WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 08:30 AM EDT

PDB ID	:	1MSW
Title	:	Structural basis for the transition from initiation to elongation transcription in T7 RNA polymerase
Authors	:	Yin, Y.W.; Steitz, T.A.
Deposited on	:	2002-09-19
Resolution	:	2.10 Å(reported)

The following versions of software and data (see references ⓘ) were used in the production of this report:

|		
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	Percentile Ranks	Value
Clashscore		47
Ramachandran outliers		4.1%
Sidechain outliers		7.3%
RNA backbone		0.60

Worse ... *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
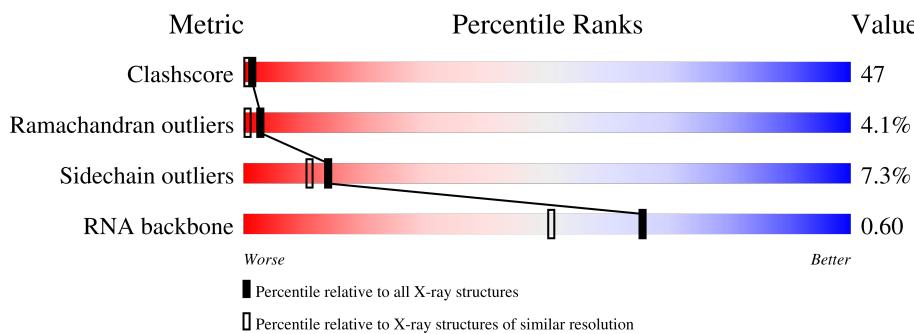
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RNA backbone	3102	1000 (2.54-1.66)

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%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	T	20	5% 60% 30% 5%
2	N	17	18% 82%
3	R	10	20% 80%
4	D	883	44% 46% 7% •

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 7956 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 DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	T	20	Total 405	C 193	N 71	O 122	P 19	0	0	0

- Molecule 2 is a DNA chain called Non-Template DNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	N	17	Total 344	C 165	N 60	O 103	P 16	0	0	0

- Molecule 3 is a RNA chain called RNA message.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	R	10	Total 215	C 97	N 44	O 65	P 9	0	0	0

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	863	Total 6802	C 4333	N 1182	O 1251	S 36	0	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	T	13	Total 13	O 13	0	0
5	N	2	Total 2	O 2	0	0
5	R	9	Total 9	O 9	0	0
5	D	166	Total 166	O 166	0	0

3 Residue-property plots ⓘ

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.

Note EDS was not executed.

• Molecule 1: Template DNA

Chain T:
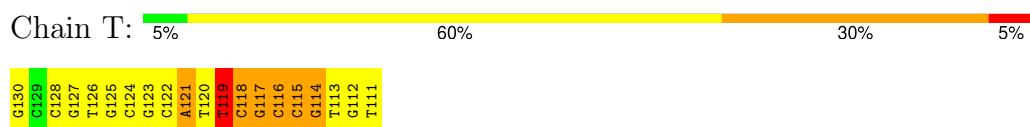
• Molecule 2: Non-Template DNA

Chain N:

• Molecule 3: RNA message

Chain R:

• Molecule 4: DNA-directed RNA polymerase

Chain D:
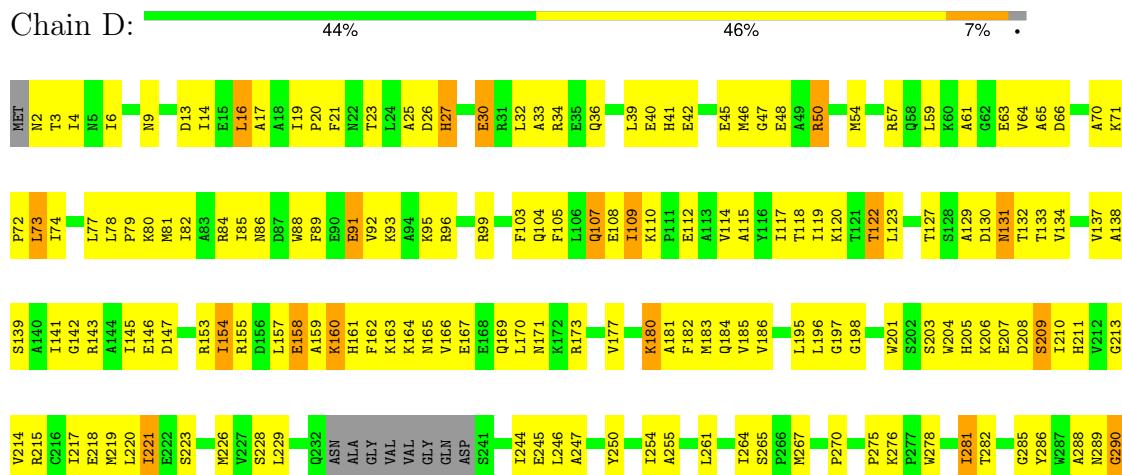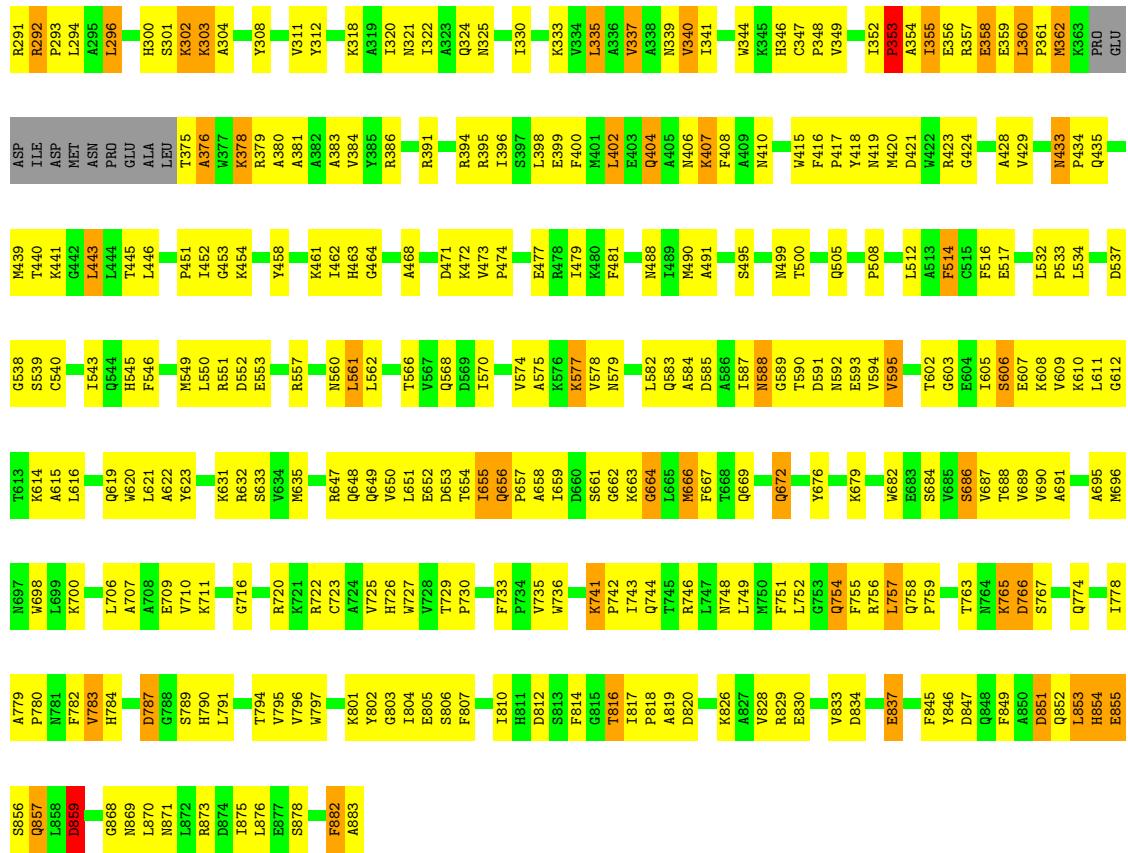
4 Data and refinement statistics ⓘ

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, α, β, γ	142.91Å 145.46Å 145.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 2.10	Depositor
% Data completeness (in resolution range)	85.0 (20.00-2.10)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	CNS	Depositor
R, R_{free}	0.241 , 0.275	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	7956	wwPDB-VP
Average B, all atoms (Å^2)	75.0	wwPDB-VP

5 Model quality (i)

5.1 Standard geometry (i)

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	T	0.46	0/452	0.90	2/696 (0.3%)
2	N	0.31	0/384	0.67	0/591
3	R	0.47	0/241	0.80	0/375
4	D	0.48	1/6955 (0.0%)	0.65	0/9407
All	All	0.47	1/8032 (0.0%)	0.67	2/11069 (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
1	T	0	7

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	407	LYS	CD-CE	5.13	1.64	1.51

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	T	119	DT	N1-C1'-C2'	-5.28	102.57	112.60
1	T	119	DT	C5'-C4'-C3'	-5.10	104.92	114.10

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	T	114	DG	Sidechain
1	T	115	DC	Sidechain
1	T	116	DC	Sidechain

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Mol	Chain	Res	Type	Group
1	T	117	DG	Sidechain
1	T	118	DC	Sidechain
1	T	119	DT	Sidechain
1	T	121	DA	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	T	405	0	227	49	0
2	N	344	0	194	17	0
3	R	215	0	112	15	0
4	D	6802	0	6770	645	0
5	D	166	0	0	246	0
5	N	2	0	0	0	0
5	R	9	0	0	8	0
5	T	13	0	0	27	0
All	All	7956	0	7303	715	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 47.

