



Full wwPDB EM Validation Report ⓘ

Feb 19, 2025 – 06:12 am GMT

PDB ID : 8RAM
EMDB ID : EMD-19019
Title : Structure of Sen1 bound RNA Polymerase II pre-termination complex
Authors : Rengachari, S.; Lidsreiber, M.; Cramer, P.
Deposited on : 2023-12-01
Resolution : 2.80 Å(reported)
Based on initial models : 6I59, 7NKX, ?, 2XZO

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:

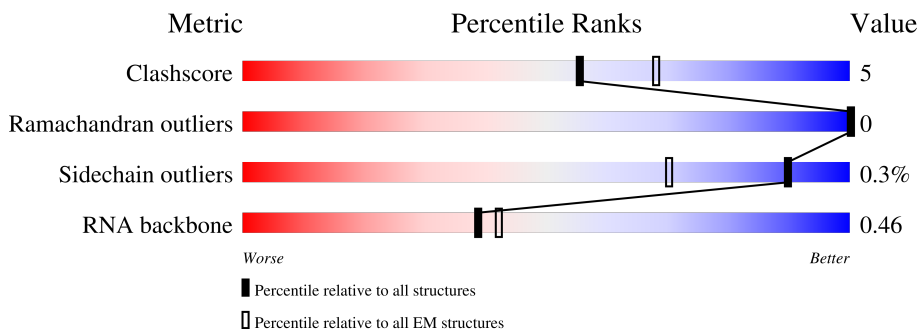
EMDB validation analysis : **FAILED**
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)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

1 Overall quality at a glance

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

The reported resolution of this entry is 2.80 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.











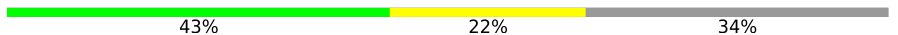
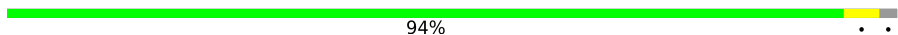

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	1733	69% (green), 12% (yellow), 19% (grey)
2	B	1224	77% (green), 14% (yellow), 9% (grey)
3	C	318	72% (green), 11% (yellow), 17% (grey)
4	D	221	64% (green), 8% (yellow), 28% (grey)
5	E	215	85% (green), 14% (yellow)
6	F	155	47% (green), 8% (yellow), 45% (grey)
7	G	171	89% (green), 11% (yellow)

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Mol	Chain	Length	Quality of chain
8	H	146	 79% 12% 9%
9	I	122	 88% 9% .
10	J	70	 84% 9% 7%
11	K	120	 81% 15% .
12	L	70	 54% 7% 39%
13	M	145	 39% 6% 55%
14	N	58	 45% . 53%
15	O	2231	 28% . 69%
16	P	35	 57% 23% . 17%
17	T	58	 43% 22% 34%
18	Y	102	 94% . .
19	Z	1063	 37% . 60%

2 Entry composition [i](#)

There are 21 unique types of molecules in this entry. The entry contains 42965 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 DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1400	11020	6948	1929	2081	62	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase II subunit RPB2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	1113	8839	5596	1553	1635	55	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	264	2078	1308	346	411	13	0	0

- Molecule 4 is a protein called DNA-directed RNA polymerase II subunit RPB4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	159	1270	788	223	257	2	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	214	1752	1111	309	321	11	0	0

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	F	85	688	439	116	130	3	0	0

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	G	171	Total	C	N	O	S	0	0
			1340	861	222	249	8		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	H	133	Total	C	N	O	S	0	0
			1068	673	180	211	4		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	I	118	Total	C	N	O	S	0	0
			964	592	178	184	10		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	J	65	Total	C	N	O	S	0	0
			532	339	93	94	6		

- Molecule 11 is a protein called DNA-directed RNA polymerase II subunit RPB11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	K	115	Total	C	N	O	S	0	1
			920	590	157	171	2		

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
12	L	43	Total	C	N	O	S	0	0
			343	211	69	59	4		

- Molecule 13 is a protein called Transcription elongation factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
13	M	65	Total	C	N	O	S	0	0
			504	311	87	101	5		

- Molecule 14 is a DNA chain called Non-template strand.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	N	27	Total	C	N	O	P	0	0
			547	262	98	160	27		

- Molecule 15 is a protein called Helicase SEN1.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	O	690	Total	C	N	O	S	0	0
			5523	3491	963	1038	31		

- Molecule 16 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	P	29	Total	C	N	O	P	0	0
			624	278	116	201	29		

- Molecule 17 is a DNA chain called Template strand.

Mol	Chain	Residues	Atoms					AltConf	Trace
17	T	38	Total	C	N	O	P	0	0
			786	374	142	232	38		

- Molecule 18 is a protein called Transcription elongation factor SPT4.

Mol	Chain	Residues	Atoms					AltConf	Trace
18	Y	100	Total	C	N	O	S	0	0
			760	474	129	147	10		

- Molecule 19 is a protein called Transcription elongation factor SPT5.

Mol	Chain	Residues	Atoms					AltConf	Trace
19	Z	429	Total	C	N	O	S	0	0
			3397	2150	605	633	9		

- Molecule 20 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
20	A	2	Total	Zn	0
			2	2	
20	B	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
20	C	1	Total 1	Zn 1	0
20	I	2	Total 2	Zn 2	0
20	J	1	Total 1	Zn 1	0
20	L	1	Total 1	Zn 1	0
20	M	1	Total 1	Zn 1	0

