



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:40 PM UTC

PDB ID : 5IZ5 / pdb_00005iz5
Title : Human GIVD cytosolic phospholipase A2
Authors : Wang, H.; Klein, M.G.
Deposited on : 2016-03-24
Resolution : 2.20 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

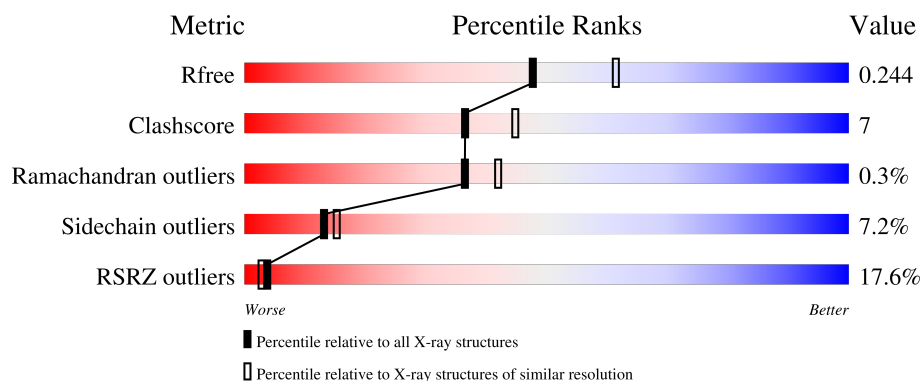
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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 $\leq 5\%$. 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	814	 20% 76% 15% • 7%
1	B	814	 12% 79% 11% • 8%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	SO4	B	907	-	-	X	-
2	SO4	B	909	-	-	X	-
2	SO4	B	910	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 12571 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 Cytosolic phospholipase A2 delta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	B	746	Total	C	N	O	S	0	15	0
			6051	3846	1037	1141	27			
1	A	757	Total	C	N	O	S	0	0	0
			6018	3828	1028	1135	27			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-3	GLY	-	expression tag	UNP Q86XP0
B	-2	ALA	-	expression tag	UNP Q86XP0
B	-1	MET	-	expression tag	UNP Q86XP0
B	0	GLY	-	expression tag	UNP Q86XP0
B	1	SER	-	expression tag	UNP Q86XP0
B	554	ALA	LYS	engineered mutation	UNP Q86XP0
B	555	ALA	ASP	engineered mutation	UNP Q86XP0
B	556	ALA	LYS	engineered mutation	UNP Q86XP0
A	-3	GLY	-	expression tag	UNP Q86XP0
A	-2	ALA	-	expression tag	UNP Q86XP0
A	-1	MET	-	expression tag	UNP Q86XP0
A	0	GLY	-	expression tag	UNP Q86XP0
A	1	SER	-	expression tag	UNP Q86XP0
A	554	ALA	LYS	engineered mutation	UNP Q86XP0
A	555	ALA	ASP	engineered mutation	UNP Q86XP0
A	556	ALA	LYS	engineered mutation	UNP Q86XP0

- Molecule 2 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



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

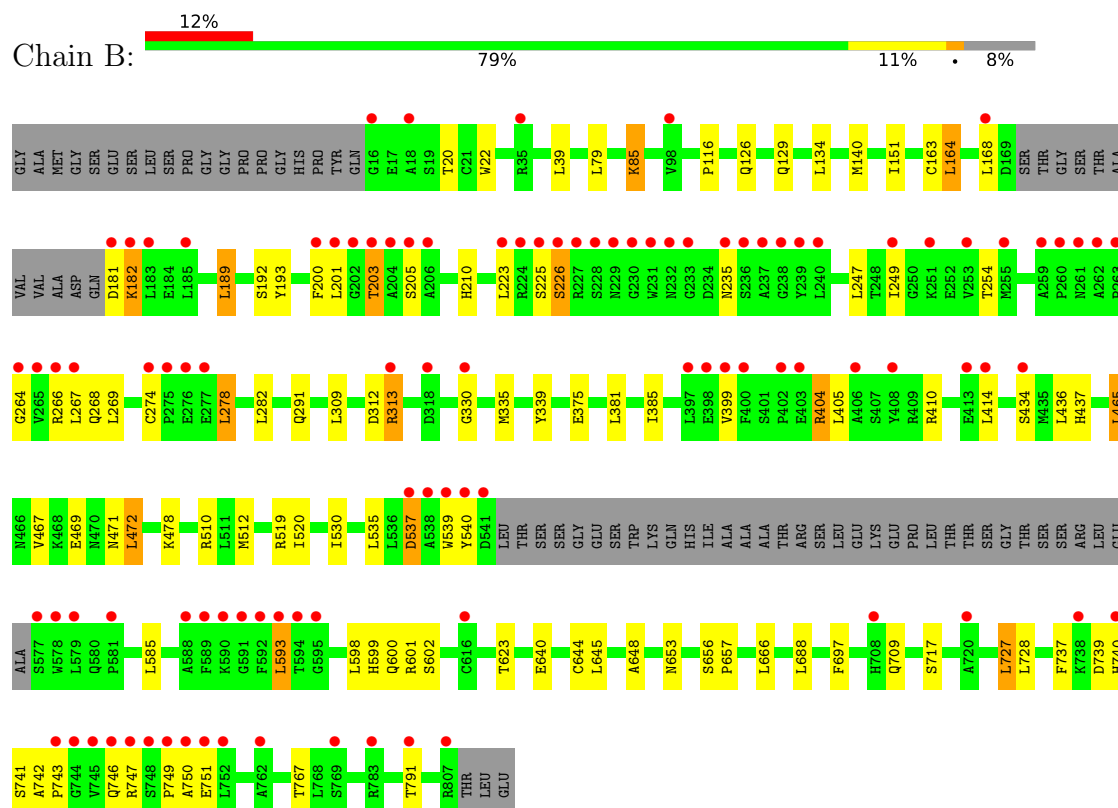
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	257	Total 257	O 257	0	0
3	A	175	Total 175	O 175	0	0

