



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 10:00 PM UTC

PDB ID : 4ADW / pdb_00004adw
Title : CRYSTAL STRUCTURE OF LEISHMANIA INFANTUM TRYPANOTHIONE REDUCTASE IN COMPLEX WITH NADPH AND TRYPANOTHIONE
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Deposited on : 2012-01-04
Resolution : 3.61 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

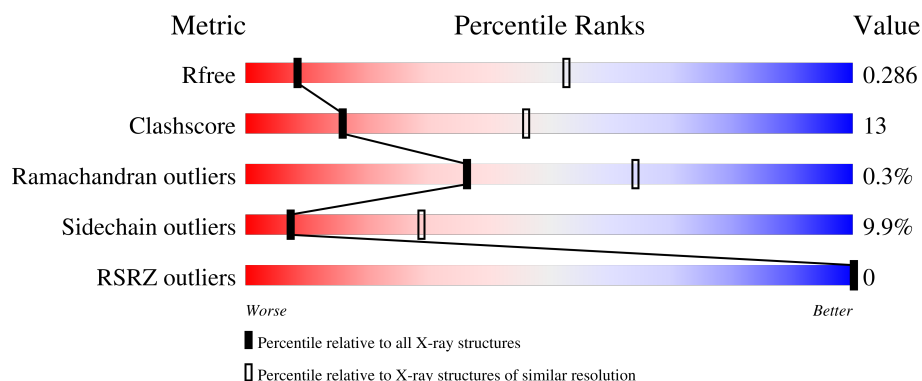
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.61 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	1062 (3.72-3.52)
Clashscore	190562	1092 (3.72-3.52)
Ramachandran outliers	187476	1057 (3.72-3.52)
Sidechain outliers	187428	1055 (3.72-3.52)
RSRZ outliers	180081	1060 (3.72-3.52)

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	511	 65% 27% • 5%
1	B	511	 67% 27% • 5%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7686 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 TRYPANOTHIONE REDUCTASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	488	Total	C	N	O	S	0	0	0
			3694	2322	634	711	27			
1	B	488	Total	C	N	O	S	0	0	0
			3694	2322	634	711	27			

There are 40 discrepancies between the modelled and reference sequences:

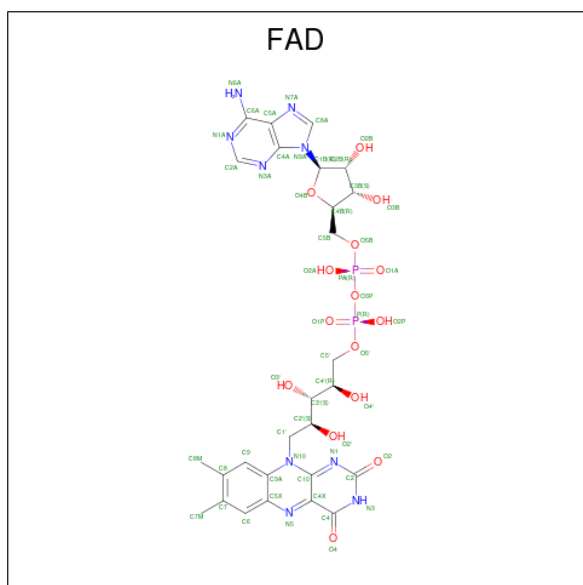
Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP A4HSF7
A	-18	GLY	-	expression tag	UNP A4HSF7
A	-17	SER	-	expression tag	UNP A4HSF7
A	-16	SER	-	expression tag	UNP A4HSF7
A	-15	HIS	-	expression tag	UNP A4HSF7
A	-14	HIS	-	expression tag	UNP A4HSF7
A	-13	HIS	-	expression tag	UNP A4HSF7
A	-12	HIS	-	expression tag	UNP A4HSF7
A	-11	HIS	-	expression tag	UNP A4HSF7
A	-10	HIS	-	expression tag	UNP A4HSF7
A	-9	SER	-	expression tag	UNP A4HSF7
A	-8	SER	-	expression tag	UNP A4HSF7
A	-7	GLY	-	expression tag	UNP A4HSF7
A	-6	LEU	-	expression tag	UNP A4HSF7
A	-5	VAL	-	expression tag	UNP A4HSF7
A	-4	PRO	-	expression tag	UNP A4HSF7
A	-3	ARG	-	expression tag	UNP A4HSF7
A	-2	GLY	-	expression tag	UNP A4HSF7
A	-1	SER	-	expression tag	UNP A4HSF7
A	0	HIS	-	expression tag	UNP A4HSF7
B	-19	MET	-	expression tag	UNP A4HSF7
B	-18	GLY	-	expression tag	UNP A4HSF7
B	-17	SER	-	expression tag	UNP A4HSF7
B	-16	SER	-	expression tag	UNP A4HSF7
B	-15	HIS	-	expression tag	UNP A4HSF7

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	HIS	-	expression tag	UNP A4HSF7
B	-13	HIS	-	expression tag	UNP A4HSF7
B	-12	HIS	-	expression tag	UNP A4HSF7
B	-11	HIS	-	expression tag	UNP A4HSF7
B	-10	HIS	-	expression tag	UNP A4HSF7
B	-9	SER	-	expression tag	UNP A4HSF7
B	-8	SER	-	expression tag	UNP A4HSF7
B	-7	GLY	-	expression tag	UNP A4HSF7
B	-6	LEU	-	expression tag	UNP A4HSF7
B	-5	VAL	-	expression tag	UNP A4HSF7
B	-4	PRO	-	expression tag	UNP A4HSF7
B	-3	ARG	-	expression tag	UNP A4HSF7
B	-2	GLY	-	expression tag	UNP A4HSF7
B	-1	SER	-	expression tag	UNP A4HSF7
B	0	HIS	-	expression tag	UNP A4HSF7

- Molecule 2 is FLAVIN-ADENINE DINUCLEOTIDE (CCD ID: FAD) (formula: $C_{27}H_{33}N_9O_{15}P_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			53	27	9	15	2		
2	B	1	Total	C	N	O	P	0	0
			53	27	9	15	2		

- Molecule 3 is NADPH DIHYDRO-NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NDP) (formula: $C_{21}H_{30}N_7O_{17}P_3$).

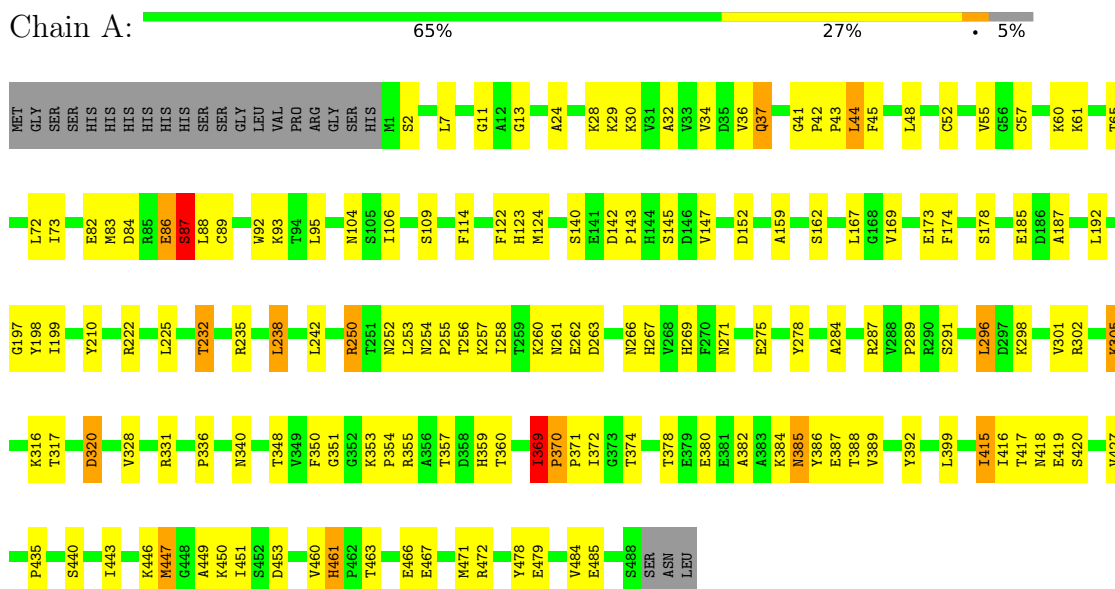
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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total	C	N	O	S	0	0
			48	27	9	10	2		

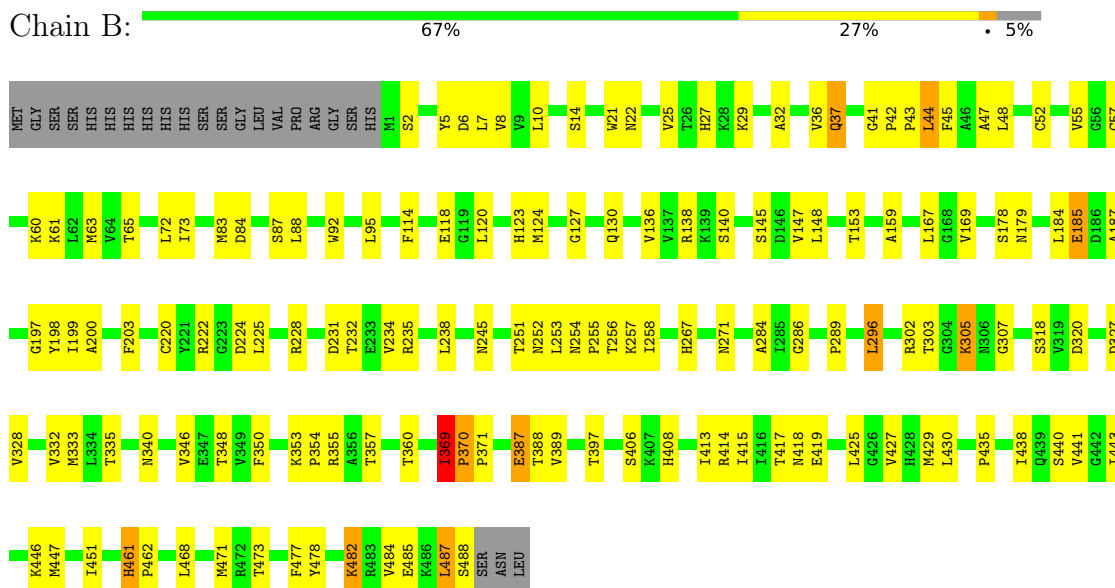
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry 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: TRYPANOTHIONE REDUCTASE



