



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 20, 2022 – 01:08 pm BST

PDB ID : 7R3C
Title : VX-inhibited acetylcholinesterase in complex with 2-((hydroxyimino)methyl)-1-(5-(4-methyl-3-nitrobenzamido)pentyl)pyridinium
Authors : Forsgren, N.; Lindgren, C.; Edvinsson, L.; Linusson, A.; Ekstrom, F.
Deposited on : 2022-02-07
Resolution : 2.40 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 following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.27
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0267
CCP4 : 7.1.010 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.27

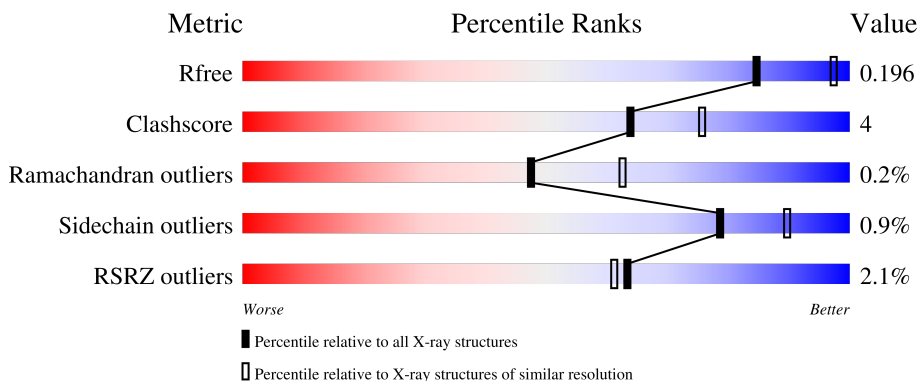
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION


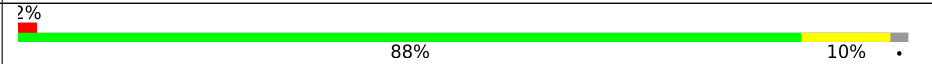
The reported resolution of this entry is 2.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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	543	 2% 88% 10% ..
1	B	543	 2% 88% 10% .

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	NAG	A	602	-	-	-	X

2 Entry composition [i](#)

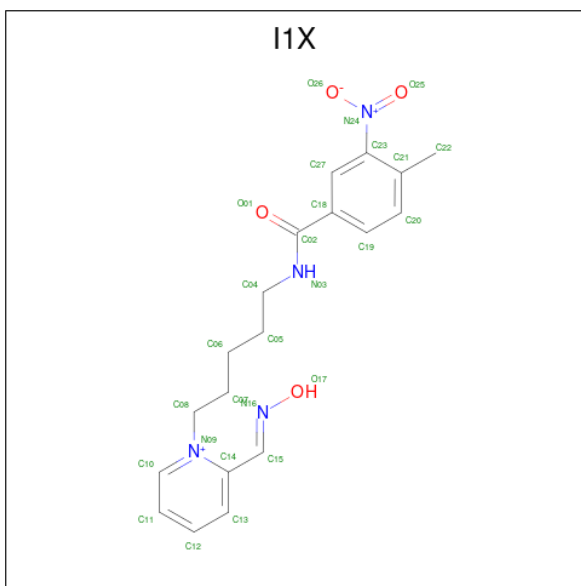
There are 7 unique types of molecules in this entry. The entry contains 8859 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Acetylcholinesterase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	P				S
1	A	535	Total	C	N	O	P	S	0	4	0
			4206	2698	731	762	1	14			
1	B	532	Total	C	N	O	P	S	0	3	0
			4167	2676	717	759	1	14			

- Molecule 2 is 4-methyl-3-nitro- {N}-[(2 {E},4 {E})-5-[2-[(oxidanylamino)methyl]pyridin-1-yl]penta-2,4-dienyl]benzamide (three-letter code: I1X) (formula: C₁₉H₂₃N₄O₄) (labeled as "Ligand of Interest" by depositor).



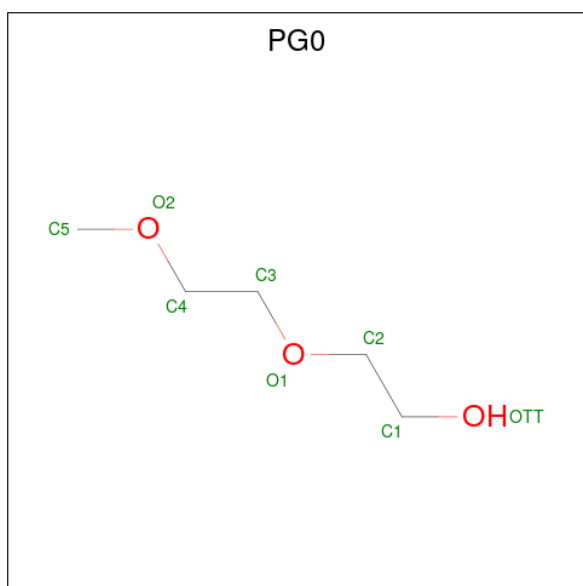
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total	C	N	O	0	0
			27	19	4	4		
2	B	1	Total	C	N	O	0	0
			27	19	4	4		

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
			Total	C	N			O
3	A	1	14	8	1	5	0	0
3	A	1	14	8	1	5	0	0

- Molecule 4 is 2-(2-METHOXYETHOXY)ETHANOL (three-letter code: PG0) (formula: $C_5H_{12}O_3$).