All (715) 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)
4:D:360:LEU:HB2	5:D:968:HOH:O	1.29	1.29
4:D:104:GLN:HB3	5:D:979:HOH:O	1.23	1.27
4:D:276:LYS:HE2	5:D:1032:HOH:O	1.22	1.26
4:D:217:ILE:O	4:D:221:ILE:HD13	1.24	1.24
4:D:428:ALA:HA	5:D:944:HOH:O	1.39	1.22
3:R:5:G:H3'	5:R:99:HOH:O	1.43	1.18
4:D:383:ALA:HB3	5:D:986:HOH:O	1.42	1.18
4:D:648:GLN:HA	5:D:1028:HOH:O	1.44	1.17
4:D:647:ARG:HG2	5:D:958:HOH:O	1.42	1.17
4:D:647:ARG:HD3	5:D:913:HOH:O	1.44	1.15
1:T:111:DT:H3'	5:T:132:HOH:O	1.50	1.12

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:360:LEU:HD23	5:D:917:HOH:O	1.49	1.11
4:D:386:ARG:HG3	5:D:933:HOH:O	1.52	1.08
4:D:285:GLY:HA2	5:D:928:HOH:O	1.54	1.07
4:D:312:TYR:HB3	5:D:976:HOH:O	1.51	1.06
4:D:735:VAL:HG12	5:D:1012:HOH:O	1.53	1.05
1:T:119:DT:H71	5:T:141:HOH:O	1.55	1.05
1:T:111:DT:C3'	5:T:132:HOH:O	2.02	1.04
4:D:794:THR:HB	5:D:892:HOH:O	1.55	1.04
4:D:330:ILE:HD13	5:D:895:HOH:O	1.54	1.04
4:D:817:ILE:HD11	5:D:947:HOH:O	1.55	1.03
4:D:141:ILE:O	4:D:145:ILE:HD13	1.57	1.03
4:D:344:TRP:CB	5:D:1015:HOH:O	2.06	1.02
4:D:96:ARG:HG3	5:D:891:HOH:O	1.60	1.01
4:D:451:PRO:HD3	5:D:1001:HOH:O	1.59	1.01
4:D:4:ILE:HG21	5:D:942:HOH:O	1.60	1.00
4:D:445:THR:HA	5:D:974:HOH:O	1.60	1.00
4:D:733:PHE:CZ	5:D:1002:HOH:O	2.15	1.00
4:D:344:TRP:HB2	5:D:1015:HOH:O	1.63	0.97
4:D:344:TRP:O	4:D:355:ILE:HD11	1.62	0.97
4:D:177:VAL:O	4:D:180:LYS:HG3	1.64	0.97
4:D:296:LEU:HD21	4:D:320:ILE:HD13	1.45	0.97
4:D:664:GLY:HA2	5:D:1031:HOH:O	1.66	0.95
4:D:65:ALA:HA	5:D:1017:HOH:O	1.65	0.94
4:D:118:THR:O	4:D:122:THR:HG23	1.67	0.94
4:D:664:GLY:CA	5:D:1031:HOH:O	2.14	0.94
4:D:270:PRO:HD3	5:D:935:HOH:O	1.69	0.93
4:D:796:VAL:HB	5:D:1016:HOH:O	1.67	0.93
4:D:795:VAL:N	5:D:892:HOH:O	2.00	0.93
4:D:816:THR:CG2	5:D:989:HOH:O	2.18	0.92
4:D:132:THR:CG2	5:D:983:HOH:O	2.17	0.92
4:D:464:GLY:HA3	5:D:1036:HOH:O	1.69	0.91
4:D:289:ASN:C	5:D:960:HOH:O	2.07	0.91
4:D:74:ILE:HG13	5:D:1017:HOH:O	1.70	0.90
4:D:355:ILE:HD13	4:D:355:ILE:H	1.35	0.90
3:R:10:G:N3	5:R:46:HOH:O	2.05	0.90
3:R:9:A:H1'	4:D:756:ARG:NH2	1.87	0.90
4:D:433:ASN:HD22	4:D:435:GLN:H	1.15	0.90
4:D:746:ARG:HE	4:D:754:GLN:HE22	1.14	0.89
4:D:816:THR:HG22	5:D:989:HOH:O	1.72	0.89
4:D:302:LYS:O	4:D:304:ALA:N	2.04	0.89
4:D:378:LYS:HD2	4:D:379:ARG:N	1.88	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:830:GLU:HB2	5:D:910:HOH:O	1.71	0.88
4:D:270:PRO:CG	5:D:935:HOH:O	2.21	0.88
4:D:137:VAL:HG21	4:D:244:ILE:HD11	1.54	0.88
4:D:491:ALA:HB1	4:D:499:ASN:ND2	1.90	0.87
4:D:419:ASN:C	5:D:957:HOH:O	2.10	0.87
3:R:10:G:C2	5:R:46:HOH:O	2.26	0.87
4:D:217:ILE:N	5:D:1005:HOH:O	2.08	0.87
4:D:546:PHE:HB3	5:D:909:HOH:O	1.74	0.86
4:D:118:THR:CA	5:D:955:HOH:O	2.23	0.86
4:D:468:ALA:HB2	5:D:987:HOH:O	1.74	0.86
4:D:118:THR:HA	5:D:955:HOH:O	1.74	0.85
4:D:129:ALA:HB3	5:D:1045:HOH:O	1.75	0.85
4:D:292:ARG:HE	4:D:292:ARG:HA	1.40	0.85
4:D:720:ARG:CZ	5:D:1029:HOH:O	2.22	0.85
3:R:9:A:H1'	4:D:756:ARG:HH21	1.42	0.85
4:D:359:GLU:HA	5:D:917:HOH:O	1.75	0.85
4:D:118:THR:N	5:D:955:HOH:O	2.10	0.84
4:D:441:LYS:N	5:D:967:HOH:O	2.11	0.84
3:R:3:C:H5'	5:R:91:HOH:O	1.76	0.83
4:D:876:LEU:HD12	5:D:1018:HOH:O	1.78	0.83
4:D:360:LEU:N	5:D:917:HOH:O	2.02	0.83
4:D:3:THR:HA	5:D:985:HOH:O	1.78	0.83
4:D:361:PRO:HD2	5:D:968:HOH:O	1.78	0.83
1:T:126:DT:H2''	1:T:125:DG:H5'	1.58	0.82
4:D:441:LYS:HG3	5:D:967:HOH:O	1.80	0.82
4:D:780:PRO:CD	5:D:1010:HOH:O	2.26	0.82
4:D:59:LEU:HD12	4:D:64:VAL:HG22	1.60	0.82
4:D:875:ILE:HG13	5:D:1014:HOH:O	1.80	0.82
4:D:270:PRO:CD	5:D:935:HOH:O	2.26	0.81
4:D:428:ALA:CB	5:D:944:HOH:O	2.24	0.81
4:D:359:GLU:CA	5:D:917:HOH:O	2.27	0.81
4:D:281:ILE:HG12	4:D:282:THR:HG23	1.62	0.81
4:D:632:ARG:HB3	5:D:916:HOH:O	1.80	0.81
4:D:873:ARG:HD3	5:D:1018:HOH:O	1.79	0.81
4:D:361:PRO:CD	5:D:968:HOH:O	2.29	0.81
4:D:741:LYS:HZ2	4:D:742:PRO:HD3	1.45	0.81
4:D:270:PRO:HG3	5:D:935:HOH:O	1.81	0.81
1:T:121:DA:H1'	5:T:135:HOH:O	1.81	0.80
4:D:733:PHE:HZ	5:D:1002:HOH:O	1.53	0.80
4:D:780:PRO:HG3	5:D:1010:HOH:O	1.81	0.80
4:D:473:VAL:HG22	4:D:474:PRO:HD2	1.63	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:276:LYS:HG2	5:D:1032:HOH:O	1.80	0.80
4:D:856:SER:HB3	5:D:884:HOH:O	1.82	0.80
4:D:157:LEU:HG	4:D:158:GLU:HG2	1.63	0.80
4:D:115:ALA:O	4:D:119:ILE:HG13	1.82	0.80
4:D:780:PRO:CG	5:D:1010:HOH:O	2.31	0.79
4:D:741:LYS:HZ2	4:D:741:LYS:HA	1.47	0.79
4:D:790:HIS:CD2	5:D:995:HOH:O	2.36	0.79
4:D:505:GLN:OE1	5:D:1046:HOH:O	2.00	0.78
1:T:128:DC:H1'	1:T:127:DG:N7	1.97	0.78
4:D:561:LEU:O	5:D:1014:HOH:O	2.01	0.78
4:D:361:PRO:N	5:D:968:HOH:O	2.17	0.78
4:D:119:ILE:O	4:D:123:LEU:HB2	1.85	0.77
4:D:756:ARG:HG3	4:D:756:ARG:HH11	1.48	0.77
3:R:5:G:C8	5:R:99:HOH:O	2.37	0.77
4:D:214:VAL:O	4:D:218:GLU:HG3	1.85	0.77
4:D:716:GLY:O	5:D:1013:HOH:O	2.02	0.77
1:T:121:DA:C1'	5:T:135:HOH:O	2.33	0.76
4:D:454:LYS:HE3	5:D:948:HOH:O	1.85	0.76
4:D:433:ASN:ND2	4:D:435:GLN:H	1.84	0.76
1:T:127:DG:H1'	1:T:126:DT:H5'	1.66	0.76
4:D:817:ILE:CD1	5:D:947:HOH:O	2.23	0.76
4:D:255:ALA:HA	5:D:942:HOH:O	1.84	0.76
4:D:514:PHE:CE2	5:D:1036:HOH:O	2.39	0.76
4:D:137:VAL:O	4:D:141:ILE:HD12	1.85	0.76
4:D:289:ASN:CA	5:D:960:HOH:O	2.33	0.75
4:D:791:LEU:O	5:D:892:HOH:O	2.04	0.75
