



# Full wwPDB X-ray Structure Validation Report ⓘ

May 17, 2020 – 08:44 am BST

PDB ID : 2QQ3  
Title : Crystal Structure Of Enoyl-CoA Hydrates Subunit I (gk\_2039) Other Form From Geobacillus Kaustophilus HTA426  
Authors : Jeyakanthan, J.; Kanaugia, S.P.; Sekar, K.; Ebihara, A.; Shinkai, A.; Kuramitsu, S.; Yokoyama, S.; RIKEN Structural Genomics/Proteomics Initiative (RSGI)  
Deposited on : 2007-07-26  
Resolution : 1.95 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](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	:	2.11
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)	:	2.11

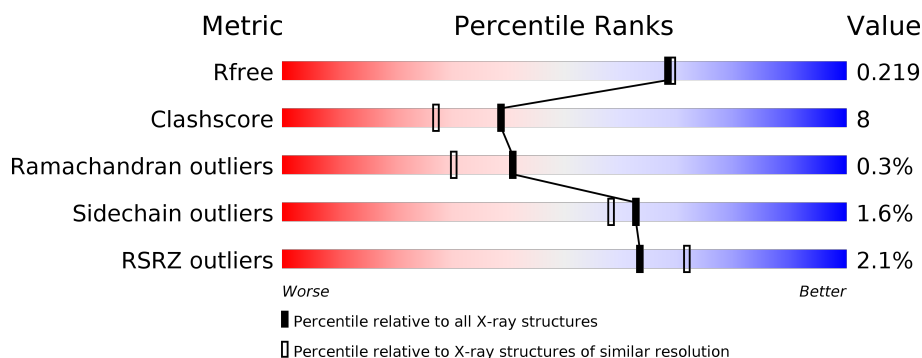
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.95 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	2580 (1.96-1.96)
Clashscore	141614	2705 (1.96-1.96)
Ramachandran outliers	138981	2678 (1.96-1.96)
Sidechain outliers	138945	2678 (1.96-1.96)
RSRZ outliers	127900	2539 (1.96-1.96)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria 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	258	<div> <div>78%</div> <div>20%</div> <div>..</div> </div>
1	B	258	<div>2%</div> <div>86%</div> <div>12%</div> <div>..</div>
1	C	258	<div>2%</div> <div>83%</div> <div>16%</div>
1	D	258	<div>2%</div> <div>81%</div> <div>18%</div> <div>.</div>
1	E	258	<div>2%</div> <div>79%</div> <div>19%</div> <div>..</div>
1	F	258	<div>%</div> <div>79%</div> <div>18%</div> <div>..</div>

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Mol	Chain	Length	Quality of chain
1	G	258	<div><div></div><div>3%</div><div>81%</div><div>18%</div><div></div></div>
1	H	258	<div><div></div><div>3%</div><div>80%</div><div>19%</div><div></div></div>
1	I	258	<div><div></div><div>2%</div><div>84%</div><div>15%</div><div></div></div>
1	J	258	<div><div></div><div>2%</div><div>85%</div><div>14%</div><div></div></div>
1	K	258	<div><div></div><div>4%</div><div>81%</div><div>18%</div><div></div></div>
1	L	258	<div><div></div><div>3%</div><div>83%</div><div>16%</div><div></div></div>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 25755 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 Enoyl-CoA hydratase subunit I.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	B	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	C	257	Total	C	N	O	S	0	0	0
			1986	1265	349	362	10			
1	D	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	E	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	F	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	G	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	H	255	Total	C	N	O	S	0	0	0
			1971	1257	347	357	10			
1	I	256	Total	C	N	O	S	0	0	0
			1980	1262	348	360	10			
1	J	256	Total	C	N	O	S	0	0	0
			1980	1262	348	360	10			
1	K	257	Total	C	N	O	S	0	0	0
			1986	1265	349	362	10			
1	L	257	Total	C	N	O	S	0	0	0
			1986	1265	349	362	10			

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	C	O	0	0
			4	2	2		
2	C	1	Total	C	O	0	0
			4	2	2		
2	C	1	Total	C	O	0	0
			4	2	2		
2	D	1	Total	C	O	0	0
			4	2	2		
2	D	1	Total	C	O	0	0
			4	2	2		
2	E	1	Total	C	O	0	0
			4	2	2		
2	E	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	F	1	Total	C	O	0	0
			4	2	2		
2	J	1	Total	C	O	0	0
			4	2	2		
2	J	1	Total	C	O	0	0
			4	2	2		
2	L	1	Total	C	O	0	0
			4	2	2		
2	L	1	Total	C	O	0	0
			4	2	2		

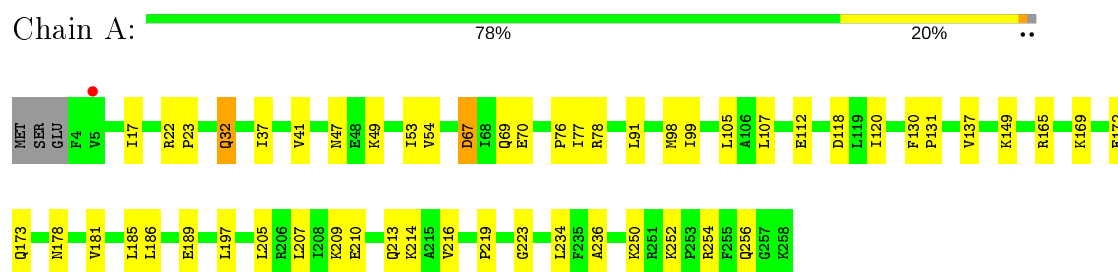
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	181	Total 181	O 181	0	0
3	B	188	Total 188	O 188	0	0
3	C	181	Total 181	O 181	0	0
3	D	168	Total 168	O 168	0	0
3	E	134	Total 134	O 134	0	0
3	F	176	Total 176	O 176	0	0
3	G	142	Total 142	O 142	0	0
3	H	132	Total 132	O 132	0	0
3	I	191	Total 191	O 191	0	0
3	J	189	Total 189	O 189	0	0
3	K	149	Total 149	O 149	0	0
3	L	157	Total 157	O 157	0	0

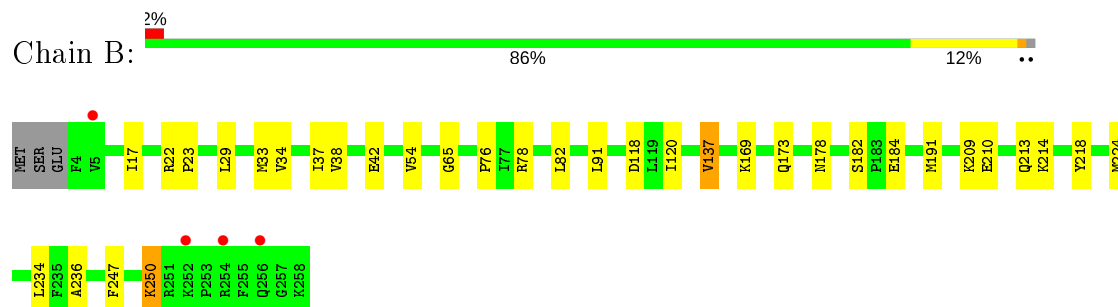
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of 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.

