



## Full wwPDB X-ray Structure Validation Report

Jun 16, 2024 – 09:13 PM EDT

PDB ID : 5PGW  
Title : CRYSTAL STRUCTURE OF 11BETA-HSD1 DOUBLE MUTANT (L262R, F278E) COMPLEXED WITH 2-[(1R,3S,5R,7S)-2-[4-(4-FLUOROPHENYL) PHENYL]-6-HYDROXYADAMANTAN-2-YL]-1-(3- HYDROXYAZETIDIN -1-YL)ETHAN-1-ONE  
Authors : Sheriff, S.  
Deposited on : 2017-02-06  
Resolution : 2.37 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the  symbol.

The types of validation reports are described at

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

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The following versions of software and data (see [references](#) ①) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtrriage (Phenix) : 1.13  
EDS : 2.37.1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

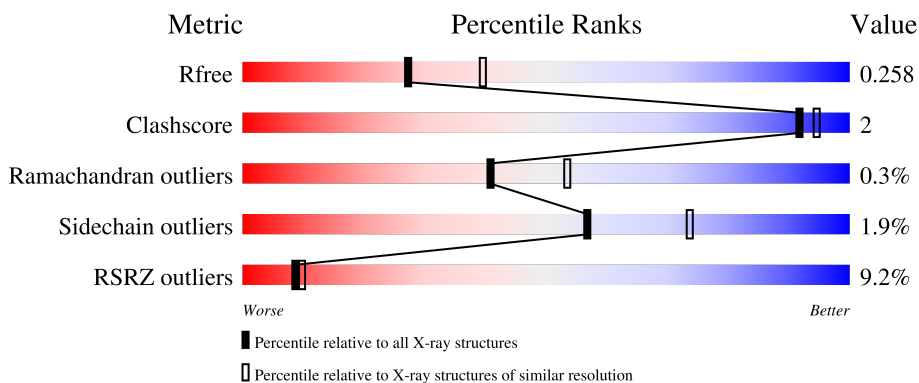
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.37 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))
$R_{free}$	130704	5509 (2.40-2.36)
Clashscore	141614	6082 (2.40-2.36)
Ramachandran outliers	138981	5973 (2.40-2.36)
Sidechain outliers	138945	5975 (2.40-2.36)
RSRZ outliers	127900	5397 (2.40-2.36)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	286	
1	B	286	
1	D	286	
1	E	286	

## 2 Entry composition i

There are 4 unique types of molecules in this entry. The entry contains 8795 atoms, of which 232 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 Corticosteroid 11-beta-dehydrogenase isozyme 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	259	1966	1253	330	367	16	0	0	0
1	B	276	2059	1306	352	385	16	0	0	0
1	D	274	2056	1303	350	385	18	0	0	0
1	E	260	1988	1266	336	370	16	0	0	0

There are 76 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	GLY	-	expression tag	UNP P28845
A	8	SER	-	expression tag	UNP P28845
A	9	HIS	-	expression tag	UNP P28845
A	10	MET	-	expression tag	UNP P28845
A	11	ALA	-	expression tag	UNP P28845
A	12	SER	-	expression tag	UNP P28845
A	13	MET	-	expression tag	UNP P28845
A	14	THR	-	expression tag	UNP P28845
A	15	GLY	-	expression tag	UNP P28845
A	16	GLY	-	expression tag	UNP P28845
A	17	GLN	-	expression tag	UNP P28845
A	18	GLN	-	expression tag	UNP P28845
A	19	MET	-	expression tag	UNP P28845
A	20	GLY	-	expression tag	UNP P28845
A	21	ARG	-	expression tag	UNP P28845
A	22	GLY	-	expression tag	UNP P28845
A	23	SER	-	expression tag	UNP P28845
A	262	ARG	LEU	engineered mutation	UNP P28845
A	278	GLU	PHE	engineered mutation	UNP P28845
B	7	GLY	-	expression tag	UNP P28845
B	8	SER	-	expression tag	UNP P28845

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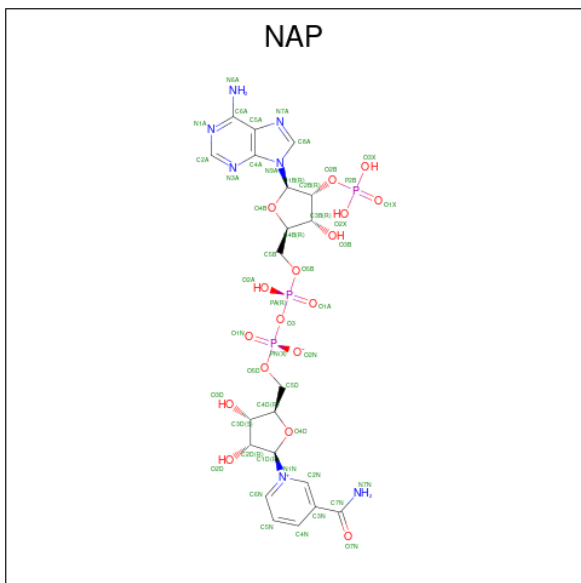
Chain	Residue	Modelled	Actual	Comment	Reference
B	9	HIS	-	expression tag	UNP P28845
B	10	MET	-	expression tag	UNP P28845
B	11	ALA	-	expression tag	UNP P28845
B	12	SER	-	expression tag	UNP P28845
B	13	MET	-	expression tag	UNP P28845
B	14	THR	-	expression tag	UNP P28845
B	15	GLY	-	expression tag	UNP P28845
B	16	GLY	-	expression tag	UNP P28845
B	17	GLN	-	expression tag	UNP P28845
B	18	GLN	-	expression tag	UNP P28845
B	19	MET	-	expression tag	UNP P28845
B	20	GLY	-	expression tag	UNP P28845
B	21	ARG	-	expression tag	UNP P28845
B	22	GLY	-	expression tag	UNP P28845
B	23	SER	-	expression tag	UNP P28845
B	262	ARG	LEU	engineered mutation	UNP P28845
B	278	GLU	PHE	engineered mutation	UNP P28845
D	7	GLY	-	expression tag	UNP P28845
D	8	SER	-	expression tag	UNP P28845
D	9	HIS	-	expression tag	UNP P28845
D	10	MET	-	expression tag	UNP P28845
D	11	ALA	-	expression tag	UNP P28845
D	12	SER	-	expression tag	UNP P28845
D	13	MET	-	expression tag	UNP P28845
D	14	THR	-	expression tag	UNP P28845
D	15	GLY	-	expression tag	UNP P28845
D	16	GLY	-	expression tag	UNP P28845
D	17	GLN	-	expression tag	UNP P28845
D	18	GLN	-	expression tag	UNP P28845
D	19	MET	-	expression tag	UNP P28845
D	20	GLY	-	expression tag	UNP P28845
D	21	ARG	-	expression tag	UNP P28845
D	22	GLY	-	expression tag	UNP P28845
D	23	SER	-	expression tag	UNP P28845
D	262	ARG	LEU	engineered mutation	UNP P28845
D	278	GLU	PHE	engineered mutation	UNP P28845
E	7	GLY	-	expression tag	UNP P28845
E	8	SER	-	expression tag	UNP P28845
E	9	HIS	-	expression tag	UNP P28845
E	10	MET	-	expression tag	UNP P28845
E	11	ALA	-	expression tag	UNP P28845
E	12	SER	-	expression tag	UNP P28845

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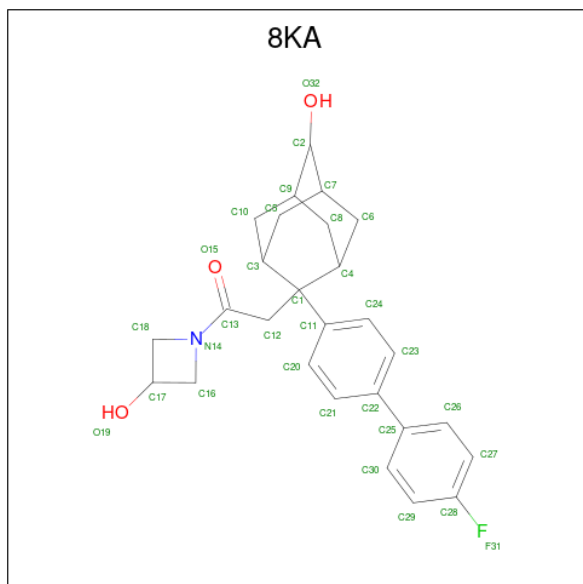
Chain	Residue	Modelled	Actual	Comment	Reference
E	13	MET	-	expression tag	UNP P28845
E	14	THR	-	expression tag	UNP P28845
E	15	GLY	-	expression tag	UNP P28845
E	16	GLY	-	expression tag	UNP P28845
E	17	GLN	-	expression tag	UNP P28845
E	18	GLN	-	expression tag	UNP P28845
E	19	MET	-	expression tag	UNP P28845
E	20	GLY	-	expression tag	UNP P28845
E	21	ARG	-	expression tag	UNP P28845
E	22	GLY	-	expression tag	UNP P28845
E	23	SER	-	expression tag	UNP P28845
E	262	ARG	LEU	engineered mutation	UNP P28845
E	278	GLU	PHE	engineered mutation	UNP P28845

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (three-letter code: NAP) (formula: C<sub>21</sub>H<sub>28</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			P
2	A	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	B	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	D	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		
2	E	1	Total	C	H	N	O	P	28	0
			76	21	28	7	17	3		

