



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 06:29 PM GMT

PDB ID : 1B1Z  
Title : STREPTOCOCCAL PYROGENIC EXOTOXIN A1  
Authors : Papageorgiou, A.C.; Acharya, K.R.  
Deposited on : 1998-11-24  
Resolution : 2.57 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](mailto: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  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : **NOT EXECUTED**  
EDS : **NOT EXECUTED**  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

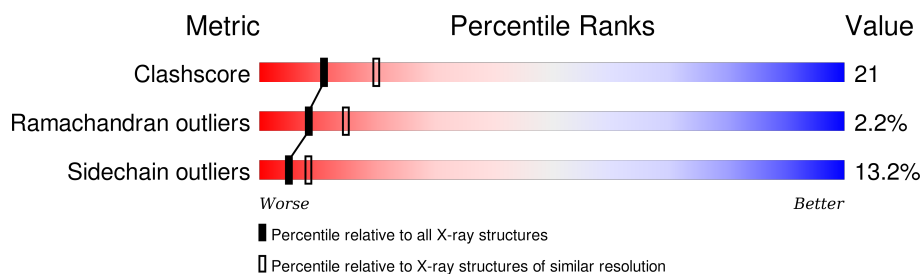
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.57 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))
Clashscore	102246	3003 (2.60-2.56)
Ramachandran outliers	100387	2956 (2.60-2.56)
Sidechain outliers	100360	2956 (2.60-2.56)

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  $\geq 3$ , 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.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	219	 60% 32% 7% •
1	B	219	 68% 24% 8%
1	C	219	 62% 30% 8%
1	D	219	 50% 39% 10% •

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 7114 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.

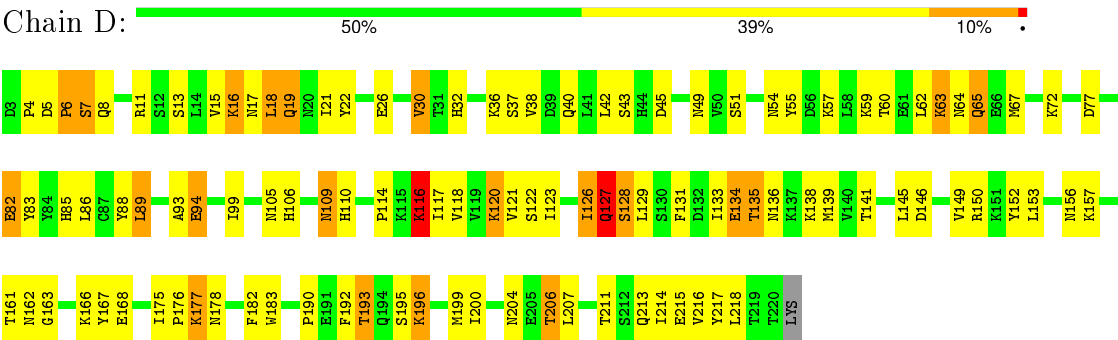
- Molecule 1 is a protein called PROTEIN (TOXIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	218	Total	C	N	O	S	0	0	0
			1762	1128	284	344	6			
1	B	218	Total	C	N	O	S	0	0	0
			1755	1125	283	341	6			
1	C	218	Total	C	N	O	S	0	0	0
			1755	1125	283	341	6			
1	D	218	Total	C	N	O	S	0	0	0
			1755	1125	283	341	6			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	24	Total	O	0	0
			24	24		
2	B	23	Total	O	0	0
			23	23		
2	C	23	Total	O	0	0
			23	23		
2	D	17	Total	O	0	0
			17	17		





## 4 Data and refinement statistics

Xtriage (Phenix) and EDS were not executed - this section will therefore be incomplete.

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	127.40 Å   101.00 Å   81.80 Å 90.00°   90.00°   90.00°	Depositor
Resolution (Å)	20.00 – 2.57	Depositor
% Data completeness (in resolution range)	97.4 (20.00-2.57)	Depositor
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.11	Depositor
Refinement program	X-PLOR 3.851	Depositor
R, $R_{free}$	0.194 , 0.274	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7114	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	30.0	wwPDB-VP

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z  > 5$	RMSZ	$\# Z  > 5$
1	A	0.42	1/1803 (0.1%)	0.61	1/2446 (0.0%)
1	B	0.38	0/1796	0.67	2/2437 (0.1%)
1	C	0.47	1/1796 (0.1%)	0.71	2/2437 (0.1%)
1	D	0.36	0/1796	0.57	0/2437
All	All	0.41	2/7191 (0.0%)	0.65	5/9757 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	207	LEU	CA-CB	10.33	1.77	1.53
1	A	207	LEU	CA-CB	-7.11	1.37	1.53

