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PDB ID	:	8JSL
EMDB ID	:	EMD-36622
Title	:	The structure of EBOV L-VP35-RNA complex
Authors	:	Qi, P.; Yi, S.
Deposited on	:	2023-06-20
Resolution	:	2.95 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 (i) 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 (1)) were used in the production of this report:

EMDB validation analysis	:	FAILED
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	FAILED
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 2.95 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	$egin{array}{c} { m Whole \ archive} \ (\#{ m Entries}) \end{array}$	${f EM\ structures}\ (\#{f Entries})$				
Clashscore	158937	4297				
Ramachandran outliers	154571	4023				
Sidechain outliers	154315	3826				
RNA backbone	4643	859				

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	А	2212	55	5%	6%	38%			
2	В	340		60%	9%	31%			
2	С	340	20% •		79%				
2	D	340	9% •		88%				
2	Е	340	10% •		88%				
3	G	18	39%	6%	11%	44%			



2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 14069 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 RNA-directed RNA polymerase L.

Mol	Chain	Residues		A	AltConf	Trace			
1	А	1362	Total 10897	C 7002	N 1853	O 1986	S 56	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
А	759	ASP	GLY	conflict	UNP A0A1C4HDB0

• Molecule 2 is a protein called Polymerase cofactor VP35.

Mol	Chain	Residues	Atoms	AltConf	Trace
2	В	235	Total C N O S 1799 1129 311 350 9	1	0
2	С	72	Total C N O S 533 333 86 110 4	0	0
2	D	40	Total C N O S 303 192 48 59 4	0	0
2	Ε	42	Total C N O S 324 203 53 65 3	0	0

• Molecule 3 is a RNA chain called The leader sequence of EBOV.

Mol	Chain	Residues		At	\mathbf{oms}	AltConf	Trace		
3	G	10	Total 212	C 94	N 34	0 74	Р 10	0	0

• Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
4	А	1	Total Zn 1 1	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: RNA-directed RNA polymerase L



