WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Oct 13, 2025 – 02:43 PM EDT

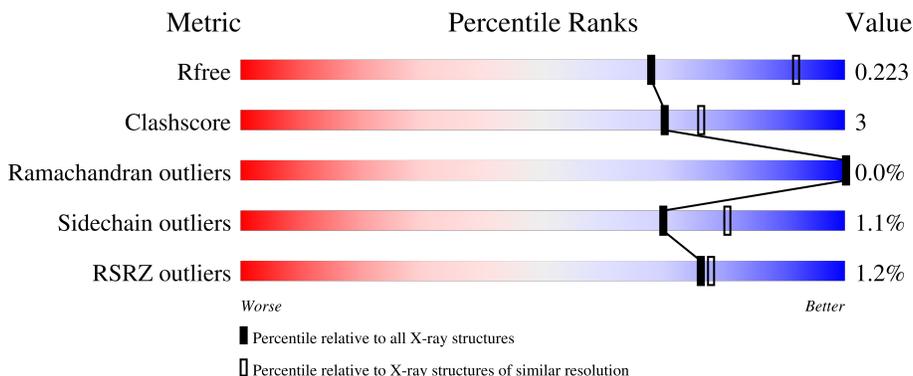|		
PDB ID	:	7MTX / pdb_00007mtx
Title	:	Crystal Structure of the Catalytic Domain of the Inosine Monophosphate Dehydrogenase from Bacillus anthracis in the complex with IMP and the inhibitor P176
Authors	:	Kim, Y.; Maltseva, N.; Makowska-Grzyska, M.; Gu, M.; Gollapalli, D.; Hedstrom, L.; Anderson, W.F.; Joachimiak, A.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on	:	2021-05-13
Resolution	:	2.44 Å(reported)

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 2.44 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		0.223
Clashscore		3
Ramachandran outliers		0.0%
Sidechain outliers		1.1%
RSRZ outliers		1.2%

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}	164625	2124 (2.46-2.42)
Clashscore	180529	2259 (2.46-2.42)
Ramachandran outliers	177936	2244 (2.46-2.42)
Sidechain outliers	177891	2244 (2.46-2.42)
RSRZ outliers	164620	2124 (2.46-2.42)

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	384	83% 8% 9%
1	B	384	83% 8% 9%
1	C	384	2% 82% 10% 8%

Continued on next page...

Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.46

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	D	384	% 82% 9% 9%
1	E	384	% 84% 7% 8%
1	F	384	2% 83% 10% 8%
1	G	384	% 82% 9% 9%
1	H	384	% 83% 8% 9%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 21542 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 Inosine-5'-monophosphate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	350	Total 2570	C 1615	N 451	O 488	S 16	0	0	0
1	B	350	Total 2578	C 1619	N 453	O 490	S 16	0	1	0
1	C	354	Total 2597	C 1631	N 455	O 495	S 16	0	0	0
1	D	351	Total 2580	C 1619	N 453	O 492	S 16	0	1	0
1	E	352	Total 2585	C 1623	N 454	O 492	S 16	0	0	0
1	F	355	Total 2614	C 1642	N 458	O 497	S 17	0	1	0
1	G	349	Total 2572	C 1615	N 453	O 488	S 16	0	1	0
1	H	349	Total 2561	C 1609	N 449	O 487	S 16	0	0	0

There are 208 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
A	-22	HIS	-	expression tag	UNP A0A6H3A7R4
A	-21	HIS	-	expression tag	UNP A0A6H3A7R4
A	-20	HIS	-	expression tag	UNP A0A6H3A7R4
A	-19	HIS	-	expression tag	UNP A0A6H3A7R4
A	-18	HIS	-	expression tag	UNP A0A6H3A7R4
A	-17	HIS	-	expression tag	UNP A0A6H3A7R4
A	-16	SER	-	expression tag	UNP A0A6H3A7R4
A	-15	SER	-	expression tag	UNP A0A6H3A7R4
A	-14	GLY	-	expression tag	UNP A0A6H3A7R4
A	-13	VAL	-	expression tag	UNP A0A6H3A7R4
A	-12	ASP	-	expression tag	UNP A0A6H3A7R4
A	-11	LEU	-	expression tag	UNP A0A6H3A7R4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	-10	GLY	-	expression tag	UNP A0A6H3A7R4
A	-9	THR	-	expression tag	UNP A0A6H3A7R4
A	-8	GLU	-	expression tag	UNP A0A6H3A7R4
A	-7	ASN	-	expression tag	UNP A0A6H3A7R4
A	-6	LEU	-	expression tag	UNP A0A6H3A7R4
A	-5	TYR	-	expression tag	UNP A0A6H3A7R4
A	-4	PHE	-	expression tag	UNP A0A6H3A7R4
A	-3	GLN	-	expression tag	UNP A0A6H3A7R4
A	-2	SER	-	expression tag	UNP A0A6H3A7R4
A	-1	ASN	-	expression tag	UNP A0A6H3A7R4
A	0	ALA	-	expression tag	UNP A0A6H3A7R4
A	92	GLY	-	linker	UNP A0A6H3A7R4
A	220	GLY	-	linker	UNP A0A6H3A7R4
B	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
B	-22	HIS	-	expression tag	UNP A0A6H3A7R4
B	-21	HIS	-	expression tag	UNP A0A6H3A7R4
B	-20	HIS	-	expression tag	UNP A0A6H3A7R4
B	-19	HIS	-	expression tag	UNP A0A6H3A7R4
B	-18	HIS	-	expression tag	UNP A0A6H3A7R4
B	-17	HIS	-	expression tag	UNP A0A6H3A7R4
B	-16	SER	-	expression tag	UNP A0A6H3A7R4
B	-15	SER	-	expression tag	UNP A0A6H3A7R4
B	-14	GLY	-	expression tag	UNP A0A6H3A7R4
B	-13	VAL	-	expression tag	UNP A0A6H3A7R4
B	-12	ASP	-	expression tag	UNP A0A6H3A7R4
B	-11	LEU	-	expression tag	UNP A0A6H3A7R4
B	-10	GLY	-	expression tag	UNP A0A6H3A7R4
B	-9	THR	-	expression tag	UNP A0A6H3A7R4
B	-8	GLU	-	expression tag	UNP A0A6H3A7R4
B	-7	ASN	-	expression tag	UNP A0A6H3A7R4
B	-6	LEU	-	expression tag	UNP A0A6H3A7R4
B	-5	TYR	-	expression tag	UNP A0A6H3A7R4
B	-4	PHE	-	expression tag	UNP A0A6H3A7R4
B	-3	GLN	-	expression tag	UNP A0A6H3A7R4
B	-2	SER	-	expression tag	UNP A0A6H3A7R4
B	-1	ASN	-	expression tag	UNP A0A6H3A7R4
B	0	ALA	-	expression tag	UNP A0A6H3A7R4
B	92	GLY	-	linker	UNP A0A6H3A7R4
B	220	GLY	-	linker	UNP A0A6H3A7R4
C	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
C	-22	HIS	-	expression tag	UNP A0A6H3A7R4
C	-21	HIS	-	expression tag	UNP A0A6H3A7R4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	-20	HIS	-	expression tag	UNP A0A6H3A7R4
C	-19	HIS	-	expression tag	UNP A0A6H3A7R4
C	-18	HIS	-	expression tag	UNP A0A6H3A7R4
C	-17	HIS	-	expression tag	UNP A0A6H3A7R4
C	-16	SER	-	expression tag	UNP A0A6H3A7R4
C	-15	SER	-	expression tag	UNP A0A6H3A7R4
C	-14	GLY	-	expression tag	UNP A0A6H3A7R4
C	-13	VAL	-	expression tag	UNP A0A6H3A7R4
C	-12	ASP	-	expression tag	UNP A0A6H3A7R4
C	-11	LEU	-	expression tag	UNP A0A6H3A7R4
C	-10	GLY	-	expression tag	UNP A0A6H3A7R4
C	-9	THR	-	expression tag	UNP A0A6H3A7R4
C	-8	GLU	-	expression tag	UNP A0A6H3A7R4
C	-7	ASN	-	expression tag	UNP A0A6H3A7R4
C	-6	LEU	-	expression tag	UNP A0A6H3A7R4
C	-5	TYR	-	expression tag	UNP A0A6H3A7R4
C	-4	PHE	-	expression tag	UNP A0A6H3A7R4
C	-3	GLN	-	expression tag	UNP A0A6H3A7R4
C	-2	SER	-	expression tag	UNP A0A6H3A7R4
C	-1	ASN	-	expression tag	UNP A0A6H3A7R4
C	0	ALA	-	expression tag	UNP A0A6H3A7R4
C	92	GLY	-	linker	UNP A0A6H3A7R4
C	220	GLY	-	linker	UNP A0A6H3A7R4
D	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
D	-22	HIS	-	expression tag	UNP A0A6H3A7R4
D	-21	HIS	-	expression tag	UNP A0A6H3A7R4
D	-20	HIS	-	expression tag	UNP A0A6H3A7R4
D	-19	HIS	-	expression tag	UNP A0A6H3A7R4
D	-18	HIS	-	expression tag	UNP A0A6H3A7R4
D	-17	HIS	-	expression tag	UNP A0A6H3A7R4
D	-16	SER	-	expression tag	UNP A0A6H3A7R4
D	-15	SER	-	expression tag	UNP A0A6H3A7R4
D	-14	GLY	-	expression tag	UNP A0A6H3A7R4
D	-13	VAL	-	expression tag	UNP A0A6H3A7R4
D	-12	ASP	-	expression tag	UNP A0A6H3A7R4
D	-11	LEU	-	expression tag	UNP A0A6H3A7R4
D	-10	GLY	-	expression tag	UNP A0A6H3A7R4
D	-9	THR	-	expression tag	UNP A0A6H3A7R4
D	-8	GLU	-	expression tag	UNP A0A6H3A7R4
D	-7	ASN	-	expression tag	UNP A0A6H3A7R4
D	-6	LEU	-	expression tag	UNP A0A6H3A7R4
D	-5	TYR	-	expression tag	UNP A0A6H3A7R4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
D	-4	PHE	-	expression tag	UNP A0A6H3A7R4
D	-3	GLN	-	expression tag	UNP A0A6H3A7R4
D	-2	SER	-	expression tag	UNP A0A6H3A7R4
D	-1	ASN	-	expression tag	UNP A0A6H3A7R4
D	0	ALA	-	expression tag	UNP A0A6H3A7R4
D	92	GLY	-	linker	UNP A0A6H3A7R4
D	220	GLY	-	linker	UNP A0A6H3A7R4
E	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
E	-22	HIS	-	expression tag	UNP A0A6H3A7R4
E	-21	HIS	-	expression tag	UNP A0A6H3A7R4
E	-20	HIS	-	expression tag	UNP A0A6H3A7R4
E	-19	HIS	-	expression tag	UNP A0A6H3A7R4
E	-18	HIS	-	expression tag	UNP A0A6H3A7R4
E	-17	HIS	-	expression tag	UNP A0A6H3A7R4
E	-16	SER	-	expression tag	UNP A0A6H3A7R4
E	-15	SER	-	expression tag	UNP A0A6H3A7R4
E	-14	GLY	-	expression tag	UNP A0A6H3A7R4
E	-13	VAL	-	expression tag	UNP A0A6H3A7R4
E	-12	ASP	-	expression tag	UNP A0A6H3A7R4
E	-11	LEU	-	expression tag	UNP A0A6H3A7R4
E	-10	GLY	-	expression tag	UNP A0A6H3A7R4
E	-9	THR	-	expression tag	UNP A0A6H3A7R4
E	-8	GLU	-	expression tag	UNP A0A6H3A7R4
E	-7	ASN	-	expression tag	UNP A0A6H3A7R4
E	-6	LEU	-	expression tag	UNP A0A6H3A7R4
E	-5	TYR	-	expression tag	UNP A0A6H3A7R4
E	-4	PHE	-	expression tag	UNP A0A6H3A7R4
E	-3	GLN	-	expression tag	UNP A0A6H3A7R4
E	-2	SER	-	expression tag	UNP A0A6H3A7R4
E	-1	ASN	-	expression tag	UNP A0A6H3A7R4
E	0	ALA	-	expression tag	UNP A0A6H3A7R4
E	92	GLY	-	linker	UNP A0A6H3A7R4
E	220	GLY	-	linker	UNP A0A6H3A7R4
F	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
F	-22	HIS	-	expression tag	UNP A0A6H3A7R4
F	-21	HIS	-	expression tag	UNP A0A6H3A7R4
F	-20	HIS	-	expression tag	UNP A0A6H3A7R4
F	-19	HIS	-	expression tag	UNP A0A6H3A7R4
F	-18	HIS	-	expression tag	UNP A0A6H3A7R4
F	-17	HIS	-	expression tag	UNP A0A6H3A7R4
F	-16	SER	-	expression tag	UNP A0A6H3A7R4
F	-15	SER	-	expression tag	UNP A0A6H3A7R4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
F	-14	GLY	-	expression tag	UNP A0A6H3A7R4
F	-13	VAL	-	expression tag	UNP A0A6H3A7R4
F	-12	ASP	-	expression tag	UNP A0A6H3A7R4
F	-11	LEU	-	expression tag	UNP A0A6H3A7R4
F	-10	GLY	-	expression tag	UNP A0A6H3A7R4
F	-9	THR	-	expression tag	UNP A0A6H3A7R4
F	-8	GLU	-	expression tag	UNP A0A6H3A7R4
F	-7	ASN	-	expression tag	UNP A0A6H3A7R4
F	-6	LEU	-	expression tag	UNP A0A6H3A7R4
F	-5	TYR	-	expression tag	UNP A0A6H3A7R4
F	-4	PHE	-	expression tag	UNP A0A6H3A7R4
F	-3	GLN	-	expression tag	UNP A0A6H3A7R4
F	-2	SER	-	expression tag	UNP A0A6H3A7R4
F	-1	ASN	-	expression tag	UNP A0A6H3A7R4
F	0	ALA	-	expression tag	UNP A0A6H3A7R4
F	92	GLY	-	linker	UNP A0A6H3A7R4
F	220	GLY	-	linker	UNP A0A6H3A7R4
G	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
G	-22	HIS	-	expression tag	UNP A0A6H3A7R4
G	-21	HIS	-	expression tag	UNP A0A6H3A7R4
G	-20	HIS	-	expression tag	UNP A0A6H3A7R4
G	-19	HIS	-	expression tag	UNP A0A6H3A7R4
G	-18	HIS	-	expression tag	UNP A0A6H3A7R4
G	-17	HIS	-	expression tag	UNP A0A6H3A7R4
G	-16	SER	-	expression tag	UNP A0A6H3A7R4
G	-15	SER	-	expression tag	UNP A0A6H3A7R4
G	-14	GLY	-	expression tag	UNP A0A6H3A7R4
G	-13	VAL	-	expression tag	UNP A0A6H3A7R4
G	-12	ASP	-	expression tag	UNP A0A6H3A7R4
G	-11	LEU	-	expression tag	UNP A0A6H3A7R4
G	-10	GLY	-	expression tag	UNP A0A6H3A7R4
G	-9	THR	-	expression tag	UNP A0A6H3A7R4
G	-8	GLU	-	expression tag	UNP A0A6H3A7R4
G	-7	ASN	-	expression tag	UNP A0A6H3A7R4
G	-6	LEU	-	expression tag	UNP A0A6H3A7R4
G	-5	TYR	-	expression tag	UNP A0A6H3A7R4
G	-4	PHE	-	expression tag	UNP A0A6H3A7R4
G	-3	GLN	-	expression tag	UNP A0A6H3A7R4
G	-2	SER	-	expression tag	UNP A0A6H3A7R4
G	-1	ASN	-	expression tag	UNP A0A6H3A7R4
G	0	ALA	-	expression tag	UNP A0A6H3A7R4
G	92	GLY	-	linker	UNP A0A6H3A7R4

