



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 02:29 PM UTC

PDB ID : 6B0Z / pdb_00006b0z
Title : IDH1 R132H mutant in complex with IDH305
Authors : Xie, X.; Kulathila, R.
Deposited on : 2017-09-15
Resolution : 2.33 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4-5-2 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

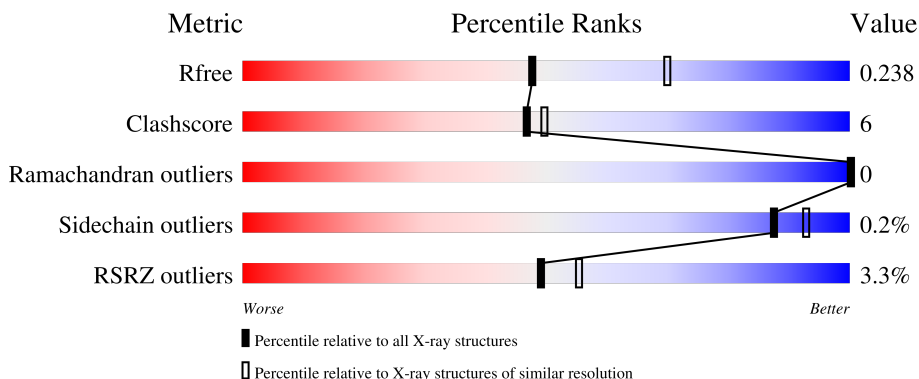
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.33 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	3031 (2.36-2.32)
Clashscore	190562	3127 (2.36-2.32)
Ramachandran outliers	187476	3095 (2.36-2.32)
Sidechain outliers	187428	3095 (2.36-2.32)
RSRZ outliers	180081	3033 (2.36-2.32)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	417	2% 85% 10% .
1	B	417	2% 88% 10% .
1	C	417	4% 82% 16% .
1	D	417	5% 80% 16% .

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 13796 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 Isocitrate dehydrogenase [NADP] cytoplasmic.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	399	Total	C	N	O	S	0	2	0
			3162	2012	535	596	19			
1	C	410	Total	C	N	O	S	0	0	0
			3249	2066	551	614	18			
1	B	409	Total	C	N	O	S	0	1	0
			3247	2064	551	614	18			
1	D	399	Total	C	N	O	S	0	3	0
			3173	2018	541	594	20			

There are 16 discrepancies between the modelled and reference sequences:

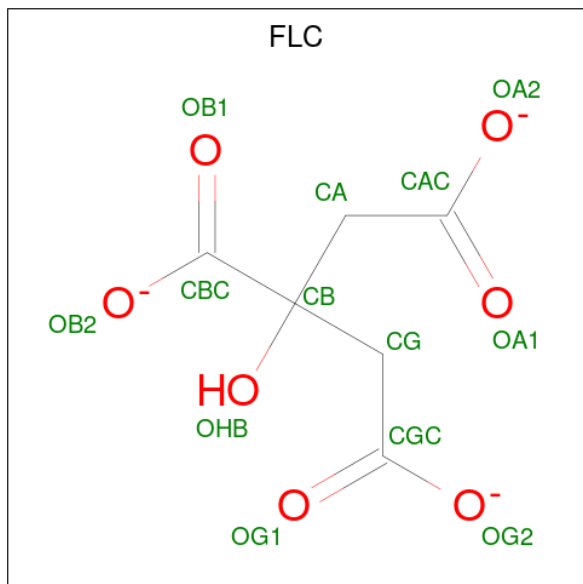
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP O75874
A	-1	PRO	-	expression tag	UNP O75874
A	0	GLY	-	expression tag	UNP O75874
A	132	HIS	ARG	engineered mutation	UNP O75874
C	-2	GLY	-	expression tag	UNP O75874
C	-1	PRO	-	expression tag	UNP O75874
C	0	GLY	-	expression tag	UNP O75874
C	132	HIS	ARG	engineered mutation	UNP O75874
B	-2	GLY	-	expression tag	UNP O75874
B	-1	PRO	-	expression tag	UNP O75874
B	0	GLY	-	expression tag	UNP O75874
B	132	HIS	ARG	engineered mutation	UNP O75874
D	-2	GLY	-	expression tag	UNP O75874
D	-1	PRO	-	expression tag	UNP O75874
D	0	GLY	-	expression tag	UNP O75874
D	132	HIS	ARG	engineered mutation	UNP O75874

- Molecule 2 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: C₂₁H₃₀N₇O₁₇P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	0	0
			35	23	4	6	2		
3	A	1	Total	C	F	N	O	0	0
			35	23	4	6	2		
3	C	1	Total	C	F	N	O	0	0
			35	23	4	6	2		
3	B	1	Total	C	F	N	O	0	0
			35	23	4	6	2		
3	D	1	Total	C	F	N	O	0	0
			35	23	4	6	2		
3	D	1	Total	C	F	N	O	0	0
			35	23	4	6	2		

- Molecule 4 is CITRATE ANION (CCD ID: FLC) (formula: $C_6H_5O_7^-$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			13	6	7		
4	C	1	Total	C	O	0	0
			13	6	7		
4	B	1	Total	C	O	0	0
			13	6	7		
4	D	1	Total	C	O	0	0
			13	6	7		

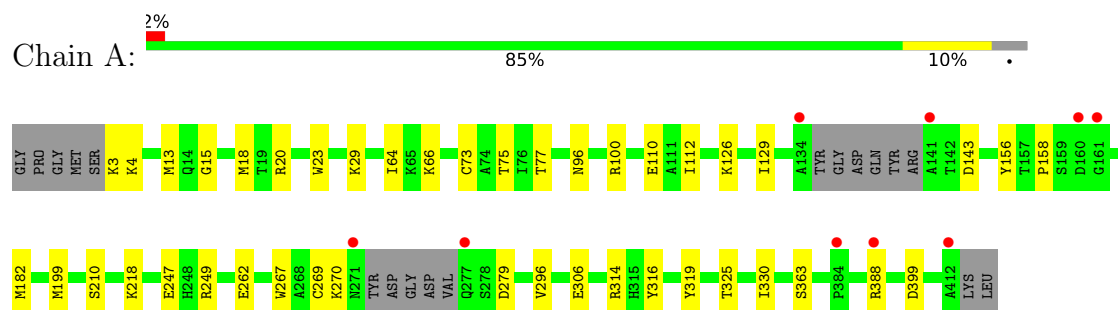
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	175	Total 175	O 175	0	0
5	C	75	Total 75	O 75	0	0
5	B	208	Total 208	O 208	0	0
5	D	53	Total 53	O 53	0	0

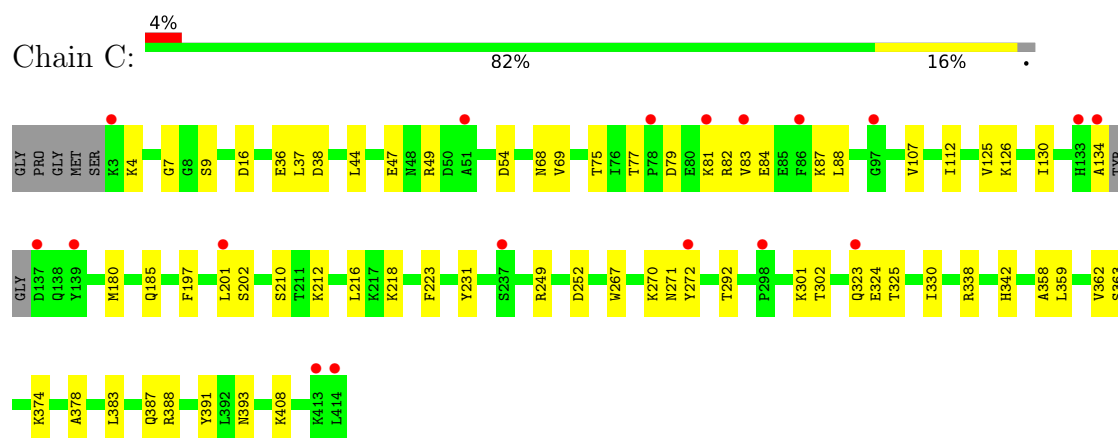
3 Residue-property plots [i](#)

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.

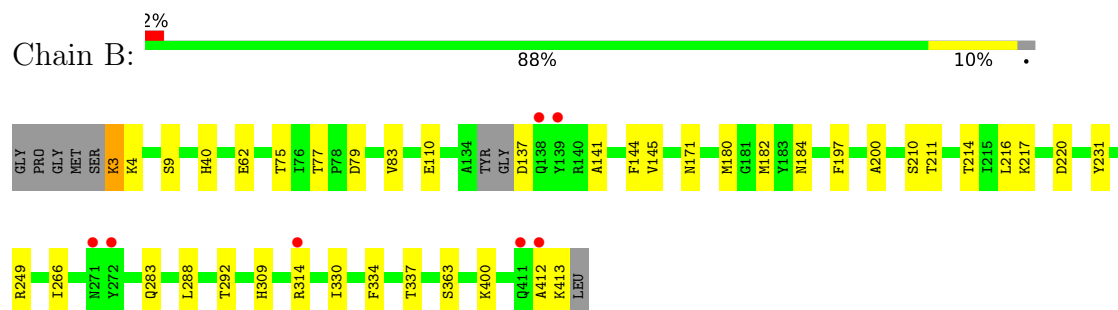
- Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic



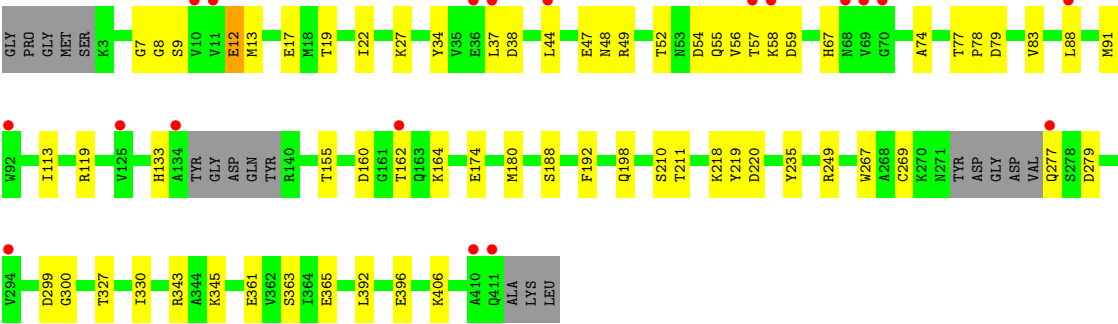
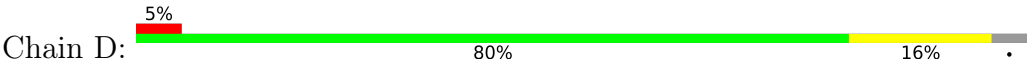
- Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic



- Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic



- Molecule 1: Isocitrate dehydrogenase [NADP] cytoplasmic



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	81.50Å 155.31Å 163.05Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.70 – 2.33 43.70 – 2.33	Depositor EDS
% Data completeness (in resolution range)	99.9 (43.70-2.33) 97.0 (43.70-2.33)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.85 (at 2.34Å)	Xtriage
Refinement program	PHENIX 1.12 _2829	Depositor
R, R_{free}	0.189 , 0.235 0.192 , 0.238	Depositor DCC
R_{free} test set	4444 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	41.0	Xtriage
Anisotropy	0.036	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 34.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.018 for -h,l,k	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	13796	wwPDB-VP
Average B, all atoms (Å ²)	48.0	wwPDB-VP

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

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 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: FLC, C81, NDP

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	0.12	0/3232	0.35	0/4355
1	B	0.12	0/3317	0.37	0/4471
1	C	0.14	0/3316	0.35	0/4470
1	D	0.15	0/3246	0.40	1/4372 (0.0%)
All	All	0.13	0/13111	0.37	1/17668 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	17	GLU	CB-CA-C	-5.43	110.30	116.54

There are no chirality outliers.

There are no planarity outliers.

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	3162	0	3143	29	0
1	B	3247	0	3217	27	0
1	C	3249	0	3220	45	0
1	D	3173	0	3163	50	0
2	A	48	0	26	3	0
2	B	48	0	26	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	48	0	26	1	0
2	D	48	0	26	0	0
3	A	70	0	0	0	0
3	B	35	0	0	0	0
3	C	35	0	0	0	0
3	D	70	0	0	1	0
4	A	13	0	5	2	0
4	B	13	0	5	3	0
4	C	13	0	5	2	0
4	D	13	0	5	0	0
5	A	175	0	0	3	0
5	B	208	0	0	2	0
5	C	75	0	0	2	0
5	D	53	0	0	1	0
All	All	13796	0	12867	148	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 6.

