Full wwPDB X-ray Structure Validation Report (i)

Aug 22, 2026 – 05:35 am BST

PDB ID	:	1E3P / pdb_00001e3p
Title	:	tungstate derivative of Streptomyces antibioticus PNPase/GPSI enzyme
Authors	:	Symmons, M.F.; Jones, G.H.; Luisi, B.F.
Deposited on	:	2000-06-20
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 (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

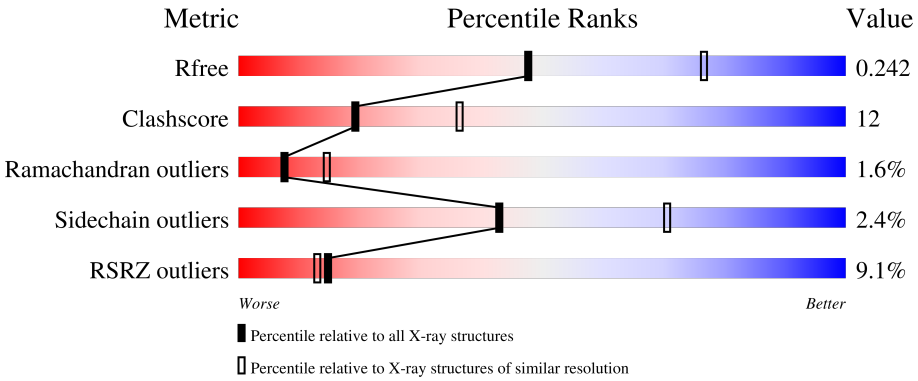
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

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 2.50 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}	180053	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (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 of 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 <=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	757	8%, 66%, 17%, ·, 15%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 5080 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.

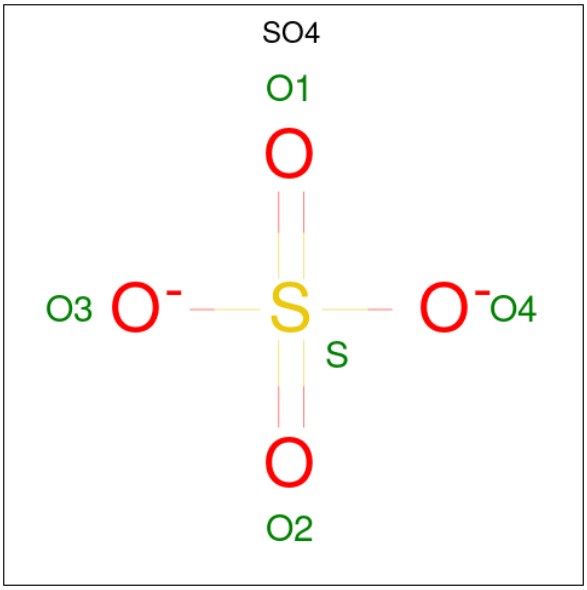
- Molecule 1 is a protein called Polyribonucleotide nucleotidyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	645	Total	C	N	O	S	0	0	0
			4720	2954	834	913	19			

There are 26 discrepancies between the modelled and reference sequences:

