WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Aug 19, 2023 – 07:31 PM EDT

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PDB ID	:	2G7K
Title	:	Structure of the Light Chain of Botulinum Neurotoxin, Serotype A Bound to small Molecule Inhibitors
Authors	:	Fu, Z.; Baldwin, M.R.; Boldt, G.E.; Crawford, A.; Janda, K.D.; Barbieri, J.T.; Kim, J.-J.P.
Deposited on	:	2006-02-28
Resolution	:	2.80 Å(reported)

1   Overall quality at a glance   ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
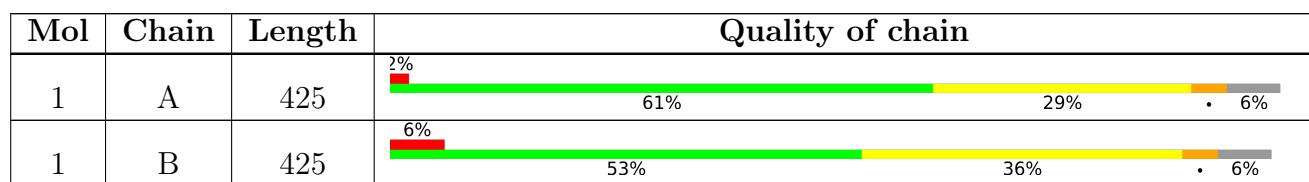
The reported resolution of this entry is 2.80 Å.

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
Rfree		0.262
Clashscore		23
Ramachandran outliers		3.8%
Sidechain outliers		3.9%
RSRZ outliers		4.5%

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))
R$_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	425	2% / 61% / 29% / · / 6%
1	B	425	6% / 53% / 36% / · / 6%

2 Entry composition ⓘ

There is only 1 type of molecule in this entry. The entry contains 6481 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 Botulinum neurotoxin type A.

| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	401	Total 3247	C 2084	N 536	O 620	S 7	0	0	0
1	B	399	Total 3234	C 2076	N 534	O 617	S 7	0	0	0
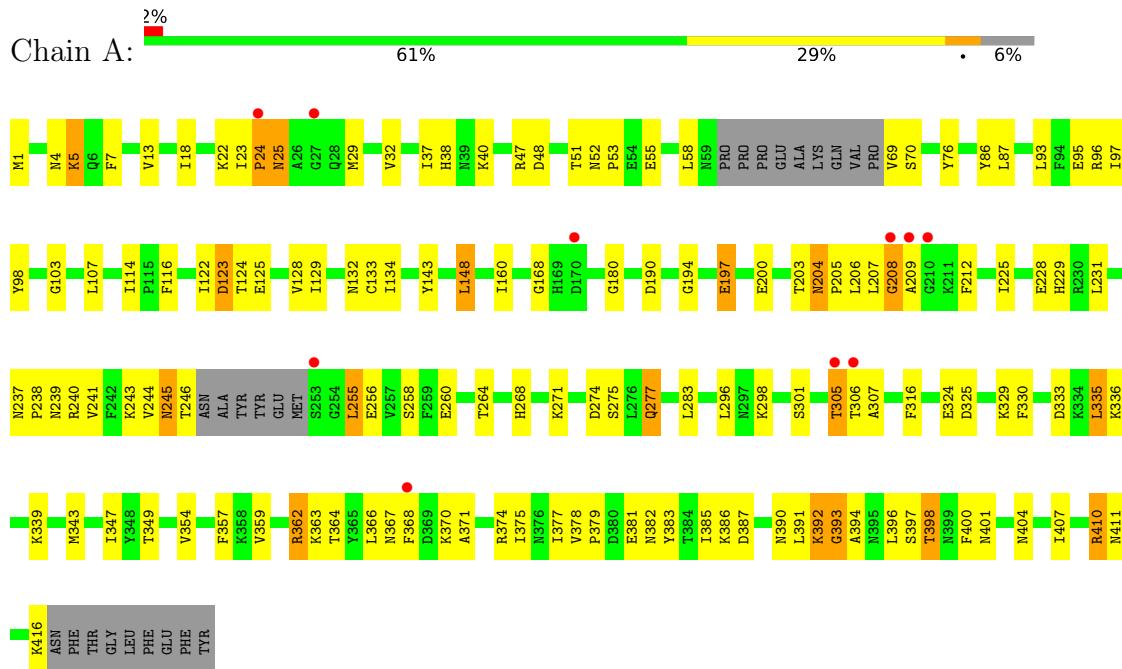
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP Q45894
B	1	MET	-	initiating methionine	UNP Q45894
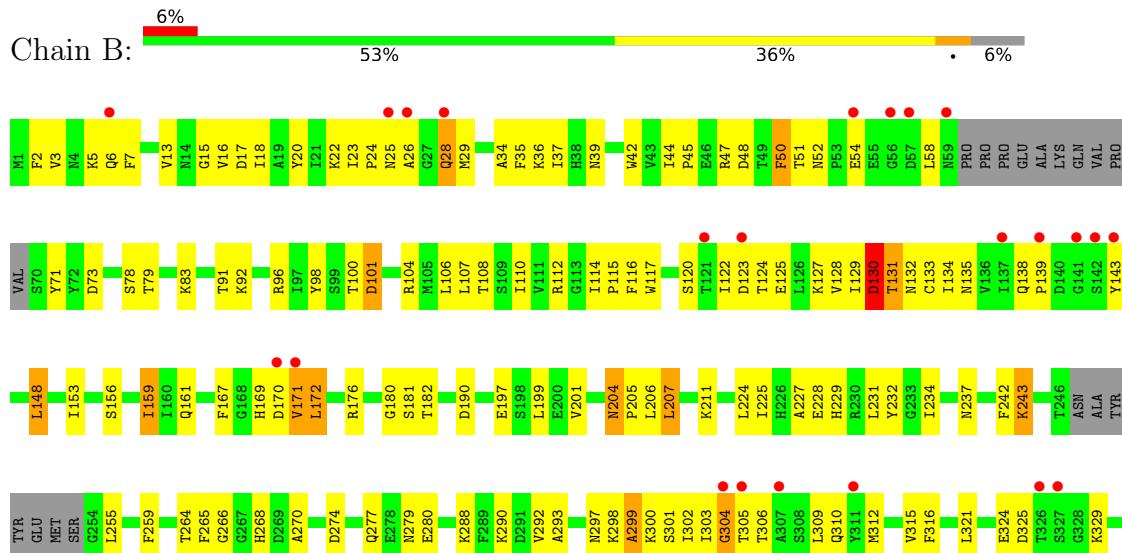
3 Residue-property plots ⓘ
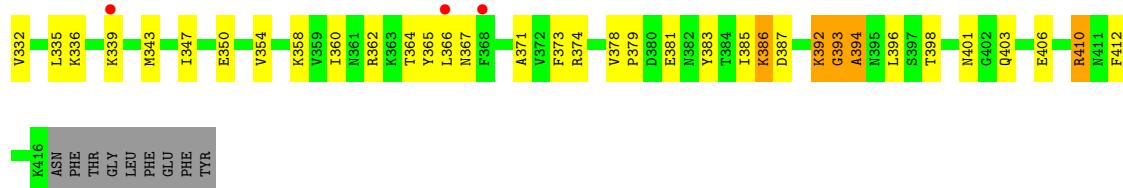
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Botulinum neurotoxin type A