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	207	LEU	CB-CA-C	-14.06	83.49	110.20
1	B	207	LEU	CA-CB-CG	9.83	137.90	115.30
1	C	207	LEU	CA-CB-CG	-8.60	95.53	115.30
1	B	207	LEU	N-CA-CB	-5.39	99.62	110.40
1	A	207	LEU	CA-CB-CG	5.08	126.97	115.30

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1762	0	1696	75	0
1	B	1755	0	1688	66	0
1	C	1755	0	1688	74	0
1	D	1755	0	1688	83	0
2	A	24	0	0	4	0
2	B	23	0	0	0	0
2	C	23	0	0	0	0
2	D	17	0	0	3	0
All	All	7114	0	6760	288	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 21.

All (288) 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:C:207:LEU:CA	1:C:207:LEU:CB	1.77	1.55
1:C:207:LEU:C	1:C:207:LEU:CB	2.21	1.07
1:A:90:CYS:HA	1:C:90:CYS:HA	1.30	1.06
1:D:17:ASN:HA	1:D:19:GLN:HE22	1.20	1.05
1:D:62:LEU:HB3	1:D:67:MET:HE2	1.36	1.04
1:B:63:LYS:H	1:B:67:MET:HE2	1.24	1.01
1:C:207:LEU:CA	1:C:207:LEU:CG	2.45	0.94
1:A:109:ASN:HD21	1:A:139:MET:H	1.10	0.93
1:C:62:LEU:HB3	1:C:67:MET:HE2	1.51	0.92
1:C:109:ASN:HD21	1:C:139:MET:H	1.17	0.92
1:A:17:ASN:HA	1:A:19:GLN:NE2	1.87	0.90
1:C:24:LEU:HD11	1:C:194:GLN:HG2	1.54	0.88
1:D:193:THR:HG22	1:D:196:LYS:H	1.39	0.86
1:B:30:VAL:HG12	1:B:82:GLU:HG3	1.58	0.85
1:D:17:ASN:HA	1:D:19:GLN:NE2	1.90	0.85
1:C:65:GLN:O	1:C:69:THR:HG23	1.77	0.85
1:D:49:ASN:HD21	1:D:57:LYS:NZ	1.76	0.84
1:C:207:LEU:CA	1:C:207:LEU:HD23	2.08	0.84
1:C:193:THR:HG22	1:C:196:LYS:H	1.43	0.84
1:B:193:THR:HG22	1:B:196:LYS:H	1.42	0.84
1:C:207:LEU:HD23	1:C:207:LEU:HA	1.60	0.83
1:C:207:LEU:CA	1:C:207:LEU:CD2	2.58	0.81
1:A:114:PRO:HB2	1:A:134:GLU:HG2	1.63	0.79
1:A:62:LEU:HD22	1:A:67:MET:HE1	1.64	0.78
1:A:5:ASP:O	1:A:8:GLN:HG3	1.83	0.78
1:A:11:ARG:HB3	1:A:168:GLU:OE1	1.84	0.77

