



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 11:21 AM UTC

PDB ID : 3DDS / pdb_00003dds
Title : Crystal structure of glycogen phosphorylase complexed with an anthranilimide based inhibitor GSK261
Authors : Nolte, R.T.
Deposited on : 2008-06-06
Resolution : 1.80 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

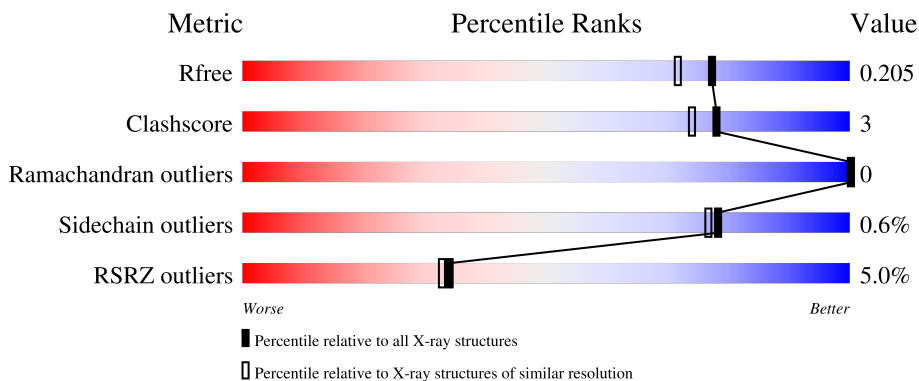
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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}	180053	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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

Mol	Chain	Length	Quality of chain
1	A	848	 5% 91% . .
1	B	848	 4% 91% . 5%

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 14698 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.

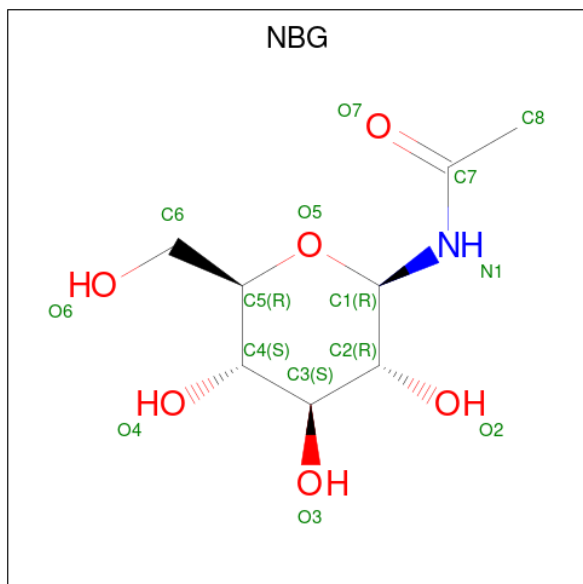
- Molecule 1 is a protein called Glycogen phosphorylase, liver form.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	P				S
1	A	811	Total 6582	C 4220	N 1115	O 1215	P 1	S 31	0	7	0
1	B	802	Total 6539	C 4196	N 1105	O 1207	P 31	S 31	0	9	0

There are 4 discrepancies between the modelled and reference sequences:

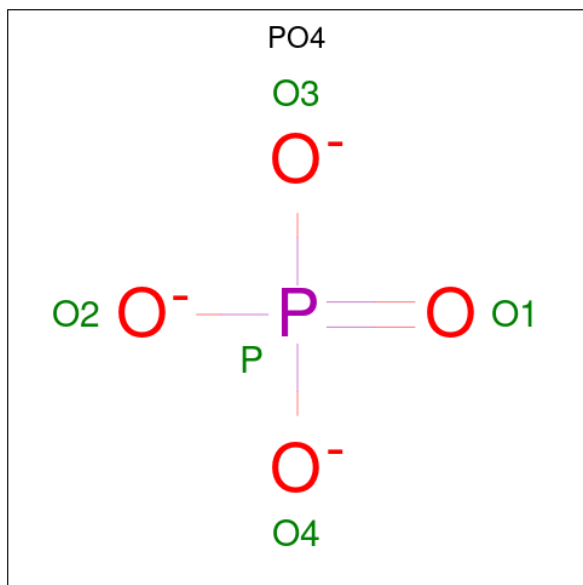
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P06737
A	0	GLY	-	expression tag	UNP P06737
B	-1	GLY	-	expression tag	UNP P06737
B	0	GLY	-	expression tag	UNP P06737

- Molecule 2 is N-acetyl-beta-D-glucopyranosylamine (CCD ID: NBG) (formula: C₈H₁₅NO₆).



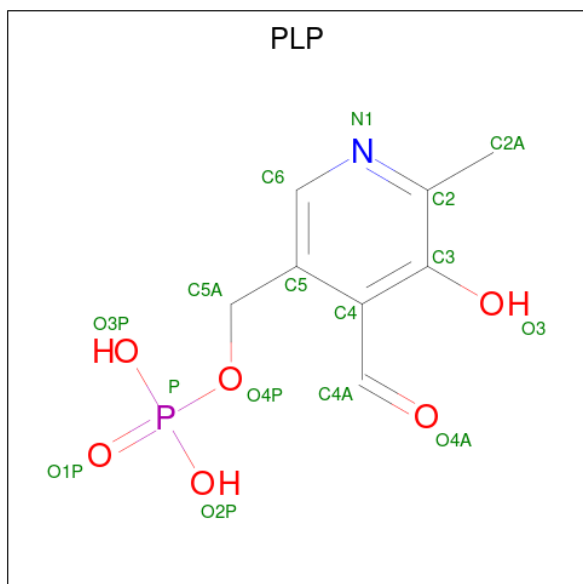
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			15	8	1	6		
2	B	1	Total	C	N	O	0	0
			15	8	1	6		

- Molecule 3 is PHOSPHATE ION (CCD ID: PO4) (formula: O_4P).



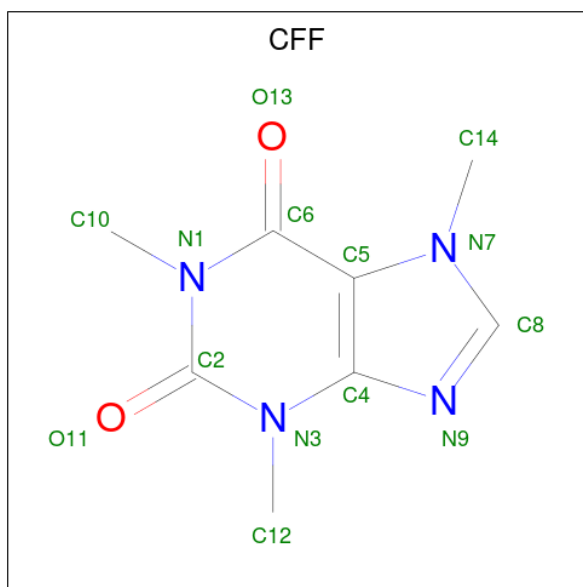
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	P	0	0
			5	4	1		

- Molecule 4 is PYRIDOXAL-5'-PHOSPHATE (CCD ID: PLP) (formula: $C_8H_{10}NO_6P$).



