35705
E	-17	HIS	-	expression tag	UNP P35705
E	-16	HIS	-	expression tag	UNP P35705
E	-15	HIS	-	expression tag	UNP P35705
E	-14	SER	-	expression tag	UNP P35705
E	-13	SER	-	expression tag	UNP P35705
E	-12	GLY	-	expression tag	UNP P35705
E	-11	LEU	-	expression tag	UNP P35705
E	-10	VAL	-	expression tag	UNP P35705
E	-9	PRO	-	expression tag	UNP P35705
E	-8	ARG	-	expression tag	UNP P35705
E	-7	GLY	-	expression tag	UNP P35705
E	-6	SER	-	expression tag	UNP P35705
E	-5	HIS	-	expression tag	UNP P35705
E	-4	MET	-	expression tag	UNP P35705
E	-3	LEU	-	expression tag	UNP P35705
E	-2	GLU	-	expression tag	UNP P35705
E	-1	ASP	-	expression tag	UNP P35705
E	0	PRO	-	expression tag	UNP P35705
E	168	SER	CYS	engineered mutation	UNP P35705
F	-24	MET	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
F	-23	GLY	-	expression tag	UNP P35705
F	-22	SER	-	expression tag	UNP P35705
F	-21	SER	-	expression tag	UNP P35705
F	-20	HIS	-	expression tag	UNP P35705
F	-19	HIS	-	expression tag	UNP P35705
F	-18	HIS	-	expression tag	UNP P35705
F	-17	HIS	-	expression tag	UNP P35705
F	-16	HIS	-	expression tag	UNP P35705
F	-15	HIS	-	expression tag	UNP P35705
F	-14	SER	-	expression tag	UNP P35705
F	-13	SER	-	expression tag	UNP P35705
F	-12	GLY	-	expression tag	UNP P35705
F	-11	LEU	-	expression tag	UNP P35705
F	-10	VAL	-	expression tag	UNP P35705
F	-9	PRO	-	expression tag	UNP P35705
F	-8	ARG	-	expression tag	UNP P35705
F	-7	GLY	-	expression tag	UNP P35705
F	-6	SER	-	expression tag	UNP P35705
F	-5	HIS	-	expression tag	UNP P35705
F	-4	MET	-	expression tag	UNP P35705
F	-3	LEU	-	expression tag	UNP P35705
F	-2	GLU	-	expression tag	UNP P35705
F	-1	ASP	-	expression tag	UNP P35705
F	0	PRO	-	expression tag	UNP P35705
F	168	SER	CYS	engineered mutation	UNP P35705
G	-24	MET	-	expression tag	UNP P35705
G	-23	GLY	-	expression tag	UNP P35705
G	-22	SER	-	expression tag	UNP P35705
G	-21	SER	-	expression tag	UNP P35705
G	-20	HIS	-	expression tag	UNP P35705
G	-19	HIS	-	expression tag	UNP P35705
G	-18	HIS	-	expression tag	UNP P35705
G	-17	HIS	-	expression tag	UNP P35705
G	-16	HIS	-	expression tag	UNP P35705
G	-15	HIS	-	expression tag	UNP P35705
G	-14	SER	-	expression tag	UNP P35705
G	-13	SER	-	expression tag	UNP P35705
G	-12	GLY	-	expression tag	UNP P35705
G	-11	LEU	-	expression tag	UNP P35705
G	-10	VAL	-	expression tag	UNP P35705
G	-9	PRO	-	expression tag	UNP P35705
G	-8	ARG	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
G	-7	GLY	-	expression tag	UNP P35705
G	-6	SER	-	expression tag	UNP P35705
G	-5	HIS	-	expression tag	UNP P35705
G	-4	MET	-	expression tag	UNP P35705
G	-3	LEU	-	expression tag	UNP P35705
G	-2	GLU	-	expression tag	UNP P35705
G	-1	ASP	-	expression tag	UNP P35705
G	0	PRO	-	expression tag	UNP P35705
G	168	SER	CYS	engineered mutation	UNP P35705
H	-24	MET	-	expression tag	UNP P35705
H	-23	GLY	-	expression tag	UNP P35705
H	-22	SER	-	expression tag	UNP P35705
H	-21	SER	-	expression tag	UNP P35705
H	-20	HIS	-	expression tag	UNP P35705
H	-19	HIS	-	expression tag	UNP P35705
H	-18	HIS	-	expression tag	UNP P35705
H	-17	HIS	-	expression tag	UNP P35705
H	-16	HIS	-	expression tag	UNP P35705
H	-15	HIS	-	expression tag	UNP P35705
H	-14	SER	-	expression tag	UNP P35705
H	-13	SER	-	expression tag	UNP P35705
H	-12	GLY	-	expression tag	UNP P35705
H	-11	LEU	-	expression tag	UNP P35705
H	-10	VAL	-	expression tag	UNP P35705
H	-9	PRO	-	expression tag	UNP P35705
H	-8	ARG	-	expression tag	UNP P35705
H	-7	GLY	-	expression tag	UNP P35705
H	-6	SER	-	expression tag	UNP P35705
H	-5	HIS	-	expression tag	UNP P35705
H	-4	MET	-	expression tag	UNP P35705
H	-3	LEU	-	expression tag	UNP P35705
H	-2	GLU	-	expression tag	UNP P35705
H	-1	ASP	-	expression tag	UNP P35705
H	0	PRO	-	expression tag	UNP P35705
H	168	SER	CYS	engineered mutation	UNP P35705
I	-24	MET	-	expression tag	UNP P35705
I	-23	GLY	-	expression tag	UNP P35705
I	-22	SER	-	expression tag	UNP P35705
I	-21	SER	-	expression tag	UNP P35705
I	-20	HIS	-	expression tag	UNP P35705
I	-19	HIS	-	expression tag	UNP P35705
I	-18	HIS	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
I	-17	HIS	-	expression tag	UNP P35705
I	-16	HIS	-	expression tag	UNP P35705
I	-15	HIS	-	expression tag	UNP P35705
I	-14	SER	-	expression tag	UNP P35705
I	-13	SER	-	expression tag	UNP P35705
I	-12	GLY	-	expression tag	UNP P35705
I	-11	LEU	-	expression tag	UNP P35705
I	-10	VAL	-	expression tag	UNP P35705
I	-9	PRO	-	expression tag	UNP P35705
I	-8	ARG	-	expression tag	UNP P35705
I	-7	GLY	-	expression tag	UNP P35705
I	-6	SER	-	expression tag	UNP P35705
I	-5	HIS	-	expression tag	UNP P35705
I	-4	MET	-	expression tag	UNP P35705
I	-3	LEU	-	expression tag	UNP P35705
I	-2	GLU	-	expression tag	UNP P35705
I	-1	ASP	-	expression tag	UNP P35705
I	0	PRO	-	expression tag	UNP P35705
I	168	SER	CYS	engineered mutation	UNP P35705
J	-24	MET	-	expression tag	UNP P35705
J	-23	GLY	-	expression tag	UNP P35705
J	-22	SER	-	expression tag	UNP P35705
J	-21	SER	-	expression tag	UNP P35705
J	-20	HIS	-	expression tag	UNP P35705
J	-19	HIS	-	expression tag	UNP P35705
J	-18	HIS	-	expression tag	UNP P35705
J	-17	HIS	-	expression tag	UNP P35705
J	-16	HIS	-	expression tag	UNP P35705
J	-15	HIS	-	expression tag	UNP P35705
J	-14	SER	-	expression tag	UNP P35705
J	-13	SER	-	expression tag	UNP P35705
J	-12	GLY	-	expression tag	UNP P35705
J	-11	LEU	-	expression tag	UNP P35705
J	-10	VAL	-	expression tag	UNP P35705
J	-9	PRO	-	expression tag	UNP P35705
J	-8	ARG	-	expression tag	UNP P35705
J	-7	GLY	-	expression tag	UNP P35705
J	-6	SER	-	expression tag	UNP P35705
J	-5	HIS	-	expression tag	UNP P35705
J	-4	MET	-	expression tag	UNP P35705
J	-3	LEU	-	expression tag	UNP P35705
J	-2	GLU	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
J	-1	ASP	-	expression tag	UNP P35705
J	0	PRO	-	expression tag	UNP P35705
J	168	SER	CYS	engineered mutation	UNP P35705
K	-24	MET	-	expression tag	UNP P35705
K	-23	GLY	-	expression tag	UNP P35705
K	-22	SER	-	expression tag	UNP P35705
K	-21	SER	-	expression tag	UNP P35705
K	-20	HIS	-	expression tag	UNP P35705
K	-19	HIS	-	expression tag	UNP P35705
K	-18	HIS	-	expression tag	UNP P35705
K	-17	HIS	-	expression tag	UNP P35705
K	-16	HIS	-	expression tag	UNP P35705
K	-15	HIS	-	expression tag	UNP P35705
K	-14	SER	-	expression tag	UNP P35705
K	-13	SER	-	expression tag	UNP P35705
K	-12	GLY	-	expression tag	UNP P35705
K	-11	LEU	-	expression tag	UNP P35705
K	-10	VAL	-	expression tag	UNP P35705
K	-9	PRO	-	expression tag	UNP P35705
K	-8	ARG	-	expression tag	UNP P35705
K	-7	GLY	-	expression tag	UNP P35705
K	-6	SER	-	expression tag	UNP P35705
K	-5	HIS	-	expression tag	UNP P35705
K	-4	MET	-	expression tag	UNP P35705
K	-3	LEU	-	expression tag	UNP P35705
K	-2	GLU	-	expression tag	UNP P35705
K	-1	ASP	-	expression tag	UNP P35705
K	0	PRO	-	expression tag	UNP P35705
K	168	SER	CYS	engineered mutation	UNP P35705
L	-24	MET	-	expression tag	UNP P35705
L	-23	GLY	-	expression tag	UNP P35705
L	-22	SER	-	expression tag	UNP P35705
L	-21	SER	-	expression tag	UNP P35705
L	-20	HIS	-	expression tag	UNP P35705
L	-19	HIS	-	expression tag	UNP P35705
L	-18	HIS	-	expression tag	UNP P35705
L	-17	HIS	-	expression tag	UNP P35705
L	-16	HIS	-	expression tag	UNP P35705
L	-15	HIS	-	expression tag	UNP P35705
L	-14	SER	-	expression tag	UNP P35705
L	-13	SER	-	expression tag	UNP P35705
L	-12	GLY	-	expression tag	UNP P35705

