



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 6, 2021 – 06:10 am BST

PDB ID : 7AL8
Title : Structure of ATSI with bovine trypsin
Authors : Reverter, D.; Covaleda, G.
Deposited on : 2020-10-05
Resolution : 2.85 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 : 2.23.2
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.23.2

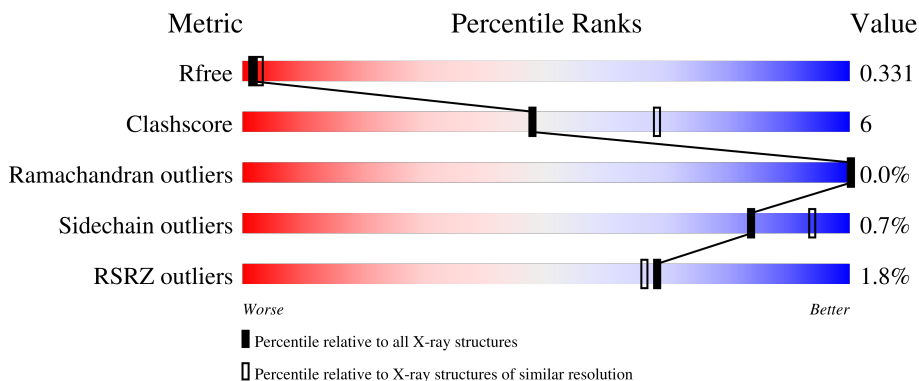
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.85 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.





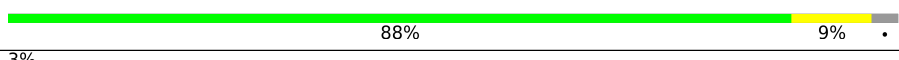
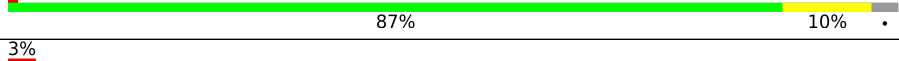

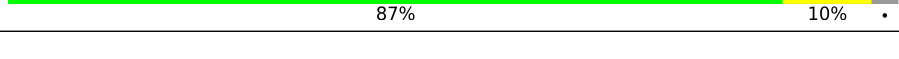
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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	B	223	 3% 89% 11%
1	E	223	 3% 87% 13%
1	H	223	 85% 15%
1	K	223	 89% 11%
1	N	223	 3% 87% 13%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	Q	223	 % 86% 14%
1	T	223	 4% 83% 17%
1	U	223	 % 85% 14%
2	C	69	 % 93%
2	F	69	 88% 9%
2	I	69	 3% 74% 23%
2	L	69	 87% 10%
2	O	69	 % 87% 10%
2	R	69	 3% 81% 16%
2	V	69	 87% 10%
2	X	69	 87% 10%

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
3	SO4	I	101	-	-	X	-
3	SO4	V	101	-	-	X	-
3	SO4	V	102	-	-	X	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 17481 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 Cationic trypsin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	U	223	1629	1012	279	324	14	0	0	0
1	B	223	1629	1012	279	324	14	0	0	0
1	E	223	1629	1012	279	324	14	0	0	0
1	H	223	1629	1012	279	324	14	0	0	0
1	K	223	1629	1012	279	324	14	0	0	0
1	N	223	1629	1012	279	324	14	0	0	0
1	Q	223	1629	1012	279	324	14	0	0	0
1	T	223	1629	1012	279	324	14	0	0	0

- Molecule 2 is a protein called Trypsin/subtilisin inhibitor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	X	67	540	339	99	100	2	0	0	0
2	C	67	540	339	99	100	2	0	0	0
2	F	67	540	339	99	100	2	0	0	0
2	I	67	540	339	99	100	2	0	0	0
2	L	67	540	339	99	100	2	0	0	0
2	O	67	540	339	99	100	2	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	R	67	Total	C	N	O	S	0	0	0
			540	339	99	100	2			
2	V	67	Total	C	N	O	S	0	0	0
			540	339	99	100	2			

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	U	1	Total	O	S	0	0
			5	4	1		
3	X	1	Total	O	S	0	0
			5	4	1		
3	X	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	E	1	Total	O	S	0	0
			5	4	1		
3	F	1	Total	O	S	0	0
			5	4	1		
3	F	1	Total	O	S	0	0
			5	4	1		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	H	1	Total O S 5 4 1	0	0
3	I	1	Total O S 5 4 1	0	0
3	I	1	Total O S 5 4 1	0	0
3	K	1	Total O S 5 4 1	0	0
3	L	1	Total O S 5 4 1	0	0
3	L	1	Total O S 5 4 1	0	0
3	N	1	Total O S 5 4 1	0	0
3	N	1	Total O S 5 4 1	0	0
3	O	1	Total O S 5 4 1	0	0
3	Q	1	Total O S 5 4 1	0	0
3	Q	1	Total O S 5 4 1	0	0
3	Q	1	Total O S 5 4 1	0	0
3	R	1	Total O S 5 4 1	0	0
3	T	1	Total O S 5 4 1	0	0
3	V	1	Total O S 5 4 1	0	0
3	V	1	Total O S 5 4 1	0	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	1	Total Ca 1 1	0	0
4	H	1	Total Ca 1 1	0	0
4	Q	1	Total Ca 1 1	0	0

Continued on next page...