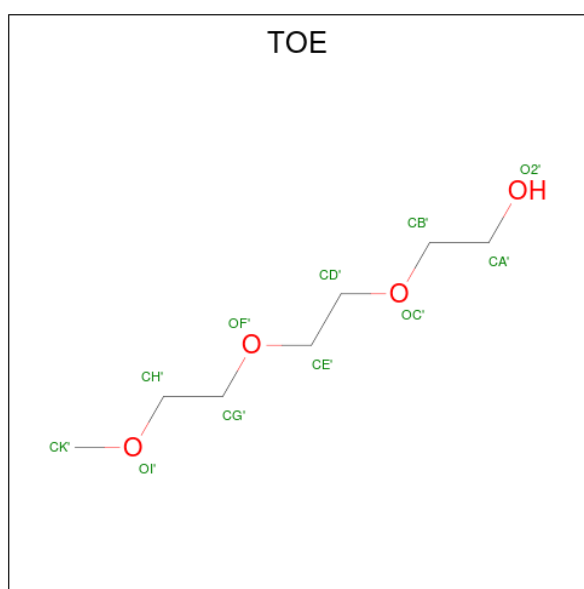
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
4	A	1	8	5	3	0	0

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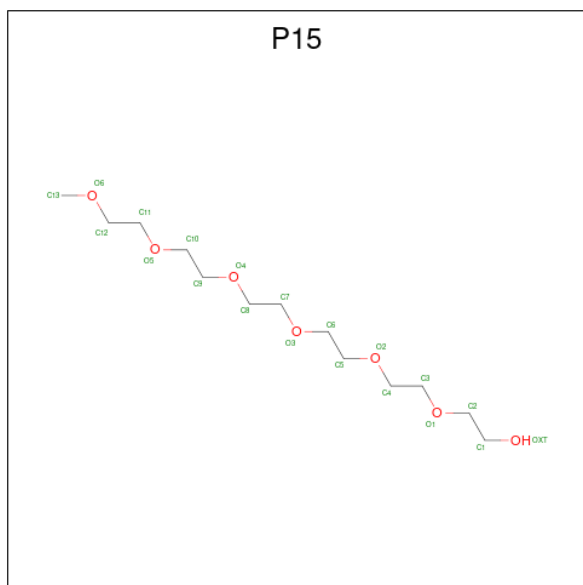
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			8	5	3		
4	A	1	Total	C	O	0	0
			8	5	3		
4	A	1	Total	C	O	0	0
			8	5	3		
4	B	1	Total	C	O	0	0
			8	5	3		
4	B	1	Total	C	O	0	0
			8	5	3		
4	B	1	Total	C	O	0	0
			8	5	3		

- Molecule 5 is 2-[2-(2-METHOXY-ETHOXY)-ETHOXY]-ETHOXYL (three-letter code: TOE) (formula: C₇H₁₆O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	C	O	0	0
			11	7	4		
5	B	1	Total	C	O	0	0
			11	7	4		
5	B	1	Total	C	O	0	0
			11	7	4		

- Molecule 6 is 2,5,8,11,14,17-HEXAOXANONADECAN-19-OL (three-letter code: P15) (formula: C₁₃H₂₈O₇).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	C O	0	0
			20	13 7		

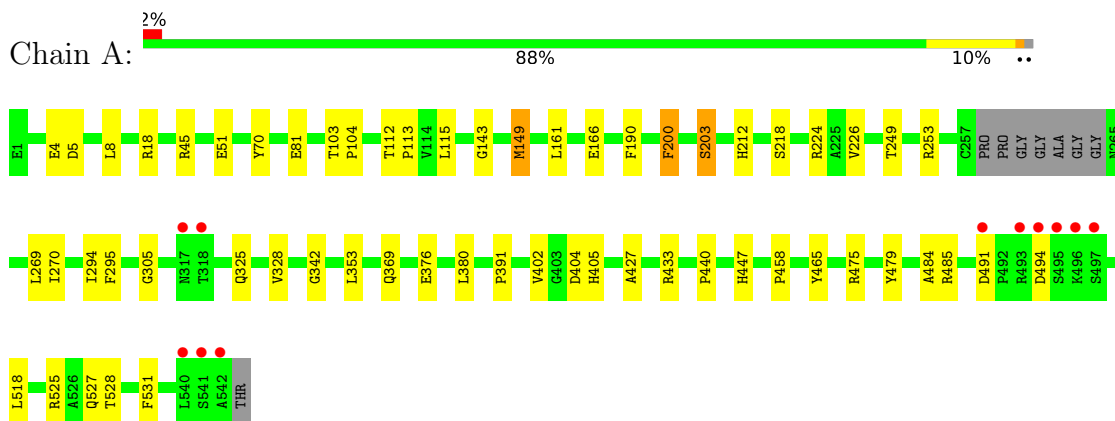
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	178	Total	O	0	0
			178	178		
7	B	117	Total	O	0	0
			117	117		

