WORLDWIDE PDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Aug 23, 2023 – 01:21 AM EDT

PDB ID	:	3DDW
Title	:	Crystal structure of glycogen phosphorylase complexed with an anthranilimide based inhibitor GSK055
Authors	:	Nolte, R.T.
Deposited on	:	2008-06-06
Resolution	:	1.90 Å(reported)

The following versions of software and data (see references (i)) 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	:	2.35
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)	:	2.35

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 1.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.193
Clashscore		2
Ramachandran outliers		0
Sidechain outliers		1.0%
RSRZ outliers		3.5%

Worse .... *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
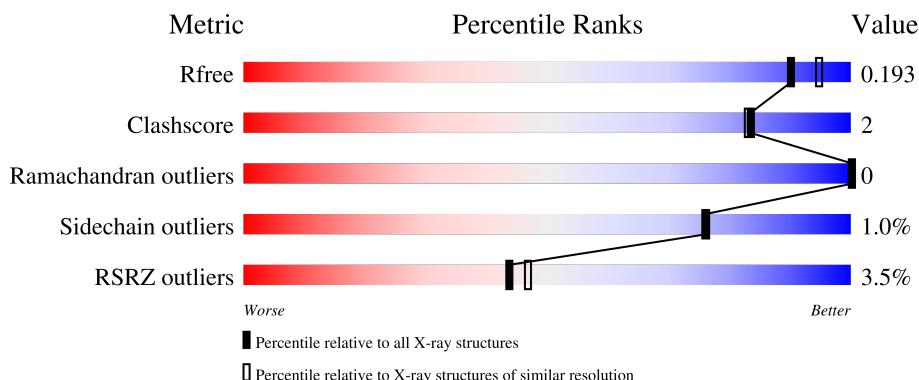
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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

Mol	Chain	Length	Quality of chain
1	A	848	4% / 90% / 6% ·
1	B	848	3% / 89% / 6% 6%
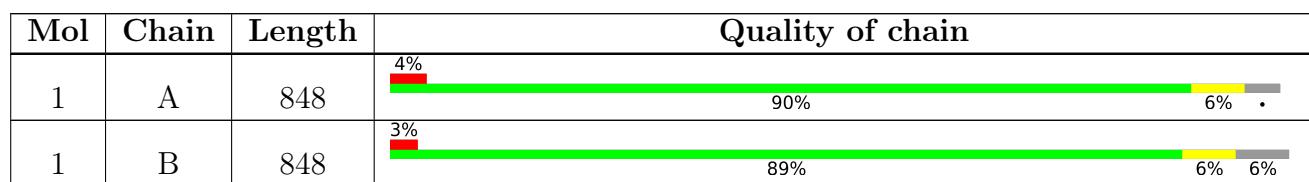
2 Entry composition ⓘ

There are 8 unique types of molecules in this entry. The entry contains 14885 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 Glycogen phosphorylase, liver form.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	811	Total 6570	C 4207	N 1118	O 1213	P 2	S 30	0	3	0
1	B	800	Total 6505	C 4176	N 1103	O 1197		S 29	0	4	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P06737
A	0	GLY	-	expression tag	UNP P06737
B	-1	GLY	-	expression tag	UNP P06737
B	0	GLY	-	expression tag	UNP P06737

- Molecule 2 is N-acetyl-beta-D-glucopyranosylamine (three-letter code: NBG) (formula: $C_8H_{15}NO_6$).
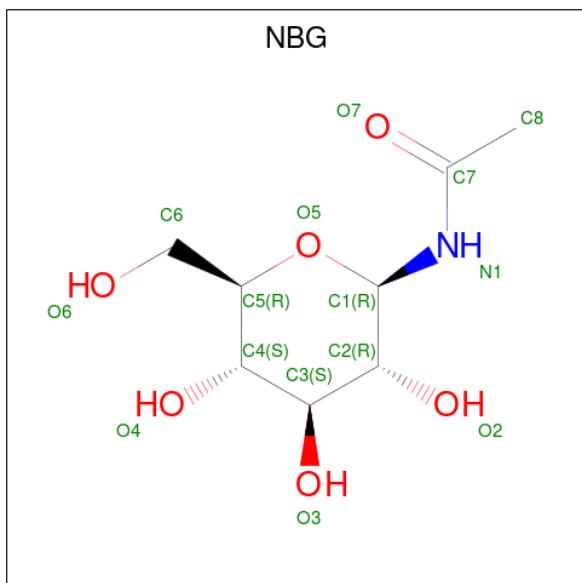
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			15	8	1	6		
2	B	1	Total	C	N	O	0	0
			15	8	1	6		

- Molecule 3 is PYRIDOXAL-5'-PHOSPHATE (three-letter code: PLP) (formula: $C_8H_{10}NO_6P$).

PLP
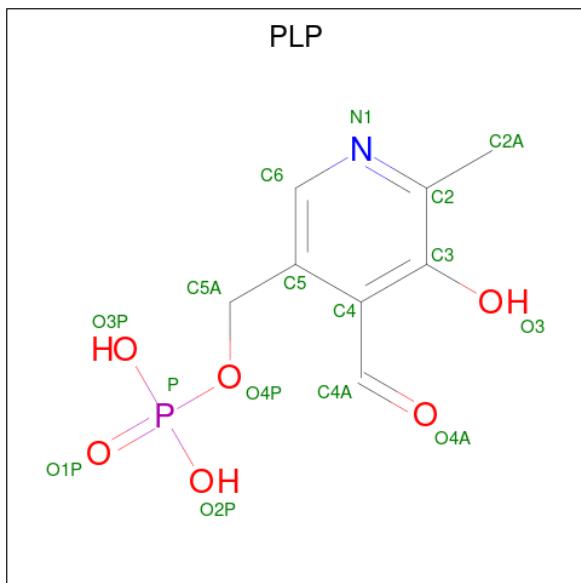
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
3	B	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

- Molecule 4 is CAFFEINE (three-letter code: CFF) (formula: $C_8H_{10}N_4O_2$).