- Molecule 3 is 2-[(1R,3S,5R,7S)-2-[4-(4-FLUOROPHENYL)PHENYL]-6-HYDROXYADAMANTAN-2-YL]-1-(3-HYDROXYAZETIDIN-1-YL)ETHAN-1-ONE (three-letter code: 8KA) (formula: C<sub>27</sub>H<sub>30</sub>FNO<sub>3</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	F	H	N			O
3	A	1	Total	C	F	H	N	O	30	0
			62	27	1	30	1	3		
3	B	1	Total	C	F	H	N	O	30	0
			62	27	1	30	1	3		
3	D	1	Total	C	F	H	N	O	30	0
			62	27	1	30	1	3		
3	E	1	Total	C	F	H	N	O	30	0
			62	27	1	30	1	3		

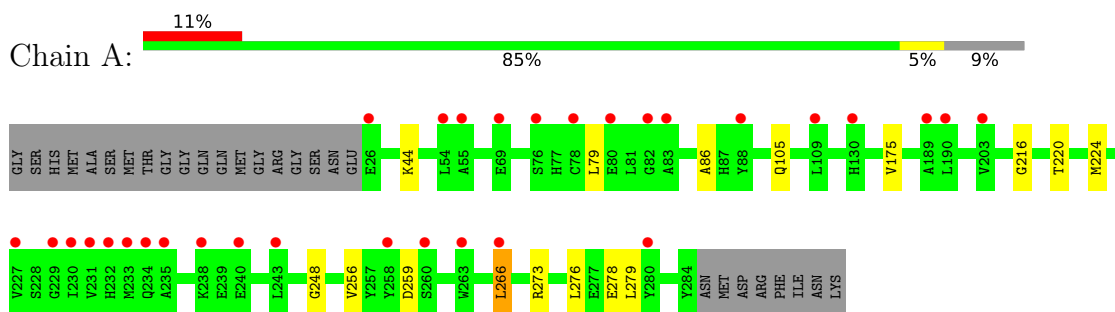
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	24	Total	O	0	0
			24	24		
4	B	22	Total	O	0	0
			22	22		
4	D	79	Total	O	0	0
			79	79		
4	E	49	Total	O	0	0
			49	49		

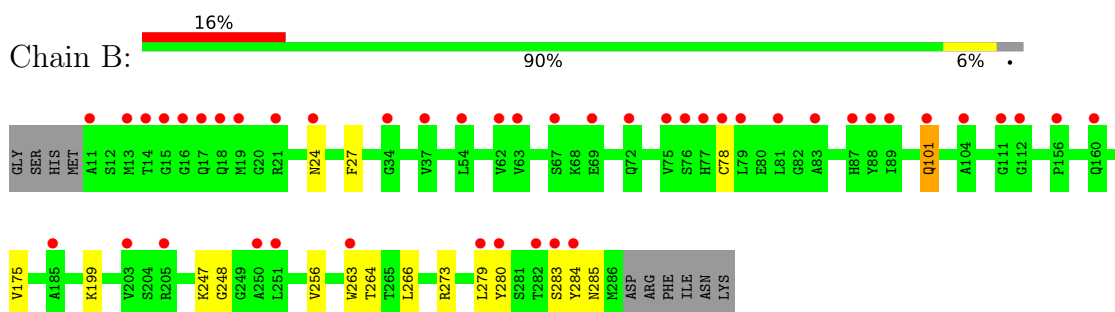
### 3 Residue-property plots [i](#)

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.

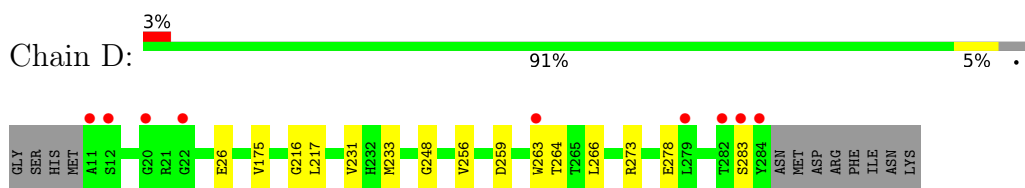
- Molecule 1: Corticosteroid 11-beta-dehydrogenase isozyme 1



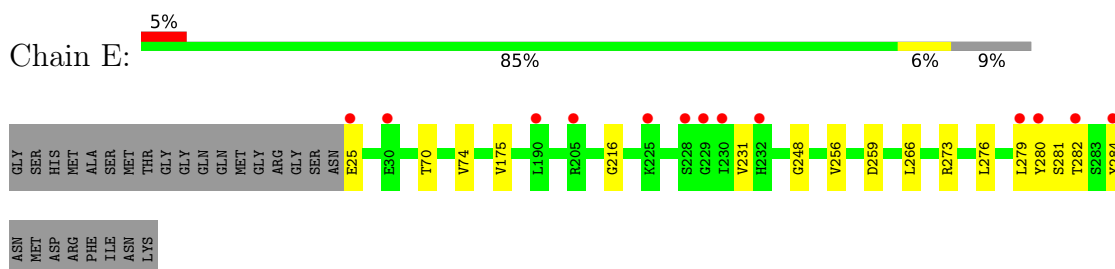
- Molecule 1: Corticosteroid 11-beta-dehydrogenase isozyme 1



- Molecule 1: Corticosteroid 11-beta-dehydrogenase isozyme 1



- Molecule 1: Corticosteroid 11-beta-dehydrogenase isozyme 1





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	74.30Å 92.80Å 162.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.24 – 2.37 38.24 – 2.37	Depositor EDS
% Data completeness (in resolution range)	97.8 (38.24-2.37) 97.9 (38.24-2.37)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.10	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.31 (at 2.37Å)	Xtrriage
Refinement program	BUSTER 2.11.7	Depositor
R, $R_{free}$	0.217 , 0.238 0.228 , 0.258	Depositor DCC
$R_{free}$ test set	1098 reflections (2.43%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	30.2	Xtrriage
Anisotropy	0.130	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.31 , 40.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.45$ , $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	8795	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.36% of the height of the origin peak. No significant pseudotranslation is detected.*

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

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NAP, 8KA

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	0.44	0/1999	0.66	0/2701
1	B	0.47	0/2092	0.69	0/2829
1	D	0.49	0/2088	0.67	0/2818
1	E	0.49	0/2021	0.67	0/2729
All	All	0.47	0/8200	0.67	0/11077

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 [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	1966	0	1991	10	0
1	B	2059	0	2053	9	0
1	D	2056	0	2075	9	0
1	E	1988	0	2025	8	0
2	A	48	28	25	1	0
2	B	48	28	25	0	0
2	D	48	28	25	0	0
2	E	48	28	25	0	0
3	A	32	30	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	32	30	0	0	0
3	D	32	30	0	0	0
3	E	32	30	0	0	0
4	A	24	0	0	0	0
4	B	22	0	0	0	0
4	D	79	0	0	0	0
4	E	49	0	0	0	0
All	All	8563	232	8244	27	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 2.

All (27) 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:273:ARG:HG3	1:B:175:VAL:HG12	1.82	0.59
1:A:175:VAL:HG12	1:B:273:ARG:HG3	1.86	0.57
1:A:266:LEU:HD21	1:D:278:GLU:HG3	1.92	0.50
1:A:216:GLY:HA3	1:A:259:ASP:OD1	2.12	0.50
1:D:264:THR:HA	1:E:276:LEU:HD21	1.95	0.49
1:D:175:VAL:HG12	1:E:273:ARG:HG3	1.95	0.49
1:B:199:LYS:CD	1:B:280:TYR:OH	2.61	0.48
1:E:216:GLY:HA3	1:E:259:ASP:OD1	2.14	0.48
1:D:217:LEU:HD22	1:D:233:MET:HG3	1.96	0.47
1:A:276:LEU:HD21	1:B:264:THR:HA	1.96	0.47
1:E:248:GLY:HA3	1:E:256:VAL:HG21	1.97	0.46
1:A:276:LEU:HD23	1:A:279:LEU:HD12	1.96	0.46
1:D:216:GLY:HA3	1:D:259:ASP:OD1	2.15	0.45
1:B:248:GLY:HA3	1:B:256:VAL:HG21	1.99	0.44
1:D:248:GLY:HA3	1:D:256:VAL:HG21	2.00	0.44
1:D:273:ARG:HG3	1:E:175:VAL:HG12	1.99	0.44
1:A:79:LEU:HG	1:A:86:ALA:HB3	1.99	0.43
1:A:248:GLY:HA3	1:A:256:VAL:HG21	2.00	0.43
1:A:220:THR:O	1:A:224:MET:HG2	2.18	0.43
1:E:280:TYR:C	1:E:282:THR:H	2.21	0.43
1:E:70:THR:O	1:E:74:VAL:HG23	2.19	0.42
1:B:263:TRP:HZ3	1:D:263:TRP:HZ3	1.66	0.42
1:B:101:GLN:HE21	1:B:101:GLN:HB3	1.74	0.42
1:D:283:SER:HB3	1:E:231:VAL:HG13	2.02	0.42
1:A:44:LYS:HG2	2:A:301:NAP:H3B	2.03	0.41
1:B:199:LYS:HD2	1:B:280:TYR:OH	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:27:PHE:CD2	1:B:247:LYS:HG2	2.56	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	257/286 (90%)	244 (95%)	13 (5%)	0	100	100
1	B	274/286 (96%)	262 (96%)	10 (4%)	2 (1%)	22	30
1	D	272/286 (95%)	262 (96%)	10 (4%)	0	100	100
1	E	258/286 (90%)	246 (95%)	11 (4%)	1 (0%)	34	46
All	All	1061/1144 (93%)	1014 (96%)	44 (4%)	3 (0%)	41	53