1:T:125:DG:H1'	1:T:124:DC:H5'	1.67	0.75
4:D:741:LYS:NZ	4:D:742:PRO:HD3	2.01	0.75
4:D:820:ASP:OD2	5:D:989:HOH:O	2.05	0.75
4:D:117:ILE:C	5:D:955:HOH:O	2.25	0.75
4:D:428:ALA:CA	5:D:944:HOH:O	2.08	0.74
5:T:139:HOH:O	4:D:780:PRO:HB2	1.87	0.74
4:D:468:ALA:CB	5:D:987:HOH:O	2.33	0.74
4:D:594:VAL:O	4:D:607:GLU:HB2	1.87	0.74
4:D:688:THR:O	5:D:1007:HOH:O	2.04	0.74
4:D:873:ARG:CA	5:D:1018:HOH:O	2.35	0.74
4:D:103:PHE:HB3	5:D:946:HOH:O	1.87	0.74
4:D:291:ARG:O	4:D:293:PRO:HD3	1.88	0.74
4:D:748:ASN:OD1	4:D:754:GLN:HB3	1.86	0.74
4:D:453:GLY:HA3	5:D:980:HOH:O	1.86	0.74
4:D:213:GLY:O	4:D:217:ILE:HG12	1.88	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:729:THR:HA	5:D:1041:HOH:O	1.88	0.73
4:D:441:LYS:CG	5:D:967:HOH:O	2.35	0.73
1:T:128:DC:O2	5:T:134:HOH:O	2.05	0.73
4:D:454:LYS:O	5:D:951:HOH:O	2.06	0.73
4:D:691:ALA:HB1	5:D:909:HOH:O	1.87	0.73
4:D:129:ALA:O	5:D:983:HOH:O	2.04	0.73
4:D:552:ASP:HB2	4:D:691:ALA:HB2	1.68	0.73
4:D:587:ILE:O	4:D:588:ASN:HB2	1.88	0.73
4:D:787:ASP:HB3	5:D:1026:HOH:O	1.87	0.73
4:D:54:MET:HG3	4:D:57:ARG:NH2	2.04	0.73
4:D:352:ILE:HG22	4:D:352:ILE:O	1.89	0.73
4:D:355:ILE:H	4:D:355:ILE:CD1	1.97	0.73
4:D:360:LEU:HD23	4:D:360:LEU:H	1.53	0.72
4:D:88:TRP:O	4:D:92:VAL:HG12	1.89	0.72
4:D:289:ASN:N	5:D:960:HOH:O	2.21	0.72
4:D:452:ILE:O	5:D:980:HOH:O	2.07	0.72
4:D:819:ALA:HB3	5:D:947:HOH:O	1.88	0.72
4:D:804:ILE:HD11	5:D:1004:HOH:O	1.88	0.72
4:D:141:ILE:O	4:D:145:ILE:CD1	2.36	0.72
4:D:247:ALA:HB3	4:D:250:TYR:HD2	1.55	0.72
4:D:795:VAL:HG23	5:D:892:HOH:O	1.90	0.71
4:D:420:MET:HE2	4:D:424:GLY:HA2	1.73	0.71
4:D:682:TRP:O	4:D:686:SER:HB2	1.91	0.71
3:R:5:G:O5'	5:R:99:HOH:O	2.09	0.71
4:D:594:VAL:HA	4:D:608:LYS:O	1.90	0.71
4:D:875:ILE:N	5:D:1014:HOH:O	2.23	0.71
4:D:107:GLN:OE1	5:D:1011:HOH:O	2.09	0.70
4:D:117:ILE:HG22	5:D:955:HOH:O	1.91	0.70
4:D:585:ASP:O	4:D:614:LYS:HG2	1.91	0.70
4:D:217:ILE:O	4:D:221:ILE:CD1	2.20	0.70
4:D:70:ALA:O	4:D:74:ILE:HG12	1.90	0.70
4:D:577:LYS:HB2	4:D:577:LYS:NZ	2.06	0.70
4:D:741:LYS:HD3	4:D:742:PRO:HD2	1.73	0.70
4:D:73:LEU:HD23	4:D:74:ILE:N	2.06	0.69
4:D:278:TRP:H	4:D:321:ASN:HD21	1.38	0.69
4:D:454:LYS:CD	5:D:948:HOH:O	2.40	0.69
4:D:423:ARG:HH12	4:D:784:HIS:HD2	1.39	0.69
1:T:111:DT:C2'	5:T:132:HOH:O	2.36	0.69
4:D:4:ILE:N	5:D:985:HOH:O	2.05	0.69
4:D:488:ASN:ND2	5:D:993:HOH:O	2.24	0.69
4:D:538:GLY:O	5:D:984:HOH:O	2.09	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:N:14:DT:H2"	2:N:15:DT:OP1	1.93	0.69
4:D:859:ASP:O	5:D:988:HOH:O	2.11	0.69
4:D:420:MET:CB	5:D:957:HOH:O	2.41	0.69
4:D:873:ARG:HA	5:D:1018:HOH:O	1.92	0.69
4:D:93:LYS:NZ	5:D:1011:HOH:O	2.26	0.69
4:D:473:VAL:CG2	4:D:474:PRO:HD2	2.23	0.69
4:D:146:GLU:OE2	5:D:971:HOH:O	2.10	0.69
4:D:709:GLU:CA	5:D:940:HOH:O	2.41	0.68
4:D:730:PRO:HD3	5:D:1041:HOH:O	1.93	0.68
3:R:1:A:H5"	5:R:75:HOH:O	1.93	0.68
4:D:324:GLN:HB3	4:D:418:TYR:HD1	1.58	0.68
4:D:765:LYS:HD3	4:D:766:ASP:N	2.09	0.68
4:D:587:ILE:HA	4:D:614:LYS:HE3	1.76	0.68
4:D:324:GLN:NE2	5:D:928:HOH:O	2.27	0.67
4:D:546:PHE:O	5:D:909:HOH:O	2.11	0.67
4:D:709:GLU:HA	5:D:940:HOH:O	1.93	0.67
4:D:109:ILE:HD13	4:D:114:VAL:CG2	2.25	0.67
4:D:755:PHE:HB2	5:D:1024:HOH:O	1.95	0.67
4:D:803:GLY:O	5:D:966:HOH:O	2.13	0.67
4:D:74:ILE:CG1	5:D:1017:HOH:O	2.36	0.67
4:D:281:ILE:HD13	4:D:281:ILE:H	1.59	0.67
1:T:130:DG:HO5'	1:T:130:DG:H8	1.41	0.67
4:D:804:ILE:HD12	4:D:820:ASP:CG	2.15	0.66
4:D:81:MET:O	4:D:85:ILE:HG12	1.95	0.66
4:D:354:ALA:HB3	4:D:391:ARG:HD2	1.77	0.66
4:D:458:TYR:O	4:D:462:ILE:HD12	1.95	0.66
4:D:655:ILE:HD12	4:D:655:ILE:H	1.60	0.66
1:T:127:DG:C5	5:T:134:HOH:O	2.47	0.66
4:D:78:LEU:HD13	4:D:119:ILE:HD12	1.77	0.66
4:D:209:SER:OG	5:D:971:HOH:O	2.12	0.66
4:D:137:VAL:HG12	4:D:141:ILE:HD11	1.78	0.66
4:D:546:PHE:C	5:D:909:HOH:O	2.33	0.66
4:D:857:GLN:OE1	4:D:857:GLN:HA	1.95	0.66
4:D:95:LYS:O	5:D:902:HOH:O	2.12	0.66
4:D:134:VAL:HG12	4:D:244:ILE:HG23	1.77	0.66
4:D:756:ARG:HG3	4:D:756:ARG:NH1	2.07	0.66
4:D:797:TRP:N	5:D:1016:HOH:O	2.27	0.66
4:D:505:GLN:HB3	5:D:952:HOH:O	1.94	0.66
4:D:807:PHE:O	5:D:941:HOH:O	2.13	0.66
4:D:4:ILE:CG2	5:D:942:HOH:O	2.30	0.66
4:D:196:LEU:H	4:D:196:LEU:HD22	1.61	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:344:TRP:CE3	5:D:1015:HOH:O	2.50	0.65
4:D:537:ASP:OD2	5:D:984:HOH:O	2.13	0.65
4:D:217:ILE:HD13	5:D:1005:HOH:O	1.95	0.65
4:D:352:ILE:O	4:D:353:PRO:O	2.15	0.65
4:D:54:MET:HG3	4:D:57:ARG:HH21	1.61	0.65
4:D:308:TYR:O	4:D:311:VAL:HG12	1.97	0.65
4:D:779:ALA:O	4:D:783:VAL:HG23	1.96	0.65
5:T:139:HOH:O	4:D:780:PRO:HG2	1.97	0.65
4:D:829:ARG:NH2	4:D:882:PHE:HA	2.11	0.65
1:T:119:DT:O4'	5:T:139:HOH:O	2.13	0.65
4:D:25:ALA:HA	5:D:937:HOH:O	1.96	0.65
4:D:500:THR:OG1	5:D:1009:HOH:O	2.15	0.65
4:D:593:GLU:HG2	4:D:594:VAL:H	1.62	0.65
4:D:228:SER:HB3	4:D:245:GLU:OE1	1.96	0.64
4:D:488:ASN:CG	5:D:993:HOH:O	2.36	0.64
4:D:360:LEU:HD23	4:D:360:LEU:N	2.13	0.64
4:D:650:VAL:HG12	4:D:655:ILE:CD1	2.27	0.64
4:D:669:GLN:HG3	4:D:672:GLN:HB2	1.79	0.64
4:D:250:TYR:O	4:D:254:ILE:HD12	1.97	0.64
4:D:355:ILE:HD13	4:D:355:ILE:N	2.09	0.64
5:T:139:HOH:O	4:D:780:PRO:CG	2.46	0.63
4:D:490:MET:HE3	5:D:926:HOH:O	1.97	0.63
4:D:787:ASP:CB	5:D:1026:HOH:O	2.43	0.63
