WORLDWIDE PDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 5, 2023 – 02:40 AM EDT

PDB ID	:	3V81
Title	:	Crystal structure of HIV-1 reverse transcriptase (RT) with DNA and the non-nucleoside inhibitor nevirapine
Authors	:	Das, K.; Martinez, S.E.; Arnold, E.
Deposited on	:	2011-12-22
Resolution	:	2.85 Å(reported)

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

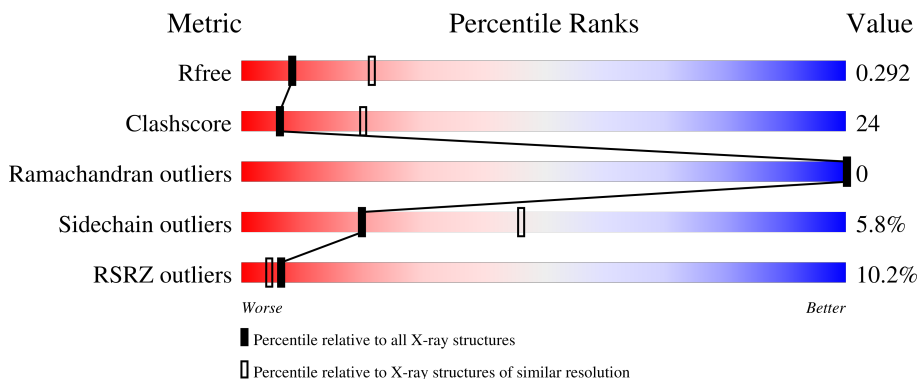|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 2.85 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.
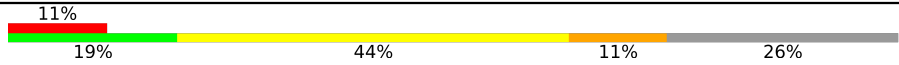

Metric	Percentile Ranks	Value
Rfree		0.292
Clashscore		24
Ramachandran outliers		0
Sidechain outliers		5.8%
RSRZ outliers		10.2%

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	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)
RSRZ outliers	127900	3103 (2.90-2.82)

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	556	14% / 57% 40% •
1	C	556	15% / 54% 44% •
2	B	428	4% / 56% 36% • •
2	D	428	6% / 60% 34% • •
3	E	27	7% / 26% 33% 15% 26%

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Mol	Chain	Length	Quality of chain
3	T	27	11% / 19% / 44% / 11% / 26%
4	F	21	5% / 14% / 52% / 29% / 5%
4	P	21	5% / 14% / 43% / 38% / 5%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 17510 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 HIV-1 Reverse Transcriptase P66 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	555	Total 4512	C 2920	N 751	O 833	S 8	0	0	0
1	C	555	Total 4512	C 2920	N 751	O 833	S 8	0	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	expression tag	UNP P03366
A	0	VAL	-	expression tag	UNP P03366
A	258	CYS	GLN	engineered mutation	UNP P03366
A	280	SER	CYS	engineered mutation	UNP P03366
A	498	ASN	ASP	engineered mutation	UNP P03366
C	-1	MET	-	expression tag	UNP P03366
C	0	VAL	-	expression tag	UNP P03366
C	258	CYS	GLN	engineered mutation	UNP P03366
C	280	SER	CYS	engineered mutation	UNP P03366
C	498	ASN	ASP	engineered mutation	UNP P03366

- Molecule 2 is a protein called HIV-1 Reverse Transcriptase P51 subunit.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	412	Total 3400	C 2212	N 563	O 619	S 6	0	0	0
2	D	412	Total 3400	C 2212	N 563	O 619	S 6	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

| Chain	Residue	Modelled	Actual	Comment	Reference
B	280	SER	CYS	engineered mutation	UNP P03366
D	280	SER	CYS	engineered mutation	UNP P03366

- Molecule 3 is a DNA chain called DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP* CP*CP*CP*GP*AP*AP*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3').

