



wwPDB X-ray Structure Validation Summary Report ⓘ

Feb 1, 2016 – 05:04 AM GMT

PDB ID : 2P9E
Title : Crystal Structure of G336V mutant of E.coli phosphoglycerate dehydrogenase
Authors : Dey, S.; Sacchettini, J.C.
Deposited on : 2007-03-25
Resolution : 2.60 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
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 (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

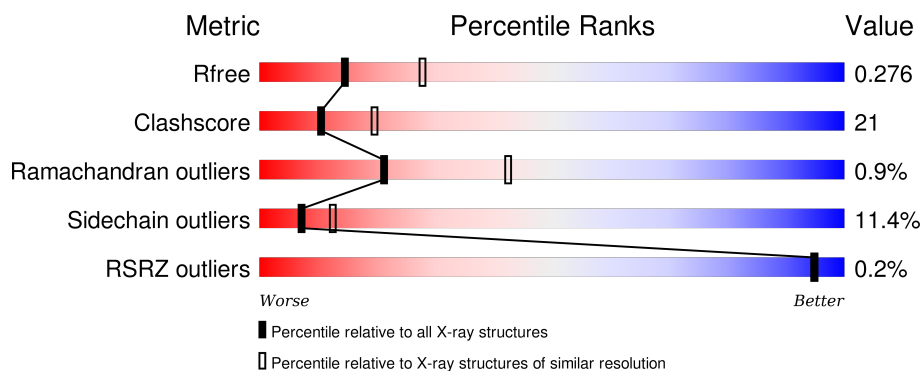
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.60 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	2328 (2.60-2.60)
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (2.60-2.60)

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	410	 60% 33% 6% .
1	B	410	 61% 33% 5% .
1	C	410	 60% 35% 5% .
1	D	410	 60% 34% . .

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
2	PO4	A	504	-	-	-	X
2	PO4	B	499	-	-	X	-
5	CIT	B	516	-	-	-	X
5	CIT	C	515	-	-	-	X
5	CIT	C	517	-	-	-	X
5	CIT	D	513	-	-	-	X

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 12648 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.

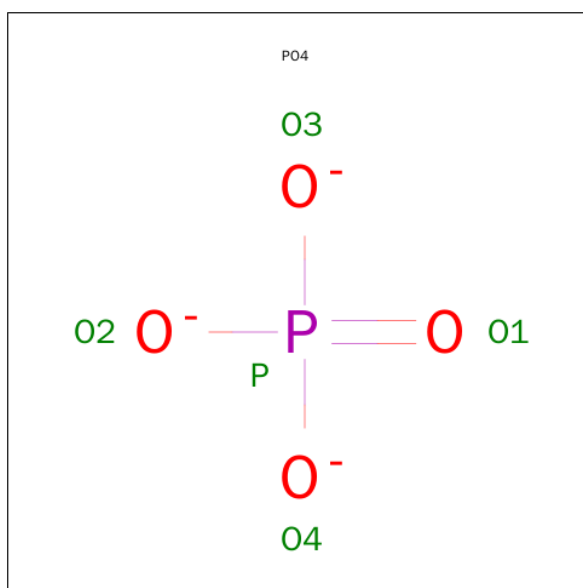
- Molecule 1 is a protein called D-3-phosphoglycerate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	406	Total	C	N	O	S	0	0	0
			3076	1950	534	584	8			
1	B	404	Total	C	N	O	S	0	0	0
			3062	1941	532	581	8			
1	C	406	Total	C	N	O	S	0	0	0
			3076	1950	534	584	8			
1	D	403	Total	C	N	O	S	0	0	0
			3053	1936	531	578	8			

There are 20 discrepancies between the modelled and reference sequences:

