



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 15, 2024 – 11:11 PM EST

PDB ID : 6V8C
Title : Design, Synthesis, and Mechanism of Fluorine-substituted Cyclohexene Analogues of GAMA-Aminobutyric Acid (GABA) as Selective Ornithine Aminotransferase Inactivators
Authors : Zhu, W.; Doubleday, P.T.; Catlin, D.S.; Weerawarna, P.; Butrin, A.; Shen, S.; Kelleher, N.L.; Liu, D.; Silverman, R.B.
Deposited on : 2019-12-10
Resolution : 1.90 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : 1.21
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.004 (Gargrove)
Density-Fitness : 1.0.11
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.40

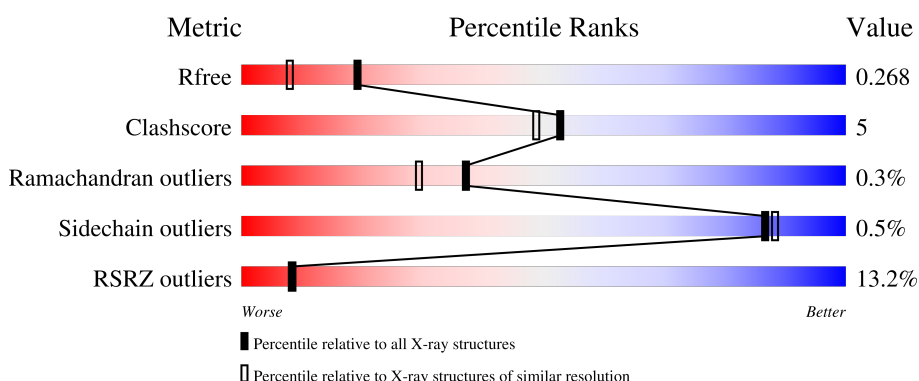
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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}	164625	7293 (1.90-1.90)
Clashscore	180529	8090 (1.90-1.90)
Ramachandran outliers	177936	8022 (1.90-1.90)
Sidechain outliers	177891	8022 (1.90-1.90)
RSRZ outliers	164620	7292 (1.90-1.90)

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

Mol	Chain	Length	Quality of chain
1	A	404	 17% 90% 9%
1	B	404	 5% 90% 9%
1	C	404	 17% 90% 10%

2 Entry composition i

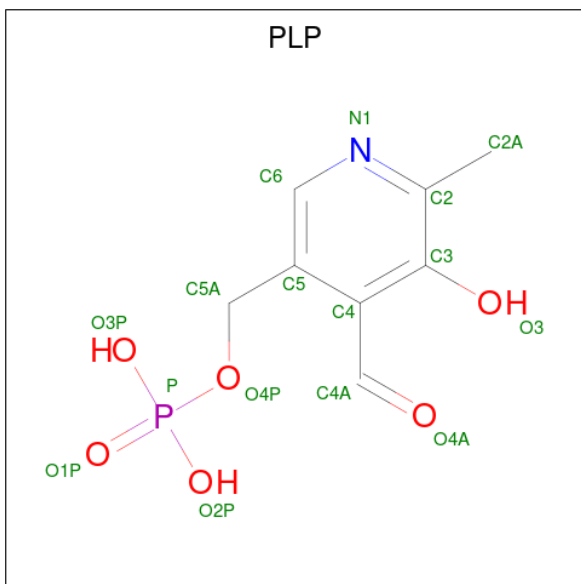
There are 4 unique types of molecules in this entry. The entry contains 10360 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Ornithine aminotransferase, mitochondrial.

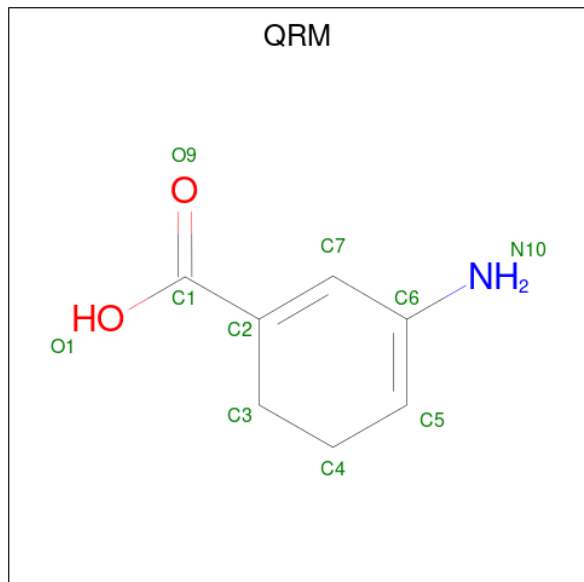
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	404	Total 3157	C 2028	N 532	O 585	S 12	0	0	0
1	B	404	Total 3161	C 2030	N 533	O 586	S 12	0	0	0
1	C	404	Total 3157	C 2028	N 532	O 585	S 12	0	0	0

- Molecule 2 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: C₈H₁₀NO₆P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	A	1	Total 15	C 8	N 1	O 5	P 1	0	0
2	B	1	Total 15	C 8	N 1	O 5	P 1	0	0
2	C	1	Total 15	C 8	N 1	O 5	P 1	0	0

- Molecule 3 is 3-aminocyclohexa-1,3-diene-1-carboxylic acid (three-letter code: QRM) (formula: C₇H₉NO₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	10	7	1	2	0	0
3	B	1	10	7	1	2	0	0
3	C	1	10	7	1	2	0	0

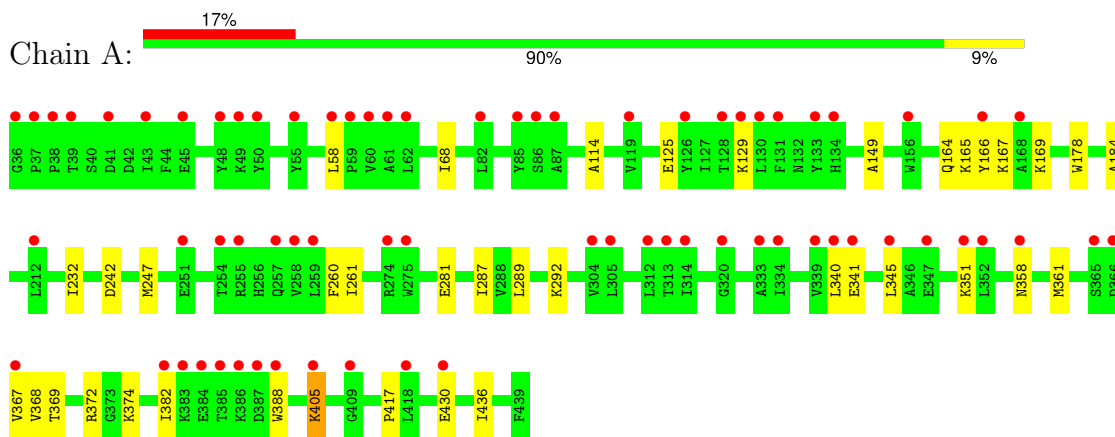
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
4	A	269	269	269	0	0
4	B	286	286	286	0	0
4	C	255	255	255	0	0

