Full wwPDB X-ray Structure Validation Report ⓘ

Oct 20, 2024 – 08:38 PM EDT

PDB ID	:	1FNV
Title	:	STRUCTURE OF STREPTOCOCCAL PYROGENIC EXOTOXIN A
Authors	:	Earhart, C.A.; Vath, G.M.; Roggiani, M.; Schlievert, P.M.; Ohlendorf, D.H.
Deposited on	:	2000-08-23
Resolution	:	3.60 Å(reported)

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

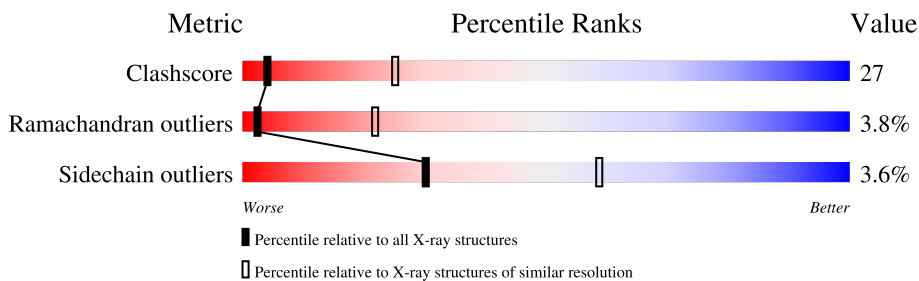|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.60 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	Percentile Ranks	Value
Clashscore		27
Ramachandran outliers		3.8%
Sidechain outliers		3.6%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	180529	1665 (3.70-3.50)
Ramachandran outliers	177936	1641 (3.70-3.50)
Sidechain outliers	177891	1640 (3.70-3.50)

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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	221	58% · 37% · 5%
1	B	221	59% · 36% · 5%
1	C	221	56% · 40% · •
1	D	221	59% · 35% · 5%

W O R L D W I D E
wwPDB
PROTEIN DATA BANK

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 7308 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 EXOTOXIN TYPE A PRECURSOR (ALLELE 1).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	221	Total	C	N	O	S	0	0	0
			1823	1166	293	358	6			
1	B	221	Total	C	N	O	S	0	0	0
			1823	1166	293	358	6			
1	C	221	Total	C	N	O	S	0	0	0
			1823	1166	293	358	6			
1	D	221	Total	C	N	O	S	0	0	0
			1823	1166	293	358	6			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	153	THR	LEU	conflict	UNP P62560
A	154	ILE	THR	conflict	UNP P62560
A	209	ASN	SER	conflict	UNP P62560
A	210	LYS	ASN	conflict	UNP P62560
B	453	THR	LEU	conflict	UNP P62560
B	454	ILE	THR	conflict	UNP P62560
B	509	ASN	SER	conflict	UNP P62560
B	510	LYS	ASN	conflict	UNP P62560
C	753	THR	LEU	conflict	UNP P62560
C	754	ILE	THR	conflict	UNP P62560
C	809	ASN	SER	conflict	UNP P62560
C	810	LYS	ASN	conflict	UNP P62560
D	1053	THR	LEU	conflict	UNP P62560
D	1054	ILE	THR	conflict	UNP P62560
D	1109	ASN	SER	conflict	UNP P62560
D	1110	LYS	ASN	conflict	UNP P62560

- Molecule 2 is CADMIUM ION (three-letter code: CD) (formula: Cd).

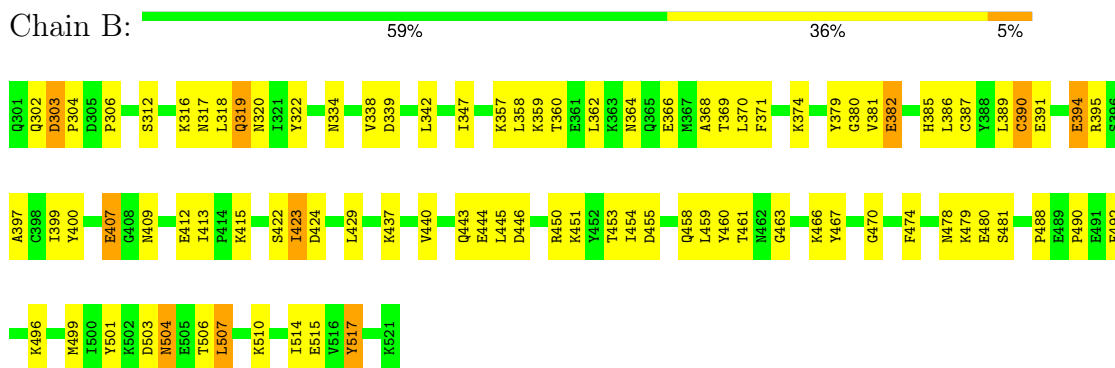| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	3	Total 3	Cd 3	0	0
2	B	4	Total 4	Cd 4	0	0
2	C	5	Total 5	Cd 5	0	0
2	D	4	Total 4	Cd 4	0	0

3 Residue-property plots ⓘ

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. 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. 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.
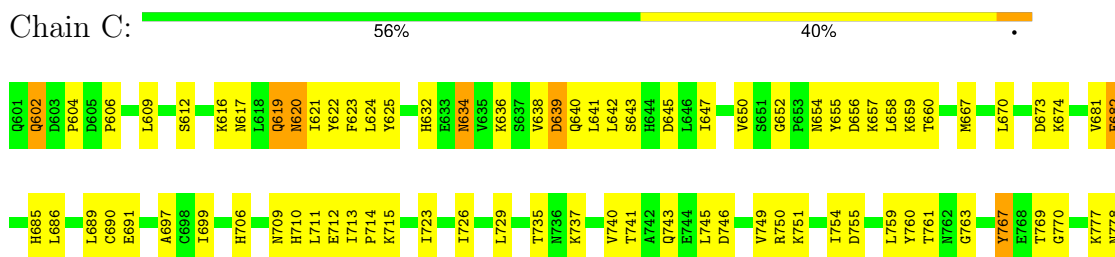
Note EDS was not executed.

