



Full wwPDB X-ray Structure Validation Report ⓘ

May 21, 2020 – 03:24 am BST

PDB ID : 2ZU7
Title : Crystal structure of mannosyl-3-phosphoglycerate synthase from *Pyrococcus horikoshii*
Authors : Kawamura, T.; Watanabe, N.; Tanaka, I.
Deposited on : 2008-10-14
Resolution : 2.50 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.11
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) : 2.11

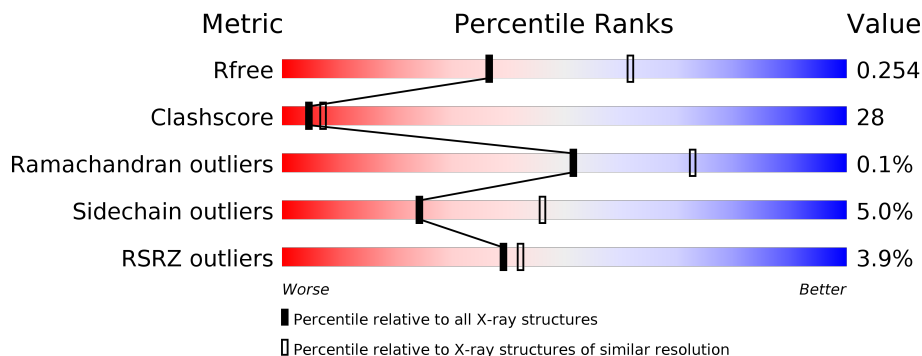
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	394	
1	B	394	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 5880 atoms, of which 0 are hydrogens and 0 are deuteriums.

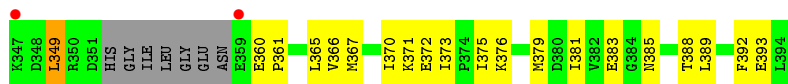
In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Mannosyl-3-phosphoglycerate synthase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	369	2968	1915	490	547	1	15	0	0	0
1	B	357	2877	1861	471	529	1	15	0	0	0

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	20	Total	O	0	0
			20	20		
2	B	15	Total	O	0	0
			15	15		



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	55.08Å 86.92Å 83.33Å 90.00° 101.78° 90.00°	Depositor
Resolution (Å)	29.93 – 2.50 29.93 – 2.50	Depositor EDS
% Data completeness (in resolution range)	94.4 (29.93-2.50) 94.5 (29.93-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	13.27 (at 2.51Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.210 , 0.256 0.211 , 0.254	Depositor DCC
R_{free} test set	1295 reflections (5.14%)	wwPDB-VP
Wilson B-factor (Å ²)	31.8	Xtrriage
Anisotropy	1.296	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 40.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	5880	wwPDB-VP
Average B, all atoms (Å ²)	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.56% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.53	0/3015	0.80	3/4045 (0.1%)
1	B	0.55	0/2922	0.80	2/3920 (0.1%)
All	All	0.54	0/5937	0.80	5/7965 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	320	VAL	N-CA-C	-8.33	88.51	111.00
1	A	64	LEU	CA-CB-CG	-6.64	100.02	115.30
1	A	322	GLU	N-CA-C	-6.13	94.46	111.00
1	A	3	LEU	CA-CB-CG	5.22	127.31	115.30
1	B	320	VAL	C-N-CA	-5.19	108.71	121.70

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	2968	0	3010	169	0
1	B	2877	0	2920	165	0
2	A	20	0	0	2	0
2	B	15	0	0	3	0
All	All	5880	0	5930	329	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 28.

