Full wwPDB X-ray Structure Validation Report ⓘ

Nov 16, 2023 – 04:10 AM JST

PDB ID	:	6KQD
Title	:	Thermus thermophilus initial transcription complex comprising sigma A and 5'-OH RNA of 3 nt
Authors	:	Zhang, Y.; Li, L.; Ebright, R.H.
Deposited on	:	2019-08-17
Resolution	:	3.30 Å(reported)

This is a Full wwPDB X-ray Structure 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/XrayValidationReportHelp
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:

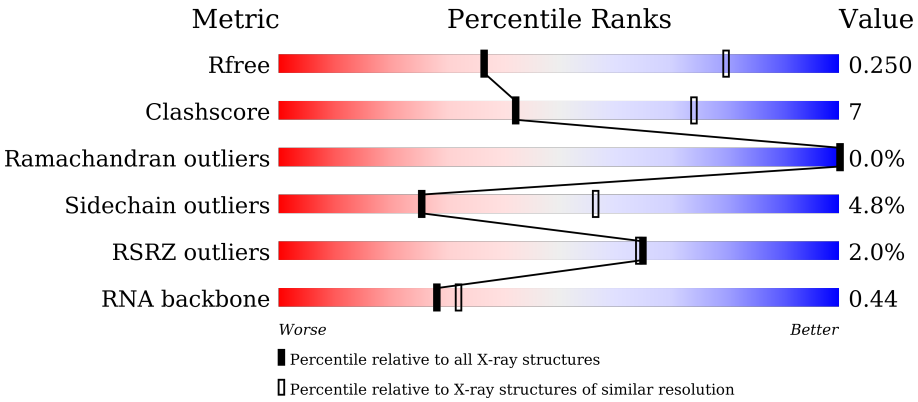
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (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:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.30 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)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)
RNA backbone	3102	1117 (3.70-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	315	59% 12% 28%
1	B	315	59% 10% 30%
1	K	315	60% 11% 28%
1	L	315	60% 11% 29%

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Mol	Chain	Length	Quality of chain
2	C	1119	2% 81% 17%
2	M	1119	4% 77% 21%
3	D	1524	2% 79% 18%
3	N	1524	% 79% 17%
4	E	99	80% 15% 5%
4	O	99	2% 78% 17% 5%
5	F	443	65% 12% 22%
5	P	443	4% 60% 16% 22%
6	G	21	38% 38% 24%
6	Q	21	48% 29% 24%
7	H	27	33% 56% 11%
7	R	27	44% 44% 11%
8	I	3	33% 33% 33%
8	S	3	33% 33% 33%

2 Entry composition (i)

There are 12 unique types of molecules in this entry. The entry contains 57160 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	226	Total	C	N	O	S	0	0	0
			1782	1138	310	332	2			
1	B	222	Total	C	N	O	S	0	0	0
			1750	1118	304	326	2			
1	K	226	Total	C	N	O	S	0	0	0
			1782	1138	310	332	2			
1	L	225	Total	C	N	O	S	0	0	0
			1773	1133	308	330	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	1111	Total	C	N	O	S	0	0	0
			8770	5548	1564	1634	24			
2	M	1111	Total	C	N	O	S	0	0	0
			8761	5542	1564	1631	24			

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	1486	Total	C	N	O	S	0	0	0
			11738	7441	2067	2195	35			
3	N	1486	Total	C	N	O	S	0	0	0
			11732	7438	2064	2195	35			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	94	Total	C	N	O	S	0	0	0
			761	486	132	139	4			
4	O	94	Total	C	N	O	S	0	0	0
			761	486	132	139	4			

- Molecule 5 is a protein called RNA polymerase sigma factor SigA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	346	Total	C	N	O	S	0	0	0
			2804	1769	509	522	4			
5	P	347	Total	C	N	O	S	0	0	0
			2814	1774	510	526	4			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-19	MET	-	initiating methionine	UNP Q5SKW1
F	-18	GLY	-	expression tag	UNP Q5SKW1
F	-17	SER	-	expression tag	UNP Q5SKW1
F	-16	SER	-	expression tag	UNP Q5SKW1
F	-15	HIS	-	expression tag	UNP Q5SKW1
F	-14	HIS	-	expression tag	UNP Q5SKW1
F	-13	HIS	-	expression tag	UNP Q5SKW1
F	-12	HIS	-	expression tag	UNP Q5SKW1
F	-11	HIS	-	expression tag	UNP Q5SKW1
F	-10	HIS	-	expression tag	UNP Q5SKW1
F	-9	SER	-	expression tag	UNP Q5SKW1
F	-8	SER	-	expression tag	UNP Q5SKW1
F	-7	GLY	-	expression tag	UNP Q5SKW1
F	-6	LEU	-	expression tag	UNP Q5SKW1
F	-5	VAL	-	expression tag	UNP Q5SKW1
F	-4	PRO	-	expression tag	UNP Q5SKW1
F	-3	ARG	-	expression tag	UNP Q5SKW1
F	-2	GLY	-	expression tag	UNP Q5SKW1
F	-1	SER	-	expression tag	UNP Q5SKW1
F	0	HIS	-	expression tag	UNP Q5SKW1
P	-19	MET	-	initiating methionine	UNP Q5SKW1
P	-18	GLY	-	expression tag	UNP Q5SKW1
P	-17	SER	-	expression tag	UNP Q5SKW1
P	-16	SER	-	expression tag	UNP Q5SKW1
P	-15	HIS	-	expression tag	UNP Q5SKW1
P	-14	HIS	-	expression tag	UNP Q5SKW1
P	-13	HIS	-	expression tag	UNP Q5SKW1
P	-12	HIS	-	expression tag	UNP Q5SKW1
P	-11	HIS	-	expression tag	UNP Q5SKW1
P	-10	HIS	-	expression tag	UNP Q5SKW1
P	-9	SER	-	expression tag	UNP Q5SKW1
P	-8	SER	-	expression tag	UNP Q5SKW1
P	-7	GLY	-	expression tag	UNP Q5SKW1
P	-6	LEU	-	expression tag	UNP Q5SKW1

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Chain	Residue	Modelled	Actual	Comment	Reference
P	-5	VAL	-	expression tag	UNP Q5SKW1
P	-4	PRO	-	expression tag	UNP Q5SKW1
P	-3	ARG	-	expression tag	UNP Q5SKW1
P	-2	GLY	-	expression tag	UNP Q5SKW1
P	-1	SER	-	expression tag	UNP Q5SKW1
P	0	HIS	-	expression tag	UNP Q5SKW1

- Molecule 6 is a DNA chain called DNA (5'-D(*CP*CP*T*GP*CP*AP*TP*CP*CP*GP*TP*GP*AP*GP*TP*CP*CP*AP*GP*GP*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
6	G	16	Total	C	N	O	P	0	0	0
			325	155	61	94	15			
6	Q	16	Total	C	N	O	P	0	0	0
			325	155	61	94	15			

- Molecule 7 is a DNA chain called DNA (5'-D(*TP*AP*TP*AP*AP*TP*GP*GP*GP*AP*GP*CP*TP*GP*TP*CP*AP*CP*GP*GP*AP*TP*GP*CP*AP*GP*G*)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
7	H	24	Total	C	N	O	P	0	0	0
			495	236	94	142	23			
7	R	24	Total	C	N	O	P	0	0	0
			495	236	94	142	23			

- Molecule 8 is a RNA chain called RNA (5'-R(*GP*GP*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
8	I	3	Total	C	N	O	P	0	0	0
			65	30	15	18	2			
8	S	3	Total	C	N	O	P	0	0	0
			65	30	15	18	2			

- Molecule 9 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	B	1	Total	Mg	0	0
			1	1		
9	D	2	Total	Mg	0	0
			2	2		
9	F	1	Total	Mg	0	0
			1	1		

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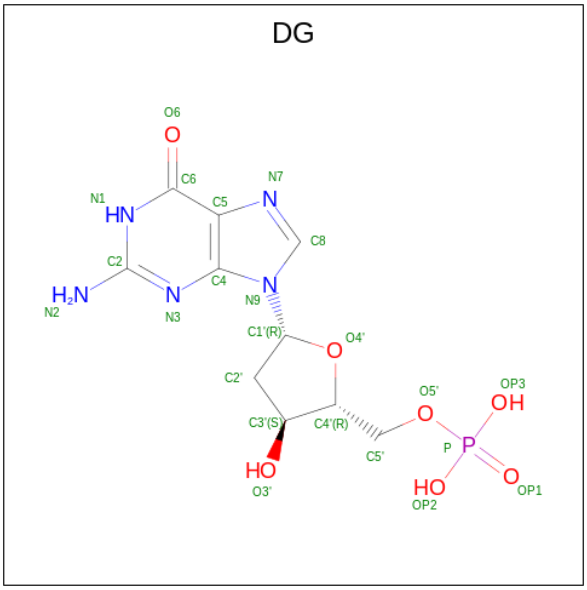
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	K	1	Total Mg 1 1	0	0
9	N	2	Total Mg 2 2	0	0

- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
10	D	2	Total Zn 2 2	0	0
10	N	2	Total Zn 2 2	0	0

- Molecule 11 is 2'-DEOXYGUANOSINE-5'-MONOPHOSPHATE (three-letter code: DG) (formula: $C_{10}H_{14}N_5O_7P$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
11	G	1	Total 22	C 10	N 5	O 6	P 1	0	0
11	Q	1	Total 22	C 10	N 5	O 6	P 1	0	0

- Molecule 12 is water.

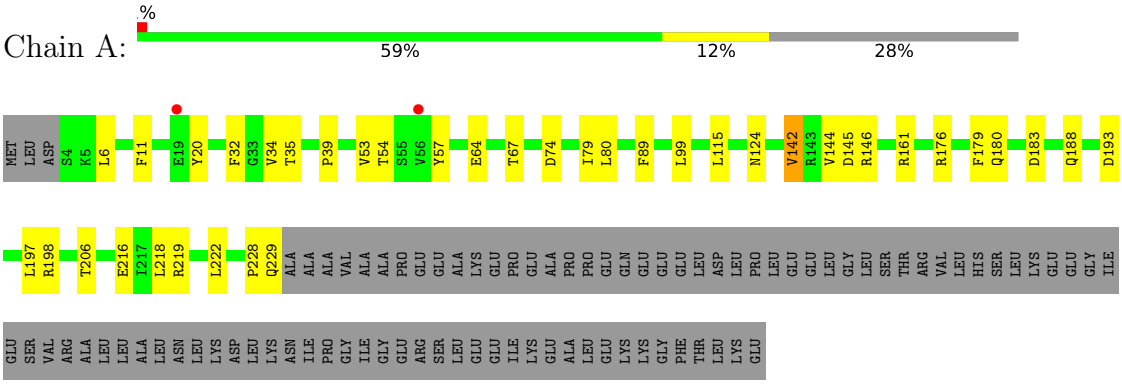
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
12	A	5	Total O 5 5	0	0
12	B	2	Total O 2 2	0	0
12	C	23	Total O 23 23	0	0
12	D	26	Total O 26 26	0	0
12	E	1	Total O 1 1	0	0
12	F	4	Total O 4 4	0	0
12	G	2	Total O 2 2	0	0
12	K	6	Total O 6 6	0	0
12	L	4	Total O 4 4	0	0
12	M	14	Total O 14 14	0	0
12	N	14	Total O 14 14	0	0
12	O	1	Total O 1 1	0	0
12	P	4	Total O 4 4	0	0
12	Q	1	Total O 1 1	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

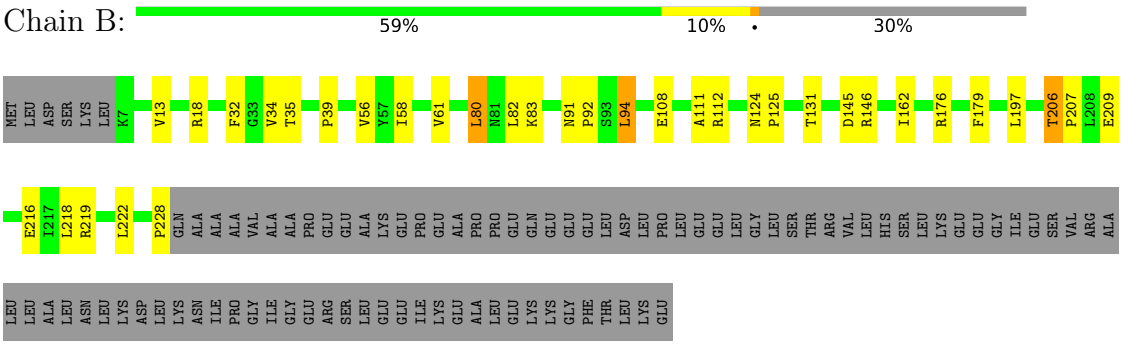
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain A:



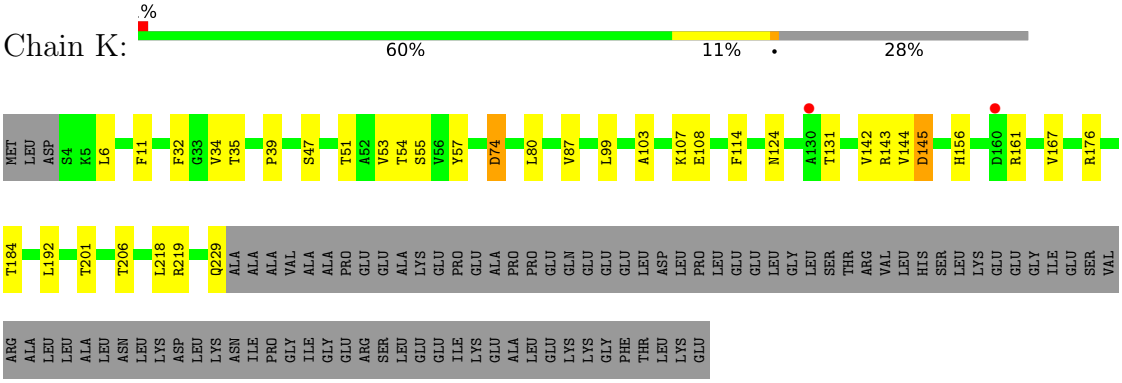
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain B:



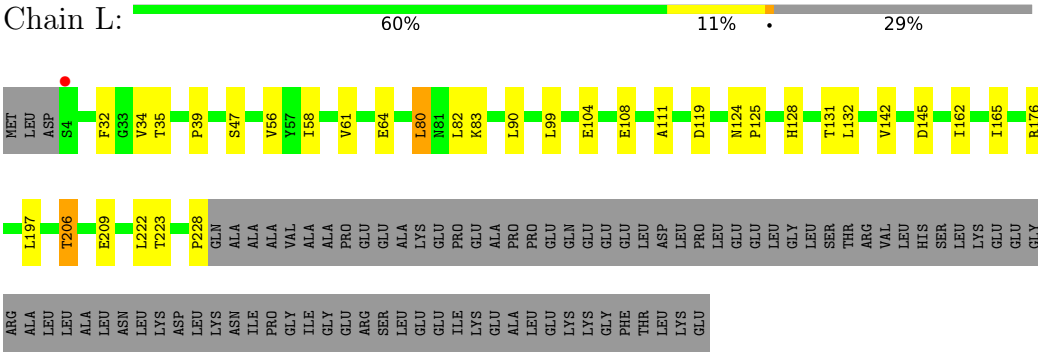
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain K:



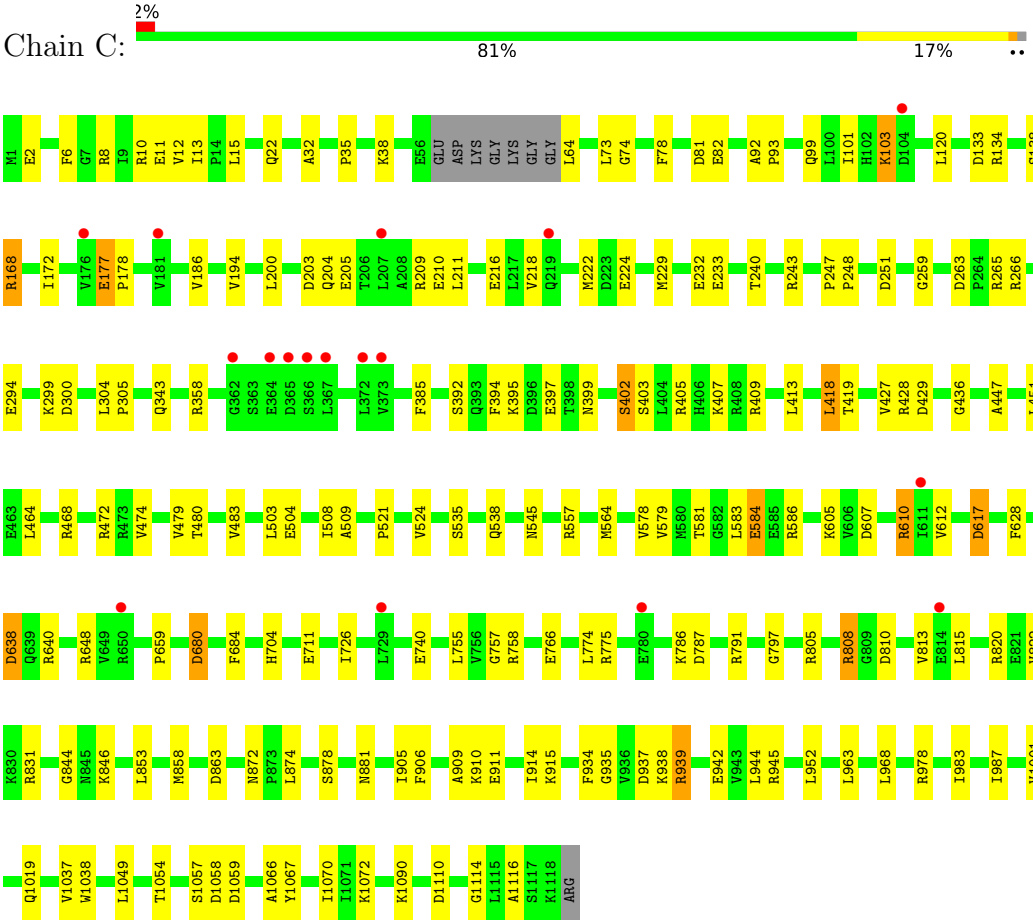
• Molecule 1: DNA-directed RNA polymerase subunit alpha

