Full wwPDB X-ray Structure Validation Report (i)

Oct 24, 2026 – 12:55 PM EDT

PDB ID	:	14CQ / pdb_000014cq
Title	:	Structure of liver pyruvate kinase in complex with allosteric activator 8c
Authors	:	Lulla, A.; Rodriguez Rivero, A.; Grotli, M.; Hyvonen, M.
Deposited on	:	2026-04-28
Resolution	:	2.18 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 (i) 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 (i)) were used in the production of this report:

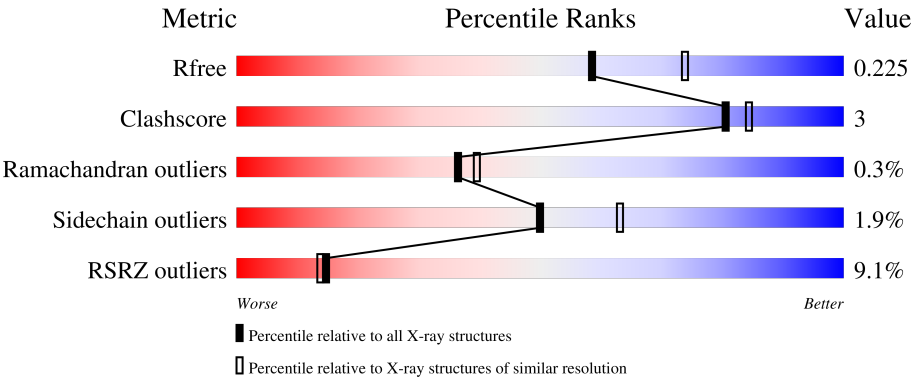
MolProbity	:	4-5-2 with Phenix2.2
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.18 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.



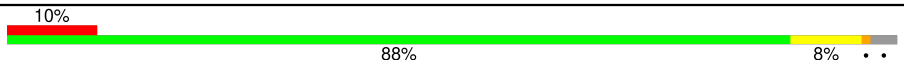
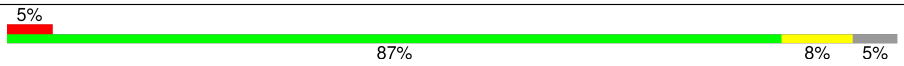
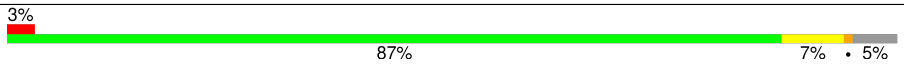
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	8975 (2.20-2.16)
Clashscore	190562	9786 (2.20-2.16)
Ramachandran outliers	187476	9664 (2.20-2.16)
Sidechain outliers	187428	9664 (2.20-2.16)
RSRZ outliers	180081	8979 (2.20-2.16)

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 <=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	20% 85% 8% 6%
1	B	447	7% 90% 7% •
1	C	447	5% 88% 6% 5%
1	D	447	2% 86% 8% • 5%
1	E	447	16% 88% 6% 5%

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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 (i)

There are 7 unique types of molecules in this entry. The entry contains 28137 atoms, of which 64 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	420	Total	C	N	O	S	0	14	0
			3257	2045	586	606	20			
1	B	436	Total	C	N	O	S	3	8	0
			3350	2104	604	622	20			
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	423	Total	C	N	O	S	0	14	0
			3286	2066	591	609	20			
1	F	432	Total	C	N	O	S	0	8	0
			3327	2094	597	616	20			
1	G	425	Total	C	N	O	S	0	10	0
			3282	2065	588	610	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:

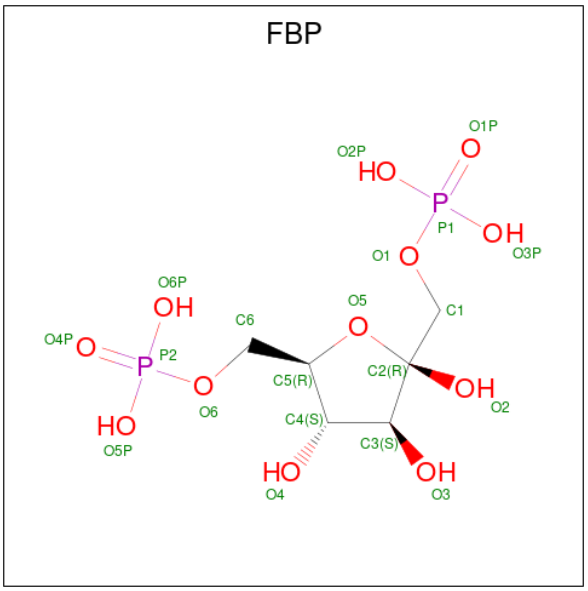
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP P30613
A	0	SER	-	expression tag	UNP P30613
A	12	ASP	SER	conflict	UNP P30613
A	130	GLY	-	linker	UNP P30613
A	131	SER	-	linker	UNP P30613
A	132	GLY	-	linker	UNP P30613
B	-1	GLY	-	expression tag	UNP P30613
B	0	SER	-	expression 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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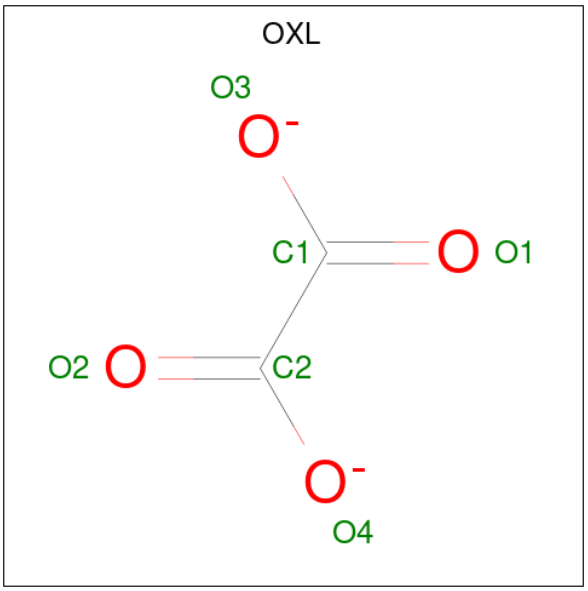
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	SER	-	expression tag	UNP P30613
C	12	ASP	SER	conflict	UNP P30613
C	130	GLY	-	linker	UNP P30613
C	131	SER	-	linker	UNP P30613
C	132	GLY	-	linker	UNP P30613
D	-1	GLY	-	expression tag	UNP P30613
D	0	SER	-	expression tag	UNP P30613
D	12	ASP	SER	conflict	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: C_2O_4).



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

- Molecule 4 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Mg 1 1	0	0
4	B	1	Total Mg 1 1	0	0
4	C	1	Total Mg 1 1	0	0
4	D	1	Total Mg 1 1	0	0

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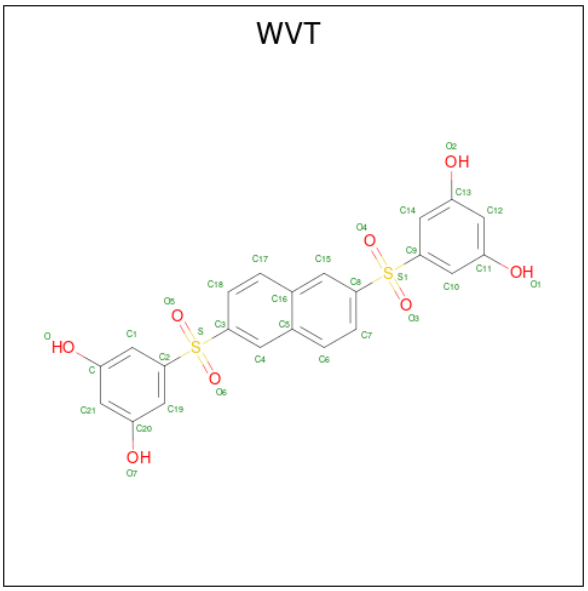
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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	E	1	Total Mg 1 1	0	0
4	F	1	Total Mg 1 1	0	0
4	G	1	Total Mg 1 1	0	0
4	H	1	Total Mg 1 1	0	0

- Molecule 5 is POTASSIUM ION (CCD ID: K) (formula: K).

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

- Molecule 6 is 5,5'-(naphthalene-2,6-diyldisulfonyl)di(benzene-1,3-diol) (CCD ID: WVT) (formula: $C_{22}H_{16}O_8S_2$) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 7 is water.

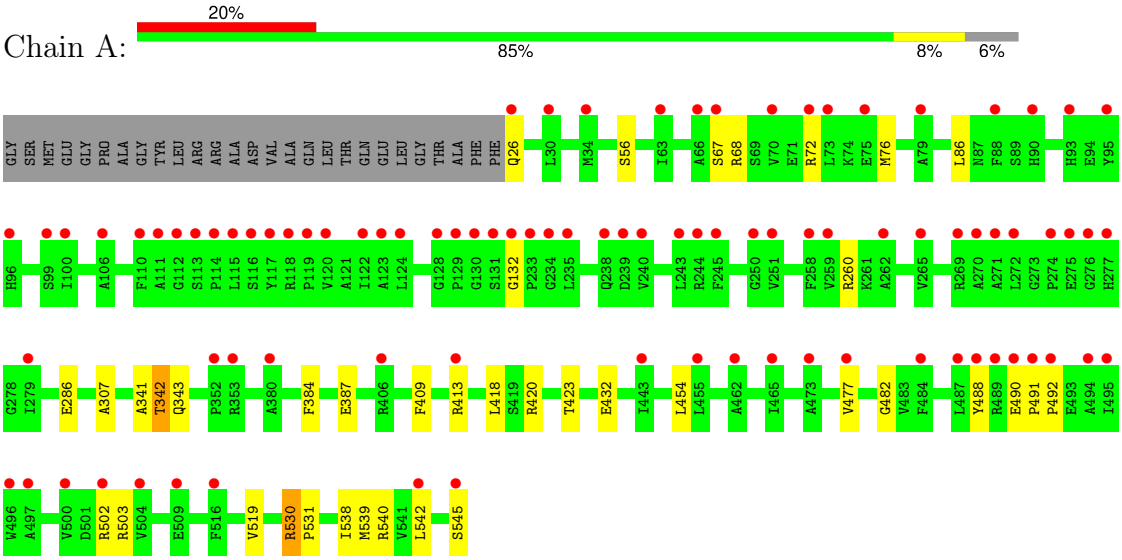
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	110	Total	O	0	0
			110	110		
7	B	170	Total	O	0	0
			170	170		
7	C	177	Total	O	0	0
			177	177		
7	D	227	Total	O	0	0
			227	227		
7	E	144	Total	O	0	0
			144	144		
7	F	160	Total	O	0	0
			160	160		
7	G	200	Total	O	0	0
			200	200		
7	H	226	Total	O	0	0
			226	226		

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.

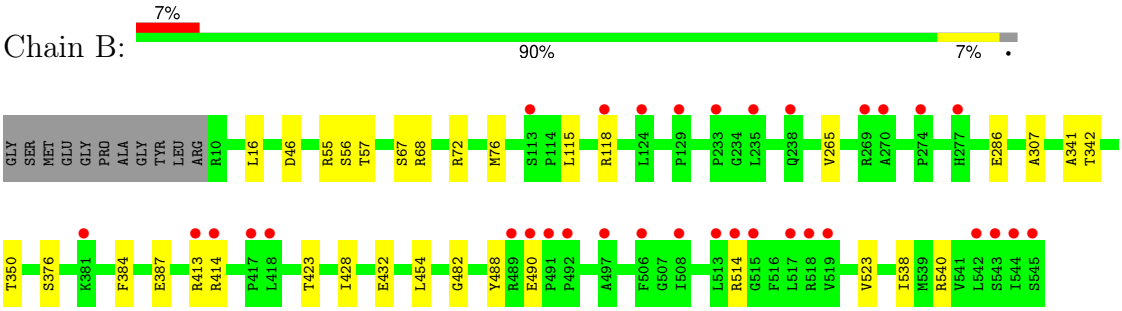
• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

Chain A:



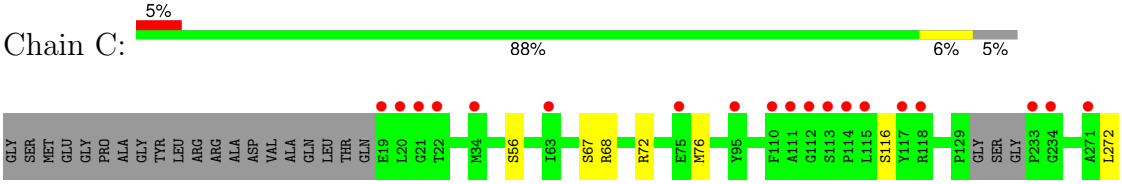
• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

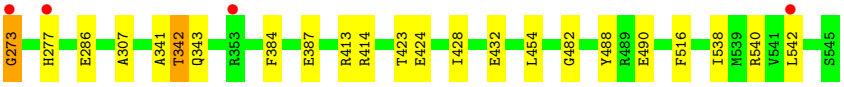
Chain B:



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

Chain C:

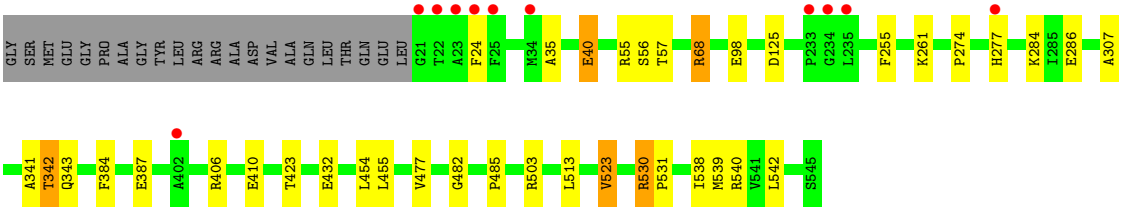




• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

Chain D:

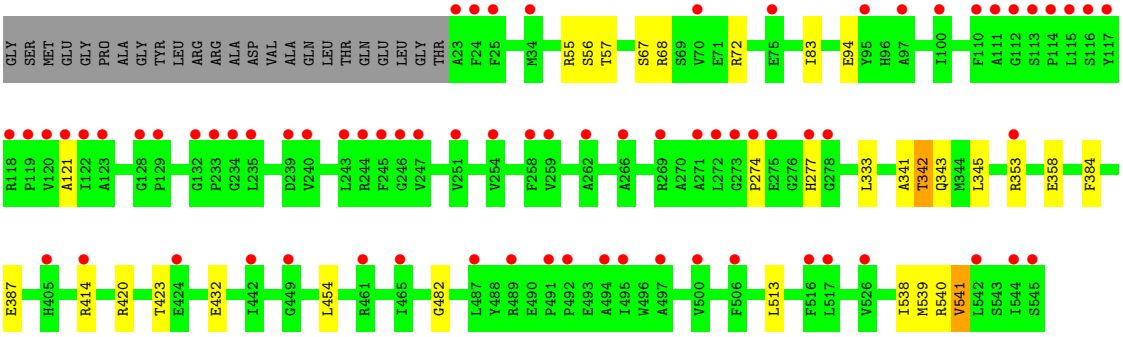




• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

Chain E:

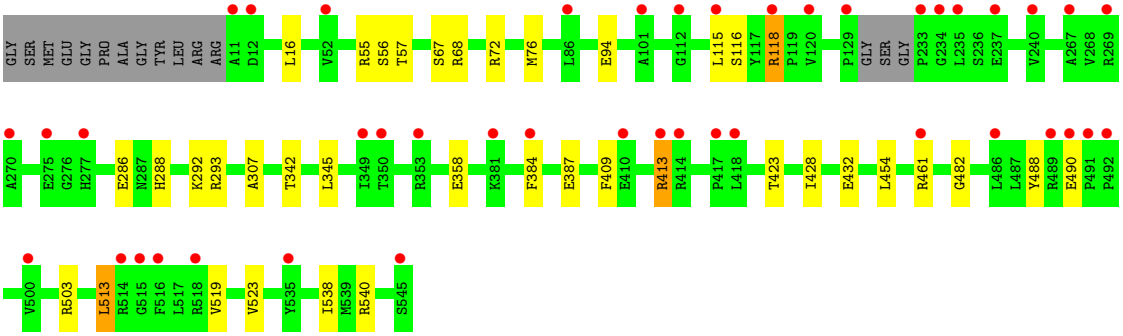




• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

Chain F:

