WORLDWIDE PDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 15, 2023 – 11:35 PM JST

PDB ID	:	6K8P
Title	:	Structural and catalytic analysis of two diverse uridine phosphorylases in the oomycete Phytophthora capsici.
Authors	:	Yang, C.C.; Zhang, X.G.
Deposited on	:	2019-06-13
Resolution	:	1.97 Å(reported)

The following versions of software and data (see references ⓘ) were used in the production of this report:

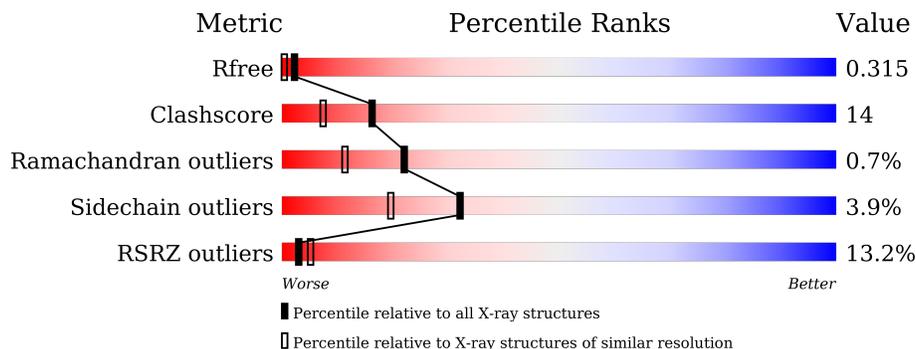|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

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 1.97 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	Percentile Ranks	Value
Rfree		0.315
Clashscore		14
Ramachandran outliers		0.7%
Sidechain outliers		3.9%
RSRZ outliers		13.2%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

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	309	9% 74% 18% • 5%
1	B	309	14% 70% 20% • 9%
1	C	309	12% 75% 18% • 5%
1	D	309	14% 70% 17% •• 9%

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 crite-

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	TDR	B	402	-	X	-	-
5	TDR	D	402	-	X	-	-

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 17908 atoms, of which 8638 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 Uridine phosphorylase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	294	Total	C	H	N	O	S	0	0	0
			4391	1372	2190	385	432	12			
1	B	280	Total	C	H	N	O	S	0	0	0
			4200	1311	2103	366	409	11			
1	C	294	Total	C	H	N	O	S	0	0	0
			4392	1372	2191	385	432	12			
1	D	280	Total	C	H	N	O	S	0	0	0
			4195	1311	2098	366	409	11			

There are 52 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	MET	-	expression tag	UNP A0A410UCT3
A	0	GLY	-	expression tag	UNP A0A410UCT3
A	297	ALA	-	expression tag	UNP A0A410UCT3
A	298	ALA	-	expression tag	UNP A0A410UCT3
A	299	ALA	-	expression tag	UNP A0A410UCT3
A	300	LEU	-	expression tag	UNP A0A410UCT3
A	301	GLU	-	expression tag	UNP A0A410UCT3
A	302	HIS	-	expression tag	UNP A0A410UCT3
A	303	HIS	-	expression tag	UNP A0A410UCT3
A	304	HIS	-	expression tag	UNP A0A410UCT3
A	305	HIS	-	expression tag	UNP A0A410UCT3
A	306	HIS	-	expression tag	UNP A0A410UCT3
A	307	HIS	-	expression tag	UNP A0A410UCT3
B	-1	MET	-	expression tag	UNP A0A410UCT3
B	0	GLY	-	expression tag	UNP A0A410UCT3
B	297	ALA	-	expression tag	UNP A0A410UCT3
B	298	ALA	-	expression tag	UNP A0A410UCT3
B	299	ALA	-	expression tag	UNP A0A410UCT3
B	300	LEU	-	expression tag	UNP A0A410UCT3
B	301	GLU	-	expression tag	UNP A0A410UCT3
B	302	HIS	-	expression tag	UNP A0A410UCT3

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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Chain	Residue	Modelled	Actual	Comment	Reference
B	303	HIS	-	expression tag	UNP A0A410UCT3
B	304	HIS	-	expression tag	UNP A0A410UCT3
B	305	HIS	-	expression tag	UNP A0A410UCT3
B	306	HIS	-	expression tag	UNP A0A410UCT3
B	307	HIS	-	expression tag	UNP A0A410UCT3
C	-1	MET	-	expression tag	UNP A0A410UCT3
C	0	GLY	-	expression tag	UNP A0A410UCT3
C	297	ALA	-	expression tag	UNP A0A410UCT3
C	298	ALA	-	expression tag	UNP A0A410UCT3
C	299	ALA	-	expression tag	UNP A0A410UCT3
C	300	LEU	-	expression tag	UNP A0A410UCT3
C	301	GLU	-	expression tag	UNP A0A410UCT3
C	302	HIS	-	expression tag	UNP A0A410UCT3
C	303	HIS	-	expression tag	UNP A0A410UCT3
C	304	HIS	-	expression tag	UNP A0A410UCT3
C	305	HIS	-	expression tag	UNP A0A410UCT3
C	306	HIS	-	expression tag	UNP A0A410UCT3
C	307	HIS	-	expression tag	UNP A0A410UCT3
D	-1	MET	-	expression tag	UNP A0A410UCT3
D	0	GLY	-	expression tag	UNP A0A410UCT3
D	297	ALA	-	expression tag	UNP A0A410UCT3
D	298	ALA	-	expression tag	UNP A0A410UCT3
D	299	ALA	-	expression tag	UNP A0A410UCT3
D	300	LEU	-	expression tag	UNP A0A410UCT3
D	301	GLU	-	expression tag	UNP A0A410UCT3
D	302	HIS	-	expression tag	UNP A0A410UCT3
D	303	HIS	-	expression tag	UNP A0A410UCT3
D	304	HIS	-	expression tag	UNP A0A410UCT3
D	305	HIS	-	expression tag	UNP A0A410UCT3
D	306	HIS	-	expression tag	UNP A0A410UCT3
D	307	HIS	-	expression tag	UNP A0A410UCT3

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P) (labeled as "Ligand of Interest" by depositor).