All (329) 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:197:MSE:HE3	1:B:199:ARG:HD2	1.27	1.16
1:B:12:PHE:CE1	1:B:233:VAL:HG11	1.97	0.99
1:B:124:LYS:HE2	1:B:385:ASN:ND2	1.81	0.96
1:A:244:MSE:HE1	1:A:246:THR:C	1.88	0.94
1:A:317:LYS:HA	1:A:320:VAL:HG12	1.49	0.94
1:A:64:LEU:HD23	1:A:100:LEU:HD22	1.48	0.94
1:A:349:LEU:HD23	1:A:355:LEU:HD22	1.50	0.93
1:B:244:MSE:HE1	1:B:246:THR:C	1.89	0.92
1:B:245:VAL:H	1:B:303:GLN:HE22	1.12	0.92
1:A:244:MSE:CE	1:A:246:THR:H	1.81	0.91
1:B:332:TYR:CE1	1:B:342:ARG:HB3	2.07	0.90
1:A:244:MSE:HE3	1:A:246:THR:H	1.37	0.89
1:B:53:MSE:HE3	1:B:181:VAL:HG13	1.52	0.89
1:B:61:ASN:HD21	1:B:87:LYS:H	1.21	0.88
1:B:221:VAL:HG13	1:B:222:SER:H	1.36	0.88
1:A:6:PRO:HG3	1:A:190:MSE:HE2	1.54	0.87
1:A:116:HIS:HD2	1:A:118:LYS:H	1.23	0.86
1:A:332:TYR:CE1	1:A:342:ARG:HG3	2.10	0.86
1:A:317:LYS:HA	1:A:320:VAL:CG1	2.05	0.86
1:B:21:GLN:OE1	1:B:190:MSE:HE1	1.76	0.85
1:A:244:MSE:CE	1:A:247:GLY:N	2.39	0.85
1:A:116:HIS:CD2	1:A:118:LYS:H	1.95	0.85
1:B:379:MSE:HE3	1:B:383:GLU:HG3	1.58	0.84
1:A:76:HIS:HE1	1:A:108:THR:O	1.62	0.82
1:B:244:MSE:CE	1:B:247:GLY:N	2.42	0.82
1:A:6:PRO:HG3	1:A:190:MSE:CE	2.09	0.82
1:A:21:GLN:HE22	1:A:190:MSE:HE1	1.44	0.82
1:A:287:ASN:HB2	2:A:406:HOH:O	1.81	0.81
1:B:6:PRO:HD3	1:B:190:MSE:HE3	1.62	0.81
1:B:245:VAL:H	1:B:303:GLN:NE2	1.78	0.81
1:B:244:MSE:HE3	1:B:246:THR:H	1.48	0.79
1:B:125:ALA:HA	1:B:381:ILE:CD1	2.14	0.77
1:A:244:MSE:HE1	1:A:247:GLY:N	1.98	0.77
1:A:129:VAL:HG11	1:A:373:ILE:HG23	1.66	0.76
1:A:244:MSE:CE	1:A:246:THR:N	2.48	0.76
1:B:197:MSE:CE	1:B:199:ARG:HD2	2.11	0.76
1:B:116:HIS:CD2	1:B:118:LYS:H	2.04	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:244:MSE:HE3	1:A:246:THR:N	2.01	0.74
1:B:332:TYR:HE1	1:B:342:ARG:HB3	1.49	0.74
1:A:321:LYS:HB3	1:A:354:ILE:CD1	2.18	0.74
1:B:244:MSE:CE	1:B:246:THR:H	2.00	0.73
1:B:221:VAL:HG13	1:B:222:SER:N	2.03	0.73
1:A:93:ARG:HA	1:A:96:LEU:HD12	1.68	0.73
1:B:116:HIS:HD2	1:B:118:LYS:H	1.37	0.73
1:B:254:MSE:HE1	1:B:264:PHE:HZ	1.53	0.72
1:B:125:ALA:HA	1:B:381:ILE:HD11	1.70	0.72
1:A:12:PHE:CE1	1:A:233:VAL:HG11	2.23	0.72
1:A:222:SER:HA	1:A:248:ASN:HD22	1.56	0.71
1:B:76:HIS:HE1	1:B:108:THR:O	1.72	0.71
1:B:280:GLU:OE2	1:B:334:SER:HB2	1.89	0.71
1:A:332:TYR:CE1	1:A:346:LEU:HD13	2.26	0.70
1:A:276:VAL:HG21	1:A:330:THR:HG22	1.75	0.69
1:B:244:MSE:HE3	1:B:246:THR:N	2.07	0.68