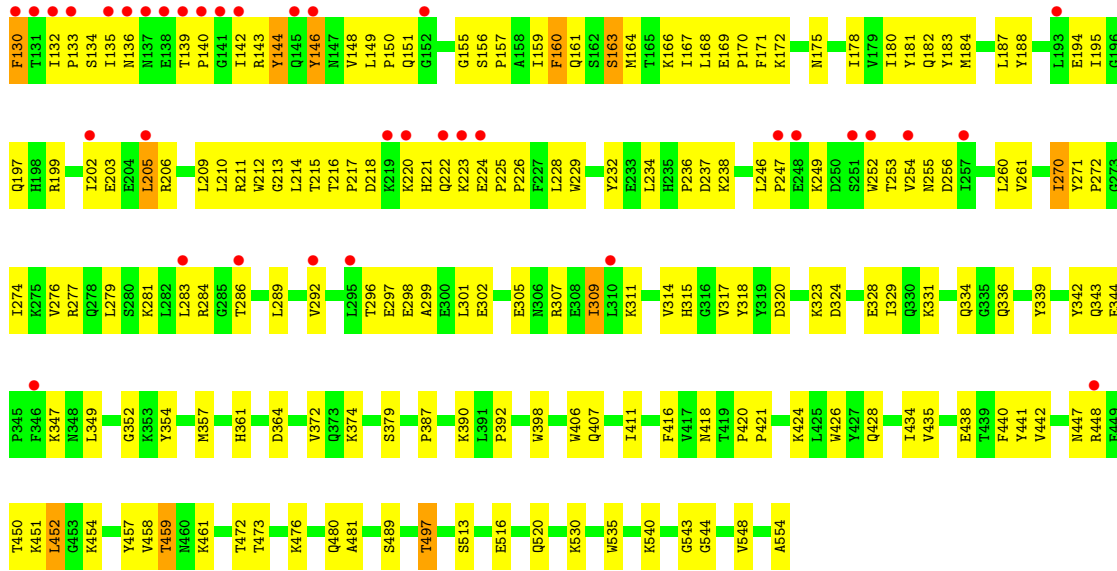| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	T	20	Total	C	N	O	P	0	0	0
			415	194	85	116	20			
3	E	20	Total	C	N	O	P	0	0	0
			415	194	85	116	20			

- Molecule 4 is a DNA chain called DNA (5'-D(*A*CP*AP*GP*TP*CP*CP*CP*TP*GP*T P*TP*CP*GP*GP*(MRG)P*CP*GP*CP*CP*(ATM))-3').

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
4	P	20	Total	C	N	O	P	S	0	0	0
			408	195	72	121	19	1			
4	F	20	Total	C	N	O	P	S	0	0	0
			408	195	72	121	19	1			

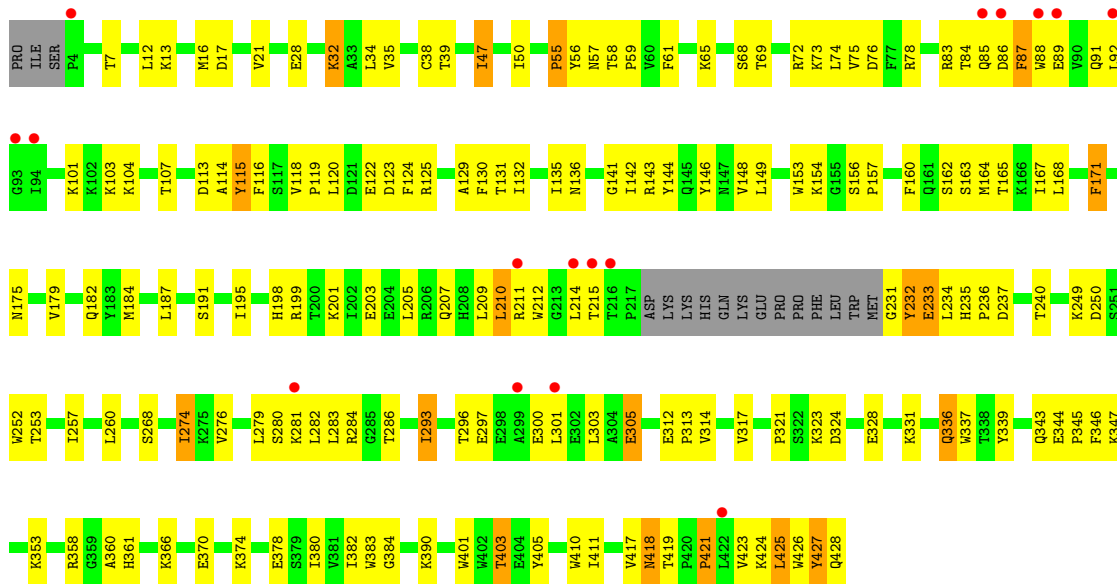- Molecule 5 is 11-CYCLOPROPYL-5,11-DIHYDRO-4-METHYL-6H-DIPYRIDO[3,2-B:2',3' -E][1,4]DIAZEPIN-6-ONE (three-letter code: NVP) (formula: $C_{15}H_{14}N_4O$).
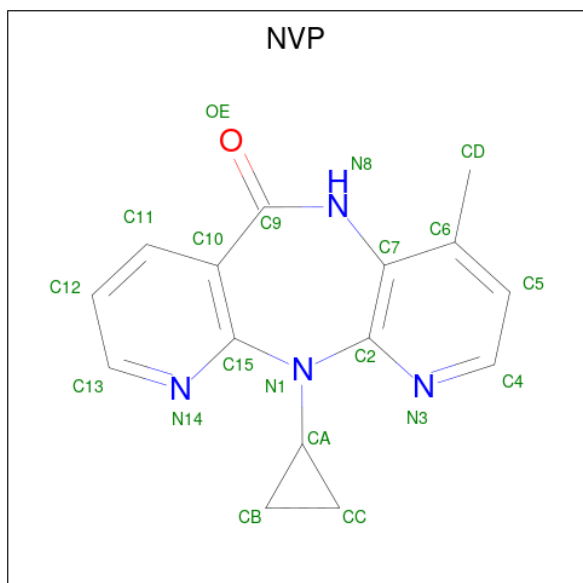