1:T:126:DT:C4	5:T:134:HOH:O	2.51	0.63
4:D:99:ARG:O	5:D:982:HOH:O	2.15	0.63
4:D:71:LYS:HA	5:D:1034:HOH:O	1.98	0.63
4:D:595:VAL:HB	4:D:607:GLU:HA	1.81	0.63
4:D:664:GLY:HA3	5:D:1031:HOH:O	1.88	0.63
4:D:746:ARG:HE	4:D:754:GLN:NE2	1.92	0.63
4:D:720:ARG:NH2	5:D:1029:HOH:O	2.31	0.63
4:D:353:PRO:HG3	4:D:394:ARG:HB2	1.80	0.63
4:D:532:LEU:O	4:D:818:PRO:HD3	1.99	0.63
4:D:423:ARG:HH12	4:D:784:HIS:CD2	2.16	0.62
4:D:579:ASN:HA	4:D:582:LEU:HB2	1.81	0.62
4:D:74:ILE:CD1	5:D:1017:HOH:O	2.47	0.62
1:T:119:DT:P	5:T:141:HOH:O	2.57	0.62
4:D:806:SER:O	4:D:816:THR:HG23	1.99	0.62
1:T:119:DT:OP2	5:T:141:HOH:O	2.16	0.62
4:D:207:GLU:HG2	4:D:211:HIS:HE1	1.65	0.62
4:D:445:THR:CB	5:D:974:HOH:O	2.47	0.62
1:T:123:DG:H2"	1:T:122:DC:H5'	1.82	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:562:LEU:HD21	4:D:870:LEU:CD1	2.30	0.62
4:D:14:ILE:HG23	4:D:288:ALA:HB1	1.81	0.61
4:D:180:LYS:HD2	4:D:181:ALA:N	2.15	0.61
1:T:126:DT:C5	5:T:134:HOH:O	2.52	0.61
4:D:340:VAL:CG2	4:D:341:ILE:N	2.64	0.61
4:D:725:VAL:HG23	4:D:774:GLN:NE2	2.15	0.61
4:D:25:ALA:O	4:D:26:ASP:HB2	2.00	0.61
4:D:50:ARG:NH2	4:D:267:MET:HG2	2.15	0.61
4:D:117:ILE:HG21	4:D:145:ILE:HD12	1.80	0.61
1:T:120:DT:H1'	1:T:119:DT:H71	1.81	0.61
4:D:104:GLN:N	5:D:946:HOH:O	2.17	0.61
4:D:330:ILE:N	4:D:330:ILE:HD12	2.16	0.61
4:D:710:VAL:HG13	4:D:720:ARG:H	1.64	0.60
4:D:330:ILE:HD13	4:D:408:PHE:O	1.99	0.60
4:D:666:MET:HE1	5:D:1031:HOH:O	2.01	0.60
4:D:790:HIS:HD2	5:D:995:HOH:O	1.80	0.60
2:N:25:DC:H1'	2:N:26:DA:H5"	1.83	0.60
3:R:4:G:O3'	4:D:394:ARG:NH1	2.33	0.60
4:D:264:ILE:HB	4:D:292:ARG:HD2	1.83	0.60
4:D:420:MET:N	5:D:957:HOH:O	2.28	0.60
4:D:797:TRP:CE2	5:D:910:HOH:O	2.51	0.60
4:D:873:ARG:O	5:D:1018:HOH:O	2.17	0.60
4:D:746:ARG:NE	4:D:754:GLN:HE22	1.94	0.60
4:D:19:ILE:HB	4:D:20:PRO:HD3	1.82	0.60
4:D:292:ARG:HA	4:D:292:ARG:NE	2.14	0.60
4:D:445:THR:CA	5:D:974:HOH:O	2.33	0.60
1:T:119:DT:C4'	5:T:139:HOH:O	2.49	0.60
4:D:816:THR:HG21	5:D:989:HOH:O	1.94	0.60
4:D:141:ILE:CD1	4:D:217:ILE:HD11	2.32	0.60
1:T:117:DG:H2"	1:T:116:DC:H5'	1.82	0.59
4:D:82:ILE:HG12	4:D:112:GLU:HA	1.83	0.59
4:D:157:LEU:HD23	4:D:196:LEU:HD12	1.83	0.59
4:D:320:ILE:HD11	4:D:420:MET:SD	2.41	0.59
4:D:360:LEU:HB3	4:D:384:VAL:HG21	1.83	0.59
4:D:765:LYS:HA	4:D:765:LYS:HZ3	1.68	0.59
4:D:539:SER:O	4:D:540:CYS:HB2	2.03	0.59
4:D:796:VAL:CB	5:D:1016:HOH:O	2.36	0.59
4:D:16:LEU:HG	4:D:20:PRO:HB2	1.85	0.59
4:D:141:ILE:HD13	4:D:217:ILE:HD11	1.84	0.59
4:D:439:MET:HB2	5:D:934:HOH:O	2.03	0.59
4:D:857:GLN:HE22	4:D:859:ASP:HB2	1.67	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:119:DT:H6	5:T:141:HOH:O	1.85	0.58
4:D:404:GLN:N	5:D:973:HOH:O	2.35	0.58
4:D:655:ILE:O	4:D:658:ALA:N	2.34	0.58
1:T:119:DT:C7	5:T:141:HOH:O	2.32	0.58
3:R:9:A:H2	5:D:991:HOH:O	1.86	0.58
4:D:13:ASP:CG	4:D:14:ILE:HD12	2.24	0.58
4:D:157:LEU:O	4:D:159:ALA:N	2.35	0.58
4:D:169:GLN:CD	4:D:169:GLN:H	2.07	0.58
4:D:826:LYS:HE2	4:D:830:GLU:OE2	2.04	0.58
2:N:17:DA:H3'	2:N:18:DC:H5"	1.85	0.58
4:D:85:ILE:HA	4:D:219:MET:HE1	1.86	0.58
4:D:337:VAL:HG11	4:D:512:LEU:HD21	1.86	0.58
4:D:562:LEU:HD21	4:D:870:LEU:HD12	1.84	0.58
4:D:80:LYS:O	5:D:1048:HOH:O	2.16	0.58
3:R:10:G:H8	4:D:301:SER:OG	1.87	0.58
4:D:25:ALA:CA	5:D:937:HOH:O	2.52	0.58
4:D:85:ILE:HA	4:D:219:MET:CE	2.34	0.58
4:D:153:ARG:O	4:D:157:LEU:HB3	2.04	0.58
4:D:153:ARG:C	4:D:155:ARG:H	2.06	0.58
4:D:812:ASP:OD2	5:D:984:HOH:O	2.17	0.58
4:D:340:VAL:HG23	4:D:341:ILE:N	2.19	0.58
4:D:344:TRP:HB3	5:D:1015:HOH:O	1.88	0.57
4:D:130:ASP:C	4:D:132:THR:H	2.07	0.57
4:D:318:LYS:O	4:D:322:ILE:HG12	2.03	0.57
4:D:137:VAL:HG12	4:D:141:ILE:CD1	2.34	0.57
4:D:420:MET:HB3	5:D:957:HOH:O	2.04	0.57
4:D:454:LYS:CE	5:D:948:HOH:O	2.45	0.57
4:D:557:ARG:O	4:D:568:GLN:HG3	2.04	0.57
4:D:611:LEU:HD22	4:D:615:ALA:HB1	1.85	0.57
4:D:633:SER:HA	4:D:649:GLN:HE22	1.69	0.57
4:D:729:THR:HG22	5:D:1041:HOH:O	2.03	0.57
4:D:154:ILE:HD11	4:D:183:MET:CE	2.33	0.57
4:D:420:MET:CE	4:D:424:GLY:HA2	2.34	0.57
4:D:335:LEU:HD22	4:D:339:ASN:ND2	2.19	0.57
4:D:404:GLN:CA	5:D:973:HOH:O	2.53	0.57
4:D:727:TRP:NE1	5:D:1037:HOH:O	2.38	0.57
4:D:110:LYS:HB3	4:D:112:GLU:OE2	2.05	0.57
4:D:420:MET:HE3	4:D:424:GLY:O	2.05	0.57
4:D:589:GLY:C	4:D:614:LYS:HG3	2.25	0.57
4:D:689:VAL:C	5:D:972:HOH:O	2.42	0.57
4:D:797:TRP:CZ3	4:D:801:LYS:HE3	2.40	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:14:ILE:HG13	4:D:290:GLY:HA2	1.87	0.57
4:D:851:ASP:O	4:D:853:LEU:N	2.38	0.57
4:D:407:LYS:HB2	5:D:973:HOH:O	2.04	0.56
1:T:120:DT:H1'	5:T:141:HOH:O	2.04	0.56
2:N:22:DG:H2"	2:N:23:DC:C6	2.40	0.56
4:D:25:ALA:HB2	5:D:937:HOH:O	2.03	0.56
4:D:30:GLU:N	5:D:937:HOH:O	2.38	0.56
4:D:147:ASP:HB3	4:D:751:PHE:HE2	1.70	0.56
4:D:208:ASP:C	4:D:210:ILE:H	2.09	0.56
4:D:440:THR:HG22	5:D:967:HOH:O	2.04	0.56
4:D:710:VAL:N	5:D:940:HOH:O	2.38	0.56
4:D:281:ILE:H	4:D:281:ILE:CD1	2.19	0.56
4:D:344:TRP:HE3	5:D:1015:HOH:O	1.87	0.56
1:T:111:DT:H3'	1:T:111:DT:OP2	2.05	0.56
5:T:139:HOH:O	4:D:780:PRO:CB	2.50	0.56
4:D:517:GLU:HG3	4:D:532:LEU:HB2	1.86	0.56
4:D:325:ASN:HB3	5:D:919:HOH:O	2.06	0.56
4:D:360:LEU:CB	5:D:968:HOH:O	2.12	0.56
4:D:780:PRO:CB	5:D:975:HOH:O	2.54	0.56
4:D:797:TRP:NE1	5:D:910:HOH:O	2.38	0.56
