



Full wwPDB X-ray Structure Validation Report ⓘ

Apr 14, 2016 – 05:38 PM EDT

PDB ID : 5AO3
Title : Crystal structure of human SAMHD1 (amino acid residues 115-626) bound to GTP
Authors : Schwefel, D.; Taylor, I.A.
Deposited on : 2015-09-09
Resolution : 3.00 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.
We welcome your comments at 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.

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

MolProbity : 4.02b-467
Mogul : 1.7.1 (RC1), CSD as537be (2016)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20027107
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) : rb-20027107

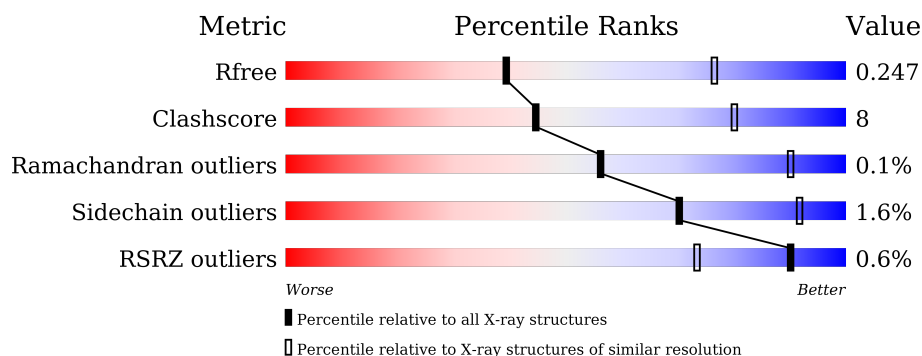
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	91344	1578 (3.00-3.00)
Clashscore	102246	1912 (3.00-3.00)
Ramachandran outliers	100387	1853 (3.00-3.00)
Sidechain outliers	100360	1856 (3.00-3.00)
RSRZ outliers	91569	1592 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for ≥ 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	538	<div> <div>64%</div> <div>17%</div> <div>•</div> <div>18%</div> </div>
1	B	538	<div> <div>67%</div> <div>15%</div> <div></div> <div>19%</div> </div>
1	C	538	<div> <div>66%</div> <div>15%</div> <div></div> <div>18%</div> </div>
1	D	538	<div> <div>%</div> <div>67%</div> <div>14%</div> <div>18%</div> </div>

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

ria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	SO4	B	1587	-	-	-	X
4	SO4	C	1586	-	-	-	X
4	SO4	D	1587	-	-	-	X
4	SO4	D	1588	-	-	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 14005 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 DEOXYNUCLEOSIDE TRIPHOSPHATE TRIPHOSPHO-HYDROLASE SAMHD1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	440	Total	C	N	O	S	0	2	0
			3471	2228	598	626	19			
1	B	438	Total	C	N	O	S	0	1	0
			3446	2210	594	623	19			
1	C	439	Total	C	N	O	S	0	1	0
			3426	2200	590	617	19			
1	D	439	Total	C	N	O	S	0	1	0
			3470	2227	605	619	19			

There are 104 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	89	MET	-	EXPRESSION TAG	UNP Q9Y3Z3
A	90	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
A	91	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
A	92	TRP	-	EXPRESSION TAG	UNP Q9Y3Z3
A	93	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
A	94	HIS	-	EXPRESSION TAG	UNP Q9Y3Z3
A	95	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
A	96	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
A	97	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
A	98	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
A	99	LYS	-	EXPRESSION TAG	UNP Q9Y3Z3
A	100	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
A	101	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
A	102	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
A	103	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
A	104	VAL	-	EXPRESSION TAG	UNP Q9Y3Z3
A	105	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
A	106	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
A	107	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
A	108	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	109	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
A	110	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
A	111	TYR	-	EXPRESSION TAG	UNP Q9Y3Z3
A	112	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
A	113	ASP	-	EXPRESSION TAG	UNP Q9Y3Z3
A	114	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
B	89	MET	-	EXPRESSION TAG	UNP Q9Y3Z3
B	90	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
B	91	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
B	92	TRP	-	EXPRESSION TAG	UNP Q9Y3Z3
B	93	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
B	94	HIS	-	EXPRESSION TAG	UNP Q9Y3Z3
B	95	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
B	96	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
B	97	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
B	98	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
B	99	LYS	-	EXPRESSION TAG	UNP Q9Y3Z3
B	100	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
B	101	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
B	102	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
B	103	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
B	104	VAL	-	EXPRESSION TAG	UNP Q9Y3Z3
B	105	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
B	106	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
B	107	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
B	108	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
B	109	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
B	110	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
B	111	TYR	-	EXPRESSION TAG	UNP Q9Y3Z3
B	112	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
B	113	ASP	-	EXPRESSION TAG	UNP Q9Y3Z3
B	114	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
C	89	MET	-	EXPRESSION TAG	UNP Q9Y3Z3
C	90	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
C	91	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
C	92	TRP	-	EXPRESSION TAG	UNP Q9Y3Z3
C	93	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
C	94	HIS	-	EXPRESSION TAG	UNP Q9Y3Z3
C	95	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
C	96	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
C	97	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
C	98	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3

Continued on next page...