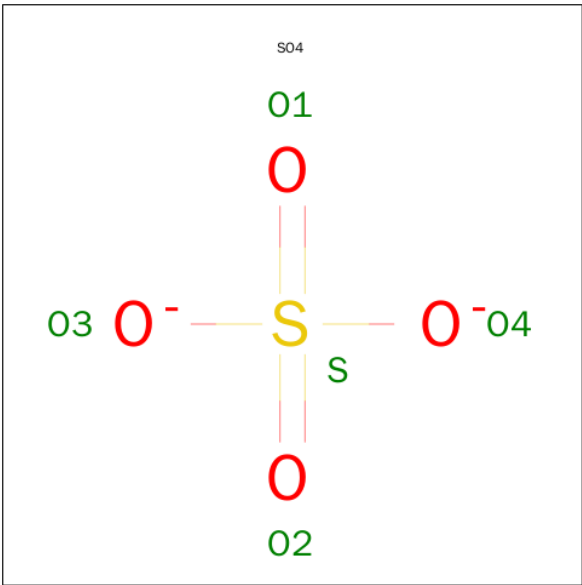
Chain	Residue	Modelled	Actual	Comment	Reference
A	81	ALA	CYS	ENGINEERED	UNP P0A9T0
A	83	ALA	CYS	ENGINEERED	UNP P0A9T0
A	250	ALA	CYS	ENGINEERED	UNP P0A9T0
A	282	ALA	CYS	ENGINEERED	UNP P0A9T0
A	336	VAL	GLY	ENGINEERED	UNP P0A9T0
B	81	ALA	CYS	ENGINEERED	UNP P0A9T0
B	83	ALA	CYS	ENGINEERED	UNP P0A9T0
B	250	ALA	CYS	ENGINEERED	UNP P0A9T0
B	282	ALA	CYS	ENGINEERED	UNP P0A9T0
B	336	VAL	GLY	ENGINEERED	UNP P0A9T0
C	81	ALA	CYS	ENGINEERED	UNP P0A9T0
C	83	ALA	CYS	ENGINEERED	UNP P0A9T0
C	250	ALA	CYS	ENGINEERED	UNP P0A9T0
C	282	ALA	CYS	ENGINEERED	UNP P0A9T0
C	336	VAL	GLY	ENGINEERED	UNP P0A9T0
D	81	ALA	CYS	ENGINEERED	UNP P0A9T0
D	83	ALA	CYS	ENGINEERED	UNP P0A9T0
D	250	ALA	CYS	ENGINEERED	UNP P0A9T0
D	282	ALA	CYS	ENGINEERED	UNP P0A9T0
D	336	VAL	GLY	ENGINEERED	UNP P0A9T0

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).



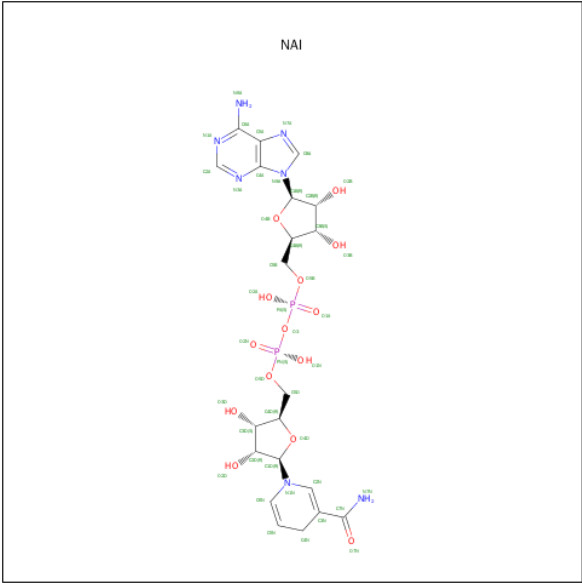
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	O	P	0	0
			5	4	1		
2	A	1	Total	O	P	0	0
			5	4	1		
2	C	1	Total	O	P	0	0
			5	4	1		
2	C	1	Total	O	P	0	0
			5	4	1		
2	B	1	Total	O	P	0	0
			5	4	1		
2	A	1	Total	O	P	0	0
			5	4	1		
2	D	1	Total	O	P	0	0
			5	4	1		
2	D	1	Total	O	P	0	0
			5	4	1		

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is 1,4-DIHYDRONICOTINAMIDE ADENINE DINUCLEOTIDE (three-letter code: NAI) (formula: C₂₁H₂₉N₇O₁₄P₂).



