wwPDB X-ray Structure Validation Summary Report (i)

Jan 27, 2025 – 04:23 PM EST

PDB ID	:	9DMC
Title	:	Human PARP1 ART domain bound to NAD+ analog benzamide adenine dinucleotide and ADP-ribose
Authors	:	Langelier, M.F.; Pascal, J.M.
Deposited on	:	2024-09-13
Resolution	:	3.00 Å(reported)

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

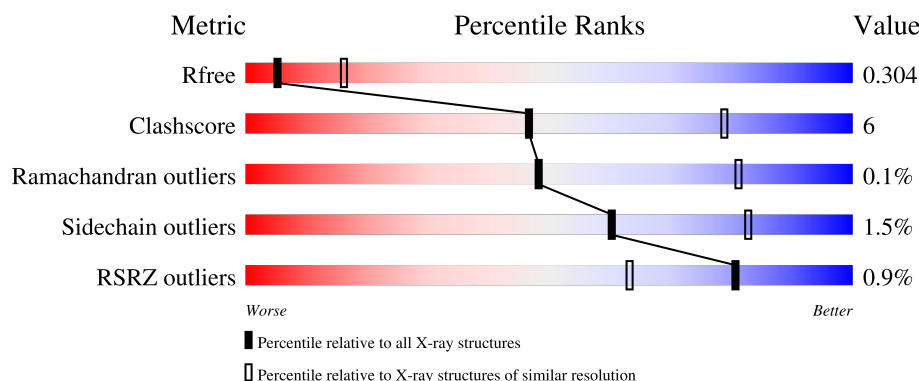|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance ⓘ

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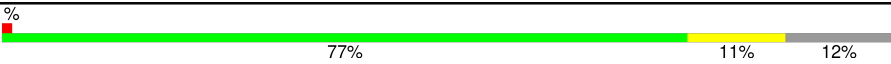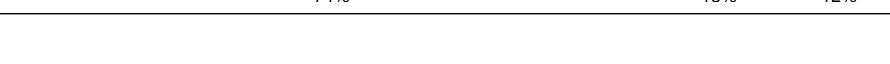*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.00 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		0.304
Clashscore		6
Ramachandran outliers		0.1%
Sidechain outliers		1.5%
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}	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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%

Mol	Chain	Length	Quality of chain
1	A	271	% 77% 11% 12%
1	B	271	75% 11% • 13%
1	C	271	70% 13% 17%
1	D	271	2% 74% 13% • 12%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 7660 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 Poly [ADP-ribose] polymerase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	238	Total	C	N	O	S	0	0	0
			1874	1202	319	347	6			
1	B	237	Total	C	N	O	S	0	0	0
			1870	1200	318	346	6			
1	C	226	Total	C	N	O	S	0	0	0
			1801	1157	307	331	6			
1	D	238	Total	C	N	O	S	0	0	0
			1877	1204	319	348	6			

There are 184 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	742	MET	-	initiating methionine	UNP P09874
A	743	GLY	-	expression tag	UNP P09874
A	744	SER	-	expression tag	UNP P09874
A	745	SER	-	expression tag	UNP P09874
A	746	HIS	-	expression tag	UNP P09874
A	747	HIS	-	expression tag	UNP P09874
A	748	HIS	-	expression tag	UNP P09874
A	749	HIS	-	expression tag	UNP P09874
A	750	HIS	-	expression tag	UNP P09874
A	751	HIS	-	expression tag	UNP P09874
A	752	SER	-	expression tag	UNP P09874
A	753	SER	-	expression tag	UNP P09874
A	754	GLY	-	expression tag	UNP P09874
A	755	LEU	-	expression tag	UNP P09874
A	756	VAL	-	expression tag	UNP P09874
A	757	PRO	-	expression tag	UNP P09874
A	758	ARG	-	expression tag	UNP P09874
A	759	GLY	-	expression tag	UNP P09874
A	760	SER	-	expression tag	UNP P09874
A	761	HIS	-	expression tag	UNP P09874
A	762	MET	-	expression tag	UNP P09874