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:17:ASN:HA	1:C:19:GLN:NE2	2.01	0.76
1:B:129:LEU:HD12	1:B:130:SER:N	2.00	0.76
1:A:90:CYS:CA	1:C:90:CYS:HA	2.16	0.72
1:B:63:LYS:H	1:B:67:MET:CE	1.99	0.70
1:D:182:PHE:HZ	1:D:207:LEU:HD21	1.57	0.70
1:B:109:ASN:HD21	1:B:139:MET:H	1.37	0.70
1:B:49:ASN:HD21	1:B:57:LYS:HE3	1.56	0.70
1:D:145:LEU:O	1:D:149:VAL:HG23	1.92	0.69
1:B:63:LYS:N	1:B:67:MET:HE2	2.05	0.69
1:B:131:PHE:HE1	1:B:133:ILE:HD13	1.58	0.69
1:D:114:PRO:HB2	1:D:134:GLU:HG3	1.75	0.69
1:D:182:PHE:CZ	1:D:207:LEU:HD21	2.26	0.69
1:A:16:LYS:O	1:A:17:ASN:HB2	1.91	0.69
1:D:109:ASN:HD21	1:D:139:MET:H	1.40	0.69
1:A:109:ASN:HD21	1:A:139:MET:N	1.89	0.68
1:B:133:ILE:HG13	1:B:148:LYS:HB3	1.77	0.67
1:A:30:VAL:HG12	1:A:82:GLU:HG3	1.77	0.67
1:B:193:THR:HG22	1:B:196:LYS:N	2.10	0.66
1:B:136:ASN:ND2	1:B:136:ASN:H	1.92	0.66
1:C:63:LYS:H	1:C:67:MET:HE2	1.60	0.66
1:D:196:LYS:O	1:D:199:MET:HG3	1.94	0.66
1:C:74:LYS:HE3	1:C:105:ASN:OD1	1.94	0.66
1:B:30:VAL:CG1	1:B:82:GLU:HG3	2.26	0.66
1:C:131:PHE:HE1	1:C:133:ILE:HD13	1.59	0.66
1:C:109:ASN:HD21	1:C:139:MET:N	1.92	0.65
1:B:174:PHE:HB3	1:B:207:LEU:HD11	1.78	0.65
1:D:63:LYS:H	1:D:67:MET:CE	2.09	0.64
1:A:170:GLY:HA2	1:A:217:TYR:O	1.98	0.64
1:A:193:THR:HG23	1:A:196:LYS:H	1.62	0.64
1:A:129:LEU:HD12	1:A:130:SER:N	2.13	0.64
1:B:5:ASP:H	1:B:8:GLN:NE2	1.96	0.63
1:D:18:LEU:HG	2:D:238:HOH:O	1.96	0.63
1:D:217:TYR:O	1:D:218:LEU:HG	1.99	0.63
1:D:161:THR:C	1:D:163:GLY:H	2.03	0.63
1:D:4:PRO:HB3	1:D:183:TRP:CZ2	2.34	0.63
1:C:64:ASN:ND2	1:C:67:MET:H	1.97	0.62
1:D:40:GLN:HG3	1:D:45:ASP:O	1.99	0.62
1:A:53:PRO:O	1:A:54:ASN:HB2	2.00	0.62
1:D:77:ASP:OD1	1:D:106:HIS:HD2	1.82	0.62
1:C:53:PRO:O	1:C:54:ASN:HB2	1.98	0.62
1:C:196:LYS:HD3	1:C:199:MET:HE3	1.82	0.61

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:91:GLU:O	1:B:85:HIS:HE1	1.83	0.61
1:A:85:HIS:ND1	1:B:94:GLU:HG3	2.16	0.61
1:A:122:SER:HA	1:A:127:GLN:HA	1.82	0.61
1:C:32:HIS:HE1	1:C:55:TYR:OH	1.84	0.60
1:D:83:TYR:CE1	1:D:195:SER:HB3	2.36	0.60
1:C:17:ASN:HA	1:C:19:GLN:HE22	1.66	0.60
1:A:129:LEU:HD12	1:A:130:SER:H	1.67	0.60
1:D:16:LYS:O	1:D:17:ASN:HB2	2.01	0.59
1:D:193:THR:HG22	1:D:196:LYS:HB2	1.82	0.59
1:C:131:PHE:CE1	1:C:133:ILE:HD13	2.36	0.59
1:B:17:ASN:HA	1:B:19:GLN:NE2	2.17	0.59
1:B:65:GLN:O	1:B:69:THR:HG23	2.02	0.59
1:B:5:ASP:O	1:B:8:GLN:N	2.24	0.59
1:D:121:VAL:HG12	1:D:122:SER:H	1.68	0.59
1:B:24:LEU:HD11	1:B:194:GLN:HG2	1.84	0.59
1:D:4:PRO:O	1:D:6:PRO:HD3	2.03	0.59
1:D:89:LEU:HD23	1:D:89:LEU:N	2.18	0.59
1:C:30:VAL:HG12	1:C:82:GLU:HG3	1.84	0.58
1:C:141:THR:HG22	1:C:206:THR:HG22	1.85	0.58
1:D:59:LYS:HG2	2:D:231:HOH:O	2.03	0.58
1:A:193:THR:CG2	1:A:196:LYS:HG3	2.34	0.58
1:A:77:ASP:OD1	1:A:106:HIS:HD2	1.87	0.58
1:C:109:ASN:ND2	1:C:139:MET:H	1.95	0.57
1:D:49:ASN:ND2	1:D:57:LYS:NZ	2.50	0.57
1:D:109:ASN:ND2	1:D:139:MET:H	2.03	0.57
1:B:31:THR:HA	1:B:78:ILE:O	2.04	0.57
1:A:90:CYS:HA	1:C:90:CYS:CA	2.20	0.57
1:C:170:GLY:HA2	1:C:217:TYR:O	2.05	0.57
1:D:126:ILE:O	1:D:128:SER:N	2.38	0.57
1:B:109:ASN:HA	1:B:138:LYS:HD2	1.86	0.56
1:D:62:LEU:HD22	1:D:67:MET:HE3	1.86	0.56
1:C:16:LYS:O	1:C:17:ASN:HB2	2.06	0.56
1:B:36:LYS:HG2	1:B:74:LYS:O	2.06	0.56
1:B:16:LYS:HB3	1:B:16:LYS:NZ	2.21	0.56
1:B:131:PHE:CE1	1:B:133:ILE:HD13	2.40	0.56
1:B:85:HIS:O	1:B:86:LEU:HB2	2.06	0.55
1:A:49:ASN:ND2	1:A:57:LYS:HZ2	2.04	0.55
1:D:16:LYS:HZ3	1:D:16:LYS:HB2	1.71	0.55
1:C:11:ARG:NH1	1:C:11:ARG:HG3	2.19	0.55
1:A:5:ASP:H	1:A:8:GLN:CD	2.09	0.55
1:A:64:ASN:ND2	1:A:67:MET:H	2.04	0.55