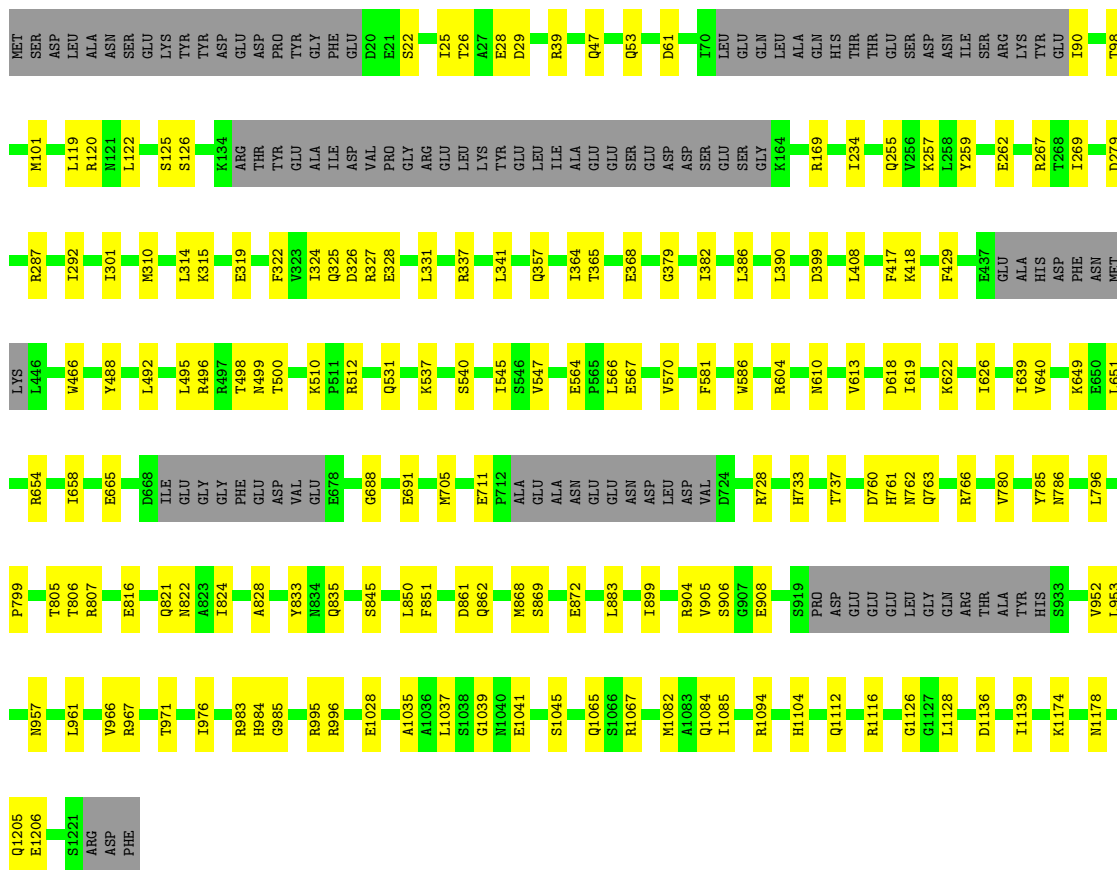
- Molecule 21 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
21	A	1	Total 1	Mg 1	0

GLU
ASN
SER
ARG

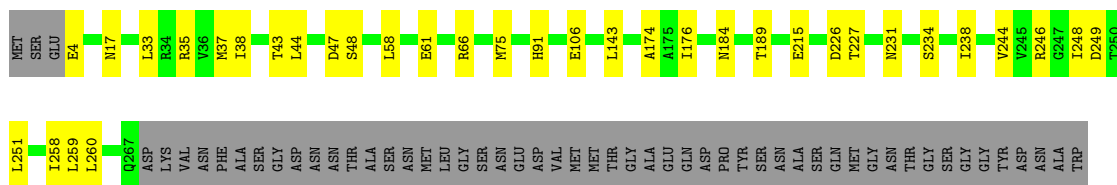
• Molecule 2: DNA-directed RNA polymerase II subunit RPB2

Chain B: 77% 14% 9%



• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

Chain C: 72% 11% 17%



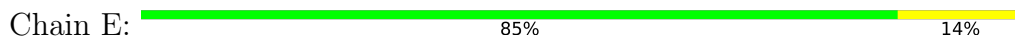
• Molecule 4: DNA-directed RNA polymerase II subunit RPB4

Chain D: 64% 8% 28%





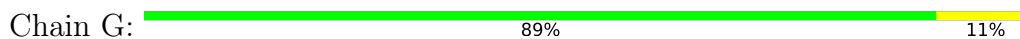
- Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1



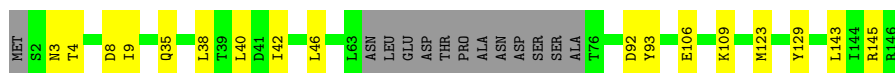
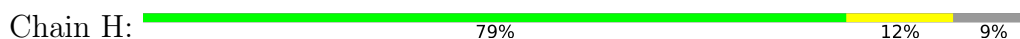
- Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2



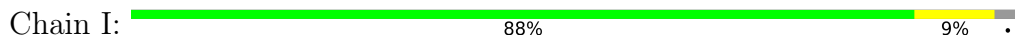
- Molecule 7: DNA-directed RNA polymerase II subunit RPB7



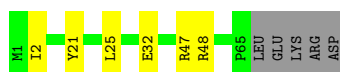
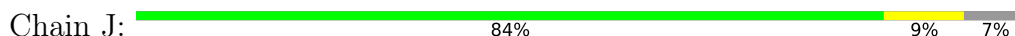
- Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3



- Molecule 9: DNA-directed RNA polymerase II subunit RPB9



- Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5



- Molecule 11: DNA-directed RNA polymerase II subunit RPB11

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	95644	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	40.02	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MG, 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).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.23	0/11217	0.39	0/15166
2	B	0.24	0/9011	0.40	0/12149
3	C	0.23	0/2116	0.40	0/2868
4	D	0.24	0/1279	0.38	0/1716
5	E	0.24	0/1788	0.38	0/2406
6	F	0.23	0/700	0.38	0/945
7	G	0.25	0/1368	0.41	0/1844
8	H	0.24	0/1086	0.43	0/1470
9	I	0.24	0/982	0.42	0/1321
10	J	0.24	0/541	0.38	0/727
11	K	0.24	0/938	0.38	0/1267
12	L	0.22	0/345	0.41	0/457
13	M	0.24	0/512	0.39	0/689
14	N	0.51	0/611	0.89	0/936
15	O	0.24	0/5625	0.37	0/7580
16	P	0.11	0/697	0.65	0/1083
17	T	0.52	0/881	0.94	0/1360
18	Y	0.23	0/776	0.39	0/1050
19	Z	0.23	0/3443	0.40	0/4632
All	All	0.25	0/43916	0.43	0/59666

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	11020	0	11104	144	0
2	B	8839	0	8896	112	0
3	C	2078	0	2041	25	0
4	D	1270	0	1287	11	0
5	E	1752	0	1776	20	0
6	F	688	0	707	7	0
7	G	1340	0	1357	12	0
8	H	1068	0	1040	14	0
9	I	964	0	922	9	0
10	J	532	0	542	5	0
11	K	920	0	929	15	0
12	L	343	0	363	4	0
13	M	504	0	480	5	0
14	N	547	0	306	1	0
15	O	5523	0	5555	34	0
16	P	624	0	315	1	0
17	T	786	0	431	11	0
18	Y	760	0	741	3	0
19	Z	3397	0	3506	28	0
20	A	2	0	0	0	0
20	B	1	0	0	0	0
20	C	1	0	0	0	0
20	I	2	0	0	0	0
20	J	1	0	0	0	0
20	L	1	0	0	0	0
20	M	1	0	0	0	0
21	A	1	0	0	0	0
All	All	42965	0	42298	410	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 5.