*Continued on next page...*

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
G	220	GLY	-	linker	UNP A0A6H3A7R4
H	-23	MET	-	initiating methionine	UNP A0A6H3A7R4
H	-22	HIS	-	expression tag	UNP A0A6H3A7R4
H	-21	HIS	-	expression tag	UNP A0A6H3A7R4
H	-20	HIS	-	expression tag	UNP A0A6H3A7R4
H	-19	HIS	-	expression tag	UNP A0A6H3A7R4
H	-18	HIS	-	expression tag	UNP A0A6H3A7R4
H	-17	HIS	-	expression tag	UNP A0A6H3A7R4
H	-16	SER	-	expression tag	UNP A0A6H3A7R4
H	-15	SER	-	expression tag	UNP A0A6H3A7R4
H	-14	GLY	-	expression tag	UNP A0A6H3A7R4
H	-13	VAL	-	expression tag	UNP A0A6H3A7R4
H	-12	ASP	-	expression tag	UNP A0A6H3A7R4
H	-11	LEU	-	expression tag	UNP A0A6H3A7R4
H	-10	GLY	-	expression tag	UNP A0A6H3A7R4
H	-9	THR	-	expression tag	UNP A0A6H3A7R4
H	-8	GLU	-	expression tag	UNP A0A6H3A7R4
H	-7	ASN	-	expression tag	UNP A0A6H3A7R4
H	-6	LEU	-	expression tag	UNP A0A6H3A7R4
H	-5	TYR	-	expression tag	UNP A0A6H3A7R4
H	-4	PHE	-	expression tag	UNP A0A6H3A7R4
H	-3	GLN	-	expression tag	UNP A0A6H3A7R4
H	-2	SER	-	expression tag	UNP A0A6H3A7R4
H	-1	ASN	-	expression tag	UNP A0A6H3A7R4
H	0	ALA	-	expression tag	UNP A0A6H3A7R4
H	92	GLY	-	linker	UNP A0A6H3A7R4
H	220	GLY	-	linker	UNP A0A6H3A7R4

- Molecule 2 is INOSINIC ACID (CCD ID: IMP) (formula: $C_{10}H_{13}N_4O_8P$).
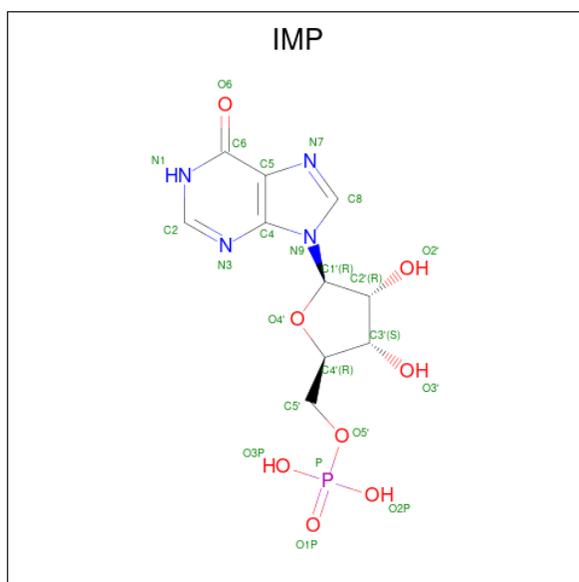
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	B	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	C	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	D	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	E	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	F	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	G	1	Total	C	N	O	P	0	0
			23	10	4	8	1		
2	H	1	Total	C	N	O	P	0	0
			23	10	4	8	1		

- Molecule 3 is N-{2-chloro-5-[({2-[3-(prop-1-en-2-yl)phenyl]propan-2-yl}carbamoyl)amino] phenyl}-beta-D-ribopyranosylamine (CCD ID: ZO4) (formula: $C_{24}H_{30}ClN_3O_5$) (labeled as "Ligand of Interest" by depositor).

ZO4
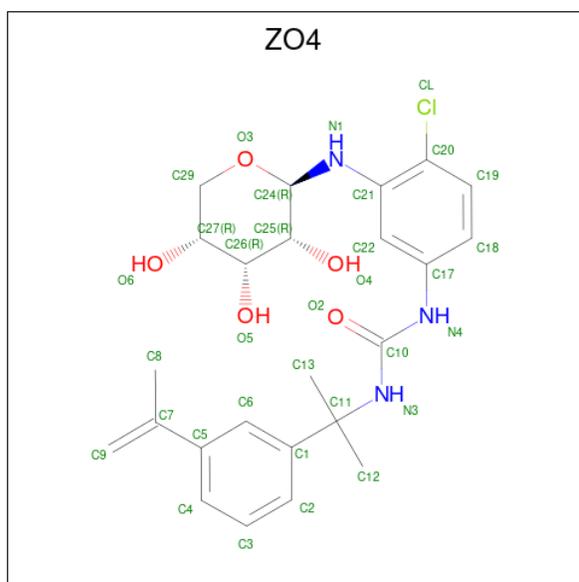
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	B	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	C	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	D	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	E	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	F	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	G	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		
3	H	1	Total	C	Cl	N	O	0	0
			33	24	1	3	5		

- Molecule 4 is POTASSIUM ION (CCD ID: K) (formula: K).

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

Continued on next page...

Continued from previous page...

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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	59	Total 59	O 59	0	0
5	B	65	Total 65	O 65	0	0
5	C	67	Total 67	O 67	0	0
5	D	58	Total 58	O 58	0	0
5	E	50	Total 50	O 50	0	0
5	F	44	Total 44	O 44	0	0
5	G	52	Total 52	O 52	0	0
5	H	34	Total 34	O 34	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 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: Inosine-5'-monophosphate dehydrogenase
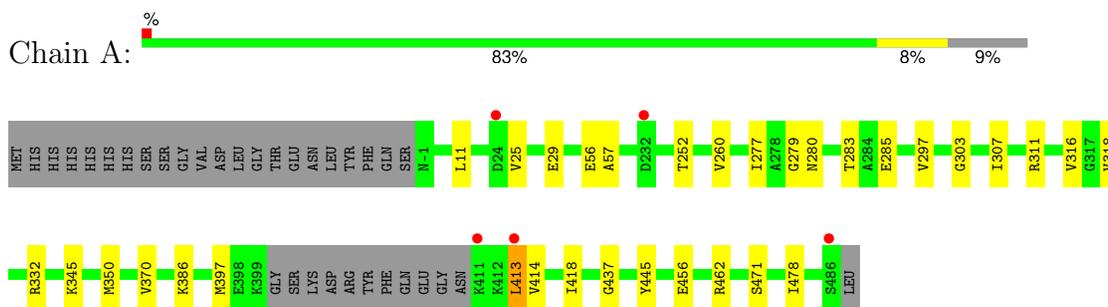
- Molecule 1: Inosine-5'-monophosphate dehydrogenase

- Molecule 1: Inosine-5'-monophosphate dehydrogenase

- Molecule 1: Inosine-5'-monophosphate dehydrogenase

• Molecule 1: Inosine-5'-monophosphate dehydrogenase

Chain E:

• Molecule 1: Inosine-5'-monophosphate dehydrogenase

Chain F:

• Molecule 1: Inosine-5'-monophosphate dehydrogenase

Chain G:

