WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jul 10, 2025 – 07:13 pm BST

PDB ID	:	6H7O / pdb_00006h7o
Title	:	ACTIVATED TURKEY BETA1 ADRENOCEPTOR WITH BOUND WEAK PARTIAL AGONIST CYANOPINDOLOL AND NANOBODY Nb6B9
Authors	:	Warne, T.; Edwards, P.C.; Dore, A.S.; Leslie, A.G.W.; Tate, C.G.
Deposited on	:	2018-07-31
Resolution	:	2.80 Å(reported)

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

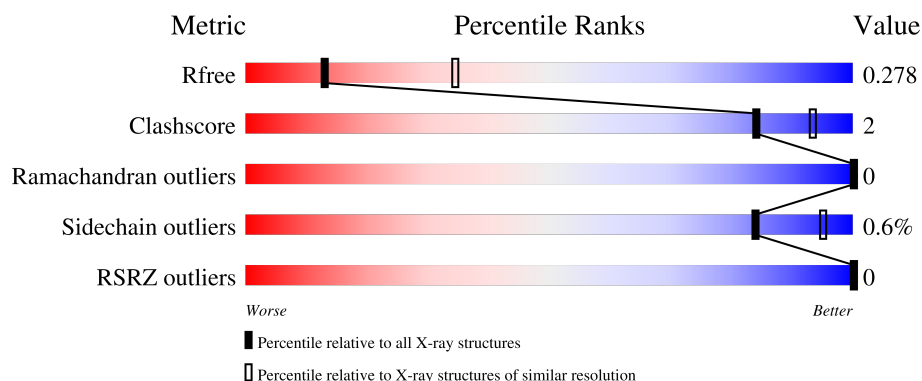|		
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.44

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 2.80 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		0.278
Clashscore		2
Ramachandran outliers		0
Sidechain outliers		0.6%
RSRZ outliers		0

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$_{free}$	164625	3657 (2.80-2.80)
Clashscore	180529	4123 (2.80-2.80)
Ramachandran outliers	177936	4071 (2.80-2.80)
Sidechain outliers	177891	4073 (2.80-2.80)
RSRZ outliers	164620	3659 (2.80-2.80)

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	E	109	96% ··
1	F	109	96% ··
2	A	307	86% 8% 6%
2	B	307	84% 7% 9%
3	C	121	93% 6% ··

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Mol	Chain	Length	Quality of chain
3	D	121	

93%   6% ·

2 Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 8190 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 Thioredoxin 1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
1	E	107	Total	C	N	O	0	0	0
			807	521	130	156			
1	F	107	Total	C	N	O	0	0	0
			807	521	130	156			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	32	SER	CYS	engineered mutation	UNP P0AA25
E	35	SER	CYS	engineered mutation	UNP P0AA25
E	109	GLU	-	expression tag	UNP P0AA25
F	32	SER	CYS	engineered mutation	UNP P0AA25
F	35	SER	CYS	engineered mutation	UNP P0AA25
F	109	GLU	-	expression tag	UNP P0AA25

- Molecule 2 is a protein called Beta-1 adrenergic receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	A	290	Total	C	N	O	S	0	0	0
			2308	1523	384	381	20			
2	B	280	Total	C	N	O	S	0	0	0
			2229	1480	363	366	20			

There are 90 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	39	ALA	-	expression tag	UNP P07700
A	40	ALA	-	expression tag	UNP P07700
A	41	ALA	-	expression tag	UNP P07700
A	42	LYS	-	expression tag	UNP P07700
A	43	VAL	-	expression tag	UNP P07700
A	68	SER	ARG	engineered mutation	UNP P07700

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Chain	Residue	Modelled	Actual	Comment	Reference
A	90	VAL	MET	engineered mutation	UNP P07700
A	116	LEU	CYS	engineered mutation	UNP P07700
A	?	-	ARG	deletion	UNP P07700
A	?	-	CYS	deletion	UNP P07700
A	?	-	GLU	deletion	UNP P07700
A	?	-	GLY	deletion	UNP P07700
A	?	-	ARG	deletion	UNP P07700
A	?	-	PHE	deletion	UNP P07700
A	?	-	TYR	deletion	UNP P07700
A	?	-	GLY	deletion	UNP P07700
A	?	-	SER	deletion	UNP P07700
A	?	-	GLN	deletion	UNP P07700
A	?	-	GLU	deletion	UNP P07700
A	?	-	GLN	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	GLN	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	LEU	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	GLN	deletion	UNP P07700
A	?	-	HIS	deletion	UNP P07700
A	?	-	GLN	deletion	UNP P07700
A	?	-	PRO	deletion	UNP P07700
A	?	-	ILE	deletion	UNP P07700
A	?	-	LEU	deletion	UNP P07700
A	?	-	GLY	deletion	UNP P07700
A	?	-	ASN	deletion	UNP P07700
A	?	-	GLY	deletion	UNP P07700
A	284	LYS	ARG	conflict	UNP P07700
A	327	ALA	PHE	engineered mutation	UNP P07700
A	338	MET	PHE	engineered mutation	UNP P07700
A	358	ALA	CYS	engineered mutation	UNP P07700
A	369	HIS	-	expression tag	UNP P07700
A	370	HIS	-	expression tag	UNP P07700
A	371	HIS	-	expression tag	UNP P07700
A	372	HIS	-	expression tag	UNP P07700
A	373	HIS	-	expression tag	UNP P07700
B	39	ALA	-	expression tag	UNP P07700
B	40	ALA	-	expression tag	UNP P07700
B	41	ALA	-	expression tag	UNP P07700

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Chain	Residue	Modelled	Actual	Comment	Reference
B	42	LYS	-	expression tag	UNP P07700
B	43	VAL	-	expression tag	UNP P07700
B	68	SER	ARG	engineered mutation	UNP P07700
B	90	VAL	MET	engineered mutation	UNP P07700
B	116	LEU	CYS	engineered mutation	UNP P07700
B	?	-	ARG	deletion	UNP P07700
B	?	-	CYS	deletion	UNP P07700
B	?	-	GLU	deletion	UNP P07700
B	?	-	GLY	deletion	UNP P07700
B	?	-	ARG	deletion	UNP P07700
B	?	-	PHE	deletion	UNP P07700
B	?	-	TYR	deletion	UNP P07700
B	?	-	GLY	deletion	UNP P07700
B	?	-	SER	deletion	UNP P07700
B	?	-	GLN	deletion	UNP P07700
B	?	-	GLU	deletion	UNP P07700
B	?	-	GLN	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	GLN	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	LEU	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	GLN	deletion	UNP P07700
B	?	-	HIS	deletion	UNP P07700
B	?	-	GLN	deletion	UNP P07700
B	?	-	PRO	deletion	UNP P07700
B	?	-	ILE	deletion	UNP P07700
B	?	-	LEU	deletion	UNP P07700
B	?	-	GLY	deletion	UNP P07700
B	?	-	ASN	deletion	UNP P07700
B	?	-	GLY	deletion	UNP P07700
B	284	LYS	ARG	conflict	UNP P07700
B	327	ALA	PHE	engineered mutation	UNP P07700
B	338	MET	PHE	engineered mutation	UNP P07700
B	358	ALA	CYS	engineered mutation	UNP P07700
B	369	HIS	-	expression tag	UNP P07700
B	370	HIS	-	expression tag	UNP P07700
B	371	HIS	-	expression tag	UNP P07700
B	372	HIS	-	expression tag	UNP P07700
B	373	HIS	-	expression tag	UNP P07700

