



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 8, 2026 – 11:18 AM EDT

PDB ID : 14CP / pdb_000014cp
Title : Structure of liver pyruvate kinase in complex with allosteric activator 8b
Authors : Lulla, A.; Rodriguez Rivero, A.; Grotli, M.; Hyvonen, M.
Deposited on : 2026-04-28
Resolution : 1.81 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

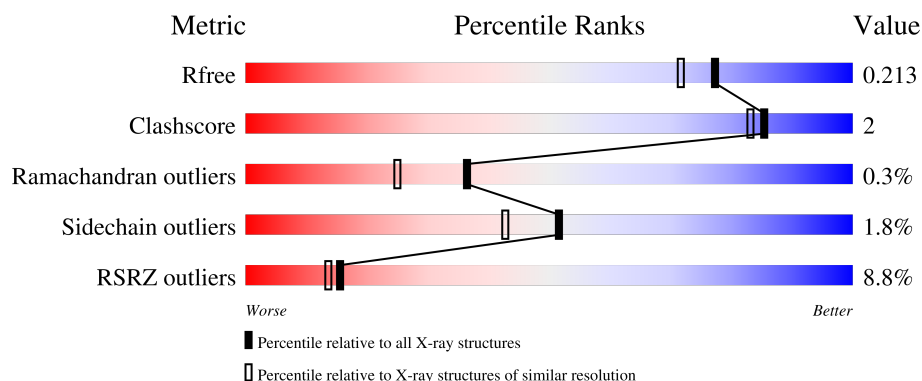
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.81 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	7662 (1.80-1.80)
Clashscore	190562	8479 (1.80-1.80)
Ramachandran outliers	187476	8391 (1.80-1.80)
Sidechain outliers	187428	8390 (1.80-1.80)
RSRZ outliers	180081	7663 (1.80-1.80)

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

Mol	Chain	Length	Quality of chain
1	A	447	12% 86% 7% 6%
1	B	447	21% 91% 6%
1	C	447	6% 89% 5% 5%
1	D	447	3% 90% 5%
1	E	447	11% 87% 7% 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	503	-	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 29381 atoms, of which 70 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	422	Total	C	N	O	S	0	13	0
			3274	2059	588	608	19			
1	B	436	Total	C	N	O	S	3	7	0
			3345	2100	604	622	19			
1	C	424	Total	C	N	O	S	0	10	0
			3275	2063	586	607	19			
1	D	425	Total	C	N	O	S	0	8	0
			3261	2048	590	604	19			
1	E	420	Total	C	N	O	S	0	13	0
			3267	2055	588	605	19			
1	F	436	Total	C	N	O	S	0	8	0
			3352	2107	604	621	20			
1	G	426	Total	C	N	O	S	0	9	0
			3283	2065	589	610	19			
1	H	425	Total	C	N	O	S	0	6	0
			3260	2046	594	601	19			

There are 48 discrepancies between the modelled and reference sequences:

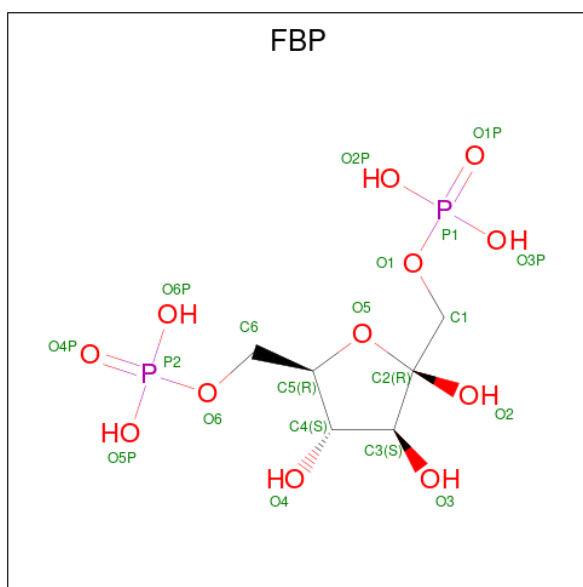
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P30613
A	0	SER	-	expression tag	UNP P30613
A	12	ASP	SER	conflict	UNP P30613
A	130	GLY	-	linker	UNP P30613
A	131	SER	-	linker	UNP P30613
A	132	GLY	-	linker	UNP P30613
B	-1	GLY	-	expression tag	UNP P30613
B	0	SER	-	expression 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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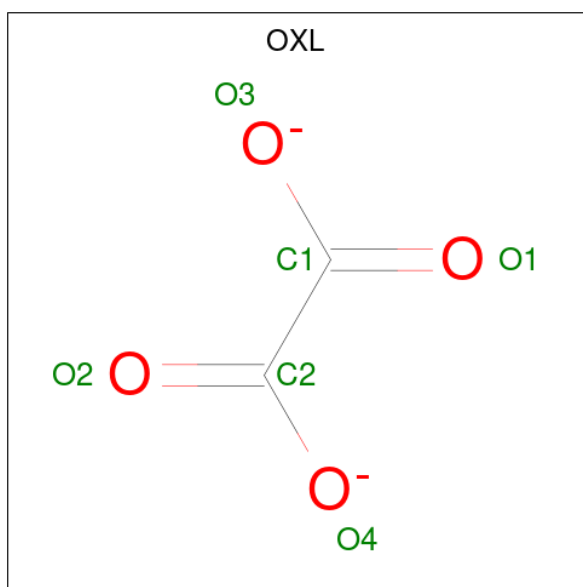
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	SER	-	expression tag	UNP P30613
C	12	ASP	SER	conflict	UNP P30613
C	130	GLY	-	linker	UNP P30613
C	131	SER	-	linker	UNP P30613
C	132	GLY	-	linker	UNP P30613
D	-1	GLY	-	expression tag	UNP P30613
D	0	SER	-	expression tag	UNP P30613
D	12	ASP	SER	conflict	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: $C_6H_{14}O_{12}P_2$).



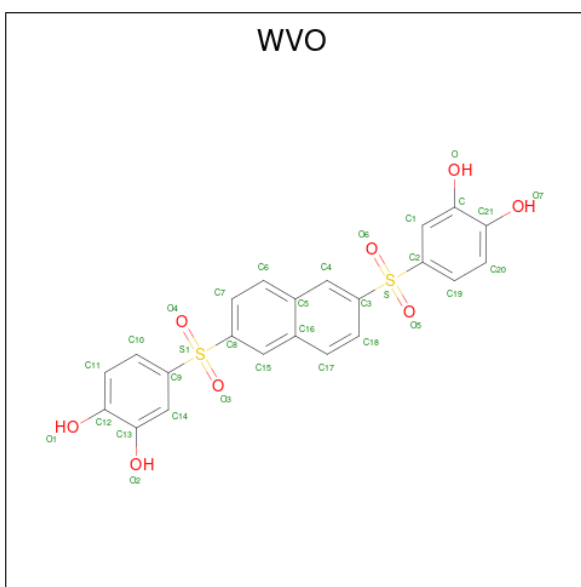
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O	P	0	0
			20	6	12	2		
2	B	1	Total	C	O	P	0	0
			20	6	12	2		
2	C	1	Total	C	O	P	0	0
			20	6	12	2		
2	D	1	Total	C	O	P	0	0
			20	6	12	2		
2	E	1	Total	C	O	P	0	0
			20	6	12	2		
2	F	1	Total	C	O	P	0	0
			20	6	12	2		
2	G	1	Total	C	O	P	0	0
			20	6	12	2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

- Molecule 3 is OXALATE ION (CCD ID: OXL) (formula: C_2O_4).



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 4,4'-(naphthalene-2,6-diyl)disulfonyl)di(benzene-1,2-diol) (CCD ID: WVO) (formula: C₂₂H₁₆O₈S₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	H	O	S	16	0
			48	22	16	8	2		
4	D	1	Total	C	H	O	S	16	0
			48	22	16	8	2		
4	E	1	Total	C	H	O	S	16	0
			48	22	16	8	2		
4	H	1	Total	C	H	O	S	16	0
			48	22	16	8	2		

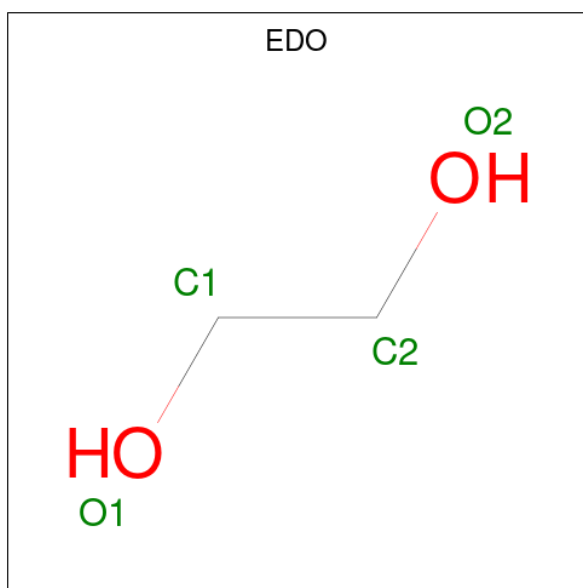
- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

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	H	1	Total C H O 10 2 6 2	6	0

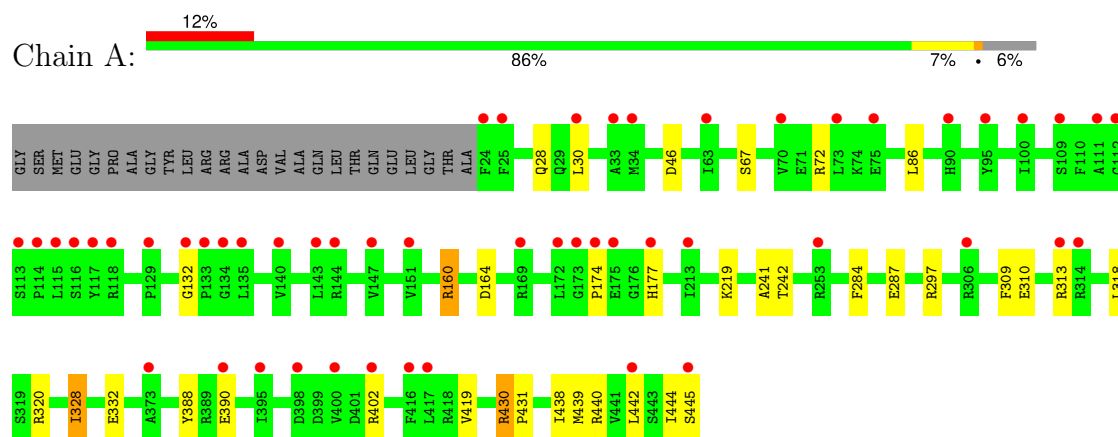
- Molecule 8 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
8	A	243	Total 243	O 243	0	0
8	B	221	Total 221	O 221	0	0
8	C	356	Total 356	O 356	0	0
8	D	398	Total 398	O 398	0	0
8	E	277	Total 277	O 277	0	0
8	F	311	Total 311	O 311	0	0
8	G	382	Total 382	O 382	0	0
8	H	450	Total 450	O 450	0	0

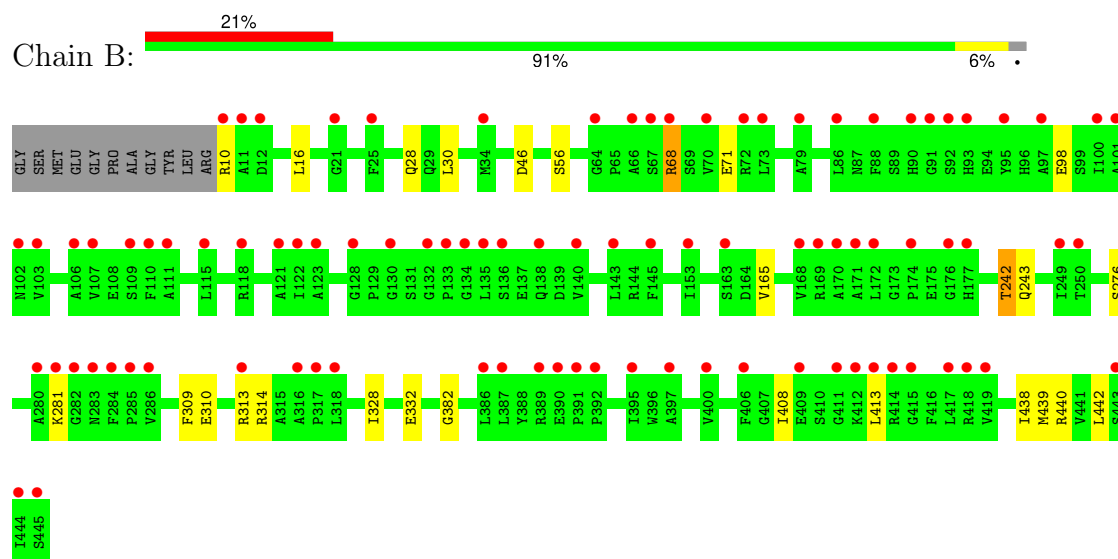
3 Residue-property plots [i](#)

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.

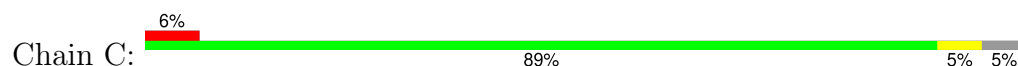
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

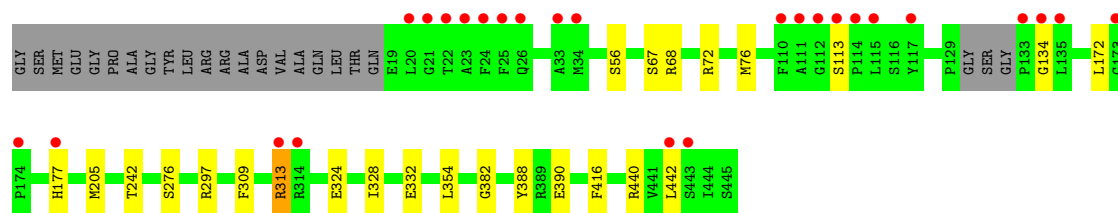


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

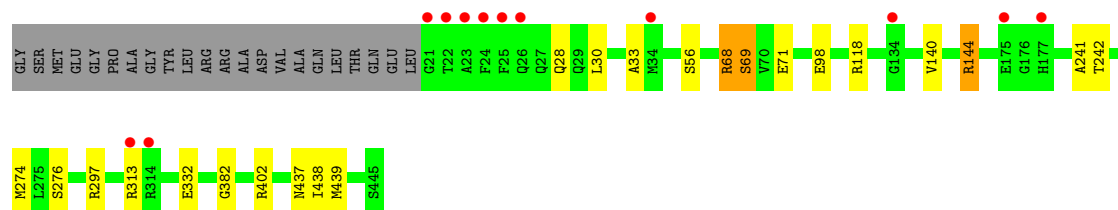
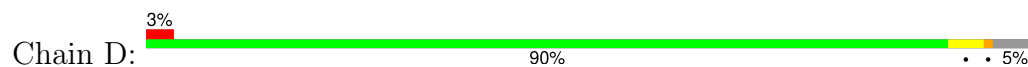