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Chain	Residue	Modelled	Actual	Comment	Reference
L	-11	LEU	-	expression tag	UNP P35705
L	-10	VAL	-	expression tag	UNP P35705
L	-9	PRO	-	expression tag	UNP P35705
L	-8	ARG	-	expression tag	UNP P35705
L	-7	GLY	-	expression tag	UNP P35705
L	-6	SER	-	expression tag	UNP P35705
L	-5	HIS	-	expression tag	UNP P35705
L	-4	MET	-	expression tag	UNP P35705
L	-3	LEU	-	expression tag	UNP P35705
L	-2	GLU	-	expression tag	UNP P35705
L	-1	ASP	-	expression tag	UNP P35705
L	0	PRO	-	expression tag	UNP P35705
L	168	SER	CYS	engineered mutation	UNP P35705

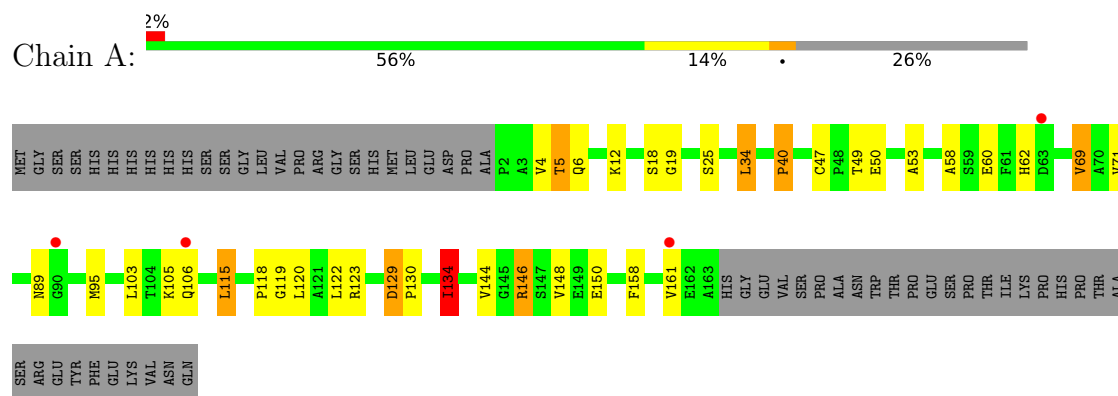
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	2	Total O 2 2	0	0
2	B	1	Total O 1 1	0	0
2	E	1	Total O 1 1	0	0
2	H	1	Total O 1 1	0	0
2	I	1	Total O 1 1	0	0
2	J	1	Total O 1 1	0	0
2	K	1	Total O 1 1	0	0
2	L	1	Total O 1 1	0	0

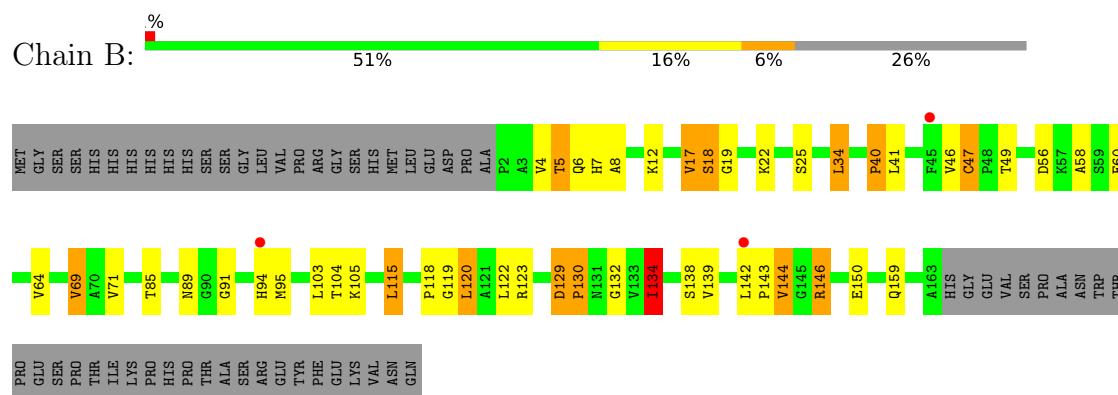
### 3 Residue-property plots

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.

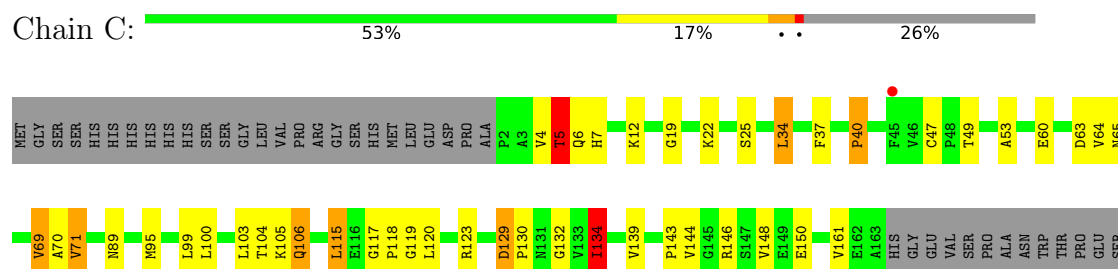
- Molecule 1: Thioredoxin-dependent peroxide reductase



- Molecule 1: Thioredoxin-dependent peroxide reductase



- Molecule 1: Thioredoxin-dependent peroxide reductase



PRO THR ILE LYS PRO HIS PRO THR ALA SER ARG GLU TYR PHE GLU LYS VAL ASN GLN

- Molecule 1: Thioredoxin-dependent peroxide reductase

Chain D:  %

Met	GLY	SER	SER	HIS	HIS	HIS	HIS	HIS	HIS	HIS	SER	SER	GLY	LEU	VAL	PRO	ARG	GLY	SER	HIS	HIS	Met	GLU	ASP	PRO	P2	A3	A4	T5	Q6	H7	P8	A9	K12	G19	S25	L34	V35	L36	F37	F38	Y39	P40	L41	D42	C47	P48	T49	A53	D56	K57	A58
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S59	E60	F61	H62	M65	E66	E67	V68	V69	A70	V71	S78	H79	L80	M89	H94	M95	A98	L99	L103	T104	K105	Q106	Y111	L115	P118	G119	L120	A121	L122	L123	D129	P130	M131	G132	V133	I134	K135	H136	V139	L142	P143	V144	G145	R146	S147	V148	F149
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

E150	T151	V155	V161	V162	A163	HIS	GLY	GLU	VAL	SER	PRO	ALA	ASN	TRP	THR	PRO	GLU	SER	PRO	THR	ILE	LYS	PRO	HIS	PRO	THR	ALA	SER	SER	ARG	GLU	TYR	PHE	GLU	LYS	VAL	ASN	SIN
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- Molecule 1: Thioredoxin-dependent peroxide reductase

