



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 01:42 PM UTC

PDB ID : 5X1W / pdb_00005x1w
Title : PKM2 in complex with compound 5
Authors : Matsui, Y.; Hanzawa, H.
Deposited on : 2017-01-27
Resolution : 3.00 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)
Xtriage (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

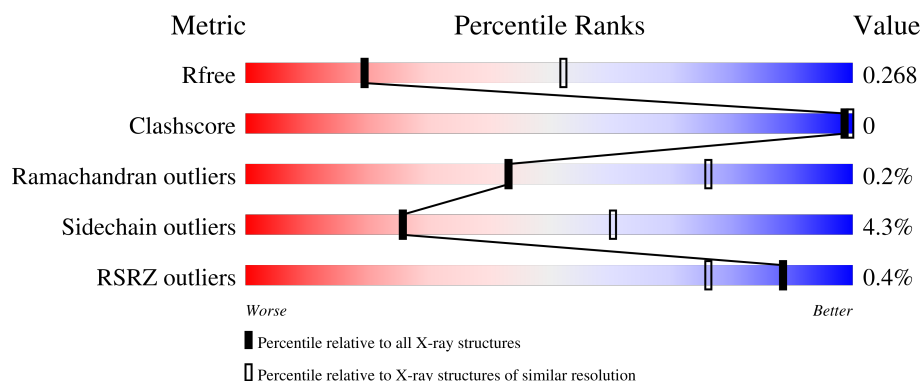
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	550	
1	B	550	
1	C	550	
1	D	550	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 15907 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 Pyruvate kinase PKM.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	518	Total	C	N	O	S	0	0	0
			3965	2492	704	744	25			
1	B	501	Total	C	N	O	S	0	0	0
			3836	2416	684	713	23			
1	C	518	Total	C	N	O	S	0	0	0
			3965	2492	704	744	25			
1	D	511	Total	C	N	O	S	0	0	0
			3919	2463	696	735	25			

There are 76 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-18	MET	-	expression tag	UNP P14618
A	-17	GLY	-	expression tag	UNP P14618
A	-16	SER	-	expression tag	UNP P14618
A	-15	SER	-	expression tag	UNP P14618
A	-14	HIS	-	expression tag	UNP P14618
A	-13	HIS	-	expression tag	UNP P14618
A	-12	HIS	-	expression tag	UNP P14618
A	-11	HIS	-	expression tag	UNP P14618
A	-10	HIS	-	expression tag	UNP P14618
A	-9	HIS	-	expression tag	UNP P14618
A	-8	SER	-	expression tag	UNP P14618
A	-7	SER	-	expression tag	UNP P14618
A	-6	GLY	-	expression tag	UNP P14618
A	-5	LEU	-	expression tag	UNP P14618
A	-4	VAL	-	expression tag	UNP P14618
A	-3	PRO	-	expression tag	UNP P14618
A	-2	ARG	-	expression tag	UNP P14618
A	-1	GLY	-	expression tag	UNP P14618
A	0	SER	-	expression tag	UNP P14618
B	-18	MET	-	expression tag	UNP P14618
B	-17	GLY	-	expression tag	UNP P14618

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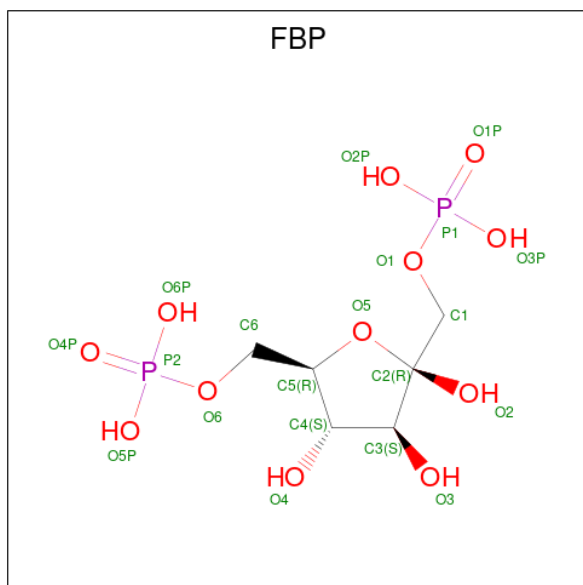
Chain	Residue	Modelled	Actual	Comment	Reference
B	-16	SER	-	expression tag	UNP P14618
B	-15	SER	-	expression tag	UNP P14618
B	-14	HIS	-	expression tag	UNP P14618
B	-13	HIS	-	expression tag	UNP P14618
B	-12	HIS	-	expression tag	UNP P14618
B	-11	HIS	-	expression tag	UNP P14618
B	-10	HIS	-	expression tag	UNP P14618
B	-9	HIS	-	expression tag	UNP P14618
B	-8	SER	-	expression tag	UNP P14618
B	-7	SER	-	expression tag	UNP P14618
B	-6	GLY	-	expression tag	UNP P14618
B	-5	LEU	-	expression tag	UNP P14618
B	-4	VAL	-	expression tag	UNP P14618
B	-3	PRO	-	expression tag	UNP P14618
B	-2	ARG	-	expression tag	UNP P14618
B	-1	GLY	-	expression tag	UNP P14618
B	0	SER	-	expression tag	UNP P14618
C	-18	MET	-	expression tag	UNP P14618
C	-17	GLY	-	expression tag	UNP P14618
C	-16	SER	-	expression tag	UNP P14618
C	-15	SER	-	expression tag	UNP P14618
C	-14	HIS	-	expression tag	UNP P14618
C	-13	HIS	-	expression tag	UNP P14618
C	-12	HIS	-	expression tag	UNP P14618
C	-11	HIS	-	expression tag	UNP P14618
C	-10	HIS	-	expression tag	UNP P14618
C	-9	HIS	-	expression tag	UNP P14618
C	-8	SER	-	expression tag	UNP P14618
C	-7	SER	-	expression tag	UNP P14618
C	-6	GLY	-	expression tag	UNP P14618
C	-5	LEU	-	expression tag	UNP P14618
C	-4	VAL	-	expression tag	UNP P14618
C	-3	PRO	-	expression tag	UNP P14618
C	-2	ARG	-	expression tag	UNP P14618
C	-1	GLY	-	expression tag	UNP P14618
C	0	SER	-	expression tag	UNP P14618
D	-18	MET	-	expression tag	UNP P14618
D	-17	GLY	-	expression tag	UNP P14618
D	-16	SER	-	expression tag	UNP P14618
D	-15	SER	-	expression tag	UNP P14618
D	-14	HIS	-	expression tag	UNP P14618
D	-13	HIS	-	expression tag	UNP P14618

