



# Full wwPDB X-ray Structure Validation Report ⓘ

May 25, 2020 – 08:54 am BST

PDB ID : 3ZH8  
Title : A novel small molecule aPKC inhibitor  
Authors : Kjaer, S.; Purkiss, A.G.; Kostelecky, B.; Knowles, P.P.; Soriano, E.; Murray-Rust, J.; McDonald, N.Q.  
Deposited on : 2012-12-20  
Resolution : 2.74 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](mailto: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.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
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) : 2.11

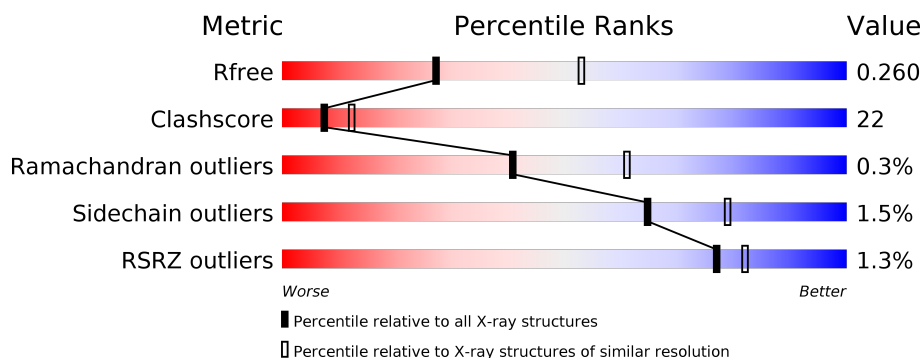
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.74 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	1271 (2.76-2.72)
Clashscore	141614	1322 (2.76-2.72)
Ramachandran outliers	138981	1297 (2.76-2.72)
Sidechain outliers	138945	1298 (2.76-2.72)
RSRZ outliers	127900	1243 (2.76-2.72)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 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	349	<div> <div>2%</div> <div> <div></div> <div>62%</div> <div>28%</div> <div>• 8%</div> </div> </div>
1	B	349	<div> <div>%</div> <div> <div></div> <div>59%</div> <div>31%</div> <div>• 9%</div> </div> </div>
1	C	349	<div> <div>%</div> <div> <div></div> <div>57%</div> <div>33%</div> <div>• 10%</div> </div> </div>

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
2	IOD	A	904	-	-	X	-
2	IOD	B	904	-	-	X	-
2	IOD	C	904	-	-	X	-
5	EDO	C	1583	-	-	-	X

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 7849 atoms, of which 135 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 PROTEIN KINASE C IOTA TYPE.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	320	Total	C	N	O	P	S	0	1	0
			2508	1618	408	467	2	13			
1	B	319	Total	C	N	O	P	S	0	1	0
			2552	1639	419	480	2	12			
1	C	314	Total	C	N	O	P	S	0	1	0
			2436	1569	400	452	2	13			

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	586	SER	CYS	engineered mutation	UNP P41743
B	586	SER	CYS	engineered mutation	UNP P41743
C	586	SER	CYS	engineered mutation	UNP P41743

- Molecule 2 is IODIDE ION (three-letter code: IOD) (formula: I).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	4	Total I 4 4	0	1
2	A	4	Total I 4 4	0	1
2	C	4	Total I 4 4	0	1

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

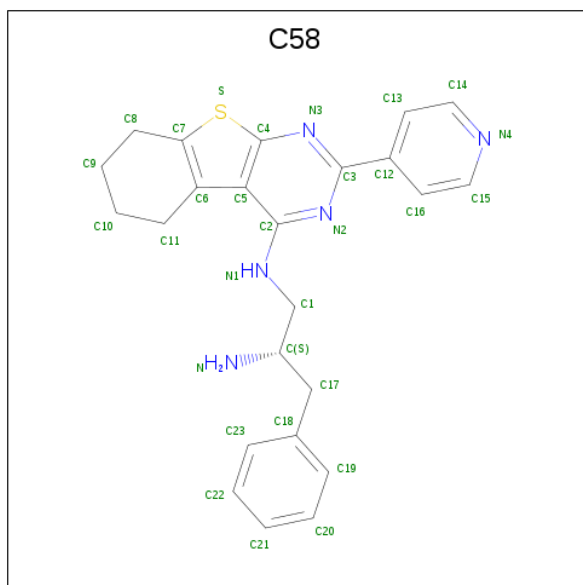
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	B	1	Total Cl 1 1	0	0
3	A	1	Total Cl 1 1	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total Cl 1 1	0	0

- Molecule 4 is (2S)-3-phenyl-N 1 -[2-(pyridin-4-yl)-5,6,7,8-tetrahydro[1]benzothieno[2,3-d]pyrimidin-4-yl]propane-1,2-diamine (three-letter code: C58) (formula: C<sub>24</sub>H<sub>25</sub>N<sub>5</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	H	N	S	0	0
			55	24	25	5	1		
4	B	1	Total	C	H	N	S	0	0
			55	24	25	5	1		
4	C	1	Total	C	H	N	S	0	0
			55	24	25	5	1		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	H	O	0	0
			10	2	6	2		
5	A	1	Total	C	H	O	0	0
			10	2	6	2		
5	A	1	Total	C	H	O	0	0
			10	2	6	2		
5	B	1	Total	C	H	O	0	0
			10	2	6	2		
5	B	1	Total	C	H	O	0	0
			10	2	6	2		
5	B	1	Total	C	H	O	0	0
			10	2	6	2		
5	B	1	Total	C	H	O	0	0
			10	2	6	2		
5	C	1	Total	C	H	O	0	0
			10	2	6	2		
5	C	1	Total	C	H	O	0	0
			10	2	6	2		
5	C	1	Total	C	H	O	0	0
			10	2	6	2		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	22	Total	O	0	0
			22	22		
6	B	29	Total	O	0	0
			29	29		

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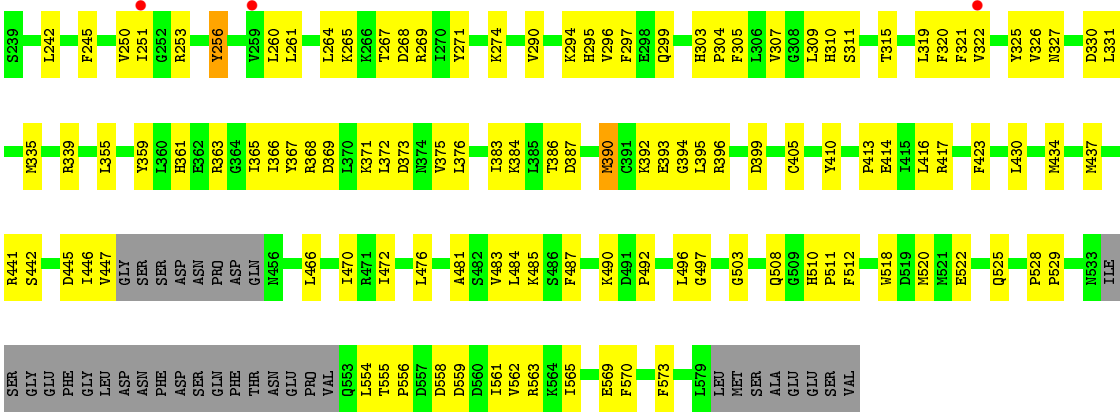
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	C	22	Total	O	0	0
			22	22		



- Molecule 1: PROTEIN KINASE C IOTA TYPE





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	113.58 Å 113.58 Å 82.41 Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	42.23 – 2.74 49.18 – 2.74	Depositor EDS
% Data completeness (in resolution range)	100.0 (42.23-2.74) 100.0 (49.18-2.74)	Depositor EDS
$R_{merge}$	0.10	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.85 (at 2.73 Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE: 1.8.1_1168)	Depositor
R, $R_{free}$	0.210 , 0.257 0.215 , 0.260	Depositor DCC
$R_{free}$ test set	1577 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	53.1	Xtriage
Anisotropy	0.261	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 44.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.46$ , $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.039 for -h,-k,l 0.308 for h,-h-k,-l 0.043 for -k,-h,-l	Xtriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	7849	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	59.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.99% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical 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: TPO, IOD, C58, EDO, CL

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	0.23	0/2544	0.40	0/3441
1	B	0.25	0/2588	0.40	0/3497
1	C	0.23	0/2471	0.40	0/3349
All	All	0.24	0/7603	0.40	0/10287

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	2508	0	2363	106	0
1	B	2552	0	2436	120	0
1	C	2436	0	2250	101	0
2	A	4	0	0	5	0
2	B	4	0	0	5	0
2	C	4	0	0	4	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
4	A	30	25	25	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	30	25	25	1	0
4	C	30	25	25	1	0
5	A	12	18	18	2	0
5	B	16	24	24	5	0
5	C	12	18	18	4	0
6	A	22	0	0	1	0
6	B	29	0	0	4	0
6	C	22	0	0	1	0
All	All	7714	135	7184	329	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 22.

