



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 1, 2026 – 12:13 PM UTC

PDB ID : 6SIU / pdb_00006siu
Title : Crystal structure of IbpAFic2 covalently tethered to Cdc42
Authors : Gulen, B.; Roselin, M.; Albers, M.; Hedberg, C.; Itzen, A.; Pogenberg, V.
Deposited on : 2019-08-12
Resolution : 2.49 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

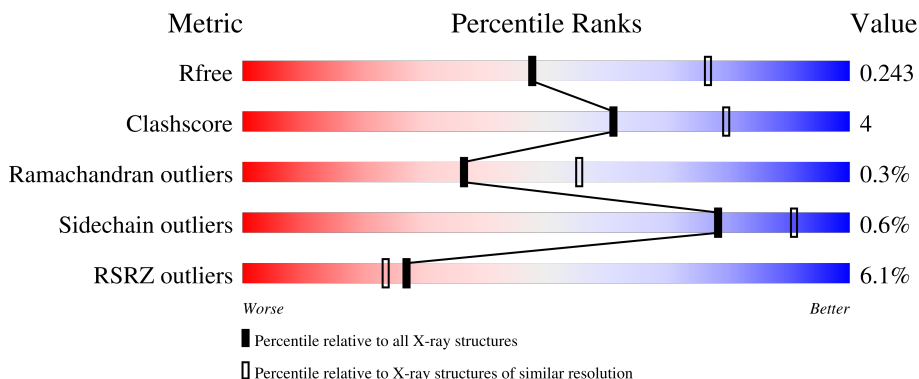
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.49 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	316	 4% 85% 8% • 7%
1	B	316	 6% 87% 7% 6%
2	C	192	 8% 80% 19% ••
2	D	192	 6% 84% 9% • 7%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 7816 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 Protein adenylyltransferase and cysteine protease IbpA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	295	Total	C	N	O	S	0	0	0
			2304	1451	387	462	4			
1	B	297	Total	C	N	O	S	0	0	0
			2312	1454	390	464	4			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3482	GLY	-	expression tag	UNP Q06277
A	3755	CYS	ILE	engineered mutation	UNP Q06277
B	3482	GLY	-	expression tag	UNP Q06277
B	3755	CYS	ILE	engineered mutation	UNP Q06277

- Molecule 2 is a protein called Cell division control protein 42 homolog.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	191	Total	C	N	O	S	0	1	0
			1486	958	236	284	8			
2	D	179	Total	C	N	O	S	0	1	0
			1399	902	222	268	7			

There are 2 discrepancies between the modelled and reference sequences:

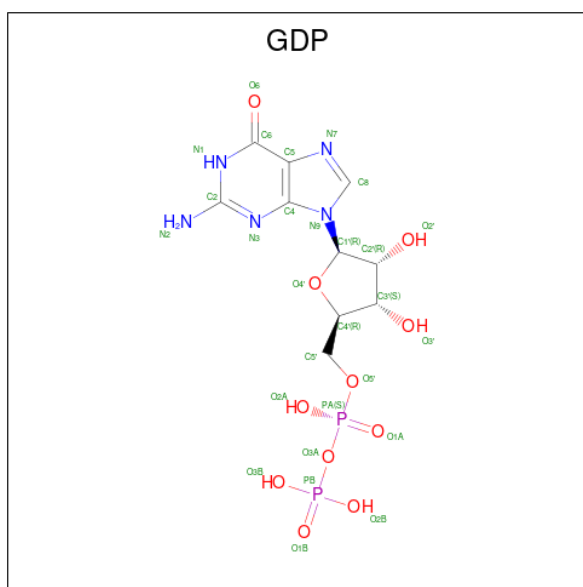
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	GLY	-	expression tag	UNP P60953
D	0	GLY	-	expression tag	UNP P60953

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0

- Molecule 4 is GUANOSINE-5'-DIPHOSPHATE (CCD ID: GDP) (formula: C₁₀H₁₅N₅O₁₁P₂).



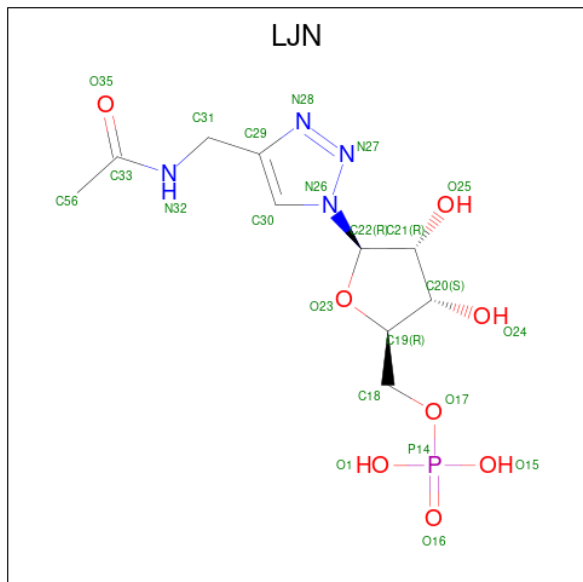
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf		
			Total	C	N	O			P	
4	C	1	Total	28	10	5	11	2	0	0
4	D	1	Total	28	10	5	11	2	0	0

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	C O		
5	C	1	Total	6 3 3	0	0
5	D	1	Total	6 3 3	0	0

- Molecule 6 is [(2 {R},3 {S},4 {R},5 {R})-5-[4-(acetamidomethyl)-1,2,3-triazol-1-yl]-3,4-bis(oxidanyl)oxolan-2-yl]methyl dihydrogen phosphate (CCD ID: LJJ) (formula: C₁₀H₁₇N₄O₈P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
6	C	1	44	20	8	14	2	0	1
6	D	1	44	20	8	14	2	0	1

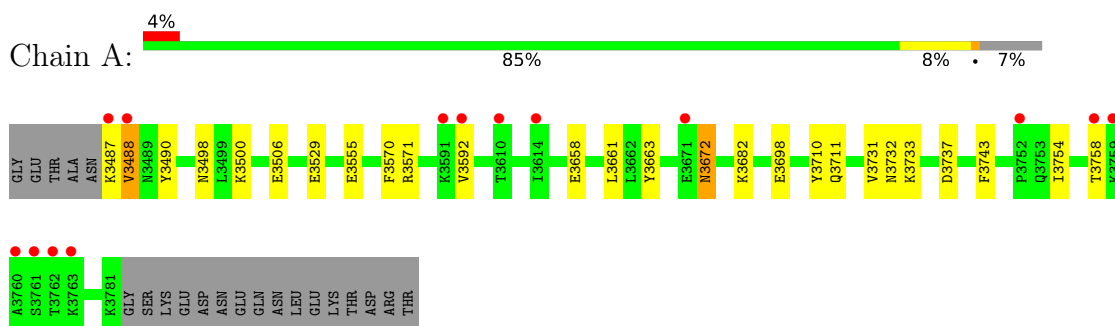
- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	32	Total	O	0	0
			32	32		
7	B	41	Total	O	0	0
			41	41		
7	C	19	Total	O	0	0
			19	19		
7	D	17	Total	O	0	0
			17	17		

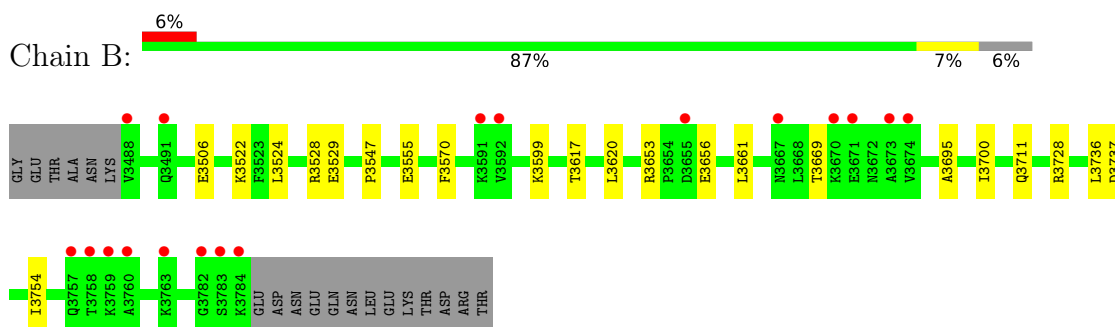
3 Residue-property plots [i](#)

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.

