



Full wwPDB EM Validation Report ⓘ

Mar 16, 2025 – 02:12 PM EDT

PDB ID : 9E2Y
EMDB ID : EMD-47472
Title : Cryo-EM structure of yeast CMG helicase stalled at G4-containing DNA template, state 3
Authors : Allwein, B.; Batra, S.; Remus, D.; Hite, R.
Deposited on : 2024-10-23
Resolution : 3.20 Å(reported)
Based on initial model : .

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 : 0.0.1.dev117
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
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) : 2.41.4

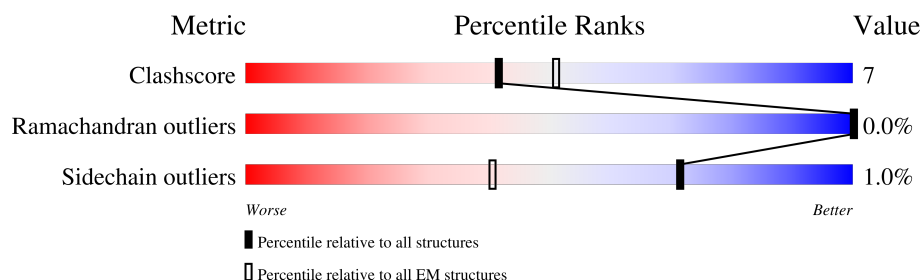
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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	208	83% 11% 6%
2	B	213	72% 16% 11%
3	C	217	71% 9% 20%
4	D	294	64% 12% 24%
5	E	650	76% 11% 13%
6	F	35	71% 29%
7	G	7	71% 29%
8	2	868	66% 9% 24%
9	3	971	56% 7% 36%

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Mol	Chain	Length	Quality of chain
10	4	933	
11	5	775	
12	6	1017	
13	7	845	
14	X	43	

2 Entry composition

There are 18 unique types of molecules in this entry. The entry contains 83461 atoms, of which 41584 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 replication complex GINS protein PSF1.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	196	Total	C	H	N	O	S	0	0
			3202	1005	1602	276	310	9		

- Molecule 2 is a protein called DNA replication complex GINS protein PSF2.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	B	189	Total	C	H	N	O	S	0	0
			3193	1014	1616	276	282	5		

- Molecule 3 is a protein called DNA replication complex GINS protein PSF3.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	C	174	Total	C	H	N	O	S	0	0
			2813	912	1413	225	257	6		

There are 23 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-22	MET	-	expression tag	UNP Q12146
C	-21	GLY	-	expression tag	UNP Q12146
C	-20	SER	-	expression tag	UNP Q12146
C	-19	SER	-	expression tag	UNP Q12146
C	-18	HIS	-	expression tag	UNP Q12146
C	-17	HIS	-	expression tag	UNP Q12146
C	-16	HIS	-	expression tag	UNP Q12146
C	-15	HIS	-	expression tag	UNP Q12146
C	-14	HIS	-	expression tag	UNP Q12146
C	-13	HIS	-	expression tag	UNP Q12146
C	-12	SER	-	expression tag	UNP Q12146
C	-11	SER	-	expression tag	UNP Q12146
C	-10	GLY	-	expression tag	UNP Q12146
C	-9	LEU	-	expression tag	UNP Q12146
C	-8	VAL	-	expression tag	UNP Q12146

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-7	PRO	-	expression tag	UNP Q12146
C	-6	ARG	-	expression tag	UNP Q12146
C	-5	GLY	-	expression tag	UNP Q12146
C	-4	SER	-	expression tag	UNP Q12146
C	-3	HIS	-	expression tag	UNP Q12146
C	-2	MET	-	expression tag	UNP Q12146
C	-1	ALA	-	expression tag	UNP Q12146
C	0	SER	-	expression tag	UNP Q12146

- Molecule 4 is a protein called DNA replication complex GINS protein SLD5.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	D	222	Total	C	H	N	O	S	0	0
			3672	1170	1843	300	347	12		

- Molecule 5 is a protein called Cell division control protein 45.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	E	566	Total	C	H	N	O	S	0	0
			9124	2922	4555	770	863	14		

- Molecule 6 is a DNA chain called Leading strand DNA template.

Mol	Chain	Residues	Atoms						AltConf	Trace
6	F	35	Total	C	H	N	O	P	0	0
			1047	347	314	133	218	35		

- Molecule 7 is a DNA chain called Lagging strand DNA template.

Mol	Chain	Residues	Atoms						AltConf	Trace
7	G	7	Total	C	H	N	O	P	0	0
			178	69	32	30	40	7		

- Molecule 8 is a protein called DNA replication licensing factor MCM2.

Mol	Chain	Residues	Atoms						AltConf	Trace
8	2	664	Total	C	H	N	O	S	0	0
			10572	3305	5305	944	999	19		

- Molecule 9 is a protein called DNA replication licensing factor MCM3.

Mol	Chain	Residues	Atoms						AltConf	Trace
9	3	618	Total	C	H	N	O	S	0	0
			9718	3044	4893	860	908	13		

- Molecule 10 is a protein called DNA replication licensing factor MCM4.

Mol	Chain	Residues	Atoms						AltConf	Trace
10	4	612	Total	C	H	N	O	S	0	0
			9785	3067	4921	838	931	28		

- Molecule 11 is a protein called Minichromosome maintenance protein 5.

Mol	Chain	Residues	Atoms						AltConf	Trace
11	5	595	Total	C	H	N	O	S	0	0
			9407	2951	4730	799	904	23		

- Molecule 12 is a protein called DNA replication licensing factor MCM6.

Mol	Chain	Residues	Atoms						AltConf	Trace
12	6	634	Total	C	H	N	O	S	0	0
			10036	3159	5031	873	948	25		

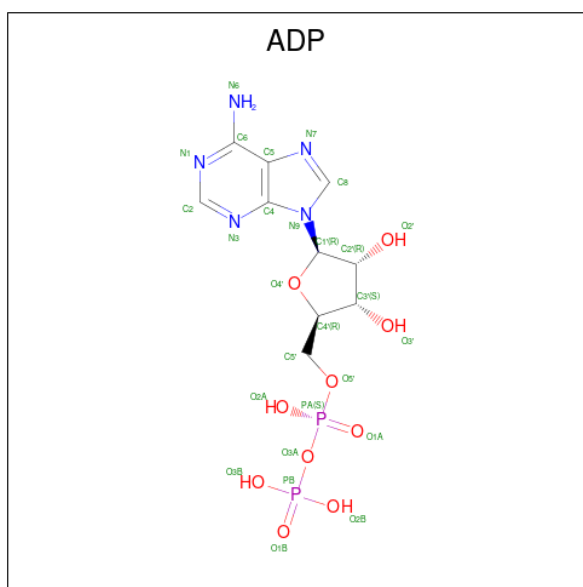
- Molecule 13 is a protein called DNA replication licensing factor MCM7.

Mol	Chain	Residues	Atoms						AltConf	Trace
13	7	615	Total	C	H	N	O	S	0	0
			9784	3075	4919	847	917	26		

- Molecule 14 is a protein called Topoisomerase 1-associated factor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	X	43	Total	C	H	N	O	0	0
			665	201	338	61	65		

- Molecule 15 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
15	2	1	Total	C	H	N	O	P	0
			39	10	12	5	10	2	

- Molecule 16 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
16	2	1	Total	Mg	0
			1	1	
16	3	1	Total	Mg	0
			1	1	
16	4	1	Total	Mg	0
			1	1	
16	5	1	Total	Mg	0
			1	1	
16	6	1	Total	Mg	0
			1	1	
16	7	1	Total	Mg	0
			1	1	

- Molecule 17 is ZINC ION (three-letter code: ZN) (formula: Zn).

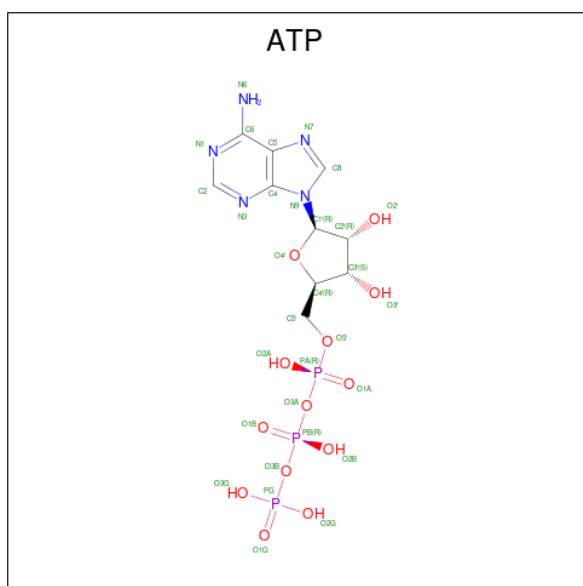
Mol	Chain	Residues	Atoms		AltConf
17	2	1	Total	Zn	0
			1	1	
17	4	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms		AltConf
17	5	1	Total	Zn	0
			1	1	
17	6	1	Total	Zn	0
			1	1	
17	7	1	Total	Zn	0
			1	1	

- Molecule 18 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).




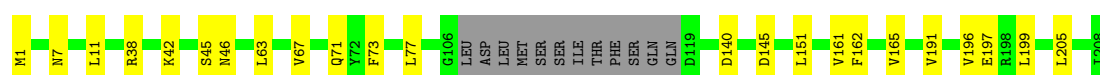
Mol	Chain	Residues	Atoms						AltConf
18	4	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
18	5	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
18	5	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
18	6	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
18	7	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	

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.

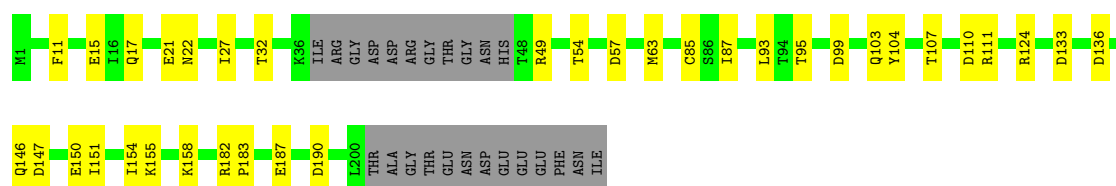
- Molecule 1: DNA replication complex GINS protein PSF1

Chain A: 



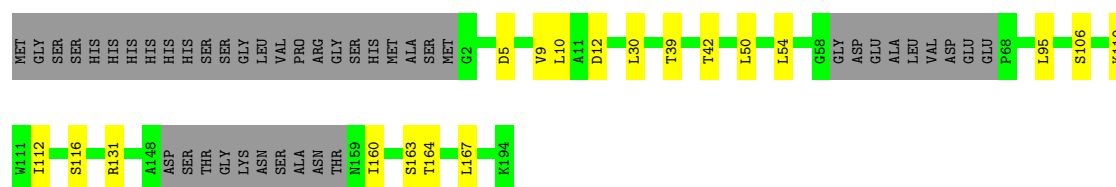
- Molecule 2: DNA replication complex GINS protein PSF2

Chain B: 



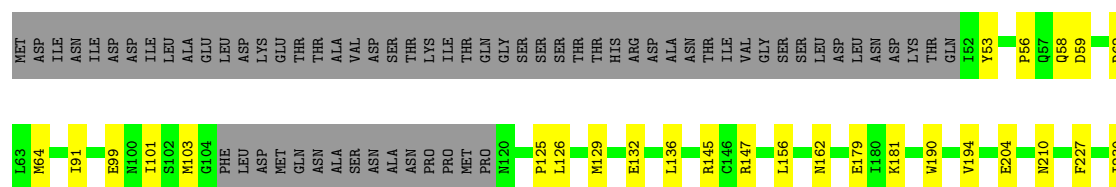
- Molecule 3: DNA replication complex GINS protein PSF3

Chain C: 

