



# wwPDB X-ray Structure Validation Summary Report ⓘ

Jan 31, 2016 – 09:40 PM GMT

PDB ID : 1Q1G  
Title : Crystal structure of Plasmodium falciparum PNP with 5'-methylthio-immucillin-H  
Authors : Shi, W.; Ting, L.M.; Kicska, G.A.; Lewandowicz, A.; Tyler, P.C.; Evans, G.B.; Furneaux, R.H.; Kim, K.; Almo, S.C.; Schramm, V.L.  
Deposited on : 2003-07-19  
Resolution : 2.02 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.  
We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

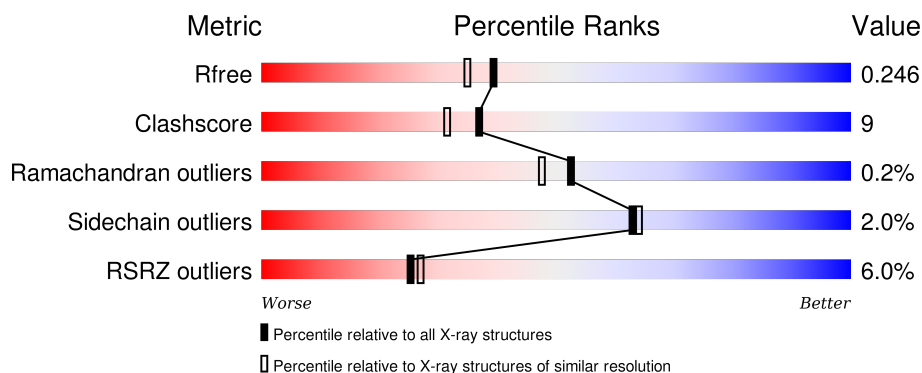
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.02 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	91344	7858 (2.04-2.00)
Clashscore	102246	9060 (2.04-2.00)
Ramachandran outliers	100387	8952 (2.04-2.00)
Sidechain outliers	100360	8951 (2.04-2.00)
RSRZ outliers	91569	7873 (2.04-2.00)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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  $\leq 5\%$ . 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	276	<div> <div>5%</div> <div>72% 15% 12%</div> </div>
1	B	276	<div> <div>9%</div> <div>71% 16% 12%</div> </div>
1	C	276	<div> <div>6%</div> <div>69% 18% 12%</div> </div>
1	D	276	<div> <div>4%</div> <div>67% 21% 12%</div> </div>
1	E	276	<div> <div>6%</div> <div>69% 18% 12%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	276	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	IPA	A	503	-	-	-	X
4	IPA	B	502	-	-	-	X
4	IPA	B	508	-	-	-	X
4	IPA	D	507	-	-	-	X
4	IPA	E	506	-	-	-	X
4	IPA	F	505	-	-	-	X

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 11789 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 Uridine phosphorylase putative.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			
1	B	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			
1	C	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			
1	D	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			
1	E	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			
1	F	243	Total	C	N	O	S	0	0	0
			1861	1179	319	347	16			

There are 186 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
A	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
A	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
A	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
A	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
A	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
A	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
A	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
A	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
A	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
A	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
A	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
A	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
A	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
A	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
A	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
A	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4

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Chain	Residue	Modelled	Actual	Comment	Reference
A	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
A	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
A	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
A	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
A	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
A	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
A	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
A	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
A	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
A	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
A	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4
A	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
A	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4
A	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4
B	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
B	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
B	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
B	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
B	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
B	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
B	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
B	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
B	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
B	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
B	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
B	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
B	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
B	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
B	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
B	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
B	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
B	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
B	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
B	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
B	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
B	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
B	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
B	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
B	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
B	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
B	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
B	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4

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Chain	Residue	Modelled	Actual	Comment	Reference
B	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
B	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4
B	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
C	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
C	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
C	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
C	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
C	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
C	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
C	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
C	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
C	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
C	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
C	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
C	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
C	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
C	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
C	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
C	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
C	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
C	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
C	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
C	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
C	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
C	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
C	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
C	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
C	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4
C	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
D	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
D	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
D	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
D	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
D	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
D	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
D	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4