Chain A:

• Molecule 1: Botulinum neurotoxin type A

Chain B:

V332 L335 K336 K339 M343 I347 E350 V354 K358 V359 I360 N361 R362 K363 T364 Y365 L366 N367 F368 A371 V372 F373 R374 V378 P379 D380 E381 N382 Y383 T384 I385 K386 D387 K392 G393 A394 N395 L396 S397 T398 N401 G402 Q403 E406 R410 N411 F412

K416 ASN PHE THR GLY LEU PHE GLU PHE TYR

4　Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	69.10Å　110.09Å　167.02Å 90.00°　90.00°　90.00°	Depositor
Resolution (Å)	29.98　–　2.80 29.97　–　2.80	Depositor EDS
% Data completeness (in resolution range)	94.9 (29.98-2.80) 94.8 (29.97-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.12	Depositor
$<I/\sigma(I)>$ [1]	3.03 (at 2.80Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.223　,　0.265 0.223　,　0.262	Depositor DCC
R_{free} test set	3059 reflections (10.03%)	wwPDB-VP
Wilson B-factor (Å^2)	36.8	Xtriage
Anisotropy	0.160	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 56.1	EDS
L-test for twinning [2]	$<|L|> = 0.48$, $<L^2> = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	6481	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.20% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $<|L|>$, $<L^2>$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0/3317	0.67	0/4482
1	B	0.43	0/3304	0.61	0/4464
All	All	0.44	0/6621	0.64	0/8946

There are no bond length outliers.

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	A	3247	0	3192	129	0
1	B	3234	0	3178	174	0
All	All	6481	0	6370	298	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 23.