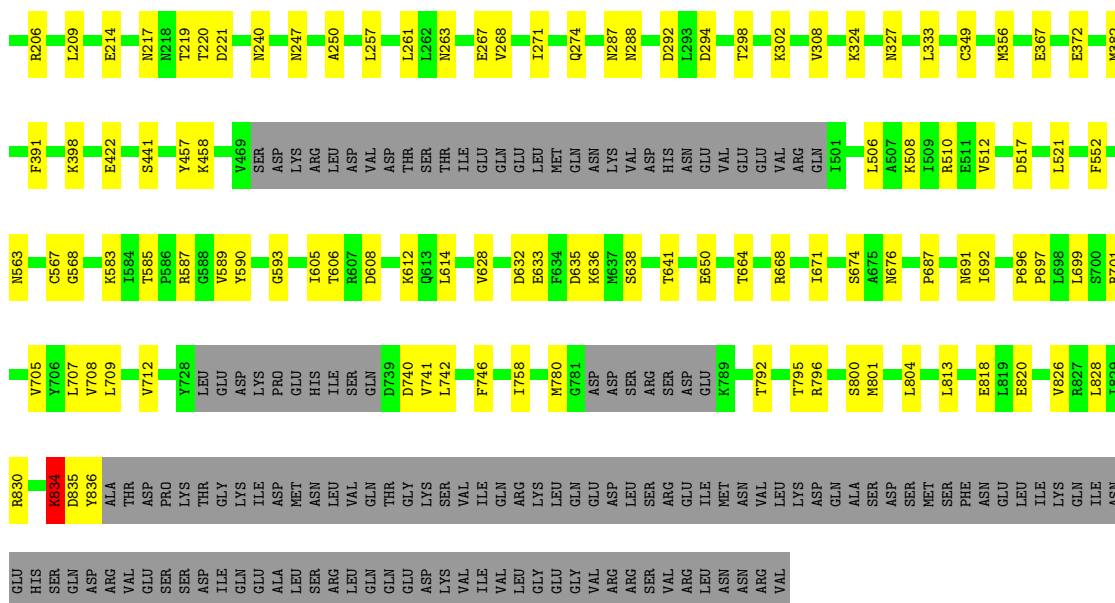


- Molecule 4: DNA replication complex GINS protein SLD5

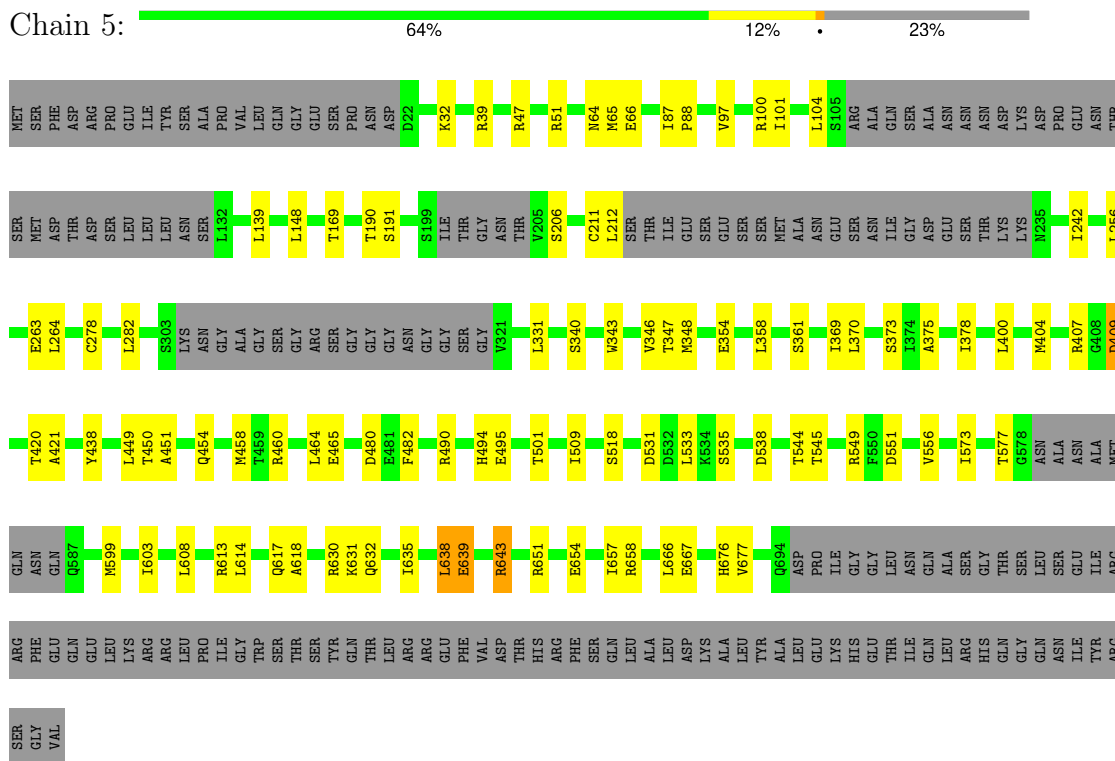
Chain D: 



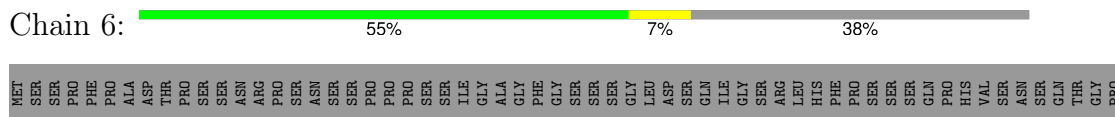


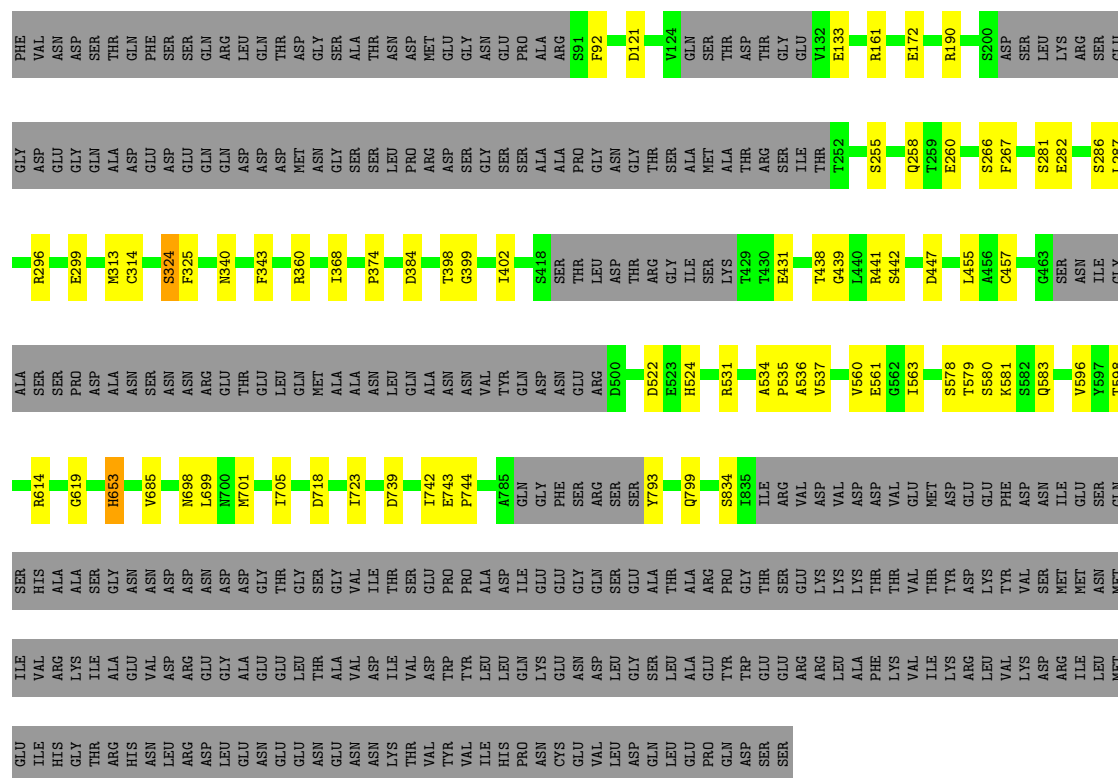


- Molecule 11: Minichromosome maintenance protein 5

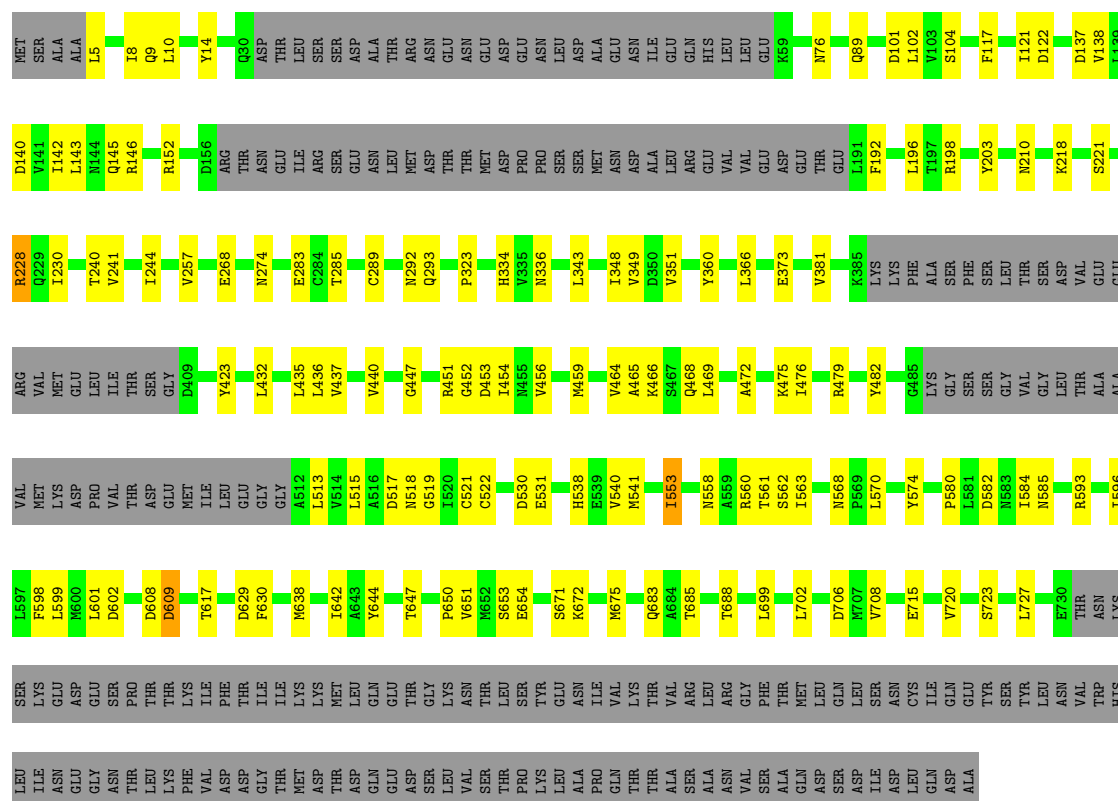


- Molecule 12: DNA replication licensing factor MCM6






• Molecule 13: DNA replication licensing factor MCM7



- Molecule 14: Topoisomerase 1-associated factor 1

Chain X:  86% 14%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	81996	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	66	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	29000	Depositor
Image detector	GATAN K3 (6k x 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, MG, ATP, ADP

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	0.27	0/1620	0.49	0/2179
2	B	0.25	0/1609	0.50	0/2177
3	C	0.27	0/1433	0.45	0/1937
4	D	0.27	0/1863	0.48	0/2517
5	E	0.30	2/4656 (0.0%)	0.51	0/6306
6	F	0.51	0/822	0.93	0/1272
7	G	0.52	0/164	0.84	0/251
8	2	0.65	15/5356 (0.3%)	0.65	8/7233 (0.1%)
9	3	0.25	0/4909	0.51	0/6657
10	4	0.27	0/4936	0.54	1/6671 (0.0%)
11	5	0.35	0/4743	0.57	0/6410
12	6	0.26	0/5086	0.51	0/6861
13	7	0.26	0/4943	0.50	0/6682
14	X	0.24	0/329	0.54	0/440
All	All	0.36	17/42469 (0.0%)	0.55	9/57593 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	2
5	E	0	3
8	2	0	7
9	3	0	3
10	4	0	3
11	5	0	7
12	6	0	2
13	7	0	1
All	All	0	28

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	2	475	SER	CA-CB	-15.56	1.29	1.52
8	2	488	SER	CA-CB	-12.56	1.34	1.52
8	2	474	PHE	C-O	-11.03	1.02	1.23
8	2	475	SER	C-O	-10.08	1.04	1.23
8	2	494	ILE	C-O	-9.90	1.04	1.23
8	2	493	ILE	C-O	-8.87	1.06	1.23
8	2	485	ARG	C-O	-6.96	1.10	1.23
8	2	480	GLU	C-O	-6.67	1.10	1.23
8	2	492	GLY	C-O	-6.33	1.13	1.23
8	2	486	LYS	C-O	-6.22	1.11	1.23
8	2	484	PHE	C-O	-6.10	1.11	1.23
8	2	496	LYS	C-O	-5.79	1.12	1.23
8	2	481	GLU	C-O	-5.78	1.12	1.23
5	E	285	ALA	C-N	-5.74	1.20	1.34
5	E	286	GLN	C-O	-5.68	1.12	1.23
8	2	476	TRP	C-O	-5.58	1.12	1.23
8	2	478	GLU	C-O	-5.11	1.13	1.23

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	4	834	LYS	C-N-CA	-8.42	100.65	121.70
8	2	495	ASP	CB-CA-C	-8.23	93.93	110.40
8	2	468	GLU	N-CA-CB	-6.79	98.38	110.60
8	2	491	ARG	CB-CA-C	-6.25	97.90	110.40
8	2	476	TRP	CA-CB-CG	6.00	125.11	113.70
8	2	483	GLU	CB-CA-C	-5.72	98.96	110.40
8	2	494	ILE	CA-C-O	-5.09	109.41	120.10
8	2	494	ILE	CA-C-N	5.06	128.34	117.20
8	2	413	ASP	CB-CG-OD1	5.06	122.86	118.30

There are no chirality outliers.