PO4
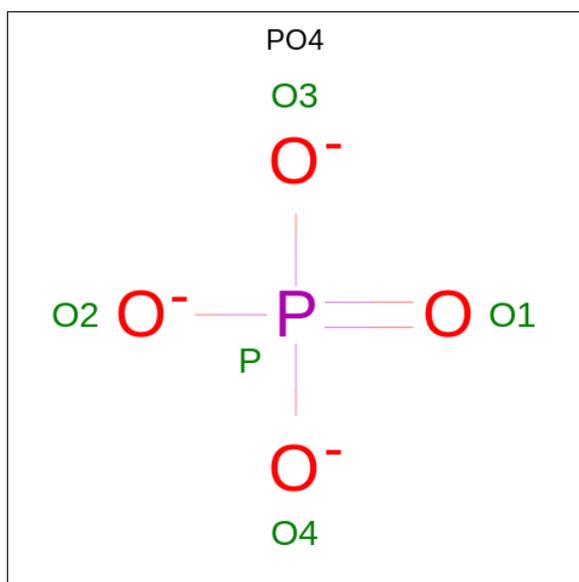
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	P	0	0
			5	4	1		
2	C	1	Total	O	P	0	0
			5	4	1		

- Molecule 3 is THYMIDINE (three-letter code: THM) (formula: $C_{10}H_{14}N_2O_5$) (labeled as "Ligand of Interest" by depositor).
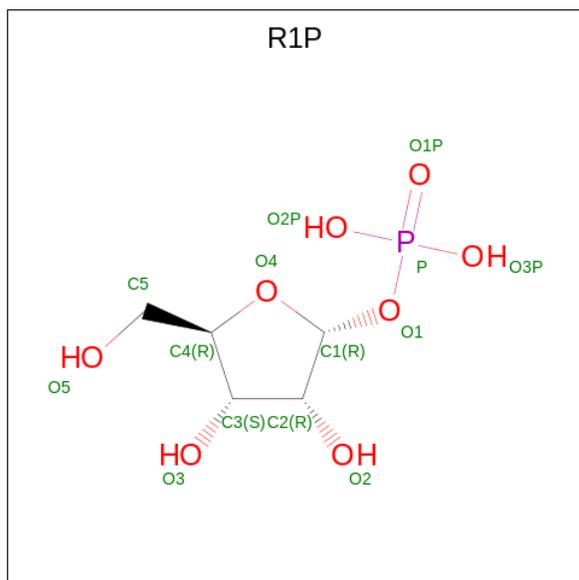
THM
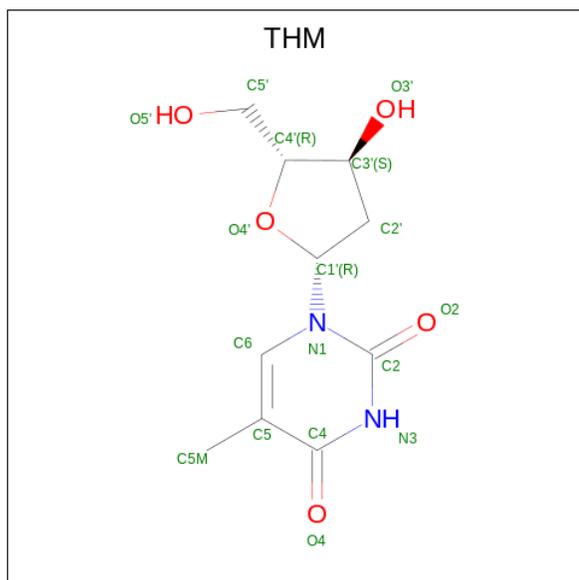
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	H	N	O	0	0
			31	10	14	2	5		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	C	1	Total 30	C 10	H 13	N 2	O 5	0	0

- Molecule 4 is 1-O-phosphono-alpha-D-ribofuranose (three-letter code: R1P) (formula: $C_5H_{11}O_8P$) (labeled as "Ligand of Interest" by depositor).

R1P

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	B	1	Total 23	C 5	H 9	O 8	P 1	0	0
4	D	1	Total 22	C 5	H 8	O 8	P 1	0	0

- Molecule 5 is THYMINE (three-letter code: TDR) (formula: $C_5H_6N_2O_2$) (labeled as "Ligand of Interest" by depositor).
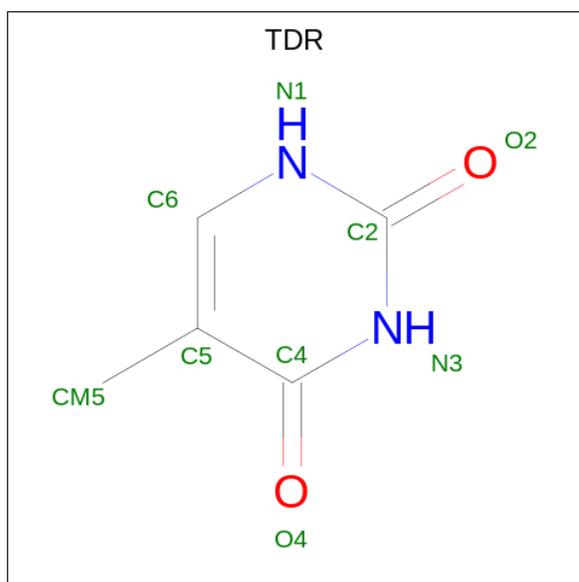
TDR

