



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 7, 2024 – 05:08 pm GMT

PDB ID : 6GG4
Title : Crystal structure of M2 PYK in complex with Phenylalanine.
Authors : McNae, I.W.; Yuan, M.; Walkinshaw, M.D.
Deposited on : 2018-05-02
Resolution : 2.46 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

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtrriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

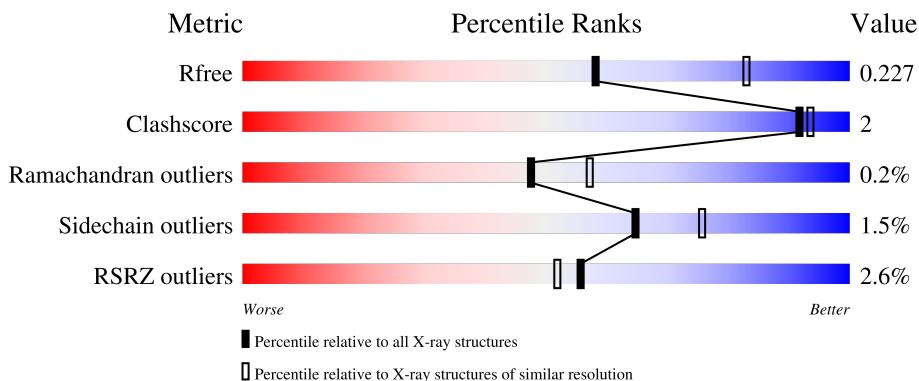
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.46 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}	130704	1544 (2.48-2.44)
Clashscore	141614	1613 (2.48-2.44)
Ramachandran outliers	138981	1598 (2.48-2.44)
Sidechain outliers	138945	1598 (2.48-2.44)
RSRZ outliers	127900	1523 (2.48-2.44)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. 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	551	 3% 88% 8%
1	B	551	 2% 88% 8%
1	C	551	 % 71% 26%
1	D	551	 2% 71% 26%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 14593 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 Pyruvate kinase PKM.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	509	3912	2460	696	732	24	0	2	0
1	B	509	3904	2455	693	732	24	0	1	0
1	C	410	3169	1990	571	587	21	0	2	0
1	D	410	3163	1986	571	585	21	0	1	0

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	initiating methionine	UNP P14618
A	-18	GLY	-	expression tag	UNP P14618
A	-17	SER	-	expression tag	UNP P14618
A	-16	SER	-	expression tag	UNP P14618
A	-15	HIS	-	expression tag	UNP P14618
A	-14	HIS	-	expression tag	UNP P14618
A	-13	HIS	-	expression tag	UNP P14618
A	-12	HIS	-	expression tag	UNP P14618
A	-11	HIS	-	expression tag	UNP P14618
A	-10	HIS	-	expression tag	UNP P14618
A	-9	SER	-	expression tag	UNP P14618
A	-8	SER	-	expression tag	UNP P14618
A	-7	GLY	-	expression tag	UNP P14618
A	-6	LEU	-	expression tag	UNP P14618
A	-5	VAL	-	expression tag	UNP P14618
A	-4	PRO	-	expression tag	UNP P14618
A	-3	ARG	-	expression tag	UNP P14618
A	-2	GLY	-	expression tag	UNP P14618
A	-1	SER	-	expression tag	UNP P14618
A	0	HIS	-	expression tag	UNP P14618
B	-19	MET	-	initiating methionine	UNP P14618

