



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 11:20 PM EDT

PDB ID : 3K5F
Title : Human BACE-1 COMPLEX WITH AYH011
Authors : Rondeau, J.-M.
Deposited on : 2009-10-07
Resolution : 2.25 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 ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
EDS : 2.37.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.37.1

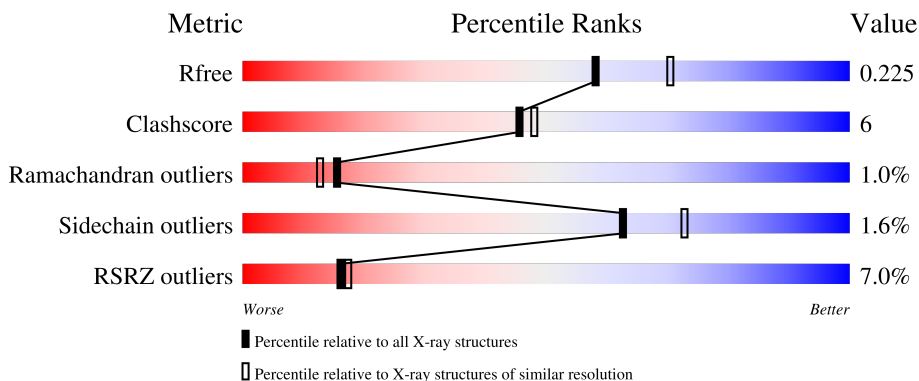
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.25 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	1377 (2.26-2.26)
Clashscore	141614	1487 (2.26-2.26)
Ramachandran outliers	138981	1449 (2.26-2.26)
Sidechain outliers	138945	1450 (2.26-2.26)
RSRZ outliers	127900	1356 (2.26-2.26)

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	402	
1	B	402	
1	C	402	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 9464 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.

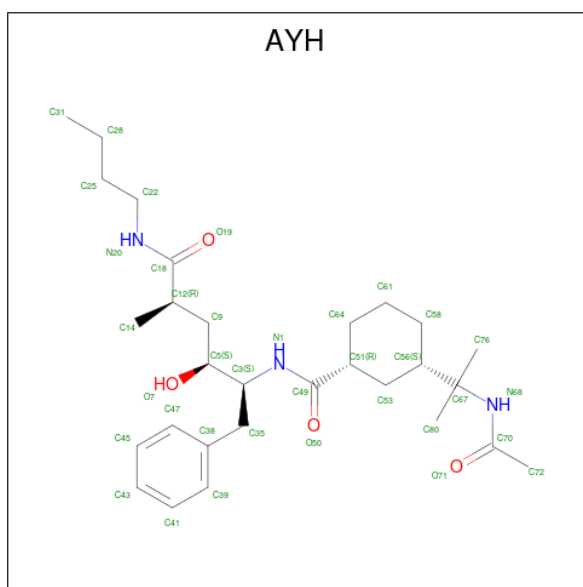
- Molecule 1 is a protein called Beta-secretase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	373	2928	1874	487	553	14	0	0	0
1	B	377	2966	1898	493	561	14	0	0	0
1	C	377	2966	1898	493	561	14	0	0	0

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 (1R,3S)-3-[1-(acetylamino)-1-methylethyl]-N-[(1S,2S,4R)-1-benzyl-5-(butylamino)-2-hydroxy-4-methyl-5-oxopentyl]cyclohexanecarboxamide (three-letter code: AYH) (formula: C₂₉H₄₇N₃O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	36	29	3	4	0	0
2	B	1	36	29	3	4	0	0
2	C	1	36	29	3	4	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	176	176	176	0	0
3	B	170	170	170	0	0
3	C	150	150	150	0	0



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.65Å 103.71Å 101.82Å 90.00° 102.53° 90.00°	Depositor
Resolution (Å)	43.62 – 2.25 43.62 – 2.25	Depositor EDS
% Data completeness (in resolution range)	91.6 (43.62-2.25) 91.7 (43.62-2.25)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.54 (at 2.24Å)	Xtrriage
Refinement program	CNS, CNX	Depositor
R, R_{free}	0.209 , 0.232 0.201 , 0.225	Depositor DCC
R_{free} test set	3718 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	42.7	Xtrriage
Anisotropy	0.300	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 45.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9464	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.04% 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: AYH

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	0.34	0/3000	0.62	2/4076 (0.0%)
1	B	0.34	0/3041	0.61	0/4133
1	C	0.34	0/3041	0.61	0/4133
All	All	0.34	0/9082	0.61	2/12342 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	342	TYR	N-CA-C	-5.24	96.87	111.00
1	A	359	CYS	CA-CB-SG	5.04	123.07	114.00

