Full wwPDB X-ray Structure Validation Report (i)

Nov 13, 2023 – 12:42 PM JST

PDB ID	:	5X5Q
Title	:	Human thymidylate synthase complexed with dUMP and raltitrexed
Authors	:	Chen, D.; Jansson, A.; Larsson, A.; Nordlund, P.
Deposited on	:	2017-02-17
Resolution	:	2.79 Å(reported)

The following versions of software and data (see references (i)) 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 2.79 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		0.262
Clashscore		2
Ramachandran outliers		0.5%
Sidechain outliers		3.1%
RSRZ outliers		0.9%

Worse ← → Better

▌ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
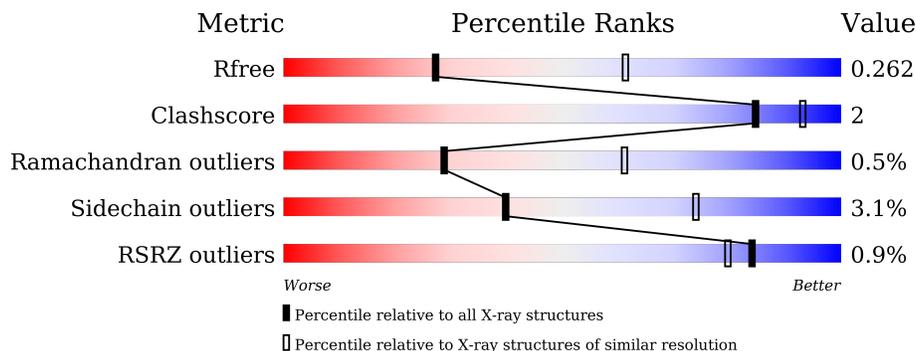
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=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	290	91% 7% ••
1	B	290	93% 6% •
1	C	290	85% 11% ••
1	D	290	88% 7% ••
1	E	290	86% 10% ••
1	F	290	90% 6% ••

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 13819 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Thymidylate synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	286	Total	C	N	O	S	0	0	0
			2291	1465	399	414	13			
1	B	287	Total	C	N	O	S	0	0	0
			2287	1463	398	413	13			
1	C	281	Total	C	N	O	S	0	0	0
			2226	1426	384	405	11			
1	D	279	Total	C	N	O	S	0	0	0
			2240	1433	389	407	11			
1	E	281	Total	C	N	O	S	0	0	0
			2258	1444	396	407	11			
1	F	280	Total	C	N	O	S	0	0	0
			2195	1407	380	397	11			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	24	SER	-	expression tag	UNP P04818
A	25	MET	-	expression tag	UNP P04818
B	24	SER	-	expression tag	UNP P04818
B	25	MET	-	expression tag	UNP P04818
C	24	SER	-	expression tag	UNP P04818
C	25	MET	-	expression tag	UNP P04818
D	24	SER	-	expression tag	UNP P04818
D	25	MET	-	expression tag	UNP P04818
E	24	SER	-	expression tag	UNP P04818
E	25	MET	-	expression tag	UNP P04818
F	24	SER	-	expression tag	UNP P04818
F	25	MET	-	expression tag	UNP P04818

- Molecule 2 is 2'-DEOXYURIDINE 5'-MONOPHOSPHATE (three-letter code: UMP) (formula: $C_9H_{13}N_2O_8P$).
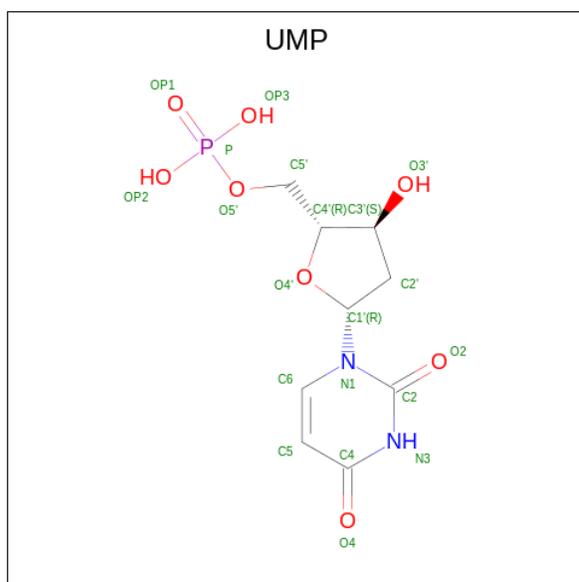
WORLDWIDE
wwPDB
PROTEIN DATA BANK

UMP

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			20	9	2	8	1		
2	B	1	Total	C	N	O	P	0	0
			20	9	2	8	1		
2	C	1	Total	C	N	O	P	0	0
			20	9	2	8	1		
2	D	1	Total	C	N	O	P	0	0
			20	9	2	8	1		
2	E	1	Total	C	N	O	P	0	0
			20	9	2	8	1		
2	F	1	Total	C	N	O	P	0	0
			20	9	2	8	1		

- Molecule 3 is TOMUDEX (three-letter code: D16) (formula: $C_{21}H_{22}N_4O_6S$).

D16

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			32	21	4	6	1		
3	B	1	Total	C	N	O	S	0	0
			32	21	4	6	1		
3	C	1	Total	C	N	O	S	0	0
			32	21	4	6	1		
3	D	1	Total	C	N	O	S	0	0
			32	21	4	6	1		
3	E	1	Total	C	N	O	S	0	0
			32	21	4	6	1		
3	F	1	Total	C	N	O	S	0	0
			32	21	4	6	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	O	0	0
			2	2		
4	B	4	Total	O	0	0
			4	4		
4	C	1	Total	O	0	0
			1	1		
4	D	2	Total	O	0	0
			2	2		
4	F	1	Total	O	0	0
			1	1		

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: Thymidylate synthase

Chain A:

• Molecule 1: Thymidylate synthase

Chain B:

• Molecule 1: Thymidylate synthase

Chain C:

• Molecule 1: Thymidylate synthase

Chain D:

• Molecule 1: Thymidylate synthase

Chain E:

SER MET P26 P27 H28 G29 Q32 Q38 R46 K47 D48 D49 R50 T53 A63 L74 L88 I108 W109 N112 R115 S124 T125 R126 V134 R140 R147 D148 S154 M179 L192 H196 L212 P224 M236 T251 Y258

E272 P273 K287 I288 D289 T306 ILE LYS MET GLU MET ALA VAL

• Molecule 1: Thymidylate synthase

%

Chain F:

90%   6% • •

SER MET P26 V45 D49 G52 S57 D69 L85 L88 K99 I108 W109 V134 S154 G155 L187 P188 H196 L212 M236 T251 H256 I257 Y258 D290 P305 THR ILE LYS MET GLU MET ALA VAL
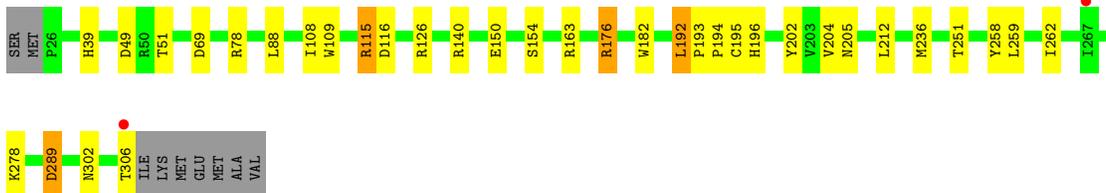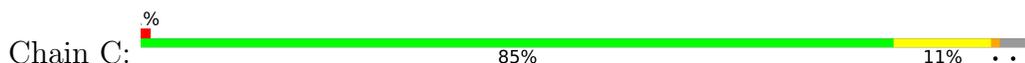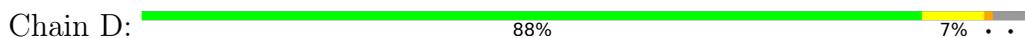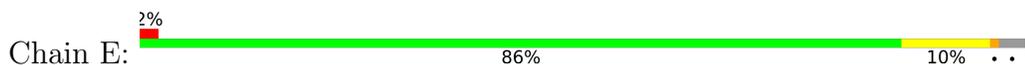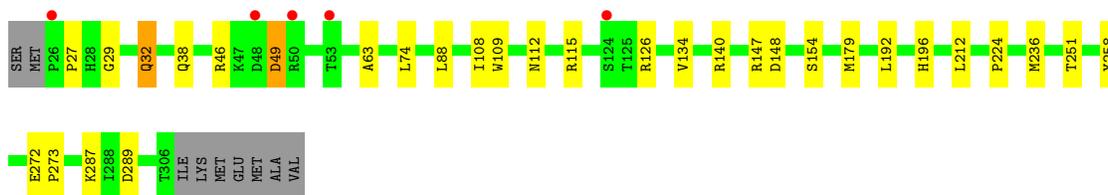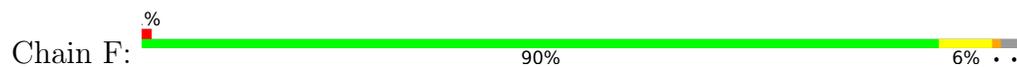
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	107.83Å 107.83Å 314.95Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	27.18 – 2.79 27.18 – 2.79	Depositor EDS
% Data completeness (in resolution range)	91.8 (27.18-2.79) 92.0 (27.18-2.79)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.45 (at 2.80Å)	Xtriage
Refinement program	REFMAC 5.8.0155	Depositor
R, R_{free}	0.221 , 0.262 0.222 , 0.262	Depositor DCC
R_{free} test set	2121 reflections (4.86%)	wwPDB-VP
Wilson B-factor (Å^2)	46.5	Xtriage
Anisotropy	0.066	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 26.7	EDS
L-test for twinning[2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	13819	wwPDB-VP
Average B, all atoms (Å^2)	50.0	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 55.71 % 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 3.0396e-05. 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: UMP, D16

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	0.79	0/2351	0.82	2/3182 (0.1%)
1	B	0.73	0/2347	0.85	2/3180 (0.1%)
1	C	0.70	0/2286	0.84	5/3103 (0.2%)
1	D	0.71	0/2298	0.82	4/3111 (0.1%)
1	E	0.70	0/2318	0.83	5/3139 (0.2%)
1	F	0.68	0/2254	0.79	1/3060 (0.0%)
All	All	0.72	0/13854	0.82	19/18775 (0.1%)

There are no bond length outliers.

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	49	ASP	CB-CG-OD1	8.47	125.92	118.30
1	D	148	ASP	CB-CG-OD1	8.06	125.56	118.30
1	F	85	LEU	CB-CG-CD2	7.97	124.56	111.00
1	E	49	ASP	CB-CG-OD2	-7.54	111.51	118.30
1	E	148	ASP	CB-CG-OD1	7.50	125.05	118.30
1	C	289	ASP	CB-CG-OD2	6.56	124.20	118.30
1	D	38	GLN	CA-CB-CG	6.07	126.76	113.40
1	B	218	ASP	CB-CG-OD2	-6.00	112.90	118.30
1	C	69	ASP	CB-CG-OD1	-5.52	113.34	118.30
1	E	148	ASP	CB-CG-OD2	-5.46	113.39	118.30
1	D	78	ARG	NE-CZ-NH1	5.44	123.02	120.30
1	C	289	ASP	CB-CG-OD1	-5.40	113.44	118.30
1	A	150	GLU	CA-CB-CG	5.38	125.23	113.40
1	E	140	ARG	NE-CZ-NH2	-5.29	117.66	120.30
1	A	126	ARG	NE-CZ-NH2	-5.26	117.67	120.30
1	D	148	ASP	CB-CG-OD2	-5.08	113.73	118.30
1	B	176	ARG	NE-CZ-NH1	5.07	122.84	120.30
1	C	115	ARG	NE-CZ-NH1	5.07	122.83	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	49	ASP	CB-CG-OD2	5.05	122.84	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2291	0	2244	12	0
1	B	2287	0	2232	5	0
1	C	2226	0	2150	14	0
1	D	2240	0	2194	11	0
1	E	2258	0	2216	15	0
1	F	2195	0	2103	10	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
3	A	32	0	20	1	0
3	B	32	0	20	1	0
3	C	32	0	20	1	0
3	D	32	0	20	1	0
3	E	32	0	20	1	0
3	F	32	0	20	1	0
4	A	2	0	0	0	0
4	B	4	0	0	0	0
4	C	1	0	0	0	0
4	D	2	0	0	0	0
4	F	1	0	0	0	0
All	All	13819	0	13319	61	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 2.