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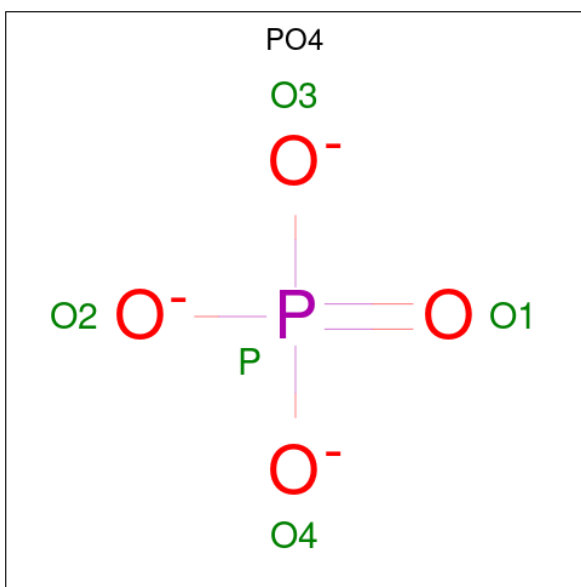
Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	expression tag	UNP P14618
B	-17	SER	-	expression tag	UNP P14618
B	-16	SER	-	expression tag	UNP P14618
B	-15	HIS	-	expression tag	UNP P14618
B	-14	HIS	-	expression tag	UNP P14618
B	-13	HIS	-	expression tag	UNP P14618
B	-12	HIS	-	expression tag	UNP P14618
B	-11	HIS	-	expression tag	UNP P14618
B	-10	HIS	-	expression tag	UNP P14618
B	-9	SER	-	expression tag	UNP P14618
B	-8	SER	-	expression tag	UNP P14618
B	-7	GLY	-	expression tag	UNP P14618
B	-6	LEU	-	expression tag	UNP P14618
B	-5	VAL	-	expression tag	UNP P14618
B	-4	PRO	-	expression tag	UNP P14618
B	-3	ARG	-	expression tag	UNP P14618
B	-2	GLY	-	expression tag	UNP P14618
B	-1	SER	-	expression tag	UNP P14618
B	0	HIS	-	expression tag	UNP P14618
C	-19	MET	-	initiating methionine	UNP P14618
C	-18	GLY	-	expression tag	UNP P14618
C	-17	SER	-	expression tag	UNP P14618
C	-16	SER	-	expression tag	UNP P14618
C	-15	HIS	-	expression tag	UNP P14618
C	-14	HIS	-	expression tag	UNP P14618
C	-13	HIS	-	expression tag	UNP P14618
C	-12	HIS	-	expression tag	UNP P14618
C	-11	HIS	-	expression tag	UNP P14618
C	-10	HIS	-	expression tag	UNP P14618
C	-9	SER	-	expression tag	UNP P14618
C	-8	SER	-	expression tag	UNP P14618
C	-7	GLY	-	expression tag	UNP P14618
C	-6	LEU	-	expression tag	UNP P14618
C	-5	VAL	-	expression tag	UNP P14618
C	-4	PRO	-	expression tag	UNP P14618
C	-3	ARG	-	expression tag	UNP P14618
C	-2	GLY	-	expression tag	UNP P14618
C	-1	SER	-	expression tag	UNP P14618
C	0	HIS	-	expression tag	UNP P14618
D	-19	MET	-	initiating methionine	UNP P14618
D	-18	GLY	-	expression tag	UNP P14618
D	-17	SER	-	expression tag	UNP P14618

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	expression tag	UNP P14618
D	-15	HIS	-	expression tag	UNP P14618
D	-14	HIS	-	expression tag	UNP P14618
D	-13	HIS	-	expression tag	UNP P14618
D	-12	HIS	-	expression tag	UNP P14618
D	-11	HIS	-	expression tag	UNP P14618
D	-10	HIS	-	expression tag	UNP P14618
D	-9	SER	-	expression tag	UNP P14618
D	-8	SER	-	expression tag	UNP P14618
D	-7	GLY	-	expression tag	UNP P14618
D	-6	LEU	-	expression tag	UNP P14618
D	-5	VAL	-	expression tag	UNP P14618
D	-4	PRO	-	expression tag	UNP P14618
D	-3	ARG	-	expression tag	UNP P14618
D	-2	GLY	-	expression tag	UNP P14618
D	-1	SER	-	expression tag	UNP P14618
D	0	HIS	-	expression tag	UNP P14618

- Molecule 2 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



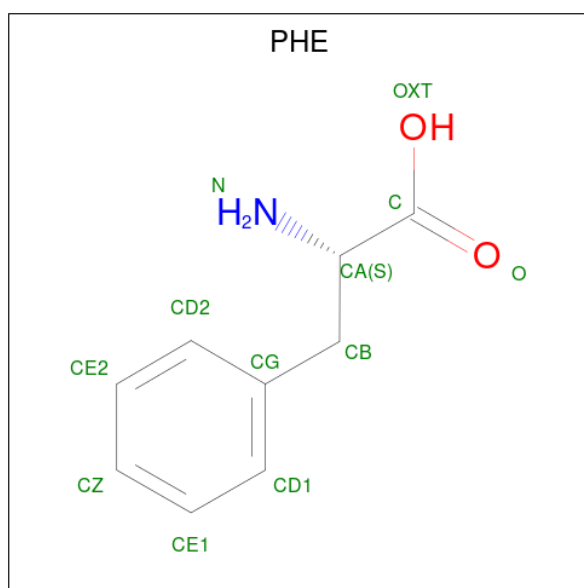
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	P	0	0
			5	4	1		
2	A	1	Total	O	P	0	0
			5	4	1		
2	A	1	Total	O	P	0	0
			5	4	1		

