Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 01:10 AM UTC

PDB ID	:	4EJF / pdb_00004ejf
Title	:	Allosteric peptides that bind to a caspase zymogen and mediate caspase tetramerization
Authors	:	Murray, J.M.
Deposited on	:	2012-04-06
Resolution	:	2.65 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:

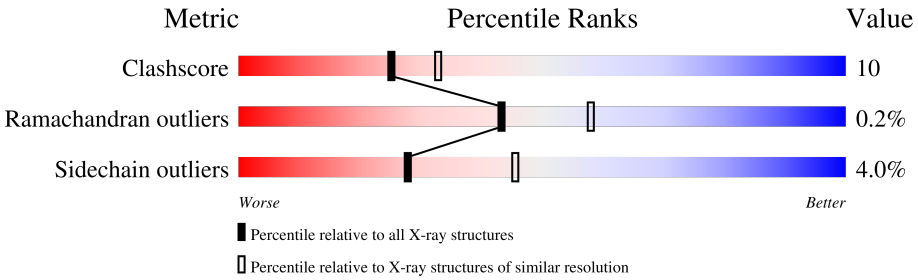
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	NOT EXECUTED
Xtriage (Phenix)	:	2.0
EDS	:	NOT EXECUTED
Buster-report	:	NOT EXECUTED
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson 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 2.65 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	2097 (2.66-2.62)
Ramachandran outliers	187476	2066 (2.66-2.62)
Sidechain outliers	187428	2066 (2.66-2.62)

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	279	70% 17% • 13%
1	B	279	64% 21% • 13%
1	C	279	64% 22% • 13%
1	D	279	68% 18% • 13%
2	E	18	50% 11% 6% 33%
2	F	18	33% 28% 39%
2	G	18	28% 33% 6% 33%
2	H	18	22% 44% 33%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 8485 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-6.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	243	Total	C	N	O	S	7	0	0
			1947	1243	338	353	13			
1	B	243	Total	C	N	O	S	0	0	0
			1950	1245	338	353	14			
1	C	243	Total	C	N	O	S	0	0	0
			1944	1239	338	353	14			
1	D	243	Total	C	N	O	S	0	0	0
			1950	1245	338	353	14			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	21	MET	-	expression tag	UNP P55212
A	22	GLY	-	expression tag	UNP P55212
A	23	SER	-	expression tag	UNP P55212
A	163	ALA	CYS	engineered mutation	UNP P55212
A	294	HIS	-	expression tag	UNP P55212
A	295	HIS	-	expression tag	UNP P55212
A	296	HIS	-	expression tag	UNP P55212
A	297	HIS	-	expression tag	UNP P55212
A	298	HIS	-	expression tag	UNP P55212
A	299	HIS	-	expression tag	UNP P55212
B	21	MET	-	expression tag	UNP P55212
B	22	GLY	-	expression tag	UNP P55212
B	23	SER	-	expression tag	UNP P55212
B	163	ALA	CYS	engineered mutation	UNP P55212
B	294	HIS	-	expression tag	UNP P55212
B	295	HIS	-	expression tag	UNP P55212
B	296	HIS	-	expression tag	UNP P55212
B	297	HIS	-	expression tag	UNP P55212
B	298	HIS	-	expression tag	UNP P55212
B	299	HIS	-	expression tag	UNP P55212
C	21	MET	-	expression tag	UNP P55212