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Chain	Residue	Modelled	Actual	Comment	Reference
D	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
D	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
D	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
D	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
D	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
D	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
D	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
D	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
D	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
D	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
D	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
D	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
D	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
D	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
D	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
D	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
D	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
D	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4
D	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
E	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
E	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
E	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
E	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
E	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
E	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
E	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
E	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
E	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
E	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
E	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
E	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
E	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
E	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
E	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
E	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
E	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
E	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4

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Chain	Residue	Modelled	Actual	Comment	Reference
E	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
E	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
E	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
E	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
E	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
E	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
E	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4
E	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4
F	0	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
F	1	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
F	246	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
F	247	GLY	-	CLONING ARTIFACT	UNP Q8I3X4
F	248	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
F	249	PHE	-	CLONING ARTIFACT	UNP Q8I3X4
F	250	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
F	251	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
F	252	TYR	-	CLONING ARTIFACT	UNP Q8I3X4
F	253	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
F	254	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
F	255	GLN	-	CLONING ARTIFACT	UNP Q8I3X4
F	256	LYS	-	CLONING ARTIFACT	UNP Q8I3X4
F	257	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
F	258	ILE	-	CLONING ARTIFACT	UNP Q8I3X4
F	259	SER	-	CLONING ARTIFACT	UNP Q8I3X4
F	260	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
F	261	GLU	-	CLONING ARTIFACT	UNP Q8I3X4
F	262	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
F	263	LEU	-	CLONING ARTIFACT	UNP Q8I3X4
F	264	ASN	-	CLONING ARTIFACT	UNP Q8I3X4
F	265	SER	-	CLONING ARTIFACT	UNP Q8I3X4
F	266	ALA	-	CLONING ARTIFACT	UNP Q8I3X4
F	267	VAL	-	CLONING ARTIFACT	UNP Q8I3X4
F	268	ASP	-	CLONING ARTIFACT	UNP Q8I3X4
F	269	HIS	-	EXPRESSION TAG	UNP Q8I3X4
F	270	HIS	-	EXPRESSION TAG	UNP Q8I3X4
F	271	HIS	-	EXPRESSION TAG	UNP Q8I3X4
F	272	HIS	-	EXPRESSION TAG	UNP Q8I3X4
F	273	HIS	-	EXPRESSION TAG	UNP Q8I3X4

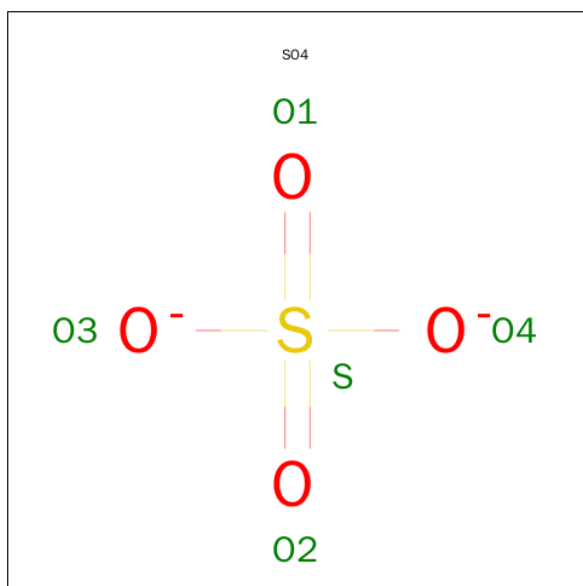
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Chain	Residue	Modelled	Actual	Comment	Reference
F	274	HIS	-	EXPRESSION TAG	UNP Q8I3X4

- Molecule 2 is SULFATE ION (three-letter code: SO<sub>4</sub>) (formula: O<sub>4</sub>S).



