



# wwPDB X-ray Structure Validation Summary Report

Jan 30, 2021 – 08:14 PM EST

PDB ID : 3MKV  
Title : Crystal structure of amidohydrolase eaj56179  
Authors : Patskovsky, Y.; Bonanno, J.; Ozyurt, S.; Sauder, J.M.; Freeman, J.; Wu, B.; Smith, D.; Bain, K.; Rodgers, L.; Wasserman, S.R.; Raushel, F.M.; Burley, S.K.; Almo, S.C.; New York SGX Research Center for Structural Genomics (NYSGXRC)  
Deposited on : 2010-04-15  
Resolution : 2.40 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

<https://www.wwpdb.org/validation/2017/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 : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.16  
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) : 2.16

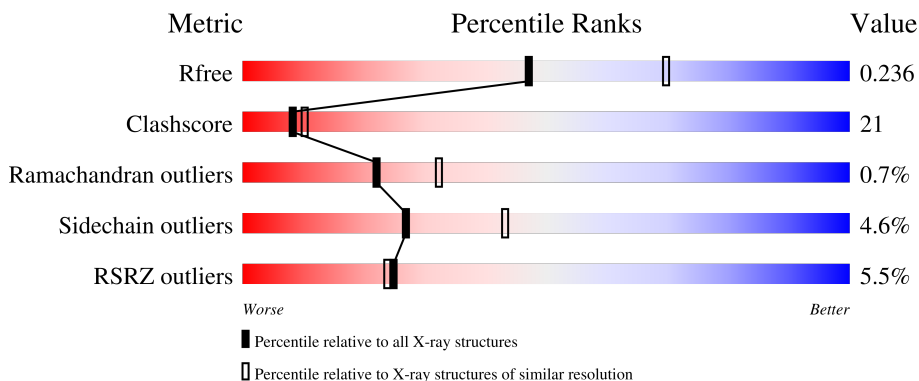
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

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  $\geq 3$ , 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	426	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 68%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">68%      26%      . .</p>
1	B	426	<div style="display: flex; align-items: center;"> <div style="width: 6%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 69%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">6%      69%      26%      . .</p>
1	C	426	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 65%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 31%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">5%      65%      31%      . .</p>
1	D	426	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 68%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">3%      68%      26%      . .</p>
1	E	426	<div style="display: flex; align-items: center;"> <div style="width: 7%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 67%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 28%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 2%; height: 10px; background-color: grey;"></div> </div> <p style="text-align: center;">7%      67%      28%      . .</p>

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Mol	Chain	Length	Quality of chain
1	F	426	
1	G	426	
1	H	426	

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
3	SO4	B	427	-	-	X	X
3	SO4	C	427	-	-	X	-
3	SO4	D	428	-	-	X	-
3	SO4	H	429	-	-	X	-

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 25975 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 PUTATIVE AMIDOHYDROLASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	414	Total 3147	C 1985	N 561	O 586	S 15	0	6	0
1	B	413	Total 3141	C 1979	N 561	O 586	S 15	0	7	0
1	C	413	Total 3138	C 1974	N 564	O 585	S 15	0	6	0
1	D	413	Total 3121	C 1965	N 557	O 584	S 15	0	3	0
1	E	413	Total 3142	C 1981	N 560	O 586	S 15	0	7	0
1	F	413	Total 3130	C 1973	N 554	O 588	S 15	0	6	0
1	G	413	Total 3131	C 1972	N 559	O 585	S 15	0	5	0
1	H	413	Total 3134	C 1971	N 562	O 586	S 15	0	5	0

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	G	2	Total 2	Zn 2	0	0
2	D	2	Total 2	Zn 2	0	0
2	E	2	Total 2	Zn 2	0	0
2	H	2	Total 2	Zn 2	0	0
2	B	2	Total 2	Zn 2	0	0
2	C	2	Total 2	Zn 2	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Zn	0	0
			2	2		
2	F	2	Total	Zn	0	0
			2	2		

