



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 8, 2026 – 10:48 AM EDT

PDB ID : 14CO / pdb_000014co
Title : Structure of liver pyruvate kinase in complex with allosteric activator 8a
Authors : Lulla, A.; Rodriguez Rivero, A.; Grotli, M.; Hyvonen, M.
Deposited on : 2026-04-28
Resolution : 1.89 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 Phenix2.2
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.2
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 : 9.0.015 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.51

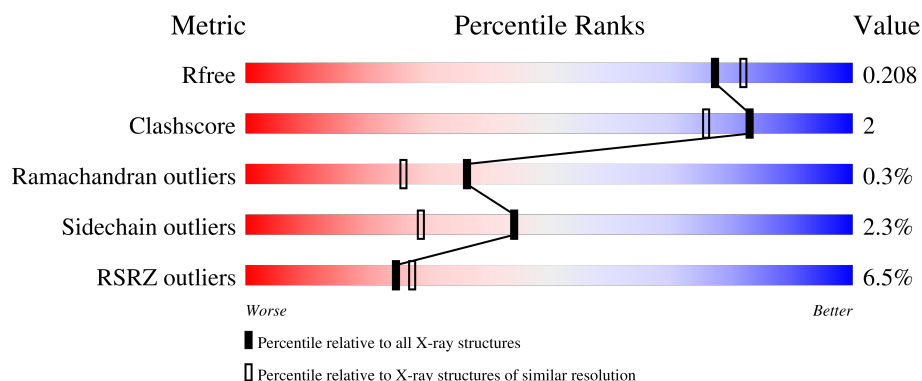
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.89 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	1220 (1.88-1.88)
Clashscore	190562	1234 (1.88-1.88)
Ramachandran outliers	187476	1222 (1.88-1.88)
Sidechain outliers	187428	1222 (1.88-1.88)
RSRZ outliers	180081	1220 (1.88-1.88)

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	447	10% 87% 7% • 6%
1	B	447	13% 91% 6% • •
1	C	447	4% 90% 5% 5%
1	D	447	3% 89% 6% • 5%
1	E	447	6% 88% 5% 6%

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Mol	Chain	Length	Quality of chain
1	F	447	
1	G	447	
1	H	447	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	OXL	A	602	-	X	-	-
3	OXL	B	602	-	X	-	-
3	OXL	C	602	-	X	-	-
3	OXL	D	602	-	X	-	-
3	OXL	E	602	-	X	-	-
3	OXL	G	602	-	X	-	-
3	OXL	H	602	-	X	-	-

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 29248 atoms, of which 106 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 Isoform L-type of Pyruvate kinase PKLR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	421	Total	C	N	O	S	0	13	0
			3267	2055	587	605	20			
1	B	436	Total	C	N	O	S	3	8	0
			3350	2104	604	622	20			
1	C	425	Total	C	N	O	S	0	10	0
			3284	2068	588	609	19			
1	D	425	Total	C	N	O	S	0	8	0
			3261	2048	590	604	19			
1	E	419	Total	C	N	O	S	0	14	0
			3265	2054	587	604	20			
1	F	433	Total	C	N	O	S	0	8	0
			3338	2100	601	617	20			
1	G	430	Total	C	N	O	S	0	10	0
			3311	2082	593	617	19			
1	H	425	Total	C	N	O	S	0	9	0
			3269	2053	593	604	19			

There are 48 discrepancies between the modelled and reference sequences:

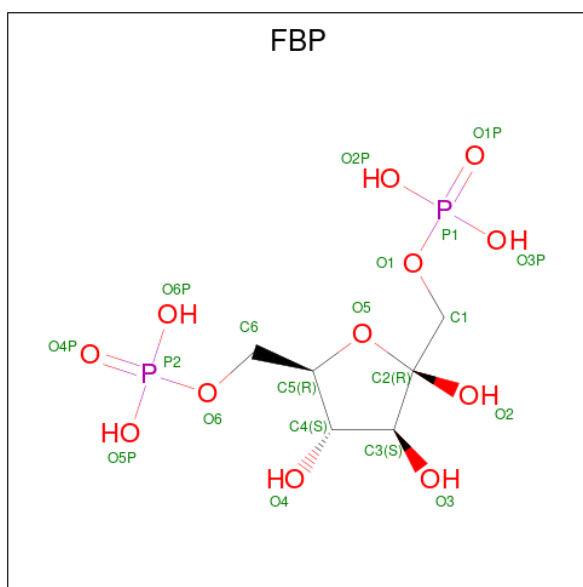
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P30613
A	0	SER	-	expression tag	UNP P30613
A	12	ASP	SER	conflict	UNP P30613
A	130	GLY	-	linker	UNP P30613
A	131	SER	-	linker	UNP P30613
A	132	GLY	-	linker	UNP P30613
B	-1	GLY	-	expression tag	UNP P30613
B	0	SER	-	expression tag	UNP P30613
B	12	ASP	SER	conflict	UNP P30613
B	130	GLY	-	linker	UNP P30613
B	131	SER	-	linker	UNP P30613
B	132	GLY	-	linker	UNP P30613
C	-1	GLY	-	expression tag	UNP P30613

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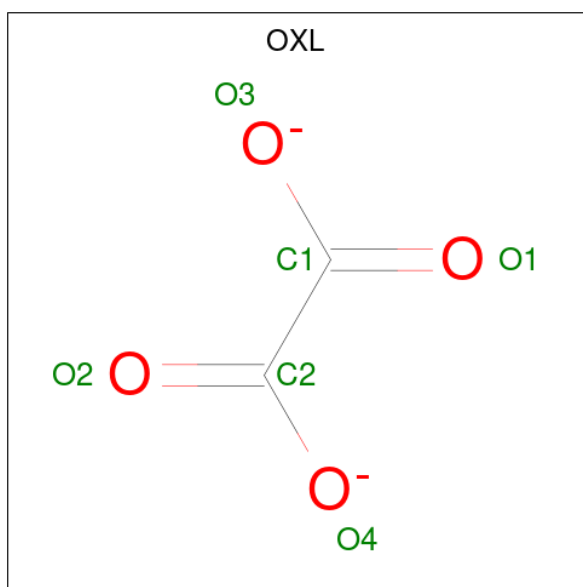
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	SER	-	expression tag	UNP P30613
C	12	ASP	SER	conflict	UNP P30613
C	130	GLY	-	linker	UNP P30613
C	131	SER	-	linker	UNP P30613
C	132	GLY	-	linker	UNP P30613
D	-1	GLY	-	expression tag	UNP P30613
D	0	SER	-	expression tag	UNP P30613
D	12	ASP	SER	conflict	UNP P30613
D	130	GLY	-	linker	UNP P30613
D	131	SER	-	linker	UNP P30613
D	132	GLY	-	linker	UNP P30613
E	-1	GLY	-	expression tag	UNP P30613
E	0	SER	-	expression tag	UNP P30613
E	12	ASP	SER	conflict	UNP P30613
E	130	GLY	-	linker	UNP P30613
E	131	SER	-	linker	UNP P30613
E	132	GLY	-	linker	UNP P30613
F	-1	GLY	-	expression tag	UNP P30613
F	0	SER	-	expression tag	UNP P30613
F	12	ASP	SER	conflict	UNP P30613
F	130	GLY	-	linker	UNP P30613
F	131	SER	-	linker	UNP P30613
F	132	GLY	-	linker	UNP P30613
G	-1	GLY	-	expression tag	UNP P30613
G	0	SER	-	expression tag	UNP P30613
G	12	ASP	SER	conflict	UNP P30613
G	130	GLY	-	linker	UNP P30613
G	131	SER	-	linker	UNP P30613
G	132	GLY	-	linker	UNP P30613
H	-1	GLY	-	expression tag	UNP P30613
H	0	SER	-	expression tag	UNP P30613
H	12	ASP	SER	conflict	UNP P30613
H	130	GLY	-	linker	UNP P30613
H	131	SER	-	linker	UNP P30613
H	132	GLY	-	linker	UNP P30613

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



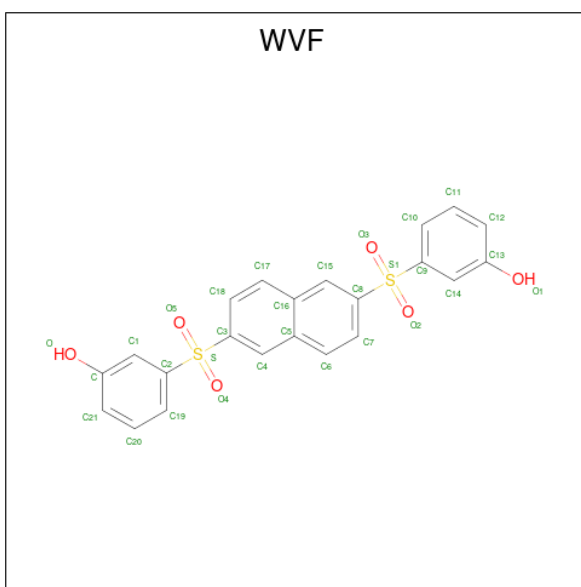
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O	P	0	0
			20	6	12	2		
2	B	1	Total	C	O	P	0	0
			20	6	12	2		
2	C	1	Total	C	O	P	0	0
			20	6	12	2		
2	D	1	Total	C	O	P	0	0
			20	6	12	2		
2	E	1	Total	C	O	P	0	0
			20	6	12	2		
2	F	1	Total	C	O	P	0	0
			20	6	12	2		
2	G	1	Total	C	O	P	0	0
			20	6	12	2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

- Molecule 3 is OXALATE ION (CCD ID: OXL) (formula: C₂O₄).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	2	4		
3	B	1	Total	C	O	0	0
			6	2	4		
3	C	1	Total	C	O	0	0
			6	2	4		
3	D	1	Total	C	O	0	0
			6	2	4		
3	E	1	Total	C	O	0	0
			6	2	4		
3	F	1	Total	C	O	0	0
			6	2	4		
3	G	1	Total	C	O	0	0
			6	2	4		
3	H	1	Total	C	O	0	0
			6	2	4		

- Molecule 4 is 3,3'-(naphthalene-2,6-diylldisulfonyl)diphenol (CCD ID: WVF) (formula: $C_{22}H_{16}O_6S_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	H	O	S	16	0
			46	22	16	6	2		
4	B	1	Total	C	H	O	S	16	0
			46	22	16	6	2		
4	E	1	Total	C	H	O	S	16	0
			46	22	16	6	2		
4	F	1	Total	C	H	O	S	16	0
			46	22	16	6	2		

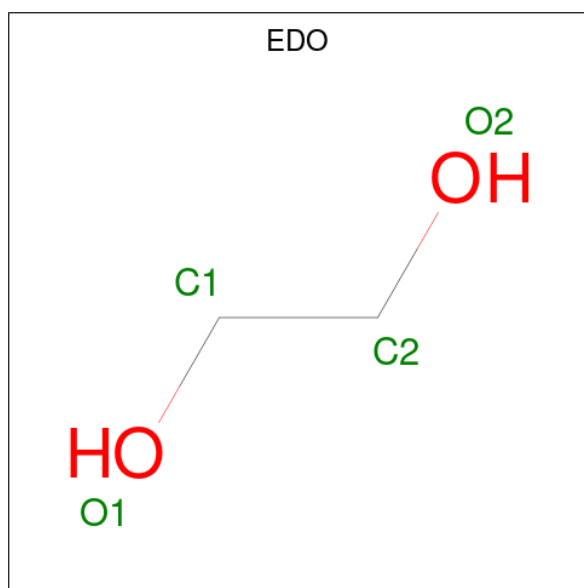
- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mg	0	0
			1	1		
5	B	1	Total	Mg	0	0
			1	1		
5	C	1	Total	Mg	0	0
			1	1		
5	D	1	Total	Mg	0	0
			1	1		
5	E	1	Total	Mg	0	0
			1	1		
5	F	1	Total	Mg	0	0
			1	1		
5	G	1	Total	Mg	0	0
			1	1		
5	H	1	Total	Mg	0	0
			1	1		

- Molecule 6 is POTASSIUM ION (CCD ID: K) (formula: K).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total K 1 1	0	0
6	B	1	Total K 1 1	0	0
6	C	1	Total K 1 1	0	0
6	D	1	Total K 1 1	0	0
6	E	1	Total K 1 1	0	0
6	F	1	Total K 1 1	0	0
6	G	1	Total K 1 1	0	0
6	H	1	Total K 1 1	0	0

- Molecule 7 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C₂H₆O₂).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	1	Total C H O 10 2 6 2	6	0
7	C	1	Total C H O 10 2 6 2	6	0
7	D	1	Total C H O 10 2 6 2	6	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
7	E	1	Total	C	H	O	6	0
			10	2	6	2		
7	F	1	Total	C	H	O	6	0
			10	2	6	2		
7	G	1	Total	C	H	O	6	0
			10	2	6	2		
7	H	1	Total	C	H	O	6	0
			10	2	6	2		

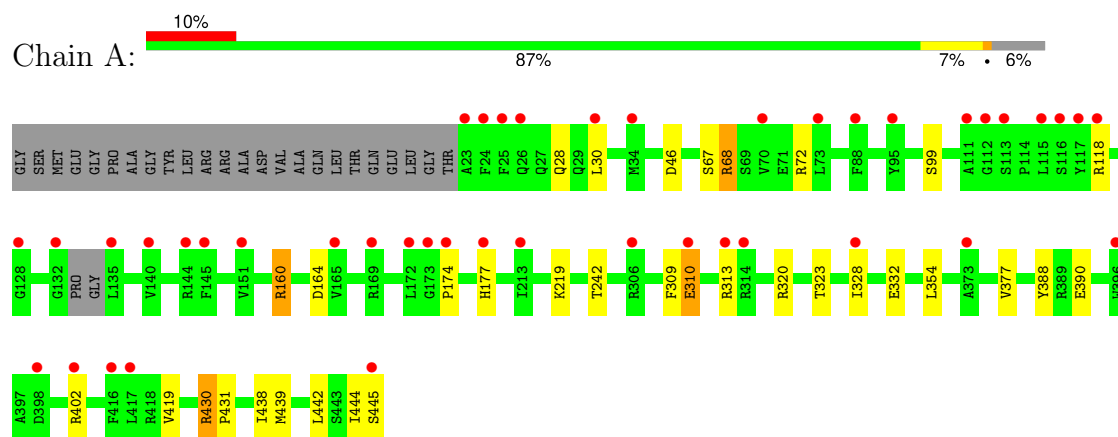
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	235	Total	O	0	0
			235	235		
8	B	227	Total	O	0	0
			227	227		
8	C	323	Total	O	0	0
			323	323		
8	D	355	Total	O	0	0
			355	355		
8	E	261	Total	O	0	0
			261	261		
8	F	304	Total	O	0	0
			304	304		
8	G	340	Total	O	0	0
			340	340		
8	H	380	Total	O	0	0
			380	380		

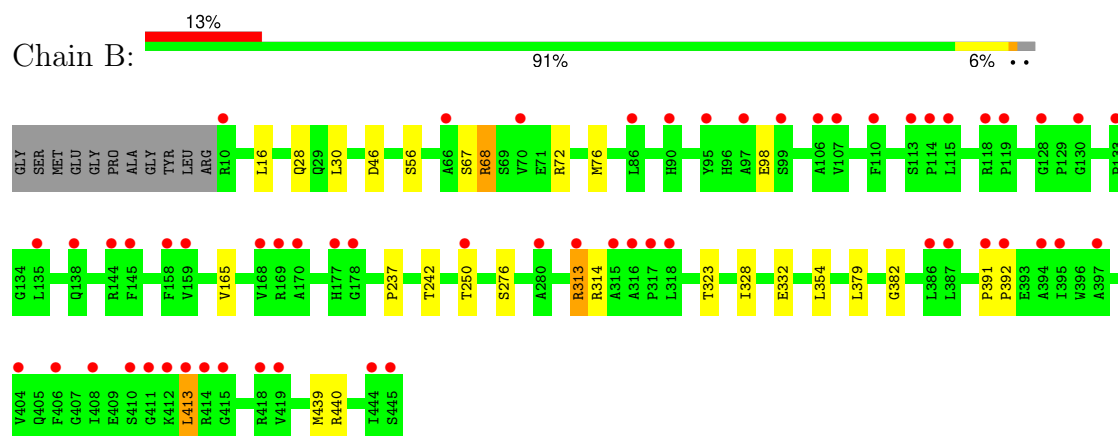
3 Residue-property plots [i](#)

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.