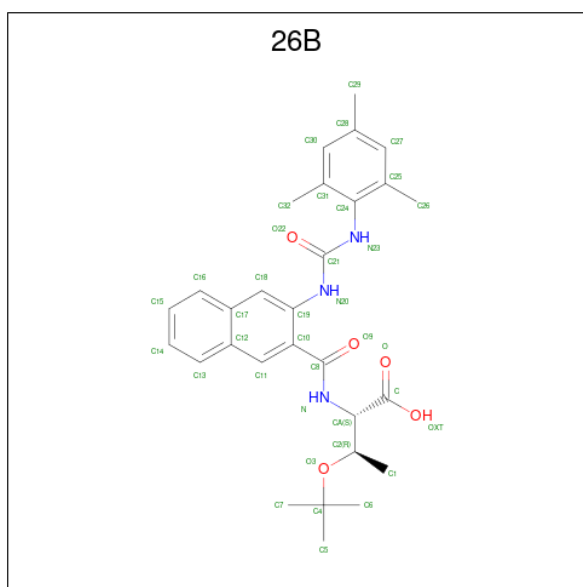
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			15	8	1	5	1		
4	B	1	Total	C	N	O	P	0	0
			15	8	1	5	1		

- Molecule 5 is CAFFEINE (CCD ID: CFF) (formula: $C_8H_{10}N_4O_2$).



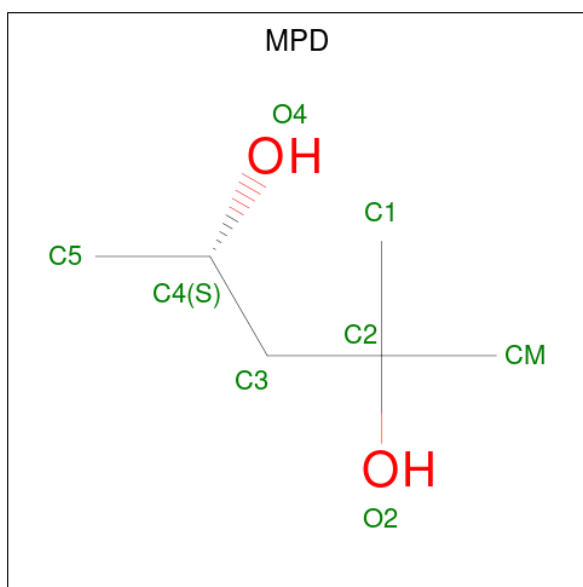
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	N	O	0	0
			14	8	4	2		
5	B	1	Total	C	N	O	0	0
			14	8	4	2		

- Molecule 6 is O-tert-butyl-N-[(3-[(2,4,6-trimethylphenyl)carbamoyl]amino)naphthalen-2-yl]carbonyl-L-threonine (CCD ID: 26B) (formula: $C_{29}H_{35}N_3O_5$).



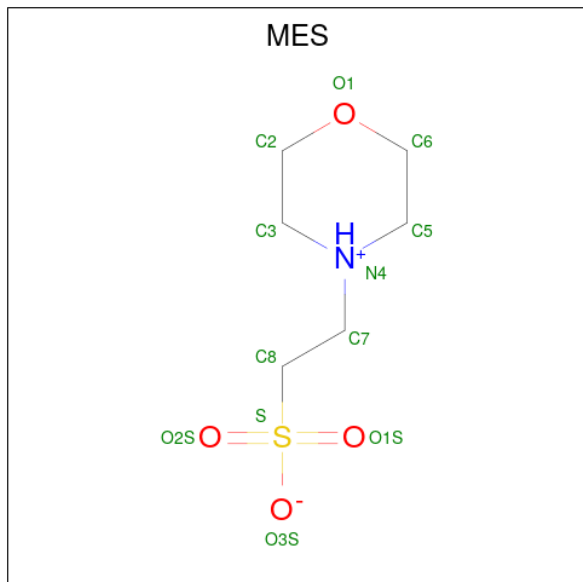
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	
6	A	1	Total	C	N	O	0	0
			37	29	3	5		
6	B	1	Total	C	N	O	0	0
			37	29	3	5		
6	B	1	Total	C	N	O	0	0
			37	29	3	5		

- Molecule 7 is (4S)-2-METHYL-2,4-PENTANEDIOL (CCD ID: MPD) (formula: C₆H₁₄O₂).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
7	A	1	Total	C	O		
			8	6	2	0	0

- Molecule 8 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (CCD ID: MES) (formula: $C_6H_{13}NO_4S$).



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

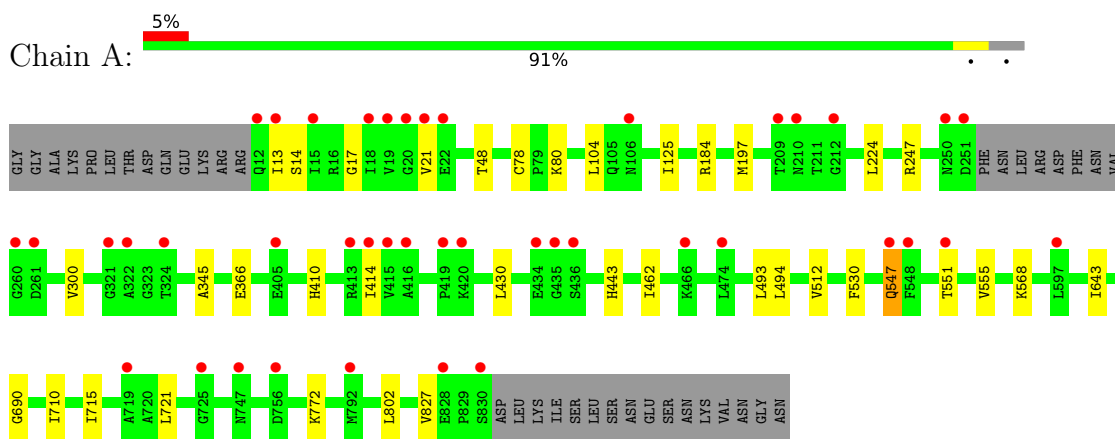
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	668	Total	O	0	0
			668	668		
9	B	685	Total	O	0	0
			685	685		