● Molecule 1: EXOTOXIN TYPE A PRECURSOR (ALLELE 1)
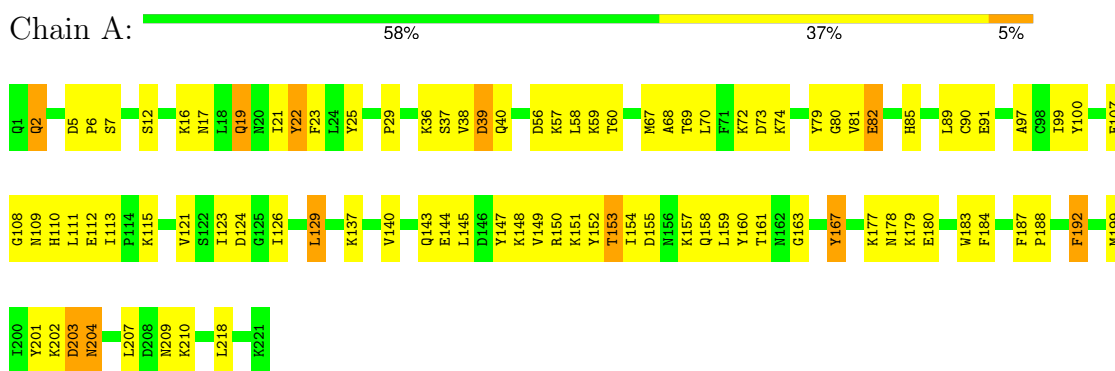
Chain A:

● Molecule 1: EXOTOXIN TYPE A PRECURSOR (ALLELE 1)

Chain B:

● Molecule 1: EXOTOXIN TYPE A PRECURSOR (ALLELE 1)

Chain C:

K779 E780 W783 F786 F787 F792 T793 Q794 S795 K796 I800 Y801 K802 D803 N804 E805 T806 L807 D808 N809 K810 L818 T819 T820 K821
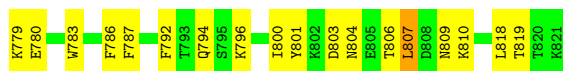
• Molecule 1: EXOTOXIN TYPE A PRECURSOR (ALLELE 1)

Chain D:

59%　　　　　　35%　　　　5%

Q901 Q902 L909 S912 V915 K916 N917 L918 Q919 N920 I921 Y922 F923 L924 Y925 V930 V938 D939 G952 Y955 D956 K957 L958 K959 T960 M967 A968 T969 L970 K974 Y979 G980 V981 E982 Y983 Y984 H985 L986 L989 C990 E991 E994 R995 S996 A997 C998 I999

L1011 E1012 I1013 P1014 K1015 I1023 I1026 L1029 K1037 K1038 M1039 V1040 Q1043 E1044 L1045 D1046 Y1047 K1048 V1049 R1050 K1051 I1054 D1055 N1056 K1057 Q1058 L1059 Y1060 Y1067 E1068 T1069 G1070 Y1071 I1075 P1076 K1077 N1078 K1079 E1080 F1084 F1087 P1088 E1091 F1092 Y1101 L1107 D1108

N1109 K1110 I1114 E1115 V1116 Y1117 L1118 T1119 T1120 K1121

4 Data and refinement statistics ⓘ

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

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	105.48Å 130.71Å 84.52Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.60	Depositor
% Data completeness (in resolution range)	75.2 (20.00-3.60)	Depositor
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.233 , 0.304	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7308	wwPDB-VP
Average B, all atoms (Å^2)	15.0	wwPDB-VP

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	0.45	0/1865	0.73	0/2522
1	B	0.44	0/1865	0.72	2/2522 (0.1%)
1	C	0.43	0/1865	0.72	0/2522
1	D	0.44	0/1865	0.71	0/2522
All	All	0.44	0/7460	0.72	2/10088 (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

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	394	GLU	N-CA-C	-5.17	97.03	111.00
1	B	387	CYS	CA-CB-SG	5.15	123.26	114.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	192	PHE	Sidechain

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	1823	0	1779	104	0
1	B	1823	0	1776	92	0
1	C	1823	0	1776	103	0
1	D	1823	0	1776	104	0
2	A	3	0	0	0	0
2	B	4	0	0	0	0
2	C	5	0	0	0	0
2	D	4	0	0	1	0
All	All	7308	0	7107	387	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 27.

All (387) 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:D:990:CYS:SG	2:D:1124:CD:CD	1.39	1.29
1:B:454:ILE:HG12	1:B:459:LEU:HB3	1.39	1.05
1:D:919:GLN:H	1:D:919:GLN:HE21	0.97	0.96
1:A:19:GLN:H	1:A:19:GLN:NE2	1.66	0.94
1:C:754:ILE:HG12	1:C:759:LEU:HB3	1.50	0.93
1:B:319:GLN:H	1:B:319:GLN:NE2	1.68	0.91
1:B:319:GLN:H	1:B:319:GLN:HE21	0.95	0.91
1:B:319:GLN:HE21	1:B:319:GLN:N	1.70	0.88
1:D:919:GLN:H	1:D:919:GLN:NE2	1.71	0.88
1:D:958:LEU:HD12	1:D:997:ALA:O	1.74	0.88
1:A:81:VAL:H	1:A:143:GLN:NE2	1.72	0.88
1:D:1054:ILE:HG12	1:D:1059:LEU:HB3	1.54	0.88
1:A:151:LYS:HE2	1:A:155:ASP:OD2	1.73	0.87
1:B:454:ILE:HA	1:B:459:LEU:H	1.39	0.86
1:C:751:LYS:HE2	1:C:755:ASP:OD2	1.76	0.86
1:B:454:ILE:HG23	1:B:460:TYR:H	1.41	0.85
1:B:381:VAL:H	1:B:443:GLN:NE2	1.73	0.85
1:B:415:LYS:HE3	1:B:510:LYS:HA	1.58	0.84
1:D:1015:LYS:HE3	1:D:1110:LYS:HA	1.58	0.84