Chain E:  53% 16% . . 26%

MET	GLY	SER	SER	HIS	HIS	HIS	HIS	HIS	SER	SER	GLY	VAL	PRO	ARG	GLY	SER	HIS	MET	LEU	GLU	ASP	PRO	ALA
P2	A3	V4	T5	Q6	H7	A8	K12	G19	K22	E23	I24	S25	Y33	L34	F37	P40	F45	V46	C47	F48	T49	A53	E60

V69	A70	V71	S78	H79	L80	N89	M95	A98	L103	T104	K105	R109	L115	P118	G119	L120	A121	L122	R123	D129	P130	N131	G132	V133	I134	V139	L142	P143	V144	G145	S146	V148	V161	E162	A163	H15	GLY	GLU	VAL	SER	PRO	ALA	ASN	TRP	THR	PER
-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

GLU SER PRO THR ILE LYS PRO HIS PRO THR ALA SER ARG GLU TYR PHE GLU LYS VAL ASN GLN

- Molecule 1: Thioredoxin-dependent peroxide reductase

Chain F:  52% 17% . . 26%

MET	GLY	SER	SER	HIS	HIS	HIS	HIS	HIS	HIS	SER	SER	GLY	LEU	VAL	PRO	ARG	GLY	SER	HIS	MET	MET	LEU	GLU	ASP	PRO	PRO	ALA	P2	A3	V4	T5	Q6	H7	A8	P9	K12	V17	S18	G19	S26	L34	P40	F45	V46	C47	P48	T49	E50	A53	D56	E60
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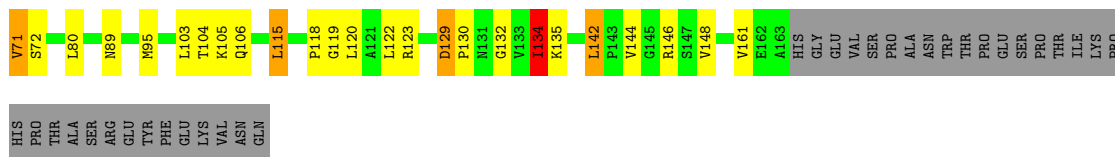
V69	A70	V71	H76	F77	L80	A81	N89	M95	L103	T104	K105	Q106	I107	S108	Y111	L115	P118	G119	L120	A121	L122	R123	D129	P130	N131	G132	V133	I134	V135	V139	P143	V144	G145	R146	S147	V148	A163	H15	GLY	GLU	VAL	SER	PRO	ALA	ASN	THR	TRP
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PRO	GLU	SER	PRO	THR	ILE	LYS	PRO	HIS	PRO	THR	ALA	SER	ARG	GLU	TYR	PHE	GLU	LYS	VAL	ASN	GLN
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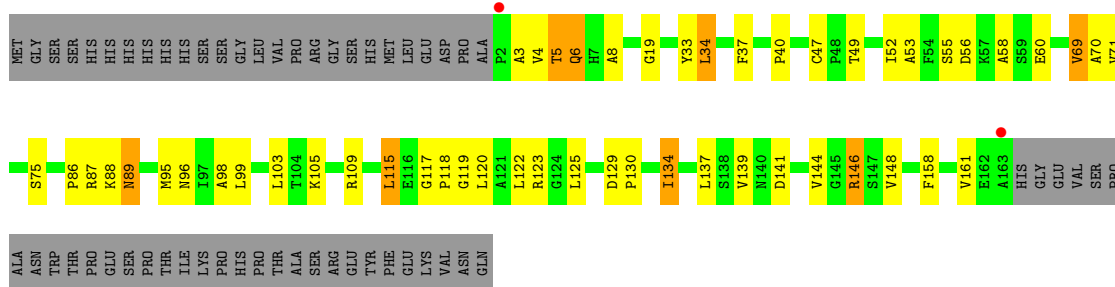
- Molecule 1: Thioredoxin-dependent peroxide reductase

Chain G:  %

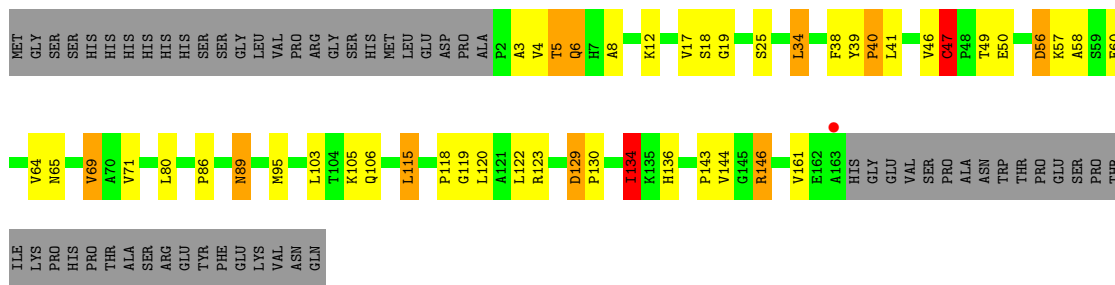
MET	GLY	SER	SER	HIS	HIS	HIS	HIS	HIS	HIS	SER	SER	GLY	LEU	VAL	ARG	GLY	SER	HIS	MET	LEU	GLU	ASP	PRO	ALA	P2	A3	V4	T5	Q6	H7	Y8	A8	V17	S18	G19	L34	V35	F38	Y39	P40	F45	V46	C47	F48	T49	A53	E60	C66	E67	V68	V69	A70
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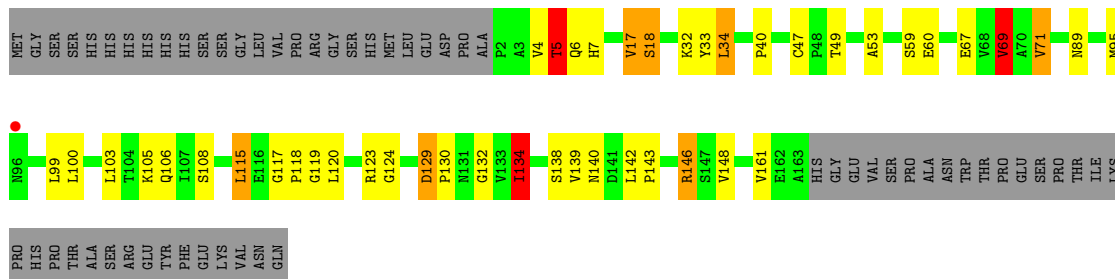
- Molecule 1: Thioredoxin-dependent peroxide reductase