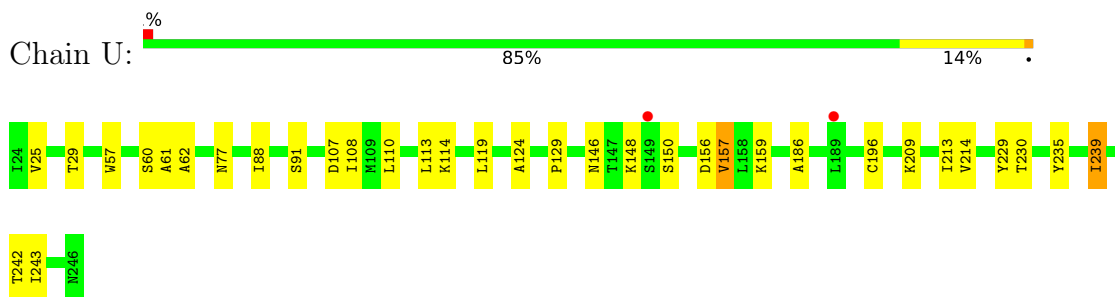
Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	T	1	Total 1	Ca 1	0	0

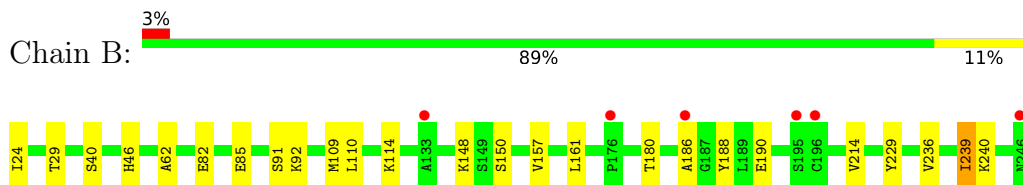
3 Residue-property plots [i](#)

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.

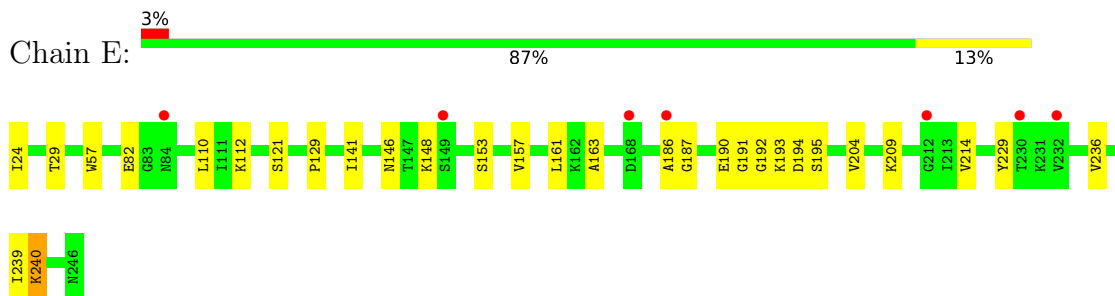
- Molecule 1: Cationic trypsin



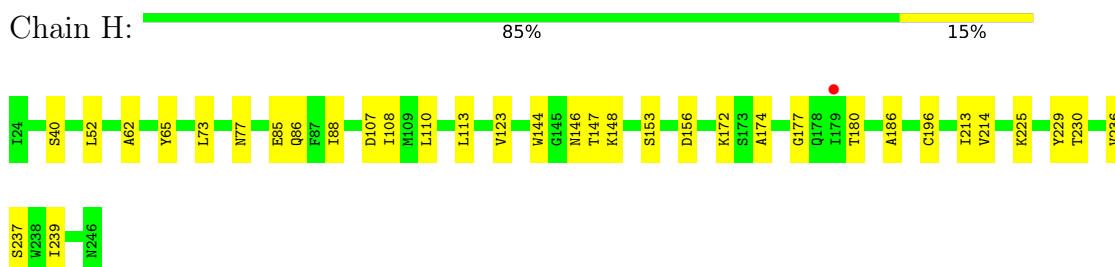
- Molecule 1: Cationic trypsin



- Molecule 1: Cationic trypsin



- Molecule 1: Cationic trypsin



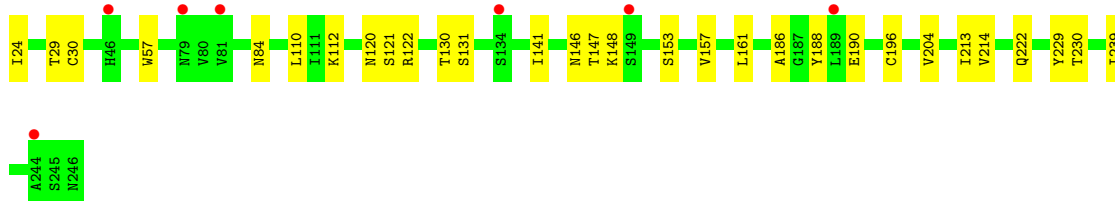
- Molecule 1: Cationic trypsin

Chain K: 89% 11%



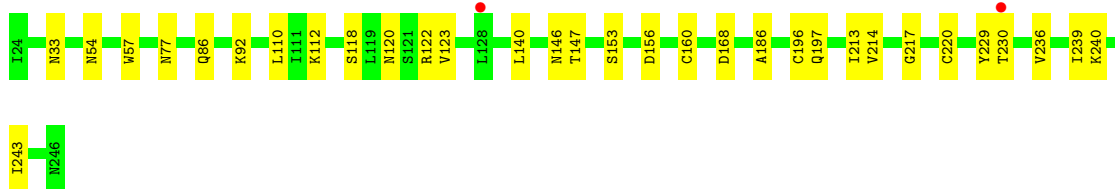
- Molecule 1: Cationic trypsin

Chain N: 3% 87% 13%



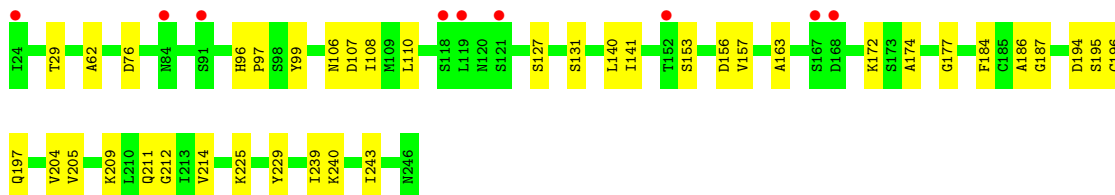
- Molecule 1: Cationic trypsin

Chain Q: % 86% 14%



- Molecule 1: Cationic trypsin

Chain T: 4% 83% 17%



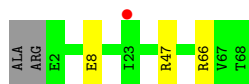
- Molecule 2: Trypsin/subtilisin inhibitor

