



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 05:35 PM UTC

PDB ID : 2BTE / pdb\_00002bte  
Title : Thermus thermophilus Leucyl-tRNA synthetase complexed with a tRNA<sup>Leu</sup> transcript in the post-editing conformation and a post-transfer editing substrate analogue  
Authors : Cusack, S.; Tukalo, M.; Yaremchuk, A.; Fukunaga, R.; Yokoyama, S.  
Deposited on : 2005-05-31  
Resolution : 2.90 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

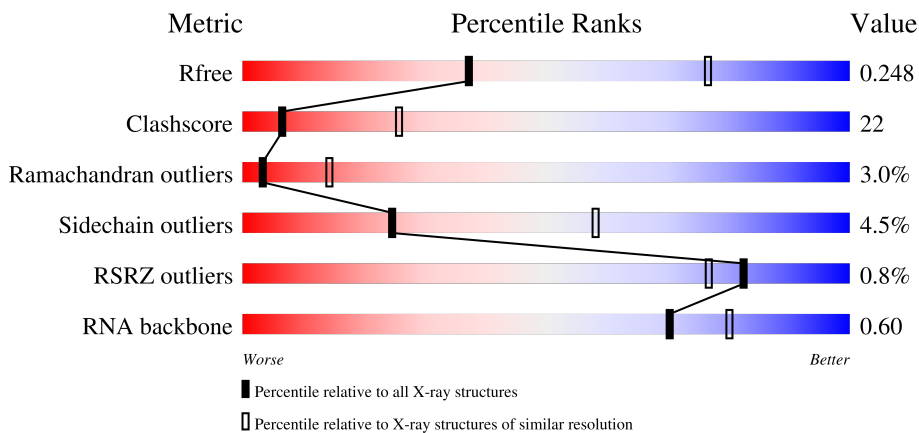
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

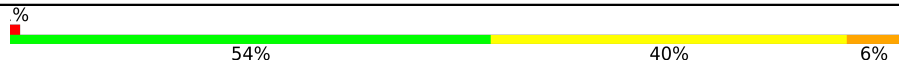
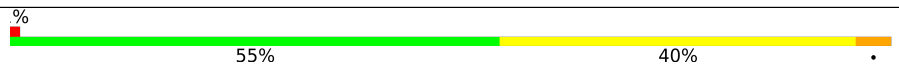
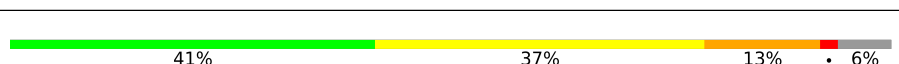
The reported resolution of this entry is 2.90 Å.

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))
$R_{free}$	180053	2481 (2.90-2.90)
Clashscore	190562	2690 (2.90-2.90)
Ramachandran outliers	187476	2623 (2.90-2.90)
Sidechain outliers	187428	2625 (2.90-2.90)
RSRZ outliers	180081	2481 (2.90-2.90)
RNA backbone	3983	1120 (3.10-2.70)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	878	 54% 40% 6%
1	D	878	 55% 40% .
2	B	83	 41% 37% 13% 6%

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Mol	Chain	Length	Quality of chain
2	E	83	 47% 37% 7% • 6%

## 2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 17815 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called AMINOACYL-TRNA SYNTHETASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	876	7122	4593	1223	1275	31	0	0	0
1	D	876	7122	4593	1223	1275	31	0	0	0

- Molecule 2 is a RNA chain called TRNALEU TRANSCRIPT WITH ANTICODON CAG.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
2	B	78	1676	745	309	544	78	0	0	0
2	E	78	1676	745	309	544	78	0	0	0

- Molecule 3 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	2	Total	Zn	0	0
			2	2		
3	D	2	Total	Zn	0	0
			2	2		

- Molecule 4 is MERCURY (II) ION (CCD ID: HG) (formula: Hg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Hg	0	0
			1	1		
4	D	1	Total	Hg	0	0
			1	1		

- Molecule 5 is SULFATE ION (CCD ID: SO4) (formula: O<sub>4</sub>S).



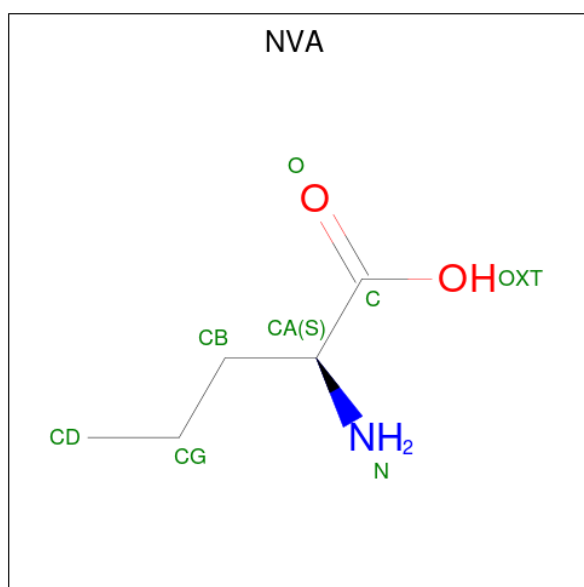
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	O	S		
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	A	1	5	4	1	0	0
5	D	1	5	4	1	0	0
5	D	1	5	4	1	0	0

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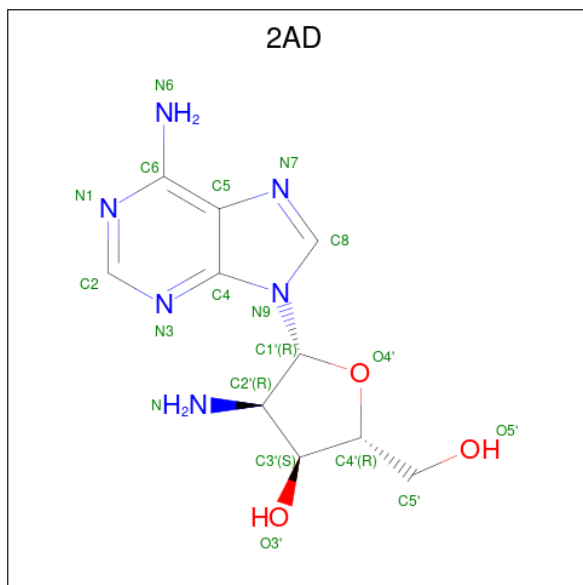
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0
5	D	1	Total O S 5 4 1	0	0

- Molecule 6 is NORVALINE (CCD ID: NVA) (formula: C<sub>5</sub>H<sub>11</sub>NO<sub>2</sub>).



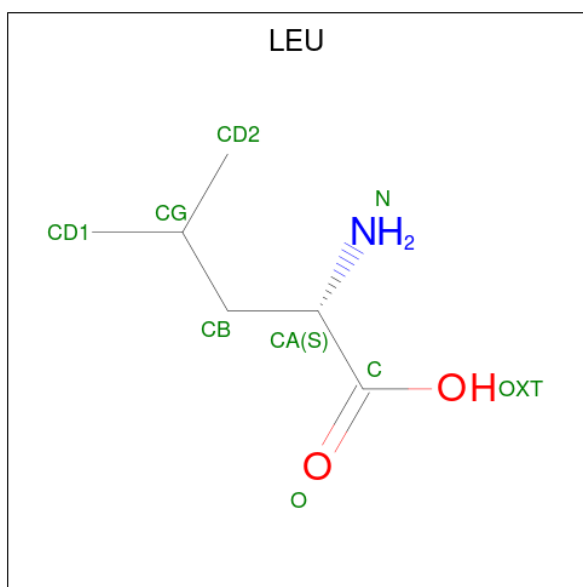
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total	C	N	O	0	0
			7	5	1	1		
6	D	1	Total	C	N	O	0	0
			7	5	1	1		

- Molecule 7 is 2'-AMINO-2'-DEOXYADENOSINE (CCD ID: 2AD) (formula: C<sub>10</sub>H<sub>14</sub>N<sub>6</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	A	1	Total	C	N	O	0	0
			19	10	6	3		
7	D	1	Total	C	N	O	0	0
			19	10	6	3		

- Molecule 8 is LEUCINE (CCD ID: LEU) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
8	A	1	Total	C	N	O	0	0
			9	6	1	2		
8	D	1	Total	C	N	O	0	0
			9	6	1	2		

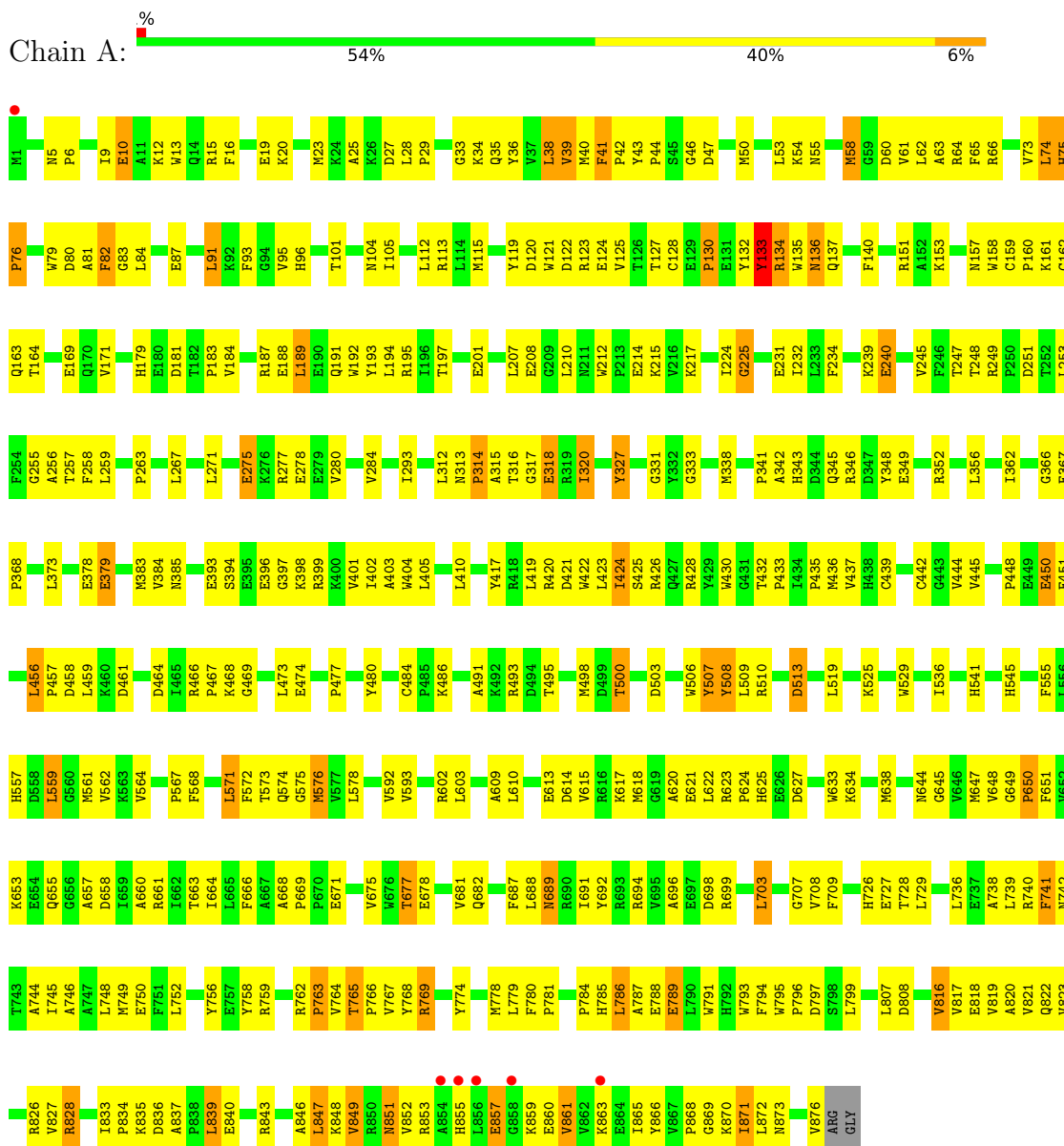
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	8	Total	O	0	0
			8	8		
9	B	5	Total	O	0	0
			5	5		
9	D	1	Total	O	0	0
			1	1		
9	E	4	Total	O	0	0
			4	4		

### 3 Residue-property plots i

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

#### • Molecule 1: AMINOACYL-TRNA SYNTHETASE



#### • Molecule 1: AMINOACYL-TRNA SYNTHETASE





CTF5  
AT6

## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	204.12Å 125.70Å 175.43Å 90.00° 120.86° 90.00°	Depositor
Resolution (Å)	24.89 – 2.90 24.89 – 2.90	Depositor EDS
% Data completeness (in resolution range)	93.6 (24.89-2.90) 93.5 (24.89-2.90)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.59 (at 2.89Å)	Xtrriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.217 , 0.253 0.218 , 0.248	Depositor DCC
$R_{free}$ test set	2369 reflections (3.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	63.0	Xtrriage
Anisotropy	0.168	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 81.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	17815	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	82.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.15% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 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: SO4, ZN, 2AD, HG, NVA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.59	0/7327	0.98	29/9945 (0.3%)
1	D	0.45	0/7327	0.86	5/9945 (0.1%)
2	B	0.49	0/1873	0.80	8/2917 (0.3%)
2	E	0.47	0/1873	0.74	3/2917 (0.1%)
All	All	0.52	0/18400	0.89	45/25724 (0.2%)

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	A	0	2
2	B	0	4
All	All	0	6

There are no bond length outliers.

