



Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 01:57 PM JST

PDB ID : 9KHX / pdb_00009khx
EMDB ID : EMD-62358
Title : Neck structure of Escherichia phage Mu
Authors : Zhou, J.Q.; Liu, H.R.
Deposited on : 2024-11-11
Resolution : 3.40 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB 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.

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 : 4-5-2 with Phenix2.0rc1
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) : 2.44

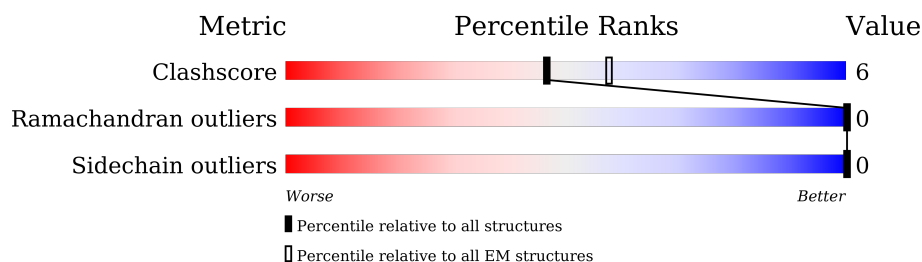
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.40 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 $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	141	84% 15% .
1	B	141	84% 15% .
1	C	141	83% 16% .
1	D	141	82% 16% .
1	E	141	84% 14% .
1	F	141	85% 13% .
1	G	141	84% 14% .
1	H	141	86% 13% .
1	I	141	85% 13% .

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Mol	Chain	Length	Quality of chain
1	J	141	 84% 15%
1	K	141	 84% 14%
1	L	141	 84% 14%
2	M	512	 62% 11% 28%
2	N	512	 61% 11% 28%
2	O	512	 62% 11% 28%
2	P	512	 61% 11% 28%
2	Q	512	 62% 11% 28%
2	R	512	 61% 11% 28%
2	S	512	 62% 11% 28%
2	T	512	 61% 11% 28%
2	U	512	 61% 11% 28%
2	V	512	 62% 10% 28%
2	W	512	 61% 11% 28%
2	X	512	 62% 10% 28%

2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 47772 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 Gene product J.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	B	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	C	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	D	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	E	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	F	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	G	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	H	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	I	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	J	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	K	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		
1	L	139	Total	C	N	O	S	0	0
			1090	683	191	213	3		

- Molecule 2 is a protein called Portal protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	X	369	Total	C	N	O	S	0	0
			2891	1818	512	544	17		
2	M	369	Total	C	N	O	S	0	0
			2891	1818	512	544	17		
2	N	369	Total	C	N	O	S	0	0
			2891	1818	512	544	17		

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Mol	Chain	Residues	Atoms					AltConf	Trace
2	O	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	P	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	Q	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	R	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	S	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	T	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	U	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	V	369	Total 2891	C 1818	N 512	O 544	S 17	0	0
2	W	369	Total 2891	C 1818	N 512	O 544	S 17	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.

- Molecule 1: Gene product J

Chain A: 



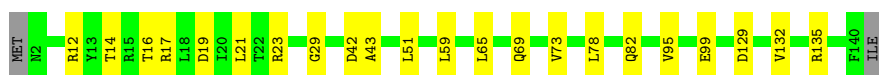
- Molecule 1: Gene product J

Chain B: 



- Molecule 1: Gene product J

Chain C: 



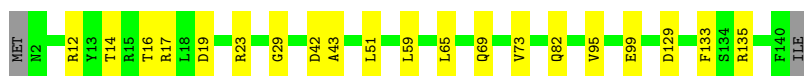
- Molecule 1: Gene product J

Chain D: 



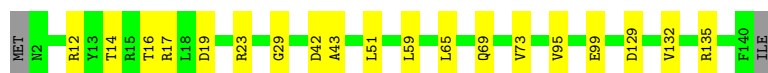
- Molecule 1: Gene product J

Chain E: 

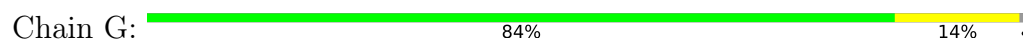


- Molecule 1: Gene product J

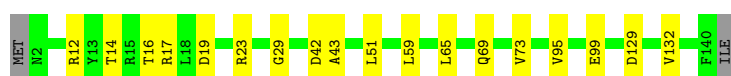
Chain F: 



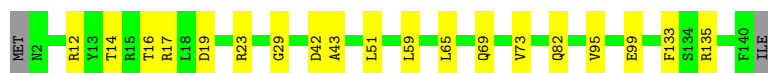
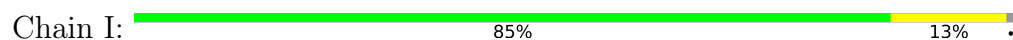
- Molecule 1: Gene product J



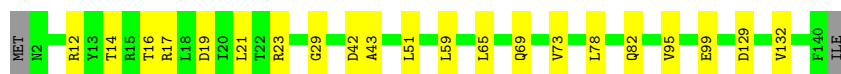
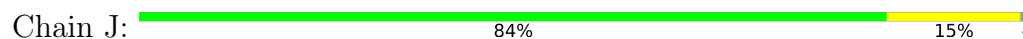
- Molecule 1: Gene product J