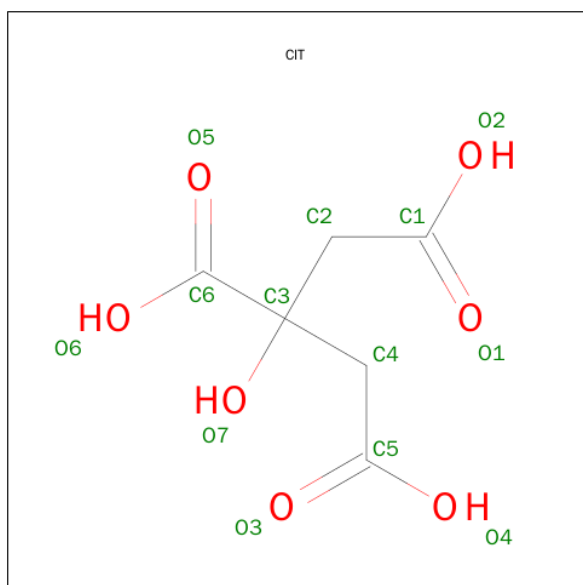
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	B	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	C	1	Total	C	N	O	P	0	0
			44	21	7	14	2		
4	D	1	Total	C	N	O	P	0	0
			44	21	7	14	2		

- Molecule 5 is CITRIC ACID (three-letter code: CIT) (formula: $C_6H_8O_7$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total	C	O	0	0
			13	6	7		
5	A	1	Total	C	O	0	0
			13	6	7		
5	C	1	Total	C	O	0	0
			13	6	7		
5	B	1	Total	C	O	0	0
			13	6	7		
5	C	1	Total	C	O	0	0
			13	6	7		
5	A	1	Total	C	O	0	0
			13	6	7		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	24	Total	O	0	0
			24	24		

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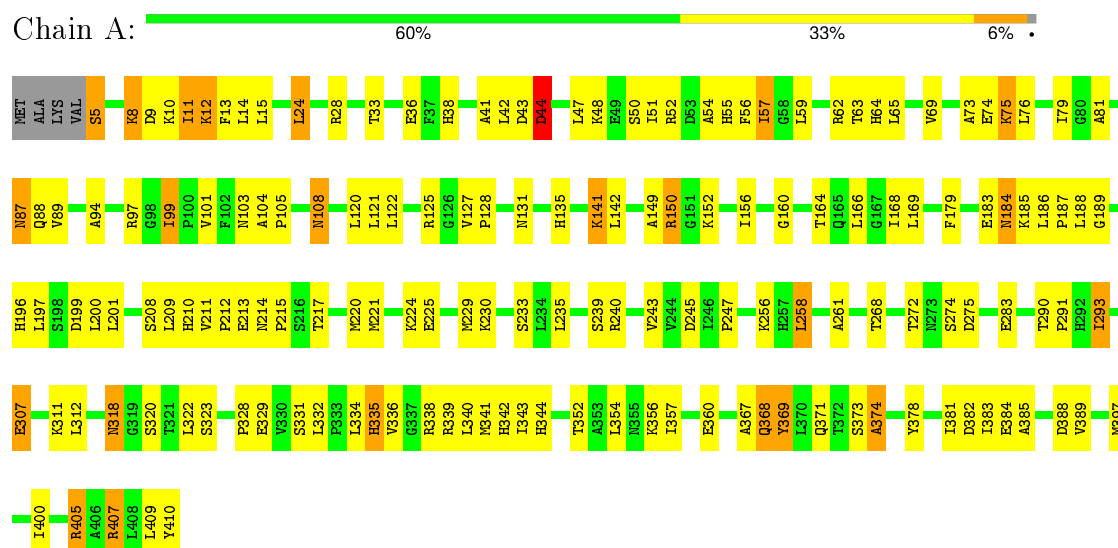
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	B	16	Total 16	O 16	0	0
6	C	15	Total 15	O 15	0	0
6	D	27	Total 27	O 27	0	0