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	9	G	N9-C1'-C2'	9.19	127.78	114.00
2	E	18	G	C2'-C3'-O3'	8.50	122.25	109.50
2	B	48	U	C5'-C4'-C3'	-7.96	103.26	115.20
1	A	75	HIS	CA-C-N	7.81	127.71	120.21
1	A	75	HIS	C-N-CA	7.81	127.71	120.21
1	A	752	LEU	N-CA-C	-7.59	102.70	110.97
1	A	727	GLU	N-CA-C	-7.35	103.27	111.28
2	B	18	G	C2'-C3'-O3'	7.30	120.45	109.50
1	D	424	ILE	N-CA-C	7.29	120.05	112.83
1	A	61	VAL	CB-CA-C	-7.18	102.69	111.88

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	559	LEU	N-CA-C	-7.05	104.24	112.92
1	A	134	ARG	N-CA-C	-7.01	102.69	111.11
1	A	513	ASP	CA-C-N	6.96	126.66	119.56
1	A	513	ASP	C-N-CA	6.96	126.66	119.56
1	A	42	PRO	N-CA-C	6.90	121.41	111.13
2	B	21	G	C4'-C3'-O3'	-6.82	102.78	113.00
2	E	9	G	C2'-C3'-O3'	6.81	119.72	109.50
1	A	769	ARG	N-CA-C	-6.79	103.57	110.97
1	A	81	ALA	N-CA-C	6.78	119.68	111.82
1	A	122	ASP	N-CA-C	-6.41	105.57	113.19
2	E	21	G	N9-C1'-C2'	6.38	121.57	112.00
1	A	744	ALA	N-CA-C	-5.99	104.83	111.36
1	A	136	ASN	N-CA-C	-5.92	104.17	111.33
1	A	5	ASN	CA-C-N	5.92	127.23	119.84
1	A	5	ASN	C-N-CA	5.92	127.23	119.84
1	A	225	GLY	N-CA-C	5.90	122.09	113.48
2	B	47(F)	G	C4'-C3'-O3'	-5.83	104.25	113.00
1	A	356	LEU	CA-C-N	5.83	125.76	119.76
1	A	356	LEU	C-N-CA	5.83	125.76	119.76
1	D	513	ASP	CA-C-N	5.69	125.36	119.56
1	D	513	ASP	C-N-CA	5.69	125.36	119.56
1	A	559	LEU	N-CA-C	-5.66	106.33	113.18
2	B	76	A	C4'-C3'-O3'	5.60	121.40	113.00
1	A	624	PRO	N-CA-C	-5.59	102.35	111.68
1	A	835	LYS	N-CA-C	-5.49	106.54	113.18
1	A	741	PHE	N-CA-C	5.45	118.04	111.40
1	D	136	ASN	N-CA-C	-5.41	105.55	111.82
1	A	795	TRP	CA-C-N	5.31	126.48	119.84
1	A	795	TRP	C-N-CA	5.31	126.48	119.84
1	A	677	THR	N-CA-C	5.22	117.12	109.24
2	B	9	G	O4'-C1'-C2'	5.20	111.00	105.80
2	B	9	G	C2'-C3'-O3'	5.09	117.13	109.50
1	A	53	LEU	N-CA-C	5.06	118.71	112.54
1	A	424	ILE	N-CA-C	5.01	120.63	113.16
1	A	445	VAL	N-CA-C	5.01	113.57	107.61

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	133	TYR	Sidechain
1	A	507	TYR	Sidechain

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Mol	Chain	Res	Type	Group
2	B	14	A	Sidechain
2	B	21	G	Sidechain
2	B	24	G	Sidechain
2	B	47(D)	G	Sidechain

## 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	7122	0	7031	354	0
1	D	7122	0	7031	312	0
2	B	1676	0	849	34	0
2	E	1676	0	849	40	0
3	A	2	0	0	0	0
3	D	2	0	0	0	0
4	A	1	0	0	0	0
4	D	1	0	0	0	0
5	A	60	0	0	0	0
5	D	65	0	0	0	0
6	A	7	0	10	2	0
6	D	7	0	10	0	0
7	A	19	0	12	3	0
7	D	19	0	12	1	0
8	A	9	0	10	0	0
8	D	9	0	10	1	0
9	A	8	0	0	1	0
9	B	5	0	0	2	0
9	D	1	0	0	0	0
9	E	4	0	0	0	0
All	All	17815	0	15824	732	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 22.