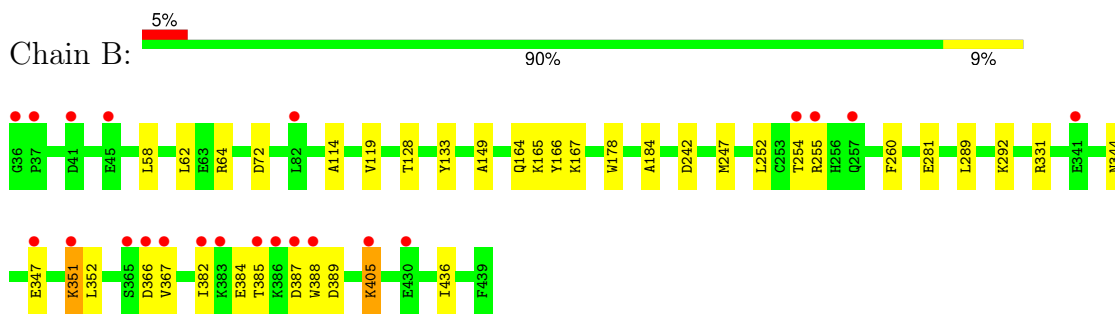
3 Residue-property plots [i](#)

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.

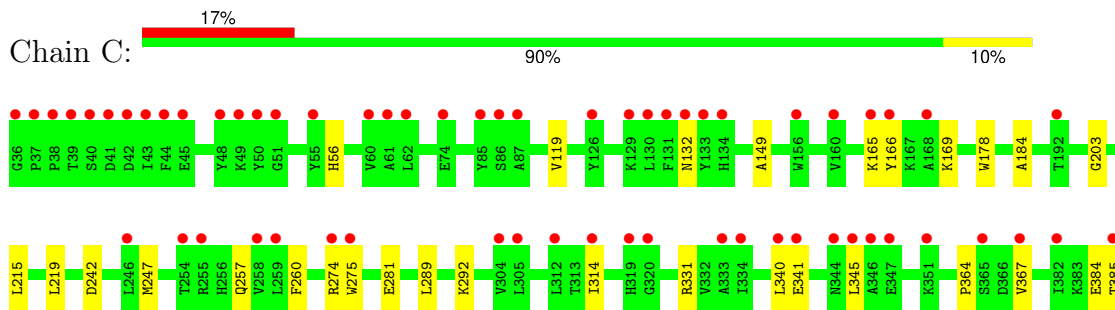
- Molecule 1: Ornithine aminotransferase, mitochondrial

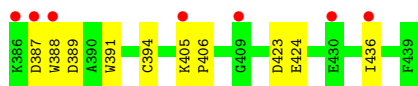


- Molecule 1: Ornithine aminotransferase, mitochondrial



- Molecule 1: Ornithine aminotransferase, mitochondrial





4 Data and refinement statistics i

Property	Value	Source
Space group	P 31 1 2	Depositor
Cell constants a, b, c, α , β , γ	193.78Å 193.78Å 57.20Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	27.97 – 1.90 27.97 – 1.90	Depositor EDS
% Data completeness (in resolution range)	96.2 (27.97-1.90) 96.2 (27.97-1.90)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	7.01 (at 1.91Å)	Xtrriage
Refinement program	PHENIX 1.17.1	Depositor
R, R_{free}	0.239 , 0.268 0.239 , 0.268	Depositor DCC
R_{free} test set	4835 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	17.9	Xtrriage
Anisotropy	0.010	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 50.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.045 for -h,-k,l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	10360	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 81.33 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.6362e-07. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PLP, QRM

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	0.32	0/3231	0.50	1/4388 (0.0%)
1	B	0.33	0/3235	0.51	1/4393 (0.0%)
1	C	0.32	0/3231	0.50	0/4388
All	All	0.32	0/9697	0.50	2/13169 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	405	LYS	CD-CE-NZ	-5.50	99.06	111.70
1	B	405	LYS	CD-CE-NZ	-5.21	99.72	111.70

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	3157	0	3156	30	1
1	B	3161	0	3162	29	1
1	C	3157	0	3156	31	0
2	A	15	0	7	1	0
2	B	15	0	7	1	0
2	C	15	0	7	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	10	0	0	1	0
3	B	10	0	0	1	0
3	C	10	0	0	1	0
4	A	269	0	0	4	0
4	B	286	0	0	4	0
4	C	255	0	0	6	0
All	All	10360	0	9495	93	2

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 5.