All (298) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:410:ARG:HH11	1:A:410:ARG:HB2	1.05	1.08
1:A:387:ASP:OD2	1:A:392:LYS:HG3	1.55	1.04

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:410:ARG:HB2	1:A:410:ARG:NH1	1.74	1.02
1:B:5:LYS:HD3	1:B:7:PHE:HE2	1.29	0.98
1:B:410:ARG:HH11	1:B:410:ARG:HB2	1.27	0.96
1:A:343:MET:HA	1:A:347:ILE:HD12	1.44	0.95
1:A:410:ARG:HH11	1:A:410:ARG:CB	1.80	0.95
1:A:225:ILE:O	1:A:228:GLU:HG2	1.66	0.94
1:A:209:ALA:H	1:A:404:ASN:HD21	1.18	0.89
1:B:265:PHE:HE2	1:B:362:ARG:HH12	1.20	0.88
1:B:122:ILE:HG22	1:B:124:THR:HG22	1.56	0.87
1:B:5:LYS:HD3	1:B:7:PHE:CE2	2.10	0.87
1:B:117:TRP:CE2	1:B:128:VAL:HB	2.11	0.85
1:B:362:ARG:HH11	1:B:362:ARG:HB2	1.42	0.84
1:B:374:ARG:HH11	1:B:374:ARG:HG3	1.44	0.82
1:B:5:LYS:CD	1:B:7:PHE:HE2	1.92	0.82
1:B:387:ASP:OD2	1:B:392:LYS:HG3	1.79	0.81
1:B:410:ARG:HB2	1:B:410:ARG:NH1	1.97	0.79
1:B:204:ASN:ND2	1:B:206:LEU:H	1.81	0.79
1:B:325:ASP:OD2	1:B:329:LYS:HB3	1.83	0.79
1:A:228:GLU:HG3	1:A:229:HIS:N	1.98	0.77
1:B:362:ARG:HH11	1:B:362:ARG:CB	1.96	0.77
1:B:228:GLU:HG3	1:B:229:HIS:H	1.51	0.76
1:A:391:LEU:O	1:A:397:SER:HB3	1.85	0.76
1:A:275:SER:HB2	1:B:243:LYS:HG2	1.66	0.76
1:B:362:ARG:HB2	1:B:362:ARG:NH1	2.01	0.75
1:B:5:LYS:CB	1:B:7:PHE:CE2	2.71	0.73
1:B:300:LYS:O	1:B:309:LEU:HD22	1.88	0.73
1:B:181:SER:O	1:B:231:LEU:HD23	1.89	0.73
1:A:268:HIS:CE1	1:B:268:HIS:HB3	2.24	0.73
1:B:255:LEU:HD12	1:B:255:LEU:O	1.89	0.72
1:B:5:LYS:HB2	1:B:7:PHE:CE2	2.24	0.71
1:A:70:SER:HA	1:A:160:ILE:HD11	1.72	0.71
1:A:305:THR:C	1:A:307:ALA:H	1.95	0.70
1:B:5:LYS:HB2	1:B:7:PHE:CZ	2.26	0.70
1:B:122:ILE:CG2	1:B:124:THR:HG22	2.21	0.70
1:A:397:SER:O	1:A:398:THR:HG23	1.92	0.70
1:A:209:ALA:N	1:A:404:ASN:HD21	1.90	0.70
1:B:172:LEU:H	1:B:172:LEU:HD23	1.56	0.70
1:A:239:ASN:HD21	1:A:240:ARG:HH12	1.39	0.69
1:B:78:SER:O	1:B:83:LYS:HE3	1.94	0.68
1:A:324:GLU:HB2	1:A:330:PHE:CE1	2.29	0.68
1:B:116:PHE:HA	1:B:316:PHE:CE1	2.29	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:134:ILE:HG23	1:B:148:LEU:HD21	1.76	0.67
1:B:266:GLY:HA2	1:B:270:ALA:HB2	1.75	0.67
1:A:245:ASN:HD22	1:A:246:THR:N	1.93	0.67
1:B:204:ASN:C	1:B:204:ASN:HD22	1.97	0.67
1:B:169:HIS:CD2	1:B:171:VAL:H	2.13	0.66
1:B:96:ARG:HA	1:B:385:ILE:HG23	1.78	0.66
1:A:382:ASN:HB3	1:A:411:ASN:OD1	1.95	0.66
1:A:225:ILE:O	1:A:228:GLU:CG	2.44	0.65
1:A:4:ASN:O	1:A:5:LYS:HB3	1.97	0.64
1:A:335:LEU:HD12	1:A:339:LYS:HE3	1.79	0.64
1:A:305:THR:O	1:A:307:ALA:N	2.31	0.64
1:A:354:VAL:HG12	1:B:201:VAL:HG21	1.80	0.64
1:B:312:MET:O	1:B:315:VAL:HG22	1.98	0.64
1:B:204:ASN:HD22	1:B:205:PRO:N	1.97	0.63
1:B:124:THR:HA	1:B:299:ALA:HA	1.78	0.63