All (61) 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:E:112:ASN:OD1	1:E:192:LEU:HD11	1.26	1.32
1:E:112:ASN:OD1	1:E:192:LEU:CD1	2.03	1.06
1:E:112:ASN:CG	1:E:192:LEU:CD1	2.35	0.95
1:E:112:ASN:CG	1:E:192:LEU:HD11	1.86	0.95
1:A:196:HIS:HB3	1:A:212:LEU:HD11	1.59	0.84
1:C:176:ARG:NH1	2:F:401:UMP:OP1	2.20	0.74
1:E:112:ASN:CG	1:E:192:LEU:HD12	2.09	0.71
1:D:115:ARG:O	1:D:115:ARG:HD3	1.90	0.70
1:E:32:GLN:HG2	1:E:63:ALA:HB1	1.76	0.68
1:C:196:HIS:HB3	1:C:212:LEU:HD11	1.79	0.64
1:B:196:HIS:HB3	1:B:212:LEU:HD11	1.79	0.63
1:E:258:TYR:CE2	3:E:402:D16:HM22	2.34	0.63
1:D:258:TYR:CE2	3:D:402:D16:HM22	2.34	0.62
1:C:202:TYR:HH	1:F:57:SER:HG	1.48	0.62
1:C:251:THR:HG21	1:F:251:THR:HG21	1.87	0.57
1:C:259:LEU:HA	1:C:262:ILE:HD12	1.84	0.57
1:B:115:ARG:NH2	1:B:126:ARG:O	2.33	0.54
1:E:196:HIS:HB3	1:E:212:LEU:HD11	1.90	0.54
1:B:251:THR:HG21	1:E:251:THR:HG21	1.89	0.53
1:C:115:ARG:NH2	1:C:126:ARG:O	2.33	0.53
1:F:187:LEU:N	1:F:188:PRO:HD2	2.23	0.53
1:E:115:ARG:NH2	1:E:126:ARG:O	2.32	0.53
1:C:258:TYR:CE2	3:C:402:D16:HM22	2.43	0.52
1:A:251:THR:HG21	1:D:251:THR:HG21	1.89	0.52
1:D:196:HIS:HB3	1:D:212:LEU:HD11	1.90	0.52
1:A:32:GLN:NE2	1:A:64:ARG:O	2.24	0.51
1:F:196:HIS:HB3	1:F:212:LEU:HD11	1.91	0.51
1:A:142:PHE:CZ	1:D:184:PRO:HD2	2.46	0.50
1:E:88:LEU:HD23	1:E:236:MET:HE1	1.93	0.50
2:A:401:UMP:OP2	1:D:175:ARG:NH1	2.45	0.50
1:D:69:ASP:OD1	1:D:278:LYS:HE3	2.13	0.49
3:B:402:D16:C14	3:B:402:D16:C7	2.90	0.48
1:F:57:SER:HB2	1:F:256:HIS:HB3	1.95	0.48
1:C:202:TYR:OH	1:F:57:SER:OG	2.24	0.47
1:A:115:ARG:NH2	1:A:126:ARG:O	2.33	0.47
1:D:88:LEU:HD23	1:D:236:MET:HE1	1.98	0.46
1:F:88:LEU:HD23	1:F:236:MET:HE1	1.98	0.46
1:C:108:ILE:HG13	1:C:109:TRP:CD1	2.51	0.46
1:B:88:LEU:HD23	1:B:236:MET:HE1	1.98	0.46
1:A:263:GLU:HB2	1:A:264:PRO:HD3	1.99	0.45
1:C:192:LEU:HD23	1:C:193:PRO:HD2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:32:GLN:HG2	1:E:63:ALA:CB	2.46	0.45
1:C:88:LEU:HD23	1:C:236:MET:HE1	1.99	0.45
1:A:264:PRO:HB3	1:A:307:ILE:HG21	1.98	0.44
1:A:88:LEU:HD23	1:A:236:MET:HE1	1.99	0.44
3:A:402:D16:C7	3:A:402:D16:C14	2.94	0.44
1:C:140:ARG:NH2	1:C:289:ASP:OD1	2.51	0.44
1:E:108:ILE:HG13	1:E:109:TRP:CD1	2.53	0.44
1:F:258:TYR:CE1	3:F:402:D16:HM22	2.53	0.44
1:D:50:ARG:HD3	2:D:401:UMP:OP2	2.18	0.44
1:D:108:ILE:HG13	1:D:109:TRP:CD1	2.53	0.43
1:C:182:TRP:CE3	1:C:194:PRO:HG2	2.54	0.42
1:C:204:VAL:HG21	1:F:45:VAL:CG1	2.49	0.42
1:F:108:ILE:HG13	1:F:109:TRP:CD1	2.54	0.42
1:B:192:LEU:HD12	1:B:192:LEU:HA	1.90	0.42
1:A:62:GLN:HE22	1:D:61:MET:CA	2.33	0.42
1:A:274:ARG:HD3	1:A:302:ASN:O	2.20	0.42
1:E:272:GLU:HA	1:E:273:PRO:HD3	1.89	0.41
1:E:74:LEU:HD12	1:E:224:PRO:HB3	2.03	0.41
1:A:265:LEU:HD23	1:A:265:LEU:HA	1.96	0.41
1:A:142:PHE:CD1	1:A:142:PHE:C	2.95	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	284/290 (98%)	275 (97%)	8 (3%)	1 (0%)	34	66
1	B	285/290 (98%)	273 (96%)	11 (4%)	1 (0%)	34	66
1	C	279/290 (96%)	267 (96%)	12 (4%)	0	100	100
1	D	277/290 (96%)	268 (97%)	8 (3%)	1 (0%)	34	66

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	279/290 (96%)	267 (96%)	9 (3%)	3 (1%)	14	41
1	F	278/290 (96%)	265 (95%)	11 (4%)	2 (1%)	22	53
All	All	1682/1740 (97%)	1615 (96%)	59 (4%)	8 (0%)	29	61

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	310	GLU
1	E	27	PRO
1	E	29	GLY
1	A	135	TYR
1	F	52	GLY
1	D	134	VAL
1	E	134	VAL
1	F	134	VAL

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	245/253 (97%)	240 (98%)	5 (2%)	55	84
1	B	243/253 (96%)	238 (98%)	5 (2%)	53	84
1	C	235/253 (93%)	221 (94%)	14 (6%)	19	48
1	D	240/253 (95%)	234 (98%)	6 (2%)	47	80
1	E	242/253 (96%)	233 (96%)	9 (4%)	34	68
1	F	227/253 (90%)	221 (97%)	6 (3%)	46	79
All	All	1432/1518 (94%)	1387 (97%)	45 (3%)	40	74

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	78	ARG
1	A	150	GLU

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Mol	Chain	Res	Type
1	A	154	SER
1	A	284	LYS
1	A	311	MET
1	B	46	ARG
1	B	154	SER
1	B	229	SER
1	B	302	ASN
1	B	311	MET
1	C	39	HIS
1	C	51	THR
1	C	78	ARG
1	C	116	ASP
1	C	150	GLU
1	C	154	SER
1	C	163	ARG
1	C	176	ARG
1	C	192	LEU
1	C	195	CYS
1	C	205	ASN
1	C	278	LYS
1	C	302	ASN
1	C	306	THR
1	D	50	ARG
1	D	78	ARG
1	D	124	SER
1	D	147	ARG
1	D	154	SER
1	D	290	ASP
1	E	32	GLN
1	E	38	GLN
1	E	46	ARG
1	E	49	ASP
1	E	147	ARG
1	E	154	SER
1	E	179	MET
1	E	287	LYS
1	E	289	ASP
1	F	57	SER
1	F	85	LEU
1	F	99	LYS
1	F	154	SER
1	F	187	LEU

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Mol	Chain	Res	Type
1	F	290	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	62	GLN
1	A	211	GLN
1	D	160	GLN
1	D	211	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

12 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	#$|Z| > 2$
3	D16	E	402	-	30,34,34	1.93	5 (16%)	37,48,48	2.17	12 (32%)
2	UMP	B	401	-	21,21,21	2.36	5 (23%)	31,31,31	2.02	5 (16%)
3	D16	D	402	-	30,34,34	1.74	4 (13%)	37,48,48	2.06	11 (29%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	D16	A	402	-	30,34,34	1.99	14 (46%)	37,48,48	1.84	4 (10%)
3	D16	B	402	-	30,34,34	1.91	11 (36%)	37,48,48	2.15	13 (35%)
3	D16	C	402	-	30,34,34	1.91	4 (13%)	37,48,48	2.21	14 (37%)
3	D16	F	402	-	30,34,34	1.98	6 (20%)	37,48,48	1.64	9 (24%)
2	UMP	F	401	-	21,21,21	2.27	7 (33%)	31,31,31	1.95	4 (12%)
2	UMP	E	401	-	21,21,21	2.44	6 (28%)	31,31,31	1.96	6 (19%)
2	UMP	D	401	-	21,21,21	2.03	6 (28%)	31,31,31	2.10	8 (25%)
2	UMP	C	401	-	21,21,21	2.39	6 (28%)	31,31,31	2.16	7 (22%)
2	UMP	A	401	-	21,21,21	2.12	5 (23%)	31,31,31	1.96	6 (19%)

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	D16	E	402	-	-	6/19/25/25	0/3/3/3
2	UMP	B	401	-	-	1/10/22/22	0/2/2/2
3	D16	D	402	-	-	1/19/25/25	0/3/3/3
3	D16	A	402	-	-	3/19/25/25	0/3/3/3
3	D16	B	402	-	-	6/19/25/25	0/3/3/3
3	D16	C	402	-	-	4/19/25/25	0/3/3/3
3	D16	F	402	-	-	5/19/25/25	0/3/3/3
2	UMP	F	401	-	-	4/10/22/22	0/2/2/2
2	UMP	E	401	-	-	2/10/22/22	0/2/2/2
2	UMP	D	401	-	-	2/10/22/22	0/2/2/2
2	UMP	C	401	-	-	3/10/22/22	0/2/2/2
2	UMP	A	401	-	-	5/10/22/22	0/2/2/2