N1

H
N

O O2

C6

C2

NH

C5 C4 N3

CM5

O

O4

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	B	1	Total	C	H	N	O	0	0
			15	5	6	2	2		
5	D	1	Total	C	H	N	O	0	0
			15	5	6	2	2		

• Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	156	Total	O	0	0
			156	156		
6	B	136	Total	O	0	0
			136	136		
6	C	170	Total	O	0	0
			170	170		
6	D	122	Total	O	0	0
			122	122		

3 Residue-property plots ⓘ

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: Uridine phosphorylase

Chain A:

- Molecule 1: Uridine phosphorylase

Chain B:

- Molecule 1: Uridine phosphorylase

Chain C:

L265 S266 G267 Q268 A277 L278 E279 W282 Q288 V291 L295 ASP ALA ALA ALA LEU GLU HIS HIS HIS HIS HIS HIS

• Molecule 1: Uridine phosphorylase

Chain D:

14%

70% 17% 9%

MET GLY MET ALA TYR GLN ASN THR ASN ALA MET PRO THR HIS SER ASP GLY T16 V17 L18 H19 L20 G21 L22 R23 A24 G25 Q26 V27 R30 V34 G35 S36 R39 V42 L47 D48 E49 G50 H51 R59 V68 G81 V82 P83 V88 E91 T92 R93

N97 M100 I103 R104 F105 G106 T107 V111 R112 E113 E114 V120 N133 P134 D135 A136 F137 F138 P139 G140 A141 S142 E143 E144 D145 R148 M167 E168 D169 K170 L171 E177 I180 A181 A182 S183 S184 D185 C186 D187 A188 L189 C200 S201 F202 Q206 G207 R208 L209

D210 K219 E222 D230 S235 M236 E237 D243 L244 S248 R249 G250 S251 I252 A256 N263 S266 G267 Q268 I269 V270 E271 S272 E273 V274 T289 I290 V291 S292 T293 P294 L295 ASP ALA ALA ALA LEU GLU HIS HIS HIS HIS HIS HIS

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 2 21 21	Depositor
Cell constants a, b, c, α, β, γ	66.96Å 97.33Å 188.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.46 – 1.97 38.46 – 1.96	Depositor EDS
% Data completeness (in resolution range)	98.7 (38.46-1.97) 98.7 (38.46-1.96)	Depositor EDS
R_{merge}	0.20	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.99 (at 1.97Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.265 , 0.316 0.265 , 0.315	Depositor DCC
R_{free} test set	4384 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	23.9	Xtriage
Anisotropy	0.186	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.41 , 59.1	EDS
L-test for twinning[2]	$< |L| > = 0.58$, $< L^2 > = 0.43$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	17908	wwPDB-VP
Average B, all atoms (Å^2)	32.0	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 66.02 % 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 6.4637e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: TDR, R1P, PO4, THM

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	0.68	3/2236 (0.1%)	0.78	2/3037 (0.1%)
1	B	0.65	0/2129	0.76	0/2890
1	C	0.73	0/2236	0.82	2/3037 (0.1%)
1	D	0.65	2/2129 (0.1%)	0.83	5/2890 (0.2%)
All	All	0.68	5/8730 (0.1%)	0.80	9/11854 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	1
1	D	0	1
All	All	0	3

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	74	SER	CB-OG	6.82	1.51	1.42
1	D	235	GLU	CB-CG	-5.73	1.41	1.52
1	D	235	GLU	CG-CD	-5.53	1.43	1.51
1	A	100	MET	CG-SD	-5.50	1.66	1.81
1	A	108	CYS	CB-SG	-5.33	1.73	1.81

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	93	ARG	NE-CZ-NH2	-6.68	116.96	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	235	GLU	CG-CD-OE2	-6.05	106.20	118.30
1	A	100	MET	CG-SD-CE	6.02	109.84	100.20
1	D	235	GLU	CB-CA-C	6.01	122.43	110.40
1	A	59	ARG	NE-CZ-NH1	5.91	123.26	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	143	GLU	Peptide
1	C	141	ALA	Peptide
1	D	181	ALA	Peptide

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	2201	2190	2190	68	1
1	B	2097	2103	2102	60	1
1	C	2201	2191	2190	58	0
1	D	2097	2098	2102	69	0
2	A	5	0	0	1	0
2	C	5	0	0	0	0
3	A	17	14	11	1	0
3	C	17	13	14	1	0
4	B	14	9	0	2	0
4	D	14	8	0	3	0
5	B	9	6	6	0	0
5	D	9	6	6	0	0
6	A	156	0	0	16	1
6	B	136	0	0	16	0
6	C	170	0	0	18	1
6	D	122	0	0	22	0
All	All	9270	8638	8621	249	2

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 14.