1:B:197:MSE:HE3	1:B:199:ARG:CD	2.16	0.68
1:A:379:MSE:O	1:A:383:GLU:HG3	1.93	0.67
1:B:61:ASN:HD22	1:B:93:ARG:HD3	1.59	0.67
1:B:244:MSE:HE1	1:B:247:GLY:N	2.09	0.67
1:B:53:MSE:CE	1:B:181:VAL:HG13	2.24	0.67
1:B:43:ARG:O	1:B:47:TYR:HD2	1.77	0.67
1:B:61:ASN:ND2	1:B:93:ARG:HD3	2.11	0.66
1:A:7:VAL:HG23	1:A:8:TYR:N	2.11	0.66
1:B:312:HIS:CD2	1:B:312:HIS:N	2.64	0.65
1:B:1:MSE:N	1:B:28:THR:HB	2.11	0.65
1:B:276:VAL:HG21	1:B:330:THR:HG22	1.77	0.65
1:B:197:MSE:HE2	1:B:301:ILE:HG12	1.78	0.65
1:A:321:LYS:HB3	1:A:354:ILE:HD13	1.78	0.64
1:B:124:LYS:HE2	1:B:385:ASN:HD21	1.63	0.64
1:B:334:SER:C	1:B:336:LEU:H	2.00	0.64
1:B:43:ARG:HG3	1:B:47:TYR:CE2	2.32	0.64
1:A:171:ASN:HA	1:A:312:HIS:CD2	2.32	0.64
1:A:7:VAL:HG23	1:A:8:TYR:H	1.62	0.64
1:B:1:MSE:H2	1:B:28:THR:HB	1.62	0.63
1:B:6:PRO:HD3	1:B:190:MSE:CE	2.28	0.63
1:B:61:ASN:ND2	1:B:87:LYS:H	1.96	0.62
1:A:244:MSE:HE2	1:A:247:GLY:N	2.13	0.62
1:B:225:THR:CB	1:B:248:ASN:HD21	2.13	0.61
1:A:18:HIS:HE1	1:A:300:GLU:OE1	1.83	0.61
1:A:59:MSE:HE2	1:A:114:MSE:HE1	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:222:SER:HA	1:A:248:ASN:ND2	2.15	0.61
1:A:43:ARG:O	1:A:47:TYR:HD2	1.84	0.61
1:A:84:SER:HB2	1:A:114:MSE:HE2	1.81	0.61
1:B:115:ILE:HD12	1:B:389:LEU:HD13	1.82	0.61
1:B:273:TYR:HA	1:B:330:THR:HG21	1.83	0.61
1:A:84:SER:HB2	1:A:114:MSE:CE	2.30	0.61
1:B:68:ASP:OD2	1:B:72:LYS:HE3	2.01	0.61
1:B:365:LEU:HD23	1:B:365:LEU:C	2.21	0.60
1:B:53:MSE:O	1:B:79:PRO:HD2	2.00	0.60
1:B:244:MSE:CE	1:B:246:THR:N	2.64	0.60
1:A:244:MSE:HE1	1:A:246:THR:CA	2.32	0.59
1:B:232:LEU:HA	1:B:341:LEU:CD2	2.31	0.59
1:B:86:SER:O	1:B:116:HIS:HE1	1.85	0.59
1:B:3:LEU:HD23	1:B:23:VAL:HA	1.85	0.59
1:B:43:ARG:HG3	1:B:47:TYR:HE2	1.67	0.59
1:A:244:MSE:HE1	1:A:246:THR:H	1.63	0.59
1:A:2:LEU:C	1:A:3:LEU:HD22	2.23	0.59
1:A:90:GLY:N	1:A:91:PRO:HA	2.16	0.59
1:B:12:PHE:HE1	1:B:233:VAL:HG11	1.63	0.59
1:A:244:MSE:HE1	1:A:246:THR:N	2.16	0.58
1:A:97:GLU:O	1:A:101:ILE:HG12	2.03	0.58
1:B:260:GLU:O	1:B:371:LYS:HB2	2.03	0.58
1:A:237:THR:O	1:A:238:ALA:HB3	2.03	0.58
1:B:12:PHE:CE1	1:B:233:VAL:CG1	2.82	0.58
1:B:85:ASN:HD21	1:B:143:SER:HB3	1.68	0.58
1:A:53:MSE:HE2	1:A:188:PHE:HE2	1.68	0.58
1:B:285:TRP:C	1:B:286:GLU:HG3	2.24	0.58
1:A:21:GLN:NE2	1:A:190:MSE:HE1	2.18	0.57
1:A:391:ARG:HH21	1:A:394:LEU:C	2.06	0.57
1:A:86:SER:O	1:A:116:HIS:HE1	1.87	0.57
1:A:59:MSE:HE2	1:A:114:MSE:CE	2.35	0.56