• Molecule 1: Inosine-5'-monophosphate dehydrogenase

Chain H:
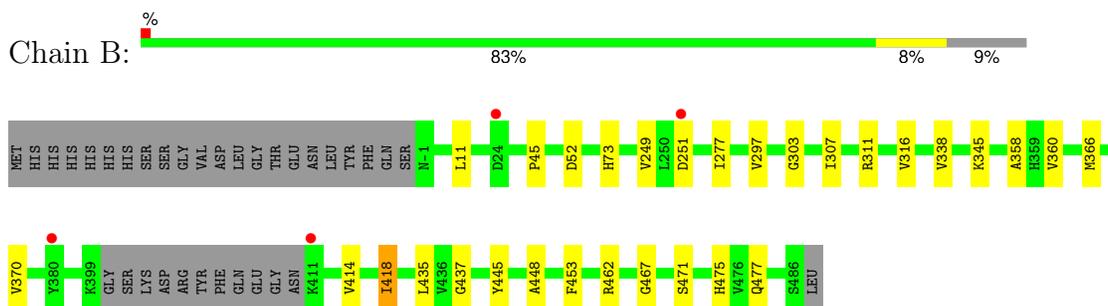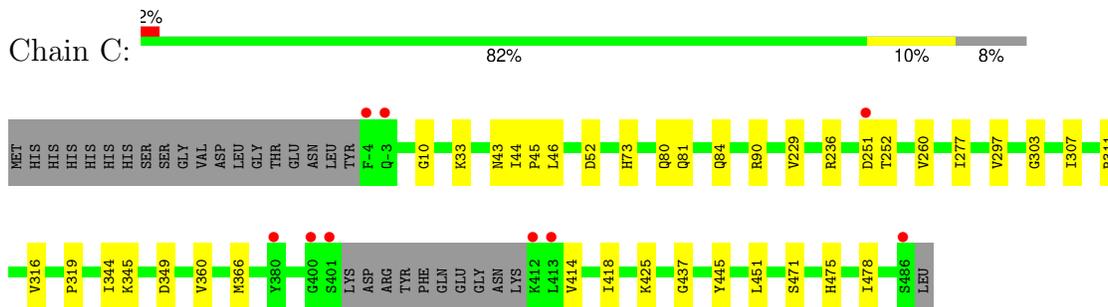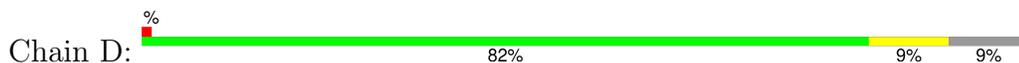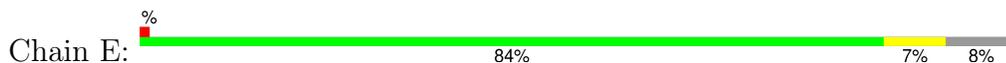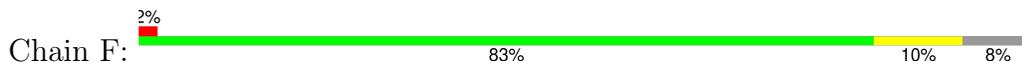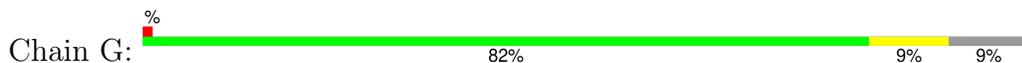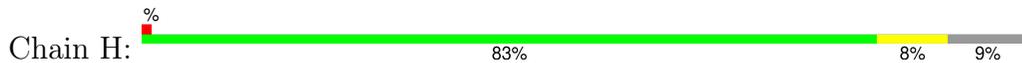
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	85.39Å 89.92Å 104.86Å 81.41° 90.03° 83.44°	Depositor
Resolution (Å)	40.08 – 2.44 40.08 – 2.44	Depositor EDS
% Data completeness (in resolution range)	91.2 (40.08-2.44) 91.6 (40.08-2.44)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.43 (at 2.42Å)	Xtriage
Refinement program	PHENIX 1.19_4092	Depositor
R, R_{free}	0.178 , 0.222 0.178 , 0.223	Depositor DCC
R_{free} test set	5155 reflections (4.50%)	wwPDB-VP
Wilson B-factor (Å^2)	35.4	Xtriage
Anisotropy	0.020	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 35.7	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	21542	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.52% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[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: ZO4, IMP, K

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	0.07	0/2606	0.23	0/3521
1	B	0.08	0/2614	0.25	0/3532
1	C	0.09	0/2634	0.26	0/3559
1	D	0.07	0/2616	0.23	0/3535
1	E	0.07	0/2621	0.23	0/3541
1	F	0.08	0/2651	0.24	0/3580
1	G	0.08	0/2608	0.23	0/3524
1	H	0.08	0/2597	0.23	0/3510
All	All	0.08	0/20947	0.24	0/28302

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	2570	0	2634	23	0
1	B	2578	0	2639	19	0
1	C	2597	0	2651	24	0
1	D	2580	0	2636	25	0
1	E	2585	0	2647	18	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	2614	0	2672	25	0
1	G	2572	0	2633	22	0
1	H	2561	0	2621	19	0
2	A	23	0	11	0	0
2	B	23	0	11	0	0
2	C	23	0	11	0	0
2	D	23	0	11	0	0
2	E	23	0	11	0	0
2	F	23	0	11	0	0
2	G	23	0	11	1	0
2	H	23	0	11	0	0
3	A	33	0	0	0	0
3	B	33	0	0	0	0
3	C	33	0	0	0	0
3	D	33	0	0	0	0
3	E	33	0	0	0	0
3	F	33	0	0	0	0
3	G	33	0	0	0	0
3	H	33	0	0	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
5	A	59	0	0	0	0
5	B	65	0	0	0	0
5	C	67	0	0	0	0
5	D	58	0	0	0	0
5	E	50	0	0	0	0
5	F	44	0	0	0	0
5	G	52	0	0	0	0
5	H	34	0	0	0	0
All	All	21542	0	21221	138	0

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

All (138) 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:414:VAL:HG21	1:D:437:GLY:HA3	1.71	0.72
1:E:437:GLY:HA3	1:F:414:VAL:HG21	1.77	0.66
1:F:437:GLY:HA3	1:H:414:VAL:HG21	1.77	0.66
1:D:332:ARG:NH2	1:D:456:GLU:OE2	2.31	0.62
1:A:418:ILE:HD13	1:C:478:ILE:HG12	1.83	0.61
1:G:350:MET:HE1	1:G:435:LEU:HB3	1.82	0.61
1:C:252:THR:HG21	1:C:260:VAL:HG21	1.81	0.60
1:C:316:VAL:HG11	1:D:445:TYR:HB3	1.84	0.59
1:C:345:LYS:HD2	1:D:475:HIS:CE1	2.38	0.58
1:H:44:ILE:HD12	1:H:46:LEU:HD12	1.83	0.58
1:G:280:ASN:OD1	1:G:299:LYS:NZ	2.32	0.57
1:E:229:VAL:HG21	1:E:260:VAL:HG22	1.85	0.57
1:A:414:VAL:HG21	1:C:437:GLY:HA3	1.86	0.57
1:F:375:GLY:O	1:F:386:LYS:NZ	2.39	0.56
1:E:344:ILE:HG23	1:E:349:ASP:HB2	1.87	0.56
1:E:345:LYS:HD2	1:G:475:HIS:CE1	2.41	0.56
1:E:414:VAL:HG21	1:G:437:GLY:HA3	1.87	0.56
1:A:252:THR:HG21	1:A:260:VAL:HG21	1.88	0.55
1:A:316:VAL:HG11	1:C:445:TYR:HB3	1.89	0.54
1:A:445:TYR:HB3	1:B:316:VAL:HG11	1.89	0.54
1:E:445:TYR:HB3	1:F:316:VAL:HG11	1.90	0.54
1:F:248:ILE:HD12	1:F:274:LEU:HD21	1.88	0.54
1:A:345:LYS:HD2	1:C:475:HIS:CE1	2.43	0.54
1:A:283:THR:HG22	1:A:285:GLU:H	1.72	0.54
1:E:252:THR:HG21	1:E:260:VAL:HG21	1.89	0.54
1:G:277:ILE:HG12	1:G:297:VAL:HB	1.90	0.54
1:F:445:TYR:HB3	1:H:316:VAL:HG11	1.89	0.54
1:G:252:THR:HG21	1:G:260:VAL:HG21	1.88	0.54
1:G:316:VAL:HG11	1:H:445:TYR:HB3	1.90	0.53
1:A:471:SER:HA	1:B:311:ARG:HD2	1.91	0.53
1:C:344:ILE:HG23	1:C:349:ASP:HB2	1.91	0.52
1:F:237:ILE:HG12	1:F:248:ILE:HD13	1.90	0.52
1:H:238:ASP:OD1	1:H:271:TYR:OH	2.25	0.52
1:F:478:ILE:HG12	1:H:418:ILE:HD13	1.92	0.52
1:C:418:ILE:HD13	1:D:478:ILE:HG12	1.92	0.52
1:G:344:ILE:HG23	1:G:349:ASP:HB2	1.91	0.51
1:B:11:LEU:HD11	1:B:462:ARG:HD3	1.91	0.51
1:F:389:ARG:HH12	1:F:399:LYS:HZ3	1.57	0.50
1:E:311:ARG:NH2	1:E:318:VAL:O	2.44	0.50
1:D:257:SER:HB2	1:D:260:VAL:HG23	1.94	0.50
1:D:45:PRO:HG3	1:D:451:LEU:HD11	1.93	0.50
1:A:437:GLY:HA3	1:B:414:VAL:HG21	1.94	0.50

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:475:HIS:CE1	1:D:345:LYS:HD2	2.47	0.50
1:C:45:PRO:HG3	1:C:451:LEU:HD11	1.94	0.50
1:E:11:LEU:HD11	1:E:462:ARG:HD3	1.94	0.49
1:G:345:LYS:HD2	1:H:475:HIS:CE1	2.47	0.49
1:H:277:ILE:HG12	1:H:297:VAL:HB	1.94	0.49
1:H:11:LEU:HD11	1:H:462:ARG:HD3	1.95	0.49
1:F:344:ILE:HG23	1:F:349:ASP:HB2	1.95	0.49
1:G:338:VAL:HG23	1:G:358:ALA:HA	1.95	0.49
1:F:311:ARG:NH2	1:F:318:VAL:O	2.46	0.49
1:G:341:ASP:OD2	2:G:502:IMP:O2'	2.31	0.49
1:A:11:LEU:HD11	1:A:462:ARG:HD3	1.95	0.48
1:B:277:ILE:HG12	1:B:297:VAL:HB	1.94	0.48
1:E:311:ARG:HD2	1:G:471:SER:HA	1.95	0.48
1:E:418:ILE:HD13	1:G:478:ILE:HG12	1.95	0.48
1:D:25:VAL:HG11	1:D:449:GLN:HG2	1.95	0.48
1:F:277:ILE:HG12	1:F:297:VAL:HB	1.95	0.48
1:C:33:LYS:HG2	1:C:43:ASN:HA	1.95	0.48
1:H:47:ILE:HG13	1:H:360:VAL:HG11	1.96	0.48
1:C:229:VAL:HG21	1:C:260:VAL:HG22	1.96	0.47
1:E:475:HIS:CD2	1:F:345:LYS:HD2	2.49	0.47
1:B:445:TYR:HB3	1:D:316:VAL:HG11	1.96	0.47
1:B:366:MET:SD	1:B:435:LEU:HD21	2.55	0.47
1:D:252:THR:HG21	1:D:260:VAL:HG21	1.97	0.47
1:B:471:SER:HA	1:D:311:ARG:HD2	1.96	0.47
1:F:471:SER:HA	1:H:311:ARG:HD2	1.97	0.47
1:G:350:MET:HG3	1:G:361:VAL:HG21	1.96	0.47
1:D:275:ASN:HA	1:D:296:ASN:HD21	1.80	0.46
1:A:311:ARG:HD2	1:C:471:SER:HA	1.97	0.46
1:B:52:ASP:HA	1:B:73:HIS:CD2	2.51	0.46
1:A:277:ILE:HG12	1:A:297:VAL:HB	1.98	0.46
1:C:52:ASP:HA	1:C:73:HIS:CD2	2.51	0.46
1:A:311:ARG:NH2	1:A:318:VAL:O	2.49	0.46
1:A:478:ILE:HG12	1:B:418:ILE:HD13	1.98	0.46
1:A:397:MET:HE2	1:A:413:LEU:HD22	1.97	0.46
1:B:477:GLN:OE1	1:D:421:ARG:NH1	2.45	0.46
1:E:277:ILE:HG12	1:E:297:VAL:HB	1.97	0.46
1:F:397[B]:MET:HE3	1:F:413:LEU:HD13	1.97	0.46
1:D:11:LEU:HD11	1:D:462:ARG:HD3	1.98	0.45
1:A:303:GLY:HA3	1:A:311:ARG:HE	1.81	0.45
1:G:311:ARG:HD2	1:H:471:SER:HA	1.98	0.45
1:F:297:VAL:HG22	1:F:337:PRO:HG2	1.98	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:52:ASP:HA	1:D:73:HIS:CD2	2.52	0.45
1:F:26:LEU:O	1:F:29:GLU:HG2	2.17	0.45
1:H:370:VAL:HG12	1:H:372:GLU:H	1.81	0.45
1:H:389:ARG:HH22	1:H:399:LYS:HD2	1.80	0.45
1:B:467:GLY:HA2	1:D:12:THR:HG21	1.99	0.45
1:C:277:ILE:HG12	1:C:297:VAL:HB	1.98	0.45
1:F:389:ARG:HH12	1:F:399:LYS:NZ	2.14	0.45
1:B:437:GLY:HA3	1:D:414:VAL:HG21	1.98	0.45
1:E:45:PRO:C	1:E:360:VAL:HG23	2.42	0.45
1:A:370:VAL:O	1:A:386:LYS:NZ	2.46	0.45
1:C:45:PRO:C	1:C:360:VAL:HG23	2.42	0.44
1:D:45:PRO:C	1:D:360:VAL:HG23	2.42	0.44
1:D:277:ILE:HG12	1:D:297:VAL:HB	1.99	0.44
1:A:25:VAL:HG23	1:A:29:GLU:HG3	1.98	0.44
1:C:80:GLN:O	1:C:84:GLN:HG2	2.18	0.44
1:F:45:PRO:C	1:F:360:VAL:HG23	2.43	0.44
1:G:89:LYS:HE3	1:G:221:LEU:O	2.17	0.44
1:G:303:GLY:HA3	1:G:311:ARG:HE	1.83	0.44
1:H:481:GLU:OE2	1:H:486:SER:OG	2.35	0.44
1:C:311:ARG:HD2	1:D:471:SER:HA	1.98	0.43
1:F:52:ASP:HA	1:F:73:HIS:CD2	2.54	0.43
1:E:303:GLY:HA3	1:E:311:ARG:NE	2.33	0.43
1:G:25:VAL:HG23	1:G:29:GLU:HG3	2.01	0.43
1:B:45:PRO:C	1:B:360:VAL:HG23	2.43	0.43
1:C:10:GLY:HA3	1:C:319:PRO:HG2	2.00	0.43
1:F:257:SER:HB2	1:F:260:VAL:HG23	1.99	0.43
1:C:366:MET:O	1:C:425:LYS:NZ	2.48	0.43
1:F:475:HIS:CE1	1:H:345:LYS:HD2	2.54	0.43
1:G:418:ILE:HD13	1:H:478:ILE:HG12	2.01	0.43
1:B:303:GLY:HA3	1:B:311:ARG:HE	1.83	0.43
1:C:44:ILE:HD12	1:C:46:LEU:HD12	2.02	0.42
1:A:332:ARG:NH2	1:A:456:GLU:OE1	2.52	0.42
1:B:249:VAL:HG12	1:B:251:ASP:HB2	2.01	0.42
1:E:10:GLY:HA3	1:E:319:PRO:HG2	2.02	0.42
1:E:79:GLU:H	1:E:79:GLU:CD	2.24	0.42
1:A:279:GLY:HA3	1:A:280:ASN:HA	1.92	0.41
1:H:242:LYS:HB3	1:H:242:LYS:HE2	1.83	0.41
1:B:448:ALA:HA	1:B:453:PHE:CD1	2.56	0.41
1:D:303:GLY:HA3	1:D:311:ARG:HE	1.85	0.41
1:G:238:ASP:O	1:G:242:LYS:HG3	2.21	0.41
1:D:296:ASN:OD1	1:D:296:ASN:N	2.51	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:471:SER:HA	1:F:311:ARG:HD2	2.02	0.41
1:H:368:ALA:HB3	1:H:422:VAL:HG21	2.02	0.41
1:C:303:GLY:HA3	1:C:311:ARG:HE	1.84	0.41
1:F:303:GLY:N	1:F:304:PRO:CD	2.84	0.41
1:G:52:ASP:HA	1:G:73:HIS:CD2	2.56	0.40
1:B:338:VAL:HG23	1:B:358:ALA:HA	2.02	0.40
1:A:56:GLU:HB3	1:A:57:ALA:H	1.74	0.40
1:A:303:GLY:HA3	1:A:311:ARG:NE	2.36	0.40
1:A:350:MET:HE2	1:A:350:MET:HB3	1.94	0.40
1:C:81:GLN:OE1	1:C:236:ARG:NH1	2.44	0.40
1:G:345:LYS:HG2	1:G:349:ASP:OD2	2.21	0.40
1:D:354:LEU:O	1:D:455:ARG:HG2	2.21	0.40
1:D:372:GLU:OE1	1:D:372:GLU:N	2.54	0.40
1:F:345:LYS:HE2	1:F:345:LYS:HB2	1.96	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	346/384 (90%)	336 (97%)	10 (3%)	0	100	100
1	B	347/384 (90%)	340 (98%)	7 (2%)	0	100	100
1	C	350/384 (91%)	341 (97%)	9 (3%)	0	100	100
1	D	348/384 (91%)	338 (97%)	10 (3%)	0	100	100
1	E	348/384 (91%)	336 (97%)	11 (3%)	1 (0%)	37	44
1	F	352/384 (92%)	342 (97%)	10 (3%)	0	100	100
1	G	346/384 (90%)	337 (97%)	9 (3%)	0	100	100
1	H	345/384 (90%)	338 (98%)	7 (2%)	0	100	100
All	All	2782/3072 (91%)	2708 (97%)	73 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	364	GLY