4:D:684:SER:O	4:D:687:VAL:HG22	2.06	0.56
4:D:454:LYS:HD3	5:D:948:HOH:O	2.05	0.56
4:D:25:ALA:CB	5:D:937:HOH:O	2.54	0.55
4:D:221:ILE:CD1	4:D:221:ILE:N	2.69	0.55
4:D:255:ALA:CA	5:D:942:HOH:O	2.49	0.55
1:T:114:DG:H4'	4:D:396:ILE:HG21	1.88	0.55
4:D:134:VAL:HG11	4:D:229:LEU:CD2	2.36	0.55
4:D:300:HIS:O	4:D:301:SER:HB2	2.06	0.55
4:D:710:VAL:CG1	4:D:720:ARG:HB3	2.37	0.55
4:D:726:HIS:HB2	4:D:736:TRP:CD1	2.41	0.55
4:D:804:ILE:CD1	5:D:1004:HOH:O	2.50	0.55
4:D:264:ILE:O	4:D:264:ILE:HD12	2.05	0.55
4:D:471:ASP:OD1	4:D:472:LYS:HE2	2.06	0.55
1:T:127:DG:H1'	1:T:126:DT:C5'	2.36	0.55
4:D:593:GLU:HG2	4:D:594:VAL:N	2.22	0.55
4:D:619:GLN:OE1	4:D:667:PHE:HA	2.06	0.55
3:R:10:G:N2	5:R:46:HOH:O	2.31	0.55
4:D:16:LEU:CG	4:D:20:PRO:HB2	2.37	0.55
4:D:689:VAL:O	4:D:689:VAL:HG23	2.06	0.55
4:D:154:ILE:HD11	4:D:183:MET:HE3	1.89	0.55
4:D:779:ALA:O	4:D:783:VAL:CG2	2.55	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:830:GLU:CB	5:D:910:HOH:O	2.43	0.55
4:D:428:ALA:HB1	5:D:944:HOH:O	1.97	0.55
4:D:829:ARG:NH1	4:D:878:SER:O	2.40	0.55
4:D:420:MET:CG	5:D:957:HOH:O	2.54	0.55
4:D:543:ILE:HD12	4:D:543:ILE:H	1.71	0.54
4:D:655:ILE:O	4:D:656:GLN:C	2.44	0.54
4:D:590:THR:HG22	4:D:591:ASP:N	2.22	0.54
4:D:160:LYS:HD3	4:D:163:LYS:HD2	1.88	0.54
4:D:853:LEU:O	4:D:854:HIS:HB2	2.08	0.54
4:D:545:HIS:O	4:D:549:MET:HG2	2.07	0.54
4:D:651:LEU:HG	4:D:656:GLN:HE21	1.73	0.54
4:D:157:LEU:CD2	4:D:196:LEU:HD12	2.37	0.54
4:D:553:GLU:HB3	5:D:893:HOH:O	2.06	0.54
4:D:13:ASP:OD2	4:D:14:ILE:HD12	2.07	0.54
4:D:347:CYS:HA	5:D:1015:HOH:O	2.06	0.54
4:D:400:PHE:O	4:D:404:GLN:HB2	2.07	0.54
4:D:570:ILE:O	4:D:574:VAL:HG23	2.08	0.54
4:D:160:LYS:HZ3	4:D:160:LYS:HB2	1.73	0.53
4:D:810:ILE:N	4:D:810:ILE:HD12	2.23	0.53
4:D:292:ARG:HE	4:D:292:ARG:CA	2.18	0.53
4:D:410:ASN:N	5:D:903:HOH:O	2.21	0.53
4:D:806:SER:HB2	5:D:1008:HOH:O	2.07	0.53
4:D:92:VAL:HG11	4:D:103:PHE:CD1	2.43	0.53
4:D:160:LYS:CD	4:D:163:LYS:HD2	2.39	0.53
4:D:335:LEU:CD2	4:D:339:ASN:ND2	2.72	0.53
4:D:791:LEU:HA	4:D:814:PHE:HE2	1.73	0.53
1:T:126:DT:C2'	1:T:125:DG:H5'	2.33	0.53
4:D:2:ASN:O	4:D:127:THR:HA	2.09	0.53
4:D:196:LEU:HD22	4:D:196:LEU:N	2.23	0.53
4:D:790:HIS:HD2	5:D:904:HOH:O	1.92	0.53
4:D:141:ILE:C	4:D:145:ILE:HD13	2.25	0.52
4:D:6:ILE:N	4:D:6:ILE:HD12	2.24	0.52
4:D:810:ILE:CD1	5:D:932:HOH:O	2.57	0.52
4:D:153:ARG:NH2	4:D:201:TRP:HB2	2.24	0.52
1:T:120:DT:H2"	5:T:141:HOH:O	2.09	0.52
5:T:131:HOH:O	4:D:421:ASP:HB2	2.08	0.52
4:D:6:ILE:HD12	4:D:6:ILE:H	1.75	0.52
1:T:122:DC:H2"	1:T:121:DA:O5'	2.10	0.52
4:D:650:VAL:HG12	4:D:655:ILE:HD11	1.91	0.52
4:D:780:PRO:CA	5:D:975:HOH:O	2.58	0.52
4:D:335:LEU:HD21	4:D:406:ASN:OD1	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:421:ASP:O	5:D:1002:HOH:O	2.18	0.52
4:D:147:ASP:HB3	4:D:751:PHE:CE2	2.45	0.52
4:D:226:MET:HA	4:D:250:TYR:CD2	2.44	0.52
4:D:727:TRP:CZ3	5:D:1012:HOH:O	2.54	0.52
4:D:380:ALA:C	5:D:986:HOH:O	2.47	0.52
4:D:533:PRO:CD	5:D:974:HOH:O	2.57	0.52
4:D:610:LYS:HA	4:D:672:GLN:OE1	2.09	0.52
3:R:10:G:C8	4:D:301:SER:OG	2.63	0.51
4:D:181:ALA:O	4:D:185:VAL:HG23	2.10	0.51
4:D:360:LEU:C	5:D:968:HOH:O	2.44	0.51
4:D:41:HIS:O	4:D:45:GLU:HG3	2.10	0.51
1:T:111:DT:H3'	1:T:111:DT:P	2.49	0.51
4:D:709:GLU:C	5:D:940:HOH:O	2.49	0.51
4:D:65:ALA:CA	5:D:1017:HOH:O	2.39	0.51
4:D:577:LYS:HB2	4:D:577:LYS:HZ3	1.75	0.51
4:D:2:ASN:OD1	4:D:245:GLU:HB2	2.11	0.51
4:D:461:LYS:HA	5:D:1036:HOH:O	2.11	0.51
1:T:120:DT:C2'	5:T:141:HOH:O	2.59	0.51
4:D:182:PHE:O	4:D:186:VAL:HG23	2.11	0.51
4:D:595:VAL:CG2	4:D:608:LYS:H	2.23	0.51
4:D:118:THR:HG22	4:D:220:LEU:HD12	1.93	0.51
4:D:433:ASN:HB2	4:D:434:PRO:CD	2.41	0.51
4:D:652:GLU:O	4:D:657:PRO:HD3	2.11	0.51
4:D:32:LEU:HG	5:D:1047:HOH:O	2.11	0.50
4:D:255:ALA:N	5:D:942:HOH:O	2.44	0.50
4:D:706:LEU:HA	5:D:1029:HOH:O	2.11	0.50
4:D:709:GLU:CG	5:D:940:HOH:O	2.60	0.50
4:D:30:GLU:HG3	4:D:34:ARG:HH21	1.76	0.50
4:D:215:ARG:O	4:D:219:MET:HG3	2.11	0.50
4:D:339:ASN:OD1	4:D:402:LEU:HD11	2.11	0.50
4:D:804:ILE:HD12	4:D:820:ASP:HB3	1.93	0.50
4:D:33:ALA:HB3	5:D:937:HOH:O	2.12	0.50
4:D:210:ILE:O	4:D:214:VAL:HG23	2.11	0.50
4:D:550:LEU:HB2	4:D:691:ALA:HB1	1.92	0.50
4:D:30:GLU:HA	5:D:937:HOH:O	2.12	0.50
4:D:85:ILE:HG22	4:D:89:PHE:CE2	2.46	0.50
4:D:143:ARG:HG2	4:D:143:ARG:HH11	1.76	0.50
4:D:341:ILE:HD11	4:D:348:PRO:CG	2.40	0.50
4:D:804:ILE:HD12	4:D:820:ASP:CB	2.42	0.50
4:D:778:ILE:HG23	4:D:779:ALA:N	2.26	0.50
1:T:119:DT:C6	5:T:141:HOH:O	2.55	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:551:ARG:HB2	4:D:868:GLY:H	1.76	0.50
4:D:655:ILE:HG23	4:D:659:ILE:HD13	1.93	0.50
4:D:217:ILE:CA	5:D:1005:HOH:O	2.57	0.50
4:D:276:LYS:CE	5:D:1032:HOH:O	2.07	0.50
4:D:631:LYS:HD3	4:D:635:MET:SD	2.51	0.50
4:D:707:ALA:O	4:D:722:ARG:HG2	2.10	0.50
4:D:711:LYS:NZ	5:D:1013:HOH:O	2.45	0.50
4:D:417:PRO:HG2	4:D:429:VAL:HB	1.94	0.50
4:D:651:LEU:HG	4:D:656:GLN:NE2	2.26	0.50
4:D:312:TYR:HD2	5:D:976:HOH:O	1.94	0.49
4:D:379:ARG:C	4:D:381:ALA:H	2.15	0.49
4:D:379:ARG:C	4:D:381:ALA:N	2.65	0.49
4:D:727:TRP:CE3	5:D:1012:HOH:O	2.64	0.49
4:D:404:GLN:HA	5:D:973:HOH:O	2.12	0.49
4:D:117:ILE:HG12	4:D:752:LEU:HD12	1.95	0.49
4:D:157:LEU:HD12	4:D:158:GLU:H	1.78	0.49
4:D:875:ILE:CG1	5:D:1014:HOH:O	2.50	0.49