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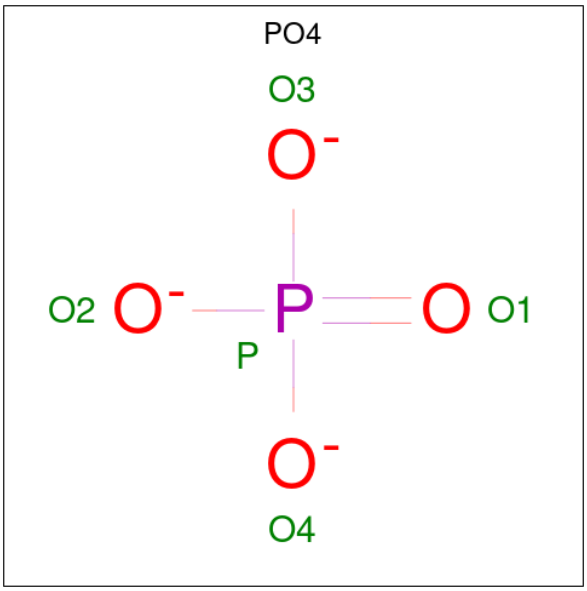
Chain	Residue	Modelled	Actual	Comment	Reference
C	22	GLY	-	expression tag	UNP P55212
C	23	SER	-	expression tag	UNP P55212
C	163	ALA	CYS	engineered mutation	UNP P55212
C	294	HIS	-	expression tag	UNP P55212
C	295	HIS	-	expression tag	UNP P55212
C	296	HIS	-	expression tag	UNP P55212
C	297	HIS	-	expression tag	UNP P55212
C	298	HIS	-	expression tag	UNP P55212
C	299	HIS	-	expression tag	UNP P55212
D	21	MET	-	expression tag	UNP P55212
D	22	GLY	-	expression tag	UNP P55212
D	23	SER	-	expression tag	UNP P55212
D	163	ALA	CYS	engineered mutation	UNP P55212
D	294	HIS	-	expression tag	UNP P55212
D	295	HIS	-	expression tag	UNP P55212
D	296	HIS	-	expression tag	UNP P55212
D	297	HIS	-	expression tag	UNP P55212
D	298	HIS	-	expression tag	UNP P55212
D	299	HIS	-	expression tag	UNP P55212

- Molecule 2 is a protein called phage-derived peptide 419.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	12	Total	C	N	O	S	0	0	0
			102	66	18	17	1			
2	F	11	Total	C	N	O	S	0	0	0
			93	61	17	14	1			
2	G	12	Total	C	N	O	S	0	0	0
			108	69	21	17	1			
2	H	12	Total	C	N	O	S	0	0	0
			102	66	18	17	1			

- Molecule 3 is PHOSPHATE ION (CCD ID: PO4) (formula: O_4P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total O P 5 4 1	0	0
3	D	1	Total O P 5 4 1	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	65	Total O 65 65	0	0
4	B	72	Total O 72 72	0	0
4	C	61	Total O 61 61	0	0
4	D	74	Total O 74 74	0	0
4	E	2	Total O 2 2	0	0
4	F	3	Total O 3 3	0	0
4	H	2	Total O 2 2	0	0

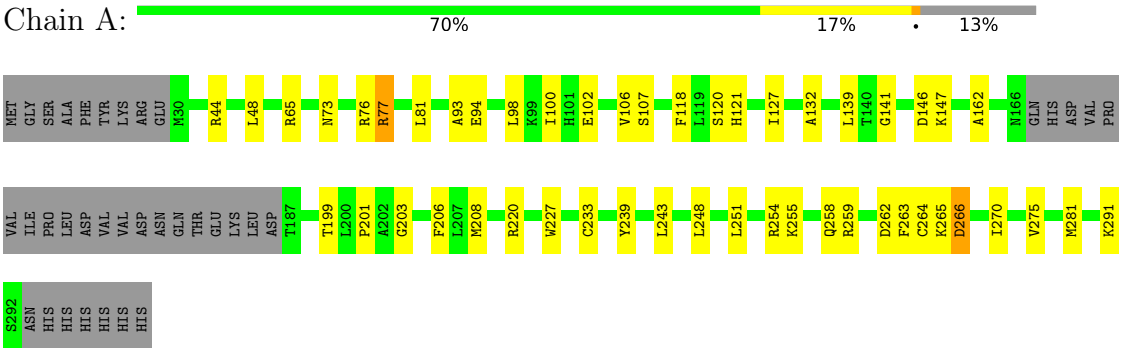
3 Residue-property plots (i)

