



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 03:35 PM UTC

PDB ID : 1JXQ / pdb_00001jxq
Title : Structure of cleaved, CARD domain deleted Caspase-9
Authors : Renatus, M.; Stennicke, H.R.; Scott, F.L.; Liddington, R.C.; Salvesen, G.S.
Deposited on : 2001-09-08
Resolution : 2.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

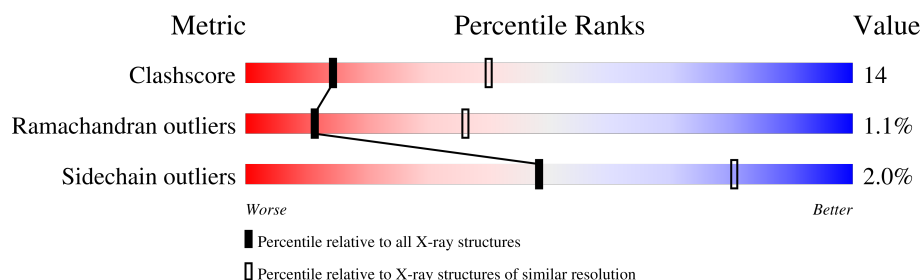
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (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 $\leq 5\%$.

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	284	61% 23% • 15%
1	B	284	51% 27% • 20%
1	C	284	55% 29% • 15%
1	D	284	50% 28% • 20%
2	E	5	80% 20%
2	F	5	80% 20%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 7596 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 Caspase-9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	242	Total	C	N	O	S	32	0	0
			1879	1198	323	342	16			
1	B	226	Total	C	N	O	S	50	0	0
			1752	1119	300	318	15			
1	C	242	Total	C	N	O	S	50	0	0
			1879	1198	323	342	16			
1	D	226	Total	C	N	O	S	54	0	0
			1752	1119	300	318	15			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	139	MET	-	initiating methionine	GB 1336027
B	139	MET	-	initiating methionine	GB 1336027
C	139	MET	-	initiating methionine	GB 1336027
D	139	MET	-	initiating methionine	GB 1336027

- Molecule 2 is a protein called benzoxycarbonyl-Val-Ala-Asp-fluoromethyl ketone Inhibitor.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	5	Total	C	N	O	10	0	1
			35	23	3	9			
2	F	5	Total	C	N	O	15	0	1
			35	23	3	9			

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	79	Total	O	0	0
			79	79		
3	B	76	Total	O	0	0
			76	76		

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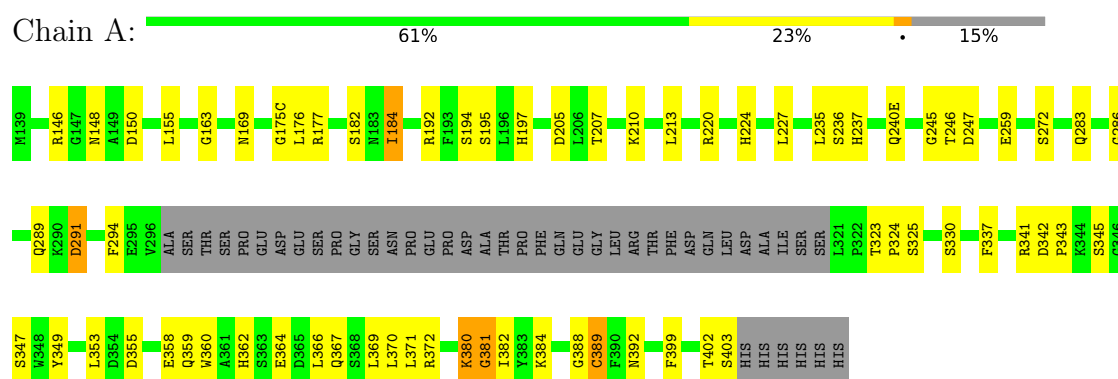
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	52	Total 52	O 52	0	0
3	D	55	Total 55	O 55	0	0
3	E	2	Total 2	O 2	0	0