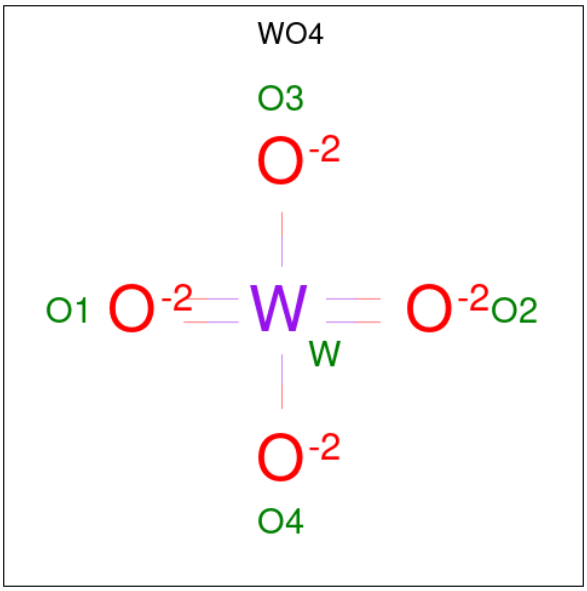
Chain	Residue	Modelled	Actual	Comment	Reference
A	-16	ALA	-	expression tag	UNP A0A1S9NJJ0
A	-15	SER	-	expression tag	UNP A0A1S9NJJ0
A	-14	MET	-	expression tag	UNP A0A1S9NJJ0
A	-13	THR	-	expression tag	UNP A0A1S9NJJ0
A	-12	GLY	-	expression tag	UNP A0A1S9NJJ0
A	-11	GLY	-	expression tag	UNP A0A1S9NJJ0
A	-10	GLN	-	expression tag	UNP A0A1S9NJJ0
A	-9	GLN	-	expression tag	UNP A0A1S9NJJ0
A	-8	MET	-	expression tag	UNP A0A1S9NJJ0
A	-7	GLY	-	expression tag	UNP A0A1S9NJJ0
A	-6	ARG	-	expression tag	UNP A0A1S9NJJ0
A	-5	GLY	-	expression tag	UNP A0A1S9NJJ0
A	-4	SER	-	expression tag	UNP A0A1S9NJJ0
A	-3	GLY	-	expression tag	UNP A0A1S9NJJ0
A	-2	SER	-	expression tag	UNP A0A1S9NJJ0
A	-1	GLU	-	expression tag	UNP A0A1S9NJJ0
A	0	PHE	-	expression tag	UNP A0A1S9NJJ0
A	31	ARG	LYS	conflict	UNP A0A1S9NJJ0
A	323	ALA	SER	conflict	UNP A0A1S9NJJ0
A	327	SER	GLN	conflict	UNP A0A1S9NJJ0
A	335	ALA	LYS	conflict	UNP A0A1S9NJJ0
A	600	ARG	GLY	conflict	UNP A0A1S9NJJ0
A	601	GLN	LYS	conflict	UNP A0A1S9NJJ0
A	647	SER	MET	conflict	UNP A0A1S9NJJ0
A	654	ILE	TYR	conflict	UNP A0A1S9NJJ0
A	657	SER	THR	conflict	UNP A0A1S9NJJ0

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0
2	A	1	Total O S 5 4 1	0	0

- Molecule 3 is TUNGSTATE(VI)ION (CCD ID: WO4) (formula: O_4W).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O W 5 4 1	0	0

- Molecule 4 is water.

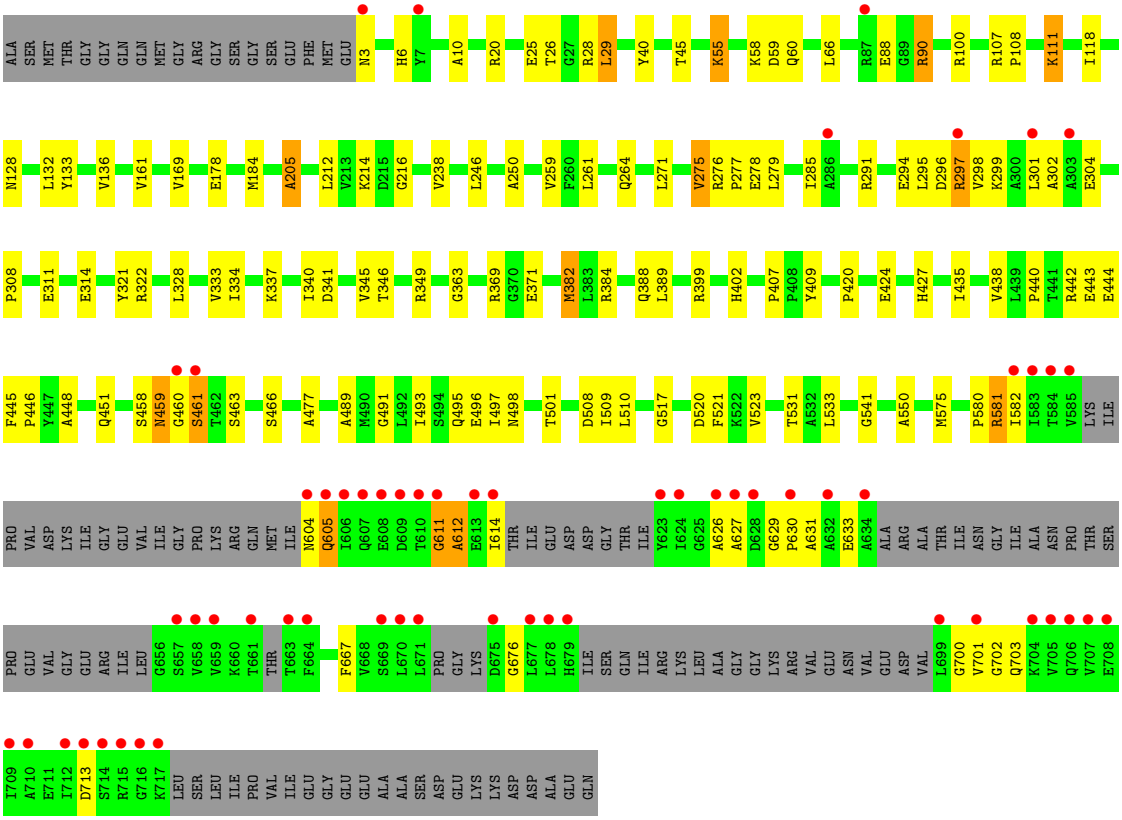
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	305	Total O 305 305	0	0