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:381:VAL:H	1:B:443:GLN:HE21	1.20	0.83
1:D:919:GLN:HE21	1:D:919:GLN:N	1.76	0.83
1:A:16:LYS:HG3	1:A:17:ASN:H	1.43	0.83
1:D:1015:LYS:HG2	1:D:1109:ASN:HD22	1.42	0.83
1:B:358:LEU:HD12	1:B:397:ALA:O	1.80	0.82
1:D:916:LYS:HG3	1:D:917:ASN:H	1.46	0.81
1:A:59:LYS:HB2	1:A:89:LEU:CD1	2.10	0.81
1:A:137:LYS:HB2	1:A:140:VAL:HG12	1.61	0.80
1:B:450:ARG:O	1:B:454:ILE:HG13	1.84	0.78
1:C:657:LYS:HB3	1:C:689:LEU:HD21	1.65	0.77
1:D:1050:ARG:O	1:D:1054:ILE:HG13	1.84	0.77
1:C:602:GLN:H	1:C:602:GLN:NE2	1.81	0.77
1:D:1054:ILE:HA	1:D:1059:LEU:H	1.49	0.77
1:A:19:GLN:H	1:A:19:GLN:HE21	1.32	0.76
1:D:959:LYS:HB2	1:D:989:LEU:CD1	2.16	0.76
1:A:59:LYS:HB2	1:A:89:LEU:HD11	1.70	0.73
1:C:604:PRO:HB3	1:C:783:TRP:CZ2	2.23	0.73
1:D:981:VAL:H	1:D:1043:GLN:NE2	1.88	0.72
1:A:115:LYS:HE3	1:A:210:LYS:HA	1.72	0.72
1:A:145:LEU:O	1:A:149:VAL:HG23	1.90	0.71
1:D:957:LYS:HB3	1:D:989:LEU:CD2	2.21	0.70
1:C:625:TYR:CE2	1:C:750:ARG:HD2	2.26	0.70
1:C:715:LYS:HE3	1:C:810:LYS:HA	1.71	0.70
1:A:81:VAL:H	1:A:143:GLN:HE21	1.37	0.70
1:C:770:GLY:O	1:C:786:PHE:HB2	1.91	0.70
1:A:2:GLN:H	1:A:2:GLN:NE2	1.90	0.70
1:B:319:GLN:NE2	1:B:319:GLN:N	2.34	0.70
1:B:359:LYS:HB2	1:B:389:LEU:HD13	1.73	0.69
1:D:981:VAL:H	1:D:1043:GLN:HE21	1.38	0.69
1:B:379:TYR:CD2	1:B:444:GLU:HG3	2.28	0.69
1:B:437:LYS:HB2	1:B:440:VAL:HG12	1.74	0.69
1:C:634:ASN:HB2	1:C:706:HIS:CD2	2.27	0.69
1:A:154:ILE:HG12	1:A:159:LEU:HB3	1.75	0.69
1:D:1115:GLU:HB3	1:D:1117:TYR:HE1	1.58	0.69
1:C:737:LYS:HB2	1:C:740:VAL:HG12	1.75	0.68
1:A:183:TRP:O	1:A:184:PHE:HD2	1.76	0.68
1:B:381:VAL:N	1:B:443:GLN:HE21	1.91	0.68
1:A:115:LYS:HG2	1:A:209:ASN:HD22	1.57	0.68
1:A:112:GLU:C	1:A:113:ILE:HD12	2.14	0.68
1:A:16:LYS:HG3	1:A:17:ASN:N	2.09	0.67
1:A:60:THR:HA	1:A:99:ILE:O	1.94	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:390:CYS:SG	1:D:991:GLU:OE1	2.50	0.67
1:D:912:SER:OG	1:D:1068:GLU:HA	1.94	0.66
1:D:1015:LYS:CE	1:D:1110:LYS:HD3	2.25	0.66
1:B:359:LYS:HB2	1:B:389:LEU:CD1	2.25	0.66
1:C:616:LYS:HG3	1:C:617:ASN:H	1.60	0.65
1:A:19:GLN:O	1:A:22:TYR:HB3	1.97	0.64
1:D:957:LYS:HB3	1:D:989:LEU:HD21	1.78	0.64
1:C:660:THR:HG23	1:C:660:THR:O	1.95	0.64
1:A:167:TYR:CD1	1:A:167:TYR:N	2.66	0.64
1:C:754:ILE:HA	1:C:759:LEU:H	1.61	0.64
1:A:60:THR:HG23	1:A:60:THR:O	1.98	0.63
1:D:1067:TYR:N	1:D:1067:TYR:CD1	2.65	0.63
1:B:316:LYS:HG3	1:B:317:ASN:N	2.14	0.63
1:D:916:LYS:HE2	1:D:1091:GLU:HG2	1.80	0.63
1:B:470:GLY:HA2	1:B:517:TYR:O	1.99	0.63
1:C:640:GLN:HB2	1:C:645:ASP:O	1.98	0.63
1:C:681:VAL:H	1:C:743:GLN:NE2	1.96	0.63
1:A:192:PHE:CD1	1:A:192:PHE:C	2.71	0.62
1:A:154:ILE:HA	1:A:159:LEU:H	1.64	0.62
1:D:959:LYS:HB2	1:D:989:LEU:HD11	1.79	0.62
1:B:415:LYS:HE3	1:B:510:LYS:HD3	1.79	0.62
1:B:316:LYS:HG3	1:B:317:ASN:H	1.64	0.62
1:C:638:VAL:O	1:C:639:ASP:HB2	1.99	0.62
1:C:806:THR:HG22	1:C:807:LEU:N	2.15	0.62
1:A:70:LEU:O	1:A:70:LEU:HD23	2.00	0.61
1:C:619:GLN:H	1:C:619:GLN:NE2	1.98	0.61
1:A:115:LYS:CE	1:A:210:LYS:HD3	2.31	0.61
1:C:658:LEU:HD12	1:C:697:ALA:O	2.00	0.60
1:C:625:TYR:CD2	1:C:750:ARG:HD2	2.36	0.60
1:B:490:PRO:HD2	1:C:643:SER:OG	2.02	0.60
1:B:467:TYR:N	1:B:467:TYR:CD1	2.70	0.60
1:D:1012:GLU:C	1:D:1013:ILE:HD12	2.21	0.60
1:D:1015:LYS:HG2	1:D:1109:ASN:ND2	2.15	0.60
1:B:412:GLU:C	1:B:413:ILE:HD12	2.22	0.59
1:B:370:LEU:HD23	1:B:370:LEU:O	2.02	0.59
1:B:443:GLN:OE1	1:B:501:TYR:HB3	2.02	0.59
1:A:115:LYS:HD3	1:A:210:LYS:NZ	2.17	0.59
1:C:602:GLN:NE2	1:C:602:GLN:N	2.50	0.59
1:B:391:GLU:OE1	1:D:990:CYS:SG	2.56	0.59
1:A:137:LYS:HB2	1:A:140:VAL:CG1	2.32	0.59
1:B:379:TYR:CD2	1:B:444:GLU:HA	2.37	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:767:TYR:CD1	1:C:767:TYR:N	2.71	0.59
1:B:407:GLU:OE1	1:B:407:GLU:N	2.36	0.59
1:C:602:GLN:N	1:C:602:GLN:HE21	2.00	0.59
1:A:38:VAL:O	1:A:39:ASP:HB2	2.03	0.58
1:B:374:LYS:HD2	1:B:374:LYS:N	2.17	0.58
1:C:657:LYS:HB3	1:C:689:LEU:CD2	2.33	0.58
1:C:674:LYS:N	1:C:674:LYS:HD2	2.18	0.58
1:B:450:ARG:HB3	1:B:454:ILE:HD11	1.86	0.58
1:B:437:LYS:HB2	1:B:440:VAL:CG1	2.34	0.58
1:D:1011:LEU:HD21	1:D:1038:LYS:HG2	1.84	0.58
