



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 08:04 PM GMT

PDB ID : 1IL2
Title : Crystal Structure of the E. coli Aspartyl-tRNA Synthetase:Yeast tRNA^{Asp}:aspartyl-Adenylate Complex
Authors : Moulinier, L.; Eiler, S.; Eriani, G.; Gangloff, J.; Thierry, J.C.; Gabriel, K.; McClain, W.H.; Moras, D.
Deposited on : 2001-05-07
Resolution : 2.60 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
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467
Mogul : 1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac : 5.8.0135
CCP4 : 6.5.0
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : trunk26865

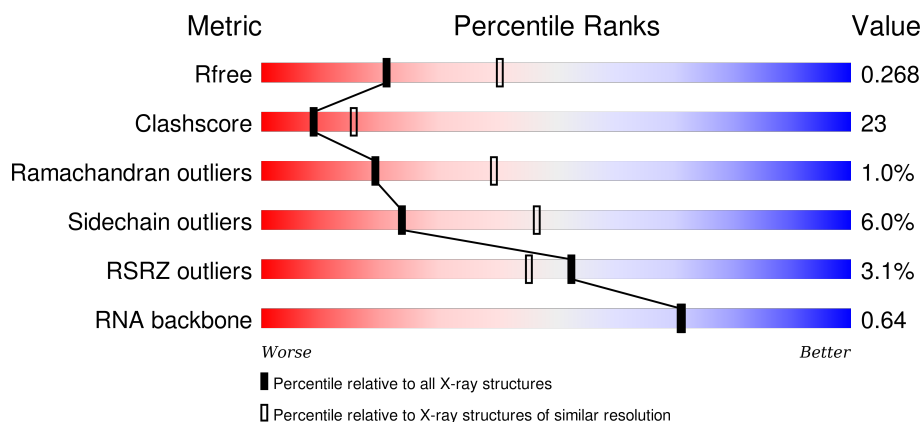
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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}	91344	2328 (2.60-2.60)
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (2.60-2.60)
RNA backbone	2183	1022 (3.00-2.20)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	C	75	<div> <div>4%</div> <div>39%</div> <div>57%</div> <div>..</div> </div>
1	D	75	<div> <div>9%</div> <div>32%</div> <div>55%</div> <div>5% 7%</div> <div>..</div> </div>
2	A	590	<div> <div>2%</div> <div>55%</div> <div>40%</div> <div>..</div> </div>
2	B	590	<div> <div>3%</div> <div>55%</div> <div>41%</div> <div>..</div> </div>

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	SO4	C	701	-	-	X	-

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 12753 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 RNA chain called ASPARTYL TRANSFER RNA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	C	75	Total	C	N	O	P	0	0	0
			1601	715	280	531	75			
1	D	70	Total	C	N	O	P	0	0	0
			1496	668	262	496	70			

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	913	PSU	U	TRNA MODIFICATION	GB 176417
C	916	H2U	U	TRNA MODIFICATION	GB 176417
C	919	H2U	U	TRNA MODIFICATION	GB 176417
C	932	PSU	U	TRNA MODIFICATION	GB 176417
C	937	1MG	G	TRNA MODIFICATION	GB 176417
C	949	5MC	C	TRNA MODIFICATION	GB 176417
C	954	5MU	U	TRNA MODIFICATION	GB 176417
C	955	PSU	U	TRNA MODIFICATION	GB 176417
D	1913	PSU	U	TRNA MODIFICATION	GB 176417
D	1916	H2U	U	TRNA MODIFICATION	GB 176417
D	1919	H2U	U	TRNA MODIFICATION	GB 176417
D	1932	PSU	U	TRNA MODIFICATION	GB 176417
D	1937	1MG	G	TRNA MODIFICATION	GB 176417
D	1949	5MC	C	TRNA MODIFICATION	GB 176417
D	1954	5MU	U	TRNA MODIFICATION	GB 176417
D	1955	PSU	U	TRNA MODIFICATION	GB 176417

- Molecule 2 is a protein called ASPARTYL-TRNA SYNTHETASE.

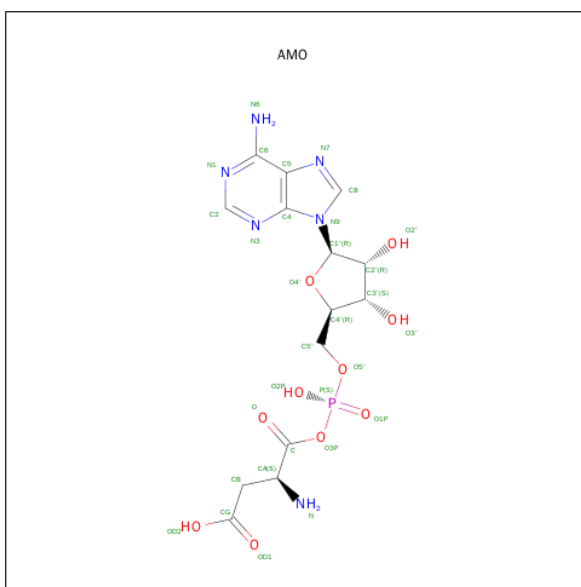
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	585	Total	C	N	O	S	0	0	0
			4591	2900	804	861	26			
2	B	585	Total	C	N	O	S	0	0	0
			4591	2900	804	861	26			

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is ASPARTYL-ADENOSINE-5'-MONOPHOSPHATE (three-letter code: AMO) (formula: C₁₄H₁₉N₆O₁₀P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			31	14	6	10	1		
4	B	1	Total	C	N	O	P	0	0
			31	14	6	10	1		

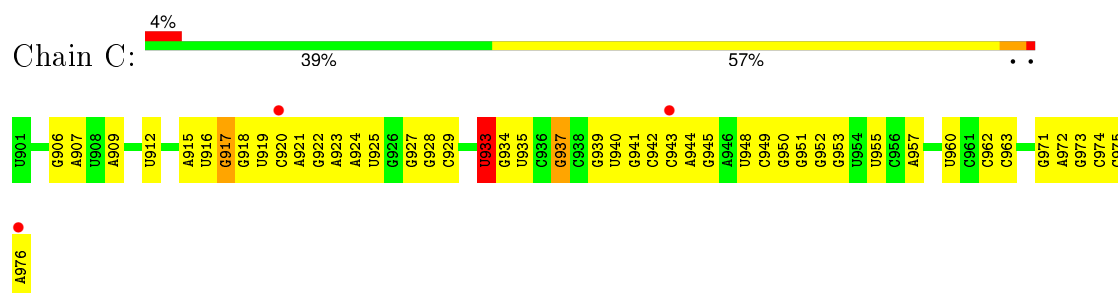
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	164	Total	O	0	0
			164	164		
5	B	178	Total	O	0	0
			178	178		
5	C	27	Total	O	0	0
			27	27		
5	D	33	Total	O	0	0
			33	33		

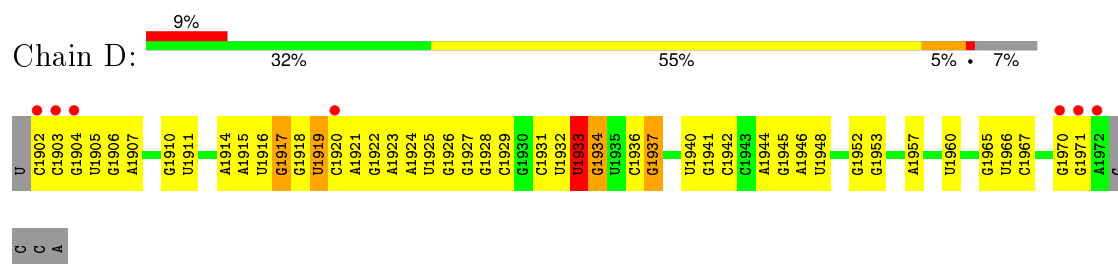
3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

