



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 09:23 PM UTC

PDB ID : 1RYE / pdb\_00001rye  
Title : Crystal Structure of the Shifted Form of the Glucose-Fructose Oxidoreductase from *Zymomonas mobilis*  
Authors : Kim, Y.; Arora, M.; Straza, M.; Donnelly, M.; Joachimiak, A.  
Deposited on : 2003-12-22  
Resolution : 2.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](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

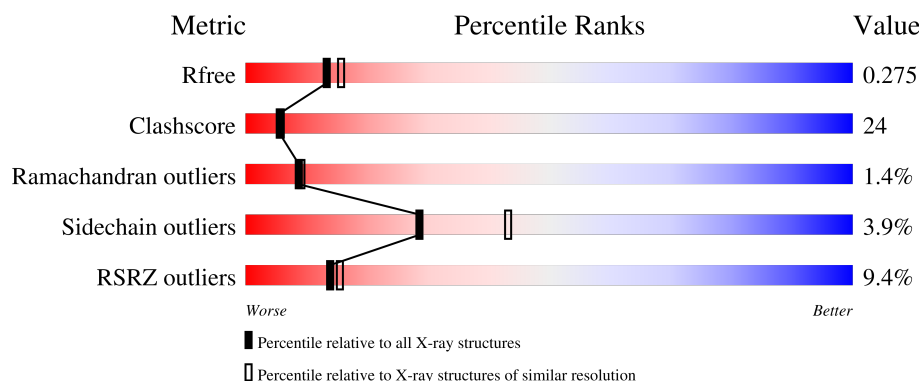
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	387	 4% 57% 29% 11%
1	B	387	 9% 55% 37% 1% 1%
1	C	387	 16% 45% 38% 1% 12%
1	D	387	 7% 60% 31% 1% 1%

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
2	NDP	C	502	X	-	-	-
4	GOL	B	601	-	-	X	-
4	GOL	D	602	-	-	X	-

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 11615 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 glucose-fructose oxidoreductase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	343	Total	C	N	O	S	0	1	0
			2692	1686	482	508	16			
1	B	371	Total	C	N	O	S	0	3	0
			2906	1818	526	543	19			
1	C	339	Total	C	N	O	S	0	0	0
			2651	1662	476	498	15			
1	D	370	Total	C	N	O	S	0	0	0
			2867	1796	515	538	18			

There are 24 discrepancies between the modelled and reference sequences:

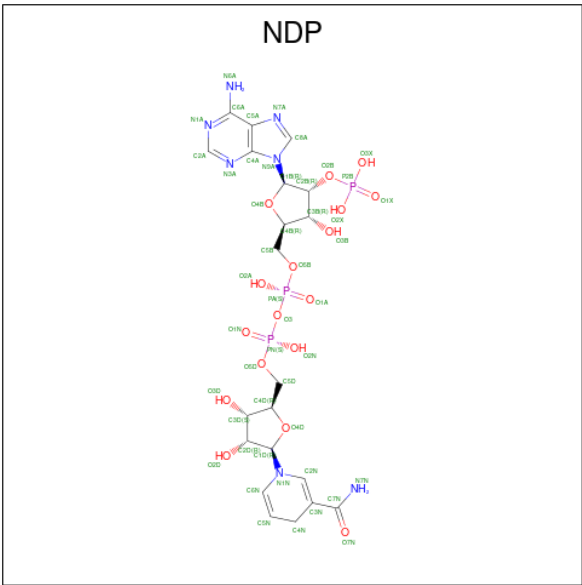
Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	HIS	-	expression tag	UNP Q07982
A	-4	HIS	-	expression tag	UNP Q07982
A	-3	HIS	-	expression tag	UNP Q07982
A	-2	HIS	-	expression tag	UNP Q07982
A	-1	HIS	-	expression tag	UNP Q07982
A	0	HIS	-	expression tag	UNP Q07982
B	-5	HIS	-	expression tag	UNP Q07982
B	-4	HIS	-	expression tag	UNP Q07982
B	-3	HIS	-	expression tag	UNP Q07982
B	-2	HIS	-	expression tag	UNP Q07982
B	-1	HIS	-	expression tag	UNP Q07982
B	0	HIS	-	expression tag	UNP Q07982
C	-5	HIS	-	expression tag	UNP Q07982
C	-4	HIS	-	expression tag	UNP Q07982
C	-3	HIS	-	expression tag	UNP Q07982
C	-2	HIS	-	expression tag	UNP Q07982
C	-1	HIS	-	expression tag	UNP Q07982
C	0	HIS	-	expression tag	UNP Q07982
D	-5	HIS	-	expression tag	UNP Q07982
D	-4	HIS	-	expression tag	UNP Q07982
D	-3	HIS	-	expression tag	UNP Q07982

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-2	HIS	-	expression tag	UNP Q07982
D	-1	HIS	-	expression tag	UNP Q07982
D	0	HIS	-	expression tag	UNP Q07982

- Molecule 2 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: C<sub>21</sub>H<sub>30</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).





Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O	S	0	0
			4	2	1	1		

- Molecule 4 is GLYCEROL (CCD ID: GOL) (formula:  $C_3H_8O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O		
			6	3	3	0	0
4	B	1	Total	C	O		
			6	3	3	0	0
4	D	1	Total	C	O		
			6	3	3	0	0

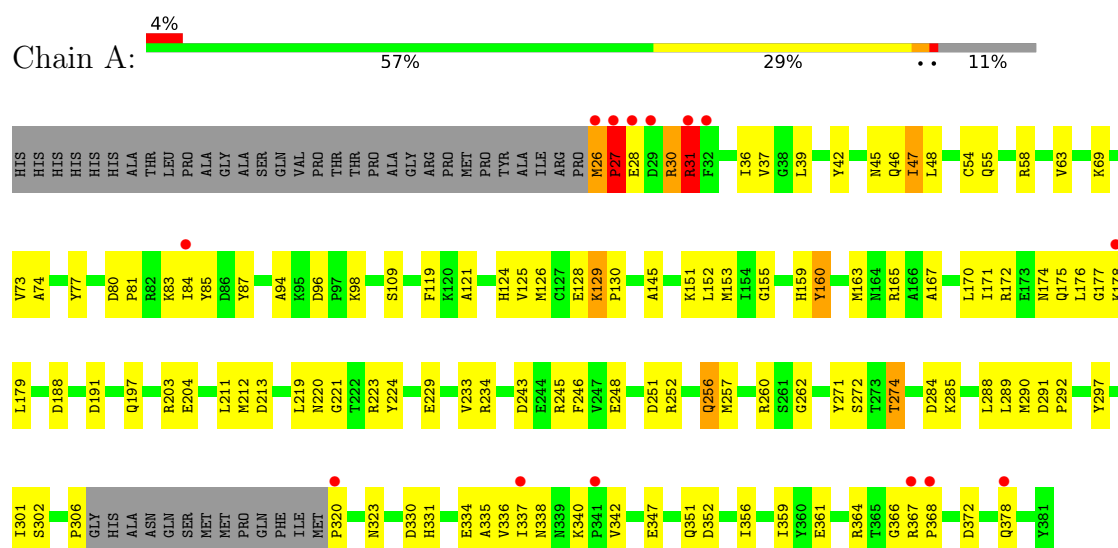
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	85	Total 85	O 85	0	0
5	B	60	Total 60	O 60	0	0
5	C	47	Total 47	O 47	0	0
5	D	93	Total 93	O 93	0	0

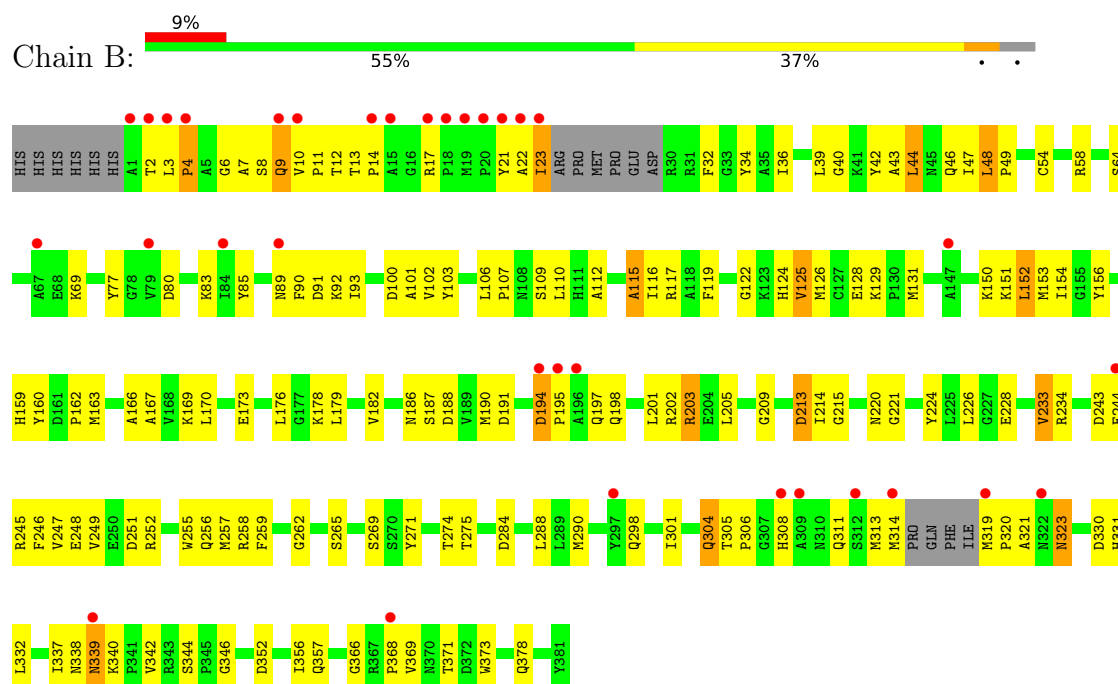
### 3 Residue-property plots [i](#)

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

- Molecule 1: glucose-fructose oxidoreductase

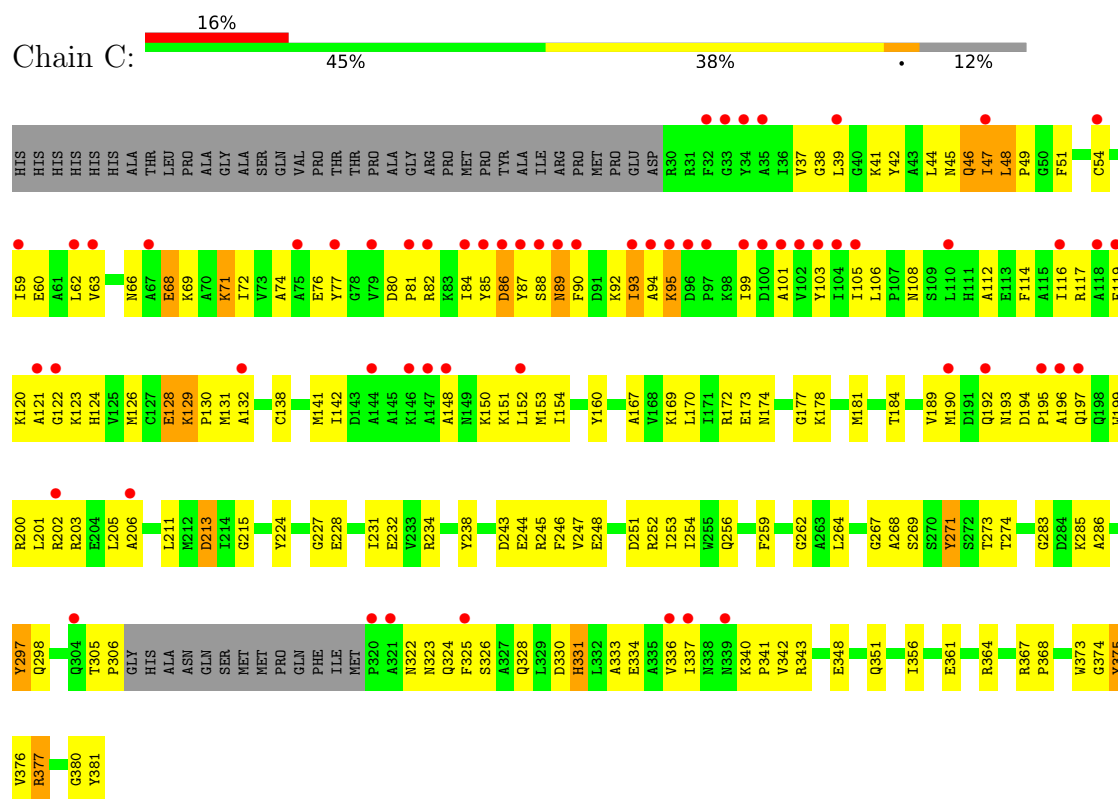


- Molecule 1: glucose-fructose oxidoreductase

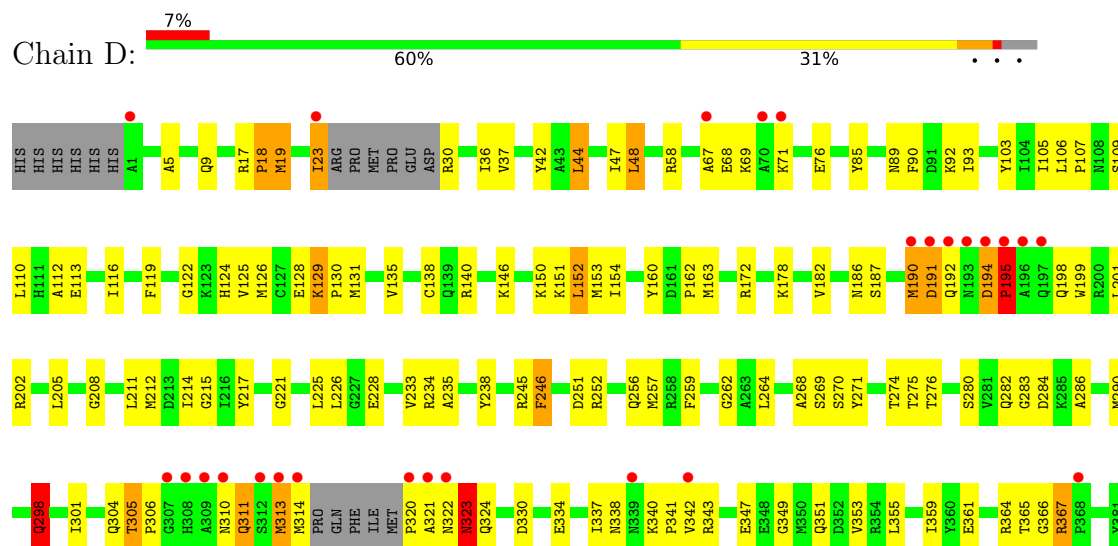




- Molecule 1: glucose-fructose oxidoreductase



- Molecule 1: glucose-fructose oxidoreductase



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	49.87Å 152.98Å 101.99Å 90.00° 103.66° 90.00°	Depositor
Resolution (Å)	49.56 – 2.30 49.56 – 2.30	Depositor EDS
% Data completeness (in resolution range)	77.1 (49.56-2.30) 77.1 (49.56-2.30)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.08 (at 2.20Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.212 , 0.276 0.212 , 0.275	Depositor DCC
$R_{free}$ test set	5127 reflections (8.72%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	26.0	Xtriage
Anisotropy	1.007	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 46.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.030 for h,-k,-h-l	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	11615	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.55% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: BME, NDP, GOL

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	0.46	0/2745	0.95	9/3707 (0.2%)
1	B	0.42	0/2964	0.91	8/4005 (0.2%)
1	C	0.37	0/2703	0.88	4/3650 (0.1%)
1	D	0.46	0/2925	0.98	7/3954 (0.2%)
All	All	0.43	0/11337	0.93	28/15316 (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	1
1	B	0	1
All	All	0	2

There are no bond length outliers.