All (28) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
8	2	230	ARG	Sidechain
8	2	482	ARG	Sidechain
8	2	489	ARG	Sidechain
8	2	491	ARG	Sidechain
8	2	581	ARG	Sidechain
8	2	771	ARG	Sidechain

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Mol	Chain	Res	Type	Group
8	2	788	ARG	Sidechain
9	3	26	ARG	Sidechain
9	3	27	ARG	Sidechain
9	3	455	ARG	Sidechain
10	4	587	ARG	Sidechain
10	4	668	ARG	Sidechain
10	4	830	ARG	Sidechain
11	5	39	ARG	Sidechain
11	5	407	ARG	Sidechain
11	5	460	ARG	Sidechain
11	5	47	ARG	Sidechain
11	5	51	ARG	Sidechain
11	5	630	ARG	Sidechain
11	5	643	ARG	Sidechain
12	6	190	ARG	Sidechain
12	6	531	ARG	Sidechain
13	7	228	ARG	Sidechain
2	B	124	ARG	Sidechain
2	B	49	ARG	Sidechain
5	E	17	ARG	Sidechain
5	E	494	ARG	Sidechain
5	E	621	ARG	Sidechain

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1600	1602	1602	16	0
2	B	1577	1616	1625	26	0
3	C	1400	1413	1413	10	0
4	D	1829	1843	1844	26	0
5	E	4569	4555	4562	44	0
6	F	733	314	398	12	0
7	G	146	32	79	2	0
8	2	5267	5305	5309	56	0
9	3	4825	4893	4897	63	0
10	4	4864	4921	4937	101	0
11	5	4677	4730	4751	70	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
12	6	5005	5031	5032	51	0
13	7	4865	4919	4919	130	0
14	X	327	338	340	16	0
15	2	27	12	12	0	0
16	2	1	0	0	0	0
16	3	1	0	0	0	0
16	4	1	0	0	0	0
16	5	1	0	0	0	0
16	6	1	0	0	0	0
16	7	1	0	0	0	0
17	2	1	0	0	0	0
17	4	1	0	0	0	0
17	5	1	0	0	0	0
17	6	1	0	0	0	0
17	7	1	0	0	0	0
18	4	31	12	12	0	0
18	5	62	24	24	5	0
18	6	31	12	12	2	0
18	7	31	12	12	1	0
All	All	41877	41584	41780	553	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 7.

All (553) 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)
11:5:278:CYS:SG	11:5:282:LEU:HB2	1.51	1.48
11:5:278:CYS:SG	11:5:282:LEU:CB	2.04	1.46
10:4:458:LYS:HE2	12:6:431:GLU:O	1.16	1.33
13:7:459:MET:SD	13:7:584:ILE:HD12	1.67	1.32
13:7:538:HIS:CD2	13:7:593:ARG:NH1	2.01	1.28
9:3:211:TYR:CD2	13:7:8:ILE:HD11	1.69	1.27
13:7:464:VAL:CG2	13:7:602:ASP:OD1	1.81	1.26
10:4:240:ASN:OD1	10:4:422:GLU:OE1	1.53	1.26
13:7:570:LEU:CG	13:7:585:ASN:HD21	1.53	1.20
10:4:605:ILE:CG2	10:4:614:LEU:HD11	1.73	1.18
10:4:605:ILE:HG22	10:4:614:LEU:HD11	1.20	1.15
9:3:211:TYR:HD2	13:7:8:ILE:CD1	1.60	1.14
2:B:27:ILE:HB	2:B:85:CYS:SG	1.88	1.14
11:5:278:CYS:SG	11:5:282:LEU:HB3	1.85	1.14

