



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 14, 2024 – 12:01 am GMT

PDB ID : 6HVG  
Title : Crystal Structure of Truncated Alternansucrase from *Leuconostoc mesenteroides* NRRL B-1355  
Authors : Molina, M.; Cioci, G.; Moulis, C.; Remaud-Simeon, M.  
Deposited on : 2018-10-11  
Resolution : 2.80 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  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36

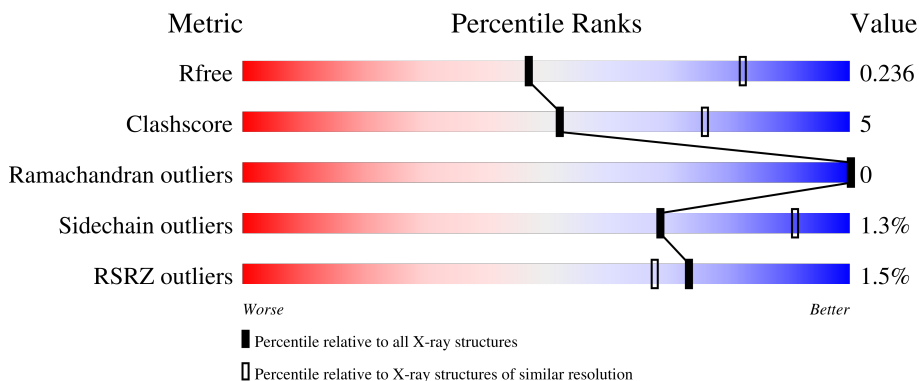
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.80 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))
$R_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

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	1435	 81% 8% 11%
1	B	1435	 69% 12% 18% 2%

## 2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 19473 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 Alternansucrase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	1278	10013	6256	1706	2025	26	0	0	0
1	B	1174	9180	5744	1563	1847	26	0	0	0

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	15	MET	-	initiating methionine	UNP Q9RE05
A	16	ALA	-	expression tag	UNP Q9RE05
A	17	HIS	-	expression tag	UNP Q9RE05
A	18	HIS	-	expression tag	UNP Q9RE05
A	19	HIS	-	expression tag	UNP Q9RE05
A	20	HIS	-	expression tag	UNP Q9RE05
A	21	HIS	-	expression tag	UNP Q9RE05
A	22	HIS	-	expression tag	UNP Q9RE05
A	23	VAL	-	expression tag	UNP Q9RE05
A	24	THR	-	expression tag	UNP Q9RE05
A	25	SER	-	expression tag	UNP Q9RE05
A	26	LEU	-	expression tag	UNP Q9RE05
A	27	TYR	-	expression tag	UNP Q9RE05
A	28	LYS	-	expression tag	UNP Q9RE05
A	29	LYS	-	expression tag	UNP Q9RE05
A	30	ALA	-	expression tag	UNP Q9RE05
A	31	GLY	-	expression tag	UNP Q9RE05
A	32	SER	-	expression tag	UNP Q9RE05
A	33	ALA	-	expression tag	UNP Q9RE05
A	34	ALA	-	expression tag	UNP Q9RE05
A	35	ALA	-	expression tag	UNP Q9RE05
A	36	PRO	-	expression tag	UNP Q9RE05
A	37	PHE	-	expression tag	UNP Q9RE05
A	38	THR	-	expression tag	UNP Q9RE05
A	1426	LYS	-	expression tag	UNP Q9RE05