Chain X: 87% 10%

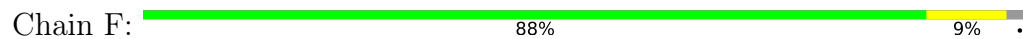


- Molecule 2: Trypsin/subtilisin inhibitor

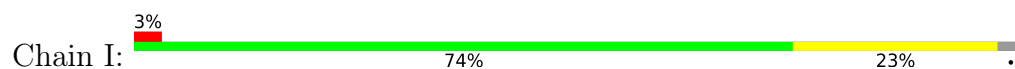
Chain C: % 93%



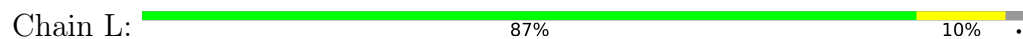
- Molecule 2: Trypsin/subtilisin inhibitor



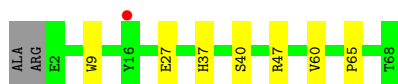
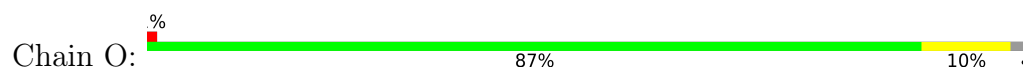
- Molecule 2: Trypsin/subtilisin inhibitor



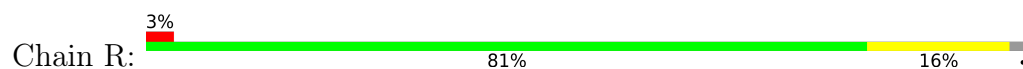
- Molecule 2: Trypsin/subtilisin inhibitor



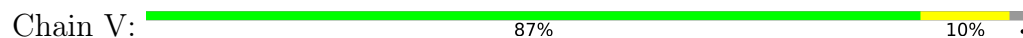
- Molecule 2: Trypsin/subtilisin inhibitor



- Molecule 2: Trypsin/subtilisin inhibitor



- Molecule 2: Trypsin/subtilisin inhibitor



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	57.29Å 92.59Å 108.55Å 90.04° 89.86° 90.03°	Depositor
Resolution (Å)	46.84 – 2.85 46.84 – 2.84	Depositor EDS
% Data completeness (in resolution range)	96.9 (46.84-2.85) 96.5 (46.84-2.84)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.64 (at 2.86Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.274 , 0.331 0.274 , 0.331	Depositor DCC
R_{free} test set	2690 reflections (5.30%)	wwPDB-VP
Wilson B-factor (Å ²)	45.2	Xtrriage
Anisotropy	1.022	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.194 for h,-k,-l 0.407 for -h,k,-l 0.195 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	17481	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 42.43 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.0431e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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](#)

Bond lengths and bond angles in the following residue types are not validated in this section: CA, 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	B	0.24	0/1660	0.41	0/2250
1	E	0.35	2/1660 (0.1%)	0.45	0/2250
1	H	0.27	0/1660	0.42	0/2250
1	K	0.23	0/1660	0.40	0/2250
1	N	0.25	0/1660	0.42	0/2250
1	Q	0.24	0/1660	0.42	0/2250
1	T	0.26	0/1660	0.43	0/2250
1	U	0.27	0/1660	0.42	0/2250
2	C	0.21	0/552	0.39	0/747
2	F	0.20	0/552	0.41	0/747
2	I	0.31	0/552	0.41	0/747
2	L	0.20	0/552	0.38	0/747
2	O	0.20	0/552	0.39	0/747
2	R	0.21	0/552	0.41	0/747
2	V	0.21	0/552	0.39	0/747
2	X	0.20	0/552	0.39	0/747
All	All	0.26	2/17696 (0.0%)	0.42	0/23976

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	190	GLU	CD-OE1	-6.83	1.18	1.25
1	E	190	GLU	CD-OE2	-5.10	1.20	1.25

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	B	1629	0	1588	15	0
1	E	1629	0	1588	17	0
1	H	1629	0	1588	22	0
1	K	1629	0	1588	17	0
1	N	1629	0	1588	18	1
1	Q	1629	0	1588	23	0
1	T	1629	0	1588	30	1
1	U	1629	0	1588	24	0
2	C	540	0	531	3	0
2	F	540	0	531	3	0
2	I	540	0	531	12	0
2	L	540	0	531	5	0
2	O	540	0	531	4	0
2	R	540	0	531	8	0
2	V	540	0	531	7	0
2	X	540	0	531	6	0
3	B	5	0	0	1	0
3	C	10	0	0	2	0
3	E	5	0	0	0	0
3	F	10	0	0	0	0
3	H	5	0	0	0	0
3	I	10	0	0	2	0
3	K	5	0	0	0	0
3	L	10	0	0	2	0
3	N	10	0	0	1	0
3	O	5	0	0	1	0
3	Q	15	0	0	0	0
3	R	5	0	0	1	0
3	T	5	0	0	0	0
3	U	5	0	0	0	0
3	V	10	0	0	5	0
3	X	10	0	0	2	0
4	E	1	0	0	0	0
4	H	1	0	0	0	0
4	Q	1	0	0	0	0
4	T	1	0	0	0	0
All	All	17481	0	16952	209	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 6.