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:7:570:LEU:HD12	13:7:585:ASN:ND2	1.59	1.14
13:7:570:LEU:CD1	13:7:585:ASN:ND2	2.12	1.13
13:7:570:LEU:HG	13:7:585:ASN:HD21	1.10	1.09
13:7:464:VAL:HG22	13:7:602:ASP:OD1	1.49	1.08
10:4:356:MET:CE	10:4:372:GLU:HG2	1.82	1.07
10:4:356:MET:HE2	10:4:372:GLU:HG2	1.40	1.04
13:7:538:HIS:NE2	13:7:593:ARG:NH1	2.04	1.04
13:7:538:HIS:CD2	13:7:593:ARG:HH12	1.70	1.02
13:7:570:LEU:CD1	13:7:585:ASN:HD21	1.69	1.00
10:4:458:LYS:CE	12:6:431:GLU:O	2.10	0.99
9:3:211:TYR:CD2	13:7:8:ILE:CD1	2.38	0.98
13:7:459:MET:SD	13:7:584:ILE:CD1	2.53	0.97
9:3:676:ILE:HG23	13:7:617:THR:HG21	1.45	0.96
10:4:302:LYS:NZ	14:X:356:ARG:HD3	1.81	0.95
10:4:650:GLU:OE1	10:4:701:ARG:NH1	2.02	0.92
11:5:495:GLU:OE2	11:5:501:THR:OG1	1.87	0.91
13:7:244:ILE:HG22	13:7:348:ILE:HG12	1.53	0.91
14:X:364:LEU:HD13	14:X:382:LEU:HD23	1.53	0.90
5:E:618:ALA:HB1	5:E:620:VAL:HG23	1.52	0.90
13:7:244:ILE:HG22	13:7:348:ILE:CG1	2.03	0.89
13:7:538:HIS:NE2	13:7:593:ARG:CZ	2.37	0.87
9:3:211:TYR:HD2	13:7:8:ILE:HD12	1.40	0.87
8:2:241:SER:OG	8:2:413:ASP:OD2	1.92	0.87
8:2:792:ASP:OD1	8:2:795:ARG:NH2	2.08	0.86
13:7:570:LEU:CG	13:7:585:ASN:ND2	2.36	0.86
13:7:464:VAL:HG23	13:7:602:ASP:OD1	1.74	0.85
13:7:437:VAL:HG21	13:7:702:LEU:HD21	1.57	0.85
13:7:570:LEU:HD12	13:7:585:ASN:HD22	1.36	0.85
9:3:156:SER:HB2	9:3:325:THR:HG23	1.58	0.84
9:3:685:ASP:O	9:3:689:ASP:OD2	1.96	0.84
10:4:606:THR:O	10:4:614:LEU:HD12	1.77	0.84
12:6:255:SER:OG	12:6:258:GLN:OE1	1.95	0.84
2:B:95:THR:OG1	2:B:136:ASP:OD2	1.94	0.83
9:3:685:ASP:O	9:3:689:ASP:CG	2.17	0.83
13:7:570:LEU:HG	13:7:585:ASN:ND2	1.92	0.83
10:4:302:LYS:HZ1	14:X:356:ARG:HD3	1.38	0.82
10:4:605:ILE:HG22	10:4:614:LEU:CD1	2.07	0.82
9:3:236:THR:OG1	9:3:237:GLU:OE1	1.98	0.81
11:5:375:ALA:HB1	11:5:378:ILE:HD12	1.64	0.80
13:7:538:HIS:NE2	13:7:593:ARG:NH2	2.28	0.80
8:2:785:LYS:NZ	8:2:835:ASP:OD1	2.12	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:7:685:THR:O	13:7:688:THR:OG1	2.00	0.79
10:4:356:MET:HE1	10:4:372:GLU:H	1.48	0.79
10:4:178:ARG:NH1	14:X:383:VAL:O	2.16	0.79
5:E:361:LYS:NZ	8:2:236:GLU:OE1	2.15	0.77
10:4:632:ASP:O	10:4:674:SER:OG	2.01	0.77
13:7:671:SER:OG	13:7:683:GLN:HA	1.85	0.77
4:D:91:ILE:HD11	4:D:136:LEU:HD22	1.66	0.77
12:6:743:GLU:N	12:6:743:GLU:OE1	2.19	0.76
3:C:95:LEU:O	3:C:131:ARG:NH2	2.18	0.76
13:7:244:ILE:CG2	13:7:348:ILE:HG12	2.16	0.76
13:7:459:MET:CE	13:7:584:ILE:HG23	2.15	0.76
13:7:8:ILE:HG22	13:7:9:GLN:N	2.01	0.76
9:3:569:HIS:NE2	11:5:654:GLU:OE2	2.15	0.75
5:E:578:THR:OG1	5:E:632:ILE:O	2.02	0.75
11:5:64:ASN:ND2	11:5:66:GLU:HG2	2.03	0.74
13:7:459:MET:HE1	13:7:584:ILE:HG23	1.70	0.73
2:B:182:ARG:NH2	4:D:294:ILE:O	2.21	0.73
12:6:282:GLU:N	12:6:282:GLU:OE1	2.20	0.73
8:2:576:LEU:O	8:2:577:THR:OG1	2.06	0.73
8:2:811:GLU:OE1	18:5:802:ATP:O2'	2.07	0.73
12:6:431:GLU:N	12:6:431:GLU:OE1	2.22	0.72
10:4:274:GLN:HG2	14:X:383:VAL:HG11	1.71	0.72
8:2:319:ARG:NH2	8:2:425:GLU:OE1	2.21	0.72
12:6:260:GLU:N	12:6:260:GLU:OE1	2.21	0.72
13:7:538:HIS:CE1	13:7:593:ARG:HH12	2.07	0.72
5:E:620:VAL:HG22	5:E:632:ILE:HD13	1.70	0.72
11:5:263:GLU:OE1	11:5:264:LEU:HD22	1.90	0.72
12:6:799:GLN:N	12:6:799:GLN:OE1	2.23	0.72
10:4:705:VAL:HG11	10:4:836:TYR:CD1	2.25	0.71
9:3:306:MET:O	11:5:206:SER:OG	2.07	0.71
12:6:561:GLU:OE2	12:6:563:ILE:HD12	1.90	0.71
13:7:644:TYR:O	13:7:647:THR:OG1	2.06	0.71
10:4:356:MET:HE1	10:4:372:GLU:HG2	1.70	0.71
13:7:519:GLY:O	13:7:561:THR:OG1	2.05	0.71
13:7:720:VAL:O	13:7:723:SER:OG	2.09	0.71
5:E:16:LEU:O	5:E:20:SER:OG	2.04	0.70
8:2:494:ILE:O	8:2:498:ILE:HD12	1.92	0.70
10:4:705:VAL:HG11	10:4:836:TYR:CE1	2.27	0.70
12:6:522:ASP:OD1	12:6:524:HIS:N	2.24	0.70
10:4:302:LYS:HZ2	14:X:356:ARG:CZ	2.05	0.70
2:B:110:ASP:OD1	2:B:110:ASP:O	2.10	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:3:211:TYR:CE2	13:7:8:ILE:HD11	2.28	0.69
9:3:674:GLU:N	9:3:674:GLU:OE1	2.26	0.69
11:5:551:ASP:OD2	11:5:658:ARG:NH1	2.25	0.69
11:5:535:SER:OG	11:5:538:ASP:OD2	2.04	0.69
10:4:356:MET:CE	10:4:372:GLU:CG	2.67	0.69
11:5:211:CYS:SG	11:5:212:LEU:N	2.65	0.68
13:7:221:SER:O	13:7:240:THR:OG1	2.09	0.68
5:E:7:GLN:N	5:E:7:GLN:OE1	2.26	0.68
10:4:593:GLY:O	10:4:636:LYS:NZ	2.26	0.68
8:2:184:GLU:OE1	8:2:184:GLU:N	2.26	0.68
10:4:795:THR:OG1	12:6:578:SER:OG	2.11	0.68
5:E:295:LEU:O	5:E:299:VAL:HG23	1.94	0.68
13:7:230:ILE:HD11	13:7:241:VAL:HG22	1.76	0.67
13:7:464:VAL:HG23	13:7:602:ASP:CG	2.15	0.67
10:4:458:LYS:HE2	12:6:431:GLU:C	2.11	0.67
13:7:466:LYS:NZ	13:7:568:ASN:OD1	2.27	0.67
3:C:163:SER:O	3:C:167:LEU:HD23	1.94	0.67
11:5:242:ILE:HD12	11:5:242:ILE:O	1.94	0.67
9:3:676:ILE:HD12	13:7:617:THR:CG2	2.25	0.66
4:D:190:TRP:O	4:D:194:VAL:HG22	1.95	0.66
2:B:27:ILE:HB	2:B:85:CYS:HG	1.60	0.66
8:2:612:MET:HB3	8:2:617:ARG:HG3	1.78	0.66
10:4:302:LYS:NZ	14:X:356:ARG:NH1	2.43	0.66
10:4:333:LEU:HD21	13:7:553:ILE:HD11	1.77	0.66
11:5:369:ILE:O	11:5:373:SER:OG	2.13	0.66
9:3:555:GLU:N	9:3:555:GLU:OE1	2.29	0.66
13:7:530:ASP:OD1	13:7:531:GLU:N	2.29	0.66
9:3:312:ASN:O	9:3:313:THR:OG1	2.11	0.65
9:3:156:SER:HB2	9:3:325:THR:CG2	2.26	0.65
11:5:635:ILE:HA	11:5:638:LEU:HD23	1.78	0.65
13:7:456:VAL:HG22	13:7:596:ILE:CG2	2.25	0.65
13:7:283:GLU:N	13:7:283:GLU:OE1	2.29	0.65
9:3:716:ARG:NH2	9:3:722:ASN:OD1	2.29	0.65
10:4:367:GLU:OE2	12:6:441:ARG:N	2.30	0.65
9:3:400:ARG:NH1	9:3:402:ASP:O	2.29	0.65
10:4:458:LYS:NZ	12:6:431:GLU:HB3	2.12	0.64
5:E:636:ASP:OD1	5:E:636:ASP:O	2.16	0.64
9:3:235:ASP:OD1	9:3:236:THR:N	2.31	0.64
2:B:190:ASP:OD1	4:D:227:PHE:HD2	1.81	0.64
13:7:152:ARG:NH1	14:X:372:THR:OG1	2.31	0.64
13:7:244:ILE:HG22	13:7:348:ILE:HG13	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:4:214:GLU:N	10:4:214:GLU:OE1	2.30	0.63
11:5:614:LEU:HD11	11:5:657:ILE:HG23	1.80	0.63
5:E:576:THR:O	5:E:576:THR:HG22	1.98	0.63
9:3:578:GLU:OE2	11:5:613:ARG:NH2	2.32	0.63
11:5:617:GLN:OE1	11:5:617:GLN:N	2.30	0.63
8:2:423:GLU:N	8:2:423:GLU:OE1	2.32	0.63
12:6:299:GLU:N	12:6:299:GLU:OE1	2.32	0.62
11:5:420:THR:HG21	11:5:556:VAL:HG11	1.81	0.62
9:3:244:GLU:OE1	13:7:14:TYR:OH	2.16	0.62
8:2:413:ASP:OD1	8:2:413:ASP:O	2.16	0.62
10:4:294:ASP:O	10:4:298:THR:HG23	1.99	0.62
13:7:8:ILE:CG2	13:7:9:GLN:N	2.62	0.62
11:5:421:ALA:N	18:5:802:ATP:O1A	2.31	0.62
12:6:324:SER:OG	12:6:325:PHE:N	2.32	0.62
4:D:281:VAL:HG23	4:D:282:ILE:HG23	1.81	0.61
10:4:585:THR:HG21	10:4:628:VAL:HB	1.82	0.61
8:2:202:ASN:OD1	8:2:203:VAL:N	2.33	0.61
10:4:512:VAL:HG11	10:4:746:PHE:CZ	2.35	0.61
13:7:122:ASP:OD2	13:7:198:ARG:NH1	2.34	0.61
10:4:333:LEU:HD21	13:7:553:ILE:CD1	2.30	0.61
12:6:266:SER:OG	12:6:457:CYS:O	2.11	0.61
5:E:618:ALA:CB	5:E:620:VAL:HG23	2.27	0.61
8:2:491:ARG:O	8:2:491:ARG:HG3	1.99	0.61
13:7:456:VAL:HG22	13:7:596:ILE:HG22	1.81	0.61
4:D:147:ARG:NE	4:D:179:GLU:OE2	2.28	0.61
5:E:577:ASP:OD1	5:E:634:ARG:NE	2.33	0.61
1:A:140:ASP:OD2	4:D:181:LYS:HE2	2.01	0.60
10:4:302:LYS:NZ	14:X:356:ARG:CD	2.59	0.60
13:7:89:GLN:OE1	13:7:102:LEU:N	2.31	0.60
4:D:99:GLU:O	4:D:103:MET:HG2	2.02	0.60
9:3:169:ARG:NH1	9:3:260:GLU:OE1	2.35	0.60
5:E:126:HIS:O	5:E:127:ARG:NE	2.34	0.60
4:D:243:ASP:OD1	4:D:246:LEU:N	2.34	0.59
9:3:277:ILE:HD12	9:3:320:LEU:HD13	1.84	0.59
11:5:354:GLU:O	11:5:358:LEU:HD12	2.03	0.59
11:5:370:LEU:HD12	11:5:666:LEU:CD1	2.33	0.59
1:A:145:ASP:OD1	1:A:145:ASP:O	2.21	0.59
9:3:412:SER:OG	11:5:651:ARG:NH1	2.36	0.58
1:A:67:VAL:HG12	1:A:71:GLN:NE2	2.17	0.58
2:B:32:THR:HG23	2:B:32:THR:O	2.03	0.58
11:5:346:VAL:HG22	11:5:608:LEU:HB3	1.86	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:7:285:THR:HG22	13:7:285:THR:O	2.02	0.58
2:B:54:THR:OG1	4:D:132:GLU:OE2	2.15	0.58
10:4:240:ASN:OD1	10:4:422:GLU:CD	2.39	0.58
2:B:11:PHE:HA	2:B:15:GLU:OE1	2.04	0.58
8:2:189:VAL:HG21	8:2:194:TYR:HE1	1.69	0.58
9:3:676:ILE:O	9:3:680:VAL:HG13	2.03	0.57
8:2:670:THR:HG22	8:2:671:GLU:H	1.69	0.57
13:7:8:ILE:CG2	13:7:9:GLN:H	2.17	0.57
2:B:147:ASP:OD2	11:5:100:ARG:NH2	2.37	0.57
11:5:278:CYS:SG	11:5:282:LEU:C	2.82	0.57
13:7:653:SER:OG	13:7:654:GLU:N	2.37	0.57
8:2:481:GLU:OE1	8:2:769:TYR:HE2	1.88	0.57
10:4:583:LYS:NZ	13:7:447:GLY:O	2.37	0.57
12:6:172:GLU:O	12:6:286:SER:OG	2.22	0.57
12:6:685:VAL:HG12	12:6:698:ASN:O	2.03	0.57
2:B:104:TYR:OH	2:B:111:ARG:NH1	2.38	0.57
5:E:434:VAL:HG22	5:E:434:VAL:O	2.04	0.56
12:6:534:ALA:O	12:6:537:VAL:HG22	2.05	0.56
3:C:5:ASP:O	3:C:9:VAL:HG23	2.05	0.56
10:4:638:SER:O	10:4:641:THR:OG1	2.19	0.56
10:4:740:ASP:OD1	10:4:741:VAL:N	2.38	0.56
13:7:538:HIS:CD2	13:7:593:ARG:CZ	2.84	0.56
1:A:7:ASN:O	1:A:11:LEU:HD23	2.05	0.56
6:F:30:DT:H2"	6:F:31:DC:C6	2.41	0.56
9:3:467:ARG:HG3	9:3:467:ARG:O	2.05	0.56
11:5:340:SER:HA	11:5:343:TRP:CE2	2.40	0.56
13:7:228:ARG:NH1	13:7:323:PRO:HG2	2.20	0.56
5:E:230:ILE:O	5:E:234:GLU:HG2	2.05	0.56
8:2:795:ARG:O	8:2:798:ILE:HG22	2.06	0.55
8:2:477:THR:HG22	8:2:478:GLU:H	1.72	0.55
1:A:42:LYS:O	1:A:46:ASN:OD1	2.24	0.55
10:4:508:LYS:O	10:4:512:VAL:HG13	2.07	0.55
10:4:302:LYS:NZ	14:X:356:ARG:CZ	2.69	0.55
11:5:549:ARG:NH1	18:5:801:ATP:O3G	2.39	0.55
4:D:210:ASN:OD1	4:D:210:ASN:O	2.24	0.55
5:E:19:SER:HG	5:E:80:SER:HG	1.45	0.55
10:4:302:LYS:HZ1	14:X:356:ARG:HH11	1.54	0.55
12:6:368:ILE:HD11	12:6:374:PRO:HB3	1.87	0.55
12:6:255:SER:O	12:6:258:GLN:NE2	2.40	0.55
12:6:653:HIS:CE1	12:6:705:ILE:HD11	2.42	0.55
13:7:437:VAL:HG21	13:7:702:LEU:CD2	2.34	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:7:137:ASP:OD2	13:7:140:ASP:N	2.37	0.54
13:7:574:TYR:CD2	13:7:601:LEU:HD11	2.43	0.54
6:F:53:DT:H1'	6:F:54:DT:C5	2.42	0.54
11:5:573:ILE:O	11:5:577:THR:HG23	2.07	0.54
13:7:562:SER:C	13:7:563:ILE:HD12	2.27	0.54
6:F:30:DT:H2''	6:F:31:DC:H6	1.73	0.54
10:4:333:LEU:HD22	10:4:398:LYS:HD2	1.90	0.54
10:4:708:VAL:O	10:4:708:VAL:HG13	2.08	0.54
10:4:818:GLU:N	10:4:818:GLU:OE1	2.40	0.54
13:7:432:LEU:CD1	13:7:469:LEU:HD12	2.37	0.54
5:E:622:ILE:O	5:E:622:ILE:HG22	2.08	0.54
11:5:420:THR:CG2	11:5:556:VAL:HG11	2.37	0.54
1:A:140:ASP:OD2	4:D:181:LYS:NZ	2.41	0.54
10:4:705:VAL:CG1	10:4:836:TYR:CD1	2.90	0.54
13:7:274:ASN:OD1	13:7:274:ASN:N	2.41	0.54
11:5:667:GLU:OE2	11:5:676:HIS:NE2	2.28	0.53
9:3:682:ASN:OD1	9:3:730:ALA:HB1	2.08	0.53
10:4:308:VAL:H	10:4:327:ASN:HD21	1.55	0.53
10:4:707:LEU:HD12	10:4:709:LEU:HD11	1.90	0.53
8:2:314:LEU:O	8:2:315:SER:OG	2.24	0.53
8:2:612:MET:HB3	8:2:617:ARG:CG	2.38	0.53
1:A:1:MET:CE	3:C:30:LEU:HD23	2.38	0.53
8:2:510:ASP:OD1	8:2:510:ASP:N	2.42	0.53
10:4:512:VAL:HG11	10:4:746:PHE:HZ	1.73	0.53
10:4:780:MET:HG2	10:4:792:THR:HG21	1.90	0.53
11:5:449:LEU:O	11:5:450:THR:OG1	2.19	0.53
13:7:699:LEU:HD11	13:7:715:GLU:HG2	1.90	0.53
2:B:103:GLN:O	2:B:107:THR:HG23	2.07	0.53
5:E:620:VAL:HG22	5:E:632:ILE:CD1	2.36	0.53
8:2:824:ARG:NH1	8:2:833:ASP:OD2	2.40	0.53
5:E:328:LEU:O	5:E:332:SER:OG	2.26	0.53
10:4:356:MET:HE2	10:4:372:GLU:CG	2.25	0.53
4:D:249:ASN:OD1	4:D:253:LYS:N	2.41	0.53
5:E:573:ASP:OD1	5:E:573:ASP:N	2.42	0.53
13:7:513:LEU:HD11	13:7:540:VAL:HG21	1.90	0.53
10:4:333:LEU:HD23	10:4:333:LEU:O	2.09	0.53
10:4:834:LYS:O	10:4:835:ASP:C	2.45	0.53
8:2:612:MET:HB2	8:2:617:ARG:HD3	1.90	0.52
10:4:563:ASN:OD1	10:4:671:ILE:HB	2.09	0.52
10:4:209:LEU:HD22	10:4:250:ALA:HA	1.92	0.52
13:7:440:VAL:HG11	13:7:452:GLY:CA	2.39	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:101:GLN:O	5:E:104:VAL:HG12	2.09	0.52
10:4:633:GLU:OE1	10:4:636:LYS:NZ	2.41	0.52
13:7:292:ASN:O	13:7:292:ASN:ND2	2.43	0.52
10:4:217:ASN:ND2	10:4:220:THR:OG1	2.43	0.52
13:7:538:HIS:CE1	13:7:593:ARG:HH22	2.27	0.52
12:6:340:ASN:ND2	12:6:343:PHE:O	2.33	0.52
2:B:22:ASN:HD22	4:D:64:MET:CE	2.23	0.52
3:C:112:ILE:O	3:C:116:SER:N	2.42	0.52
4:D:204:GLU:OE1	4:D:204:GLU:N	2.39	0.52
10:4:190:CYS:SG	10:4:257:LEU:HD13	2.49	0.52
13:7:146:ARG:NH2	13:7:268:GLU:O	2.43	0.52
8:2:482:ARG:HH11	8:2:482:ARG:HG3	1.75	0.51
9:3:362:ILE:O	9:3:366:SER:OG	2.27	0.51
9:3:697:ILE:HD11	9:3:737:LEU:HD13	1.91	0.51
10:4:650:GLU:OE1	10:4:701:ARG:CZ	2.57	0.51
10:4:796:ARG:NH2	18:6:1101:ATP:O1A	2.43	0.51
13:7:699:LEU:HD11	13:7:715:GLU:CG	2.40	0.51
13:7:8:ILE:HG22	13:7:9:GLN:H	1.70	0.51
5:E:435:GLY:O	5:E:436:ASN:CB	2.57	0.51
10:4:302:LYS:HZ3	14:X:356:ARG:HD3	1.74	0.51
13:7:143:LEU:HD13	13:7:192:PHE:CZ	2.46	0.51
13:7:435:LEU:HD13	13:7:454:ILE:O	2.10	0.51
2:B:27:ILE:CD1	2:B:85:CYS:SG	2.99	0.51
8:2:511:ILE:HD11	8:2:683:VAL:CG2	2.41	0.51
11:5:347:THR:OG1	11:5:348:MET:HG2	2.10	0.51
1:A:161:VAL:HG23	1:A:162:PHE:HD1	1.76	0.51
5:E:612:ILE:HD12	5:E:644:LEU:HD12	1.92	0.51
10:4:567:CYS:SG	10:4:692:ILE:HD13	2.50	0.51
9:3:299:LYS:HD3	9:3:322:LEU:HD11	1.93	0.51
13:7:538:HIS:CG	13:7:593:ARG:HH12	2.20	0.51
8:2:178:ARG:O	8:2:205:ARG:NH1	2.44	0.51