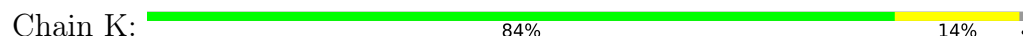
- Molecule 1: Gene product J



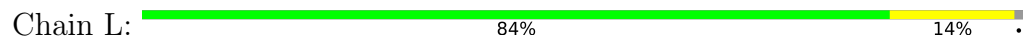
- Molecule 1: Gene product J



- Molecule 1: Gene product J

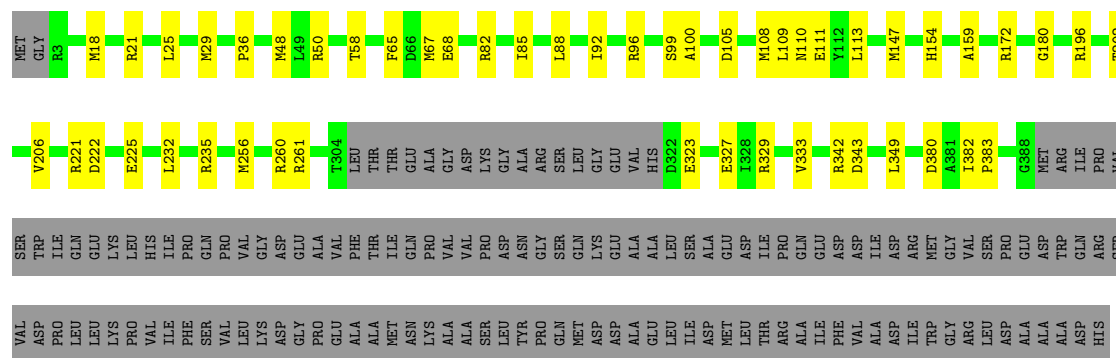


- Molecule 1: Gene product J



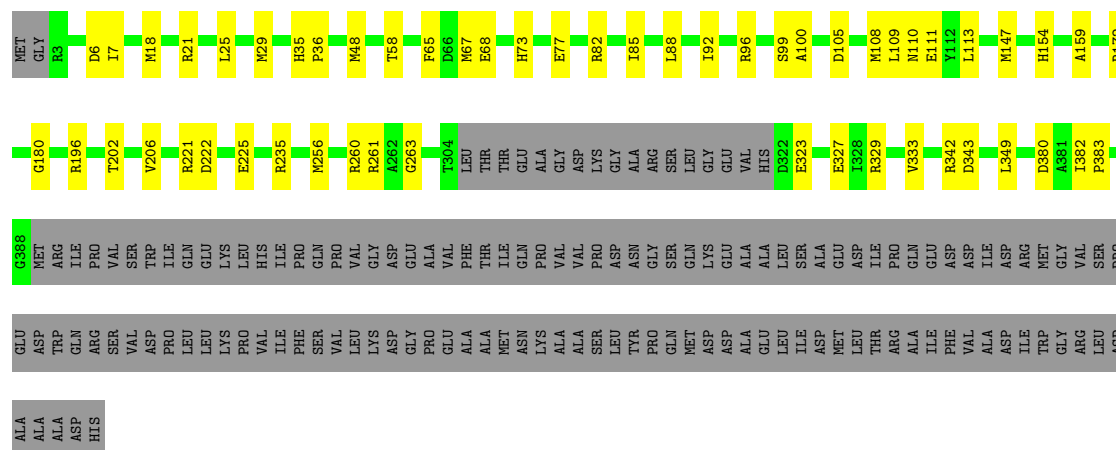
- Molecule 2: Portal protein





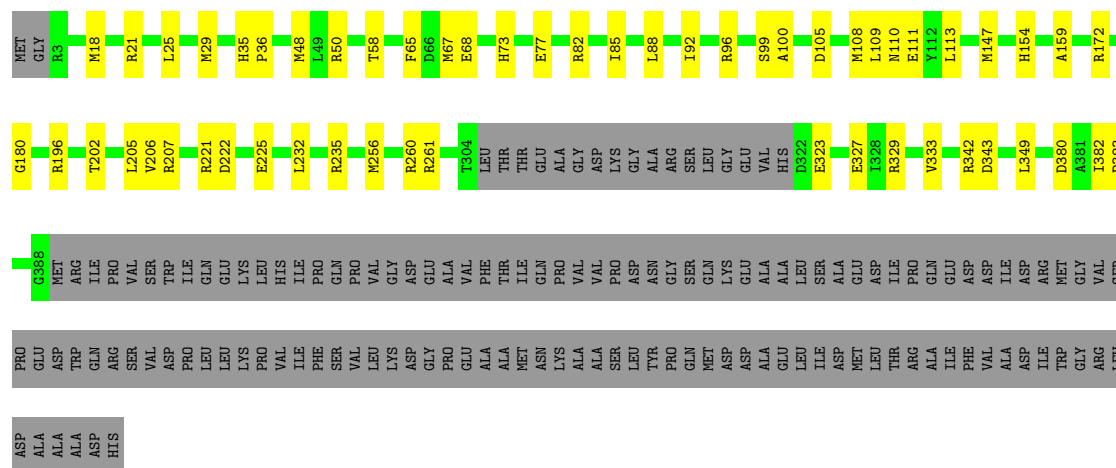
- Molecule 2: Portal protein

Chain M: 62% 11% 28%



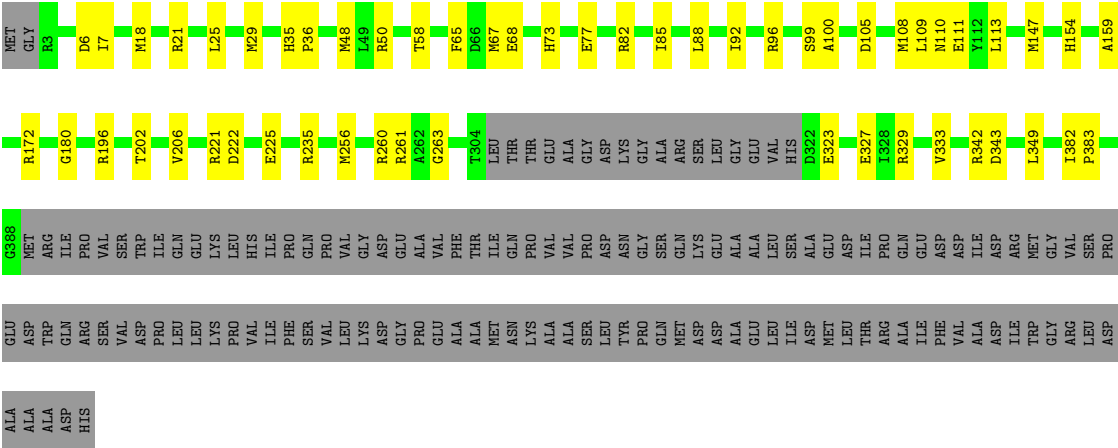
- Molecule 2: Portal protein

Chain N: 61% 11% 28%

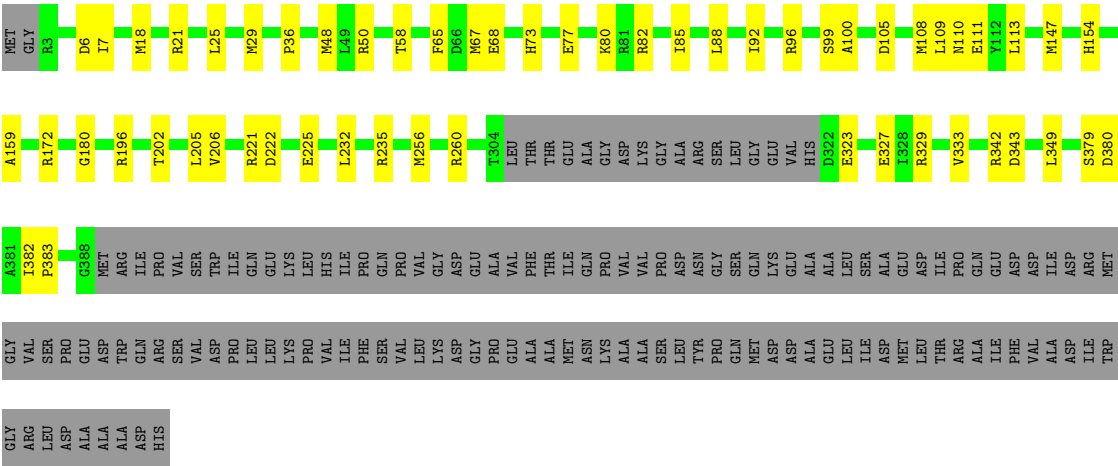


- Molecule 2: Portal protein

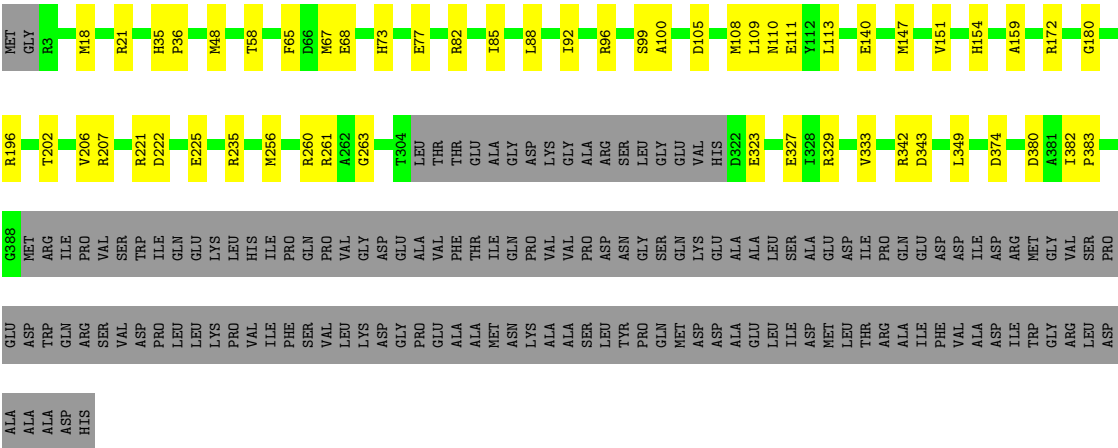
Chain O: 62% 11% 28%



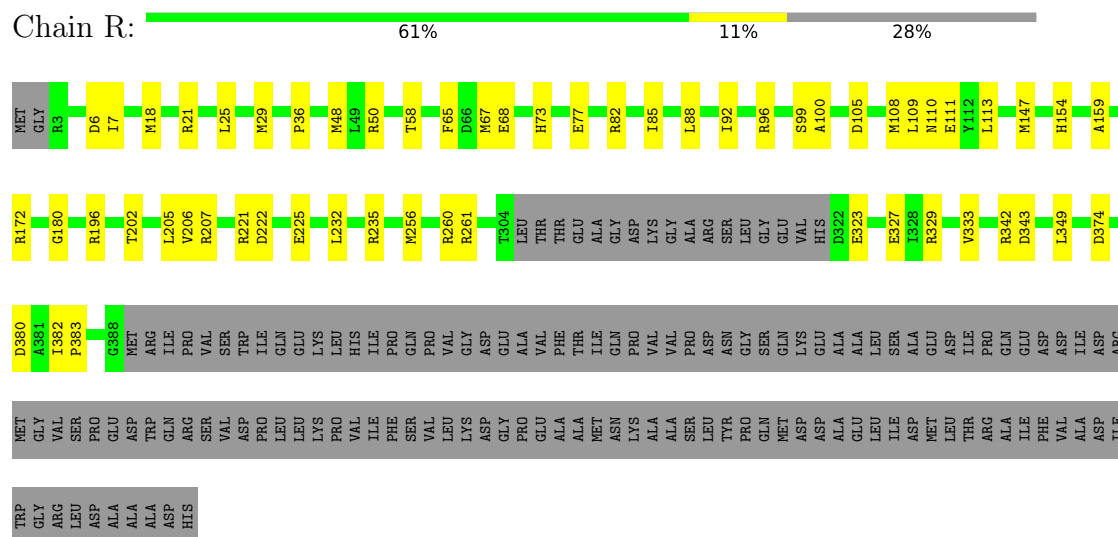
● Molecule 2: Portal protein



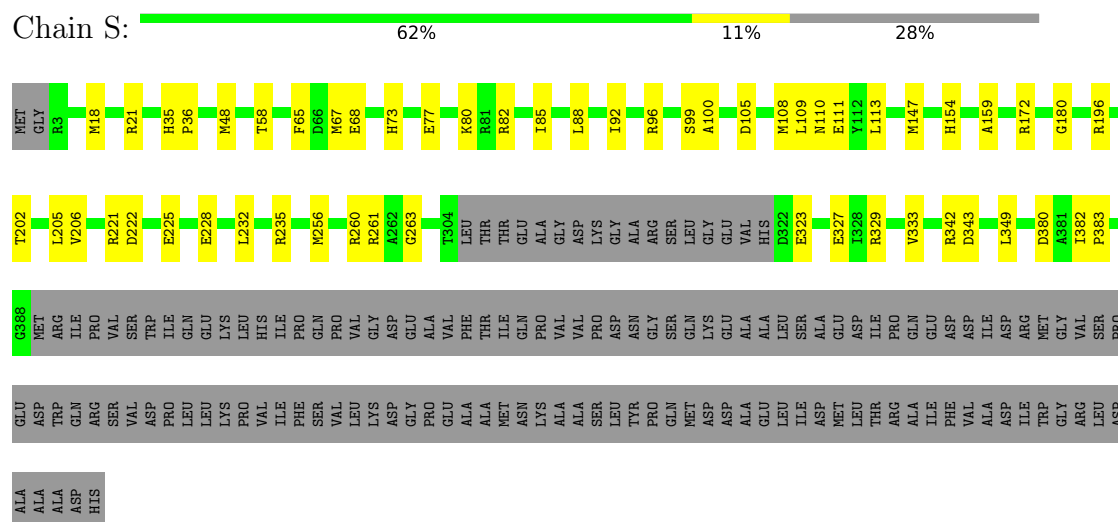
● Molecule 2: Portal protein



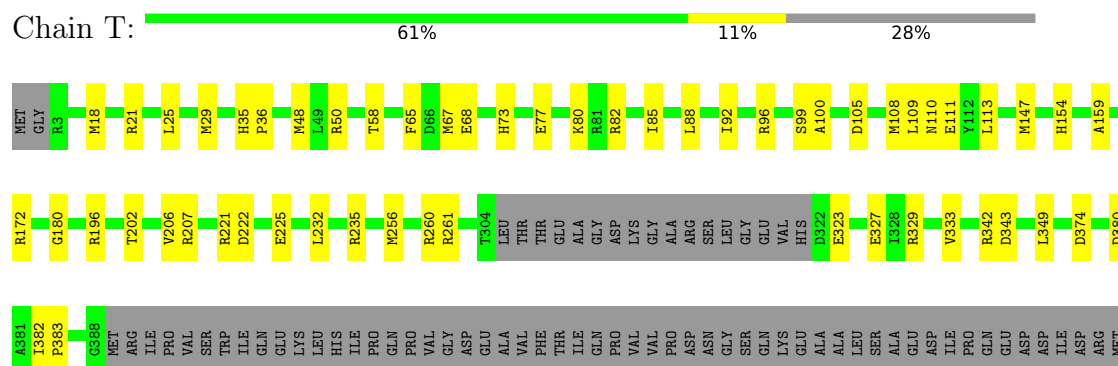
- Molecule 2: Portal protein



- Molecule 2: Portal protein



- Molecule 2: Portal protein



ASP	ASP
ILE	ILE
TRP	TRP
GLY	GLY
ARG	ARG
LEU	LEU
ASP	ASP
ALA	ALA
ALA	ALA
ASP	ASP
HIS	HIS
ASP	ASP
ARG	ARG
GLN	GLN
LEU	LEU
LYS	LYS
VAL	VAL
ILE	ILE
ILE	ILE
PHE	PHE
SER	SER
VAL	VAL
LEU	LEU
LYS	LYS
PRO	PRO
HIS	HIS
LEU	LEU
GLY	GLY
ASP	ASP
GLN	GLN
PRO	PRO
ALA	ALA
ALA	ALA
PHE	PHE
THR	THR
ILE	ILE
GLN	GLN
ASP	ASP
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GLY	GLY
ASN	ASN
ASP	ASP
PRO	PRO
VAL	VAL
ALA	ALA
ALA	ALA
THR	THR
ILE	ILE
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PRO	PRO
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SER	SER
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	55035	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	35	Depositor
Minimum defocus (nm)	2000	Depositor
Maximum defocus (nm)	4000	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	0.10	0/1112	0.25	0/1517
1	B	0.10	0/1112	0.25	0/1517
1	C	0.10	0/1112	0.25	0/1517
1	D	0.10	0/1112	0.25	0/1517
1	E	0.10	0/1112	0.25	0/1517
1	F	0.10	0/1112	0.25	0/1517
1	G	0.10	0/1112	0.25	0/1517
1	H	0.10	0/1112	0.25	0/1517
1	I	0.10	0/1112	0.25	0/1517
1	J	0.10	0/1112	0.25	0/1517
1	K	0.10	0/1112	0.25	0/1517
1	L	0.10	0/1112	0.25	0/1517
2	M	0.10	0/2950	0.26	0/3985
2	N	0.10	0/2950	0.26	0/3985
2	O	0.10	0/2950	0.26	0/3985
2	P	0.10	0/2950	0.26	0/3985
2	Q	0.10	0/2950	0.26	0/3985
2	R	0.10	0/2950	0.26	0/3985
2	S	0.10	0/2950	0.26	0/3985
2	T	0.10	0/2950	0.26	0/3985
2	U	0.10	0/2950	0.26	0/3985
2	V	0.10	0/2950	0.26	0/3985
2	W	0.10	0/2950	0.26	0/3985
2	X	0.10	0/2950	0.26	0/3985
All	All	0.10	0/48744	0.26	0/66024

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1090	0	1069	15	0
1	B	1090	0	1069	15	0
1	C	1090	0	1069	16	0
1	D	1090	0	1069	17	0
1	E	1090	0	1069	15	0
1	F	1090	0	1069	15	0
1	G	1090	0	1069	15	0
1	H	1090	0	1069	13	0
1	I	1090	0	1069	14	0
1	J	1090	0	1069	15	0
1	K	1090	0	1069	14	0
1	L	1090	0	1069	14	0
2	M	2891	0	2825	37	0
2	N	2891	0	2825	37	0
2	O	2891	0	2825	35	0
2	P	2891	0	2825	39	0
2	Q	2891	0	2825	39	0
2	R	2891	0	2825	40	0
2	S	2891	0	2825	39	0
2	T	2891	0	2825	39	0
2	U	2891	0	2825	41	0
2	V	2891	0	2825	37	0
2	W	2891	0	2825	39	0
2	X	2891	0	2825	33	0
All	All	47772	0	46728	554	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 6.