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	2928	0	2848	41	0
1	B	2966	0	2875	31	0
1	C	2966	0	2875	45	0
2	A	36	0	47	0	0
2	B	36	0	47	0	0
2	C	36	0	47	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	176	0	0	4	0
3	B	170	0	0	1	0
3	C	150	0	0	6	0
All	All	9464	0	8739	113	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 (113) 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:C:202:ILE:HD12	1:C:379:MET:HE2	1.64	0.79
1:C:202:ILE:CD1	1:C:379:MET:HG3	2.11	0.78
1:A:196:GLU:HG3	3:A:531:HOH:O	1.84	0.78
1:C:267:LEU:HD23	1:C:267:LEU:H	1.49	0.76
1:B:363:ASP:HB3	1:B:366:ARG:O	1.90	0.72
1:C:335:ALA:O	1:C:339:GLU:HG3	1.93	0.68
1:C:196:GLU:HG3	3:C:535:HOH:O	1.95	0.66
1:A:106:ASP:OD1	1:C:1:GLU:HG2	1.97	0.64
1:A:276:PRO:O	1:A:279:ILE:HG12	1.98	0.64
1:C:363:ASP:HB3	1:C:366:ARG:O	1.98	0.63
1:A:2:MET:HG2	1:A:90:GLY:HA2	1.82	0.62
1:C:304:GLN:HG3	1:C:361:VAL:HG11	1.81	0.62
1:B:260:GLY:HA3	1:B:266:GLN:HE21	1.65	0.60
1:C:276:PRO:O	1:C:279:ILE:HG12	2.02	0.60
1:B:335:ALA:O	1:B:339:GLU:HG3	2.01	0.60
1:A:205:ARG:HD3	1:A:212:ASP:OD2	2.02	0.59
1:C:267:LEU:HD23	1:C:267:LEU:N	2.17	0.59
1:C:202:ILE:CD1	1:C:379:MET:HE2	2.32	0.59
1:C:235:ARG:HB2	1:C:332:VAL:HB	1.85	0.58
1:B:196:GLU:HG3	3:B:490:HOH:O	2.02	0.58
1:C:2:MET:HG2	1:C:90:GLY:HA2	1.84	0.58
1:C:20:VAL:HG12	1:C:85:VAL:HG22	1.86	0.57
1:A:104:GLU:OE1	1:C:46(P):SER:HA	2.04	0.57
1:A:260:GLY:HA3	1:A:266:GLN:HE21	1.70	0.56
1:B:20:VAL:HG12	1:B:85:VAL:HG22	1.88	0.56
1:A:20:VAL:HG12	1:A:85:VAL:HG22	1.88	0.55
1:A:123:TYR:CZ	1:A:196:GLU:HG2	2.42	0.55
1:B:365:PHE:CD1	1:B:366:ARG:HG3	2.41	0.55
1:B:2:MET:HG2	1:B:90:GLY:HA2	1.88	0.55
1:B:235:ARG:HB2	1:B:332:VAL:HB	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:202:ILE:HD13	1:C:379:MET:HG3	1.89	0.54
1:A:325:SER:HB3	3:A:537:HOH:O	2.08	0.53
1:B:271:GLN:HA	1:B:317:ASP:OD1	2.08	0.53
1:A:280:PHE:HB3	1:A:302:PRO:HB3	1.92	0.52
1:C:309:VAL:HG11	1:C:321:LYS:HG3	1.92	0.52
1:B:301:LEU:HD11	1:B:367:THR:HA	1.92	0.52
1:C:202:ILE:HD11	1:C:379:MET:HG3	1.88	0.51
1:A:314:THR:HB	1:A:316:GLN:NE2	2.26	0.51
1:C:216:ASP:HA	3:C:536:HOH:O	2.10	0.51
1:C:238:LYS:O	1:C:242:GLU:HG3	2.12	0.50
1:A:235:ARG:HB2	1:A:332:VAL:HB	1.94	0.50
1:B:110:ILE:HB	1:B:113:SER:HB3	1.93	0.49
1:A:104:GLU:HG2	1:C:48(P):VAL:HB	1.94	0.49
1:C:123:TYR:CZ	1:C:196:GLU:HG2	2.48	0.49
1:C:110:ILE:HB	1:C:113:SER:HB3	1.94	0.49
1:B:238:LYS:O	1:B:242:GLU:HG3	2.12	0.49
1:B:267:LEU:H	1:B:267:LEU:HD23	1.78	0.49
1:B:276:PRO:O	1:B:279:ILE:HG12	2.13	0.48
1:A:269:CYS:HA	1:A:319:CYS:HA	1.95	0.48
1:A:378:ASP:HB3	1:A:381:ASP:OD2	2.14	0.48
1:B:260:GLY:HA3	1:B:266:GLN:HG3	1.93	0.48
1:A:314:THR:HB	1:A:316:GLN:HE22	1.78	0.48
1:B:8:GLY:O	1:B:170:VAL:HG22	2.13	0.48
1:C:278:ASN:H	1:C:278:ASN:HD22	1.60	0.48
1:B:123:TYR:CZ	1:B:196:GLU:HG2	2.48	0.47