10:4:521:LEU:HD21	10:4:742:LEU:HD11	1.93	0.51
1:A:140:ASP:OD2	4:D:181:LYS:CE	2.58	0.50
10:4:635:ASP:OD2	10:4:676:ASN:O	2.29	0.50
13:7:479:ARG:NE	13:7:517:ASP:O	2.44	0.50
4:D:53:TYR:OH	4:D:56:PRO:HD3	2.11	0.50
13:7:203:TYR:OH	13:7:336:ASN:O	2.26	0.50
5:E:296:GLN:HG2	5:E:320:ILE:HD13	1.92	0.50
9:3:313:THR:O	9:3:314:LEU:HD12	2.12	0.50
9:3:413:THR:O	9:3:413:THR:HG22	2.12	0.50
13:7:563:ILE:HD12	13:7:563:ILE:N	2.27	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:4:302:LYS:HZ1	14:X:356:ARG:NH1	2.07	0.50
10:4:687:PRO:O	10:4:691:ASN:ND2	2.42	0.50
10:4:758:ILE:HG12	10:4:813:LEU:HD23	1.92	0.50
6:F:49:DT:O4	12:6:360:ARG:NH1	2.45	0.50
10:4:356:MET:SD	10:4:372:GLU:CD	2.91	0.50
4:D:125:PRO:O	4:D:129:MET:HG3	2.12	0.50
6:F:31:DC:C2'	6:F:32:DT:H71	2.42	0.50
8:2:422:GLU:OE2	8:2:458:ARG:NH1	2.45	0.50
13:7:570:LEU:CD1	13:7:585:ASN:HD22	2.03	0.49
12:6:742:ILE:HG22	12:6:744:PRO:HD3	1.92	0.49
13:7:464:VAL:HG23	13:7:602:ASP:OD2	2.11	0.49
6:F:40:DG:C2	11:5:458:MET:SD	3.06	0.49
9:3:676:ILE:HG23	13:7:617:THR:CG2	2.29	0.49
11:5:139:LEU:HD12	11:5:331:LEU:HD13	1.94	0.49
11:5:409:ASP:OD2	11:5:518:SER:OG	2.29	0.49
1:A:199:LEU:HB3	1:A:205:LEU:HD13	1.92	0.49
2:B:17:GLN:NE2	2:B:21:GLU:OE2	2.46	0.49
11:5:278:CYS:SG	11:5:282:LEU:O	2.71	0.49
11:5:638:LEU:HG	11:5:639:GLU:N	2.27	0.49
12:6:133:GLU:N	12:6:133:GLU:OE1	2.45	0.49
8:2:863:ILE:N	8:2:863:ILE:HD12	2.27	0.49
9:3:210:HIS:HB3	13:7:5:LEU:HD12	1.95	0.49
10:4:614:LEU:HB3	12:6:296:ARG:HH22	1.77	0.49
12:6:560:VAL:HG22	12:6:560:VAL:O	2.11	0.49
13:7:8:ILE:HG22	13:7:10:LEU:HD12	1.93	0.49
11:5:278:CYS:SG	11:5:282:LEU:CA	2.92	0.49
9:3:185:ILE:HD11	9:3:261:MET:SD	2.53	0.49
9:3:687:ARG:HD3	13:7:609:ASP:OD2	2.12	0.49
10:4:267:GLU:O	10:4:271:ILE:HG23	2.13	0.49
13:7:596:ILE:HD11	13:7:720:VAL:HA	1.95	0.49
4:D:280:GLU:O	4:D:280:GLU:OE1	2.31	0.49
11:5:450:THR:OG1	11:5:451:ALA:N	2.46	0.49
9:3:554:ASN:OD1	9:3:555:GLU:N	2.44	0.49
4:D:91:ILE:HD11	4:D:136:LEU:CD2	2.40	0.48
5:E:292:TYR:OH	5:E:407:ASP:O	2.20	0.48
11:5:64:ASN:ND2	11:5:66:GLU:CG	2.74	0.48
8:2:364:CYS:SG	8:2:367:CYS:N	2.85	0.48
10:4:219:THR:HG23	10:4:220:THR:N	2.28	0.48
11:5:438:TYR:OH	11:5:480:ASP:OD2	2.31	0.48
11:5:654:GLU:OE1	18:5:801:ATP:O2'	2.30	0.48
8:2:307:ARG:NH1	8:2:392:GLU:OE1	2.45	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:5:64:ASN:ND2	11:5:66:GLU:OE2	2.46	0.48
5:E:99:ASP:OD1	5:E:101:GLN:N	2.45	0.48
10:4:506:LEU:O	10:4:510:ARG:HG2	2.14	0.48
10:4:521:LEU:HD21	10:4:742:LEU:CD1	2.44	0.48
12:6:614:ARG:NE	12:6:619:GLY:O	2.46	0.48
2:B:27:ILE:HD12	2:B:85:CYS:SG	2.54	0.48
6:F:51:DG:OP1	10:4:612:LYS:NZ	2.45	0.48
9:3:672:THR:O	9:3:676:ILE:HG12	2.13	0.48
9:3:211:TYR:CD2	13:7:8:ILE:HD12	2.31	0.48
5:E:230:ILE:HG22	5:E:234:GLU:OE2	2.13	0.48
9:3:568:THR:HG23	11:5:400:LEU:HD11	1.95	0.48
13:7:101:ASP:OD2	13:7:104:SER:OG	2.15	0.47
13:7:464:VAL:CG2	13:7:602:ASP:CG	2.69	0.47
4:D:58:GLN:O	4:D:62:ASP:OD1	2.31	0.47
8:2:762:LEU:HD13	8:2:762:LEU:O	2.14	0.47
1:A:191:VAL:HG21	1:A:196:VAL:HG11	1.96	0.47
11:5:190:THR:HG22	11:5:191:SER:H	1.79	0.47
8:2:783:MET:HG3	11:5:573:ILE:HG21	1.97	0.47
1:A:63:LEU:HD21	1:A:71:GLN:HE22	1.79	0.47
2:B:87:ILE:N	2:B:133:ASP:OD2	2.47	0.47
8:2:493:ILE:O	8:2:494:ILE:C	2.44	0.47
9:3:277:ILE:CD1	9:3:320:LEU:HD13	2.45	0.47
10:4:567:CYS:SG	10:4:692:ILE:CD1	3.03	0.47
10:4:608:ASP:O	10:4:612:LYS:N	2.47	0.47
12:6:402:ILE:CD1	12:6:455:LEU:HD13	2.45	0.47
13:7:138:VAL:HG12	13:7:142:ILE:HD12	1.97	0.47
10:4:302:LYS:HZ2	14:X:356:ARG:NH1	2.09	0.47
11:5:65:MET:HE2	11:5:139:LEU:HD13	1.97	0.47
13:7:210:ASN:OD1	13:7:210:ASN:N	2.48	0.47
10:4:292:ASP:OD1	10:4:294:ASP:N	2.48	0.47
8:2:676:ARG:NH2	18:5:802:ATP:O1G	2.45	0.46
9:3:685:ASP:O	9:3:689:ASP:OD1	2.33	0.46
12:6:438:THR:OG1	12:6:439:GLY:N	2.47	0.46
12:6:581:LYS:NZ	18:6:1101:ATP:O2G	2.45	0.46
11:5:632:GLN:HA	11:5:635:ILE:HG12	1.97	0.46
12:6:287:LEU:HD12	12:6:399:GLY:O	2.16	0.46
3:C:39:THR:O	3:C:42:THR:OG1	2.25	0.46
5:E:99:ASP:OD1	5:E:99:ASP:C	2.53	0.46
5:E:525:TYR:HA	5:E:565:LEU:HD12	1.97	0.46
9:3:90:ASN:OD1	9:3:90:ASN:N	2.48	0.46
9:3:277:ILE:HD11	9:3:320:LEU:HD22	1.96	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:2:503:PRO:HG3	8:2:756:SER:HB2	1.98	0.46
5:E:579:TYR:CD2	5:E:637:LEU:HD22	2.51	0.46
7:G:3:DA:OP2	7:G:3:DA:O4'	2.34	0.46
12:6:718:ASP:CG	12:6:723:ILE:HG21	2.36	0.46
13:7:451:ARG:NE	13:7:541:MET:O	2.48	0.46
13:7:596:ILE:HD12	13:7:720:VAL:HG12	1.96	0.46
9:3:698:THR:HG22	9:3:699:ALA:H	1.80	0.46
5:E:5:ILE:HD11	5:E:145:ASP:HA	1.97	0.46
13:7:117:PHE:O	13:7:121:ILE:HG13	2.16	0.46
5:E:576:THR:O	5:E:576:THR:CG2	2.62	0.46
14:X:379:SER:O	14:X:383:VAL:HG23	2.16	0.45
2:B:95:THR:O	2:B:99:ASP:OD2	2.33	0.45
9:3:132:LEU:C	9:3:132:LEU:HD23	2.37	0.45
11:5:454:GLN:OE1	11:5:465:GLU:OE1	2.34	0.45
13:7:228:ARG:CZ	13:7:323:PRO:CD	2.93	0.45
10:4:696:PRO:HA	10:4:699:LEU:HD23	1.99	0.45
10:4:801:MET:SD	10:4:826:VAL:HG12	2.57	0.45
11:5:169:THR:HG22	11:5:256:LEU:HD22	1.98	0.45
13:7:482:TYR:HA	13:7:522:CYS:HB2	1.98	0.45
10:4:517:ASP:OD1	10:4:517:ASP:N	2.41	0.45
12:6:718:ASP:OD1	12:6:723:ILE:HG21	2.17	0.45
8:2:425:GLU:OE2	8:2:459:ARG:NH2	2.49	0.45
8:2:612:MET:CB	8:2:617:ARG:CG	2.95	0.45
13:7:196:LEU:HD13	13:7:257:VAL:HG11	1.98	0.45
1:A:165:VAL:HB	1:A:205:LEU:HD23	1.97	0.45
5:E:155:GLN:OE1	5:E:155:GLN:N	2.46	0.45
10:4:567:CYS:SG	10:4:568:GLY:N	2.90	0.45
12:6:121:ASP:HB2	12:6:161:ARG:HH12	1.82	0.45
13:7:521:CYS:N	13:7:562:SER:O	2.47	0.45
2:B:146:GLN:O	2:B:150:GLU:HG3	2.16	0.45
11:5:531:ASP:OD1	11:5:533:LEU:N	2.48	0.45
5:E:248:VAL:HG22	5:E:248:VAL:O	2.16	0.45
8:2:494:ILE:HD11	8:2:824:ARG:HD3	1.98	0.45
2:B:22:ASN:HD22	4:D:64:MET:HE2	1.81	0.45
5:E:131:LEU:HD13	5:E:240:TYR:CE2	2.52	0.45
10:4:302:LYS:HZ1	14:X:356:ARG:CD	2.19	0.45
13:7:349:VAL:HG23	13:7:351:VAL:HG23	1.99	0.45
13:7:599:LEU:O	13:7:727:LEU:HD22	2.17	0.45
8:2:459:ARG:NH1	8:2:466:GLU:OE2	2.50	0.45
10:4:349:CYS:HA	10:4:382:MET:HE2	1.99	0.45
12:6:834:SER:O	12:6:834:SER:OG	2.31	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:57:ASP:OD1	2:B:57:ASP:N	2.47	0.44
10:4:261:LEU:HB2	10:4:268:VAL:HG11	1.99	0.44
12:6:402:ILE:HD13	12:6:455:LEU:HD13	1.98	0.44
13:7:472:ALA:O	13:7:476:ILE:HG22	2.17	0.44
13:7:629:ASP:OD1	13:7:630:PHE:N	2.49	0.44
13:7:675:MET:O	13:7:675:MET:SD	2.75	0.44
5:E:74:LEU:HD11	5:E:81:LEU:HD13	2.00	0.44
8:2:203:VAL:O	8:2:207:ILE:HG13	2.18	0.44
9:3:170:THR:O	9:3:170:THR:HG22	2.17	0.44
9:3:504:THR:OG1	9:3:505:THR:N	2.50	0.44
12:6:313:MET:SD	12:6:314:CYS:N	2.91	0.44
5:E:159:TYR:CE2	5:E:163:LEU:HD11	2.53	0.44
8:2:687:VAL:HG23	12:6:793:TYR:OH	2.17	0.44
9:3:462:MET:CE	9:3:489:VAL:HG11	2.47	0.44
5:E:564:LEU:O	5:E:565:LEU:HD22	2.18	0.44
10:4:441:SER:OG	10:4:457:TYR:HB3	2.17	0.44
10:4:835:ASP:OD1	10:4:836:TYR:N	2.51	0.44
12:6:267:PHE:O	12:6:398:THR:HG21	2.18	0.44
13:7:459:MET:HE3	13:7:584:ILE:HG23	1.95	0.44
2:B:158:LYS:NZ	11:5:104:LEU:HD23	2.33	0.44
4:D:101:ILE:HG21	4:D:126:LEU:HD21	1.99	0.44
5:E:607:MET:O	5:E:611:GLN:HG2	2.18	0.44
12:6:536:ALA:HB3	12:6:583:GLN:HE21	1.82	0.44
8:2:437:ASN:O	8:2:441:LYS:HD3	2.18	0.44
13:7:343:LEU:HD21	13:7:381:VAL:HG11	1.99	0.44
3:C:50:LEU:O	3:C:54:LEU:HD23	2.18	0.44
4:D:230:ILE:HG21	4:D:282:ILE:HD13	1.99	0.44
5:E:278:THR:HG23	5:E:425:VAL:HG21	1.99	0.44
9:3:21:PHE:HE1	9:3:127:LYS:HD3	1.81	0.44
11:5:482:PHE:O	11:5:490:ARG:NH1	2.51	0.44
10:4:820:GLU:OE1	10:4:820:GLU:HA	2.18	0.44
8:2:550:SER:OG	8:2:607:ASP:OD2	2.36	0.43
10:4:712:VAL:HG22	13:7:683:GLN:HE22	1.83	0.43
11:5:464:LEU:HD13	11:5:509:ILE:HG21	2.00	0.43
13:7:468:GLN:NE2	18:7:1001:ATP:O2A	2.51	0.43
5:E:233:TYR:O	5:E:236:VAL:HG12	2.17	0.43
10:4:287:ASN:O	10:4:288:ASN:OD1	2.37	0.43
11:5:32:LYS:HG3	11:5:97:VAL:CG2	2.47	0.43
12:6:718:ASP:OD1	12:6:718:ASP:O	2.36	0.43
1:A:11:LEU:HD22	3:C:10:LEU:HD21	2.00	0.43
9:3:522:GLN:OE1	11:5:544:THR:HG21	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
13:7:574:TYR:HD2	13:7:601:LEU:HD11	1.82	0.43
12:6:535:PRO:HB2	12:6:742:ILE:HG23	2.01	0.43
8:2:511:ILE:HD11	8:2:683:VAL:HG21	2.01	0.43
6:F:31:DC:H2'	6:F:32:DT:H71	2.00	0.43
8:2:483:GLU:C	8:2:485:ARG:N	2.70	0.43
3:C:160:ILE:O	3:C:164:THR:HG22	2.19	0.43
8:2:482:ARG:HH11	8:2:482:ARG:CG	2.32	0.43
10:4:206:ARG:NH1	10:4:247:ASN:OD1	2.51	0.43
10:4:263:ASN:OD1	10:4:324:LYS:NZ	2.51	0.43
12:6:579:THR:O	12:6:580:SER:OG	2.34	0.43
8:2:326:ARG:HG3	8:2:326:ARG:HH11	1.84	0.42
8:2:577:THR:OG1	8:2:578:ALA:N	2.52	0.42
11:5:148:LEU:O	11:5:148:LEU:HD23	2.19	0.42
13:7:518:ASN:OD1	13:7:560:ARG:NH2	2.52	0.42
3:C:12:ASP:OD1	3:C:110:LYS:NZ	2.44	0.42
1:A:151:LEU:O	4:D:145:ARG:NH1	2.52	0.42
12:6:699:LEU:HD23	12:6:701:MET:SD	2.59	0.42
13:7:513:LEU:HD23	13:7:513:LEU:O	2.19	0.42
13:7:580:PRO:O	13:7:584:ILE:HG12	2.20	0.42
7:G:2:DC:H1'	7:G:3:DA:OP2	2.20	0.42
10:4:800:SER:O	10:4:804:LEU:HD23	2.20	0.42
9:3:676:ILE:HD12	13:7:617:THR:HG23	1.98	0.42
10:4:217:ASN:N	10:4:221:ASP:OD2	2.41	0.42
2:B:147:ASP:O	2:B:151:ILE:HG13	2.20	0.42
10:4:240:ASN:CG	10:4:422:GLU:OE1	2.45	0.42
11:5:599:MET:O	11:5:603:ILE:HG12	2.20	0.42
9:3:513:ILE:HG23	9:3:513:ILE:O	2.20	0.42
11:5:420:THR:O	11:5:421:ALA:HB3	2.20	0.42
13:7:476:ILE:HD12	13:7:638:MET:SD	2.60	0.42
5:E:325:TYR:CE2	5:E:406:ARG:HD3	2.55	0.42
13:7:366:LEU:HD13	13:7:366:LEU:C	2.40	0.42
13:7:440:VAL:HG11	13:7:452:GLY:HA2	2.02	0.42
9:3:358:ASP:OD1	9:3:358:ASP:N	2.53	0.42
9:3:698:THR:HG22	9:3:699:ALA:N	2.35	0.42
10:4:589:VAL:HG12	10:4:590:TYR:N	2.35	0.42
1:A:73:PHE:O	1:A:77:LEU:HD23	2.20	0.41
4:D:156:LEU:HD12	4:D:210:ASN:HB3	2.02	0.41
5:E:259:LEU:HD13	5:E:269:ASN:OD1	2.20	0.41
8:2:459:ARG:O	8:2:459:ARG:HG2	2.20	0.41
10:4:712:VAL:HG21	13:7:672:LYS:HG3	2.02	0.41
10:4:268:VAL:O	10:4:271:ILE:HG13	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:F:31:DC:C2	6:F:32:DT:C5	3.08	0.41
9:3:370:SER:HB2	11:5:404:MET:CE	2.50	0.41
12:6:596:VAL:HG12	12:6:598:THR:CG2	2.49	0.41
13:7:436:LEU:HD23	13:7:642:ILE:HD13	2.02	0.41
10:4:696:PRO:N	10:4:697:PRO:CD	2.83	0.41
11:5:169:THR:HG22	11:5:256:LEU:CD2	2.50	0.41
13:7:76:ASN:N	13:7:76:ASN:OD1	2.54	0.41
2:B:154:ILE:HD11	11:5:101:ILE:O	2.20	0.41
8:2:325:THR:HG22	8:2:389:THR:O	2.20	0.41
2:B:183:PRO:O	2:B:187:GLU:OE1	2.38	0.41
5:E:514:LEU:HD11	5:E:555:CYS:SG	2.61	0.41
6:F:40:DG:N2	11:5:458:MET:SD	2.93	0.41
12:6:536:ALA:CB	12:6:583:GLN:HE21	2.34	0.41
12:6:653:HIS:ND1	12:6:705:ILE:HD11	2.35	0.41
6:F:43:DG:N3	6:F:43:DG:H2'	2.35	0.41
8:2:227:TYR:HA	8:2:230:ARG:HB2	2.03	0.41
9:3:255:ARG:NH1	9:3:275:ASP:OD2	2.51	0.41
10:4:333:LEU:HD23	10:4:333:LEU:C	2.41	0.41
11:5:420:THR:CG2	11:5:420:THR:O	2.68	0.41
13:7:453:ASP:OD2	13:7:562:SER:N	2.53	0.41
13:7:479:ARG:NH2	13:7:515:LEU:O	2.53	0.41
2:B:111:ARG:O	2:B:155:LYS:NZ	2.39	0.41
11:5:87:ILE:HB	11:5:88:PRO:HD3	2.03	0.41
13:7:289:CYS:O	13:7:293:GLN:N	2.53	0.41
13:7:650:PRO:HA	13:7:706:ASP:HA	2.03	0.41
8:2:613:ASN:O	8:2:617:ARG:HG3	2.21	0.41
10:4:391:PHE:HB2	12:6:281:SER:OG	2.21	0.41
13:7:440:VAL:HG21	13:7:452:GLY:HA2	2.03	0.41
13:7:464:VAL:HG12	13:7:465:ALA:N	2.36	0.41
9:3:691:ASN:O	9:3:693:LYS:NZ	2.49	0.40
13:7:584:ILE:N	13:7:584:ILE:HD13	2.35	0.40
8:2:484:PHE:HZ	8:2:765:LYS:HB3	1.86	0.40
9:3:411:PRO:HG3	11:5:545:THR:HG22	2.03	0.40
5:E:545:LEU:HG	5:E:569:LEU:HD23	2.04	0.40
10:4:696:PRO:HA	10:4:699:LEU:CD2	2.52	0.40
11:5:531:ASP:OD1	11:5:531:ASP:C	2.59	0.40
11:5:618:ALA:HB1	11:5:677:VAL:HG21	2.04	0.40
13:7:651:VAL:O	13:7:708:VAL:HG23	2.21	0.40
6:F:59:DC:H3'	8:2:574:VAL:HG21	2.02	0.40
9:3:299:LYS:HD3	9:3:322:LEU:CD1	2.51	0.40
9:3:519:VAL:HG22	9:3:534:ALA:HB2	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:5:97:VAL:HG12	11:5:101:ILE:HD12	2.04	0.40
13:7:145:GLN:OE1	13:7:145:GLN:HA	2.22	0.40
8:2:409:ILE:HD12	8:2:450:ILE:HD13	2.02	0.40
9:3:360:PHE:CE1	9:3:382:LEU:HD23	2.56	0.40
13:7:360:TYR:OH	13:7:373:GLU:OE2	2.24	0.40
13:7:558:ASN:OD1	13:7:560:ARG:NH2	2.54	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	192/208 (92%)	187 (97%)	5 (3%)	0	100	100
2	B	185/213 (87%)	179 (97%)	6 (3%)	0	100	100
3	C	168/217 (77%)	166 (99%)	2 (1%)	0	100	100
4	D	216/294 (74%)	206 (95%)	10 (5%)	0	100	100
5	E	560/650 (86%)	546 (98%)	14 (2%)	0	100	100
8	2	660/868 (76%)	641 (97%)	19 (3%)	0	100	100
9	3	608/971 (63%)	594 (98%)	14 (2%)	0	100	100
10	4	604/933 (65%)	591 (98%)	12 (2%)	1 (0%)	44	75
11	5	583/775 (75%)	555 (95%)	28 (5%)	0	100	100
12	6	622/1017 (61%)	599 (96%)	23 (4%)	0	100	100
13	7	605/845 (72%)	590 (98%)	15 (2%)	0	100	100
14	X	41/43 (95%)	40 (98%)	1 (2%)	0	100	100
All	All	5044/7034 (72%)	4894 (97%)	149 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
10	4	834	LYS