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

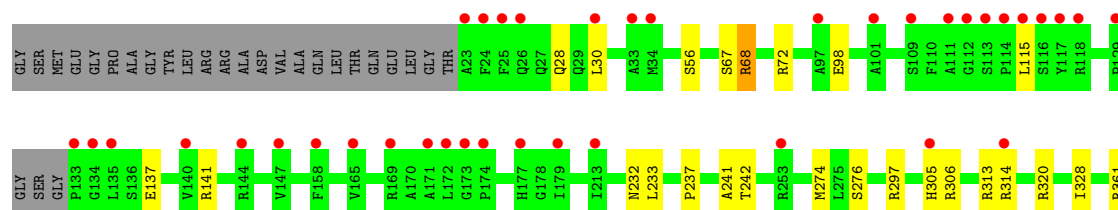
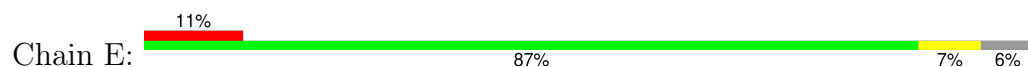




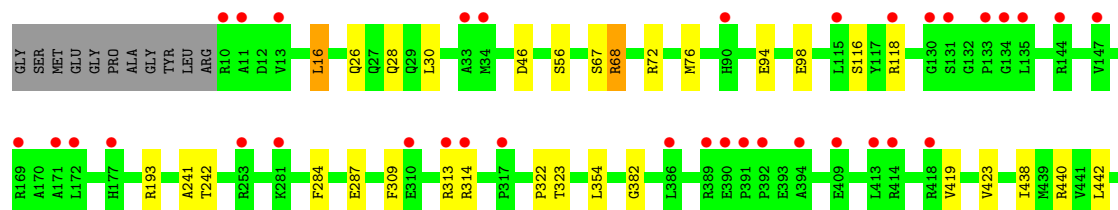
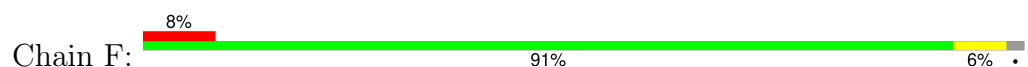
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR



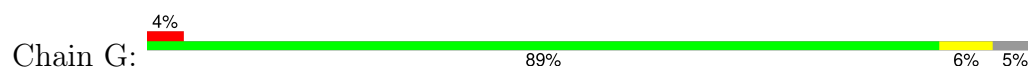
- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

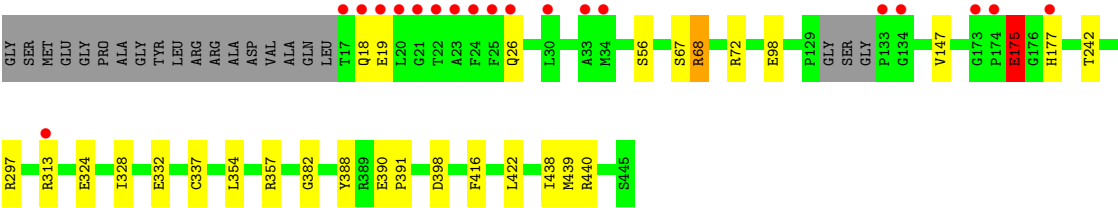


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR

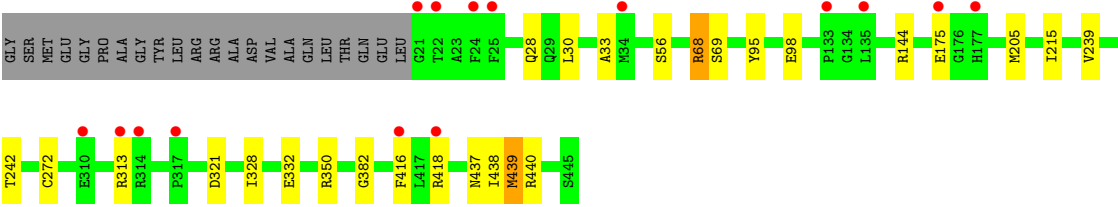
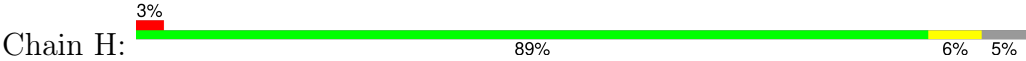


- Molecule 1: Isoform L-type of Pyruvate kinase PKLR





● 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	207.99Å 112.54Å 188.84Å 90.00° 91.65° 90.00°	Depositor
Resolution (Å)	188.76 – 1.81 188.76 – 1.81	Depositor EDS
% Data completeness (in resolution range)	68.8 (188.76-1.81) 68.8 (188.76-1.81)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.80 (at 1.81Å)	Xtriage
Refinement program	BUSTER 2.10.4	Depositor
R, R_{free}	0.193 , 0.223 0.185 , 0.213	Depositor DCC
R_{free} test set	13482 reflections (3.39%)	wwPDB-VP
Wilson B-factor (Å ²)	29.6	Xtriage
Anisotropy	0.021	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 46.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.002 for -h,-k,l	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	29381	wwPDB-VP
Average B, all atoms (Å ²)	36.0	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 45.00 % 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 1.4081e-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, FBP, OXL, K, WVO

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	0.72	0/3368	0.98	6/4553 (0.1%)
1	B	0.76	2/3421 (0.1%)	0.98	1/4626 (0.0%)
1	C	0.81	2/3360 (0.1%)	0.99	3/4542 (0.1%)
1	D	0.81	1/3341 (0.0%)	0.99	0/4517
1	E	0.75	1/3361 (0.0%)	0.97	2/4542 (0.0%)
1	F	0.79	0/3431	0.98	3/4639 (0.1%)
1	G	0.83	1/3365 (0.0%)	1.00	3/4549 (0.1%)
1	H	0.86	2/3331 (0.1%)	0.99	1/4503 (0.0%)
All	All	0.79	9/26978 (0.0%)	0.99	19/36471 (0.1%)

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	276[A]	SER	CA-C	7.17	1.56	1.52
1	B	276[B]	SER	CA-C	7.17	1.56	1.52
1	C	276	SER	CA-C	7.05	1.56	1.52
1	E	276	SER	CA-C	6.57	1.55	1.52
1	G	391	PRO	CA-C	6.22	1.55	1.51
1	D	276	SER	CA-C	6.11	1.55	1.52
1	C	205	MET	SD-CE	-5.41	1.66	1.79
1	H	205	MET	SD-CE	-5.34	1.66	1.79
1	H	215	ILE	CA-C	5.04	1.56	1.52

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	175	GLU	CB-CG-CD	7.61	125.54	112.60
1	A	132	GLY	N-CA-C	6.42	125.44	112.34
1	C	416	PHE	CA-CB-CG	6.11	119.91	113.80
1	E	441	VAL	N-CA-CB	5.83	118.03	111.21

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	416	PHE	CA-CB-CG	5.76	119.56	113.80
1	B	46	ASP	CA-CB-CG	5.70	118.30	112.60
1	C	442[A]	LEU	N-CA-C	5.70	120.27	112.68
1	C	442[B]	LEU	N-CA-C	5.70	120.27	112.68
1	G	416	PHE	CA-CB-CG	5.63	119.43	113.80
1	F	46	ASP	CA-CB-CG	5.46	118.06	112.60
1	F	241	ALA	CA-C-N	5.34	131.74	121.54
1	F	241	ALA	C-N-CA	5.34	131.74	121.54
1	A	46	ASP	CA-CB-CG	5.25	117.85	112.60
1	G	398	ASP	CA-CB-CG	5.25	117.85	112.60
1	E	232	ASN	CA-CB-CG	5.24	117.84	112.60
1	A	241	ALA	CA-C-N	5.12	131.32	121.54
1	A	241	ALA	C-N-CA	5.12	131.32	121.54
1	A	444	ILE	CA-C-N	5.06	130.80	121.70
1	A	444	ILE	C-N-CA	5.06	130.80	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	3274	0	3345	23	0
1	B	3345	0	3408	17	0
1	C	3275	0	3343	15	0
1	D	3261	0	3321	14	0
1	E	3267	0	3336	19	0
1	F	3352	0	3423	19	0
1	G	3283	0	3346	15	0
1	H	3260	0	3317	16	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

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
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	32	16	0	0	0
4	D	32	16	0	0	0
4	E	32	16	0	0	0
4	H	32	16	0	0	0
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	H	4	6	6	0	0
8	A	243	0	0	1	0
8	B	221	0	0	1	0
8	C	356	0	0	2	0
8	D	398	0	0	1	0
8	E	277	0	0	0	1
8	F	311	0	0	1	0
8	G	382	0	0	0	0
8	H	450	0	0	2	1
All	All	29311	70	26925	116	1

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 (116) 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:G:324[A]:GLU:HG3	1:G:354:LEU:HD13	1.65	0.79
1:C:324[A]:GLU:HG3	1:C:354:LEU:HD13	1.65	0.78
1:E:320[B]:ARG:HG3	1:F:16:LEU:HD11	1.63	0.78
1:C:313:ARG:HG2	1:C:328:ILE:HD11	1.70	0.73
1:C:134:GLY:HA3	8:C:924:HOH:O	1.89	0.72
1:A:313:ARG:HD2	8:B:831:HOH:O	1.92	0.70
1:G:440:ARG:HG2	1:H:438:ILE:HG12	1.74	0.69
1:A:309:PHE:CE2	1:A:313:ARG:NH1	2.65	0.65
1:D:33:ALA:O	8:D:601:HOH:O	2.13	0.64
1:A:438:ILE:HG12	1:B:440:ARG:HG2	1.79	0.64
1:A:160:ARG:HG2	1:A:164:ASP:OD2	1.96	0.64
1:F:309:PHE:CE2	1:F:313:ARG:NH1	2.66	0.64
1:A:174:PRO:HA	1:A:177:HIS:CE1	2.32	0.64
1:C:440:ARG:HG2	1:D:438:ILE:HG12	1.80	0.64
1:E:28:GLN:O	1:E:361:ARG:NH1	2.31	0.64
1:A:320[B]:ARG:HG3	1:B:16:LEU:HD11	1.80	0.62
1:A:174:PRO:HA	1:A:177:HIS:NE2	2.14	0.62
1:D:71[B]:GLU:H	1:D:71[B]:GLU:CD	2.06	0.61
1:G:438:ILE:HG12	1:H:440:ARG:HG2	1.83	0.61
1:H:313:ARG:HG2	1:H:328:ILE:HD11	1.83	0.61
1:A:430:ARG:HD2	1:A:431:PRO:O	2.01	0.61
1:A:67:SER:HA	1:A:72:ARG:HG2	1.83	0.60
1:H:68:ARG:HH22	1:H:98:GLU:HB2	1.66	0.59
1:H:68:ARG:NH2	1:H:98:GLU:HB2	2.17	0.59
1:G:56:SER:HB2	1:G:382:GLY:HA2	1.85	0.58
1:A:440:ARG:HG2	1:B:438:ILE:HG12	1.86	0.58
1:E:305:HIS:CE1	1:E:361:ARG:HH21	2.22	0.57
1:G:313:ARG:HG2	1:G:328:ILE:HD11	1.87	0.57
1:F:67:SER:HA	1:F:72:ARG:HG2	1.87	0.57
1:B:309:PHE:CD2	1:B:313:ARG:NH1	2.74	0.56
1:E:313:ARG:HG2	1:E:328:ILE:HD11	1.87	0.56
1:B:56:SER:HB2	1:B:382:GLY:HA2	1.89	0.55
1:F:309:PHE:CD2	1:F:313:ARG:NH1	2.72	0.55
1:A:313:ARG:NH2	1:B:313:ARG:NH2	2.55	0.55
1:C:440:ARG:HD3	8:C:814:HOH:O	2.07	0.54
1:C:56:SER:HB2	1:C:382:GLY:HA2	1.90	0.54
1:E:438:ILE:HG12	1:F:440:ARG:HG2	1.89	0.54
1:H:33:ALA:O	8:H:701:HOH:O	2.18	0.54
1:D:56:SER:HB2	1:D:382:GLY:HA2	1.91	0.53
1:C:313:ARG:HH12	1:D:313:ARG:NH2	2.06	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:68:ARG:NH2	1:D:98:GLU:HB2	2.24	0.53
1:E:56:SER:HB2	1:E:382:GLY:HA2	1.91	0.53
1:H:56:SER:HB2	1:H:382:GLY:HA2	1.90	0.53
1:F:56:SER:HB2	1:F:382:GLY:HA2	1.91	0.52
1:E:441:VAL:HG22	1:F:322:PRO:HB3	1.93	0.51
1:G:67:SER:HA	1:G:72:ARG:HG2	1.93	0.50
1:D:69:SER:OG	1:D:71[B]:GLU:HG2	2.11	0.50
1:B:310:GLU:HG2	1:B:313:ARG:HH22	1.76	0.50
1:C:177[A]:HIS:ND1	1:G:177[A]:HIS:ND1	2.59	0.50
1:B:242:THR:HG22	1:B:243:GLN:HG3	1.95	0.49
1:A:419:VAL:HG13	1:A:445:SER:HB3	1.95	0.49
1:C:67:SER:HA	1:C:72:ARG:HG2	1.94	0.49
1:B:68:ARG:NH2	1:B:98:GLU:HB3	2.29	0.48
1:A:313:ARG:NH1	1:A:332:GLU:OE2	2.46	0.48
1:C:332[B]:GLU:OE2	1:D:332[B]:GLU:OE1	2.31	0.47
1:E:305:HIS:ND1	1:E:361:ARG:NH2	2.53	0.47
1:A:309:PHE:HE2	1:A:313:ARG:HH12	1.61	0.47
1:E:68:ARG:NH2	1:E:98:GLU:HB3	2.29	0.47
1:G:388:TYR:CZ	1:G:390:GLU:HB2	2.49	0.47
1:A:313:ARG:HG3	1:A:328:ILE:HD11	1.96	0.46
1:F:116:SER:O	1:F:118:ARG:HD2	2.13	0.46
1:E:440:ARG:HG2	1:F:438:ILE:HG12	1.97	0.46
1:G:337:CYS:HB2	1:G:422:LEU:HD12	1.97	0.46
1:B:309:PHE:CE2	1:B:313:ARG:NH1	2.78	0.46
1:H:68:ARG:NH2	1:H:95:TYR:O	2.49	0.46
1:D:241:ALA:HB1	1:D:274:MET:HE2	1.98	0.46
1:H:437:ASN:OD1	1:H:438:ILE:HG13	2.16	0.46
1:F:28:GLN:HG3	1:F:30:LEU:HG	1.98	0.45
1:B:28:GLN:HG3	1:B:30:LEU:HG	1.99	0.45
1:E:137:GLU:O	1:E:141:ARG:HD3	2.16	0.45
1:H:56:SER:HB2	1:H:382:GLY:CA	2.46	0.45
1:H:28:GLN:HG3	1:H:30:LEU:HG	1.99	0.45
1:E:28:GLN:HG3	1:E:30:LEU:HG	1.97	0.45
1:D:56:SER:HB2	1:D:382:GLY:CA	2.47	0.45
1:E:306:ARG:HH11	1:F:314:ARG:NH2	2.15	0.44
1:A:310[B]:GLU:HG2	1:A:313:ARG:HH21	1.82	0.44
1:E:306:ARG:NH1	1:F:314:ARG:NH2	2.65	0.44
1:A:332:GLU:OE2	1:B:332[B]:GLU:OE1	2.36	0.44
1:B:71:GLU:H	1:B:71:GLU:CD	2.25	0.44
1:H:239:VAL:HG22	1:H:272:CYS:HB2	2.00	0.44
1:E:67:SER:HA	1:E:72:ARG:HG2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:439:MET:HE3	1:H:439:MET:HG2	2.00	0.43
1:A:28:GLN:HG3	1:A:30:LEU:HG	2.00	0.43
1:A:318:LEU:HB3	1:B:16:LEU:HD22	2.00	0.43
1:B:313:ARG:HG2	1:B:328:ILE:HD11	2.01	0.43
1:D:28:GLN:HG3	1:D:30:LEU:HG	2.01	0.43
1:H:418:ARG:HD3	8:H:873:HOH:O	2.18	0.43
1:D:437:ASN:OD1	1:D:438:ILE:HG13	2.19	0.43
1:G:56:SER:HB2	1:G:382:GLY:CA	2.47	0.43
1:F:68:ARG:NH2	1:F:98:GLU:HB3	2.33	0.43
1:F:67:SER:HB2	1:F:76[B]:MET:SD	2.59	0.43
1:A:388:TYR:CZ	1:A:390[B]:GLU:HB2	2.54	0.42
1:B:56:SER:HB2	1:B:382:GLY:CA	2.48	0.42
1:A:284:PHE:HB3	1:A:287:GLU:HB2	2.02	0.42
1:C:309:PHE:CE2	1:C:313:ARG:HD3	2.55	0.42
1:A:86:LEU:HD22	1:A:86:LEU:N	2.35	0.41
1:C:67:SER:HB2	1:C:76[B]:MET:SD	2.60	0.41
1:E:241:ALA:HB1	1:E:274:MET:HE2	2.02	0.41
1:G:354:LEU:O	1:G:357:ARG:HG2	2.20	0.41
1:D:140:VAL:O	1:D:144[B]:ARG:HG3	2.20	0.41
1:F:284:PHE:HB3	1:F:287:GLU:HB2	2.02	0.41
1:E:237:PRO:HB3	1:E:379:LEU:O	2.20	0.41
1:F:323:THR:HG22	1:F:354:LEU:HD12	2.03	0.41
1:C:313:ARG:NH1	1:D:313:ARG:NH2	2.69	0.41
1:G:332:GLU:OE1	1:H:332:GLU:OE1	2.39	0.41
1:G:68:ARG:NH2	1:G:98[A]:GLU:HB2	2.36	0.41
1:E:320[A]:ARG:HD3	1:F:16:LEU:HD11	2.03	0.41
1:E:437:ASN:OD1	1:E:438:ILE:HG13	2.21	0.41
1:C:56:SER:HB2	1:C:382:GLY:CA	2.51	0.41
1:F:423:VAL:HG12	1:F:442[B]:LEU:HB3	2.02	0.41
1:G:147:VAL:CG1	1:G:175:GLU:HG2	2.51	0.40
1:A:219:LYS:NZ	8:A:710:HOH:O	2.54	0.40
1:B:408:ILE:HD11	1:B:442[B]:LEU:HD23	2.04	0.40
1:H:321:ASP:OD2	1:H:350:ARG:NH2	2.52	0.40
1:C:388:TYR:CZ	1:C:390:GLU:HB2	2.55	0.40
1:F:314:ARG:HD2	8:F:928:HOH:O	2.22	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:E:885:HOH:O	8:H:813:HOH:O[2_656]	2.08	0.12