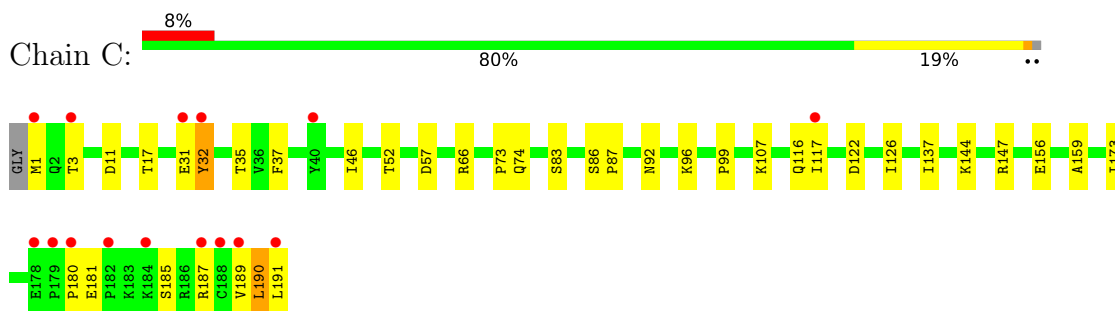
- Molecule 1: Protein adenylyltransferase and cysteine protease IbpA



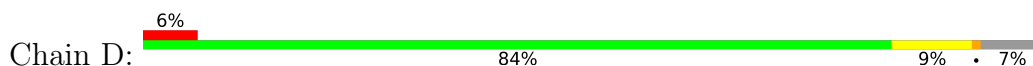
- Molecule 1: Protein adenylyltransferase and cysteine protease IbpA



- Molecule 2: Cell division control protein 42 homolog



- Molecule 2: Cell division control protein 42 homolog





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	92.24Å 102.21Å 129.27Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	80.20 – 2.49 80.18 – 2.49	Depositor EDS
% Data completeness (in resolution range)	72.9 (80.20-2.49) 72.9 (80.18-2.49)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.75 (at 2.48Å)	Xtrriage
Refinement program	PHENIX 1.16_3549	Depositor
R, R_{free}	0.190 , 0.239 (Not available) , 0.243	Depositor DCC
R_{free} test set	1504 reflections (4.75%)	wwPDB-VP
Wilson B-factor (Å ²)	44.8	Xtrriage
Anisotropy	0.037	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 54.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7816	wwPDB-VP
Average B, all atoms (Å ²)	52.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.66% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, LJM, SO4, GDP

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	0.19	0/2337	0.31	0/3158
1	B	0.19	0/2345	0.32	0/3169
2	C	0.25	0/1520	0.41	0/2071
2	D	0.25	0/1431	0.34	0/1951
All	All	0.21	0/7633	0.34	0/10349

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 [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2304	0	2307	17	0
1	B	2312	0	2309	17	0
2	C	1486	0	1494	23	0
2	D	1399	0	1403	14	0
3	A	20	0	0	0	0
3	B	20	0	0	1	0
3	C	5	0	0	0	0
3	D	5	0	0	0	0
4	C	28	0	12	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	28	0	12	3	0
5	C	6	0	8	0	0
5	D	6	0	8	1	0
6	C	44	0	0	2	0
6	D	44	0	0	0	0
7	A	32	0	0	0	0
7	B	41	0	0	1	0
7	C	19	0	0	1	0
7	D	17	0	0	0	0
All	All	7816	0	7553	64	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 4.

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)
1:B:3669:THR:HG23	2:C:35:THR:HG22	1.71	0.71
1:A:3490:TYR:O	1:A:3500:LYS:NZ	2.28	0.66
2:C:46:ILE:HG13	2:C:173:ILE:HG21	1.80	0.63
1:A:3506:GLU:HG3	1:A:3570:PHE:HB3	1.82	0.60
2:C:73:PRO:O	2:C:74:GLN:HG2	2.00	0.60
1:A:3672:ASN:O	1:A:3758:THR:N	2.28	0.59
2:D:36:VAL:HG21	5:D:202:GOL:H2	1.84	0.59
1:B:3555:GLU:OE1	2:C:66:ARG:NH1	2.35	0.59
1:B:3728:ARG:NH1	6:C:203[A]:LJN:O25	2.33	0.58
1:A:3498:ASN:ND2	1:A:3698:GLU:O	2.38	0.56
1:B:3754:ILE:HB	6:C:203[A]:LJN:O35	2.07	0.55
1:B:3599:LYS:NZ	1:B:3737:ASP:OD1	2.33	0.54
1:A:3663:TYR:CG	1:A:3682:LYS:HE3	2.43	0.54
2:C:144:LYS:HG2	2:C:147:ARG:HH22	1.72	0.54
1:A:3661:LEU:HD21	1:B:3529:GLU:HB2	1.90	0.53
1:A:3672:ASN:HD21	4:D:201:GDP:H4'	1.74	0.53
1:B:3599:LYS:HG2	1:B:3736:LEU:HD23	1.91	0.53
1:A:3711:GLN:HG3	1:A:3754:ILE:HG23	1.90	0.53
1:B:3711:GLN:HG3	1:B:3754:ILE:HG23	1.90	0.52
2:D:53:LEU:HD22	2:D:173:ILE:HD11	1.93	0.51
2:C:3:THR:HG22	2:C:52:THR:HB	1.92	0.50
2:C:117:ILE:HD11	2:C:156:GLU:HB3	1.93	0.50
1:A:3529:GLU:HB2	1:B:3661:LEU:HD21	1.93	0.50
1:A:3487:LYS:HE2	1:A:3571:ARG:HE	1.77	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:3506:GLU:HG3	1:B:3570:PHE:HB3	1.93	0.50
1:A:3733:LYS:NZ	1:A:3737:ASP:OD2	2.43	0.49
1:A:3555:GLU:OE1	2:D:66:ARG:NH1	2.46	0.48
2:C:144:LYS:HG2	2:C:147:ARG:NH2	2.27	0.48
2:C:32[A]:TYR:N	2:C:32[A]:TYR:CD2	2.82	0.48
2:D:87:PRO:HA	2:D:137:ILE:HD11	1.96	0.47
1:A:3658:GLU:HG3	1:B:3547:PRO:HA	1.97	0.47
2:C:11:ASP:OD2	2:C:92:ASN:ND2	2.36	0.47
1:A:3682:LYS:HD3	1:B:3522:LYS:HE2	1.96	0.47
1:B:3617:THR:HG22	1:B:3620:LEU:H	1.80	0.47
2:C:116:GLN:HG2	4:C:201:GDP:C5	2.50	0.47
1:B:3695:ALA:HA	1:B:3700:ILE:HD12	1.97	0.47
2:C:191:LEU:O	7:C:301:HOH:O	2.20	0.47
2:C:96:LYS:C	2:C:99:PRO:HD2	2.41	0.46
1:B:3653:ARG:HE	1:B:3656:GLU:CD	2.23	0.45
2:D:116:GLN:HG2	4:D:201:GDP:C5	2.51	0.45
2:D:44:VAL:HG22	2:D:46:ILE:H	1.80	0.45
3:B:3803:SO4:O3	7:B:3901:HOH:O	2.20	0.45
1:B:3524:LEU:O	1:B:3528:ARG:HG3	2.17	0.45
2:D:37:PHE:HB3	2:D:57:ASP:HB2	1.98	0.44
2:D:31:GLU:HG2	2:D:32[B]:TYR:H	1.80	0.44
2:D:8:VAL:HG22	2:D:79:LEU:HD12	1.99	0.44
2:D:116:GLN:HG2	4:D:201:GDP:C6	2.52	0.44
2:C:87:PRO:HA	2:C:137:ILE:HD11	2.00	0.43
2:C:185:SER:C	2:C:187:ARG:H	2.26	0.43
1:A:3710:TYR:HB2	1:A:3731:VAL:HG21	2.00	0.43
2:D:121:ASP:OD1	2:D:121:ASP:N	2.49	0.43
2:C:1:MET:HE1	2:D:43:THR:HG21	2.01	0.43
2:C:83:SER:HB3	2:C:86:SER:HB3	2.01	0.42
2:C:122:ASP:O	2:C:126:ILE:HG12	2.19	0.42
2:D:46:ILE:HD12	2:D:170:ASP:OD1	2.19	0.42
2:D:31:GLU:HG2	2:D:32[A]:TYR:H	1.82	0.42
1:B:3653:ARG:NE	1:B:3656:GLU:OE2	2.46	0.42
2:C:159:ALA:N	4:C:201:GDP:O6	2.52	0.42
1:A:3487:LYS:HG2	1:A:3488:VAL:H	1.85	0.41
2:C:17:THR:HG23	2:C:37:PHE:HB2	2.02	0.41
2:C:37:PHE:HB3	2:C:57:ASP:HB2	2.03	0.41
2:C:107:LYS:HE2	2:C:181:GLU:HG3	2.03	0.41
2:C:189:VAL:C	2:C:190:LEU:HD13	2.46	0.41
1:A:3732:ASN:OD1	1:A:3743:PHE:N	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	293/316 (93%)	290 (99%)	3 (1%)	0	100	100
1	B	295/316 (93%)	293 (99%)	2 (1%)	0	100	100
2	C	190/192 (99%)	181 (95%)	5 (3%)	4 (2%)	5	9
2	D	178/192 (93%)	175 (98%)	3 (2%)	0	100	100
All	All	956/1016 (94%)	939 (98%)	13 (1%)	4 (0%)	36	49