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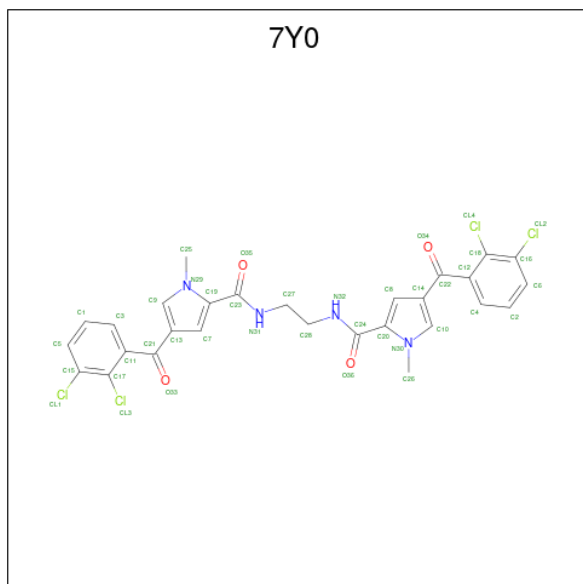
Chain	Residue	Modelled	Actual	Comment	Reference
D	-12	HIS	-	expression tag	UNP P14618
D	-11	HIS	-	expression tag	UNP P14618
D	-10	HIS	-	expression tag	UNP P14618
D	-9	HIS	-	expression tag	UNP P14618
D	-8	SER	-	expression tag	UNP P14618
D	-7	SER	-	expression tag	UNP P14618
D	-6	GLY	-	expression tag	UNP P14618
D	-5	LEU	-	expression tag	UNP P14618
D	-4	VAL	-	expression tag	UNP P14618
D	-3	PRO	-	expression tag	UNP P14618
D	-2	ARG	-	expression tag	UNP P14618
D	-1	GLY	-	expression tag	UNP P14618
D	0	SER	-	expression tag	UNP P14618

- Molecule 2 is 1,6-di-O-phosphono-beta-D-fructofuranose (CCD ID: FBP) (formula: $C_6H_{14}O_{12}P_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O	P	0	0
			20	6	12	2		
2	B	1	Total	C	O	P	0	0
			20	6	12	2		
2	C	1	Total	C	O	P	0	0
			20	6	12	2		
2	D	1	Total	C	O	P	0	0
			20	6	12	2		

- Molecule 3 is 4-[2,3-bis(chloranyl)phenyl]carbonyl-N-[2-[[4-[2,3-bis(chloranyl)phenyl]carbonyl-1-methyl-pyrrol-2-yl]carbonylamino]ethyl]-1-methyl-pyrrole-2-carboxamide (CCD ID: 7Y0) (formula: C₂₈H₂₂Cl₄N₄O₄).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	B	1	Total	C	Cl	N	O	0	0
			40	28	4	4	4		
3	C	1	Total	C	Cl	N	O	0	0
			40	28	4	4	4		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	16	Total	O	0	0
			16	16		
4	B	18	Total	O	0	0
			18	18		
4	C	12	Total	O	0	0
			12	12		
4	D	16	Total	O	0	0
			16	16		



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	80.82Å 153.49Å 94.21Å 90.00° 103.52° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00 20.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	92.6 (20.00-3.00) 92.3 (20.00-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.11	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.26 (at 3.00Å)	Xtriage
Refinement program	REFMAC 5.7.0029	Depositor
R, R_{free}	0.237 , 0.290 0.215 , 0.268	Depositor DCC
R_{free} test set	4099 reflections (0.60%)	wwPDB-VP
Wilson B-factor (Å ²)	40.7	Xtriage
Anisotropy	0.375	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 27.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	15907	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.51% 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: FBP, 7Y0

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	0.67	0/4029	1.15	4/5441 (0.1%)
1	B	0.66	0/3897	1.14	6/5262 (0.1%)
1	C	0.67	0/4029	1.13	4/5441 (0.1%)
1	D	0.67	0/3982	1.15	8/5377 (0.1%)
All	All	0.67	0/15937	1.14	22/21521 (0.1%)

There are no bond length outliers.

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	52	GLY	CA-C-N	6.74	126.70	119.28
1	D	52	GLY	C-N-CA	6.74	126.70	119.28
1	D	44	ASN	N-CA-C	6.18	118.09	111.36
1	C	16	GLN	N-CA-C	5.76	119.89	112.86
1	A	332	GLU	N-CA-C	5.75	117.54	111.28
1	A	44	ASN	N-CA-C	5.71	119.42	112.23
1	B	436	ARG	N-CA-C	5.36	117.81	111.33
1	C	52	GLY	CA-C-N	5.32	125.13	119.28
1	C	52	GLY	C-N-CA	5.32	125.13	119.28
1	D	332	GLU	N-CA-C	5.31	117.07	111.28
1	A	52	GLY	CA-C-N	5.24	124.87	119.05
1	A	52	GLY	C-N-CA	5.24	124.87	119.05
1	D	442	ALA	N-CA-C	5.17	116.91	111.28
1	D	31	CYS	N-CA-C	5.16	116.91	111.28
1	D	294	ARG	N-CA-C	5.12	117.76	111.82
1	B	363	GLY	CA-C-N	5.09	127.35	120.38
1	B	363	GLY	C-N-CA	5.09	127.35	120.38
1	C	442	ALA	N-CA-C	5.06	118.23	111.75
1	B	435	GLY	CA-C-N	5.06	127.31	120.38
1	B	435	GLY	C-N-CA	5.06	127.31	120.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	332	GLU	N-CA-C	5.04	117.42	111.33
1	D	404	ILE	CB-CA-C	5.01	117.11	111.80

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	3965	0	4049	4	0
1	B	3836	0	3932	2	0
1	C	3965	0	4049	7	0
1	D	3919	0	3995	4	0
2	A	20	0	10	0	0
2	B	20	0	10	0	0
2	C	20	0	10	0	0
2	D	20	0	10	0	0
3	B	40	0	0	0	0
3	C	40	0	0	0	0
4	A	16	0	0	0	0
4	B	18	0	0	0	0
4	C	12	0	0	0	0
4	D	16	0	0	0	0
All	All	15907	0	16065	16	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 0.

All (16) 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:175:TYR:HB3	1:B:179:GLY:HA2	1.90	0.54
1:B:328:THR:HG22	1:B:329:GLN:HG3	1.96	0.48
1:C:328:THR:HG22	1:C:329:GLN:HG3	1.95	0.48
1:A:157:LEU:HD13	1:A:203:LEU:HD21	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:40:ILE:HD12	1:C:42:ALA:HB3	1.96	0.46
1:C:246:ARG:HG2	1:C:273:ASN:HD21	1.81	0.45
1:D:157:LEU:HD13	1:D:203:LEU:HD21	1.99	0.44
1:D:50:THR:OG1	1:D:73:ARG:NH1	2.46	0.44
1:D:134:LEU:HD21	1:D:140:LEU:HD13	1.99	0.43
1:C:48:ILE:HB	1:C:360:MET:HG3	2.00	0.42
1:D:409:THR:HG22	1:D:522:THR:HB	2.01	0.42
1:C:482:TRP:CD1	1:C:517:PRO:HG3	2.55	0.42
1:A:48:ILE:HB	1:A:360:MET:HG3	2.03	0.41
1:A:392:LEU:HD21	1:C:400:ARG:HE	1.85	0.41
1:A:346:SER:O	1:A:350:ASN:ND2	2.54	0.40
1:C:268:ILE:HG21	1:C:325:ILE:HD12	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	516/550 (94%)	500 (97%)	15 (3%)	1 (0%)	43	76
1	B	495/550 (90%)	482 (97%)	12 (2%)	1 (0%)	43	76
1	C	516/550 (94%)	502 (97%)	13 (2%)	1 (0%)	43	76
1	D	507/550 (92%)	490 (97%)	16 (3%)	1 (0%)	43	76
All	All	2034/2200 (92%)	1974 (97%)	56 (3%)	4 (0%)	43	76

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	328	THR
1	A	328	THR
1	C	328	THR

