



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 16, 2024 – 12:08 AM EDT

PDB ID : 1TR2  
Title : Crystal structure of human full-length vinculin (residues 1-1066)  
Authors : Borgon, R.A.; Vonrhein, C.; Bricogne, G.; Bois, P.R.; Izard, T.  
Deposited on : 2004-06-19  
Resolution : 2.90 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](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)  
Xtrriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

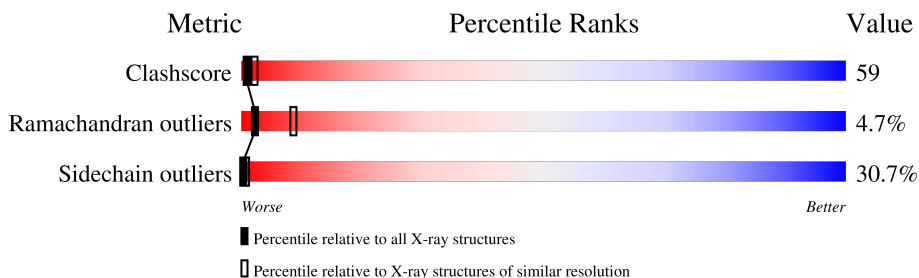
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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  $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	1066	 28%                      48%                      19%    . .
1	B	1066	 29%                      48%                      18%    . .

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 16033 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 VINCULIN ISOFORM 1.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	1028	7908	4876	1436	1550	10	36	99	8	0
1	B	1029	7907	4873	1438	1550	10	36	117	7	0

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	INITIATING METHIONINE	UNP P18206
A	26	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	74	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	94	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	154	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	168	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	171	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	174	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	190	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	195	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	209	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	237	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	266	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	327	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	331	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	350	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	377	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	533	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	534	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	587	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	591	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	698	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	709	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	741	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	748	MSE	MET	MODIFIED RESIDUE	UNP P18206

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Chain	Residue	Modelled	Actual	Comment	Reference
A	797	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	799	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	898	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	899	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	900	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	926	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	930	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	933	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	1005	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	1022	MSE	MET	MODIFIED RESIDUE	UNP P18206
A	1031	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	1	MSE	MET	INITIATING METHIONINE	UNP P18206
B	26	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	74	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	94	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	154	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	168	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	171	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	174	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	190	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	195	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	209	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	237	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	266	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	327	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	331	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	350	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	377	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	533	MSE	MET	MODIFIED RESIDUE	UNP P18206
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B	587	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	591	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	698	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	709	MSE	MET	MODIFIED RESIDUE	UNP P18206
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B	900	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	926	MSE	MET	MODIFIED RESIDUE	UNP P18206

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Chain	Residue	Modelled	Actual	Comment	Reference
B	930	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	933	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	1005	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	1022	MSE	MET	MODIFIED RESIDUE	UNP P18206
B	1031	MSE	MET	MODIFIED RESIDUE	UNP P18206

- Molecule 2 is water.

