



# Full wwPDB X-ray Structure Validation Report ⓘ

Apr 14, 2025 – 07:43 PM EDT

PDB ID : 2Q3Q / pdb\_00002q3q  
Title : Ensemble refinement of the protein crystal structure of At1g24000 from Arabidopsis thaliana  
Authors : Levin, E.J.; Kondrashov, D.A.; Wesenberg, G.E.; Phillips Jr., G.N.; Center for Eukaryotic Structural Genomics (CESG)  
Deposited on : 2007-05-30  
Resolution : 2.10 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	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.42

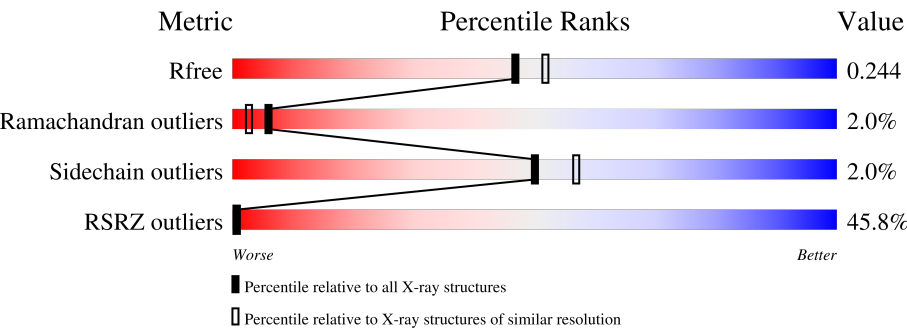
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 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.






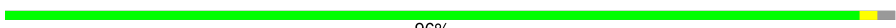









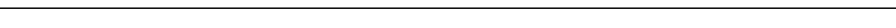

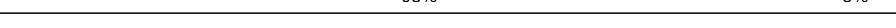
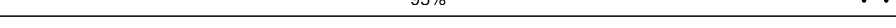
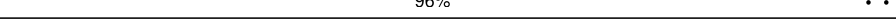
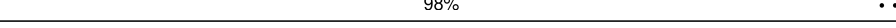
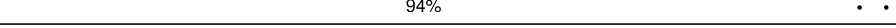
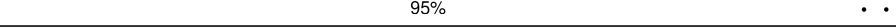
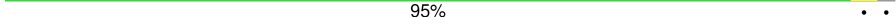

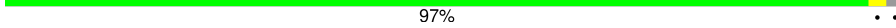
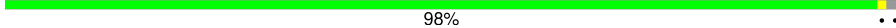
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	164625	6234 (2.10-2.10)
Ramachandran outliers	177936	6839 (2.10-2.10)
Sidechain outliers	177891	6840 (2.10-2.10)
RSRZ outliers	164620	6234 (2.10-2.10)

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	1-A	122	<div><div>45%</div><div>95%</div><div>..</div></div>
1	1-B	122	<div><div>43%</div><div>97%</div><div>..</div></div>
1	10-A	122	<div><div>98%</div><div>..</div></div>
1	10-B	122	<div><div>95%</div><div>..</div></div>
1	11-A	122	<div><div>94%</div><div>..</div></div>
1	11-B	122	<div><div>88%</div><div>11%</div><div>.</div></div>
1	12-A	122	<div><div>91%</div><div>7%</div><div>.</div></div>

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Mol	Chain	Length	Quality of chain
1	12-B	122	 94% . .
1	13-A	122	 94% . .
1	13-B	122	 93% 5% . .
1	14-A	122	 96% . .
1	14-B	122	 96% . .
1	15-A	122	 93% 5% . .
1	15-B	122	 93% 6% . .
1	16-A	122	 93% . . .
1	16-B	122	 92% 7% . .
1	2-A	122	 92% 7% . .
1	2-B	122	 97% . .
1	3-A	122	 95% . .
1	3-B	122	 98% .
1	4-A	122	 97% . .
1	4-B	122	 93% 5% . .
1	5-A	122	 95% . .
1	5-B	122	 96% . .
1	6-A	122	 98% . .
1	6-B	122	 94% . .
1	7-A	122	 95% . .
1	7-B	122	 95% . .
1	8-A	122	 93% 5% . .
1	8-B	122	 97% . .
1	9-A	122	 98% . .
1	9-B	122	 97% . .