All (148) 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:C:212:LYS:NZ	1:C:271:ASN:OD1	1.97	0.98
1:D:55:GLN:HE22	1:D:58:LYS:HE2	1.32	0.91
1:D:7:GLY:HA3	1:D:37:LEU:HD23	1.58	0.86
1:D:52:THR:HG21	1:D:56:VAL:HG12	1.67	0.76
1:D:55:GLN:NE2	1:D:59:ASP:OD1	2.19	0.74
1:D:19:THR:HG21	1:D:74:ALA:HB3	1.71	0.72
1:A:218:LYS:NZ	5:A:603:HOH:O	2.21	0.72
1:D:83:VAL:HG23	1:D:88:LEU:HB2	1.75	0.68
1:A:267:TRP:CD1	1:A:269[B]:CYS:HG	2.12	0.66
2:B:501:NDP:H42N	4:B:503:FLC:HA2	1.81	0.63
1:B:77:THR:OG1	4:B:503:FLC:OB2	2.16	0.63
1:D:52:THR:HG23	1:D:54:ASP:N	2.13	0.62
1:C:77:THR:OG1	4:C:503:FLC:OB2	2.17	0.61
1:A:96:ASN:O	1:A:100:ARG:HG3	2.00	0.61
1:C:323:GLN:N	1:C:323:GLN:OE1	2.34	0.61
1:B:283:GLN:HB2	1:B:288:LEU:HD22	1.81	0.60
1:C:16:ASP:OD2	1:C:49:ARG:NH2	2.35	0.60
1:D:47:GLU:HG2	1:D:48:ASN:N	2.17	0.60
1:C:330:ILE:HD12	1:C:363:SER:HB3	1.84	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:144:PHE:HA	1:D:218:LYS:HD3	1.84	0.59
1:B:288:LEU:HG	1:B:309:HIS:HB3	1.84	0.59
1:C:130:ILE:HG21	1:C:272:TYR:CZ	2.38	0.58
1:B:110:GLU:O	1:B:292:THR:HG22	2.04	0.58
1:D:52:THR:OG1	1:D:55:GLN:HB3	2.05	0.57
1:B:9:SER:OG	1:B:40:HIS:NE2	2.36	0.57
1:D:155:THR:HG21	1:D:164:LYS:HE2	1.85	0.57
1:D:48:ASN:O	1:D:52:THR:HG22	2.05	0.57
1:A:77:THR:OG1	4:A:503:FLC:OB1	2.17	0.56
1:C:112:ILE:HD13	1:C:330:ILE:HG22	1.87	0.56
1:A:15:GLY:O	1:A:20:ARG:NH2	2.36	0.55
1:C:185:GLN:NE2	5:C:601:HOH:O	2.32	0.55
1:C:378:ALA:HB1	1:C:383:LEU:HA	1.88	0.54
1:A:218:LYS:NZ	5:A:602:HOH:O	2.21	0.54
1:C:49:ARG:O	1:C:54:ASP:N	2.37	0.54
1:D:267:TRP:CD1	1:D:269[A]:CYS:HG	2.26	0.54
1:B:200:ALA:HA	1:B:266:ILE:HD12	1.89	0.53
1:C:201:LEU:HD12	1:C:202:SER:N	2.23	0.53
1:A:388:ARG:O	1:A:388:ARG:NH2	2.40	0.53
1:C:44:LEU:O	1:C:49:ARG:NE	2.41	0.53
1:A:210:SER:HA	1:A:249:ARG:O	2.09	0.53
1:C:69:VAL:HG22	1:C:342:HIS:HD2	1.74	0.52
1:C:75:THR:O	2:C:501:NDP:H2N	2.09	0.52
1:D:8:GLY:O	1:D:38:ASP:N	2.37	0.51
1:D:67:HIS:O	1:D:343:ARG:NH1	2.42	0.51
1:C:107:VAL:HG23	1:C:134:ALA:HB2	1.92	0.51
1:B:314:ARG:NE	2:B:501:NDP:O2X	2.36	0.51
1:D:55:GLN:HE22	1:D:58:LYS:CE	2.15	0.51
1:C:84:GLU:OE1	1:C:87:LYS:HE2	2.10	0.51
1:C:387:GLN:NE2	5:C:607:HOH:O	2.44	0.51
1:A:112:ILE:HD13	1:A:330:ILE:HG22	1.93	0.50
1:A:330:ILE:HD12	1:A:363:SER:HB3	1.92	0.50
1:C:130:ILE:HD13	1:C:267:TRP:HB3	1.92	0.50
1:B:330:ILE:HD12	1:B:363:SER:HB3	1.92	0.50
1:A:319:TYR:HB2	1:A:325:THR:HG21	1.94	0.50
1:C:7:GLY:HA3	1:C:37:LEU:HD23	1.93	0.50
1:D:52:THR:HG23	1:D:54:ASP:H	1.76	0.50
1:A:199:MET:HE2	1:A:296:VAL:HG21	1.94	0.50
1:D:160:ASP:CG	1:D:162:THR:HG1	2.20	0.49
1:D:174:GLU:O	5:D:601:HOH:O	2.20	0.49
1:B:145:VAL:HG23	1:D:218:LYS:HB3	1.95	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:54:ASP:OD1	1:D:57:THR:OG1	2.23	0.49
1:C:374:LYS:HD2	1:C:391:TYR:CZ	2.47	0.49
1:C:270:LYS:HE3	1:C:271:ASN:OD1	2.12	0.49
1:D:47:GLU:OE2	1:D:47:GLU:N	2.44	0.49
1:A:23:TRP:CD2	1:A:73:CYS:HB2	2.47	0.49
1:D:330:ILE:HD12	1:D:363:SER:HB3	1.94	0.49
1:C:252:ASP:OD1	1:C:252:ASP:N	2.42	0.48
1:C:223:PHE:CE2	1:C:270:LYS:HG3	2.48	0.48
1:D:13:MET:HG2	1:D:44:LEU:HD13	1.95	0.48
1:C:358:ALA:O	1:C:362:VAL:HG12	2.13	0.48
4:C:503:FLC:OG1	4:C:503:FLC:OHB	2.29	0.48
1:B:412:ALA:O	1:B:413:LYS:NZ	2.36	0.48
1:D:279:ASP:OD1	1:D:279:ASP:N	2.32	0.48
1:A:270:LYS:HD3	1:A:270:LYS:C	2.38	0.47
1:D:113:ILE:HG23	1:D:119:ARG:HD3	1.96	0.47
1:D:345:LYS:C	1:D:345:LYS:HD3	2.38	0.47
1:D:22:ILE:HD11	1:D:327:THR:HB	1.95	0.47
1:D:44:LEU:O	1:D:49:ARG:NE	2.43	0.47
1:D:49:ARG:HA	1:D:52:THR:HG22	1.97	0.47
1:C:212:LYS:NZ	1:C:271:ASN:CG	2.72	0.47
1:C:79:ASP:OD1	1:C:82:ARG:HG2	2.15	0.46
1:C:83:VAL:HA	1:C:88:LEU:HD12	1.97	0.46
1:C:359:LEU:HA	1:C:362:VAL:HG12	1.96	0.46
1:B:137:ASP:OD2	1:B:184:ASN:ND2	2.49	0.46
1:B:197:PHE:CZ	1:B:231:TYR:HB2	2.49	0.46
1:A:29:LYS:HE3	1:A:399:ASP:OD1	2.15	0.46
1:A:247:GLU:OE2	1:A:249:ARG:NH1	2.46	0.46
1:C:210:SER:HA	1:C:249:ARG:O	2.15	0.46
1:C:4:LYS:HD2	1:C:36:GLU:HG3	1.96	0.46
1:B:214:THR:O	1:B:217:LYS:NZ	2.38	0.46
1:B:211:THR:HB	1:B:220:ASP:HB3	1.97	0.46
1:C:197:PHE:CZ	1:C:231:TYR:HB2	2.50	0.46
1:B:210:SER:HA	1:B:249:ARG:O	2.16	0.45
1:D:211:THR:HB	1:D:220:ASP:HB3	1.98	0.45
1:D:9:SER:HA	1:D:38:ASP:HB3	1.99	0.45
1:D:34:TYR:OH	1:D:406:LYS:HD3	2.16	0.45
1:D:79:ASP:C	1:D:91:MET:HE2	2.42	0.45
1:A:156:TYR:CE2	1:A:158:PRO:HG3	2.52	0.45
1:A:306:GLU:OE1	5:A:601:HOH:O	2.21	0.45
1:C:81:LYS:HB2	1:C:81:LYS:HE2	1.89	0.44
1:B:400:LYS:NZ	5:B:606:HOH:O	2.36	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:47:GLU:H	1:C:47:GLU:CD	2.25	0.44
1:D:77:THR:HA	1:D:78:PRO:HD3	1.89	0.44
1:A:314:ARG:NE	2:A:501:NDP:O2X	2.51	0.44
1:A:75:THR:O	2:A:501:NDP:H2N	2.18	0.43
2:A:501:NDP:H42N	4:A:503:FLC:HA2	1.99	0.43
1:D:47:GLU:CG	1:D:48:ASN:N	2.80	0.43
1:A:13:MET:HE1	1:A:64:ILE:HD11	2.00	0.43
1:B:75:THR:O	2:B:501:NDP:H2N	2.18	0.43
1:D:44:LEU:HD21	1:D:57:THR:HA	2.00	0.43
1:B:216:LEU:HD22	1:D:180:MET:HE1	2.00	0.43
1:D:392:LEU:HB3	1:D:396:GLU:HB2	2.00	0.43
1:A:182:MET:SD	1:C:180:MET:HE3	2.59	0.43
1:B:4:LYS:NZ	5:B:626:HOH:O	2.52	0.43
1:B:413:LYS:HA	1:B:413:LYS:HD3	1.83	0.43
1:A:3:LYS:HD2	1:A:4:LYS:O	2.19	0.43
1:C:324:GLU:OE2	1:C:388:ARG:NH1	2.52	0.43
1:D:133:HIS:HE1	1:D:188:SER:HB3	1.84	0.42
1:A:110:GLU:HB2	1:A:129:ILE:HG12	2.01	0.42
1:C:125:VAL:HG23	1:C:126:LYS:HG3	2.02	0.42
1:B:3:LYS:HA	1:B:3:LYS:HD3	1.85	0.42
1:C:270:LYS:CE	1:C:271:ASN:OD1	2.68	0.42
1:D:210:SER:HA	1:D:249:ARG:O	2.19	0.42
1:A:18:MET:HB2	1:A:316:TYR:HB2	2.01	0.42
1:C:212:LYS:HE2	1:C:216:LEU:HD12	2.02	0.42
1:D:198:GLN:HE22	1:D:235:TYR:HE1	1.68	0.42
1:B:180:MET:HE2	1:D:219:TYR:CG	2.55	0.41
1:C:325:THR:O	1:C:393:ASN:HB2	2.20	0.41
1:B:79:ASP:O	1:B:83:VAL:HG23	2.20	0.41
2:B:501:NDP:H42N	4:B:503:FLC:CA	2.50	0.41
1:D:12:GLU:OE1	1:D:27:LYS:NZ	2.48	0.41
1:D:44:LEU:HD12	1:D:44:LEU:N	2.35	0.41
1:D:299:ASP:OD1	1:D:300:GLY:N	2.53	0.41
1:D:361:GLU:O	1:D:365:GLU:HG3	2.19	0.41
1:D:277:GLN:HB3	3:D:504:C81:C10	2.50	0.41
1:C:301:LYS:O	1:C:342:HIS:NE2	2.32	0.41
1:C:292:THR:HG21	1:C:338:ARG:HH11	1.85	0.41
1:D:133:HIS:HB2	1:D:192:PHE:CE2	2.56	0.41
1:A:279:ASP:OD2	1:A:279:ASP:N	2.53	0.41
1:D:13:MET:HG2	1:D:44:LEU:CD1	2.50	0.41
1:A:126:LYS:NZ	1:A:262:GLU:OE1	2.39	0.41
1:C:68:ASN:HA	1:C:302:THR:HG23	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:408:LYS:HB2	1:C:408:LYS:HE2	1.81	0.40
1:B:141:ALA:HB2	1:B:182:MET:HG2	2.03	0.40
1:A:143:ASP:O	1:C:218:LYS:HD2	2.21	0.40
1:C:9:SER:HA	1:C:38:ASP:HB3	2.03	0.40
1:B:334:PHE:HA	1:B:337:THR:OG1	2.22	0.40
1:A:66:LYS:HE2	1:B:62:GLU:OE2	2.22	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	395/417 (95%)	384 (97%)	11 (3%)	0	100	100
1	B	406/417 (97%)	394 (97%)	12 (3%)	0	100	100
1	C	406/417 (97%)	393 (97%)	13 (3%)	0	100	100
1	D	396/417 (95%)	385 (97%)	11 (3%)	0	100	100
All	All	1603/1668 (96%)	1556 (97%)	47 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	339/351 (97%)	339 (100%)	0	100	100
1	B	347/351 (99%)	345 (99%)	2 (1%)	78	86
1	C	347/351 (99%)	347 (100%)	0	100	100
1	D	341/351 (97%)	340 (100%)	1 (0%)	86	91
All	All	1374/1404 (98%)	1371 (100%)	3 (0%)	87	93