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Chain	Residue	Modelled	Actual	Comment	Reference
A	1427	GLY	-	expression tag	UNP Q9RE05
A	1428	GLY	-	expression tag	UNP Q9RE05
A	1429	ARG	-	expression tag	UNP Q9RE05
A	1430	ALA	-	expression tag	UNP Q9RE05
A	1431	ASP	-	expression tag	UNP Q9RE05
A	1432	PRO	-	expression tag	UNP Q9RE05
A	1433	ALA	-	expression tag	UNP Q9RE05
A	1434	PHE	-	expression tag	UNP Q9RE05
A	1435	LEU	-	expression tag	UNP Q9RE05
A	1436	TYR	-	expression tag	UNP Q9RE05
A	1437	LYS	-	expression tag	UNP Q9RE05
A	1438	VAL	-	expression tag	UNP Q9RE05
A	1439	VAL	-	expression tag	UNP Q9RE05
A	1440	SER	-	expression tag	UNP Q9RE05
A	1441	ALA	-	expression tag	UNP Q9RE05
A	1442	TRP	-	expression tag	UNP Q9RE05
A	1443	SER	-	expression tag	UNP Q9RE05
A	1444	HIS	-	expression tag	UNP Q9RE05
A	1445	PRO	-	expression tag	UNP Q9RE05
A	1446	GLN	-	expression tag	UNP Q9RE05
A	1447	PHE	-	expression tag	UNP Q9RE05
A	1448	GLU	-	expression tag	UNP Q9RE05
A	1449	LYS	-	expression tag	UNP Q9RE05
B	15	MET	-	initiating methionine	UNP Q9RE05
B	16	ALA	-	expression tag	UNP Q9RE05
B	17	HIS	-	expression tag	UNP Q9RE05
B	18	HIS	-	expression tag	UNP Q9RE05
B	19	HIS	-	expression tag	UNP Q9RE05
B	20	HIS	-	expression tag	UNP Q9RE05
B	21	HIS	-	expression tag	UNP Q9RE05
B	22	HIS	-	expression tag	UNP Q9RE05
B	23	VAL	-	expression tag	UNP Q9RE05
B	24	THR	-	expression tag	UNP Q9RE05
B	25	SER	-	expression tag	UNP Q9RE05
B	26	LEU	-	expression tag	UNP Q9RE05
B	27	TYR	-	expression tag	UNP Q9RE05
B	28	LYS	-	expression tag	UNP Q9RE05
B	29	LYS	-	expression tag	UNP Q9RE05
B	30	ALA	-	expression tag	UNP Q9RE05
B	31	GLY	-	expression tag	UNP Q9RE05
B	32	SER	-	expression tag	UNP Q9RE05
B	33	ALA	-	expression tag	UNP Q9RE05

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Chain	Residue	Modelled	Actual	Comment	Reference
B	34	ALA	-	expression tag	UNP Q9RE05
B	35	ALA	-	expression tag	UNP Q9RE05
B	36	PRO	-	expression tag	UNP Q9RE05
B	37	PHE	-	expression tag	UNP Q9RE05
B	38	THR	-	expression tag	UNP Q9RE05
B	1426	LYS	-	expression tag	UNP Q9RE05
B	1427	GLY	-	expression tag	UNP Q9RE05
B	1428	GLY	-	expression tag	UNP Q9RE05
B	1429	ARG	-	expression tag	UNP Q9RE05
B	1430	ALA	-	expression tag	UNP Q9RE05
B	1431	ASP	-	expression tag	UNP Q9RE05
B	1432	PRO	-	expression tag	UNP Q9RE05
B	1433	ALA	-	expression tag	UNP Q9RE05
B	1434	PHE	-	expression tag	UNP Q9RE05
B	1435	LEU	-	expression tag	UNP Q9RE05
B	1436	TYR	-	expression tag	UNP Q9RE05
B	1437	LYS	-	expression tag	UNP Q9RE05
B	1438	VAL	-	expression tag	UNP Q9RE05
B	1439	VAL	-	expression tag	UNP Q9RE05
B	1440	SER	-	expression tag	UNP Q9RE05
B	1441	ALA	-	expression tag	UNP Q9RE05
B	1442	TRP	-	expression tag	UNP Q9RE05
B	1443	SER	-	expression tag	UNP Q9RE05
B	1444	HIS	-	expression tag	UNP Q9RE05
B	1445	PRO	-	expression tag	UNP Q9RE05
B	1446	GLN	-	expression tag	UNP Q9RE05
B	1447	PHE	-	expression tag	UNP Q9RE05
B	1448	GLU	-	expression tag	UNP Q9RE05
B	1449	LYS	-	expression tag	UNP Q9RE05

