Full wwPDB X-ray Structure Validation Report ⓘ

Aug 6, 2020 – 10:14 PM BST

PDB ID	:	3SFC
Title	:	Structure-Based Optimization of Potent 4- and 6-Azaindole-3-Carboxamides as Renin Inhibitors
Authors	:	Scheiper, B.; Matter, H.; Steinhagen, H.; Bocskei, Z.; Fleury, V.; McCort, G.
Deposited on	:	2011-06-13
Resolution	:	2.10 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

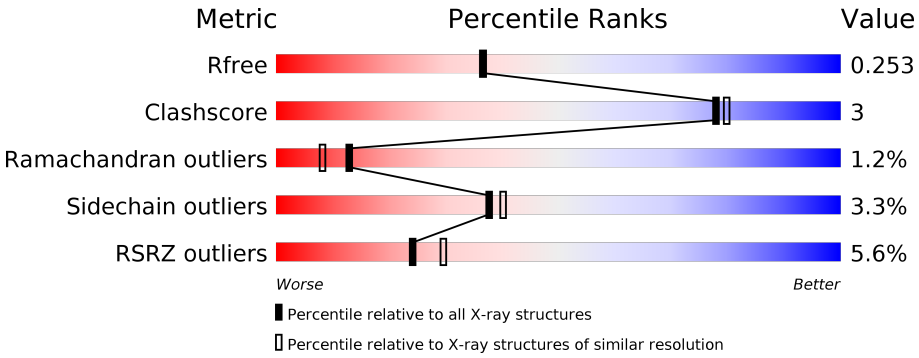
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.13.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.13.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

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 on 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	340	5% 89% 11%
1	B	340	6% 91% 8%

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
4	S53	A	331	-	-	-	X

2 Entry composition

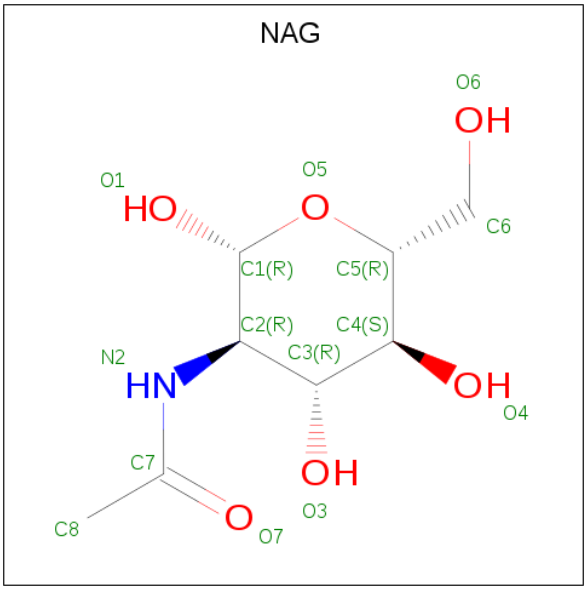
There are 5 unique types of molecules in this entry. The entry contains 5894 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Renin.

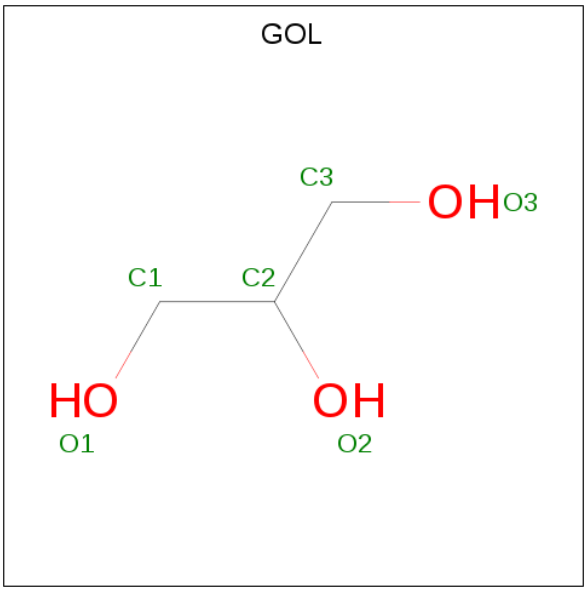
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	340	Total	C	N	O	S	0	0	0
			2621	1672	424	511	14			
1	B	340	Total	C	N	O	S	0	0	0
			2621	1672	424	511	14			

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



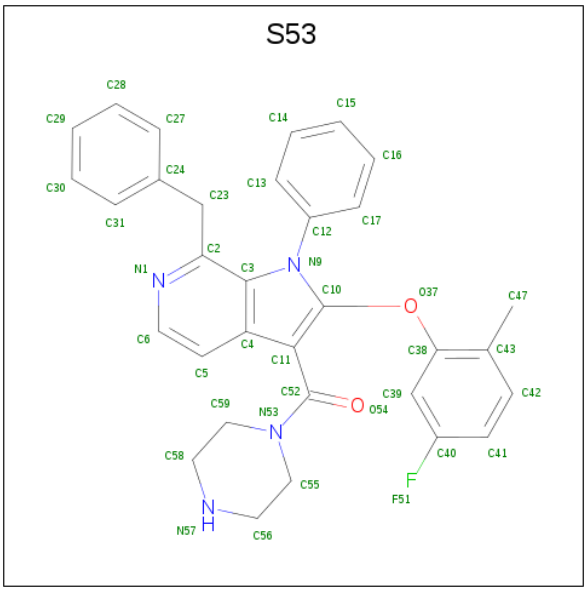
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C O 6 3 3	0	0
3	A	1	Total C O 6 3 3	0	0
3	A	1	Total C O 6 3 3	0	0
3	B	1	Total C O 6 3 3	0	0

- Molecule 4 is [7-benzyl-2-(5-fluoro-2-methylphenoxy)-1-phenyl-1H-pyrrolo[2,3-c]pyridin-3-yl](piperazin-1-yl)methanone (three-letter code: S53) (formula: $C_{32}H_{29}FN_4O_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	F	N	O	0	0
			39	32	1	4	2		
4	A	1	Total	C	F	N	O	0	0
			39	32	1	4	2		
4	B	1	Total	C	F	N	O	0	0
			39	32	1	4	2		

- Molecule 5 is water.

