



wwPDB X-ray Structure Validation Summary Report ⓘ

Mar 10, 2026 – 01:18 AM UTC

PDB ID : 3Q45 / pdb_00003q45
Title : Crystal structure of Dipeptide Epimerase from *Cytophaga hutchinsonii* complexed with Mg and dipeptide D-Ala-L-Val
Authors : Lukk, T.; Gerlt, J.A.; Nair, S.K.
Deposited on : 2010-12-22
Resolution : 3.00 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<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:

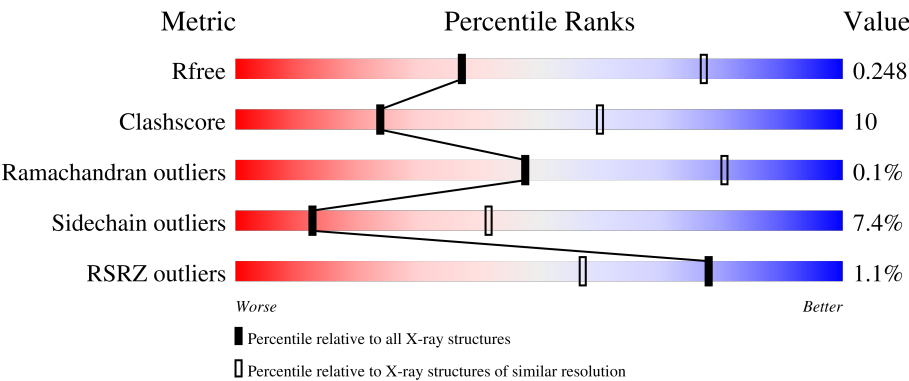
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 3.00 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R _{free}	180053	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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	368	% 78% 20% .
1	B	368	2% 76% 22% .
1	C	368	% 75% 23% .
1	D	368	77% 21% .
1	E	368	% 79% 20% .

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Mol	Chain	Length	Quality of chain
1	F	368	% 79% 19%
1	G	368	2% 73% 25%
1	H	368	74% 23%
1	I	368	2% 78% 20%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 25663 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 Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	B	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	C	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	D	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	E	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	F	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	G	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	H	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			
1	I	368	Total	C	N	O	S	0	0	0
			2826	1799	476	532	19			

- Molecule 2 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

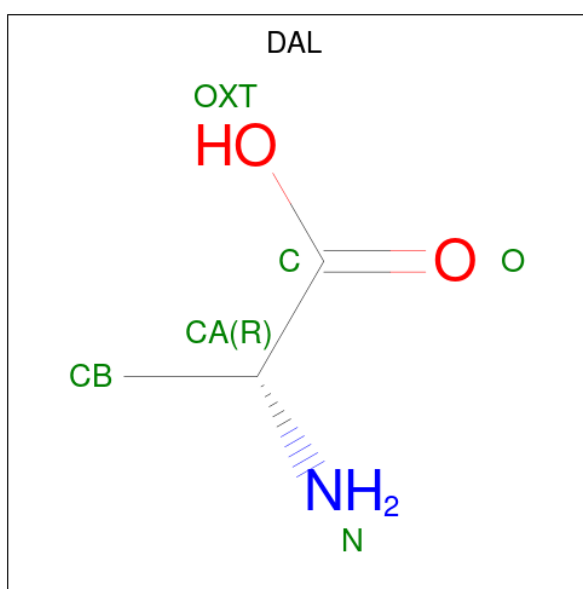
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Mg	0	0
			1	1		
2	B	1	Total	Mg	0	0
			1	1		
2	C	1	Total	Mg	0	0
			1	1		
2	D	1	Total	Mg	0	0
			1	1		
2	E	1	Total	Mg	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	F	1	Total	Mg	0	0
			1	1		
2	G	1	Total	Mg	0	0
			1	1		
2	H	1	Total	Mg	0	0
			1	1		
2	I	1	Total	Mg	0	0
			1	1		

- Molecule 3 is D-ALANINE (CCD ID: DAL) (formula: $C_3H_7NO_2$).