4:D:159:ALA:HA	4:D:195:LEU:HD21	1.94	0.49
4:D:254:ILE:C	5:D:942:HOH:O	2.49	0.49
4:D:291:ARG:C	4:D:293:PRO:HD3	2.32	0.49
4:D:495:SER:HA	5:D:929:HOH:O	2.13	0.49
4:D:710:VAL:HG13	4:D:720:ARG:N	2.28	0.49
1:T:127:DG:H2"	1:T:126:DT:OP2	2.13	0.49
4:D:417:PRO:O	5:D:944:HOH:O	2.20	0.49
4:D:593:GLU:CG	4:D:594:VAL:H	2.25	0.49
4:D:653:ASP:O	4:D:657:PRO:HG3	2.12	0.49
4:D:47:GLY:HA3	4:D:265:SER:O	2.12	0.49
4:D:352:ILE:O	4:D:352:ILE:CG2	2.61	0.49
4:D:854:HIS:O	4:D:855:GLU:O	2.31	0.49
4:D:654:THR:O	4:D:657:PRO:HG2	2.13	0.48
4:D:13:ASP:OD1	4:D:14:ILE:HD12	2.12	0.48
4:D:195:LEU:C	4:D:197:GLY:H	2.16	0.48
4:D:473:VAL:HG11	4:D:477:GLU:OE2	2.13	0.48
4:D:207:GLU:HG2	4:D:211:HIS:CE1	2.45	0.48
4:D:543:ILE:HD12	4:D:543:ILE:N	2.27	0.48
4:D:620:TRP:O	4:D:623:TYR:HB3	2.13	0.48
4:D:744:GLN:NE2	4:D:758:GLN:NE2	2.61	0.48
4:D:833:VAL:O	4:D:837:GLU:HB2	2.12	0.48
4:D:873:ARG:CB	5:D:1018:HOH:O	2.57	0.48
4:D:88:TRP:O	4:D:91:GLU:HG2	2.14	0.48
4:D:349:VAL:HG13	4:D:508:PRO:HG3	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:360:LEU:N	4:D:360:LEU:CD2	2.76	0.48
4:D:584:ALA:O	4:D:588:ASN:HB3	2.14	0.48
4:D:162:PHE:C	4:D:164:LYS:H	2.17	0.48
4:D:330:ILE:CD1	5:D:895:HOH:O	2.33	0.48
4:D:729:THR:CB	5:D:1041:HOH:O	2.61	0.48
4:D:533:PRO:HA	4:D:816:THR:O	2.13	0.48
4:D:707:ALA:O	4:D:722:ARG:NH1	2.43	0.48
2:N:28:DG:H2"	2:N:29:DG:H8	1.79	0.48
2:N:22:DG:H2"	2:N:23:DC:C5	2.48	0.48
4:D:468:ALA:HA	5:D:952:HOH:O	2.13	0.48
4:D:828:VAL:HG11	4:D:882:PHE:O	2.13	0.48
1:T:117:DG:H2"	1:T:116:DC:C5'	2.43	0.48
4:D:276:LYS:CD	5:D:1032:HOH:O	2.55	0.48
4:D:286:TYR:CZ	4:D:417:PRO:HG3	2.48	0.48
4:D:320:ILE:O	4:D:324:GLN:HG2	2.14	0.48
4:D:278:TRP:CH2	4:D:294:LEU:HB3	2.50	0.47
4:D:595:VAL:CB	4:D:607:GLU:HA	2.43	0.47
4:D:375:THR:O	4:D:376:ALA:HB3	2.14	0.47
4:D:650:VAL:O	4:D:655:ILE:HD12	2.14	0.47
1:T:128:DC:H42	2:N:27:DC:H42	1.61	0.47
4:D:25:ALA:C	4:D:27:HIS:H	2.17	0.47
4:D:537:ASP:N	4:D:882:PHE:HD1	2.13	0.47
4:D:669:GLN:HG2	4:D:672:GLN:NE2	2.30	0.47
3:R:6:C:H5'	4:D:171:ASN:O	2.15	0.47
4:D:46:MET:O	4:D:267:MET:HE2	2.15	0.47
4:D:690:VAL:N	5:D:972:HOH:O	2.48	0.47
4:D:93:LYS:HE3	4:D:103:PHE:HZ	1.79	0.47
4:D:109:ILE:HD12	4:D:109:ILE:H	1.80	0.47
4:D:20:PRO:O	4:D:23:THR:HB	2.14	0.47
4:D:330:ILE:N	4:D:330:ILE:CD1	2.78	0.47
4:D:735:VAL:CG2	5:D:1037:HOH:O	2.63	0.47
4:D:254:ILE:HG22	5:D:942:HOH:O	2.15	0.46
4:D:676:TYR:O	4:D:679:LYS:HB3	2.16	0.46
4:D:828:VAL:CG1	4:D:882:PHE:O	2.63	0.46
4:D:577:LYS:HD3	4:D:687:VAL:CG2	2.45	0.46
4:D:700:LYS:NZ	4:D:700:LYS:HB3	2.30	0.46
4:D:4:ILE:HD13	4:D:254:ILE:HG21	1.98	0.46
4:D:85:ILE:HD13	4:D:219:MET:SD	2.55	0.46
4:D:226:MET:O	4:D:246:LEU:HD12	2.16	0.46
4:D:473:VAL:HG22	4:D:474:PRO:CD	2.40	0.46
4:D:696:MET:O	4:D:700:LYS:HG3	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:296:LEU:CD2	4:D:320:ILE:HD13	2.32	0.46
4:D:802:TYR:OH	4:D:826:LYS:HD3	2.15	0.46
2:N:27:DC:H2"	2:N:28:DG:H5"	1.98	0.46
4:D:817:ILE:CG1	5:D:947:HOH:O	2.60	0.46
4:D:70:ALA:HB1	5:D:1017:HOH:O	2.15	0.46
4:D:481:PHE:HE2	5:D:987:HOH:O	1.98	0.46
4:D:765:LYS:HD3	4:D:766:ASP:H	1.78	0.46
1:T:126:DT:H1'	1:T:125:DG:H5"	1.98	0.45
4:D:379:ARG:O	5:D:986:HOH:O	2.21	0.45
4:D:669:GLN:HG2	4:D:672:GLN:HE21	1.81	0.45
4:D:855:GLU:HB3	4:D:856:SER:H	1.44	0.45
4:D:157:LEU:HG	4:D:196:LEU:HD12	1.98	0.45
4:D:421:ASP:OD1	4:D:421:ASP:C	2.54	0.45
4:D:763:THR:CG2	5:D:962:HOH:O	0.76	0.45
1:T:112:DG:O4'	1:T:112:DG:N3	2.50	0.45
4:D:360:LEU:O	4:D:362:MET:SD	2.75	0.45
1:T:113:DT:H2'	4:D:57:ARG:NH1	2.31	0.45
4:D:505:GLN:CA	5:D:952:HOH:O	2.64	0.45
4:D:105:PHE:O	4:D:108:GLU:HG2	2.17	0.45
4:D:169:GLN:CD	4:D:169:GLN:N	2.69	0.45
4:D:577:LYS:HB2	4:D:577:LYS:HZ2	1.80	0.45
4:D:659:ILE:HD11	4:D:667:PHE:HD2	1.81	0.45
4:D:74:ILE:HD11	5:D:1017:HOH:O	2.11	0.45
4:D:330:ILE:HD11	4:D:408:PHE:CB	2.47	0.45
4:D:398:LEU:O	4:D:402:LEU:HB2	2.17	0.45
4:D:461:LYS:HE2	4:D:479:ILE:HD12	1.97	0.45
4:D:621:LEU:C	4:D:623:TYR:H	2.19	0.45
4:D:655:ILE:CG2	4:D:659:ILE:HD13	2.47	0.45
4:D:875:ILE:CA	5:D:1014:HOH:O	2.64	0.45
1:T:126:DT:H1'	1:T:125:DG:C5'	2.46	0.45
4:D:162:PHE:O	4:D:167:GLU:N	2.49	0.45
4:D:270:PRO:CB	5:D:935:HOH:O	2.62	0.45
4:D:655:ILE:HD12	4:D:655:ILE:N	2.30	0.45
4:D:816:THR:HG22	4:D:817:ILE:H	1.82	0.45
1:T:115:DC:H2'	1:T:115:DC:O5'	2.17	0.45
4:D:160:LYS:C	4:D:162:PHE:N	2.68	0.45
4:D:229:LEU:HD23	4:D:244:ILE:HG23	1.98	0.45
4:D:321:ASN:O	4:D:325:ASN:HB2	2.17	0.45
4:D:727:TRP:CZ2	4:D:782:PHE:HA	2.52	0.45
1:T:123:DG:H2"	1:T:122:DC:C5'	2.47	0.44
4:D:533:PRO:HD2	5:D:974:HOH:O	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:633:SER:CA	4:D:649:GLN:HE22	2.30	0.44
4:D:706:LEU:O	4:D:723:CYS:N	2.43	0.44
4:D:276:LYS:CG	5:D:1032:HOH:O	2.50	0.44
4:D:416:PHE:HE1	5:D:935:HOH:O	2.01	0.44
2:N:17:DA:C3'	2:N:18:DC:H5"	2.46	0.44
4:D:73:LEU:O	4:D:77:LEU:HG	2.17	0.44
4:D:651:LEU:HA	4:D:655:ILE:HD13	1.99	0.44
4:D:154:ILE:HG22	4:D:196:LEU:HD21	2.00	0.44
4:D:395:ARG:O	4:D:399:GLU:HG3	2.17	0.44
4:D:566:THR:HG23	4:D:568:GLN:HE22	1.83	0.44
4:D:655:ILE:HG22	4:D:656:GLN:N	2.33	0.44
4:D:145:ILE:HD12	4:D:145:ILE:N	2.32	0.44
4:D:278:TRP:HH2	4:D:294:LEU:HB3	1.81	0.44
4:D:873:ARG:HG3	4:D:873:ARG:HH11	1.83	0.44