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 32160 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 Uncharacterized protein At1g24000.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	1-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	2-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	3-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	4-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	5-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	6-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	7-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	8-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	9-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	10-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	11-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	12-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	13-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	14-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	15-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	16-A	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			

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Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	1-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	2-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	3-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	4-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	5-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	6-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	7-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	8-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	9-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	10-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	11-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	12-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	13-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	14-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	15-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			
1	16-B	120	Total	C	N	O	S	Se	0	0	0
			952	616	153	180	1	2			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	SER	-	expression tag	UNP P0C0B0
A	50	MSE	MET	modified residue	UNP P0C0B0
A	54	MSE	MET	modified residue	UNP P0C0B0
B	1	SER	-	expression tag	UNP P0C0B0
B	50	MSE	MET	modified residue	UNP P0C0B0
B	54	MSE	MET	modified residue	UNP P0C0B0

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	1-A	66	Total O 66 66	0	0
2	2-A	67	Total O 67 67	0	0
2	3-A	67	Total O 67 67	0	0
2	4-A	67	Total O 67 67	0	0
2	5-A	63	Total O 63 63	0	0
2	6-A	66	Total O 66 66	0	0
2	7-A	65	Total O 65 65	0	0
2	8-A	65	Total O 65 65	0	0
2	9-A	66	Total O 66 66	0	0
2	10-A	67	Total O 67 67	0	0
2	11-A	67	Total O 67 67	0	0
2	12-A	66	Total O 66 66	0	0
2	13-A	67	Total O 67 67	0	0
2	14-A	69	Total O 69 69	0	0
2	15-A	66	Total O 66 66	0	0
2	16-A	67	Total O 67 67	0	0
2	1-B	40	Total O 40 40	0	0
2	2-B	39	Total O 39 39	0	0
2	3-B	39	Total O 39 39	0	0
2	4-B	39	Total O 39 39	0	0
2	5-B	43	Total O 43 43	0	0

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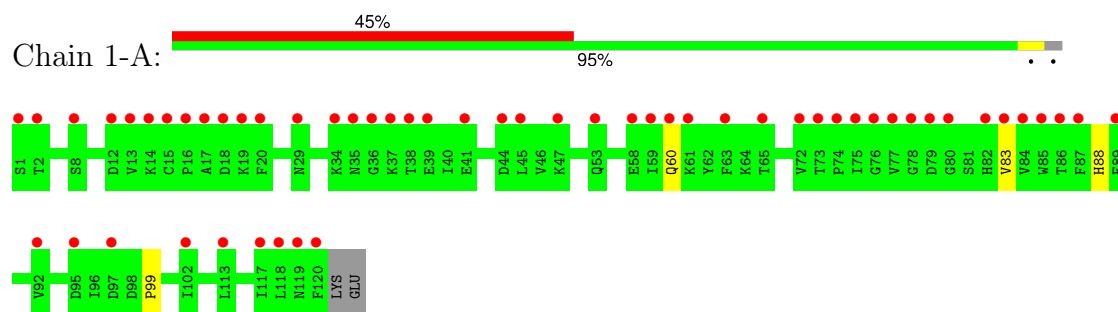
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	6-B	40	Total 40	O 40	0	0
2	7-B	41	Total 41	O 41	0	0
2	8-B	41	Total 41	O 41	0	0
2	9-B	40	Total 40	O 40	0	0
2	10-B	39	Total 39	O 39	0	0
2	11-B	39	Total 39	O 39	0	0
2	12-B	40	Total 40	O 40	0	0
2	13-B	39	Total 39	O 39	0	0
2	14-B	37	Total 37	O 37	0	0
2	15-B	40	Total 40	O 40	0	0
2	16-B	39	Total 39	O 39	0	0

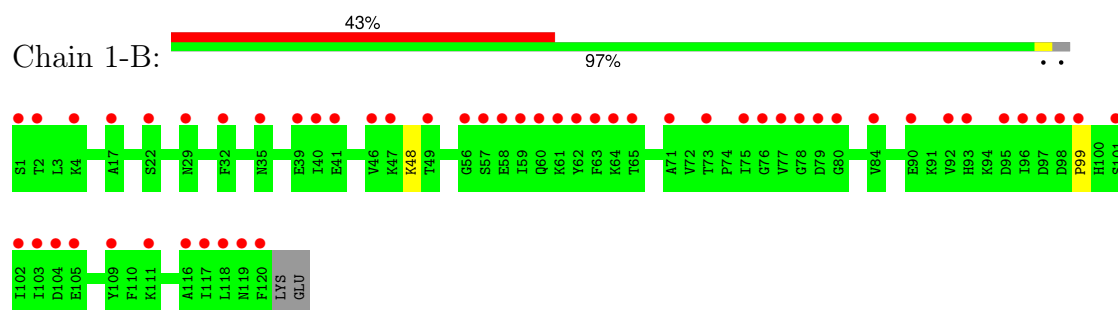
### 3 Residue-property plots

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.