- Molecule 3 is a protein called Camelid antibody fragment Nb6B9.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	120	Total	C	N	O	S	0	0	0
			910	569	159	178	4			
3	D	121	Total	C	N	O	S	0	0	0
			916	572	160	180	4			

- Molecule 4 is Cyanopindolol (CCD ID: P32) (formula: $C_{16}H_{21}N_3O_2$).
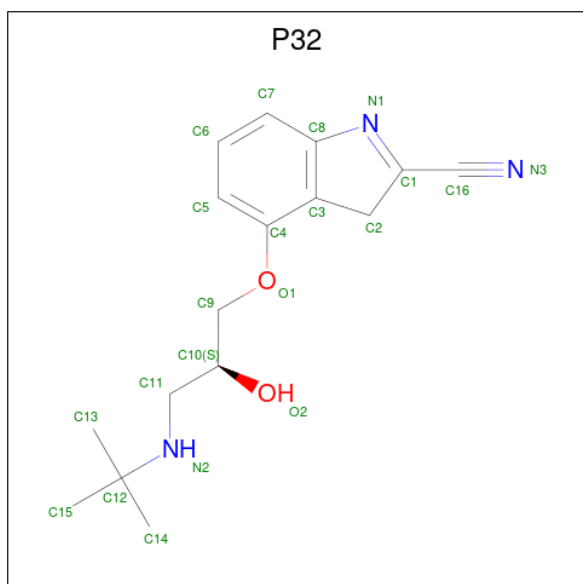
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			21	16	3	2		
4	B	1	Total	C	N	O	0	0
			21	16	3	2		

- Molecule 5 is SODIUM ION (CCD ID: NA) (formula: Na).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Na	0	0
			1	1		
5	B	1	Total	Na	0	0
			1	1		

- Molecule 6 is HEGA-10 (CCD ID: 2CV) (formula: $C_{18}H_{37}NO_7$).
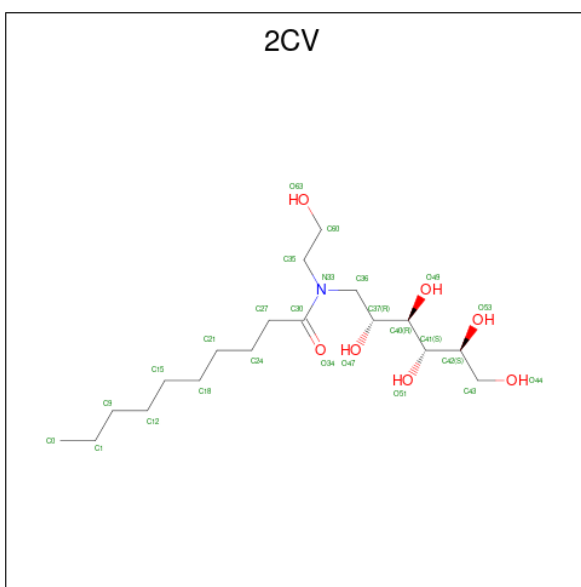
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total 26	C 18	N 1	O 7	0	0
6	A	1	Total 16	C 14	N 1	O 1	0	0
6	A	1	Total 26	C 18	N 1	O 7	0	0
6	A	1	Total 26	C 18	N 1	O 7	0	0
6	A	1	Total 26	C 18	N 1	O 7	0	0
6	B	1	Total 26	C 18	N 1	O 7	0	0
6	B	1	Total 16	C 14	N 1	O 1	0	0

- Molecule 7 is water.

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

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: Thioredoxin 1

Chain E:

- Molecule 1: Thioredoxin 1

Chain F:

- Molecule 2: Beta-1 adrenergic receptor

Chain A:
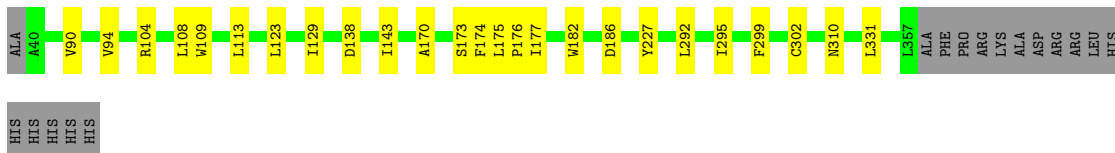
- Molecule 2: Beta-1 adrenergic receptor

Chain B:
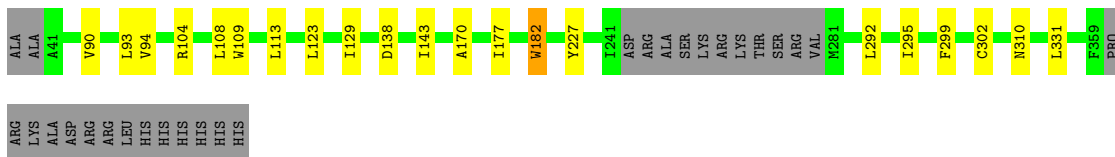
- Molecule 3: Camelid antibody fragment Nb6B9

Chain C:

SER Q1 L11 L20 L31 M82 L85 I104 Y105 D106 T117 S120

• Molecule 3: Camelid antibody fragment Nb6B9

Chain D:

93% 6% •

S0 L11 L20 L31 M82 L85 I104 Y105 D106 T117 S120

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	116.57Å 119.96Å 130.10Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.22 – 2.80 38.22 – 2.80	Depositor EDS
% Data completeness (in resolution range)	52.0 (38.22-2.80) 52.2 (38.22-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.40 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.8.0174	Depositor
R, R_{free}	0.240 , 0.274 0.245 , 0.278	Depositor DCC
R_{free} test set	1124 reflections (4.72%)	wwPDB-VP
Wilson B-factor (Å^2)	73.7	Xtriage
Anisotropy	0.062	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.22 , 43.7	EDS
L-test for twinning[2]	$< |L| > = 0.43, < L^2 > = 0.25$	Xtriage
Estimated twinning fraction	0.053 for k,h,-l	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	8190	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 3.25% 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: P32, 2CV, NA

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	E	0.62	0/822	0.76	0/1117
1	F	0.62	0/822	0.76	0/1117
2	A	0.58	0/2362	0.89	0/3215
2	B	0.58	0/2283	0.89	1/3110 (0.0%)
3	C	0.51	0/927	0.74	0/1256
3	D	0.53	0/933	0.73	0/1264
All	All	0.57	0/8149	0.83	1/11079 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	182	TRP	N-CA-C	5.01	117.47	111.71