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	32[A]	TYR
2	C	32[B]	TYR
2	C	31	GLU
2	C	180	PRO

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	255/279 (91%)	252 (99%)	3 (1%)	63	83
1	B	255/279 (91%)	255 (100%)	0	100	100
2	C	168/171 (98%)	167 (99%)	1 (1%)	78	91
2	D	158/171 (92%)	156 (99%)	2 (1%)	61	82
All	All	836/900 (93%)	830 (99%)	6 (1%)	78	89

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	3488	VAL
1	A	3592	VAL
1	A	3672	ASN
2	C	190	LEU
2	D	32[A]	TYR
2	D	32[B]	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3623	GLN
1	A	3667	ASN
1	B	3667	ASN
1	B	3753	GLN
2	C	39	ASN
2	D	61	GLN
2	D	74	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

18 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	LJN	D	203[A]	1,2	20,23,24	4.13	10 (50%)	27,32,35	2.83	9 (33%)
5	GOL	C	202	-	5,5,5	0.79	0	5,5,5	1.21	1 (20%)
3	SO4	B	3804	-	4,4,4	0.24	0	6,6,6	0.14	0
3	SO4	A	3804	-	4,4,4	0.25	0	6,6,6	0.11	0
4	GDP	D	201	-	29,30,30	1.18	2 (6%)	45,47,47	1.73	7 (15%)
3	SO4	C	204	-	4,4,4	0.24	0	6,6,6	0.14	0
5	GOL	D	202	-	5,5,5	0.88	0	5,5,5	1.13	0
6	LJN	D	203[B]	1,2	20,23,24	4.10	10 (50%)	27,32,35	2.86	7 (25%)
3	SO4	A	3803	-	4,4,4	0.22	0	6,6,6	0.12	0
6	LJN	C	203[A]	1,2	20,23,24	4.06	10 (50%)	27,32,35	3.20	10 (37%)
3	SO4	B	3802	-	4,4,4	0.25	0	6,6,6	0.09	0
3	SO4	D	204	-	4,4,4	0.26	0	6,6,6	0.06	0
4	GDP	C	201	-	29,30,30	1.15	2 (6%)	45,47,47	1.75	5 (11%)
6	LJN	C	203[B]	1,2	20,23,24	4.06	11 (55%)	27,32,35	2.99	9 (33%)
3	SO4	A	3801	-	4,4,4	0.22	0	6,6,6	0.15	0
3	SO4	A	3802	-	4,4,4	0.24	0	6,6,6	0.09	0
3	SO4	B	3803	-	4,4,4	0.23	0	6,6,6	0.12	0
3	SO4	B	3801	-	4,4,4	0.24	0	6,6,6	0.14	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	LJN	D	203[A]	1,2	-	4/12/30/31	0/2/2/2
5	GOL	C	202	-	-	0/4/4/4	-
5	GOL	D	202	-	-	0/4/4/4	-
4	GDP	D	201	-	-	0/16/32/32	0/3/3/3
6	LJN	D	203[B]	1,2	-	1/12/30/31	0/2/2/2
6	LJN	C	203[A]	1,2	-	0/12/30/31	0/2/2/2
4	GDP	C	201	-	-	0/16/32/32	0/3/3/3
6	LJN	C	203[B]	1,2	-	5/12/30/31	0/2/2/2