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

- Molecule 3 is PHENYLALANINE (three-letter code: PHE) (formula: C₉H₁₁NO₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			12	9	1	2		
3	B	1	Total	C	N	O	0	0
			12	9	1	2		
3	C	1	Total	C	N	O	0	0
			12	9	1	2		
3	D	1	Total	C	N	O	0	0
			12	9	1	2		

- Molecule 4 is POTASSIUM ION (three-letter code: K) (formula: K).

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

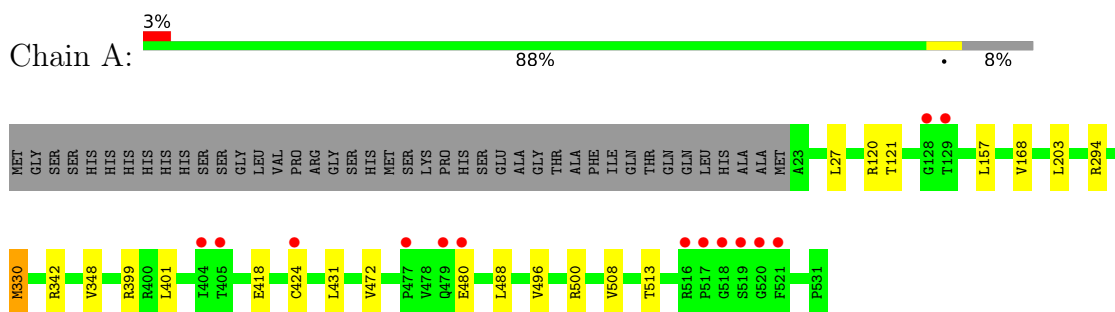
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	106	Total O 106 106	0	0
5	B	92	Total O 92 92	0	0
5	C	99	Total O 99 99	0	0
5	D	56	Total O 56 56	0	0

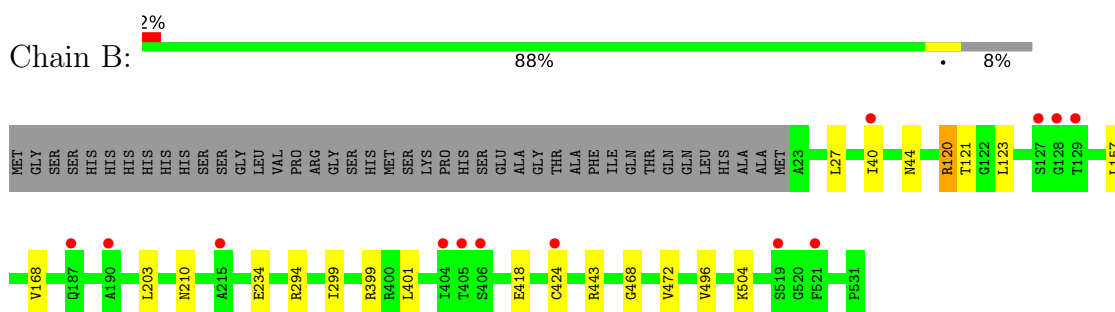
3 Residue-property plots [i](#)