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 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: Polyribonucleotide nucleotidyltransferase

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3 2	Depositor
Cell constants a, b, c, α, β, γ	130.83Å 130.83Å 328.73Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.84 – 2.50 19.84 – 2.50	Depositor EDS
% Data completeness (in resolution range)	97.9 (19.84-2.50) 98.1 (19.84-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$< I/\sigma(I) >$ [1]	2.51 (at 2.50Å)	Xtriage
Refinement program	CNS 0.9	Depositor
R, R_{free}	0.213 , 0.247 0.210 , 0.242	Depositor DCC
R_{free} test set	3536 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å^2)	46.9	Xtriage
Anisotropy	0.193	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 55.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.009 for -1/3*h+1/3*k+1/3*l,-k,8/3*h+4/3*k+1/3*l 0.011 for -2/3*h-1/3*k-1/3*l,-1/3*h-2/3*k+1/3*l,-4/3*h+4/3*k+1/3*l 0.012 for -h,1/3*h-1/3*k-1/3*l,-4/3*h-8/3*k+1/3*l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	5080	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.51% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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

Bond lengths and bond angles in the following residue types are not validated in this section: SO4, WO4

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	0.40	0/4785	0.90	12/6487 (0.2%)

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	205	ALA	N-CA-C	-8.22	99.00	110.35
1	A	216	GLY	N-CA-C	7.59	121.70	113.58
1	A	275	VAL	N-CA-C	6.51	119.45	113.20
1	A	128	ASN	N-CA-C	-6.37	100.14	109.50
1	A	448	ALA	N-CA-C	-5.99	99.51	109.46
1	A	214	LYS	N-CA-C	-5.68	104.99	111.07
1	A	458	SER	N-CA-C	5.37	118.19	108.69
1	A	136	VAL	N-CA-C	-5.25	105.42	110.72
1	A	90	ARG	CA-C-N	5.24	126.39	119.84
1	A	90	ARG	C-N-CA	5.24	126.39	119.84
1	A	184	MET	N-CA-C	5.19	116.85	108.34
1	A	297	ARG	CD-NE-CZ	-5.08	117.29	124.40

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	4720	0	4626	110	0
2	A	50	0	0	1	0
3	A	5	0	0	1	0
4	A	305	0	0	7	0
All	All	5080	0	4626	110	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 12.