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	24	ASN
1	B	283	SER
1	E	281	SER

### 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	211/237 (89%)	208 (99%)	3 (1%)	67	81
1	B	214/237 (90%)	208 (97%)	6 (3%)	43	61
1	D	218/237 (92%)	215 (99%)	3 (1%)	67	81
1	E	215/237 (91%)	211 (98%)	4 (2%)	57	73
All	All	858/948 (90%)	842 (98%)	16 (2%)	57	73

All (16) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	105	GLN
1	A	266	LEU
1	A	278	GLU
1	B	78	CYS
1	B	101	GLN
1	B	266	LEU
1	B	279	LEU
1	B	284	TYR
1	B	285	ASN
1	D	26	GLU
1	D	231	VAL
1	D	266	LEU
1	E	25	GLU
1	E	266	LEU
1	E	279	LEU
1	E	284	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	101	GLN

### 5.3.3 RNA [i](#)

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 monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

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	NAP	B	301	-	45,52,52	0.77	1 (2%)	56,80,80	0.85	2 (3%)
3	8KA	E	302	-	33,37,37	0.54	1 (3%)	41,57,57	0.41	0
3	8KA	D	302	-	33,37,37	0.64	1 (3%)	41,57,57	0.33	0
2	NAP	D	301	-	45,52,52	0.83	1 (2%)	56,80,80	0.83	2 (3%)
3	8KA	B	302	-	33,37,37	0.52	1 (3%)	41,57,57	0.34	0
2	NAP	A	301	-	45,52,52	0.90	1 (2%)	56,80,80	1.00	4 (7%)
2	NAP	E	301	-	45,52,52	0.78	1 (2%)	56,80,80	0.86	2 (3%)
3	8KA	A	302	-	33,37,37	0.53	1 (3%)	41,57,57	0.35	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAP	B	301	-	-	2/31/67/67	0/5/5/5
3	8KA	E	302	-	-	7/17/63/63	0/7/6/6
3	8KA	D	302	-	-	6/17/63/63	0/7/6/6
2	NAP	D	301	-	-	4/31/67/67	0/5/5/5
3	8KA	B	302	-	-	10/17/63/63	0/7/6/6
2	NAP	A	301	-	-	4/31/67/67	0/5/5/5
2	NAP	E	301	-	-	8/31/67/67	0/5/5/5
3	8KA	A	302	-	-	6/17/63/63	0/7/6/6

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	NAP	C2N-N1N	4.66	1.40	1.35
2	E	301	NAP	C2N-N1N	3.66	1.39	1.35
2	D	301	NAP	C2N-N1N	3.47	1.39	1.35
2	B	301	NAP	C2N-N1N	3.42	1.39	1.35
3	D	302	8KA	C1-C11	3.13	1.60	1.51
3	E	302	8KA	C1-C11	2.47	1.58	1.51
3	A	302	8KA	C1-C11	2.44	1.58	1.51
3	B	302	8KA	C1-C11	2.34	1.57	1.51

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	301	NAP	O4D-C1D-C2D	-4.07	100.97	106.93
2	E	301	NAP	O4D-C1D-C2D	-3.66	101.58	106.93
2	B	301	NAP	O4D-C1D-C2D	-3.38	101.98	106.93
2	D	301	NAP	O4D-C1D-C2D	-3.06	102.46	106.93
2	E	301	NAP	C5A-C6A-N6A	2.37	123.96	120.35
2	A	301	NAP	C5A-C6A-N6A	2.35	123.93	120.35
2	A	301	NAP	O2B-C2B-C1B	2.31	118.43	110.10
2	A	301	NAP	C3B-C2B-C1B	-2.27	98.62	102.89
2	B	301	NAP	C5A-C6A-N6A	2.26	123.78	120.35
2	D	301	NAP	C5A-C6A-N6A	2.23	123.74	120.35

There are no chirality outliers.

All (47) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	302	8KA	C3-C1-C11-C20
3	A	302	8KA	C3-C1-C11-C24
3	B	302	8KA	C3-C1-C11-C20
3	B	302	8KA	C3-C1-C11-C24
3	D	302	8KA	C12-C1-C11-C20
3	E	302	8KA	C12-C1-C11-C20
3	E	302	8KA	C4-C1-C11-C24
2	A	301	NAP	C1B-C2B-O2B-P2B
3	A	302	8KA	C12-C1-C11-C20
3	A	302	8KA	C12-C1-C11-C24
3	B	302	8KA	C12-C1-C11-C20
3	B	302	8KA	C12-C1-C11-C24
3	D	302	8KA	C12-C1-C11-C24
3	E	302	8KA	C12-C1-C11-C24

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Mol	Chain	Res	Type	Atoms
3	B	302	8KA	C23-C22-C25-C26
3	A	302	8KA	C4-C1-C11-C20
3	A	302	8KA	C4-C1-C11-C24
3	B	302	8KA	C4-C1-C11-C20
3	B	302	8KA	C4-C1-C11-C24
3	D	302	8KA	C3-C1-C11-C20
3	D	302	8KA	C4-C1-C11-C20
3	D	302	8KA	C3-C1-C11-C24
3	D	302	8KA	C4-C1-C11-C24
3	E	302	8KA	C3-C1-C11-C20
3	E	302	8KA	C4-C1-C11-C20
3	E	302	8KA	C3-C1-C11-C24
3	B	302	8KA	C23-C22-C25-C30
3	B	302	8KA	C21-C22-C25-C26
2	E	301	NAP	C5D-O5D-PN-O3
2	A	301	NAP	PN-O3-PA-O1A
2	D	301	NAP	PN-O3-PA-O1A
2	E	301	NAP	PN-O3-PA-O1A
2	E	301	NAP	C5D-O5D-PN-O2N
3	B	302	8KA	C21-C22-C25-C30
2	B	301	NAP	C1B-C2B-O2B-P2B
2	A	301	NAP	O4B-C4B-C5B-O5B
2	B	301	NAP	O4B-C4B-C5B-O5B
2	A	301	NAP	C3B-C2B-O2B-P2B
2	D	301	NAP	C3B-C2B-O2B-P2B
2	D	301	NAP	C1B-C2B-O2B-P2B
2	E	301	NAP	C1B-C2B-O2B-P2B
3	E	302	8KA	C23-C22-C25-C26
2	E	301	NAP	C3B-C2B-O2B-P2B
2	D	301	NAP	O4B-C4B-C5B-O5B
2	E	301	NAP	O4B-C4B-C5B-O5B
2	E	301	NAP	PN-O3-PA-O2A
2	E	301	NAP	C5D-O5D-PN-O1N

There are no ring outliers.

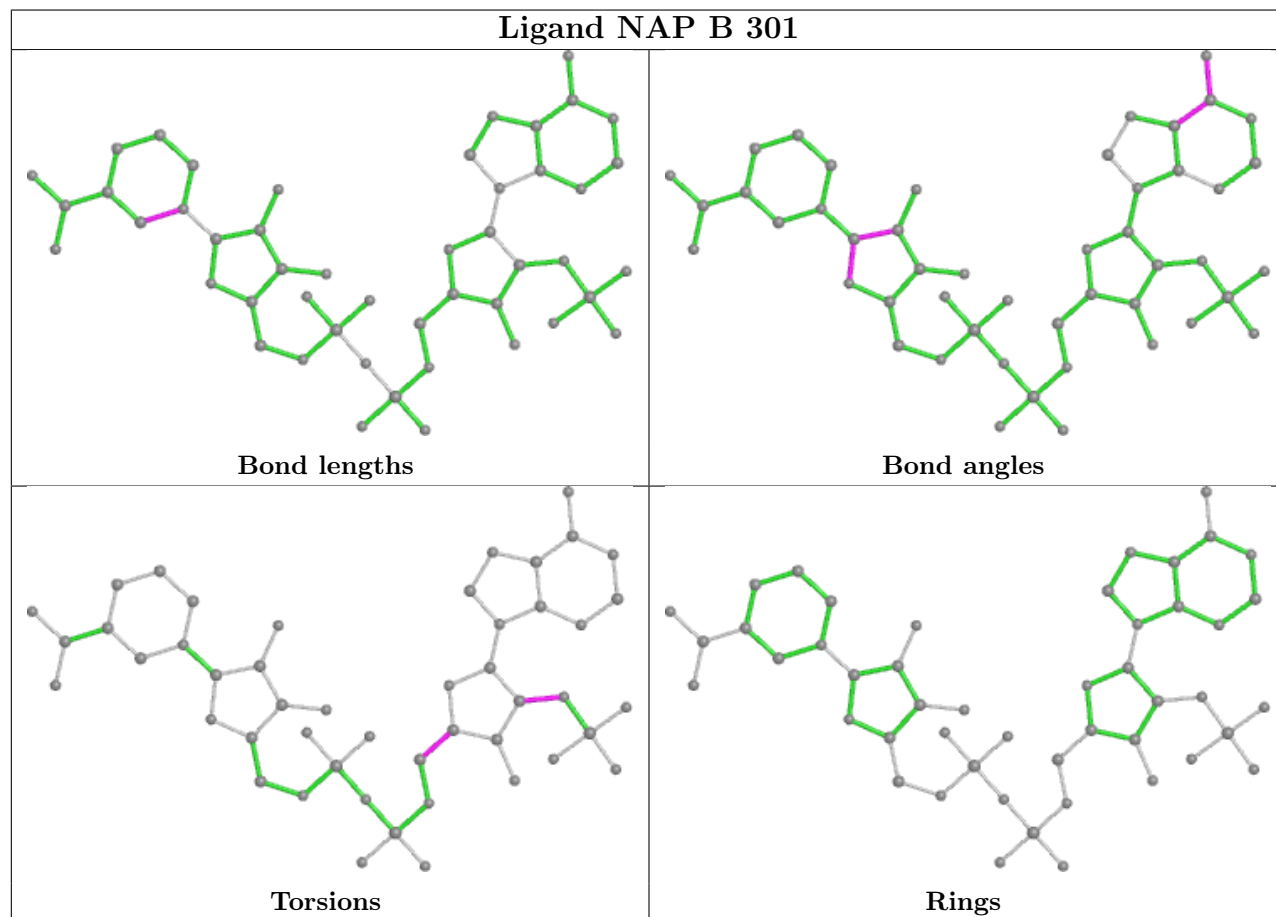
1 monomer is involved in 1 short contact:

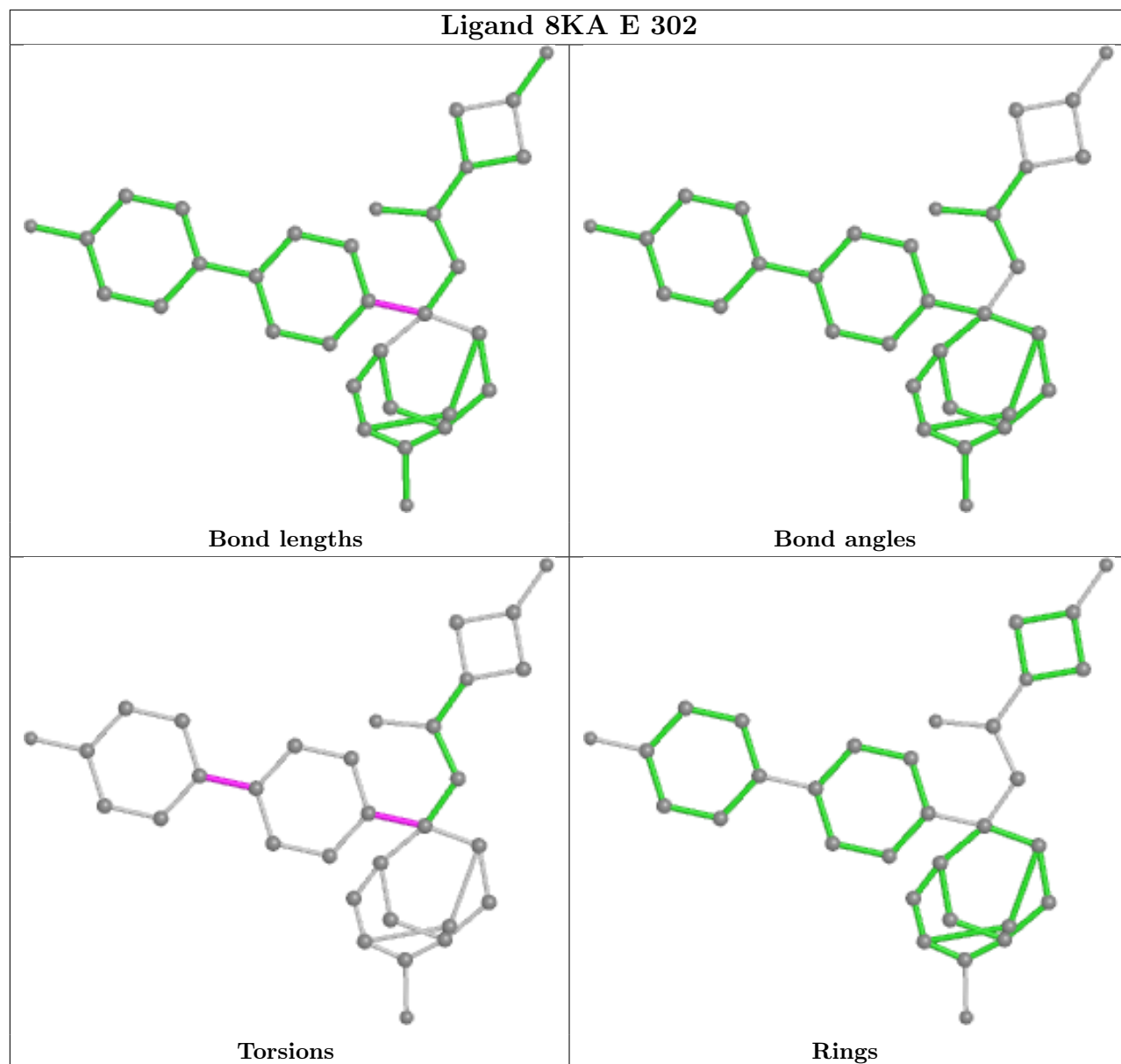
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	NAP	1	0

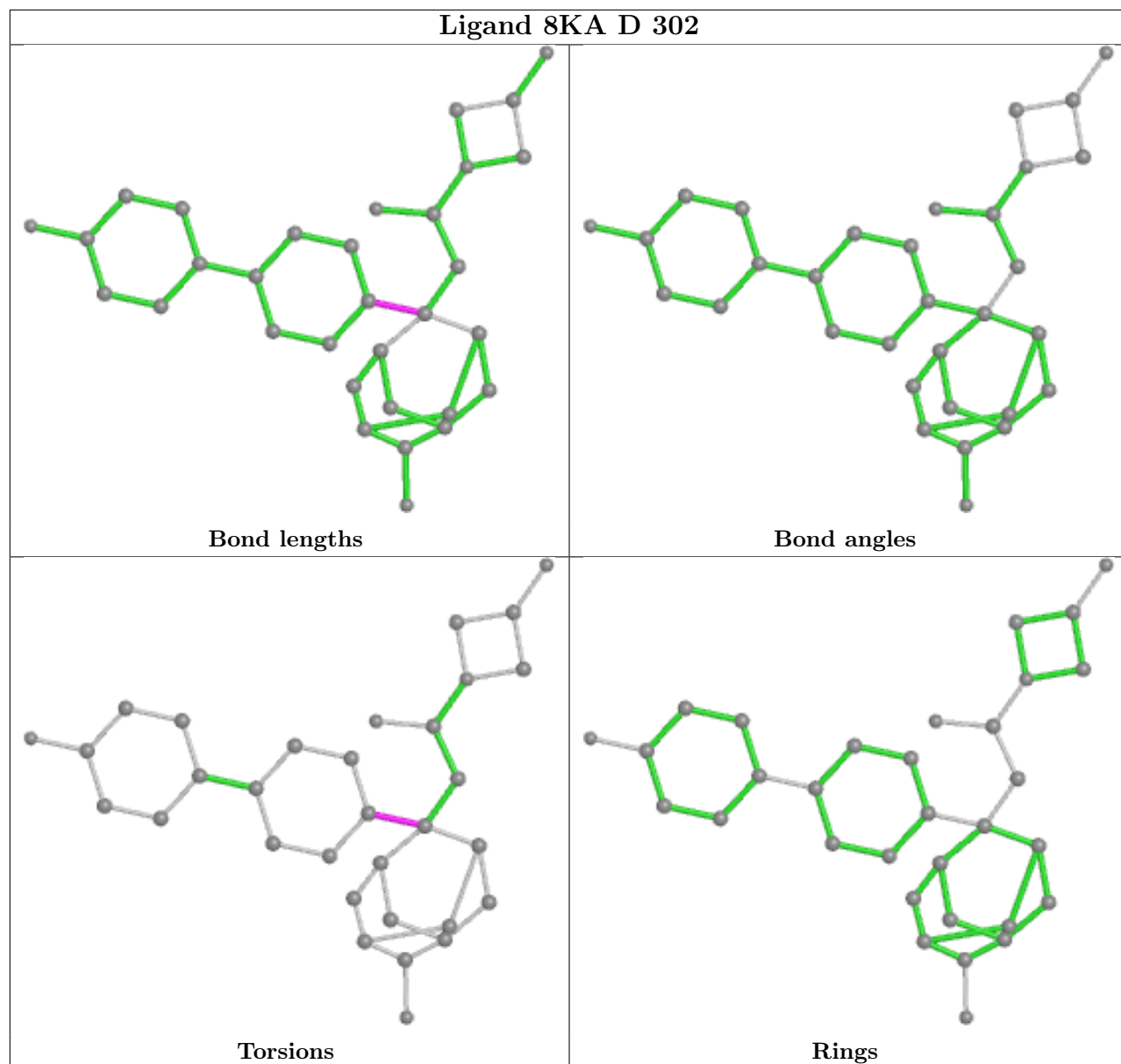
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In