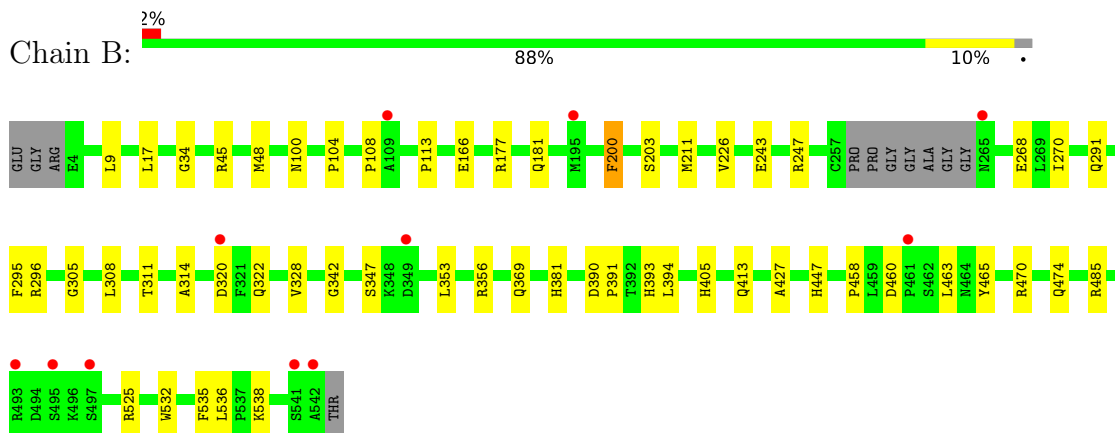
3 Residue-property plots [i](#)

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: Acetylcholinesterase



- Molecule 1: Acetylcholinesterase



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	79.15Å 112.09Å 226.85Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.03 – 2.40 29.03 – 2.40	Depositor EDS
% Data completeness (in resolution range)	97.7 (29.03-2.40) 97.8 (29.03-2.40)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.30 (at 2.39Å)	Xtrriage
Refinement program	PHENIX 1.12_2829, PHENIX 1.12_2829	Depositor
R, R_{free}	0.169 , 0.197 0.168 , 0.196	Depositor DCC
R_{free} test set	1549 reflections (1.99%)	wwPDB-VP
Wilson B-factor (Å ²)	40.0	Xtrriage
Anisotropy	0.879	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	(Not available) , (Not available)	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	8859	wwPDB-VP
Average B, all atoms (Å ²)	51.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.64% of the height of the origin peak. No significant pseudotranslation is detected.*

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: NAG, P15, SVX, TOE, I1X, PG0

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	0.39	0/4329	0.55	0/5912
1	B	0.35	0/4286	0.54	0/5857
All	All	0.37	0/8615	0.55	0/11769

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4206	0	4098	40	0
1	B	4167	0	4051	33	0
2	A	27	0	0	2	0
2	B	27	0	0	1	0
3	A	28	0	26	0	0
4	A	32	0	48	1	0
4	B	24	0	36	2	0
5	A	11	0	16	0	0
5	B	22	0	32	0	0
6	A	20	0	28	2	0
7	A	178	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	117	0	0	0	0
All	All	8859	0	8335	71	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.

