



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 12:38 PM UTC

PDB ID : 4XDK / pdb_00004xdk
Title : Crystal structure of human two pore domain potassium ion channel TREK2 (K2P10.1) in complex with norfluoxetine
Authors : Pike, A.C.W.; Dong, Y.Y.; Mackenzie, A.; Mukhopadhyay, S.; Arrowsmith, C.H.; Edwards, A.M.; Bountra, C.; Burgess-Brown, N.A.; Carpenter, E.P.; Structural Genomics Consortium (SGC)
Deposited on : 2014-12-19
Resolution : 3.60 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

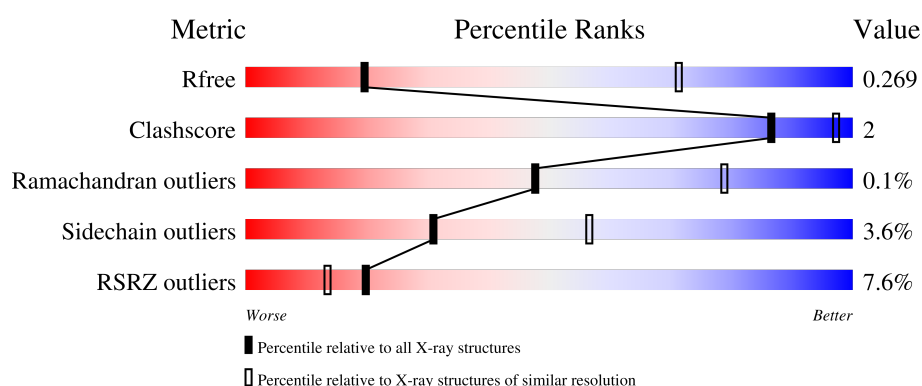
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.60 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}	180053	1747 (3.70-3.50)
Clashscore	190562	1827 (3.70-3.50)
Ramachandran outliers	187476	1773 (3.70-3.50)
Sidechain outliers	187428	1772 (3.70-3.50)
RSRZ outliers	180081	1745 (3.70-3.50)

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	282	5% 79% 9% 12%
1	B	282	9% 80% 9% 11%
1	C	282	6% 78% 17%
1	D	282	7% 79% 6% 15%

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
5	405	A	608[A]	-	-	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 7135 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 Potassium channel subfamily K member 10.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	248	Total	C	N	O	S	0	0	0
			1847	1238	281	324	4			
1	B	251	Total	C	N	O	S	0	0	0
			1844	1231	286	323	4			
1	C	233	Total	C	N	O	S	0	0	0
			1597	1043	260	290	4			
1	D	241	Total	C	N	O	S	0	0	0
			1633	1078	260	292	3			

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	66	MET	-	initiating methionine	UNP P57789
A	341	ALA	-	expression tag	UNP P57789
A	342	GLU	-	expression tag	UNP P57789
A	343	ASN	-	expression tag	UNP P57789
A	344	LEU	-	expression tag	UNP P57789
A	345	TYR	-	expression tag	UNP P57789
A	346	PHE	-	expression tag	UNP P57789
A	347	GLN	-	expression tag	UNP P57789
B	66	MET	-	initiating methionine	UNP P57789
B	341	ALA	-	expression tag	UNP P57789
B	342	GLU	-	expression tag	UNP P57789
B	343	ASN	-	expression tag	UNP P57789
B	344	LEU	-	expression tag	UNP P57789
B	345	TYR	-	expression tag	UNP P57789
B	346	PHE	-	expression tag	UNP P57789
B	347	GLN	-	expression tag	UNP P57789
C	66	MET	-	initiating methionine	UNP P57789
C	341	ALA	-	expression tag	UNP P57789
C	342	GLU	-	expression tag	UNP P57789
C	343	ASN	-	expression tag	UNP P57789
C	344	LEU	-	expression tag	UNP P57789

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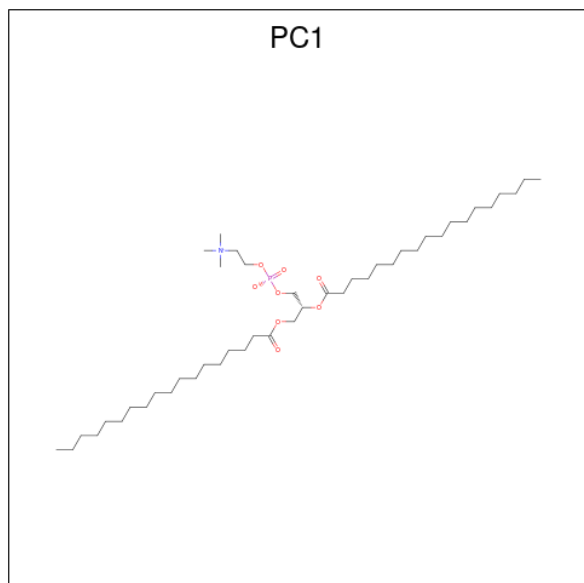
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Chain	Residue	Modelled	Actual	Comment	Reference
C	345	TYR	-	expression tag	UNP P57789
C	346	PHE	-	expression tag	UNP P57789
C	347	GLN	-	expression tag	UNP P57789
D	66	MET	-	initiating methionine	UNP P57789
D	341	ALA	-	expression tag	UNP P57789
D	342	GLU	-	expression tag	UNP P57789
D	343	ASN	-	expression tag	UNP P57789
D	344	LEU	-	expression tag	UNP P57789
D	345	TYR	-	expression tag	UNP P57789
D	346	PHE	-	expression tag	UNP P57789
D	347	GLN	-	expression tag	UNP P57789

- Molecule 2 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	3	Total K 3 3	0	0
2	C	3	Total K 3 3	0	0

- Molecule 3 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: PC1) (formula: C₄₄H₈₈NO₈P).



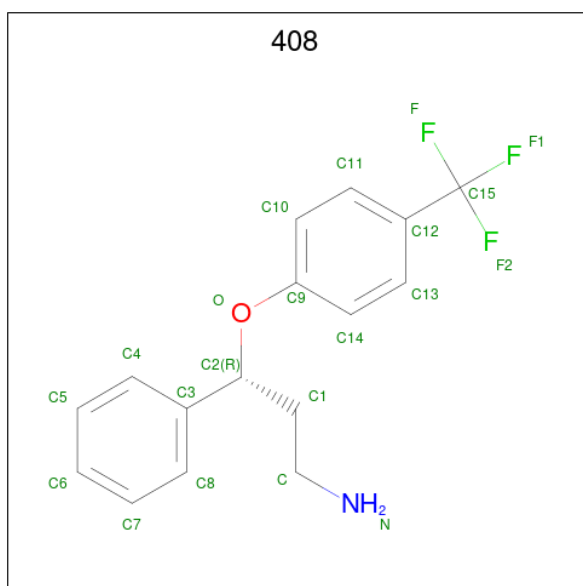
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 11 11	0	0

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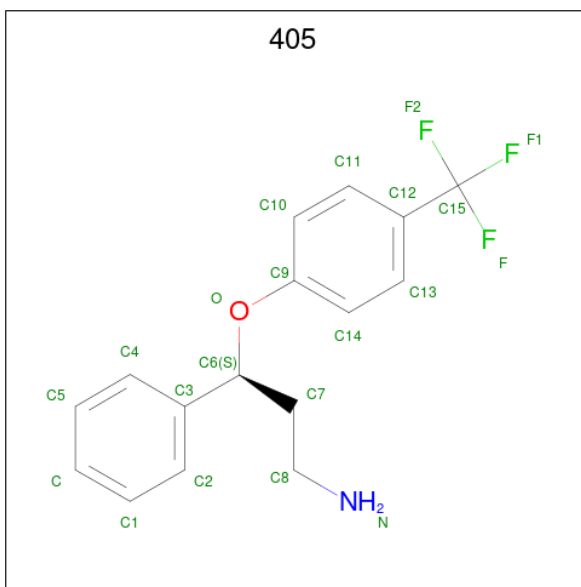
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C 10 10	0	0
3	B	1	Total C 11 11	0	0
3	B	1	Total C 8 8	0	0

- Molecule 4 is (3R)-3-phenyl-3-[4-(trifluoromethyl)phenoxy]propan-1-amine (CCD ID: 408) (formula: C₁₆H₁₆F₃NO).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C F N O 21 16 3 1 1	0	1
4	B	1	Total C F N O 21 16 3 1 1	0	1
4	C	1	Total C F N O 21 16 3 1 1	0	1
4	C	1	Total C F N O 21 16 3 1 1	0	1

- Molecule 5 is (3S)-3-phenyl-3-[4-(trifluoromethyl)phenoxy]propan-1-amine (CCD ID: 405) (formula: C₁₆H₁₆F₃NO).

