W O R L D W I D E

wwPDB

P R O T E I N   D A T A   B A N K

Full wwPDB X-ray Structure Validation Report ⓘ

Oct 22, 2024 – 01:39 AM EDT

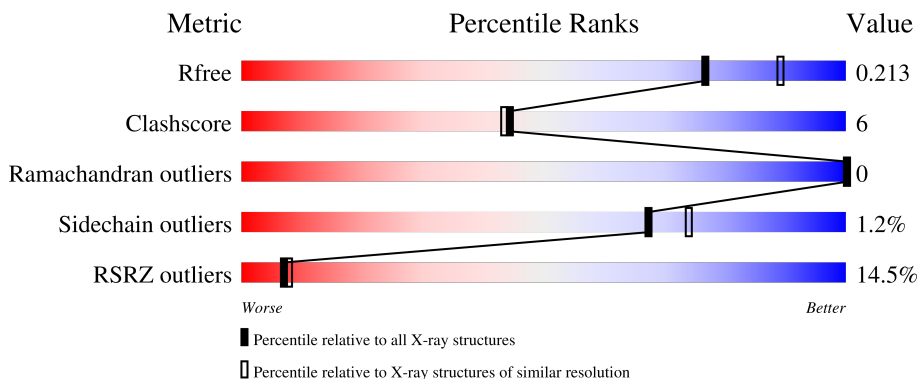|		
PDB ID	:	3K5C
Title	:	Human BACE-1 complex with NB-216
Authors	:	Rondeau, J.-M.
Deposited on	:	2009-10-07
Resolution	:	2.12 Å(reported)

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 2.12 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		0.213
Clashscore		6
Ramachandran outliers		0
Sidechain outliers		1.2%
RSRZ outliers		14.5%

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	7689 (2.14-2.10)
Clashscore	180529	8431 (2.14-2.10)
Ramachandran outliers	177936	8366 (2.14-2.10)
Sidechain outliers	177891	8367 (2.14-2.10)
RSRZ outliers	164620	7689 (2.14-2.10)

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

Mol	Chain	Length	Quality of chain
1	A	402	13% / 80% 13% • 6%
1	B	402	14% / 83% 10% • 6%
1	C	402	14% / 79% 15% 5%

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2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 9519 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.
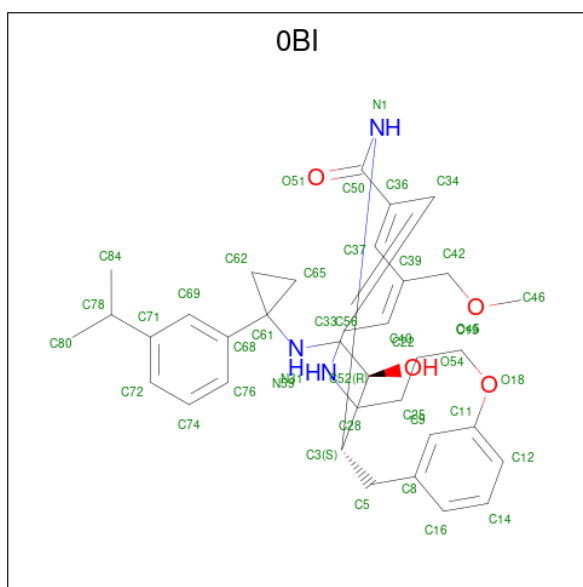
- Molecule 1 is a protein called Beta-secretase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	377	Total	C	N	O	S	0	0	0
			2966	1898	493	561	14			
1	B	377	Total	C	N	O	S	0	0	0
			2966	1898	493	561	14			
1	C	381	Total	C	N	O	S	0	0	0
			2993	1917	497	565	14			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	33P	GLY	-	expression tag	UNP P56817
A	34P	PRO	-	expression tag	UNP P56817
B	33P	GLY	-	expression tag	UNP P56817
B	34P	PRO	-	expression tag	UNP P56817
C	33P	GLY	-	expression tag	UNP P56817
C	34P	PRO	-	expression tag	UNP P56817

- Molecule 2 is (4S)-4-[(1R)-1-hydroxy-2-({1-[3-(1-methylethyl)phenyl]cyclopropyl}amino)ethyl]-19-(methoxymethyl)-11-oxa-3,16-diazatric yclo[15.3.1.1 6,10]docosa-1(21),6(22),7,9,17,19-hexaen-2-one (three-letter code: 0BI) (formula: $C_{35}H_{45}N_3O_4$).

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total 42	C 35	N 3	O 4	0	0
2	B	1	Total 42	C 35	N 3	O 4	0	0
2	C	1	Total 42	C 35	N 3	O 4	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	162	Total 162	O 162	0	0
3	B	135	Total 135	O 135	0	0
3	C	171	Total 171	O 171	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: Beta-secretase 1

Chain A:

- Molecule 1: Beta-secretase 1

Chain B:

- Molecule 1: Beta-secretase 1

Chain C:

Q271 A272 G273 T274 T275 P276 W277 N278 I279 Y286 T292 N293 Q303 R307 P308 V309 E310 D311 V312 A313 T314 S315 Q316 D317 D318 C319 Y320 K321 F322 A323 I352 A358 C359 H360 V361 H362 D363 E364 F365 R366 V375 D378 M379 E380 N385 ILE
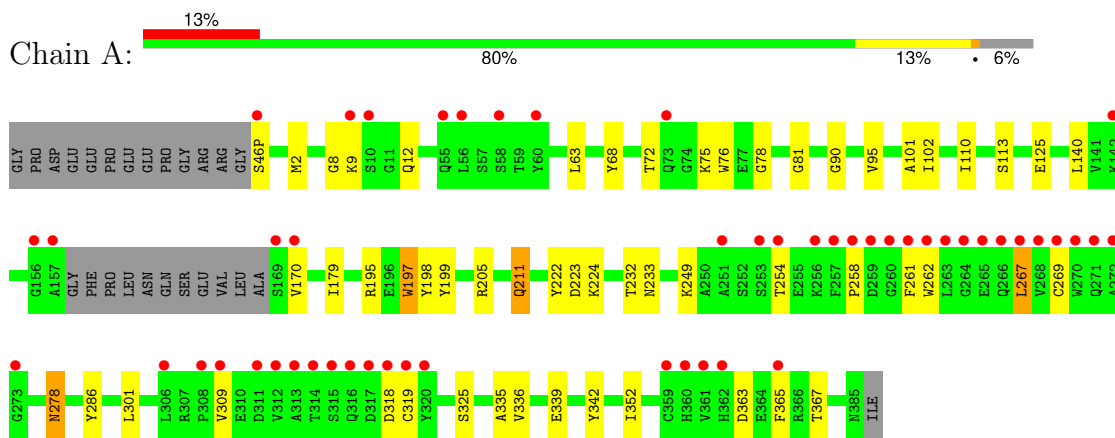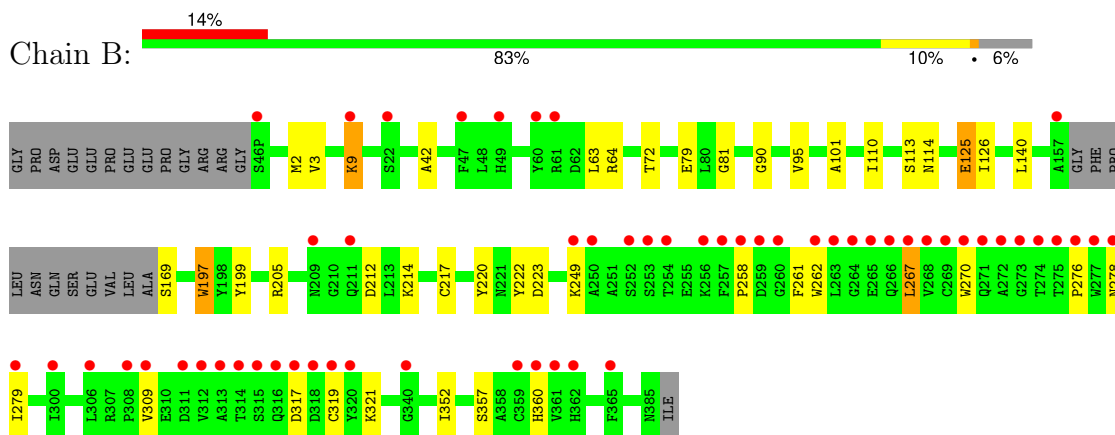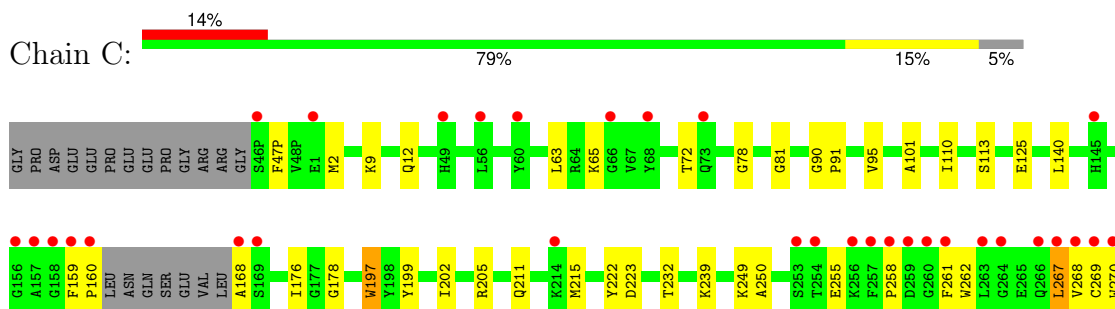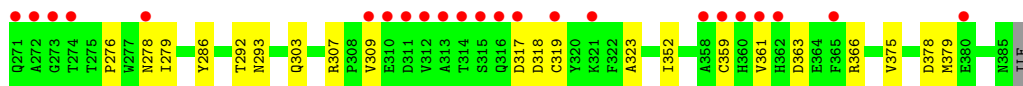
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	81.75Å 103.19Å 100.14Å 90.00° 104.44° 90.00°	Depositor
Resolution (Å)	70.55 – 2.12 70.55 – 2.12	Depositor EDS
% Data completeness (in resolution range)	99.6 (70.55-2.12) 99.8 (70.55-2.12)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	0.05	Depositor
$< I/\sigma(I) >$ [1]	3.46 (at 2.12Å)	Xtriage
Refinement program	CNS, CNX 2005	Depositor
R, R_{free}	0.200 , 0.220 0.194 , 0.213	Depositor DCC
R_{free} test set	9103 reflections (9.99%)	wwPDB-VP
Wilson B-factor (Å^2)	41.1	Xtriage
Anisotropy	0.221	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 35.8	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	9519	wwPDB-VP
Average B, all atoms (Å^2)	48.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.77% 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: 0BI

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	0.30	0/3041	0.47	0/4133
1	B	0.30	0/3041	0.47	0/4133
1	C	0.30	0/3070	0.48	0/4173
All	All	0.30	0/9152	0.48	0/12439

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 ⓘ

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	2966	0	2875	36	0
1	B	2966	0	2875	32	0
1	C	2993	0	2899	43	0
2	A	42	0	45	1	0
2	B	42	0	45	1	0
2	C	42	0	45	2	0
3	A	162	0	0	2	0
3	B	135	0	0	0	0
3	C	171	0	0	1	0
All	All	9519	0	8784	106	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 6.