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:133:ILE:CG1	1:B:148:LYS:HB3	2.37	0.55
1:B:53:PRO:O	1:B:54:ASN:HB2	2.07	0.54
1:C:11:ARG:CG	1:C:11:ARG:HH11	2.20	0.54
2:A:245:HOH:O	1:B:195:SER:HB3	2.07	0.54
1:D:63:LYS:H	1:D:67:MET:HE1	1.72	0.54
1:D:193:THR:HG22	1:D:196:LYS:N	2.17	0.54
1:D:153:LEU:HD11	1:D:216:VAL:HG11	1.89	0.54
1:B:136:ASN:HD22	1:B:136:ASN:H	1.56	0.54
1:C:63:LYS:H	1:C:67:MET:CE	2.22	0.53
1:A:85:HIS:O	1:A:86:LEU:HB2	2.08	0.53
1:C:40:GLN:HG3	1:C:45:ASP:O	2.09	0.53
1:C:120:LYS:HD2	1:C:214:ILE:O	2.09	0.53
1:B:62:LEU:HD23	1:B:101:GLY:HA2	1.90	0.53
1:D:109:ASN:HD21	1:D:139:MET:N	2.06	0.53
1:D:4:PRO:HB3	1:D:183:TRP:CH2	2.44	0.53
1:A:85:HIS:CE1	1:A:86:LEU:HG	2.44	0.53
1:B:4:PRO:HB3	1:B:183:TRP:CH2	2.44	0.52
1:D:175:ILE:HB	1:D:213:GLN:HG3	1.92	0.52
1:A:15:VAL:HG11	1:A:18:LEU:HD13	1.91	0.52
1:A:177:LYS:HG3	1:A:211:THR:HB	1.91	0.52
1:B:15:VAL:HA	1:B:190:PRO:HA	1.91	0.52
1:B:11:ARG:HB2	1:B:14:LEU:HD22	1.92	0.52
1:A:11:ARG:HB2	1:A:14:LEU:HD22	1.91	0.52
1:D:121:VAL:HG12	1:D:122:SER:N	2.25	0.52
1:A:182:PHE:CZ	1:A:207:LEU:HD21	2.45	0.52
1:C:207:LEU:HB3	1:C:212:SER:OG	2.10	0.52
1:C:62:LEU:CB	1:C:67:MET:HE2	2.34	0.52
1:A:17:ASN:HA	1:A:19:GLN:HE21	1.70	0.52
1:B:49:ASN:ND2	1:B:57:LYS:HE3	2.22	0.52
1:A:53:PRO:O	1:A:54:ASN:CB	2.58	0.51
1:B:40:GLN:HG3	1:B:45:ASP:O	2.11	0.51
1:C:136:ASN:H	1:C:136:ASN:HD22	1.58	0.51
1:C:196:LYS:HD3	1:C:199:MET:CE	2.40	0.51
1:B:136:ASN:ND2	1:B:136:ASN:N	2.59	0.51
1:C:11:ARG:HH11	1:C:11:ARG:HG3	1.76	0.51
1:A:203:ASP:OD1	2:A:230:HOH:O	2.19	0.51
1:C:141:THR:HA	1:C:206:THR:HA	1.92	0.51
1:B:4:PRO:HB3	1:B:183:TRP:CZ2	2.45	0.51
1:D:62:LEU:HB3	1:D:67:MET:CE	2.25	0.51
1:A:64:ASN:C	1:A:64:ASN:HD22	2.14	0.51
1:D:106:HIS:CD2	1:D:110:HIS:HE1	2.28	0.51