All (110) 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:A:446:PRO:HB2	1:A:582:ILE:HD12	1.40	1.02
1:A:349:ARG:HH22	1:A:460:GLY:HA3	1.30	0.96
1:A:275:VAL:HG12	1:A:301:LEU:HD12	1.56	0.88
1:A:275:VAL:HG11	1:A:302:ALA:HB2	1.65	0.78
1:A:261:LEU:HD12	1:A:264:GLN:HE22	1.56	0.70
1:A:667:PHE:HA	1:A:676:GLY:O	1.92	0.69
1:A:55:LYS:H	1:A:55:LYS:HD3	1.58	0.69
1:A:626:ALA:HB1	1:A:631:ALA:HB3	1.73	0.69
1:A:575:MET:HB3	1:A:581:ARG:HH22	1.57	0.68
1:A:308:PRO:O	1:A:311:GLU:HG2	1.95	0.66
1:A:55:LYS:HG2	2:A:905:SO4:O3	1.96	0.65
1:A:369:ARG:HD3	1:A:508:ASP:OD1	1.97	0.65
1:A:275:VAL:HG12	1:A:301:LEU:CD1	2.24	0.65
1:A:276:ARG:HB3	1:A:277:PRO:HD3	1.79	0.65
1:A:349:ARG:NH2	1:A:460:GLY:HA3	2.07	0.65
1:A:420:PRO:HA	1:A:424:GLU:OE1	1.96	0.65
1:A:580:PRO:C	1:A:581:ARG:HD2	2.23	0.64
1:A:399:ARG:HD3	1:A:442:ARG:HG2	1.82	0.61
1:A:629:GLY:N	1:A:630:PRO:HD2	2.16	0.61
1:A:444:GLU:HA	1:A:703:GLN:HA	1.84	0.60
1:A:626:ALA:CB	1:A:631:ALA:HB3	2.32	0.60
1:A:424:GLU:HG3	4:A:2244:HOH:O	2.01	0.60
1:A:493:ILE:HD13	1:A:517:GLY:HA2	1.83	0.60
1:A:495:GLN:HE21	1:A:497:ILE:HD11	1.67	0.59
1:A:58:LYS:HA	1:A:60:GLN:HE22	1.67	0.59
1:A:389:LEU:HD12	1:A:389:LEU:N	2.19	0.58
1:A:100:ARG:HD3	4:A:2095:HOH:O	2.03	0.58
1:A:28:ARG:HG2	1:A:29:LEU:HD13	1.86	0.57
1:A:90:ARG:HD2	1:A:90:ARG:H	1.69	0.57
1:A:575:MET:HB3	1:A:581:ARG:NH2	2.19	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:111:LYS:HE2	1:A:259:VAL:CG2	2.35	0.57
1:A:55:LYS:HD3	1:A:55:LYS:N	2.20	0.56
1:A:90:ARG:H	1:A:90:ARG:CD	2.20	0.54
1:A:541:GLY:HA3	4:A:2158:HOH:O	2.08	0.54
1:A:399:ARG:NH2	1:A:440:PRO:O	2.40	0.53
1:A:261:LEU:HD12	1:A:264:GLN:NE2	2.22	0.53
1:A:334:ILE:HG13	1:A:495:GLN:HG2	1.91	0.53
1:A:294:GLU:O	1:A:298:VAL:HG23	2.09	0.53
1:A:55:LYS:H	1:A:55:LYS:CD	2.16	0.53
1:A:133:TYR:C	1:A:133:TYR:CD1	2.87	0.53
1:A:496:GLU:HA	1:A:501:THR:HA	1.90	0.53
1:A:444:GLU:HB3	4:A:2296:HOH:O	2.07	0.53
1:A:26:THR:HG22	1:A:246:LEU:HD11	1.90	0.52
1:A:461:SER:HA	3:A:911:WO4:O1	2.08	0.52
1:A:10:ALA:HB1	1:A:238:VAL:HG12	1.91	0.52
1:A:382:MET:HB2	1:A:384:ARG:HG2	1.91	0.51
1:A:212:LEU:HD23	4:A:2173:HOH:O	2.10	0.51
1:A:611:GLY:O	1:A:612:ALA:HB2	2.09	0.51
1:A:407:PRO:HB2	1:A:409:TYR:CE2	2.45	0.51
1:A:178:GLU:HG3	4:A:2141:HOH:O	2.10	0.50
1:A:369:ARG:HD3	1:A:508:ASP:CG	2.36	0.50
1:A:314:GLU:H	1:A:314:GLU:CD	2.19	0.50
1:A:382:MET:HA	1:A:382:MET:HE2	1.93	0.50
1:A:278:GLU:CD	1:A:278:GLU:H	2.20	0.50
1:A:271:LEU:HD21	1:A:321:TYR:HA	1.94	0.49