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	47	ILE	N-CA-C	10.69	120.67	110.30
1	D	125	VAL	N-CA-C	8.81	120.45	108.11
1	A	47	ILE	N-CA-C	7.92	117.95	110.74
1	D	19	MET	N-CA-C	-7.26	100.61	109.83
1	A	26	MET	CA-C-N	7.25	128.90	119.84
1	A	26	MET	C-N-CA	7.25	128.90	119.84
1	B	194	ASP	CA-C-N	7.25	127.26	119.28
1	B	194	ASP	C-N-CA	7.25	127.26	119.28
1	C	213	ASP	N-CA-C	7.07	118.77	111.14
1	C	47	ILE	N-CA-C	6.95	116.95	110.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	125	VAL	N-CA-C	6.69	117.47	108.11
1	C	331	HIS	N-CA-C	-6.36	105.17	113.12
1	B	115	ALA	N-CA-C	-6.33	104.45	111.36
1	C	89	ASN	N-CA-C	-6.28	105.47	113.01
1	A	126	MET	N-CA-C	-6.24	98.35	108.52
1	B	125	VAL	N-CA-C	6.03	116.81	108.12
1	D	305	THR	N-CA-C	-5.77	101.60	110.32
1	B	366	GLY	N-CA-C	-5.68	107.42	115.43
1	A	297	TYR	N-CA-C	5.65	119.69	112.12
1	A	213	ASP	N-CA-C	5.64	117.29	111.03
1	D	246	PHE	N-CA-C	5.52	119.64	113.02
1	D	298	GLN	N-CA-C	5.38	117.44	108.02
1	A	31	ARG	N-CA-C	5.35	122.20	110.80
1	B	203	ARG	N-CA-C	5.33	117.78	111.33
1	B	213	ASP	N-CA-C	5.30	117.86	111.40
1	B	357	GLN	N-CA-C	-5.24	105.48	111.14
1	A	274	THR	N-CA-C	5.20	117.23	110.53
1	D	44	LEU	N-CA-C	5.11	116.93	111.36

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	160	TYR	Sidechain
1	B	160	TYR	Sidechain

## 5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2692	0	2649	104	0
1	B	2906	0	2871	160	0
1	C	2651	0	2616	158	0
1	D	2867	0	2832	148	0
2	A	48	0	25	2	0
2	B	48	0	23	1	0
2	C	48	0	23	10	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	48	0	25	4	0
3	A	4	0	6	3	0
4	A	6	0	8	0	0
4	B	6	0	8	4	0
4	D	6	0	8	5	0
5	A	85	0	0	2	0
5	B	60	0	0	2	0
5	C	47	0	0	0	0
5	D	93	0	0	3	0
All	All	11615	0	11094	528	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 24.