The worst 5 of 249 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)
4:B:401:R1P:O4	4:B:401:R1P:C1	1.70	1.24
4:D:401:R1P:O4	4:D:401:R1P:C1	1.69	1.21
1:D:167:MET:SD	6:D:604:HOH:O	2.09	1.08
1:D:274:VAL:HG11	6:D:595:HOH:O	1.56	1.04
1:A:54:THR:HG21	6:A:510:HOH:O	1.60	1.01

All (2) 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)
6:A:647:HOH:O	6:C:659:HOH:O[1_545]	2.12	0.08
1:A:161:LYS:HZ1	1:B:181:ALA:O[1_455]	1.59	0.01

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	292/309 (94%)	278 (95%)	10 (3%)	4 (1%)	11	3
1	B	278/309 (90%)	268 (96%)	10 (4%)	0	100	100
1	C	292/309 (94%)	272 (93%)	17 (6%)	3 (1%)	15	6
1	D	278/309 (90%)	270 (97%)	7 (2%)	1 (0%)	34	22
All	All	1140/1236 (92%)	1088 (95%)	44 (4%)	8 (1%)	22	11

5 of 8 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	5	ASN
1	A	6	THR
1	A	144	GLU

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Mol	Chain	Res	Type
1	C	142	SER
1	C	6	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	242/253 (96%)	235 (97%)	7 (3%)	42	31
1	B	231/253 (91%)	222 (96%)	9 (4%)	32	19
1	C	242/253 (96%)	233 (96%)	9 (4%)	34	22
1	D	231/253 (91%)	219 (95%)	12 (5%)	23	10
All	All	946/1012 (94%)	909 (96%)	37 (4%)	32	19

5 of 37 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	49	GLU
1	D	272	SER
1	D	93	ARG
1	D	210	ASP
1	B	210	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

8 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
4	R1P	B	401	-	13,14,14	5.46	7 (53%)	20,21,21	4.17	9 (45%)
4	R1P	D	401	-	13,14,14	5.20	8 (61%)	20,21,21	3.88	7 (35%)
5	TDR	D	402	-	9,9,9	4.72	6 (66%)	12,12,12	2.90	5 (41%)
2	PO4	A	401	-	4,4,4	1.33	0	6,6,6	0.85	0
2	PO4	C	401	-	4,4,4	1.99	1 (25%)	6,6,6	0.56	0
3	THM	A	402	-	18,18,18	5.19	14 (77%)	26,26,26	2.15	9 (34%)
5	TDR	B	402	-	9,9,9	5.12	7 (77%)	12,12,12	2.94	6 (50%)
3	THM	C	402	-	18,18,18	5.15	13 (72%)	26,26,26	1.86	6 (23%)

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
4	R1P	B	401	-	-	0/6/23/23	0/1/1/1
4	R1P	D	401	-	-	0/6/23/23	0/1/1/1
5	TDR	D	402	-	-	-	0/1/1/1
3	THM	A	402	-	-	0/6/18/18	0/2/2/2
5	TDR	B	402	-	-	-	0/1/1/1
3	THM	C	402	-	-	0/6/18/18	0/2/2/2

The worst 5 of 56 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	401	R1P	O4-C1	16.12	1.70	1.41
4	D	401	R1P	O4-C1	15.65	1.69	1.41
3	A	402	THM	C2'-C3'	-11.45	1.22	1.52
3	C	402	THM	C2'-C3'	-10.77	1.24	1.52
3	C	402	THM	C6-C5	9.00	1.49	1.34

The worst 5 of 42 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	401	R1P	O4-C1-O1	12.63	134.24	109.18
4	D	401	R1P	O4-C1-O1	11.05	131.11	109.18
4	D	401	R1P	O4-C1-C2	-8.51	94.02	104.98
4	B	401	R1P	O4-C1-C2	-7.65	95.13	104.98
4	D	401	R1P	O1-C1-C2	7.34	119.15	106.72

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	401	R1P	2	0
4	D	401	R1P	3	0
2	A	401	PO4	1	0
3	A	402	THM	1	0
3	C	402	THM	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 R1P B 401

Bond lengths

Bond angles

Torsions

Rings

Ligand R1P D 401

Bond lengths

Bond angles

Torsions

Rings

Ligand TDR D 402

Bond lengths

Bond angles

Torsions

Rings

Ligand PO4 A 401

Bond lengths

Bond angles

Torsions

Rings

Ligand PO4 C 401

Bond lengths

Bond angles

Torsions

Rings

Ligand THM A 402

Bond lengths

Bond angles

Torsions

Rings

Ligand TDR B 402

Bond lengths

Bond angles

Torsions

Rings

Ligand THM C 402

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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	294/309 (95%)	0.89	29 (9%)	7	12	14, 24, 62, 90	0
1	B	280/309 (90%)	1.16	42 (15%)	2	3	16, 27, 59, 115	0
1	C	294/309 (95%)	1.06	37 (12%)	3	6	14, 24, 63, 96	0
1	D	280/309 (90%)	1.13	44 (15%)	2	3	15, 28, 57, 97	0
All	All	1148/1236 (92%)	1.06	152 (13%)	3	5	14, 26, 61, 115	0

The worst 5 of 152 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	3	TYR	14.8
1	B	142	SER	12.4
1	B	141	ALA	11.5
1	D	185	ASP	11.3
1	C	142	SER	10.8