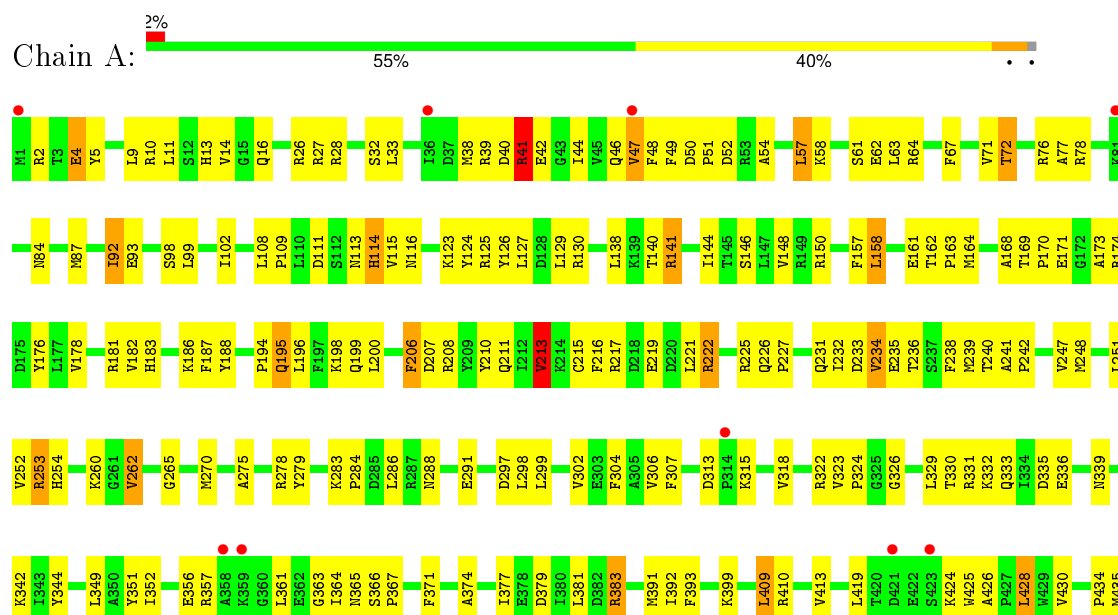
• Molecule 1: ASPARTYL TRANSFER RNA

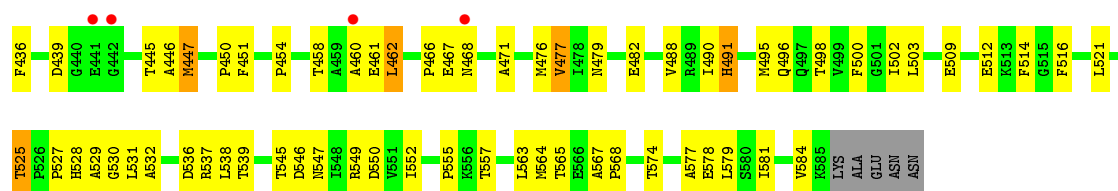


• Molecule 1: ASPARTYL TRANSFER RNA

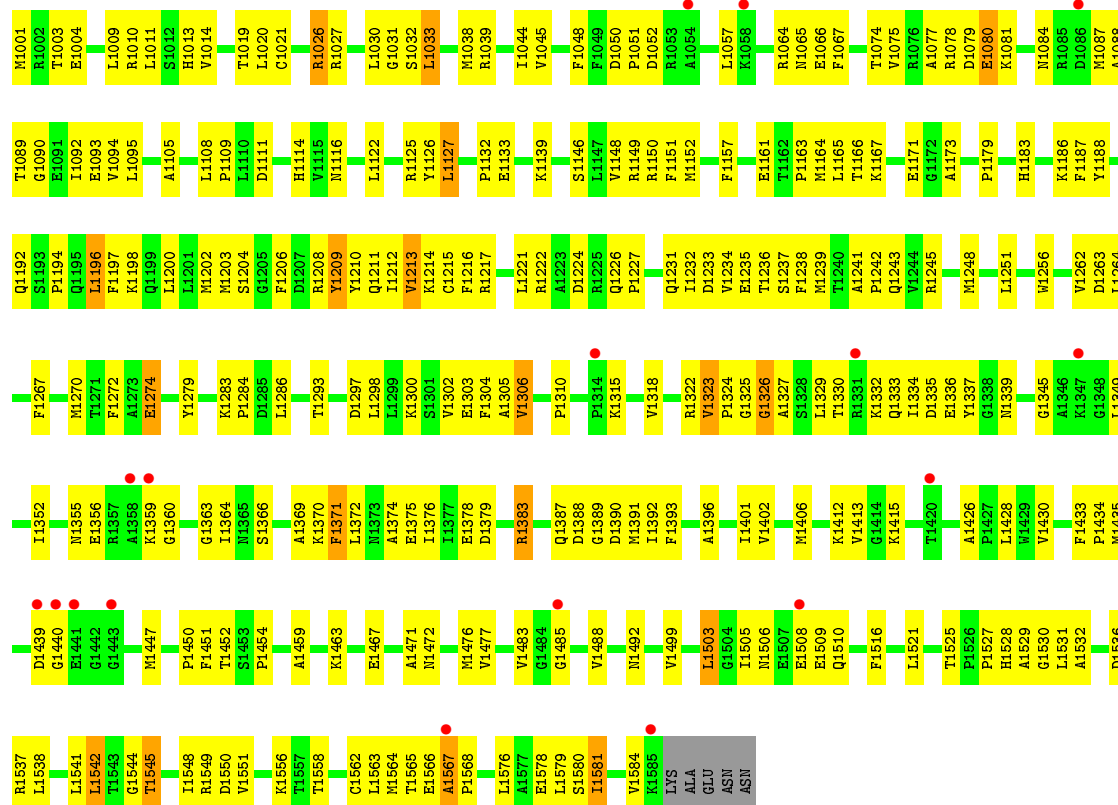


• Molecule 2: ASPARTYL-TRNA SYNTHETASE





• Molecule 2: ASPARTYL-TRNA SYNTHETASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	75.80 Å 222.80 Å 80.80 Å 90.00° 111.80° 90.00°	Depositor
Resolution (Å)	11.50 – 2.60 24.27 – 2.50	Depositor EDS
% Data completeness (in resolution range)	84.1 (11.50-2.60) 84.7 (24.27-2.50)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	3.70	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.23 (at 2.50 Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, R_{free}	0.204 , 0.257 0.220 , 0.268	Depositor DCC
R_{free} test set	3252 reflections (4.87%)	DCC
Wilson B-factor (Å ²)	42.5	Xtriage
Anisotropy	0.415	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 62.0	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	2 of 75742 reflections (0.003%)	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	12753	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.43% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 5MU, AMO, H2U, SO4, 5MC, 1MG, PSU

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	C	0.42	0/1604	0.71	1/2500 (0.0%)
1	D	0.41	1/1487 (0.1%)	0.68	1/2318 (0.0%)
2	A	0.40	0/4677	0.72	3/6320 (0.0%)
2	B	0.39	0/4677	0.72	1/6320 (0.0%)
All	All	0.40	1/12445 (0.0%)	0.71	6/17458 (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	C	0	2
1	D	0	1
All	All	0	3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	1902	C	P-O5'	5.67	1.65	1.59

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	1902	C	O5'-P-OP2	-6.61	99.75	105.70
2	B	1232	ILE	N-CA-C	-6.43	93.65	111.00
2	A	213	VAL	CB-CA-C	-6.02	99.96	111.40
2	A	206	PHE	N-CA-C	-6.01	94.78	111.00
2	A	232	ILE	N-CA-C	-5.72	95.55	111.00
1	C	933	U	N1-C1'-C2'	5.32	120.92	114.00

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	918	G	Sidechain
1	C	933	U	Sidechain
1	D	1933	U	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	C	1601	0	811	54	0
1	D	1496	0	757	32	0
2	A	4591	0	4590	246	0
2	B	4591	0	4587	246	0
3	B	5	0	0	0	0
3	C	5	0	0	2	0
4	A	31	0	17	1	0
4	B	31	0	17	1	0
5	A	164	0	0	11	0
5	B	178	0	0	8	0
5	C	27	0	0	2	0
5	D	33	0	0	0	0
All	All	12753	0	10779	537	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 23.

All (537) 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:A:236:THR:HB	2:A:239:MET:HE3	1.38	1.02
2:A:545:THR:HG22	2:A:547:ASN:H	1.23	0.99
2:B:1009:LEU:HA	2:B:1013:HIS:HD2	1.27	0.99
2:A:161:GLU:HA	2:A:211:GLN:NE2	1.80	0.96
2:A:547:ASN:OD1	2:A:549:ARG:HG2	1.66	0.95
2:A:72:THR:HG23	2:A:98:SER:HB3	1.52	0.91