All (93) 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:B:58:LEU:H	1:B:405:LYS:NZ	1.78	0.81
1:C:367:VAL:HG23	1:C:388:TRP:CZ2	2.19	0.78
1:A:58:LEU:H	1:A:405:LYS:NZ	1.82	0.76
1:C:314:ILE:HG22	4:C:601:HOH:O	1.85	0.75
1:A:58:LEU:HB2	1:A:405:LYS:HE2	1.66	0.75
1:C:314:ILE:O	4:C:601:HOH:O	2.09	0.70
1:A:58:LEU:H	1:A:405:LYS:HZ1	1.39	0.69
1:C:274:ARG:NH1	4:C:604:HOH:O	2.25	0.68
1:C:391:TRP:HZ3	1:C:405:LYS:HE3	1.58	0.68
1:B:242:ASP:OD2	4:B:601:HOH:O	2.10	0.67
1:B:254:THR:HG22	4:B:847:HOH:O	1.95	0.67
1:B:367:VAL:HG13	1:B:388:TRP:CH2	2.30	0.66
1:B:58:LEU:H	1:B:405:LYS:HZ1	1.41	0.66
1:B:58:LEU:HB2	1:B:405:LYS:HE2	1.77	0.66
1:A:242:ASP:OD2	4:A:601:HOH:O	2.13	0.66
1:A:367:VAL:HG11	1:A:436:ILE:HG23	1.78	0.65
1:B:367:VAL:HG11	1:B:436:ILE:HG23	1.79	0.64
1:C:275:TRP:HZ2	1:C:341:GLU:HG3	1.63	0.64
1:C:384:GLU:HG3	1:C:389:ASP:HB3	1.81	0.62
1:C:364:PRO:HG2	1:C:367:VAL:CG1	2.30	0.62
1:A:167:LYS:HE3	4:A:813:HOH:O	2.01	0.60
1:A:367:VAL:HG13	1:A:388:TRP:CH2	2.37	0.59
1:C:169:LYS:HD2	1:C:203:GLY:HA2	1.85	0.59
1:C:340:LEU:HD23	1:C:345:LEU:HD12	1.85	0.58
1:C:132:ASN:HB3	4:C:766:HOH:O	2.03	0.58
1:B:344:ASN:HB3	1:B:347:GLU:OE2	2.05	0.57
1:A:340:LEU:HD23	1:A:345:LEU:HD12	1.88	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:382:ILE:HG23	1:B:388:TRP:CH2	2.40	0.56
1:C:391:TRP:CZ3	1:C:405:LYS:HE3	2.39	0.56
1:C:367:VAL:HG23	1:C:388:TRP:HZ2	1.70	0.54
1:C:314:ILE:C	4:C:601:HOH:O	2.45	0.54
1:C:367:VAL:HG21	1:C:436:ILE:HG23	1.90	0.53
1:B:58:LEU:H	1:B:405:LYS:HZ3	1.54	0.53
1:C:364:PRO:HG2	1:C:367:VAL:HG12	1.91	0.52
1:A:430:GLU:HG2	4:B:777:HOH:O	2.09	0.52
1:A:125:GLU:O	1:A:129:LYS:HG2	2.08	0.52
1:A:178:TRP:CZ2	1:A:184:ALA:HA	2.44	0.52
1:C:367:VAL:HG23	1:C:388:TRP:CH2	2.44	0.52
1:B:351:LYS:HD2	1:B:352:LEU:HD23	1.92	0.51
1:A:372:ARG:HD2	4:A:701:HOH:O	2.11	0.50
1:B:367:VAL:HG13	1:B:388:TRP:CZ2	2.47	0.50
1:A:382:ILE:HG23	1:A:388:TRP:CH2	2.46	0.49
1:C:56:HIS:O	1:C:405:LYS:NZ	2.40	0.49
1:A:367:VAL:HG12	1:A:368:VAL:HG23	1.94	0.49
1:C:178:TRP:CZ2	1:C:184:ALA:HA	2.47	0.49
1:B:58:LEU:N	1:B:405:LYS:HZ3	2.11	0.48
1:B:366:ASP:OD2	1:B:367:VAL:HG23	2.14	0.48
1:A:164:GLN:HB2	1:A:167:LYS:HE2	1.95	0.48
1:C:247:MET:HG3	1:C:281:GLU:HB3	1.95	0.48
1:B:178:TRP:CZ2	1:B:184:ALA:HA	2.50	0.47
1:B:252:LEU:HD23	1:B:255:ARG:HH21	1.80	0.46
1:A:149:ALA:HB2	1:A:289:LEU:HD21	1.98	0.45
1:A:165:LYS:HA	1:A:166:TYR:HA	1.65	0.45
1:A:369:THR:HG21	4:A:769:HOH:O	2.16	0.45
1:B:385:THR:OG1	1:B:388:TRP:N	2.49	0.45
1:C:242:ASP:OD2	4:C:603:HOH:O	2.21	0.45
1:C:364:PRO:HG2	1:C:367:VAL:HG11	1.98	0.45
1:A:247:MET:HG3	1:A:281:GLU:HB3	1.98	0.45
1:B:149:ALA:HB2	1:B:289:LEU:HD21	1.99	0.44
1:B:387:ASP:OD1	1:B:387:ASP:N	2.51	0.44
2:A:501:PLP:O3	3:A:502:QRM:N10	2.48	0.44
1:B:165:LYS:HA	1:B:166:TYR:HA	1.67	0.44
1:B:247:MET:HG3	1:B:281:GLU:HB3	1.99	0.44
1:C:215:LEU:O	1:C:219:LEU:HG	2.17	0.44
1:B:58:LEU:N	1:B:405:LYS:NZ	2.57	0.44
1:C:385:THR:HG1	1:C:387:ASP:CG	2.21	0.44
1:B:119:VAL:HG11	1:B:331:ARG:HG2	2.00	0.44
1:B:62:LEU:HA	1:B:72:ASP:HA	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:501:PLP:O3	3:B:502:QRM:N10	2.50	0.43
1:C:165:LYS:HA	1:C:166:TYR:HA	1.68	0.43
1:C:394:CYS:SG	1:C:406:PRO:HD3	2.58	0.43
1:A:232:ILE:HD11	1:A:374:LYS:HD2	2.01	0.43
1:A:367:VAL:HG13	1:A:388:TRP:CZ2	2.53	0.43
1:C:119:VAL:HG11	1:C:331:ARG:HG2	2.00	0.43
1:A:167:LYS:O	1:A:169:LYS:NZ	2.48	0.42
1:A:341:GLU:HA	1:A:341:GLU:OE2	2.20	0.42
1:C:169:LYS:CD	1:C:203:GLY:HA2	2.50	0.42
1:C:275:TRP:CZ2	1:C:341:GLU:HG3	2.50	0.42
1:A:261:ILE:HG12	1:A:287:ILE:HD12	2.01	0.42
1:A:68:ILE:HA	1:A:417:PRO:HG2	2.02	0.41
1:A:58:LEU:H	1:A:405:LYS:HZ3	1.65	0.41
1:A:169:LYS:HA	1:A:169:LYS:HD3	1.89	0.41
1:B:128:THR:HB	1:B:133:TYR:O	2.21	0.41
1:B:164:GLN:HB2	1:B:167:LYS:HE2	2.02	0.41
1:B:384:GLU:HG3	1:B:389:ASP:HB3	2.02	0.41
1:A:358:ASN:HA	1:A:361:MET:HE3	2.02	0.41
1:C:149:ALA:HB2	1:C:289:LEU:HD21	2.01	0.41
1:B:385:THR:HG1	1:B:388:TRP:H	1.67	0.40
1:C:423:ASP:OD1	1:C:424:GLU:N	2.54	0.40
2:C:501:PLP:O3	3:C:502:QRM:N10	2.52	0.40
1:A:58:LEU:N	1:A:405:LYS:NZ	2.60	0.40
1:A:367:VAL:HG13	1:A:388:TRP:HH2	1.84	0.40
1:B:64:ARG:NH2	4:B:603:HOH:O	2.30	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:114:ALA:O	1:A:405:LYS:NZ[5_555]	1.85	0.35
1:B:114:ALA:O	1:B:405:LYS:NZ[6_565]	1.92	0.28

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	402/404 (100%)	383 (95%)	18 (4%)	1 (0%)	44	36
1	B	402/404 (100%)	385 (96%)	16 (4%)	1 (0%)	44	36
1	C	402/404 (100%)	383 (95%)	17 (4%)	2 (0%)	25	17
All	All	1206/1212 (100%)	1151 (95%)	51 (4%)	4 (0%)	37	29

