Full wwPDB X-ray Structure Validation Report ⓘ

Jan 10, 2024 – 03:25 pm GMT

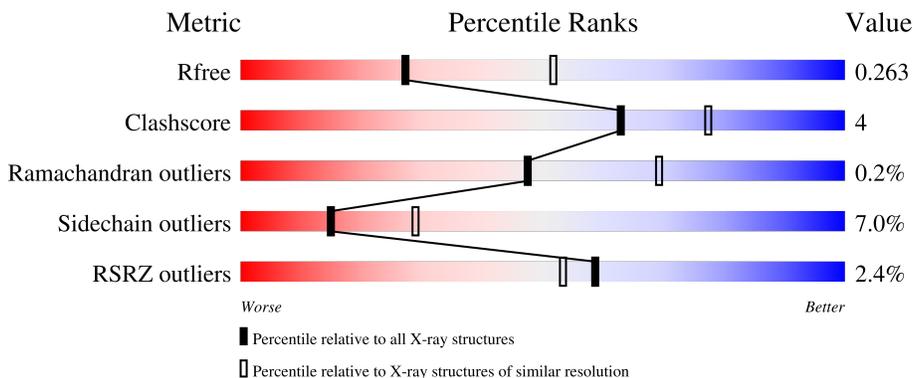|		
PDB ID	:	8R5Q
Title	:	Structure of apo TDO with a bound inhibitor
Authors	:	Wicki, M.; Mac Sweeney, A.
Deposited on	:	2023-11-17
Resolution	:	2.62 Å(reported)

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 2.62 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	Percentile Ranks	Value
Rfree		0.263
Clashscore		4
Ramachandran outliers		0.2%
Sidechain outliers		7.0%
RSRZ outliers		2.4%

Worse ← → *Better*

▌ Percentile relative to all X-ray structures
▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)
RSRZ outliers	127900	3731 (2.64-2.60)

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 <=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	358	% 73% 13% · 12%
1	B	358	2% 80% 8% · 11%
1	C	358	3% 75% 13% · 11%
1	D	358	3% 77% 10% · 12%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 9960 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 Tryptophan 2,3-dioxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	314	Total	C	N	O	S	0	0	0
			2512	1628	428	446	10			
1	B	318	Total	C	N	O	S	0	0	0
			2513	1628	427	448	10			
1	C	317	Total	C	N	O	S	0	0	0
			2464	1591	424	439	10			
1	D	314	Total	C	N	O	S	0	0	0
			2310	1492	394	414	10			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	390	GLU	-	expression tag	UNP P48775
A	391	HIS	-	expression tag	UNP P48775
A	392	HIS	-	expression tag	UNP P48775
A	393	HIS	-	expression tag	UNP P48775
A	394	HIS	-	expression tag	UNP P48775
A	395	HIS	-	expression tag	UNP P48775
A	396	HIS	-	expression tag	UNP P48775
B	390	GLU	-	expression tag	UNP P48775
B	391	HIS	-	expression tag	UNP P48775
B	392	HIS	-	expression tag	UNP P48775
B	393	HIS	-	expression tag	UNP P48775
B	394	HIS	-	expression tag	UNP P48775
B	395	HIS	-	expression tag	UNP P48775
B	396	HIS	-	expression tag	UNP P48775
C	390	GLU	-	expression tag	UNP P48775
C	391	HIS	-	expression tag	UNP P48775
C	392	HIS	-	expression tag	UNP P48775
C	393	HIS	-	expression tag	UNP P48775
C	394	HIS	-	expression tag	UNP P48775
C	395	HIS	-	expression tag	UNP P48775
C	396	HIS	-	expression tag	UNP P48775

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Chain	Residue	Modelled	Actual	Comment	Reference
D	390	GLU	-	expression tag	UNP P48775
D	391	HIS	-	expression tag	UNP P48775
D	392	HIS	-	expression tag	UNP P48775
D	393	HIS	-	expression tag	UNP P48775
D	394	HIS	-	expression tag	UNP P48775
D	395	HIS	-	expression tag	UNP P48775
D	396	HIS	-	expression tag	UNP P48775

- Molecule 2 is 3-chloranyl- {N}-[(1 {S})-1-(6-chloranylpyridin-3-yl)-2-phenyl-ethyl]an iline (three-letter code: Y5N) (formula: $C_{19}H_{16}Cl_2N_2$) (labeled as "Ligand of Interest" by depositor).
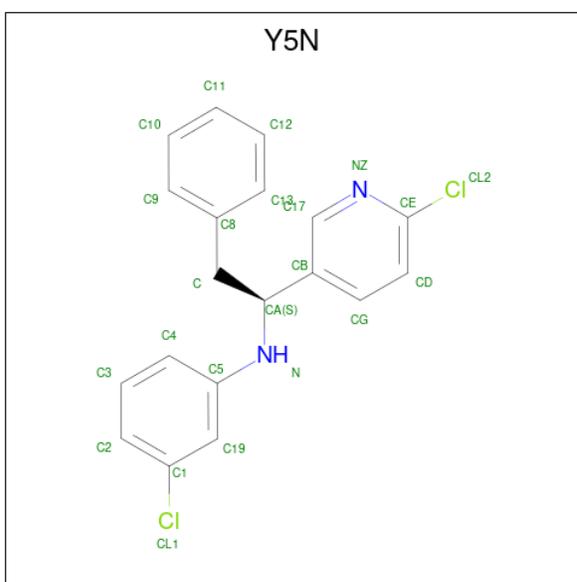
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 23	C 19	Cl 2	N 2	0	0
2	B	1	Total 23	C 19	Cl 2	N 2	0	0
2	C	1	Total 23	C 19	Cl 2	N 2	0	0
2	D	1	Total 23	C 19	Cl 2	N 2	0	0

- Molecule 3 is alpha-methyl-L-tryptophan (three-letter code: ZIQ) (formula: $C_{12}H_{14}N_2O_2$).
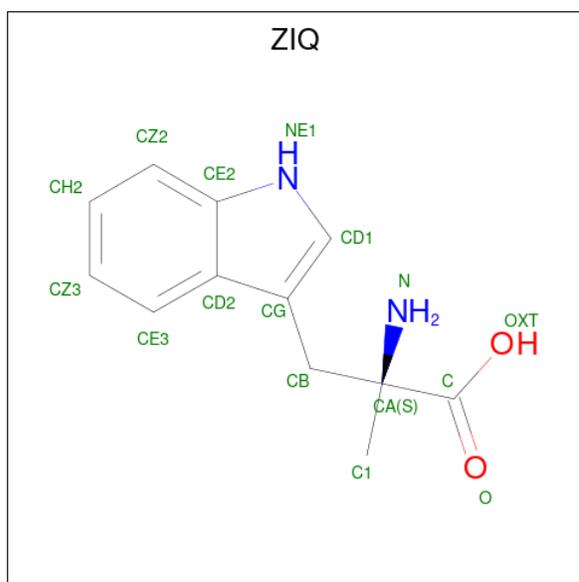
ZIQ