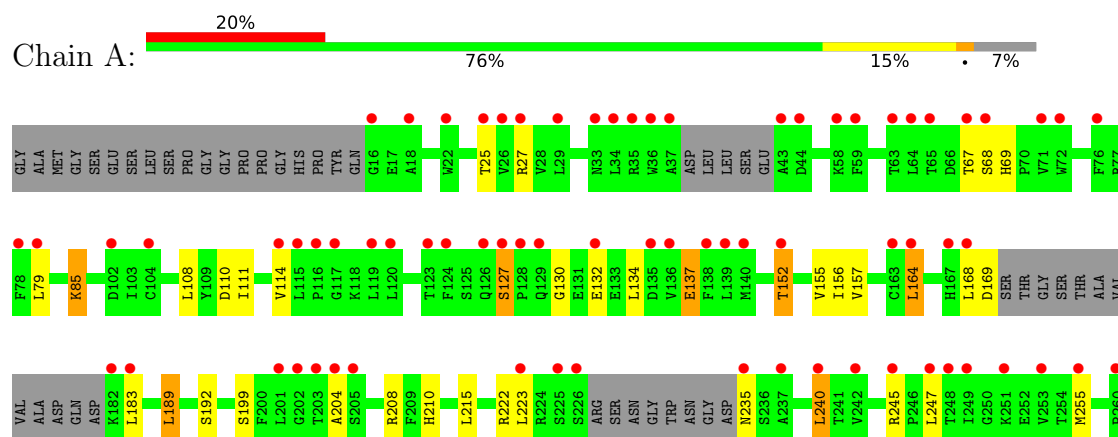
3 Residue-property plots [i](#)

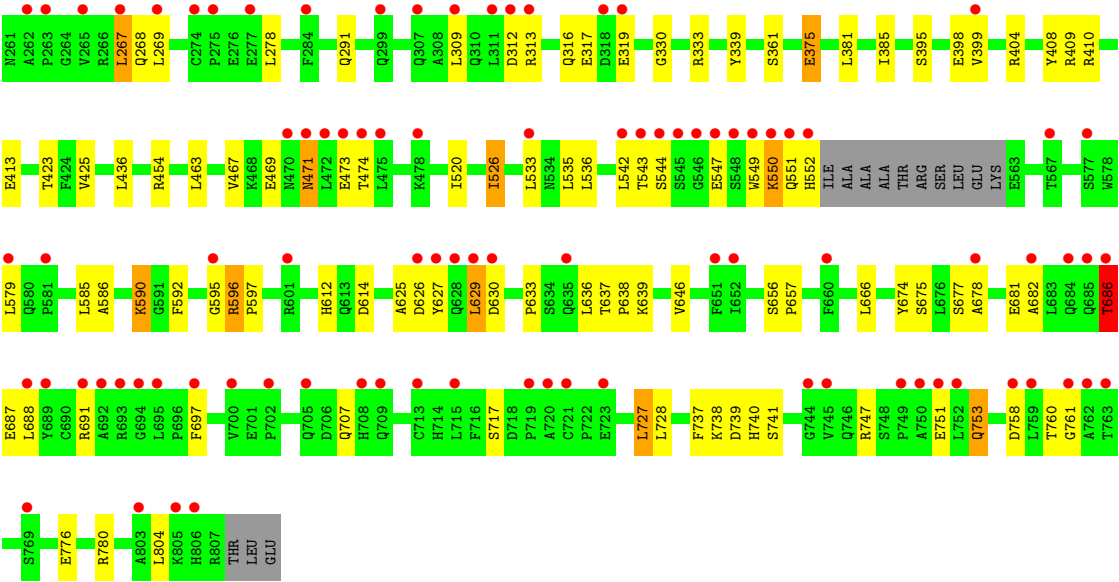
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Cytosolic phospholipase A2 delta



- Molecule 1: Cytosolic phospholipase A2 delta





4 Data and refinement statistics

Property	Value	Source
Space group	P 62	Depositor
Cell constants a, b, c, α , β , γ	180.78Å 180.78Å 133.54Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	156.56 – 2.20 156.56 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.7 (156.56-2.20) 99.7 (156.56-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.15 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.8.0049	Depositor
R, R_{free}	0.223 , 0.238 0.228 , 0.244	Depositor DCC
R_{free} test set	6282 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	44.4	Xtriage
Anisotropy	0.048	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 37.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	0.020 for h,-h-k,-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12571	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.21% 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

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

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	0.47	0/6160	0.76	5/8358 (0.1%)
1	B	0.47	0/6196	0.74	0/8410
All	All	0.47	0/12356	0.75	5/16768 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
All	All	0	2

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	596	ARG	N-CA-C	5.79	118.28	110.29
1	A	526	ILE	CB-CA-C	-5.63	104.76	111.97
1	A	686	THR	N-CA-CB	5.59	118.33	110.12
1	A	473	GLU	N-CA-C	-5.38	103.28	110.55
1	A	760	THR	N-CA-C	5.09	121.65	110.80

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	595	GLY	Peptide

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Mol	Chain	Res	Type	Group
1	B	313	ARG	Peptide

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	6018	0	5922	87	0
1	B	6051	0	5946	88	0
2	A	20	0	0	1	0
2	B	50	0	0	12	0
3	A	175	0	0	13	1
3	B	257	0	0	11	0
All	All	12571	0	11868	172	1

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 7.