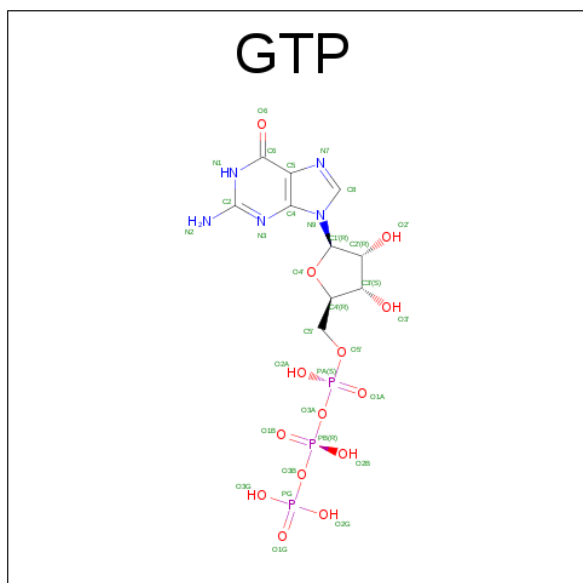
Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	99	LYS	-	EXPRESSION TAG	UNP Q9Y3Z3
C	100	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
C	101	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
C	102	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
C	103	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
C	104	VAL	-	EXPRESSION TAG	UNP Q9Y3Z3
C	105	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
C	106	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
C	107	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
C	108	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
C	109	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
C	110	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
C	111	TYR	-	EXPRESSION TAG	UNP Q9Y3Z3
C	112	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
C	113	ASP	-	EXPRESSION TAG	UNP Q9Y3Z3
C	114	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
D	89	MET	-	EXPRESSION TAG	UNP Q9Y3Z3
D	90	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
D	91	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
D	92	TRP	-	EXPRESSION TAG	UNP Q9Y3Z3
D	93	SER	-	EXPRESSION TAG	UNP Q9Y3Z3
D	94	HIS	-	EXPRESSION TAG	UNP Q9Y3Z3
D	95	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
D	96	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
D	97	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
D	98	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
D	99	LYS	-	EXPRESSION TAG	UNP Q9Y3Z3
D	100	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
D	101	ALA	-	EXPRESSION TAG	UNP Q9Y3Z3
D	102	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
D	103	GLU	-	EXPRESSION TAG	UNP Q9Y3Z3
D	104	VAL	-	EXPRESSION TAG	UNP Q9Y3Z3
D	105	LEU	-	EXPRESSION TAG	UNP Q9Y3Z3
D	106	PHE	-	EXPRESSION TAG	UNP Q9Y3Z3
D	107	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
D	108	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
D	109	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3
D	110	GLY	-	EXPRESSION TAG	UNP Q9Y3Z3
D	111	TYR	-	EXPRESSION TAG	UNP Q9Y3Z3
D	112	GLN	-	EXPRESSION TAG	UNP Q9Y3Z3
D	113	ASP	-	EXPRESSION TAG	UNP Q9Y3Z3
D	114	PRO	-	EXPRESSION TAG	UNP Q9Y3Z3

- Molecule 2 is FE (III) ION (three-letter code: FE) (formula: Fe).

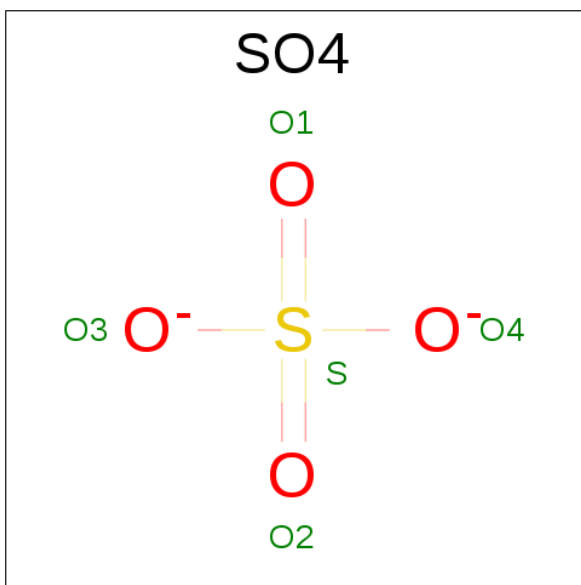
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Fe	0	0
			1	1		
2	A	1	Total	Fe	0	0
			1	1		
2	D	1	Total	Fe	0	0
			1	1		
2	C	1	Total	Fe	0	0
			1	1		

- Molecule 3 is GUANOSINE-5'-TRIPHOSPHATE (three-letter code: GTP) (formula: C₁₀H₁₆N₅O₁₄P₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
3	C	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
3	D	1	Total	C	N	O	P	0	0
			32	10	5	14	3		
3	D	1	Total	C	N	O	P	0	0
			32	10	5	14	3		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



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

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	O	0	0
			1	1		

Continued on next page...

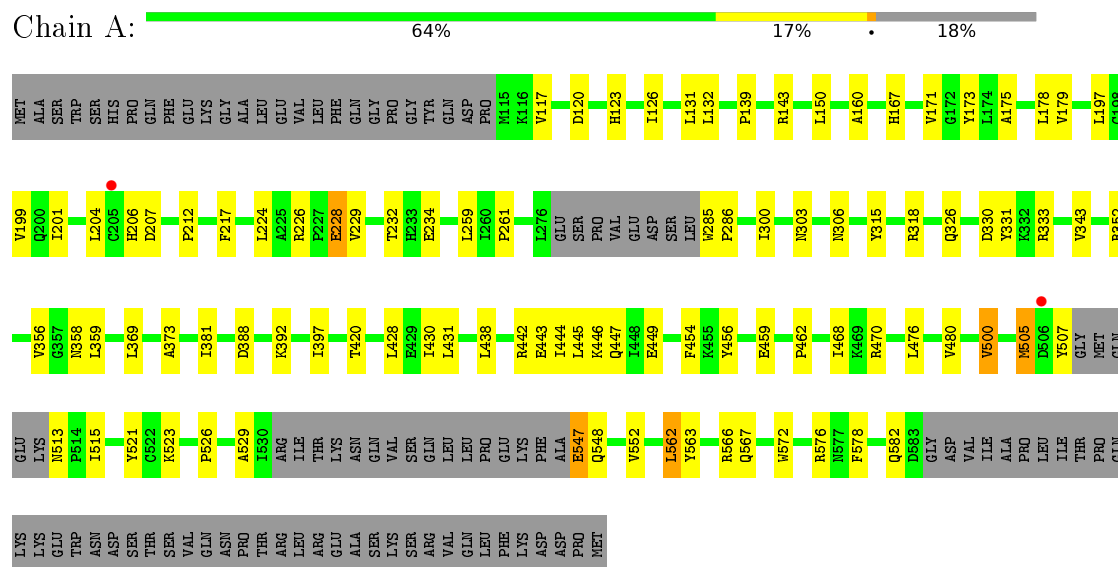
Continued from previous page...