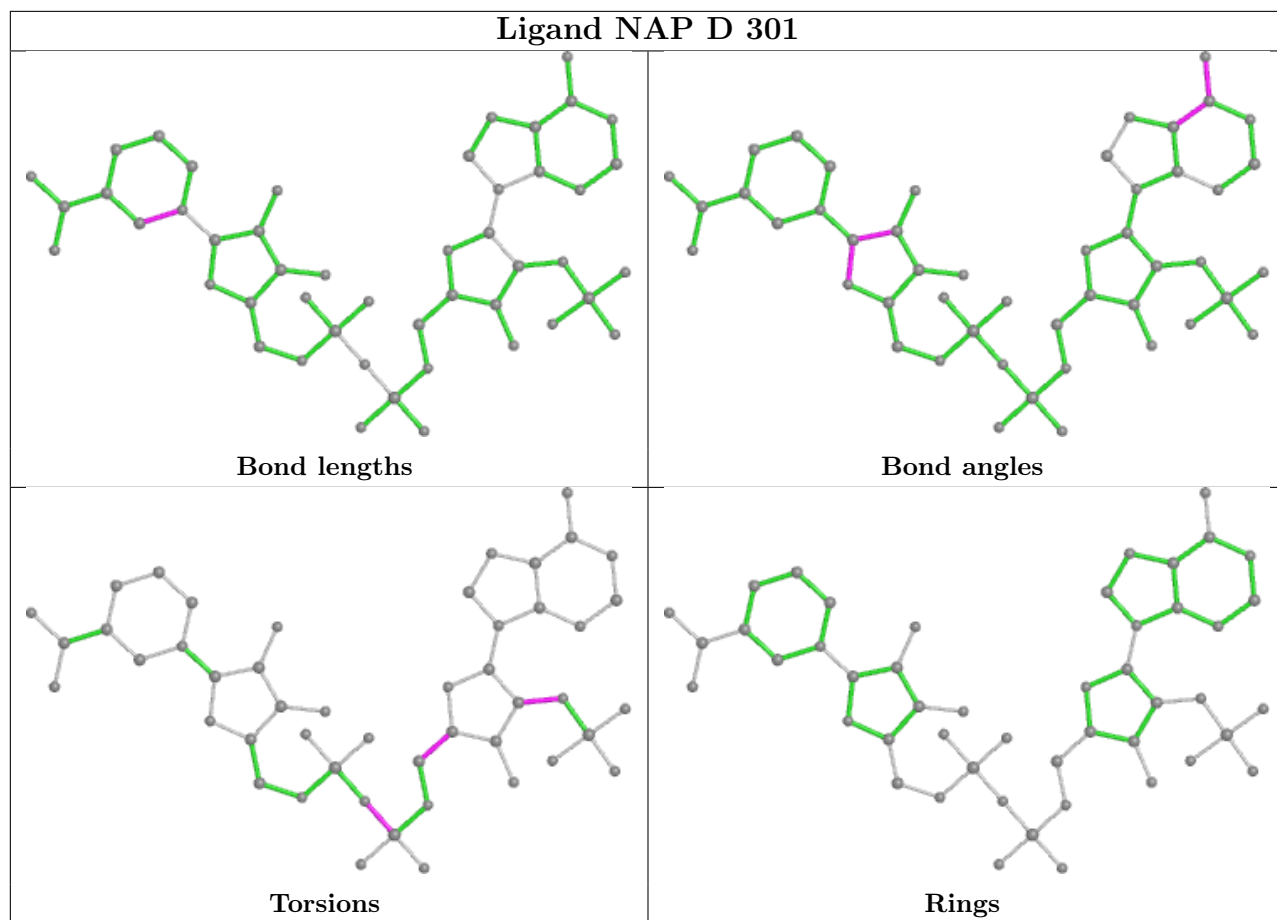


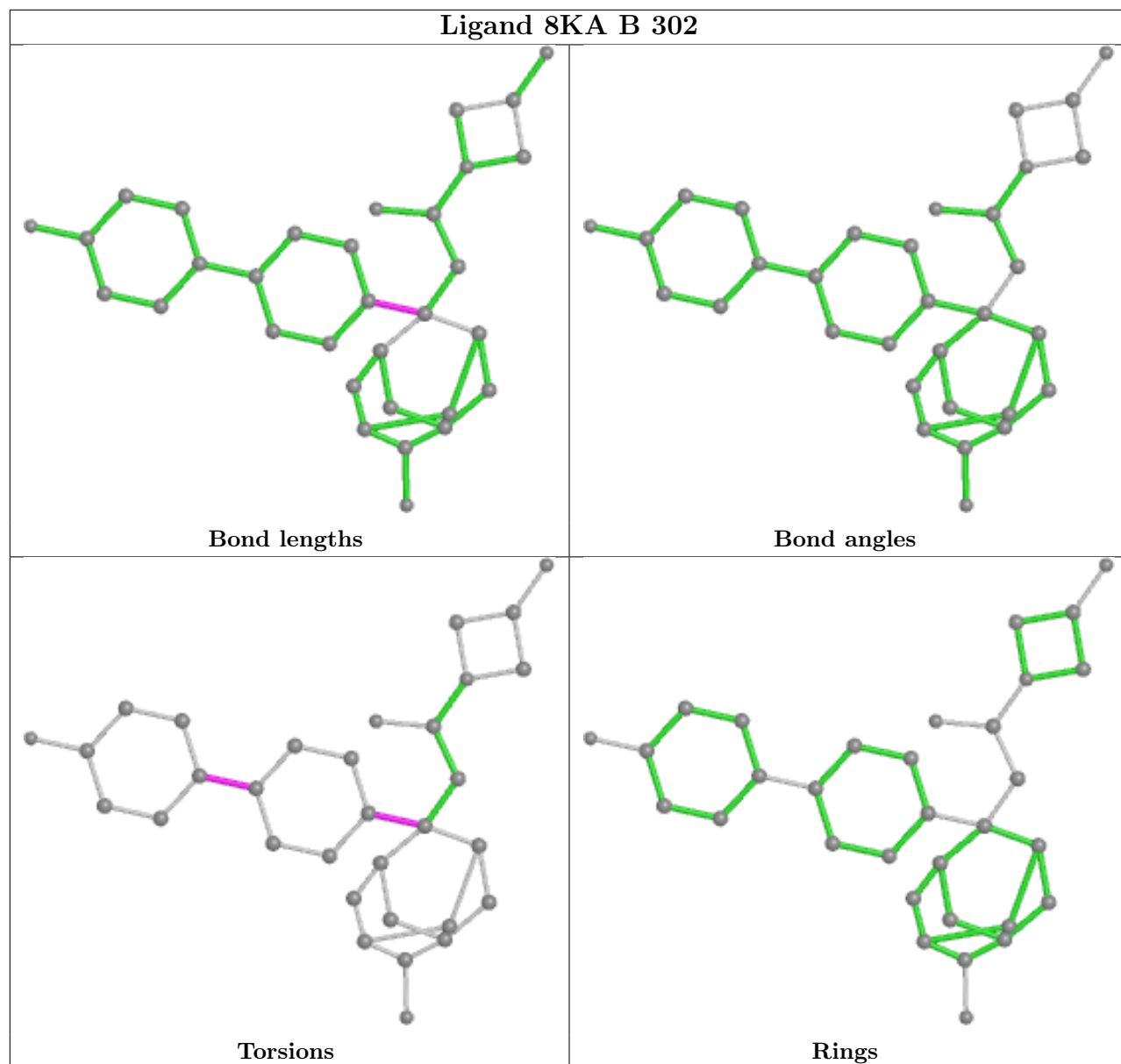
addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier.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