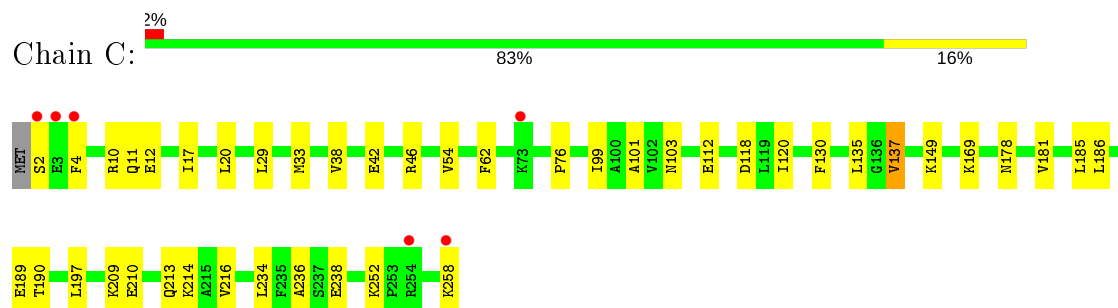
#### • Molecule 1: Enoyl-CoA hydratase subunit I



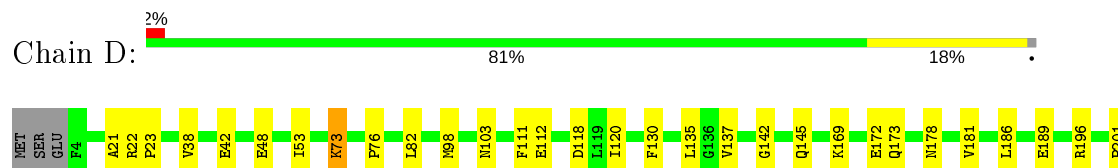
#### • Molecule 1: Enoyl-CoA hydratase subunit I



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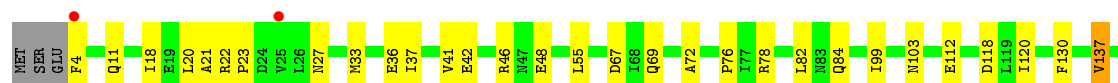
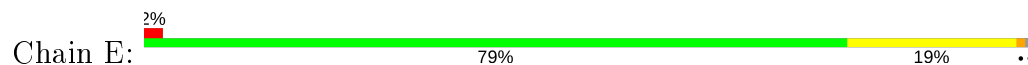


#### • Molecule 1: Enoyl-CoA hydratase subunit I

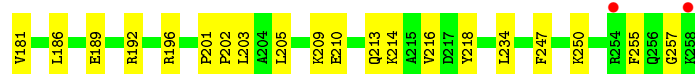
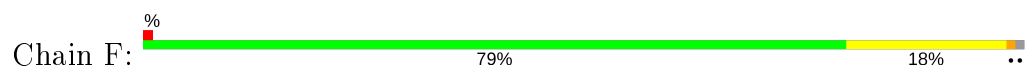




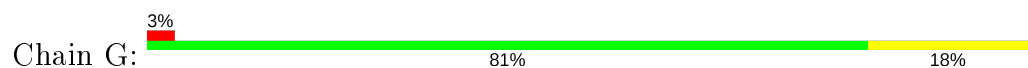
• Molecule 1: Enoyl-CoA hydratase subunit I



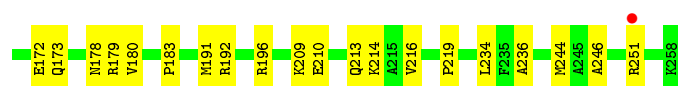
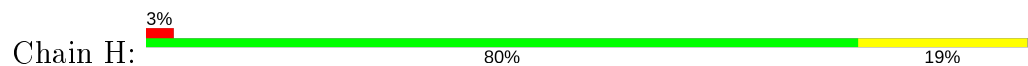
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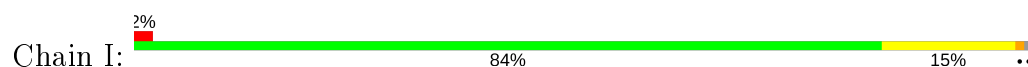
• Molecule 1: Enoyl-CoA hydratase subunit I



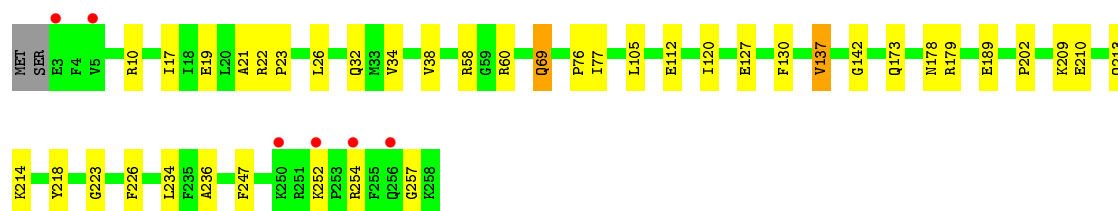
• Molecule 1: Enoyl-CoA hydratase subunit I



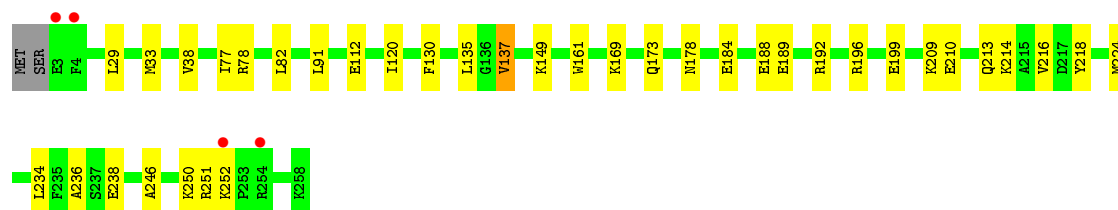
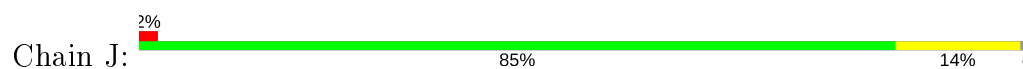
• Molecule 1: Enoyl-CoA hydratase subunit I



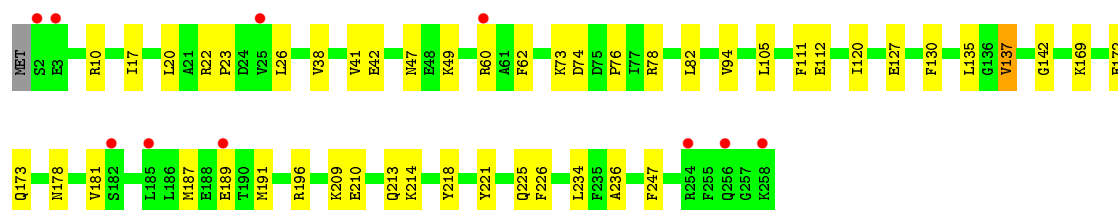
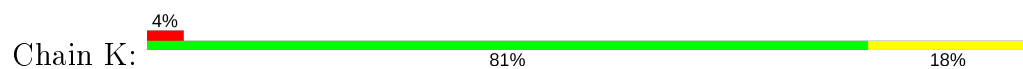




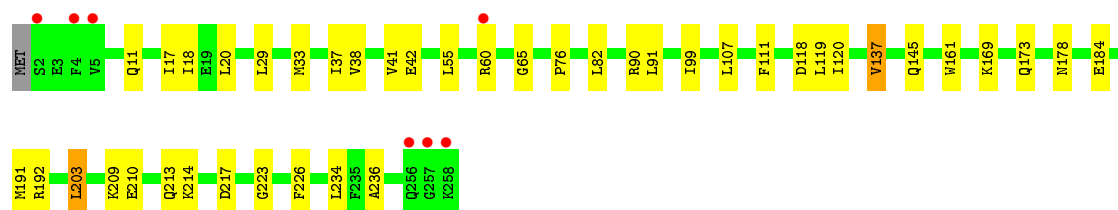
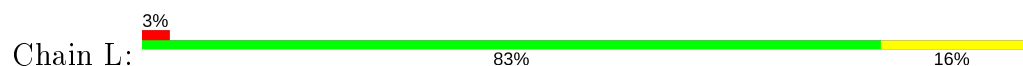
• Molecule 1: Enoyl-CoA hydratase subunit I