- Molecule 1: Thioredoxin-dependent peroxide reductase

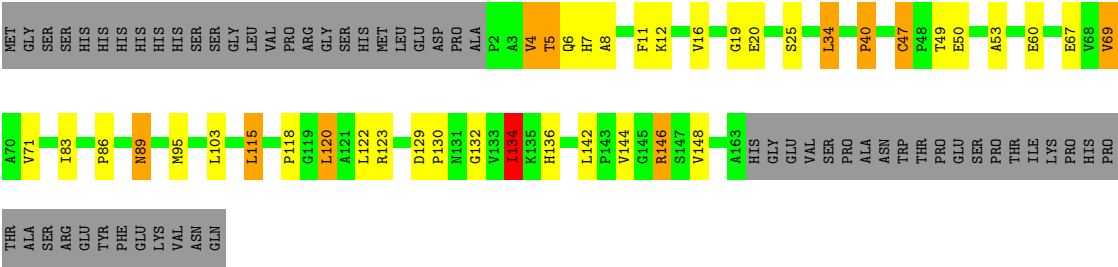


- Molecule 1: Thioredoxin-dependent peroxide reductase

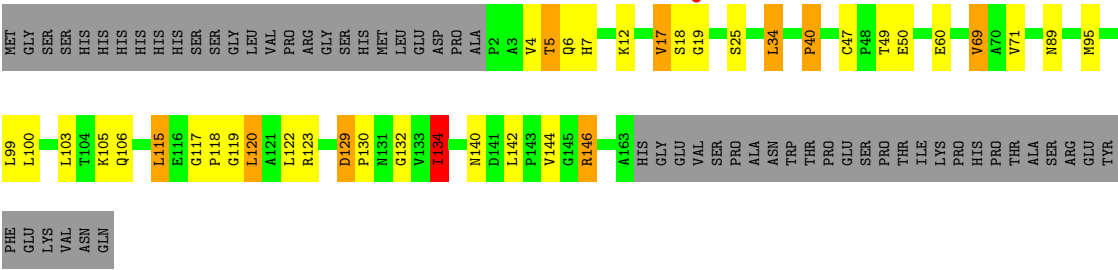


- Molecule 1: Thioredoxin-dependent peroxide reductase





● Molecule 1: Thioredoxin-dependent peroxide reductase





## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	301.00Å 80.68Å 124.30Å 90.00° 112.76° 90.00°	Depositor
Resolution (Å)	35.00 – 3.30 35.00 – 3.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (35.00-3.30) 99.9 (35.00-3.30)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.37 (at 3.33Å)	Xtriage
Refinement program	REFMAC 5.2.0005	Depositor
R, $R_{free}$	0.226 , 0.265 0.220 , 0.256	Depositor DCC
$R_{free}$ test set	2109 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	80.0	Xtriage
Anisotropy	0.138	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 57.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.028 for -h-2*1,-k,l	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	15201	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	72.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.82	2/1298 (0.2%)	0.99	4/1762 (0.2%)
1	B	0.93	2/1298 (0.2%)	1.09	10/1762 (0.6%)
1	C	0.88	1/1298 (0.1%)	1.09	4/1762 (0.2%)
1	D	1.08	1/1298 (0.1%)	1.15	6/1762 (0.3%)
1	E	0.96	2/1298 (0.2%)	1.12	5/1762 (0.3%)
1	F	0.94	1/1298 (0.1%)	1.09	6/1762 (0.3%)
1	G	0.94	3/1298 (0.2%)	1.10	5/1762 (0.3%)
1	H	0.90	0/1298	1.07	2/1762 (0.1%)
1	I	0.90	3/1298 (0.2%)	1.14	8/1762 (0.5%)
1	J	0.89	3/1298 (0.2%)	1.10	6/1762 (0.3%)
1	K	0.91	1/1298 (0.1%)	1.07	6/1762 (0.3%)
1	L	0.98	2/1298 (0.2%)	1.09	8/1762 (0.5%)
All	All	0.93	21/15576 (0.1%)	1.09	70/21144 (0.3%)

All (21) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	134	ILE	CA-CB	8.07	1.63	1.54
1	G	134	ILE	CA-CB	8.03	1.63	1.54
1	B	18	SER	CA-C	-7.34	1.47	1.52
1	C	134	ILE	CA-CB	7.33	1.62	1.54
1	B	134	ILE	CA-CB	7.04	1.62	1.54
1	L	134	ILE	CA-CB	6.65	1.61	1.54
1	A	134	ILE	CA-CB	6.56	1.61	1.54
1	D	142	LEU	C-N	6.52	1.38	1.33
1	J	18	SER	CA-C	-6.40	1.48	1.52
1	E	134	ILE	CA-CB	6.31	1.61	1.54
1	F	134	ILE	CA-CB	5.83	1.60	1.54
1	I	46	VAL	CA-CB	5.83	1.61	1.54
1	E	142	LEU	C-N	5.67	1.38	1.33
1	G	142	LEU	CA-C	5.60	1.58	1.52
1	L	18	SER	CA-C	-5.50	1.49	1.52
1	G	18	SER	CA-C	-5.36	1.49	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	J	134	ILE	CA-CB	5.28	1.60	1.54
1	I	134	ILE	CA-CB	5.23	1.60	1.54
1	I	18	SER	CA-C	-5.17	1.49	1.52
1	A	18	SER	CA-C	-5.07	1.49	1.52
1	J	69	VAL	CA-CB	5.02	1.60	1.54

All (70) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	4	VAL	N-CA-C	8.12	114.90	106.21
1	L	142	LEU	CA-C-N	-8.10	112.56	120.83
1	L	142	LEU	C-N-CA	-8.10	112.56	120.83
1	C	19	GLY	N-CA-C	-8.10	101.71	115.80
1	D	4	VAL	N-CA-C	7.82	114.58	106.21
1	E	144	VAL	N-CA-C	7.48	118.67	107.75
1	L	19	GLY	N-CA-C	-7.45	103.31	115.46
1	I	129	ASP	CA-C-N	7.39	129.07	119.84
1	I	129	ASP	C-N-CA	7.39	129.07	119.84
1	H	19	GLY	N-CA-C	-7.29	103.58	115.46
1	I	144	VAL	N-CA-C	7.27	119.45	107.24
1	A	19	GLY	N-CA-C	-7.18	103.75	115.46
1	L	144	VAL	N-CA-C	7.09	118.27	107.77
1	J	142	LEU	CA-C-N	-7.06	111.01	119.84
1	J	142	LEU	C-N-CA	-7.06	111.01	119.84
1	I	46	VAL	N-CA-C	6.81	117.59	110.72
1	C	129	ASP	CA-C-N	6.49	127.96	119.84
1	C	129	ASP	C-N-CA	6.49	127.96	119.84
1	I	19	GLY	N-CA-C	-6.31	104.63	115.61
1	F	144	VAL	N-CA-C	6.30	117.09	107.77
1	G	19	GLY	N-CA-C	-6.28	105.22	115.46
1	D	129	ASP	CA-C-N	6.21	127.60	119.84
1	D	129	ASP	C-N-CA	6.21	127.60	119.84
1	H	144	VAL	N-CA-C	6.18	116.91	107.77
1	A	144	VAL	N-CA-C	6.12	116.82	107.77
1	F	19	GLY	N-CA-C	-6.09	105.20	115.80
1	D	19	GLY	N-CA-C	-6.04	105.11	115.61
1	K	142	LEU	CA-C-N	-5.93	114.13	121.00
1	K	142	LEU	C-N-CA	-5.93	114.13	121.00
1	G	144	VAL	N-CA-C	5.89	117.37	107.18
1	B	129	ASP	CA-C-N	5.82	127.12	119.84
1	B	129	ASP	C-N-CA	5.82	127.12	119.84
1	B	46	VAL	N-CA-C	5.80	117.33	111.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	47	CYS	N-CA-C	5.77	122.55	109.81
1	C	144	VAL	N-CA-C	5.62	116.08	107.77
1	J	17	VAL	CA-C-N	-5.61	114.91	121.64
1	J	17	VAL	C-N-CA	-5.61	114.91	121.64
1	B	19	GLY	N-CA-C	-5.60	106.06	115.80
1	J	129	ASP	CA-C-N	5.55	126.77	119.84
1	J	129	ASP	C-N-CA	5.55	126.77	119.84
1	F	129	ASP	CA-C-N	5.50	126.71	119.84
1	F	129	ASP	C-N-CA	5.50	126.71	119.84
1	B	138	SER	N-CA-C	-5.48	100.96	109.72
1	K	47	CYS	N-CA-C	5.46	121.88	109.81
1	K	144	VAL	N-CA-C	5.41	115.91	108.12
1	E	129	ASP	CA-C-N	5.40	126.59	119.84
1	E	129	ASP	C-N-CA	5.40	126.59	119.84
1	B	17	VAL	CA-C-N	-5.40	115.16	121.64
1	B	17	VAL	C-N-CA	-5.40	115.16	121.64
1	B	144	VAL	N-CA-C	5.33	115.79	108.12
1	A	129	ASP	CA-C-N	5.31	126.48	119.84
1	A	129	ASP	C-N-CA	5.31	126.48	119.84
1	L	17	VAL	N-CA-C	5.26	115.92	110.82
1	D	144	VAL	N-CA-C	5.23	115.50	107.77
1	E	47	CYS	N-CA-C	5.22	121.34	109.81
1	B	142	LEU	CA-C-N	-5.21	113.33	119.84
1	B	142	LEU	C-N-CA	-5.21	113.33	119.84
1	E	19	GLY	N-CA-C	-5.21	106.55	115.61
1	L	134	ILE	CB-CA-C	5.20	117.17	111.08
1	L	129	ASP	CA-C-N	5.19	126.33	119.84
1	L	129	ASP	C-N-CA	5.19	126.33	119.84
1	D	4	VAL	CB-CA-C	-5.11	107.50	113.22
1	K	19	GLY	N-CA-C	-5.10	107.15	115.46
1	G	46	VAL	N-CA-C	5.07	118.23	111.44
1	G	129	ASP	CA-C-N	5.06	126.17	119.84
1	G	129	ASP	C-N-CA	5.06	126.17	119.84
1	I	17	VAL	CA-C-N	-5.06	115.15	121.98
1	I	17	VAL	C-N-CA	-5.06	115.15	121.98
1	F	5	THR	N-CA-CB	5.03	119.00	110.49
1	F	47	CYS	N-CA-C	5.01	120.89	109.81

There are no chirality outliers.

There are no planarity outliers.

## 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	1266	0	1261	21	0
1	B	1266	0	1261	24	0
1	C	1266	0	1261	26	0
1	D	1266	0	1261	35	0
1	E	1266	0	1261	27	0
1	F	1266	0	1261	29	0
1	G	1266	0	1261	22	0
1	H	1266	0	1261	25	0
1	I	1266	0	1261	32	0
1	J	1266	0	1261	22	0
1	K	1266	0	1261	21	0
1	L	1266	0	1261	19	0
2	A	2	0	0	0	0
2	B	1	0	0	0	0
2	E	1	0	0	0	0
2	H	1	0	0	0	0
2	I	1	0	0	0	0
2	J	1	0	0	0	0
2	K	1	0	0	0	0
2	L	1	0	0	0	0
All	All	15201	0	15132	277	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 9.