1:B:237:THR:O	1:B:238:ALA:HB3	2.05	0.56
1:A:105:TYR:CD1	1:A:392:PHE:HB3	2.40	0.56
1:A:6:PRO:CG	1:A:190:MSE:CE	2.83	0.56
1:A:320:VAL:HG22	1:A:321:LYS:HG2	1.88	0.56
1:A:149:MSE:HG2	1:A:166:PHE:CE1	2.41	0.56
1:A:270:ILE:O	1:A:274:GLU:HG3	2.05	0.56
1:A:105:TYR:CE1	1:A:392:PHE:HB3	2.40	0.56
1:A:6:PRO:CG	1:A:190:MSE:HE2	2.32	0.56
1:A:389:LEU:C	1:A:389:LEU:HD13	2.25	0.56
1:B:221:VAL:CG1	1:B:222:SER:H	2.13	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:93:ARG:O	1:B:97:GLU:HG3	2.04	0.56
1:A:252:HIS:HE1	1:A:274:GLU:OE2	1.87	0.56
1:A:349:LEU:HG	1:A:355:LEU:HB2	1.87	0.56
1:B:231:LEU:HD12	1:B:234:SER:OG	2.06	0.56
1:B:339:ASP:O	1:B:343:LYS:HG3	2.05	0.56
1:A:98:VAL:O	1:A:102:ARG:HG3	2.05	0.55
1:A:53:MSE:HE2	1:A:188:PHE:CE2	2.40	0.55
1:B:245:VAL:N	1:B:303:GLN:HE22	1.94	0.55
1:B:254:MSE:HE1	1:B:264:PHE:CZ	2.37	0.55
1:B:345:ILE:HG22	1:B:349:LEU:HD22	1.89	0.55
1:B:312:HIS:O	1:B:313:GLU:HG3	2.07	0.55
1:B:6:PRO:CD	1:B:190:MSE:HE3	2.34	0.55
1:A:116:HIS:HD2	1:A:118:LYS:N	1.99	0.55
1:A:93:ARG:CB	1:A:96:LEU:HD12	2.38	0.54
1:A:82:ILE:HG21	1:A:114:MSE:HE3	1.88	0.54
1:A:332:TYR:CE1	1:A:346:LEU:CD1	2.91	0.54
1:B:244:MSE:HE2	1:B:247:GLY:CA	2.37	0.54
1:B:340:ASN:HA	1:B:343:LYS:HD2	1.88	0.54
1:B:92:ASN:O	1:B:95:LYS:HB3	2.08	0.54
1:A:82:ILE:CG2	1:A:114:MSE:HE3	2.37	0.54
1:A:254:MSE:HE1	1:A:264:PHE:HZ	1.72	0.54
1:A:391:ARG:NE	1:A:394:LEU:OXT	2.35	0.54
1:B:150:LEU:HD22	1:B:370:ILE:HG21	1.90	0.54
1:A:250:GLY:O	1:A:252:HIS:HD2	1.91	0.53
1:B:341:LEU:O	1:B:341:LEU:HD12	2.08	0.53
1:B:274:GLU:O	1:B:278:ILE:HG13	2.09	0.53
1:A:285:TRP:O	1:A:286:GLU:HB3	2.08	0.53
1:B:201:HIS:O	1:B:305:GLU:HA	2.07	0.53
1:A:310:HIS:CE1	1:A:312:HIS:ND1	2.76	0.53
1:A:202:TRP:CD2	1:A:310:HIS:HB2	2.44	0.53
1:A:389:LEU:O	1:A:390:LEU:HD12	2.09	0.53
1:B:231:LEU:HD21	1:B:344:ARG:NH1	2.23	0.53
1:A:84:SER:CB	1:A:114:MSE:HE2	2.39	0.53
1:A:21:GLN:HE22	1:A:190:MSE:CE	2.19	0.53
1:A:90:GLY:N	1:A:91:PRO:CA	2.71	0.53
1:B:97:GLU:O	1:B:101:ILE:HG12	2.08	0.53
1:A:252:HIS:CE1	1:A:274:GLU:OE2	2.61	0.53
1:A:93:ARG:CA	1:A:96:LEU:HD12	2.37	0.53
1:A:75:PRO:HA	1:B:27:ASP:HB2	1.91	0.52
1:B:250:GLY:O	1:B:252:HIS:HD2	1.92	0.52
1:B:332:TYR:CD1	1:B:342:ARG:HB3	2.44	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:285:TRP:N	1:B:285:TRP:CD1	2.78	0.52
1:A:133:ASP:OD1	1:A:367:MSE:HA	2.09	0.52