All (528) 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:A:366:GLY:HA3	4:B:601:GOL:H11	1.40	1.01
1:B:195:PRO:HB3	1:B:201:LEU:HD13	1.40	1.00
2:D:503:NDP:H42N	4:D:602:GOL:H31	1.43	1.00
1:A:191:ASP:H	1:A:197:GLN:NE2	1.63	0.96
1:D:131:MET:HE3	1:D:154:ILE:HD11	1.50	0.94
1:D:191:ASP:HB3	1:D:245:ARG:HD3	1.49	0.92
1:B:304:GLN:H	1:B:304:GLN:HE21	1.16	0.89
1:B:10:VAL:HG13	1:B:17:ARG:HH21	1.37	0.87
1:C:306:PRO:HG3	1:D:274:THR:HG23	1.55	0.86
1:B:320:PRO:HG3	1:D:311:GLN:HG3	1.58	0.85
1:C:51:PHE:HA	1:C:54:CYS:SG	2.16	0.85
1:B:166:ALA:HB1	1:B:313:MET:HE1	1.57	0.85
1:B:314:MET:C	1:D:314:MET:HB2	2.01	0.85
1:B:233:VAL:HG23	1:B:257:MET:HG2	1.60	0.83
1:D:163:MET:HE3	1:D:321:ALA:HB1	1.61	0.82
1:B:304:GLN:H	1:B:304:GLN:NE2	1.78	0.81
1:C:243:ASP:OD1	1:C:245:ARG:HD3	1.81	0.81
1:B:10:VAL:N	1:C:202:ARG:HH22	1.80	0.79
1:D:190:MET:HG2	1:D:201:LEU:HD21	1.64	0.79
1:A:337:ILE:HG22	1:A:338:ASN:ND2	1.98	0.78
1:A:27:PRO:CD	1:D:71:LYS:HB3	2.14	0.77
1:C:131:MET:HE3	1:C:154:ILE:HD11	1.67	0.76
1:B:337:ILE:HG22	1:B:338:ASN:ND2	2.01	0.76
1:A:124:HIS:HD2	1:A:151:LYS:H	1.31	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:286:ALA:HB2	1:D:305:THR:HG22	1.67	0.76
1:C:116:ILE:HG22	1:C:120:LYS:HE2	1.68	0.76
1:B:320:PRO:HB2	1:B:323:ASN:ND2	2.01	0.75
1:D:37:VAL:HG12	1:D:106:LEU:HD21	1.71	0.73
1:B:169:LYS:O	1:B:173:GLU:HG3	1.89	0.73
1:B:320:PRO:HG3	1:D:311:GLN:CG	2.18	0.73
1:D:107:PRO:HG2	1:D:110:LEU:HD23	1.71	0.72
1:B:10:VAL:HG13	1:B:17:ARG:NH2	2.04	0.72
1:B:243:ASP:OD1	1:B:245:ARG:HB2	1.89	0.72
1:A:27:PRO:HD2	1:D:71:LYS:HB3	1.70	0.71
1:A:30:ARG:HG3	1:A:31:ARG:HG3	1.70	0.71
1:B:11:PRO:C	1:B:13:THR:H	1.99	0.71
1:A:83:LYS:HD3	5:A:674:HOH:O	1.91	0.71
1:D:191:ASP:HB3	1:D:245:ARG:CD	2.21	0.70
1:D:337:ILE:HG22	1:D:338:ASN:ND2	2.06	0.70
1:B:320:PRO:CG	1:D:311:GLN:HG3	2.20	0.70
1:D:68:GLU:CD	1:D:68:GLU:H	1.99	0.70
1:C:122:GLY:O	1:C:150:LYS:HE3	1.92	0.70
1:B:103:TYR:CD2	1:B:126:MET:HG2	2.27	0.69
1:D:124:HIS:HD2	1:D:151:LYS:H	1.40	0.69
1:C:72:ILE:O	1:C:76:GLU:HG3	1.92	0.69
1:B:10:VAL:HG22	1:B:17:ARG:HH22	1.58	0.69
1:A:163:MET:HA	1:A:163:MET:HE2	1.74	0.69
1:B:124:HIS:CD2	1:B:151:LYS:H	2.11	0.68
1:A:26:MET:HE1	1:D:68:GLU:HB3	1.75	0.68
1:C:85:TYR:HA	1:C:89:ASN:HD21	1.59	0.68
1:A:30:ARG:CG	1:A:31:ARG:H	2.07	0.68
1:A:129:LYS:C	1:A:129:LYS:HE2	2.20	0.66
1:A:274:THR:HB	1:B:306:PRO:HG3	1.76	0.66
1:B:153:MET:SD	1:B:342:VAL:HG21	2.35	0.66
1:B:314:MET:O	1:D:314:MET:HB2	1.94	0.66
1:A:306:PRO:HG3	1:B:274:THR:HG23	1.77	0.66
1:B:163:MET:HE2	1:B:163:MET:HA	1.78	0.66
1:C:169:LYS:O	1:C:173:GLU:HG3	1.96	0.66
1:A:274:THR:HG21	1:B:306:PRO:HG2	1.77	0.66
1:B:131:MET:HE3	1:B:154:ILE:HD11	1.76	0.66
1:B:187:SER:O	1:B:275:THR:HA	1.96	0.66
1:C:128:GLU:OE1	1:C:129:LYS:HG3	1.95	0.65
1:C:37:VAL:HA	1:C:63:VAL:HB	1.79	0.65
1:C:95:LYS:HE2	1:C:95:LYS:O	1.97	0.65
1:B:107:PRO:HG2	1:B:110:LEU:HD13	1.77	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:368:PRO:HD3	4:B:601:GOL:O1	1.96	0.65
1:B:153:MET:CG	1:B:342:VAL:HG21	2.27	0.65
1:C:105:ILE:O	1:C:105:ILE:HG22	1.96	0.65
1:D:67:ALA:O	1:D:71:LYS:HG3	1.96	0.65
1:B:195:PRO:HB3	1:B:201:LEU:CD1	2.21	0.64
1:C:103:TYR:CD2	1:C:126:MET:HG2	2.32	0.64
1:C:192:GLN:CD	1:C:192:GLN:H	2.05	0.64
1:A:234:ARG:HB2	1:A:256[A]:GLN:HG3	1.80	0.64
1:D:163:MET:HE3	1:D:321:ALA:CB	2.27	0.64
1:A:45:ASN:HB3	1:A:46:GLN:NE2	2.13	0.64
1:C:286:ALA:HB2	1:C:305:THR:HG22	1.80	0.64
1:C:124:HIS:CD2	1:C:151:LYS:H	2.16	0.63
1:C:148:ALA:O	1:C:150:LYS:HG2	1.98	0.63
1:B:44:LEU:HD12	1:B:48:LEU:HD23	1.79	0.63
1:B:320:PRO:HB2	1:B:323:ASN:HD21	1.63	0.63
1:D:337:ILE:C	1:D:338:ASN:HD22	2.07	0.63
1:A:30:ARG:HG3	1:A:31:ARG:H	1.62	0.63
1:A:252:ARG:NH2	1:B:262:GLY:O	2.32	0.63
1:B:190:MET:HE2	1:B:198:GLN:NE2	2.13	0.63
1:B:190:MET:HE2	1:B:198:GLN:HE22	1.63	0.63
1:C:128:GLU:OE1	2:C:502:NDP:H2N	1.99	0.63
1:C:228:GLU:HG3	1:C:259:PHE:CD2	2.34	0.62
1:C:93:ILE:O	1:C:123:LYS:HE3	1.99	0.62
1:C:129:LYS:C	1:C:129:LYS:HE2	2.24	0.62
1:D:186:ASN:O	1:D:269:SER:HA	1.99	0.62
1:B:304:GLN:NE2	1:B:304:GLN:N	2.46	0.62
1:C:200:ARG:HA	1:C:206:ALA:HB2	1.80	0.62
1:C:71:LYS:NZ	1:C:71:LYS:HA	2.14	0.62
5:A:644:HOH:O	1:D:17:ARG:HD3	2.00	0.61
1:D:23:ILE:HD13	1:D:23:ILE:C	2.25	0.61
1:A:69:LYS:HG3	1:D:19:MET:SD	2.39	0.61
1:B:314:MET:HG3	1:D:314:MET:C	2.25	0.61
1:C:101:ALA:HB2	1:C:124:HIS:HB2	1.82	0.61
1:B:337:ILE:C	1:B:338:ASN:HD22	2.09	0.61
1:B:2:THR:HG22	1:B:3:LEU:N	2.15	0.61
1:C:153:MET:HE1	1:C:331:HIS:HB3	1.81	0.61
1:D:90:PHE:O	1:D:93:ILE:HG12	1.99	0.61
1:D:313:MET:HE1	1:D:314:MET:HE3	1.82	0.61
1:D:361:GLU:OE2	1:D:364:ARG:NH2	2.34	0.61
1:D:246:PHE:CD1	1:D:251:ASP:HB2	2.36	0.61
1:C:62:LEU:HD12	1:C:74:ALA:HB2	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:244:GLU:H	1:C:244:GLU:CD	2.09	0.61
1:D:128:GLU:OE1	2:D:503:NDP:H2N	2.01	0.61
1:A:87:TYR:OH	2:A:500:NDP:O1X	2.19	0.60
1:B:17:ARG:N	2:C:502:NDP:O3X	2.35	0.60
1:B:10:VAL:H	1:C:202:ARG:HH22	1.49	0.60
1:B:153:MET:HG3	1:B:342:VAL:HG21	1.82	0.60
1:D:68:GLU:O	1:D:71:LYS:HB2	2.00	0.60
1:D:202:ARG:HG3	1:D:202:ARG:HH11	1.66	0.60
1:B:194:ASP:N	1:B:195:PRO:HD3	2.16	0.60
1:B:304:GLN:HE21	1:B:304:GLN:N	1.93	0.60
1:B:122:GLY:O	1:B:150:LYS:HE3	2.01	0.60
1:C:177:GLY:HA3	1:C:285:LYS:HB2	1.82	0.60
1:B:101:ALA:HB2	1:B:124:HIS:HB2	1.84	0.59
1:D:233:VAL:HG22	1:D:257:MET:HG2	1.85	0.59
1:B:221:GLY:HA2	1:B:224:TYR:CE2	2.38	0.59
1:B:244:GLU:O	1:B:247:VAL:HG23	2.03	0.59
1:B:17:ARG:HB2	2:C:502:NDP:O3X	2.02	0.59
1:C:238:TYR:HB3	1:D:264:LEU:HD11	1.84	0.59
1:B:2:THR:HA	1:C:247:VAL:HG21	1.84	0.59
1:D:337:ILE:HG22	1:D:338:ASN:HD22	1.68	0.59
1:C:196:ALA:HB2	2:C:502:NDP:O1A	2.03	0.58
1:C:99:ILE:O	1:C:123:LYS:HD2	2.01	0.58
1:B:186:ASN:O	1:B:269:SER:HA	2.03	0.58
1:D:217:TYR:OH	4:D:602:GOL:H32	2.04	0.58
1:C:228:GLU:HG3	1:C:259:PHE:HD2	1.68	0.58
1:D:274:THR:HG22	1:D:275:THR:N	2.17	0.58
1:A:191:ASP:H	1:A:197:GLN:HE22	1.44	0.58
1:B:2:THR:HG22	1:B:3:LEU:H	1.67	0.58
1:D:338:ASN:HD22	1:D:338:ASN:N	1.99	0.57
1:A:39:LEU:HB2	1:A:69:LYS:HE3	1.85	0.57
1:C:42:TYR:CE2	1:C:47:ILE:HD11	2.39	0.57
1:A:233:VAL:HG11	1:A:359:ILE:HG12	1.86	0.57
1:D:30:ARG:O	1:D:58:ARG:NH1	2.38	0.57
1:B:338:ASN:O	1:B:339:ASN:C	2.47	0.57
1:C:194:ASP:HB3	1:C:197:GLN:HG3	1.87	0.57
1:D:135:VAL:O	1:D:138:CYS:HB2	2.04	0.57
1:D:340:LYS:HB3	1:D:341:PRO:HD2	1.87	0.57
1:C:71:LYS:HA	1:C:71:LYS:HZ3	1.69	0.57
1:A:130:PRO:HG3	1:A:212:MET:HE3	1.85	0.57
1:A:178:LYS:HG2	1:A:284:ASP:CG	2.30	0.56
1:A:229:GLU:OE1	1:A:351:GLN:NE2	2.32	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:23:ILE:HD13	1:B:23:ILE:C	2.30	0.56
1:B:331:HIS:CD2	1:B:342:VAL:HG23	2.39	0.56
1:B:209:GLY:CA	1:B:249:VAL:HB	2.35	0.56
1:C:39:LEU:HB2	1:C:69:LYS:HE3	1.87	0.56
1:C:323:ASN:OD1	1:C:325:PHE:HB2	2.05	0.56
1:B:80:ASP:HB3	1:B:83:LYS:HG3	1.87	0.56
1:B:234:ARG:HD2	1:B:256[B]:GLN:OE1	2.05	0.56
1:C:190:MET:HG2	1:C:201:LEU:HD21	1.88	0.56
1:C:377:ARG:NH1	1:C:380:GLY:O	2.39	0.56
2:D:503:NDP:H42N	4:D:602:GOL:C3	2.28	0.56
1:C:151:LYS:HD2	1:C:336:VAL:HG22	1.88	0.56
1:A:109:SER:HB3	1:A:204:GLU:O	2.05	0.56
1:D:187:SER:HA	1:D:214:ILE:HD12	1.86	0.56
1:D:330:ASP:O	1:D:334:GLU:HG3	2.07	0.55
1:C:60:GLU:HG2	1:C:99:ILE:HG12	1.89	0.55
1:C:322:ASN:OD1	1:C:326:SER:HB2	2.06	0.55
1:A:233:VAL:HG22	1:A:257:MET:HG2	1.89	0.55
1:C:37:VAL:HG12	1:C:106:LEU:HD21	1.89	0.55
1:C:231:ILE:HG13	1:C:232:GLU:N	2.22	0.55
1:C:351:GLN:HE22	1:C:373:TRP:HE1	1.55	0.55
1:B:323:ASN:HA	5:B:617:HOH:O	2.06	0.55
1:C:119:PHE:C	1:C:121:ALA:H	2.15	0.55
1:C:199:TRP:CZ2	2:C:502:NDP:H3D	2.42	0.55
1:C:224:TYR:CB	1:C:381:TYR:HB3	2.37	0.55
1:B:4:PRO:HD2	1:B:7:ALA:HB3	1.87	0.54
1:B:152:LEU:HD13	1:B:346:GLY:HA3	1.89	0.54
1:D:190:MET:HG3	1:D:191:ASP:N	2.22	0.54
1:D:119:PHE:HZ	1:D:152:LEU:HG	1.70	0.54
1:D:187:SER:HB3	1:D:270:SER:HB3	1.88	0.54
1:D:251:ASP:OD2	1:D:252:ARG:HD3	2.08	0.54
1:A:288:LEU:HD12	1:A:289:LEU:H	1.72	0.54
1:B:258[B]:ARG:NH1	1:B:262:GLY:HA2	2.22	0.54
1:C:132:ALA:HB3	1:C:138:CYS:SG	2.48	0.54
1:D:30:ARG:HB3	1:D:58:ARG:HD3	1.89	0.54
1:D:89:ASN:O	1:D:92:LYS:HG2	2.07	0.54
1:B:39:LEU:HB2	1:B:69:LYS:HD3	1.90	0.54
1:B:10:VAL:N	1:C:202:ARG:NH2	2.54	0.54
1:C:374:GLY:O	1:C:375:TYR:C	2.51	0.54
1:A:291:ASP:HA	1:A:292:PRO:C	2.33	0.53
1:B:179:LEU:HD13	1:B:226:LEU:HD23	1.89	0.53
1:C:51:PHE:CD2	1:C:59:ILE:HG12	2.44	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:208:GLY:HA3	1:D:212:MET:HG3	1.89	0.53
1:D:322:ASN:O	1:D:324:GLN:N	2.37	0.53
1:B:3:LEU:HD11	1:C:248:GLU:CD	2.34	0.53
1:A:27:PRO:HD3	1:D:71:LYS:HB3	1.91	0.53
1:B:48:LEU:HB3	1:B:77:TYR:CZ	2.44	0.53
1:D:211:LEU:HA	1:D:215:GLY:HA3	1.89	0.53
1:B:337:ILE:HG22	1:B:338:ASN:HD21	1.71	0.53
1:D:163:MET:HE1	1:D:314:MET:SD	2.49	0.53
1:C:81:PRO:HA	1:C:84:ILE:HG13	1.91	0.53
1:C:262:GLY:O	1:D:252:ARG:NH2	2.39	0.53
1:B:42:TYR:CD1	1:B:46:GLN:HG3	2.44	0.53
1:B:203:ARG:HB2	1:B:248:GLU:HB3	1.90	0.53
1:C:103:TYR:CE2	1:C:126:MET:HG2	2.44	0.52
1:C:252:ARG:NH2	1:D:262:GLY:O	2.42	0.52
1:A:96:ASP:OD1	1:A:98:LYS:HB2	2.10	0.52
1:A:124:HIS:CD2	1:A:151:LYS:H	2.19	0.52
1:B:323:ASN:HB3	5:B:608:HOH:O	2.08	0.52
1:A:80:ASP:HB3	1:A:83:LYS:HG3	1.92	0.52
1:A:211:LEU:HD23	1:A:356:ILE:HG23	1.91	0.52
1:A:330:ASP:O	1:A:334:GLU:HG2	2.09	0.52
1:C:108:ASN:OD1	1:C:130:PRO:HD2	2.09	0.52
1:D:347:GLU:OE1	1:D:347:GLU:N	2.38	0.52
1:A:301:ILE:HG13	1:A:301:ILE:O	2.10	0.52
1:A:221:GLY:HA2	1:A:224:TYR:CE2	2.44	0.52
1:B:228:GLU:HG3	1:B:259:PHE:CD2	2.44	0.52
1:B:338:ASN:O	1:B:340:LYS:N	2.42	0.52
1:D:163:MET:N	1:D:163:MET:HE2	2.24	0.52
1:D:5:ALA:O	1:D:9:GLN:HG3	2.10	0.52
1:B:342:VAL:HG22	1:B:344:SER:H	1.74	0.52
1:C:251:ASP:OD2	1:C:252:ARG:HD2	2.09	0.52
1:C:367:ARG:CG	1:C:368:PRO:HD2	2.39	0.52
1:D:122:GLY:O	1:D:150:LYS:HE3	2.10	0.52
1:B:308:HIS:N	1:B:308:HIS:CD2	2.77	0.51
1:D:228:GLU:HG3	1:D:259:PHE:CD2	2.45	0.51
3:A:604:BME:H21	1:B:178:LYS:HD3	1.92	0.51
1:B:43:ALA:O	1:B:48:LEU:HD22	2.09	0.51
1:B:112:ALA:O	1:B:116:ILE:HG13	2.10	0.51
1:A:260:ARG:NH2	1:A:372:ASP:OD2	2.43	0.51
1:C:224:TYR:HA	1:C:381:TYR:HB3	1.91	0.51
1:B:368:PRO:HG2	4:B:601:GOL:O2	2.10	0.51
1:D:68:GLU:CD	1:D:68:GLU:N	2.69	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:365:THR:OG1	1:D:367:ARG:HG3	2.11	0.51
1:C:138:CYS:O	1:C:142:ILE:HG13	2.11	0.51
1:D:304:GLN:HG2	1:D:310:ASN:OD1	2.11	0.51
1:B:89:ASN:HB2	1:B:92:LYS:HD2	1.93	0.51
1:A:48:LEU:HB3	1:A:77:TYR:CZ	2.46	0.51
1:C:60:GLU:CG	1:C:99:ILE:HG12	2.41	0.51
1:A:290:MET:HA	1:A:301:ILE:HG22	1.93	0.50
1:C:153:MET:HE3	1:C:342:VAL:CG2	2.41	0.50
1:C:330:ASP:O	1:C:334:GLU:HG3	2.10	0.50
1:B:319:MET:HB2	1:D:313:MET:HA	1.93	0.50
1:A:243:ASP:OD1	1:A:245:ARG:HD3	2.11	0.50
1:D:178:LYS:O	1:D:283:GLY:HA2	2.10	0.50
1:D:313:MET:HE2	1:D:314:MET:HB3	1.93	0.50
1:A:338:ASN:O	1:A:340:LYS:HG3	2.11	0.50
1:C:38:GLY:HA3	1:C:106:LEU:HD23	1.93	0.50
1:B:48:LEU:HB2	1:B:49:PRO:HD3	1.94	0.50
1:C:153:MET:HB2	1:C:342:VAL:HG21	1.93	0.50
1:D:199:TRP:CB	1:D:205:LEU:HD13	2.42	0.50
1:D:119:PHE:CZ	1:D:152:LEU:HG	2.46	0.50
1:A:176:LEU:C	1:A:285:LYS:HB3	2.36	0.49
1:B:36:ILE:HD12	1:B:36:ILE:N	2.27	0.49
1:D:110:LEU:N	1:D:110:LEU:HD22	2.25	0.49
1:D:246:PHE:CG	1:D:251:ASP:HB2	2.47	0.49
1:D:274:THR:CG2	1:D:275:THR:N	2.74	0.49
1:B:42:TYR:CD1	2:B:501:NDP:H41N	2.48	0.49
1:B:197:GLN:O	1:B:197:GLN:HG2	2.12	0.49
1:C:80:ASP:C	1:C:82:ARG:H	2.19	0.49
1:D:163:MET:HE2	1:D:163:MET:HA	1.94	0.49
1:D:129:LYS:HA	1:D:130:PRO:C	2.36	0.49
1:A:119:PHE:CE2	1:A:145:ALA:HB2	2.47	0.49
1:B:156:TYR:O	1:B:159:HIS:HB2	2.13	0.49
1:C:86:ASP:CG	1:C:87:TYR:N	2.70	0.49
1:C:114:PHE:HA	1:C:117:ARG:HB2	1.94	0.49
1:C:196:ALA:HA	2:C:502:NDP:PA	2.51	0.49
1:D:338:ASN:ND2	1:D:338:ASN:N	2.60	0.49
1:A:129:LYS:HE2	1:A:129:LYS:O	2.12	0.49
1:A:288:LEU:HD12	1:A:289:LEU:N	2.28	0.49