- Molecule 3 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



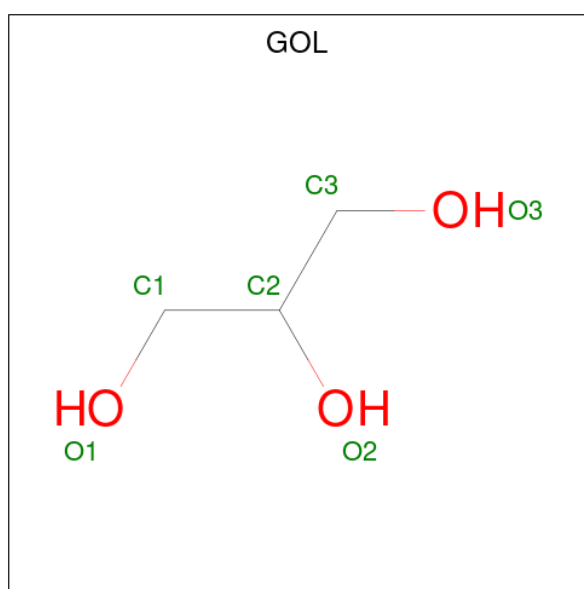
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	A	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		
3	C	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	D	1	Total	O	S	0	0
			5	4	1		
3	E	1	Total	O	S	0	0
			5	4	1		
3	E	1	Total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

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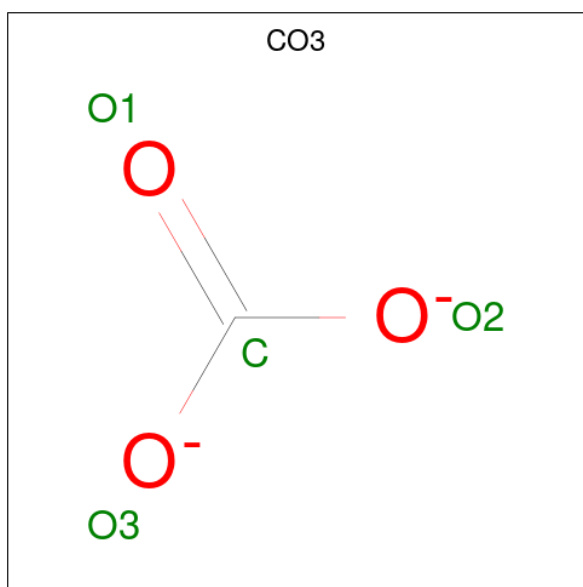
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	G	1	Total O S 5 4 1	0	0
3	H	1	Total O S 5 4 1	0	0
3	H	1	Total O S 5 4 1	0	0
3	H	1	Total O S 5 4 1	0	0

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



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0

- Molecule 5 is CARBONATE ION (three-letter code: CO3) (formula: CO<sub>3</sub>).