	ARG MET LEU LEU PRO VAL MET SER SER LYS	PHE HIS ASP ASP GLN TLE CLU LEU	ASN ASN SER ALA SER GLN THR THR THR THR THR	ASN ASN THR THR PHE LYS ASP GLN	ARG ALA ALA ARG LEU PRO ARG GLN	VAL GLU VAL ILE THR
MET ASP ALA GLU THR THR GLU ASN ASN ASN	ARG SER LYS LEU TYR GLU VAL HIS	LYS LEU ILEU ILEU HIS HIS VAL ASP PRO SER	VAL LEU LYS ALA ALA ALA VAL LYS VAL LYS VAL LYS	LEO SER ASP ASP GLU GLU MET LEU TRP	LEU ASN ASN ASN LEU ALA PRO	PHE ALA THR GLY
TYR LEU LLE LYS PRO PRO TLE THR SER SER ALA	ARG SER GLU TRP TYR LEU CYS LEU	THR ASN PHE LEU SER THR THR ARG LYS MET	PRO HIS GLN ASN HIS ASN HIS SER CYS CYS GLN GLN	VAL ILEU THR ALA LEU GLN GLN GLN	ILE GLN ARG SER PRO TYR TRP	SER HIS LEU THR
GLN TYR ALA ASP CYS CYS CYS CYS LEU HIS LEU LEU SER	TYR ILE ARG LEU GLY PHE PRO SER LEU	GLU LYS VAL LEU TYR HIS ARG TYR ASN	VAL ASP SER LYS ARG GLY PRO PRO LEU VAL SER	VAL THR GLN HIS LEU HIS LEU ARG	ALA GLU TLE ARG GLU CLU LEU THR	ASP TYR ASN GLN
GLN ARG GLN SER ARG THR THR TYR HIS	PHE ILE ARG ARG ALA CY GLY ILE	THR LYS LEU VAL ASN ASP TYR LEU LYS	PHE LEU LEU VAL GLN ALA ALA LVS HIS ASN	TRP TRP GLN GLU PHE LYS LYS	LEU PRO GLU LEU LEU SER VAL	ASN ARG PHE TYR
HIS ILE ARG ASP CYS ASN CYS GLU GLU ARG	PHE LEU VAL GLN THR LEU LEU HIS	ARG MET GLN ASP SER GLU VAL LYS LEU	GLU ARG LEU CLY CLY GLY CLZ LEU SER PHE	ASP GLY LEU TYR ARG PHE ASP		
• Molecule 2:	Polymerase	cofactor VP3	35			
Chain B:		60%	9%	31	%	
MET THR THR ARG LYS GLY ARG GLY HIS	THR VAL ALA ALA THR GLN ASP ASP	MET PRO GLY GLU CLU SER GLY TRP TLE	SER GLU GLU GLN HET THR GLY GLY ARG TLE PRO	ASP ASP ILE PHE CYS ASP ILE ILE GLU	ASN ASN PRO GLY LEU CYS TYR	SER GLN MET GLN GLN
GLN THR LYS PRO ASN LYS MET ASN ASN	SER GLN GLN GLN GLN ASP PRO ITE CYS	ASN HIS SER PHE GLU GLU VAL VAL CAL	LEU ALA SER SER SER LEU LEU ALA VAL VAL VAL CLN GLN	THR THR ALA ALA SER GLU CL14	L118 V121 A125	1120 N132 D143
L144 T148 E165 H166 H166 H166 K184	L242 D257 1258 F263 F263 C275	q279 1280 P292 P293 V294 V294 L311	V326 C326 V327 L330 Q331 D332 C333 K334 K334	I340		
• Molecule 2:	Polymerase	cofactor VP3	35			
• Molecule 2: Chain C:	Polymerase	cofactor VP3	35 79%			
Molecule 2: Chain C:	Polymerase	cofactor VP3	35 79% 88 11 11 11 11 11 11 11 11 11 11 11 11 1	ASP ASP TLE PHE CYS CYS ASP LLE GLU	ASN ASN PRO CLEU CYS TYA	SER GLN MET GLN
Molecule 2: Chain C: La H H H N H S 10 NY 5 H	Polymerase	Cofactor VP3	35 414 414 414 414 414 414 414 414 414 41	THR ASP THR ASP ILE ASP ALA ILE ALA PLE SER ASP GLU CYS SER ASP LEO GLU GLU GLU GLU	L114 ASN L114 ASN K141 GLY S174 CYS L175 ATYR	E178 SER SIT9 GLN ALA MET ILE GLN