All (172) 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:740[B]:HIS:CA	1:B:747[B]:ARG:HD2	1.60	1.29
1:B:740[B]:HIS:C	1:B:747[B]:ARG:HD2	1.62	1.24
1:B:740[B]:HIS:C	1:B:747[B]:ARG:CD	2.16	1.19
1:A:333:ARG:NH1	1:A:674:TYR:O	1.86	1.06
1:B:740[B]:HIS:HA	1:B:747[B]:ARG:HD2	1.38	1.06
1:B:740[B]:HIS:CA	1:B:747[B]:ARG:CD	2.36	1.04
1:A:404:ARG:HB3	3:A:1007:HOH:O	1.63	0.97
1:B:540:TYR:OH	1:B:593:LEU:CD1	2.13	0.96
1:B:510:ARG:NH1	3:B:1001:HOH:O	1.82	0.94
1:B:602:SER:N	2:B:909:SO4:O3	2.05	0.88
1:A:737:PHE:O	2:A:904:SO4:O2	1.93	0.86
1:B:767:THR:HG22	3:B:1111:HOH:O	1.75	0.86
1:A:469:GLU:O	1:A:471:ASN:ND2	2.09	0.86
1:B:740[B]:HIS:N	1:B:747[B]:ARG:HD3	1.92	0.84
1:A:761:GLY:N	3:A:1001:HOH:O	2.11	0.83
1:B:737:PHE:O	1:B:747[A]:ARG:NH1	2.11	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:540:TYR:OH	1:B:593:LEU:HD12	1.80	0.81
1:B:740[B]:HIS:N	1:B:747[B]:ARG:CD	2.44	0.80
1:B:274:CYS:SG	3:B:1007:HOH:O	2.41	0.79
1:B:537:ASP:HA	1:B:540:TYR:CE1	2.18	0.78
1:A:758:ASP:OD1	3:A:1001:HOH:O	2.01	0.77
1:A:675:SER:OG	1:A:677:SER:O	2.04	0.76
1:B:140:MET:HG2	3:B:1156:HOH:O	1.84	0.75
1:B:749[A]:PRO:O	1:B:750[A]:ALA:HB3	1.87	0.74
1:A:409:ARG:NH1	1:A:413:GLU:OE2	2.21	0.74
1:A:626:ASP:N	1:A:630:ASP:OD2	2.21	0.74
1:B:740[B]:HIS:C	1:B:747[B]:ARG:NE	2.46	0.73
1:B:540:TYR:OH	1:B:593:LEU:HD11	1.88	0.73
1:B:741[B]:SER:N	1:B:747[B]:ARG:HD2	2.04	0.72
1:A:152:THR:HG21	1:A:612:HIS:HD2	1.55	0.72
1:B:749[A]:PRO:O	1:B:750[A]:ALA:CB	2.39	0.71
1:B:739[B]:ASP:O	1:B:747[B]:ARG:HG2	1.91	0.71
1:A:152:THR:HG23	1:A:157:VAL:HG22	1.74	0.70
1:B:163:CYS:HG	1:B:274:CYS:HG	1.38	0.70
1:B:510:ARG:NH2	3:B:1005:HOH:O	2.26	0.69
1:A:199:SER:OG	1:A:204:ALA:HB3	1.93	0.69
1:A:747:ARG:HG3	1:A:751:GLU:HB2	1.74	0.68
1:B:640:GLU:OE1	3:B:1002:HOH:O	2.09	0.68
2:B:905:SO4:O1	1:A:596:ARG:NH2	2.28	0.67
1:B:200:PHE:O	1:B:203:THR:HG22	1.94	0.67
1:A:592:PHE:O	1:A:596:ARG:NH1	2.29	0.66
1:B:645:LEU:N	2:B:909:SO4:O2	2.27	0.66
1:A:319:GLU:OE2	1:A:804:LEU:O	2.14	0.66
1:A:408:TYR:CZ	3:A:1007:HOH:O	2.47	0.65
1:B:599:HIS:HD2	1:B:600:GLN:O	1.80	0.65
1:A:111:ILE:O	1:A:114:VAL:HG12	1.96	0.65
1:B:742[A]:ALA:HB1	1:B:743[A]:PRO:HD2	1.80	0.64
1:B:339:TYR:OH	2:B:910:SO4:O1	2.13	0.64
1:B:181:ASP:N	1:B:201:LEU:HB2	2.12	0.64
1:A:199:SER:OG	1:A:204:ALA:CB	2.45	0.64
1:A:549:TRP:O	1:A:551:GLN:N	2.31	0.64
1:A:69:HIS:O	1:A:69:HIS:CG	2.51	0.62
1:B:193:TYR:CD2	1:B:512:MET:HE2	2.33	0.62
1:B:381:LEU:O	1:B:385:ILE:HG12	2.00	0.62
1:B:741[B]:SER:CA	1:B:747[B]:ARG:HE	2.13	0.62
1:A:630:ASP:HA	1:A:636:LEU:HD21	1.80	0.62