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

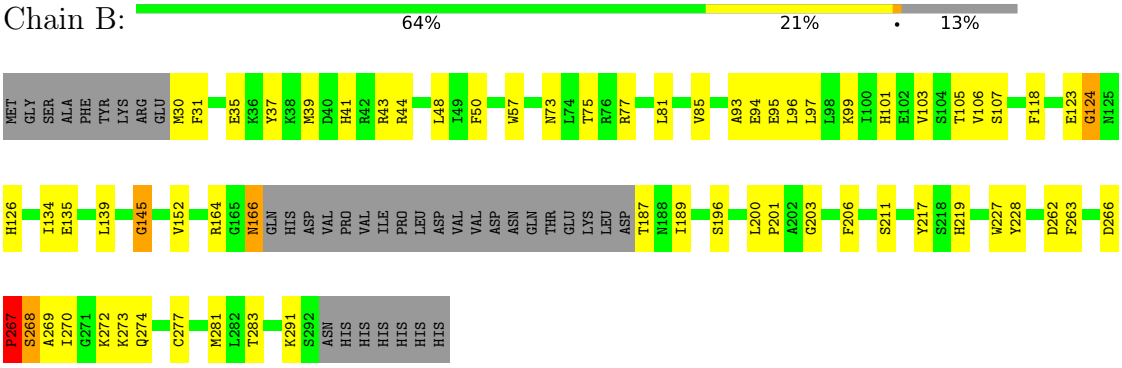
• Molecule 1: Caspase-6

Chain A:



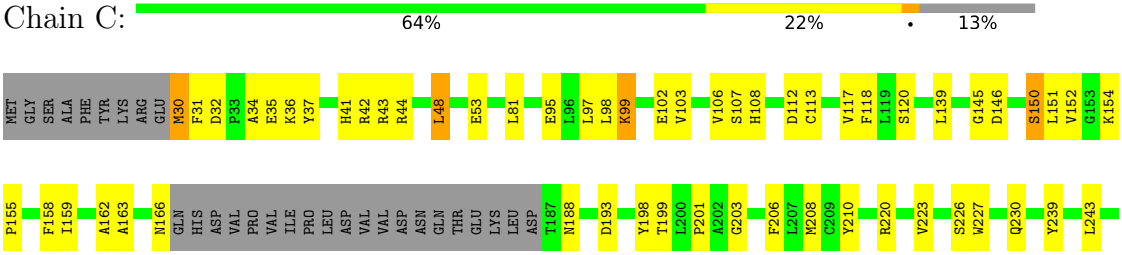
• Molecule 1: Caspase-6

Chain B:



• Molecule 1: Caspase-6

Chain C:

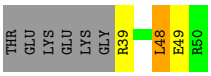


• Molecule 1: Caspase-6

Chain D:

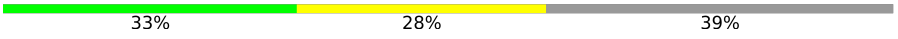
• Molecule 2: phage-derived peptide 419

Chain E:



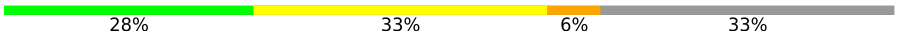
• Molecule 2: phage-derived peptide 419

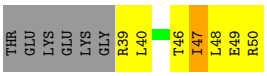
Chain F:



• Molecule 2: phage-derived peptide 419

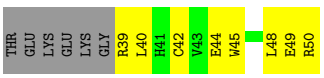
Chain G:





• Molecule 2: phage-derived peptide 419

Chain H:



4 Data and refinement statistics (i)

EDS was 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	128.30Å 105.69Å 91.92Å 90.00° 106.61° 90.00°	Depositor
Resolution (Å)	58.93 – 2.65	Depositor
% Data completeness (in resolution range)	99.4 (58.93-2.65)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$< I/\sigma(I) >$ [1]	2.04 (at 2.65Å)	Xtriage
Refinement program	PHENIX dev_713	Depositor
R, R_{free}	0.188 , 0.239	Depositor
Wilson B-factor (Å^2)	31.4	Xtriage
Anisotropy	0.679	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	8485	wwPDB-VP
Average B, all atoms (Å^2)	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 53.94 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.9251e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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

Bond lengths and bond angles in the following residue types are not validated in this section: PO4

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	0.28	0/1992	0.75	2/2683 (0.1%)
1	B	0.26	0/1995	0.75	4/2686 (0.1%)
1	C	0.29	0/1988	0.70	0/2677
1	D	0.28	0/1995	0.72	1/2686 (0.0%)
2	E	0.24	0/104	0.60	0/141
2	F	0.26	0/95	0.59	0/129
2	G	0.23	0/110	0.62	0/148
2	H	0.24	0/104	0.62	0/141
All	All	0.27	0/8383	0.72	7/11291 (0.1%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	145	GLY	N-CA-C	8.04	122.38	112.73
1	A	266	ASP	CA-C-N	7.16	127.16	119.28
1	A	266	ASP	C-N-CA	7.16	127.16	119.28
1	B	200	LEU	CA-C-N	6.55	127.92	120.85
1	B	200	LEU	C-N-CA	6.55	127.92	120.85
1	B	267	PRO	CB-CA-C	6.54	122.35	111.56
1	D	139	LEU	N-CA-C	5.84	117.44	111.14