All (732) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:826:ARG:HB2	1:D:828:ARG:HH21	1.12	1.08
1:D:826:ARG:HB2	1:D:828:ARG:NH2	1.80	0.96
1:D:851:ASN:HD22	1:D:853:ARG:HG3	1.30	0.94
1:D:62:LEU:HD11	1:D:739:LEU:HD11	1.47	0.93
1:A:839:LEU:HD12	1:A:839:LEU:H	1.33	0.92
1:A:687:PHE:O	1:A:691:ILE:HG13	1.72	0.89
1:A:821:VAL:HG13	1:A:872:LEU:HD23	1.56	0.88
1:D:58:MET:HE1	1:D:670:PRO:HB3	1.57	0.87
1:D:870:LYS:O	1:D:871:ILE:HD12	1.75	0.87
1:A:688:LEU:HA	1:A:691:ILE:HD12	1.57	0.86
1:D:256:ALA:HB2	1:D:338:MET:HE3	1.56	0.86
1:D:852:VAL:HG12	1:D:855:HIS:HB2	1.57	0.86
1:D:679:GLU:HA	1:D:682:GLN:HE21	1.40	0.86
1:D:649:GLY:O	1:D:653:LYS:HG2	1.74	0.86
1:A:183:PRO:HB3	1:A:293:ILE:HD12	1.60	0.83
1:A:115:MET:HE2	1:A:648:VAL:HG13	1.61	0.82
1:D:34:LYS:HD2	1:D:34:LYS:C	2.04	0.82
1:A:647:MET:HE2	1:A:647:MET:H	1.46	0.80
1:D:277:ARG:HH11	1:D:277:ARG:HB2	1.45	0.80
1:D:581:THR:HG21	1:D:642:LYS:HD2	1.62	0.79
1:D:450:GLU:H	1:D:450:GLU:CD	1.91	0.79
1:D:824:ASN:HD21	1:D:876:VAL:HB	1.46	0.79
2:B:47(C):A:H5'	2:B:47(D):G:OP2	1.84	0.78
1:D:39:VAL:HG12	1:D:536:ILE:HB	1.65	0.78
1:A:726:HIS:HD2	1:A:808:ASP:H	1.28	0.78
1:A:823:VAL:HG23	1:A:828:ARG:HG3	1.65	0.77
1:D:189:LEU:HD22	1:D:191:GLN:HE21	1.49	0.77
1:D:224:ILE:HA	1:D:419:LEU:HB2	1.67	0.77
2:E:14:A:H1'	2:E:22:A:N7	2.01	0.76
1:A:331:GLY:HA3	1:A:420:ARG:HH22	1.50	0.76
1:A:726:HIS:CD2	1:A:808:ASP:H	2.03	0.76
1:D:83:GLY:HA3	1:D:500:THR:HB	1.67	0.75
1:A:823:VAL:HB	1:A:828:ARG:HD2	1.67	0.75
1:A:248:THR:HG23	7:A:1893:2AD:H5'1	1.67	0.75
1:A:82:PHE:CD2	1:A:128:CYS:HA	2.22	0.74
1:A:256:ALA:HB2	1:A:338:MET:HE3	1.69	0.74
1:D:189:LEU:HD23	1:D:190:GLU:H	1.53	0.74
1:D:687:PHE:CE1	1:D:749:MET:HG2	2.23	0.74
1:A:817:VAL:CG1	1:A:870:LYS:HE2	2.19	0.73
1:A:439:CYS:HB2	1:A:484:CYS:HB2	1.70	0.73
1:D:647:MET:HB3	1:D:650:PRO:HD2	1.69	0.73
1:A:774:TYR:O	1:A:778:MET:HG3	1.89	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:474:GLU:OE2	1:A:495:THR:HG21	1.88	0.72
2:E:7:G:H3'	2:E:8:U:H5'	1.69	0.72
1:D:863:LYS:HE2	1:D:865:ILE:HD11	1.72	0.72
1:A:780:PHE:HB3	1:A:781:PRO:HD3	1.69	0.72
1:A:765:THR:OG1	1:A:767:VAL:HG12	1.91	0.71
1:D:728:THR:HG22	1:D:778:MET:HE1	1.70	0.71
2:E:18:G:N2	2:E:57:A:H2'	2.05	0.71
1:A:822:GLN:HB3	1:A:827:VAL:HA	1.71	0.71
7:D:1895:2AD:H5'1	2:E:74:C:H5''	1.72	0.71
1:A:240:GLU:CD	1:A:240:GLU:H	1.99	0.71
1:A:457:PRO:HG2	1:A:473:LEU:HD22	1.72	0.71
1:A:819:VAL:HG22	1:A:870:LYS:HA	1.70	0.71
1:A:852:VAL:HG12	1:A:855:HIS:HB2	1.72	0.70
1:D:700:GLU:HA	1:D:703:LEU:HD12	1.73	0.70
1:A:187:ARG:HG3	1:A:187:ARG:HH11	1.55	0.70
1:D:406:GLU:HG2	1:D:412:LYS:HA	1.72	0.70
1:A:677:THR:O	1:A:681:VAL:HG23	1.92	0.70
1:A:823:VAL:CG2	1:A:828:ARG:HG3	2.21	0.70
1:A:450:GLU:CD	1:A:450:GLU:H	1.98	0.69
1:D:823:VAL:CG2	1:D:828:ARG:HD2	2.22	0.69
1:D:537:GLY:O	1:D:573:THR:HA	1.93	0.69
2:E:66:C:H2'	2:E:67:C:H6	1.57	0.69
1:A:817:VAL:HG12	1:A:818:GLU:H	1.58	0.69
1:D:851:ASN:HD22	1:D:853:ARG:CG	2.05	0.69
1:A:647:MET:HB3	1:A:650:PRO:HD2	1.75	0.68
1:A:189:LEU:HD22	1:A:191:GLN:NE2	2.08	0.68
1:A:609:ALA:O	1:A:610:LEU:HD23	1.92	0.68
1:D:251:ASP:O	1:D:383:MET:HE3	1.92	0.68
1:A:823:VAL:HB	1:A:828:ARG:CD	2.24	0.68
1:D:392:THR:HG22	1:D:393:GLU:H	1.58	0.67
1:A:658:ASP:OD2	1:A:785:HIS:HB2	1.94	0.67
1:A:456:LEU:HD23	1:A:457:PRO:HD2	1.77	0.67
1:D:849:VAL:HG23	1:D:852:VAL:HA	1.75	0.67
1:A:253:LEU:HA	1:A:338:MET:HE1	1.77	0.67
1:A:846:ALA:O	1:A:849:VAL:HG13	1.94	0.67
1:A:870:LYS:O	1:A:871:ILE:HD12	1.95	0.67
1:D:709:PHE:CE2	1:D:714:LEU:HD11	2.30	0.67
1:D:530:MET:HE3	1:D:531:PRO:HA	1.77	0.67
1:D:860:GLU:HB2	1:D:876:VAL:HG13	1.77	0.67
1:A:819:VAL:HG13	1:A:870:LYS:C	2.20	0.66
1:D:338:MET:HG3	1:D:338:MET:O	1.94	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:851:ASN:ND2	1:D:853:ARG:HG3	2.08	0.66
1:D:823:VAL:HG23	1:D:828:ARG:HD2	1.78	0.66
1:A:249:ARG:HG3	6:A:1892:NVA:HD1	1.78	0.66
1:D:55:ASN:ND2	1:D:574:GLN:HG3	2.10	0.66
1:A:41:PHE:O	1:A:41:PHE:HD1	1.79	0.66
1:A:194:LEU:HD11	1:A:424:ILE:HD13	1.78	0.65
1:A:331:GLY:HA3	1:A:420:ARG:NH2	2.10	0.65
1:D:851:ASN:HB2	1:D:853:ARG:HG3	1.78	0.65
1:D:9:ILE:O	1:D:12:LYS:HB3	1.97	0.65
1:A:75:HIS:NE2	9:A:2003:HOH:O	2.26	0.65
1:D:861:VAL:HA	1:D:876:VAL:HA	1.79	0.65
2:E:66:C:H2'	2:E:67:C:C6	2.32	0.65
1:A:192:TRP:HB2	1:A:425:SER:HB3	1.79	0.65
1:D:816:VAL:HA	1:D:834:PRO:HA	1.79	0.65
1:A:507:TYR:O	1:A:510:ARG:N	2.30	0.64
1:A:572:PHE:CD1	1:A:573:THR:N	2.65	0.64
1:A:839:LEU:HD12	1:A:839:LEU:N	2.08	0.64
1:A:823:VAL:CB	1:A:828:ARG:HG3	2.28	0.64
1:A:466:ARG:HD3	1:A:468:LYS:NZ	2.13	0.64
1:A:162:CYS:HB3	1:A:164:THR:HG22	1.80	0.63
1:D:523:PRO:O	1:D:527:ASN:ND2	2.31	0.63
1:A:649:GLY:O	1:A:653:LYS:HG2	1.99	0.63
1:A:728:THR:HG22	1:A:778:MET:HE1	1.80	0.63
1:D:752:LEU:HA	1:D:755:LEU:HD12	1.79	0.63
1:D:105:ILE:O	1:D:109:LYS:HB2	1.99	0.63
1:D:814:LYS:O	1:D:835:LYS:HE3	1.98	0.63
1:A:750:GLU:OE1	2:B:23:C:H5'	1.99	0.63
1:D:162:CYS:SG	1:D:179:HIS:HE1	2.21	0.63
1:D:660:ALA:O	1:D:664:ILE:HG13	1.99	0.63
1:A:82:PHE:HE2	1:A:133:TYR:CD1	2.17	0.63
1:D:195:ARG:HA	1:D:421:ASP:OD1	1.99	0.63
1:A:623:ARG:HD2	1:A:633:TRP:CD1	2.34	0.62
1:A:647:MET:HE2	1:A:647:MET:N	2.14	0.62
1:D:574:GLN:HE21	1:D:574:GLN:HA	1.65	0.62
1:D:588:VAL:HG22	1:D:593:VAL:HG13	1.81	0.62
1:D:869:GLY:C	1:D:870:LYS:HD3	2.24	0.62
1:A:83:GLY:HA3	1:A:500:THR:HB	1.82	0.62
1:A:833:ILE:HD13	1:A:837:ALA:HB3	1.81	0.62
1:A:54:LYS:HG2	1:A:58:MET:HE3	1.82	0.62
1:A:38:LEU:HD12	1:A:39:VAL:N	2.15	0.62
1:A:576:MET:HA	1:A:576:MET:HE2	1.81	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:263:PRO:HD3	1:D:325:ALA:O	2.01	0.61
2:E:20:U:O2'	2:E:20(A):A:H5'	2.00	0.61
1:D:833:ILE:HD13	1:D:837:ALA:HB3	1.81	0.61
1:A:29:PRO:HG3	1:A:529:TRP:CZ2	2.34	0.61
1:D:23:MET:CE	1:D:63:ALA:HB1	2.30	0.61
1:D:709:PHE:HE2	1:D:714:LEU:HD11	1.63	0.61
1:A:157:ASN:HB3	1:A:184:VAL:HG11	1.82	0.61
1:A:169:GLU:OE1	1:A:169:GLU:N	2.32	0.61
1:A:423:LEU:HD23	1:A:423:LEU:C	2.26	0.61
1:A:745:ILE:HG22	1:A:749:MET:HE3	1.81	0.61
1:D:759:ARG:HD3	1:D:768:TYR:CE1	2.36	0.61
1:D:728:THR:CG2	1:D:778:MET:HE1	2.30	0.61
1:D:456:LEU:HD23	1:D:457:PRO:HD2	1.83	0.60
1:D:394:SER:O	1:D:398:LYS:HG3	2.00	0.60
1:A:41:PHE:CE1	1:A:80:ASP:HB2	2.37	0.60
1:A:668:ALA:HB1	1:A:669:PRO:CD	2.31	0.60
2:E:47(C):A:H5'	2:E:47(D):G:OP2	2.01	0.60
1:D:28:LEU:HD21	1:D:525:LYS:HG2	1.81	0.60
1:D:136:ASN:HD21	1:D:506:TRP:HE1	1.49	0.60
1:D:55:ASN:HD21	1:D:574:GLN:HB2	1.66	0.60
1:A:40:MET:HE2	1:A:545:HIS:HD2	1.67	0.60
1:A:263:PRO:O	1:A:284:VAL:HG13	2.02	0.60
1:D:668:ALA:HB1	1:D:669:PRO:CD	2.32	0.59
1:A:255:GLY:O	1:A:257:THR:HG23	2.01	0.59
1:D:678:GLU:O	1:D:682:GLN:HG3	2.02	0.59
1:D:780:PHE:HB3	1:D:781:PRO:HD3	1.84	0.59
1:A:484:CYS:SG	1:A:486:LYS:HB3	2.42	0.59
1:D:277:ARG:HB2	1:D:277:ARG:NH1	2.16	0.59
1:A:610:LEU:HD13	1:A:618:MET:HE1	1.85	0.59
2:E:50:C:H2'	2:E:51:G:H8	1.67	0.59
2:E:65:C:O2'	2:E:66:C:H5'	2.02	0.59
1:A:43:TYR:CE1	1:A:80:ASP:OD2	2.56	0.59
1:A:707:GLY:N	1:A:769:ARG:HD3	2.17	0.59
1:D:694:ARG:HD2	1:D:756:TYR:CE1	2.38	0.59
2:E:14:A:H1'	2:E:22:A:C5	2.37	0.59
1:A:764:VAL:HG12	1:A:764:VAL:O	2.03	0.58
1:D:82:PHE:CD2	1:D:128:CYS:HA	2.37	0.58
1:D:668:ALA:HB1	1:D:669:PRO:HD2	1.85	0.58
1:D:816:VAL:HG22	1:D:834:PRO:HG3	1.84	0.58
1:A:9:ILE:HG21	1:A:789:GLU:HG2	1.85	0.58
1:A:863:LYS:HE2	1:A:865:ILE:HD11	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:817:VAL:HG11	1:A:870:LYS:HE2	1.84	0.58
2:E:42:U:H2'	2:E:43:G:H8	1.69	0.58
1:A:663:THR:O	1:A:663:THR:HG22	2.03	0.58
2:B:47(D):G:O2'	2:B:47(E):C:H5'	2.03	0.58
1:A:816:VAL:H	1:A:834:PRO:HA	1.69	0.58
1:D:870:LYS:C	1:D:871:ILE:HD12	2.29	0.58
1:A:466:ARG:HH11	1:A:468:LYS:HZ1	1.51	0.58
1:D:664:ILE:HA	1:D:674:MET:HE1	1.85	0.58
1:D:511:TYR:O	1:D:514:PRO:HD3	2.02	0.57
1:A:694:ARG:HH21	1:A:698:ASP:CG	2.12	0.57
2:E:7:G:H3'	2:E:8:U:C5'	2.33	0.57
1:A:79:TRP:CE2	1:A:105:ILE:HG23	2.39	0.57
1:A:817:VAL:HG12	1:A:870:LYS:HE2	1.87	0.57
1:A:826:ARG:HD3	1:A:828:ARG:HH21	1.69	0.57
1:D:51:GLY:HA2	1:D:577:VAL:HB	1.85	0.57
1:D:823:VAL:HB	1:D:828:ARG:CZ	2.33	0.57
1:A:46:GLY:N	1:A:104:ASN:HD21	2.03	0.57
1:A:651:PHE:CZ	1:A:655:GLN:HG3	2.40	0.57
1:A:93:PHE:O	1:A:95:VAL:HG23	2.04	0.57
1:A:426:ARG:HH11	1:A:426:ARG:HG2	1.69	0.57
1:A:826:ARG:HD3	1:A:828:ARG:NH2	2.20	0.57
1:D:327:TYR:CE1	1:D:346:ARG:HD3	2.40	0.57
1:A:195:ARG:HA	1:A:421:ASP:OD1	2.06	0.56
1:A:437:VAL:HG12	1:A:491:ALA:HB1	1.86	0.56
1:D:172:VAL:HG12	1:D:173:GLU:HG3	1.88	0.56
1:A:112:LEU:HD13	1:A:119:TYR:HE2	1.70	0.56
1:A:258:PHE:HA	1:A:320:ILE:HB	1.86	0.56
1:A:338:MET:O	1:A:338:MET:HG3	2.05	0.56
1:D:58:MET:HE1	1:D:670:PRO:CB	2.33	0.56
1:D:847:LEU:O	1:D:852:VAL:HG13	2.06	0.56
1:A:187:ARG:HG3	1:A:187:ARG:NH1	2.21	0.56
1:A:541:HIS:HB3	1:A:545:HIS:HB3	1.86	0.56
1:A:748:LEU:HD21	1:A:778:MET:HE3	1.88	0.56
1:A:823:VAL:HB	1:A:828:ARG:HG3	1.88	0.56
1:D:29:PRO:HD2	1:D:528:ALA:HB1	1.87	0.56
1:A:54:LYS:O	1:A:58:MET:HG3	2.06	0.56
1:D:215:LYS:HE2	1:D:539:VAL:HG11	1.87	0.56
1:D:232:ILE:HG12	1:D:405:LEU:HD13	1.87	0.56
1:D:327:TYR:CD1	1:D:327:TYR:C	2.84	0.56
1:A:726:HIS:CD2	1:A:808:ASP:N	2.74	0.55
1:A:74:LEU:CD1	1:A:76:PRO:HD3	2.35	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:669:PRO:HA	1:A:742:ASN:ND2	2.21	0.55
1:A:707:GLY:CA	1:A:769:ARG:HD3	2.36	0.55
1:A:726:HIS:HD2	1:A:808:ASP:N	2.02	0.55
1:A:823:VAL:H	1:A:828:ARG:CG	2.19	0.55
1:D:96:HIS:HB3	1:D:99:ASP:OD2	2.06	0.55
1:D:290:LYS:HE3	1:D:298:GLU:OE2	2.06	0.55
1:A:657:ALA:O	1:A:660:ALA:N	2.39	0.55
1:A:153:LYS:HG2	1:A:188:GLU:OE2	2.05	0.55
1:A:843:ARG:O	1:A:847:LEU:HG	2.07	0.55
1:A:866:TYR:O	1:A:868:PRO:HD3	2.06	0.55
1:A:121:TRP:C	1:A:123:ARG:H	2.14	0.55
1:A:506:TRP:O	1:A:509:LEU:HB2	2.07	0.55
1:D:245:VAL:HA	1:D:334:THR:OG1	2.07	0.55
1:D:187:ARG:HG3	1:D:187:ARG:HH11	1.71	0.55
1:D:331:GLY:HA3	1:D:420:ARG:NH2	2.22	0.55
2:E:53:G:O2'	2:E:54:U:H5'	2.07	0.55
1:D:586:VAL:HG22	1:D:630:LEU:O	2.07	0.55
1:A:493:ARG:HG2	1:A:493:ARG:HH11	1.72	0.55
2:E:61:C:O2'	2:E:62:C:H5'	2.07	0.54
1:A:34:LYS:HD2	1:A:34:LYS:C	2.32	0.54
1:A:239:LYS:HD2	1:A:239:LYS:N	2.22	0.54
1:A:615:VAL:HA	1:A:618:MET:HE3	1.89	0.54
1:D:225:GLY:HA2	2:E:73:A:N3	2.23	0.54
1:A:234:PHE:CE2	1:A:259:LEU:HD21	2.42	0.54
1:A:275:GLU:H	1:A:275:GLU:CD	2.13	0.54
1:D:852:VAL:HG12	1:D:855:HIS:CB	2.35	0.54
1:A:248:THR:CG2	7:A:1893:2AD:H5'1	2.36	0.54
1:A:823:VAL:HB	1:A:828:ARG:CG	2.37	0.54
2:B:42:U:O2'	2:B:43:G:H5'	2.08	0.54
1:D:370:PRO:O	1:D:373:LEU:HD12	2.06	0.54
1:A:694:ARG:HD2	1:A:756:TYR:CE1	2.42	0.54
1:D:820:ALA:HA	1:D:830:THR:HG22	1.89	0.54
1:D:658:ASP:OD2	1:D:785:HIS:HB2	2.08	0.54
1:A:251:ASP:O	1:A:383:MET:HE3	2.08	0.54
1:D:136:ASN:OD1	1:D:503:ASP:HB3	2.08	0.53
1:A:43:TYR:HE1	1:A:80:ASP:OD2	1.90	0.53