3 Residue-property plots

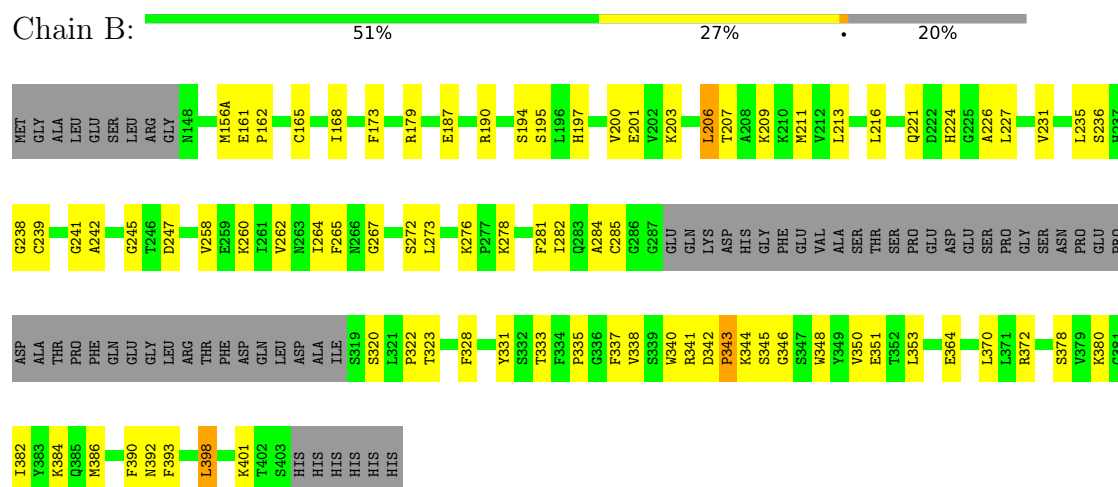
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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.

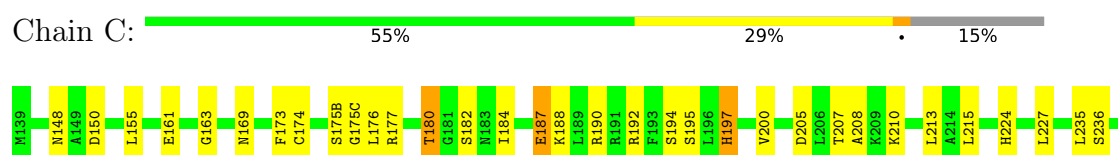
• Molecule 1: Caspase-9



• Molecule 1: Caspase-9



• Molecule 1: Caspase-9



4 Data and refinement statistics

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

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	144.30Å 81.80Å 125.40Å 90.00° 111.70° 90.00°	Depositor
Resolution (Å)	19.91 – 2.80	Depositor
% Data completeness (in resolution range)	98.2 (19.91-2.80)	Depositor
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.233 , 0.275	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7596	wwPDB-VP
Average B, all atoms (Å ²)	32.0	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: PHQ, CF0

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	0.50	0/1921	1.05	13/2592 (0.5%)
1	B	0.50	0/1792	0.99	6/2421 (0.2%)
1	C	0.47	0/1921	1.05	13/2592 (0.5%)
1	D	0.47	0/1792	0.97	4/2421 (0.2%)
2	E	0.29	0/23	0.55	0/30
2	F	0.38	0/23	0.53	0/30
All	All	0.49	0/7472	1.02	36/10086 (0.4%)

There are no bond length outliers.