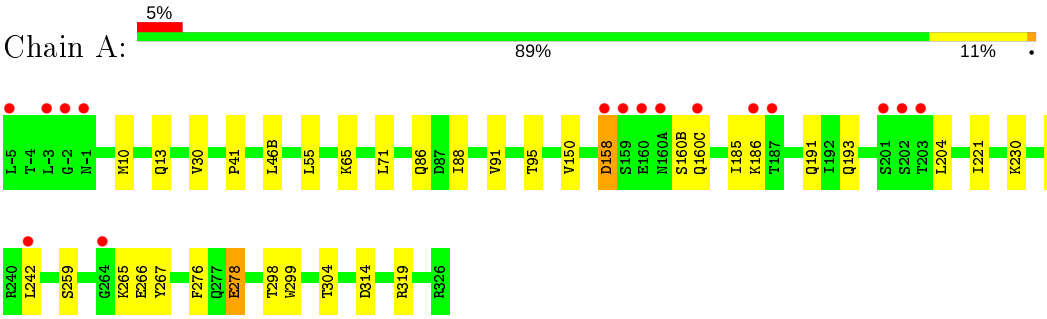
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	259	Total	O	0	0
			259	259		
5	B	224	Total	O	0	0
			224	224		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

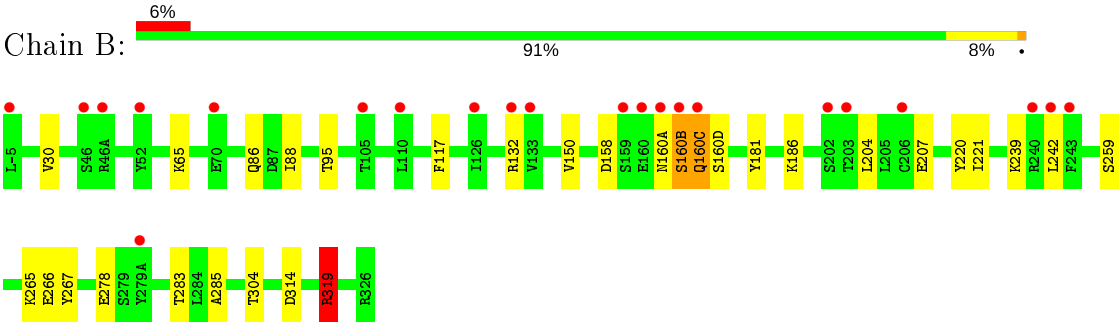
- Molecule 1: Renin

Chain A:



- Molecule 1: Renin

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 3	Depositor
Cell constants a, b, c, α, β, γ	138.79Å 138.79Å 138.79Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	62.07 – 2.10 62.07 – 2.10	Depositor EDS
% Data completeness (in resolution range)	97.7 (62.07-2.10) 97.1 (62.07-2.10)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.45 (at 2.10Å)	Xtriage
Refinement program	BUSTER-TNT, BUSTER 2.9.7	Depositor
R, R_{free}	0.211 , 0.243 0.212 , 0.253	Depositor DCC
R_{free} test set	2590 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å^2)	37.4	Xtriage
Anisotropy	0.000	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 58.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.46$, $< L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.055 for l,-k,h	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	5894	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 3.36% of the height of the origin peak. No significant pseudotranslation is detected.*

[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: GOL, S53, NAG

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	0.46	0/2681	0.69	0/3636
1	B	0.46	0/2681	0.71	1/3636 (0.0%)
All	All	0.46	0/5362	0.70	1/7272 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	319	ARG	CD-NE-CZ	5.81	131.73	123.60

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	2621	0	2555	18	0
1	B	2621	0	2555	15	0
2	A	14	0	13	0	0
2	B	14	0	13	0	0
3	A	18	0	24	3	0
3	B	6	0	8	1	0
4	A	78	0	58	0	0
4	B	39	0	29	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	259	0	0	0	0
5	B	224	0	0	2	0
All	All	5894	0	5255	31	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 3.