2:B:38:A:O2'	2:B:39:U:H5'	2.07	0.53
2:B:47(A):C:H2'	2:B:47(B):A:O4'	2.08	0.53
1:D:772:ILE:O	1:D:776:LEU:HG	2.08	0.53
1:D:870:LYS:HD3	1:D:870:LYS:N	2.21	0.53
1:A:423:LEU:C	1:A:423:LEU:CD2	2.81	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:398:LYS:O	1:D:402:ILE:HG13	2.08	0.53
1:D:501:PHE:CE2	1:D:544:LEU:HD22	2.43	0.53
1:D:574:GLN:HA	1:D:574:GLN:NE2	2.22	0.53
2:E:65:C:H2'	2:E:66:C:H6	1.74	0.53
1:A:610:LEU:HD13	1:A:618:MET:CE	2.39	0.53
1:D:55:ASN:HD21	1:D:574:GLN:CB	2.22	0.53
1:A:396:GLU:HA	1:A:399:ARG:HE	1.73	0.53
1:D:84:LEU:HB2	1:D:85:PRO:HD3	1.89	0.53
1:A:50:MET:HE1	1:A:115:MET:HE1	1.91	0.53
2:B:1:G:H2'	2:B:2:C:C6	2.44	0.53
2:B:18:G:N2	2:B:57:A:H2'	2.24	0.53
1:D:380:PRO:HB3	1:D:394:SER:HB2	1.91	0.53
1:D:845:GLU:HA	1:D:848:LYS:HE3	1.90	0.53
1:D:863:LYS:HB3	1:D:875:VAL:HB	1.89	0.53
1:A:267:LEU:HB3	1:A:271:LEU:HD12	1.90	0.53
1:A:568:PHE:CD1	1:A:568:PHE:N	2.74	0.53
1:D:177:TRP:CD1	1:D:177:TRP:H	2.25	0.53
1:A:623:ARG:HD2	1:A:633:TRP:NE1	2.23	0.53
1:A:671:GLU:CD	1:A:671:GLU:H	2.17	0.53
1:D:396:GLU:HG2	1:D:400:LYS:HE3	1.91	0.53
1:A:458:ASP:C	1:A:459:LEU:HD12	2.34	0.53
1:A:833:ILE:HD12	1:A:834:PRO:O	2.09	0.53
1:D:65:PHE:CG	1:D:736:LEU:HD13	2.44	0.53
1:D:841:VAL:O	1:D:845:GLU:HB2	2.08	0.53
1:D:866:TYR:O	1:D:868:PRO:HD3	2.09	0.52
2:B:1:G:H2'	2:B:2:C:H6	1.74	0.52
1:D:136:ASN:ND2	1:D:506:TRP:HE1	2.07	0.52
1:D:863:LYS:HE2	1:D:865:ILE:CD1	2.39	0.52
1:A:64:ARG:HH11	1:A:64:ARG:HG2	1.73	0.52
1:A:15:ARG:HB3	1:A:19:GLU:OE2	2.10	0.52
1:A:852:VAL:HG12	1:A:855:HIS:CB	2.38	0.52
2:E:50:C:H2'	2:E:51:G:C8	2.45	0.52
1:A:696:ALA:HA	1:A:793:TRP:HZ3	1.75	0.52
1:A:793:TRP:HB2	1:A:794:PHE:CE2	2.44	0.52
2:E:18:G:H5'	2:E:18:G:H8	1.74	0.52
1:A:745:ILE:CG2	1:A:749:MET:HE3	2.40	0.52
1:A:780:PHE:CD1	1:A:784:PRO:HA	2.45	0.52
1:D:43:TYR:O	1:D:45:SER:N	2.43	0.52
1:D:583:PHE:HE2	1:D:634:LYS:HB3	1.75	0.52
1:A:436:MET:HE3	1:A:444:VAL:HG12	1.91	0.52
1:D:352:ARG:HG3	1:D:352:ARG:HH11	1.75	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:666:PHE:HE1	1:A:746:ALA:HB2	1.75	0.52
1:A:851:ASN:CG	1:A:853:ARG:HB2	2.35	0.52
1:A:13:TRP:CE3	1:A:788:GLU:HG2	2.45	0.51
1:D:226:ARG:HH11	1:D:226:ARG:HG3	1.75	0.51
1:D:277:ARG:HD2	1:D:281:LEU:CD1	2.40	0.51
1:A:133:TYR:HB2	1:A:432:THR:HG23	1.91	0.51
1:A:823:VAL:H	1:A:828:ARG:HG2	1.74	0.51
1:D:715:GLU:HA	1:D:719:ARG:HB2	1.91	0.51
2:E:18:G:H21	2:E:57:A:H2'	1.73	0.51
1:A:137:GLN:NE2	1:A:433:PRO:O	2.37	0.51
1:A:442:CYS:SG	1:A:486:LYS:HD3	2.51	0.51
1:D:133:TYR:O	1:D:137:GLN:HG3	2.10	0.51
1:D:594:ARG:HA	1:D:609:ALA:HA	1.91	0.51
1:D:162:CYS:HB3	1:D:164:THR:HG22	1.90	0.51
1:A:40:MET:HE2	1:A:545:HIS:CD2	2.43	0.51
1:A:121:TRP:C	1:A:123:ARG:N	2.68	0.51
1:A:341:PRO:HB3	1:A:348:TYR:HA	1.92	0.51
1:A:745:ILE:O	1:A:748:LEU:N	2.37	0.51
2:B:7:G:H3'	2:B:8:U:H5'	1.91	0.51
1:A:25:ALA:N	1:A:120:ASP:OD2	2.42	0.51
1:A:46:GLY:H	1:A:104:ASN:HD21	1.59	0.51
1:D:706:SER:O	1:D:766:PRO:HB3	2.11	0.51
2:B:47(D):G:C2'	2:B:47(E):C:H5'	2.41	0.51
1:D:687:PHE:CD1	1:D:749:MET:HG2	2.46	0.51
1:A:327:TYR:CE1	1:A:346:ARG:HD3	2.46	0.50
1:A:557:HIS:HD2	1:A:562:VAL:O	1.94	0.50
1:A:625:HIS:ND1	1:A:627:ASP:OD2	2.44	0.50
1:D:366:GLY:O	1:D:368:PRO:HD3	2.11	0.50
1:D:369:LEU:HD11	1:D:377:TYR:CD2	2.46	0.50
1:A:267:LEU:HB3	1:A:271:LEU:CD1	2.41	0.50
1:A:466:ARG:HD3	1:A:468:LYS:HZ1	1.76	0.50
1:D:133:TYR:HB2	1:D:432:THR:HG23	1.94	0.50
1:D:219:MET:HE3	2:E:71:G:H5''	1.93	0.50
1:A:638:MET:HA	1:A:644:ASN:OD1	2.11	0.50
1:D:823:VAL:C	1:D:825:GLY:H	2.20	0.50
1:D:16:PHE:HA	1:D:19:GLU:OE1	2.11	0.50
1:D:34:LYS:HD2	1:D:34:LYS:O	2.11	0.50
1:D:96:HIS:CD2	1:D:98:LYS:HB3	2.47	0.50
1:D:140:PHE:HE2	1:D:424:ILE:HD11	1.76	0.50
1:D:277:ARG:HH11	1:D:277:ARG:CB	2.19	0.50
1:D:647:MET:HB3	1:D:650:PRO:CD	2.40	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:9:ILE:CG2	1:A:789:GLU:OE1	2.59	0.50
1:A:50:MET:HE1	1:A:115:MET:CE	2.41	0.50
1:A:280:VAL:O	1:A:284:VAL:HG23	2.12	0.50
1:A:826:ARG:CD	1:A:828:ARG:HH21	2.24	0.50
1:D:816:VAL:CA	1:D:834:PRO:HA	2.40	0.50
1:A:9:ILE:HG22	1:A:789:GLU:OE1	2.11	0.50
1:A:55:ASN:HD22	1:A:55:ASN:N	2.10	0.50
1:D:50:MET:CE	1:D:648:VAL:HG22	2.42	0.50
1:D:312:LEU:HD12	1:D:317:GLY:O	2.12	0.50
1:D:312:LEU:HD11	1:D:319:ARG:HG3	1.93	0.50
1:D:388:PRO:HG2	1:D:389:PHE:CD2	2.47	0.50
1:D:679:GLU:HA	1:D:682:GLN:NE2	2.20	0.50
1:A:312:LEU:HD12	1:A:317:GLY:O	2.11	0.49
1:A:823:VAL:HG11	1:A:857:GLU:HB3	1.93	0.49
1:D:414:ARG:HH21	1:D:416:THR:CG2	2.25	0.49
1:D:597:GLU:HB2	1:D:598:PRO:HD3	1.94	0.49
1:D:723:GLY:O	1:D:727:GLU:HB2	2.12	0.49
1:D:819:VAL:HG13	1:D:870:LYS:C	2.37	0.49
1:D:867:VAL:HG12	1:D:867:VAL:O	2.12	0.49
1:D:588:VAL:HG13	1:D:593:VAL:HG22	1.94	0.49
1:D:671:GLU:HG2	1:D:672:ASN:N	2.28	0.49
2:E:8:U:H1'	2:E:48:U:H1'	1.94	0.49
1:A:189:LEU:HD22	1:A:191:GLN:HE21	1.75	0.49
1:A:197:THR:HG23	1:A:421:ASP:OD1	2.12	0.49
1:A:240:GLU:CD	1:A:240:GLU:N	2.68	0.49
1:A:507:TYR:O	1:A:508:TYR:C	2.54	0.49
1:A:477:PRO:HG3	1:A:480:TYR:OH	2.12	0.49
1:D:54:LYS:O	1:D:58:MET:HG3	2.12	0.49
1:A:397:GLY:O	1:A:401:VAL:HG23	2.11	0.49
1:A:610:LEU:CD1	1:A:618:MET:HE1	2.43	0.49
1:A:668:ALA:HB1	1:A:669:PRO:HD3	1.94	0.49
1:D:659:ILE:HD12	1:D:659:ILE:N	2.27	0.49
1:A:136:ASN:ND2	1:A:506:TRP:HE1	2.10	0.49
1:A:699:ARG:O	1:A:703:LEU:HD12	2.13	0.49
1:A:822:GLN:O	1:A:873:ASN:HA	2.13	0.49
1:D:339:ALA:HA	1:D:347:ASP:OD2	2.12	0.49
1:D:207:LEU:HD21	1:D:550:ARG:NH1	2.28	0.49
1:D:363:GLU:OE2	1:D:368:PRO:HB3	2.13	0.49
1:A:638:MET:HG3	1:A:645:GLY:HA2	1.95	0.49
1:D:152:ALA:O	1:D:190:GLU:HA	2.13	0.49
1:A:27:ASP:O	1:A:28:LEU:HD23	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:101:THR:O	1:A:105:ILE:HG13	2.13	0.49
1:A:253:LEU:HG	1:A:315:ALA:HB2	1.94	0.49
1:D:313:ASN:O	1:D:317:GLY:N	2.41	0.49
1:A:104:ASN:O	1:A:105:ILE:C	2.56	0.48
1:A:593:VAL:HG12	1:A:593:VAL:O	2.13	0.48
1:A:758:TYR:OH	1:A:765:THR:HG21	2.12	0.48
1:D:38:LEU:HD23	1:D:535:TYR:CE1	2.48	0.48
1:D:49:HIS:HB2	1:D:646:VAL:O	2.13	0.48
1:D:135:TRP:O	1:D:139:ILE:HG13	2.13	0.48
1:D:836:ASP:O	1:D:837:ALA:C	2.56	0.48
1:D:442:CYS:SG	1:D:486:LYS:HD3	2.52	0.48
1:A:133:TYR:C	1:A:133:TYR:CD2	2.90	0.48
1:D:253:LEU:HA	1:D:338:MET:HE1	1.95	0.48
2:B:14:A:H1'	2:B:22:A:C5	2.48	0.48
2:E:42:U:H2'	2:E:43:G:C8	2.48	0.48
1:A:507:TYR:O	1:A:509:LEU:N	2.46	0.48
1:A:651:PHE:CE1	1:A:655:GLN:HG3	2.48	0.48
1:A:678:GLU:HG2	1:A:682:GLN:HE21	1.77	0.48
1:D:31:GLY:C	1:D:33:GLY:H	2.21	0.48
1:D:694:ARG:NH1	1:D:759:ARG:HG3	2.28	0.48
1:A:194:LEU:HD12	1:A:424:ILE:HG21	1.96	0.48
1:A:480:TYR:HA	1:A:493:ARG:HB2	1.96	0.48
1:A:791:TRP:CD2	1:A:799:LEU:HD21	2.49	0.48
2:B:47(C):A:C8	2:B:47(D):G:H1'	2.48	0.48
1:D:222:ALA:HA	2:E:73:A:C5	2.48	0.48
1:A:785:HIS:O	1:A:787:ALA:N	2.46	0.48
1:D:402:ILE:O	1:D:406:GLU:HG3	2.13	0.48
1:D:465:ILE:HG13	1:D:466:ARG:N	2.28	0.48
1:D:796:PRO:HG2	1:D:797:ASP:H	1.78	0.48
1:D:46:GLY:H	1:D:104:ASN:ND2	2.12	0.48
1:A:58:MET:SD	1:A:574:GLN:OE1	2.72	0.48
2:B:53:G:O2'	2:B:54:U:H5'	2.13	0.48
1:D:151:ARG:HG3	1:D:192:TRP:CZ3	2.49	0.48
1:D:206:ASP:OD2	1:D:554:LYS:HE3	2.13	0.48
1:D:541:HIS:O	1:D:542:ALA:C	2.57	0.48
1:A:120:ASP:OD1	1:A:120:ASP:C	2.56	0.47
1:A:133:TYR:O	1:A:134:ARG:C	2.57	0.47
1:A:620:ALA:HB1	1:A:633:TRP:O	2.14	0.47
1:A:729:LEU:HD23	1:A:807:LEU:HA	1.96	0.47
1:D:237:GLU:HB2	1:D:312:LEU:HD21	1.95	0.47
1:A:194:LEU:CD1	1:A:424:ILE:HG21	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:40:MET:HE2	1:D:545:HIS:HD2	1.79	0.47
1:D:687:PHE:HE1	1:D:749:MET:HA	1.79	0.47
1:D:730:LYS:O	1:D:734:GLU:HG3	2.14	0.47
1:A:555:PHE:CE2	1:A:559:LEU:HD11	2.49	0.47
1:A:758:TYR:OH	1:A:765:THR:CG2	2.63	0.47
2:B:24:G:O2'	2:B:25:C:H5'	2.14	0.47
1:D:148:LEU:HD23	1:D:195:ARG:HB3	1.96	0.47
1:D:690:ARG:HH21	1:D:756:TYR:HD2	1.60	0.47
1:A:179:HIS:C	1:A:181:ASP:H	2.22	0.47
1:A:316:THR:OG1	1:A:318:GLU:HG2	2.15	0.47
1:A:578:LEU:HB2	1:A:675:VAL:HG22	1.96	0.47
1:A:741:PHE:O	1:A:742:ASN:C	2.55	0.47
1:A:507:TYR:C	1:A:509:LEU:N	2.71	0.47
1:A:571:LEU:O	1:A:571:LEU:HG	2.14	0.47
1:A:851:ASN:H	1:A:851:ASN:ND2	2.12	0.47
1:D:131:GLU:CD	1:D:131:GLU:H	2.23	0.47
1:A:135:TRP:O	1:A:136:ASN:C	2.58	0.47
1:A:420:ARG:NH1	1:A:420:ARG:HG2	2.28	0.47
1:A:428:ARG:NH1	1:A:467:PRO:HG3	2.30	0.47
1:A:861:VAL:HA	1:A:876:VAL:HA	1.96	0.47
2:B:7:G:H3'	2:B:8:U:C5'	2.45	0.47
2:B:19:G:OP1	2:B:60:U:N3	2.47	0.47
1:D:393:GLU:O	1:D:394:SER:C	2.57	0.47
2:B:20:U:H6	2:B:20:U:H5'	1.79	0.47
1:D:226:ARG:HG3	1:D:417:TYR:HE1	1.79	0.47
1:D:583:PHE:CE2	1:D:634:LYS:HB3	2.49	0.47
2:E:60:U:C5'	2:E:61:C:H5	2.27	0.47
1:D:17:TRP:CH2	1:D:784:PRO:HB2	2.50	0.47
1:D:361:VAL:HG23	1:D:362:ILE:HG12	1.97	0.47
1:D:406:GLU:HA	1:D:411:GLY:O	2.15	0.47
1:D:859:LYS:C	1:D:860:GLU:OE2	2.58	0.47
1:A:16:PHE:CE1	1:A:20:LYS:HG3	2.50	0.47
1:A:171:VAL:HG13	1:A:184:VAL:HG21	1.96	0.47
1:A:210:LEU:HG	1:A:212:TRP:CD1	2.50	0.46
1:A:663:THR:O	1:A:663:THR:CG2	2.62	0.46
1:D:518:ARG:O	1:D:519:LEU:HG	2.14	0.46
2:B:60:U:H5''	2:B:61:C:H5	1.80	0.46
1:D:822:GLN:HB3	1:D:827:VAL:HA	1.96	0.46
1:A:140:PHE:CD1	1:A:140:PHE:C	2.93	0.46
1:A:140:PHE:CD2	1:A:498:MET:HE2	2.51	0.46
1:A:373:LEU:N	1:A:373:LEU:HD12	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:312:LEU:HD13	1:D:319:ARG:HA	1.96	0.46
1:A:621:GLU:C	1:A:622:LEU:HD23	2.41	0.46
1:D:866:TYR:HD1	1:D:872:LEU:HD13	1.80	0.46
1:D:50:MET:HE2	1:D:648:VAL:HG22	1.97	0.46
1:D:500:THR:C	1:D:502:PHE:H	2.23	0.46
1:D:819:VAL:HG22	1:D:870:LYS:HA	1.96	0.46
2:E:18:G:H5'	2:E:18:G:C8	2.50	0.46
1:A:183:PRO:CB	1:A:293:ILE:HD12	2.39	0.46
2:E:2:C:H2'	2:E:3:C:H6	1.81	0.46
1:A:29:PRO:CG	1:A:529:TRP:CZ2	2.99	0.46
1:D:508:TYR:CD1	1:D:509:LEU:HG	2.51	0.46
1:A:161:LYS:HD3	1:A:179:HIS:CD2	2.50	0.46
1:A:513:ASP:OD2	1:A:525:LYS:HD2	2.16	0.46
1:D:55:ASN:ND2	1:D:574:GLN:CG	2.79	0.46
1:D:157:ASN:HB3	1:D:184:VAL:HG11	1.98	0.46
2:E:38:A:O2'	2:E:39:U:H5'	2.16	0.46
1:A:133:TYR:C	1:A:133:TYR:HD2	2.24	0.46
1:A:657:ALA:O	1:A:658:ASP:C	2.58	0.46
1:A:748:LEU:HD21	1:A:778:MET:CE	2.45	0.46
1:A:60:ASP:OD1	1:A:661:ARG:NH2	2.40	0.46
1:A:313:ASN:O	1:A:315:ALA:N	2.48	0.46
1:D:49:HIS:O	1:D:50:MET:C	2.59	0.46
1:D:826:ARG:HG3	1:D:826:ARG:HH11	1.79	0.46
1:D:38:LEU:CD1	1:D:76:PRO:HG2	2.46	0.45
1:D:41:PHE:CE1	8:D:1893:LEU:HG	2.50	0.45
1:D:851:ASN:HB2	1:D:853:ARG:CG	2.45	0.45
2:E:67:C:O2'	2:E:68:C:H5'	2.15	0.45
1:A:623:ARG:HD2	1:A:633:TRP:CE2	2.51	0.45
1:D:189:LEU:CD2	1:D:190:GLU:H	2.24	0.45
1:D:480:TYR:HB2	1:D:492:LYS:HG3	1.97	0.45
1:A:201:GLU:OE1	1:A:417:TYR:OH	2.32	0.45
1:A:159:CYS:HB3	1:A:162:CYS:HB2	1.97	0.45
1:A:853:ARG:O	1:A:857:GLU:HB2	2.17	0.45
1:D:183:PRO:HG3	1:D:293:ILE:HD12	1.97	0.45
1:D:196:ILE:HG13	1:D:551:PHE:CG	2.52	0.45
1:D:824:ASN:ND2	1:D:876:VAL:HB	2.22	0.45
1:A:738:ALA:HB1	1:A:740:ARG:HH12	1.82	0.45