1:A:446:PRO:HB2	1:A:582:ILE:CD1	2.26	0.49
1:A:700:GLY:H	1:A:703:GLN:CB	2.25	0.49
1:A:523:VAL:HG22	1:A:533:LEU:HD13	1.94	0.49
1:A:388:GLN:C	1:A:389:LEU:HD12	2.38	0.49
1:A:90:ARG:HD2	1:A:90:ARG:N	2.28	0.49
1:A:302:ALA:C	1:A:304:GLU:H	2.22	0.48
1:A:445:PHE:HE1	1:A:575:MET:HE1	1.78	0.48
1:A:291:ARG:NH2	1:A:341:ASP:HA	2.27	0.48
1:A:443:GLU:OE1	1:A:443:GLU:N	2.45	0.48
1:A:580:PRO:HB3	1:A:626:ALA:O	2.13	0.48
1:A:107:ARG:HB3	1:A:108:PRO:HD3	1.95	0.48
1:A:6:HIS:CD2	1:A:250:ALA:HB2	2.49	0.47
1:A:107:ARG:HB3	1:A:108:PRO:CD	2.45	0.46
1:A:291:ARG:O	1:A:295:LEU:HB2	2.15	0.46
1:A:463:SER:O	1:A:466:SER:HB3	2.15	0.46
1:A:278:GLU:CD	1:A:278:GLU:N	2.73	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:427:HIS:HB3	1:A:463:SER:HB3	1.97	0.46
1:A:345:VAL:HG23	1:A:346:THR:HG23	1.96	0.46
1:A:340:ILE:HG12	1:A:340:ILE:O	2.16	0.46
1:A:580:PRO:HB3	1:A:627:ALA:HA	1.97	0.46
1:A:297:ARG:HH11	1:A:297:ARG:HD2	1.60	0.45
1:A:371:GLU:HB2	1:A:459:ASN:HB3	1.98	0.45
1:A:445:PHE:CE1	1:A:575:MET:HE1	2.51	0.45
1:A:349:ARG:HH11	1:A:510:LEU:HD23	1.82	0.45
1:A:349:ARG:NH1	1:A:510:LEU:HD23	2.33	0.44
1:A:322:ARG:NE	1:A:322:ARG:HA	2.33	0.44
1:A:285:ILE:HD12	1:A:291:ARG:HA	2.00	0.43
1:A:301:LEU:HD13	1:A:301:LEU:O	2.19	0.43
1:A:399:ARG:CD	1:A:442:ARG:HG2	2.46	0.43
1:A:299:LYS:HG2	1:A:321:TYR:CZ	2.53	0.43
1:A:612:ALA:O	1:A:614:ILE:N	2.51	0.43
1:A:301:LEU:HD13	1:A:301:LEU:C	2.43	0.42
1:A:333:VAL:O	1:A:337:LYS:HA	2.20	0.42
1:A:58:LYS:HA	1:A:60:GLN:NE2	2.33	0.42
1:A:279:LEU:HG	1:A:328:LEU:HD12	2.02	0.42
1:A:461:SER:CB	1:A:489:ALA:HB2	2.50	0.42
1:A:25:GLU:HG2	1:A:26:THR:N	2.35	0.42
1:A:294:GLU:C	1:A:296:ASP:H	2.28	0.42
1:A:161:VAL:HA	1:A:169:VAL:O	2.20	0.42
1:A:491:GLY:HA3	1:A:509:ILE:HG21	2.01	0.41
1:A:111:LYS:HE2	1:A:259:VAL:HG21	2.02	0.41
1:A:517:GLY:HA3	4:A:2268:HOH:O	2.21	0.41
1:A:275:VAL:O	1:A:276:ARG:C	2.64	0.41
1:A:409:TYR:CD1	1:A:409:TYR:C	2.98	0.41
1:A:604:ASN:O	1:A:605:GLN:C	2.64	0.41
1:A:349:ARG:HH22	1:A:460:GLY:CA	2.16	0.41
1:A:435:ILE:O	1:A:438:VAL:HG22	2.21	0.41
1:A:111:LYS:HE2	1:A:259:VAL:HG22	2.02	0.41
1:A:66:LEU:HD12	1:A:118:ILE:O	2.21	0.41
1:A:363:GLY:HA3	1:A:477:ALA:HB2	2.02	0.41
1:A:521:PHE:CZ	1:A:550:ALA:HB1	2.56	0.41
1:A:629:GLY:N	1:A:630:PRO:CD	2.81	0.41
1:A:205:ALA:HB2	1:A:531:THR:HA	2.02	0.40
1:A:402:HIS:HA	1:A:451:GLN:O	2.21	0.40
1:A:40:TYR:HA	1:A:45:THR:O	2.21	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	631/757 (83%)	577 (91%)	44 (7%)	10 (2%)	7 14