All (31) 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:158:ASP:HA	1:B:160(D):SER:HA	1.30	1.09
1:A:191:GLN:HE21	1:A:298:THR:HG21	1.38	0.89
1:A:13:GLN:HA	3:A:328:GOL:H2	1.79	0.64
1:B:181:TYR:CD1	1:B:319:ARG:HD3	2.36	0.61
1:B:314:ASP:OD2	1:B:319:ARG:HD2	2.04	0.57
1:A:298:THR:HG22	1:A:299:TRP:O	2.07	0.54
1:A:191:GLN:NE2	1:A:298:THR:HG21	2.18	0.51
1:B:259:SER:HB3	1:B:266:GLU:HG3	1.94	0.50
1:B:186:LYS:NZ	5:B:509:HOH:O	2.47	0.46
1:B:65:LYS:HB2	1:B:86:GLN:HB3	1.98	0.46
1:B:88:ILE:HG23	1:B:95:THR:HG23	1.98	0.46
1:A:259:SER:HB3	1:A:266:GLU:HG3	1.99	0.45
1:A:30:VAL:HG21	3:A:328:GOL:H11	1.99	0.45
1:B:150:VAL:HG12	1:B:314:ASP:HA	1.98	0.44
1:A:150:VAL:HG12	1:A:314:ASP:HA	1.98	0.44
1:A:65:LYS:HB2	1:A:86:GLN:HB3	1.99	0.44
1:A:221:ILE:HG13	1:A:304:THR:HB	2.00	0.43
1:B:220:TYR:HB3	1:B:285:ALA:O	2.18	0.43
1:A:185:ILE:HD13	1:A:193:GLN:HB2	2.00	0.43
1:B:221:ILE:HG13	1:B:304:THR:HB	2.00	0.43
3:B:327:GOL:H12	5:B:371:HOH:O	2.17	0.43
1:A:41:PRO:HB2	1:A:55:LEU:HD23	2.01	0.42
1:B:160(B):SER:O	1:B:160(C):GLN:HB2	2.20	0.42
1:A:88:ILE:HG23	1:A:95:THR:HG23	2.01	0.42
1:B:30:VAL:HG23	1:B:117:PHE:CG	2.55	0.42
1:A:278:GLU:HA	1:B:160(A):ASN:HA	2.01	0.41
1:A:158:ASP:N	1:B:160(C):GLN:O	2.51	0.41
1:B:265:LYS:HD2	1:B:267:TYR:CZ	2.55	0.41
1:A:191:GLN:HE21	1:A:298:THR:CG2	2.21	0.41
1:A:276:PHE:CE1	3:A:327:GOL:H31	2.56	0.41
1:A:265:LYS:HD2	1:A:267:TYR:CZ	2.56	0.41

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	338/340 (99%)	327 (97%)	7 (2%)	4 (1%)	13 8
1	B	338/340 (99%)	327 (97%)	7 (2%)	4 (1%)	13 8
All	All	676/680 (99%)	654 (97%)	14 (2%)	8 (1%)	13 8

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	160(B)	SER
1	A	158	ASP
1	A	242	LEU
1	B	158	ASP
1	B	160(C)	GLN
1	A	160(C)	GLN
1	B	242	LEU
1	A	160(B)	SER

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	290/290 (100%)	278 (96%)	12 (4%)	30 31
1	B	290/290 (100%)	283 (98%)	7 (2%)	49 53

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	580/580 (100%)	561 (97%)	19 (3%)	38 40

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	MET
1	A	46(B)	LEU
1	A	71	LEU
1	A	91	VAL
1	A	186	LYS
1	A	204	LEU
1	A	230	LYS
1	A	233	GLU
1	A	238	LYS
1	A	239	LYS
1	A	278	GLU
1	A	319	ARG
1	B	132	ARG
1	B	204	LEU
1	B	207	GLU
1	B	239	LYS
1	B	278	GLU
1	B	283	THR
1	B	319	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	191	GLN
1	A	193	GLN
1	A	318	ASN
1	B	183	ASN
1	B	287	HIS

5.3.3 RNA

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)

9 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	$\#\|Z\| > 2$
3	GOL	A	327	-	5,5,5	0.48	0	5,5,5	0.94	0
3	GOL	A	329	-	5,5,5	0.52	0	5,5,5	0.56	0
3	GOL	B	327	-	5,5,5	0.50	0	5,5,5	0.58	0
4	S53	B	328	-	41,44,44	2.14	4 (9%)	48,62,62	2.72	14 (29%)
2	NAG	A	367	1	14,14,15	1.39	3 (21%)	17,19,21	1.72	4 (23%)
4	S53	A	331	-	41,44,44	2.18	5 (12%)	48,62,62	2.56	15 (31%)
2	NAG	B	367	1	14,14,15	1.43	3 (21%)	17,19,21	1.68	3 (17%)
4	S53	A	330	-	41,44,44	2.02	4 (9%)	48,62,62	2.82	15 (31%)
3	GOL	A	328	-	5,5,5	0.51	0	5,5,5	0.43	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
3	GOL	A	327	-	-	4/4/4/4	-
3	GOL	A	329	-	-	2/4/4/4	-
3	GOL	B	327	-	-	4/4/4/4	-
4	S53	B	328	-	-	1/15/28/28	0/6/6/6

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	A	367	1	-	1/6/23/26	0/1/1/1
4	S53	A	331	-	-	0/15/28/28	0/6/6/6
2	NAG	B	367	1	-	1/6/23/26	0/1/1/1
4	S53	A	330	-	-	4/15/28/28	0/6/6/6
3	GOL	A	328	-	-	4/4/4/4	-

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	328	S53	C2-N1	9.24	1.37	1.32
4	A	331	S53	C2-N1	9.23	1.37	1.32
4	A	331	S53	C12-N9	-8.23	1.34	1.45
4	A	330	S53	C2-N1	7.99	1.36	1.32
4	B	328	S53	C12-N9	-7.77	1.35	1.45
4	A	330	S53	C12-N9	-7.58	1.35	1.45
4	A	330	S53	C5-C6	2.92	1.40	1.36
4	B	328	S53	C5-C6	2.76	1.40	1.36
4	A	330	S53	C11-C52	-2.76	1.49	1.51
4	A	331	S53	C5-C6	2.65	1.40	1.36
2	B	367	NAG	C1-C2	2.32	1.55	1.52
2	A	367	NAG	C4-C3	2.32	1.58	1.52
2	B	367	NAG	C4-C5	2.18	1.57	1.53
4	A	331	S53	C3-N9	-2.17	1.36	1.39
4	B	328	S53	C3-N9	-2.15	1.36	1.39
2	A	367	NAG	C1-C2	2.12	1.55	1.52
4	A	331	S53	C11-C52	-2.12	1.50	1.51
2	A	367	NAG	C4-C5	2.07	1.57	1.53
2	B	367	NAG	C4-C3	2.04	1.57	1.52