• Molecule 1: Enoyl-CoA hydratase subunit I



• Molecule 1: Enoyl-CoA hydratase subunit I



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	76.56Å 115.05Å 163.16Å 90.00° 93.80° 90.00°	Depositor
Resolution (Å)	22.80 – 1.95 22.80 – 1.95	Depositor EDS
% Data completeness (in resolution range)	95.6 (22.80-1.95) 95.8 (22.80-1.95)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	0.07	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.86 (at 1.95Å)	Xtriage
Refinement program	CNS 1.1	Depositor
R, $R_{free}$	0.184 , 0.223 0.180 , 0.219	Depositor DCC
$R_{free}$ test set	9738 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	19.3	Xtriage
Anisotropy	0.111	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.35 , 55.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	25755	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 36.92 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 4.6414e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: EDO

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	0.30	0/2004	0.57	0/2703
1	B	0.32	0/2004	0.57	0/2703
1	C	0.32	0/2019	0.57	0/2723
1	D	0.31	0/2004	0.57	0/2703
1	E	0.30	0/2004	0.56	0/2703
1	F	0.32	0/2004	0.56	0/2703
1	G	0.31	0/2004	0.56	0/2703
1	H	0.30	0/2004	0.56	0/2703
1	I	0.31	0/2013	0.57	0/2715
1	J	0.32	0/2013	0.60	0/2715
1	K	0.30	0/2019	0.55	0/2723
1	L	0.30	0/2019	0.57	0/2723
All	All	0.31	0/24111	0.57	0/32520