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	E	807	0	809	1	0
1	F	807	0	809	1	0
2	A	2308	0	2418	13	0
2	B	2229	0	2326	13	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	910	0	878	6	0
3	D	916	0	883	6	0
4	A	21	0	21	1	0
4	B	21	0	21	1	0
5	A	1	0	0	0	0
5	B	1	0	0	0	0
6	A	120	0	171	2	0
6	B	42	0	60	0	0
7	A	2	0	0	0	0
7	B	3	0	0	0	0
7	C	2	0	0	0	0
All	All	8190	0	8396	36	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 (36) 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)
6:A:407:2CV:H02C	2:B:93:LEU:HD11	1.81	0.61
3:C:20:LEU:HG	3:C:82:MET:HE2	1.84	0.60
2:B:227:TYR:HB3	2:B:292:LEU:HD11	1.84	0.60
2:A:227:TYR:HB3	2:A:292:LEU:HD11	1.83	0.59
3:D:20:LEU:HG	3:D:82:MET:HE2	1.85	0.59
2:B:123:LEU:HD12	2:B:170:ALA:HA	1.89	0.54
2:A:123:LEU:HD12	2:A:170:ALA:HA	1.90	0.54
3:C:11:LEU:HD23	3:C:117:THR:HB	1.91	0.53
6:A:407:2CV:C0	2:B:93:LEU:HD11	2.40	0.51
2:B:177:ILE:HA	2:B:182:TRP:CD1	2.48	0.49
3:D:11:LEU:HD23	3:D:117:THR:HB	1.95	0.49
2:A:104:ARG:HG3	2:A:108:LEU:HD11	1.96	0.48
2:A:109:TRP:HB3	2:A:113:LEU:HD12	1.96	0.47
2:A:177:ILE:HA	2:A:182:TRP:CD1	2.49	0.47
2:A:302:CYS:HA	2:A:331:LEU:HG	1.97	0.46
3:D:106:ASP:N	3:D:106:ASP:OD1	2.48	0.46
2:B:109:TRP:HB3	2:B:113:LEU:HD12	1.97	0.46
2:A:295:ILE:HD11	3:C:104:ILE:HD11	1.98	0.46
1:F:28:TRP:HB2	1:F:35:SER:HB3	1.98	0.46
2:B:104:ARG:HG3	2:B:108:LEU:HD11	1.98	0.45
2:B:302:CYS:HA	2:B:331:LEU:HG	1.98	0.45
3:C:106:ASP:N	3:C:106:ASP:OD1	2.49	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:28:TRP:HB2	1:E:35:SER:HB3	1.99	0.43
2:B:129:ILE:HG23	2:B:299:PHE:CE1	2.53	0.43
2:A:129:ILE:HG23	2:A:299:PHE:CE1	2.53	0.43
2:B:295:ILE:HD11	3:D:104:ILE:HD11	2.01	0.43
3:C:82:MET:HB3	3:C:85:LEU:HD21	2.00	0.43
3:D:82:MET:HB3	3:D:85:LEU:HD21	2.01	0.43
2:A:90:VAL:HA	2:A:94:VAL:HB	2.01	0.42
2:A:310:ASN:HD21	4:A:401:P32:H2	1.85	0.41
2:B:310:ASN:HD21	4:B:401:P32:H2	1.84	0.41
2:B:143:ILE:CG2	3:D:31:LEU:HD13	2.50	0.41
2:B:90:VAL:HA	2:B:94:VAL:HB	2.02	0.41
2:A:143:ILE:CG2	3:C:31:LEU:HD13	2.51	0.40
2:A:175:LEU:HB3	2:A:176:PRO:HD3	2.02	0.40
2:A:173:SER:OG	2:A:174:PHE:N	2.55	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	E	105/109 (96%)	104 (99%)	1 (1%)	0	100	100
1	F	105/109 (96%)	104 (99%)	1 (1%)	0	100	100
2	A	288/307 (94%)	282 (98%)	6 (2%)	0	100	100
2	B	276/307 (90%)	269 (98%)	7 (2%)	0	100	100
3	C	118/121 (98%)	116 (98%)	2 (2%)	0	100	100
3	D	119/121 (98%)	117 (98%)	2 (2%)	0	100	100
All	All	1011/1074 (94%)	992 (98%)	19 (2%)	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	E	83/88 (94%)	83 (100%)	0	100	100
1	F	83/88 (94%)	83 (100%)	0	100	100
2	A	252/266 (95%)	250 (99%)	2 (1%)	79	93
2	B	243/266 (91%)	242 (100%)	1 (0%)	89	96
3	C	94/95 (99%)	93 (99%)	1 (1%)	70	90
3	D	95/95 (100%)	94 (99%)	1 (1%)	70	90
All	All	850/898 (95%)	845 (99%)	5 (1%)	84	95

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	A	138	ASP
2	A	186	ASP
3	C	106	ASP
2	B	138	ASP
3	D	106	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	310	ASN
2	B	310	ASN
3	D	115	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 11 ligands modelled in this entry, 2 are monoatomic - leaving 9 for Mogul analysis.

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	#$|Z| > 2$
6	2CV	A	407	-	25,25,25	0.36	0	29,30,30	0.89	2 (6%)
6	2CV	A	404	-	15,15,25	0.53	0	16,16,30	0.70	0
6	2CV	A	406	-	25,25,25	0.50	0	29,30,30	1.41	3 (10%)
6	2CV	B	404	-	15,15,25	0.60	0	16,16,30	0.93	0
6	2CV	A	405	-	25,25,25	0.71	1 (4%)	29,30,30	1.11	3 (10%)
4	P32	B	401	-	22,22,22	2.91	5 (22%)	25,31,31	2.42	7 (28%)
6	2CV	B	403	-	25,25,25	0.46	0	29,30,30	1.00	3 (10%)
6	2CV	A	403	-	25,25,25	0.38	0	29,30,30	0.88	2 (6%)
4	P32	A	401	-	22,22,22	2.84	5 (22%)	25,31,31	2.42	7 (28%)

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
6	2CV	A	407	-	-	17/34/34/34	-
6	2CV	A	404	-	-	2/17/17/34	-
6	2CV	A	406	-	-	12/34/34/34	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	2CV	B	404	-	-	2/17/17/34	-
6	2CV	A	405	-	-	10/34/34/34	-
4	P32	B	401	-	-	0/11/21/21	0/2/2/2
6	2CV	B	403	-	-	8/34/34/34	-
6	2CV	A	403	-	-	9/34/34/34	-
4	P32	A	401	-	-	0/11/21/21	0/2/2/2

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	401	P32	C16-C1	-8.75	1.34	1.44
4	A	401	P32	C16-C1	-8.34	1.35	1.44
4	B	401	P32	C8-C3	6.71	1.49	1.39
4	A	401	P32	C8-C3	6.65	1.49	1.39
4	B	401	P32	C4-C3	5.86	1.48	1.40
4	A	401	P32	C4-C3	5.83	1.48	1.40
4	B	401	P32	C2-C3	-4.19	1.44	1.50
4	A	401	P32	C2-C3	-3.77	1.45	1.50
6	A	405	2CV	C36-C37	2.07	1.55	1.52
4	B	401	P32	C12-N2	-2.04	1.45	1.49
4	A	401	P32	C12-N2	-2.04	1.45	1.49

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	401	P32	C2-C1-N1	6.59	122.22	114.31
4	B	401	P32	C2-C1-N1	6.37	121.95	114.31
4	B	401	P32	C11-N2-C12	5.76	122.68	116.54
4	A	401	P32	C8-N1-C1	-5.46	103.25	107.41
4	B	401	P32	C8-N1-C1	-5.01	103.60	107.41
4	A	401	P32	C11-N2-C12	4.93	121.80	116.54
6	A	406	2CV	C27-C30-N33	4.10	124.42	118.01
4	A	401	P32	C9-O1-C4	3.10	125.16	118.27
4	A	401	P32	O1-C4-C3	3.08	120.16	115.71
4	B	401	P32	O1-C4-C3	3.07	120.14	115.71
4	B	401	P32	C9-O1-C4	3.05	125.06	118.27
6	A	405	2CV	C37-C40-C41	3.03	117.21	112.47
4	B	401	P32	C5-C4-C3	-2.95	116.50	120.54
6	A	406	2CV	C42-C41-C40	2.92	117.03	112.47
6	A	407	2CV	C35-N33-C36	-2.84	113.03	116.41
4	A	401	P32	C5-C4-C3	-2.78	116.73	120.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	403	2CV	C27-C30-N33	2.66	122.17	118.01
6	B	403	2CV	C35-N33-C36	-2.53	113.39	116.41
6	A	406	2CV	O34-C30-C27	-2.53	114.11	121.31
4	A	401	P32	C7-C8-C3	-2.51	118.75	121.58
4	B	401	P32	C7-C8-C3	-2.37	118.91	121.58
6	A	403	2CV	C36-C37-C40	2.34	116.33	109.79
6	A	405	2CV	C60-C35-N33	-2.24	106.74	112.55
6	A	405	2CV	C42-C41-C40	2.16	115.84	112.47
6	B	403	2CV	C43-C42-C41	2.13	117.03	112.41
6	A	403	2CV	C27-C30-N33	2.11	121.31	118.01
6	A	407	2CV	C27-C30-N33	2.06	121.23	118.01

There are no chirality outliers.