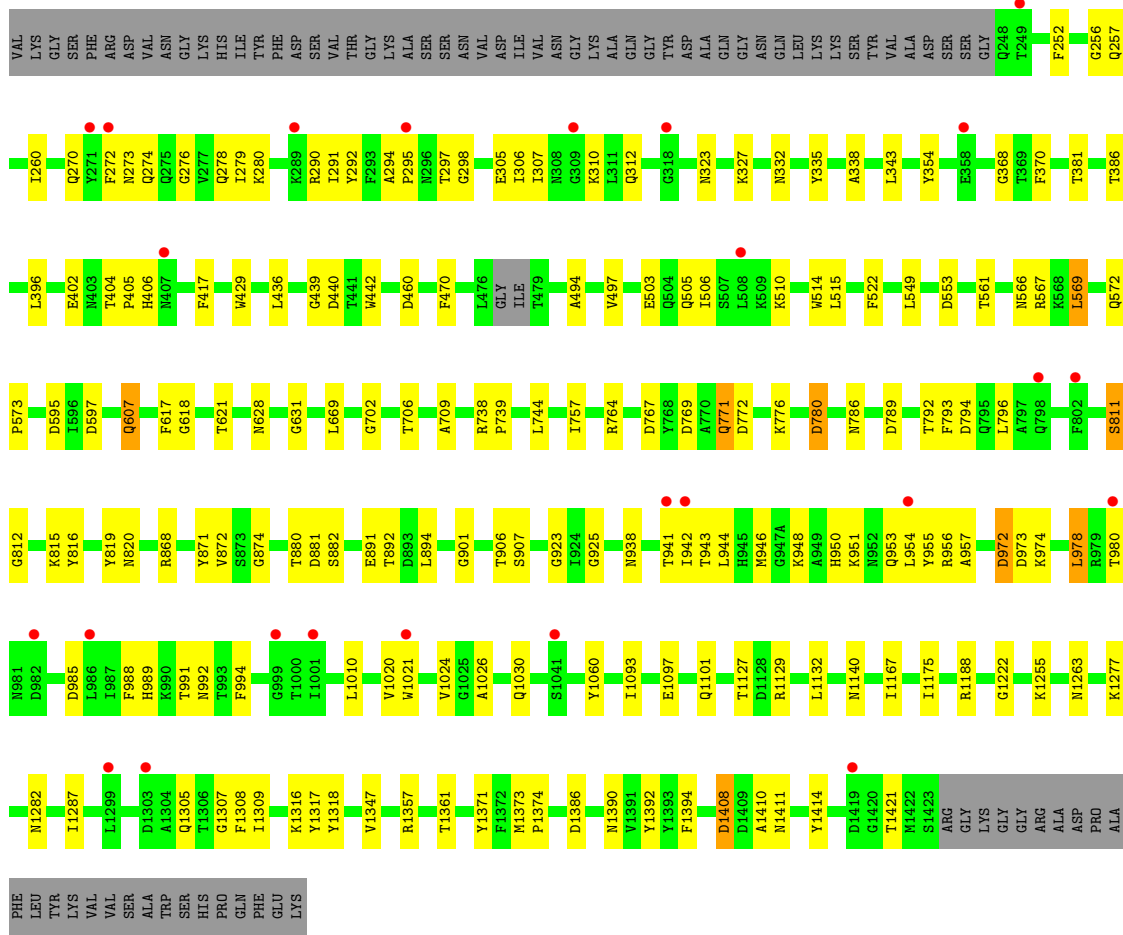
- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Ca 1 1	0	0
2	B	1	Total Ca 1 1	0	0

- Molecule 3 is water.

<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>		<b>ZeroOcc</b>	<b>AltConf</b>
3	A	166	Total 166	O 166	0	0
3	B	112	Total 112	O 112	0	0







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	101.23Å 134.80Å 237.03Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.82 – 2.80 47.82 – 2.80	Depositor EDS
% Data completeness (in resolution range)	99.3 (47.82-2.80) 99.3 (47.82-2.80)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.98 (at 2.81Å)	Xtrriage
Refinement program	REFMAC 5.8.0073	Depositor
R, $R_{free}$	0.207 , 0.237 0.208 , 0.236	Depositor DCC
$R_{free}$ test set	4021 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	60.3	Xtrriage
Anisotropy	0.189	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 28.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	19473	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	66.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.23% 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 [i](#)

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

Bond lengths and bond angles in the following residue types are not validated in this section: CA

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	0.49	0/10225	0.64	0/13863
1	B	0.50	0/9374	0.65	0/12709
All	All	0.50	0/19599	0.64	0/26572

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 [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	10013	0	9418	78	0
1	B	9180	0	8628	125	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
3	A	166	0	0	5	0
3	B	112	0	0	1	0
All	All	19473	0	18046	203	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 5.