All (45) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	203[A]	LJN	N28-N27	9.39	1.47	1.32
6	D	203[B]	LJN	N28-N27	9.38	1.47	1.32
6	C	203[B]	LJN	N28-N27	9.32	1.47	1.32
6	C	203[A]	LJN	N28-N27	9.19	1.47	1.32
6	D	203[A]	LJN	N26-N27	9.16	1.46	1.35
6	C	203[B]	LJN	N26-N27	9.05	1.46	1.35
6	D	203[B]	LJN	N26-N27	9.01	1.46	1.35
6	C	203[A]	LJN	N26-N27	8.87	1.46	1.35
6	D	203[A]	LJN	C30-C29	7.13	1.48	1.36
6	D	203[B]	LJN	C30-C29	7.09	1.48	1.36
6	C	203[A]	LJN	C30-C29	7.08	1.48	1.36
6	C	203[B]	LJN	C30-C29	6.95	1.47	1.36
6	D	203[A]	LJN	C33-N32	5.37	1.48	1.34
6	D	203[B]	LJN	C33-N32	5.33	1.48	1.34
6	C	203[B]	LJN	C33-N32	5.23	1.48	1.34
6	C	203[A]	LJN	C33-N32	5.16	1.48	1.34
6	D	203[A]	LJN	C30-N26	5.06	1.43	1.34
6	C	203[A]	LJN	C30-N26	4.96	1.43	1.34
6	D	203[B]	LJN	C30-N26	4.94	1.43	1.34
6	C	203[A]	LJN	C29-N28	4.86	1.44	1.36
6	C	203[B]	LJN	C30-N26	4.80	1.42	1.34
6	D	203[A]	LJN	C29-N28	4.78	1.44	1.36
6	D	203[B]	LJN	C29-N28	4.76	1.44	1.36
6	C	203[B]	LJN	C29-N28	4.73	1.44	1.36
6	D	203[A]	LJN	C31-C29	3.29	1.54	1.49
6	D	203[B]	LJN	C31-C29	3.28	1.54	1.49
4	C	201	GDP	C5-C4	3.25	1.47	1.38
4	D	201	GDP	C5-C4	3.20	1.47	1.38
6	C	203[A]	LJN	C31-C29	3.07	1.54	1.49
6	C	203[B]	LJN	C31-C29	2.88	1.54	1.49
6	C	203[A]	LJN	O35-C33	-2.44	1.17	1.23
4	C	201	GDP	C6-N1	-2.40	1.34	1.38
4	D	201	GDP	C6-N1	-2.39	1.34	1.38
6	C	203[A]	LJN	C22-N26	-2.34	1.42	1.46
6	C	203[B]	LJN	C56-C33	2.17	1.55	1.50
6	C	203[B]	LJN	P14-O17	2.16	1.69	1.62
6	D	203[B]	LJN	C56-C33	2.11	1.54	1.50
6	C	203[B]	LJN	C22-N26	-2.11	1.42	1.46
6	D	203[A]	LJN	C56-C33	2.09	1.54	1.50
6	D	203[A]	LJN	C31-N32	2.09	1.50	1.45
6	D	203[B]	LJN	C22-N26	-2.08	1.42	1.46
6	D	203[B]	LJN	C31-N32	2.04	1.50	1.45
6	C	203[A]	LJN	C31-N32	2.03	1.50	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	D	203[A]	LJN	C22-N26	-2.01	1.43	1.46
6	C	203[B]	LJN	O35-C33	-2.01	1.18	1.23

All (48) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	C	203[B]	LJN	C30-C29-N28	7.58	117.34	108.12
6	C	203[A]	LJN	C29-C30-N26	-7.46	97.86	105.13
6	C	203[B]	LJN	C29-C30-N26	-7.32	98.00	105.13
6	C	203[A]	LJN	C30-C29-N28	7.31	117.00	108.12
6	D	203[B]	LJN	C30-C29-N28	7.17	116.84	108.12
6	D	203[B]	LJN	C29-C30-N26	-7.13	98.19	105.13
6	D	203[A]	LJN	C30-C29-N28	7.09	116.74	108.12
6	D	203[A]	LJN	C29-C30-N26	-6.96	98.35	105.13
6	C	203[A]	LJN	C30-N26-N27	6.00	116.28	110.63
4	C	201	GDP	C5-C4-N3	-5.96	118.91	128.39
4	D	201	GDP	C5-C4-N3	-5.89	119.02	128.39
6	D	203[B]	LJN	C30-N26-N27	5.74	116.03	110.63
6	C	203[B]	LJN	C30-N26-N27	5.65	115.94	110.63
6	C	203[B]	LJN	C29-N28-N27	-5.58	102.98	109.01
6	D	203[A]	LJN	C30-N26-N27	5.51	115.81	110.63
6	C	203[A]	LJN	C29-N28-N27	-5.20	103.39	109.01
4	C	201	GDP	C2-N3-C4	5.12	121.11	112.30
6	D	203[B]	LJN	C29-N28-N27	-5.11	103.49	109.01
4	D	201	GDP	C2-N3-C4	5.04	120.98	112.30
6	D	203[A]	LJN	C29-N28-N27	-5.03	103.58	109.01
6	C	203[B]	LJN	C31-C29-C30	-5.01	120.77	130.03
6	C	203[A]	LJN	C56-C33-N32	4.94	124.55	116.12
6	C	203[A]	LJN	C21-C22-N26	-4.67	106.78	112.14
4	D	201	GDP	N9-C4-N3	4.40	134.75	125.95
6	D	203[B]	LJN	C31-C29-C30	-4.27	122.12	130.03
6	D	203[A]	LJN	C31-C29-C30	-4.25	122.17	130.03
6	C	203[A]	LJN	C31-C29-C30	-4.22	122.23	130.03
4	C	201	GDP	N9-C4-N3	4.11	134.17	125.95
4	C	201	GDP	C6-C5-N7	3.80	137.21	130.29
4	D	201	GDP	C6-C5-N7	3.52	136.69	130.29
6	D	203[B]	LJN	C22-N26-C30	-3.42	122.05	128.40
6	C	203[B]	LJN	C22-N26-C30	-3.31	122.24	128.40
6	D	203[A]	LJN	C22-N26-C30	-3.31	122.25	128.40
4	C	201	GDP	C4-C5-N7	-2.96	105.97	110.67
6	D	203[B]	LJN	C56-C33-N32	2.86	121.00	116.12
6	C	203[A]	LJN	C22-N26-C30	-2.84	123.12	128.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	D	203[A]	LJN	C56-C33-N32	2.75	120.82	116.12
6	C	203[A]	LJN	O35-C33-C56	-2.74	117.18	122.05
4	D	201	GDP	C4-C5-N7	-2.56	106.61	110.67
6	D	203[A]	LJN	C20-C21-C22	2.41	106.02	101.46
6	C	203[B]	LJN	C29-C31-N32	-2.38	106.92	112.34
6	C	203[B]	LJN	C56-C33-N32	2.30	120.05	116.12
4	D	201	GDP	O6-C6-C5	-2.26	120.56	126.53
6	D	203[A]	LJN	C21-C20-C19	2.26	106.97	102.61
6	C	203[B]	LJN	O23-C22-N26	2.22	111.97	109.10
5	C	202	GOL	C3-C2-C1	-2.18	103.81	111.80
6	C	203[A]	LJN	O23-C22-N26	2.05	111.75	109.10
4	D	201	GDP	C5-C6-N1	2.03	118.41	113.25

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	D	203[A]	LJN	C21-C22-N26-N27
6	D	203[A]	LJN	O17-C18-C19-C20
6	C	203[B]	LJN	C56-C33-N32-C31
6	C	203[B]	LJN	O35-C33-N32-C31
6	C	203[B]	LJN	O17-C18-C19-C20
6	D	203[A]	LJN	O17-C18-C19-O23
6	C	203[B]	LJN	C19-C18-O17-P14
6	D	203[A]	LJN	C19-C18-O17-P14
6	C	203[B]	LJN	O17-C18-C19-O23
6	D	203[B]	LJN	O17-C18-C19-O23