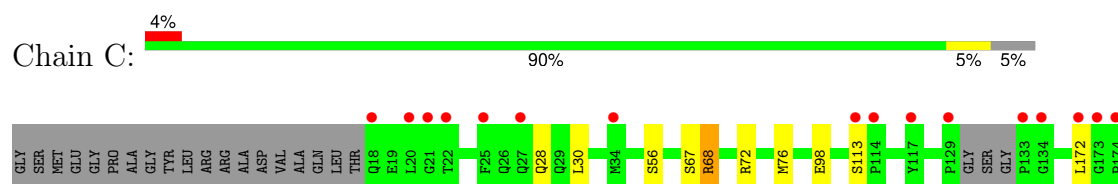
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR



- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

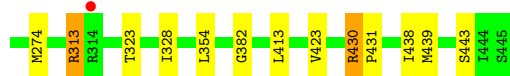
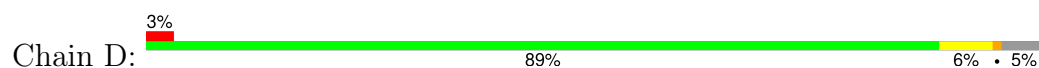


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

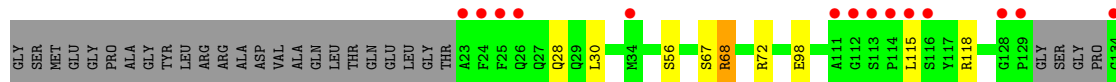
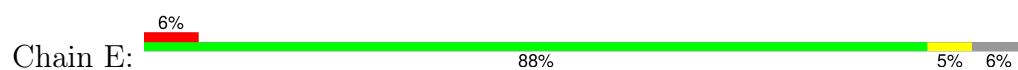




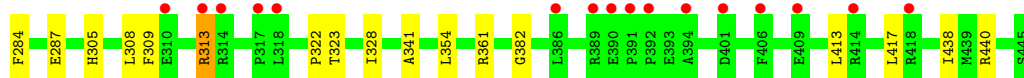
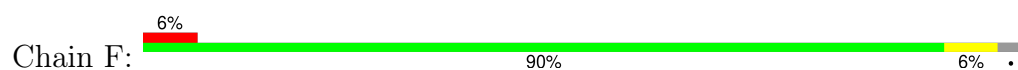
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR



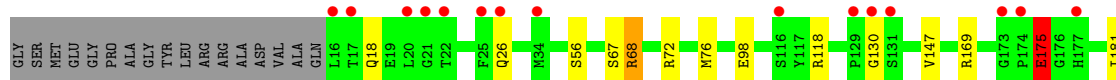
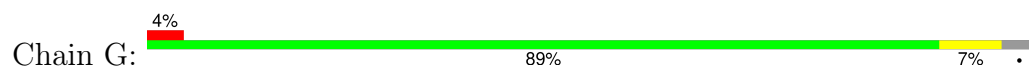
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR



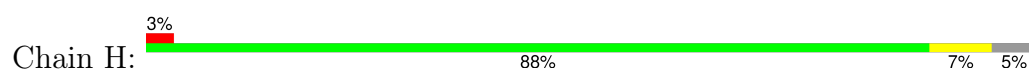
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

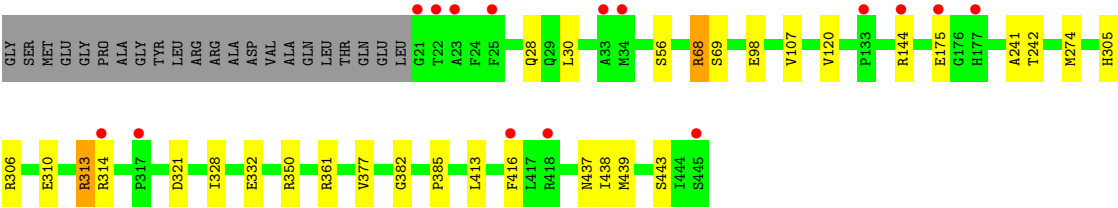


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR



- Molecule 1: Isoform L-type of Pyruvate kinase PKLR





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	207.43Å 112.95Å 188.28Å 90.00° 91.92° 90.00°	Depositor
Resolution (Å)	188.17 – 1.89 188.17 – 1.89	Depositor EDS
% Data completeness (in resolution range)	70.6 (188.17-1.89) 70.6 (188.17-1.89)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.58 (at 1.88Å)	Xtriage
Refinement program	BUSTER 2.10.4	Depositor
R, R_{free}	0.188 , 0.220 0.178 , 0.208	Depositor DCC
R_{free} test set	12149 reflections (3.49%)	wwPDB-VP
Wilson B-factor (Å ²)	33.4	Xtriage
Anisotropy	0.031	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.000 for -h,-k,l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	29248	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.42 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.5297e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: EDO, MG, WVF, OXL, FBP, K

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	0.71	0/3359	0.97	3/4538 (0.1%)
1	B	0.75	2/3429 (0.1%)	0.98	1/4636 (0.0%)
1	C	0.80	1/3369 (0.0%)	0.97	1/4554 (0.0%)
1	D	0.81	0/3341	1.00	0/4517
1	E	0.71	0/3361	0.97	1/4541 (0.0%)
1	F	0.76	0/3416	1.00	1/4617 (0.0%)
1	G	0.81	1/3397 (0.0%)	0.98	2/4594 (0.0%)
1	H	0.84	0/3352	1.00	1/4531 (0.0%)
All	All	0.77	4/27024 (0.0%)	0.98	10/36528 (0.0%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	276	SER	CA-C	8.16	1.56	1.52
1	B	276[A]	SER	CA-C	5.97	1.55	1.52
1	B	276[B]	SER	CA-C	5.97	1.55	1.52
1	G	391	PRO	CA-C	5.94	1.55	1.51

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	175	GLU	CB-CG-CD	6.26	123.25	112.60
1	E	441	VAL	N-CA-CB	6.21	118.48	111.21
1	C	416	PHE	CA-CB-CG	6.18	119.98	113.80
1	A	46	ASP	CA-CB-CG	5.87	118.47	112.60
1	G	416	PHE	CA-CB-CG	5.85	119.65	113.80
1	B	46	ASP	CA-CB-CG	5.77	118.37	112.60
1	H	416	PHE	CA-CB-CG	5.63	119.43	113.80
1	F	46	ASP	CA-CB-CG	5.30	117.90	112.60
1	A	444	ILE	CA-C-N	5.16	130.98	121.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	444	ILE	C-N-CA	5.16	130.98	121.70

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	3267	0	3342	21	0
1	B	3350	0	3417	19	0
1	C	3284	0	3351	13	0
1	D	3261	0	3321	13	0
1	E	3265	0	3337	16	0
1	F	3338	0	3412	21	0
1	G	3311	0	3374	22	0
1	H	3269	0	3334	22	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
2	E	20	0	10	0	0
2	F	20	0	10	0	0
2	G	20	0	10	0	0
2	H	20	0	10	0	0
3	A	6	0	0	0	0
3	B	6	0	0	0	0
3	C	6	0	0	0	0
3	D	6	0	0	0	0
3	E	6	0	0	0	0
3	F	6	0	0	0	0
3	G	6	0	0	0	0
3	H	6	0	0	0	0
4	A	30	16	0	0	0
4	B	30	16	0	0	0
4	E	30	16	0	0	0
4	F	30	16	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	1	0	0	0	0
5	B	1	0	0	0	0
5	C	1	0	0	0	0
5	D	1	0	0	0	0
5	E	1	0	0	0	0
5	F	1	0	0	0	0
5	G	1	0	0	0	0
5	H	1	0	0	0	0
6	A	1	0	0	0	0
6	B	1	0	0	0	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
6	E	1	0	0	0	0
6	F	1	0	0	0	0
6	G	1	0	0	0	0
6	H	1	0	0	0	0
7	B	4	6	6	0	0
7	C	4	6	6	0	0
7	D	4	6	6	0	0
7	E	4	6	6	0	0
7	F	4	6	6	1	0
7	G	4	6	6	1	0
7	H	4	6	6	0	0
8	A	235	0	0	1	0
8	B	227	0	0	0	0
8	C	323	0	0	1	0
8	D	355	0	0	0	0
8	E	261	0	0	0	0
8	F	304	0	0	2	0
8	G	340	0	0	0	0
8	H	380	0	0	0	0
All	All	29142	106	27010	126	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 2.

All (126) 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:C:313:ARG:HG3	1:C:328:ILE:HD11	1.52	0.91
1:F:313:ARG:HG2	1:F:328:ILE:HD11	1.55	0.88

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:313:ARG:HG2	1:B:328:ILE:HD11	1.59	0.84
1:E:320[B]:ARG:HG3	1:F:16:LEU:HD11	1.69	0.74
1:A:438:ILE:HG12	1:B:440:ARG:HG2	1.69	0.73
1:F:309:PHE:CE2	1:F:313:ARG:NH1	2.59	0.71
1:A:309:PHE:CE2	1:A:313:ARG:NH1	2.59	0.70
1:A:313:ARG:NH2	1:B:313:ARG:NH2	2.40	0.69
1:F:313:ARG:HD2	8:F:807:HOH:O	1.90	0.69
1:A:174:PRO:HA	1:A:177:HIS:NE2	2.09	0.67
1:G:314:ARG:HH21	1:H:306:ARG:HH11	1.42	0.67
1:G:440:ARG:HG2	1:H:438:ILE:HG12	1.77	0.66
1:A:320[B]:ARG:HG3	1:B:16:LEU:HD11	1.79	0.65
1:H:313:ARG:HG2	1:H:328:ILE:HD11	1.78	0.64
1:A:320[A]:ARG:HD3	1:B:16:LEU:HD11	1.81	0.63
1:D:430:ARG:HD2	1:D:431:PRO:O	1.99	0.62
1:G:324[A]:GLU:HG2	1:G:354:LEU:HD13	1.80	0.62
1:C:440:ARG:HD3	8:C:764:HOH:O	1.99	0.61
1:C:324[A]:GLU:HG2	1:C:354:LEU:HD13	1.82	0.61
1:G:314:ARG:NH2	1:H:306:ARG:HD3	2.15	0.61
1:G:313:ARG:HG3	1:G:328:ILE:HD11	1.82	0.61
1:E:305:HIS:ND1	1:E:361:ARG:NH1	2.48	0.60
1:E:438:ILE:HG12	1:F:440:ARG:HG2	1.83	0.60
1:E:320[A]:ARG:HD3	1:F:16:LEU:HD11	1.82	0.60
1:H:68:ARG:NH2	1:H:98:GLU:HB2	2.17	0.59
1:A:430:ARG:HD2	1:A:431:PRO:O	2.02	0.59
1:F:28:GLN:O	1:F:361:ARG:NH2	2.35	0.59
1:A:67:SER:HA	1:A:72:ARG:HG2	1.84	0.59
1:C:440:ARG:HG2	1:D:438:ILE:HG12	1.83	0.59
1:D:68:ARG:NH2	1:D:98:GLU:HB2	2.18	0.58
1:H:28:GLN:O	1:H:361:ARG:NH2	2.37	0.58
1:C:313:ARG:CG	1:C:328:ILE:HD11	2.31	0.57
1:A:309:PHE:HE2	1:A:313:ARG:HH12	1.51	0.57
1:D:56:SER:HB2	1:D:382:GLY:HA2	1.87	0.57
1:E:28:GLN:O	1:E:361:ARG:NH2	2.38	0.57
1:G:56:SER:HB2	1:G:382:GLY:HA2	1.88	0.55
1:E:313:ARG:HG2	1:E:328:ILE:HD11	1.87	0.55
1:H:305:HIS:ND1	1:H:361:ARG:NH1	2.53	0.55
1:E:440:ARG:HG2	1:F:438:ILE:HG12	1.88	0.54
1:G:308:LEU:HD21	7:G:603:EDO:H11	1.88	0.54
1:D:313:ARG:HG2	1:D:328:ILE:HD11	1.90	0.54
1:E:305:HIS:CE1	1:E:361:ARG:HH11	2.25	0.54
1:A:68:ARG:HD2	1:A:99:SER:OG	2.09	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:56:SER:HB2	1:B:382:GLY:HA2	1.91	0.53
1:C:56:SER:HB2	1:C:382:GLY:HA2	1.90	0.53
1:F:56:SER:HB2	1:F:382:GLY:HA2	1.91	0.53
1:H:68:ARG:HH22	1:H:98:GLU:HB2	1.73	0.52
1:H:56:SER:HB2	1:H:382:GLY:HA2	1.93	0.51
1:A:160:ARG:HG2	1:A:164:ASP:OD2	2.11	0.51
1:F:67:SER:HA	1:F:72:ARG:HG2	1.93	0.51
1:E:137:GLU:O	1:E:141:ARG:HD3	2.12	0.49
1:A:310:GLU:HG2	1:A:313:ARG:HH21	1.77	0.49
1:F:308:LEU:HD21	7:F:604:EDO:H11	1.94	0.49
1:E:56:SER:HB2	1:E:382:GLY:HA2	1.94	0.48
1:C:321:ASP:OD2	1:C:324[A]:GLU:HG3	2.13	0.48
1:E:441:VAL:HG22	1:F:322:PRO:HB3	1.96	0.47
1:B:323:THR:HG22	1:B:354:LEU:HD12	1.97	0.47
1:G:323:THR:HG22	1:G:354:LEU:HD12	1.97	0.46
1:D:56:SER:HB2	1:D:382:GLY:CA	2.45	0.46
1:G:147:VAL:CG1	1:G:175:GLU:HG2	2.45	0.46
1:C:67:SER:HA	1:C:72:ARG:HG2	1.97	0.46
1:G:68:ARG:NH2	1:G:98[A]:GLU:HB2	2.31	0.46
1:H:437:ASN:OD1	1:H:438:ILE:HG13	2.16	0.45
1:A:219:LYS:NZ	8:A:704:HOH:O	2.49	0.45
1:D:68:ARG:HH22	1:D:98:GLU:HB2	1.81	0.45
1:G:169:ARG:HG2	1:G:181:ILE:CD1	2.47	0.45
1:A:313:ARG:NH2	1:B:313:ARG:CZ	2.80	0.45
1:G:67:SER:HA	1:G:72:ARG:HG2	1.98	0.45
1:A:388:TYR:CZ	1:A:390[B]:GLU:HB2	2.52	0.45
1:F:305:HIS:ND1	1:F:361:ARG:NH1	2.60	0.45
1:A:419:VAL:HG13	1:A:445:SER:HB3	1.97	0.45
1:D:323:THR:HG22	1:D:354:LEU:HD12	1.99	0.44
1:E:67:SER:HA	1:E:72:ARG:HG2	1.98	0.44
1:C:67:SER:HB2	1:C:76[B]:MET:SD	2.58	0.44
1:A:28:GLN:HG3	1:A:30:LEU:HG	2.00	0.44
1:C:323:THR:HG22	1:C:354:LEU:HD12	2.00	0.44
1:G:188:HIS:CE1	1:G:192:LYS:HG3	2.53	0.44
1:G:306:ARG:HD3	1:H:314:ARG:CZ	2.47	0.44
1:B:68:ARG:NH2	1:B:98:GLU:HB3	2.33	0.44
1:B:67:SER:HB2	1:B:76[B]:MET:SD	2.58	0.44
1:F:56:SER:HB2	1:F:382:GLY:CA	2.47	0.44
1:G:332[A]:GLU:OE1	1:H:332[A]:GLU:OE1	2.35	0.44
1:G:67:SER:HB2	1:G:76[B]:MET:SD	2.58	0.44
1:G:321:ASP:OD2	1:G:324[A]:GLU:HG3	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:332:GLU:CD	1:B:313:ARG:HD2	2.43	0.43
1:C:68:ARG:NH2	1:C:98[A]:GLU:HB2	2.32	0.43
1:E:309:PHE:O	1:E:313:ARG:HB2	2.17	0.43
1:G:388:TYR:CZ	1:G:390:GLU:HB2	2.54	0.43
1:B:67:SER:HA	1:B:72:ARG:HG2	1.99	0.43
1:A:332:GLU:OE2	1:B:332[A]:GLU:OE1	2.36	0.43
1:F:68:ARG:NH2	1:F:98:GLU:HB3	2.32	0.43
1:B:56:SER:HB2	1:B:382:GLY:CA	2.48	0.43
1:F:284:PHE:HB3	1:F:287:GLU:HB2	2.01	0.43
1:H:56:SER:HB2	1:H:382:GLY:CA	2.49	0.43
1:F:28:GLN:HG3	1:F:30:LEU:HG	2.01	0.43
1:H:28:GLN:HG3	1:H:30:LEU:HG	1.99	0.43
1:H:241:ALA:HB1	1:H:274:MET:HE2	2.01	0.43
1:D:28:GLN:HG3	1:D:30:LEU:HG	2.01	0.42
1:A:323:THR:HG22	1:A:354:LEU:HD12	2.02	0.42
1:G:314:ARG:HH21	1:H:306:ARG:NH1	2.13	0.42
1:F:305:HIS:CE1	1:F:361:ARG:HH11	2.36	0.42
1:F:313:ARG:CD	8:F:807:HOH:O	2.60	0.42
1:G:68:ARG:NH2	1:G:98[B]:GLU:HB3	2.35	0.42
1:D:107:VAL:HG21	1:D:120:VAL:HB	2.02	0.42
1:E:437:ASN:OD1	1:E:438:ILE:HG13	2.20	0.41
1:G:56:SER:HB2	1:G:382:GLY:CA	2.49	0.41
1:B:391:PRO:HA	1:B:392:PRO:HD3	1.97	0.41
1:H:377:VAL:CG2	1:H:385:PRO:HB3	2.50	0.41
1:D:71[B]:GLU:CD	1:D:71[B]:GLU:H	2.26	0.41
1:D:241:ALA:HB1	1:D:274:MET:HE2	2.03	0.41
1:E:68:ARG:NH2	1:E:98:GLU:HB3	2.35	0.41
1:G:314:ARG:HD2	1:H:310:GLU:OE2	2.19	0.41
1:B:28:GLN:HG3	1:B:30:LEU:HG	2.02	0.41
1:C:28:GLN:HG3	1:C:30:LEU:HG	2.02	0.41
1:C:309:PHE:O	1:C:313:ARG:HB2	2.20	0.41
1:F:323:THR:HG22	1:F:354:LEU:HD12	2.03	0.41
1:H:30:LEU:HD23	1:H:30:LEU:HA	1.98	0.41
1:H:107:VAL:HG21	1:H:120:VAL:HB	2.03	0.41
1:B:237:PRO:HB3	1:B:379:LEU:O	2.21	0.41
1:E:28:GLN:HG3	1:E:30:LEU:HG	2.03	0.41
1:A:332:GLU:OE2	1:B:332[B]:GLU:OE1	2.39	0.40
1:D:313:ARG:CG	1:D:328:ILE:HD11	2.49	0.40
1:H:305:HIS:CE1	1:H:361:ARG:HH11	2.37	0.40
1:F:341:ALA:HB3	1:F:417:LEU:HD21	2.03	0.40
1:H:321:ASP:OD2	1:H:350:ARG:NH2	2.52	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:413:LEU:HD13	1:B:413:LEU:HA	1.97	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	430/447 (96%)	424 (99%)	5 (1%)	1 (0%)	43	34
1	B	442/447 (99%)	435 (98%)	6 (1%)	1 (0%)	43	34
1	C	431/447 (96%)	425 (99%)	5 (1%)	1 (0%)	43	34
1	D	431/447 (96%)	425 (99%)	5 (1%)	1 (0%)	43	34
1	E	429/447 (96%)	423 (99%)	5 (1%)	1 (0%)	43	34
1	F	437/447 (98%)	433 (99%)	3 (1%)	1 (0%)	43	34
1	G	438/447 (98%)	428 (98%)	8 (2%)	2 (0%)	24	13
1	H	432/447 (97%)	427 (99%)	4 (1%)	1 (0%)	43	34
All	All	3470/3576 (97%)	3420 (99%)	41 (1%)	9 (0%)	36	26