All (209) 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:T:110:LEU:HD21	1:T:239:ILE:HD12	1.47	0.94
1:B:110:LEU:HD21	1:B:239:ILE:HD13	1.51	0.93
1:T:110:LEU:HD21	1:T:239:ILE:CD1	1.99	0.91
1:K:110:LEU:HD21	1:K:239:ILE:HD13	1.52	0.90
1:E:239:ILE:H	1:E:239:ILE:HD12	1.40	0.86
1:Q:54:ASN:HD21	1:Q:243:ILE:HD13	1.43	0.83
2:V:12:LEU:HD23	2:V:15:GLU:OE1	1.81	0.80
1:E:236:VAL:O	1:E:240:LYS:HB2	1.85	0.76
1:U:235:TYR:O	1:U:239:ILE:HG13	1.86	0.75
2:V:12:LEU:CD2	2:V:15:GLU:OE1	2.34	0.75
1:Q:57:TRP:CD2	1:Q:243:ILE:HG12	2.23	0.72
1:U:129:PRO:HA	1:U:209:LYS:HD3	1.71	0.72
1:Q:33:ASN:HD22	1:Q:122:ARG:HB3	1.54	0.71
2:X:36:LYS:NZ	2:X:41:GLY:O	2.23	0.71
2:R:11:GLU:HG3	2:R:12:LEU:HG	1.73	0.70
1:B:82:GLU:HB2	1:B:85:GLU:OE2	1.91	0.70
2:I:32:ARG:NH2	3:V:101:SO4:S	2.64	0.70
2:I:47:ARG:HB3	2:I:49:ASP:OD1	1.92	0.70
2:V:66:ARG:NH1	3:V:102:SO4:O2	2.26	0.69
1:T:110:LEU:CD2	1:T:239:ILE:HD12	2.23	0.69
1:H:110:LEU:HD21	1:H:239:ILE:HG12	1.75	0.67
1:T:110:LEU:HD11	1:T:239:ILE:HD12	1.75	0.66
1:U:213:ILE:HB	1:U:230:THR:HB	1.77	0.66
3:I:101:SO4:O2	2:V:32:ARG:NH2	2.30	0.65
1:N:110:LEU:HD11	1:N:239:ILE:HA	1.78	0.65
2:F:36:LYS:NZ	2:F:41:GLY:O	2.31	0.64
1:T:108:ILE:HD11	1:T:239:ILE:HD11	1.78	0.64
1:U:148:LYS:NZ	1:U:150:SER:O	2.31	0.63
1:B:91:SER:HB2	1:B:114:LYS:HG3	1.80	0.63
1:N:29:THR:HG23	1:N:157:VAL:HG11	1.80	0.62
1:Q:57:TRP:CE2	1:Q:243:ILE:HG12	2.34	0.62
1:T:110:LEU:HD21	1:T:239:ILE:HD11	1.82	0.62
1:B:110:LEU:HD11	1:B:239:ILE:HA	1.81	0.61
1:T:110:LEU:HD11	1:T:239:ILE:CD1	2.30	0.61
1:H:110:LEU:HD11	1:H:239:ILE:HA	1.82	0.61
2:I:32:ARG:NH2	3:V:101:SO4:O4	2.33	0.61
1:E:129:PRO:HA	1:E:209:LYS:HD3	1.83	0.61

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:239:ILE:H	1:E:239:ILE:CD1	2.11	0.61
1:N:148:LYS:HD3	1:N:153:SER:HB3	1.83	0.60
1:N:148:LYS:NZ	3:N:301:SO4:O4	2.27	0.59
1:Q:57:TRP:CG	1:Q:243:ILE:HG12	2.38	0.59
1:U:110:LEU:HD11	1:U:239:ILE:HA	1.83	0.58
1:H:172:LYS:HE3	1:H:177:GLY:H	1.68	0.58
1:U:110:LEU:HD21	1:U:239:ILE:HD13	1.84	0.58
2:C:47:ARG:NH1	3:C:101:SO4:O2	2.26	0.57
1:T:174:ALA:O	1:T:225:LYS:NZ	2.31	0.57
1:Q:86:GLN:HE21	1:Q:123:VAL:HG21	1.69	0.56
2:C:8:GLU:HG2	2:C:66:ARG:HG2	1.88	0.56
1:T:140:LEU:HB3	1:T:205:VAL:HG22	1.88	0.56
1:E:110:LEU:HD11	1:E:239:ILE:HA	1.88	0.55
2:L:47:ARG:NH1	3:L:101:SO4:O4	2.37	0.55
1:U:214:VAL:HA	1:U:229:TYR:HD2	1.72	0.55
2:C:66:ARG:NH1	3:C:102:SO4:O1	2.35	0.55
1:H:147:THR:OG1	1:H:153:SER:O	2.24	0.55
1:K:194:ASP:OD1	1:K:195:SER:N	2.39	0.55
2:L:36:LYS:NZ	2:L:41:GLY:O	2.40	0.55
1:T:29:THR:HG23	1:T:157:VAL:HG11	1.89	0.55
1:B:148:LYS:NZ	1:B:150:SER:O	2.39	0.54
1:K:152:THR:OG1	2:L:66:ARG:NH1	2.41	0.54
1:T:163:ALA:HB1	1:T:187:GLY:HA2	1.89	0.54
2:I:50:ARG:NH2	2:I:68:THR:O	2.36	0.54
1:Q:213:ILE:HB	1:Q:230:THR:HB	1.91	0.53
1:U:214:VAL:HA	1:U:229:TYR:CD2	2.44	0.53
2:X:47:ARG:NH1	3:X:101:SO4:O2	2.39	0.53
1:H:174:ALA:O	1:H:225:LYS:NZ	2.41	0.53
2:I:47:ARG:NH1	3:I:101:SO4:O4	2.39	0.52
1:U:29:THR:HG23	1:U:157:VAL:HG11	1.91	0.52
1:U:235:TYR:O	1:U:239:ILE:CG1	2.54	0.52
1:K:29:THR:HG23	1:K:157:VAL:HG11	1.90	0.52
1:T:153:SER:O	1:T:153:SER:OG	2.26	0.52
1:B:24:ILE:HG21	1:B:161:LEU:HB2	1.92	0.51
1:N:188:TYR:HB3	1:N:190:GLU:OE1	2.10	0.51
1:H:85:GLU:HG3	1:K:81:VAL:HG11	1.93	0.51
1:Q:214:VAL:HA	1:Q:229:TYR:CD2	2.45	0.51
2:V:66:ARG:NH1	3:V:102:SO4:S	2.78	0.51
1:U:108:ILE:HD11	1:U:239:ILE:HD11	1.93	0.50
1:N:214:VAL:HA	1:N:229:TYR:HD2	1.75	0.50
1:Q:186:ALA:HB3	1:Q:229:TYR:CE1	2.46	0.50