All (51) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	330	S53	C6-N1-C2	9.88	123.60	118.18
4	A	331	S53	C6-N1-C2	8.87	123.05	118.18
4	B	328	S53	C6-N1-C2	8.58	122.89	118.18
4	A	330	S53	C3-C2-N1	-8.47	117.98	122.77
4	B	328	S53	C11-C52-N53	8.45	126.86	117.73
4	A	330	S53	C11-C52-N53	8.26	126.66	117.73
4	A	331	S53	C3-C2-N1	-8.17	118.15	122.77
4	B	328	S53	C3-C2-N1	-7.63	118.45	122.77
4	A	330	S53	C13-C12-N9	4.64	123.55	119.24
4	B	328	S53	C17-C12-C13	-4.16	115.16	121.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	328	S53	C17-C12-N9	4.05	123.00	119.24
4	A	331	S53	C11-C52-N53	3.98	122.03	117.73
4	A	331	S53	C17-C12-C13	-3.95	115.47	121.33
4	A	331	S53	C58-N57-C56	3.95	121.69	110.34
4	A	330	S53	C17-C12-C13	-3.88	115.58	121.33
4	A	331	S53	C38-O37-C10	3.63	127.19	119.89
2	B	367	NAG	C4-C3-C2	3.62	116.32	111.02
2	A	367	NAG	C3-C4-C5	3.60	116.66	110.24
4	B	328	S53	C58-N57-C56	3.58	120.64	110.34
2	B	367	NAG	C3-C4-C5	3.56	116.58	110.24
4	A	330	S53	C5-C6-N1	-3.47	120.39	123.81
2	A	367	NAG	C4-C3-C2	3.44	116.05	111.02
4	B	328	S53	C14-C13-C12	3.43	123.08	118.63
4	A	331	S53	C17-C12-N9	3.42	122.41	119.24
4	A	331	S53	C14-C13-C12	3.37	123.00	118.63
4	A	330	S53	O54-C52-C11	-3.32	113.37	118.67
4	B	328	S53	C16-C17-C12	3.31	122.92	118.63
4	A	330	S53	C14-C13-C12	3.28	122.89	118.63
4	B	328	S53	C5-C6-N1	-3.22	120.64	123.81
4	A	331	S53	C16-C17-C12	3.20	122.79	118.63
4	A	331	S53	C5-C6-N1	-3.13	120.72	123.81
4	A	331	S53	C13-C12-N9	3.08	122.10	119.24
4	B	328	S53	O54-C52-C11	-2.90	114.04	118.67
4	A	331	S53	C4-C11-C52	-2.82	121.29	125.80
4	A	330	S53	C16-C17-C12	2.80	122.27	118.63
4	B	328	S53	C41-C40-C39	-2.78	119.67	123.29
4	B	328	S53	C13-C12-N9	2.77	121.81	119.24
4	A	330	S53	C59-N53-C55	2.70	117.82	112.62
4	A	330	S53	C58-N57-C56	2.66	117.99	110.34
2	B	367	NAG	O5-C5-C4	2.59	117.13	110.83
2	A	367	NAG	O5-C5-C4	2.58	117.09	110.83
4	A	331	S53	C41-C40-C39	-2.37	120.21	123.29
4	A	330	S53	C41-C40-C39	-2.37	120.22	123.29
4	A	331	S53	C6-C5-C4	-2.30	117.86	119.81
4	A	330	S53	C6-C5-C4	-2.30	117.86	119.81
4	A	331	S53	C5-C4-C3	2.30	121.02	116.73
4	B	328	S53	C56-C55-N53	-2.29	104.41	109.45
4	A	330	S53	C5-C4-C3	2.26	120.95	116.73
4	B	328	S53	C4-C11-C52	-2.25	122.21	125.80
4	A	330	S53	C4-C11-C52	-2.17	122.33	125.80
2	A	367	NAG	C1-C2-N2	2.05	114.00	110.49

There are no chirality outliers.

All (21) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	327	GOL	C1-C2-C3-O3
3	A	329	GOL	O1-C1-C2-C3
3	B	327	GOL	O1-C1-C2-O2
3	B	327	GOL	C1-C2-C3-O3
4	A	330	S53	C13-C12-N9-C3
4	A	330	S53	C13-C12-N9-C10
4	A	330	S53	C17-C12-N9-C10
3	A	328	GOL	O1-C1-C2-C3
3	A	328	GOL	C1-C2-C3-O3
2	B	367	NAG	O5-C5-C6-O6
2	A	367	NAG	O5-C5-C6-O6
3	A	327	GOL	O1-C1-C2-C3
3	B	327	GOL	O1-C1-C2-C3
3	A	329	GOL	O1-C1-C2-O2
3	B	327	GOL	O2-C2-C3-O3
3	A	328	GOL	O2-C2-C3-O3
3	A	327	GOL	O2-C2-C3-O3
3	A	327	GOL	O1-C1-C2-O2
3	A	328	GOL	O1-C1-C2-O2
4	B	328	S53	C17-C12-N9-C3
4	A	330	S53	C17-C12-N9-C3

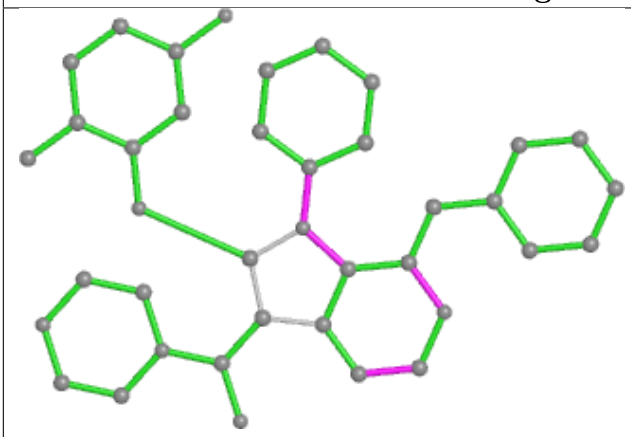
There are no ring outliers.