All (277) 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:L:129:ASP:HB2	1:L:130:PRO:HD2	1.57	0.86
1:C:150:GLU:HG2	1:D:150:GLU:HG2	1.57	0.86
1:C:129:ASP:HB2	1:C:130:PRO:HD2	1.65	0.77
1:I:129:ASP:HB2	1:I:130:PRO:HD2	1.72	0.71
1:B:4:VAL:HG22	1:B:134:ILE:HD11	1.70	0.71
1:K:12:LYS:HG3	1:K:25:SER:HB3	1.71	0.71
1:B:34:LEU:HD21	1:B:69:VAL:HG13	1.72	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:139:VAL:HB	1:D:4:VAL:HG21	1.73	0.71
1:G:34:LEU:HD21	1:G:69:VAL:HG13	1.73	0.70
1:E:129:ASP:HB2	1:E:130:PRO:HD2	1.73	0.70
1:L:105:LYS:HE3	1:L:119:GLY:O	1.94	0.68
1:I:34:LEU:HD21	1:I:69:VAL:HG13	1.75	0.67
1:E:34:LEU:HD21	1:E:69:VAL:HG13	1.77	0.67
1:A:129:ASP:HB2	1:A:130:PRO:HD2	1.77	0.66
1:C:161:VAL:HG21	1:D:143:PRO:HB2	1.76	0.66
1:K:129:ASP:HB2	1:K:130:PRO:HD2	1.75	0.66
1:H:34:LEU:HD21	1:H:69:VAL:HG13	1.77	0.66
1:G:129:ASP:HB2	1:G:130:PRO:HD2	1.78	0.66
1:H:4:VAL:HG22	1:H:134:ILE:HD11	1.76	0.65
1:I:4:VAL:HG21	1:J:139:VAL:HB	1.79	0.65
1:J:105:LYS:HE3	1:J:119:GLY:O	1.97	0.64
1:H:123:ARG:HB3	1:H:146:ARG:NH2	2.12	0.64
1:C:34:LEU:HD21	1:C:69:VAL:HG13	1.80	0.64
1:A:34:LEU:HD21	1:A:69:VAL:HG13	1.80	0.63
1:J:129:ASP:HB2	1:J:130:PRO:HD2	1.80	0.63
1:A:4:VAL:HG21	1:B:139:VAL:HB	1.81	0.63
1:A:150:GLU:HG2	1:B:150:GLU:HG2	1.80	0.63
1:G:105:LYS:HE3	1:G:119:GLY:O	1.99	0.63
1:B:12:LYS:HG3	1:B:25:SER:HB3	1.81	0.63
1:J:123:ARG:HB3	1:J:146:ARG:NH2	2.14	0.63
1:L:34:LEU:HD21	1:L:69:VAL:HG13	1.80	0.62
1:H:105:LYS:HE3	1:H:119:GLY:O	1.99	0.62
1:L:12:LYS:HG3	1:L:25:SER:HB3	1.80	0.62
1:K:34:LEU:HD21	1:K:69:VAL:HG13	1.80	0.62
1:C:105:LYS:HE3	1:C:119:GLY:O	1.99	0.62
1:E:37:PHE:CE1	1:E:70:ALA:HB2	2.35	0.61
1:B:129:ASP:HB2	1:B:130:PRO:HD2	1.82	0.61
1:J:4:VAL:HG22	1:J:134:ILE:HD11	1.82	0.61
1:E:123:ARG:HB3	1:E:146:ARG:NH2	2.16	0.61
1:J:34:LEU:HD21	1:J:69:VAL:HG13	1.83	0.61
1:I:123:ARG:HB3	1:I:146:ARG:NH2	2.15	0.60
1:F:129:ASP:HB2	1:F:130:PRO:HD2	1.83	0.60
1:D:12:LYS:HG3	1:D:25:SER:HB3	1.82	0.60
1:C:40:PRO:HD2	1:C:47:CYS:SG	2.42	0.60
1:C:115:LEU:HB3	1:C:118:PRO:HD2	1.85	0.59
1:I:4:VAL:HG22	1:I:134:ILE:HD11	1.84	0.59
1:G:4:VAL:HG22	1:G:134:ILE:HD11	1.83	0.59
1:C:143:PRO:HB2	1:D:161:VAL:HG21	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:50:GLU:OE1	1:L:123:ARG:NH1	2.36	0.58
1:F:3:ALA:O	1:F:6:GLN:HG3	2.02	0.58
1:A:58:ALA:O	1:A:62:HIS:ND1	2.35	0.58
1:E:53:ALA:HB1	1:E:148:VAL:HG21	1.84	0.58
1:K:50:GLU:OE1	1:K:123:ARG:NH1	2.36	0.58
1:C:4:VAL:HA	1:C:134:ILE:HG13	1.84	0.58
1:G:4:VAL:HG21	1:H:139:VAL:HB	1.86	0.58
1:D:129:ASP:HB2	1:D:130:PRO:HD2	1.85	0.57
1:F:40:PRO:HD2	1:F:47:CYS:SG	2.44	0.57
1:F:104:THR:HG23	1:F:106:GLN:H	1.69	0.57
1:F:34:LEU:HD21	1:F:69:VAL:HG13	1.87	0.57
1:A:105:LYS:HE3	1:A:119:GLY:O	2.05	0.57
1:E:4:VAL:HG21	1:F:139:VAL:CG1	2.34	0.56
1:A:4:VAL:HG22	1:A:134:ILE:HD11	1.88	0.56
1:D:151:THR:O	1:D:155:VAL:HG23	2.05	0.56
1:H:53:ALA:HB1	1:H:148:VAL:HG21	1.88	0.56
1:L:4:VAL:HG22	1:L:134:ILE:HD11	1.88	0.56
1:I:115:LEU:HB3	1:I:118:PRO:HD2	1.87	0.56
1:F:50:GLU:OE1	1:F:123:ARG:NH1	2.39	0.55
1:K:8:ALA:HB2	1:K:134:ILE:HG22	1.88	0.55
1:H:69:VAL:HB	1:H:98:ALA:HB3	1.87	0.55
1:C:4:VAL:HG21	1:D:139:VAL:HB	1.89	0.55
1:K:115:LEU:HB3	1:K:118:PRO:HD2	1.87	0.55
1:E:161:VAL:HG21	1:F:143:PRO:HB2	1.89	0.55
1:E:69:VAL:HB	1:E:98:ALA:HB3	1.89	0.54
1:F:12:LYS:HG3	1:F:25:SER:HB3	1.89	0.54
1:D:34:LEU:HD21	1:D:69:VAL:HG13	1.89	0.54
1:D:53:ALA:HB1	1:D:148:VAL:HG21	1.89	0.54
1:I:12:LYS:HG3	1:I:25:SER:HB3	1.89	0.54
1:L:40:PRO:HD2	1:L:47:CYS:SG	2.48	0.54
1:I:143:PRO:CG	1:J:161:VAL:HG21	2.38	0.54
1:L:4:VAL:HA	1:L:134:ILE:HG13	1.89	0.54
1:B:123:ARG:HB3	1:B:146:ARG:NH2	2.23	0.54
1:E:105:LYS:HE3	1:E:119:GLY:O	2.07	0.53
1:H:115:LEU:HD13	1:H:122:LEU:HG	1.91	0.53
1:L:115:LEU:HB3	1:L:118:PRO:HD2	1.90	0.53
1:A:115:LEU:HB3	1:A:118:PRO:HD2	1.90	0.53
1:F:47:CYS:HA	1:F:123:ARG:HH22	1.74	0.53
1:E:53:ALA:CB	1:E:148:VAL:HG21	2.39	0.53
1:F:104:THR:HG23	1:F:106:GLN:CB	2.39	0.52
1:J:53:ALA:HB1	1:J:148:VAL:HG21	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:4:VAL:HA	1:B:134:ILE:HG13	1.90	0.52
1:D:123:ARG:HB3	1:D:146:ARG:NH2	2.24	0.52
1:E:47:CYS:HA	1:E:123:ARG:HH22	1.74	0.52
1:E:115:LEU:HB3	1:E:118:PRO:HD2	1.91	0.52
1:L:123:ARG:HB3	1:L:146:ARG:NH2	2.25	0.52
1:F:104:THR:HG23	1:F:106:GLN:HB3	1.91	0.52
1:G:115:LEU:HB3	1:G:118:PRO:HD2	1.91	0.52
1:A:161:VAL:HG21	1:B:143:PRO:HB2	1.90	0.52
1:H:8:ALA:HB2	1:H:134:ILE:HG22	1.91	0.52
1:I:50:GLU:OE1	1:I:123:ARG:NH1	2.43	0.52
1:G:67:GLU:OE1	1:G:67:GLU:HA	2.09	0.52
1:D:56:ASP:C	1:D:58:ALA:H	2.18	0.51
1:E:139:VAL:HB	1:F:4:VAL:HG21	1.92	0.51
1:A:12:LYS:HG3	1:A:25:SER:HB3	1.92	0.51
1:A:40:PRO:HD2	1:A:47:CYS:SG	2.50	0.51
1:D:7:HIS:HA	1:D:132:GLY:O	2.10	0.51
1:F:115:LEU:HB3	1:F:118:PRO:HD2	1.92	0.51
1:D:98:ALA:O	1:D:99:LEU:HD12	2.11	0.51
1:A:123:ARG:HB3	1:A:146:ARG:NH2	2.25	0.51
1:C:4:VAL:HG22	1:C:134:ILE:HD11	1.91	0.51
1:F:129:ASP:OD2	1:F:135:LYS:HD3	2.10	0.51
1:C:139:VAL:O	1:D:136:HIS:HA	2.10	0.51
1:K:122:LEU:HD13	1:L:4:VAL:HB	1.93	0.50
1:J:4:VAL:HA	1:J:134:ILE:HG13	1.92	0.50
1:H:115:LEU:HB3	1:H:118:PRO:HD2	1.93	0.50
1:H:129:ASP:HB2	1:H:130:PRO:HD2	1.94	0.50
1:D:67:GLU:HA	1:D:67:GLU:OE1	2.11	0.50
1:H:52:ILE:HG23	1:H:87:ARG:NH1	2.26	0.50
1:J:115:LEU:HB3	1:J:118:PRO:HD2	1.94	0.50
1:H:53:ALA:CB	1:H:148:VAL:HG21	2.41	0.50
1:D:4:VAL:HG22	1:D:134:ILE:HD11	1.94	0.49
1:D:4:VAL:HA	1:D:134:ILE:HG13	1.93	0.49
1:I:105:LYS:HE3	1:I:119:GLY:O	2.12	0.49
1:E:7:HIS:HA	1:E:132:GLY:O	2.13	0.49
1:K:123:ARG:HB3	1:K:146:ARG:NH2	2.28	0.49
1:C:71:VAL:HB	1:C:100:LEU:HB3	1.93	0.49
1:B:115:LEU:HB3	1:B:118:PRO:HD2	1.93	0.49
1:G:4:VAL:HA	1:G:134:ILE:HG13	1.95	0.49
1:B:40:PRO:HD2	1:B:47:CYS:SG	2.52	0.49
1:H:88:LYS:HD3	1:H:89:ASN:OD1	2.13	0.48
1:I:56:ASP:C	1:I:58:ALA:H	2.21	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:VAL:HA	1:A:134:ILE:HG13	1.95	0.48
1:C:7:HIS:HA	1:C:132:GLY:O	2.13	0.48
1:H:3:ALA:O	1:H:6:GLN:HG3	2.14	0.48
1:J:34:LEU:HD21	1:J:69:VAL:CG1	2.44	0.48
1:E:40:PRO:HD2	1:E:47:CYS:SG	2.54	0.48
1:I:134:ILE:HG13	1:I:134:ILE:O	2.14	0.48
1:C:161:VAL:HG21	1:D:143:PRO:CB	2.42	0.48