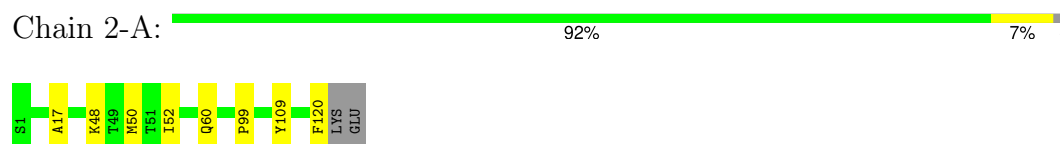
- Molecule 1: Uncharacterized protein At1g24000



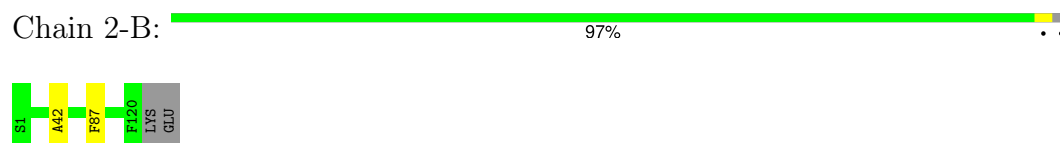
- Molecule 1: Uncharacterized protein At1g24000



- Molecule 1: Uncharacterized protein At1g24000



- Molecule 1: Uncharacterized protein At1g24000



- Molecule 1: Uncharacterized protein At1g24000

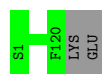


Chain 3-A:  95% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 3-B:  98% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 4-A:  97% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 4-B:  93% 5% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 5-A:  95% ..



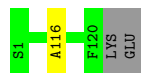
- Molecule 1: Uncharacterized protein At1g24000

Chain 5-B:  96% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 6-A:  98% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 6-B:  94% ..



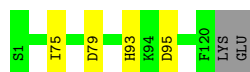
- Molecule 1: Uncharacterized protein At1g24000

Chain 7-A:  95% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 7-B:  95% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 8-A:  93% 5% ..



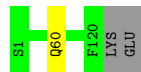
- Molecule 1: Uncharacterized protein At1g24000

Chain 8-B:  97% ..



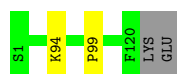
- Molecule 1: Uncharacterized protein At1g24000

Chain 9-A:  98% ..




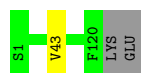
- Molecule 1: Uncharacterized protein At1g24000

Chain 9-B:  97% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 10-A:  98% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 10-B:  95% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 11-A:  94% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 11-B:  88% 11% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 12-A:  91% 7% .



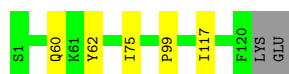
- Molecule 1: Uncharacterized protein At1g24000

Chain 12-B:  94% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 13-A:  94% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 13-B:  93% 5% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 14-A:  96% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 14-B:  96% ..



- Molecule 1: Uncharacterized protein At1g24000

Chain 15-A:  93% 5% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 15-B:  93% 6% .



- Molecule 1: Uncharacterized protein At1g24000

Chain 16-A:  93% . .



- Molecule 1: Uncharacterized protein At1g24000

Chain 16-B:  92% 7% .