All (554) 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:E:42:ASP:OD2	1:F:12:ARG:NH2	2.25	0.69
1:K:42:ASP:OD2	1:L:12:ARG:NH2	2.30	0.65
1:D:23:ARG:NH1	1:D:29:GLY:O	2.30	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:23:ARG:NH1	1:E:29:GLY:O	2.30	0.65
1:C:23:ARG:NH1	1:C:29:GLY:O	2.30	0.65
1:K:23:ARG:NH1	1:K:29:GLY:O	2.30	0.64
2:S:18:MET:HB2	2:S:21:ARG:HG3	1.79	0.64
1:L:23:ARG:NH1	1:L:29:GLY:O	2.30	0.64
1:H:23:ARG:NH1	1:H:29:GLY:O	2.30	0.64
1:J:23:ARG:NH1	1:J:29:GLY:O	2.30	0.64
1:F:23:ARG:NH1	1:F:29:GLY:O	2.30	0.64
2:V:18:MET:HB2	2:V:21:ARG:HG3	1.79	0.64
1:I:23:ARG:NH1	1:I:29:GLY:O	2.30	0.64
2:U:18:MET:HB2	2:U:21:ARG:HG3	1.79	0.64
1:A:23:ARG:NH1	1:A:29:GLY:O	2.30	0.64
1:G:23:ARG:NH1	1:G:29:GLY:O	2.30	0.64
1:B:23:ARG:NH1	1:B:29:GLY:O	2.30	0.63
2:R:18:MET:HB2	2:R:21:ARG:HG3	1.79	0.63
1:I:42:ASP:OD2	1:J:12:ARG:NH2	2.31	0.63
2:T:18:MET:HB2	2:T:21:ARG:HG3	1.80	0.63
2:N:18:MET:HB2	2:N:21:ARG:HG3	1.79	0.63
2:O:18:MET:HB2	2:O:21:ARG:HG3	1.79	0.63
2:P:18:MET:HB2	2:P:21:ARG:HG3	1.79	0.63
1:G:42:ASP:OD2	1:H:12:ARG:NH2	2.32	0.63
2:M:18:MET:HB2	2:M:21:ARG:HG3	1.79	0.62
2:Q:18:MET:HB2	2:Q:21:ARG:HG3	1.79	0.62
1:A:42:ASP:OD2	1:B:12:ARG:NH2	2.32	0.62
2:X:18:MET:HB2	2:X:21:ARG:HG3	1.80	0.62
2:W:18:MET:HB2	2:W:21:ARG:HG3	1.79	0.62
2:O:88:LEU:HD11	2:O:329:ARG:HH11	1.65	0.61
2:Q:88:LEU:HD11	2:Q:329:ARG:HH11	1.65	0.61
2:P:88:LEU:HD11	2:P:329:ARG:HH11	1.66	0.61
2:R:88:LEU:HD11	2:R:329:ARG:HH11	1.66	0.61
2:S:88:LEU:HD11	2:S:329:ARG:HH11	1.65	0.60
2:M:88:LEU:HD11	2:M:329:ARG:HH11	1.66	0.60
2:N:88:LEU:HD11	2:N:329:ARG:HH11	1.65	0.60
2:X:88:LEU:HD11	2:X:329:ARG:HH11	1.66	0.60
1:H:42:ASP:OD2	1:I:12:ARG:NH2	2.35	0.60
2:T:88:LEU:HD11	2:T:329:ARG:HH11	1.65	0.60
1:F:132:VAL:HG12	1:G:135:ARG:HH12	1.67	0.60
2:V:196:ARG:NH2	2:V:202:THR:O	2.36	0.59
2:T:196:ARG:NH2	2:T:202:THR:O	2.36	0.59
2:U:88:LEU:HD11	2:U:329:ARG:HH11	1.65	0.59
2:X:196:ARG:NH2	2:X:202:THR:O	2.36	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:R:196:ARG:NH2	2:R:202:THR:O	2.36	0.59
2:V:88:LEU:HD11	2:V:329:ARG:HH11	1.66	0.59
2:W:88:LEU:HD12	2:W:333:VAL:HG21	1.85	0.59
2:V:88:LEU:HD12	2:V:333:VAL:HG21	1.85	0.59
2:X:88:LEU:HD12	2:X:333:VAL:HG21	1.85	0.59
2:W:88:LEU:HD11	2:W:329:ARG:HH11	1.65	0.59
2:P:196:ARG:NH2	2:P:202:THR:O	2.36	0.59
2:Q:196:ARG:NH2	2:Q:202:THR:O	2.36	0.59
2:U:196:ARG:NH2	2:U:202:THR:O	2.36	0.59
2:N:196:ARG:NH2	2:N:202:THR:O	2.36	0.59
2:M:88:LEU:HD12	2:M:333:VAL:HG21	1.85	0.58
2:O:196:ARG:NH2	2:O:202:THR:O	2.36	0.58
2:S:196:ARG:NH2	2:S:202:THR:O	2.36	0.58
2:M:196:ARG:NH2	2:M:202:THR:O	2.36	0.58
2:W:196:ARG:NH2	2:W:202:THR:O	2.36	0.58
2:U:88:LEU:HD12	2:U:333:VAL:HG21	1.85	0.58
1:C:42:ASP:OD2	1:D:12:ARG:NH2	2.37	0.58
1:B:42:ASP:OD2	1:C:12:ARG:NH2	2.37	0.58
2:N:88:LEU:HD12	2:N:333:VAL:HG21	1.85	0.58
2:R:88:LEU:HD12	2:R:333:VAL:HG21	1.85	0.58
1:D:42:ASP:OD2	1:E:12:ARG:NH2	2.38	0.57
2:Q:88:LEU:HD12	2:Q:333:VAL:HG21	1.85	0.57
2:R:260:ARG:NH2	2:T:225:GLU:OE1	2.37	0.57
2:S:88:LEU:HD12	2:S:333:VAL:HG21	1.85	0.57
2:X:260:ARG:NH2	2:N:225:GLU:OE1	2.37	0.57
2:P:88:LEU:HD12	2:P:333:VAL:HG21	1.85	0.57
2:X:96:ARG:HD2	2:W:111:GLU:HG3	1.87	0.57
1:J:42:ASP:OD2	1:K:12:ARG:NH2	2.38	0.57
2:T:260:ARG:NH2	2:V:225:GLU:OE1	2.37	0.57
2:O:88:LEU:HD12	2:O:333:VAL:HG21	1.85	0.56
2:T:88:LEU:HD12	2:T:333:VAL:HG21	1.85	0.56
2:P:260:ARG:NH2	2:R:225:GLU:OE1	2.38	0.56
2:M:111:GLU:HG3	2:N:96:ARG:HD2	1.87	0.56
2:O:111:GLU:HG3	2:P:96:ARG:HD2	1.87	0.56
2:P:92:ILE:HD11	2:P:113:LEU:HD12	1.88	0.56
2:Q:111:GLU:HG3	2:R:96:ARG:HD2	1.86	0.56
2:O:92:ILE:HD11	2:O:113:LEU:HD12	1.88	0.56
2:Q:92:ILE:HD11	2:Q:113:LEU:HD12	1.88	0.56
2:U:111:GLU:HG3	2:V:96:ARG:HD2	1.87	0.56
2:N:92:ILE:HD11	2:N:113:LEU:HD12	1.88	0.55
1:H:14:THR:HB	1:H:17:ARG:HG3	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:14:THR:HB	1:I:17:ARG:HG3	1.89	0.55
2:M:92:ILE:HD11	2:M:113:LEU:HD12	1.88	0.55
2:U:92:ILE:HD11	2:U:113:LEU:HD12	1.88	0.55
2:W:92:ILE:HD11	2:W:113:LEU:HD12	1.88	0.55
2:X:92:ILE:HD11	2:X:113:LEU:HD12	1.88	0.55
1:J:14:THR:HB	1:J:17:ARG:HG3	1.89	0.55
2:N:260:ARG:NH2	2:P:225:GLU:OE1	2.39	0.55
2:T:92:ILE:HD11	2:T:113:LEU:HD12	1.88	0.55
2:S:92:ILE:HD11	2:S:113:LEU:HD12	1.88	0.55
2:X:225:GLU:OE1	2:V:260:ARG:NH2	2.39	0.55
1:K:14:THR:HB	1:K:17:ARG:HG3	1.89	0.55
2:R:92:ILE:HD11	2:R:113:LEU:HD12	1.88	0.55
2:S:111:GLU:HG3	2:T:96:ARG:HD2	1.87	0.55
2:V:92:ILE:HD11	2:V:113:LEU:HD12	1.88	0.55
1:G:14:THR:HB	1:G:17:ARG:HG3	1.89	0.55
2:Q:260:ARG:NH2	2:S:225:GLU:OE1	2.40	0.55
1:F:14:THR:HB	1:F:17:ARG:HG3	1.89	0.55
1:L:14:THR:HB	1:L:17:ARG:HG3	1.89	0.54
2:S:260:ARG:NH2	2:U:225:GLU:OE1	2.41	0.54
1:E:14:THR:HB	1:E:17:ARG:HG3	1.89	0.54
1:A:12:ARG:NH2	1:L:42:ASP:OD2	2.40	0.54
2:R:67:MET:HE1	2:R:206:VAL:HG23	1.90	0.54
1:A:14:THR:HB	1:A:17:ARG:HG3	1.89	0.54
2:Q:67:MET:HE1	2:Q:206:VAL:HG23	1.90	0.54
1:D:14:THR:HB	1:D:17:ARG:HG3	1.89	0.54
1:C:14:THR:HB	1:C:17:ARG:HG3	1.89	0.54
2:O:67:MET:HE1	2:O:206:VAL:HG23	1.90	0.54
2:S:67:MET:HE1	2:S:206:VAL:HG23	1.90	0.54
1:B:14:THR:HB	1:B:17:ARG:HG3	1.89	0.54