1:A:282:PHE:CE1	1:A:294:VAL:HG11	2.45	0.52
1:A:333:HIS:HE1	1:A:361:PRO:O	1.93	0.52
1:A:27:ASP:O	1:B:76:HIS:HB2	2.10	0.52
1:B:235:GLU:OE1	1:B:338:THR:OG1	2.17	0.52
1:A:236:HIS:HE1	1:A:336:LEU:O	1.93	0.52
1:B:280:GLU:OE2	1:B:334:SER:CB	2.56	0.51
1:B:50:LEU:HD12	1:B:53:MSE:HE2	1.92	0.51
1:A:310:HIS:CE1	1:A:312:HIS:CE1	2.98	0.51
1:A:221:VAL:HG21	1:A:320:VAL:HG23	1.93	0.51
1:B:270:ILE:O	1:B:274:GLU:HG3	2.11	0.51
1:A:137:GLU:H	1:A:137:GLU:CD	2.14	0.51
1:A:256:MSE:O	1:A:260:GLU:HB2	2.11	0.51
1:A:317:LYS:O	1:A:320:VAL:HG13	2.11	0.51
1:B:222:SER:HA	1:B:248:ASN:HD22	1.75	0.51
1:B:334:SER:C	1:B:336:LEU:N	2.64	0.51
1:A:391:ARG:NH2	1:A:394:LEU:O	2.44	0.51
1:B:281:ARG:NH2	1:B:287:ASN:HB2	2.26	0.51
1:B:372:GLU:OE1	1:B:372:GLU:HA	2.11	0.51
1:B:222:SER:HA	1:B:248:ASN:ND2	2.26	0.50
1:B:285:TRP:C	1:B:286:GLU:CG	2.79	0.50
1:A:119:ASP:OD2	1:A:386:SER:HB2	2.12	0.50
1:A:261:ILE:HA	1:A:369:PRO:HB3	1.94	0.50
1:A:321:LYS:HB3	1:A:354:ILE:HD11	1.90	0.50
1:B:244:MSE:HE2	1:B:247:GLY:N	2.24	0.49
1:B:288:VAL:HA	1:B:295:PHE:CD2	2.47	0.49
1:B:285:TRP:O	1:B:286:GLU:CG	2.60	0.49
1:A:137:GLU:O	1:A:139:GLY:N	2.45	0.49
1:A:12:PHE:CE1	1:A:233:VAL:CG1	2.94	0.49
1:A:388:THR:O	1:A:390:LEU:HD13	2.13	0.49
1:B:319:HIS:ND1	1:B:319:HIS:N	2.58	0.49
1:A:1:MSE:N	1:A:28:THR:HB	2.27	0.49
1:B:150:LEU:HD22	1:B:370:ILE:CG2	2.43	0.49
1:A:24:ILE:HG22	1:B:108:THR:HG22	1.94	0.49
1:A:254:MSE:HE1	1:A:264:PHE:CZ	2.46	0.49
1:A:29:GLU:O	1:A:30:THR:C	2.51	0.49
1:B:285:TRP:O	1:B:286:GLU:HG2	2.12	0.49
1:A:201:HIS:O	1:A:305:GLU:HA	2.13	0.48
1:B:201:HIS:HB2	1:B:246:THR:HG22	1.94	0.48
1:B:338:THR:O	1:B:342:ARG:HG3	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:386:SER:OG	1:A:389:LEU:HB2	2.13	0.48
1:A:6:PRO:HG3	1:A:190:MSE:HE1	1.94	0.48
1:B:64:LEU:HD11	1:B:96:LEU:HB3	1.94	0.48
1:A:72:LYS:HG2	1:B:24:ILE:O	2.13	0.48
1:A:3:LEU:HD13	1:A:23:VAL:HA	1.95	0.48
1:A:389:LEU:CD1	1:A:391:ARG:HG3	2.43	0.48
1:B:3:LEU:HD12	1:B:190:MSE:SE	2.64	0.47
1:A:125:ALA:HA	1:A:381:ILE:HG21	1.96	0.47
1:A:389:LEU:HD11	1:A:391:ARG:HG3	1.96	0.47
1:B:341:LEU:O	1:B:345:ILE:HG13	2.14	0.47
1:B:365:LEU:HD23	1:B:366:VAL:N	2.30	0.47
1:B:360:GLU:HB3	1:B:361:PRO:CD	2.44	0.47
1:A:258:LEU:O	1:A:262:LEU:HG	2.15	0.47
1:A:332:TYR:CE1	1:A:342:ARG:CG	2.90	0.47
1:A:76:HIS:CE1	1:A:108:THR:O	2.54	0.47
1:B:112:ILE:HG22	1:B:392:PHE:HB2	1.97	0.47
1:B:41:ILE:HD11	1:B:190:MSE:HG3	1.95	0.47