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Mol	Chain	Res	Type
1	D	328	THR

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	426/452 (94%)	403 (95%)	23 (5%)	20	53
1	B	412/452 (91%)	394 (96%)	18 (4%)	25	60
1	C	426/452 (94%)	411 (96%)	15 (4%)	32	65
1	D	421/452 (93%)	404 (96%)	17 (4%)	28	62
All	All	1685/1808 (93%)	1612 (96%)	73 (4%)	26	60

All (73) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	ILE
1	A	41	THR
1	A	64	MET
1	A	120	ARG
1	A	136	LYS
1	A	153	ASP
1	A	156	ILE
1	A	164	ILE
1	A	169	GLU
1	A	170	VAL
1	A	186	LYS
1	A	188	LYS
1	A	223	GLU
1	A	273	ASN
1	A	285	GLU
1	A	323	PRO
1	A	346	SER
1	A	392	LEU
1	A	401	LEU
1	A	412	THR

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Mol	Chain	Res	Type
1	A	500	ARG
1	A	508	VAL
1	A	513	THR
1	B	74	LEU
1	B	134	LEU
1	B	136	LYS
1	B	164	ILE
1	B	185	VAL
1	B	191	ASP
1	B	194	VAL
1	B	195	THR
1	B	260	GLU
1	B	285	GLU
1	B	328	THR
1	B	353	LEU
1	B	399	ARG
1	B	409	THR
1	B	414	VAL
1	B	454	THR
1	B	504	LYS
1	B	513	THR
1	C	14	GLN
1	C	74	LEU
1	C	106	ARG
1	C	135	LYS
1	C	162	LYS
1	C	168	VAL
1	C	260	GLU
1	C	261	LYS
1	C	328	THR
1	C	367	LYS
1	C	405	THR
1	C	436	ARG
1	C	458	GLN
1	C	480	GLU
1	C	519	SER
1	D	16	GLN
1	D	41	THR
1	D	74	LEU
1	D	132	VAL
1	D	139	THR
1	D	142	ILE

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Mol	Chain	Res	Type
1	D	144	LEU
1	D	154	GLU
1	D	168	VAL
1	D	180	LEU
1	D	194	VAL
1	D	196	GLU
1	D	285	GLU
1	D	336	LYS
1	D	401	LEU
1	D	409	THR
1	D	436	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	75	ASN
1	A	78	HIS
1	A	199	ASN
1	A	393	GLN
1	B	75	ASN
1	B	235	GLN
1	B	393	GLN
1	C	16	GLN
1	C	44	ASN
1	C	90	ASN
1	C	187	GLN
1	C	199	ASN
1	C	273	ASN
1	C	393	GLN
1	C	456	ASN
1	C	491	ASN
1	D	16	GLN
1	D	78	HIS
1	D	187	GLN
1	D	391	HIS
1	D	393	GLN
1	D	458	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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	$\# Z > 2$
2	FBP	B	602	-	18,20,20	0.69	0	21,32,32	0.95	0
3	7Y0	B	601	-	43,43,43	0.86	2 (4%)	54,62,62	1.52	8 (14%)
2	FBP	A	601	-	18,20,20	0.66	0	21,32,32	0.96	1 (4%)
2	FBP	C	602	-	18,20,20	0.65	0	21,32,32	0.96	0
3	7Y0	C	601	-	43,43,43	0.94	2 (4%)	54,62,62	1.45	9 (16%)
2	FBP	D	601	-	18,20,20	0.74	1 (5%)	21,32,32	0.94	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
2	FBP	B	602	-	-	4/13/32/32	0/1/1/1
3	7Y0	B	601	-	-	2/31/31/31	0/4/4/4
2	FBP	A	601	-	-	4/13/32/32	0/1/1/1
2	FBP	C	602	-	-	2/13/32/32	0/1/1/1
3	7Y0	C	601	-	-	6/31/31/31	0/4/4/4
2	FBP	D	601	-	-	4/13/32/32	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	601	7Y0	C24-N32	3.79	1.40	1.33
3	B	601	7Y0	C24-N32	2.95	1.38	1.33
3	B	601	7Y0	C23-N31	2.41	1.37	1.33
3	C	601	7Y0	C23-N31	2.35	1.37	1.33
2	D	601	FBP	O2-C2	2.21	1.44	1.40

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	601	7Y0	C24-C20-N30	4.81	127.99	122.78
3	B	601	7Y0	C23-C19-N29	4.53	127.69	122.78
3	C	601	7Y0	C23-C19-N29	4.47	127.62	122.78
3	C	601	7Y0	C24-C20-N30	3.90	127.00	122.78
3	B	601	7Y0	C19-C23-N31	-3.14	111.30	117.20
3	B	601	7Y0	C20-C24-N32	-2.98	111.61	117.20
3	C	601	7Y0	C19-C23-N31	-2.48	112.54	117.20
3	C	601	7Y0	C20-C24-N32	-2.47	112.56	117.20
3	C	601	7Y0	O35-C23-C19	2.46	125.69	120.24
3	B	601	7Y0	O35-C23-C19	2.45	125.67	120.24
3	B	601	7Y0	O36-C24-C20	2.40	125.56	120.24
3	C	601	7Y0	C4-C12-C18	2.30	120.49	118.60
3	C	601	7Y0	C3-C11-C17	2.22	120.43	118.60
3	C	601	7Y0	C9-N29-C19	2.17	110.79	109.03
3	C	601	7Y0	C7-C19-N29	-2.10	105.10	107.45
3	B	601	7Y0	C3-C11-C17	2.04	120.28	118.60
2	A	601	FBP	O3P-P1-O2P	2.00	115.32	107.80
3	B	601	7Y0	C10-N30-C20	2.00	110.66	109.03

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	FBP	C1-O1-P1-O1P
2	B	602	FBP	O1-C1-C2-O5
2	D	601	FBP	O1-C1-C2-O2
2	D	601	FBP	O1-C1-C2-O5
3	B	601	7Y0	C7-C13-C21-O33
3	B	601	7Y0	C8-C14-C22-O34
3	C	601	7Y0	C7-C13-C21-O33
2	B	602	FBP	C4-C5-C6-O6
2	C	602	FBP	C4-C5-C6-O6