CFF
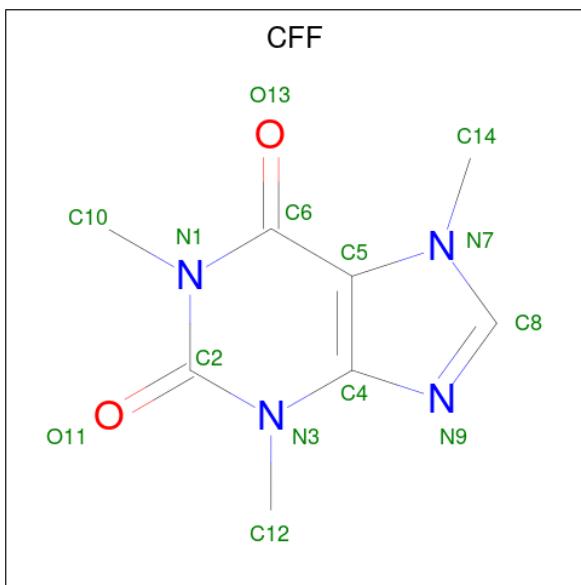
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total 14	C 8	N 4	O 2	0	0
4	B	1	Total 14	C 8	N 4	O 2	0	0

- Molecule 5 is (2S)-{[(3-{[(2-chloro-6-methylphenyl)carbamoyl]amino}naphthalen-2-yl)carbonyl]amino}(phenyl)ethanoic acid (three-letter code: 055) (formula: $C_{27}H_{22}ClN_3O_4$).

055
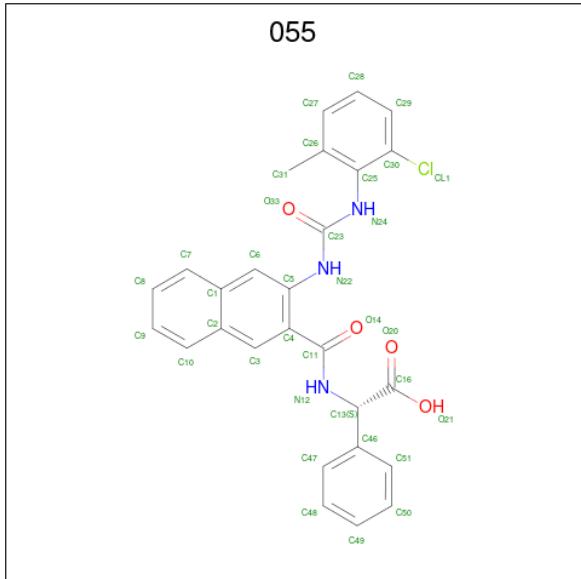
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total 35	C 27	Cl 1	N 3	O 4	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	Cl	N	O		
5	B	1	35	27	1	3	4	0	0

- Molecule 6 is (4S)-2-METHYL-2,4-PENTANEDIOL (three-letter code: MPD) (formula: $C_6H_{14}O_2$).
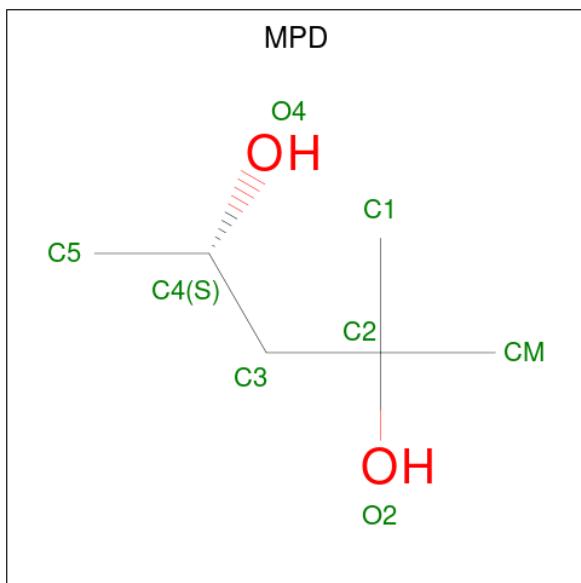
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
6	A	1	8	6	2	0	0
6	B	1	8	6	2	0	0

- Molecule 7 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: $C_6H_{13}NO_4S$).

MES
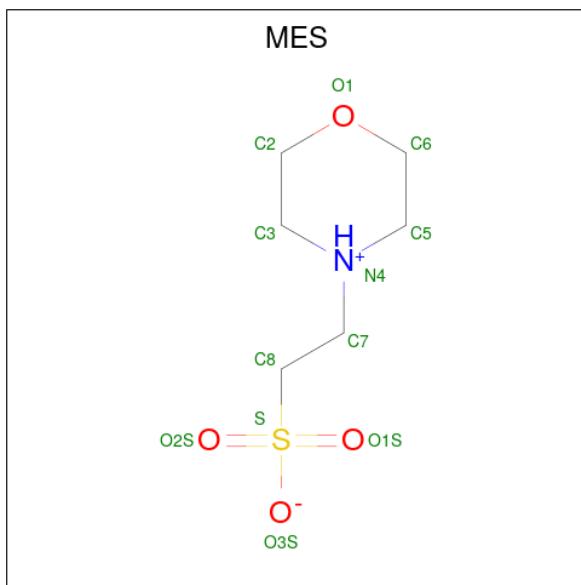
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
7	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
7	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	793	Total	O	0	0
			793	793		
8	B	819	Total	O	0	0
			819	819		