Chain L:



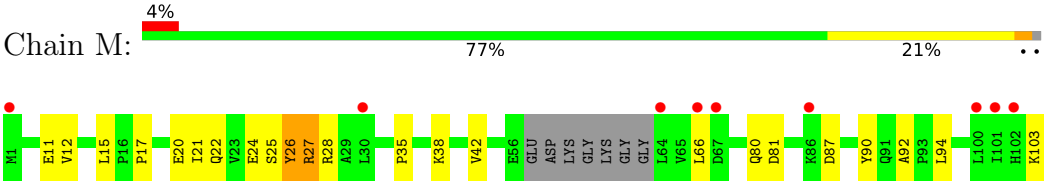
• Molecule 2: DNA-directed RNA polymerase subunit beta

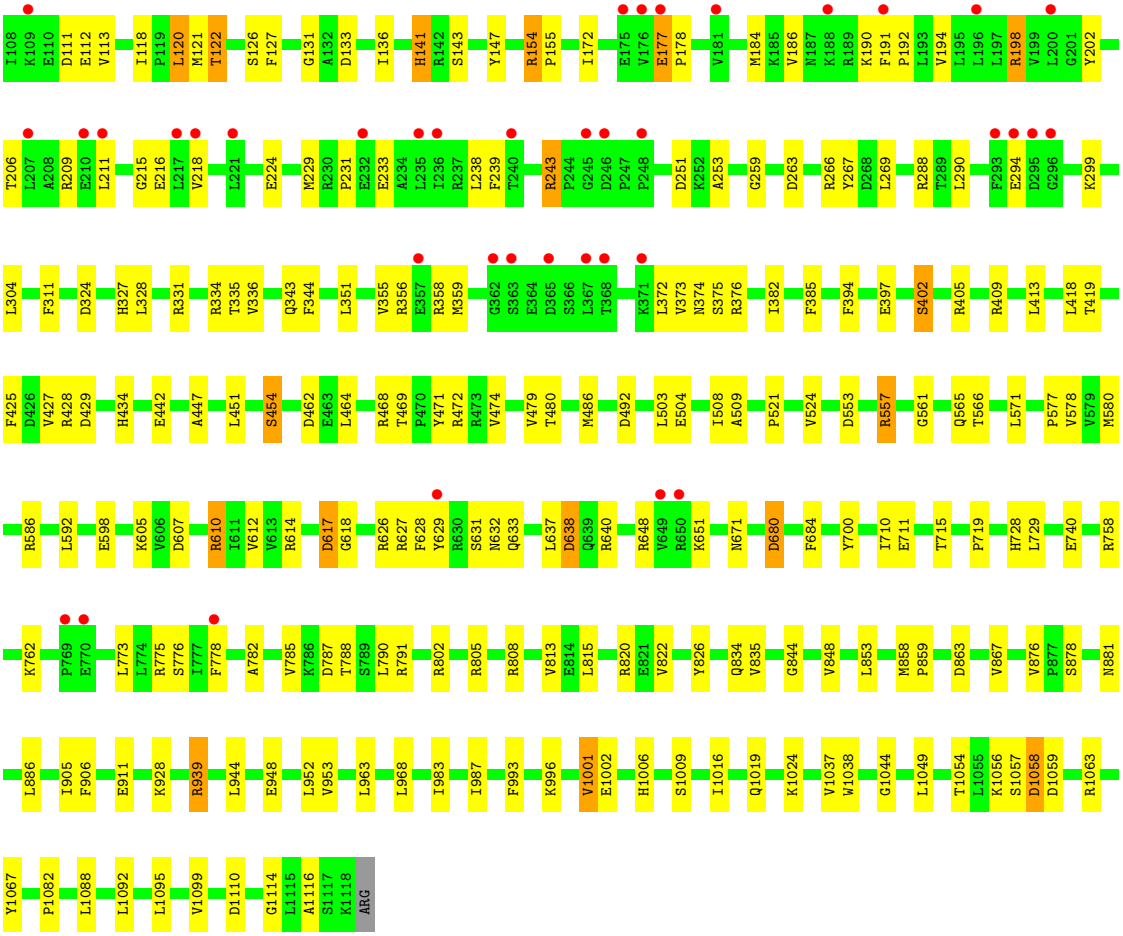
Chain C:



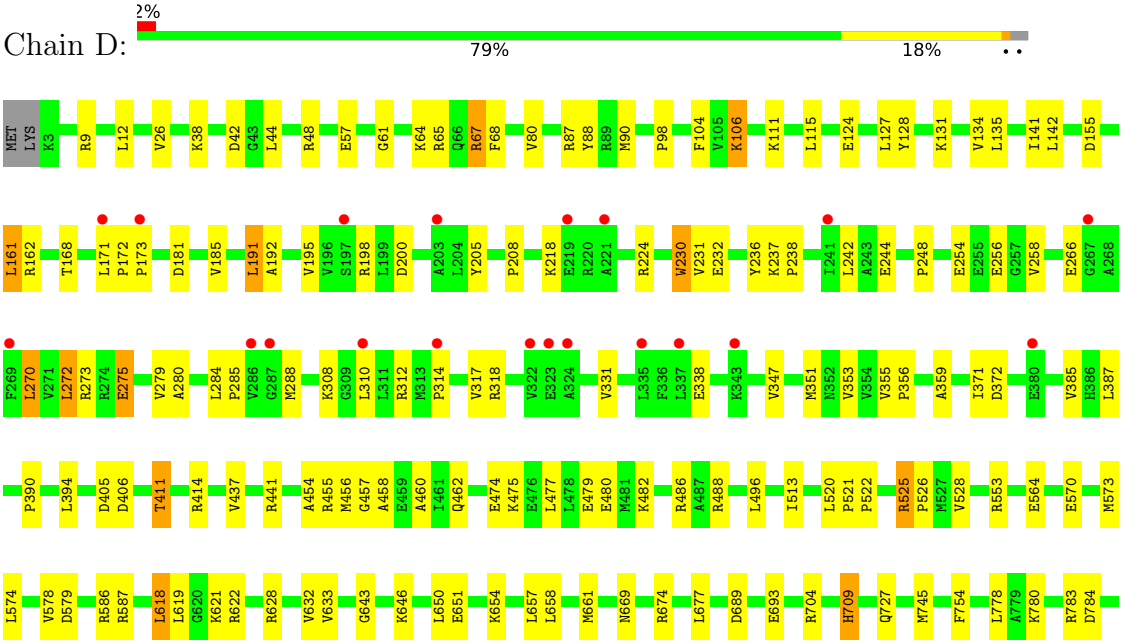
• Molecule 2: DNA-directed RNA polymerase subunit beta

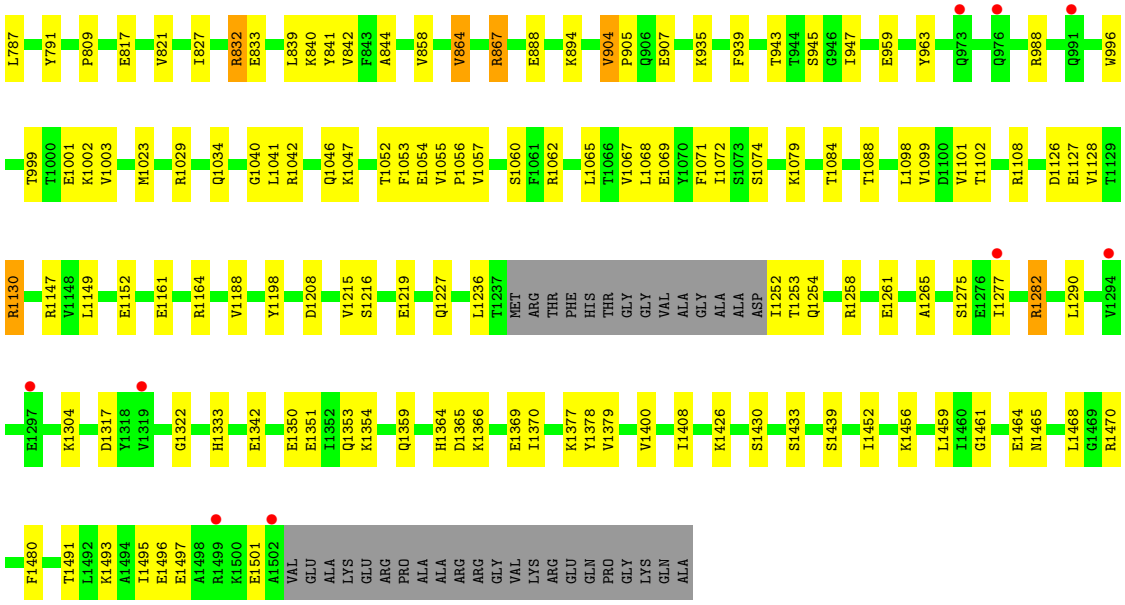
Chain M:



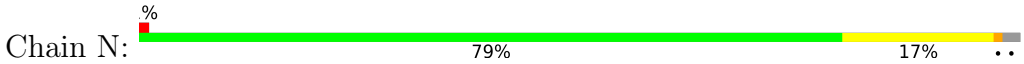


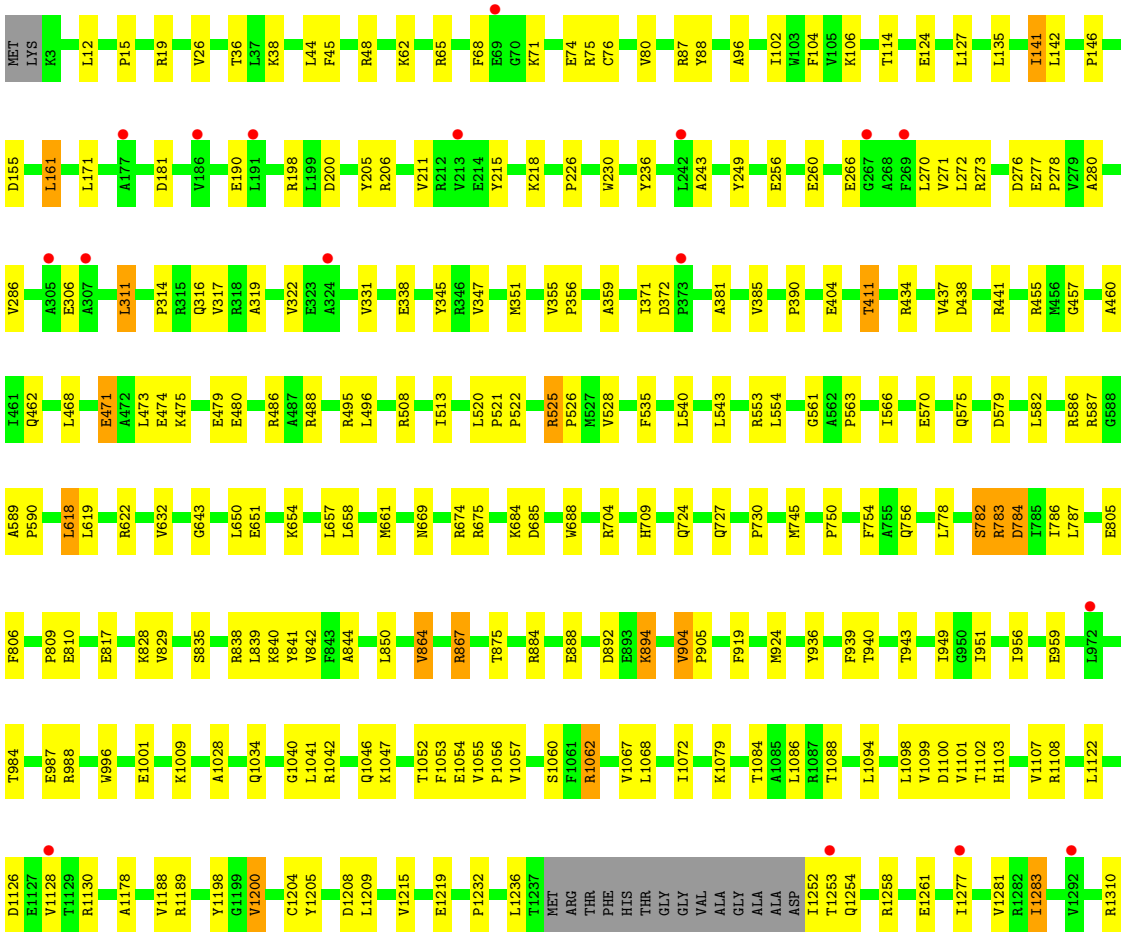
• Molecule 3: DNA-directed RNA polymerase subunit beta'

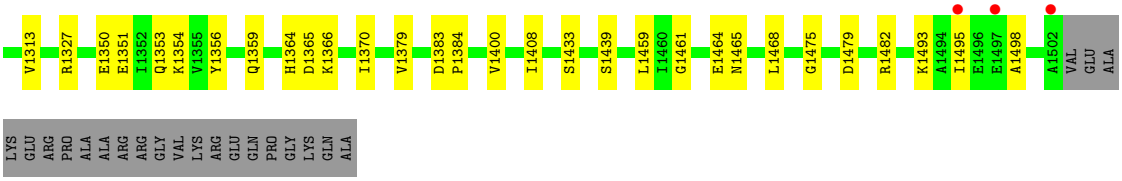




• Molecule 3: DNA-directed RNA polymerase subunit beta'





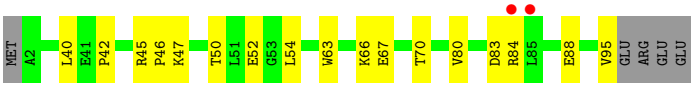


• Molecule 4: DNA-directed RNA polymerase subunit omega

Chain E:

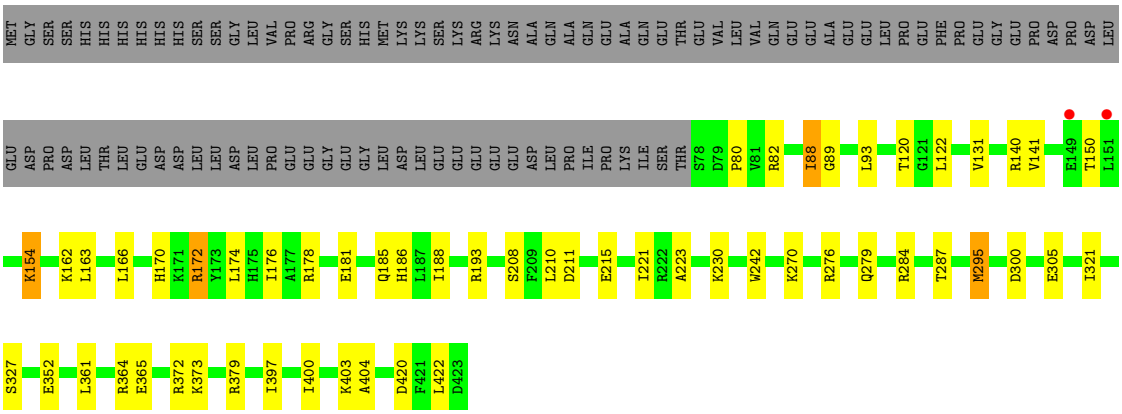
• Molecule 4: DNA-directed RNA polymerase subunit omega

Chain O:



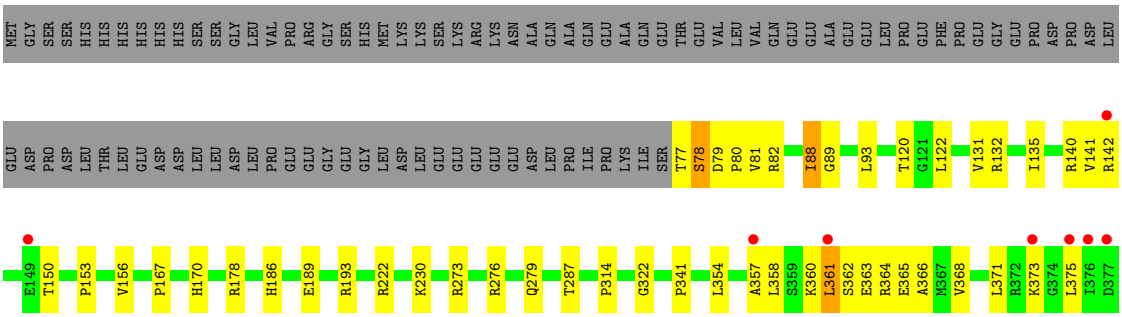
• Molecule 5: RNA polymerase sigma factor SigA