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	G	130	GLY
1	A	242	THR
1	B	242	THR
1	C	242	THR
1	D	242	THR
1	E	242	THR
1	F	242	THR
1	G	242	THR
1	H	242	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	347/352 (99%)	336 (97%)	11 (3%)	34	17
1	B	353/352 (100%)	345 (98%)	8 (2%)	44	29
1	C	348/352 (99%)	344 (99%)	4 (1%)	65	56
1	D	344/352 (98%)	331 (96%)	13 (4%)	29	13
1	E	347/352 (99%)	337 (97%)	10 (3%)	37	20
1	F	352/352 (100%)	346 (98%)	6 (2%)	53	40
1	G	351/352 (100%)	345 (98%)	6 (2%)	53	40
1	H	345/352 (98%)	336 (97%)	9 (3%)	40	24
All	All	2787/2816 (99%)	2720 (98%)	67 (2%)	44	27

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	68	ARG
1	A	118	ARG
1	A	160	ARG
1	A	310	GLU
1	A	328	ILE
1	A	377	VAL
1	A	402	ARG
1	A	430	ARG
1	A	439[A]	MET
1	A	439[B]	MET
1	A	442	LEU
1	B	68	ARG
1	B	165	VAL
1	B	250	THR
1	B	313	ARG
1	B	314	ARG
1	B	413	LEU
1	B	439[A]	MET
1	B	439[B]	MET

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Mol	Chain	Res	Type
1	C	68	ARG
1	C	113	SER
1	C	172[A]	LEU
1	C	172[B]	LEU
1	D	22	THR
1	D	68	ARG
1	D	69	SER
1	D	118	ARG
1	D	131	SER
1	D	144[A]	ARG
1	D	144[B]	ARG
1	D	313	ARG
1	D	413	LEU
1	D	423	VAL
1	D	430	ARG
1	D	439	MET
1	D	443	SER
1	E	68	ARG
1	E	115	LEU
1	E	118	ARG
1	E	313	ARG
1	E	314	ARG
1	E	413	LEU
1	E	418	ARG
1	E	439[A]	MET
1	E	439[B]	MET
1	E	441	VAL
1	F	10	ARG
1	F	68	ARG
1	F	94	GLU
1	F	193	ARG
1	F	313	ARG
1	F	413	LEU
1	G	18	GLN
1	G	26	GLN
1	G	68	ARG
1	G	118	ARG
1	G	175	GLU
1	G	377	VAL
1	H	68	ARG
1	H	69	SER
1	H	144[A]	ARG

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Mol	Chain	Res	Type
1	H	144[B]	ARG
1	H	175	GLU
1	H	313	ARG
1	H	413	LEU
1	H	439	MET
1	H	443	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	27	GLN
1	C	90	HIS
1	C	372	GLN
1	D	27	GLN
1	D	90	HIS
1	G	18	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](#)

Of 43 ligands modelled in this entry, 16 are monoatomic - leaving 27 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	OXL	C	602	5	5,5,5	1.81	1 (20%)	6,6,6	2.22	2 (33%)
3	OXL	H	602	5	5,5,5	1.80	2 (40%)	6,6,6	1.83	2 (33%)
2	FBP	C	601	-	18,20,20	0.67	0	21,32,32	0.63	0
7	EDO	H	603	-	3,3,3	0.39	0	2,2,2	0.22	0
2	FBP	B	601	-	18,20,20	0.45	0	21,32,32	0.72	0
2	FBP	E	601	-	18,20,20	0.58	0	21,32,32	0.67	0
7	EDO	B	603	-	3,3,3	0.16	0	2,2,2	0.20	0
2	FBP	D	601	-	18,20,20	0.62	0	21,32,32	1.02	1 (4%)
7	EDO	G	603	-	3,3,3	0.31	0	2,2,2	0.32	0
7	EDO	F	604	-	3,3,3	0.21	0	2,2,2	0.40	0
2	FBP	H	601	-	18,20,20	0.68	0	21,32,32	0.75	1 (4%)
4	WVF	E	604	-	33,33,33	0.28	0	48,50,50	0.42	0
3	OXL	F	602	5	5,5,5	2.02	1 (20%)	6,6,6	2.44	3 (50%)
3	OXL	E	602	5	5,5,5	2.21	2 (40%)	6,6,6	1.36	1 (16%)
7	EDO	D	603	-	3,3,3	0.30	0	2,2,2	0.25	0
4	WVF	F	603	-	33,33,33	0.33	0	48,50,50	0.41	0
7	EDO	E	603	-	3,3,3	0.33	0	2,2,2	0.31	0
4	WVF	B	604	-	33,33,33	0.27	0	48,50,50	0.41	0
3	OXL	G	602	5	5,5,5	2.43	2 (40%)	6,6,6	1.67	2 (33%)
3	OXL	A	602	5	5,5,5	1.86	2 (40%)	6,6,6	2.35	3 (50%)
2	FBP	G	601	-	18,20,20	0.43	0	21,32,32	0.65	0
7	EDO	C	603	-	3,3,3	0.41	0	2,2,2	0.38	0
3	OXL	B	602	5	5,5,5	2.24	2 (40%)	6,6,6	1.64	2 (33%)
3	OXL	D	602	5	5,5,5	2.18	2 (40%)	6,6,6	2.02	2 (33%)
4	WVF	A	603	-	33,33,33	0.27	0	48,50,50	0.39	0
2	FBP	A	601	-	18,20,20	0.47	0	21,32,32	0.63	0
2	FBP	F	601	-	18,20,20	0.46	0	21,32,32	0.61	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	OXL	C	602	5	-	4/4/4/4	-
3	OXL	H	602	5	-	4/4/4/4	-
2	FBP	C	601	-	-	2/13/32/32	0/1/1/1
7	EDO	H	603	-	-	0/1/1/1	-
2	FBP	B	601	-	-	2/13/32/32	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FBP	E	601	-	-	2/13/32/32	0/1/1/1
7	EDO	B	603	-	-	0/1/1/1	-
2	FBP	D	601	-	-	2/13/32/32	0/1/1/1
7	EDO	G	603	-	-	0/1/1/1	-
7	EDO	F	604	-	-	0/1/1/1	-
2	FBP	H	601	-	-	2/13/32/32	0/1/1/1
4	WVF	E	604	-	-	0/24/24/24	0/4/4/4
3	OXL	F	602	5	-	0/4/4/4	-
3	OXL	E	602	5	-	4/4/4/4	-
7	EDO	D	603	-	-	0/1/1/1	-
4	WVF	F	603	-	-	0/24/24/24	0/4/4/4
7	EDO	E	603	-	-	1/1/1/1	-
4	WVF	B	604	-	-	0/24/24/24	0/4/4/4
3	OXL	G	602	5	-	4/4/4/4	-
3	OXL	A	602	5	-	4/4/4/4	-
2	FBP	G	601	-	-	2/13/32/32	0/1/1/1
7	EDO	C	603	-	-	0/1/1/1	-
3	OXL	B	602	5	-	4/4/4/4	-
3	OXL	D	602	5	-	4/4/4/4	-
4	WVF	A	603	-	-	0/24/24/24	0/4/4/4
2	FBP	A	601	-	-	2/13/32/32	0/1/1/1
2	FBP	F	601	-	-	2/13/32/32	0/1/1/1

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	602	OXL	O2-C2	4.84	1.34	1.22
3	B	602	OXL	O2-C2	4.11	1.32	1.22
3	F	602	OXL	O2-C2	3.98	1.32	1.22
3	E	602	OXL	O4-C2	-3.51	1.21	1.30
3	A	602	OXL	O2-C2	3.47	1.31	1.22
3	D	602	OXL	O2-C2	3.42	1.31	1.22
3	C	602	OXL	O2-C2	3.41	1.31	1.22
3	E	602	OXL	O2-C2	3.12	1.30	1.22
3	D	602	OXL	O4-C2	-2.96	1.22	1.30
3	H	602	OXL	O4-C2	-2.93	1.22	1.30
3	B	602	OXL	O4-C2	-2.72	1.23	1.30
3	H	602	OXL	O2-C2	2.48	1.28	1.22
3	G	602	OXL	O4-C2	-2.42	1.24	1.30
3	A	602	OXL	O4-C2	-2.17	1.24	1.30

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	F	602	OXL	O4-C2-C1	4.47	121.50	112.83
3	C	602	OXL	O4-C2-C1	4.38	121.33	112.83
3	A	602	OXL	O4-C2-C1	4.34	121.24	112.83
3	H	602	OXL	O4-C2-C1	3.88	120.35	112.83
3	D	602	OXL	O4-C2-C1	3.19	119.01	112.83
2	D	601	FBP	O6-P2-O4P	2.97	114.48	106.44
3	F	602	OXL	O2-C2-C1	-2.96	114.46	120.63
3	D	602	OXL	O3-C1-C2	2.93	118.51	112.83
3	A	602	OXL	O2-C2-C1	-2.88	114.62	120.63
3	C	602	OXL	O2-C2-C1	-2.84	114.72	120.63
3	G	602	OXL	O4-C2-C1	2.71	118.09	112.83
3	B	602	OXL	O3-C1-C2	2.69	118.05	112.83
3	G	602	OXL	O3-C1-C2	2.60	117.88	112.83
3	B	602	OXL	O4-C2-C1	2.58	117.83	112.83
3	F	602	OXL	O3-C1-C2	2.53	117.74	112.83
3	E	602	OXL	O4-C2-C1	2.44	117.56	112.83
3	A	602	OXL	O3-C1-C2	2.38	117.45	112.83
2	H	601	FBP	O6-P2-O4P	2.34	112.76	106.44
3	H	602	OXL	O2-C2-C1	-2.06	116.35	120.63

There are no chirality outliers.

All (45) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	FBP	C4-C5-C6-O6
2	C	601	FBP	C4-C5-C6-O6
2	D	601	FBP	C4-C5-C6-O6
2	E	601	FBP	C4-C5-C6-O6
2	F	601	FBP	C4-C5-C6-O6
2	G	601	FBP	C4-C5-C6-O6
2	H	601	FBP	C4-C5-C6-O6
2	B	601	FBP	C4-C5-C6-O6
2	A	601	FBP	O5-C5-C6-O6
2	B	601	FBP	O5-C5-C6-O6
2	C	601	FBP	O5-C5-C6-O6
2	D	601	FBP	O5-C5-C6-O6
2	E	601	FBP	O5-C5-C6-O6
2	F	601	FBP	O5-C5-C6-O6
2	G	601	FBP	O5-C5-C6-O6
2	H	601	FBP	O5-C5-C6-O6
3	H	602	OXL	O3-C1-C2-O4

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Mol	Chain	Res	Type	Atoms
3	A	602	OXL	O3-C1-C2-O4
3	B	602	OXL	O3-C1-C2-O4
3	C	602	OXL	O3-C1-C2-O4
3	G	602	OXL	O3-C1-C2-O4
3	A	602	OXL	O1-C1-C2-O2
3	B	602	OXL	O1-C1-C2-O2
3	C	602	OXL	O1-C1-C2-O2
3	G	602	OXL	O1-C1-C2-O2
3	D	602	OXL	O3-C1-C2-O4
3	E	602	OXL	O3-C1-C2-O4
3	D	602	OXL	O1-C1-C2-O2
3	E	602	OXL	O1-C1-C2-O2
3	H	602	OXL	O1-C1-C2-O2
3	A	602	OXL	O3-C1-C2-O2
3	B	602	OXL	O1-C1-C2-O4
3	A	602	OXL	O1-C1-C2-O4
3	B	602	OXL	O3-C1-C2-O2
3	C	602	OXL	O1-C1-C2-O4
3	C	602	OXL	O3-C1-C2-O2
3	G	602	OXL	O1-C1-C2-O4
3	G	602	OXL	O3-C1-C2-O2
7	E	603	EDO	O1-C1-C2-O2
3	D	602	OXL	O1-C1-C2-O4
3	D	602	OXL	O3-C1-C2-O2
3	E	602	OXL	O3-C1-C2-O2
3	H	602	OXL	O1-C1-C2-O4
3	E	602	OXL	O1-C1-C2-O4
3	H	602	OXL	O3-C1-C2-O2