All (71) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:479:TYR:OH	1:A:518:LEU:HD13	1.57	1.03
1:A:479:TYR:OH	1:A:518:LEU:CD1	2.26	0.84
1:B:311:THR:HG23	1:B:314:ALA:H	1.49	0.77
1:A:475:ARG:NH2	1:A:518:LEU:HD12	2.01	0.75
1:A:113:PRO:HG2	1:A:485:ARG:HG2	1.72	0.71
1:A:149:MET:O	1:A:149:MET:HG2	1.92	0.69
1:B:268:GLU:N	1:B:268:GLU:OE2	2.26	0.69
1:A:475:ARG:HH21	1:A:518:LEU:CD1	2.09	0.64
1:B:353:LEU:HB3	1:B:391:PRO:HB2	1.80	0.64
1:B:460:ASP:HB3	1:B:463:LEU:HD12	1.82	0.62
1:A:380:LEU:HD12	1:B:535:PHE:HB2	1.84	0.59
1:A:479:TYR:HH	1:A:518:LEU:HD13	1.63	0.59
1:A:161:LEU:HD11	1:A:269:LEU:HD22	1.86	0.58
1:B:470:ARG:O	1:B:474:GLN:HG3	2.04	0.58
1:A:475:ARG:NH2	1:A:518:LEU:CD1	2.65	0.57
1:B:296:ARG:HH22	1:B:405:HIS:HE1	1.51	0.57
1:B:113:PRO:HG3	1:B:485:ARG:HG2	1.86	0.55
1:A:45[A]:ARG:NH1	1:A:51:GLU:OE1	2.40	0.54
1:A:224:ARG:HG2	1:A:325:GLN:HB2	1.88	0.54
1:A:4:GLU:OE2	1:A:18:ARG:NH1	2.37	0.54
1:B:104:PRO:HG2	1:B:108:PRO:HG3	1.90	0.53
1:A:376:GLU:HG3	1:B:538:LYS:HE3	1.90	0.52
1:A:433:ARG:NH2	1:A:440:PRO:O	2.42	0.52
1:A:491:ASP:HB3	1:A:494:ASP:HB3	1.91	0.52
1:B:328:VAL:O	1:B:427:ALA:HA	2.10	0.52
1:B:211:MET:HG2	1:B:308:LEU:HD21	1.91	0.52
1:B:447:HIS:O	2:B:601:I1X:O17	2.29	0.51
1:B:413:GLN:HG3	4:B:602:PG0:H21	1.92	0.51
1:A:249:THR:O	1:A:253:ARG:HG3	2.11	0.51
1:A:447:HIS:O	2:A:601:I1X:O17	2.29	0.49
1:B:320:ASP:OD1	1:B:322:GLN:HG3	2.13	0.49
1:A:404:ASP:OD1	1:A:525:ARG:NH1	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:200:PHE:CB	1:B:226:VAL:HB	2.43	0.48
1:B:296:ARG:HH22	1:B:405:HIS:CE1	2.31	0.47
6:A:609:P15:H12	1:B:381:HIS:O	2.16	0.46
1:B:390:ASP:OD1	1:B:393:HIS:ND1	2.38	0.46
1:A:328:VAL:O	1:A:427:ALA:HA	2.16	0.46
1:A:200:PHE:HB2	1:A:226:VAL:HB	1.98	0.46
1:A:203:SVX:H1C1	2:A:601:I1X:C05	2.46	0.46
1:A:475:ARG:HH22	1:A:518:LEU:HD12	1.78	0.46
1:A:527:GLN:HE21	6:A:609:P15:H11	1.81	0.46
1:A:200:PHE:CB	1:A:226:VAL:HB	2.46	0.46
1:B:458:PRO:HA	1:B:465:TYR:CD2	2.50	0.45
1:A:369[B]:GLN:HE22	1:A:405:HIS:CE1	2.34	0.45
1:B:177:ARG:O	1:B:181:GLN:HG3	2.17	0.45
1:B:166:GLU:HG2	1:B:270:ILE:HD13	1.98	0.45
1:B:291:GLN:OE1	1:B:369[A]:GLN:NE2	2.49	0.45
1:A:5:ASP:HB3	1:A:8:LEU:HD12	1.99	0.45
1:A:294:ILE:HD11	1:A:402:VAL:HG21	1.99	0.44
1:A:112:THR:HG21	1:A:143:GLY:O	2.17	0.44
1:A:212:HIS:HD2	1:A:218:SER:OG	2.01	0.44
1:B:243:GLU:O	1:B:247:ARG:HG3	2.18	0.43
1:A:115:LEU:HD21	1:A:484:ALA:HB2	2.00	0.43
1:B:305:GLY:HA3	4:B:604:PG0:H22	2.00	0.43
1:A:353:LEU:HB3	1:A:391:PRO:HB2	1.99	0.43
1:A:166:GLU:HB2	1:A:270:ILE:HD13	2.01	0.43
1:A:81:GLU:H	1:A:81:GLU:CD	2.22	0.42
1:B:34:GLY:H	1:B:100:ASN:HD22	1.66	0.42
1:A:305:GLY:HA3	4:A:604:PG0:H41	2.02	0.42
1:A:376:GLU:O	1:A:380:LEU:HG	2.20	0.42
1:B:9:LEU:HD23	1:B:17:LEU:O	2.20	0.42
1:A:104:PRO:HG3	1:A:143:GLY:HA2	2.02	0.41
1:A:458:PRO:HA	1:A:465:TYR:CD2	2.55	0.41
1:B:9:LEU:HD23	1:B:9:LEU:HA	1.92	0.41
1:B:356:ARG:HA	1:B:394:LEU:HD13	2.03	0.41
1:A:103:THR:HG21	1:A:190:PHE:HB3	2.01	0.41
1:A:528:THR:O	1:A:531:PHE:HB3	2.20	0.41
1:B:532:TRP:CE3	1:B:536:LEU:HD12	2.56	0.40
1:B:200:PHE:HB2	1:B:226:VAL:HB	2.02	0.40
1:B:45:ARG:HD2	1:B:45:ARG:HA	1.75	0.40
1:B:48:MET:SD	1:B:166:GLU:HA	2.61	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	534/543 (98%)	516 (97%)	17 (3%)	1 (0%)	47	62
1	B	530/543 (98%)	512 (97%)	17 (3%)	1 (0%)	47	62
All	All	1064/1086 (98%)	1028 (97%)	34 (3%)	2 (0%)	47	62

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	342	GLY
1	B	342	GLY

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	441/442 (100%)	437 (99%)	4 (1%)	78	90
1	B	437/442 (99%)	433 (99%)	4 (1%)	78	90
All	All	878/884 (99%)	870 (99%)	8 (1%)	78	90

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	70	TYR
1	A	149	MET
1	A	200	PHE
1	A	295	PHE

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Mol	Chain	Res	Type
1	B	200	PHE
1	B	295	PHE
1	B	347	SER
1	B	525	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	212	HIS
1	B	100	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](#)

2 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
1	SVX	A	203	1	10,11,12	1.34	3 (30%)	9,14,16	1.68	1 (11%)
1	SVX	B	203	1	10,11,12	1.48	2 (20%)	9,14,16	2.44	3 (33%)

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
1	SVX	A	203	1	-	4/9/12/14	-
1	SVX	B	203	1	-	3/9/12/14	-

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	203	SVX	P1-OG	2.89	1.61	1.58
1	B	203	SVX	P1-O6	2.67	1.51	1.47
1	A	203	SVX	P1-O6	2.18	1.50	1.47
1	A	203	SVX	P1-C4	2.17	1.82	1.77
1	A	203	SVX	P1-OG	2.01	1.60	1.58

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	203	SVX	OG-CB-CA	5.31	113.31	108.14
1	A	203	SVX	O5-P1-C4	3.50	115.08	105.41
1	B	203	SVX	O5-P1-O6	-2.96	104.64	113.10
1	B	203	SVX	O5-P1-C4	2.87	113.35	105.41

There are no chirality outliers.