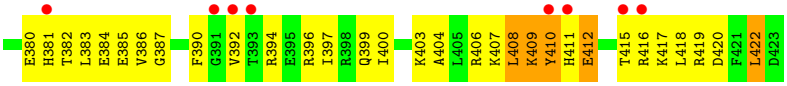
Chain F:



• Molecule 5: RNA polymerase sigma factor SigA

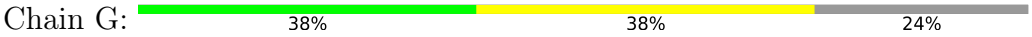
Chain P:





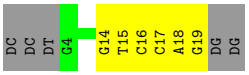
• Molecule 6: DNA (5'-D(*CP*CP*T*GP*CP*AP*TP*CP*CP*GP*TP*GP*AP*GP*TP*CP*CP*AP*GP*GP*G)-3')

Chain G:



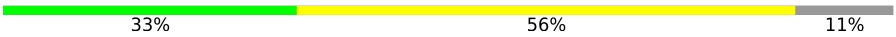
• Molecule 6: DNA (5'-D(*CP*CP*T*GP*CP*AP*TP*CP*CP*GP*TP*GP*AP*GP*TP*CP*CP*AP*GP*GP*G)-3')

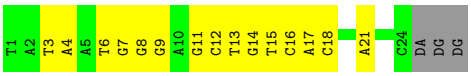
Chain Q:



• Molecule 7: DNA (5'-D(*TP*AP*TP*AP*AP*TP*GP*GP*GP*AP*GP*CP*TP*GP*TP*CP*AP*CP*GP*GP*AP*TP*GP*CP*CP*AP*GP*G*)-3')

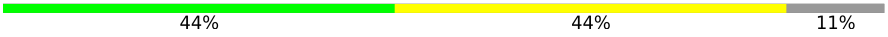
Chain H:

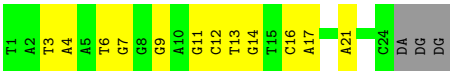




• Molecule 7: DNA (5'-D(*TP*AP*TP*AP*AP*TP*GP*GP*GP*AP*GP*CP*TP*GP*TP*CP*AP*CP*GP*GP*AP*TP*GP*CP*CP*AP*GP*G*)-3')

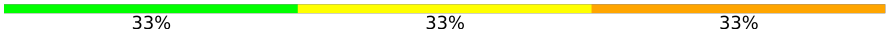
Chain R:





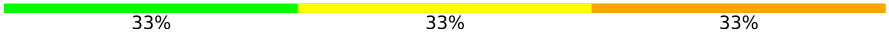
• Molecule 8: RNA (5'-R(*GP*GP*A)-3')

Chain I:



• Molecule 8: RNA (5'-R(*GP*GP*A)-3')

Chain S:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	185.50Å 104.04Å 297.44Å 90.00° 98.50° 90.00°	Depositor
Resolution (Å)	44.35 – 3.30 44.35 – 3.30	Depositor EDS
% Data completeness (in resolution range)	91.3 (44.35-3.30) 91.5 (44.35-3.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.29 (at 3.32Å)	Xtriage
Refinement program	PHENIX 1.14_3260	Depositor
R, R_{free}	0.207 , 0.250 0.207 , 0.250	Depositor DCC
R_{free} test set	1338 reflections (0.86%)	wwPDB-VP
Wilson B-factor (Å^2)	77.2	Xtriage
Anisotropy	0.549	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 49.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	57160	wwPDB-VP
Average B, all atoms (Å^2)	83.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.47 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.5182e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

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	0.27	0/1814	0.46	0/2466
1	B	0.26	0/1782	0.46	0/2424
1	K	0.27	0/1814	0.46	0/2466
1	L	0.26	0/1805	0.46	0/2454
2	C	0.27	0/8937	0.45	0/12087
2	M	0.28	0/8927	0.46	0/12073
3	D	0.28	0/11944	0.45	0/16149
3	N	0.26	0/11938	0.44	0/16142
4	E	0.26	0/775	0.41	0/1045
4	O	0.25	0/775	0.41	0/1045
5	F	0.25	0/2849	0.41	0/3833
5	P	0.26	0/2859	0.42	0/3847
6	G	0.69	0/364	0.90	0/560
6	Q	0.58	0/364	0.90	0/560
7	H	0.67	0/556	0.98	0/858
7	R	0.64	0/556	0.97	0/858
8	I	0.36	0/73	0.85	0/113
8	S	0.42	0/73	1.14	0/113
All	All	0.29	0/58205	0.48	0/79093