1:B:34:TYR:HB2	1:B:58:ARG:O	2.13	0.49
1:D:89:ASN:HB2	1:D:92:LYS:HG3	1.94	0.49
1:C:48:LEU:HB3	1:C:77:TYR:CZ	2.47	0.49
1:A:191:ASP:N	1:A:197:GLN:NE2	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:189:VAL:HG23	1:C:274:THR:HA	1.95	0.49
1:C:274:THR:HB	1:D:306:PRO:CG	2.43	0.49
1:D:187:SER:HA	1:D:214:ILE:CD1	2.43	0.49
1:B:4:PRO:HD2	1:B:7:ALA:CB	2.43	0.48
1:B:10:VAL:HG22	1:B:17:ARG:NH2	2.26	0.48
1:A:272:SER:HB2	3:A:604:BME:H12	1.94	0.48
1:B:2:THR:O	1:C:244:GLU:HB3	2.14	0.48
1:B:102:VAL:HG12	1:B:125:VAL:HG22	1.94	0.48
1:C:84:ILE:HG22	1:C:84:ILE:O	2.13	0.48
1:D:30:ARG:CB	1:D:58:ARG:HD3	2.43	0.48
1:B:90:PHE:HB3	1:B:117:ARG:NH2	2.29	0.48
1:C:42:TYR:CZ	1:C:47:ILE:HD11	2.48	0.48
1:D:190:MET:HE1	1:D:198:GLN:HE21	1.78	0.48
1:B:40:GLY:O	1:B:44:LEU:HB2	2.14	0.48
1:C:153:MET:CG	1:C:342:VAL:HG21	2.44	0.48
1:B:124:HIS:HD2	1:B:151:LYS:H	1.57	0.48
1:A:274:THR:CG2	1:B:306:PRO:HG2	2.43	0.48
1:C:160:TYR:OH	1:C:343:ARG:HB3	2.13	0.48
1:D:298:GLN:HE21	1:D:298:GLN:C	2.21	0.48
1:A:290:MET:HG2	1:A:301:ILE:CG2	2.44	0.48
1:B:34:TYR:OH	1:B:332:LEU:HB3	2.13	0.48
1:A:167:ALA:HB1	1:A:288:LEU:HD21	1.96	0.48
1:B:11:PRO:C	1:B:13:THR:N	2.66	0.48
1:A:45:ASN:CB	1:A:46:GLN:NE2	2.77	0.48
1:B:337:ILE:C	1:B:338:ASN:ND2	2.72	0.48
1:C:274:THR:HG23	1:D:284:ASP:C	2.39	0.48
1:B:220:ASN:ND2	1:B:352:ASP:OD2	2.39	0.47
1:C:178:LYS:O	1:C:283:GLY:HA2	2.13	0.47
1:C:367:ARG:HG3	1:C:368:PRO:HD2	1.95	0.47
1:D:162:PRO:HB2	1:D:321:ALA:HA	1.95	0.47
1:B:102:VAL:CG1	1:B:125:VAL:HG22	2.44	0.47
1:B:190:MET:HE3	1:B:190:MET:HA	1.95	0.47
1:A:219:LEU:O	1:A:223:ARG:HG3	2.14	0.47
1:B:233:VAL:HG12	1:B:369:VAL:HB	1.95	0.47
1:D:153:MET:HB2	1:D:342:VAL:HG21	1.96	0.47
1:D:199:TRP:HB2	1:D:205:LEU:HD13	1.97	0.47
1:A:94:ALA:HB2	1:A:121:ALA:HB1	1.96	0.47
1:A:151:LYS:HD2	1:A:336:VAL:HG22	1.95	0.47
1:C:194:ASP:HB3	1:C:197:GLN:CG	2.44	0.47
1:D:194:ASP:N	1:D:195:PRO:CD	2.76	0.47
1:B:12:THR:HA	1:C:205:LEU:HD21	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:290:MET:HG2	1:B:301:ILE:HG22	1.96	0.47
1:C:172:ARG:HH22	1:C:227:GLY:CA	2.28	0.47
1:C:167:ALA:O	1:C:170:LEU:HG	2.14	0.47
1:C:297:TYR:O	1:C:298:GLN:HB2	2.14	0.47
1:D:163:MET:HE2	1:D:163:MET:CA	2.44	0.47
1:A:331:HIS:CD2	1:A:342:VAL:HG23	2.50	0.47
1:C:264:LEU:HD11	1:D:238:TYR:HB3	1.97	0.47
1:D:351:GLN:HE21	1:D:355:LEU:HD11	1.80	0.47
1:A:26:MET:HB2	1:A:55:GLN:HG3	1.97	0.46
1:B:179:LEU:CD1	1:B:226:LEU:HD23	2.45	0.46
1:A:42:TYR:CE2	1:A:47:ILE:HD11	2.50	0.46
1:B:10:VAL:O	1:C:202:ARG:NH1	2.48	0.46
1:C:42:TYR:O	1:C:47:ILE:HG12	2.16	0.46
1:A:170:LEU:O	1:A:175:GLN:HB2	2.15	0.46
1:B:109:SER:OG	1:B:110:LEU:HD12	2.15	0.46
1:A:36:ILE:HG12	1:A:48:LEU:HD11	1.96	0.46
1:B:9:GLN:CD	1:B:9:GLN:O	2.58	0.46
1:B:176:LEU:HD11	1:B:288:LEU:HB3	1.98	0.46
1:B:22:ALA:O	1:B:23:ILE:C	2.58	0.46
1:D:186:ASN:HA	1:D:276:THR:O	2.15	0.46
1:C:192:GLN:HE21	1:C:193:ASN:ND2	2.13	0.46
1:D:290:MET:HG2	1:D:301:ILE:HG22	1.98	0.46
1:A:262:GLY:O	1:B:252:ARG:NH2	2.47	0.46
1:A:337:ILE:HG22	1:A:338:ASN:HD22	1.77	0.46
1:A:211:LEU:CD2	1:A:356:ILE:HG23	2.46	0.46
1:C:374:GLY:O	1:C:376:VAL:HG23	2.16	0.46
1:D:106:LEU:HB3	1:D:107:PRO:HD2	1.96	0.46
1:D:109:SER:OG	1:D:110:LEU:HD22	2.16	0.46
1:B:21:TYR:HB2	1:C:41:LYS:HE2	1.98	0.46
1:B:115:ALA:O	1:B:119:PHE:CD2	2.68	0.46
1:B:190:MET:HE3	1:B:191:ASP:H	1.81	0.46
1:A:119:PHE:CZ	1:A:145:ALA:HB2	2.51	0.46
1:A:367:ARG:CG	1:A:368:PRO:HD2	2.46	0.46
1:B:32:PHE:N	1:B:58:ARG:NH1	2.63	0.46
1:B:201:LEU:HD22	1:B:245:ARG:O	2.16	0.46
1:A:347:GLU:CD	1:A:347:GLU:H	2.25	0.45
1:C:243:ASP:CG	1:C:245:ARG:HD3	2.41	0.45
1:D:194:ASP:O	1:D:195:PRO:C	2.59	0.45
1:D:323:ASN:N	1:D:323:ASN:HD22	2.14	0.45
1:A:172:ARG:C	1:A:174:ASN:H	2.23	0.45
1:B:103:TYR:HE1	1:B:128:GLU:HG2	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:162:PRO:HB2	1:B:321:ALA:HA	1.97	0.45
1:C:68:GLU:O	1:C:71:LYS:HB3	2.16	0.45
1:C:131:MET:CE	1:C:154:ILE:HD11	2.42	0.45
1:D:217:TYR:CE2	4:D:602:GOL:H32	2.52	0.45
1:B:54:CYS:HB3	1:B:330:ASP:OD1	2.16	0.45
1:B:85:TYR:CZ	1:B:93:ILE:HG22	2.51	0.45
1:B:162:PRO:CB	1:B:321:ALA:HA	2.46	0.45
1:A:251:ASP:OD2	1:A:252:ARG:HD3	2.16	0.45
1:B:8:SER:C	1:C:202:ARG:NH2	2.74	0.45
1:B:91:ASP:OD1	1:B:117:ARG:NH2	2.49	0.45
1:D:202:ARG:HG3	1:D:202:ARG:NH1	2.30	0.45
3:A:604:BME:H22	1:B:284:ASP:HB3	1.99	0.45
1:B:2:THR:O	1:B:3:LEU:C	2.59	0.45
1:B:167:ALA:O	1:B:170:LEU:HG	2.17	0.45
1:C:211:LEU:CD2	1:C:356:ILE:HG23	2.46	0.45
1:C:203:ARG:HB2	1:C:248:GLU:HB3	1.99	0.45
1:C:306:PRO:HD3	1:D:274:THR:HG21	1.99	0.45
1:A:30:ARG:CG	1:A:31:ARG:N	2.78	0.45
1:A:39:LEU:HD13	1:A:73:VAL:HG21	1.99	0.45
1:A:74:ALA:HB2	1:A:84:ILE:HD11	1.98	0.45
1:C:199:TRP:HZ2	2:C:502:NDP:H3D	1.82	0.45
1:D:85:TYR:N	1:D:85:TYR:CD1	2.84	0.45
1:B:32:PHE:CE1	1:B:100:ASP:HB3	2.52	0.45
1:C:46:GLN:HB2	1:C:325:PHE:CE1	2.52	0.45
1:A:153:MET:HE3	1:A:160:TYR:OH	2.16	0.44
1:B:213:ASP:OD2	1:B:214:ILE:HG23	2.17	0.44
1:C:85:TYR:CA	1:C:89:ASN:HD21	2.28	0.44
1:C:44:LEU:O	1:C:49:PRO:CD	2.66	0.44
1:B:106:LEU:HB3	1:B:107:PRO:HD2	1.98	0.44
1:C:200:ARG:NH2	2:C:502:NDP:H6N	2.33	0.44
1:C:203:ARG:HG2	1:C:203:ARG:HH11	1.81	0.44
1:D:313:MET:HE2	1:D:314:MET:CB	2.48	0.44
1:D:349:GLY:O	1:D:353:VAL:HG23	2.17	0.44
1:A:63:VAL:HA	1:A:85:TYR:O	2.17	0.44
1:B:42:TYR:CE2	1:B:47:ILE:HD11	2.53	0.44
1:B:103:TYR:HA	1:B:126:MET:O	2.18	0.44
1:B:110:LEU:HD12	1:B:110:LEU:N	2.33	0.44
1:D:215:GLY:HA2	1:D:269:SER:HB3	2.00	0.44
1:A:28:GLU:N	1:A:28:GLU:OE1	2.50	0.44
1:C:112:ALA:HA	1:C:141:MET:SD	2.58	0.44
1:C:190:MET:HE2	1:C:271:TYR:CE2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:246:PHE:CD2	1:C:251:ASP:HB2	2.53	0.44
1:D:23:ILE:C	1:D:23:ILE:CD1	2.91	0.43
1:D:190:MET:HE3	1:D:190:MET:C	2.43	0.43
1:C:213:ASP:CB	1:C:271:TYR:OH	2.66	0.43
1:D:215:GLY:CA	1:D:269:SER:HB3	2.48	0.43
1:C:324:GLN:HG3	1:C:325:PHE:N	2.33	0.43
1:A:203:ARG:NH1	1:A:248:GLU:O	2.51	0.43
1:B:314:MET:C	1:D:314:MET:CB	2.84	0.43
1:A:27:PRO:HB2	1:A:28:GLU:OE1	2.18	0.43
1:C:351:GLN:NE2	1:C:373:TRP:HE1	2.16	0.43
1:D:228:GLU:HG3	1:D:259:PHE:HD2	1.82	0.43
1:C:37:VAL:HG13	1:C:63:VAL:HG11	2.01	0.43
1:C:66:ASN:OD1	1:C:68:GLU:HB3	2.18	0.43
1:D:217:TYR:CZ	4:D:602:GOL:H32	2.54	0.43
1:B:39:LEU:HG	1:B:64:SER:HB2	1.99	0.43
1:B:198:GLN:HB2	1:B:201:LEU:HD12	2.00	0.43
1:B:209:GLY:HA2	1:B:249:VAL:HB	2.00	0.43
1:C:41:LYS:O	1:C:45:ASN:HB2	2.19	0.43
1:C:234:ARG:HD2	1:C:256:GLN:OE1	2.18	0.43
1:D:48:LEU:HD12	1:D:48:LEU:HA	1.84	0.43
1:D:68:GLU:HA	1:D:71:LYS:HD2	1.99	0.43
1:A:174:ASN:CG	1:A:174:ASN:O	2.59	0.43
1:B:352:ASP:O	1:B:356:ILE:HG13	2.19	0.43
1:C:80:ASP:C	1:C:82:ARG:N	2.76	0.43
1:D:187:SER:CB	1:D:270:SER:HB3	2.48	0.43
1:D:234:ARG:HD2	1:D:256:GLN:OE1	2.19	0.43
1:B:311:GLN:HB3	1:D:320:PRO:HG3	2.01	0.43
1:C:361:GLU:HG3	1:C:364:ARG:NH2	2.33	0.43
1:C:44:LEU:HD23	1:C:48:LEU:HD22	2.00	0.42
1:D:274:THR:HG22	5:D:646:HOH:O	2.18	0.42
1:A:367:ARG:HG3	1:A:368:PRO:HD2	2.01	0.42
1:C:80:ASP:OD1	1:C:82:ARG:HB3	2.19	0.42
1:D:182:VAL:HA	1:D:280:SER:O	2.18	0.42
1:D:246:PHE:CE1	1:D:251:ASP:HB2	2.54	0.42
1:B:311:GLN:HG2	1:D:320:PRO:HG2	2.01	0.42
1:C:126:MET:HA	1:C:153:MET:O	2.19	0.42
1:C:215:GLY:CA	1:C:269:SER:HB3	2.50	0.42
1:A:85:TYR:CD1	1:A:85:TYR:N	2.88	0.42
1:B:182:VAL:O	1:B:265:SER:HA	2.20	0.42
1:B:246:PHE:CD2	1:B:251:ASP:HB2	2.54	0.42
1:C:172:ARG:HH22	1:C:227:GLY:HA2	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:305:THR:HB	1:C:306:PRO:HD2	2.02	0.42
1:A:323:ASN:HB3	1:D:76:GLU:HA	2.00	0.42
1:B:103:TYR:CE2	1:B:126:MET:HG2	2.55	0.42
1:C:122:GLY:C	1:C:150:LYS:HE3	2.44	0.42
1:C:348:GLU:OE1	1:C:377:ARG:HD3	2.19	0.42
1:D:103:TYR:HA	1:D:126:MET:O	2.20	0.42
1:B:311:GLN:HB3	1:D:320:PRO:CG	2.50	0.42
1:D:190:MET:HG3	1:D:191:ASP:H	1.84	0.42
1:C:254:ILE:HG12	1:C:268:ALA:HB2	2.00	0.42
1:A:129:LYS:HA	1:A:130:PRO:C	2.44	0.42
1:A:171:ILE:CG2	1:A:179:LEU:HD11	2.49	0.42
1:C:42:TYR:HA	1:C:46:GLN:HG2	2.01	0.42
1:C:90:PHE:O	1:C:93:ILE:HG23	2.18	0.42
1:A:80:ASP:HA	1:A:81:PRO:HD2	1.85	0.42
1:A:178:LYS:HG2	1:A:284:ASP:OD2	2.20	0.42
1:A:367:ARG:HG2	1:A:368:PRO:N	2.35	0.42
1:C:199:TRP:HB2	1:C:205:LEU:HD13	2.02	0.42
1:D:160:TYR:OH	1:D:343:ARG:HB3	2.20	0.42
1:A:361:GLU:HG3	1:A:364:ARG:NH2	2.35	0.42
1:B:109:SER:HB3	1:B:205:LEU:HA	2.02	0.42
1:C:105:ILE:O	1:C:105:ILE:CG2	2.67	0.42
1:C:172:ARG:C	1:C:174:ASN:H	2.27	0.42
1:C:224:TYR:HB2	1:C:381:TYR:HB3	2.02	0.42
1:D:36:ILE:N	1:D:36:ILE:HD12	2.35	0.42
1:A:347:GLU:CD	1:A:347:GLU:N	2.78	0.41
1:A:128:GLU:OE1	2:A:500:NDP:H2N	2.20	0.41
1:C:85:TYR:HE2	1:C:92:LYS:HB3	1.85	0.41
1:C:373:TRP:HD1	1:C:375:TYR:H	1.68	0.41
1:A:37:VAL:HG22	1:A:63:VAL:HG21	2.02	0.41
1:A:289:LEU:O	1:A:301:ILE:HA	2.20	0.41
1:B:90:PHE:O	1:B:93:ILE:HG23	2.20	0.41
1:C:273:THR:HB	1:D:282:GLN:HB3	2.02	0.41
1:D:313:MET:HE2	1:D:314:MET:N	2.35	0.41
1:C:103:TYR:OH	1:C:328:GLN:NE2	2.51	0.41
1:C:234:ARG:HG3	1:C:234:ARG:HH11	1.86	0.41
1:D:129:LYS:HD3	5:D:653:HOH:O	2.20	0.41
1:B:320:PRO:CB	1:D:311:GLN:HG3	2.49	0.41
1:C:93:ILE:O	1:C:123:LYS:CE	2.68	0.41
1:D:17:ARG:HB3	1:D:18:PRO:HD2	2.02	0.41
1:D:105:ILE:HG22	1:D:105:ILE:O	2.21	0.41
1:B:153:MET:SD	1:B:342:VAL:CG2	3.08	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:184:THR:O	1:C:267:GLY:HA2	2.20	0.41
1:C:331:HIS:HD2	1:C:342:VAL:HG23	1.86	0.41
1:D:192:GLN:O	1:D:192:GLN:HG3	2.19	0.41
1:A:31:ARG:O	1:A:58:ARG:NH1	2.53	0.41
1:A:220:ASN:ND2	1:A:352:ASP:OD2	2.47	0.41
1:B:190:MET:O	1:B:191:ASP:C	2.63	0.41
1:B:320:PRO:HB3	1:D:311:GLN:HG3	2.03	0.41
1:C:340:LYS:HB3	1:C:341:PRO:HD2	2.03	0.41
1:A:177:GLY:HA3	1:A:285:LYS:HB2	2.01	0.41
1:D:112:ALA:O	1:D:116:ILE:HG13	2.21	0.41
1:A:159:HIS:O	1:A:165:ARG:HD3	2.21	0.41
1:B:13:THR:O	1:B:14:PRO:C	2.62	0.41
1:B:122:GLY:C	1:B:150:LYS:HE3	2.46	0.41
1:B:371:THR:O	1:B:373:TRP:N	2.53	0.41
1:C:114:PHE:CD1	1:C:114:PHE:N	2.89	0.41
1:C:333:ALA:O	1:C:337:ILE:HG13	2.21	0.41
1:C:348:GLU:OE1	1:C:377:ARG:NE	2.53	0.41
1:D:42:TYR:CD1	2:D:503:NDP:H41N	2.55	0.41
1:D:190:MET:HE2	1:D:198:GLN:HG2	2.01	0.41
1:D:226:LEU:HD12	1:D:259:PHE:CZ	2.56	0.41
1:D:235:ALA:HB2	1:D:359:ILE:HG23	2.02	0.41
1:A:27:PRO:O	1:A:54:CYS:O	2.39	0.41
1:B:2:THR:CG2	1:B:3:LEU:N	2.83	0.41
1:C:71:LYS:O	1:C:72:ILE:C	2.63	0.41
1:C:224:TYR:CA	1:C:381:TYR:HB3	2.51	0.41
2:C:502:NDP:H2N	2:C:502:NDP:H71N	1.69	0.41
1:D:153:MET:CG	1:D:342:VAL:HG21	2.51	0.41
1:D:191:ASP:HB3	1:D:245:ARG:CG	2.50	0.41
1:A:151:LYS:HE3	1:A:335:ALA:O	2.21	0.40
1:A:246:PHE:CD2	1:A:251:ASP:HB2	2.57	0.40
1:B:23:ILE:C	1:B:23:ILE:CD1	2.94	0.40
1:B:255:TRP:CD1	1:B:257:MET:HE2	2.57	0.40
1:C:42:TYR:CD1	2:C:502:NDP:H41N	2.57	0.40
1:C:62:LEU:CD1	1:C:74:ALA:HB2	2.49	0.40
1:C:92:LYS:O	1:C:94:ALA:N	2.54	0.40
1:D:140:ARG:HH11	1:D:140:ARG:HG2	1.86	0.40
1:A:366:GLY:HA3	4:B:601:GOL:H31	2.03	0.40
1:C:211:LEU:HB2	1:C:253:ILE:HG21	2.02	0.40
1:C:251:ASP:OD2	1:C:252:ARG:CD	2.69	0.40
1:D:221:GLY:O	1:D:225:LEU:HG	2.21	0.40
1:A:288:LEU:HD12	1:A:302:SER:O	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:6:GLY:HA2	1:B:9:GLN:HG3	2.02	0.40
1:D:190:MET:CE	1:D:198:GLN:HE21	2.34	0.40
1:D:366:GLY:HA2	5:D:644:HOH:O	2.21	0.40
1:A:178:LYS:O	1:A:178:LYS:HG3	2.20	0.40
1:C:181:MET:HE3	1:D:268:ALA:HB1	2.03	0.40
1:C:322:ASN:OD1	1:C:323:ASN:N	2.55	0.40
1:A:39:LEU:O	1:A:69:LYS:NZ	2.52	0.40
1:A:246:PHE:CG	1:A:251:ASP:HB2	2.57	0.40
1:B:202:ARG:HG3	1:B:202:ARG:HH11	1.85	0.40
1:B:215:GLY:CA	1:B:269:SER:HB3	2.52	0.40
1:D:131:MET:HE3	1:D:154:ILE:CD1	2.35	0.40
1:D:146:LYS:NZ	1:D:146:LYS:HB3	2.36	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	
1	A	340/387 (88%)	315 (93%)	20 (6%)	5 (2%)	8	8
1	B	368/387 (95%)	322 (88%)	42 (11%)	4 (1%)	11	13
1	C	335/387 (87%)	293 (88%)	36 (11%)	6 (2%)	6	6
1	D	364/387 (94%)	333 (92%)	26 (7%)	5 (1%)	9	9
All	All	1407/1548 (91%)	1263 (90%)	124 (9%)	20 (1%)	9	9