All (329) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:387:ASP:HA	2:B:904:IOD:I	2.16	1.16
1:A:387:ASP:HA	2:A:904:IOD:I	2.30	1.00
1:B:366:ILE:HD11	1:B:395:LEU:CD2	1.91	0.99
1:B:366:ILE:HD11	1:B:395:LEU:HD21	1.48	0.95
1:B:390:MET:HE1	1:B:406:GLY:N	1.82	0.94
1:A:521:MET:HA	1:A:521:MET:HE3	1.52	0.92
1:C:250:VAL:HG22	1:C:260:LEU:CD2	1.99	0.91
1:A:390:MET:HE1	1:A:406:GLY:N	1.85	0.90
1:A:446:ILE:HG22	1:A:447:VAL:HG13	1.60	0.84
1:B:521:MET:HE3	1:B:526:VAL:HB	1.61	0.83
1:B:521:MET:HE3	1:B:521:MET:HA	1.61	0.82
1:B:387:ASP:CA	2:B:904:IOD:I	2.98	0.82
1:A:310:HIS:HB2	1:A:581:MET:CE	2.08	0.82
1:B:446:ILE:HG22	1:B:447:VAL:HG13	1.61	0.82
1:A:264:LEU:HB3	1:A:267:THR:HG22	1.62	0.81
1:C:446:ILE:HG22	1:C:447:VAL:HG13	1.64	0.80
1:C:405:CYS:HA	5:C:1582:EDO:H11	1.65	0.79
1:A:435:PHE:CG	1:A:443:PRO:HG3	2.17	0.79
1:B:325:TYR:CE2	1:B:327:ASN:HB3	2.18	0.78
1:C:442:SER:N	1:C:445:ASP:OD2	2.17	0.78
1:B:521:MET:CE	1:B:526:VAL:HB	2.14	0.77
1:A:390:MET:HE2	1:A:406:GLY:HA2	1.65	0.77
1:C:434:MET:HA	1:C:437:MET:HE2	1.67	0.76
1:C:355:LEU:HD13	1:C:522:GLU:HG2	1.67	0.76
1:C:366:ILE:HD11	1:C:395:LEU:HD22	1.68	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:376:LEU:HD22	4:C:1580:C58:H23	1.67	0.75
1:C:250:VAL:HG22	1:C:260:LEU:HD22	1.68	0.74
1:A:390:MET:CE	1:A:406:GLY:HA2	2.17	0.74
1:A:483:VAL:HG13	1:A:510:HIS:CE1	2.23	0.74
1:B:278:LYS:HG2	1:B:570:PHE:CE2	2.23	0.73
1:B:366:ILE:HD11	1:B:395:LEU:HD22	1.69	0.73
1:A:310:HIS:HB2	1:A:581:MET:HE2	1.71	0.73
1:C:261:LEU:HD21	1:C:325:TYR:CE1	2.23	0.73
1:C:387:ASP:HA	2:C:904:IOD:I	2.58	0.72
1:A:533:ASN:O	1:A:534:ILE:HG13	1.89	0.72
1:C:339:ARG:HA	1:C:339:ARG:HH11	1.54	0.72
1:B:242:LEU:HD22	1:B:313:PHE:CE1	2.25	0.72
1:B:325:TYR:HE2	1:B:327:ASN:HB3	1.50	0.71
1:B:413:PRO:O	1:B:417:ARG:HG3	1.90	0.71
1:A:574:GLU:OE2	6:A:2004:HOH:O	2.08	0.71
1:B:483:VAL:HG13	1:B:510:HIS:CE1	2.24	0.71
1:A:521:MET:HA	1:A:521:MET:CE	2.20	0.70
1:A:264:LEU:HB3	1:A:267:THR:CG2	2.21	0.70
1:A:278:LYS:HB2	1:A:570:PHE:CZ	2.26	0.70
1:B:318:ARG:NH1	1:B:557:ASP:OD1	2.24	0.69
1:B:396:ARG:O	1:B:399:ASP:HB2	1.92	0.69
1:B:264:LEU:HB3	1:B:267:THR:HG22	1.75	0.69
1:B:535:SER:OG	1:B:536:GLY:N	2.25	0.69
1:C:483:VAL:HG11	1:C:512:PHE:HB3	1.74	0.69
1:B:295:HIS:ND1	1:B:393:GLU:OE2	2.27	0.68
1:C:245:PHE:O	1:C:265:LYS:HE3	1.94	0.68
1:C:372:LEU:HB2	5:C:1581:EDO:H11	1.76	0.67
1:A:387:ASP:CA	2:A:904:IOD:I	3.13	0.65
1:A:521:MET:HE3	1:A:526:VAL:HB	1.78	0.65
1:A:267:THR:HG23	1:A:269:ARG:H	1.62	0.64
1:B:571:GLU:OE1	6:B:2029:HOH:O	2.15	0.64
1:A:393:GLU:HG2	1:A:394:GLY:N	2.12	0.64
1:B:445:ASP:OD2	6:B:2021:HOH:O	2.15	0.64
1:A:396:ARG:O	1:A:399:ASP:HB2	1.97	0.64
1:B:359:TYR:O	1:B:363:ARG:HG2	1.98	0.64
1:B:250:VAL:HG22	1:B:260:LEU:CD2	2.27	0.64
1:A:430:LEU:O	1:A:434:MET:HG3	1.98	0.64
1:B:242:LEU:HD22	1:B:313:PHE:HE1	1.63	0.63
1:C:396:ARG:O	1:C:399:ASP:HB2	1.98	0.63
1:C:295:HIS:O	1:C:299:GLN:HG2	1.98	0.63
1:A:240:LEU:CD2	1:A:576:ILE:HD11	2.28	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:518:TRP:N	6:B:2026:HOH:O	2.31	0.63
1:B:435:PHE:CG	1:B:443:PRO:HG3	2.34	0.63
1:A:470:ILE:O	1:A:485:LYS:HE2	1.97	0.63
1:C:470:ILE:O	1:C:485:LYS:HE2	1.99	0.63
1:C:390:MET:CE	1:C:390:MET:HA	2.29	0.63
1:B:266:LYS:HG2	1:B:266:LYS:O	1.99	0.62
1:A:263:ARG:NH1	1:A:265:LYS:HA	2.14	0.62
1:B:240:LEU:CD1	1:B:576:ILE:HD11	2.29	0.62
1:A:264:LEU:HD23	1:A:267:THR:HG21	1.80	0.62
1:B:393:GLU:HG2	1:B:394:GLY:N	2.15	0.61
1:B:427:TRP:HE1	5:B:1585:EDO:H21	1.65	0.61
1:C:260:LEU:HD11	1:C:554:LEU:HD21	1.82	0.61
1:B:278:LYS:HG3	1:B:570:PHE:CZ	2.35	0.61
1:B:483:VAL:HG11	1:B:512:PHE:HB3	1.81	0.61
1:C:413:PRO:O	1:C:417:ARG:HG3	2.01	0.61
1:B:240:LEU:HD13	1:B:576:ILE:HD11	1.82	0.61
1:B:390:MET:HE1	1:B:406:GLY:H	1.66	0.61
1:C:430:LEU:O	1:C:434:MET:HG3	2.00	0.61
1:A:417:ARG:HD2	1:A:419:GLU:OE2	2.01	0.60
1:C:297:PHE:CD1	1:C:309:LEU:HB2	2.36	0.60
1:C:483:VAL:HG11	1:C:512:PHE:CB	2.32	0.60
1:A:413:PRO:O	1:A:417:ARG:HG3	2.01	0.60
1:A:435:PHE:CD1	1:A:443:PRO:HG3	2.37	0.60
1:B:264:LEU:HB3	1:B:267:THR:CG2	2.32	0.60
1:A:278:LYS:HD2	1:A:317:SER:C	2.22	0.59
1:A:400:THR:OG1	1:A:420:ASP:HB3	2.02	0.59
1:B:361:HIS:NE2	1:B:426:ASP:OD2	2.23	0.59
1:B:533:ASN:OD1	1:B:534:ILE:HG23	2.03	0.59
1:C:274:LYS:HB3	1:C:321:PHE:HB2	1.85	0.59
1:A:390:MET:HE1	1:A:406:GLY:CA	2.31	0.59
1:A:486:SER:HB3	1:A:496:LEU:HB2	1.85	0.59
1:B:326:VAL:HG21	1:B:384:LYS:HD2	1.84	0.59
1:A:434:MET:HA	1:A:437:MET:HE2	1.85	0.59
1:C:393:GLU:HG2	1:C:394:GLY:N	2.17	0.59
1:A:534:ILE:HD12	1:A:534:ILE:C	2.23	0.58
1:C:359:TYR:HD1	5:C:1583:EDO:H12	1.68	0.58
1:B:242:LEU:CD2	1:B:313:PHE:HE1	2.17	0.58
1:C:434:MET:HA	1:C:437:MET:CE	2.34	0.58
1:C:251:ILE:HD13	1:C:261:LEU:HG	1.85	0.58
1:C:417:ARG:NH2	1:C:490:LYS:O	2.29	0.58
1:B:390:MET:CE	1:B:406:GLY:HA2	2.33	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:325:TYR:CE2	1:C:327:ASN:HB3	2.38	0.57