2:B:65:C:H2'	2:B:66:C:H6	1.81	0.45
1:D:96:HIS:ND1	1:D:97:PRO:HD2	2.32	0.45
2:E:71:G:O2'	2:E:72:C:H5'	2.16	0.45
1:D:6:PRO:O	1:D:7:HIS:C	2.60	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:130:PRO:C	1:D:132:TYR:H	2.25	0.45
1:A:95:VAL:HG12	1:A:96:HIS:N	2.32	0.45
1:A:163:GLN:NE2	1:A:469:GLY:HA2	2.32	0.45
2:B:60:U:C5'	2:B:61:C:H5	2.30	0.45
1:D:38:LEU:HD13	1:D:76:PRO:HG2	1.98	0.45
1:D:144:TRP:HA	1:D:149:ALA:HB3	1.98	0.45
1:A:366:GLY:O	1:A:368:PRO:HD3	2.17	0.45
1:D:79:TRP:CE2	1:D:105:ILE:HG23	2.52	0.45
1:D:816:VAL:HA	1:D:833:ILE:O	2.17	0.45
1:A:780:PHE:HB3	1:A:781:PRO:CD	2.44	0.45
1:A:849:VAL:HG23	1:A:852:VAL:H	1.81	0.45
1:A:859:LYS:HB2	1:A:860:GLU:OE2	2.16	0.45
1:D:207:LEU:O	1:D:208:GLU:C	2.60	0.45
1:D:457:PRO:O	1:D:459:LEU:HD13	2.17	0.45
1:D:867:VAL:O	1:D:869:GLY:N	2.50	0.45
1:A:826:ARG:O	1:A:828:ARG:HG2	2.16	0.45
1:D:176:CYS:HB3	1:D:179:HIS:HB2	1.98	0.45
1:D:181:ASP:O	1:D:183:PRO:HD3	2.17	0.44
1:A:41:PHE:CD1	1:A:41:PHE:C	2.95	0.44
1:A:74:LEU:HD12	1:A:76:PRO:HD3	1.98	0.44
1:A:689:ASN:O	1:A:692:TYR:N	2.50	0.44
1:A:249:ARG:HG3	1:A:249:ARG:HH11	1.82	0.44
1:A:846:ALA:C	1:A:848:LYS:H	2.25	0.44
1:D:574:GLN:NE2	1:D:574:GLN:CA	2.77	0.44
1:D:690:ARG:NH2	1:D:756:TYR:HD2	2.16	0.44
2:E:2:C:O2'	2:E:3:C:H5'	2.17	0.44
1:A:34:LYS:C	1:A:34:LYS:CD	2.90	0.44
1:A:728:THR:CG2	1:A:778:MET:HE1	2.47	0.44
1:A:836:ASP:O	1:A:837:ALA:C	2.61	0.44
2:B:65:C:H2'	2:B:66:C:C6	2.53	0.44
1:D:687:PHE:CG	1:D:749:MET:HE2	2.52	0.44
1:A:232:ILE:HG12	1:A:405:LEU:HD13	1.99	0.44
1:A:426:ARG:HG2	1:A:426:ARG:NH1	2.32	0.44
2:B:3:C:H2'	2:B:4:G:H8	1.82	0.44
1:A:157:ASN:HB3	1:A:184:VAL:CG1	2.47	0.44
1:A:193:TYR:HA	1:A:422:TRP:O	2.16	0.44
1:A:555:PHE:CZ	1:A:559:LEU:HD11	2.53	0.44
1:A:779:LEU:O	1:A:780:PHE:C	2.61	0.44
1:D:57:THR:O	1:D:60:ASP:N	2.51	0.44
1:D:313:ASN:C	1:D:315:ALA:H	2.26	0.44
1:D:436:MET:HE3	1:D:444:VAL:HG12	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:575:GLY:O	1:A:576:MET:O	2.36	0.44
1:D:152:ALA:O	1:D:190:GLU:HG3	2.17	0.44
1:A:84:LEU:HD22	1:A:162:CYS:SG	2.58	0.44
1:D:25:ALA:HB2	1:D:74:LEU:HA	1.99	0.44
1:D:191:GLN:HB3	1:D:425:SER:OG	2.18	0.44
1:A:507:TYR:CD2	1:A:508:TYR:N	2.85	0.43
1:D:323:TRP:HB3	1:D:324:THR:H	1.71	0.43
1:A:345:GLN:HG3	1:A:349:GLU:OE2	2.18	0.43
1:A:519:LEU:HD22	1:A:561:MET:HE1	1.99	0.43
1:A:759:ARG:NH2	1:A:764:VAL:HG23	2.34	0.43
1:D:600:ARG:NH1	1:D:600:ARG:HG2	2.33	0.43
1:D:833:ILE:H	1:D:833:ILE:HG13	1.71	0.43
1:D:846:ALA:O	1:D:849:VAL:HG13	2.17	0.43
1:D:445:VAL:HG11	1:D:486:LYS:HB2	2.00	0.43
1:D:664:ILE:HG12	1:D:676:TRP:HZ3	1.83	0.43
1:D:822:GLN:HG3	1:D:873:ASN:OD1	2.19	0.43
1:A:313:ASN:C	1:A:315:ALA:H	2.24	0.43
1:A:817:VAL:HG12	1:A:818:GLU:N	2.29	0.43
1:D:83:GLY:CA	1:D:500:THR:HB	2.44	0.43
1:D:429:TYR:CE1	1:D:456:LEU:HD22	2.54	0.43
1:D:762:ARG:HA	1:D:763:PRO:HD3	1.83	0.43
1:A:851:ASN:N	1:A:851:ASN:HD22	2.16	0.43
1:D:43:TYR:CE1	1:D:80:ASP:OD2	2.71	0.43
1:D:183:PRO:HB3	1:D:293:ILE:HD12	1.99	0.43
1:D:541:HIS:HB3	1:D:545:HIS:HB3	2.01	0.43
1:A:572:PHE:CD1	1:A:572:PHE:C	2.97	0.43
1:D:44:PRO:HD2	1:D:80:ASP:O	2.18	0.43
1:D:810:LYS:HA	1:D:813:GLU:OE1	2.17	0.43
1:D:819:VAL:HG21	1:D:833:ILE:HD11	2.00	0.43
1:A:79:TRP:CD2	1:A:105:ILE:HG23	2.54	0.43
1:A:214:GLU:O	1:A:215:LYS:C	2.62	0.43
1:A:234:PHE:CD2	1:A:259:LEU:HD21	2.54	0.43
2:B:28:A:P	9:B:2002:HOH:O	2.75	0.43
1:D:40:MET:HE2	1:D:545:HIS:CD2	2.54	0.43
1:D:234:PHE:HA	1:D:235:PRO:HD3	1.87	0.43
1:D:432:THR:HG22	1:D:498:MET:HE3	2.01	0.43
1:D:651:PHE:CE1	1:D:676:TRP:HZ2	2.36	0.43
1:D:658:ASP:O	1:D:662:ILE:HG12	2.19	0.43
1:D:845:GLU:HA	1:D:848:LYS:CE	2.48	0.43
1:A:127:THR:HA	1:A:132:TYR:CD1	2.53	0.43
1:A:348:TYR:C	1:A:348:TYR:CD1	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:29:PRO:HG3	1:D:529:TRP:CZ2	2.53	0.43
1:D:32:ARG:HG2	1:D:70:GLY:O	2.17	0.43
1:D:136:ASN:HD22	1:D:136:ASN:HA	1.63	0.43
1:A:9:ILE:O	1:A:12:LYS:HB3	2.19	0.43
1:A:402:ILE:HG22	1:A:403:ALA:N	2.33	0.43
1:D:15:ARG:O	1:D:19:GLU:HG3	2.19	0.43
1:D:838:PRO:HD2	1:D:841:VAL:CG2	2.49	0.43
1:A:133:TYR:HB2	1:A:432:THR:CG2	2.49	0.43
1:A:225:GLY:HA2	2:B:73:A:N3	2.34	0.43
1:A:738:ALA:HB1	1:A:740:ARG:NH1	2.33	0.43
1:A:767:VAL:HG13	1:A:768:TYR:N	2.34	0.43
1:A:799:LEU:HA	1:A:799:LEU:HD23	1.80	0.43
2:B:50:C:O4'	2:E:47(C):A:C2	2.71	0.43
1:D:360:LYS:HB3	1:D:360:LYS:HE2	1.90	0.43
1:A:75:HIS:O	1:A:119:TYR:HD1	2.02	0.42
2:B:45:G:H2'	2:B:46:C:H6	1.84	0.42
1:A:649:GLY:O	1:A:650:PRO:C	2.62	0.42
1:A:745:ILE:O	1:A:748:LEU:HB2	2.19	0.42
1:A:823:VAL:N	1:A:828:ARG:HG3	2.34	0.42
1:D:277:ARG:HD2	1:D:281:LEU:HD11	2.01	0.42
1:D:671:GLU:HG2	1:D:672:ASN:H	1.83	0.42
1:D:846:ALA:O	1:D:847:LEU:C	2.61	0.42
1:A:207:LEU:O	1:A:217:LYS:HE2	2.19	0.42
1:A:373:LEU:HD12	1:A:373:LEU:H	1.83	0.42
1:A:742:ASN:OD1	1:A:742:ASN:N	2.49	0.42
2:B:47:G:N2	2:B:47(C):A:OP2	2.48	0.42
2:B:47(B):A:C6	2:B:47(C):A:N1	2.87	0.42
1:D:742:ASN:CG	1:D:743:THR:H	2.27	0.42
1:D:788:GLU:OE2	1:D:799:LEU:HB2	2.18	0.42
1:A:158:TRP:HZ2	1:A:163:GLN:NE2	2.17	0.42
1:A:160:PRO:O	1:A:163:GLN:HG2	2.20	0.42
1:A:507:TYR:CG	1:A:508:TYR:N	2.87	0.42
1:A:621:GLU:O	1:A:622:LEU:HD23	2.20	0.42
1:A:762:ARG:HA	1:A:763:PRO:HD3	1.87	0.42
1:A:849:VAL:HG23	1:A:852:VAL:N	2.34	0.42
2:B:28:A:H8	9:B:2002:HOH:O	2.01	0.42
1:D:126:THR:C	1:D:128:CYS:H	2.27	0.42
1:D:707:GLY:N	1:D:769:ARG:HD3	2.35	0.42
1:A:79:TRP:NE1	1:A:124:GLU:OE2	2.42	0.42
1:A:239:LYS:N	1:A:239:LYS:CD	2.82	0.42
2:E:9:G:O2'	2:E:10:G:OP1	2.31	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:613:GLU:O	1:A:617:LYS:HG3	2.20	0.42
1:D:120:ASP:OD1	1:D:122:ASP:HB2	2.18	0.42
1:D:160:PRO:HG2	1:D:182:THR:CG2	2.49	0.42
1:D:457:PRO:HG2	1:D:473:LEU:HD22	2.01	0.42
1:D:461:ASP:OD1	1:D:464:ASP:HB2	2.20	0.42
1:D:465:ILE:O	1:D:472:PRO:HG2	2.19	0.42
1:A:35:GLN:HG3	1:A:66:ARG:HD2	2.01	0.42
1:A:649:GLY:C	1:A:651:PHE:N	2.75	0.42
1:A:675:VAL:HG12	1:A:677:THR:HG23	2.01	0.42
1:A:758:TYR:CZ	1:A:762:ARG:HG2	2.54	0.42
1:A:851:ASN:O	1:A:852:VAL:C	2.61	0.42
1:D:64:ARG:O	1:D:68:MET:HG3	2.19	0.42
1:D:226:ARG:HG3	1:D:226:ARG:NH1	2.33	0.42
1:A:55:ASN:ND2	1:A:574:GLN:HG3	2.35	0.42
1:A:327:TYR:C	1:A:327:TYR:CD1	2.96	0.42
1:A:620:ALA:HB2	1:A:634:LYS:HB2	2.01	0.42
1:A:785:HIS:C	1:A:787:ALA:N	2.78	0.42
1:D:226:ARG:HA	1:D:417:TYR:HD1	1.84	0.42
1:D:233:LEU:CD2	1:D:244:PRO:HB3	2.49	0.42
1:D:727:GLU:HA	1:D:812:LEU:HD22	2.02	0.42
1:D:823:VAL:C	1:D:825:GLY:N	2.78	0.42
2:E:30:G:H1	2:E:40:C:H42	1.66	0.42
1:A:791:TRP:CE3	1:A:799:LEU:HD21	2.54	0.42
1:D:146:LYS:HG2	1:D:146:LYS:O	2.19	0.42
1:A:785:HIS:O	1:A:786:LEU:C	2.62	0.42
1:A:819:VAL:HG12	1:A:820:ALA:N	2.35	0.42
1:A:231:GLU:HA	1:A:245:VAL:O	2.20	0.41
1:A:384:VAL:HG22	1:A:385:ASN:N	2.35	0.41
1:A:477:PRO:HG3	1:A:480:TYR:CZ	2.55	0.41
1:D:133:TYR:HB2	1:D:432:THR:CG2	2.49	0.41
1:D:223:TRP:HB2	1:D:543:VAL:HG11	2.02	0.41
1:D:225:GLY:HA2	2:E:73:A:C2	2.55	0.41
1:D:234:PHE:CE2	1:D:314:PRO:HD2	2.55	0.41
1:D:254:PHE:C	1:D:361:VAL:HG11	2.44	0.41
1:A:23:MET:HE2	1:A:63:ALA:HB1	2.02	0.41
1:A:401:VAL:O	1:A:404:TRP:HB3	2.20	0.41
1:D:41:PHE:N	1:D:41:PHE:CD1	2.88	0.41
1:D:728:THR:O	1:D:729:LEU:C	2.63	0.41
1:A:249:ARG:CG	6:A:1892:NVA:HD1	2.48	0.41
1:A:343:HIS:CE1	1:A:362:ILE:HB	2.56	0.41
1:A:461:ASP:OD2	1:A:461:ASP:C	2.60	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:840:GLU:H	1:A:840:GLU:CD	2.25	0.41
1:D:151:ARG:HG3	1:D:192:TRP:CE3	2.55	0.41
1:A:192:TRP:CH2	1:A:436:MET:HG3	2.55	0.41
1:A:466:ARG:NH1	1:A:468:LYS:HE3	2.35	0.41
1:A:480:TYR:CD1	1:A:480:TYR:C	2.98	0.41
1:A:493:ARG:HG2	1:A:493:ARG:NH1	2.34	0.41
1:D:312:LEU:CD1	1:D:319:ARG:HG3	2.49	0.41
1:D:480:TYR:O	1:D:492:LYS:HA	2.19	0.41
1:D:487:CYS:SG	1:D:488:GLY:N	2.93	0.41
1:D:687:PHE:CE1	1:D:749:MET:HA	2.55	0.41
1:A:762:ARG:HG3	1:A:763:PRO:HD2	2.01	0.41
1:D:265:HIS:ND1	1:D:266:PRO:HD2	2.35	0.41
1:D:388:PRO:HG2	1:D:389:PHE:H	1.84	0.41
1:D:614:ASP:O	1:D:618:MET:HG2	2.20	0.41
1:D:685:TRP:O	1:D:689:ASN:HB2	2.21	0.41
1:A:567:PRO:HB2	1:A:568:PHE:CE1	2.56	0.41
1:A:678:GLU:HG2	1:A:682:GLN:NE2	2.36	0.41
1:D:584:GLY:O	1:D:631:HIS:HA	2.20	0.41
1:D:823:VAL:HB	1:D:828:ARG:NH1	2.36	0.41
2:E:14:A:H1'	2:E:22:A:C8	2.54	0.41
1:A:461:ASP:OD1	1:A:464:ASP:HB2	2.21	0.41
2:B:55:U:H2'	2:B:57:A:OP2	2.19	0.41
1:D:230:ALA:HA	1:D:413:GLY:HA2	2.03	0.41
1:A:151:ARG:HG2	1:A:151:ARG:HH11	1.86	0.41
1:A:766:PRO:O	1:A:767:VAL:C	2.64	0.41
1:D:305:VAL:O	1:D:324:THR:HG22	2.20	0.41
1:D:786:LEU:O	1:D:789:GLU:HB3	2.21	0.41
1:A:23:MET:HE1	1:A:73:VAL:HG11	2.02	0.41
1:A:41:PHE:CE1	1:A:80:ASP:CB	3.03	0.41
1:A:87:GLU:HG2	1:A:91:LEU:HD22	2.03	0.41
1:A:253:LEU:HD12	1:A:253:LEU:O	2.21	0.41
1:A:313:ASN:C	1:A:315:ALA:N	2.77	0.41
1:A:378:GLU:O	1:A:379:GLU:O	2.39	0.41
1:A:536:ILE:N	1:A:536:ILE:HD12	2.35	0.41
1:A:739:LEU:HD12	1:A:739:LEU:N	2.36	0.41
2:B:47(C):A:N3	2:E:66:C:H1'	2.35	0.41
1:D:765:THR:O	1:D:768:TYR:HB3	2.20	0.41
1:A:393:GLU:O	1:A:394:SER:C	2.64	0.41
1:A:448:PRO:HD2	1:A:451:GLU:OE1	2.21	0.41
1:D:126:THR:O	1:D:128:CYS:N	2.54	0.41
1:D:177:TRP:H	1:D:177:TRP:HD1	1.66	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:767:VAL:HG13	1:D:768:TYR:N	2.34	0.41
2:E:58:A:C2	2:E:60:U:H2'	2.56	0.41
1:A:708:VAL:O	1:A:709:PHE:HB3	2.21	0.40
1:D:155:LEU:HD12	1:D:264:GLU:HG2	2.02	0.40
1:D:392:THR:HG22	1:D:393:GLU:N	2.30	0.40
1:D:591:SER:O	1:D:611:SER:HA	2.21	0.40
1:D:708:VAL:O	1:D:709:PHE:HB3	2.21	0.40
1:D:748:LEU:CD2	1:D:778:MET:HE3	2.51	0.40
1:D:816:VAL:H	1:D:834:PRO:HA	1.86	0.40
2:E:66:C:C2	2:E:67:C:C5	3.09	0.40
1:A:224:ILE:HA	1:A:419:LEU:HB2	2.02	0.40
1:A:342:ALA:O	1:A:343:HIS:ND1	2.55	0.40
1:D:477:PRO:C	1:D:479:PHE:N	2.78	0.40
1:D:611:SER:O	1:D:615:VAL:HG23	2.21	0.40
1:A:65:PHE:CG	1:A:736:LEU:HD13	2.56	0.40
1:A:247:THR:HA	7:A:1893:2AD:H3'	2.03	0.40
1:A:314:PRO:HB2	1:A:410:LEU:HD22	2.02	0.40
1:A:625:HIS:HB3	1:A:627:ASP:OD2	2.21	0.40
1:A:846:ALA:C	1:A:848:LYS:N	2.80	0.40
1:D:249:ARG:C	1:D:251:ASP:N	2.79	0.40
1:D:600:ARG:HG2	1:D:600:ARG:HH11	1.86	0.40
2:E:60:U:H5'	2:E:61:C:H5	1.85	0.40
1:A:64:ARG:HG2	1:A:64:ARG:NH1	2.36	0.40
1:A:826:ARG:HB2	1:A:828:ARG:HH21	1.87	0.40
2:B:18:G:H21	2:B:57:A:H2'	1.87	0.40
1:D:437:VAL:HG23	1:D:447:VAL:HG22	2.04	0.40
1:A:82:PHE:HE2	1:A:133:TYR:HD1	1.66	0.40
1:A:130:PRO:HA	1:A:133:TYR:CE2	2.56	0.40
1:A:457:PRO:O	1:A:459:LEU:HD13	2.22	0.40
1:A:603:LEU:HD23	1:A:603:LEU:HA	1.87	0.40
1:A:740:ARG:HG3	1:A:740:ARG:HH11	1.86	0.40
2:B:27:C:O2'	2:B:28:A:H5'	2.21	0.40
1:D:313:ASN:C	1:D:315:ALA:N	2.79	0.40
1:D:816:VAL:N	1:D:834:PRO:HA	2.36	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	874/878 (100%)	728 (83%)	120 (14%)	26 (3%)	3	14
1	D	874/878 (100%)	735 (84%)	113 (13%)	26 (3%)	3	14
All	All	1748/1756 (100%)	1463 (84%)	233 (13%)	52 (3%)	3	14