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:260:LYS:HB2	2:A:262:VAL:HG12	1.53	0.90
2:A:458:THR:HB	2:A:461:GLU:HG3	1.56	0.88
2:B:1241:ALA:HB3	2:B:1242:PRO:HD3	1.58	0.85
2:B:1531:LEU:HD13	2:B:1532:ALA:N	1.92	0.84
2:A:102:ILE:HG21	2:B:1527:PRO:HD3	1.60	0.84
2:B:1009:LEU:HA	2:B:1013:HIS:CD2	2.12	0.83
2:A:545:THR:HG22	2:A:546:ASP:H	1.43	0.83
2:B:1111:ASP:H	2:B:1116:ASN:HD21	1.25	0.82
2:B:1336:GLU:HG3	2:B:1337:TYR:H	1.44	0.81
2:B:1356:GLU:HB3	2:B:1359:LYS:HD3	1.62	0.81
2:A:491:HIS:HD2	2:A:527:PRO:HA	1.47	0.80
2:B:1163:PRO:HG2	2:B:1166:THR:CG2	2.11	0.80
2:B:1567:ALA:HB3	2:B:1568:PRO:HD3	1.62	0.80
2:B:1048:PHE:HE1	2:B:1050:ASP:HB3	1.47	0.79
2:B:1248:MET:HA	2:B:1248:MET:HE2	1.65	0.78
2:B:1326:GLY:O	2:B:1329:LEU:HD13	1.83	0.78
2:A:183:HIS:HB3	2:A:186:LYS:HD2	1.67	0.77
2:B:1026:ARG:HE	2:B:1065:ASN:HD21	1.33	0.77
2:A:72:THR:CG2	2:A:98:SER:HB3	2.15	0.77
2:A:458:THR:HG22	2:A:460:ALA:H	1.51	0.76
2:A:521:LEU:HA	2:A:525:THR:HG21	1.67	0.76
1:C:915:A:H2'	1:C:916:H2U:H62	1.68	0.76
2:A:352:ILE:HA	2:A:366:SER:HB3	1.67	0.75
2:A:236:THR:CB	2:A:239:MET:HE3	2.14	0.75
2:A:48:PHE:CE1	2:A:50:ASP:HB3	2.22	0.75
2:A:330:THR:HG22	2:A:332:LYS:H	1.50	0.75
2:A:545:THR:HG22	2:A:546:ASP:N	2.03	0.74
2:A:27:ARG:HD3	2:A:63:LEU:O	1.89	0.73
2:B:1336:GLU:HG3	2:B:1337:TYR:N	2.03	0.72
2:B:1302:VAL:HG12	2:B:1304:PHE:H	1.54	0.72
2:B:1415:LYS:HE3	5:B:2209:HOH:O	1.90	0.72
2:B:1562:CYS:HB3	2:B:1567:ALA:HB2	1.71	0.72
2:A:211:GLN:CD	2:A:213:VAL:HG13	2.09	0.71
2:A:158:LEU:HD21	2:B:1139:LYS:HG2	1.71	0.71
2:B:1171:GLU:HG2	2:B:1217:ARG:NH2	2.06	0.70
1:C:933:U:H1'	2:A:33:LEU:HD13	1.74	0.70
2:A:298:LEU:HD21	2:A:379:ASP:HB3	1.73	0.70
2:B:1325:GLY:O	2:B:1327:ALA:N	2.25	0.70
2:B:1459:ALA:O	2:B:1463:LYS:HG2	1.91	0.69
2:A:10:ARG:H	2:A:13:HIS:CD2	2.10	0.69
2:B:1374:ALA:O	2:B:1378:GLU:HG3	1.92	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:426:ALA:H	2:A:479:ASN:ND2	1.90	0.69
2:A:426:ALA:H	2:A:479:ASN:HD21	1.40	0.69
2:A:48:PHE:HE1	2:A:50:ASP:HB3	1.55	0.69
2:B:1202:MET:HE2	2:B:1237:SER:HB3	1.75	0.69
2:B:1434:PRO:HG2	2:B:1447:MET:HG3	1.72	0.69
1:C:915:A:O2'	1:C:916:H2U:H5'	1.93	0.69
2:A:349:LEU:HD11	2:A:393:PHE:HB3	1.75	0.68
2:A:545:THR:HG22	2:A:547:ASN:N	2.01	0.68
2:A:557:THR:HG21	2:A:563:LEU:HD21	1.74	0.68
2:A:557:THR:CG2	2:A:563:LEU:HD21	2.23	0.68
2:B:1318:VAL:HG13	2:B:1396:ALA:HB2	1.75	0.68
2:A:41:ARG:HD2	5:A:2343:HOH:O	1.94	0.68
2:B:1322:ARG:HH21	2:B:1387:GLN:HG2	1.58	0.68
2:A:330:THR:HB	2:A:333:GLN:HG3	1.76	0.67
2:A:286:LEU:HD22	2:A:428:LEU:HD22	1.75	0.67
1:D:1903:C:O2'	1:D:1904:G:H5'	1.95	0.67
2:B:1352:ILE:HA	2:B:1366:SER:HB2	1.76	0.67
2:B:1499:VAL:O	2:B:1503:LEU:HD22	1.94	0.66
2:B:1077:ALA:HA	2:B:1092:ILE:HD13	1.78	0.66
2:A:545:THR:HG21	2:A:550:ASP:HB2	1.77	0.65
2:B:1187:PHE:HZ	2:B:1581:ILE:HD11	1.62	0.65
2:A:565:THR:HB	2:B:1167:LYS:HD2	1.78	0.65
2:A:288:ASN:HB3	2:A:410:ARG:NH2	2.11	0.65
2:A:41:ARG:HH21	2:B:1208:ARG:H	1.43	0.65
1:D:1970:G:O2'	1:D:1971:G:H5'	1.97	0.65
2:B:1163:PRO:HG2	2:B:1166:THR:HG21	1.78	0.65
2:A:50:ASP:HB2	2:A:51:PRO:HD2	1.77	0.65
2:A:260:LYS:HB2	2:A:262:VAL:CG1	2.25	0.64
2:B:1435:MET:HA	2:B:1471:ALA:HB2	1.80	0.64
2:A:351:TYR:O	2:A:366:SER:HB2	1.96	0.64
2:A:278:ARG:O	2:A:291:GLU:HB2	1.98	0.64
2:A:144:ILE:O	2:A:148:VAL:HG23	1.98	0.63
2:A:162:THR:H	2:A:211:GLN:HE22	1.47	0.62
2:A:270:MET:CE	2:A:284:PRO:HG3	2.29	0.62
2:A:361:LEU:HD11	2:A:374:ALA:HB2	1.81	0.62
2:A:39:ARG:HB2	2:A:44:ILE:HG12	1.81	0.62
2:A:130:ARG:HG3	2:B:1204:SER:O	1.99	0.62
2:B:1531:LEU:HD13	2:B:1532:ALA:H	1.62	0.62
1:C:976:A:H3'	4:A:831:AMO:O1P	2.00	0.62
2:A:194:PRO:HG2	2:A:213:VAL:HG21	1.81	0.62
2:B:1026:ARG:NE	2:B:1065:ASN:HD21	1.96	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:270:MET:HE2	2:A:284:PRO:HG3	1.81	0.62
2:A:221:LEU:O	2:A:222:ARG:HD3	2.00	0.62
2:A:236:THR:HB	2:A:239:MET:CE	2.23	0.62
2:B:1234:VAL:HG11	2:B:1248:MET:SD	2.40	0.61
2:A:322:ARG:NH1	2:A:324:PRO:HG3	2.14	0.61
2:A:462:LEU:HD22	2:A:502:ILE:CD1	2.30	0.61
1:D:1933:U:O4'	2:B:1032:SER:HB2	2.00	0.61
2:A:170:PRO:HG2	2:A:514:PHE:CZ	2.36	0.61
1:C:976:A:H5'	2:A:217:ARG:NH1	2.15	0.61
1:C:909:A:N3	1:C:945:G:H2'	2.16	0.60
2:B:1375:GLU:HA	2:B:1378:GLU:OE1	2.01	0.60
2:A:568:PRO:HD3	2:B:1188:TYR:CE1	2.36	0.60
2:A:196:LEU:HD21	2:A:451:PHE:CZ	2.37	0.60
2:B:1364:ILE:HD12	2:B:1364:ILE:C	2.22	0.60
2:A:248:MET:CE	2:A:248:MET:HA	2.31	0.60
2:B:1009:LEU:HD12	2:B:1045:VAL:HG21	1.83	0.60
2:A:326:GLY:O	2:A:329:LEU:HD13	2.01	0.60
1:C:976:A:N3	1:C:976:A:H2'	2.16	0.60
2:B:1187:PHE:CZ	2:B:1581:ILE:HD11	2.36	0.60
2:A:141:ARG:NH2	2:A:536:ASP:OD1	2.35	0.60
2:A:468:ASN:HD22	2:A:468:ASN:N	2.00	0.60
2:A:304:PHE:HB2	2:A:371:PHE:HB3	1.84	0.60
2:A:323:VAL:CG2	2:A:326:GLY:HA3	2.32	0.60
2:A:64:ARG:HB2	2:A:67:PHE:CE2	2.37	0.59
1:D:1952:G:O2'	1:D:1953:G:H5'	2.02	0.59
2:B:1298:LEU:HD13	2:B:1383:ARG:NH2	2.16	0.59
2:A:46:GLN:NE2	2:A:78:ARG:NH1	2.51	0.59
2:B:1167:LYS:HD3	2:B:1516:PHE:CE2	2.37	0.59
1:C:920:C:H2'	1:C:921:A:H5''	1.85	0.59
2:A:126:TYR:CD1	2:A:127:LEU:HD22	2.37	0.59
2:A:221:LEU:N	2:A:221:LEU:HD12	2.17	0.59
2:A:409:LEU:CD2	2:A:413:VAL:HG23	2.33	0.59
2:B:1272:PHE:CD2	2:B:1434:PRO:HD3	2.38	0.59
2:A:111:ASP:HB3	2:A:114:HIS:NE2	2.17	0.59
2:B:1349:LEU:HD11	2:B:1393:PHE:HB3	1.85	0.58
2:A:235:GLU:OE2	2:A:530:GLY:HA3	2.03	0.58
2:B:1014:VAL:CG2	2:B:1092:ILE:HD11	2.33	0.58
2:A:210:TYR:HA	2:A:233:ASP:O	2.04	0.58
2:B:1402:VAL:O	2:B:1406:MET:HB2	2.04	0.58
2:A:339:ASN:O	2:A:342:LYS:HB2	2.04	0.58
2:A:130:ARG:HD2	2:B:1203:MET:O	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:436:PHE:HE1	2:A:462:LEU:HD21	1.69	0.58
2:A:391:MET:HG3	2:A:392:ILE:N	2.18	0.58
2:B:1538:LEU:O	2:B:1542:LEU:HD22	2.03	0.58
2:B:1010:ARG:NH2	2:B:1088:ALA:HB1	2.19	0.58
1:C:976:A:OP1	2:A:171:GLU:O	2.21	0.58
2:B:1238:PHE:CE2	2:B:1527:PRO:HD2	2.39	0.58
2:B:1211:GLN:CD	2:B:1213:VAL:HG13	2.24	0.57
1:C:916:H2U:H2'	1:C:960:U:O2	2.04	0.57
2:B:1050:ASP:HB2	2:B:1051:PRO:CD	2.33	0.57
2:A:41:ARG:NH2	2:B:1208:ARG:H	2.03	0.57
1:C:972:A:H2'	1:C:973:G:O4'	2.04	0.57
2:B:1009:LEU:O	2:B:1089:THR:HG22	2.04	0.57
2:B:1428:LEU:HD21	2:B:1477:VAL:HB	1.85	0.57
1:D:1941:G:H2'	1:D:1942:C:C6	2.40	0.57
2:B:1485:GLY:O	2:B:1531:LEU:HD22	2.05	0.57
2:A:126:TYR:CE1	2:A:127:LEU:HD22	2.40	0.57
2:B:1150:ARG:NH2	5:B:2386:HOH:O	2.37	0.57
2:A:356:GLU:O	2:A:363:GLY:HA3	2.06	0.56
2:B:1013:HIS:O	2:B:1075:VAL:HB	2.05	0.56
1:C:976:A:O2'	2:A:482:GLU:OE1	2.22	0.56
1:D:1924:A:H2'	1:D:1925:U:C6	2.40	0.56
2:B:1485:GLY:C	2:B:1531:LEU:HD22	2.26	0.56
1:C:974:C:H2'	1:C:975:C:O4'	2.05	0.56
2:B:1196:LEU:HD23	2:B:1516:PHE:HZ	1.70	0.56
2:A:491:HIS:CD2	2:A:527:PRO:HA	2.35	0.56
1:C:933:U:H1'	2:A:33:LEU:CD1	2.36	0.56
2:B:1356:GLU:CB	2:B:1359:LYS:HD3	2.35	0.56
2:B:1126:TYR:CD1	2:B:1127:LEU:HD13	2.41	0.55
2:A:247:VAL:HG13	2:A:248:MET:HE3	1.87	0.55
2:A:531:LEU:HD23	2:A:531:LEU:C	2.26	0.55
1:D:1917:G:N2	1:D:1957:A:H2'	2.21	0.55
2:B:1210:TYR:HA	2:B:1233:ASP:O	2.06	0.55
2:B:1549:ARG:HH22	2:B:1558:THR:HG23	1.71	0.55
2:B:1092:ILE:CG2	2:B:1093:GLU:N	2.69	0.55
2:B:1084:ASN:HB3	2:B:1087:MET:HE2	1.89	0.55
2:A:410:ARG:HD3	5:A:2012:HOH:O	2.06	0.55
2:A:278:ARG:HD2	2:A:291:GLU:OE2	2.06	0.55
1:C:976:A:N3	1:C:976:A:C2'	2.70	0.55
1:C:909:A:H5''	5:C:2341:HOH:O	2.05	0.55
2:B:1545:THR:HG21	2:B:1550:ASP:HB2	1.88	0.55
2:A:170:PRO:HG2	2:A:514:PHE:HZ	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:364:ILE:C	2:A:364:ILE:HD12	2.27	0.55
2:B:1183:HIS:HB3	2:B:1186:LYS:HD2	1.88	0.55
1:D:1940:U:H2'	1:D:1941:G:H8	1.73	0.54
1:C:976:A:N6	2:A:447:MET:SD	2.81	0.54
2:B:1428:LEU:CD2	2:B:1477:VAL:HB	2.38	0.54
2:A:531:LEU:HD23	2:A:532:ALA:N	2.22	0.54
2:A:545:THR:CG2	2:A:546:ASP:H	2.18	0.54
1:D:1921:A:H61	1:D:1946:A:H2'	1.70	0.54
2:A:466:PRO:HG2	2:A:467:GLU:H	1.73	0.54
1:C:944:A:O2'	1:C:945:G:H5'	2.07	0.54
2:B:1209:TYR:CG	2:B:1210:TYR:N	2.75	0.54
2:B:1356:GLU:HA	2:B:1388:ASP:OD2	2.07	0.54
2:B:1048:PHE:CE1	2:B:1050:ASP:HB3	2.37	0.54