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	F	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	71	MET	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	1971	0	2019	39	0
1	B	1971	0	2019	28	0
1	C	1986	0	2030	33	0
1	D	1971	0	2019	32	0
1	E	1971	0	2019	38	0
1	F	1971	0	2019	43	0
1	G	1971	0	2019	32	0
1	H	1971	0	2019	35	0
1	I	1980	0	2025	30	0
1	J	1980	0	2025	29	0
1	K	1986	0	2030	31	0
1	L	1986	0	2030	39	0
2	B	4	0	6	2	0
2	C	8	0	12	2	0
2	D	8	0	12	0	0
2	E	8	0	12	1	0
2	F	8	0	12	2	0
2	J	8	0	12	0	0
2	L	8	0	12	0	0
3	A	181	0	0	4	0
3	B	188	0	0	0	0
3	C	181	0	0	8	0
3	D	168	0	0	2	0
3	E	134	0	0	3	0
3	F	176	0	0	3	0
3	G	142	0	0	2	0
3	H	132	0	0	3	0
3	I	191	0	0	2	0
3	J	189	0	0	3	0
3	K	149	0	0	1	0
3	L	157	0	0	3	0
All	All	25755	0	24351	361	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 (361) 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:L:120:ILE:H	1:L:178:ASN:HD22	1.07	0.99
1:G:120:ILE:H	1:G:178:ASN:HD22	1.10	0.91
1:D:181:VAL:HG11	1:D:189:GLU:HG3	1.50	0.90
1:B:120:ILE:H	1:B:178:ASN:HD22	1.19	0.90
1:F:181:VAL:HG11	1:F:189:GLU:HG3	1.52	0.90
1:C:120:ILE:H	1:C:178:ASN:HD22	1.18	0.87
1:A:120:ILE:H	1:A:178:ASN:HD22	1.21	0.86
1:I:120:ILE:H	1:I:178:ASN:HD22	1.23	0.85
1:K:181:VAL:HG11	1:K:189:GLU:HG3	1.59	0.85
1:F:120:ILE:H	1:F:178:ASN:HD22	1.27	0.83
1:K:120:ILE:H	1:K:178:ASN:HD22	1.24	0.81
1:F:179:ARG:HH12	1:F:196:ARG:HH22	1.28	0.79
1:D:169:LYS:O	1:D:173:GLN:HG2	1.84	0.77
1:F:99:ILE:HD12	1:F:119:LEU:HB2	1.67	0.77
1:L:120:ILE:H	1:L:178:ASN:ND2	1.83	0.77
1:D:120:ILE:H	1:D:178:ASN:HD22	1.33	0.76
1:F:192:ARG:HG2	1:F:196:ARG:NH1	1.99	0.76
1:J:192:ARG:HG2	1:J:196:ARG:NH1	2.00	0.76
1:H:137:VAL:HG12	1:H:138:MET:H	1.52	0.75
1:J:238:GLU:HG2	3:J:2086:HOH:O	1.86	0.75
1:E:120:ILE:H	1:E:178:ASN:HD22	1.33	0.74
1:G:120:ILE:H	1:G:178:ASN:ND2	1.84	0.74
1:C:120:ILE:H	1:C:178:ASN:ND2	1.83	0.73
1:J:199:GLU:HG3	3:J:2084:HOH:O	1.88	0.73
1:L:169:LYS:HG2	1:L:173:GLN:HE21	1.52	0.73
1:B:65:GLY:HA3	2:B:2009:EDO:H11	1.72	0.72
1:A:252:LYS:HE3	1:A:254:ARG:NH2	2.04	0.72
1:C:2:SER:HB3	3:C:2059:HOH:O	1.88	0.72
1:B:169:LYS:O	1:B:173:GLN:HG2	1.89	0.71
1:L:60:ARG:HD2	3:L:2153:HOH:O	1.89	0.71
1:H:120:ILE:H	1:H:178:ASN:HD22	1.38	0.70
1:J:169:LYS:O	1:J:173:GLN:HG3	1.92	0.70
1:E:48:GLU:HA	2:E:2008:EDO:H11	1.73	0.69
1:E:42:GLU:O	1:E:46:ARG:HG2	1.92	0.69
1:I:32:GLN:HG3	3:I:326:HOH:O	1.92	0.69
1:C:46:ARG:HG3	1:C:46:ARG:HH11	1.59	0.68
1:J:120:ILE:H	1:J:178:ASN:HD22	1.39	0.68
1:E:46:ARG:HG3	3:E:2065:HOH:O	1.93	0.67
1:E:82:LEU:HD22	1:E:84:GLN:HB3	1.77	0.67
1:H:12:GLU:HG3	3:H:295:HOH:O	1.95	0.66
1:C:238:GLU:OE2	1:C:258:LYS:HE2	1.95	0.66
1:D:209:LYS:O	1:D:213:GLN:HG3	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:192:ARG:HG2	1:H:196:ARG:HH12	1.60	0.66
1:C:213:GLN:HG2	3:C:2054:HOH:O	1.96	0.65
1:B:120:ILE:H	1:B:178:ASN:ND2	1.91	0.65
1:A:250:LYS:HZ2	1:A:250:LYS:HB3	1.62	0.64
1:K:73:LYS:HE3	3:K:302:HOH:O	1.97	0.64
1:F:179:ARG:HH22	1:F:196:ARG:HH21	1.46	0.64
1:B:76:PRO:HG2	1:C:236:ALA:HB2	1.78	0.64
1:A:219:PRO:HB3	1:L:217:ASP:HB3	1.80	0.64
1:E:118:ASP:OD1	1:E:209:LYS:HE3	1.99	0.63
1:F:172:GLU:HG2	3:F:2023:HOH:O	1.99	0.63
1:F:209:LYS:O	1:F:213:GLN:HG3	1.99	0.63
1:A:185:LEU:O	1:A:189:GLU:HG2	1.99	0.62
1:G:209:LYS:O	1:G:213:GLN:HG3	2.00	0.62
1:H:137:VAL:HG12	1:H:138:MET:N	2.14	0.61
1:E:137:VAL:HA	1:L:234:LEU:HD13	1.82	0.61
1:H:209:LYS:O	1:H:213:GLN:HG3	2.01	0.61
1:F:247:PHE:HB2	1:J:135:LEU:HD22	1.81	0.61
1:F:234:LEU:HD13	1:J:137:VAL:HA	1.82	0.61
1:F:135:LEU:CD2	1:I:247:PHE:HB2	2.31	0.61
1:L:38:VAL:HG22	1:L:91:LEU:HG	1.81	0.61
1:H:192:ARG:HG2	1:H:196:ARG:NH1	2.17	0.60
1:A:137:VAL:HA	1:E:234:LEU:HD13	1.84	0.60
1:C:209:LYS:O	1:C:213:GLN:HG3	2.01	0.60
1:F:192:ARG:HG2	1:F:196:ARG:HH11	1.66	0.59
1:J:214:LYS:HD2	1:J:218:TYR:CE1	2.37	0.59
1:L:209:LYS:O	1:L:213:GLN:HG3	2.01	0.59
1:A:17:ILE:HD13	1:A:54:VAL:HB	1.85	0.59
1:J:184:GLU:H	1:J:184:GLU:CD	2.04	0.59
1:J:192:ARG:HG2	1:J:196:ARG:HH12	1.64	0.59
1:J:252:LYS:NZ	1:J:252:LYS:HB3	2.16	0.59
1:G:47:ASN:OD1	1:G:49:LYS:HB2	2.03	0.59
1:E:209:LYS:O	1:E:213:GLN:HG3	2.03	0.59
1:I:137:VAL:HA	1:J:234:LEU:HD13	1.83	0.59
1:F:137:VAL:HA	1:I:234:LEU:HD13	1.85	0.59
1:J:252:LYS:HZ2	1:J:252:LYS:HB3	1.67	0.58
1:C:135:LEU:HD22	1:K:247:PHE:HB2	1.85	0.58
1:E:192:ARG:HG2	1:E:196:ARG:NH1	2.18	0.58
1:F:38:VAL:HG22	1:F:91:LEU:HG	1.86	0.57
1:A:118:ASP:OD1	1:A:209:LYS:HE3	2.05	0.57
1:C:252:LYS:HG2	3:C:2116:HOH:O	2.04	0.57
1:G:76:PRO:HG2	1:H:236:ALA:HB2	1.85	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:120:ILE:H	1:A:178:ASN:ND2	1.98	0.57
1:K:209:LYS:O	1:K:213:GLN:HG3	2.05	0.57
1:K:120:ILE:H	1:K:178:ASN:ND2	2.01	0.57
1:G:137:VAL:HA	1:H:234:LEU:HD13	1.85	0.56
1:D:103:ASN:HA	1:D:186:LEU:HD22	1.86	0.56
1:A:236:ALA:HB2	1:L:76:PRO:HG2	1.86	0.56
1:G:202:PRO:HD2	1:G:257:GLY:HA2	1.87	0.56
1:E:18:ILE:HB	1:E:55:LEU:HD23	1.87	0.56
1:I:120:ILE:H	1:I:178:ASN:ND2	1.99	0.55
1:G:169:LYS:O	1:G:173:GLN:HG2	2.06	0.55
1:D:201:PRO:HG2	1:H:136:GLY:HA2	1.89	0.55
1:A:77:ILE:HG23	1:F:203:LEU:HD11	1.89	0.55
1:B:209:LYS:O	1:B:213:GLN:HG3	2.06	0.55
1:H:246:ALA:HA	1:H:251:ARG:HG2	1.88	0.55
1:A:210:GLU:O	1:A:214:LYS:HG2	2.07	0.55
1:E:21:ALA:O	1:E:22:ARG:HD2	2.06	0.55
1:I:26:LEU:HD21	1:I:60:ARG:CZ	2.37	0.55
1:I:19:GLU:CD	1:I:58:ARG:HE	2.09	0.54
1:B:78:ARG:HH11	1:B:78:ARG:HG3	1.71	0.54
1:C:112:GLU:HG3	1:C:130:PHE:HE1	1.72	0.54
1:I:202:PRO:HD2	1:I:257:GLY:HA2	1.89	0.54
1:C:99:ILE:HD11	1:C:197:LEU:HD12	1.89	0.54
1:L:38:VAL:O	1:L:42:GLU:HG3	2.08	0.54
1:B:38:VAL:O	1:B:42:GLU:HG3	2.06	0.54