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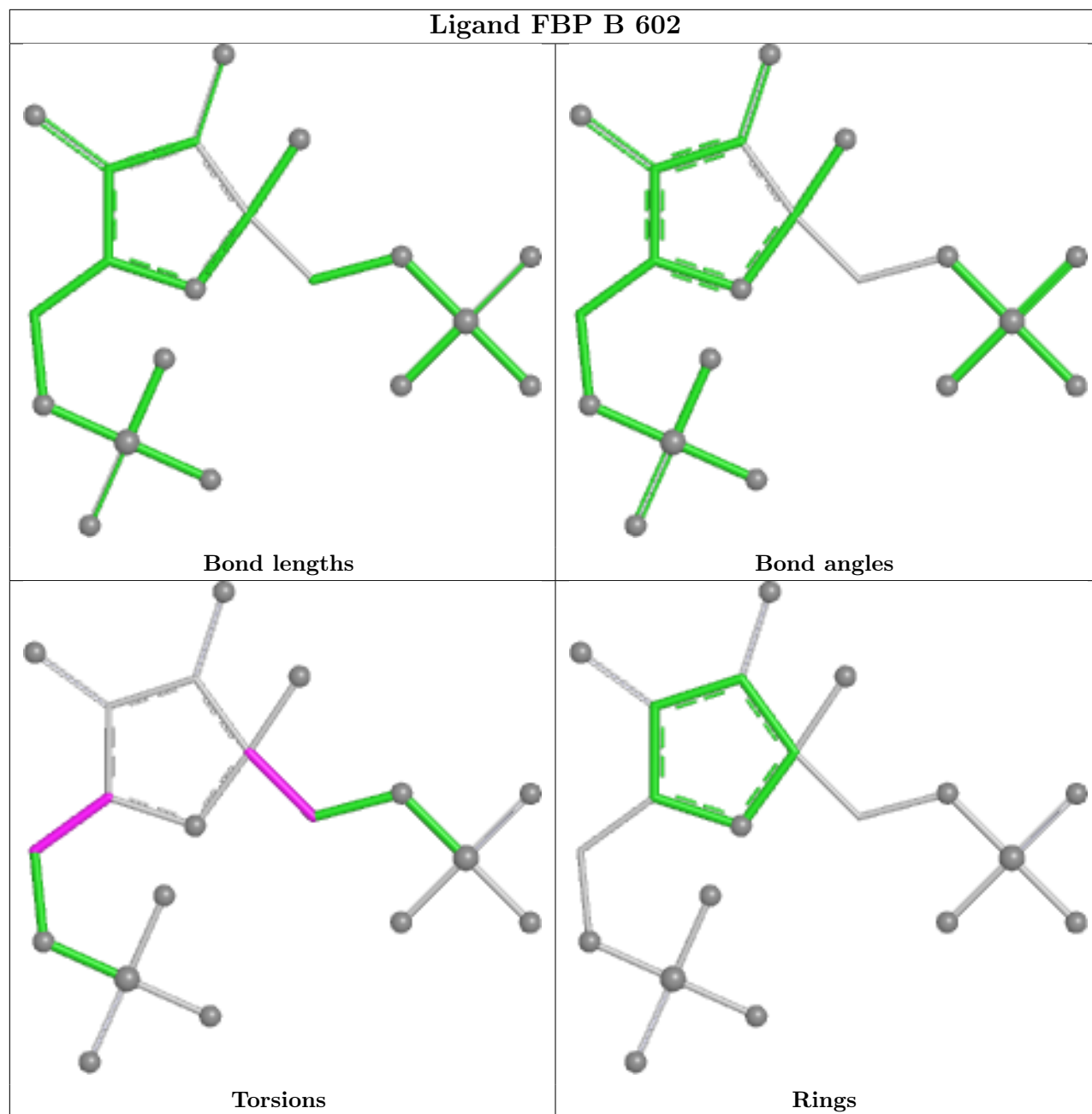
Mol	Chain	Res	Type	Atoms
2	A	601	FBP	C4-C5-C6-O6
2	B	602	FBP	O5-C5-C6-O6
3	C	601	7Y0	O36-C24-N32-C28
2	C	602	FBP	O5-C5-C6-O6
2	A	601	FBP	O5-C5-C6-O6
2	D	601	FBP	C6-O6-P2-O4P
3	C	601	7Y0	N31-C27-C28-N32
3	C	601	7Y0	C10-C14-C22-O34
2	B	602	FBP	O1-C1-C2-O2
3	C	601	7Y0	C8-C14-C22-O34
3	C	601	7Y0	C20-C24-N32-C28
2	D	601	FBP	C4-C5-C6-O6
2	A	601	FBP	C1-O1-P1-O3P

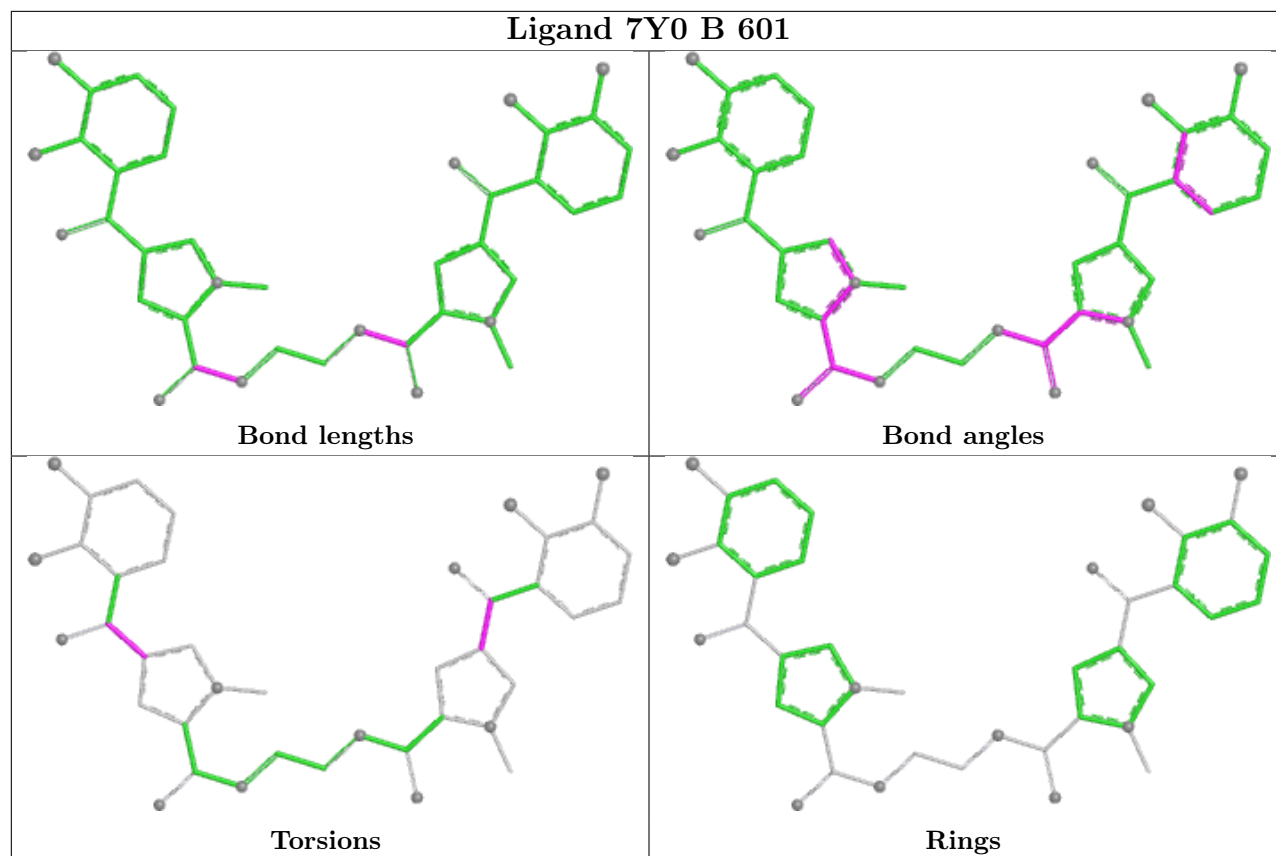
There are no ring outliers.

No monomer is involved in short contacts.