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	45.68Å 34.26Å 78.60Å 90.00° 90.01° 90.00°	Depositor
Resolution (Å)	20.81 – 2.10 20.81 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.8 (20.81-2.10) 99.7 (20.81-2.10)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	10.19 (at 2.09Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.174 , 0.241 0.175 , 0.244	Depositor DCC
$R_{free}$ test set	732 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	21.1	Xtriage
Anisotropy	0.033	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.03 , 59.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.026 for h,-k,-l	Xtriage
$F_o, F_c$ correlation	0.82	EDS
Total number of atoms	32160	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	21.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.20% 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	1-A	0.49	0/971	0.63	0/1303
1	1-B	0.44	0/971	0.67	0/1303
1	2-A	0.49	0/971	0.68	0/1303
1	2-B	0.45	0/971	0.62	0/1303
1	3-A	0.49	0/971	0.65	0/1303
1	3-B	0.45	0/971	0.64	0/1303
1	4-A	0.48	0/971	0.65	0/1303
1	4-B	0.44	0/971	0.63	0/1303
1	5-A	0.48	0/971	0.65	0/1303
1	5-B	0.45	0/971	0.65	0/1303
1	6-A	0.49	0/971	0.65	0/1303
1	6-B	0.45	0/971	0.65	0/1303
1	7-A	0.48	0/971	0.65	0/1303
1	7-B	0.45	0/971	0.63	0/1303
1	8-A	0.50	0/971	0.62	0/1303
1	8-B	0.44	0/971	0.64	0/1303
1	9-A	0.48	0/971	0.66	0/1303
1	9-B	0.44	0/971	0.63	0/1303
1	10-A	0.50	0/971	0.67	0/1303
1	10-B	0.44	0/971	0.63	0/1303
1	11-A	0.49	0/971	0.67	0/1303
1	11-B	0.45	0/971	0.63	0/1303
1	12-A	0.47	0/971	0.66	0/1303
1	12-B	0.44	0/971	0.64	0/1303
1	13-A	0.55	0/971	0.72	0/1303
1	13-B	0.49	0/971	0.69	0/1303
1	14-A	0.54	0/971	0.74	0/1303
1	14-B	0.50	0/971	0.68	0/1303
1	15-A	0.53	0/971	0.73	0/1303
1	15-B	0.48	0/971	0.69	0/1303
1	16-A	0.54	0/971	0.72	0/1303
1	16-B	0.49	0/971	0.69	0/1303
All	All	0.48	0/31072	0.66	0/41696

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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	1-A	952	0	958	0	0
1	1-B	952	0	958	0	0
1	2-A	952	0	958	0	0
1	2-B	952	0	958	0	0
1	3-A	952	0	958	0	0
1	3-B	952	0	958	0	0
1	4-A	952	0	958	0	0
1	4-B	952	0	958	0	0
1	5-A	952	0	958	0	0
1	5-B	952	0	958	0	0
1	6-A	952	0	958	0	0
1	6-B	952	0	958	0	0
1	7-A	952	0	958	0	0
1	7-B	952	0	958	0	0
1	8-A	952	0	958	0	0
1	8-B	952	0	958	0	0
1	9-A	952	0	958	0	0
1	9-B	952	0	958	0	0
1	10-A	952	0	958	0	0
1	10-B	952	0	958	0	0
1	11-A	952	0	958	0	0
1	11-B	952	0	958	0	0
1	12-A	952	0	958	0	0
1	12-B	952	0	958	0	0
1	13-A	952	0	958	0	0
1	13-B	952	0	958	0	0
1	14-A	952	0	958	0	0
1	14-B	952	0	958	0	0
1	15-A	952	0	958	0	0
1	15-B	952	0	958	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	16-A	952	0	958	0	0
1	16-B	952	0	958	0	0
2	1-A	66	0	0	0	0
2	1-B	40	0	0	0	0
2	2-A	67	0	0	0	0
2	2-B	39	0	0	0	0
2	3-A	67	0	0	0	0
2	3-B	39	0	0	0	0
2	4-A	67	0	0	0	0
2	4-B	39	0	0	0	0
2	5-A	63	0	0	0	0
2	5-B	43	0	0	0	0
2	6-A	66	0	0	0	0
2	6-B	40	0	0	0	0
2	7-A	65	0	0	0	0
2	7-B	41	0	0	0	0
2	8-A	65	0	0	0	0
2	8-B	41	0	0	0	0
2	9-A	66	0	0	0	0
2	9-B	40	0	0	0	0
2	10-A	67	0	0	0	0
2	10-B	39	0	0	0	0
2	11-A	67	0	0	0	0
2	11-B	39	0	0	0	0
2	12-A	66	0	0	0	0
2	12-B	40	0	0	0	0
2	13-A	67	0	0	0	0
2	13-B	39	0	0	0	0
2	14-A	69	0	0	0	0
2	14-B	37	0	0	0	0
2	15-A	66	0	0	0	0
2	15-B	40	0	0	0	0
2	16-A	67	0	0	0	0
2	16-B	39	0	0	0	0
All	All	32160	0	30656	0	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). Clashscore could not be calculated for this entry.

There are no clashes within the asymmetric unit.

There are no symmetry-related clashes.



## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	1-A	118/122 (97%)	106 (90%)	9 (8%)	3 (2%)	4	2
1	1-B	118/122 (97%)	107 (91%)	10 (8%)	1 (1%)	16	13
1	2-A	118/122 (97%)	109 (92%)	6 (5%)	3 (2%)	4	2
1	2-B	118/122 (97%)	103 (87%)	14 (12%)	1 (1%)	16	13
1	3-A	118/122 (97%)	108 (92%)	8 (7%)	2 (2%)	7	4
1	3-B	118/122 (97%)	108 (92%)	10 (8%)	0	100	100
1	4-A	118/122 (97%)	110 (93%)	7 (6%)	1 (1%)	16	13
1	4-B	118/122 (97%)	108 (92%)	6 (5%)	4 (3%)	3	1
1	5-A	118/122 (97%)	111 (94%)	5 (4%)	2 (2%)	7	4
1	5-B	118/122 (97%)	106 (90%)	11 (9%)	1 (1%)	16	13
1	6-A	118/122 (97%)	110 (93%)	7 (6%)	1 (1%)	16	13
1	6-B	118/122 (97%)	101 (86%)	15 (13%)	2 (2%)	7	4
1	7-A	118/122 (97%)	111 (94%)	6 (5%)	1 (1%)	16	13
1	7-B	118/122 (97%)	107 (91%)	10 (8%)	1 (1%)	16	13
1	8-A	118/122 (97%)	96 (81%)	19 (16%)	3 (2%)	4	2
1	8-B	118/122 (97%)	107 (91%)	9 (8%)	2 (2%)	7	4
1	9-A	118/122 (97%)	107 (91%)	11 (9%)	0	100	100
1	9-B	118/122 (97%)	105 (89%)	11 (9%)	2 (2%)	7	4
1	10-A	118/122 (97%)	111 (94%)	6 (5%)	1 (1%)	16	13
1	10-B	118/122 (97%)	103 (87%)	13 (11%)	2 (2%)	7	4
1	11-A	118/122 (97%)	110 (93%)	5 (4%)	3 (2%)	4	2
1	11-B	118/122 (97%)	94 (80%)	16 (14%)	8 (7%)	1	0
1	12-A	118/122 (97%)	102 (86%)	11 (9%)	5 (4%)	2	0
1	12-B	118/122 (97%)	101 (86%)	13 (11%)	4 (3%)	3	1
1	13-A	118/122 (97%)	114 (97%)	2 (2%)	2 (2%)	7	4

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	13-B	118/122 (97%)	107 (91%)	7 (6%)	4 (3%)	3	1
1	14-A	118/122 (97%)	110 (93%)	7 (6%)	1 (1%)	16	13
1	14-B	118/122 (97%)	106 (90%)	10 (8%)	2 (2%)	7	4
1	15-A	118/122 (97%)	108 (92%)	8 (7%)	2 (2%)	7	4
1	15-B	118/122 (97%)	105 (89%)	8 (7%)	5 (4%)	2	0
1	16-A	118/122 (97%)	98 (83%)	17 (14%)	3 (2%)	4	2
1	16-B	118/122 (97%)	103 (87%)	12 (10%)	3 (2%)	4	2
All	All	3776/3904 (97%)	3392 (90%)	309 (8%)	75 (2%)	6	3

All (75) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	2-A	17	ALA
1	2-B	42	ALA
1	8-A	88	HIS
1	10-B	91	LYS
1	11-B	32	PHE
1	11-B	42	ALA
1	12-A	58	GLU
1	12-A	93	HIS
1	14-A	42	ALA
1	16-A	14	LYS
1	1-A	88	HIS
1	2-A	52	ILE
1	4-B	79	ASP
1	4-B	116	ALA
1	5-A	17	ALA
1	6-B	80	GLY
1	8-A	116	ALA
1	11-B	88	HIS
1	12-A	59	ILE
1	14-B	27	ASP
1	15-A	61	LYS
1	15-B	79	ASP
1	15-B	80	GLY
1	16-A	57	SER
1	1-B	99	PRO
1	5-A	99	PRO
1	6-A	116	ALA
1	6-B	58	GLU