All (60) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	403	2CV	N33-C35-C60-O63
6	A	405	2CV	C37-C36-N33-C35
6	A	406	2CV	C40-C41-C42-O53
6	A	406	2CV	O51-C41-C42-O53
6	A	407	2CV	N33-C35-C60-O63
6	A	407	2CV	N33-C36-C37-O47
6	A	407	2CV	C37-C40-C41-O51
6	A	407	2CV	O49-C40-C41-O51
6	A	407	2CV	O53-C42-C43-O44
6	A	407	2CV	O49-C40-C41-C42
6	A	405	2CV	C40-C41-C42-O53
6	A	405	2CV	O51-C41-C42-C43
6	A	406	2CV	O51-C41-C42-C43
6	A	407	2CV	C21-C24-C27-C30
6	A	405	2CV	C40-C41-C42-C43
6	A	406	2CV	C40-C41-C42-C43
6	A	407	2CV	C24-C27-C30-O34
6	A	403	2CV	O34-C30-N33-C36
6	A	407	2CV	C37-C40-C41-C42
6	B	403	2CV	C21-C24-C27-C30
6	A	407	2CV	C37-C36-N33-C30
6	B	403	2CV	N33-C35-C60-O63
6	A	407	2CV	C37-C36-N33-C35
6	A	405	2CV	O51-C41-C42-O53
6	A	407	2CV	C41-C42-C43-O44
6	A	407	2CV	C24-C27-C30-N33

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Mol	Chain	Res	Type	Atoms
6	A	403	2CV	C15-C12-C9-C1
6	A	403	2CV	C27-C30-N33-C36
6	B	403	2CV	C15-C18-C21-C24
6	A	405	2CV	C15-C18-C21-C24
6	A	405	2CV	C12-C15-C18-C21
6	A	406	2CV	C60-C35-N33-C36
6	A	403	2CV	C12-C15-C18-C21
6	A	406	2CV	C18-C21-C24-C27
6	A	406	2CV	C15-C12-C9-C1
6	B	404	2CV	C12-C15-C18-C21
6	A	406	2CV	C21-C24-C27-C30
6	A	404	2CV	C18-C21-C24-C27
6	A	403	2CV	C21-C24-C27-C30
6	A	405	2CV	C21-C24-C27-C30
6	A	403	2CV	O34-C30-N33-C35
6	A	403	2CV	C27-C30-N33-C35
6	B	403	2CV	C40-C41-C42-C43
6	B	403	2CV	C24-C27-C30-O34
6	A	405	2CV	C37-C36-N33-C30
6	A	404	2CV	C12-C15-C18-C21
6	A	407	2CV	C15-C12-C9-C1
6	A	406	2CV	N33-C36-C37-O47
6	A	407	2CV	N33-C36-C37-C40
6	A	406	2CV	C60-C35-N33-C30
6	A	405	2CV	C9-C12-C15-C18
6	A	407	2CV	C18-C21-C24-C27
6	B	403	2CV	C18-C21-C24-C27
6	B	403	2CV	C24-C27-C30-N33
6	A	406	2CV	O47-C37-C40-C41
6	A	407	2CV	C15-C18-C21-C24
6	B	404	2CV	C15-C18-C21-C24
6	B	403	2CV	C0-C1-C9-C12
6	A	406	2CV	N33-C35-C60-O63
6	A	403	2CV	C36-C37-C40-O49

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	407	2CV	2	0
4	B	401	P32	1	0
4	A	401	P32	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.
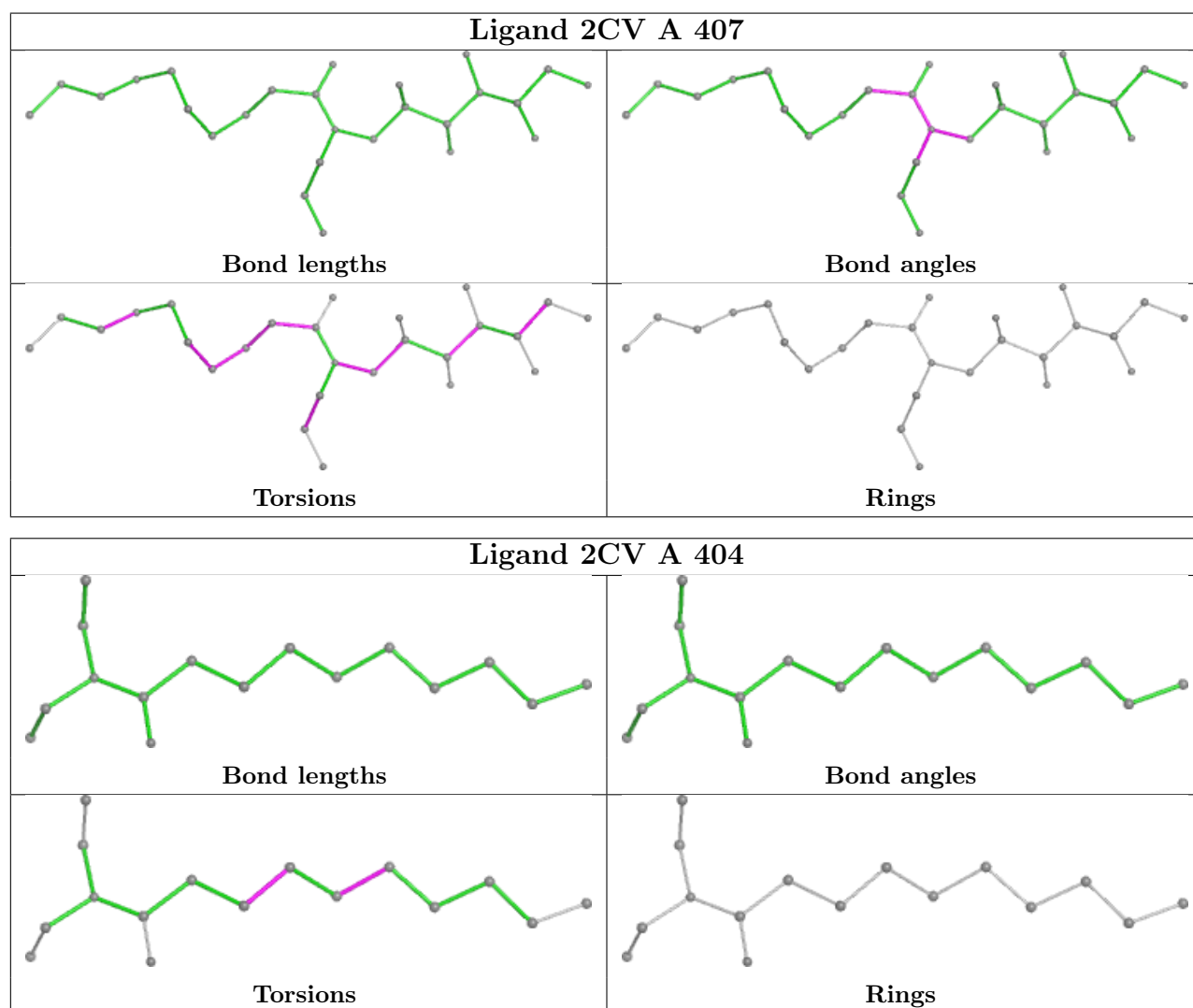
Ligand 2CV A 407
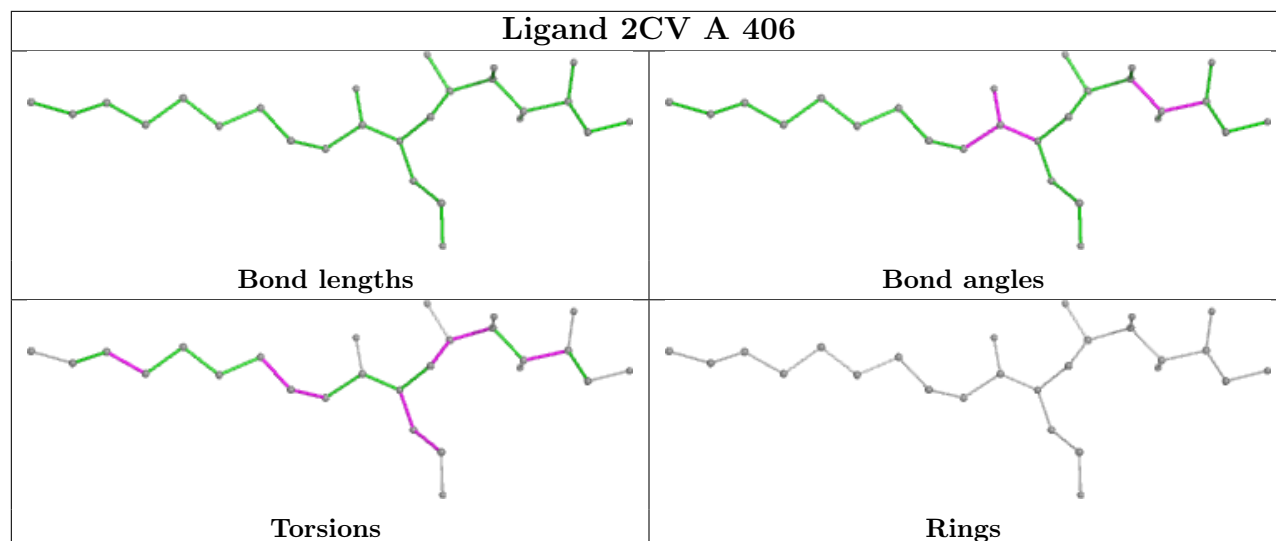
Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV A 404

Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV A 406

Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV B 404

Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV A 405

Bond lengths

Bond angles

Torsions

Rings

Ligand P32 B 401

Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV B 403

Bond lengths

Bond angles

Torsions

Rings

Ligand 2CV A 403

Ligand P32 A 401
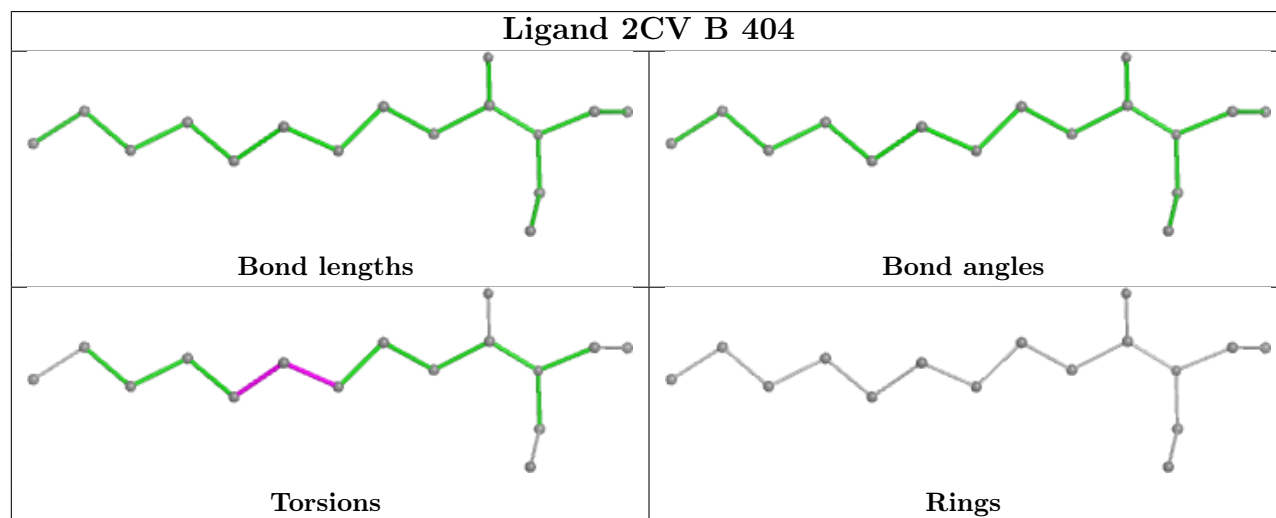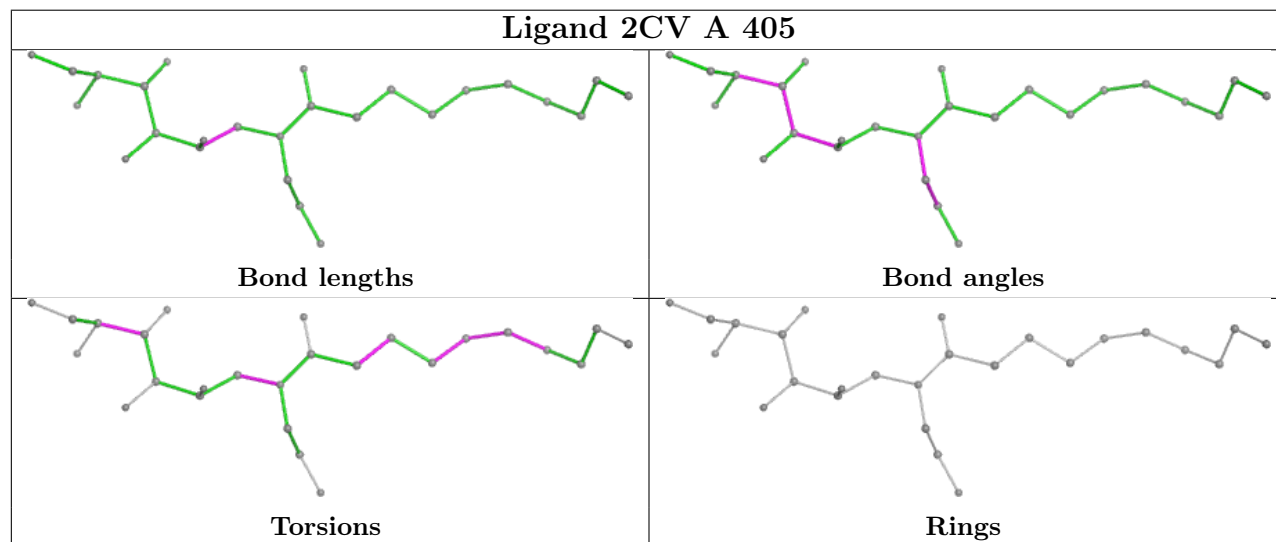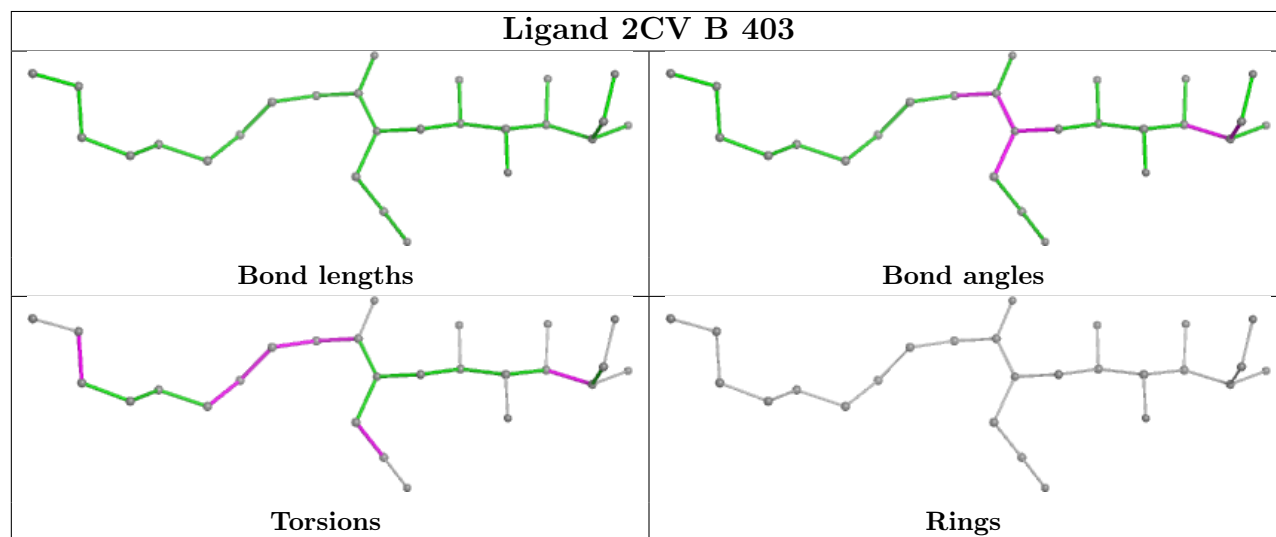