



# Full wwPDB/EMDatabank EM Map/Model Validation Report ⓘ

Mar 17, 2018 – 01:27 PM EDT

PDB ID : 6B0X  
EMDB ID: : EMD-7030  
Title : Capsid protein and C-terminal part of scaffolding protein in the Staphylococcus aureus phage 80alpha procapsid  
Authors : Kizziah, J.L.; Dearborn, A.D.; Dokland, T.  
Deposited on : 2017-09-15  
Resolution : 3.72 Å(reported)

This is a Full wwPDB/EMDatabank EM Map/Model Validation Report  
for a publicly released PDB/EMDB entry.

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A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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MolProbity : 4.02b-467  
Percentile statistics : 20171227.v01 (using entries in the PDB archive December 27th 2017)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20031021

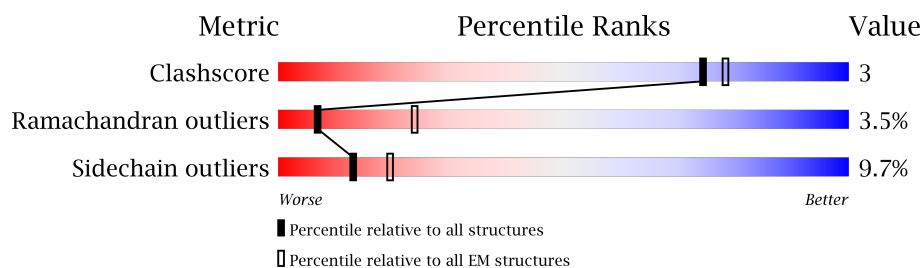
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.72 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)	EM structures (#Entries)
Clashscore	136327	1886
Ramachandran outliers	132723	1663
Sidechain outliers	132532	1531

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	324	72% 15% • 12%
1	B	324	73% 13% • 12%
1	C	324	73% 14% • 12%
1	D	324	68% 18% • 12%
1	E	324	77% 9% • 12%
1	F	324	73% 14% • 12%
1	G	324	69% 18% • 12%
2	a	206	7% 93%
2	b	206	7% 92%

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Mol	Chain	Length	Quality of chain	
2	c	206	<div><div></div></div> 7% <div></div> 93%	
2	d	206	<div><div></div></div> 8% <div></div> 92%	
2	e	206	<div><div></div></div> 8% <div></div> 92%	
2	f	206	<div><div></div></div> 7% <div></div> 92%	
2	g	206	<div><div></div></div> 7% <div></div> 92%	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 16791 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Major head protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	B	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	C	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	D	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	E	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	F	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		
1	G	284	Total	C	N	O	S	0	0
			2270	1446	370	443	11		

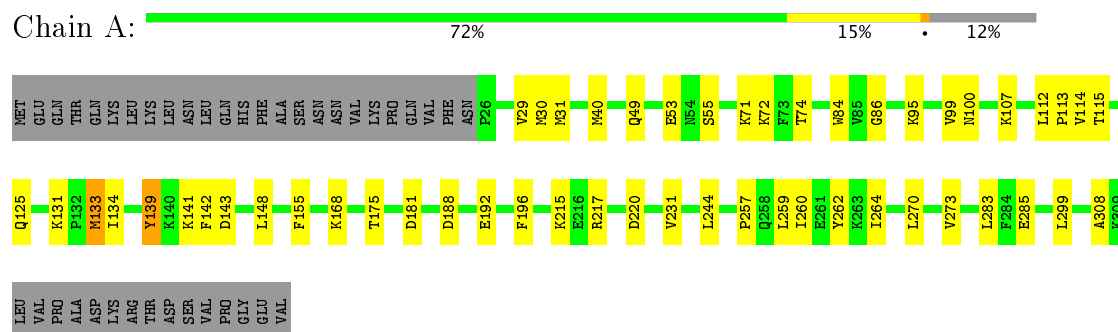
- Molecule 2 is a protein called Scaffold protein.