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Mol	Chain	Res	Type
1	8-A	78	GLY
1	11-A	101	SER
1	11-A	118	LEU
1	11-B	3	LEU
1	12-A	57	SER
1	12-B	43	VAL
1	13-B	94	LYS
1	16-B	77	VAL
1	9-B	94	LYS
1	15-B	59	ILE
1	3-A	41	GLU
1	4-B	58	GLU
1	10-B	77	VAL
1	11-B	34	LYS
1	12-B	94	LYS
1	2-A	99	PRO
1	4-B	59	ILE
1	8-B	76	GLY
1	8-B	99	PRO
1	9-B	99	PRO
1	11-B	43	VAL
1	16-B	52	ILE
1	16-B	75	ILE
1	3-A	43	VAL
1	11-B	76	GLY
1	13-A	99	PRO
1	16-A	76	GLY
1	5-B	99	PRO
1	7-A	99	PRO
1	10-A	43	VAL
1	11-A	99	PRO
1	12-B	76	GLY
1	13-A	75	ILE
1	13-B	77	VAL
1	14-B	59	ILE
1	1-A	99	PRO
1	7-B	75	ILE
1	13-B	75	ILE
1	15-A	75	ILE
1	15-B	99	PRO
1	1-A	83	VAL
1	4-A	99	PRO

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Mol	Chain	Res	Type
1	12-A	76	GLY
1	15-B	9	VAL
1	11-B	77	VAL
1	12-B	78	GLY
1	13-B	99	PRO

### 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	1-A	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	1-B	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	2-A	107/107 (100%)	102 (95%)	5 (5%)	22	22
1	2-B	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	3-A	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	3-B	107/107 (100%)	107 (100%)	0	100	100
1	4-A	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	4-B	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	5-A	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	5-B	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	6-A	107/107 (100%)	107 (100%)	0	100	100
1	6-B	107/107 (100%)	104 (97%)	3 (3%)	38	43
1	7-A	107/107 (100%)	104 (97%)	3 (3%)	38	43
1	7-B	107/107 (100%)	104 (97%)	3 (3%)	38	43
1	8-A	107/107 (100%)	104 (97%)	3 (3%)	38	43
1	8-B	107/107 (100%)	107 (100%)	0	100	100
1	9-A	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	9-B	107/107 (100%)	107 (100%)	0	100	100
1	10-A	107/107 (100%)	107 (100%)	0	100	100
1	10-B	107/107 (100%)	105 (98%)	2 (2%)	52	59

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	11-A	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	11-B	107/107 (100%)	102 (95%)	5 (5%)	22	22
1	12-A	107/107 (100%)	103 (96%)	4 (4%)	29	31
1	12-B	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	13-A	107/107 (100%)	104 (97%)	3 (3%)	38	43
1	13-B	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	14-A	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	14-B	107/107 (100%)	106 (99%)	1 (1%)	75	82
1	15-A	107/107 (100%)	103 (96%)	4 (4%)	29	31
1	15-B	107/107 (100%)	105 (98%)	2 (2%)	52	59
1	16-A	107/107 (100%)	103 (96%)	4 (4%)	29	31
1	16-B	107/107 (100%)	102 (95%)	5 (5%)	22	22
All	All	3424/3424 (100%)	3357 (98%)	67 (2%)	50	57

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	1-A	60	GLN
1	1-B	48	LYS
1	2-A	48	LYS
1	2-A	50	MSE
1	2-A	60	GLN
1	2-A	109	TYR
1	2-A	120	PHE
1	2-B	87	PHE
1	3-A	60	GLN
1	3-A	114	ASP
1	4-A	33	GLU
1	4-B	3	LEU
1	4-B	95	ASP
1	5-A	38	THR
1	5-A	60	GLN
1	5-B	86	THR
1	5-B	87	PHE
1	6-B	69	SER
1	6-B	87	PHE
1	6-B	101	SER
1	7-A	3	LEU

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Mol	Chain	Res	Type
1	7-A	60	GLN
1	7-A	87	PHE
1	7-B	79	ASP
1	7-B	93	HIS
1	7-B	95	ASP
1	8-A	53	GLN
1	8-A	54	MSE
1	8-A	60	GLN
1	9-A	60	GLN
1	10-B	48	LYS
1	10-B	52	ILE
1	11-A	54	MSE
1	11-A	120	PHE
1	11-B	7	LEU
1	11-B	54	MSE
1	11-B	86	THR
1	11-B	95	ASP
1	11-B	105	GLU
1	12-A	18	ASP
1	12-A	34	LYS
1	12-A	89	PHE
1	12-A	94	LYS
1	12-B	87	PHE
1	13-A	60	GLN
1	13-A	62	TYR
1	13-A	117	ILE
1	13-B	54	MSE
1	13-B	95	ASP
1	14-A	60	GLN
1	14-A	98	ASP
1	14-B	54	MSE
1	15-A	54	MSE
1	15-A	60	GLN
1	15-A	63	PHE
1	15-A	109	TYR
1	15-B	103	ILE
1	15-B	109	TYR
1	16-A	57	SER
1	16-A	59	ILE
1	16-A	88	HIS
1	16-A	90	GLU
1	16-B	47	LYS