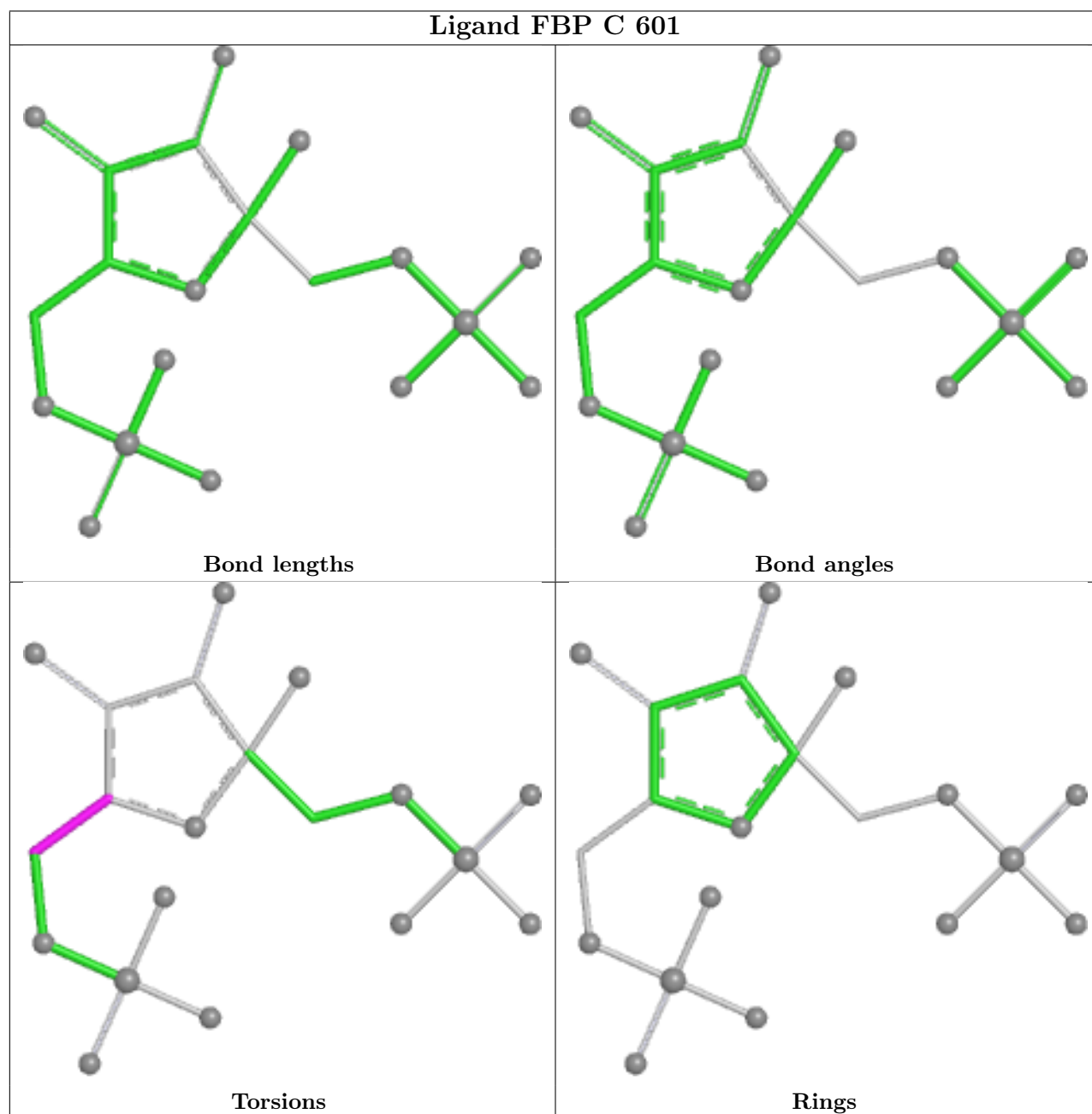
There are no ring outliers.

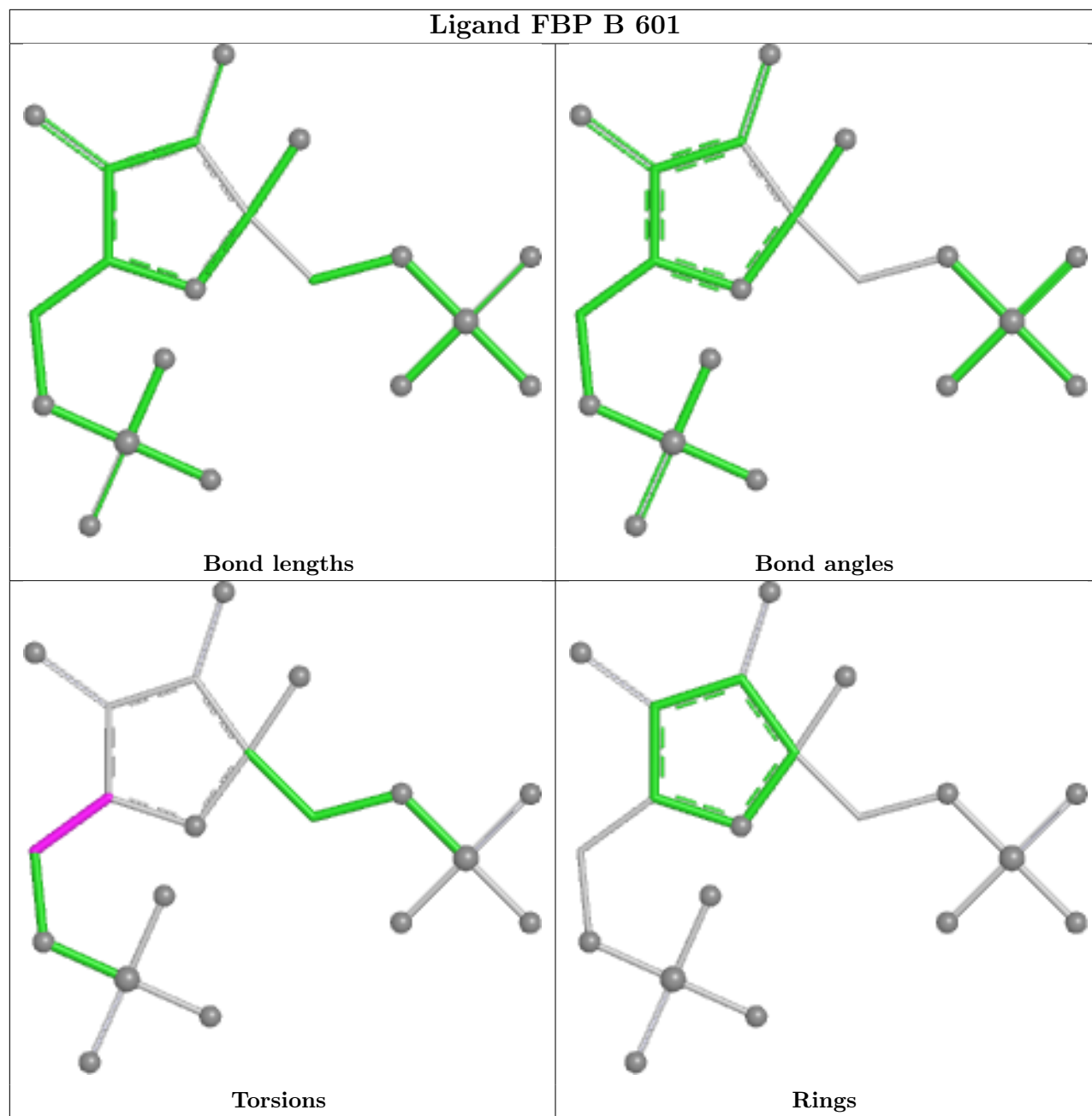
2 monomers are involved in 2 short contacts:

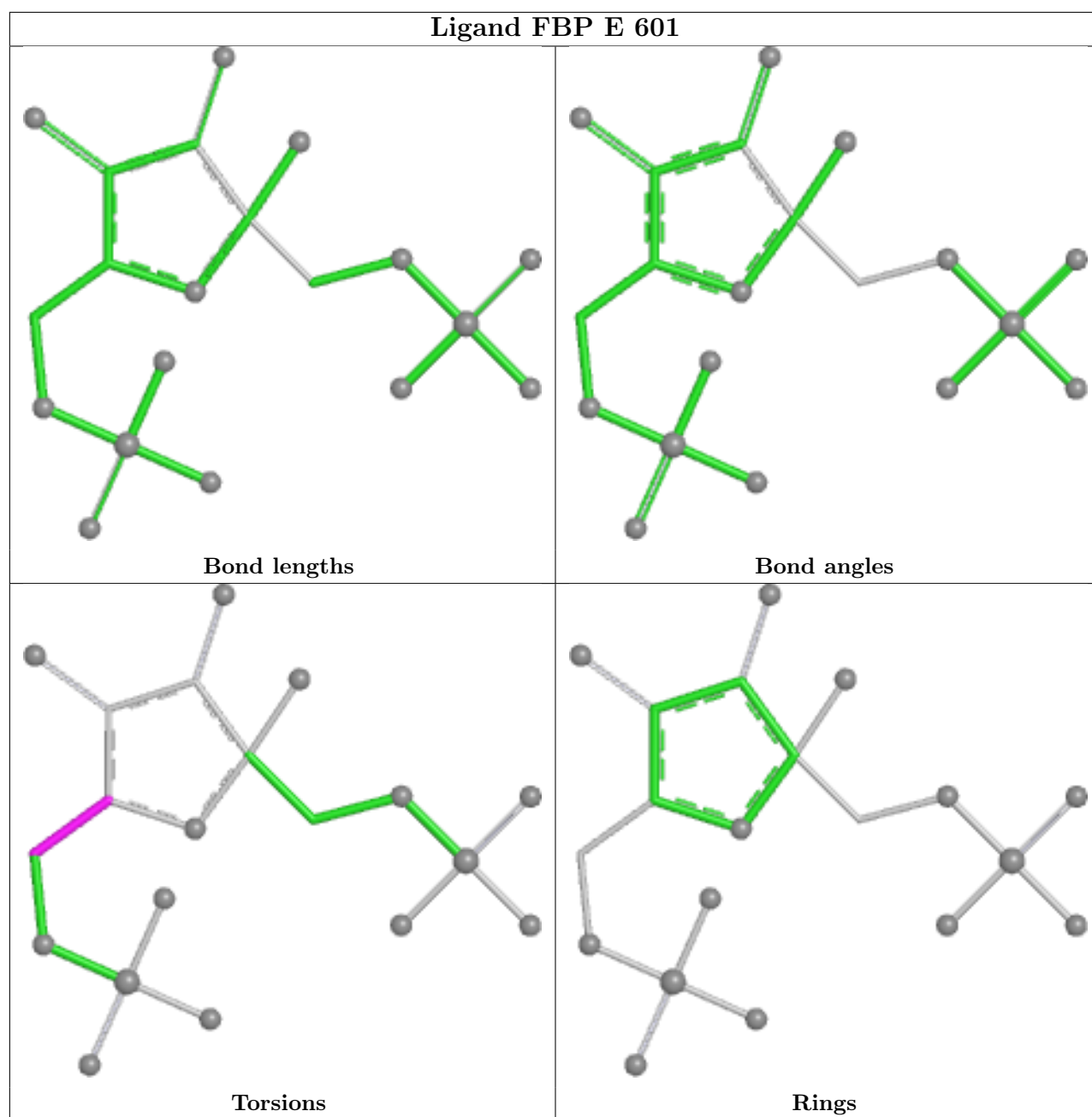
Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	G	603	EDO	1	0
7	F	604	EDO	1	0

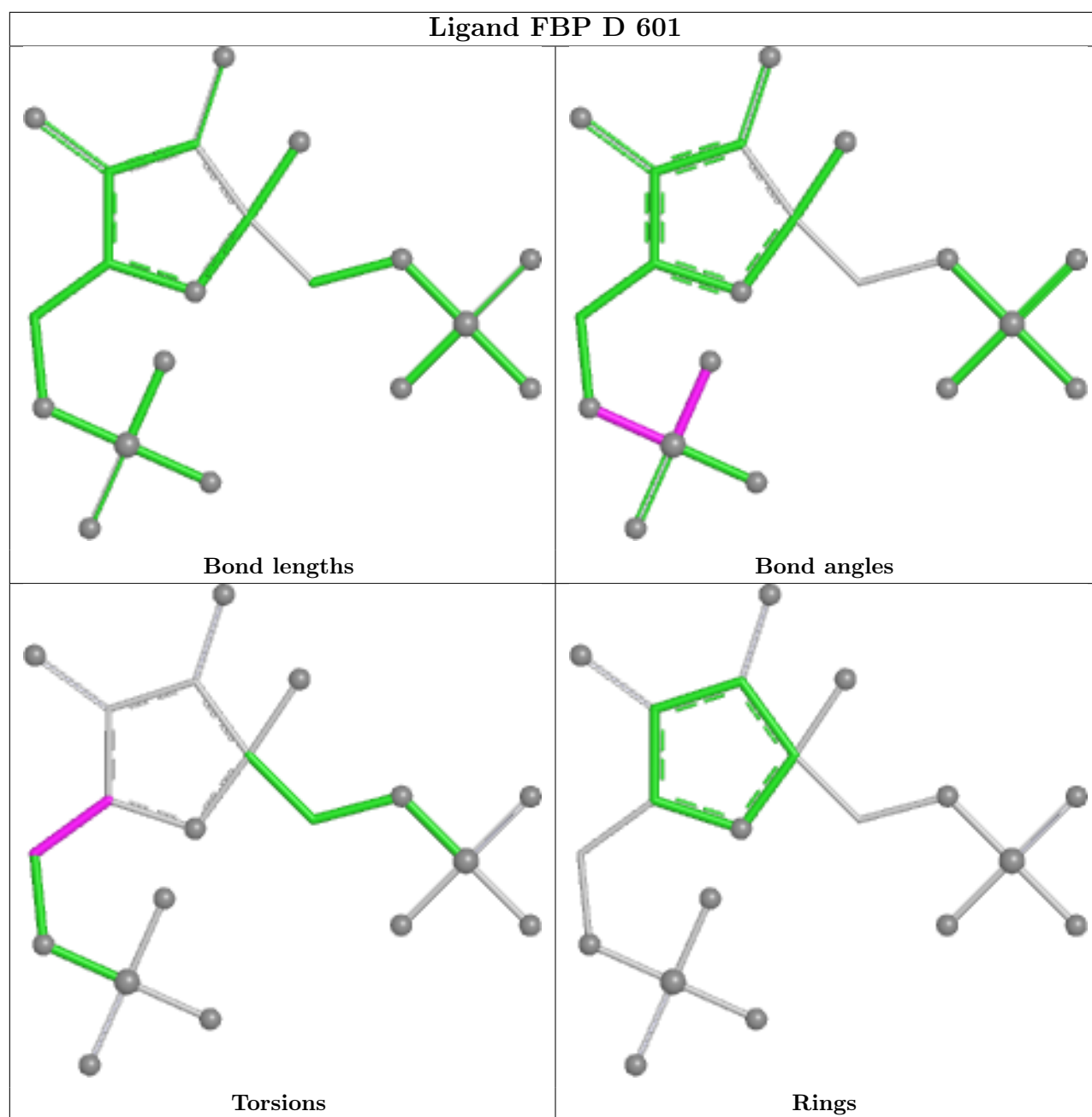
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