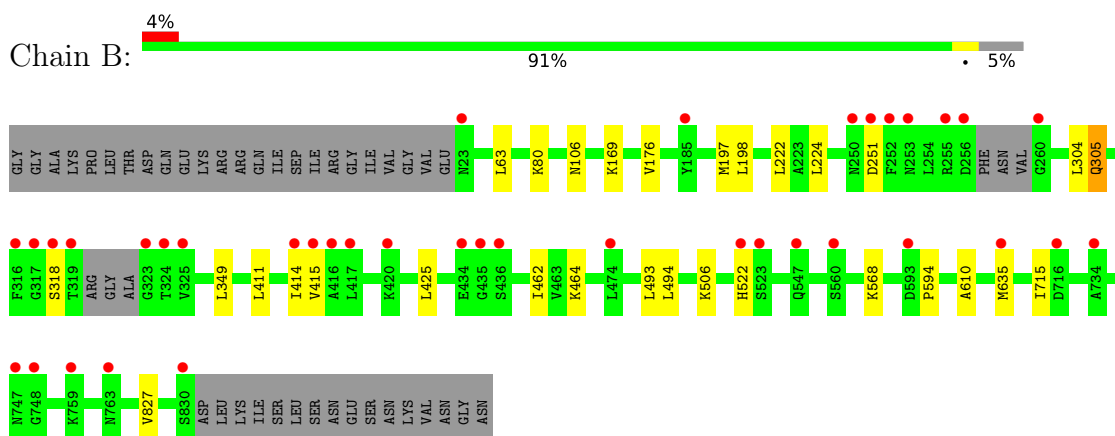
3 Residue-property plots [i](#)

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: Glycogen phosphorylase, liver form



- Molecule 1: Glycogen phosphorylase, liver form



4 Data and refinement statistics

Property	Value	Source
Space group	P 31	Depositor
Cell constants a, b, c, α , β , γ	124.40Å 124.40Å 123.61Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.66 – 1.80 19.66 – 1.80	Depositor EDS
% Data completeness (in resolution range)	96.9 (19.66-1.80) 96.8 (19.66-1.80)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.76 (at 1.80Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.174 , 0.198 0.183 , 0.205	Depositor DCC
R_{free} test set	5803 reflections (2.93%)	wwPDB-VP
Wilson B-factor (Å ²)	25.6	Xtriage
Anisotropy	0.076	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.41 , 52.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	0.001 for -h,-k,l 0.016 for h,-h-k,-l 0.007 for -k,-h,-l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	14698	wwPDB-VP
Average B, all atoms (Å ²)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.79% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MES, SEP, PLP, NBG, PO4, CFF, MPD, 26B

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	0.49	0/6719	0.69	0/9094
1	B	0.48	0/6690	0.68	0/9052
All	All	0.49	0/13409	0.69	0/18146

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	6582	0	6536	49	0
1	B	6539	0	6480	21	0
2	A	15	0	15	0	0
2	B	15	0	15	0	0
3	A	5	0	0	0	0
4	A	15	0	7	0	0
4	B	15	0	7	0	0
5	A	14	0	10	0	0
5	B	14	0	10	2	0
6	A	37	0	34	0	0
6	B	74	0	68	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	A	8	0	14	2	0
8	B	12	0	12	0	0
9	A	668	0	0	2	0
9	B	685	0	0	5	0
All	All	14698	0	13208	74	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 (74) 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:197[B]:MET:CE	1:A:224[B]:LEU:CB	2.29	1.10
1:A:197[B]:MET:CE	1:A:224[B]:LEU:HB2	1.88	1.02
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:CG	1.90	1.01
1:A:197[B]:MET:CE	1:A:224[B]:LEU:HG	1.96	0.96
1:A:197[B]:MET:HE2	1:A:224[B]:LEU:CA	2.00	0.92
1:A:197[B]:MET:HE2	1:A:224[B]:LEU:CB	1.99	0.92
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:CB	1.98	0.92
1:A:197[B]:MET:CE	1:A:224[B]:LEU:CG	2.49	0.91
1:B:106:ASN:OD1	9:B:1591:HOH:O	1.91	0.87
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:HB2	1.53	0.86
1:A:197[B]:MET:HE2	1:A:224[B]:LEU:HB2	1.56	0.83
1:A:547:GLN:NE2	9:A:1229:HOH:O	2.05	0.79
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:HG	1.57	0.78
1:A:78[B]:CYS:SG	9:A:975:HOH:O	2.41	0.77
1:A:197[B]:MET:HE3	1:A:224[B]:LEU:HG	1.67	0.74
1:A:197[B]:MET:CE	1:A:224[B]:LEU:CA	2.64	0.70
1:A:493:LEU:HD21	1:A:512:VAL:HG22	1.75	0.68
1:B:197[A]:MET:HE2	1:B:222:LEU:HB3	1.77	0.66
1:A:184:ARG:NH2	1:B:197[B]:MET:HE1	2.10	0.66
1:A:13:ILE:HD12	1:A:104:LEU:CD2	2.26	0.66
1:A:547:GLN:O	1:A:551:THR:HG23	1.96	0.65
1:A:555[B]:VAL:HG11	1:A:643:ILE:HD11	1.78	0.65
1:A:197[B]:MET:CE	1:A:224[B]:LEU:HA	2.29	0.63
1:A:197[B]:MET:HE2	1:A:224[B]:LEU:HA	1.82	0.62
1:B:198:LEU:HD13	1:B:305:GLN:HB3	1.82	0.61
1:A:197[A]:MET:HE2	1:A:224[A]:LEU:HD11	1.83	0.59
1:A:493:LEU:HD11	1:A:512:VAL:HG11	1.85	0.58
1:B:304[A]:LEU:HD22	1:B:349:LEU:HD13	1.85	0.58
1:B:522:HIS:NE2	9:B:1094:HOH:O	2.11	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:530:PHE:HE2	1:A:802:LEU:HD13	1.71	0.55
1:B:506:LYS:NZ	9:B:1183:HOH:O	2.40	0.55
1:B:197[A]:MET:HE3	1:B:224:LEU:HB2	1.88	0.54
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:CD1	2.36	0.53
1:A:13:ILE:HD12	1:A:104:LEU:HD23	1.91	0.52
1:B:411:LEU:HD23	1:B:414:ILE:HD12	1.91	0.52
1:A:197[A]:MET:HE2	1:A:224[A]:LEU:CD1	2.40	0.51
1:A:197[A]:MET:HE2	1:A:224[A]:LEU:CG	2.41	0.51
1:B:464:LYS:NZ	9:B:1442:HOH:O	2.44	0.51
1:B:594:PRO:HG3	1:B:635[A]:MET:HE3	1.93	0.50
1:A:197[B]:MET:HE2	1:A:224[B]:LEU:N	2.26	0.49
1:B:197[A]:MET:HE2	1:B:222:LEU:CB	2.42	0.49
1:A:555[A]:VAL:HG21	1:A:643:ILE:CD1	2.43	0.49
1:B:80:LYS:HB3	1:B:827:VAL:HG12	1.97	0.47
1:B:415:VAL:HG22	1:B:425:LEU:HD11	1.98	0.46
7:A:906:MPD:C1	7:A:906:MPD:O4	2.63	0.46
1:A:410:HIS:CE1	1:A:414:ILE:HD11	2.51	0.46
1:A:13:ILE:HD12	1:A:104:LEU:HD21	1.96	0.45
1:B:63:LEU:C	1:B:63:LEU:HD12	2.41	0.45
1:A:300:VAL:HG13	1:A:345:ALA:HA	1.98	0.45
1:B:169:LYS:HB2	1:B:176:VAL:CG2	2.46	0.45
1:A:555[A]:VAL:HG21	1:A:643:ILE:HD11	1.97	0.45
1:A:197[A]:MET:HE2	1:A:224[A]:LEU:HG	1.99	0.45
1:A:494:LEU:C	1:A:494:LEU:HD23	2.43	0.44
1:A:530:PHE:CE2	1:A:802:LEU:HD13	2.53	0.44
1:A:80:LYS:HB3	1:A:827:VAL:HG12	2.00	0.44
1:B:594:PRO:CG	1:B:635[A]:MET:HE3	2.47	0.44
1:A:48:THR:HG22	1:A:125:ILE:HG13	1.99	0.44
6:B:906:26B:H5B	6:B:906:26B:H1	2.00	0.43
1:B:494:LEU:C	1:B:494:LEU:HD23	2.42	0.43
1:A:224[A]:LEU:HD22	1:A:247:ARG:HG3	2.00	0.43
1:A:300:VAL:CG1	1:A:345:ALA:HA	2.49	0.43
1:B:635[B]:MET:HE3	1:B:635[B]:MET:HA	2.00	0.43
6:B:905:26B:H7	9:B:1585:HOH:O	2.18	0.42
1:A:493:LEU:HD11	1:A:512:VAL:CG1	2.49	0.42
1:A:197[B]:MET:HE1	1:A:224[B]:LEU:HD12	2.00	0.42
1:A:430:LEU:HD22	1:A:443:HIS:HB3	2.01	0.42
1:B:462:ILE:HD11	1:B:715:ILE:CD1	2.50	0.42
5:B:903:CFF:H141	5:B:903:CFF:O13	2.20	0.42
1:A:462:ILE:HD11	1:A:715:ILE:CD1	2.50	0.41
1:A:17:GLY:O	1:A:21:VAL:HG23	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:610:ALA:CB	5:B:903:CFF:H81	2.51	0.40
1:A:690:GLY:O	1:A:710:ILE:HA	2.21	0.40
1:A:721:LEU:HD23	1:A:772:LYS:HD3	2.03	0.40
7:A:906:MPD:O4	7:A:906:MPD:H11	2.20	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	813/848 (96%)	794 (98%)	19 (2%)	0	100	100
1	B	805/848 (95%)	790 (98%)	15 (2%)	0	100	100
All	All	1618/1696 (95%)	1584 (98%)	34 (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	705/738 (96%)	702 (100%)	3 (0%)	84	83
1	B	703/738 (95%)	698 (99%)	5 (1%)	76	73
All	All	1408/1476 (95%)	1400 (99%)	8 (1%)	78	77