3 Residue-property plots ⓘ

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

- Molecule 1: Glycogen phosphorylase, liver form

Chain A:

- Molecule 1: Glycogen phosphorylase, liver form

Chain B:
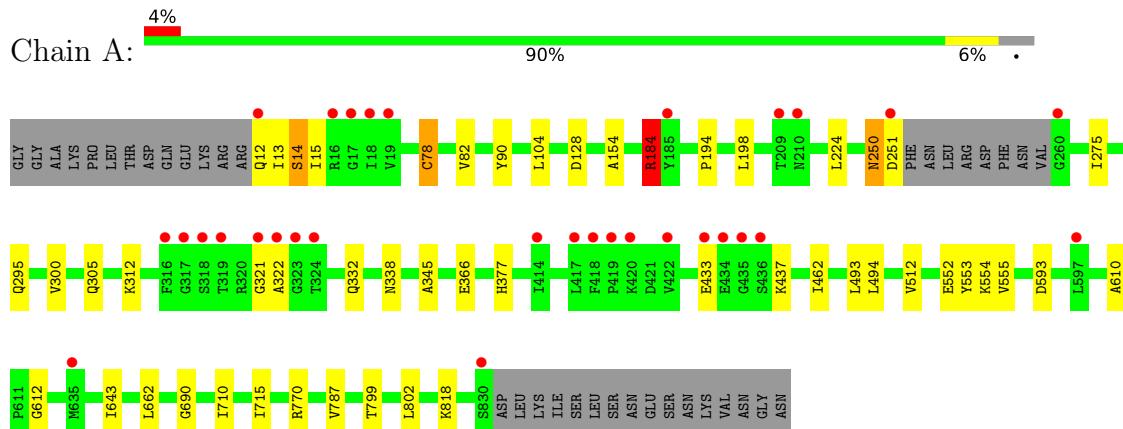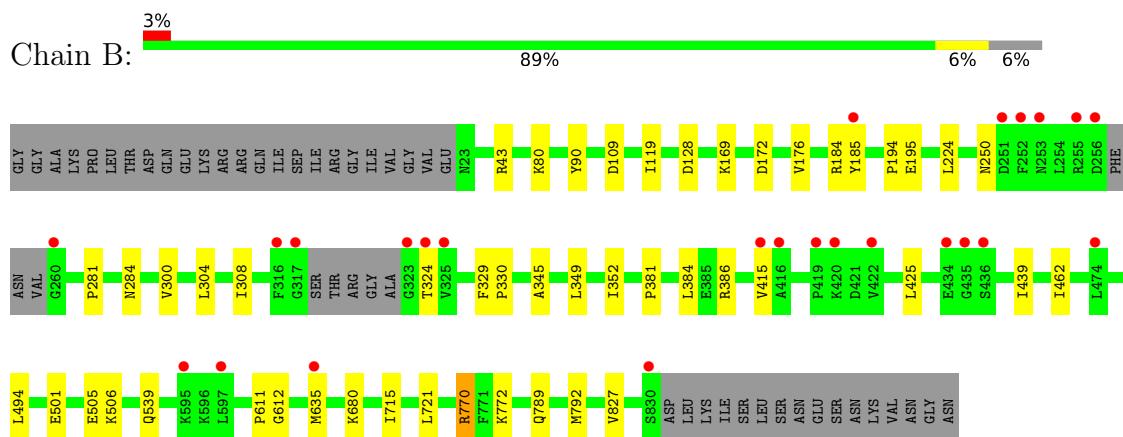
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α, β, γ	124.37Å 124.37Å 123.62Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	38.63 – 1.90 32.73 – 1.90	Depositor EDS
% Data completeness (in resolution range)	99.9 (38.63-1.90) 99.9 (32.73-1.90)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.25 (at 1.89Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.153 , 0.186 0.162 , 0.193	Depositor DCC
R_{free} test set	5095 reflections (3.03%)	wwPDB-VP
Wilson B-factor (Å^2)	20.2	Xtriage
Anisotropy	0.019	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 53.9	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.007 for -h,-k,l 0.022 for h,-h-k,-l 0.011 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	14885	wwPDB-VP
Average B, all atoms (Å^2)	26.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.76% 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: MES, SEP, 055, CFF, MPD, PLP, NBG

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	0/6694	0.61	3/9055 (0.0%)
1	B	0.46	0/6650	0.60	2/8995 (0.0%)
All	All	0.46	0/13344	0.60	5/18050 (0.0%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	770	ARG	NE-CZ-NH1	6.16	123.38	120.30
1	A	770	ARG	NE-CZ-NH2	-5.92	117.34	120.30
1	B	770	ARG	NE-CZ-NH2	-5.82	117.39	120.30
1	B	770	ARG	NE-CZ-NH1	5.69	123.14	120.30
1	A	184	ARG	NE-CZ-NH2	5.51	123.06	120.30

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	6570	0	6533	29	3
1	B	6505	0	6464	34	2
2	A	15	0	15	1	0
2	B	15	0	15	0	0

Continued on next page...