1:A:251:ILE:CG1	1:A:259:VAL:HG12	2.33	0.57
1:B:392:LYS:HG3	1:B:395:LEU:HD11	1.86	0.57
1:B:483:VAL:HG11	1:B:512:PHE:CB	2.34	0.57
1:A:352:GLU:OE2	1:A:382:HIS:ND1	2.27	0.56
1:B:315:THR:HG23	1:B:320:PHE:CE1	2.40	0.56
1:B:400:THR:HG23	6:B:2017:HOH:O	2.06	0.56
1:B:390:MET:HE2	1:B:406:GLY:HA2	1.87	0.56
1:C:367:TYR:OH	1:C:386:THR:O	2.20	0.56
1:B:278:LYS:HG3	1:B:570:PHE:CE1	2.40	0.56
1:A:303:HIS:ND1	1:A:304:PRO:HD2	2.21	0.56
1:B:387:ASP:HB2	4:B:1581:C58:S	2.45	0.56
1:B:390:MET:HE1	1:B:406:GLY:CA	2.35	0.56
1:A:390:MET:CE	1:A:406:GLY:CA	2.84	0.56
1:A:483:VAL:HG11	1:A:512:PHE:HB3	1.86	0.56
1:C:390:MET:HE3	1:C:390:MET:HA	1.88	0.55
1:A:258:LYS:HE2	1:A:260:LEU:HD21	1.88	0.55
1:B:258:LYS:HD3	1:B:260:LEU:HD21	1.89	0.55
1:B:483:VAL:CG1	1:B:510:HIS:CE1	2.89	0.55
1:A:326:VAL:HG21	1:A:384:LYS:HD2	1.88	0.55
1:A:338:GLN:HG2	1:A:341:LEU:HD23	1.88	0.55
1:A:368:ARG:CZ	1:A:392:LYS:HB2	2.36	0.55
1:B:498:CYS:HB3	5:B:1582:EDO:H11	1.88	0.55
1:A:531:LYS:HB3	1:A:533:ASN:OD1	2.07	0.55
1:B:378:ASP:O	1:B:532:PRO:HG2	2.07	0.54
1:C:299:GLN:OE1	1:C:363:ARG:NH2	2.34	0.54
1:A:240:LEU:HD23	1:A:576:ILE:HD11	1.88	0.54
1:C:483:VAL:HG23	1:C:484:LEU:N	2.22	0.54
1:B:504:PHE:O	1:B:508:GLN:HG3	2.07	0.54
1:C:267:THR:CB	1:C:269:ARG:HG2	2.38	0.54
1:A:297:PHE:HB3	1:A:309:LEU:HB2	1.88	0.54
1:C:296:VAL:HG22	1:C:365:ILE:HD13	1.88	0.54
1:C:310:HIS:HB3	1:C:322:VAL:HG12	1.89	0.54
1:A:338:GLN:HG2	1:A:341:LEU:CD2	2.37	0.54
1:B:278:LYS:CG	1:B:570:PHE:CZ	2.91	0.54
1:C:326:VAL:HG21	1:C:384:LYS:HD2	1.90	0.54
1:B:296:VAL:HG22	1:B:365:ILE:HD13	1.89	0.53
1:B:303:HIS:ND1	1:B:304:PRO:HD2	2.24	0.53
1:B:424:SER:HB3	5:B:1582:EDO:H21	1.89	0.53
1:B:430:LEU:O	1:B:434:MET:HG3	2.08	0.53
1:B:387:ASP:N	2:B:904:IOD:I	3.12	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:245:PHE:O	1:B:265:LYS:HE3	2.09	0.53
1:B:510:HIS:ND1	1:B:511:PRO:HD2	2.23	0.53
1:A:533:ASN:C	1:A:534:ILE:HG13	2.29	0.52
1:A:264:LEU:HD23	1:A:267:THR:CG2	2.39	0.52
1:C:383:ILE:C	1:C:383:ILE:HD12	2.29	0.52
1:B:278:LYS:CG	1:B:570:PHE:CE2	2.92	0.52
1:A:303:HIS:CE1	1:A:304:PRO:HD2	2.45	0.52
1:C:274:LYS:HD2	2:C:904:IOD:I	2.80	0.52
1:C:508:GLN:HA	1:C:518:TRP:CZ2	2.44	0.52
1:C:330:ASP:HB3	1:C:376:LEU:HD23	1.92	0.52
1:B:245:PHE:CZ	1:B:264:LEU:HD13	2.44	0.52
1:B:366:ILE:CD1	1:B:395:LEU:CD2	2.79	0.52
1:B:483:VAL:HG23	1:B:484:LEU:N	2.25	0.52
1:C:472:ILE:CG2	1:C:476:LEU:HD12	2.39	0.52
1:B:368:ARG:O	1:B:390:MET:HE2	2.09	0.51
1:B:533:ASN:O	1:B:534:ILE:CG1	2.58	0.51
1:C:295:HIS:ND1	1:C:393:GLU:OE2	2.42	0.51
1:C:562:VAL:HA	1:C:565:ILE:HG13	1.91	0.51
1:B:267:THR:HG23	1:B:269:ARG:H	1.75	0.51
1:C:315:THR:HG23	1:C:320:PHE:CE1	2.46	0.51
1:C:310:HIS:N	1:C:322:VAL:O	2.40	0.51
1:B:246:ASP:OD1	1:B:265:LYS:HE2	2.11	0.50
1:C:558:ASP:CG	1:C:561:ILE:HG13	2.32	0.50
1:A:483:VAL:CG1	1:A:510:HIS:CE1	2.93	0.50
1:B:392:LYS:CG	1:B:395:LEU:HD11	2.41	0.50
1:C:253:ARG:HG3	1:C:253:ARG:O	2.11	0.50
1:A:534:ILE:HD12	1:A:535:SER:HB3	1.93	0.50
1:B:383:ILE:C	1:B:383:ILE:HD12	2.32	0.50
1:B:297:PHE:CD1	1:B:309:LEU:HB2	2.46	0.50
1:B:274:LYS:HB3	1:B:321:PHE:HB2	1.94	0.50
1:C:271:TYR:CZ	1:C:310:HIS:CD2	2.99	0.49
1:C:325:TYR:O	6:C:2007:HOH:O	2.20	0.49
1:A:278:LYS:HD3	1:A:316:GLU:O	2.12	0.49
1:A:288:ASP:O	1:A:292:THR:HG23	2.12	0.49
1:B:521:MET:HE1	1:B:526:VAL:HB	1.94	0.49
1:A:383:ILE:C	1:A:383:ILE:HD12	2.32	0.49
1:B:456:ASN:N	1:B:459:ASP:HB2	2.27	0.49
1:C:368:ARG:CZ	1:C:392:LYS:HB2	2.42	0.49
1:B:366:ILE:CD1	1:B:395:LEU:HD22	2.41	0.49
1:A:239:SER:HA	5:A:1585:EDO:H11	1.95	0.49
1:A:387:ASP:HB2	4:A:1582:C58:S	2.52	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:395:LEU:HG	1:A:399:ASP:HB3	1.94	0.49
1:C:303:HIS:HE1	1:C:305:PHE:HB2	1.78	0.49
1:C:361:HIS:CD2	1:C:423:PHE:CD1	3.01	0.49
1:C:442:SER:HB3	1:C:445:ASP:OD1	2.13	0.48
1:C:309:LEU:HD22	1:C:322:VAL:O	2.14	0.48
1:A:309:LEU:HD13	1:A:311:SER:N	2.28	0.48
1:A:296:VAL:HG22	1:A:365:ILE:HD13	1.95	0.48
1:C:387:ASP:CA	2:C:904:IOD:I	3.29	0.48
1:C:510:HIS:ND1	1:C:511:PRO:HD2	2.27	0.48
1:B:400:THR:OG1	1:B:420:ASP:HB3	2.14	0.48
1:C:441:ARG:HB2	1:C:445:ASP:OD2	2.14	0.48
1:A:295:HIS:ND1	1:A:393:GLU:OE2	2.44	0.48
1:C:559:ASP:O	1:C:563:ARG:HB2	2.13	0.48
1:A:328:GLY:HA3	1:A:377:LEU:O	2.13	0.48
1:C:359:TYR:O	1:C:363:ARG:HG2	2.14	0.48
1:A:297:PHE:HZ	2:A:904:IOD:I	2.67	0.47
1:B:366:ILE:CD1	1:B:395:LEU:HD21	2.32	0.47
1:B:264:LEU:HD23	1:B:267:THR:HG21	1.94	0.47
1:A:510:HIS:ND1	1:A:511:PRO:HD2	2.30	0.47
1:B:358:ASN:O	1:B:362:GLU:HG3	2.15	0.47
1:C:294:LYS:NZ	1:C:573:PHE:HA	2.28	0.47
1:A:528:PRO:HA	1:A:529:PRO:HD3	1.75	0.47
1:C:416:LEU:HB2	1:C:466:LEU:HD21	1.97	0.47
1:B:278:LYS:HD2	1:B:570:PHE:CG	2.50	0.47
1:A:337:ARG:NH2	1:A:530:PHE:CZ	2.82	0.47
1:A:521:MET:CE	1:A:526:VAL:HB	2.43	0.47
1:A:446:ILE:O	1:A:447:VAL:HG22	2.15	0.46
1:A:264:LEU:CB	1:A:267:THR:HG22	2.41	0.46
1:B:274:LYS:HD2	2:B:904:IOD:I	2.86	0.46
1:C:305:PHE:HE2	1:C:355:LEU:HD12	1.80	0.46