1:T:123:DG:H1'	1:T:122:DC:H5"	1.99	0.44
1:T:118:DC:H2"	1:T:117:DG:OP2	2.18	0.44
4:D:9:ASN:OD1	4:D:48:GLU:OE2	2.35	0.44
4:D:655:ILE:HG23	4:D:659:ILE:CD1	2.48	0.44
4:D:727:TRP:CD1	5:D:1037:HOH:O	2.56	0.44
4:D:281:ILE:HD13	4:D:281:ILE:N	2.30	0.44
2:N:24:DG:H2"	2:N:25:DC:C6	2.53	0.44
4:D:33:ALA:CB	5:D:937:HOH:O	2.64	0.44
4:D:208:ASP:O	4:D:210:ILE:N	2.51	0.44
4:D:221:ILE:CD1	4:D:221:ILE:H	2.30	0.44
4:D:78:LEU:HB3	4:D:79:PRO:HD3	2.00	0.43
4:D:153:ARG:C	4:D:155:ARG:N	2.71	0.43
4:D:109:ILE:H	4:D:109:ILE:CD1	2.30	0.43
4:D:275:PRO:HD3	4:D:415:TRP:HB3	2.00	0.43
4:D:452:ILE:HG23	4:D:453:GLY:N	2.32	0.43
4:D:661:SER:C	4:D:663:LYS:H	2.21	0.43
4:D:117:ILE:CG2	4:D:145:ILE:HD12	2.46	0.43
4:D:353:PRO:HG3	4:D:394:ARG:CB	2.47	0.43
4:D:846:TYR:HA	4:D:849:PHE:CE1	2.53	0.43
4:D:157:LEU:O	4:D:158:GLU:C	2.55	0.43
4:D:157:LEU:CG	4:D:196:LEU:HD12	2.48	0.43
4:D:356:GLU:HG2	4:D:357:ARG:N	2.33	0.43
4:D:652:GLU:OE2	5:D:1028:HOH:O	2.21	0.43
4:D:744:GLN:HE21	4:D:758:GLN:NE2	2.17	0.43
4:D:39:LEU:HD12	4:D:39:LEU:HA	1.73	0.43
4:D:109:ILE:HD13	4:D:114:VAL:HG22	2.00	0.43
4:D:180:LYS:O	4:D:184:GLN:HG3	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:17:ALA:O	4:D:21:PHE:HB2	2.18	0.43
4:D:386:ARG:CG	5:D:933:HOH:O	2.34	0.43
1:T:119:DT:H4'	5:T:139:HOH:O	2.15	0.42
2:N:27:DC:C2'	2:N:28:DG:H5"	2.49	0.42
4:D:632:ARG:HE	4:D:632:ARG:HA	1.84	0.42
4:D:204:TRP:O	4:D:205:HIS:CB	2.66	0.42
4:D:324:GLN:CD	5:D:928:HOH:O	2.53	0.42
4:D:439:MET:O	4:D:443:LEU:HD22	2.18	0.42
4:D:579:ASN:O	4:D:583:GLN:HG2	2.18	0.42
4:D:582:LEU:HB3	4:D:621:LEU:HD21	2.01	0.42
4:D:612:GLY:O	4:D:615:ALA:N	2.52	0.42
4:D:160:LYS:NZ	4:D:160:LYS:HA	2.34	0.42
4:D:463:HIS:CB	4:D:534:LEU:HD22	2.48	0.42
4:D:593:GLU:CG	4:D:594:VAL:N	2.82	0.42
4:D:138:ALA:O	4:D:213:GLY:HA3	2.19	0.42
4:D:302:LYS:HG2	4:D:303:LYS:N	2.35	0.42
4:D:464:GLY:CA	5:D:1036:HOH:O	2.44	0.42
4:D:78:LEU:HA	4:D:119:ILE:HD11	2.02	0.42
4:D:166:VAL:HG12	4:D:166:VAL:O	2.20	0.42
4:D:575:ALA:O	4:D:578:VAL:HB	2.19	0.42
4:D:32:LEU:O	4:D:33:ALA:C	2.58	0.42
4:D:64:VAL:HG21	4:D:127:THR:OG1	2.20	0.42
4:D:84:ARG:HB2	4:D:223:SER:HB3	2.00	0.42
4:D:154:ILE:HD11	4:D:183:MET:HE1	1.99	0.42
1:T:128:DC:H42	2:N:27:DC:N4	2.17	0.42
2:N:16:DT:H2"	2:N:17:DA:O5'	2.20	0.42
2:N:26:DA:H2"	2:N:27:DC:O5'	2.19	0.42
4:D:130:ASP:C	4:D:132:THR:N	2.71	0.42
4:D:729:THR:OG1	4:D:733:PHE:HB3	2.20	0.42
4:D:729:THR:HB	4:D:789:SER:HB2	2.02	0.42
4:D:758:GLN:HA	4:D:759:PRO:HD3	1.85	0.42
2:N:29:DG:H2"	2:N:30:DC:H5	1.85	0.42
4:D:65:ALA:HB2	4:D:123:LEU:HD23	2.01	0.42
4:D:446:LEU:HD13	4:D:806:SER:HB3	2.02	0.42
4:D:735:VAL:C	5:D:1012:HOH:O	2.57	0.42
4:D:537:ASP:CG	5:D:984:HOH:O	2.55	0.42
4:D:611:LEU:HD22	4:D:615:ALA:CB	2.48	0.42
4:D:698:TRP:HZ3	4:D:845:PHE:HD2	1.68	0.42
4:D:828:VAL:HG21	4:D:883:ALA:HA	2.01	0.42
4:D:17:ALA:C	4:D:20:PRO:HD2	2.40	0.41
4:D:63:GLU:O	4:D:66:ASP:HB2	2.19	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:330:ILE:HD11	4:D:408:PHE:HB2	2.02	0.41
4:D:41:HIS:CE1	4:D:45:GLU:OE2	2.72	0.41
4:D:86:ASN:HD22	4:D:86:ASN:HA	1.69	0.41
4:D:141:ILE:HG23	4:D:145:ILE:HD11	2.02	0.41
4:D:157:LEU:HG	4:D:158:GLU:N	2.36	0.41
4:D:221:ILE:HD13	4:D:221:ILE:H	1.85	0.41
4:D:208:ASP:C	4:D:210:ILE:N	2.74	0.41
4:D:749:LEU:HD23	4:D:749:LEU:HA	1.89	0.41
4:D:790:HIS:CD2	5:D:904:HOH:O	2.70	0.41
4:D:869:ASN:N	5:D:893:HOH:O	2.15	0.41
4:D:16:LEU:HD21	4:D:20:PRO:HB2	2.02	0.41
4:D:560:ASN:HA	5:D:938:HOH:O	2.19	0.41
4:D:690:VAL:HG22	5:D:972:HOH:O	2.20	0.41
4:D:710:VAL:HG12	4:D:720:ARG:HB3	2.02	0.41
4:D:561:LEU:HA	4:D:561:LEU:HD12	1.88	0.41
4:D:605:ILE:O	4:D:606:SER:HB3	2.21	0.41
2:N:27:DC:H2"	2:N:28:DG:OP1	2.21	0.41
4:D:744:GLN:HB3	4:D:757:LEU:O	2.21	0.41
1:T:127:DG:N7	5:T:134:HOH:O	2.50	0.41
4:D:71:LYS:N	4:D:72:PRO:HD2	2.36	0.41
4:D:333:LYS:HB3	4:D:516:PHE:CE1	2.56	0.41
4:D:608:LYS:HG3	4:D:609:VAL:N	2.36	0.41
4:D:378:LYS:HD2	4:D:379:ARG:H	1.77	0.41
4:D:550:LEU:HD11	4:D:695:ALA:HB2	2.02	0.41
4:D:828:VAL:CG2	4:D:883:ALA:HA	2.50	0.41
2:N:17:DA:H2'	4:D:173:ARG:NH2	2.35	0.41
4:D:42:GLU:CD	5:D:1035:HOH:O	2.59	0.41
4:D:88:TRP:CZ2	4:D:215:ARG:HD3	2.55	0.41
4:D:131:ASN:C	4:D:133:THR:H	2.24	0.41
4:D:139:SER:O	4:D:143:ARG:HG2	2.20	0.41
4:D:142:GLY:HA3	5:D:924:HOH:O	2.21	0.41
4:D:161:HIS:CE1	4:D:165:ASN:HB2	2.55	0.41
4:D:285:GLY:CA	5:D:928:HOH:O	2.35	0.41
4:D:551:ARG:HA	4:D:551:ARG:HD3	1.84	0.41
4:D:595:VAL:HG23	4:D:608:LYS:H	1.84	0.41
4:D:622:ALA:O	4:D:666:MET:HG2	2.21	0.41
4:D:360:LEU:CD2	5:D:917:HOH:O	2.31	0.41
4:D:404:GLN:HA	4:D:404:GLN:NE2	2.36	0.41
4:D:577:LYS:HD3	4:D:687:VAL:HG21	2.03	0.41
4:D:857:GLN:NE2	4:D:859:ASP:HB2	2.34	0.41
4:D:36:GLN:HE21	4:D:40:GLU:CG	2.34	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:817:ILE:O	4:D:817:ILE:HG13	2.21	0.40
1:T:125:DG:H2"	1:T:124:DC:OP2	2.20	0.40
4:D:330:ILE:CD1	4:D:330:ILE:H	2.34	0.40
4:D:590:THR:CG2	4:D:591:ASP:N	2.83	0.40
4:D:74:ILE:HB	5:D:1034:HOH:O	2.21	0.40
4:D:647:ARG:CD	5:D:913:HOH:O	2.29	0.40
4:D:765:LYS:C	4:D:765:LYS:HZ2	2.24	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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	
4	D	857/883 (97%)	736 (86%)	86 (10%)	35 (4%)	3	1