W O R L D W I D E
wwPDB
PROTEIN DATA BANK

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	15	0	7	0	0
3	B	15	0	7	1	0
4	A	14	0	10	2	0
4	B	14	0	10	1	0
5	A	35	0	21	1	0
5	B	35	0	21	1	0
6	A	8	0	14	0	0
6	B	8	0	14	1	0
7	B	24	0	24	0	0
8	A	793	0	0	7	0
8	B	819	0	0	8	1
All	All	14885	0	13155	64	3

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (64) 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)
8:A:1005:HOH:O	1:B:195[B]:GLU:HG2	1.73	0.86
1:B:324:THR:HG22	8:B:1944:HOH:O	1.87	0.74
1:A:13:ILE:HD12	1:A:104:LEU:HD23	1.74	0.70
1:A:13:ILE:HD12	1:A:104:LEU:CD2	2.23	0.69
1:B:194:PRO:HA	1:B:224:LEU:HD13	1.76	0.68
1:A:194:PRO:HB3	1:B:185:TYR:CD1	2.31	0.65
1:A:493:LEU:HD11	1:A:512:VAL:HG11	1.80	0.62
1:B:415:VAL:HG22	1:B:425:LEU:HD11	1.81	0.60
1:B:109[A]:ASP:OD1	1:B:119:ILE:HG21	2.02	0.59
8:A:1005:HOH:O	1:B:195[A]:GLU:HG2	2.02	0.59
1:A:555:VAL:HG21	1:A:643:ILE:CD1	2.36	0.56
1:A:799:THR:HG23	8:A:1136:HOH:O	2.06	0.55
1:B:635:MET:HE2	8:B:1993:HOH:O	2.08	0.54
1:A:14[B]:SEP:O1P	1:A:15:ILE:N	2.41	0.53
8:A:1005:HOH:O	1:B:195[A]:GLU:CG	2.54	0.53
1:A:802:LEU:HD23	1:A:802:LEU:C	2.31	0.51
1:A:493:LEU:HD21	1:A:512:VAL:HG22	1.92	0.51
1:B:506:LYS:NZ	8:B:1925:HOH:O	2.43	0.50
1:B:304:LEU:HD22	1:B:349:LEU:HD13	1.94	0.49
1:B:184:ARG:HG2	1:B:185:TYR:CE1	2.47	0.49
1:A:818:LYS:NZ	8:A:1656:HOH:O	2.36	0.48
1:A:194:PRO:HB3	1:B:185:TYR:CE1	2.49	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:169:LYS:HB2	1:B:176:VAL:CG2	2.45	0.47
1:A:78[B]:CYS:SG	1:A:332:GLN:OE1	2.60	0.46
1:A:433:GLU:HG3	1:A:437:LYS:NZ	2.31	0.46
1:B:300:VAL:HG13	1:B:345:ALA:HA	1.97	0.45
5:A:905:O55:O33	5:A:905:O55:H6	2.17	0.45
1:A:82:VAL:O	1:A:154:ALA:HA	2.17	0.45
1:B:462:ILE:HD11	1:B:715:ILE:CD1	2.47	0.45
1:A:494:LEU:C	1:A:494:LEU:HD23	2.38	0.44
1:B:721:LEU:HD23	1:B:772:LYS:HD3	1.98	0.44
1:A:612:GLY:C	4:A:903:CFF:H142	2.38	0.44
1:B:284:ASN:ND2	8:B:1900:HOH:O	2.51	0.44
1:B:789:GLN:HA	1:B:792:MET:HE2	1.99	0.44
1:B:308:ILE:HD13	1:B:352:ILE:HG21	2.00	0.44
1:A:184:ARG:NH1	1:B:250:ASN:ND2	2.65	0.43
1:B:80:LYS:HB3	1:B:827:VAL:HG12	2.00	0.43
1:B:539:GLN:NE2	8:B:1809:HOH:O	2.43	0.43
1:A:300:VAL:HG13	1:A:345:ALA:HA	2.00	0.43
5:B:906:O55:O33	5:B:906:O55:H6	2.18	0.43
1:B:612:GLY:C	4:B:903:CFF:H142	2.39	0.43
1:B:184:ARG:HG2	1:B:185:TYR:CD1	2.54	0.43
1:B:281:PRO:HG2	1:B:611:PRO:HD2	2.01	0.43
1:B:381:PRO:HA	1:B:384:LEU:HG	2.00	0.43
1:A:250:ASN:O	1:A:251:ASP:HB2	2.19	0.42
1:A:462:ILE:HD11	1:A:715:ILE:CD1	2.50	0.42
1:B:329:PHE:HB3	1:B:330:PRO:HD3	2.02	0.42
1:B:494:LEU:C	1:B:494:LEU:HD23	2.40	0.42
1:A:275:ILE:O	1:A:295:GLN:HG2	2.20	0.42
2:A:901:NBG:H3	8:A:1312:HOH:O	2.20	0.42
1:A:552:GLU:HB2	1:A:553:TYR:CD1	2.54	0.42
6:B:907:MPD:H12	8:B:2121:HOH:O	2.19	0.42
1:A:662:LEU:HD22	1:A:787:VAL:HG11	2.02	0.41
1:A:300:VAL:CG1	1:A:345:ALA:HA	2.51	0.41
1:A:338:ASN:OD1	1:A:377:HIS:NE2	2.53	0.41
1:A:610:ALA:CB	4:A:903:CFF:H81	2.50	0.41
1:B:792:MET:HG2	8:B:2150:HOH:O	2.20	0.41
1:B:194:PRO:CA	1:B:224:LEU:HD13	2.47	0.41
1:B:386:ARG:HA	1:B:439:ILE:O	2.21	0.41
1:B:680:LYS:NZ	3:B:902:PLP:O3	2.52	0.41
1:A:198:LEU:HD13	1:A:305:GLN:HB2	2.03	0.40
1:A:322:ALA:HB3	8:A:1683:HOH:O	2.21	0.40
1:A:690:GLY:O	1:A:710:ILE:HA	2.21	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:770:ARG:HD2	8:B:1724:HOH:O	2.20	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:312:LYS:NZ	1:B:505:GLU:OE2[2_435]	2.08	0.12
1:A:312:LYS:NZ	1:B:501:GLU:OE2[2_435]	2.09	0.11
1:A:321:GLY:O	8:B:1713:HOH:O[2_435]	2.11	0.09