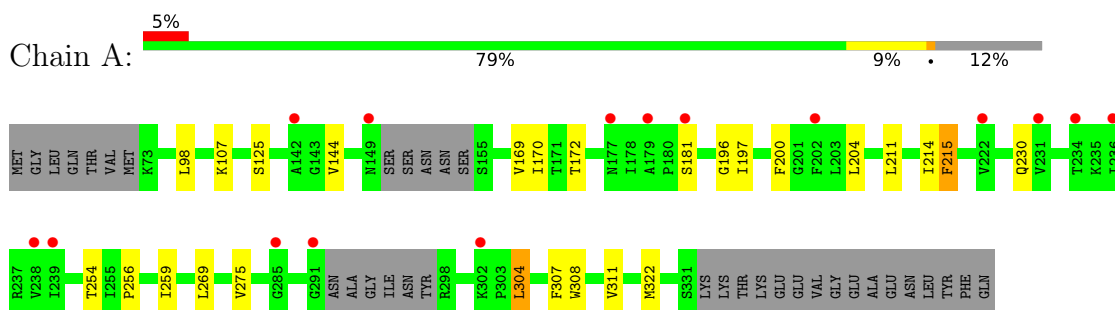


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	F	N	O	0	1
			21	16	3	1	1		
5	A	1	Total	C	F	N	O	0	1
			21	16	3	1	1		
5	C	1	Total	C	F	N	O	0	1
			21	16	3	1	1		
5	C	1	Total	C	F	N	O	0	1
			21	16	3	1	1		

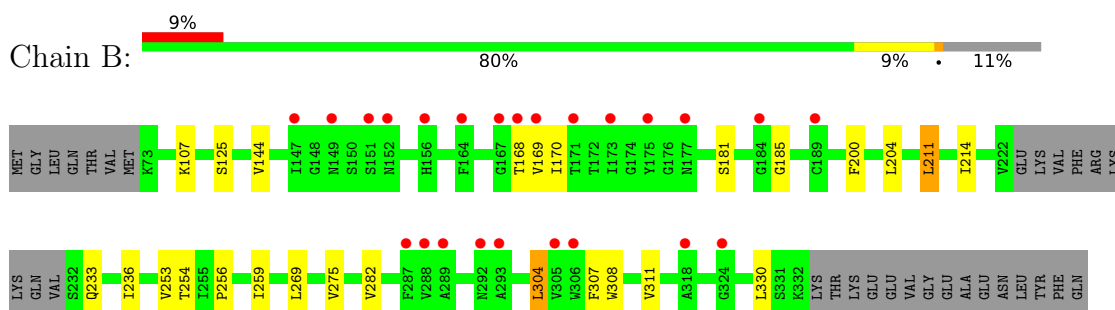
3 Residue-property plots [i](#)

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.

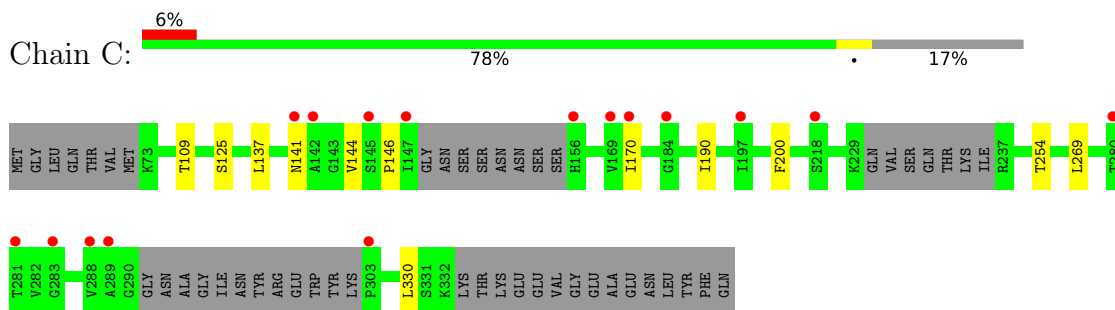
- Molecule 1: Potassium channel subfamily K member 10



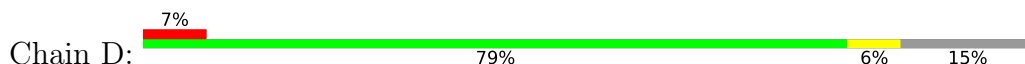
- Molecule 1: Potassium channel subfamily K member 10

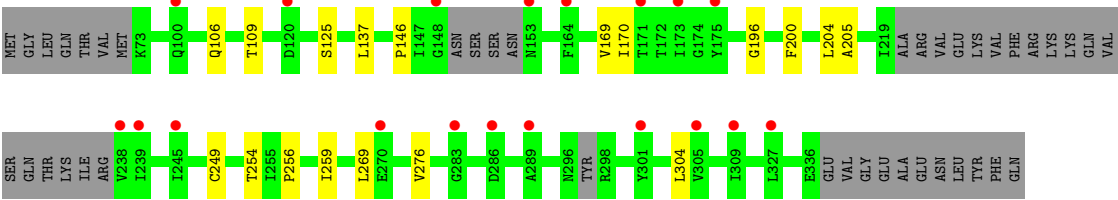


- Molecule 1: Potassium channel subfamily K member 10



- Molecule 1: Potassium channel subfamily K member 10





4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	75.19Å 113.03Å 112.50Å 90.00° 90.41° 90.00°	Depositor
Resolution (Å)	39.87 – 3.60 39.87 – 3.60	Depositor EDS
% Data completeness (in resolution range)	99.4 (39.87-3.60) 99.4 (39.87-3.60)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.22 (at 3.57Å)	Xtriage
Refinement program	BUSTER 2.10.1	Depositor
R, R_{free}	0.248 , 0.254 (Not available) , 0.269	Depositor DCC
R_{free} test set	1132 reflections (5.16%)	wwPDB-VP
Wilson B-factor (Å ²)	156.4	Xtriage
Anisotropy	0.482	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.27 , 139.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	0.039 for -h,-l,-k 0.025 for -h,l,k 0.049 for h,-k,-l	Xtriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	7135	wwPDB-VP
Average B, all atoms (Å ²)	181.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.75% 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

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 405, PC1, 408, K

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	0.80	1/1896 (0.1%)	1.45	7/2597 (0.3%)
1	B	0.81	0/1892	1.46	4/2594 (0.2%)
1	C	0.82	0/1628	1.51	3/2231 (0.1%)
1	D	0.83	0/1669	1.48	6/2293 (0.3%)
All	All	0.81	1/7085 (0.0%)	1.47	20/9715 (0.2%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	197	ILE	CA-C	5.11	1.56	1.52

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	215	PHE	CA-CB-CG	6.76	120.56	113.80
1	A	254	THR	CA-C-N	6.24	125.32	120.33
1	A	254	THR	C-N-CA	6.24	125.32	120.33
1	B	254	THR	CA-C-N	6.10	125.21	120.33
1	B	254	THR	C-N-CA	6.10	125.21	120.33
1	C	141	ASN	CA-CB-CG	6.07	118.67	112.60
1	B	169	VAL	CA-C-N	6.03	129.03	120.53
1	B	169	VAL	C-N-CA	6.03	129.03	120.53
1	A	169	VAL	CA-C-N	5.85	128.47	120.46
1	A	169	VAL	C-N-CA	5.85	128.47	120.46
1	C	254	THR	CA-C-N	5.83	125.00	120.33
1	C	254	THR	C-N-CA	5.83	125.00	120.33
1	D	254	THR	CA-C-N	5.82	124.99	120.33
1	D	254	THR	C-N-CA	5.82	124.99	120.33
1	A	196	GLY	CA-C-N	5.79	123.89	120.24
1	A	196	GLY	C-N-CA	5.79	123.89	120.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	169	VAL	CA-C-N	5.34	127.77	120.46
1	D	169	VAL	C-N-CA	5.34	127.77	120.46
1	D	205	ALA	CA-C-N	5.26	125.82	119.98
1	D	205	ALA	C-N-CA	5.26	125.82	119.98