All (106) 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:367:THR:H	1:C:211:GLN:HE22	1.19	0.85
1:A:267:LEU:H	1:A:267:LEU:HD23	1.48	0.74
1:B:267:LEU:H	1:B:267:LEU:HD23	1.55	0.72
1:C:255:GLU:OE1	1:C:270:TRP:NE1	2.26	0.69
1:C:267:LEU:HD23	1:C:267:LEU:H	1.58	0.69
1:B:9:LYS:N	1:B:9:LYS:HD2	2.10	0.66
1:A:46(P):SER:HB3	3:A:539:HOH:O	1.96	0.65
1:C:268:VAL:O	1:C:319:CYS:HA	1.97	0.63
1:C:9:LYS:HD3	1:C:168:ALA:HB3	1.79	0.63
1:A:367:THR:H	1:C:211:GLN:NE2	1.95	0.63
1:B:205:ARG:NH2	1:B:212:ASP:HB2	2.14	0.62
1:A:72:THR:HB	2:A:387:0BI:H37	1.81	0.62
1:A:267:LEU:HD12	1:A:319:CYS:HB3	1.85	0.59
1:A:233:ASN:HD22	1:A:325:SER:HG	1.51	0.57
1:B:2:MET:HG2	1:B:90:GLY:HA2	1.88	0.56
1:C:267:LEU:HD13	1:C:309:VAL:CG2	2.36	0.56
1:A:68:TYR:CD1	1:B:3:VAL:HG11	2.41	0.55
1:C:65:LYS:HD3	3:C:540:HOH:O	2.07	0.55
1:A:254:THR:HG23	1:C:278:ASN:OD1	2.07	0.55
1:C:269:CYS:HA	1:C:318:ASP:O	2.07	0.55
1:A:258:PRO:O	1:A:261:PHE:HB3	2.07	0.55
1:C:258:PRO:O	1:C:261:PHE:HB3	2.07	0.55
1:C:72:THR:HB	2:C:387:0BI:H37	1.88	0.54
1:A:335:ALA:O	1:A:339:GLU:HG3	2.07	0.54
1:B:9:LYS:NZ	1:B:114:ASN:HB2	2.23	0.53
1:A:2:MET:HG2	1:A:90:GLY:HA2	1.90	0.53
1:C:303:GLN:HB2	1:C:361:VAL:HG11	1.91	0.53
1:B:276:PRO:O	1:B:279:ILE:HG12	2.09	0.53
1:A:278:ASN:HD22	1:A:278:ASN:H	1.57	0.52
1:C:110:ILE:HB	1:C:113:SER:HB3	1.91	0.52
1:B:110:ILE:HB	1:B:113:SER:HB3	1.91	0.52
1:B:357:SER:O	1:B:360:HIS:HB3	2.10	0.52
1:A:110:ILE:HB	1:A:113:SER:HB3	1.92	0.52
1:C:159:PHE:HB3	1:C:160:PRO:HD2	1.92	0.52
1:B:258:PRO:O	1:B:261:PHE:HB3	2.09	0.51
1:B:267:LEU:HD13	1:B:309:VAL:CG2	2.41	0.51
1:B:270:TRP:O	1:B:317:ASP:HB3	2.10	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:2:MET:HG2	1:C:90:GLY:HA2	1.93	0.51
1:C:12:GLN:OE1	1:C:113:SER:HA	2.11	0.50
1:C:276:PRO:O	1:C:279:ILE:HG12	2.12	0.49
1:C:363:ASP:HB3	1:C:366:ARG:O	2.13	0.49
1:C:293:ASN:HA	1:C:375:VAL:HA	1.93	0.49
1:B:63:LEU:HG	1:B:81:GLY:HA2	1.95	0.48
1:A:125:GLU:OE2	1:A:195:ARG:NH2	2.44	0.48
1:B:267:LEU:HD13	1:B:309:VAL:HG21	1.95	0.48
1:C:125:GLU:HG2	1:C:197:TRP:HB3	1.95	0.48
1:B:199:TYR:HB3	1:B:352:ILE:HD11	1.94	0.48
1:A:199:TYR:HB3	1:A:352:ILE:HD11	1.95	0.48
1:C:267:LEU:HD13	1:C:309:VAL:HG21	1.96	0.48
1:C:249:LYS:HE2	1:C:262:TRP:CD1	2.49	0.47
1:B:72:THR:HB	2:B:387:0BI:H37	1.97	0.47
1:A:249:LYS:HE2	1:A:262:TRP:CD1	2.50	0.46
1:C:267:LEU:HD23	1:C:267:LEU:N	2.26	0.46
1:C:199:TYR:HB3	1:C:352:ILE:HD11	1.96	0.46
1:A:222:TYR:HA	1:A:223:ASP:HA	1.65	0.45
1:C:270:TRP:O	1:C:317:ASP:HB3	2.16	0.45
1:B:212:ASP:O	1:B:214:LYS:HG3	2.16	0.45
1:A:211:GLN:HB2	3:A:455:HOH:O	2.16	0.45
1:C:202:ILE:CD1	1:C:379:MET:HG3	2.46	0.45
1:C:63:LEU:HG	1:C:81:GLY:HA2	1.99	0.45
1:A:232:THR:O	1:A:336:VAL:HG13	2.17	0.44
1:A:267:LEU:HD13	1:A:309:VAL:CG2	2.47	0.44
1:A:211:GLN:HB2	1:A:211:GLN:HE21	1.65	0.44
1:C:359:CYS:SG	1:C:359:CYS:O	2.76	0.44
1:C:267:LEU:HD13	1:C:309:VAL:HG23	1.98	0.44
1:A:95:VAL:HG11	1:A:140:LEU:HA	2.00	0.44
1:B:9:LYS:N	1:B:9:LYS:CD	2.81	0.44
1:C:202:ILE:HD11	1:C:379:MET:HG3	2.00	0.44
1:B:249:LYS:HE2	1:B:262:TRP:CD1	2.52	0.43
1:C:205:ARG:HB3	1:C:286:TYR:HB2	2.00	0.43
1:C:307:ARG:HG3	1:C:323:ALA:HB2	1.99	0.43
1:C:215:MET:HE1	1:C:239:LYS:HG2	2.00	0.43
1:B:125:GLU:O	1:B:125:GLU:HG3	2.17	0.43
1:B:222:TYR:HA	1:B:223:ASP:HA	1.63	0.43
1:C:95:VAL:HG11	1:C:140:LEU:HA	2.00	0.43
1:C:78:GLY:HA3	1:C:101:ALA:O	2.18	0.43
1:A:9:LYS:HD2	1:A:12:GLN:OE1	2.19	0.42
1:A:301:LEU:HD13	1:A:363:ASP:HB2	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:267:LEU:HD23	1:B:267:LEU:N	2.28	0.42
1:C:65:LYS:HE2	1:C:65:LYS:HB2	1.95	0.42
1:A:8:GLY:O	1:A:170:VAL:HG22	2.19	0.42
1:C:292:THR:HG21	1:C:378:ASP:HB3	2.00	0.42
1:B:217:CYS:HA	1:B:220:TYR:CD1	2.55	0.42
1:C:232:THR:OG1	2:C:387:0BI:H28	2.20	0.42
1:A:269:CYS:HA	1:A:318:ASP:O	2.20	0.41
1:B:309:VAL:HG11	1:B:321:LYS:HG3	2.02	0.41
1:A:205:ARG:HB3	1:A:286:TYR:HB2	2.02	0.41
1:B:95:VAL:HG11	1:B:140:LEU:HA	2.02	0.41
1:A:365:PHE:CG	1:C:250:ALA:HB1	2.56	0.41
1:C:91:PRO:HD3	1:C:176:ILE:HB	2.03	0.41
1:B:42:ALA:CB	1:B:101:ALA:HB1	2.51	0.41
1:B:126:ILE:HG23	1:B:197:TRP:HB2	2.03	0.41
1:B:278:ASN:H	1:B:278:ASN:HD22	1.69	0.41
1:C:47(P):PHE:CZ	1:C:178:GLY:HA3	2.56	0.41
1:A:63:LEU:HG	1:A:81:GLY:HA2	2.02	0.41
1:A:179:ILE:HG23	1:A:342:TYR:HE2	1.86	0.41
1:B:9:LYS:HZ1	1:B:114:ASN:HB2	1.84	0.41
1:B:267:LEU:HD12	1:B:319:CYS:HB3	2.02	0.41
1:C:222:TYR:HA	1:C:223:ASP:HA	1.63	0.41
1:A:78:GLY:HA3	1:A:101:ALA:O	2.21	0.41
1:A:197:TRP:CD1	1:A:197:TRP:N	2.89	0.41
1:B:64:ARG:HA	1:B:79:GLU:OE2	2.20	0.41
1:A:8:GLY:C	1:A:170:VAL:HG22	2.42	0.40
1:A:76:TRP:HB2	1:A:102:ILE:HG23	2.03	0.40
1:B:197:TRP:N	1:B:197:TRP:CD1	2.89	0.40
1:A:198:TYR:CE2	1:A:224:LYS:HE3	2.56	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	373/402 (93%)	365 (98%)	8 (2%)	0	100	100
1	B	373/402 (93%)	361 (97%)	12 (3%)	0	100	100
1	C	377/402 (94%)	363 (96%)	14 (4%)	0	100	100
All	All	1123/1206 (93%)	1089 (97%)	34 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	322/342 (94%)	317 (98%)	5 (2%)	58	65
1	B	322/342 (94%)	317 (98%)	5 (2%)	58	65
1	C	324/342 (95%)	322 (99%)	2 (1%)	84	89
All	All	968/1026 (94%)	956 (99%)	12 (1%)	67	74