1:A:381:LEU:O	1:A:385:ILE:HG12	1.99	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:519:ARG:NH1	2:B:907:SO4:O1	2.29	0.60
1:A:425:VAL:HG11	1:A:526:ILE:HD13	1.83	0.59
1:B:168:LEU:O	1:B:266:ARG:O	2.22	0.58
1:B:85:LYS:HE3	3:B:1037:HOH:O	2.02	0.58
1:B:537:ASP:HA	1:B:540:TYR:CD1	2.38	0.58
1:B:741[B]:SER:N	1:B:747[B]:ARG:NE	2.52	0.57
1:B:741[B]:SER:N	1:B:747[B]:ARG:CD	2.65	0.57
1:B:335:MET:SD	2:B:910:SO4:O2	2.63	0.57
1:B:740[A]:HIS:HB3	1:B:742[A]:ALA:O	2.03	0.57
1:A:152:THR:CG2	1:A:157:VAL:HG22	2.34	0.57
1:A:168:LEU:HD13	1:A:267:LEU:CD1	2.35	0.57
1:B:182:LYS:HD3	1:B:182:LYS:H	1.69	0.56
1:B:741[B]:SER:HB3	1:B:747[B]:ARG:HE	1.71	0.56
1:B:741[B]:SER:N	1:B:747[B]:ARG:HE	2.04	0.56
1:A:471:ASN:HB3	3:A:1119:HOH:O	2.05	0.56
1:B:210:HIS:ND1	1:B:512:MET:HE1	2.21	0.55
1:B:601:ARG:HB3	2:B:909:SO4:O3	2.07	0.54
1:B:291:GLN:HG2	3:B:1246:HOH:O	2.06	0.54
1:B:478:LYS:NZ	1:A:413:GLU:OE2	2.41	0.53
1:B:697:PHE:CE1	1:B:727:LEU:HD11	2.45	0.52
1:A:395:SER:O	1:A:399:VAL:HG23	2.10	0.52
1:B:535:LEU:HD12	3:B:1236:HOH:O	2.10	0.51
1:A:586:ALA:O	1:A:590:LYS:HB2	2.10	0.51
1:A:682:ALA:O	1:A:686:THR:HG22	2.10	0.51
1:B:339:TYR:HB3	1:B:385:ILE:CD1	2.40	0.51
1:A:27:ARG:HB3	1:A:137:GLU:HG3	1.91	0.51
1:A:535:LEU:HA	1:A:579:LEU:HD11	1.93	0.51
1:B:399:VAL:HA	1:B:404:ARG:HG2	1.93	0.51
1:A:474:THR:HG22	1:A:629:LEU:HD11	1.92	0.50
1:A:678:ALA:HB1	1:A:681:GLU:HB2	1.92	0.50
1:A:152:THR:HG22	1:A:156:ILE:O	2.11	0.50
1:A:375:GLU:HG3	3:A:1148:HOH:O	2.12	0.50
1:A:682:ALA:O	1:A:686:THR:CG2	2.60	0.50
1:A:339:TYR:HB3	1:A:385:ILE:CD1	2.42	0.50
1:B:20:THR:HG23	3:B:1060:HOH:O	2.12	0.50
1:B:225:SER:HB3	1:B:235:ASN:HD22	1.76	0.49
1:B:740[B]:HIS:C	1:B:747[B]:ARG:HD3	2.26	0.49
1:B:85:LYS:CE	3:B:1037:HOH:O	2.59	0.49
1:B:602:SER:OG	2:B:909:SO4:O4	2.28	0.49
1:B:741[B]:SER:CB	1:B:747[B]:ARG:HE	2.25	0.49
1:A:152:THR:HG21	1:A:612:HIS:CD2	2.42	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:434:SER:O	1:B:437:HIS:O	2.31	0.49
1:B:645:LEU:HD12	2:B:909:SO4:O4	2.13	0.49
1:B:739[B]:ASP:C	1:B:747[B]:ARG:CD	2.86	0.49
1:A:67:THR:O	1:A:68:SER:HB3	2.11	0.49
1:A:776:GLU:HB2	3:A:1155:HOH:O	2.13	0.48
1:A:423:THR:HG22	1:A:597:PRO:HG2	1.95	0.48
1:A:753:GLN:O	1:A:780:ARG:NH1	2.46	0.48
1:A:168:LEU:HD13	1:A:267:LEU:HD11	1.94	0.48
1:A:375:GLU:CD	1:A:454:ARG:HH22	2.19	0.48
1:B:254:THR:OG1	1:B:268:GLN:NE2	2.41	0.47
1:B:519:ARG:HD3	2:B:907:SO4:O1	2.14	0.47
1:B:182:LYS:HD3	1:B:182:LYS:N	2.28	0.47
1:B:540:TYR:CZ	1:B:593:LEU:HD11	2.50	0.47
1:A:164:LEU:HD12	1:A:164:LEU:C	2.39	0.47
1:A:469:GLU:C	1:A:471:ASN:ND2	2.72	0.46
1:A:164:LEU:HD12	1:A:164:LEU:O	2.16	0.46
1:B:465:LEU:HD22	1:B:648:ALA:HA	1.97	0.46