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:5:ASP:O	1:B:7:SER:N	2.45	0.50
1:D:15:VAL:HA	1:D:190:PRO:HA	1.94	0.50
1:A:111:LEU:HD23	1:A:138:LYS:HD2	1.94	0.49
1:C:88:TYR:C	1:C:89:LEU:HD23	2.32	0.49
1:D:146:ASP:O	1:D:150:ARG:HG3	2.12	0.49
1:B:5:ASP:O	1:B:8:GLN:HB2	2.13	0.49
1:A:131:PHE:CE1	1:A:133:ILE:HD13	2.47	0.49
1:D:141:THR:HA	1:D:206:THR:HA	1.94	0.49
1:B:44:HIS:HD2	1:B:61:GLU:HG2	1.77	0.49
1:D:5:ASP:O	1:D:7:SER:N	2.45	0.49
1:A:62:LEU:HD12	1:A:68:ALA:HA	1.95	0.48
1:A:94:GLU:HG2	1:B:85:HIS:HB3	1.94	0.48
1:A:32:HIS:HE1	1:A:55:TYR:OH	1.96	0.48
1:D:63:LYS:H	1:D:67:MET:HE2	1.77	0.48
1:C:193:THR:HG22	1:C:196:LYS:N	2.22	0.48
1:A:62:LEU:HD22	1:A:67:MET:CE	2.41	0.48
1:C:215:GLU:OE1	1:C:217:TYR:OH	2.29	0.48
1:D:114:PRO:CB	1:D:134:GLU:HG3	2.42	0.48
1:A:38:VAL:HG11	1:A:49:ASN:OD1	2.13	0.48
1:C:64:ASN:HD22	1:C:64:ASN:C	2.16	0.48
1:D:17:ASN:CA	1:D:19:GLN:NE2	2.71	0.48
1:B:62:LEU:HB3	1:B:67:MET:CE	2.44	0.48
1:B:62:LEU:HB3	1:B:67:MET:HE2	1.95	0.47
1:A:40:GLN:HG3	1:A:45:ASP:O	2.14	0.47
1:C:29:PRO:HD3	1:C:147:TYR:CZ	2.48	0.47
1:D:49:ASN:HD21	1:D:57:LYS:HZ3	1.56	0.47
1:D:43:SER:HB3	1:D:65:GLN:HB2	1.96	0.47
1:D:161:THR:C	1:D:163:GLY:N	2.67	0.47
1:A:111:LEU:CD2	1:A:138:LYS:HD2	2.45	0.47
1:A:15:VAL:HA	1:A:190:PRO:HA	1.96	0.47
1:D:152:TYR:CE1	1:D:156:ASN:ND2	2.83	0.47
1:A:82:GLU:HA	1:A:99:ILE:HG22	1.97	0.46
1:A:146:ASP:O	1:A:150:ARG:HG3	2.15	0.46
1:A:33:GLU:HA	1:A:77:ASP:OD1	2.15	0.46
1:D:211:THR:O	1:D:211:THR:OG1	2.33	0.46
1:A:16:LYS:HG2	1:A:190:PRO:O	2.15	0.46
1:D:77:ASP:OD1	1:D:106:HIS:CD2	2.65	0.46
1:C:11:ARG:CG	1:C:11:ARG:NH1	2.78	0.46
1:D:30:VAL:HG11	1:D:99:ILE:HG21	1.97	0.46
1:A:193:THR:HG21	1:A:196:LYS:HG3	1.98	0.46
1:A:24:LEU:HD13	1:A:198:LEU:HD21	1.97	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:189:GLU:OE2	1:C:65:GLN:HB3	2.15	0.46
1:B:109:ASN:ND2	1:B:138:LYS:HB2	2.31	0.46
1:C:11:ARG:HB2	1:C:14:LEU:HD22	1.97	0.46
1:A:84:TYR:O	1:A:87:CYS:HB3	2.15	0.46
1:C:129:LEU:HG	1:C:130:SER:N	2.31	0.46
1:C:196:LYS:O	1:C:199:MET:HG3	2.16	0.46
1:D:22:TYR:CE1	1:D:26:GLU:HG3	2.51	0.46
1:C:188:PRO:HB3	1:C:197:TYR:CD1	2.52	0.45
1:D:129:LEU:HD22	1:D:157:LYS:HE3	1.97	0.45
1:C:90:CYS:C	1:C:92:ASN:H	2.19	0.45
1:D:88:TYR:C	1:D:89:LEU:HD23	2.36	0.45
1:A:49:ASN:ND2	1:A:57:LYS:NZ	2.64	0.45
1:D:135:THR:HG21	1:D:145:LEU:HD21	1.98	0.45
1:C:22:TYR:O	1:C:26:GLU:HB3	2.16	0.45
1:C:85:HIS:O	1:C:86:LEU:HB2	2.17	0.45
1:C:208:ASP:OD2	1:C:211:THR:HG23	2.16	0.45
1:C:133:ILE:HG13	1:C:148:LYS:HB3	1.97	0.44
1:A:19:GLN:H	1:A:19:GLN:HG3	1.47	0.44
1:B:5:ASP:H	1:B:8:GLN:HE21	1.62	0.44
1:A:187:PHE:HD1	2:A:225:HOH:O	1.99	0.44
1:A:38:VAL:HG21	1:A:49:ASN:OD1	2.17	0.44
1:B:44:HIS:CD2	1:B:61:GLU:HG2	2.52	0.44
1:A:109:ASN:ND2	1:A:139:MET:H	1.93	0.44
1:B:129:LEU:HD12	1:B:130:SER:H	1.77	0.44
2:A:245:HOH:O	1:B:193:THR:HG23	2.18	0.44
1:D:82:GLU:HA	1:D:99:ILE:HG22	1.99	0.44
1:B:168:GLU:OE2	1:B:168:GLU:HA	2.18	0.44
1:C:77:ASP:OD1	1:C:106:HIS:HD2	1.99	0.44
1:A:114:PRO:HB2	1:A:134:GLU:CG	2.41	0.44
1:A:109:ASN:ND2	1:A:138:LYS:HB2	2.33	0.44
1:B:136:ASN:HD22	1:B:136:ASN:N	2.14	0.44
1:D:141:THR:HB	2:D:222:HOH:O	2.17	0.43
1:D:32:HIS:HE1	1:D:55:TYR:OH	2.01	0.43
1:D:49:ASN:HA	1:D:49:ASN:HD22	1.62	0.43
1:C:117:ILE:HD12	1:C:117:ILE:N	2.32	0.43
1:D:177:LYS:HG3	1:D:178:ASN:N	2.33	0.43
1:B:119:VAL:O	1:B:130:SER:HA	2.18	0.43
1:D:131:PHE:HZ	1:D:149:VAL:HG13	1.83	0.43
1:A:38:VAL:HG11	1:A:49:ASN:CG	2.38	0.43
1:C:114:PRO:HB2	1:C:134:GLU:HG2	1.99	0.43
1:D:40:GLN:HG2	1:D:42:LEU:O	2.19	0.43