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	3	LYS
1	B	171	ASN
1	D	12	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	68	ASN
1	B	68	ASN
1	B	184	ASN
1	D	90	GLN
1	D	96	ASN
1	D	101	ASN
1	D	171	ASN
1	D	198	GLN
1	D	277	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

14 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
3	C81	A	502	-	35,38,38	0.83	0	47,56,56	2.34	16 (34%)
3	C81	D	504	-	35,38,38	0.98	1 (2%)	47,56,56	2.43	18 (38%)
3	C81	D	502	-	35,38,38	0.85	0	47,56,56	2.48	18 (38%)
2	NDP	D	501	-	51,52,52	1.38	5 (9%)	71,80,80	1.89	17 (23%)
2	NDP	B	501	-	51,52,52	1.33	7 (13%)	71,80,80	1.52	9 (12%)
3	C81	A	504	-	35,38,38	0.95	1 (2%)	47,56,56	2.38	17 (36%)
4	FLC	A	503	-	12,12,12	1.23	1 (8%)	17,17,17	1.29	3 (17%)
3	C81	C	502	-	35,38,38	0.85	0	47,56,56	2.30	15 (31%)
4	FLC	C	503	-	12,12,12	1.19	1 (8%)	17,17,17	1.18	1 (5%)
4	FLC	D	503	-	12,12,12	1.17	1 (8%)	17,17,17	1.21	1 (5%)
3	C81	B	502	-	35,38,38	0.85	0	47,56,56	2.36	18 (38%)
2	NDP	A	501	-	51,52,52	1.31	6 (11%)	71,80,80	1.52	9 (12%)
4	FLC	B	503	-	12,12,12	1.24	1 (8%)	17,17,17	1.10	1 (5%)
2	NDP	C	501	-	51,52,52	1.31	5 (9%)	71,80,80	1.52	10 (14%)

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
3	C81	A	502	-	-	0/26/39/39	0/4/4/4
3	C81	D	504	-	-	5/26/39/39	0/4/4/4
3	C81	D	502	-	-	0/26/39/39	0/4/4/4
2	NDP	D	501	-	-	9/34/77/77	0/5/5/5
2	NDP	B	501	-	-	7/34/77/77	0/5/5/5
3	C81	A	504	-	-	2/26/39/39	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	FLC	A	503	-	-	2/16/16/16	-
3	C81	C	502	-	-	0/26/39/39	0/4/4/4
4	FLC	C	503	-	-	6/16/16/16	-
4	FLC	D	503	-	-	8/16/16/16	-
3	C81	B	502	-	-	0/26/39/39	0/4/4/4
2	NDP	A	501	-	-	9/34/77/77	0/5/5/5
4	FLC	B	503	-	-	0/16/16/16	-
2	NDP	C	501	-	-	8/34/77/77	0/5/5/5

All (29) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	501	NDP	C4N-C3N	-5.65	1.39	1.50
2	B	501	NDP	C4N-C3N	-5.62	1.39	1.50
2	C	501	NDP	C4N-C3N	-5.62	1.39	1.50
2	A	501	NDP	C4N-C3N	-5.50	1.39	1.50
2	C	501	NDP	C4N-C5N	-3.63	1.39	1.49
2	D	501	NDP	C4N-C5N	-3.62	1.39	1.49
2	B	501	NDP	C4N-C5N	-3.59	1.39	1.49
2	A	501	NDP	C4N-C5N	-3.58	1.39	1.49
2	D	501	NDP	P2B-O2B	-2.80	1.54	1.59
3	D	504	C81	C16-C15	2.75	1.55	1.52
3	A	504	C81	C16-C15	2.67	1.55	1.52
4	A	503	FLC	CB-CBC	-2.58	1.50	1.53
4	B	503	FLC	CB-CBC	-2.45	1.50	1.53
2	A	501	NDP	C6N-C5N	2.29	1.40	1.33
2	B	501	NDP	C6N-C5N	2.24	1.39	1.33
2	D	501	NDP	C8A-N9A	-2.24	1.33	1.37
2	B	501	NDP	PA-O3	2.23	1.61	1.59
2	C	501	NDP	C6N-C5N	2.21	1.39	1.33
4	C	503	FLC	CB-CBC	-2.20	1.51	1.53
2	D	501	NDP	C6N-C5N	2.19	1.39	1.33
2	B	501	NDP	C8A-N7A	2.18	1.35	1.31
4	D	503	FLC	CB-CBC	-2.16	1.51	1.53
2	A	501	NDP	PA-O3	2.15	1.61	1.59
2	B	501	NDP	PN-O3	2.13	1.61	1.59
2	A	501	NDP	C5A-N7A	-2.13	1.35	1.39
2	C	501	NDP	C5A-N7A	-2.10	1.35	1.39
2	B	501	NDP	C5A-N7A	-2.10	1.35	1.39
2	C	501	NDP	C8A-N7A	2.08	1.35	1.31
2	A	501	NDP	C8A-N7A	2.04	1.35	1.31

All (153) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	504	C81	N1-C2-N3	-6.89	119.76	126.42
3	A	504	C81	N1-C2-N3	-6.65	119.99	126.42
3	B	502	C81	N1-C2-N3	-6.53	120.10	126.42
3	D	504	C81	C6-N1-C2	6.53	120.88	115.42
3	D	502	C81	N1-C2-N3	-6.44	120.19	126.42
3	C	502	C81	N1-C2-N3	-6.43	120.20	126.42
3	A	502	C81	N1-C2-N3	-6.40	120.23	126.42
3	A	504	C81	C6-N1-C2	6.39	120.76	115.42
3	B	502	C81	C6-N1-C2	6.30	120.68	115.42
3	C	502	C81	C6-N1-C2	6.21	120.61	115.42
3	A	502	C81	C6-N1-C2	6.10	120.52	115.42
3	D	502	C81	C6-N1-C2	6.10	120.51	115.42
3	A	504	C81	C18-N17-C16	5.68	122.06	118.00
3	D	504	C81	C18-N17-C16	5.55	121.97	118.00
3	D	502	C81	C15-C16-N17	5.34	120.88	116.03
2	A	501	NDP	C5A-C4A-N3A	-5.33	119.37	126.72
3	D	502	C81	C10-C9-N7	-5.28	95.56	100.11
2	B	501	NDP	C5A-C4A-N3A	-5.23	119.52	126.72
2	D	501	NDP	N3A-C2A-N1A	-5.19	120.72	128.58
2	C	501	NDP	C5A-C4A-N3A	-5.18	119.58	126.72
2	D	501	NDP	C5A-C4A-N3A	-5.15	119.62	126.72
3	A	502	C81	C18-N17-C16	5.06	121.62	118.00
3	D	504	C81	C10-C9-N7	-4.95	95.84	100.11
2	D	501	NDP	O2B-C2B-C1B	-4.95	92.66	110.05
2	B	501	NDP	N3A-C2A-N1A	-4.91	121.15	128.58
2	C	501	NDP	N3A-C2A-N1A	-4.89	121.18	128.58
3	C	502	C81	C18-N17-C16	4.81	121.44	118.00
2	A	501	NDP	N3A-C2A-N1A	-4.79	121.33	128.58
3	D	502	C81	C18-N17-C16	4.70	121.36	118.00
3	A	504	C81	C10-C9-N7	-4.53	96.20	100.11
3	B	502	C81	C18-N17-C16	4.51	121.23	118.00
3	D	504	C81	C21-C16-N17	-4.41	118.65	123.00
3	A	504	C81	C21-C16-N17	-4.32	118.74	123.00
2	D	501	NDP	N3A-C4A-N9A	4.18	134.28	127.17
3	B	502	C81	C10-C9-N7	-4.10	96.57	100.11
3	A	502	C81	C10-C9-N7	-4.06	96.61	100.11
2	D	501	NDP	C4A-N9A-C8A	3.98	109.91	105.74
3	B	502	C81	C15-C16-N17	3.89	119.56	116.03
2	D	501	NDP	N9A-C8A-N7A	-3.88	108.43	113.94
3	A	502	C81	N8-C2-N1	3.74	122.68	116.75
3	A	502	C81	C15-C16-N17	3.62	119.31	116.03
3	C	502	C81	C15-C16-N17	3.58	119.27	116.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	502	C81	N8-C2-N1	3.57	122.42	116.75
3	A	502	C81	C21-C16-N17	-3.52	119.53	123.00
2	B	501	NDP	N9A-C8A-N7A	-3.52	108.95	113.94
2	B	501	NDP	C2A-N3A-C4A	3.48	120.33	111.83
3	C	502	C81	C21-C16-N17	-3.48	119.57	123.00
2	A	501	NDP	C2A-N3A-C4A	3.48	120.33	111.83
2	C	501	NDP	C2A-N3A-C4A	3.47	120.31	111.83
2	D	501	NDP	C2A-N3A-C4A	3.46	120.29	111.83
3	D	502	C81	C26-N25-C24	3.44	121.94	117.48
3	D	502	C81	C21-C16-N17	-3.44	119.61	123.00
2	C	501	NDP	N9A-C8A-N7A	-3.43	109.08	113.94
2	D	501	NDP	P2B-O2B-C2B	-3.38	114.40	123.43
2	A	501	NDP	N3A-C4A-N9A	3.35	132.87	127.17
3	B	502	C81	C26-N25-C24	3.35	121.82	117.48
3	B	502	C81	C21-C16-N17	-3.34	119.70	123.00
2	A	501	NDP	N9A-C8A-N7A	-3.34	109.20	113.94
2	C	501	NDP	N3A-C4A-N9A	3.27	132.74	127.17
3	B	502	C81	N8-C2-N1	3.27	121.93	116.75
2	B	501	NDP	N3A-C4A-N9A	3.26	132.71	127.17
3	D	504	C81	N8-C2-N1	3.25	121.90	116.75
3	B	502	C81	C5-C6-N1	-3.24	120.00	123.97
3	C	502	C81	C26-N25-C24	3.22	121.66	117.48
3	C	502	C81	C10-C9-N7	-3.20	97.35	100.11
3	C	502	C81	C5-C6-N1	-3.19	120.06	123.97
3	D	504	C81	C26-N25-C24	3.16	121.58	117.48
3	A	502	C81	C5-C6-N1	-3.15	120.11	123.97
3	C	502	C81	N8-C2-N1	3.15	121.75	116.75
3	D	502	C81	C27-C26-N25	-3.15	120.11	123.97
2	D	501	NDP	O4B-C1B-C2B	-3.12	101.21	106.59
3	D	502	C81	C5-C6-N1	-3.12	120.15	123.97
3	A	504	C81	C15-C16-N17	3.10	118.84	116.03
3	B	502	C81	C27-C26-N25	-3.10	120.18	123.97
3	D	504	C81	C5-C6-N1	-3.10	120.18	123.97
3	A	504	C81	C5-C6-N1	-3.09	120.19	123.97
3	A	504	C81	N8-C2-N1	3.09	121.65	116.75
3	C	502	C81	C27-C26-N25	-3.06	120.22	123.97
2	D	501	NDP	O3X-P2B-O2B	-3.05	93.95	105.85
3	D	504	C81	C15-C16-N17	3.04	118.79	116.03
3	A	502	C81	C26-N25-C24	3.03	121.41	117.48
3	C	502	C81	C5-C4-N3	-3.03	118.66	123.62
3	A	504	C81	C26-N25-C24	3.02	121.40	117.48
3	D	502	C81	C10-O11-C12	-2.96	106.71	109.94