All (79) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	402	D16	C-N	6.16	1.47	1.34
3	E	402	D16	C-N	6.04	1.47	1.34
3	F	402	D16	C-N	6.01	1.47	1.34
3	D	402	D16	C-N	5.93	1.47	1.34
2	C	401	UMP	C6-C5	5.66	1.48	1.35
2	E	401	UMP	C2-N1	5.48	1.47	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	402	D16	C2-N3	5.42	1.43	1.31
3	C	402	D16	C2-N3	5.40	1.43	1.31
2	B	401	UMP	C2-N1	5.33	1.47	1.38
2	C	401	UMP	C2-N1	5.15	1.46	1.38
2	B	401	UMP	C6-C5	5.08	1.46	1.35
2	E	401	UMP	C6-C5	5.05	1.46	1.35
2	F	401	UMP	C6-C5	4.99	1.46	1.35
3	E	402	D16	C2-N3	4.95	1.42	1.31
2	B	401	UMP	C2-N3	4.81	1.46	1.38
2	E	401	UMP	C2-N3	4.76	1.46	1.38
2	A	401	UMP	C2-N1	4.63	1.45	1.38
2	F	401	UMP	C2-N1	4.58	1.45	1.38
2	F	401	UMP	C2-N3	4.35	1.45	1.38
2	D	401	UMP	C6-C5	4.34	1.45	1.35
3	B	402	D16	C-N	4.34	1.43	1.34
2	A	401	UMP	C6-C5	4.28	1.45	1.35
2	A	401	UMP	C2-N3	3.89	1.44	1.38
3	C	402	D16	C8A-N1	3.87	1.46	1.39
2	D	401	UMP	C2-N1	3.79	1.44	1.38
3	D	402	D16	C2-N3	3.78	1.39	1.31
2	C	401	UMP	C2-N3	3.76	1.44	1.38
2	C	401	UMP	C6-N1	3.66	1.46	1.38
3	A	402	D16	C-N	3.64	1.42	1.34
2	A	401	UMP	C2'-C3'	-3.53	1.43	1.52
2	D	401	UMP	C2-N3	3.51	1.44	1.38
3	A	402	D16	C4A-C8A	-3.51	1.35	1.41
2	B	401	UMP	C2'-C3'	-3.47	1.43	1.52
3	E	402	D16	C8A-N1	3.45	1.45	1.39
3	F	402	D16	C8A-N1	3.39	1.45	1.39
2	F	401	UMP	C2'-C3'	-3.34	1.44	1.52
3	B	402	D16	C14-S13	-3.28	1.67	1.72
3	A	402	D16	C2-N3	3.18	1.38	1.31
2	C	401	UMP	C2'-C3'	-3.09	1.44	1.52
2	E	401	UMP	C6-N1	3.09	1.45	1.38
3	D	402	D16	C8A-N1	3.09	1.45	1.39
3	B	402	D16	C4A-C8A	-3.08	1.36	1.41
3	A	402	D16	C14-S13	-3.07	1.67	1.72
3	B	402	D16	C2-N3	3.06	1.38	1.31
2	E	401	UMP	C2'-C3'	-3.05	1.44	1.52
3	E	402	D16	C2-N1	3.04	1.45	1.36
3	A	402	D16	C5-C6	-3.03	1.34	1.39
2	D	401	UMP	C6-N1	3.02	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	402	D16	C2-N1	2.96	1.44	1.36
2	D	401	UMP	C2'-C3'	-2.96	1.45	1.52
2	E	401	UMP	C4-N3	2.90	1.43	1.38
3	F	402	D16	C4A-C4	2.89	1.51	1.48
3	A	402	D16	O4-C4	-2.89	1.18	1.23
3	F	402	D16	C2-N1	2.88	1.44	1.36
3	B	402	D16	O4-C4	-2.86	1.18	1.23
3	A	402	D16	CP1-N10	-2.78	1.41	1.46
2	F	401	UMP	C6-N1	2.67	1.44	1.38
3	D	402	D16	C2-N1	2.64	1.43	1.36
3	B	402	D16	CP1-N10	-2.61	1.41	1.46
3	E	402	D16	O4-C4	-2.50	1.19	1.23
3	B	402	D16	C2-N1	2.36	1.43	1.36
2	A	401	UMP	C6-N1	2.35	1.43	1.38
2	F	401	UMP	C4-N3	2.32	1.42	1.38
3	A	402	D16	O-C	-2.31	1.18	1.23
3	B	402	D16	C5-C6	-2.26	1.35	1.39
3	A	402	D16	C8A-N1	2.25	1.43	1.39
3	A	402	D16	C2-N1	2.17	1.42	1.36
2	B	401	UMP	C6-N1	2.14	1.43	1.38
2	C	401	UMP	C4-N3	2.13	1.42	1.38
3	B	402	D16	C8A-N1	2.12	1.43	1.39
3	A	402	D16	C9-N10	-2.07	1.42	1.46
3	A	402	D16	C4A-C4	-2.06	1.45	1.48
3	B	402	D16	C9-N10	-2.05	1.42	1.46
3	A	402	D16	CB-CA	-2.03	1.48	1.53
2	D	401	UMP	C3'-C4'	-2.02	1.47	1.53
2	F	401	UMP	O5'-C5'	-2.02	1.37	1.44
3	B	402	D16	O2-CT	-2.02	1.23	1.30
3	F	402	D16	C5-C4A	2.01	1.43	1.39
3	A	402	D16	O2-CT	-2.00	1.24	1.30

All (99) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	401	UMP	C2'-C1'-N1	8.58	133.53	113.77
2	C	401	UMP	C2'-C1'-N1	8.48	133.29	113.77
2	E	401	UMP	C2'-C1'-N1	7.74	131.59	113.77
2	F	401	UMP	C2'-C1'-N1	7.38	130.77	113.77
2	B	401	UMP	C2'-C1'-N1	7.27	130.52	113.77
3	B	402	D16	C6-C9-N10	-6.81	105.35	113.81
3	A	402	D16	C6-C9-N10	-6.42	105.84	113.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	401	UMP	C2'-C1'-N1	6.15	127.94	113.77
3	E	402	D16	C11-C-N	6.09	126.50	115.21
2	A	401	UMP	O4'-C1'-N1	5.22	117.19	107.86
2	F	401	UMP	O4'-C1'-N1	5.12	117.02	107.86
3	D	402	D16	C6-C9-N10	-5.01	107.58	113.81
3	C	402	D16	C5-C4A-C8A	4.99	123.46	119.00
2	B	401	UMP	O4'-C1'-N1	4.82	116.48	107.86
3	C	402	D16	C6-C9-N10	-4.81	107.83	113.81
3	D	402	D16	C11-C-N	4.74	123.99	115.21
2	C	401	UMP	O4'-C1'-N1	4.58	116.06	107.86
3	B	402	D16	C11-C-N	4.53	123.61	115.21
3	E	402	D16	C6-C9-N10	-4.50	108.22	113.81
3	C	402	D16	C4A-C8A-N1	4.31	122.88	119.49
3	C	402	D16	O2-CT-O1	-4.29	114.35	124.09
3	B	402	D16	CM2-C2-N1	4.02	124.20	116.27
3	B	402	D16	C5-C4A-C8A	3.95	122.53	119.00
3	E	402	D16	C5-C4A-C8A	3.89	122.48	119.00
3	A	402	D16	C5-C4A-C8A	3.75	122.35	119.00
3	F	402	D16	C4A-C8A-N1	3.74	122.43	119.49
3	D	402	D16	O4-C4-N3	-3.55	116.38	120.59
3	A	402	D16	CM2-C2-N1	3.50	123.18	116.27
3	D	402	D16	CM2-C2-N1	3.42	123.02	116.27
3	C	402	D16	CM2-C2-N1	3.41	123.01	116.27
3	E	402	D16	C4A-C8A-N1	3.26	122.06	119.49
2	B	401	UMP	P-O5'-C5'	3.25	127.26	118.30
2	E	401	UMP	O4'-C1'-N1	3.17	113.53	107.86
3	E	402	D16	O-C-C11	-3.16	114.19	121.08
3	C	402	D16	O2-CT-CA	3.16	123.91	113.40
3	A	402	D16	O2-CT-O1	-3.08	117.09	124.09
2	D	401	UMP	C5-C4-N3	3.03	119.38	114.84
2	D	401	UMP	O4-C4-C5	-3.02	119.85	125.16
2	A	401	UMP	O4-C4-C5	-3.01	119.87	125.16
3	D	402	D16	O2-CT-CA	3.00	123.38	113.40
3	E	402	D16	CM2-C2-N1	2.92	122.04	116.27
2	D	401	UMP	O4'-C1'-N1	2.91	113.07	107.86
2	E	401	UMP	O4-C4-C5	-2.91	120.04	125.16
3	F	402	D16	C11-C-N	2.89	120.56	115.21
3	D	402	D16	C5-C4A-C8A	2.82	121.53	119.00
3	F	402	D16	C5-C4A-C8A	2.79	121.49	119.00
3	C	402	D16	C4A-C5-C6	-2.78	116.99	121.41
3	C	402	D16	N1-C2-N3	-2.77	119.19	122.91
2	F	401	UMP	O4-C4-C5	-2.74	120.35	125.16