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:Q:110:LEU:HD11	1:Q:239:ILE:HA	1.92	0.50
2:R:47:ARG:NH1	3:R:101:SO4:O2	2.30	0.50
1:K:77:ASN:N	1:K:82:GLU:OE2	2.36	0.50
1:E:191:GLY:O	1:E:193:LYS:N	2.39	0.50
1:U:186:ALA:HB3	1:U:229:TYR:CE1	2.47	0.49
1:K:214:VAL:HA	1:K:229:TYR:CD2	2.47	0.49
1:T:214:VAL:HA	1:T:229:TYR:HD2	1.76	0.49
1:H:153:SER:O	1:H:153:SER:OG	2.20	0.49
2:F:8:GLU:HG2	2:F:66:ARG:HG2	1.93	0.49
1:T:214:VAL:HA	1:T:229:TYR:CD2	2.47	0.49
2:X:40:SER:OG	2:X:41:GLY:N	2.46	0.49
2:O:37:HIS:O	2:O:40:SER:OG	2.25	0.49
1:E:194:ASP:OD1	1:E:195:SER:N	2.46	0.48
1:U:209:LYS:NZ	2:R:15:GLU:OE2	2.41	0.48
1:T:194:ASP:OD1	1:T:195:SER:N	2.46	0.48
1:B:214:VAL:HA	1:B:229:TYR:CD2	2.49	0.48
1:B:236:VAL:O	1:B:240:LYS:HG3	2.13	0.48
1:Q:236:VAL:O	1:Q:240:LYS:HB2	2.13	0.48
1:Q:214:VAL:HA	1:Q:229:TYR:HD2	1.79	0.48
2:R:9:TRP:HD1	2:R:11:GLU:OE2	1.95	0.48
2:L:51:VAL:HG22	2:L:67:VAL:HG22	1.94	0.48
1:U:110:LEU:HD12	1:U:242:THR:HB	1.94	0.48
1:B:29:THR:HG23	1:B:157:VAL:HG11	1.96	0.48
1:H:186:ALA:HB3	1:H:229:TYR:CE1	2.49	0.48
1:K:110:LEU:HD21	1:K:239:ILE:CD1	2.36	0.48
2:L:66:ARG:NH2	3:L:102:SO4:O3	2.47	0.48
1:E:214:VAL:HA	1:E:229:TYR:CD2	2.48	0.47
1:B:214:VAL:HA	1:B:229:TYR:HD2	1.79	0.47
1:H:236:VAL:HG23	1:H:237:SER:N	2.29	0.47
1:Q:147:THR:OG1	1:Q:153:SER:OG	2.32	0.47
1:T:96:HIS:HB2	1:T:108:ILE:HG23	1.95	0.47
1:U:88:ILE:HD12	1:U:113:LEU:HD23	1.96	0.47
1:U:157:VAL:HG12	1:U:159:LYS:HE3	1.95	0.47
1:H:214:VAL:HA	1:H:229:TYR:CD2	2.49	0.47
1:Q:197:GLN:NE2	1:Q:220:CYS:SG	2.88	0.47
1:K:24:ILE:HG21	1:K:161:LEU:HB2	1.96	0.47
1:Q:140:LEU:HD11	1:Q:160:CYS:HB3	1.95	0.47
1:Q:57:TRP:NE1	1:Q:243:ILE:HG23	2.30	0.47
2:O:47:ARG:NH1	3:O:101:SO4:O4	2.48	0.46
1:U:146:ASN:HB3	1:U:196:CYS:SG	2.55	0.46
1:T:110:LEU:CD1	1:T:239:ILE:HD12	2.42	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:148:LYS:HD3	1:H:153:SER:HB3	1.96	0.46
1:U:77:ASN:HA	1:U:156:ASP:O	2.16	0.46
1:T:186:ALA:HB3	1:T:229:TYR:CE1	2.51	0.46
1:U:62:ALA:N	1:U:107:ASP:OD1	2.49	0.46
1:N:213:ILE:HB	1:N:230:THR:HB	1.98	0.46
2:I:24:ILE:HD13	2:I:51:VAL:HG11	1.97	0.46
1:E:29:THR:HG23	1:E:157:VAL:HG11	1.97	0.45
1:H:65:TYR:OH	2:V:22:ALA:HB2	2.16	0.45
1:H:77:ASN:HA	1:H:156:ASP:O	2.17	0.45
2:I:32:ARG:NH2	3:V:101:SO4:O1	2.46	0.45
1:T:172:LYS:HE3	1:T:177:GLY:H	1.82	0.45
1:U:91:SER:HB3	1:U:114:LYS:HA	1.98	0.45
1:Q:146:ASN:HB3	1:Q:196:CYS:SG	2.57	0.45
1:E:24:ILE:HG21	1:E:161:LEU:HB2	1.99	0.45
1:N:24:ILE:HG21	1:N:161:LEU:HB2	1.97	0.45
1:Q:118:SER:O	1:Q:120:ASN:ND2	2.50	0.45
2:I:36:LYS:HD2	2:I:42:PHE:CE1	2.52	0.45
1:T:62:ALA:N	1:T:107:ASP:OD1	2.49	0.45
1:T:127:SER:HB2	1:T:209:LYS:HG2	1.98	0.45
1:Q:92:LYS:HB3	1:Q:112:LYS:HB3	1.97	0.45
1:E:186:ALA:HB3	1:E:229:TYR:CE1	2.52	0.45
1:H:52:LEU:HD13	1:H:73:LEU:HD21	1.99	0.45
2:I:58:THR:HB	2:I:60:VAL:HG12	1.99	0.44
1:N:214:VAL:HA	1:N:229:TYR:CD2	2.52	0.44
1:K:235:TYR:O	1:K:239:ILE:CG1	2.65	0.44
