



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 14, 2017 – 09:08 pm GMT

PDB ID : 2GP4
Title : Structure of [FeS]cluster-free Apo Form of 6-Phosphogluconate Dehydratase from *Shewanella oneidensis*
Authors : Schormann, N.; Symersky, J.; Southeast Collaboratory for Structural Genomics (SECSG)
Deposited on : 2006-04-16
Resolution : 2.49 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

<http://wwpdb.org/validation/2016/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
Xtriage (Phenix)	:	1.9-1692
EDS	:	trunk28620
Percentile statistics	:	20161228.v01 (using entries in the PDB archive December 28th 2016)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	recalc28949

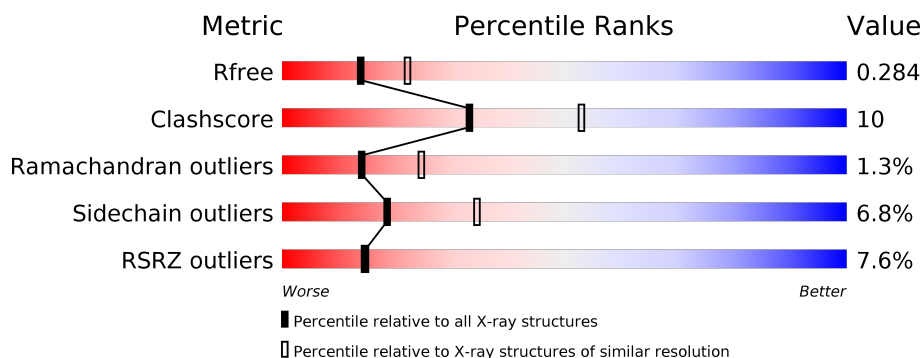
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.49 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}	100719	3846 (2.50-2.50)
Clashscore	112137	4554 (2.50-2.50)
Ramachandran outliers	110173	4463 (2.50-2.50)
Sidechain outliers	110143	4465 (2.50-2.50)
RSRZ outliers	101464	3876 (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. 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	628	<div> <div>6%</div> <div> <div></div> <div>64%</div> <div>15%</div> <div>•</div> <div>17%</div> </div> </div>
1	B	628	<div> <div>6%</div> <div> <div></div> <div>65%</div> <div>12%</div> <div>•</div> <div>21%</div> </div> </div>

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 8116 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 6-phosphogluconate dehydratase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	523	Total	C	N	O	S	Se	0	0	0
			3892	2445	685	743	5	14			
1	B	495	Total	C	N	O	S	Se	0	0	0
			3671	2307	649	697	4	14			

There are 74 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MSE	-	EXPRESSION TAG	GB 24348501
A	-18	GLY	-	EXPRESSION TAG	GB 24348501
A	-17	SER	-	EXPRESSION TAG	GB 24348501
A	-16	SER	-	EXPRESSION TAG	GB 24348501
A	-15	HIS	-	EXPRESSION TAG	GB 24348501
A	-14	HIS	-	EXPRESSION TAG	GB 24348501
A	-13	HIS	-	EXPRESSION TAG	GB 24348501
A	-12	HIS	-	EXPRESSION TAG	GB 24348501
A	-11	HIS	-	EXPRESSION TAG	GB 24348501
A	-10	HIS	-	EXPRESSION TAG	GB 24348501
A	-9	SER	-	EXPRESSION TAG	GB 24348501
A	-8	SER	-	EXPRESSION TAG	GB 24348501
A	-7	GLY	-	EXPRESSION TAG	GB 24348501
A	-6	LEU	-	EXPRESSION TAG	GB 24348501
A	-5	VAL	-	EXPRESSION TAG	GB 24348501
A	-4	PRO	-	EXPRESSION TAG	GB 24348501
A	-3	ARG	-	EXPRESSION TAG	GB 24348501
A	-2	GLY	-	EXPRESSION TAG	GB 24348501
A	-1	SER	-	EXPRESSION TAG	GB 24348501
A	0	HIS	-	EXPRESSION TAG	GB 24348501
A	1	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	77	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	111	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	122	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	134	MSE	MET	MODIFIED RESIDUE	GB 24348501