1:A:137:GLU:C	1:A:139:GLY:N	2.69	0.47
1:A:244:MSE:HE2	1:A:247:GLY:CA	2.44	0.47
1:B:197:MSE:SE	1:B:199:ARG:HH11	2.48	0.47
1:A:357:GLU:HG3	1:A:357:GLU:O	2.15	0.46
1:B:237:THR:O	1:B:238:ALA:CB	2.62	0.46
1:B:252:HIS:HE1	1:B:274:GLU:OE2	1.98	0.46
1:A:222:SER:HB2	2:A:402:HOH:O	2.15	0.46
1:A:64:LEU:CD2	1:A:100:LEU:HD22	2.32	0.46
1:B:76:HIS:CE1	1:B:108:THR:O	2.59	0.46
1:B:310:HIS:HA	2:B:399:HOH:O	2.15	0.46
1:B:229:LEU:O	1:B:232:LEU:HB3	2.16	0.46
1:B:2:LEU:HD23	1:B:40:ASN:HA	1.97	0.46
1:B:195:TYR:CZ	1:B:294:VAL:HG22	2.50	0.46
1:A:273:TYR:HA	1:A:330:THR:HG21	1.98	0.46
1:B:244:MSE:HE1	1:B:246:THR:CA	2.46	0.46
1:A:82:ILE:HB	1:A:114:MSE:HG3	1.98	0.46
1:A:27:ASP:HB2	1:B:75:PRO:HA	1.98	0.46
1:A:59:MSE:HE3	1:A:97:GLU:CD	2.36	0.46
1:A:93:ARG:HB3	1:A:96:LEU:HD12	1.98	0.45
1:B:134:ILE:O	1:B:134:ILE:HG12	2.15	0.45
1:B:59:MSE:HE3	1:B:97:GLU:CD	2.36	0.45
1:A:131:TYR:CG	1:A:373:ILE:HD11	2.52	0.45
1:A:6:PRO:HD3	1:A:190:MSE:CE	2.45	0.45
1:B:225:THR:HB	1:B:248:ASN:HD21	1.79	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:333:HIS:HE1	1:B:361:PRO:O	2.00	0.45
1:A:280:GLU:OE2	1:A:335:LYS:HE2	2.17	0.45
1:B:375:ILE:HG23	1:B:376:LYS:N	2.31	0.45
1:A:132:THR:O	1:A:132:THR:HG22	2.16	0.45
1:A:5:ALA:HA	1:A:39:SER:OG	2.16	0.45
1:B:235:GLU:HB3	1:B:338:THR:HG21	1.97	0.45
1:A:202:TRP:CZ2	1:A:310:HIS:CE1	3.06	0.44
1:B:64:LEU:HD23	1:B:64:LEU:HA	1.82	0.44
1:A:201:HIS:HB2	1:A:246:THR:HG22	2.00	0.44
1:A:376:LYS:HD2	1:A:376:LYS:HA	1.75	0.44
1:A:68:ASP:OD1	1:A:72:LYS:HE3	2.17	0.44
1:A:82:ILE:HD12	1:A:112:ILE:HD11	1.98	0.44
1:B:197:MSE:HE1	1:B:275:ILE:CD1	2.48	0.44
1:A:285:TRP:CD1	1:A:285:TRP:N	2.84	0.44
1:A:389:LEU:HD13	1:A:390:LEU:N	2.33	0.44
1:A:335:LYS:H	1:A:335:LYS:HG2	1.50	0.44
1:A:137:GLU:CD	1:A:137:GLU:N	2.71	0.44
1:A:316:GLY:C	1:A:317:LYS:HG3	2.38	0.44
1:B:252:HIS:CE1	1:B:274:GLU:OE2	2.71	0.44
1:A:119:ASP:CG	1:A:386:SER:HB2	2.38	0.44
1:B:373:ILE:O	1:B:375:ILE:N	2.51	0.44
1:B:246:THR:HB	1:B:249:ALA:HB2	2.00	0.44
1:B:312:HIS:HD2	1:B:312:HIS:N	2.13	0.44
1:B:111:LYS:HG2	1:B:393:GLU:O	2.17	0.43
1:B:116:HIS:HD2	1:B:118:LYS:N	2.10	0.43
1:B:129:VAL:CG1	1:B:129:VAL:O	2.65	0.43
1:B:149:MSE:HG2	1:B:166:PHE:CE1	2.53	0.43
1:B:10:GLU:C	1:B:11:ILE:HD12	2.39	0.43
1:B:147:GLU:HG3	1:B:367:MSE:SE	2.68	0.43
1:B:221:VAL:CG1	1:B:222:SER:N	2.73	0.43
1:A:246:THR:HB	1:A:249:ALA:HB2	2.00	0.43