All (203) 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:290:ARG:NH2	1:B:305:GLU:OE1	2.26	0.67
1:B:948:LYS:O	1:B:951:LYS:HG3	1.95	0.67
1:A:706:THR:HG21	3:A:2212:HOH:O	1.94	0.66
1:B:617:PHE:CE1	1:B:1132:LEU:HD12	2.31	0.65
1:B:972:ASP:OD2	1:B:972:ASP:N	2.29	0.65
1:A:892:THR:HG23	1:A:934:LEU:HD21	1.79	0.64
1:B:402:GLU:O	1:B:405:PRO:HD2	1.98	0.64
1:A:1222:GLY:O	1:A:1255:LYS:HE2	1.99	0.63
1:A:152:PRO:HA	1:A:180:ASN:O	1.99	0.61
1:A:417:PHE:HB2	1:A:1287:ILE:HD13	1.81	0.61
1:B:874:GLY:HA3	1:B:901:GLY:O	2.01	0.60
1:B:386:THR:HG22	3:B:2152:HOH:O	2.00	0.60
1:A:874:GLY:HA3	1:A:901:GLY:O	2.02	0.60
1:B:767:ASP:O	1:B:771:GLN:NE2	2.34	0.60
1:B:417:PHE:HB2	1:B:1287:ILE:HD13	1.83	0.59
1:B:1222:GLY:O	1:B:1255:LYS:HE2	2.01	0.59
1:B:273:ASN:OD1	1:B:276:GLY:N	2.35	0.58
1:B:567:ARG:O	1:B:569:LEU:HD13	2.04	0.58
1:B:868:ARG:HA	1:B:872:VAL:CG2	2.33	0.58
1:B:270:GLN:HG2	1:B:298:GLY:O	2.04	0.58
1:B:706:THR:HA	1:B:819:TYR:O	2.03	0.58
1:B:1408:ASP:HB2	1:B:1414:TYR:HE2	1.68	0.58
1:B:429:TRP:CH2	1:B:515:LEU:HD23	2.38	0.57
1:A:786:ASN:O	1:A:789:ASP:HB2	2.05	0.57
1:B:956:ARG:HG2	1:B:1024:VAL:HG12	1.87	0.57
1:A:1347:VAL:HG11	1:A:1357:ARG:HD2	1.86	0.56
1:A:290:ARG:O	1:A:318:GLY:HA2	2.06	0.56
1:B:1347:VAL:HG11	1:B:1357:ARG:HD2	1.87	0.56
1:A:284:GLN:HG3	1:A:286:VAL:CG2	2.35	0.56
1:A:894:LEU:HD23	1:A:942:ILE:HD13	1.88	0.56
1:A:231:ASP:HB3	1:A:237:LEU:HD21	1.89	0.55
1:A:330:ALA:O	1:A:1410:ALA:HA	2.06	0.55
1:A:745:VAL:HG22	1:A:756:VAL:HG21	1.88	0.55
1:B:506:ILE:HG13	1:B:514:TRP:HZ2	1.71	0.55
1:B:1410:ALA:O	1:B:1411:ASN:CB	2.54	0.55
1:B:506:ILE:O	1:B:510:LYS:N	2.37	0.55
1:B:1373:MET:HB3	1:B:1374:PRO:CD	2.37	0.55
1:B:1373:MET:HB3	1:B:1374:PRO:HD2	1.87	0.55
1:A:745:VAL:HG22	1:A:756:VAL:CG2	2.37	0.55
1:A:996:LYS:HB2	1:A:1000:THR:H	1.72	0.55
1:B:954:LEU:HD23	1:B:1024:VAL:HG21	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:284:GLN:HG3	1:A:286:VAL:HG23	1.87	0.54
1:A:708:GLY:O	1:A:712:ARG:NH2	2.40	0.54
1:B:767:ASP:C	1:B:771:GLN:HE21	2.11	0.54
1:B:280:LYS:HB3	1:B:295:PRO:O	2.08	0.53
1:B:950:HIS:ND1	1:B:955:TYR:OH	2.38	0.53
1:B:617:PHE:CE1	1:B:621:THR:HG21	2.44	0.53
1:B:1305:GLN:O	1:B:1318:TYR:HB3	2.08	0.53
1:B:252:PHE:HA	1:B:257:GLN:O	2.08	0.53
1:A:175:VAL:CG1	1:A:179:GLN:HG3	2.39	0.52
1:A:271:TYR:CD1	1:A:286:VAL:HG21	2.44	0.52
1:B:1371:TYR:HB2	1:B:1394:PHE:CZ	2.45	0.52