1:C:309:LEU:HD13	1:C:311:SER:N	2.30	0.46
1:A:328:GLY:CA	1:A:377:LEU:O	2.63	0.46
1:A:326:VAL:CG2	1:A:384:LYS:HD2	2.45	0.46
1:C:487:PHE:CZ	1:C:496:LEU:HD23	2.51	0.46
1:B:303:HIS:HB3	1:B:306:LEU:HD12	1.98	0.46
1:A:395:LEU:HG	1:A:399:ASP:CB	2.46	0.45
1:B:245:PHE:CE1	1:B:264:LEU:HD13	2.51	0.45
1:C:250:VAL:HG22	1:C:260:LEU:HD23	1.94	0.45
1:B:303:HIS:CE1	1:B:304:PRO:HD2	2.51	0.45
1:B:414:GLU:CD	1:B:492:PRO:HG3	2.37	0.45
1:A:567:GLN:HA	1:A:570:PHE:HD2	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:392:LYS:HG3	1:B:395:LEU:CD1	2.47	0.45
1:C:264:LEU:O	1:C:268:ASP:N	2.46	0.45
1:A:483:VAL:HG11	1:A:512:PHE:CB	2.46	0.45
1:B:303:HIS:HA	1:B:304:PRO:HD3	1.78	0.45
1:C:483:VAL:CG1	1:C:512:PHE:CB	2.94	0.45
1:B:504:PHE:CE2	1:B:508:GLN:OE1	2.69	0.45
1:C:555:TPO:HA	1:C:556:PRO:HD3	1.88	0.45
1:B:434:MET:HA	1:B:437:MET:HE2	1.98	0.45
1:B:417:ARG:NH2	1:B:490:LYS:O	2.40	0.45
1:C:559:ASP:HB3	1:C:563:ARG:HH21	1.81	0.45
1:A:562:VAL:HA	1:A:565:ILE:HG13	1.99	0.45
1:A:310:HIS:HB2	1:A:581:MET:HE1	1.94	0.45
1:A:368:ARG:O	1:A:390:MET:CE	2.65	0.45
1:A:318:ARG:NH2	1:A:555:TPO:O	2.43	0.45
1:A:531:LYS:HD2	1:A:531:LYS:N	2.32	0.45
1:B:485:LYS:HD2	1:B:485:LYS:HA	1.78	0.45
1:C:303:HIS:CE1	1:C:305:PHE:HB2	2.52	0.45
1:C:335:MET:O	1:C:339:ARG:HA	2.17	0.45
1:A:390:MET:HE3	1:A:390:MET:HB3	1.76	0.44
1:A:303:HIS:CG	1:A:304:PRO:HD2	2.52	0.44
1:B:278:LYS:HE3	1:B:567:GLN:OE1	2.17	0.44
1:B:309:LEU:HD22	1:B:322:VAL:O	2.18	0.44
1:B:510:HIS:CG	1:B:511:PRO:HD2	2.52	0.44
1:C:497:GLY:HA2	1:C:503:GLY:O	2.17	0.44
1:C:355:LEU:HD22	1:C:522:GLU:OE2	2.18	0.44
1:A:436:GLU:HB3	5:A:1584:EDO:H12	1.99	0.44
1:B:531:LYS:HD2	1:B:531:LYS:N	2.31	0.44
1:C:483:VAL:CG1	1:C:512:PHE:HB3	2.45	0.44
1:A:534:ILE:HD13	1:B:269:ARG:HD2	2.00	0.44
1:A:245:PHE:CZ	1:A:264:LEU:HD13	2.53	0.44
1:B:328:GLY:O	1:B:532:PRO:HB3	2.17	0.44
1:A:310:HIS:CB	1:A:581:MET:HE2	2.44	0.43
1:B:345:HIS:CD2	1:B:529:PRO:HB2	2.53	0.43
1:B:361:HIS:ND1	5:B:1585:EDO:C2	2.81	0.43
1:C:376:LEU:O	1:C:383:ILE:HA	2.18	0.43
1:A:521:MET:CA	1:A:521:MET:CE	2.95	0.43
1:B:361:HIS:ND1	5:B:1585:EDO:H21	2.32	0.43
1:B:528:PRO:HA	1:B:529:PRO:HD3	1.74	0.43
1:C:483:VAL:HG13	1:C:510:HIS:CE1	2.54	0.43
1:A:414:GLU:CD	1:A:492:PRO:HG3	2.38	0.43
1:A:534:ILE:O	1:A:534:ILE:HD12	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:290:VAL:HG23	1:C:569:GLU:OE2	2.18	0.43
1:B:417:ARG:HD2	1:B:419:GLU:OE2	2.19	0.43
1:C:366:ILE:HD11	1:C:395:LEU:CD2	2.42	0.43
1:B:328:GLY:CA	1:B:377:LEU:O	2.67	0.43
1:A:245:PHE:O	1:A:265:LYS:HE3	2.18	0.43
1:A:274:LYS:HD2	2:A:904:IOD:I	2.89	0.43
1:C:558:ASP:HB3	1:C:561:ILE:HD12	2.00	0.43
1:B:312:CYS:HB2	1:B:320:PHE:O	2.19	0.43
1:C:520:MET:HE2	1:C:525:GLN:HB3	2.01	0.43
1:A:510:HIS:CG	1:A:511:PRO:HD2	2.54	0.42
1:C:442:SER:HB3	1:C:445:ASP:CG	2.39	0.42
1:B:562:VAL:HA	1:B:565:ILE:HG13	2.01	0.42
1:C:369:ASP:HB2	1:C:390:MET:HG3	2.01	0.42
1:A:274:LYS:HB3	1:A:321:PHE:HB2	2.00	0.42
1:A:514:ARG:O	1:A:515:ASN:HB2	2.19	0.42
1:A:275:VAL:CG1	1:A:318:ARG:HD3	2.50	0.42
1:C:307:VAL:HG12	1:C:384:LYS:HD2	2.00	0.42
1:B:366:ILE:O	1:B:391:CYS:HA	2.20	0.42
1:C:331:LEU:CD1	1:C:375:VAL:HG11	2.50	0.42
1:C:414:GLU:CD	1:C:492:PRO:HG3	2.39	0.42
1:A:376:LEU:O	1:A:383:ILE:HA	2.20	0.42
1:C:242:LEU:HD12	1:C:242:LEU:HA	1.89	0.42
1:C:371:LYS:HG3	1:C:373:ASP:OD1	2.20	0.42
1:A:433:LEU:C	1:A:433:LEU:HD23	2.41	0.41
1:A:303:HIS:CG	1:A:304:PRO:CD	3.03	0.41
1:C:325:TYR:HE2	1:C:327:ASN:HB3	1.83	0.41
1:A:315:THR:HG23	1:A:320:PHE:CE1	2.55	0.41
1:B:278:LYS:HB2	1:B:317:SER:O	2.21	0.41
1:B:446:ILE:O	1:B:447:VAL:HG22	2.21	0.41
1:C:303:HIS:HA	1:C:304:PRO:HD3	1.76	0.41
1:A:246:ASP:OD1	1:A:265:LYS:HE2	2.21	0.41
1:B:527:VAL:HA	1:B:528:PRO:HD3	1.85	0.41
1:C:355:LEU:CD1	1:C:522:GLU:HG2	2.46	0.41
1:A:472:ILE:CG2	1:A:476:LEU:HD12	2.51	0.41
1:B:295:HIS:O	1:B:299:GLN:HG2	2.20	0.41
1:C:481:ALA:O	1:C:485:LYS:HB2	2.21	0.41
1:C:528:PRO:HA	1:C:529:PRO:HD3	1.76	0.41
1:A:262:VAL:HG11	1:A:273:MET:CE	2.51	0.40
1:A:533:ASN:O	1:A:535:SER:N	2.54	0.40
1:B:308:GLY:O	1:B:323:ILE:HG23	2.21	0.40
1:B:344:GLU:OE1	1:B:344:GLU:N	2.39	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:307:VAL:HA	1:C:384:LYS:HD3	2.03	0.40
1:A:368:ARG:O	1:A:390:MET:HE2	2.21	0.40
1:A:483:VAL:HG23	1:A:484:LEU:N	2.36	0.40
1:B:250:VAL:HG22	1:B:260:LEU:HD22	2.02	0.40
1:C:410:TYR:HE1	5:C:1581:EDO:H22	1.87	0.40
1:B:309:LEU:HD13	1:B:311:SER:N	2.37	0.40
1:C:390:MET:HE2	1:C:390:MET:HA	2.03	0.40
1:C:319:LEU:HD11	1:C:570:PHE:CD1	2.56	0.40
1:A:324:GLU:HB2	1:A:581:MET:SD	2.61	0.40
1:B:303:HIS:CG	1:B:304:PRO:HD2	2.56	0.40
1:B:373:ASP:N	1:B:373:ASP:OD1	2.53	0.40
1:B:521:MET:CE	1:B:521:MET:HA	2.42	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	312/349 (89%)	299 (96%)	11 (4%)	2 (1%)	25	44
1	B	311/349 (89%)	302 (97%)	8 (3%)	1 (0%)	41	61
1	C	306/349 (88%)	299 (98%)	7 (2%)	0	100	100
All	All	929/1047 (89%)	900 (97%)	26 (3%)	3 (0%)	41	61