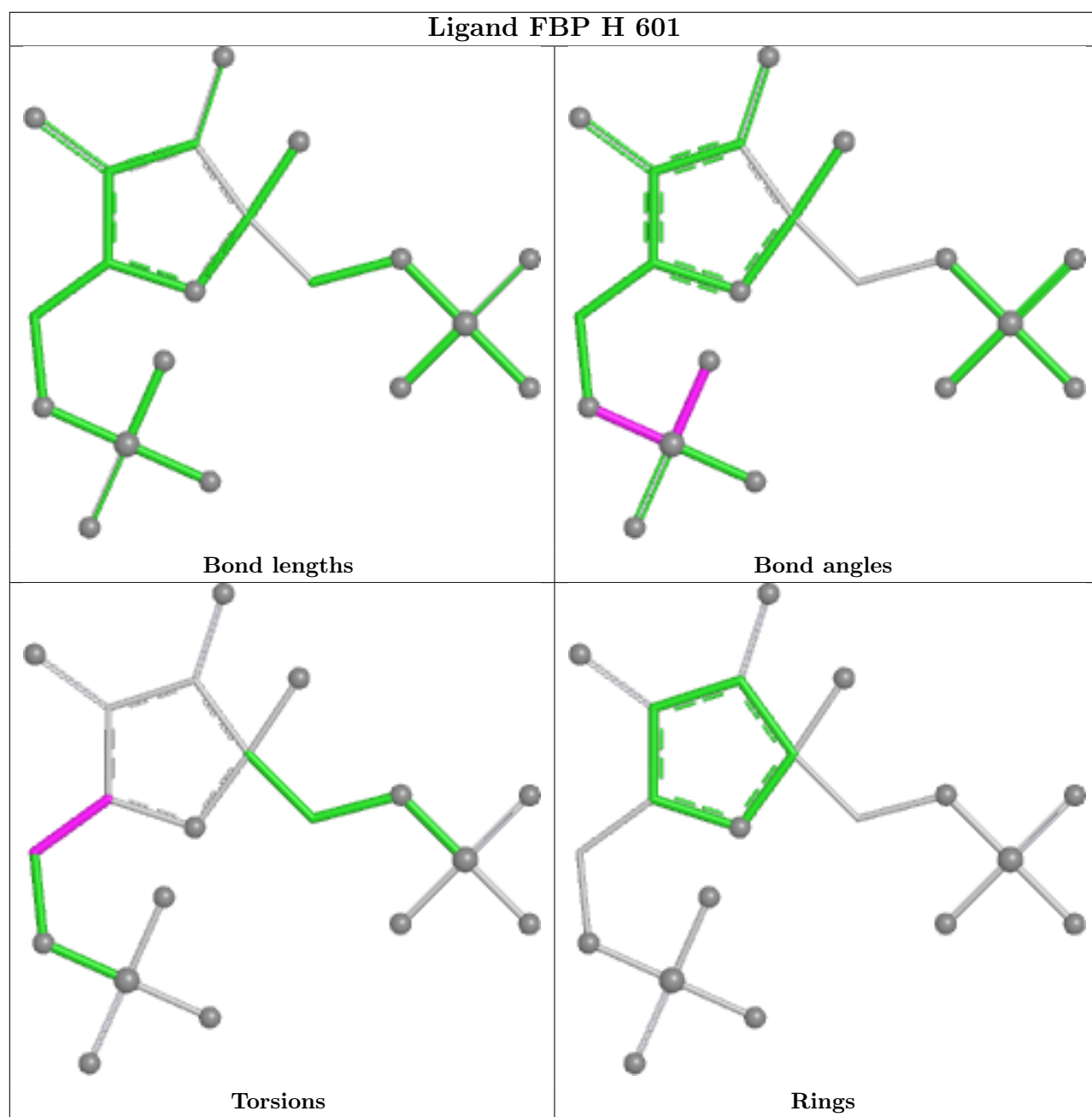
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.

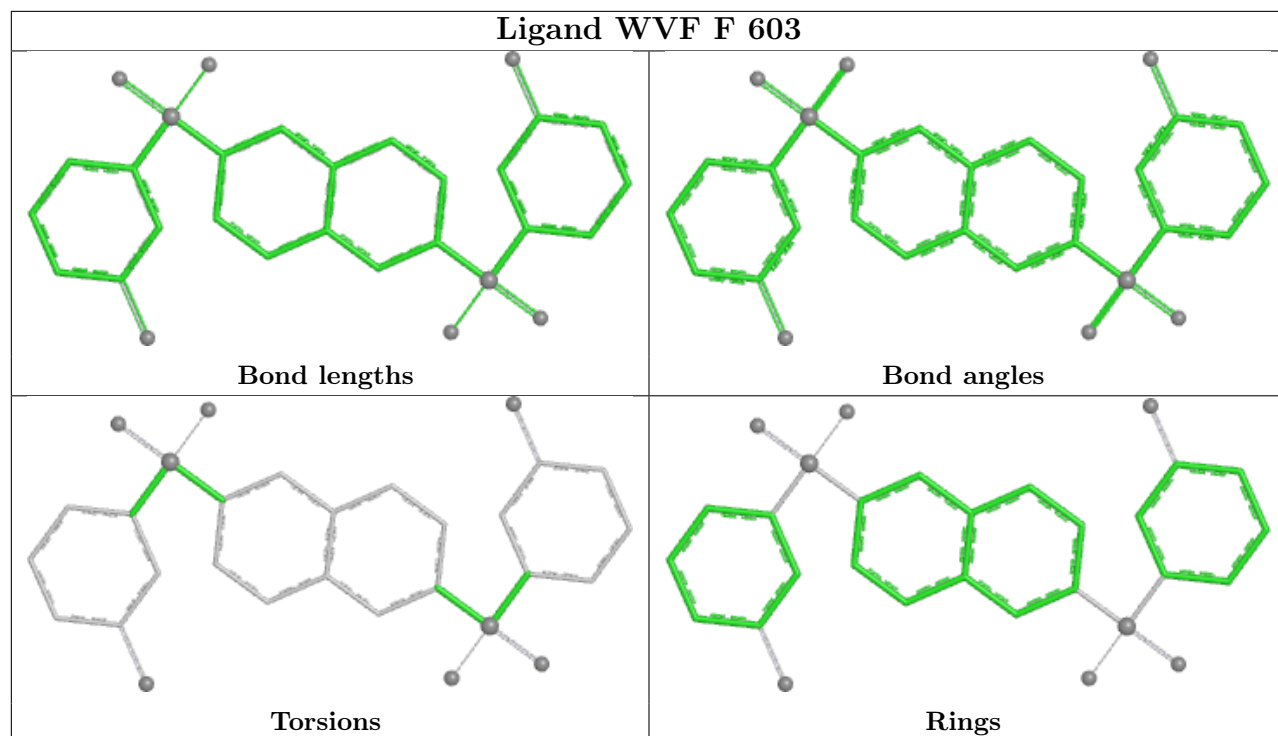
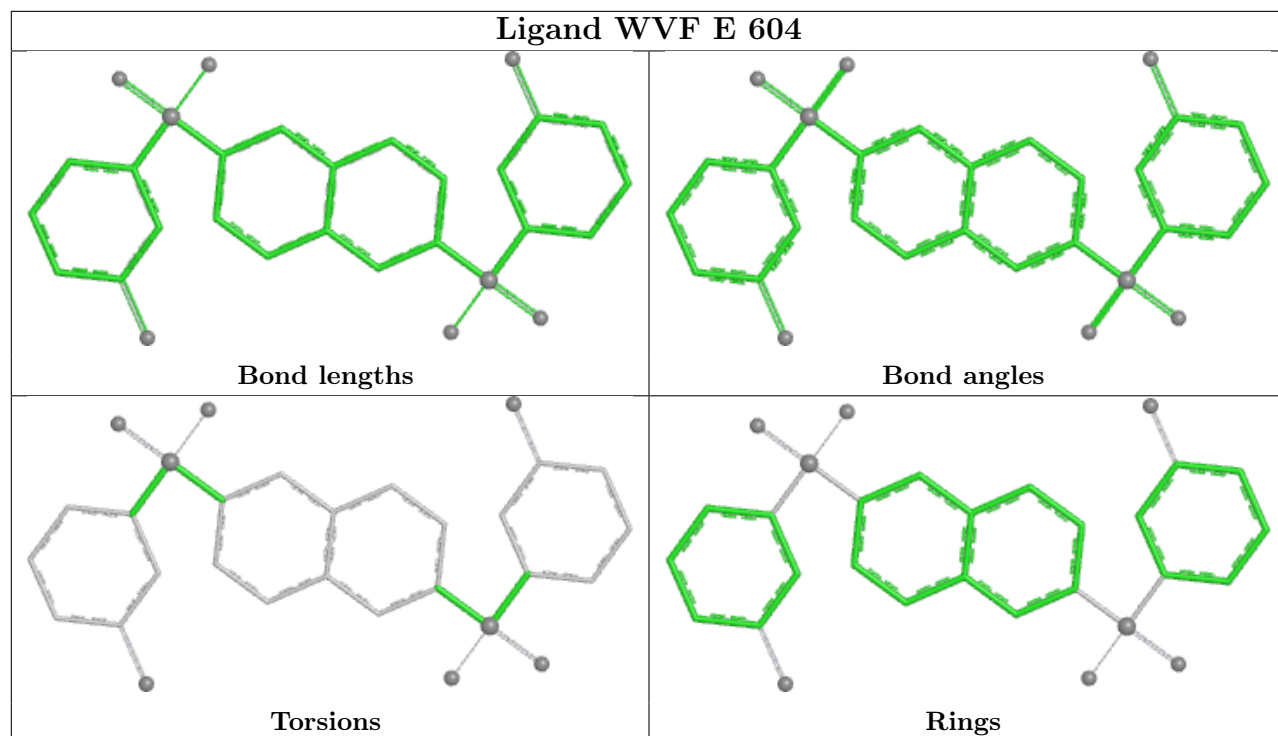