All (20) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	31	ARG
1	A	378	GLN
1	B	339	ASN

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Mol	Chain	Res	Type
1	D	195	PRO
1	D	323	ASN
1	A	27	PRO
1	A	30	ARG
1	B	378	GLN
1	D	190	MET
1	D	194	ASP
1	B	4	PRO
1	C	93	ILE
1	C	377	ARG
1	C	68	GLU
1	C	88	SER
1	C	195	PRO
1	C	375	TYR
1	D	18	PRO
1	B	323	ASN
1	A	155	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	
1	A	280/314 (89%)	272 (97%)	8 (3%)	37	55
1	B	301/314 (96%)	289 (96%)	12 (4%)	28	42
1	C	275/314 (88%)	265 (96%)	10 (4%)	31	47
1	D	297/314 (95%)	281 (95%)	16 (5%)	20	29
All	All	1153/1256 (92%)	1107 (96%)	46 (4%)	28	42

All (46) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	PRO
1	A	129	LYS
1	A	152	LEU
1	A	188	ASP

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Mol	Chain	Res	Type
1	A	256[A]	GLN
1	A	256[B]	GLN
1	A	271	TYR
1	A	320	PRO
1	B	9	GLN
1	B	23	ILE
1	B	44	LEU
1	B	48	LEU
1	B	129	LYS
1	B	152	LEU
1	B	188	ASP
1	B	233	VAL
1	B	271	TYR
1	B	298	GLN
1	B	304	GLN
1	B	305	THR
1	C	46	GLN
1	C	48	LEU
1	C	71	LYS
1	C	86	ASP
1	C	95	LYS
1	C	128	GLU
1	C	129	LYS
1	C	152	LEU
1	C	271	TYR
1	C	297	TYR
1	D	23	ILE
1	D	44	LEU
1	D	48	LEU
1	D	69	LYS
1	D	113	GLU
1	D	129	LYS
1	D	152	LEU
1	D	172	ARG
1	D	191	ASP
1	D	195	PRO
1	D	271	TYR
1	D	298	GLN
1	D	311	GLN
1	D	313	MET
1	D	323	ASN
1	D	367	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (38) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	46	GLN
1	A	56	HIS
1	A	124	HIS
1	A	139	GLN
1	A	174	ASN
1	A	197	GLN
1	A	338	ASN
1	B	9	GLN
1	B	45	ASN
1	B	124	HIS
1	B	149	ASN
1	B	193	ASN
1	B	197	GLN
1	B	198	GLN
1	B	304	GLN
1	B	308	HIS
1	B	338	ASN
1	B	339	ASN
1	B	378	GLN
1	C	108	ASN
1	C	124	HIS
1	C	149	ASN
1	C	193	ASN
1	C	198	GLN
1	C	298	GLN
1	C	331	HIS
1	C	338	ASN
1	D	46	GLN
1	D	124	HIS
1	D	139	GLN
1	D	149	ASN
1	D	186	ASN
1	D	198	GLN
1	D	298	GLN
1	D	323	ASN
1	D	338	ASN
1	D	339	ASN
1	D	378	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

8 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	GOL	B	601	-	5,5,5	0.36	0	5,5,5	0.60	0
4	GOL	D	602	-	5,5,5	0.43	0	5,5,5	0.49	0
2	NDP	D	503	-	51,52,52	3.25	8 (15%)	71,80,80	2.73	29 (40%)
3	BME	A	604	-	3,3,3	0.53	0	2,2,2	0.09	0
4	GOL	A	603	-	5,5,5	0.33	0	5,5,5	0.59	0
2	NDP	B	501	-	51,52,52	3.50	9 (17%)	71,80,80	3.34	32 (45%)
2	NDP	A	500	-	51,52,52	3.13	10 (19%)	71,80,80	3.04	38 (53%)
2	NDP	C	502	-	51,52,52	3.35	11 (21%)	71,80,80	3.10	31 (43%)

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	GOL	B	601	-	-	0/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	D	602	-	-	1/4/4/4	-
2	NDP	D	503	-	-	6/34/77/77	0/5/5/5
3	BME	A	604	-	-	1/1/1/1	-
4	GOL	A	603	-	-	0/4/4/4	-
2	NDP	B	501	-	-	11/34/77/77	0/5/5/5
2	NDP	A	500	-	-	3/34/77/77	0/5/5/5
2	NDP	C	502	-	2/2/14/17	13/34/77/77	0/5/5/5

All (38) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	501	NDP	PA-O3	21.73	1.83	1.59
2	C	502	NDP	PA-O3	20.29	1.81	1.59
2	D	503	NDP	PA-O3	19.89	1.81	1.59
2	A	500	NDP	PA-O3	18.14	1.79	1.59
2	A	500	NDP	O7N-C7N	7.49	1.42	1.24
2	C	502	NDP	O7N-C7N	7.41	1.41	1.24
2	D	503	NDP	O7N-C7N	7.39	1.41	1.24
2	B	501	NDP	O7N-C7N	7.19	1.41	1.24
2	C	502	NDP	PA-O5B	5.64	1.81	1.59
2	A	500	NDP	PA-O5B	5.42	1.80	1.59
2	B	501	NDP	PA-O5B	5.18	1.79	1.59
2	D	503	NDP	PA-O5B	4.83	1.78	1.59
2	C	502	NDP	PA-O1A	3.84	1.64	1.50
2	B	501	NDP	PA-O1A	3.78	1.63	1.50
2	A	500	NDP	PA-O1A	3.59	1.63	1.50
2	D	503	NDP	PA-O1A	3.47	1.62	1.50
2	D	503	NDP	C8A-N7A	3.06	1.37	1.31
2	B	501	NDP	PN-O3	3.04	1.62	1.59
2	B	501	NDP	C8A-N7A	2.79	1.37	1.31
2	B	501	NDP	C2A-N1A	2.76	1.38	1.33
2	C	502	NDP	C2A-N1A	2.54	1.38	1.33
2	C	502	NDP	C6N-C5N	2.46	1.40	1.33
2	A	500	NDP	C8A-N7A	2.40	1.36	1.31
2	C	502	NDP	C5A-N7A	-2.37	1.34	1.39
2	A	500	NDP	C6N-C5N	2.36	1.40	1.33
2	B	501	NDP	C2A-N3A	2.36	1.38	1.33
2	C	502	NDP	C8A-N7A	2.35	1.36	1.31
2	C	502	NDP	C2A-N3A	2.34	1.38	1.33
2	A	500	NDP	C3B-C2B	-2.26	1.48	1.53
2	D	503	NDP	C6N-C5N	2.24	1.39	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	500	NDP	P2B-O2B	-2.24	1.55	1.59
2	A	500	NDP	C5A-N7A	-2.11	1.35	1.39
2	C	502	NDP	O4D-C4D	-2.08	1.40	1.45
2	D	503	NDP	C2A-N1A	2.07	1.37	1.33
2	B	501	NDP	C6N-C5N	2.06	1.39	1.33
2	D	503	NDP	PA-O2A	2.03	1.64	1.55
2	C	502	NDP	PN-O3	2.02	1.61	1.59
2	A	500	NDP	C4N-C3N	2.01	1.53	1.50