2:M:260:ARG:NH2	2:O:225:GLU:OE1	2.41	0.54
2:P:67:MET:HE1	2:P:206:VAL:HG23	1.90	0.54
2:M:225:GLU:OE1	2:W:260:ARG:NH2	2.41	0.53
2:N:67:MET:HE1	2:N:206:VAL:HG23	1.90	0.53
2:P:92:ILE:HB	2:P:110:ASN:HB2	1.90	0.53
2:T:92:ILE:HB	2:T:110:ASN:HB2	1.90	0.53
2:U:260:ARG:NH2	2:W:225:GLU:OE1	2.41	0.53
2:O:92:ILE:HB	2:O:110:ASN:HB2	1.90	0.53
2:T:67:MET:HE1	2:T:206:VAL:HG23	1.90	0.53
2:N:92:ILE:HB	2:N:110:ASN:HB2	1.90	0.53
2:U:92:ILE:HB	2:U:110:ASN:HB2	1.90	0.53
1:F:42:ASP:OD2	1:G:12:ARG:NH2	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:67:MET:HE1	2:M:206:VAL:HG23	1.90	0.53
2:S:92:ILE:HB	2:S:110:ASN:HB2	1.90	0.53
2:U:67:MET:HE1	2:U:206:VAL:HG23	1.90	0.53
2:X:92:ILE:HB	2:X:110:ASN:HB2	1.90	0.53
2:M:92:ILE:HB	2:M:110:ASN:HB2	1.91	0.53
2:O:260:ARG:NH2	2:Q:225:GLU:OE1	2.42	0.53
2:Q:92:ILE:HB	2:Q:110:ASN:HB2	1.91	0.53
2:X:67:MET:HE1	2:X:206:VAL:HG23	1.90	0.53
2:V:67:MET:HE1	2:V:206:VAL:HG23	1.90	0.52
2:W:92:ILE:HB	2:W:110:ASN:HB2	1.90	0.52
2:V:92:ILE:HB	2:V:110:ASN:HB2	1.90	0.52
2:W:67:MET:HE1	2:W:206:VAL:HG23	1.90	0.52
2:R:92:ILE:HB	2:R:110:ASN:HB2	1.90	0.52
1:I:43:ALA:HB1	1:I:73:VAL:HG23	1.92	0.52
1:L:43:ALA:HB1	1:L:73:VAL:HG23	1.92	0.51
1:B:43:ALA:HB1	1:B:73:VAL:HG23	1.92	0.51
1:C:43:ALA:HB1	1:C:73:VAL:HG23	1.93	0.51
1:E:43:ALA:HB1	1:E:73:VAL:HG23	1.92	0.51
1:F:43:ALA:HB1	1:F:73:VAL:HG23	1.93	0.51
2:O:172:ARG:NH1	2:O:180:GLY:O	2.44	0.51
1:K:43:ALA:HB1	1:K:73:VAL:HG23	1.93	0.51
1:H:43:ALA:HB1	1:H:73:VAL:HG23	1.93	0.51
1:J:43:ALA:HB1	1:J:73:VAL:HG23	1.92	0.51
1:A:95:VAL:O	1:A:99:GLU:HG3	2.11	0.51
1:F:95:VAL:O	1:F:99:GLU:HG3	2.11	0.51
1:B:95:VAL:O	1:B:99:GLU:HG3	2.11	0.50
2:X:172:ARG:NH1	2:X:180:GLY:O	2.44	0.50
1:E:95:VAL:O	1:E:99:GLU:HG3	2.12	0.50
2:P:172:ARG:NH1	2:P:180:GLY:O	2.44	0.50
1:G:95:VAL:O	1:G:99:GLU:HG3	2.12	0.50
1:G:43:ALA:HB1	1:G:73:VAL:HG23	1.92	0.50
1:B:132:VAL:HG12	1:C:135:ARG:HH12	1.77	0.50
1:D:43:ALA:HB1	1:D:73:VAL:HG23	1.92	0.50
1:L:95:VAL:O	1:L:99:GLU:HG3	2.12	0.50
1:A:43:ALA:HB1	1:A:73:VAL:HG23	1.92	0.50
1:C:95:VAL:O	1:C:99:GLU:HG3	2.12	0.50
1:H:95:VAL:O	1:H:99:GLU:HG3	2.11	0.49
1:D:95:VAL:O	1:D:99:GLU:HG3	2.11	0.49
1:J:132:VAL:HG12	1:K:135:ARG:HH12	1.77	0.49
2:U:172:ARG:NH1	2:U:180:GLY:O	2.44	0.49
2:V:111:GLU:HG3	2:W:96:ARG:HD2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:19:ASP:O	1:A:23:ARG:HG2	2.13	0.49
1:I:95:VAL:O	1:I:99:GLU:HG3	2.11	0.49
1:I:19:ASP:O	1:I:23:ARG:HG2	2.13	0.49
1:J:95:VAL:O	1:J:99:GLU:HG3	2.11	0.49
1:K:19:ASP:O	1:K:23:ARG:HG2	2.13	0.49
1:C:19:ASP:O	1:C:23:ARG:HG2	2.13	0.49
1:G:19:ASP:O	1:G:23:ARG:HG2	2.12	0.49
1:E:19:ASP:O	1:E:23:ARG:HG2	2.13	0.49
1:K:95:VAL:O	1:K:99:GLU:HG3	2.11	0.49
1:L:19:ASP:O	1:L:23:ARG:HG2	2.13	0.49
1:C:69:GLN:O	1:C:73:VAL:HG22	2.13	0.49
1:H:19:ASP:O	1:H:23:ARG:HG2	2.12	0.49
2:M:172:ARG:NH1	2:M:180:GLY:O	2.44	0.49
1:D:69:GLN:O	1:D:73:VAL:HG22	2.13	0.49
1:F:19:ASP:O	1:F:23:ARG:HG2	2.12	0.49
1:E:69:GLN:O	1:E:73:VAL:HG22	2.13	0.49
2:Q:172:ARG:NH1	2:Q:180:GLY:O	2.44	0.49
1:F:69:GLN:O	1:F:73:VAL:HG22	2.13	0.49
1:J:19:ASP:O	1:J:23:ARG:HG2	2.13	0.49
1:B:19:ASP:O	1:B:23:ARG:HG2	2.13	0.48
1:C:132:VAL:HG12	1:D:135:ARG:HH12	1.79	0.48
1:J:51:LEU:HD13	1:J:59:LEU:HD11	1.95	0.48
1:A:69:GLN:O	1:A:73:VAL:HG22	2.13	0.48
1:D:19:ASP:O	1:D:23:ARG:HG2	2.13	0.48
2:P:111:GLU:HG3	2:Q:96:ARG:HD2	1.94	0.48
1:D:51:LEU:HD13	1:D:59:LEU:HD11	1.96	0.48
1:D:132:VAL:HG12	1:E:135:ARG:HH12	1.77	0.48
1:E:51:LEU:HD13	1:E:59:LEU:HD11	1.96	0.48
1:F:51:LEU:HD13	1:F:59:LEU:HD11	1.95	0.48
1:H:69:GLN:O	1:H:73:VAL:HG22	2.13	0.48
1:I:51:LEU:HD13	1:I:59:LEU:HD11	1.95	0.48
1:K:51:LEU:HD13	1:K:59:LEU:HD11	1.96	0.48
2:N:111:GLU:HG3	2:O:96:ARG:HD2	1.96	0.48
1:H:51:LEU:HD13	1:H:59:LEU:HD11	1.96	0.48
1:B:69:GLN:O	1:B:73:VAL:HG22	2.13	0.48
1:C:51:LEU:HD13	1:C:59:LEU:HD11	1.96	0.48
1:L:51:LEU:HD13	1:L:59:LEU:HD11	1.96	0.48
2:T:172:ARG:NH1	2:T:180:GLY:O	2.44	0.48
1:J:69:GLN:O	1:J:73:VAL:HG22	2.13	0.48
2:V:172:ARG:NH1	2:V:180:GLY:O	2.44	0.48
1:A:51:LEU:HD13	1:A:59:LEU:HD11	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:51:LEU:HD13	1:B:59:LEU:HD11	1.95	0.48
1:G:51:LEU:HD13	1:G:59:LEU:HD11	1.96	0.48
1:I:69:GLN:O	1:I:73:VAL:HG22	2.13	0.48
1:G:69:GLN:O	1:G:73:VAL:HG22	2.13	0.48
1:K:69:GLN:O	1:K:73:VAL:HG22	2.13	0.48
2:R:172:ARG:NH1	2:R:180:GLY:O	2.44	0.48
2:W:374:ASP:OD1	2:W:374:ASP:N	2.47	0.47
2:S:172:ARG:NH1	2:S:180:GLY:O	2.44	0.47
1:L:69:GLN:O	1:L:73:VAL:HG22	2.13	0.47
2:Q:374:ASP:OD1	2:Q:374:ASP:N	2.47	0.47
2:N:172:ARG:NH1	2:N:180:GLY:O	2.44	0.47
2:R:105:ASP:O	2:R:108:MET:HG3	2.15	0.46
2:T:111:GLU:HG3	2:U:96:ARG:HD2	1.97	0.46
2:U:105:ASP:O	2:U:108:MET:HG3	2.15	0.46
1:A:132:VAL:HG12	1:B:135:ARG:HH12	1.80	0.46
2:X:111:GLU:HG3	2:M:96:ARG:HD2	1.98	0.46
2:T:105:ASP:O	2:T:108:MET:HG3	2.15	0.46
2:M:105:ASP:O	2:M:108:MET:HG3	2.15	0.46
2:W:105:ASP:O	2:W:108:MET:HG3	2.15	0.46
2:R:111:GLU:HG3	2:S:96:ARG:HD2	1.96	0.46
2:S:105:ASP:O	2:S:108:MET:HG3	2.15	0.46
2:V:105:ASP:O	2:V:108:MET:HG3	2.15	0.46
2:N:105:ASP:O	2:N:108:MET:HG3	2.15	0.46
2:P:105:ASP:O	2:P:108:MET:HG3	2.15	0.45
2:Q:105:ASP:O	2:Q:108:MET:HG3	2.15	0.45