CZ2

CH2

CE2

NE1

H
N

CD1

N

NH₂

OXT

OH

CZ3

CD2

CG

CE3

CB

CA(S)

C

C1

O

O

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			16	12	2	2		
3	B	1	Total	C	N	O	0	0
			16	12	2	2		
3	C	1	Total	C	N	O	0	0
			16	12	2	2		
3	D	1	Total	C	N	O	0	0
			16	12	2	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	O	0	0
			2	2		
4	B	3	Total	O	0	0
			3	3		

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: Tryptophan 2,3-dioxygenase

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• Molecule 1: Tryptophan 2,3-dioxygenase

Chain D:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	91.33Å 132.49Å 135.57Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	75.75 – 2.62 75.75 – 2.62	Depositor EDS
% Data completeness (in resolution range)	79.2 (75.75-2.62) 79.2 (75.75-2.62)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.26 (at 2.62Å)	Xtriage
Refinement program	BUSTER 2.11.8	Depositor
R, R_{free}	0.254 , 0.267 0.248 , 0.263	Depositor DCC
R_{free} test set	1876 reflections (4.72%)	wwPDB-VP
Wilson B-factor (Å^2)	74.3	Xtriage
Anisotropy	0.105	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 58.5	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.34$	Xtriage
Estimated twinning fraction	0.002 for -h,l,k	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	9960	wwPDB-VP
Average B, all atoms (Å^2)	78.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.05% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: Y5N, ZIQ

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	0.38	0/2568	0.51	0/3475
1	B	0.39	0/2570	0.53	0/3479
1	C	0.36	0/2521	0.51	0/3422
1	D	0.37	0/2364	0.52	0/3217
All	All	0.38	0/10023	0.52	0/13593

There are no bond length outliers.

There are no bond angle outliers.

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	2512	0	2404	29	0
1	B	2513	0	2365	18	0
1	C	2464	0	2258	29	0
1	D	2310	0	1957	20	0
2	A	23	0	0	1	0
2	B	23	0	0	1	0
2	C	23	0	0	1	0
2	D	23	0	0	1	0
3	A	16	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	16	0	0	0	0
3	C	16	0	0	0	0
3	D	16	0	0	1	0
4	A	2	0	0	0	0
4	B	3	0	0	0	0
All	All	9960	0	8984	82	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 4.