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	503	FLC	OB2-CBC-CB	2.95	118.80	113.14
3	A	502	C81	C27-C26-N25	-2.94	120.37	123.97
2	D	501	NDP	O4D-C1D-N1N	2.93	113.67	108.08
4	D	503	FLC	OB2-CBC-CB	2.91	118.72	113.14
3	B	502	C81	C5-C4-N3	-2.89	118.89	123.62
3	D	502	C81	C5-C4-N3	-2.85	118.95	123.62
3	A	502	C81	C5-C4-N3	-2.85	118.96	123.62
2	B	501	NDP	C4A-C5A-N7A	-2.79	107.39	110.58
3	A	502	C81	C5-C4-N7	2.77	124.56	122.38
2	A	501	NDP	C4A-C5A-N7A	-2.77	107.41	110.58
2	C	501	NDP	O4D-C1D-N1N	2.77	113.36	108.08
3	D	504	C81	C14-C9-N7	2.76	116.80	112.05
4	C	503	FLC	OB2-CBC-CB	2.73	118.39	113.14
2	C	501	NDP	C4A-C5A-N7A	-2.72	107.48	110.58
2	B	501	NDP	C5A-N7A-C8A	2.63	107.59	103.45
3	A	504	C81	C5-C4-N3	-2.63	119.31	123.62
2	A	501	NDP	C5A-N7A-C8A	2.62	107.56	103.45
3	C	502	C81	C14-C9-N7	2.61	116.55	112.05
2	C	501	NDP	C5A-N7A-C8A	2.60	107.53	103.45
3	A	504	C81	C14-C9-N7	2.59	116.51	112.05
2	D	501	NDP	O4B-C1B-N9A	2.58	113.04	108.09
2	B	501	NDP	C1D-N1N-C2N	-2.55	116.94	121.14
3	C	502	C81	C6-C5-C4	2.54	118.42	115.94
3	D	504	C81	C5-C4-N3	-2.50	119.53	123.62
3	A	502	C81	C2-N3-C4	2.49	122.13	114.38
3	D	502	C81	C2-N3-C4	2.48	122.10	114.38
3	C	502	C81	C2-N3-C4	2.46	122.03	114.38
3	B	502	C81	C2-N3-C4	2.46	122.03	114.38
4	B	503	FLC	OB2-CBC-CB	2.44	117.83	113.14
2	B	501	NDP	C4A-N9A-C8A	2.44	108.30	105.74
2	D	501	NDP	C5A-N7A-C8A	2.44	107.28	103.45
3	D	502	C81	C5-C4-N7	2.43	124.29	122.38
2	A	501	NDP	C1D-N1N-C2N	-2.42	117.15	121.14
3	D	504	C81	C2-N3-C4	2.41	121.89	114.38
3	B	502	C81	C6-C5-C4	2.40	118.29	115.94
3	A	504	C81	C2-N3-C4	2.40	121.84	114.38
2	C	501	NDP	C4A-N9A-C8A	2.38	108.24	105.74
4	A	503	FLC	OB1-CBC-CB	-2.35	117.54	122.09
3	A	502	C81	C28-C15-C16	-2.31	108.18	110.98
3	D	504	C81	C10-O11-C12	-2.31	107.42	109.94
3	D	502	C81	C19-C18-N17	-2.30	120.88	124.53
3	A	504	C81	C27-C26-N25	-2.30	121.16	123.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	502	C81	F33-C32-C24	-2.27	108.43	112.43
2	C	501	NDP	C1D-N1N-C2N	-2.25	117.44	121.14
3	D	504	C81	C5-C4-N7	2.24	124.14	122.38
3	D	504	C81	C27-C26-N25	-2.24	121.23	123.97
3	A	504	C81	C5-C4-N7	2.23	124.13	122.38
3	B	502	C81	C5-C4-N7	2.22	124.13	122.38
3	A	502	C81	C19-C18-N17	-2.22	121.01	124.53
2	A	501	NDP	C4A-N9A-C8A	2.22	108.07	105.74
3	D	502	C81	C6-C5-C4	2.19	118.09	115.94
3	A	504	C81	C19-C18-N17	-2.19	121.06	124.53
3	A	502	C81	C6-C5-C4	2.16	118.06	115.94
3	A	504	C81	C10-O11-C12	-2.15	107.59	109.94
3	D	502	C81	O11-C10-C9	-2.14	103.22	105.63
3	C	502	C81	C5-C4-N7	2.13	124.05	122.38
3	D	504	C81	C23-C22-C19	-2.13	117.04	120.61
3	D	504	C81	C19-C18-N17	-2.12	121.17	124.53
3	B	502	C81	F33-C32-C24	-2.09	108.75	112.43
2	D	501	NDP	O2X-P2B-O2B	-2.05	97.84	105.85
2	D	501	NDP	O2X-P2B-O1X	2.05	118.80	110.83
3	B	502	C81	C19-C18-N17	-2.04	121.30	124.53
3	B	502	C81	C14-C9-N7	2.04	115.56	112.05
2	D	501	NDP	C1D-N1N-C2N	-2.04	117.78	121.14
2	D	501	NDP	C4A-C5A-N7A	-2.01	108.28	110.58
3	B	502	C81	F34-C32-C24	-2.01	108.89	112.43
3	D	504	C81	C27-C22-C19	2.01	124.24	120.91
3	A	504	C81	C6-C5-C4	2.01	117.91	115.94
4	A	503	FLC	OA2-CAC-CA	2.01	120.71	114.35

There are no chirality outliers.

All (56) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	NDP	C5D-O5D-PN-O3
2	A	501	NDP	C5D-O5D-PN-O1N
2	A	501	NDP	C5D-O5D-PN-O2N
2	C	501	NDP	C5D-O5D-PN-O3
2	C	501	NDP	C5D-O5D-PN-O1N
2	C	501	NDP	C5D-O5D-PN-O2N
2	B	501	NDP	C5D-O5D-PN-O3
2	B	501	NDP	C5D-O5D-PN-O1N
2	B	501	NDP	C5D-O5D-PN-O2N
2	D	501	NDP	C5D-O5D-PN-O3

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Mol	Chain	Res	Type	Atoms
2	D	501	NDP	C5D-O5D-PN-O1N
2	D	501	NDP	C5D-O5D-PN-O2N
3	D	504	C81	C16-C15-N8-C2
4	C	503	FLC	CG-CB-CBC-OB1
4	C	503	FLC	CG-CB-CBC-OB2
4	C	503	FLC	OHB-CB-CBC-OB1
4	C	503	FLC	OHB-CB-CBC-OB2
4	D	503	FLC	CG-CB-CBC-OB1
4	D	503	FLC	CG-CB-CBC-OB2
4	D	503	FLC	OHB-CB-CBC-OB1
4	D	503	FLC	OHB-CB-CBC-OB2
2	C	501	NDP	C3B-C4B-C5B-O5B
2	D	501	NDP	O4B-C4B-C5B-O5B
2	D	501	NDP	C3B-C4B-C5B-O5B
2	C	501	NDP	O4B-C4B-C5B-O5B
2	A	501	NDP	O4B-C4B-C5B-O5B
2	B	501	NDP	O4B-C4B-C5B-O5B
2	B	501	NDP	C3B-C4B-C5B-O5B
2	A	501	NDP	C3B-C4B-C5B-O5B
4	D	503	FLC	CB-CG-CGC-OG1
4	D	503	FLC	CB-CG-CGC-OG2
4	C	503	FLC	CA-CB-CBC-OB1
4	C	503	FLC	CA-CB-CBC-OB2
2	A	501	NDP	C2B-O2B-P2B-O2X
2	D	501	NDP	C2B-O2B-P2B-O2X
2	B	501	NDP	O4D-C1D-N1N-C2N
3	D	504	C81	C18-C19-C22-C23
3	D	504	C81	C18-C19-C22-C27
4	A	503	FLC	CB-CA-CAC-OA2
2	A	501	NDP	O4D-C1D-N1N-C2N
2	D	501	NDP	O4D-C1D-N1N-C2N
2	C	501	NDP	O4D-C1D-N1N-C2N
2	A	501	NDP	C2B-O2B-P2B-O1X
4	A	503	FLC	CB-CA-CAC-OA1
4	D	503	FLC	CB-CA-CAC-OA2
2	C	501	NDP	C2D-C1D-N1N-C2N
2	B	501	NDP	C2D-C1D-N1N-C2N
4	D	503	FLC	CB-CA-CAC-OA1
3	D	504	C81	N1-C2-N8-C15
2	A	501	NDP	C2D-C1D-N1N-C2N
2	D	501	NDP	C2B-O2B-P2B-O3X
2	D	501	NDP	C2B-O2B-P2B-O1X

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Mol	Chain	Res	Type	Atoms
3	A	504	C81	C30-C14-C9-N7
3	D	504	C81	C30-C14-C9-N7
3	A	504	C81	C18-C19-C22-C23
2	C	501	NDP	PA-O3-PN-O2N

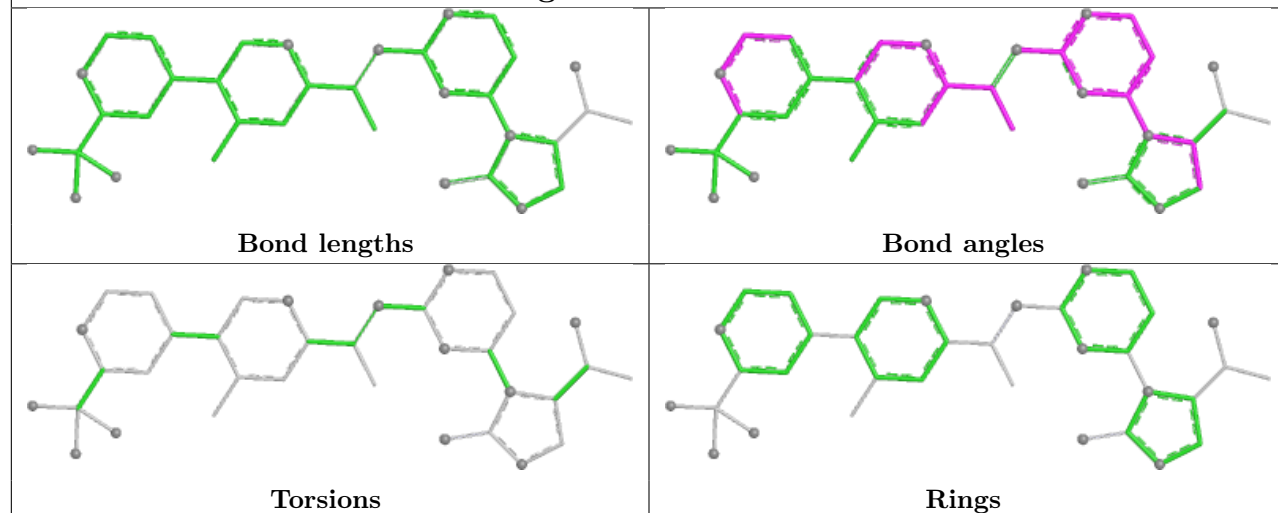
There are no ring outliers.

7 monomers are involved in 13 short contacts:

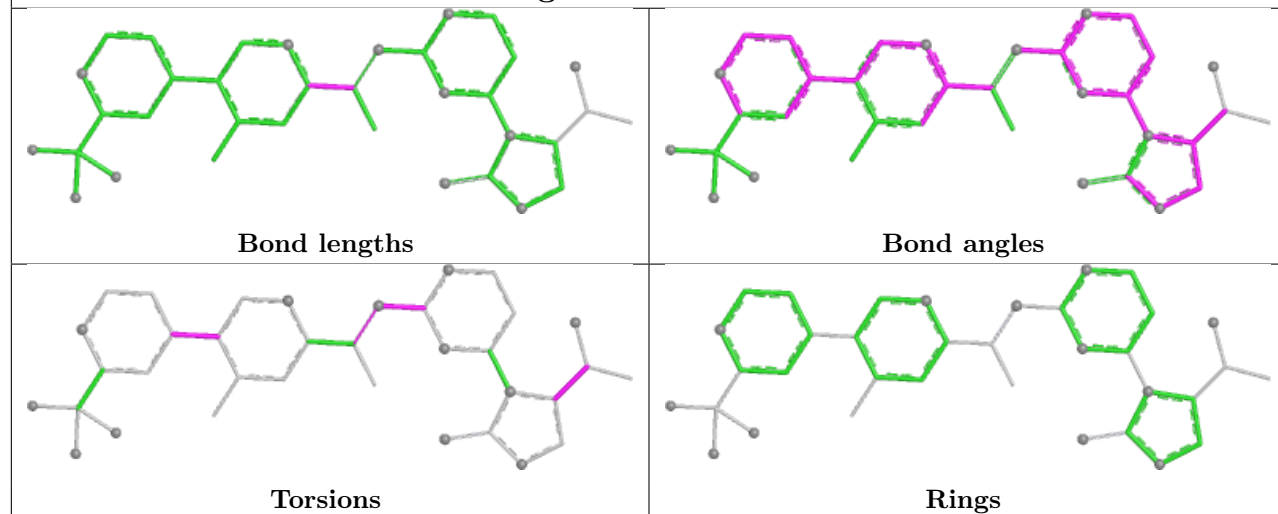
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	504	C81	1	0
2	B	501	NDP	4	0
4	A	503	FLC	2	0
4	C	503	FLC	2	0
2	A	501	NDP	3	0
4	B	503	FLC	3	0
2	C	501	NDP	1	0

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.