1:A:268:GLN:OE1	3:A:1002:HOH:O	2.21	0.46
1:A:627:TYR:CD2	1:A:627:TYR:C	2.94	0.46
1:B:151:ILE:HD13	1:B:278:LEU:HD22	1.98	0.46
1:A:208:ARG:HG2	1:A:210:HIS:CE1	2.52	0.45
1:A:625:ALA:HA	1:A:630:ASP:OD2	2.16	0.45
1:B:472:LEU:O	1:A:409:ARG:NH2	2.48	0.45
1:B:739[B]:ASP:C	1:B:747[B]:ARG:HG2	2.40	0.45
1:A:291:GLN:HG2	3:A:1167:HOH:O	2.15	0.45
1:B:151:ILE:CD1	1:B:278:LEU:HD22	2.46	0.45
1:B:530:ILE:O	1:B:539:TRP:NE1	2.50	0.45
1:A:85:LYS:HG2	1:A:633:PRO:HG3	1.98	0.45
1:A:240:LEU:HD12	1:A:255:MET:SD	2.56	0.45
1:A:189:LEU:HG	1:A:192:SER:HB3	1.98	0.45
1:B:656:SER:N	1:B:657:PRO:CD	2.79	0.45
1:A:542:LEU:HD23	1:A:542:LEU:HA	1.91	0.45
1:A:536:LEU:HD21	1:A:542:LEU:HD12	1.98	0.44
1:A:164:LEU:C	1:A:164:LEU:CD1	2.90	0.44
1:A:656:SER:N	1:A:657:PRO:CD	2.81	0.44
1:B:189:LEU:HG	1:B:192:SER:HB3	1.99	0.44
1:A:533:LEU:C	1:A:533:LEU:HD23	2.42	0.44
1:A:25:THR:HG23	3:A:1075:HOH:O	2.17	0.44
1:B:163:CYS:SG	1:B:274:CYS:SG	3.02	0.44
1:A:739:ASP:HB2	1:A:740:HIS:ND1	2.33	0.44
1:B:740[B]:HIS:O	1:B:747[B]:ARG:CD	2.63	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:85:LYS:NZ	1:A:110:ASP:OD1	2.30	0.43
1:A:245:ARG:NH1	3:A:1019:HOH:O	2.52	0.43
1:A:596:ARG:HG2	3:A:1079:HOH:O	2.18	0.43
1:A:697:PHE:CE1	1:A:727:LEU:HD11	2.53	0.43
1:B:747[B]:ARG:HG2	1:B:747[B]:ARG:H	1.55	0.43
1:A:474:THR:CG2	1:A:629:LEU:HD11	2.48	0.42
1:B:644:CYS:HA	2:B:909:SO4:O2	2.19	0.42
1:A:637:THR:N	1:A:638:PRO:CD	2.83	0.42
1:A:550:LYS:O	1:A:552:HIS:CD2	2.73	0.42
1:A:687:GLU:OE2	1:A:691:ARG:NH1	2.52	0.42
1:A:127:SER:OG	1:A:130:GLY:N	2.52	0.42
1:B:740[B]:HIS:HA	1:B:747[B]:ARG:CD	2.26	0.41
1:A:168:LEU:HD12	1:A:169:ASP:N	2.36	0.41
1:A:549:TRP:CE3	1:A:550:LYS:N	2.88	0.41
1:A:549:TRP:HE3	1:A:551:GLN:CB	2.33	0.41
1:B:601:ARG:CB	2:B:909:SO4:O3	2.67	0.41
1:B:751[B]:GLU:O	1:B:751[B]:GLU:HG2	2.20	0.41
1:A:316:GLN:HG2	1:A:319:GLU:HB2	2.03	0.41
1:A:741:SER:HB3	1:A:747:ARG:HG2	2.02	0.41
1:B:182:LYS:O	1:B:226:SER:OG	2.32	0.41
1:A:739:ASP:HB2	1:A:740:HIS:CE1	2.55	0.41
1:B:164:LEU:C	1:B:164:LEU:HD13	2.46	0.41
1:A:398:GLU:HB3	3:A:1107:HOH:O	2.19	0.41
1:A:747:ARG:HG3	1:A:751:GLU:CB	2.47	0.41
1:A:747:ARG:CZ	1:A:751:GLU:HG3	2.51	0.41
1:B:168:LEU:HD12	1:B:205:SER:HA	2.03	0.41
1:B:653:ASN:HB2	1:A:410:ARG:CD	2.51	0.41
1:A:79:LEU:HD12	1:A:79:LEU:HA	1.96	0.41
1:A:316:GLN:OE1	1:A:316:GLN:N	2.23	0.41
1:B:22:TRP:CZ3	1:B:116:PRO:HB3	2.56	0.40
1:B:539:TRP:CE3	1:B:539:TRP:HA	2.56	0.40
1:B:739[B]:ASP:O	1:B:746[B]:GLN:HG3	2.21	0.40
1:A:111:ILE:O	1:A:114:VAL:CG1	2.67	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:1015:HOH:O	3:A:1100:HOH:O[3_455]	1.77	0.43

