Full wwPDB EM Validation Report ⓘ

Mar 18, 2025 – 03:19 pm GMT

PDB ID	:	9GB0
EMDB ID	:	EMD-51193
Title	:	Extended phiCD508 portal adjacent capsid
Authors	:	Wilson, J.S.; Fagan, R.P.; Bullough, P.A.
Deposited on	:	2024-07-29
Resolution	:	3.23 Å(reported)

This is a Full wwPDB EM 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/EMValidationReportHelp
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:

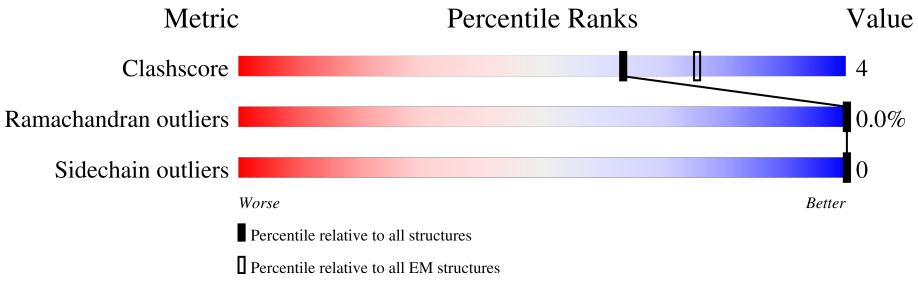
EMDB validation analysis	:	FAILED
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.41

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 3.23 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	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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%

Mol	Chain	Length	Quality of chain
1	A	345	73% 10% 17%
1	B	345	74% 5% 21%
1	E	345	73% 10% 17%
1	F	345	74% 5% 21%
1	I	345	72% 11% 17%
1	J	345	73% 7% 21%
1	M	345	72% 11% 17%
1	N	345	73% 6% 21%
1	Q	345	75% 8% 17%

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Mol	Chain	Length	Quality of chain
1	R	345	74% 5% 21%
2	C	127	81% 7% 12%
2	D	127	87% 11%
2	G	127	80% 9% 12%
2	H	127	85% 13%
2	K	127	79% 9% 12%
2	L	127	83% 15%
2	O	127	80% 8% 12%
2	P	127	84% 14%
2	S	127	79% 9% 12%
2	T	127	86% 13%
2	U	127	87% 12%
2	V	127	86% 13%
2	W	127	86% 13%
2	X	127	84% 14%
2	Y	127	87% 11%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 72430 atoms, of which 36090 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 gp49 - Major capsid protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	286	Total	C	H	N	O	S	0	0
			4521	1440	2261	381	431	8		
1	B	274	Total	C	H	N	O	S	0	0
			4329	1382	2162	367	411	7		
1	E	286	Total	C	H	N	O	S	0	0
			4521	1440	2261	381	431	8		
1	F	274	Total	C	H	N	O	S	0	0
			4329	1382	2162	367	411	7		
1	I	286	Total	C	H	N	O	S	0	0
			4521	1440	2261	381	431	8		
1	J	274	Total	C	H	N	O	S	0	0
			4329	1382	2162	367	411	7		
1	M	286	Total	C	H	N	O	S	0	0
			4521	1440	2261	381	431	8		
1	N	274	Total	C	H	N	O	S	0	0
			4329	1382	2162	367	411	7		
1	Q	286	Total	C	H	N	O	S	0	0
			4521	1440	2261	381	431	8		
1	R	274	Total	C	H	N	O	S	0	0
			4329	1382	2162	367	411	7		

- Molecule 2 is a protein called gp48 - Minor capsid protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	C	112	Total	C	H	N	O	S	0	0
			1744	554	863	147	179	1		
2	D	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	G	112	Total	C	H	N	O	S	0	0
			1744	554	863	147	179	1		
2	H	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	K	112	Total	C	H	N	O	S	0	0
			1744	554	863	147	179	1		

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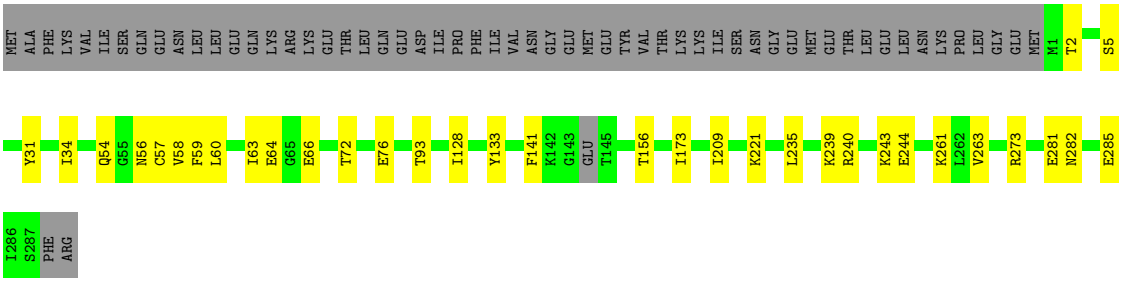
Mol	Chain	Residues	Atoms						AltConf	Trace
2	L	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	O	112	Total	C	H	N	O	S	0	0
			1744	554	863	147	179	1		
2	P	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	S	112	Total	C	H	N	O	S	0	0
			1744	554	863	147	179	1		
2	T	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	U	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	V	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	W	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	X	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		
2	Y	125	Total	C	H	N	O	S	0	0
			1946	618	966	163	198	1		

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.

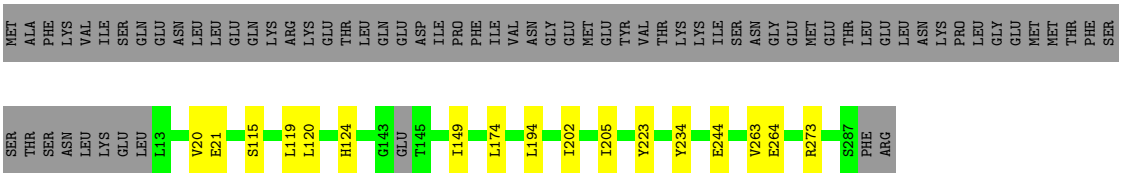
• Molecule 1: gp49 - Major capsid protein

Chain A:



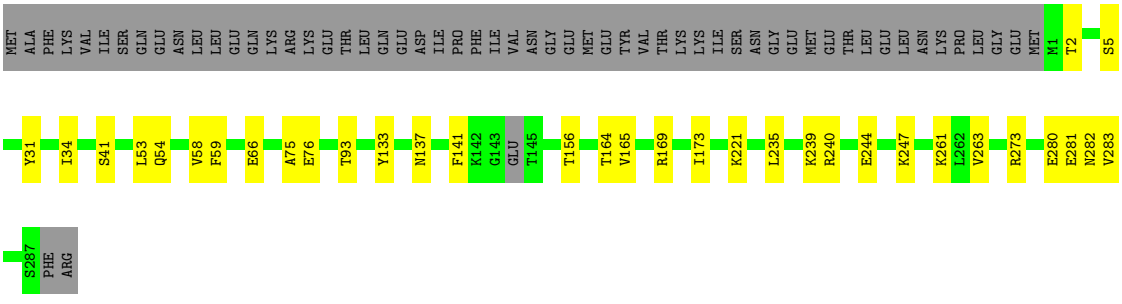
• Molecule 1: gp49 - Major capsid protein

Chain B:



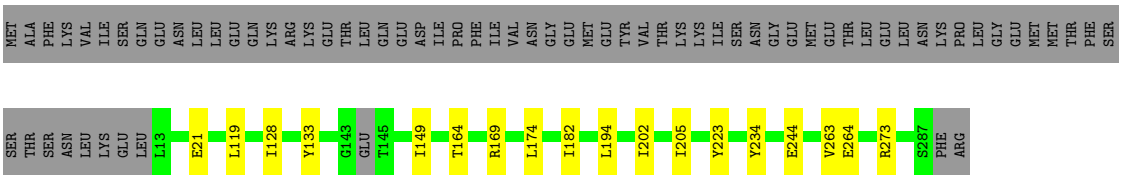
• Molecule 1: gp49 - Major capsid protein

Chain E:



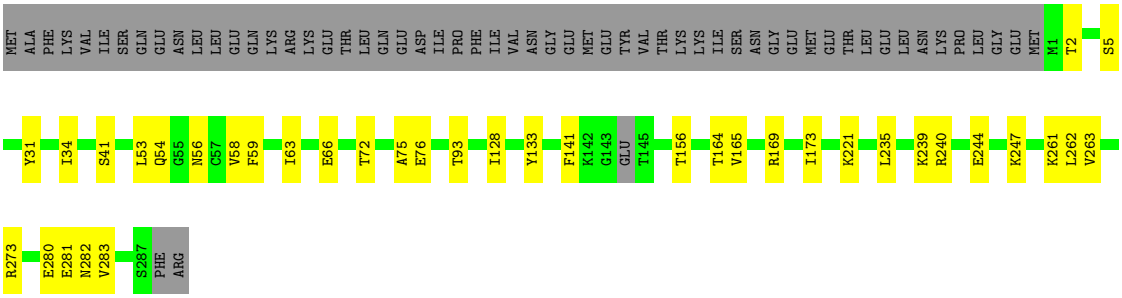
• Molecule 1: gp49 - Major capsid protein

Chain F:



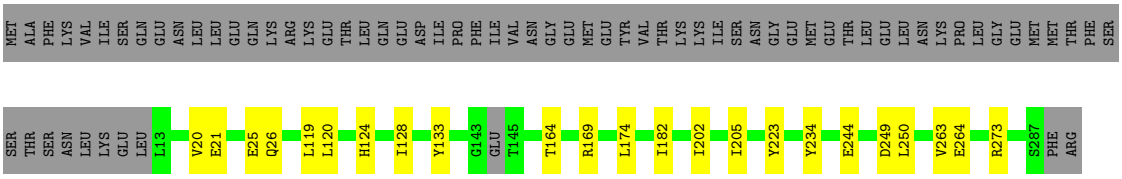
• Molecule 1: gp49 - Major capsid protein

Chain I:



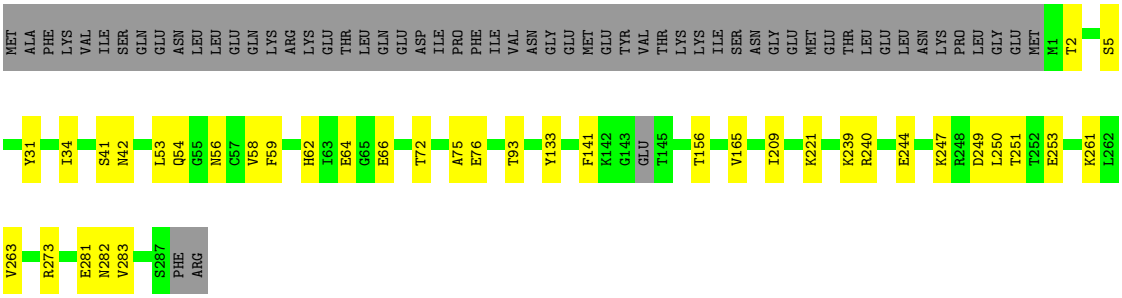
• Molecule 1: gp49 - Major capsid protein

Chain J:



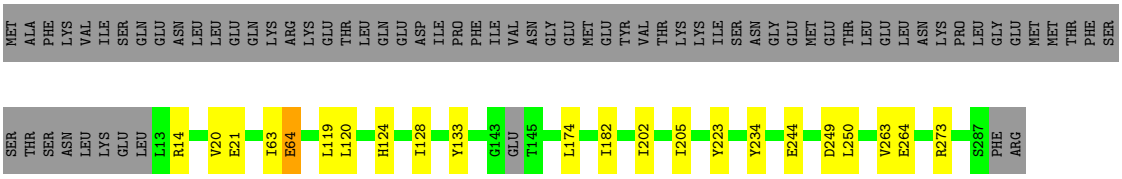
• Molecule 1: gp49 - Major capsid protein

Chain M:



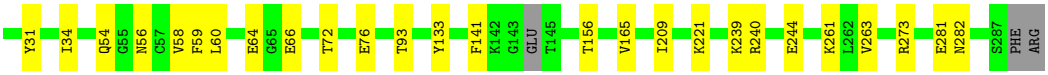
• Molecule 1: gp49 - Major capsid protein

Chain N:



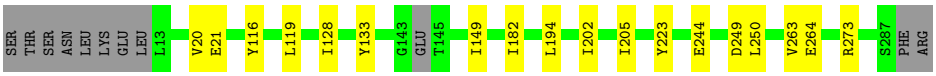
• Molecule 1: gp49 - Major capsid protein

Chain Q:



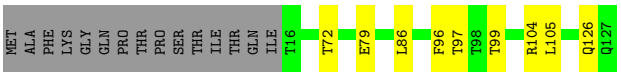
• Molecule 1: gp49 - Major capsid protein