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	144	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	173	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	181	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	233	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	237	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	260	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	305	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	353	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	484	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	507	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	512	MSE	MET	MODIFIED RESIDUE	GB 24348501
A	579	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	-19	MSE	-	EXPRESSION TAG	GB 24348501
B	-18	GLY	-	EXPRESSION TAG	GB 24348501
B	-17	SER	-	EXPRESSION TAG	GB 24348501
B	-16	SER	-	EXPRESSION TAG	GB 24348501
B	-15	HIS	-	EXPRESSION TAG	GB 24348501
B	-14	HIS	-	EXPRESSION TAG	GB 24348501
B	-13	HIS	-	EXPRESSION TAG	GB 24348501
B	-12	HIS	-	EXPRESSION TAG	GB 24348501
B	-11	HIS	-	EXPRESSION TAG	GB 24348501
B	-10	HIS	-	EXPRESSION TAG	GB 24348501
B	-9	SER	-	EXPRESSION TAG	GB 24348501
B	-8	SER	-	EXPRESSION TAG	GB 24348501
B	-7	GLY	-	EXPRESSION TAG	GB 24348501
B	-6	LEU	-	EXPRESSION TAG	GB 24348501
B	-5	VAL	-	EXPRESSION TAG	GB 24348501
B	-4	PRO	-	EXPRESSION TAG	GB 24348501
B	-3	ARG	-	EXPRESSION TAG	GB 24348501
B	-2	GLY	-	EXPRESSION TAG	GB 24348501
B	-1	SER	-	EXPRESSION TAG	GB 24348501
B	0	HIS	-	EXPRESSION TAG	GB 24348501
B	1	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	77	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	111	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	122	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	134	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	144	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	173	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	181	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	233	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	237	MSE	MET	MODIFIED RESIDUE	GB 24348501

Continued on next page...

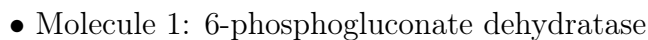
Continued from previous page...

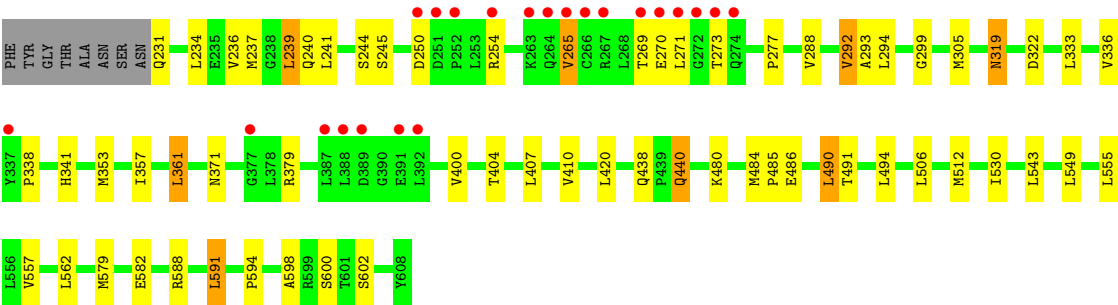
Chain	Residue	Modelled	Actual	Comment	Reference
B	260	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	305	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	353	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	484	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	507	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	512	MSE	MET	MODIFIED RESIDUE	GB 24348501
B	579	MSE	MET	MODIFIED RESIDUE	GB 24348501

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	292	Total O 292 292	0	0
2	B	261	Total O 261 261	0	0