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	194	SER	N-CA-C	-8.36	102.25	111.36
1	A	380	LYS	N-CA-C	7.70	119.74	110.19
1	A	194	SER	N-CA-C	-7.52	103.17	111.36
1	A	360	TRP	N-CA-C	7.48	123.96	114.31
1	D	333	THR	N-CA-C	-7.27	99.58	109.54
1	B	340	TRP	N-CA-C	7.19	120.96	111.75
1	C	382	ILE	N-CA-C	-7.15	103.50	110.72
1	A	382	ILE	N-CA-C	-6.74	103.66	111.00
1	B	245	GLY	N-CA-C	-6.74	102.25	112.89
1	A	175(C)	GLY	N-CA-C	-6.71	106.20	114.92
1	D	245	GLY	N-CA-C	-6.71	101.79	112.66
1	C	175(C)	GLY	N-CA-C	-6.66	106.13	115.32
1	C	380	LYS	N-CA-C	6.54	119.37	110.35
1	A	245	GLY	N-CA-C	-6.31	102.70	112.85
1	B	194	SER	N-CA-C	-6.29	104.35	111.14
1	A	197	HIS	N-CA-C	6.22	120.20	112.24
1	B	392	ASN	N-CA-C	6.04	118.52	108.20
1	C	360	TRP	N-CA-C	6.03	123.13	114.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	335	PRO	N-CA-C	-6.03	102.15	111.13
1	B	200	VAL	N-CA-C	6.00	116.81	108.89
1	C	245	GLY	N-CA-C	-5.84	103.44	112.85
1	C	289	GLN	N-CA-C	5.79	118.72	110.10
1	A	371	LEU	N-CA-C	-5.77	104.91	111.14
1	C	197	HIS	N-CA-C	5.60	119.41	112.24
1	A	289	GLN	N-CA-C	5.60	118.36	109.96
1	C	359	GLN	N-CA-C	5.53	118.07	111.71
1	C	286	GLY	N-CA-C	-5.44	107.18	115.66
1	D	335	PRO	N-CA-C	-5.41	103.64	111.22
1	D	392	ASN	N-CA-C	5.37	117.39	108.20
1	C	371	LEU	N-CA-C	-5.34	105.37	111.14
1	A	286	GLY	N-CA-C	-5.33	107.34	115.66
1	A	359	GLN	N-CA-C	5.25	117.75	111.71
1	A	291	ASP	N-CA-C	5.23	117.25	109.25
1	A	389	CYS	N-CA-C	5.17	116.92	109.07
1	C	282	ILE	N-CA-C	5.11	115.40	107.28
1	C	392	ASN	N-CA-C	5.07	116.57	108.41

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	1879	0	1864	40	0
1	B	1752	0	1743	53	0
1	C	1879	0	1864	56	0
1	D	1752	0	1743	64	0
2	E	35	0	25	1	0
2	F	35	0	25	1	0
3	A	79	0	0	2	0
3	B	76	0	0	0	0
3	C	52	0	0	0	0
3	D	55	0	0	3	0
3	E	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	7596	0	7264	199	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 14.