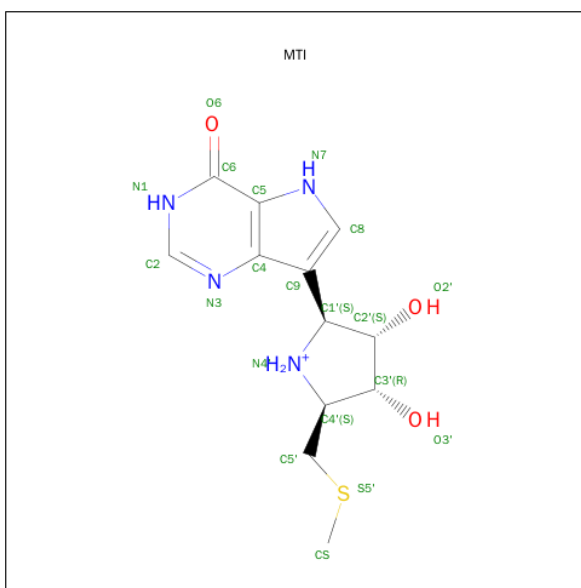
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		

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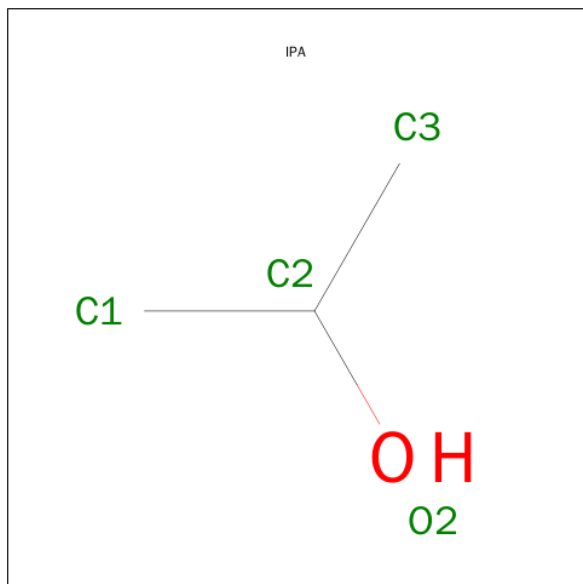
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	D	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is 3,4-DIHYDROXY-2-[(METHYLSULFANYL)METHYL]-5-(4-OXO-4,5-DIHYDRO-3H-PYRROLO[3,2-D]PYRIMIDIN-7-YL)PYRROLIDINIUM (three-letter code: MTI) (formula: C<sub>12</sub>H<sub>17</sub>N<sub>4</sub>O<sub>3</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	S	0	0
			20	12	4	3	1		
3	B	1	Total	C	N	O	S	0	0
			20	12	4	3	1		
3	C	1	Total	C	N	O	S	0	0
			20	12	4	3	1		
3	D	1	Total	C	N	O	S	0	0
			20	12	4	3	1		
3	E	1	Total	C	N	O	S	0	0
			20	12	4	3	1		
3	F	1	Total	C	N	O	S	0	0
			20	12	4	3	1		

- Molecule 4 is ISOPROPYL ALCOHOL (three-letter code: IPA) (formula: C<sub>3</sub>H<sub>8</sub>O).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	B	1	Total	C	O	0	0
			4	3	1		
4	B	1	Total	C	O	0	0
			4	3	1		
4	A	1	Total	C	O	0	0
			4	3	1		
4	F	1	Total	C	O	0	0
			4	3	1		
4	F	1	Total	C	O	0	0
			4	3	1		
4	E	1	Total	C	O	0	0
			4	3	1		

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

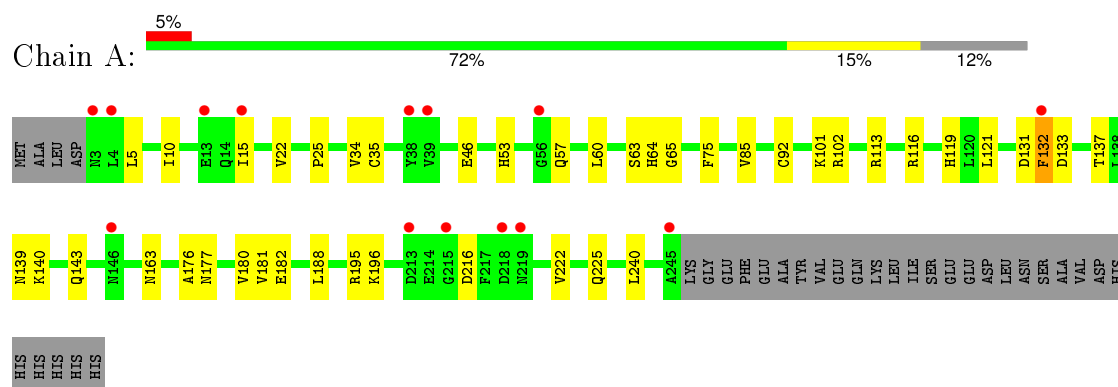
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	56	Total	O	0	0
			56	56		
5	B	45	Total	O	0	0
			45	45		
5	C	51	Total	O	0	0
			51	51		
5	D	61	Total	O	0	0
			61	61		
5	E	65	Total	O	0	0
			65	65		
5	F	79	Total	O	0	0
			79	79		