- Molecule 1: 6-phosphogluconate dehydratase





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	61.36Å 118.65Å 160.02Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.68 – 2.49 47.65 – 2.49	Depositor EDS
% Data completeness (in resolution range)	100.0 (48.68-2.49) 99.5 (47.65-2.49)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.39 (at 2.48Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.230 , 0.291 0.226 , 0.284	Depositor DCC
R_{free} test set	2086 reflections (5.30%)	DCC
Wilson B-factor (Å ²)	31.8	Xtriage
Anisotropy	0.077	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 53.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	8116	wwPDB-VP
Average B, all atoms (Å ²)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.77% 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

5.1 Standard geometry

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.37	0/3934	0.55	0/5304
1	B	0.36	0/3710	0.56	0/5003
All	All	0.37	0/7644	0.55	0/10307

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	A	3892	0	3949	85	0
1	B	3671	0	3735	65	0
2	A	292	0	0	7	0
2	B	261	0	0	2	0
All	All	8116	0	7684	150	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 10.

All (150) 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:122:MSE:HE2	1:B:486:GLU:H	1.17	1.08

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:305:MSE:HE2	1:B:598:ALA:HB2	1.34	1.05
1:A:119:GLN:HB2	1:A:120:PRO:HD3	1.40	1.04
1:B:305:MSE:CE	1:B:598:ALA:HB2	1.89	1.02
1:B:305:MSE:HE2	1:B:598:ALA:CB	1.97	0.94
1:A:122:MSE:HE2	1:A:486:GLU:H	1.31	0.93
1:A:158:VAL:HG11	1:A:234:LEU:HD21	1.48	0.93
1:B:440:GLN:HE21	1:B:440:GLN:H	1.19	0.87
1:B:158:VAL:HG11	1:B:234:LEU:HD21	1.57	0.86
1:A:507:MSE:HE1	1:A:544:ILE:HG21	1.58	0.86
1:B:122:MSE:HE2	1:B:486:GLU:N	1.94	0.81
1:A:507:MSE:CE	1:A:544:ILE:HG21	2.12	0.80
1:A:158:VAL:CG1	1:A:234:LEU:HD21	2.13	0.79
1:A:507:MSE:HE1	1:A:544:ILE:CG2	2.12	0.78
1:B:119:GLN:HB2	1:B:120:PRO:HD3	1.68	0.73
1:B:353:MSE:O	1:B:357:ILE:HG12	1.88	0.73
1:A:209:GLU:OE1	1:A:251:ASP:HB3	1.89	0.72
1:A:210:ALA:O	1:A:211:GLU:HB3	1.89	0.72
1:A:379:ARG:HD2	2:A:712:HOH:O	1.90	0.72
1:A:305:MSE:SE	1:A:484:MSE:HE1	2.40	0.72
1:A:269:THR:HG22	1:A:271:LEU:H	1.56	0.70
1:B:588:ARG:HA	1:B:591:LEU:HD22	1.73	0.70
1:A:214:SER:HB2	1:A:216:HIS:ND1	2.06	0.70
1:B:555:LEU:HG	1:B:557:VAL:HG22	1.73	0.70
1:A:96:GLN:O	1:A:97:GLU:HB2	1.91	0.69
1:A:206:GLN:O	1:A:209:GLU:HG2	1.91	0.69
1:B:122:MSE:CE	1:B:486:GLU:H	2.02	0.68
1:A:571:ASP:OD1	1:A:573:ARG:HD3	1.94	0.68
1:A:119:GLN:HB2	1:A:120:PRO:CD	2.20	0.67
1:B:122:MSE:HE3	1:B:122:MSE:O	1.95	0.67
1:A:103:GLN:HG3	1:A:145:PHE:CE1	2.30	0.66
1:B:440:GLN:H	1:B:440:GLN:NE2	1.94	0.65
1:B:353:MSE:HE3	1:B:357:ILE:HD11	1.78	0.64
1:A:156:LYS:HA	2:A:879:HOH:O	1.97	0.64
1:A:211:GLU:HB2	1:A:388:LEU:HD22	1.79	0.64
1:A:174:LEU:HD13	1:A:265:VAL:HG22	1.79	0.63
1:B:305:MSE:HE3	1:B:594:PRO:HA	1.82	0.62
1:A:255:GLU:O	1:A:259:LYS:HG2	2.01	0.61
1:A:216:HIS:O	1:A:220:THR:HG22	2.00	0.61
1:A:123:GLU:HG3	2:A:781:HOH:O	2.01	0.60
1:A:204:ARG:HG3	1:A:221:CYS:SG	2.41	0.60
1:B:357:ILE:HG22	1:B:361:LEU:HD22	1.82	0.60