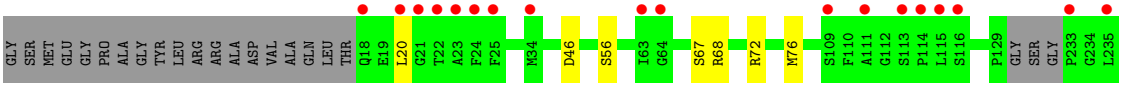


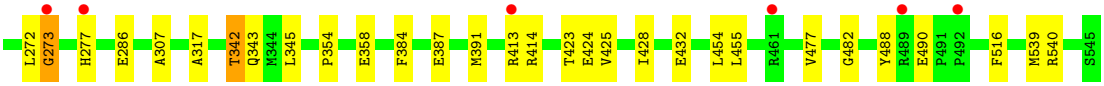


• Molecule 1: Isoform L-type of Pyruvate kinase PKLR

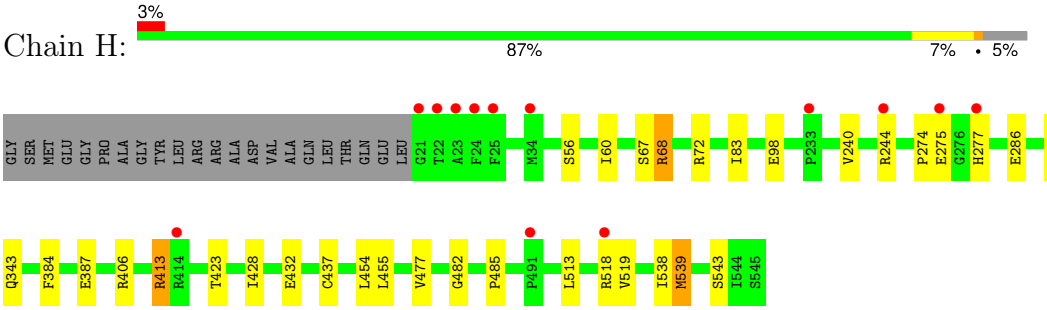
Chain G:







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



4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	206.92Å 112.69Å 187.89Å 90.00° 92.39° 90.00°	Depositor
Resolution (Å)	187.72 – 2.18 187.72 – 2.18	Depositor EDS
% Data completeness (in resolution range)	66.2 (187.72-2.18) 66.2 (187.72-2.18)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.76 (at 2.18Å)	Xtriage
Refinement program	BUSTER 2.10.4	Depositor
R, R_{free}	0.207 , 0.238 0.195 , 0.225	Depositor DCC
R_{free} test set	7328 reflections (3.28%)	wwPDB-VP
Wilson B-factor (Å^2)	35.8	Xtriage
Anisotropy	0.016	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 42.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.001 for -h,-k,l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	28137	wwPDB-VP
Average B, all atoms (Å^2)	42.0	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 65.52 % 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 6.9960e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: MG, OXL, K, FBP, WVT

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	0.67	0/3352	1.00	3/4531 (0.1%)
1	B	0.72	2/3429 (0.1%)	1.01	3/4636 (0.1%)
1	C	0.70	0/3360	1.03	5/4542 (0.1%)
1	D	0.75	0/3341	1.03	4/4517 (0.1%)
1	E	0.67	0/3384	0.99	3/4574 (0.1%)
1	F	0.70	0/3405	1.01	0/4603
1	G	0.71	0/3367	1.01	4/4551 (0.1%)
1	H	0.74	0/3352	1.03	4/4531 (0.1%)
All	All	0.71	2/26990 (0.0%)	1.02	26/36485 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	376[A]	SER	CA-C	5.44	1.55	1.52
1	B	376[B]	SER	CA-C	5.44	1.55	1.52

All (26) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	G	516	PHE	CA-CB-CG	5.93	119.73	113.80
1	H	455	LEU	CA-C-N	5.83	128.10	120.28
1	H	455	LEU	C-N-CA	5.83	128.10	120.28
1	D	455	LEU	CA-C-N	5.66	127.86	120.28
1	D	455	LEU	C-N-CA	5.66	127.86	120.28
1	C	542[A]	LEU	N-CA-C	5.60	120.61	113.55
1	C	542[B]	LEU	N-CA-C	5.60	120.61	113.55
1	G	455	LEU	CA-C-N	5.40	127.52	120.28
1	G	455	LEU	C-N-CA	5.40	127.52	120.28
1	H	341	ALA	CA-C-N	5.40	131.85	121.54
1	H	341	ALA	C-N-CA	5.40	131.85	121.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	46	ASP	CA-CB-CG	5.37	117.97	112.60
1	E	541	VAL	N-CA-CB	5.36	117.48	111.21
1	A	341	ALA	CA-C-N	5.25	131.56	121.54
1	A	341	ALA	C-N-CA	5.25	131.56	121.54
1	C	341	ALA	CA-C-N	5.23	131.53	121.54
1	C	341	ALA	C-N-CA	5.23	131.53	121.54
1	D	341	ALA	CA-C-N	5.22	131.52	121.54
1	D	341	ALA	C-N-CA	5.22	131.52	121.54
1	G	46	ASP	CA-CB-CG	5.20	117.80	112.60
1	C	516	PHE	CA-CB-CG	5.16	118.96	113.80
1	B	341	ALA	CA-C-N	5.13	131.33	121.54
1	B	341	ALA	C-N-CA	5.13	131.33	121.54
1	A	132	GLY	N-CA-C	5.05	122.65	112.34
1	E	341	ALA	CA-C-N	5.03	131.15	121.54
1	E	341	ALA	C-N-CA	5.03	131.15	121.54

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3257	0	3336	24	0
1	B	3350	0	3417	19	0
1	C	3275	0	3343	18	0
1	D	3261	0	3321	22	0
1	E	3286	0	3355	14	0
1	F	3327	0	3399	21	0
1	G	3282	0	3345	24	0
1	H	3269	0	3334	23	0
2	A	20	0	10	1	0
2	B	20	0	10	0	0
2	C	20	0	10	0	0
2	D	20	0	10	1	0
2	E	20	0	10	0	0
2	F	20	0	10	1	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	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	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	C	32	16	0	0	0
6	D	32	16	0	0	0
6	E	32	16	0	0	0
6	F	32	16	0	0	0
7	A	110	0	0	0	0
7	B	170	0	0	0	0
7	C	177	0	0	0	0
7	D	227	0	0	1	0
7	E	144	0	0	0	0
7	F	160	0	0	1	0
7	G	200	0	0	0	0
7	H	226	0	0	0	0
All	All	28073	64	26930	137	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (137) 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:424[A]:GLU:HG3	1:C:454:LEU:HD13	1.62	0.81
1:A:413:ARG:NH2	1:B:413:ARG:NH2	2.28	0.81
1:G:424[A]:GLU:HG3	1:G:454:LEU:HD13	1.64	0.80
1:D:24:PHE:HB3	7:D:767:HOH:O	1.88	0.72
1:C:538:ILE:HG12	1:D:540:ARG:HG2	1.72	0.71
1:E:420[B]:ARG:HG3	1:F:16:LEU:HD11	1.73	0.69
1:C:277[A]:HIS:ND1	1:G:277[A]:HIS:ND1	2.41	0.68
1:C:413:ARG:HG2	1:C:428:ILE:HD11	1.79	0.64
1:A:538:ILE:HG12	1:B:540:ARG:HG2	1.78	0.64
1:A:420[B]:ARG:HG3	1:B:16:LEU:HD11	1.79	0.63
1:G:539:MET:HE3	1:H:539:MET:HG2	1.79	0.63
1:H:413:ARG:HG2	1:H:428:ILE:HD11	1.81	0.62
1:F:116:SER:O	1:F:118:ARG:HD2	2.00	0.61
1:G:56:SER:HB2	1:G:482:GLY:HA2	1.82	0.60
1:C:540:ARG:HG2	1:D:538:ILE:HG12	1.84	0.60
1:A:409:PHE:CE2	1:A:413:ARG:NH1	2.70	0.58
1:F:67:SER:HA	1:F:72:ARG:HG2	1.86	0.58
1:G:540:ARG:HG2	1:H:538:ILE:HG12	1.86	0.57
1:A:67:SER:HA	1:A:72:ARG:HG2	1.84	0.57
1:A:409:PHE:HE2	1:A:413:ARG:HH12	1.52	0.56
1:A:413:ARG:NH2	1:B:413:ARG:CZ	2.70	0.55
1:B:56:SER:HB2	1:B:482:GLY:HA2	1.89	0.55
1:D:56:SER:HB2	1:D:482:GLY:HA2	1.88	0.55
1:A:342:THR:HG22	1:A:343:GLN:HG3	1.89	0.54
1:E:538:ILE:HG12	1:F:540:ARG:HG2	1.91	0.53
1:A:540:ARG:HG2	1:B:538:ILE:HG12	1.90	0.53
1:E:423:THR:HG22	1:E:454:LEU:HD12	1.90	0.53
1:F:409:PHE:CE2	1:F:413:ARG:NH1	2.75	0.53
1:A:413:ARG:HH21	1:B:413:ARG:NH2	2.06	0.53
1:D:35:ALA:HB1	1:D:40:GLU:HB3	1.91	0.53
1:D:523:VAL:HG12	1:D:542:LEU:HB3	1.91	0.52
1:E:353:ARG:HH21	1:G:317:ALA:HB2	1.74	0.52
1:E:342:THR:HG22	1:E:343:GLN:HG3	1.92	0.52
1:E:540:ARG:HG2	1:F:538:ILE:HG12	1.90	0.52
1:H:274:PRO:HA	1:H:277[A]:HIS:CE1	2.45	0.52
1:B:67:SER:HA	1:B:72:ARG:HG2	1.92	0.51
1:D:423:THR:HG22	1:D:454:LEU:HD12	1.93	0.51
1:F:413:ARG:HG3	1:F:428:ILE:HD11	1.93	0.51
1:H:518:ARG:HD3	1:H:519:VAL:H	1.76	0.51
1:C:56:SER:HB2	1:C:482:GLY:HA2	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:274:PRO:HA	1:E:277[A]:HIS:CE1	2.46	0.50
1:F:56:SER:HB2	1:F:482:GLY:HA2	1.94	0.50
1:B:423:THR:HG22	1:B:454:LEU:HD12	1.93	0.50
1:F:461:ARG:HD3	7:F:792:HOH:O	2.12	0.50
1:D:68:ARG:NH2	1:D:98:GLU:HB2	2.27	0.50
1:G:414:ARG:NH2	1:H:406:ARG:HD3	2.26	0.50
1:F:115:LEU:HD11	1:F:513:LEU:HD23	1.94	0.50
1:H:56:SER:HB2	1:H:482:GLY:HA2	1.94	0.50
1:H:423:THR:HG22	1:H:454:LEU:HD12	1.94	0.49
1:H:68:ARG:NH2	1:H:98:GLU:HB2	2.27	0.49
1:C:384:PHE:HB3	1:C:387:GLU:HB2	1.94	0.49
1:G:423:THR:HG22	1:G:454:LEU:HD12	1.94	0.49
1:G:342:THR:HG22	1:G:343:GLN:HG3	1.94	0.49
1:A:56:SER:HB2	1:A:482:GLY:HA2	1.94	0.49
1:D:384:PHE:HB3	1:D:387:GLU:HB2	1.94	0.48
1:F:384:PHE:HB3	1:F:387:GLU:HB2	1.95	0.48
1:G:67:SER:HA	1:G:72:ARG:HG2	1.95	0.48
1:C:423:THR:HG22	1:C:454:LEU:HD12	1.95	0.48
1:G:413:ARG:HG3	1:G:428:ILE:HD11	1.94	0.48
1:B:384:PHE:HB3	1:B:387:GLU:HB2	1.95	0.48
1:A:384:PHE:HB3	1:A:387:GLU:HB2	1.96	0.47
1:G:56:SER:HB2	1:G:482:GLY:CA	2.43	0.47
1:A:519:VAL:HG22	1:A:545:SER:HB3	1.96	0.47
1:F:67:SER:HB2	1:F:76[B]:MET:SD	2.53	0.47
1:H:342:THR:HG22	1:H:343:GLN:HG3	1.96	0.47
1:A:418:LEU:HB3	1:B:16:LEU:HD22	1.96	0.47
1:E:384:PHE:HB3	1:E:387:GLU:HB2	1.96	0.47
1:H:384:PHE:HB3	1:H:387:GLU:HB2	1.96	0.47
1:D:274:PRO:HA	1:D:277[A]:HIS:CE1	2.50	0.47
1:D:342:THR:HG22	1:D:343:GLN:HG3	1.96	0.47
1:E:56:SER:HB2	1:E:482:GLY:HA2	1.97	0.47
1:G:414:ARG:CZ	1:H:406:ARG:HD3	2.45	0.47
1:F:488:TYR:CZ	1:F:490:GLU:HB2	2.50	0.47
1:B:67:SER:HB2	1:B:76[B]:MET:SD	2.55	0.46
1:F:55:ARG:HD2	1:F:57:THR:O	2.16	0.46
1:E:67:SER:HA	1:E:72:ARG:HG2	1.97	0.46
1:A:423:THR:HG22	1:A:454:LEU:HD12	1.96	0.46
1:B:55:ARG:HD2	1:B:57:THR:O	2.16	0.46
1:G:67:SER:HB2	1:G:76[B]:MET:SD	2.56	0.45
1:C:414:ARG:HD2	1:D:410:GLU:OE2	2.16	0.45
1:G:272:LEU:O	1:G:273:GLY:O	2.34	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:488:TYR:CZ	1:G:490:GLU:HB2	2.52	0.45
1:G:354:PRO:HG3	1:G:391:MET:HG2	1.98	0.45
1:A:432:GLU:OE2	1:B:432[B]:GLU:OE1	2.34	0.45
1:C:67:SER:HA	1:C:72:ARG:HG2	1.98	0.45
1:D:530:ARG:HD2	1:D:531:PRO:O	2.16	0.45
1:G:286:GLU:HG2	1:G:307:ALA:HB3	1.98	0.45
1:G:384:PHE:HB3	1:G:387:GLU:HB2	1.98	0.45
1:A:519:VAL:HG13	1:A:545:SER:HB3	1.98	0.45
1:C:286:GLU:HG2	1:C:307:ALA:HB3	1.99	0.45
1:H:56:SER:HB2	1:H:482:GLY:CA	2.47	0.45
1:D:56:SER:HB2	1:D:482:GLY:CA	2.47	0.44
1:C:67:SER:HB2	1:C:76[B]:MET:SD	2.57	0.44
1:C:432[B]:GLU:OE2	1:D:432[B]:GLU:OE1	2.35	0.44
1:B:413:ARG:HG2	1:B:428:ILE:HD11	2.00	0.44
1:G:432[B]:GLU:OE2	1:H:432[B]:GLU:OE1	2.36	0.44
1:C:414:ARG:NH2	1:D:406:ARG:HD3	2.32	0.44
1:G:425:VAL:HG21	1:H:437:CYS:HB3	1.99	0.44
1:B:488:TYR:CZ	1:B:490:GLU:HB2	2.53	0.44
1:D:477:VAL:CG2	1:D:485:PRO:HB3	2.48	0.44
1:F:423:THR:HG22	1:F:454:LEU:HD12	2.00	0.44
1:A:530:ARG:HD2	1:A:531:PRO:O	2.19	0.43
1:B:56:SER:HB2	1:B:482:GLY:CA	2.48	0.43
1:H:286:GLU:HG2	1:H:307:ALA:HB3	2.00	0.43
1:F:503:ARG:NH1	2:F:601:FBP:O2P	2.45	0.43
1:G:414:ARG:NH2	1:H:406:ARG:HH11	2.17	0.42
1:H:67:SER:HA	1:H:72:ARG:HG2	2.01	0.42
1:H:477:VAL:CG2	1:H:485:PRO:HB3	2.49	0.42
1:A:286:GLU:HG2	1:A:307:ALA:HB3	2.01	0.42
1:C:342:THR:HG22	1:C:343:GLN:HG3	2.01	0.42
1:F:286:GLU:HG2	1:F:307:ALA:HB3	2.00	0.42
1:A:432:GLU:OE2	1:B:432[A]:GLU:OE1	2.36	0.42
1:A:488:TYR:CE1	1:A:490[B]:GLU:HB2	2.55	0.42
1:G:345:LEU:HD23	1:G:358:GLU:HB3	2.02	0.42
1:D:286:GLU:HG2	1:D:307:ALA:HB3	2.02	0.42
1:A:491:PRO:HA	1:A:492:PRO:HD3	1.94	0.41
1:A:503:ARG:NH1	2:A:601:FBP:O2P	2.45	0.41
1:D:55:ARG:HD2	1:D:57:THR:O	2.20	0.41
1:F:56:SER:HB2	1:F:482:GLY:CA	2.50	0.41
1:C:488:TYR:CZ	1:C:490:GLU:HB2	2.55	0.41
1:D:255:PHE:HB3	1:D:284:LYS:HD2	2.02	0.41
1:A:67:SER:HB2	1:A:76[A]:MET:SD	2.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:125:ASP:HA	1:D:255:PHE:HB2	2.03	0.41
1:E:345:LEU:HD23	1:E:358:GLU:HB3	2.03	0.41
1:F:288:HIS:CE1	1:F:292:LYS:HG3	2.56	0.41
1:F:345:LEU:HD23	1:F:358:GLU:HB3	2.03	0.40
1:E:83:ILE:HG12	1:E:121:ALA:HB3	2.03	0.40
1:H:240:VAL:O	1:H:244[B]:ARG:HG3	2.21	0.40
1:B:286:GLU:HG2	1:B:307:ALA:HB3	2.02	0.40
1:C:488:TYR:CE2	1:C:490:GLU:HB2	2.56	0.40
1:E:432:GLU:OE2	1:F:432[B]:GLU:OE1	2.40	0.40
1:G:414:ARG:HH21	1:H:406:ARG:HH11	1.69	0.40
1:H:60:ILE:HG12	1:H:83:ILE:HB	2.04	0.40
1:D:503:ARG:NH1	2:D:601:FBP:O2P	2.42	0.40
1:E:55:ARG:HD2	1:E:57:THR:O	2.22	0.40
1:H:68:ARG:HH22	1:H:98:GLU:HB2	1.86	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	432/447 (97%)	425 (98%)	6 (1%)	1 (0%)	43	49
1	B	442/447 (99%)	435 (98%)	6 (1%)	1 (0%)	43	49
1	C	430/447 (96%)	421 (98%)	7 (2%)	2 (0%)	24	25
1	D	431/447 (96%)	427 (99%)	3 (1%)	1 (0%)	43	49
1	E	435/447 (97%)	429 (99%)	5 (1%)	1 (0%)	43	49
1	F	436/447 (98%)	431 (99%)	4 (1%)	1 (0%)	43	49
1	G	431/447 (96%)	423 (98%)	6 (1%)	2 (0%)	24	25
1	H	432/447 (97%)	427 (99%)	4 (1%)	1 (0%)	43	49
All	All	3469/3576 (97%)	3418 (98%)	41 (1%)	10 (0%)	36	39