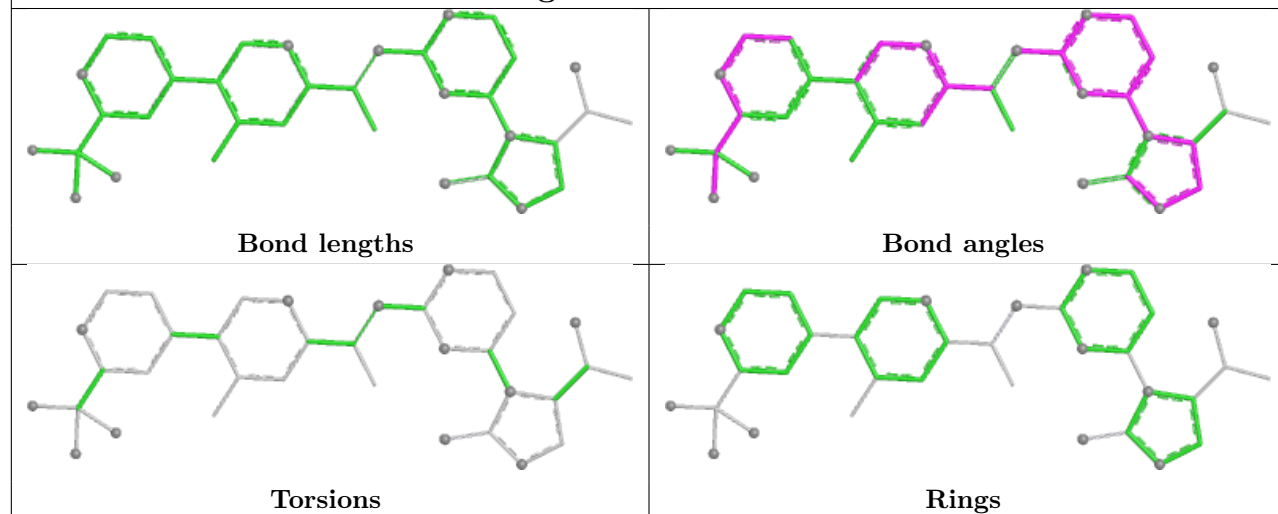
Ligand C81 A 502

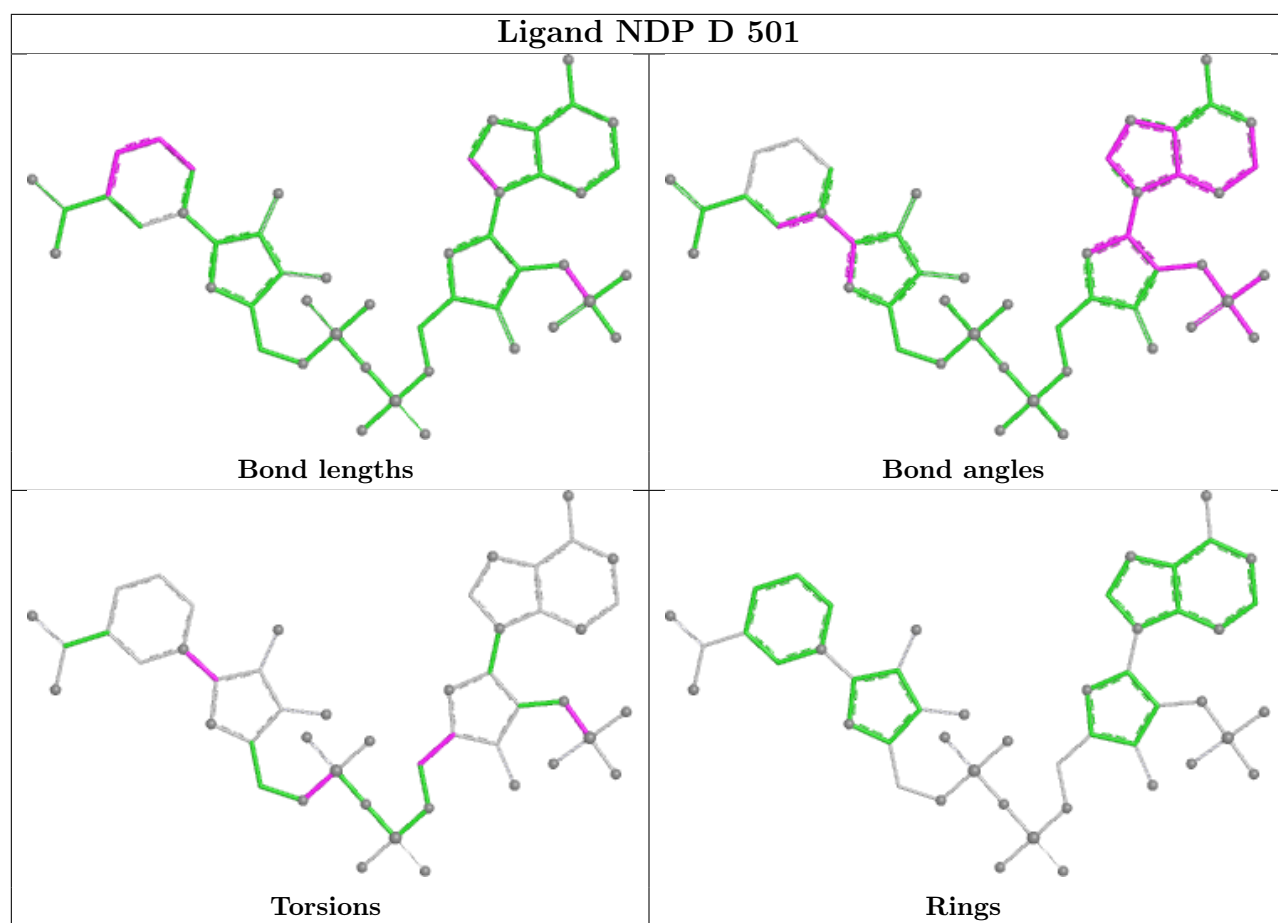


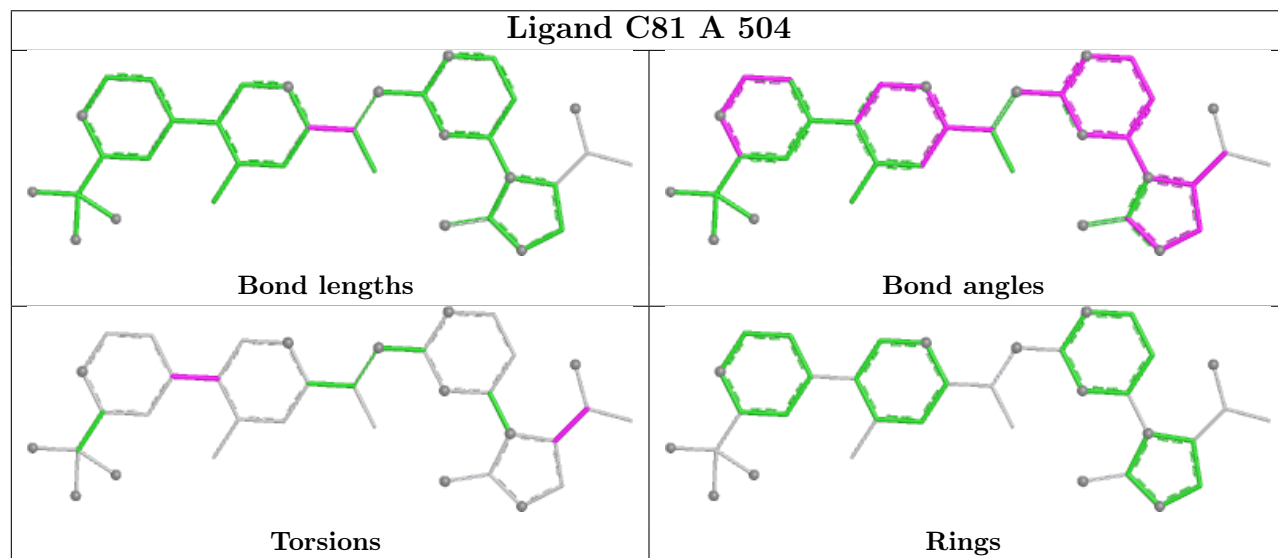
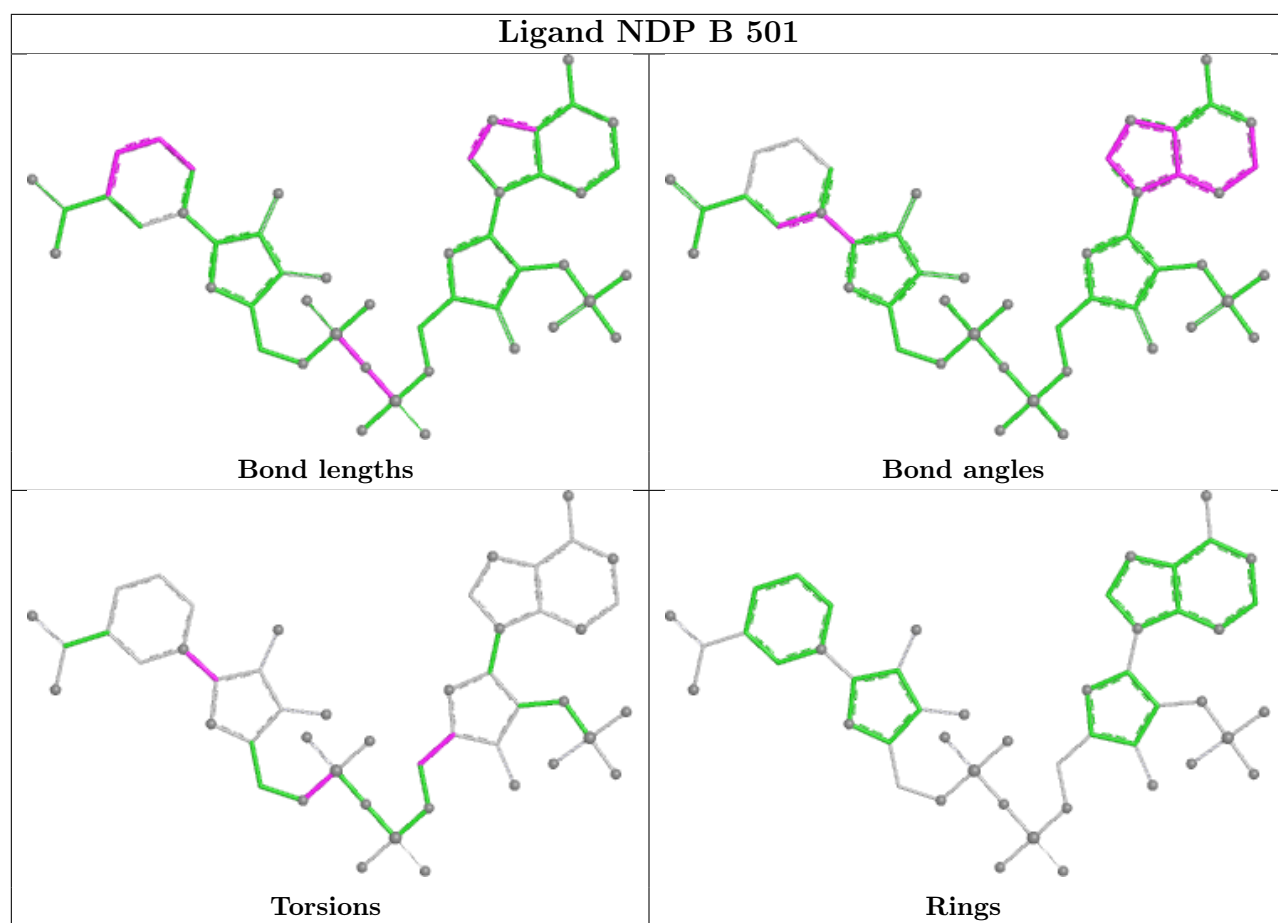
Ligand C81 D 504