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:15:ARG:NH2	1:B:322:ASP:OD2	2.34	0.60
1:A:103:GLN:HG2	1:A:108:VAL:O	2.02	0.59
1:B:174:LEU:HD13	1:B:265:VAL:HG13	1.83	0.59
1:A:96:GLN:N	2:A:658:HOH:O	2.35	0.59
1:A:149:LEU:HD21	1:A:265:VAL:HG21	1.85	0.59
1:A:333:LEU:HD21	1:A:410:VAL:HG12	1.83	0.59
1:B:440:GLN:HE21	1:B:440:GLN:N	1.98	0.58
1:A:236:VAL:HG11	1:A:293:ALA:HB2	1.83	0.58
1:A:534:LEU:HD11	1:A:562:LEU:HD13	1.86	0.58
1:A:388:LEU:HD12	1:A:393:ARG:HD3	1.86	0.58
1:A:588:ARG:HA	1:A:591:LEU:HD22	1.87	0.57
1:A:261:ALA:O	1:A:265:VAL:HG23	2.03	0.57
1:B:236:VAL:HG11	1:B:293:ALA:HB2	1.86	0.56
1:A:157:ILE:O	1:A:158:VAL:HB	2.05	0.56
1:A:361:LEU:HD13	1:A:366:LEU:HB2	1.87	0.56
1:B:116:THR:CG2	1:B:125:SER:HA	2.36	0.55
1:A:211:GLU:HB2	1:A:388:LEU:CD2	2.37	0.55
1:B:305:MSE:SE	1:B:484:MSE:HE1	2.55	0.55
1:B:319:ASN:C	1:B:319:ASN:HD22	2.10	0.55
1:A:116:THR:HG23	1:A:125:SER:HA	1.87	0.55
1:B:244:SER:O	1:B:254:ARG:NH2	2.40	0.55
1:B:490:LEU:CB	1:B:512:MSE:HE1	2.36	0.54
1:A:153:ILE:HD13	1:A:157:ILE:HD12	1.89	0.54
1:A:507:MSE:HE2	1:A:553:LEU:HD11	1.89	0.53
1:B:122:MSE:HE2	1:B:485:PRO:HA	1.89	0.53
1:A:103:GLN:HB2	1:A:145:PHE:CD1	2.43	0.53
1:B:494:LEU:HD22	1:B:506:LEU:HD22	1.91	0.52
1:B:490:LEU:HB2	1:B:512:MSE:HE1	1.91	0.52
1:A:337:TYR:O	1:A:338:PRO:C	2.46	0.52
1:A:507:MSE:HE1	1:A:544:ILE:HG23	1.93	0.51
1:B:103:GLN:HB3	1:B:145:PHE:CD2	2.46	0.51
1:A:216:HIS:CD2	1:A:217:SER:HG	2.28	0.51
1:B:116:THR:HG23	1:B:125:SER:HA	1.92	0.51
1:A:204:ARG:HA	1:A:207:LEU:HD12	1.92	0.51
1:A:231:GLN:HA	1:A:234:LEU:HD23	1.93	0.51
1:A:240:GLN:HE22	1:A:245:SER:HB3	1.76	0.50
1:B:294:LEU:HD22	1:B:299:GLY:HA3	1.93	0.50
1:B:15:ARG:HD3	2:B:847:HOH:O	2.12	0.50
1:A:97:GLU:CG	1:A:114:GLY:HA3	2.42	0.50
1:B:120:PRO:HB2	1:B:579:MSE:HG3	1.94	0.50
1:A:215:TYR:CG	1:A:402:LEU:HD11	2.47	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:237:MSE:HE3	1:B:239:LEU:CD2	2.42	0.49
1:A:337:TYR:O	1:A:340:GLY:O	2.30	0.49
1:B:404:THR:HA	1:B:407:LEU:O	2.13	0.49
1:A:319:ASN:C	1:A:319:ASN:HD22	2.15	0.49
1:B:122:MSE:CE	1:B:485:PRO:HA	2.43	0.49
1:B:491:THR:HG23	1:B:512:MSE:HE2	1.95	0.48
1:B:231:GLN:HE21	1:B:245:SER:HB2	1.78	0.48
1:B:357:ILE:HG22	1:B:361:LEU:CD2	2.42	0.48
1:A:494:LEU:HD13	1:A:506:LEU:HD21	1.96	0.48
1:A:158:VAL:HB	1:A:159:PRO:HD3	1.96	0.47
1:B:169:GLY:O	1:B:277:PRO:HB2	2.14	0.47
1:A:149:LEU:CD2	1:A:265:VAL:HG21	2.45	0.47
1:A:148:ALA:HB3	1:A:173:MSE:HG2	1.96	0.47
1:A:211:GLU:HG2	1:A:211:GLU:O	2.15	0.47
1:A:122:MSE:HE2	1:A:486:GLU:N	2.14	0.47