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	273	GLY
1	G	273	GLY
1	A	342	THR
1	B	342	THR
1	C	342	THR
1	D	342	THR
1	E	342	THR
1	F	342	THR
1	G	342	THR
1	H	342	THR

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	347/352 (99%)	337 (97%)	10 (3%)	37	47
1	B	353/352 (100%)	345 (98%)	8 (2%)	44	56
1	C	347/352 (99%)	342 (99%)	5 (1%)	59	72
1	D	344/352 (98%)	337 (98%)	7 (2%)	48	61
1	E	349/352 (99%)	341 (98%)	8 (2%)	44	56
1	F	351/352 (100%)	343 (98%)	8 (2%)	44	56
1	G	348/352 (99%)	345 (99%)	3 (1%)	70	81
1	H	345/352 (98%)	339 (98%)	6 (2%)	53	66
All	All	2784/2816 (99%)	2729 (98%)	55 (2%)	50	61

All (55) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	26	GLN
1	A	68	ARG
1	A	86	LEU
1	A	260	ARG

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Mol	Chain	Res	Type
1	A	477	VAL
1	A	502	ARG
1	A	530	ARG
1	A	539[A]	MET
1	A	539[B]	MET
1	A	542	LEU
1	B	68	ARG
1	B	115	LEU
1	B	118	ARG
1	B	265	VAL
1	B	350	THR
1	B	414	ARG
1	B	514	ARG
1	B	523	VAL
1	C	68	ARG
1	C	116[A]	SER
1	C	116[B]	SER
1	C	272[A]	LEU
1	C	272[B]	LEU
1	D	40	GLU
1	D	68	ARG
1	D	261	LYS
1	D	513	LEU
1	D	523	VAL
1	D	530	ARG
1	D	539	MET
1	E	68	ARG
1	E	94	GLU
1	E	333	LEU
1	E	414	ARG
1	E	513	LEU
1	E	539[A]	MET
1	E	539[B]	MET
1	E	541	VAL
1	F	68	ARG
1	F	94	GLU
1	F	118	ARG
1	F	293	ARG
1	F	413	ARG
1	F	513	LEU
1	F	519	VAL
1	F	523	VAL

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Mol	Chain	Res	Type
1	G	20	LEU
1	G	68	ARG
1	G	477	VAL
1	H	68	ARG
1	H	275	GLU
1	H	413	ARG
1	H	513	LEU
1	H	539	MET
1	H	543	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	90	HIS
1	B	90	HIS
1	B	392	GLN
1	C	26	GLN
1	C	90	HIS
1	D	392	GLN
1	E	90	HIS
1	F	90	HIS
1	G	90	HIS
1	G	392	GLN
1	H	90	HIS
1	H	392	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 36 ligands modelled in this entry, 16 are monoatomic - leaving 20 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	H	602	4	5,5,5	1.93	2 (40%)	6,6,6	1.50	1 (16%)
6	WVT	E	603	-	35,35,35	0.27	0	50,54,54	0.29	0
2	FBP	A	601	-	18,20,20	0.34	0	21,32,32	0.57	0
3	OXL	C	602	4	5,5,5	2.07	2 (40%)	6,6,6	1.60	1 (16%)
3	OXL	E	602	4	5,5,5	2.12	2 (40%)	6,6,6	2.11	2 (33%)
6	WVT	D	603	-	35,35,35	0.20	0	50,54,54	0.35	0
2	FBP	H	601	-	18,20,20	0.62	0	21,32,32	0.96	1 (4%)
2	FBP	D	601	-	18,20,20	0.58	0	21,32,32	1.00	1 (4%)
3	OXL	A	602	4	5,5,5	1.94	2 (40%)	6,6,6	2.20	3 (50%)
2	FBP	B	601	-	18,20,20	0.39	0	21,32,32	0.56	0
3	OXL	D	602	4	5,5,5	2.33	3 (60%)	6,6,6	2.30	2 (33%)
6	WVT	F	603	-	35,35,35	0.24	0	50,54,54	0.31	0
3	OXL	G	602	4	5,5,5	2.47	2 (40%)	6,6,6	1.85	2 (33%)
2	FBP	F	601	-	18,20,20	0.44	0	21,32,32	0.67	0
6	WVT	C	603	-	35,35,35	0.22	0	50,54,54	0.28	0
3	OXL	F	602	4	5,5,5	2.08	2 (40%)	6,6,6	2.33	3 (50%)
2	FBP	C	601	-	18,20,20	0.68	0	21,32,32	0.72	1 (4%)
2	FBP	G	601	-	18,20,20	0.46	0	21,32,32	0.51	0
2	FBP	E	601	-	18,20,20	0.30	0	21,32,32	0.64	0
3	OXL	B	602	4	5,5,5	2.11	2 (40%)	6,6,6	2.18	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	H	602	4	-	4/4/4/4	-
6	WVT	E	603	-	-	0/24/24/24	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FBP	A	601	-	-	2/13/32/32	0/1/1/1
3	OXL	C	602	4	-	4/4/4/4	-
3	OXL	E	602	4	-	4/4/4/4	-
6	WVT	D	603	-	-	0/24/24/24	0/4/4/4
2	FBP	H	601	-	-	2/13/32/32	0/1/1/1
2	FBP	D	601	-	-	2/13/32/32	0/1/1/1
3	OXL	A	602	4	-	4/4/4/4	-
2	FBP	B	601	-	-	2/13/32/32	0/1/1/1
3	OXL	D	602	4	-	4/4/4/4	-
6	WVT	F	603	-	-	0/24/24/24	0/4/4/4
3	OXL	G	602	4	-	4/4/4/4	-
2	FBP	F	601	-	-	2/13/32/32	0/1/1/1
6	WVT	C	603	-	-	0/24/24/24	0/4/4/4
3	OXL	F	602	4	-	0/4/4/4	-
2	FBP	C	601	-	-	2/13/32/32	0/1/1/1
2	FBP	G	601	-	-	2/13/32/32	0/1/1/1
2	FBP	E	601	-	-	2/13/32/32	0/1/1/1
3	OXL	B	602	4	-	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	4.57	1.33	1.22
3	B	602	OXL	O2-C2	3.73	1.31	1.22
3	F	602	OXL	O2-C2	3.72	1.31	1.22
3	C	602	OXL	O2-C2	3.69	1.31	1.22
3	A	602	OXL	O2-C2	3.56	1.31	1.22
3	D	602	OXL	O2-C2	3.35	1.30	1.22
3	E	602	OXL	O2-C2	3.29	1.30	1.22
3	D	602	OXL	O4-C2	-3.17	1.21	1.30
3	H	602	OXL	O2-C2	3.04	1.30	1.22
3	E	602	OXL	O4-C2	-2.97	1.22	1.30
3	B	602	OXL	O4-C2	-2.82	1.22	1.30
3	H	602	OXL	O4-C2	-2.74	1.23	1.30
3	C	602	OXL	O4-C2	-2.55	1.23	1.30
3	G	602	OXL	O4-C2	-2.53	1.23	1.30
3	A	602	OXL	O4-C2	-2.37	1.24	1.30
3	F	602	OXL	O4-C2	-2.17	1.24	1.30
3	D	602	OXL	C2-C1	2.09	1.58	1.54

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	602	OXL	O4-C2-C1	4.48	121.53	112.83
3	A	602	OXL	O4-C2-C1	4.18	120.94	112.83
3	E	602	OXL	O4-C2-C1	3.68	119.97	112.83
3	D	602	OXL	O4-C2-C1	3.61	119.82	112.83
3	D	602	OXL	O3-C1-C2	3.57	119.76	112.83
3	B	602	OXL	O4-C2-C1	3.42	119.46	112.83
3	B	602	OXL	O3-C1-C2	3.36	119.36	112.83
2	D	601	FBP	O6-P2-O4P	3.28	115.30	106.44
2	H	601	FBP	O6-P2-O4P	3.28	115.30	106.44
3	H	602	OXL	O4-C2-C1	3.19	119.01	112.83
3	G	602	OXL	O4-C2-C1	3.19	119.01	112.83
3	C	602	OXL	O4-C2-C1	3.17	118.98	112.83
3	E	602	OXL	O3-C1-C2	2.93	118.52	112.83
3	F	602	OXL	O2-C2-C1	-2.72	114.96	120.63
3	G	602	OXL	O3-C1-C2	2.71	118.09	112.83
3	A	602	OXL	O2-C2-C1	-2.54	115.33	120.63
2	C	601	FBP	O6-P2-O4P	2.23	112.48	106.44
3	F	602	OXL	O3-C1-C2	2.20	117.09	112.83
3	A	602	OXL	O3-C1-C2	2.20	117.09	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	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	A	601	FBP	O5-C5-C6-O6
2	D	601	FBP	O5-C5-C6-O6
2	E	601	FBP	O5-C5-C6-O6
2	H	601	FBP	O5-C5-C6-O6
2	B	601	FBP	O5-C5-C6-O6
2	F	601	FBP	O5-C5-C6-O6
2	G	601	FBP	O5-C5-C6-O6
2	C	601	FBP	O5-C5-C6-O6
3	C	602	OXL	O3-C1-C2-O4

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

There are no ring outliers.

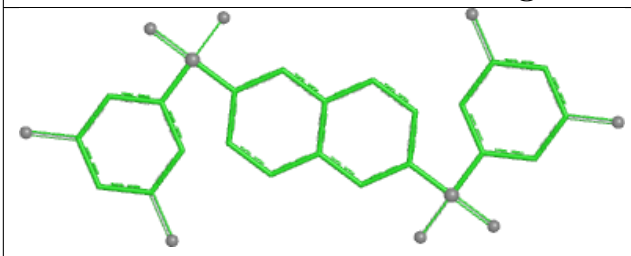
3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	601	FBP	1	0
2	D	601	FBP	1	0
2	F	601	FBP	1	0

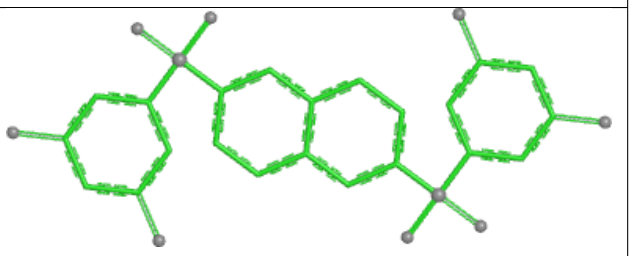
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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

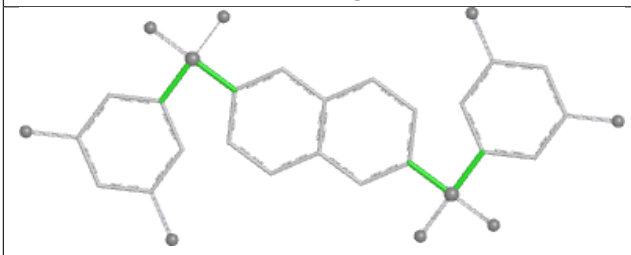
Ligand WVT E 603



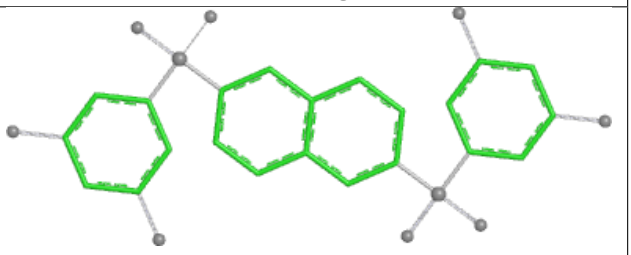
Bond lengths



Bond angles

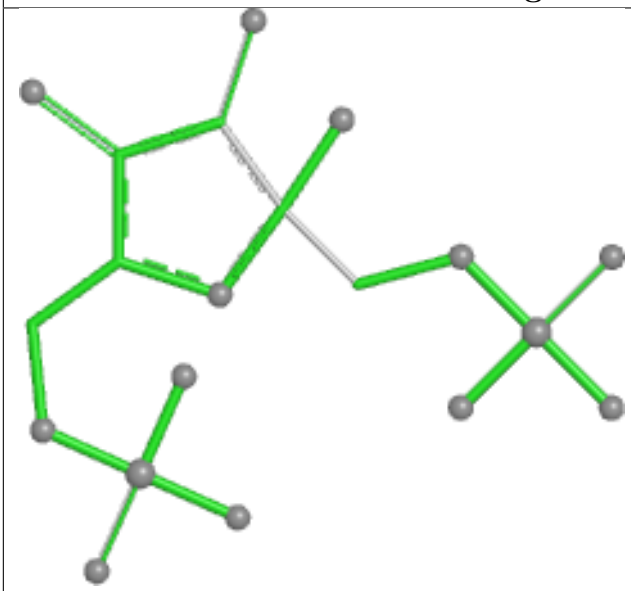


Torsions

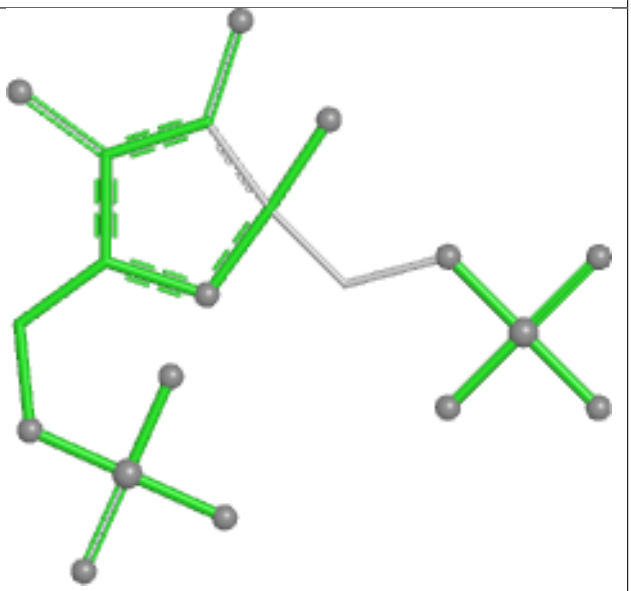


Rings

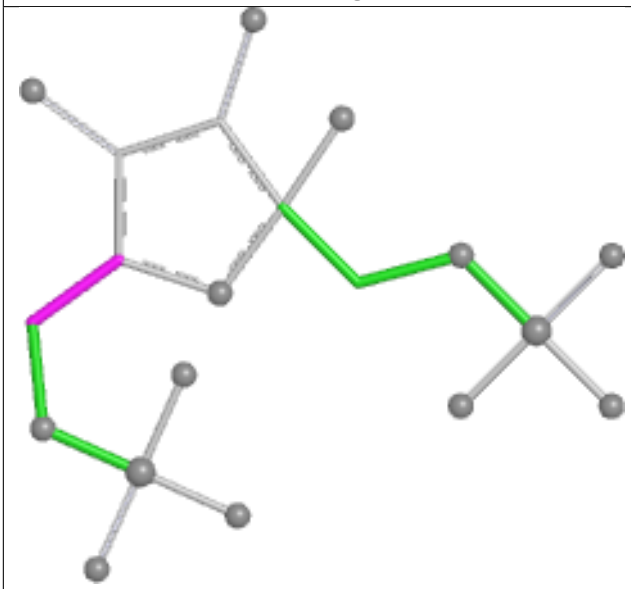
Ligand FBP A 601



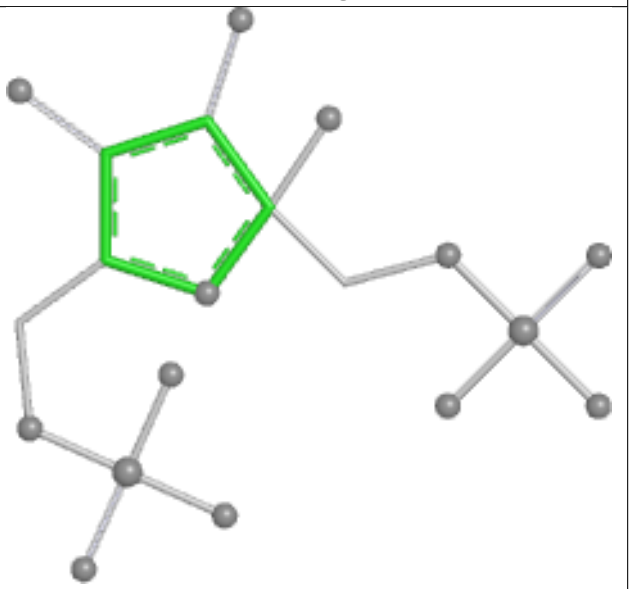
Bond lengths



Bond angles

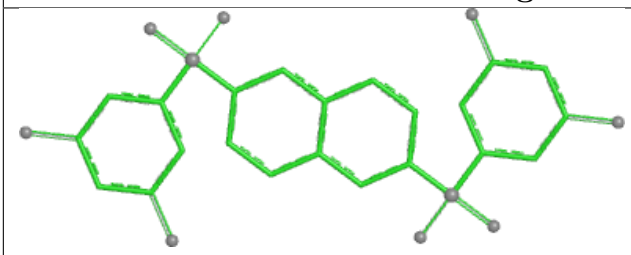


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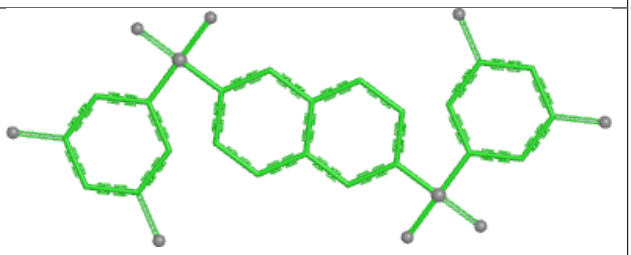