2:W:172:ARG:NH1	2:W:180:GLY:O	2.44	0.45
2:X:105:ASP:O	2:X:108:MET:HG3	2.15	0.45
2:R:65:PHE:O	2:R:68:GLU:HG2	2.17	0.45
2:S:65:PHE:O	2:S:68:GLU:HG2	2.17	0.45
2:Q:65:PHE:O	2:Q:68:GLU:HG2	2.17	0.45
2:T:108:MET:HE1	2:T:147:MET:HE1	1.99	0.45
2:P:65:PHE:O	2:P:68:GLU:HG2	2.17	0.45
2:O:65:PHE:O	2:O:68:GLU:HG2	2.17	0.45
2:O:105:ASP:O	2:O:108:MET:HG3	2.15	0.45
2:S:108:MET:HE1	2:S:147:MET:HE1	1.99	0.45
2:T:65:PHE:O	2:T:68:GLU:HG2	2.17	0.45
2:U:108:MET:HE1	2:U:147:MET:HE1	1.99	0.45
2:M:263:GLY:HA3	2:N:256:MET:HE3	1.99	0.44
2:O:342:ARG:NH1	2:O:343:ASP:OD1	2.50	0.44
2:X:342:ARG:NH1	2:X:343:ASP:OD1	2.50	0.44
2:V:108:MET:HE1	2:V:147:MET:HE1	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:108:MET:HE1	2:W:147:MET:HE1	1.99	0.44
2:W:342:ARG:NH1	2:W:343:ASP:OD1	2.50	0.44
2:M:342:ARG:NH1	2:M:343:ASP:OD1	2.50	0.44
2:R:108:MET:HE1	2:R:147:MET:HE1	1.99	0.44
2:S:342:ARG:NH1	2:S:343:ASP:OD1	2.50	0.44
2:U:65:PHE:O	2:U:68:GLU:HG2	2.17	0.44
2:N:65:PHE:O	2:N:68:GLU:HG2	2.17	0.44
2:N:342:ARG:NH1	2:N:343:ASP:OD1	2.50	0.44
2:R:342:ARG:NH1	2:R:343:ASP:OD1	2.50	0.44
1:F:135:ARG:HH22	2:S:228:GLU:HG3	1.82	0.44
2:Q:108:MET:HE1	2:Q:147:MET:HE1	1.99	0.44
2:Q:260:ARG:HB3	2:Q:261:ARG:H	1.66	0.44
2:T:342:ARG:NH1	2:T:343:ASP:OD1	2.50	0.44
2:X:108:MET:HE1	2:X:147:MET:HE1	1.99	0.44
2:W:82:ARG:HA	2:W:85:ILE:HG22	2.00	0.44
2:V:65:PHE:O	2:V:68:GLU:HG2	2.17	0.44
2:M:65:PHE:O	2:M:68:GLU:HG2	2.17	0.44
2:P:108:MET:HE1	2:P:147:MET:HE1	1.99	0.44
2:P:342:ARG:NH1	2:P:343:ASP:OD1	2.50	0.44
2:Q:68:GLU:CD	2:R:196:ARG:HD2	2.43	0.44
2:Q:342:ARG:NH1	2:Q:343:ASP:OD1	2.50	0.44
2:U:342:ARG:NH1	2:U:343:ASP:OD1	2.50	0.44
2:V:82:ARG:HA	2:V:85:ILE:HG22	2.00	0.44
2:W:65:PHE:O	2:W:68:GLU:HG2	2.17	0.44
2:X:82:ARG:HA	2:X:85:ILE:HG22	2.00	0.44
2:M:108:MET:HE1	2:M:147:MET:HE1	1.99	0.43
2:T:82:ARG:HA	2:T:85:ILE:HG22	2.00	0.43
2:U:82:ARG:HA	2:U:85:ILE:HG22	2.00	0.43
2:X:65:PHE:O	2:X:68:GLU:HG2	2.17	0.43
2:M:82:ARG:HA	2:M:85:ILE:HG22	2.00	0.43
2:N:108:MET:HE1	2:N:147:MET:HE1	1.99	0.43
2:O:108:MET:HE1	2:O:147:MET:HE1	1.99	0.43
2:S:263:GLY:HA3	2:T:256:MET:HE3	1.99	0.43
2:V:342:ARG:NH1	2:V:343:ASP:OD1	2.50	0.43
2:X:58:THR:HG23	2:X:159:ALA:HB1	2.01	0.43
1:C:65:LEU:O	1:C:69:GLN:HG2	2.19	0.43
1:D:65:LEU:O	1:D:69:GLN:HG2	2.19	0.43
1:F:65:LEU:O	1:F:69:GLN:HG2	2.19	0.43
2:M:35:HIS:HE1	2:N:50:ARG:HG3	1.83	0.43
2:M:58:THR:HG23	2:M:159:ALA:HB1	2.01	0.43
2:N:82:ARG:HA	2:N:85:ILE:HG22	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:S:82:ARG:HA	2:S:85:ILE:HG22	2.00	0.43
2:X:232:LEU:HD13	2:W:261:ARG:HB3	2.00	0.43
1:H:65:LEU:O	1:H:69:GLN:HG2	2.19	0.43
2:N:58:THR:HG23	2:N:159:ALA:HB1	2.01	0.43
2:S:35:HIS:HE1	2:T:50:ARG:HG3	1.84	0.43
2:T:260:ARG:HD2	2:T:260:ARG:HA	1.92	0.43
1:A:65:LEU:O	1:A:69:GLN:HG2	2.19	0.43
1:J:65:LEU:O	1:J:69:GLN:HG2	2.19	0.43
2:O:82:ARG:HA	2:O:85:ILE:HG22	2.00	0.43
2:P:82:ARG:HA	2:P:85:ILE:HG22	2.00	0.43
2:Q:82:ARG:HA	2:Q:85:ILE:HG22	2.00	0.43
2:R:82:ARG:HA	2:R:85:ILE:HG22	2.00	0.43
2:W:58:THR:HG23	2:W:159:ALA:HB1	2.01	0.43
1:A:135:ARG:HH12	1:L:132:VAL:HG12	1.84	0.43
1:K:65:LEU:O	1:K:69:GLN:HG2	2.19	0.43
2:N:205:LEU:HD23	2:N:205:LEU:HA	1.88	0.43
2:P:6:ASP:OD1	2:P:7:ILE:N	2.51	0.43
2:Q:221:ARG:HG3	2:Q:222:ASP:N	2.34	0.43
1:E:65:LEU:O	1:E:69:GLN:HG2	2.19	0.43
1:I:65:LEU:O	1:I:69:GLN:HG2	2.19	0.43
2:Q:263:GLY:HA3	2:R:256:MET:HE3	1.99	0.43
2:V:260:ARG:HB3	2:V:261:ARG:H	1.66	0.43
1:B:65:LEU:O	1:B:69:GLN:HG2	2.19	0.43
2:R:221:ARG:HG3	2:R:222:ASP:N	2.34	0.43
2:V:18:MET:HE1	2:V:154:HIS:CE1	2.54	0.43
2:X:18:MET:HE1	2:X:154:HIS:CE1	2.54	0.43
2:X:50:ARG:HG3	2:W:35:HIS:HE1	1.84	0.43
2:O:58:THR:HG23	2:O:159:ALA:HB1	2.01	0.43
2:P:221:ARG:HG3	2:P:222:ASP:N	2.34	0.43
2:U:221:ARG:HG3	2:U:222:ASP:N	2.34	0.43
2:U:374:ASP:OD1	2:U:374:ASP:N	2.47	0.43
2:W:18:MET:HE1	2:W:154:HIS:CE1	2.54	0.43
2:M:18:MET:HE1	2:M:154:HIS:CE1	2.54	0.43
2:N:18:MET:HE1	2:N:154:HIS:CE1	2.54	0.43
2:P:260:ARG:HD2	2:P:260:ARG:HA	1.92	0.43
2:S:68:GLU:CD	2:T:196:ARG:HD2	2.44	0.43
2:T:374:ASP:OD1	2:T:374:ASP:N	2.47	0.43
2:V:58:THR:HG23	2:V:159:ALA:HB1	2.01	0.43
2:V:221:ARG:HG3	2:V:222:ASP:N	2.34	0.43
2:W:6:ASP:OD1	2:W:7:ILE:N	2.51	0.43
1:I:133:PHE:O	2:W:221:ARG:NH2	2.52	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:65:LEU:O	1:L:69:GLN:HG2	2.19	0.42
2:U:263:GLY:HA3	2:V:256:MET:HE3	2.00	0.42
2:X:235:ARG:HH21	2:X:256:MET:HE2	1.84	0.42
2:O:221:ARG:HG3	2:O:222:ASP:N	2.34	0.42
2:T:221:ARG:HG3	2:T:222:ASP:N	2.33	0.42
2:U:260:ARG:HB3	2:U:261:ARG:H	1.66	0.42
2:X:323:GLU:O	2:X:327:GLU:HG2	2.19	0.42
2:P:58:THR:HG23	2:P:159:ALA:HB1	2.01	0.42
2:Q:35:HIS:HE1	2:R:50:ARG:HG3	1.84	0.42
2:Q:260:ARG:HD2	2:Q:260:ARG:HA	1.91	0.42
2:T:18:MET:HE1	2:T:154:HIS:CE1	2.54	0.42
2:T:261:ARG:HB3	2:U:232:LEU:HD13	2.02	0.42
2:U:18:MET:HE1	2:U:154:HIS:CE1	2.54	0.42
2:U:58:THR:HG23	2:U:159:ALA:HB1	2.01	0.42
2:W:140:GLU:O	2:W:151:VAL:N	2.46	0.42
1:G:65:LEU:O	1:G:69:GLN:HG2	2.19	0.42
2:M:6:ASP:OD1	2:M:7:ILE:N	2.51	0.42
2:M:235:ARG:HH21	2:M:256:MET:HE2	1.84	0.42
2:R:6:ASP:OD1	2:R:7:ILE:N	2.51	0.42
2:S:221:ARG:HG3	2:S:222:ASP:N	2.34	0.42