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	257	GLN
1	A	292	LYS
1	B	292	LYS
1	C	292	LYS

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	336/337 (100%)	334 (99%)	2 (1%)	84	86
1	B	337/337 (100%)	335 (99%)	2 (1%)	84	86
1	C	336/337 (100%)	335 (100%)	1 (0%)	91	92
All	All	1009/1011 (100%)	1004 (100%)	5 (0%)	86	88

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

Mol	Chain	Res	Type
1	A	260	PHE
1	A	351	LYS
1	B	260	PHE
1	B	351	LYS
1	C	260	PHE

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

sidechains are listed below:

Mol	Chain	Res	Type
1	A	99	ASN
1	B	257	GLN
1	C	400	ASN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	QRM	C	502	2	9,10,10	3.24	4 (44%)	11,13,13	1.92	4 (36%)
2	PLP	A	501	3	15,15,16	1.07	2 (13%)	21,22,23	0.94	2 (9%)
3	QRM	B	502	2	9,10,10	3.29	3 (33%)	11,13,13	1.83	4 (36%)
2	PLP	B	501	3	15,15,16	0.97	1 (6%)	21,22,23	0.86	0
3	QRM	A	502	2	9,10,10	3.24	4 (44%)	11,13,13	1.87	4 (36%)
2	PLP	C	501	3	15,15,16	1.07	2 (13%)	21,22,23	0.98	2 (9%)

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
3	QRM	C	502	2	-	0/4/14/14	0/1/1/1
2	PLP	A	501	3	-	0/6/6/8	0/1/1/1
3	QRM	B	502	2	-	0/4/14/14	0/1/1/1
2	PLP	B	501	3	-	0/6/6/8	0/1/1/1
3	QRM	A	502	2	-	0/4/14/14	0/1/1/1
2	PLP	C	501	3	-	0/6/6/8	0/1/1/1

All (16) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	502	QRM	C3-C2	-6.26	1.39	1.50
3	C	502	QRM	C3-C2	-6.11	1.39	1.50
3	A	502	QRM	C3-C2	-6.09	1.39	1.50
3	B	502	QRM	C3-C4	-5.45	1.39	1.52
3	C	502	QRM	C3-C4	-5.39	1.39	1.52
3	A	502	QRM	C3-C4	-5.38	1.39	1.52
3	B	502	QRM	C4-C5	-4.02	1.39	1.50
3	C	502	QRM	C4-C5	-3.92	1.39	1.50
3	A	502	QRM	C4-C5	-3.88	1.40	1.50
2	C	501	PLP	C2-N1	2.49	1.38	1.33
2	A	501	PLP	C2-N1	2.39	1.38	1.33
2	B	501	PLP	C6-N1	2.20	1.38	1.34
2	A	501	PLP	C6-N1	2.12	1.38	1.34
2	C	501	PLP	C6-N1	2.08	1.38	1.34
3	A	502	QRM	C5-C6	2.02	1.40	1.34
3	C	502	QRM	C5-C6	2.02	1.40	1.34

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	502	QRM	C3-C4-C5	3.43	120.51	111.14
3	C	502	QRM	C3-C4-C5	3.38	120.37	111.14
3	A	502	QRM	C3-C4-C5	3.29	120.11	111.14
3	C	502	QRM	C4-C3-C2	2.54	120.79	113.72
3	C	502	QRM	C4-C5-C6	-2.50	118.62	122.75
3	A	502	QRM	C4-C3-C2	2.47	120.58	113.72
3	B	502	QRM	C4-C3-C2	2.40	120.41	113.72
3	C	502	QRM	C5-C6-N10	-2.40	120.01	123.99
3	B	502	QRM	C4-C5-C6	-2.38	118.83	122.75
2	C	501	PLP	C6-C5-C4	2.33	120.01	118.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	501	PLP	C5-C6-N1	-2.28	120.11	123.83
3	A	502	QRM	C4-C5-C6	-2.28	118.99	122.75
2	A	501	PLP	C6-C5-C4	2.23	119.92	118.10
2	A	501	PLP	C5-C6-N1	-2.22	120.21	123.83
3	A	502	QRM	C5-C6-N10	-2.22	120.31	123.99
3	B	502	QRM	C5-C6-N10	-2.15	120.42	123.99

There are no chirality outliers.