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	1947	0	1915	38	0
1	B	1950	0	1922	42	0
1	C	1944	0	1915	43	0
1	D	1950	0	1922	28	0
2	E	102	0	96	1	0
2	F	93	0	90	5	0
2	G	108	0	107	10	0
2	H	102	0	96	11	0
3	C	5	0	0	1	0
3	D	5	0	0	0	0
4	A	65	0	0	0	0
4	B	72	0	0	3	0
4	C	61	0	0	3	0
4	D	74	0	0	0	0
4	E	2	0	0	0	0
4	F	3	0	0	0	0
4	H	2	0	0	0	0
All	All	8485	0	8063	157	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 10.

All (157) 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)
2:G:50:ARG:C	2:H:39:ARG:HH12	1.86	0.83
2:G:49:GLU:HG2	2:G:50:ARG:H	1.45	0.81
1:C:30:MET:HG3	1:C:31:PHE:H	1.48	0.79
1:B:95:GLU:O	1:B:99:LYS:HD3	1.89	0.72
1:C:30:MET:HG3	1:C:31:PHE:N	2.05	0.71
1:C:99:LYS:NZ	1:C:102:GLU:OE1	2.24	0.70
1:A:118:PHE:CZ	1:A:139:LEU:HD13	2.27	0.69
1:C:201:PRO:HB2	1:C:281:MET:SD	2.32	0.69
1:A:44:ARG:HH21	1:A:291:LYS:HG3	1.58	0.68
1:C:98:LEU:O	1:C:102:GLU:HG3	1.92	0.68
1:B:118:PHE:CZ	1:B:139:LEU:HD13	2.29	0.67
1:B:44:ARG:HD2	1:B:81:LEU:O	1.95	0.66
1:C:188:ASN:OD1	1:C:223:VAL:HB	1.96	0.65
1:C:32:ASP:HB3	1:C:35:GLU:HB2	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:145:GLY:HA2	1:C:152:VAL:HG22	1.78	0.64
1:C:285:LYS:NZ	1:D:247:GLU:OE1	2.33	0.62
1:A:203:GLY:O	1:A:206:PHE:HB2	2.00	0.61
1:D:203:GLY:O	1:D:206:PHE:HB2	2.01	0.61
1:D:110:ASP:N	1:D:110:ASP:OD1	2.33	0.61
1:B:166:ASN:N	1:B:166:ASN:OD1	2.34	0.60
2:G:50:ARG:C	2:H:39:ARG:NH1	2.59	0.59
1:B:57:TRP:CZ2	2:G:50:ARG:C	2.80	0.59
1:D:48:LEU:HD23	1:D:86:LYS:HB2	1.85	0.58
1:D:48:LEU:HD11	1:D:103:VAL:HG21	1.86	0.57
1:C:108:HIS:H	1:C:150:SER:CB	2.18	0.56
1:A:102:GLU:O	1:A:106:VAL:HG23	2.05	0.56
1:A:44:ARG:NH1	1:A:81:LEU:O	2.39	0.56
1:C:118:PHE:CE2	1:C:139:LEU:HD13	2.40	0.56
2:G:46:THR:HG23	2:G:48:LEU:CD1	2.36	0.56
1:C:44:ARG:HD2	1:C:81:LEU:O	2.07	0.55
1:B:75:THR:O	1:B:85:VAL:HG21	2.07	0.55
1:A:281:MET:SD	1:B:277:CYS:HB3	2.47	0.55
1:B:263:PHE:O	1:B:263:PHE:CD1	2.61	0.54
1:C:37:TYR:CD2	1:C:155:PRO:HG3	2.43	0.53
1:A:73:ASN:O	1:A:76:ARG:HG2	2.10	0.52
1:A:239:TYR:HB3	1:A:243:LEU:HD22	1.91	0.52
1:D:201:PRO:HB2	1:D:281:MET:SD	2.49	0.52
1:A:118:PHE:HB3	1:A:127:ILE:CD1	2.40	0.52
1:A:118:PHE:HZ	1:A:139:LEU:HD13	1.71	0.52
2:H:42:CYS:SG	2:H:44:GLU:O	2.68	0.51
1:C:203:GLY:O	1:C:206:PHE:HB2	2.11	0.51
1:C:262:ASP:HB3	1:C:264:CYS:HB3	1.90	0.51
1:C:199:THR:HG22	1:C:210:TYR:CG	2.45	0.51
1:A:262:ASP:O	1:A:264:CYS:N	2.43	0.51
1:C:113:CYS:HB2	1:C:155:PRO:O	2.11	0.51
1:C:120:SER:O	1:C:162:ALA:HA	2.10	0.51
1:B:94:GLU:HG3	4:B:301:HOH:O	2.11	0.50
1:A:98:LEU:O	1:A:102:GLU:HG3	2.12	0.50
1:B:37:TYR:O	1:B:39:MET:HG2	2.12	0.50