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	B	2	Total	O	0	0
			2	2		
5	C	2	Total	O	0	0
			2	2		

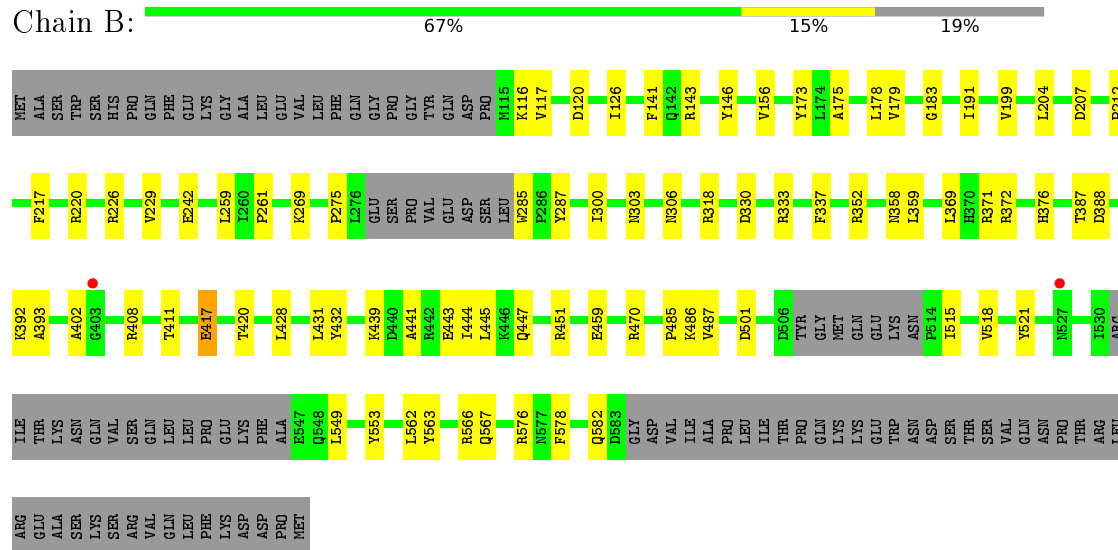
3 Residue-property plots

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: DEOXYNUCLEOSIDE TRIPHOSPHATE TRIPHOSPHOHYDROLASE SAMHD1



• Molecule 1: DEOXYNUCLEOSIDE TRIPHOSPHATE TRIPHOSPHOHYDROLASE SAMHD1



• Molecule 1: DEOXYNUCLEOSIDE TRIPHOSPHATE TRIPHOSPHOHYDROLASE SAMHD1

Chain C: 66%15%18%

LYS	SER	ARG	VAL	GLN	LEU	PHE	LYS	ASP	ASP	PRO	MET	LEU	LEU	PRO	GLU	LYS	PHE	GLN	GLY	PRO	GLY	TYR	GLN	ASP	P114																																					
G203	L204	C205	H206	I222	P223	G238	L259	L260	P261	P275	L276	GLU	SER	PRO	VAL	GLU	ASP	SER	L284	V285	P286	E299	I300	R305	V310	D311	K312	Y315	R318	D319	C320	Q326	N327	D353	K354	V179	L359	V378	M385	K392	I397	C198	V199	G200	T420	L201	N425	A202														
L426	F427	I430	R442	E443	I444	L445	K446	Y450	R451	F454	P462	T463	R470	Y473	E474	A483	K484	P485	L489	V500	D501	V502	ALA	PRO	PRO	LEU	LEU	ILE	ILE	ALA	ASN	GLN	LYS	ASN	PRO	T415	D516	H517	V518	C522	I530	ARG	ILE	THR	LYS	ASN	GLN	ARG	GLU	ALA	SER											
LEU	LEU	PRO	GLU	LYS	PHE	ALA	E547	I550	R551	V552	V563	A564	A565	R566	V570	Q571	A574	D575	T576	R577	F578	Q582	D583	GLY	ASP	VAL	ILE	ILE	ALA	PRO	PRO	LEU	LEU	ILE	THR	THR	PRO	GLN	GLN	LYS	LYS	GLU	GLU	TRP	ASN	TRP	ASP	SER	THR	THR	VAL	GLN	ASN	PRO	THR	THR	ARG	LEU	ARG	GLU	ALA	SER

● Molecule 1: DEOXYNUCLEOSIDE TRIPHOSPHATE TRIPHOSPHOHYDROLASE SAMHD1

Chain D: 67%14%18%

LYS	SER	ARG	VAL	GLN	LEU	PHE	LYS	ASP	ASP	PRO	MET	LEU	LEU	PRO	GLU	LYS	PHE	ALA	E547	Q548	L549	K556	R559	K560	R566	Q567	Y568	F569	V570	Q571	Y572		R576	R577	F578	D583	GLY	ASP	VAL	ILE	ALA	PRO	LEU	ILE	LYS	THR	PRO	GLN	LYS	GLU	TRP	ASN	ASP	SER	THR	SER	VAL	GLN	ASN	PRO	THR	ARG	LEU	ARG	GLU	ALA	SER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	81.92Å 95.73Å 97.59Å 91.37° 108.97° 115.33°	Depositor
Resolution (Å)	29.66 – 3.00 29.66 – 3.00	Depositor EDS
% Data completeness (in resolution range)	91.1 (29.66-3.00) 85.5 (29.66-3.00)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.36 (at 3.00Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE: 1.8.4_1496)	Depositor
R, R_{free}	0.177 , 0.247 0.177 , 0.247	Depositor DCC
R_{free} test set	2274 reflections (5.04%)	DCC
Wilson B-factor (Å ²)	69.7	Xtriage
Anisotropy	0.198	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 65.4	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	0 of 45151 reflections	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	14005	wwPDB-VP
Average B, all atoms (Å ²)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 14.38% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, FE, 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	0.52	1/3562 (0.0%)	0.69	2/4829 (0.0%)
1	B	0.50	0/3532	0.66	0/4784
1	C	0.46	0/3513	0.64	0/4763
1	D	0.49	0/3558	0.67	0/4811
All	All	0.49	1/14165 (0.0%)	0.67	2/19187 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	449	GLU	CG-CD	6.48	1.61	1.51