Molecule 2: Chain C: Law Wather Stress St	Polymerase	Cofactor VP3	210 CLU SER CLU CLU SER CLU CLU CLU SER CLU	LALA DILM VALL LAS THR ASP LEU ALA ILE ARG SER PHE ARG GLU CYS ASP GLU CYS MET LEU CYS TLE LEU LLU TYR ELOS GLU TLE GLOS GLU	ASP HIS L114 ASN LEU PRO PRO PRO CL2 CL7 CL7 CVS GLY L175 VYR TVR	ALLA E178 ALLA PHE S179 GLN HIS ALA MET GLN ILE GLN
Molecule 2: Chain C: International and a state of the sta	Polymerase 20% . 1111 C 20% . 20% .	Cofactor VP3	ASP 4124 ALA 2124 ALA 21	LIN ALA ULA VALL LYS LYS THR ASY ARG ASP ILE ASP VAL LEU ALA ILE PRO ARG SER PHE ILE ASP CU CYS PHE ILE SER ASP CLU CYS CTU CYS CLU CYS CYS CLU CYS CLU CYS CLU CYS CLU CYS CLU CYS CLU CYS CLU CYS CLU CYS CYS CLU CYS CLU CYS	ALA ASP ASN ALA HIS L114 ASN PRO LEU LEU PRO PRO PRO VAL GIV K141 GLY VAL GIV X141 LEU HIS PHE S174 CYS HIS GIV L175 YYR	ARG ALA E178 ALA SER PHE <mark>S179</mark> GLN ARG HIS ALA MET GLY GLN ILE GLN
 Molecule 2: Chain C: IIII 2000 AND C: IIIII 2000 AND C: IIII 2000 AND C:	Polymerase 20% • 1 NA 20% • 1 NA	Cofactor VP3 Mag CT A 28 ANA CT A 38 ANA CT A 38 ANA CT A 38 ANA C	Asp and the second second second second second asp and the second asp and the second s	LIN ALLA ULA UNAL LYS LYS THE ASP ARG ASP THE ASP VAL LEU ALA THE PHE LEU ALA THE PHE THE SER ASP CT CY ASP TYR ELON GLU ASP TYR ELON GLU	ALA ASP ASN ALA HIS L114 ASN PRO LEU PRO PRO PRO VAL GLY K141 GLY VAL GLY K141 LEU ILE PHE S174 CYS HIS GLY L175 YYR	ARG ALA E178 ALA SER PHE S179 GLN ARG HIS ALA MET GLN TLE GLN
Molecule 2: Chain C: Main C:	Polymerase	cofactor VP3	35 79% 79% 79% 79% 79% 79% 79% 79%	LIN ALLA ULUA UNAL LYS LYS THR ASY ARG ASP THE ASP VAL LEU ALLA THE PRO ARG SER PHE THE ASN GLU CYS PHE THE SER ASP GLU MET LEU ASP TYR ELOB GLU ASP TYR ELOB GLU	ALA ASP ASN ALA HIS L114 ASN PRO LEU LEU PRO PRO PRO VAL GIY K141 GLY VAL GIY S174 CYS HIS GLY L175 YYR HIS GLY L175 YYR	ARC ALA E178 ALA SER PHE <mark>S179</mark> GLN ARC HIS ALA MET GLN ILE GLN
 Molecule 2: Chain C: State of the set of the set	Polymerase	cofactor VP3	35 79% 79% 79% 1000 1000 1000	LITA ALA ULA VAL LITA LA THA VAL ARG ASP ILE ASP VAL LEU ALA ILE PRO ARG SER PHE ILE ASH GLU CYS PHE ILE SER ASP GLN MET LEU ILE ASP TYR EJOB GLU	ALA ASP ASP ASN ALA HIS L114 ASN PRO LEU R141 ASN VAL CLV R141 CLY VAL CLY L175 L175 TYR HIS CLY CYS	ARG ALA E178 ALA SER PHE 3179 GLN ARG HIS ALA MET GLY GLN ILE GLN