All (410) 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:A:956:LEU:HD13	1:A:1021:LEU:HD22	1.46	0.97
1:A:1424:VAL:HG22	1:A:1436:ILE:HD11	1.53	0.90
1:A:853:ASP:OD1	1:A:855:THR:OG1	1.95	0.83
19:Z:8:SER:HG	19:Z:11:THR:HG1	1.27	0.81
2:B:971:THR:OG1	3:C:61:GLU:OE1	2.00	0.80
15:O:1246:LYS:NZ	15:O:1292:GLU:OE2	2.14	0.80
10:J:21:TYR:OH	10:J:32:GLU:OE1	1.99	0.80
4:D:22:GLU:OE1	4:D:28:GLN:NE2	2.15	0.79
2:B:98:THR:O	2:B:126:SER:OG	1.99	0.79
19:Z:849:ASN:ND2	19:Z:869:PRO:O	2.15	0.78
2:B:287:ARG:NH1	2:B:292:ILE:O	2.17	0.78
11:K:11:LEU:O	11:K:37:LYS:NZ	2.17	0.78
2:B:906:SER:OG	19:Z:830:GLU:OE1	2.01	0.77
1:A:811:GLN:NE2	2:B:705:MET:SD	2.58	0.77
1:A:885:THR:O	1:A:940:ARG:NH1	2.18	0.77
2:B:101:MET:O	2:B:169:ARG:NH2	2.17	0.77
3:C:106:GLU:OE1	15:O:1114:ASN:ND2	2.19	0.76
13:M:37:THR:OG1	13:M:46:THR:OG1	2.04	0.76
1:A:134:ARG:NH1	1:A:221:SER:O	2.18	0.76
1:A:306:ASN:ND2	1:A:322:VAL:O	2.19	0.75
1:A:215:SER:OG	1:A:218:ASP:OD1	2.05	0.75
2:B:315:LYS:NZ	2:B:319:GLU:OE2	2.19	0.75
1:A:567:LYS:NZ	8:H:93:TYR:O	2.20	0.74
6:F:97:ARG:NE	6:F:124:GLU:OE1	2.21	0.74
1:A:782:ARG:NH2	1:A:785:PRO:O	2.20	0.73
15:O:1125:TYR:O	15:O:1173:ARG:NH1	2.22	0.73
7:G:129:SER:OG	7:G:137:ILE:O	2.07	0.73
19:Z:626:THR:OG1	19:Z:629:ASN:OD1	2.07	0.73
1:A:1394:THR:O	1:A:1399:ARG:NH1	2.23	0.72
2:B:604:ARG:NH2	2:B:691:GLU:OE2	2.23	0.72
2:B:822:ASN:O	10:J:48:ARG:NH1	2.23	0.72
2:B:862:GLN:OE1	2:B:957:ASN:ND2	2.23	0.71
1:A:1386:ARG:O	1:A:1391:ARG:NH1	2.24	0.71
2:B:26:THR:OG1	2:B:29:ASP:OD1	2.09	0.71
1:A:360:GLU:OE1	1:A:459:ARG:NH2	2.23	0.70
2:B:649:LYS:NZ	2:B:737:THR:O	2.24	0.70
15:O:1717:THR:OG1	15:O:1754:GLU:OE1	2.08	0.70
2:B:399:ASP:OD2	2:B:510:LYS:NZ	2.23	0.70
1:A:350:ARG:NH1	1:A:486:GLU:OE1	2.25	0.70
15:O:1720:GLU:OE1	15:O:1723:ARG:NH2	2.25	0.70
1:A:291:GLU:N	1:A:291:GLU:OE1	2.25	0.70
2:B:766:ARG:NH2	2:B:985:GLY:O	2.24	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:8:ASP:OD1	8:H:9:ILE:N	2.24	0.69
1:A:378:GLU:OE2	1:A:384:ASN:ND2	2.26	0.69
1:A:344:ARG:NH1	17:T:27:DT:OP1	2.25	0.69
4:D:153:ARG:NH2	4:D:182:SER:O	2.24	0.69
9:I:19:ASP:O	9:I:23:ASN:N	2.25	0.69
15:O:1758:LYS:NZ	15:O:1762:GLU:OE2	2.26	0.68
1:A:148:CYS:SG	1:A:164:ARG:NH2	2.66	0.68
1:A:317:LYS:O	17:T:35:DA:N6	2.27	0.68
2:B:53:GLN:NE2	2:B:547:VAL:O	2.26	0.68
18:Y:75:LYS:NZ	18:Y:77:ASP:OD1	2.25	0.68
1:A:114:LEU:O	1:A:164:ARG:NH1	2.27	0.68
1:A:881:GLN:HB2	1:A:956:LEU:HD12	1.76	0.68
4:D:139:LYS:O	4:D:143:ASN:ND2	2.27	0.67
15:O:1339:GLN:OE1	15:O:1365:LYS:NZ	2.28	0.67
1:A:378:GLU:OE1	1:A:434:ARG:NE	2.28	0.67
2:B:28:GLU:OE2	2:B:807:ARG:NH1	2.28	0.67
2:B:39:ARG:NH2	2:B:665:GLU:OE1	2.28	0.66
1:A:358:ASN:OD1	2:B:833:TYR:OH	2.12	0.66
1:A:446:ARG:NH1	1:A:479:ASN:O	2.29	0.65
1:A:74:MET:O	2:B:1116:ARG:NH1	2.30	0.65
7:G:85:GLU:N	7:G:85:GLU:OE1	2.29	0.65
1:A:43:GLU:O	1:A:44:THR:OG1	2.14	0.65
3:C:226:ASP:OD1	3:C:227:THR:N	2.29	0.65
1:A:711:ARG:NH1	9:I:95:THR:O	2.30	0.65
2:B:711:GLU:N	2:B:711:GLU:OE1	2.30	0.65
2:B:1065:GLN:OE1	2:B:1067:ARG:N	2.30	0.64
8:H:3:ASN:OD1	8:H:4:THR:N	2.30	0.64
15:O:1336:ASN:ND2	15:O:1655:TYR:OH	2.31	0.64
2:B:328:GLU:N	2:B:328:GLU:OE1	2.30	0.64
19:Z:860:GLU:N	19:Z:860:GLU:OE1	2.30	0.64
2:B:639:ILE:HD12	2:B:688:GLY:O	1.98	0.63
1:A:871:ASP:OD1	5:E:204:THR:OG1	2.10	0.63
2:B:639:ILE:HD11	2:B:691:GLU:HB2	1.81	0.63
2:B:908:GLU:N	2:B:908:GLU:OE1	2.32	0.62
15:O:1188:ARG:NH1	15:O:1274:LEU:O	2.32	0.62