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	433/447 (97%)	426 (98%)	6 (1%)	1 (0%)	43	31
1	B	441/447 (99%)	436 (99%)	4 (1%)	1 (0%)	43	31
1	C	430/447 (96%)	423 (98%)	6 (1%)	1 (0%)	43	31
1	D	431/447 (96%)	426 (99%)	4 (1%)	1 (0%)	43	31
1	E	429/447 (96%)	424 (99%)	4 (1%)	1 (0%)	43	31
1	F	442/447 (99%)	437 (99%)	4 (1%)	1 (0%)	43	31
1	G	431/447 (96%)	422 (98%)	7 (2%)	2 (0%)	24	14
1	H	429/447 (96%)	426 (99%)	2 (0%)	1 (0%)	43	31
All	All	3466/3576 (97%)	3420 (99%)	37 (1%)	9 (0%)	36	25

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	G	19	GLU
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	348/352 (99%)	341 (98%)	7 (2%)	48	38
1	B	352/352 (100%)	345 (98%)	7 (2%)	48	38
1	C	347/352 (99%)	341 (98%)	6 (2%)	53	45
1	D	344/352 (98%)	336 (98%)	8 (2%)	44	33
1	E	347/352 (99%)	339 (98%)	8 (2%)	44	33
1	F	353/352 (100%)	347 (98%)	6 (2%)	53	45
1	G	348/352 (99%)	343 (99%)	5 (1%)	59	52
1	H	342/352 (97%)	336 (98%)	6 (2%)	51	43
All	All	2781/2816 (99%)	2728 (98%)	53 (2%)	51	41

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	160	ARG
1	A	297	ARG
1	A	328	ILE
1	A	402	ARG
1	A	430	ARG
1	A	439	MET
1	A	442	LEU
1	B	10	ARG
1	B	68	ARG
1	B	165	VAL
1	B	281	LYS
1	B	314	ARG
1	B	413	LEU
1	B	439	MET
1	C	68	ARG
1	C	113	SER
1	C	172[A]	LEU
1	C	172[B]	LEU
1	C	297	ARG
1	C	313	ARG
1	D	68	ARG
1	D	69	SER
1	D	118	ARG
1	D	144[A]	ARG
1	D	144[B]	ARG

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Mol	Chain	Res	Type
1	D	297	ARG
1	D	402	ARG
1	D	439	MET
1	E	68	ARG
1	E	115	LEU
1	E	233	LEU
1	E	297	ARG
1	E	314	ARG
1	E	402	ARG
1	E	413	LEU
1	E	441	VAL
1	F	16	LEU
1	F	26	GLN
1	F	68	ARG
1	F	94	GLU
1	F	193	ARG
1	F	419	VAL
1	G	18	GLN
1	G	26	GLN
1	G	68	ARG
1	G	175	GLU
1	G	297	ARG
1	H	68	ARG
1	H	69	SER
1	H	144[A]	ARG
1	H	144[B]	ARG
1	H	175	GLU
1	H	439	MET

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

Mol	Chain	Res	Type
1	A	26	GLN
1	B	27	GLN
1	D	27	GLN
1	D	437	ASN
1	E	27	GLN
1	G	372	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 37 ligands modelled in this entry, 16 are monoatomic - leaving 21 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	G	602	5	5,5,5	2.18	2 (40%)	6,6,6	1.27	1 (16%)
3	OXL	C	602	5	5,5,5	1.94	2 (40%)	6,6,6	2.33	3 (50%)
3	OXL	F	602	5	5,5,5	1.79	2 (40%)	6,6,6	2.44	3 (50%)
2	FBP	F	601	-	18,20,20	0.45	0	21,32,32	0.59	0
7	EDO	H	604	-	3,3,3	0.36	0	2,2,2	0.10	0
2	FBP	E	601	-	18,20,20	0.61	0	21,32,32	0.75	0
3	OXL	H	602	5	5,5,5	1.81	2 (40%)	6,6,6	1.89	2 (33%)
4	WVO	E	603	-	35,35,35	0.27	0	52,54,54	0.38	0
2	FBP	A	601	-	18,20,20	0.60	0	21,32,32	0.76	1 (4%)
2	FBP	G	601	-	18,20,20	0.38	0	21,32,32	0.71	0
3	OXL	A	602	5	5,5,5	1.88	2 (40%)	6,6,6	2.11	3 (50%)
4	WVO	A	603	-	35,35,35	0.26	0	52,54,54	0.37	0
2	FBP	H	601	-	18,20,20	0.87	1 (5%)	21,32,32	0.81	1 (4%)
2	FBP	C	601	-	18,20,20	0.69	0	21,32,32	0.66	0
4	WVO	H	603	-	35,35,35	0.30	0	52,54,54	0.43	0
4	WVO	D	501	-	35,35,35	0.27	0	52,54,54	0.42	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	FBP	D	502	-	18,20,20	0.54	0	21,32,32	0.91	1 (4%)
3	OXL	E	602	5	5,5,5	2.25	2 (40%)	6,6,6	1.46	2 (33%)
3	OXL	B	602	5	5,5,5	2.25	2 (40%)	6,6,6	1.11	0
2	FBP	B	601	-	18,20,20	0.55	0	21,32,32	0.84	1 (4%)
3	OXL	D	503	5	5,5,5	2.23	2 (40%)	6,6,6	1.88	2 (33%)

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	G	602	5	-	4/4/4/4	-
3	OXL	C	602	5	-	4/4/4/4	-
3	OXL	F	602	5	-	0/4/4/4	-
2	FBP	F	601	-	-	2/13/32/32	0/1/1/1
7	EDO	H	604	-	-	0/1/1/1	-
2	FBP	E	601	-	-	2/13/32/32	0/1/1/1
3	OXL	H	602	5	-	4/4/4/4	-
4	WVO	E	603	-	-	0/24/24/24	0/4/4/4
2	FBP	A	601	-	-	2/13/32/32	0/1/1/1
2	FBP	G	601	-	-	2/13/32/32	0/1/1/1
3	OXL	A	602	5	-	4/4/4/4	-
4	WVO	A	603	-	-	0/24/24/24	0/4/4/4
2	FBP	H	601	-	-	2/13/32/32	0/1/1/1
2	FBP	C	601	-	-	2/13/32/32	0/1/1/1
4	WVO	H	603	-	-	0/24/24/24	0/4/4/4
4	WVO	D	501	-	-	0/24/24/24	0/4/4/4
2	FBP	D	502	-	-	2/13/32/32	0/1/1/1
3	OXL	E	602	5	-	4/4/4/4	-
3	OXL	B	602	5	-	4/4/4/4	-
2	FBP	B	601	-	-	2/13/32/32	0/1/1/1
3	OXL	D	503	5	-	4/4/4/4	-

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	602	OXL	O2-C2	4.24	1.33	1.22

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	602	OXL	O2-C2	4.07	1.32	1.22
3	C	602	OXL	O2-C2	3.63	1.31	1.22
3	E	602	OXL	O4-C2	-3.45	1.21	1.30
3	A	602	OXL	O2-C2	3.41	1.31	1.22
3	D	503	OXL	O2-C2	3.36	1.30	1.22
3	E	602	OXL	O2-C2	3.33	1.30	1.22
3	F	602	OXL	O2-C2	3.26	1.30	1.22
3	D	503	OXL	O4-C2	-3.14	1.22	1.30
3	H	602	OXL	O4-C2	-3.02	1.22	1.30
3	B	602	OXL	O4-C2	-2.88	1.22	1.30
3	H	602	OXL	O2-C2	2.54	1.28	1.22
3	A	602	OXL	O4-C2	-2.45	1.23	1.30
2	H	601	FBP	P2-O6P	-2.35	1.46	1.54
3	G	602	OXL	O4-C2	-2.33	1.24	1.30
3	F	602	OXL	O4-C2	-2.25	1.24	1.30
3	C	602	OXL	O4-C2	-2.01	1.25	1.30

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	602	OXL	O4-C2-C1	4.39	121.34	112.83
3	F	602	OXL	O4-C2-C1	4.30	121.17	112.83
3	A	602	OXL	O4-C2-C1	3.95	120.49	112.83
3	H	602	OXL	O4-C2-C1	3.88	120.35	112.83
3	D	503	OXL	O4-C2-C1	3.18	118.99	112.83
2	H	601	FBP	O6-P2-O4P	3.00	114.56	106.44
2	D	502	FBP	O6-P2-O4P	3.00	114.54	106.44
3	C	602	OXL	O2-C2-C1	-2.98	114.43	120.63
2	B	601	FBP	O6-P2-O4P	2.95	114.41	106.44
3	F	602	OXL	O3-C1-C2	2.94	118.53	112.83
3	F	602	OXL	O2-C2-C1	-2.73	114.95	120.63
3	E	602	OXL	O4-C2-C1	2.62	117.91	112.83
3	D	503	OXL	O3-C1-C2	2.61	117.89	112.83
3	G	602	OXL	O4-C2-C1	2.50	117.67	112.83
3	A	602	OXL	O2-C2-C1	-2.46	115.51	120.63
3	H	602	OXL	O2-C2-C1	-2.20	116.04	120.63
3	A	602	OXL	O3-C1-C2	2.20	117.09	112.83
2	A	601	FBP	O3P-P1-O1P	2.17	119.30	110.83
3	E	602	OXL	O3-C1-C2	2.16	117.03	112.83
3	C	602	OXL	O3-C1-C2	2.05	116.80	112.83

There are no chirality outliers.

All (44) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	FBP	C4-C5-C6-O6
2	B	601	FBP	C4-C5-C6-O6
2	D	502	FBP	C4-C5-C6-O6
2	C	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	A	601	FBP	O5-C5-C6-O6
2	B	601	FBP	O5-C5-C6-O6
2	G	601	FBP	O5-C5-C6-O6
2	H	601	FBP	O5-C5-C6-O6
2	C	601	FBP	O5-C5-C6-O6
2	D	502	FBP	O5-C5-C6-O6
2	E	601	FBP	O5-C5-C6-O6
2	F	601	FBP	O5-C5-C6-O6
3	G	602	OXL	O3-C1-C2-O4
3	A	602	OXL	O3-C1-C2-O4
3	H	602	OXL	O3-C1-C2-O4
3	A	602	OXL	O1-C1-C2-O2
3	G	602	OXL	O1-C1-C2-O2
3	B	602	OXL	O3-C1-C2-O4
3	C	602	OXL	O3-C1-C2-O4
3	D	503	OXL	O3-C1-C2-O4
3	B	602	OXL	O1-C1-C2-O2
3	C	602	OXL	O1-C1-C2-O2
3	D	503	OXL	O1-C1-C2-O2
3	E	602	OXL	O1-C1-C2-O2
3	E	602	OXL	O3-C1-C2-O4
3	H	602	OXL	O1-C1-C2-O2
3	H	602	OXL	O3-C1-C2-O2
3	A	602	OXL	O1-C1-C2-O4
3	A	602	OXL	O3-C1-C2-O2
3	B	602	OXL	O3-C1-C2-O2
3	G	602	OXL	O1-C1-C2-O4
3	G	602	OXL	O3-C1-C2-O2
3	D	503	OXL	O3-C1-C2-O2
3	B	602	OXL	O1-C1-C2-O4
3	C	602	OXL	O1-C1-C2-O4
3	C	602	OXL	O3-C1-C2-O2
3	D	503	OXL	O1-C1-C2-O4
3	E	602	OXL	O1-C1-C2-O4