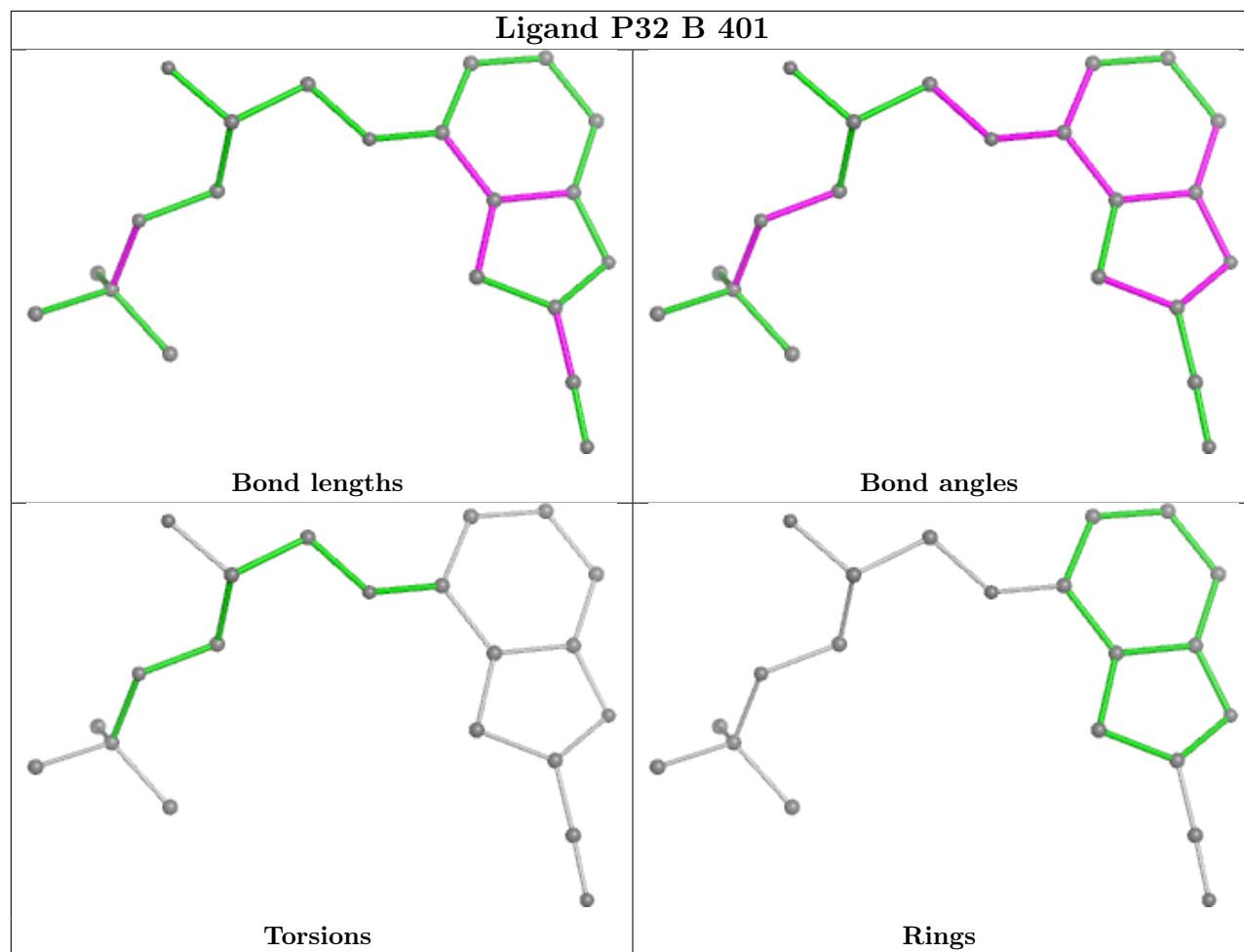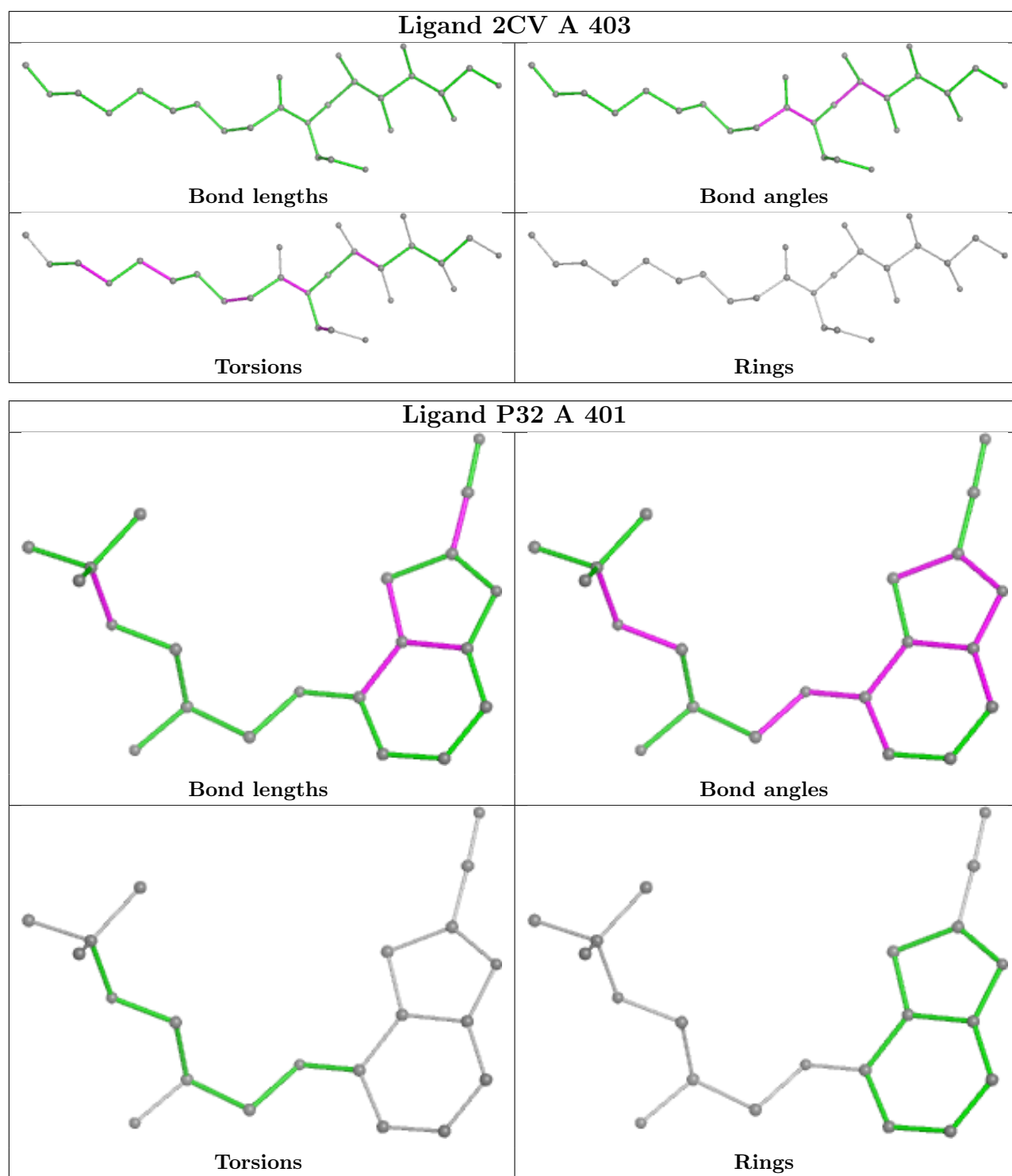
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	E	107/109 (98%)	-1.15	0	100	100	103, 145, 183, 213	0
1	F	107/109 (98%)	-1.49	0	100	100	87, 120, 159, 169	0
2	A	290/307 (94%)	-1.51	0	100	100	30, 62, 112, 132	0
2	B	280/307 (91%)	-1.52	0	100	100	31, 69, 124, 158	0
3	C	120/121 (99%)	-1.61	0	100	100	33, 54, 93, 122	0
3	D	121/121 (100%)	-1.44	0	100	100	45, 67, 102, 122	0
All	All	1025/1074 (95%)	-1.48	0	100	100	30, 74, 155, 213	0