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	562	LEU	CA-CB-CG	-5.18	103.38	115.30
1	A	470	ARG	NE-CZ-NH1	-5.18	117.71	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3471	0	3299	61	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	3446	0	3277	56	0
1	C	3426	0	3241	52	0
1	D	3470	0	3348	51	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	32	0	12	4	0
3	C	32	0	12	0	0
3	D	64	0	24	3	0
4	A	15	0	0	0	0
4	B	20	0	0	2	0
4	C	10	0	0	0	0
4	D	10	0	0	0	0
5	A	1	0	0	1	0
5	B	2	0	0	2	0
5	C	2	0	0	0	0
All	All	14005	0	13213	216	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 8.

All (216) 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)
3:A:1585:GTP:H5"	1:C:451:ARG:HH21	1.35	0.89
1:B:371:ARG:NH1	4:B:1585:SO4:O1	2.12	0.83
1:A:179:VAL:HG22	1:A:300:ILE:HD13	1.68	0.75
1:B:352:ARG:HB3	1:B:521:TYR:CZ	2.22	0.75
1:A:442[B]:ARG:HD2	1:A:446:LYS:HE3	1.68	0.74
1:B:175:ALA:HB1	1:B:199:VAL:HG12	1.73	0.71
1:C:320:CYS:SG	1:C:327:ASN:HB2	2.30	0.70
1:A:175:ALA:HB1	1:A:199:VAL:HG12	1.71	0.69
1:D:497:ASP:OD2	1:D:556:LYS:NZ	2.26	0.69
1:D:179:VAL:HG22	1:D:300:ILE:HD13	1.76	0.67
1:C:175:ALA:HB1	1:C:199:VAL:HG12	1.76	0.67
1:A:428:LEU:HD13	1:C:425:ASN:HB2	1.76	0.67
1:B:402:ALA:HB2	1:B:417:GLU:CD	2.16	0.67
1:B:179:VAL:HG22	1:B:300:ILE:HD13	1.77	0.66
1:A:513:ASN:HB3	1:A:515:ILE:HG22	1.78	0.65
1:D:442:ARG:HG2	1:D:446:LYS:HE3	1.78	0.64