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Chain	Residue	Modelled	Actual	Comment	Reference
A	763	THR	-	expression tag	UNP P09874
A	764	LYS	-	expression tag	UNP P09874
A	765	SER	-	expression tag	UNP P09874
A	766	LYS	-	expression tag	UNP P09874
A	767	LEU	-	expression tag	UNP P09874
A	768	PRO	-	expression tag	UNP P09874
A	769	LYS	-	expression tag	UNP P09874
A	770	PRO	-	expression tag	UNP P09874
A	771	VAL	-	expression tag	UNP P09874
A	772	GLN	-	expression tag	UNP P09874
A	773	ASP	-	expression tag	UNP P09874
A	774	LEU	-	expression tag	UNP P09874
A	775	ILE	-	expression tag	UNP P09874
A	776	LYS	-	expression tag	UNP P09874
A	777	MET	-	expression tag	UNP P09874
A	778	ILE	-	expression tag	UNP P09874
A	779	PHE	-	expression tag	UNP P09874
A	780	GLY	-	expression tag	UNP P09874
A	781	SER	-	expression tag	UNP P09874
A	782	GLY	-	expression tag	UNP P09874
A	783	SER	-	expression tag	UNP P09874
A	784	GLY	-	expression tag	UNP P09874
A	785	SER	-	expression tag	UNP P09874
A	786	GLY	-	expression tag	UNP P09874
A	787	GLY	-	expression tag	UNP P09874
B	742	MET	-	initiating methionine	UNP P09874
B	743	GLY	-	expression tag	UNP P09874
B	744	SER	-	expression tag	UNP P09874
B	745	SER	-	expression tag	UNP P09874
B	746	HIS	-	expression tag	UNP P09874
B	747	HIS	-	expression tag	UNP P09874
B	748	HIS	-	expression tag	UNP P09874
B	749	HIS	-	expression tag	UNP P09874
B	750	HIS	-	expression tag	UNP P09874
B	751	HIS	-	expression tag	UNP P09874
B	752	SER	-	expression tag	UNP P09874
B	753	SER	-	expression tag	UNP P09874
B	754	GLY	-	expression tag	UNP P09874
B	755	LEU	-	expression tag	UNP P09874
B	756	VAL	-	expression tag	UNP P09874
B	757	PRO	-	expression tag	UNP P09874
B	758	ARG	-	expression tag	UNP P09874

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Chain	Residue	Modelled	Actual	Comment	Reference
B	759	GLY	-	expression tag	UNP P09874
B	760	SER	-	expression tag	UNP P09874
B	761	HIS	-	expression tag	UNP P09874
B	762	MET	-	expression tag	UNP P09874
B	763	THR	-	expression tag	UNP P09874
B	764	LYS	-	expression tag	UNP P09874
B	765	SER	-	expression tag	UNP P09874
B	766	LYS	-	expression tag	UNP P09874
B	767	LEU	-	expression tag	UNP P09874
B	768	PRO	-	expression tag	UNP P09874
B	769	LYS	-	expression tag	UNP P09874
B	770	PRO	-	expression tag	UNP P09874
B	771	VAL	-	expression tag	UNP P09874
B	772	GLN	-	expression tag	UNP P09874
B	773	ASP	-	expression tag	UNP P09874
B	774	LEU	-	expression tag	UNP P09874
B	775	ILE	-	expression tag	UNP P09874
B	776	LYS	-	expression tag	UNP P09874
B	777	MET	-	expression tag	UNP P09874
B	778	ILE	-	expression tag	UNP P09874
B	779	PHE	-	expression tag	UNP P09874
B	780	GLY	-	expression tag	UNP P09874
B	781	SER	-	expression tag	UNP P09874
B	782	GLY	-	expression tag	UNP P09874
B	783	SER	-	expression tag	UNP P09874
B	784	GLY	-	expression tag	UNP P09874
B	785	SER	-	expression tag	UNP P09874
B	786	GLY	-	expression tag	UNP P09874
B	787	GLY	-	expression tag	UNP P09874
C	742	MET	-	initiating methionine	UNP P09874
C	743	GLY	-	expression tag	UNP P09874
C	744	SER	-	expression tag	UNP P09874
C	745	SER	-	expression tag	UNP P09874
C	746	HIS	-	expression tag	UNP P09874
C	747	HIS	-	expression tag	UNP P09874
C	748	HIS	-	expression tag	UNP P09874
C	749	HIS	-	expression tag	UNP P09874
C	750	HIS	-	expression tag	UNP P09874
C	751	HIS	-	expression tag	UNP P09874
C	752	SER	-	expression tag	UNP P09874
C	753	SER	-	expression tag	UNP P09874
C	754	GLY	-	expression tag	UNP P09874

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Chain	Residue	Modelled	Actual	Comment	Reference
C	755	LEU	-	expression tag	UNP P09874
C	756	VAL	-	expression tag	UNP P09874
C	757	PRO	-	expression tag	UNP P09874
C	758	ARG	-	expression tag	UNP P09874
C	759	GLY	-	expression tag	UNP P09874
C	760	SER	-	expression tag	UNP P09874
C	761	HIS	-	expression tag	UNP P09874
C	762	MET	-	expression tag	UNP P09874
C	763	THR	-	expression tag	UNP P09874
C	764	LYS	-	expression tag	UNP P09874
C	765	SER	-	expression tag	UNP P09874
C	766	LYS	-	expression tag	UNP P09874
C	767	LEU	-	expression tag	UNP P09874
C	768	PRO	-	expression tag	UNP P09874
C	769	LYS	-	expression tag	UNP P09874
C	770	PRO	-	expression tag	UNP P09874
C	771	VAL	-	expression tag	UNP P09874
C	772	GLN	-	expression tag	UNP P09874
C	773	ASP	-	expression tag	UNP P09874
C	774	LEU	-	expression tag	UNP P09874
C	775	ILE	-	expression tag	UNP P09874
C	776	LYS	-	expression tag	UNP P09874
C	777	MET	-	expression tag	UNP P09874
C	778	ILE	-	expression tag	UNP P09874
C	779	PHE	-	expression tag	UNP P09874
C	780	GLY	-	expression tag	UNP P09874
C	781	SER	-	expression tag	UNP P09874
C	782	GLY	-	expression tag	UNP P09874
C	783	SER	-	expression tag	UNP P09874
C	784	GLY	-	expression tag	UNP P09874
C	785	SER	-	expression tag	UNP P09874
C	786	GLY	-	expression tag	UNP P09874
C	787	GLY	-	expression tag	UNP P09874
D	742	MET	-	initiating methionine	UNP P09874
D	743	GLY	-	expression tag	UNP P09874
D	744	SER	-	expression tag	UNP P09874
D	745	SER	-	expression tag	UNP P09874
D	746	HIS	-	expression tag	UNP P09874
D	747	HIS	-	expression tag	UNP P09874
D	748	HIS	-	expression tag	UNP P09874
D	749	HIS	-	expression tag	UNP P09874
D	750	HIS	-	expression tag	UNP P09874