1:A:113:SER:N	3:A:420:HOH:O	2.48	0.47
1:A:238:LYS:O	1:A:242:GLU:HG3	2.15	0.47
1:B:179:ILE:HG23	1:B:342:TYR:HE2	1.78	0.47
1:B:265:GLU:O	1:B:321:LYS:HE2	2.14	0.47
1:B:272:ALA:HB2	1:B:316:GLN:O	2.14	0.47
1:A:65:LYS:HE2	1:A:129:PRO:HG3	1.97	0.47
1:A:235:ARG:HB3	1:A:327:SER:HB2	1.96	0.47
1:A:110:ILE:HB	1:A:113:SER:HB3	1.95	0.46
1:A:298:ILE:HB	1:A:341:PHE:CZ	2.50	0.46
1:C:32:ASP:OD1	1:C:230:GLY:HA3	2.16	0.46
1:C:63:LEU:HG	1:C:81:GLY:HA2	1.98	0.46
1:B:235:ARG:HB3	1:B:327:SER:HB2	1.99	0.45
1:B:303:GLN:HB2	1:B:361:VAL:HG11	1.98	0.45
1:A:314:THR:HG22	1:A:315:SER:N	2.32	0.45
1:C:211:GLN:HB2	3:C:526:HOH:O	2.17	0.45
1:A:113:SER:O	1:A:114:ASN:CB	2.65	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:235:ARG:HB3	1:C:327:SER:HB2	1.98	0.45
1:A:267:LEU:N	1:A:267:LEU:HD23	2.31	0.45
1:B:63:LEU:HG	1:B:81:GLY:HA2	1.98	0.45
1:A:1:GLU:HG2	1:B:106:ASP:OD1	2.17	0.44
1:B:113:SER:O	1:B:114:ASN:CB	2.65	0.44
1:A:259:ASP:O	1:A:263:LEU:HG	2.17	0.44
1:C:278:ASN:HD22	1:C:278:ASN:N	2.15	0.44
1:C:378:ASP:HB2	3:C:487:HOH:O	2.15	0.44
1:A:63:LEU:HG	1:A:81:GLY:HA2	1.99	0.44
1:C:23:PRO:HA	1:C:24:PRO:HD3	1.87	0.44
1:C:179:ILE:HG23	1:C:342:TYR:HE2	1.83	0.44
1:A:222:TYR:HA	1:A:223:ASP:HA	1.69	0.44
1:B:19:THR:HA	1:B:25:GLN:O	2.18	0.44
1:A:265:GLU:O	1:A:321:LYS:HE2	2.17	0.44
1:A:271:GLN:HB3	1:A:274:THR:HG21	1.99	0.44
1:C:272:ALA:HB2	1:C:316:GLN:O	2.17	0.44
1:B:301:LEU:HD11	1:B:367:THR:CA	2.48	0.44
1:C:44:PRO:HA	3:C:440:HOH:O	2.18	0.43
1:A:23:PRO:HA	1:A:24:PRO:HD3	1.88	0.43
1:B:65:LYS:HE2	1:B:129:PRO:HG3	2.00	0.43
1:C:151:SER:OG	1:C:175:ILE:HB	2.18	0.43
1:A:32:ASP:OD1	1:A:230:GLY:HA3	2.18	0.43
1:C:222:TYR:HA	1:C:223:ASP:HA	1.67	0.43
1:A:184:TYR:HB2	1:A:356:VAL:O	2.19	0.42
1:B:45:HIS:HA	1:B:46:PRO:HD3	1.91	0.42
1:C:197:TRP:CG	1:C:198:TYR:N	2.86	0.42
1:A:271:GLN:HB3	1:A:274:THR:CG2	2.50	0.42
1:C:113:SER:O	1:C:114:ASN:CB	2.68	0.41
1:B:344:VAL:O	1:B:352:ILE:HA	2.21	0.41
1:C:292:THR:HG21	1:C:378:ASP:HB3	2.02	0.41
1:A:197:TRP:CG	1:A:198:TYR:N	2.88	0.41
1:C:4:ASP:HA	1:C:172:GLY:O	2.21	0.41
1:A:181:HIS:HB3	3:A:540:HOH:O	2.19	0.41
1:C:268:VAL:O	1:C:319:CYS:HA	2.21	0.41
1:A:114:ASN:HD22	1:A:114:ASN:HA	1.67	0.41
1:C:75:LYS:HE2	3:C:400:HOH:O	2.20	0.41
1:C:216:ASP:OD1	1:C:218:LYS:HB2	2.21	0.41
1:B:134:GLU:HA	1:B:135:PRO:HD3	1.93	0.40
1:A:45:HIS:HA	1:A:46:PRO:HD3	1.92	0.40
1:A:126:ILE:HG23	1:A:197:TRP:HB2	2.03	0.40
1:C:301:LEU:HD12	1:C:361:VAL:HG23	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:314:THR:HB	1:C:316:GLN:OE1	2.21	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	367/402 (91%)	350 (95%)	12 (3%)	5 (1%)	11	7
1	B	373/402 (93%)	354 (95%)	16 (4%)	3 (1%)	19	17
1	C	373/402 (93%)	357 (96%)	13 (4%)	3 (1%)	19	17
All	All	1113/1206 (92%)	1061 (95%)	41 (4%)	11 (1%)	15	13