All (12) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	75	LYS
1	A	197	TRP
1	A	211	GLN
1	A	267	LEU
1	A	278	ASN
1	B	9	LYS
1	B	125	GLU
1	B	169	SER
1	B	197	TRP
1	B	267	LEU
1	C	197	TRP
1	C	267	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

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Mol	Chain	Res	Type
1	A	114	ASN
1	A	326	GLN
1	B	114	ASN
1	B	278	ASN
1	B	293	ASN
1	B	326	GLN
1	C	114	ASN
1	C	211	GLN
1	C	326	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 ⓘ

3 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	$\#|Z| > 2$
2	0BI	B	387	-	45,46,46	1.56	5 (11%)	60,64,64	1.12	6 (10%)
2	0BI	A	387	-	45,46,46	1.57	6 (13%)	60,64,64	1.12	5 (8%)
2	0BI	C	387	-	45,46,46	1.59	6 (13%)	60,64,64	1.13	5 (8%)

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
2	0BI	B	387	-	-	4/41/48/48	0/4/5/5
2	0BI	A	387	-	-	4/41/48/48	0/4/5/5
2	0BI	C	387	-	-	4/41/48/48	0/4/5/5

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	387	0BI	C65-C61	3.87	1.55	1.51
2	A	387	0BI	C65-C61	3.81	1.55	1.51
2	B	387	0BI	C65-C61	3.65	1.55	1.51
2	A	387	0BI	C62-C61	3.30	1.54	1.51
2	C	387	0BI	C62-C61	3.17	1.54	1.51
2	B	387	0BI	C62-C61	2.96	1.54	1.51
2	B	387	0BI	C69-C71	2.41	1.42	1.39
2	C	387	0BI	C72-C71	2.39	1.42	1.39
2	C	387	0BI	C69-C71	2.29	1.42	1.39
2	C	387	0BI	C56-C52	2.29	1.55	1.52
2	B	387	0BI	C9-C11	2.28	1.42	1.39
2	A	387	0BI	C69-C71	2.28	1.42	1.39
2	B	387	0BI	C72-C71	2.11	1.42	1.39
2	A	387	0BI	C9-C11	2.06	1.42	1.39
2	A	387	0BI	C56-C52	2.06	1.55	1.52
2	A	387	0BI	C34-C33	2.05	1.42	1.39
2	C	387	0BI	C9-C11	2.04	1.42	1.39

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	387	0BI	C62-C61-N59	-4.10	113.42	117.30
2	A	387	0BI	C62-C61-N59	-3.77	113.72	117.30
2	B	387	0BI	C62-C61-C68	-3.72	114.06	118.78
2	B	387	0BI	C62-C61-N59	-3.72	113.78	117.30
2	A	387	0BI	C62-C61-C68	-3.66	114.13	118.78
2	C	387	0BI	C62-C61-C68	-3.42	114.44	118.78
2	A	387	0BI	C19-O18-C11	2.80	125.20	117.93
2	C	387	0BI	C19-O18-C11	2.77	125.13	117.93
2	B	387	0BI	C19-O18-C11	2.41	124.21	117.93
2	A	387	0BI	C3-N1-C50	2.39	127.29	122.94
2	A	387	0BI	C36-C50-N1	2.32	121.34	117.04

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	387	0BI	C36-C50-N1	2.27	121.24	117.04
2	B	387	0BI	O54-C52-C56	-2.25	105.24	109.67
2	C	387	0BI	C36-C50-N1	2.21	121.15	117.04
2	C	387	0BI	C3-N1-C50	2.18	126.91	122.94
2	B	387	0BI	C3-N1-C50	2.16	126.88	122.94

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	387	0BI	C39-C42-O45-C46
2	B	387	0BI	C39-C42-O45-C46
2	C	387	0BI	C39-C42-O45-C46
2	B	387	0BI	C22-C19-O18-C11
2	C	387	0BI	C22-C19-O18-C11
2	A	387	0BI	C22-C19-O18-C11
2	A	387	0BI	C62-C61-C68-C69
2	A	387	0BI	C62-C61-C68-C76
2	B	387	0BI	C62-C61-C68-C69
2	B	387	0BI	C62-C61-C68-C76
2	C	387	0BI	C62-C61-C68-C69
2	C	387	0BI	C62-C61-C68-C76