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	534	ILE
1	A	534	ILE
1	A	387	ASP

### 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	253/311 (81%)	249 (98%)	4 (2%)	62	78
1	B	267/311 (86%)	262 (98%)	5 (2%)	57	74
1	C	238/311 (76%)	236 (99%)	2 (1%)	81	89
All	All	758/933 (81%)	747 (98%)	11 (2%)	65	79

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	395	LEU
1	A	519	ASP
1	A	521	MET
1	A	581	MET
1	B	338	GLN
1	B	459	ASP
1	B	521	MET
1	B	534	ILE
1	B	535	SER
1	C	256[A]	TYR
1	C	390	MET

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

Mol	Chain	Res	Type
1	B	358	ASN
1	C	327	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

6 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	TPO	A	555	1	8,10,11	1.06	0	10,14,16	1.83	2 (20%)
1	TPO	C	403	1	8,10,11	1.03	0	10,14,16	2.22	1 (10%)
1	TPO	B	403	1	8,10,11	1.03	0	10,14,16	2.03	2 (20%)
1	TPO	A	403	1	8,10,11	1.09	0	10,14,16	2.11	2 (20%)
1	TPO	B	555	1	8,10,11	1.09	0	10,14,16	1.79	1 (10%)
1	TPO	C	555	1	8,10,11	1.09	0	10,14,16	1.81	1 (10%)

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	TPO	A	555	1	-	0/9/11/13	-
1	TPO	C	403	1	-	3/9/11/13	-
1	TPO	B	403	1	-	2/9/11/13	-
1	TPO	A	403	1	-	1/9/11/13	-
1	TPO	B	555	1	-	1/9/11/13	-
1	TPO	C	555	1	-	3/9/11/13	-

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	403	TPO	P-OG1-CB	-6.56	103.41	123.21
1	A	403	TPO	P-OG1-CB	-5.87	105.47	123.21
1	B	403	TPO	P-OG1-CB	-5.65	106.14	123.21
1	C	555	TPO	P-OG1-CB	-5.09	107.83	123.21
1	A	555	TPO	P-OG1-CB	-4.91	108.38	123.21

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	555	TPO	P-OG1-CB	-4.91	108.39	123.21
1	A	403	TPO	CG2-CB-CA	-2.32	108.58	113.16
1	B	403	TPO	CG2-CB-CA	-2.17	108.88	113.16
1	A	555	TPO	CG2-CB-CA	-2.01	109.20	113.16

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	403	TPO	O-C-CA-CB
1	B	403	TPO	O-C-CA-CB
1	C	555	TPO	N-CA-CB-OG1
1	C	555	TPO	C-CA-CB-CG2
1	C	403	TPO	CB-OG1-P-O2P
1	C	403	TPO	CB-OG1-P-O3P
1	B	403	TPO	CB-OG1-P-O3P
1	A	403	TPO	CB-OG1-P-O3P
1	B	555	TPO	O-C-CA-CB
1	C	555	TPO	O-C-CA-CB