7:G:12:THR:OG1	7:G:69:GLU:OE1	2.08	0.62
9:I:90:GLN:OE1	9:I:92:ARG:NH1	2.32	0.62
5:E:24:LYS:NZ	5:E:32:GLN:OE1	2.33	0.62
1:A:951:GLU:OE1	1:A:953:ASN:N	2.33	0.61
19:Z:854:GLU:N	19:Z:854:GLU:OE1	2.33	0.61
4:D:41:GLN:OE1	4:D:41:GLN:N	2.34	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:22:PHE:CE2	1:A:27:VAL:HG22	2.36	0.60
15:O:1191:VAL:O	15:O:1266:ARG:NH2	2.34	0.60
1:A:68:GLN:N	1:A:68:GLN:OE1	2.33	0.60
1:A:867:ILE:HD11	1:A:1000:LEU:HD11	1.82	0.60
1:A:865:GLN:NE2	1:A:1373:ASP:OD2	2.33	0.60
2:B:816:GLU:N	2:B:816:GLU:OE1	2.35	0.60
4:D:150:ASN:OD1	4:D:151:PHE:N	2.35	0.60
1:A:1318:THR:HG23	5:E:141:VAL:HG11	1.84	0.59
15:O:1654:GLN:N	15:O:1654:GLN:OE1	2.35	0.59
19:Z:870:GLN:OE1	19:Z:870:GLN:N	2.35	0.59
1:A:1168:GLU:N	1:A:1168:GLU:OE1	2.35	0.59
1:A:700:ASN:ND2	9:I:113:ASP:OD2	2.34	0.59
2:B:25:ILE:HD11	2:B:658:ILE:HG13	1.85	0.59
19:Z:28:ILE:CD1	19:Z:52:ILE:HG22	2.32	0.58
19:Z:860:GLU:O	19:Z:864:ARG:N	2.35	0.58
1:A:173:THR:OG1	1:A:184:SER:OG	2.21	0.58
1:A:547:LEU:HD22	11:K:58:PHE:CD1	2.38	0.58
2:B:310:MET:HG3	2:B:386:LEU:HD13	1.84	0.58
2:B:733:HIS:O	2:B:733:HIS:ND1	2.37	0.58
2:B:314:LEU:HD21	2:B:386:LEU:HD11	1.85	0.58
3:C:58:LEU:HD11	10:J:2:ILE:HD11	1.86	0.58
1:A:1166:ASP:O	1:A:1169:ILE:HG22	2.03	0.58
15:O:1650:LEU:HD23	15:O:1651:LEU:N	2.19	0.58
19:Z:24:GLU:OE1	19:Z:24:GLU:N	2.37	0.58
1:A:1407:GLU:N	1:A:1407:GLU:OE1	2.37	0.57
2:B:828:ALA:HB2	2:B:1085:ILE:HG23	1.87	0.57
3:C:234:SER:OG	3:C:238:ILE:O	2.08	0.57
1:A:1064:VAL:HG12	1:A:1370:LEU:HD22	1.86	0.57
1:A:348:SER:HB2	2:B:1128:LEU:HD22	1.85	0.57
1:A:1390:ASN:OD1	1:A:1391:ARG:NH2	2.37	0.57
1:A:1100:ARG:NH2	1:A:1330:ASN:OD1	2.38	0.57
2:B:287:ARG:NE	2:B:324:ILE:O	2.38	0.56
2:B:610:ASN:O	2:B:613:VAL:HG12	2.05	0.56
1:A:293:GLU:OE2	1:A:297:GLN:NE2	2.38	0.56
13:M:39:ASP:O	13:M:43:SER:N	2.38	0.56
1:A:43:GLU:OE1	1:A:43:GLU:N	2.38	0.56
1:A:154:SER:OG	1:A:157:ASP:O	2.22	0.56
2:B:899:ILE:O	2:B:952:VAL:HG21	2.05	0.56
7:G:117:GLN:N	7:G:117:GLN:OE1	2.39	0.56
5:E:36:GLU:OE1	5:E:36:GLU:N	2.37	0.56
1:A:269:ILE:O	1:A:273:ASN:ND2	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:262:GLU:OE1	2:B:267:ARG:NH2	2.39	0.56
2:B:496:ARG:NH2	2:B:540:SER:O	2.36	0.56
2:B:570:VAL:O	2:B:570:VAL:HG13	2.05	0.56
2:B:499:ASN:OD1	2:B:500:THR:N	2.39	0.56
3:C:91:HIS:O	3:C:91:HIS:ND1	2.39	0.56
5:E:33:GLU:N	5:E:33:GLU:OE1	2.38	0.56
5:E:85:GLU:N	5:E:85:GLU:OE1	2.38	0.56
1:A:845:LEU:HD21	1:A:1374:VAL:HG11	1.87	0.55
2:B:259:TYR:OH	2:B:279:ASP:OD2	2.22	0.55
15:O:1789:GLU:OE1	15:O:1789:GLU:N	2.37	0.55
1:A:1169:ILE:HG21	1:A:1239:ARG:HD3	1.87	0.55
1:A:1426:GLU:OE1	1:A:1426:GLU:N	2.37	0.55
15:O:1453:LYS:O	15:O:1456:THR:HG22	2.06	0.55
1:A:660:ASN:O	2:B:1082:MET:N	2.38	0.55
1:A:1211:GLN:OE1	1:A:1274:ARG:NH1	2.39	0.55
2:B:567:GLU:N	2:B:567:GLU:OE1	2.37	0.55
18:Y:83:GLU:OE1	18:Y:83:GLU:N	2.39	0.55
1:A:365:GLY:N	1:A:469:ARG:O	2.34	0.55
1:A:1063:MET:SD	1:A:1436:ILE:HG23	2.47	0.55
1:A:1155:ASP:OD2	1:A:1239:ARG:NH2	2.40	0.55
8:H:106:GLU:OE1	8:H:106:GLU:N	2.40	0.55
2:B:564:GLU:N	2:B:564:GLU:OE1	2.38	0.55
2:B:868:MET:O	2:B:869:SER:OG	2.19	0.55
4:D:199:ASN:OD1	4:D:200:ASN:N	2.39	0.55
14:N:45:DT:O2	17:T:16:DG:N2	2.39	0.55
15:O:1293:ARG:NH1	15:O:1570:SER:O	2.40	0.54
3:C:258:ILE:HD11	11:K:42:LEU:HD13	1.89	0.54
5:E:40:GLU:OE1	5:E:43:LYS:NZ	2.36	0.54
1:A:67:CYS:O	1:A:71:GLN:N	2.40	0.54