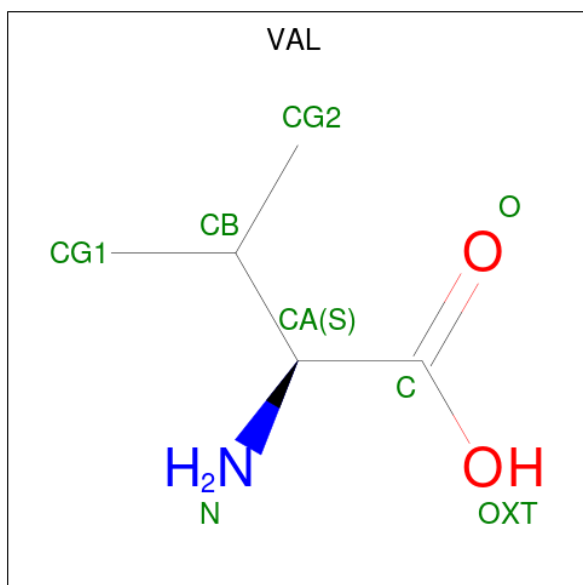
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			5	3	1	1		
3	B	1	Total	C	N	O	0	0
			5	3	1	1		
3	C	1	Total	C	N	O	0	0
			5	3	1	1		
3	D	1	Total	C	N	O	0	0
			5	3	1	1		
3	E	1	Total	C	N	O	0	0
			5	3	1	1		
3	F	1	Total	C	N	O	0	0
			5	3	1	1		
3	G	1	Total	C	N	O	0	0
			5	3	1	1		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	H	1	Total	C	N	O	0	0
			5	3	1	1		
3	I	1	Total	C	N	O	0	0
			5	3	1	1		

- Molecule 4 is VALINE (CCD ID: VAL) (formula: $C_5H_{11}NO_2$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	N	O	0	0
			8	5	1	2		
4	B	1	Total	C	N	O	0	0
			8	5	1	2		
4	C	1	Total	C	N	O	0	0
			8	5	1	2		
4	D	1	Total	C	N	O	0	0
			8	5	1	2		
4	E	1	Total	C	N	O	0	0
			8	5	1	2		
4	F	1	Total	C	N	O	0	0
			8	5	1	2		
4	G	1	Total	C	N	O	0	0
			8	5	1	2		
4	H	1	Total	C	N	O	0	0
			8	5	1	2		
4	I	1	Total	C	N	O	0	0
			8	5	1	2		

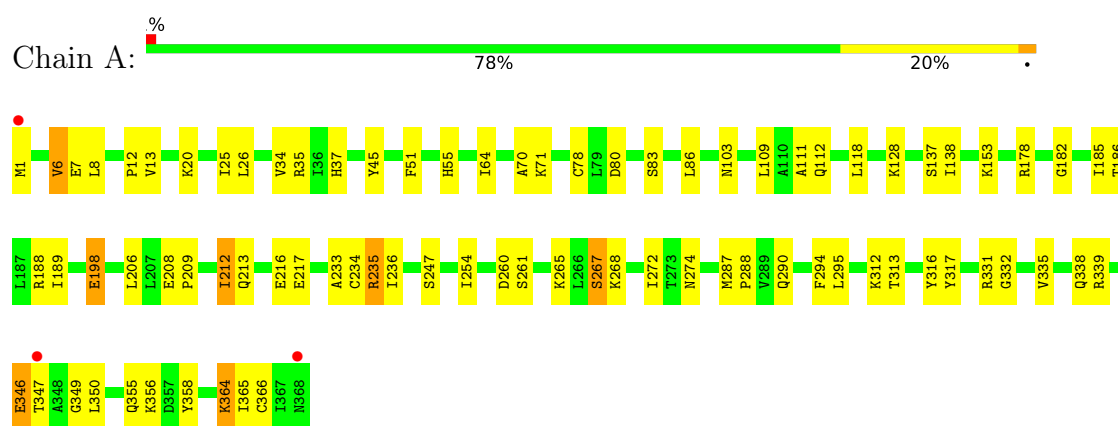
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	28	Total 28	O 28	0	0
5	B	28	Total 28	O 28	0	0
5	C	18	Total 18	O 18	0	0
5	D	6	Total 6	O 6	0	0
5	E	6	Total 6	O 6	0	0
5	F	3	Total 3	O 3	0	0
5	G	11	Total 11	O 11	0	0
5	H	2	Total 2	O 2	0	0
5	I	1	Total 1	O 1	0	0