1:B:17:ILE:HD13	1:B:54:VAL:HB	1.89	0.54
1:L:99:ILE:CD1	1:L:119:LEU:HB2	2.38	0.54
1:A:76:PRO:HG2	1:E:236:ALA:HB2	1.90	0.54
1:F:38:VAL:O	1:F:42:GLU:HG3	2.07	0.54
1:L:37:ILE:O	1:L:41:VAL:HG23	2.08	0.54
1:C:17:ILE:CD1	1:C:54:VAL:HB	2.39	0.53
1:L:118:ASP:OD1	1:L:209:LYS:HE3	2.07	0.53
1:J:38:VAL:HG22	1:J:91:LEU:HG	1.90	0.53
1:L:29:LEU:HD23	1:L:33:MET:CE	2.39	0.53
1:A:207:LEU:HD22	1:A:234:LEU:HD21	1.91	0.53
1:C:76:PRO:HG2	1:K:236:ALA:HB2	1.91	0.53
1:G:20:LEU:HB3	1:G:33:MET:HE3	1.90	0.53
1:B:65:GLY:CA	2:B:2009:EDO:H11	2.38	0.53
1:F:135:LEU:HD22	1:I:247:PHE:HB2	1.91	0.53
1:G:99:ILE:HD12	1:G:119:LEU:HB2	1.92	0.53
1:H:78:ARG:HH11	1:H:78:ARG:HG3	1.75	0.52
1:E:78:ARG:HG3	1:E:78:ARG:HH11	1.74	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:99:ILE:CD1	1:F:119:LEU:HD12	2.39	0.52
1:J:188:GLU:HG2	1:J:192:ARG:HH22	1.74	0.52
1:B:38:VAL:HG22	1:B:91:LEU:HG	1.91	0.52
1:E:4:PHE:HB3	1:E:36:GLU:OE1	2.10	0.52
1:J:189:GLU:OE2	1:J:192:ARG:NH1	2.42	0.52
1:A:254:ARG:HG2	3:A:370:HOH:O	2.09	0.52
1:G:217:ASP:HB3	1:H:219:PRO:HB3	1.91	0.52
1:C:10:ARG:NH1	1:C:12:GLU:OE1	2.38	0.52
1:C:181:VAL:HG11	1:C:189:GLU:HG3	1.91	0.52
1:E:145:GLN:HE21	1:L:223:GLY:HA3	1.75	0.51
1:D:221:TYR:O	1:D:225:GLN:HG2	2.09	0.51
1:H:17:ILE:HD11	1:H:191:MET:CE	2.40	0.51
1:F:202:PRO:HD2	1:F:257:GLY:HA2	1.91	0.51
1:L:210:GLU:O	1:L:214:LYS:HG2	2.11	0.51
1:A:209:LYS:O	1:A:213:GLN:HG3	2.09	0.51
1:D:236:ALA:HB2	1:H:76:PRO:HG2	1.93	0.51
1:D:118:ASP:OD1	1:D:209:LYS:HE3	2.11	0.51
1:F:131:PRO:HG2	2:F:2010:EDO:H11	1.93	0.51
1:B:247:PHE:HB2	1:K:135:LEU:HD21	1.92	0.50
1:A:53:ILE:HB	1:A:98:MET:HG2	1.93	0.50
1:C:38:VAL:O	1:C:42:GLU:HG3	2.10	0.50
1:I:209:LYS:O	1:I:213:GLN:HG3	2.12	0.50
1:D:73:LYS:NZ	1:D:73:LYS:HB3	2.27	0.50
1:F:76:PRO:HG2	1:I:236:ALA:HB2	1.93	0.50
1:E:145:GLN:NE2	1:L:223:GLY:HA3	2.27	0.50
1:G:207:LEU:HD22	1:G:234:LEU:HD21	1.93	0.50
1:G:32:GLN:O	1:G:36:GLU:HG3	2.11	0.50
1:H:169:LYS:HD3	3:H:280:HOH:O	2.11	0.50
1:G:112:GLU:HG3	1:G:130:PHE:HE1	1.77	0.50
1:I:252:LYS:HD2	1:I:254:ARG:NH2	2.26	0.50
1:H:210:GLU:O	1:H:214:LYS:HG2	2.12	0.49
1:A:78:ARG:HG2	1:A:78:ARG:HH11	1.77	0.49
1:D:201:PRO:HG3	1:D:255:PHE:CE2	2.47	0.49
1:F:112:GLU:HG3	1:F:130:PHE:HE1	1.76	0.49
1:G:20:LEU:HD12	1:G:62:PHE:O	2.13	0.49
1:K:221:TYR:O	1:K:225:GLN:HG2	2.13	0.49
1:L:17:ILE:HD11	1:L:191:MET:CE	2.43	0.49
1:B:236:ALA:HB2	1:K:76:PRO:HG2	1.94	0.49
1:E:76:PRO:HG2	1:L:236:ALA:HB2	1.95	0.49
1:C:210:GLU:O	1:C:214:LYS:HG2	2.12	0.49
1:C:46:ARG:HD2	3:C:2179:HOH:O	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:101:ALA:HB2	1:C:190:THR:HG21	1.95	0.48
1:K:38:VAL:O	1:K:42:GLU:HG3	2.12	0.48
1:C:46:ARG:HG3	1:C:46:ARG:NH1	2.23	0.48
1:H:53:ILE:HB	1:H:98:MET:HG2	1.94	0.48
1:I:69:GLN:HB2	3:I:403:HOH:O	2.13	0.48
1:E:82:LEU:O	1:E:82:LEU:HD23	2.12	0.48
1:F:135:LEU:HD21	1:I:247:PHE:HB2	1.95	0.48
1:A:181:VAL:HG11	1:A:189:GLU:HG3	1.95	0.48
1:D:22:ARG:N	1:D:23:PRO:CD	2.76	0.48
1:H:172:GLU:OE1	1:H:180:VAL:HG23	2.14	0.48
1:D:214:LYS:HG3	1:D:226:PHE:CD2	2.49	0.48
1:F:99:ILE:HD11	1:F:119:LEU:HD12	1.96	0.48
1:A:67:ASP:OD2	1:A:70:GLU:HB2	2.14	0.48
1:D:76:PRO:HG2	1:G:236:ALA:HB2	1.95	0.48
1:B:247:PHE:HB2	1:K:135:LEU:CD2	2.44	0.48
1:B:17:ILE:CD1	1:B:54:VAL:HB	2.44	0.47
1:D:137:VAL:HA	1:G:234:LEU:HD13	1.96	0.47
1:J:78:ARG:HD2	3:J:2035:HOH:O	2.14	0.47
1:E:214:LYS:HG3	1:E:226:PHE:CD2	2.49	0.47
1:K:105:LEU:HD23	1:K:127:GLU:HB2	1.97	0.47
1:L:120:ILE:N	1:L:178:ASN:HD22	1.92	0.47
1:D:252:LYS:HB2	1:D:254:ARG:HH12	1.80	0.47
1:C:11:GLN:NE2	3:C:2112:HOH:O	2.45	0.47
1:J:149:LYS:HD3	1:J:216:VAL:CG1	2.44	0.47
1:K:169:LYS:O	1:K:173:GLN:HG3	2.14	0.47
1:K:10:ARG:NH1	1:K:17:ILE:HD12	2.30	0.47
1:K:74:ASP:OD1	1:K:78:ARG:NH1	2.40	0.47
1:D:252:LYS:CB	1:D:254:ARG:HH12	2.28	0.47
1:B:214:LYS:O	1:B:218:TYR:HB2	2.14	0.47
1:D:135:LEU:HD22	1:G:247:PHE:HB2	1.97	0.47
1:E:20:LEU:HB3	1:E:33:MET:HE1	1.95	0.47
1:K:20:LEU:HD12	1:K:62:PHE:O	2.15	0.47
1:H:132:GLU:HG2	3:H:303:HOH:O	2.14	0.47
1:H:42:GLU:O	1:H:46:ARG:HD3	2.15	0.47
1:A:169:LYS:O	1:A:173:GLN:HG3	2.14	0.47
1:D:21:ALA:O	1:D:22:ARG:HD2	2.15	0.47
1:E:22:ARG:HB2	1:E:27:ASN:HA	1.97	0.47
1:F:103:ASN:HA	1:F:186:LEU:HD22	1.97	0.47
1:D:112:GLU:HG3	1:D:130:PHE:HE1	1.80	0.47
1:E:242:GLU:CD	1:E:251:ARG:HH22	2.18	0.47
1:E:169:LYS:HD2	1:E:173:GLN:HE21	1.80	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:18:ILE:HB	1:E:55:LEU:CD2	2.45	0.46
1:I:179:ARG:HD3	1:I:189:GLU:OE2	2.15	0.46
1:L:214:LYS:HG3	1:L:226:PHE:CD2	2.51	0.46
1:D:238:GLU:HB2	1:D:258:LYS:HG3	1.97	0.46
1:E:11:GLN:HG3	3:E:2052:HOH:O	2.15	0.46
1:H:22:ARG:N	1:H:23:PRO:CD	2.78	0.46
1:B:182:SER:HB2	1:B:184:GLU:OE2	2.15	0.46
1:E:120:ILE:H	1:E:178:ASN:ND2	2.08	0.46
1:E:112:GLU:HG3	1:E:130:PHE:HE1	1.79	0.46
1:F:179:ARG:HH22	1:F:196:ARG:NH2	2.11	0.46
1:H:133:VAL:HA	1:H:137:VAL:O	2.16	0.46
1:I:210:GLU:O	1:I:214:LYS:HG2	2.15	0.46
1:L:29:LEU:HD23	1:L:33:MET:HE2	1.97	0.46
1:J:209:LYS:O	1:J:213:GLN:HG3	2.16	0.46
2:C:2003:EDO:H21	3:C:2180:HOH:O	2.14	0.46
1:F:18:ILE:HB	1:F:55:LEU:HD23	1.96	0.46
1:F:120:ILE:H	1:F:178:ASN:ND2	2.05	0.45
1:K:112:GLU:HG3	1:K:130:PHE:HE1	1.81	0.45
1:B:234:LEU:HD13	1:K:137:VAL:HA	1.98	0.45
1:A:22:ARG:N	1:A:23:PRO:CD	2.79	0.45
1:C:17:ILE:HD12	1:C:54:VAL:HB	1.99	0.45
1:H:149:LYS:HD3	1:H:216:VAL:CG1	2.47	0.45
1:H:41:VAL:HG11	1:H:94:VAL:HG21	1.98	0.45
1:L:20:LEU:HD23	1:L:33:MET:HE3	1.98	0.45
1:B:137:VAL:HA	1:C:234:LEU:HD13	1.99	0.45
1:H:112:GLU:HG3	1:H:130:PHE:HE1	1.82	0.45
1:D:53:ILE:HB	1:D:98:MET:HG2	1.99	0.45
1:I:22:ARG:N	1:I:23:PRO:CD	2.80	0.45
1:E:82:LEU:HD23	3:E:2046:HOH:O	2.16	0.45