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	360	HIS
1	C	313	ALA
1	A	316	GLN
1	B	272	ALA
1	C	316	GLN
1	A	315	SER
1	A	272	ALA
1	A	313	ALA
1	A	70	PRO
1	C	70	PRO
1	B	70	PRO

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	318/342 (93%)	312 (98%)	6 (2%)	57	66
1	B	322/342 (94%)	318 (99%)	4 (1%)	71	80
1	C	322/342 (94%)	317 (98%)	5 (2%)	62	73
All	All	962/1026 (94%)	947 (98%)	15 (2%)	62	73

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	114	ASN
1	A	197	TRP
1	A	205	ARG
1	A	267	LEU
1	A	316	GLN
1	A	360	HIS
1	B	114	ASN
1	B	197	TRP
1	B	254	THR
1	B	373	PRO
1	C	114	ASN
1	C	197	TRP
1	C	259	ASP
1	C	267	LEU
1	C	278	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	73	GLN
1	A	114	ASN
1	A	211	GLN
1	A	266	GLN
1	A	271	GLN
1	A	316	GLN

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Mol	Chain	Res	Type
1	A	326	GLN
1	B	73	GLN
1	B	114	ASN
1	B	266	GLN
1	B	271	GLN
1	B	316	GLN
1	B	326	GLN
1	C	73	GLN
1	C	114	ASN
1	C	211	GLN
1	C	271	GLN
1	C	278	ASN
1	C	294	GLN
1	C	316	GLN
1	C	326	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

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	AYH	A	387	-	35,37,37	1.01	1 (2%)	43,50,50	1.10	4 (9%)
2	AYH	B	387	-	35,37,37	1.12	1 (2%)	43,50,50	1.14	5 (11%)
2	AYH	C	387	-	35,37,37	1.16	4 (11%)	43,50,50	1.09	3 (6%)

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	AYH	A	387	-	-	0/40/50/50	0/2/2/2
2	AYH	B	387	-	-	0/40/50/50	0/2/2/2
2	AYH	C	387	-	-	0/40/50/50	0/2/2/2

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	387	AYH	C76-C67	3.07	1.56	1.53
2	B	387	AYH	C80-C67	2.81	1.55	1.53
2	C	387	AYH	C80-C67	2.04	1.55	1.53
2	A	387	AYH	C80-C67	2.03	1.55	1.53
2	C	387	AYH	C41-C39	2.03	1.42	1.38
2	C	387	AYH	C58-C56	2.01	1.57	1.53

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	387	AYH	C3-N1-C49	-3.48	117.19	123.25
2	A	387	AYH	C3-N1-C49	-3.02	117.99	123.25
2	B	387	AYH	C3-N1-C49	-2.96	118.09	123.25
2	B	387	AYH	C5-C3-N1	2.75	115.13	109.97
2	A	387	AYH	C5-C3-N1	2.43	114.52	109.97
2	C	387	AYH	C5-C3-N1	2.36	114.39	109.97
2	B	387	AYH	C80-C67-N68	2.27	111.77	107.37
2	B	387	AYH	C14-C12-C18	-2.13	105.72	109.64
2	C	387	AYH	C80-C67-N68	2.12	111.48	107.37
2	A	387	AYH	C80-C67-N68	2.06	111.37	107.37
2	A	387	AYH	C22-N20-C18	-2.05	118.86	122.55
2	B	387	AYH	C22-N20-C18	-2.05	118.87	122.55