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

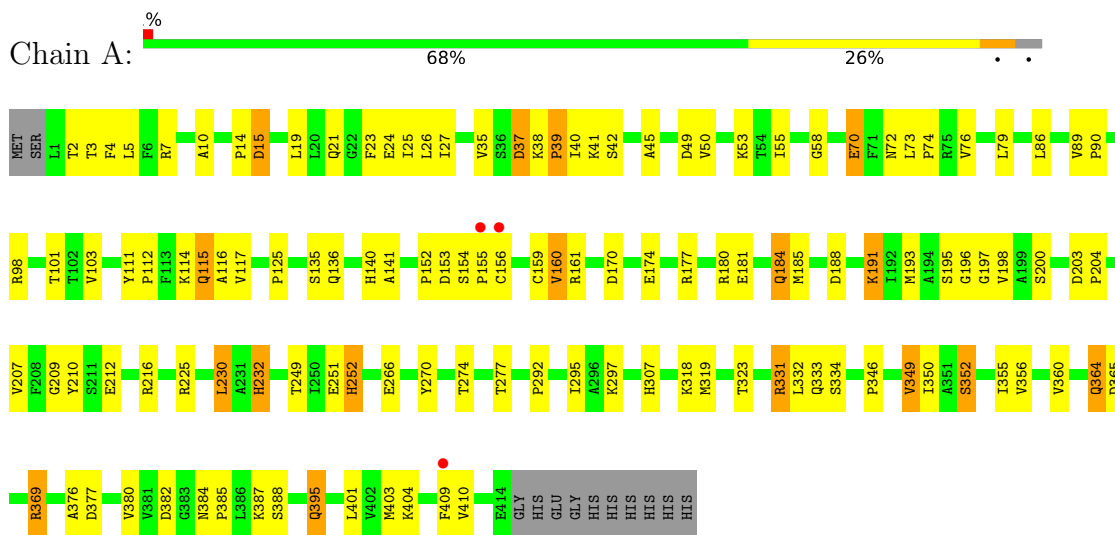
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	135	Total O 135 135	0	0
6	B	124	Total O 124 124	0	0
6	C	111	Total O 111 111	0	0
6	D	99	Total O 99 99	0	0
6	E	90	Total O 90 90	0	0
6	F	88	Total O 88 88	0	0
6	G	75	Total O 75 75	0	0
6	H	68	Total O 68 68	0	0

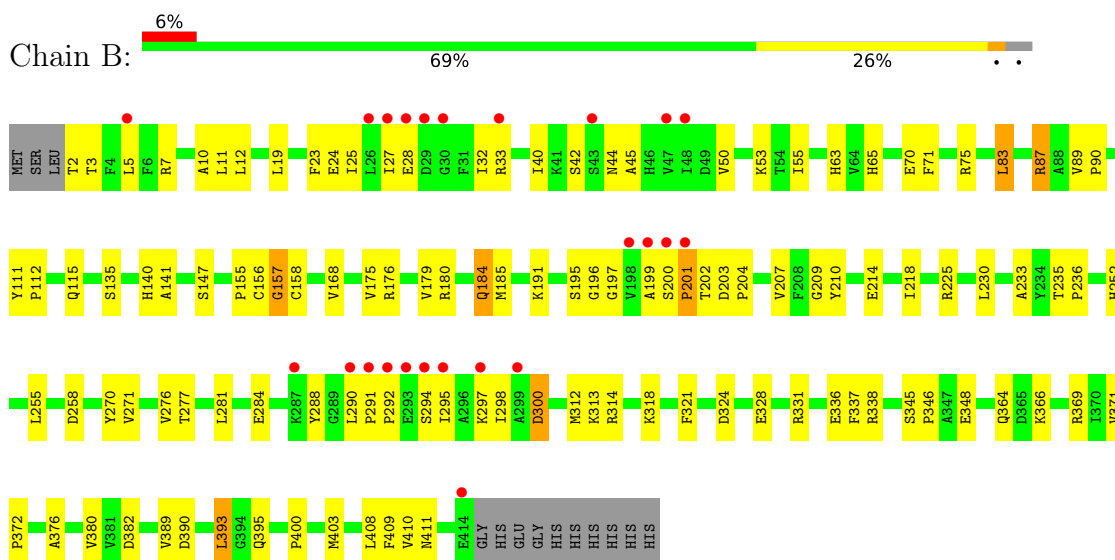
### 3 Residue-property plots [i](#)