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	1782	0	1834	21	0
1	B	1750	0	1797	23	0
1	K	1782	0	1834	19	0
1	L	1773	0	1826	26	0
2	C	8770	0	8874	114	0
2	M	8761	0	8863	174	0
3	D	11738	0	11971	167	0
3	N	11732	0	11960	181	0
4	E	761	0	778	10	0
4	O	761	0	778	11	0
5	F	2804	0	2880	36	0
5	P	2814	0	2889	60	0
6	G	325	0	181	9	0
6	Q	325	0	181	6	0
7	H	495	0	272	18	0
7	R	495	0	272	16	0
8	I	65	0	34	2	0
8	S	65	0	34	2	0
9	B	1	0	0	0	0
9	D	2	0	0	0	0
9	F	1	0	0	0	0
9	K	1	0	0	0	0
9	N	2	0	0	0	0
10	D	2	0	0	0	0
10	N	2	0	0	0	0
11	G	22	0	12	3	0
11	Q	22	0	12	1	0
12	A	5	0	0	0	0
12	B	2	0	0	0	0
12	C	23	0	0	0	0
12	D	26	0	0	0	0
12	E	1	0	0	0	0
12	F	4	0	0	0	0
12	G	2	0	0	0	0
12	K	6	0	0	0	0
12	L	4	0	0	0	0
12	M	14	0	0	1	0
12	N	14	0	0	1	0
12	O	1	0	0	0	0
12	P	4	0	0	0	0
12	Q	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	57160	0	57282	784	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 (784) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:90:TYR:CE2	2:M:120:LEU:HD12	1.75	1.21
3:N:243:ALA:HB3	3:N:311:LEU:HD21	1.27	1.11
2:M:90:TYR:CE2	2:M:120:LEU:CD1	2.33	1.11
2:M:90:TYR:CD2	2:M:120:LEU:HD12	1.97	0.99
2:M:27:ARG:HB3	2:M:27:ARG:NH1	1.78	0.96
3:N:243:ALA:CB	3:N:311:LEU:HD21	1.97	0.95
2:M:335:THR:HG22	2:M:336:VAL:H	1.30	0.94
2:C:684:PHE:HE1	3:D:783:ARG:HB2	1.31	0.94
2:M:22:GLN:NE2	2:M:336:VAL:CG2	2.34	0.91
3:N:783:ARG:HB3	3:N:1028:ALA:O	1.74	0.87
2:C:1019:GLN:HG2	2:C:1058:ASP:HB2	1.57	0.86
2:M:92:ALA:HB2	2:M:120:LEU:CD2	2.07	0.84
2:M:335:THR:HG22	2:M:336:VAL:N	1.92	0.83
3:N:311:LEU:HD23	3:N:311:LEU:O	1.79	0.81
2:M:1019:GLN:HG2	2:M:1058:ASP:HB2	1.64	0.79
3:D:272:LEU:O	3:D:279:VAL:HG12	1.84	0.78
2:M:20:GLU:O	2:M:24:GLU:HB2	1.85	0.77
2:M:462:ASP:HB3	2:M:468:ARG:HD2	1.67	0.77
2:M:335:THR:CG2	2:M:336:VAL:H	1.98	0.76
2:M:22:GLN:NE2	2:M:336:VAL:HG23	1.98	0.76
3:N:1258:ARG:HH21	3:N:1351:GLU:HG2	1.51	0.76
3:N:1495:ILE:HD13	4:O:80:VAL:HG21	1.69	0.75
3:N:1108:ARG:NH2	3:N:1198:TYR:O	2.20	0.75
2:M:27:ARG:HB3	2:M:27:ARG:HH11	1.51	0.74
1:B:206:THR:HG22	1:B:209:GLU:H	1.53	0.73
8:I:2:G:H2'	8:I:3:A:H5"	1.71	0.73
3:N:783:ARG:HD3	3:N:1028:ALA:O	1.88	0.72
5:F:400:ILE:HA	5:F:403:LYS:HG2	1.71	0.72
3:N:520:LEU:O	3:N:525:ARG:NH1	2.23	0.72
3:D:162:ARG:O	3:D:414:ARG:NH1	2.23	0.72
5:P:357:ALA:HB1	5:P:408:LEU:HD21	1.71	0.72
5:P:77:THR:HG23	5:P:78:SER:N	2.03	0.71
3:N:675:ARG:NH2	5:P:420:ASP:OD2	2.24	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:983:ILE:HG21	2:C:987:ILE:HD11	1.72	0.71
3:N:1498:ALA:HB1	4:O:84:ARG:HH21	1.54	0.71
2:M:711:GLU:HG2	2:M:822:VAL:HG22	1.73	0.70
3:N:243:ALA:HB3	3:N:311:LEU:CD2	2.15	0.70
2:C:168:ARG:NH2	2:C:265:ARG:O	2.24	0.69
2:M:22:GLN:HE22	2:M:336:VAL:CG2	2.03	0.69
2:M:121:MET:CE	2:M:127:PHE:CZ	2.75	0.69
2:C:684:PHE:HE1	3:D:783:ARG:CB	2.05	0.68
2:C:343:GLN:HG3	2:C:385:PHE:HB2	1.76	0.68
2:M:983:ILE:HG21	2:M:987:ILE:HD11	1.75	0.68
8:S:2:G:H2'	8:S:3:A:H5"	1.73	0.68
2:M:17:PRO:O	2:M:20:GLU:HB3	1.94	0.68
3:N:243:ALA:CA	3:N:311:LEU:HD21	2.23	0.68
2:M:27:ARG:HB3	2:M:27:ARG:CZ	2.22	0.67
3:N:1236:LEU:HA	3:N:1359:GLN:HG2	1.77	0.67
3:N:218:LYS:HG2	3:N:338:GLU:HG2	1.76	0.67
1:L:206:THR:HG22	1:L:209:GLU:H	1.59	0.67
3:D:1254:GLN:HB3	3:D:1258:ARG:HB2	1.77	0.67
3:D:988:ARG:NH2	3:D:1054:GLU:OE2	2.27	0.66
3:N:1254:GLN:HB3	3:N:1258:ARG:HB2	1.76	0.66
3:D:275:GLU:OE1	3:D:275:GLU:HA	1.95	0.66
2:M:397:GLU:HG3	2:M:631:SER:HB2	1.78	0.66
3:N:311:LEU:CD2	3:N:311:LEU:H	2.09	0.66
5:F:365:GLU:HB2	5:F:404:ALA:HB2	1.78	0.66
2:M:24:GLU:OE2	2:M:27:ARG:NH2	2.29	0.65
6:Q:15:DT:H2'	6:Q:16:DC:C6	2.30	0.65
5:P:193:ARG:HB3	7:R:7:DG:H5"	1.78	0.65
3:N:1310:ARG:HB2	3:N:1327:ARG:HB2	1.79	0.65
3:D:480:GLU:OE2	3:D:488:ARG:NH2	2.30	0.65
3:D:1461:GLY:O	3:D:1465:ASN:ND2	2.30	0.64
2:M:121:MET:HE2	2:M:127:PHE:CE1	2.32	0.64
5:P:131:VAL:HG13	5:P:178:ARG:HD3	1.79	0.64
3:D:1236:LEU:HA	3:D:1359:GLN:HG3	1.78	0.64
2:M:90:TYR:CD2	2:M:120:LEU:CD1	2.73	0.64
3:N:142:LEU:HB2	3:N:161:LEU:HD11	1.79	0.64
1:A:216:GLU:OE2	1:A:219:ARG:NH2	2.31	0.64
2:C:628:PHE:H	2:C:638:ASP:HB2	1.61	0.64
2:M:121:MET:HE2	2:M:127:PHE:CZ	2.33	0.64
3:N:643:GLY:HA3	3:N:727:GLN:HB2	1.79	0.64
2:M:577:PRO:HG2	2:M:580:MET:HG2	1.80	0.64
3:N:243:ALA:O	3:N:311:LEU:CD2	2.45	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:176:ARG:NH1	2:C:863:ASP:O	2.30	0.63
2:C:413:LEU:HD21	2:C:451:LEU:HD13	1.79	0.63
3:N:619:LEU:HD11	3:N:1439:SER:HB2	1.79	0.63
1:L:83:LYS:NZ	3:N:842:VAL:O	2.32	0.63
5:F:193:ARG:HB3	7:H:7:DG:H5"	1.81	0.63
7:R:3:DT:H2'	7:R:4:DA:C8	2.33	0.63
3:D:643:GLY:HA3	3:D:727:GLN:HB2	1.80	0.63
1:K:74:ASP:HB3	2:M:627:ARG:HH12	1.62	0.63
2:M:94:LEU:HD22	2:M:118:ILE:HD11	1.80	0.63
2:M:802:ARG:HB2	2:M:826:TYR:HB2	1.80	0.63
3:N:750:PRO:O	3:N:756:GLN:NE2	2.32	0.63
5:F:131:VAL:HG13	5:F:178:ARG:HD3	1.81	0.62
2:M:66:LEU:HD22	2:M:372:LEU:HD23	1.80	0.62
3:N:311:LEU:H	3:N:311:LEU:HD22	1.65	0.62
3:N:622:ARG:NH1	6:Q:17:DC:OP1	2.29	0.62
3:N:462:GLN:HB2	3:N:513:ILE:HG21	1.82	0.62
3:D:61:GLY:O	3:D:64:LYS:NZ	2.33	0.61
2:C:684:PHE:CE1	3:D:783:ARG:HB2	2.23	0.61
3:N:956:ILE:HD11	3:N:1062:ARG:HD2	1.82	0.61
3:D:1258:ARG:HH21	3:D:1351:GLU:HG2	1.64	0.61
3:N:266:GLU:HB3	3:N:314:PRO:HB3	1.83	0.61
2:C:521:PRO:HB3	3:D:1068:LEU:HD21	1.83	0.61
2:M:25:SER:CB	2:M:335:THR:CG2	2.79	0.61
2:M:121:MET:CE	2:M:127:PHE:CE1	2.84	0.61
2:M:462:ASP:OD2	2:M:468:ARG:NH1	2.30	0.61
3:N:211:VAL:HG13	3:N:345:TYR:HB2	1.82	0.61
3:D:619:LEU:HD11	3:D:1439:SER:HB2	1.81	0.61
5:F:270:LYS:HG2	5:F:295:MET:HE1	1.83	0.60
5:P:361:LEU:HD12	5:P:362:SER:H	1.65	0.60
1:A:222:LEU:HD21	1:B:218:LEU:HD23	1.82	0.60
2:M:773:LEU:HD23	5:P:354:LEU:HD13	1.83	0.60
3:D:1353:GLN:NE2	3:D:1365:ASP:OD1	2.34	0.60
3:N:563:PRO:HD2	3:N:566:ILE:HD12	1.83	0.60
1:L:176:ARG:NH2	3:N:888:GLU:OE1	2.35	0.60
2:M:92:ALA:CB	2:M:120:LEU:CD2	2.79	0.60
3:D:1108:ARG:NH2	3:D:1198:TYR:O	2.35	0.60
5:P:382:THR:OG1	5:P:385:GLU:OE2	2.20	0.60
3:D:106:LYS:HE3	3:D:587:ARG:HG3	1.83	0.59
1:A:179:PHE:HB3	1:A:197:LEU:HD23	1.85	0.59
6:G:19:DG:H2'	11:G:101:DG:C5	2.37	0.59
2:M:21:ILE:HG23	2:M:22:GLN:H	1.67	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:N:124:GLU:OE2	3:N:587:ARG:NH2	2.35	0.59
3:D:124:GLU:OE2	3:D:587:ARG:NH2	2.35	0.59
2:M:628:PHE:H	2:M:638:ASP:HB2	1.68	0.59
2:M:1056:LYS:NZ	12:M:1201:HOH:O	2.35	0.59
3:N:272:LEU:HB2	3:N:280:ALA:HB3	1.84	0.59
5:P:193:ARG:HB2	7:R:6:DT:H1'	1.85	0.59
2:M:719:PRO:HB3	2:M:820:ARG:NE	2.18	0.59
2:C:1110:ASP:OD2	2:C:1114:GLY:N	2.30	0.58
5:F:397:ILE:HD12	5:F:400:ILE:HD11	1.84	0.58
2:M:614:ARG:NH2	2:M:618:GLY:O	2.36	0.58
2:C:210:GLU:HG2	2:C:304:LEU:HD21	1.84	0.58
2:C:787:ASP:OD2	2:C:791:ARG:NH2	2.36	0.58
3:D:238:PRO:HD3	3:D:318:ARG:HG3	1.84	0.58
3:D:520:LEU:O	3:D:525:ARG:NH1	2.35	0.58
3:N:71:LYS:NZ	3:N:74:GLU:OE2	2.37	0.58
6:Q:18:DA:H2'	6:Q:19:DG:C8	2.39	0.58
3:N:106:LYS:HE3	3:N:587:ARG:HG3	1.86	0.58
2:C:704:HIS:CD2	2:C:831:ARG:HD2	2.38	0.58
2:C:711:GLU:HG2	2:C:822:VAL:HG22	1.86	0.58
1:L:56:VAL:HG21	1:L:82:LEU:HD13	1.86	0.58
1:L:80:LEU:HG	3:N:844:ALA:HA	1.85	0.58
3:D:462:GLN:HB2	3:D:513:ILE:HG21	1.85	0.58
2:M:521:PRO:HB3	3:N:1068:LEU:HD21	1.85	0.57
2:M:1116:ALA:HB2	3:N:88:TYR:HB3	1.84	0.57
5:P:77:THR:HG23	5:P:78:SER:H	1.67	0.57
7:R:16:DC:C4	7:R:17:DA:N6	2.72	0.57
1:B:91:ASN:HB3	1:B:94:LEU:HB2	1.86	0.57
3:N:26:VAL:HG11	3:N:44:LEU:HD23	1.86	0.57
3:N:1040:GLY:O	3:N:1060:SER:HB3	2.04	0.57
2:M:1037:VAL:HG13	2:M:1049:LEU:HD11	1.86	0.57
3:N:1353:GLN:NE2	3:N:1365:ASP:OD1	2.37	0.57
6:G:15:DT:H2'	6:G:16:DC:C6	2.39	0.57
3:N:260:GLU:OE1	3:N:273:ARG:NH1	2.37	0.57
1:L:108:GLU:HG2	1:L:131:THR:HG22	1.86	0.57
2:M:90:TYR:CE2	2:M:120:LEU:HD11	2.38	0.57
3:D:142:LEU:HB2	3:D:161:LEU:HD11	1.86	0.56
2:M:331:ARG:NH2	7:R:14:DG:O6	2.38	0.56
2:M:409:ARG:HH21	2:M:454:SER:HB2	1.70	0.56
3:N:1042:ARG:HB3	3:N:1057:VAL:HB	1.86	0.56
1:K:53:VAL:HG22	1:K:144:VAL:HG22	1.87	0.56
3:D:356:PRO:HG2	3:D:359:ALA:HB2	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:22:GLN:HE22	2:M:336:VAL:HG22	1.70	0.56
2:C:167:LYS:HD3	7:H:12:DC:H5	1.70	0.56
3:D:809:PRO:HB3	3:D:839:LEU:HD13	1.86	0.56
3:D:479:GLU:OE1	3:D:482:LYS:NZ	2.38	0.56
2:M:21:ILE:HG23	2:M:22:GLN:N	2.21	0.56
3:N:1461:GLY:O	3:N:1465:ASN:ND2	2.39	0.56
5:P:273:ARG:HG2	5:P:276:ARG:HH12	1.71	0.56
2:M:1095:LEU:HD23	3:N:582:LEU:HD22	1.88	0.56
3:N:809:PRO:HB3	3:N:839:LEU:HD13	1.88	0.56
3:N:996:TRP:CD2	3:N:1056:PRO:HG3	2.40	0.56
1:A:99:LEU:HB2	1:A:142:VAL:HG22	1.88	0.55
7:H:3:DT:H2'	7:H:4:DA:C8	2.42	0.55
2:M:259:GLY:HA2	2:M:263:ASP:HB2	1.88	0.55
3:D:1152:GLU:HG3	3:D:1161:GLU:HA	1.88	0.55
3:D:1491:THR:HG21	4:E:89:MET:HG2	1.89	0.55
5:F:321:ILE:O	5:F:327:SER:OG	2.24	0.55
2:C:1016:ILE:O	3:D:87:ARG:NH1	2.36	0.55
2:C:1009:SER:HB3	3:D:651:GLU:O	2.05	0.55
3:N:127:LEU:HA	3:N:457:GLY:HA2	1.89	0.55
5:P:386:VAL:HG22	5:P:397:ILE:HD13	1.88	0.55
2:C:504:GLU:HG2	2:C:509:ALA:HB2	1.89	0.55
3:D:272:LEU:HB2	3:D:280:ALA:HB3	1.89	0.55
5:P:364:ARG:HH22	5:P:392:VAL:HG21	1.70	0.55
1:B:176:ARG:NH2	3:D:888:GLU:OE1	2.40	0.55
5:F:361:LEU:HB3	5:F:365:GLU:HG3	1.89	0.55
1:K:32:PHE:HA	1:K:35:THR:HB	1.88	0.55
2:M:504:GLU:HG2	2:M:509:ALA:HB2	1.89	0.55
3:D:1495:ILE:HG12	4:E:88:GLU:HG3	1.89	0.55
2:M:343:GLN:HG3	2:M:385:PHE:HB2	1.89	0.55
2:C:808:ARG:NH2	5:F:305:GLU:OE2	2.40	0.54
3:D:353:VAL:HG11	3:D:387:LEU:HD11	1.89	0.54
2:M:104:ASP:OD1	2:M:105:THR:N	2.40	0.54
2:M:409:ARG:NH2	2:M:442:GLU:OE2	2.41	0.54
3:D:832:ARG:HD2	3:D:833:GLU:H	1.72	0.54
6:Q:15:DT:H2'	6:Q:16:DC:H6	1.72	0.54
3:D:411:THR:HB	3:D:437:VAL:H	1.73	0.54
1:L:99:LEU:HB2	1:L:142:VAL:HG22	1.88	0.54
2:M:206:THR:HG22	2:M:209:ARG:HH22	1.71	0.54
1:B:80:LEU:HG	3:D:844:ALA:HA	1.89	0.54
3:D:1459:LEU:HD23	3:D:1464:GLU:HB3	1.89	0.54
5:F:163:LEU:HD13	5:F:174:LEU:HD13	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:25:SER:CB	2:M:335:THR:HG22	2.38	0.54
2:C:1038:TRP:CE2	3:D:1099:VAL:HG11	2.43	0.54
2:M:605:LYS:HB2	2:M:612:VAL:HB	1.90	0.54
2:M:878:SER:HA	3:N:1034:GLN:OE1	2.07	0.54
3:N:48:ARG:NE	3:N:76:CYS:O	2.41	0.54
5:P:396:ARG:HH21	5:P:400:ILE:HD12	1.71	0.54
3:N:657:LEU:HG	3:N:661:MET:HE2	1.90	0.54
3:D:455:ARG:HB2	3:D:460:ALA:HB2	1.90	0.54
2:M:28:ARG:NH1	2:M:42:VAL:HG21	2.23	0.54
2:C:605:LYS:HB2	2:C:612:VAL:HB	1.90	0.54
1:B:216:GLU:OE1	1:B:219:ARG:NH2	2.37	0.54
2:C:617:ASP:OD1	2:C:617:ASP:N	2.41	0.54
2:C:878:SER:HA	3:D:1034:GLN:OE1	2.08	0.54
3:D:1046:GLN:N	3:D:1046:GLN:OE1	2.40	0.54
3:N:355:VAL:HG11	3:N:385:VAL:HG21	1.89	0.54
5:P:140:ARG:HG3	5:P:142:ARG:HH12	1.74	0.54
2:C:259:GLY:HA2	2:C:263:ASP:HB2	1.90	0.53
3:D:1040:GLY:O	3:D:1060:SER:HB3	2.08	0.53
3:D:574:LEU:O	3:D:578:VAL:HG23	2.07	0.53
3:D:1042:ARG:HB3	3:D:1057:VAL:HB	1.91	0.53
1:B:83:LYS:NZ	3:D:842:VAL:O	2.42	0.53
5:F:193:ARG:HB2	7:H:6:DT:H1'	1.89	0.53
3:N:480:GLU:OE2	3:N:488:ARG:NH2	2.40	0.53
3:N:806:PHE:O	3:N:829:VAL:HA	2.08	0.53
3:N:438:ASP:OD2	3:N:441:ARG:NH2	2.39	0.53
5:P:415:THR:HG22	5:P:416:ARG:HG2	1.91	0.53
5:F:93:LEU:HD21	5:F:193:ARG:HD2	1.90	0.53
3:N:959:GLU:N	3:N:959:GLU:OE1	2.42	0.53
3:D:1379:VAL:HG21	3:D:1400:VAL:HG11	1.91	0.53
2:M:335:THR:CG2	2:M:336:VAL:N	2.60	0.53
2:M:177:GLU:HG3	2:M:178:PRO:HD2	1.91	0.53
4:E:39:VAL:O	4:E:72:ARG:NH1	2.42	0.53
2:M:1006:HIS:HB2	2:M:1024:LYS:HG3	1.91	0.53
3:N:243:ALA:N	3:N:311:LEU:HD21	2.23	0.53
1:B:111:ALA:HB3	1:B:125:PRO:HA	1.91	0.52
2:C:15:LEU:O	2:C:586:ARG:NH2	2.32	0.52
2:M:405:ARG:HD2	2:M:442:GLU:OE2	2.09	0.52
5:P:365:GLU:HA	5:P:368:VAL:HG22	1.92	0.52
5:P:408:LEU:O	5:P:412:GLU:HB2	2.09	0.52
2:M:26:TYR:HE2	2:M:120:LEU:HA	1.73	0.52
6:Q:14:DG:H2'	6:Q:15:DT:C6	2.44	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:294:GLU:HB3	2:M:299:LYS:HD2	1.91	0.52
2:C:211:LEU:HD11	2:C:304:LEU:HD11	1.92	0.52
2:C:684:PHE:CE1	3:D:783:ARG:CB	2.88	0.52
6:G:12:DG:H2'	6:G:13:DA:C8	2.44	0.52
1:L:80:LEU:HD11	3:N:842:VAL:HG12	1.91	0.52
2:M:617:ASP:OD1	2:M:617:ASP:N	2.43	0.52
3:N:553:ARG:HD2	3:N:570:GLU:OE2	2.09	0.52
3:N:141:ILE:HA	3:N:146:PRO:HA	1.90	0.52
3:N:1107:VAL:HA	3:N:1200:VAL:O	2.10	0.52
3:D:9:ARG:HB2	3:D:1456:LYS:HG2	1.91	0.52
5:P:89:GLY:HA3	7:R:7:DG:C6	2.45	0.52
2:C:428:ARG:NH2	2:C:447:ALA:O	2.41	0.52
3:D:1258:ARG:NH1	3:D:1261:GLU:OE2	2.36	0.52
3:D:526:PRO:HB2	3:D:528:VAL:HG13	1.91	0.51
2:M:92:ALA:CB	2:M:120:LEU:HD23	2.40	0.51
2:M:948:GLU:HB3	2:M:953:VAL:HG23	1.92	0.51
3:N:243:ALA:N	3:N:311:LEU:CD2	2.73	0.51
3:N:936:TYR:O	3:N:940:THR:OG1	2.26	0.51
3:N:474:GLU:HG3	3:N:496:LEU:HD11	1.91	0.51
3:D:371:ILE:HG23	5:F:230:LYS:HD2	1.91	0.51
2:M:25:SER:CB	2:M:335:THR:HG21	2.40	0.51
3:N:1046:GLN:N	3:N:1046:GLN:OE1	2.43	0.51
5:P:412:GLU:HG3	5:P:416:ARG:HE	1.75	0.51
2:C:78:PHE:HB3	2:C:82:GLU:HG2	1.92	0.51
3:N:782:SER:O	3:N:786:ILE:HG13	2.10	0.51
3:N:904:VAL:HG22	3:N:905:PRO:HD2	1.91	0.51
1:A:20:TYR:OH	1:A:198:ARG:HD2	2.11	0.51
1:L:80:LEU:HD23	3:N:867:ARG:HD3	1.92	0.51
2:C:177:GLU:HG3	2:C:178:PRO:HD2	1.93	0.51
3:D:784:ASP:HB2	3:D:939:PHE:HE1	1.74	0.51
2:C:1037:VAL:HG13	2:C:1049:LEU:HD11	1.92	0.51
2:M:229:MET:HB3	2:M:233:GLU:HB2	1.92	0.51
2:C:229:MET:HB2	2:C:233:GLU:HB2	1.93	0.51
4:E:45:ARG:NH1	4:E:56:ASP:OD2	2.43	0.51
7:H:17:DA:H2"	7:H:18:DC:C6	2.46	0.51
2:M:12:VAL:HG11	2:M:472:ARG:HD3	1.93	0.51
7:R:16:DC:H1'	7:R:17:DA:C8	2.46	0.51
3:D:318:ARG:NH1	3:D:338:GLU:OE1	2.44	0.51
2:C:243:ARG:NH2	7:H:9:DG:O6	2.44	0.51
3:D:959:GLU:N	3:D:959:GLU:OE1	2.43	0.51
2:M:35:PRO:HG2	2:M:38:LYS:HB2	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:179:PHE:HB3	1:B:197:LEU:HD13	1.92	0.50
5:F:80:PRO:HB2	5:F:210:LEU:HD11	1.93	0.50
3:N:411:THR:HG23	5:P:178:ARG:HB2	1.93	0.50
2:M:905:ILE:HG23	2:M:906:PHE:HD2	1.77	0.50
3:N:704:ARG:HB2	3:N:745:MET:HG2	1.93	0.50
2:C:607:ASP:HB2	2:C:610:ARG:NH1	2.26	0.50
3:D:128:TYR:OH	3:D:579:ASP:OD2	2.24	0.50
2:M:719:PRO:HB3	2:M:820:ARG:HE	1.76	0.50
2:C:167:LYS:HD3	7:H:12:DC:C5	2.47	0.50
3:D:272:LEU:C	3:D:279:VAL:HG12	2.32	0.50
3:D:553:ARG:HD2	3:D:570:GLU:OE2	2.12	0.50
1:K:55:SER:HB3	1:K:143:ARG:HB3	1.94	0.50
3:N:984:THR:HG22	3:N:987:GLU:HG3	1.94	0.50
1:B:124:ASN:OD1	1:B:124:ASN:N	2.45	0.50
3:D:840:LYS:HE3	3:D:841:TYR:CZ	2.46	0.50
2:M:710:ILE:HD12	2:M:790:LEU:HB2	1.94	0.50
2:C:405:ARG:NH1	2:C:409:ARG:HH11	2.10	0.50
3:N:784:ASP:CB	3:N:939:PHE:HE1	2.25	0.50
3:N:356:PRO:HG2	3:N:359:ALA:HB2	1.94	0.49
2:M:1063:ARG:HG3	5:P:341:PRO:HG3	1.94	0.49
3:N:1281:VAL:HG21	3:N:1313:VAL:HG21	1.93	0.49
2:C:937:ASP:OD2	2:C:939:ARG:NH1	2.45	0.49
2:M:92:ALA:HB2	2:M:120:LEU:HD21	1.92	0.49
2:M:503:LEU:HD23	2:M:508:ILE:HA	1.94	0.49
7:R:11:DG:H4'	7:R:11:DG:OP1	2.12	0.49
1:L:58:ILE:HB	1:L:61:VAL:HB	1.95	0.49
2:M:87:ASP:HA	2:M:131:GLY:HA3	1.93	0.49
3:N:243:ALA:CA	3:N:311:LEU:CD2	2.90	0.49
3:N:841:TYR:HB2	3:N:864:VAL:HG22	1.94	0.49
1:A:32:PHE:HA	1:A:35:THR:HB	1.94	0.49
3:D:218:LYS:HG2	3:D:338:GLU:HG2	1.93	0.49
3:D:258:VAL:HG12	3:D:273:ARG:O	2.12	0.49
4:O:42:PRO:HA	4:O:45:ARG:HD2	1.94	0.49
5:P:93:LEU:HD21	5:P:193:ARG:HD2	1.95	0.49
5:F:181:GLU:O	5:F:185:GLN:HG2	2.13	0.49
1:B:56:VAL:HG21	1:B:82:LEU:HD13	1.94	0.49
2:M:607:ASP:HB2	2:M:610:ARG:NH1	2.28	0.49
3:N:784:ASP:HB3	3:N:939:PHE:CE1	2.48	0.49
2:M:1009:SER:HB3	3:N:651:GLU:O	2.13	0.49
5:F:166:LEU:HD13	5:F:170:HIS:HB3	1.94	0.49
2:M:776:SER:OG	5:P:373:LYS:NZ	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:35:PRO:HG2	2:C:38:LYS:HD3	1.94	0.48
3:D:224:ARG:NE	3:D:254:GLU:OE2	2.31	0.48
2:M:266:ARG:NH1	7:R:11:DG:N7	2.60	0.48
2:M:402:SER:HA	2:M:566:THR:HG23	1.95	0.48
3:D:181:ASP:HB2	3:D:205:TYR:CD2	2.48	0.48
3:D:475:LYS:O	3:D:479:GLU:HG2	2.13	0.48
3:N:840:LYS:HE3	3:N:841:TYR:CZ	2.48	0.48
1:K:156:HIS:NE2	1:K:167:VAL:O	2.39	0.48
3:N:243:ALA:H	3:N:311:LEU:HD23	1.77	0.48
3:N:1350:GLU:O	3:N:1354:LYS:HG3	2.13	0.48
2:M:141:HIS:CE1	2:M:334:ARG:HD2	2.47	0.48
3:N:1046:GLN:HA	3:N:1052:THR:HA	1.95	0.48
1:A:54:THR:HG21	1:A:145:ASP:HB2	1.95	0.48
2:C:405:ARG:CZ	2:C:409:ARG:HH11	2.26	0.48
2:C:462:ASP:HB3	2:C:468:ARG:HD2	1.94	0.48
3:D:244:GLU:HG3	3:D:310:LEU:HG	1.95	0.48
3:N:850:LEU:HD12	3:N:884:ARG:NH2	2.29	0.48
1:A:57:TYR:CD1	1:A:161:ARG:HD2	2.48	0.48
2:C:684:PHE:HB3	3:D:633:VAL:HG21	1.96	0.48
3:D:784:ASP:HB2	3:D:939:PHE:CE1	2.48	0.48
2:M:775:ARG:HD3	2:M:782:ALA:HB2	1.94	0.48
2:M:1110:ASP:OD2	2:M:1114:GLY:N	2.27	0.48
3:N:654:LYS:O	3:N:658:LEU:HG	2.13	0.48
3:D:622:ARG:NH1	6:G:17:DC:OP1	2.45	0.48
2:M:1092:LEU:HD13	2:M:1099:VAL:HG21	1.96	0.48
3:N:1068:LEU:O	3:N:1072:ILE:HG12	2.14	0.48
1:L:124:ASN:OD1	1:L:124:ASN:N	2.47	0.48
2:M:376:ARG:NH1	5:P:279:GLN:OE1	2.42	0.48
3:D:171:LEU:HD22	3:D:390:PRO:HG2	1.95	0.48
6:G:18:DA:H2'	6:G:19:DG:O4'	2.14	0.48
7:H:11:DG:H4'	7:H:11:DG:OP1	2.13	0.48
1:K:51:THR:OG1	1:K:87:VAL:O	2.21	0.48
3:N:260:GLU:HB3	3:N:271:VAL:HB	1.96	0.48
2:C:911:GLU:O	2:C:915:LYS:HG2	2.14	0.47
3:D:42:ASP:OD1	3:D:48:ARG:NH2	2.47	0.47
2:M:356:ARG:HA	2:M:359:MET:HE3	1.96	0.47
5:P:404:ALA:O	5:P:408:LEU:HB2	2.14	0.47
3:D:1464:GLU:OE1	3:D:1464:GLU:N	2.37	0.47
2:M:172:ILE:HG13	2:M:186:VAL:HG22	1.95	0.47
2:M:944:LEU:HD21	2:M:963:LEU:HD23	1.95	0.47
3:N:685:ASP:HA	3:N:688:TRP:HD1	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:N:988:ARG:NH2	3:N:1054:GLU:OE2	2.47	0.47
5:P:322:GLY:HA2	11:Q:101:DG:H22	1.78	0.47
2:M:468:ARG:HA	2:M:486:MET:O	2.13	0.47
3:N:273:ARG:HG2	3:N:278:PRO:HA	1.96	0.47
5:P:79:ASP:O	5:P:81:VAL:N	2.47	0.47
7:R:12:DC:H1'	7:R:13:DT:C4	2.49	0.47
3:D:1275:SER:O	3:D:1322:GLY:N	2.42	0.47
3:D:1364:HIS:ND1	3:D:1366:LYS:HB2	2.29	0.47
3:D:1377:LYS:HE3	3:D:1378:TYR:CZ	2.50	0.47
3:N:243:ALA:C	3:N:311:LEU:CD2	2.83	0.47
3:N:782:SER:O	3:N:786:ILE:HB	2.14	0.47
1:A:64:GLU:HG3	1:A:79:ILE:HD12	1.95	0.47
2:M:355:VAL:HG12	2:M:359:MET:HE2	1.96	0.47
3:N:475:LYS:O	3:N:479:GLU:HG2	2.15	0.47
3:N:783:ARG:HB3	3:N:1028:ALA:C	2.31	0.47
3:D:1046:GLN:HA	3:D:1052:THR:HA	1.97	0.47
3:N:1364:HIS:ND1	3:N:1366:LYS:HB2	2.29	0.47
1:A:180:GLN:NE2	2:C:935:GLY:O	2.48	0.47
3:D:67:ARG:CZ	5:F:379:ARG:HD3	2.45	0.47
3:D:236:TYR:CZ	3:D:242:LEU:HD12	2.50	0.47
3:D:996:TRP:CD2	3:D:1056:PRO:HG3	2.50	0.47
2:M:154:ARG:H	2:M:154:ARG:HG2	1.54	0.47