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	268/298 (90%)	266 (99%)	2 (1%)	81	89
1	B	269/298 (90%)	265 (98%)	4 (2%)	60	73
1	C	271/298 (91%)	268 (99%)	3 (1%)	70	80
1	D	269/298 (90%)	266 (99%)	3 (1%)	70	80
1	E	270/298 (91%)	267 (99%)	3 (1%)	70	80
1	F	273/298 (92%)	270 (99%)	3 (1%)	70	80
1	G	268/298 (90%)	264 (98%)	4 (2%)	60	73
1	H	267/298 (90%)	266 (100%)	1 (0%)	89	94
All	All	2155/2384 (90%)	2132 (99%)	23 (1%)	70	80

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	307	ILE
1	A	413	LEU
1	B	307	ILE
1	B	345	LYS
1	B	370	VAL
1	B	418	ILE
1	C	90	ARG
1	C	251	ASP
1	C	307	ILE
1	D	307	ILE
1	D	370	VAL
1	D	378	GLU
1	E	38	GLU

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	E	307	ILE
1	E	397	MET
1	F	41	GLN
1	F	307	ILE
1	F	370	VAL
1	G	263	LYS
1	G	307	ILE
1	G	366	MET
1	G	370	VAL
1	H	397	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	256	HIS
1	B	475	HIS
1	C	-1	ASN
1	C	41	GLN
1	C	381	GLN
1	C	475	HIS
1	D	256	HIS
1	D	258	GLN
1	D	433	HIS
1	D	477	GLN
1	F	475	HIS
1	G	258	GLN
1	G	334	HIS
1	H	384	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5   Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 24 ligands modelled in this entry, 8 are monoatomic - leaving 16 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	IMP	G	502	-	21,25,25	1.58	2 (9%)	22,38,38	1.51	5 (22%)
3	ZO4	D	503	-	35,35,35	1.06	4 (11%)	51,51,51	1.68	4 (7%)
2	IMP	A	501	-	21,25,25	1.57	2 (9%)	22,38,38	1.50	6 (27%)
3	ZO4	G	503	-	35,35,35	1.06	4 (11%)	51,51,51	1.58	3 (5%)
2	IMP	B	501	-	21,25,25	1.57	2 (9%)	22,38,38	1.50	5 (22%)
3	ZO4	A	502	-	35,35,35	1.12	5 (14%)	51,51,51	2.99	6 (11%)
2	IMP	H	502	-	21,25,25	1.56	2 (9%)	22,38,38	1.53	6 (27%)
3	ZO4	C	503	-	35,35,35	1.14	5 (14%)	51,51,51	3.14	6 (11%)
3	ZO4	F	502	-	35,35,35	1.05	4 (11%)	51,51,51	1.64	3 (5%)
2	IMP	F	501	-	21,25,25	1.57	2 (9%)	22,38,38	1.51	6 (27%)
3	ZO4	B	502	-	35,35,35	1.05	4 (11%)	51,51,51	1.74	4 (7%)
3	ZO4	H	503	-	35,35,35	1.06	5 (14%)	51,51,51	1.24	4 (7%)
3	ZO4	E	502	-	35,35,35	1.05	4 (11%)	51,51,51	1.40	5 (9%)
2	IMP	C	502	-	21,25,25	1.56	2 (9%)	22,38,38	1.49	6 (27%)
2	IMP	D	502	-	21,25,25	1.57	2 (9%)	22,38,38	1.51	5 (22%)
2	IMP	E	501	-	21,25,25	1.57	2 (9%)	22,38,38	1.52	5 (22%)

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	IMP	G	502	-	-	5/6/26/26	0/3/3/3
3	ZO4	D	503	-	-	0/23/40/40	0/3/3/3
2	IMP	A	501	-	-	5/6/26/26	0/3/3/3
3	ZO4	G	503	-	-	0/23/40/40	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	IMP	B	501	-	-	5/6/26/26	0/3/3/3
3	ZO4	A	502	-	-	2/23/40/40	0/3/3/3
2	IMP	H	502	-	-	4/6/26/26	0/3/3/3
3	ZO4	C	503	-	-	2/23/40/40	0/3/3/3
3	ZO4	F	502	-	-	0/23/40/40	0/3/3/3
2	IMP	F	501	-	-	5/6/26/26	0/3/3/3
3	ZO4	B	502	-	-	0/23/40/40	0/3/3/3
3	ZO4	H	503	-	-	1/23/40/40	0/3/3/3
3	ZO4	E	502	-	-	0/23/40/40	0/3/3/3
2	IMP	C	502	-	-	5/6/26/26	0/3/3/3
2	IMP	D	502	-	-	4/6/26/26	0/3/3/3
2	IMP	E	501	-	-	3/6/26/26	0/3/3/3

All (51) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	502	IMP	C2-N3	5.26	1.38	1.29
2	D	502	IMP	C2-N3	5.22	1.38	1.29
2	E	501	IMP	C2-N3	5.22	1.38	1.29
2	B	501	IMP	C2-N3	5.21	1.38	1.29
2	C	502	IMP	C2-N3	5.20	1.38	1.29
2	F	501	IMP	C2-N3	5.20	1.38	1.29
2	H	502	IMP	C2-N3	5.20	1.38	1.29
2	A	501	IMP	C2-N3	5.17	1.38	1.29
2	A	501	IMP	C5-C6	-3.97	1.39	1.47
2	F	501	IMP	C5-C6	-3.97	1.39	1.47
2	G	502	IMP	C5-C6	-3.97	1.39	1.47
2	E	501	IMP	C5-C6	-3.96	1.39	1.47
2	D	502	IMP	C5-C6	-3.93	1.39	1.47
2	B	501	IMP	C5-C6	-3.93	1.39	1.47
2	C	502	IMP	C5-C6	-3.92	1.39	1.47
2	H	502	IMP	C5-C6	-3.91	1.39	1.47
3	A	502	ZO4	C24-N1	3.19	1.47	1.42
3	C	503	ZO4	C24-N1	3.09	1.47	1.42
3	C	503	ZO4	C8-C7	-2.88	1.32	1.46
3	E	502	ZO4	C8-C7	-2.87	1.32	1.46
3	A	502	ZO4	C8-C7	-2.87	1.32	1.46
3	H	503	ZO4	C8-C7	-2.86	1.32	1.46
3	G	503	ZO4	C8-C7	-2.86	1.32	1.46
3	D	503	ZO4	C8-C7	-2.86	1.32	1.46

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	502	ZO4	C8-C7	-2.86	1.32	1.46
3	B	502	ZO4	C8-C7	-2.86	1.32	1.46
3	H	503	ZO4	C11-C1	-2.80	1.50	1.53
3	C	503	ZO4	C11-C1	-2.79	1.50	1.53
3	D	503	ZO4	C11-C1	-2.79	1.50	1.53
3	A	502	ZO4	C11-C1	-2.75	1.50	1.53
3	E	502	ZO4	C11-C1	-2.73	1.50	1.53
3	B	502	ZO4	C11-C1	-2.72	1.50	1.53
3	F	502	ZO4	C11-C1	-2.71	1.50	1.53
3	C	503	ZO4	C20-CL	2.70	1.80	1.73
3	H	503	ZO4	C20-CL	2.70	1.80	1.73
3	A	502	ZO4	C20-CL	2.70	1.80	1.73
3	G	503	ZO4	C20-CL	2.69	1.80	1.73
3	G	503	ZO4	C11-C1	-2.68	1.50	1.53
3	F	502	ZO4	C20-CL	2.66	1.79	1.73
3	D	503	ZO4	C20-CL	2.65	1.79	1.73
3	E	502	ZO4	C20-CL	2.62	1.79	1.73
3	B	502	ZO4	C20-CL	2.58	1.79	1.73
3	B	502	ZO4	C17-N4	-2.46	1.36	1.41
3	D	503	ZO4	C17-N4	-2.39	1.36	1.41
3	G	503	ZO4	C17-N4	-2.38	1.36	1.41
3	E	502	ZO4	C17-N4	-2.37	1.36	1.41
3	C	503	ZO4	C17-N4	-2.36	1.36	1.41
3	F	502	ZO4	C17-N4	-2.36	1.36	1.41
3	H	503	ZO4	C17-N4	-2.34	1.36	1.41
3	A	502	ZO4	C17-N4	-2.29	1.37	1.41
3	H	503	ZO4	C24-N1	2.18	1.46	1.42