All (82) 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:141:ASN:HA	1:C:144:ARG:HG2	1.49	0.94
1:A:273:HIS:CE1	1:A:289:LEU:HD11	2.04	0.93
1:C:273:HIS:CE1	1:C:289:LEU:HD11	2.07	0.88
1:D:141:ASN:HA	1:D:144:ARG:HG2	1.73	0.68
1:A:212:THR:HG22	3:A:502:ZIQ:CZ2	2.26	0.66
1:D:96:ILE:HG22	1:D:102:VAL:HG23	1.76	0.66
1:B:144:ARG:NH2	1:C:372:LEU:HD22	2.11	0.65
1:B:96:ILE:HG22	1:B:102:VAL:HG23	1.78	0.64
1:A:48:LEU:HB3	1:A:52:LEU:HD22	1.79	0.64
1:C:202:LEU:HD21	1:C:283:ARG:HB3	1.79	0.63
1:C:96:ILE:HG22	1:C:102:VAL:HG23	1.79	0.63
1:C:48:LEU:HB3	1:C:52:LEU:HD22	1.80	0.62
1:A:168:LEU:HD11	1:A:283:ARG:HD3	1.82	0.62
1:A:96:ILE:HG22	1:A:102:VAL:HG23	1.81	0.62
1:B:106:ARG:HG2	1:D:302:PRO:HD3	1.81	0.61
1:D:212:THR:HG22	3:D:502:ZIQ:CZ2	2.30	0.61
1:A:210:GLU:HG2	1:A:287:ARG:HB3	1.82	0.60
1:C:376:HIS:CD2	1:C:377:TRP:HD1	2.21	0.59
1:C:46:LEU:HD21	2:D:501:Y5N:CL1	2.41	0.58
1:A:131:ILE:CD1	1:B:124:LEU:HD22	2.35	0.57
1:B:144:ARG:O	1:B:144:ARG:HG2	2.03	0.57
1:D:141:ASN:HA	1:D:144:ARG:CG	2.36	0.56
1:A:376:HIS:CD2	1:A:377:TRP:HD1	2.24	0.56
1:B:59:SER:HB3	1:B:66:ILE:HD12	1.88	0.55
1:A:240:ARG:HH22	1:A:253:GLN:HG2	1.71	0.55
1:C:376:HIS:CD2	1:C:377:TRP:CD1	2.95	0.54
1:A:151:SER:HB2	1:A:332:VAL:HG11	1.89	0.54
1:D:213:PRO:HB2	1:D:389:LEU:HD21	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:75:THR:HG22	1:C:128:GLN:HE21	1.72	0.53
1:C:151:SER:HB2	1:C:332:VAL:HG11	1.91	0.52
1:A:131:ILE:HD11	1:B:124:LEU:HD22	1.92	0.52
1:A:45:TYR:CE1	1:B:147:LEU:HD22	2.45	0.52
1:A:376:HIS:CD2	1:A:377:TRP:CD1	2.98	0.52
1:D:102:VAL:CG1	1:D:208:TRP:CD1	2.93	0.51
1:C:51:VAL:HG12	1:C:52:LEU:HD13	1.93	0.50
1:B:151:SER:HB2	1:B:332:VAL:HG11	1.93	0.50
1:B:144:ARG:NH2	1:C:372:LEU:HD13	2.27	0.50
1:A:51:VAL:HG12	1:A:52:LEU:HD13	1.93	0.50
1:A:102:VAL:CG1	1:A:208:TRP:CD1	2.94	0.49
1:B:144:ARG:HH21	1:C:372:LEU:HD22	1.76	0.49
1:C:121:ILE:HG12	1:D:131:ILE:HD13	1.93	0.49
1:D:135:MET:O	1:D:334:ARG:NH2	2.44	0.48
1:B:102:VAL:CG1	1:B:208:TRP:CD1	2.97	0.48
1:C:141:ASN:HA	1:C:144:ARG:CG	2.33	0.48
1:D:105:GLU:OE1	1:D:303:ARG:HD2	2.14	0.48
1:B:391:HIS:HD2	1:D:303:ARG:HG2	1.79	0.48
1:C:102:VAL:CG1	1:C:208:TRP:CD1	2.97	0.47
1:C:144:ARG:O	1:C:145:GLU:CB	2.62	0.47
1:D:144:ARG:HG2	1:D:144:ARG:HH21	1.79	0.47
1:A:273:HIS:NE2	1:A:277:LEU:CD1	2.78	0.47
2:A:501:Y5N:CL1	1:B:46:LEU:HD21	2.52	0.47
1:B:105:GLU:OE1	1:B:303:ARG:HD2	2.16	0.46
1:A:124:LEU:HD22	1:B:131:ILE:CD1	2.45	0.46
1:A:273:HIS:CE1	1:A:277:LEU:CD1	2.99	0.46
1:A:273:HIS:NE2	1:A:277:LEU:HD13	2.31	0.46
1:A:250:LYS:O	1:A:254:VAL:HG23	2.16	0.46
1:D:57:LEU:HD21	1:D:70:HIS:HA	1.99	0.45
1:C:319:SER:HB3	1:C:360:LYS:NZ	2.32	0.44
2:C:501:Y5N:CL1	1:D:46:LEU:HD21	2.54	0.44
1:A:84:LYS:HD2	1:B:52:LEU:HD22	1.98	0.44
1:C:303:ARG:HD3	1:C:389:LEU:HA	2.00	0.44
1:D:132:LEU:HD23	1:D:132:LEU:HA	1.89	0.44
1:B:144:ARG:HH22	1:C:372:LEU:HB3	1.82	0.44
1:D:75:THR:HG22	1:D:128:GLN:HE21	1.82	0.43
1:D:59:SER:HB2	1:D:66:ILE:HD12	2.01	0.43
1:D:212:THR:HA	1:D:213:PRO:HD3	1.94	0.42
1:C:135:MET:O	1:C:334:ARG:NH2	2.46	0.42
1:A:46:LEU:HD21	2:B:501:Y5N:CL1	2.56	0.42
1:C:132:LEU:HD23	1:C:132:LEU:HA	1.92	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:297:PHE:HZ	1:A:373:ILE:HD12	1.84	0.41
1:C:376:HIS:NE2	1:C:377:TRP:CD1	2.88	0.41
1:C:168:LEU:HD21	1:C:283:ARG:HD3	2.02	0.41
1:A:376:HIS:NE2	1:A:377:TRP:CD1	2.87	0.41
1:A:106:ARG:NH1	1:C:300:GLU:OE1	2.54	0.41
1:C:304:PHE:C	1:C:307:PRO:HD2	2.41	0.41
1:D:98:GLN:HE21	1:D:199:LYS:HB2	1.86	0.41
1:A:98:GLN:HG3	1:A:204:LEU:HD21	2.03	0.41
1:A:234:LEU:HD13	1:A:261:LYS:HG3	2.02	0.41
1:C:131:ILE:CD1	1:D:124:LEU:HD22	2.51	0.41
1:C:160:LEU:O	1:C:164:LYS:HG3	2.21	0.41
1:A:132:LEU:HD23	1:A:132:LEU:HA	1.94	0.40
1:A:220:PHE:HB2	1:A:385:ILE:HG13	2.02	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	308/358 (86%)	298 (97%)	8 (3%)	2 (1%)	25	45
1	B	312/358 (87%)	297 (95%)	15 (5%)	0	100	100
1	C	311/358 (87%)	301 (97%)	9 (3%)	1 (0%)	41	62
1	D	306/358 (86%)	291 (95%)	15 (5%)	0	100	100
All	All	1237/1432 (86%)	1187 (96%)	47 (4%)	3 (0%)	47	69

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	145	GLU
1	A	246	GLU

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Mol	Chain	Res	Type
1	A	219	GLY

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	255/330 (77%)	237 (93%)	18 (7%)	14	28
1	B	250/330 (76%)	233 (93%)	17 (7%)	16	30
1	C	236/330 (72%)	221 (94%)	15 (6%)	17	34
1	D	191/330 (58%)	176 (92%)	15 (8%)	12	23
All	All	932/1320 (71%)	867 (93%)	65 (7%)	15	29

All (65) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	LEU
1	A	58	GLN
1	A	101	HIS
1	A	106	ARG
1	A	109	LEU
1	A	110	LYS
1	A	147	LEU
1	A	216	GLU
1	A	226	LEU
1	A	246	GLU
1	A	250	LYS
1	A	253	GLN
1	A	267	LEU
1	A	287	ARG
1	A	299	ARG
1	A	310	LEU
1	A	363	VAL
1	A	380	LYS
1	B	84	LYS
1	B	90	LEU

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Mol	Chain	Res	Type
1	B	95	GLU
1	B	101	HIS
1	B	106	ARG
1	B	109	LEU
1	B	147	LEU
1	B	159	ARG
1	B	187	GLU
1	B	188	GLU
1	B	216	GLU
1	B	226	LEU
1	B	246	GLU
1	B	267	LEU
1	B	363	VAL
1	B	370	THR
1	B	391	HIS
1	C	52	LEU
1	C	58	GLN
1	C	65	LYS
1	C	71	LEU
1	C	75	THR
1	C	90	LEU
1	C	101	HIS
1	C	109	LEU
1	C	147	LEU
1	C	159	ARG
1	C	189	ASN
1	C	231	THR
1	C	246	GLU
1	C	267	LEU
1	C	363	VAL
1	D	58	GLN
1	D	65	LYS
1	D	75	THR
1	D	80	GLU
1	D	101	HIS
1	D	127	GLN
1	D	144	ARG
1	D	147	LEU
1	D	187	GLU
1	D	191	LEU
1	D	192	LEU
1	D	239	ILE