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Chain	Residue	Modelled	Actual	Comment	Reference
D	751	HIS	-	expression tag	UNP P09874
D	752	SER	-	expression tag	UNP P09874
D	753	SER	-	expression tag	UNP P09874
D	754	GLY	-	expression tag	UNP P09874
D	755	LEU	-	expression tag	UNP P09874
D	756	VAL	-	expression tag	UNP P09874
D	757	PRO	-	expression tag	UNP P09874
D	758	ARG	-	expression tag	UNP P09874
D	759	GLY	-	expression tag	UNP P09874
D	760	SER	-	expression tag	UNP P09874
D	761	HIS	-	expression tag	UNP P09874
D	762	MET	-	expression tag	UNP P09874
D	763	THR	-	expression tag	UNP P09874
D	764	LYS	-	expression tag	UNP P09874
D	765	SER	-	expression tag	UNP P09874
D	766	LYS	-	expression tag	UNP P09874
D	767	LEU	-	expression tag	UNP P09874
D	768	PRO	-	expression tag	UNP P09874
D	769	LYS	-	expression tag	UNP P09874
D	770	PRO	-	expression tag	UNP P09874
D	771	VAL	-	expression tag	UNP P09874
D	772	GLN	-	expression tag	UNP P09874
D	773	ASP	-	expression tag	UNP P09874
D	774	LEU	-	expression tag	UNP P09874
D	775	ILE	-	expression tag	UNP P09874
D	776	LYS	-	expression tag	UNP P09874
D	777	MET	-	expression tag	UNP P09874
D	778	ILE	-	expression tag	UNP P09874
D	779	PHE	-	expression tag	UNP P09874
D	780	GLY	-	expression tag	UNP P09874
D	781	SER	-	expression tag	UNP P09874
D	782	GLY	-	expression tag	UNP P09874
D	783	SER	-	expression tag	UNP P09874
D	784	GLY	-	expression tag	UNP P09874
D	785	SER	-	expression tag	UNP P09874
D	786	GLY	-	expression tag	UNP P09874
D	787	GLY	-	expression tag	UNP P09874

- Molecule 2 is [(2R,3S,4R,5R)-5-(6-amino-9H-purin-9-yl)-3,4-dihydroxytetrahydrofuran-2-yl]methyl [(2R,3S,4R,5S)-5-(3-carbamoylphenyl)-3,4-dihydroxytetrahydrofuran-2-yl]methyl dihydrogen diphosphate (non-preferred name) (three-letter code: DQV) (formula: $C_{22}H_{28}N_6O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).

DQV
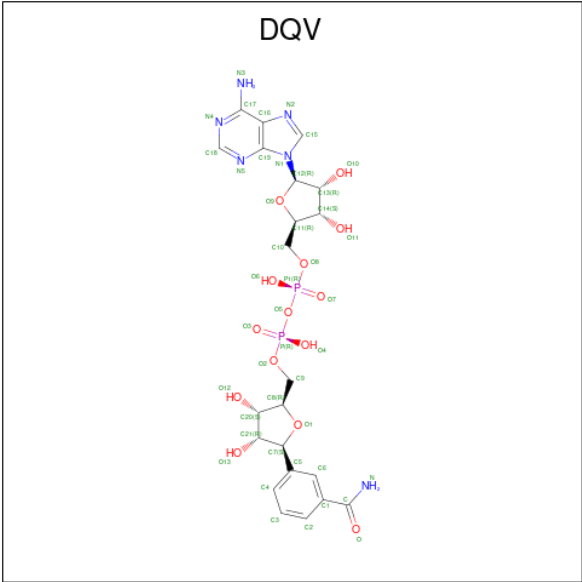
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			44	22	6	14	2		
2	B	1	Total	C	N	O	P	0	1
			55	24	6	21	4		
2	C	1	Total	C	N	O	P	0	0
			44	22	6	14	2		
2	D	1	Total	C	N	O	P	0	1
			52	23	6	20	3		

- Molecule 3 is ADENOSINE-5-DIPHOSPHORIBOSE (three-letter code: APR) (formula: $C_{15}H_{23}N_5O_{14}P_2$) (labeled as "Ligand of Interest" by depositor).