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			20	15	4	1		
5	C	1	Total	C	N	O	0	0
			20	15	4	1		

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: HIV-1 Reverse Transcriptase P66 subunit

- Molecule 1: HIV-1 Reverse Transcriptase P66 subunit

• Molecule 2: HIV-1 Reverse Transcriptase P51 subunit
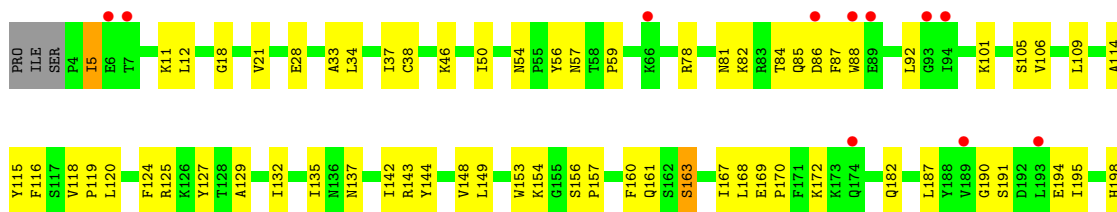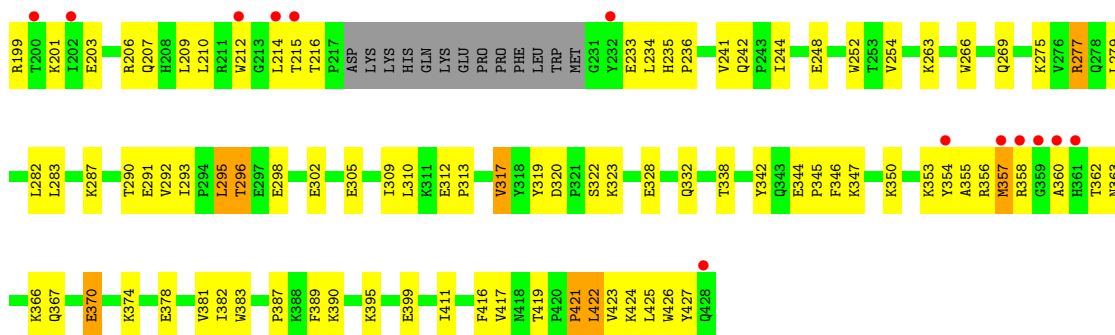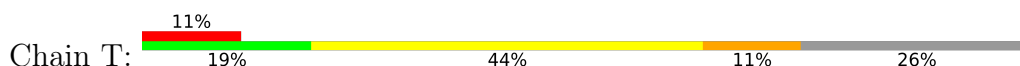
Chain B:

• Molecule 2: HIV-1 Reverse Transcriptase P51 subunit
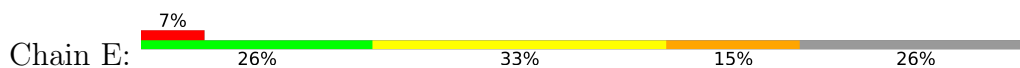
Chain D:

● Molecule 3: DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP*CP*CP*CP*GP*AP*AP
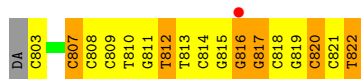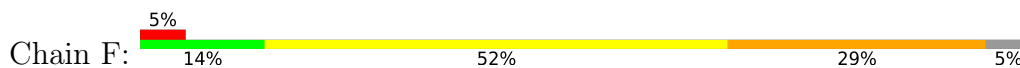*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3')

Chain T:

● Molecule 3: DNA (5'-D(*AP*TP*GP*GP*AP*AP*GP*GP*CP*GP*CP*CP*CP*GP*AP*AP
*CP*AP*GP*GP*GP*AP*CP*TP*GP*TP*G)-3')

Chain E:

● Molecule 4: DNA (5'-D(*A*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MR
G)P*CP*GP*CP*CP*(ATM))-3')

Chain P:

● Molecule 4: DNA (5'-D(*A*CP*AP*GP*TP*CP*CP*CP*TP*GP*TP*TP*CP*GP*GP*(MR
G)P*CP*GP*CP*CP*(ATM))-3')