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Mol	Chain	Res	Type
1	D	272	ARG
1	D	310	LEU
1	D	376	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	221	ASN
1	B	221	ASN
1	B	391	HIS
1	C	128	GLN
1	D	58	GLN
1	D	98	GLN
1	D	128	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 monosaccharides 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
2	Y5N	A	501	-	25,25,25	0.38	0	31,33,33	0.46	0
2	Y5N	C	501	-	25,25,25	0.26	0	31,33,33	0.31	0
2	Y5N	D	501	-	25,25,25	0.29	0	31,33,33	0.31	0
3	ZIQ	D	502	-	13,17,17	1.21	1 (7%)	14,25,25	1.17	2 (14%)
3	ZIQ	B	502	-	13,17,17	1.17	0	14,25,25	1.16	2 (14%)
3	ZIQ	A	502	-	13,17,17	1.14	0	14,25,25	1.19	2 (14%)
2	Y5N	B	501	-	25,25,25	0.26	0	31,33,33	0.32	0
3	ZIQ	C	502	-	13,17,17	1.18	0	14,25,25	1.07	2 (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
2	Y5N	A	501	-	-	0/12/12/12	0/3/3/3
2	Y5N	C	501	-	-	0/12/12/12	0/3/3/3
2	Y5N	D	501	-	-	0/12/12/12	0/3/3/3
3	ZIQ	D	502	-	-	4/9/11/11	0/2/2/2
3	ZIQ	B	502	-	-	4/9/11/11	0/2/2/2
3	ZIQ	A	502	-	-	4/9/11/11	0/2/2/2
2	Y5N	B	501	-	-	0/12/12/12	0/3/3/3
3	ZIQ	C	502	-	-	4/9/11/11	0/2/2/2

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	502	ZIQ	CB-CA	-2.10	1.52	1.55

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	502	ZIQ	CE3-CD2-CE2	2.80	121.88	118.17
3	D	502	ZIQ	CE3-CD2-CE2	2.70	121.74	118.17
3	A	502	ZIQ	CE3-CD2-CE2	2.61	121.63	118.17
3	B	502	ZIQ	CE3-CD2-CG	-2.50	129.82	134.42
3	D	502	ZIQ	CE3-CD2-CG	-2.46	129.89	134.42
3	A	502	ZIQ	CE3-CD2-CG	-2.43	129.95	134.42
3	C	502	ZIQ	CE3-CD2-CE2	2.36	121.30	118.17
3	C	502	ZIQ	CE3-CD2-CG	-2.33	130.15	134.42

There are no chirality outliers.
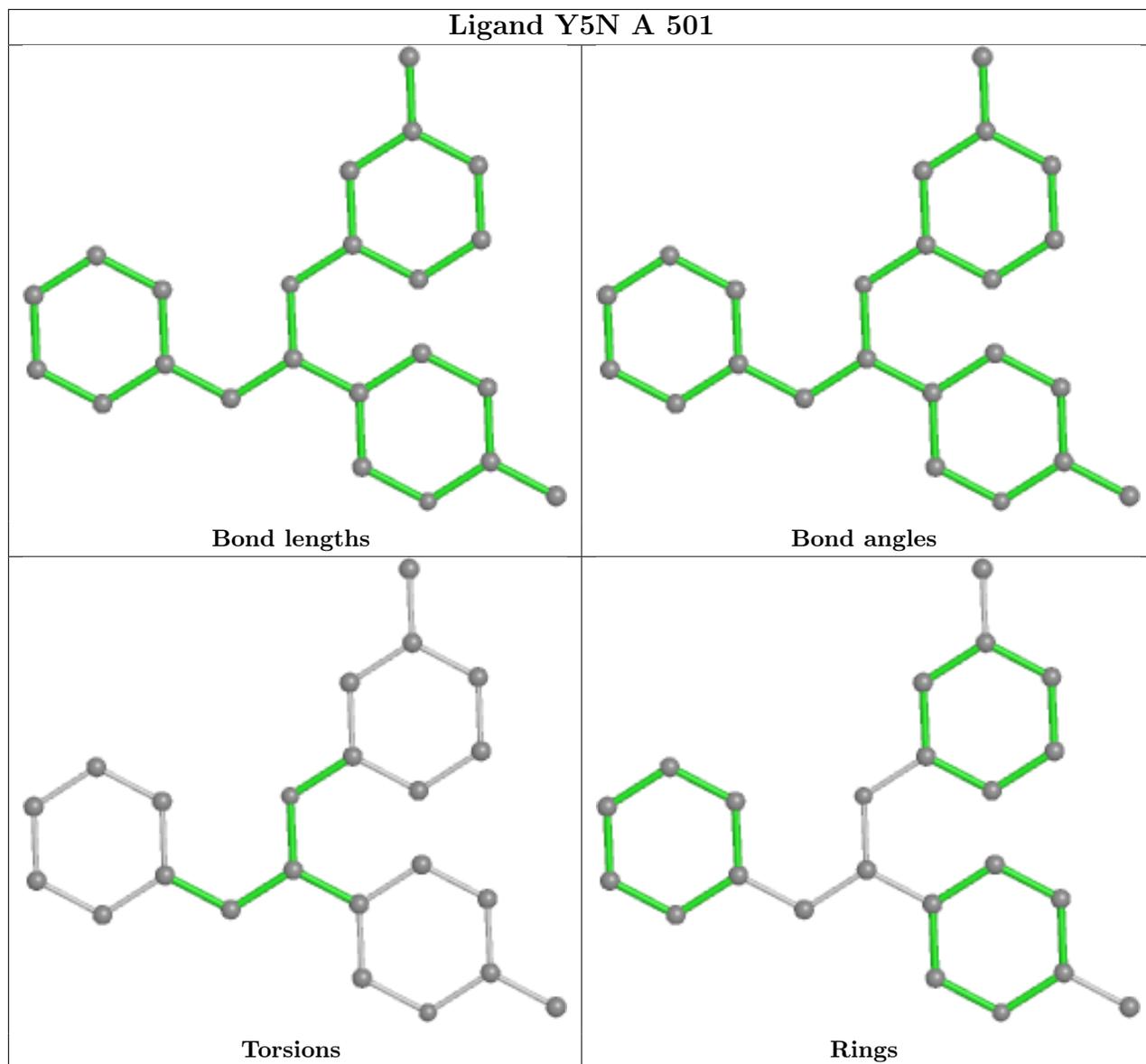
All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	502	ZIQ	O-C-CA-C1
3	A	502	ZIQ	OXT-C-CA-C1
3	B	502	ZIQ	OXT-C-CA-C1
3	B	502	ZIQ	O-C-CA-C1
3	C	502	ZIQ	OXT-C-CA-C1
3	A	502	ZIQ	OXT-C-CA-CB
3	B	502	ZIQ	OXT-C-CA-CB
3	C	502	ZIQ	OXT-C-CA-CB
3	C	502	ZIQ	O-C-CA-C1
3	D	502	ZIQ	OXT-C-CA-C1
3	A	502	ZIQ	O-C-CA-CB
3	B	502	ZIQ	O-C-CA-CB
3	C	502	ZIQ	O-C-CA-CB
3	D	502	ZIQ	O-C-CA-CB
3	D	502	ZIQ	OXT-C-CA-CB
3	D	502	ZIQ	O-C-CA-C1

There are no ring outliers.