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	A	1847	0	1779	12	0
1	B	1844	0	1780	12	0
1	C	1597	0	1447	5	0
1	D	1633	0	1446	8	0
2	A	3	0	0	0	0
2	C	3	0	0	0	0
3	A	21	0	37	1	0
3	B	19	0	33	1	0
4	A	21	0	16	0	0
4	B	21	0	8	0	0
4	C	42	0	32	0	0
5	A	42	0	26	0	0
5	C	42	0	32	0	0
All	All	7135	0	6636	29	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 (29) 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:D:170:ILE:CG2	1:D:200:PHE:HB2	2.32	0.59
1:A:170:ILE:CG2	1:A:200:PHE:HB2	2.36	0.55
1:B:304:LEU:HD23	3:B:401:PC1:H2H2	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:170:ILE:HG22	1:D:200:PHE:HB2	1.89	0.53
1:D:170:ILE:HD12	1:D:196:GLY:HA3	1.90	0.52
1:A:144:VAL:HG11	1:B:107:LYS:HA	1.92	0.51
1:A:304:LEU:HD23	3:A:604:PC1:H2H2	1.91	0.51
1:B:307:PHE:O	1:B:311:VAL:HG23	2.10	0.51
1:B:233:GLN:HA	1:B:236:ILE:HD12	1.95	0.48
1:C:137:LEU:HD11	1:D:146:PRO:HD2	1.95	0.47
1:A:107:LYS:HA	1:B:144:VAL:HG11	1.96	0.47
1:D:256:PRO:HA	1:D:259:ILE:HD12	1.97	0.46
1:A:215:PHE:HB2	1:A:322:MET:HE1	1.98	0.46
1:B:256:PRO:HA	1:B:259:ILE:HD12	1.98	0.45
1:A:256:PRO:HA	1:A:259:ILE:HD12	1.99	0.45
1:C:190:ILE:HG23	1:D:276:VAL:HG11	1.98	0.45
1:C:144:VAL:HG21	1:D:106:GLN:CB	2.47	0.45
1:A:170:ILE:HG22	1:A:200:PHE:HB2	2.00	0.44
1:B:253:VAL:HA	1:B:275:VAL:HG11	2.01	0.43
1:C:170:ILE:CG2	1:C:200:PHE:HB2	2.49	0.43
1:C:146:PRO:HG2	1:D:137:LEU:HD11	2.01	0.43
1:A:275:VAL:HG13	1:A:308:TRP:HZ2	1.83	0.42
1:B:170:ILE:CG2	1:B:200:PHE:HB2	2.49	0.42
1:B:275:VAL:HG13	1:B:308:TRP:HZ2	1.85	0.42
1:A:307:PHE:O	1:A:311:VAL:HG23	2.20	0.41
1:B:211:LEU:HA	1:B:214:ILE:HD12	2.02	0.41
1:A:98:LEU:HD13	1:B:185:GLY:HA2	2.03	0.41
1:A:211:LEU:HA	1:A:214:ILE:HD12	2.01	0.40
1:A:172:THR:HA	1:B:282:VAL:HG22	2.03	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	A	242/282 (86%)	236 (98%)	5 (2%)	1 (0%)	30	61
1	B	247/282 (88%)	242 (98%)	5 (2%)	0	100	100
1	C	225/282 (80%)	222 (99%)	3 (1%)	0	100	100
1	D	233/282 (83%)	228 (98%)	5 (2%)	0	100	100
All	All	947/1128 (84%)	928 (98%)	18 (2%)	1 (0%)	48	79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	230	GLN

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	181/233 (78%)	176 (97%)	5 (3%)	38	60
1	B	179/233 (77%)	171 (96%)	8 (4%)	24	51
1	C	138/233 (59%)	134 (97%)	4 (3%)	37	60
1	D	133/233 (57%)	127 (96%)	6 (4%)	24	51
All	All	631/932 (68%)	608 (96%)	23 (4%)	31	56

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	125	SER
1	A	181	SER
1	A	204	LEU
1	A	269	LEU
1	A	304	LEU
1	B	125	SER
1	B	168	THR
1	B	181	SER
1	B	204	LEU
1	B	211	LEU

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Mol	Chain	Res	Type
1	B	269	LEU
1	B	304	LEU
1	B	330	LEU
1	C	109	THR
1	C	125	SER
1	C	269	LEU
1	C	330	LEU
1	D	109	THR
1	D	125	SER
1	D	204	LEU
1	D	249	CYS
1	D	269	LEU
1	D	304	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	106	GLN
1	A	156	HIS
1	A	177	ASN
1	B	156	HIS
1	C	141	ASN
1	D	135	HIS
1	D	156	HIS

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

Of 18 ligands modelled in this entry, 6 are monoatomic - leaving 12 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	$\# Z > 2$
4	408	C	606[A]	-	22,22,22	0.22	0	30,30,30	0.32	0
5	405	C	607[B]	-	22,22,22	0.22	0	30,30,30	0.39	0
3	PC1	A	604	-	10,10,53	0.23	0	9,9,61	0.12	0
3	PC1	B	401	-	10,10,53	0.18	0	9,9,61	0.14	0
3	PC1	B	402	-	7,7,53	0.20	0	6,6,61	0.12	0
4	408	A	606[A]	-	22,22,22	0.20	0	30,30,30	0.40	0
5	405	A	607[B]	-	22,22,22	0.21	0	30,30,30	0.42	0
4	408	C	604[A]	-	22,22,22	0.22	0	30,30,30	0.36	0
5	405	C	605[B]	-	22,22,22	0.22	0	30,30,30	0.34	0
3	PC1	A	605	-	9,9,53	0.27	0	8,8,61	0.15	0
5	405	A	608[A]	-	22,22,22	0.21	0	30,30,30	0.35	0
4	408	B	403[B]	-	22,22,22	0.21	0	30,30,30	0.37	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	408	C	606[A]	-	-	3/17/17/17	0/2/2/2
5	405	C	607[B]	-	-	3/17/17/17	0/2/2/2
3	PC1	A	604	-	-	0/8/8/57	-
3	PC1	B	401	-	-	0/8/8/57	-
3	PC1	B	402	-	-	0/5/5/57	-
4	408	A	606[A]	-	-	3/17/17/17	0/2/2/2
5	405	A	607[B]	-	-	3/17/17/17	0/2/2/2
4	408	C	604[A]	-	-	3/17/17/17	0/2/2/2
5	405	C	605[B]	-	-	3/17/17/17	0/2/2/2
3	PC1	A	605	-	-	0/7/7/57	-
5	405	A	608[A]	-	-	3/17/17/17	0/2/2/2

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	408	B	403[B]	-	-	3/17/17/17	0/2/2/2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (24) torsion outliers are listed below:

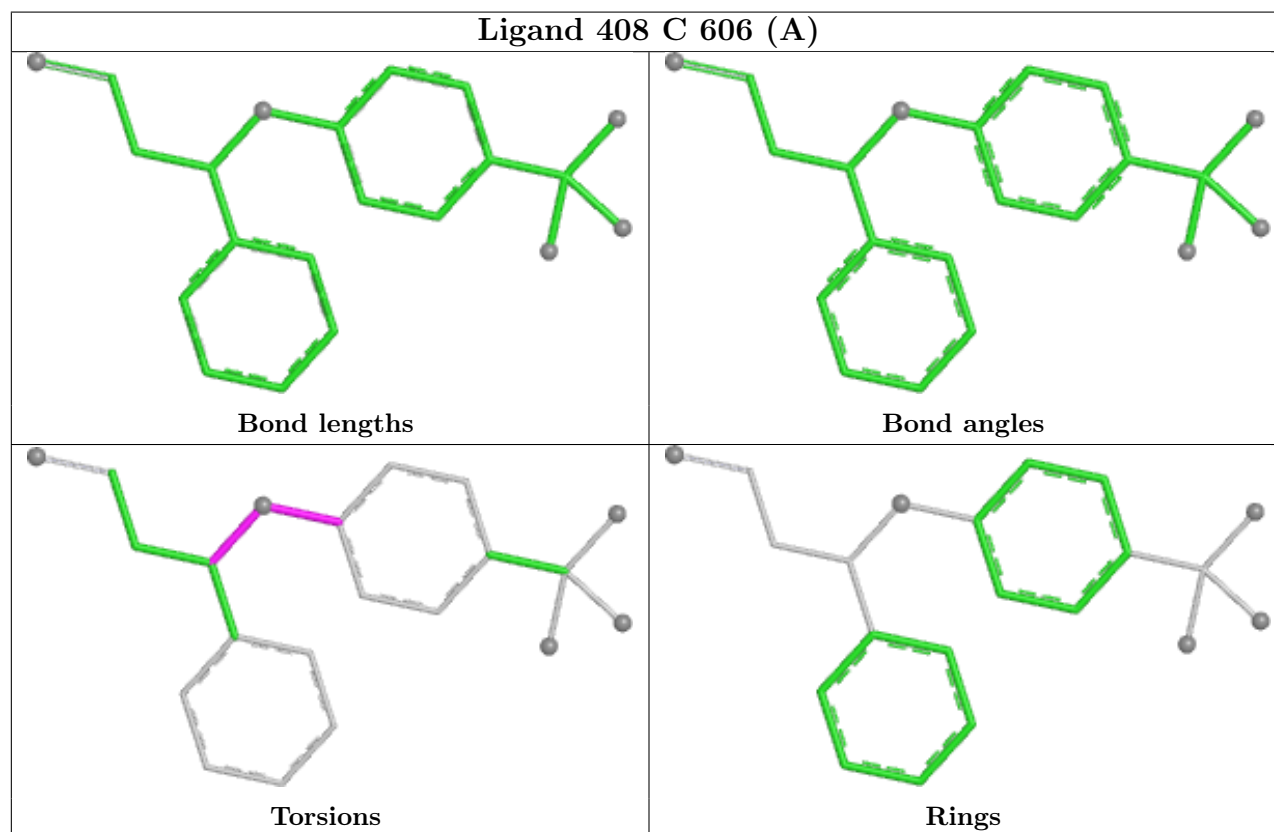
Mol	Chain	Res	Type	Atoms
5	A	607[B]	405	C6-C7-C8-N
5	A	608[A]	405	C6-C7-C8-N
5	C	607[B]	405	C6-C7-C8-N
5	A	607[B]	405	C10-C9-O-C6
4	A	606[A]	408	C3-C2-O-C9
4	B	403[B]	408	C3-C2-O-C9
4	C	604[A]	408	C3-C2-O-C9
4	C	606[A]	408	C3-C2-O-C9
5	A	607[B]	405	C14-C9-O-C6
5	A	608[A]	405	C10-C9-O-C6
5	A	608[A]	405	C14-C9-O-C6
4	B	403[B]	408	C14-C9-O-C2
4	C	604[A]	408	C14-C9-O-C2
4	C	604[A]	408	C10-C9-O-C2
4	C	606[A]	408	C14-C9-O-C2
4	A	606[A]	408	C14-C9-O-C2
5	C	605[B]	405	C10-C9-O-C6
5	C	605[B]	405	C14-C9-O-C6
5	C	607[B]	405	C14-C9-O-C6
4	B	403[B]	408	C10-C9-O-C2
4	C	606[A]	408	C10-C9-O-C2
5	C	607[B]	405	C10-C9-O-C6
4	A	606[A]	408	C10-C9-O-C2
5	C	605[B]	405	C6-C7-C8-N

There are no ring outliers.

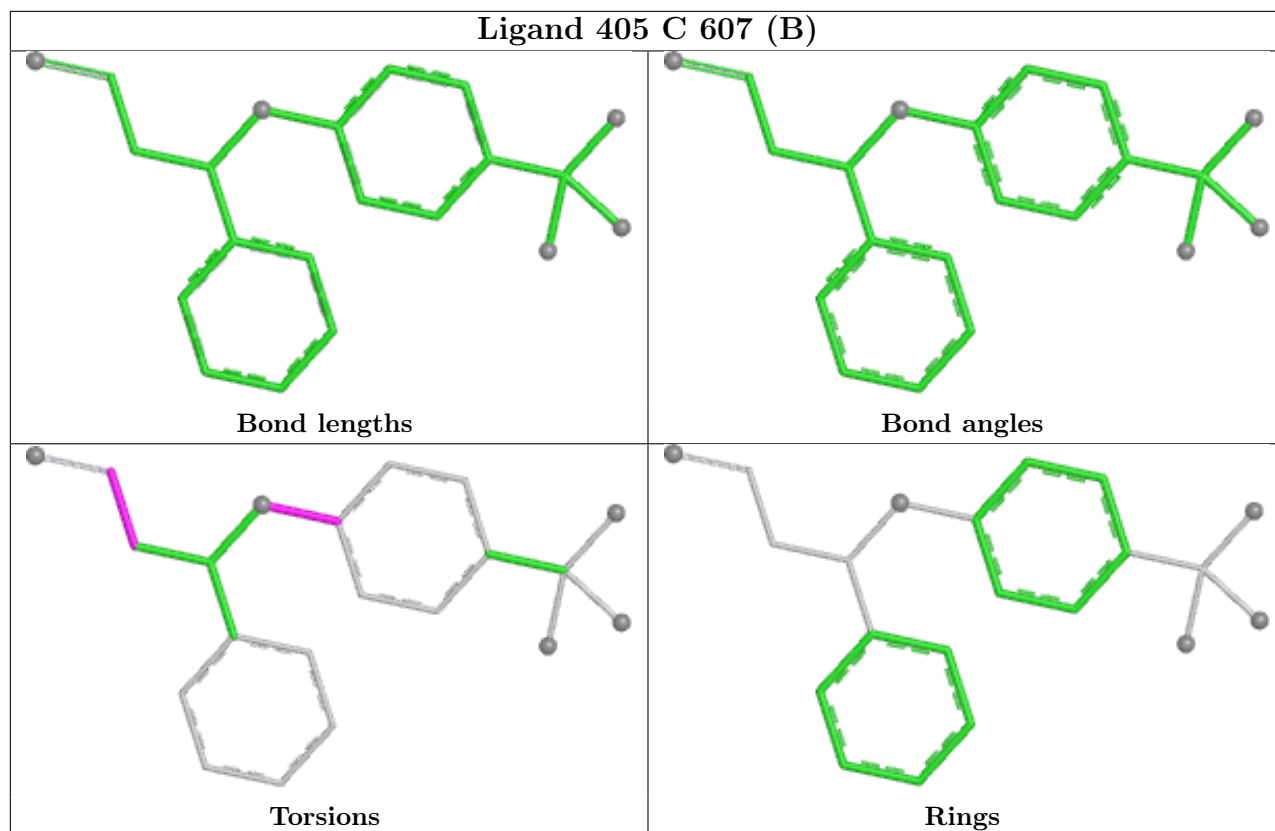
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	604	PC1	1	0
3	B	401	PC1	1	0

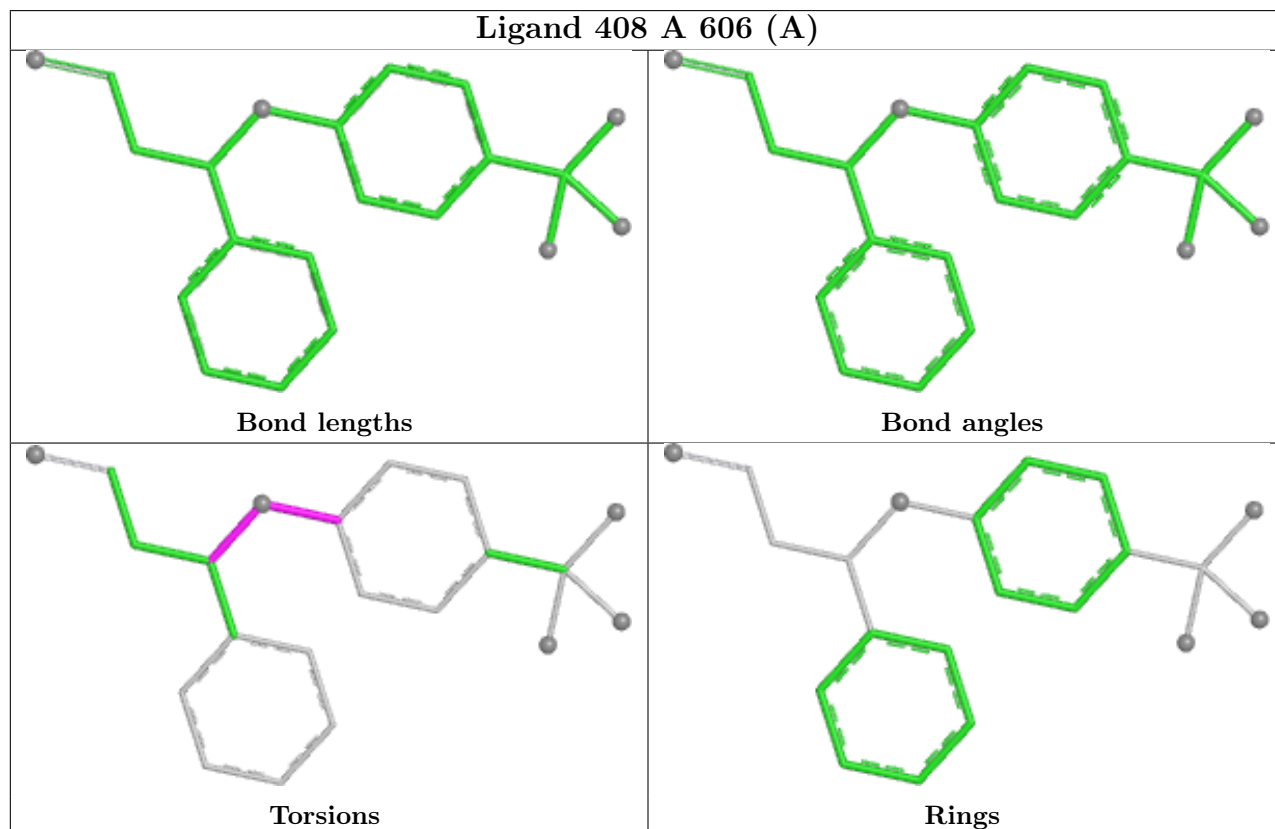
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