1:A:270:ILE:HD12	1:A:270:ILE:N	2.26	0.49
1:C:118:PHE:CZ	1:C:139:LEU:HD13	2.48	0.49
1:B:93:ALA:HB3	2:H:45:TRP:CD1	2.47	0.49
1:B:201:PRO:HB2	1:B:281:MET:SD	2.52	0.49
1:D:220:ARG:HA	1:D:226:SER:HA	1.94	0.49
2:H:49:GLU:O	2:H:50:ARG:C	2.56	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:187:THR:HG23	1:D:189:ILE:HD11	1.95	0.49
1:B:73:ASN:O	1:B:77:ARG:HG2	2.13	0.48
1:B:43:ARG:NH2	4:B:329:HOH:O	2.32	0.48
1:C:48:LEU:HD11	1:C:103:VAL:HG21	1.95	0.48
1:C:265:LYS:HB3	1:C:265:LYS:HE2	1.65	0.48
1:B:145:GLY:HA2	1:B:152:VAL:HG22	1.96	0.48
1:B:203:GLY:O	1:B:206:PHE:HB2	2.14	0.48
1:A:118:PHE:HB3	1:A:127:ILE:HD11	1.96	0.48
1:C:30:MET:HE3	1:C:30:MET:HB2	1.76	0.48
1:C:108:HIS:HB2	1:C:150:SER:HB2	1.96	0.48
1:A:201:PRO:HB2	1:A:281:MET:SD	2.54	0.47
1:D:165:GLY:HA2	1:D:193:ASP:OD2	2.14	0.47
1:A:77:ARG:HD2	1:A:233:CYS:O	2.13	0.47
1:C:151:LEU:HA	1:C:154:LYS:HD2	1.96	0.47
1:A:100:ILE:HD13	1:A:139:LEU:HD22	1.96	0.47
2:G:47:ILE:C	2:G:48:LEU:HD12	2.39	0.47
1:D:94:GLU:HG2	2:H:40:LEU:HD13	1.96	0.47
1:A:44:ARG:HH21	1:A:291:LYS:CG	2.25	0.47
1:C:227:TRP:CD2	1:C:259:ARG:HD3	2.49	0.47
1:A:265:LYS:HE3	1:A:265:LYS:HA	1.96	0.46
2:E:48:LEU:HD22	2:F:41:HIS:HB2	1.97	0.46
1:B:219:HIS:HB2	1:B:227:TRP:CD2	2.50	0.46
1:A:65:ARG:O	1:A:220:ARG:HD2	2.15	0.46
1:B:164:ARG:HB2	1:B:196:SER:HB3	1.96	0.46
2:G:50:ARG:CA	2:H:39:ARG:HH12	2.28	0.46
1:B:266:ASP:C	1:B:268:SER:H	2.24	0.46
1:C:34:ALA:HA	1:C:285:LYS:HE3	1.98	0.46
1:C:37:TYR:CG	1:C:155:PRO:HG3	2.51	0.46
1:B:123:GLU:O	1:B:124:GLY:C	2.59	0.46
1:B:211:SER:HA	1:B:228:TYR:CD1	2.51	0.46
1:D:118:PHE:HB3	1:D:127:ILE:CD1	2.46	0.46
1:A:141:GLY:O	1:A:147:LYS:HD2	2.17	0.45
1:B:266:ASP:O	1:B:268:SER:N	2.50	0.45
1:D:41:HIS:O	1:D:291:LYS:NZ	2.40	0.45
1:A:201:PRO:HA	1:A:208:MET:HG3	1.98	0.45
1:D:148:CYS:SG	1:D:151:LEU:HD12	2.56	0.45
1:C:226:SER:O	1:C:230:GLN:HG3	2.16	0.45
1:A:120:SER:O	1:A:162:ALA:HA	2.17	0.45
1:B:217:TYR:O	1:B:274:GLN:HB2	2.17	0.45
1:D:98:LEU:HG	2:H:40:LEU:HD11	1.98	0.45
1:A:139:LEU:HD23	1:A:139:LEU:HA	1.58	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:49:GLU:HG2	2:G:50:ARG:N	2.22	0.45
1:B:262:ASP:HA	1:B:270:ILE:HG23	2.00	0.44
1:C:41:HIS:HB2	1:C:112:ASP:OD1	2.17	0.44
1:C:264:CYS:O	1:C:264:CYS:SG	2.75	0.44
1:D:120:SER:O	1:D:162:ALA:HA	2.18	0.44
1:C:198:TYR:HA	4:C:453:HOH:O	2.18	0.44
1:B:266:ASP:N	1:B:267:PRO:HD3	2.33	0.44
1:C:97:LEU:HD22	2:F:47:ILE:HD11	1.99	0.44
1:A:106:VAL:HG12	1:A:107:SER:H	1.83	0.44
1:C:243:LEU:HG	4:C:416:HOH:O	2.17	0.44
1:D:58:HIS:CE1	2:H:48:LEU:HD22	2.53	0.44
1:A:44:ARG:HE	1:A:291:LYS:HD2	1.82	0.44