All (199) 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:330:SER:HA	1:C:389:CYS:HB3	1.54	0.87
1:A:330:SER:HA	1:A:389:CYS:HB3	1.59	0.82
1:B:348:TRP:CZ2	1:B:380:LYS:HG3	2.16	0.79
1:B:179:ARG:NH2	1:B:285:CYS:HB2	2.04	0.72
1:B:273:LEU:HA	1:B:276:LYS:HD2	1.73	0.71
1:D:207:THR:HG22	1:D:209:LYS:H	1.55	0.70
1:D:284:ALA:HB3	1:D:333:THR:HG22	1.73	0.70
1:C:325:SER:HA	1:D:386:MET:HE1	1.75	0.69
1:C:325:SER:HA	1:D:386:MET:CE	2.23	0.68
1:C:294:PHE:CE2	1:D:267:GLY:HA3	2.30	0.67
1:B:378:SER:HB3	1:B:386:MET:HE2	1.75	0.67
1:D:179:ARG:NH2	1:D:285:CYS:HB2	2.09	0.67
1:A:224:HIS:N	1:A:272:SER:OG	2.30	0.65
1:A:355:ASP:O	1:A:358:GLU:HB3	1.97	0.65
1:D:273:LEU:HA	1:D:276:LYS:HD2	1.80	0.64
1:C:355:ASP:O	1:C:358:GLU:HB3	1.98	0.63
1:D:348:TRP:CE2	1:D:380:LYS:HD2	2.33	0.63
1:B:216:LEU:HD23	1:B:264:ILE:HG23	1.79	0.63
1:B:241:GLY:C	1:B:258:VAL:HG23	2.23	0.63
1:A:163:GLY:HA2	1:A:227:LEU:HD22	1.81	0.62
1:B:207:THR:HG22	1:B:209:LYS:H	1.64	0.62
1:B:239:CYS:HB3	1:B:242:ALA:HB3	1.81	0.62
1:A:294:PHE:CE2	1:B:267:GLY:HA3	2.36	0.61
1:C:224:HIS:N	1:C:272:SER:OG	2.35	0.60
1:B:337:PHE:HA	1:B:346:GLY:O	2.01	0.60
1:C:169:ASN:HD22	1:C:235:LEU:HB2	1.66	0.60
1:A:283:GLN:HE21	1:A:349:TYR:HD2	1.50	0.59
1:B:179:ARG:HH22	1:B:285:CYS:HB2	1.68	0.59
1:C:207:THR:HG22	1:C:247:ASP:HB3	1.84	0.59
1:D:341:ARG:HG2	1:D:341:ARG:HH11	1.68	0.59
1:D:241:GLY:C	1:D:258:VAL:HG23	2.28	0.58
1:D:156(A):MET:HG2	1:D:226:ALA:O	2.04	0.57
1:A:169:ASN:HD22	1:A:235:LEU:HB2	1.69	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:384:LYS:HB3	1:D:322:PRO:HG3	1.86	0.57
1:A:163:GLY:HA2	1:A:227:LEU:HD13	1.87	0.57
1:D:216:LEU:HD23	1:D:264:ILE:HG23	1.86	0.57
1:D:179:ARG:HH22	1:D:285:CYS:HB2	1.70	0.56
1:A:220:ARG:HH21	1:A:220:ARG:HG3	1.70	0.56
1:A:294:PHE:O	1:B:320:SER:HA	2.06	0.56
1:D:260:LYS:O	1:D:264:ILE:HG13	2.06	0.56
1:A:341:ARG:HE	2:E:505:ASP:CG	2.14	0.56
1:A:192:ARG:O	1:A:195:SER:HB3	2.04	0.55
1:B:258:VAL:O	1:B:262:VAL:HG23	2.06	0.55
1:B:281:PHE:C	1:B:282:ILE:HD12	2.32	0.55
1:A:291:ASP:HB2	1:A:337:PHE:CD1	2.42	0.55
1:A:146:ARG:NH2	1:A:362:HIS:O	2.40	0.54
1:D:224:HIS:N	1:D:272:SER:OG	2.38	0.54
1:A:353:LEU:C	1:A:353:LEU:HD23	2.33	0.54
1:D:156(A):MET:HG3	1:D:162:PRO:O	2.07	0.54
1:A:367:GLN:CD	1:A:392:ASN:ND2	2.66	0.54
1:C:175(B):SER:HB3	1:C:176:LEU:HD12	1.89	0.54
1:D:341:ARG:HG2	1:D:341:ARG:NH1	2.23	0.53
1:D:239:CYS:HB3	1:D:242:ALA:HB3	1.91	0.53
1:B:338:VAL:HG22	1:B:345:SER:HB2	1.91	0.53
1:D:379:VAL:O	1:D:379:VAL:HG12	2.09	0.53
1:A:384:LYS:HB3	1:B:322:PRO:HG3	1.90	0.53
1:B:156(A):MET:HG3	1:B:162:PRO:O	2.09	0.53
1:D:398:LEU:C	1:D:398:LEU:HD12	2.33	0.53
1:B:398:LEU:C	1:B:398:LEU:HD12	2.34	0.52
1:B:238:GLY:HA3	1:B:284:ALA:HB1	1.91	0.52
1:D:190:ARG:HG2	1:D:190:ARG:HH11	1.74	0.52
1:B:156(A):MET:HG2	1:B:226:ALA:O	2.09	0.52
1:D:207:THR:HG23	1:D:247:ASP:CG	2.35	0.52
1:A:184:ILE:HD11	1:A:345:SER:C	2.34	0.52
1:B:341:ARG:O	1:B:343:PRO:HD3	2.10	0.52
1:A:235:LEU:O	1:A:236:SER:HB2	2.09	0.52
1:D:233:VAL:HG22	1:D:281:PHE:HB2	1.91	0.52
1:B:353:LEU:C	1:B:353:LEU:HD23	2.35	0.52