Rings

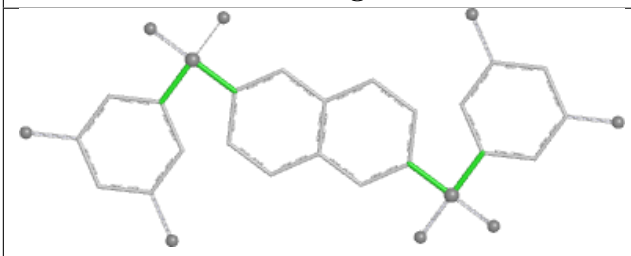
Ligand WVT D 603



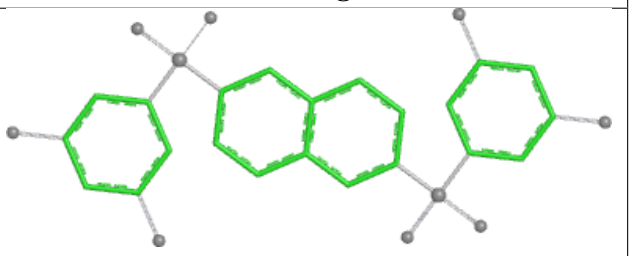
Bond lengths



Bond angles

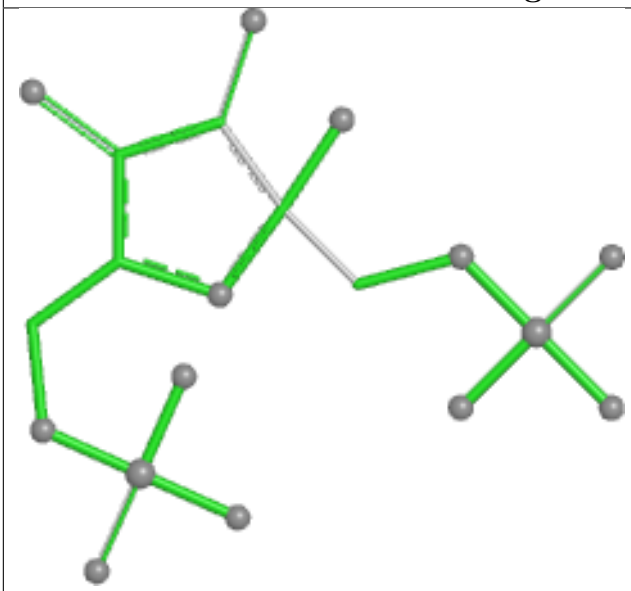


Torsions

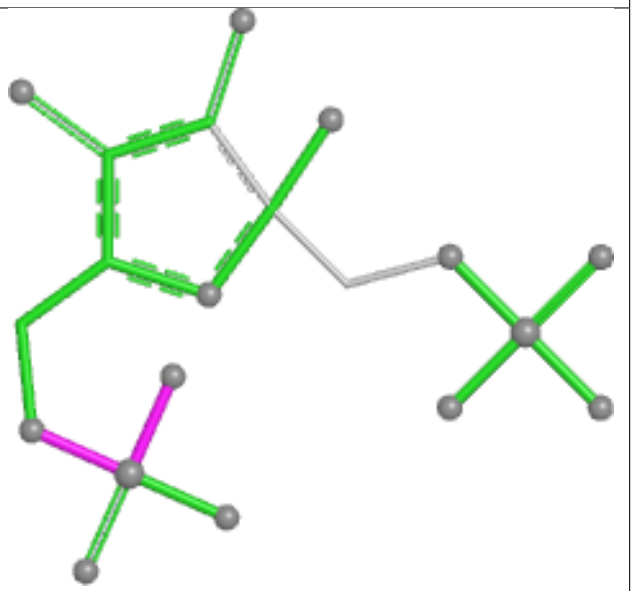


Rings

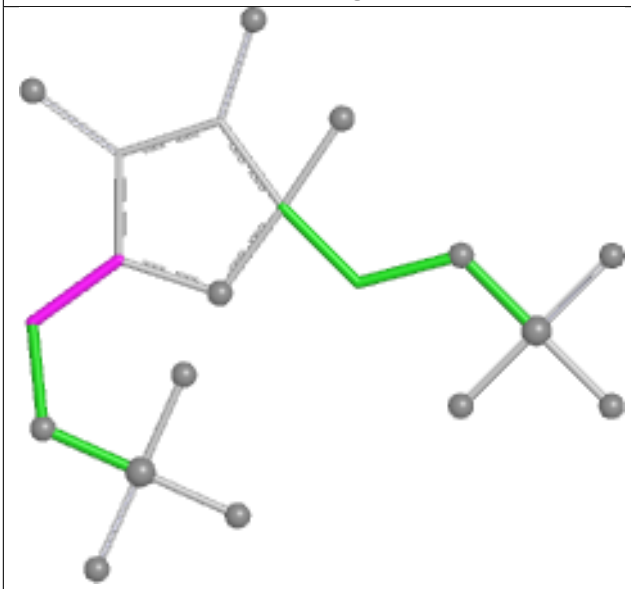
Ligand FBP H 601



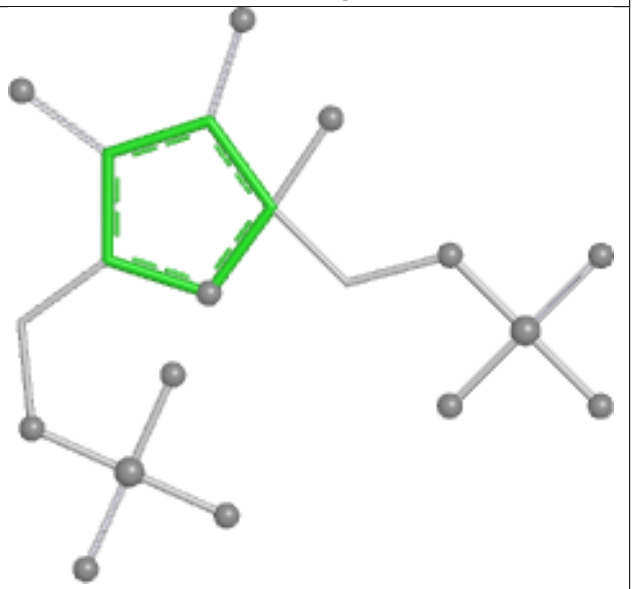
Bond lengths



Bond angles

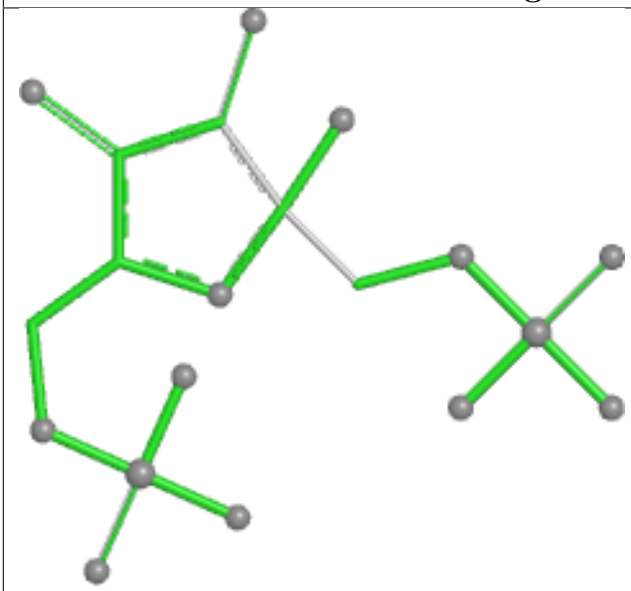


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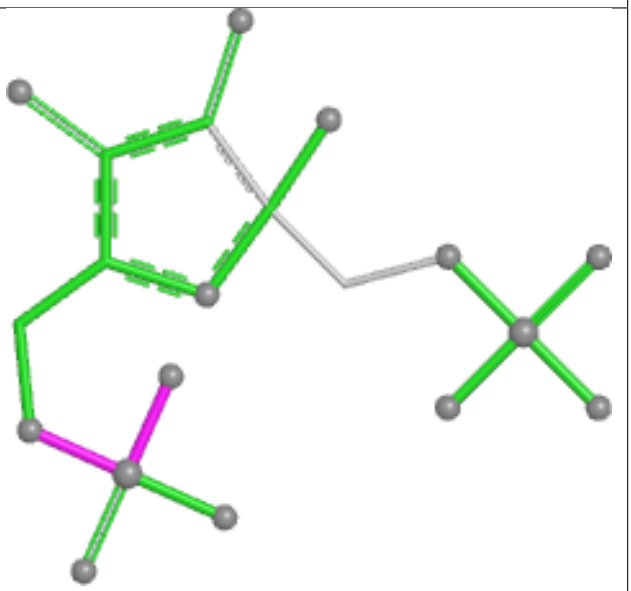


Rings

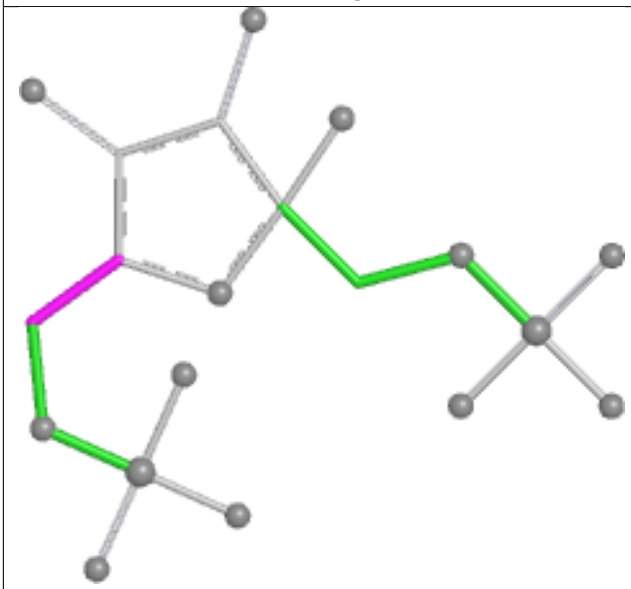
Ligand FBP D 601



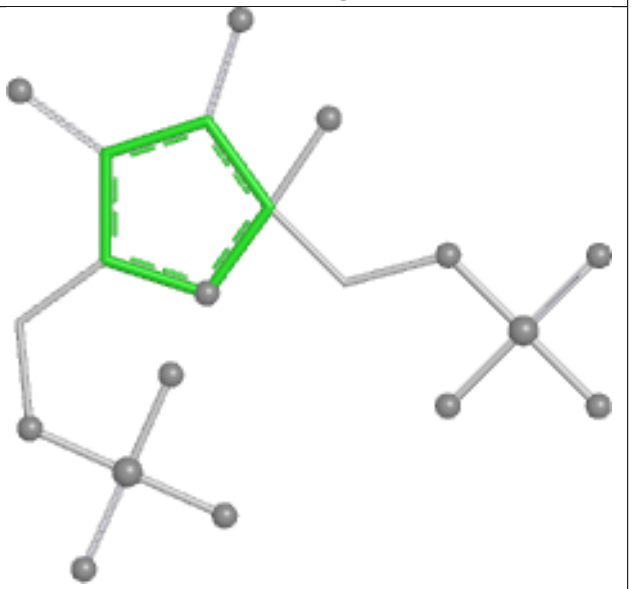
Bond lengths



Bond angles

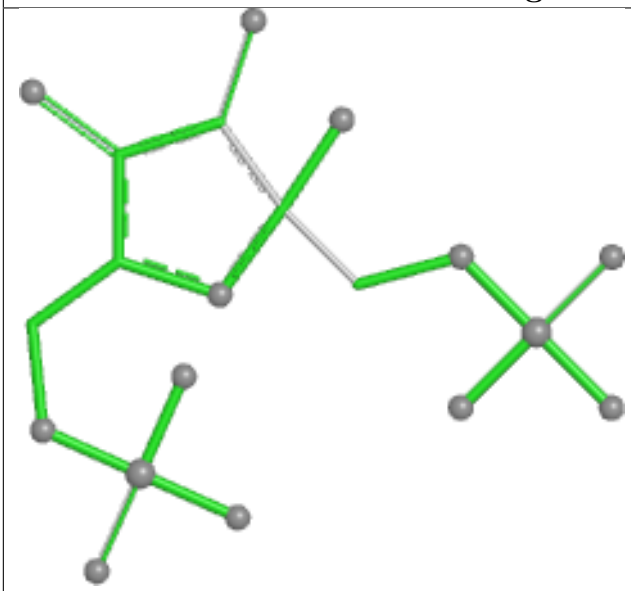


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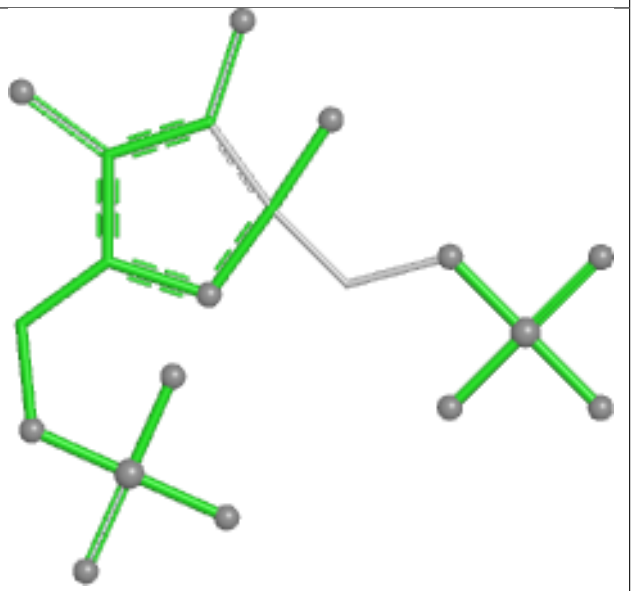