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Mol	Chain	Res	Type
1	16-B	93	HIS
1	16-B	94	LYS
1	16-B	95	ASP
1	16-B	109	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (77) such sidechains are listed below:

Mol	Chain	Res	Type
1	1-A	53	GLN
1	1-A	60	GLN
1	1-B	53	GLN
1	1-B	88	HIS
1	1-B	100	HIS
1	1-B	119	ASN
1	2-A	60	GLN
1	2-A	88	HIS
1	2-B	29	ASN
1	2-B	53	GLN
1	2-B	119	ASN
1	3-A	35	ASN
1	3-A	53	GLN
1	3-B	35	ASN
1	3-B	53	GLN
1	3-B	88	HIS
1	3-B	119	ASN
1	4-A	53	GLN
1	4-A	60	GLN
1	4-B	35	ASN
1	4-B	53	GLN
1	4-B	88	HIS
1	4-B	100	HIS
1	4-B	119	ASN
1	5-A	53	GLN
1	5-B	53	GLN
1	5-B	119	ASN
1	6-A	53	GLN
1	6-A	60	GLN
1	6-B	29	ASN
1	6-B	35	ASN
1	6-B	53	GLN
1	7-A	53	GLN
1	7-A	60	GLN

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Mol	Chain	Res	Type
1	7-B	35	ASN
1	7-B	53	GLN
1	7-B	100	HIS
1	8-A	53	GLN
1	8-B	35	ASN
1	8-B	53	GLN
1	8-B	88	HIS
1	8-B	119	ASN
1	9-A	53	GLN
1	9-A	60	GLN
1	9-B	35	ASN
1	9-B	53	GLN
1	10-A	53	GLN
1	10-A	60	GLN
1	10-B	53	GLN
1	10-B	88	HIS
1	10-B	119	ASN
1	11-A	53	GLN
1	11-A	60	GLN
1	11-A	119	ASN
1	11-B	53	GLN
1	11-B	119	ASN
1	12-A	53	GLN
1	12-B	29	ASN
1	12-B	35	ASN
1	12-B	53	GLN
1	12-B	100	HIS
1	12-B	119	ASN
1	13-A	53	GLN
1	13-B	35	ASN
1	13-B	53	GLN
1	13-B	88	HIS
1	14-B	53	GLN
1	14-B	88	HIS
1	15-A	53	GLN
1	15-A	60	GLN
1	15-B	29	ASN
1	15-B	53	GLN
1	16-A	35	ASN
1	16-A	88	HIS
1	16-B	53	GLN
1	16-B	88	HIS

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Mol	Chain	Res	Type
1	16-B	119	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

### 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	1-A	118/122 (96%)	2.13	55 (46%) 0 1	1, 1, 2, 3	118 (100%)
1	1-B	118/122 (96%)	2.04	53 (44%) 1 1	1, 1, 3, 3	118 (100%)
1	2-A	0/122	-	-	-	-
1	2-B	0/122	-	-	-	-
1	3-A	0/122	-	-	-	-
1	3-B	0/122	-	-	-	-
1	4-A	0/122	-	-	-	-
1	4-B	0/122	-	-	-	-
1	5-A	0/122	-	-	-	-
1	5-B	0/122	-	-	-	-
1	6-A	0/122	-	-	-	-
1	6-B	0/122	-	-	-	-
1	7-A	0/122	-	-	-	-
1	7-B	0/122	-	-	-	-
1	8-A	0/122	-	-	-	-
1	8-B	0/122	-	-	-	-
1	9-A	0/122	-	-	-	-
1	9-B	0/122	-	-	-	-
1	10-A	0/122	-	-	-	-
1	10-B	0/122	-	-	-	-
1	11-A	0/122	-	-	-	-
1	11-B	0/122	-	-	-	-
1	12-A	0/122	-	-	-	-
1	12-B	0/122	-	-	-	-
1	13-A	0/122	-	-	-	-
1	13-B	0/122	-	-	-	-
1	14-A	0/122	-	-	-	-
1	14-B	0/122	-	-	-	-
1	15-A	0/122	-	-	-	-
1	15-B	0/122	-	-	-	-
1	16-A	0/122	-	-	-	-
1	16-B	0/122	-	-	-	-

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Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
All	All	236/3904 (6%)	2.08	108 (45%) <b>1</b> <b>1</b>	1, 1, 2, 3	236 (100%)