1:A:175:VAL:HG11	1:A:179:GLN:HG3	1.92	0.52
1:A:472:SER:HB3	1:A:479:THR:HA	1.91	0.52
1:B:396:LEU:HB2	1:B:1309:ILE:HB	1.91	0.52
1:A:188:PHE:HA	1:A:193:TYR:O	2.10	0.52
1:B:631:GLY:HA3	1:B:669:LEU:O	2.09	0.52
1:A:726:ASN:O	1:A:727:GLY:C	2.48	0.52
1:B:894:LEU:HD13	1:B:942:ILE:HD13	1.92	0.51
1:B:1410:ALA:O	1:B:1411:ASN:HB2	2.10	0.51
1:A:756:VAL:HG22	3:A:2157:HOH:O	2.10	0.51
1:B:553:ASP:OD1	1:B:567:ARG:NH1	2.43	0.51
1:B:989:HIS:O	1:B:992:ASN:ND2	2.43	0.51
1:B:354:TYR:HE1	1:B:381:THR:HG22	1.76	0.51
1:B:738:ARG:HG3	1:B:739:PRO:HD2	1.93	0.51
1:B:973:ASP:OD1	1:B:974:LYS:HG3	2.11	0.51
1:B:335:TYR:CD2	1:B:343:LEU:HD12	2.46	0.51
1:A:706:THR:CG2	1:A:818:ASP:OD2	2.59	0.51
1:A:522:PHE:O	1:A:525:THR:HB	2.11	0.50
1:B:631:GLY:O	1:B:1167:ILE:HA	2.12	0.50
1:B:503:GLU:OE1	1:B:503:GLU:HA	2.12	0.50
1:A:1097:GLU:HA	1:A:1167:ILE:HB	1.94	0.50
1:A:595:ASP:HB2	3:A:2160:HOH:O	2.12	0.49
1:B:989:HIS:HB2	1:B:991:THR:O	2.12	0.49
1:B:617:PHE:CZ	1:B:1132:LEU:HD12	2.47	0.49
1:B:944:LEU:HB3	1:B:946:MET:HE3	1.93	0.49
1:B:506:ILE:HG13	1:B:514:TRP:CZ2	2.48	0.49
1:B:764:ARG:NH1	1:B:769:ASP:O	2.45	0.49
1:B:819:TYR:O	1:B:820:ASN:HB2	2.12	0.49
1:A:189:ASP:OD1	1:A:200:ARG:NH2	2.46	0.49
1:A:470:PHE:CD2	1:A:522:PHE:HB2	2.48	0.49
1:B:780:ASP:OD2	1:B:815:LYS:HE2	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1298:GLN:NE2	1:A:1320:ILE:O	2.46	0.48
1:B:868:ARG:HA	1:B:872:VAL:HG23	1.94	0.48
1:B:874:GLY:CA	1:B:901:GLY:O	2.61	0.48
1:B:1097:GLU:HA	1:B:1167:ILE:HB	1.95	0.48
1:A:325:PHE:CE1	1:A:349:ILE:HD11	2.49	0.48
1:B:252:PHE:CD2	1:B:256:GLY:O	2.67	0.48
1:B:406:HIS:HB3	1:B:442:TRP:CE3	2.48	0.48
1:B:549:LEU:HD23	1:B:1188:ARG:HA	1.95	0.48
1:B:279:ILE:HD13	1:B:279:ILE:N	2.28	0.48
1:A:358:GLU:H	1:A:358:GLU:CD	2.16	0.48
1:B:470:PHE:CD2	1:B:522:PHE:HB2	2.49	0.48
1:A:238:LYS:HG2	1:A:254:GLY:O	2.14	0.47
1:B:307:ILE:HG13	1:B:312:GLN:NE2	2.28	0.47
1:A:205:LYS:HE3	1:A:235:ASN:OD1	2.13	0.47
1:A:264:THR:HA	1:A:268:ASN:O	2.14	0.47
1:B:793:PHE:O	1:B:794:ASP:C	2.53	0.47
1:B:894:LEU:CD1	1:B:942:ILE:HD13	2.43	0.47
1:B:1026:ALA:HB1	1:B:1030:GLN:NE2	2.28	0.47
1:A:717:TYR:OH	1:A:885:LYS:HG2	2.14	0.47
1:A:898:VAL:HG22	1:A:946:MET:HE1	1.96	0.47
1:B:953:GLN:N	1:B:980:THR:OG1	2.48	0.47
1:A:944:LEU:HB3	1:A:946:MET:HE3	1.97	0.47
1:A:1063:PHE:CG	1:A:1099:ALA:HB2	2.50	0.47
1:B:294:ALA:HB3	1:B:297:THR:HG23	1.97	0.46