• Molecule 1: TRYPANOTHIONE REDUCTASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 41	Depositor
Cell constants a, b, c, α , β , γ	103.94Å 103.94Å 192.24Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.61 50.00 – 3.61	Depositor EDS
% Data completeness (in resolution range)	97.9 (50.00-3.61) 97.9 (50.00-3.61)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.66 (at 3.57Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.249 , 0.304 0.239 , 0.286	Depositor DCC
R_{free} test set	1193 reflections (5.20%)	wwPDB-VP
Wilson B-factor (Å ²)	103.0	Xtriage
Anisotropy	0.032	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 178.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.429 for h,-k,-l	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	7686	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.80% 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

5.1 Standard geometry

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

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	0.54	0/3767	0.89	6/5100 (0.1%)
1	B	0.53	0/3767	0.88	5/5100 (0.1%)
All	All	0.53	0/7534	0.89	11/10200 (0.1%)

There are no bond length outliers.

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	369	ILE	CA-C-N	-5.89	114.31	120.38
1	B	369	ILE	C-N-CA	-5.89	114.31	120.38
1	A	37	GLN	N-CA-C	5.74	116.66	108.74
1	B	461	HIS	N-CA-C	5.71	120.51	112.75
1	B	461	HIS	CA-C-N	-5.41	113.07	119.84
1	B	461	HIS	C-N-CA	-5.41	113.07	119.84
1	A	461	HIS	CA-C-N	-5.39	114.37	120.89
1	A	461	HIS	C-N-CA	-5.39	114.37	120.89
1	A	87	SER	N-CA-C	-5.21	106.19	112.54
1	A	369	ILE	CA-C-N	-5.19	115.03	120.38
1	A	369	ILE	C-N-CA	-5.19	115.03	120.38

There are no chirality outliers.

There are no planarity outliers.

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	3694	0	3647	101	0
1	B	3694	0	3647	109	0
2	A	53	0	31	1	0
2	B	53	0	31	3	0
3	A	48	0	26	3	0
3	B	48	0	26	9	0
4	A	48	0	47	3	0
4	B	48	0	47	4	0
All	All	7686	0	7502	200	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 13.