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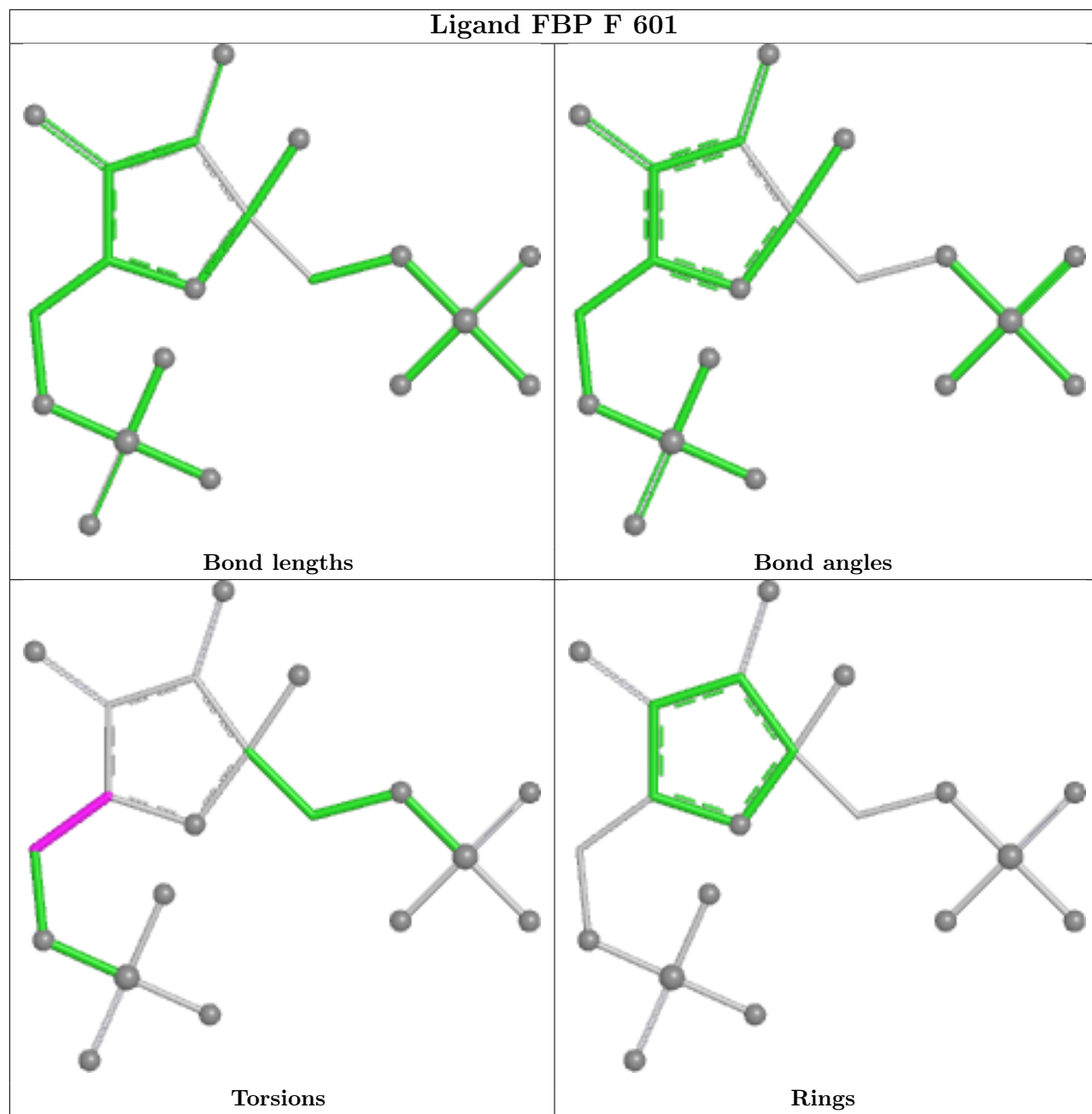
Mol	Chain	Res	Type	Atoms
3	E	602	OXL	O3-C1-C2-O2
3	H	602	OXL	O1-C1-C2-O4

There are no ring outliers.

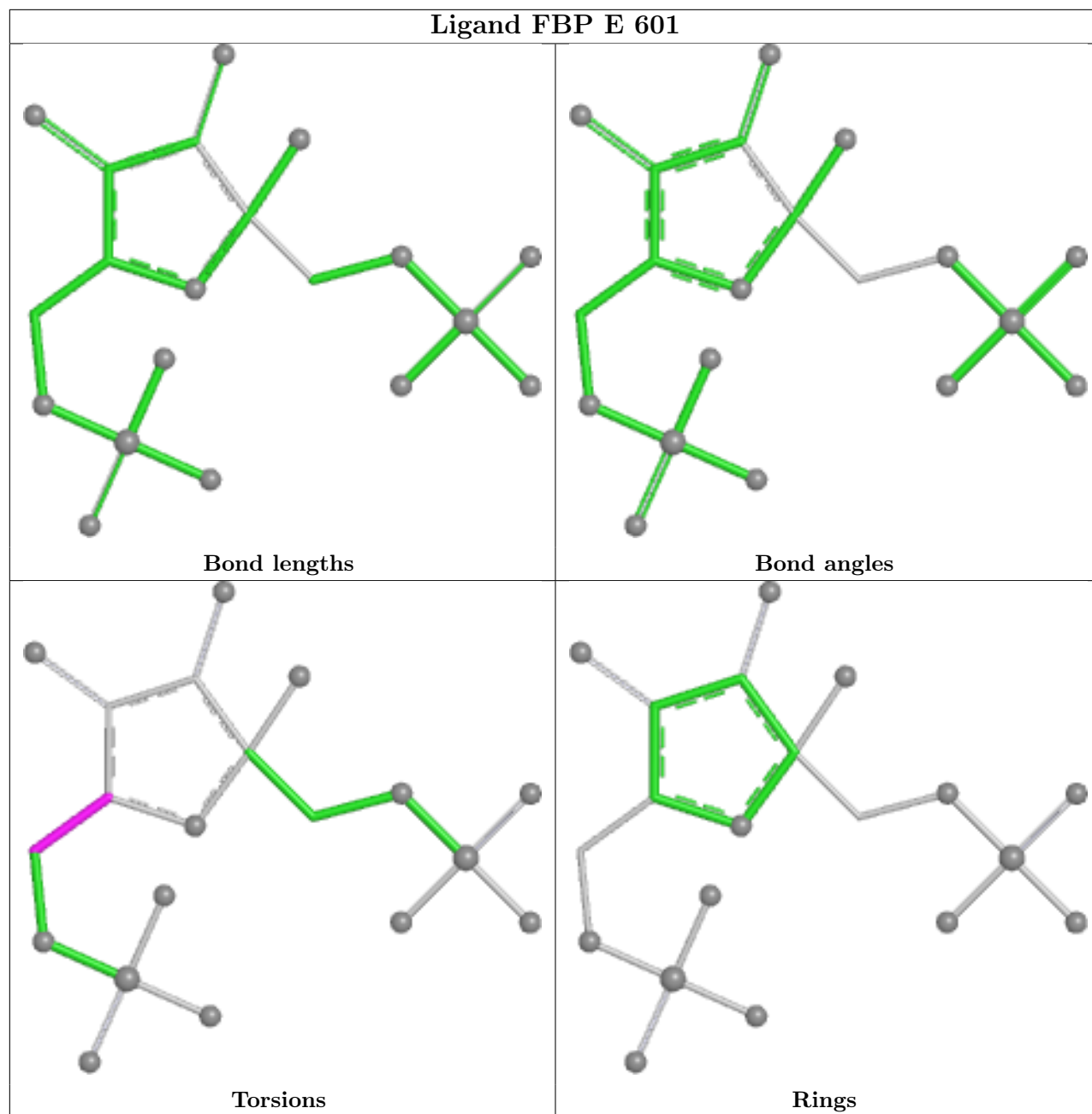
No monomer is involved in short contacts.

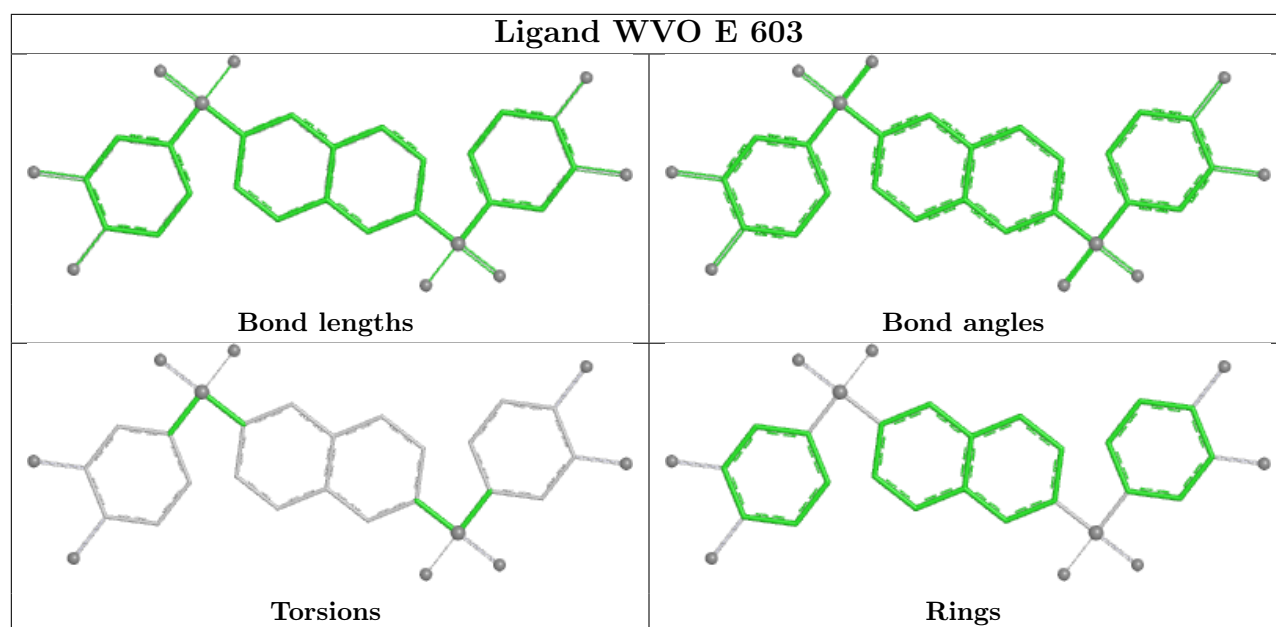
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