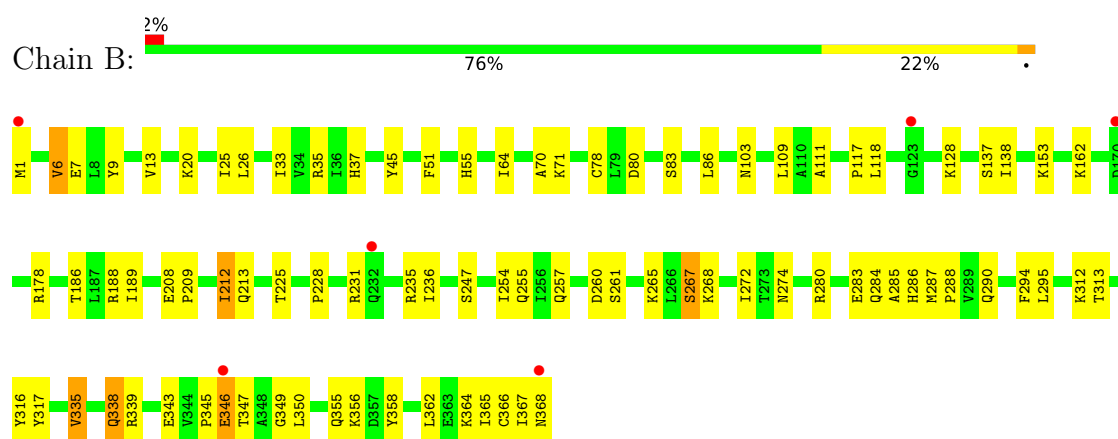
3 Residue-property plots

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.

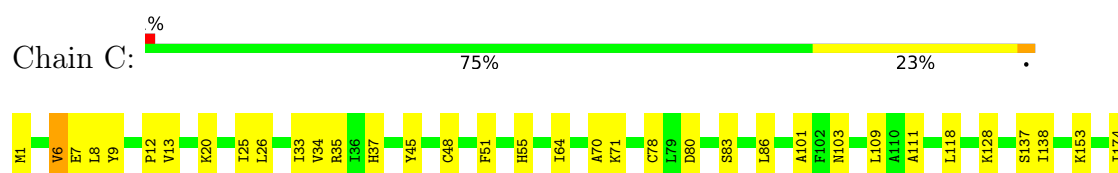
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase

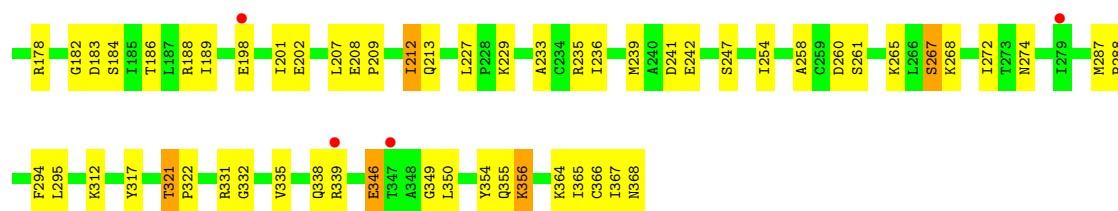


- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase



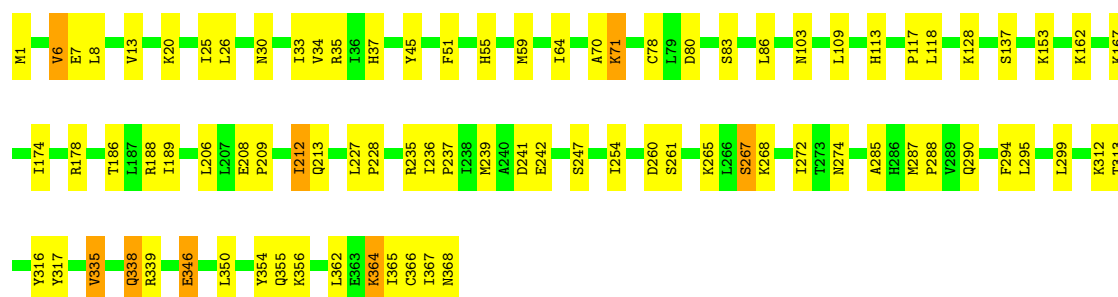
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase





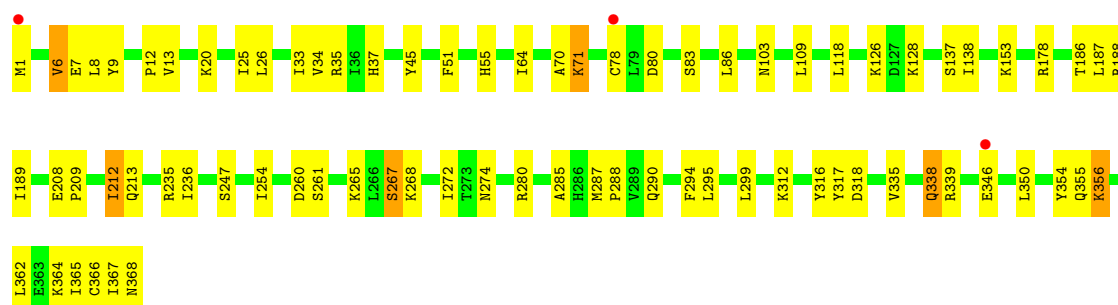
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase

Chain D: 77% 21% .



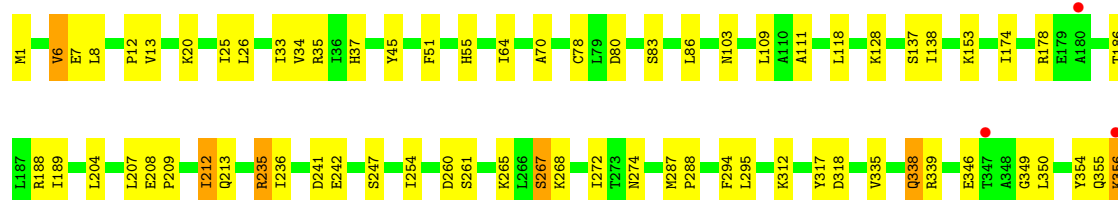
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase

Chain E: 79% 20% .



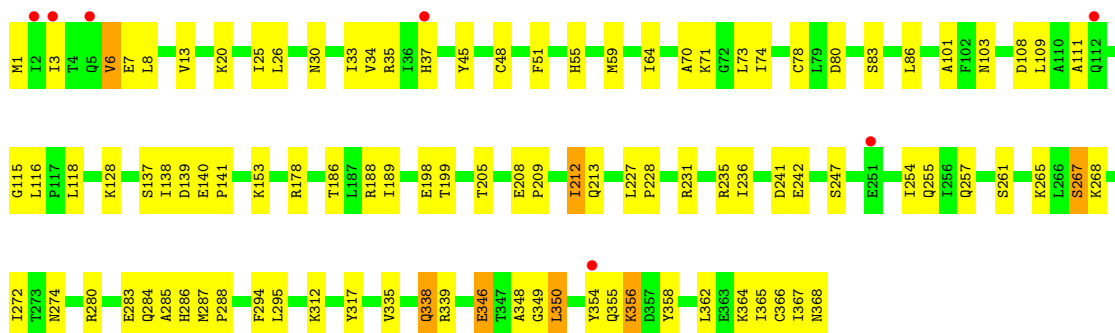
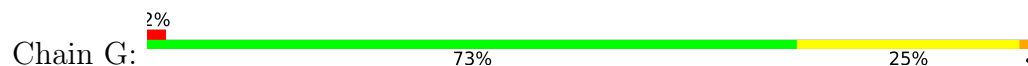
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase

Chain F: 79% 19% .