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: PUTATIVE AMIDOHYDROLASE



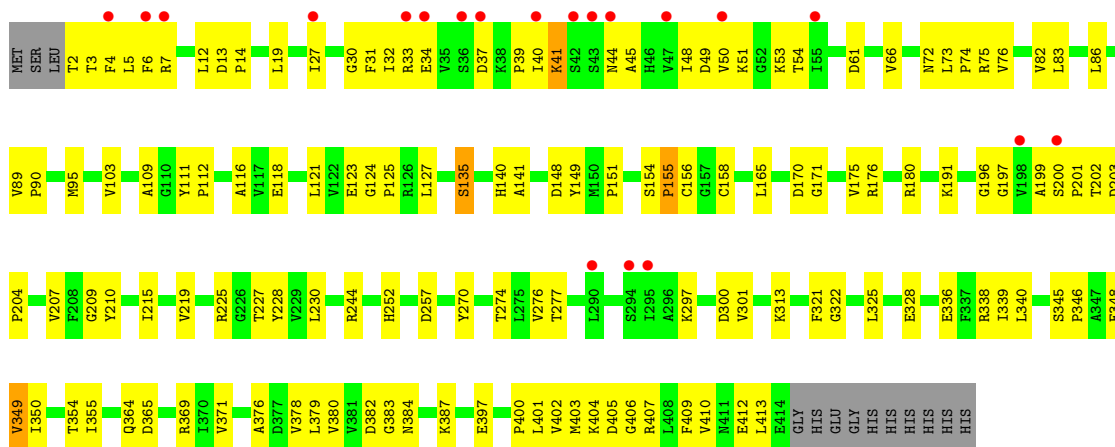
#### • Molecule 1: PUTATIVE AMIDOHYDROLASE



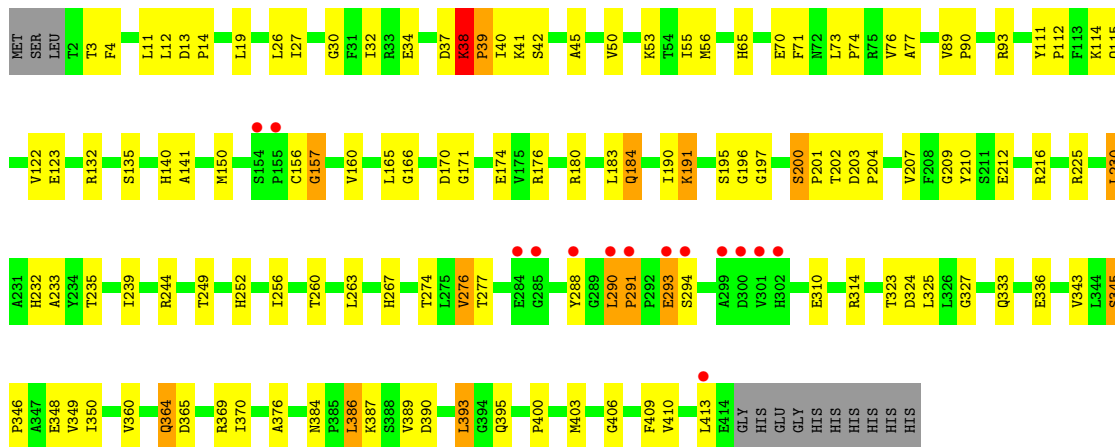
#### • Molecule 1: PUTATIVE AMIDOHYDROLASE