All (130) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	502	NDP	C2B-C1B-N9A	11.24	132.25	113.75
2	B	501	NDP	C2B-C1B-N9A	9.87	130.00	113.75
2	C	502	NDP	O4B-C1B-N9A	8.92	125.23	108.09
2	B	501	NDP	O2B-C2B-C1B	8.86	141.20	110.05
2	D	503	NDP	C2B-C1B-N9A	8.35	127.49	113.75
2	B	501	NDP	N9A-C8A-N7A	-7.79	102.89	113.94
2	B	501	NDP	C4A-C5A-N7A	-7.74	101.73	110.58
2	B	501	NDP	C5A-N7A-C8A	7.60	115.40	103.45
2	C	502	NDP	O3B-C3B-C4B	7.53	132.72	111.08
2	D	503	NDP	N9A-C8A-N7A	-7.37	103.48	113.94
2	A	500	NDP	C1D-N1N-C2N	-7.21	109.27	121.14
2	A	500	NDP	C2B-C1B-N9A	7.17	125.55	113.75
2	A	500	NDP	O2B-C2B-C1B	7.13	135.11	110.05
2	A	500	NDP	N3A-C2A-N1A	-6.92	118.10	128.58
2	B	501	NDP	O4B-C1B-N9A	6.83	121.21	108.09
2	D	503	NDP	O2B-C2B-C1B	6.42	132.64	110.05
2	B	501	NDP	O2N-PN-O3	6.08	123.72	107.27
2	C	502	NDP	N9A-C8A-N7A	-6.02	105.39	113.94
2	C	502	NDP	O2B-C2B-C1B	5.98	131.08	110.05
2	D	503	NDP	C4A-N9A-C8A	5.82	111.85	105.74
2	A	500	NDP	C3B-C2B-C1B	-5.80	91.71	102.81
2	B	501	NDP	O4D-C1D-N1N	5.72	118.98	108.08
2	A	500	NDP	C4A-C5A-N7A	-5.63	104.15	110.58
2	D	503	NDP	O4B-C1B-N9A	5.57	118.79	108.09
2	B	501	NDP	O3B-C3B-C4B	5.49	126.85	111.08
2	C	502	NDP	C5A-N7A-C8A	5.23	111.67	103.45
2	B	501	NDP	O3-PN-O1N	-5.16	95.18	110.70
2	A	500	NDP	C2A-N1A-C6A	5.00	126.94	118.73
2	D	503	NDP	C5A-N7A-C8A	4.95	111.23	103.45
2	B	501	NDP	N6A-C6A-N1A	-4.95	107.36	118.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	500	NDP	O2A-PA-O1A	4.83	134.92	112.44
2	C	502	NDP	C1D-N1N-C2N	-4.75	113.32	121.14
2	A	500	NDP	O4B-C1B-C2B	4.74	114.75	106.59
2	A	500	NDP	N9A-C8A-N7A	-4.74	107.22	113.94
2	C	502	NDP	O3B-C3B-C2B	4.70	124.36	111.19
2	C	502	NDP	N3A-C2A-N1A	-4.60	121.62	128.58
2	A	500	NDP	C5A-N7A-C8A	4.58	110.65	103.45
2	D	503	NDP	O2A-PA-O3	-4.57	94.91	107.27
2	A	500	NDP	O7N-C7N-C3N	-4.55	112.33	120.90
2	A	500	NDP	C5A-C4A-N9A	4.52	110.74	105.81
2	C	502	NDP	C4A-C5A-N7A	-4.36	105.59	110.58
2	D	503	NDP	C4A-N9A-C1B	-4.35	116.46	126.63
2	B	501	NDP	O3B-C3B-C2B	4.27	123.14	111.19
2	B	501	NDP	C5A-C4A-N9A	4.21	110.39	105.81
2	B	501	NDP	O3-PA-O1A	4.15	123.19	110.70
2	A	500	NDP	C6N-N1N-C2N	4.12	123.73	119.32
2	D	503	NDP	C1D-N1N-C2N	-4.04	114.49	121.14
2	C	502	NDP	O2A-PA-O3	4.00	118.08	107.27
2	D	503	NDP	O3B-C3B-C4B	3.98	122.51	111.08
2	B	501	NDP	C5B-C4B-C3B	-3.97	100.91	115.21
2	A	500	NDP	O2N-PN-O1N	3.93	130.73	112.44
2	B	501	NDP	C6A-C5A-N7A	3.88	139.57	132.09
2	A	500	NDP	O3B-C3B-C4B	3.87	122.19	111.08
2	C	502	NDP	O4D-C1D-N1N	-3.83	100.78	108.08
2	C	502	NDP	O2D-C2D-C3D	3.78	123.92	111.82
2	D	503	NDP	N3A-C2A-N1A	-3.77	122.88	128.58
2	C	502	NDP	O7N-C7N-C3N	-3.74	113.85	120.90
2	B	501	NDP	C4A-N9A-C8A	3.66	109.59	105.74
2	C	502	NDP	O2B-C2B-C3B	3.64	124.73	111.68
2	D	503	NDP	O3-PN-O1N	-3.62	99.81	110.70
2	C	502	NDP	O2N-PN-O3	3.59	116.98	107.27
2	D	503	NDP	O3X-P2B-O2B	-3.57	91.94	105.85
2	D	503	NDP	C3N-C2N-N1N	-3.54	118.00	123.20
2	A	500	NDP	O4B-C1B-N9A	3.53	114.86	108.09
2	D	503	NDP	O3X-P2B-O2X	3.51	120.95	107.80
2	C	502	NDP	O4D-C4D-C5D	-3.50	98.12	109.33
2	B	501	NDP	C2D-C1D-N1N	-3.34	105.09	113.31
2	D	503	NDP	O2D-C2D-C1D	3.32	121.55	110.10
2	A	500	NDP	O4D-C1D-N1N	-3.29	101.82	108.08
2	B	501	NDP	C1D-N1N-C2N	-3.26	115.76	121.14
2	C	502	NDP	O2X-P2B-O1X	3.13	123.05	110.83
2	C	502	NDP	C3B-C2B-C1B	-3.13	96.82	102.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	500	NDP	C3N-C7N-N7N	3.12	123.20	117.67
2	C	502	NDP	C4A-N9A-C8A	3.04	108.92	105.74
2	A	500	NDP	C5B-C4B-C3B	-3.00	104.42	115.21
2	D	503	NDP	O4B-C4B-C5B	3.00	118.94	109.33
2	B	501	NDP	O5B-C5B-C4B	-2.98	98.86	108.99
2	C	502	NDP	O4B-C1B-C2B	-2.97	101.48	106.59
2	A	500	NDP	C3D-C2D-C1D	-2.97	95.85	101.46
2	D	503	NDP	O2B-C2B-C3B	-2.91	101.23	111.68
2	A	500	NDP	C6A-C5A-N7A	2.90	137.69	132.09
2	A	500	NDP	P2B-O2B-C2B	-2.86	115.81	123.43
2	A	500	NDP	C4B-O4B-C1B	-2.83	103.21	109.47
2	B	501	NDP	C5A-C4A-N3A	-2.83	122.82	126.72
2	C	502	NDP	C3N-C2N-N1N	-2.81	119.08	123.20
2	A	500	NDP	O2X-P2B-O2B	-2.79	94.98	105.85
2	A	500	NDP	C2B-C3B-C4B	2.78	107.97	101.99
2	C	502	NDP	O5D-PN-O1N	-2.77	97.95	108.94
2	D	503	NDP	O5D-C5D-C4D	2.75	118.35	108.99
2	B	501	NDP	O2B-P2B-O1X	-2.74	99.58	109.33
2	B	501	NDP	C5A-C6A-N6A	2.73	130.05	123.29
2	B	501	NDP	O2X-P2B-O2B	-2.72	95.27	105.85
2	D	503	NDP	C4A-C5A-N7A	-2.70	107.50	110.58
2	B	501	NDP	O2X-P2B-O1X	2.65	121.16	110.83
2	A	500	NDP	O2D-C2D-C1D	2.64	119.20	110.10
2	D	503	NDP	O2A-PA-O5B	2.64	119.52	107.57
2	B	501	NDP	O7N-C7N-C3N	-2.61	115.99	120.90
2	B	501	NDP	P2B-O2B-C2B	2.60	130.38	123.43
2	B	501	NDP	O2N-PN-O5D	2.56	119.15	107.57
2	A	500	NDP	N3A-C4A-N9A	-2.49	122.93	127.17
2	C	502	NDP	O2X-P2B-O2B	-2.49	96.16	105.85
2	A	500	NDP	C1D-N1N-C6N	2.43	125.91	120.77
2	D	503	NDP	O2N-PN-O3	2.41	113.78	107.27
2	C	502	NDP	C5A-C4A-N9A	2.38	108.41	105.81
2	C	502	NDP	C6A-C5A-N7A	2.37	136.65	132.09
2	C	502	NDP	C2A-N3A-C4A	2.36	117.61	111.83
2	D	503	NDP	C4B-O4B-C1B	-2.35	104.28	109.47
2	C	502	NDP	C6N-N1N-C2N	2.32	121.80	119.32
2	C	502	NDP	C5A-C4A-N3A	-2.30	123.55	126.72
2	A	500	NDP	O5D-PN-O1N	-2.30	99.83	108.94
2	A	500	NDP	O2A-PA-O5B	-2.29	97.17	107.57
2	A	500	NDP	O2D-C2D-C3D	2.29	119.16	111.82
2	A	500	NDP	C5A-C6A-N6A	2.29	128.95	123.29
2	D	503	NDP	O3D-C3D-C4D	-2.28	104.53	111.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501	NDP	N3A-C2A-N1A	-2.24	125.19	128.58
2	A	500	NDP	O3X-P2B-O1X	2.21	119.46	110.83
2	D	503	NDP	C6N-N1N-C2N	2.19	121.66	119.32
2	A	500	NDP	PA-O5B-C5B	-2.18	108.83	121.35
2	C	502	NDP	O3X-P2B-O2B	2.16	114.25	105.85
2	C	502	NDP	O3-PN-O1N	-2.14	104.25	110.70
2	A	500	NDP	C2D-C3D-C4D	2.12	106.71	102.61
2	B	501	NDP	C4B-O4B-C1B	-2.11	104.81	109.47
2	A	500	NDP	O2X-P2B-O1X	2.08	118.95	110.83
2	D	503	NDP	C2D-C3D-C4D	2.08	106.62	102.61
2	A	500	NDP	C3N-C2N-N1N	-2.07	120.17	123.20
2	D	503	NDP	O2N-PN-O5D	2.06	116.89	107.57
2	D	503	NDP	C3N-C7N-N7N	2.04	121.29	117.67
2	D	503	NDP	C1B-N9A-C8A	2.03	131.60	127.09
2	B	501	NDP	O4B-C4B-C5B	2.01	115.77	109.33
2	B	501	NDP	O4B-C4B-C3B	2.01	109.14	105.15

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
2	C	502	NDP	C3B
2	C	502	NDP	C1B

All (35) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	501	NDP	C5B-O5B-PA-O1A
2	B	501	NDP	C5B-O5B-PA-O2A
2	B	501	NDP	C5B-O5B-PA-O3
2	C	502	NDP	PN-O3-PA-O5B
2	C	502	NDP	C5D-O5D-PN-O3
2	C	502	NDP	C5D-O5D-PN-O2N
2	B	501	NDP	O4B-C4B-C5B-O5B
2	B	501	NDP	C3B-C4B-C5B-O5B
3	A	604	BME	O1-C1-C2-S2
4	D	602	GOL	O1-C1-C2-O2
2	A	500	NDP	C3B-C4B-C5B-O5B
2	A	500	NDP	O4D-C1D-N1N-C2N
2	B	501	NDP	O4D-C4D-C5D-O5D
2	C	502	NDP	C5D-O5D-PN-O1N
2	C	502	NDP	C2D-C1D-N1N-C2N
2	C	502	NDP	PA-O3-PN-O2N

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Mol	Chain	Res	Type	Atoms
2	A	500	NDP	O4B-C4B-C5B-O5B
2	D	503	NDP	O4D-C1D-N1N-C2N
2	B	501	NDP	O4D-C1D-N1N-C2N
2	B	501	NDP	C2N-C3N-C7N-N7N
2	C	502	NDP	O4D-C1D-N1N-C2N
2	C	502	NDP	C2N-C3N-C7N-N7N
2	D	503	NDP	C2D-C1D-N1N-C2N
2	B	501	NDP	C2D-C1D-N1N-C2N
2	D	503	NDP	O4D-C1D-N1N-C6N
2	D	503	NDP	C2D-C1D-N1N-C6N
2	C	502	NDP	C4B-C5B-O5B-PA
2	B	501	NDP	O4B-C1B-N9A-C8A
2	C	502	NDP	O4B-C1B-N9A-C8A
2	D	503	NDP	O4B-C1B-N9A-C8A
2	D	503	NDP	O4B-C4B-C5B-O5B
2	C	502	NDP	C2B-O2B-P2B-O3X
2	B	501	NDP	C3D-C4D-C5D-O5D
2	C	502	NDP	C3D-C4D-C5D-O5D
2	C	502	NDP	O4B-C4B-C5B-O5B

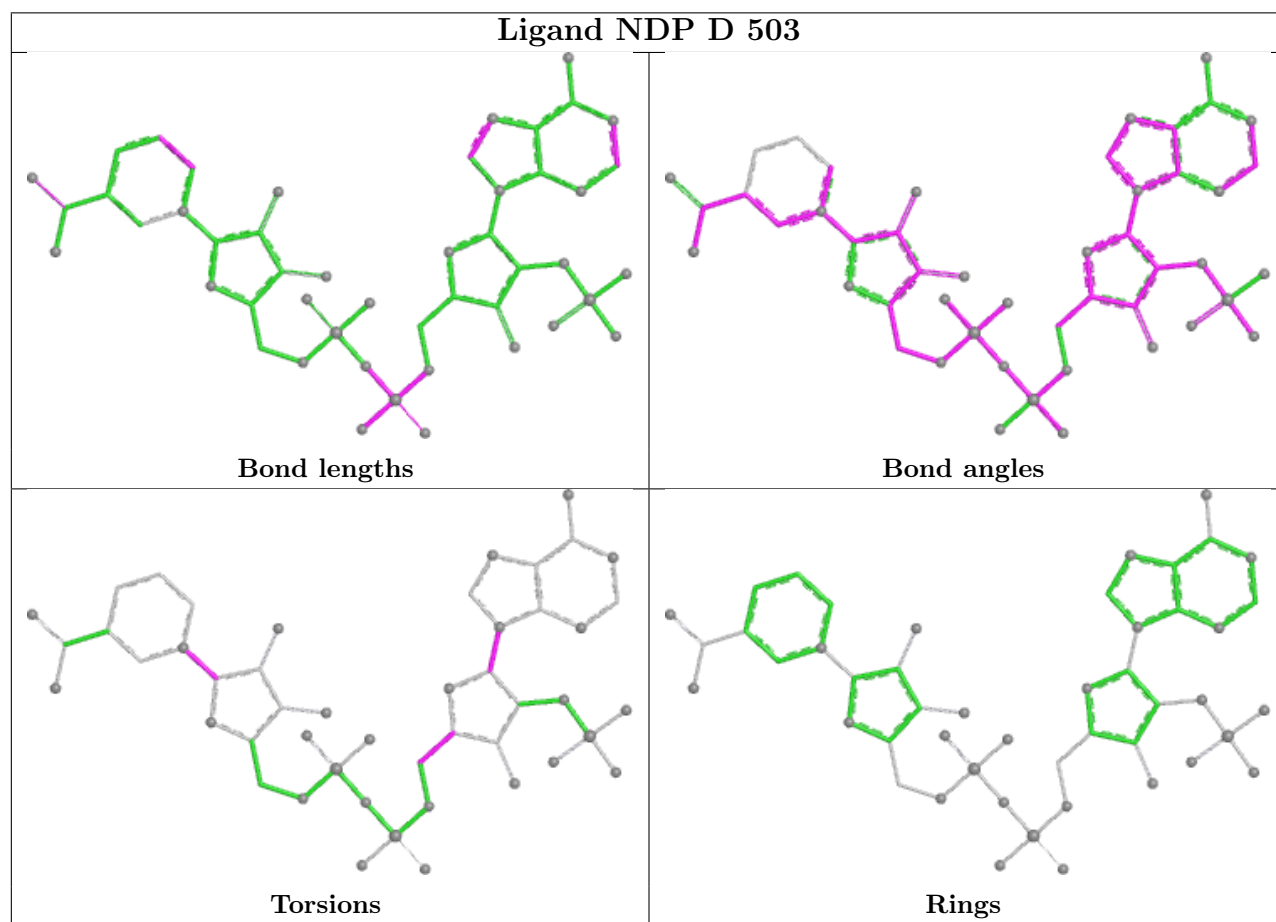
There are no ring outliers.