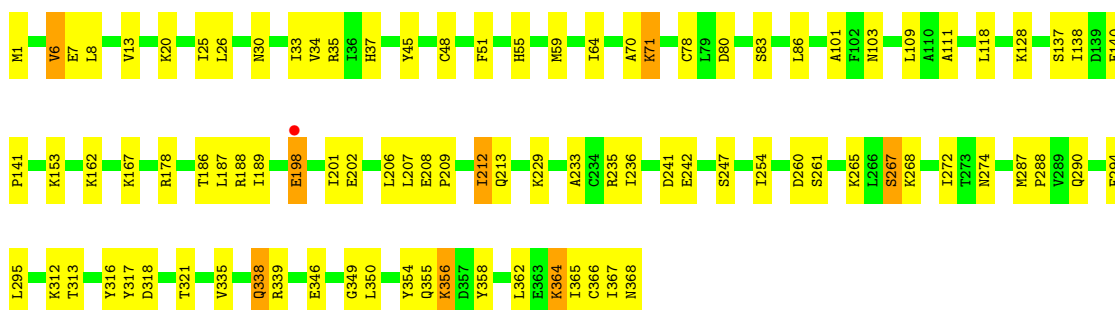




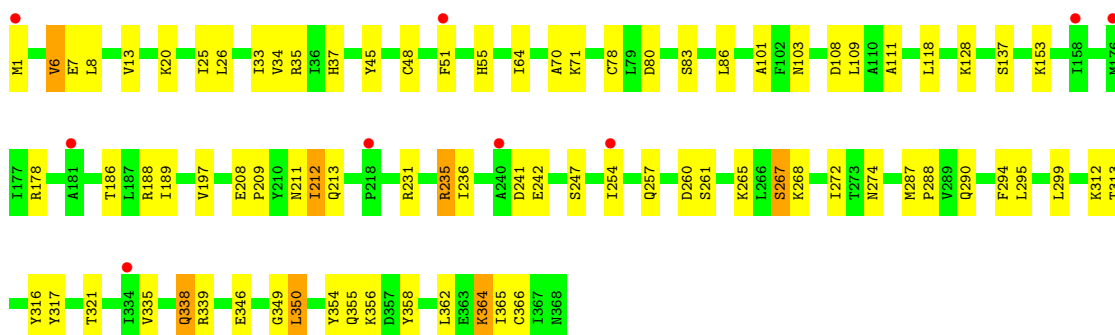
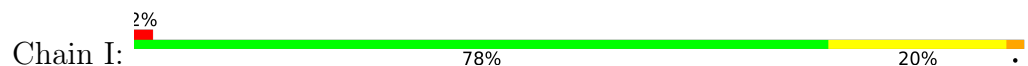
- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase



- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase



- Molecule 1: Mandelate racemase/muconate lactonizing enzyme family; possible chloromuconate cycloisomerase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	94.00Å 158.20Å 182.74Å 90.00° 100.28° 90.00°	Depositor
Resolution (Å)	20.00 – 3.00 20.00 – 3.00	Depositor EDS
% Data completeness (in resolution range)	100.0 (20.00-3.00) 99.6 (20.00-3.00)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.19 (at 2.89Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.227 , 0.251 (Not available) , 0.248	Depositor DCC
R_{free} test set	5811 reflections (4.98%)	wwPDB-VP
Wilson B-factor (Å ²)	71.3	Xtriage
Anisotropy	0.064	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 33.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	25663	wwPDB-VP
Average B, all atoms (Å ²)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.33% 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: DAL, MG

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	0.66	0/2875	0.81	2/3890 (0.1%)
1	B	0.71	0/2875	0.83	1/3890 (0.0%)
1	C	0.60	0/2875	0.82	0/3890
1	D	0.51	0/2875	0.79	0/3890
1	E	0.52	0/2875	0.80	0/3890
1	F	0.52	0/2875	0.81	1/3890 (0.0%)
1	G	0.53	0/2875	0.81	1/3890 (0.0%)
1	H	0.53	0/2875	0.81	1/3890 (0.0%)
1	I	0.56	0/2875	0.80	3/3890 (0.1%)
All	All	0.57	0/25875	0.81	9/35010 (0.0%)

There are no bond length outliers.