1:F:118:PRO:HG2	1:F:120:LEU:HD22	1.96	0.48
1:D:3:ALA:HB3	1:D:6:GLN:HE21	1.78	0.47
1:D:42:ASP:OD2	1:D:79:HIS:ND1	2.47	0.47
1:K:129:ASP:OD1	1:K:129:ASP:C	2.57	0.47
1:E:8:ALA:HB2	1:E:134:ILE:HG22	1.96	0.47
1:D:39:TYR:HB2	1:D:47:CYS:SG	2.54	0.47
1:E:12:LYS:HG3	1:E:25:SER:HB3	1.97	0.47
1:D:58:ALA:C	1:D:62:HIS:HD1	2.22	0.47
1:I:64:VAL:O	1:I:65:ASN:HB2	2.14	0.47
1:I:161:VAL:HG21	1:J:143:PRO:HB2	1.96	0.47
1:K:11:PHE:O	1:K:25:SER:HA	2.15	0.47
1:A:62:HIS:HD1	1:A:62:HIS:H	1.63	0.47
1:B:7:HIS:HA	1:B:132:GLY:O	2.15	0.47
1:K:40:PRO:HD2	1:K:47:CYS:SG	2.55	0.47
1:D:115:LEU:HB3	1:D:118:PRO:HD2	1.96	0.46
1:I:40:PRO:HD2	1:I:47:CYS:SG	2.54	0.46
1:F:7:HIS:HA	1:F:132:GLY:O	2.16	0.46
1:G:34:LEU:HD21	1:G:69:VAL:CG1	2.43	0.46
1:K:86:PRO:HD2	1:K:89:ASN:ND2	2.30	0.46
1:K:118:PRO:HB2	1:K:120:LEU:HD22	1.97	0.46
1:D:9:PRO:HD2	1:D:111:TYR:CZ	2.51	0.46
1:F:104:THR:C	1:F:106:GLN:H	2.23	0.46
1:C:4:VAL:O	1:C:5:THR:OG1	2.31	0.46
1:B:129:ASP:C	1:B:129:ASP:OD1	2.59	0.46
1:D:53:ALA:CB	1:D:148:VAL:HG21	2.46	0.46
1:L:115:LEU:HD13	1:L:122:LEU:HG	1.97	0.46
1:E:123:ARG:HD3	1:E:146:ARG:HH21	1.81	0.46
1:J:32:LYS:HE2	1:J:67:GLU:HG2	1.97	0.46
1:D:80:LEU:HD12	1:D:80:LEU:HA	1.65	0.45
1:H:3:ALA:HB3	1:H:6:GLN:HE21	1.80	0.45
1:C:129:ASP:OD1	1:C:129:ASP:C	2.59	0.45
1:K:4:VAL:HG22	1:K:134:ILE:HD11	1.98	0.45
1:G:115:LEU:HD13	1:G:122:LEU:HG	1.97	0.45
1:C:104:THR:OG1	1:C:106:GLN:HB2	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:47:CYS:HA	1:H:123:ARG:HH22	1.81	0.45
1:E:4:VAL:HG21	1:F:139:VAL:HB	1.99	0.45
1:E:37:PHE:CZ	1:E:70:ALA:HB2	2.52	0.45
1:G:40:PRO:HD2	1:G:47:CYS:SG	2.57	0.45
1:J:33:TYR:CD1	1:J:130:PRO:HD3	2.52	0.45
1:G:39:TYR:O	1:G:72:SER:HB2	2.16	0.45
1:C:65:ASN:O	1:C:65:ASN:CG	2.59	0.44
1:I:3:ALA:HB3	1:I:6:GLN:HE21	1.82	0.44
1:I:115:LEU:HD13	1:I:122:LEU:HG	1.97	0.44
1:A:53:ALA:HB1	1:A:148:VAL:HG21	1.98	0.44
1:B:34:LEU:HD21	1:B:69:VAL:CG1	2.45	0.44
1:E:115:LEU:HD13	1:E:122:LEU:HG	1.98	0.44
1:F:4:VAL:HA	1:F:134:ILE:HG13	1.99	0.44
1:F:9:PRO:HD2	1:F:111:TYR:CE2	2.52	0.44
1:H:37:PHE:CE1	1:H:70:ALA:HB2	2.52	0.44
1:H:86:PRO:HD2	1:H:89:ASN:ND2	2.32	0.44
1:I:8:ALA:HB2	1:I:134:ILE:HG22	1.99	0.44
1:B:41:LEU:HD11	1:B:120:LEU:HD12	1.99	0.44
1:K:136:HIS:ND1	1:L:140:ASN:OD1	2.44	0.44
1:F:53:ALA:HB1	1:F:148:VAL:HG21	2.00	0.44
1:H:75:SER:HB3	1:I:41:LEU:HD22	1.99	0.44
1:F:53:ALA:CB	1:F:148:VAL:HG21	2.48	0.44
1:I:129:ASP:CB	1:I:130:PRO:HD2	2.38	0.44
1:E:33:TYR:CD1	1:E:130:PRO:HD3	2.52	0.43
1:G:7:HIS:HA	1:G:132:GLY:O	2.17	0.43
1:I:38:PHE:HA	1:I:71:VAL:O	2.18	0.43
1:B:85:THR:HG22	1:B:91:GLY:HA3	1.99	0.43
1:E:129:ASP:CB	1:E:130:PRO:HD2	2.42	0.43
1:H:33:TYR:CD1	1:H:130:PRO:HD3	2.52	0.43
1:L:118:PRO:HG2	1:L:120:LEU:HD22	2.00	0.43
1:H:56:ASP:C	1:H:58:ALA:H	2.26	0.43
1:H:158:PHE:HA	1:H:161:VAL:HG12	1.98	0.43
1:D:58:ALA:O	1:D:62:HIS:ND1	2.48	0.43
1:C:37:PHE:CE1	1:C:70:ALA:HB2	2.54	0.43
1:E:24:ILE:O	1:E:24:ILE:HG13	2.18	0.43
1:G:35:VAL:HG23	1:G:66:CYS:SG	2.59	0.43
1:I:136:HIS:ND1	1:J:140:ASN:OD1	2.45	0.43
1:J:129:ASP:OD1	1:J:129:ASP:C	2.61	0.43
1:B:105:LYS:HE3	1:B:119:GLY:O	2.18	0.43
1:G:53:ALA:HB1	1:G:148:VAL:HG21	2.01	0.43
1:G:80:LEU:HD12	1:G:80:LEU:HA	1.81	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:56:ASP:O	1:I:58:ALA:N	2.52	0.43
1:K:53:ALA:CB	1:K:148:VAL:HG21	2.49	0.43
1:A:4:VAL:HB	1:B:122:LEU:HD13	2.01	0.42
1:C:63:ASP:C	1:C:65:ASN:H	2.27	0.42
1:D:38:PHE:HA	1:D:71:VAL:O	2.19	0.42
1:I:161:VAL:O	1:I:161:VAL:HG22	2.19	0.42
1:B:8:ALA:HB2	1:B:134:ILE:HG22	2.00	0.42
1:I:123:ARG:HD3	1:I:146:ARG:HH21	1.83	0.42
1:L:7:HIS:HA	1:L:132:GLY:O	2.20	0.42
1:B:123:ARG:HD3	1:B:146:ARG:HH21	1.85	0.42
1:J:4:VAL:O	1:J:5:THR:OG1	2.25	0.42
1:J:7:HIS:HA	1:J:132:GLY:O	2.19	0.42
1:K:4:VAL:HA	1:K:134:ILE:HG13	2.01	0.42
1:B:64:VAL:O	1:B:159:GLN:NE2	2.41	0.42
1:C:47:CYS:HA	1:C:123:ARG:HH22	1.84	0.42
1:D:94:HIS:O	1:D:95:MET:HE2	2.19	0.42
1:F:4:VAL:HG22	1:F:134:ILE:HD11	2.00	0.42
1:G:161:VAL:O	1:G:161:VAL:HG22	2.19	0.42
1:I:34:LEU:HD21	1:I:69:VAL:CG1	2.47	0.42
1:J:47:CYS:HA	1:J:123:ARG:HH22	1.84	0.42
1:K:7:HIS:HA	1:K:132:GLY:O	2.19	0.42
1:K:67:GLU:OE1	1:K:67:GLU:HA	2.19	0.42
1:A:115:LEU:HD13	1:A:122:LEU:HG	2.02	0.42
1:L:129:ASP:CB	1:L:130:PRO:HD2	2.30	0.42
1:A:47:CYS:HA	1:A:123:ARG:HH22	1.85	0.42
1:A:158:PHE:CD1	1:B:144:VAL:HG21	2.55	0.42
1:E:3:ALA:HB3	1:E:6:GLN:HE21	1.85	0.42
1:I:47:CYS:HA	1:I:123:ARG:HH22	1.84	0.42
1:G:38:PHE:HA	1:G:71:VAL:O	2.20	0.42
1:L:120:LEU:HD23	1:L:120:LEU:O	2.20	0.42
1:I:161:VAL:HG21	1:J:143:PRO:CB	2.50	0.42
1:E:4:VAL:HB	1:F:122:LEU:HD13	2.01	0.41
1:I:86:PRO:HD2	1:I:89:ASN:ND2	2.35	0.41
1:B:56:ASP:C	1:B:58:ALA:H	2.29	0.41
1:D:115:LEU:HD13	1:D:122:LEU:HG	2.01	0.41
1:G:104:THR:HG23	1:G:106:GLN:H	1.85	0.41
1:A:50:GLU:OE1	1:A:123:ARG:NH1	2.54	0.41
1:I:39:TYR:HB2	1:I:47:CYS:SG	2.61	0.41
1:K:47:CYS:HA	1:K:123:ARG:HH22	1.85	0.41
1:C:12:LYS:HG3	1:C:25:SER:HB3	2.03	0.41
1:I:80:LEU:HD12	1:I:80:LEU:HA	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:125:LEU:O	1:H:137:LEU:HA	2.21	0.41
1:D:47:CYS:N	1:D:48:PRO:CD	2.83	0.41
1:F:50:GLU:OE2	1:F:146:ARG:CZ	2.68	0.41
1:F:129:ASP:OD1	1:F:129:ASP:C	2.64	0.41
1:J:71:VAL:HB	1:J:100:LEU:HB3	2.02	0.41
1:K:16:VAL:HG11	1:K:83:ILE:CD1	2.51	0.41
1:L:47:CYS:HA	1:L:123:ARG:HH22	1.86	0.41
1:F:8:ALA:HB2	1:F:134:ILE:HG22	2.03	0.41
1:B:104:THR:O	1:B:105:LYS:HB2	2.21	0.40
1:C:53:ALA:HB1	1:C:148:VAL:HG21	2.03	0.40
1:G:123:ARG:NE	1:G:142:LEU:O	2.38	0.40
1:C:129:ASP:CB	1:C:130:PRO:HD2	2.35	0.40
1:D:34:LEU:HD22	1:D:36:LEU:N	2.36	0.40
1:D:104:THR:C	1:D:106:GLN:H	2.30	0.40
1:G:8:ALA:HB2	1:G:134:ILE:HG22	2.03	0.40
1:H:55:SER:O	1:H:96:ASN:HB2	2.21	0.40
1:L:71:VAL:HB	1:L:100:LEU:HB3	2.02	0.40
1:D:65:ASN:O	1:D:65:ASN:CG	2.64	0.40
1:F:76:HIS:NE2	1:F:77:PHE:CE2	2.89	0.40
1:G:129:ASP:OD2	1:G:135:LYS:HD3	2.21	0.40
1:J:124:GLY:HA2	1:J:138:SER:O	2.22	0.40
1:A:53:ALA:CB	1:A:148:VAL:HG21	2.52	0.40
1:E:80:LEU:HD12	1:E:80:LEU:HA	1.74	0.40
1:I:86:PRO:HD2	1:I:89:ASN:HD22	1.86	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	160/220 (73%)	143 (89%)	15 (9%)	2 (1%)	<b>9</b> 35