1:F:98:MET:O	1:F:99:ILE:HD13	2.17	0.45
1:A:78:ARG:NH1	1:A:78:ARG:HG2	2.32	0.45
1:E:37:ILE:O	1:E:41:VAL:HG23	2.16	0.45
1:A:112:GLU:HG3	1:A:130:PHE:HE1	1.82	0.44
1:C:118:ASP:OD1	1:C:209:LYS:HE3	2.17	0.44
1:D:48:GLU:HB2	3:D:2139:HOH:O	2.16	0.44
1:F:179:ARG:HH12	1:F:196:ARG:NH2	2.05	0.44
1:B:17:ILE:HD11	1:B:191:MET:SD	2.57	0.44
1:B:118:ASP:OD1	1:B:209:LYS:HE3	2.17	0.44
1:K:214:LYS:HG3	1:K:226:PHE:CD2	2.53	0.44
1:K:41:VAL:CG1	1:K:94:VAL:HG21	2.47	0.44
1:L:65:GLY:HA2	1:L:107:LEU:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:99:ILE:CD1	1:F:119:LEU:HB2	2.44	0.44
1:G:167:SER:OG	1:G:170:GLU:HG3	2.16	0.44
1:D:38:VAL:O	1:D:42:GLU:HG3	2.17	0.44
1:F:78:ARG:HD2	3:F:2030:HOH:O	2.17	0.44
1:K:17:ILE:HD11	1:K:191:MET:CE	2.47	0.44
1:K:214:LYS:HD2	1:K:218:TYR:CE1	2.51	0.44
1:G:17:ILE:HD11	1:G:191:MET:SD	2.58	0.44
1:I:214:LYS:HG3	1:I:226:PHE:CD2	2.52	0.44
1:I:76:PRO:HG2	1:J:236:ALA:HB2	2.00	0.44
1:J:189:GLU:HA	1:J:192:ARG:NH1	2.32	0.44
1:A:105:LEU:HD22	1:A:107:LEU:HG	2.00	0.44
1:G:37:ILE:O	1:G:41:VAL:HG23	2.18	0.44
1:L:99:ILE:CD1	1:L:119:LEU:HD12	2.48	0.44
1:C:185:LEU:O	1:C:189:GLU:HG2	2.17	0.43
1:J:184:GLU:N	1:J:184:GLU:CD	2.71	0.43
1:L:18:ILE:HB	1:L:55:LEU:HD23	2.00	0.43
1:G:99:ILE:CD1	1:G:119:LEU:HD12	2.48	0.43
1:I:21:ALA:O	1:I:22:ARG:HD2	2.17	0.43
1:I:254:ARG:HA	1:I:254:ARG:HD3	1.68	0.43
1:K:187:MET:O	1:K:191:MET:HG2	2.17	0.43
1:F:20:LEU:HD12	1:F:62:PHE:O	2.18	0.43
1:F:149:LYS:HD3	1:F:216:VAL:CG1	2.49	0.43
1:I:105:LEU:HD23	1:I:127:GLU:HB2	2.00	0.43
1:L:184:GLU:H	1:L:184:GLU:CD	2.22	0.43
1:F:210:GLU:O	1:F:214:LYS:HG2	2.19	0.43
1:G:33:MET:O	1:G:37:ILE:HG13	2.18	0.43
1:A:181:VAL:HG21	1:A:186:LEU:HA	2.00	0.43
1:G:214:LYS:HD2	1:G:218:TYR:CE1	2.53	0.43
1:L:42:GLU:OE1	1:L:90:ARG:NH2	2.50	0.43
1:A:99:ILE:HD11	1:A:197:LEU:HD12	2.00	0.43
1:C:149:LYS:HD3	1:C:216:VAL:CG1	2.48	0.43
1:I:77:ILE:HD12	1:L:203:LEU:HD11	2.01	0.43
1:D:201:PRO:HG3	1:D:255:PHE:CZ	2.54	0.43
1:H:41:VAL:CG1	1:H:94:VAL:HG21	2.49	0.43
1:A:149:LYS:HD3	1:A:216:VAL:CG1	2.49	0.43
1:D:145:GLN:NE2	1:G:223:GLY:HA3	2.33	0.43
1:I:10:ARG:NH1	1:I:17:ILE:HD12	2.33	0.43
1:I:142:GLY:HA2	1:J:224:MET:HG2	2.00	0.43
1:K:41:VAL:HG12	1:K:94:VAL:HG21	2.00	0.43
1:C:137:VAL:HA	1:K:234:LEU:HD13	2.00	0.43
1:A:165:ARG:NH2	3:A:435:HOH:O	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:99:ILE:HD11	1:E:197:LEU:HD12	2.00	0.43
1:D:142:GLY:HA2	1:G:224:MET:HG2	2.01	0.43
1:B:22:ARG:N	1:B:23:PRO:CD	2.82	0.42
1:G:68:ILE:HG23	1:H:244:MET:CE	2.49	0.42
1:H:123:SER:OG	1:H:183:PRO:HG3	2.19	0.42
1:I:214:LYS:HD2	1:I:218:TYR:CE1	2.54	0.42
1:L:99:ILE:HD13	1:L:119:LEU:HB2	2.00	0.42
1:F:201:PRO:HG3	1:F:255:PHE:CD2	2.54	0.42
1:J:112:GLU:HG3	1:J:130:PHE:HE1	1.83	0.42
1:B:250:LYS:HD2	1:B:250:LYS:N	2.35	0.42
1:C:20:LEU:HD12	1:C:62:PHE:O	2.19	0.42
1:B:29:LEU:HD23	1:B:33:MET:SD	2.59	0.42
2:C:2003:EDO:H12	3:C:2024:HOH:O	2.18	0.42
1:D:210:GLU:O	1:D:214:LYS:HG2	2.20	0.42
1:E:22:ARG:N	1:E:23:PRO:CD	2.83	0.42
1:C:17:ILE:HD13	1:C:54:VAL:HB	2.01	0.42
1:E:103:ASN:HA	1:E:186:LEU:HD22	2.02	0.42
1:G:203:LEU:HB2	3:G:261:HOH:O	2.20	0.42
1:H:120:ILE:H	1:H:178:ASN:ND2	2.13	0.42
1:C:29:LEU:HD23	1:C:33:MET:SD	2.60	0.42
1:D:196:ARG:HG2	3:D:2046:HOH:O	2.20	0.42
1:F:214:LYS:HD2	1:F:218:TYR:CE1	2.55	0.42
1:D:234:LEU:HD12	1:H:138:MET:HG2	2.01	0.42
1:E:202:PRO:HD2	1:E:257:GLY:HA2	2.02	0.42
1:G:103:ASN:HA	1:G:186:LEU:HD22	2.02	0.42
1:H:38:VAL:O	1:H:42:GLU:HG3	2.20	0.42
1:A:207:LEU:HD22	1:A:234:LEU:CD2	2.49	0.41
1:A:223:GLY:HA3	1:L:145:GLN:NE2	2.35	0.41
1:D:223:GLY:HA3	1:H:145:GLN:NE2	2.35	0.41
1:L:99:ILE:HD11	1:L:119:LEU:HD12	2.00	0.41
1:L:192:ARG:HD3	3:L:2096:HOH:O	2.19	0.41
1:A:69:GLN:NE2	1:E:248:LEU:HD13	2.35	0.41
1:F:71:MET:HG3	3:F:2151:HOH:O	2.19	0.41
1:A:234:LEU:HD13	1:L:137:VAL:HA	2.02	0.41
1:B:224:MET:HG2	1:K:142:GLY:HA2	2.01	0.41
1:J:246:ALA:HB1	1:J:251:ARG:O	2.21	0.41
1:K:210:GLU:O	1:K:214:LYS:HG2	2.19	0.41
1:F:105:LEU:HD23	1:F:127:GLU:HB2	2.02	0.41
1:F:145:GLN:NE2	1:I:223:GLY:HA3	2.36	0.41
1:G:18:ILE:HB	1:G:55:LEU:HD23	2.02	0.41
1:G:118:ASP:OD1	1:G:209:LYS:HE3	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:34:VAL:O	1:I:38:VAL:HG23	2.20	0.41
1:K:26:LEU:HD21	1:K:60:ARG:NH1	2.36	0.41
1:C:103:ASN:HA	1:C:186:LEU:HD22	2.01	0.41
1:H:22:ARG:HB3	1:H:25:VAL:CG2	2.51	0.41
1:E:157:LEU:O	1:E:161:TRP:HB2	2.21	0.41
1:E:203:LEU:HD13	1:J:77:ILE:HD12	2.03	0.41
1:A:32:GLN:HB2	3:A:393:HOH:O	2.21	0.41
1:A:37:ILE:O	1:A:41:VAL:HG23	2.20	0.41
1:A:47:ASN:OD1	1:A:49:LYS:HB2	2.20	0.41
1:A:131:PRO:HG2	3:A:350:HOH:O	2.21	0.40
1:B:210:GLU:O	1:B:214:LYS:HG2	2.21	0.40
1:C:169:LYS:HD3	3:C:2138:HOH:O	2.21	0.40
1:G:72:ALA:HB3	3:G:310:HOH:O	2.21	0.40
1:J:29:LEU:HD23	1:J:33:MET:SD	2.61	0.40
1:L:119:LEU:HA	1:L:178:ASN:ND2	2.36	0.40
1:A:250:LYS:HZ3	1:A:250:LYS:HA	1.87	0.40
1:E:67:ASP:OD1	1:E:69:GLN:HB3	2.20	0.40
1:K:22:ARG:N	1:K:23:PRO:CD	2.84	0.40
1:L:119:LEU:HA	1:L:178:ASN:HD21	1.85	0.40
1:A:205:LEU:HD22	1:L:161:TRP:CD1	2.55	0.40
1:B:34:VAL:O	1:B:38:VAL:HG23	2.22	0.40
1:J:210:GLU:O	1:J:214:LYS:HG2	2.21	0.40
1:K:47:ASN:OD1	1:K:49:LYS:HB2	2.20	0.40
1:B:33:MET:O	1:B:37:ILE:HG13	2.21	0.40
1:D:244:MET:HE2	1:D:248:LEU:HG	2.03	0.40
1:F:192:ARG:HG2	1:F:196:ARG:HH12	1.81	0.40
1:F:205:LEU:HD22	1:J:161:TRP:CD1	2.57	0.40
1:F:66:ALA:HB2	2:F:2011:EDO:O1	2.21	0.40
1:H:179:ARG:HE	1:H:179:ARG:HB2	1.72	0.40
1:I:112:GLU:HG3	1:I:130:PHE:HE1	1.85	0.40
1:L:11:GLN:NE2	3:L:2048:HOH:O	2.53	0.40
1:L:203:LEU:HD13	1:L:234:LEU:HD23	2.03	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