1:A:1070:GLN:NE2	2:B:1136:ASP:OD1	2.40	0.54
18:Y:99:VAL:HG12	18:Y:99:VAL:O	2.08	0.54
1:A:22:PHE:CD2	1:A:27:VAL:HG22	2.42	0.54
11:K:79:GLU:OE1	11:K:79:GLU:N	2.38	0.54
1:A:544:ASP:O	11:K:47:ARG:NH2	2.41	0.54
2:B:322:PHE:O	2:B:325:GLN:NE2	2.39	0.54
4:D:157:GLN:N	4:D:157:GLN:OE1	2.40	0.54
1:A:588:LEU:HD23	1:A:589:GLN:N	2.22	0.54
11:K:38:GLU:OE1	11:K:42:LEU:HD12	2.07	0.54
1:A:1423:GLY:O	1:A:1427:ASN:ND2	2.41	0.54
2:B:512:ARG:NH1	2:B:531:GLN:O	2.41	0.54
2:B:984:HIS:NE2	2:B:1028:GLU:OE1	2.40	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:47:GLN:NE2	2:B:495:LEU:O	2.41	0.53
1:A:1120:LEU:HD21	1:A:1131:ALA:HA	1.91	0.53
1:A:1446:ASP:OD1	7:G:58:ARG:NH1	2.41	0.53
15:O:1452:ILE:O	15:O:1452:ILE:HG22	2.09	0.53
5:E:168:TYR:HB3	5:E:170:LEU:HD13	1.90	0.53
2:B:996:ARG:CZ	3:C:38:ILE:HD11	2.38	0.53
3:C:215:GLU:OE1	3:C:215:GLU:N	2.39	0.53
1:A:997:LEU:O	1:A:1011:GLN:NE2	2.42	0.53
1:A:23:SER:O	1:A:27:VAL:HG23	2.08	0.53
1:A:394:ASN:ND2	1:A:400:PRO:O	2.41	0.53
2:B:995:ARG:NH2	11:K:39:ASP:OD2	2.42	0.53
2:B:872:GLU:OE1	2:B:872:GLU:N	2.41	0.52
1:A:863:VAL:O	1:A:863:VAL:HG23	2.10	0.52
2:B:1037:LEU:O	10:J:47:ARG:NH2	2.43	0.52
11:K:36:GLU:OE1	11:K:70:ARG:NE	2.42	0.52
1:A:4:GLN:N	1:A:76:GLU:OE2	2.43	0.52
2:B:357:GLN:NE2	2:B:368:GLU:OE1	2.41	0.52
3:C:17:ASN:OD1	3:C:231:ASN:ND2	2.39	0.52
1:A:593:GLU:N	1:A:593:GLU:OE1	2.40	0.52
3:C:75:MET:O	3:C:246:ARG:NH2	2.39	0.52
5:E:138:ALA:O	5:E:141:VAL:HG12	2.09	0.52
2:B:1104:HIS:NE2	2:B:1126:GLY:O	2.37	0.52
3:C:33:LEU:HD13	3:C:248:ILE:HD13	1.92	0.52
2:B:125:SER:O	2:B:169:ARG:NH2	2.42	0.52
2:B:762:ASN:OD1	2:B:763:GLN:N	2.43	0.52
1:A:577:ILE:O	1:A:580:VAL:HG22	2.09	0.51
1:A:1209:MET:HE3	1:A:1236:LEU:HD13	1.93	0.51
2:B:851:PHE:O	2:B:1094:ARG:NH1	2.44	0.51
19:Z:121:ILE:HD11	19:Z:122:TYR:CZ	2.46	0.51
1:A:120:GLU:OE1	1:A:123:ARG:NH2	2.41	0.51
1:A:977:LYS:O	1:A:1036:ARG:NH2	2.43	0.50
1:A:1279:ILE:HG23	1:A:1308:THR:CG2	2.41	0.50
3:C:259:LEU:HD21	11:K:91:CYS:HB2	1.93	0.50
1:A:1189:SER:O	1:A:1241:ARG:NH1	2.45	0.50
1:A:451:HIS:NE2	1:A:477:PRO:O	2.40	0.50
15:O:1687:PRO:O	15:O:1689:HIS:ND1	2.41	0.50
1:A:1324:PRO:O	1:A:1327:ILE:HG22	2.12	0.50
12:L:65:VAL:HG23	19:Z:832:HIS:NE2	2.26	0.50
2:B:301:ILE:HD13	2:B:379:GLY:HA2	1.94	0.50
2:B:566:LEU:HD22	2:B:586:TRP:O	2.10	0.50
2:B:806:THR:HG23	2:B:1045:SER:HA	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:H:35:GLN:OE1	8:H:35:GLN:N	2.40	0.50
2:B:1174:LYS:O	2:B:1178:ASN:N	2.44	0.49
1:A:1198:ASP:OD2	1:A:1201:ALA:N	2.44	0.49
2:B:488:TYR:CE2	2:B:492:LEU:HD11	2.47	0.49
2:B:1084:GLN:OE1	2:B:1084:GLN:N	2.42	0.49
5:E:48:ASP:OD1	5:E:51:GLY:N	2.45	0.49
15:O:1429:ASP:OD1	15:O:1433:HIS:N	2.45	0.49
1:A:1234:GLU:OE1	1:A:1234:GLU:N	2.41	0.49
1:A:894:GLU:OE2	1:A:933:TYR:OH	2.30	0.49
1:A:557:ASP:OD1	1:A:558:GLY:N	2.46	0.49
2:B:805:THR:OG1	2:B:1041:GLU:OE2	2.16	0.49
7:G:11:ILE:HD11	7:G:29:LYS:HD3	1.94	0.49
11:K:100:ALA:O	11:K:104:ASN:ND2	2.40	0.49
19:Z:732:PHE:CD1	19:Z:746:VAL:HG22	2.48	0.49
1:A:845:LEU:HD23	1:A:848:ILE:HD12	1.95	0.49
1:A:1265:ASN:ND2	1:A:1269:GLU:OE2	2.43	0.49
1:A:78:PRO:O	2:B:1205:GLN:NE2	2.45	0.48
1:A:1042:PHE:CE1	1:A:1046:LEU:HD11	2.48	0.48
19:Z:801:LEU:HD23	19:Z:802:GLY:N	2.28	0.48
2:B:326:ASP:OD1	2:B:327:ARG:N	2.46	0.48
4:D:34:GLN:N	4:D:34:GLN:OE1	2.46	0.48
8:H:109:LYS:O	8:H:129:TYR:OH	2.31	0.48
2:B:119:LEU:HD12	2:B:953:LEU:HD22	1.95	0.48
2:B:364:ILE:CD1	2:B:365:THR:HG22	2.44	0.48