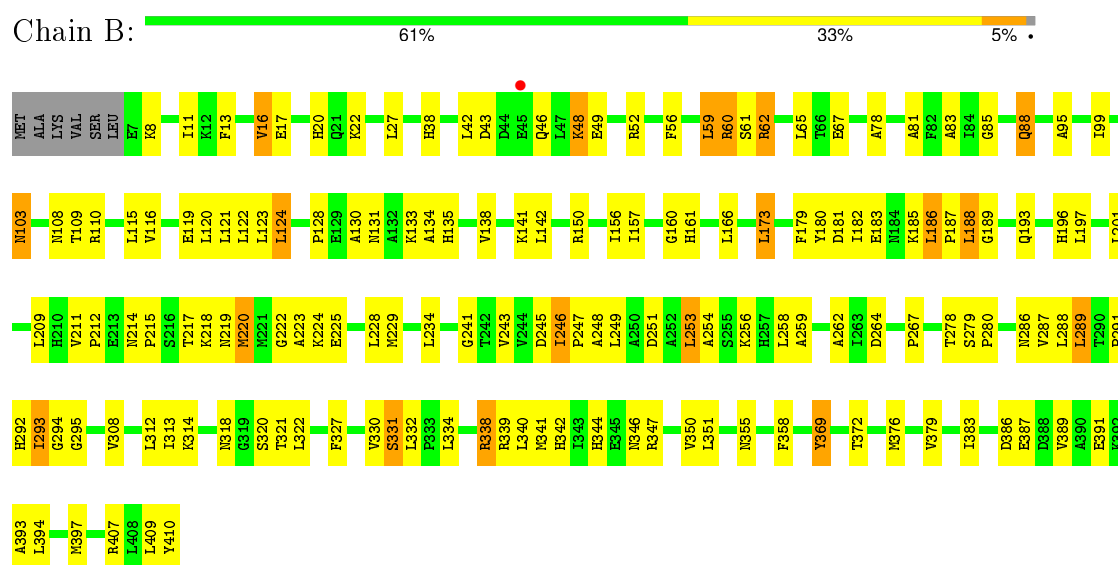
3 Residue-property plots

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.

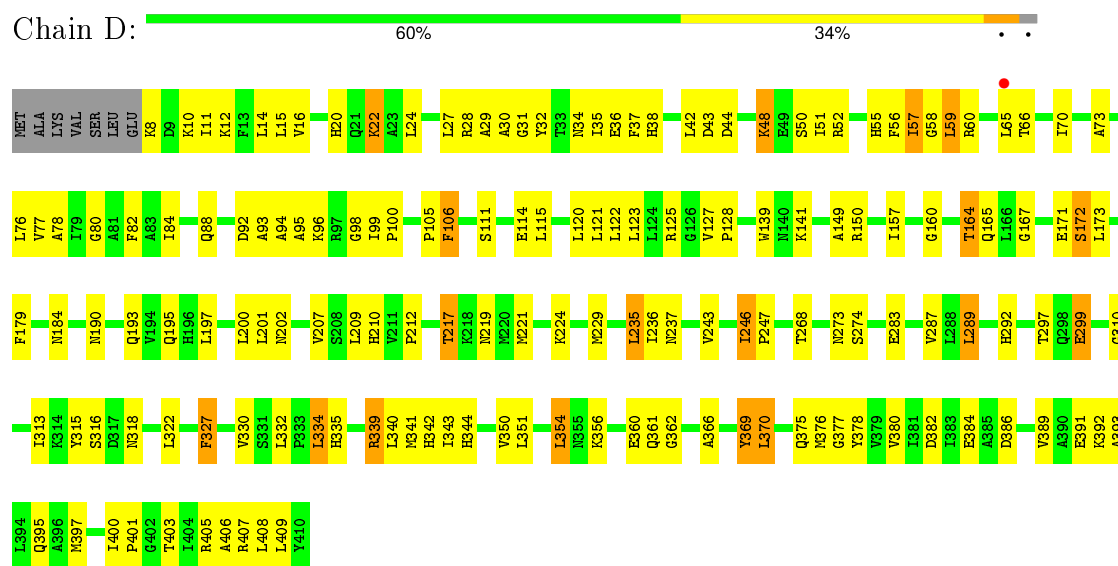
• Molecule 1: D-3-phosphoglycerate dehydrogenase