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

of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	253/258 (98%)	244 (96%)	9 (4%)	0	100	100
1	B	253/258 (98%)	245 (97%)	7 (3%)	1 (0%)	34	22
1	C	255/258 (99%)	247 (97%)	7 (3%)	1 (0%)	34	22
1	D	253/258 (98%)	244 (96%)	9 (4%)	0	100	100
1	E	253/258 (98%)	241 (95%)	10 (4%)	2 (1%)	19	9
1	F	253/258 (98%)	248 (98%)	4 (2%)	1 (0%)	34	22
1	G	253/258 (98%)	247 (98%)	6 (2%)	0	100	100
1	H	253/258 (98%)	245 (97%)	8 (3%)	0	100	100
1	I	254/258 (98%)	247 (97%)	6 (2%)	1 (0%)	34	22
1	J	254/258 (98%)	245 (96%)	8 (3%)	1 (0%)	34	22
1	K	255/258 (99%)	245 (96%)	9 (4%)	1 (0%)	34	22
1	L	255/258 (99%)	241 (94%)	13 (5%)	1 (0%)	34	22
All	All	3044/3096 (98%)	2939 (97%)	96 (3%)	9 (0%)	41	30

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	72	ALA
1	I	137	VAL
1	E	137	VAL
1	K	137	VAL
1	B	137	VAL
1	C	137	VAL
1	F	137	VAL
1	J	137	VAL
1	L	137	VAL

### 5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	199/202 (98%)	194 (98%)	5 (2%)	47	38
1	B	199/202 (98%)	197 (99%)	2 (1%)	76	74
1	C	201/202 (100%)	200 (100%)	1 (0%)	88	88
1	D	199/202 (98%)	195 (98%)	4 (2%)	55	48
1	E	199/202 (98%)	197 (99%)	2 (1%)	76	74
1	F	199/202 (98%)	195 (98%)	4 (2%)	55	48
1	G	199/202 (98%)	195 (98%)	4 (2%)	55	48
1	H	199/202 (98%)	194 (98%)	5 (2%)	47	38
1	I	200/202 (99%)	198 (99%)	2 (1%)	76	74
1	J	200/202 (99%)	198 (99%)	2 (1%)	76	74
1	K	201/202 (100%)	197 (98%)	4 (2%)	55	48
1	L	201/202 (100%)	198 (98%)	3 (2%)	65	60
All	All	2396/2424 (99%)	2358 (98%)	38 (2%)	62	58

All (38) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	GLN
1	A	67	ASP
1	A	91	LEU
1	A	172	GLU
1	A	256	GLN
1	B	82	LEU
1	B	250	LYS
1	C	4	PHE
1	D	73	LYS
1	D	82	LEU
1	D	111	PHE
1	D	172	GLU
1	E	242	GLU
1	E	251	ARG
1	F	82	LEU
1	F	111	PHE
1	F	172	GLU
1	F	250	LYS
1	G	48	GLU
1	G	49	LYS
1	G	78	ARG
1	G	82	LEU

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Mol	Chain	Res	Type
1	H	12	GLU
1	H	26	LEU
1	H	69	GLN
1	H	111	PHE
1	H	173	GLN
1	I	69	GLN
1	I	173	GLN
1	J	82	LEU
1	J	250	LYS
1	K	82	LEU
1	K	111	PHE
1	K	172	GLU
1	K	196	ARG
1	L	82	LEU
1	L	111	PHE
1	L	203	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	69	GLN
1	A	145	GLN
1	A	173	GLN
1	A	178	ASN
1	A	256	GLN
1	B	32	GLN
1	B	145	GLN
1	B	173	GLN
1	B	178	ASN
1	C	11	GLN
1	C	69	GLN
1	C	145	GLN
1	C	178	ASN
1	C	256	GLN
1	D	32	GLN
1	D	145	GLN
1	D	178	ASN
1	E	145	GLN
1	E	173	GLN
1	E	178	ASN
1	F	145	GLN
1	F	178	ASN