GLN THR	LYS PRO ASN PRO	LYS MET ARG	ASN SER GLN	THR GLN THR	ASP ASP PRO	ILE CYS ASN	HIS SER PHE	GLU	VAL VAL GLN THR	LEU ALA	SER LEU ALA	THR VAL VAT	GLN GLN	GLN THR TIE	ALA SER	GLU SER	GLU	GLN R110	<mark>S113</mark> L114	K119	P120	V134
Y142	T149 GLY ARG AIA	THR ALA THR	ALA ALA ALA	THR GLU AT A	TYR TRP	ALA GLU HIS	GLY GLN PRO	PRO PRO	GLT PRO SER LEU	TYR GLU	GLU SER ALA	ILE ARG	LYS	GLU SER	ASP	THR VAL	PROGLN	VAL	AKG GLU ALA	PHE ASN	LEU	ASP SER THR
THR SER	LEU THR GLU GLU	ASN PHE GLY	LYS PRO ASP	ILE SER AT A	ALA ASP	LEU ARG ASN	ILE MET TVR	ASP HIS	PRO GLY PHE	GLY THR	ALA PHE HIS	GLN LEU	GLN VAL	TLE CYS T VS	LEU GLY	LYS ASP	SER	LEU	ASF ILE ILE	HIS ALA	GLU PHE	GLN ALA SER
LEU ALA	GLY ASP SFR	PRO GLN CYS	ALA LEU ILE	GLN ILE THR	LYS ARG	VAL PRO ILE	PHE GLN ASP	ALA ALA	PRO VAL TI.E	HIS	ARG SER ARG	GLY ASP TI F	PRO	ALA CYS CI N	LYS SER	LEU ARG	PRO VAL	PRO PRO	PRO LYS	ILE ASP	GLY	TRP VAL CYS
VAL PHE	GLN GLN ASP	GL Y LY S THR	GLY GLY	ILE																		
• 1	Aolec	ule :	2: P	olyn	nera	use o	cofa	ctor	VP3	35												
Ch	ain I	E: :	10%	•							88	8%										
MET THR	THR ARG THR I VS	GLY ARG GLY	HIS THR VAL	ALA THR THR	GLN GSN	ASP ARG MET	PRO GLY PRO	GLU	GLY GLY TRP	SER	GLN LEU MET	THR GL Y ADC	TLE	VAL ASN	TLE	CYS ASP	ILE GLU	ASN ASN	GLY CLY	CYS TYR	ALA SER	GLN GLN
GLN THR	LYS PRO ASN	LYS MET ARG	ASN SER GLN	THR GLN THR	ASP PRO	ILE CYS ASN	HIS SER PHE	GLU	VAL VAL GLN THR	LEU ALA	SER LEU ALA	THR VAL VAI	GLN	GLN THR TIF	ALA SER	E105	111		M124	L131	V139	D143
<mark>V 146</mark> MET	THR THR GLY ABG	ALA THR ALA	THR ALA ALA	ALA THR GIII	ALA TYR	TRP ALA GLU	HIS GLN	PRO PRO	PRO GLY SFR	LEU TYR	GLU GLU SER	ALA ILE APC	CLYS CLY	ILE GLU SEE	ARG ASP	GLU THR	VAL PRO	GLN	VAL ARG GLU	ALA PHE	ASN	LEU ASP SER
THR	SER LEU THR	GLU ASN PHE	GLY LYS PRO	ASP ILE SFP	ALA LYS	ASP LEU ARG	ASN ILE MFT	ASP	LEU PRO GLY	PHE GLY	THR ALA PHE	HIS GLN 1 EII	VAL GLN	VAL ILE	LYS	GLY	ASP SER	SER	ASP ILE	ILE HIS	GLU	PHE GLN ALA
SER LEU	ALA GLV GLY	SER PRO GLN	CYS ALA LEU	ILE GLN TI F	THR LYS	ARG VAL PRO	ILE PHE GLN	ASP ALA	ALA PRO PRO VAL	ILE HIS	ILE ARG SER	ARG GLY ASD	TLE	ALA	CLN CLN	SER	ARG PRO	VAL PRO	PRU SER PRO	LYS	ASP ARG	GLY TRP VAL
CYS VAL	PHE GLN CI N	ASP GLY LYS	THR LEU GLY	LEU LYS TIF	TLE																	
• 1	Aolec	ule a	3: T	he l	ead	er se	eque	ence	of E	BO	V											