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	808/848 (95%)	790 (98%)	18 (2%)	0	100	100
1	B	798/848 (94%)	780 (98%)	18 (2%)	0	100	100
All	All	1606/1696 (95%)	1570 (98%)	36 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	703/738 (95%)	692 (98%)	11 (2%)	62	60

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	699/738 (95%)	695 (99%)	4 (1%)	86	87
All	All	1402/1476 (95%)	1387 (99%)	15 (1%)	76	73

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

Mol	Chain	Res	Type
1	A	12	GLN
1	A	78[A]	CYS
1	A	78[B]	CYS
1	A	90	TYR
1	A	128	ASP
1	A	184	ARG
1	A	224	LEU
1	A	250	ASN
1	A	366	GLU
1	A	554	LYS
1	A	593	ASP
1	B	43	ARG
1	B	90	TYR
1	B	128	ASP
1	B	172	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	73	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 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	SEP	A	14[B]	1	8,9,10	1.49	1 (12%)	8,12,14	1.39	1 (12%)
1	SEP	A	14[A]	1	8,9,10	1.55	1 (12%)	8,12,14	1.47	2 (25%)

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	SEP	A	14[B]	1	-	4/5/8/10	-
1	SEP	A	14[A]	1	-	0/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	14[A]	SEP	P-O1P	3.41	1.61	1.50
1	A	14[B]	SEP	P-O1P	3.18	1.60	1.50

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	14[A]	SEP	OG-CB-CA	3.03	111.09	108.14
1	A	14[B]	SEP	OG-CB-CA	2.59	110.66	108.14
1	A	14[A]	SEP	P-OG-CB	-2.14	112.39	118.30

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	14[B]	SEP	N-CA-CB-OG
1	A	14[B]	SEP	CA-CB-OG-P
1	A	14[B]	SEP	CB-OG-P-O2P
1	A	14[B]	SEP	CB-OG-P-O3P

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	14[B]	SEP	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

12 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	PLP	B	902	1	15,15,16	1.09	1 (6%)	20,22,23	0.91	0
6	MPD	B	907	-	7,7,7	0.24	0	9,10,10	0.13	0
7	MES	B	904	-	12,12,12	1.95	1 (8%)	14,16,16	2.58	5 (35%)
5	055	B	906	-	38,38,38	3.11	9 (23%)	50,53,53	1.83	8 (16%)
6	MPD	A	906	-	7,7,7	0.35	0	9,10,10	0.41	0
4	CFF	B	903	-	8,15,15	1.63	3 (37%)	8,23,23	1.29	1 (12%)
3	PLP	A	902	1	15,15,16	1.23	2 (13%)	20,22,23	1.05	1 (5%)
7	MES	B	905	-	12,12,12	2.15	1 (8%)	14,16,16	2.28	4 (28%)
2	NBG	A	901	-	15,15,15	0.80	1 (6%)	21,21,21	1.17	3 (14%)
5	055	A	905	-	38,38,38	3.04	8 (21%)	50,53,53	1.84	9 (18%)
2	NBG	B	901	-	15,15,15	0.88	1 (6%)	21,21,21	1.28	3 (14%)
4	CFF	A	903	-	8,15,15	1.77	3 (37%)	8,23,23	1.07	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	PLP	B	902	1	-	2/6/6/8	0/1/1/1

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	MPD	B	907	-	-	0/5/5/5	-
7	MES	B	904	-	-	4/6/14/14	0/1/1/1
5	055	B	906	-	-	10/24/24/24	0/4/4/4
6	MPD	A	906	-	-	0/5/5/5	-
4	CFF	B	903	-	-		0/2/2/2
3	PLP	A	902	1	-	2/6/6/8	0/1/1/1
7	MES	B	905	-	-	4/6/14/14	0/1/1/1
2	NBG	A	901	-	-	0/6/26/26	0/1/1/1
5	055	A	905	-	-	9/24/24/24	0/4/4/4
2	NBG	B	901	-	-	0/6/26/26	0/1/1/1
4	CFF	A	903	-	-		0/2/2/2

All (30) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	906	055	C51-C46	9.43	1.54	1.39
5	A	905	055	C51-C46	9.23	1.54	1.39
5	A	905	055	C47-C46	9.17	1.53	1.39
5	B	906	055	C47-C46	9.07	1.53	1.39
7	B	905	MES	C8-S	-7.16	1.67	1.77
5	B	906	055	C48-C47	6.63	1.52	1.38
5	B	906	055	C50-C51	6.59	1.52	1.38
5	A	905	055	C48-C47	6.52	1.52	1.38
5	A	905	055	C50-C51	6.46	1.52	1.38
7	B	904	MES	C8-S	-6.41	1.68	1.77
5	B	906	055	C49-C48	5.50	1.52	1.38
5	A	905	055	C50-C49	5.38	1.52	1.38
5	B	906	055	C50-C49	5.37	1.52	1.38
5	A	905	055	C49-C48	5.31	1.52	1.38
4	A	903	CFF	C6-N1	3.21	1.43	1.38
5	A	905	055	C25-N24	-2.95	1.37	1.43
2	B	901	NBG	C1-N1	2.90	1.46	1.43
2	A	901	NBG	C1-N1	2.70	1.46	1.43
5	B	906	055	C30-CL1	2.61	1.79	1.73
4	B	903	CFF	C6-N1	2.60	1.42	1.38
5	B	906	055	C25-N24	-2.52	1.38	1.43
4	A	903	CFF	C5-C4	-2.49	1.36	1.39
4	B	903	CFF	C8-N9	2.38	1.38	1.34
4	B	903	CFF	C5-C4	-2.36	1.36	1.39
3	A	902	PLP	C2-N1	2.27	1.38	1.33
3	A	902	PLP	C6-N1	2.26	1.39	1.34