There are no ring outliers.
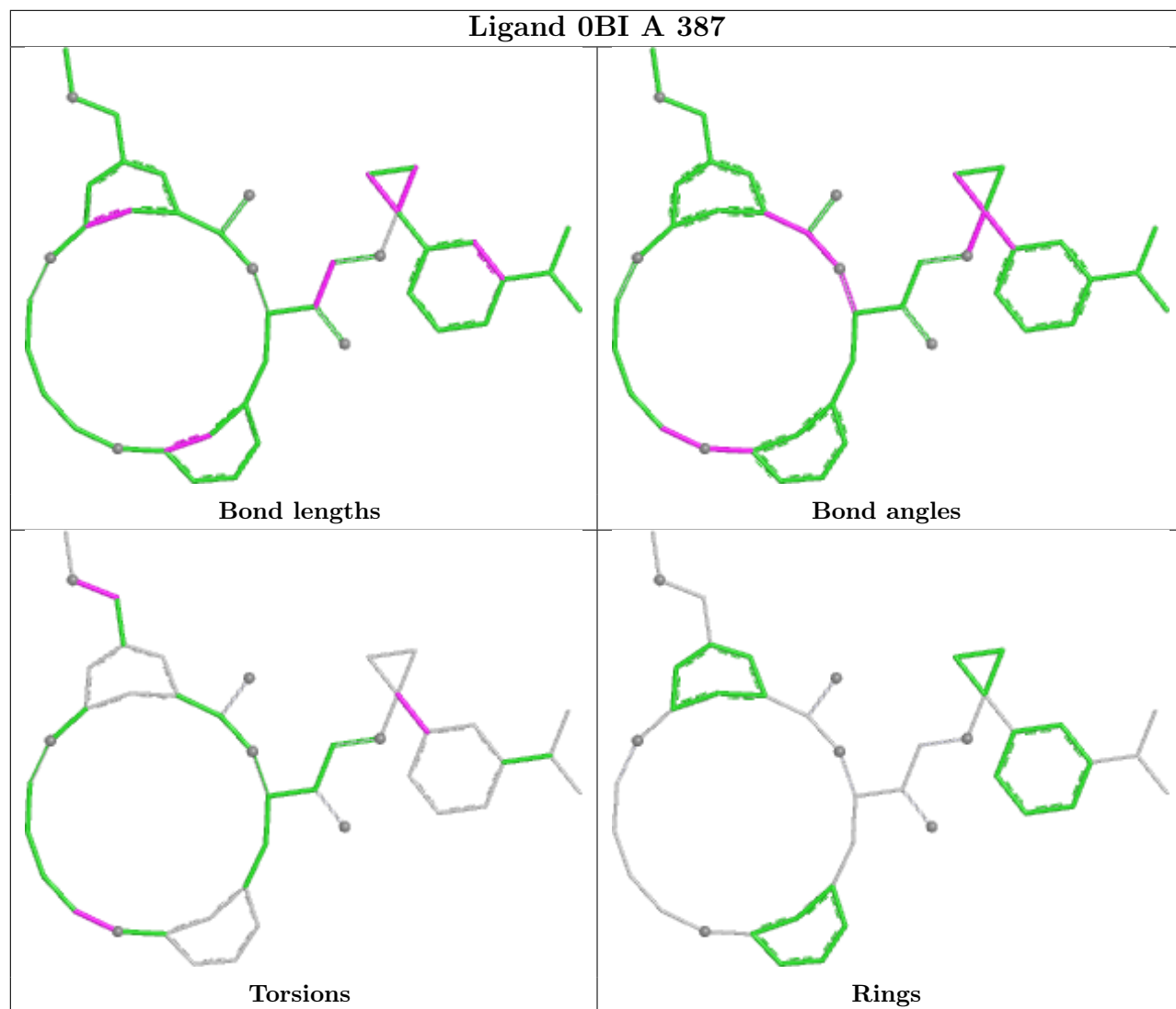
3 monomers are involved in 4 short contacts:

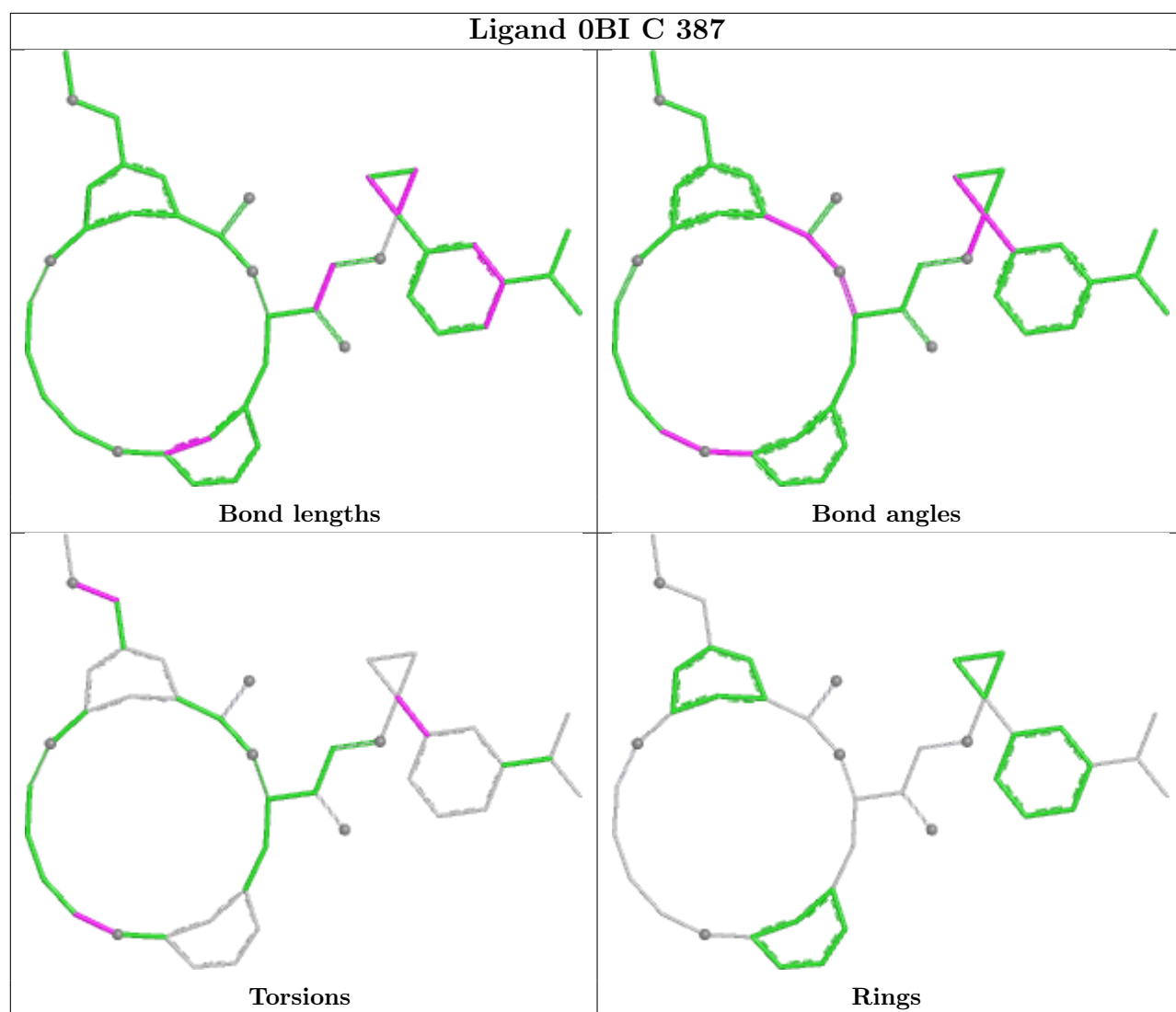| Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	387	0BI	1	0
2	A	387	0BI	1	0
2	C	387	0BI	2	0