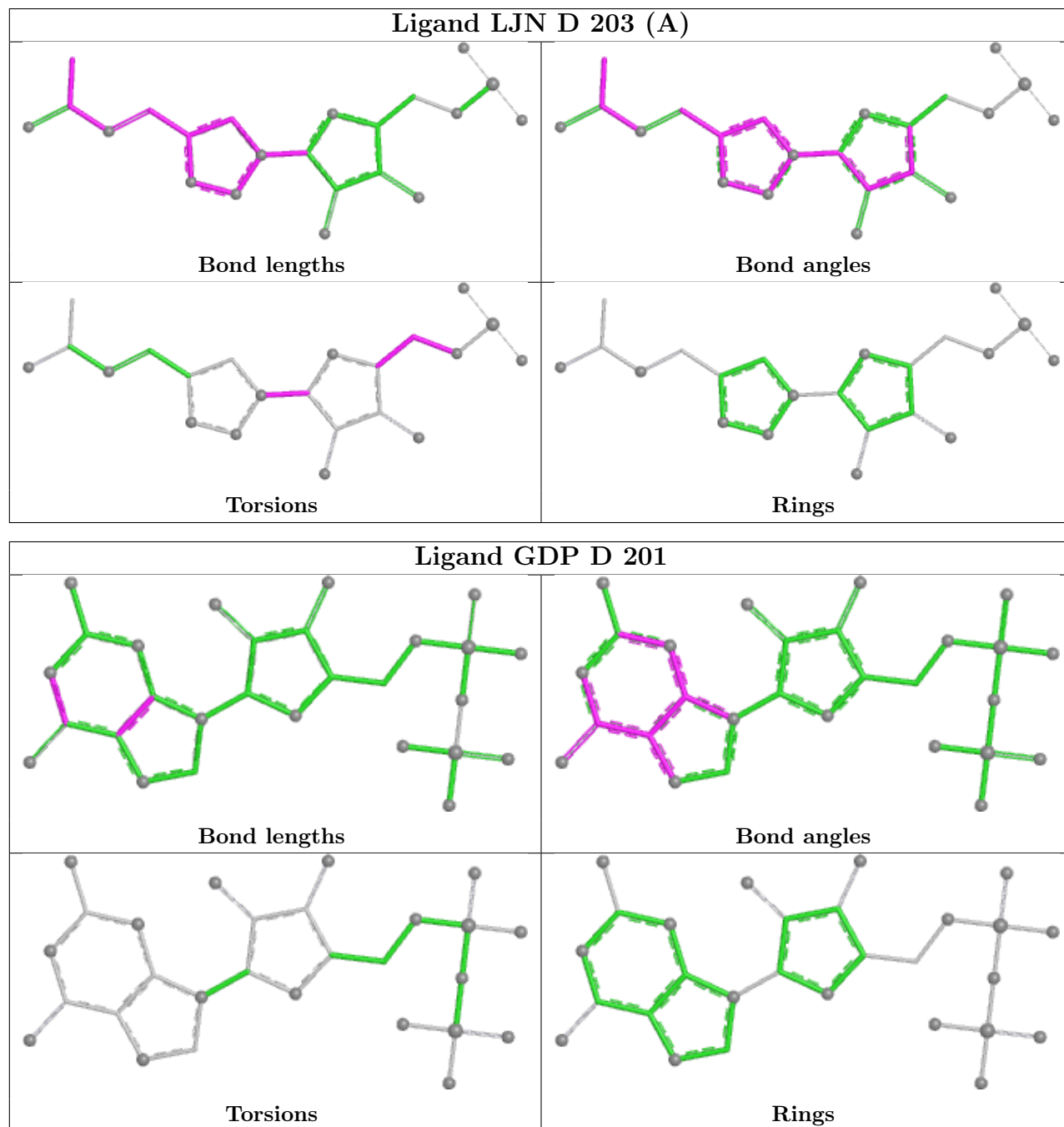
There are no ring outliers.

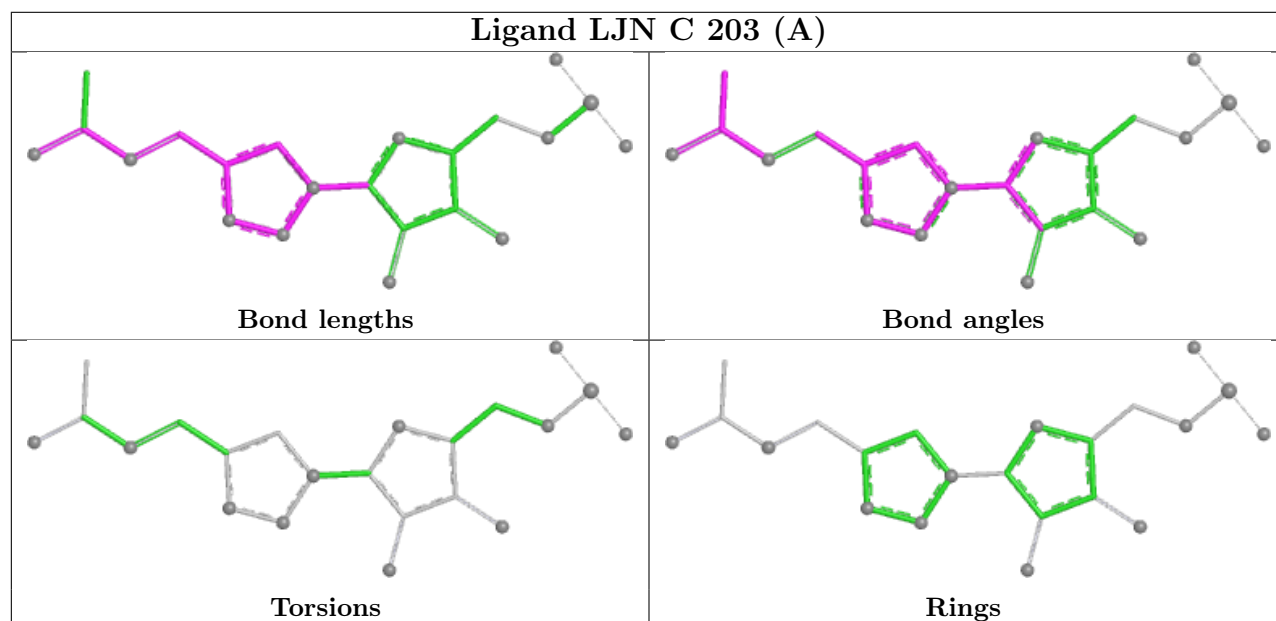
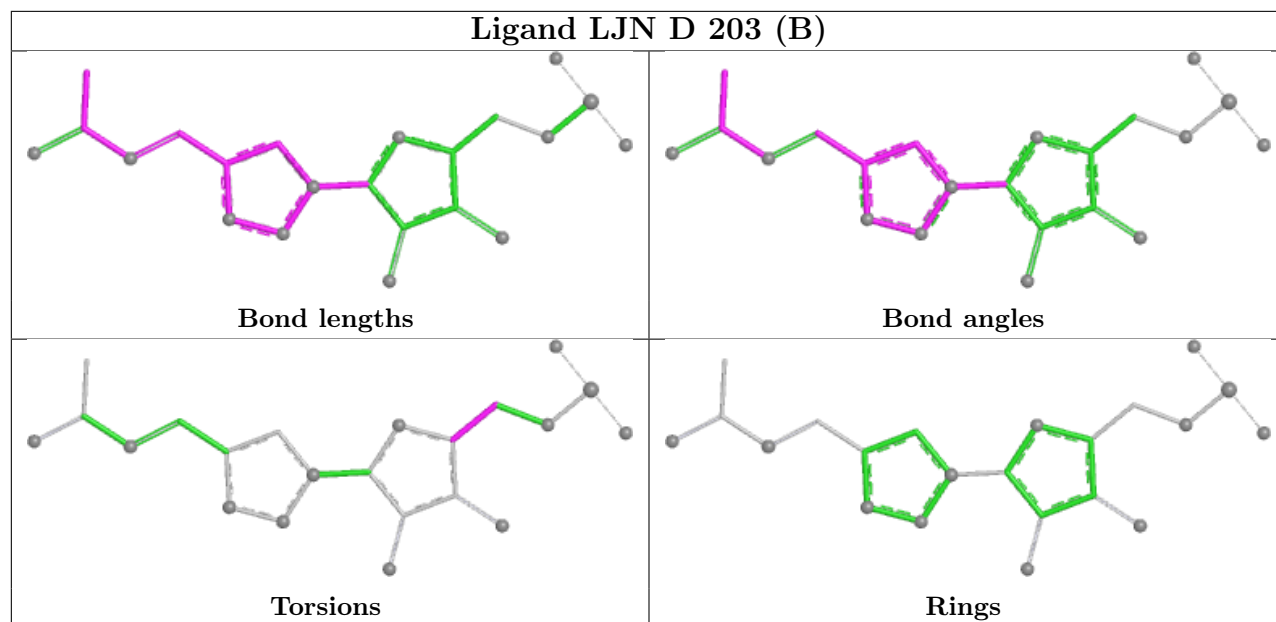
5 monomers are involved in 9 short contacts:

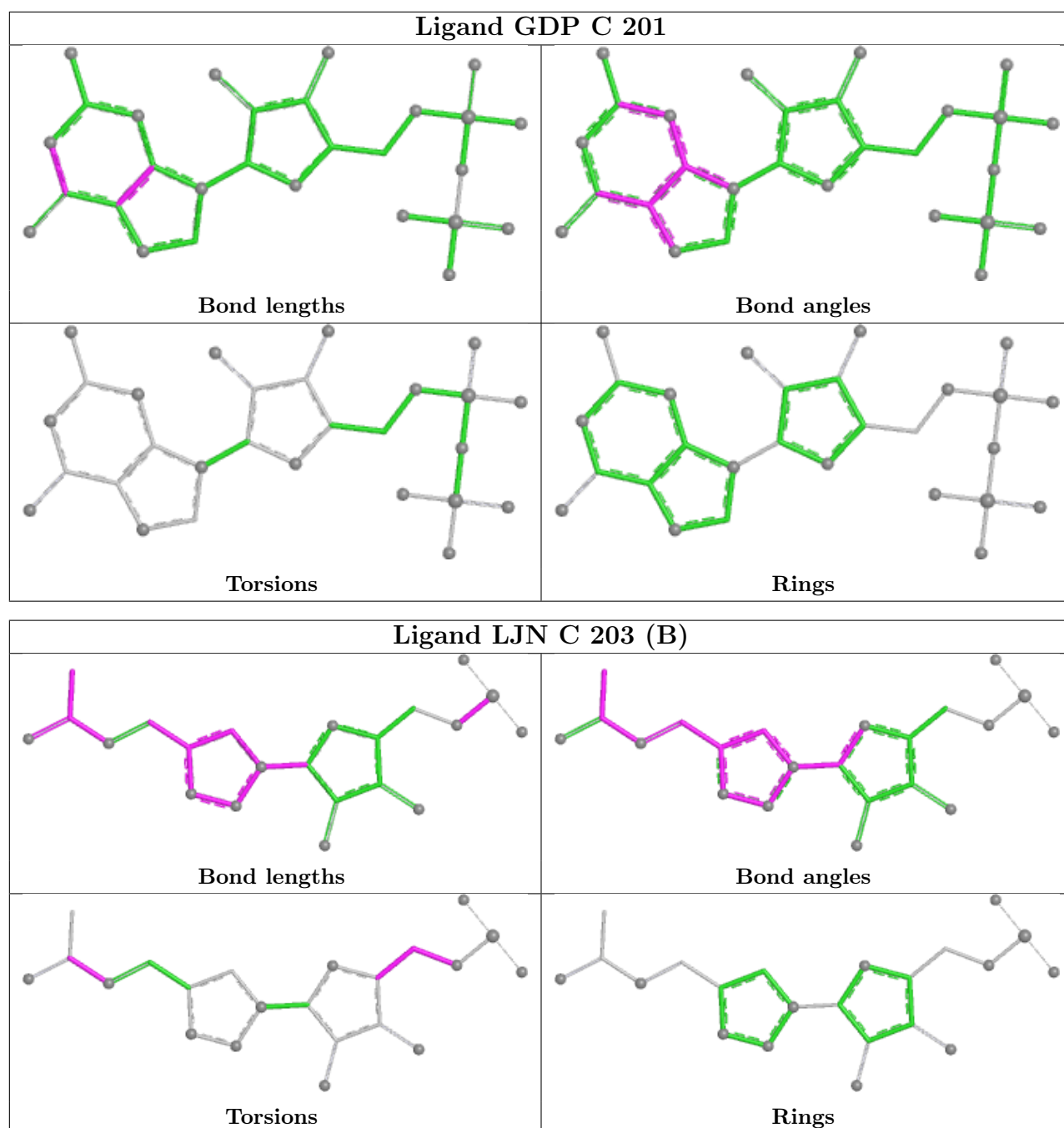
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	201	GDP	3	0
5	D	202	GOL	1	0
6	C	203[A]	LJN	2	0
4	C	201	GDP	2	0
3	B	3803	SO4	1	0

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

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	295/316 (93%)	0.17	14 (4%) 36 32	24, 51, 99, 137	0
1	B	297/316 (93%)	-0.02	18 (6%) 27 23	21, 42, 88, 115	0
2	C	191/192 (99%)	0.39	15 (7%) 18 16	29, 52, 82, 171	1 (0%)
2	D	179/192 (93%)	0.29	12 (6%) 24 21	28, 51, 92, 141	1 (0%)
All	All	962/1016 (94%)	0.18	59 (6%) 27 23	21, 49, 92, 171	2 (0%)

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	187	ARG	5.4
2	C	188	CYS	5.0
2	C	178	GLU	4.9
2	C	179	PRO	4.9
2	D	46	ILE	4.4
2	C	182	PRO	4.3
2	D	49	GLU	4.3
2	C	32[A]	TYR	4.3
1	A	3759	LYS	4.0
1	A	3760	ALA	4.0
2	C	180	PRO	3.9
1	B	3488	VAL	3.7
2	C	191	LEU	3.7
2	D	45	MET	3.7
1	A	3762	THR	3.6
1	B	3671	GLU	3.6
1	A	3592	VAL	3.6
2	C	189	VAL	3.5
1	B	3763	LYS	3.4
1	B	3670	LYS	3.4
1	A	3488	VAL	3.3

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Mol	Chain	Res	Type	RSRZ
2	D	1	MET	3.2
1	A	3758	THR	3.1
1	B	3655	ASP	3.1
2	D	32[A]	TYR	3.1
1	B	3758	THR	2.9
2	D	48	GLY	2.9
2	D	40	TYR	2.9
2	C	40	TYR	2.8
2	C	184	LYS	2.8
1	B	3783	SER	2.6
1	A	3761	SER	2.5
1	B	3673	ALA	2.5
1	B	3592	VAL	2.5
2	D	47	GLY	2.5
1	A	3487	LYS	2.4
1	A	3591	LYS	2.4
1	B	3674	VAL	2.4
1	B	3784	LYS	2.4
1	B	3782	GLY	2.4
1	B	3760	ALA	2.3
2	D	117	ILE	2.3
2	D	179	PRO	2.3
1	B	3757	GLN	2.3
1	A	3763	LYS	2.3
1	B	3667	ASN	2.2
2	C	1	MET	2.2
1	A	3610	THR	2.2
1	A	3614	ILE	2.2
1	A	3752	PRO	2.2
2	D	50	PRO	2.2
2	D	147	ARG	2.2
1	B	3759	LYS	2.2
1	A	3671	GLU	2.1
2	C	31	GLU	2.1
2	C	3	THR	2.1
2	C	117	ILE	2.1
1	B	3491	GLN	2.0
1	B	3591	LYS	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