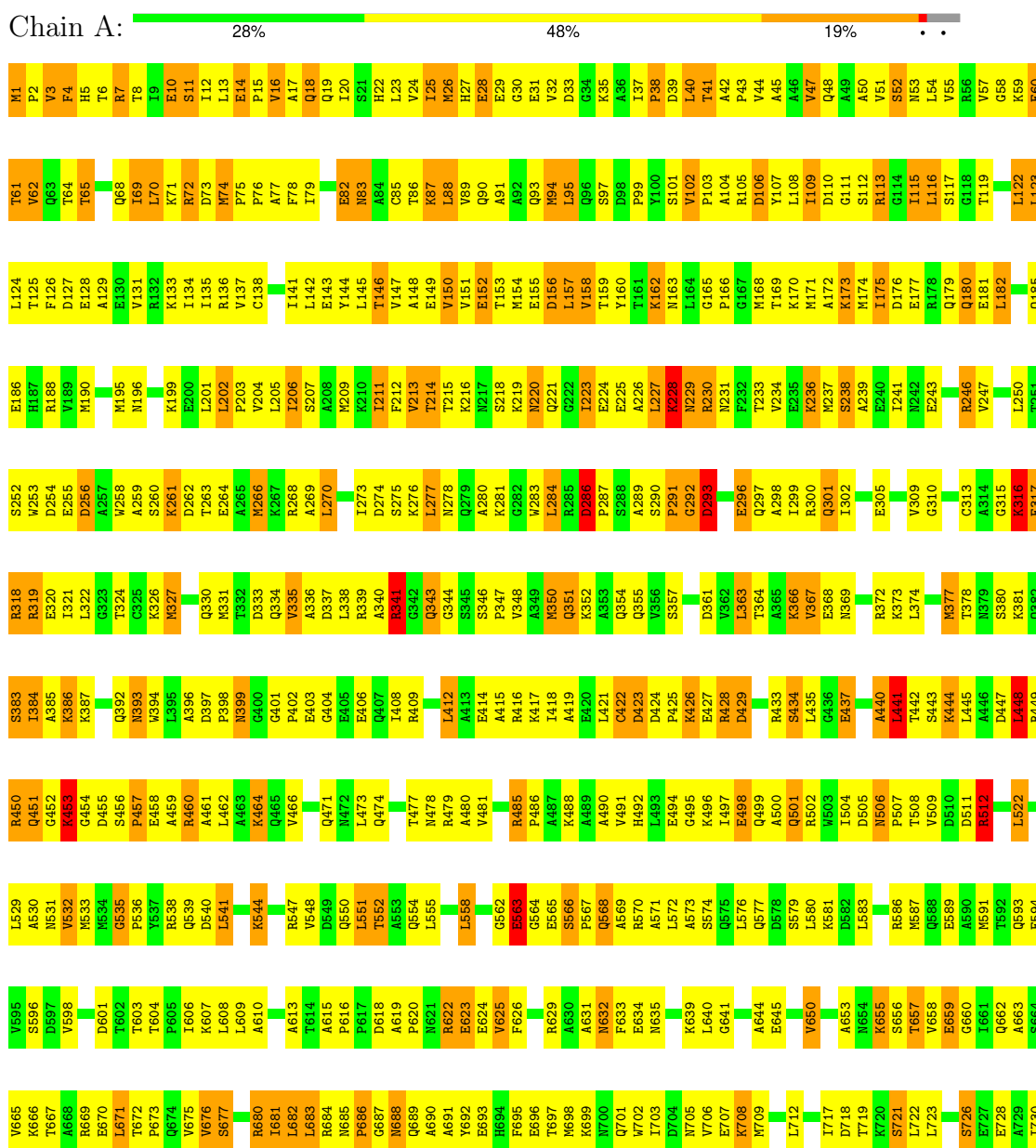
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	108	Total O 108 108	0	0
2	B	110	Total O 110 110	0	0

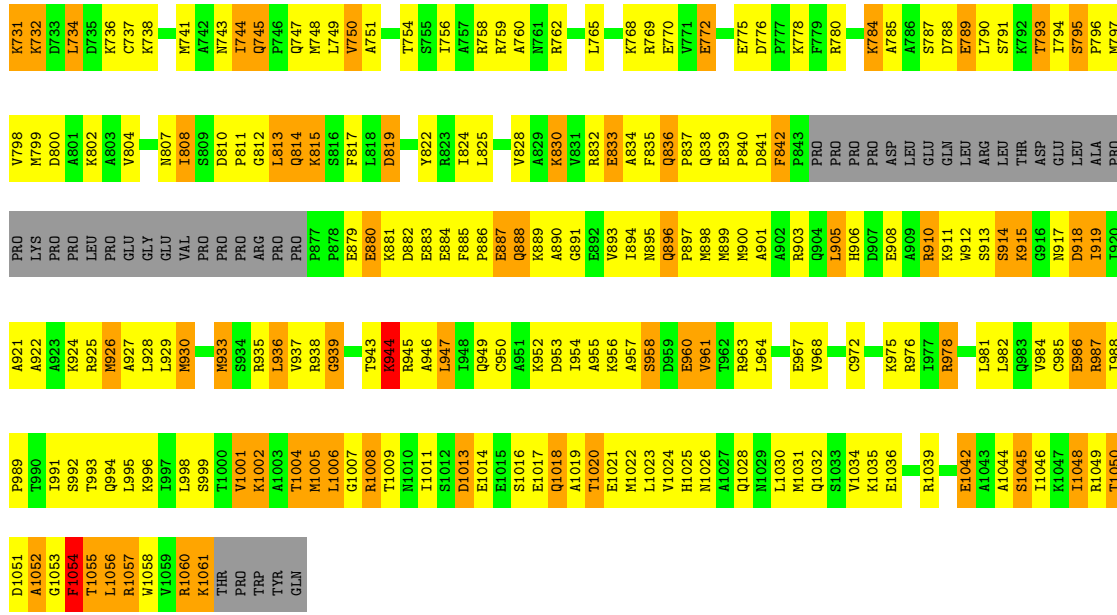
### 3 Residue-property plots [i](#)

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. 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. 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.