1:A:368:ARG:CB	1:A:369:PRO:CD	2.96	0.43
1:A:266:THR:CG2	1:A:365:LEU:HD23	2.48	0.43
1:B:312:HIS:O	1:B:313:GLU:CB	2.66	0.43
1:A:320:VAL:O	1:A:323:MSE:HB3	2.19	0.43
1:A:88:ARG:O	1:A:89:GLU:HB3	2.18	0.43
1:B:286:GLU:C	1:B:288:VAL:N	2.71	0.43
1:B:273:TYR:HD1	1:B:330:THR:HG23	1.84	0.43
1:B:243:ILE:HG23	1:B:244:MSE:N	2.34	0.43
1:A:131:TYR:CD1	1:A:373:ILE:HD11	2.54	0.43
1:B:94:TYR:CE2	1:B:388:THR:HB	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:53:MSE:HE3	1:B:181:VAL:CG1	2.38	0.43
1:B:50:LEU:HB3	1:B:77:LYS:HG2	2.00	0.43
1:A:43:ARG:O	1:A:47:TYR:CD2	2.70	0.43
1:A:92:ASN:O	1:A:95:LYS:HB3	2.19	0.43
1:A:389:LEU:HD11	1:A:391:ARG:CD	2.49	0.43
1:A:317:LYS:CA	1:A:320:VAL:HG12	2.35	0.42
1:B:267:GLY:HA2	2:B:397:HOH:O	2.19	0.42
1:B:337:ALA:HB3	1:B:342:ARG:HE	1.83	0.42
1:B:50:LEU:HA	1:B:50:LEU:HD12	1.76	0.42
1:B:260:GLU:CD	1:B:371:LYS:HD3	2.40	0.42
1:A:82:ILE:CD1	1:A:112:ILE:HD11	2.49	0.42
1:B:287:ASN:O	1:B:290:GLU:N	2.51	0.42
1:B:140:MSE:HE2	2:B:402:HOH:O	2.19	0.42
1:B:41:ILE:HD11	1:B:190:MSE:CG	2.50	0.42
1:A:150:LEU:HD23	1:A:150:LEU:HA	1.82	0.42
1:A:248:ASN:HB3	1:A:323:MSE:HE2	2.02	0.42
1:B:244:MSE:CE	1:B:246:THR:C	2.66	0.42
1:B:20:VAL:HA	1:B:303:GLN:O	2.19	0.42
1:A:389:LEU:C	1:A:390:LEU:HD12	2.40	0.42
1:B:195:TYR:CE1	1:B:257:LYS:HB3	2.55	0.42
1:B:147:GLU:O	1:B:151:VAL:HG23	2.20	0.41
1:B:230:ASN:OD1	1:B:241:THR:HG23	2.19	0.41
1:B:111:LYS:HE3	1:B:111:LYS:HB2	1.62	0.41
1:A:237:THR:O	1:A:238:ALA:CB	2.67	0.41
1:A:3:LEU:HD22	1:A:3:LEU:N	2.36	0.41
1:B:4:GLU:HA	1:B:38:ILE:HD13	2.02	0.41
1:B:287:ASN:C	1:B:289:GLU:N	2.73	0.41
1:A:133:ASP:CG	1:A:367:MSE:HA	2.40	0.41
1:B:239:PHE:CD2	1:B:239:PHE:N	2.88	0.41
1:A:138:ASN:N	1:A:138:ASN:OD1	2.54	0.41
1:A:135:LEU:HA	1:A:140:MSE:O	2.21	0.41
1:A:50:LEU:HG	1:A:78:CYS:SG	2.61	0.41
1:A:202:TRP:CG	1:A:310:HIS:HB2	2.56	0.41
1:A:18:HIS:CE1	1:A:300:GLU:OE1	2.70	0.41
1:B:124:LYS:HE2	1:B:385:ASN:CG	2.37	0.41
1:A:43:ARG:HG3	1:A:47:TYR:HE2	1.85	0.41
1:A:381:ILE:O	1:A:385:ASN:HB2	2.19	0.41
1:A:225:THR:O	1:A:229:LEU:HG	2.21	0.40
1:A:374:PRO:HB2	1:A:377:GLU:OE1	2.21	0.40
1:B:1:MSE:SE	1:B:3:LEU:HD21	2.72	0.40
1:B:125:ALA:HB2	1:B:381:ILE:HG13	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:177:VAL:HA	1:A:180:TYR:CD2	2.56	0.40
1:A:7:VAL:CG2	1:A:8:TYR:N	2.79	0.40
1:A:266:THR:HG21	1:A:365:LEU:HD23	2.03	0.40