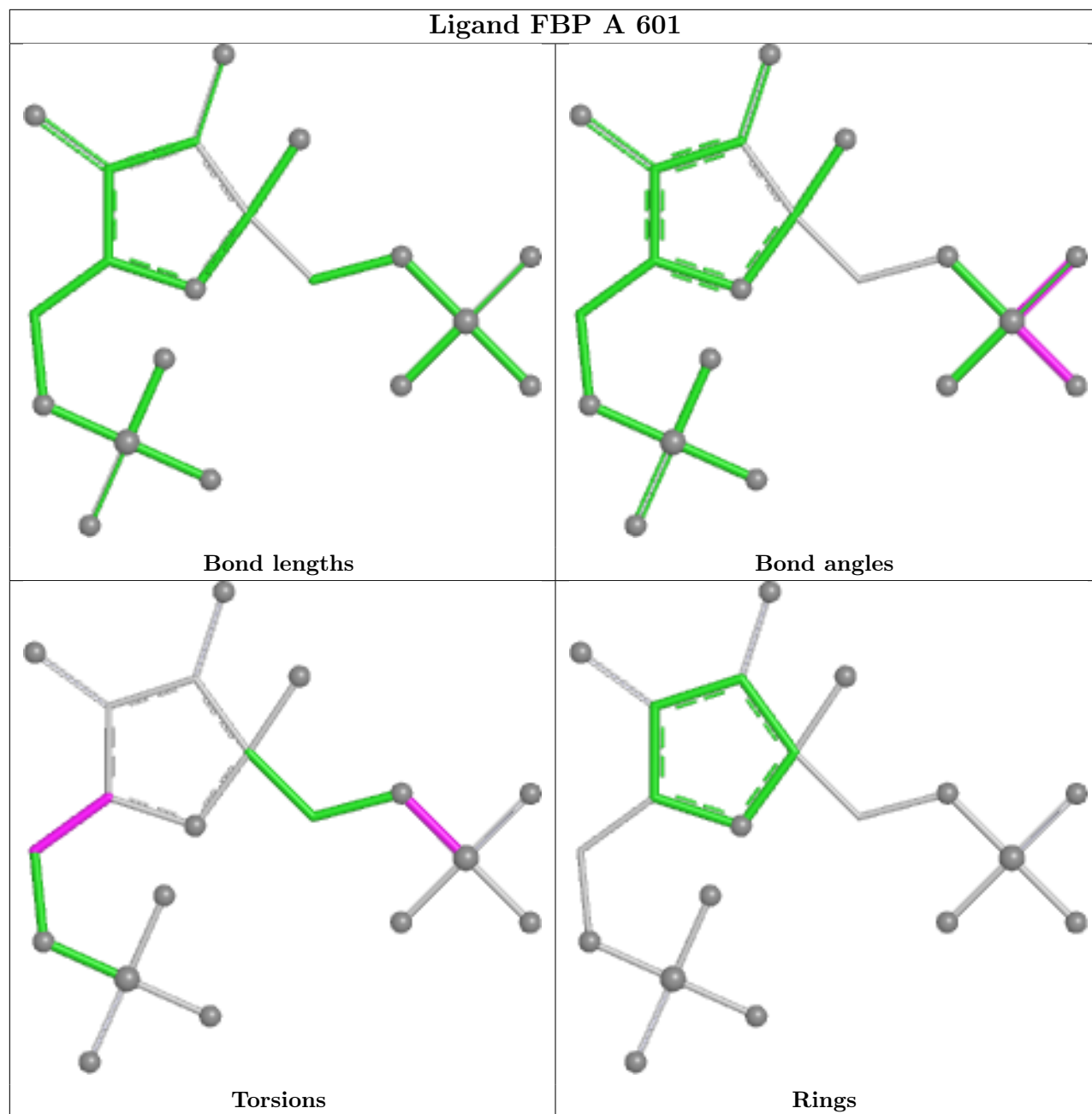
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.