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	459	ASN
1	A	461	SER
1	A	612	ALA
1	A	605	GLN
1	A	633	GLU
1	A	702	GLY
1	A	498	ASN
1	A	713	ASP
1	A	611	GLY
1	A	701	VAL

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	463/597 (78%)	452 (98%)	11 (2%)	43 70

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ASN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	20	ARG
1	A	29	LEU
1	A	55	LYS
1	A	59	ASP
1	A	88	GLU
1	A	111	LYS
1	A	132	LEU
1	A	382	MET
1	A	520	ASP
1	A	581	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	ASN
1	A	6	HIS
1	A	60	GLN
1	A	211	GLN
1	A	264	GLN
1	A	289	GLN
1	A	373	GLN
1	A	388	GLN
1	A	451	GLN
1	A	495	GLN
1	A	578	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)

11 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	SO4	A	902	-	4,4,4	0.26	0	6,6,6	0.06	0
2	SO4	A	904	-	4,4,4	0.29	0	6,6,6	0.06	0
2	SO4	A	908	-	4,4,4	0.26	0	6,6,6	0.04	0
2	SO4	A	906	-	4,4,4	0.23	0	6,6,6	0.05	0
2	SO4	A	901	-	4,4,4	0.28	0	6,6,6	0.06	0
3	WO4	A	911	-	0,4,4	-	-	-		
2	SO4	A	905	-	4,4,4	0.28	0	6,6,6	0.06	0
2	SO4	A	903	-	4,4,4	0.31	0	6,6,6	0.08	0
2	SO4	A	909	-	4,4,4	0.27	0	6,6,6	0.21	0
2	SO4	A	907	-	4,4,4	0.24	0	6,6,6	0.14	0
2	SO4	A	910	-	4,4,4	0.28	0	6,6,6	0.09	0

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.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	911	WO4	1	0
2	A	905	SO4	1	0

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^{th} 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	645/757 (85%)	0.13	59 (9%)	15	13	26, 45, 100, 100	0

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	713	ASP	5.5
1	A	627	ALA	5.2
1	A	659	VAL	5.1
1	A	623	TYR	4.6
1	A	679	HIS	4.5
1	A	708	GLU	4.5
1	A	605	GLN	4.3
1	A	678	LEU	4.2
1	A	714	SER	4.1
1	A	604	ASN	4.0
1	A	657	SER	4.0
1	A	707	VAL	3.9
1	A	286	ALA	3.9
1	A	705	VAL	3.8
1	A	715	ARG	3.8
1	A	634	ALA	3.7
1	A	607	GLN	3.7
1	A	606	ILE	3.7
1	A	585	VAL	3.6
1	A	706	GLN	3.6
1	A	701	VAL	3.5
1	A	710	ALA	3.5
1	A	709	ILE	3.4
1	A	664	PHE	3.4
1	A	699	LEU	3.4
1	A	461	SER	3.3
1	A	675	ASP	3.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	670	LEU	3.3
1	A	663	THR	3.3
1	A	712	ILE	3.2
1	A	717	LYS	3.1
1	A	704	LYS	3.0
1	A	460	GLY	3.0
1	A	624	ILE	3.0
1	A	632	ALA	2.8
1	A	613	GLU	2.8
1	A	610	THR	2.8
1	A	584	THR	2.7
1	A	614	ILE	2.7
1	A	677	LEU	2.6
1	A	671	LEU	2.6
1	A	303	ALA	2.6
1	A	3	ASN	2.5
1	A	661	THR	2.4
1	A	7	TYR	2.4
1	A	608	GLU	2.4
1	A	609	ASP	2.3
1	A	658	VAL	2.3
1	A	582	ILE	2.2
1	A	628	ASP	2.2
1	A	626	ALA	2.2
1	A	611	GLY	2.2
1	A	716	GLY	2.2
1	A	583	ILE	2.2
1	A	87	ARG	2.2
1	A	669	SER	2.1
1	A	630	PRO	2.1
1	A	297	ARG	2.0
1	A	301	LEU	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 oligosaccharides 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^{th} 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(Å^2)	Q<0.9
2	SO4	A	903	5/5	0.64	0.22	57,57,59,61	5
2	SO4	A	905	5/5	0.71	0.23	66,66,67,68	5
2	SO4	A	910	5/5	0.81	0.17	54,57,57,58	5
2	SO4	A	908	5/5	0.84	0.17	54,55,55,55	5
2	SO4	A	904	5/5	0.87	0.11	49,50,52,52	5
2	SO4	A	909	5/5	0.87	0.18	36,38,41,41	5
2	SO4	A	901	5/5	0.87	0.14	59,60,61,61	5
2	SO4	A	907	5/5	0.88	0.18	44,45,46,47	5
2	SO4	A	902	5/5	0.89	0.23	43,43,44,44	5
3	WO4	A	911	5/5	0.91	0.19	72,73,73,74	5
2	SO4	A	906	5/5	0.93	0.15	53,53,53,54	5

6.5 Other polymers (i)

There are no such residues in this entry.