There are no RSRZ outliers to report.

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 oligosaccharides in this entry.

6.4 Ligands ⓘ

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	2CV	A	406	26/26	0.97	0.05	49,60,71,79	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
6	2CV	B	403	26/26	0.97	0.04	71,94,118,124	0
5	NA	B	402	1/1	0.98	0.03	63,63,63,63	0
6	2CV	A	405	26/26	0.98	0.07	51,99,135,138	0
6	2CV	B	404	16/26	0.98	0.05	36,39,53,54	0
6	2CV	A	404	16/26	0.99	0.04	54,63,81,82	0
4	P32	B	401	21/21	0.99	0.04	55,64,77,77	0
5	NA	A	402	1/1	0.99	0.06	48,48,48,48	0
6	2CV	A	407	26/26	0.99	0.05	59,78,93,106	0
4	P32	A	401	21/21	0.99	0.06	40,42,57,60	0
6	2CV	A	403	26/26	0.99	0.04	69,88,97,101	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 2CV A 406:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative) and green (positive)
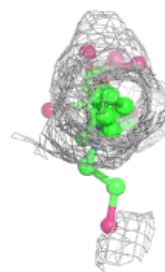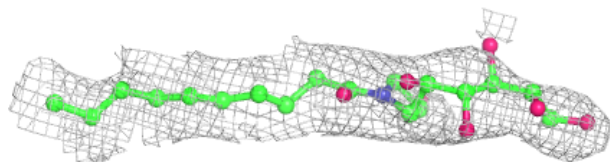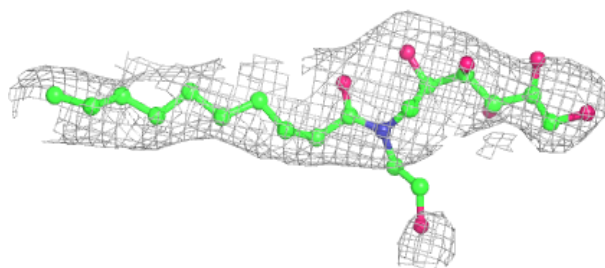
Electron density around 2CV B 403:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
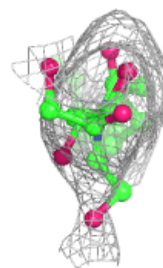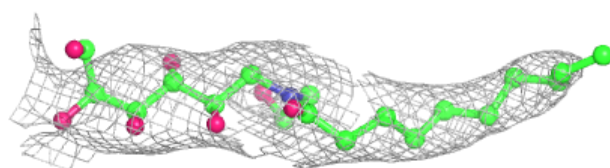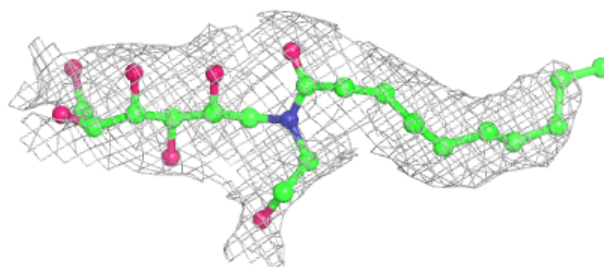
Electron density around 2CV A 405:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
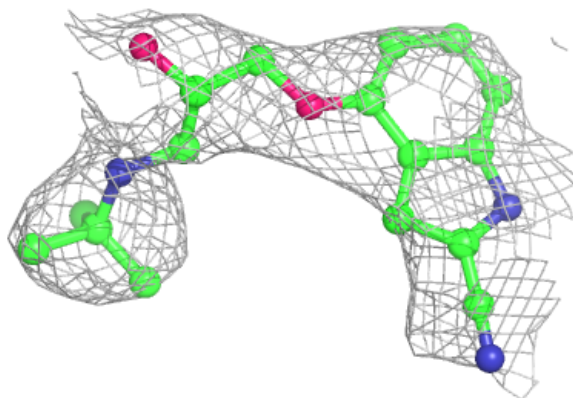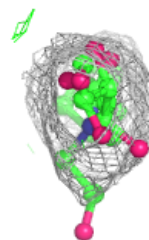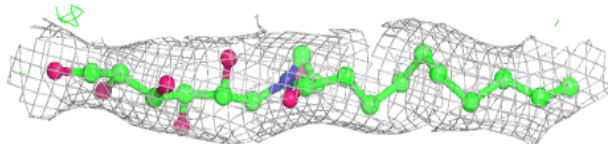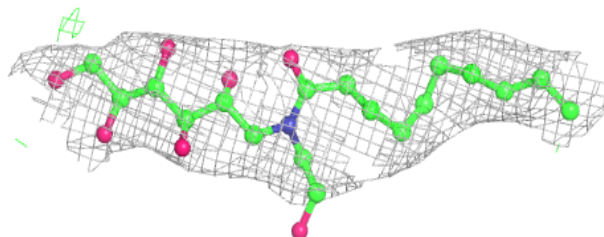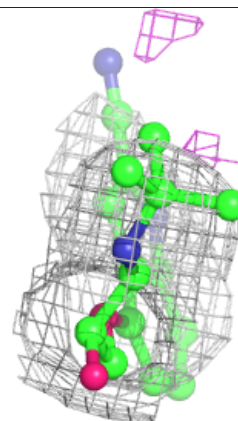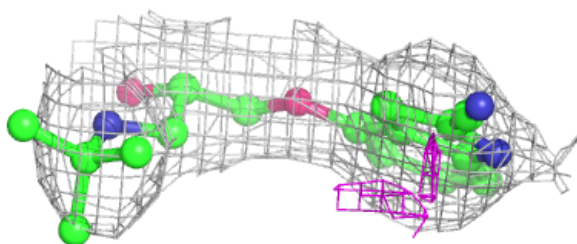mF_o-DF_c (at 3 rmsd) in purple (negative)