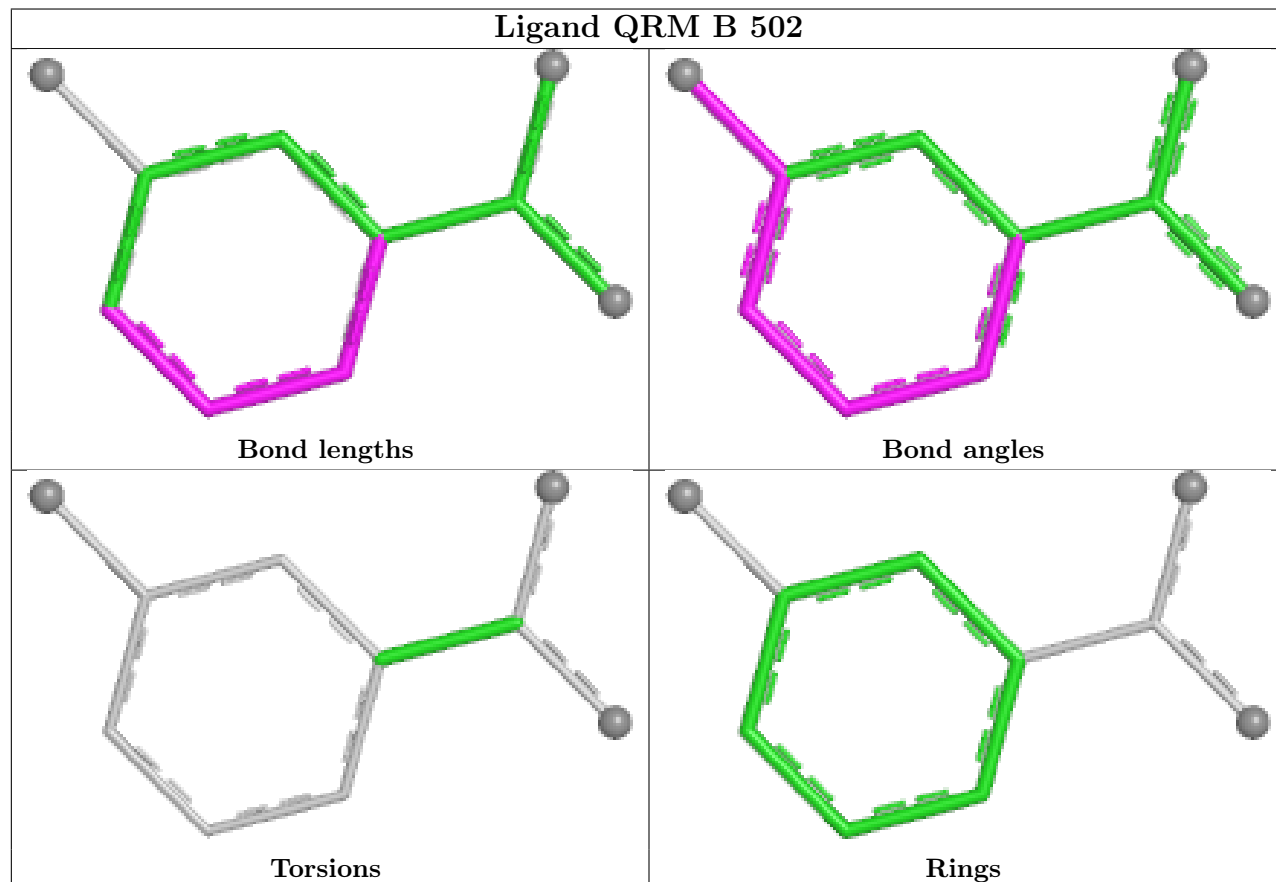
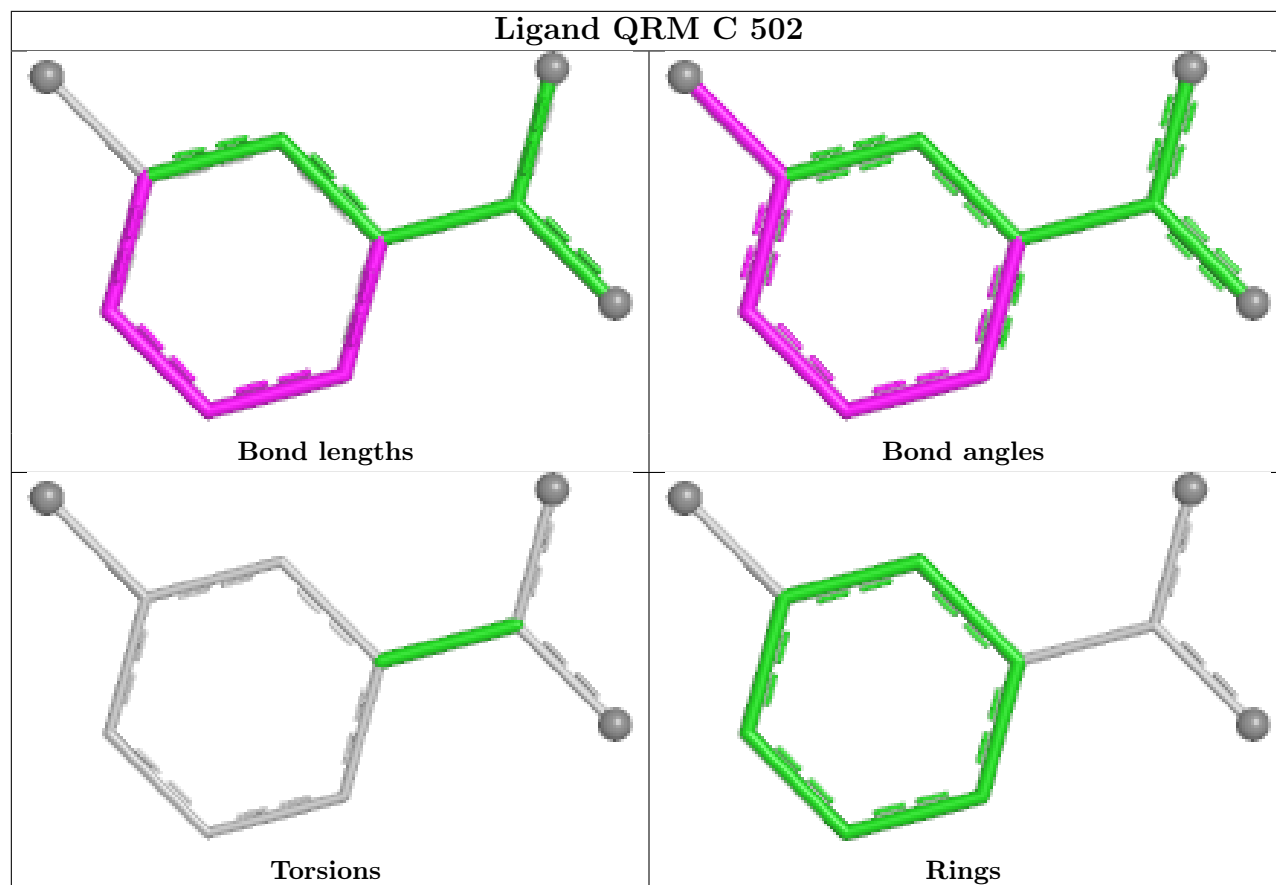
There are no torsion outliers.