1:A:530:ILE:HG21	1:A:572:LEU:HD11	1.96	0.47
1:A:97:GLU:HG3	1:A:114:GLY:HA3	1.97	0.47
1:B:288:VAL:O	1:B:292:VAL:HG12	2.14	0.47
1:A:348:HIS:HD2	2:A:687:HOH:O	1.98	0.46
1:A:408:THR:HG21	1:A:413:PRO:HA	1.97	0.45
1:B:237:MSE:HE3	1:B:239:LEU:HD22	1.99	0.45
1:A:359:GLU:HB3	1:A:410:VAL:HG13	1.99	0.45
1:B:240:GLN:NE2	1:B:245:SER:HB3	2.32	0.45
1:B:484:MSE:HE2	1:B:484:MSE:HB3	1.86	0.45
1:A:170:HIS:CD2	1:A:170:HIS:H	2.35	0.45
1:A:582:GLU:CD	1:A:582:GLU:H	2.18	0.44
1:B:305:MSE:HE2	1:B:598:ALA:HB3	1.90	0.44
1:B:240:GLN:HE22	1:B:245:SER:HB3	1.83	0.44
1:B:170:HIS:H	1:B:170:HIS:CD2	2.34	0.44
1:B:269:THR:HG22	1:B:270:GLU:N	2.33	0.44
1:B:582:GLU:H	1:B:582:GLU:CD	2.21	0.44
1:A:358:LYS:HE3	1:A:399:THR:HG22	1.99	0.44
1:A:408:THR:CG2	1:A:413:PRO:HA	2.48	0.44
1:B:480:LYS:HB3	1:B:530:ILE:HD11	2.00	0.44
1:A:487:LEU:O	1:A:512:MSE:HG3	2.18	0.43
1:A:448:ALA:HB2	1:A:544:ILE:HD12	2.00	0.43
1:B:153:ILE:HG13	1:B:153:ILE:H	1.58	0.43
1:B:156:LYS:HA	2:B:739:HOH:O	2.17	0.43
1:B:101:VAL:HG13	1:B:150:LEU:HD23	2.00	0.43
1:B:591:LEU:HD13	1:B:600:SER:HB3	2.01	0.43
1:A:215:TYR:CD2	1:A:402:LEU:HD11	2.54	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:153:ILE:HD12	1:B:157:ILE:HG13	2.01	0.43
1:A:201:LYS:O	1:A:204:ARG:HD3	2.18	0.42
1:A:268:LEU:HG	1:A:276:SER:HB2	2.01	0.42
1:A:294:LEU:HD22	1:A:299:GLY:HA3	2.00	0.42
1:A:427:LEU:HD13	1:A:507:MSE:SE	2.70	0.42
1:A:288:VAL:O	1:A:292:VAL:HG13	2.20	0.42
1:A:149:LEU:HD21	1:A:265:VAL:CG2	2.47	0.42
1:A:204:ARG:HG2	1:A:205:ALA:N	2.35	0.42
1:B:103:GLN:CB	1:B:145:PHE:CD2	3.02	0.42
1:A:466:LEU:HB3	1:A:497:LEU:HD21	2.02	0.42
1:A:555:LEU:HG	1:A:557:VAL:HG22	2.02	0.41
1:A:99:GLY:N	2:A:852:HOH:O	2.51	0.41
1:B:336:VAL:HG13	1:B:338:PRO:HD2	2.02	0.41
1:A:219:GLY:HA2	1:A:349:ALA:HB1	2.03	0.41
1:A:592:SER:O	1:A:598:ALA:HA	2.20	0.41
1:B:438:GLN:HB3	1:B:440:GLN:NE2	2.36	0.41
1:A:117:GLN:HB2	2:A:883:HOH:O	2.20	0.41
1:A:578:GLY:N	1:A:582:GLU:OE2	2.50	0.41
1:B:116:THR:HG21	1:B:125:SER:HA	2.02	0.40
1:A:154:CYS:SG	1:A:155:ASP:N	2.94	0.40
1:B:146:ASP:O	1:B:172:PRO:HD2	2.22	0.40
1:B:115:VAL:HG12	1:B:157:ILE:HD11	2.03	0.40
1:B:557:VAL:HG21	1:B:562:LEU:HD21	2.04	0.40
1:A:204:ARG:HG2	1:A:205:ALA:H	1.86	0.40
1:B:371:ASN:HD22	1:B:371:ASN:HA	1.75	0.40
1:B:379:ARG:HA	1:B:379:ARG:HD3	1.90	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	509/628 (81%)	486 (96%)	16 (3%)	7 (1%)	13	23
1	B	483/628 (77%)	461 (95%)	16 (3%)	6 (1%)	15	27
All	All	992/1256 (79%)	947 (96%)	32 (3%)	13 (1%)	14	25