1:A:335:LEU:O	1:A:339:LYS:HG3	1.99	0.62
1:B:228:GLU:HG3	1:B:229:HIS:N	2.13	0.62
1:A:239:ASN:HD21	1:A:240:ARG:NH1	1.98	0.62
1:B:130:ASP:OD2	1:B:130:ASP:N	2.30	0.62
1:B:396:LEU:HA	1:B:401:ASN:HB2	1.81	0.62
1:A:305:THR:C	1:A:307:ALA:N	2.51	0.61
1:A:204:ASN:HD22	1:A:205:PRO:N	1.98	0.61
1:B:125:GLU:HA	1:B:301:SER:O	2.02	0.60
1:A:225:ILE:CG2	1:A:264:THR:HG23	2.32	0.60
1:B:315:VAL:HG23	1:B:316:PHE:N	2.16	0.60
1:B:315:VAL:CG2	1:B:316:PHE:N	2.64	0.60
1:A:392:LYS:O	1:A:394:ALA:N	2.34	0.60
1:A:197:GLU:OE2	1:A:207:LEU:HB2	2.02	0.59
1:B:225:ILE:O	1:B:228:GLU:HG3	2.03	0.59
1:A:325:ASP:OD2	1:A:329:LYS:HB3	2.03	0.59
1:B:34:ALA:HB2	1:B:44:ILE:HG12	1.84	0.59
1:A:22:LYS:O	1:A:24:PRO:HD3	2.02	0.59
1:A:122:ILE:HG22	1:A:124:THR:HG22	1.83	0.59
1:A:204:ASN:ND2	1:A:206:LEU:H	2.01	0.59
1:A:47:ARG:CZ	1:A:58:LEU:HD13	2.33	0.58
1:B:50:PHE:O	1:B:52:ASN:N	2.37	0.58
1:B:224:LEU:O	1:B:227:ALA:HB3	2.03	0.58
1:A:228:GLU:HG3	1:A:229:HIS:H	1.69	0.58
1:B:127:LYS:HG2	1:B:128:VAL:N	2.18	0.58
1:B:106:LEU:O	1:B:110:ILE:HG13	2.04	0.57
1:A:204:ASN:HD22	1:A:205:PRO:CD	2.17	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:392:LYS:O	1:B:394:ALA:N	2.37	0.57
1:A:241:VAL:HG12	1:A:258:SER:HA	1.86	0.57
1:B:161:GLN:HG3	1:B:161:GLN:O	2.04	0.57
1:A:400:PHE:CZ	1:B:201:VAL:HG12	2.40	0.56
1:B:22:LYS:HB2	1:B:135:ASN:HB2	1.87	0.56
1:B:204:ASN:HB3	1:B:207:LEU:HD13	1.87	0.56
1:B:302:ILE:HB	1:B:309:LEU:HD12	1.87	0.56
1:B:358:LYS:HB2	1:B:358:LYS:NZ	2.20	0.56
1:A:13:VAL:HA	1:A:18:ILE:HG22	1.86	0.56
1:B:101:ASP:HA	1:B:104:ARG:NH1	2.21	0.56
1:B:225:ILE:O	1:B:228:GLU:CG	2.54	0.56
1:B:23:ILE:HG22	1:B:26:ALA:HB2	1.87	0.56
1:B:5:LYS:CD	1:B:7:PHE:CE2	2.78	0.56
1:B:5:LYS:HB3	1:B:7:PHE:CE2	2.40	0.56
1:A:324:GLU:HB2	1:A:330:PHE:CD1	2.41	0.56
1:A:134:ILE:HD13	1:A:148:LEU:HD13	1.88	0.55
1:A:40:LYS:HE3	1:A:114:ILE:HD11	1.89	0.55
1:B:169:HIS:CG	1:B:170:ASP:N	2.74	0.55
1:A:69:VAL:HG23	1:A:416:LYS:HD3	1.87	0.55
1:A:204:ASN:HD22	1:A:204:ASN:C	2.10	0.55
1:B:374:ARG:HH11	1:B:374:ARG:CG	2.18	0.55
1:B:134:ILE:HD13	1:B:148:LEU:HD13	1.89	0.55
1:B:266:GLY:CA	1:B:270:ALA:HB2	2.36	0.54
1:A:69:VAL:CG2	1:A:416:LYS:HD3	2.38	0.54
1:A:204:ASN:HD22	1:A:205:PRO:HD2	1.72	0.54
1:A:245:ASN:HD22	1:A:245:ASN:C	2.08	0.54
1:A:194:GLY:HA2	1:A:212:PHE:O	2.07	0.54
1:A:200:GLU:HB2	1:A:203:THR:HG23	1.90	0.54
1:A:93:LEU:HD21	1:A:377:ILE:HD13	1.89	0.53
1:B:343:MET:HA	1:B:347:ILE:HD12	1.89	0.53
1:B:7:PHE:HE1	1:B:37:ILE:HA	1.74	0.53
1:A:396:LEU:HA	1:A:401:ASN:HB2	1.91	0.53
1:A:255:LEU:HD23	1:A:256:GLU:N	2.24	0.53
1:B:373:PHE:CD2	1:B:412:PHE:HB3	2.44	0.53
1:B:406:GLU:HA	1:B:406:GLU:OE1	2.09	0.53
1:B:120:SER:OG	1:B:125:GLU:HB2	2.08	0.53