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

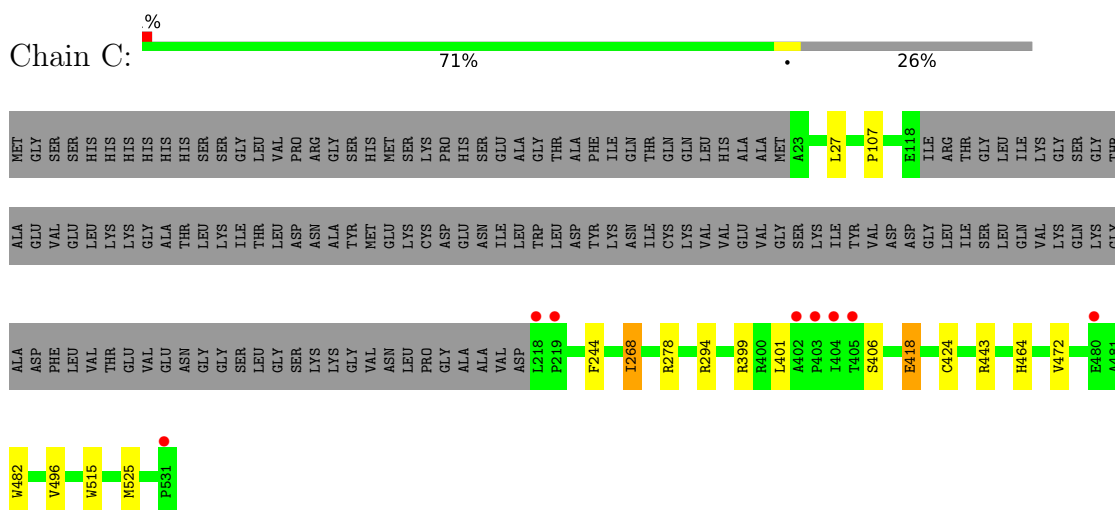
- Molecule 1: Pyruvate kinase PKM



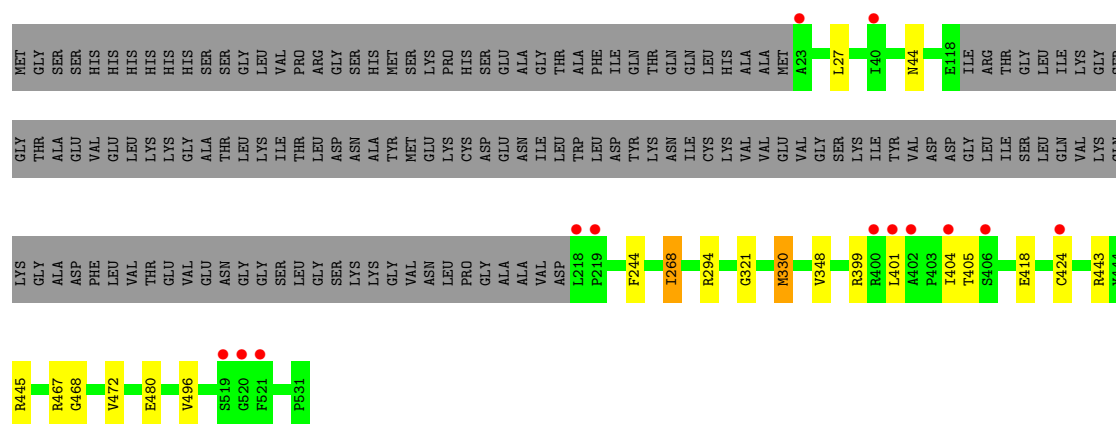
- Molecule 1: Pyruvate kinase PKM



- Molecule 1: Pyruvate kinase PKM



- Molecule 1: Pyruvate kinase PKM



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	97.37Å 70.34Å 168.64Å 90.00° 106.06° 90.00°	Depositor
Resolution (Å)	162.06 – 2.46 71.88 – 2.46	Depositor EDS
% Data completeness (in resolution range)	98.6 (162.06-2.46) 98.6 (71.88-2.46)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.49 (at 2.45Å)	Xtrriage
Refinement program	REFMAC 5.8.0189	Depositor
R, R_{free}	0.197 , 0.225 0.200 , 0.227	Depositor DCC
R_{free} test set	3904 reflections (4.94%)	wwPDB-VP
Wilson B-factor (Å ²)	42.2	Xtrriage
Anisotropy	0.128	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 33.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.018 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	14593	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.66% 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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, CSO, K