3 monomers are involved in 4 short contacts:

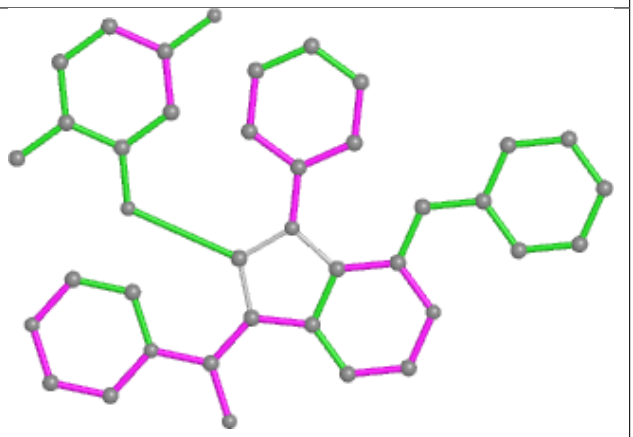
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	327	GOL	1	0
3	B	327	GOL	1	0
3	A	328	GOL	2	0

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.

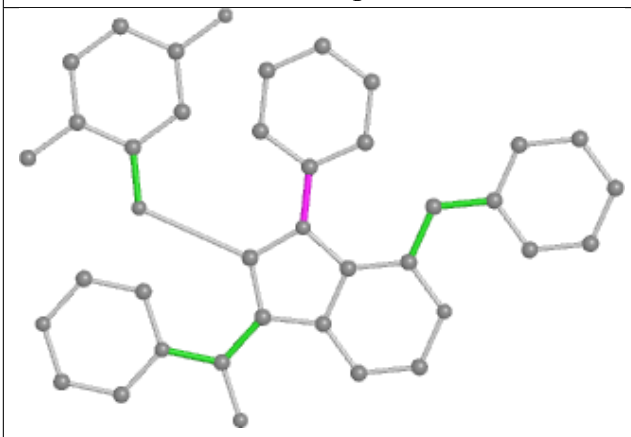
Ligand S53 B 328



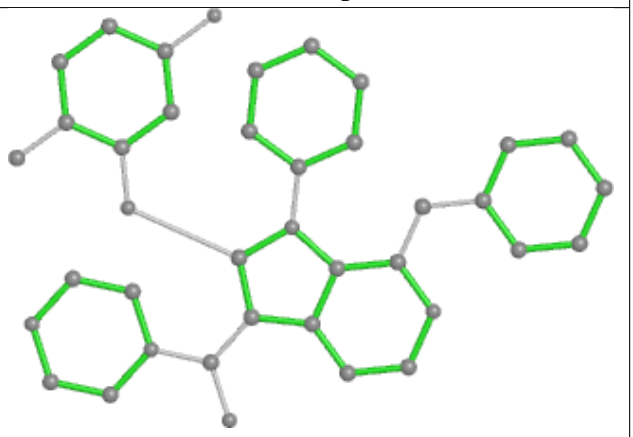
Bond lengths



Bond angles

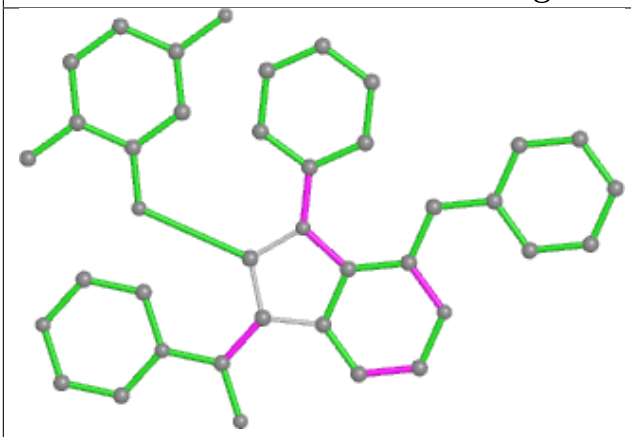


Torsions

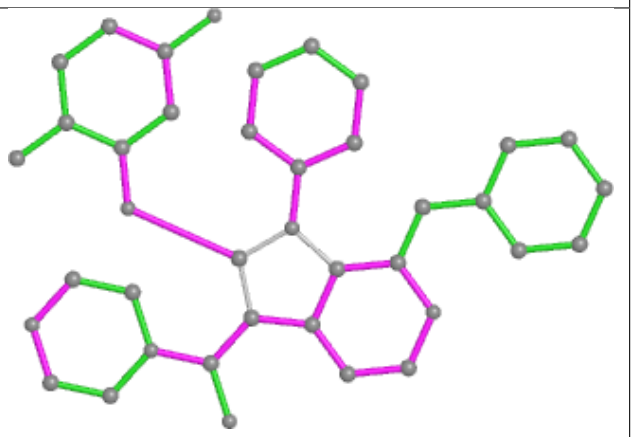


Rings

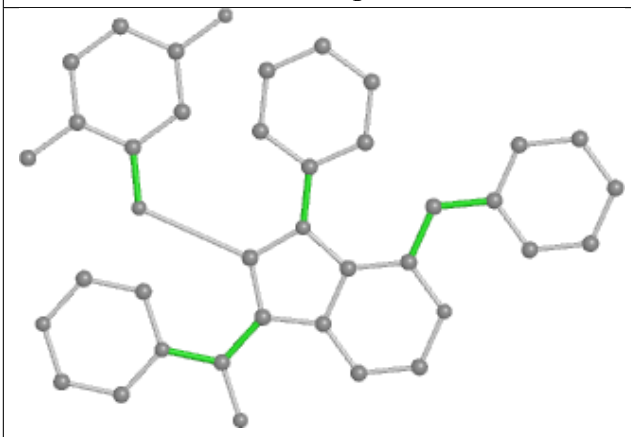
Ligand S53 A 331



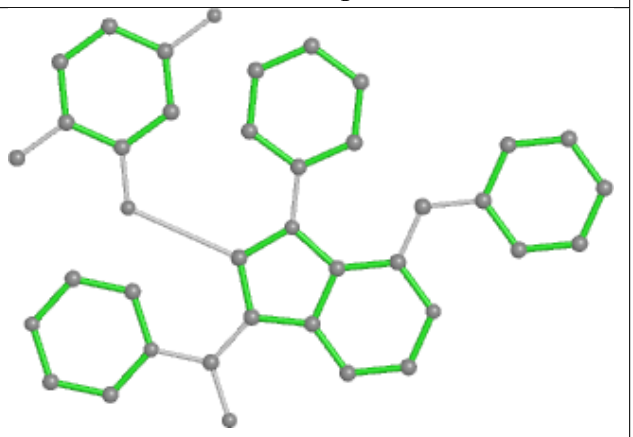
Bond lengths



Bond angles

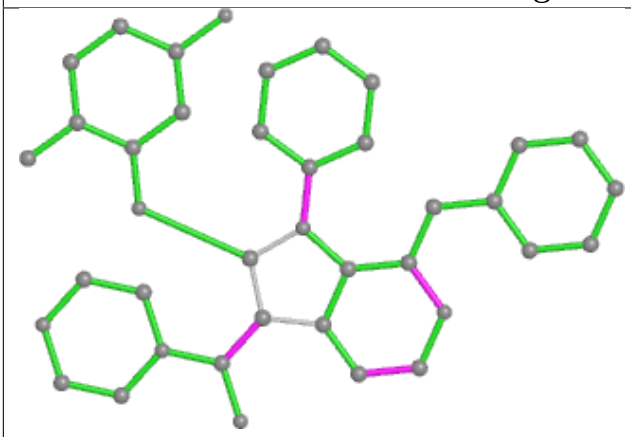


Torsions

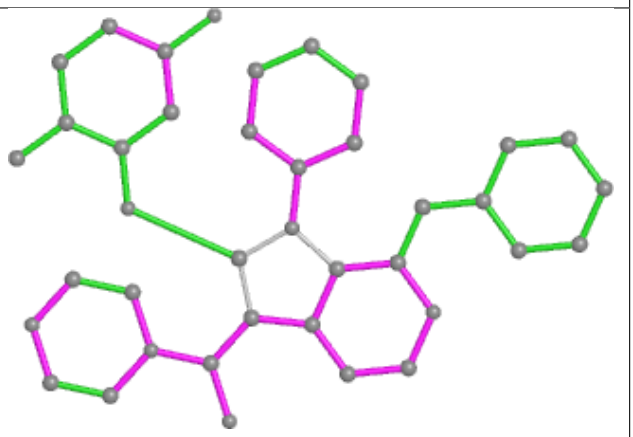


Rings

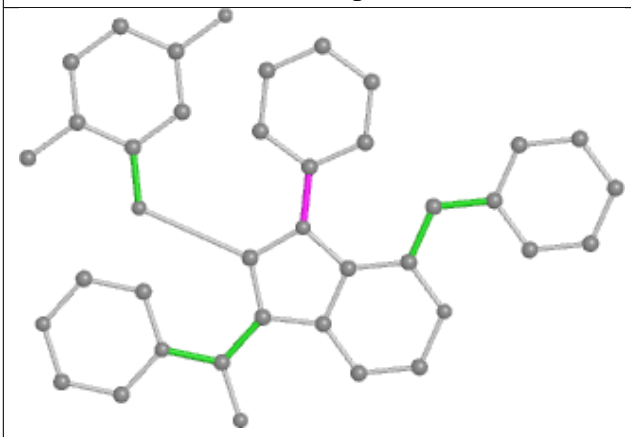
Ligand S53 A 330