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	180/193 (93%)	177 (98%)	3 (2%)	56	78
2	B	178/198 (90%)	176 (99%)	2 (1%)	70	86
3	C	156/192 (81%)	155 (99%)	1 (1%)	84	92
4	D	214/279 (77%)	212 (99%)	2 (1%)	75	89
5	E	505/586 (86%)	500 (99%)	5 (1%)	73	87
8	2	582/770 (76%)	577 (99%)	5 (1%)	75	89
9	3	533/835 (64%)	531 (100%)	2 (0%)	89	94
10	4	551/848 (65%)	547 (99%)	4 (1%)	81	92
11	5	535/688 (78%)	528 (99%)	7 (1%)	65	83
12	6	551/886 (62%)	544 (99%)	7 (1%)	65	83
13	7	542/753 (72%)	533 (98%)	9 (2%)	56	78
14	X	37/37 (100%)	37 (100%)	0	100	100
All	All	4564/6265 (73%)	4517 (99%)	47 (1%)	71	87

All (47) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	38	ARG
1	A	45	SER
1	A	197	GLU
2	B	63	MET
2	B	93	LEU
3	C	106	SER
4	D	59	ASP
4	D	162	ASN
5	E	21	SER
5	E	393	ASP

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Mol	Chain	Res	Type
5	E	398	ARG
5	E	494	ARG
5	E	573	ASP
8	2	194	TYR
8	2	271	PHE
8	2	659	SER
8	2	689	GLU
8	2	781	MET
9	3	325	THR
9	3	354	SER
10	4	552	PHE
10	4	664	THR
10	4	828	LEU
10	4	834	LYS
11	5	361	SER
11	5	409	ASP
11	5	494	HIS
11	5	631	LYS
11	5	638	LEU
11	5	639	GLU
11	5	643	ARG
12	6	92	PHE
12	6	324	SER
12	6	384	ASP
12	6	442	SER
12	6	447	ASP
12	6	653	HIS
12	6	739	ASP
13	7	218	LYS
13	7	334	HIS
13	7	423	TYR
13	7	475	LYS
13	7	553	ILE
13	7	582	ASP
13	7	598	PHE
13	7	608	ASP
13	7	609	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	71	GLN

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Mol	Chain	Res	Type
1	A	125	HIS
2	B	22	ASN
4	D	210	ASN
4	D	231	HIS
5	E	331	HIS
5	E	395	ASN
11	5	64	ASN
11	5	454	GLN
12	6	524	HIS
12	6	583	GLN
13	7	585	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 17 ligands modelled in this entry, 11 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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 $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
15	ADP	2	1001	16	24,29,29	0.88	1 (4%)	29,45,45	1.31	2 (6%)
18	ATP	5	801	16	28,33,33	0.68	0	34,52,52	1.21	2 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
18	ATP	4	1001	16	28,33,33	0.64	0	34,52,52	0.95	2 (5%)
18	ATP	6	1101	16	28,33,33	0.65	0	34,52,52	1.12	2 (5%)
18	ATP	7	1001	16	28,33,33	0.63	0	34,52,52	0.99	2 (5%)
18	ATP	5	802	16	28,33,33	0.69	0	34,52,52	1.10	2 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
15	ADP	2	1001	16	-	1/12/32/32	0/3/3/3
18	ATP	5	801	16	-	5/18/38/38	0/3/3/3
18	ATP	4	1001	16	-	6/18/38/38	0/3/3/3
18	ATP	6	1101	16	-	0/18/38/38	0/3/3/3
18	ATP	7	1001	16	-	6/18/38/38	0/3/3/3
18	ATP	5	802	16	-	6/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
15	2	1001	ADP	O4'-C1'	2.05	1.43	1.40

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
18	5	801	ATP	C4'-O4'-C1'	-4.63	105.69	109.92
15	2	1001	ADP	N3-C2-N1	-4.25	122.90	128.67
18	5	802	ATP	C4'-O4'-C1'	-3.88	106.38	109.92
18	6	1101	ATP	C4'-O4'-C1'	-3.70	106.54	109.92
15	2	1001	ADP	C4-C5-N7	-2.50	106.69	109.34
18	6	1101	ATP	C5-C6-N6	2.35	123.88	120.31
18	5	802	ATP	C5-C6-N6	2.31	123.83	120.31
18	7	1001	ATP	C5-C6-N6	2.31	123.82	120.31
18	4	1001	ATP	C5-C6-N6	2.29	123.80	120.31
18	5	801	ATP	C5-C6-N6	2.29	123.79	120.31
18	7	1001	ATP	C4'-O4'-C1'	-2.18	107.92	109.92
18	4	1001	ATP	O4'-C1'-N9	-2.08	105.99	108.75

There are no chirality outliers.