2:B:1356:GLU:OE2	2:B:1388:ASP:OD2	2.25	0.54
2:B:1026:ARG:NH2	2:B:1027:ARG:HG3	2.23	0.54
2:B:1430:VAL:O	2:B:1433:PHE:HE1	1.91	0.54
1:D:1933:U:C2'	1:D:1934:G:OP2	2.56	0.53
2:A:211:GLN:HG2	2:A:213:VAL:HG13	1.88	0.53
2:B:1467:GLU:H	2:B:1467:GLU:CD	2.12	0.53
2:B:1151:PHE:CD2	2:B:1251:LEU:HD13	2.43	0.53
2:A:488:VAL:HA	2:A:529:ALA:CB	2.38	0.53
2:A:304:PHE:CE2	2:A:306:VAL:HB	2.44	0.53
2:A:211:GLN:CG	2:A:213:VAL:HG13	2.38	0.53
2:B:1537:ARG:O	2:B:1541:LEU:HD13	2.09	0.53
2:A:297:ASP:OD2	2:A:383:ARG:NH2	2.42	0.53
2:A:188:TYR:CZ	2:B:1568:PRO:HG3	2.43	0.53
2:A:253:ARG:HG3	2:A:253:ARG:HH11	1.73	0.53
1:C:912:U:H3'	5:C:2108:HOH:O	2.09	0.53
1:D:1906:G:H2'	1:D:1907:A:C8	2.44	0.53
2:B:1033:LEU:HD22	2:B:1048:PHE:HZ	1.74	0.53
2:B:1304:PHE:CZ	2:B:1306:VAL:HG22	2.44	0.53
2:A:198:LYS:HD2	2:A:235:GLU:HB2	1.90	0.53
1:D:1944:A:O2'	1:D:1945:G:H5'	2.09	0.53
1:D:1911:U:O2'	2:B:1114:HIS:HE1	1.92	0.52
2:B:1033:LEU:HD22	2:B:1048:PHE:CZ	2.43	0.52
2:A:129:LEU:HB2	2:B:1204:SER:HB3	1.90	0.52
2:B:1064:ARG:HB2	2:B:1067:PHE:CE2	2.44	0.52
2:A:77:ALA:HA	2:A:92:ILE:HD12	1.91	0.52
2:B:1161:GLU:HA	2:B:1211:GLN:OE1	2.09	0.52
2:B:1372:LEU:HD23	2:B:1376:ILE:CG2	2.39	0.52
2:B:1286:LEU:HB2	2:B:1426:ALA:HB1	1.90	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:545:THR:CG2	2:A:546:ASP:N	2.73	0.52
2:A:92:ILE:HG23	2:A:93:GLU:N	2.25	0.52
2:A:323:VAL:HG22	2:A:326:GLY:HA3	1.91	0.52
1:D:1922:G:O6	1:D:1946:A:N1	2.43	0.52
2:A:11:LEU:HA	2:A:92:ILE:HD13	1.92	0.52
2:A:241:ALA:HB3	2:A:242:PRO:HD3	1.92	0.52
2:B:1167:LYS:HD3	2:B:1516:PHE:HE2	1.73	0.51
2:A:11:LEU:O	2:A:14:VAL:HG23	2.10	0.51
1:D:1914:A:O2'	1:D:1915:A:H5'	2.11	0.51
1:C:962:C:H2'	1:C:963:C:H6	1.75	0.51
2:B:1211:GLN:CD	2:B:1213:VAL:CG1	2.79	0.51
2:B:1194:PRO:HG2	2:B:1213:VAL:HG21	1.91	0.51
2:B:1567:ALA:CB	2:B:1568:PRO:HD3	2.37	0.51
2:A:270:MET:HE3	2:A:275:ALA:HB2	1.92	0.51
2:A:488:VAL:HA	2:A:529:ALA:HB2	1.91	0.51
2:B:1584:VAL:O	2:B:1584:VAL:HG23	2.11	0.51
2:B:1010:ARG:H	2:B:1013:HIS:CD2	2.28	0.51
2:A:563:LEU:HD22	2:A:563:LEU:H	1.75	0.51
2:A:182:VAL:HG23	2:A:183:HIS:CD2	2.46	0.51
2:A:270:MET:O	2:A:430:VAL:HA	2.11	0.51
1:C:976:A:O2'	2:A:482:GLU:CD	2.49	0.51
1:C:906:G:O2'	1:C:907:A:H5'	2.11	0.51
2:B:1033:LEU:O	2:B:1033:LEU:HD12	2.11	0.51
2:A:315:LYS:O	2:A:399:LYS:HG3	2.11	0.51
1:C:952:G:O2'	1:C:953:G:H5'	2.11	0.51
2:A:260:LYS:CB	2:A:262:VAL:HG12	2.33	0.51
2:A:196:LEU:HD13	2:A:516:PHE:HZ	1.75	0.51
2:B:1256:TRP:CD1	2:B:1264:LEU:HD21	2.46	0.51
2:B:1323:VAL:HG22	2:B:1323:VAL:O	2.09	0.51
2:A:357:ARG:HH11	2:A:357:ARG:HG2	1.75	0.51
1:D:1966:U:H2'	1:D:1967:C:C6	2.46	0.51
2:B:1192:GLN:HA	2:B:1216:PHE:O	2.11	0.51
2:A:221:LEU:H	2:A:221:LEU:HD12	1.77	0.50
1:C:962:C:H2'	1:C:963:C:C6	2.47	0.50
2:A:173:ALA:CB	2:A:217:ARG:HB3	2.42	0.50
2:B:1248:MET:CA	2:B:1248:MET:HE2	2.38	0.50
2:B:1330:THR:OG1	2:B:1333:GLN:HG3	2.11	0.50
2:A:84:ASN:CG	2:A:87:MET:HG3	2.32	0.50
2:A:252:VAL:HG21	2:A:476:MET:SD	2.52	0.50
2:B:1148:VAL:O	2:B:1152:MET:HG2	2.11	0.50
2:B:1111:ASP:HB3	2:B:1114:HIS:CE1	2.47	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:521:LEU:HA	2:A:525:THR:CG2	2.40	0.50
2:B:1537:ARG:NH2	4:B:1831:AMO:H2'2	2.26	0.50
2:A:26:ARG:NH1	2:A:113:ASN:HD21	2.10	0.50
2:A:574:THR:O	2:A:577:ALA:HB3	2.12	0.50
2:B:1078:ARG:HD2	2:B:1090:GLY:O	2.12	0.49
1:C:939:G:O2'	1:C:940:U:H5'	2.12	0.49
2:B:1326:GLY:HA2	2:B:1329:LEU:HD13	1.94	0.49
1:D:1941:G:H2'	1:D:1942:C:H6	1.76	0.49
2:A:141:ARG:HG2	2:A:539:THR:HG21	1.94	0.49
2:A:157:PHE:CD2	2:A:208:ARG:HB3	2.47	0.49
2:B:1236:THR:O	2:B:1528:HIS:HB2	2.12	0.49
2:A:13:HIS:O	2:A:16:GLN:HB2	2.13	0.49
2:A:40:ASP:O	2:A:42:GLU:N	2.45	0.49
2:A:333:GLN:O	2:A:336:GLU:HG2	2.13	0.49
2:A:545:THR:HG21	2:A:550:ASP:CB	2.42	0.49
2:A:323:VAL:O	2:A:323:VAL:CG2	2.60	0.49
2:A:123:LYS:HD2	2:A:124:TYR:CE1	2.48	0.49
2:B:1149:ARG:CZ	2:B:1212:ILE:HD12	2.42	0.49
2:A:516:PHE:CD2	2:B:1565:THR:HG22	2.48	0.49
1:D:1916:H2U:H2'	1:D:1960:U:O2	2.13	0.49
2:A:468:ASN:ND2	2:A:468:ASN:N	2.61	0.49
2:A:253:ARG:NH1	2:A:253:ARG:HG3	2.28	0.49
2:A:238:PHE:CE2	2:B:1021:CYS:HB3	2.47	0.49
2:B:1372:LEU:HD12	2:B:1372:LEU:N	2.28	0.49
2:B:1372:LEU:HD23	2:B:1376:ILE:HG21	1.93	0.49
1:C:917:G:H4'	1:C:960:U:C2	2.48	0.48
2:B:1109:PRO:HD2	2:B:1127:LEU:HD23	1.94	0.48
1:C:962:C:O2'	1:C:963:C:H5'	2.12	0.48
2:A:445:THR:HG22	2:A:446:ALA:N	2.29	0.48
2:B:1111:ASP:N	2:B:1116:ASN:HD21	2.03	0.48
2:A:130:ARG:HG2	5:A:2066:HOH:O	2.12	0.48
2:B:1066:GLU:HG2	2:B:1108:LEU:HD11	1.95	0.48
2:B:1508:GLU:CD	2:B:1508:GLU:H	2.16	0.48
2:A:47:VAL:CG2	2:A:49:PHE:CE1	2.97	0.48
1:C:976:A:H5'	2:A:217:ARG:HH12	1.78	0.48
2:A:164:MET:HG3	2:B:1216:PHE:HZ	1.79	0.48
1:C:942:C:O2'	1:C:943:C:H5'	2.14	0.48
2:B:1238:PHE:HE2	2:B:1527:PRO:HD2	1.78	0.48
2:B:1283:LYS:HG3	2:B:1283:LYS:O	2.14	0.48
2:B:1488:VAL:HA	2:B:1529:ALA:HB2	1.96	0.48
2:B:1179:PRO:HB2	2:B:1579:LEU:HD13	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1435:MET:HE3	5:B:2235:HOH:O	2.13	0.48
1:C:912:U:C5'	2:A:116:ASN:HA	2.44	0.48
1:C:941:G:H2'	1:C:942:C:C6	2.49	0.48
2:B:1215:CYS:SG	2:B:1231:GLN:HG3	2.53	0.48
2:A:102:ILE:HD12	2:A:102:ILE:H	1.78	0.48
2:A:9:LEU:O	2:A:10:ARG:HD3	2.14	0.48
1:C:976:A:H1'	2:A:482:GLU:OE2	2.13	0.48
2:B:1270:MET:HG3	2:B:1274:GLU:HB3	1.96	0.48
2:A:377:ILE:O	2:A:381:LEU:HG	2.14	0.48
2:B:1222:ARG:HD2	2:B:1224:ASP:OD2	2.13	0.48
2:A:161:GLU:HA	2:A:211:GLN:HE21	1.75	0.47
2:A:330:THR:HG22	2:A:331:ARG:N	2.29	0.47
2:B:1304:PHE:CE1	2:B:1306:VAL:HG13	2.49	0.47
1:C:929:C:H42	1:C:941:G:H1	1.61	0.47
2:A:545:THR:CG2	2:A:547:ASN:H	2.10	0.47
2:B:1111:ASP:H	2:B:1116:ASN:ND2	2.02	0.47
1:C:975:C:H1'	2:A:225:ARG:NH2	2.29	0.47
2:A:164:MET:HG3	2:B:1164:MET:HE1	1.96	0.47
2:B:1245:ARG:NH2	5:B:2107:HOH:O	2.47	0.47
1:D:1928:G:O2'	1:D:1929:C:H5'	2.14	0.47
2:A:253:ARG:NH1	2:A:265:GLY:O	2.48	0.47
2:B:1001:MET:N	2:B:1021:CYS:HG	2.13	0.47
1:D:1931:C:O2'	1:D:1932:PSU:H5''	2.14	0.47
2:B:1576:LEU:HB3	2:B:1581:ILE:O	2.14	0.47
1:D:1918:G:O2'	1:D:1919:H2U:P	2.73	0.47
2:B:1318:VAL:HG22	2:B:1396:ALA:HB1	1.97	0.47
1:C:935:U:O2'	2:A:28:ARG:HD2	2.14	0.47
2:B:1324:PRO:HA	2:B:1390:ASP:OD1	2.14	0.47
2:B:1092:ILE:HG23	2:B:1093:GLU:N	2.29	0.47
1:C:928:G:O2'	1:C:929:C:H5'	2.15	0.47
2:B:1472:ASN:HA	5:B:2081:HOH:O	2.13	0.47
1:C:944:A:C2'	1:C:945:G:H5'	2.45	0.47
2:A:226:GLN:HB3	5:A:2064:HOH:O	2.14	0.47
2:B:1235:GLU:OE2	2:B:1530:GLY:HA3	2.15	0.47
2:B:1435:MET:CE	2:B:1454:PRO:HG3	2.46	0.46
2:A:283:LYS:N	2:A:284:PRO:CD	2.77	0.46
2:B:1146:SER:O	2:B:1150:ARG:HG3	2.15	0.46
2:B:1026:ARG:HE	2:B:1026:ARG:HA	1.80	0.46
2:A:50:ASP:OD2	2:A:50:ASP:C	2.54	0.46
2:A:304:PHE:CZ	2:A:306:VAL:HB	2.51	0.46
2:B:1211:GLN:HG3	2:B:1213:VAL:HG13	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1167:LYS:HE3	2:B:1167:LYS:HB2	1.72	0.46
1:C:923:A:H2'	1:C:924:A:C8	2.50	0.46
2:A:168:ALA:HB3	5:A:2370:HOH:O	2.14	0.46
2:B:1567:ALA:HB3	2:B:1568:PRO:CD	2.38	0.46
2:B:1202:MET:HE2	2:B:1237:SER:CB	2.45	0.46
2:A:126:TYR:CE1	2:A:127:LEU:CD2	2.98	0.46
2:A:234:VAL:HG13	2:A:531:LEU:O	2.15	0.46
2:A:76:ARG:O	2:A:92:ILE:HG13	2.15	0.46
2:A:299:LEU:HD12	2:A:318:VAL:HG11	1.97	0.46
2:B:1330:THR:O	2:B:1334:ILE:HD13	2.16	0.46
2:A:565:THR:HB	2:B:1167:LYS:CD	2.46	0.46
2:B:1492:ASN:HB2	5:B:2273:HOH:O	2.14	0.46
2:B:1300:LYS:HG2	5:B:2305:HOH:O	2.15	0.46
2:B:1166:THR:HG21	2:B:1197:PHE:CE2	2.51	0.46
2:B:1196:LEU:HD11	2:B:1451:PHE:CE1	2.50	0.46
2:B:1030:LEU:HD12	2:B:1030:LEU:N	2.30	0.46
2:A:162:THR:HB	2:A:163:PRO:HD2	1.98	0.46
2:A:498:THR:O	2:A:502:ILE:HG13	2.16	0.46
2:B:1038:MET:O	2:B:1044:ILE:HA	2.15	0.46
2:A:313:ASP:OD1	2:A:315:LYS:N	2.47	0.46
2:B:1329:LEU:HA	2:B:1333:GLN:OE1	2.15	0.46
1:C:933:U:C1'	2:A:33:LEU:HD13	2.45	0.46
2:A:324:PRO:HD2	2:A:419:LEU:HD13	1.97	0.46
2:A:206:PHE:O	5:A:2336:HOH:O	2.20	0.46
2:B:1239:MET:HE3	2:B:1243:GLN:HB3	1.97	0.46
2:A:196:LEU:HD13	2:A:516:PHE:CZ	2.50	0.46
1:C:971:G:O2'	1:C:972:A:H5'	2.16	0.46
2:B:1066:GLU:O	2:B:1105:ALA:HB2	2.16	0.45
2:B:1327:ALA:CB	2:B:1389:GLY:O	2.65	0.45