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	905	055	C3-C4	2.21	1.40	1.37
3	B	902	PLP	C2-N1	2.10	1.37	1.33
4	A	903	CFF	C8-N9	2.08	1.38	1.34
5	B	906	055	C5-N22	-2.02	1.37	1.41

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	B	904	MES	C5-N4-C3	6.72	123.95	108.83
5	B	906	055	N22-C23-N24	6.56	123.95	112.49
5	A	905	055	N22-C23-N24	6.45	123.76	112.49
5	B	906	055	C51-C46-C13	-6.08	110.80	120.80
7	B	905	MES	C5-N4-C3	5.22	120.58	108.83
5	A	905	055	C51-C46-C13	-4.93	112.69	120.80
5	B	906	055	O33-C23-N24	-4.75	115.59	123.62
5	A	905	055	O33-C23-N24	-4.69	115.68	123.62
7	B	904	MES	C7-N4-C3	4.15	121.84	111.23
7	B	904	MES	O1S-S-C8	3.73	111.41	106.92
5	B	906	055	C47-C46-C13	-3.73	114.68	120.80
5	A	905	055	C47-C46-C13	-3.46	115.11	120.80
7	B	905	MES	C7-N4-C3	3.40	119.93	111.23
7	B	905	MES	O3S-S-C8	3.33	111.16	105.77
7	B	905	MES	C7-N4-C5	3.22	119.48	111.23
5	A	905	055	C30-C25-C26	-3.09	116.48	119.87
2	A	901	NBG	C5-O5-C1	2.94	116.51	112.52
5	B	906	055	C30-C25-C26	-2.91	116.67	119.87
5	A	905	055	C46-C13-N12	-2.66	105.98	112.89
5	A	905	055	C3-C4-C5	2.45	121.19	119.00
5	B	906	055	C27-C26-C25	2.41	121.34	117.77
2	B	901	NBG	C3-C2-C1	2.37	113.40	109.94
5	A	905	055	C25-C30-CL1	2.37	121.98	119.27
4	B	903	CFF	C4-C5-C6	-2.34	118.46	119.96
5	B	906	055	C3-C4-C5	2.28	121.04	119.00
2	B	901	NBG	C1-N1-C7	2.27	125.32	122.57
5	B	906	055	C46-C13-N12	-2.25	107.05	112.89
5	A	905	055	C27-C26-C25	2.14	120.95	117.77
2	A	901	NBG	C3-C2-C1	2.13	113.05	109.94
7	B	904	MES	O2S-S-C8	2.13	109.48	106.92
3	A	902	PLP	O4P-C5A-C5	-2.09	105.36	109.35
2	A	901	NBG	C1-N1-C7	2.08	125.09	122.57
2	B	901	NBG	O2-C2-C1	-2.07	105.68	109.39
7	B	904	MES	C6-C5-N4	2.04	113.19	110.10

There are no chirality outliers.

All (31) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	906	055	C46-C13-C16-O21
7	B	904	MES	C8-C7-N4-C3
7	B	904	MES	C7-C8-S-O1S
7	B	904	MES	C7-C8-S-O2S
7	B	905	MES	C7-C8-S-O2S
7	B	905	MES	C7-C8-S-O3S
5	A	905	055	O33-C23-N24-C25
5	B	906	055	O33-C23-N24-C25
5	A	905	055	N22-C23-N24-C25
5	B	906	055	N22-C23-N24-C25
5	A	905	055	C16-C13-C46-C47
7	B	904	MES	C7-C8-S-O3S
5	A	905	055	C16-C13-C46-C51
5	B	906	055	C16-C13-C46-C47
5	B	906	055	C16-C13-C46-C51
7	B	905	MES	C8-C7-N4-C5
5	A	905	055	C46-C13-C16-O21
5	B	906	055	C46-C13-C16-O20
3	A	902	PLP	C4-C5-C5A-O4P
3	B	902	PLP	C4-C5-C5A-O4P
7	B	905	MES	C7-C8-S-O1S
5	B	906	055	C46-C13-N12-C11
5	B	906	055	C16-C13-N12-C11
5	A	905	055	C16-C13-N12-C11
3	A	902	PLP	C6-C5-C5A-O4P
3	B	902	PLP	C6-C5-C5A-O4P
5	A	905	055	N12-C13-C16-O21
5	B	906	055	N12-C13-C16-O21
5	B	906	055	N12-C13-C16-O20
5	A	905	055	C46-C13-C16-O20
5	A	905	055	C46-C13-N12-C11

There are no ring outliers.