Mol	Chain	Residues	Atoms				AltConf	Trace
2	a	14	Total	C	N	O	0	0
			116	72	25	19		
2	b	16	Total	C	N	O	0	0
			132	82	28	22		
2	c	15	Total	C	N	O	0	0
			125	77	27	21		
2	d	16	Total	C	N	O	0	0
			132	82	28	22		
2	e	16	Total	C	N	O	0	0
			132	82	28	22		
2	f	16	Total	C	N	O	0	0
			132	82	28	22		
2	g	16	Total	C	N	O	0	0
			132	82	28	22		

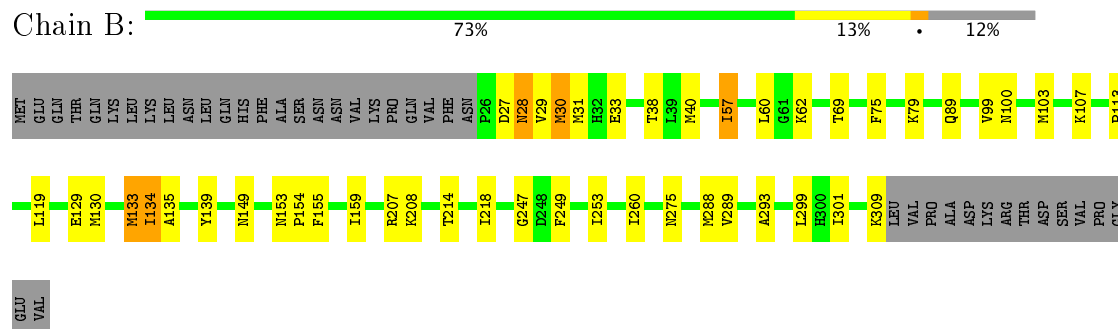
### 3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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.