Rings

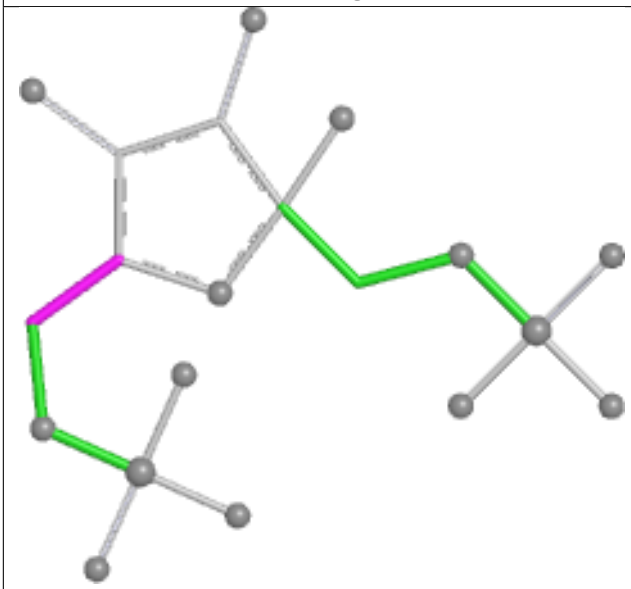
Ligand FBP B 601



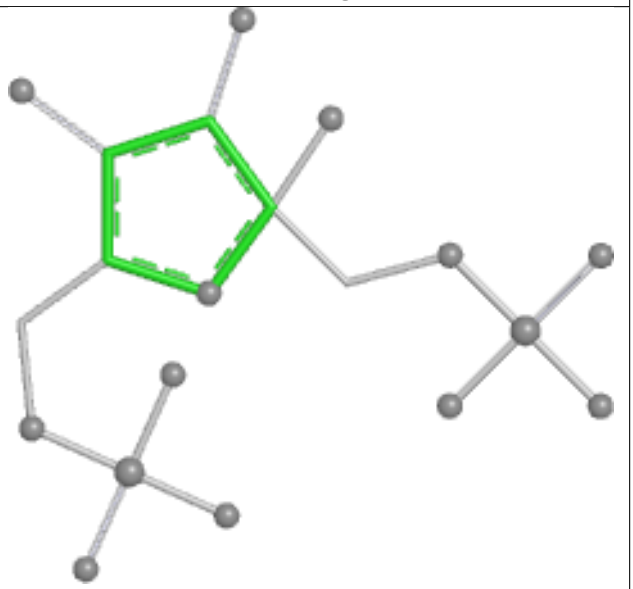
Bond lengths



Bond angles

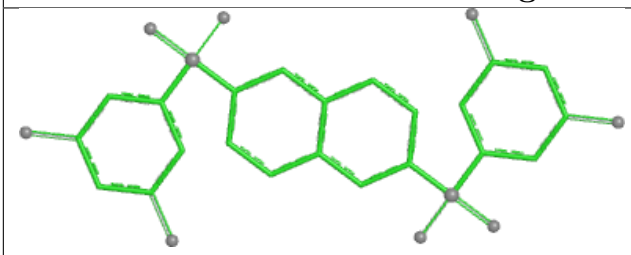


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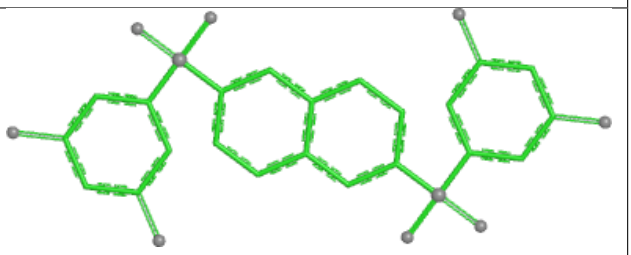


Rings

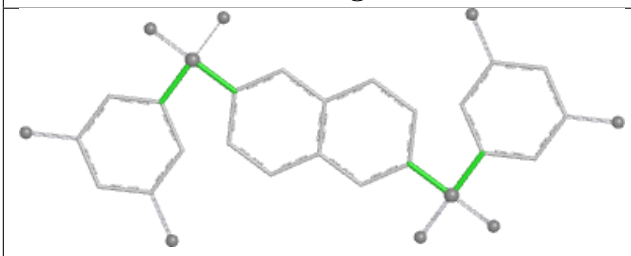
Ligand WVT F 603



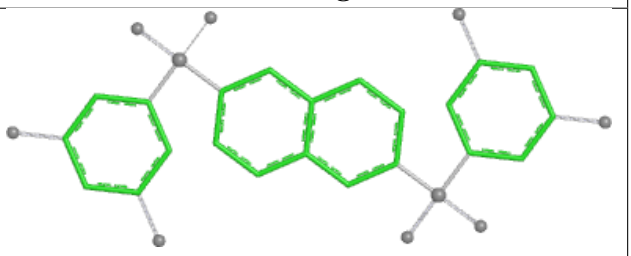
Bond lengths



Bond angles

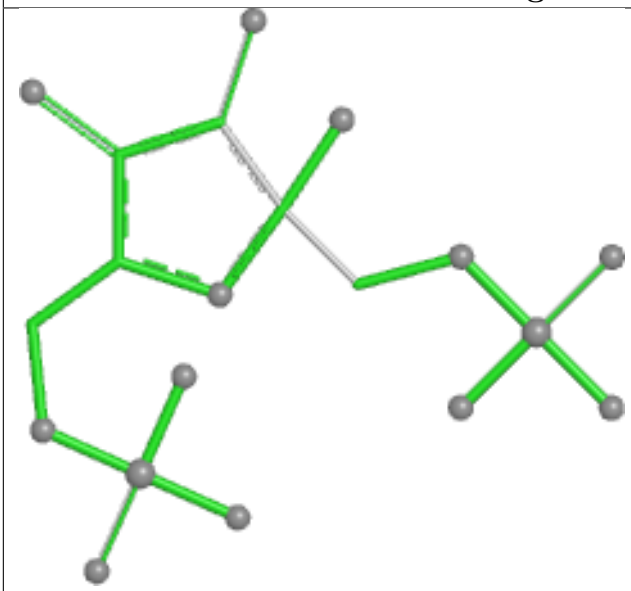


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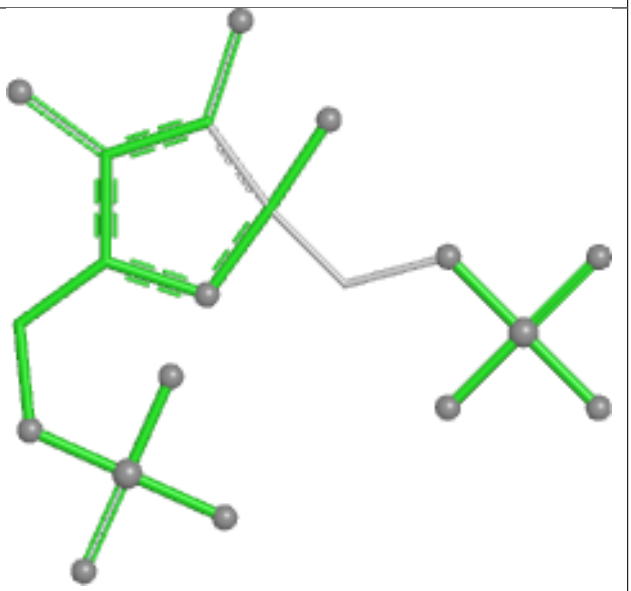