All (52) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	576	MET
1	A	796	PRO
1	D	208	GLU
1	D	542	ALA
1	D	861	VAL
1	A	430	TRP
1	A	763	PRO
1	A	786	LEU
1	A	861	VAL
1	D	53	LEU
1	D	127	THR
1	D	225	GLY
1	D	390	ASP
1	D	392	THR
1	D	501	PHE
1	D	850	ARG
1	A	398	LYS
1	A	789	GLU
1	A	797	ASP
1	D	6	PRO
1	D	596	PRO
1	D	868	PRO
1	A	10	GLU
1	A	208	GLU
1	A	333	GLY

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Mol	Chain	Res	Type
1	A	847	LEU
1	D	7	HIS
1	D	30	GLY
1	D	32	ARG
1	D	44	PRO
1	A	277	ARG
1	A	508	TYR
1	D	792	HIS
1	D	796	PRO
1	D	824	ASN
1	A	6	PRO
1	A	689	ASN
1	A	869	GLY
1	D	469	GLY
1	D	543	VAL
1	D	875	VAL
1	A	379	GLU
1	A	33	GLY
1	A	314	PRO
1	A	435	PRO
1	A	564	VAL
1	D	763	PRO
1	D	805	PRO
1	A	44	PRO
1	A	816	VAL
1	A	849	VAL
1	D	816	VAL