5.3 Torsion angles

5.3.1 Protein backbone

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	747/814 (92%)	723 (97%)	22 (3%)	2 (0%)	36	42
1	B	755/814 (93%)	733 (97%)	20 (3%)	2 (0%)	36	42
All	All	1502/1628 (92%)	1456 (97%)	42 (3%)	4 (0%)	36	42

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	264	GLY
1	A	550	LYS
1	B	330	GLY
1	A	330	GLY

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	659/702 (94%)	610 (93%)	49 (7%)	13	14
1	B	661/702 (94%)	616 (93%)	45 (7%)	14	17
All	All	1320/1404 (94%)	1226 (93%)	94 (7%)	13	16

All (94) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	39	LEU
1	B	79	LEU

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Mol	Chain	Res	Type
1	B	85	LYS
1	B	126	GLN
1	B	129	GLN
1	B	134	LEU
1	B	164	LEU
1	B	182	LYS
1	B	189	LEU
1	B	203	THR
1	B	223	LEU
1	B	226	SER
1	B	247	LEU
1	B	249	ILE
1	B	267	LEU
1	B	269	LEU
1	B	278	LEU
1	B	282	LEU
1	B	309	LEU
1	B	312	ASP
1	B	313	ARG
1	B	375	GLU
1	B	404	ARG
1	B	405	LEU
1	B	410	ARG
1	B	414	LEU
1	B	436	LEU
1	B	465	LEU
1	B	467	VAL
1	B	469	GLU
1	B	471	ASN
1	B	472	LEU
1	B	520	ILE
1	B	537	ASP
1	B	585	LEU
1	B	593	LEU
1	B	598	LEU
1	B	623	THR
1	B	666	LEU
1	B	688	LEU
1	B	709	GLN
1	B	717	SER
1	B	727	LEU
1	B	728	LEU

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Mol	Chain	Res	Type
1	B	791	THR
1	A	85	LYS
1	A	108	LEU
1	A	127	SER
1	A	132	GLU
1	A	134	LEU
1	A	137	GLU
1	A	152	THR
1	A	155	VAL
1	A	164	LEU
1	A	183	LEU
1	A	189	LEU
1	A	215	LEU
1	A	222	ARG
1	A	223	LEU
1	A	235	ASN
1	A	240	LEU
1	A	247	LEU
1	A	267	LEU
1	A	269	LEU
1	A	278	LEU
1	A	309	LEU
1	A	312	ASP
1	A	313	ARG
1	A	317	GLU
1	A	361	SER
1	A	375	GLU
1	A	436	LEU
1	A	463	LEU
1	A	467	VAL
1	A	471	ASN
1	A	520	ILE
1	A	543	THR
1	A	544	SER
1	A	547	GLU
1	A	585	LEU
1	A	590	LYS
1	A	614	ASP
1	A	629	LEU
1	A	639	LYS
1	A	646	VAL
1	A	666	LEU

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Mol	Chain	Res	Type
1	A	686	THR
1	A	688	LEU
1	A	707	GLN
1	A	717	SER
1	A	727	LEU
1	A	728	LEU
1	A	738	LYS
1	A	753	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	33	ASN
1	B	167	HIS
1	B	268	GLN
1	B	281	HIS
1	B	599	HIS
1	B	628	GLN
1	B	705	GLN
1	B	806	HIS
1	A	23	GLN
1	A	73	ASN
1	A	167	HIS
1	A	341	HIS
1	A	471	ASN
1	A	552	HIS
1	A	705	GLN
1	A	707	GLN
1	A	708	HIS
1	A	746	GLN
1	A	753	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

There are no oligosaccharides in this entry.

5.6 Ligand geometry

14 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	901	-	4,4,4	0.44	0	6,6,6	0.05	0
2	SO4	B	906	-	4,4,4	0.43	0	6,6,6	0.09	0
2	SO4	B	901	-	4,4,4	0.42	0	6,6,6	0.12	0
2	SO4	B	909	-	4,4,4	0.31	0	6,6,6	0.21	0
2	SO4	B	905	-	4,4,4	0.42	0	6,6,6	0.11	0
2	SO4	A	902	-	4,4,4	0.40	0	6,6,6	0.16	0
2	SO4	A	904	-	4,4,4	0.42	0	6,6,6	0.25	0
2	SO4	A	903	-	4,4,4	0.44	0	6,6,6	0.11	0
2	SO4	B	904	-	4,4,4	0.44	0	6,6,6	0.09	0
2	SO4	B	907	-	4,4,4	0.46	0	6,6,6	0.22	0
2	SO4	B	908	-	4,4,4	0.49	0	6,6,6	0.15	0
2	SO4	B	910	-	4,4,4	0.43	0	6,6,6	0.19	0
2	SO4	B	903	-	4,4,4	0.43	0	6,6,6	0.14	0
2	SO4	B	902	-	4,4,4	0.45	0	6,6,6	0.13	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.