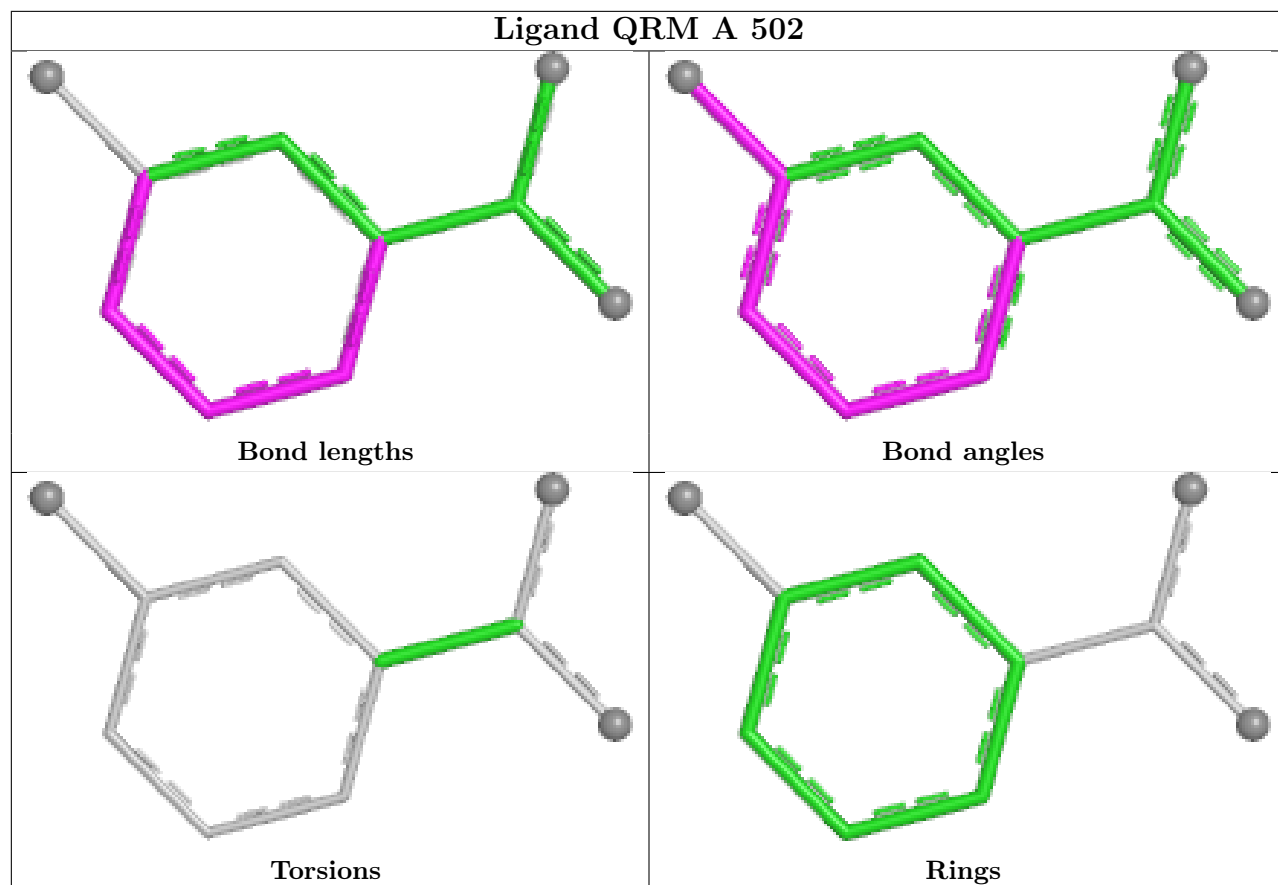
There are no ring outliers.

6 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	502	QRM	1	0
2	A	501	PLP	1	0
3	B	502	QRM	1	0
2	B	501	PLP	1	0
3	A	502	QRM	1	0
2	C	501	PLP	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

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	A	404/404 (100%)	1.06	70 (17%) 5 4	14, 25, 43, 87	0
1	B	404/404 (100%)	-0.22	22 (5%) 32 34	5, 15, 32, 61	0
1	C	404/404 (100%)	1.09	68 (16%) 5 5	13, 25, 45, 86	0
All	All	1212/1212 (100%)	0.64	160 (13%) 8 8	5, 22, 43, 87	0

All (160) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	388	TRP	7.9
1	C	388	TRP	6.4
1	A	41	ASP	5.9
1	A	37	PRO	5.3
1	B	257	GLN	5.2
1	C	255	ARG	5.1
1	A	388	TRP	5.0
1	C	45	GLU	4.8
1	C	254	THR	4.7
1	B	367	VAL	4.6
1	B	347	GLU	4.5
1	A	386	LYS	4.5
1	B	365	SER	4.5
1	A	275	TRP	4.5
1	A	45	GLU	4.4
1	C	367	VAL	4.3
1	B	405	LYS	4.3
1	C	386	LYS	4.3
1	B	37	PRO	4.2
1	C	347	GLU	4.1
1	A	38	PRO	4.1
1	C	385	THR	4.1
1	C	41	ASP	4.1

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Mol	Chain	Res	Type	RSRZ
1	A	341	GLU	4.1
1	C	275	TRP	4.0
1	B	41	ASP	4.0
1	B	254	THR	3.9
1	B	385	THR	3.9
1	A	126	TYR	3.8
1	A	130	LEU	3.8
1	C	48	TYR	3.7
1	C	341	GLU	3.7
1	B	430	GLU	3.7
1	C	37	PRO	3.7
1	A	385	THR	3.7
1	B	387	ASP	3.6
1	C	36	GLY	3.6
1	C	87	ALA	3.5
1	B	45	GLU	3.5
1	B	255	ARG	3.5
1	A	347	GLU	3.5
1	A	334	ILE	3.4
1	A	365	SER	3.4
1	B	341	GLU	3.4
1	C	351	LYS	3.4
1	B	36	GLY	3.4
1	C	126	TYR	3.4
1	A	36	GLY	3.3
1	A	86	SER	3.3
1	B	351	LYS	3.3
1	B	82	LEU	3.2
1	A	166	TYR	3.2
1	C	86	SER	3.2
1	A	405	LYS	3.2
1	A	43	ILE	3.1
1	C	334	ILE	3.1
1	A	85	TYR	3.1
1	C	133	TYR	3.0
1	C	436	ILE	3.0
1	A	48	TYR	3.0
1	A	254	THR	3.0
1	C	39	THR	3.0
1	C	130	LEU	3.0
1	A	351	LYS	3.0
1	A	258	VAL	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	38	PRO	2.9
1	C	85	TYR	2.9
1	C	405	LYS	2.9
1	A	133	TYR	2.9
1	C	166	TYR	2.8
1	C	320	GLY	2.8
1	A	87	ALA	2.8
1	A	156	TRP	2.8
1	A	387	ASP	2.7
1	C	131	PHE	2.7
1	A	255	ARG	2.7
1	A	128	THR	2.6
1	C	43	ILE	2.6
1	C	314	ILE	2.6
1	A	129	LYS	2.6
1	A	312	LEU	2.6
1	A	345	LEU	2.6
1	C	55	TYR	2.6
1	C	60	VAL	2.6
1	C	430	GLU	2.6
1	A	257	GLN	2.6
1	A	60	VAL	2.6
1	B	383	LYS	2.6
1	C	74	GLU	2.6
1	A	367	VAL	2.5
1	C	304	VAL	2.5
1	A	58	LEU	2.5
1	A	134	HIS	2.5
1	A	366	ASP	2.5
1	B	366	ASP	2.5
1	A	352	LEU	2.5
1	C	345	LEU	2.5
1	C	346	ALA	2.5
1	A	131	PHE	2.5
1	C	305	LEU	2.5
1	C	312	LEU	2.5
1	C	258	VAL	2.5
1	A	49	LYS	2.4
1	A	409	GLY	2.4
1	A	305	LEU	2.4
1	B	386	LYS	2.4
1	C	51	GLY	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	384	GLU	2.4
1	C	274	ARG	2.4
1	A	383	LYS	2.4
1	C	319	HIS	2.4
1	C	44	PHE	2.4
1	A	382	ILE	2.4
1	A	61	ALA	2.4
1	C	387	ASP	2.4
1	A	82	LEU	2.3
1	B	382	ILE	2.3
1	C	61	ALA	2.3
1	C	168	ALA	2.3
1	A	251	GLU	2.3
1	C	49	LYS	2.3
1	C	134	HIS	2.3
1	A	340	LEU	2.3
1	A	168	ALA	2.3
1	C	129	LYS	2.3
1	A	212	LEU	2.3
1	A	430	GLU	2.2
1	A	418	LEU	2.2
1	C	259	LEU	2.2
1	A	358	ASN	2.2
1	C	192	THR	2.2
1	A	304	VAL	2.2
1	A	62	LEU	2.2
1	C	62	LEU	2.2
1	C	132	ASN	2.2
1	A	50	TYR	2.2
1	C	365	SER	2.2
1	A	320	GLY	2.2
1	A	333	ALA	2.2
1	A	55	TYR	2.2
1	C	156	TRP	2.1
1	C	42	ASP	2.1
1	C	40	SER	2.1
1	C	344	ASN	2.1
1	A	119	VAL	2.1
1	C	246	LEU	2.1
1	C	340	LEU	2.1
1	A	59	PRO	2.1
1	A	314	ILE	2.1