2:A:306:VAL:HG12	2:A:307:PHE:CD2	2.51	0.45
2:A:579:LEU:HB3	2:A:581:ILE:HG12	1.97	0.45
2:B:1079:ASP:O	2:B:1080:GLU:C	2.53	0.45
2:B:1336:GLU:O	2:B:1339:ASN:N	2.49	0.45
2:B:1262:VAL:CG1	2:B:1263:ASP:N	2.80	0.45
1:D:1910:G:C2	1:D:1926:G:H1'	2.51	0.45
2:B:1009:LEU:O	2:B:1010:ARG:HD2	2.16	0.45
2:B:1248:MET:CE	2:B:1248:MET:HA	2.43	0.45
2:B:1241:ALA:HB3	2:B:1242:PRO:CD	2.40	0.45
2:B:1208:ARG:NH2	2:B:1239:MET:SD	2.88	0.45
2:A:278:ARG:HB2	2:A:279:TYR:CE1	2.51	0.45
2:B:1506:ASN:O	2:B:1510:GLN:HG3	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1505:ILE:HG23	2:B:1509:GLU:CG	2.47	0.45
2:A:211:GLN:CD	2:A:213:VAL:CG1	2.82	0.45
2:B:1355:ASN:HB2	2:B:1363:GLY:O	2.17	0.45
2:A:41:ARG:HG3	2:A:42:GLU:N	2.32	0.45
2:B:1196:LEU:HD11	2:B:1451:PHE:CZ	2.52	0.45
2:B:1297:ASP:OD2	2:B:1383:ARG:NH2	2.49	0.45
1:D:1923:A:H2'	1:D:1924:A:C8	2.52	0.45
2:B:1108:LEU:HA	2:B:1109:PRO:HD3	1.67	0.45
2:A:450:PRO:HB3	2:A:503:LEU:CD1	2.47	0.45
2:A:366:SER:HA	2:A:367:PRO:HD3	1.77	0.45
2:A:323:VAL:HG22	2:A:323:VAL:O	2.16	0.45
2:B:1226:GLN:HG2	2:B:1548:ILE:HD13	1.99	0.45
2:B:1325:GLY:O	2:B:1389:GLY:O	2.34	0.44
2:A:240:THR:HB	2:A:242:PRO:HD2	1.99	0.44
2:A:207:ASP:HA	5:A:2336:HOH:O	2.16	0.44
2:A:490:ILE:HD13	2:A:495:MET:HG3	1.98	0.44
2:A:251:LEU:O	2:A:254:HIS:HB3	2.18	0.44
2:B:1026:ARG:HA	2:B:1065:ASN:HD21	1.82	0.44
2:A:333:GLN:HA	2:A:336:GLU:HG2	2.00	0.44
2:B:1439:ASP:OD2	2:B:1440:GLY:N	2.50	0.44
2:A:102:ILE:N	2:A:102:ILE:HD12	2.33	0.44
2:B:1391:MET:HG3	2:B:1392:ILE:N	2.33	0.44
2:B:1359:LYS:HB2	2:B:1363:GLY:HA3	2.00	0.44
2:B:1304:PHE:CE2	2:B:1306:VAL:HG22	2.51	0.44
2:B:1004:GLU:HG2	2:B:1009:LEU:HD21	1.98	0.44
2:A:298:LEU:HD21	2:A:379:ASP:CB	2.43	0.44
2:B:1366:SER:HB3	2:B:1369:ALA:HB2	2.00	0.44
1:D:1933:U:O2'	1:D:1934:G:OP2	2.35	0.44
2:A:326:GLY:C	2:A:391:MET:HB2	2.38	0.44
1:C:950:G:O2'	1:C:951:G:H5'	2.17	0.44
2:B:1488:VAL:HA	2:B:1529:ALA:CB	2.47	0.44
2:A:215:CYS:SG	2:A:231:GLN:HG3	2.58	0.44
2:A:424:LYS:HD2	2:A:424:LYS:HA	1.73	0.44
2:A:49:PHE:HB3	2:A:57:LEU:HD22	2.00	0.44
2:A:454:PRO:HG2	2:A:462:LEU:HD12	2.00	0.44
2:A:169:THR:HG21	2:A:195:GLN:HB3	2.00	0.44
1:C:975:C:H4'	2:A:219:GLU:HG3	2.00	0.44
2:B:1270:MET:O	2:B:1430:VAL:HA	2.18	0.44
2:B:1370:LYS:HG3	2:B:1371:PHE:N	2.32	0.44
2:A:187:PHE:N	2:A:187:PHE:CD1	2.85	0.44
2:A:199:GLN:HG2	2:A:528:HIS:CD2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1322:ARG:HD3	2:B:1322:ARG:O	2.18	0.44
2:B:1198:LYS:HD2	2:B:1235:GLU:HB2	1.99	0.44
1:C:955:PSU:H2'	1:C:957:A:OP2	2.17	0.44
2:A:286:LEU:HB2	2:A:426:ALA:HB1	1.99	0.44
2:B:1039:ARG:NH2	2:B:1066:GLU:OE1	2.51	0.44
2:B:1132:PRO:HD2	2:B:1133:GLU:OE1	2.17	0.44
2:A:567:ALA:HA	2:A:568:PRO:C	2.38	0.43
2:B:1327:ALA:HB3	2:B:1389:GLY:O	2.18	0.43
2:B:1435:MET:CE	2:B:1452:THR:O	2.66	0.43
2:A:188:TYR:CE1	2:B:1568:PRO:HG3	2.54	0.43
2:B:1521:LEU:HA	2:B:1525:THR:OG1	2.18	0.43
2:A:49:PHE:CZ	2:A:99:LEU:HD22	2.53	0.43
2:B:1283:LYS:HA	2:B:1477:VAL:HG21	2.00	0.43
2:B:1039:ARG:HB2	2:B:1044:ILE:HG12	2.01	0.43
2:B:1435:MET:HE2	2:B:1454:PRO:HG3	2.00	0.43
2:B:1435:MET:HE1	2:B:1452:THR:O	2.19	0.43
1:C:976:A:O2'	2:A:482:GLU:OE2	2.36	0.43
2:A:111:ASP:HB3	2:A:114:HIS:CD2	2.53	0.43
2:B:1127:LEU:HD12	2:B:1127:LEU:HA	1.85	0.43
2:A:174:ARG:NE	2:B:1578:GLU:OE2	2.49	0.43
1:D:1936:C:O3'	1:D:1937:1MG:H3'	2.19	0.43
2:B:1302:VAL:HG12	2:B:1304:PHE:N	2.29	0.43
2:A:5:TYR:HB3	2:A:42:GLU:HB2	1.99	0.43
1:C:921:A:O2'	1:C:922:G:C8	2.69	0.43
2:A:26:ARG:HH12	2:A:113:ASN:HD21	1.67	0.43
2:B:1026:ARG:HH21	2:B:1027:ARG:HG3	1.83	0.43
2:B:1196:LEU:HD23	2:B:1516:PHE:CZ	2.52	0.43
1:D:1934:G:O2'	2:B:1081:LYS:HE3	2.19	0.43
2:A:357:ARG:NH1	2:A:357:ARG:HG2	2.34	0.43
2:B:1262:VAL:HG12	2:B:1263:ASP:N	2.34	0.43
2:A:496:GLN:NE2	2:A:500:PHE:CE2	2.86	0.43
1:C:920:C:C2'	1:C:921:A:H5''	2.47	0.43
2:A:176:TYR:OH	2:A:227:PRO:HB2	2.18	0.43
1:C:951:G:H2'	1:C:952:G:O4'	2.19	0.42
2:B:1505:ILE:HG23	2:B:1509:GLU:HG2	2.00	0.42
2:A:297:ASP:CG	2:A:383:ARG:HH22	2.22	0.42
2:B:1165:LEU:HD23	2:B:1165:LEU:HA	1.89	0.42
2:B:1227:PRO:HG3	2:B:1556:LYS:HG3	1.99	0.42
2:A:426:ALA:N	2:A:479:ASN:HD21	2.14	0.42
2:B:1157:PHE:CD2	2:B:1208:ARG:HB3	2.54	0.42
2:A:568:PRO:HD3	2:B:1188:TYR:CZ	2.54	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:409:LEU:CD2	2:A:413:VAL:CG2	2.98	0.42
2:B:1548:ILE:O	2:B:1551:VAL:HG22	2.18	0.42
2:A:424:LYS:HG3	2:A:425:TRP:H	1.84	0.42
2:A:434:PRO:HG3	5:A:2236:HOH:O	2.18	0.42
2:A:169:THR:HG23	2:A:196:LEU:HG	2.01	0.42
2:B:1198:LYS:HB3	2:B:1209:TYR:CE2	2.53	0.42
2:A:32:SER:O	2:A:33:LEU:HD12	2.19	0.42
2:B:1211:GLN:CG	2:B:1213:VAL:HG13	2.50	0.42
1:D:1941:G:O2'	1:D:1942:C:H5'	2.20	0.42
2:B:1345:GLY:O	2:B:1401:ILE:HD13	2.19	0.42
2:B:1267:PHE:N	2:B:1267:PHE:CD2	2.87	0.42
2:A:330:THR:CG2	2:A:331:ARG:N	2.83	0.42
1:D:1904:G:H2'	1:D:1905:U:O4'	2.20	0.42
1:D:1970:G:C2'	1:D:1971:G:H5'	2.49	0.42
2:A:127:LEU:HA	2:A:130:ARG:HD3	2.01	0.42
2:A:58:LYS:HD3	2:A:58:LYS:C	2.40	0.42
2:B:1412:LYS:O	2:B:1413:VAL:C	2.58	0.42
2:A:428:LEU:HG	2:A:477:VAL:HG22	2.01	0.42
1:C:927:G:O2'	1:C:928:G:H5'	2.20	0.42
2:B:1030:LEU:N	2:B:1030:LEU:CD1	2.82	0.42
2:B:1315:LYS:HB3	2:B:1315:LYS:HE2	1.78	0.42
2:A:552:ILE:O	2:A:555:PRO:HG3	2.19	0.42
2:B:1279:TYR:CD1	2:B:1284:PRO:HB3	2.55	0.42
2:B:1567:ALA:O	2:B:1568:PRO:C	2.53	0.41
2:B:1293:THR:HG21	2:B:1383:ARG:HG2	2.02	0.41
2:B:1298:LEU:HD13	2:B:1383:ARG:HH22	1.82	0.41
2:B:1330:THR:HG23	2:B:1333:GLN:OE1	2.20	0.41
2:B:1014:VAL:HG22	2:B:1092:ILE:HD11	2.02	0.41
1:C:976:A:H4'	3:C:701:SO4:O3	2.20	0.41
2:B:1549:ARG:NH2	2:B:1558:THR:HG23	2.36	0.41
2:A:178:VAL:HB	2:A:188:TYR:HB2	2.01	0.41
2:B:1567:ALA:CB	2:B:1568:PRO:CD	2.98	0.41
2:A:564:MET:SD	2:B:1200:LEU:HD13	2.60	0.41
2:B:1298:LEU:HD21	2:B:1379:ASP:HB3	2.03	0.41
1:D:1965:G:H2'	1:D:1966:U:C6	2.55	0.41
2:A:146:SER:O	2:A:150:ARG:HG3	2.20	0.41
2:A:435:MET:HA	2:A:471:ALA:HB2	2.03	0.41
2:B:1196:LEU:O	2:B:1200:LEU:HG	2.21	0.41
2:B:1221:LEU:HD11	2:B:1227:PRO:HD3	2.02	0.41
2:A:38:MET:O	2:A:44:ILE:HA	2.20	0.41
1:D:1933:U:O2'	1:D:1934:G:P	2.79	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:1020:LEU:HB2	2:B:1038:MET:HE1	2.03	0.41
2:A:58:LYS:O	2:A:61:SER:HB2	2.20	0.41
2:A:181:ARG:HG3	2:A:578:GLU:HB2	2.02	0.41
2:A:4:GLU:HG3	5:A:2304:HOH:O	2.20	0.41
2:A:138:LEU:HD12	2:B:1206:PHE:CZ	2.55	0.41
2:A:39:ARG:HG2	2:A:40:ASP:N	2.34	0.41
3:C:701:SO4:O1	2:A:537:ARG:NH1	2.35	0.41
1:C:937:1MG:HM11	1:C:937:1MG:HN21	1.54	0.41
2:B:1360:GLY:O	2:B:1363:GLY:N	2.51	0.41
2:A:140:THR:O	2:A:144:ILE:HG13	2.21	0.41
2:A:46:GLN:HE22	2:A:78:ARG:HH11	1.69	0.41
2:B:1066:GLU:CG	2:B:1108:LEU:HD11	2.50	0.41
2:A:364:ILE:HD12	2:A:365:ASN:N	2.36	0.41
2:B:1536:ASP:HB2	5:B:2015:HOH:O	2.21	0.41
2:A:239:MET:HE2	5:A:2061:HOH:O	2.20	0.41
2:B:1020:LEU:HB2	2:B:1038:MET:CE	2.51	0.41
2:B:1173:ALA:O	2:B:1192:GLN:NE2	2.53	0.41
1:D:1926:G:O2'	1:D:1927:G:H5'	2.20	0.41
2:A:344:TYR:CD1	2:A:344:TYR:N	2.88	0.41
2:A:108:LEU:HA	2:A:109:PRO:HD3	1.69	0.41
2:A:200:LEU:HD13	2:B:1564:MET:SD	2.61	0.41
2:B:1003:THR:HG23	2:B:1019:THR:HB	2.02	0.41
2:B:1332:LYS:HD2	2:B:1335:ASP:HB2	2.02	0.41
2:A:216:PHE:CZ	2:B:1164:MET:HE2	2.56	0.41
1:C:924:A:H2'	1:C:925:U:C6	2.56	0.41
2:B:1476:MET:HE2	2:B:1483:VAL:HG23	2.02	0.41
2:A:248:MET:HA	2:A:248:MET:HE2	2.00	0.40
2:A:138:LEU:HA	2:A:138:LEU:HD23	1.82	0.40
2:A:536:ASP:HB2	5:A:2328:HOH:O	2.21	0.40
1:C:939:G:H2'	1:C:940:U:O4'	2.21	0.40
2:B:1026:ARG:HA	2:B:1065:ASN:ND2	2.35	0.40
2:A:63:LEU:HD11	2:A:99:LEU:HD21	2.02	0.40
2:B:1565:THR:O	2:B:1566:GLU:HB2	2.21	0.40
2:B:1126:TYR:CE1	2:B:1127:LEU:HD13	2.56	0.40
2:B:1430:VAL:O	2:B:1433:PHE:CE1	2.72	0.40
2:B:1306:VAL:O	2:B:1310:PRO:HD2	2.22	0.40
1:C:949:5MC:H2'	1:C:950:G:C8	2.56	0.40
1:C:949:5MC:H2'	1:C:950:G:H8	1.87	0.40
2:A:584:VAL:HG22	2:B:1580:SER:CA	2.51	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	
2	A	583/590 (99%)	539 (92%)	40 (7%)	4 (1%)	26	51
2	B	583/590 (99%)	520 (89%)	55 (9%)	8 (1%)	14	28
All	All	1166/1180 (99%)	1059 (91%)	95 (8%)	12 (1%)	19	39