1:B:371:ALA:HB1	1:B:373:PHE:CE1	2.44	0.53
1:B:386:LYS:HB2	1:B:386:LYS:NZ	2.24	0.53
1:B:225:ILE:HA	1:B:228:GLU:HG2	1.90	0.53
1:B:169:HIS:CD2	1:B:172:LEU:HG	2.44	0.52
1:B:190:ASP:O	1:B:374:ARG:HD2	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:374:ARG:HG3	1:B:374:ARG:NH1	2.19	0.52
1:A:229:HIS:ND1	1:A:260:GLU:OE2	2.41	0.52
1:A:359:VAL:O	1:B:201:VAL:HG11	2.09	0.52
1:B:197:GLU:OE2	1:B:197:GLU:HA	2.10	0.52
1:A:343:MET:CA	1:A:347:ILE:HD12	2.31	0.52
1:A:357:PHE:HB3	1:A:359:VAL:HG13	1.92	0.52
1:B:17:ASP:OD1	1:B:18:ILE:HG13	2.10	0.52
1:B:50:PHE:C	1:B:52:ASN:H	2.13	0.52
1:B:290:LYS:HG2	1:B:332:VAL:HB	1.92	0.52
1:B:124:THR:CA	1:B:299:ALA:HA	2.40	0.51
1:B:101:ASP:HA	1:B:104:ARG:HH11	1.76	0.51
1:B:204:ASN:HD22	1:B:206:LEU:H	1.57	0.50
1:A:208:GLY:O	1:A:209:ALA:HB2	2.11	0.50
1:B:392:LYS:O	1:B:393:GLY:C	2.49	0.50
1:B:108:THR:O	1:B:112:ARG:HG3	2.10	0.50
1:B:387:ASP:OD2	1:B:392:LYS:CG	2.54	0.50
1:A:240:ARG:HG2	1:A:240:ARG:HH11	1.77	0.50
1:A:245:ASN:C	1:A:245:ASN:ND2	2.65	0.50
1:B:360:ILE:HG22	1:B:403:GLN:CD	2.32	0.49
1:A:129:ILE:HB	1:A:132:ASN:ND2	2.28	0.49
1:B:50:PHE:C	1:B:52:ASN:N	2.66	0.49
1:B:104:ARG:NH1	1:B:104:ARG:HB3	2.27	0.49
1:B:125:GLU:OE2	1:B:303:ILE:HD11	2.13	0.49
1:B:169:HIS:CG	1:B:170:ASP:H	2.30	0.49
1:B:298:LYS:O	1:B:299:ALA:O	2.31	0.49
1:B:169:HIS:HD2	1:B:171:VAL:H	1.57	0.49
1:B:204:ASN:HD22	1:B:205:PRO:CD	2.26	0.48
1:A:23:ILE:O	1:A:24:PRO:C	2.50	0.48
1:B:378:VAL:HB	1:B:379:PRO:HD3	1.95	0.48
1:B:410:ARG:HH11	1:B:410:ARG:CB	2.12	0.48
1:B:24:PRO:CG	1:B:133:CYS:O	2.61	0.48
1:B:374:ARG:CG	1:B:374:ARG:NH1	2.76	0.48
1:A:404:ASN:HB3	1:A:407:ILE:HB	1.95	0.48
1:B:34:ALA:CB	1:B:44:ILE:HG12	2.43	0.48
1:A:392:LYS:O	1:A:393:GLY:C	2.51	0.48
1:B:148:LEU:HD23	1:B:148:LEU:H	1.79	0.48
1:A:52:ASN:HD22	1:A:55:GLU:HG3	1.79	0.48
1:B:24:PRO:HG2	1:B:133:CYS:O	2.13	0.48
1:B:36:LYS:HB2	1:B:42:TRP:CE2	2.48	0.48
1:A:97:ILE:O	1:A:103:GLY:HA3	2.14	0.48
1:A:387:ASP:OD2	1:A:392:LYS:CG	2.44	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:47:ARG:CZ	1:B:58:LEU:HD13	2.44	0.48
1:A:381:GLU:N	1:A:381:GLU:CD	2.67	0.47
1:B:255:LEU:HD11	1:B:366:LEU:CD1	2.44	0.47
1:A:37:ILE:O	1:A:38:HIS:HB2	2.15	0.47
1:B:398:THR:O	1:B:401:ASN:ND2	2.47	0.47
1:B:101:ASP:OD1	1:B:101:ASP:N	2.41	0.47
1:B:16:VAL:HG12	1:B:17:ASP:N	2.28	0.47
1:B:302:ILE:HD11	1:B:312:MET:HG3	1.96	0.47
1:B:315:VAL:CG2	1:B:316:PHE:H	2.27	0.47
1:A:116:PHE:HE1	1:A:296:LEU:HD21	1.79	0.47
1:A:190:ASP:O	1:A:374:ARG:HD3	2.15	0.47
1:A:324:GLU:HB2	1:A:330:PHE:HE1	1.78	0.47
1:A:375:ILE:HD12	1:A:377:ILE:HG23	1.95	0.47
1:B:134:ILE:HG23	1:B:148:LEU:CD2	2.44	0.47