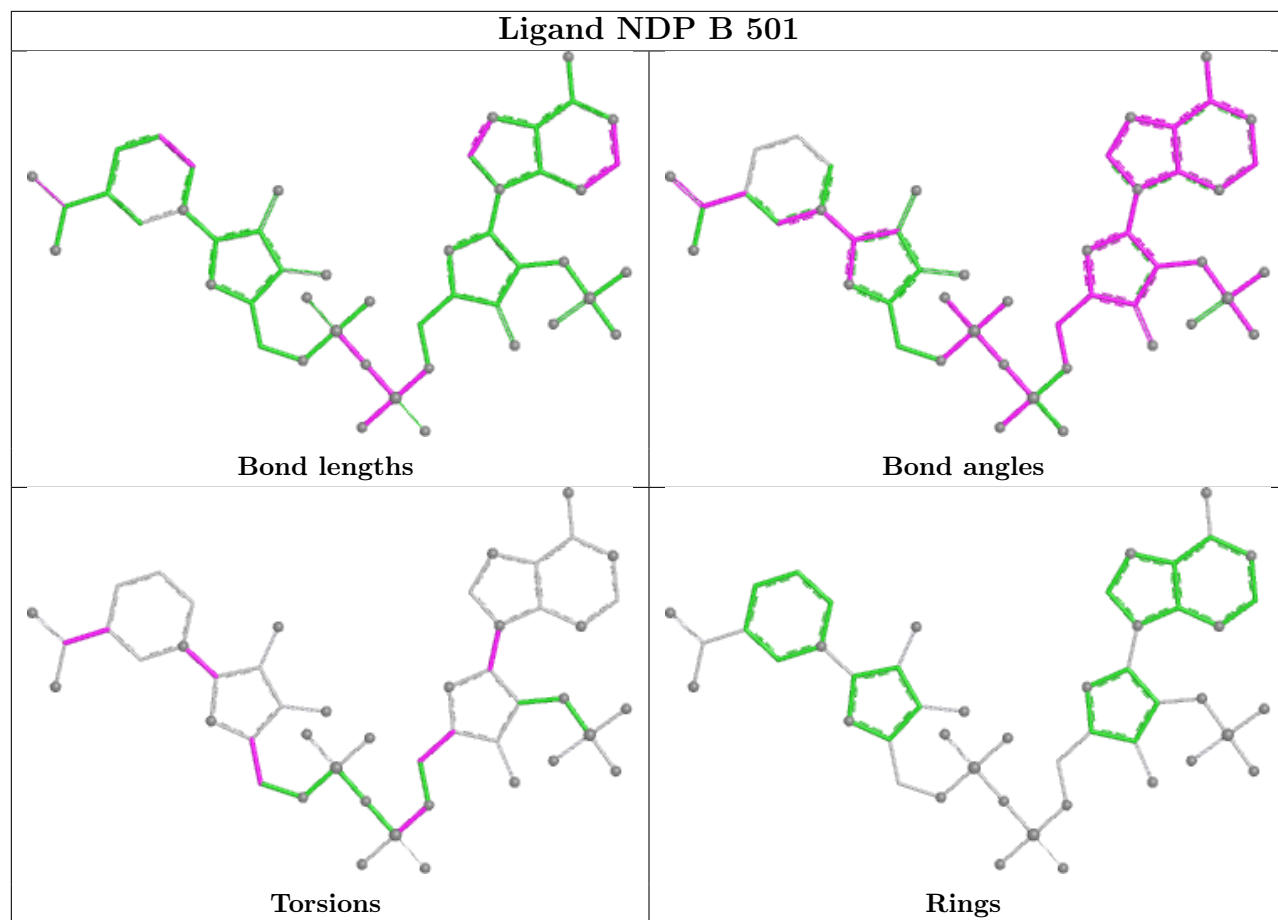
7 monomers are involved in 27 short contacts:

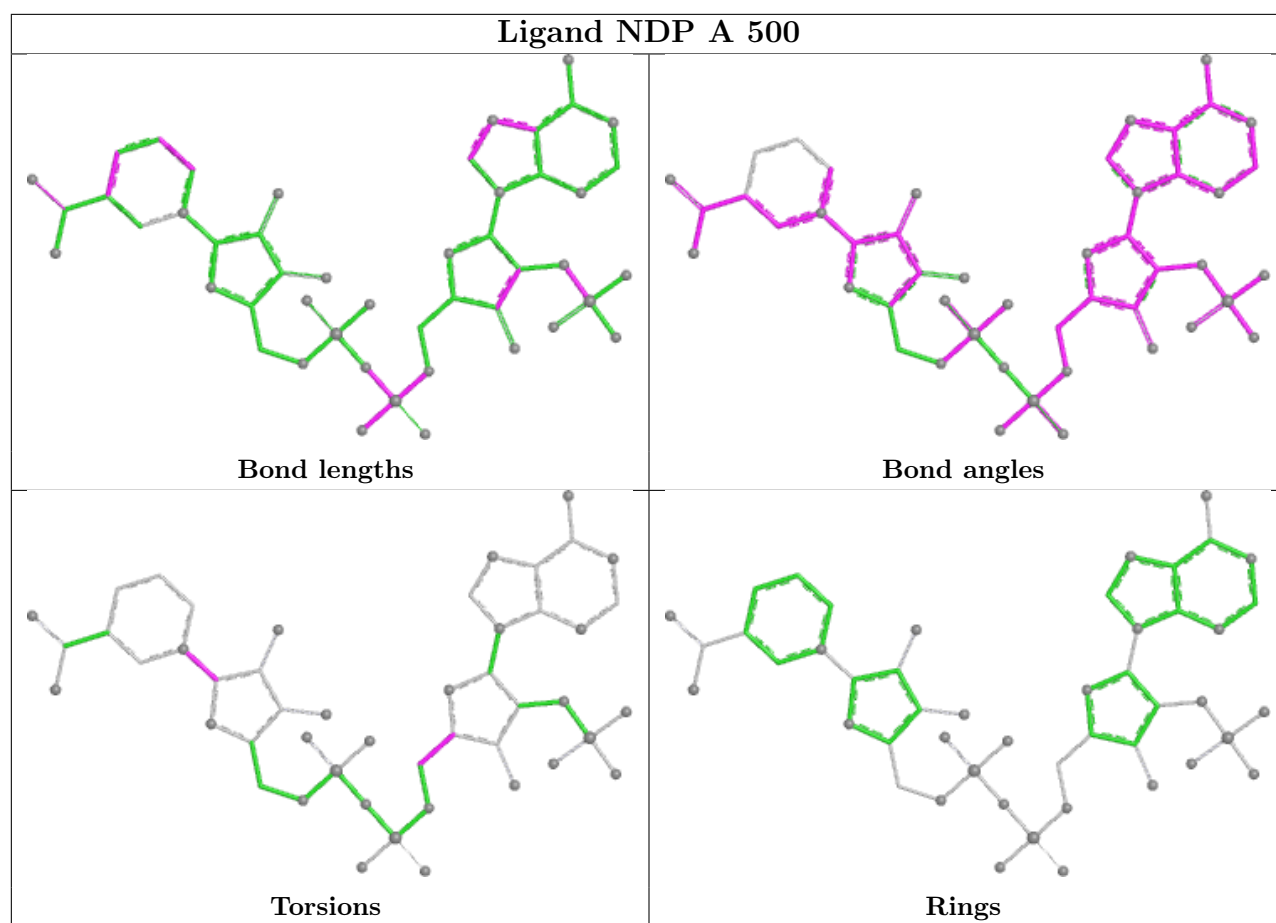
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	601	GOL	4	0
4	D	602	GOL	5	0
2	D	503	NDP	4	0
3	A	604	BME	3	0
2	B	501	NDP	1	0
2	A	500	NDP	2	0
2	C	502	NDP	10	0

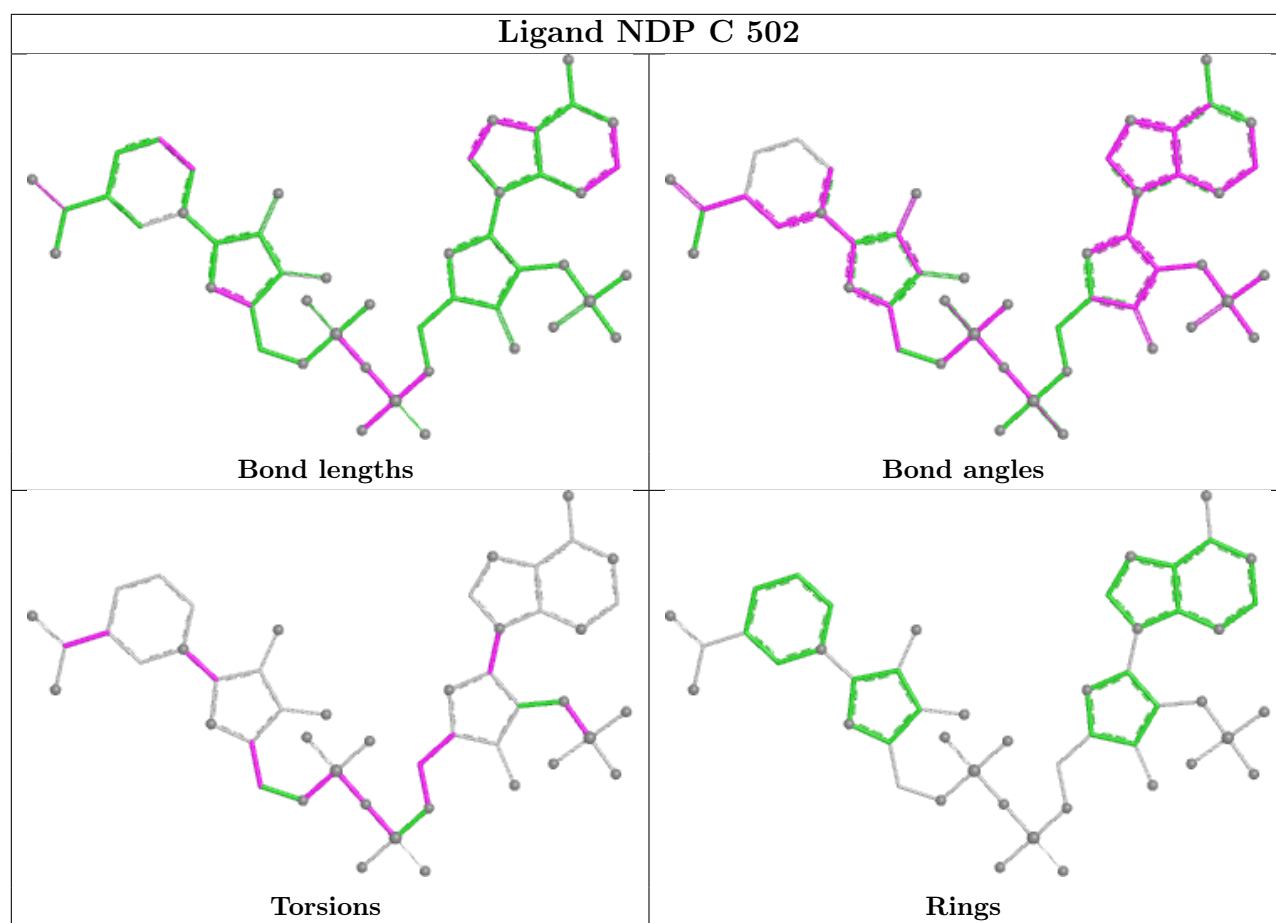
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.









## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<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	343/387 (88%)	0.23	14 (4%)	41	43	16, 37, 59, 124	1 (0%)
1	B	371/387 (95%)	0.68	33 (8%)	15	17	16, 46, 83, 102	3 (0%)
1	C	339/387 (87%)	1.13	61 (17%)	3	4	26, 57, 87, 97	0
1	D	370/387 (95%)	0.40	26 (7%)	22	24	22, 37, 71, 103	0
All	All	1423/1548 (91%)	0.61	134 (9%)	14	15	16, 43, 82, 124	4 (0%)

All (134) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	314	MET	6.8
1	B	23	ILE	5.1
1	A	26	MET	5.0
1	B	3	LEU	4.7
1	C	337	ILE	4.6
1	B	21	TYR	4.5
1	D	194	ASP	4.3
1	C	99	ILE	4.3
1	B	22	ALA	4.2
1	C	320	PRO	4.1
1	D	191	ASP	4.1
1	C	90	PHE	4.0
1	A	27	PRO	4.0
1	C	39	LEU	4.0
1	D	195	PRO	3.9
1	A	320	PRO	3.8
1	C	147	ALA	3.8
1	D	70	ALA	3.7
1	C	102	VAL	3.6
1	D	308	HIS	3.6
1	B	314	MET	3.6

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Mol	Chain	Res	Type	RSRZ
1	D	320	PRO	3.6
1	C	144	ALA	3.5
1	D	322	ASN	3.5
1	B	18	PRO	3.5
1	B	2	THR	3.5
1	C	196	ALA	3.4
1	C	77	TYR	3.3
1	C	93	ILE	3.3
1	C	32	PHE	3.2
1	C	101	ALA	3.2
1	C	304	GLN	3.2
1	B	339	ASN	3.1
1	D	196	ALA	3.1
1	D	321	ALA	3.1
1	A	31	ARG	3.0
1	C	95	LYS	3.0
1	B	1	ALA	3.0
1	C	89	ASN	3.0
1	C	152	LEU	3.0
1	D	193	ASN	3.0
1	B	15	ALA	3.0
1	D	309	ALA	3.0
1	C	79	VAL	3.0
1	C	59	ILE	3.0
1	A	337	ILE	2.9
1	B	19	MET	2.9
1	D	23	ILE	2.9
1	C	85	TYR	2.9
1	B	368	PRO	2.9
1	B	322	ASN	2.9
1	C	103	TYR	2.8
1	B	309	ALA	2.8
1	C	87	TYR	2.8
1	C	148	ALA	2.8
1	C	119	PHE	2.8
1	C	339	ASN	2.7
1	D	307	GLY	2.7
1	C	121	ALA	2.7
1	C	47	ILE	2.7
1	B	195	PRO	2.7
1	C	195	PRO	2.7
1	D	368	PRO	2.7

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Mol	Chain	Res	Type	RSRZ
1	D	313	MET	2.7
1	C	75	ALA	2.7
1	B	9	GLN	2.6
1	C	33	GLY	2.6
1	C	84	ILE	2.6
1	C	88	SER	2.6
1	C	110	LEU	2.6
1	D	1	ALA	2.6
1	A	341	PRO	2.5
1	B	79	VAL	2.5
1	C	105	ILE	2.5
1	B	17	ARG	2.5
1	C	96	ASP	2.5
1	A	28	GLU	2.5
1	C	190	MET	2.5
1	C	192	GLN	2.5
1	C	146	LYS	2.5
1	A	84	ILE	2.4
1	D	192	GLN	2.4
1	C	206	ALA	2.4
1	C	321	ALA	2.4
1	C	336	VAL	2.4
1	C	81	PRO	2.4
1	C	202	ARG	2.4
1	D	310	ASN	2.3
1	A	368	PRO	2.3
1	D	312	SER	2.3
1	A	178	LYS	2.3
1	B	297	TYR	2.3
1	C	97	PRO	2.3
1	B	10	VAL	2.3
1	B	20	PRO	2.3
1	B	84	ILE	2.3
1	D	339	ASN	2.3
1	B	4	PRO	2.3
1	B	308	HIS	2.3
1	C	197	GLN	2.3
1	C	34	TYR	2.2
1	C	62	LEU	2.2
1	C	86	ASP	2.2
1	C	67	ALA	2.2
1	C	132	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	342	VAL	2.2
1	D	71	LYS	2.2
1	C	118	ALA	2.2
1	D	67	ALA	2.2
1	C	116	ILE	2.2
1	B	319	MET	2.2
1	C	100	ASP	2.2
1	B	89	ASN	2.1
1	C	325	PHE	2.1
1	D	197	GLN	2.1
1	C	122	GLY	2.1
1	B	67	ALA	2.1
1	A	29	ASP	2.1
1	B	244	GLU	2.1
1	A	367	ARG	2.1
1	B	147	ALA	2.1
1	B	196	ALA	2.1
1	C	35	ALA	2.1
1	C	94	ALA	2.1
1	D	190	MET	2.1
1	B	194	ASP	2.1
1	C	104	ILE	2.1
1	C	63	VAL	2.1
1	B	312	SER	2.0
1	C	54	CYS	2.0
1	C	82	ARG	2.0
1	A	32	PHE	2.0
1	A	378	GLN	2.0
1	B	14	PRO	2.0

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

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

## 6.3 Carbohydrates ⓘ

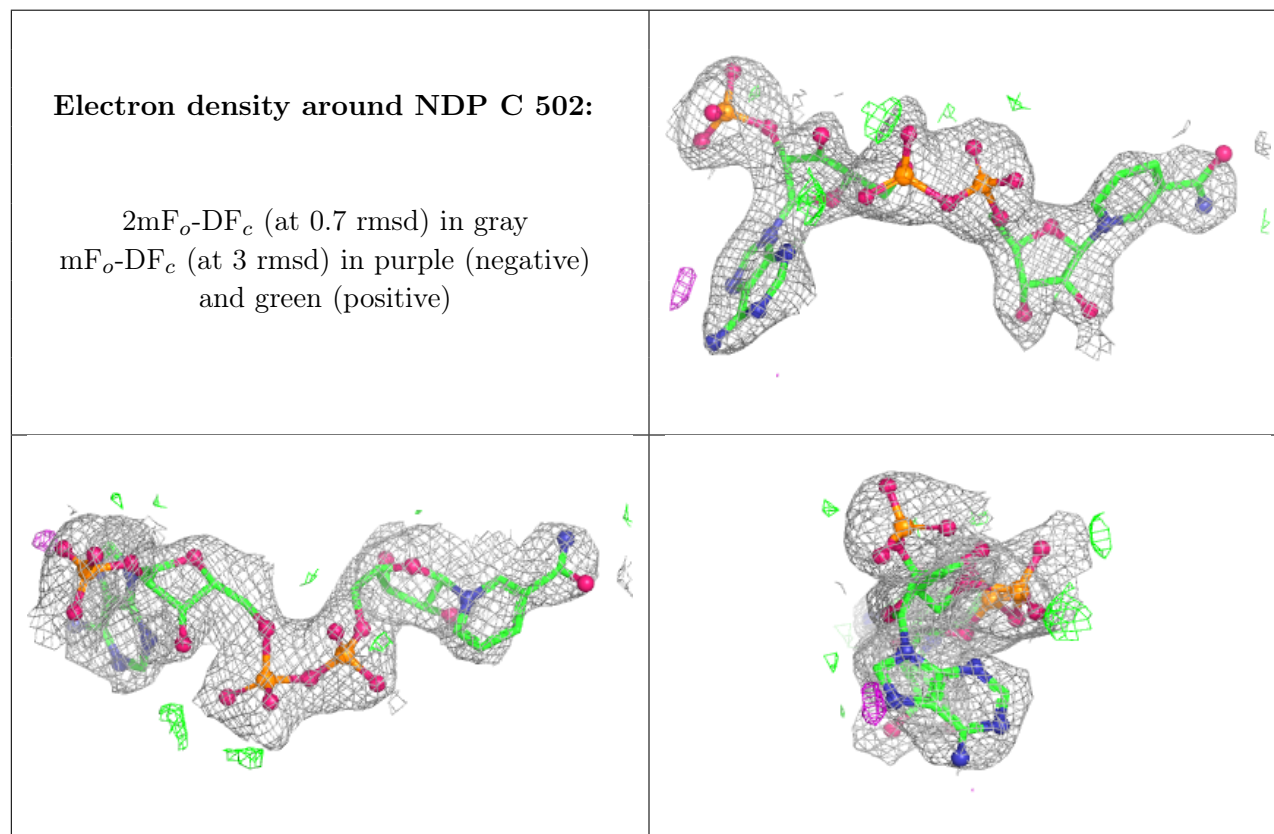
There are no oligosaccharides in this entry.

## 6.4 Ligands ⓘ

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.

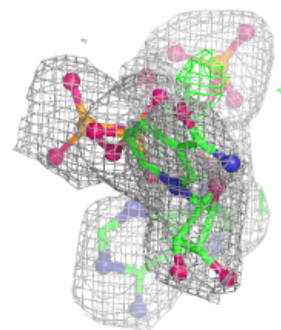
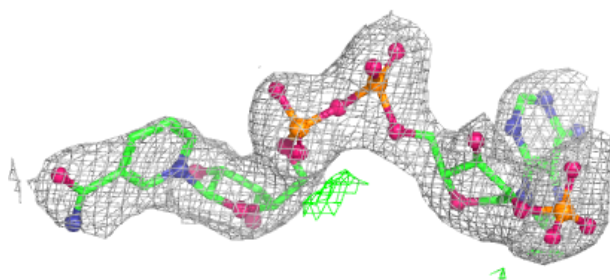
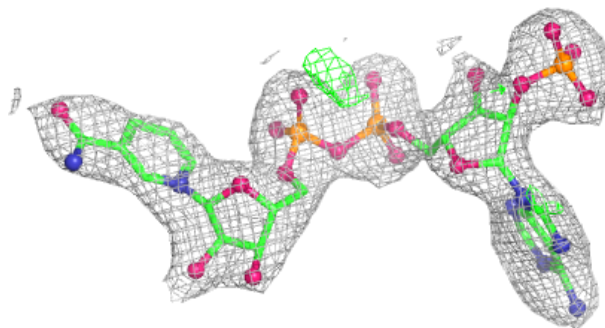
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
4	GOL	A	603	6/6	0.81	0.12	56,57,57,57	0
4	GOL	D	602	6/6	0.82	0.17	56,59,60,60	0
4	GOL	B	601	6/6	0.83	0.12	49,51,53,54	0
3	BME	A	604	4/4	0.93	0.13	60,63,64,64	0
2	NDP	C	502	48/48	0.93	0.10	43,50,55,56	10
2	NDP	B	501	48/48	0.94	0.09	42,49,52,54	4
2	NDP	D	503	48/48	0.94	0.08	27,39,46,48	5
2	NDP	A	500	48/48	0.97	0.07	23,29,38,41	7

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

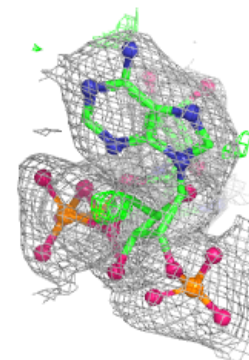
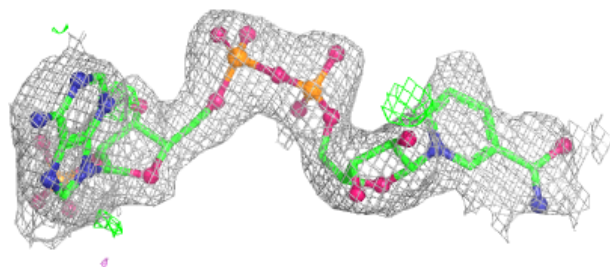
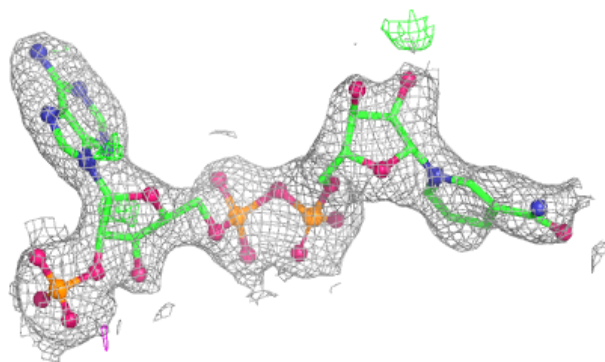


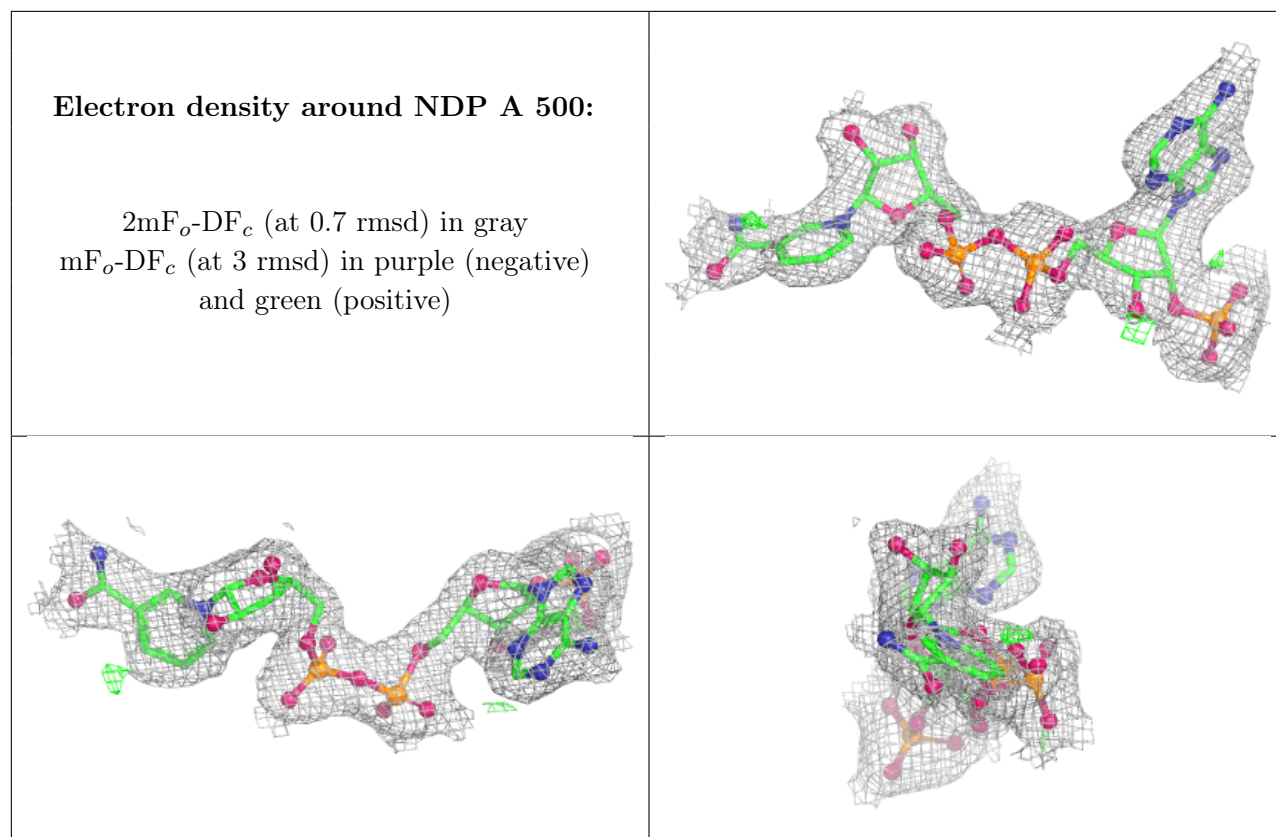
**Electron density around NDP B 501:**

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

**Electron density around NDP D 503:**

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





## 6.5 Other polymers [i](#)

There are no such residues in this entry.