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	A	41	ARG
2	A	115	VAL
2	B	1305	ALA
2	B	1326	GLY
2	B	1567	ALA
2	A	54	ALA
2	A	195	GLN
2	B	1371	PHE
2	B	1031	GLY
2	B	1450	PRO
2	B	1306	VAL
2	B	1544	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	
2	A	486/490 (99%)	453 (93%)	33 (7%)	20	39

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	486/490 (99%)	461 (95%)	25 (5%)	29	55
All	All	972/980 (99%)	914 (94%)	58 (6%)	24	47

All (58) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	2	ARG
2	A	4	GLU
2	A	41	ARG
2	A	47	VAL
2	A	52	ASP
2	A	57	LEU
2	A	62	GLU
2	A	71	VAL
2	A	72	THR
2	A	92	ILE
2	A	114	HIS
2	A	125	ARG
2	A	141	ARG
2	A	158	LEU
2	A	213	VAL
2	A	222	ARG
2	A	234	VAL
2	A	253	ARG
2	A	262	VAL
2	A	302	VAL
2	A	335	ASP
2	A	383	ARG
2	A	409	LEU
2	A	428	LEU
2	A	439	ASP
2	A	447	MET
2	A	462	LEU
2	A	477	VAL
2	A	491	HIS
2	A	509	GLU
2	A	512	GLU
2	A	525	THR
2	A	538	LEU
2	B	1011	LEU
2	B	1026	ARG
2	B	1033	LEU