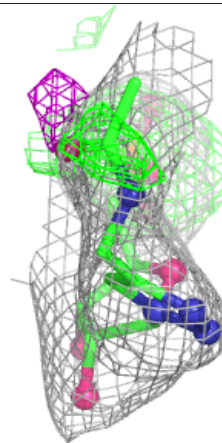
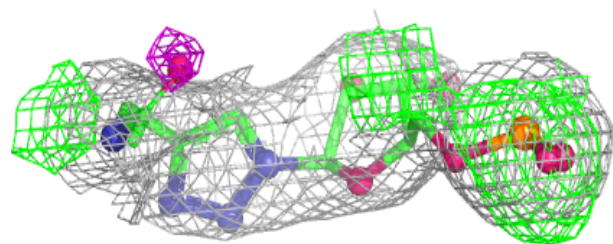
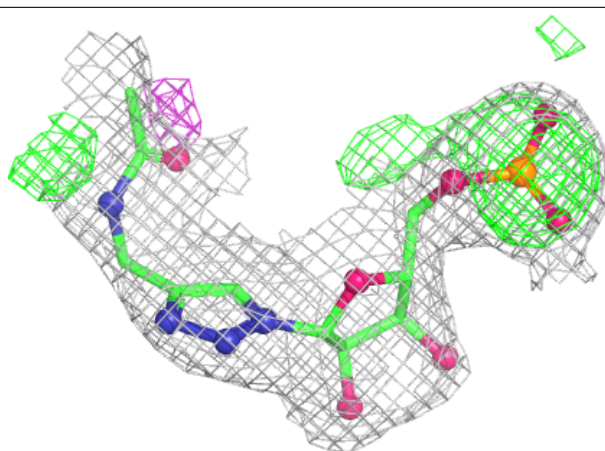
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	SO4	A	3804	5/5	0.64	0.14	91,94,108,110	0
3	SO4	A	3803	5/5	0.71	0.12	98,101,112,116	0
3	SO4	B	3803	5/5	0.74	0.14	93,97,101,105	0
3	SO4	C	204	5/5	0.80	0.12	111,112,117,120	0
3	SO4	D	204	5/5	0.80	0.12	91,93,101,108	0
6	LJN	D	203[A]	22/23	0.82	0.20	41,61,67,68	22
6	LJN	D	203[B]	22/23	0.82	0.20	56,62,68,69	22
3	SO4	B	3804	5/5	0.83	0.11	86,91,95,96	0
3	SO4	B	3802	5/5	0.84	0.10	75,87,90,92	0
6	LJN	C	203[A]	22/23	0.89	0.17	43,58,67,69	22
6	LJN	C	203[B]	22/23	0.89	0.17	43,58,68,69	22
5	GOL	C	202	6/6	0.90	0.10	34,39,40,53	0
3	SO4	A	3802	5/5	0.91	0.12	79,81,84,88	0
5	GOL	D	202	6/6	0.94	0.11	38,48,54,58	0
3	SO4	A	3801	5/5	0.96	0.07	55,56,61,62	0
4	GDP	C	201	28/28	0.97	0.07	28,44,61,64	0
4	GDP	D	201	28/28	0.97	0.06	27,43,51,53	0
3	SO4	B	3801	5/5	0.98	0.05	41,50,55,56	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.

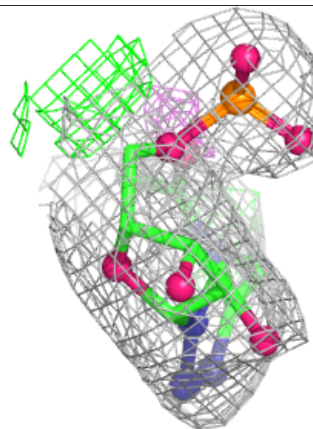
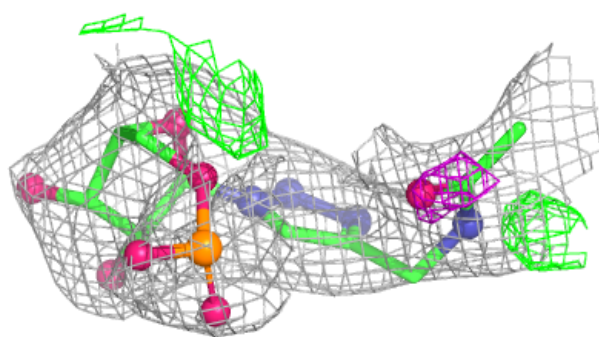
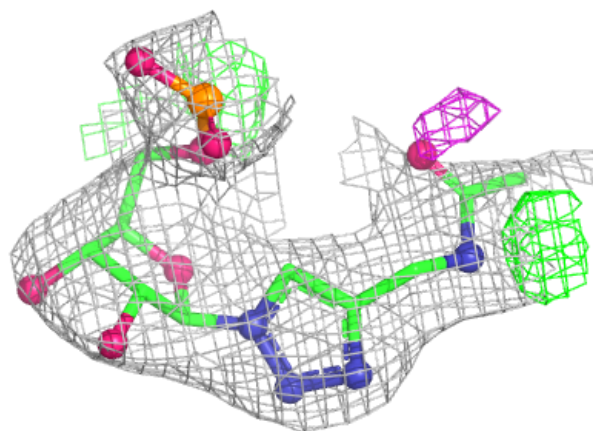
Electron density around LJJ D 203 (A):

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



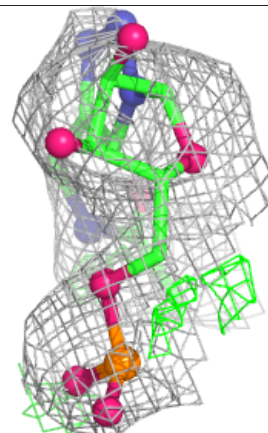
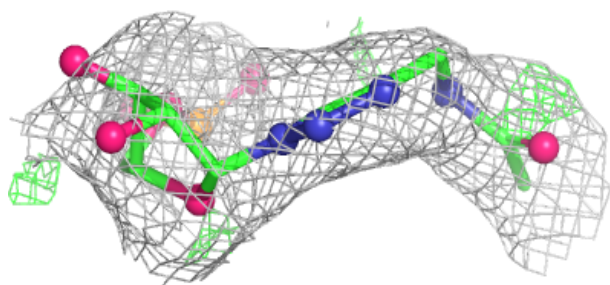
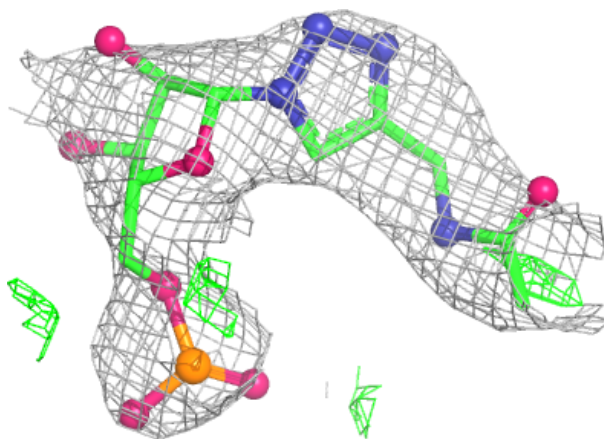
Electron density around LJJ D 203 (B):