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:4:PRO:HB3	1:A:183:TRP:CZ2	2.53	0.43
1:D:49:ASN:HD21	1:D:57:LYS:HZ2	1.64	0.43
1:D:116:LYS:HB3	1:D:134:GLU:HB2	2.00	0.43
1:D:89:LEU:N	1:D:89:LEU:CD2	2.80	0.43
1:C:94:GLU:H	1:C:94:GLU:HG2	1.52	0.43
1:D:117:ILE:HG21	1:D:214:ILE:HD12	2.00	0.43
1:D:217:TYR:C	1:D:218:LEU:HG	2.39	0.43
1:B:53:PRO:O	1:B:54:ASN:CB	2.67	0.43
1:C:207:LEU:C	1:C:207:LEU:HB2	2.31	0.43
1:A:5:ASP:N	1:A:8:GLN:OE1	2.51	0.43
1:B:36:LYS:HD3	1:B:73:ASP:O	2.18	0.43
1:B:64:ASN:C	1:B:64:ASN:HD22	2.22	0.43
1:B:83:TYR:CE1	1:B:195:SER:HB2	2.54	0.42
1:C:40:GLN:HG2	1:C:42:LEU:O	2.19	0.42
1:D:176:PRO:HB3	1:D:207:LEU:HD22	2.00	0.42
1:C:85:HIS:ND1	1:D:94:GLU:HB3	2.33	0.42
1:D:117:ILE:HB	1:D:133:ILE:HG22	2.02	0.42
1:A:177:LYS:HB3	1:A:178:ASN:H	1.60	0.42
1:A:21:ILE:O	1:A:24:LEU:HB2	2.19	0.42
1:B:170:GLY:HA2	1:B:217:TYR:O	2.19	0.42
1:A:65:GLN:HG2	1:A:66:GLU:OE2	2.19	0.42
1:C:67:MET:O	1:C:70:LEU:HB3	2.20	0.42
1:D:109:ASN:HD21	1:D:139:MET:HB2	1.84	0.42
1:A:182:PHE:HZ	1:A:207:LEU:HD21	1.84	0.42
1:A:152:TYR:C	1:A:152:TYR:CD2	2.92	0.42
1:A:144:GLU:OE2	1:A:148:LYS:NZ	2.53	0.42
1:B:182:PHE:HE2	1:B:207:LEU:HD21	1.85	0.42
1:B:140:VAL:HG13	1:B:145:LEU:HD11	2.02	0.42
1:D:60:THR:O	1:D:60:THR:HG23	2.19	0.41
1:A:85:HIS:HB3	1:B:94:GLU:HG3	2.02	0.41
1:D:123:ILE:O	1:D:126:ILE:HD12	2.20	0.41
1:A:141:THR:HG22	1:A:206:THR:HG22	2.01	0.41
1:B:5:ASP:HA	1:B:6:PRO:HD2	1.83	0.41
1:C:207:LEU:CB	1:C:208:ASP:N	2.80	0.41
1:C:62:LEU:CD1	1:C:68:ALA:HA	2.51	0.41
1:C:53:PRO:O	1:C:54:ASN:CB	2.65	0.41
1:D:21:ILE:HG12	1:D:192:PHE:CZ	2.55	0.41
1:D:16:LYS:HB2	1:D:16:LYS:NZ	2.34	0.41
1:D:120:LYS:HB2	1:D:127:GLN:NE2	2.36	0.41
1:D:85:HIS:O	1:D:86:LEU:HB2	2.21	0.41
1:D:67:MET:CE	1:D:204:ASN:HB2	2.51	0.41