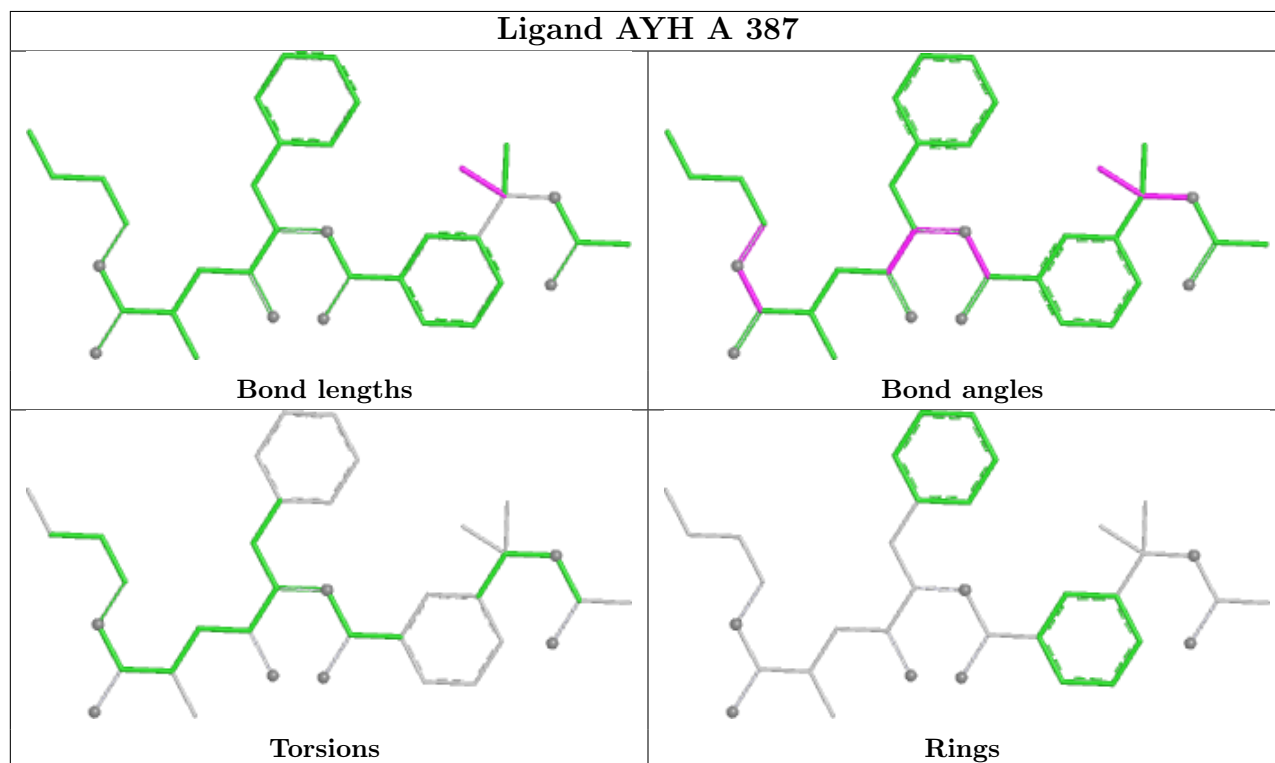
There are no chirality outliers.