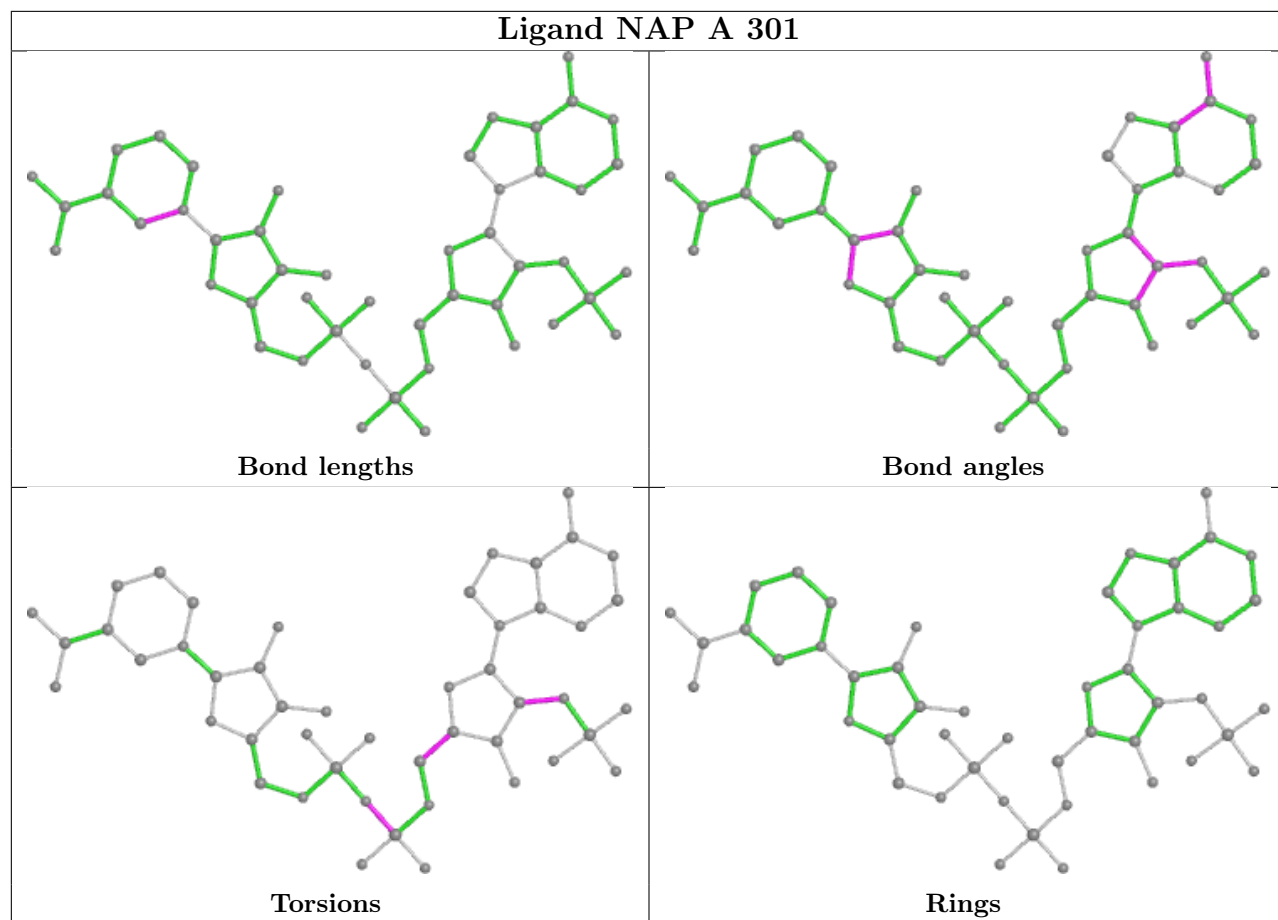


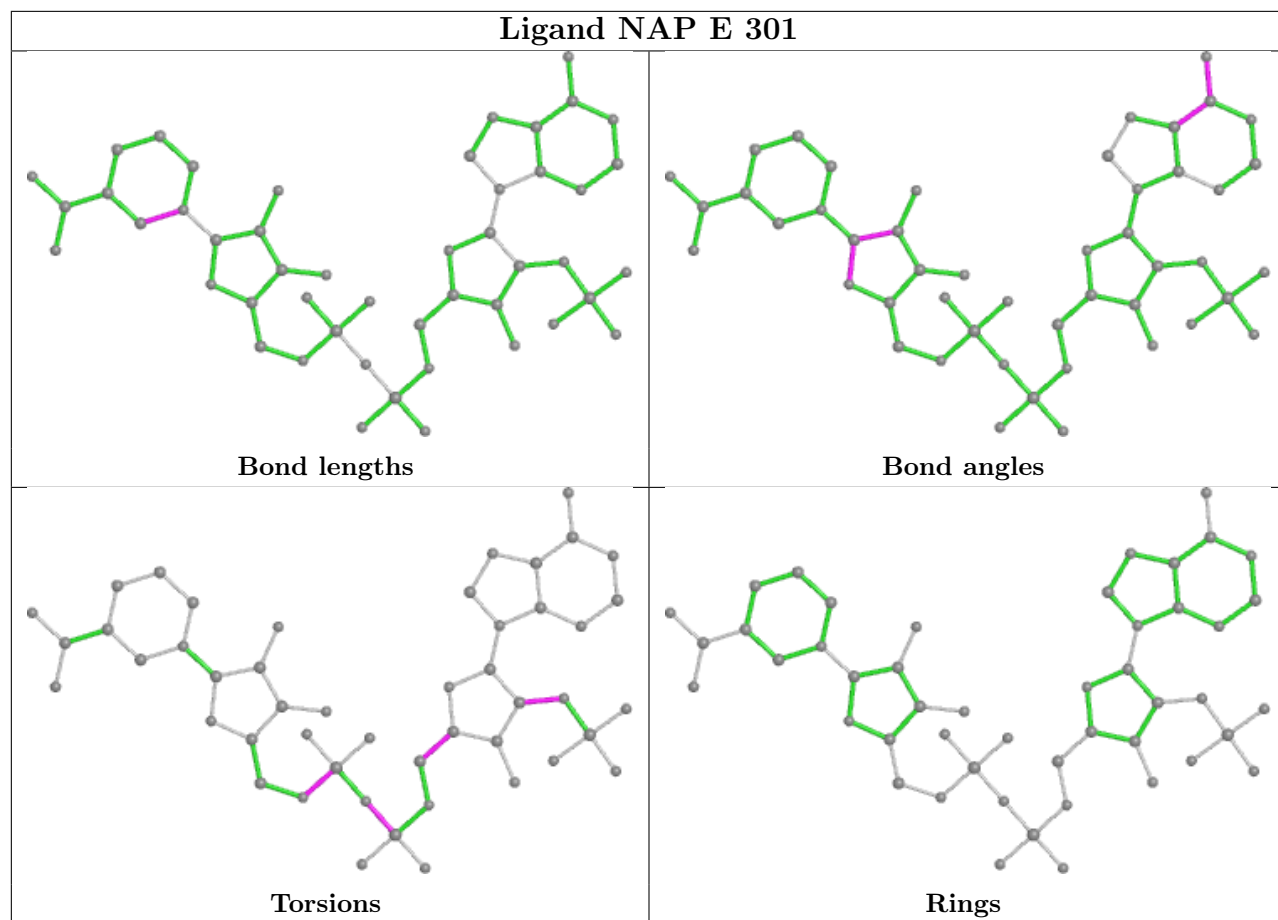


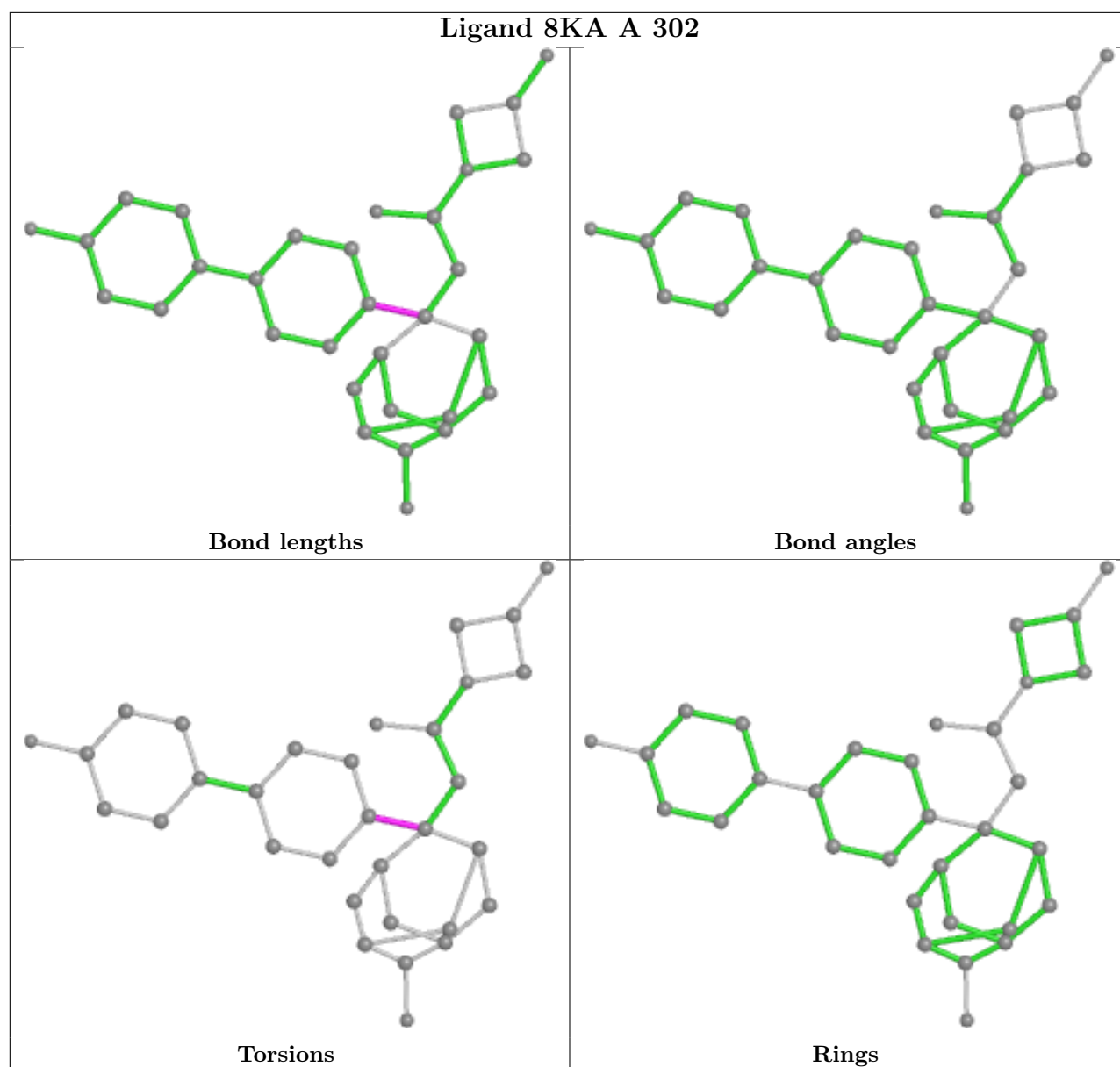












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [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, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	259/286 (90%)	0.78	31 (11%) 4 5	20, 42, 75, 91	0
1	B	276/286 (96%)	0.89	45 (16%) 1 1	16, 43, 81, 93	0
1	D	274/286 (95%)	-0.12	9 (3%) 46 49	12, 23, 54, 78	0
1	E	260/286 (90%)	0.08	13 (5%) 28 31	14, 31, 60, 108	0
All	All	1069/1144 (93%)	0.41	98 (9%) 9 10	12, 34, 72, 108	0