All (24) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
18	4	1001	ATP	PB-O3B-PG-O2G
18	4	1001	ATP	C5'-O5'-PA-O2A
18	4	1001	ATP	C5'-O5'-PA-O3A
18	5	801	ATP	C5'-O5'-PA-O1A
18	5	801	ATP	C5'-O5'-PA-O3A
18	5	801	ATP	O4'-C4'-C5'-O5'
18	5	802	ATP	C5'-O5'-PA-O1A
18	7	1001	ATP	C5'-O5'-PA-O1A
18	7	1001	ATP	C5'-O5'-PA-O3A
18	5	801	ATP	C3'-C4'-C5'-O5'
18	5	802	ATP	PG-O3B-PB-O1B
18	7	1001	ATP	PA-O3A-PB-O1B
18	7	1001	ATP	PB-O3B-PG-O2G
15	2	1001	ADP	C5'-O5'-PA-O1A
18	5	802	ATP	C5'-O5'-PA-O3A
18	7	1001	ATP	C5'-O5'-PA-O2A
18	4	1001	ATP	C4'-C5'-O5'-PA
18	4	1001	ATP	PB-O3A-PA-O2A
18	5	802	ATP	PG-O3B-PB-O2B
18	5	802	ATP	C4'-C5'-O5'-PA
18	5	802	ATP	C3'-C4'-C5'-O5'
18	4	1001	ATP	PB-O3B-PG-O1G
18	7	1001	ATP	PA-O3A-PB-O2B
18	5	801	ATP	PA-O3A-PB-O2B

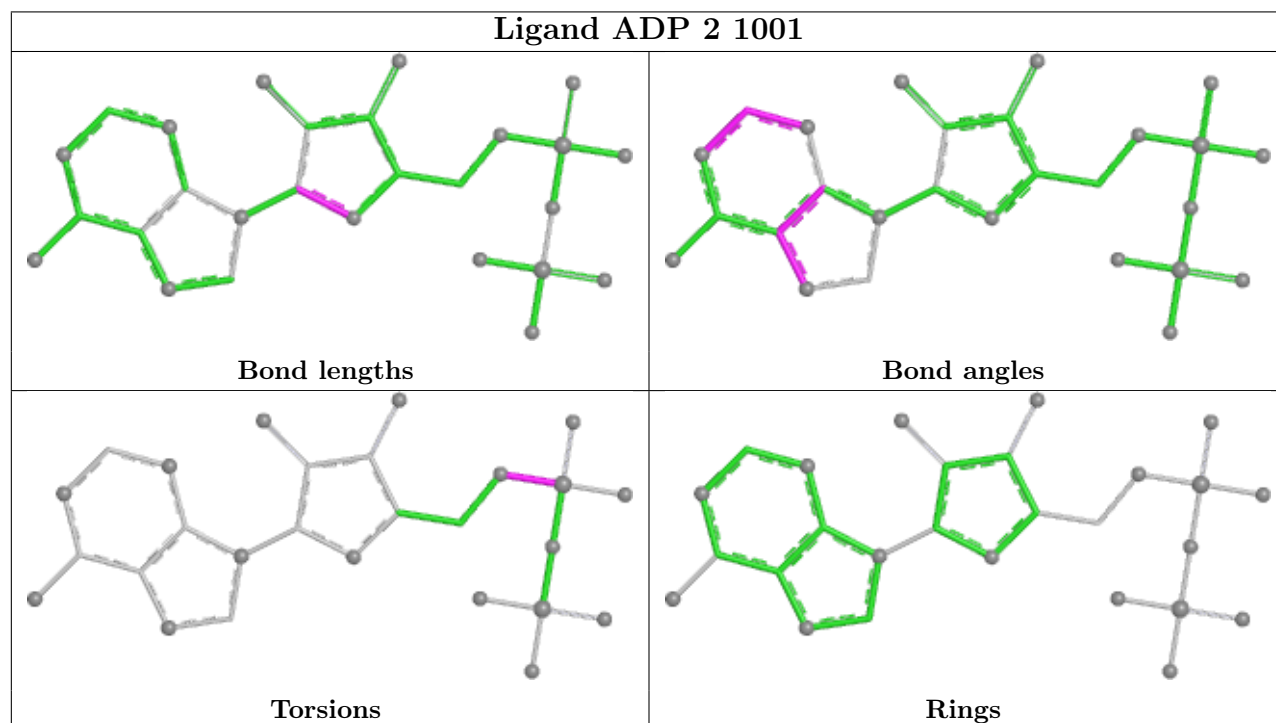
There are no ring outliers.

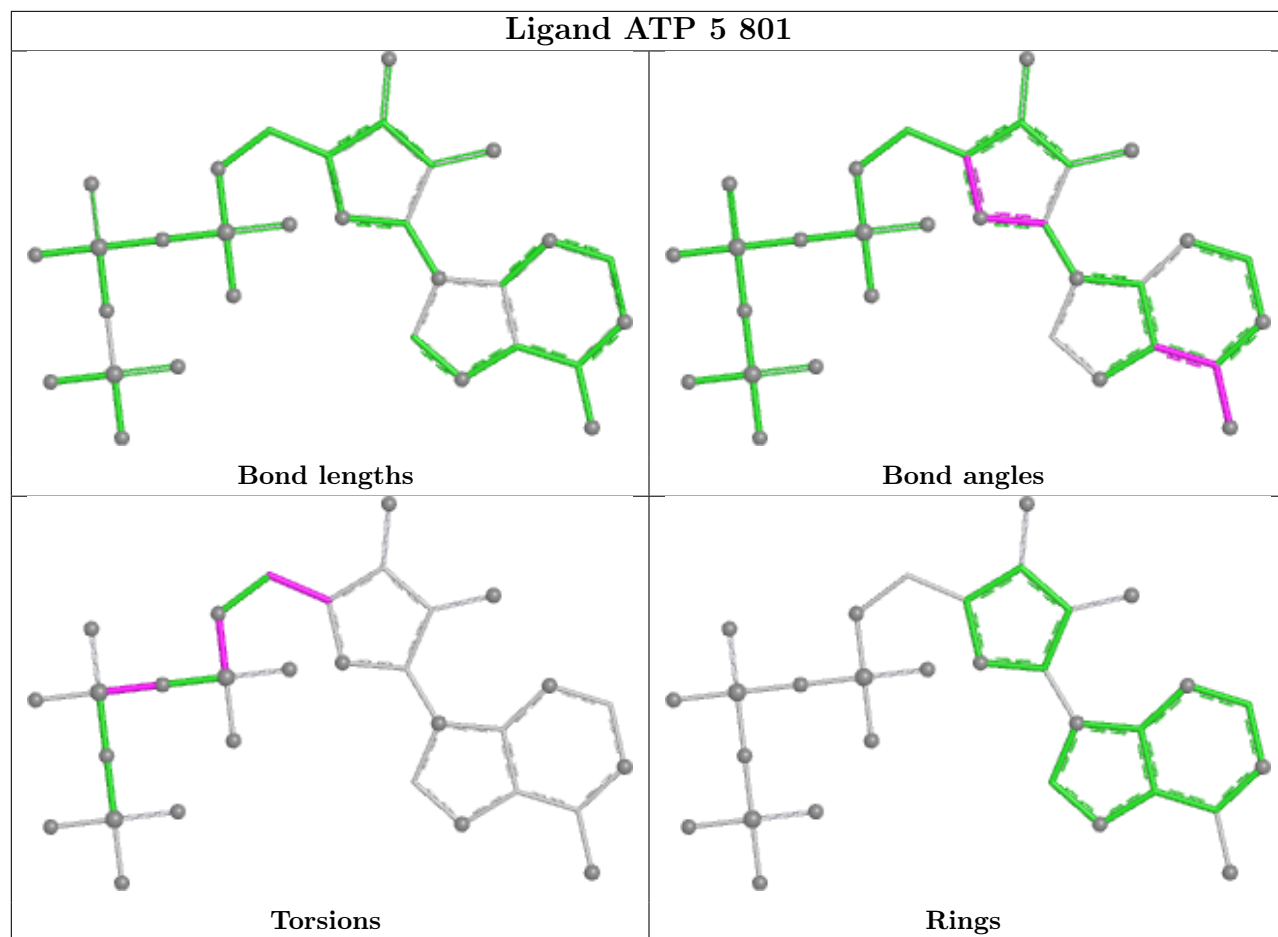
4 monomers are involved in 8 short contacts:

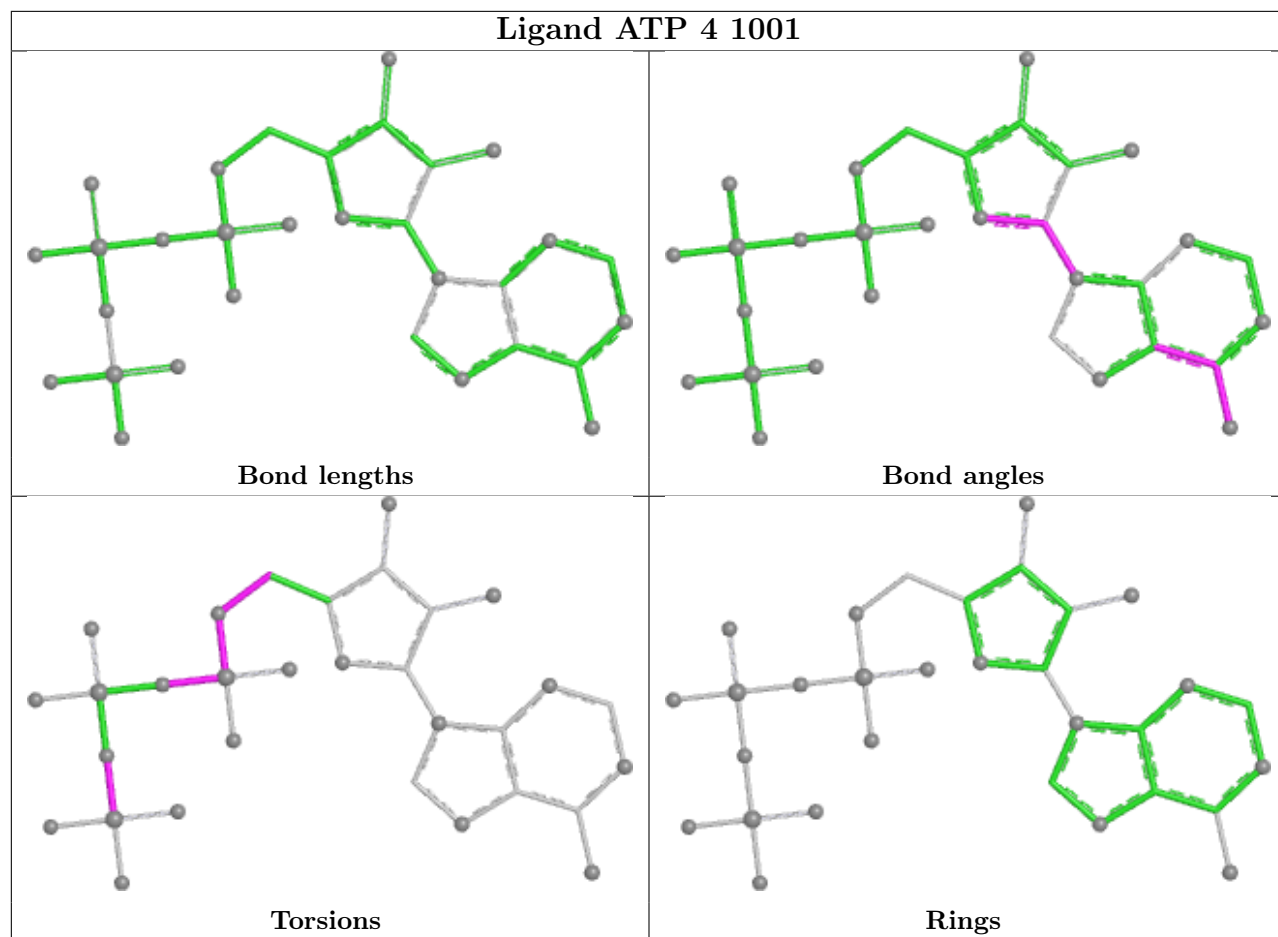
Mol	Chain	Res	Type	Clashes	Symm-Clashes
18	5	801	ATP	2	0
18	6	1101	ATP	2	0
18	7	1001	ATP	1	0
18	5	802	ATP	3	0