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.45	0/3973	0.67	2/5363 (0.0%)
1	B	0.43	0/3962	0.67	3/5349 (0.1%)
1	C	0.46	0/3222	0.69	1/4351 (0.0%)
1	D	0.44	0/3213	0.68	1/4339 (0.0%)
All	All	0.45	0/14370	0.68	7/19402 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	443	ARG	NE-CZ-NH2	-6.67	116.97	120.30
1	D	330	MET	CG-SD-CE	5.54	109.07	100.20
1	A	330	MET	CG-SD-CE	5.54	109.07	100.20
1	C	278	ARG	NE-CZ-NH1	5.38	122.99	120.30
1	A	120	ARG	NE-CZ-NH1	-5.22	117.69	120.30
1	B	120	ARG	NE-CZ-NH2	-5.17	117.72	120.30
1	B	120	ARG	NE-CZ-NH1	5.05	122.83	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	3912	0	4006	16	0
1	B	3904	0	3993	10	0
1	C	3169	0	3227	11	0
1	D	3163	0	3222	13	0
2	A	15	0	0	0	0
2	B	15	0	0	0	0
2	C	5	0	0	0	0
2	D	5	0	0	0	0
3	A	12	0	8	0	0
3	B	12	0	8	0	0
3	C	12	0	8	0	0
3	D	12	0	8	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
5	A	106	0	0	0	0
5	B	92	0	0	1	0
5	C	99	0	0	1	0
5	D	56	0	0	0	0
All	All	14593	0	14480	45	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 2.

All (45) 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:A:500[B]:ARG:HG3	1:A:500[B]:ARG:HH11	1.29	0.97
1:A:500[B]:ARG:HH11	1:A:500[B]:ARG:CG	1.93	0.81
1:A:330:MET:CE	1:A:348:VAL:HG22	2.16	0.76
1:D:330:MET:CE	1:D:348:VAL:HG22	2.17	0.74
1:A:330:MET:HE3	1:A:348:VAL:HG22	1.70	0.74
1:D:330:MET:HE3	1:D:348:VAL:HG22	1.71	0.72
1:C:482:TRP:CH2	1:C:515:TRP:O	2.51	0.62
1:A:500[B]:ARG:CG	1:A:500[B]:ARG:NH1	2.62	0.60
1:A:399:ARG:NH1	1:A:418:GLU:OE1	2.36	0.59
1:B:399:ARG:NH1	1:B:418:GLU:OE1	2.36	0.58
1:C:399:ARG:NH1	1:C:418:GLU:OE1	2.37	0.58
1:D:399:ARG:NH1	1:D:418:GLU:OE1	2.37	0.57
1:B:27:LEU:HD23	1:C:401:LEU:HD12	1.88	0.56
1:D:321:GLY:HA3	1:D:443:ARG:HD2	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:268:ILE:HD12	1:C:268:ILE:N	2.25	0.52
1:B:472:VAL:HG11	1:B:496:VAL:HG11	1.92	0.51
1:C:472:VAL:HG11	1:C:496:VAL:HG11	1.92	0.51
1:A:27:LEU:HD23	1:D:401:LEU:HD12	1.93	0.51
1:C:107:PRO:O	1:C:464:HIS:HE1	1.92	0.51
1:D:268:ILE:HD12	1:D:268:ILE:N	2.26	0.51
1:D:330:MET:HE2	1:D:348:VAL:HG22	1.92	0.50
1:A:401:LEU:HD12	1:D:27:LEU:HD23	1.93	0.50
1:D:472:VAL:HG11	1:D:496:VAL:HG11	1.94	0.50
1:B:401:LEU:HD12	1:C:27:LEU:HD23	1.94	0.49
1:A:330:MET:HE2	1:A:348:VAL:HG22	1.92	0.49
1:B:157:LEU:HD13	1:B:203:LEU:HD21	1.94	0.49
1:B:234:GLU:OE1	5:B:701:HOH:O	2.20	0.48
1:C:482:TRP:CZ3	1:C:515:TRP:O	2.67	0.48
1:B:210:ASN:ND2	1:B:299:ILE:HD13	2.29	0.48
1:A:157:LEU:HD13	1:A:203:LEU:HD21	1.96	0.48
1:B:44:ASN:HD22	1:B:468:GLY:HA2	1.80	0.46
1:A:472:VAL:HG11	1:A:496:VAL:HG11	1.98	0.46
1:A:330:MET:HE3	1:A:330:MET:HA	1.97	0.46
1:D:445[B]:ARG:NE	1:D:467:ARG:HD3	2.31	0.45
1:D:44:ASN:HD22	1:D:468:GLY:HA2	1.81	0.45
1:A:500[B]:ARG:HG3	1:A:500[B]:ARG:NH1	2.10	0.43
1:A:508:VAL:HG21	1:C:406:SER:HB2	2.00	0.43
1:C:107:PRO:O	1:C:464:HIS:CE1	2.70	0.43
1:A:431:LEU:HD12	1:A:513:THR:HG22	2.00	0.43
1:C:268:ILE:N	1:C:268:ILE:CD1	2.82	0.42
1:D:268:ILE:N	1:D:268:ILE:CD1	2.82	0.42
1:B:121:THR:HB	1:B:157:LEU:HD11	2.01	0.41
1:A:121:THR:HB	1:A:157:LEU:HD11	2.01	0.41
1:B:401:LEU:HD21	5:C:710:HOH:O	2.20	0.40
1:D:330:MET:HE3	1:D:330:MET:HA	2.02	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	508/551 (92%)	496 (98%)	11 (2%)	1 (0%)	47	57
1	B	507/551 (92%)	494 (97%)	12 (2%)	1 (0%)	47	57
1	C	407/551 (74%)	400 (98%)	6 (2%)	1 (0%)	47	57
1	D	406/551 (74%)	400 (98%)	5 (1%)	1 (0%)	47	57
All	All	1828/2204 (83%)	1790 (98%)	34 (2%)	4 (0%)	47	57