6 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	501	Y5N	1	0
2	C	501	Y5N	1	0
2	D	501	Y5N	1	0
3	D	502	ZIQ	1	0
3	A	502	ZIQ	1	0
2	B	501	Y5N	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 then 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 Y5N A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand Y5N C 501

Bond lengths

Bond angles

Torsions

Rings

Ligand Y5N D 501

Bond lengths

Bond angles

Torsions

Rings

Ligand Y5N B 501

Bond lengths

Bond angles

Torsions

Rings
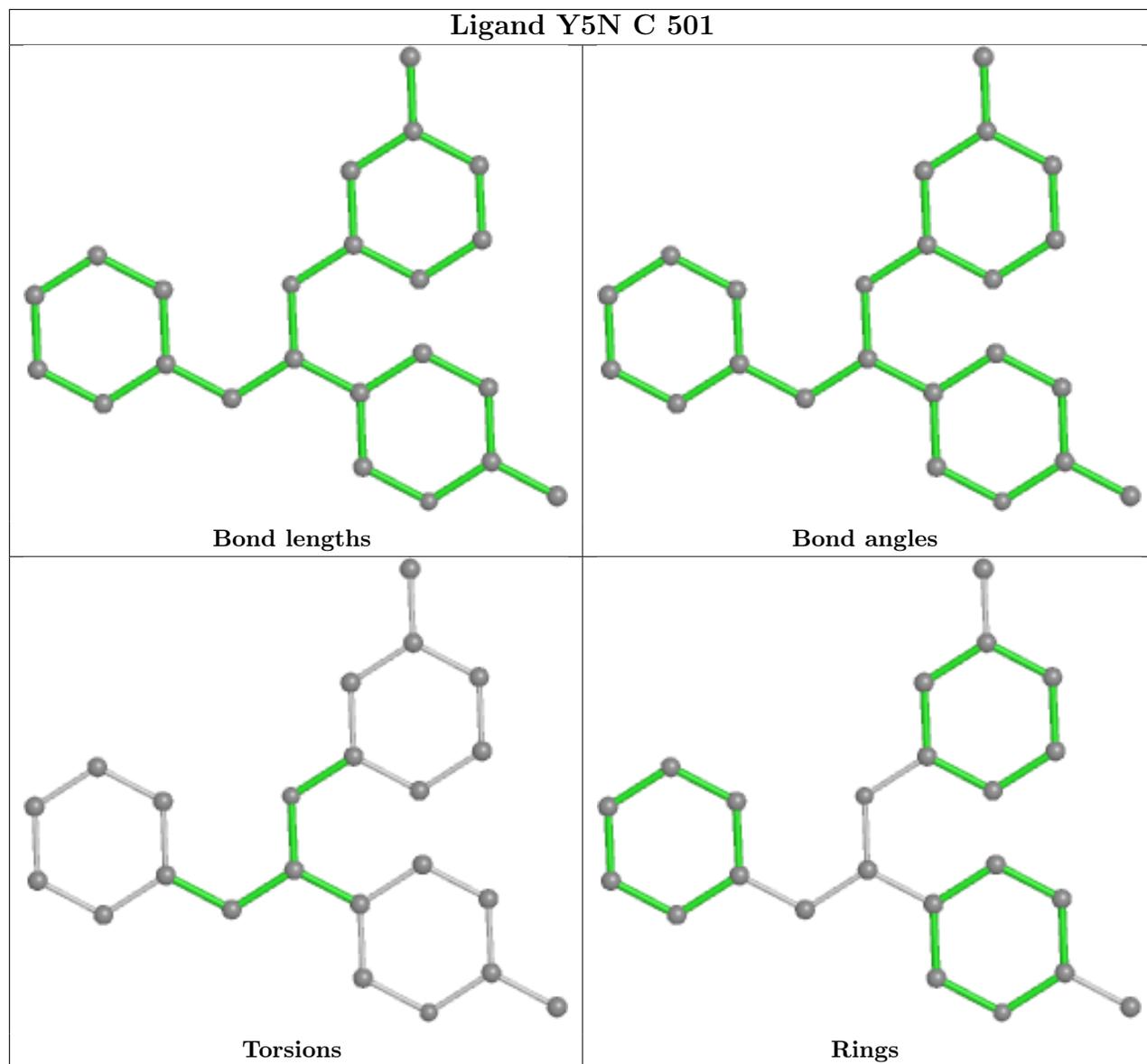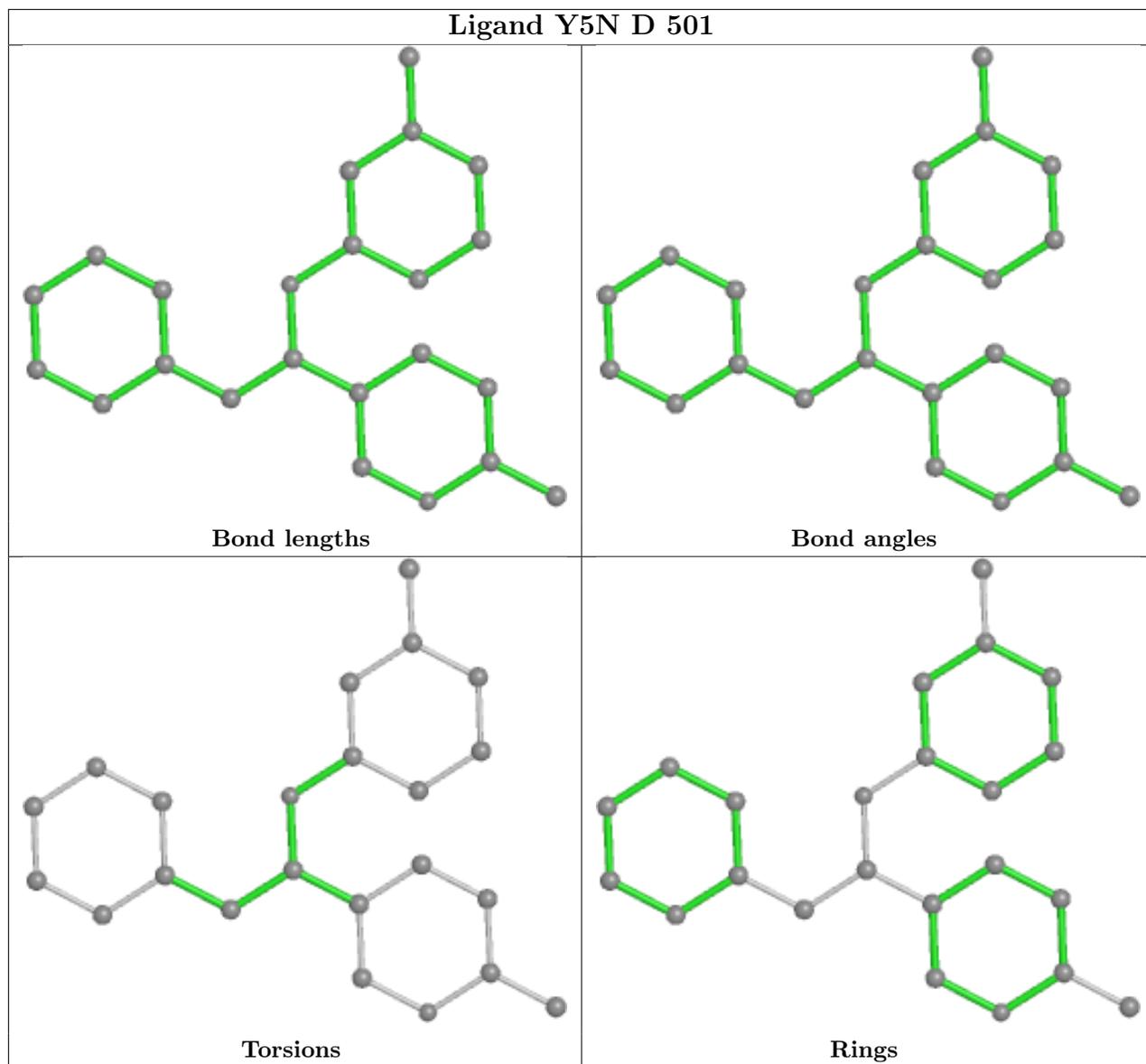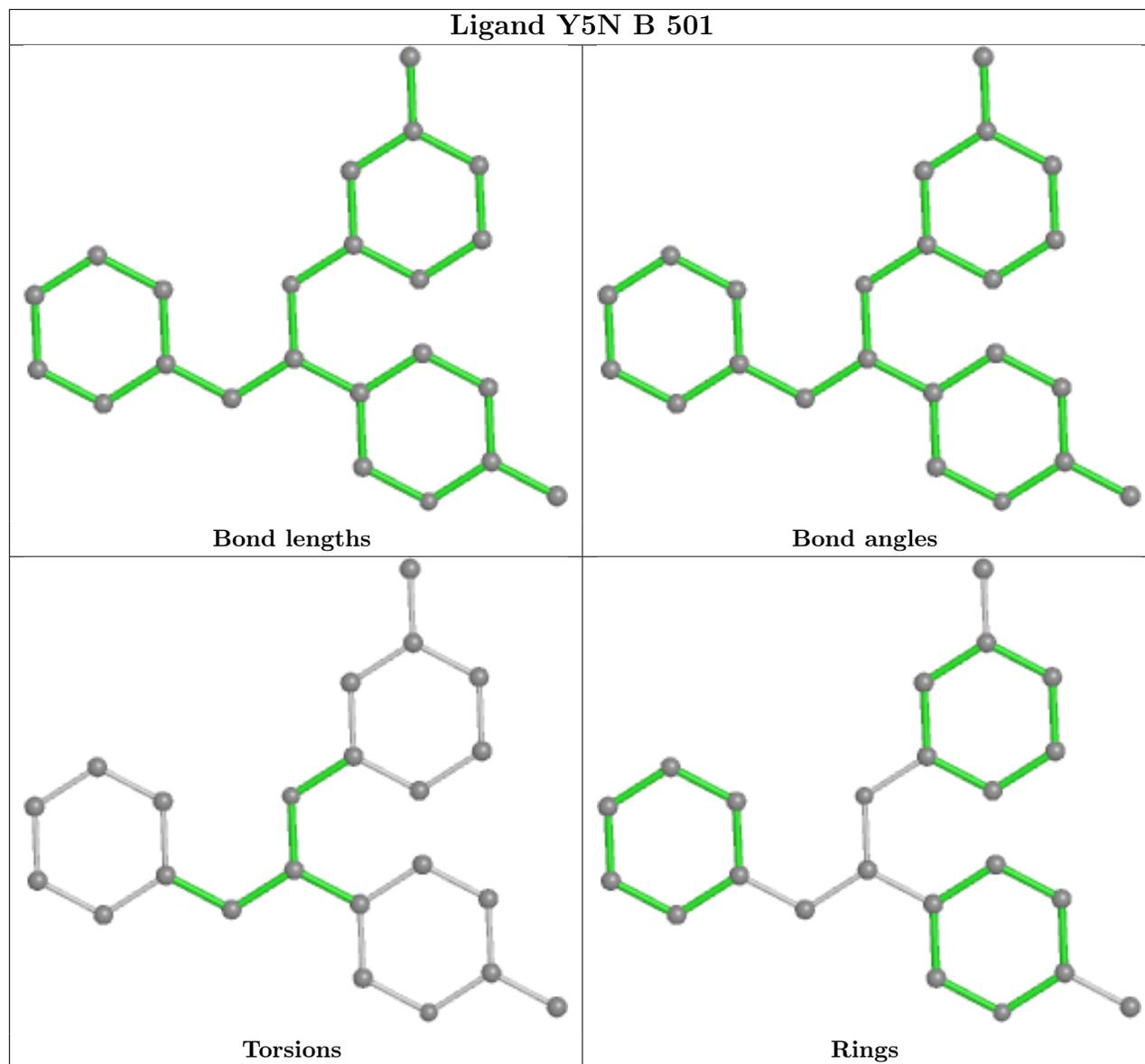
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