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Mol	Chain	Res	Type
1	G	145	GLN
1	G	178	ASN
1	H	145	GLN
1	H	173	GLN
1	H	178	ASN
1	I	32	GLN
1	I	145	GLN
1	I	178	ASN
1	J	145	GLN
1	J	178	ASN
1	K	11	GLN
1	K	145	GLN
1	K	178	ASN
1	L	11	GLN
1	L	145	GLN
1	L	173	GLN
1	L	178	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](#)

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

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

13 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	EDO	C	2003	-	3,3,3	0.48	0	2,2,2	0.32	0
2	EDO	E	2008	-	3,3,3	0.49	0	2,2,2	0.28	0
2	EDO	F	2010	-	3,3,3	0.50	0	2,2,2	0.35	0
2	EDO	D	2002	-	3,3,3	0.51	0	2,2,2	0.32	0
2	EDO	L	2007	-	3,3,3	0.47	0	2,2,2	0.52	0
2	EDO	E	2012	-	3,3,3	0.47	0	2,2,2	0.56	0
2	EDO	C	2004	-	3,3,3	0.50	0	2,2,2	0.27	0
2	EDO	F	2011	-	3,3,3	0.49	0	2,2,2	0.29	0
2	EDO	D	2001	-	3,3,3	0.52	0	2,2,2	0.24	0
2	EDO	J	2006	-	3,3,3	0.49	0	2,2,2	0.30	0
2	EDO	B	2009	-	3,3,3	0.49	0	2,2,2	0.30	0
2	EDO	L	2013	-	3,3,3	0.46	0	2,2,2	0.27	0
2	EDO	J	2005	-	3,3,3	0.49	0	2,2,2	0.28	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
2	EDO	C	2003	-	-	0/1/1/1	-
2	EDO	E	2008	-	-	0/1/1/1	-
2	EDO	F	2010	-	-	0/1/1/1	-
2	EDO	D	2002	-	-	0/1/1/1	-
2	EDO	L	2007	-	-	0/1/1/1	-
2	EDO	E	2012	-	-	0/1/1/1	-
2	EDO	C	2004	-	-	0/1/1/1	-
2	EDO	F	2011	-	-	0/1/1/1	-
2	EDO	D	2001	-	-	0/1/1/1	-
2	EDO	J	2006	-	-	0/1/1/1	-
2	EDO	B	2009	-	-	0/1/1/1	-
2	EDO	L	2013	-	-	0/1/1/1	-
2	EDO	J	2005	-	-	0/1/1/1	-

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.

5 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	2003	EDO	2	0
2	E	2008	EDO	1	0
2	F	2010	EDO	1	0
2	F	2011	EDO	1	0
2	B	2009	EDO	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 ⓘ

### 6.1 Protein, DNA and RNA chains ⓘ

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	255/258 (98%)	-0.09	1 (0%) 92 95	11, 21, 42, 63	0
1	B	255/258 (98%)	-0.27	4 (1%) 72 79	11, 18, 40, 68	0
1	C	257/258 (99%)	-0.18	6 (2%) 60 69	10, 18, 43, 95	0
1	D	255/258 (98%)	-0.11	5 (1%) 65 73	11, 20, 41, 67	0
1	E	255/258 (98%)	0.02	4 (1%) 72 79	11, 23, 44, 66	0
1	F	255/258 (98%)	-0.22	3 (1%) 79 84	10, 19, 41, 64	0
1	G	255/258 (98%)	-0.05	7 (2%) 54 63	10, 22, 40, 66	0
1	H	255/258 (98%)	0.02	7 (2%) 54 63	12, 24, 49, 63	0
1	I	256/258 (99%)	-0.18	6 (2%) 60 69	11, 19, 39, 77	0
1	J	256/258 (99%)	-0.28	4 (1%) 72 79	10, 18, 40, 81	0
1	K	257/258 (99%)	0.01	10 (3%) 39 49	13, 22, 47, 70	0
1	L	257/258 (99%)	0.02	7 (2%) 54 63	11, 23, 46, 91	0
All	All	3068/3096 (99%)	-0.11	64 (2%) 63 72	10, 21, 43, 95	0

All (64) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	2	SER	7.7
1	C	2	SER	6.0
1	C	3	GLU	5.9
1	K	2	SER	5.8
1	J	3	GLU	5.7
1	J	4	PHE	5.0
1	L	258	LYS	4.4
1	G	4	PHE	4.3
1	I	3	GLU	4.0
1	K	256	GLN	3.9
1	H	4	PHE	3.8

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Mol	Chain	Res	Type	RSRZ
1	H	5	VAL	3.5
1	B	254	ARG	3.4
1	K	182	SER	3.4
1	C	254	ARG	3.3
1	K	185	LEU	3.1
1	K	3	GLU	3.1
1	G	254	ARG	3.1
1	L	257	GLY	3.1
1	A	5	VAL	3.0
1	L	5	VAL	3.0
1	D	250	LYS	3.0
1	K	258	LYS	3.0
1	D	252	LYS	2.9
1	B	256	GLN	2.9
1	L	60	ARG	2.9
1	G	114	ALA	2.9
1	H	71	MET	2.8
1	I	254	ARG	2.8
1	D	254	ARG	2.7
1	I	5	VAL	2.7
1	D	258	LYS	2.6
1	G	5	VAL	2.6
1	E	254	ARG	2.6
1	F	254	ARG	2.6
1	F	258	LYS	2.6
1	H	72	ALA	2.5
1	C	73	LYS	2.5
1	J	254	ARG	2.5
1	G	99	ILE	2.5
1	E	4	PHE	2.5
1	C	258	LYS	2.4
1	H	68	ILE	2.4
1	K	189	GLU	2.4
1	E	25	VAL	2.4
1	I	256	GLN	2.3
1	J	252	LYS	2.3
1	D	251	ARG	2.3
1	E	256	GLN	2.3
1	I	252	LYS	2.3
1	L	4	PHE	2.2
1	K	60	ARG	2.2
1	F	4	PHE	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	252	LYS	2.2
1	H	251	ARG	2.2
1	G	256	GLN	2.2
1	C	4	PHE	2.1
1	B	5	VAL	2.1
1	L	256	GLN	2.1
1	H	12	GLU	2.1
1	I	250	LYS	2.0
1	G	252	LYS	2.0
1	K	25	VAL	2.0
1	K	254	ARG	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 [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
2	EDO	E	2008	4/4	0.71	0.20	32,33,35,36	0
2	EDO	L	2013	4/4	0.73	0.26	48,51,52,53	0
2	EDO	L	2007	4/4	0.78	0.20	48,48,50,52	0
2	EDO	E	2012	4/4	0.87	0.27	40,41,43,45	0
2	EDO	J	2005	4/4	0.87	0.16	25,28,29,32	0
2	EDO	B	2009	4/4	0.89	0.16	36,37,37,40	0
2	EDO	C	2003	4/4	0.91	0.17	30,31,33,37	0
2	EDO	C	2004	4/4	0.91	0.13	25,25,27,27	0
2	EDO	F	2011	4/4	0.91	0.15	29,31,31,33	0
2	EDO	D	2001	4/4	0.93	0.22	30,35,37,38	0
2	EDO	D	2002	4/4	0.95	0.10	23,24,26,27	0
2	EDO	F	2010	4/4	0.95	0.08	25,27,28,29	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	EDO	J	2006	4/4	0.95	0.11	16,21,21,24	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.