1:B:148:LEU:HD23	1:B:148:LEU:N	2.30	0.47
1:A:96:ARG:HA	1:A:385:ILE:HG23	1.97	0.47
1:A:225:ILE:HG21	1:A:264:THR:HG23	1.96	0.47
1:B:13:VAL:HG11	1:B:20:TYR:HD1	1.78	0.47
1:B:96:ARG:CA	1:B:385:ILE:HG23	2.44	0.47
1:B:36:LYS:HE2	1:B:39:ASN:O	2.15	0.46
1:B:124:THR:O	1:B:299:ALA:HA	2.14	0.46
1:B:265:PHE:CE2	1:B:365:TYR:HA	2.50	0.46
1:B:350:GLU:O	1:B:354:VAL:HG23	2.15	0.46
1:A:7:PHE:HB3	1:A:87:LEU:HD21	1.98	0.46
1:A:24:PRO:HD2	1:A:133:CYS:O	2.16	0.46
1:B:180:GLY:HA3	1:B:231:LEU:O	2.15	0.46
1:B:288:LYS:O	1:B:292:VAL:HG23	2.15	0.46
1:B:304:GLY:O	1:B:306:THR:N	2.48	0.46
1:A:4:ASN:O	1:A:5:LYS:CB	2.63	0.46
1:A:134:ILE:CD1	1:A:148:LEU:HD13	2.44	0.46
1:A:255:LEU:HD23	1:A:256:GLU:H	1.81	0.46
1:B:98:TYR:HD1	1:B:107:LEU:HD12	1.81	0.46
1:A:116:PHE:HA	1:A:316:PHE:CE1	2.50	0.46
1:B:3:VAL:HG13	1:B:37:ILE:HB	1.96	0.46
1:A:48:ASP:OD1	1:A:51:THR:HG23	2.15	0.46
1:B:293:ALA:O	1:B:297:ASN:ND2	2.49	0.46
1:B:279:ASN:O	1:B:280:GLU:C	2.53	0.46
1:A:52:ASN:ND2	1:A:55:GLU:HG3	2.31	0.46
1:A:225:ILE:C	1:A:228:GLU:HG2	2.34	0.46
1:B:204:ASN:ND2	1:B:204:ASN:C	2.65	0.46
1:B:176:ARG:HD2	1:B:237:ASN:HA	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1:MET:HA	1:A:4:ASN:OD1	2.16	0.45
1:A:228:GLU:CG	1:A:229:HIS:N	2.75	0.45
1:B:265:PHE:CE2	1:B:362:ARG:NH1	2.79	0.45
1:B:371:ALA:HB1	1:B:373:PHE:HE1	1.80	0.45
1:A:378:VAL:HB	1:A:379:PRO:HD3	1.97	0.45
1:A:24:PRO:O	1:A:25:ASN:HB2	2.16	0.45
1:A:381:GLU:CD	1:A:381:GLU:H	2.19	0.45
1:B:100:THR:O	1:B:104:ARG:N	2.42	0.45
1:A:208:GLY:HA3	1:A:404:ASN:ND2	2.32	0.45
1:A:1:MET:O	1:A:4:ASN:OD1	2.34	0.45
1:B:324:GLU:HA	1:B:329:LYS:O	2.16	0.45
1:A:47:ARG:NH1	1:A:76:TYR:HB3	2.32	0.45
1:B:302:ILE:HB	1:B:309:LEU:CD1	2.46	0.45
1:A:239:ASN:ND2	1:A:240:ARG:NH1	2.65	0.44
1:A:370:LYS:HB2	1:A:370:LYS:NZ	2.32	0.44
1:A:237:ASN:OD1	1:A:238:PRO:HD2	2.18	0.44
1:A:52:ASN:HA	1:A:53:PRO:HD3	1.85	0.44
1:A:277:GLN:HE21	1:A:277:GLN:HB2	1.65	0.44
1:B:124:THR:C	1:B:299:ALA:HA	2.38	0.44
1:A:122:ILE:CG2	1:A:124:THR:HG22	2.47	0.44
1:A:363:LYS:HE2	1:A:363:LYS:HA	2.00	0.44
1:A:392:LYS:C	1:A:394:ALA:N	2.71	0.44
1:B:204:ASN:HD21	1:B:206:LEU:HB2	1.82	0.44
1:B:255:LEU:HD12	1:B:255:LEU:C	2.37	0.44
1:B:79:THR:O	1:B:83:LYS:HG3	2.18	0.44
1:B:2:PHE:HB2	1:B:98:TYR:CG	2.53	0.43
1:B:225:ILE:CG2	1:B:264:THR:HG23	2.48	0.43
1:A:335:LEU:CD1	1:A:339:LYS:HE3	2.47	0.43
1:B:29:MET:O	1:B:29:MET:HG3	2.18	0.43
1:A:225:ILE:HD13	1:A:349:THR:HA	2.00	0.43
1:A:362:ARG:HG3	1:A:362:ARG:HH11	1.83	0.43
1:B:128:VAL:HG22	1:B:129:ILE:N	2.33	0.43
1:B:321:LEU:O	1:B:336:LYS:HE3	2.19	0.43
1:B:36:LYS:HB2	1:B:42:TRP:CZ2	2.54	0.43
1:B:54:GLU:H	1:B:54:GLU:CD	2.21	0.43