Chain R:



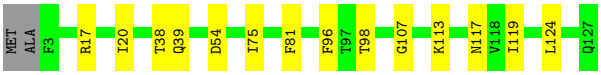
• Molecule 2: gp48 - Minor capsid protein

Chain C:



• Molecule 2: gp48 - Minor capsid protein

Chain D:

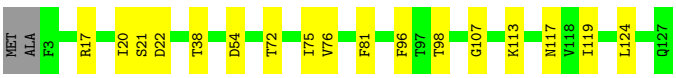


• Molecule 2: gp48 - Minor capsid protein

Chain G:

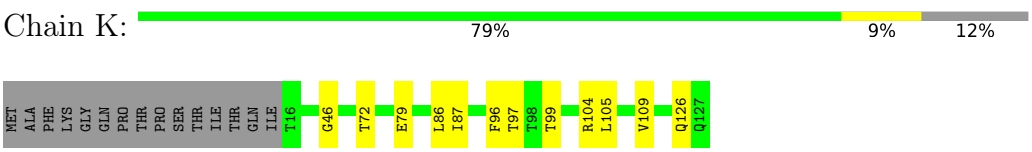
• Molecule 2: gp48 - Minor capsid protein

Chain H:



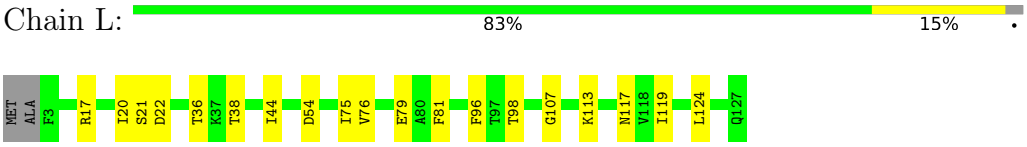
• Molecule 2: gp48 - Minor capsid protein

Chain K:



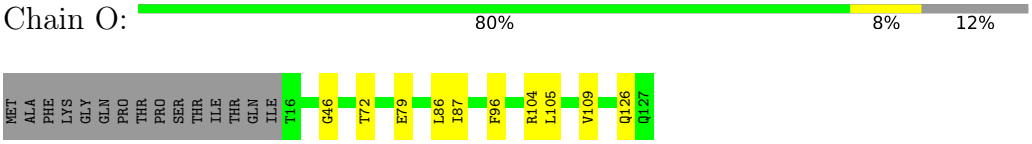
• Molecule 2: gp48 - Minor capsid protein

Chain L:



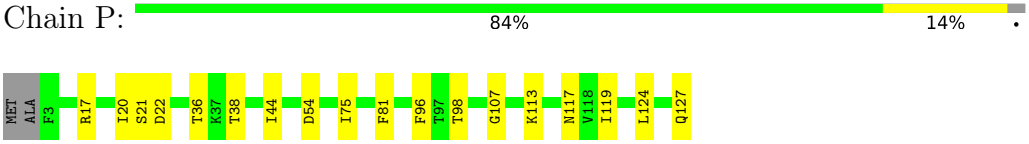
• Molecule 2: gp48 - Minor capsid protein

Chain O:



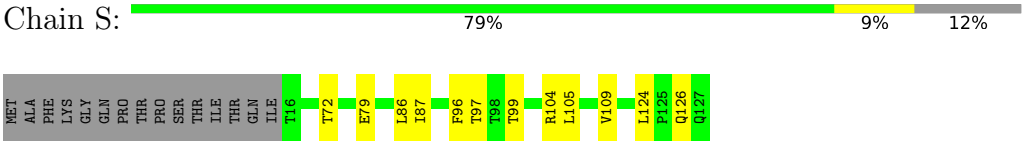
• Molecule 2: gp48 - Minor capsid protein

Chain P:



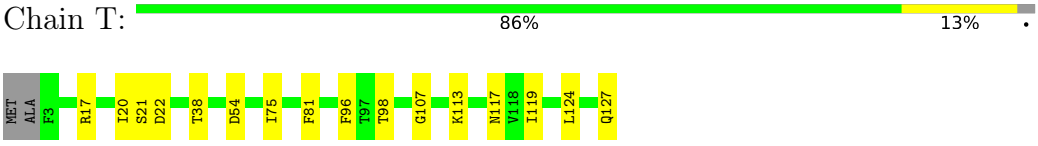
• Molecule 2: gp48 - Minor capsid protein

Chain S:



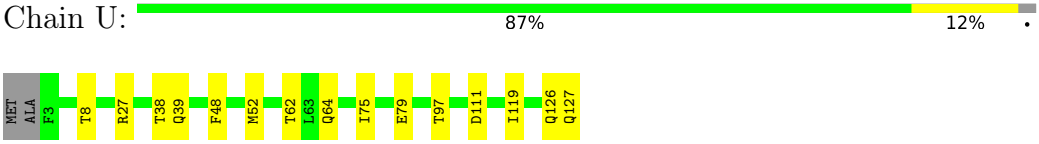
• Molecule 2: gp48 - Minor capsid protein

Chain T:



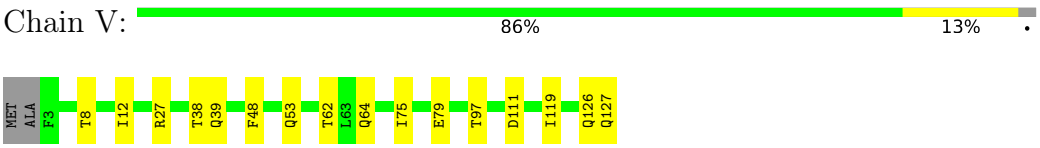
• Molecule 2: gp48 - Minor capsid protein

Chain U:



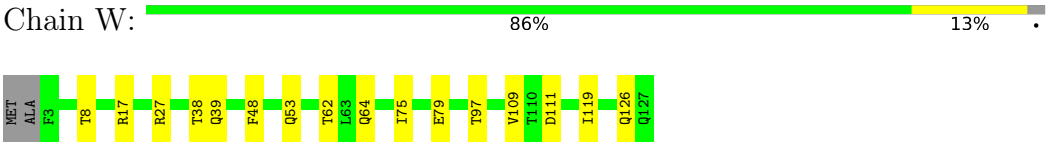
• Molecule 2: gp48 - Minor capsid protein

Chain V:



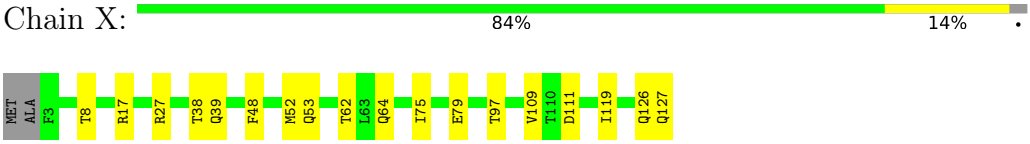
• Molecule 2: gp48 - Minor capsid protein

Chain W:



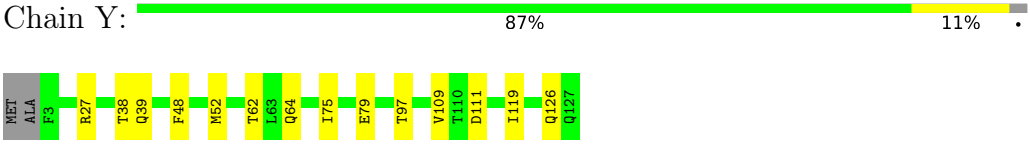
• Molecule 2: gp48 - Minor capsid protein

Chain X:



• Molecule 2: gp48 - Minor capsid protein

Chain Y:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	23343	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	42	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

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	0.31	0/2303	0.53	0/3114
1	B	0.30	0/2209	0.53	0/2988
1	E	0.31	0/2303	0.54	0/3114
1	F	0.30	0/2209	0.52	0/2988
1	I	0.31	0/2303	0.54	0/3114
1	J	0.30	0/2209	0.53	0/2988
1	M	0.31	0/2303	0.53	0/3114
1	N	0.30	0/2209	0.53	0/2988
1	Q	0.31	0/2303	0.53	0/3114
1	R	0.30	0/2209	0.52	0/2988
2	C	0.30	0/894	0.57	0/1207
2	D	0.30	0/996	0.53	0/1347
2	G	0.30	0/894	0.57	0/1207
2	H	0.30	0/996	0.53	0/1347
2	K	0.30	0/894	0.55	0/1207
2	L	0.30	0/996	0.54	0/1347
2	O	0.31	0/894	0.56	0/1207
2	P	0.30	0/996	0.55	0/1347
2	S	0.30	0/894	0.56	0/1207
2	T	0.31	0/996	0.54	0/1347
2	U	0.31	0/996	0.57	0/1347
2	V	0.32	0/996	0.56	0/1347
2	W	0.31	0/996	0.57	0/1347
2	X	0.31	0/996	0.57	0/1347
2	Y	0.32	0/996	0.57	0/1347
All	All	0.31	0/36990	0.54	0/50015

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	2260	2261	2266	30	0
1	B	2167	2162	2169	12	0
1	E	2260	2261	2266	25	0
1	F	2167	2162	2169	12	0
1	I	2260	2261	2266	28	0
1	J	2167	2162	2169	15	0
1	M	2260	2261	2266	29	0
1	N	2167	2162	2169	15	0
1	Q	2260	2261	2266	24	0
1	R	2167	2162	2169	13	0
2	C	881	863	862	5	0
2	D	980	966	965	10	0
2	G	881	863	862	7	0
2	H	980	966	965	11	0
2	K	881	863	862	7	0
2	L	980	966	965	11	0
2	O	881	863	862	6	0
2	P	980	966	965	10	0
2	S	881	863	862	7	0
2	T	980	966	965	11	0
2	U	980	966	965	12	0
2	V	980	966	965	13	0
2	W	980	966	965	13	0
2	X	980	966	965	17	0
2	Y	980	966	965	10	0
All	All	36340	36090	36135	287	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 4.

All (287) 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:D:75:ILE:HG21	2:D:119:ILE:HD12	1.48	0.96
2:H:75:ILE:HG21	2:H:119:ILE:HD12	1.48	0.95