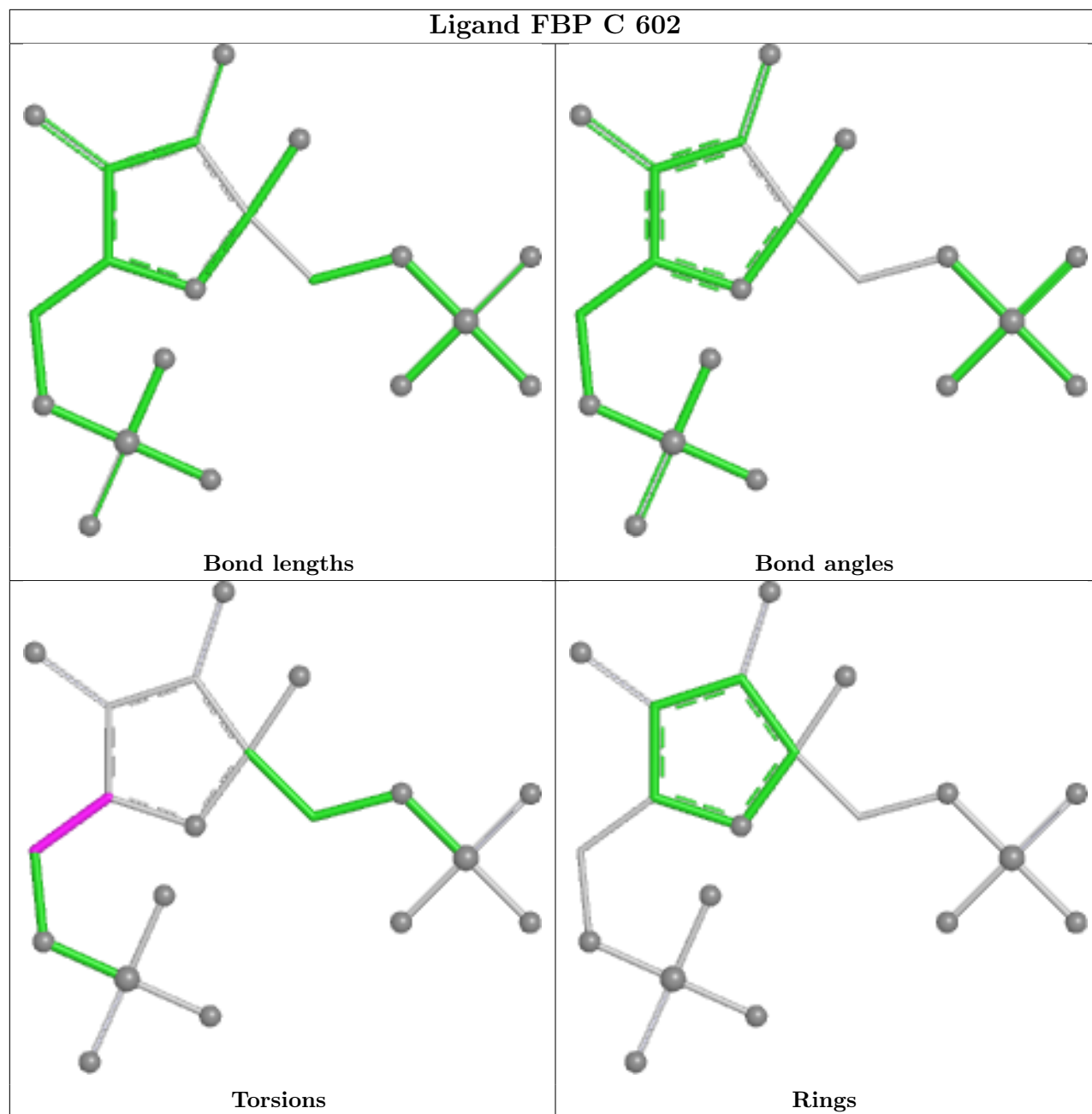
Ligand FBP B 602

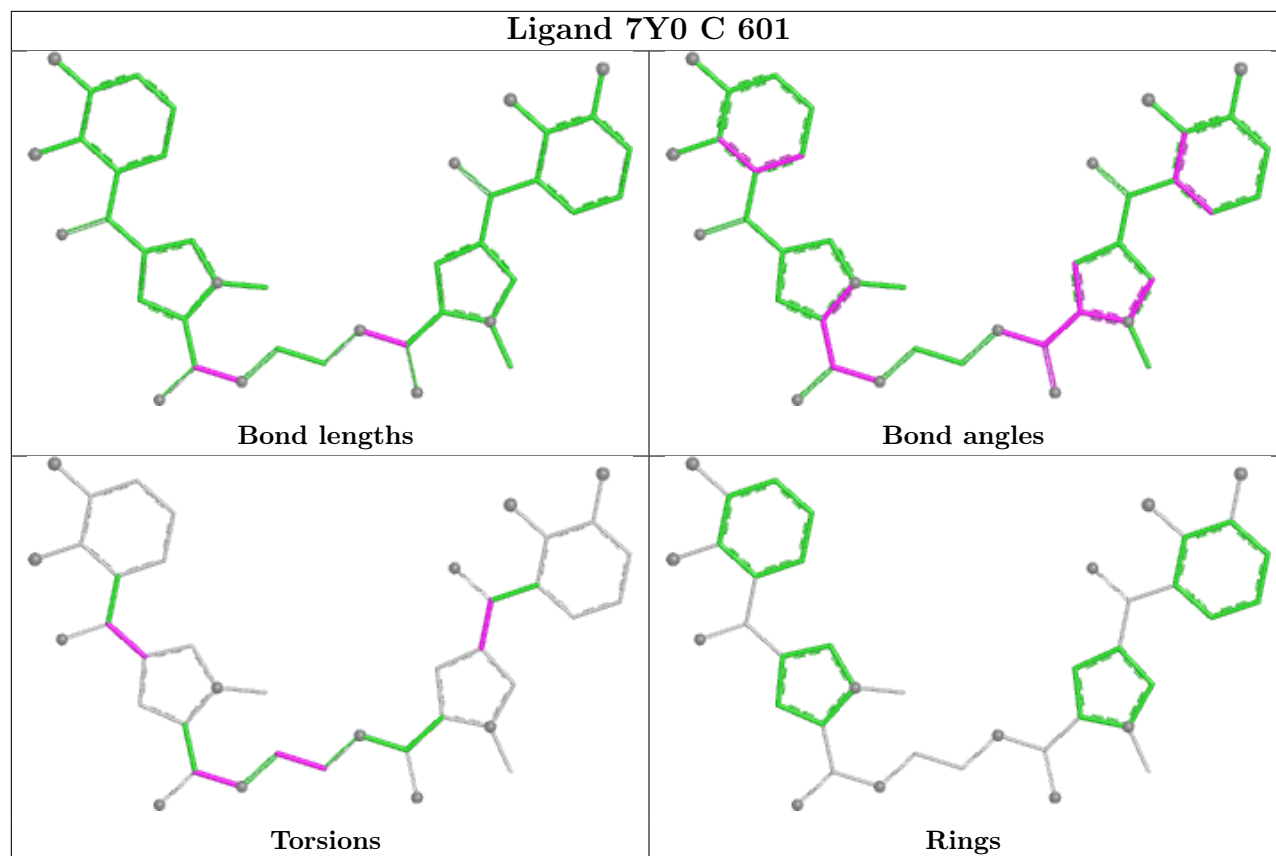


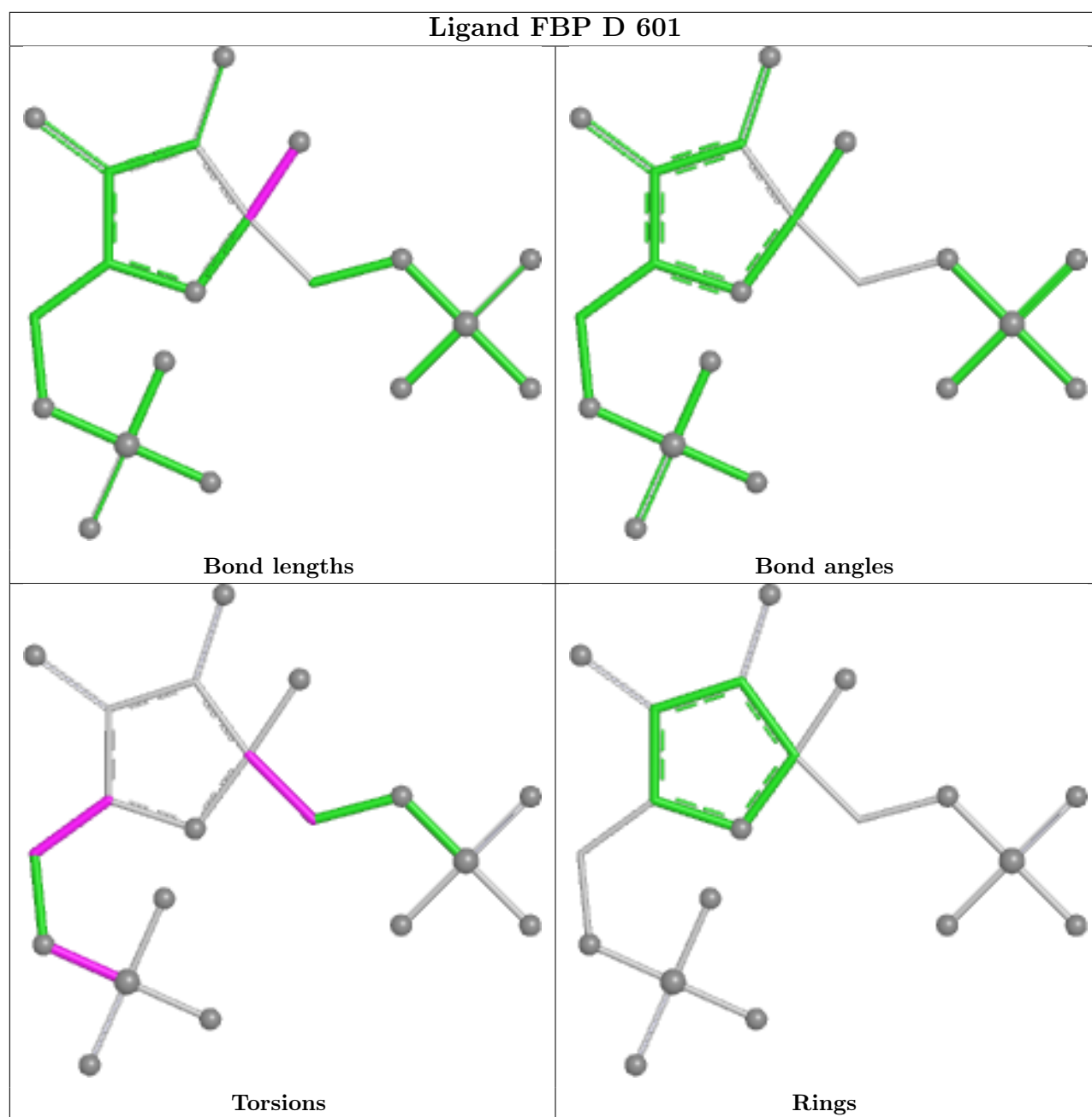


Ligand FBP A 601









5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	518/550 (94%)	-0.05	2 (0%) 88 76	33, 40, 85, 98	0
1	B	501/550 (91%)	-0.02	3 (0%) 85 69	26, 42, 94, 109	1 (0%)
1	C	518/550 (94%)	-0.10	3 (0%) 85 69	33, 42, 65, 88	0
1	D	511/550 (92%)	-0.05	1 (0%) 91 83	33, 42, 87, 103	0
All	All	2048/2200 (93%)	-0.06	9 (0%) 88 76	26, 42, 85, 109	1 (0%)