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	97	GLU
1	A	158	VAL
1	B	98	VAL
1	B	153	ILE
1	A	153	ILE
1	A	155	ASP
1	B	97	GLU
1	B	273	THR
1	A	119	GLN
1	A	337	TYR
1	B	119	GLN
1	B	271	LEU
1	A	202	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	416/482 (86%)	385 (92%)	31 (8%)	16	29
1	B	392/482 (81%)	368 (94%)	24 (6%)	22	40
All	All	808/964 (84%)	753 (93%)	55 (7%)	18	34

All (55) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	92	LYS
1	A	103	GLN
1	A	116	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	117	GLN
1	A	126	LEU
1	A	156	LYS
1	A	162	LEU
1	A	203	ASP
1	A	204	ARG
1	A	211	GLU
1	A	215	TYR
1	A	220	THR
1	A	239	LEU
1	A	241	LEU
1	A	271	LEU
1	A	292	VAL
1	A	303	LEU
1	A	319	ASN
1	A	333	LEU
1	A	356	LEU
1	A	361	LEU
1	A	410	VAL
1	A	420	LEU
1	A	468	ARG
1	A	490	LEU
1	A	494	LEU
1	A	497	LEU
1	A	512	MSE
1	A	543	LEU
1	A	549	LEU
1	A	591	LEU
1	B	103	GLN
1	B	116	THR
1	B	122	MSE
1	B	126	LEU
1	B	157	ILE
1	B	162	LEU
1	B	239	LEU
1	B	241	LEU
1	B	250	ASP
1	B	265	VAL
1	B	292	VAL
1	B	319	ASN
1	B	333	LEU
1	B	341	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	361	LEU
1	B	400	VAL
1	B	410	VAL
1	B	420	LEU
1	B	440	GLN
1	B	490	LEU
1	B	543	LEU
1	B	549	LEU
1	B	591	LEU
1	B	602	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	28	ASN
1	A	142	HIS
1	A	170	HIS
1	A	231	GLN
1	A	240	GLN
1	A	319	ASN
1	A	438	GLN
1	B	6	GLN
1	B	96	GLN
1	B	142	HIS
1	B	170	HIS
1	B	231	GLN
1	B	240	GLN
1	B	248	ASN
1	B	319	ASN
1	B	371	ASN
1	B	440	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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	509/628 (81%)	0.18	40 (7%)	13 13	16, 26, 49, 70	0
1	B	481/628 (76%)	0.17	35 (7%)	16 16	16, 25, 48, 62	0
All	All	990/1256 (78%)	0.18	75 (7%)	15 14	16, 25, 49, 70	0