1:C:291:ASP:HB2	1:C:337:PHE:CD1	2.45	0.52
1:D:353:LEU:C	1:D:353:LEU:HD23	2.35	0.51
1:A:169:ASN:HD21	1:A:182:SER:HB3	1.74	0.51
1:C:163:GLY:HA2	1:C:227:LEU:HD22	1.92	0.51
1:D:208:ALA:O	1:D:212:VAL:HG23	2.10	0.51
1:C:163:GLY:HA2	1:C:227:LEU:HD13	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:337:PHE:HA	1:D:346:GLY:O	2.11	0.51
1:C:342:ASP:OD2	1:C:343:PRO:HD2	2.10	0.51
1:C:341:ARG:HE	2:F:505:ASP:CG	2.17	0.51
1:C:235:LEU:O	1:C:236:SER:HB2	2.11	0.50
1:C:192:ARG:O	1:C:195:SER:HB3	2.11	0.50
1:C:388:GLY:HA3	1:D:393:PHE:CE2	2.47	0.50
1:B:207:THR:HG22	1:B:209:LYS:N	2.27	0.50
1:D:154:ILE:HG21	3:D:446:HOH:O	2.12	0.50
1:B:341:ARG:NH2	1:D:191:ARG:HG2	2.27	0.50
1:C:353:LEU:C	1:C:353:LEU:HD23	2.37	0.49
1:D:364:GLU:OE2	1:D:372:ARG:NH1	2.45	0.49
1:B:342:ASP:C	1:B:344:LYS:H	2.20	0.49
1:A:240(E):GLN:N	1:A:259:GLU:OE2	2.34	0.49
1:A:342:ASP:OD2	1:A:343:PRO:HD2	2.11	0.49
1:C:331:TYR:HE2	1:C:390:PHE:CD1	2.30	0.49
1:D:163:GLY:HA3	1:D:229:CYS:O	2.13	0.49
1:C:174:CYS:O	1:C:175(B):SER:HB2	2.13	0.48
1:C:287:GLY:HA3	1:C:336:GLY:C	2.38	0.48
1:C:215:LEU:HD13	1:C:261:ILE:HG23	1.96	0.48
1:C:294:PHE:O	1:D:320:SER:HA	2.14	0.48
1:D:192:ARG:NH2	1:D:354:ASP:OD2	2.46	0.48
1:D:207:THR:HG22	1:D:209:LYS:N	2.27	0.48
1:D:238:GLY:HA3	1:D:284:ALA:HB1	1.95	0.48
1:C:155:LEU:HD22	1:C:399:PHE:O	2.14	0.48
1:C:155:LEU:HD21	1:C:398:LEU:HD11	1.96	0.48
1:C:187:GLU:OE2	1:C:190:ARG:NE	2.44	0.48
1:D:190:ARG:HG2	1:D:190:ARG:NH1	2.28	0.48
1:D:262:VAL:HG13	1:D:327:ILE:HD12	1.96	0.48
1:D:216:LEU:HD13	3:D:430:HOH:O	2.14	0.47
1:C:169:ASN:HD21	1:C:182:SER:HB3	1.80	0.47
1:B:337:PHE:CD1	1:B:343:PRO:HA	2.50	0.47
1:C:266:ASN:HD21	1:C:269:SER:HB2	1.78	0.47
1:C:180:THR:HG22	1:C:343:PRO:HA	1.97	0.47
1:D:161:GLU:OE1	1:D:197:HIS:HD2	1.98	0.46
1:C:173:PHE:CD2	1:C:176:LEU:HD13	2.50	0.46
1:C:240(E):GLN:N	1:C:259:GLU:OE2	2.36	0.46
1:A:210:LYS:HD2	3:A:418:HOH:O	2.14	0.46
1:B:209:LYS:O	1:B:213:LEU:HD23	2.15	0.46
1:B:328:PHE:CD2	1:B:328:PHE:C	2.94	0.46
1:B:348:TRP:CH2	1:B:380:LYS:HG3	2.48	0.46
1:A:380:LYS:O	1:A:381:GLY:O	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:187:GLU:OE2	1:D:187:GLU:HA	2.15	0.46
1:D:197:HIS:HE1	1:D:403:SER:HA	1.81	0.46
1:C:287:GLY:N	1:C:337:PHE:O	2.48	0.45
1:A:402:THR:O	1:A:403:SER:C	2.60	0.45
1:B:168:ILE:HD12	1:B:206:LEU:HD22	1.97	0.45
1:B:187:GLU:HA	1:B:187:GLU:OE2	2.16	0.45
1:B:227:LEU:O	1:B:276:LYS:NZ	2.42	0.45
1:A:176:LEU:HB3	1:A:237:HIS:CD2	2.52	0.45
1:C:278:LYS:HB2	1:C:327:ILE:HD13	1.98	0.45
1:C:283:GLN:HE21	1:C:349:TYR:HD2	1.63	0.45
1:C:380:LYS:O	1:C:381:GLY:O	2.35	0.45
1:B:224:HIS:N	1:B:272:SER:OG	2.50	0.44
1:C:188:LYS:NZ	1:C:351:GLU:HG3	2.31	0.44
1:B:201:GLU:OE2	1:B:203:LYS:HE3	2.17	0.44
1:D:165:CYS:HA	1:D:231:VAL:O	2.17	0.44
1:D:173:PHE:CD1	1:D:173:PHE:N	2.85	0.44
1:A:364:GLU:CD	3:A:469:HOH:O	2.60	0.44
1:C:148:ASN:OD1	1:C:150:ASP:HB2	2.16	0.44
1:A:291:ASP:HB2	1:A:337:PHE:CE1	2.53	0.44
1:B:207:THR:HG23	1:B:247:ASP:CG	2.43	0.43
1:B:390:PHE:N	1:B:390:PHE:CD2	2.84	0.43
1:D:207:THR:O	1:D:211:MET:HG3	2.17	0.43
1:D:282:ILE:HG21	1:D:331:TYR:CE2	2.53	0.43