1:B:368:GLY:HA3	1:B:370:PHE:CE2	2.51	0.46
1:B:404:THR:N	1:B:405:PRO:CD	2.78	0.46
1:B:906:THR:HG22	1:B:907:SER:N	2.29	0.46
1:B:1308:PHE:HA	1:B:1316:LYS:O	2.15	0.46
1:B:272:PHE:HE1	1:B:278:GLN:HB2	1.81	0.46
1:B:291:ILE:HG22	1:B:292:TYR:N	2.30	0.46
1:A:189:ASP:OD2	1:A:200:ARG:NH2	2.49	0.46
1:A:228:GLN:NE2	3:A:2110:HOH:O	2.48	0.46
1:A:157:HIS:CE1	1:A:168:ILE:HB	2.51	0.46
1:B:291:ILE:CG2	1:B:292:TYR:N	2.79	0.46
1:A:744:LEU:HD11	1:A:757:ILE:HB	1.98	0.46
1:B:572:GLN:HB2	1:B:573:PRO:HD2	1.98	0.46
1:A:792:THR:HG22	1:A:795:GLN:H	1.80	0.45
1:B:1390:ASN:HB3	1:B:1421:THR:HG22	1.98	0.45
1:A:187:TYR:HB2	1:A:209:PHE:CZ	2.52	0.45
1:B:702:GLY:HA2	1:B:706:THR:OG1	2.17	0.45
1:B:505:GLN:HB3	1:B:514:TRP:CZ2	2.52	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:470:PHE:CE2	1:A:522:PHE:HB2	2.52	0.45
1:A:978:LEU:HD22	1:A:994:PHE:HE1	1.81	0.45
1:B:772:ASP:O	1:B:776:LYS:HG3	2.17	0.44
1:B:925:GLY:O	1:B:1020:VAL:HA	2.18	0.44
1:A:944:LEU:HD13	1:A:946:MET:HE3	1.99	0.44
1:B:815:LYS:HG2	1:B:816:TYR:CZ	2.52	0.44
1:B:709:ALA:HB2	1:B:819:TYR:OH	2.17	0.44
1:B:272:PHE:CE1	1:B:278:GLN:HB2	2.53	0.44
1:B:744:LEU:HD11	1:B:757:ILE:HB	2.00	0.44
1:A:307:ILE:HB	1:A:312:GLN:OE1	2.18	0.44
1:A:794:ASP:OD2	1:A:794:ASP:N	2.50	0.44
1:B:793:PHE:O	1:B:796:LEU:N	2.51	0.44
1:B:973:ASP:OD1	1:B:974:LYS:N	2.50	0.44
1:A:1061:GLU:HA	1:A:1097:GLU:HB3	2.00	0.44
1:B:618:GLY:N	1:B:628:ASN:OD1	2.51	0.44
1:B:1277:LYS:HE3	1:B:1282:ASN:HA	2.00	0.44
1:A:969:TYR:HB3	1:A:975:ALA:HB2	2.00	0.43
1:B:494:ALA:O	1:B:497:VAL:HG22	2.17	0.43
1:B:811:SER:O	1:B:1010:LEU:CD2	2.66	0.43
1:B:811:SER:O	1:B:1010:LEU:HD23	2.18	0.43
1:A:553:ASP:OD1	1:A:567:ARG:NH1	2.52	0.43
1:A:978:LEU:HD22	1:A:994:PHE:CE1	2.53	0.43
1:B:406:HIS:HB3	1:B:442:TRP:CZ3	2.54	0.43
1:B:894:LEU:CD1	1:B:942:ILE:CD1	2.97	0.43
1:A:572:GLN:HB2	1:A:573:PRO:HD2	2.00	0.43
1:B:294:ALA:HB3	1:B:297:THR:CG2	2.48	0.43
1:B:323:ASN:OD1	1:B:338:ALA:HB2	2.19	0.43
1:B:881:ASP:OD2	1:B:891:GLU:HA	2.19	0.43
1:A:943:THR:CG2	1:A:985:ASP:HB3	2.49	0.42
1:A:561:THR:O	1:A:561:THR:HG22	2.18	0.42
1:B:595:ASP:OD2	1:B:1263:ASN:ND2	2.38	0.42
1:A:708:GLY:O	1:A:712:ARG:NE	2.53	0.42
1:A:1406:ILE:CG2	1:A:1414:TYR:HB2	2.50	0.42
1:A:561:THR:O	1:A:561:THR:CG2	2.67	0.42
1:B:566:ASN:O	1:B:597:ASP:OD2	2.36	0.42
1:B:941:THR:HA	1:B:988:PHE:O	2.20	0.42
1:B:943:THR:CG2	1:B:985:ASP:HB3	2.50	0.42