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	555	TPO	1	0
1	C	555	TPO	1	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 28 ligands modelled in this entry, 15 are monoatomic - leaving 13 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	$\# Z  > 2$
5	EDO	B	1585	-	3,3,3	0.47	0	2,2,2	0.26	0
5	EDO	B	1584	-	3,3,3	0.47	0	2,2,2	0.22	0
5	EDO	C	1583	-	3,3,3	0.45	0	2,2,2	0.29	0
5	EDO	A	1584	-	3,3,3	0.45	0	2,2,2	0.30	0
4	C58	A	1582	-	31,34,34	0.67	1 (3%)	30,47,47	0.65	0
5	EDO	B	1582	-	3,3,3	0.49	0	2,2,2	0.15	0
4	C58	B	1581	-	31,34,34	0.66	1 (3%)	30,47,47	1.10	0
5	EDO	C	1581	-	3,3,3	0.43	0	2,2,2	0.34	0
5	EDO	A	1585	-	3,3,3	0.47	0	2,2,2	0.28	0
5	EDO	B	1583	-	3,3,3	0.49	0	2,2,2	0.25	0
4	C58	C	1580	-	31,34,34	0.63	1 (3%)	30,47,47	1.09	0
5	EDO	C	1582	-	3,3,3	0.47	0	2,2,2	0.26	0
5	EDO	A	1583	-	3,3,3	0.47	0	2,2,2	0.28	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
5	EDO	B	1585	-	-	0/1/1/1	-
5	EDO	B	1584	-	-	0/1/1/1	-
5	EDO	C	1583	-	-	1/1/1/1	-
5	EDO	A	1584	-	-	0/1/1/1	-
4	C58	A	1582	-	-	0/13/20/20	0/5/5/5
5	EDO	B	1582	-	-	0/1/1/1	-
4	C58	B	1581	-	-	1/13/20/20	0/5/5/5
5	EDO	C	1581	-	-	1/1/1/1	-
5	EDO	A	1585	-	-	0/1/1/1	-
5	EDO	B	1583	-	-	1/1/1/1	-
4	C58	C	1580	-	-	0/13/20/20	0/5/5/5
5	EDO	C	1582	-	-	0/1/1/1	-
5	EDO	A	1583	-	-	0/1/1/1	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	1580	C58	C6-C5	2.31	1.46	1.40
4	A	1582	C58	C6-C5	2.26	1.46	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	1581	C58	C6-C5	2.25	1.46	1.40

There are no bond angle outliers.

There are no chirality outliers.

All (4) torsion outliers are listed below:

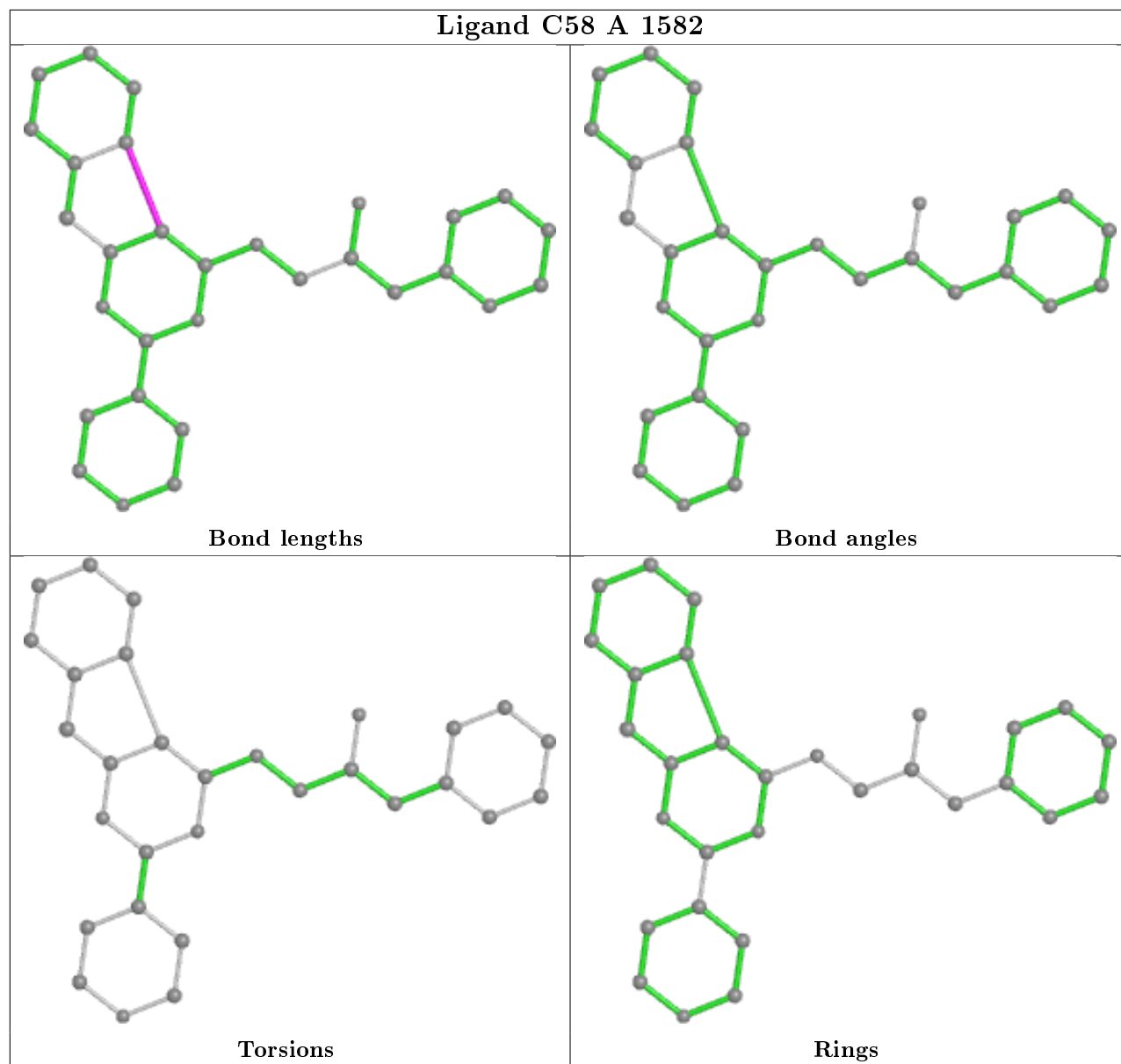
Mol	Chain	Res	Type	Atoms
5	C	1583	EDO	O1-C1-C2-O2
5	C	1581	EDO	O1-C1-C2-O2
4	B	1581	C58	C-C1-N1-C2
5	B	1583	EDO	O1-C1-C2-O2

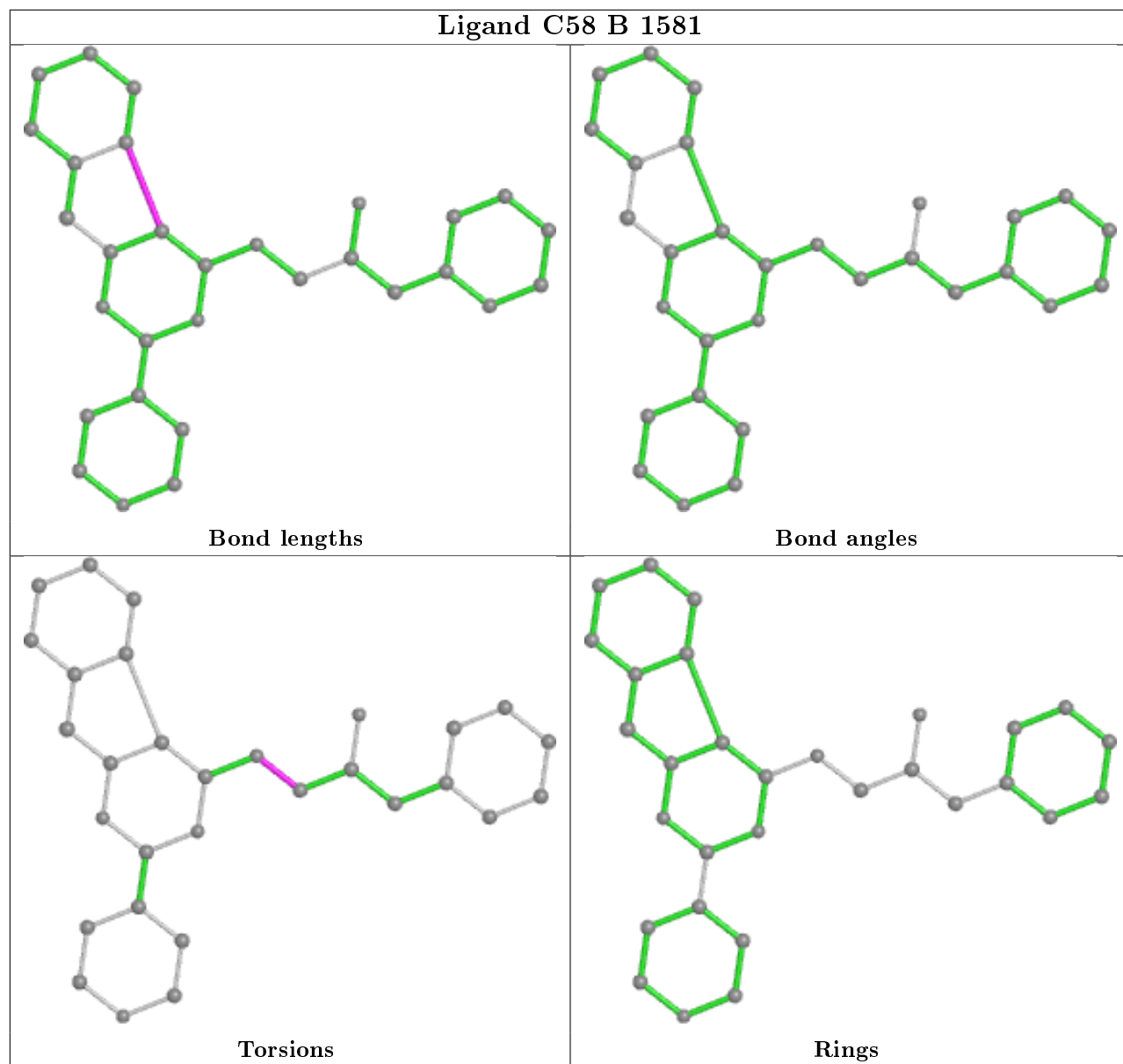
There are no ring outliers.