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:62:LEU:HD13	1:C:68:ALA:HA	2.03	0.41
1:D:13:SER:HG	1:D:168:GLU:CD	2.23	0.41
1:C:50:VAL:HG23	1:C:55:TYR:HE1	1.85	0.41
1:A:133:ILE:HD12	1:A:133:ILE:HA	1.80	0.41
1:C:136:ASN:HD22	1:C:136:ASN:N	2.16	0.41
1:B:30:VAL:HG12	1:B:82:GLU:CG	2.41	0.40
1:D:49:ASN:ND2	1:D:57:LYS:HZ3	2.14	0.40
1:A:19:GLN:O	1:A:23:PHE:CD1	2.74	0.40
1:C:69:THR:HA	1:C:72:LYS:HB2	2.02	0.40
1:A:62:LEU:CD1	1:A:68:ALA:HA	2.51	0.40
1:C:67:MET:CE	1:C:204:ASN:HB2	2.50	0.40
1:C:109:ASN:ND2	1:C:138:LYS:HB2	2.37	0.40
1:B:30:VAL:O	1:B:30:VAL:HG22	2.21	0.40
1:A:203:ASP:C	1:A:203:ASP:OD1	2.60	0.40
1:D:167:TYR:CD2	1:D:167:TYR:N	2.89	0.40
1:A:85:HIS:CG	1:B:94:GLU:HG3	2.55	0.40

There are no symmetry-related clashes.

## 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	216/219 (99%)	202 (94%)	11 (5%)	3 (1%)	14	27
1	B	216/219 (99%)	202 (94%)	11 (5%)	3 (1%)	14	27
1	C	216/219 (99%)	204 (94%)	10 (5%)	2 (1%)	21	41
1	D	216/219 (99%)	179 (83%)	26 (12%)	11 (5%)	2	3
All	All	864/876 (99%)	787 (91%)	58 (7%)	19 (2%)	8	15

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	177	LYS
1	D	109	ASN
1	D	127	GLN
1	A	72	LYS
1	A	90	CYS
1	B	6	PRO
1	B	177	LYS
1	D	6	PRO
1	D	7	SER
1	D	54	ASN
1	D	93	ALA
1	D	116	LYS
1	D	177	LYS
1	D	128	SER
1	B	179	LYS
1	C	17	ASN
1	C	91	GLU
1	D	63	LYS
1	D	162	ASN