2:S:260:ARG:HB3	2:S:261:ARG:H	1.66	0.42
2:U:68:GLU:CD	2:V:196:ARG:HD2	2.45	0.42
2:W:221:ARG:HG3	2:W:222:ASP:N	2.34	0.42
2:N:235:ARG:HH21	2:N:256:MET:HE2	1.84	0.42
2:O:35:HIS:HE1	2:P:50:ARG:HG3	1.85	0.42
2:Q:323:GLU:O	2:Q:327:GLU:HG2	2.19	0.42
2:R:235:ARG:HH21	2:R:256:MET:HE2	1.84	0.42
2:W:235:ARG:HH21	2:W:256:MET:HE2	1.84	0.42
2:W:323:GLU:O	2:W:327:GLU:HG2	2.19	0.42
1:A:14:THR:HG22	1:A:16:THR:H	1.85	0.42
2:M:68:GLU:CD	2:N:196:ARG:HD2	2.44	0.42
2:O:68:GLU:CD	2:P:196:ARG:HD2	2.45	0.42
2:S:235:ARG:HH21	2:S:256:MET:HE2	1.84	0.42
2:V:235:ARG:HH21	2:V:256:MET:HE2	1.84	0.42
1:E:133:PHE:O	2:S:221:ARG:NH2	2.53	0.42
1:J:14:THR:HG22	1:J:16:THR:H	1.85	0.42
1:L:14:THR:HG22	1:L:16:THR:H	1.85	0.42
2:M:323:GLU:O	2:M:327:GLU:HG2	2.19	0.42
2:U:235:ARG:HH21	2:U:256:MET:HE2	1.84	0.42
2:V:323:GLU:O	2:V:327:GLU:HG2	2.19	0.42
1:B:14:THR:HG22	1:B:16:THR:H	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:82:GLN:O	1:C:82:GLN:HG2	2.20	0.42
1:F:135:ARG:NH2	2:S:228:GLU:HG3	2.35	0.42
2:O:260:ARG:HD2	2:O:260:ARG:HA	1.91	0.42
2:Q:58:THR:HG23	2:Q:159:ALA:HB1	2.01	0.42
2:Q:235:ARG:HH21	2:Q:256:MET:HE2	1.84	0.42
2:R:323:GLU:O	2:R:327:GLU:HG2	2.19	0.42
2:S:205:LEU:HD23	2:S:205:LEU:HA	1.88	0.42
2:T:58:THR:HG23	2:T:159:ALA:HB1	2.00	0.42
2:V:260:ARG:HD2	2:V:260:ARG:HA	1.91	0.42
2:X:221:ARG:HG3	2:X:222:ASP:N	2.33	0.42
2:X:256:MET:HE3	2:W:263:GLY:HA3	2.01	0.42
1:C:14:THR:HG22	1:C:16:THR:H	1.85	0.42
1:E:82:GLN:HG2	1:E:82:GLN:O	2.20	0.42
2:N:323:GLU:O	2:N:327:GLU:HG2	2.19	0.42
2:O:235:ARG:HH21	2:O:256:MET:HE2	1.84	0.42
2:P:235:ARG:HH21	2:P:256:MET:HE2	1.84	0.42
2:P:323:GLU:O	2:P:327:GLU:HG2	2.19	0.42
2:R:58:THR:HG23	2:R:159:ALA:HB1	2.01	0.42
2:S:58:THR:HG23	2:S:159:ALA:HB1	2.01	0.42
2:S:323:GLU:O	2:S:327:GLU:HG2	2.19	0.42
2:T:323:GLU:O	2:T:327:GLU:HG2	2.19	0.42
1:A:82:GLN:O	1:A:82:GLN:HG2	2.20	0.42
2:X:196:ARG:HD2	2:W:68:GLU:CD	2.44	0.42
1:H:14:THR:HG22	1:H:16:THR:H	1.85	0.42
1:K:14:THR:HG22	1:K:16:THR:H	1.85	0.42
2:M:261:ARG:HB3	2:N:232:LEU:HD13	2.01	0.42
2:N:221:ARG:HG3	2:N:222:ASP:N	2.34	0.42
2:P:18:MET:HE1	2:P:154:HIS:CE1	2.54	0.42
2:R:18:MET:HE1	2:R:154:HIS:CE1	2.54	0.42
2:T:35:HIS:HE1	2:U:50:ARG:HG3	1.85	0.42
2:T:99:SER:OG	2:T:100:ALA:N	2.53	0.42
2:T:235:ARG:HH21	2:T:256:MET:HE2	1.84	0.42
2:V:374:ASP:OD1	2:V:374:ASP:N	2.47	0.42
1:L:82:GLN:HG2	1:L:82:GLN:O	2.20	0.41
2:N:73:HIS:O	2:N:77:GLU:HG2	2.20	0.41
2:O:18:MET:HE1	2:O:154:HIS:CE1	2.54	0.41
2:O:99:SER:OG	2:O:100:ALA:N	2.53	0.41
2:O:323:GLU:O	2:O:327:GLU:HG2	2.19	0.41
1:K:82:GLN:O	1:K:82:GLN:HG2	2.20	0.41
2:P:88:LEU:HD23	2:P:88:LEU:HA	1.93	0.41
2:S:99:SER:OG	2:S:100:ALA:N	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:U:323:GLU:O	2:U:327:GLU:HG2	2.19	0.41
1:F:129:ASP:OD1	1:F:129:ASP:N	2.53	0.41
1:G:82:GLN:O	1:G:82:GLN:HG2	2.20	0.41
2:M:88:LEU:HD23	2:M:88:LEU:HA	1.93	0.41
2:M:109:LEU:HD11	2:M:349:LEU:HD21	2.03	0.41
2:R:205:LEU:HD23	2:R:205:LEU:HA	1.88	0.41
2:U:99:SER:OG	2:U:100:ALA:N	2.53	0.41
2:X:109:LEU:HD11	2:X:349:LEU:HD21	2.03	0.41
1:D:14:THR:HG22	1:D:16:THR:H	1.85	0.41
1:H:129:ASP:OD1	1:H:129:ASP:N	2.53	0.41
2:N:109:LEU:HD11	2:N:349:LEU:HD21	2.03	0.41
2:O:73:HIS:O	2:O:77:GLU:HG2	2.20	0.41
2:T:80:LYS:HE3	2:T:80:LYS:HB2	1.83	0.41
2:U:6:ASP:OD1	2:U:7:ILE:N	2.51	0.41
1:J:82:GLN:O	1:J:82:GLN:HG2	2.20	0.41
2:O:109:LEU:HD11	2:O:349:LEU:HD21	2.03	0.41
2:R:25:LEU:O	2:R:29:MET:HG2	2.21	0.41
2:R:73:HIS:O	2:R:77:GLU:HG2	2.20	0.41
2:S:18:MET:HE1	2:S:154:HIS:CE1	2.54	0.41
2:S:73:HIS:O	2:S:77:GLU:HG2	2.20	0.41
2:T:73:HIS:O	2:T:77:GLU:HG2	2.20	0.41
2:T:109:LEU:HD11	2:T:349:LEU:HD21	2.03	0.41
2:U:73:HIS:O	2:U:77:GLU:HG2	2.20	0.41
2:U:109:LEU:HD11	2:U:349:LEU:HD21	2.03	0.41
2:V:109:LEU:HD11	2:V:349:LEU:HD21	2.03	0.41
2:W:109:LEU:HD11	2:W:349:LEU:HD21	2.03	0.41
2:X:25:LEU:O	2:X:29:MET:HG2	2.21	0.41
1:D:82:GLN:O	1:D:82:GLN:HG2	2.20	0.41
1:E:129:ASP:OD1	1:E:129:ASP:N	2.53	0.41
1:G:14:THR:HG22	1:G:16:THR:H	1.85	0.41
1:I:14:THR:HG22	1:I:16:THR:H	1.85	0.41
2:N:25:LEU:O	2:N:29:MET:HG2	2.21	0.41
2:O:261:ARG:HB3	2:P:232:LEU:HD13	2.02	0.41
2:P:25:LEU:O	2:P:29:MET:HG2	2.21	0.41
2:Q:73:HIS:O	2:Q:77:GLU:HG2	2.21	0.41
2:Q:261:ARG:HB3	2:R:232:LEU:HD13	2.02	0.41
2:R:99:SER:OG	2:R:100:ALA:N	2.53	0.41
2:R:261:ARG:HB3	2:S:232:LEU:HD13	2.02	0.41
2:R:382:ILE:HB	2:R:383:PRO:HD3	2.03	0.41
2:S:382:ILE:HB	2:S:383:PRO:HD3	2.03	0.41
2:T:25:LEU:O	2:T:29:MET:HG2	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:V:73:HIS:O	2:V:77:GLU:HG2	2.21	0.41
2:V:382:ILE:HB	2:V:383:PRO:HD3	2.03	0.41
2:W:25:LEU:O	2:W:29:MET:HG2	2.21	0.41
1:A:21:LEU:HD13	1:A:78:LEU:HB3	2.03	0.41
1:B:82:GLN:O	1:B:82:GLN:HG2	2.20	0.41
1:E:14:THR:HG22	1:E:16:THR:H	1.85	0.41
2:M:25:LEU:O	2:M:29:MET:HG2	2.21	0.41
2:O:263:GLY:HA3	2:P:256:MET:HE3	2.02	0.41
2:P:205:LEU:HD23	2:P:205:LEU:HA	1.88	0.41
2:Q:36:PRO:HB2	2:Q:48:MET:HE1	2.03	0.41
2:S:109:LEU:HD11	2:S:349:LEU:HD21	2.03	0.41
2:U:35:HIS:HE1	2:V:50:ARG:HG3	1.85	0.41
2:U:36:PRO:HB2	2:U:48:MET:HE1	2.03	0.41
2:U:382:ILE:HB	2:U:383:PRO:HD3	2.03	0.41
2:V:99:SER:OG	2:V:100:ALA:N	2.53	0.41