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	E	402	D16	CP1-N10-C9	2.73	122.10	114.84
2	C	401	UMP	C5-C4-N3	2.68	118.85	114.84
3	F	402	D16	O2-CT-O1	-2.64	118.09	124.09
3	F	402	D16	C8A-C4A-C4	-2.64	117.38	120.39
3	E	402	D16	C4A-C4-N3	2.62	121.57	117.88
2	A	401	UMP	O5'-C5'-C4'	2.59	117.92	108.99
3	E	402	D16	C4A-C5-C6	-2.56	117.35	121.41
3	B	402	D16	O2-CT-O1	-2.52	118.37	124.09
2	D	401	UMP	C1'-N1-C6	-2.52	116.58	121.55
2	E	401	UMP	OP2-P-O5'	2.51	113.42	106.73
3	B	402	D16	CM2-C2-N3	-2.48	111.62	119.13
3	D	402	D16	CP1-N10-C9	2.42	121.27	114.84
3	D	402	D16	C4A-C5-C6	-2.38	117.63	121.41
3	C	402	D16	CB-CG-CD	2.35	118.75	112.51
2	B	401	UMP	O4-C4-C5	-2.35	121.02	125.16
3	C	402	D16	O4-C4-C4A	-2.34	117.97	121.54
3	B	402	D16	C4A-C5-C6	-2.34	117.70	121.41
3	D	402	D16	CB-CA-CT	2.32	115.96	110.35
3	C	402	D16	CG-CB-CA	2.32	117.48	113.16
3	F	402	D16	OE2-CD-CG	2.31	121.47	114.03
2	D	401	UMP	C1'-N1-C2	2.31	122.19	117.64
3	B	402	D16	C8A-N1-C2	-2.30	115.78	121.84
2	A	401	UMP	P-O5'-C5'	2.30	124.63	118.30
2	E	401	UMP	C5-C4-N3	2.29	118.27	114.84
2	C	401	UMP	P-O5'-C5'	2.28	124.59	118.30
3	E	402	D16	O2-CT-O1	-2.25	118.99	124.09
2	C	401	UMP	C3'-C2'-C1'	2.24	108.16	102.54
3	B	402	D16	O2-CT-CA	2.23	120.83	113.40
3	F	402	D16	N1-C2-N3	-2.22	119.93	122.91
3	B	402	D16	C5-C4A-C4	-2.21	116.50	121.28
3	E	402	D16	C8A-C4A-C4	-2.21	117.87	120.39
2	E	401	UMP	C1'-N1-C6	-2.19	117.23	121.55
3	B	402	D16	O-C-C11	-2.18	116.33	121.08
3	F	402	D16	C4A-C5-C6	-2.18	117.95	121.41
3	D	402	D16	O-C-C11	-2.16	116.38	121.08
3	C	402	D16	CP1-N10-C9	2.15	120.54	114.84
3	F	402	D16	O2-CT-CA	2.13	120.50	113.40
3	E	402	D16	CG-CB-CA	2.12	117.11	113.16
2	D	401	UMP	OP2-P-O5'	2.11	112.35	106.73
3	D	402	D16	OE2-CD-CG	2.10	120.78	114.03
3	C	402	D16	C8A-C4A-C4	-2.09	118.00	120.39
2	A	401	UMP	C5-C4-N3	2.09	117.96	114.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	402	D16	OE2-CD-CG	2.08	120.72	114.03
2	F	401	UMP	O5'-P-OP1	2.07	112.27	106.47
2	B	401	UMP	O5'-C5'-C4'	2.06	116.09	108.99
3	C	402	D16	OE2-CD-OE1	-2.04	118.22	123.30
2	C	401	UMP	O5'-C5'-C4'	2.02	115.95	108.99
2	D	401	UMP	O4'-C4'-C5'	2.02	116.01	109.37
3	B	402	D16	CP1-N10-C9	2.01	120.19	114.84
2	C	401	UMP	O2-C2-N3	-2.01	117.76	121.50

There are no chirality outliers.

All (42) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	401	UMP	C5'-O5'-P-OP2
2	A	401	UMP	C5'-O5'-P-OP3
3	E	402	D16	C6-C9-N10-CP1
3	E	402	D16	CB-CA-N-C
3	E	402	D16	N-CA-CB-CG
3	F	402	D16	N-CA-CB-CG
2	A	401	UMP	C3'-C4'-C5'-O5'
2	A	401	UMP	O4'-C4'-C5'-O5'
3	B	402	D16	CB-CA-CT-O2
3	A	402	D16	N-CA-CB-CG
3	A	402	D16	CT-CA-CB-CG
3	E	402	D16	CT-CA-CB-CG
3	F	402	D16	CT-CA-CB-CG
3	B	402	D16	CB-CA-CT-O1
2	F	401	UMP	C2'-C1'-N1-C2
2	F	401	UMP	C2'-C1'-N1-C6
3	A	402	D16	C6-C9-N10-CP1
3	B	402	D16	C6-C9-N10-CP1
3	C	402	D16	C6-C9-N10-CP1
3	D	402	D16	C6-C9-N10-CP1
3	F	402	D16	C6-C9-N10-CP1
2	F	401	UMP	O4'-C4'-C5'-O5'
2	C	401	UMP	C5'-O5'-P-OP2
2	A	401	UMP	C2'-C1'-N1-C2
2	C	401	UMP	C2'-C1'-N1-C2
2	D	401	UMP	C2'-C1'-N1-C2
2	E	401	UMP	C2'-C1'-N1-C2
3	C	402	D16	CB-CA-CT-O1
3	C	402	D16	CB-CA-CT-O2

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Mol	Chain	Res	Type	Atoms
2	C	401	UMP	O4'-C4'-C5'-O5'
2	E	401	UMP	O4'-C4'-C5'-O5'
2	F	401	UMP	C3'-C4'-C5'-O5'
3	F	402	D16	OE1-CD-CG-CB
3	C	402	D16	CA-CB-CG-CD
3	F	402	D16	OE2-CD-CG-CB
3	E	402	D16	OE2-CD-CG-CB
3	B	402	D16	OE2-CD-CG-CB
3	E	402	D16	OE1-CD-CG-CB
3	B	402	D16	OE1-CD-CG-CB
2	B	401	UMP	O4'-C4'-C5'-O5'
2	D	401	UMP	O4'-C4'-C5'-O5'
3	B	402	D16	N-CA-CT-O2

There are no ring outliers.