APR
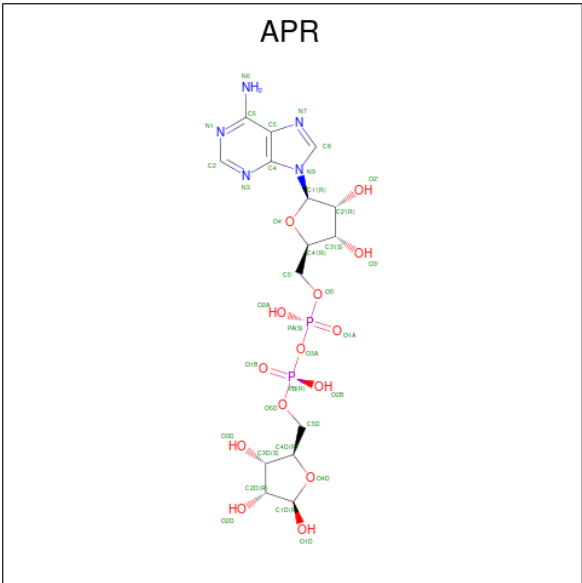
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total 36	C 15	N 5	O 14	P 2	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	3	Total 3	O 3	0	0
4	B	1	Total 1	O 1	0	0
4	C	1	Total 1	O 1	0	0
4	D	2	Total 2	O 2	0	0

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. 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. 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: Poly [ADP-ribose] polymerase 1
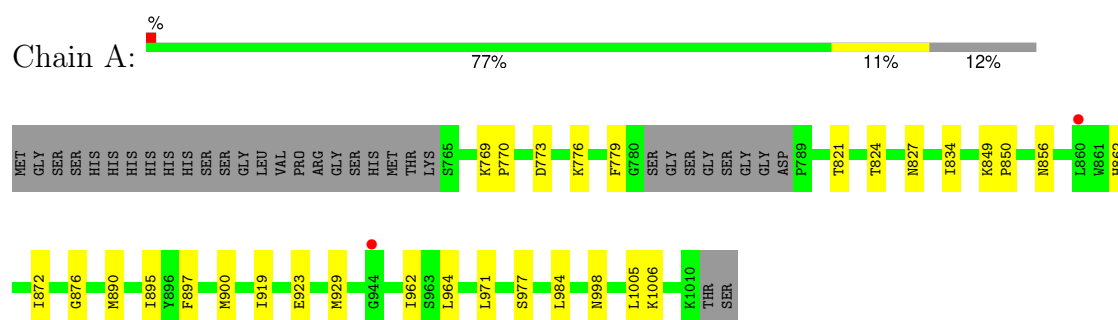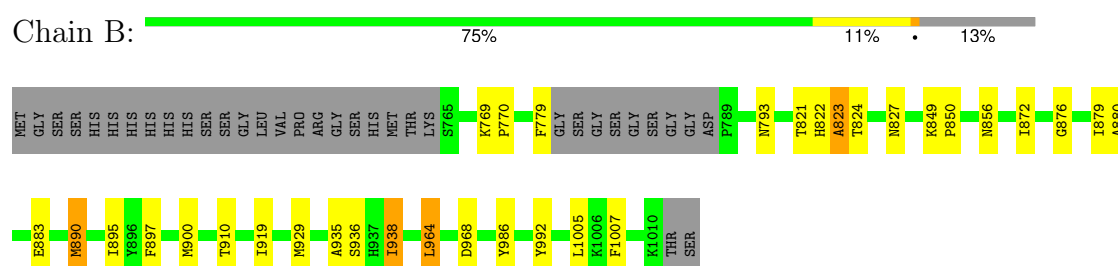
Chain A:

- Molecule 1: Poly [ADP-ribose] polymerase 1

Chain B:

- Molecule 1: Poly [ADP-ribose] polymerase 1

Chain C:

- Molecule 1: Poly [ADP-ribose] polymerase 1

Chain D:
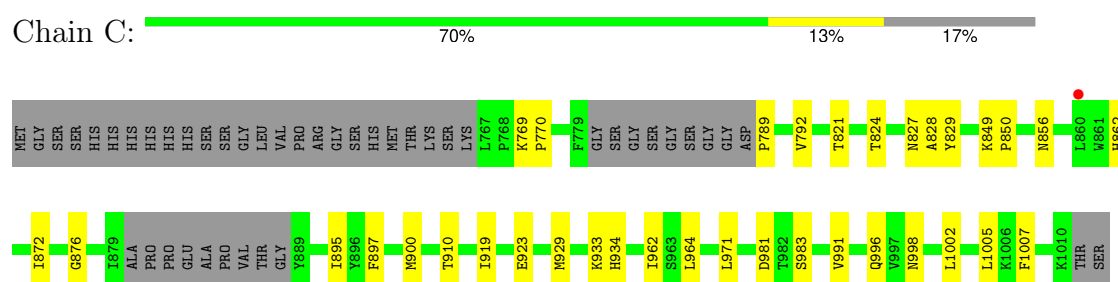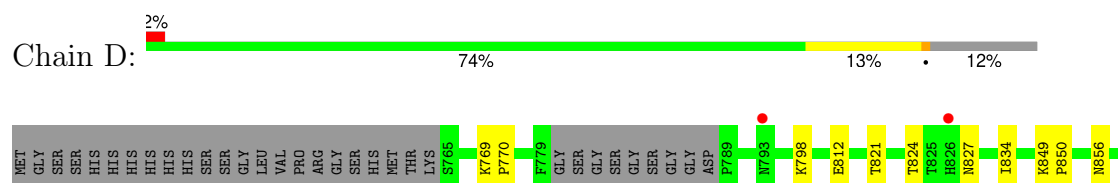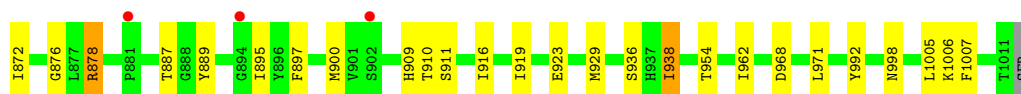
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	44.46Å 74.91Å 85.11Å 98.31° 105.04° 105.38°	Depositor
Resolution (Å)	25.00 – 3.00 25.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	92.4 (25.00-3.00) 83.5 (25.00-3.00)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.88 (at 3.00Å)	Xtriage
Refinement program	REFMAC 5.8.0425	Depositor
R, R_{free}	0.292 , 0.317 0.277 , 0.304	Depositor DCC
R_{free} test set	918 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å^2)	76.5	Xtriage
Anisotropy	0.722	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.26 , 163.3	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.053 for h,-h-k,-h-l	Xtriage
F_o,F_c correlation	0.83	EDS
Total number of atoms	7660	wwPDB-VP
Average B, all atoms (Å^2)	112.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 12.34% of the height of the origin peak. No significant pseudotranslation is detected.*

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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: APR, DQV

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	0.31	0/1914	0.61	0/2585
1	B	0.31	0/1910	0.61	0/2580
1	C	0.31	0/1837	0.60	0/2475
1	D	0.31	0/1917	0.61	0/2590
All	All	0.31	0/7578	0.60	0/10230

There are no bond length outliers.

There are no bond angle outliers.

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	1874	0	1899	22	0
1	B	1870	0	1896	20	0
1	C	1801	0	1832	24	0
1	D	1877	0	1903	24	0
2	A	44	0	0	2	0
2	B	55	0	0	0	0
2	C	44	0	0	1	0
2	D	52	0	0	0	0
3	A	36	0	21	4	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	3	0	0	1	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	2	0	0	0	0
All	All	7660	0	7551	85	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 6.

The worst 5 of 85 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:991:VAL:HG11	1:C:996:GLN:HB2	1.62	0.81
1:A:769:LYS:HG2	1:A:770:PRO:HD3	1.66	0.77
1:A:769:LYS:CG	1:A:770:PRO:HD3	2.21	0.71
1:A:890:MET:SD	3:A:1102:APR:O2'	2.50	0.68
1:D:938:ILE:HD11	1:D:992:TYR:CE2	2.28	0.68

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	234/271 (86%)	224 (96%)	10 (4%)	0	100	100
1	B	233/271 (86%)	220 (94%)	12 (5%)	1 (0%)	30	66
1	C	220/271 (81%)	209 (95%)	11 (5%)	0	100	100
1	D	234/271 (86%)	224 (96%)	10 (4%)	0	100	100
All	All	921/1084 (85%)	877 (95%)	43 (5%)	1 (0%)	48	81

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	823	ALA

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	206/233 (88%)	205 (100%)	1 (0%)	86	94
1	B	206/233 (88%)	201 (98%)	5 (2%)	44	74
1	C	199/233 (85%)	199 (100%)	0	100	100
1	D	207/233 (89%)	201 (97%)	6 (3%)	37	70
All	All	818/932 (88%)	806 (98%)	12 (2%)	60	83

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	812	GLU
1	D	878	ARG
1	D	968	ASP
1	D	938	ILE
1	B	938	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	827	ASN
1	B	822	HIS
1	B	827	ASN
1	C	827	ASN
1	D	827	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

7 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	$\#|Z| > 2$
2	DQV	D	1101[A]	-	44,48,48	0.58	0	56,73,73	0.69	2 (3%)
3	APR	A	1102	-	35,39,39	0.67	0	42,60,60	0.79	2 (4%)
2	DQV	C	1101	-	44,48,48	0.61	0	56,73,73	0.62	1 (1%)
2	DQV	D	1101[B]	-	44,48,48	0.61	0	56,73,73	0.68	2 (3%)
2	DQV	A	1101	-	44,48,48	0.58	0	56,73,73	0.76	2 (3%)
2	DQV	B	1101[A]	-	44,48,48	0.59	0	56,73,73	0.79	1 (1%)
2	DQV	B	1101[B]	-	44,48,48	0.58	0	56,73,73	0.79	1 (1%)

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
2	DQV	D	1101[A]	-	-	7/26/62/62	0/5/5/5
3	APR	A	1102	-	-	4/18/54/54	0/4/4/4
2	DQV	C	1101	-	-	8/26/62/62	0/5/5/5
2	DQV	D	1101[B]	-	-	8/26/62/62	0/5/5/5
2	DQV	A	1101	-	-	5/26/62/62	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	DQV	B	1101[A]	-	-	5/26/62/62	0/5/5/5
2	DQV	B	1101[B]	-	-	5/26/62/62	0/5/5/5

There are no bond length outliers.