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(Å²)	Q<0.9
1	A	314/358 (87%)	-0.03	3 (0%)	82	80	47, 73, 105, 122	0
1	B	318/358 (88%)	0.03	6 (1%)	66	62	47, 73, 114, 132	0
1	C	317/358 (88%)	0.10	9 (2%)	53	47	50, 78, 108, 124	0
1	D	314/358 (87%)	0.06	12 (3%)	40	34	55, 87, 125, 135	0
All	All	1263/1432 (88%)	0.04	30 (2%)	59	53	47, 77, 116, 135	0

All (30) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	151	SER	7.2
1	C	149	PRO	5.6
1	C	359	TYR	4.3
1	C	150	ALA	4.2
1	A	151	SER	4.1
1	D	192	LEU	3.9
1	B	184	PHE	3.4
1	B	316	ASP	3.2
1	C	168	LEU	3.2
1	D	389	LEU	3.2
1	D	193	LEU	3.2
1	A	388	PHE	3.1
1	B	386	HIS	2.9
1	C	133	GLU	2.8
1	D	384	THR	2.8
1	D	385	ILE	2.7
1	B	389	LEU	2.6
1	C	333	HIS	2.5
1	D	144	ARG	2.5
1	B	371	TYR	2.4
1	D	253	GLN	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	116	HIS	2.2
1	B	197	GLN	2.2
1	D	293	LEU	2.2
1	D	51	VAL	2.2
1	D	386	HIS	2.1
1	C	153	PHE	2.1
1	C	289	LEU	2.1
1	A	149	PRO	2.0
1	D	141	ASN	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 monosaccharides 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