• Molecule 1: D-3-phosphoglycerate dehydrogenase



• Molecule 1: D-3-phosphoglycerate dehydrogenase



4 Data and refinement statistics

Property	Value	Source
Space group	P 43	Depositor
Cell constants a, b, c, α , β , γ	76.24Å 76.24Å 353.65Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	35.00 – 2.60 42.11 – 2.60	Depositor EDS
% Data completeness (in resolution range)	99.5 (35.00-2.60) 99.5 (42.11-2.60)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.81 (at 2.61Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.206 , 0.279 0.203 , 0.276	Depositor DCC
R_{free} test set	3107 reflections (5.34%)	DCC
Wilson B-factor (Å ²)	41.1	Xtriage
Anisotropy	0.597	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 12.8	EDS
Estimated twinning fraction	0.215 for h,-k,-l	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.25$	Xtriage
Outliers	0 of 61318 reflections	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	12648	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.29% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, NAI, SO4, CIT

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	0.74	0/3129	0.88	0/4241
1	B	0.79	1/3115 (0.0%)	0.88	0/4222
1	C	0.78	0/3129	0.94	2/4241 (0.0%)
1	D	0.79	0/3106	0.89	1/4210 (0.0%)
All	All	0.78	1/12479 (0.0%)	0.90	3/16914 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	C	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	185	LYS	CE-NZ	6.13	1.64	1.49

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	207	VAL	CB-CA-C	-5.25	101.42	111.40
1	C	370	LEU	CA-CB-CG	5.20	127.26	115.30
1	D	200	LEU	CB-CG-CD1	-5.02	102.47	111.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	334	LEU	Peptide

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	3076	0	3122	144	0
1	B	3062	0	3106	140	0
1	C	3076	0	3122	139	0
1	D	3053	0	3100	127	0
2	A	10	0	0	0	0
2	B	10	0	0	3	0
2	C	10	0	0	0	0
2	D	10	0	0	0	0
3	C	5	0	0	1	0
4	A	44	0	27	2	0
4	B	44	0	27	4	0
4	C	44	0	27	0	0
4	D	44	0	27	1	0
5	A	26	0	10	7	0
5	B	13	0	5	3	0
5	C	26	0	10	6	0
5	D	13	0	5	3	0
6	A	24	0	0	4	0
6	B	16	0	0	0	0
6	C	15	0	0	1	0
6	D	27	0	0	2	0
All	All	12648	0	12588	539	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 21.

The worst 5 of 539 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:D:268:THR:HB	6:D:590:HOH:O	1.39	1.17
1:C:342:HIS:CD2	1:C:344:HIS:HD2	1.63	1.16

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:196:HIS:HB3	2:B:499:PO4:O4	1.52	1.09
1:B:214:ASN:HB2	1:B:215:PRO:HD3	1.42	1.01
1:A:62:ARG:HH21	1:A:272:THR:HB	1.25	1.00

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	404/410 (98%)	365 (90%)	33 (8%)	6 (2%)	13	26
1	B	402/410 (98%)	363 (90%)	37 (9%)	2 (0%)	34	60
1	C	404/410 (98%)	373 (92%)	26 (6%)	5 (1%)	16	33
1	D	401/410 (98%)	374 (93%)	25 (6%)	2 (0%)	34	60
All	All	1611/1640 (98%)	1475 (92%)	121 (8%)	15 (1%)	21	42