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 monosaccharides 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($\mathring{A}^2$)	Q<0.9
3	THM	A	402	17/17	0.88	0.15	20,30,36,37	0
3	THM	C	402	17/17	0.88	0.16	20,30,39,45	0
4	R1P	D	401	14/14	0.88	0.23	17,35,49,50	0
5	TDR	D	402	9/9	0.89	0.17	20,32,41,49	0
4	R1P	B	401	14/14	0.91	0.20	18,30,46,48	0
5	TDR	B	402	9/9	0.92	0.17	24,33,41,42	0
2	PO4	A	401	5/5	0.98	0.19	16,16,20,21	0
2	PO4	C	401	5/5	0.99	0.13	16,17,18,19	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 THM A 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
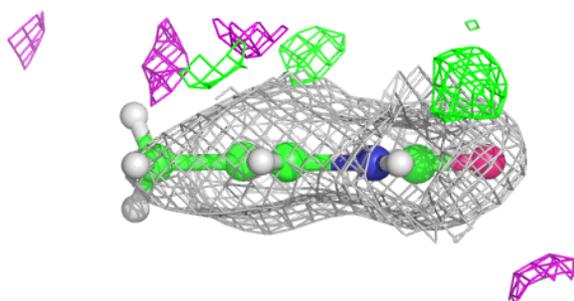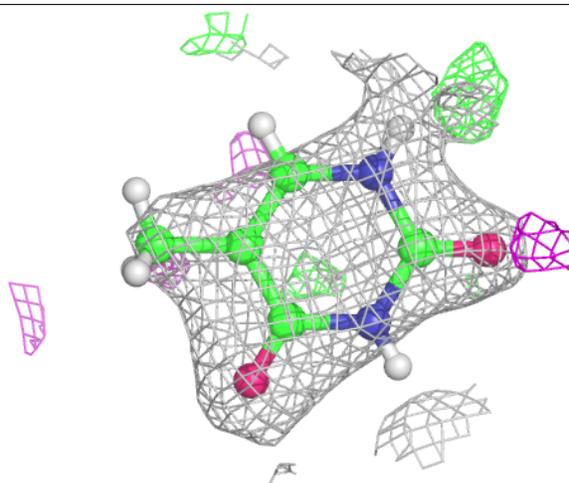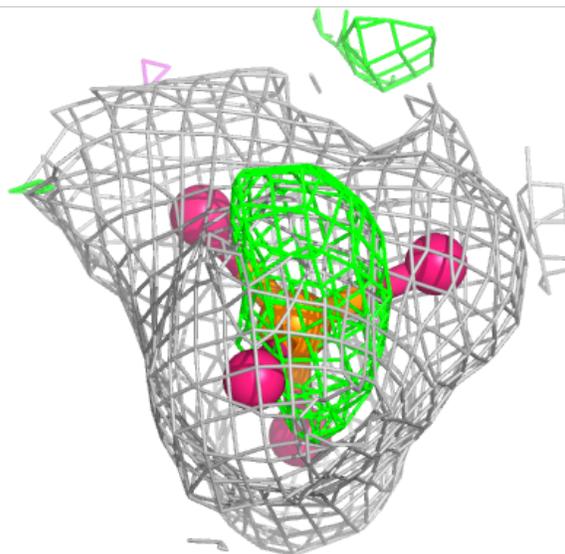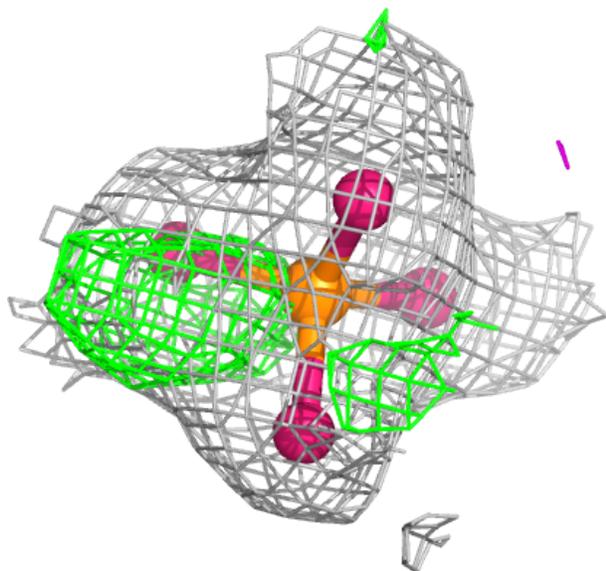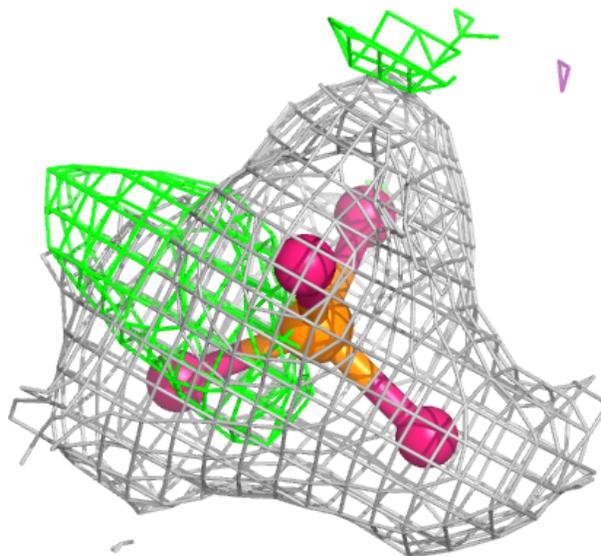mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)
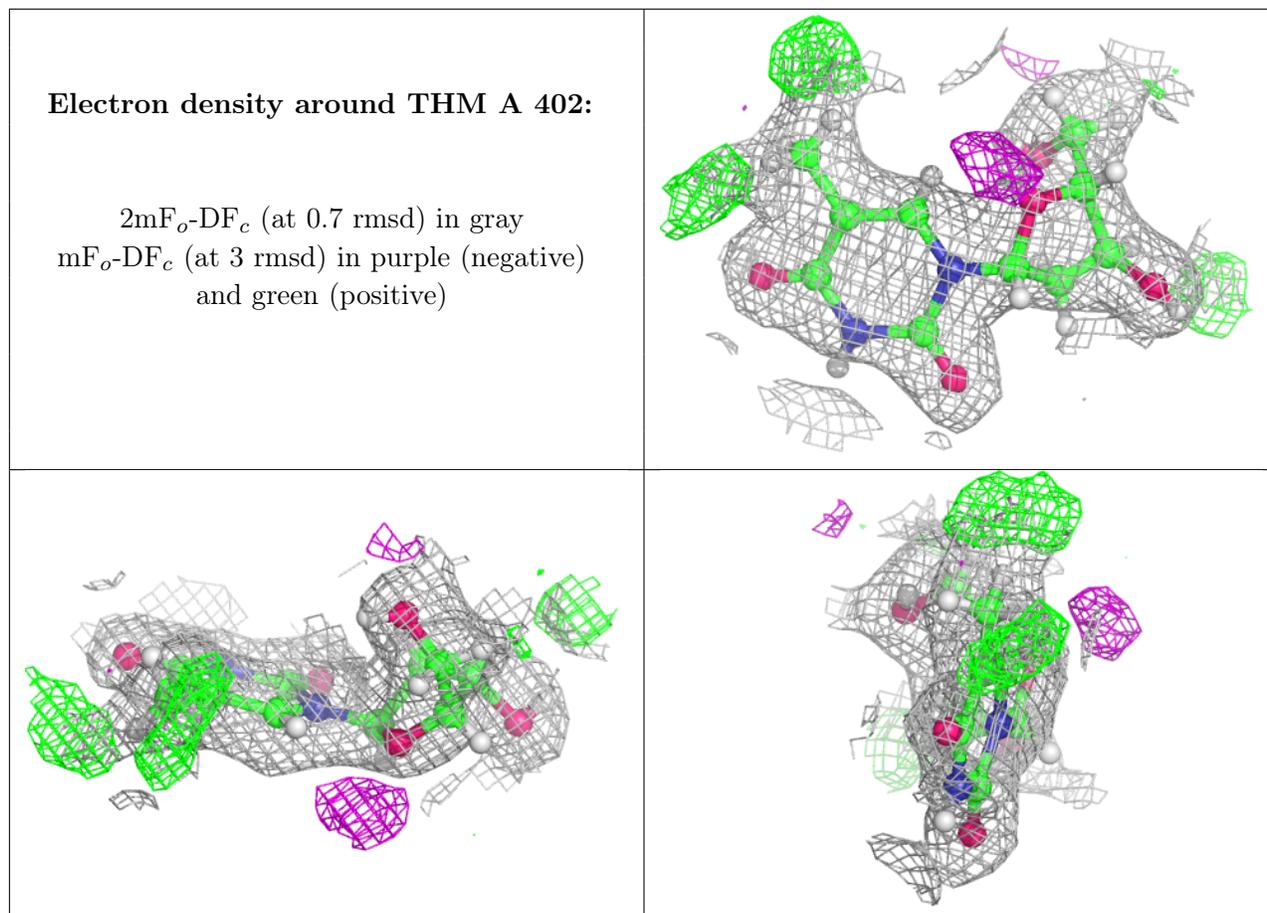
Electron density around THM C 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
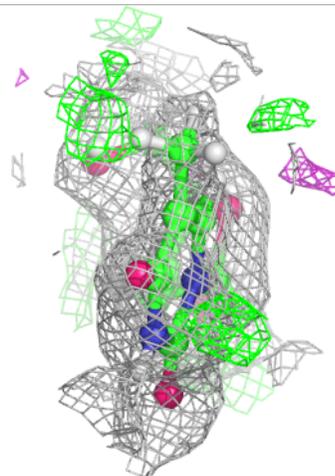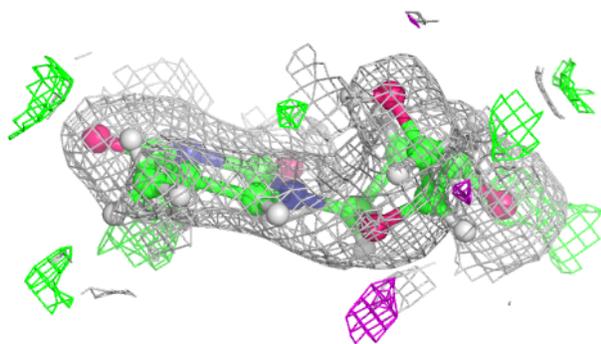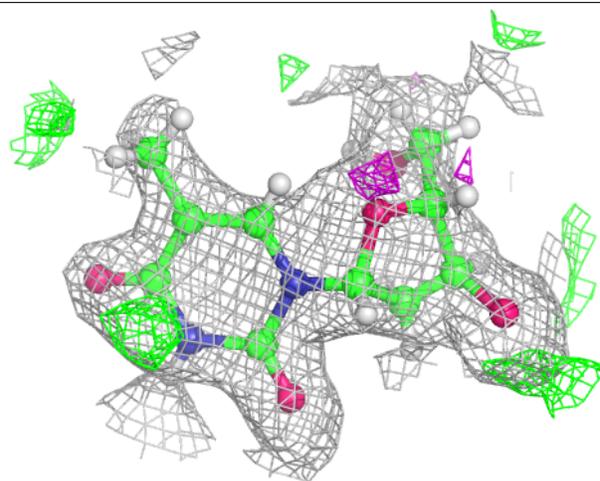