All (7) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	203	SVX	N-CA-CB-OG
1	A	203	SVX	C2-O5-P1-C4
1	B	203	SVX	N-CA-CB-OG
1	B	203	SVX	C2-O5-P1-C4
1	B	203	SVX	C2-O5-P1-O6
1	A	203	SVX	C2-O5-P1-O6
1	A	203	SVX	C1-C2-O5-P1

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	203	SVX	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

15 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
4	PG0	A	605	-	7,7,7	0.59	0	6,6,6	0.82	0
3	NAG	A	602	1	14,14,15	1.39	1 (7%)	17,19,21	1.32	2 (11%)
2	I1X	B	601	-	27,28,28	1.89	4 (14%)	29,36,36	1.42	3 (10%)
4	PG0	A	606	-	7,7,7	0.59	0	6,6,6	0.83	0
5	TOE	B	605	-	10,10,10	0.62	0	9,9,9	0.90	0
6	P15	A	609	-	19,19,19	0.56	0	18,18,18	0.92	0
5	TOE	A	608	-	10,10,10	0.59	0	9,9,9	0.84	0
4	PG0	B	603	-	7,7,7	0.61	0	6,6,6	0.68	0
4	PG0	A	604	-	7,7,7	0.61	0	6,6,6	0.75	0
4	PG0	A	607	-	7,7,7	0.62	0	6,6,6	0.81	0
4	PG0	B	602	-	7,7,7	0.53	0	6,6,6	0.84	0
4	PG0	B	604	-	7,7,7	0.59	0	6,6,6	0.75	0
3	NAG	A	603	1	14,14,15	0.62	0	17,19,21	0.56	0
5	TOE	B	606	-	10,10,10	0.60	0	9,9,9	0.77	0
2	I1X	A	601	-	27,28,28	1.86	4 (14%)	29,36,36	1.45	4 (13%)

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	PG0	A	605	-	-	1/5/5/5	-
3	NAG	A	602	1	-	2/6/23/26	0/1/1/1
2	I1X	B	601	-	-	7/18/20/20	0/2/2/2
4	PG0	A	606	-	-	4/5/5/5	-
5	TOE	B	605	-	-	5/8/8/8	-
6	P15	A	609	-	-	6/17/17/17	-
5	TOE	A	608	-	-	5/8/8/8	-
4	PG0	B	603	-	-	4/5/5/5	-
4	PG0	A	604	-	-	3/5/5/5	-
4	PG0	A	607	-	-	4/5/5/5	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	PG0	B	602	-	-	3/5/5/5	-
4	PG0	B	604	-	-	5/5/5/5	-
3	NAG	A	603	1	-	1/6/23/26	0/1/1/1
5	TOE	B	606	-	-	5/8/8/8	-
2	I1X	A	601	-	-	4/18/20/20	0/2/2/2

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	601	I1X	C02-N03	6.56	1.48	1.33
2	A	601	I1X	C02-N03	6.55	1.48	1.33
2	A	601	I1X	O25-N24	5.06	1.31	1.22
2	B	601	I1X	O25-N24	4.94	1.31	1.22
3	A	602	NAG	C1-C2	4.74	1.59	1.52
2	B	601	I1X	O17-N16	-3.32	1.33	1.40
2	A	601	I1X	O17-N16	-2.99	1.33	1.40
2	A	601	I1X	C15-N16	2.13	1.31	1.27
2	B	601	I1X	C15-N16	2.02	1.31	1.27

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	I1X	O17-N16-C15	4.18	119.23	111.86
2	A	601	I1X	O17-N16-C15	3.99	118.91	111.86
2	B	601	I1X	C07-C08-N09	3.98	119.73	112.31
3	A	602	NAG	C1-O5-C5	3.91	117.49	112.19
2	A	601	I1X	C06-C07-C08	3.46	125.47	112.32
2	B	601	I1X	C13-C14-N09	2.22	120.24	117.52
3	A	602	NAG	C2-N2-C7	2.11	125.90	122.90
2	A	601	I1X	C13-C14-C15	-2.09	116.63	121.24
2	A	601	I1X	C06-C05-C04	2.04	123.21	113.56

There are no chirality outliers.

All (59) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	I1X	C14-C15-N16-O17
2	B	601	I1X	C13-C14-C15-N16
2	B	601	I1X	N09-C14-C15-N16
2	B	601	I1X	C07-C08-N09-C10