7 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	902	PLP	1	0
6	B	907	MPD	1	0
5	B	906	055	1	0
4	B	903	CFF	1	0

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	901	NBG	1	0
5	A	905	055	1	0
4	A	903	CFF	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 055 B 906

Bond lengths

Bond angles

Torsions

Rings

Ligand 055 A 905

Bond lengths

Bond angles

Torsions

Rings
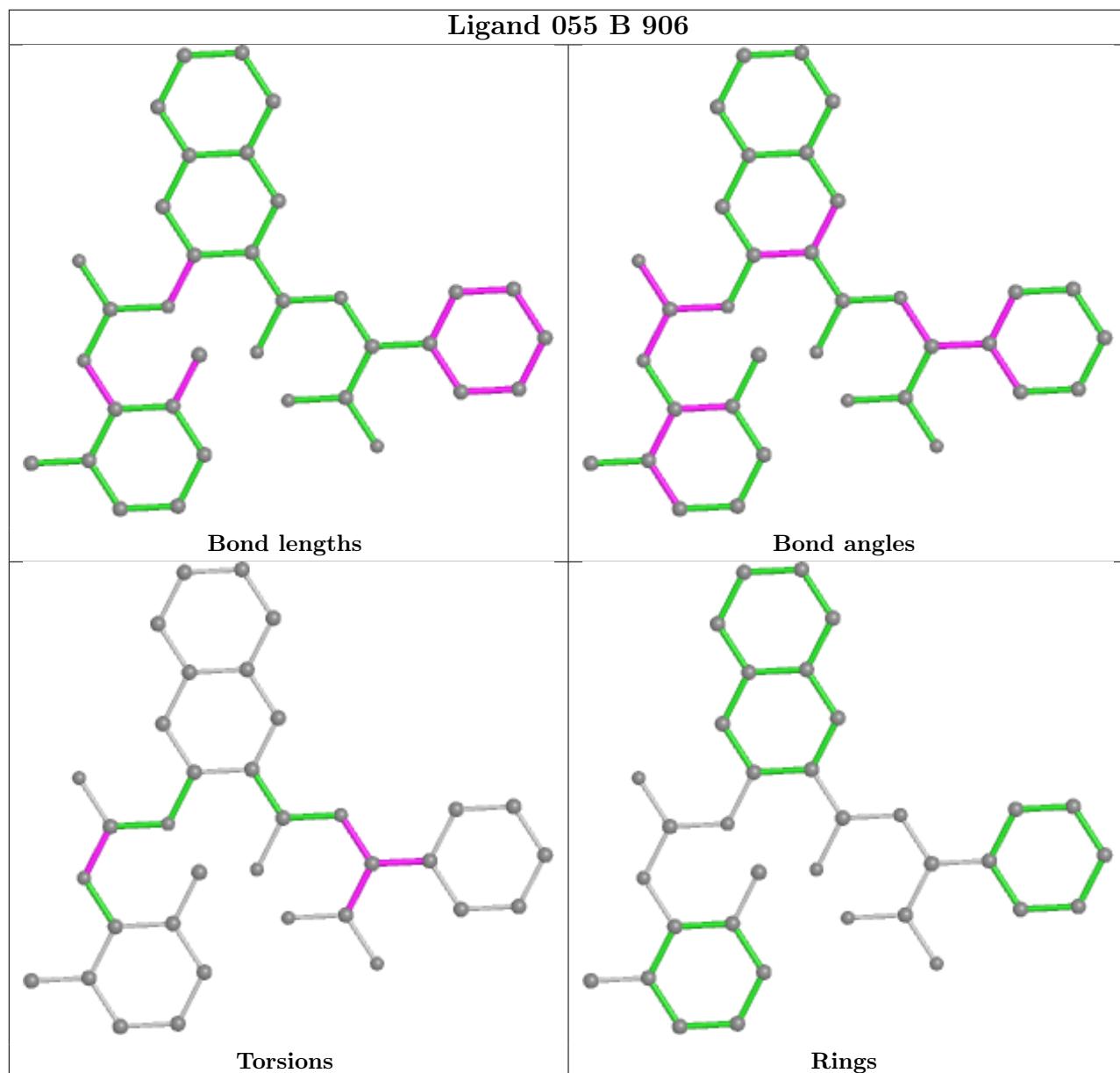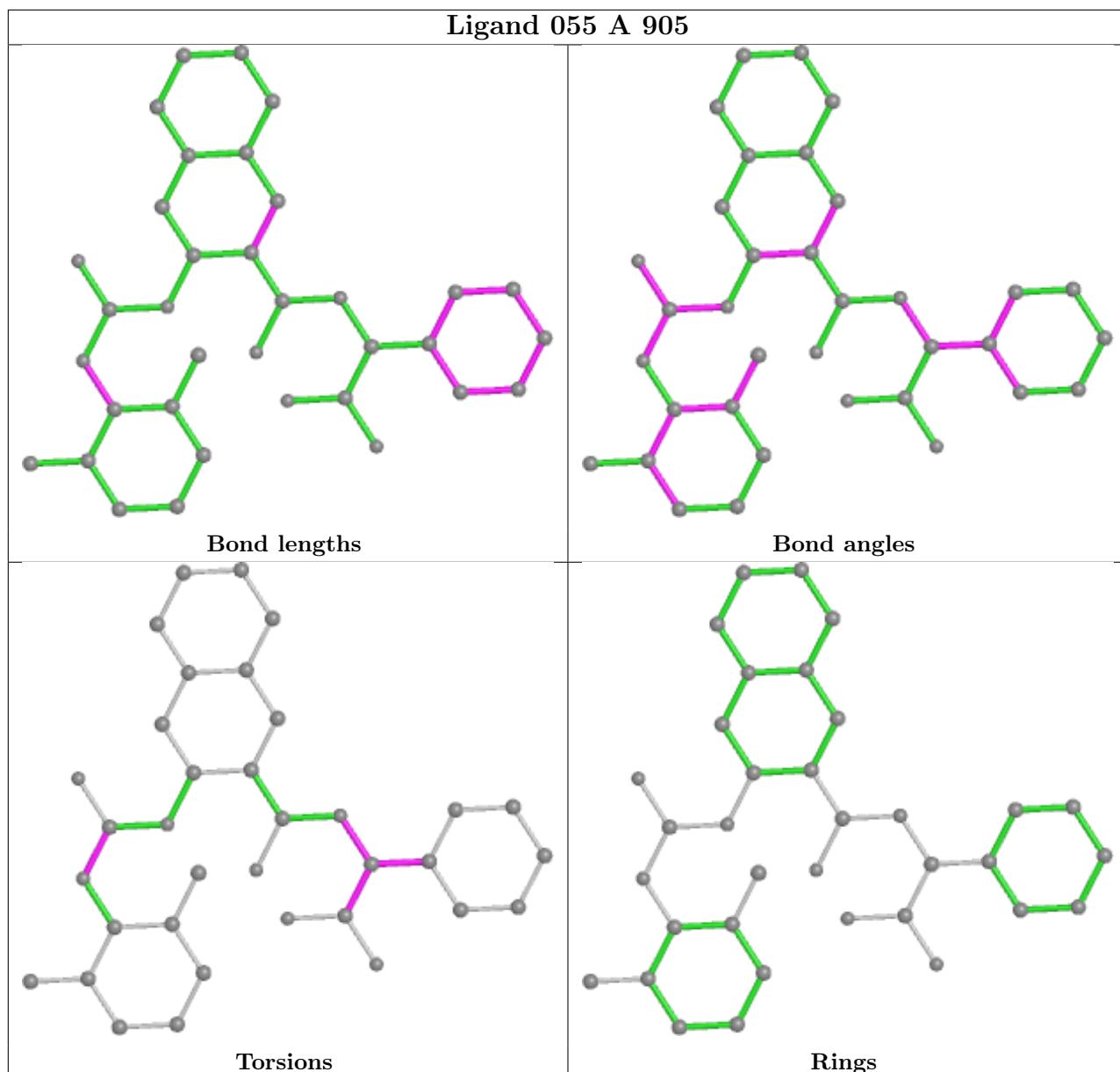
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	810/848 (95%)	-0.18	31 (3%)	40	43	14, 23, 40, 53	0
1	B	800/848 (94%)	-0.28	25 (3%)	49	51	14, 22, 39, 61	0
All	All	1610/1696 (94%)	-0.23	56 (3%)	44	47	14, 22, 39, 61	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	322	ALA	10.3
1	B	323	GLY	7.4
1	B	316	PHE	6.3
1	B	435	GLY	6.2
1	A	323	GLY	5.4
1	A	435	GLY	5.3
1	A	260	GLY	5.1
1	A	17	GLY	4.6
1	A	316	PHE	4.6
1	A	436	SER	4.6
1	A	19	VAL	4.4
1	A	317	GLY	4.3
1	B	256	ASP	4.2
1	A	18	ILE	4.1
1	A	324	THR	4.0
1	B	317	GLY	3.9
1	A	420	LYS	3.8
1	A	419	PRO	3.5
1	B	597	LEU	3.5
1	B	436	SER	3.5
1	A	830	SER	3.4
1	A	319	THR	3.3
1	A	422	VAL	3.3
1	A	209	THR	3.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	595	LYS	3.2
1	A	321	GLY	3.2
1	B	325	VAL	3.0
1	A	597	LEU	2.9
1	B	635	MET	2.9
1	A	210	ASN	2.9
1	B	416	ALA	2.8
1	A	251	ASP	2.8
1	B	324	THR	2.8
1	B	474	LEU	2.7
1	B	434	GLU	2.7