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:337:PHE:HB3	1:B:352:ARG:HG2	1.79	0.64
1:D:220:ARG:HG2	1:D:387:THR:HG21	1.79	0.63
1:B:116:LYS:NZ	3:D:1585:GTP:O1A	2.25	0.63
1:D:576:ARG:HG2	1:D:578:PHE:CE2	2.33	0.63
1:B:428:LEU:HD13	1:D:425:ASN:HB2	1.81	0.62
1:C:175:ALA:O	1:C:179:VAL:HG23	1.98	0.62
1:A:505:MET:HE1	1:A:547:GLU:HB2	1.82	0.60
1:B:372:ARG:NH1	4:B:1586:SO4:O1	2.31	0.60
1:B:439:LYS:NZ	1:B:443:GLU:OE2	2.36	0.59
3:A:1585:GTP:O2B	1:C:378:VAL:HG21	2.02	0.58
1:A:431:LEU:HD13	1:A:445:LEU:HB3	1.86	0.58
1:B:566:ARG:NH2	1:B:582:GLN:O	2.37	0.58
1:D:275:PRO:HB3	1:D:286:PRO:HB2	1.85	0.58
1:C:299:GLU:OE2	1:C:305:ARG:NH2	2.37	0.57
1:C:197:LEU:O	1:C:201:ILE:HG13	2.04	0.57
1:A:462:PRO:HA	1:A:578:PHE:CD1	2.39	0.57
1:C:397:ILE:HG21	1:C:426:ILE:HD11	1.86	0.56
1:D:175:ALA:O	1:D:179:VAL:HG23	2.05	0.56
1:D:360:TYR:HE1	1:D:515:ILE:HG13	1.70	0.56
1:D:355:GLU:O	1:D:355:GLU:HG3	2.06	0.56
1:A:381:ILE:HG23	1:A:454:PHE:HB2	1.88	0.55
1:D:431:LEU:HD23	1:D:432:TYR:CE1	2.41	0.55
1:B:285:TRP:CH2	1:B:287:TYR:HD2	2.23	0.55
1:B:576:ARG:HG2	1:B:578:PHE:CE2	2.41	0.55
1:C:144:LEU:HD23	1:C:147:ILE:HD12	1.88	0.55
1:B:408:ARG:HH11	1:B:408:ARG:HG2	1.72	0.55
1:A:303:ASN:ND2	1:A:306:ASN:OD1	2.40	0.54
1:D:483:ALA:O	1:D:485:PRO:HD3	2.06	0.54
3:A:1585:GTP:H5"	1:C:451:ARG:NH2	2.15	0.54
1:A:343:VAL:HG22	1:A:529:ALA:HB2	1.90	0.54
1:D:175:ALA:HB1	1:D:199:VAL:HG12	1.89	0.54
1:A:500:VAL:HB	1:A:552:VAL:HG22	1.91	0.53
1:D:231:TRP:CD2	1:D:413:ILE:HD12	2.43	0.53
1:A:179:VAL:HG22	1:A:300:ILE:CD1	2.37	0.53
1:C:359:LEU:HD11	1:C:518:VAL:HG11	1.89	0.53
1:B:146:TYR:CD1	1:D:428:LEU:HD11	2.43	0.53
1:B:515:ILE:O	1:B:518:VAL:HG12	2.08	0.53
1:D:353:ASP:OD1	1:D:354:LYS:N	2.41	0.53
1:C:385:MET:HG2	1:C:454:PHE:CE2	2.43	0.53
1:D:232:THR:OG1	1:D:235:GLN:HG3	2.09	0.53
1:B:226:ARG:NE	1:B:229:VAL:HG21	2.25	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:456:TYR:OH	1:A:459:GLU:HB2	2.10	0.52
1:B:212:PRO:HD2	1:B:217:PHE:CD1	2.45	0.52
1:D:320:CYS:SG	1:D:327:ASN:HB2	2.50	0.52
1:D:559:ARG:HG2	1:D:560:LYS:N	2.24	0.52
1:B:392:LYS:HE2	1:B:444:ILE:HD11	1.90	0.52
1:C:275:PRO:HB3	1:C:286:PRO:HB2	1.92	0.52
1:C:566:ARG:NH2	1:C:582:GLN:O	2.44	0.51
1:A:123:HIS:CE1	1:A:331:TYR:HH	2.25	0.51
1:A:175:ALA:HB1	1:A:199:VAL:CG1	2.38	0.51
1:C:522:CYS:HB2	1:C:530:ILE:HD11	1.91	0.51
1:A:150:LEU:HD12	1:A:160:ALA:HB1	1.92	0.51
1:C:180:HIS:O	1:C:184:GLU:HG2	2.11	0.51
1:A:143:ARG:HD2	1:A:420:THR:HA	1.93	0.50
1:D:197:LEU:O	1:D:201:ILE:HG13	2.11	0.50
1:D:359:LEU:HD11	1:D:518:VAL:HG11	1.93	0.50
1:A:226:ARG:NE	1:A:229:VAL:HG21	2.26	0.50
1:C:179:VAL:HG22	1:C:300:ILE:HD13	1.93	0.50
1:C:473:TYR:CE1	1:C:502:VAL:HG21	2.47	0.50
1:D:369:LEU:HD13	1:D:374:TYR:OH	2.12	0.50
1:D:576:ARG:HG2	1:D:578:PHE:CZ	2.45	0.50
1:C:194:ARG:HD2	1:C:258:GLY:O	2.11	0.50
1:B:220:ARG:HG2	1:B:387:THR:HG21	1.94	0.50
1:D:360:TYR:CE1	1:D:515:ILE:HG13	2.47	0.49
1:C:144:LEU:HD22	1:C:164:ARG:CB	2.42	0.49
1:D:232:THR:HB	1:D:234:GLU:OE1	2.13	0.49
1:C:576:ARG:HG2	1:C:578:PHE:CE2	2.47	0.49
1:D:156:VAL:HG11	1:D:376:HIS:CE1	2.48	0.49
1:A:171:VAL:HG21	1:A:206:HIS:CE1	2.48	0.49
1:A:212:PRO:HD2	1:A:217:PHE:CD1	2.47	0.49
1:C:500:VAL:HG22	1:C:552:VAL:HG22	1.94	0.49
1:C:392:LYS:HD2	1:C:444:ILE:HD11	1.95	0.48
1:A:232:THR:HB	1:A:234:GLU:OE1	2.13	0.48
1:B:428:LEU:HD22	1:B:432:TYR:CZ	2.47	0.48
1:A:178:LEU:HD23	1:A:300:ILE:HG12	1.94	0.48
1:B:156:VAL:HG11	1:B:376:HIS:CE1	2.48	0.48
1:B:126:ILE:HG23	1:B:173:TYR:CD1	2.48	0.48
1:A:175:ALA:O	1:A:179:VAL:HG23	2.13	0.48
1:B:444:ILE:O	1:B:447[B]:GLN:HB2	2.14	0.48
1:A:330:ASP:OD2	1:A:333:ARG:HB2	2.14	0.48
1:B:226:ARG:HE	1:B:229:VAL:HG21	1.78	0.48
1:B:563:TYR:O	1:B:567:GLN:HG2	2.13	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:120:ASP:OD1	1:C:318:ARG:NH2	2.47	0.48
1:C:442:ARG:O	1:C:446:LYS:HG3	2.13	0.48
1:C:169:LEU:HD23	1:C:204:LEU:HD11	1.96	0.48
1:D:425:ASN:ND2	1:D:429:GLU:OE2	2.47	0.48
1:A:562:LEU:HD23	1:A:562:LEU:HA	1.60	0.47
1:A:566:ARG:NH2	1:A:582:GLN:O	2.46	0.47
1:C:385:MET:HG2	1:C:454:PHE:CD2	2.49	0.47
1:D:223:PRO:HG3	1:D:470:ARG:HG2	1.97	0.47
1:D:223:PRO:CG	1:D:470:ARG:HG2	2.45	0.47
1:A:228:GLU:H	1:A:228:GLU:HG3	1.21	0.47
1:B:359:LEU:HD13	1:B:518:VAL:HG11	1.95	0.47
1:C:462:PRO:HA	1:C:578:PHE:CD1	2.49	0.47
1:D:443:GLU:O	1:D:447[A]:GLN:HG2	2.15	0.47
1:D:150:LEU:HD12	1:D:160:ALA:HB1	1.95	0.47
1:D:143:ARG:HD2	1:D:420:THR:HA	1.96	0.47
1:C:470:ARG:HG3	1:C:473:TYR:CE2	2.50	0.47
1:A:259:LEU:O	1:A:261:PRO:HD3	2.15	0.46
1:C:489:LEU:HD13	1:C:564:ALA:HA	1.96	0.46
1:A:131:LEU:HD23	1:A:197:LEU:HD13	1.97	0.46
1:C:489:LEU:HD22	1:C:563:TYR:HE2	1.80	0.46