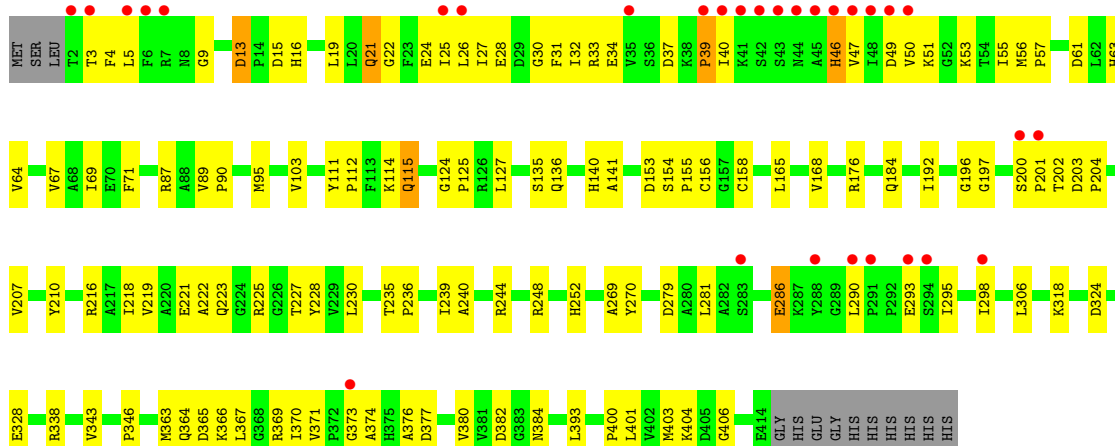




• Molecule 1: PUTATIVE AMIDOHYDROLASE

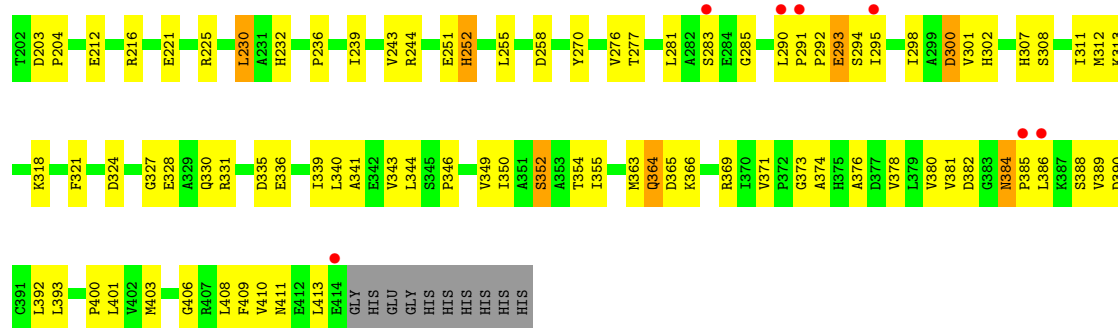


• Molecule 1: PUTATIVE AMIDOHYDROLASE



• Molecule 1: PUTATIVE AMIDOHYDROLASE





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	92.02Å 198.60Å 104.29Å 90.00° 107.76° 90.00°	Depositor
Resolution (Å)	40.00 – 2.40 49.81 – 2.39	Depositor EDS
% Data completeness (in resolution range)	95.2 (40.00-2.40) 94.7 (49.81-2.39)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.56 (at 2.39Å)	Xtrriage
Refinement program	REFMAC 5.3.0034	Depositor
R, $R_{free}$	0.171 , 0.229 0.179 , 0.236	Depositor DCC
$R_{free}$ test set	3989 reflections (3.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	47.1	Xtrriage
Anisotropy	0.319	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 64.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	25975	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.81% 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, 0.333 respectively for untwinned datasets, and 0.375, 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: GOL, ZN, KCX, CO3, 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	0.36	0/3207	0.52	0/4346
1	B	0.40	0/3204	0.55	0/4342
1	C	0.41	0/3197	0.54	0/4332
1	D	0.38	0/3172	0.53	0/4301
1	E	0.37	0/3205	0.52	0/4343
1	F	0.38	0/3191	0.54	0/4328
1	G	0.37	0/3189	0.53	0/4324
1	H	0.36	0/3191	0.54	0/4327
All	All	0.38	0/25556	0.54	0/34643