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	160/220 (73%)	144 (90%)	13 (8%)	3 (2%)	6	28
1	C	160/220 (73%)	141 (88%)	15 (9%)	4 (2%)	4	23
1	D	160/220 (73%)	141 (88%)	15 (9%)	4 (2%)	4	23
1	E	160/220 (73%)	142 (89%)	16 (10%)	2 (1%)	9	35
1	F	160/220 (73%)	140 (88%)	16 (10%)	4 (2%)	4	23
1	G	160/220 (73%)	143 (89%)	15 (9%)	2 (1%)	9	35
1	H	160/220 (73%)	139 (87%)	17 (11%)	4 (2%)	4	23
1	I	160/220 (73%)	139 (87%)	17 (11%)	4 (2%)	4	23
1	J	160/220 (73%)	140 (88%)	17 (11%)	3 (2%)	6	28
1	K	160/220 (73%)	143 (89%)	15 (9%)	2 (1%)	9	35
1	L	160/220 (73%)	146 (91%)	11 (7%)	3 (2%)	6	28
All	All	1920/2640 (73%)	1701 (89%)	182 (10%)	37 (2%)	6	28

All (37) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	5	THR
1	B	5	THR
1	C	5	THR
1	D	5	THR
1	E	5	THR
1	F	5	THR
1	G	5	THR
1	H	5	THR
1	I	5	THR
1	J	5	THR
1	K	5	THR
1	L	5	THR
1	B	40	PRO
1	I	57	LYS
1	J	40	PRO
1	K	40	PRO
1	A	40	PRO
1	C	40	PRO
1	D	40	PRO
1	D	57	LYS
1	E	40	PRO
1	F	40	PRO

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Mol	Chain	Res	Type
1	G	40	PRO
1	H	40	PRO
1	H	141	ASP
1	I	40	PRO
1	I	56	ASP
1	L	40	PRO
1	F	56	ASP
1	F	81	ALA
1	J	117	GLY
1	C	64	VAL
1	C	117	GLY
1	B	130	PRO
1	D	130	PRO
1	H	117	GLY
1	L	117	GLY