Chain F:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	89.82Å 132.05Å 142.73Å 90.00° 100.84° 90.00°	Depositor
Resolution (Å)	38.41 – 2.85 38.41 – 2.85	Depositor EDS
% Data completeness (in resolution range)	98.7 (38.41-2.85) 98.6 (38.41-2.85)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.99 (at 2.86Å)	Xtriage
Refinement program	PHENIX 1.7.1_743	Depositor
R, R_{free}	0.251 , 0.298 0.245 , 0.292	Depositor DCC
R_{free} test set	2288 reflections (3.04%)	wwPDB-VP
Wilson B-factor (Å^2)	54.2	Xtriage
Anisotropy	0.010	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.29 , 62.7	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	17510	wwPDB-VP
Average B, all atoms (Å^2)	82.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.58% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: ATM, MRG, NVP

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	0.49	0/4630	0.61	0/6290
1	C	0.49	0/4630	0.63	0/6290
2	B	0.51	0/3497	0.66	2/4751 (0.0%)
2	D	0.48	0/3497	0.63	0/4751
3	E	0.70	0/467	1.55	9/719 (1.3%)
3	T	0.67	0/467	1.46	6/719 (0.8%)
4	F	0.72	0/400	1.66	13/612 (2.1%)
4	P	1.15	2/400 (0.5%)	1.74	13/612 (2.1%)
All	All	0.53	2/17988 (0.0%)	0.79	43/24744 (0.2%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1
2	D	0	1
All	All	0	2

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	P	805	DG	O3'-P	-14.74	1.43	1.61
4	P	806	DT	O3'-P	-9.82	1.49	1.61

The worst 5 of 43 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	P	807	DC	O4'-C1'-N1	12.19	116.53	108.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	F	807	DC	O4'-C1'-N1	10.73	115.51	108.00
3	T	719	DG	O4'-C1'-N9	10.60	115.42	108.00
4	P	820	DC	O4'-C4'-C3'	-8.80	100.72	106.00
4	P	805	DG	O3'-P-O5'	8.18	119.54	104.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	421	PRO	Peptide
2	D	421	PRO	Peptide

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	4512	0	4570	228	0
1	C	4512	0	4570	256	0
2	B	3400	0	3433	158	0
2	D	3400	0	3433	143	0
3	E	415	0	222	12	0
3	T	415	0	222	21	0
4	F	408	0	231	18	0
4	P	408	0	231	23	0
5	A	20	0	14	2	0
5	C	20	0	14	1	0
All	All	17510	0	16940	827	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 24.

The worst 5 of 827 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:5:ILE:HG22	1:C:212:TRP:HD1	1.09	1.17

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:5:ILE:HG22	1:A:212:TRP:HD1	1.17	1.08
1:C:21:VAL:H	1:C:57:ASN:HB2	0.93	1.06
1:A:283:LEU:HD13	4:P:817:MRG:H231	1.39	1.03
1:C:283:LEU:HD23	4:F:817:MRG:H231	1.44	0.99

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	553/556 (100%)	524 (95%)	29 (5%)	0	100	100
1	C	553/556 (100%)	522 (94%)	31 (6%)	0	100	100
2	B	408/428 (95%)	395 (97%)	13 (3%)	0	100	100
2	D	408/428 (95%)	396 (97%)	12 (3%)	0	100	100
All	All	1922/1968 (98%)	1837 (96%)	85 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	495/497 (100%)	466 (94%)	29 (6%)	19	45
1	C	495/497 (100%)	471 (95%)	24 (5%)	25	55

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	374/390 (96%)	344 (92%)	30 (8%)	12	31
2	D	374/390 (96%)	357 (96%)	17 (4%)	27	57
All	All	1738/1774 (98%)	1638 (94%)	100 (6%)	20	46

5 of 100 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	418	ASN
1	C	205	LEU
2	D	424	LYS
1	C	2	ILE
1	C	142	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 15 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	222	GLN
2	D	336	GLN
1	C	235	HIS
2	D	367	GLN
2	D	235	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
4	MRG	F	817	3,4,1	21,28,29	2.34	8 (38%)	19,39,42	1.65	5 (26%)
4	MRG	P	817	3,4,1	21,28,29	2.38	8 (38%)	19,39,42	1.62	5 (26%)
4	ATM	F	822	3,4	19,23,24	1.39	2 (10%)	27,32,35	2.46	9 (33%)
4	ATM	P	822	3,4	19,23,24	1.30	2 (10%)	27,32,35	2.45	8 (29%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	MRG	F	817	3,4,1	-	5/8/26/27	0/3/3/3
4	MRG	P	817	3,4,1	-	4/8/26/27	0/3/3/3
4	ATM	F	822	3,4	-	3/10/24/25	0/2/2/2
4	ATM	P	822	3,4	-	3/10/24/25	0/2/2/2