Rings

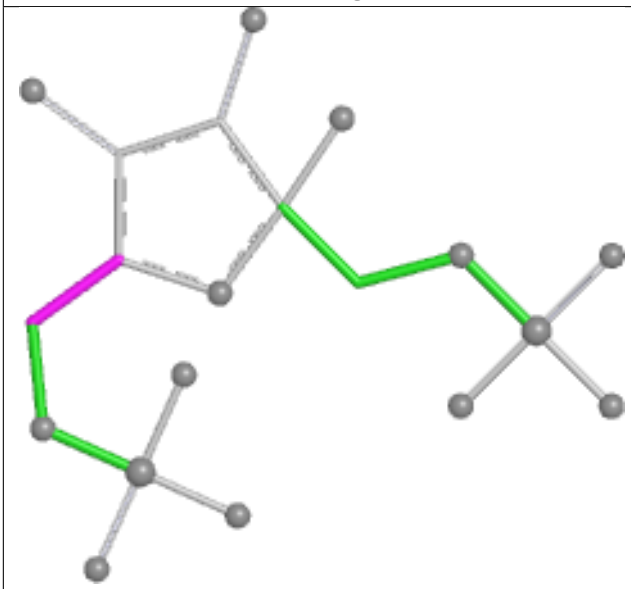
Ligand FBP F 601



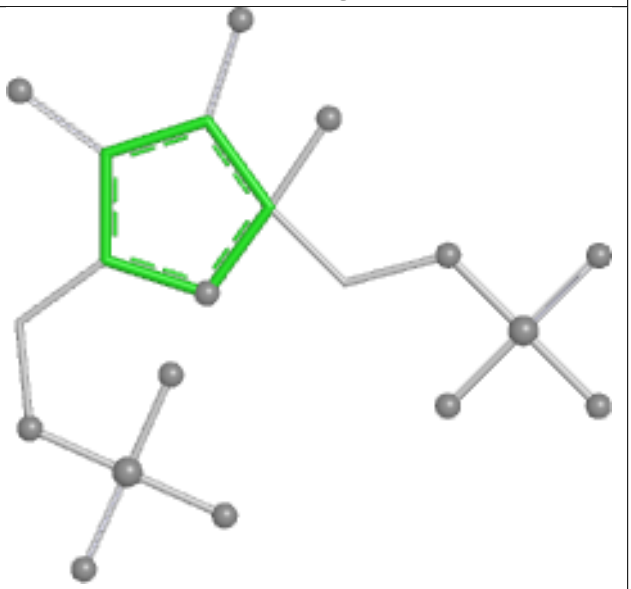
Bond lengths



Bond angles

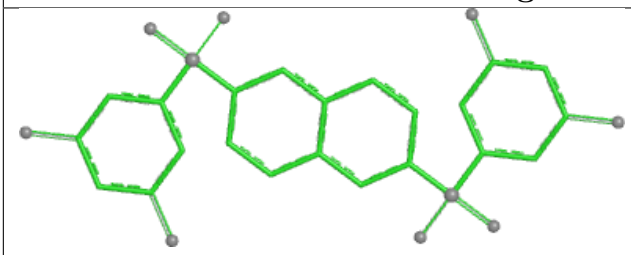


Torsions

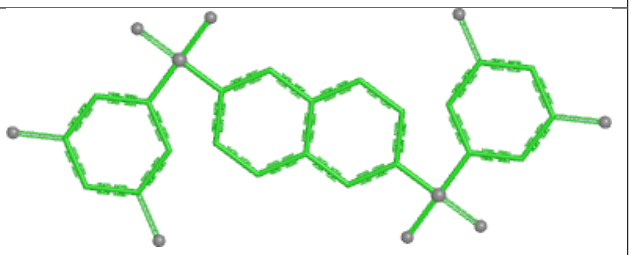


Rings

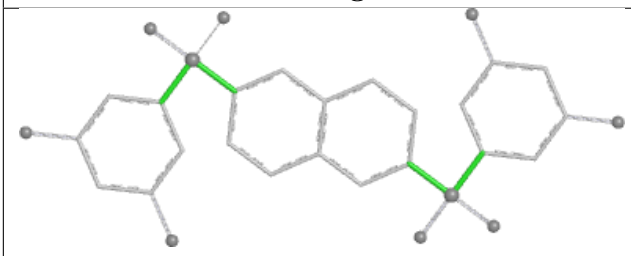
Ligand WVT C 603



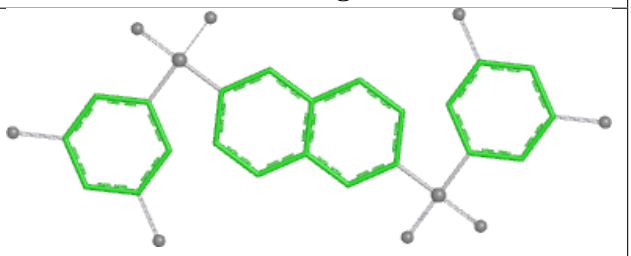
Bond lengths



Bond angles

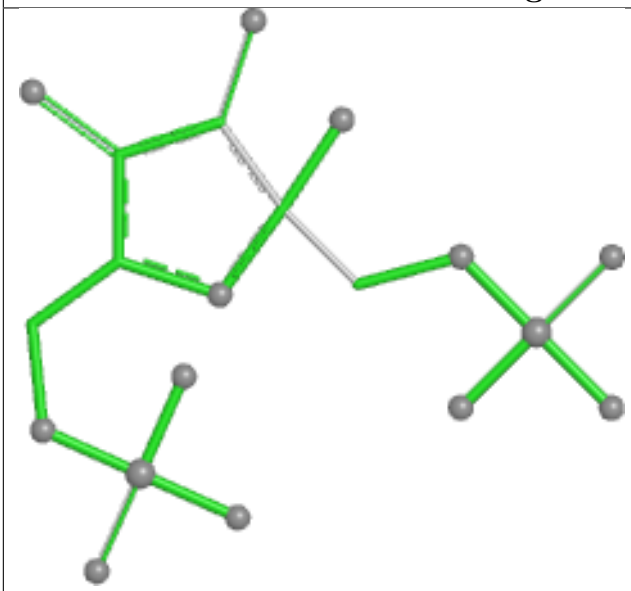


Torsions

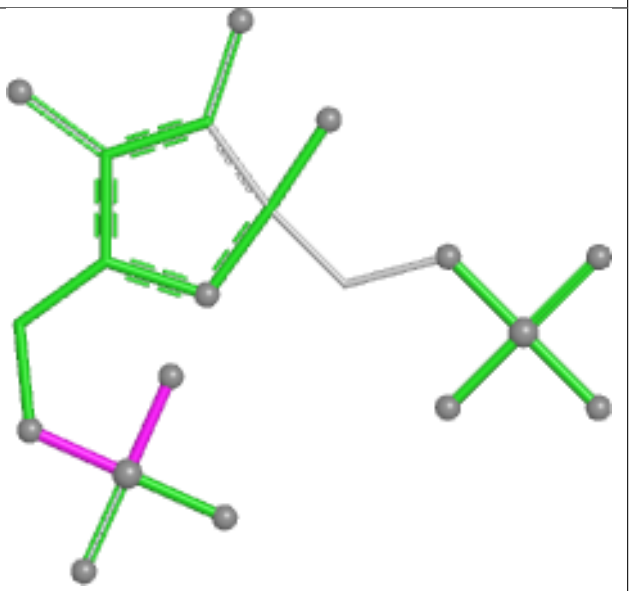


Rings

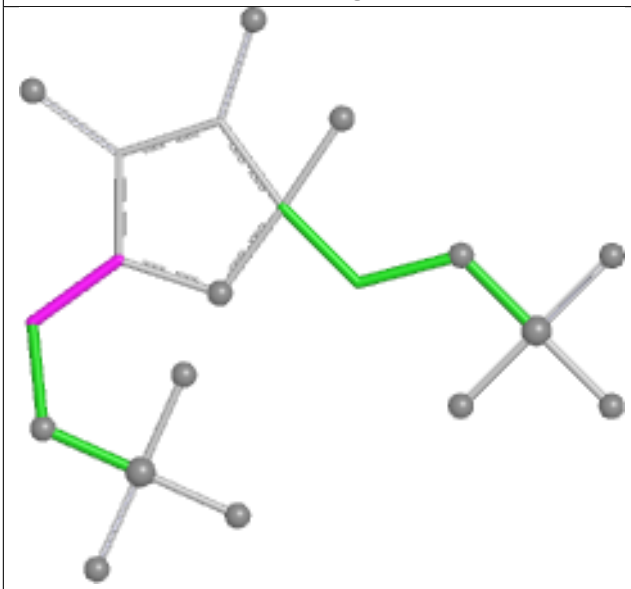
Ligand FBP C 601



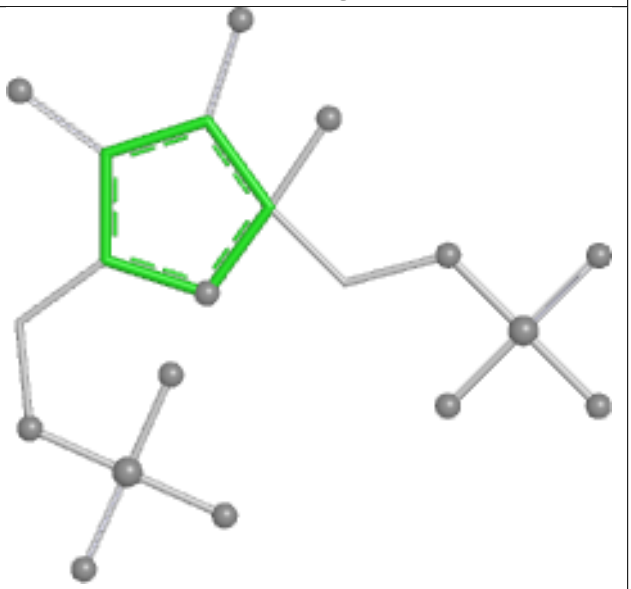
Bond lengths



Bond angles

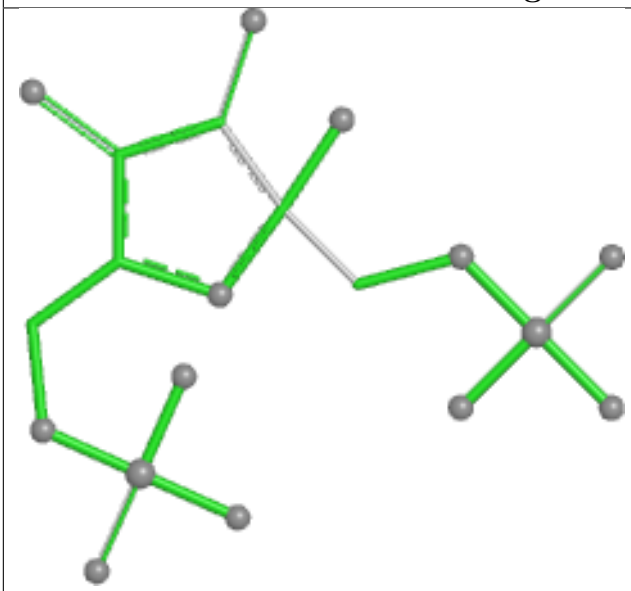


Torsions

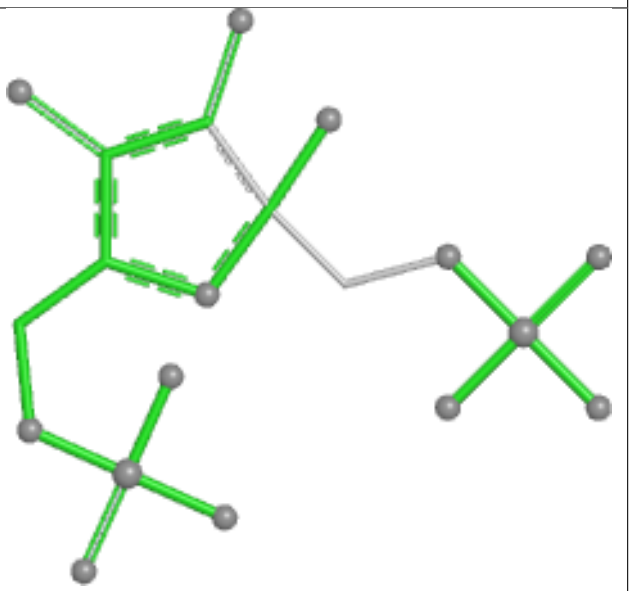


Rings

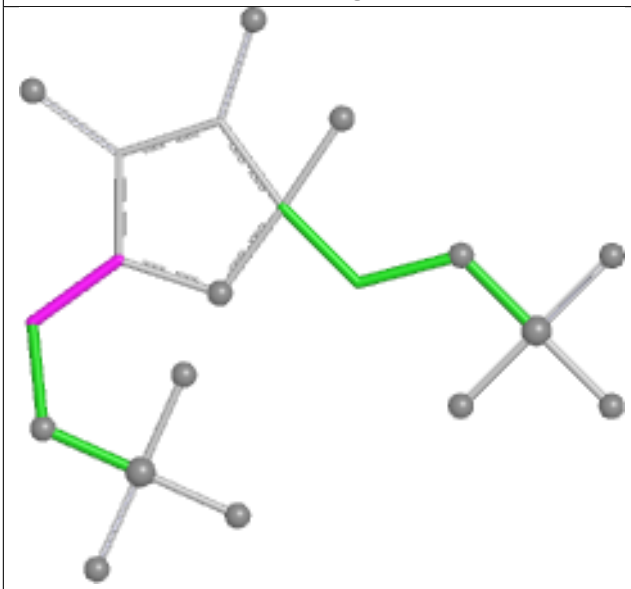
Ligand FBP G 601



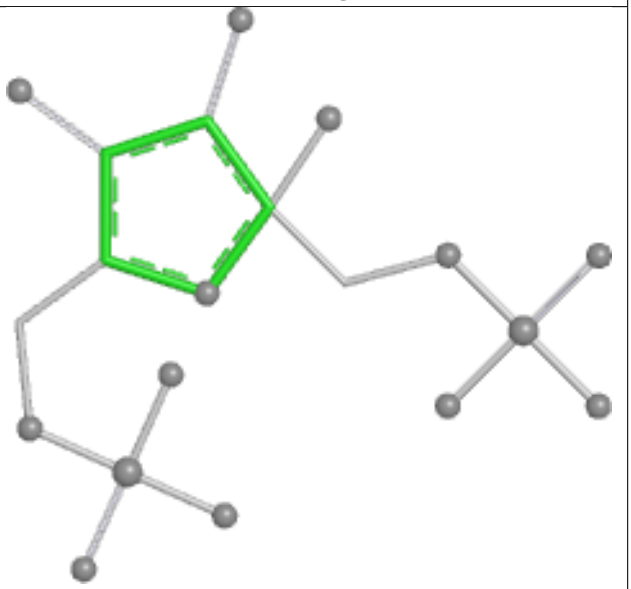
Bond lengths



Bond angles

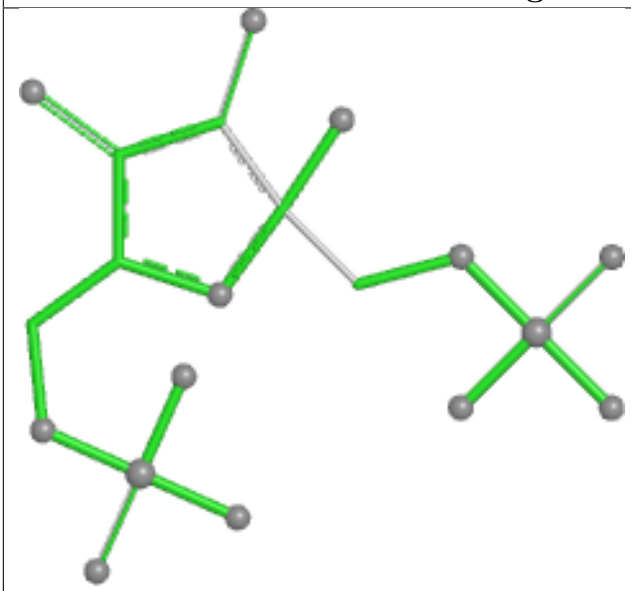


Torsions

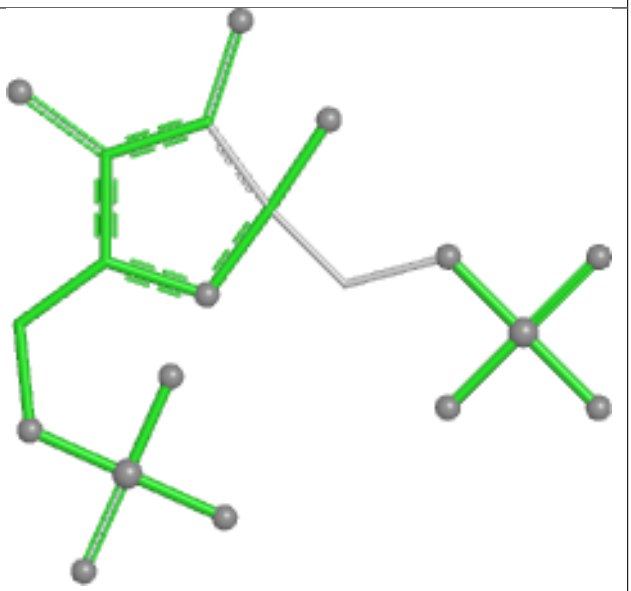


Rings

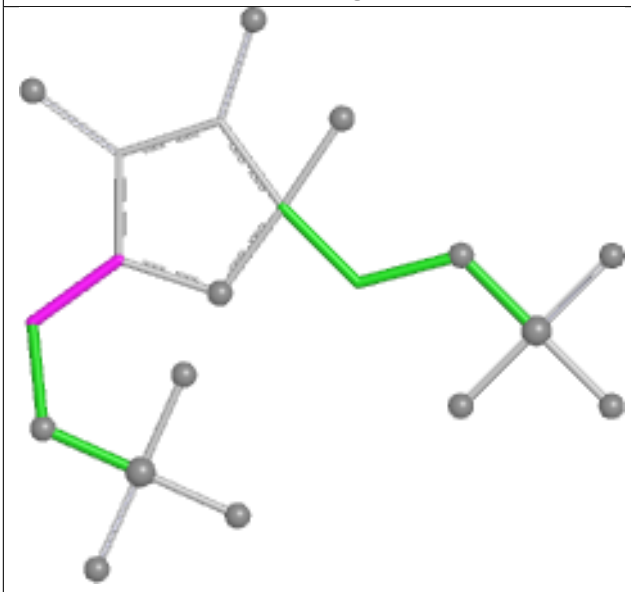
Ligand FBP E 601



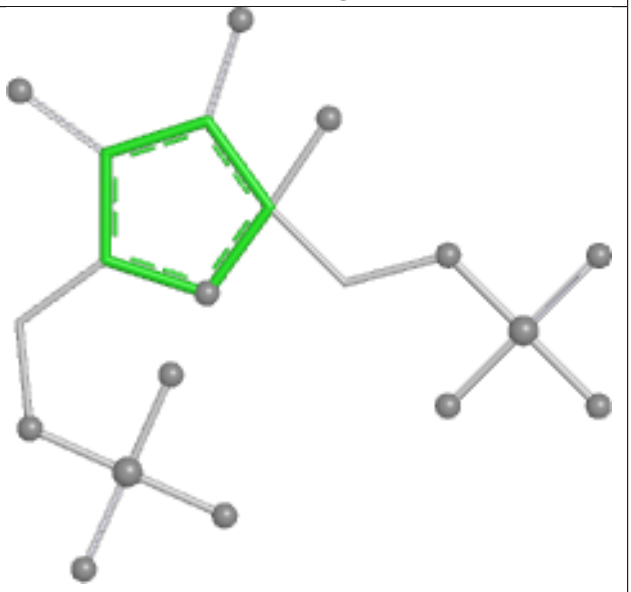
Bond lengths



Bond angles



Torsions



Rings

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, 95^{th} 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	420/447 (93%)	1.25	91 (21%) 2 2	22, 49, 80, 96	14 (3%)
1	B	436/447 (97%)	0.61	33 (7%) 20 19	19, 39, 68, 84	8 (1%)
1	C	424/447 (94%)	0.43	23 (5%) 31 30	20, 39, 59, 80	10 (2%)
1	D	425/447 (95%)	0.05	11 (2%) 57 56	13, 29, 51, 81	8 (1%)
1	E	423/447 (94%)	1.06	73 (17%) 4 3	24, 46, 79, 96	14 (3%)
1	F	432/447 (96%)	0.66	43 (9%) 12 11	18, 41, 65, 84	8 (1%)
1	G	425/447 (95%)	0.40	24 (5%) 30 29	19, 37, 56, 83	11 (2%)
1	H	425/447 (95%)	0.10	13 (3%) 51 51	16, 31, 52, 72	9 (2%)
All	All	3410/3576 (95%)	0.57	311 (9%) 15 14	13, 39, 67, 96	82 (2%)

All (311) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	115	LEU	7.1
1	F	233	PRO	6.8
1	E	114	PRO	6.6
1	E	115	LEU	6.4
1	B	545	SER	6.2
1	A	545	SER	6.2
1	E	277[A]	HIS	5.8
1	A	114	PRO	5.2
1	E	233	PRO	5.1
1	D	25	PHE	5.1
1	H	21	GLY	4.9
1	E	23	ALA	4.9
1	A	233	PRO	4.9
1	A	116	SER	4.9
1	C	233	PRO	4.7
1	B	492	PRO	4.6

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Mol	Chain	Res	Type	RSRZ
1	H	25	PHE	4.4
1	E	542	LEU	4.4
1	G	18	GLN	4.4
1	E	240	VAL	4.3
1	A	234	GLY	4.3
1	E	116	SER	4.3
1	A	26	GLN	4.2
1	A	113	SER	4.1
1	A	492	PRO	4.1
1	E	111	ALA	4.1
1	A	502	ARG	4.1
1	F	491	PRO	4.1
1	A	269[A]	ARG	4.0
1	G	277[A]	HIS	4.0
1	E	112	GLY	4.0
1	D	21	GLY	3.9
1	A	413	ARG	3.9
1	E	25	PHE	3.8
1	G	116[A]	SER	3.7
1	A	117	TYR	3.7
1	E	117	TYR	3.7
1	A	235	LEU	3.7
1	B	513	LEU	3.7
1	E	491	PRO	3.7
1	A	240	VAL	3.7
1	A	495	ILE	3.6
1	B	519	VAL	3.5
1	A	111	ALA	3.5
1	G	233	PRO	3.5
1	A	132	GLY	3.5
1	F	461	ARG	3.5
1	A	95	TYR	3.5
1	F	353	ARG	3.5
1	E	113	SER	3.5
1	D	24	PHE	3.4
1	A	490[A]	GLU	3.4
1	F	518	ARG	3.4
1	A	243	LEU	3.4
1	F	234	GLY	3.4
1	B	233	PRO	3.4
1	E	269[A]	ARG	3.3
1	F	489	ARG	3.3

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Mol	Chain	Res	Type	RSRZ
1	G	115	LEU	3.3
1	E	234	GLY	3.3
1	E	544	ILE	3.3
1	G	20	LEU	3.3
1	B	118	ARG	3.2
1	E	251	VAL	3.2
1	A	494	ALA	3.2
1	C	277[A]	HIS	3.2
1	A	112	GLY	3.2
1	E	449	GLY	3.2
1	H	34	MET	3.2
1	A	34	MET	3.2
1	E	122	ILE	3.1
1	C	117	TYR	3.1
1	H	518	ARG	3.1
1	G	25	PHE	3.1
1	F	514	ARG	3.1
1	E	75	GLU	3.1
1	E	353	ARG	3.1
1	E	128	GLY	3.1
1	H	22	THR	3.1
1	H	244[A]	ARG	3.1
1	C	115	LEU	3.1
1	E	545	SER	3.1
1	B	413	ARG	3.0
1	E	274	PRO	3.0
1	H	277[A]	HIS	3.0
1	E	271	ALA	3.0
1	A	465	ILE	3.0
1	F	492	PRO	3.0
1	A	500	VAL	3.0
1	C	20	LEU	3.0
1	A	130	GLY	3.0
1	E	110	PHE	3.0
1	B	514	ARG	3.0
1	E	517	LEU	3.0
1	G	63	ILE	3.0
1	G	273	GLY	3.0
1	G	114	PRO	3.0
1	A	484	PHE	3.0
1	F	545	SER	2.9
1	A	251	VAL	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	259	VAL	2.9
1	E	266	ALA	2.9
1	C	114	PRO	2.9
1	A	118	ARG	2.9
1	E	405	HIS	2.9
1	A	477	VAL	2.8
1	E	516	PHE	2.8
1	A	277	HIS	2.8
1	A	353	ARG	2.8
1	C	19	GLU	2.8
1	D	23	ALA	2.8
1	F	115	LEU	2.8
1	A	491	PRO	2.8
1	A	100	ILE	2.8
1	E	424	GLU	2.8
1	E	258	PHE	2.8
1	A	473	ALA	2.8
1	A	124	LEU	2.8
1	C	542[A]	LEU	2.8
1	D	233	PRO	2.8
1	F	414	ARG	2.7
1	F	277	HIS	2.7
1	A	30	LEU	2.7
1	B	269[A]	ARG	2.7
1	F	129	PRO	2.7
1	A	131	SER	2.7
1	F	490	GLU	2.7
1	A	271	ALA	2.7
1	F	270	ALA	2.7
1	H	23	ALA	2.7
1	A	489	ARG	2.7
1	B	489	ARG	2.7
1	A	265	VAL	2.7
1	E	247	VAL	2.7
1	G	21	GLY	2.7
1	A	406	ARG	2.7
1	B	414	ARG	2.7
1	F	11	ALA	2.7
1	B	490	GLU	2.7
1	E	254	VAL	2.7
1	G	113	SER	2.7
1	B	544	ILE	2.7

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Mol	Chain	Res	Type	RSRZ
1	C	353	ARG	2.7
1	D	22	THR	2.6
1	B	277	HIS	2.6
1	A	516	PHE	2.6
1	G	492	PRO	2.6
1	C	95	TYR	2.6
1	E	414	ARG	2.6
1	E	97	ALA	2.6
1	E	497	ALA	2.6
1	A	274	PRO	2.6
1	A	542	LEU	2.6
1	B	381	LYS	2.6
1	B	417	PRO	2.6
1	D	235	LEU	2.6
1	F	269[A]	ARG	2.6
1	G	109	SER	2.6
1	E	492	PRO	2.6
1	A	496	TRP	2.6
1	B	113	SER	2.6
1	A	88	PHE	2.5
1	B	506	PHE	2.5
1	F	500	VAL	2.5
1	A	276	GLY	2.5
1	C	34	MET	2.5
1	A	352	PRO	2.5
1	H	233	PRO	2.5
1	A	272	LEU	2.5
1	F	410	GLU	2.5
1	C	110	PHE	2.5
1	B	515	GLY	2.5
1	E	118	ARG	2.5
1	H	414	ARG	2.5
1	A	239	ASP	2.5
1	A	123	ALA	2.5
1	A	238	GLN	2.5
1	E	243	LEU	2.5
1	D	34	MET	2.5
1	A	70	VAL	2.5
1	B	238	GLN	2.5
1	C	22	THR	2.5
1	B	418	LEU	2.5
1	H	24	PHE	2.5