1:B:269:ALA:HA	1:B:272:LYS:HD2	1.99	0.44
1:A:255:LYS:O	1:A:258:GLN:HG2	2.18	0.43
2:G:39:ARG:HB2	2:H:48:LEU:O	2.18	0.43
1:B:35:GLU:HG3	4:B:335:HOH:O	2.18	0.43
1:C:163:ALA:HB3	3:C:301:PO4:O3	2.19	0.43
1:A:262:ASP:O	1:A:263:PHE:C	2.62	0.43
1:A:227:TRP:CD2	1:A:259:ARG:HD3	2.54	0.43
1:A:239:TYR:CB	1:A:243:LEU:HD22	2.49	0.43
1:B:97:LEU:HD21	1:B:134:ILE:HG21	2.01	0.43
1:B:48:LEU:HD21	1:B:103:VAL:HG21	2.00	0.43
1:B:123:GLU:O	1:B:123:GLU:HG3	2.18	0.43
1:C:106:VAL:HG12	1:C:107:SER:N	2.33	0.43
1:A:94:GLU:HB2	2:F:40:LEU:CD2	2.49	0.43
2:F:39:ARG:HG2	2:F:40:LEU:H	1.83	0.43
1:A:254:ARG:HB2	1:B:283:THR:HB	2.01	0.42
1:D:39:MET:HE3	1:D:44:ARG:HH11	1.84	0.42
1:B:126:HIS:CD2	1:B:135:GLU:HG2	2.54	0.42
1:D:98:LEU:O	1:D:102:GLU:HG3	2.18	0.42
1:D:219:HIS:HB2	1:D:227:TRP:CD2	2.54	0.42
1:C:158:PHE:HB2	1:C:208:MET:SD	2.59	0.42
1:D:192:VAL:HG21	1:D:269:ALA:CB	2.49	0.42
1:D:77:ARG:O	1:D:81:LEU:HG	2.19	0.42
2:H:49:GLU:OE1	2:H:49:GLU:HA	2.18	0.42
1:A:93:ALA:HB2	1:A:132:ALA:HB3	2.02	0.42
1:D:95:GLU:O	1:D:99:LYS:HG2	2.19	0.42
1:A:120:SER:OG	1:A:121:HIS:N	2.52	0.42
1:A:275:VAL:CG1	1:B:281:MET:HE2	2.50	0.41
1:B:273:LYS:HE2	1:B:273:LYS:HB3	1.80	0.41
1:A:199:THR:OG1	1:B:201:PRO:CD	2.68	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:30:MET:HG3	1:B:31:PHE:H	1.84	0.41
1:D:30:MET:HG3	1:D:31:PHE:N	2.36	0.41
1:A:248:LEU:O	1:A:251:LEU:HB2	2.21	0.41
1:C:220:ARG:HA	1:C:226:SER:HA	2.01	0.41
1:D:74:LEU:HD13	1:D:117:VAL:HG11	2.02	0.41
1:B:106:VAL:HG12	1:B:107:SER:N	2.35	0.41
1:C:281:MET:HG2	1:D:277:CYS:HB3	2.03	0.41
1:B:41:HIS:O	1:B:291:LYS:NZ	2.53	0.41
1:B:75:THR:HG23	1:B:85:VAL:HG11	2.03	0.41
1:C:108:HIS:H	1:C:150:SER:HB2	1.85	0.41
1:C:117:VAL:HG22	1:C:159:ILE:HB	2.02	0.41
1:D:50:PHE:CE1	1:D:96:LEU:HG	2.56	0.41
1:B:101:HIS:O	1:B:105:THR:HG23	2.20	0.40
1:B:57:TRP:HZ2	2:G:50:ARG:C	2.28	0.40
1:A:94:GLU:HB2	2:F:40:LEU:HD22	2.04	0.40
1:C:43:ARG:HD2	4:C:403:HOH:O	2.21	0.40
1:C:239:TYR:HB3	1:C:243:LEU:HD22	2.04	0.40
1:B:50:PHE:CE1	1:B:96:LEU:HG	2.57	0.40
1:C:31:PHE:CE2	1:D:254:ARG:NH2	2.90	0.40
1:D:267:PRO:HA	1:D:270:ILE:CD1	2.51	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	239/279 (86%)	224 (94%)	15 (6%)	0	100 100
1	B	239/279 (86%)	225 (94%)	12 (5%)	2 (1%)	16 24
1	C	239/279 (86%)	229 (96%)	10 (4%)	0	100 100
1	D	239/279 (86%)	231 (97%)	8 (3%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	E	10/18 (56%)	10 (100%)	0	0	100 100
2	F	9/18 (50%)	8 (89%)	1 (11%)	0	100 100
2	G	10/18 (56%)	9 (90%)	1 (10%)	0	100 100
2	H	10/18 (56%)	10 (100%)	0	0	100 100
All	All	995/1188 (84%)	946 (95%)	47 (5%)	2 (0%)	43 58