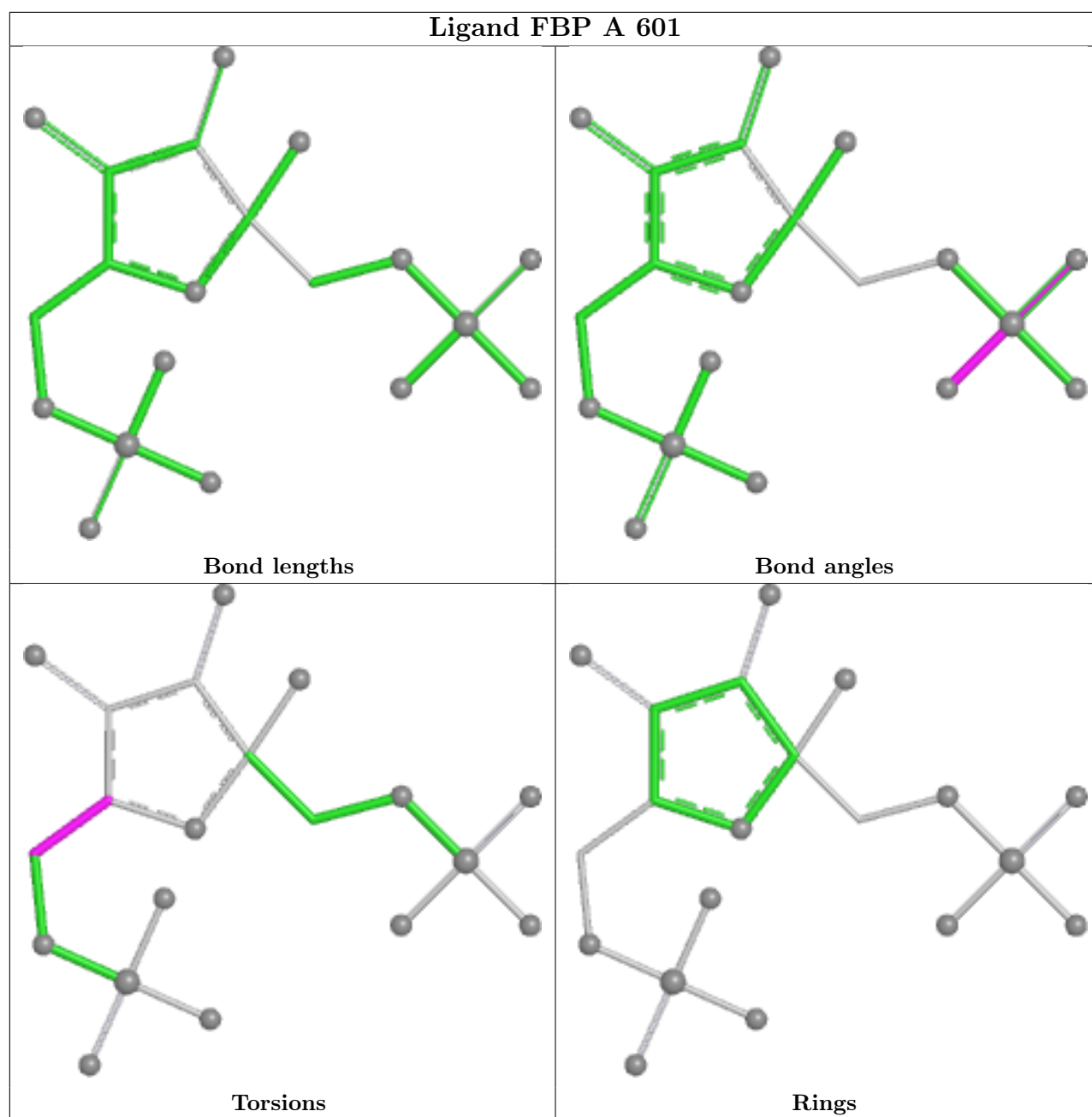
Ligand FBP F 601

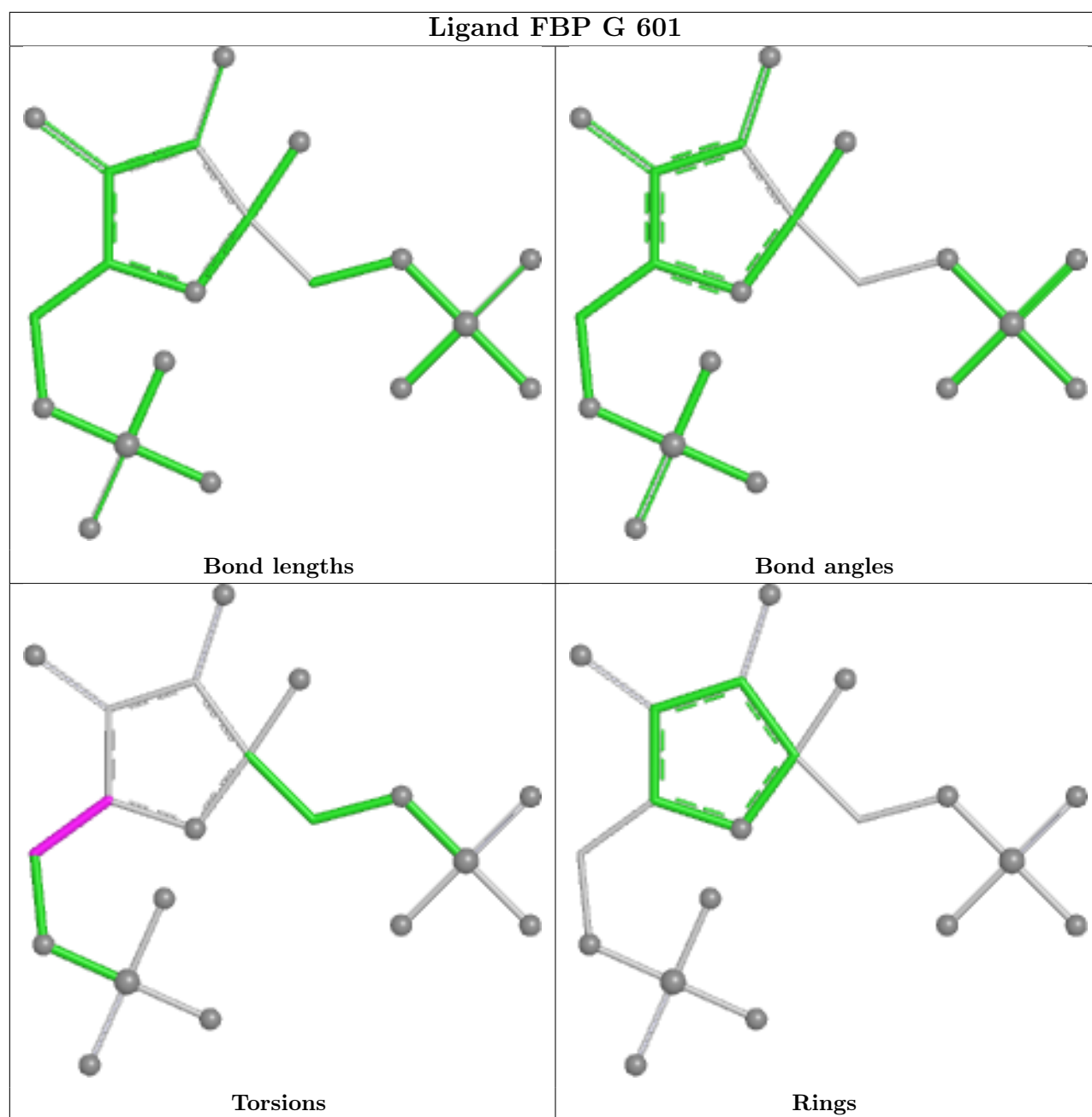


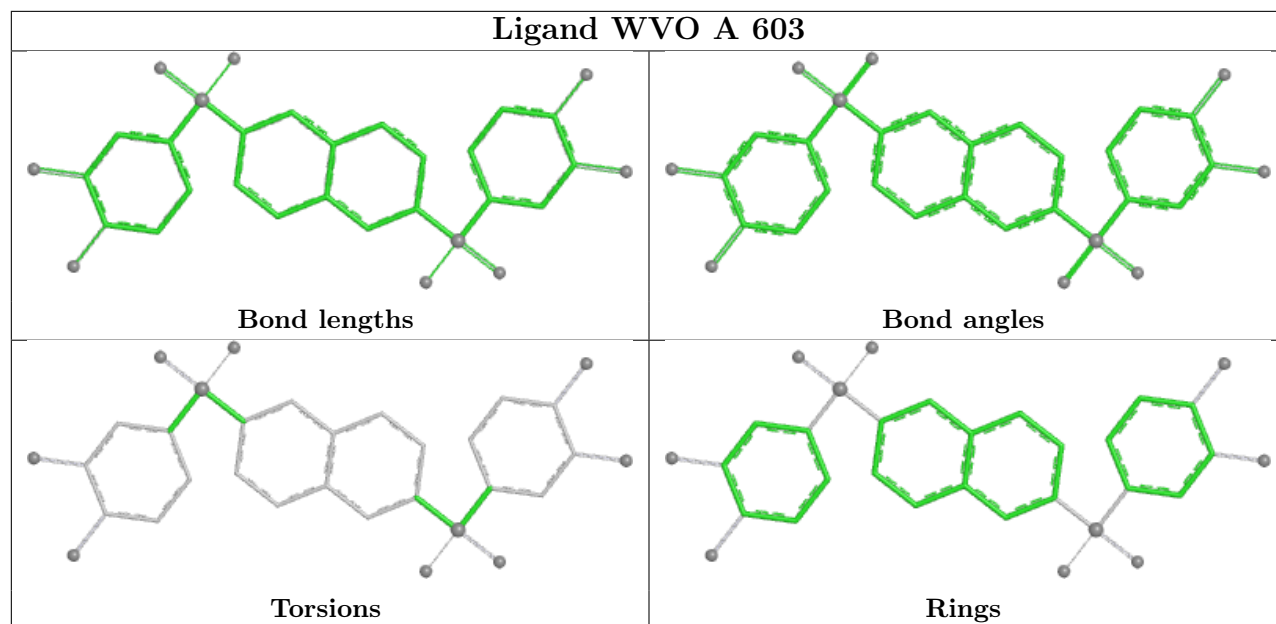
Ligand FBP E 601

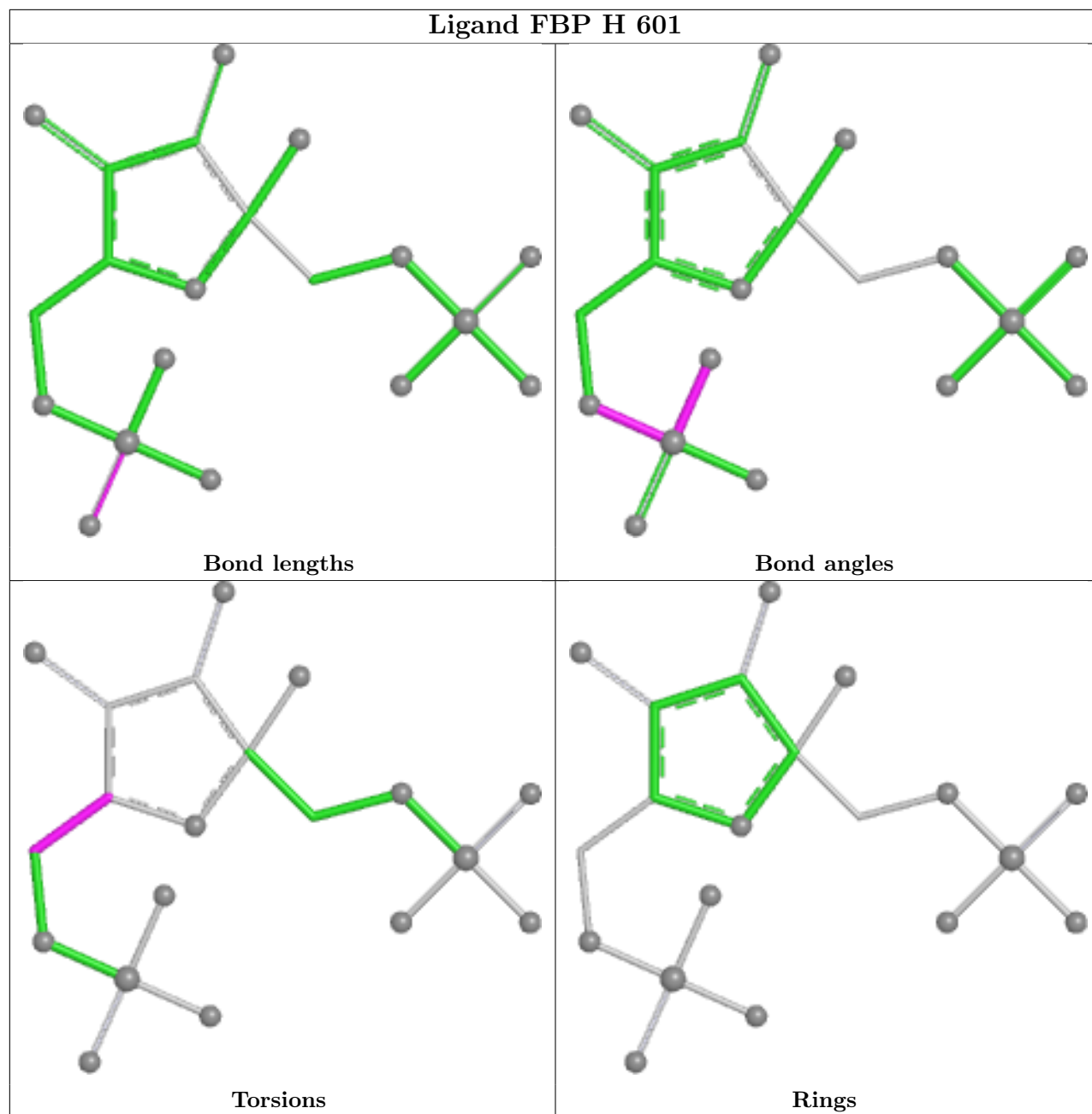


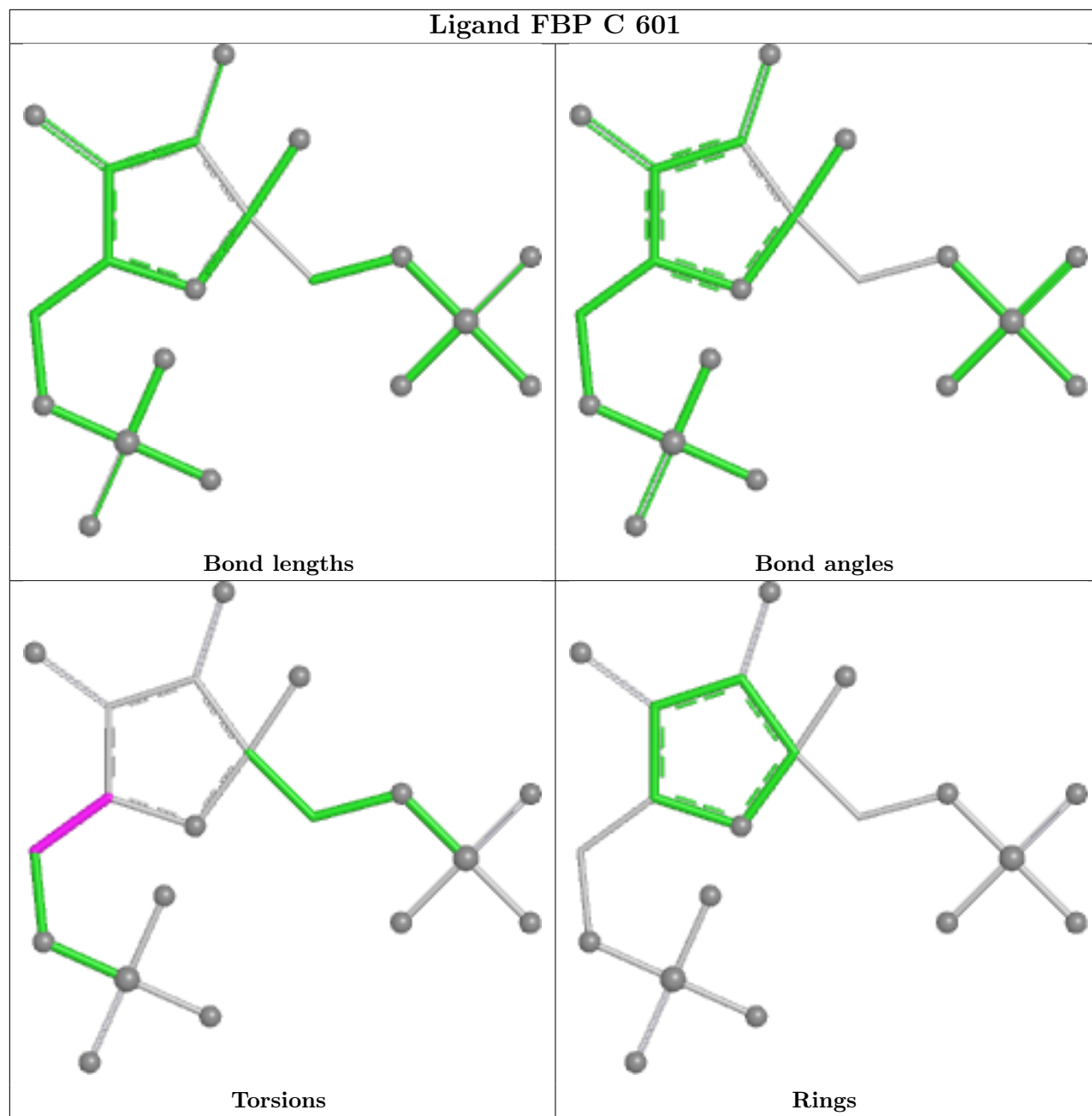


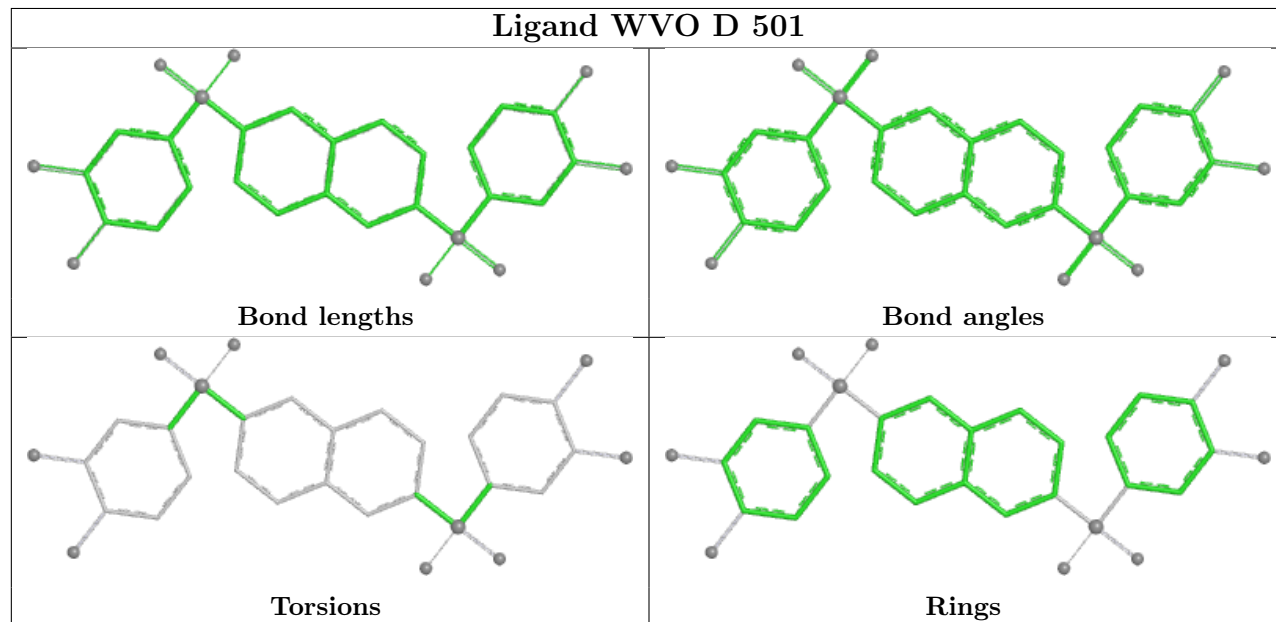
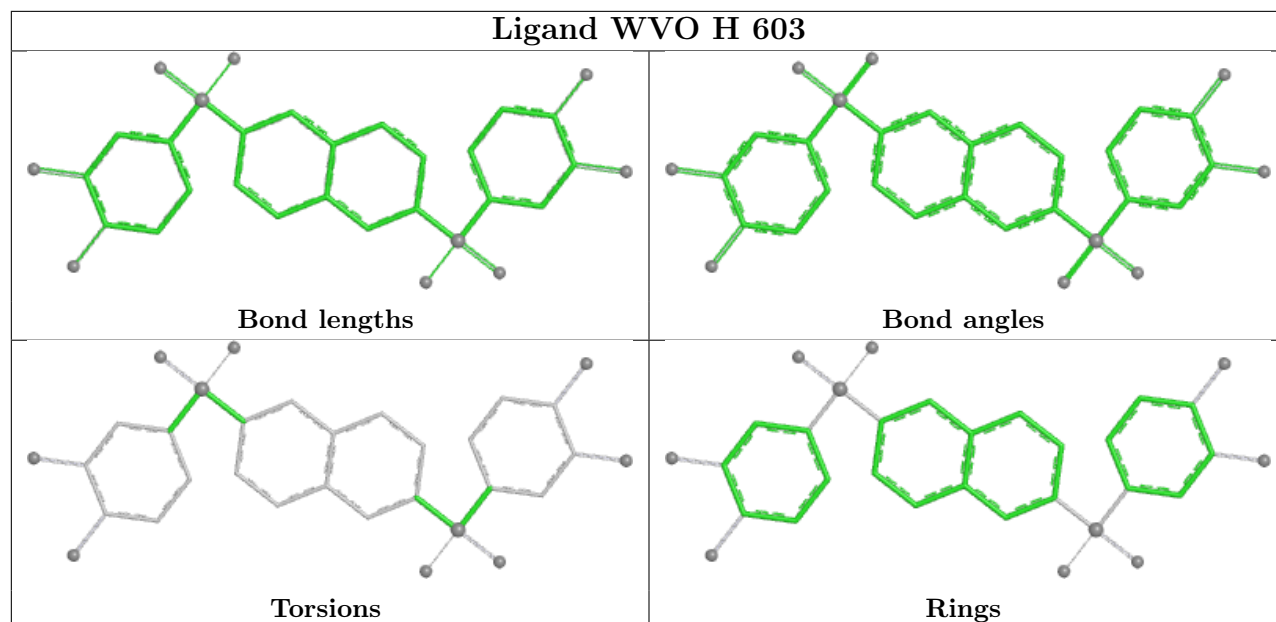