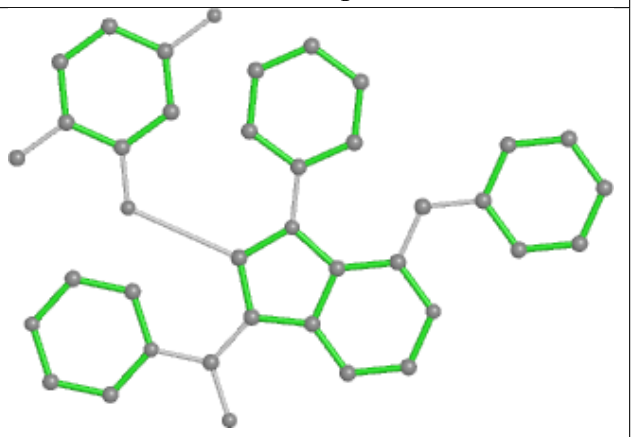
Bond lengths



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, 95^{th} 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	340/340 (100%)	0.24	16 (4%)	31	37	26, 40, 70, 112	0
1	B	340/340 (100%)	0.39	22 (6%)	18	23	27, 51, 81, 108	0
All	All	680/680 (100%)	0.31	38 (5%)	24	29	26, 45, 79, 112	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	160	GLU	6.6
1	B	160(B)	SER	6.2
1	A	158	ASP	6.2
1	A	187	THR	5.4
1	B	132	ARG	4.9
1	B	160(A)	ASN	4.7
1	B	160(C)	GLN	4.6
1	B	-5	LEU	4.6
1	A	-1	ASN	4.5
1	B	242	LEU	4.5
1	B	159	SER	4.2
1	B	70	GLU	4.2
1	B	203	THR	4.2
1	B	160	GLU	3.9
1	A	159	SER	3.5
1	A	186	LYS	3.5
1	A	-5	LEU	3.3
1	B	110	LEU	3.3
1	B	52	TYR	3.2
1	A	-2	GLY	3.2
1	B	279(A)	TYR	3.2
1	A	242	LEU	3.1
1	A	201	SER	3.1
1	B	46	SER	3.1