All (98) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	284	TYR	8.4
1	A	230	ILE	7.0
1	A	263	TRP	6.4
1	A	78	CYS	6.0
1	E	232	HIS	5.1
1	A	235	ALA	4.8
1	B	17	GLN	4.8
1	B	205	ARG	4.7
1	B	11	ALA	4.6
1	B	79	LEU	4.6
1	B	75	VAL	4.1
1	D	263	TRP	4.1
1	B	18	GLN	4.1
1	A	82	GLY	4.0
1	A	258	TYR	3.9
1	B	283	SER	3.9
1	B	203	VAL	3.9
1	B	72	GLN	3.9
1	D	20	GLY	3.8
1	B	83	ALA	3.8
1	A	243	LEU	3.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	D	279	LEU	3.8
1	A	234	GLN	3.7
1	B	87	HIS	3.7
1	A	69	GLU	3.6
1	B	19	MET	3.5
1	E	228	SER	3.5
1	B	37	VAL	3.4
1	B	14	THR	3.3
1	E	225	LYS	3.3
1	A	189	ALA	3.2
1	D	12	SER	3.2
1	A	232	HIS	3.2
1	D	282	THR	3.2
1	E	25	GLU	3.1
1	A	231	VAL	3.1
1	A	83	ALA	3.1
1	B	34	GLY	3.0
1	A	260	SER	3.0
1	B	88	TYR	3.0
1	A	76	SER	3.0
1	E	282	THR	3.0
1	A	266	LEU	2.9
1	B	54	LEU	2.9
1	A	203	VAL	2.9
1	B	16	GLY	2.9
1	A	233	MET	2.9
1	E	280	TYR	2.9
1	B	15	GLY	2.8
1	B	104	ALA	2.8
1	B	89	ILE	2.8
1	A	227	VAL	2.8
1	A	229	GLY	2.8
1	A	54	LEU	2.8
1	B	280	TYR	2.7
1	B	282	THR	2.7
1	B	67	SER	2.7
1	B	24	ASN	2.7
1	B	160	GLN	2.6
1	B	78	CYS	2.6
1	B	156	PRO	2.6
1	B	77	HIS	2.6
1	B	81	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	280	TYR	2.5
1	D	284	TYR	2.5
1	A	130	HIS	2.5
1	B	13	MET	2.4
1	A	88	TYR	2.4
1	B	279	LEU	2.4
1	A	55	ALA	2.4
1	B	21	ARG	2.4
1	E	230	ILE	2.4
1	A	190	LEU	2.4
1	B	251	LEU	2.4
1	B	263	TRP	2.3
1	E	229	GLY	2.3
1	B	76	SER	2.3
1	E	279	LEU	2.2
1	B	185	ALA	2.2
1	E	205	ARG	2.2
1	B	111	GLY	2.2
1	A	238	LYS	2.2
1	E	190	LEU	2.2
1	D	283	SER	2.2
1	B	69	GLU	2.1
1	E	284	TYR	2.1
1	B	62	VAL	2.1
1	D	22	GLY	2.1
1	D	11	ALA	2.1
1	A	109	LEU	2.1
1	A	240	GLU	2.1
1	B	112	GLY	2.1
1	B	101	GLN	2.1
1	B	63	VAL	2.1
1	A	26	GLU	2.1
1	E	30	GLU	2.1
1	B	250	ALA	2.1
1	A	80	GLU	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 [i](#)

There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

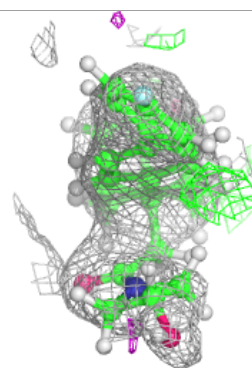
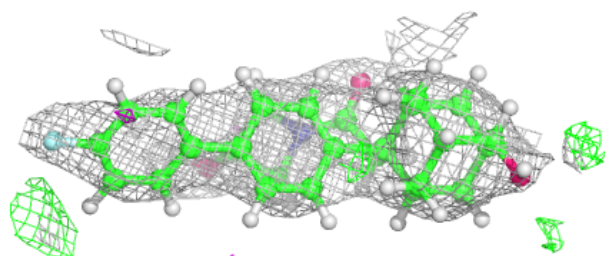
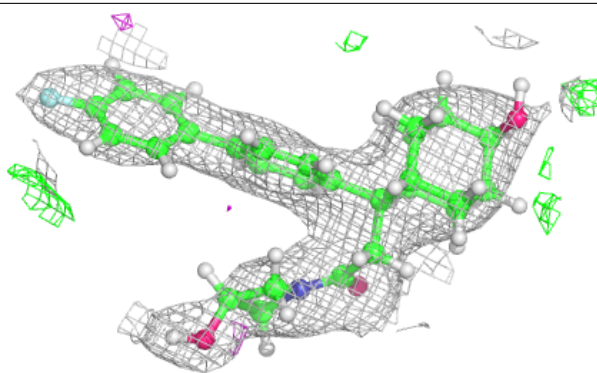
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
3	8KA	A	302	32/32	0.87	0.17	40,44,47,51	30
3	8KA	E	302	32/32	0.92	0.12	26,30,37,43	30
3	8KA	B	302	32/32	0.93	0.13	19,27,30,32	30
3	8KA	D	302	32/32	0.95	0.11	12,19,22,23	30
2	NAP	A	301	48/48	0.96	0.10	21,32,38,42	28
2	NAP	B	301	48/48	0.96	0.10	15,30,45,52	28
2	NAP	E	301	48/48	0.97	0.09	12,24,31,34	28
2	NAP	D	301	48/48	0.99	0.09	9,17,24,25	28

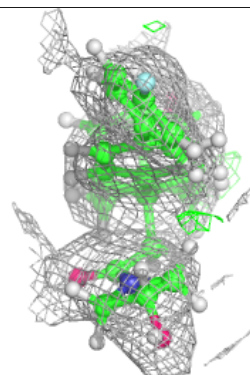
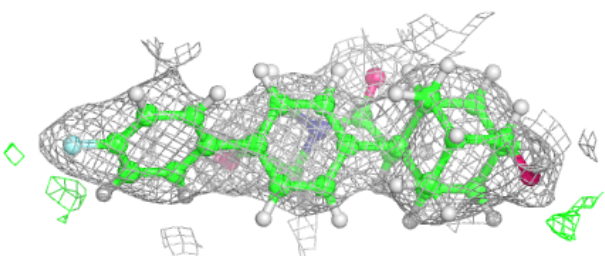
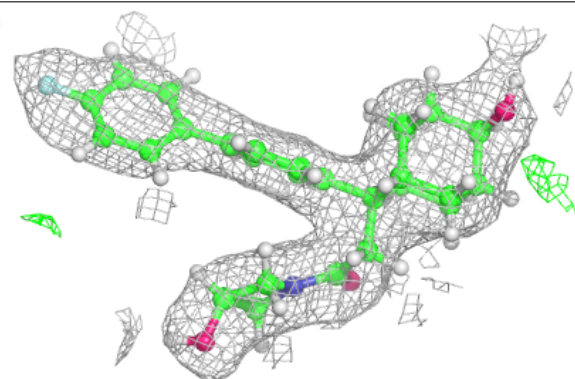
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

**Electron density around 8KA A 302:**

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

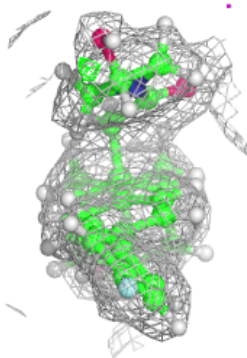
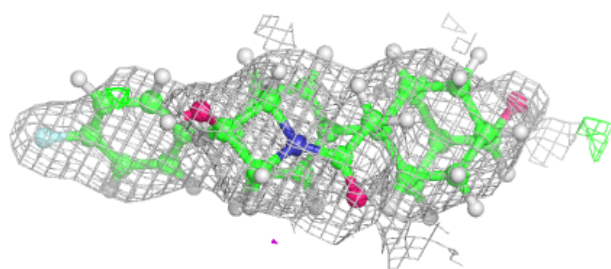
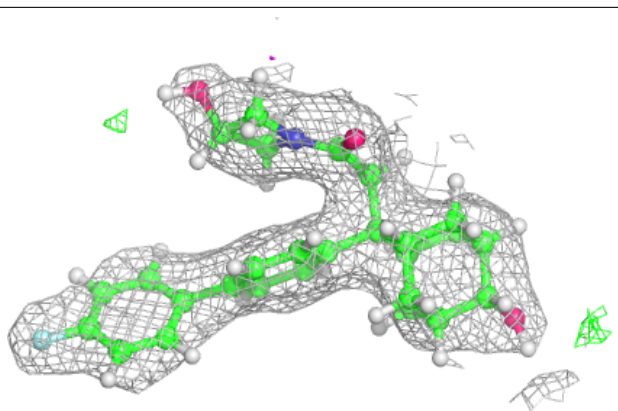
**Electron density around 8KA E 302:**