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Mol	Chain	Res	Type
2	B	1052	ASP
2	B	1057	LEU
2	B	1074	THR
2	B	1080	GLU
2	B	1094	VAL
2	B	1095	LEU
2	B	1122	LEU
2	B	1125	ARG
2	B	1127	LEU
2	B	1196	LEU
2	B	1209	TYR
2	B	1213	VAL
2	B	1214	LYS
2	B	1274	GLU
2	B	1303	GLU
2	B	1323	VAL
2	B	1383	ARG
2	B	1503	LEU
2	B	1542	LEU
2	B	1545	THR
2	B	1563	LEU
2	B	1581	ILE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	13	HIS
2	A	70	GLN
2	A	113	ASN
2	A	211	GLN
2	A	226	GLN
2	A	339	ASN
2	A	468	ASN
2	A	479	ASN
2	A	491	HIS
2	B	1008	GLN
2	B	1013	HIS
2	B	1065	ASN
2	B	1082	ASN
2	B	1114	HIS
2	B	1116	ASN
2	B	1195	GLN

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Mol	Chain	Res	Type
2	B	1199	GLN
2	B	1497	GLN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
1	C	74/75 (98%)	6 (8%)	0
1	D	69/75 (92%)	6 (8%)	1 (1%)
All	All	143/150 (95%)	12 (8%)	1 (0%)

All (12) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
1	C	917	G
1	C	919	H2U
1	C	933	U
1	C	934	G
1	C	937	1MG
1	C	948	U
1	D	1917	G
1	D	1919	H2U
1	D	1920	C
1	D	1934	G
1	D	1937	1MG
1	D	1948	U

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
1	D	1933	U

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

16 non-standard protein/DNA/RNA residues are modelled in this entry.

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
1	PSU	C	913	1	13,21,22	2.07	4 (30%)	18,30,33	6.02	4 (22%)
1	H2U	C	916	1	17,21,22	0.93	1 (5%)	23,30,33	1.34	1 (4%)
1	H2U	C	919	1	17,21,22	0.67	0	23,30,33	1.34	1 (4%)
1	PSU	C	932	1	13,21,22	2.56	4 (30%)	18,30,33	5.93	3 (16%)
1	1MG	C	937	1	16,26,27	0.81	0	19,39,42	1.41	1 (5%)
1	5MC	C	949	1	13,22,23	1.08	2 (15%)	15,32,35	0.62	0
1	5MU	C	954	1	12,22,23	1.19	2 (16%)	14,32,35	4.47	3 (21%)
1	PSU	C	955	1	13,21,22	2.16	4 (30%)	18,30,33	5.96	4 (22%)
1	PSU	D	1913	1	13,21,22	2.38	3 (23%)	18,30,33	5.94	4 (22%)
1	H2U	D	1916	1	17,21,22	0.77	1 (5%)	23,30,33	1.27	2 (8%)
1	H2U	D	1919	1	17,21,22	0.75	1 (5%)	23,30,33	1.42	1 (4%)
1	PSU	D	1932	1	13,21,22	2.13	4 (30%)	18,30,33	5.90	3 (16%)
1	1MG	D	1937	1	16,26,27	0.80	1 (6%)	19,39,42	1.44	1 (5%)
1	5MC	D	1949	1	13,22,23	1.04	2 (15%)	15,32,35	0.63	0
1	5MU	D	1954	1	12,22,23	1.12	1 (8%)	14,32,35	4.39	3 (21%)
1	PSU	D	1955	1	13,21,22	2.45	3 (23%)	18,30,33	5.85	4 (22%)

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
1	PSU	C	913	1	-	0/7/25/26	0/2/2/2
1	H2U	C	916	1	-	0/7/38/39	0/2/2/2
1	H2U	C	919	1	-	0/7/38/39	0/2/2/2
1	PSU	C	932	1	-	0/7/25/26	0/2/2/2
1	1MG	C	937	1	-	0/3/25/26	0/3/3/3
1	5MC	C	949	1	-	0/3/25/26	0/2/2/2
1	5MU	C	954	1	-	0/3/25/26	0/2/2/2
1	PSU	C	955	1	-	0/7/25/26	0/2/2/2
1	PSU	D	1913	1	-	0/7/25/26	0/2/2/2
1	H2U	D	1916	1	-	0/7/38/39	0/2/2/2
1	H2U	D	1919	1	-	0/7/38/39	0/2/2/2
1	PSU	D	1932	1	-	0/7/25/26	0/2/2/2
1	1MG	D	1937	1	-	0/3/25/26	0/3/3/3
1	5MC	D	1949	1	-	0/3/25/26	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	5MU	D	1954	1	-	0/3/25/26	0/2/2/2
1	PSU	D	1955	1	-	0/7/25/26	0/2/2/2