The worst 5 of 20 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	P	817	MRG	C2-N2	6.64	1.48	1.34
4	F	817	MRG	C2-N2	6.56	1.48	1.34
4	F	817	MRG	C2-N1	4.14	1.43	1.36
4	P	817	MRG	C2-N1	3.98	1.43	1.36
4	P	817	MRG	C4-N3	3.74	1.46	1.37

The worst 5 of 27 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	F	822	ATM	C4-N3-C2	-6.04	119.53	127.35
4	P	822	ATM	C5-C4-N3	6.03	120.46	115.31
4	P	822	ATM	C4-N3-C2	-5.98	119.61	127.35
4	F	822	ATM	C5-C4-N3	5.96	120.40	115.31
4	F	822	ATM	O4-C4-C5	-4.46	119.73	124.90

There are no chirality outliers.

5 of 15 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	P	817	MRG	N2-C21-C22-C23
4	P	817	MRG	C21-C22-C23-S24

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Mol	Chain	Res	Type	Atoms
4	P	822	ATM	C4'-C5'-O5'-P
4	F	817	MRG	N2-C21-C22-C23
4	F	817	MRG	C21-C22-C23-S24

There are no ring outliers.

4 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	817	MRG	4	0
4	P	817	MRG	4	0
4	F	822	ATM	5	0
4	P	822	ATM	5	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

2 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	$\#|Z| > 2$
5	NVP	A	901	-	23,23,23	1.60	6 (26%)	34,34,34	4.00	15 (44%)
5	NVP	C	901	-	23,23,23	1.53	5 (21%)	34,34,34	4.12	16 (47%)

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
5	NVP	A	901	-	-	0/4/6/6	0/4/4/4

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W O R L D W I D E
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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NVP	C	901	-	-	0/4/6/6	0/4/4/4

The worst 5 of 11 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	901	NVP	C2-N3	3.51	1.41	1.34
5	A	901	NVP	C15-N14	3.45	1.41	1.34
5	C	901	NVP	C2-N3	3.30	1.40	1.34
5	C	901	NVP	C15-N14	3.26	1.40	1.34
5	C	901	NVP	C13-N14	2.76	1.40	1.34

The worst 5 of 31 bond angle outliers are listed below:

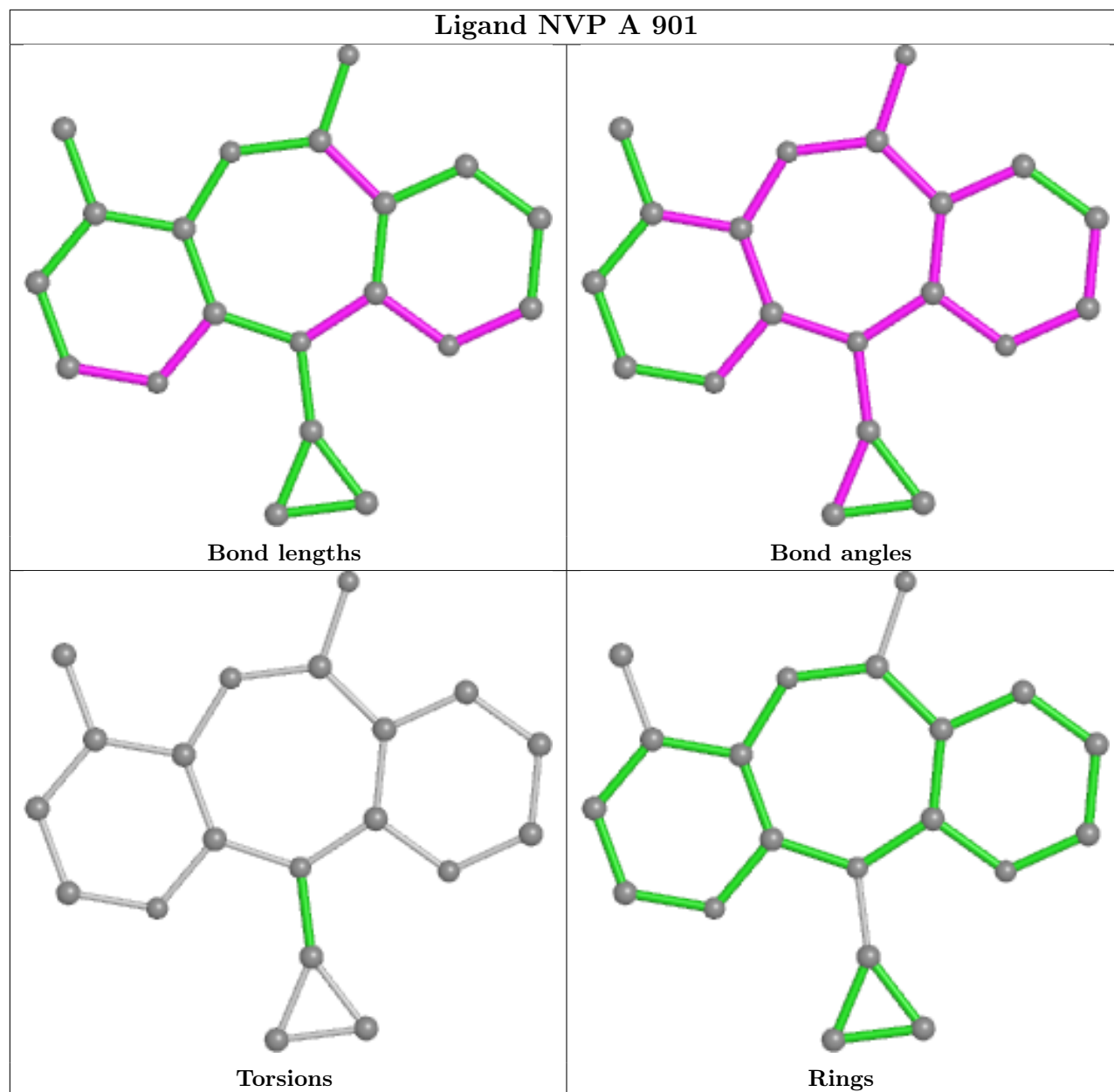| Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	901	NVP	C7-C2-N1	16.51	126.47	120.09
5	A	901	NVP	C7-C2-N1	15.21	125.96	120.09
5	A	901	NVP	C7-N8-C9	-8.85	120.89	128.40
5	A	901	NVP	C10-C15-N1	6.52	125.88	120.72
5	C	901	NVP	C10-C9-N8	6.42	125.86	120.16