1:B:1408:ASP:OD1	1:B:1410:ALA:N	2.38	0.42
1:B:812:GLY:HA3	1:B:1010:LEU:HD23	2.01	0.42
1:B:370:PHE:CD2	1:B:370:PHE:N	2.88	0.42
1:A:1116:LEU:HA	1:A:1119:PHE:CZ	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:252:PHE:HB3	1:B:256:GLY:C	2.40	0.41
1:B:956:ARG:CG	1:B:1024:VAL:HG12	2.48	0.41
1:B:1307:GLY:O	1:B:1317:TYR:HA	2.19	0.41
1:A:551:TYR:CE1	1:A:1184:VAL:HG21	2.55	0.41
1:A:1373:MET:HB3	1:A:1374:PRO:CD	2.50	0.41
1:B:957:ALA:N	1:B:1021:TRP:CE3	2.88	0.41
1:A:469:ASN:OD1	1:A:480:THR:O	2.38	0.41
1:B:252:PHE:HD2	1:B:257:GLN:C	2.22	0.41
1:A:205:LYS:CE	1:A:235:ASN:OD1	2.68	0.41
1:A:1406:ILE:HG22	1:A:1414:TYR:HB2	2.01	0.41
1:B:307:ILE:HG13	1:B:312:GLN:HE22	1.86	0.41
1:B:871:TYR:HB3	1:B:923:GLY:O	2.20	0.41
1:B:978:LEU:HG	1:B:994:PHE:CE1	2.56	0.41
1:A:767:ASP:O	1:A:771:GLN:OE1	2.38	0.41
1:B:1101:GLN:HB2	1:B:1132:LEU:HD22	2.02	0.41
1:B:771:GLN:H	1:B:771:GLN:HG3	1.47	0.41
1:B:1127:THR:O	1:B:1175:ILE:HD11	2.21	0.41
1:A:160:ASN:HA	1:A:164:TYR:O	2.21	0.41
1:A:195:VAL:HG21	1:A:200:ARG:NH2	2.36	0.41
1:B:306:ILE:HD12	1:B:306:ILE:O	2.20	0.41
1:A:330:ALA:HB1	1:A:1410:ALA:O	2.20	0.41
1:A:771:GLN:H	1:A:771:GLN:HG3	1.45	0.41
1:B:1386:ASP:HB3	1:B:1392:TYR:HE1	1.85	0.41
1:B:1408:ASP:CB	1:B:1414:TYR:HE2	2.32	0.41
1:A:406:HIS:HB3	1:A:442:TRP:CZ3	2.57	0.41
1:B:561:THR:O	1:B:561:THR:CG2	2.69	0.41
1:B:260:ILE:HD13	1:B:274:GLN:O	2.21	0.40
1:B:327:LYS:HA	1:B:332:ASN:O	2.21	0.40
1:B:1060:TYR:HB2	1:B:1093:ILE:HG13	2.03	0.40
1:A:618:GLY:N	1:A:628:ASN:OD1	2.54	0.40
1:B:436:LEU:CD2	1:B:439:GLY:HA2	2.51	0.40
1:B:561:THR:O	1:B:561:THR:HG22	2.20	0.40
1:B:786:ASN:O	1:B:789:ASP:HB2	2.21	0.40
1:B:792:THR:HG22	1:B:793:PHE:N	2.37	0.40
1:A:812:GLY:HA3	1:A:1010:LEU:HD23	2.02	0.40
1:A:571:ARG:HB2	3:A:2189:HOH:O	2.22	0.40
1:A:944:LEU:HB3	1:A:946:MET:CE	2.51	0.40
1:B:368:GLY:C	1:B:370:PHE:CE2	2.95	0.40
1:B:607:GLN:OE1	1:B:1129:ARG:NH2	2.48	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	1276/1435 (89%)	1225 (96%)	51 (4%)	0	100	100
1	B	1170/1435 (82%)	1120 (96%)	50 (4%)	0	100	100
All	All	2446/2870 (85%)	2345 (96%)	101 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 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	1067/1213 (88%)	1058 (99%)	9 (1%)	81	94
1	B	971/1213 (80%)	954 (98%)	17 (2%)	59	86
All	All	2038/2426 (84%)	2012 (99%)	26 (1%)	69	91