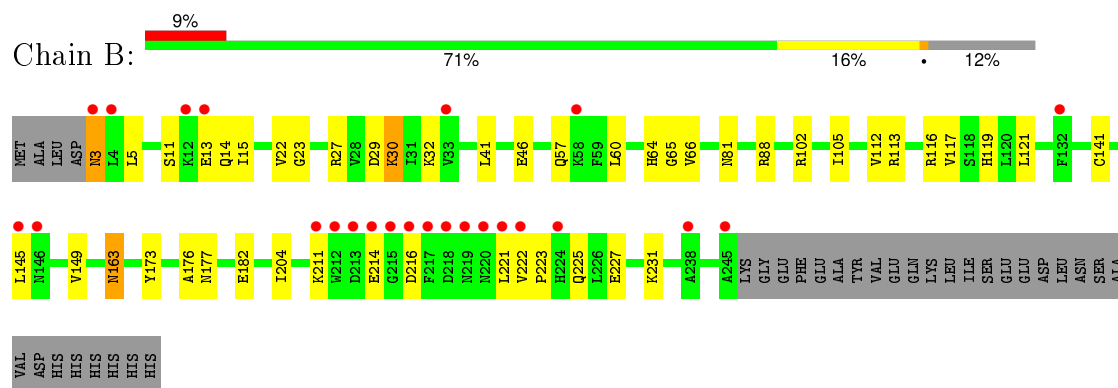
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

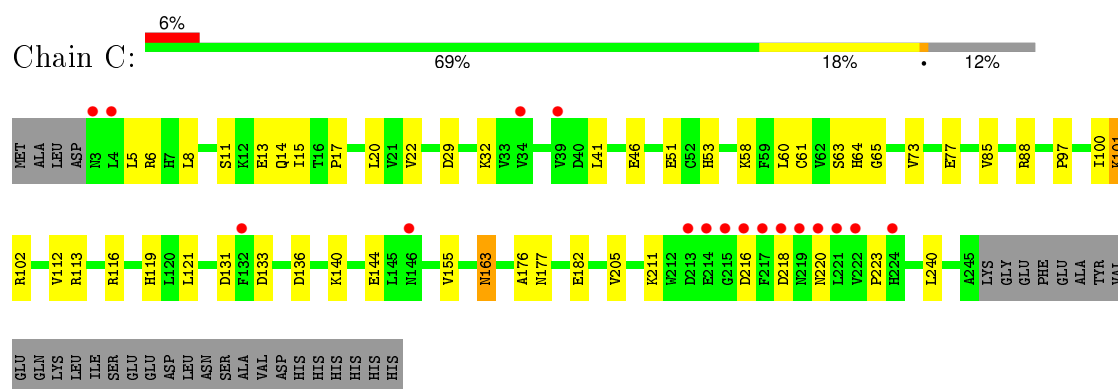
- Molecule 1: Uridine phosphorylase putative



- Molecule 1: Uridine phosphorylase putative



- Molecule 1: Uridine phosphorylase putative



[illegible]

Chain E:

6% 69% 18% 12%

ALA TRP VAL GLN GLN LYS LEU LEU SER SER ASP ASP ASN ASN VAL ASP HIS HIS HIS HIS HIS HIS L121 D131 F132 D133 L138 M139 K140 E144 V147 S157 D158 M163 E182 L188 I202 V205 D206 F211 F212 D213 E214 G215 D216 F217 D218 N219 L219 N220 P223 H224 Q225 N228 I232 A238 F239 L240 A241 T242 F243 Y244 A245 LYS GLY GLU PHE C119