1:A:332:TYR:HE1	1:A:346:LEU:HD13	1.82	0.40
1:A:360:GLU:HA	1:A:361:PRO:HD3	1.93	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	361/394 (92%)	339 (94%)	21 (6%)	1 (0%)	41	61
1	B	347/394 (88%)	323 (93%)	24 (7%)	0	100	100
All	All	708/788 (90%)	662 (94%)	45 (6%)	1 (0%)	51	73

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	138	ASN

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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	326/334 (98%)	308 (94%)	18 (6%)	21	41
1	B	317/334 (95%)	303 (96%)	14 (4%)	28	52
All	All	643/668 (96%)	611 (95%)	32 (5%)	24	46

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	LEU
1	A	30	THR
1	A	50	LEU
1	A	64	LEU
1	A	71	LEU
1	A	107	LEU
1	A	133	ASP
1	A	135	LEU
1	A	138	ASN
1	A	143	SER
1	A	155	LEU
1	A	202	TRP
1	A	220	ARG
1	A	313	GLU
1	A	320	VAL
1	A	335	LYS
1	A	346	LEU
1	A	368	ARG
1	B	50	LEU
1	B	71	LEU
1	B	88	ARG
1	B	96	LEU
1	B	129	VAL
1	B	143	SER
1	B	155	LEU
1	B	242	THR
1	B	251	GLU
1	B	312	HIS
1	B	319	HIS
1	B	320	VAL
1	B	339	ASP
1	B	349	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	18	HIS
1	A	21	GLN
1	A	76	HIS
1	A	109	HIS
1	A	116	HIS
1	A	236	HIS
1	A	248	ASN
1	A	252	HIS
1	A	310	HIS
1	A	333	HIS
1	B	61	ASN
1	B	65	HIS
1	B	76	HIS
1	B	106	ASN
1	B	116	HIS
1	B	138	ASN
1	B	248	ASN
1	B	252	HIS
1	B	303	GLN
1	B	312	HIS
1	B	333	HIS
1	B	385	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 carbohydrates 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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	354/394 (89%)	0.03	8 (2%) 60 63	21, 38, 65, 79	0
1	B	342/394 (86%)	0.23	19 (5%) 24 25	25, 41, 67, 76	0
All	All	696/788 (88%)	0.13	27 (3%) 39 42	21, 40, 66, 79	0

All (27) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	321	LYS	4.0
1	B	296	ASP	3.9
1	A	354	ILE	3.9
1	B	320	VAL	3.7
1	A	311	PHE	3.4
1	B	312	HIS	3.2
1	B	319	HIS	3.1
1	A	321	LYS	2.7
1	B	347	LYS	2.7
1	B	287	ASN	2.6
1	B	292	LYS	2.6
1	B	359	GLU	2.6
1	B	311	PHE	2.6
1	B	55	VAL	2.5
1	B	236	HIS	2.5
1	B	165	GLY	2.4
1	A	320	VAL	2.4
1	A	339	ASP	2.3
1	B	56	ILE	2.3
1	B	252	HIS	2.2
1	A	29	GLU	2.2
1	B	151	VAL	2.1
1	B	288	VAL	2.1
1	B	253	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	358	ASN	2.1
1	A	202	TRP	2.1
1	B	137	GLU	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 carbohydrates 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.