All (200) 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:461:HIS:CD2	1:B:57:CYS:SG	2.27	1.27
1:A:178:SER:HB3	1:A:199:ILE:HD11	1.19	1.12
1:A:57:CYS:SG	1:B:461:HIS:CD2	2.46	1.08
3:B:1490:NDP:H51N	3:B:1490:NDP:H6N	1.35	1.07
1:B:52:CYS:HB2	1:B:57:CYS:SG	1.98	1.04
1:A:389:VAL:HG23	1:A:478:TYR:HB2	1.36	1.02
1:A:57:CYS:HG	1:B:461:HIS:CD2	1.77	1.01
1:A:57:CYS:SG	1:B:461:HIS:NE2	2.36	0.99
1:A:461:HIS:HD2	1:B:57:CYS:SG	1.77	0.95
1:B:84:ASP:HB3	1:B:87:SER:HB2	1.48	0.95
1:B:389:VAL:HG23	1:B:478:TYR:HB2	1.49	0.94
1:A:57:CYS:HG	1:B:461:HIS:HE2	0.91	0.90
1:A:461:HIS:CD2	1:B:57:CYS:HG	1.84	0.90
1:A:461:HIS:NE2	1:B:57:CYS:SG	2.42	0.88
1:A:461:HIS:CE1	4:A:1491:GCG:SG2	2.69	0.86
1:A:305:LYS:HD3	1:A:305:LYS:H	1.41	0.85
1:A:250:ARG:HG2	1:A:253:LEU:HD22	1.60	0.83
1:A:140:SER:HB3	1:A:145:SER:HB3	1.62	0.81
1:A:52:CYS:HB2	1:A:57:CYS:SG	2.22	0.79
1:B:369:ILE:HG22	1:B:370:PRO:HD3	1.65	0.78
1:A:178:SER:CB	1:A:199:ILE:HD11	2.10	0.76
1:B:348:THR:HA	1:B:354:PRO:HA	1.68	0.75
1:B:389:VAL:CG2	1:B:478:TYR:HB2	2.17	0.74
1:B:461:HIS:CE1	4:B:1491:GCG:SG2	2.81	0.74
1:A:389:VAL:CG2	1:A:478:TYR:HB2	2.18	0.71
3:B:1490:NDP:H51N	3:B:1490:NDP:C6N	2.20	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:199:ILE:HG23	3:B:1490:NDP:H5N	1.74	0.70
1:A:57:CYS:SG	1:B:461:HIS:HD2	2.10	0.69
1:A:348:THR:HA	1:A:354:PRO:HA	1.74	0.69
1:B:140:SER:HB3	1:B:145:SER:HB3	1.75	0.69
1:A:140:SER:HB3	1:A:145:SER:CB	2.25	0.66
1:B:487:LEU:O	1:B:488:SER:HB3	1.94	0.66
1:B:29:LYS:HE3	1:B:350:PHE:HD1	1.59	0.66
1:A:52:CYS:SG	4:B:1491:GCG:SG2	2.93	0.66
1:A:463:THR:O	1:A:466:GLU:HG2	1.95	0.66
1:A:174:PHE:CE1	1:A:260:LYS:HB2	2.31	0.65
1:B:10:LEU:HD11	1:B:127:GLY:HA3	1.79	0.65
4:A:1491:GCG:SG2	1:B:52:CYS:SG	2.85	0.62
1:B:37:GLN:HA	1:B:124:MET:HE3	1.81	0.62
1:B:296:LEU:HD22	1:B:296:LEU:H	1.65	0.62
1:B:63:MET:HG2	1:B:95:LEU:HD21	1.83	0.61
1:B:387:GLU:HG2	1:B:388:THR:H	1.64	0.61
1:B:92:TRP:HB2	1:B:187:ALA:HB2	1.82	0.61
1:B:340:ASN:HD22	1:B:357:THR:HG23	1.66	0.60
1:A:238:LEU:HD22	1:A:242:LEU:HG	1.85	0.59
1:A:479:GLU:HB2	1:A:484:VAL:HG21	1.85	0.58
1:B:461:HIS:HE1	4:B:1491:GCG:H2	1.52	0.57
1:A:387:GLU:HG2	1:A:388:THR:H	1.69	0.57
1:B:36:VAL:CG1	1:B:44:LEU:HD22	2.34	0.57
1:B:42:PRO:HG2	1:B:43:PRO:HD3	1.86	0.57
1:A:178:SER:HB3	1:A:199:ILE:CD1	2.14	0.56
1:B:14:SER:HB3	1:B:335:THR:HG23	1.86	0.56
1:B:461:HIS:NE2	4:B:1491:GCG:SG2	2.77	0.56
1:B:159:ALA:O	2:B:1489:FAD:H52A	2.04	0.56
1:B:289:PRO:HB3	1:B:328:VAL:HA	1.89	0.55
1:A:11:GLY:C	1:A:13:GLY:H	2.15	0.55
1:B:37:GLN:HE21	1:B:47:ALA:HB2	1.71	0.54
1:A:331:ARG:HD2	1:A:359:HIS:NE2	2.22	0.54
1:B:73:ILE:HD13	1:B:88:LEU:HD11	1.89	0.54
1:A:316:LYS:HD2	1:A:320:ASP:HA	1.90	0.53
1:B:232:THR:HA	1:B:235:ARG:HD3	1.89	0.53
1:B:224:ASP:HA	1:B:251:THR:HB	1.91	0.53
1:A:369:ILE:HG22	1:A:370:PRO:HD3	1.90	0.53
1:A:37:GLN:HE22	1:A:41:GLY:HA3	1.73	0.53
1:A:222:ARG:HH21	3:A:1490:NDP:P2B	2.31	0.52
1:A:32:ALA:HB1	1:A:123:HIS:CD2	2.44	0.52
1:A:222:ARG:O	1:A:252:ASN:HA	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:254:ASN:H	1:A:271:ASN:HB2	1.76	0.51
1:A:340:ASN:HD22	1:A:357:THR:HG23	1.74	0.51
1:A:52:CYS:CB	1:A:57:CYS:SG	2.97	0.51
1:B:387:GLU:HG2	1:B:388:THR:N	2.26	0.51
1:A:199:ILE:HG22	3:A:1490:NDP:PN	2.50	0.51
1:A:289:PRO:HB3	1:A:328:VAL:HA	1.92	0.51
1:A:57:CYS:HB2	1:B:462:PRO:HG3	1.93	0.50
1:A:73:ILE:HD13	1:A:88:LEU:HD11	1.93	0.50
1:B:228:ARG:NH1	3:B:1490:NDP:O2X	2.44	0.50
1:A:336:PRO:HG3	1:B:461:HIS:HB2	1.93	0.49
1:B:32:ALA:HB1	1:B:123:HIS:CD2	2.46	0.49
1:B:8:VAL:HG22	1:B:32:ALA:HB3	1.95	0.49
1:B:387:GLU:HG2	1:B:388:THR:HG22	1.93	0.49
1:A:92:TRP:HB2	1:A:187:ALA:HB2	1.94	0.49
1:A:467:GLU:O	1:A:471:MET:HE2	2.12	0.49
1:B:199:ILE:CG2	3:B:1490:NDP:H5N	2.40	0.49
1:B:222:ARG:O	1:B:252:ASN:HA	2.13	0.49
1:B:413:ILE:HG21	1:B:471:MET:HE1	1.93	0.49
1:B:418:ASN:HB2	1:B:425:LEU:HD21	1.95	0.49
1:B:443:ILE:O	1:B:447:MET:HB2	2.13	0.49
1:A:29:LYS:HE3	1:A:350:PHE:HD1	1.77	0.49
1:B:36:VAL:HG12	1:B:44:LEU:HD22	1.95	0.49
1:A:261:ASN:HB2	1:A:263:ASP:OD1	2.13	0.48
1:A:87:SER:HB3	1:B:84:ASP:H	1.78	0.48
1:B:224:ASP:HB3	1:B:252:ASN:ND2	2.29	0.48
1:B:258:ILE:HA	1:B:267:HIS:O	2.13	0.48
1:A:95:LEU:HD13	1:A:210:TYR:OH	2.13	0.48
1:A:380:GLU:O	1:A:384:LYS:HG2	2.13	0.48
1:B:48:LEU:HD11	1:B:114:PHE:HE2	1.79	0.48
1:A:185:GLU:H	1:A:185:GLU:CD	2.22	0.48
1:B:286:GLY:HA2	3:B:1490:NDP:O2N	2.13	0.48
1:A:450:LYS:O	1:A:453:ASP:HB2	2.14	0.48
1:A:197:GLY:O	1:A:198:TYR:C	2.57	0.47
1:B:45:PHE:HB3	1:B:55:VAL:HG11	1.95	0.47
1:A:36:VAL:CG1	1:A:44:LEU:HD22	2.44	0.47
1:A:316:LYS:HG3	1:A:317:THR:N	2.28	0.47
1:B:6:ASP:OD2	1:B:29:LYS:HG3	2.14	0.47
1:A:296:LEU:HB3	1:A:301:VAL:HB	1.97	0.47
1:A:305:LYS:H	1:A:305:LYS:CD	2.16	0.47
1:B:222:ARG:HH21	3:B:1490:NDP:P2B	2.37	0.47
1:A:415:ILE:HG23	1:A:427:VAL:HG22	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:254:ASN:HB3	1:B:271:ASN:HD22	1.80	0.47
1:A:162:SER:HB2	1:A:287:ARG:HB3	1.96	0.46
1:B:84:ASP:CB	1:B:87:SER:HB2	2.34	0.46
1:B:305:LYS:H	1:B:305:LYS:CD	2.28	0.46
1:A:417:THR:HG21	1:A:451:ILE:HB	1.97	0.46
3:A:1490:NDP:H6N	3:A:1490:NDP:H51N	1.97	0.46
1:B:140:SER:HB3	1:B:145:SER:CB	2.43	0.46
1:B:231:ASP:HB3	1:B:234:VAL:HG23	1.97	0.46
1:A:29:LYS:HE3	1:A:350:PHE:CD1	2.50	0.46
1:B:487:LEU:O	1:B:488:SER:CB	2.64	0.46
1:A:45:PHE:HB3	1:A:55:VAL:HG11	1.97	0.46
1:A:84:ASP:C	1:A:86:GLU:H	2.23	0.46
1:B:477:PHE:HB2	1:B:484:VAL:HG23	1.98	0.46
1:A:443:ILE:O	1:A:447:MET:HB2	2.16	0.46
1:B:415:ILE:HG23	1:B:427:VAL:HG22	1.98	0.46
1:A:60:LYS:HD2	1:A:60:LYS:C	2.41	0.45
1:A:42:PRO:HG2	1:A:43:PRO:HD3	1.98	0.45
1:B:234:VAL:HG13	1:B:430:LEU:HB2	1.99	0.45
1:B:254:ASN:H	1:B:271:ASN:HB2	1.81	0.45
1:B:185:GLU:OE1	1:B:185:GLU:N	2.47	0.45
1:B:57:CYS:HB3	2:B:1489:FAD:C4	2.46	0.45
1:B:197:GLY:O	1:B:198:TYR:C	2.59	0.45
1:B:224:ASP:HB3	1:B:252:ASN:HD21	1.82	0.45
1:A:296:LEU:HD22	1:A:296:LEU:H	1.81	0.45
1:B:199:ILE:HG12	3:B:1490:NDP:O1N	2.17	0.45
1:A:199:ILE:HG23	1:A:284:ALA:HB1	1.98	0.45
1:A:291:SER:HB2	1:A:296:LEU:HD21	1.98	0.45
1:A:174:PHE:HB3	1:A:266:ASN:HD22	1.82	0.44
1:A:267:HIS:CE1	1:A:275:GLU:HB3	2.53	0.44
1:B:406:SER:C	1:B:408:HIS:H	2.24	0.44
1:A:92:TRP:CB	1:A:187:ALA:HB2	2.47	0.44
1:A:122:PHE:CE2	1:A:124:MET:HB2	2.52	0.44
1:B:388:THR:HG23	1:B:419:GLU:HB3	1.99	0.44
1:B:413:ILE:HG12	1:B:429:MET:HG2	1.99	0.44
1:A:351:GLY:C	1:A:353:LYS:H	2.26	0.44
1:A:371:PRO:HB2	1:A:435:PRO:HD3	2.00	0.44
1:A:232:THR:HA	1:A:235:ARG:HD3	1.99	0.44
1:B:369:ILE:HD13	1:B:369:ILE:HA	1.68	0.44
1:A:159:ALA:O	2:A:1489:FAD:H52A	2.18	0.44
1:B:60:LYS:C	1:B:60:LYS:HD2	2.43	0.44
1:A:392:TYR:HE2	1:A:472:ARG:O	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:52:CYS:CB	1:B:57:CYS:SG	2.90	0.43
1:B:220:CYS:HB2	1:B:253:LEU:HD23	2.01	0.43
1:A:369:ILE:HA	1:A:369:ILE:HD13	1.72	0.43
1:B:371:PRO:HB2	1:B:435:PRO:HD3	2.01	0.43
1:A:48:LEU:HD11	1:A:114:PHE:HE2	1.83	0.43
1:B:14:SER:CB	1:B:335:THR:HG23	2.48	0.43
1:A:72:LEU:HD13	1:B:72:LEU:HD13	2.01	0.43
1:A:461:HIS:NE2	4:A:1491:GCG:SG2	2.90	0.43
1:A:340:ASN:ND2	1:A:357:THR:HG23	2.34	0.43
1:A:385:ASN:C	1:A:385:ASN:OD1	2.61	0.43
1:A:169:VAL:HB	1:A:256:THR:O	2.19	0.43
1:A:461:HIS:O	1:A:461:HIS:ND1	2.52	0.43
2:B:1489:FAD:H9	2:B:1489:FAD:H1'1	1.85	0.43
1:B:199:ILE:O	1:B:203:PHE:HB2	2.19	0.42
1:B:41:GLY:O	1:B:45:PHE:HA	2.19	0.42
1:B:42:PRO:CG	1:B:43:PRO:HD3	2.48	0.42
1:A:142:ASP:HA	1:A:143:PRO:HD3	1.95	0.42
1:A:238:LEU:HD12	1:A:372:ILE:HD11	2.00	0.42
1:A:387:GLU:HG2	1:A:388:THR:N	2.33	0.42
1:B:169:VAL:HB	1:B:256:THR:O	2.20	0.42
1:B:21:TRP:O	1:B:25:VAL:HG23	2.20	0.42
1:B:45:PHE:CD1	1:B:179:ASN:HB3	2.55	0.42
1:B:5:TYR:O	1:B:153:THR:HA	2.19	0.42
1:A:106:ILE:O	1:A:109:SER:HB3	2.20	0.42
1:B:57:CYS:HA	1:B:60:LYS:HE2	2.02	0.42
1:B:130:GLN:HB2	1:B:136:VAL:HG23	2.02	0.41
1:B:303:THR:HB	1:B:307:GLY:HA2	2.01	0.41
1:B:438:ILE:O	1:B:441:VAL:HB	2.20	0.41
1:A:57:CYS:O	1:A:61:LYS:HB2	2.20	0.41
1:B:327:ASP:OD1	1:B:333:MET:HB2	2.20	0.41
1:B:22:ASN:HB3	1:B:346:VAL:HG11	2.02	0.41
1:B:29:LYS:HG2	1:B:350:PHE:CE1	2.55	0.41
1:A:24:ALA:O	1:A:28:LYS:HA	2.21	0.41
1:A:382:ALA:O	1:A:386:TYR:HB2	2.21	0.41
1:A:305:LYS:HD3	1:A:305:LYS:N	2.22	0.41
1:A:418:ASN:HD21	1:A:420:SER:HB2	1.86	0.41
1:B:200:ALA:HB2	1:B:284:ALA:HB3	2.02	0.41
1:A:52:CYS:SG	1:A:57:CYS:SG	3.19	0.41
1:A:192:LEU:HD22	1:A:278:TYR:CE2	2.56	0.41
1:A:257:LYS:HB3	1:A:269:HIS:HB2	2.02	0.41
1:A:449:ALA:HB2	1:B:447:MET:HE1	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:27:HIS:HB3	1:B:29:LYS:HD3	2.03	0.41
1:B:48:LEU:HD11	1:B:114:PHE:CE2	2.55	0.41
1:B:254:ASN:HA	1:B:255:PRO:HD3	1.94	0.41
1:B:417:THR:HG21	1:B:451:ILE:HB	2.03	0.41
1:B:138:ARG:HB3	1:B:145:SER:OG	2.21	0.40
1:B:231:ASP:OD1	1:B:414:ARG:HD3	2.21	0.40
1:B:478:TYR:HA	1:B:482:LYS:O	2.21	0.40
1:A:254:ASN:HA	1:A:255:PRO:HD3	1.94	0.40
1:B:198:TYR:CE1	3:B:1490:NDP:H2D	2.57	0.40
1:A:34:VAL:HA	1:A:123:HIS:O	2.21	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	486/511 (95%)	435 (90%)	50 (10%)	1 (0%)	43	71
1	B	486/511 (95%)	435 (90%)	49 (10%)	2 (0%)	30	59
All	All	972/1022 (95%)	870 (90%)	99 (10%)	3 (0%)	36	64