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	741/742 (100%)	699 (94%)	42 (6%)	18	49
1	D	741/742 (100%)	716 (97%)	25 (3%)	32	66
All	All	1482/1484 (100%)	1415 (96%)	67 (4%)	24	58

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	GLU
1	A	36	TYR
1	A	38	LEU
1	A	39	VAL
1	A	41	PHE
1	A	47	ASP
1	A	58	MET
1	A	62	LEU
1	A	74	LEU
1	A	76	PRO
1	A	82	PHE
1	A	91	LEU
1	A	113	ARG
1	A	125	VAL
1	A	130	PRO
1	A	133	TYR
1	A	189	LEU
1	A	240	GLU
1	A	275	GLU
1	A	278	GLU
1	A	318	GLU
1	A	320	ILE
1	A	327	TYR
1	A	352	ARG
1	A	367	GLU
1	A	450	GLU
1	A	456	LEU
1	A	500	THR
1	A	503	ASP
1	A	571	LEU
1	A	592	VAL
1	A	602	ARG
1	A	614	ASP
1	A	650	PRO
1	A	664	ILE
1	A	703	LEU
1	A	765	THR
1	A	828	ARG
1	A	839	LEU
1	A	851	ASN
1	A	857	GLU
1	A	871	ILE

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Mol	Chain	Res	Type
1	D	41	PHE
1	D	82	PHE
1	D	189	LEU
1	D	197	THR
1	D	214	GLU
1	D	247	THR
1	D	264	GLU
1	D	275	GLU
1	D	277	ARG
1	D	327	TYR
1	D	379	GLU
1	D	392	THR
1	D	450	GLU
1	D	451	GLU
1	D	456	LEU
1	D	503	ASP
1	D	700	GLU
1	D	736	LEU
1	D	805	PRO
1	D	836	ASP
1	D	845	GLU
1	D	849	VAL
1	D	851	ASN
1	D	868	PRO
1	D	870	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	49	HIS
1	A	55	ASN
1	A	104	ASN
1	A	163	GLN
1	A	179	HIS
1	A	438	HIS
1	A	541	HIS
1	A	557	HIS
1	A	574	GLN
1	A	682	GLN
1	A	726	HIS
1	A	785	HIS
1	A	822	GLN

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Mol	Chain	Res	Type
1	A	851	ASN
1	D	5	ASN
1	D	55	ASN
1	D	104	ASN
1	D	136	ASN
1	D	515	HIS
1	D	655	GLN
1	D	682	GLN
1	D	726	HIS
1	D	824	ASN
1	D	832	HIS
1	D	851	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	B	76/83 (91%)	10 (13%)	2 (2%)
2	E	76/83 (91%)	8 (10%)	2 (2%)
All	All	152/166 (91%)	18 (11%)	4 (2%)

All (18) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	B	7	G
2	B	8	U
2	B	10	G
2	B	18	G
2	B	19	G
2	B	20	U
2	B	47(C)	A
2	B	47(D)	G
2	B	48	U
2	B	73	A
2	E	10	G
2	E	18	G
2	E	19	G
2	E	20	U
2	E	47(C)	A
2	E	47(D)	G
2	E	48	U
2	E	73	A

All (4) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
2	B	9	G
2	B	18	G
2	E	9	G
2	E	18	G

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 37 ligands modelled in this entry, 6 are monoatomic - leaving 31 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
6	NVA	D	1894	7	5,6,7	0.48	0	2,6,8	0.29	0
5	SO4	A	1882	-	4,4,4	0.37	0	6,6,6	0.13	0
5	SO4	A	1881	-	4,4,4	0.36	0	6,6,6	0.15	0
5	SO4	D	1886	-	4,4,4	0.36	0	6,6,6	0.12	0
5	SO4	D	1890	-	4,4,4	0.37	0	6,6,6	0.10	0
5	SO4	D	1887	-	4,4,4	0.36	0	6,6,6	0.07	0
5	SO4	D	1888	-	4,4,4	0.36	0	6,6,6	0.08	0
8	LEU	A	1894	-	6,8,8	0.80	0	5,10,10	0.31	0
5	SO4	D	1885	-	4,4,4	0.38	0	6,6,6	0.07	0
5	SO4	D	1880	-	4,4,4	0.36	0	6,6,6	0.08	0
5	SO4	A	1884	-	4,4,4	0.38	0	6,6,6	0.09	0
5	SO4	A	1880	-	4,4,4	0.39	0	6,6,6	0.12	0
5	SO4	A	1885	-	4,4,4	0.39	0	6,6,6	0.06	0
8	LEU	D	1893	-	6,8,8	0.87	0	5,10,10	0.25	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	SO4	D	1883	-	4,4,4	0.36	0	6,6,6	0.09	0
5	SO4	D	1891	-	4,4,4	0.37	0	6,6,6	0.07	0
5	SO4	D	1884	-	4,4,4	0.37	0	6,6,6	0.06	0
5	SO4	A	1889	-	4,4,4	0.38	0	6,6,6	0.11	0
5	SO4	A	1890	-	4,4,4	0.38	0	6,6,6	0.11	0
5	SO4	D	1892	-	4,4,4	0.38	0	6,6,6	0.09	0
5	SO4	D	1889	-	4,4,4	0.38	0	6,6,6	0.06	0
5	SO4	A	1891	-	4,4,4	0.36	0	6,6,6	0.11	0
5	SO4	D	1881	-	4,4,4	0.38	0	6,6,6	0.11	0
5	SO4	A	1888	-	4,4,4	0.38	0	6,6,6	0.09	0
5	SO4	A	1883	-	4,4,4	0.38	0	6,6,6	0.13	0
5	SO4	A	1886	-	4,4,4	0.36	0	6,6,6	0.09	0
6	NVA	A	1892	7	5,6,7	0.55	0	2,6,8	0.31	0
5	SO4	D	1882	-	4,4,4	0.38	0	6,6,6	0.07	0
5	SO4	A	1887	-	4,4,4	0.38	0	6,6,6	0.10	0
7	2AD	A	1893	6	20,21,21	0.24	0	28,31,31	0.43	0
7	2AD	D	1895	6	20,21,21	0.26	0	28,31,31	0.48	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
6	NVA	D	1894	7	-	0/4/5/7	-
8	LEU	D	1893	-	-	0/8/8/8	-
6	NVA	A	1892	7	-	1/4/5/7	-
8	LEU	A	1894	-	-	2/8/8/8	-
7	2AD	A	1893	6	-	0/6/22/22	0/3/3/3
7	2AD	D	1895	6	-	1/6/22/22	0/3/3/3