1:A:91:GLU:OE1	1:C:690:CYS:SG	2.58	0.58
1:A:5:ASP:O	1:A:7:SER:N	2.36	0.58
1:C:750:ARG:O	1:C:754:ILE:HG13	2.04	0.57
1:B:319:GLN:O	1:B:322:TYR:N	2.34	0.57
1:A:143:GLN:HG3	1:A:201:TYR:CD1	2.40	0.57
1:D:1051:LYS:HE2	1:D:1055:ASP:OD2	2.04	0.57
1:A:79:TYR:CE2	1:A:144:GLU:HG3	2.40	0.57
1:D:902:GLN:NE2	1:D:902:GLN:H	2.03	0.57
1:A:21:ILE:HG21	1:A:160:TYR:CE2	2.40	0.57
1:C:685:HIS:CD2	1:D:994:GLU:HG2	2.39	0.57
1:A:202:LYS:C	1:A:204:ASN:H	2.08	0.57
1:D:960:THR:HG23	1:D:960:THR:O	2.04	0.56
1:B:461:THR:O	1:B:463:GLY:N	2.35	0.56
1:D:967:MET:O	1:D:970:LEU:HB3	2.05	0.56
1:D:1088:PRO:HG3	1:D:1092:PHE:CE2	2.40	0.56
1:A:19:GLN:NE2	1:A:19:GLN:N	2.46	0.56
1:B:492:PHE:CD1	1:B:492:PHE:C	2.77	0.56
1:B:368:ALA:C	1:B:370:LEU:H	2.09	0.56
1:A:123:ILE:O	1:A:126:ILE:HG12	2.06	0.56
1:A:68:ALA:C	1:A:70:LEU:H	2.09	0.56
1:A:143:GLN:HG3	1:A:201:TYR:CE1	2.40	0.56
1:C:616:LYS:HG3	1:C:617:ASN:N	2.20	0.56
1:D:1050:ARG:O	1:D:1051:LYS:C	2.43	0.56
1:B:391:GLU:OE1	1:D:991:GLU:HG2	2.05	0.56
1:D:1015:LYS:HE3	1:D:1110:LYS:HD3	1.86	0.56
1:C:710:HIS:CD2	1:C:711:LEU:H	2.24	0.55
1:D:1037:LYS:HB2	1:D:1040:VAL:CG1	2.37	0.55
1:D:1054:ILE:HG23	1:D:1060:TYR:H	1.71	0.55
1:A:150:ARG:O	1:A:151:LYS:C	2.45	0.55
1:D:1037:LYS:HB2	1:D:1040:VAL:HG12	1.88	0.55
1:D:925:TYR:CD2	1:D:1050:ARG:HD2	2.42	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:57:LYS:HB3	1:A:89:LEU:CD2	2.37	0.55
1:B:379:TYR:CE2	1:B:444:GLU:HG3	2.42	0.54
1:D:916:LYS:HG3	1:D:917:ASN:N	2.19	0.54
1:C:737:LYS:HB2	1:C:740:VAL:CG1	2.37	0.54
1:D:925:TYR:CE2	1:D:1050:ARG:HD2	2.43	0.54
1:A:40:GLN:NE2	1:A:72:LYS:HE2	2.23	0.54
1:B:440:VAL:O	1:B:506:THR:HG23	2.07	0.54
1:A:90:CYS:SG	1:C:691:GLU:OE1	2.59	0.54
1:B:443:GLN:HG3	1:B:501:TYR:CE1	2.43	0.54
1:B:503:ASP:O	1:B:504:ASN:C	2.46	0.54
1:B:451:LYS:HE2	1:B:455:ASP:OD2	2.08	0.54
1:C:796:LYS:O	1:C:796:LYS:HD3	2.08	0.54
1:C:710:HIS:HD2	1:C:711:LEU:H	1.54	0.54
1:A:58:LEU:HD12	1:A:97:ALA:O	2.08	0.53
1:A:167:TYR:CD2	1:A:218:LEU:HD13	2.44	0.53
1:B:443:GLN:HG3	1:B:501:TYR:CD1	2.42	0.53
1:B:488:PRO:HG3	1:B:492:PHE:CE2	2.44	0.53
1:C:792:PHE:CD1	1:C:792:PHE:C	2.81	0.53
1:B:415:LYS:CE	1:B:510:LYS:HD3	2.39	0.53
1:B:319:GLN:O	1:B:322:TYR:HB3	2.08	0.53
1:A:74:LYS:HD2	1:A:74:LYS:N	2.23	0.53
1:C:682:GLU:HA	1:C:699:ILE:HG22	1.90	0.53
1:B:382:GLU:HA	1:B:399:ILE:HG22	1.89	0.53
1:C:670:LEU:HD23	1:C:670:LEU:O	2.08	0.53
1:A:67:MET:O	1:A:70:LEU:HB3	2.09	0.53
1:A:81:VAL:N	1:A:143:GLN:HE21	2.04	0.52
1:C:745:LEU:O	1:C:749:VAL:HG23	2.09	0.52
1:D:998:CYS:O	1:D:999:ILE:HG23	2.08	0.52
1:A:19:GLN:HE21	1:A:19:GLN:N	2.05	0.52
1:D:1050:ARG:HB3	1:D:1054:ILE:HD11	1.90	0.52
1:B:391:GLU:HG2	1:D:991:GLU:OE1	2.10	0.52
1:D:968:ALA:C	1:D:970:LEU:H	2.12	0.52
1:A:23:PHE:CE2	1:B:395:ARG:NH1	2.78	0.52
1:B:342:LEU:HD22	1:C:792:PHE:HA	1.92	0.52
1:C:715:LYS:HG2	1:C:809:ASN:HD22	1.74	0.52
1:B:454:ILE:O	1:B:458:GLN:HA	2.09	0.51
1:C:761:THR:C	1:C:763:GLY:H	2.12	0.51
1:D:1078:ASN:O	1:D:1079:LYS:HB3	2.10	0.51
1:D:970:LEU:C	1:D:970:LEU:HD23	2.31	0.51
1:C:723:ILE:O	1:C:726:ILE:HG12	2.11	0.51
1:A:107:GLU:OE1	1:A:107:GLU:N	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:115:LYS:HG2	1:A:209:ASN:ND2	2.24	0.51
1:D:1029:LEU:C	1:D:1029:LEU:HD12	2.31	0.51
1:A:110:HIS:HD2	1:A:111:LEU:H	1.59	0.51
1:A:115:LYS:HE2	1:A:210:LYS:HD3	1.93	0.51
1:C:658:LEU:HD12	1:C:659:LYS:H	1.75	0.51
1:C:769:THR:HG1	1:C:819:THR:HG1	1.59	0.51
1:A:150:ARG:O	1:A:154:ILE:HG13	2.11	0.51
1:B:454:ILE:HD13	1:B:460:TYR:HD1	1.76	0.51
1:C:609:LEU:HD13	1:C:769:THR:HB	1.93	0.51
1:C:619:GLN:H	1:C:619:GLN:HE21	1.58	0.50
1:D:960:THR:HA	1:D:999:ILE:O	2.11	0.50
1:A:110:HIS:CD2	1:A:111:LEU:N	2.80	0.50
1:C:657:LYS:CB	1:C:689:LEU:HD21	2.39	0.50
1:B:385:HIS:CD2	1:B:386:LEU:HG	2.46	0.50
1:C:710:HIS:CD2	1:C:711:LEU:N	2.80	0.50
1:D:1057:LYS:O	1:D:1058:GLN:HB2	2.12	0.50
1:A:121:VAL:HB	1:A:129:LEU:HD12	1.94	0.50
1:C:639:ASP:O	1:C:647:ILE:HB	2.12	0.49
1:C:713:ILE:HG23	1:C:714:PRO:HD2	1.93	0.49
1:B:338:VAL:O	1:B:339:ASP:HB2	2.12	0.49
1:D:915:VAL:HG11	1:D:918:LEU:HD13	1.93	0.49
1:C:623:PHE:CE2	1:D:995:ARG:NH1	2.81	0.49