Electron density around R1P D 401:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
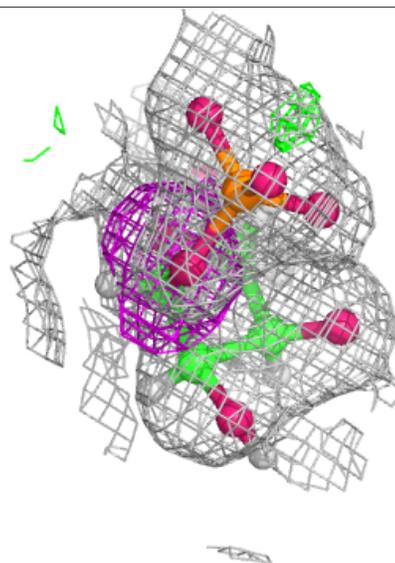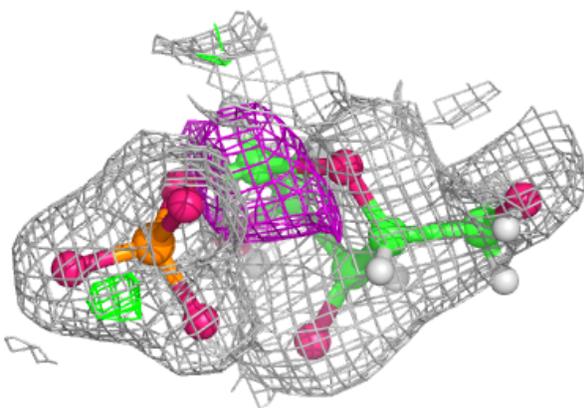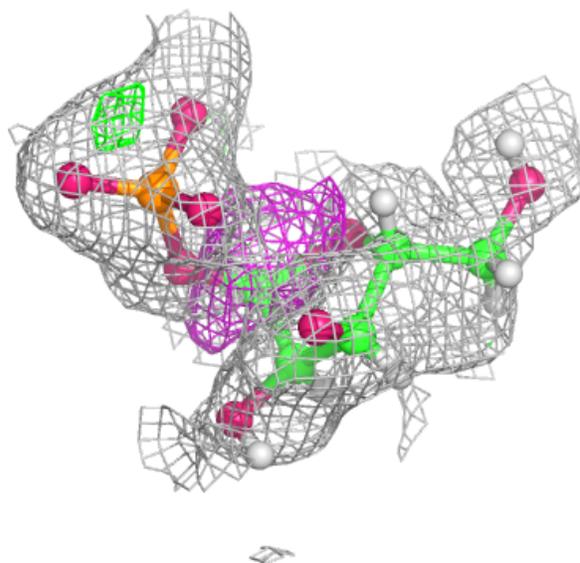
Electron density around TDR D 402:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
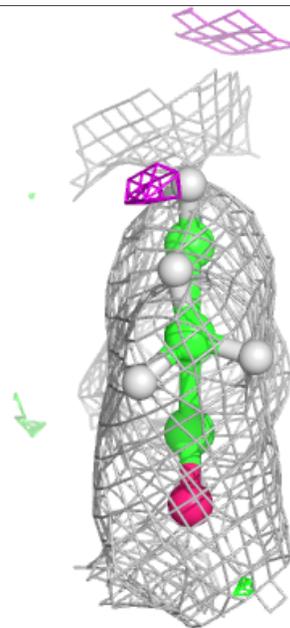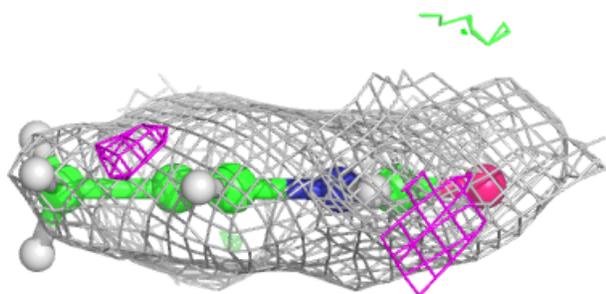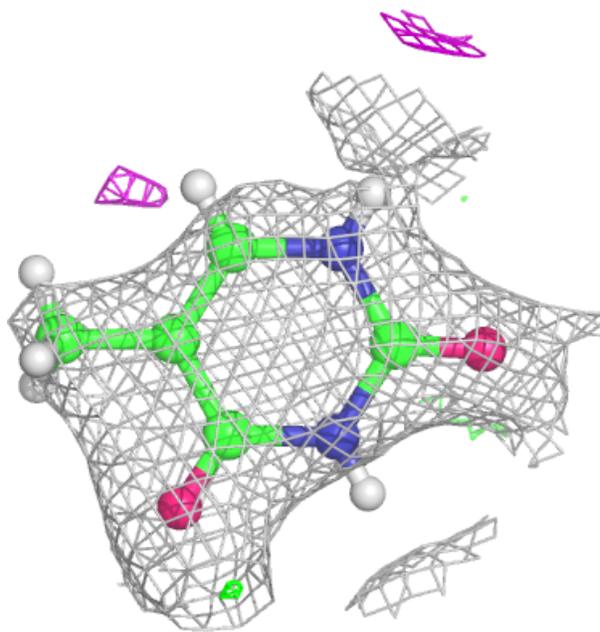
Electron density around R1P B 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
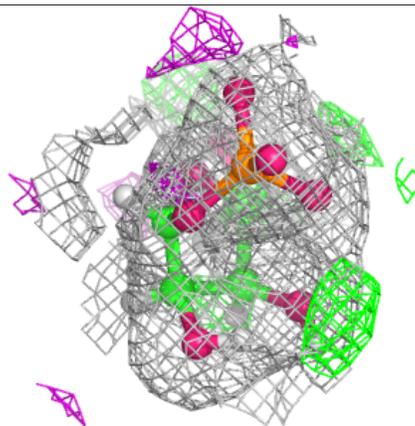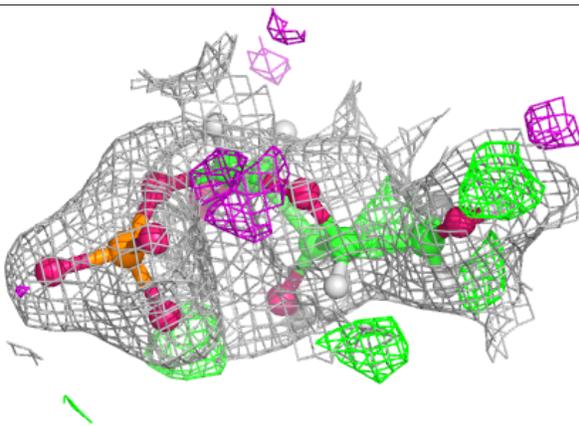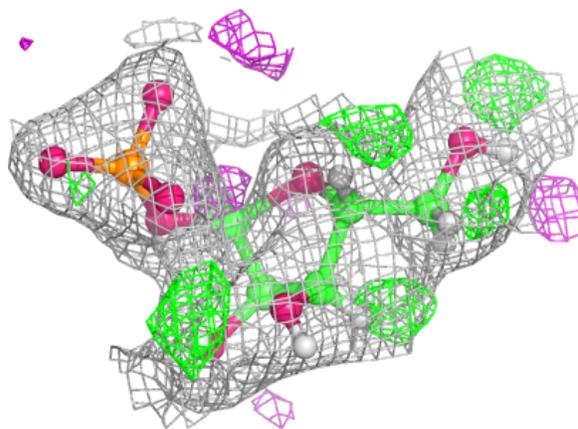