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	424	CYS
1	B	424	CYS
1	C	424	CYS
1	D	424	CYS

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	420/452 (93%)	415 (99%)	5 (1%)	71	81
1	B	419/452 (93%)	413 (99%)	6 (1%)	67	77
1	C	339/452 (75%)	333 (98%)	6 (2%)	59	71
1	D	338/452 (75%)	332 (98%)	6 (2%)	59	71
All	All	1516/1808 (84%)	1493 (98%)	23 (2%)	65	76

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

Mol	Chain	Res	Type
1	A	168	VAL
1	A	294	ARG
1	A	342	ARG
1	A	480	GLU

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Mol	Chain	Res	Type
1	A	488	LEU
1	B	40	ILE
1	B	120	ARG
1	B	123	LEU
1	B	168	VAL
1	B	294	ARG
1	B	504	LYS
1	C	244	PHE
1	C	268	ILE
1	C	294	ARG
1	C	418	GLU
1	C	443	ARG
1	C	525	MET
1	D	244	PHE
1	D	268	ILE
1	D	294	ARG
1	D	404	ILE
1	D	405	THR
1	D	480	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	44	ASN
1	B	210	ASN
1	B	391	HIS
1	C	391	HIS
1	C	458	GLN
1	C	464	HIS
1	D	44	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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
1	CSO	D	474	1	3,6,7	0.65	0	0,6,8	-	-
1	CSO	B	474	1	3,6,7	0.63	0	0,6,8	-	-
1	CSO	C	474	1	3,6,7	0.55	0	0,6,8	-	-
1	CSO	A	474	1	3,6,7	0.54	0	0,6,8	-	-

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
1	CSO	D	474	1	-	0/1/5/7	-
1	CSO	B	474	1	-	0/1/5/7	-
1	CSO	C	474	1	-	0/1/5/7	-
1	CSO	A	474	1	-	0/1/5/7	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 16 ligands modelled in this entry, 4 are monoatomic - leaving 12 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	PHE	A	603	-	11,12,12	0.74	0	14,15,15	0.88	1 (7%)
2	PO4	A	601	-	4,4,4	1.02	0	6,6,6	0.94	0
2	PO4	A	602	-	4,4,4	0.88	0	6,6,6	0.71	0
3	PHE	D	602	-	11,12,12	0.76	0	14,15,15	0.88	1 (7%)
3	PHE	B	603	-	11,12,12	0.63	0	14,15,15	0.84	1 (7%)
2	PO4	B	602	-	4,4,4	0.80	0	6,6,6	0.56	0
2	PO4	D	601	-	4,4,4	0.77	0	6,6,6	0.75	0
2	PO4	B	601	-	4,4,4	0.80	0	6,6,6	0.80	0
2	PO4	B	604	-	4,4,4	0.89	0	6,6,6	0.45	0
2	PO4	C	601	-	4,4,4	0.80	0	6,6,6	0.80	0
2	PO4	A	604	-	4,4,4	0.69	0	6,6,6	0.62	0
3	PHE	C	602	-	11,12,12	0.60	0	14,15,15	0.86	2 (14%)