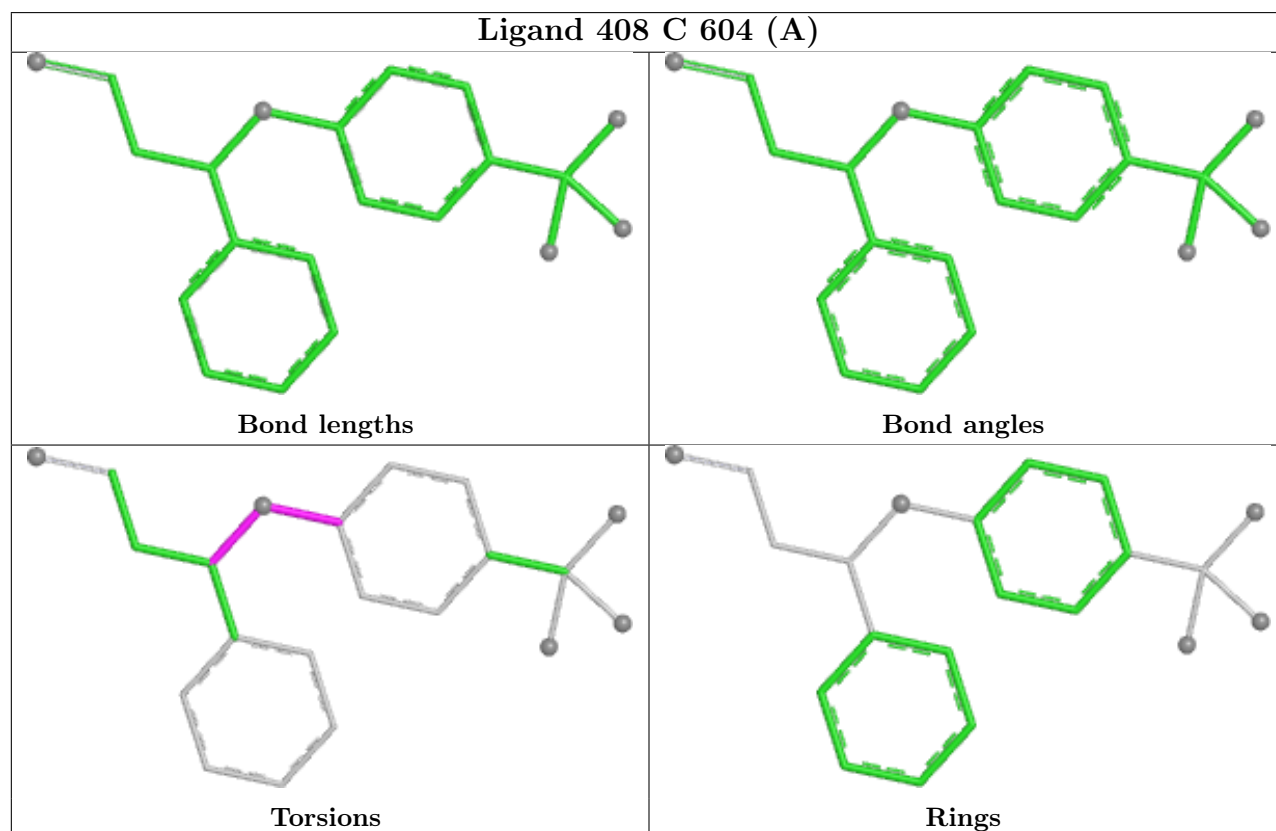
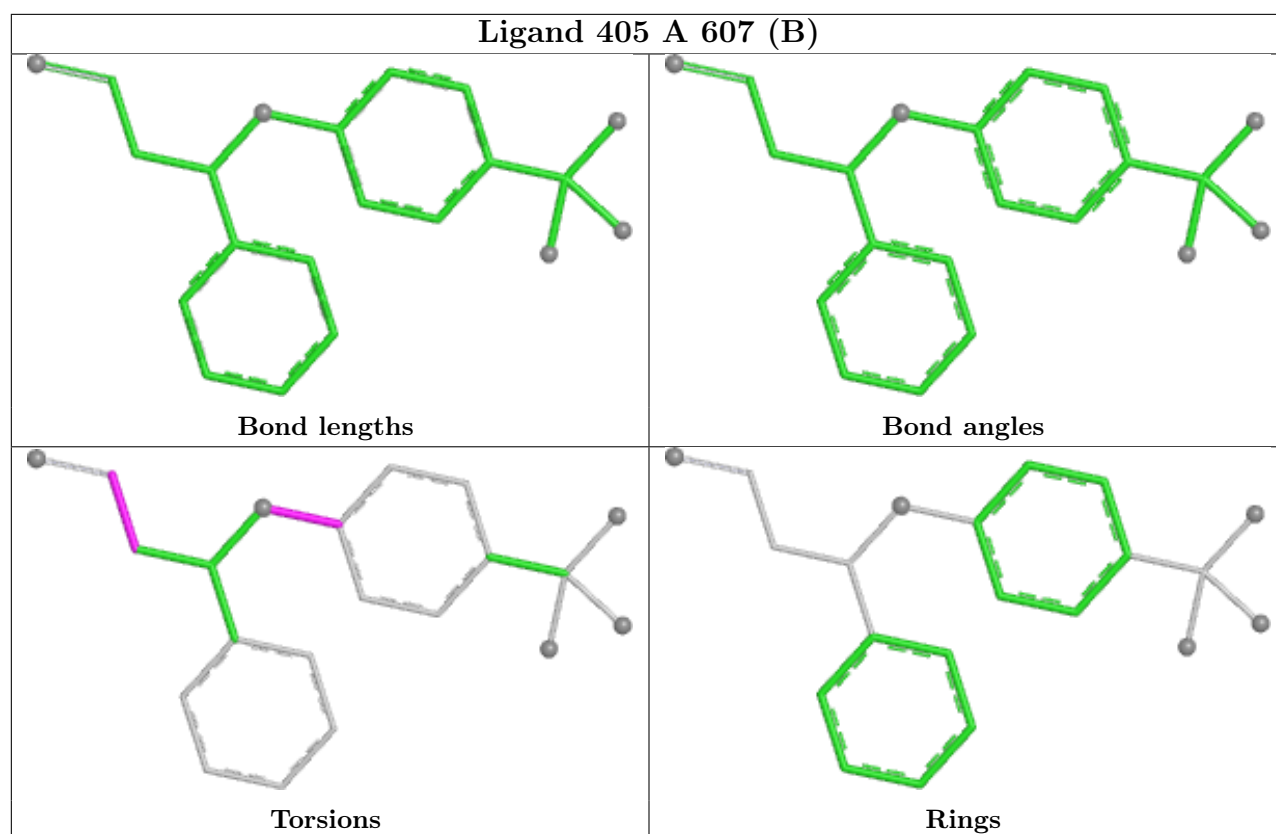