All (75) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	389	ASP	6.5
1	A	215	TYR	6.5
1	B	273	THR	6.3
1	B	271	LEU	6.2
1	A	91	LEU	6.1
1	B	116	THR	5.5
1	B	391	GLU	4.9
1	B	95	CYS	4.7
1	B	388	LEU	4.7
1	B	272	GLY	4.3
1	A	271	LEU	4.2
1	A	155	ASP	4.2
1	A	103	GLN	4.1
1	A	154	CYS	3.9
1	B	265	VAL	3.8
1	A	114	GLY	3.8
1	B	112	CYS	3.8
1	A	116	THR	3.8
1	B	96	GLN	3.7
1	B	103	GLN	3.7
1	A	273	THR	3.7
1	B	117	GLN	3.6
1	A	0	HIS	3.6
1	A	153	ILE	3.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	98	VAL	3.3
1	A	337	TYR	3.2
1	A	202	VAL	3.2
1	A	118	GLY	3.1
1	B	387	LEU	3.1
1	A	272	GLY	3.1
1	B	115	VAL	3.0
1	A	341	HIS	3.0
1	A	97	GLU	3.0
1	A	557	VAL	2.9
1	B	154	CYS	2.9
1	B	337	TYR	2.9
1	B	274	GLN	2.9
1	B	153	ILE	2.9
1	A	113	ASP	2.9
1	B	392	LEU	2.8
1	A	224	TYR	2.8
1	A	112	CYS	2.8
1	A	90	LEU	2.8
1	B	0	HIS	2.8
1	A	102	ALA	2.8
1	A	117	GLN	2.8
1	A	558	SER	2.7
1	A	115	VAL	2.7
1	A	216	HIS	2.7
1	B	267	ARG	2.7
1	B	113	ASP	2.6
1	A	203	ASP	2.5
1	A	223	PHE	2.5
1	A	96	GLN	2.5
1	B	251	ASP	2.4
1	B	105	ALA	2.4
1	B	269	THR	2.4
1	B	250	ASP	2.3
1	A	221	CYS	2.3
1	B	252	PRO	2.2
1	B	264	GLN	2.2
1	B	254	ARG	2.1
1	A	101	VAL	2.1
1	A	232	LEU	2.1
1	A	250	ASP	2.1
1	A	231	GLN	2.1

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	92	LYS	2.1
1	B	97	GLU	2.1
1	B	263	LYS	2.0
1	B	270	GLU	2.0
1	A	201	LYS	2.0
1	B	377	GLY	2.0
1	A	564	THR	2.0
1	B	266	CYS	2.0
1	A	157	ILE	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.