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	3147	0	3206	109	0
1	B	3141	0	3194	108	0
1	C	3138	0	3193	139	0
1	D	3121	0	3158	131	0
1	E	3142	0	3197	118	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	3130	0	3168	175	0
1	G	3131	0	3170	137	0
1	H	3134	0	3175	170	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
2	E	2	0	0	0	0
2	F	2	0	0	0	0
2	G	2	0	0	0	0
2	H	2	0	0	0	0
3	A	10	0	0	0	0
3	B	10	0	0	3	0
3	C	5	0	0	2	0
3	D	10	0	0	2	0
3	E	10	0	0	0	0
3	G	5	0	0	0	0
3	H	15	0	0	4	0
4	C	6	0	8	1	0
4	D	6	0	8	3	0
5	F	4	0	0	0	0
5	G	4	0	0	0	0
6	A	135	0	0	8	0
6	B	124	0	0	6	0
6	C	111	0	0	4	0
6	D	99	0	0	4	0
6	E	90	0	0	9	0
6	F	88	0	0	6	0
6	G	75	0	0	5	0
6	H	68	0	0	6	0
All	All	25975	0	25477	1068	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 1068 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:H:95:MET:CE	1:H:103:VAL:HG11	1.66	1.25
1:G:7:ARG:HG3	1:G:24:GLU:OE1	1.44	1.12
1:H:53:LYS:HG3	1:H:381:VAL:O	1.47	1.12

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:50:VAL:HG21	1:G:55:ILE:HD11	1.18	1.12
1:G:376:ALA:HB1	1:G:403:MET:CE	1.78	1.11

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	417/426 (98%)	395 (95%)	20 (5%)	2 (0%)	29	41
1	B	417/426 (98%)	388 (93%)	25 (6%)	4 (1%)	15	23
1	C	416/426 (98%)	392 (94%)	21 (5%)	3 (1%)	22	32
1	D	413/426 (97%)	386 (94%)	22 (5%)	5 (1%)	13	19
1	E	417/426 (98%)	391 (94%)	23 (6%)	3 (1%)	22	32
1	F	416/426 (98%)	384 (92%)	32 (8%)	0	100	100
1	G	415/426 (97%)	386 (93%)	24 (6%)	5 (1%)	13	19
1	H	415/426 (97%)	387 (93%)	26 (6%)	2 (0%)	29	41
All	All	3326/3408 (98%)	3109 (94%)	193 (6%)	24 (1%)	22	32

5 of 24 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	157	GLY
1	D	157	GLY
1	E	210	TYR
1	G	46[A]	HIS
1	G	46[B]	HIS

### 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	332/336 (99%)	313 (94%)	19 (6%)	20	33
1	B	332/336 (99%)	316 (95%)	16 (5%)	25	41
1	C	331/336 (98%)	323 (98%)	8 (2%)	49	68
1	D	328/336 (98%)	314 (96%)	14 (4%)	29	46
1	E	332/336 (99%)	319 (96%)	13 (4%)	32	50
1	F	331/336 (98%)	310 (94%)	21 (6%)	18	28
1	G	330/336 (98%)	315 (96%)	15 (4%)	27	44
1	H	330/336 (98%)	314 (95%)	16 (5%)	25	41
All	All	2646/2688 (98%)	2524 (95%)	122 (5%)	27	43

5 of 122 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	393	LEU
1	E	364	GLN
1	H	154	SER
1	D	395	GLN
1	E	46	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 15 such sidechains are listed below:

Mol	Chain	Res	Type
1	E	115	GLN
1	E	184	GLN
1	H	184	GLN
1	E	46	HIS
1	G	184	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.



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

8 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	KCX	H	191	1,2	7,11,12	0.77	0	4,12,14	1.28	1 (25%)
1	KCX	C	191	1,2	7,11,12	0.31	0	4,12,14	1.52	1 (25%)
1	KCX	D	191	1,2	7,11,12	0.71	0	4,12,14	1.21	1 (25%)
1	KCX	A	191	1,2	7,11,12	0.79	0	4,12,14	1.13	1 (25%)
1	KCX	B	191	1,2	7,11,12	0.76	0	4,12,14	0.94	0
1	KCX	G	191	1,2	7,11,12	0.76	0	4,12,14	1.01	0
1	KCX	E	191	1,2	7,11,12	0.75	0	4,12,14	0.99	0
1	KCX	F	191	1,2	7,11,12	0.62	0	4,12,14	1.09	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
1	KCX	H	191	1,2	-	0/7/10/12	-
1	KCX	C	191	1,2	-	1/7/10/12	-
1	KCX	D	191	1,2	-	0/7/10/12	-
1	KCX	A	191	1,2	-	1/7/10/12	-
1	KCX	B	191	1,2	-	0/7/10/12	-
1	KCX	G	191	1,2	-	0/7/10/12	-
1	KCX	E	191	1,2	-	0/7/10/12	-
1	KCX	F	191	1,2	-	0/7/10/12	-