All (35) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	16	LEU
4	D	158	GLU
4	D	302	LYS
4	D	303	LYS
4	D	353	PRO
4	D	588	ASN
4	D	592	ASN
4	D	655	ILE
4	D	852	GLN
4	D	854	HIS
4	D	855	GLU
4	D	61	ALA
4	D	203	SER
4	D	206	LYS

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Mol	Chain	Res	Type
4	D	209	SER
4	D	290	GLY
4	D	358	GLU
4	D	404	GLN
4	D	595	VAL
4	D	602	THR
4	D	606	SER
4	D	767	SER
4	D	851	ASP
4	D	198	GLY
4	D	376	ALA
4	D	853	LEU
4	D	30	GLU
4	D	859	ASP
4	D	882	PHE
4	D	656	GLN
4	D	662	GLY
4	D	766	ASP
4	D	154	ILE
4	D	603	GLY
4	D	664	GLY

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 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	
4	D	711/729 (98%)	659 (93%)	52 (7%)	14	11

All (52) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	D	27	HIS
4	D	50	ARG
4	D	73	LEU
4	D	91	GLU
4	D	107	GLN

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Mol	Chain	Res	Type
4	D	109	ILE
4	D	120	LYS
4	D	122	THR
4	D	131	ASN
4	D	160	LYS
4	D	170	LEU
4	D	180	LYS
4	D	221	ILE
4	D	261	LEU
4	D	281	ILE
4	D	292	ARG
4	D	296	LEU
4	D	335	LEU
4	D	337	VAL
4	D	340	VAL
4	D	346	HIS
4	D	353	PRO
4	D	355	ILE
4	D	358	GLU
4	D	360	LEU
4	D	362	MET
4	D	378	LYS
4	D	402	LEU
4	D	433	ASN
4	D	443	LEU
4	D	514	PHE
4	D	561	LEU
4	D	577	LYS
4	D	616	LEU
4	D	666	MET
4	D	672	GLN
4	D	686	SER
4	D	741	LYS
4	D	743	ILE
4	D	754	GLN
4	D	757	LEU
4	D	765	LYS
4	D	783	VAL
4	D	787	ASP
4	D	805	GLU
4	D	816	THR
4	D	834	ASP

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Mol	Chain	Res	Type
4	D	837	GLU
4	D	847	ASP
4	D	857	GLN
4	D	859	ASP
4	D	871	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
4	D	9	ASN
4	D	41	HIS
4	D	86	ASN
4	D	107	GLN
4	D	131	ASN
4	D	161	HIS
4	D	184	GLN
4	D	321	ASN
4	D	433	ASN
4	D	544	GLN
4	D	568	GLN
4	D	649	GLN
4	D	656	GLN
4	D	697	ASN
4	D	726	HIS
4	D	744	GLN
4	D	754	GLN
4	D	758	GLN
4	D	772	HIS
4	D	781	ASN
4	D	784	HIS
4	D	811	HIS
4	D	848	GLN
4	D	871	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	R	9/10 (90%)	1 (11%)	0

All (1) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	R	8	C

There are no RNA pucker outliers to report.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates ⓘ

EDS was not executed - this section is therefore empty.

6.4 Ligands ⓘ

EDS was not executed - this section is therefore empty.

6.5 Other polymers ⓘ

EDS was not executed - this section is therefore empty.