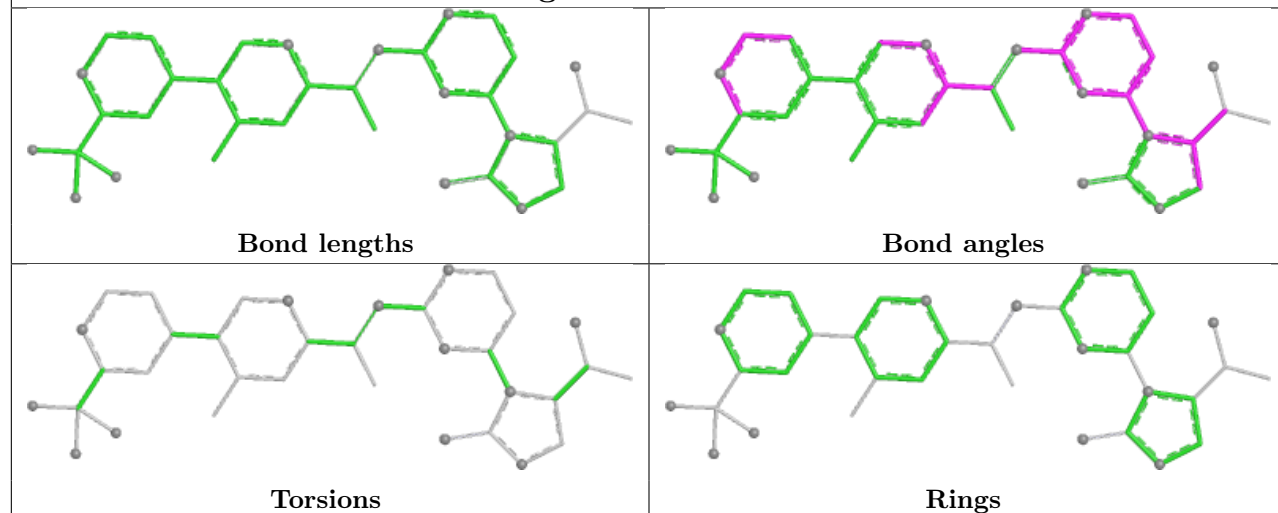
Ligand C81 D 502



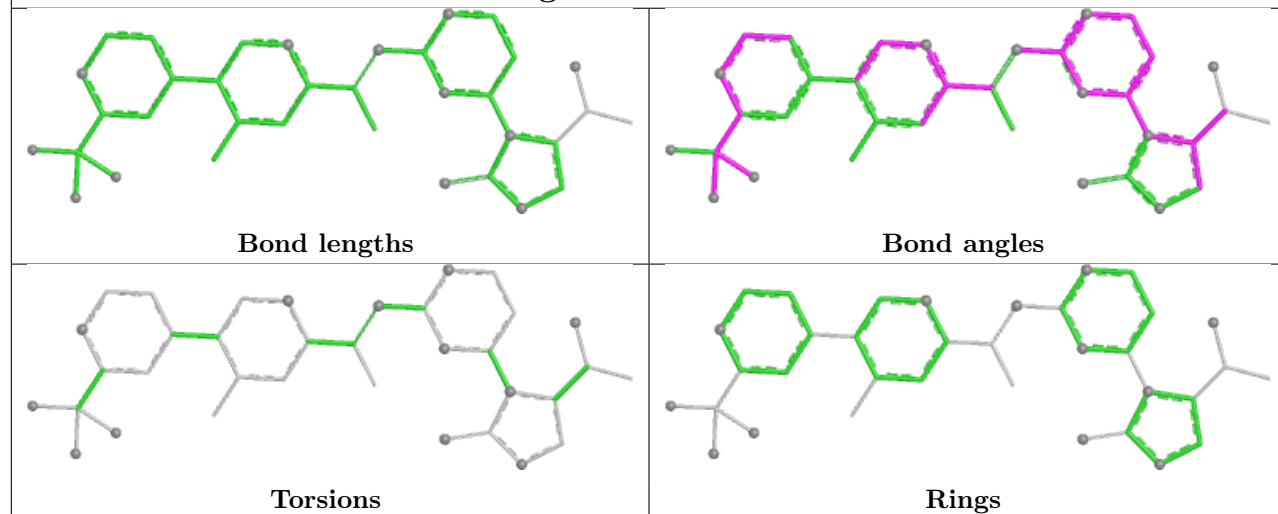


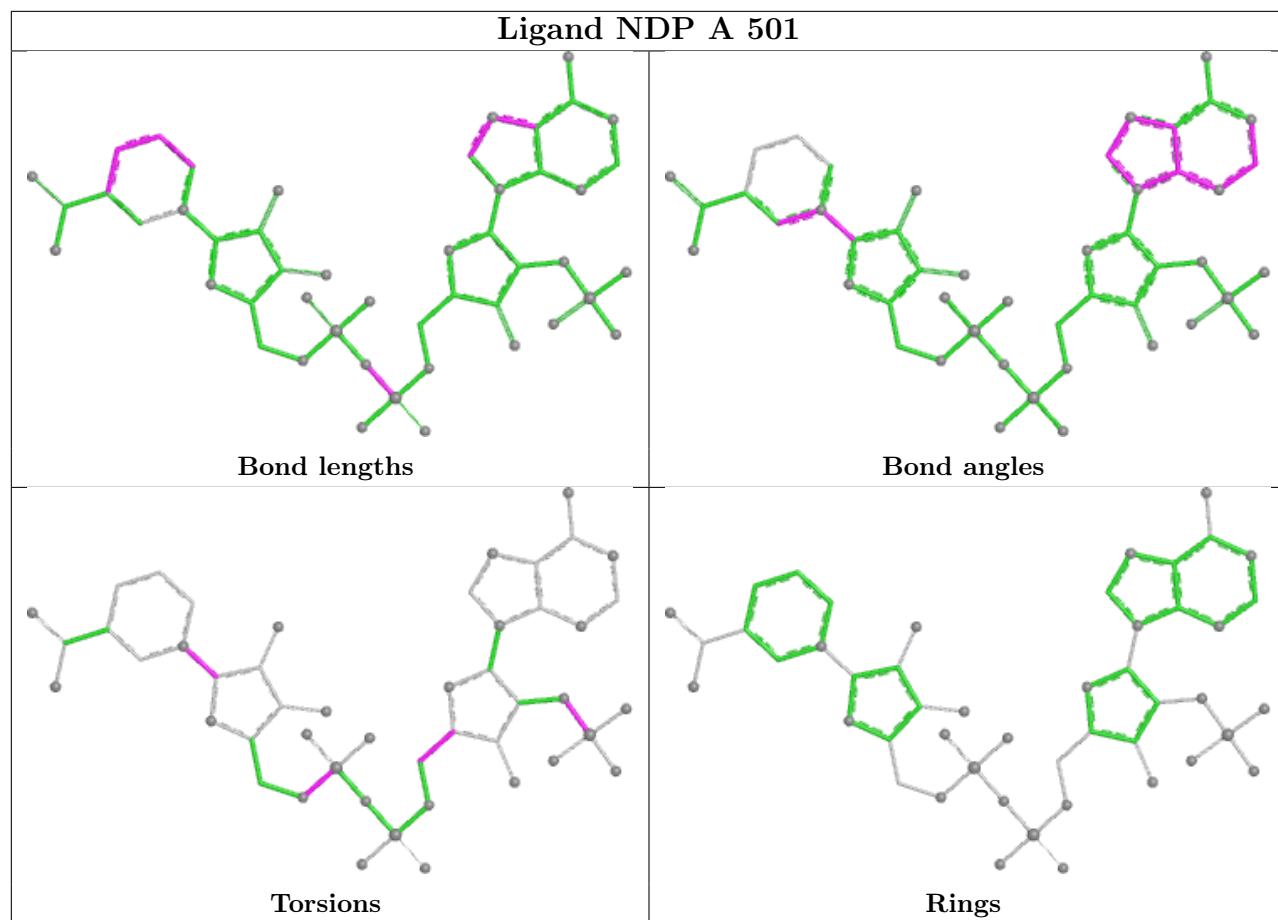


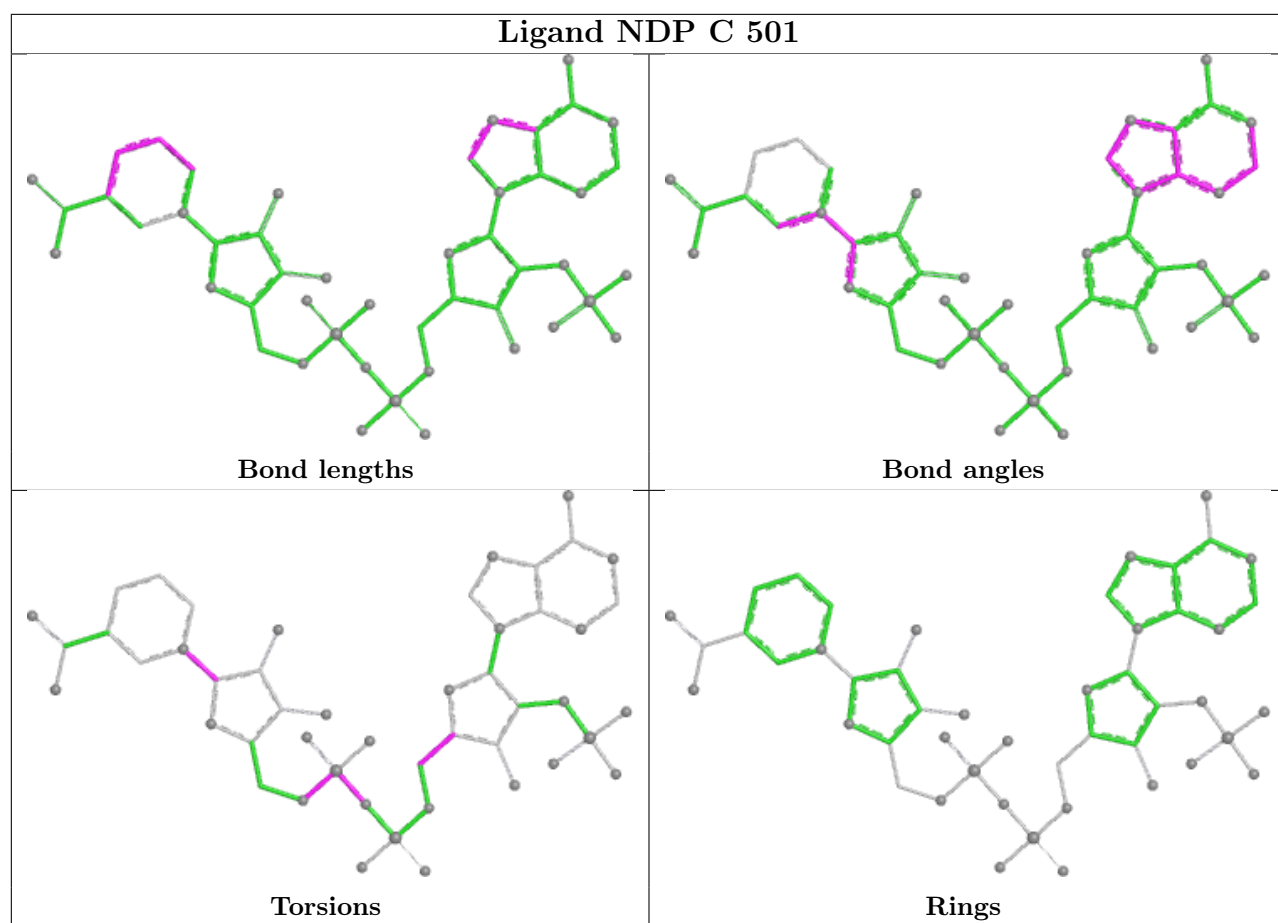
Ligand C81 C 502



Ligand C81 B 502







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	399/417 (95%)	-0.12	9 (2%) 61 66	21, 39, 61, 73	2 (0%)
1	B	409/417 (98%)	-0.23	7 (1%) 69 73	26, 37, 55, 83	1 (0%)
1	C	410/417 (98%)	0.34	18 (4%) 39 45	31, 51, 82, 98	0
1	D	399/417 (95%)	0.49	19 (4%) 35 42	27, 56, 81, 94	3 (0%)
All	All	1617/1668 (96%)	0.12	53 (3%) 49 55	21, 45, 75, 98	6 (0%)