3:N:526:PRO:HB2	3:N:528:VAL:HG13	1.96	0.47
3:D:787:LEU:HD21	3:D:947:ILE:HG21	1.97	0.47
2:M:224:GLU:CD	2:M:224:GLU:H	2.18	0.47
2:M:886:LEU:HD21	3:N:951:ILE:HG12	1.97	0.47
3:N:171:LEU:HD22	3:N:390:PRO:HG2	1.96	0.47
3:D:1426:LYS:O	3:D:1430:SER:OG	2.26	0.47
1:K:176:ARG:NH1	2:M:863:ASP:O	2.48	0.47
3:N:371:ILE:HD12	5:P:230:LYS:HA	1.96	0.47
2:C:394:PHE:CE2	2:C:632:ASN:HB3	2.51	0.46
3:D:355:VAL:HG11	3:D:385:VAL:HG21	1.97	0.46
2:M:22:GLN:CD	2:M:336:VAL:CG2	2.84	0.46
2:M:474:VAL:HG22	2:M:479:VAL:HG22	1.96	0.46
2:M:561:GLY:O	2:M:565:GLN:HG3	2.15	0.46
3:N:45:PHE:CD2	3:N:522:PRO:HB3	2.50	0.46
3:N:347:VAL:HG13	3:N:351:MET:HB2	1.97	0.46
3:N:658:LEU:HA	3:N:661:MET:HE3	1.97	0.46
2:C:394:PHE:CE2	11:G:101:DG:H5"	2.50	0.46
2:C:1067:TYR:OH	3:D:674:ARG:NH1	2.48	0.46
3:D:44:LEU:HB3	3:D:525:ARG:NH2	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1149:LEU:HD12	3:D:1164:ARG:HB3	1.95	0.46
2:M:80:GLN:NE2	2:M:122:THR:HG22	2.30	0.46
2:M:469:THR:HG23	2:M:471:TYR:CE2	2.50	0.46
2:M:680:ASP:H	3:N:943:THR:HB	1.80	0.46
3:D:1480:PHE:O	4:E:18:ARG:NH2	2.48	0.46
3:N:411:THR:HB	3:N:437:VAL:H	1.81	0.46
3:N:575:GLN:O	3:N:579:ASP:OD2	2.34	0.46
2:C:172:ILE:HG13	2:C:186:VAL:HG22	1.97	0.46
2:C:474:VAL:HG22	2:C:479:VAL:HG22	1.96	0.46
2:C:1116:ALA:HB2	3:D:88:TYR:HB3	1.96	0.46
3:D:791:TYR:CD1	3:D:945:SER:HB2	2.51	0.46
3:D:1282:ARG:HE	3:D:1282:ARG:HB3	1.50	0.46
5:F:188:ILE:HD13	5:F:221:ILE:HG12	1.98	0.46
2:M:243:ARG:NH2	7:R:9:DG:O6	2.47	0.46
2:M:834:GLN:HE21	2:M:1001:VAL:HG23	1.80	0.46
3:N:434:ARG:NH2	5:P:135:ILE:O	2.49	0.46
3:N:1208:ASP:HB2	3:N:1215:VAL:HA	1.97	0.46
3:N:1366:LYS:O	3:N:1370:ILE:HG12	2.15	0.46
2:C:399:ASN:H	2:C:402:SER:HG	1.61	0.46
3:D:1101:VAL:HG13	3:D:1102:THR:HG23	1.98	0.46
2:M:198:ARG:CZ	2:M:231:PRO:HD3	2.46	0.46
2:M:778:PHE:HZ	5:P:419:ARG:HA	1.81	0.46
3:N:36:THR:HG23	3:N:38:LYS:H	1.80	0.46
2:C:134:ARG:NH1	2:C:392:SER:O	2.48	0.46
2:C:436:GLY:HA2	2:C:538:GLN:O	2.15	0.46
2:C:578:VAL:HG23	2:C:579:VAL:HG23	1.98	0.46
3:D:134:VAL:HG12	3:D:454:ALA:HB2	1.97	0.46
5:F:154:LYS:HB2	5:F:154:LYS:HE2	1.80	0.46
3:N:243:ALA:O	3:N:311:LEU:HD22	2.15	0.46
2:C:872:ASN:ND2	3:D:784:ASP:OD2	2.41	0.46
2:M:90:TYR:CZ	2:M:120:LEU:CD1	2.96	0.46
2:M:787:ASP:OD2	2:M:791:ARG:NH2	2.49	0.46
2:C:1054:THR:O	2:C:1059:ASP:HB3	2.16	0.46
2:M:24:GLU:OE2	2:M:24:GLU:HA	2.16	0.46
2:M:324:ASP:HB3	2:M:327:HIS:HB2	1.97	0.46
1:A:11:PHE:O	1:B:228:PRO:HA	2.16	0.46
2:C:92:ALA:HB2	2:C:120:LEU:HD11	1.97	0.46
3:N:181:ASP:HB2	3:N:205:TYR:CD2	2.51	0.46
2:C:6:PHE:CD1	2:C:909:ALA:HB2	2.50	0.45
2:C:32:ALA:HB2	2:C:73:LEU:HD12	1.97	0.45
7:H:21:DA:H5'	7:H:21:DA:H8	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:K:39:PRO:HG3	1:L:39:PRO:HG3	1.97	0.45
1:L:188:GLN:H	1:L:188:GLN:CD	2.19	0.45
5:P:384:GLU:HG2	5:P:385:GLU:OE2	2.17	0.45
3:D:553:ARG:NE	5:F:215:GLU:OE2	2.43	0.45
3:D:1366:LYS:O	3:D:1370:ILE:HG12	2.16	0.45
6:G:15:DT:H2'	6:G:16:DC:H6	1.78	0.45
3:D:127:LEU:HA	3:D:457:GLY:HA2	1.97	0.45
2:M:577:PRO:HB3	2:M:993:PHE:CG	2.52	0.45
2:M:740:GLU:HB3	2:M:805:ARG:NH1	2.31	0.45
1:A:39:PRO:HG3	1:B:39:PRO:HG3	1.99	0.45
2:C:755:LEU:HD22	2:C:825:VAL:HG11	1.98	0.45
2:C:939:ARG:H	2:C:939:ARG:HG2	1.46	0.45
3:D:237:LYS:HA	3:D:318:ARG:HG3	1.98	0.45
3:D:474:GLU:HG3	3:D:496:LEU:HD11	1.98	0.45
7:H:17:DA:H2"	7:H:18:DC:H6	1.81	0.45
2:C:203:ASP:OD1	2:C:204:GLN:N	2.47	0.45
3:N:1258:ARG:NH1	3:N:1261:GLU:OE2	2.43	0.45
3:D:657:LEU:HG	3:D:661:MET:HE2	1.98	0.45
3:D:1065:LEU:HD23	3:D:1069:GLU:HB3	1.99	0.45
5:F:223:ALA:HB2	5:F:242:TRP:HB2	1.99	0.45
2:M:105:THR:HG22	2:M:107:LEU:H	1.82	0.45
2:M:374:ASN:OD1	5:P:276:ARG:HD3	2.15	0.45
2:M:571:LEU:HD22	2:M:700:TYR:HA	1.98	0.45
7:R:16:DC:H2"	7:R:17:DA:C8	2.51	0.45
2:C:266:ARG:NH1	7:H:11:DG:O6	2.49	0.45
3:D:405:ASP:CG	3:D:406:ASP:H	2.20	0.45
5:F:276:ARG:O	5:F:279:GLN:HG3	2.17	0.45
7:H:15:DT:H2"	7:H:16:DC:H5'	1.98	0.45
3:N:535:PHE:HB3	5:P:314:PRO:HB3	1.99	0.45
4:O:47:LYS:HG3	4:O:54:LEU:HD23	1.99	0.45
1:A:198:ARG:HD3	2:C:934:PHE:CZ	2.52	0.45
1:B:58:ILE:HB	1:B:61:VAL:HB	1.99	0.45
2:C:395:LYS:HE2	2:C:403:SER:CB	2.47	0.45
2:M:629:TYR:HD2	2:M:637:LEU:HD13	1.82	0.45
2:M:853:LEU:HB2	2:M:858:MET:CE	2.47	0.45
3:N:540:LEU:HD23	3:N:543:LEU:HD12	1.98	0.45
2:M:628:PHE:H	2:M:638:ASP:CB	2.30	0.45
2:M:1054:THR:HG22	2:M:1082:PRO:HG3	1.98	0.45
3:N:835:SER:OG	3:N:838:ARG:HG3	2.17	0.45
5:P:88:ILE:HD12	5:P:88:ILE:HA	1.77	0.45
2:M:758:ARG:HH21	2:M:788:THR:HB	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:P:383:LEU:HB3	5:P:394:ARG:HG3	1.99	0.44
5:P:409:LYS:HE2	5:P:409:LYS:HB2	1.72	0.44
3:D:248:PRO:HG3	3:D:308:LYS:HG3	1.99	0.44
7:H:13:DT:H2"	7:H:14:DG:OP1	2.17	0.44
1:K:108:GLU:HG2	1:K:131:THR:HG23	1.97	0.44
1:K:218:LEU:HG	1:L:222:LEU:HD11	1.99	0.44
3:N:520:LEU:HD12	3:N:521:PRO:HD2	1.99	0.44
3:N:919:PHE:CE1	3:N:924:MET:HG2	2.52	0.44
2:C:905:ILE:HG23	2:C:906:PHE:HD2	1.81	0.44
3:D:356:PRO:HB3	3:D:441:ARG:HA	1.98	0.44
3:D:1493:LYS:HD2	3:D:1493:LYS:HA	1.74	0.44
2:M:328:LEU:HD23	2:M:328:LEU:HA	1.84	0.44
2:M:629:TYR:CD2	2:M:637:LEU:HD13	2.52	0.44
2:M:876:VAL:HB	3:N:949:ILE:HD12	1.99	0.44
2:M:1054:THR:O	2:M:1059:ASP:HB3	2.17	0.44
3:N:96:ALA:HB3	3:N:554:LEU:HD23	1.99	0.44
1:B:32:PHE:HA	1:B:35:THR:HB	2.00	0.44
2:C:581:THR:N	2:C:584:GLU:OE2	2.46	0.44
2:C:810:ASP:OD1	2:C:810:ASP:N	2.50	0.44
3:D:564:GLU:OE2	5:F:140:ARG:NH2	2.48	0.44
3:D:689:ASP:O	3:D:693:GLU:HG3	2.18	0.44
3:D:841:TYR:HB2	3:D:864:VAL:HG22	1.99	0.44
3:D:1350:GLU:O	3:D:1354:LYS:HG3	2.17	0.44
2:M:778:PHE:CZ	5:P:419:ARG:HA	2.53	0.44
2:M:1016:ILE:O	3:N:87:ARG:NH1	2.50	0.44
3:N:12:LEU:HD21	3:N:104:PHE:CZ	2.51	0.44
3:N:875:THR:HG22	12:N:2104:HOH:O	2.17	0.44
3:N:1122:LEU:HD13	3:N:1178:ALA:HB2	1.98	0.44
4:O:66:LYS:O	4:O:70:THR:HG23	2.17	0.44
5:F:172:ARG:O	5:F:176:ILE:HG12	2.17	0.44
5:F:208:SER:HB3	5:F:211:ASP:OD2	2.18	0.44
2:M:728:HIS:HD2	5:P:422:LEU:HD13	1.82	0.44
2:C:64:LEU:N	2:C:103:LYS:HE2	2.32	0.44
3:D:266:GLU:HG3	3:D:314:PRO:HB3	1.99	0.44
3:D:1047:LYS:HG2	3:D:1053:PHE:CZ	2.53	0.44
3:N:1084:THR:O	3:N:1088:THR:HG23	2.18	0.44
5:P:358:LEU:O	5:P:366:ALA:HB2	2.16	0.44
5:P:399:GLN:O	5:P:403:LYS:HG2	2.17	0.44
5:P:403:LYS:HA	5:P:406:ARG:HG2	1.99	0.44
3:D:709:HIS:HA	3:D:1227:GLN:HB3	2.00	0.44
3:D:1208:ASP:HB2	3:D:1215:VAL:HA	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:279:GLN:HA	5:F:284:ARG:O	2.18	0.44
2:M:684:PHE:CD2	3:N:730:PRO:HB3	2.52	0.44
3:N:1283:ILE:HD13	3:N:1283:ILE:H	1.82	0.44
3:D:90:MET:SD	3:D:521:PRO:HD3	2.57	0.44
2:M:1044:GLY:O	3:N:1475:GLY:HA3	2.18	0.44
3:N:1232:PRO:HG2	3:N:1356:TYR:HE2	1.82	0.44
4:O:46:PRO:HD2	4:O:63:TRP:CE2	2.53	0.44
2:C:1090:LYS:HD3	2:C:1090:LYS:HA	1.82	0.44
3:D:230:TRP:CZ2	3:D:232:GLU:HG2	2.53	0.44
3:D:1216:SER:OG	4:E:16:LYS:HG2	2.18	0.44
2:M:22:GLN:OE1	2:M:136:ILE:O	2.36	0.44
2:M:26:TYR:CE2	2:M:120:LEU:HA	2.52	0.44
2:M:729:LEU:HD23	2:M:729:LEU:HA	1.86	0.44
3:N:782:SER:O	3:N:786:ILE:CG1	2.65	0.44
3:N:782:SER:O	3:N:786:ILE:CB	2.66	0.44
4:O:83:ASP:OD1	4:O:83:ASP:N	2.50	0.44
5:P:373:LYS:HD3	5:P:373:LYS:HA	1.66	0.44
2:C:13:ILE:HD13	2:C:483:VAL:HG11	1.99	0.43
2:C:200:LEU:HD13	2:C:300:ASP:HB2	2.00	0.43
1:K:11:PHE:O	1:L:228:PRO:HA	2.17	0.43
1:K:54:THR:HG21	1:K:145:ASP:HB2	2.00	0.43
1:L:64:GLU:HA	1:L:165:ILE:HD13	2.00	0.43
1:A:53:VAL:HG22	1:A:144:VAL:HG22	2.00	0.43
3:D:12:LEU:HD21	3:D:104:PHE:CZ	2.52	0.43
3:D:1265:ALA:O	3:D:1333:HIS:HE1	2.01	0.43
4:E:83:ASP:OD1	4:E:83:ASP:N	2.52	0.43
2:M:428:ARG:NH2	2:M:447:ALA:O	2.40	0.43
1:A:218:LEU:HG	1:B:222:LEU:HD11	2.00	0.43
3:D:26:VAL:HG11	3:D:44:LEU:HD23	1.99	0.43
3:D:904:VAL:HG22	3:D:905:PRO:HD2	1.99	0.43
3:D:963:TYR:CE1	3:D:1002:LYS:HD3	2.53	0.43
7:H:12:DC:H1'	7:H:13:DT:C5	2.53	0.43
3:N:44:LEU:HB3	3:N:525:ARG:NH2	2.33	0.43
5:P:79:ASP:O	5:P:82:ARG:N	2.51	0.43
5:P:120:THR:HG22	5:P:122:LEU:HD13	2.00	0.43
8:S:2:G:C2'	8:S:3:A:H5"	2.45	0.43
2:C:418:LEU:HD11	7:H:14:DG:H2'	2.00	0.43
3:D:477:LEU:HB2	3:D:496:LEU:HD13	2.01	0.43
3:D:791:TYR:CE1	3:D:945:SER:HB2	2.54	0.43
5:F:89:GLY:HA3	7:H:7:DG:C6	2.54	0.43
3:N:1094:LEU:O	3:N:1098:LEU:HG	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:12:VAL:HG21	2:C:472:ARG:HD3	2.01	0.43
2:C:944:LEU:HD21	2:C:963:LEU:HD23	2.01	0.43
2:C:1072:LYS:NZ	5:F:352:GLU:OE2	2.43	0.43
4:E:57:ASP:O	4:E:63:TRP:NE1	2.47	0.43
1:K:57:TYR:CD1	1:K:161:ARG:HD2	2.53	0.43
1:L:90:LEU:HD12	1:L:119:ASP:HA	2.00	0.43
2:M:394:PHE:CE2	2:M:632:ASN:HB3	2.53	0.43
2:M:1038:TRP:CE2	3:N:1099:VAL:HG11	2.53	0.43
3:N:561:GLY:HA3	5:P:132:ARG:HD3	2.00	0.43
6:Q:16:DC:H2'	6:Q:17:DC:C6	2.53	0.43
1:B:80:LEU:HD11	3:D:842:VAL:HG12	2.00	0.43
2:C:503:LEU:HD23	2:C:508:ILE:HA	2.00	0.43
2:C:726:ILE:HD11	2:C:757:GLY:HA3	2.01	0.43
3:D:1084:THR:O	3:D:1088:THR:HG23	2.19	0.43
5:F:88:ILE:HA	5:F:88:ILE:HD12	1.72	0.43
2:M:700:TYR:HD1	2:M:996:LYS:HB2	1.83	0.43
2:C:797:GLY:O	2:C:829:GLN:NE2	2.52	0.43
2:C:853:LEU:HB2	2:C:858:MET:CE	2.48	0.43
3:D:111:LYS:HG3	3:D:1452:ILE:HD11	2.00	0.43
3:D:654:LYS:O	3:D:658:LEU:HG	2.19	0.43
2:M:24:GLU:OE1	2:M:27:ARG:NH2	2.51	0.43
1:A:228:PRO:HB3	1:B:13:VAL:HG21	2.00	0.43
2:C:557:ARG:HG3	2:C:844:GLY:HA3	2.01	0.43
2:C:874:LEU:HD23	3:D:1023:MET:SD	2.58	0.43
1:K:47:SER:HG	1:L:32:PHE:HE1	1.64	0.43
2:M:215:GLY:O	2:M:218:VAL:HG12	2.19	0.43
2:M:1058:ASP:OD2	2:M:1082:PRO:HB3	2.18	0.43
3:N:44:LEU:HB3	3:N:525:ARG:HH21	1.83	0.43
3:N:1100:ASP:O	3:N:1103:HIS:HD2	2.02	0.43
2:C:294:GLU:HB3	2:C:299:LYS:HD2	2.00	0.43
5:F:373:LYS:HD3	5:F:373:LYS:HA	1.72	0.43
2:M:553:ASP:HA	2:M:881:ASN:HA	2.00	0.43
3:N:1498:ALA:HB1	4:O:84:ARG:NH2	2.30	0.43
3:D:1493:LYS:O	3:D:1497:GLU:HG2	2.18	0.43
2:M:239:PHE:CD1	2:M:253:ALA:HA	2.54	0.43
3:N:226:PRO:HD3	3:N:249:TYR:CZ	2.54	0.43
3:N:563:PRO:HB3	5:P:189:GLU:HG3	2.01	0.43
4:O:52:GLU:OE1	4:O:52:GLU:N	2.49	0.43
5:P:358:LEU:HD12	5:P:408:LEU:HD11	2.01	0.43
2:C:1058:ASP:OD2	3:D:621:LYS:HE2	2.19	0.42
2:C:1066:ALA:O	2:C:1070:ILE:HG13	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:131:LYS:O	3:D:456:MET:HG2	2.19	0.42
2:M:15:LEU:O	2:M:586:ARG:NH2	2.44	0.42
2:M:202:TYR:CE1	2:M:304:LEU:HD22	2.54	0.42
2:M:425:PHE:CE1	3:N:1086:LEU:HD12	2.54	0.42
2:M:939:ARG:H	2:M:939:ARG:HG2	1.50	0.42
3:N:1252:ILE:HG23	3:N:1253:THR:HG23	2.00	0.42
1:B:80:LEU:HB3	3:D:867:ARG:NH2	2.34	0.42
2:C:240:THR:HG22	2:C:248:PRO:HG3	2.01	0.42
3:D:284:LEU:HD22	3:D:288:MET:HE2	2.01	0.42
3:N:783:ARG:O	3:N:787:LEU:HB2	2.19	0.42
3:N:1189:ARG:HB3	3:N:1204:CYS:HA	2.01	0.42
5:P:406:ARG:HG3	5:P:407:LYS:N	2.34	0.42
3:D:314:PRO:HB2	3:D:317:VAL:HG12	2.00	0.42
6:G:11:DT:H2"	6:G:12:DG:C8	2.55	0.42
2:M:28:ARG:HH12	2:M:42:VAL:HG11	1.83	0.42
2:M:211:LEU:HD21	2:M:311:PHE:CE2	2.54	0.42
2:M:413:LEU:HD21	2:M:451:LEU:HD13	2.01	0.42
2:M:1002:GLU:HA	3:N:724:GLN:HE22	1.84	0.42
7:R:13:DT:H2"	7:R:14:DG:OP1	2.19	0.42
1:A:89:PHE:HB2	1:A:146:ARG:NH2	2.34	0.42
1:B:108:GLU:HG2	1:B:131:THR:HG22	2.00	0.42
2:C:711:GLU:O	2:C:758:ARG:NH1	2.51	0.42
3:D:573:MET:SD	5:F:210:LEU:HB3	2.59	0.42
3:D:1252:ILE:HG23	3:D:1253:THR:HG23	2.00	0.42
5:F:300:ASP:OD1	5:F:300:ASP:N	2.52	0.42
1:K:124:ASN:OD1	1:K:124:ASN:N	2.51	0.42
7:R:21:DA:H5'	7:R:21:DA:C8	2.55	0.42
2:C:218:VAL:O	2:C:222:MET:HG2	2.20	0.42
2:C:680:ASP:H	3:D:943:THR:HB	1.84	0.42
3:D:704:ARG:HB2	3:D:745:MET:HG2	2.01	0.42
3:D:1342:GLU:CD	3:D:1342:GLU:H	2.22	0.42
2:M:191:PHE:HB2	2:M:192:PRO:HD2	2.00	0.42
3:N:311:LEU:CD2	3:N:311:LEU:N	2.74	0.42
3:N:473:LEU:HD21	3:N:495:ARG:HH21	1.84	0.42
3:N:1047:LYS:HG2	3:N:1053:PHE:CZ	2.55	0.42
2:C:881:ASN:OD1	2:C:881:ASN:N	2.53	0.42
3:D:115:LEU:HD23	3:D:115:LEU:HA	1.84	0.42
3:N:102:ILE:HB	3:N:579:ASP:OD1	2.19	0.42
3:N:1126:ASP:OD1	3:N:1126:ASP:N	2.43	0.42
2:C:535:SER:O	2:C:538:GLN:HG2	2.19	0.42
3:D:172:PRO:HA	3:D:173:PRO:HD3	1.95	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:270:LEU:HD12	3:D:284:LEU:HD11	2.02	0.42
3:D:1068:LEU:O	3:D:1072:ILE:HG12	2.20	0.42
6:G:19:DG:H2'	11:G:101:DG:C4	2.55	0.42
1:L:111:ALA:HB3	1:L:125:PRO:HA	2.02	0.42
2:M:143:SER:O	2:M:147:TYR:OH	2.28	0.42
3:N:62:LYS:HD2	3:N:75:ARG:HH21	1.83	0.42
3:N:114:THR:HG23	3:N:495:ARG:HG2	2.01	0.42
3:N:236:TYR:HB2	3:N:319:ALA:HB3	2.01	0.42
3:N:1379:VAL:HG21	3:N:1400:VAL:HG11	2.01	0.42
2:C:22:GLN:HG3	2:C:407:LYS:HB3	2.00	0.42
2:C:395:LYS:HE2	2:C:403:SER:HB2	2.02	0.42
3:D:1098:LEU:HA	3:D:1101:VAL:HG12	2.02	0.42
7:H:21:DA:H5'	7:H:21:DA:C8	2.54	0.42
3:N:468:LEU:HD23	3:N:468:LEU:HA	1.90	0.42
3:N:684:LYS:HB3	3:N:684:LYS:HE2	1.84	0.42
4:O:40:LEU:HG	4:O:67:GLU:HG2	2.01	0.42
3:D:98:PRO:O	3:D:458:ALA:HB3	2.20	0.42
3:D:208:PRO:HG2	3:D:353:VAL:HG21	2.02	0.42
3:D:821:VAL:HG11	3:D:827:ILE:HD12	2.02	0.42
4:E:68:LEU:HD12	4:E:68:LEU:HA	1.85	0.42
3:N:71:LYS:O	3:N:80:VAL:HG22	2.18	0.42
3:N:226:PRO:HD3	3:N:249:TYR:CE1	2.55	0.42
3:N:805:GLU:HG3	3:N:828:LYS:HB2	2.01	0.42
3:N:892:ASP:OD1	3:N:894:LYS:HD2	2.19	0.42
1:B:92:PRO:O	1:B:146:ARG:NH1	2.50	0.42
2:C:224:GLU:H	2:C:224:GLU:CD	2.23	0.42
5:F:120:THR:HG22	5:F:122:LEU:HD13	2.01	0.42
2:M:24:GLU:CD	2:M:27:ARG:NH2	2.73	0.42
2:C:808:ARG:HB2	2:C:820:ARG:O	2.20	0.41
3:D:185:VAL:HG11	3:D:191:LEU:HD11	2.01	0.41
3:D:347:VAL:HG13	3:D:351:MET:HB2	2.01	0.41
1:K:99:LEU:HB3	1:K:114:PHE:CD1	2.55	0.41
2:M:191:PHE:CZ	2:M:238:LEU:HD11	2.55	0.41
3:N:784:ASP:HB3	3:N:939:PHE:HE1	1.85	0.41
2:C:740:GLU:HB3	2:C:805:ARG:NH1	2.35	0.41
2:C:766:GLU:HG3	3:D:64:LYS:HD2	2.02	0.41
3:D:192:ALA:HB3	3:D:195:VAL:HB	2.02	0.41
3:D:618:LEU:HD12	3:D:618:LEU:HA	1.89	0.41
3:D:999:THR:O	3:D:1003:VAL:HG13	2.20	0.41
1:L:162:ILE:HD12	1:L:162:ILE:HA	1.87	0.41
3:N:471:GLU:H	3:N:471:GLU:HG2	1.64	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:P:410:TYR:HD1	5:P:410:TYR:HA	1.68	0.41
2:C:247:PRO:HA	2:C:248:PRO:HD3	1.86	0.41
3:D:242:LEU:HD23	3:D:285:PRO:HG3	2.02	0.41
3:D:355:VAL:HG13	3:D:359:ALA:HB3	2.03	0.41
2:M:327:HIS:NE2	2:M:492:ASP:OD2	2.46	0.41
2:M:557:ARG:HG3	2:M:844:GLY:HA3	2.02	0.41
3:N:215:TYR:HE1	3:N:381:ALA:H	1.67	0.41
5:P:380:GLU:CD	5:P:380:GLU:H	2.24	0.41
1:B:162:ILE:HD12	1:B:162:ILE:HA	1.82	0.41
1:K:103:ALA:HB1	1:K:107:LYS:HD3	2.02	0.41
3:N:206:ARG:HD2	3:N:206:ARG:HA	1.87	0.41
3:N:589:ALA:HA	3:N:590:PRO:HD3	1.94	0.41
3:N:1464:GLU:OE1	3:N:1464:GLU:N	2.46	0.41
1:B:18:ARG:O	1:B:207:PRO:HD3	2.21	0.41
3:D:38:LYS:HD3	3:D:38:LYS:HA	1.85	0.41
8:I:2:G:C2'	8:I:3:A:H5"	2.46	0.41
1:L:32:PHE:HA	1:L:35:THR:HB	2.03	0.41
2:M:184:MET:O	2:M:190:LYS:HA	2.21	0.41
2:M:578:VAL:HG13	2:M:671:ASN:CG	2.41	0.41
5:P:390:PHE:HB2	5:P:397:ILE:HD11	2.01	0.41
3:D:1468:LEU:HB3	3:D:1470:ARG:HG3	2.02	0.41
2:M:351:LEU:HD11	2:M:373:VAL:HG13	2.02	0.41
2:M:762:LYS:HE3	2:M:785:VAL:O	2.20	0.41
2:M:911:GLU:OE2	3:N:1062:ARG:NH1	2.51	0.41
2:M:1088:LEU:HD22	3:N:618:LEU:HD21	2.01	0.41
5:P:153:PRO:HA	5:P:156:VAL:HG22	2.03	0.41
5:P:167:PRO:HG2	5:P:170:HIS:HB2	2.01	0.41
7:R:21:DA:H5'	7:R:21:DA:H8	1.85	0.41
2:C:397:GLU:HG3	2:C:631:SER:HB2	2.01	0.41
2:C:1038:TRP:NE1	3:D:1099:VAL:HG11	2.35	0.41
3:D:1147:ARG:NH2	3:D:1369:GLU:OE1	2.52	0.41
2:M:122:THR:OG1	2:M:126:SER:O	2.39	0.41
2:M:598:GLU:O	2:M:651:LYS:HG3	2.20	0.41
1:A:124:ASN:OD1	1:A:124:ASN:N	2.53	0.41
2:C:905:ILE:HG23	2:C:906:PHE:CD2	2.56	0.41
4:E:46:PRO:HD2	4:E:63:TRP:CE2	2.55	0.41
5:F:82:ARG:HB2	7:H:8:DG:O6	2.21	0.41
1:L:104:GLU:HA	1:L:132:LEU:HD23	2.03	0.41
2:M:351:LEU:HD12	2:M:375:SER:HA	2.03	0.41
3:N:1479:ASP:OD1	3:N:1482:ARG:NH2	2.35	0.41
2:C:74:GLY:HA3	2:C:93:PRO:HG2	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:638:ASP:H	2:C:659:PRO:HG3	1.85	0.41
3:D:168:THR:OG1	3:D:394:LEU:HD13	2.21	0.41
1:L:128:HIS:CE1	1:L:131:THR:HG23	2.56	0.41
1:L:223:THR:O	1:L:223:THR:HG22	2.21	0.41
2:M:111:ASP:OD1	2:M:112:GLU:N	2.54	0.41
2:M:269:LEU:O	2:M:288:ARG:HD2	2.21	0.41
2:M:859:PRO:O	2:M:867:VAL:HG22	2.21	0.41
3:N:314:PRO:HB2	3:N:317:VAL:HG12	2.02	0.41
5:P:354:LEU:HD23	5:P:354:LEU:HA	1.95	0.41
5:P:371:LEU:HD22	5:P:381:HIS:CE1	2.56	0.41
7:R:12:DC:H1'	7:R:13:DT:C5	2.55	0.41
1:A:183:ASP:HA	2:C:938:LYS:HE3	2.02	0.41
3:D:622:ARG:HH12	6:G:17:DC:P	2.44	0.41
5:F:162:LYS:HB2	5:F:162:LYS:HE3	1.77	0.41
2:M:154:ARG:HA	2:M:155:PRO:HD3	1.98	0.41
3:N:1205:TYR:CE1	3:N:1366:LYS:HD2	2.55	0.41
3:N:1383:ASP:HA	3:N:1384:PRO:HD3	1.96	0.41
2:C:304:LEU:HB3	2:C:305:PRO:HD3	2.04	0.40
2:C:564:MET:SD	2:C:846:LYS:HD3	2.61	0.40
3:D:521:PRO:HA	3:D:522:PRO:HD3	1.93	0.40
3:N:455:ARG:HB2	3:N:460:ALA:HB2	2.03	0.40
2:C:874:LEU:HB3	3:D:1029:ARG:HG3	2.01	0.40
2:C:942:GLU:HG3	2:C:945:ARG:HH21	1.86	0.40
3:D:57:GLU:HG3	3:D:64:LYS:HG2	2.03	0.40
1:K:184:THR:O	1:K:192:LEU:HB2	2.21	0.40
3:N:1459:LEU:HD21	3:N:1468:LEU:HD22	2.03	0.40
3:N:1495:ILE:HG12	4:O:88:GLU:HG3	2.02	0.40
5:P:140:ARG:HG3	5:P:142:ARG:HH22	1.86	0.40
5:P:141:VAL:HG21	5:P:153:PRO:HD3	2.02	0.40
5:P:387:GLY:HA2	5:P:397:ILE:HD12	2.02	0.40
1:A:115:LEU:HD23	1:A:115:LEU:HA	1.90	0.40
2:C:205:GLU:O	2:C:209:ARG:HG2	2.20	0.40
2:C:409:ARG:HD3	2:C:409:ARG:HA	1.96	0.40
3:D:646:LYS:HB2	3:D:646:LYS:HE3	1.82	0.40
3:D:1126:ASP:O	3:D:1130:ARG:HA	2.22	0.40
1:L:80:LEU:HB3	3:N:867:ARG:NH2	2.37	0.40
2:M:267:TYR:CE1	2:M:290:LEU:HG	2.56	0.40
3:N:1101:VAL:HG13	3:N:1102:THR:HG23	2.03	0.40
5:P:396:ARG:NH2	5:P:400:ILE:HD12	2.35	0.40
2:C:910:LYS:O	2:C:914:ILE:HG13	2.22	0.40
3:D:661:MET:HE2	3:D:677:LEU:HD11	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:935:LYS:HE2	3:D:935:LYS:HB3	1.93	0.40
3:D:1071:PHE:O	3:D:1074:SER:OG	2.34	0.40
2:M:344:PHE:CD1	2:M:382:ILE:HD11	2.56	0.40
3:N:15:PRO:O	3:N:19:ARG:HG3	2.22	0.40
3:N:38:LYS:HA	3:N:38:LYS:HD3	1.84	0.40
3:N:778:LEU:HD23	3:N:778:LEU:HA	1.86	0.40
2:C:99:GLN:OE1	2:C:101:ILE:HD11	2.21	0.40
2:C:545:ASN:HB3	2:C:583:LEU:HD22	2.03	0.40
5:F:88:ILE:HG23	5:F:193:ARG:HG2	2.03	0.40
1:K:32:PHE:HE1	1:L:47:SER:HG	1.68	0.40
2:M:835:VAL:O	2:M:1001:VAL:HG21	2.22	0.40
2:M:1067:TYR:OH	3:N:674:ARG:NH1	2.54	0.40
3:N:810:GLU:CD	3:N:810:GLU:H	2.25	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 X-ray entries followed by that with respect to entries of similar resolution.