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:T:75:ILE:HG21	2:T:119:ILE:HD12	1.49	0.94
2:L:75:ILE:HG21	2:L:119:ILE:HD12	1.50	0.92
2:P:75:ILE:HG21	2:P:119:ILE:HD12	1.51	0.91
1:E:221:LYS:NZ	2:U:111:ASP:OD2	2.23	0.72
1:M:54:GLN:NE2	1:M:76:GLU:OE2	2.23	0.71
1:I:54:GLN:NE2	1:I:76:GLU:OE2	2.23	0.71
1:I:221:LYS:NZ	2:V:111:ASP:OD2	2.24	0.71
1:A:54:GLN:NE2	1:A:76:GLU:OE2	2.22	0.71
1:M:221:LYS:NZ	2:W:111:ASP:OD2	2.24	0.71
1:M:244:GLU:OE2	1:M:273:ARG:NH2	2.23	0.71
1:Q:54:GLN:NE2	1:Q:76:GLU:OE2	2.23	0.71
1:Q:221:LYS:NZ	2:X:111:ASP:OD2	2.23	0.71
1:A:66:GLU:OE2	2:X:27:ARG:NH1	2.24	0.71
1:A:244:GLU:OE2	1:A:273:ARG:NH2	2.23	0.70
1:E:54:GLN:NE2	1:E:76:GLU:OE2	2.24	0.70
1:I:244:GLU:OE2	1:I:273:ARG:NH2	2.24	0.70
1:Q:244:GLU:OE2	1:Q:273:ARG:NH2	2.24	0.70
1:A:221:LYS:NZ	2:Y:111:ASP:OD2	2.23	0.69
1:E:244:GLU:OE2	1:E:273:ARG:NH2	2.26	0.69
1:Q:133:TYR:OH	1:Q:282:ASN:ND2	2.26	0.69
1:E:66:GLU:HB3	2:Y:62:THR:HG21	1.75	0.68
1:I:66:GLU:HB3	2:U:62:THR:HG21	1.75	0.68
1:E:133:TYR:OH	1:E:282:ASN:ND2	2.27	0.68
1:N:244:GLU:OE2	1:N:273:ARG:NH1	2.27	0.68
1:Q:66:GLU:HB3	2:W:62:THR:HG21	1.76	0.68
1:M:133:TYR:OH	1:M:282:ASN:ND2	2.28	0.67
1:M:66:GLU:HB3	2:V:62:THR:HG21	1.77	0.67
2:G:79:GLU:N	2:G:79:GLU:OE1	2.28	0.67
1:I:133:TYR:OH	1:I:282:ASN:ND2	2.28	0.66
1:J:244:GLU:OE2	1:J:273:ARG:NH1	2.28	0.66
2:C:79:GLU:N	2:C:79:GLU:OE1	2.29	0.66
1:I:240:ARG:NH1	1:J:21:GLU:OE2	2.31	0.64
1:E:41:SER:O	1:E:247:LYS:NZ	2.28	0.64
1:Q:66:GLU:OE2	2:W:27:ARG:NH1	2.30	0.64
2:S:104:ARG:NH2	2:S:126:GLN:OE1	2.30	0.64
1:E:240:ARG:NH1	1:F:21:GLU:OE2	2.31	0.63
2:L:17:ARG:HH12	2:L:20:ILE:HD12	1.63	0.63
1:A:141:PHE:O	1:A:156:THR:OG1	2.17	0.63
2:T:113:LYS:NZ	2:T:117:ASN:OD1	2.32	0.62
1:M:240:ARG:NH1	1:N:21:GLU:OE2	2.31	0.62
2:P:17:ARG:HH12	2:P:20:ILE:HD12	1.64	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:244:GLU:OE2	1:F:273:ARG:NH1	2.32	0.62
2:O:86:LEU:HD22	2:O:105:LEU:HD11	1.82	0.62
2:P:113:LYS:NZ	2:P:117:ASN:OD1	2.33	0.62
2:T:17:ARG:HH12	2:T:20:ILE:HD12	1.63	0.62
1:A:66:GLU:HB3	2:X:62:THR:HG21	1.82	0.61
1:A:133:TYR:OH	1:A:282:ASN:ND2	2.34	0.61
2:C:86:LEU:HD22	2:C:105:LEU:HD11	1.82	0.61
1:F:202:ILE:HG21	1:F:205:ILE:HD12	1.83	0.61
1:E:31:TYR:OH	1:E:244:GLU:OE2	2.15	0.60
2:S:86:LEU:HD22	2:S:105:LEU:HD11	1.82	0.60
1:M:58:VAL:HG11	1:N:223:TYR:CD2	2.35	0.60
1:A:31:TYR:OH	1:A:244:GLU:OE2	2.13	0.60
2:K:86:LEU:HD22	2:K:105:LEU:HD11	1.83	0.60
2:K:79:GLU:OE1	2:K:79:GLU:N	2.34	0.60
2:C:104:ARG:NH2	2:C:126:GLN:OE1	2.33	0.60
1:A:240:ARG:NH1	1:B:21:GLU:OE2	2.35	0.59
1:M:31:TYR:OH	1:M:244:GLU:OE2	2.13	0.59
1:N:20:VAL:HG21	2:V:8:THR:HG21	1.84	0.59
1:M:41:SER:O	1:M:247:LYS:NZ	2.32	0.59
1:R:20:VAL:HG21	2:W:8:THR:HG21	1.85	0.59
2:L:113:LYS:NZ	2:L:117:ASN:OD1	2.35	0.58
1:I:41:SER:O	1:I:247:LYS:NZ	2.35	0.58
1:B:244:GLU:OE2	1:B:273:ARG:NH1	2.36	0.58
2:H:113:LYS:NZ	2:H:117:ASN:OD1	2.36	0.58
1:Q:31:TYR:OH	1:Q:244:GLU:OE2	2.12	0.58
1:R:244:GLU:OE2	1:R:273:ARG:NH1	2.36	0.58
1:Q:58:VAL:HG11	1:R:223:TYR:CD2	2.38	0.57
2:G:86:LEU:HD22	2:G:105:LEU:HD11	1.86	0.56
1:R:128:ILE:O	1:R:133:TYR:OH	2.16	0.56
2:H:75:ILE:HG22	2:H:96:PHE:HB2	1.88	0.56
1:A:58:VAL:HG11	1:B:223:TYR:CD2	2.40	0.56
1:J:20:VAL:HG21	2:U:8:THR:HG21	1.87	0.56
2:D:113:LYS:NZ	2:D:117:ASN:OD1	2.37	0.56
2:D:17:ARG:HH12	2:D:20:ILE:HD12	1.71	0.55
2:L:75:ILE:HG22	2:L:96:PHE:HB2	1.89	0.55
2:G:104:ARG:NH2	2:G:126:GLN:OE1	2.39	0.55
1:M:59:PHE:HB3	1:N:119:LEU:HD22	1.89	0.55
1:Q:59:PHE:HB3	1:R:119:LEU:HD22	1.89	0.55
2:X:48:PHE:O	2:X:126:GLN:NE2	2.39	0.55
2:C:97:THR:OG1	2:C:99:THR:HG23	2.07	0.54
1:I:31:TYR:OH	1:I:244:GLU:OE2	2.15	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:Q:261:LYS:NZ	2:X:64:GLN:OE1	2.40	0.54
2:W:75:ILE:HG21	2:W:119:ILE:HD12	1.89	0.54
1:N:128:ILE:O	1:N:133:TYR:OH	2.14	0.54
2:S:97:THR:OG1	2:S:99:THR:HG23	2.07	0.54
1:A:59:PHE:HB3	1:B:119:LEU:HD22	1.90	0.54
2:D:107:GLY:N	2:D:124:LEU:HD12	2.23	0.54
1:A:128:ILE:O	1:A:133:TYR:OH	2.15	0.54
2:D:75:ILE:HG22	2:D:96:PHE:HB2	1.90	0.53
1:E:59:PHE:CB	1:F:119:LEU:HD22	2.39	0.53
2:Y:48:PHE:O	2:Y:126:GLN:NE2	2.41	0.53
2:P:75:ILE:HG22	2:P:96:PHE:HB2	1.90	0.53
2:H:107:GLY:N	2:H:124:LEU:HD12	2.23	0.53
2:T:75:ILE:HG22	2:T:96:PHE:HB2	1.91	0.53
2:G:97:THR:OG1	2:G:99:THR:HG23	2.09	0.53
2:V:75:ILE:HG21	2:V:119:ILE:HD12	1.90	0.53
1:A:2:THR:O	1:A:5:SER:OG	2.25	0.52
2:T:107:GLY:N	2:T:124:LEU:HD12	2.24	0.52
2:L:38:THR:OG1	2:L:54:ASP:OD1	2.18	0.52
1:M:2:THR:O	1:M:5:SER:OG	2.27	0.52
1:E:281:GLU:N	1:E:281:GLU:OE1	2.41	0.52
1:I:66:GLU:OE2	2:U:27:ARG:NH1	2.43	0.52
1:I:58:VAL:HG11	1:J:223:TYR:CD2	2.45	0.52
1:I:59:PHE:HB3	1:J:119:LEU:HD22	1.92	0.52