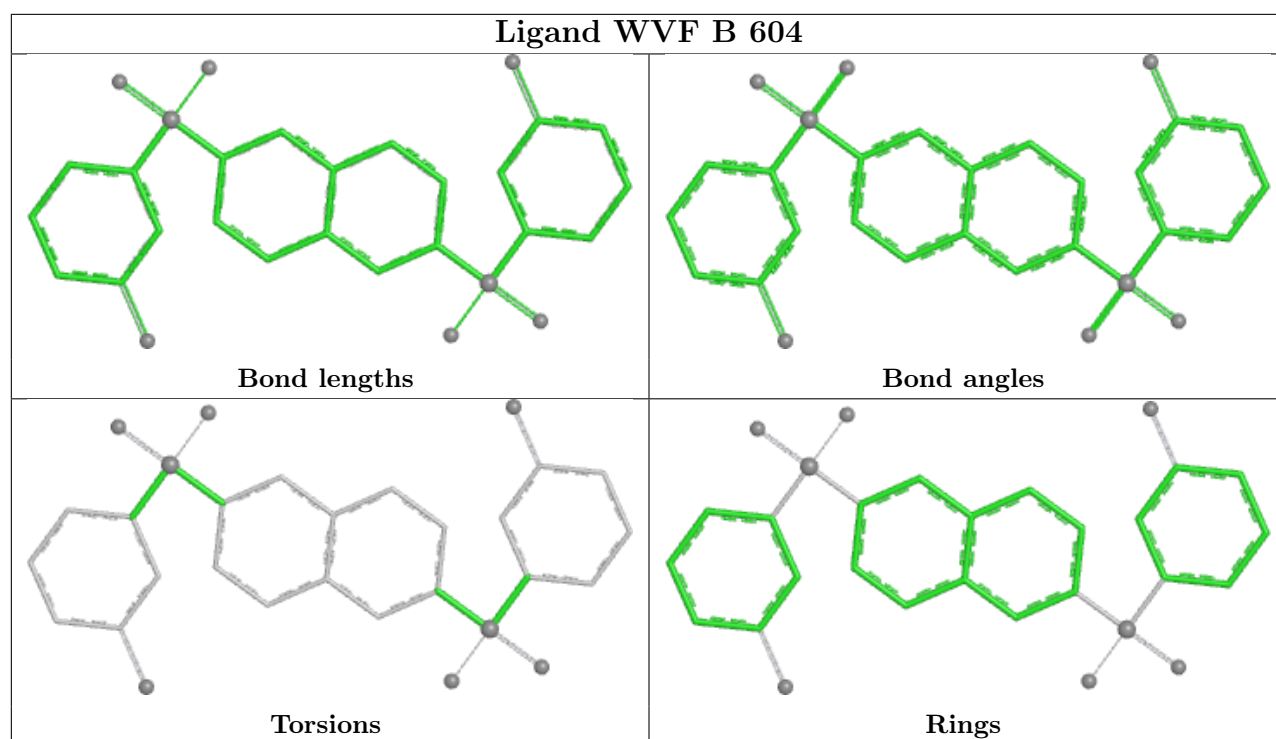


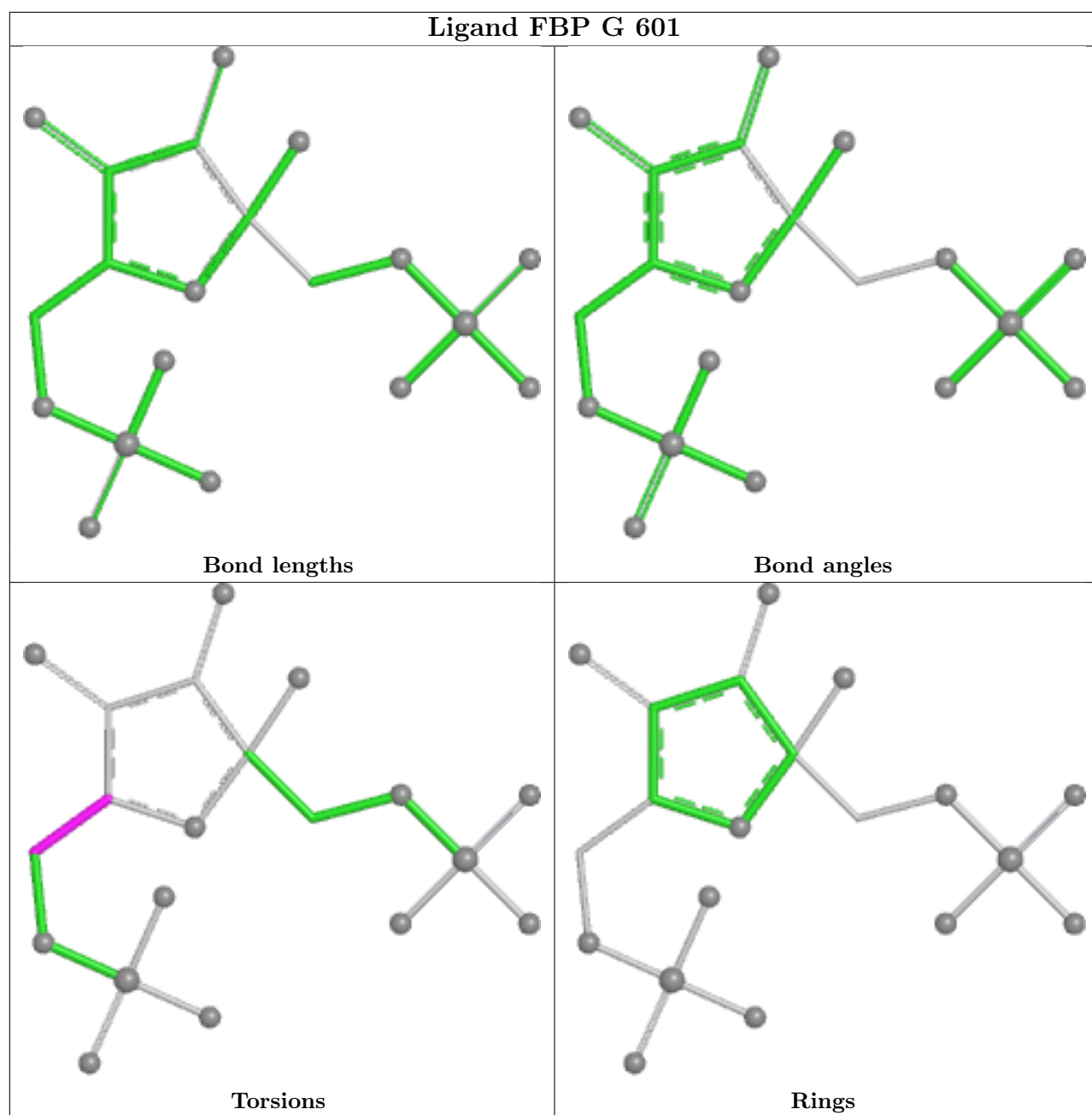


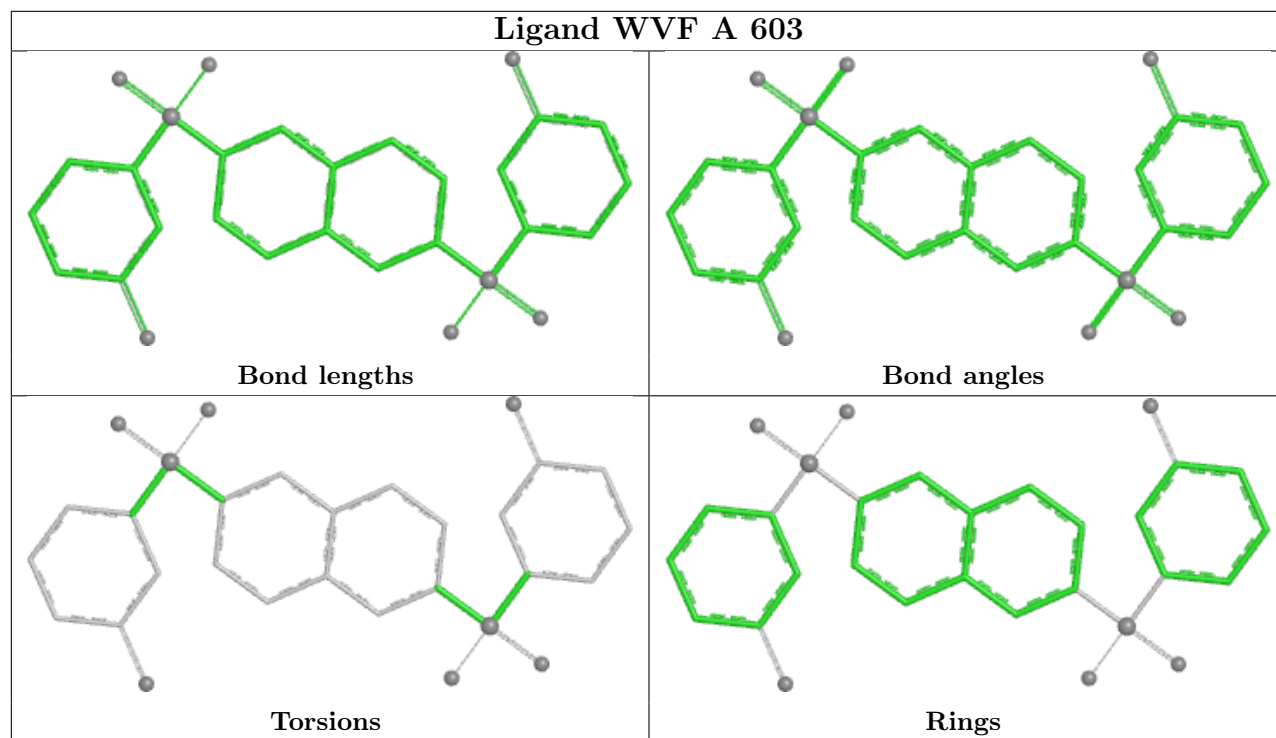


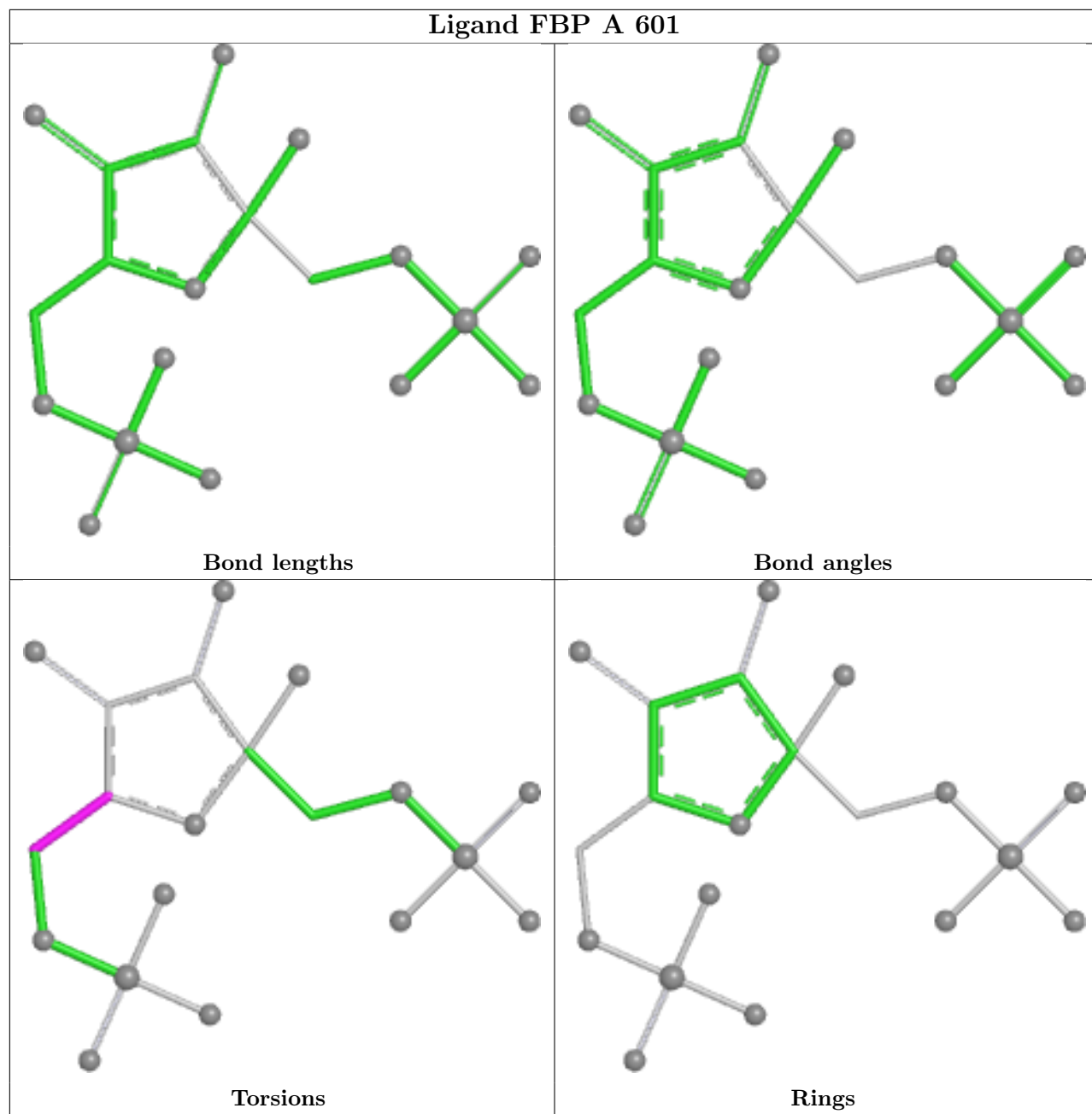


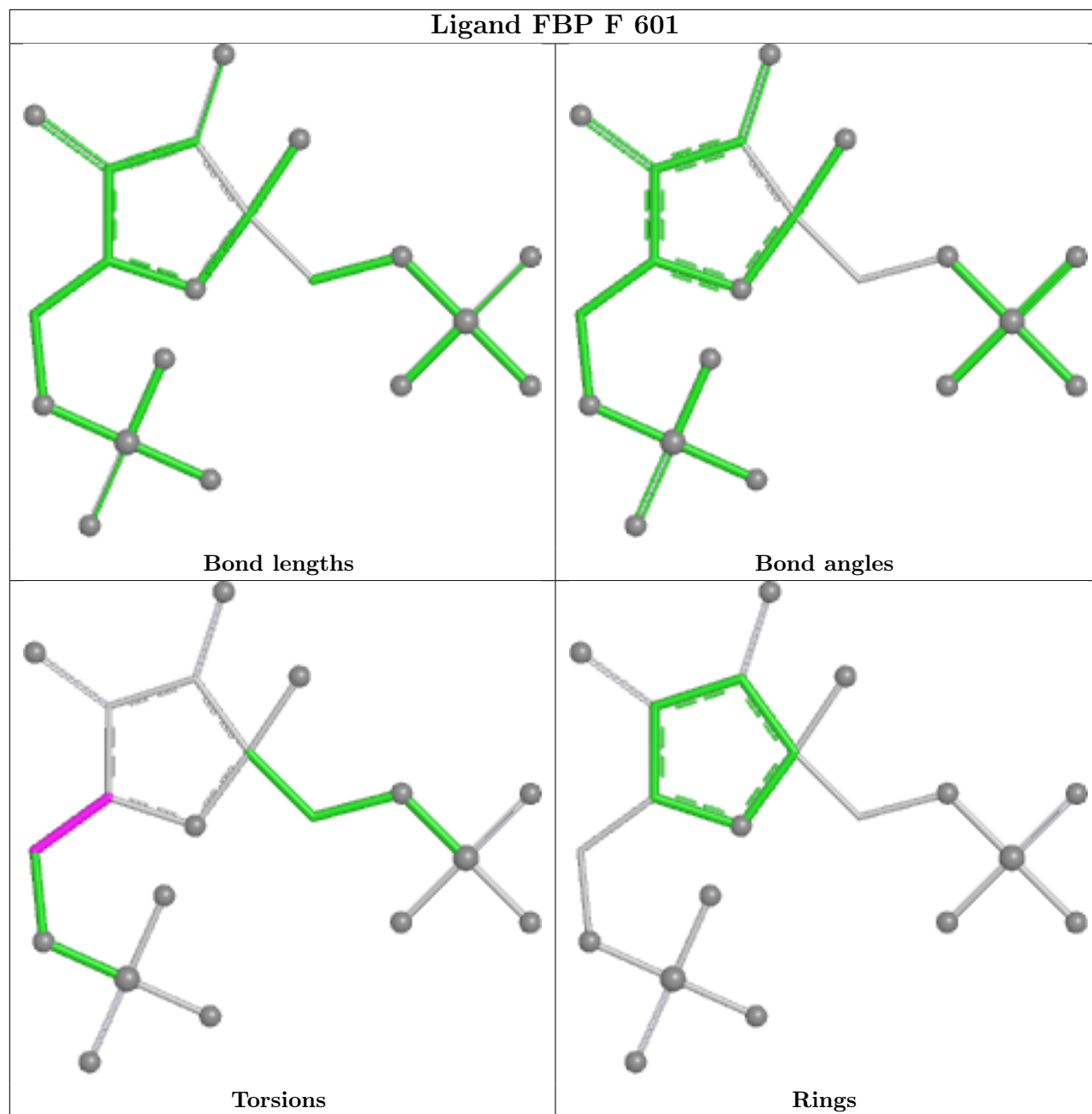












5.7 Other polymers [i](#)

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	421/447 (94%)	0.74	43 (10%) 12 14	20, 42, 68, 84	13 (3%)
1	B	436/447 (97%)	0.80	57 (13%) 7 8	19, 42, 72, 82	8 (1%)
1	C	425/447 (95%)	0.16	20 (4%) 36 38	19, 34, 53, 85	10 (2%)
1	D	425/447 (95%)	-0.07	12 (2%) 55 59	17, 30, 50, 82	8 (1%)
1	E	419/447 (93%)	0.50	27 (6%) 25 28	20, 39, 65, 80	14 (3%)
1	F	433/447 (96%)	0.40	28 (6%) 25 27	19, 37, 60, 79	8 (1%)
1	G	430/447 (96%)	0.07	19 (4%) 39 42	18, 32, 51, 87	11 (2%)
1	H	425/447 (95%)	-0.16	15 (3%) 47 52	15, 28, 49, 72	9 (2%)
All	All	3414/3576 (95%)	0.31	221 (6%) 25 27	15, 35, 63, 87	81 (2%)

All (221) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	173	GLY	6.6
1	C	173	GLY	6.0
1	F	133	PRO	5.8
1	C	133	PRO	5.7
1	A	25	PHE	5.6
1	B	445	SER	5.5
1	G	16	LEU	5.2
1	B	413	LEU	5.0
1	E	177[A]	HIS	5.0
1	H	21	GLY	4.8
1	A	132	GLY	4.4
1	D	25	PHE	4.4
1	E	25	PHE	4.3
1	D	21	GLY	4.2
1	G	177[A]	HIS	4.2
1	B	115	LEU	4.2

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Mol	Chain	Res	Type	RSRZ
1	B	415	GLY	4.1
1	A	169[A]	ARG	4.1
1	A	445	SER	4.0
1	E	114	PRO	4.0
1	C	20	LEU	4.0
1	A	112	GLY	3.9
1	F	418	ARG	3.8
1	D	23	ALA	3.8
1	B	169[A]	ARG	3.8
1	C	177[A]	HIS	3.7
1	A	113	SER	3.7
1	A	402	ARG	3.7
1	A	34	MET	3.7
1	D	34	MET	3.7
1	D	24	PHE	3.7
1	A	115	LEU	3.6
1	B	391	PRO	3.6
1	D	177[A]	HIS	3.6
1	C	134	GLY	3.5
1	B	392	PRO	3.5
1	E	134	GLY	3.4
1	G	20	LEU	3.4
1	A	313	ARG	3.4
1	F	169[A]	ARG	3.4
1	G	131	SER	3.3
1	A	140	VAL	3.3
1	E	115	LEU	3.3
1	H	25	PHE	3.3
1	F	391	PRO	3.3
1	B	419	VAL	3.3
1	D	22	THR	3.2
1	F	392	PRO	3.2
1	A	416	PHE	3.2
1	G	25	PHE	3.2
1	H	22	THR	3.2
1	B	318	LEU	3.2
1	B	114	PRO	3.1
1	B	418	ARG	3.1
1	B	70	VAL	3.1
1	G	17	THR	3.1
1	E	416	PHE	3.1
1	A	135	LEU	3.0

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Mol	Chain	Res	Type	RSRZ
1	F	414	ARG	3.0
1	E	129	PRO	3.0
1	B	313	ARG	3.0
1	A	70	VAL	3.0
1	E	112	GLY	3.0
1	B	316	ALA	3.0
1	B	412	LYS	3.0
1	B	414	ARG	3.0
1	A	172	LEU	2.9
1	B	135	LEU	2.9
1	B	95	TYR	2.9
1	A	23	ALA	2.9
1	A	95	TYR	2.9
1	C	22	THR	2.9
1	G	34	MET	2.9
1	H	34	MET	2.9
1	E	116	SER	2.9
1	B	406	PHE	2.9
1	C	25	PHE	2.9
1	C	34	MET	2.9
1	C	21	GLY	2.9
1	H	418	ARG	2.8
1	B	408	ILE	2.8
1	A	116	SER	2.8
1	H	23	ALA	2.8
1	B	411	GLY	2.8
1	F	115	LEU	2.8
1	F	253	ARG	2.8
1	G	130	GLY	2.7
1	F	318	LEU	2.7
1	E	23	ALA	2.7
1	F	134	GLY	2.7
1	F	135	LEU	2.7
1	A	213	ILE	2.7
1	E	26	GLN	2.7
1	G	174	PRO	2.7
1	E	111	ALA	2.6
1	B	118	ARG	2.6
1	G	116[A]	SER	2.6
1	B	90	HIS	2.6
1	E	444	ILE	2.6
1	E	34	MET	2.6

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Mol	Chain	Res	Type	RSRZ
1	F	390	GLU	2.6
1	A	314	ARG	2.6
1	D	314	ARG	2.6
1	E	169[A]	ARG	2.6
1	F	314	ARG	2.6
1	H	144[A]	ARG	2.6
1	A	328	ILE	2.6
1	B	130	GLY	2.6
1	B	280	ALA	2.5
1	A	151	VAL	2.5
1	B	250	THR	2.5
1	C	174	PRO	2.5
1	G	129	PRO	2.5
1	A	24	PHE	2.5
1	B	444	ILE	2.5
1	A	177	HIS	2.5
1	B	144	ARG	2.5
1	B	177	HIS	2.5
1	C	313	ARG	2.5
1	B	386	LEU	2.5
1	C	172[A]	LEU	2.5
1	E	113	SER	2.5
1	B	133	PRO	2.5
1	E	392	PRO	2.5
1	C	314	ARG	2.4
1	F	409	GLU	2.4
1	F	281	LYS	2.4
1	G	22	THR	2.4
1	F	129	PRO	2.4
1	H	314	ARG	2.4
1	B	128	GLY	2.4
1	B	145	PHE	2.4
1	E	144	ARG	2.4
1	A	165	VAL	2.4
1	H	445	SER	2.4
1	E	135	LEU	2.4
1	F	386	LEU	2.4
1	A	88	PHE	2.4
1	A	398	ASP	2.4
1	E	158	PHE	2.4
1	F	394	ALA	2.4
1	E	128	GLY	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	410	SER	2.4
1	A	306	ARG	2.3
1	E	253	ARG	2.3
1	B	138	GLN	2.3
1	C	18	GLN	2.3
1	D	133	PRO	2.3
1	A	144	ARG	2.3
1	B	387	LEU	2.3
1	A	145	PHE	2.3
1	F	177	HIS	2.3
1	A	73	LEU	2.3
1	B	106	ALA	2.3
1	B	317	PRO	2.3
1	F	389	ARG	2.3
1	A	26	GLN	2.3
1	A	417	LEU	2.3
1	A	111	ALA	2.2
1	A	128	GLY	2.2
1	C	114	PRO	2.2
1	C	117	TYR	2.2
1	D	134	GLY	2.2
1	F	112	GLY	2.2
1	F	317	PRO	2.2
1	H	133	PRO	2.2
1	F	401	ASP	2.2
1	A	118	ARG	2.2
1	B	86	LEU	2.2
1	H	416	PHE	2.2
1	G	314	ARG	2.2
1	B	119	PRO	2.2
1	A	373	ALA	2.2
1	B	97	ALA	2.2
1	B	170	ALA	2.2
1	B	110	PHE	2.2
1	B	10	ARG	2.2
1	B	168	VAL	2.2
1	D	131	SER	2.2
1	G	21	GLY	2.2
1	F	313	ARG	2.2
1	A	310	GLU	2.1
1	F	406	PHE	2.1
1	A	30	LEU	2.1