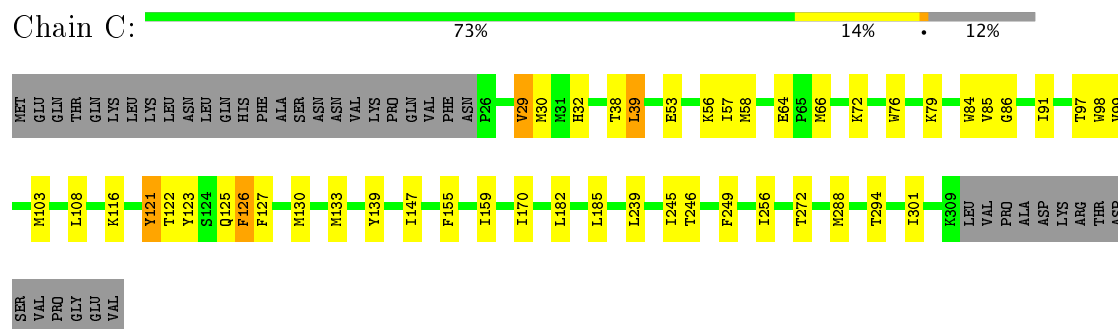
- Molecule 1: Major head protein



- Molecule 1: Major head protein

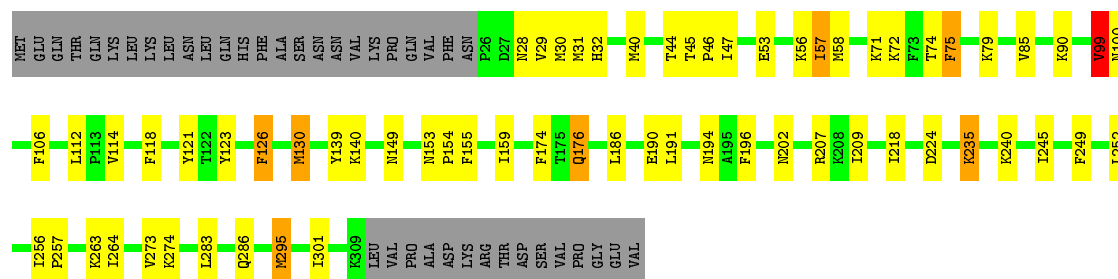


- Molecule 1: Major head protein




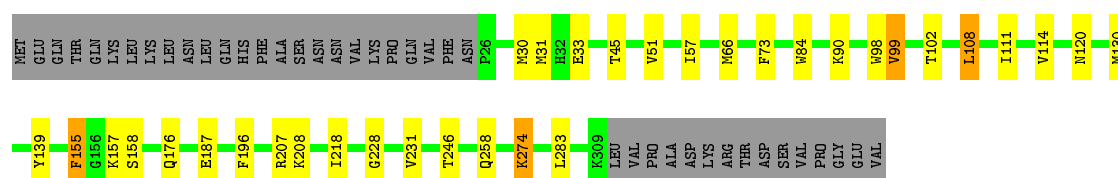
- Molecule 1: Major head protein

Chain D:  68% 18% 12%



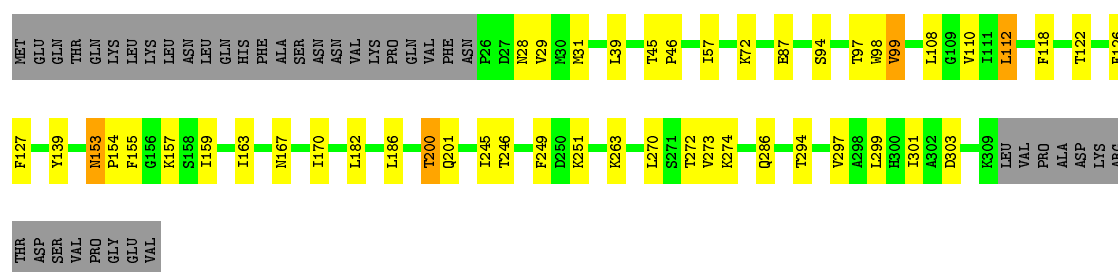
- Molecule 1: Major head protein

Chain E:  77% 9% 12%



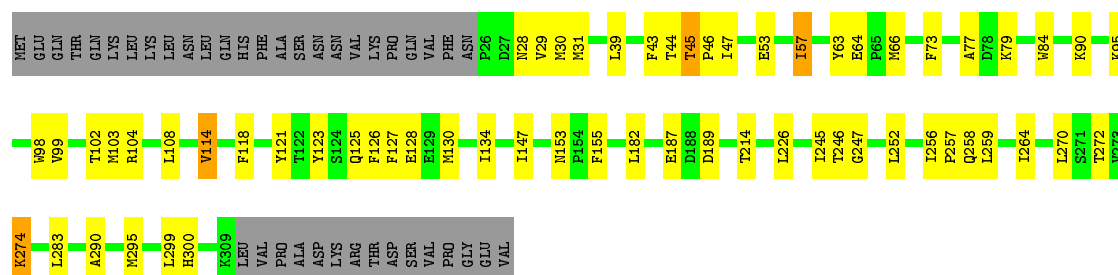
- Molecule 1: Major head protein

Chain F:  73% 14% 12%



- Molecule 1: Major head protein

Chain G:  69% 18% 12%



- Molecule 2: Scaffold protein

Chain a:  7% 93%



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P191  
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- Molecule 2: Scaffold protein

Chain e: 8% 92%

MET  
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- Molecule 2: Scaffold protein

Chain f: 7% 92%

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- Molecule 2: Scaffold protein

Chain g: 7% 92%

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K205  
N206



## 4 Experimental information

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, I	Depositor
Number of particles used	10557	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	Not provided	Depositor
Maximum defocus (nm)	Not provided	Depositor
Magnification	Not provided	Depositor
Image detector	DIRECT ELECTRON DE-20 (5k x 3k)	Depositor