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Mol	Chain	Res	Type	RSRZ
1	B	133	VAL	3.0
1	A	202	SER	3.0
1	B	202	SER	2.9
1	A	203	THR	2.7
1	B	240	ARG	2.6
1	A	-3	LEU	2.6
1	B	105	THR	2.5
1	B	126	ILE	2.5
1	A	160(A)	ASN	2.3
1	B	243	PHE	2.2
1	A	264	GLY	2.2
1	B	46(A)	ARG	2.1
1	A	160(C)	GLN	2.0
1	B	206	CYS	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)

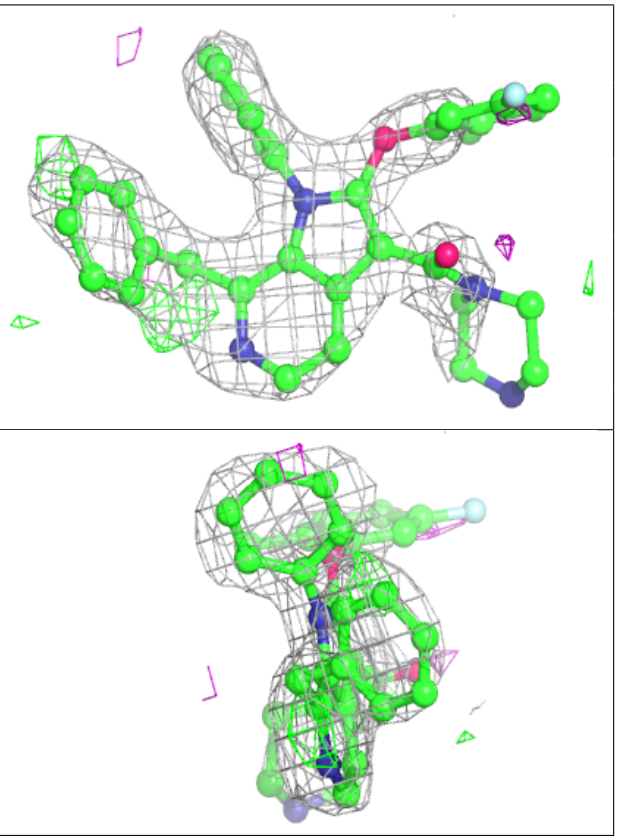
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

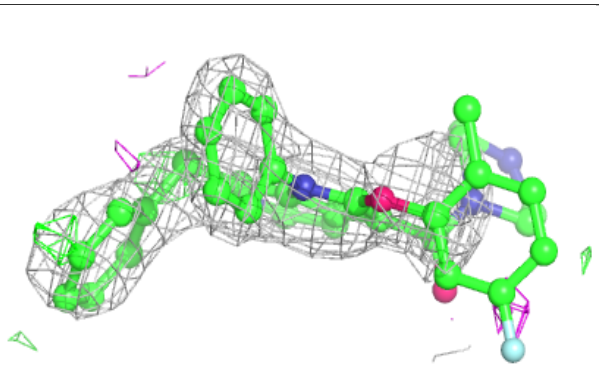
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	NAG	B	367	14/15	0.69	0.27	80,84,86,86	0
4	S53	A	331	39/39	0.72	0.69	35,49,60,61	39
3	GOL	A	329	6/6	0.77	0.20	71,72,72,72	0
2	NAG	A	367	14/15	0.78	0.15	59,62,65,65	0
3	GOL	A	327	6/6	0.82	0.23	59,60,61,61	0
3	GOL	B	327	6/6	0.86	0.20	59,59,60,60	0
3	GOL	A	328	6/6	0.88	0.29	49,49,50,51	0
4	S53	B	328	39/39	0.92	0.11	42,51,67,67	0
4	S53	A	330	39/39	0.96	0.12	26,31,35,37	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 S53 A 331:

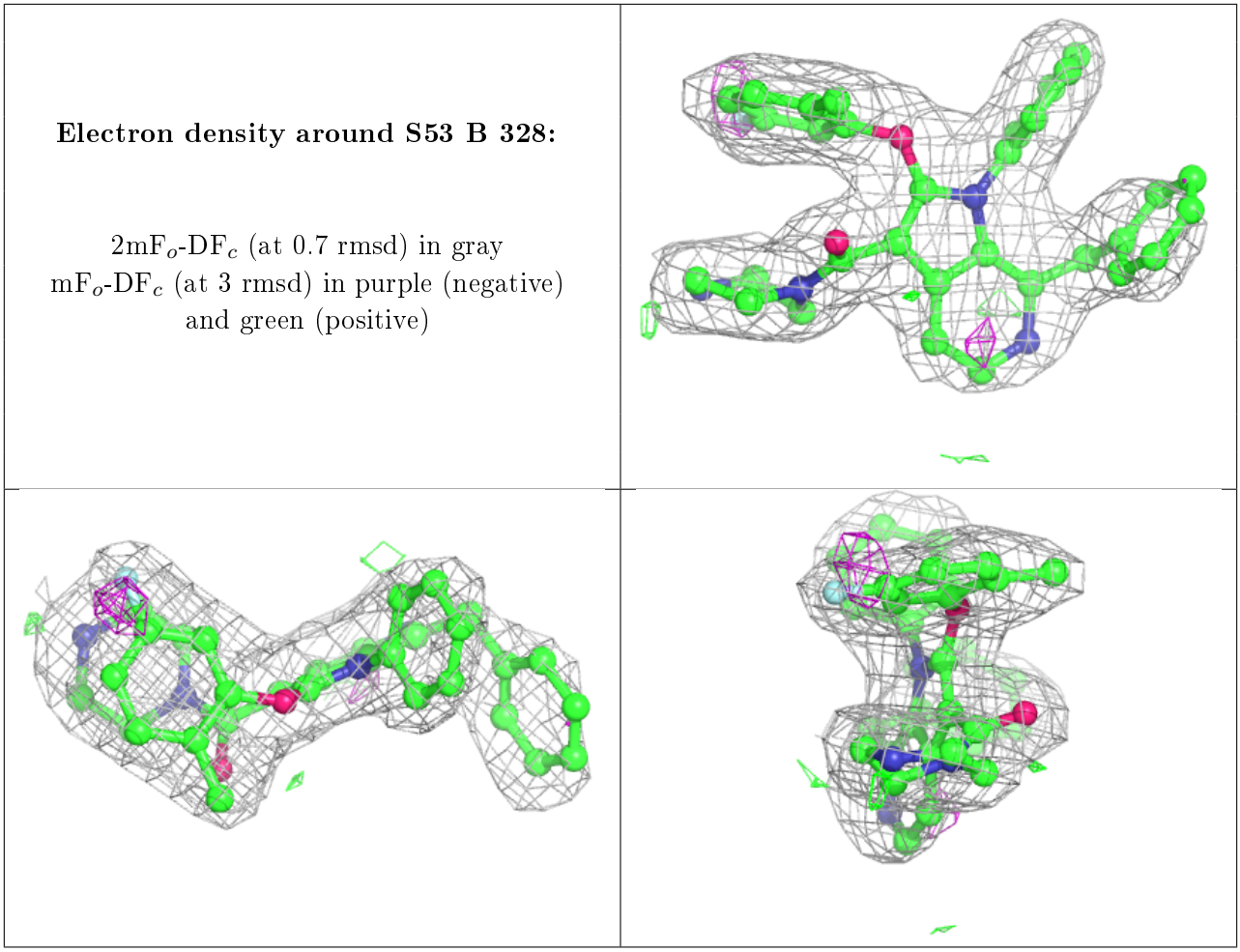
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)





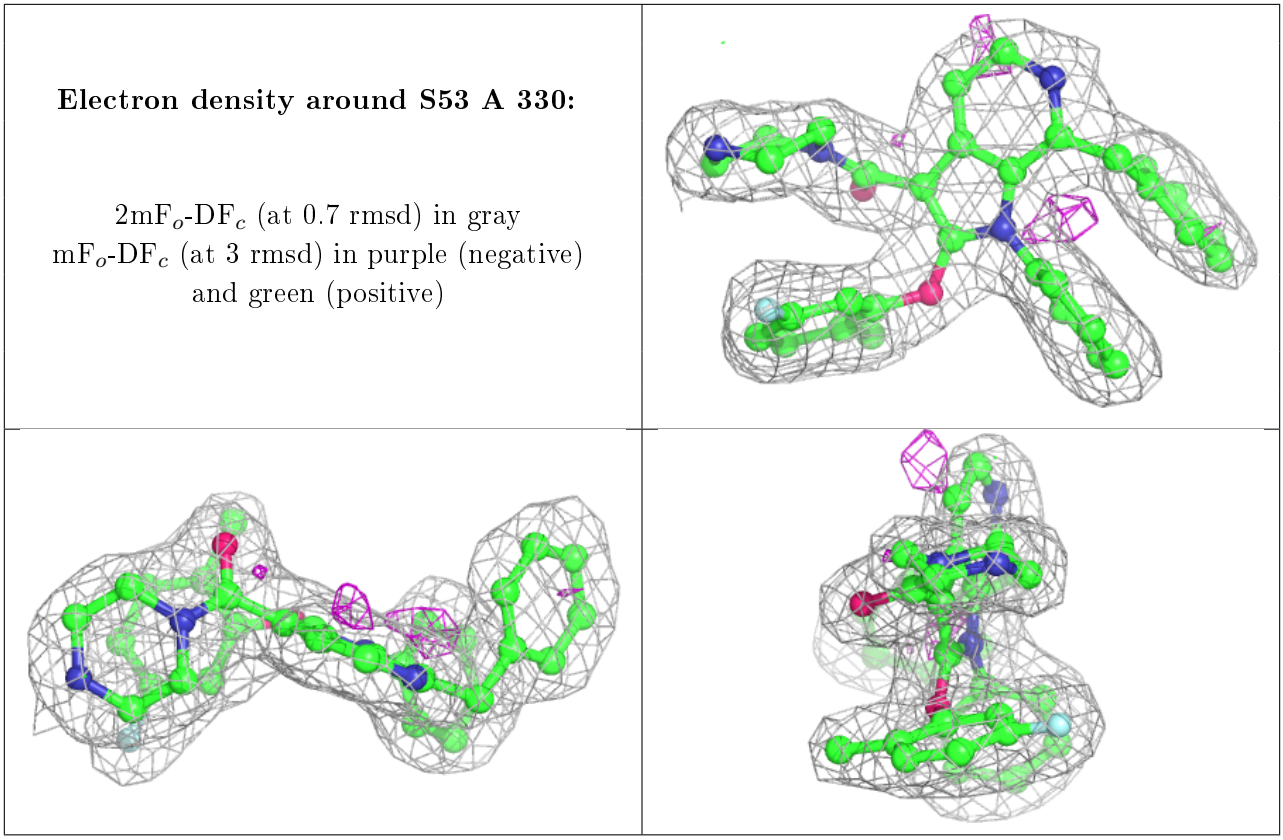
Electron density around S53 B 328:

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



Electron density around S53 A 330:

$2mF_o$-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.