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	PHE	A	603	-	-	0/8/8/8	0/1/1/1
3	PHE	B	603	-	-	0/8/8/8	0/1/1/1
3	PHE	D	602	-	-	0/8/8/8	0/1/1/1
3	PHE	C	602	-	-	0/8/8/8	0/1/1/1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	603	PHE	OXT-C-CA	2.47	121.78	113.38
3	D	602	PHE	OXT-C-CA	2.35	121.38	113.38
3	B	603	PHE	OXT-C-CA	2.30	121.22	113.38
3	C	602	PHE	OXT-C-O	-2.29	118.89	124.09
3	C	602	PHE	OXT-C-CA	2.13	120.64	113.38

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data [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	508/551 (92%)	-0.08	14 (2%) 53 49	44, 58, 91, 124	0
1	B	508/551 (92%)	0.12	13 (2%) 56 52	43, 62, 100, 120	0
1	C	409/551 (74%)	-0.05	8 (1%) 65 62	42, 55, 85, 123	0
1	D	409/551 (74%)	0.00	13 (3%) 47 44	44, 60, 96, 134	0
All	All	1834/2204 (83%)	0.00	48 (2%) 56 52	42, 59, 97, 134	0

All (48) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	128	GLY	9.6
1	B	406	SER	6.4
1	A	518	GLY	4.7
1	A	480	GLU	4.3
1	C	218	LEU	3.9
1	D	521	PHE	3.7
1	D	40	ILE	3.7
1	B	127	SER	3.5
1	D	23	ALA	3.4
1	A	519	SER	3.3
1	C	402	ALA	3.3
1	B	404	ILE	3.3
1	C	404	ILE	3.2
1	B	129	THR	3.1
1	A	405	THR	3.1
1	D	424	CYS	3.1
1	D	218	LEU	3.0
1	C	219	PRO	3.0
1	A	479	GLN	2.9
1	A	517	PRO	2.9
1	C	531	PRO	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	480	GLU	2.8
1	D	520	GLY	2.8
1	A	404	ILE	2.8
1	B	187	GLN	2.8
1	B	405	THR	2.7
1	D	402	ALA	2.7
1	A	129	THR	2.6
1	A	521	PHE	2.6
1	B	190	ALA	2.6
1	B	519	SER	2.6
1	B	424	CYS	2.5
1	A	424	CYS	2.4
1	B	215	ALA	2.4
1	C	405	THR	2.4
1	B	521	PHE	2.3
1	A	516	ARG	2.3
1	D	404	ILE	2.3
1	D	519	SER	2.3
1	C	403	PRO	2.3
1	D	219	PRO	2.2
1	B	40	ILE	2.2
1	A	477	PRO	2.2
1	D	406	SER	2.2
1	A	520	GLY	2.1
1	D	401	LEU	2.1
1	D	400	ARG	2.0
1	A	128	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q < 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q < 0.9
1	CSO	A	474	7/8	0.93	0.10	60,63,65,65	0
1	CSO	D	474	7/8	0.95	0.17	62,68,72,75	0
1	CSO	C	474	7/8	0.97	0.13	55,58,62,64	0
1	CSO	B	474	7/8	0.97	0.12	69,75,79,83	0

6.3 Carbohydrates [i](#)

There are no monosaccharides 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. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	K	C	603	1/1	0.82	0.22	90,90,90,90	0
2	PO4	B	602	5/5	0.88	0.20	86,87,93,93	0
2	PO4	A	602	5/5	0.91	0.16	83,90,90,91	0
4	K	D	603	1/1	0.92	0.21	81,81,81,81	0
3	PHE	D	602	12/12	0.94	0.17	49,50,54,58	0
2	PO4	A	604	5/5	0.94	0.12	72,76,78,80	0
3	PHE	A	603	12/12	0.94	0.16	48,49,52,52	0
3	PHE	B	603	12/12	0.95	0.14	50,52,53,54	0
2	PO4	B	604	5/5	0.95	0.13	84,85,88,89	0
3	PHE	C	602	12/12	0.96	0.16	44,45,49,50	0
4	K	B	605	1/1	0.98	0.10	61,61,61,61	0
2	PO4	D	601	5/5	0.98	0.10	53,54,57,57	0
4	K	A	605	1/1	0.98	0.10	57,57,57,57	0
2	PO4	A	601	5/5	0.99	0.14	52,55,56,57	0
2	PO4	B	601	5/5	0.99	0.09	52,52,54,55	0
2	PO4	C	601	5/5	0.99	0.12	49,49,50,50	0

6.5 Other polymers [i](#)

There are no such residues in this entry.