1	A	434	GLU	2.7
1	B	422	VAL	2.6
1	A	417	LEU	2.6
1	B	252	PHE	2.6
1	B	185	TYR	2.5
1	A	318	SER	2.5
1	B	419	PRO	2.5
1	B	420	LYS	2.5
1	B	253	ASN	2.5
1	A	185	TYR	2.4
1	B	415	VAL	2.3
1	A	635	MET	2.3
1	B	255	ARG	2.3
1	A	418	PHE	2.2
1	A	12	GLN	2.1
1	B	251	ASP	2.1
1	A	414	ILE	2.1
1	A	433	GLU	2.1
1	B	260	GLY	2.0
1	B	830	SER	2.0
1	A	16	ARG	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, 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
1	SEP	A	14[A]	10/11	0.69	0.26	47,47,48,48	10

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	SEP	A	14[B]	10/11	0.69	0.26	46,47,47,48	10

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
6	MPD	A	906	8/8	0.69	0.24	54,56,57,57	0
7	MES	B	905	12/12	0.78	0.28	82,82,83,83	0
6	MPD	B	907	8/8	0.81	0.21	48,49,51,52	0
2	NBG	B	901	15/15	0.87	0.17	26,32,36,36	0
7	MES	B	904	12/12	0.90	0.18	42,43,45,46	0
5	055	B	906	35/35	0.90	0.12	20,25,33,34	0
4	CFF	B	903	14/14	0.91	0.10	23,25,26,26	0
2	NBG	A	901	15/15	0.91	0.13	24,29,33,34	0
5	055	A	905	35/35	0.92	0.10	19,23,30,30	0
4	CFF	A	903	14/14	0.93	0.10	23,25,26,26	0
3	PLP	A	902	15/16	0.98	0.10	15,17,21,23	0
3	PLP	B	902	15/16	0.99	0.07	14,16,22,24	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 055 B 906:

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

Electron density around 055 A 905:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.