1:N:84:ASN:ND2	1:N:122:ARG:HG3	2.33	0.44
1:U:25:VAL:HG23	1:U:196:CYS:HB2	1.98	0.44
1:T:76:ASP:OD1	1:T:157:VAL:HG13	2.17	0.44
1:H:88:ILE:HB	1:H:113:LEU:HD23	1.99	0.44
2:R:36:LYS:HD3	2:R:42:PHE:CE1	2.53	0.44
1:T:99:TYR:HA	1:T:106:ASN:HB2	2.00	0.44
1:T:196:CYS:SG	1:T:197:GLN:N	2.88	0.43
1:H:213:ILE:HB	1:H:230:THR:HB	1.99	0.43
1:T:184:PHE:HZ	1:T:212:GLY:HA3	1.83	0.43
1:T:243:ILE:HG22	1:T:243:ILE:O	2.19	0.43
1:U:57:TRP:NE1	1:U:243:ILE:HG23	2.33	0.43
1:H:86:GLN:HE21	1:H:123:VAL:HG21	1.83	0.43
1:H:108:ILE:HD11	1:H:239:ILE:HD11	2.00	0.43
1:K:174:ALA:O	1:K:225:LYS:HE2	2.19	0.43
1:N:141:ILE:HG12	1:N:204:VAL:HG22	1.99	0.43
1:Q:57:TRP:CD1	1:Q:243:ILE:HG12	2.53	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:V:8:GLU:HG2	2:V:66:ARG:HG2	2.00	0.42
1:K:214:VAL:HA	1:K:229:TYR:HD2	1.84	0.42
1:E:148:LYS:HD2	1:E:153:SER:HB3	2.02	0.42
1:H:146:ASN:HB3	1:H:196:CYS:SG	2.60	0.42
1:T:141:ILE:HG12	1:T:204:VAL:HG22	2.02	0.42
2:X:36:LYS:HE2	2:X:36:LYS:HB3	1.82	0.42
1:N:186:ALA:HB3	1:N:229:TYR:CE1	2.54	0.42
2:O:9:TRP:O	2:O:65:PRO:HD2	2.19	0.42
1:T:96:HIS:HA	1:T:97:PRO:HD3	1.94	0.42
1:B:186:ALA:HB3	1:B:229:TYR:CE1	2.54	0.42
1:H:40:SER:HB2	1:H:144:TRP:CZ3	2.55	0.42
2:X:6:LYS:HE2	2:X:8:GLU:O	2.20	0.42
1:E:141:ILE:HG12	1:E:204:VAL:HG22	2.02	0.42
1:Q:77:ASN:HA	1:Q:156:ASP:O	2.19	0.42
2:R:60:VAL:O	2:R:62:VAL:HG23	2.20	0.42
1:N:57:TRP:CH2	1:N:112:LYS:HB2	2.56	0.41
1:Q:217:GLY:O	2:R:42:PHE:N	2.38	0.41
1:N:146:ASN:HB3	1:N:196:CYS:SG	2.60	0.41
2:O:9:TRP:NE1	2:O:27:GLU:OE1	2.49	0.41
1:B:62:ALA:HA	1:B:109:MET:HB2	2.03	0.41
1:E:82:GLU:H	1:E:82:GLU:HG3	1.72	0.41
1:H:214:VAL:HA	1:H:229:TYR:HD2	1.84	0.41
1:N:147:THR:OG1	1:N:153:SER:OG	2.38	0.41
1:U:60:SER:OG	1:U:61:ALA:N	2.54	0.41
1:H:62:ALA:N	1:H:107:ASP:OD1	2.54	0.41
2:I:6:LYS:O	2:I:28:ASN:ND2	2.53	0.41
1:T:131:SER:O	1:T:211:GLN:NE2	2.46	0.41
1:B:40:SER:OG	1:B:46:HIS:ND1	2.40	0.41
1:B:188:TYR:HB3	1:B:190:GLU:HG2	2.03	0.41
3:B:301:SO4:O4	1:N:153:SER:HB2	2.21	0.41
1:E:57:TRP:CH2	1:E:112:LYS:HB2	2.55	0.41
1:E:163:ALA:HB1	1:E:187:GLY:HA2	2.02	0.41
2:I:9:TRP:O	2:I:65:PRO:HD2	2.21	0.41
2:I:45:ASP:O	2:I:50:ARG:NH2	2.52	0.41
1:K:174:ALA:O	1:K:176:PRO:HD3	2.20	0.41
1:N:120:ASN:HB2	1:N:121:SER:H	1.73	0.41
1:B:92:LYS:HD3	1:B:92:LYS:HA	1.89	0.41
1:K:65:TYR:HE1	1:K:93:SER:HB2	1.86	0.41
1:Q:147:THR:OG1	1:Q:153:SER:O	2.35	0.41
2:X:66:ARG:NH2	3:X:102:SO4:O1	2.51	0.40
1:N:130:THR:OG1	1:N:131:SER:N	2.54	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:U:119:LEU:HD22	1:U:124:ALA:HA	2.03	0.40
1:T:156:ASP:OD1	1:T:157:VAL:N	2.54	0.40
2:F:9:TRP:O	2:F:65:PRO:HD2	2.22	0.40
1:K:186:ALA:HB3	1:K:229:TYR:CE1	2.56	0.40
1:K:196:CYS:SG	1:K:197:GLN:N	2.92	0.40
1:E:146:ASN:ND2	1:E:148:LYS:H	2.20	0.40
1:K:110:LEU:HD11	1:K:239:ILE:HA	2.03	0.40
2:R:64:THR:O	2:R:66:ARG:HG3	2.21	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)
1:N:30:CYS:O	1:T:240:LYS:NZ[1_566]	2.14	0.06