5 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	909	SO4	7	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	905	SO4	1	0
2	A	904	SO4	1	0
2	B	907	SO4	2	0
2	B	910	SO4	2	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, 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	757/814 (92%)	1.18	164 (21%) 2 1	34, 56, 94, 131	0
1	B	746/814 (91%)	0.81	101 (13%) 7 5	29, 45, 92, 116	15 (2%)
All	All	1503/1628 (92%)	1.00	265 (17%) 4 3	29, 51, 93, 131	15 (0%)

All (265) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	743[A]	PRO	10.9
1	B	744[A]	GLY	10.4
1	B	591	GLY	7.9
1	A	475	LEU	7.8
1	A	549	TRP	6.5
1	A	36	TRP	6.3
1	B	231	TRP	6.0
1	B	578	TRP	6.0
1	B	745[A]	VAL	5.9
1	B	593	LEU	5.9
1	B	749[A]	PRO	5.8
1	B	540	TYR	5.6
1	A	629	LEU	5.5
1	B	262	ALA	5.3
1	B	400	PHE	5.1
1	B	261	ASN	5.1
1	B	265	VAL	5.1
1	B	239	TYR	4.9
1	B	592	PHE	4.9
1	A	255	MET	4.8
1	B	274	CYS	4.7
1	A	37	ALA	4.7
1	A	472	LEU	4.5
1	B	168	LEU	4.4

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Mol	Chain	Res	Type	RSRZ
1	A	128	PRO	4.3
1	A	64	LEU	4.3
1	A	626	ASP	4.3
1	A	627	TYR	4.3
1	B	260	PRO	4.2
1	A	204	ALA	4.2
1	A	720	ALA	4.2
1	A	168	LEU	4.2
1	B	264	GLY	4.1
1	B	230	GLY	4.1
1	B	235	ASN	4.0
1	A	651	PHE	4.0
1	A	546	GLY	4.0
1	A	68	SER	4.0
1	A	29	LEU	4.0
1	B	746[A]	GLN	4.0
1	A	22	TRP	3.9
1	B	233	GLY	3.9
1	B	537	ASP	3.9
1	A	548	SER	3.9
1	A	34	LEU	3.9
1	B	249	ILE	3.9
1	B	204	ALA	3.9
1	B	275	PRO	3.8
1	A	319	GLU	3.8
1	B	577	SER	3.8
1	B	238	GLY	3.8
1	B	399	VAL	3.8
1	A	474	THR	3.7
1	B	539	TRP	3.7
1	A	806	HIS	3.7
1	A	248	THR	3.7
1	A	552	HIS	3.6
1	A	551	GLN	3.5
1	A	203	THR	3.5
1	B	588	ALA	3.5
1	B	228	SER	3.5
1	A	686	THR	3.5
1	A	249	ILE	3.5
1	B	769	SER	3.4
1	A	71	VAL	3.4
1	B	16	GLY	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	263	PRO	3.4
1	A	140	MET	3.4
1	A	163	CYS	3.4
1	A	253	VAL	3.3
1	A	119	LEU	3.3
1	A	43	ALA	3.3
1	B	595	GLY	3.2
1	A	542	LEU	3.2
1	B	205	SER	3.2
1	B	747[A]	ARG	3.2
1	B	397	LEU	3.2
1	A	749	PRO	3.2
1	A	114	VAL	3.2
1	A	117	GLY	3.2
1	B	183	LEU	3.2
1	A	65	THR	3.2
1	A	544	SER	3.1
1	B	541	ASP	3.1
1	A	744	GLY	3.1
1	B	589	PHE	3.1
1	A	713	CYS	3.1
1	B	538	ALA	3.1
1	B	751[A]	GLU	3.0
1	A	277	GLU	3.0
1	A	652	ILE	3.0
1	A	205	SER	3.0
1	B	752[A]	LEU	3.0
1	A	25	THR	3.0
1	A	689	TYR	3.0
1	A	274	CYS	3.0
1	B	402	PRO	3.0
1	A	635	GLN	2.9
1	A	152	THR	2.9
1	B	259	ALA	2.9
1	A	18	ALA	2.9
1	A	251	LYS	2.9
1	B	579	LEU	2.9
1	A	78	PHE	2.9
1	A	695	LEU	2.9
1	B	398	GLU	2.9
1	A	182	LYS	2.8
1	B	413	GLU	2.8