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	366	GLU
1	A	547	GLN
1	A	568	LYS
1	B	251	ASP
1	B	305	GLN
1	B	318	SER
1	B	493	LEU
1	B	568	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	97	ASN
1	A	332	GLN
1	A	341	HIS
1	A	481	ASN
1	B	96	GLN
1	B	97	ASN
1	B	106	ASN
1	B	539	GLN
1	B	822	GLN
1	B	823	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

1 non-standard protein/DNA/RNA residue is 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	1	8,9,10	1.62	1 (12%)	7,12,14	1.06	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
1	SEP	A	14	1	-	0/6/8/10	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	14	SEP	P-O1P	3.54	1.61	1.50

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides 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
6	26B	B	906	-	39,39,39	1.05	1 (2%)	57,57,57	1.02	5 (8%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	PLP	B	902	1	15,15,16	1.02	1 (6%)	21,22,23	1.00	0
6	26B	B	905	-	39,39,39	0.98	1 (2%)	57,57,57	0.96	2 (3%)
5	CFF	A	904	-	15,15,15	1.48	3 (20%)	23,23,23	2.15	9 (39%)
7	MPD	A	906	-	7,7,7	0.31	0	9,10,10	0.33	0
2	NBG	B	901	-	15,15,15	0.72	1 (6%)	21,21,21	1.08	2 (9%)
5	CFF	B	903	-	15,15,15	1.57	3 (20%)	23,23,23	2.19	8 (34%)
6	26B	A	905	-	39,39,39	0.98	0	57,57,57	1.06	4 (7%)
2	NBG	A	901	-	15,15,15	0.59	0	21,21,21	0.91	0
8	MES	B	904	-	12,12,12	2.18	1 (8%)	15,16,16	2.19	4 (26%)
3	PO4	A	902	-	4,4,4	0.97	0	6,6,6	0.48	0
4	PLP	A	903	1	15,15,16	1.14	2 (13%)	21,22,23	0.97	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
6	26B	B	906	-	-	2/29/29/29	0/3/3/3
4	PLP	B	902	1	-	2/6/6/8	0/1/1/1
6	26B	B	905	-	-	2/29/29/29	0/3/3/3
7	MPD	A	906	-	-	0/5/5/5	-
8	MES	B	904	-	-	1/6/14/14	0/1/1/1
2	NBG	B	901	-	-	0/6/26/26	0/1/1/1
5	CFF	A	904	-	-	-	0/2/2/2
5	CFF	B	903	-	-	-	0/2/2/2
2	NBG	A	901	-	-	0/6/26/26	0/1/1/1
6	26B	A	905	-	-	2/29/29/29	0/3/3/3
4	PLP	A	903	1	-	2/6/6/8	0/1/1/1

All (13) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	B	904	MES	C8-S	-7.25	1.67	1.77
5	B	903	CFF	C5-N7	-3.27	1.32	1.38
5	A	904	CFF	C5-N7	-3.01	1.33	1.38
4	A	903	PLP	C2-N1	2.58	1.38	1.33
2	B	901	NBG	C1-N1	2.51	1.46	1.43
4	A	903	PLP	C6-N1	2.28	1.39	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	B	903	CFF	C2-N3	-2.28	1.34	1.39
4	B	902	PLP	C2-N1	2.24	1.37	1.33
5	B	903	CFF	C8-N9	2.21	1.38	1.32
5	A	904	CFF	C2-N3	-2.08	1.34	1.39
6	B	906	26B	C8-N	2.07	1.39	1.34
5	A	904	CFF	C8-N9	2.03	1.38	1.32
6	B	905	26B	C8-N	2.02	1.38	1.34