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	901	NVP	2	0
5	C	901	NVP	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 NVP A 901

Bond lengths

Bond angles

Torsions

Rings

Ligand NVP C 901

Bond lengths

Bond angles

Torsions

Rings
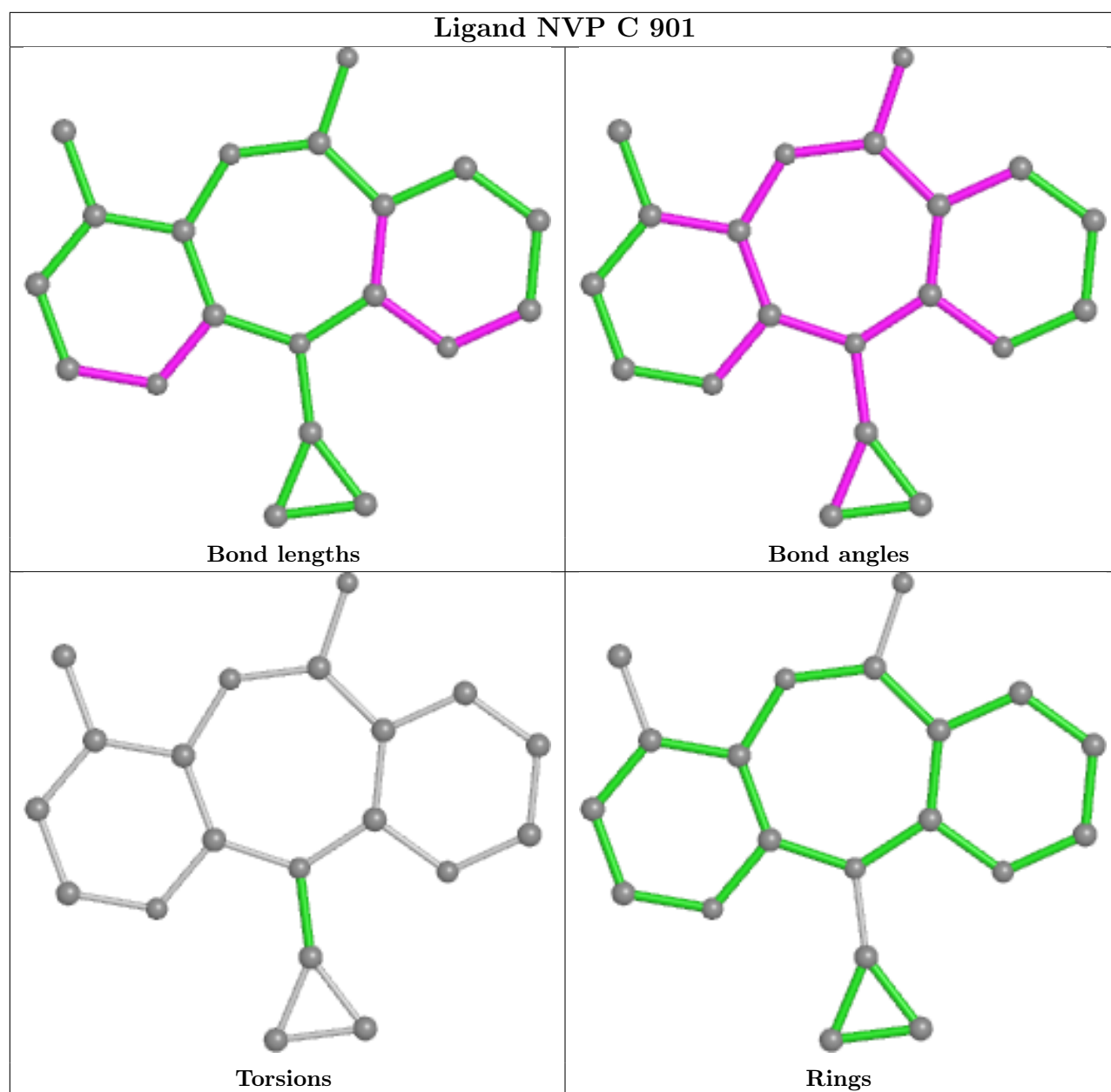
5.7 Other polymers ⓘ

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	555/556 (99%)	0.74	76 (13%)	3	2	25, 77, 185, 198	0
1	C	555/556 (99%)	0.72	82 (14%)	2	1	24, 79, 184, 196	0
2	B	412/428 (96%)	0.11	16 (3%)	39	34	28, 63, 141, 161	0
2	D	412/428 (96%)	0.16	24 (5%)	23	18	31, 64, 149, 167	0
3	E	20/27 (74%)	0.29	2 (10%)	7	5	78, 107, 166, 175	0
3	T	20/27 (74%)	0.24	3 (15%)	2	1	75, 92, 162, 179	0
4	F	18/21 (85%)	0.41	1 (5%)	24	20	49, 95, 166, 171	0
4	P	18/21 (85%)	0.31	1 (5%)	24	20	49, 88, 164, 175	0