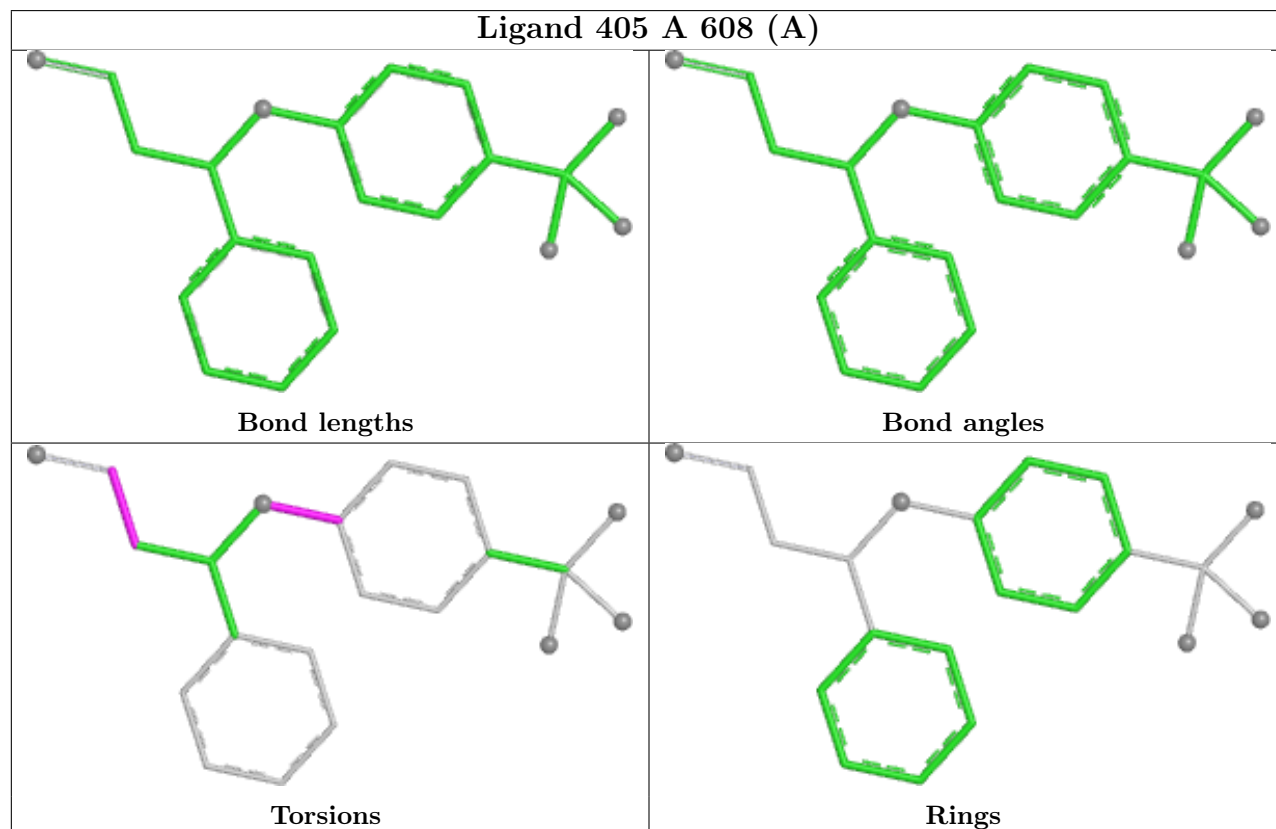
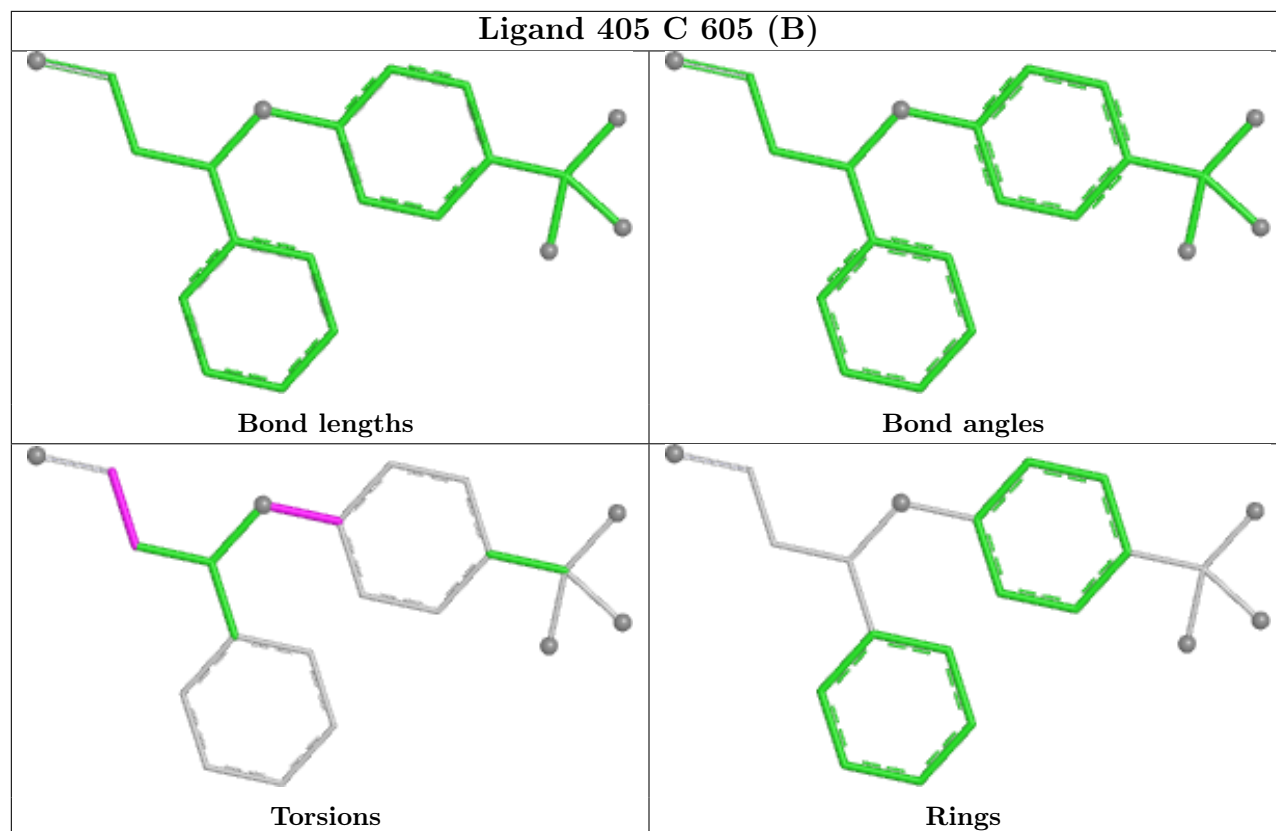
Ligand 405 C 607 (B)

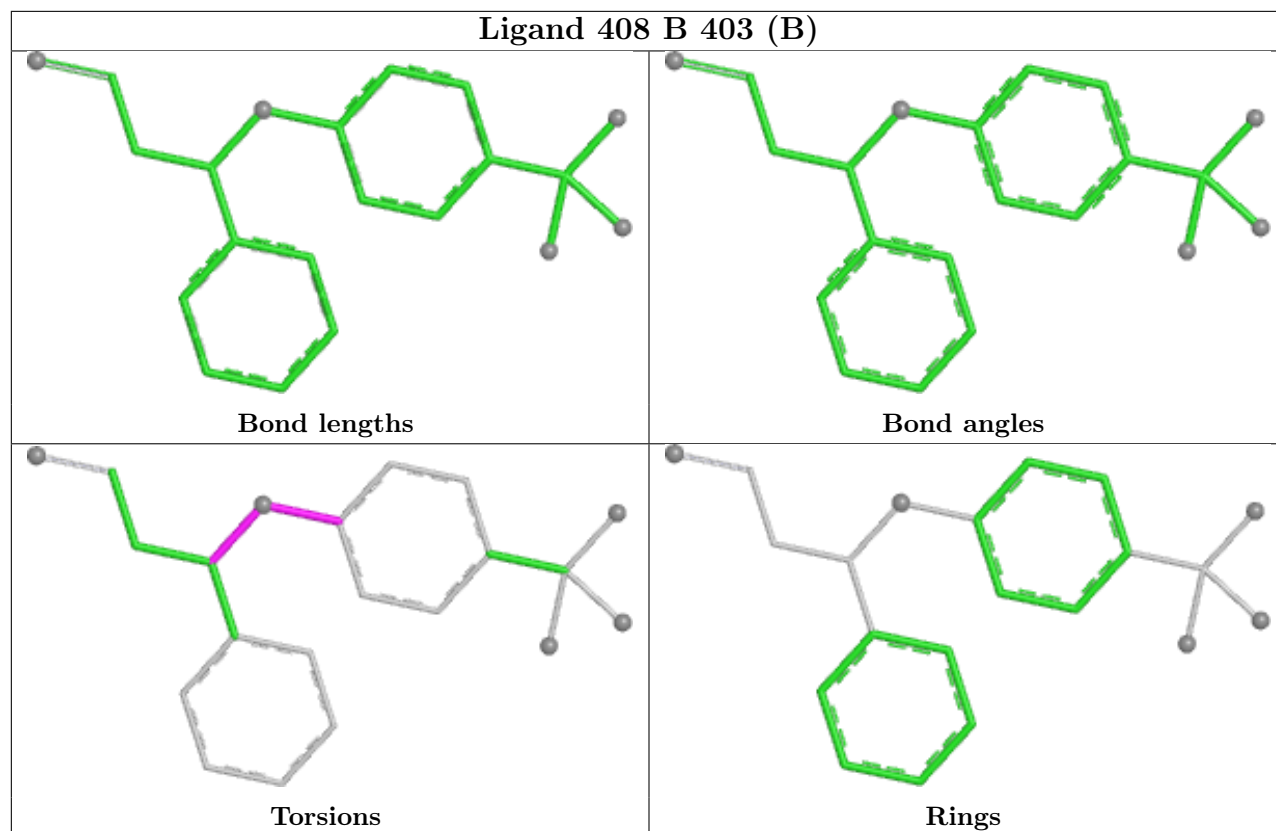


Ligand 408 A 606 (A)