2:B:640:VAL:HG22	2:B:651:LEU:CD2	2.44	0.48
9:I:60:GLN:OE1	9:I:60:GLN:N	2.41	0.48
1:A:1223:ASP:C	1:A:1224:LEU:HD12	2.33	0.48
2:B:786:ASN:O	2:B:967:ARG:NH2	2.46	0.48
2:B:952:VAL:HG22	2:B:966:VAL:HG22	1.95	0.48
15:O:1127:ARG:NH2	15:O:1134:ASP:OD1	2.43	0.48
15:O:1333:TYR:HB3	15:O:1335:LEU:HD13	1.96	0.48
1:A:1373:ASP:O	1:A:1377:THR:N	2.47	0.48
2:B:364:ILE:HD12	2:B:365:THR:HG22	1.95	0.48
2:B:904:ARG:NH1	2:B:905:VAL:O	2.47	0.48
16:P:11:C:O2	16:P:12:U:N3	2.47	0.48
11:K:37:LYS:N	11:K:69:ALA:O	2.46	0.47
3:C:37:MET:SD	3:C:244:VAL:HG12	2.53	0.47
19:Z:28:ILE:HD12	19:Z:52:ILE:HG22	1.96	0.47
1:A:414:ASP:OD1	1:A:415:LEU:N	2.47	0.47
1:A:205:GLU:OE1	1:A:205:GLU:N	2.42	0.47
2:B:824:ILE:N	2:B:824:ILE:HD12	2.28	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
17:T:9:DT:C6	17:T:10:DT:H72	2.50	0.47
1:A:571:LEU:CD1	8:H:46:LEU:HD11	2.45	0.47
1:A:917:SER:OG	1:A:918:GLU:OE1	2.30	0.47
2:B:640:VAL:HG12	2:B:649:LYS:HG3	1.97	0.47
15:O:1787:GLU:OE1	15:O:1787:GLU:N	2.47	0.47
19:Z:616:SER:O	19:Z:620:SER:N	2.47	0.47
3:C:47:ASP:OD1	12:L:70:ARG:NH1	2.46	0.47
15:O:1668:GLU:O	15:O:1671:GLN:NE2	2.48	0.47
6:F:85:MET:CE	6:F:93:ILE:HD12	2.45	0.47
8:H:40:LEU:HD13	8:H:123:MET:HB2	1.96	0.47
17:T:8:DT:H2'	17:T:9:DT:H72	1.95	0.47
19:Z:699:ASP:OD1	19:Z:703:ASN:N	2.49	0.47
15:O:1408:ILE:HD12	15:O:1408:ILE:N	2.30	0.46
1:A:790:ASP:OD2	9:I:87:GLN:N	2.49	0.46
1:A:1054:LEU:O	1:A:1057:VAL:HG12	2.16	0.46
5:E:26:ARG:NH2	5:E:133:GLU:OE1	2.48	0.46
8:H:92:ASP:O	8:H:145:ARG:NH2	2.47	0.46
1:A:356:ASP:OD1	11:K:65:HIS:NE2	2.48	0.46
1:A:675:THR:OG1	1:A:736:ASN:OD1	2.29	0.46
9:I:21:GLU:OE1	9:I:21:GLU:N	2.45	0.46
2:B:845:SER:HB3	2:B:850:LEU:HD22	1.97	0.46
12:L:40:LEU:HD21	12:L:56:LEU:HD21	1.97	0.46
2:B:234:ILE:HD13	2:B:257:LYS:HD3	1.96	0.46
2:B:785:TYR:O	2:B:967:ARG:NH1	2.48	0.46
3:C:35:ARG:NE	11:K:41:THR:OG1	2.41	0.46
5:E:136:ASN:OD1	5:E:137:GLU:N	2.48	0.46
19:Z:711:ILE:HD12	19:Z:711:ILE:C	2.36	0.46
2:B:301:ILE:HD12	2:B:382:ILE:HG21	1.97	0.46
7:G:86:VAL:HG22	7:G:146:LYS:HG2	1.98	0.45
1:A:349:ALA:O	2:B:1128:LEU:HD21	2.16	0.45
1:A:118:HIS:O	1:A:123:ARG:NH1	2.49	0.45
1:A:1412:ALA:O	1:A:1416:ALA:N	2.49	0.45
1:A:453:MET:SD	1:A:453:MET:N	2.89	0.45
1:A:1318:THR:CG2	5:E:141:VAL:HG11	2.45	0.45
1:A:709:THR:HG23	1:A:712:GLU:H	1.81	0.45
1:A:834:THR:HG21	1:A:1076:ALA:O	2.17	0.45
2:B:619:ILE:N	2:B:619:ILE:HD12	2.32	0.45
3:C:38:ILE:HB	3:C:176:ILE:HD12	1.98	0.45
2:B:1035:ALA:O	2:B:1039:GLY:N	2.42	0.45
15:O:1216:LEU:HD12	15:O:1245:ALA:O	2.17	0.45
1:A:333:GLU:OE1	1:A:333:GLU:N	2.43	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:399:HIS:O	1:A:435:HIS:ND1	2.48	0.45
1:A:352:VAL:HG12	1:A:353:ILE:N	2.33	0.44
2:B:618:ASP:O	2:B:622:LYS:N	2.50	0.44
3:C:260:LEU:HD23	3:C:260:LEU:O	2.18	0.44
1:A:68:GLN:O	1:A:71:GLN:NE2	2.50	0.44
7:G:103:VAL:HG13	7:G:103:VAL:O	2.17	0.44
4:D:45:GLU:OE1	4:D:45:GLU:N	2.50	0.44
6:F:79:ARG:NH1	6:F:145:ASP:O	2.49	0.44
1:A:800:VAL:HG11	1:A:808:LEU:HD22	1.99	0.44
1:A:830:LYS:O	1:A:834:THR:HG23	2.17	0.44
2:B:255:GLN:N	2:B:255:GLN:OE1	2.50	0.44
5:E:68:SER:O	5:E:72:PHE:N	2.45	0.44
8:H:143:LEU:N	8:H:143:LEU:HD12	2.32	0.44
1:A:868:TYR:HE1	1:A:1064:VAL:HG13	1.82	0.44
1:A:1216:ILE:HG21	1:A:1226:VAL:HG21	1.99	0.44
2:B:120:ARG:HE	2:B:122:LEU:HD11	1.81	0.44
3:C:184:ASN:ND2	3:C:189:THR:O	2.51	0.44
5:E:185:ALA:O	5:E:189:GLY:N	2.50	0.44