1:C:210:LYS:HA	1:C:213:LEU:HD12	2.00	0.43
1:C:371:LEU:HD11	1:D:367:GLN:OE1	2.17	0.43
1:D:240(F):PHE:HB2	1:D:259:GLU:HB3	2.00	0.43
1:D:375:ASN:O	1:D:379:VAL:HG23	2.18	0.43
1:A:148:ASN:OD1	1:A:150:ASP:HB2	2.17	0.43
1:D:263:ASN:O	1:D:266:ASN:ND2	2.51	0.43
1:D:370:LEU:HD12	1:D:370:LEU:HA	1.79	0.43
1:A:210:LYS:HA	1:A:213:LEU:HD12	2.00	0.43
1:B:238:GLY:CA	1:B:284:ALA:HB1	2.48	0.43
1:B:161:GLU:OE2	1:B:401:LYS:NZ	2.48	0.43
1:C:388:GLY:HA3	1:D:393:PHE:CD2	2.53	0.43
1:B:206:LEU:HB3	1:B:211:MET:HG3	2.00	0.43
1:C:184:ILE:HD11	1:C:345:SER:C	2.43	0.43
1:C:207:THR:HA	1:C:246:THR:HG22	2.00	0.43
1:D:263:ASN:C	1:D:265:PHE:N	2.74	0.43
1:C:173:PHE:N	1:C:173:PHE:CD1	2.86	0.42
1:C:334:PHE:HD1	1:D:393:PHE:CD2	2.38	0.42
1:D:258:VAL:O	1:D:262:VAL:HG23	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:342:ASP:HA	1:D:343:PRO:HD3	1.86	0.42
1:B:284:ALA:HB3	1:B:333:THR:HG22	2.00	0.42
1:D:190:ARG:O	1:D:194:SER:HB2	2.20	0.42
1:D:204:GLY:O	1:D:205:ASP:C	2.61	0.42
1:B:282:ILE:HG21	1:B:331:TYR:CE2	2.55	0.42
1:B:165:CYS:HA	1:B:231:VAL:O	2.20	0.42
1:C:291:ASP:OD2	1:C:384:LYS:HB2	2.20	0.42
1:C:341:ARG:HA	1:C:347:SER:HA	2.01	0.42
1:D:247:ASP:OD2	1:D:254:CYS:HB2	2.20	0.42
1:B:337:PHE:CE1	1:B:343:PRO:HA	2.54	0.41
1:C:207:THR:O	1:C:208:ALA:C	2.62	0.41
1:C:369:LEU:O	1:C:372:ARG:HB2	2.20	0.41
1:D:207:THR:HG23	1:D:247:ASP:OD1	2.20	0.41
1:A:341:ARG:HA	1:A:347:SER:HA	2.03	0.41
1:B:260:LYS:O	1:B:264:ILE:HG13	2.20	0.41
1:D:168:ILE:HD12	1:D:206:LEU:HD22	2.02	0.41
1:A:207:THR:HG22	1:A:247:ASP:HB3	2.03	0.41
1:C:190:ARG:HA	1:C:200:VAL:HG11	2.03	0.41
1:A:155:LEU:HD22	1:A:399:PHE:O	2.21	0.41
1:B:338:VAL:HG22	1:B:345:SER:CB	2.50	0.41
1:A:323:THR:HA	1:A:324:PRO:HD3	1.95	0.41
1:C:161:GLU:OE1	1:C:197:HIS:ND1	2.47	0.41
1:C:376:ALA:O	1:C:379:VAL:HG22	2.20	0.41
1:D:191:ARG:HD2	3:D:439:HOH:O	2.19	0.41
1:B:173:PHE:CD1	1:B:173:PHE:N	2.89	0.41
1:B:235:LEU:O	1:B:236:SER:HB2	2.21	0.41
1:C:175(B):SER:HB3	1:C:176:LEU:CD1	2.50	0.41
1:C:175(B):SER:CB	1:C:176:LEU:HD12	2.51	0.41
1:A:369:LEU:O	1:A:372:ARG:HB2	2.21	0.41
1:D:348:TRP:CD2	1:D:380:LYS:HD2	2.56	0.41
1:A:366:LEU:O	1:A:370:LEU:HD23	2.21	0.41
1:B:364:GLU:OE2	1:B:372:ARG:NH1	2.53	0.41
1:A:388:GLY:HA3	1:B:393:PHE:CD2	2.56	0.41
1:B:190:ARG:HH11	1:B:190:ARG:HG2	1.86	0.41
1:B:265:PHE:O	1:B:278:LYS:HD3	2.20	0.40
1:A:169:ASN:ND2	1:A:235:LEU:HD12	2.35	0.40
1:C:347:SER:O	1:C:348:TRP:C	2.64	0.40
1:C:362:HIS:HA	1:C:402:THR:HG21	2.03	0.40
1:B:350:VAL:HG23	1:B:351:GLU:N	2.35	0.40
1:A:207:THR:HA	1:A:246:THR:HG22	2.02	0.40
1:A:342:ASP:OD1	1:A:345:SER:HB3	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:195:SER:C	1:B:197:HIS:H	2.30	0.40
1:D:390:PHE:CD2	1:D:390:PHE:N	2.87	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	238/284 (84%)	229 (96%)	7 (3%)	2 (1%)	16	44
1	B	222/284 (78%)	210 (95%)	9 (4%)	3 (1%)	9	30
1	C	238/284 (84%)	226 (95%)	10 (4%)	2 (1%)	16	44
1	D	222/284 (78%)	207 (93%)	12 (5%)	3 (1%)	9	30
2	E	1/5 (20%)	1 (100%)	0	0	100	100
2	F	1/5 (20%)	0	1 (100%)	0	100	100
All	All	922/1146 (80%)	873 (95%)	39 (4%)	10 (1%)	11	36