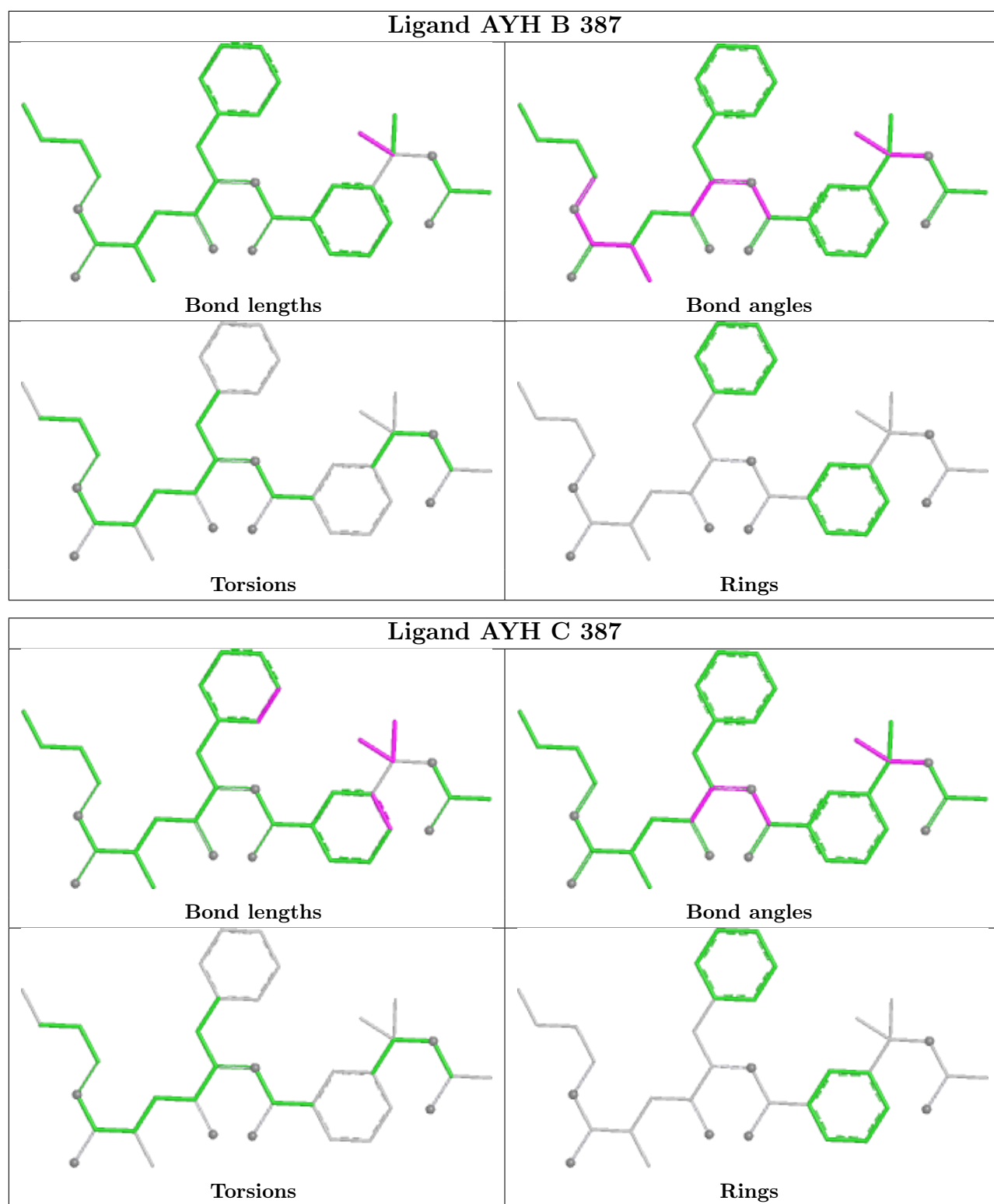
There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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

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	373/402 (92%)	0.54	36 (9%) 7 8	25, 42, 82, 112	0
1	B	377/402 (93%)	0.38	23 (6%) 21 23	26, 43, 77, 112	0
1	C	377/402 (93%)	0.35	20 (5%) 26 29	27, 44, 72, 107	0
All	All	1127/1206 (93%)	0.43	79 (7%) 16 17	25, 43, 78, 112	0

All (79) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	312	VAL	11.8
1	B	365	PHE	9.1
1	B	312	VAL	8.8
1	A	313	ALA	7.3
1	A	311	ASP	7.3
1	B	314	THR	7.3
1	B	313	ALA	7.3
1	B	315	SER	7.0
1	C	312	VAL	6.7
1	A	315	SER	6.6
1	A	314	THR	6.0
1	A	273	GLY	5.6
1	C	362	HIS	5.5
1	A	310	GLU	5.5
1	C	314	THR	5.4
1	B	364	GLU	5.3
1	C	313	ALA	5.2
1	A	268	VAL	4.8
1	B	311	ASP	4.8
1	C	311	ASP	4.8
1	A	360	HIS	4.6
1	A	316	GLN	4.2
1	C	364	GLU	4.2