2:B:327:ARG:O	2:B:331:LEU:HD23	2.18	0.44
2:B:337:ARG:NH1	13:M:65:GLN:OE1	2.50	0.44
13:M:39:ASP:OD2	13:M:42:ASN:ND2	2.51	0.44
1:A:571:LEU:HD12	8:H:46:LEU:HD11	2.00	0.44
15:O:1201:VAL:HG22	15:O:1202:ALA:N	2.32	0.44
1:A:225:ASN:O	1:A:229:SER:N	2.51	0.44
1:A:465:TYR:HB3	2:B:976:ILE:HD11	2.00	0.44
1:A:1333:ILE:HD12	1:A:1333:ILE:H	1.83	0.44
2:B:310:MET:CG	2:B:386:LEU:HD13	2.47	0.44
2:B:341:LEU:HD22	19:Z:73:GLU:OE1	2.18	0.44
1:A:472:LEU:HD13	2:B:835:GLN:OE1	2.17	0.43
15:O:1565:ILE:HD12	15:O:1565:ILE:N	2.33	0.43
15:O:1710:ASN:O	15:O:1714:MET:N	2.43	0.43
2:B:581:PHE:O	2:B:626:ILE:N	2.45	0.43
2:B:760:ASP:OD1	2:B:761:HIS:ND1	2.51	0.43
4:D:130:LEU:O	4:D:130:LEU:HD23	2.18	0.43
1:A:471:ASN:O	1:A:474:VAL:HG22	2.18	0.43
1:A:1282:VAL:HG22	1:A:1308:THR:HG23	2.00	0.43
15:O:1309:GLN:O	15:O:1313:ALA:N	2.46	0.43
7:G:39:THR:O	7:G:43:GLY:N	2.51	0.43
15:O:1354:LEU:HD11	15:O:1642:MET:HB3	2.00	0.43
1:A:18:GLN:NE2	1:A:1416:ALA:O	2.51	0.43
2:B:996:ARG:NH1	3:C:174:ALA:O	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:390:LEU:O	9:I:92:ARG:NH2	2.52	0.43
1:A:1147:THR:HG22	1:A:1197:LEU:CD2	2.49	0.43
1:A:1371:LEU:O	1:A:1374:VAL:HG12	2.19	0.43
2:B:983:ARG:NH2	2:B:1028:GLU:OE2	2.44	0.43
1:A:35:ILE:HD12	1:A:35:ILE:N	2.34	0.42
1:A:181:LEU:HD12	1:A:181:LEU:O	2.19	0.42
1:A:939:ASP:OD2	1:A:1023:ARG:NH2	2.51	0.42
2:B:780:VAL:HG23	2:B:780:VAL:O	2.19	0.42
3:C:251:LEU:HD23	11:K:98:LEU:HD21	2.01	0.42
10:J:21:TYR:CE2	10:J:25:LEU:HD11	2.52	0.42
1:A:1279:ILE:HG23	1:A:1308:THR:HG21	2.00	0.42
1:A:1318:THR:HG22	1:A:1318:THR:O	2.20	0.42
15:O:1635:ASN:OD1	15:O:1636:GLN:N	2.52	0.42
19:Z:121:ILE:HD11	19:Z:122:TYR:CE2	2.54	0.42
2:B:90:ILE:HD12	2:B:90:ILE:N	2.34	0.42
5:E:26:ARG:O	5:E:155:ARG:NH2	2.47	0.42
6:F:130:ILE:HG22	6:F:132:LEU:H	1.84	0.42
8:H:40:LEU:HD21	8:H:42:ILE:HD11	2.00	0.42
17:T:13:DT:H2'	17:T:14:DG:C8	2.54	0.42
19:Z:711:ILE:HD13	19:Z:752:VAL:CG1	2.49	0.42
1:A:786:HIS:ND1	2:B:705:MET:SD	2.93	0.42
1:A:378:GLU:OE2	1:A:387:ARG:NH1	2.52	0.42
2:B:861:ASP:OD1	2:B:862:GLN:N	2.52	0.42
2:B:1112:GLN:O	2:B:1116:ARG:N	2.51	0.42
7:G:119:LEU:HD23	7:G:120:THR:N	2.35	0.42
1:A:1443:VAL:HG23	7:G:61:ILE:HB	2.02	0.42
2:B:269:ILE:HD12	2:B:269:ILE:N	2.34	0.42
15:O:1191:VAL:HG12	15:O:1192:SER:H	1.84	0.42
15:O:1733:PHE:O	15:O:1737:ASP:N	2.52	0.42
1:A:328:ARG:NH2	2:B:1206:GLU:OE2	2.52	0.42
1:A:658:LEU:HD23	1:A:658:LEU:O	2.19	0.42
1:A:808:LEU:O	2:B:728:ARG:NH2	2.53	0.42
2:B:408:LEU:HD11	2:B:545:ILE:HB	2.02	0.42
11:K:111:LEU:HD23	11:K:111:LEU:O	2.20	0.42
13:M:34:VAL:HG13	13:M:47:LEU:HD21	2.02	0.42
19:Z:79:VAL:HG11	19:Z:82:ILE:HD12	2.02	0.42
2:B:417:PHE:O	2:B:418:LYS:C	2.58	0.41
4:D:27:LEU:N	4:D:27:LEU:HD22	2.36	0.41
15:O:1235:ASP:O	15:O:1239:ALA:N	2.53	0.41
3:C:48:SER:OG	12:L:66:GLN:NE2	2.53	0.41
2:B:796:LEU:HD23	2:B:799:PRO:HA	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:33:LEU:HD13	3:C:248:ILE:CD1	2.50	0.41
5:E:128:PRO:N	5:E:129:PRO:HD2	2.36	0.41
1:A:397:ASN:HB3	19:Z:839:THR:HG21	2.02	0.41
7:G:26:LEU:O	7:G:26:LEU:HD23	2.21	0.41
8:H:38:LEU:HD21	8:H:40:LEU:HB2	2.02	0.41
17:T:40:DC:C6	17:T:41:DT:H72	2.55	0.41
19:Z:805:VAL:HG12	19:Z:847:TYR:CD1	2.55	0.41
1:A:64:ASN:C	1:A:65:LEU:HD12	2.41	0.41
5:E:77:SER:HG	5:E:105:PHE:HD2	1.68	0.41
6:F:155:LEU:N	6:F:155:LEU:HD22	2.36	0.41
3:C:43:THR:HG22	3:C:44:LEU:N	2.36	0.41
1:A:913:LEU:HD23	1:A:913:LEU:N	2.36	0.41
1:A:1006:ILE:N	1:A:1006:ILE:HD12	2.36	0.41