## 5 Model quality [i](#)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >2	RMSZ	# Z  >2
1	A	0.42	0/2312	0.59	0/3116
1	B	0.40	0/2312	0.56	0/3116
1	C	0.39	0/2312	0.58	0/3116
1	D	0.40	0/2312	0.58	0/3116
1	E	0.40	0/2312	0.58	0/3116
1	F	0.40	0/2312	0.57	0/3116
1	G	0.39	0/2312	0.58	0/3116
2	a	0.42	0/115	0.51	0/151
2	b	0.35	0/132	0.60	0/174
2	c	0.38	0/124	0.51	0/163
2	d	0.32	0/132	0.54	0/174
2	e	0.33	0/132	0.53	0/174
2	f	0.36	0/132	0.51	0/174
2	g	0.34	0/132	0.54	0/174
All	All	0.40	0/17083	0.57	0/22996

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2270	0	2261	5	0
1	B	2270	0	2261	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2270	0	2261	32	0
1	D	2270	0	2261	19	0
1	E	2270	0	2261	6	0
1	F	2270	0	2261	17	0
1	G	2270	0	2261	30	0
2	a	116	0	131	0	0
2	b	132	0	147	0	0
2	c	125	0	139	0	0
2	d	132	0	147	0	0
2	e	132	0	147	0	0
2	f	132	0	147	0	0
2	g	132	0	147	0	0
All	All	16791	0	16832	112	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 3.