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Mol	Chain	Res	Type	RSRZ
1	C	316	GLN	4.2
1	A	251	ALA	4.1
1	C	315	SER	4.1
1	C	365	PHE	4.1
1	A	270	TRP	4.0
1	B	316	GLN	3.9
1	B	361	VAL	3.6
1	A	250	ALA	3.6
1	A	254	THR	3.4
1	A	271	GLN	3.4
1	B	362	HIS	3.4
1	A	272	ALA	3.3
1	C	47	PHE	3.3
1	A	319	CYS	3.2
1	A	279	ILE	3.2
1	A	368	ALA	3.2
1	B	310	GLU	3.1
1	A	318	ASP	3.1
1	A	317	ASP	3.1
1	A	145	HIS	3.0
1	A	275	THR	2.9
1	C	271	GLN	2.9
1	B	271	GLN	2.9
1	A	309	VAL	2.8
1	C	145	HIS	2.8
1	C	310	GLU	2.7
1	A	320	TYR	2.7
1	B	145	HIS	2.7
1	A	274	THR	2.7
1	A	280	PHE	2.6
1	B	47	PHE	2.6
1	C	49	HIS	2.5
1	B	59	THR	2.5
1	A	269	CYS	2.5
1	A	252	SER	2.4
1	B	55	GLN	2.4
1	B	317	ASP	2.3
1	B	363	ASP	2.3
1	C	112	GLY	2.3
1	C	46	PRO	2.3
1	B	360	HIS	2.2
1	A	276	PRO	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	367	THR	2.2
1	A	214	LYS	2.2
1	A	211	GLN	2.2
1	B	113	SER	2.2
1	B	51	TYR	2.1
1	B	46(P)	SER	2.1
1	A	366	ARG	2.1
1	C	317	ASP	2.1
1	C	46(P)	SER	2.1
1	C	21	GLY	2.1
1	A	256	LYS	2.1
1	B	367	THR	2.0
1	A	46	PRO	2.0
1	C	55	GLN	2.0

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

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

6.3 Carbohydrates [i](#)

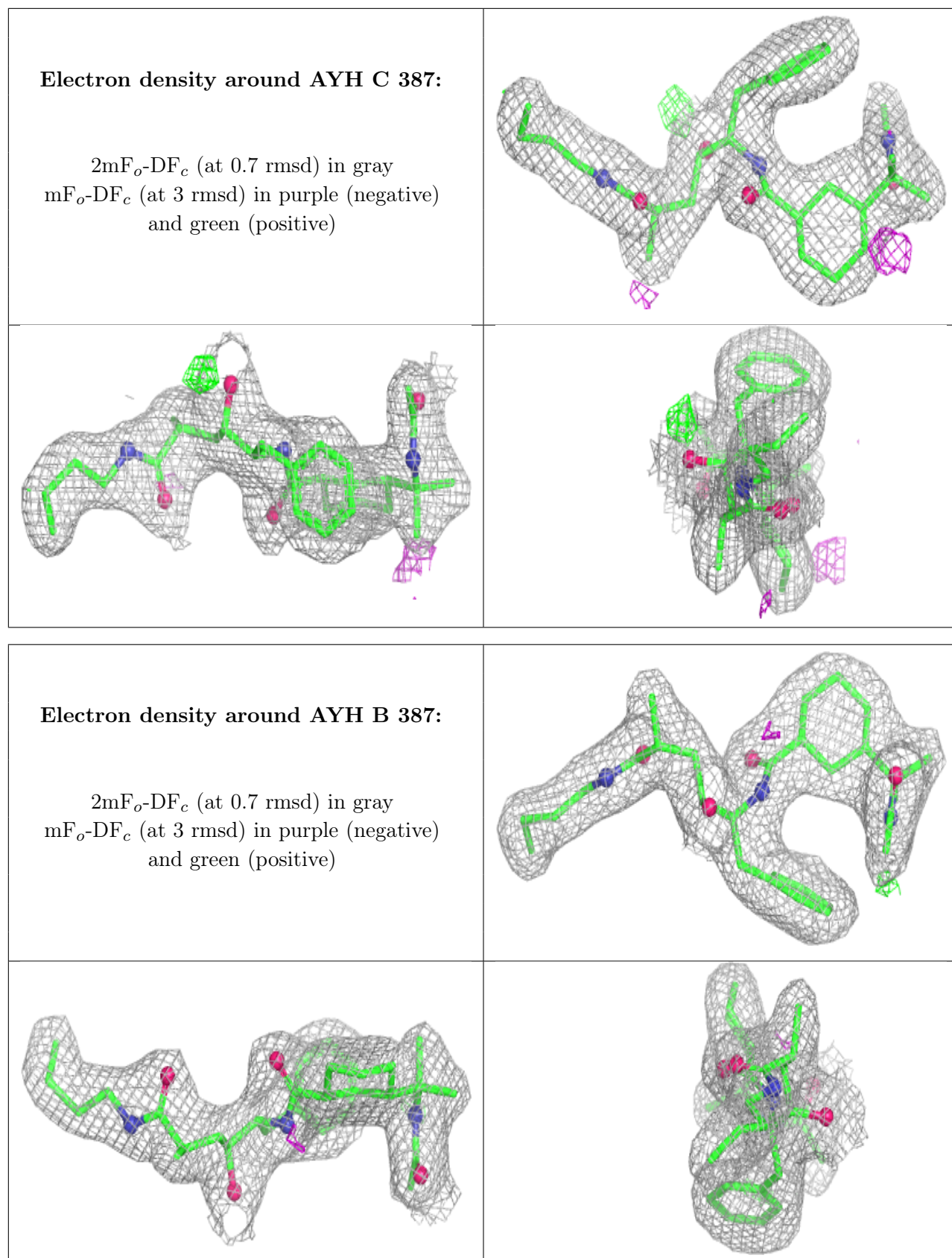
There are no monosaccharides in this entry.