All (79) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	503	ZO4	C20-C21-N1	-15.78	112.36	120.43
3	A	502	ZO4	C20-C21-N1	-14.64	112.95	120.43
3	C	503	ZO4	C21-N1-C24	13.53	136.58	123.18
3	A	502	ZO4	C21-N1-C24	13.46	136.51	123.18
3	B	502	ZO4	C25-C24-N1	-8.69	102.65	110.67
3	F	502	ZO4	C25-C24-N1	-8.17	103.12	110.67
3	D	503	ZO4	C25-C24-N1	-8.11	103.18	110.67
3	G	503	ZO4	C25-C24-N1	-7.89	103.39	110.67
3	E	502	ZO4	C25-C24-N1	-6.84	104.35	110.67
3	B	502	ZO4	C20-C21-N1	-6.69	117.01	120.43
3	D	503	ZO4	C20-C21-N1	-6.49	117.11	120.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	F	502	ZO4	C20-C21-N1	-6.15	117.28	120.43
3	G	503	ZO4	C20-C21-N1	-5.74	117.49	120.43
3	H	503	ZO4	C25-C24-N1	-5.08	105.98	110.67
3	C	503	ZO4	C22-C21-N1	4.20	128.50	121.90
3	E	502	ZO4	C20-C21-N1	-4.19	118.29	120.43
3	A	502	ZO4	C22-C21-N1	4.05	128.27	121.90
3	C	503	ZO4	C25-C24-N1	4.05	114.41	110.67
2	H	502	IMP	C8-N7-C5	3.72	108.89	102.55
2	B	501	IMP	C8-N7-C5	3.72	108.89	102.55
2	F	501	IMP	C8-N7-C5	3.72	108.88	102.55
2	C	502	IMP	C8-N7-C5	3.72	108.88	102.55
2	E	501	IMP	C8-N7-C5	3.72	108.88	102.55
2	D	502	IMP	C8-N7-C5	3.71	108.86	102.55
2	G	502	IMP	C8-N7-C5	3.70	108.86	102.55
2	A	501	IMP	C8-N7-C5	3.69	108.83	102.55
3	A	502	ZO4	C25-C24-N1	3.58	113.98	110.67
3	H	503	ZO4	C21-N1-C24	-3.26	119.95	123.18
2	B	501	IMP	C2-N1-C6	-2.98	119.84	123.42
2	C	502	IMP	C2-N1-C6	-2.92	119.91	123.42
2	E	501	IMP	C2-N1-C6	-2.87	119.97	123.42
2	G	502	IMP	C2-N1-C6	-2.87	119.97	123.42
2	D	502	IMP	C2-N1-C6	-2.79	120.07	123.42
2	F	501	IMP	C2-N1-C6	-2.78	120.08	123.42
2	H	502	IMP	C2-N1-C6	-2.76	120.11	123.42
2	B	501	IMP	C5-C6-N1	2.73	119.28	114.07
2	C	502	IMP	C5-C6-N1	2.73	119.28	114.07
2	A	501	IMP	C2-N1-C6	-2.72	120.16	123.42
2	D	502	IMP	C5-C6-N1	2.71	119.25	114.07
2	G	502	IMP	C5-C6-N1	2.69	119.19	114.07
2	E	501	IMP	C5-C6-N1	2.67	119.17	114.07
2	A	501	IMP	C5-C6-N1	2.67	119.16	114.07
2	H	502	IMP	C5-C6-N1	2.63	119.09	114.07
2	F	501	IMP	C5-C6-N1	2.61	119.04	114.07
2	H	502	IMP	O6-C6-C5	-2.57	119.22	124.32
2	E	501	IMP	O6-C6-C5	-2.57	119.23	124.32
2	G	502	IMP	O6-C6-C5	-2.57	119.23	124.32
2	F	501	IMP	O6-C6-C5	-2.54	119.28	124.32
3	H	503	ZO4	C11-N3-C10	2.49	129.19	124.01
2	D	502	IMP	O6-C6-C5	-2.48	119.40	124.32
3	C	503	ZO4	C11-N3-C10	2.47	129.14	124.01
2	A	501	IMP	O6-C6-C5	-2.44	119.47	124.32
3	H	503	ZO4	C12-C11-N3	2.43	114.17	107.88

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	502	ZO4	C11-N3-C10	2.41	129.02	124.01
3	B	502	ZO4	C22-C21-C20	2.30	120.57	118.21
2	A	501	IMP	N1-C2-N3	-2.29	120.26	125.75
2	D	502	IMP	N1-C2-N3	-2.29	120.26	125.75
2	B	501	IMP	O6-C6-C5	-2.28	119.80	124.32
3	F	502	ZO4	C22-C21-C20	2.27	120.53	118.21
3	E	502	ZO4	C11-N3-C10	2.26	128.71	124.01
3	D	503	ZO4	C22-C21-C20	2.24	120.50	118.21
3	D	503	ZO4	C11-N3-C10	2.23	128.64	124.01
2	H	502	IMP	N1-C2-N3	-2.23	120.41	125.75
2	F	501	IMP	N1-C2-N3	-2.22	120.43	125.75
2	G	502	IMP	N1-C2-N3	-2.22	120.43	125.75
3	G	503	ZO4	C22-C21-C20	2.20	120.46	118.21
3	E	502	ZO4	C12-C11-N3	2.20	113.58	107.88
2	E	501	IMP	N1-C2-N3	-2.18	120.53	125.75
2	C	502	IMP	O6-C6-C5	-2.16	120.03	124.32
2	C	502	IMP	N1-C2-N3	-2.16	120.56	125.75
2	B	501	IMP	N1-C2-N3	-2.15	120.59	125.75
3	A	502	ZO4	C12-C11-N3	2.13	113.40	107.88
3	B	502	ZO4	C11-N3-C10	2.13	128.43	124.01
3	E	502	ZO4	C22-C21-C20	2.05	120.30	118.21
2	A	501	IMP	O2P-P-O1P	2.04	118.79	110.83
2	H	502	IMP	O2P-P-O1P	2.03	118.73	110.83
2	F	501	IMP	O2P-P-O1P	2.02	118.70	110.83
3	C	503	ZO4	C17-N4-C10	2.02	130.73	126.61
2	C	502	IMP	O2P-P-O1P	2.02	118.69	110.83

There are no chirality outliers.

All (41) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	IMP	C5'-O5'-P-O1P
2	A	501	IMP	C5'-O5'-P-O2P
2	A	501	IMP	C5'-O5'-P-O3P
2	B	501	IMP	C5'-O5'-P-O1P
2	B	501	IMP	C5'-O5'-P-O2P
2	B	501	IMP	C5'-O5'-P-O3P
2	C	502	IMP	C5'-O5'-P-O1P
2	C	502	IMP	C5'-O5'-P-O2P
2	C	502	IMP	C5'-O5'-P-O3P
2	D	502	IMP	C5'-O5'-P-O3P
2	E	501	IMP	C5'-O5'-P-O2P

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
2	E	501	IMP	C5'-O5'-P-O3P
2	F	501	IMP	C5'-O5'-P-O1P
2	F	501	IMP	C5'-O5'-P-O2P
2	F	501	IMP	C5'-O5'-P-O3P
2	G	502	IMP	C5'-O5'-P-O1P
2	G	502	IMP	C5'-O5'-P-O2P
2	G	502	IMP	C5'-O5'-P-O3P
2	H	502	IMP	C5'-O5'-P-O2P
2	H	502	IMP	C5'-O5'-P-O3P
3	A	502	ZO4	C25-C24-N1-C21
3	C	503	ZO4	C25-C24-N1-C21
2	D	502	IMP	C5'-O5'-P-O1P
2	E	501	IMP	C5'-O5'-P-O1P
2	H	502	IMP	C5'-O5'-P-O1P
2	B	501	IMP	C3'-C4'-C5'-O5'
2	C	502	IMP	C3'-C4'-C5'-O5'
3	A	502	ZO4	O3-C24-N1-C21
3	C	503	ZO4	O3-C24-N1-C21
2	A	501	IMP	C3'-C4'-C5'-O5'
2	D	502	IMP	C5'-O5'-P-O2P
2	F	501	IMP	C3'-C4'-C5'-O5'
2	C	502	IMP	O4'-C4'-C5'-O5'
2	G	502	IMP	C3'-C4'-C5'-O5'
2	H	502	IMP	C3'-C4'-C5'-O5'
2	A	501	IMP	O4'-C4'-C5'-O5'
2	B	501	IMP	O4'-C4'-C5'-O5'
2	D	502	IMP	C3'-C4'-C5'-O5'
2	F	501	IMP	O4'-C4'-C5'-O5'
3	H	503	ZO4	C12-C11-N3-C10
2	G	502	IMP	O4'-C4'-C5'-O5'

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	502	IMP	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 IMP G 502

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 D 503

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP A 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 G 503	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand IMP B 501	
 Bond lengths	 Bond angles
 Torsions	 Rings

Ligand ZO4 A 502

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP H 502

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 C 503

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 F 502

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP F 501

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 B 502

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 H 503

Bond lengths

Bond angles

Torsions

Rings

Ligand ZO4 E 502

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP C 502

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP D 502

Bond lengths

Bond angles

Torsions

Rings

Ligand IMP E 501

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(Å²)	Q<0.9
1	A	350/384 (91%)	-0.26	5 (1%)	73	75	24, 37, 60, 89	0
1	B	350/384 (91%)	-0.25	4 (1%)	77	79	19, 35, 60, 80	1 (0%)
1	C	354/384 (92%)	-0.13	9 (2%)	58	60	25, 35, 63, 104	0
1	D	351/384 (91%)	-0.20	2 (0%)	85	87	24, 37, 63, 95	1 (0%)
1	E	352/384 (91%)	-0.18	2 (0%)	85	87	27, 38, 66, 90	0
1	F	355/384 (92%)	-0.06	8 (2%)	61	62	25, 40, 65, 101	1 (0%)
1	G	349/384 (90%)	-0.11	2 (0%)	85	87	18, 42, 67, 93	1 (0%)
1	H	349/384 (90%)	-0.11	2 (0%)	85	87	30, 43, 64, 91	0
All	All	2810/3072 (91%)	-0.16	34 (1%)	76	78	18, 39, 64, 104	4 (0%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	413	LEU	4.8
1	H	413	LEU	4.4
1	F	413	LEU	4.3
1	C	401	SER	3.7
1	F	-4	PHE	3.3
1	E	413	LEU	3.2
1	A	486	SER	3.1
1	D	413	LEU	2.9
1	C	-3	GLN	2.9
1	F	398	GLU	2.9
1	C	-4	PHE	2.8
1	F	-3	GLN	2.8
1	C	380	TYR	2.7
1	B	251	ASP	2.7
1	E	411	LYS	2.6
1	C	412	LYS	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	F	486	SER	2.6
1	D	476	VAL	2.5
1	F	401	SER	2.5
1	F	380	TYR	2.5
1	C	251	ASP	2.5
1	C	400	GLY	2.5
1	G	380	TYR	2.4
1	G	-1	ASN	2.4
1	B	411	LYS	2.3
1	H	412	LYS	2.3
1	A	24	ASP	2.3
1	A	411	LYS	2.2
1	C	486	SER	2.2
1	A	232	ASP	2.1
1	B	380	TYR	2.1
1	B	24	ASP	2.0
1	F	-1	ASN	2.0
1	A	413	LEU	2.0

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

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

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	ZO4	A	502	33/33	0.82	0.15	27,35,65,72	33
3	ZO4	D	503	33/33	0.84	0.16	24,34,65,68	33
3	ZO4	H	503	33/33	0.85	0.14	30,44,80,82	0
3	ZO4	B	502	33/33	0.86	0.14	27,34,69,70	33
3	ZO4	F	502	33/33	0.88	0.13	26,40,64,68	33