All (53) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	139	TYR	4.6
1	D	134	ALA	4.3
1	C	139	TYR	4.0
1	A	134	ALA	3.6
1	C	272	TYR	3.4
1	B	272	TYR	3.3
1	D	10	VAL	3.2
1	A	412	ALA	3.1
1	A	161	GLY	3.1
1	D	277	GLN	3.0
1	A	277	GLN	3.0
1	C	83	VAL	2.9
1	D	125	VAL	2.9
1	D	162	THR	2.7
1	B	411	GLN	2.7
1	C	298	PRO	2.7
1	A	388	ARG	2.6
1	D	69	VAL	2.6
1	C	86	PHE	2.5
1	C	3	LYS	2.5
1	B	138	GLN	2.5

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Mol	Chain	Res	Type	RSRZ
1	D	11	VAL	2.5
1	C	414	LEU	2.4
1	D	36	GLU	2.4
1	D	70	GLY	2.4
1	D	294	VAL	2.4
1	D	411	GLN	2.4
1	C	237	SER	2.4
1	C	134	ALA	2.3
1	C	201	LEU	2.3
1	A	271	ASN	2.3
1	C	78	PRO	2.3
1	C	97	GLY	2.3
1	C	137	ASP	2.3
1	C	81	LYS	2.3
1	D	37	LEU	2.2
1	D	410	ALA	2.2
1	D	92	TRP	2.2
1	D	44	LEU	2.2
1	A	160	ASP	2.2
1	B	271	ASN	2.2
1	D	58	LYS	2.2
1	D	57	THR	2.2
1	C	133	HIS	2.2
1	A	384	PRO	2.1
1	D	68	ASN	2.1
1	C	323	GLN	2.1
1	B	314	ARG	2.1
1	B	412	ALA	2.0
1	A	141	ALA	2.0
1	C	51	ALA	2.0
1	D	88	LEU	2.0
1	C	413	LYS	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

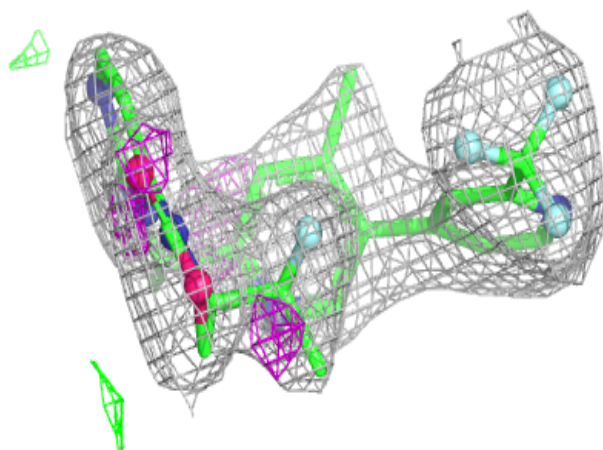
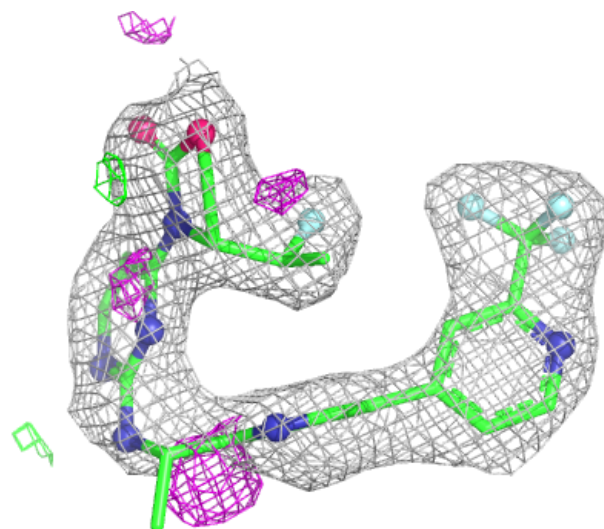
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	FLC	C	503	13/13	0.56	0.15	86,92,96,97	0
4	FLC	D	503	13/13	0.66	0.16	73,77,87,89	0
4	FLC	B	503	13/13	0.80	0.12	51,60,68,69	0
4	FLC	A	503	13/13	0.83	0.11	56,59,68,69	0
3	C81	A	504	35/35	0.88	0.12	53,59,65,66	0
3	C81	D	504	35/35	0.90	0.12	50,63,69,70	0
2	NDP	C	501	48/48	0.91	0.09	49,60,71,73	0
2	NDP	D	501	48/48	0.91	0.09	42,59,69,81	0
3	C81	D	502	35/35	0.92	0.11	41,51,70,72	0
3	C81	A	502	35/35	0.94	0.10	30,39,54,56	0
3	C81	C	502	35/35	0.95	0.09	38,44,54,60	0
3	C81	B	502	35/35	0.96	0.07	30,37,53,60	0
2	NDP	B	501	48/48	0.97	0.05	24,34,41,59	0
2	NDP	A	501	48/48	0.97	0.06	28,39,47,49	0

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

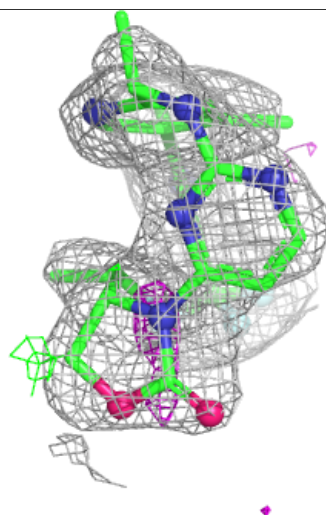
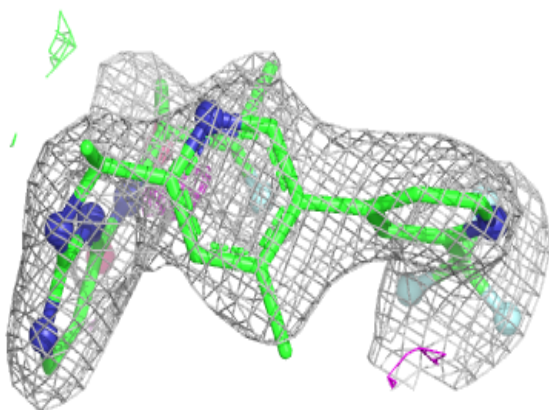
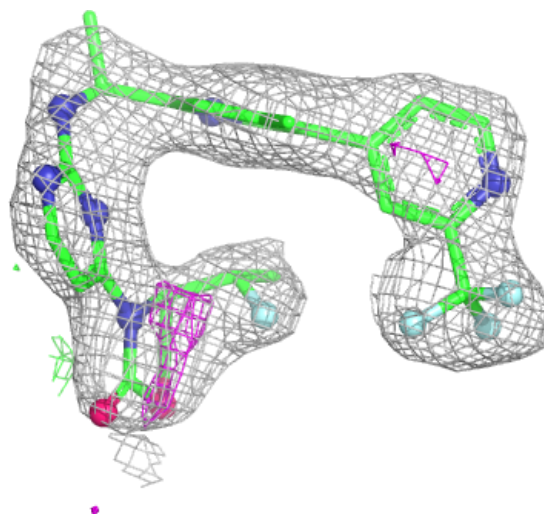
Electron density around C81 A 504:

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



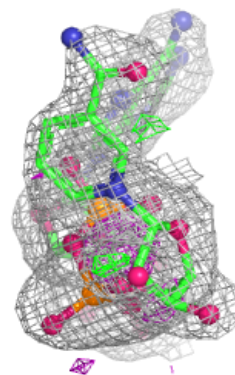
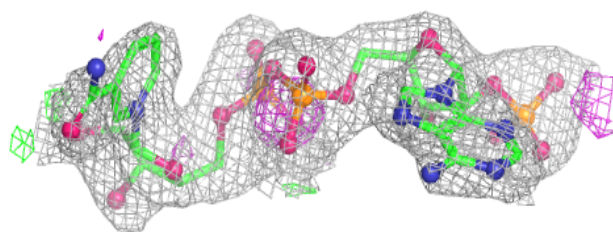
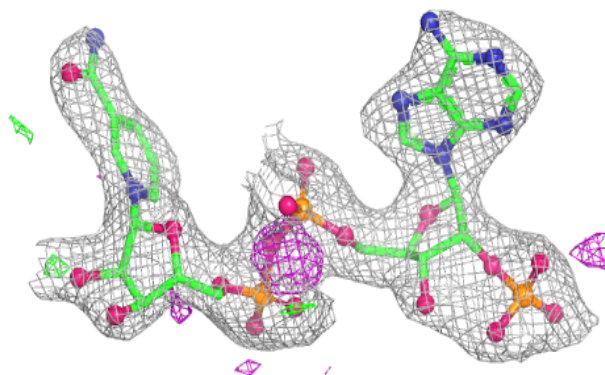
Electron density around C81 D 504:

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

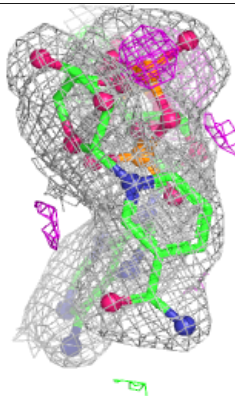
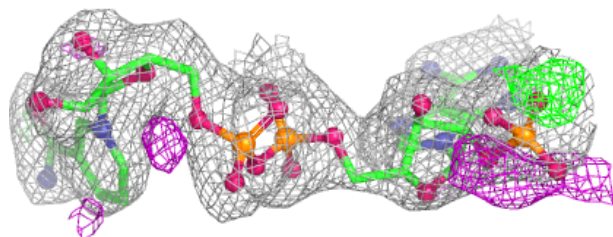
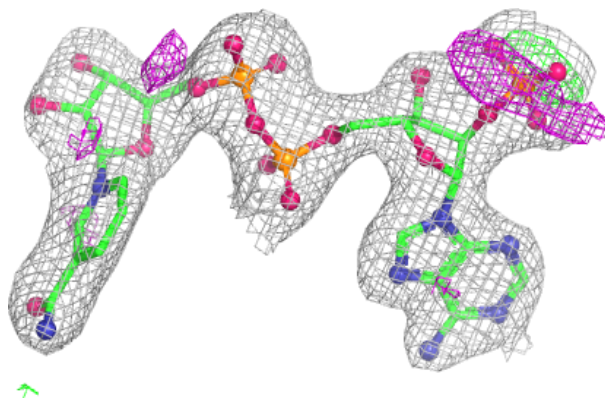


Electron density around NDP C 501:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

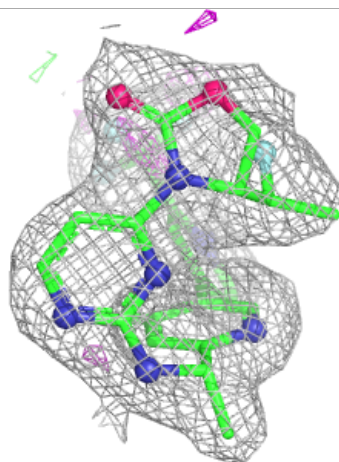
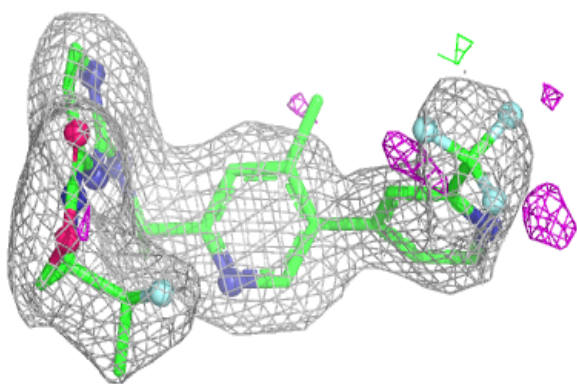
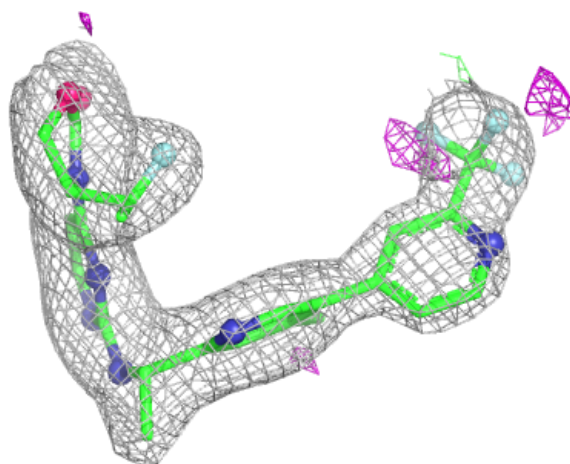
**Electron density around NDP D 501:**