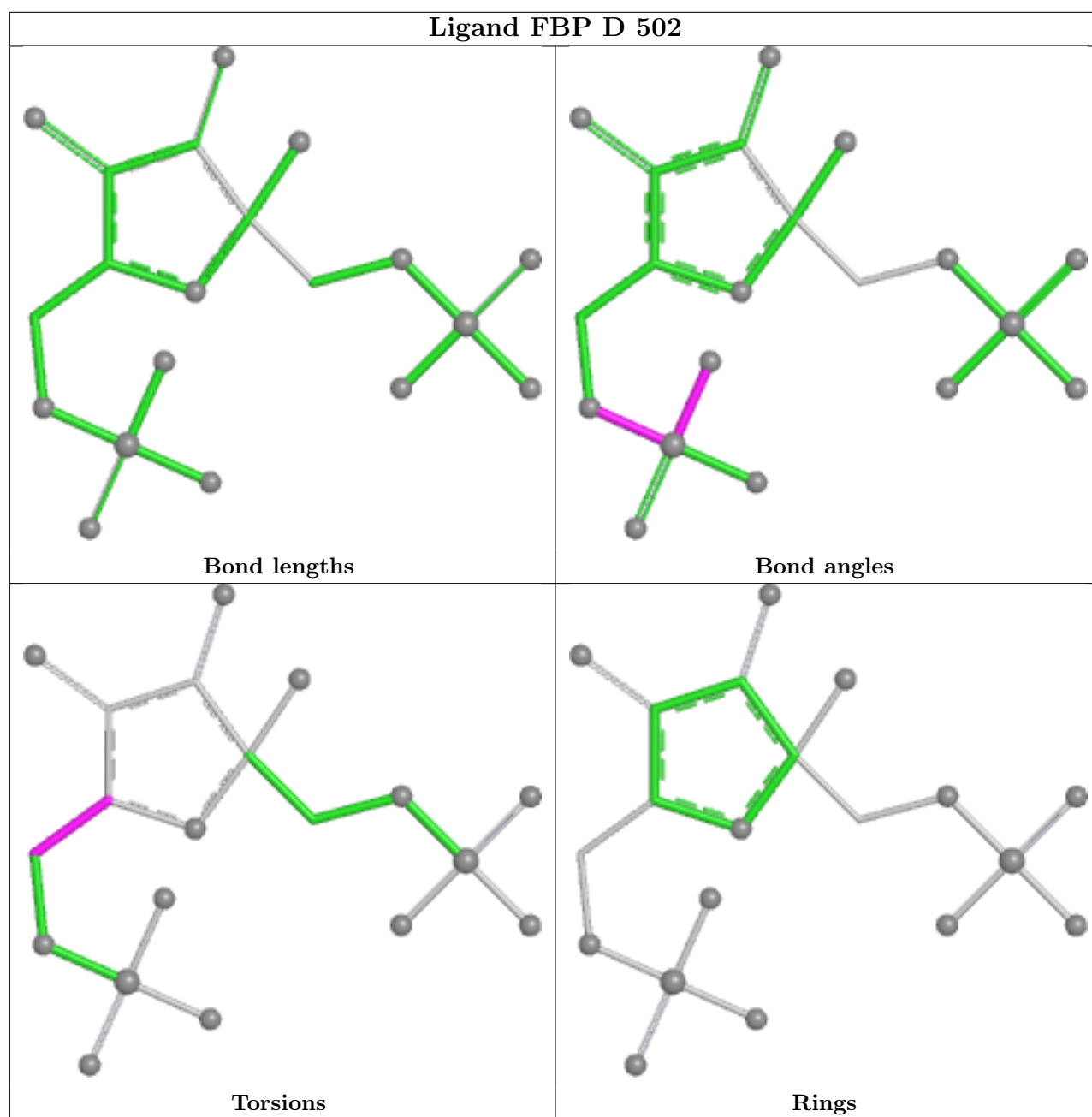


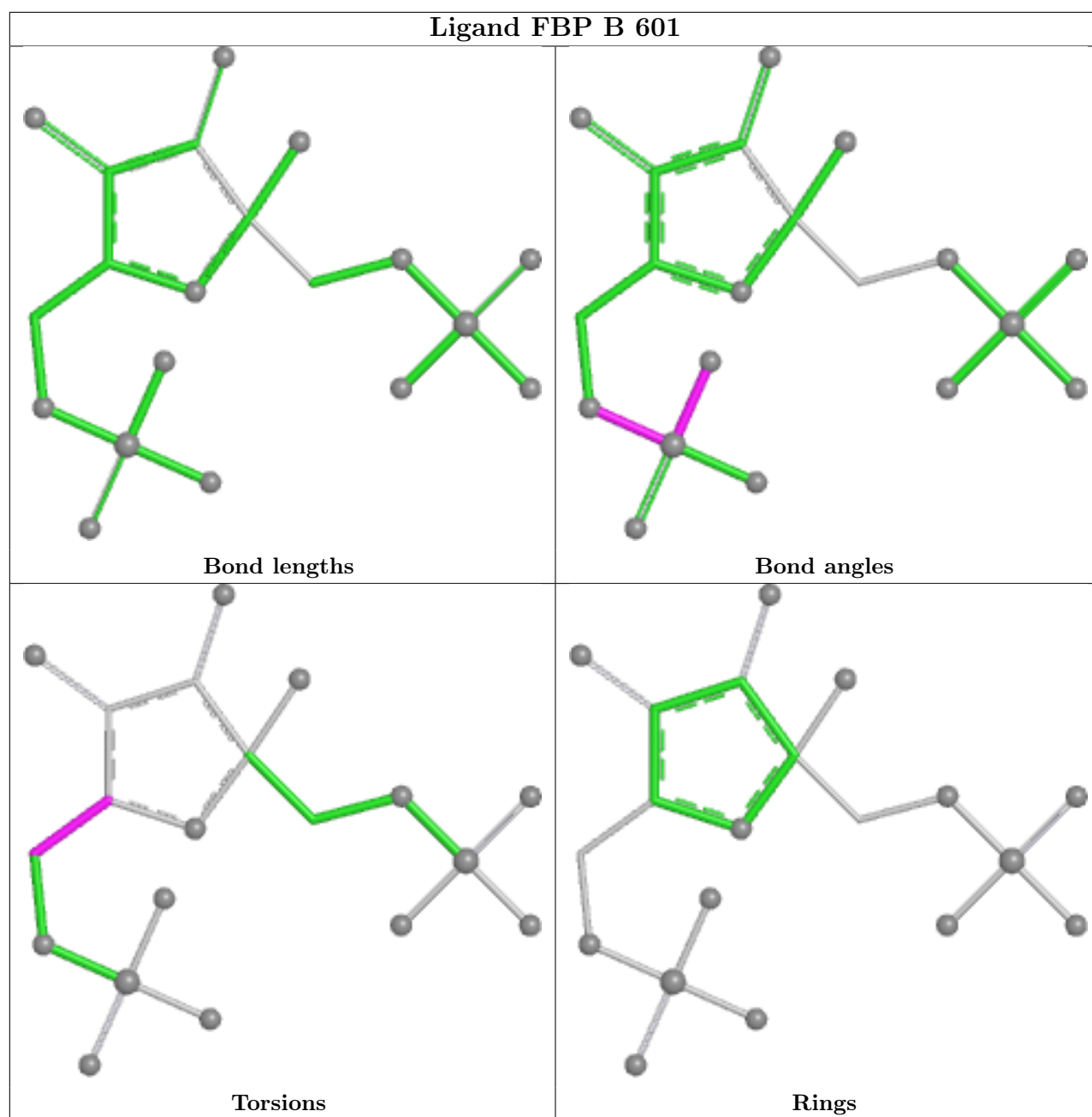












5.7 Other polymers [i](#)

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 ⓘ

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	422/447 (94%)	0.85	52 (12%)	8 6	19, 39, 65, 82	13 (3%)
1	B	436/447 (97%)	1.05	92 (21%)	2 2	19, 40, 66, 77	7 (1%)
1	C	424/447 (94%)	0.15	26 (6%)	27 25	17, 29, 50, 80	10 (2%)
1	D	425/447 (95%)	-0.05	12 (2%)	55 55	14, 27, 46, 77	8 (1%)
1	E	420/447 (93%)	0.68	47 (11%)	10 8	19, 36, 62, 74	13 (3%)
1	F	436/447 (97%)	0.41	36 (8%)	17 15	17, 32, 56, 71	8 (1%)
1	G	426/447 (95%)	0.01	19 (4%)	38 37	15, 28, 45, 92	10 (2%)
1	H	425/447 (95%)	-0.21	15 (3%)	47 47	12, 24, 44, 64	6 (1%)
All	All	3414/3576 (95%)	0.36	299 (8%)	15 13	12, 32, 60, 92	75 (2%)

All (299) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	25	PHE	9.4
1	G	173	GLY	7.8
1	C	173	GLY	7.1
1	E	25	PHE	6.7
1	E	133	PRO	5.2
1	A	133	PRO	5.1
1	H	21	GLY	5.0
1	G	20	LEU	5.0
1	D	25	PHE	5.0
1	C	133	PRO	4.9
1	E	177[A]	HIS	4.9
1	B	250	THR	4.8
1	A	402	ARG	4.7
1	F	418	ARG	4.7
1	A	134	GLY	4.6
1	A	24	PHE	4.5

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Mol	Chain	Res	Type	RSRZ
1	G	17	THR	4.5
1	E	114	PRO	4.4
1	B	392	PRO	4.3
1	C	25	PHE	4.2
1	B	415	GLY	4.2
1	C	134	GLY	4.2
1	A	114	PRO	4.2
1	F	413	LEU	4.2
1	A	30	LEU	4.1
1	B	445	SER	4.1
1	A	115	LEU	4.1
1	A	34	MET	4.1
1	G	19	GLU	4.1
1	B	169[A]	ARG	4.1
1	B	391	PRO	4.0
1	G	133	PRO	4.0
1	F	169[A]	ARG	3.9
1	B	413	LEU	3.9
1	F	317	PRO	3.9
1	B	409	GLU	3.9
1	C	34	MET	3.9
1	G	18	GLN	3.9
1	H	25	PHE	3.9
1	A	445	SER	3.8
1	B	143	LEU	3.8
1	D	21	GLY	3.8
1	E	115	LEU	3.8
1	H	22	THR	3.8
1	E	129	PRO	3.7
1	C	20	LEU	3.7
1	D	23	ALA	3.7
1	B	70	VAL	3.7
1	E	134	GLY	3.7
1	F	392	PRO	3.7
1	B	91	GLY	3.6
1	D	22	THR	3.6
1	G	25	PHE	3.6
1	B	419	VAL	3.6
1	F	391	PRO	3.5
1	B	418	ARG	3.5
1	F	414	ARG	3.5
1	A	73	LEU	3.5

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Mol	Chain	Res	Type	RSRZ
1	E	23	ALA	3.5
1	A	132	GLY	3.5
1	B	90	HIS	3.4
1	B	133	PRO	3.4
1	E	392	PRO	3.4
1	B	284	PHE	3.4
1	B	281	LYS	3.4
1	A	113	SER	3.4
1	A	70	VAL	3.3
1	A	172	LEU	3.3
1	D	24	PHE	3.3
1	E	416	PHE	3.3
1	F	130	GLY	3.3
1	A	116	SER	3.3
1	D	177[A]	HIS	3.3
1	A	313	ARG	3.3
1	B	95	TYR	3.2
1	C	115	LEU	3.2
1	A	140	VAL	3.2
1	C	22	THR	3.2
1	B	118	ARG	3.2
1	G	33	ALA	3.2
1	A	118	ARG	3.2
1	B	97	ALA	3.1
1	H	133	PRO	3.1
1	B	115	LEU	3.1
1	B	172	LEU	3.1
1	G	34	MET	3.1
1	B	135	LEU	3.1
1	F	409	GLU	3.1
1	B	318	LEU	3.1
1	A	416	PHE	3.1
1	G	24	PHE	3.1
1	C	114	PRO	3.1
1	E	34	MET	3.0
1	B	67	SER	3.0
1	B	280	ALA	3.0
1	F	144	ARG	3.0
1	C	21	GLY	3.0
1	C	442[A]	LEU	3.0
1	A	117	TYR	3.0
1	A	151	VAL	3.0

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Mol	Chain	Res	Type	RSRZ
1	B	414	ARG	3.0
1	C	23	ALA	3.0
1	B	10	ARG	2.9
1	B	66	ALA	2.9
1	F	314	ARG	2.9
1	F	389	ARG	2.9
1	B	132	GLY	2.9
1	C	177[A]	HIS	2.9
1	B	412	LYS	2.9
1	F	115	LEU	2.9
1	F	172	LEU	2.9
1	B	168	VAL	2.9
1	A	135	LEU	2.9
1	B	100	ILE	2.9
1	E	135	LEU	2.8
1	A	169[A]	ARG	2.8
1	G	174	PRO	2.8
1	F	390	GLU	2.8
1	E	172	LEU	2.8
1	B	285	PRO	2.8
1	E	24	PHE	2.8
1	C	313	ARG	2.8
1	F	34	MET	2.8
1	B	111	ALA	2.7
1	D	314	ARG	2.7
1	F	10	ARG	2.7
1	G	23	ALA	2.7
1	H	314	ARG	2.7
1	H	418	ARG	2.7
1	B	386	LEU	2.7
1	E	109	SER	2.7
1	A	253	ARG	2.7
1	B	286	VAL	2.7
1	B	313	ARG	2.7
1	F	394	ALA	2.7
1	B	145	PHE	2.7
1	G	22	THR	2.7
1	B	174	PRO	2.7
1	E	26	GLN	2.7
1	A	147	VAL	2.7
1	F	177	HIS	2.7
1	G	177[A]	HIS	2.7