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\mathring{A}^2$)	Q<0.9
3	ZO4	E	502	33/33	0.88	0.12	26,37,66,76	0
3	ZO4	G	503	33/33	0.89	0.12	31,42,70,75	0
3	ZO4	C	503	33/33	0.90	0.11	23,33,61,65	33
2	IMP	F	501	23/23	0.93	0.09	31,35,38,45	0
2	IMP	G	502	23/23	0.94	0.09	29,34,38,42	0
2	IMP	H	502	23/23	0.94	0.09	29,37,40,41	0
2	IMP	E	501	23/23	0.95	0.08	27,32,36,41	0
2	IMP	A	501	23/23	0.96	0.07	25,33,36,38	0
2	IMP	B	501	23/23	0.96	0.07	23,31,35,35	0
2	IMP	C	502	23/23	0.96	0.08	23,28,33,37	0
2	IMP	D	502	23/23	0.96	0.07	24,32,35,36	0
4	K	A	503	1/1	0.98	0.04	34,34,34,34	0
4	K	C	501	1/1	0.98	0.09	37,37,37,37	0
4	K	D	501	1/1	0.98	0.05	30,30,30,30	0
4	K	E	503	1/1	0.98	0.04	35,35,35,35	0
4	K	F	503	1/1	0.98	0.10	37,37,37,37	0
4	K	G	501	1/1	0.98	0.03	30,30,30,30	0
4	K	B	503	1/1	0.99	0.07	31,31,31,31	0
4	K	H	501	1/1	0.99	0.04	33,33,33,33	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.
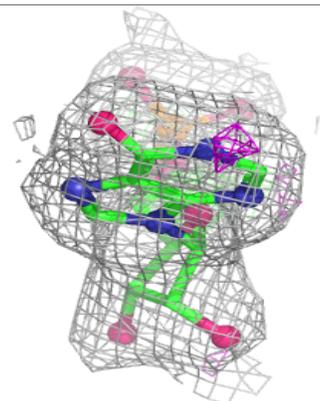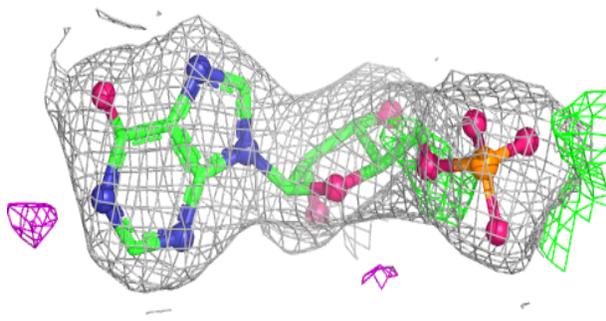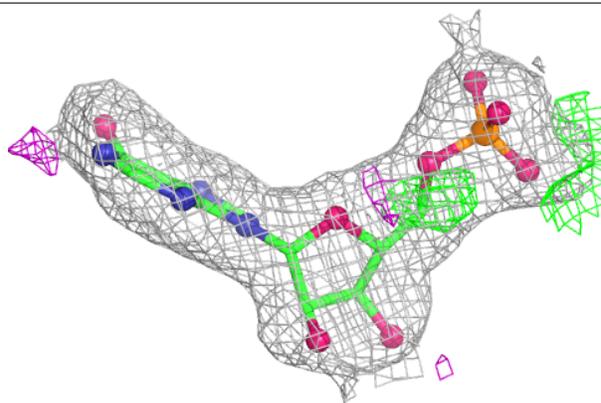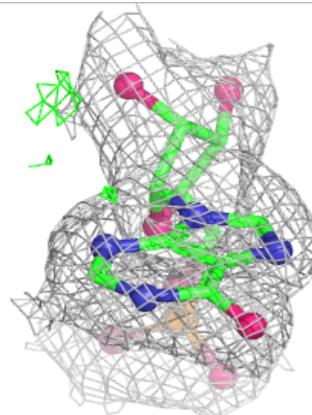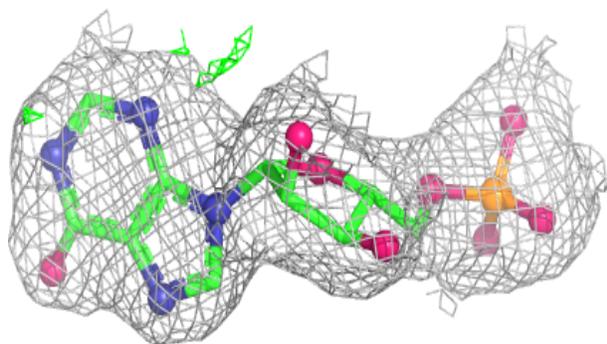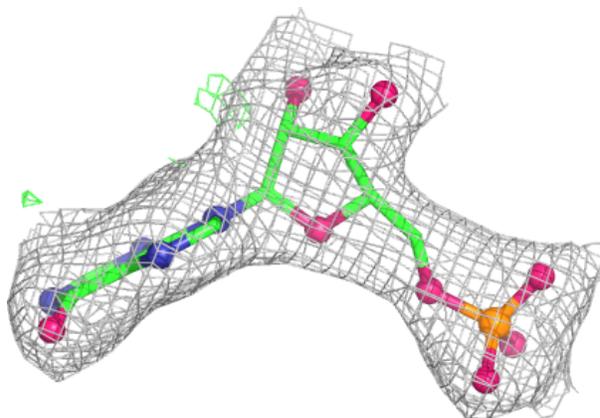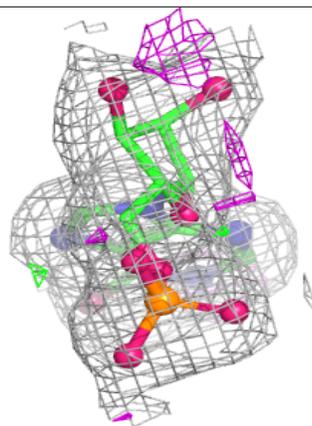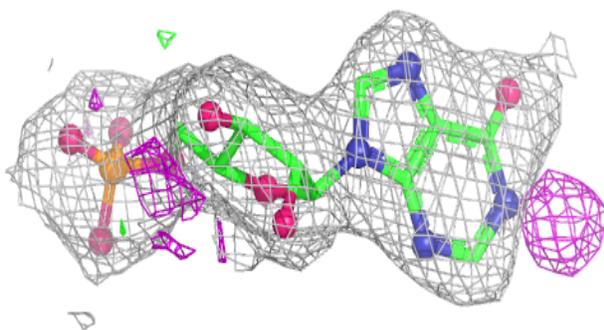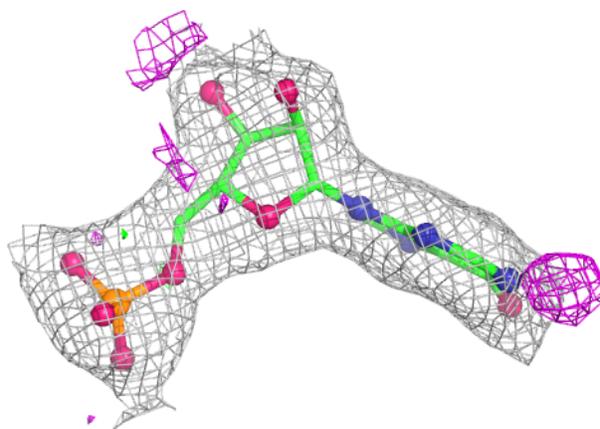
Electron density around ZO4 A 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
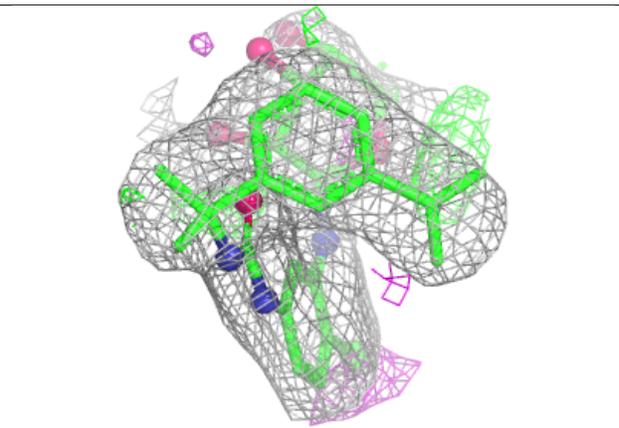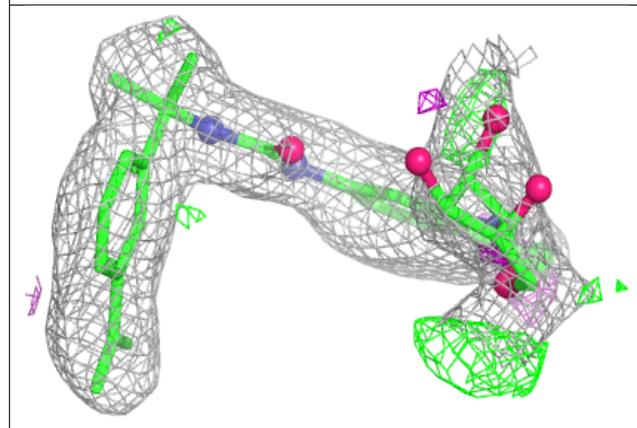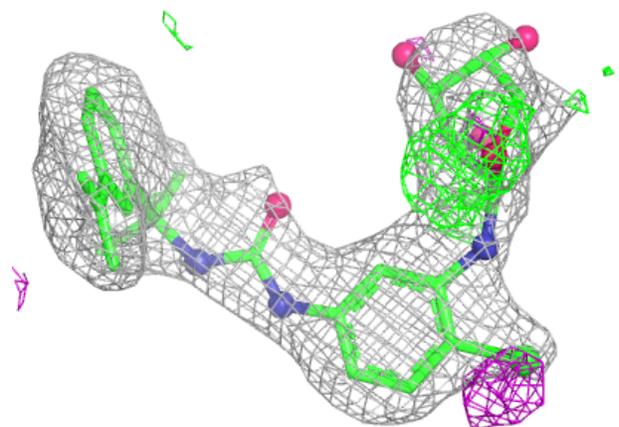
Electron density around ZO4 D 503:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
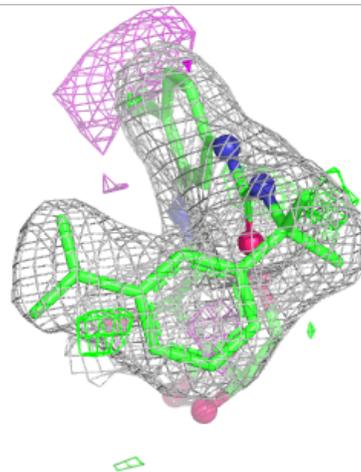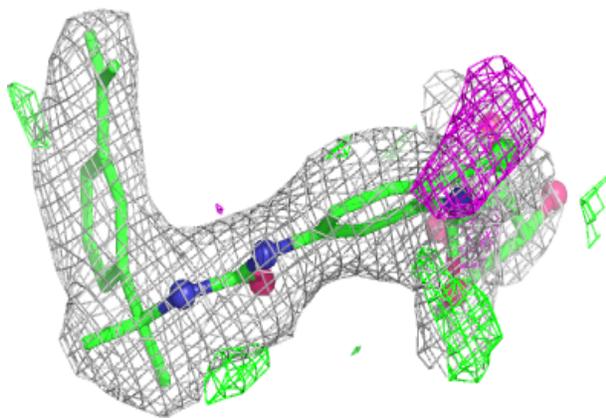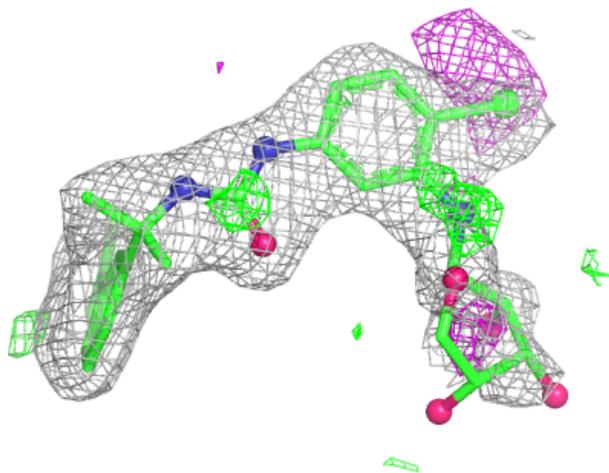
Electron density around ZO4 H 503:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