Chain G:	39%	6%	11%	44%
8 <mark>867 58</mark> 69999				



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	642661	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE	Depositor
	CORRECTION	
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{\AA}^2)$	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 $(6k \ge 4k)$	Depositor



5 Model quality (i)

5.1 Standard geometry (i)

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

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).

Mal	Chain	Bond	Bond lengths		angles
	Unam	RMSZ	# Z > 5	RMSZ	# Z > 5
1	А	0.25	0/11168	0.47	0/15169
2	В	0.25	0/1836	0.48	0/2496
2	С	0.26	0/544	0.45	0/745
2	D	0.25	0/305	0.50	0/412
2	Ε	0.24	0/326	0.50	0/440
3	G	0.18	0/235	0.78	0/364
All	All	0.25	0/14414	0.48	0/19626

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	А	10897	0	10861	82	0
2	В	1799	0	1777	21	0
2	С	533	0	502	4	0
2	D	303	0	316	7	0
2	Е	324	0	329	6	0
3	G	212	0	107	1	0
4	А	1	0	0	0	0
All	All	14069	0	13892	108	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 (108) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom_1	Atom_2	Interatomic	Clash
Atom-1	At0111-2	distance $(Å)$	overlap (Å)
2:B:263:PHE:HB2	2:B:280:ILE:HD11	1.69	0.74
1:A:1153:CYS:SG	1:A:1347:HIS:HE1	2.10	0.73
2:B:275:CYS:O	2:B:279:GLN:NE2	2.27	0.68
1:A:114:LEU:HD22	1:A:858:ARG:HD3	1.77	0.66
1:A:905:VAL:HG23	1:A:911:GLY:HA3	1.77	0.66
2:B:330:LEU:HB2	2:B:334:LYS:HB2	1.77	0.66
1:A:667:TYR:O	1:A:671:GLN:NE2	2.29	0.66
2:D:119:LYS:HG3	2:D:120:PRO:HD3	1.76	0.66
1:A:1029:ARG:NH1	1:A:1272:ASN:OD1	2.28	0.65
2:B:257:ASP:OD1	2:B:258:ILE:HD12	1.98	0.64
1:A:1218:GLU:OE1	1:A:1247:ARG:NH2	2.31	0.64
1:A:608:GLN:OE1	1:A:736:ARG:NH1	2.31	0.63
1:A:313:THR:HG23	1:A:316:LYS:HE2	1.80	0.63
1:A:93:GLU:HB3	1:A:94:PRO:HD3	1.80	0.63
1:A:429:VAL:HG21	1:A:443:ILE:HD13	1.82	0.61
1:A:491:ARG:NH2	1:A:692:ASN:O	2.31	0.61
1:A:906:PRO:HA	1:A:913:SER:HB3	1.83	0.61
2:C:174:SER:HB2	2:C:178:GLU:HG3	1.82	0.60
1:A:649:ILE:HG21	1:A:663:ASN:HB3	1.83	0.60
1:A:1229:VAL:HG13	1:A:1230:THR:HG23	1.84	0.59
1:A:1380:ILE:HG22	1:A:1381:TYR:H	1.67	0.59
1:A:1268:VAL:HG23	1:A:1269:HIS:HD2	1.69	0.58
2:B:294:VAL:HG22	2:B:327:VAL:HB	1.87	0.57
1:A:520:PHE:O	1:A:998:ASN:ND2	2.39	0.56
1:A:883:PHE:CE1	1:A:888:LEU:HD21	2.40	0.56
1:A:803:LYS:O	1:A:814:GLN:NE2	2.39	0.55
1:A:1026:VAL:HG21	1:A:1122:LEU:HD22	1.89	0.55
2:E:120:PRO:O	2:E:124:MET:HG2	2.07	0.55
1:A:1145:LYS:O	1:A:1343:ARG:NH1	2.40	0.55
1:A:1145:LYS:HB2	1:A:1148:GLU:HG3	1.90	0.54
1:A:643:GLU:O	2:B:148:THR:OG1	2.27	0.52
1:A:989:ARG:NH1	1:A:993:THR:OG1	2.43	0.52
1:A:1170:LYS:NZ	1:A:1189:ASP:O	2.35	0.51
1:A:476:SER:HA	1:A:1379:LEU:HD21	1.93	0.51
1:A:1144:LEU:HD11	1:A:1150:CYS:HB2	1.92	0.51
2:B:242:LEU:HD13	2:B:325:VAL:HG12	1.93	0.51
1:A:742:ASP:O	1:A:743:ASN:ND2	2.39	0.51

Continued on next page...