The worst 5 of 11 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1101	DQV	C20-C21-C7	2.62	104.83	101.89
3	A	1102	APR	C1D-C2D-C3D	2.55	105.42	102.29
3	A	1102	APR	C5-C6-N6	2.35	123.89	120.31
2	A	1101	DQV	C16-C17-N3	2.32	123.84	120.31
2	D	1101[A]	DQV	C16-C17-N3	2.30	123.81	120.31

There are no chirality outliers.

5 of 42 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1101	DQV	C9-O2-P-O3
2	A	1101	DQV	C9-O2-P-O5
2	B	1101[A]	DQV	C10-O8-P1-O6
2	B	1101[A]	DQV	C9-O2-P-O5
2	B	1101[B]	DQV	O1-C8-C9-O2

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1102	APR	4	0
2	C	1101	DQV	1	0
2	A	1101	DQV	2	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 DQV D 1101 (A)

Bond lengths

Bond angles

Torsions

Rings

Ligand APR A 1102

Bond lengths

Bond angles

Torsions

Rings

Ligand DQV C 1101

Bond lengths

Bond angles

Torsions

Rings

Ligand DQV D 1101 (B)

Bond lengths

Bond angles

Torsions

Rings

Ligand DQV A 1101

Bond lengths

Bond angles

Torsions

Rings

Ligand DQV B 1101 (A)

Bond lengths

Bond angles

Torsions

Rings

Ligand DQV B 1101 (B)

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 ⓘ

<mark>**Warning**: The R factor obtained from EDS is 0.3658, which does not match the depositor's R factor of 0.29249. Please interpret the results in this section carefully.</mark>

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(Å²)	Q<0.9
1	A	238/271 (87%)	0.24	2 (0%)	82	66	72, 110, 142, 189	0
1	B	237/271 (87%)	0.23	0	100	100	65, 104, 143, 197	0
1	C	226/271 (83%)	0.29	1 (0%)	89	77	68, 115, 156, 187	0
1	D	238/271 (87%)	0.35	5 (2%)	63	41	70, 115, 149, 166	0
All	All	939/1084 (86%)	0.27	8 (0%)	81	63	65, 111, 147, 197	0

The worst 5 of 8 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	793	ASN	2.4
1	C	860	LEU	2.4
1	D	894	GLY	2.4
1	D	902	SER	2.3
1	A	944	GLY	2.3

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
2	DQV	D	1101[A]	44/44	0.92	0.13	70,96,115,119	8
2	DQV	D	1101[B]	44/44	0.92	0.13	70,94,115,119	8
2	DQV	C	1101	44/44	0.95	0.10	83,109,135,139	0
3	APR	A	1102	36/36	0.95	0.12	109,123,145,146	0
2	DQV	A	1101	44/44	0.96	0.10	77,114,133,139	0
2	DQV	B	1101[A]	44/44	0.97	0.10	69,84,106,109	11
2	DQV	B	1101[B]	44/44	0.97	0.10	69,80,106,109	11

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 DQV D 1101 (A):