2:W:382:ILE:HB	2:W:383:PRO:HD3	2.03	0.41
2:X:260:ARG:HB3	2:X:261:ARG:H	1.66	0.41
1:K:21:LEU:HD13	1:K:78:LEU:HB3	2.03	0.41
1:L:21:LEU:HD13	1:L:78:LEU:HB3	2.03	0.41
2:M:73:HIS:O	2:M:77:GLU:HG2	2.21	0.41
2:P:73:HIS:O	2:P:77:GLU:HG2	2.20	0.41
2:P:99:SER:OG	2:P:100:ALA:N	2.53	0.41
2:P:109:LEU:HD11	2:P:349:LEU:HD21	2.03	0.41
2:P:379:SER:HB2	2:Q:380:ASP:OD2	2.20	0.41
2:Q:99:SER:OG	2:Q:100:ALA:N	2.53	0.41
2:Q:206:VAL:HG13	2:Q:207:ARG:HD2	2.03	0.41
2:Q:382:ILE:HB	2:Q:383:PRO:HD3	2.03	0.41
2:R:36:PRO:HB2	2:R:48:MET:HE1	2.03	0.41
2:S:36:PRO:HB2	2:S:48:MET:HE1	2.03	0.41
2:T:36:PRO:HB2	2:T:48:MET:HE1	2.03	0.41
2:T:382:ILE:HB	2:T:383:PRO:HD3	2.03	0.41
2:V:36:PRO:HB2	2:V:48:MET:HE1	2.03	0.41
2:W:380:ASP:O	2:W:383:PRO:HD2	2.21	0.41
2:X:99:SER:OG	2:X:100:ALA:N	2.53	0.41
1:B:21:LEU:HD13	1:B:78:LEU:HB3	2.03	0.41
1:F:14:THR:HG22	1:F:16:THR:H	1.85	0.41
1:I:82:GLN:O	1:I:82:GLN:HG2	2.20	0.41
2:M:380:ASP:O	2:M:383:PRO:HD2	2.21	0.41
2:O:6:ASP:OD1	2:O:7:ILE:N	2.51	0.41
2:O:382:ILE:HB	2:O:383:PRO:HD3	2.03	0.41
2:P:382:ILE:HB	2:P:383:PRO:HD3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:R:109:LEU:HD11	2:R:349:LEU:HD21	2.03	0.41
2:R:260:ARG:HD2	2:R:260:ARG:HA	1.92	0.41
2:R:374:ASP:OD1	2:R:374:ASP:N	2.47	0.41
2:R:380:ASP:O	2:R:383:PRO:HD2	2.21	0.41
2:S:261:ARG:HB3	2:T:232:LEU:HD13	2.02	0.41
2:S:380:ASP:O	2:S:383:PRO:HD2	2.21	0.41
2:T:206:VAL:HG13	2:T:207:ARG:HD2	2.03	0.41
2:U:380:ASP:O	2:U:383:PRO:HD2	2.21	0.41
2:V:25:LEU:O	2:V:29:MET:HG2	2.21	0.41
2:W:36:PRO:HB2	2:W:48:MET:HE1	2.03	0.41
2:W:73:HIS:O	2:W:77:GLU:HG2	2.20	0.41
2:W:99:SER:OG	2:W:100:ALA:N	2.54	0.41
1:G:129:ASP:OD1	1:G:129:ASP:N	2.53	0.41
2:P:36:PRO:HB2	2:P:48:MET:HE1	2.03	0.41
2:P:80:LYS:HE3	2:P:80:LYS:HB2	1.83	0.41
2:X:36:PRO:HB2	2:X:48:MET:HE1	2.03	0.40
2:X:382:ILE:HB	2:X:383:PRO:HD3	2.03	0.40
1:C:129:ASP:OD1	1:C:129:ASP:N	2.53	0.40
2:M:99:SER:OG	2:M:100:ALA:N	2.53	0.40
2:M:221:ARG:HG3	2:M:222:ASP:N	2.34	0.40
2:M:260:ARG:HB3	2:M:261:ARG:H	1.66	0.40
2:N:36:PRO:HB2	2:N:48:MET:HE1	2.03	0.40
2:N:382:ILE:HB	2:N:383:PRO:HD3	2.03	0.40
2:Q:18:MET:HE1	2:Q:154:HIS:CE1	2.54	0.40
2:Q:109:LEU:HD11	2:Q:349:LEU:HD21	2.03	0.40
2:U:25:LEU:O	2:U:29:MET:HG2	2.21	0.40
1:C:21:LEU:HD13	1:C:78:LEU:HB3	2.03	0.40
1:D:129:ASP:OD1	1:D:129:ASP:N	2.53	0.40
1:D:133:PHE:O	2:R:221:ARG:NH2	2.54	0.40
1:H:132:VAL:HG12	1:I:135:ARG:HH12	1.86	0.40
1:J:129:ASP:OD1	1:J:129:ASP:N	2.53	0.40
2:M:36:PRO:HB2	2:M:48:MET:HE1	2.03	0.40
2:M:382:ILE:HB	2:M:383:PRO:HD3	2.03	0.40
2:N:99:SER:OG	2:N:100:ALA:N	2.54	0.40
2:N:206:VAL:HG13	2:N:207:ARG:HD2	2.03	0.40
2:U:206:VAL:HG13	2:U:207:ARG:HD2	2.03	0.40
2:U:261:ARG:HB3	2:V:232:LEU:HD13	2.03	0.40
2:W:206:VAL:HG13	2:W:207:ARG:HD2	2.03	0.40
1:J:21:LEU:HD13	1:J:78:LEU:HB3	2.03	0.40
2:N:35:HIS:HE1	2:O:50:ARG:HG3	1.86	0.40
2:N:380:ASP:O	2:N:383:PRO:HD2	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:O:36:PRO:HB2	2:O:48:MET:HE1	2.03	0.40
2:Q:140:GLU:O	2:Q:151:VAL:N	2.46	0.40
2:Q:380:ASP:O	2:Q:383:PRO:HD2	2.21	0.40
2:X:380:ASP:O	2:X:383:PRO:HD2	2.21	0.40
1:G:133:PHE:O	2:U:221:ARG:NH2	2.54	0.40
2:M:113:LEU:HD23	2:M:113:LEU:HA	1.95	0.40
2:N:260:ARG:HB3	2:N:261:ARG:H	1.66	0.40
2:O:25:LEU:O	2:O:29:MET:HG2	2.21	0.40
2:S:80:LYS:HB2	2:S:80:LYS:HE3	1.83	0.40
2:U:260:ARG:HD2	2:U:260:ARG:HA	1.91	0.40
2:W:260:ARG:HD2	2:W:260:ARG:HA	1.92	0.40
1:D:130:PRO:HA	1:D:131:PRO:HD3	2.02	0.40
2:P:380:ASP:O	2:P:383:PRO:HD2	2.21	0.40
2:Q:88:LEU:HD23	2:Q:88:LEU:HA	1.93	0.40
2:R:206:VAL:HG13	2:R:207:ARG:HD2	2.03	0.40
2:T:380:ASP:O	2:T:383:PRO:HD2	2.21	0.40
2:V:88:LEU:HD23	2:V:88:LEU:HA	1.93	0.40
2:V:380:ASP:O	2:V:383:PRO:HD2	2.21	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	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	B	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	C	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	D	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	E	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	F	137/141 (97%)	135 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	H	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	I	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	J	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	K	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
1	L	137/141 (97%)	135 (98%)	2 (2%)	0	100	100
2	M	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	N	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	O	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	P	365/512 (71%)	362 (99%)	3 (1%)	0	100	100
2	Q	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	R	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	S	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	T	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	U	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	V	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
2	W	365/512 (71%)	362 (99%)	3 (1%)	0	100	100
2	X	365/512 (71%)	361 (99%)	4 (1%)	0	100	100
All	All	6024/7836 (77%)	5954 (99%)	70 (1%)	0	100	100