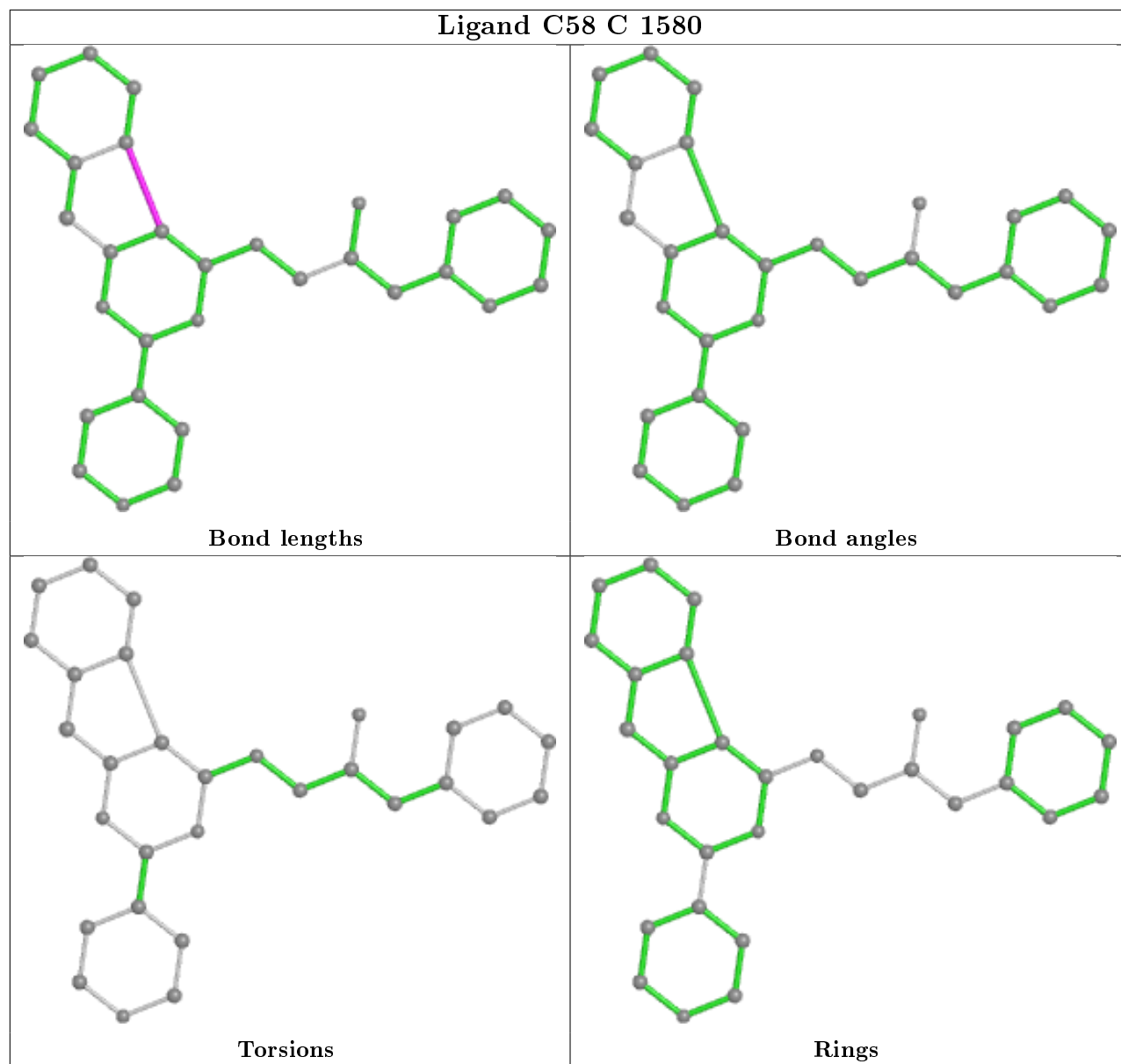
10 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	B	1585	EDO	3	0
5	C	1583	EDO	1	0
5	A	1584	EDO	1	0
4	A	1582	C58	1	0
5	B	1582	EDO	2	0
4	B	1581	C58	1	0
5	C	1581	EDO	2	0
5	A	1585	EDO	1	0
4	C	1580	C58	1	0
5	C	1582	EDO	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q < 0.9
1	A	318/349 (91%)	-0.06	6 (1%) 66 73	32, 60, 87, 118	0
1	B	317/349 (90%)	-0.11	3 (0%) 84 88	25, 50, 82, 110	0
1	C	312/349 (89%)	0.06	3 (0%) 82 86	41, 65, 101, 121	0
All	All	947/1047 (90%)	-0.04	12 (1%) 77 82	25, 59, 91, 121	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	534	ILE	4.2
1	A	581	MET	4.1
1	A	446	ILE	3.8
1	C	259	VAL	2.5
1	C	322	VAL	2.4
1	B	272	ALA	2.4
1	A	559	ASP	2.3
1	B	533	ASN	2.2
1	B	534	ILE	2.1
1	A	296	VAL	2.1
1	A	460	TYR	2.1
1	C	251	ILE	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, 95<sup>th</sup> 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 <sup>2</sup> )	Q < 0.9
1	TPO	C	555	11/12	0.90	0.15	78,99,130,135	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
1	TPO	A	555	11/12	0.96	0.15	52,66,95,95	0
1	TPO	B	555	11/12	0.97	0.10	55,61,66,100	0
1	TPO	A	403	11/12	0.97	0.12	41,51,58,58	0
1	TPO	B	403	11/12	0.98	0.13	36,39,45,46	0
1	TPO	C	403	11/12	0.98	0.15	46,52,58,58	0

## 6.3 Carbohydrates [i](#)

There are no carbohydrates 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, 95<sup>th</sup> 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.