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Mol	Chain	Res	Type	RSRZ
1	F	310	GLU	2.1
1	H	177[A]	HIS	2.1
1	B	315	ALA	2.1
1	E	24	PHE	2.1
1	G	26	GLN	2.1
1	B	395	ILE	2.1
1	E	443[A]	SER	2.1
1	B	159	VAL	2.1
1	B	404	VAL	2.1
1	E	147	VAL	2.1
1	H	175	GLU	2.1
1	A	174	PRO	2.1
1	B	66	ALA	2.1
1	B	397	ALA	2.1
1	E	171	ALA	2.1
1	C	253	ARG	2.1
1	F	118	ARG	2.1
1	G	313	ARG	2.1
1	G	418	ARG	2.1
1	B	178	GLY	2.1
1	B	107	VAL	2.1
1	E	140	VAL	2.1
1	C	27	GLN	2.1
1	H	33	ALA	2.1
1	D	144[A]	ARG	2.1
1	B	158	PHE	2.0
1	C	113	SER	2.0
1	G	213	ILE	2.0
1	A	173	GLY	2.0
1	H	317	PRO	2.0
1	A	396	TRP	2.0
1	B	394	ALA	2.0
1	F	144	ARG	2.0
1	B	99	SER	2.0
1	B	113	SER	2.0
1	A	117	TYR	2.0
1	C	129	PRO	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 ⓘ

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.

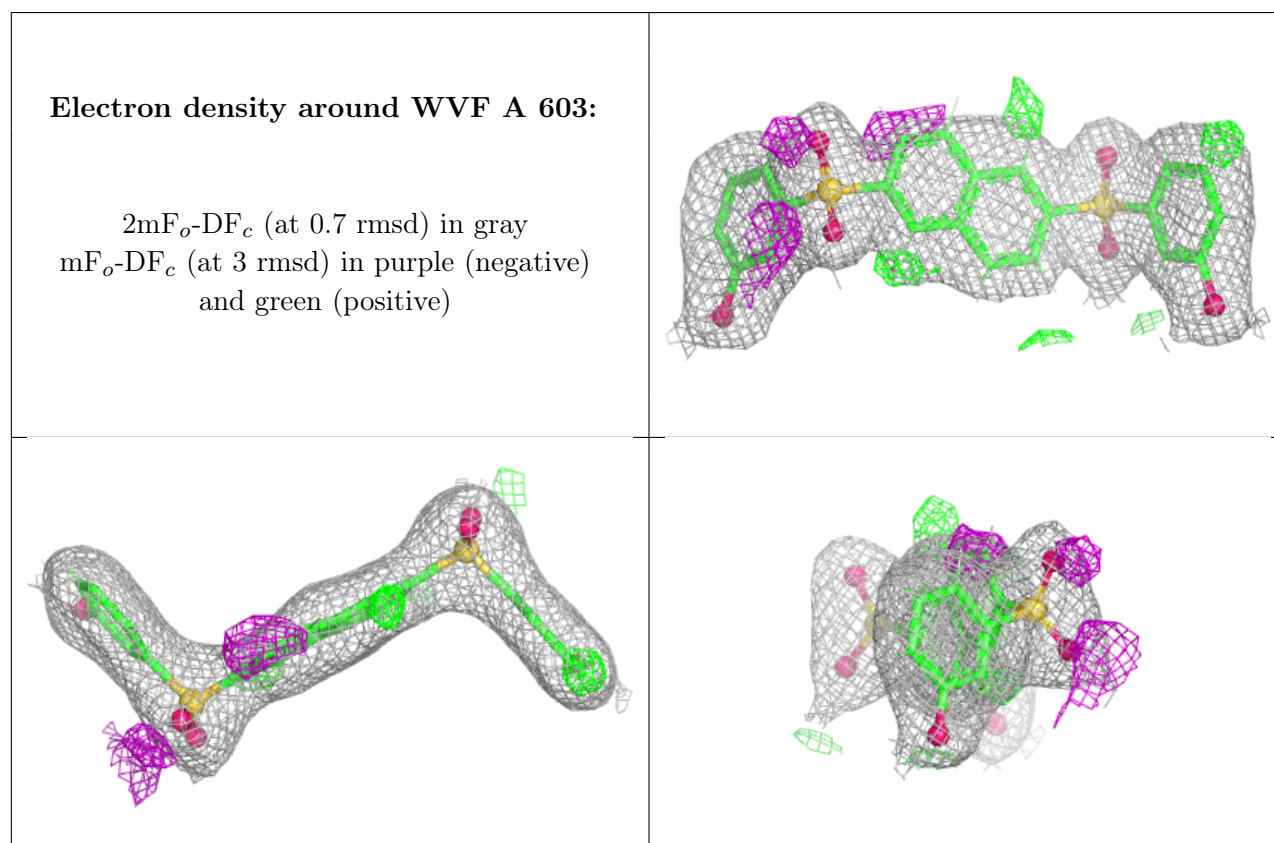
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	OXL	E	602	6/6	0.88	0.11	48,49,49,49	0
5	MG	B	605	1/1	0.89	0.12	50,50,50,50	0
3	OXL	F	602	6/6	0.91	0.10	43,44,46,47	0
7	EDO	E	603	4/4	0.91	0.12	44,45,45,45	6
3	OXL	A	602	6/6	0.93	0.08	48,49,49,50	0
3	OXL	C	602	6/6	0.94	0.08	42,43,44,45	0
3	OXL	D	602	6/6	0.94	0.07	35,36,38,38	0
7	EDO	D	603	4/4	0.94	0.11	39,39,40,40	6
3	OXL	B	602	6/6	0.94	0.08	41,43,45,46	0
7	EDO	G	603	4/4	0.94	0.10	38,38,40,40	6
7	EDO	H	603	4/4	0.94	0.13	35,35,36,36	6
3	OXL	H	602	6/6	0.95	0.07	35,36,36,37	0
3	OXL	G	602	6/6	0.95	0.07	39,40,41,42	0
6	K	A	605	1/1	0.95	0.09	72,72,72,72	0
7	EDO	B	603	4/4	0.95	0.10	35,36,38,38	6
4	WVF	A	603	30/30	0.96	0.08	27,31,35,35	16
6	K	C	605	1/1	0.96	0.12	57,57,57,57	0
7	EDO	F	604	4/4	0.96	0.09	37,37,38,38	6
2	FBP	B	601	20/20	0.96	0.07	39,40,44,45	0
7	EDO	C	603	4/4	0.96	0.08	33,33,34,34	6
6	K	F	606	1/1	0.97	0.10	72,72,72,72	0
6	K	G	605	1/1	0.97	0.12	57,57,57,57	0
4	WVF	E	604	30/30	0.97	0.07	30,33,35,36	16
4	WVF	F	603	30/30	0.97	0.07	28,32,35,35	16
2	FBP	F	601	20/20	0.97	0.06	34,39,44,44	0
2	FBP	A	601	20/20	0.97	0.06	37,39,40,40	0
6	K	B	606	1/1	0.97	0.08	58,58,58,58	0
4	WVF	B	604	30/30	0.97	0.07	27,31,33,33	16
6	K	E	606	1/1	0.97	0.15	71,71,71,71	0
2	FBP	E	601	20/20	0.98	0.05	33,35,37,37	0
6	K	H	605	1/1	0.98	0.11	47,47,47,47	0
2	FBP	G	601	20/20	0.98	0.04	23,26,28,29	0

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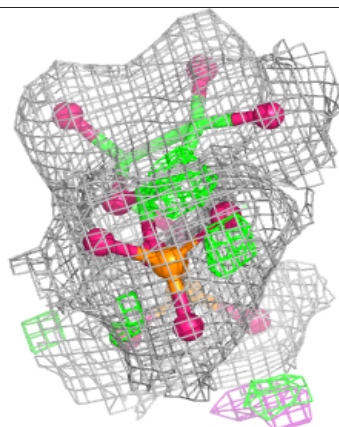
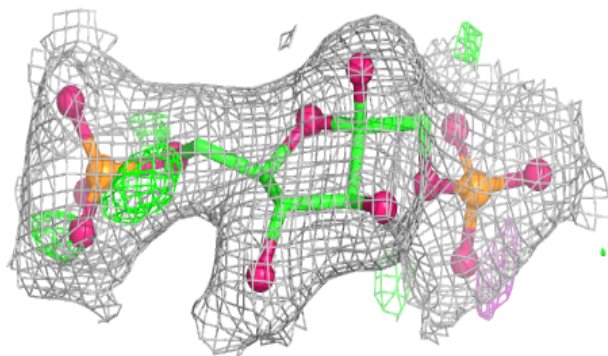
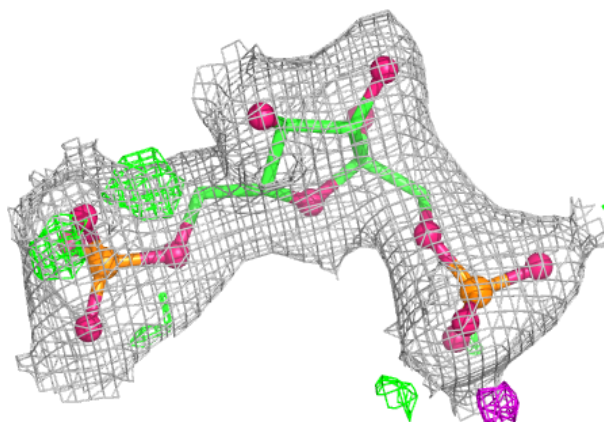
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
5	MG	E	605	1/1	0.99	0.03	40,40,40,40	0
5	MG	F	605	1/1	0.99	0.03	36,36,36,36	0
5	MG	G	604	1/1	0.99	0.03	33,33,33,33	0
2	FBP	C	601	20/20	0.99	0.03	25,26,31,33	0
2	FBP	H	601	20/20	0.99	0.04	22,24,26,27	0
5	MG	A	604	1/1	0.99	0.04	50,50,50,50	0
6	K	D	605	1/1	0.99	0.10	43,43,43,43	0
2	FBP	D	601	20/20	0.99	0.04	23,25,29,29	0
5	MG	C	604	1/1	0.99	0.03	37,37,37,37	0
5	MG	H	604	1/1	1.00	0.03	31,31,31,31	0
5	MG	D	604	1/1	1.00	0.02	35,35,35,35	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.

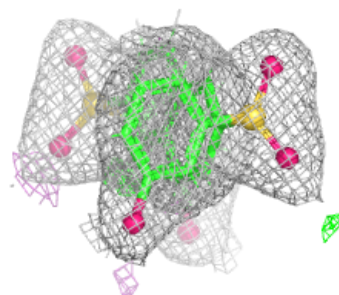
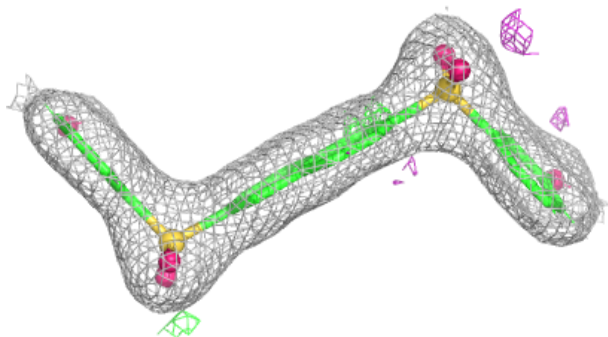
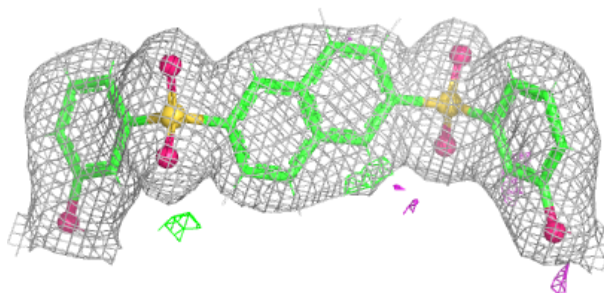


Electron density around FBP B 601:

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

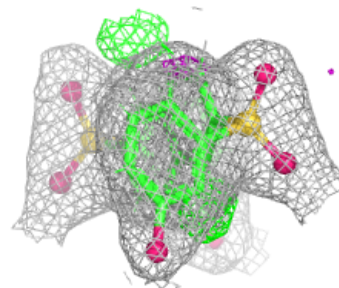
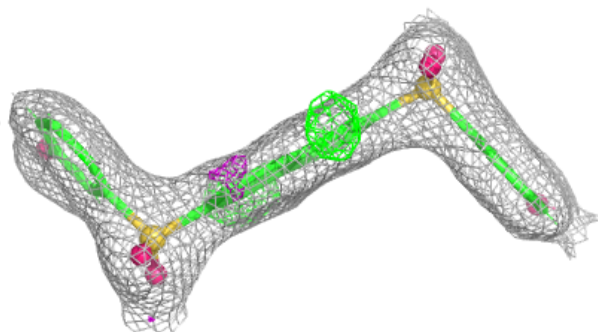
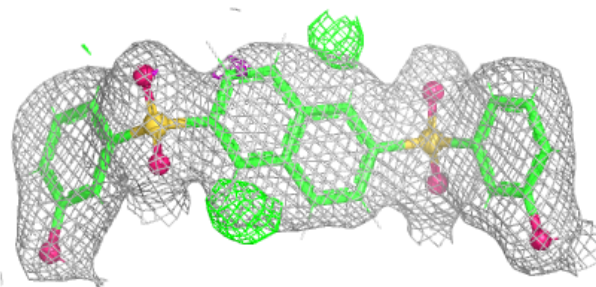
**Electron density around WVF E 604:**

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

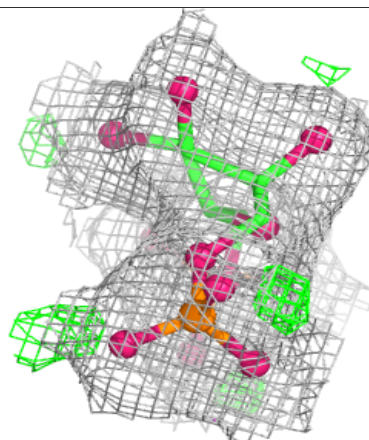
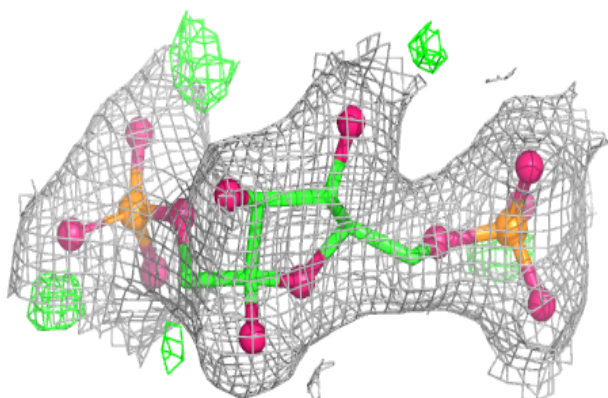
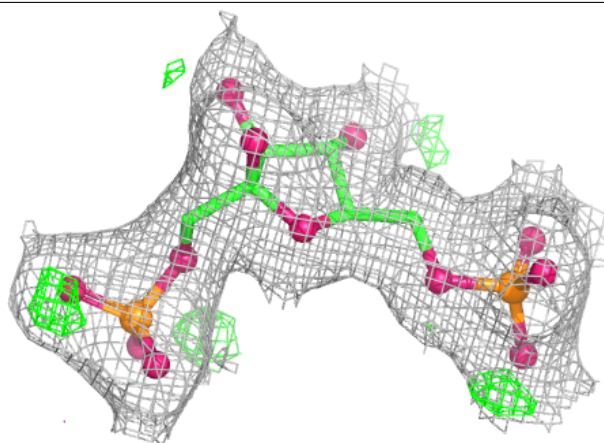