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 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 0BI B 387	
Bond lengths	Bond angles
Torsions	Rings

Ligand 0BI A 387

Bond lengths

Bond angles

Torsions

Rings

Ligand 0BI C 387

Bond lengths

Bond angles

Torsions

Rings
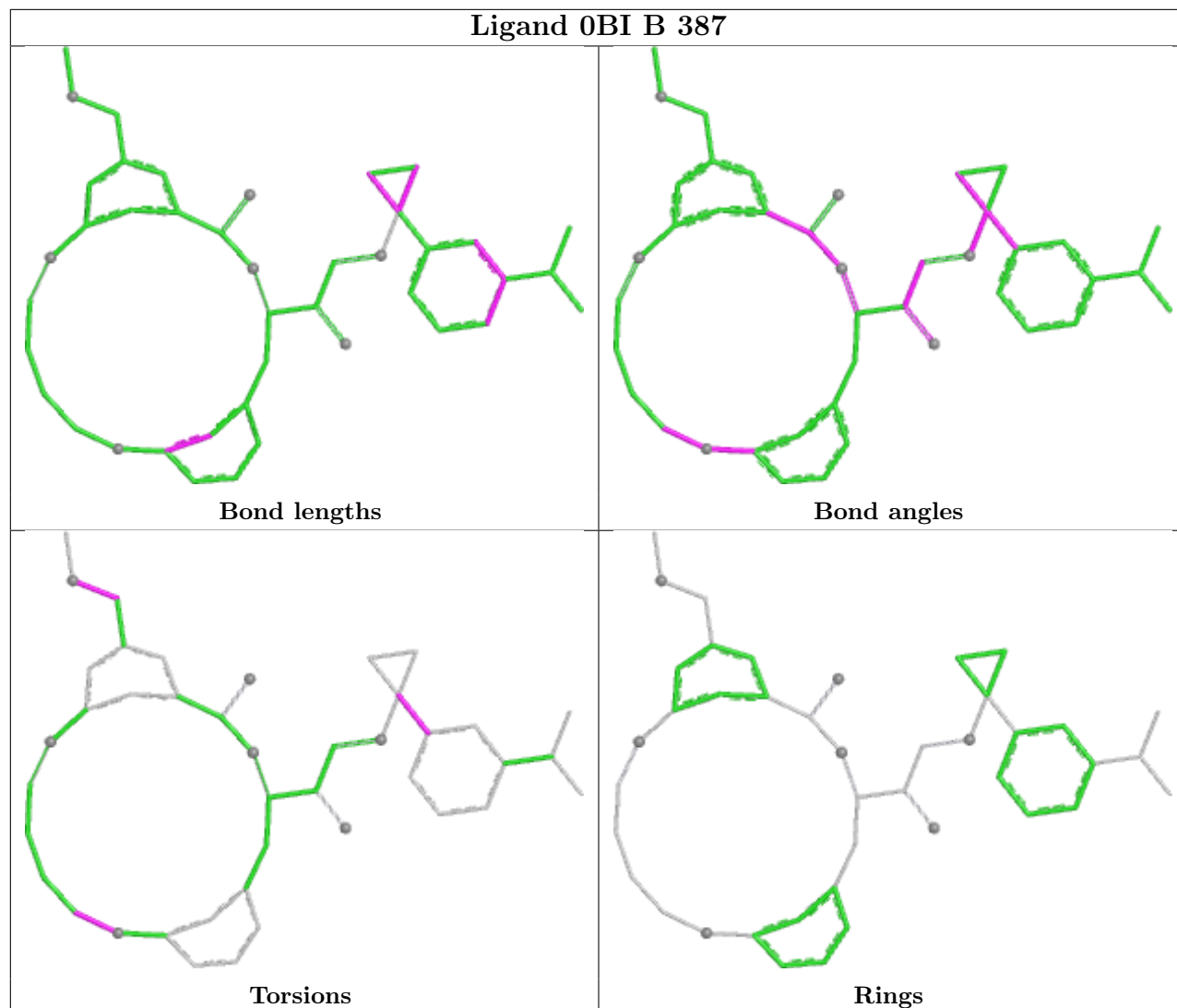
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	377/402 (93%)	0.61	52 (13%)	8	9	28, 44, 81, 116	0
1	B	377/402 (93%)	0.74	58 (15%)	6	7	27, 45, 85, 118	0
1	C	381/402 (94%)	0.67	55 (14%)	7	8	29, 44, 83, 116	0
All	All	1135/1206 (94%)	0.68	165 (14%)	7	8	27, 45, 84, 118	0

All (165) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	312	VAL	9.2
1	B	361	VAL	8.0
1	C	312	VAL	7.8
1	B	314	THR	7.1
1	B	312	VAL	7.0
1	B	313	ALA	6.9
1	A	313	ALA	6.5
1	A	314	THR	6.3
1	B	315	SER	6.2
1	B	267	LEU	6.1
1	C	258	PRO	5.6
1	A	272	ALA	5.5
1	C	168	ALA	5.5
1	C	313	ALA	5.4
1	A	258	PRO	5.4
1	C	272	ALA	5.3
1	A	273	GLY	5.2
1	B	258	PRO	5.2
1	C	159	PHE	5.2
1	C	269	CYS	5.1
1	C	160	PRO	5.0
1	C	158	GLY	4.9
1	B	256	LYS	4.8