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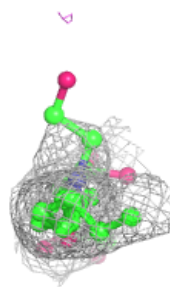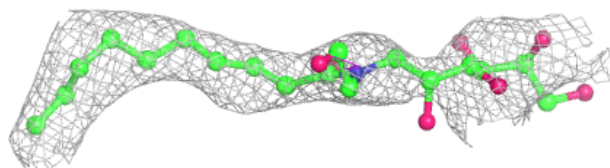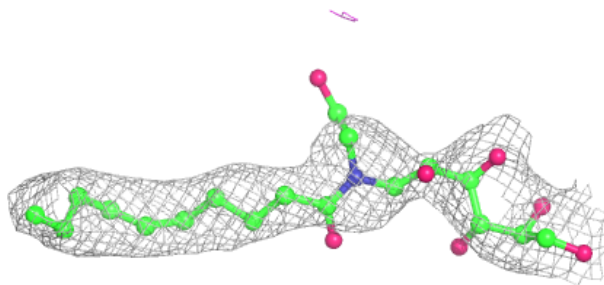
Electron density around 2CV B 404:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
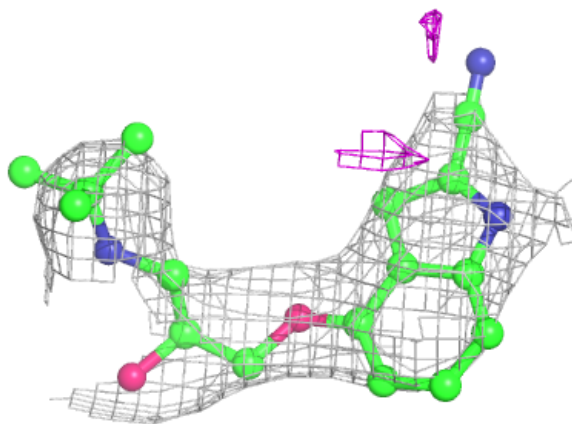mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
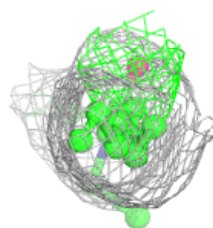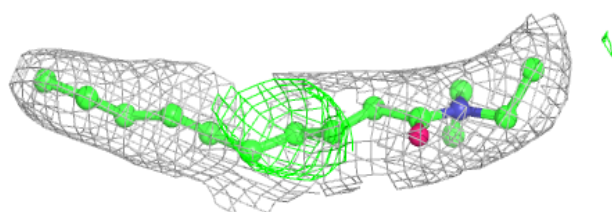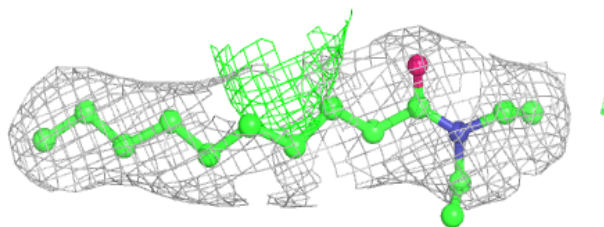
Electron density around 2CV A 404:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
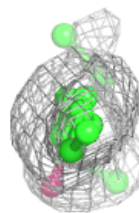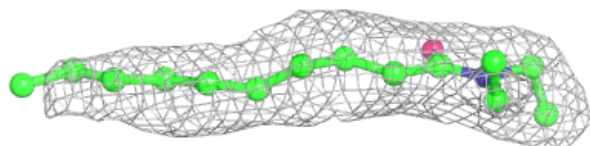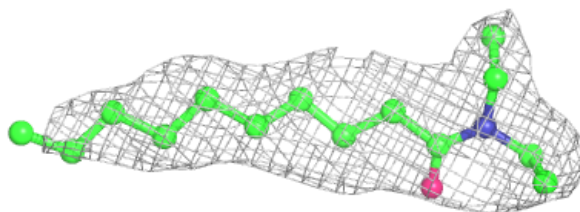
Electron density around P32 B 401:

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mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
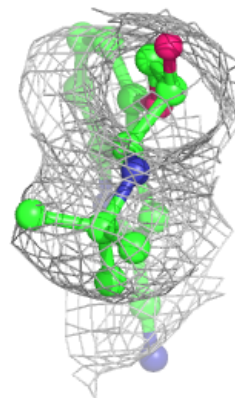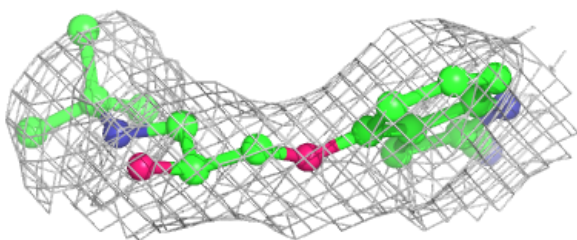
Electron density around 2CV A 407:

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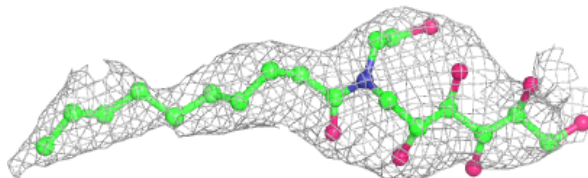and green (positive)

Electron density around P32 A 401:

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 2CV A 403:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
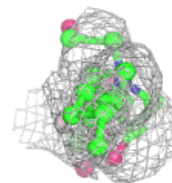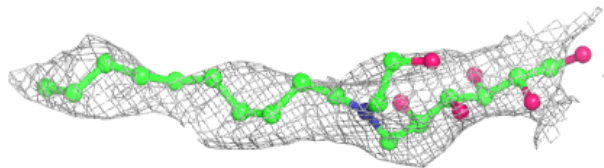
6.5 Other polymers (i)

There are no such residues in this entry.