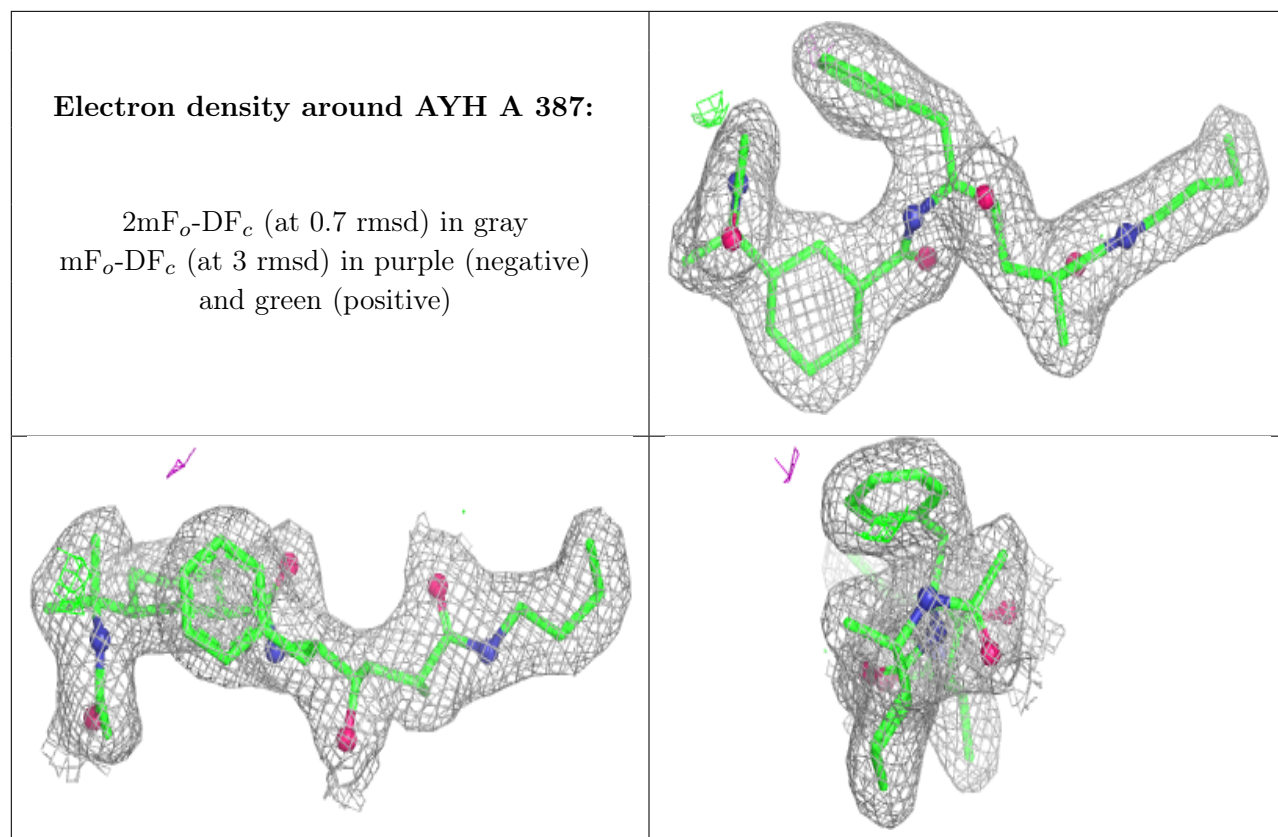
6.4 Ligands [i](#)

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	AYH	C	387	36/36	0.95	0.15	27,32,38,45	0
2	AYH	B	387	36/36	0.97	0.19	27,33,38,40	0
2	AYH	A	387	36/36	0.97	0.16	26,34,39,41	0

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





6.5 Other polymers [i](#)

There are no such residues in this entry.