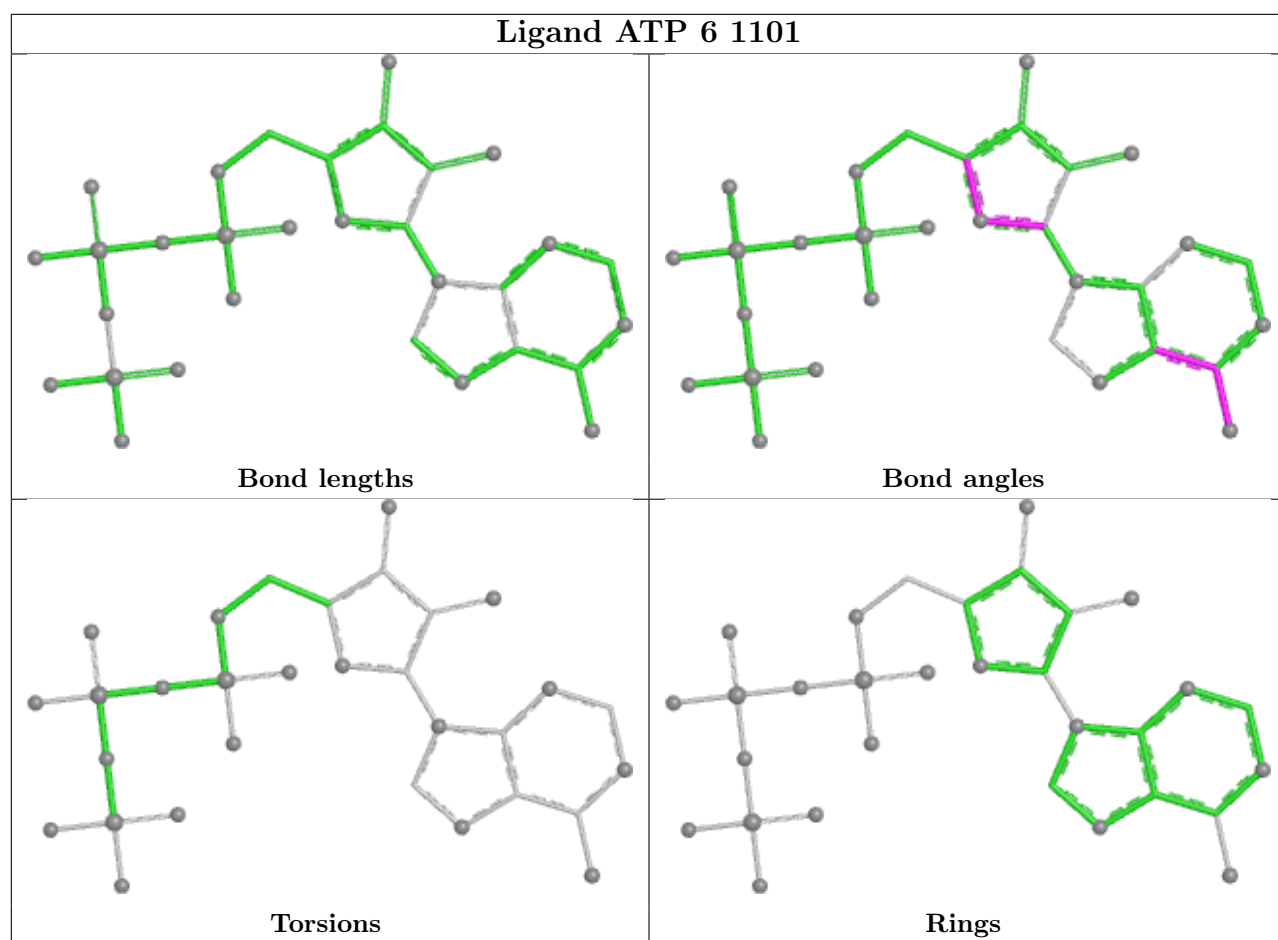
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

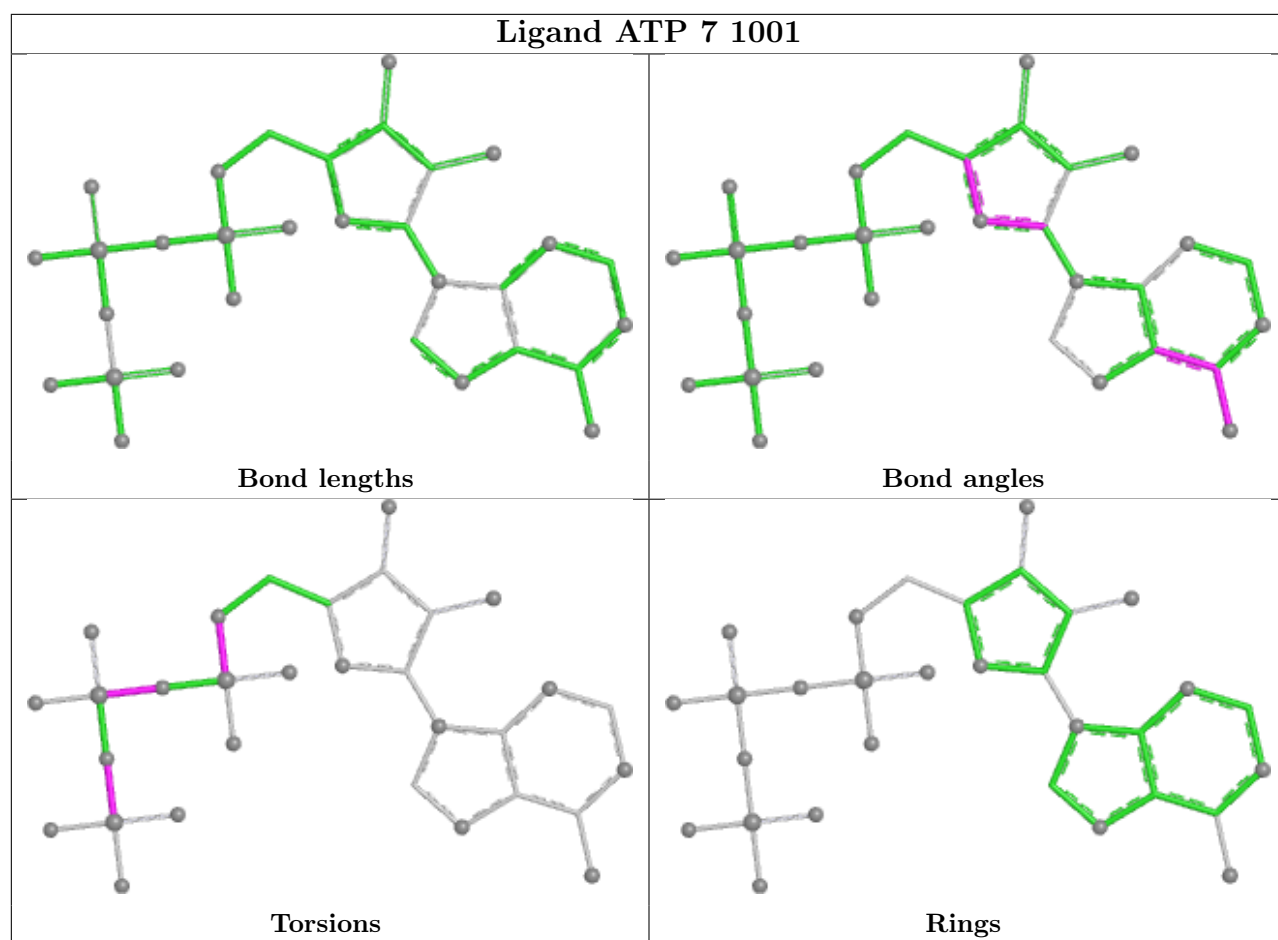
average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

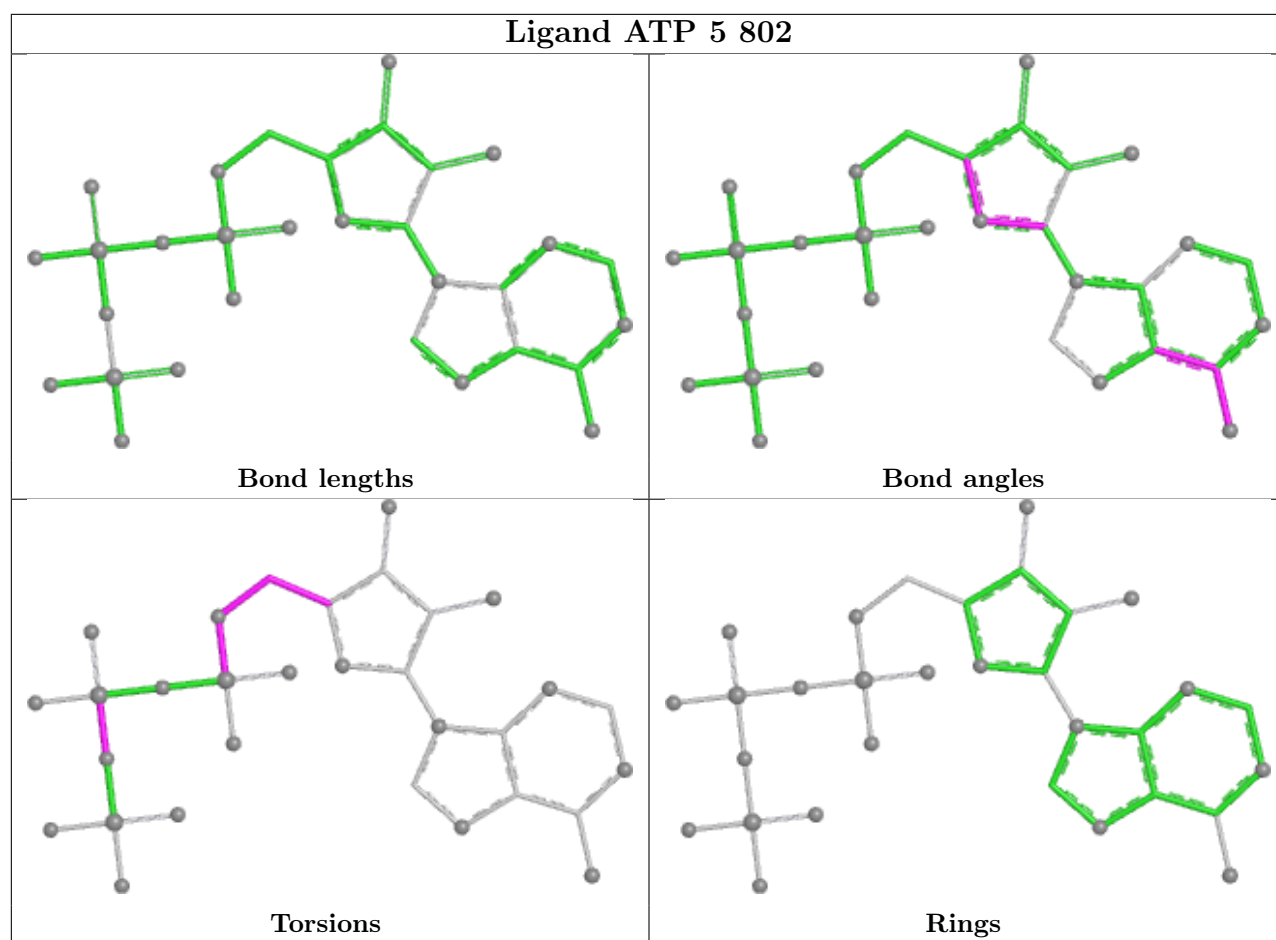












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Map visualisation

This section contains visualisations of the EMDB entry EMD-47472. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections

This section was not generated.

6.2 Central slices

This section was not generated.

6.3 Largest variance slices

This section was not generated.

6.4 Orthogonal standard-deviation projections (False-color)

This section was not generated.

6.5 Orthogonal surface views

This section was not generated.

6.6 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

7 Map analysis ⓘ

This section contains the results of statistical analysis of the map.

7.1 Map-value distribution ⓘ

This section was not generated.

7.2 Volume estimate versus contour level ⓘ

This section was not generated.

7.3 Rotationally averaged power spectrum ⓘ

This section was not generated. The rotationally averaged power spectrum had issues being displayed.

8 Fourier-Shell correlation ⓘ

This section was not generated. No FSC curve or half-maps provided.

9 Map-model fit

This section was not generated.