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

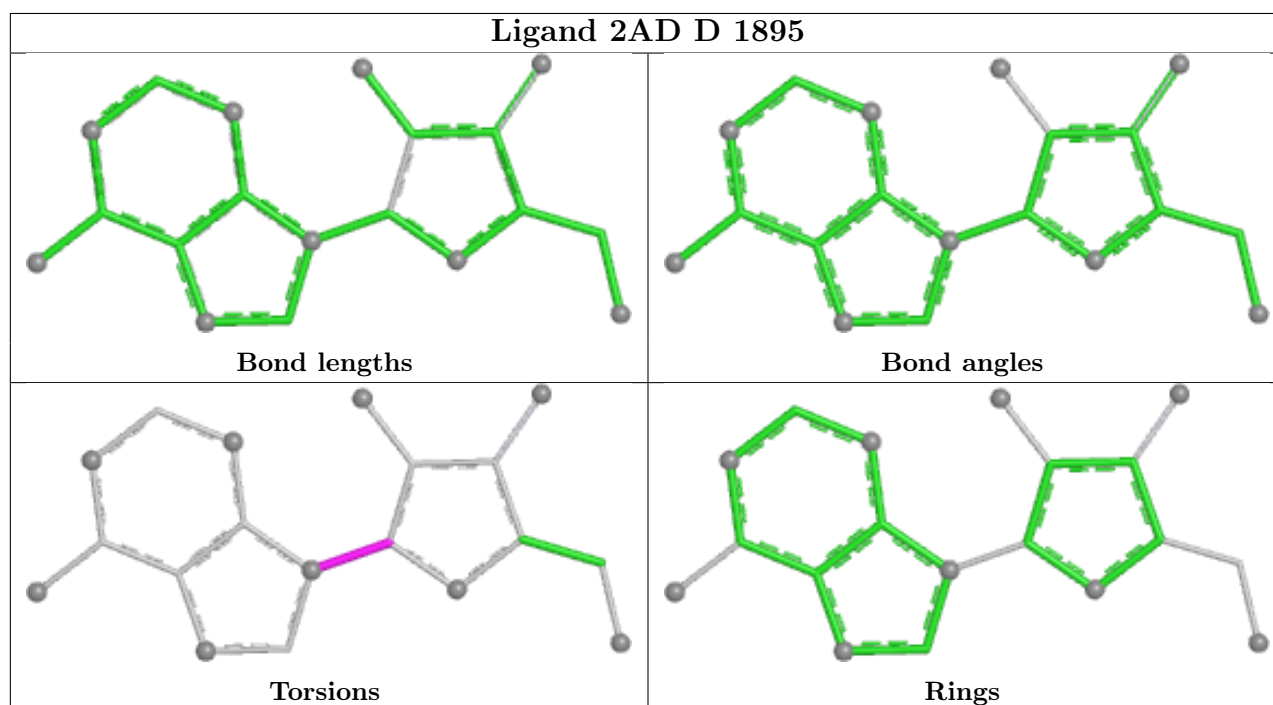
Mol	Chain	Res	Type	Atoms
6	A	1892	NVA	O-C-CA-CB
8	A	1894	LEU	N-CA-CB-CG
8	A	1894	LEU	OXT-C-CA-N
7	D	1895	2AD	C2'-C1'-N9-C8

There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	D	1893	LEU	1	0
6	A	1892	NVA	2	0
7	A	1893	2AD	3	0
7	D	1895	2AD	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	876/878 (99%)	-0.26	6 (0%) 84 79	25, 67, 104, 136	0
1	D	876/878 (99%)	0.01	10 (1%) 78 71	57, 93, 139, 161	0
2	B	78/83 (93%)	-0.30	0 100 100	35, 70, 150, 186	0
2	E	78/83 (93%)	-0.14	0 100 100	50, 79, 157, 189	0
All	All	1908/1922 (99%)	-0.13	16 (0%) 82 77	25, 79, 130, 189	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	858	GLY	3.3
1	D	857	GLU	3.1
1	D	856	LEU	2.9
1	D	854	ALA	2.8
1	A	856	LEU	2.8
1	D	598	PRO	2.7
1	D	592	VAL	2.7
1	A	855	HIS	2.6
1	A	854	ALA	2.6
1	A	863	LYS	2.5
1	D	585	PRO	2.4
1	D	4	TYR	2.2
1	D	465	ILE	2.2
1	D	503	ASP	2.1
1	A	1	MET	2.1
1	D	861	VAL	2.0

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

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

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 6.4 Ligands [i](#)

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

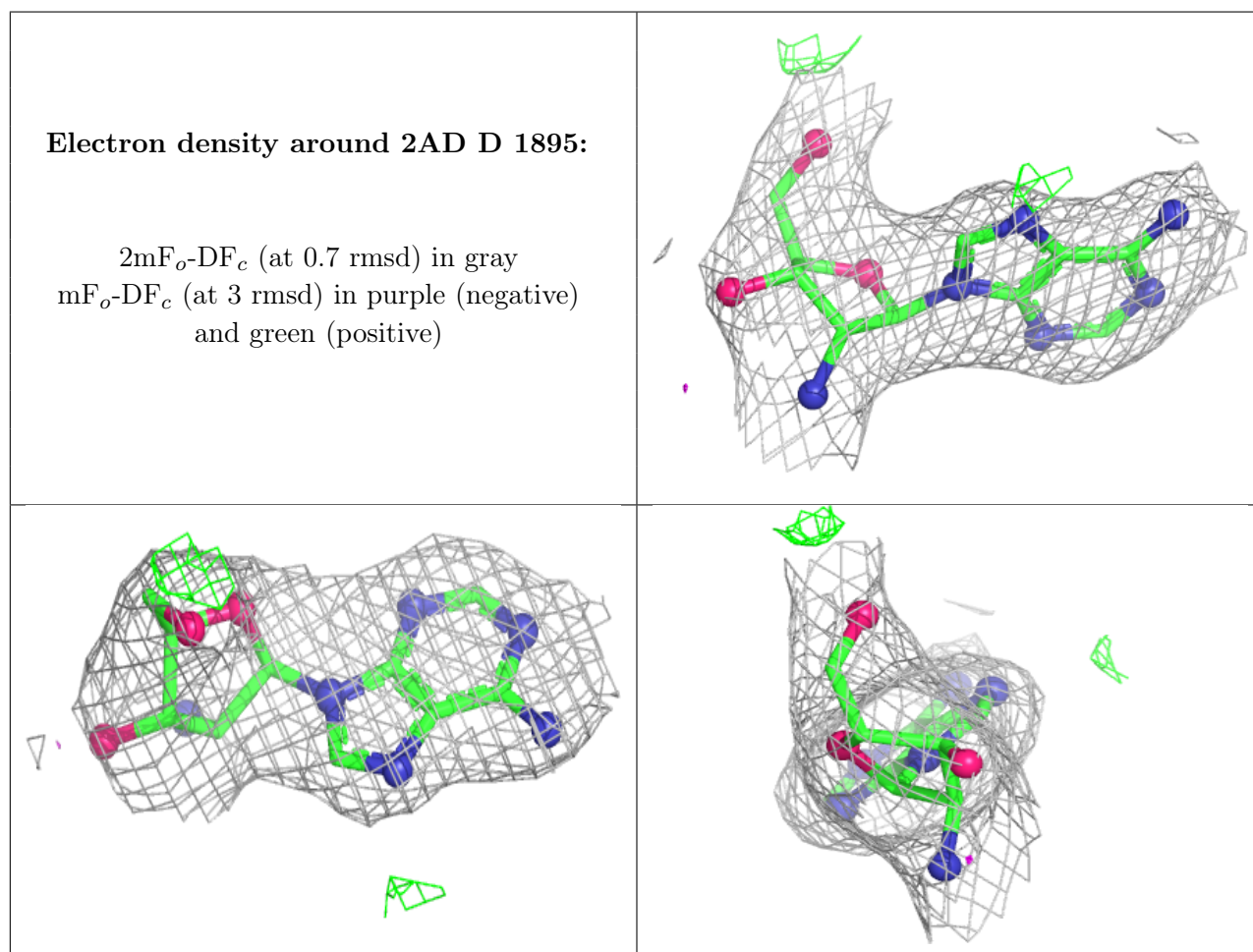
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	SO4	D	1882	5/5	0.58	0.11	153,154,155,155	0
5	SO4	D	1885	5/5	0.67	0.18	143,145,146,146	0
5	SO4	D	1883	5/5	0.69	0.11	140,140,141,142	0
5	SO4	D	1888	5/5	0.70	0.13	153,154,154,154	0
5	SO4	D	1880	5/5	0.71	0.10	152,152,153,153	0
5	SO4	D	1890	5/5	0.71	0.11	153,153,154,155	0
5	SO4	A	1880	5/5	0.79	0.12	148,148,149,149	0
5	SO4	D	1889	5/5	0.81	0.12	136,137,138,139	0
5	SO4	A	1883	5/5	0.81	0.07	132,133,134,134	0
5	SO4	D	1886	5/5	0.83	0.14	133,135,136,136	0
5	SO4	A	1885	5/5	0.83	0.16	122,122,123,123	0
5	SO4	D	1892	5/5	0.83	0.10	135,136,138,138	0
5	SO4	A	1888	5/5	0.84	0.14	146,147,147,148	0
5	SO4	A	1886	5/5	0.85	0.15	144,144,145,146	0
5	SO4	A	1891	5/5	0.87	0.12	143,144,145,145	0
5	SO4	A	1889	5/5	0.87	0.14	117,117,119,120	0
5	SO4	A	1887	5/5	0.88	0.09	113,114,115,116	0
5	SO4	D	1891	5/5	0.88	0.09	112,113,115,115	0
5	SO4	A	1890	5/5	0.88	0.13	148,150,150,151	0
5	SO4	D	1887	5/5	0.90	0.08	103,104,105,106	0
5	SO4	D	1884	5/5	0.92	0.06	119,119,121,121	0
6	NVA	A	1892	7/8	0.92	0.19	75,77,81,84	0
5	SO4	A	1884	5/5	0.93	0.07	95,96,98,98	0
5	SO4	D	1881	5/5	0.93	0.06	101,101,103,104	0
5	SO4	A	1882	5/5	0.95	0.06	86,89,92,93	0
6	NVA	D	1894	7/8	0.95	0.14	58,61,66,67	0
7	2AD	A	1893	19/19	0.95	0.08	50,58,75,76	0
8	LEU	D	1893	9/9	0.95	0.11	91,94,95,95	0
5	SO4	A	1881	5/5	0.96	0.06	69,75,76,76	0
7	2AD	D	1895	19/19	0.96	0.07	59,66,71,71	0
8	LEU	A	1894	9/9	0.96	0.10	41,50,58,60	0
3	ZN	A	1877	1/1	0.96	0.08	117,117,117,117	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	ZN	D	1878	1/1	0.97	0.06	97,97,97,97	0
4	HG	D	1879	1/1	0.97	0.06	156,156,156,156	0
3	ZN	D	1877	1/1	0.97	0.10	142,142,142,142	0
3	ZN	A	1878	1/1	0.99	0.06	68,68,68,68	0
4	HG	A	1879	1/1	0.99	0.04	109,109,109,109	0

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



## 6.5 Other polymers [i](#)

There are no such residues in this entry.