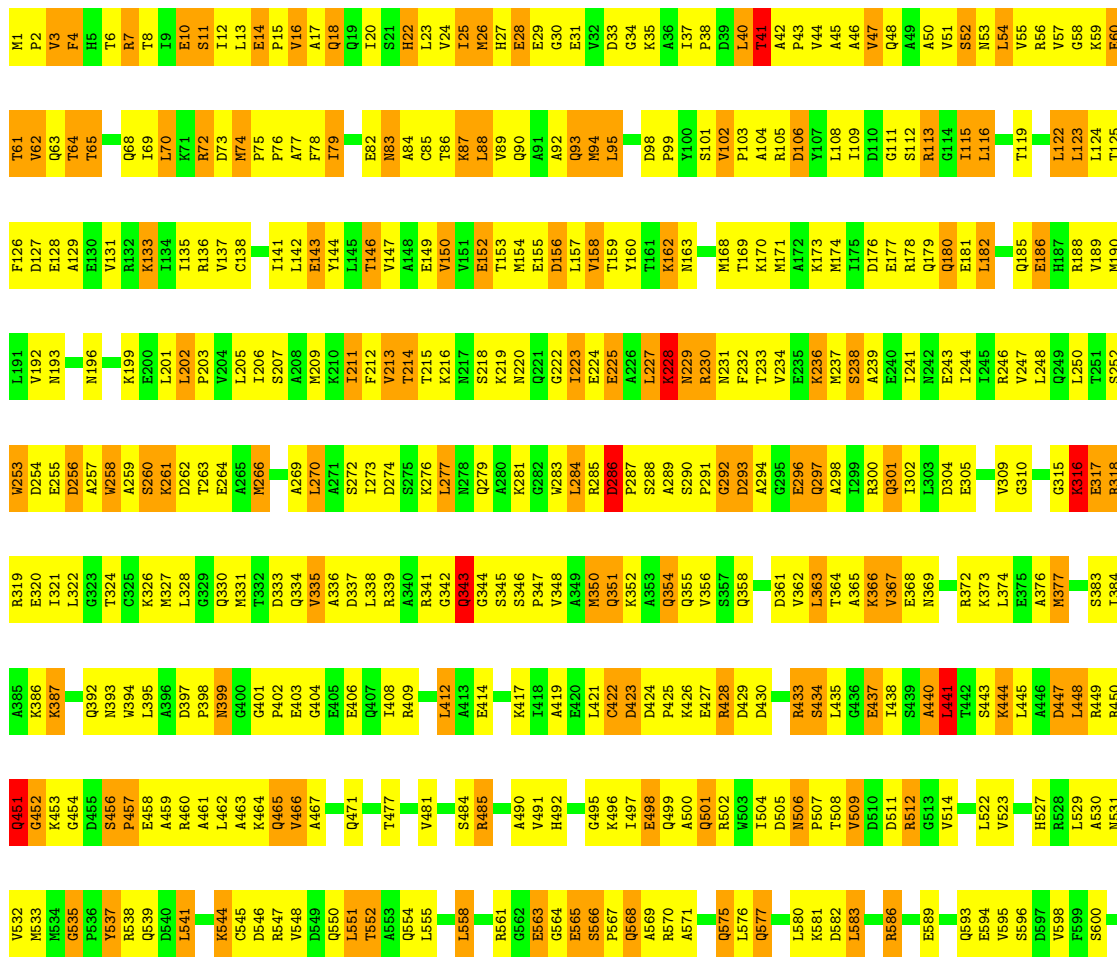
Note EDS was not executed.