The worst 5 of 9 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	358	TYR	N-CA-C	-6.41	104.22	111.14
1	I	358	TYR	N-CA-C	-5.96	104.70	111.14
1	A	358	TYR	N-CA-C	-5.63	105.06	111.14
1	A	198	GLU	CA-CB-CG	5.61	125.33	114.10
1	G	358	TYR	N-CA-C	-5.59	105.10	111.14

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	2826	0	2870	58	0
1	B	2826	0	2870	74	0
1	C	2826	0	2870	79	0
1	D	2826	0	2870	60	0
1	E	2826	0	2870	51	0
1	F	2826	0	2870	46	0
1	G	2826	0	2870	88	0
1	H	2826	0	2870	77	0
1	I	2826	0	2870	52	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
2	I	1	0	0	0	0
3	A	5	0	6	0	0
3	B	5	0	6	0	0
3	C	5	0	6	0	0
3	D	5	0	6	0	0
3	E	5	0	6	2	0
3	F	5	0	6	1	0
3	G	5	0	6	0	0
3	H	5	0	6	1	0
3	I	5	0	6	0	0
4	A	8	0	9	3	0
4	B	8	0	9	2	0
4	C	8	0	9	2	0
4	D	8	0	9	3	0
4	E	8	0	9	2	0
4	F	8	0	9	0	0
4	G	8	0	9	1	0
4	H	8	0	9	1	0
4	I	8	0	9	2	0
5	A	28	0	0	2	0
5	B	28	0	0	0	0
5	C	18	0	0	3	0
5	D	6	0	0	0	0
5	E	6	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	F	3	0	0	0	0
5	G	11	0	0	11	0
5	H	2	0	0	0	0
5	I	1	0	0	0	0
All	All	25663	0	25965	519	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 10.

The worst 5 of 519 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:C:198:GLU:OE1	1:H:201:ILE:HD13	1.39	1.19
1:B:231:ARG:HH22	1:G:286:HIS:CE1	1.74	1.06
1:C:201:ILE:HD13	1:H:198:GLU:OE1	1.56	1.05
1:B:286:HIS:CE1	1:G:231:ARG:HH22	1.75	1.04
1:A:332:GLY:HA3	1:B:346:GLU:OE2	1.62	1.00

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	366/368 (100%)	348 (95%)	17 (5%)	1 (0%)	36	70
1	B	366/368 (100%)	353 (96%)	13 (4%)	0	100	100
1	C	366/368 (100%)	353 (96%)	12 (3%)	1 (0%)	36	70
1	D	366/368 (100%)	353 (96%)	13 (4%)	0	100	100
1	E	366/368 (100%)	350 (96%)	15 (4%)	1 (0%)	36	70
1	F	366/368 (100%)	349 (95%)	16 (4%)	1 (0%)	36	70

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	G	366/368 (100%)	353 (96%)	13 (4%)	0	100	100
1	H	366/368 (100%)	350 (96%)	16 (4%)	0	100	100
1	I	366/368 (100%)	350 (96%)	16 (4%)	0	100	100
All	All	3294/3312 (100%)	3159 (96%)	131 (4%)	4 (0%)	48	80

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	12	PRO
1	A	12	PRO
1	E	12	PRO
1	C	12	PRO

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	306/306 (100%)	283 (92%)	23 (8%)	12	41
1	B	306/306 (100%)	284 (93%)	22 (7%)	13	43
1	C	306/306 (100%)	285 (93%)	21 (7%)	14	45
1	D	306/306 (100%)	283 (92%)	23 (8%)	12	41
1	E	306/306 (100%)	284 (93%)	22 (7%)	13	43
1	F	306/306 (100%)	285 (93%)	21 (7%)	14	45
1	G	306/306 (100%)	284 (93%)	22 (7%)	13	43
1	H	306/306 (100%)	280 (92%)	26 (8%)	10	36
1	I	306/306 (100%)	283 (92%)	23 (8%)	12	41
All	All	2754/2754 (100%)	2551 (93%)	203 (7%)	13	42

5 of 203 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	109	LEU
1	G	235	ARG
1	I	355	GLN
1	F	186	THR
1	F	362	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 92 such sidechains are listed below:

Mol	Chain	Res	Type
1	F	232	GLN
1	G	286	HIS
1	F	284	GLN
1	G	192	ASN
1	H	131	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](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 27 ligands modelled in this entry, 9 are monoatomic - leaving 18 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	DAL	E	2478	4	3,4,5	1.01	0	2,4,6	0.90	0
4	VAL	I	2487	3,2	6,7,7	1.07	0	8,9,9	1.81	3 (37%)
3	DAL	B	2472	4	3,4,5	0.50	0	2,4,6	1.08	0
3	DAL	C	2474	4	3,4,5	0.85	0	2,4,6	1.02	0
4	VAL	C	2475	3,2	6,7,7	1.24	1 (16%)	8,9,9	2.32	3 (37%)
3	DAL	I	2486	4	3,4,5	0.80	0	2,4,6	1.09	0
4	VAL	D	2477	3,2	6,7,7	1.02	1 (16%)	8,9,9	1.62	2 (25%)
4	VAL	G	2483	3,2	6,7,7	1.57	1 (16%)	8,9,9	1.91	3 (37%)
4	VAL	A	2471	3,2	6,7,7	1.37	1 (16%)	8,9,9	1.87	2 (25%)
3	DAL	F	2480	4	3,4,5	0.56	0	2,4,6	0.94	0
4	VAL	H	2485	3,2	6,7,7	1.20	1 (16%)	8,9,9	1.69	2 (25%)
4	VAL	F	2481	3,2	6,7,7	0.99	1 (16%)	8,9,9	1.69	3 (37%)
4	VAL	B	2473	3,2	6,7,7	1.16	1 (16%)	8,9,9	1.36	2 (25%)
3	DAL	D	2476	4	3,4,5	0.59	0	2,4,6	0.90	0
3	DAL	H	2484	4	3,4,5	0.75	0	2,4,6	0.89	0
4	VAL	E	2479	3,2	6,7,7	1.04	1 (16%)	8,9,9	1.90	2 (25%)
3	DAL	A	2470	4	3,4,5	0.75	0	2,4,6	0.99	0
3	DAL	G	2482	4	3,4,5	0.79	0	2,4,6	1.24	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DAL	E	2478	4	-	1/1/2/4	-
4	VAL	I	2487	3,2	-	4/8/8/8	-
3	DAL	B	2472	4	-	0/1/2/4	-
3	DAL	C	2474	4	-	0/1/2/4	-
4	VAL	C	2475	3,2	-	4/8/8/8	-
3	DAL	I	2486	4	-	0/1/2/4	-
4	VAL	D	2477	3,2	-	1/8/8/8	-
4	VAL	G	2483	3,2	-	5/8/8/8	-
4	VAL	A	2471	3,2	-	5/8/8/8	-
3	DAL	F	2480	4	-	0/1/2/4	-
4	VAL	H	2485	3,2	-	4/8/8/8	-
4	VAL	F	2481	3,2	-	1/8/8/8	-
4	VAL	B	2473	3,2	-	5/8/8/8	-
3	DAL	D	2476	4	-	0/1/2/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	DAL	H	2484	4	-	1/1/2/4	-
4	VAL	E	2479	3,2	-	3/8/8/8	-
3	DAL	A	2470	4	-	0/1/2/4	-
3	DAL	G	2482	4	-	0/1/2/4	-

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	G	2483	VAL	CA-C	3.10	1.58	1.52
4	H	2485	VAL	OXT-C	-2.60	1.22	1.30
4	D	2477	VAL	OXT-C	-2.46	1.22	1.30
4	B	2473	VAL	OXT-C	-2.33	1.23	1.30
4	F	2481	VAL	OXT-C	-2.33	1.23	1.30

The worst 5 of 22 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	2475	VAL	OXT-C-O	-4.68	113.47	124.08
4	A	2471	VAL	OXT-C-O	-4.39	114.12	124.08
4	E	2479	VAL	OXT-C-O	-4.13	114.71	124.08
4	C	2475	VAL	C-CA-N	3.89	117.67	109.49
4	G	2483	VAL	OXT-C-O	-3.75	115.57	124.08

There are no chirality outliers.

5 of 34 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	E	2478	DAL	O-C-CA-CB
3	H	2484	DAL	O-C-CA-CB
4	A	2471	VAL	OXT-C-CA-N
4	A	2471	VAL	O-C-CA-CB
4	A	2471	VAL	OXT-C-CA-CB

There are no ring outliers.