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	224/315 (71%)	220 (98%)	4 (2%)	0	100	100
1	B	220/315 (70%)	216 (98%)	4 (2%)	0	100	100
1	K	224/315 (71%)	222 (99%)	2 (1%)	0	100	100
1	L	223/315 (71%)	218 (98%)	5 (2%)	0	100	100
2	C	1107/1119 (99%)	1089 (98%)	18 (2%)	0	100	100
2	M	1107/1119 (99%)	1084 (98%)	23 (2%)	0	100	100
3	D	1482/1524 (97%)	1462 (99%)	20 (1%)	0	100	100
3	N	1482/1524 (97%)	1463 (99%)	19 (1%)	0	100	100
4	E	92/99 (93%)	91 (99%)	1 (1%)	0	100	100
4	O	92/99 (93%)	91 (99%)	1 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
5	F	344/443 (78%)	343 (100%)	1 (0%)	0	100 100
5	P	345/443 (78%)	341 (99%)	3 (1%)	1 (0%)	41 71
All	All	6942/7630 (91%)	6840 (98%)	101 (2%)	1 (0%)	100 100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
5	P	80	PRO

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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	199/273 (73%)	189 (95%)	10 (5%)	24 55
1	B	195/273 (71%)	189 (97%)	6 (3%)	40 67
1	K	199/273 (73%)	189 (95%)	10 (5%)	24 55
1	L	198/273 (72%)	192 (97%)	6 (3%)	41 68
2	C	936/941 (100%)	889 (95%)	47 (5%)	24 55
2	M	934/941 (99%)	884 (95%)	50 (5%)	22 53
3	D	1253/1279 (98%)	1191 (95%)	62 (5%)	25 56
3	N	1252/1279 (98%)	1192 (95%)	60 (5%)	25 56
4	E	83/88 (94%)	81 (98%)	2 (2%)	49 73
4	O	83/88 (94%)	81 (98%)	2 (2%)	49 73
5	F	300/388 (77%)	288 (96%)	12 (4%)	31 61
5	P	302/388 (78%)	284 (94%)	18 (6%)	19 49
All	All	5934/6484 (92%)	5649 (95%)	285 (5%)	25 56