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	381	GLY
1	C	381	GLY
1	B	382	ILE
1	C	205	ASP
1	D	384	LYS
1	B	384	LYS
1	D	205	ASP
1	A	205	ASP
1	D	381	GLY
1	B	343	PRO

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	208/245 (85%)	205 (99%)	3 (1%)	59	85
1	B	196/245 (80%)	191 (97%)	5 (3%)	40	75
1	C	208/245 (85%)	205 (99%)	3 (1%)	59	85
1	D	196/245 (80%)	191 (97%)	5 (3%)	40	75
2	E	3/3 (100%)	3 (100%)	0	100	100
2	F	3/3 (100%)	3 (100%)	0	100	100
All	All	814/986 (83%)	798 (98%)	16 (2%)	48	80

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	177	ARG
1	A	184	ILE
1	A	325	SER
1	B	206	LEU
1	B	221	GLN
1	B	323	THR
1	B	370	LEU
1	B	398	LEU
1	C	177	ARG
1	C	180	THR
1	C	187	GLU
1	D	192	ARG
1	D	221	GLN
1	D	370	LEU
1	D	398	LEU
1	D	402	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (17) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	169	ASN

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Mol	Chain	Res	Type
1	A	283	GLN
1	A	292	HIS
1	A	362	HIS
1	B	197	HIS
1	B	221	GLN
1	B	224	HIS
1	B	375	ASN
1	C	164	HIS
1	C	169	ASN
1	C	283	GLN
1	C	292	HIS
1	C	375	ASN
1	D	197	HIS
1	D	221	GLN
1	D	224	HIS
1	D	375	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 oligosaccharides 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 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.