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



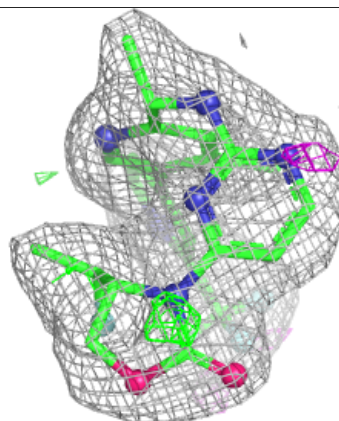
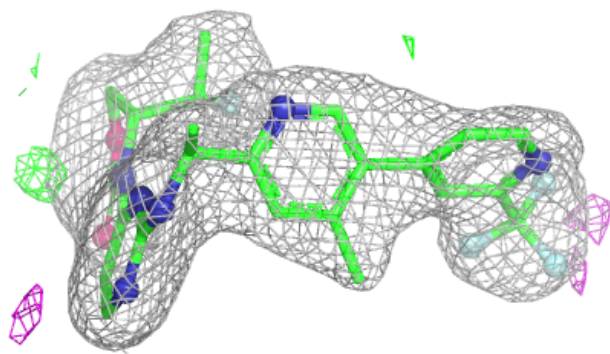
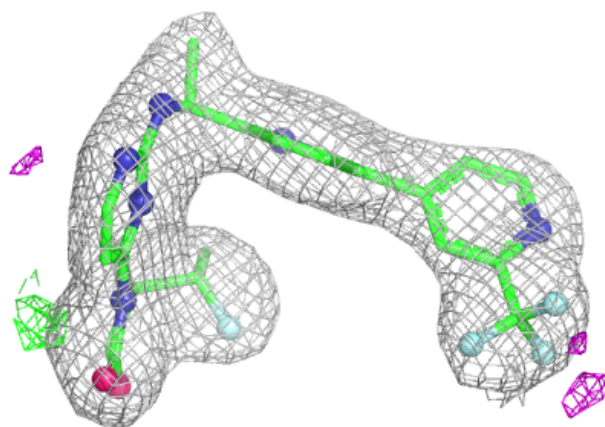
Electron density around C81 D 502:

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



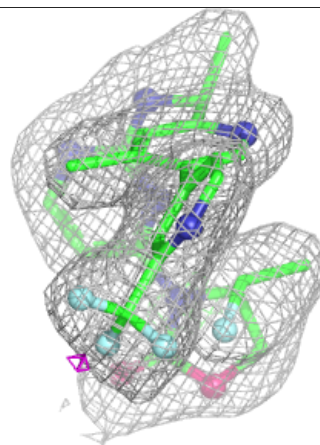
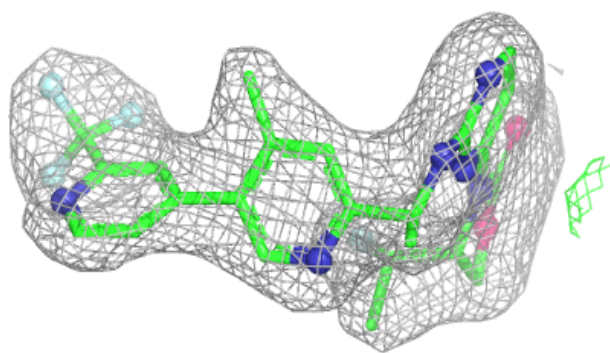
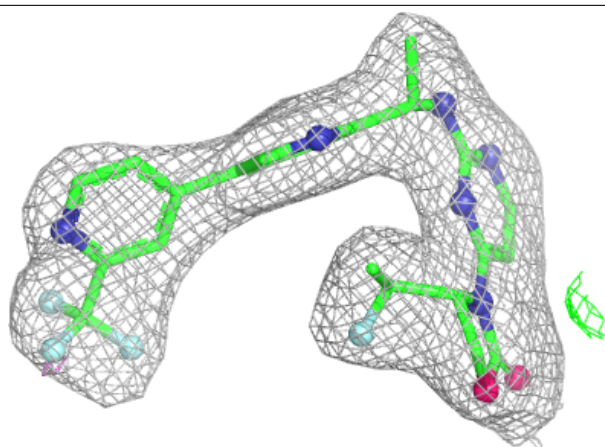
Electron density around C81 A 502:

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and green (positive)



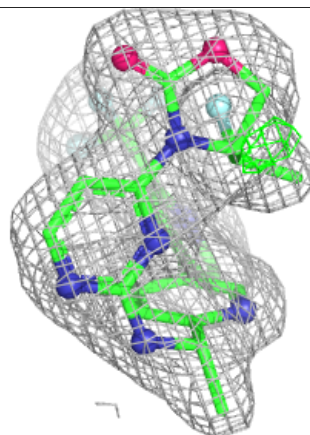
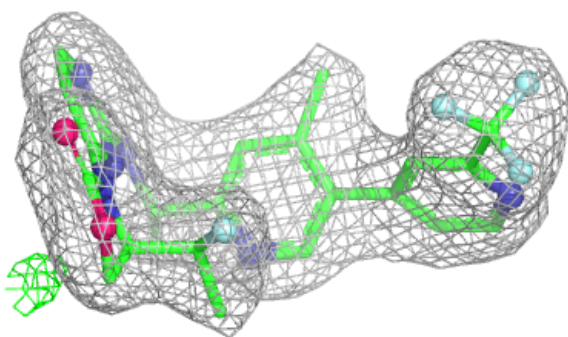
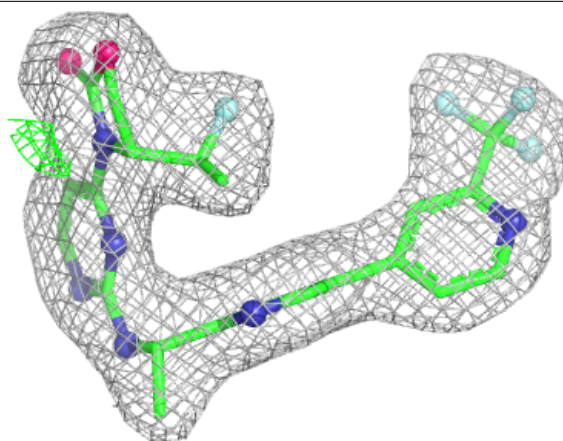
Electron density around C81 C 502:

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 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)

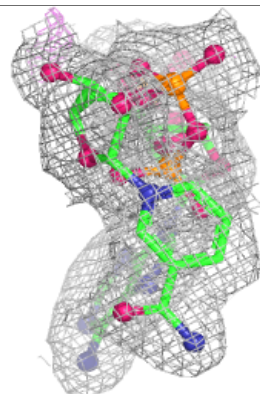
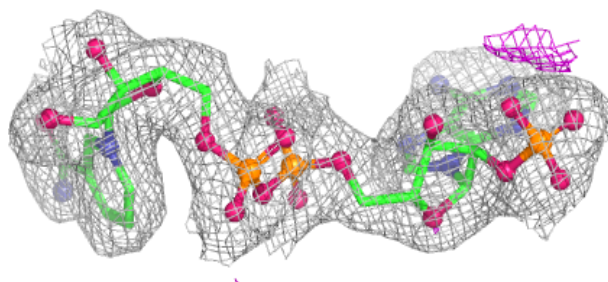
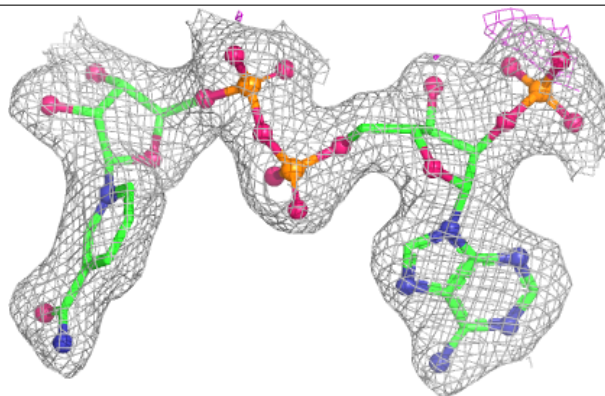


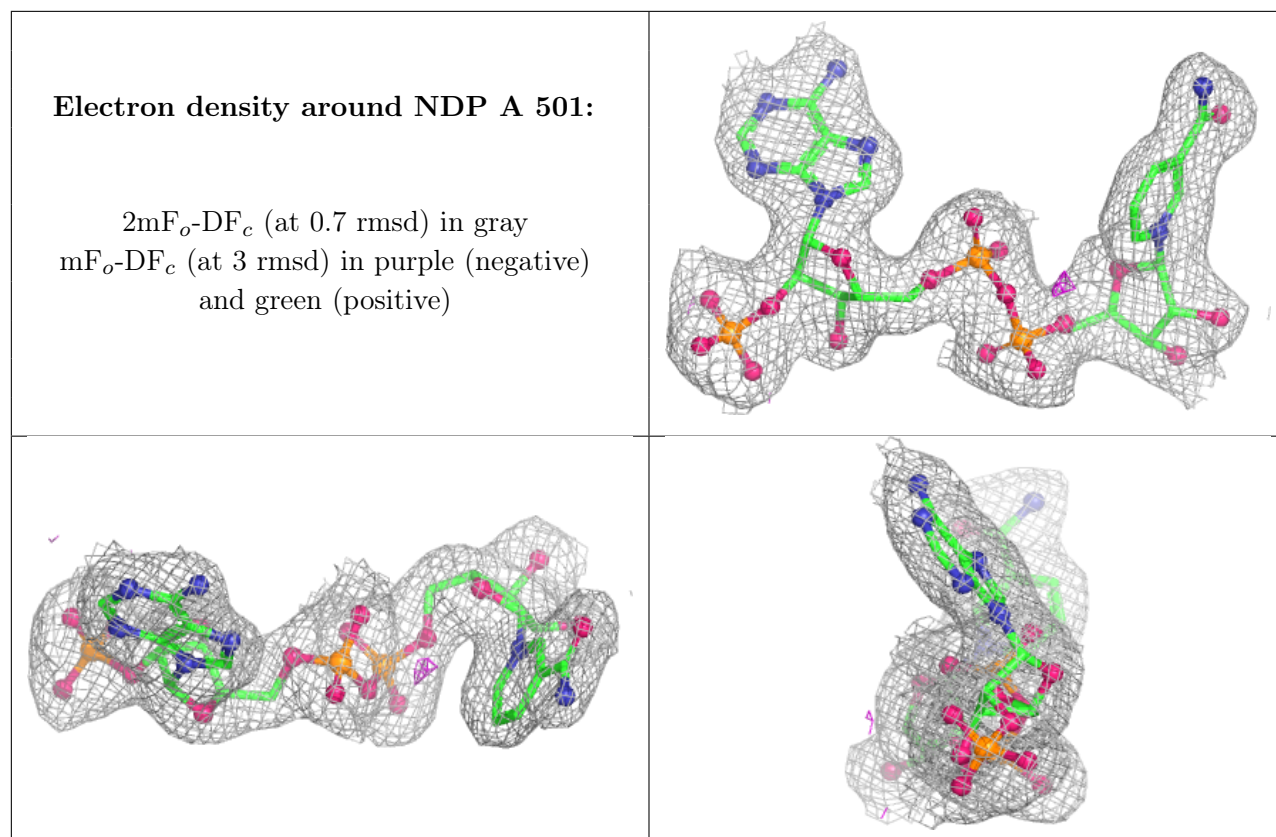
Electron density around C81 B 502:

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

**Electron density around NDP 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)





6.5 Other polymers [i](#)

There are no such residues in this entry.