Electron density around TDR B 402:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
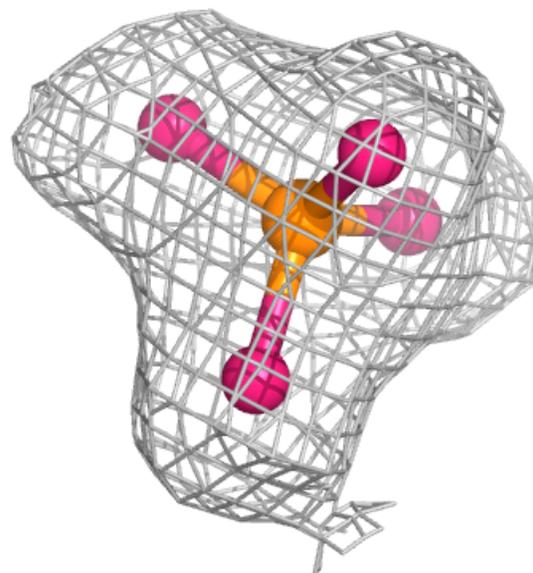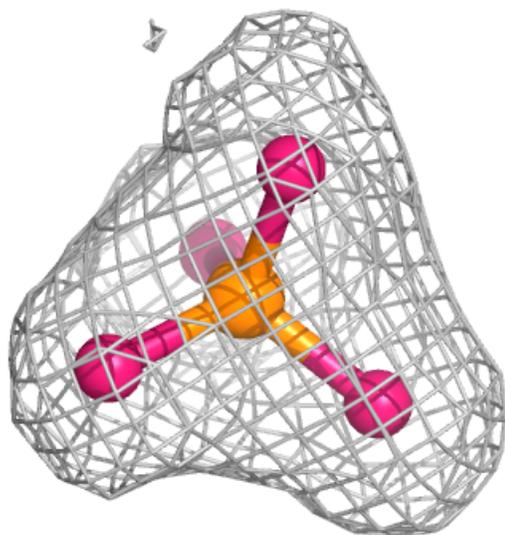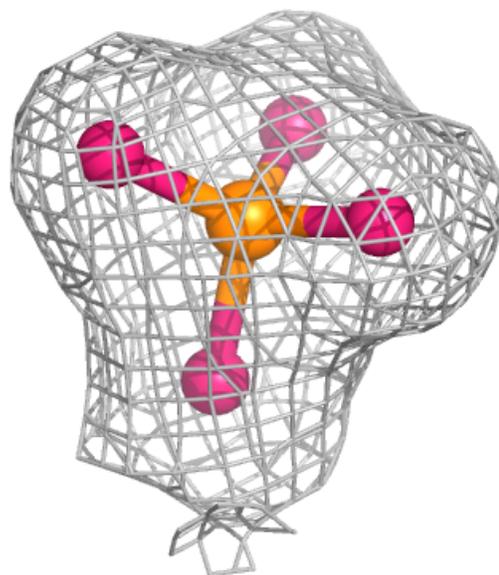mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
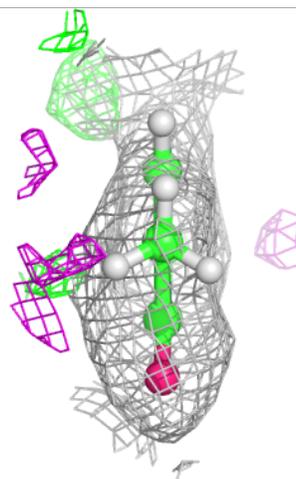
Electron density around PO4 A 401:

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

Electron density around PO4 C 401:

$2mF_o$-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 ⓘ

There are no such residues in this entry.