All (26) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	372	ASN
1	A	460	ASP
1	A	737	ASN
1	A	771	GLN
1	A	789	ASP
1	A	792	THR
1	A	794	ASP
1	A	934	LEU

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Mol	Chain	Res	Type
1	A	973	ASP
1	B	310	LYS
1	B	440	ASP
1	B	460	ASP
1	B	569	LEU
1	B	607	GLN
1	B	771	GLN
1	B	780	ASP
1	B	811	SER
1	B	880	THR
1	B	882	SER
1	B	892	THR
1	B	938	ASN
1	B	972	ASP
1	B	978	LEU
1	B	1140	ASN
1	B	1361	THR
1	B	1408	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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](#)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers

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	1278/1435 (89%)	-0.06	12 (0%) 84 80	37, 60, 94, 131	0
1	B	1174/1435 (81%)	0.05	25 (2%) 63 54	40, 66, 111, 161	0
All	All	2452/2870 (85%)	-0.01	37 (1%) 73 68	37, 63, 103, 161	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	982	ASP	5.0
1	B	986	LEU	4.3
1	B	942	ILE	3.5
1	A	326	SER	3.4
1	B	358	GLU	2.9
1	A	184	ASN	2.8
1	B	1041	SER	2.8
1	B	1001	ILE	2.7
1	B	941	THR	2.7
1	A	317	ASN	2.7
1	B	309	GLY	2.7
1	B	980	THR	2.7
1	B	1303	ASP	2.6
1	B	272	PHE	2.6
1	B	1021	TRP	2.6
1	B	271	TYR	2.5
1	A	307	ILE	2.5
1	B	289	LYS	2.5
1	B	407	ASN	2.5
1	B	295	PRO	2.4
1	A	370	PHE	2.4
1	B	1299	LEU	2.4
1	A	1410	ALA	2.4
1	A	331	GLY	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	1419	ASP	2.2
1	B	249	THR	2.2
1	A	350	SER	2.2
1	B	802	PHE	2.2
1	A	265	ILE	2.2
1	A	311	LEU	2.1
1	B	954	LEU	2.1
1	A	997	GLN	2.1
1	B	508	LEU	2.1
1	B	318	GLY	2.1
1	B	798	GLN	2.1
1	B	999	GLY	2.1
1	A	1041	SER	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 monosaccharides in this entry.

## 6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	CA	B	2000	1/1	0.91	0.12	56,56,56,56	0
2	CA	A	2000	1/1	0.99	0.12	47,47,47,47	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.