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	387	GLU
1	A	370	PRO
1	B	370	PRO

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	397/417 (95%)	355 (89%)	42 (11%)	6	26
1	B	397/417 (95%)	360 (91%)	37 (9%)	8	30
All	All	794/834 (95%)	715 (90%)	79 (10%)	7	29

All (79) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	SER
1	A	7	LEU
1	A	30	LYS
1	A	44	LEU
1	A	65	THR
1	A	82	GLU
1	A	83	MET
1	A	86	GLU
1	A	87	SER
1	A	89	CYS
1	A	93	LYS
1	A	104	ASN
1	A	147	VAL
1	A	152	ASP
1	A	167	LEU
1	A	173	GLU
1	A	225	LEU
1	A	232	THR
1	A	238	LEU
1	A	250	ARG
1	A	258	ILE
1	A	262	GLU
1	A	296	LEU
1	A	298	LYS
1	A	302	ARG
1	A	305	LYS
1	A	320	ASP

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Mol	Chain	Res	Type
1	A	355	ARG
1	A	360	THR
1	A	369	ILE
1	A	374	THR
1	A	378	THR
1	A	385	ASN
1	A	399	LEU
1	A	415	ILE
1	A	416	ILE
1	A	419	GLU
1	A	440	SER
1	A	446	LYS
1	A	447	MET
1	A	460	VAL
1	A	485	GLU
1	B	2	SER
1	B	7	LEU
1	B	37	GLN
1	B	44	LEU
1	B	61	LYS
1	B	65	THR
1	B	83	MET
1	B	118	GLU
1	B	120	LEU
1	B	147	VAL
1	B	148	LEU
1	B	167	LEU
1	B	178	SER
1	B	184	LEU
1	B	185	GLU
1	B	225	LEU
1	B	238	LEU
1	B	245	ASN
1	B	257	LYS
1	B	296	LEU
1	B	302	ARG
1	B	305	LYS
1	B	318	SER
1	B	320	ASP
1	B	332	VAL
1	B	353	LYS
1	B	355	ARG

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Mol	Chain	Res	Type
1	B	360	THR
1	B	369	ILE
1	B	397	THR
1	B	440	SER
1	B	446	LYS
1	B	468	LEU
1	B	473	THR
1	B	482	LYS
1	B	485	GLU
1	B	487	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	37	GLN
1	A	130	GLN
1	A	208	ASN
1	A	241	GLN
1	A	252	ASN
1	A	254	ASN
1	A	267	HIS
1	A	295	GLN
1	A	418	ASN
1	A	421	ASN
1	A	461	HIS
1	B	37	GLN
1	B	100	ASN
1	B	208	ASN
1	B	241	GLN
1	B	245	ASN
1	B	252	ASN
1	B	266	ASN
1	B	271	ASN
1	B	295	GLN
1	B	310	GLN
1	B	340	ASN
1	B	385	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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$
2	FAD	B	1489	-	58,58,58	1.15	5 (8%)	85,89,89	1.60	17 (20%)
4	GCG	A	1491	-	45,47,47	1.48	8 (17%)	52,58,58	1.23	5 (9%)
3	NDP	B	1490	-	51,52,52	2.09	13 (25%)	71,80,80	2.65	15 (21%)
3	NDP	A	1490	-	51,52,52	2.03	13 (25%)	71,80,80	2.61	16 (22%)
4	GCG	B	1491	-	45,47,47	1.52	7 (15%)	52,58,58	1.31	7 (13%)
2	FAD	A	1489	-	58,58,58	1.13	6 (10%)	85,89,89	1.57	15 (17%)

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
2	FAD	B	1489	-	-	6/34/50/50	0/6/6/6
4	GCG	A	1491	-	-	19/61/61/61	-
3	NDP	B	1490	-	-	9/34/77/77	0/5/5/5
3	NDP	A	1490	-	-	8/34/77/77	0/5/5/5
4	GCG	B	1491	-	-	23/61/61/61	-
2	FAD	A	1489	-	-	5/34/50/50	0/6/6/6

All (52) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1490	NDP	PA-O3	7.60	1.67	1.59
3	A	1490	NDP	PA-O3	7.49	1.67	1.59
3	B	1490	NDP	PN-O3	5.16	1.65	1.59
3	B	1490	NDP	PA-O1A	4.49	1.66	1.50
3	B	1490	NDP	PN-O1N	4.36	1.65	1.50
3	A	1490	NDP	PN-O3	4.35	1.64	1.59
3	A	1490	NDP	PA-O1A	4.33	1.65	1.50
3	A	1490	NDP	PN-O1N	4.28	1.65	1.50
3	B	1490	NDP	C4N-C5N	-3.71	1.39	1.49
2	B	1489	FAD	C4X-N5	3.66	1.38	1.30
2	A	1489	FAD	C4X-N5	3.51	1.38	1.30
3	A	1490	NDP	P2B-O1X	3.47	1.61	1.50
3	A	1490	NDP	C4N-C5N	-3.45	1.40	1.49
3	B	1490	NDP	C5A-N7A	-3.42	1.32	1.39
2	B	1489	FAD	C10-N1	3.36	1.40	1.33
3	B	1490	NDP	P2B-O1X	3.35	1.60	1.50
3	A	1490	NDP	C5A-N7A	-3.34	1.33	1.39
4	B	1491	GCG	CB6-CA6	3.18	1.56	1.53
4	A	1491	GCG	CA6-N6	3.16	1.52	1.45
4	B	1491	GCG	CB2-CA2	3.10	1.56	1.53
2	A	1489	FAD	C10-N1	2.99	1.39	1.33
2	B	1489	FAD	C2A-N1A	2.92	1.39	1.33
2	A	1489	FAD	C2A-N1A	2.88	1.39	1.33
3	A	1490	NDP	C7N-C3N	2.83	1.54	1.48
4	B	1491	GCG	CA6-C6	2.80	1.60	1.52
4	B	1491	GCG	CA6-N6	2.74	1.51	1.45
2	B	1489	FAD	C2A-N3A	2.68	1.38	1.33
2	A	1489	FAD	C2A-N3A	2.61	1.38	1.33
4	A	1491	GCG	CA6-C6	2.59	1.59	1.52
4	A	1491	GCG	CB2-CA2	2.54	1.55	1.53
4	A	1491	GCG	CB6-CA6	2.47	1.55	1.53
4	A	1491	GCG	CG1-CD1	2.39	1.56	1.51
3	A	1490	NDP	C4N-C3N	2.39	1.54	1.50
3	B	1490	NDP	C7N-C3N	2.30	1.53	1.48
3	B	1490	NDP	O4D-C1D	2.29	1.47	1.42
4	A	1491	GCG	CG7-CD7	2.22	1.55	1.51
3	B	1490	NDP	C8A-N9A	-2.19	1.33	1.37
3	A	1490	NDP	C6N-C5N	2.17	1.39	1.33
4	A	1491	GCG	C5-N11	2.14	1.38	1.33
2	B	1489	FAD	C8A-N7A	2.12	1.35	1.31
2	A	1489	FAD	C8A-N7A	2.11	1.35	1.31
4	B	1491	GCG	CA5-N5	2.11	1.50	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1491	GCG	C6-N5	2.11	1.38	1.33
3	A	1490	NDP	C8A-N9A	-2.11	1.34	1.37
3	A	1490	NDP	O4D-C1D	2.10	1.46	1.42
3	B	1490	NDP	C6N-C5N	2.09	1.39	1.33
3	B	1490	NDP	C4N-C3N	2.06	1.53	1.50
4	B	1491	GCG	CG1-CD1	2.06	1.55	1.51
3	B	1490	NDP	C4A-N9A	-2.05	1.33	1.37
3	A	1490	NDP	C4A-N9A	-2.03	1.33	1.37
2	A	1489	FAD	C5A-N7A	-2.02	1.35	1.39
4	A	1491	GCG	CA2-N2	2.01	1.50	1.45

All (75) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1490	NDP	O3-PN-O1N	-12.63	72.72	110.70
3	A	1490	NDP	O3-PN-O1N	-11.28	76.77	110.70
3	A	1490	NDP	O2N-PN-O3	-9.04	82.85	107.27
3	B	1490	NDP	O2N-PN-O3	-8.16	85.23	107.27
3	B	1490	NDP	O5B-PA-O1A	-7.35	79.80	108.94
3	A	1490	NDP	O5B-PA-O1A	-6.98	81.27	108.94
2	A	1489	FAD	N3A-C2A-N1A	-5.63	120.06	128.58
3	B	1490	NDP	O2A-PA-O5B	-5.48	82.71	107.57
2	B	1489	FAD	N3A-C2A-N1A	-5.46	120.31	128.58
3	B	1490	NDP	C5A-C4A-N3A	-5.40	119.28	126.72
3	A	1490	NDP	O2A-PA-O5B	-5.40	83.09	107.57
3	A	1490	NDP	C5A-C4A-N3A	-5.31	119.40	126.72
3	A	1490	NDP	N3A-C2A-N1A	-4.83	121.27	128.58
3	B	1490	NDP	N3A-C2A-N1A	-4.61	121.61	128.58
3	A	1490	NDP	O2A-PA-O3	4.59	119.68	107.27
2	B	1489	FAD	C5A-C4A-N3A	-4.49	120.53	126.72
2	A	1489	FAD	C5A-C4A-N3A	-4.36	120.71	126.72
2	A	1489	FAD	N9A-C8A-N7A	-4.09	108.14	113.94
2	B	1489	FAD	N9A-C8A-N7A	-4.00	108.27	113.94
3	B	1490	NDP	N3A-C4A-N9A	3.84	133.70	127.17
3	A	1490	NDP	N3A-C4A-N9A	3.80	133.63	127.17
2	A	1489	FAD	C5A-N7A-C8A	3.70	109.27	103.45
2	B	1489	FAD	C5A-N7A-C8A	3.67	109.22	103.45
4	A	1491	GCG	CA6-N6-CD7	3.62	130.76	121.68
3	A	1490	NDP	C2A-N3A-C4A	3.60	120.62	111.83
3	B	1490	NDP	C2A-N3A-C4A	3.53	120.44	111.83
3	B	1490	NDP	O2A-PA-O3	3.51	116.76	107.27
2	B	1489	FAD	C4-N3-C2	-3.48	119.46	125.64