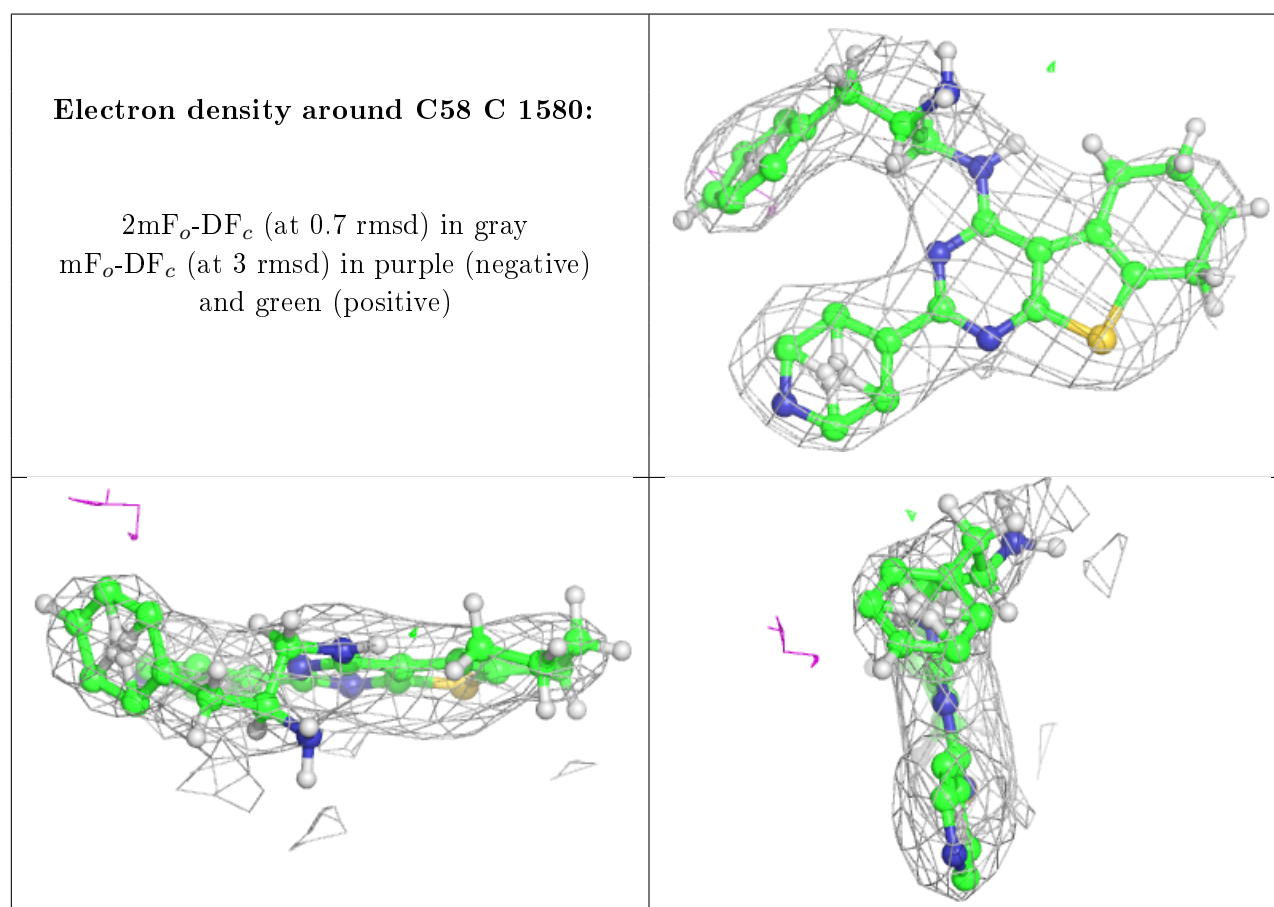
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	EDO	B	1582	4/4	0.68	0.36	61,74,75,75	0
5	EDO	C	1583	4/4	0.69	0.49	81,97,98,98	0
5	EDO	A	1585	4/4	0.75	0.17	77,92,94,94	0
5	EDO	B	1583	4/4	0.79	0.40	66,79,80,80	0
5	EDO	B	1584	4/4	0.82	0.25	52,63,67,69	0
5	EDO	A	1583	4/4	0.86	0.18	65,78,79,79	0
5	EDO	A	1584	4/4	0.88	0.30	70,84,85,85	0
5	EDO	C	1582	4/4	0.88	0.39	58,70,72,73	0
3	CL	C	912	1/1	0.89	0.10	57,57,57,57	0
5	EDO	C	1581	4/4	0.90	0.50	65,78,79,80	0
5	EDO	B	1585	4/4	0.90	0.22	48,58,63,64	0
3	CL	A	912	1/1	0.93	0.12	47,47,47,47	0
3	CL	B	912	1/1	0.94	0.10	58,58,58,58	0
4	C58	C	1580	30/30	0.95	0.20	61,75,98,99	0
4	C58	B	1581	30/30	0.95	0.21	35,43,53,54	0
4	C58	A	1582	30/30	0.96	0.23	38,47,56,58	0
2	IOD	A	902	1/1	0.97	0.07	87,87,87,87	0
2	IOD	C	903[B]	1/1	0.97	0.09	38,38,38,38	1
2	IOD	C	901	1/1	0.98	0.18	77,77,77,77	0
2	IOD	A	901	1/1	0.98	0.11	61,61,61,61	0
2	IOD	B	903[B]	1/1	0.98	0.09	29,29,29,29	1
2	IOD	B	901	1/1	0.99	0.15	56,56,56,56	0
2	IOD	A	903[B]	1/1	0.99	0.06	29,29,29,29	1

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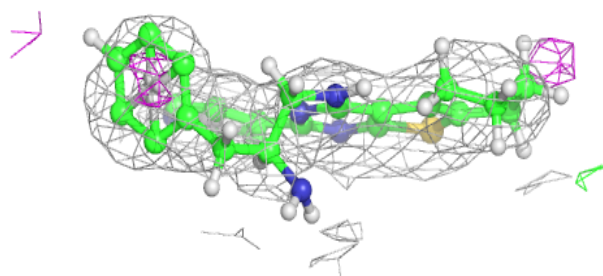
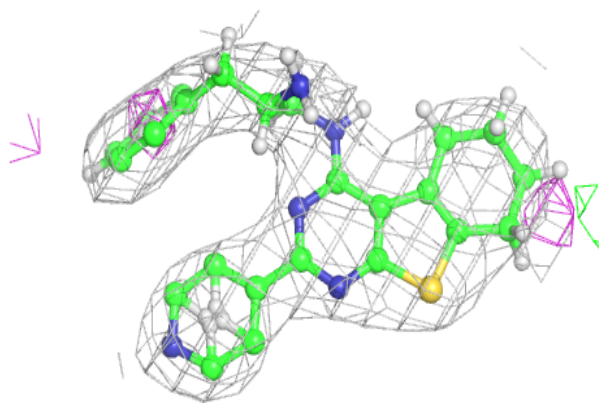
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	IOD	B	904	1/1	0.99	0.09	58,58,58,58	1
2	IOD	C	902	1/1	0.99	0.16	72,72,72,72	0
2	IOD	C	904	1/1	0.99	0.19	63,63,63,63	1
2	IOD	A	904	1/1	0.99	0.06	53,53,53,53	1
2	IOD	B	902	1/1	0.99	0.12	70,70,70,70	0

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.



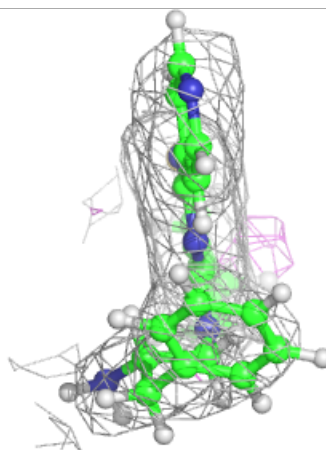
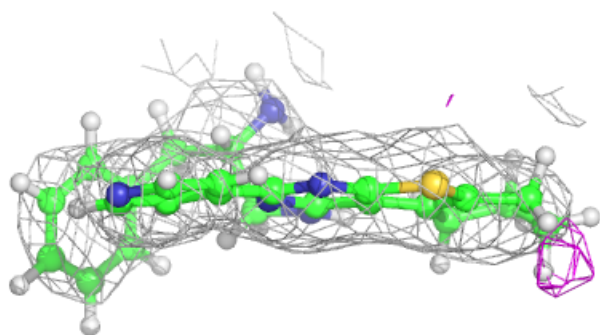
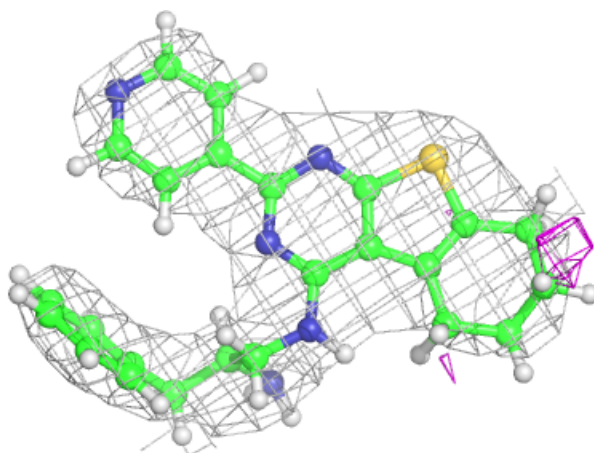
**Electron density around C58 B 1581:**

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



**Electron density around C58 A 1582:**

$2mF_o-DF_c$  (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.