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Mol	Chain	Res	Type	Atoms
5	B	606	TOE	OF'-CG'-CH'-OI'
2	B	601	I1X	C05-C06-C07-C08
5	B	605	TOE	OC'-CD'-CE'-OF'
4	B	604	PG0	O1-C3-C4-O2
4	B	603	PG0	O1-C3-C4-O2
3	A	602	NAG	O5-C5-C6-O6
2	A	601	I1X	C06-C07-C08-N09
3	A	602	NAG	C4-C5-C6-O6
5	B	606	TOE	OC'-CD'-CE'-OF'
5	A	608	TOE	OF'-CG'-CH'-OI'
5	A	608	TOE	OC'-CD'-CE'-OF'
6	A	609	P15	O5-C11-C12-O6
5	A	608	TOE	O2'-CA'-CB'-OC'
6	A	609	P15	O5-C10-C9-O4
2	B	601	I1X	C06-C07-C08-N09
4	A	604	PG0	OTT-C1-C2-O1
4	A	606	PG0	OTT-C1-C2-O1
4	B	603	PG0	OTT-C1-C2-O1
2	A	601	I1X	C04-C05-C06-C07
5	B	606	TOE	O2'-CA'-CB'-OC'
3	A	603	NAG	O5-C5-C6-O6
2	B	601	I1X	C07-C08-N09-C14
5	B	605	TOE	OF'-CG'-CH'-OI'
4	A	606	PG0	C3-C4-O2-C5
4	B	603	PG0	C3-C4-O2-C5
2	A	601	I1X	C05-C06-C07-C08
4	B	604	PG0	OTT-C1-C2-O1
5	B	605	TOE	CE'-CD'-OC'-CB'
5	B	606	TOE	CH'-CG'-OF'-CE'
4	B	602	PG0	C1-C2-O1-C3
6	A	609	P15	C3-C4-O2-C5
5	A	608	TOE	CD'-CE'-OF'-CG'
4	A	606	PG0	C4-C3-O1-C2
6	A	609	P15	C10-C9-O4-C8
4	A	606	PG0	O1-C3-C4-O2
4	B	604	PG0	C3-C4-O2-C5
4	B	603	PG0	C4-C3-O1-C2
4	B	604	PG0	C4-C3-O1-C2
4	A	605	PG0	OTT-C1-C2-O1
4	A	607	PG0	C4-C3-O1-C2
4	B	602	PG0	C3-C4-O2-C5
2	B	601	I1X	N03-C04-C05-C06

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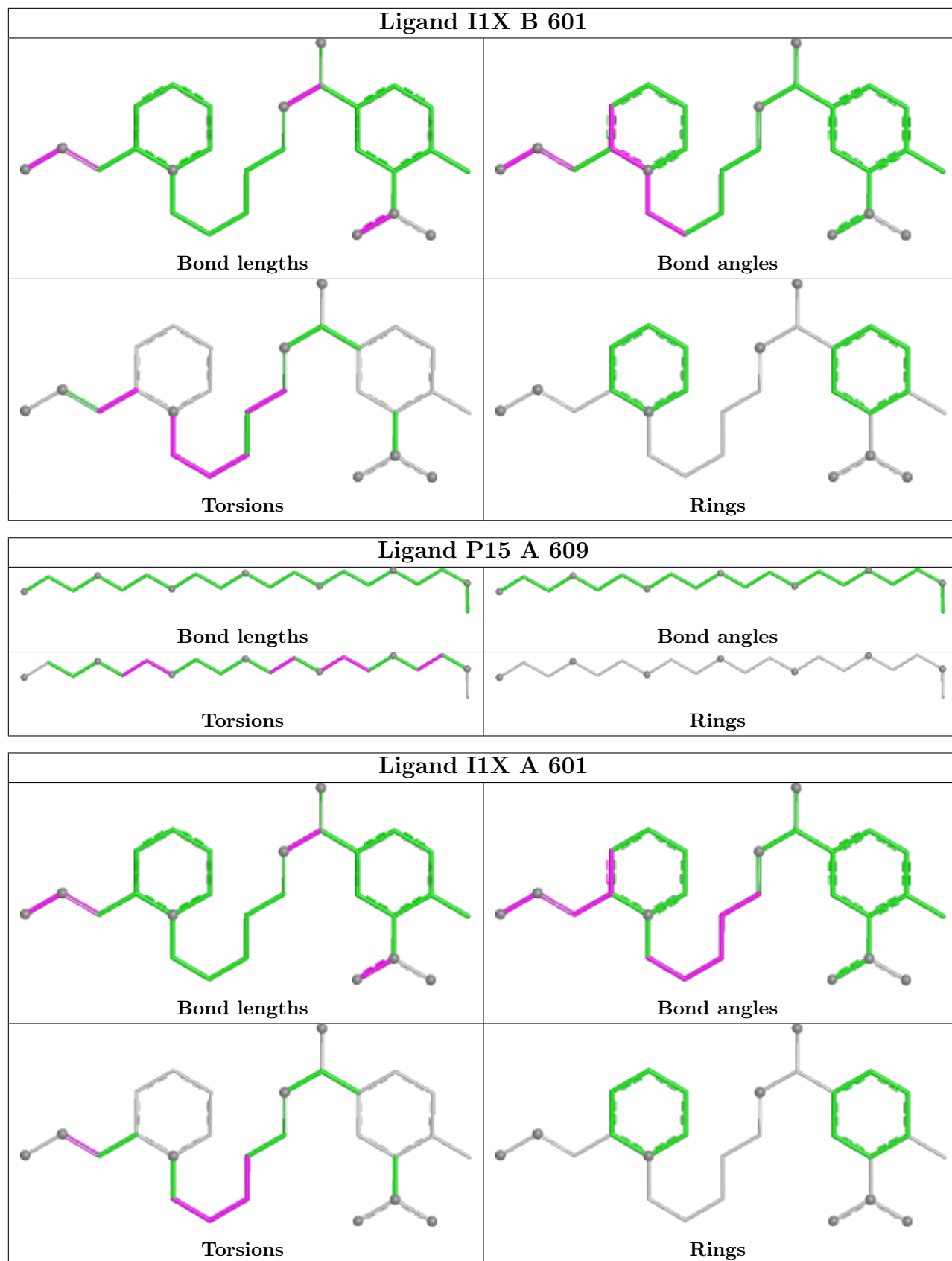
Mol	Chain	Res	Type	Atoms
5	B	606	TOE	CE'-CD'-OC'-CB'
4	A	607	PG0	OTT-C1-C2-O1
5	A	608	TOE	CE'-CD'-OC'-CB'
6	A	609	P15	O3-C7-C8-O4
4	B	604	PG0	C1-C2-O1-C3
5	B	605	TOE	CD'-CE'-OF'-CG'
4	A	607	PG0	O1-C3-C4-O2
5	B	605	TOE	CG'-CH'-OI'-CK'
4	A	604	PG0	C3-C4-O2-C5
4	A	607	PG0	C1-C2-O1-C3
4	B	602	PG0	O1-C3-C4-O2
6	A	609	P15	O1-C3-C4-O2
4	A	604	PG0	O1-C3-C4-O2