1:Q:64:GLU:HB2	2:W:53:GLN:NE2	2.25	0.52
1:E:58:VAL:HG11	1:F:223:TYR:CD2	2.44	0.52
2:K:104:ARG:NH2	2:K:126:GLN:OE1	2.43	0.52
1:A:59:PHE:CB	1:B:119:LEU:HD22	2.40	0.51
1:F:128:ILE:O	1:F:133:TYR:OH	2.20	0.51
2:U:48:PHE:O	2:U:126:GLN:NE2	2.42	0.51
1:E:2:THR:O	1:E:5:SER:OG	2.28	0.51
1:Q:240:ARG:NH1	1:R:21:GLU:OE2	2.42	0.51
1:A:261:LYS:NZ	2:Y:64:GLN:OE1	2.44	0.51
2:L:81:PHE:CE2	2:L:98:THR:HG23	2.45	0.51
1:M:281:GLU:N	1:M:281:GLU:OE1	2.44	0.51
2:W:48:PHE:O	2:W:126:GLN:NE2	2.44	0.51
2:V:48:PHE:O	2:V:126:GLN:NE2	2.44	0.51
2:L:21:SER:OG	2:L:22:ASP:N	2.43	0.51
1:Q:72:THR:OG1	2:W:17:ARG:NH2	2.43	0.51
1:M:34:ILE:HD11	1:M:209:ILE:HD11	1.93	0.50
2:V:79:GLU:OE2	2:V:97:THR:OG1	2.29	0.50
1:E:165:VAL:HG21	1:F:182:ILE:HD11	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:79:GLU:OE2	2:W:97:THR:OG1	2.29	0.50
2:T:21:SER:OG	2:T:22:ASP:N	2.45	0.50
2:G:46:GLY:O	2:G:104:ARG:NH1	2.43	0.50
1:I:59:PHE:CB	1:J:119:LEU:HD22	2.41	0.50
1:A:281:GLU:N	1:A:281:GLU:OE1	2.44	0.50
1:J:164:THR:O	1:J:169:ARG:N	2.42	0.50
1:E:59:PHE:HB3	1:F:119:LEU:HD22	1.93	0.50
2:H:81:PHE:CE2	2:H:98:THR:HG23	2.46	0.50
1:M:66:GLU:OE2	2:V:27:ARG:NH1	2.44	0.50
2:U:79:GLU:OE2	2:U:97:THR:OG1	2.29	0.49
1:N:174:LEU:HD12	1:N:234:TYR:O	2.12	0.49
2:T:127:GLN:OE1	2:V:127:GLN:NE2	2.45	0.49
2:P:38:THR:OG1	2:P:54:ASP:OD1	2.24	0.49
1:I:281:GLU:OE1	1:I:281:GLU:N	2.46	0.49
2:L:107:GLY:N	2:L:124:LEU:HD12	2.27	0.49
2:O:104:ARG:NH2	2:O:126:GLN:OE1	2.42	0.49
2:Y:79:GLU:OE2	2:Y:97:THR:OG1	2.30	0.49
2:H:17:ARG:HH12	2:H:20:ILE:HD12	1.78	0.49
1:J:202:ILE:HG21	1:J:205:ILE:HD12	1.94	0.49
1:A:64:GLU:HB3	2:X:53:GLN:HG2	1.94	0.49
1:E:169:ARG:NE	1:E:280:GLU:O	2.45	0.49
1:M:141:PHE:O	1:M:156:THR:OG1	2.30	0.48
2:X:79:GLU:OE2	2:X:97:THR:OG1	2.31	0.48
2:P:21:SER:OG	2:P:22:ASP:N	2.47	0.48
1:I:2:THR:O	1:I:5:SER:OG	2.29	0.48
1:Q:34:ILE:HD11	1:Q:209:ILE:HD11	1.95	0.48
1:Q:59:PHE:CB	1:R:119:LEU:HD22	2.43	0.48
1:I:261:LYS:NZ	2:V:64:GLN:OE1	2.46	0.48
1:M:34:ILE:O	1:M:239:LYS:N	2.47	0.48
1:M:261:LYS:NZ	2:W:64:GLN:OE1	2.46	0.48
2:U:75:ILE:HG21	2:U:119:ILE:HD12	1.95	0.48
1:B:20:VAL:HG21	2:X:8:THR:HG21	1.95	0.48
1:E:93:THR:HG22	1:E:263:VAL:HG12	1.96	0.48
1:B:202:ILE:HG21	1:B:205:ILE:HD12	1.95	0.48
2:D:38:THR:N	2:D:54:ASP:OD1	2.46	0.48
1:F:164:THR:O	1:F:169:ARG:N	2.47	0.48
1:Q:2:THR:O	1:Q:5:SER:OG	2.30	0.48
2:Y:38:THR:HG23	2:Y:52:MET:O	2.14	0.47
1:I:165:VAL:HG21	1:J:182:ILE:HD11	1.96	0.47
1:J:174:LEU:HD12	1:J:234:TYR:O	2.14	0.47
1:M:42:ASN:O	1:N:14:ARG:NH1	2.47	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:M:59:PHE:CB	1:N:119:LEU:HD22	2.44	0.47
1:Q:141:PHE:O	1:Q:156:THR:OG1	2.31	0.47
1:E:34:ILE:O	1:E:239:LYS:N	2.48	0.47
1:I:34:ILE:O	1:I:239:LYS:N	2.47	0.47
1:E:66:GLU:OE2	2:Y:27:ARG:NH1	2.47	0.47
2:U:38:THR:HG23	2:U:52:MET:O	2.14	0.47
2:Y:75:ILE:HG21	2:Y:119:ILE:HD12	1.97	0.47
1:Q:281:GLU:N	1:Q:281:GLU:OE1	2.47	0.47
1:Q:34:ILE:O	1:Q:239:LYS:N	2.47	0.47
2:X:38:THR:HG23	2:X:52:MET:O	2.15	0.47
1:R:202:ILE:HG21	1:R:205:ILE:HD12	1.96	0.47
1:E:141:PHE:O	1:E:156:THR:OG1	2.33	0.47
1:A:63:ILE:HD11	2:X:62:THR:HG23	1.96	0.46
1:M:64:GLU:HB2	2:V:53:GLN:NE2	2.30	0.46
2:T:81:PHE:CE2	2:T:98:THR:HG23	2.51	0.46
2:D:81:PHE:CE2	2:D:98:THR:HG23	2.50	0.46
2:L:36:THR:HG21	2:L:44:ILE:HD11	1.96	0.46
2:P:36:THR:HG21	2:P:44:ILE:HD11	1.97	0.46
2:P:127:GLN:OE1	2:U:127:GLN:NE2	2.48	0.46
1:I:63:ILE:HD11	2:U:62:THR:HG23	1.98	0.46
2:U:38:THR:HG22	2:U:39:GLN:HG2	1.98	0.46
1:I:169:ARG:NE	1:I:280:GLU:O	2.47	0.45
1:M:165:VAL:HG21	1:N:182:ILE:HD11	1.99	0.45
2:P:81:PHE:CE2	2:P:98:THR:HG23	2.51	0.45
2:P:107:GLY:N	2:P:124:LEU:HD12	2.32	0.45
2:X:38:THR:HG22	2:X:39:GLN:HG2	1.98	0.45
2:Y:38:THR:HG22	2:Y:39:GLN:HG2	1.99	0.45
1:R:116:TYR:OH	1:R:273:ARG:NH2	2.50	0.45
2:X:75:ILE:HG21	2:X:119:ILE:HD12	1.99	0.45
2:H:38:THR:OG1	2:H:54:ASP:OD1	2.20	0.45
2:S:72:THR:HG21	2:S:96:PHE:CE2	2.51	0.45
1:A:240:ARG:O	1:A:243:LYS:NZ	2.49	0.45
1:E:261:LYS:NZ	2:U:64:GLN:OE1	2.50	0.44
2:W:38:THR:HG22	2:W:39:GLN:HG2	1.99	0.44
1:A:72:THR:OG1	2:X:17:ARG:NH2	2.50	0.44
2:T:81:PHE:CG	2:T:119:ILE:HD11	2.53	0.44
1:M:56:ASN:N	1:M:72:THR:O	2.47	0.44
1:N:63:ILE:O	1:N:64:GLU:HB2	2.18	0.44
2:O:87:ILE:HD11	2:O:109:VAL:CG2	2.48	0.44
2:C:72:THR:HG21	2:C:96:PHE:CE2	2.53	0.44
2:G:124:LEU:HD22	2:X:127:GLN:HG2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:21:SER:OG	2:H:22:ASP:N	2.50	0.44
1:A:34:ILE:O	1:A:239:LYS:N	2.50	0.44
1:A:63:ILE:CD1	2:X:62:THR:HG23	2.48	0.44
1:Q:165:VAL:HG21	1:R:182:ILE:HD11	1.99	0.44
1:B:149:ILE:HG21	1:B:194:LEU:HD13	1.99	0.44
2:H:76:VAL:HG22	2:H:96:PHE:O	2.18	0.43