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1489	FAD	C4-N3-C2	-3.43	119.55	125.64
4	B	1491	GCG	CA2-CB2-SG2	3.41	118.00	114.16
2	B	1489	FAD	C2A-N3A-C4A	3.25	119.78	111.83
2	A	1489	FAD	C2A-N3A-C4A	3.23	119.73	111.83
3	A	1490	NDP	N9A-C8A-N7A	-3.14	109.48	113.94
4	A	1491	GCG	C6-CA6-N6	3.12	119.54	111.11
2	B	1489	FAD	O4B-C1B-N9A	3.09	114.03	108.09
2	B	1489	FAD	N3A-C4A-N9A	2.98	132.24	127.17
2	B	1489	FAD	C4X-C4-N3	2.93	120.72	113.25
4	B	1491	GCG	CA6-N6-CD7	2.92	129.02	121.68
3	B	1490	NDP	N9A-C8A-N7A	-2.92	109.79	113.94
2	A	1489	FAD	N3A-C4A-N9A	2.80	131.92	127.17
2	A	1489	FAD	C4X-C4-N3	2.80	120.37	113.25
3	A	1490	NDP	C3D-C2D-C1D	2.79	106.74	101.46
3	A	1490	NDP	C5A-N7A-C8A	2.78	107.81	103.45
4	A	1491	GCG	CA2-N2-CD1	2.76	128.61	121.68
2	A	1489	FAD	C4A-C5A-N7A	-2.74	107.45	110.58
4	B	1491	GCG	CA2-N2-CD1	2.70	128.46	121.68
3	B	1490	NDP	C5A-N7A-C8A	2.69	107.68	103.45
4	B	1491	GCG	CA5-N5-C6	2.65	128.07	121.38
2	B	1489	FAD	C4A-C5A-N7A	-2.64	107.56	110.58
2	B	1489	FAD	C4X-C10-N1	-2.63	118.13	124.59
2	A	1489	FAD	C9A-C5X-N5	-2.60	119.69	122.45
4	B	1491	GCG	C6-CA6-N6	2.59	118.11	111.11
2	A	1489	FAD	O4-C4-C4X	-2.59	119.71	126.53
2	B	1489	FAD	O4-C4-C4X	-2.50	119.93	126.53
2	B	1489	FAD	C9A-C5X-N5	-2.48	119.82	122.45
3	B	1490	NDP	C4A-C5A-N7A	-2.48	107.75	110.58
2	B	1489	FAD	C10-C4X-N5	-2.46	119.78	124.81
3	A	1490	NDP	C4A-C5A-N7A	-2.46	107.77	110.58
3	B	1490	NDP	C3D-C2D-C1D	2.42	106.05	101.46
2	A	1489	FAD	C4X-C10-N1	-2.39	118.73	124.59
2	A	1489	FAD	C10-C4X-N5	-2.36	120.00	124.81
3	A	1490	NDP	O2N-PN-O5D	2.35	118.23	107.57
4	B	1491	GCG	OD1-CD1-N2	2.31	126.86	122.95
3	B	1490	NDP	C2B-C1B-N9A	-2.27	110.01	113.75
4	A	1491	GCG	OD1-CD1-N2	2.25	126.76	122.95
2	B	1489	FAD	C6A-C5A-C4A	2.24	120.24	117.18
2	B	1489	FAD	C4X-C10-N10	2.22	119.67	116.48
2	A	1489	FAD	C6A-C5A-C4A	2.22	120.21	117.18
4	A	1491	GCG	CG1-CB1-CA1	-2.21	108.79	113.86
2	A	1489	FAD	C4X-C10-N10	2.19	119.62	116.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	1490	NDP	O2N-PN-O1N	2.15	122.44	112.44
3	A	1490	NDP	C4A-N9A-C8A	2.12	107.97	105.74
2	B	1489	FAD	C10-N1-C2	2.11	121.42	116.85
4	B	1491	GCG	CG1-CB1-CA1	-2.04	109.18	113.86
3	A	1490	NDP	O3X-P2B-O2B	2.02	113.72	105.85

There are no chirality outliers.

All (70) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1489	FAD	C5'-O5'-P-O1P
2	A	1489	FAD	C5'-O5'-P-O2P
2	A	1489	FAD	C5'-O5'-P-O3P
2	B	1489	FAD	C5'-O5'-P-O1P
2	B	1489	FAD	C5'-O5'-P-O2P
2	B	1489	FAD	C5'-O5'-P-O3P
3	A	1490	NDP	C5D-O5D-PN-O1N
3	A	1490	NDP	C5D-O5D-PN-O2N
3	A	1490	NDP	O4D-C1D-N1N-C2N
3	B	1490	NDP	PA-O3-PN-O5D
3	B	1490	NDP	C5D-O5D-PN-O3
3	B	1490	NDP	C5D-O5D-PN-O1N
3	B	1490	NDP	O4D-C1D-N1N-C2N
4	A	1491	GCG	N2-CA2-CB2-SG2
4	A	1491	GCG	C2-CA2-CB2-SG2
4	A	1491	GCG	C6-CA6-N6-CD7
4	B	1491	GCG	C2-CA2-N2-CD1
4	B	1491	GCG	N2-CA2-CB2-SG2
4	B	1491	GCG	C2-CA2-CB2-SG2
4	B	1491	GCG	C5-CA5-N5-C6
4	A	1491	GCG	C2-CA2-N2-CD1
4	B	1491	GCG	C6-CA6-N6-CD7
4	B	1491	GCG	C3S-C4S-C5S-N6S
3	A	1490	NDP	C3D-C4D-C5D-O5D
4	A	1491	GCG	C5-CA5-N5-C6
3	A	1490	NDP	O4D-C4D-C5D-O5D
3	B	1490	NDP	O4D-C4D-C5D-O5D
4	A	1491	GCG	C2S-C3S-C4S-C5S
4	B	1491	GCG	O5-C5-CA5-N5
4	B	1491	GCG	C8S-C7S-N6S-C5S
3	B	1490	NDP	C3D-C4D-C5D-O5D
4	A	1491	GCG	O5-C5-CA5-N5

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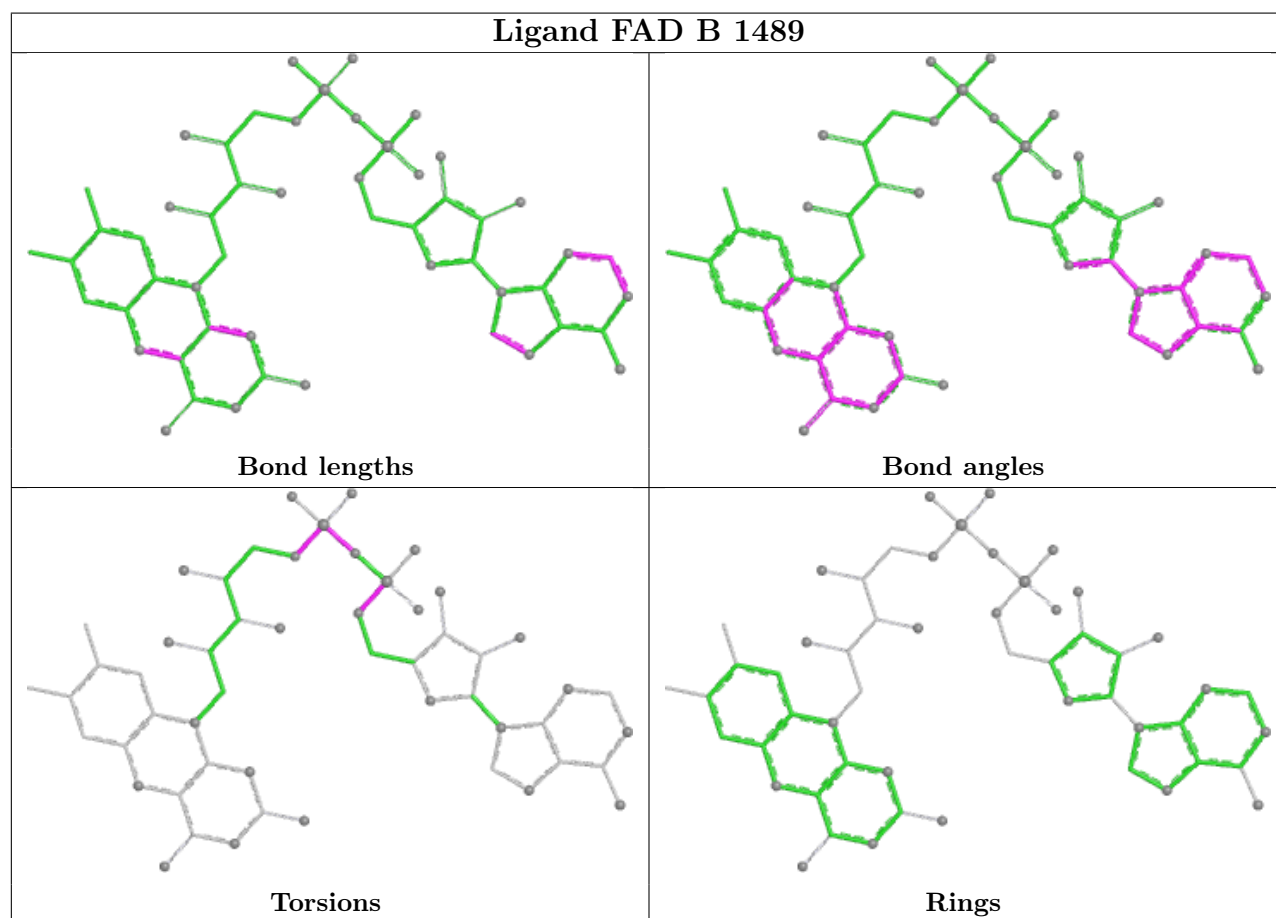
Mol	Chain	Res	Type	Atoms
4	A	1491	GCG	N11-C5-CA5-N5
4	B	1491	GCG	N11-C5-CA5-N5
4	A	1491	GCG	CA1-CB1-CG1-CD1
4	B	1491	GCG	O17-C7-CA7-CB7
4	B	1491	GCG	O27-C7-CA7-CB7
4	B	1491	GCG	O2-C2-CA2-N2
4	A	1491	GCG	N3-C2-CA2-N2
4	A	1491	GCG	O2-C2-CA2-N2
4	A	1491	GCG	CA7-CB7-CG7-CD7
4	B	1491	GCG	N3-C2-CA2-N2
4	B	1491	GCG	C7S-C8S-C9S-N11
2	A	1489	FAD	PA-O3P-P-O5'
2	B	1489	FAD	PA-O3P-P-O5'
3	A	1490	NDP	PA-O3-PN-O5D
4	A	1491	GCG	C4S-C5S-N6S-C7S
4	B	1491	GCG	CA1-CB1-CG1-CD1
4	A	1491	GCG	C7-CA7-CB7-CG7
4	A	1491	GCG	OD7-CD7-CG7-CB7
2	B	1489	FAD	C5B-O5B-PA-O1A
2	A	1489	FAD	PA-O3P-P-O1P
2	B	1489	FAD	PA-O3P-P-O1P
4	B	1491	GCG	O17-C7-CA7-N7
4	A	1491	GCG	N6-CD7-CG7-CB7
4	A	1491	GCG	OD1-CD1-CG1-CB1
4	A	1491	GCG	O21-C1-CA1-N1
4	B	1491	GCG	O21-C1-CA1-N1
4	B	1491	GCG	OD7-CD7-CG7-CB7
3	A	1490	NDP	C2N-C3N-C7N-N7N
3	B	1490	NDP	C2N-C3N-C7N-N7N
4	B	1491	GCG	N6-CD7-CG7-CB7
4	B	1491	GCG	O11-C1-CA1-N1
4	A	1491	GCG	N2-CD1-CG1-CB1
3	A	1490	NDP	PN-O3-PA-O1A
3	B	1490	NDP	C2B-O2B-P2B-O3X
4	B	1491	GCG	N7-CA7-CB7-CG7
4	B	1491	GCG	O27-C7-CA7-N7
4	B	1491	GCG	C2S-C3S-C4S-C5S
3	B	1490	NDP	PN-O3-PA-O2A