1:B:183:GLY:HA2	1:B:191:ILE:HD12	1.97	0.46
1:C:144:LEU:HD22	1:C:164:ARG:HB2	1.98	0.46
1:D:385:MET:HG2	1:D:454:PHE:CD2	2.50	0.46
1:B:501:ASP:HB2	1:B:553:TYR:CE2	2.50	0.46
1:D:470:ARG:HG3	1:D:473:TYR:CE2	2.50	0.46
1:D:231:TRP:CE3	1:D:413:ILE:HD12	2.49	0.46
1:A:167:HIS:O	1:A:171:VAL:HG23	2.15	0.46
1:B:393:ALA:HB2	1:B:441:ALA:CB	2.46	0.46
1:B:562:LEU:HA	1:B:562:LEU:HD23	1.77	0.46
1:A:356:VAL:HG23	1:A:515:ILE:HD11	1.98	0.46
1:C:143:ARG:HD2	1:C:420:THR:HA	1.97	0.46
1:D:462:PRO:HB3	1:D:578:PHE:CE1	2.50	0.46
1:A:333:ARG:NH2	1:A:358:ASN:HB2	2.31	0.46
1:B:431:LEU:HD13	1:B:445:LEU:HB3	1.98	0.45
1:D:462:PRO:HA	1:D:578:PHE:CD1	2.51	0.45
1:D:515:ILE:HG23	1:D:520:PHE:HE1	1.81	0.45
1:A:523:LYS:O	1:A:526:PRO:HD3	2.16	0.45
1:A:207:ASP:HB2	5:A:2001:HOH:O	2.17	0.45
1:A:315:TYR:HA	1:A:318:ARG:HB3	1.98	0.45
1:A:563:TYR:O	1:A:567:GLN:HG2	2.16	0.45
1:C:426:ILE:O	1:C:430:ILE:HG13	2.17	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:566:ARG:O	1:D:570:VAL:HG23	2.16	0.45
1:A:359:LEU:HD23	1:A:359:LEU:HA	1.61	0.45
1:C:150:LEU:HD12	1:C:160:ALA:HB1	1.99	0.44
1:C:462:PRO:HG3	1:C:550:ILE:HD11	1.98	0.44
1:A:388:ASP:HB3	1:A:444:ILE:HD13	2.00	0.44
1:B:141:PHE:CE2	1:B:204:LEU:HG	2.53	0.44
1:B:179:VAL:HG22	1:B:300:ILE:CD1	2.46	0.44
1:C:353:ASP:OD1	1:C:354:LYS:N	2.50	0.44
1:B:486:LYS:HA	1:B:487:VAL:C	2.38	0.44
1:A:117:VAL:O	3:A:1585:GTP:O2'	2.36	0.44
1:C:203:GLY:O	1:C:206:HIS:ND1	2.42	0.44
1:B:178:LEU:HD23	1:B:300:ILE:HG23	1.99	0.44
1:A:179:VAL:CG2	1:A:199:VAL:HG11	2.48	0.44
1:A:576:ARG:HG2	1:A:578:PHE:CE2	2.52	0.44
1:A:462:PRO:HG3	1:A:548:GLN:OE1	2.18	0.43
1:D:480:VAL:HG22	1:D:572:TRP:CD2	2.52	0.43
1:C:259:LEU:O	1:C:261:PRO:HD3	2.19	0.43
1:C:223:PRO:CG	1:C:470:ARG:HG2	2.48	0.43
1:D:120:ASP:OD1	1:D:318:ARG:NH2	2.51	0.43
1:D:459:GLU:OE2	1:D:549:LEU:HD13	2.18	0.43
1:A:197:LEU:O	1:A:201:ILE:HG13	2.19	0.43
1:B:330:ASP:OD2	1:B:333:ARG:HB2	2.18	0.43
1:B:451:ARG:HD2	1:B:451:ARG:HA	1.88	0.43
1:B:553:TYR:OH	5:B:2002:HOH:O	2.20	0.43
1:A:397:ILE:HD11	1:A:430:ILE:HG12	2.00	0.43
1:C:132:LEU:HA	1:C:132:LEU:HD23	1.70	0.43
1:C:174:LEU:HB3	1:C:310:VAL:HB	2.00	0.43
1:A:468:ILE:HG21	1:A:476:LEU:HD11	2.01	0.43
1:B:369:LEU:HA	1:B:369:LEU:HD23	1.93	0.43
1:C:566:ARG:O	1:C:570:VAL:HG23	2.19	0.43
1:A:352:ARG:HB2	1:A:521:TYR:CZ	2.54	0.42
1:A:480:VAL:HG22	1:A:572:TRP:CG	2.54	0.42
1:D:197:LEU:HA	1:D:197:LEU:HD23	1.73	0.42
1:D:492:LYS:HA	1:D:568:TYR:OH	2.19	0.42
1:C:427:PHE:CE2	1:C:445:LEU:HD22	2.54	0.42
1:A:139:PRO:HD3	1:C:450:TYR:CE1	2.54	0.42
1:B:207:ASP:HB2	5:B:2001:HOH:O	2.18	0.42
1:A:369:LEU:O	1:A:373:ALA:HB3	2.20	0.42
1:B:259:LEU:O	1:B:261:PRO:HD3	2.19	0.42
1:C:197:LEU:HA	1:C:197:LEU:HD23	1.74	0.42
1:A:132:LEU:HD22	1:A:204:LEU:HD22	2.02	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:483:ALA:O	1:C:485:PRO:HD3	2.18	0.42
1:B:417:GLU:H	1:B:417:GLU:HG2	1.45	0.42
1:A:224:LEU:HD23	1:A:224:LEU:HA	1.82	0.42
1:B:388:ASP:O	1:B:392:LYS:HG3	2.19	0.42
1:D:312:LYS:HA	1:D:315:TYR:CE2	2.55	0.42
1:A:443:GLU:O	1:A:447[B]:GLN:HG3	2.19	0.42
1:B:459:GLU:OE2	1:B:549:LEU:HD13	2.20	0.42
1:A:442[B]:ARG:CD	1:A:446:LYS:HE3	2.43	0.41
1:B:120:ASP:OD1	1:B:318:ARG:NH2	2.53	0.41
1:B:242:GLU:OE1	1:B:269:LYS:NZ	2.35	0.41
1:B:303:ASN:ND2	1:B:306:ASN:OD1	2.53	0.41
1:C:312:LYS:HD3	1:C:315:TYR:OH	2.20	0.41
1:B:116:LYS:NZ	3:D:1585:GTP:HN22	2.17	0.41
1:A:285:TRP:HA	1:A:286:PRO:HD3	1.77	0.41
1:D:275:PRO:CB	1:D:286:PRO:HB2	2.50	0.41
1:A:120:ASP:OD1	1:A:318:ARG:NH2	2.53	0.41
1:B:226:ARG:NH1	1:B:411:THR:HA	2.35	0.41
1:B:116:LYS:HZ2	3:D:1585:GTP:HN22	1.69	0.41
1:B:359:LEU:HA	1:B:359:LEU:HD23	1.79	0.41
1:B:143:ARG:HD2	1:B:420:THR:HA	2.02	0.41
1:D:456:TYR:OH	1:D:459:GLU:HB2	2.21	0.41
1:D:505:MET:HG3	1:D:547:GLU:HB2	2.03	0.41
1:B:175:ALA:O	1:B:179:VAL:HG23	2.20	0.41
1:B:275:PRO:HD3	1:B:287:TYR:CE1	2.56	0.41
1:A:226:ARG:HE	1:A:229:VAL:HG21	1.86	0.41
1:D:522:CYS:SG	1:D:523:LYS:N	2.94	0.41
1:A:388:ASP:O	1:A:392:LYS:HG3	2.21	0.41
1:A:126:ILE:HG23	1:A:173:TYR:HB2	2.02	0.40
1:B:333:ARG:NH2	1:B:358:ASN:HB2	2.36	0.40
1:C:359:LEU:HA	1:C:359:LEU:HD23	1.87	0.40
1:A:438:LEU:O	1:A:442[B]:ARG:HB2	2.21	0.40
1:D:515:ILE:HG23	1:D:520:PHE:CE1	2.56	0.40
1:C:222:ILE:HB	1:C:223:PRO:HD3	2.03	0.40
1:A:480:VAL:HG22	1:A:572:TRP:CD2	2.56	0.40
1:C:571:GLN:O	1:C:574:ALA:HB3	2.22	0.40
1:D:204:LEU:HD12	1:D:204:LEU:HA	1.91	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	434/538 (81%)	422 (97%)	12 (3%)	0	100	100
1	B	431/538 (80%)	424 (98%)	6 (1%)	1 (0%)	52	88
1	C	432/538 (80%)	423 (98%)	8 (2%)	1 (0%)	52	88
1	D	432/538 (80%)	423 (98%)	9 (2%)	0	100	100
All	All	1729/2152 (80%)	1692 (98%)	35 (2%)	2 (0%)	56	90