2:K:87:ILE:HD11	2:K:109:VAL:CG2	2.48	0.43
2:D:38:THR:OG1	2:D:54:ASP:OD1	2.25	0.43
1:I:53:LEU:HD23	1:I:75:ALA:HB2	2.01	0.43
1:Q:64:GLU:HG3	2:W:53:GLN:HG2	2.01	0.43
1:I:141:PHE:O	1:I:156:THR:OG1	2.35	0.43
2:O:46:GLY:O	2:O:104:ARG:NH1	2.44	0.43
1:B:120:LEU:O	1:B:124:HIS:ND1	2.52	0.43
1:B:174:LEU:HD12	1:B:234:TYR:O	2.18	0.43
2:G:72:THR:HG21	2:G:96:PHE:CE2	2.54	0.43
1:J:128:ILE:O	1:J:133:TYR:OH	2.18	0.43
2:L:76:VAL:HG22	2:L:96:PHE:O	2.19	0.43
1:N:202:ILE:HG21	1:N:205:ILE:HD12	2.00	0.43
1:A:34:ILE:HD11	1:A:209:ILE:HD11	2.00	0.43
1:A:56:ASN:N	1:A:72:THR:O	2.48	0.43
1:M:93:THR:HG22	1:M:263:VAL:HG12	2.01	0.43
1:F:149:ILE:HG21	1:F:194:LEU:HD13	2.01	0.43
1:J:263:VAL:HG12	1:J:264:GLU:O	2.19	0.43
2:K:72:THR:HG21	2:K:96:PHE:CE2	2.54	0.43
1:F:174:LEU:HD12	1:F:234:TYR:O	2.19	0.43
2:T:17:ARG:NH1	2:T:20:ILE:HD12	2.33	0.43
1:E:137:ASN:O	1:E:283:VAL:HG13	2.19	0.43
1:Q:93:THR:HG22	1:Q:263:VAL:HG12	2.01	0.43
1:J:120:LEU:O	1:J:124:HIS:ND1	2.52	0.42
2:O:72:THR:HG21	2:O:96:PHE:CE2	2.54	0.42
1:A:93:THR:HG22	1:A:263:VAL:HG12	2.01	0.42
1:E:53:LEU:HD23	1:E:75:ALA:HB2	2.00	0.42
2:K:46:GLY:O	2:K:104:ARG:NH1	2.46	0.42
1:R:149:ILE:HG21	1:R:194:LEU:HD13	2.01	0.42
1:E:173:ILE:O	1:E:235:LEU:HD12	2.20	0.42
1:R:263:VAL:HG12	1:R:264:GLU:O	2.20	0.42
2:L:79:GLU:OE2	2:L:98:THR:OG1	2.34	0.42
1:N:120:LEU:O	1:N:124:HIS:ND1	2.53	0.42
1:F:263:VAL:HG12	1:F:264:GLU:O	2.19	0.42
1:M:76:GLU:HB3	2:V:12:ILE:HD12	2.01	0.42
1:A:285:GLU:N	1:A:285:GLU:OE1	2.53	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:164:THR:HG22	1:E:283:VAL:HG21	2.01	0.42
1:I:56:ASN:N	1:I:72:THR:O	2.51	0.42
1:I:164:THR:HG22	1:I:283:VAL:HG21	2.02	0.42
2:H:38:THR:N	2:H:54:ASP:OD1	2.53	0.41
1:M:282:ASN:OD1	1:M:283:VAL:N	2.53	0.41
1:N:263:VAL:HG12	1:N:264:GLU:O	2.19	0.41
2:S:79:GLU:OE1	2:S:79:GLU:N	2.54	0.41
2:S:87:ILE:HD11	2:S:109:VAL:CG2	2.50	0.41
1:B:263:VAL:HG12	1:B:264:GLU:O	2.20	0.41
1:Q:58:VAL:HG13	1:Q:60:LEU:CD2	2.51	0.41
2:V:38:THR:HG22	2:V:39:GLN:HG2	2.02	0.41
1:A:58:VAL:HG13	1:A:60:LEU:CD2	2.50	0.41
1:N:249:ASP:OD1	1:N:250:LEU:N	2.52	0.41
1:J:25:GLU:OE1	1:J:26:GLN:N	2.49	0.41
1:R:249:ASP:OD1	1:R:250:LEU:N	2.51	0.41
2:K:97:THR:OG1	2:K:99:THR:HG23	2.21	0.41
1:A:64:GLU:O	2:X:53:GLN:NE2	2.53	0.41
1:I:93:THR:HG22	1:I:263:VAL:HG12	2.01	0.41
2:S:124:LEU:HD22	2:V:127:GLN:HG2	2.03	0.41
1:A:173:ILE:O	1:A:235:LEU:HD12	2.21	0.41
2:D:38:THR:HG22	2:D:39:GLN:OE1	2.20	0.41
1:I:173:ILE:O	1:I:235:LEU:HD12	2.21	0.41
1:Q:56:ASN:N	1:Q:72:THR:O	2.50	0.41
1:J:249:ASP:OD1	1:J:250:LEU:N	2.52	0.41
1:M:251:THR:HG22	1:M:253:GLU:OE1	2.21	0.41
2:W:109:VAL:HG13	2:W:119:ILE:HG23	2.02	0.41
1:I:282:ASN:OD1	1:I:283:VAL:N	2.54	0.40
2:X:109:VAL:HG13	2:X:119:ILE:HG23	2.02	0.40
2:Y:109:VAL:HG13	2:Y:119:ILE:HG23	2.03	0.40
1:M:53:LEU:HD23	1:M:75:ALA:HB2	2.03	0.40
2:O:79:GLU:OE1	2:O:79:GLU:N	2.55	0.40
2:T:38:THR:OG1	2:T:54:ASP:OD1	2.32	0.40
1:A:57:CYS:O	1:B:115:SER:OG	2.33	0.40
2:D:81:PHE:CG	2:D:119:ILE:HD11	2.55	0.40
1:I:128:ILE:O	1:I:133:TYR:OH	2.27	0.40
1:E:282:ASN:OD1	1:E:283:VAL:N	2.55	0.40
1:I:262:LEU:HD12	1:M:62:HIS:CD2	2.56	0.40
2:H:72:THR:HG21	2:H:96:PHE:CE2	2.57	0.40
1:M:249:ASP:OD1	1:M:250:LEU:N	2.54	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 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	284/345 (82%)	273 (96%)	11 (4%)	0	100	100
1	B	272/345 (79%)	253 (93%)	19 (7%)	0	100	100
1	E	284/345 (82%)	276 (97%)	8 (3%)	0	100	100
1	F	272/345 (79%)	259 (95%)	13 (5%)	0	100	100
1	I	284/345 (82%)	274 (96%)	10 (4%)	0	100	100
1	J	272/345 (79%)	256 (94%)	16 (6%)	0	100	100
1	M	284/345 (82%)	276 (97%)	8 (3%)	0	100	100
1	N	272/345 (79%)	260 (96%)	11 (4%)	1 (0%)	30	62
1	Q	284/345 (82%)	276 (97%)	8 (3%)	0	100	100
1	R	272/345 (79%)	255 (94%)	17 (6%)	0	100	100
2	C	110/127 (87%)	103 (94%)	7 (6%)	0	100	100
2	D	123/127 (97%)	109 (89%)	14 (11%)	0	100	100
2	G	110/127 (87%)	104 (94%)	6 (6%)	0	100	100
2	H	123/127 (97%)	111 (90%)	12 (10%)	0	100	100
2	K	110/127 (87%)	102 (93%)	8 (7%)	0	100	100
2	L	123/127 (97%)	111 (90%)	12 (10%)	0	100	100
2	O	110/127 (87%)	102 (93%)	8 (7%)	0	100	100
2	P	123/127 (97%)	110 (89%)	13 (11%)	0	100	100
2	S	110/127 (87%)	103 (94%)	7 (6%)	0	100	100
2	T	123/127 (97%)	108 (88%)	15 (12%)	0	100	100
2	U	123/127 (97%)	111 (90%)	12 (10%)	0	100	100
2	V	123/127 (97%)	113 (92%)	10 (8%)	0	100	100
2	W	123/127 (97%)	112 (91%)	11 (9%)	0	100	100
2	X	123/127 (97%)	112 (91%)	11 (9%)	0	100	100
2	Y	123/127 (97%)	112 (91%)	11 (9%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	4560/5355 (85%)	4281 (94%)	278 (6%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	N	64	GLU