3	ZIQ	A	502	16/16	0.88	0.23	89,89,90,90	0
2	Y5N	B	501	23/23	0.93	0.18	66,68,69,71	0
2	Y5N	D	501	23/23	0.94	0.19	72,75,76,77	0
2	Y5N	A	501	23/23	0.94	0.24	68,69,75,77	0
3	ZIQ	D	502	16/16	0.94	0.21	101,101,103,103	0
3	ZIQ	C	502	16/16	0.95	0.15	69,71,76,76	0
2	Y5N	C	501	23/23	0.96	0.31	70,71,76,77	0
3	ZIQ	B	502	16/16	0.97	0.14	67,67,69,70	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.
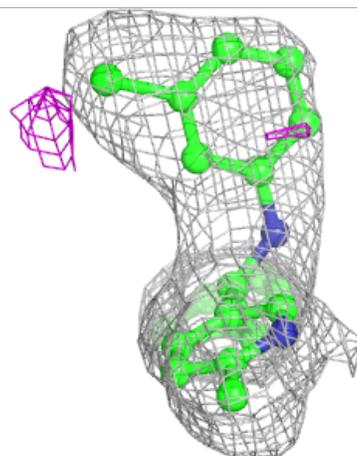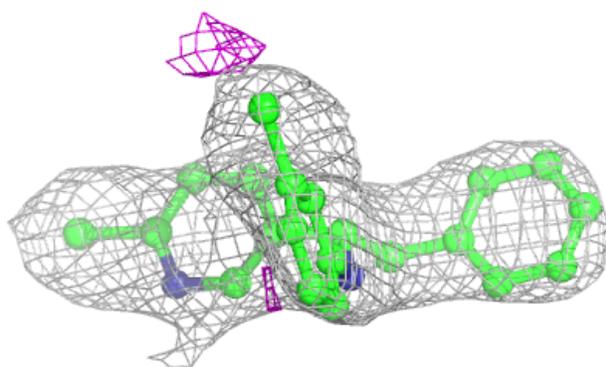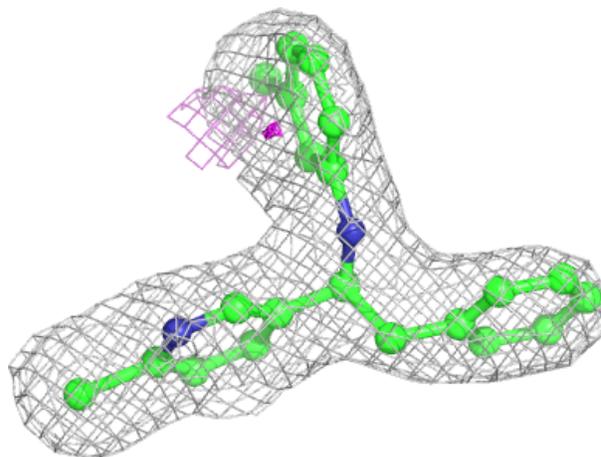
Electron density around Y5N B 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
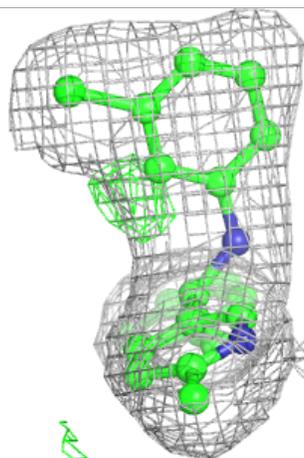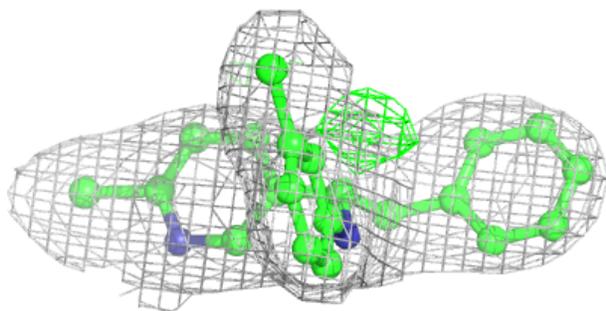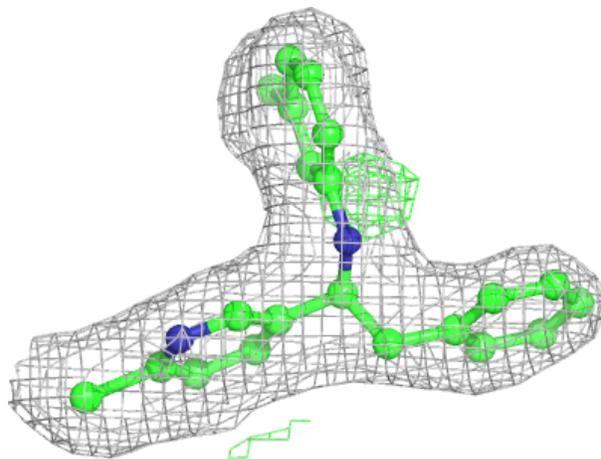
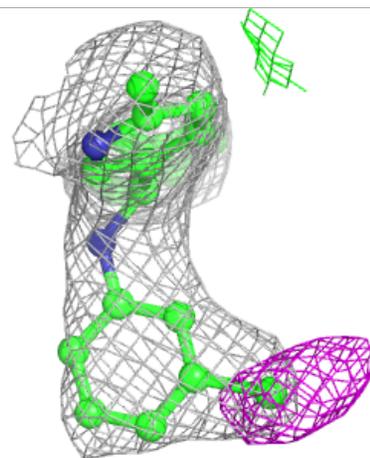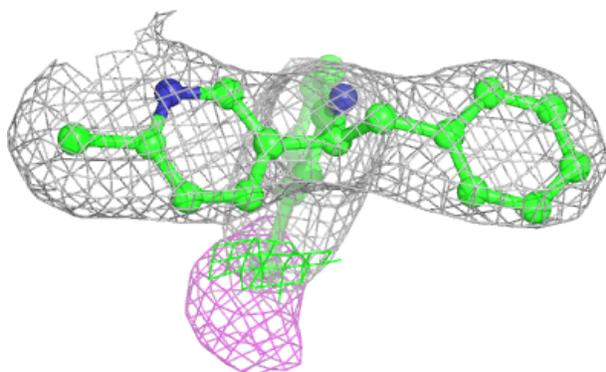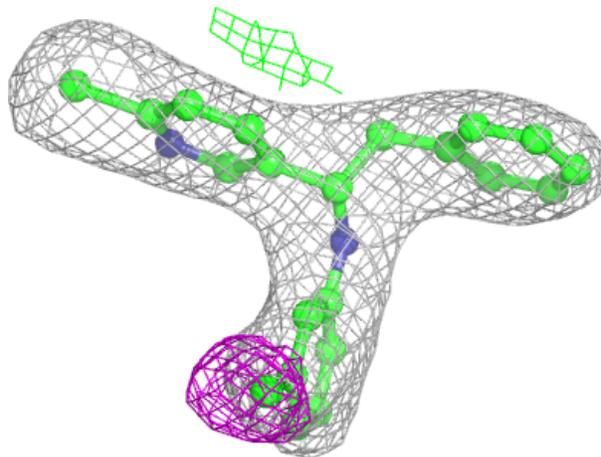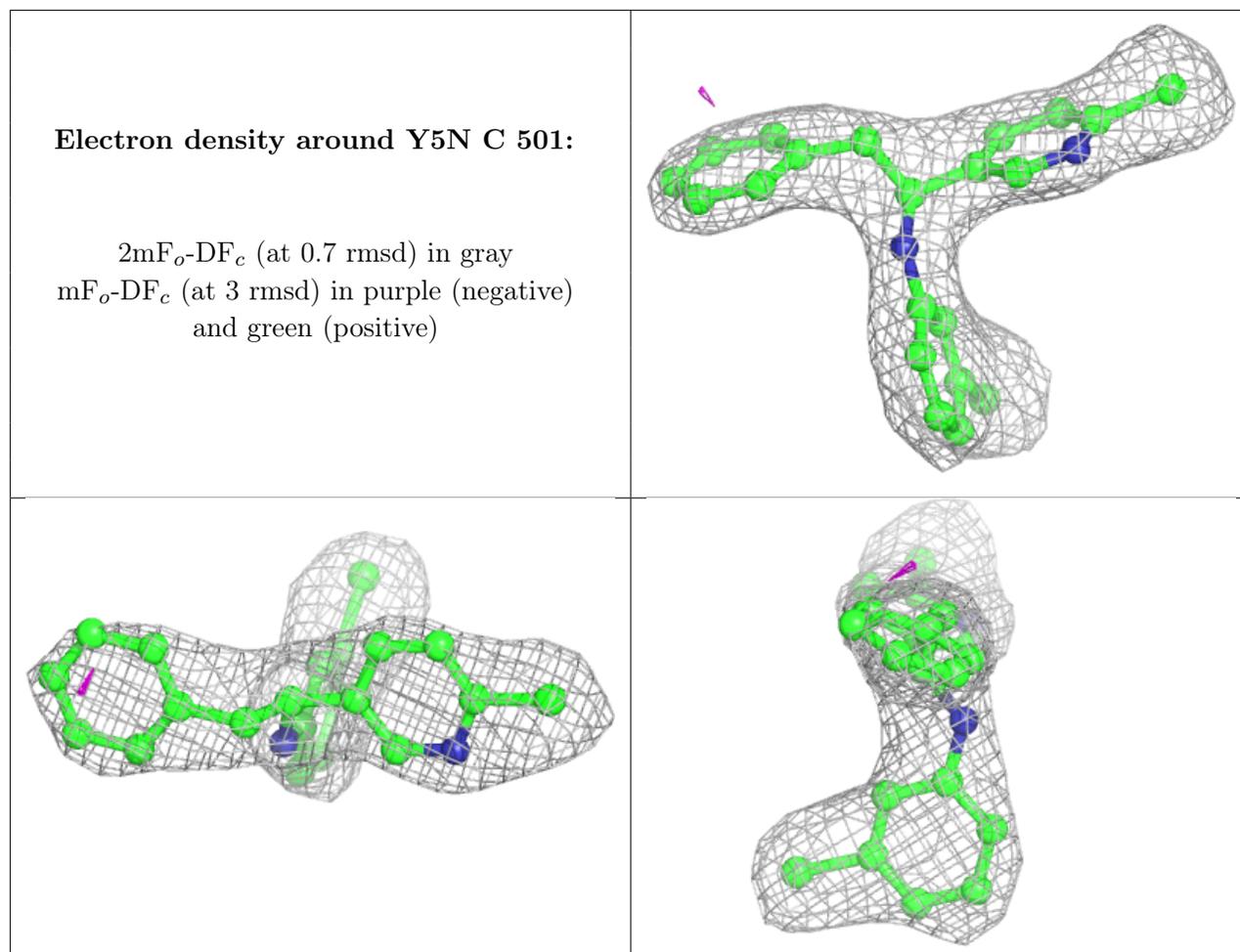**Electron density around Y5N D 501:**

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 Y5N A 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 Y5N C 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.