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	B	904	MES	C5-N4-C3	6.64	123.15	108.84
5	B	903	CFF	C5-C6-N1	3.88	119.16	112.06
5	A	904	CFF	C5-C6-N1	3.84	119.10	112.06
5	B	903	CFF	C14-N7-C8	3.77	133.35	126.28
5	B	903	CFF	C14-N7-C5	-3.73	118.89	127.77
5	A	904	CFF	C14-N7-C5	-3.62	119.15	127.77
5	A	904	CFF	C14-N7-C8	3.62	133.06	126.28
5	B	903	CFF	C6-N1-C2	-3.62	119.78	125.66
5	A	904	CFF	C6-N1-C2	-3.54	119.90	125.66
5	B	903	CFF	C6-C5-C4	-3.33	118.72	122.92
5	A	904	CFF	C6-C5-C4	-3.32	118.73	122.92
5	B	903	CFF	O13-C6-C5	-3.26	119.69	126.38
5	A	904	CFF	O13-C6-C5	-3.25	119.72	126.38
8	B	904	MES	C7-N4-C5	2.96	119.12	111.24
6	B	906	26B	C1-C2-CA	-2.87	107.63	113.26
6	B	906	26B	C4-O3-C2	-2.75	114.16	118.64
6	A	905	26B	C4-O3-C2	-2.71	114.23	118.64
2	B	901	NBG	C3-C2-C1	2.62	113.70	109.86
5	B	903	CFF	C12-N3-C2	2.48	121.66	117.33
8	B	904	MES	C7-N4-C3	2.43	117.72	111.24
5	B	903	CFF	N3-C2-N1	2.37	120.10	117.14
5	A	904	CFF	N3-C2-N1	2.35	120.07	117.14
6	B	905	26B	C1-C2-CA	-2.32	108.70	113.26
6	B	906	26B	C25-C27-C28	-2.32	119.93	122.13
6	A	905	26B	C25-C27-C28	-2.30	119.94	122.13
6	A	905	26B	C1-C2-CA	-2.27	108.80	113.26
5	A	904	CFF	C12-N3-C2	2.25	121.26	117.33
5	A	904	CFF	C10-N1-C6	2.22	121.07	117.64
6	B	906	26B	C31-C30-C28	-2.19	120.05	122.13
6	A	905	26B	C31-C30-C28	-2.16	120.07	122.13
8	B	904	MES	O3S-S-C8	2.13	110.17	106.00

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	905	26B	C25-C27-C28	-2.11	120.12	122.13
6	B	906	26B	C30-C28-C27	2.04	120.38	118.11
2	B	901	NBG	C1-N1-C7	2.01	125.02	122.51

There are no chirality outliers.

All (11) torsion outliers are listed below:

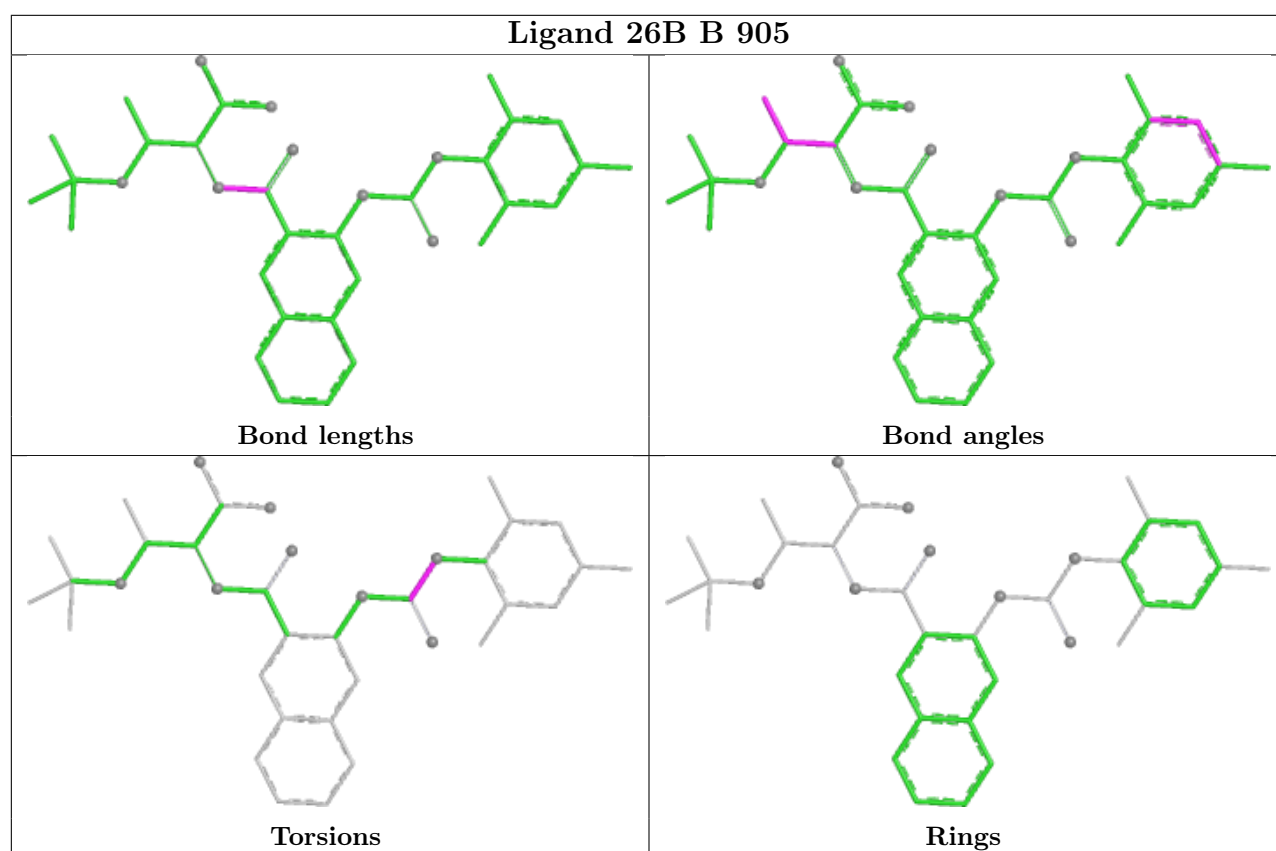
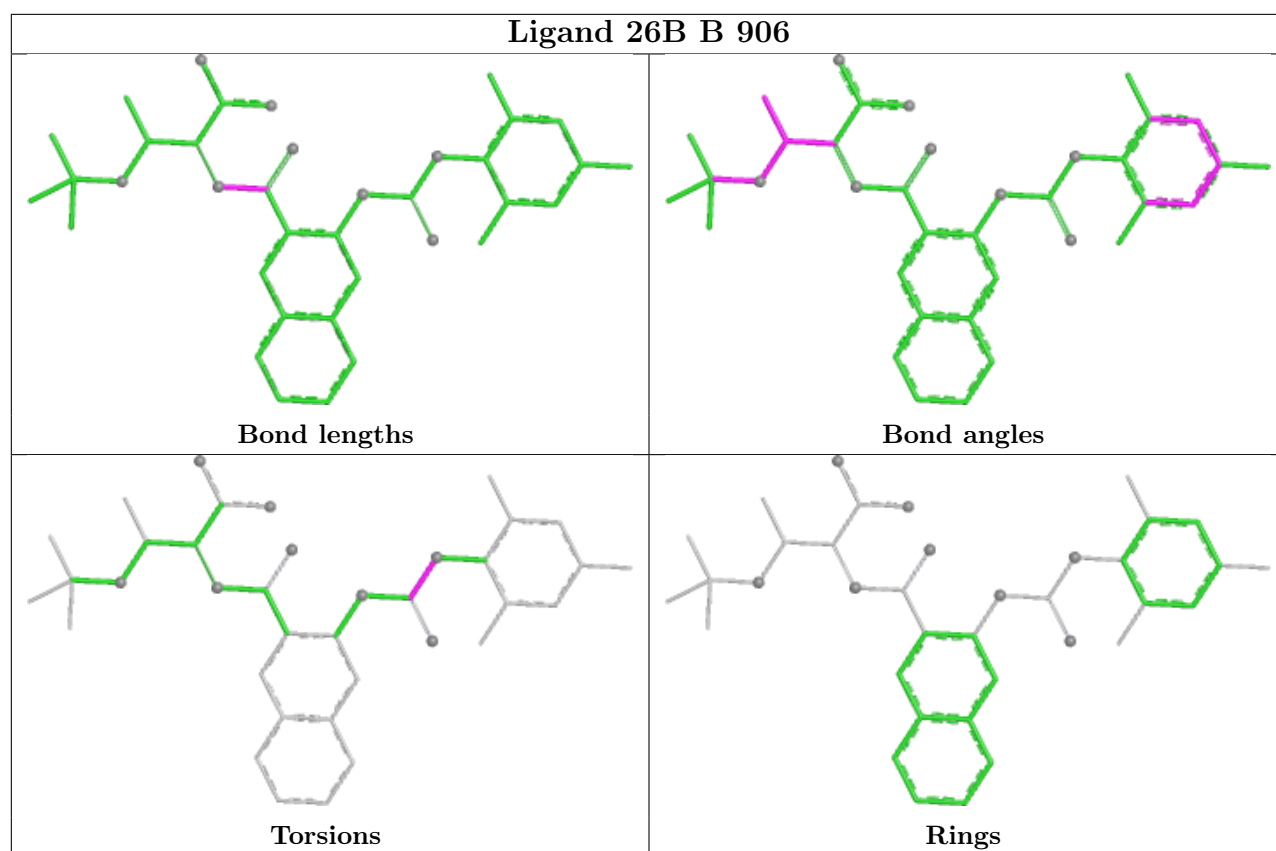
Mol	Chain	Res	Type	Atoms
6	B	906	26B	O22-C21-N23-C24
6	B	906	26B	N20-C21-N23-C24
6	A	905	26B	O22-C21-N23-C24
6	B	905	26B	O22-C21-N23-C24
6	B	905	26B	N20-C21-N23-C24
6	A	905	26B	N20-C21-N23-C24
8	B	904	MES	C8-C7-N4-C3
4	A	903	PLP	C4-C5-C5A-O4P
4	B	902	PLP	C4-C5-C5A-O4P
4	A	903	PLP	C6-C5-C5A-O4P
4	B	902	PLP	C6-C5-C5A-O4P