1:D:912:SER:HB3	1:D:1087:PHE:CE2	2.47	0.49
1:A:57:LYS:HB3	1:A:89:LEU:HD23	1.94	0.49
1:C:681:VAL:H	1:C:743:GLN:HE21	1.60	0.49
1:A:161:THR:C	1:A:163:GLY:H	2.16	0.49
1:D:1078:ASN:OD1	1:D:1079:LYS:N	2.46	0.49
1:D:994:GLU:O	1:D:995:ARG:HB2	2.13	0.48
1:B:362:LEU:HD12	1:B:368:ALA:HA	1.95	0.48
1:B:422:SER:O	1:B:423:ILE:HG13	2.13	0.48
1:C:632:HIS:CD2	1:C:650:VAL:HG21	2.48	0.48
1:C:778:ASN:O	1:C:779:LYS:HB3	2.14	0.48
1:B:478:ASN:OD1	1:B:479:LYS:N	2.46	0.48
1:C:619:GLN:HG2	1:C:620:ASN:N	2.29	0.48
1:D:1026:ILE:O	1:D:1026:ILE:HG13	2.14	0.48
1:A:203:ASP:O	1:A:204:ASN:C	2.52	0.48
1:C:619:GLN:O	1:C:621:ILE:N	2.46	0.48
1:D:1015:LYS:HD3	1:D:1110:LYS:NZ	2.29	0.48
1:D:916:LYS:CG	1:D:917:ASN:H	2.22	0.48
1:D:979:TYR:CE2	1:D:1044:GLU:HG3	2.49	0.48
1:A:37:SER:OG	1:A:72:LYS:O	2.31	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:113:ILE:HD12	1:A:113:ILE:N	2.28	0.48
1:B:474:PHE:O	1:B:481:SER:HB2	2.14	0.47
1:C:612:SER:HB3	1:C:787:PHE:CE2	2.49	0.47
1:D:970:LEU:HD23	1:D:970:LEU:O	2.14	0.47
1:D:1015:LYS:HE2	1:D:1110:LYS:HD3	1.96	0.47
1:A:100:TYR:CE2	1:A:199:MET:HG2	2.49	0.47
1:A:121:VAL:HB	1:A:129:LEU:CD1	2.45	0.47
1:D:998:CYS:O	1:D:999:ILE:CG2	2.62	0.47
1:C:670:LEU:HD23	1:C:670:LEU:C	2.35	0.47
1:D:1071:TYR:HB2	1:D:1084:PHE:O	2.15	0.47
1:A:81:VAL:N	1:A:143:GLN:NE2	2.51	0.47
1:A:91:GLU:OE1	1:C:691:GLU:HG2	2.14	0.47
1:D:1023:ILE:O	1:D:1026:ILE:HG12	2.15	0.47
1:A:2:GLN:NE2	1:A:2:GLN:N	2.61	0.47
1:A:25:TYR:CE2	1:A:150:ARG:HD2	2.49	0.47
1:C:624:LEU:HD11	1:C:794:GLN:HG2	1.96	0.47
1:C:796:LYS:HD3	1:C:796:LYS:C	2.34	0.47
1:D:902:GLN:NE2	1:D:902:GLN:N	2.63	0.47
1:C:619:GLN:O	1:C:622:TYR:HB3	2.15	0.47
1:C:746:ASP:OD1	1:C:801:TYR:OH	2.22	0.47
1:D:930:VAL:HG13	1:D:955:TYR:OH	2.14	0.47
1:B:364:ASN:OD1	1:B:366:GLU:HB2	2.14	0.47
1:C:754:ILE:HD13	1:C:760:TYR:HD1	1.79	0.47
1:D:919:GLN:O	1:D:922:TYR:N	2.47	0.47
1:D:1045:LEU:O	1:D:1049:VAL:HG23	2.15	0.47
1:A:2:GLN:N	1:A:2:GLN:HE21	2.12	0.47
1:B:368:ALA:O	1:B:370:LEU:N	2.47	0.47
1:C:652:GLY:HA3	1:C:655:TYR:CZ	2.50	0.47
1:C:750:ARG:O	1:C:751:LYS:C	2.53	0.47
1:D:1107:LEU:O	1:D:1107:LEU:HD12	2.15	0.47
1:B:303:ASP:HA	1:B:304:PRO:HD2	1.73	0.46
1:C:685:HIS:O	1:C:686:LEU:HB2	2.15	0.46
1:A:25:TYR:CD2	1:A:150:ARG:HD2	2.50	0.46
1:C:657:LYS:CB	1:C:689:LEU:CD2	2.94	0.46
1:D:1043:GLN:HG3	1:D:1101:TYR:CD1	2.50	0.46
1:A:68:ALA:O	1:A:70:LEU:N	2.45	0.46
1:D:919:GLN:NE2	1:D:919:GLN:N	2.46	0.46
1:D:919:GLN:O	1:D:921:ILE:N	2.48	0.46
1:D:985:HIS:O	1:D:986:LEU:HB2	2.14	0.46
1:A:12:SER:HB3	1:A:187:PHE:CE2	2.50	0.46
1:A:80:GLY:HA2	1:A:143:GLN:NE2	2.31	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:407:GLU:H	1:B:407:GLU:CD	2.19	0.46
1:C:713:ILE:HA	1:C:714:PRO:HD3	1.75	0.46
1:C:729:LEU:HD12	1:C:729:LEU:C	2.36	0.46
1:A:183:TRP:C	1:A:184:PHE:CD2	2.89	0.46
1:B:423:ILE:O	1:B:424:ASP:HB2	2.14	0.46
1:C:770:GLY:HA3	1:C:818:LEU:CD2	2.46	0.46
1:A:5:ASP:C	1:A:7:SER:H	2.18	0.46
1:A:36:LYS:HD2	1:A:73:ASP:O	2.14	0.46
1:D:922:TYR:O	1:D:923:PHE:C	2.54	0.46
1:A:2:GLN:H	1:A:2:GLN:HE21	1.64	0.46
1:A:157:LYS:O	1:A:158:GLN:HB2	2.15	0.46
1:B:371:PHE:CD1	1:B:371:PHE:N	2.83	0.46
1:B:413:ILE:HD12	1:B:413:ILE:N	2.31	0.46
1:D:974:LYS:HD2	1:D:974:LYS:N	2.30	0.46
1:C:715:LYS:HG2	1:C:809:ASN:ND2	2.30	0.46
1:D:994:GLU:O	1:D:995:ARG:CB	2.64	0.45
1:A:56:ASP:OD2	1:A:56:ASP:N	2.49	0.45
1:C:770:GLY:HA3	1:C:818:LEU:HD23	1.98	0.45
1:B:514:ILE:HG22	1:B:515:GLU:N	2.31	0.45
1:B:517:TYR:N	1:B:517:TYR:CD1	2.84	0.45
1:C:604:PRO:HB3	1:C:783:TRP:CH2	2.50	0.45
1:B:488:PRO:CG	1:B:492:PHE:CE2	3.00	0.45
1:D:1088:PRO:CG	1:D:1092:PHE:CE2	3.00	0.45
1:A:19:GLN:O	1:A:22:TYR:N	2.50	0.45
1:A:115:LYS:HE3	1:A:210:LYS:HD3	1.99	0.45
1:C:619:GLN:O	1:C:622:TYR:N	2.49	0.45
1:C:681:VAL:HG23	1:C:743:GLN:HE21	1.81	0.45
1:A:178:ASN:OD1	1:A:179:LYS:N	2.50	0.45
1:A:202:LYS:O	1:A:204:ASN:N	2.50	0.45
1:A:167:TYR:N	1:A:167:TYR:HD1	2.12	0.45
1:B:370:LEU:O	1:B:374:LYS:HD3	2.16	0.44
1:B:390:CYS:SG	1:D:991:GLU:OE2	2.75	0.44
1:C:641:LEU:HG	1:C:642:LEU:HG	1.99	0.44
1:D:917:ASN:HB3	1:D:920:ASN:ND2	2.32	0.44
1:B:360:THR:HG23	1:B:360:THR:O	2.17	0.44