All	All	2010/2064 (97%)	0.47	205 (10%)	6	4	24, 71, 172, 198	0

The worst 5 of 205 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	133	PRO	19.7
1	A	132	ILE	14.7
1	A	60	VAL	13.6
1	C	62	ALA	13.0
1	C	61	PHE	12.8

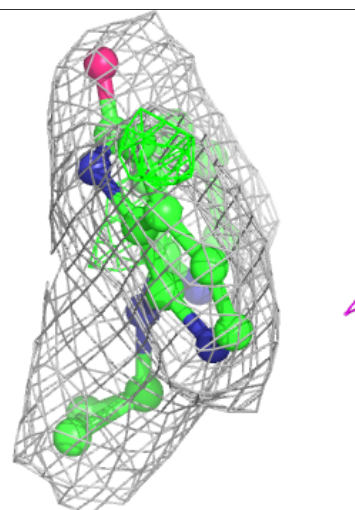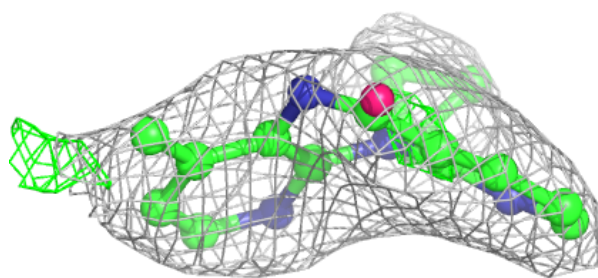## 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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(Å²)	Q<0.9
4	MRG	F	817	26/27	0.82	0.31	97,121,156,164	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	ATM	F	822	22/23	0.84	0.23	107,118,133,136	0
4	MRG	P	817	26/27	0.86	0.27	87,107,136,143	0
4	ATM	P	822	22/23	0.91	0.18	103,116,127,129	0

6.3　Carbohydrates ⓘ

There are no monosaccharides in this entry.
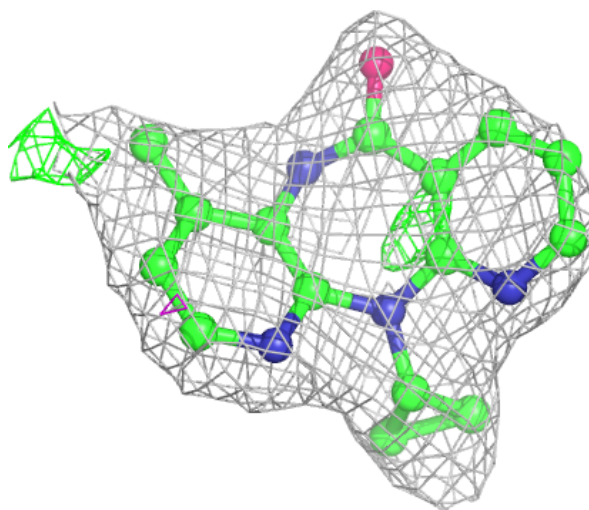
6.4　Ligands ⓘ