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 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	246/301 (82%)	246 (100%)	0	100	100
1	B	234/301 (78%)	234 (100%)	0	100	100
1	E	246/301 (82%)	246 (100%)	0	100	100
1	F	234/301 (78%)	234 (100%)	0	100	100
1	I	246/301 (82%)	246 (100%)	0	100	100
1	J	234/301 (78%)	234 (100%)	0	100	100
1	M	246/301 (82%)	246 (100%)	0	100	100
1	N	234/301 (78%)	234 (100%)	0	100	100
1	Q	246/301 (82%)	246 (100%)	0	100	100
1	R	234/301 (78%)	234 (100%)	0	100	100
2	C	96/109 (88%)	96 (100%)	0	100	100
2	D	108/109 (99%)	108 (100%)	0	100	100
2	G	96/109 (88%)	96 (100%)	0	100	100
2	H	108/109 (99%)	108 (100%)	0	100	100
2	K	96/109 (88%)	96 (100%)	0	100	100
2	L	108/109 (99%)	108 (100%)	0	100	100
2	O	96/109 (88%)	96 (100%)	0	100	100
2	P	108/109 (99%)	108 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	S	96/109 (88%)	96 (100%)	0	100	100
2	T	108/109 (99%)	108 (100%)	0	100	100
2	U	108/109 (99%)	108 (100%)	0	100	100
2	V	108/109 (99%)	108 (100%)	0	100	100
2	W	108/109 (99%)	108 (100%)	0	100	100
2	X	108/109 (99%)	108 (100%)	0	100	100
2	Y	108/109 (99%)	108 (100%)	0	100	100
All	All	3960/4645 (85%)	3960 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	E	282	ASN
1	M	282	ASN
1	N	62	HIS
1	Q	282	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 (i)

There are no chain breaks in this entry.