There are no ring outliers.

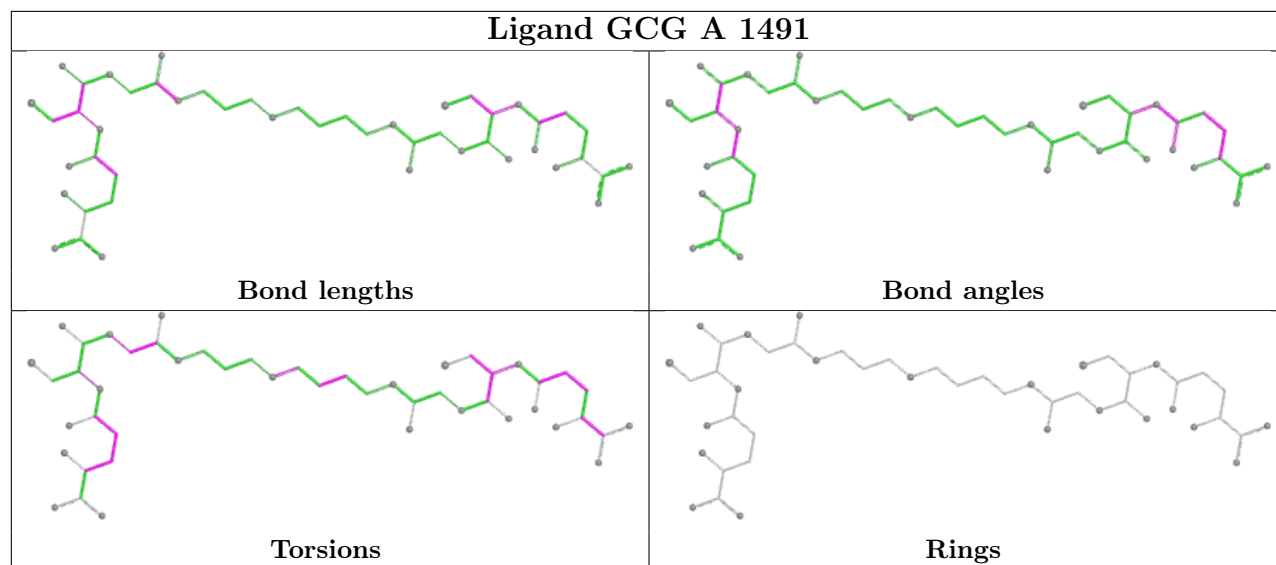
6 monomers are involved in 23 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	1489	FAD	3	0
4	A	1491	GCG	3	0
3	B	1490	NDP	9	0
3	A	1490	NDP	3	0
4	B	1491	GCG	4	0
2	A	1489	FAD	1	0

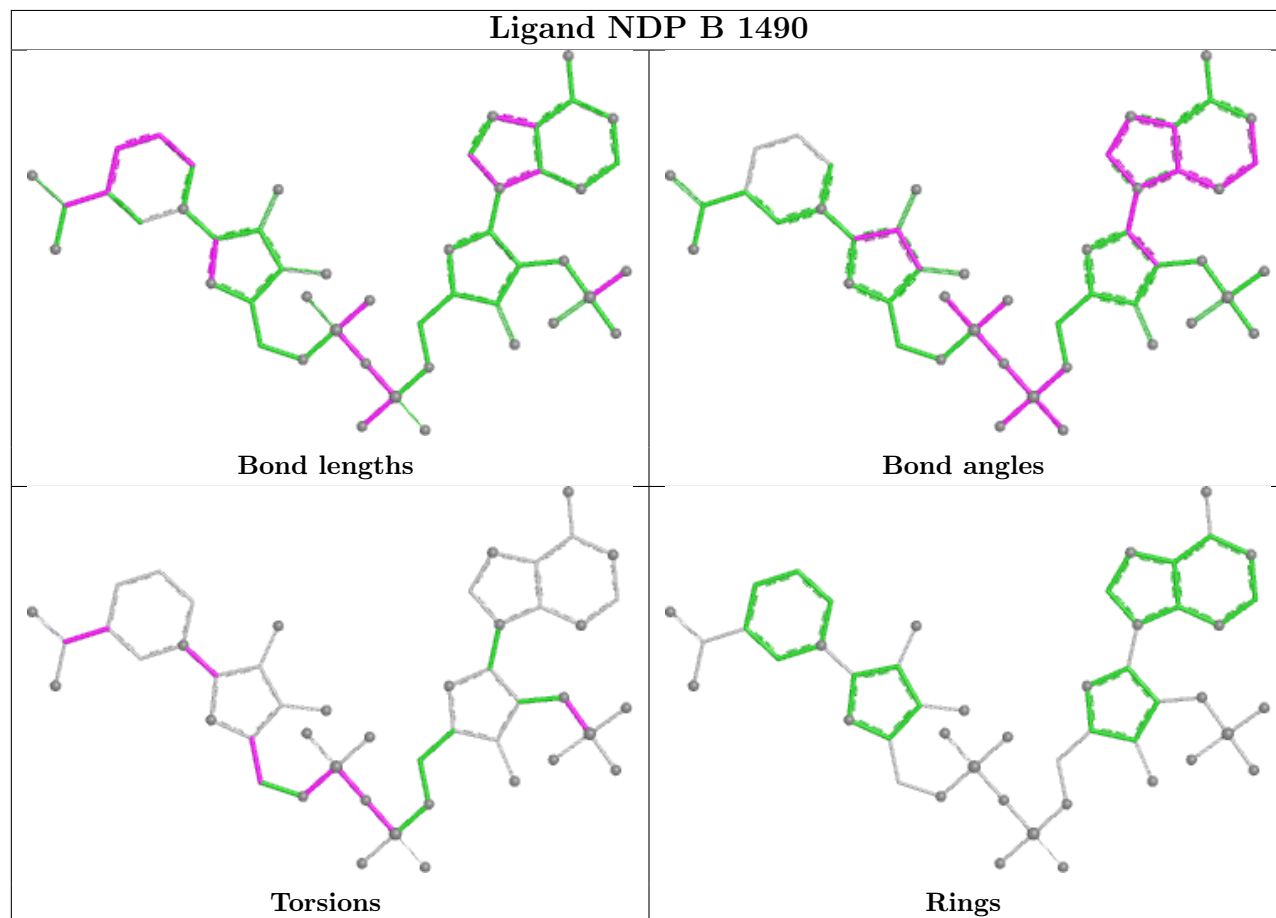
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.