All (108) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	1-A	120	PHE	7.8
1	1-A	15	CYS	6.6
1	1-A	79	ASP	6.1
1	1-B	77	VAL	6.1
1	1-B	120	PHE	5.8
1	1-B	102	ILE	5.6
1	1-A	37	LYS	4.9
1	1-B	49	THR	4.9
1	1-A	76	GLY	4.7
1	1-A	117	ILE	4.5
1	1-A	29	ASN	4.4
1	1-A	87	PHE	4.3
1	1-A	53	GLN	4.3
1	1-B	97	ASP	4.3
1	1-A	74	PRO	4.1
1	1-B	119	ASN	4.0
1	1-A	73	THR	4.0
1	1-B	96	ILE	4.0
1	1-B	79	ASP	4.0
1	1-A	18	ASP	4.0
1	1-A	84	VAL	4.0
1	1-B	98	ASP	3.9
1	1-B	104	ASP	3.9
1	1-B	1	SER	3.8
1	1-B	95	ASP	3.8
1	1-B	101	SER	3.8
1	1-B	93	HIS	3.7
1	1-A	65	THR	3.7
1	1-A	118	LEU	3.6
1	1-B	58	GLU	3.6
1	1-B	60	GLN	3.6
1	1-B	92	VAL	3.6
1	1-A	86	THR	3.5
1	1-A	59	ILE	3.5
1	1-A	34	LYS	3.5
1	1-A	60	GLN	3.4
1	1-A	1	SER	3.4

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Mol	Chain	Res	Type	RSRZ
1	1-A	35	ASN	3.3
1	1-A	113	LEU	3.3
1	1-B	117	ILE	3.3
1	1-A	78	GLY	3.3
1	1-A	58	GLU	3.3
1	1-B	59	ILE	3.2
1	1-B	78	GLY	3.2
1	1-A	19	LYS	3.2
1	1-B	2	THR	3.2
1	1-A	92	VAL	3.1
1	1-A	41	GLU	3.1
1	1-B	62	TYR	3.1
1	1-B	56	GLY	3.0
1	1-A	16	PRO	3.0
1	1-A	36	GLY	2.9
1	1-A	47	LYS	2.9
1	1-A	38	THR	2.9
1	1-A	39	GLU	2.8
1	1-A	61	LYS	2.8
1	1-B	75	ILE	2.8
1	1-B	84	VAL	2.8
1	1-B	116	ALA	2.8
1	1-B	111	LYS	2.8
1	1-B	40	ILE	2.8
1	1-B	76	GLY	2.7
1	1-A	83	VAL	2.7
1	1-A	75	ILE	2.7
1	1-B	29	ASN	2.6
1	1-B	46	VAL	2.6
1	1-A	85	TRP	2.6
1	1-A	119	ASN	2.6
1	1-B	39	GLU	2.6
1	1-B	64	LYS	2.6
1	1-A	102	ILE	2.6
1	1-B	105	GLU	2.5
1	1-A	20	PHE	2.5
1	1-A	8	SER	2.5
1	1-B	80	GLY	2.5
1	1-B	35	ASN	2.5
1	1-A	82	HIS	2.4
1	1-B	99	PRO	2.4
1	1-B	22	SER	2.4

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Mol	Chain	Res	Type	RSRZ
1	1-B	61	LYS	2.3
1	1-B	118	LEU	2.3
1	1-B	65	THR	2.3
1	1-B	47	LYS	2.3
1	1-A	80	GLY	2.3
1	1-B	90	GLU	2.2
1	1-A	14	LYS	2.2
1	1-B	73	THR	2.2
1	1-B	71	ALA	2.2
1	1-A	72	VAL	2.2
1	1-B	63	PHE	2.2
1	1-A	44	ASP	2.2
1	1-A	77	VAL	2.1
1	1-A	63	PHE	2.1
1	1-A	89	PHE	2.1
1	1-B	32	PHE	2.1
1	1-A	2	THR	2.1
1	1-A	95	ASP	2.1
1	1-A	97	ASP	2.1
1	1-B	57	SER	2.1
1	1-A	17	ALA	2.1
1	1-B	17	ALA	2.1
1	1-B	109	TYR	2.1
1	1-B	4	LYS	2.1
1	1-B	41	GLU	2.1
1	1-A	13	VAL	2.1
1	1-A	12	ASP	2.1
1	1-A	45	LEU	2.1
1	1-B	103	ILE	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

## 6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

## 6.4 Ligands ⓘ

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.