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Mol	Chain	Res	Type	RSRZ
1	C	409	GLY	2.1
1	A	339	VAL	2.1
1	C	160	VAL	2.1
1	C	333	ALA	2.1
1	C	382	ILE	2.1
1	A	313	THR	2.1
1	C	50	TYR	2.1
1	A	274	ARG	2.1
1	A	259	LEU	2.0
1	A	39	THR	2.0
1	C	165	LYS	2.0

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

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

6.3 Carbohydrates [i](#)

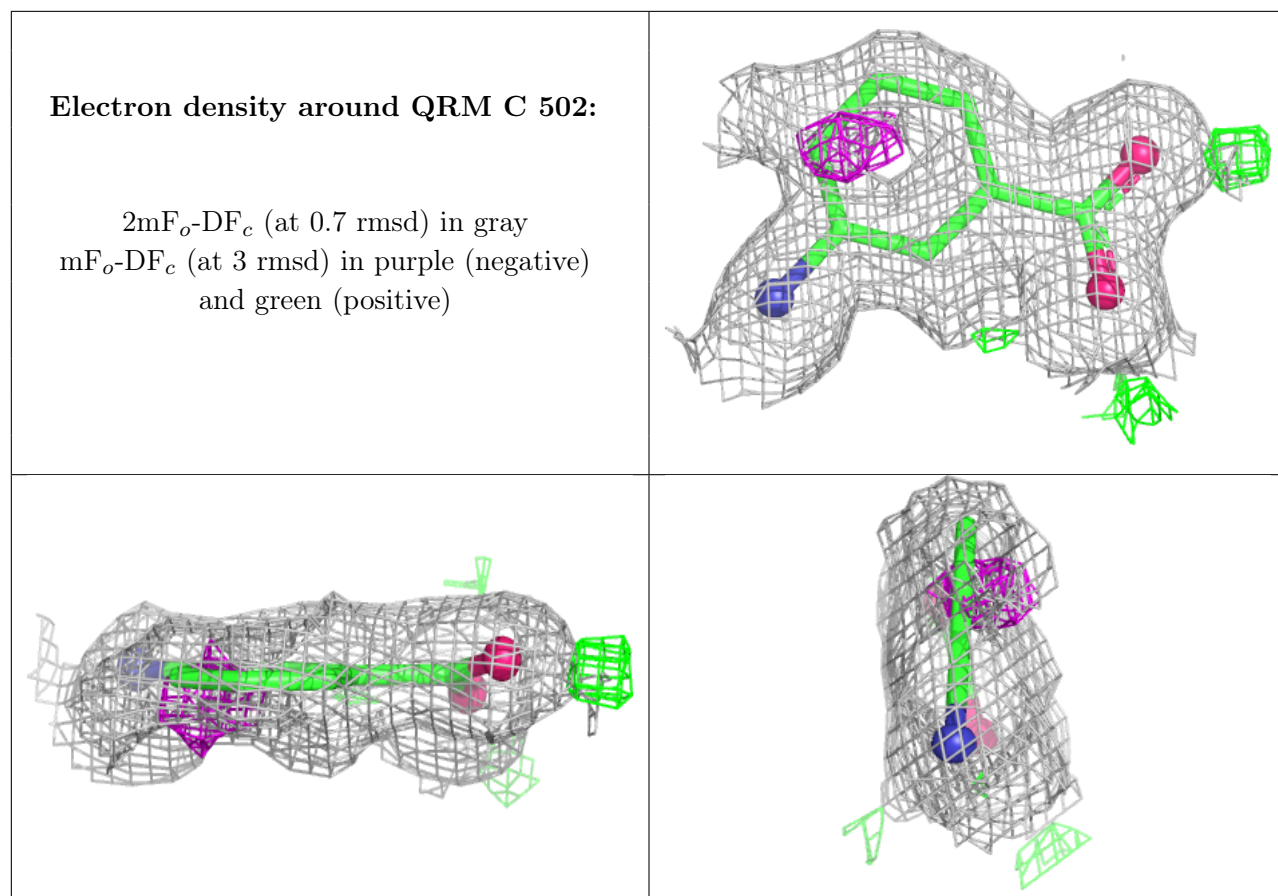
There are no monosaccharides in this entry.