There are no Ramachandran outliers to report.

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	118/120 (98%)	118 (100%)	0	100	100
1	B	118/120 (98%)	118 (100%)	0	100	100
1	C	118/120 (98%)	118 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	D	118/120 (98%)	118 (100%)	0	100	100
1	E	118/120 (98%)	118 (100%)	0	100	100
1	F	118/120 (98%)	118 (100%)	0	100	100
1	G	118/120 (98%)	118 (100%)	0	100	100
1	H	118/120 (98%)	118 (100%)	0	100	100
1	I	118/120 (98%)	118 (100%)	0	100	100
1	J	118/120 (98%)	118 (100%)	0	100	100
1	K	118/120 (98%)	118 (100%)	0	100	100
1	L	118/120 (98%)	118 (100%)	0	100	100
2	M	297/418 (71%)	297 (100%)	0	100	100
2	N	297/418 (71%)	297 (100%)	0	100	100
2	O	297/418 (71%)	297 (100%)	0	100	100
2	P	297/418 (71%)	297 (100%)	0	100	100
2	Q	297/418 (71%)	297 (100%)	0	100	100
2	R	297/418 (71%)	297 (100%)	0	100	100
2	S	297/418 (71%)	297 (100%)	0	100	100
2	T	297/418 (71%)	297 (100%)	0	100	100
2	U	297/418 (71%)	297 (100%)	0	100	100
2	V	297/418 (71%)	297 (100%)	0	100	100
2	W	297/418 (71%)	297 (100%)	0	100	100
2	X	297/418 (71%)	297 (100%)	0	100	100
All	All	4980/6456 (77%)	4980 (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 (11) such sidechains are listed below:

Mol	Chain	Res	Type
2	X	184	GLN
2	M	184	GLN
2	N	184	GLN
2	P	155	HIS
2	P	184	GLN
2	R	184	GLN

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Mol	Chain	Res	Type
2	S	184	GLN
2	T	184	GLN
2	U	184	GLN
2	V	184	GLN
2	W	184	GLN

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.