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Mol	Chain	Res	Type	RSRZ
1	C	267	LEU	4.7
1	C	361	VAL	4.6
1	C	46(P)	SER	4.5
1	C	362	HIS	4.5
1	B	257	PHE	4.5
1	A	157	ALA	4.4
1	A	317	ASP	4.2
1	B	250	ALA	4.2
1	A	365	PHE	4.2
1	B	309	VAL	4.2
1	C	254	THR	4.1
1	B	46(P)	SER	4.1
1	A	316	GLN	4.1
1	A	256	LYS	4.1
1	C	314	THR	4.1
1	A	266	GLN	4.1
1	C	257	PHE	4.0
1	A	267	LEU	4.0
1	B	273	GLY	3.9
1	C	315	SER	3.9
1	C	271	GLN	3.8
1	C	264	GLY	3.8
1	C	359	CYS	3.8
1	A	254	THR	3.7
1	C	157	ALA	3.7
1	C	365	PHE	3.7
1	B	359	CYS	3.6
1	C	263	LEU	3.6
1	C	259	ASP	3.6
1	C	268	VAL	3.6
1	A	269	CYS	3.6
1	C	317	ASP	3.6
1	A	311	ASP	3.5
1	B	278	ASN	3.5
1	B	254	THR	3.5
1	B	308	PRO	3.5
1	B	277	TRP	3.5
1	A	253	SER	3.4
1	A	315	SER	3.4
1	C	311	ASP	3.4
1	A	309	VAL	3.4
1	A	362	HIS	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	271	GLN	3.3
1	B	362	HIS	3.3
1	B	272	ALA	3.3
1	B	365	PHE	3.3
1	B	157	ALA	3.3
1	C	321	LYS	3.3
1	B	263	LEU	3.3
1	B	360	HIS	3.3
1	C	49	HIS	3.3
1	B	319	CYS	3.2
1	C	260	GLY	3.2
1	B	320	TYR	3.2
1	A	259	ASP	3.2
1	C	309	VAL	3.2
1	C	261	PHE	3.1
1	B	262	TRP	3.1
1	C	310	GLU	3.0
1	B	274	THR	3.0
1	A	257	PHE	3.0
1	A	55	GLN	2.9
1	B	265	GLU	2.9
1	B	268	VAL	2.9
1	C	145	HIS	2.9
1	B	266	GLN	2.9
1	A	319	CYS	2.9
1	B	317	ASP	2.9
1	C	319	CYS	2.9
1	B	340	GLY	2.9
1	C	270	TRP	2.8
1	A	318	ASP	2.8
1	A	268	VAL	2.8
1	C	214	LYS	2.8
1	A	60	TYR	2.8
1	B	252	SER	2.8
1	A	360	HIS	2.7
1	C	316	GLN	2.7
1	B	276	PRO	2.7
1	A	264	GLY	2.7
1	C	169	SER	2.7
1	B	316	GLN	2.7
1	C	253	SER	2.6
1	A	361	VAL	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	273	GLY	2.6
1	B	269	CYS	2.6
1	A	271	GLN	2.6
1	A	156	GLY	2.6
1	A	170	VAL	2.6
1	B	318	ASP	2.6
1	B	47	PHE	2.6
1	A	308	PRO	2.6
1	B	9	LYS	2.5
1	C	278	ASN	2.5
1	A	265	GLU	2.5
1	B	270	TRP	2.5
1	C	266	GLN	2.5
1	A	169	SER	2.4
1	A	56	LEU	2.4
1	A	251	ALA	2.4
1	A	262	TRP	2.4
1	B	275	THR	2.4
1	C	68	TYR	2.4
1	A	73	GLN	2.4
1	A	263	LEU	2.4
1	B	22	SER	2.4
1	B	260	GLY	2.4
1	C	66	GLY	2.4
1	C	56	LEU	2.3
1	B	311	ASP	2.3
1	B	60	TYR	2.3
1	C	156	GLY	2.3
1	B	209	ASN	2.3
1	C	256	LYS	2.3
1	B	49	HIS	2.3
1	A	46(P)	SER	2.3
1	B	253	SER	2.3
1	C	380	GLU	2.2
1	A	142	LYS	2.2
1	C	360	HIS	2.2
1	C	73	GLN	2.2
1	B	306	LEU	2.2
1	A	58	SER	2.2
1	B	249	LYS	2.2
1	A	359	CYS	2.2
1	A	10	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	261	PHE	2.1
1	A	306	LEU	2.1
1	B	279	ILE	2.1
1	C	274	THR	2.1
1	A	270	TRP	2.1
1	B	259	ASP	2.1
1	B	61	ARG	2.1
1	B	264	GLY	2.1
1	A	260	GLY	2.1
1	B	211	GLN	2.1
1	C	1	GLU	2.1
1	A	9	LYS	2.1
1	A	320	TYR	2.1
1	B	300	ILE	2.1
1	C	358	ALA	2.0
1	C	60	TYR	2.0

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 monosaccharides in this entry.