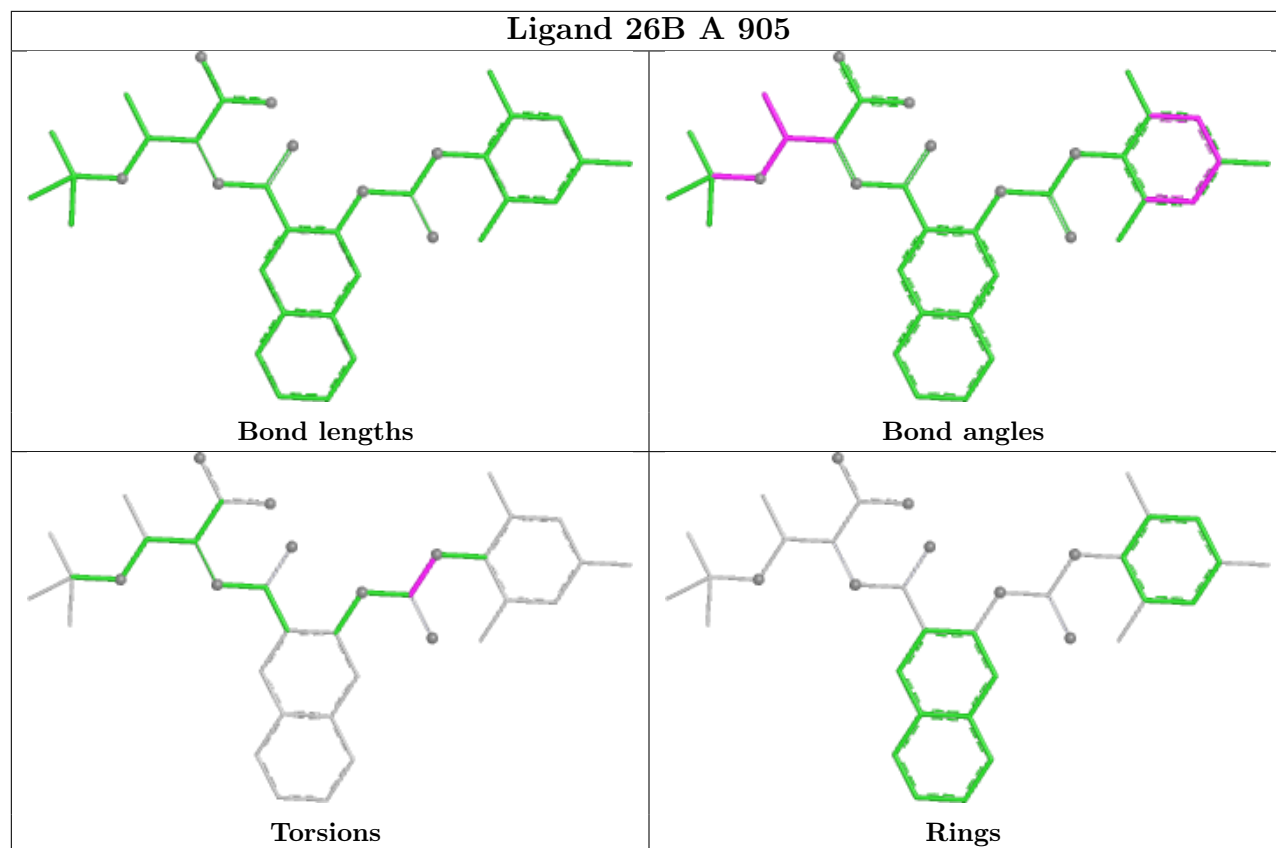
There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	B	906	26B	1	0
6	B	905	26B	1	0
7	A	906	MPD	2	0
5	B	903	CFE	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 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

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	810/848 (95%)	0.13	42 (5%) 33 31	12, 30, 46, 62	7 (0%)
1	B	802/848 (94%)	0.07	38 (4%) 36 35	12, 29, 46, 60	9 (1%)
All	All	1612/1696 (95%)	0.10	80 (4%) 34 33	12, 29, 46, 62	16 (0%)