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	485	PRO
1	B	485	PRO

5.3.2 Protein sidechains [i](#)

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	355/478 (74%)	349 (98%)	6 (2%)	68	91
1	B	352/478 (74%)	349 (99%)	3 (1%)	84	95
1	C	347/478 (73%)	341 (98%)	6 (2%)	68	91
1	D	359/478 (75%)	351 (98%)	8 (2%)	60	88
All	All	1413/1912 (74%)	1390 (98%)	23 (2%)	70	92

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

Mol	Chain	Res	Type
1	A	228	GLU
1	A	326	GLN
1	A	500	VAL
1	A	505	MET
1	A	507	TYR
1	A	547	GLU
1	B	117	VAL
1	B	417	GLU
1	B	470	ARG
1	C	180	HIS
1	C	276	LEU
1	C	326	GLN
1	C	443	GLU
1	C	474	GLU
1	C	517	HIS
1	D	117	VAL
1	D	210	HIS
1	D	461	GLN
1	D	463	THR
1	D	471	GLU
1	D	474	GLU
1	D	505	MET
1	D	559	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	210	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

Of 19 ligands modelled in this entry, 4 are monoatomic - leaving 15 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
3	GTP	A	1585	-	26,34,34	0.86	0	29,54,54	1.75	4 (13%)
4	SO4	A	1586	-	4,4,4	0.22	0	6,6,6	0.22	0
4	SO4	A	1587	-	4,4,4	0.18	0	6,6,6	0.14	0
4	SO4	A	1588	2	4,4,4	0.10	0	6,6,6	0.37	0
4	SO4	B	1585	-	4,4,4	0.22	0	6,6,6	0.12	0
4	SO4	B	1586	-	4,4,4	0.23	0	6,6,6	0.13	0
4	SO4	B	1587	-	4,4,4	0.24	0	6,6,6	0.09	0
4	SO4	B	1588	2	4,4,4	0.17	0	6,6,6	0.15	0
3	GTP	C	1585	-	26,34,34	0.87	1 (3%)	29,54,54	1.61	5 (17%)
4	SO4	C	1586	-	4,4,4	0.21	0	6,6,6	0.16	0
4	SO4	C	1587	2	4,4,4	0.21	0	6,6,6	0.31	0
3	GTP	D	1585	-	26,34,34	0.85	1 (3%)	29,54,54	1.70	5 (17%)
3	GTP	D	1586	-	26,34,34	0.88	1 (3%)	29,54,54	1.73	5 (17%)
4	SO4	D	1587	-	4,4,4	0.24	0	6,6,6	0.09	0
4	SO4	D	1588	2	4,4,4	0.11	0	6,6,6	0.23	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	GTP	A	1585	-	-	0/18/38/38	0/3/3/3
4	SO4	A	1586	-	-	0/0/0/0	0/0/0/0
4	SO4	A	1587	-	-	0/0/0/0	0/0/0/0
4	SO4	A	1588	2	-	0/0/0/0	0/0/0/0
4	SO4	B	1585	-	-	0/0/0/0	0/0/0/0
4	SO4	B	1586	-	-	0/0/0/0	0/0/0/0
4	SO4	B	1587	-	-	0/0/0/0	0/0/0/0
4	SO4	B	1588	2	-	0/0/0/0	0/0/0/0
3	GTP	C	1585	-	-	0/18/38/38	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	SO4	C	1586	-	-	0/0/0/0	0/0/0/0
4	SO4	C	1587	2	-	0/0/0/0	0/0/0/0
3	GTP	D	1585	-	-	0/18/38/38	0/3/3/3
3	GTP	D	1586	-	-	0/18/38/38	0/3/3/3
4	SO4	D	1587	-	-	0/0/0/0	0/0/0/0
4	SO4	D	1588	2	-	0/0/0/0	0/0/0/0