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	248/282 (87%)	0.35	15 (6%)	27 17	116, 154, 198, 229	0
1	B	251/282 (89%)	0.38	24 (9%)	13 10	107, 162, 209, 230	0
1	C	233/282 (82%)	0.35	16 (6%)	23 15	135, 212, 271, 276	0
1	D	241/282 (85%)	0.43	19 (7%)	18 13	155, 207, 250, 260	0
All	All	973/1128 (86%)	0.38	74 (7%)	20 13	107, 178, 250, 276	0

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	222	VAL	6.2
1	B	289	ALA	5.1
1	C	303	PRO	5.0
1	B	164	PHE	4.2
1	B	168	THR	4.1
1	C	283	GLY	4.0
1	A	239	ILE	3.9
1	A	238	VAL	3.8
1	B	171	THR	3.8
1	D	245	ILE	3.7
1	A	181	SER	3.6
1	B	175	TYR	3.5
1	D	289	ALA	3.4
1	C	170	ILE	3.3
1	D	270	GLU	3.3
1	A	291	GLY	3.3
1	B	152	ASN	3.2
1	C	281	THR	3.2
1	C	156	HIS	3.2
1	A	236	ILE	3.2
1	B	184	GLY	3.2

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Mol	Chain	Res	Type	RSRZ
1	D	173	ILE	3.0
1	D	327	LEU	3.0
1	A	177	ASN	3.0
1	B	189	CYS	2.9
1	D	305	VAL	2.8
1	A	149	ASN	2.8
1	B	324	GLY	2.8
1	B	318	ALA	2.7
1	D	175	TYR	2.7
1	D	148	GLY	2.7
1	C	280	THR	2.7
1	B	287	PHE	2.7
1	D	239	ILE	2.7
1	C	197	ILE	2.6
1	B	147	ILE	2.6
1	D	309	ILE	2.6
1	B	149	ASN	2.6
1	C	142	ALA	2.6
1	C	145	SER	2.5
1	B	151	SER	2.5
1	B	173	ILE	2.5
1	C	288	VAL	2.5
1	D	171	THR	2.5
1	B	288	VAL	2.4
1	A	142	ALA	2.4
1	B	167	GLY	2.4
1	C	218	SER	2.4
1	D	286	ASP	2.4
1	D	301	TYR	2.4
1	A	231	VAL	2.4
1	D	164	PHE	2.4
1	C	184	GLY	2.4
1	B	177	ASN	2.3
1	A	202	PHE	2.3
1	C	147	ILE	2.3
1	B	156	HIS	2.3
1	D	283	GLY	2.3
1	D	120	ASP	2.2
1	B	169	VAL	2.2
1	A	234	THR	2.2
1	C	169	VAL	2.2
1	A	285	GLY	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	141	ASN	2.1
1	B	305	VAL	2.1
1	D	100	GLN	2.1
1	D	238	VAL	2.1
1	B	306	TRP	2.1
1	A	179	ALA	2.1
1	B	293	ALA	2.1
1	C	289	ALA	2.1
1	D	153	ASN	2.0
1	A	302	LYS	2.0
1	B	292	ASN	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 oligosaccharides 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
5	405	A	607[B]	21/21	0.72	0.34	166,172,183,185	21
4	408	C	604[A]	21/21	0.76	0.26	241,245,253,255	21
5	405	A	608[A]	21/21	0.78	0.40	187,195,202,205	21
3	PC1	A	605	10/54	0.80	0.32	119,121,126,128	0
4	408	C	606[A]	21/21	0.80	0.28	243,246,248,248	21
5	405	C	607[B]	21/21	0.83	0.30	243,247,249,249	21
2	K	C	603	1/1	0.85	0.14	208,208,208,208	0
5	405	C	605[B]	21/21	0.86	0.27	222,230,239,244	21
3	PC1	B	401	11/54	0.87	0.28	135,141,155,161	0
3	PC1	A	604	11/54	0.89	0.22	139,141,144,145	0
4	408	B	403[B]	21/21	0.89	0.37	203,210,218,221	21
3	PC1	B	402	8/54	0.90	0.34	147,156,162,165	0

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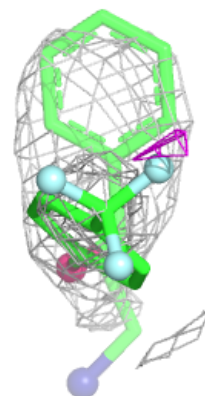
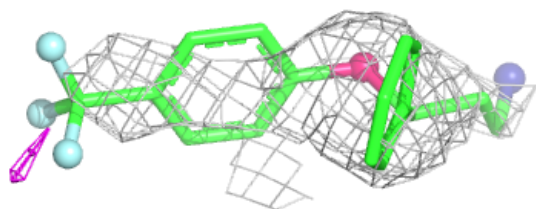
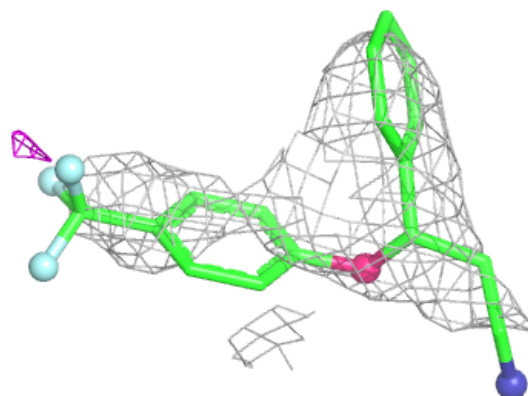
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
2	K	C	601	1/1	0.90	0.17	256,256,256,256	0
4	408	A	606[A]	21/21	0.91	0.30	204,207,218,220	21
2	K	A	603	1/1	0.97	0.09	136,136,136,136	0
2	K	C	602	1/1	0.98	0.10	181,181,181,181	0
2	K	A	601	1/1	0.98	0.13	145,145,145,145	0
2	K	A	602	1/1	0.99	0.07	118,118,118,118	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.

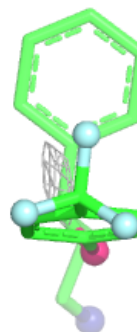
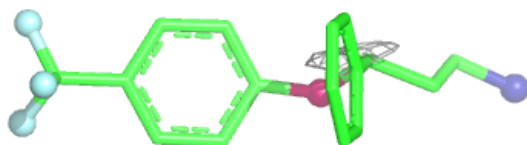
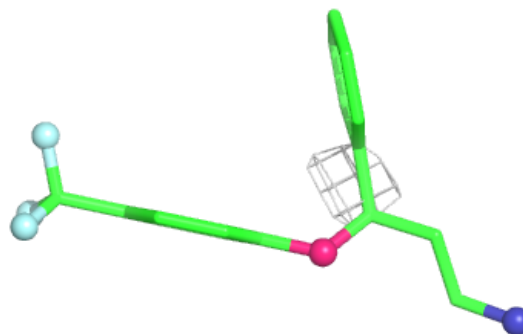
Electron density around 405 A 607 (B):

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

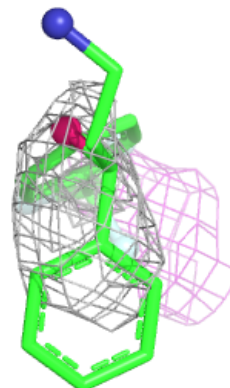
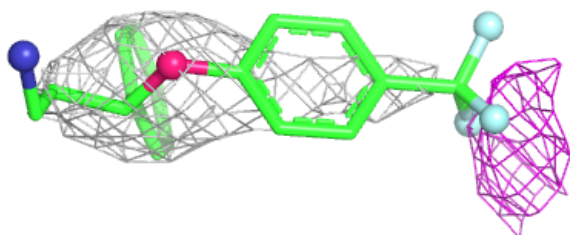
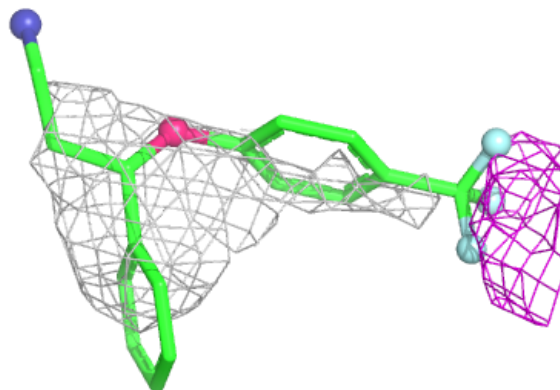