All (33) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	932	PSU	C5-C1'	-6.72	1.46	1.52
1	D	1955	PSU	C5-C1'	-6.44	1.46	1.52
1	D	1913	PSU	C5-C1'	-5.96	1.47	1.52
1	C	955	PSU	C5-C1'	-4.96	1.47	1.52
1	D	1913	PSU	C6-N1	-4.73	1.24	1.34
1	D	1932	PSU	C6-N1	-4.71	1.24	1.34
1	D	1955	PSU	C6-N1	-4.64	1.24	1.34
1	C	913	PSU	C6-N1	-4.64	1.24	1.34
1	C	955	PSU	C6-N1	-4.61	1.24	1.34
1	C	932	PSU	C6-N1	-4.57	1.24	1.34
1	D	1932	PSU	C5-C1'	-4.54	1.48	1.52
1	C	913	PSU	C5-C1'	-4.34	1.48	1.52
1	C	932	PSU	C6-C5	-3.00	1.34	1.38
1	D	1913	PSU	C6-C5	-2.76	1.34	1.38
1	C	913	PSU	C6-C5	-2.66	1.34	1.38
1	D	1932	PSU	C6-C5	-2.65	1.34	1.38
1	D	1955	PSU	C6-C5	-2.57	1.34	1.38
1	C	955	PSU	C6-C5	-2.56	1.34	1.38
1	D	1949	5MC	C6-C5	-2.44	1.33	1.40
1	C	949	5MC	C6-C5	-2.18	1.34	1.40
1	D	1937	1MG	C8-N7	-2.00	1.30	1.34
1	D	1916	H2U	C2-N1	2.11	1.38	1.35
1	C	913	PSU	C4-N3	2.12	1.37	1.33
1	C	954	5MU	C6-N1	2.15	1.38	1.35
1	D	1949	5MC	C5-C4	2.25	1.44	1.41
1	C	932	PSU	C4-N3	2.27	1.37	1.33
1	D	1919	H2U	C2-N1	2.28	1.39	1.35
1	D	1932	PSU	C4-N3	2.28	1.37	1.33
1	C	955	PSU	C4-N3	2.33	1.37	1.33
1	C	949	5MC	C5-C4	2.72	1.45	1.41
1	D	1954	5MU	C4-N3	2.73	1.38	1.33
1	C	954	5MU	C4-N3	2.76	1.38	1.33
1	C	916	H2U	C2-N1	2.79	1.39	1.35

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	913	PSU	N1-C2-N3	-21.71	114.48	128.33
1	C	955	PSU	N1-C2-N3	-21.63	114.53	128.33
1	C	932	PSU	N1-C2-N3	-21.49	114.62	128.33
1	D	1913	PSU	N1-C2-N3	-21.41	114.67	128.33
1	D	1932	PSU	N1-C2-N3	-21.37	114.70	128.33
1	D	1955	PSU	N1-C2-N3	-21.20	114.81	128.33
1	C	954	5MU	C5-C4-N3	-8.72	115.43	125.14
1	D	1954	5MU	C5-C4-N3	-8.29	115.91	125.14
1	C	937	1MG	C5-C6-N1	-5.19	111.74	118.33
1	D	1937	1MG	C5-C6-N1	-5.18	111.76	118.33
1	D	1955	PSU	O4'-C1'-C2'	2.11	106.88	104.73
1	D	1916	H2U	C4-N3-C2	2.18	127.58	125.79
1	C	954	5MU	C5M-C5-C6	2.23	123.11	118.62
1	D	1954	5MU	C5M-C5-C6	2.40	123.44	118.62
1	C	955	PSU	O4'-C1'-C2'	2.60	107.38	104.73
1	C	913	PSU	O4'-C1'-C2'	3.15	107.94	104.73
1	D	1913	PSU	O4'-C1'-C2'	3.25	108.05	104.73
1	D	1932	PSU	C6-N1-C2	4.32	122.41	115.47
1	C	932	PSU	C6-N1-C2	4.35	122.46	115.47
1	D	1955	PSU	C6-N1-C2	4.40	122.54	115.47
1	D	1913	PSU	C6-N1-C2	4.53	122.75	115.47
1	C	955	PSU	C6-N1-C2	4.57	122.82	115.47
1	C	913	PSU	C6-N1-C2	4.63	122.91	115.47
1	D	1916	H2U	C5-C6-N1	5.29	116.42	110.70
1	C	919	H2U	C5-C6-N1	5.60	116.77	110.70
1	C	916	H2U	C5-C6-N1	5.95	117.14	110.70
1	D	1919	H2U	C5-C6-N1	6.18	117.40	110.70
1	D	1955	PSU	C4-N3-C2	11.71	125.37	115.25
1	D	1913	PSU	C4-N3-C2	11.75	125.41	115.25
1	C	955	PSU	C4-N3-C2	11.89	125.52	115.25
1	C	913	PSU	C4-N3-C2	11.95	125.58	115.25
1	C	932	PSU	C4-N3-C2	11.96	125.58	115.25
1	D	1932	PSU	C4-N3-C2	12.07	125.68	115.25
1	D	1954	5MU	C4-N3-C2	13.96	127.31	115.25
1	C	954	5MU	C4-N3-C2	14.02	127.37	115.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

8 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	916	H2U	3	0
1	C	937	1MG	1	0
1	C	949	5MC	2	0
1	C	955	PSU	1	0
1	D	1916	H2U	1	0
1	D	1919	H2U	1	0
1	D	1932	PSU	1	0
1	D	1937	1MG	1	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

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	$\# Z > 2$
4	AMO	A	831	-	23,33,33	0.79	1 (4%)	24,49,49	1.82	2 (8%)
3	SO4	B	1701	-	4,4,4	0.13	0	6,6,6	0.09	0
4	AMO	B	1831	-	23,33,33	0.74	1 (4%)	24,49,49	1.48	1 (4%)
3	SO4	C	701	-	4,4,4	0.21	0	6,6,6	0.12	0

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
4	AMO	A	831	-	-	0/15/39/39	0/3/3/3
3	SO4	B	1701	-	-	0/0/0/0	0/0/0/0
4	AMO	B	1831	-	-	0/15/39/39	0/3/3/3
3	SO4	C	701	-	-	0/0/0/0	0/0/0/0

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1831	AMO	P-O3P	2.03	1.64	1.60
4	A	831	AMO	P-O3P	2.52	1.65	1.60

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	831	AMO	O2P-P-O3P	-2.32	96.98	104.16
4	B	1831	AMO	O3P-P-O5'	6.32	119.31	102.86
4	A	831	AMO	O3P-P-O5'	8.02	123.74	102.86

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	831	AMO	1	0
4	B	1831	AMO	1	0
3	C	701	SO4	2	0

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, 95th 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	C	67/75 (89%)	0.25	3 (4%) 37 29	36, 59, 80, 99	0
1	D	62/75 (82%)	0.32	7 (11%) 7 4	39, 54, 94, 101	0
2	A	585/590 (99%)	-0.18	13 (2%) 65 59	18, 37, 66, 86	0
2	B	585/590 (99%)	-0.13	17 (2%) 55 48	20, 40, 67, 92	0
All	All	1299/1330 (97%)	-0.11	40 (3%) 52 45	18, 41, 70, 101	0

All (40) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1920	C	7.1
1	D	1972	A	6.1
1	C	976	A	4.8
1	C	920	C	4.4
1	D	1902	C	4.3
1	D	1971	G	4.1
2	B	1585	LYS	3.7
2	A	441	GLU	3.6
2	A	359	LYS	3.5
2	A	442	GLY	3.4
2	A	47	VAL	3.3
2	B	1441	GLU	3.2
1	D	1903	C	3.1
2	B	1567	ALA	2.9
2	B	1314	PRO	2.7
2	B	1331	ARG	2.6
2	B	1359	LYS	2.6
1	D	1970	G	2.5
2	B	1358	ALA	2.5
2	A	1	MET	2.5
1	D	1904	G	2.5

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Mol	Chain	Res	Type	RSRZ
2	B	1086	ASP	2.5
2	A	423	SER	2.5
2	B	1440	GLY	2.4
2	B	1058	LYS	2.4
2	A	36	ILE	2.4
2	A	358	ALA	2.4
2	A	421	ASP	2.3
2	B	1443	GLY	2.3
2	A	314	PRO	2.3
2	B	1420	THR	2.2
1	C	943	C	2.2
2	B	1347	LYS	2.1
2	B	1508	GLU	2.1
2	B	1054	ALA	2.1
2	A	468	ASN	2.1
2	A	81	LYS	2.1
2	B	1485	GLY	2.1
2	A	460	ALA	2.0
2	B	1439	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th 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	LLDF	B-factors(Å ²)	Q<0.9
1	5MC	C	949	21/22	0.87	0.22	-	50,68,87,89	0
1	5MU	D	1954	21/22	0.95	0.14	-	29,45,51,52	0
1	H2U	C	919	20/21	0.78	0.40	-	99,101,101,101	0
1	PSU	D	1955	20/21	0.94	0.14	-	37,49,56,57	0
1	PSU	C	913	20/21	0.94	0.16	-	44,52,60,60	0
1	5MC	D	1949	21/22	0.95	0.18	-	46,51,54,57	0
1	5MU	C	954	21/22	0.84	0.24	-	38,70,83,85	0
1	PSU	D	1913	20/21	0.95	0.15	-	43,56,63,64	0
1	PSU	D	1932	20/21	0.94	0.16	-	55,63,66,70	0
1	H2U	D	1916	20/21	0.95	0.22	-	59,65,69,71	0
1	H2U	D	1919	20/21	0.73	0.52	-	92,101,101,101	0
1	1MG	C	937	24/25	0.88	0.26	-	57,66,91,91	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
1	1MG	D	1937	24/25	0.85	0.28	-	58,72,100,101	0
1	PSU	C	955	20/21	0.84	0.24	-	64,76,87,89	0
1	PSU	C	932	20/21	0.90	0.16	-	50,70,76,81	0
1	H2U	C	916	20/21	0.96	0.19	-	63,67,72,73	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95th 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	LLDF	B-factors(\AA^2)	Q<0.9
4	AMO	B	1831	31/31	0.91	0.20	0.13	23,36,65,75	0
3	SO4	C	701	5/5	0.94	0.22	0.11	97,97,100,101	0
4	AMO	A	831	31/31	0.94	0.16	-0.44	16,33,64,72	0
3	SO4	B	1701	5/5	0.96	0.15	-0.70	64,68,72,72	0

6.5 Other polymers [i](#)

There are no such residues in this entry.