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Mol	Chain	Res	Type	RSRZ
1	A	318	ASP	2.8
1	A	129	GLN	2.8
1	A	311	LEU	2.8
1	A	678	ALA	2.8
1	A	104	CYS	2.8
1	A	545	SER	2.8
1	A	577	SER	2.8
1	A	719	PRO	2.8
1	B	185	LEU	2.8
1	A	35	ARG	2.8
1	A	708	HIS	2.7
1	A	202	GLY	2.7
1	A	595	GLY	2.7
1	A	16	GLY	2.7
1	A	72	TRP	2.7
1	A	693	ARG	2.7
1	B	237	ALA	2.7
1	A	762	ALA	2.7
1	B	182	LYS	2.7
1	A	245	ARG	2.7
1	A	235	ASN	2.6
1	A	115	LEU	2.6
1	A	685	GLN	2.6
1	B	807	ARG	2.6
1	A	745	VAL	2.6
1	A	127	SER	2.6
1	B	223	LEU	2.6
1	B	276	GLU	2.6
1	A	547	GLU	2.6
1	A	601	ARG	2.6
1	A	697	PHE	2.6
1	B	590	LYS	2.5
1	A	136	VAL	2.5
1	B	783	ARG	2.5
1	A	223	LEU	2.5
1	A	269	LEU	2.5
1	A	135	ASP	2.5
1	B	330	GLY	2.5
1	B	594	THR	2.5
1	A	763	THR	2.5
1	A	226	SER	2.5
1	A	751	GLU	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	227	ARG	2.5
1	B	255	MET	2.5
1	A	630	ASP	2.5
1	A	682	ALA	2.5
1	A	263	PRO	2.5
1	A	63	THR	2.5
1	A	126	GLN	2.5
1	B	236	SER	2.5
1	B	35	ARG	2.5
1	A	471	ASN	2.5
1	B	18	ALA	2.5
1	A	692	ALA	2.5
1	A	750	ALA	2.5
1	B	791	THR	2.4
1	A	124	PHE	2.4
1	A	267	LEU	2.4
1	A	688	LEU	2.4
1	B	740[A]	HIS	2.4
1	A	167	HIS	2.4
1	A	242	VAL	2.4
1	A	265	VAL	2.4
1	A	478	LYS	2.4
1	B	414	LEU	2.4
1	A	579	LEU	2.4
1	A	752	LEU	2.4
1	A	313	ARG	2.4
1	A	44	ASP	2.4
1	A	543	THR	2.4
1	B	408	TYR	2.3
1	A	139	LEU	2.3
1	A	550	LYS	2.3
1	A	702	PRO	2.3
1	B	226	SER	2.3
1	B	708	HIS	2.3
1	A	59	PHE	2.3
1	A	307	GLN	2.3
1	A	183	LEU	2.3
1	A	201	LEU	2.3
1	A	240	LEU	2.3
1	A	132	GLU	2.3
1	A	684	GLN	2.3
1	B	253	VAL	2.3

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Mol	Chain	Res	Type	RSRZ
1	A	102	ASP	2.3
1	B	720	ALA	2.3
1	A	237	ALA	2.3
1	B	201	LEU	2.2
1	B	240	LEU	2.2
1	A	138	PHE	2.2
1	A	700	VAL	2.3
1	B	232	ASN	2.2
1	B	616	CYS	2.2
1	A	470	ASN	2.2
1	A	116	PRO	2.2
1	A	691	ARG	2.2
1	B	203	THR	2.2
1	A	123	THR	2.2
1	A	225	SER	2.2
1	A	26	VAL	2.2
1	A	120	LEU	2.2
1	B	318	ASP	2.2
1	A	758	ASP	2.2
1	B	313	ARG	2.2
1	A	694	GLY	2.2
1	A	761	GLY	2.2
1	A	628	GLN	2.2
1	B	406	ALA	2.2
1	A	567	THR	2.2
1	A	33	ASN	2.2
1	A	275	PRO	2.2
1	B	277	GLU	2.2
1	A	805	LYS	2.2
1	B	225	SER	2.2
1	A	67	THR	2.2
1	A	309	LEU	2.2
1	A	399	VAL	2.2
1	B	181	ASP	2.1
1	B	202	GLY	2.1
1	A	262	ALA	2.1
1	A	312	ASP	2.1
1	B	581	PRO	2.1
1	A	660	PHE	2.1
1	A	705	GLN	2.1
1	A	709	GLN	2.1
1	A	803	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	267	LEU	2.1
1	B	403	GLU	2.1
1	A	260	PRO	2.1
1	A	76	PHE	2.1
1	A	27	ARG	2.1
1	B	434	SER	2.1
1	B	206	ALA	2.1
1	A	723	GLU	2.1
1	A	79	LEU	2.1
1	A	247	LEU	2.1
1	A	299	GLN	2.1
1	A	715	LEU	2.1
1	A	581	PRO	2.1
1	B	98	VAL	2.1
1	B	200	PHE	2.1
1	A	58	LYS	2.0
1	B	748[A]	SER	2.0
1	A	769	SER	2.0
1	B	750[A]	ALA	2.0
1	A	473	GLU	2.0
1	B	229	ASN	2.0
1	A	164	LEU	2.0
1	A	533	LEU	2.0
1	A	759	LEU	2.0
1	A	284	PHE	2.0
1	B	762	ALA	2.0
1	A	721	CYS	2.0
1	B	224	ARG	2.0
1	B	266	ARG	2.0
1	B	251	LYS	2.0
1	B	738[A]	LYS	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

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, 95th 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	B	906	5/5	0.55	0.17	120,122,123,124	0
2	SO4	B	908	5/5	0.74	0.12	71,75,78,78	0
2	SO4	A	904	5/5	0.74	0.15	98,103,105,107	0
2	SO4	B	904	5/5	0.75	0.15	91,91,92,95	0
2	SO4	B	903	5/5	0.77	0.17	81,89,90,91	0
2	SO4	A	901	5/5	0.81	0.15	120,121,123,123	0
2	SO4	B	902	5/5	0.81	0.10	89,90,92,93	0
2	SO4	A	903	5/5	0.83	0.11	83,84,85,85	0
2	SO4	B	907	5/5	0.83	0.12	66,71,75,77	0
2	SO4	B	901	5/5	0.85	0.11	76,76,78,80	0
2	SO4	A	902	5/5	0.87	0.10	78,80,83,88	0
2	SO4	B	905	5/5	0.89	0.09	76,79,80,80	0
2	SO4	B	910	5/5	0.90	0.41	64,65,66,66	5
2	SO4	B	909	5/5	0.95	0.22	26,32,33,34	5

6.5 Other polymers

There are no such residues in this entry.