9 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	402	D16	1	0
3	D	402	D16	1	0
3	A	402	D16	1	0
3	B	402	D16	1	0
3	C	402	D16	1	0
3	F	402	D16	1	0
2	F	401	UMP	1	0
2	D	401	UMP	1	0
2	A	401	UMP	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 D16 E 402

Bond lengths	Bond angles
Torsions	Rings

Ligand UMP B 401

Bond lengths	Bond angles
Torsions	Rings

Ligand D16 D 402

Bond lengths	Bond angles
Torsions	Rings

Ligand D16 A 402

Bond lengths

Bond angles

Torsions

Rings

Ligand D16 B 402

Bond lengths

Bond angles

Torsions

Rings

Ligand D16 C 402

Bond lengths

Bond angles

Torsions

Rings

Ligand D16 F 402

Bond lengths

Bond angles

Torsions

Rings

Ligand UMP F 401

Bond lengths

Bond angles

Torsions

Rings

Ligand UMP E 401

Bond lengths

Bond angles

Torsions

Rings

Full wwPDB X-ray Structure Validation Report

Ligand UMP D 401	
Bond lengths	Bond angles
Torsions	Rings

Ligand UMP C 401	
Bond lengths	Bond angles
Torsions	Rings

Ligand UMP A 401

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	286/290 (98%)	-0.38	2 (0%)	87 84	26, 41, 65, 96	0
1	B	287/290 (98%)	-0.33	3 (1%)	82 77	33, 46, 66, 97	0
1	C	281/290 (96%)	-0.11	2 (0%)	87 84	34, 53, 77, 86	0
1	D	279/290 (96%)	-0.28	1 (0%)	92 91	26, 43, 67, 98	0
1	E	281/290 (96%)	-0.19	5 (1%)	68 61	32, 47, 74, 102	0
1	F	280/290 (96%)	-0.12	3 (1%)	80 75	37, 54, 83, 107	0
All	All	1694/1740 (97%)	-0.24	16 (0%)	84 80	26, 48, 73, 107	0

All (16) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	267	ILE	4.0
1	A	307	ILE	3.9
1	D	28	HIS	2.9
1	C	306	THR	2.7
1	E	124	SER	2.5
1	E	26	PRO	2.5
1	B	229	SER	2.4
1	E	50	ARG	2.4
1	E	53	THR	2.3
1	B	69	ASP	2.2
1	A	309	MET	2.2
1	E	48	ASP	2.1
1	F	155	GLY	2.1
1	F	69	ASP	2.1
1	B	230	TYR	2.0
1	F	49	ASP	2.0

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

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

6.3 Carbohydrates ⓘ

There are no 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($Å^2$)	Q<0.9
3	D16	B	402	32/32	0.86	0.22	53,64,84,86	0
3	D16	F	402	32/32	0.87	0.23	55,67,93,99	0
3	D16	E	402	32/32	0.88	0.22	52,61,85,95	0
3	D16	D	402	32/32	0.88	0.22	49,62,89,106	0
3	D16	C	402	32/32	0.91	0.19	55,66,89,91	0
3	D16	A	402	32/32	0.91	0.18	44,52,107,121	0
2	UMP	C	401	20/20	0.97	0.13	34,49,56,58	0
2	UMP	D	401	20/20	0.97	0.11	32,35,38,40	0
2	UMP	E	401	20/20	0.98	0.09	37,43,46,53	0
2	UMP	F	401	20/20	0.98	0.10	44,49,58,60	0
2	UMP	A	401	20/20	0.98	0.12	31,34,37,37	0
2	UMP	B	401	20/20	0.98	0.10	32,35,38,39	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.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Electron density around D16 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)
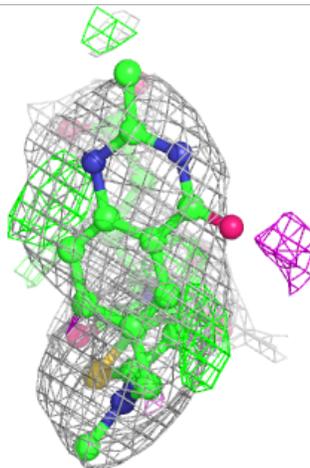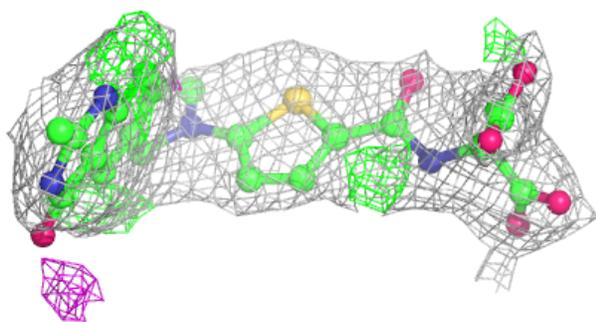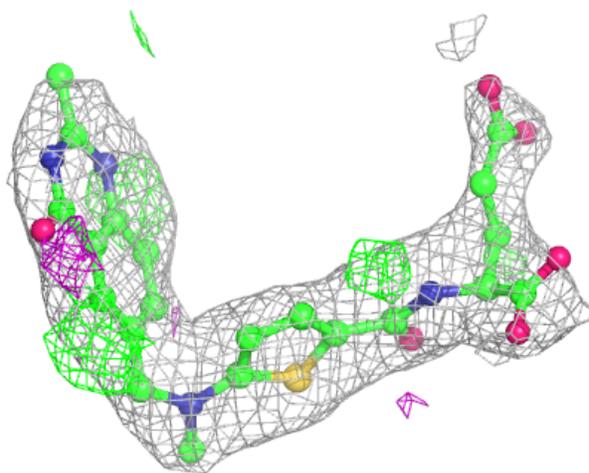
Electron density around D16 F 402:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
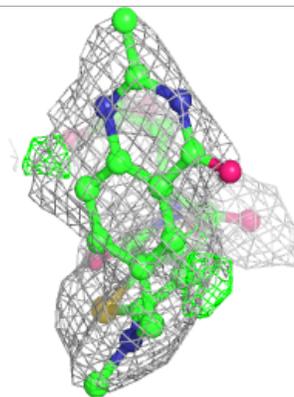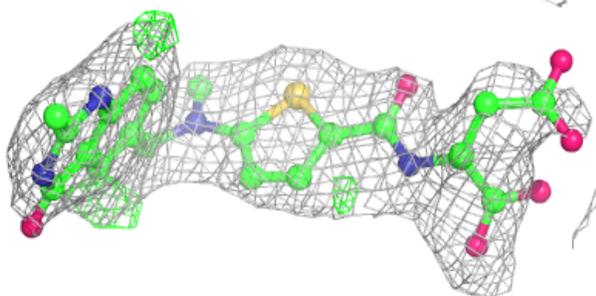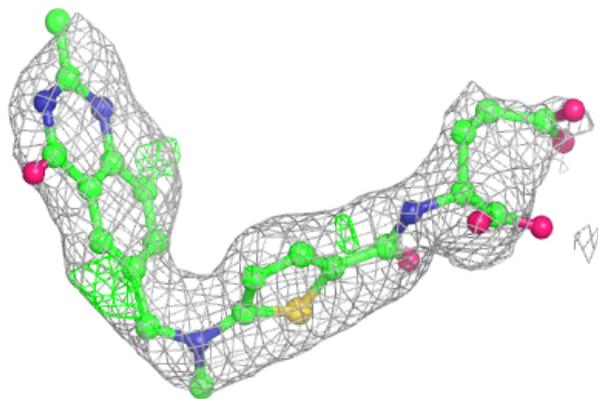
Electron density around D16 E 402:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
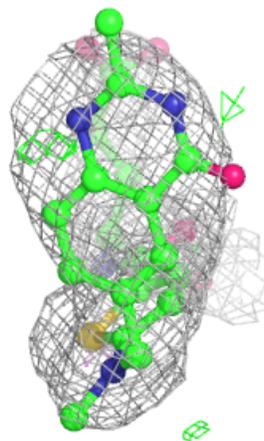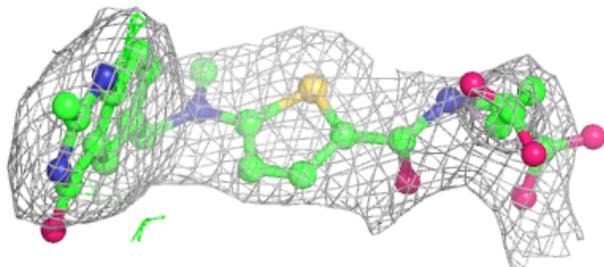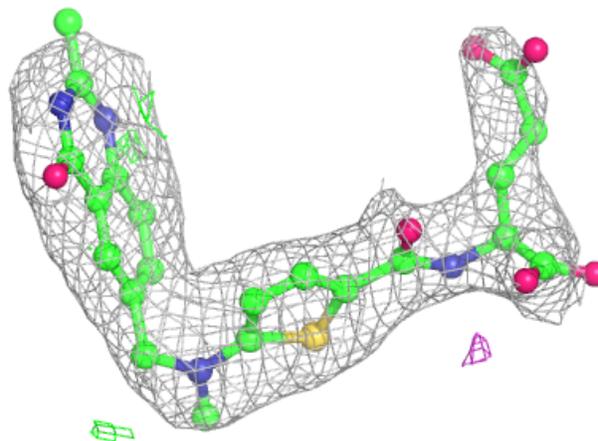
Electron density around D16 D 402:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
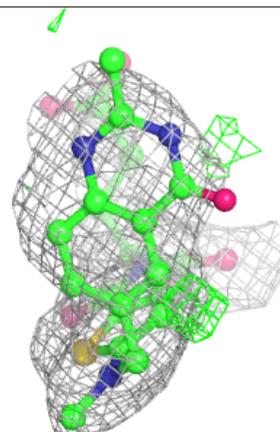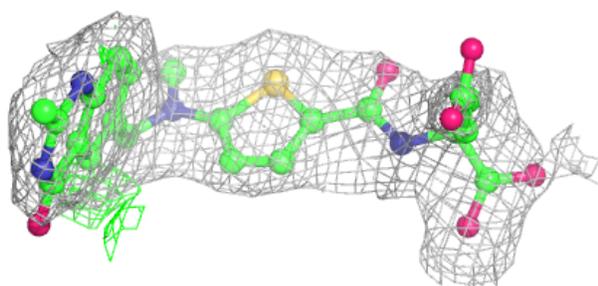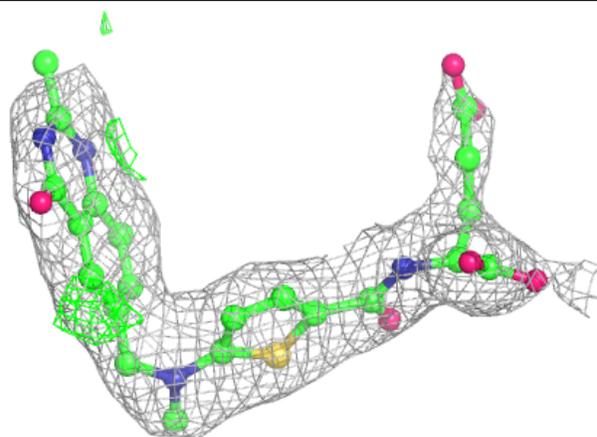
Electron density around D16 C 402:

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$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
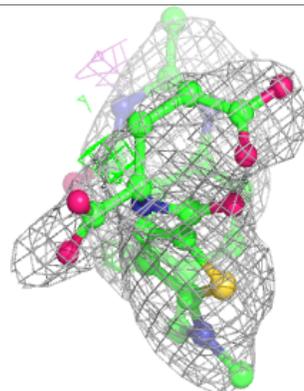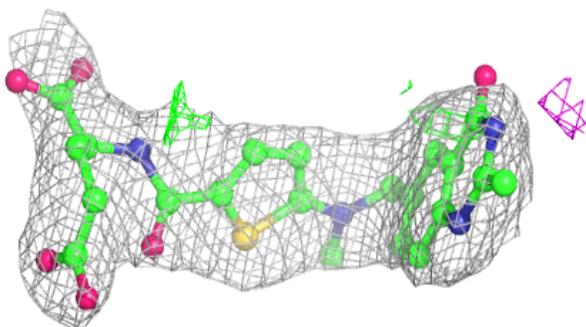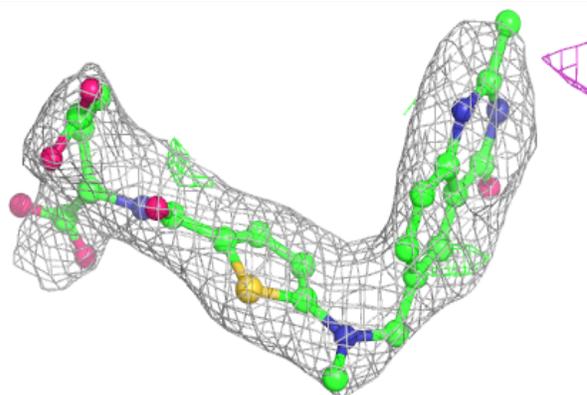
Electron density around D16 A 402:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
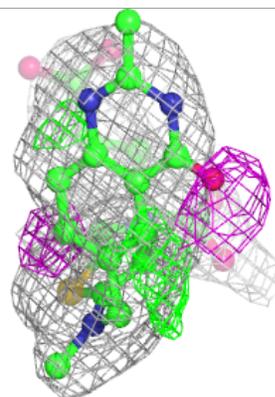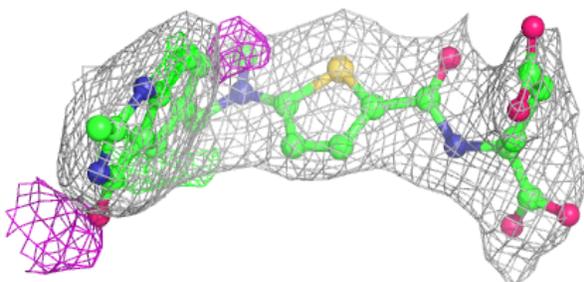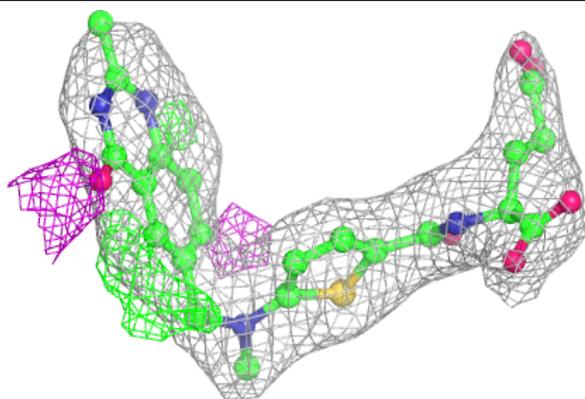
Electron density around UMP C 401:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
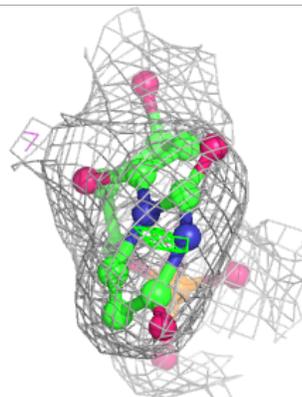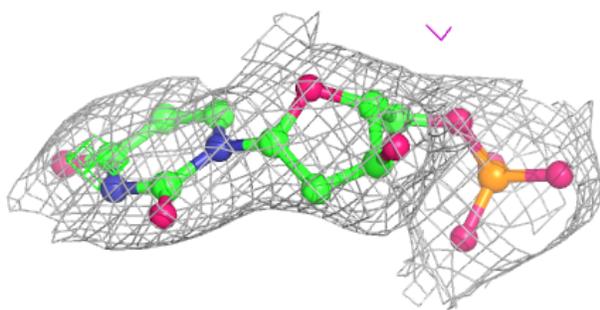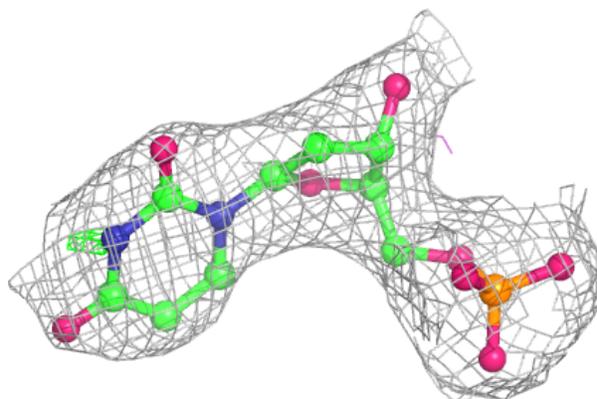
Electron density around UMP D 401:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
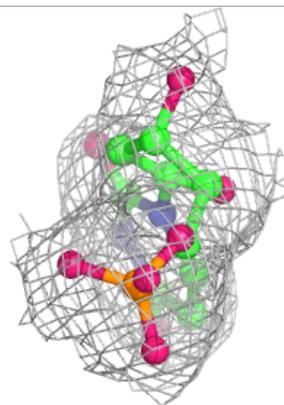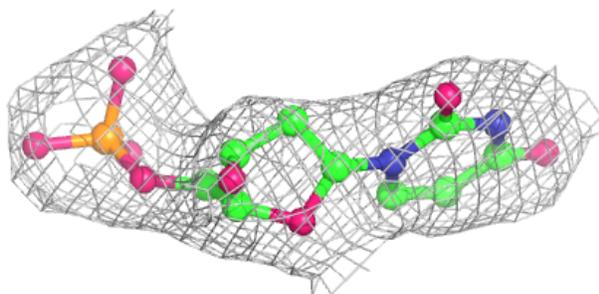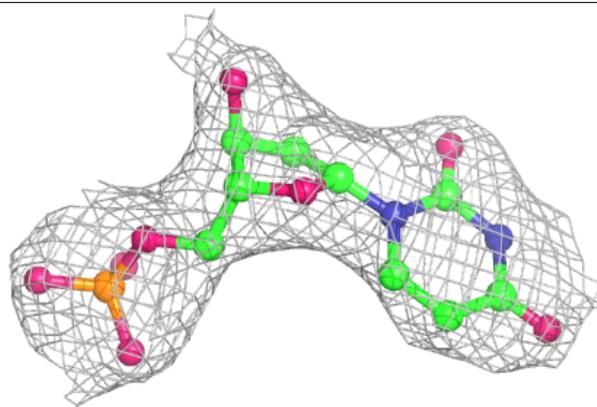
Electron density around UMP E 401:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
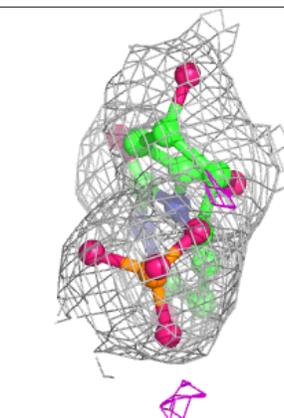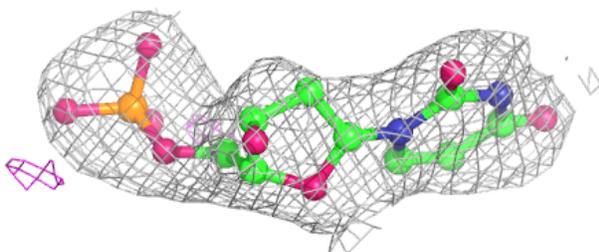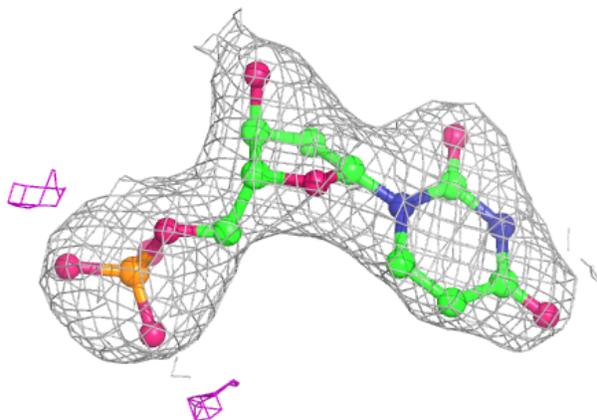
Electron density around UMP F 401:

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mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
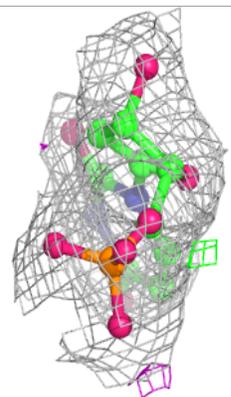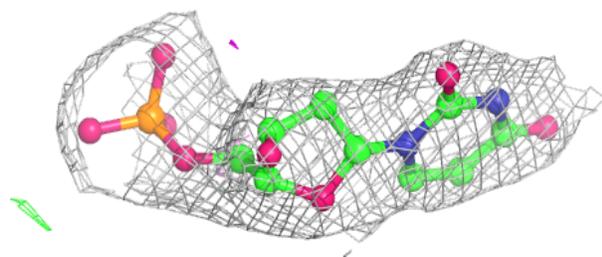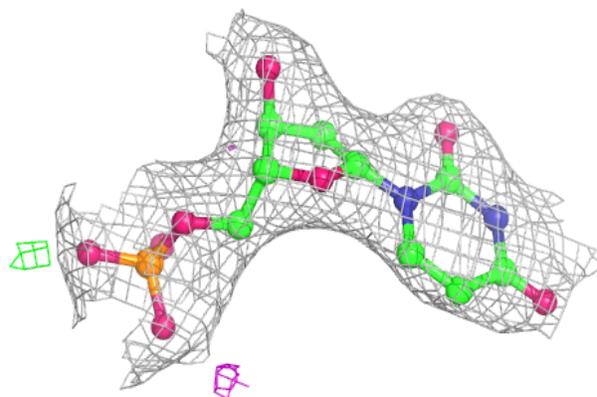
Electron density around UMP A 401:

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 UMP 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)

6.5 Other polymers ⓘ

There are no such residues in this entry.