All (285) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	LEU

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Mol	Chain	Res	Type
1	A	34	VAL
1	A	67	THR
1	A	74	ASP
1	A	80	LEU
1	A	142	VAL
1	A	188	GLN
1	A	193	ASP
1	A	206	THR
1	A	229	GLN
1	B	34	VAL
1	B	80	LEU
1	B	94	LEU
1	B	112	ARG
1	B	145	ASP
1	B	206	THR
2	C	2	GLU
2	C	8	ARG
2	C	10	ARG
2	C	11	GLU
2	C	81	ASP
2	C	103	LYS
2	C	133	ASP
2	C	138	SER
2	C	141	HIS
2	C	168	ARG
2	C	177	GLU
2	C	194	VAL
2	C	216	GLU
2	C	232	GLU
2	C	251	ASP
2	C	269	LEU
2	C	284	ARG
2	C	358	ARG
2	C	402	SER
2	C	418	LEU
2	C	419	THR
2	C	427	VAL
2	C	429	ASP
2	C	454	SER
2	C	464	LEU
2	C	480	THR
2	C	524	VAL

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Mol	Chain	Res	Type
2	C	584	GLU
2	C	610	ARG
2	C	617	ASP
2	C	633	GLN
2	C	638	ASP
2	C	640	ARG
2	C	648	ARG
2	C	680	ASP
2	C	774	LEU
2	C	775	ARG
2	C	786	LYS
2	C	808	ARG
2	C	813	VAL
2	C	815	LEU
2	C	939	ARG
2	C	952	LEU
2	C	968	LEU
2	C	978	ARG
2	C	1001	VAL
2	C	1057	SER
3	D	65	ARG
3	D	67	ARG
3	D	68	PHE
3	D	80	VAL
3	D	106	LYS
3	D	135	LEU
3	D	141	ILE
3	D	155	ASP
3	D	161	LEU
3	D	191	LEU
3	D	198	ARG
3	D	200	ASP
3	D	230	TRP
3	D	231	VAL
3	D	256	GLU
3	D	270	LEU
3	D	272	LEU
3	D	275	GLU
3	D	312	ARG
3	D	331	VAL
3	D	372	ASP
3	D	411	THR

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Mol	Chain	Res	Type
3	D	486	ARG
3	D	525	ARG
3	D	586	ARG
3	D	618	LEU
3	D	628	ARG
3	D	632	VAL
3	D	650	LEU
3	D	669	ASN
3	D	709	HIS
3	D	754	PHE
3	D	778	LEU
3	D	780	LYS
3	D	817	GLU
3	D	832	ARG
3	D	858	VAL
3	D	864	VAL
3	D	867	ARG
3	D	894	LYS
3	D	904	VAL
3	D	907	GLU
3	D	1001	GLU
3	D	1041	LEU
3	D	1055	VAL
3	D	1062	ARG
3	D	1067	VAL
3	D	1079	LYS
3	D	1127	GLU
3	D	1128	VAL
3	D	1130	ARG
3	D	1188	VAL
3	D	1219	GLU
3	D	1277	ILE
3	D	1282	ARG
3	D	1290	LEU
3	D	1304	LYS
3	D	1317	ASP
3	D	1408	ILE
3	D	1433	SER
3	D	1496	GLU
3	D	1501	GLU
4	E	50	THR
4	E	95	VAL

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Mol	Chain	Res	Type
5	F	88	ILE
5	F	141	VAL
5	F	150	THR
5	F	154	LYS
5	F	172	ARG
5	F	186	HIS
5	F	287	THR
5	F	295	MET
5	F	364	ARG
5	F	372	ARG
5	F	420	ASP
5	F	422	LEU
1	K	6	LEU
1	K	34	VAL
1	K	74	ASP
1	K	80	LEU
1	K	142	VAL
1	K	145	ASP
1	K	201	THR
1	K	206	THR
1	K	219	ARG
1	K	229	GLN
1	L	34	VAL
1	L	80	LEU
1	L	145	ASP
1	L	183	ASP
1	L	197	LEU
1	L	206	THR
2	M	11	GLU
2	M	26	TYR
2	M	27	ARG
2	M	81	ASP
2	M	103	LYS
2	M	113	VAL
2	M	120	LEU
2	M	122	THR
2	M	133	ASP
2	M	141	HIS
2	M	154	ARG
2	M	177	GLU
2	M	194	VAL
2	M	198	ARG

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Mol	Chain	Res	Type
2	M	216	GLU
2	M	243	ARG
2	M	251	ASP
2	M	358	ARG
2	M	402	SER
2	M	418	LEU
2	M	419	THR
2	M	427	VAL
2	M	429	ASP
2	M	434	HIS
2	M	454	SER
2	M	464	LEU
2	M	480	THR
2	M	524	VAL
2	M	557	ARG
2	M	592	LEU
2	M	610	ARG
2	M	617	ASP
2	M	626	ARG
2	M	633	GLN
2	M	638	ASP
2	M	640	ARG
2	M	648	ARG
2	M	680	ASP
2	M	715	THR
2	M	808	ARG
2	M	813	VAL
2	M	815	LEU
2	M	848	VAL
2	M	928	LYS
2	M	939	ARG
2	M	952	LEU
2	M	968	LEU
2	M	1001	VAL
2	M	1057	SER
2	M	1058	ASP
3	N	65	ARG
3	N	68	PHE
3	N	135	LEU
3	N	141	ILE
3	N	155	ASP
3	N	161	LEU

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Mol	Chain	Res	Type
3	N	190	GLU
3	N	198	ARG
3	N	200	ASP
3	N	230	TRP
3	N	256	GLU
3	N	270	LEU
3	N	276	ASP
3	N	277	GLU
3	N	286	VAL
3	N	306	GLU
3	N	311	LEU
3	N	316	GLN
3	N	322	VAL
3	N	331	VAL
3	N	372	ASP
3	N	404	GLU
3	N	411	THR
3	N	471	GLU
3	N	486	ARG
3	N	508	ARG
3	N	525	ARG
3	N	586	ARG
3	N	618	LEU
3	N	632	VAL
3	N	650	LEU
3	N	669	ASN
3	N	709	HIS
3	N	754	PHE
3	N	782	SER
3	N	783	ARG
3	N	784	ASP
3	N	817	GLU
3	N	864	VAL
3	N	867	ARG
3	N	894	LYS
3	N	904	VAL
3	N	1001	GLU
3	N	1009	LYS
3	N	1041	LEU
3	N	1055	VAL
3	N	1062	ARG
3	N	1067	VAL

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Mol	Chain	Res	Type
3	N	1079	LYS
3	N	1128	VAL
3	N	1130	ARG
3	N	1188	VAL
3	N	1200	VAL
3	N	1209	LEU
3	N	1219	GLU
3	N	1277	ILE
3	N	1283	ILE
3	N	1408	ILE
3	N	1433	SER
3	N	1493	LYS
4	O	50	THR
4	O	95	VAL
5	P	78	SER
5	P	88	ILE
5	P	150	THR
5	P	186	HIS
5	P	222	ARG
5	P	287	THR
5	P	360	LYS
5	P	361	LEU
5	P	363	GLU
5	P	375	LEU
5	P	408	LEU
5	P	409	LYS
5	P	410	TYR
5	P	411	HIS
5	P	412	GLU
5	P	417	LYS
5	P	418	LEU
5	P	422	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
3	D	1333	HIS
4	E	33	HIS
2	M	22	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
8	I	2/3 (66%)	1 (50%)	0
8	S	2/3 (66%)	1 (50%)	0
All	All	4/6 (66%)	2 (50%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
8	I	3	A
8	S	3	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 monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 13 ligands modelled in this entry, 11 are monoatomic - leaving 2 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	$\#\|Z\| > 2$
11	DG	G	101	-	18,24,25	0.93	1 (5%)	19,35,38	0.79	1 (5%)
11	DG	Q	101	-	18,24,25	1.02	2 (11%)	19,35,38	0.69	1 (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
11	DG	G	101	-	-	2/3/21/22	0/3/3/3
11	DG	Q	101	-	-	0/3/21/22	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
11	Q	101	DG	C5-C6	-2.49	1.42	1.47
11	G	101	DG	C5-C6	-2.20	1.42	1.47
11	Q	101	DG	C8-N7	-2.16	1.31	1.35

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
11	G	101	DG	O6-C6-C5	2.26	128.78	124.37
11	Q	101	DG	O6-C6-C5	2.04	128.36	124.37

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
11	G	101	DG	O4'-C4'-C5'-O5'
11	G	101	DG	C3'-C4'-C5'-O5'

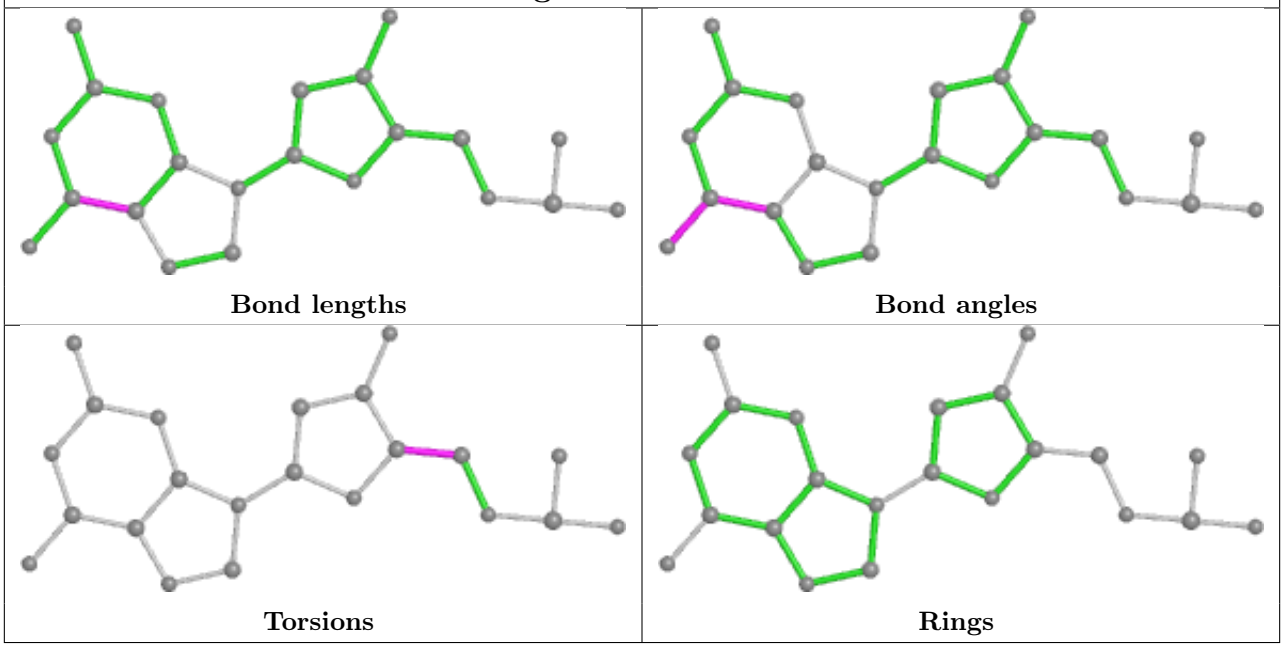
There are no ring outliers.