1:B:466:LYS:HB3	1:B:467:TYR:CE1	2.52	0.44
1:C:806:THR:CG2	1:C:807:LEU:N	2.80	0.44
1:D:957:LYS:HB3	1:D:989:LEU:HD23	1.98	0.44
1:D:1092:PHE:CD1	1:D:1092:PHE:C	2.90	0.44
1:C:632:HIS:CE1	1:C:650:VAL:HB	2.53	0.44
1:D:1011:LEU:HD21	1:D:1038:LYS:CG	2.47	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:129:LEU:HD12	1:A:129:LEU:C	2.38	0.44
1:B:391:GLU:OE2	1:D:990:CYS:SG	2.76	0.44
1:D:1114:ILE:HG22	1:D:1115:GLU:N	2.32	0.44
1:C:670:LEU:O	1:C:674:LYS:HD3	2.18	0.43
1:D:1077:LYS:HD3	1:D:1077:LYS:C	2.39	0.43
1:A:82:GLU:OE1	1:A:82:GLU:N	2.43	0.43
1:B:347:ILE:HG12	1:B:389:LEU:HD11	2.00	0.43
1:B:506:THR:HG22	1:B:507:LEU:N	2.33	0.43
1:C:667:MET:O	1:C:670:LEU:HB3	2.18	0.43
1:D:1067:TYR:N	1:D:1067:TYR:HD1	2.14	0.43
1:A:147:TYR:O	1:A:148:LYS:C	2.57	0.43
1:A:183:TRP:O	1:A:184:PHE:CD2	2.63	0.43
1:D:909:LEU:HD13	1:D:1069:THR:HB	2.00	0.43
1:B:357:LYS:HB3	1:B:389:LEU:CD2	2.48	0.43
1:C:750:ARG:HB3	1:C:754:ILE:HD11	2.00	0.43
1:B:459:LEU:HD23	1:B:460:TYR:CE1	2.53	0.43
1:A:188:PRO:HB2	1:A:192:PHE:CD2	2.54	0.43
1:B:382:GLU:OE1	1:B:382:GLU:N	2.42	0.43
1:C:743:GLN:HG3	1:C:801:TYR:CE1	2.54	0.43
1:C:803:ASP:O	1:C:804:ASN:C	2.56	0.43
1:D:1117:TYR:N	1:D:1117:TYR:CD1	2.85	0.43
1:B:445:LEU:O	1:B:446:ASP:C	2.57	0.43
1:B:496:LYS:O	1:B:496:LYS:HD3	2.18	0.43
1:C:726:ILE:HG13	1:C:726:ILE:O	2.19	0.43
1:A:29:PRO:HD3	1:A:147:TYR:CZ	2.54	0.43
1:B:374:LYS:N	1:B:374:LYS:CD	2.82	0.42
1:D:983:TYR:HE2	1:D:986:LEU:O	2.02	0.42
1:D:1067:TYR:HD1	1:D:1067:TYR:H	1.66	0.42
1:A:12:SER:HB3	1:A:187:PHE:CD2	2.55	0.42
1:B:454:ILE:HG12	1:B:459:LEU:CB	2.28	0.42
1:C:741:THR:C	1:C:743:GLN:N	2.71	0.42
1:B:450:ARG:O	1:B:451:LYS:C	2.58	0.42
1:A:70:LEU:O	1:A:74:LYS:HD3	2.19	0.42
1:C:625:TYR:CZ	1:C:750:ARG:NH1	2.87	0.42
1:D:952:GLY:HA3	1:D:955:TYR:CE2	2.55	0.42
1:B:429:LEU:C	1:B:429:LEU:HD12	2.40	0.42
1:D:957:LYS:CB	1:D:989:LEU:CD2	2.96	0.42
1:C:735:THR:OG1	1:C:740:VAL:HG11	2.20	0.42
1:D:1013:ILE:HG23	1:D:1014:PRO:HD2	2.02	0.42
1:D:1069:THR:HG1	1:D:1119:THR:HG1	1.62	0.42
1:C:659:LYS:HB2	1:C:689:LEU:CD1	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:318:LEU:O	1:B:319:GLN:C	2.58	0.42
1:B:454:ILE:HD13	1:B:460:TYR:CD1	2.55	0.42
1:C:654:ASN:O	1:C:655:TYR:HB3	2.19	0.42
1:C:751:LYS:CE	1:C:755:ASP:OD2	2.57	0.42
1:D:938:VAL:O	1:D:939:ASP:HB2	2.20	0.42
1:A:85:HIS:CD2	1:B:394:GLU:HG2	2.55	0.42
1:C:712:GLU:C	1:C:713:ILE:HD12	2.39	0.42
1:C:761:THR:C	1:C:763:GLY:N	2.73	0.42
1:A:108:GLY:C	1:A:110:HIS:H	2.24	0.41
1:A:153:THR:O	1:A:158:GLN:N	2.53	0.41
1:D:924:LEU:HD23	1:D:924:LEU:HA	1.88	0.41
1:C:656:ASP:O	1:C:657:LYS:HG2	2.20	0.41
1:A:16:LYS:CG	1:A:17:ASN:N	2.81	0.41
1:A:29:PRO:HD3	1:A:147:TYR:OH	2.20	0.41
1:A:183:TRP:C	1:A:184:PHE:HD2	2.21	0.41
1:B:380:GLY:HA2	1:B:443:GLN:NE2	2.36	0.41
1:B:461:THR:C	1:B:463:GLY:N	2.74	0.41
1:C:770:GLY:CA	1:C:818:LEU:HD23	2.50	0.41
1:D:1117:TYR:N	1:D:1117:TYR:HD1	2.18	0.41
1:A:123:ILE:O	1:A:124:ASP:HB2	2.20	0.41
1:B:496:LYS:HD3	1:B:496:LYS:C	2.41	0.41
1:C:689:LEU:HD12	1:C:689:LEU:HA	1.87	0.41
1:A:70:LEU:HD23	1:A:70:LEU:C	2.41	0.41
1:A:161:THR:C	1:A:163:GLY:N	2.73	0.41
1:A:202:LYS:C	1:A:204:ASN:N	2.72	0.41
1:B:400:TYR:CE2	1:B:499:MET:HG2	2.56	0.41
1:C:636:LYS:HD2	1:C:673:ASP:O	2.21	0.41
1:C:713:ILE:HD12	1:C:713:ILE:N	2.35	0.41
1:C:715:LYS:HE3	1:C:810:LYS:HD3	2.03	0.41
1:D:1013:ILE:HD12	1:D:1013:ILE:N	2.36	0.41
1:D:952:GLY:HA3	1:D:955:TYR:CZ	2.56	0.41
1:A:16:LYS:CG	1:A:17:ASN:H	2.23	0.40
1:C:761:THR:O	1:C:763:GLY:N	2.44	0.40
1:D:902:GLN:N	1:D:902:GLN:HE21	2.19	0.40
1:D:919:GLN:C	1:D:921:ILE:H	2.25	0.40
1:A:68:ALA:C	1:A:70:LEU:N	2.74	0.40
1:A:91:GLU:HG2	1:C:691:GLU:OE1	2.20	0.40
1:D:1075:ILE:O	1:D:1075:ILE:HG22	2.21	0.40
1:C:800:ILE:HG13	1:C:801:TYR:CD2	2.57	0.40
1:D:1047:TYR:O	1:D:1048:LYS:C	2.60	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	219/221 (99%)	184 (84%)	25 (11%)	10 (5%)	2	18
1	B	219/221 (99%)	179 (82%)	30 (14%)	10 (5%)	2	18
1	C	219/221 (99%)	180 (82%)	33 (15%)	6 (3%)	4	28
1	D	219/221 (99%)	178 (81%)	34 (16%)	7 (3%)	3	25
All	All	876/884 (99%)	721 (82%)	122 (14%)	33 (4%)	2	22