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Mol	Chain	Res	Type	RSRZ
1	C	273	GLY	2.5
1	E	70	VAL	2.4
1	E	120	VAL	2.4
1	C	113	SER	2.4
1	B	491	PRO	2.4
1	E	121	ALA	2.4
1	A	128	GLY	2.4
1	E	132	GLY	2.4
1	E	129	PRO	2.4
1	A	66	ALA	2.4
1	A	380	ALA	2.4
1	G	413	ARG	2.4
1	E	235	LEU	2.4
1	F	486	LEU	2.4
1	C	234	GLY	2.4
1	F	112	GLY	2.4
1	A	110	PHE	2.4
1	E	506	PHE	2.4
1	F	384	PHE	2.4
1	A	63	ILE	2.4
1	E	442	ILE	2.4
1	B	543	SER	2.4
1	G	34	MET	2.4
1	A	488	TYR	2.4
1	F	350	THR	2.4
1	B	274	PRO	2.4
1	A	275	GLU	2.4
1	E	278	GLY	2.4
1	E	239	ASP	2.4
1	E	461	ARG	2.4
1	B	270	ALA	2.3
1	A	73	LEU	2.3
1	G	235	LEU	2.3
1	A	244	ARG	2.3
1	A	504	VAL	2.3
1	G	22	THR	2.3
1	B	497	ALA	2.3
1	A	90	HIS	2.3
1	D	277[A]	HIS	2.3
1	E	119	PRO	2.3
1	F	267	ALA	2.3
1	A	250	GLY	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	235	LEU	2.3
1	F	86	LEU	2.3
1	F	118	ARG	2.3
1	A	93	HIS	2.3
1	A	96	HIS	2.3
1	G	24	PHE	2.3
1	A	443	ILE	2.3
1	F	52	VAL	2.3
1	A	462	ALA	2.3
1	D	234	GLY	2.3
1	B	517	LEU	2.3
1	F	535	TYR	2.3
1	E	495	ILE	2.2
1	A	119	PRO	2.2
1	E	500	VAL	2.2
1	A	79	ALA	2.2
1	B	124	LEU	2.2
1	F	235	LEU	2.2
1	F	275	GLU	2.2
1	C	21	GLY	2.2
1	A	509	GLU	2.2
1	E	275	GLU	2.2
1	G	23	ALA	2.2
1	A	455	LEU	2.2
1	A	67	SER	2.2
1	E	489	ARG	2.2
1	A	122	ILE	2.2
1	A	245	PHE	2.2
1	C	63	ILE	2.2
1	F	417	PRO	2.2
1	F	240	VAL	2.2
1	A	75[A]	GLU	2.2
1	E	123	ALA	2.2
1	F	381	LYS	2.2
1	E	100	ILE	2.1
1	E	465	ILE	2.1
1	E	273	GLY	2.1
1	C	111	ALA	2.1
1	E	244	ARG	2.1
1	E	487	LEU	2.1
1	F	418	LEU	2.1
1	E	34	MET	2.1

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Mol	Chain	Res	Type	RSRZ
1	F	237	GLU	2.1
1	H	491	PRO	2.1
1	B	508	ILE	2.1
1	B	518	ARG	2.1
1	A	262	ALA	2.1
1	D	402	ALA	2.1
1	E	262	ALA	2.1
1	B	542[A]	LEU	2.1
1	B	129	PRO	2.1
1	A	72	ARG	2.1
1	C	112	GLY	2.1
1	C	118	ARG	2.1
1	G	461	ARG	2.1
1	G	489	ARG	2.1
1	A	258	PHE	2.1
1	E	24	PHE	2.1
1	F	516	PHE	2.1
1	A	120	VAL	2.1
1	E	526	VAL	2.1
1	F	120	VAL	2.1
1	A	497	ALA	2.1
1	C	271	ALA	2.1
1	G	111	ALA	2.1
1	C	75	GLU	2.1
1	E	246	GLY	2.1
1	E	259	VAL	2.1
1	A	106	ALA	2.1
1	E	494	ALA	2.1
1	F	101	ALA	2.1
1	F	12	ASP	2.0
1	A	129	PRO	2.0
1	E	95	TYR	2.0
1	G	64	GLY	2.0
1	A	279	ILE	2.0
1	F	349	ILE	2.0
1	E	245	PHE	2.0
1	H	275	GLU	2.0
1	A	99	SER	2.0
1	A	270	ALA	2.0
1	A	487	LEU	2.0
1	E	272	LEU	2.0
1	F	413	ARG	2.0

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Mol	Chain	Res	Type	RSRZ
1	F	515	GLY	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} 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
4	MG	G	603	1/1	0.80	0.13	40,40,40,40	0
4	MG	B	603	1/1	0.84	0.14	45,45,45,45	0
3	OXL	E	602	6/6	0.84	0.12	55,56,57,57	0
4	MG	H	603	1/1	0.85	0.19	49,49,49,49	0
3	OXL	G	602	6/6	0.87	0.12	50,50,52,52	0
3	OXL	F	602	6/6	0.88	0.12	48,49,51,51	0
3	OXL	C	602	6/6	0.89	0.11	52,52,53,53	0
4	MG	D	604	1/1	0.90	0.17	47,47,47,47	0
3	OXL	A	602	6/6	0.91	0.10	56,57,58,58	0
2	FBP	A	601	20/20	0.91	0.10	47,50,51,52	0
4	MG	C	604	1/1	0.91	0.12	39,39,39,39	0
3	OXL	H	602	6/6	0.93	0.11	48,49,50,51	0
2	FBP	F	601	20/20	0.93	0.09	38,43,48,48	0
5	K	A	604	1/1	0.93	0.12	76,76,76,76	0
5	K	E	605	1/1	0.93	0.09	94,94,94,94	0
2	FBP	E	601	20/20	0.94	0.08	44,46,49,49	0
3	OXL	B	602	6/6	0.94	0.09	56,56,57,57	0
3	OXL	D	602	6/6	0.95	0.10	39,40,41,42	0
4	MG	F	604	1/1	0.95	0.09	48,48,48,48	0
5	K	C	605	1/1	0.95	0.08	66,66,66,66	0
4	MG	A	603	1/1	0.95	0.14	43,43,43,43	0
2	FBP	B	601	20/20	0.96	0.07	35,39,46,46	0

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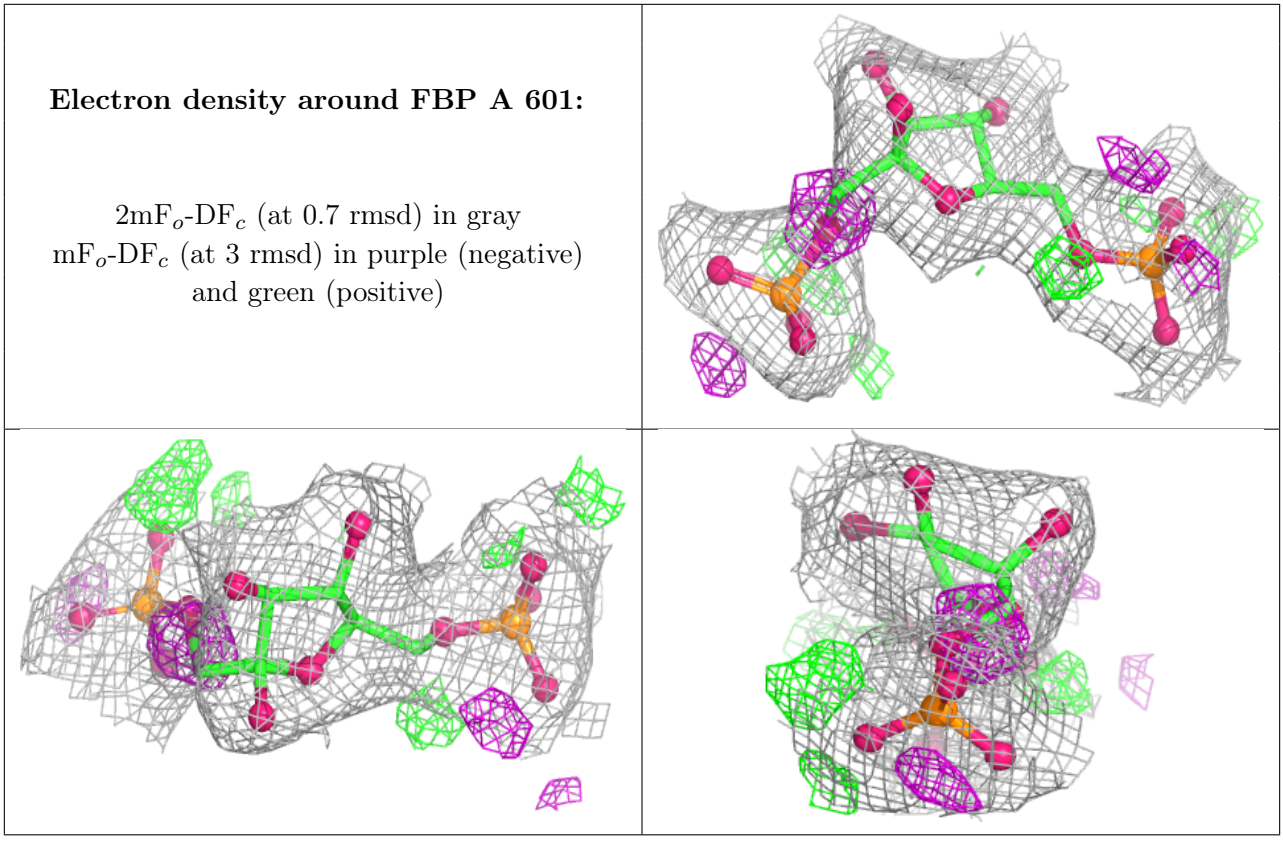
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MG	E	604	1/1	0.96	0.10	43,43,43,43	0
5	K	F	605	1/1	0.96	0.06	74,74,74,74	0
6	WVT	E	603	32/32	0.96	0.07	29,33,35,35	16
6	WVT	F	603	32/32	0.96	0.07	27,27,30,32	16
5	K	G	604	1/1	0.97	0.08	60,60,60,60	0
5	K	H	604	1/1	0.97	0.10	47,47,47,47	0
6	WVT	C	603	32/32	0.97	0.06	27,30,32,33	16
6	WVT	D	603	32/32	0.97	0.07	27,28,31,31	16
5	K	B	604	1/1	0.97	0.05	60,60,60,60	0
2	FBP	C	601	20/20	0.97	0.06	31,33,38,38	0
2	FBP	G	601	20/20	0.98	0.04	30,33,36,36	0
2	FBP	H	601	20/20	0.98	0.05	24,27,31,31	0
2	FBP	D	601	20/20	0.98	0.05	22,24,26,27	0
5	K	D	605	1/1	0.98	0.13	44,44,44,44	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.

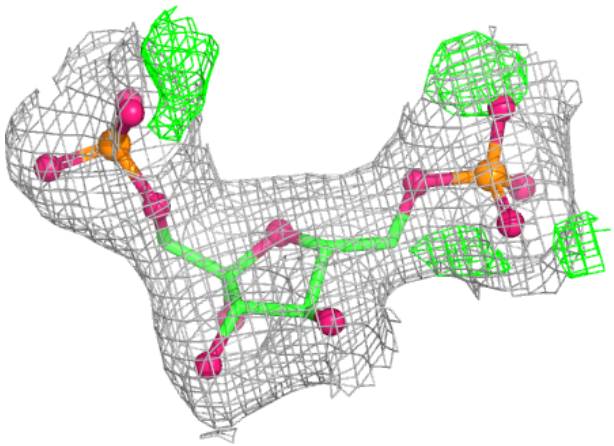
Electron density around FBP A 601:

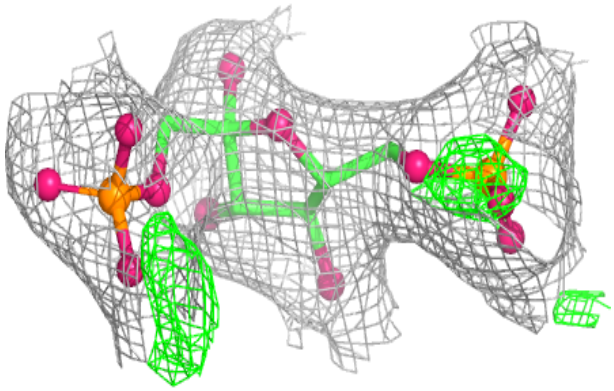
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

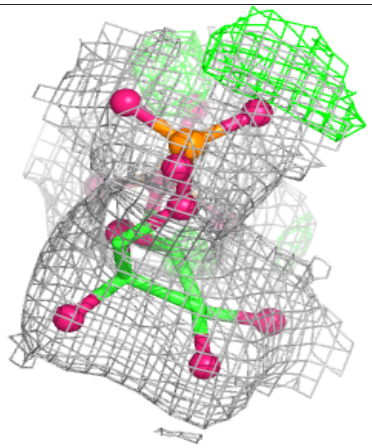


Electron density around FBP F 601:

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

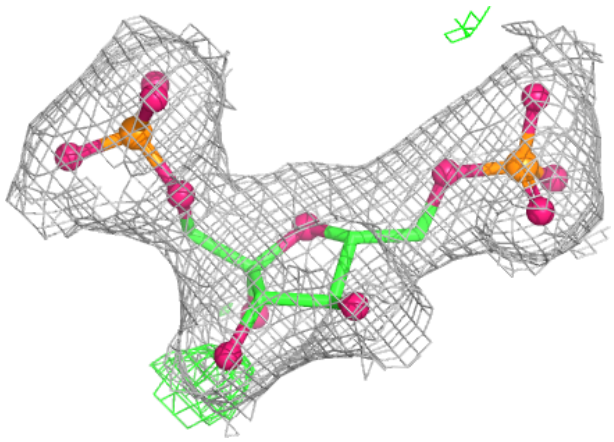


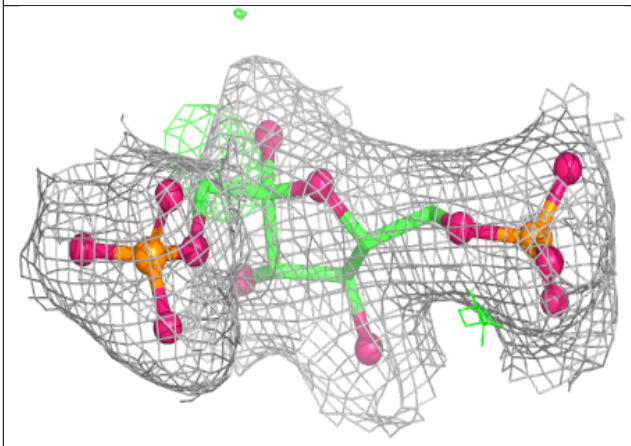


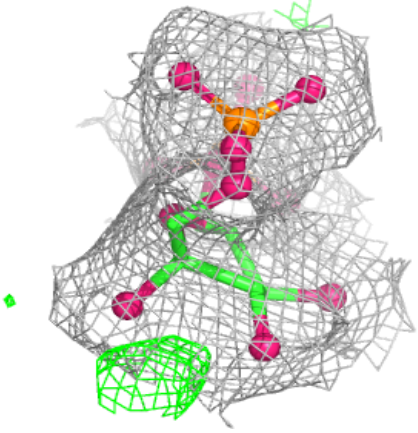


Electron density around FBP E 601:

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

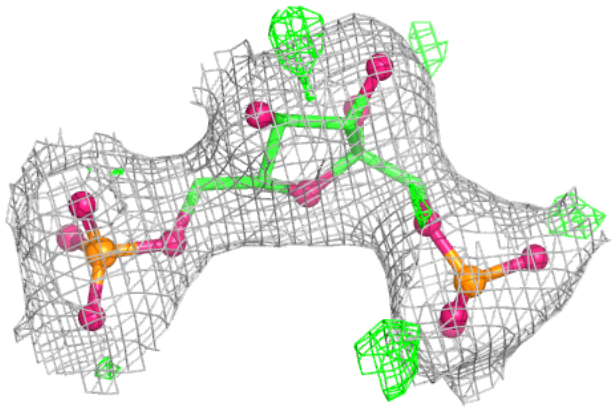


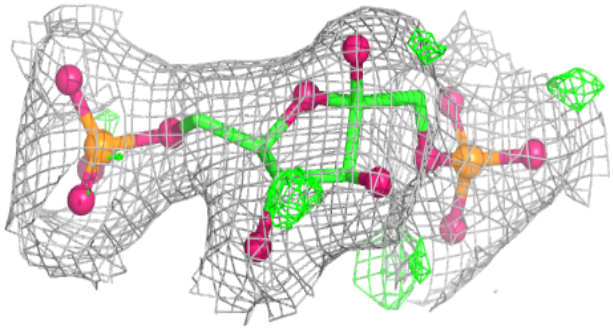


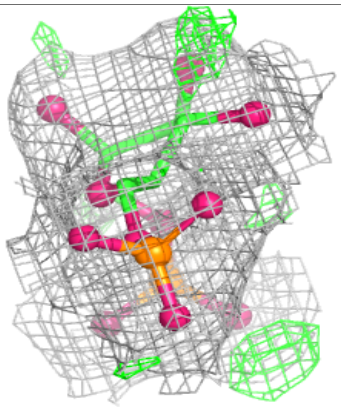


Electron density around FBP B 601:

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

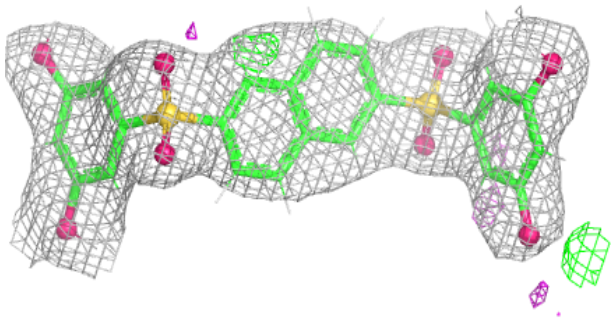


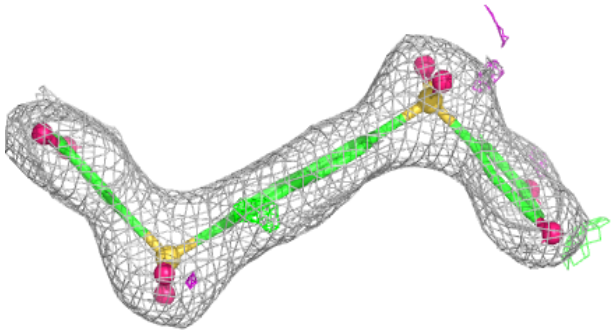


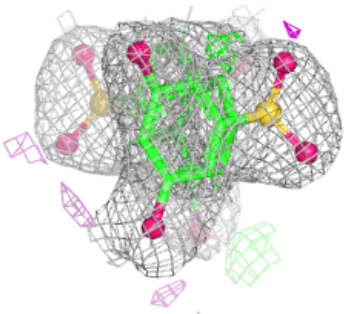


Electron density around WVT E 603:

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

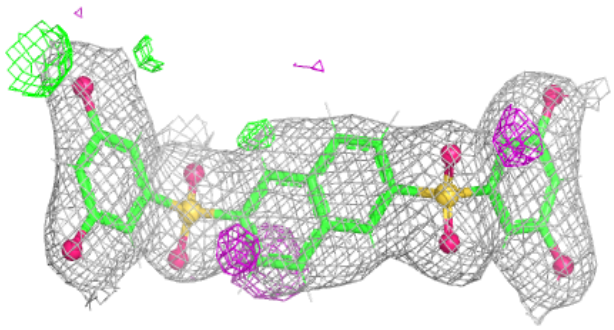


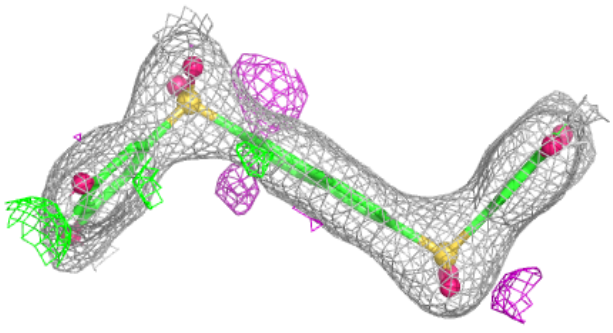


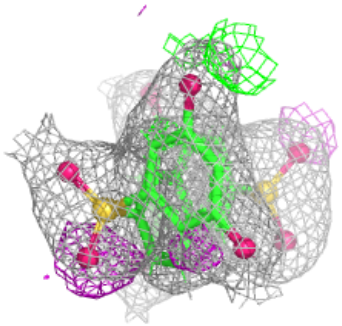


Electron density around WVT F 603:

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

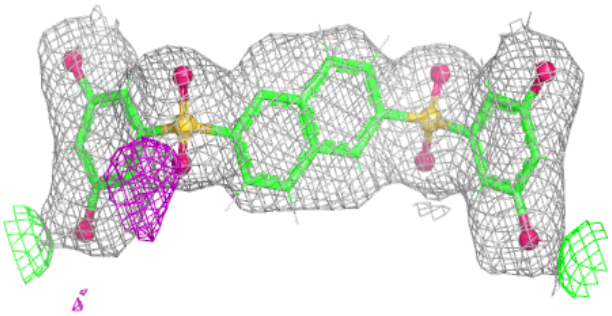


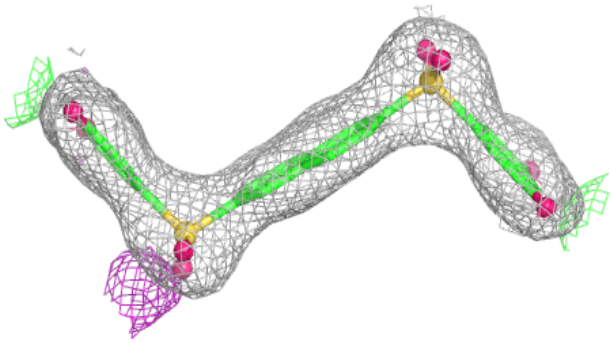


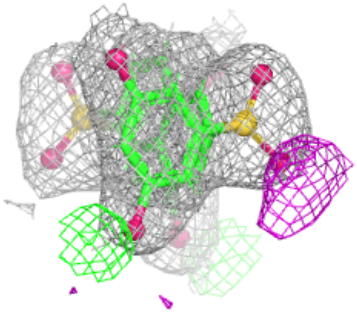


Electron density around WVT C 603:

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

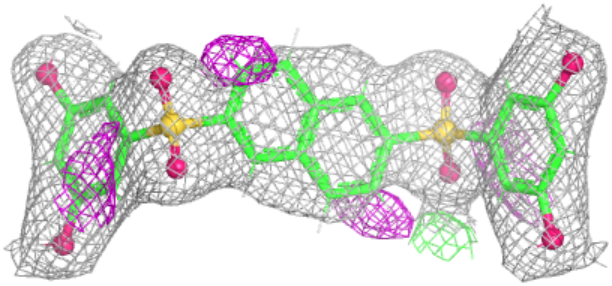


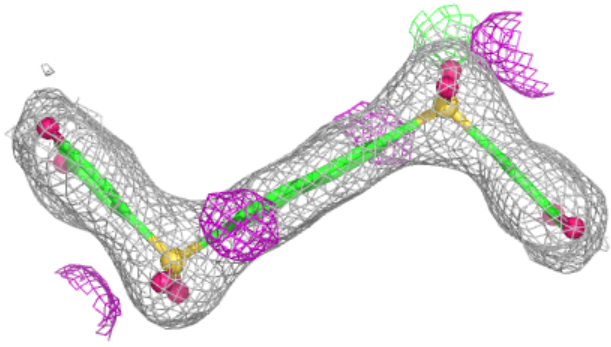


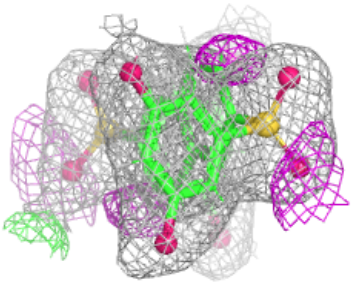


Electron density around WVT D 603:

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

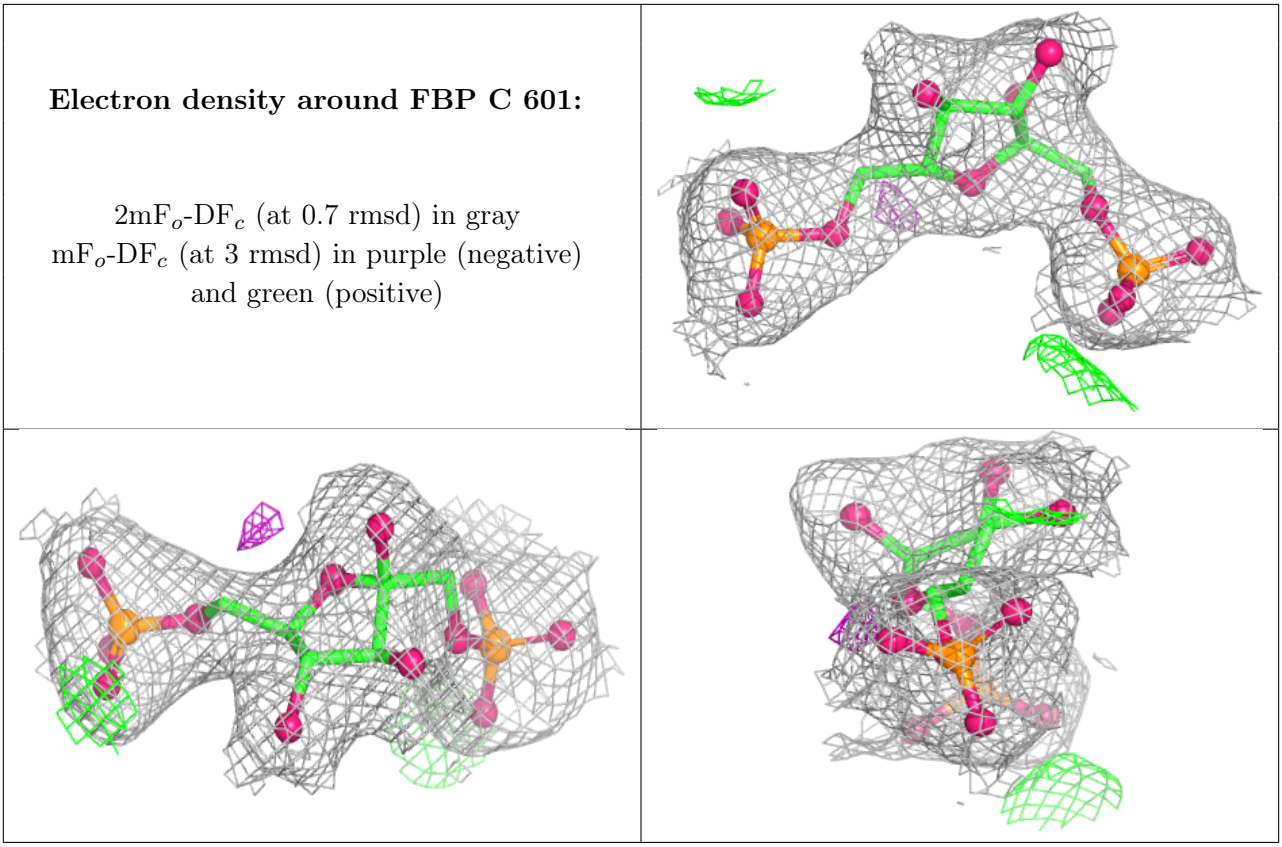






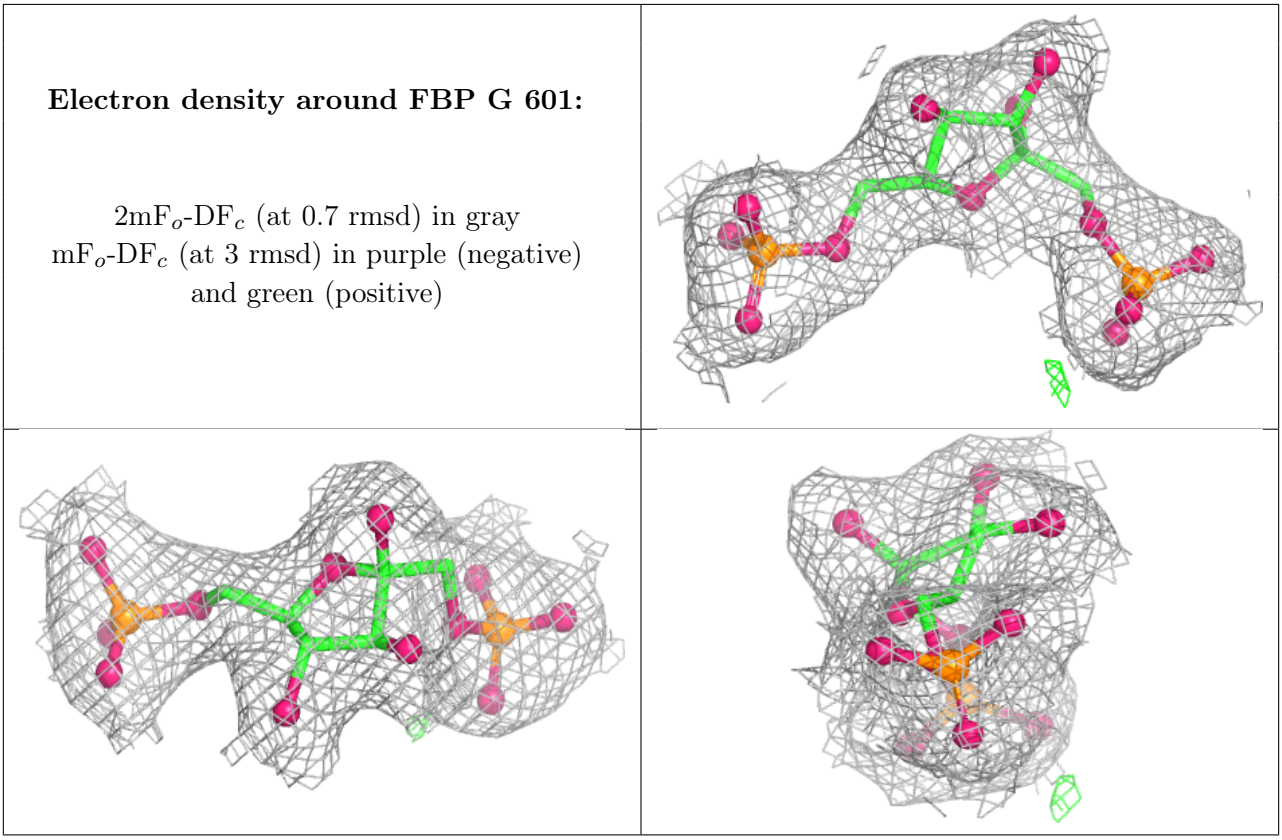
Electron density around FBP C 601:

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



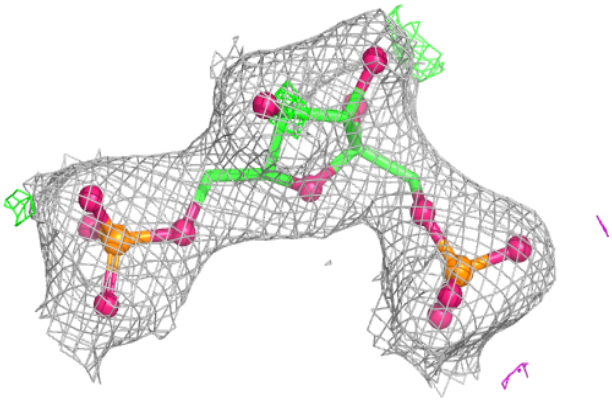
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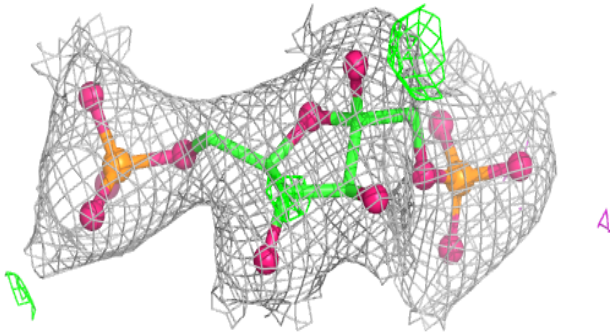
$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

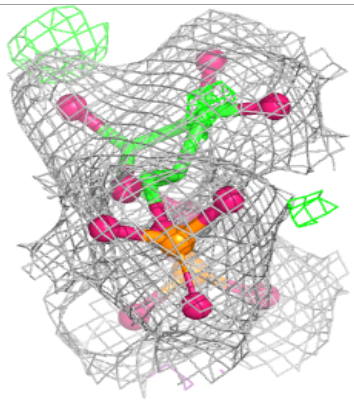


Electron density around FBP H 601:

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

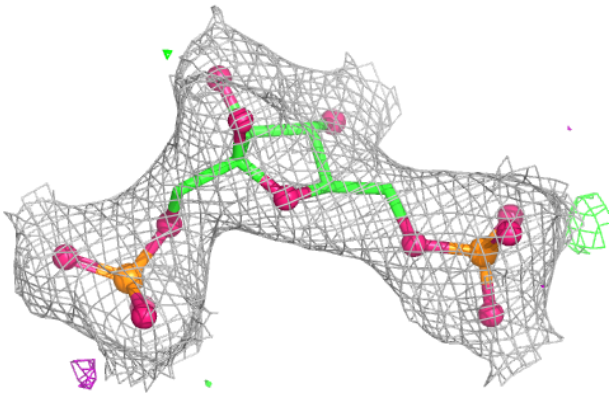


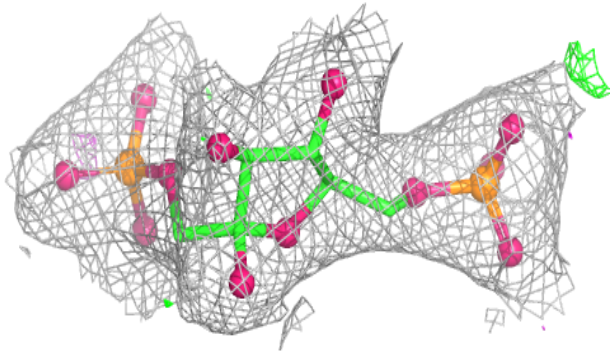


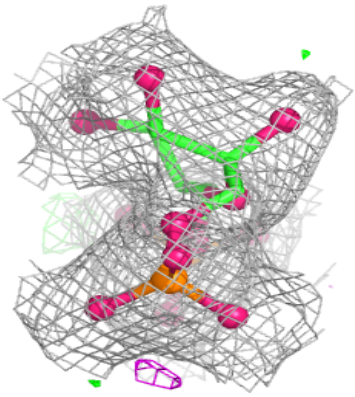


Electron density around FBP D 601:

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







6.5 Other polymers (i)

There are no such residues in this entry.