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	124	GLY
1	B	267	PRO

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	210/245 (86%)	206 (98%)	4 (2%)	50 70
1	B	211/245 (86%)	207 (98%)	4 (2%)	50 70
1	C	210/245 (86%)	196 (93%)	14 (7%)	15 24
1	D	211/245 (86%)	204 (97%)	7 (3%)	33 53
2	E	11/17 (65%)	8 (73%)	3 (27%)	0 0
2	F	10/17 (59%)	9 (90%)	1 (10%)	7 10
2	G	12/17 (71%)	10 (83%)	2 (17%)	2 2
2	H	11/17 (65%)	11 (100%)	0	100 100
All	All	886/1048 (84%)	851 (96%)	35 (4%)	28 45

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	LEU
1	A	77	ARG

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Mol	Chain	Res	Type
1	A	146	ASP
1	A	266	ASP
1	B	166	ASN
1	B	187	THR
1	B	189	ILE
1	B	268	SER
1	C	30	MET
1	C	36	LYS
1	C	42	ARG
1	C	48	LEU
1	C	53	GLU
1	C	95	GLU
1	C	99	LYS
1	C	146	ASP
1	C	150	SER
1	C	166	ASN
1	C	193	ASP
1	C	255	LYS
1	C	264	CYS
1	C	268	SER
1	D	53	GLU
1	D	94	GLU
1	D	110	ASP
1	D	133	LYS
1	D	139	LEU
1	D	255	LYS
1	D	265	LYS
2	E	39	ARG
2	E	48	LEU
2	E	49	GLU
2	F	48	LEU
2	G	40	LEU
2	G	47	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	126	HIS
1	B	58	HIS
1	C	161	GLN
1	C	224	ASN
1	C	230	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

Mogul was not executed - this section is therefore empty.

5.5 Carbohydrates

Mogul was not executed - this section is therefore empty.

5.6 Ligand geometry

Mogul was not executed - this section is therefore empty.

5.7 Other polymers

Mogul was not executed - this section is therefore empty.

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.