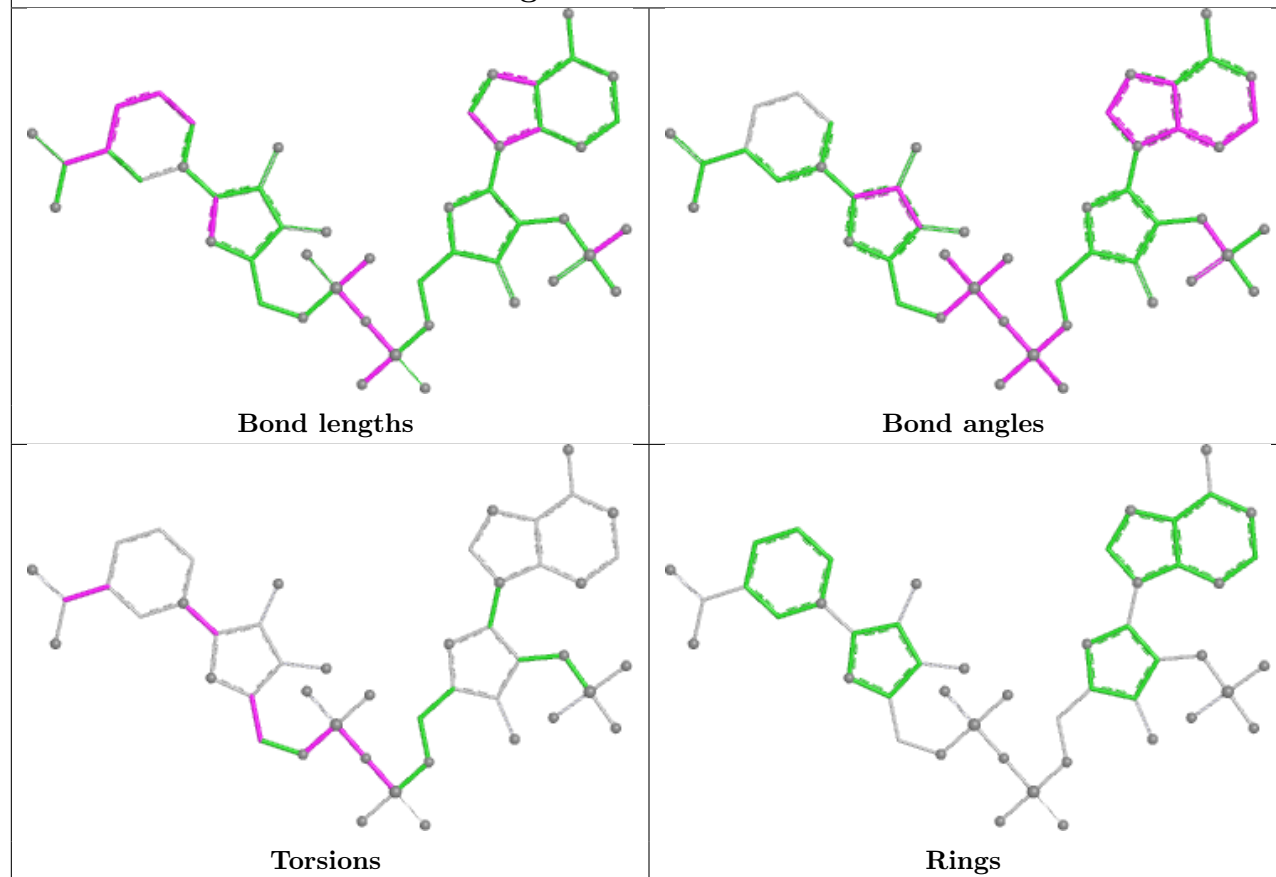
Ligand GCG A 1491



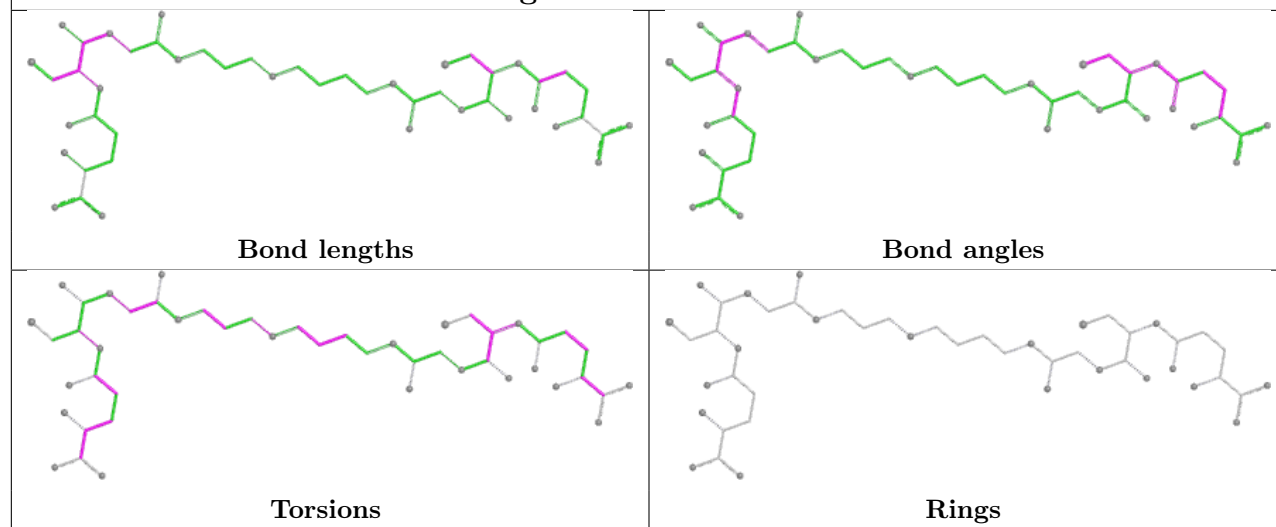
Ligand NDP B 1490

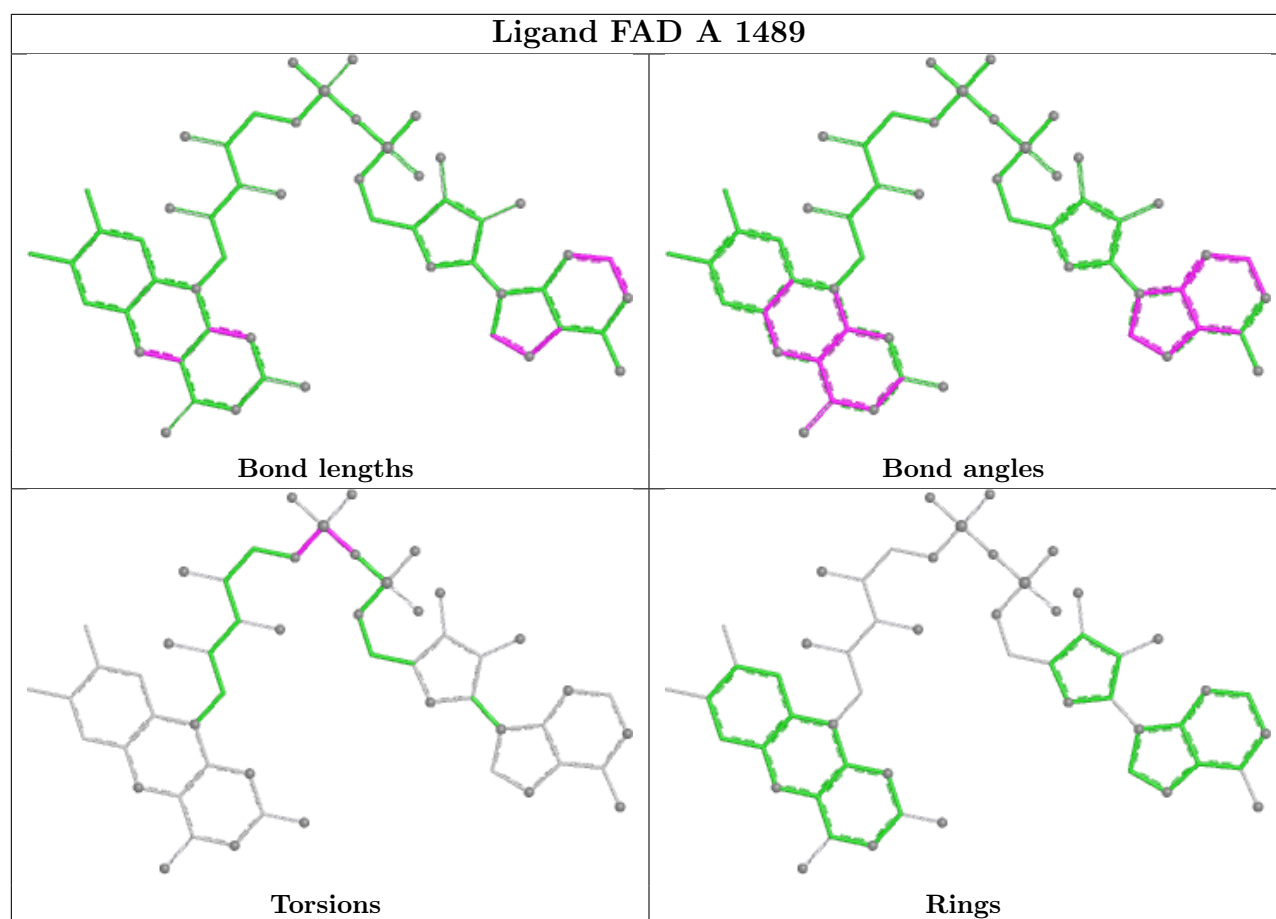


Ligand NDP A 1490



Ligand GCG B 1491





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 [i](#)

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	488/511 (95%)	-1.00	0 100 100	61, 85, 85, 85	1 (0%)
1	B	488/511 (95%)	-1.01	0 100 100	61, 85, 85, 85	1 (0%)
All	All	976/1022 (95%)	-1.01	0 100 100	61, 85, 85, 85	2 (0%)

There are no RSRZ outliers to report.