MET LEU LEU ASP H3 L4 L5 I10 I11 K12 E13 Q14 I15 V22 V28 I31 V34 E46 Y47 K48 Q57 L60 S63 H64 G65 F75 E76 E77 V85 A89 D88 L99 I100 K101 R102 I107 C108 M109 R113 E114 D115 R116 H120

Chain F:

Residue Type	Count
Green	70
Yellow	17
Grey	12

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	86.44Å 91.73Å 238.94Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.02 45.87 – 2.02	Depositor EDS
% Data completeness (in resolution range)	88.8 (30.00-2.02) 91.5 (45.87-2.02)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.05	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.97 (at 2.03Å)	Xtriage
Refinement program	CNS 1.0	Depositor
R, $R_{free}$	0.211 , 0.242 0.215 , 0.246	Depositor DCC
$R_{free}$ test set	11400 reflections (10.01%)	DCC
Wilson B-factor (Å <sup>2</sup> )	23.0	Xtriage
Anisotropy	0.478	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 53.6	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.30$	Xtriage
Outliers	0 of 113901 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	11789	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.44% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MTI, IPA, SO4

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	0.32	0/1893	0.58	0/2561
1	B	0.30	0/1893	0.56	0/2561
1	C	0.31	0/1893	0.57	0/2561
1	D	0.31	0/1893	0.59	0/2561
1	E	0.33	0/1893	0.59	0/2561
1	F	0.33	0/1893	0.59	0/2561
All	All	0.32	0/11358	0.58	0/15366

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 [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1861	0	1882	35	0
1	B	1861	0	1882	38	0
1	C	1861	0	1882	35	0
1	D	1861	0	1882	41	0
1	E	1861	0	1882	38	0
1	F	1861	0	1882	40	0
2	A	20	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	20	0	0	0	0
2	C	15	0	0	0	0
2	D	20	0	0	1	0
2	E	15	0	0	0	0
2	F	20	0	0	0	0
3	A	20	0	17	0	0
3	B	20	0	17	2	0
3	C	20	0	17	1	0
3	D	20	0	17	0	0
3	E	20	0	17	2	0
3	F	20	0	17	1	0
4	A	4	0	8	0	0
4	B	12	0	24	1	0
4	D	8	0	16	1	0
4	E	4	0	8	0	0
4	F	8	0	16	1	0
5	A	56	0	0	2	0
5	B	45	0	0	1	0
5	C	51	0	0	1	0
5	D	61	0	0	3	0
5	E	65	0	0	3	0
5	F	79	0	0	2	0
All	All	11789	0	11466	215	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 9.

The worst 5 of 215 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:5:LEU:HD11	1:C:15:ILE:HD11	1.49	0.94
1:D:163:ASN:HD22	1:D:164:LYS:H	1.20	0.89
1:E:102:ARG:HH11	1:E:102:ARG:HB2	1.37	0.86
1:A:133:ASP:O	1:A:137:THR:HG23	1.76	0.84
1:B:5:LEU:HD11	1:B:15:ILE:HD11	1.61	0.83

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	241/276 (87%)	231 (96%)	10 (4%)	0	100	100
1	B	241/276 (87%)	234 (97%)	6 (2%)	1 (0%)	39	32
1	C	241/276 (87%)	228 (95%)	12 (5%)	1 (0%)	39	32
1	D	241/276 (87%)	230 (95%)	11 (5%)	0	100	100
1	E	241/276 (87%)	234 (97%)	6 (2%)	1 (0%)	39	32
1	F	241/276 (87%)	233 (97%)	8 (3%)	0	100	100
All	All	1446/1656 (87%)	1390 (96%)	53 (4%)	3 (0%)	52	47

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	223	PRO
1	E	223	PRO
1	C	223	PRO

### 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	206/235 (88%)	203 (98%)	3 (2%)	72	74
1	B	206/235 (88%)	201 (98%)	5 (2%)	57	56
1	C	206/235 (88%)	202 (98%)	4 (2%)	65	66
1	D	206/235 (88%)	203 (98%)	3 (2%)	72	74