Electron density around WVF F 603:

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

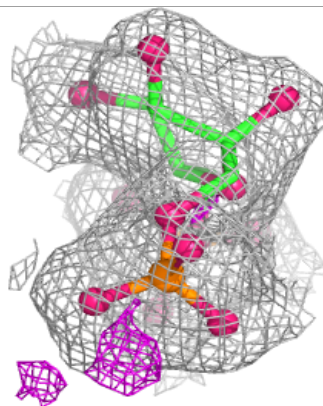
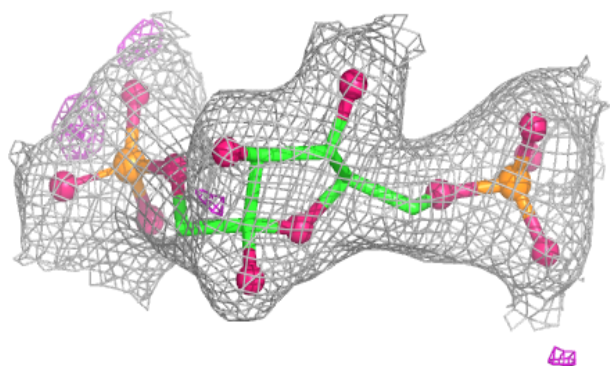
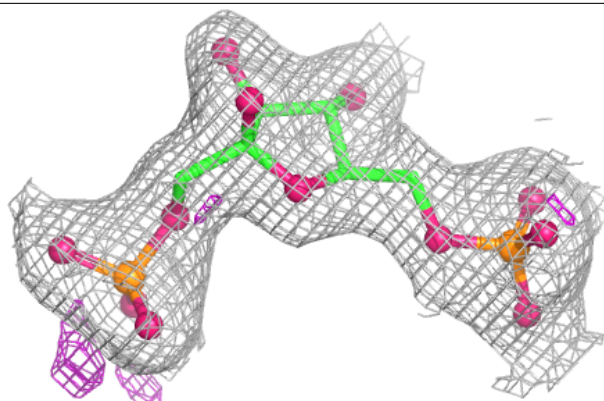
**Electron density around FBP F 601:**

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and green (positive)

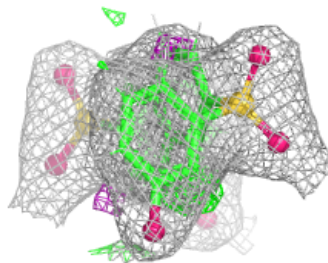
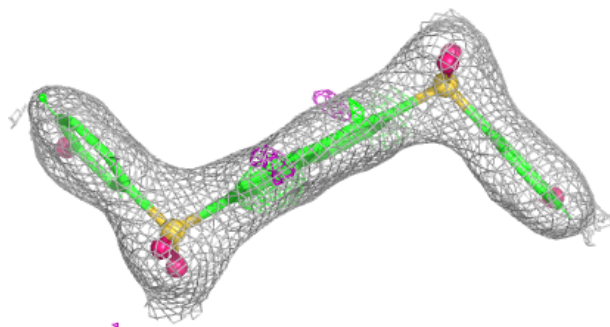
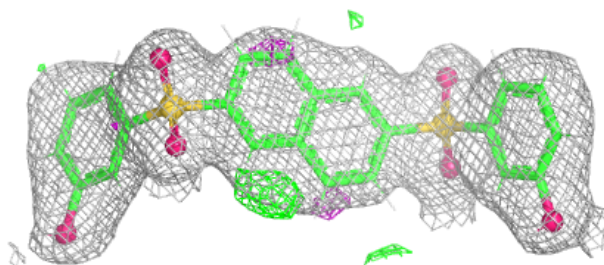


Electron density around FBP A 601:

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

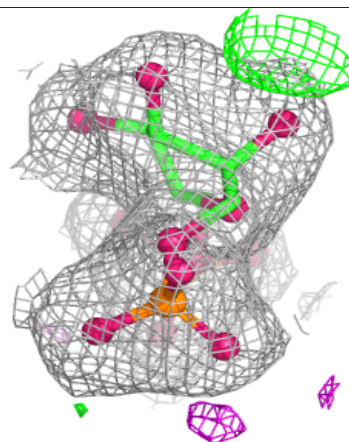
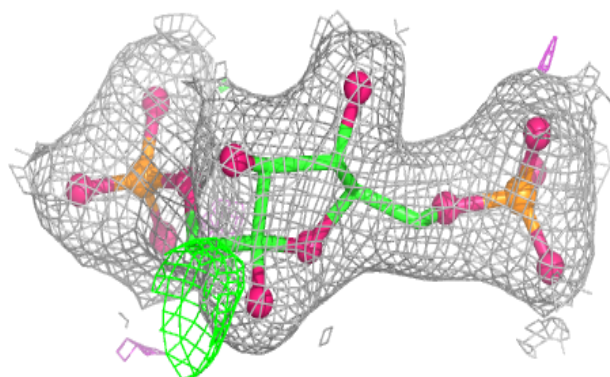
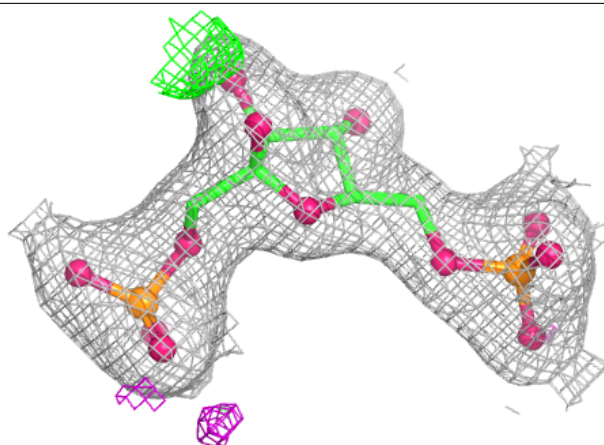
**Electron density around WVF B 604:**

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

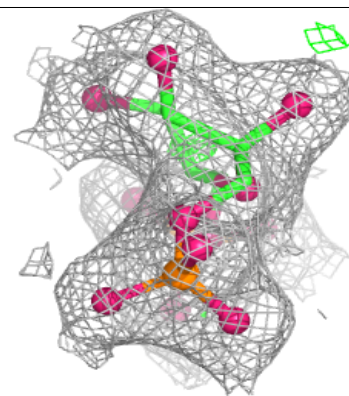
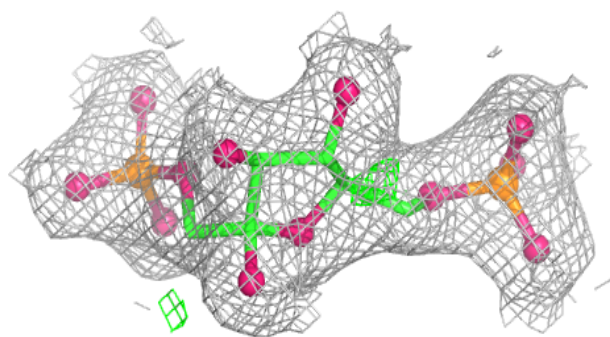
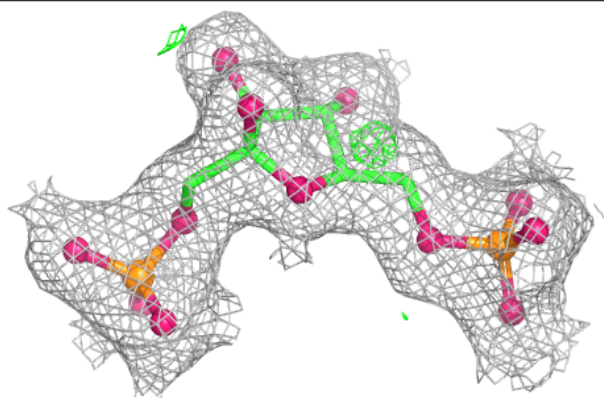


Electron density around FBP E 601:

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

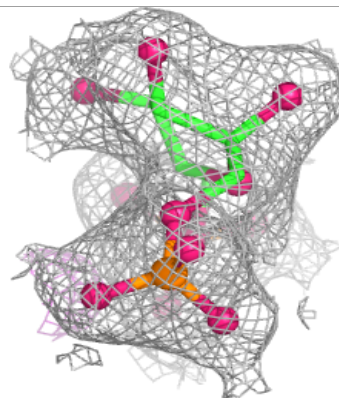
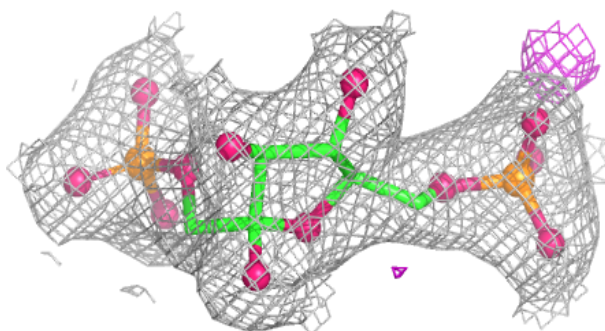
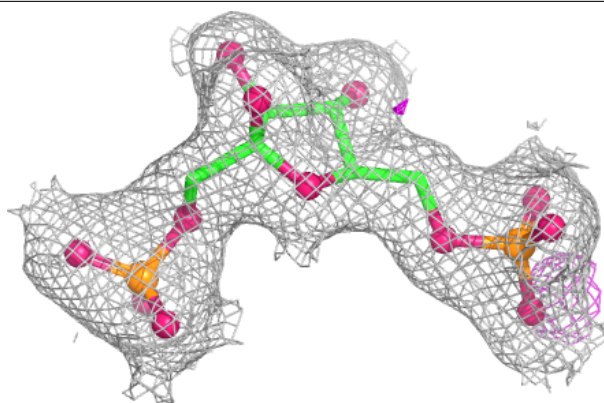
**Electron density around FBP G 601:**

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

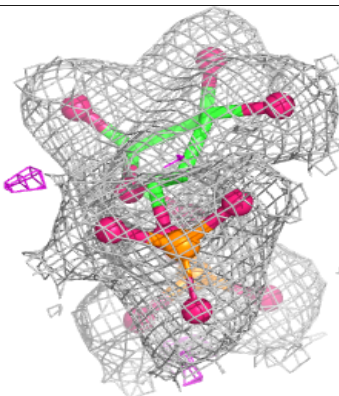
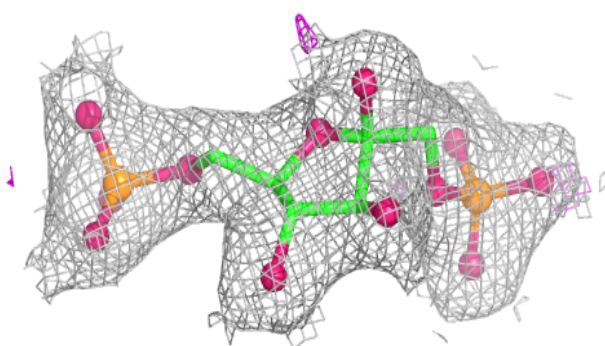
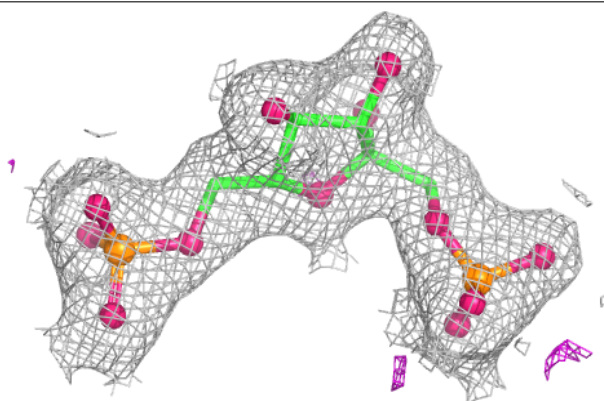


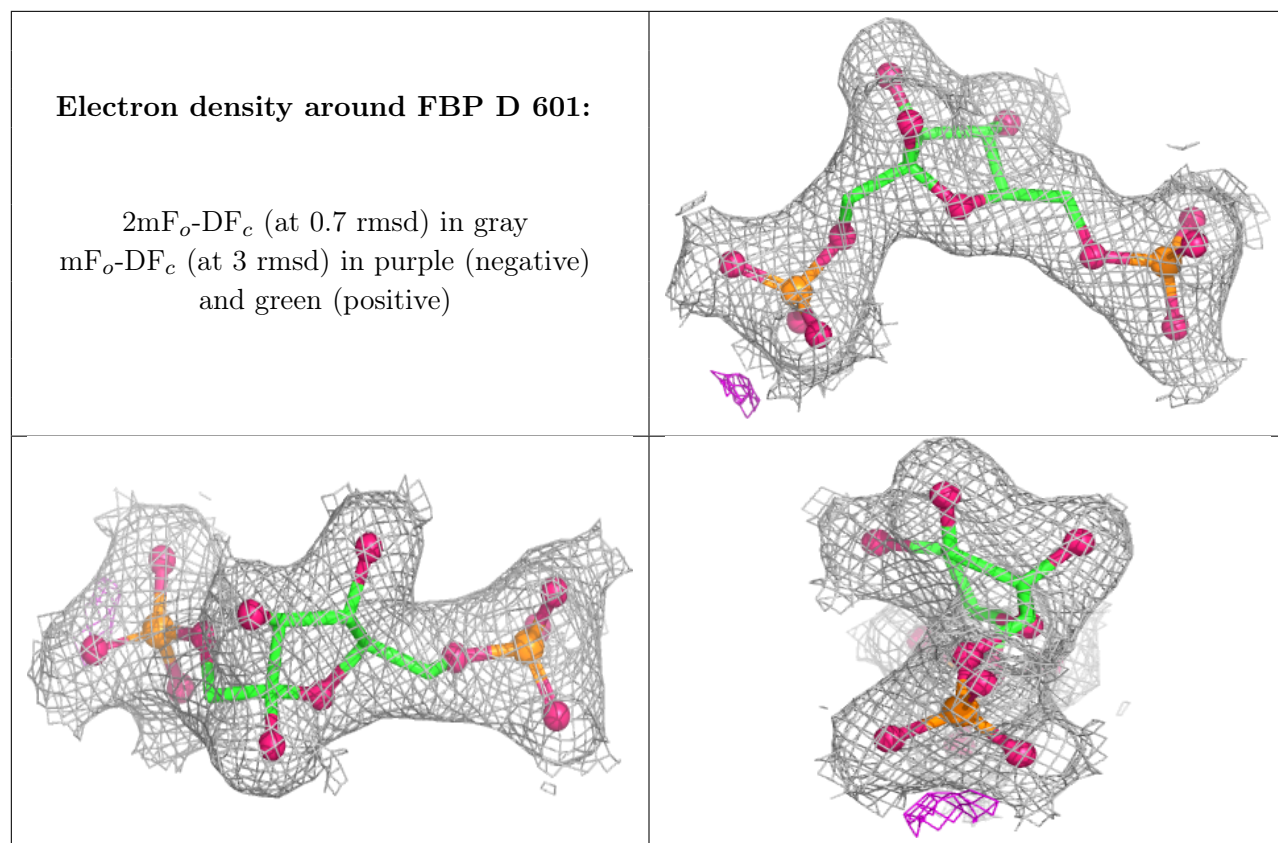
Electron density around FBP C 601:

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

**Electron density around FBP H 601:**

$2mF_o-DF_c$ (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.