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	B	221/223 (99%)	213 (96%)	8 (4%)	0	100	100
1	E	221/223 (99%)	209 (95%)	11 (5%)	1 (0%)	29	57
1	H	221/223 (99%)	208 (94%)	13 (6%)	0	100	100
1	K	221/223 (99%)	213 (96%)	8 (4%)	0	100	100
1	N	221/223 (99%)	210 (95%)	11 (5%)	0	100	100
1	Q	221/223 (99%)	210 (95%)	11 (5%)	0	100	100
1	T	221/223 (99%)	209 (95%)	12 (5%)	0	100	100
1	U	221/223 (99%)	209 (95%)	12 (5%)	0	100	100
2	C	65/69 (94%)	62 (95%)	3 (5%)	0	100	100
2	F	65/69 (94%)	62 (95%)	3 (5%)	0	100	100

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	I	65/69 (94%)	61 (94%)	4 (6%)	0	100	100
2	L	65/69 (94%)	62 (95%)	3 (5%)	0	100	100
2	O	65/69 (94%)	63 (97%)	2 (3%)	0	100	100
2	R	65/69 (94%)	63 (97%)	2 (3%)	0	100	100
2	V	65/69 (94%)	61 (94%)	4 (6%)	0	100	100
2	X	65/69 (94%)	60 (92%)	5 (8%)	0	100	100
All	All	2288/2336 (98%)	2175 (95%)	112 (5%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	192	GLY

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	B	184/184 (100%)	182 (99%)	2 (1%)	73	90
1	E	184/184 (100%)	182 (99%)	2 (1%)	73	90
1	H	184/184 (100%)	183 (100%)	1 (0%)	88	96
1	K	184/184 (100%)	183 (100%)	1 (0%)	88	96
1	N	184/184 (100%)	183 (100%)	1 (0%)	88	96
1	Q	184/184 (100%)	183 (100%)	1 (0%)	88	96
1	T	184/184 (100%)	184 (100%)	0	100	100
1	U	184/184 (100%)	182 (99%)	2 (1%)	73	90
2	C	59/60 (98%)	59 (100%)	0	100	100
2	F	59/60 (98%)	59 (100%)	0	100	100
2	I	59/60 (98%)	59 (100%)	0	100	100
2	L	59/60 (98%)	58 (98%)	1 (2%)	60	83

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	O	59/60 (98%)	58 (98%)	1 (2%)	60	83
2	R	59/60 (98%)	59 (100%)	0	100	100
2	V	59/60 (98%)	58 (98%)	1 (2%)	60	83
2	X	59/60 (98%)	59 (100%)	0	100	100
All	All	1944/1952 (100%)	1931 (99%)	13 (1%)	84	94

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	U	157	VAL
1	U	239	ILE
1	B	180	THR
1	B	239	ILE
1	E	121	SER
1	E	240	LYS
1	H	180	THR
1	K	190	GLU
2	L	39	ARG
1	N	222	GLN
2	O	60	VAL
1	Q	168	ASP
2	V	60	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
2	X	30	ASN
1	B	234	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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 29 ligands modelled in this entry, 4 are monoatomic - leaving 25 for Mogul analysis.

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	$\# Z > 2$
3	SO4	N	302	-	4,4,4	0.14	0	6,6,6	0.07	0
3	SO4	X	102	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	C	102	-	4,4,4	0.10	0	6,6,6	0.07	0
3	SO4	V	102	-	4,4,4	0.10	0	6,6,6	0.11	0
3	SO4	K	301	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	L	102	-	4,4,4	0.14	0	6,6,6	0.07	0
3	SO4	R	101	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	H	302	-	4,4,4	0.15	0	6,6,6	0.05	0
3	SO4	U	301	-	4,4,4	0.15	0	6,6,6	0.15	0
3	SO4	Q	303	-	4,4,4	0.10	0	6,6,6	0.08	0
3	SO4	B	301	-	4,4,4	0.14	0	6,6,6	0.12	0
3	SO4	C	101	-	4,4,4	0.13	0	6,6,6	0.06	0
3	SO4	T	302	-	4,4,4	0.11	0	6,6,6	0.60	0
3	SO4	I	102	-	4,4,4	0.14	0	6,6,6	0.07	0
3	SO4	O	101	-	4,4,4	0.14	0	6,6,6	0.04	0
3	SO4	X	101	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	I	101	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	E	302	-	4,4,4	0.14	0	6,6,6	0.05	0
3	SO4	Q	304	-	4,4,4	0.14	0	6,6,6	0.38	0
3	SO4	F	102	-	4,4,4	0.10	0	6,6,6	0.11	0
3	SO4	Q	302	-	4,4,4	0.14	0	6,6,6	0.06	0
3	SO4	L	101	-	4,4,4	0.14	0	6,6,6	0.04	0
3	SO4	F	101	-	4,4,4	0.14	0	6,6,6	0.04	0
3	SO4	N	301	-	4,4,4	0.15	0	6,6,6	0.06	0
3	SO4	V	101	-	4,4,4	0.14	0	6,6,6	0.05	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.