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

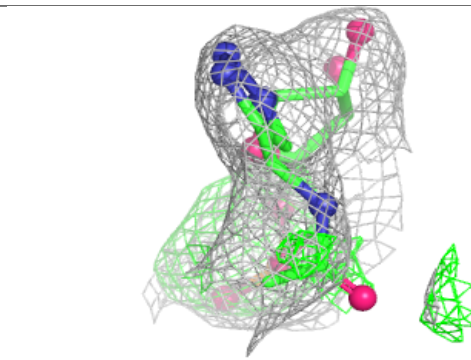
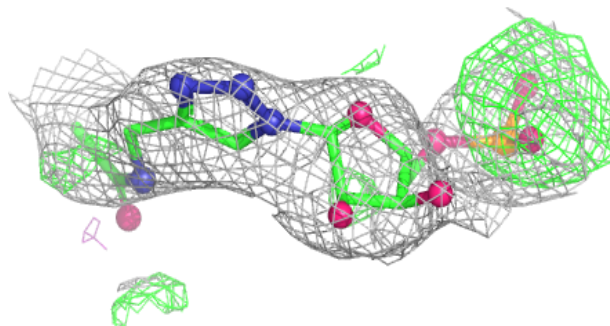
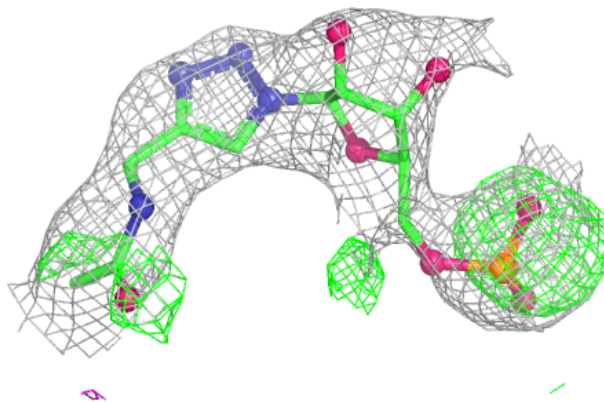


Electron density around LJM C 203 (A):

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

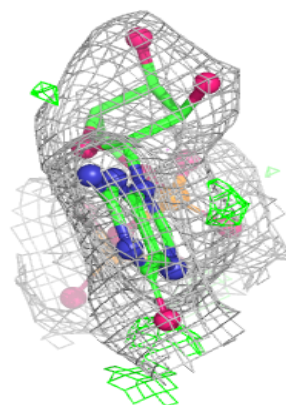
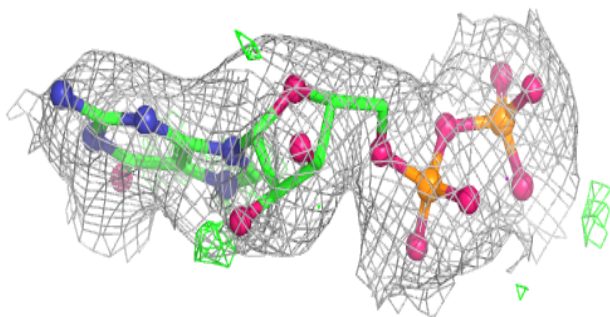
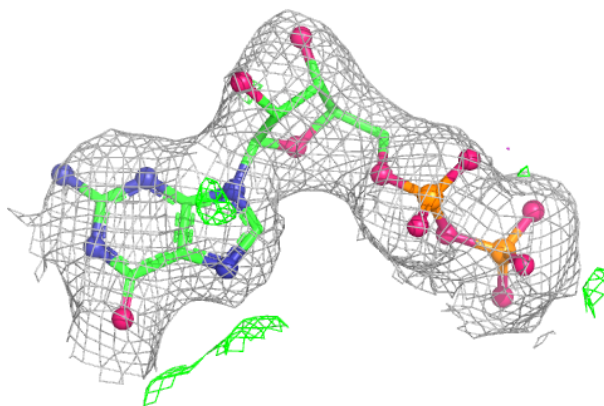
**Electron density around LJM C 203 (B):**

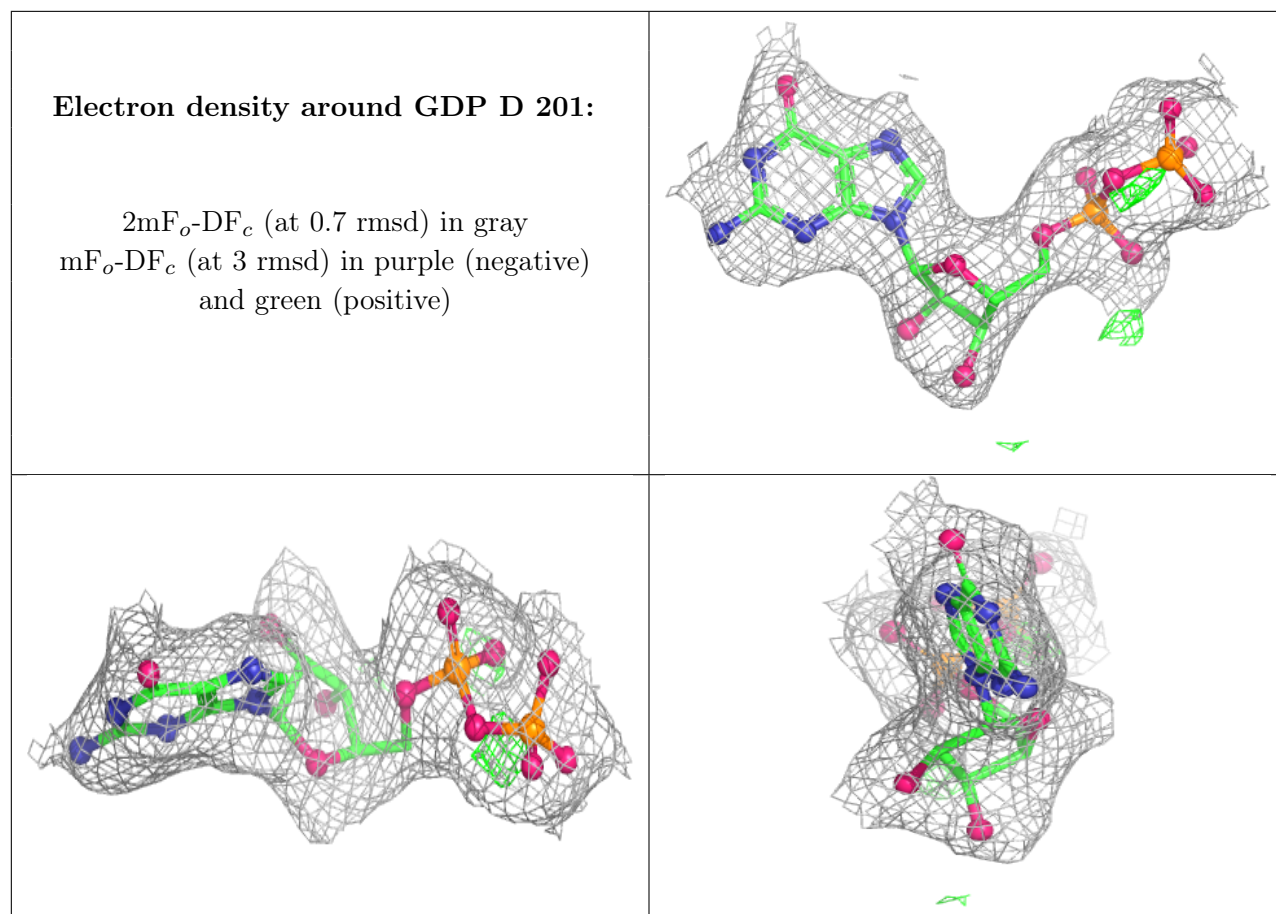
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around GDP C 201:

$2mF_o-DF_c$ (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.