2 monomers are involved in 4 short contacts:

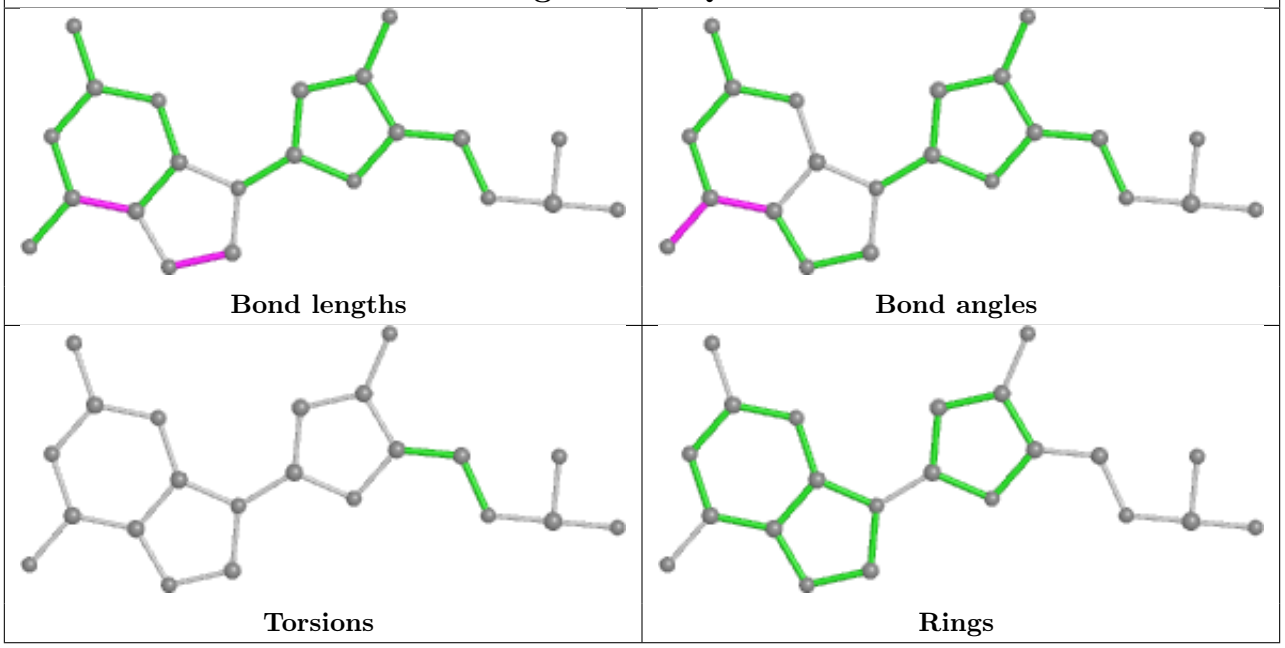
Mol	Chain	Res	Type	Clashes	Symm-Clashes
11	G	101	DG	3	0
11	Q	101	DG	1	0

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 then 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.

Ligand DG G 101



Ligand DG Q 101



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 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	226/315 (71%)	-0.25	2 (0%) 84 84	47, 73, 98, 113	0
1	B	222/315 (70%)	-0.19	0 100 100	47, 81, 116, 144	0
1	K	226/315 (71%)	-0.13	2 (0%) 84 84	54, 84, 109, 120	0
1	L	225/315 (71%)	-0.19	1 (0%) 92 93	50, 89, 124, 145	0
2	C	1111/1119 (99%)	-0.14	17 (1%) 73 72	29, 65, 124, 151	0
2	M	1111/1119 (99%)	0.08	50 (4%) 33 32	34, 88, 154, 168	0
3	D	1486/1524 (97%)	-0.10	29 (1%) 65 64	27, 68, 131, 177	1 (0%)
3	N	1486/1524 (97%)	-0.07	20 (1%) 77 77	34, 75, 131, 182	1 (0%)
4	E	94/99 (94%)	-0.20	0 100 100	43, 69, 114, 120	0
4	O	94/99 (94%)	-0.25	2 (2%) 63 62	54, 83, 126, 140	0
5	F	346/443 (78%)	-0.16	2 (0%) 89 90	43, 78, 129, 142	0
5	P	347/443 (78%)	0.08	16 (4%) 32 30	56, 94, 163, 181	0
6	G	16/21 (76%)	-0.49	0 100 100	44, 84, 174, 175	0
6	Q	16/21 (76%)	-0.60	0 100 100	54, 94, 182, 184	0
7	H	24/27 (88%)	-0.50	0 100 100	71, 109, 162, 194	0
7	R	24/27 (88%)	-0.37	0 100 100	72, 119, 172, 204	0
8	I	3/3 (100%)	-0.55	0 100 100	57, 57, 60, 69	0
8	S	3/3 (100%)	-0.49	0 100 100	66, 66, 69, 78	0
All	All	7060/7732 (91%)	-0.08	141 (1%) 65 64	27, 78, 137, 204	2 (0%)

All (141) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	P	375	LEU	5.5
3	D	322	VAL	5.0
5	P	377	ASP	5.0

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Mol	Chain	Res	Type	RSRZ
3	N	191	LEU	4.9
2	M	64	LEU	4.8
3	D	241	ILE	4.4
2	M	362	GLY	4.3
2	C	365	ASP	4.2
3	D	203	ALA	3.9
5	P	392	VAL	3.8
2	M	296	GLY	3.8
3	D	324	ALA	3.8
3	D	1297	GLU	3.8
1	K	130	ALA	3.7
2	M	293	PHE	3.6
2	M	363	SER	3.5
2	M	196	LEU	3.5
2	M	295	ASP	3.5
2	M	240	THR	3.5
2	M	210	GLU	3.5
2	M	367	LEU	3.5
2	M	181	VAL	3.4
5	P	410	TYR	3.4
2	M	770	GLU	3.2
2	C	367	LEU	3.2
2	C	362	GLY	3.2
3	N	307	ALA	3.2
3	D	310	LEU	3.2
3	D	335	LEU	3.2
3	D	219	GLU	3.2
2	C	207	LEU	3.1
5	P	393	THR	3.1
2	M	207	LEU	3.1
2	C	814	GLU	3.1
2	M	176	VAL	3.1
2	C	364	GLU	3.0
2	M	232	GLU	3.0
5	P	373	LYS	3.0
2	M	368	THR	3.0
3	D	991	GLN	3.0
2	C	219	GLN	3.0
2	C	104	ASP	3.0
2	M	236	ILE	3.0
2	C	366	SER	3.0
3	D	1499	ARG	2.9

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Mol	Chain	Res	Type	RSRZ
5	P	381	HIS	2.9
2	C	176	VAL	2.8
2	C	373	VAL	2.8
2	M	188	LYS	2.8
2	M	246	ASP	2.8
3	N	269	PHE	2.8
5	P	415	THR	2.8
2	C	650	ARG	2.7
3	N	1277	ILE	2.7
2	C	372	LEU	2.7
3	D	337	LEU	2.7
3	N	242	LEU	2.7
2	M	66	LEU	2.7
2	M	248	PRO	2.7
2	M	294	GLU	2.7
2	M	67	ASP	2.7
3	D	380	GLU	2.7
5	P	361	LEU	2.6
3	D	1294	VAL	2.6
2	M	86	LYS	2.6
2	M	175	GLU	2.6
2	M	217	LEU	2.6
2	M	769	PRO	2.6
1	L	4	SER	2.6
3	D	1277	ILE	2.6
5	P	376	ILE	2.5
2	M	211	LEU	2.5
3	N	1292	VAL	2.5
2	M	649	VAL	2.5
2	C	780	GLU	2.5
5	P	416	ARG	2.5
2	M	107	LEU	2.5
5	P	411	HIS	2.4
2	M	109	LYS	2.4
3	N	972	LEU	2.4
5	P	142	ARG	2.4
2	M	357	GLU	2.4
4	O	85	LEU	2.4
5	F	149	GLU	2.4
3	D	1319	VAL	2.4
2	M	102	HIS	2.4
3	D	976	GLN	2.4

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Mol	Chain	Res	Type	RSRZ
2	M	191	PHE	2.4
5	P	149	GLU	2.4
3	D	1502	ALA	2.4
3	D	269	PHE	2.4
2	C	611	ILE	2.4
3	D	343	LYS	2.3
3	N	373	PRO	2.3
2	M	104	ASP	2.3
3	D	286	VAL	2.3
5	P	391	GLY	2.3
2	M	1	MET	2.3
1	K	160	ASP	2.3
2	M	650	ARG	2.3
2	M	101	ILE	2.3
3	D	171	LEU	2.3
2	M	778	PHE	2.2
2	M	200	LEU	2.2
2	M	100	LEU	2.2
3	D	323	GLU	2.2
5	F	151	LEU	2.2
2	C	181	VAL	2.2
3	D	973	GLN	2.2
3	N	1128	VAL	2.2
3	N	324	ALA	2.2
5	P	357	ALA	2.2
2	M	245	GLY	2.2
3	N	213	VAL	2.2
3	N	177	ALA	2.2
3	N	1502	ALA	2.2
2	M	371	LYS	2.2
3	N	186	VAL	2.2
2	M	218	VAL	2.1
3	N	69	GLU	2.1
3	D	197	SER	2.1
3	N	1495	ILE	2.1
3	D	287	GLY	2.1
3	N	305	ALA	2.1
1	A	56	VAL	2.1
2	M	30	LEU	2.1
3	N	267	GLY	2.1
3	D	267	GLY	2.1
3	D	221	ALA	2.1

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Mol	Chain	Res	Type	RSRZ
2	M	365	ASP	2.1
3	N	1253	THR	2.1
3	N	1497	GLU	2.1
1	A	19	GLU	2.0
2	M	629	TYR	2.0
2	C	729	LEU	2.0
2	M	177	GLU	2.0
2	M	221	LEU	2.0
2	M	235	LEU	2.0
4	O	84	ARG	2.0
3	D	314	PRO	2.0
3	D	173	PRO	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
11	DG	Q	101	22/23	0.60	0.31	89,113,119,120	0
9	MG	B	2001	1/1	0.66	0.33	80,80,80,80	0
11	DG	G	101	22/23	0.77	0.25	71,100,108,124	0
9	MG	F	2001	1/1	0.85	0.10	64,64,64,64	0
9	MG	K	1001	1/1	0.93	0.27	76,76,76,76	0
10	ZN	N	2002	1/1	0.96	0.05	120,120,120,120	0
9	MG	N	2003	1/1	0.97	0.25	44,44,44,44	0
9	MG	N	2004	1/1	0.98	0.31	61,61,61,61	0
9	MG	D	2004	1/1	0.98	0.48	42,42,42,42	0
10	ZN	N	2001	1/1	0.99	0.20	55,55,55,55	0
9	MG	D	2003	1/1	0.99	0.22	36,36,36,36	0

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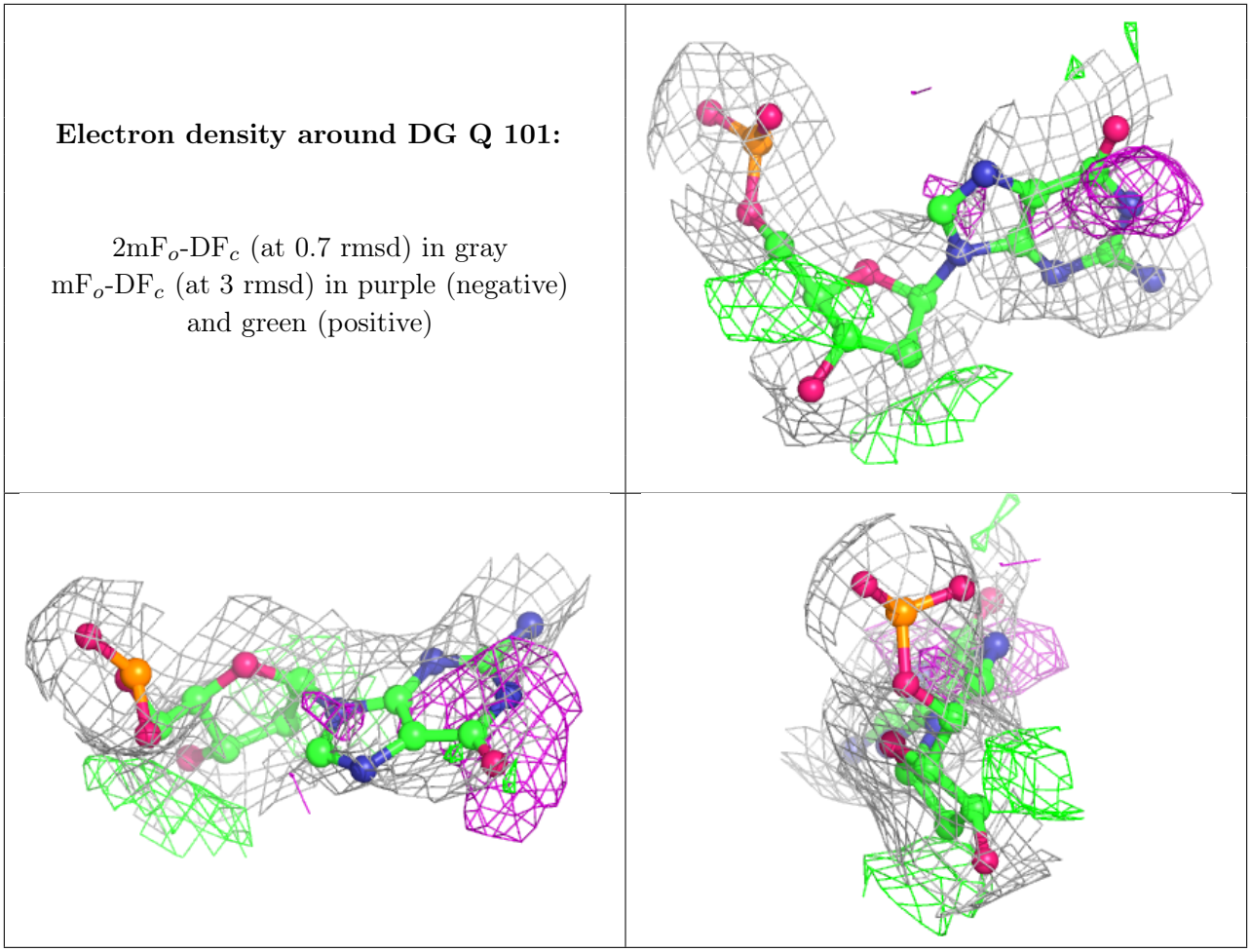
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
10	ZN	D	2001	1/1	0.99	0.18	49,49,49,49	0
10	ZN	D	2002	1/1	0.99	0.07	88,88,88,88	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

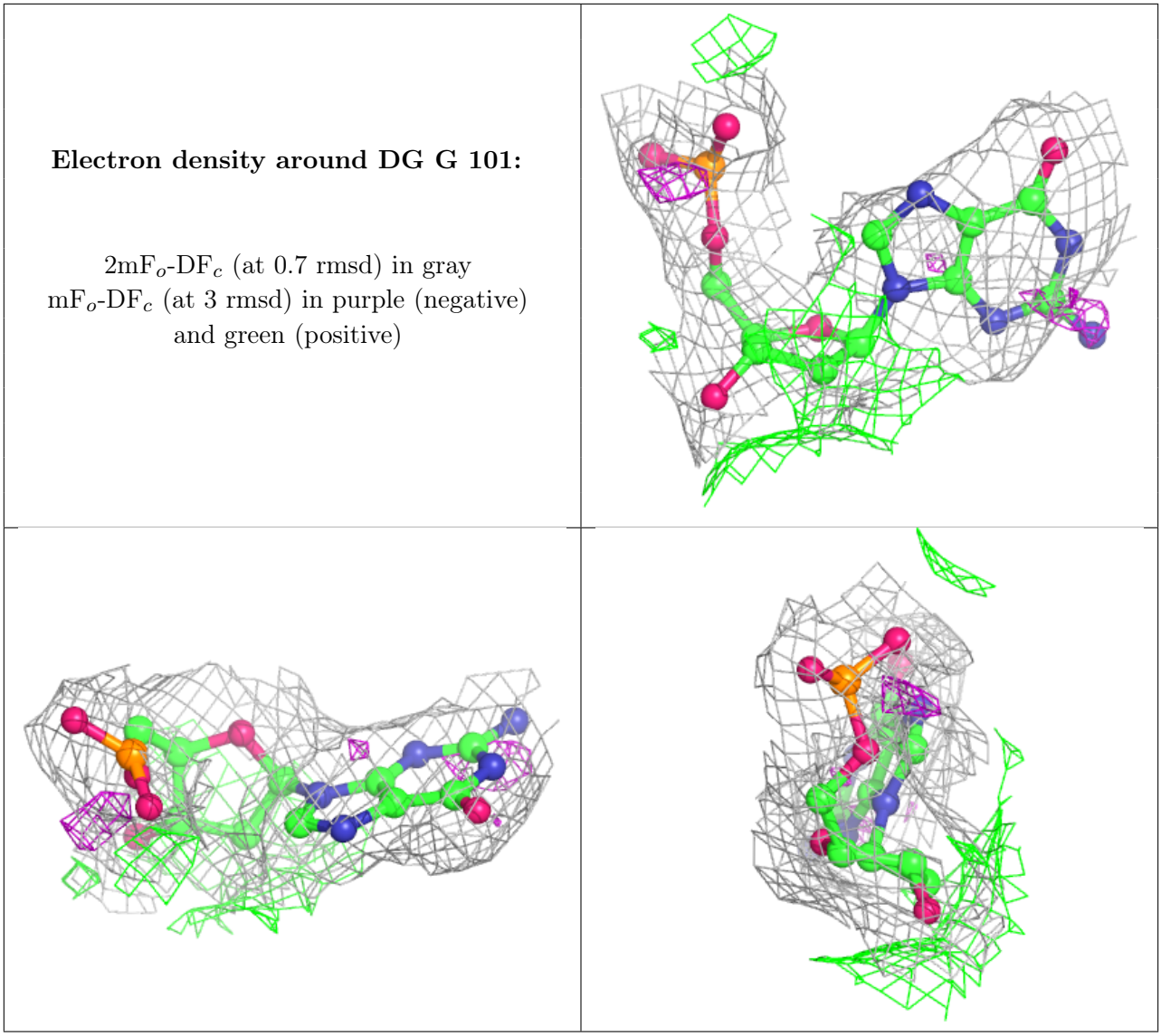
Electron density around DG Q 101:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around DG G 101:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers

There are no such residues in this entry.