All (112) 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:G:39:LEU:HD21	1:G:127:PHE:CE2	1.76	1.21
1:C:126:PHE:CD1	1:C:130:MET:HG3	1.78	1.16
1:G:39:LEU:HD21	1:G:127:PHE:HE2	1.13	1.01
1:C:126:PHE:CE1	1:C:130:MET:CG	2.44	1.00
1:C:126:PHE:CD1	1:C:130:MET:CG	2.53	0.91
1:C:126:PHE:CE1	1:C:130:MET:SD	2.65	0.89
1:C:126:PHE:HD1	1:C:130:MET:HG3	1.38	0.82
1:G:39:LEU:CD2	1:G:127:PHE:CE2	2.61	0.81
1:C:39:LEU:CD2	1:C:127:PHE:HE2	1.98	0.76
1:C:121:TYR:O	1:C:125:GLN:HB2	1.87	0.73
1:G:121:TYR:O	1:G:125:GLN:HB2	1.93	0.68
1:C:39:LEU:HD23	1:C:127:PHE:CE2	2.29	0.67
1:G:108:LEU:HD21	1:G:126:PHE:CE2	2.30	0.66
1:F:163:ILE:HD13	1:F:303:ASP:HB2	1.79	0.64
1:G:108:LEU:HD21	1:G:126:PHE:HE2	1.63	0.62
1:C:126:PHE:CE1	1:C:130:MET:HG2	2.33	0.62
1:G:57:ILE:HB	1:G:147:ILE:HD11	1.80	0.62
1:C:126:PHE:O	1:C:130:MET:HG3	2.00	0.62
1:C:126:PHE:CE1	1:C:130:MET:HG3	2.17	0.60
1:C:182:LEU:HD21	1:C:245:ILE:HD11	1.84	0.59
1:C:32:HIS:HD2	1:C:123:TYR:HA	1.69	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:39:LEU:HD22	1:C:127:PHE:HE2	1.70	0.57
1:C:39:LEU:CD2	1:C:127:PHE:CE2	2.82	0.57
1:C:126:PHE:HE1	1:C:130:MET:HG2	1.69	0.57
1:D:45:THR:HG23	1:D:46:PRO:HD3	1.86	0.57
1:B:134:ILE:HD12	1:B:289:VAL:HG21	1.87	0.56
1:C:159:ILE:HG23	1:C:301:ILE:HG21	1.88	0.56
1:G:45:THR:HG23	1:G:46:PRO:HD3	1.86	0.56
1:E:99:VAL:HG21	1:E:155:PHE:HB3	1.87	0.55
1:A:264:ILE:HG21	1:G:264:ILE:HG22	1.89	0.55
1:G:108:LEU:CD2	1:G:126:PHE:CE2	2.90	0.55
1:A:55:SER:HA	1:A:139:TYR:CD1	2.42	0.54
1:D:57:ILE:HD11	1:D:249:PHE:CE1	2.42	0.54
1:D:74:THR:O	1:D:75:PHE:HB2	2.07	0.54
1:F:108:LEU:HG	1:F:112:LEU:HD11	1.89	0.54
1:C:126:PHE:CD1	1:C:130:MET:SD	3.01	0.53
1:G:126:PHE:CZ	1:G:130:MET:CE	2.92	0.53
1:A:133:MET:SD	1:A:134:ILE:N	2.81	0.53
1:C:108:LEU:HD21	1:C:130:MET:HA	1.90	0.53
1:E:176:GLN:HE21	1:E:218:ILE:HD11	1.73	0.52
1:C:108:LEU:HD22	1:C:133:MET:HB2	1.92	0.52
1:B:159:ILE:HG23	1:B:301:ILE:HG21	1.91	0.52
1:D:159:ILE:HG23	1:D:301:ILE:HG21	1.91	0.52
1:G:121:TYR:O	1:G:125:GLN:CG	2.58	0.52
1:F:45:THR:HG23	1:F:46:PRO:HD3	1.92	0.51
1:F:97:THR:HB	1:F:294:THR:HG21	1.92	0.51
1:C:121:TYR:O	1:C:125:GLN:CG	2.59	0.51
1:F:39:LEU:HD13	1:F:127:PHE:CZ	2.45	0.51
1:A:196:PHE:HB2	1:A:231:VAL:HG22	1.93	0.51
1:D:196:PHE:CZ	1:D:245:ILE:HD11	2.46	0.51
1:C:121:TYR:O	1:C:125:GLN:CB	2.57	0.50
1:G:108:LEU:HD22	1:G:130:MET:HE3	1.94	0.49
1:D:196:PHE:CE2	1:D:245:ILE:HD11	2.47	0.49
1:D:121:TYR:CE2	1:D:123:TYR:HA	2.47	0.49
1:D:121:TYR:CZ	1:D:126:PHE:HB3	2.47	0.49
1:C:246:THR:HG23	1:C:249:PHE:CE1	2.47	0.49
1:D:44:THR:HG23	1:D:257:PRO:HD3	1.95	0.48