There are no ring outliers.

6 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	601	I1X	1	0
6	A	609	P15	2	0
4	A	604	PG0	1	0
4	B	602	PG0	1	0
4	B	604	PG0	1	0
2	A	601	I1X	2	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	534/543 (98%)	-0.01	11 (2%) 63 61	31, 45, 75, 131	0
1	B	531/543 (97%)	0.05	11 (2%) 63 61	33, 52, 78, 111	0
All	All	1065/1086 (98%)	0.02	22 (2%) 63 61	31, 48, 77, 131	0

All (22) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	495	SER	5.1
1	B	497	SER	4.8
1	A	496	LYS	3.9
1	A	542	ALA	3.4
1	A	540	LEU	3.1
1	B	542	ALA	3.1
1	A	497	SER	3.0
1	A	494	ASP	3.0
1	B	495	SER	2.8
1	A	541	SER	2.7
1	A	493	ARG	2.6
1	A	318	THR	2.5
1	B	541	SER	2.3
1	B	109	ALA	2.3
1	B	265	ASN	2.2
1	A	317	ASN	2.2
1	B	461	PRO	2.1
1	A	491	ASP	2.1
1	B	349	ASP	2.1
1	B	195	MET	2.0
1	B	493	ARG	2.0
1	B	320	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	SVX	A	203	12/13	0.96	0.21	34,38,70,74	0
1	SVX	B	203	12/13	0.96	0.17	35,41,66,69	0

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

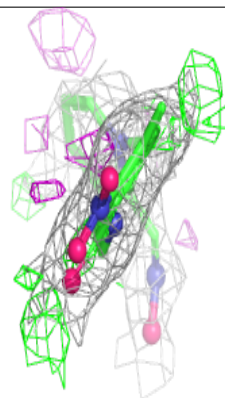
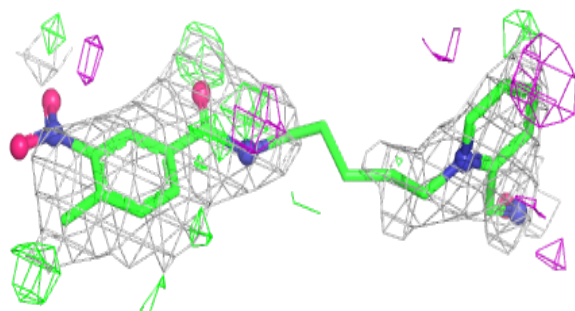
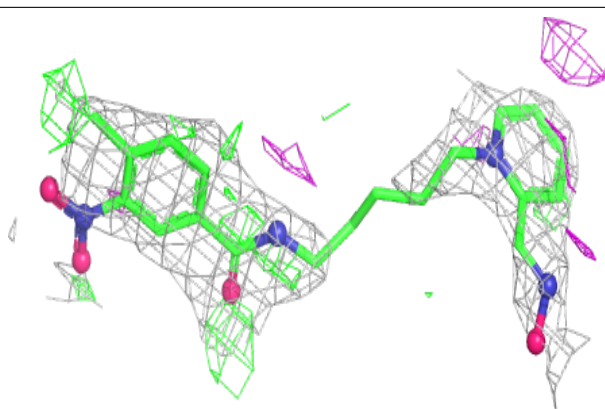
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	PG0	B	602	8/8	0.64	0.27	76,91,93,94	0
4	PG0	A	605	8/8	0.67	0.37	84,93,96,97	0
3	NAG	A	602	14/15	0.71	0.47	76,84,90,91	0
4	PG0	A	607	8/8	0.78	0.38	89,91,94,97	0
2	I1X	A	601	27/27	0.79	0.30	54,67,90,95	27
3	NAG	A	603	14/15	0.81	0.36	80,94,105,106	0
4	PG0	B	604	8/8	0.81	0.23	63,81,88,89	0
4	PG0	A	606	8/8	0.82	0.22	66,74,79,83	0
5	TOE	A	608	11/11	0.83	0.18	59,75,82,82	0
2	I1X	B	601	27/27	0.84	0.28	63,82,99,100	27
5	TOE	B	605	11/11	0.84	0.39	85,87,94,96	0
5	TOE	B	606	11/11	0.86	0.18	65,70,82,84	0
4	PG0	B	603	8/8	0.87	0.14	60,66,74,74	0
4	PG0	A	604	8/8	0.90	0.24	64,67,77,80	0
6	P15	A	609	20/20	0.93	0.22	42,64,80,83	0