	the second se	Interatomic	Clash
Atom-1	Atom-2	distance (Å)	overlap (Å)
1:A:1173:ILE:O	1:A:1175:SER:N	2.44	0.51
1:A:454:ILE:O	1:A:454:ILE:HG13	2.11	0.50
1:A:495:ASP:OD1	1:A:691:ARG:NH1	2.44	0.50
1:A:548:PHE:HA	1:A:565:LYS:O	2.12	0.50
1:A:1141:VAL:HG21	1:A:1326:LEU:HD21	1.92	0.50
1:A:405:PHE:HD1	2:B:144:LEU:HD13	1.77	0.49
2:B:132:ASN:HA	2:E:131:LEU:HD11	1.95	0.49
1:A:694:PRO:O	1:A:702:ARG:NH2	2.46	0.48
1:A:400:ARG:NH1	2:B:178:GLU:OE2	2.46	0.48
1:A:474:ILE:HD12	1:A:583:ASP:HB3	1.95	0.48
1:A:1042:LYS:HD2	1:A:1379:LEU:HD13	1.95	0.47
1:A:1340:GLN:N	1:A:1340:GLN:OE1	2.47	0.47
1:A:521:LEU:HB3	1:A:996:ALA:HA	1.95	0.47
1:A:450:PRO:O	1:A:451:LEU:HB2	2.15	0.47
1:A:599:ARG:NH2	1:A:1287:ASN:OD1	2.46	0.47
1:A:608:GLN:HG2	1:A:734:LYS:HE3	1.97	0.47
1:A:671:GLN:HG2	2:C:175:LEU:HD22	1.97	0.47
2:D:110:ARG:HD3	2:E:111:ILE:HD11	1.96	0.47
1:A:1269:HIS:HE1	1:A:1311:ASP:HB2	1.80	0.47
1:A:515:ARG:HB2	1:A:518:GLU:OE1	2.15	0.47
1:A:173:TRP:CE2	1:A:184:GLY:HA3	2.50	0.47
2:B:118:LEU:O	2:B:121:VAL:HG22	2.15	0.46
1:A:1249:ASN:ND2	1:A:1381:TYR:OH	2.26	0.46
2:D:114:LEU:HD23	2:E:114:LEU:HD13	1.97	0.46
2:B:125:ALA:HA	2:B:128:ILE:HG22	1.97	0.46
1:A:181:ASP:HB2	1:A:192:LYS:HB3	1.97	0.46
1:A:239:MET:O	1:A:243:LEU:HG	2.16	0.45
1:A:852:ARG:NH1	1:A:1332:ARG:O	2.50	0.45
1:A:32:TYR:O	1:A:70:THR:OG1	2.29	0.44
1:A:756:THR:OG1	1:A:760:GLU:OE2	2.35	0.44
1:A:312:TYR:HA	1:A:316:LYS:HD2	1.98	0.44
1:A:507:PRO:HA	1:A:508:PRO:HD3	1.91	0.44
1:A:541:LEU:O	1:A:546:ARG:NH1	2.50	0.44
1:A:624:VAL:HG22	1:A:751:VAL:HG23	2.00	0.44
1:A:462:TYR:OH	2:B:143:ASP:OD2	2.28	0.44
1:A:153:TYR:OH	1:A:824:PRO:HD2	2.18	0.44
1:A:1023:SER:HB2	1:A:1363:TYR:CZ	2.53	0.43
1:A:451:LEU:HB3	1:A:452:PRO:HD3	2.01	0.43
1:A:1023:SER:OG	1:A:1024:THR:N	2.52	0.43
1:A:1241:LYS:O	1:A:1245:GLU:HG2	2.18	0.43
1:A:1087:SER:OG	1:A:1088:TYR:N	2.52	0.43