13 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	X	102	SO4	1	0
3	C	102	SO4	1	0
3	V	102	SO4	2	0
3	L	102	SO4	1	0
3	R	101	SO4	1	0
3	B	301	SO4	1	0
3	C	101	SO4	1	0
3	O	101	SO4	1	0
3	X	101	SO4	1	0
3	I	101	SO4	2	0
3	L	101	SO4	1	0
3	N	301	SO4	1	0
3	V	101	SO4	3	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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	B	223/223 (100%)	0.31	6 (2%) 54 50	38, 48, 59, 64	0
1	E	223/223 (100%)	0.22	7 (3%) 49 44	32, 43, 54, 58	0
1	H	223/223 (100%)	0.25	1 (0%) 92 92	36, 47, 58, 64	1 (0%)
1	K	223/223 (100%)	0.11	1 (0%) 92 92	25, 38, 51, 60	2 (0%)
1	N	223/223 (100%)	0.33	7 (3%) 49 44	43, 51, 61, 68	1 (0%)
1	Q	223/223 (100%)	0.17	2 (0%) 84 84	36, 48, 60, 71	1 (0%)
1	T	223/223 (100%)	0.38	9 (4%) 38 32	42, 52, 62, 69	2 (0%)
1	U	223/223 (100%)	0.17	2 (0%) 84 84	29, 40, 52, 62	2 (0%)
2	C	67/69 (97%)	0.12	1 (1%) 73 72	42, 49, 60, 65	0
2	F	67/69 (97%)	0.06	0 100 100	37, 47, 55, 62	0
2	I	67/69 (97%)	0.27	2 (2%) 50 45	40, 47, 61, 67	0
2	L	67/69 (97%)	0.00	0 100 100	28, 37, 50, 58	0
2	O	67/69 (97%)	0.17	1 (1%) 73 72	34, 46, 57, 62	0
2	R	67/69 (97%)	0.14	2 (2%) 50 45	33, 40, 55, 58	0
2	V	67/69 (97%)	0.17	0 100 100	36, 43, 54, 60	0
2	X	67/69 (97%)	-0.03	0 100 100	28, 35, 49, 55	0
All	All	2320/2336 (99%)	0.21	41 (1%) 68 66	25, 46, 59, 71	9 (0%)

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	84	ASN	3.4
1	U	189	LEU	3.2
1	B	186	ALA	3.2
2	R	62	VAL	3.2
1	T	24	ILE	3.0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	N	81	VAL	2.9
1	N	189	LEU	2.8
1	K	230	THR	2.7
1	H	179	ILE	2.6
1	N	149	SER	2.6
1	E	212	GLY	2.5
1	T	84	ASN	2.5
1	T	119	LEU	2.5
1	T	168	ASP	2.5
1	E	186	ALA	2.5
1	T	121	SER	2.5
1	B	196	CYS	2.5
1	E	149	SER	2.4
1	N	244	ALA	2.4
1	Q	230	THR	2.4
1	T	91	SER	2.4
2	C	23	ILE	2.4
1	E	232	VAL	2.4
1	E	230	THR	2.3
1	Q	128	LEU	2.3
2	R	16	TYR	2.3
1	B	176	PRO	2.3
1	B	195	SER	2.2
1	T	152	THR	2.2
1	E	168	ASP	2.2
1	B	133	ALA	2.2
1	T	118	SER	2.2
2	O	16	TYR	2.1
2	I	16	TYR	2.1
1	U	149	SER	2.1
2	I	62	VAL	2.1
1	T	167	SER	2.0
1	N	79	ASN	2.0
1	N	46	HIS	2.0
1	B	246	ASN	2.0
1	N	134	SER	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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
4	CA	T	301	1/1	0.62	0.11	81,81,81,81	0
4	CA	H	301	1/1	0.64	0.31	98,98,98,98	0
3	SO4	I	102	5/5	0.64	0.24	87,89,93,96	0
4	CA	E	301	1/1	0.71	0.10	73,73,73,73	0
4	CA	Q	301	1/1	0.77	0.19	87,87,87,87	0
3	SO4	X	102	5/5	0.80	0.19	80,81,84,90	0
3	SO4	F	102	5/5	0.82	0.20	92,94,97,98	0
3	SO4	N	301	5/5	0.89	0.22	75,76,78,79	0
3	SO4	E	302	5/5	0.90	0.20	69,70,72,74	0
3	SO4	N	302	5/5	0.91	0.17	65,68,70,71	0
3	SO4	V	102	5/5	0.92	0.17	81,81,81,84	0
3	SO4	C	102	5/5	0.92	0.19	78,78,79,80	0
3	SO4	Q	302	5/5	0.92	0.14	67,69,73,73	0
3	SO4	Q	303	5/5	0.92	0.15	76,76,80,80	0
3	SO4	Q	304	5/5	0.92	0.15	62,64,66,70	0
3	SO4	T	302	5/5	0.93	0.16	71,72,74,75	0
3	SO4	H	302	5/5	0.93	0.14	58,59,61,63	0
3	SO4	I	101	5/5	0.93	0.16	72,72,74,77	0
3	SO4	R	101	5/5	0.94	0.12	61,63,66,69	0
3	SO4	K	301	5/5	0.94	0.20	73,75,76,77	0
3	SO4	V	101	5/5	0.94	0.14	61,61,63,69	0
3	SO4	B	301	5/5	0.94	0.15	65,65,66,68	0
3	SO4	U	301	5/5	0.95	0.12	59,60,61,66	0
3	SO4	L	102	5/5	0.95	0.12	53,53,55,61	0
3	SO4	C	101	5/5	0.95	0.10	58,59,60,62	0
3	SO4	O	101	5/5	0.96	0.09	70,70,72,74	0
3	SO4	F	101	5/5	0.97	0.09	47,47,50,55	0
3	SO4	X	101	5/5	0.97	0.10	41,45,48,48	0
3	SO4	L	101	5/5	0.97	0.13	44,47,49,49	0

6.5 Other polymers [i](#)

There are no such residues in this entry.