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	1586	GTP	C6-N1	2.66	1.37	1.33
3	C	1585	GTP	C6-N1	2.75	1.38	1.33
3	D	1585	GTP	C6-N1	2.91	1.38	1.33

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	1586	GTP	N3-C2-N1	-5.59	119.95	127.56
3	A	1585	GTP	N3-C2-N1	-5.56	119.99	127.56
3	C	1585	GTP	N3-C2-N1	-5.52	120.05	127.56
3	D	1585	GTP	N3-C2-N1	-5.29	120.36	127.56
3	D	1586	GTP	C5-C6-N1	-3.14	119.42	123.52
3	D	1585	GTP	C5-C6-N1	-2.72	119.96	123.52
3	C	1585	GTP	C5-C6-N1	-2.49	120.27	123.52
3	C	1585	GTP	C4'-O4'-C1'	2.28	112.06	109.64
3	C	1585	GTP	C6-N1-C2	2.40	118.70	115.88
3	D	1586	GTP	N2-C2-N1	2.48	121.30	117.20
3	D	1585	GTP	C1'-N9-C4	2.60	129.71	126.81
3	A	1585	GTP	N2-C2-N3	2.68	122.74	117.72
3	A	1585	GTP	C6-N1-C2	2.68	119.03	115.88
3	D	1586	GTP	C1'-N9-C4	2.85	129.99	126.81
3	D	1585	GTP	C6-N1-C2	3.19	119.62	115.88
3	D	1586	GTP	C6-N1-C2	3.39	119.85	115.88
3	C	1585	GTP	N2-C2-N1	3.47	122.92	117.20
3	D	1585	GTP	C4'-O4'-C1'	3.47	113.32	109.64
3	A	1585	GTP	C1'-N9-C4	4.11	131.39	126.81

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1585	GTP	4	0
4	B	1585	SO4	1	0
4	B	1586	SO4	1	0
3	D	1585	GTP	3	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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	440/538 (81%)	-0.64	2 (0%) 91 76	24, 58, 114, 202	0
1	B	438/538 (81%)	-0.63	2 (0%) 91 76	23, 60, 109, 177	0
1	C	439/538 (81%)	-0.51	2 (0%) 91 76	31, 67, 117, 170	0
1	D	439/538 (81%)	-0.44	4 (0%) 85 64	29, 63, 112, 175	0
All	All	1756/2152 (81%)	-0.55	10 (0%) 90 73	23, 62, 114, 202	0

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	527	ASN	3.1
1	C	489	LEU	2.9
1	D	515	ILE	2.8
1	D	524	THR	2.6
1	D	463	THR	2.5
1	A	506	ASP	2.5
1	C	463	THR	2.4
1	B	403	GLY	2.3
1	D	525	ALA	2.1
1	A	205	CYS	2.0

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, 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	LLDF	B-factors(Å ²)	Q<0.9
4	SO4	D	1587	5/5	0.80	0.28	5.21	129,135,137,142	0
4	SO4	B	1587	5/5	0.87	0.26	4.22	133,136,139,143	0
4	SO4	C	1586	5/5	0.89	0.25	3.98	109,115,116,124	0
4	SO4	D	1588	5/5	0.94	0.32	2.27	112,112,112,112	0
4	SO4	B	1586	5/5	0.93	0.23	1.76	135,135,139,140	0
4	SO4	C	1587	5/5	0.93	0.22	1.08	106,106,106,106	0
3	GTP	D	1586	32/32	0.94	0.19	0.94	50,89,183,200	0
3	GTP	A	1585	32/32	0.91	0.24	0.89	64,109,163,181	0
3	GTP	D	1585	32/32	0.90	0.23	0.73	58,116,197,199	0
3	GTP	C	1585	32/32	0.94	0.16	0.19	42,86,155,195	0
4	SO4	B	1588	5/5	0.98	0.15	-0.40	97,97,97,97	0
4	SO4	A	1588	5/5	0.97	0.14	-1.03	93,93,93,93	0
2	FE	C	1584	1/1	1.00	0.14	-1.20	36,36,36,36	0
2	FE	D	1584	1/1	0.98	0.16	-1.37	30,30,30,30	0
2	FE	B	1584	1/1	0.99	0.13	-1.70	32,32,32,32	0
2	FE	A	1584	1/1	1.00	0.12	-3.30	30,30,30,30	0
4	SO4	B	1585	5/5	0.93	0.14	-	115,121,124,126	0
4	SO4	A	1586	5/5	0.92	0.25	-	128,130,135,136	0
4	SO4	A	1587	5/5	0.97	0.14	-	114,120,121,125	0

6.5 Other polymers ⓘ

There are no such residues in this entry.