1:G:121:TYR:O	1:G:125:GLN:CB	2.61	0.48
1:B:260:ILE:HG22	1:B:288:MET:HB3	1.95	0.48
1:G:77:ALA:HB3	1:G:79:LYS:HE3	1.95	0.48
1:G:182:LEU:HD21	1:G:245:ILE:CD1	2.44	0.47
1:F:110:VAL:HG21	1:G:73:PHE:CE1	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:99:VAL:HG21	1:D:155:PHE:CD1	2.49	0.47
1:D:264:ILE:O	1:D:286:GLN:NE2	2.44	0.47
1:G:102:THR:HG23	1:G:290:ALA:HA	1.96	0.47
1:A:133:MET:SD	1:A:134:ILE:HG23	2.55	0.46
1:C:147:ILE:HA	1:C:159:ILE:HD12	1.97	0.46
1:F:159:ILE:HG23	1:F:301:ILE:HG21	1.96	0.46
1:E:111:ILE:O	1:E:114:VAL:HG22	2.15	0.46
1:D:32:HIS:CE1	1:D:118:PHE:CZ	3.04	0.45
1:F:112:LEU:HD13	1:F:118:PHE:CE1	2.51	0.45
1:G:39:LEU:HD22	1:G:257:PRO:HG2	1.96	0.45
1:F:186:LEU:HD22	1:F:245:ILE:HD13	1.99	0.45
1:G:108:LEU:C	1:G:108:LEU:HD23	2.36	0.45
1:G:126:PHE:HZ	1:G:130:MET:HE1	1.81	0.45
1:E:218:ILE:HD12	1:E:218:ILE:N	2.33	0.44
1:G:43:PHE:CE2	1:G:123:TYR:HE2	2.35	0.44
1:D:174:PHE:HB3	1:D:209:ILE:HD11	1.98	0.44
1:G:182:LEU:HD21	1:G:245:ILE:HD11	1.99	0.44
1:G:128:GLU:OE2	1:G:128:GLU:HA	2.18	0.44
1:D:176:GLN:HG3	1:D:218:ILE:HD11	2.00	0.44
1:F:286:GLN:OE1	1:F:286:GLN:N	2.51	0.43
1:C:126:PHE:CZ	1:C:130:MET:SD	3.09	0.43
1:G:108:LEU:HD21	1:G:118:PHE:CZ	2.54	0.43
1:B:153:ASN:N	1:B:154:PRO:CD	2.81	0.43
1:D:126:PHE:CD2	1:D:130:MET:HG3	2.54	0.43
1:F:57:ILE:HG23	1:F:251:LYS:HD2	2.01	0.43
1:D:112:LEU:HD11	1:D:126:PHE:CD2	2.55	0.42
1:G:44:THR:HG23	1:G:257:PRO:HD3	2.02	0.42
1:G:47:ILE:HD12	1:G:134:ILE:HD12	2.01	0.42
1:D:140:LYS:NZ	1:D:235:LYS:O	2.53	0.42
1:G:214:THR:O	1:G:214:THR:HG23	2.19	0.42
1:E:108:LEU:HD11	1:E:130:MET:HB2	2.02	0.41
1:G:126:PHE:HZ	1:G:130:MET:CE	2.33	0.41
1:D:153:ASN:N	1:D:154:PRO:CD	2.83	0.41
1:C:97:THR:HB	1:C:294:THR:HG21	2.02	0.41
1:B:133:MET:O	1:B:135:ALA:N	2.53	0.41
1:D:295:MET:SD	1:D:295:MET:N	2.93	0.41
1:F:108:LEU:HD11	1:F:112:LEU:HD21	2.02	0.41
1:F:200:THR:HG22	1:G:187:GLU:HG2	2.01	0.41
1:F:99:VAL:HG21	1:F:155:PHE:CB	2.51	0.41
1:C:126:PHE:HD1	1:C:126:PHE:O	2.02	0.41
1:E:196:PHE:HB2	1:E:231:VAL:HG22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:253:ILE:HD13	1:B:293:ALA:HB2	2.03	0.41
1:C:170:ILE:HD11	1:C:185:LEU:HD11	2.03	0.41
1:C:32:HIS:HB2	1:C:122:THR:C	2.41	0.41
1:C:39:LEU:HB3	1:C:127:PHE:CZ	2.57	0.40
1:C:182:LEU:HD21	1:C:245:ILE:CD1	2.48	0.40
1:F:153:ASN:N	1:F:154:PRO:CD	2.84	0.40
1:F:170:ILE:HD12	1:F:182:LEU:HD13	2.04	0.40
1:F:249:PHE:CE2	1:F:297:VAL:HG22	2.56	0.40
1:C:38:THR:HG22	1:C:256:ILE:HG21	2.04	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 PDB entries followed by that with respect to all EM entries.