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.
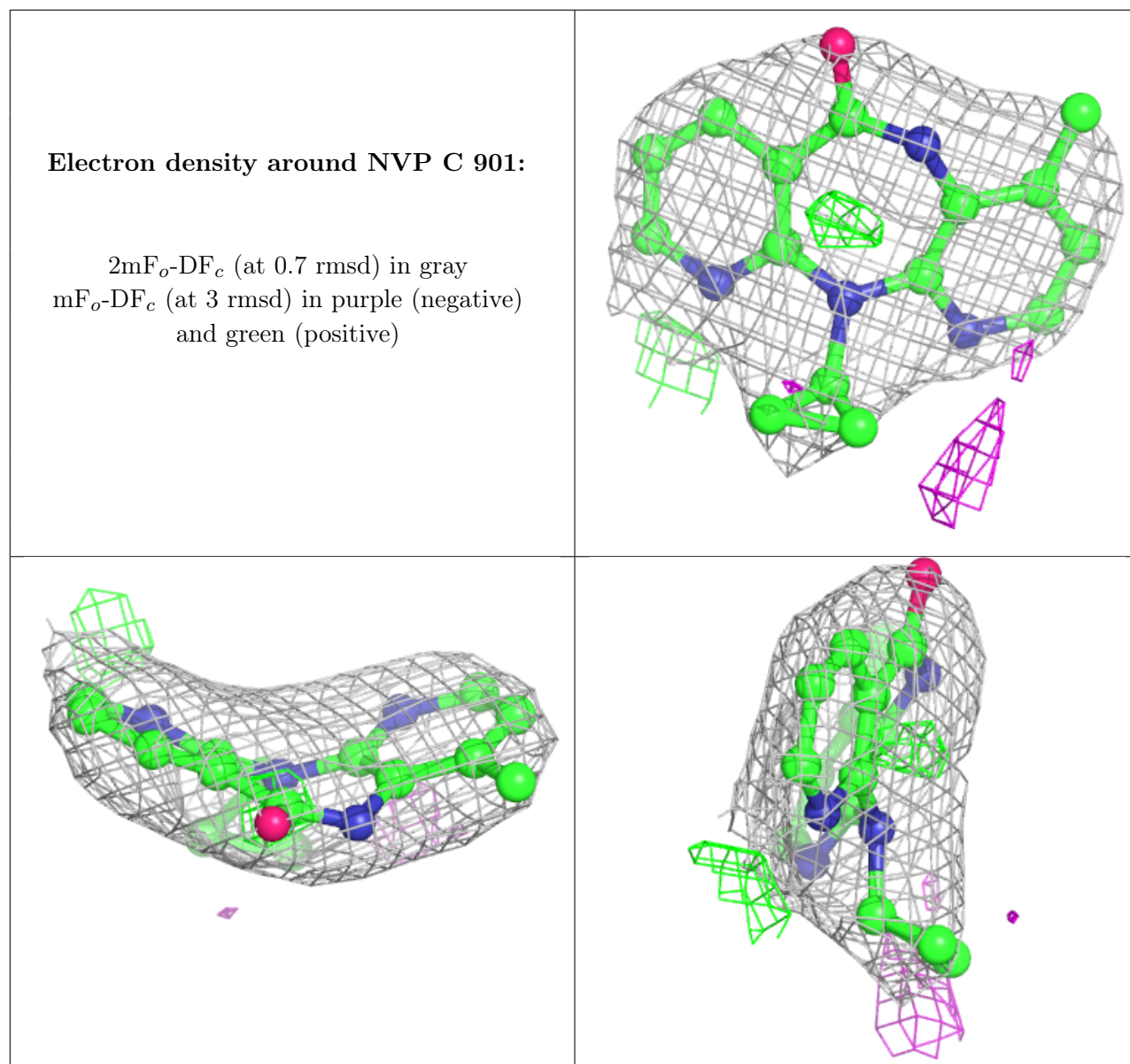
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	NVP	A	901	20/20	0.94	0.24	63,69,75,77	0
5	NVP	C	901	20/20	0.95	0.26	67,73,78,88	0

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 NVP A 901:

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

Electron density around NVP C 901:

$2mF_o$-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 ⓘ

There are no such residues in this entry.