All (80) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	318	SER	5.7
1	A	420	LYS	4.6
1	A	322	ALA	4.5
1	B	319	THR	4.4
1	A	436	SER	4.0
1	B	253	ASN	3.9
1	A	260	GLY	3.9
1	A	251	ASP	3.9
1	A	21	VAL	3.7
1	B	324	THR	3.6
1	A	22	GLU	3.5
1	B	256	ASP	3.5
1	A	250	ASN	3.4
1	B	420	LYS	3.4
1	A	12	GLN	3.4
1	A	434	GLU	3.3
1	B	323	GLY	3.3
1	A	20	GLY	3.2
1	A	830	SER	3.2
1	B	434	GLU	3.1
1	B	325	VAL	3.1
1	A	416	ALA	3.0
1	B	251	ASP	3.0
1	A	435	GLY	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	316	PHE	2.9
1	A	210	ASN	2.9
1	B	255	ARG	2.9
1	B	830	SER	2.9
1	A	547	GLN	2.8
1	A	719	ALA	2.8
1	B	414	ILE	2.8
1	A	209	THR	2.7
1	B	260	GLY	2.6
1	B	317	GLY	2.6
1	B	415	VAL	2.6
1	B	522	HIS	2.5
1	A	597	LEU	2.5
1	A	415	VAL	2.5
1	A	324	THR	2.5
1	A	15	ILE	2.5
1	A	419	PRO	2.5
1	A	19	VAL	2.4
1	B	250	ASN	2.4
1	B	763	ASN	2.4
1	B	417	LEU	2.4
1	B	436	SER	2.4
1	B	474	LEU	2.4
1	A	466	LYS	2.4
1	A	261	ASP	2.4
1	A	321	GLY	2.4
1	A	548	PHE	2.4
1	A	551	THR	2.4
1	A	18	ILE	2.4
1	B	635[A]	MET	2.4
1	B	560	SER	2.3
1	A	474	LEU	2.3
1	B	593	ASP	2.3
1	B	547	GLN	2.3
1	B	435	GLY	2.3
1	B	716	ASP	2.3
1	A	413	ARG	2.2
1	A	828	GLU	2.2
1	A	747	ASN	2.2
1	B	523	SER	2.2
1	B	416	ALA	2.2
1	B	734	ALA	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	23	ASN	2.2
1	B	748	GLY	2.2
1	A	212	GLY	2.2
1	A	792[A]	MET	2.1
1	B	252	PHE	2.1
1	B	759	LYS	2.1
1	B	185	TYR	2.1
1	A	106	ASN	2.1
1	B	747	ASN	2.1
1	A	756	ASP	2.1
1	A	405	GLU	2.0
1	A	414	ILE	2.0
1	A	725	GLY	2.0
1	A	13	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, 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	10/11	0.82	0.20	58,59,60,60	0

6.3 Carbohydrates [i](#)

There are no oligosaccharides 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.

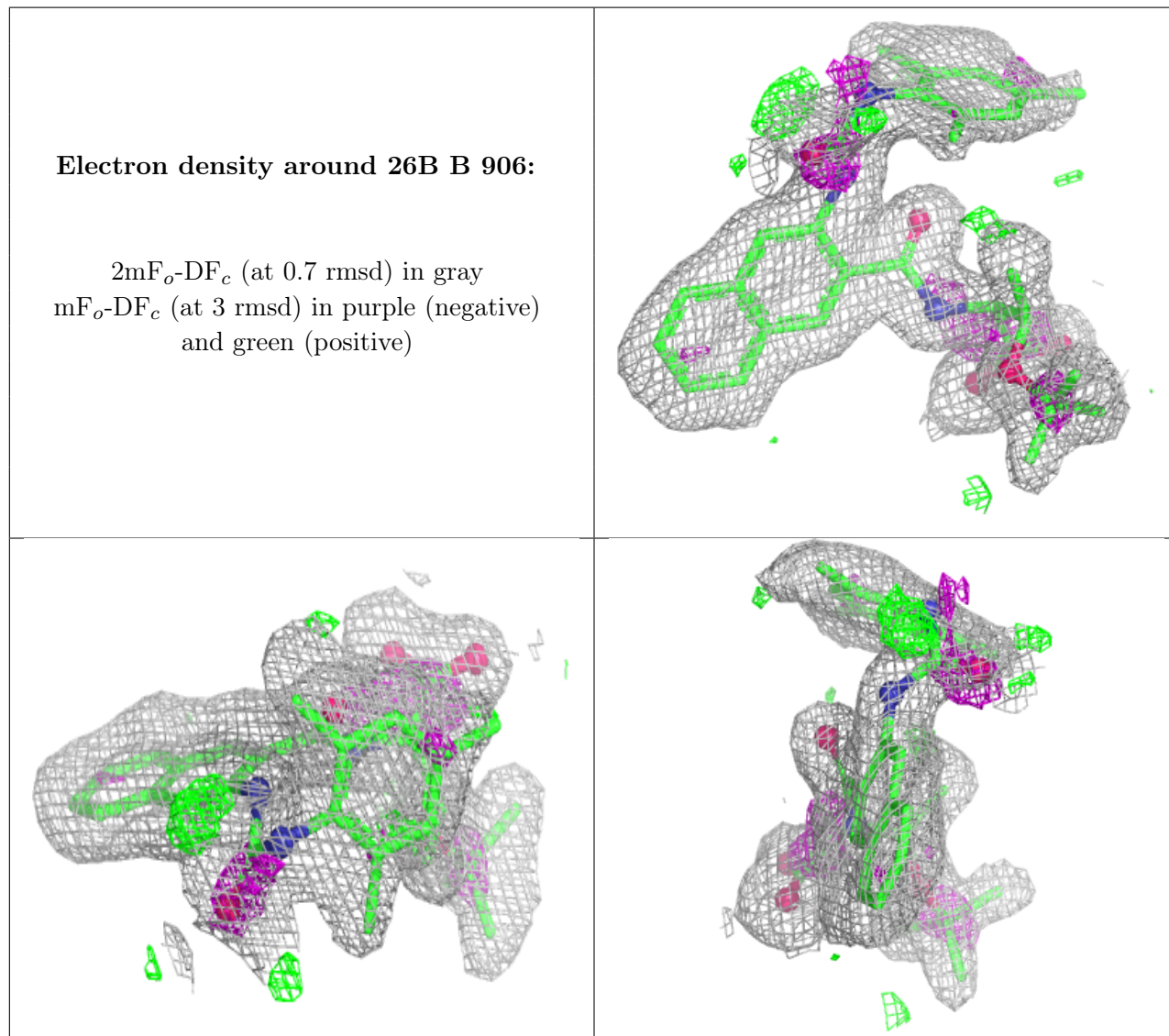
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	PO4	A	902	5/5	0.65	0.16	77,78,78,78	0
6	26B	B	906	37/37	0.84	0.11	35,37,47,48	0
7	MPD	A	906	8/8	0.84	0.12	40,42,43,43	0