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
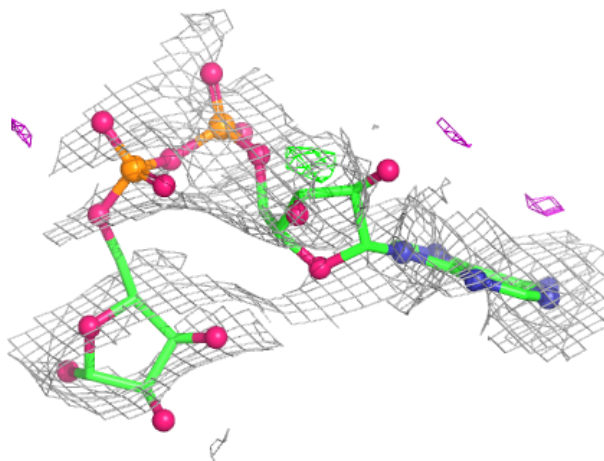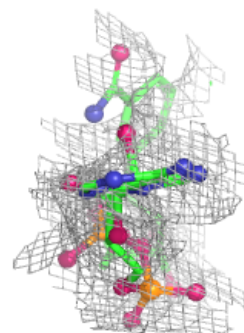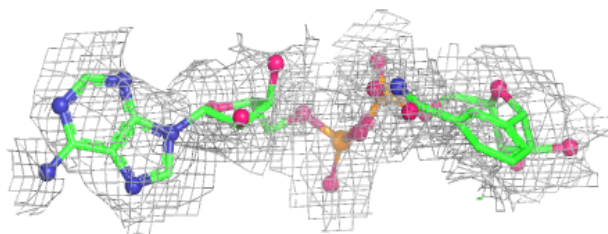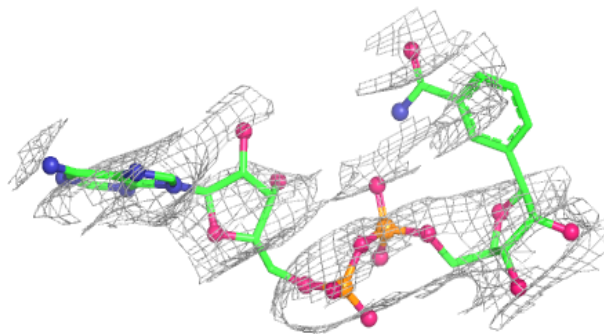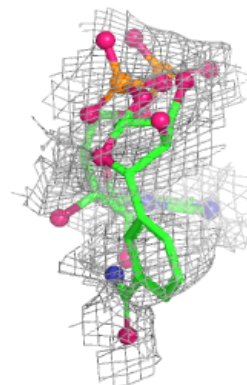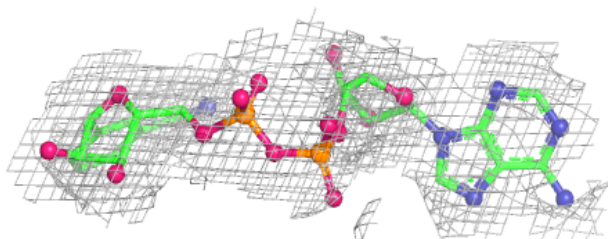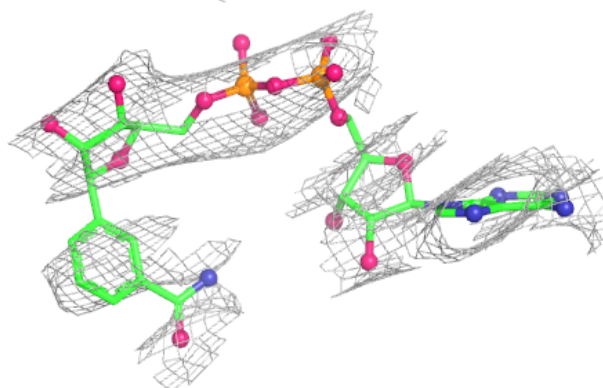and green (positive)
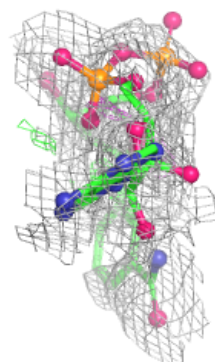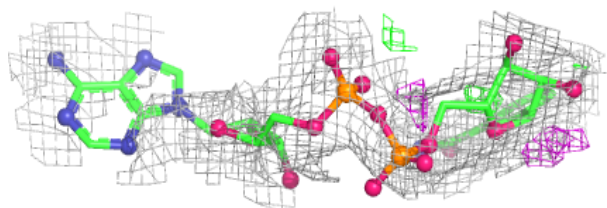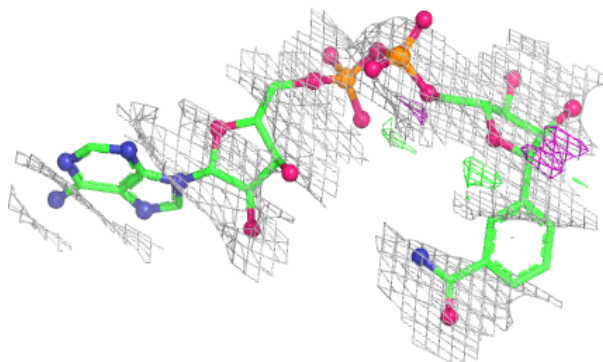
Electron density around DQV D 1101 (B):