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	191	KCX	CE-NZ-CX	-2.76	118.28	122.95
1	H	191	KCX	CE-NZ-CX	-2.35	118.96	122.95

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	191	KCX	CE-NZ-CX	-2.16	119.30	122.95
1	A	191	KCX	CE-NZ-CX	-2.03	119.51	122.95

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	191	KCX	CG-CD-CE-NZ
1	A	191	KCX	CG-CD-CE-NZ

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	H	191	KCX	2	0
1	D	191	KCX	1	0
1	A	191	KCX	2	0
1	B	191	KCX	1	0

## 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 33 ligands modelled in this entry, 16 are monoatomic - leaving 17 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
5	CO3	G	428	-	0,3,3	0.00	-	0,3,3	0.00	-
5	CO3	F	427	-	0,3,3	0.00	-	0,3,3	0.00	-
3	SO4	A	428	-	4,4,4	0.15	0	6,6,6	0.14	0
3	SO4	H	429	-	4,4,4	0.14	0	6,6,6	0.06	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	SO4	D	427	-	4,4,4	0.16	0	6,6,6	0.13	0
3	SO4	H	427	-	4,4,4	0.14	0	6,6,6	0.08	0
3	SO4	B	427	-	4,4,4	0.15	0	6,6,6	0.17	0
3	SO4	H	428	-	4,4,4	0.12	0	6,6,6	0.08	0
3	SO4	A	427	-	4,4,4	0.14	0	6,6,6	0.12	0
4	GOL	D	429	-	5,5,5	0.37	0	5,5,5	0.16	0
3	SO4	D	428	-	4,4,4	0.14	0	6,6,6	0.09	0
4	GOL	C	428	-	5,5,5	0.31	0	5,5,5	0.41	0
3	SO4	B	428	-	4,4,4	0.13	0	6,6,6	0.24	0
3	SO4	G	427	-	4,4,4	0.13	0	6,6,6	0.14	0
3	SO4	E	427	-	4,4,4	0.15	0	6,6,6	0.08	0
3	SO4	E	428	-	4,4,4	0.18	0	6,6,6	0.09	0
3	SO4	C	427	-	4,4,4	0.15	0	6,6,6	0.16	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
4	GOL	C	428	-	-	3/4/4/4	-
4	GOL	D	429	-	-	4/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	428	GOL	O1-C1-C2-C3
4	D	429	GOL	O1-C1-C2-C3
4	D	429	GOL	C1-C2-C3-O3
4	D	429	GOL	O1-C1-C2-O2
4	C	428	GOL	O1-C1-C2-O2

There are no ring outliers.

7 monomers are involved in 15 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	429	SO4	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	427	SO4	1	0
3	B	427	SO4	3	0
4	D	429	GOL	3	0
3	D	428	SO4	2	0
4	C	428	GOL	1	0
3	C	427	SO4	2	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	413/426 (96%)	0.04	3 (0%) 87 86	40, 58, 96, 119	0
1	B	412/426 (96%)	0.24	24 (5%) 23 22	40, 54, 108, 136	0
1	C	412/426 (96%)	0.24	20 (4%) 29 28	39, 58, 100, 123	0
1	D	412/426 (96%)	0.17	14 (3%) 45 44	43, 63, 105, 123	0
1	E	412/426 (96%)	0.29	30 (7%) 15 13	45, 61, 109, 132	0
1	F	412/426 (96%)	0.40	37 (8%) 9 8	42, 66, 119, 132	0
1	G	412/426 (96%)	0.18	17 (4%) 37 36	41, 66, 112, 129	0
1	H	412/426 (96%)	0.42	37 (8%) 9 8	44, 72, 116, 133	0
All	All	3297/3408 (96%)	0.25	182 (5%) 25 24	39, 62, 110, 136	0