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	206/235 (88%)	201 (98%)	5 (2%)	57	56
1	F	206/235 (88%)	201 (98%)	5 (2%)	57	56
All	All	1236/1410 (88%)	1211 (98%)	25 (2%)	63	64

5 of 25 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	182	GLU
1	D	163	ASN
1	F	180	VAL
1	D	121	LEU
1	D	182	GLU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 30 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	228	ASN
1	D	64	HIS
1	F	64	HIS
1	D	57	GLN
1	D	119	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

37 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
3	MTI	A	301	-	21,22,22	2.70	10 (47%)	11,32,32	3.66	4 (36%)
2	SO4	A	401	-	4,4,4	3.22	2 (50%)	6,6,6	0.95	0
2	SO4	A	413	-	4,4,4	3.25	2 (50%)	6,6,6	0.96	0
2	SO4	A	414	-	4,4,4	3.26	2 (50%)	6,6,6	0.95	0
2	SO4	A	418	-	4,4,4	3.28	2 (50%)	6,6,6	0.97	0
4	IPA	A	503	-	3,3,3	0.27	0	3,3,3	0.36	0
3	MTI	B	302	-	21,22,22	2.67	10 (47%)	11,32,32	3.76	4 (36%)
2	SO4	B	402	-	4,4,4	3.20	2 (50%)	6,6,6	1.01	0
2	SO4	B	407	-	4,4,4	3.16	2 (50%)	6,6,6	1.01	0
2	SO4	B	410	-	4,4,4	3.26	2 (50%)	6,6,6	0.97	0
2	SO4	B	417	-	4,4,4	3.24	2 (50%)	6,6,6	0.96	0
4	IPA	B	501	-	3,3,3	0.26	0	3,3,3	0.34	0
4	IPA	B	502	-	3,3,3	0.29	0	3,3,3	0.34	0
4	IPA	B	508	-	3,3,3	0.32	0	3,3,3	0.35	0
3	MTI	C	303	-	21,22,22	2.57	10 (47%)	11,32,32	3.85	4 (36%)
2	SO4	C	403	-	4,4,4	3.21	2 (50%)	6,6,6	0.94	0
2	SO4	C	416	-	4,4,4	3.21	2 (50%)	6,6,6	0.91	0
2	SO4	C	422	-	4,4,4	3.27	2 (50%)	6,6,6	0.94	0
3	MTI	D	304	-	21,22,22	2.58	9 (42%)	11,32,32	3.81	4 (36%)
2	SO4	D	404	-	4,4,4	3.25	2 (50%)	6,6,6	0.94	0
2	SO4	D	408	-	4,4,4	3.08	2 (50%)	6,6,6	0.95	0
2	SO4	D	412	-	4,4,4	3.26	2 (50%)	6,6,6	0.95	0
2	SO4	D	421	-	4,4,4	3.32	2 (50%)	6,6,6	0.96	0
4	IPA	D	507	-	3,3,3	0.26	0	3,3,3	0.33	0
4	IPA	D	509	-	3,3,3	0.28	0	3,3,3	0.33	0
3	MTI	E	305	-	21,22,22	2.63	10 (47%)	11,32,32	3.70	4 (36%)
2	SO4	E	405	-	4,4,4	3.23	2 (50%)	6,6,6	0.97	0
2	SO4	E	415	-	4,4,4	3.16	2 (50%)	6,6,6	0.95	0
2	SO4	E	420	-	4,4,4	3.27	2 (50%)	6,6,6	0.97	0
4	IPA	E	506	-	3,3,3	0.21	0	3,3,3	0.32	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	MTI	F	306	-	21,22,22	2.57	10 (47%)	11,32,32	3.76	4 (36%)
2	SO4	F	406	-	4,4,4	3.17	2 (50%)	6,6,6	0.91	0
2	SO4	F	409	-	4,4,4	3.20	2 (50%)	6,6,6	0.98	0
2	SO4	F	411	-	4,4,4	3.17	2 (50%)	6,6,6	0.95	0
2	SO4	F	419	-	4,4,4	3.28	2 (50%)	6,6,6	0.99	0
4	IPA	F	504	-	3,3,3	0.26	0	3,3,3	0.31	0
4	IPA	F	505	-	3,3,3	0.29	0	3,3,3	0.34	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the chemical component dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	MTI	A	301	-	-	0/3/23/23	0/3/3/3
2	SO4	A	401	-	-	0/0/0/0	0/0/0/0
2	SO4	A	413	-	-	0/0/0/0	0/0/0/0
2	SO4	A	414	-	-	0/0/0/0	0/0/0/0
2	SO4	A	418	-	-	0/0/0/0	0/0/0/0
4	IPA	A	503	-	-	0/0/0/0	0/0/0/0
3	MTI	B	302	-	-	0/3/23/23	0/3/3/3
2	SO4	B	402	-	-	0/0/0/0	0/0/0/0
2	SO4	B	407	-	-	0/0/0/0	0/0/0/0
2	SO4	B	410	-	-	0/0/0/0	0/0/0/0
2	SO4	B	417	-	-	0/0/0/0	0/0/0/0
4	IPA	B	501	-	-	0/0/0/0	0/0/0/0
4	IPA	B	502	-	-	0/0/0/0	0/0/0/0
4	IPA	B	508	-	-	0/0/0/0	0/0/0/0
3	MTI	C	303	-	-	0/3/23/23	0/3/3/3
2	SO4	C	403	-	-	0/0/0/0	0/0/0/0
2	SO4	C	416	-	-	0/0/0/0	0/0/0/0
2	SO4	C	422	-	-	0/0/0/0	0/0/0/0
3	MTI	D	304	-	-	0/3/23/23	0/3/3/3
2	SO4	D	404	-	-	0/0/0/0	0/0/0/0
2	SO4	D	408	-	-	0/0/0/0	0/0/0/0
2	SO4	D	412	-	-	0/0/0/0	0/0/0/0
2	SO4	D	421	-	-	0/0/0/0	0/0/0/0
4	IPA	D	507	-	-	0/0/0/0	0/0/0/0
4	IPA	D	509	-	-	0/0/0/0	0/0/0/0
3	MTI	E	305	-	-	0/3/23/23	0/3/3/3
2	SO4	E	405	-	-	0/0/0/0	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	SO4	E	415	-	-	0/0/0/0	0/0/0/0
2	SO4	E	420	-	-	0/0/0/0	0/0/0/0
4	IPA	E	506	-	-	0/0/0/0	0/0/0/0
3	MTI	F	306	-	-	0/3/23/23	0/3/3/3
2	SO4	F	406	-	-	0/0/0/0	0/0/0/0
2	SO4	F	409	-	-	0/0/0/0	0/0/0/0
2	SO4	F	411	-	-	0/0/0/0	0/0/0/0
2	SO4	F	419	-	-	0/0/0/0	0/0/0/0
4	IPA	F	504	-	-	0/0/0/0	0/0/0/0
4	IPA	F	505	-	-	0/0/0/0	0/0/0/0