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	282/324 (87%)	235 (83%)	32 (11%)	15 (5%)	2	24
1	B	282/324 (87%)	230 (82%)	39 (14%)	13 (5%)	2	27
1	C	282/324 (87%)	236 (84%)	39 (14%)	7 (2%)	6	41
1	D	282/324 (87%)	236 (84%)	36 (13%)	10 (4%)	4	35
1	E	282/324 (87%)	231 (82%)	44 (16%)	7 (2%)	6	41
1	F	282/324 (87%)	239 (85%)	34 (12%)	9 (3%)	4	36
1	G	282/324 (87%)	228 (81%)	43 (15%)	11 (4%)	3	31
2	a	12/206 (6%)	11 (92%)	1 (8%)	0	100	100
2	b	14/206 (7%)	13 (93%)	0	1 (7%)	1	18
2	c	13/206 (6%)	13 (100%)	0	0	100	100
2	d	14/206 (7%)	13 (93%)	1 (7%)	0	100	100
2	e	14/206 (7%)	12 (86%)	2 (14%)	0	100	100
2	f	14/206 (7%)	14 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	g	14/206 (7%)	14 (100%)	0	0	100	100
All	All	2069/3710 (56%)	1725 (83%)	271 (13%)	73 (4%)	7	35

All (73) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	30	MET
1	A	113	PRO
1	A	114	VAL
1	A	192	GLU
1	B	113	PRO
1	C	85	VAL
1	D	75	PHE
1	D	99	VAL
1	E	99	VAL
1	F	99	VAL
1	G	114	VAL
2	b	205	LYS
1	A	99	VAL
1	A	115	THR
1	A	257	PRO
1	A	283	LEU
1	B	99	VAL
1	C	91	ILE
1	C	99	VAL
1	D	273	VAL
1	E	283	LEU
1	F	122	THR
1	F	273	VAL
1	G	99	VAL
1	G	300	HIS
1	A	188	ASP
1	B	79	LYS
1	C	30	MET
1	D	30	MET
1	D	114	VAL
1	E	274	LYS
1	F	29	VAL
1	F	272	THR
1	G	30	MET
1	G	258	GLN
1	G	283	LEU

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Mol	Chain	Res	Type
1	A	84	TRP
1	A	308	ALA
1	B	29	VAL
1	B	30	MET
1	B	33	GLU
1	D	106	PHE
1	D	224	ASP
1	D	283	LEU
1	E	84	TRP
1	F	28	ASN
1	G	84	TRP
1	A	29	VAL
1	A	131	LYS
1	B	28	ASN
1	B	134	ILE
1	B	214	THR
1	D	28	ASN
1	D	29	VAL
1	E	158	SER
1	E	228	GLY
1	E	258	GLN
1	F	246	THR
1	G	272	THR
1	G	274	LYS
1	A	273	VAL
1	B	57	ILE
1	B	89	GLN
1	B	218	ILE
1	C	272	THR
1	F	153	ASN
1	F	167	ASN
1	B	247	GLY
1	C	86	GLY
1	G	29	VAL
1	G	247	GLY
1	C	29	VAL
1	A	86	GLY

### 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 PDB entries followed by that with respect to all EM



entries.

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	249/286 (87%)	217 (87%)	32 (13%)	5	27
1	B	249/286 (87%)	222 (89%)	27 (11%)	7	35
1	C	249/286 (87%)	228 (92%)	21 (8%)	12	46
1	D	249/286 (87%)	217 (87%)	32 (13%)	5	27
1	E	249/286 (87%)	228 (92%)	21 (8%)	12	46
1	F	249/286 (87%)	234 (94%)	15 (6%)	21	58
1	G	249/286 (87%)	223 (90%)	26 (10%)	8	36
2	a	12/178 (7%)	12 (100%)	0	100	100
2	b	14/178 (8%)	13 (93%)	1 (7%)	16	52
2	c	13/178 (7%)	13 (100%)	0	100	100
2	d	14/178 (8%)	14 (100%)	0	100	100
2	e	14/178 (8%)	14 (100%)	0	100	100
2	f	14/178 (8%)	13 (93%)	1 (7%)	16	52
2	g	14/178 (8%)	12 (86%)	2 (14%)	3	24
All	All	1838/3248 (57%)	1660 (90%)	178 (10%)	13	39

All (178) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	31	MET
1	A	40	MET
1	A	49	GLN
1	A	53	GLU
1	A	71	LYS
1	A	72	LYS
1	A	74	THR
1	A	95	LYS
1	A	100	ASN
1	A	107	LYS
1	A	112	LEU
1	A	125	GLN
1	A	133	MET
1	A	139	TYR
1	A	141	LYS

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Mol	Chain	Res	Type
1	A	142	PHE
1	A	143	ASP
1	A	148	LEU
1	A	155	PHE
1	A	168	LYS
1	A	175	THR
1	A	181	ASP
1	A	215	LYS
1	A	217	ARG
1	A	220	ASP
1	A	244	LEU
1	A	259	LEU
1	A	260	ILE
1	A	262	TYR
1	A	270	LEU
1	A	285	GLU
1	A	299	LEU
1	B	27	ASP
1	B	28	ASN
1	B	30	MET
1	B	31	MET
1	B	38	THR
1	B	40	MET
1	B	57	ILE
1	B	60	LEU
1	B	62	LYS
1	B	69	THR
1	B	75	PHE
1	B	100	ASN
1	B	103	MET
1	B	107	LYS
1	B	119	LEU
1	B	129	GLU
1	B	130	MET
1	B	133	MET
1	B	139	TYR
1	B	149	ASN
1	B	155	PHE
1	B	207	ARG
1	B	208	LYS
1	B	249	PHE
1	B	275	ASN