Electron density around 408 C 604 (A):

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

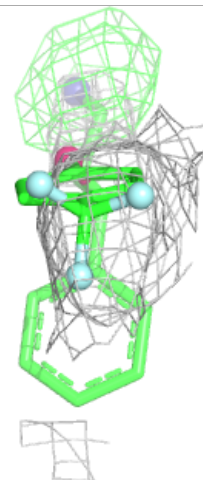
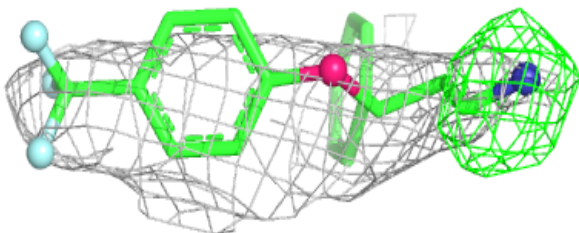
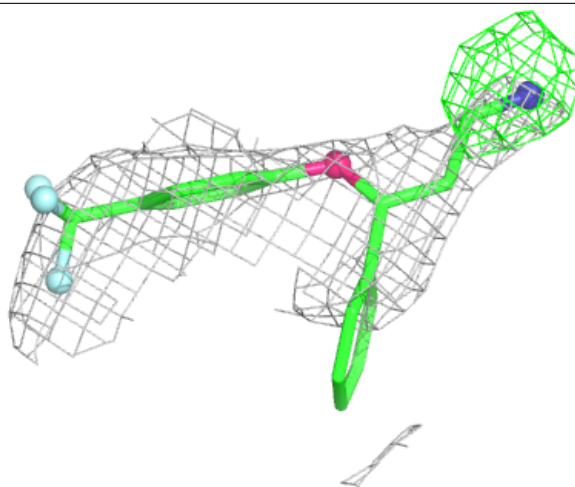
**Electron density around 405 A 608 (A):**

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



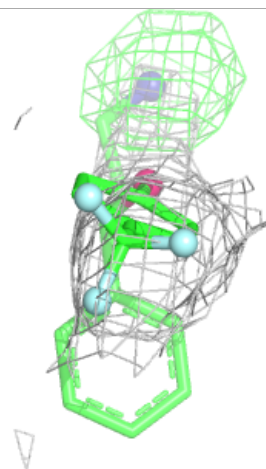
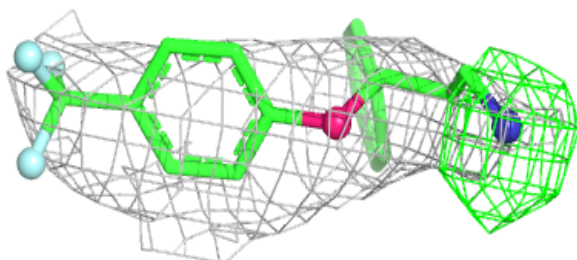
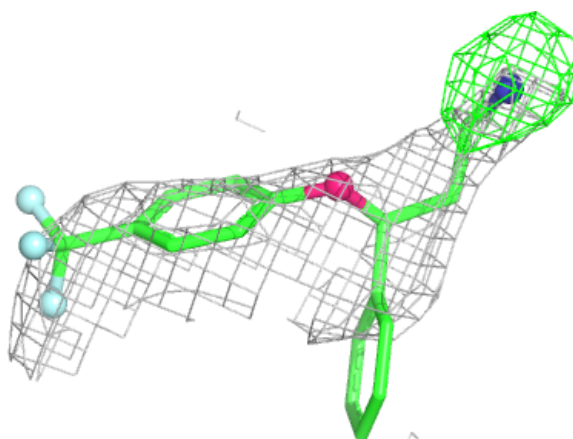
Electron density around 408 C 606 (A):

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



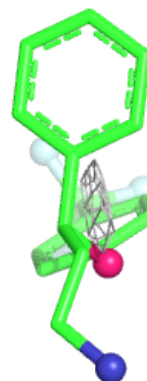
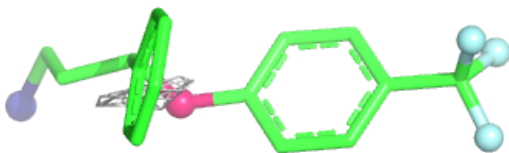
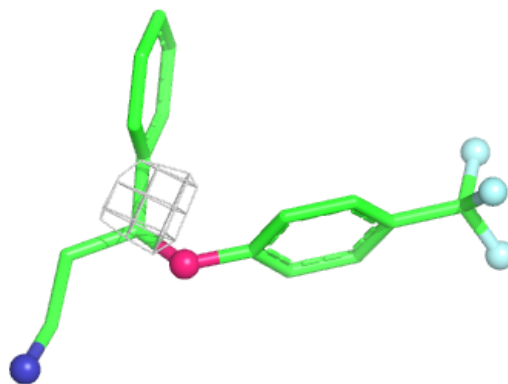
Electron density around 405 C 607 (B):

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

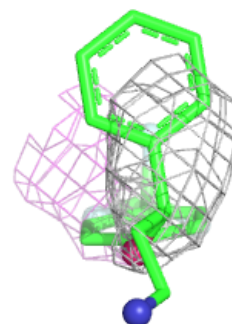
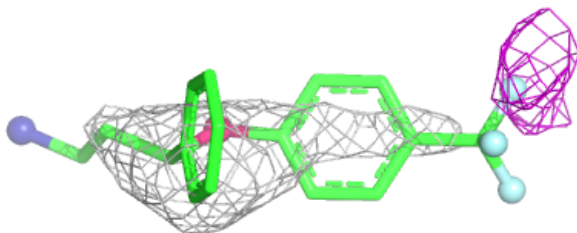
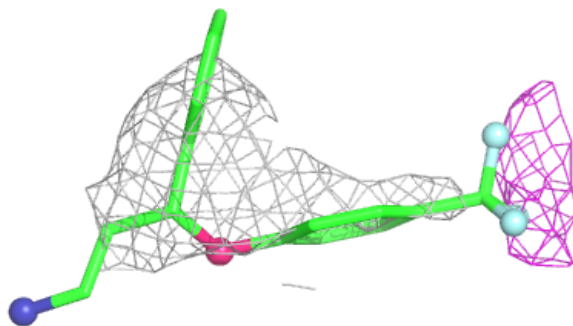


Electron density around 405 C 605 (B):

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

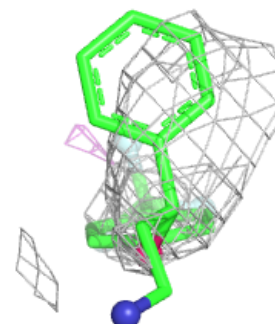
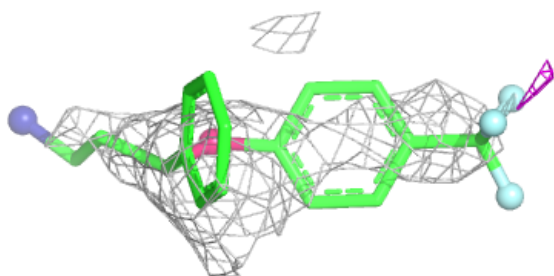
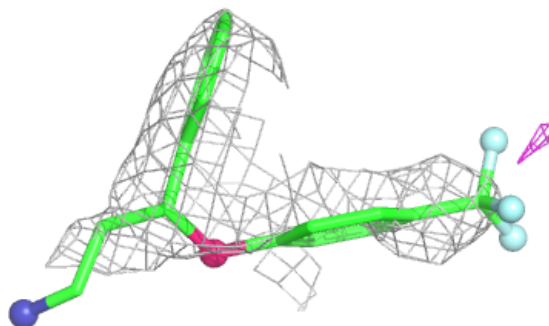
**Electron density around 408 B 403 (B):**

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



Electron density around 408 A 606 (A):

$2mF_o - DF_c$ (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.