The worst 5 of 103 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	412	SO4	O3-S	-4.60	1.30	1.47
2	B	402	SO4	O3-S	-4.60	1.30	1.47
2	A	414	SO4	O3-S	-4.59	1.30	1.47
2	C	422	SO4	O3-S	-4.57	1.31	1.47
2	F	411	SO4	O3-S	-4.56	1.31	1.47

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	303	MTI	N3-C2-N1	-9.79	121.40	128.89
3	D	304	MTI	N3-C2-N1	-9.69	121.47	128.89
3	F	306	MTI	N3-C2-N1	-9.62	121.53	128.89
3	B	302	MTI	N3-C2-N1	-9.58	121.56	128.89
3	A	301	MTI	N3-C2-N1	-9.41	121.69	128.89

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

9 monomers are involved in 11 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	413	SO4	1	0
3	B	302	MTI	2	0
4	B	501	IPA	1	0
3	C	303	MTI	1	0
2	D	412	SO4	1	0
4	D	509	IPA	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	305	MTI	2	0
3	F	306	MTI	1	0
4	F	504	IPA	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	243/276 (88%)	0.28	14 (5%) 26 28	14, 29, 47, 57	0
1	B	243/276 (88%)	0.64	24 (9%) 9 10	14, 33, 51, 62	0
1	C	243/276 (88%)	0.53	17 (6%) 19 21	12, 29, 48, 62	0
1	D	243/276 (88%)	0.42	12 (4%) 33 35	11, 28, 47, 58	0
1	E	243/276 (88%)	0.26	16 (6%) 22 23	10, 24, 45, 63	0
1	F	243/276 (88%)	0.25	5 (2%) 67 68	11, 24, 41, 51	0
All	All	1458/1656 (88%)	0.39	88 (6%) 25 27	10, 27, 48, 63	0