1:B:362:ARG:HE	1:B:367:ASN:HB2	1.84	0.43
1:A:274:ASP:C	1:A:274:ASP:OD1	2.57	0.43
1:B:131:THR:HB	1:B:167:PHE:HB2	2.00	0.43
1:A:244:VAL:HG22	1:A:255:LEU:O	2.19	0.42
1:B:197:GLU:OE2	1:B:360:ILE:HD11	2.18	0.42
1:A:180:GLY:HA3	1:A:231:LEU:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:48:ASP:HA	1:B:153:ILE:HD11	2.02	0.42
1:B:120:SER:HB3	1:B:125:GLU:O	2.19	0.42
1:B:232:TYR:O	1:B:234:ILE:HG23	2.19	0.42
1:B:360:ILE:HG22	1:B:403:GLN:OE1	2.19	0.42
1:B:138:GLN:HB3	1:B:139:PRO:HD2	2.02	0.42
1:B:96:ARG:HG3	1:B:385:ILE:O	2.19	0.42
1:A:29:MET:HB2	1:A:29:MET:HE3	1.92	0.42
1:A:125:GLU:HG3	1:A:301:SER:OG	2.19	0.42
1:A:143:TYR:CD1	1:A:143:TYR:C	2.92	0.42
1:A:243:LYS:HE3	1:A:256:GLU:OE2	2.20	0.42
1:A:225:ILE:HG23	1:A:228:GLU:OE2	2.19	0.42
1:A:271:LYS:HD3	1:A:271:LYS:HA	1.70	0.42
1:A:386:LYS:HB2	1:A:386:LYS:HE2	1.75	0.42
1:B:71:TYR:CE2	1:B:159:ILE:HD12	2.55	0.42
1:B:92:LYS:NZ	1:B:383:TYR:O	2.48	0.42
1:B:132:ASN:HA	1:B:182:THR:OG1	2.19	0.42
1:A:123:ASP:OD2	1:A:298:LYS:HE2	2.20	0.42
1:A:204:ASN:ND2	1:A:206:LEU:N	2.65	0.42
1:A:392:LYS:O	1:A:394:ALA:O	2.38	0.42
1:A:387:ASP:HB3	1:A:390:ASN:O	2.20	0.41
1:B:302:ILE:HG21	1:B:309:LEU:CA	2.50	0.41
1:A:95:GLU:OE1	1:A:95:GLU:HA	2.19	0.41
1:A:204:ASN:HD21	1:A:206:LEU:HB3	1.85	0.41
1:A:333:ASP:OD2	1:A:336:LYS:HG3	2.19	0.41
1:B:274:ASP:H	1:B:277:GLN:HE21	1.67	0.41
1:B:22:LYS:HB3	1:B:22:LYS:HE3	1.89	0.41
1:B:15:GLY:HA3	1:B:139:PRO:HD3	2.02	0.41
1:B:3:VAL:HG21	1:B:91:THR:HG23	2.02	0.41
1:B:96:ARG:HD3	1:B:383:TYR:OH	2.20	0.41
1:B:302:ILE:HG22	1:B:309:LEU:HB2	2.01	0.41
1:A:204:ASN:ND2	1:A:205:PRO:HD2	2.35	0.41
1:A:362:ARG:HG3	1:A:362:ARG:NH1	2.35	0.41
1:B:123:ASP:O	1:B:123:ASP:OD2	2.38	0.41
1:A:377:ILE:HG22	1:A:383:TYR:CD2	2.56	0.41
1:A:98:TYR:HD1	1:A:107:LEU:HD12	1.86	0.41
1:B:143:TYR:O	1:B:143:TYR:CD1	2.74	0.41
1:B:114:ILE:O	1:B:115:PRO:C	2.60	0.41
1:B:211:LYS:HD3	1:B:371:ALA:HB2	2.03	0.41
1:B:302:ILE:O	1:B:302:ILE:HG12	2.19	0.41
1:A:204:ASN:HD21	1:A:206:LEU:CB	2.34	0.40
1:A:364:THR:HG23	1:A:366:LEU:O	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:225:ILE:O	1:B:228:GLU:HG2	2.21	0.40
1:B:47:ARG:NH1	1:B:58:LEU:HD13	2.36	0.40
1:B:197:GLU:HG2	1:B:207:LEU:HD23	2.02	0.40
1:B:335:LEU:HG	1:B:339:LYS:HE3	2.03	0.40
1:B:358:LYS:NZ	1:B:358:LYS:CB	2.83	0.40
1:A:24:PRO:O	1:A:25:ASN:CB	2.70	0.40
1:A:86:TYR:CD1	1:A:86:TYR:C	2.93	0.40
1:B:35:PHE:CD1	1:B:35:PHE:N	2.89	0.40
1:B:242:PHE:HB2	1:B:259:PHE:HE1	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	395/425 (93%)	347 (88%)	36 (9%)	12 (3%)	4	15
1	B	393/425 (92%)	339 (86%)	36 (9%)	18 (5%)	2	7
All	All	788/850 (93%)	686 (87%)	72 (9%)	30 (4%)	3	10