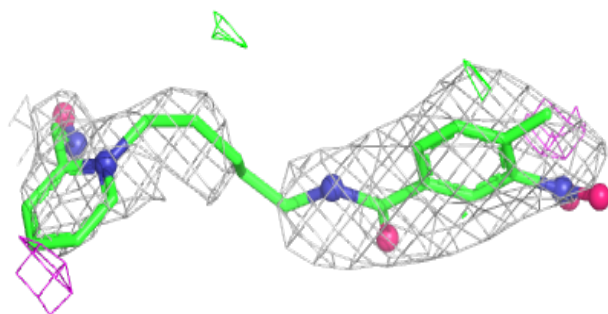
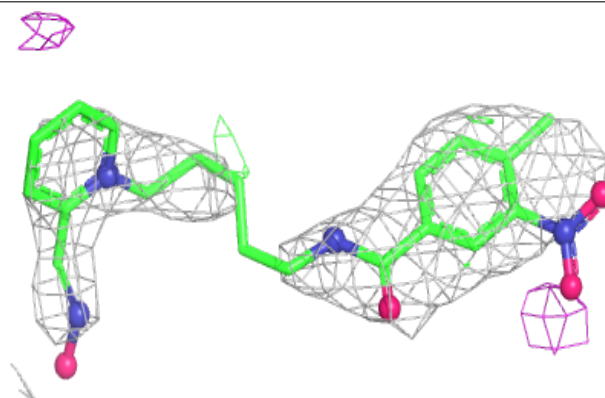
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

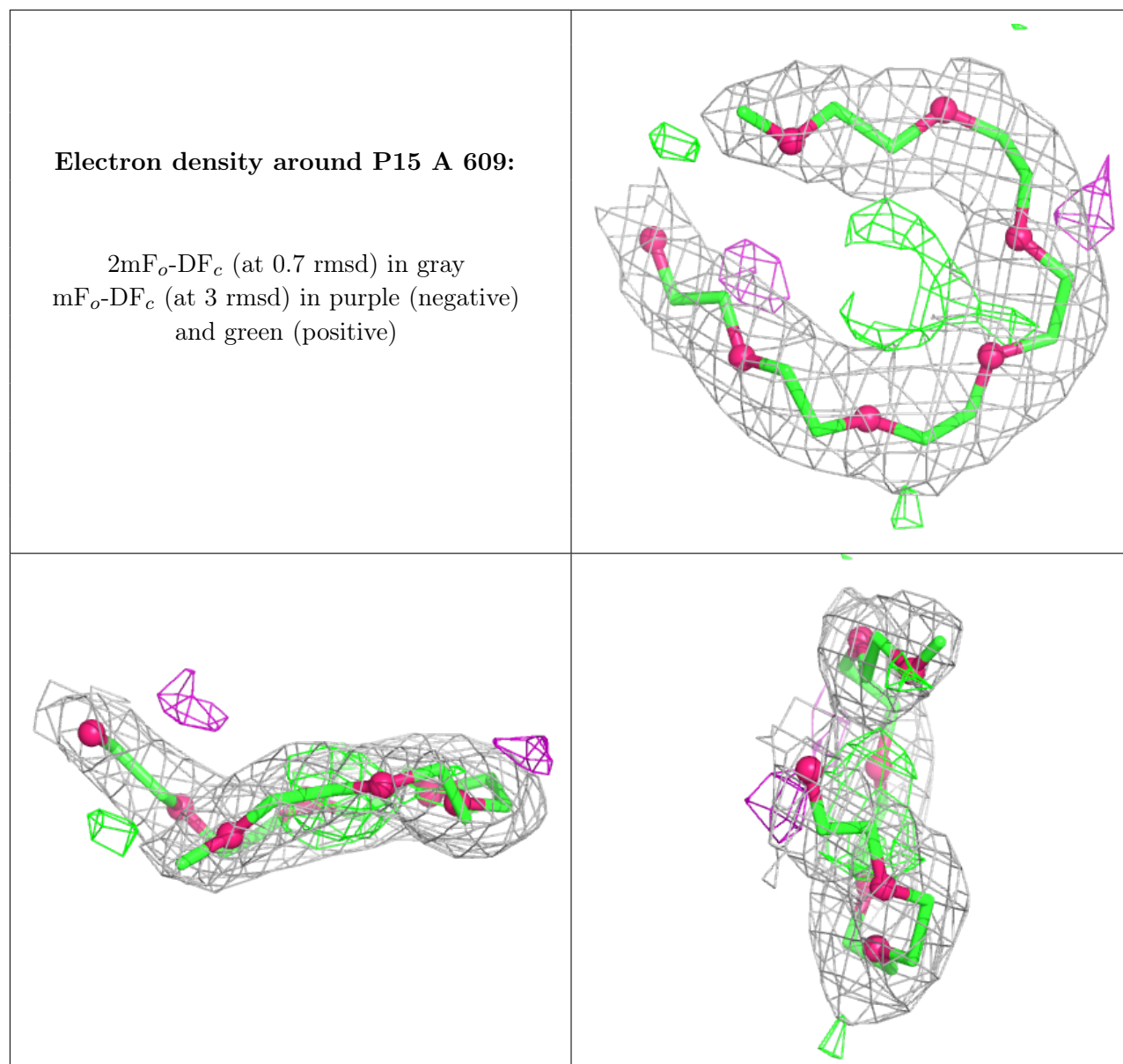
Electron density around I1X A 601:

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

**Electron density around I1X B 601:**

$2mF_o-DF_c$ (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.