The worst 5 of 88 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	3	ASN	5.5
1	C	3	ASN	5.4
1	A	132	PHE	5.4
1	E	213	ASP	5.2
1	C	215	GLY	5.0

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

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

### 6.3 Carbohydrates [i](#)

There are no carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. The B-factors column lists the minimum, median, 95<sup>th</sup> 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
4	IPA	A	503	4/4	0.85	0.15	15.28	23,24,25,26	0
4	IPA	B	502	4/4	0.82	0.20	13.02	21,21,22,24	0
4	IPA	F	505	4/4	0.66	0.28	11.81	24,26,27,28	0
4	IPA	B	508	4/4	0.73	0.23	7.09	24,24,25,26	0
4	IPA	E	506	4/4	0.83	0.20	6.72	23,24,26,26	0
4	IPA	D	507	4/4	0.88	0.16	3.92	19,21,22,22	0
3	MTI	D	304	20/20	0.95	0.15	0.50	19,20,33,36	0
3	MTI	F	306	20/20	0.95	0.14	0.31	18,20,32,34	0
3	MTI	C	303	20/20	0.92	0.15	0.23	25,30,41,44	0
3	MTI	E	305	20/20	0.93	0.14	0.19	26,28,37,42	0
3	MTI	A	301	20/20	0.94	0.12	0.17	19,22,34,36	0
2	SO4	F	411	5/5	0.96	0.13	0.09	40,41,44,44	0
2	SO4	E	420	5/5	0.95	0.14	0.07	44,46,47,48	0
2	SO4	D	412	5/5	0.95	0.16	0.02	52,52,54,54	0
2	SO4	D	421	5/5	0.95	0.19	-0.01	56,57,58,58	0
2	SO4	F	419	5/5	0.92	0.18	-0.01	48,51,52,52	0
2	SO4	B	417	5/5	0.93	0.16	-0.03	69,70,70,71	0
3	MTI	B	302	20/20	0.92	0.13	-0.07	27,34,46,48	0
2	SO4	C	403	5/5	0.97	0.13	-0.18	30,31,34,35	0
2	SO4	A	418	5/5	0.94	0.16	-0.39	59,59,59,62	0
2	SO4	A	401	5/5	0.97	0.12	-0.57	32,32,35,35	0
2	SO4	C	422	5/5	0.95	0.10	-0.70	44,45,48,48	0
2	SO4	B	407	5/5	0.98	0.10	-0.72	25,27,29,31	0
2	SO4	E	415	5/5	0.98	0.09	-0.90	20,22,26,27	0
2	SO4	E	405	5/5	0.98	0.11	-1.04	26,27,27,28	0
2	SO4	D	404	5/5	0.97	0.12	-1.06	29,29,30,30	0
2	SO4	F	406	5/5	0.96	0.10	-1.40	23,24,26,27	0
2	SO4	C	416	5/5	0.98	0.07	-1.45	25,26,27,29	0
2	SO4	B	402	5/5	0.96	0.11	-1.57	40,40,42,42	0
2	SO4	D	408	5/5	0.97	0.09	-1.91	18,25,25,27	0
2	SO4	A	414	5/5	0.98	0.08	-2.06	22,26,28,29	0
2	SO4	F	409	5/5	0.98	0.06	-2.61	20,23,29,30	0
2	SO4	B	410	5/5	0.90	0.25	-	69,70,70,70	0
4	IPA	D	509	4/4	0.62	0.27	-	24,24,24,27	0
4	IPA	F	504	4/4	0.79	0.25	-	15,18,21,23	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	SO4	A	413	5/5	0.91	0.33	-	65,65,66,66	0
4	IPA	B	501	4/4	0.49	0.30	-	29,30,30,31	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.