### 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	198/206 (96%)	172 (87%)	26 (13%)	5	9
1	B	196/206 (95%)	176 (90%)	20 (10%)	9	16
1	C	196/206 (95%)	170 (87%)	26 (13%)	5	8
1	D	196/206 (95%)	164 (84%)	32 (16%)	3	4
All	All	786/824 (95%)	682 (87%)	104 (13%)	5	8

All (104) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3	ASP
1	A	8	GLN
1	A	12	SER

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type
1	A	14	LEU
1	A	16	LYS
1	A	19	GLN
1	A	30	VAL
1	A	33	GLU
1	A	37	SER
1	A	38	VAL
1	A	63	LYS
1	A	64	ASN
1	A	67	MET
1	A	82	GLU
1	A	91	GLU
1	A	116	LYS
1	A	118	VAL
1	A	122	SER
1	A	133	ILE
1	A	136	ASN
1	A	138	LYS
1	A	157	LYS
1	A	158	GLN
1	A	166	LYS
1	A	177	LYS
1	A	207	LEU
1	B	3	ASP
1	B	8	GLN
1	B	14	LEU
1	B	16	LYS
1	B	19	GLN
1	B	30	VAL
1	B	36	LYS
1	B	57	LYS
1	B	64	ASN
1	B	82	GLU
1	B	89	LEU
1	B	90	CYS
1	B	122	SER
1	B	129	LEU
1	B	133	ILE
1	B	136	ASN
1	B	177	LYS
1	B	181	SER
1	B	193	THR

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	195	SER
1	C	8	GLN
1	C	11	ARG
1	C	12	SER
1	C	14	LEU
1	C	16	LYS
1	C	19	GLN
1	C	30	VAL
1	C	35	VAL
1	C	37	SER
1	C	38	VAL
1	C	49	ASN
1	C	57	LYS
1	C	64	ASN
1	C	65	GLN
1	C	72	LYS
1	C	74	LYS
1	C	82	GLU
1	C	89	LEU
1	C	94	GLU
1	C	120	LYS
1	C	122	SER
1	C	126	ILE
1	C	127	GLN
1	C	136	ASN
1	C	177	LYS
1	C	193	THR
1	D	8	GLN
1	D	11	ARG
1	D	16	LYS
1	D	18	LEU
1	D	19	GLN
1	D	30	VAL
1	D	36	LYS
1	D	37	SER
1	D	38	VAL
1	D	51	SER
1	D	64	ASN
1	D	65	GLN
1	D	72	LYS
1	D	82	GLU
1	D	89	LEU

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	D	94	GLU
1	D	105	ASN
1	D	116	LYS
1	D	118	VAL
1	D	120	LYS
1	D	126	ILE
1	D	127	GLN
1	D	134	GLU
1	D	135	THR
1	D	136	ASN
1	D	138	LYS
1	D	166	LYS
1	D	193	THR
1	D	196	LYS
1	D	200	ILE
1	D	206	THR
1	D	215	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (37) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	32	HIS
1	A	49	ASN
1	A	64	ASN
1	A	65	GLN
1	A	106	HIS
1	A	109	ASN
1	A	136	ASN
1	A	158	GLN
1	B	8	GLN
1	B	32	HIS
1	B	44	HIS
1	B	49	ASN
1	B	64	ASN
1	B	85	HIS
1	B	109	ASN
1	B	110	HIS
1	B	136	ASN
1	C	8	GLN
1	C	32	HIS
1	C	49	ASN
1	C	64	ASN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	C	65	GLN
1	C	106	HIS
1	C	109	ASN
1	C	110	HIS
1	C	136	ASN
1	D	19	GLN
1	D	32	HIS
1	D	49	ASN
1	D	64	ASN
1	D	65	GLN
1	D	75	ASN
1	D	106	HIS
1	D	109	ASN
1	D	110	HIS
1	D	143	GLN
1	D	210	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

## 6 Fit of model and data ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

EDS was not executed - this section will therefore be empty.

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

EDS was not executed - this section will therefore be empty.

### 6.3 Carbohydrates ⓘ

EDS was not executed - this section will therefore be empty.

### 6.4 Ligands ⓘ

EDS was not executed - this section will therefore be empty.

### 6.5 Other polymers ⓘ

EDS was not executed - this section will therefore be empty.