### 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	139/190 (73%)	124 (89%)	15 (11%)	6	23
1	B	139/190 (73%)	120 (86%)	19 (14%)	3	16
1	C	139/190 (73%)	122 (88%)	17 (12%)	5	19
1	D	139/190 (73%)	123 (88%)	16 (12%)	5	21
1	E	139/190 (73%)	121 (87%)	18 (13%)	4	17
1	F	139/190 (73%)	123 (88%)	16 (12%)	5	21
1	G	139/190 (73%)	124 (89%)	15 (11%)	6	23
1	H	139/190 (73%)	123 (88%)	16 (12%)	5	21
1	I	139/190 (73%)	124 (89%)	15 (11%)	6	23
1	J	139/190 (73%)	119 (86%)	20 (14%)	3	14
1	K	139/190 (73%)	124 (89%)	15 (11%)	6	23
1	L	139/190 (73%)	123 (88%)	16 (12%)	5	21

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1668/2280 (73%)	1470 (88%)	198 (12%)	5 20

All (198) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	5	THR
1	A	6	GLN
1	A	34	LEU
1	A	49	THR
1	A	60	GLU
1	A	69	VAL
1	A	71	VAL
1	A	89	ASN
1	A	95	MET
1	A	103	LEU
1	A	106	GLN
1	A	115	LEU
1	A	120	LEU
1	A	134	ILE
1	A	146	ARG
1	B	5	THR
1	B	6	GLN
1	B	17	VAL
1	B	18	SER
1	B	22	LYS
1	B	34	LEU
1	B	47	CYS
1	B	49	THR
1	B	60	GLU
1	B	69	VAL
1	B	71	VAL
1	B	89	ASN
1	B	94	HIS
1	B	95	MET
1	B	103	LEU
1	B	115	LEU
1	B	120	LEU
1	B	134	ILE
1	B	146	ARG
1	C	5	THR
1	C	6	GLN
1	C	22	LYS

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Mol	Chain	Res	Type
1	C	34	LEU
1	C	49	THR
1	C	60	GLU
1	C	69	VAL
1	C	71	VAL
1	C	89	ASN
1	C	95	MET
1	C	99	LEU
1	C	103	LEU
1	C	106	GLN
1	C	115	LEU
1	C	120	LEU
1	C	134	ILE
1	C	146	ARG
1	D	5	THR
1	D	6	GLN
1	D	34	LEU
1	D	47	CYS
1	D	49	THR
1	D	60	GLU
1	D	69	VAL
1	D	71	VAL
1	D	78	SER
1	D	89	ASN
1	D	95	MET
1	D	103	LEU
1	D	106	GLN
1	D	115	LEU
1	D	120	LEU
1	D	134	ILE
1	E	5	THR
1	E	6	GLN
1	E	22	LYS
1	E	34	LEU
1	E	47	CYS
1	E	49	THR
1	E	60	GLU
1	E	69	VAL
1	E	71	VAL
1	E	78	SER
1	E	89	ASN
1	E	95	MET

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Mol	Chain	Res	Type
1	E	103	LEU
1	E	109	ARG
1	E	115	LEU
1	E	120	LEU
1	E	134	ILE
1	E	146	ARG
1	F	5	THR
1	F	6	GLN
1	F	17	VAL
1	F	34	LEU
1	F	49	THR
1	F	60	GLU
1	F	69	VAL
1	F	71	VAL
1	F	80	LEU
1	F	89	ASN
1	F	95	MET
1	F	103	LEU
1	F	108	SER
1	F	115	LEU
1	F	120	LEU
1	F	134	ILE
1	G	5	THR
1	G	6	GLN
1	G	17	VAL
1	G	34	LEU
1	G	49	THR
1	G	60	GLU
1	G	69	VAL
1	G	71	VAL
1	G	89	ASN
1	G	95	MET
1	G	103	LEU
1	G	115	LEU
1	G	120	LEU
1	G	134	ILE
1	G	146	ARG
1	H	5	THR
1	H	6	GLN
1	H	34	LEU
1	H	49	THR
1	H	60	GLU

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Mol	Chain	Res	Type
1	H	69	VAL
1	H	71	VAL
1	H	89	ASN
1	H	95	MET
1	H	99	LEU
1	H	103	LEU
1	H	109	ARG
1	H	115	LEU
1	H	120	LEU
1	H	134	ILE
1	H	146	ARG
1	I	5	THR
1	I	6	GLN
1	I	34	LEU
1	I	47	CYS
1	I	49	THR
1	I	60	GLU
1	I	69	VAL
1	I	89	ASN
1	I	95	MET
1	I	103	LEU
1	I	106	GLN
1	I	115	LEU
1	I	120	LEU
1	I	134	ILE
1	I	146	ARG
1	J	5	THR
1	J	6	GLN
1	J	17	VAL
1	J	18	SER
1	J	34	LEU
1	J	49	THR
1	J	59	SER
1	J	60	GLU
1	J	69	VAL
1	J	71	VAL
1	J	89	ASN
1	J	95	MET
1	J	99	LEU
1	J	103	LEU
1	J	106	GLN
1	J	108	SER

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Mol	Chain	Res	Type
1	J	115	LEU
1	J	120	LEU
1	J	134	ILE
1	J	146	ARG
1	K	5	THR
1	K	6	GLN
1	K	20	GLU
1	K	34	LEU
1	K	49	THR
1	K	60	GLU
1	K	69	VAL
1	K	71	VAL
1	K	89	ASN
1	K	95	MET
1	K	103	LEU
1	K	115	LEU
1	K	120	LEU
1	K	134	ILE
1	K	146	ARG
1	L	5	THR
1	L	6	GLN
1	L	17	VAL
1	L	34	LEU
1	L	49	THR
1	L	60	GLU
1	L	69	VAL
1	L	89	ASN
1	L	95	MET
1	L	99	LEU
1	L	103	LEU
1	L	106	GLN
1	L	115	LEU
1	L	120	LEU
1	L	134	ILE
1	L	146	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	6	GLN
1	B	6	GLN
1	B	106	GLN

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Mol	Chain	Res	Type
1	C	94	HIS
1	D	6	GLN
1	D	65	ASN
1	D	94	HIS
1	E	6	GLN
1	E	65	ASN
1	E	89	ASN
1	F	65	ASN
1	G	6	GLN
1	H	6	GLN
1	I	6	GLN
1	I	94	HIS
1	J	106	GLN
1	K	65	ASN
1	K	89	ASN
1	K	94	HIS
1	K	96	ASN
1	L	106	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](#)

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 ⓘ

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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	162/220 (73%)	0.39	4 (2%) 58 39	58, 74, 87, 92	0
1	B	162/220 (73%)	-0.00	3 (1%) 66 48	58, 74, 86, 92	0
1	C	162/220 (73%)	-0.06	1 (0%) 85 73	57, 74, 86, 92	0
1	D	162/220 (73%)	0.40	3 (1%) 66 48	58, 74, 87, 91	0
1	E	162/220 (73%)	0.05	1 (0%) 85 73	56, 74, 87, 92	0
1	F	162/220 (73%)	-0.01	1 (0%) 85 73	58, 74, 87, 92	0
1	G	162/220 (73%)	-0.11	2 (1%) 76 58	58, 74, 86, 92	0
1	H	162/220 (73%)	0.01	2 (1%) 76 58	57, 74, 86, 92	0
1	I	162/220 (73%)	-0.07	1 (0%) 85 73	58, 74, 87, 90	0
1	J	162/220 (73%)	0.07	1 (0%) 85 73	58, 73, 86, 92	0
1	K	162/220 (73%)	-0.07	0 100 100	58, 74, 86, 92	0
1	L	162/220 (73%)	0.21	1 (0%) 85 73	58, 73, 86, 92	0
All	All	1944/2640 (73%)	0.07	20 (1%) 79 63	56, 74, 87, 92	0

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	90	GLY	3.3
1	G	45	PHE	3.1
1	E	45	PHE	2.8
1	A	161	VAL	2.6
1	D	163	ALA	2.5
1	B	94	HIS	2.5
1	C	45	PHE	2.4
1	B	142	LEU	2.4
1	B	45	PHE	2.3
1	G	46	VAL	2.3
1	H	2	PRO	2.3

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Mol	Chain	Res	Type	RSRZ
1	I	163	ALA	2.3
1	H	163	ALA	2.3
1	F	45	PHE	2.3
1	J	96	ASN	2.3
1	L	19	GLY	2.2
1	D	65	ASN	2.2
1	A	63	ASP	2.1
1	A	106	GLN	2.1
1	D	69	VAL	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](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.