The worst 5 of 182 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	298	ILE	9.8
1	B	294	SER	7.3
1	F	294	SER	6.7
1	C	42	SER	6.3
1	B	199	ALA	6.1

### 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, 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	B-factors(Å <sup>2</sup> )	Q<0.9
1	KCX	H	191	12/13	0.95	0.19	48,54,76,85	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
1	KCX	C	191	12/13	0.96	0.18	36,43,61,65	0
1	KCX	D	191	12/13	0.96	0.15	40,49,63,63	0
1	KCX	B	191	12/13	0.96	0.13	42,45,64,67	0
1	KCX	G	191	12/13	0.96	0.16	43,53,59,65	0
1	KCX	F	191	12/13	0.96	0.13	44,50,61,66	0
1	KCX	E	191	12/13	0.97	0.16	45,49,59,63	0
1	KCX	A	191	12/13	0.98	0.16	34,45,61,66	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, 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	B-factors(Å <sup>2</sup> )	Q<0.9
5	CO3	F	427	4/4	0.68	0.13	117,117,118,118	0
3	SO4	B	427	5/5	0.76	0.48	64,66,73,77	5
3	SO4	E	428	5/5	0.78	0.20	51,56,60,69	5
3	SO4	H	427	5/5	0.83	0.30	59,62,64,66	5
4	GOL	C	428	6/6	0.85	0.31	92,99,101,105	0
5	CO3	G	428	4/4	0.85	0.26	86,87,89,90	0
3	SO4	C	427	5/5	0.86	0.25	47,49,59,61	5
4	GOL	D	429	6/6	0.89	0.25	75,85,86,90	0
3	SO4	D	428	5/5	0.90	0.30	71,75,78,79	5
3	SO4	H	429	5/5	0.91	0.14	77,79,82,83	5
3	SO4	A	427	5/5	0.92	0.25	57,57,64,64	5
3	SO4	H	428	5/5	0.95	0.20	88,97,101,102	0
3	SO4	D	427	5/5	0.96	0.29	50,52,56,58	5
3	SO4	A	428	5/5	0.96	0.22	40,44,46,47	5
3	SO4	E	427	5/5	0.96	0.17	41,45,53,53	5
2	ZN	D	426	1/1	0.97	0.13	73,73,73,73	0
3	SO4	G	427	5/5	0.97	0.17	35,38,49,49	5
3	SO4	B	428	5/5	0.97	0.24	37,42,48,49	5
2	ZN	B	426	1/1	0.98	0.11	66,66,66,66	0
2	ZN	D	425	1/1	0.98	0.11	63,63,63,63	0
2	ZN	E	426	1/1	0.99	0.11	68,68,68,68	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	ZN	F	425	1/1	0.99	0.09	73,73,73,73	0
2	ZN	F	426	1/1	0.99	0.08	76,76,76,76	0
2	ZN	H	426	1/1	0.99	0.10	72,72,72,72	0
2	ZN	G	426	1/1	0.99	0.08	70,70,70,70	0
2	ZN	E	425	1/1	0.99	0.10	63,63,63,63	0
2	ZN	C	426	1/1	0.99	0.10	66,66,66,66	0
2	ZN	A	425	1/1	0.99	0.14	59,59,59,59	0
2	ZN	B	425	1/1	0.99	0.09	62,62,62,62	0
2	ZN	C	425	1/1	0.99	0.11	63,63,63,63	0
2	ZN	A	426	1/1	0.99	0.16	66,66,66,66	0
2	ZN	H	425	1/1	0.99	0.10	72,72,72,72	0
2	ZN	G	425	1/1	1.00	0.10	64,64,64,64	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.