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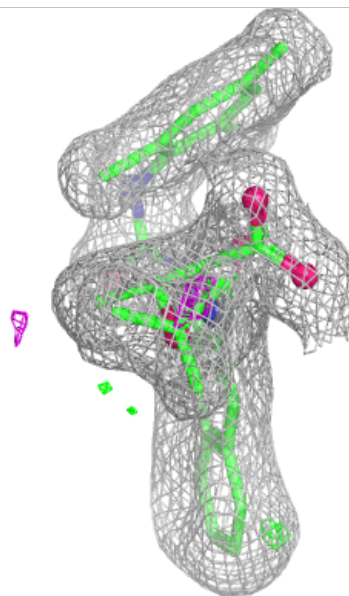
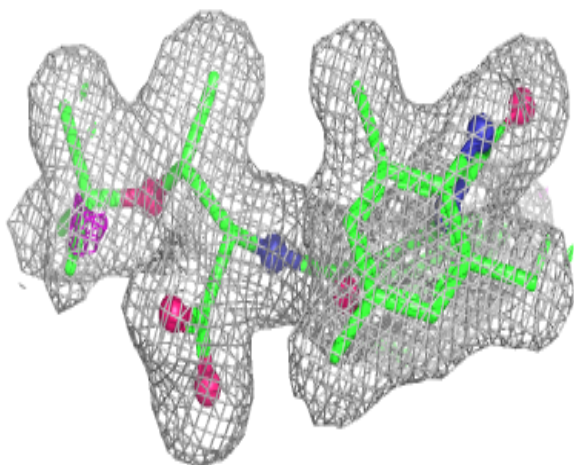
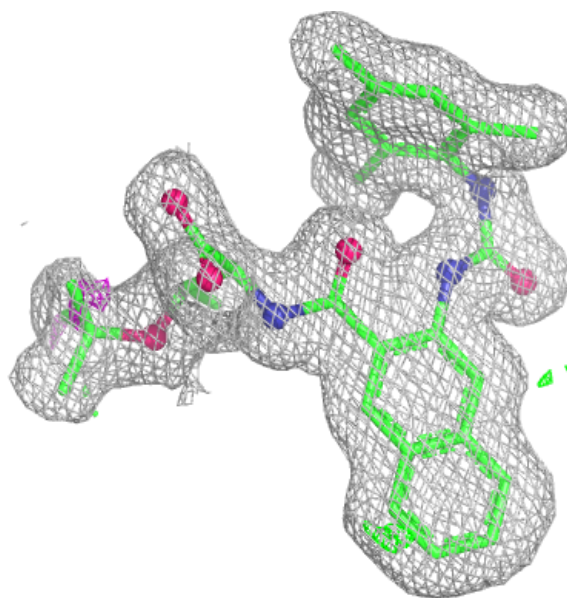
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	CFF	B	903	14/14	0.87	0.12	33,34,35,35	0
5	CFF	A	904	14/14	0.88	0.11	32,33,34,34	0
8	MES	B	904	12/12	0.91	0.13	44,47,49,49	0
2	NBG	B	901	15/15	0.92	0.08	28,30,33,33	0
6	26B	B	905	37/37	0.93	0.07	24,27,32,33	0
6	26B	A	905	37/37	0.95	0.07	23,26,30,31	0
2	NBG	A	901	15/15	0.96	0.06	26,29,31,31	0
4	PLP	B	902	15/16	0.97	0.05	23,25,29,31	0
4	PLP	A	903	15/16	0.97	0.06	23,24,29,31	0

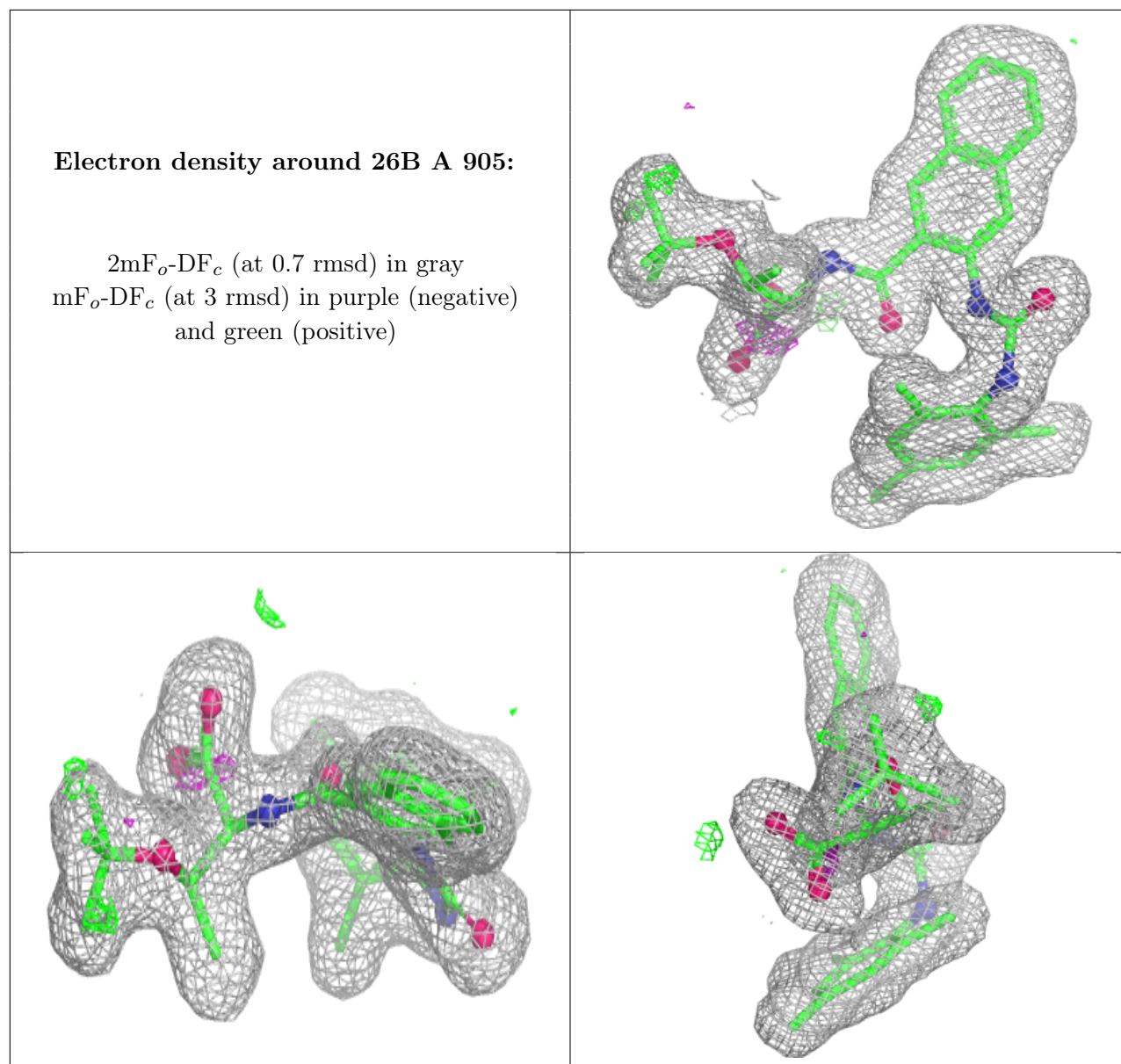
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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



Electron density around 26B B 905:

$2mF_o-DF_c$ (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.