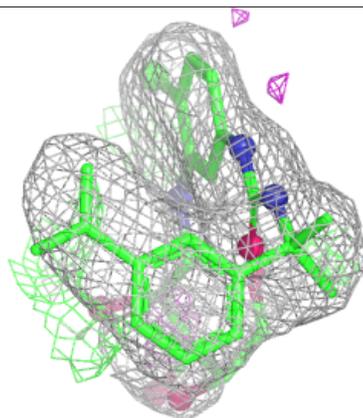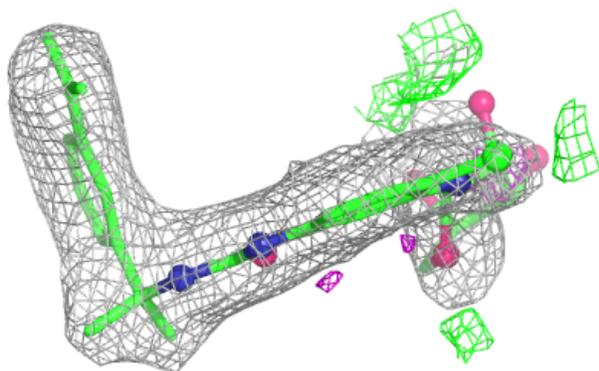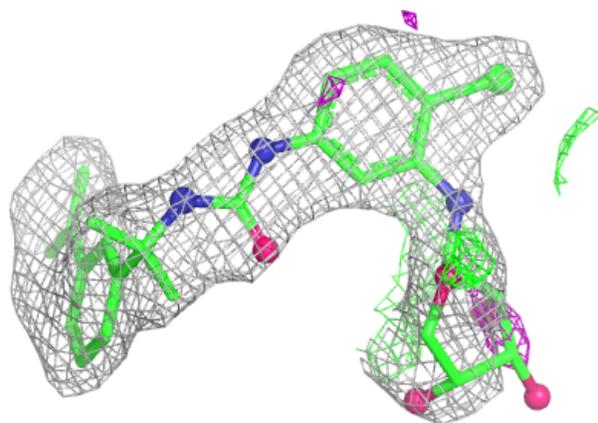
Electron density around ZO4 B 502:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
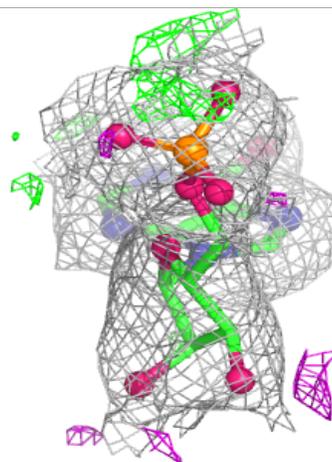$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
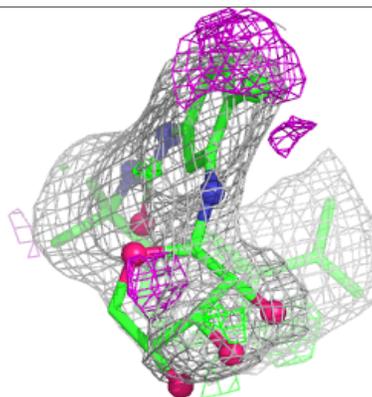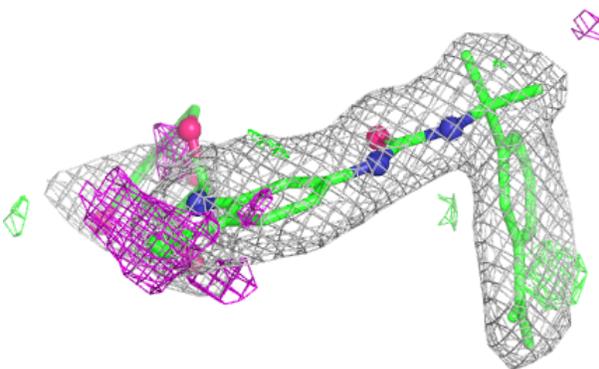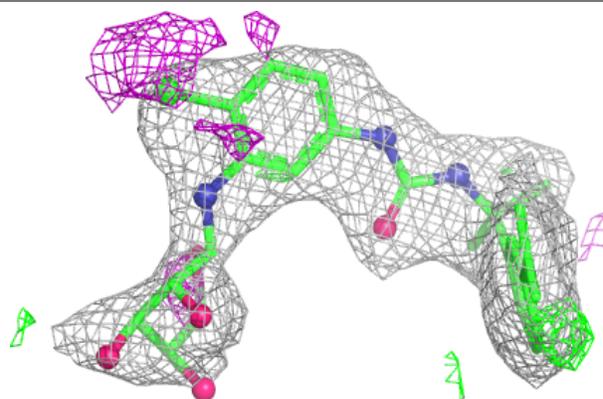
Electron density around ZO4 F 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
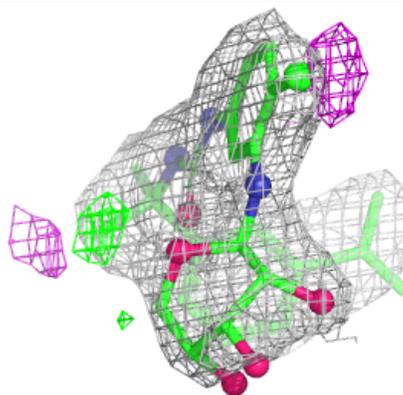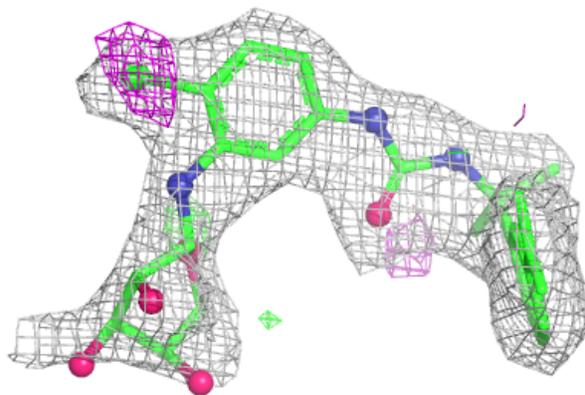
Electron density around ZO4 E 502:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
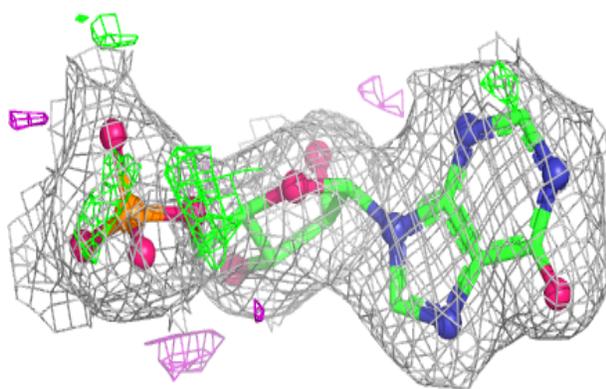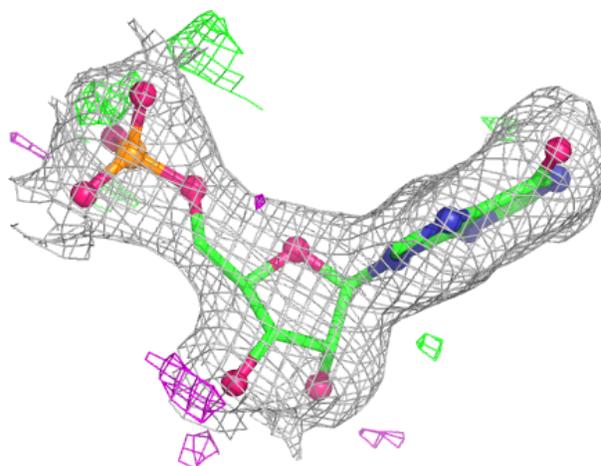and green (positive)
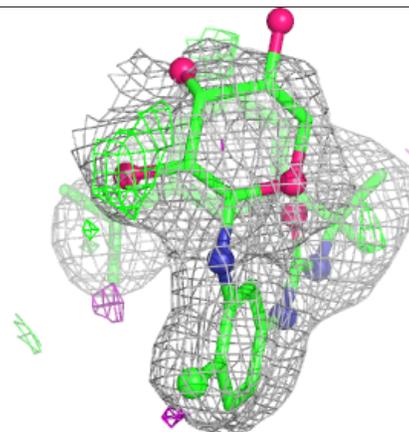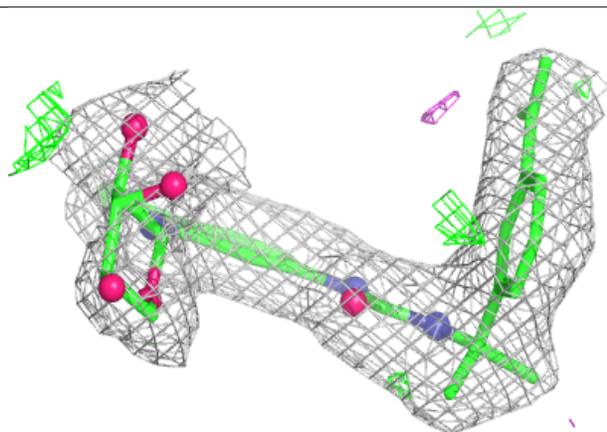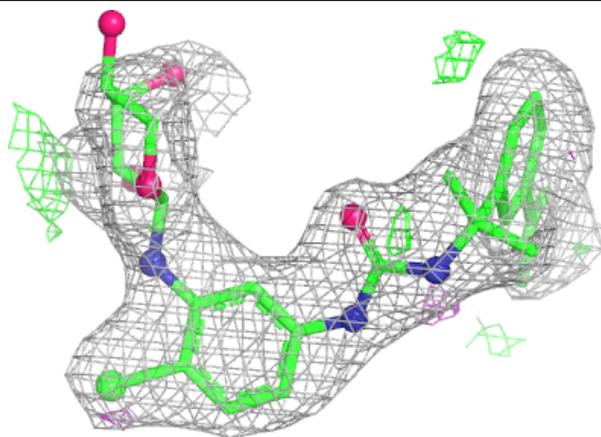
Electron density around ZO4 G 503:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
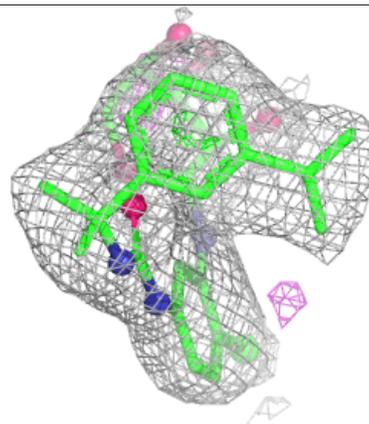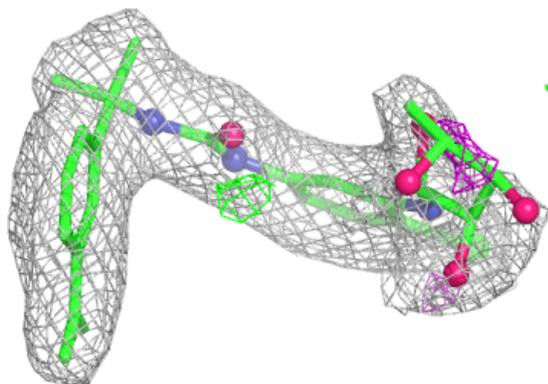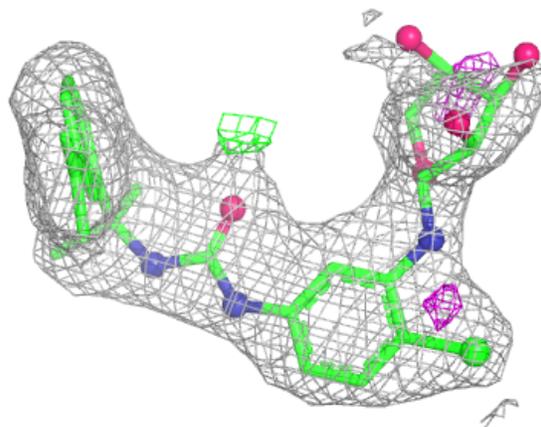
Electron density around ZO4 C 503:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
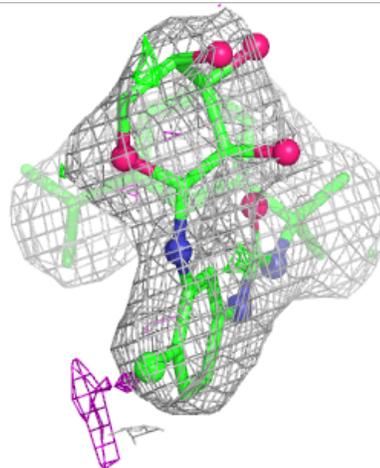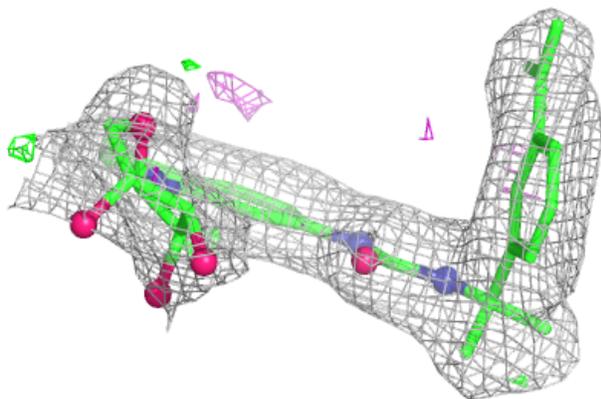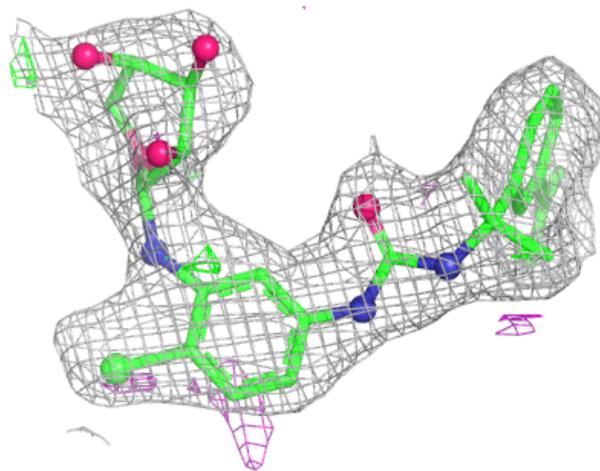
Electron density around IMP F 501:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
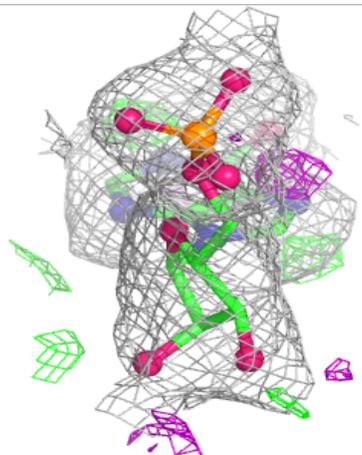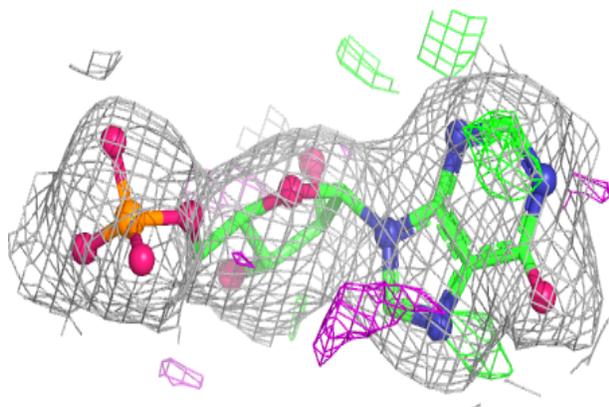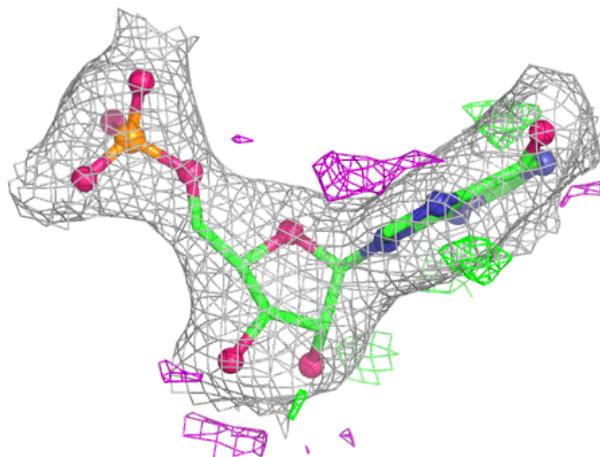
Electron density around IMP G 502:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
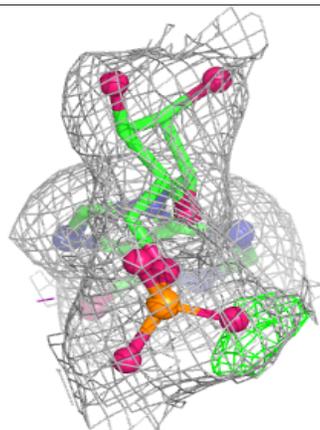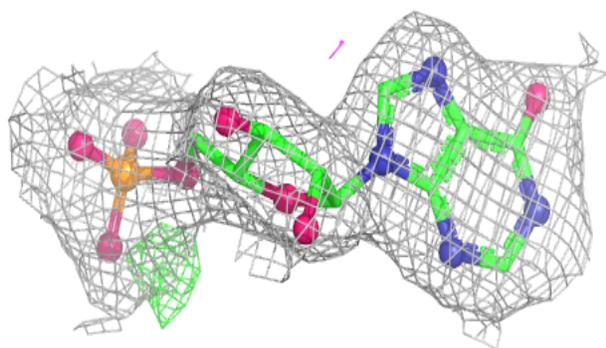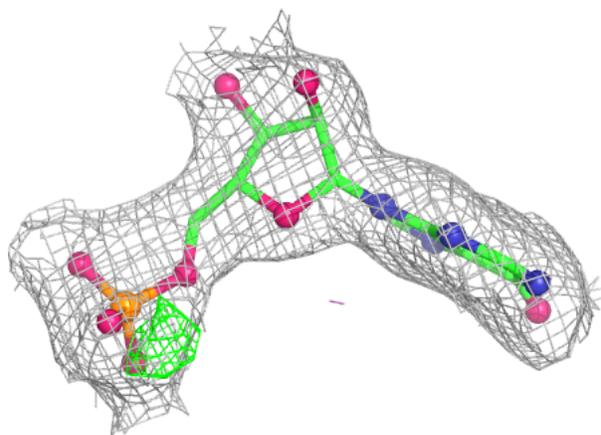
Electron density around IMP H 502:

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 IMP E 501:

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 IMP A 501:

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

Electron density around IMP B 501:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
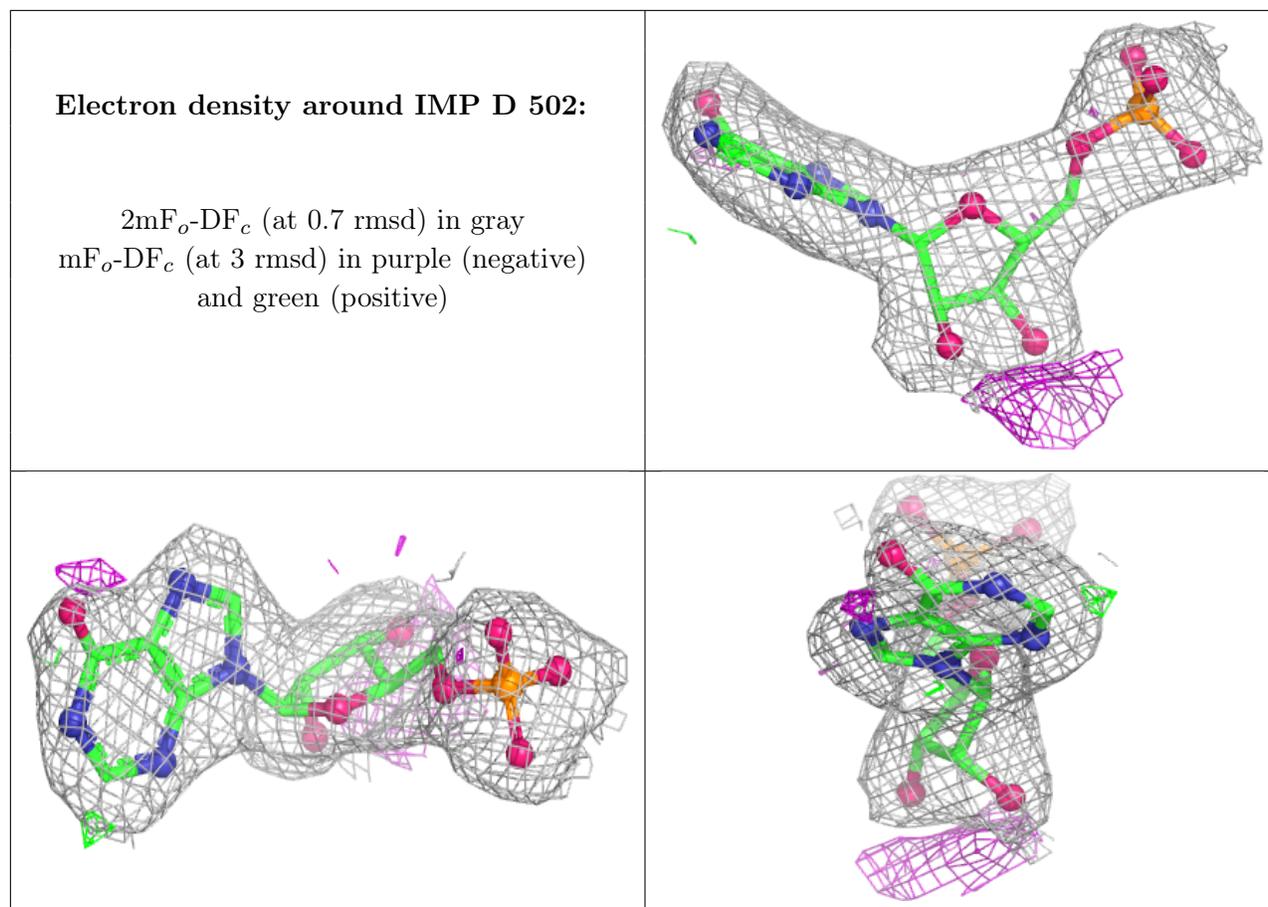
Electron density around IMP C 502:

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

Electron density around IMP D 502:

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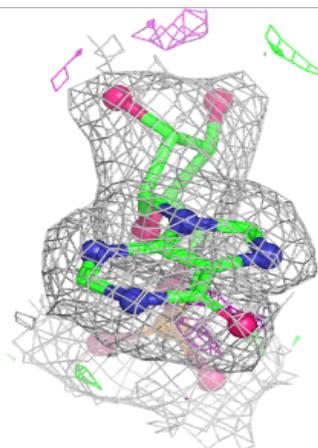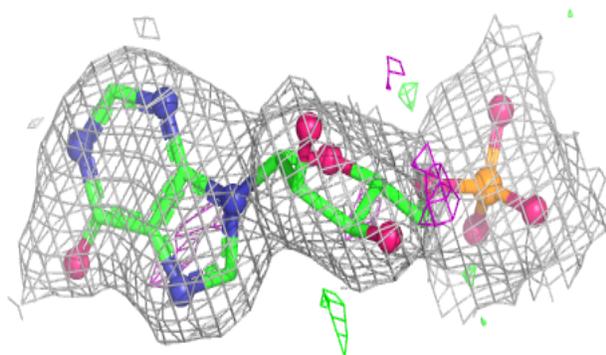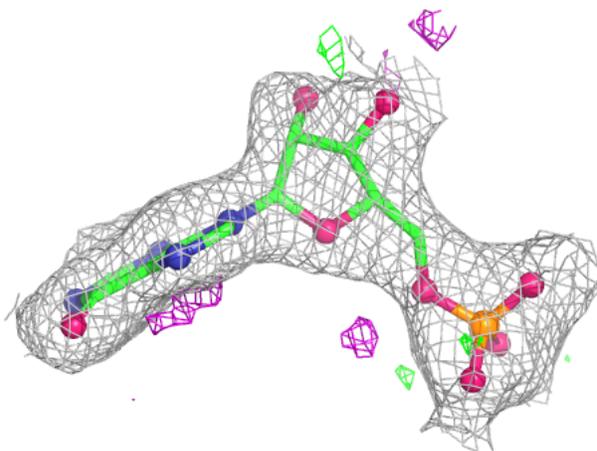
6.5 Other polymers (i)

There are no such residues in this entry.