All (33) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	180	GLU
1	B	480	GLU
1	C	780	GLU
1	D	1080	GLU
1	A	6	PRO
1	A	109	ASN
1	A	152	TYR
1	A	203	ASP
1	B	334	ASN
1	B	369	THR
1	A	153	THR
1	B	312	SER
1	B	409	ASN
1	B	423	ILE
1	D	920	ASN
1	D	969	THR
1	A	22	TYR
1	A	69	THR
1	B	320	ASN
1	B	453	THR
1	B	504	ASN
1	C	606	PRO

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Mol	Chain	Res	Type
1	C	620	ASN
1	D	922	TYR
1	D	995	ARG
1	A	39	ASP
1	A	204	ASN
1	B	306	PRO
1	C	639	ASP
1	C	709	ASN
1	D	1047	TYR
1	D	1058	GLN
1	C	634	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	208/208 (100%)	201 (97%)	7 (3%)	32	60
1	B	208/208 (100%)	200 (96%)	8 (4%)	28	57
1	C	208/208 (100%)	202 (97%)	6 (3%)	37	63
1	D	208/208 (100%)	199 (96%)	9 (4%)	25	54
All	All	832/832 (100%)	802 (96%)	30 (4%)	30	59

All (30) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	GLN
1	A	19	GLN
1	A	82	GLU
1	A	129	LEU
1	A	167	TYR
1	A	177	LYS
1	A	207	LEU
1	B	302	GLN
1	B	303	ASP
1	B	319	GLN