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

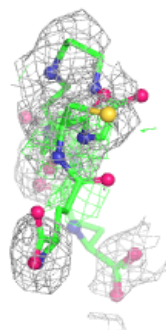
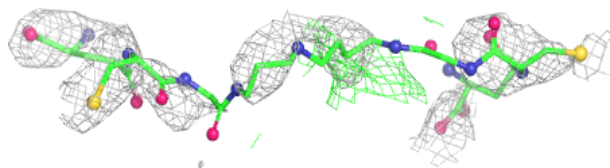
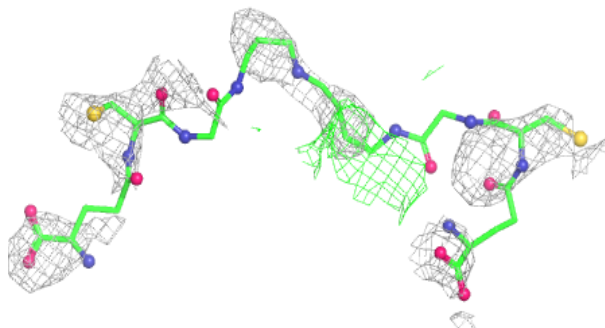
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists 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	GCG	B	1491	48/48	0.95	0.10	30,30,30,30	48
4	GCG	A	1491	48/48	0.97	0.08	30,30,30,30	48
3	NDP	A	1490	48/48	0.99	0.05	85,85,85,85	48
3	NDP	B	1490	48/48	0.99	0.06	85,85,85,85	48
2	FAD	A	1489	53/53	0.99	0.05	85,85,85,85	0
2	FAD	B	1489	53/53	0.99	0.05	85,85,85,85	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.

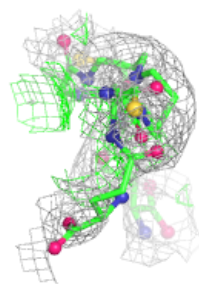
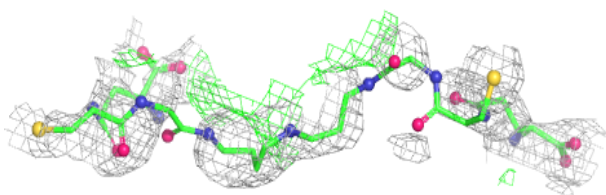
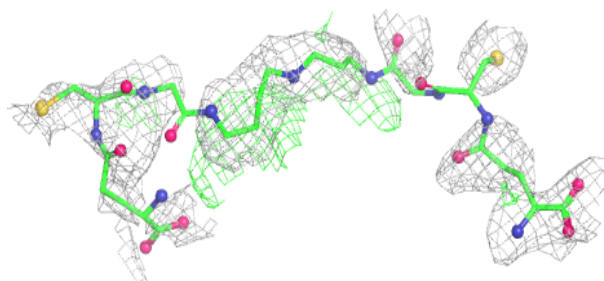
Electron density around GCG B 1491:

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

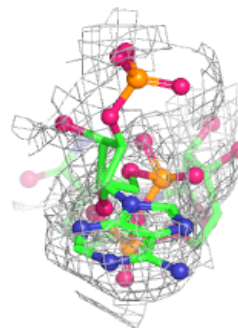
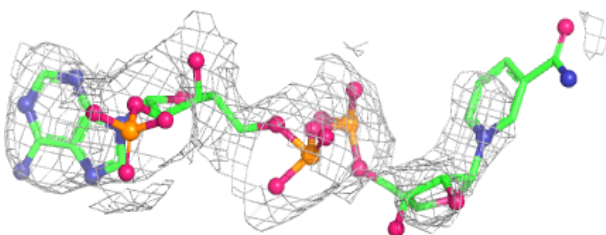
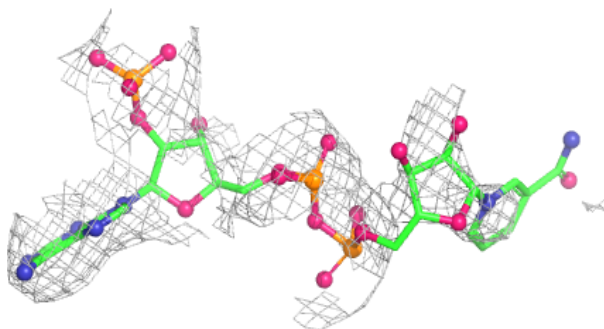


Electron density around GCG A 1491:

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

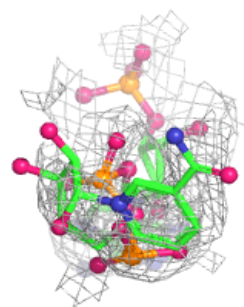
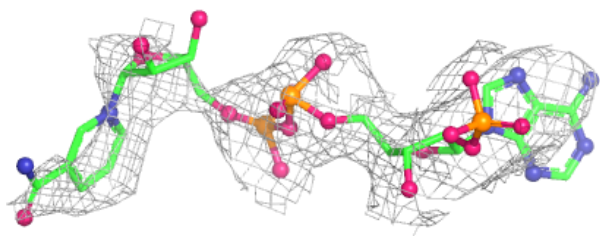
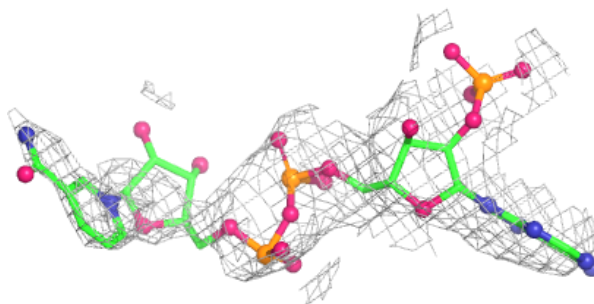
**Electron density around NDP A 1490:**

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

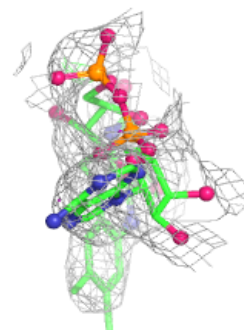
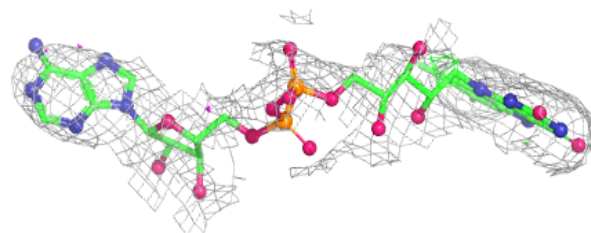
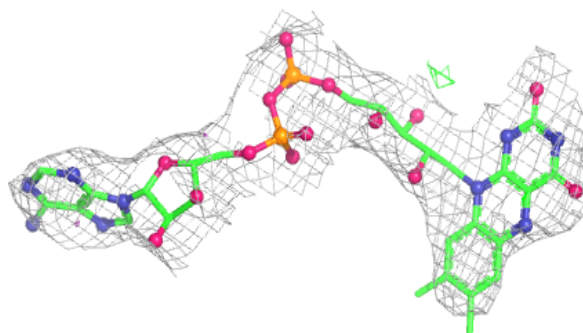


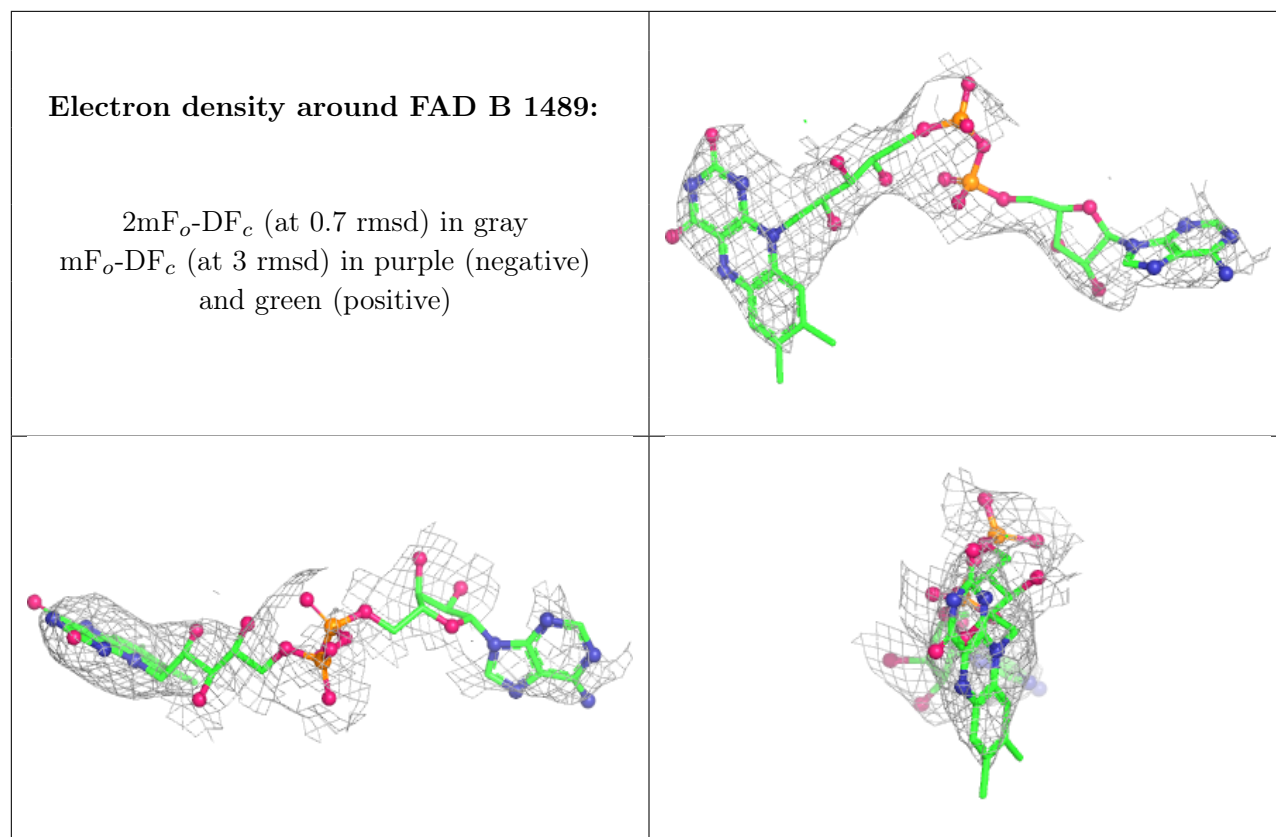
Electron density around NDP B 1490:

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

**Electron density around FAD A 1489:**

$2mF_o-DF_c$ (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.