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Mol	Chain	Res	Type
1	B	299	LEU
1	B	309	LYS
1	C	29	VAL
1	C	39	LEU
1	C	53	GLU
1	C	56	LYS
1	C	57	ILE
1	C	58	MET
1	C	64	GLU
1	C	66	MET
1	C	72	LYS
1	C	76	TRP
1	C	79	LYS
1	C	84	TRP
1	C	98	TRP
1	C	103	MET
1	C	116	LYS
1	C	121	TYR
1	C	126	PHE
1	C	139	TYR
1	C	155	PHE
1	C	239	LEU
1	C	288	MET
1	D	31	MET
1	D	40	MET
1	D	47	ILE
1	D	53	GLU
1	D	56	LYS
1	D	57	ILE
1	D	58	MET
1	D	71	LYS
1	D	72	LYS
1	D	79	LYS
1	D	85	VAL
1	D	90	LYS
1	D	99	VAL
1	D	100	ASN
1	D	126	PHE
1	D	130	MET
1	D	139	TYR
1	D	149	ASN
1	D	176	GLN

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Mol	Chain	Res	Type
1	D	186	LEU
1	D	190	GLU
1	D	191	LEU
1	D	194	ASN
1	D	202	ASN
1	D	207	ARG
1	D	235	LYS
1	D	240	LYS
1	D	252	LEU
1	D	256	ILE
1	D	263	LYS
1	D	274	LYS
1	D	295	MET
1	E	30	MET
1	E	31	MET
1	E	33	GLU
1	E	45	THR
1	E	51	VAL
1	E	57	ILE
1	E	66	MET
1	E	73	PHE
1	E	90	LYS
1	E	98	TRP
1	E	102	THR
1	E	108	LEU
1	E	120	ASN
1	E	139	TYR
1	E	155	PHE
1	E	157	LYS
1	E	187	GLU
1	E	207	ARG
1	E	208	LYS
1	E	246	THR
1	E	274	LYS
1	F	31	MET
1	F	72	LYS
1	F	87	GLU
1	F	94	SER
1	F	98	TRP
1	F	112	LEU
1	F	126	PHE
1	F	139	TYR

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Mol	Chain	Res	Type
1	F	157	LYS
1	F	200	THR
1	F	201	GLN
1	F	263	LYS
1	F	270	LEU
1	F	274	LYS
1	F	299	LEU
1	G	28	ASN
1	G	31	MET
1	G	45	THR
1	G	53	GLU
1	G	57	ILE
1	G	63	TYR
1	G	64	GLU
1	G	66	MET
1	G	90	LYS
1	G	95	LYS
1	G	98	TRP
1	G	103	MET
1	G	104	ARG
1	G	114	VAL
1	G	153	ASN
1	G	155	PHE
1	G	189	ASP
1	G	226	LEU
1	G	246	THR
1	G	252	LEU
1	G	256	ILE
1	G	259	LEU
1	G	270	LEU
1	G	274	LYS
1	G	295	MET
1	G	299	LEU
2	b	205	LYS
2	f	193	ASN
2	g	202	ARG
2	g	205	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	59	GLN

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Mol	Chain	Res	Type
1	A	125	GLN
1	A	149	ASN
1	A	161	GLN
1	A	258	GLN
1	B	49	GLN
1	B	100	ASN
1	B	178	ASN
1	B	202	ASN
1	C	32	HIS
1	C	238	ASN
1	D	59	GLN
1	E	120	ASN
1	E	176	GLN
1	E	202	ASN
1	F	153	ASN
1	G	202	ASN
1	G	286	GLN
2	a	193	ASN
2	f	193	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 carbohydrates 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.