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	9	ASP
1	A	374	ALA
1	B	224	LYS
1	A	44	ASP
1	A	336	VAL

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	325/328 (99%)	286 (88%)	39 (12%)	6	11
1	B	323/328 (98%)	290 (90%)	33 (10%)	9	17
1	C	325/328 (99%)	288 (89%)	37 (11%)	7	12
1	D	322/328 (98%)	283 (88%)	39 (12%)	6	11
All	All	1295/1312 (99%)	1147 (89%)	148 (11%)	7	12

5 of 148 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	338	ARG
1	C	55	HIS
1	D	339	ARG
1	B	347	ARG
1	C	39	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 51 such sidechains are listed below:

Mol	Chain	Res	Type
1	C	34	ASN
1	C	140	ASN
1	D	346	ASN
1	C	55	HIS
1	C	190	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

5.6 Ligand geometry

19 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PO4	A	500	-	4,4,4	1.02	0	6,6,6	0.30	0
2	PO4	A	504	-	4,4,4	0.33	0	6,6,6	0.30	0
4	NAI	A	508	-	38,48,48	1.74	5 (13%)	48,73,73	1.82	10 (20%)
5	CIT	A	514	-	3,12,12	1.04	0	3,17,17	2.32	2 (66%)
5	CIT	A	518	-	3,12,12	1.08	0	3,17,17	5.16	3 (100%)
2	PO4	B	499	-	4,4,4	0.46	0	6,6,6	0.31	0
2	PO4	B	503	-	4,4,4	0.85	0	6,6,6	0.27	0
4	NAI	B	509	-	38,48,48	1.73	6 (15%)	48,73,73	2.23	9 (18%)
5	CIT	B	516	-	3,12,12	1.52	0	3,17,17	2.90	1 (33%)
2	PO4	C	501	-	4,4,4	0.80	0	6,6,6	0.29	0
2	PO4	C	502	-	4,4,4	0.42	0	6,6,6	0.31	0
3	SO4	C	506	-	4,4,4	0.38	0	6,6,6	0.46	0
4	NAI	C	510	-	38,48,48	1.75	6 (15%)	48,73,73	2.05	9 (18%)
5	CIT	C	515	-	3,12,12	1.20	0	3,17,17	3.89	2 (66%)
5	CIT	C	517	-	3,12,12	1.73	0	3,17,17	3.70	1 (33%)
2	PO4	D	505	-	4,4,4	0.52	0	6,6,6	0.27	0
2	PO4	D	507	-	4,4,4	0.35	0	6,6,6	0.31	0
4	NAI	D	511	-	38,48,48	1.76	6 (15%)	48,73,73	2.38	13 (27%)
5	CIT	D	513	-	3,12,12	1.32	0	3,17,17	5.22	2 (66%)

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	PO4	A	500	-	-	0/0/0/0	0/0/0/0
2	PO4	A	504	-	-	0/0/0/0	0/0/0/0
4	NAI	A	508	-	-	0/25/72/72	0/5/5/5

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	CIT	A	514	-	-	0/6/16/16	0/0/0/0
5	CIT	A	518	-	-	0/6/16/16	0/0/0/0
2	PO4	B	499	-	-	0/0/0/0	0/0/0/0
2	PO4	B	503	-	-	0/0/0/0	0/0/0/0
4	NAI	B	509	-	-	0/25/72/72	0/5/5/5
5	CIT	B	516	-	-	0/6/16/16	0/0/0/0
2	PO4	C	501	-	-	0/0/0/0	0/0/0/0
2	PO4	C	502	-	-	0/0/0/0	0/0/0/0
3	SO4	C	506	-	-	0/0/0/0	0/0/0/0
4	NAI	C	510	-	-	0/25/72/72	0/5/5/5
5	CIT	C	515	-	-	0/6/16/16	0/0/0/0
5	CIT	C	517	-	-	0/6/16/16	0/0/0/0
2	PO4	D	505	-	-	0/0/0/0	0/0/0/0
2	PO4	D	507	-	-	0/0/0/0	0/0/0/0
4	NAI	D	511	-	-	0/25/72/72	0/5/5/5
5	CIT	D	513	-	-	0/6/16/16	0/0/0/0