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

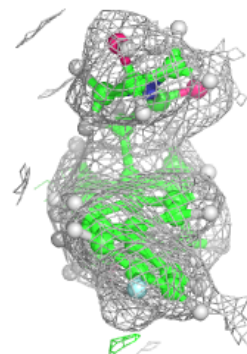
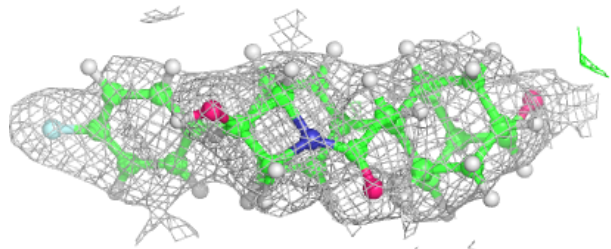
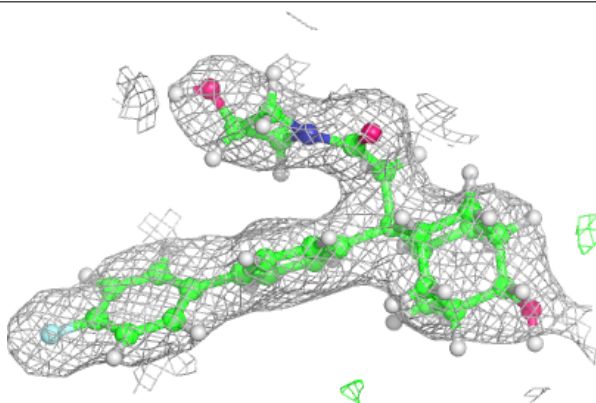


**Electron density around 8KA B 302:**

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

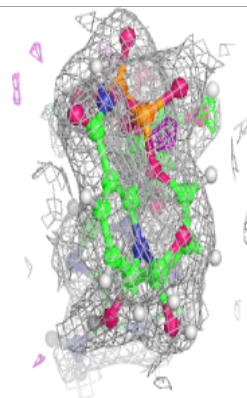
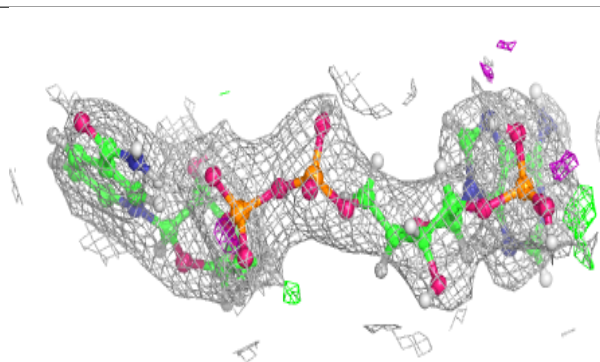
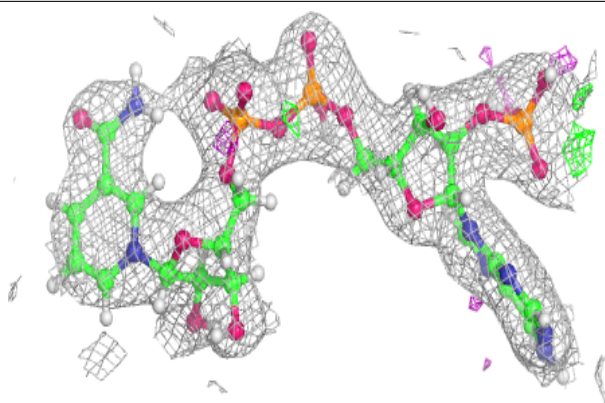
**Electron density around 8KA D 302:**

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

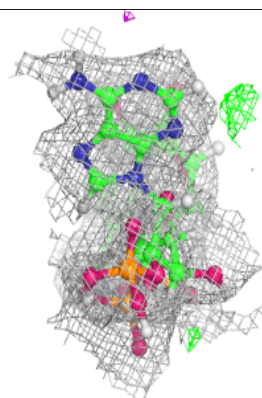
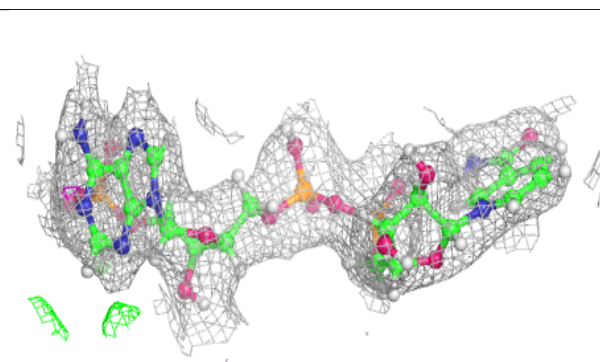
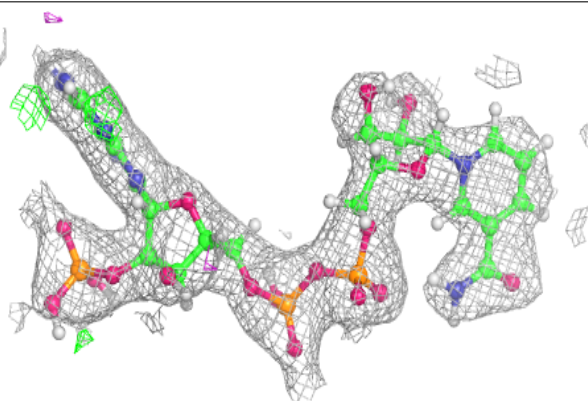


**Electron density around NAP A 301:**

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

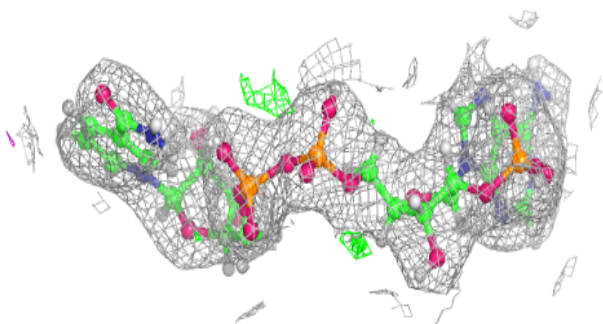
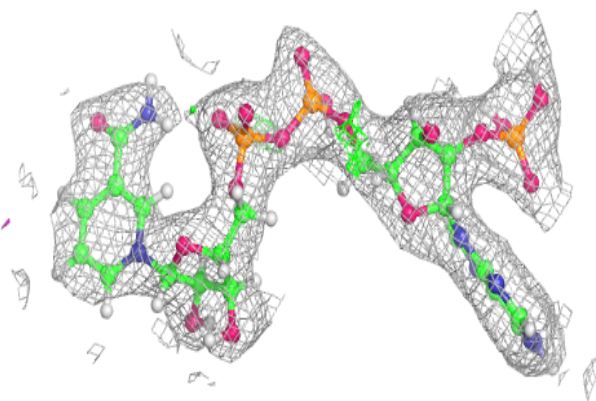
**Electron density around NAP B 301:**

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

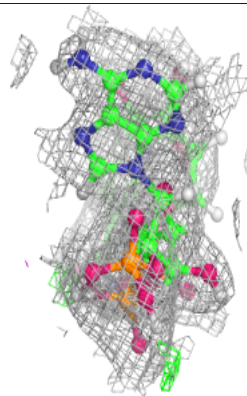
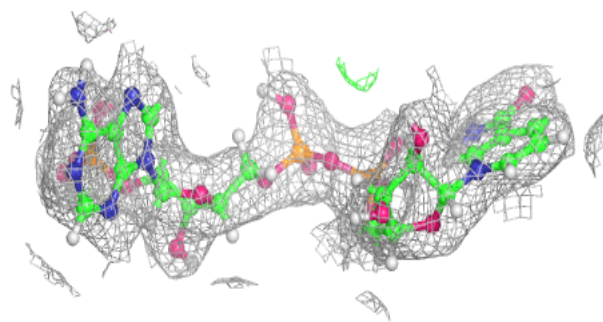
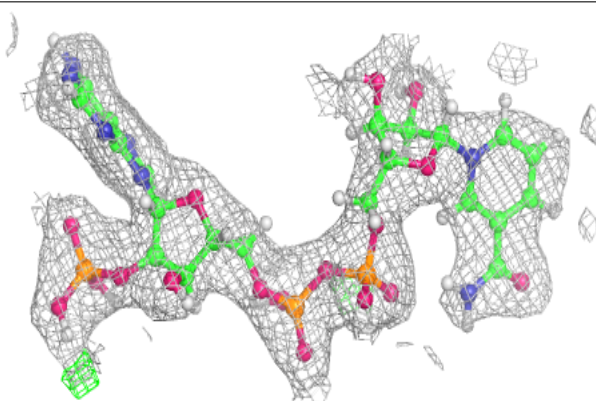


**Electron density around NAP E 301:**

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

**Electron density around NAP D 301:**

$2mF_o-DF_c$  (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.