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
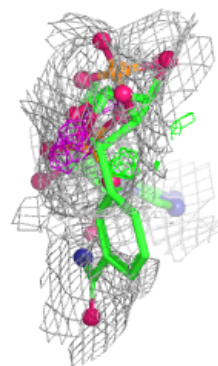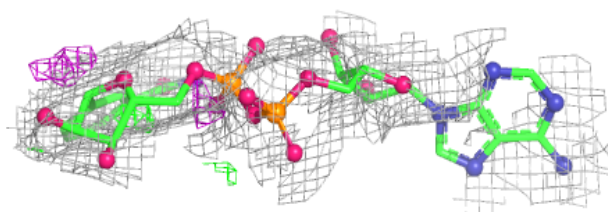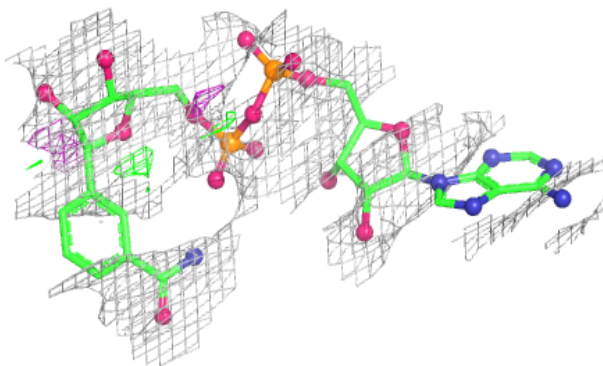
Electron density around DQV C 1101:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
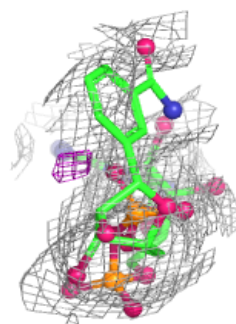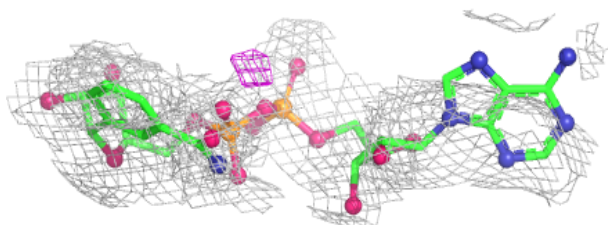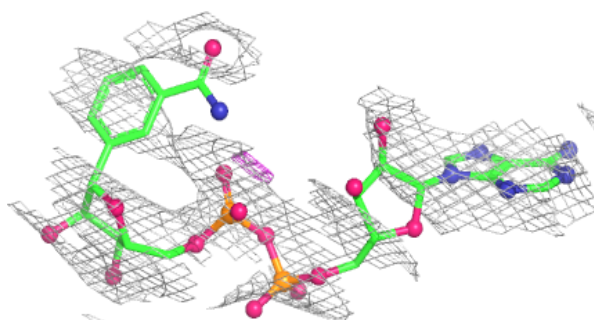
Electron density around APR A 1102:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
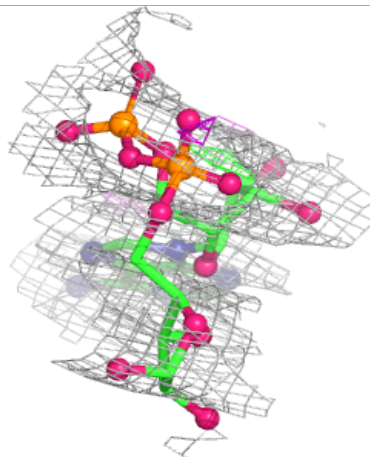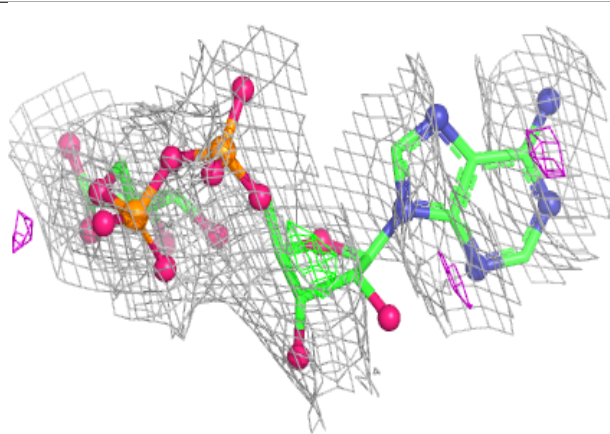
Electron density around DQV A 1101:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
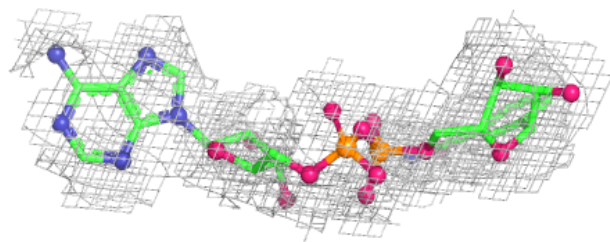mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
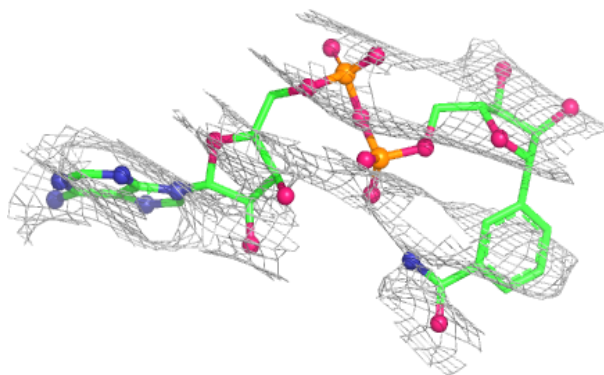and green (positive)

Electron density around DQV B 1101 (A):

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 DQV B 1101 (B):

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
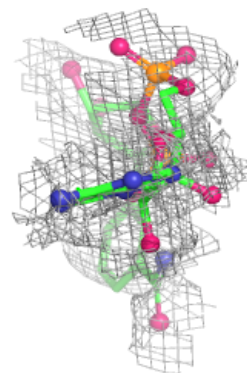
6.5 Other polymers (i)

There are no such residues in this entry.