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Mol	Chain	Res	Type	RSRZ
1	C	117	TYR	2.7
1	B	73	LEU	2.7
1	E	443[A]	SER	2.7
1	B	102	ASN	2.7
1	A	173	GLY	2.6
1	D	134	GLY	2.6
1	A	95	TYR	2.6
1	B	72	ARG	2.6
1	B	317	PRO	2.6
1	B	34	MET	2.6
1	E	144	ARG	2.6
1	B	92	SER	2.6
1	B	395	ILE	2.6
1	E	169[A]	ARG	2.6
1	E	171	ALA	2.6
1	F	33	ALA	2.6
1	B	443	SER	2.6
1	E	391	PRO	2.6
1	B	249	ILE	2.6
1	E	33	ALA	2.5
1	F	133	PRO	2.5
1	E	413	LEU	2.5
1	A	213	ILE	2.5
1	A	395	ILE	2.5
1	A	111	ALA	2.5
1	G	26	GLN	2.5
1	A	442	LEU	2.5
1	F	313	ARG	2.5
1	E	116	SER	2.5
1	A	174	PRO	2.5
1	C	112	GLY	2.4
1	E	117	TYR	2.4
1	B	406	PHE	2.4
1	E	442	LEU	2.4
1	A	75[A]	GLU	2.4
1	E	113	SER	2.4
1	H	34	MET	2.4
1	B	411	GLY	2.4
1	B	177	HIS	2.4
1	D	34	MET	2.4
1	E	158	PHE	2.4
1	B	12	ASP	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	444	ILE	2.4
1	B	106	ALA	2.4
1	F	11	ALA	2.4
1	B	163	SER	2.4
1	A	143	LEU	2.4
1	B	387	LEU	2.4
1	B	110	PHE	2.4
1	E	444	ILE	2.4
1	G	313	ARG	2.4
1	E	165	VAL	2.4
1	E	253	ARG	2.3
1	B	138	GLN	2.3
1	B	123	ALA	2.3
1	B	153	ILE	2.3
1	E	97	ALA	2.3
1	E	111	ALA	2.3
1	B	21	GLY	2.3
1	A	400	VAL	2.3
1	B	103	VAL	2.3
1	B	109	SER	2.3
1	A	314	ARG	2.3
1	C	110	PHE	2.3
1	B	79	ALA	2.3
1	A	112	GLY	2.3
1	A	109	SER	2.3
1	C	314	ARG	2.3
1	H	177[A]	HIS	2.3
1	H	24	PHE	2.3
1	E	174	PRO	2.3
1	A	100	ILE	2.3
1	B	282	GLY	2.3
1	F	445	SER	2.3
1	A	417	LEU	2.3
1	C	135	LEU	2.3
1	B	389	ARG	2.2
1	F	118	ARG	2.2
1	B	88	PHE	2.2
1	C	174	PRO	2.2
1	E	394	ALA	2.2
1	C	113	SER	2.2
1	A	63	ILE	2.2
1	B	400	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	F	253	ARG	2.2
1	H	310	GLU	2.2
1	G	21	GLY	2.2
1	B	316	ALA	2.2
1	C	111	ALA	2.2
1	F	13	VAL	2.2
1	B	130	GLY	2.2
1	B	11	ALA	2.2
1	C	24	PHE	2.2
1	E	140	VAL	2.2
1	B	136	SER	2.2
1	E	30	LEU	2.2
1	F	386	LEU	2.2
1	H	317	PRO	2.2
1	B	101	ALA	2.2
1	B	171	ALA	2.2
1	E	101	ALA	2.2
1	F	171	ALA	2.2
1	A	177	HIS	2.1
1	A	306	ARG	2.2
1	E	118	ARG	2.2
1	B	390	GLU	2.1
1	H	175	GLU	2.1
1	D	26	GLN	2.1
1	E	112	GLY	2.1
1	E	173	GLY	2.1
1	G	134	GLY	2.1
1	G	30	LEU	2.1
1	A	90	HIS	2.1
1	A	390[A]	GLU	2.1
1	B	93	HIS	2.1
1	D	175	GLU	2.1
1	A	373	ALA	2.1
1	B	283	ASN	2.1
1	H	416	PHE	2.1
1	A	398	ASP	2.1
1	B	107	VAL	2.1
1	F	90	HIS	2.1
1	F	135	LEU	2.1
1	B	170	ALA	2.1
1	B	122	ILE	2.1
1	B	68	ARG	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	128	GLY	2.1
1	B	134	GLY	2.1
1	E	147	VAL	2.1
1	B	86	LEU	2.1
1	B	417	LEU	2.1
1	H	135	LEU	2.1
1	B	397	ALA	2.1
1	A	144	ARG	2.1
1	D	313	ARG	2.1
1	E	314	ARG	2.1
1	H	313	ARG	2.1
1	B	25	PHE	2.0
1	C	443[A]	SER	2.0
1	E	179	ILE	2.0
1	E	213	ILE	2.0
1	E	395	ILE	2.0
1	F	131	SER	2.0
1	F	281	LYS	2.0
1	B	64	GLY	2.0
1	B	176	GLY	2.0
1	E	305	HIS	2.0
1	A	33	ALA	2.0
1	B	121	ALA	2.0
1	C	33	ALA	2.0
1	A	175	GLU	2.0
1	F	310	GLU	2.0
1	C	26	GLN	2.0
1	F	134	GLY	2.0
1	A	129	PRO	2.0
1	B	140	VAL	2.0
1	F	147	VAL	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 ⓘ

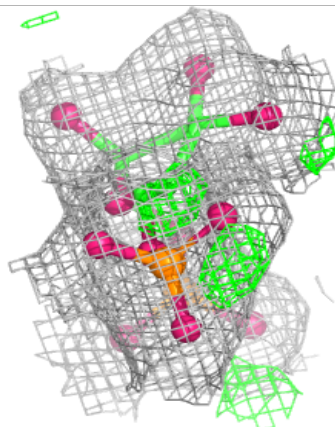
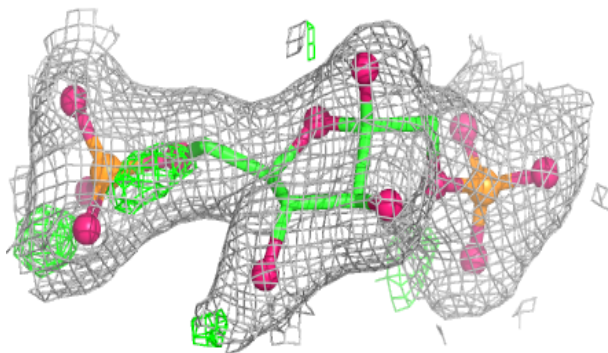
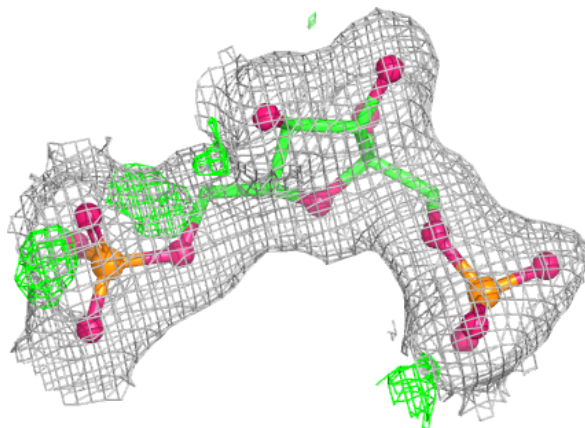
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists 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	0.90	0.10	46,47,47,47	0
3	OXL	A	602	6/6	0.92	0.09	43,43,44,45	0
3	OXL	B	602	6/6	0.93	0.09	37,38,41,41	0
3	OXL	F	602	6/6	0.93	0.08	34,34,36,37	0
2	FBP	B	601	20/20	0.95	0.08	34,35,40,40	0
3	OXL	D	503	6/6	0.95	0.07	32,34,34,34	0
5	MG	B	603	1/1	0.95	0.10	50,50,50,50	0
6	K	A	605	1/1	0.95	0.14	68,68,68,68	0
7	EDO	H	604	4/4	0.95	0.09	28,28,29,29	6
4	WVO	A	603	32/32	0.96	0.08	25,28,33,33	16
4	WVO	E	603	32/32	0.96	0.07	25,29,33,33	16
3	OXL	C	602	6/6	0.96	0.07	35,36,37,37	0
2	FBP	A	601	20/20	0.96	0.07	33,34,35,35	0
6	K	B	604	1/1	0.96	0.12	63,63,63,63	0
6	K	E	605	1/1	0.96	0.24	67,67,67,67	0
6	K	F	604	1/1	0.96	0.14	58,58,58,58	0
3	OXL	G	602	6/6	0.96	0.06	33,33,34,35	0
2	FBP	F	601	20/20	0.97	0.06	29,32,36,37	0
4	WVO	D	501	32/32	0.97	0.07	25,28,32,32	16
2	FBP	E	601	20/20	0.97	0.06	30,31,33,33	0
4	WVO	H	603	32/32	0.97	0.06	23,27,32,32	16
6	K	G	604	1/1	0.97	0.18	52,52,52,52	0
3	OXL	H	602	6/6	0.97	0.08	27,28,30,30	0
5	MG	D	504	1/1	0.98	0.03	29,29,29,29	0
6	K	C	604	1/1	0.98	0.17	48,48,48,48	0
6	K	H	606	1/1	0.98	0.09	43,43,43,43	0
5	MG	C	603	1/1	0.98	0.05	35,35,35,35	0
5	MG	H	605	1/1	0.99	0.02	28,28,28,28	0
2	FBP	H	601	20/20	0.99	0.04	16,19,22,22	0
5	MG	A	604	1/1	0.99	0.03	46,46,46,46	0
2	FBP	C	601	20/20	0.99	0.04	21,22,25,25	0
6	K	D	505	1/1	0.99	0.06	39,39,39,39	0
2	FBP	D	502	20/20	0.99	0.04	20,22,25,25	0
2	FBP	G	601	20/20	0.99	0.04	18,21,21,22	0
5	MG	E	604	1/1	0.99	0.03	42,42,42,42	0
5	MG	F	603	1/1	0.99	0.02	33,33,33,33	0
5	MG	G	603	1/1	0.99	0.06	30,30,30,30	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.

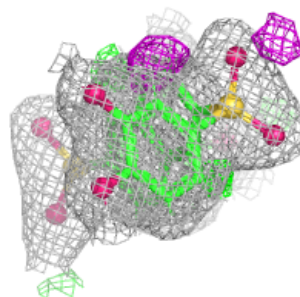
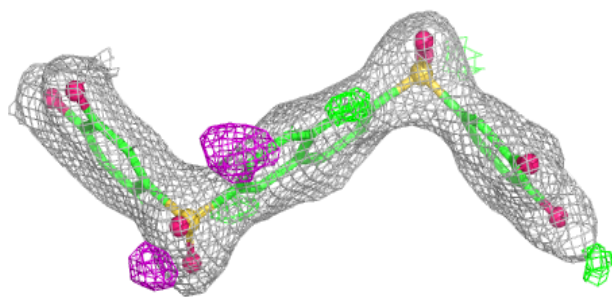
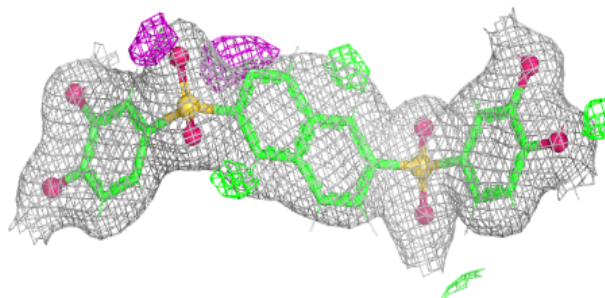
Electron density around FBP B 601:

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

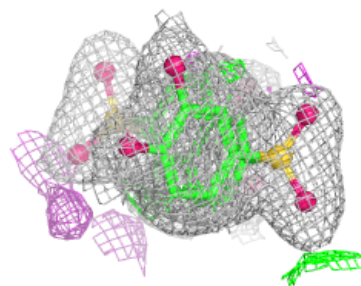
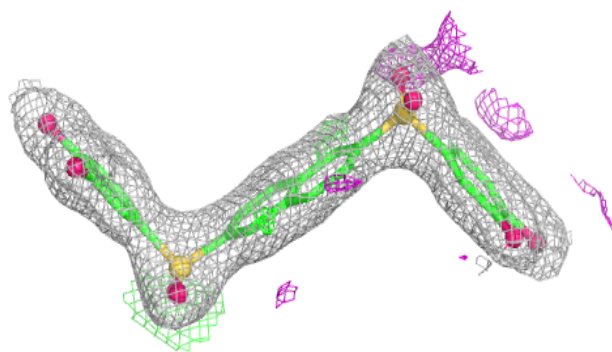
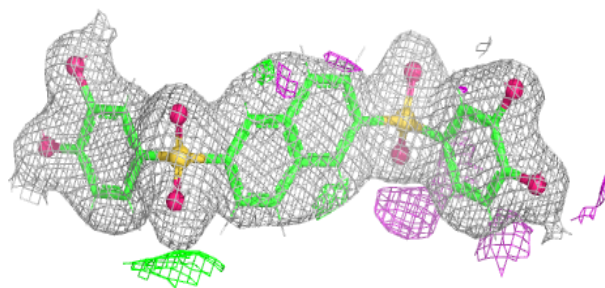


Electron density around WVO A 603:

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

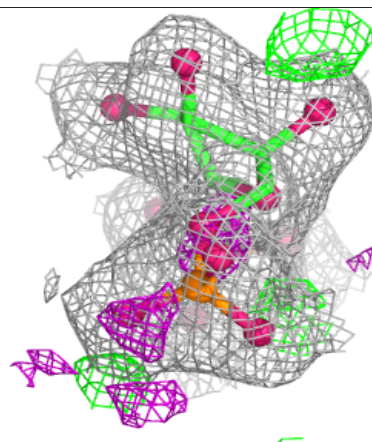
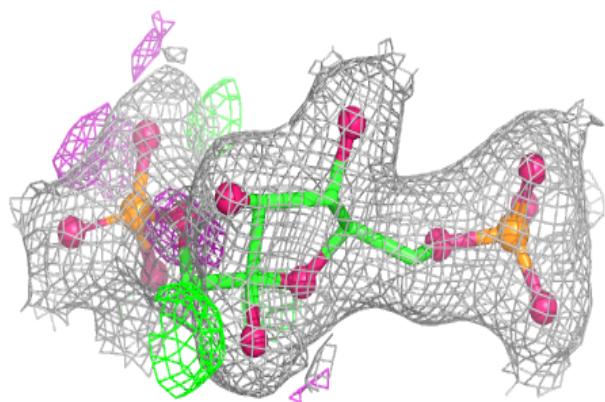
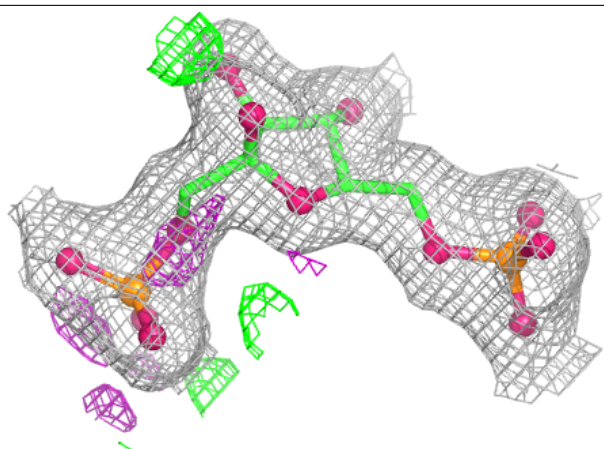
**Electron density around WVO E 603:**

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



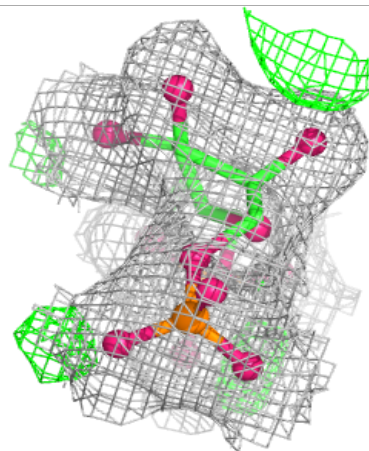
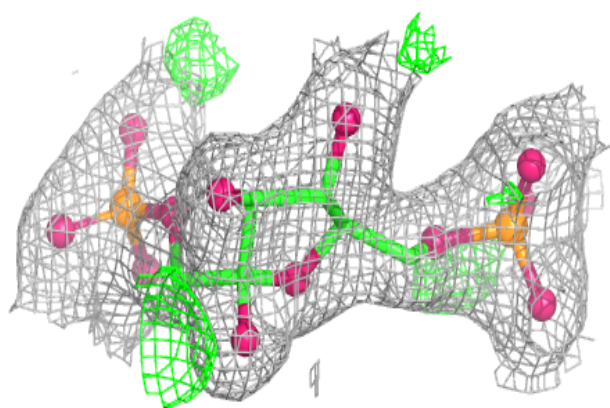
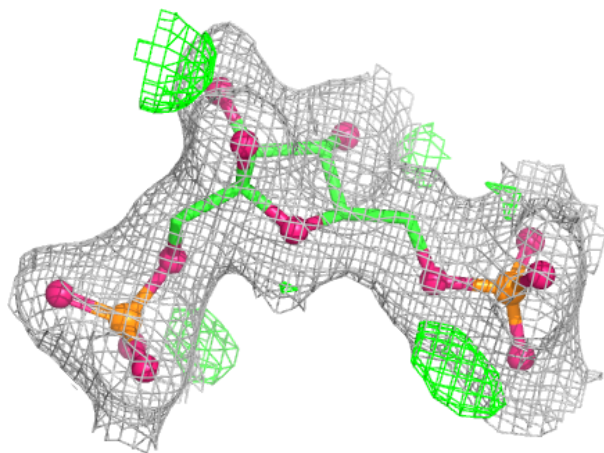
Electron density around FBP A 601:

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



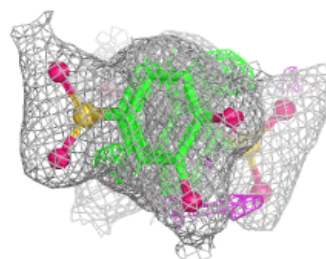
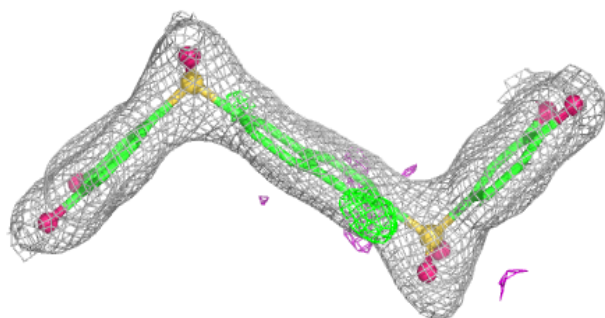
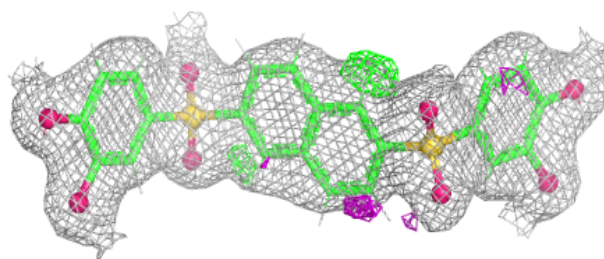
Electron density around FBP F 601:

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

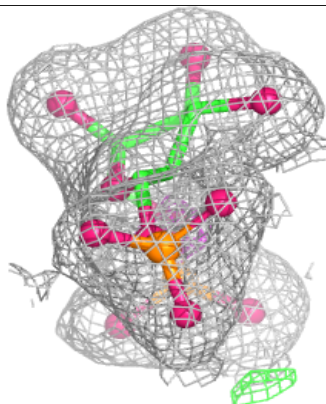
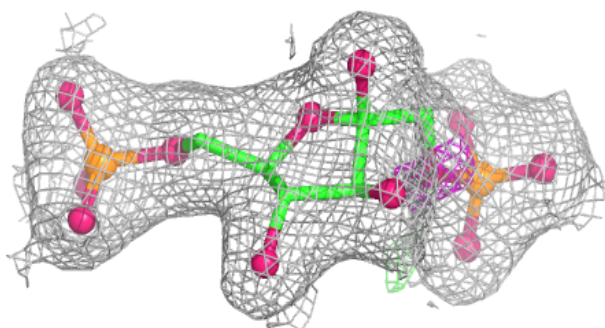
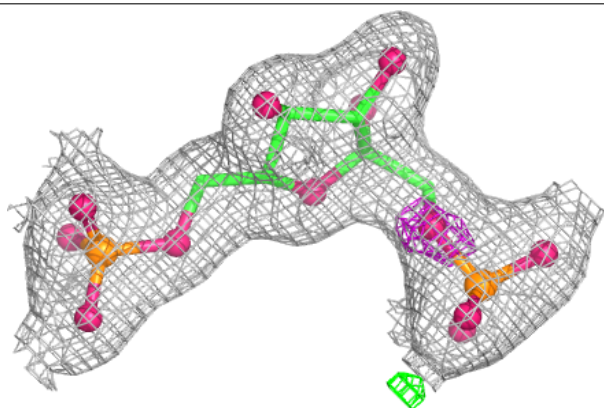


Electron density around WVO D 501:

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

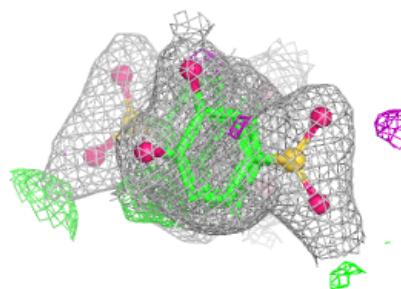
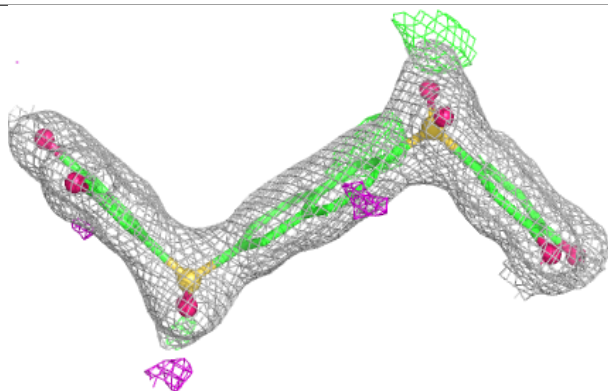
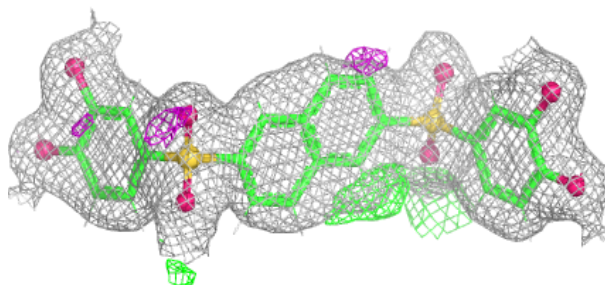
**Electron density around FBP E 601:**

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

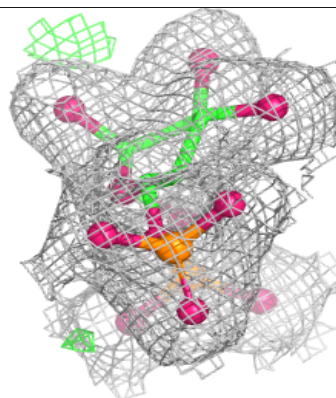
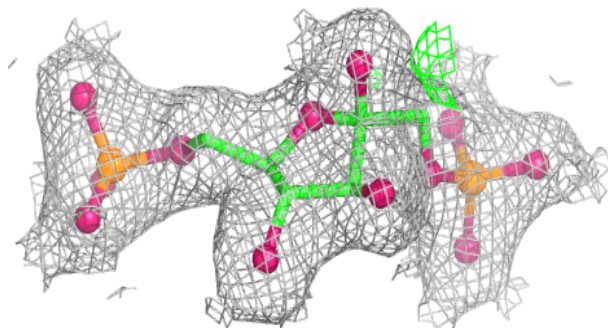
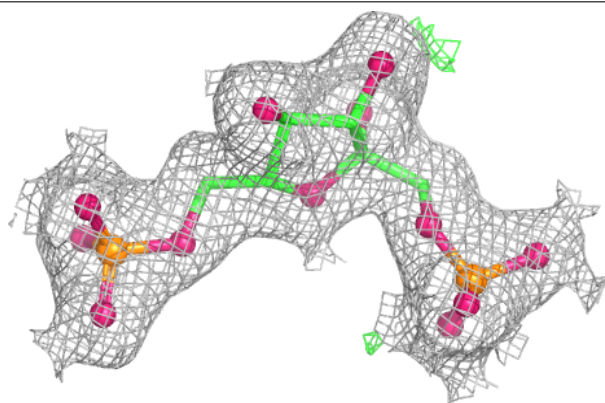


Electron density around WVO H 603:

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

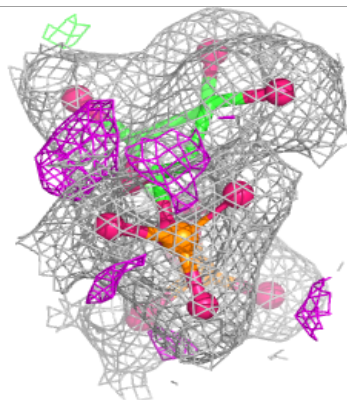
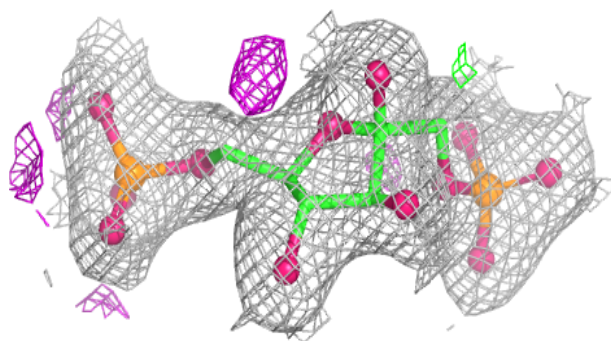
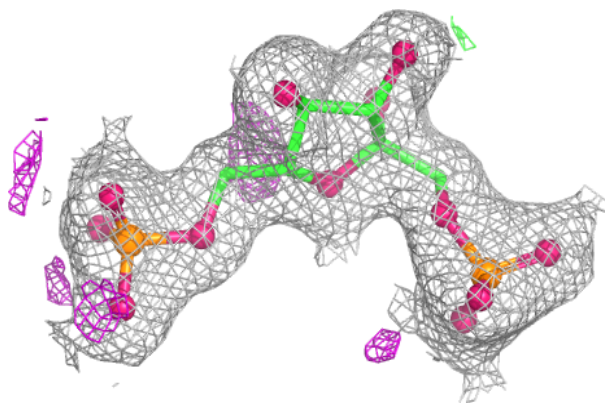
**Electron density around FBP H 601:**

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

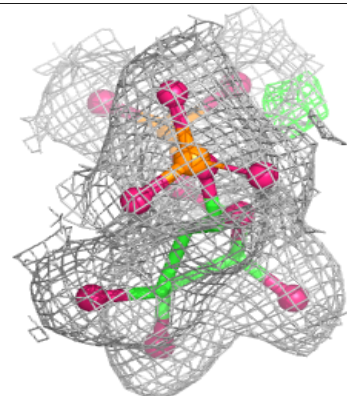
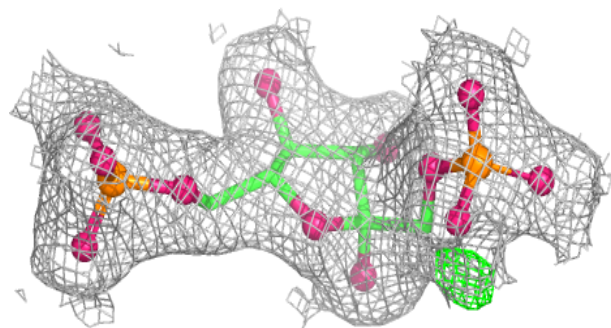
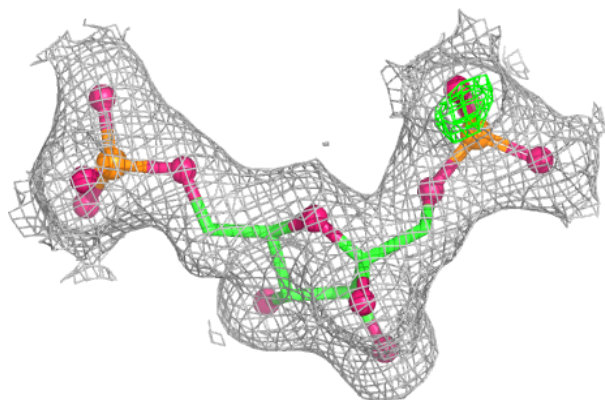


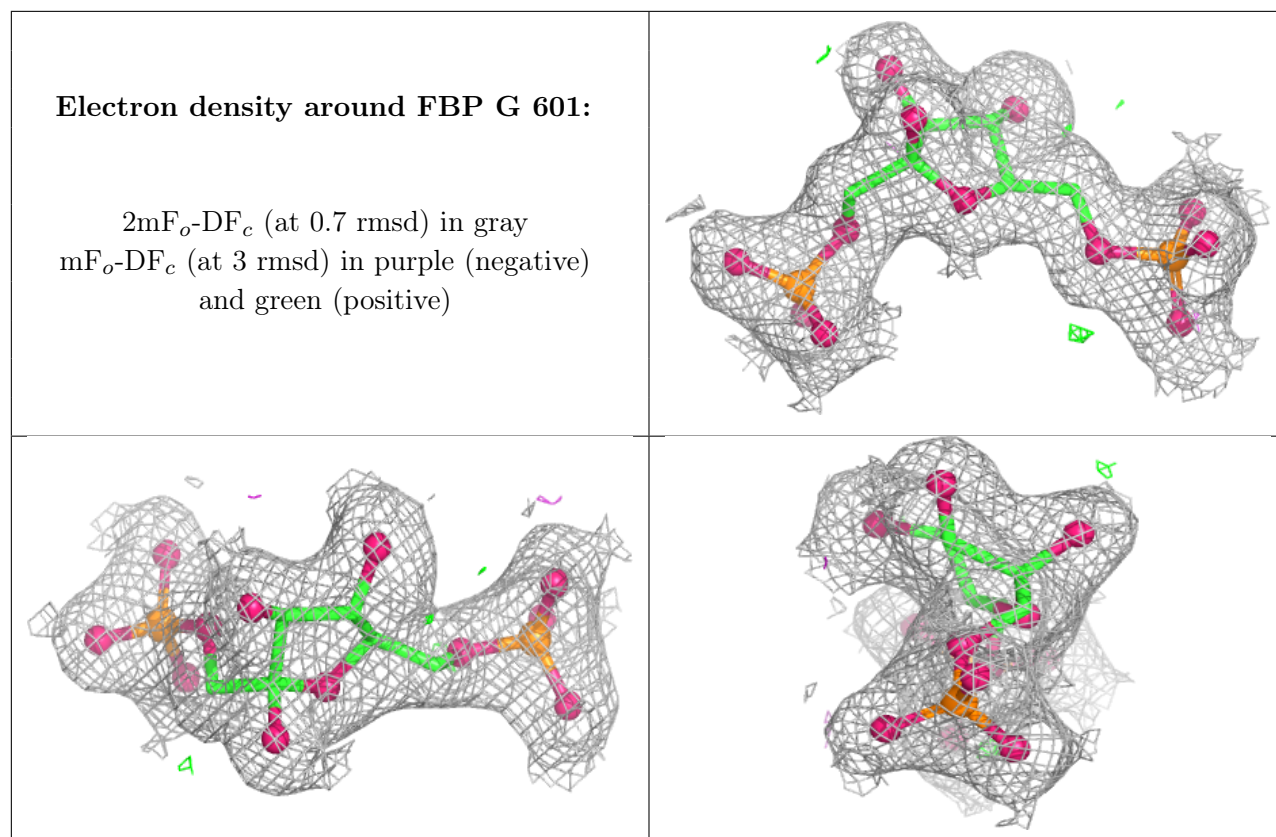
Electron density around FBP C 601:

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

**Electron density around FBP D 502:**

$2mF_o-DF_c$ (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.