2:B:796:LEU:HD21	2:B:821:GLN:HG3	2.02	0.41
5:E:50:MET:SD	5:E:52:ARG:NH2	2.92	0.41
19:Z:711:ILE:HD13	19:Z:752:VAL:HG11	2.02	0.41
1:A:302:THR:HG21	1:A:314:ALA:HB2	2.03	0.41
1:A:902:LEU:HD23	1:A:902:LEU:O	2.21	0.41
1:A:1436:ILE:HD13	2:B:1139:ILE:HD12	2.01	0.41
3:C:66:ARG:NH2	3:C:143:LEU:O	2.50	0.41
17:T:11:DA:H2'	17:T:12:DT:H6	1.85	0.41
17:T:13:DT:H2'	17:T:14:DG:O4'	2.21	0.41
1:A:1063:MET:O	1:A:1067:LEU:HD13	2.20	0.41
1:A:1223:ASP:O	1:A:1243:VAL:HG22	2.21	0.41
6:F:135:ARG:NH1	6:F:145:ASP:OD2	2.54	0.41
17:T:35:DA:N3	17:T:35:DA:H2'	2.35	0.41
8:H:40:LEU:CD2	8:H:42:ILE:HD11	2.50	0.40
9:I:103:CYS:O	9:I:107:SER:N	2.50	0.40
15:O:1792:LEU:N	15:O:1792:LEU:HD12	2.37	0.40
19:Z:625:ILE:HG22	19:Z:626:THR:N	2.35	0.40
2:B:22:SER:O	2:B:654:ARG:NH1	2.52	0.40
19:Z:840:ILE:HD11	19:Z:844:LYS:HD2	2.04	0.40
1:A:199:LEU:N	1:A:199:LEU:HD12	2.36	0.40
1:A:800:VAL:CG1	1:A:808:LEU:HD22	2.52	0.40
2:B:498:THR:N	2:B:537:LYS:O	2.48	0.40
5:E:165:LEU:O	5:E:169:ARG:N	2.54	0.40
17:T:34:DC:H4'	17:T:35:DA:H5'	2.03	0.40
19:Z:600:ASP:OD1	19:Z:601:ALA:N	2.55	0.40
1:A:956:LEU:HD13	1:A:1021:LEU:CD2	2.34	0.40
6:F:89:GLU:OE2	6:F:136:ARG:NE	2.55	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	1388/1733 (80%)	1350 (97%)	38 (3%)	0	100	100
2	B	1099/1224 (90%)	1070 (97%)	29 (3%)	0	100	100
3	C	262/318 (82%)	255 (97%)	7 (3%)	0	100	100
4	D	155/221 (70%)	152 (98%)	3 (2%)	0	100	100
5	E	212/215 (99%)	210 (99%)	2 (1%)	0	100	100
6	F	83/155 (54%)	81 (98%)	2 (2%)	0	100	100
7	G	169/171 (99%)	169 (100%)	0	0	100	100
8	H	129/146 (88%)	125 (97%)	4 (3%)	0	100	100
9	I	116/122 (95%)	113 (97%)	3 (3%)	0	100	100
10	J	63/70 (90%)	63 (100%)	0	0	100	100
11	K	113/120 (94%)	113 (100%)	0	0	100	100
12	L	41/70 (59%)	40 (98%)	1 (2%)	0	100	100
13	M	63/145 (43%)	63 (100%)	0	0	100	100
15	O	684/2231 (31%)	676 (99%)	8 (1%)	0	100	100
18	Y	98/102 (96%)	98 (100%)	0	0	100	100
19	Z	417/1063 (39%)	412 (99%)	5 (1%)	0	100	100
All	All	5092/8106 (63%)	4990 (98%)	102 (2%)	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	1225/1520 (81%)	1222 (100%)	3 (0%)	92	97
2	B	964/1061 (91%)	959 (100%)	5 (0%)	86	95
3	C	232/274 (85%)	230 (99%)	2 (1%)	75	92
4	D	141/200 (70%)	140 (99%)	1 (1%)	81	94
5	E	196/197 (100%)	196 (100%)	0	100	100
6	F	75/137 (55%)	75 (100%)	0	100	100
7	G	152/152 (100%)	152 (100%)	0	100	100
8	H	117/128 (91%)	117 (100%)	0	100	100
9	I	112/116 (97%)	112 (100%)	0	100	100
10	J	60/65 (92%)	60 (100%)	0	100	100
11	K	99/102 (97%)	99 (100%)	0	100	100
12	L	38/57 (67%)	38 (100%)	0	100	100
13	M	60/131 (46%)	60 (100%)	0	100	100
15	O	615/2010 (31%)	614 (100%)	1 (0%)	92	97
18	Y	85/87 (98%)	85 (100%)	0	100	100
19	Z	376/876 (43%)	376 (100%)	0	100	100
All	All	4547/7113 (64%)	4535 (100%)	12 (0%)	90	97

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	92	HIS
1	A	470	LEU
1	A	939	ASP
2	B	61	ASP
2	B	429	PHE
2	B	466	TRP
2	B	883	LEU
2	B	961	LEU
3	C	4	GLU
3	C	249	ASP
4	D	127	ASP
15	O	1277	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	47	GLN

5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
16	P	27/35 (77%)	8 (29%)	0

All (8) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
16	P	2	G
16	P	4	C
16	P	7	G
16	P	10	U
16	P	11	C
16	P	13	A
16	P	21	G
16	P	24	A

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 10 are 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.