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Mol	Chain	Res	Type
1	B	382	GLU
1	B	390	CYS
1	B	407	GLU
1	B	507	LEU
1	B	517	TYR
1	C	602	GLN
1	C	619	GLN
1	C	682	GLU
1	C	767	TYR
1	C	777	LYS
1	C	807	LEU
1	D	902	GLN
1	D	919	GLN
1	D	982	GLU
1	D	1067	TYR
1	D	1077	LYS
1	D	1088	PRO
1	D	1107	LEU
1	D	1117	TYR
1	D	1121	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (43) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1	GLN
1	A	2	GLN
1	A	8	GLN
1	A	19	GLN
1	A	40	GLN
1	A	85	HIS
1	A	110	HIS
1	A	143	GLN
1	A	156	ASN
1	A	162	ASN
1	A	194	GLN
1	B	301	GLN
1	B	302	GLN
1	B	308	GLN
1	B	317	ASN
1	B	319	GLN
1	B	385	HIS
1	B	410	HIS

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Mol	Chain	Res	Type
1	B	443	GLN
1	B	456	ASN
1	B	494	GLN
1	C	601	GLN
1	C	602	GLN
1	C	608	GLN
1	C	619	GLN
1	C	620	ASN
1	C	640	GLN
1	C	685	HIS
1	C	710	HIS
1	C	743	GLN
1	C	756	ASN
1	C	762	ASN
1	C	794	GLN
1	D	901	GLN
1	D	902	GLN
1	D	908	GLN
1	D	919	GLN
1	D	920	ASN
1	D	940	GLN
1	D	985	HIS
1	D	1010	HIS
1	D	1043	GLN
1	D	1094	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 ⓘ

Of 16 ligands modelled in this entry, 16 are monoatomic - leaving 0 for Mogul analysis.

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.

No monomer is involved in short contacts.

5.7　Other polymers ⓘ

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 is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates ⓘ

EDS was not executed - this section is therefore empty.

6.4 Ligands ⓘ

EDS was not executed - this section is therefore empty.

6.5 Other polymers ⓘ

EDS was not executed - this section is therefore empty.