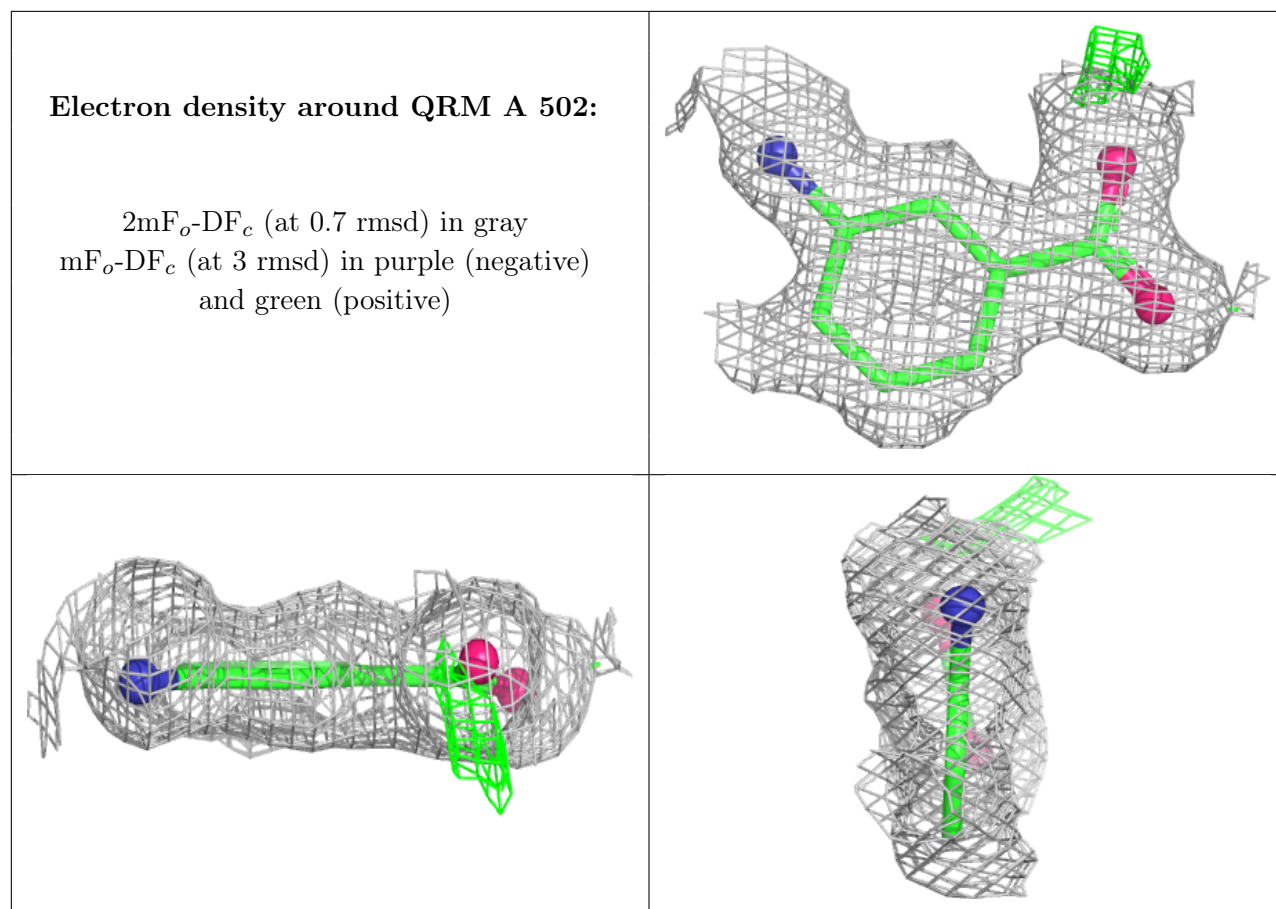
6.4 Ligands [i](#)

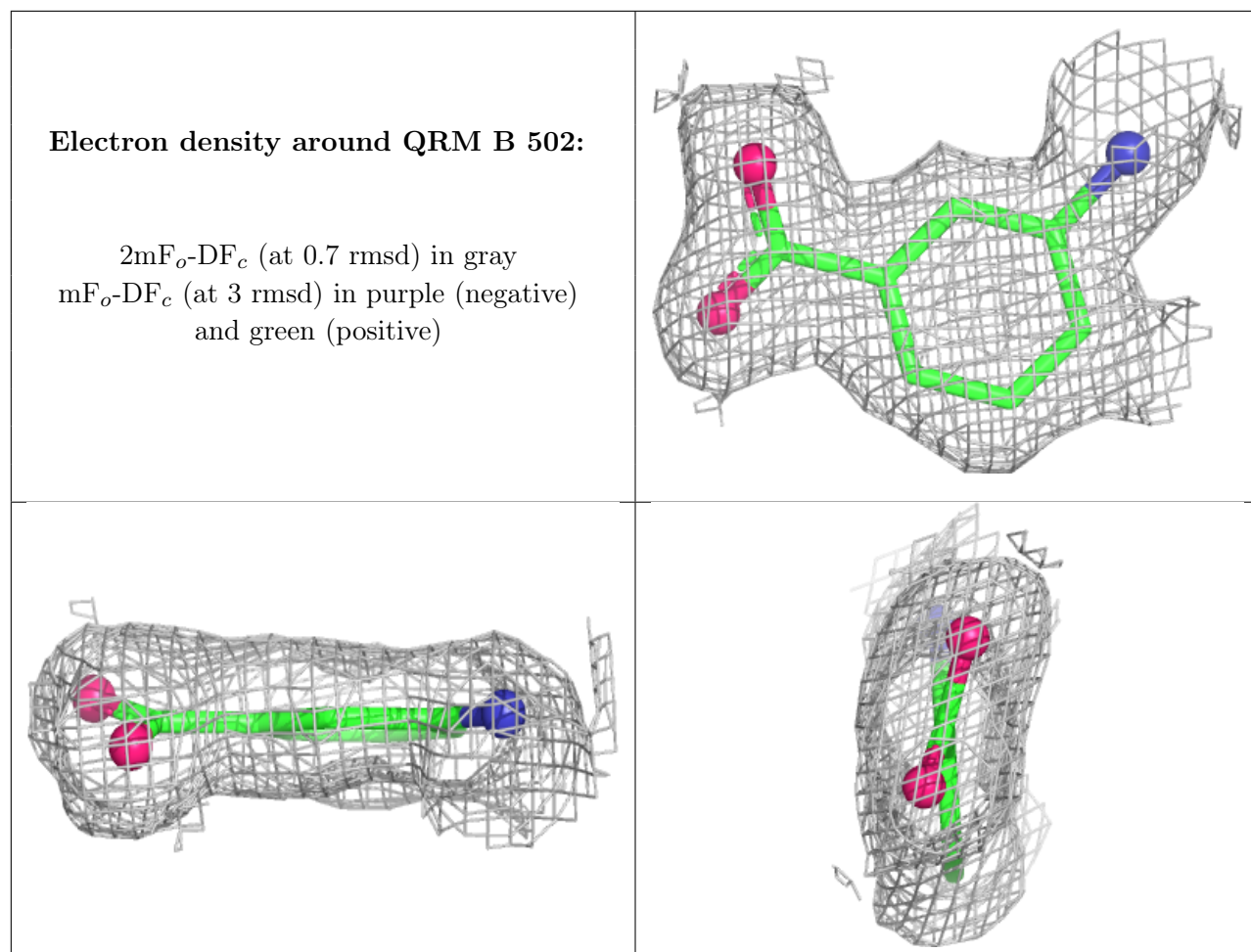
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	QRM	C	502	10/10	0.81	0.13	18,24,26,27	0
3	QRM	A	502	10/10	0.84	0.11	19,23,25,27	0
2	PLP	A	501	15/16	0.94	0.09	15,17,21,21	0
2	PLP	C	501	15/16	0.94	0.09	12,16,19,20	0
3	QRM	B	502	10/10	0.95	0.06	15,18,19,21	0
2	PLP	B	501	15/16	0.98	0.06	6,9,12,13	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.







6.5 Other polymers [i](#)

There are no such residues in this entry.