6.4 Ligands ⓘ

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	0BI	A	387	42/42	0.94	0.10	30,36,44,59	0
2	0BI	B	387	42/42	0.95	0.09	31,37,43,58	0
2	0BI	C	387	42/42	0.96	0.08	31,36,44,59	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.
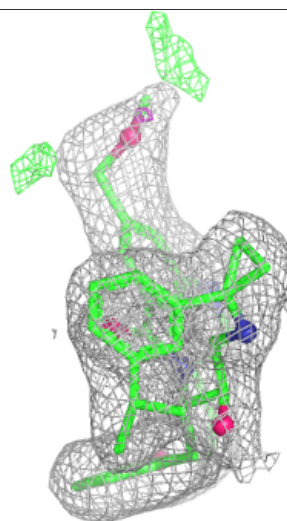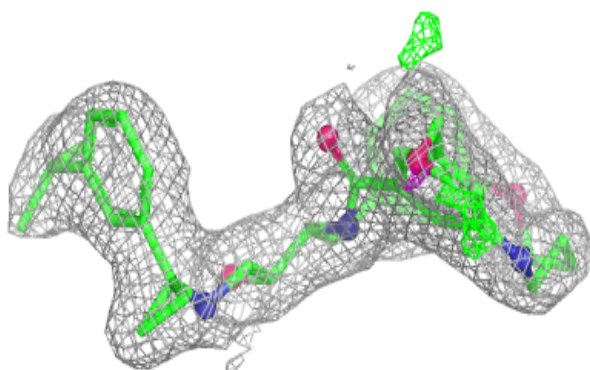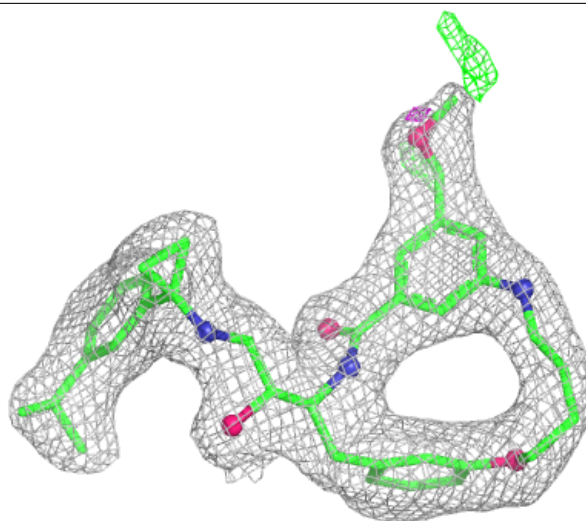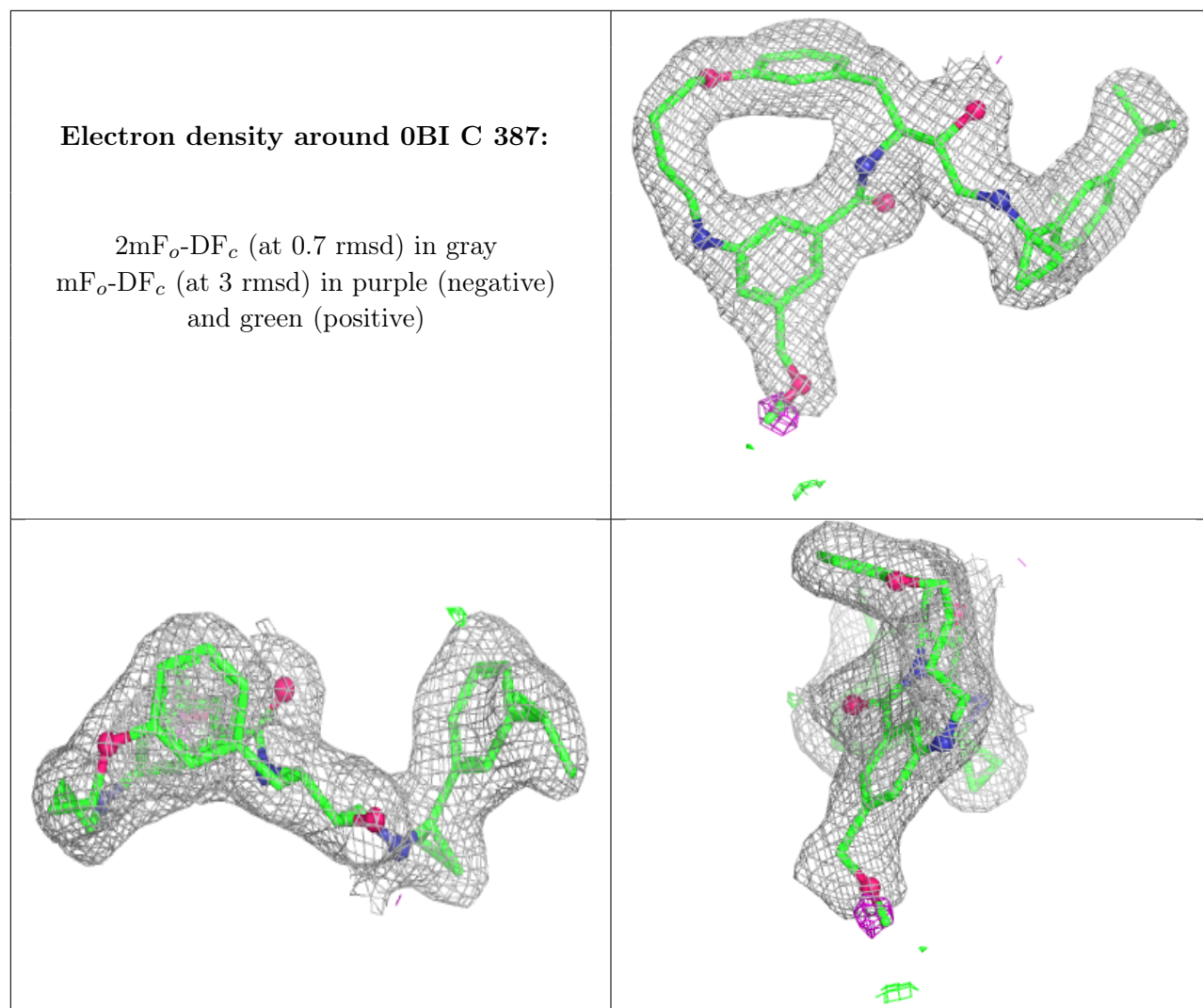
Electron density around 0BI A 387:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
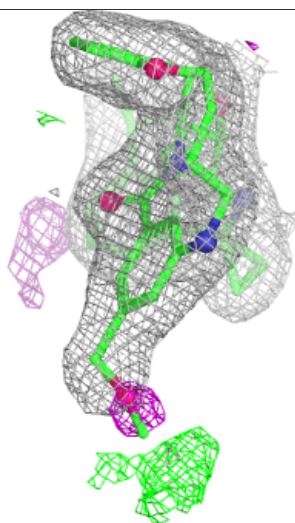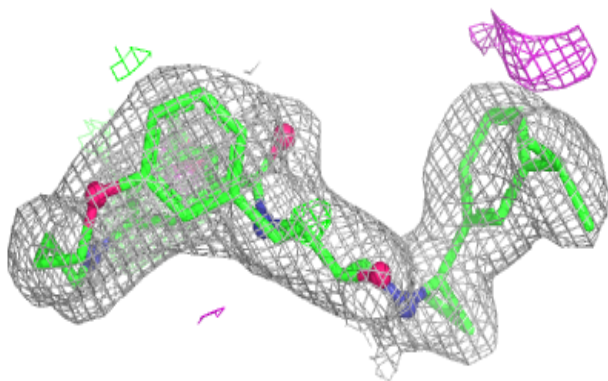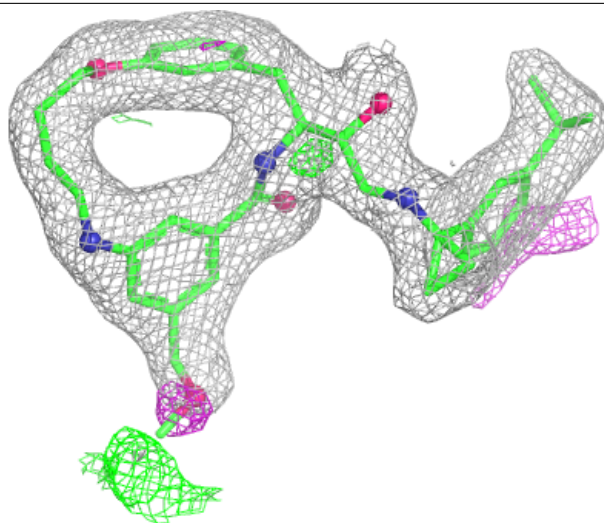
Electron density around 0BI B 387:

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

Electron density around 0BI C 387:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.