The worst 5 of 23 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	511	NAI	C4N-C5N	-4.61	1.39	1.49
4	C	510	NAI	C4N-C5N	-4.56	1.39	1.49
4	A	508	NAI	C4N-C5N	-4.51	1.39	1.49
4	B	509	NAI	C4N-C5N	-4.13	1.40	1.49
4	C	510	NAI	PN-O1N	-2.13	1.45	1.54

The worst 5 of 52 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	511	NAI	N3A-C2A-N1A	-11.29	120.25	128.89
4	B	509	NAI	N3A-C2A-N1A	-11.07	120.42	128.89
4	C	510	NAI	N3A-C2A-N1A	-11.07	120.42	128.89
4	A	508	NAI	N3A-C2A-N1A	-7.95	122.81	128.89
5	D	513	CIT	C3-C4-C5	-7.03	103.71	114.96

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

11 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	508	NAI	2	0
5	A	514	CIT	5	0
5	A	518	CIT	2	0
2	B	499	PO4	3	0
4	B	509	NAI	4	0
5	B	516	CIT	3	0
3	C	506	SO4	1	0
5	C	515	CIT	2	0
5	C	517	CIT	4	0
4	D	511	NAI	1	0
5	D	513	CIT	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	406/410 (99%)	-0.29	0	100 100	20, 38, 66, 87	3 (0%)
1	B	404/410 (98%)	-0.33	1 (0%)	95 95	17, 37, 59, 73	3 (0%)
1	C	406/410 (99%)	-0.32	2 (0%)	91 90	21, 37, 64, 92	8 (1%)
1	D	403/410 (98%)	-0.31	1 (0%)	95 95	16, 36, 69, 87	6 (1%)
All	All	1619/1640 (98%)	-0.31	4 (0%)	95 95	16, 37, 65, 92	20 (1%)

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	6	LEU	4.7
1	B	45	GLU	3.6
1	D	65	LEU	2.2
1	C	335	HIS	2.1

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 [i](#)

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(\AA^2)	Q<0.9
5	CIT	C	517	13/13	0.89	0.32	5.53	61,71,82,89	0
5	CIT	D	513	13/13	0.89	0.28	3.73	49,69,77,85	0
5	CIT	B	516	13/13	0.82	0.23	3.31	29,53,60,66	0
5	CIT	C	515	13/13	0.87	0.24	2.32	44,62,73,81	0
2	PO4	A	504	5/5	0.93	0.20	2.03	61,67,69,79	0
5	CIT	A	518	13/13	0.81	0.31	1.99	59,68,81,96	0
2	PO4	C	501	5/5	0.99	0.15	0.29	28,32,36,41	0
4	NAI	A	508	44/44	0.98	0.15	0.06	18,37,48,51	0
4	NAI	D	511	44/44	0.97	0.13	-0.19	27,39,49,53	0
2	PO4	B	503	5/5	0.97	0.15	-0.27	35,39,45,48	0
4	NAI	C	510	44/44	0.98	0.14	-0.28	21,41,49,53	0
2	PO4	D	505	5/5	0.96	0.13	-1.24	51,61,71,71	0
4	NAI	B	509	44/44	0.97	0.12	-1.50	26,45,51,59	0
2	PO4	B	499	5/5	0.92	0.11	-1.56	62,62,75,76	0
2	PO4	C	502	5/5	0.99	0.12	-1.73	25,28,35,37	0
2	PO4	D	507	5/5	0.97	0.13	-	54,56,59,64	0
3	SO4	C	506	5/5	0.93	0.11	-	56,57,70,72	0
5	CIT	A	514	13/13	0.86	0.26	-	58,72,97,102	0
2	PO4	A	500	5/5	0.99	0.15	-	16,25,29,30	0

6.5 Other polymers

There are no such residues in this entry.