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	Interatomic	Clash	
Atom-1	Atom-2	distance (Å)	overlap (Å)
2:B:165:GLU:HG2	2:B:166:HIS:CE1	2.54	0.43
1:A:664:TRP:O	1:A:668:THR:HG22	2.19	0.42
2:B:311:LEU:HD12	2:B:336:LEU:HD13	2.00	0.42
1:A:940:LEU:HD11	1:A:952:LEU:HD12	2.02	0.42
2:B:292:PRO:HA	2:B:293:PRO:HD3	1.96	0.42
3:G:7:C:HO2'	3:G:8:C:H6	1.68	0.41
1:A:91:PRO:HD2	1:A:158:LEU:HD11	2.02	0.41
1:A:451:LEU:O	1:A:454:ILE:HG12	2.20	0.41
1:A:458:LEU:HD12	1:A:458:LEU:HA	1.94	0.41
1:A:1316:PHE:O	1:A:1320:ILE:HG12	2.20	0.41
1:A:377:HIS:NE2	1:A:555:LYS:HB2	2.35	0.41
1:A:739:VAL:HG22	1:A:744:GLN:HB3	2.01	0.41
2:D:134:VAL:HG22	2:E:139:VAL:HG21	2.02	0.41
2:D:141:LYS:NZ	2:E:143:ASP:HA	2.36	0.41
2:B:184:LYS:HE2	2:B:184:LYS:HB2	1.81	0.41
2:B:257:ASP:OD1	2:B:258:ILE:N	2.53	0.41
2:D:110:ARG:O	2:D:113:SER:OG	2.26	0.41
1:A:799:ILE:HG13	1:A:799:ILE:O	2.20	0.41
2:B:332:ASP:OD1	2:B:332:ASP:N	2.49	0.41
1:A:402:ILE:O	1:A:406:GLU:HG2	2.21	0.41
1:A:1163:PRO:HB3	1:A:1299:LEU:HA	2.02	0.41
1:A:61:LYS:HB3	1:A:61:LYS:HE2	1.79	0.40
1:A:1374:TYR:HB3	1:A:1380:ILE:CG2	2.50	0.40
1:A:419:TYR:CE1	1:A:427:TYR:HB3	2.56	0.40
1:A:53:LEU:HD22	1:A:59:VAL:HG21	2.03	0.40
2:C:141:LYS:HD3	2:D:142:TYR:CE2	2.56	0.40
1:A:478:LEU:HD11	1:A:1378:GLU:HG2	2.02	0.40
1:A:831:ASP:HB3	1:A:872:LEU:HD21	2.03	0.40
2:B:114:LEU:HA	2:C:114:LEU:HD12	2.03	0.40
1:A:405:PHE:CD1	2:B:144:LEU:HD13	2.56	0.40

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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.



Mol	Chain	Analysed	Favoured	Allowed	Outliers	Perce	ntiles
1	А	1354/2212~(61%)	1261 (93%)	85~(6%)	8 (1%)	25	60
2	В	234/340~(69%)	220 (94%)	14 (6%)	0	100	100
2	С	70/340~(21%)	65~(93%)	5 (7%)	0	100	100
2	D	38/340~(11%)	37~(97%)	1 (3%)	0	100	100
2	Е	40/340~(12%)	38~(95%)	2(5%)	0	100	100
All	All	1736/3572~(49%)	1621 (93%)	107 (6%)	8 (0%)	32	64

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	А	451	LEU
1	А	751	VAL
1	А	1174	VAL
1	А	851	THR
1	А	829	ILE
1	А	1281	MET
1	А	1090	ASP
1	А	1280	PHE

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent side chain 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	Percer	ntiles
1	А	1210/1994~(61%)	1209 (100%)	1 (0%)	93	98
2	В	197/294~(67%)	197~(100%)	0	100	100
2	С	55/294~(19%)	55~(100%)	0	100	100
2	D	35/294~(12%)	34~(97%)	1 (3%)	42	73
2	Е	37/294~(13%)	37~(100%)	0	100	100
All	All	1534/3170~(48%)	1532 (100%)	2(0%)	93	98



All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	А	491	ARG
2	D	119	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	А	1269	HIS
2	В	279	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	G	9/18~(50%)	3~(33%)	0

All (3) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	G	1	G
3	G	7	С
3	G	8	С

There are no RNA pucker outliers to report.

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.



There are no chirality outliers. There are no torsion outliers. There are no ring outliers.

No monomer is involved in short contacts.

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.