11 monomers are involved in 20 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	2478	DAL	2	0
4	I	2487	VAL	2	0
4	C	2475	VAL	2	0
4	D	2477	VAL	3	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	G	2483	VAL	1	0
4	A	2471	VAL	3	0
3	F	2480	DAL	1	0
4	H	2485	VAL	1	0
4	B	2473	VAL	2	0
3	H	2484	DAL	1	0
4	E	2479	VAL	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, 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	368/368 (100%)	0.02	3 (0%) 82 64	42, 62, 93, 116	0
1	B	368/368 (100%)	0.12	6 (1%) 70 47	39, 60, 91, 114	0
1	C	368/368 (100%)	0.02	4 (1%) 78 57	40, 64, 94, 115	0
1	D	368/368 (100%)	-0.09	0 100 100	48, 69, 98, 119	0
1	E	368/368 (100%)	-0.03	3 (0%) 82 64	46, 69, 97, 119	0
1	F	368/368 (100%)	-0.01	3 (0%) 82 64	49, 68, 96, 116	0
1	G	368/368 (100%)	0.07	7 (1%) 66 43	49, 68, 97, 116	0
1	H	368/368 (100%)	0.01	1 (0%) 90 79	51, 69, 95, 119	0
1	I	368/368 (100%)	0.73	9 (2%) 59 36	53, 73, 98, 119	0
All	All	3312/3312 (100%)	0.09	36 (1%) 78 57	39, 67, 97, 119	0

The worst 5 of 36 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	H	198	GLU	4.5
1	C	198	GLU	4.1
1	B	346	GLU	3.4
1	B	368	ASN	2.9
1	C	347	THR	2.8

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 oligosaccharides 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($\text{\AA}^2$)	Q<0.9
2	MG	I	1609	1/1	0.82	0.10	90,90,90,90	0
2	MG	H	1608	1/1	0.86	0.12	83,83,83,83	0
2	MG	F	1606	1/1	0.88	0.07	67,67,67,67	0
3	DAL	H	2484	5/6	0.89	0.16	83,83,83,84	0
3	DAL	E	2478	5/6	0.91	0.12	74,75,75,75	0
4	VAL	I	2487	8/8	0.91	0.16	102,102,102,102	0
3	DAL	C	2474	5/6	0.93	0.11	70,71,71,72	0
2	MG	E	1605	1/1	0.93	0.09	89,89,89,89	0
4	VAL	D	2477	8/8	0.94	0.12	90,91,91,92	0
3	DAL	I	2486	5/6	0.94	0.15	102,102,102,103	0
4	VAL	B	2473	8/8	0.95	0.11	46,47,47,48	0
4	VAL	C	2475	8/8	0.95	0.12	70,70,71,71	0
3	DAL	D	2476	5/6	0.95	0.11	92,92,92,92	0
4	VAL	F	2481	8/8	0.95	0.10	83,84,84,85	0
4	VAL	H	2485	8/8	0.95	0.12	82,83,83,84	0
3	DAL	F	2480	5/6	0.95	0.10	81,81,82,83	0
4	VAL	G	2483	8/8	0.96	0.11	60,61,62,62	0
2	MG	B	1602	1/1	0.96	0.05	56,56,56,56	0
3	DAL	A	2470	5/6	0.96	0.09	65,65,66,66	0
2	MG	D	1604	1/1	0.97	0.07	96,96,96,96	0
2	MG	A	1601	1/1	0.97	0.05	61,61,61,61	0
2	MG	C	1603	1/1	0.97	0.05	60,60,60,60	0
4	VAL	E	2479	8/8	0.97	0.10	72,73,74,74	0
3	DAL	G	2482	5/6	0.97	0.07	60,60,60,61	0
3	DAL	B	2472	5/6	0.97	0.08	43,44,45,46	0
2	MG	G	1607	1/1	0.97	0.04	46,46,46,46	0
4	VAL	A	2471	8/8	0.97	0.08	64,66,67,67	0

6.5 Other polymers [i](#)

There are no such residues in this entry.