All (30) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	5	LYS
1	A	305	THR
1	A	392	LYS
1	B	299	ALA
1	B	305	THR
1	B	392	LYS
1	A	25	ASN
1	A	168	GLY
1	A	197	GLU

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Mol	Chain	Res	Type
1	A	208	GLY
1	A	393	GLY
1	B	51	THR
1	B	199	LEU
1	B	393	GLY
1	A	123	ASP
1	A	306	THR
1	A	368	PHE
1	A	371	ALA
1	B	25	ASN
1	B	131	THR
1	B	156	SER
1	B	73	ASP
1	B	130	ASP
1	B	159	ILE
1	B	394	ALA
1	B	28	GLN
1	B	45	PRO
1	B	207	LEU
1	B	304	GLY
1	B	171	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	360/381 (94%)	346 (96%)	14 (4%)	32	66
1	B	358/381 (94%)	344 (96%)	14 (4%)	32	66
All	All	718/762 (94%)	690 (96%)	28 (4%)	32	66

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	PRO
1	A	32	VAL

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Mol	Chain	Res	Type
1	A	128	VAL
1	A	148	LEU
1	A	204	ASN
1	A	245	ASN
1	A	255	LEU
1	A	277	GLN
1	A	283	LEU
1	A	335	LEU
1	A	362	ARG
1	A	367	ASN
1	A	398	THR
1	A	410	ARG
1	B	6	GLN
1	B	28	GLN
1	B	50	PHE
1	B	101	ASP
1	B	130	ASP
1	B	148	LEU
1	B	172	LEU
1	B	204	ASN
1	B	243	LYS
1	B	310	GLN
1	B	364	THR
1	B	381	GLU
1	B	386	LYS
1	B	410	ARG

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

Mol	Chain	Res	Type
1	A	28	GLN
1	A	59	ASN
1	A	135	ASN
1	A	204	ASN
1	A	239	ASN
1	A	245	ASN
1	A	268	HIS
1	A	277	GLN
1	A	352	ASN
1	A	404	ASN
1	B	6	GLN
1	B	28	GLN

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Mol	Chain	Res	Type
1	B	59	ASN
1	B	138	GLN
1	B	169	HIS
1	B	204	ASN
1	B	277	GLN
1	B	287	ASN
1	B	355	ASN

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 monosaccharides in this entry.

5.6　Ligand geometry ⓘ

There are no ligands in this entry.

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 ⓘ

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	401/425 (94%)	-0.32	10 (2%)	57	47	9, 25, 70, 89	0
1	B	399/425 (93%)	0.14	26 (6%)	18	11	16, 44, 85, 95	0
All	All	800/850 (94%)	-0.09	36 (4%)	33	23	9, 36, 81, 95	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	368	PHE	5.2
1	B	143	TYR	5.0
1	B	305	THR	4.9
1	B	142	SER	4.2
1	A	305	THR	3.9
1	B	28	GLN	3.6
1	B	123	ASP	3.6
1	B	26	ALA	3.5
1	B	25	ASN	3.4
1	B	311	TYR	3.4
1	A	208	GLY	3.3
1	B	141	GLY	3.2
1	A	170	ASP	3.2
1	A	27	GLY	3.1
1	B	368	PHE	3.1
1	B	171	VAL	2.9
1	A	209	ALA	2.8
1	A	306	THR	2.8
1	A	253	SER	2.8
1	B	137	ILE	2.8
1	B	121	THR	2.7
1	A	24	PRO	2.7
1	B	54	GLU	2.5
1	B	307	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	139	PRO	2.4
1	A	210	GLY	2.4
1	B	170	ASP	2.3
1	B	304	GLY	2.3
1	B	56	GLY	2.3
1	B	326	THR	2.2
1	B	57	ASP	2.1
1	B	327	SER	2.1
1	B	339	LYS	2.1
1	B	6	GLN	2.1
1	B	366	LEU	2.1
1	B	59	ASN	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 ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.