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	147	ALA	3.4
1	B	124	ILE	2.8
1	A	136	LYS	2.6
1	C	404	ILE	2.3
1	C	217	ASP	2.3
1	B	137	GLY	2.3
1	D	151	LYS	2.2
1	C	178	ASP	2.1
1	A	190	ALA	2.1

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

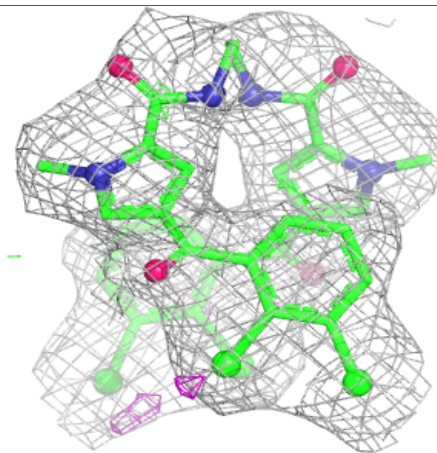
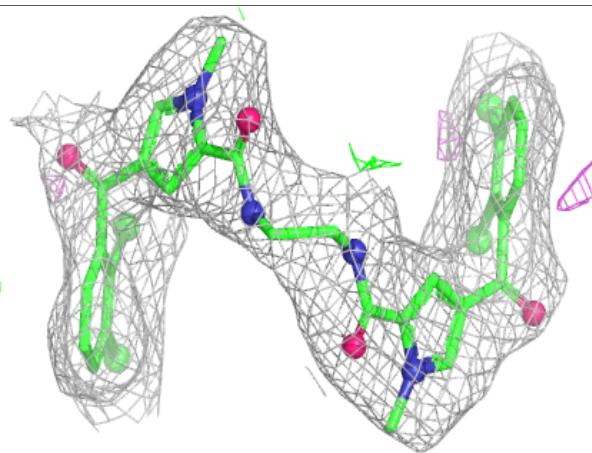
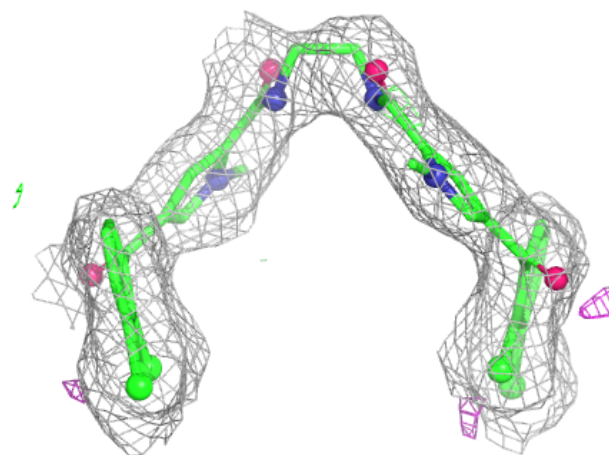
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists 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	7Y0	B	601	40/40	0.94	0.08	31,32,35,36	0
2	FBP	D	601	20/20	0.95	0.08	33,35,37,37	0
2	FBP	A	601	20/20	0.95	0.07	31,35,38,38	0
3	7Y0	C	601	40/40	0.95	0.08	29,31,39,41	0
2	FBP	C	602	20/20	0.96	0.07	33,34,37,37	0
2	FBP	B	602	20/20	0.97	0.07	27,33,38,40	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.

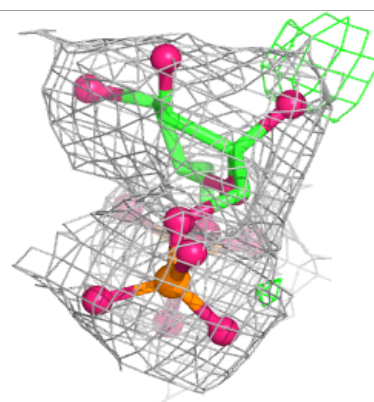
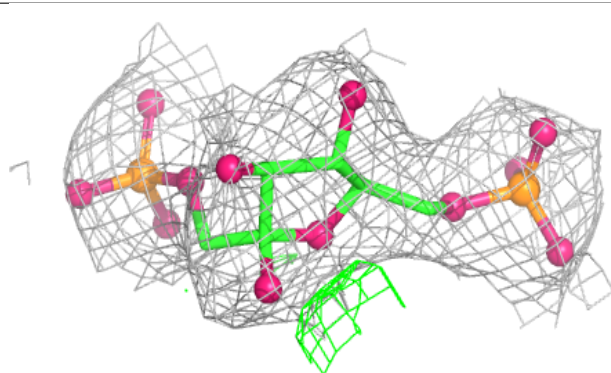
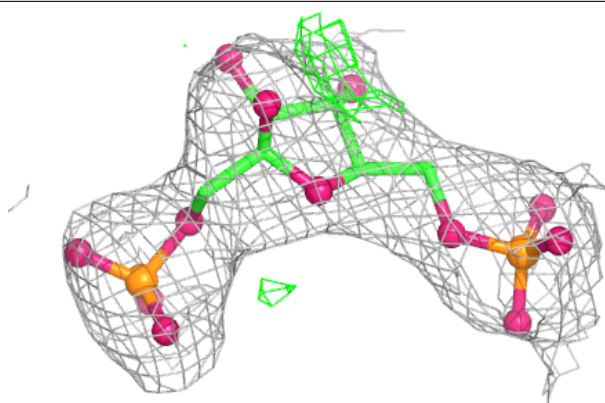
Electron density around 7Y0 B 601:

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



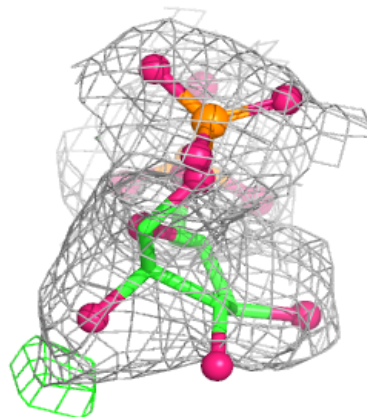
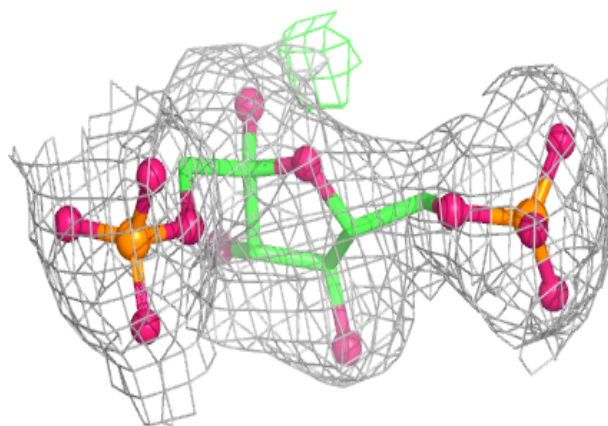
Electron density around FBP D 601:

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



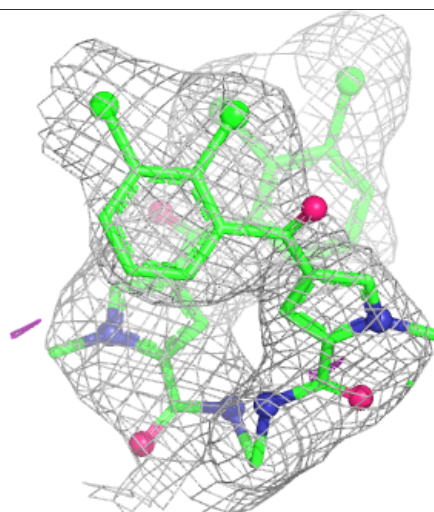
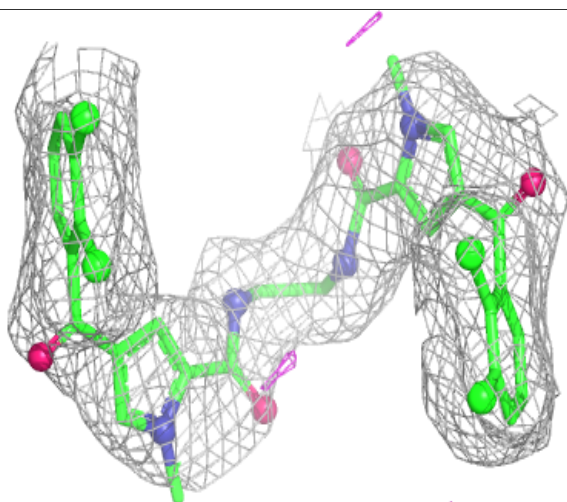
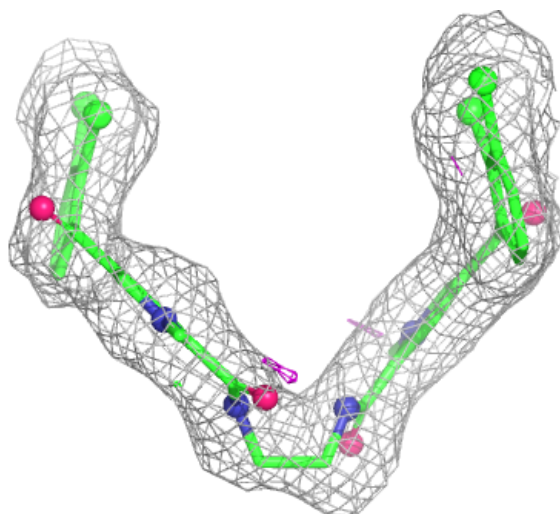
Electron density around FBP A 601:

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



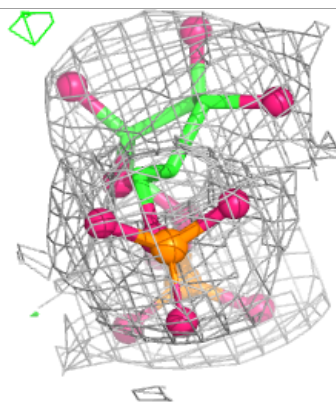
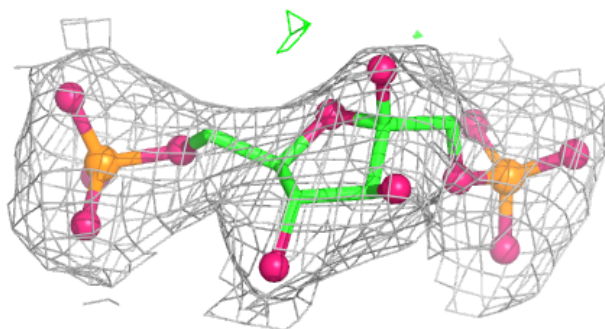
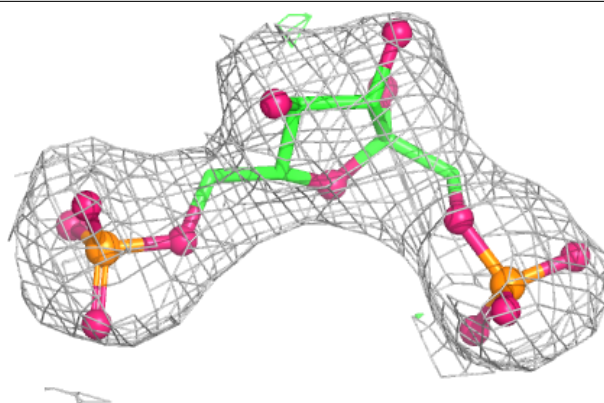
Electron density around 7Y0 C 601:

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

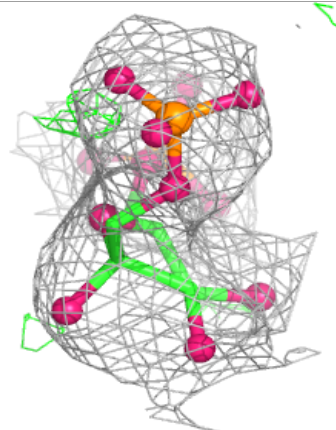
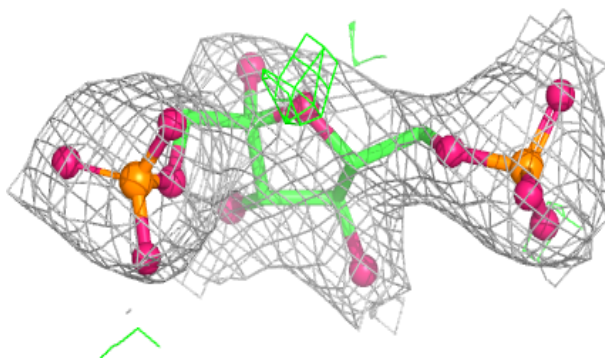
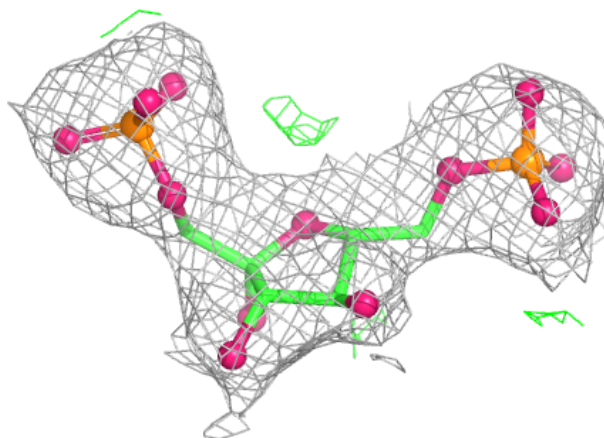


Electron density around FBP C 602:

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

**Electron density around FBP B 602:**

$2mF_o-DF_c$ (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.