- Molecule 1: VINCULIN ISOFORM 1





● Molecule 1: VINCULIN ISOFORM 1



A1003	S934	PRO	D810	M741	T669
T1004	R935	PRO	P811	A742	T604
M1005	L936	ARG	G812	M743	P605
L1006	V937	PRO	L813	I744	L671
G1007	PRO	PRO	Q814	P745	I672
L1008	PRO	PRO	K815	P746	K607
I1011	G940	P877	S816	Q747	L608
S1012	S941	P878	F817	M748	L609
S1013	G942	E879	F818	M749	A610
D1013	T943	E880	L818	L749	V611
R944	K944	K881	D819	V750	A612
R945	D882	D882	Y822	A751	A613
A946	E883	E883	R823	T754	T614
L947	E884	E884	R824	S755	A615
I948	F885	F885	I824	I756	P616
Q949	P886	P886	L825	A757	P617
A1018	E887	E887	PRO	R758	D618
A1019	K888	K888	V828	Q688	A619
T1020	PRO	PRO	A829	R689	P620
E1021	D953	D953	K830	A760	M621
M1022	I954	I954	R831	A761	R622
L1023	A955	A955	E832	R762	E623
V1024	K956	K956	I894	I763	E624
H1025	A957	A957	E833	L764	V625
M1026	S958	S958	A834	L765	F626
A1027	D959	D959	F835	V766	D627
Q1028	E960	E960	Q836	A767	E628
PRO	V961	V961	P837	K768	R629
M1031	T962	T962	Q838	R769	PRO
Q1032	R963	R963	E839	E770	M632
K1035	L964	L964	P840	V771	F633
E1036	PRO	PRO	E772	PRO	E634
PRO	E967	E967	F842	D776	M635
R1039	C972	C972	PRO	PRO	K639
E1042	T973	T973	PRO	PRO	L640
PRO	D974	D974	PRO	PRO	G641
PRO	K975	K975	PRO	PRO	PRO
S1045	R976	R976	ASP	K784	A644
I1046	I977	I977	LEU	A785	E645
R1047	R978	R978	LEU	A786	PRO
PRO	R979	R979	GLN	S787	I717
R1048	T979	T979	LEU	D788	D718
R1049	N980	N980	LEU	E789	A648
T1050	L981	L981	ARG	PRO	A649
D1051	PRO	PRO	LEU	L790	V650
A1052	C985	C985	THR	S721	PRO
G1053	E986	E986	ASP	T793	A653
F1054	R987	R987	GLU	I794	M654
T1055	I988	I988	LEU	S795	K655
L1056	P989	P989	ALA	P796	S656
R1057	T990	T990	PRO	M797	T657
PRO	PRO	PRO	PRO	V798	V658
R1060	T993	T993	LYS	M799	E659
K1061	Q994	Q994	PRO	I730	G660
PRO	L995	L995	PRO	K731	PRO
TRP	K996	K996	LEU	A801	I661
TRP	I997	I997	LEU	K802	Q662
GLN	L998	L998	GLU	A803	A663
PRO	S999	S999	GLY	V804	S664
PRO	T1000	T1000	GLY	PRO	V665
PRO	V1001	V1001	VAL	M807	K666
PRO	K1002	K1002	PRO	I808	T667
PRO	PRO	PRO	PRO	PRO	A668



## 4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	66.74Å 154.08Å 108.95Å 90.00° 90.44° 90.00°	Depositor
Resolution (Å)	56.86 – 2.90	Depositor
% Data completeness (in resolution range)	100.0 (56.86-2.90)	Depositor
$R_{merge}$	0.15	Depositor
$R_{sym}$	(Not available)	Depositor
Refinement program	BUSTER-TNT 1.1.1	Depositor
R, $R_{free}$	0.232 , 0.300	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	16033	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	92.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.39	0/7994	0.61	2/10720 (0.0%)
1	B	0.38	0/7992	0.60	1/10717 (0.0%)
All	All	0.38	0/15986	0.61	3/21437 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1054	PHE	CB-CG-CD2	-10.78	113.25	120.80
1	A	1054	PHE	CB-CG-CD1	7.84	126.29	120.80
1	B	616	PRO	CA-N-CD	-5.02	104.48	111.50

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	7908	0	8065	912	0
1	B	7907	0	8072	958	0
2	A	108	0	0	12	0
2	B	110	0	0	12	0
All	All	16033	0	16137	1865	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 59.

The worst 5 of 1865 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:B:65:THR:HG21	1:B:70:LEU:HD22	1.21	1.18
1:A:74:MSE:HE3	1:A:122:LEU:HD21	1.18	1.18
1:B:913:SER:HB2	1:B:915:LYS:HG3	1.24	1.17
1:B:729:ALA:HA	1:B:732:LYS:HD3	1.24	1.16
1:B:215:THR:HG22	1:B:223:ILE:HG13	1.26	1.16

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	1032/1066 (97%)	849 (82%)	140 (14%)	43 (4%)	3	10
1	B	1032/1066 (97%)	849 (82%)	130 (13%)	53 (5%)	2	7
All	All	2064/2132 (97%)	1698 (82%)	270 (13%)	96 (5%)	2	8

5 of 96 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	33	ASP
1	A	402	PRO
1	A	441	LEU
1	A	453	LYS
1	A	686	PRO

### 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	850/842 (101%)	587 (69%)	263 (31%)	0	1
1	B	850/842 (101%)	590 (69%)	260 (31%)	0	1
All	All	1700/1684 (101%)	1177 (69%)	523 (31%)	0	1

5 of 523 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	879	GLU
1	B	919	ILE
1	B	841	ASP
1	B	1057	ARG
1	A	814	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 42 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	351	GLN
1	B	807	ASN
1	B	472	ASN
1	B	593	GLN
1	B	888	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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

### 6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.