



wwPDB X-ray Structure Validation Summary Report ⓘ

Jun 24, 2024 – 08:29 PM EDT

PDB ID : 6TC0
Title : Crystal structure of MMS19-CIAO1-CIAO2B CIA targeting complex
Authors : Kassube, S.A.; Thoma, N.H.
Deposited on : 2019-11-04
Resolution : 3.60 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.20.1
EDS : 2.37.1
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) : 2.37.1

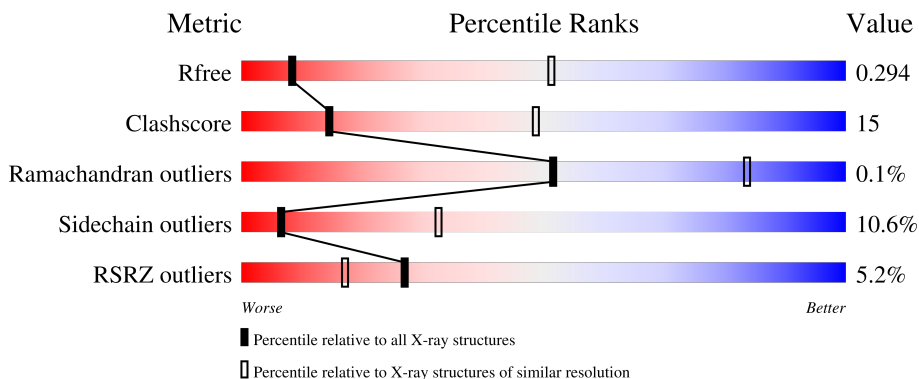
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.60 Å.

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




Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1257 (3.70-3.50)
Clashscore	141614	1353 (3.70-3.50)
Ramachandran outliers	138981	1307 (3.70-3.50)
Sidechain outliers	138945	1307 (3.70-3.50)
RSRZ outliers	127900	1161 (3.70-3.50)

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	338	 3% 81% 17% ..
1	D	338	 27% 83% 16% ..
2	B	159	 4% 72% 23% ..
2	E	159	 6% 77% 19% ..
3	C	1035	 2% 58% 32% 6% ..

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Mol	Chain	Length	Quality of chain
3	F	1035	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a green segment on the left labeled '59%', a yellow segment in the middle labeled '30%', and a red segment on the right labeled '6%'. There are two small black dots at the end of the bar. A '%' symbol is located at the top left of the bar.</p>

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 22972 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 Probable cytosolic iron-sulfur protein assembly protein Ciao1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	336	2613	1629	455	516	13	0	0	0
1	D	336	2613	1629	455	516	13	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP Q7K1Y4
A	-1	GLY	-	expression tag	UNP Q7K1Y4
A	0	GLY	-	expression tag	UNP Q7K1Y4
A	1	ARG	-	expression tag	UNP Q7K1Y4
D	-2	GLY	-	expression tag	UNP Q7K1Y4
D	-1	GLY	-	expression tag	UNP Q7K1Y4
D	0	GLY	-	expression tag	UNP Q7K1Y4
D	1	ARG	-	expression tag	UNP Q7K1Y4

- Molecule 2 is a protein called MIP18 family protein galla-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	154	1223	765	217	238	3	0	0	0
2	E	154	1223	765	217	238	3	0	0	0

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	GLY	-	expression tag	UNP Q9VTC4
B	-1	GLY	-	expression tag	UNP Q9VTC4
B	0	GLY	-	expression tag	UNP Q9VTC4
B	1	ARG	-	expression tag	UNP Q9VTC4

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-2	GLY	-	expression tag	UNP Q9VTC4
E	-1	GLY	-	expression tag	UNP Q9VTC4
E	0	GLY	-	expression tag	UNP Q9VTC4
E	1	ARG	-	expression tag	UNP Q9VTC4

- Molecule 3 is a protein called MMS19 nucleotide excision repair protein homolog.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	994	Total	C	N	O	S	0	0	0
			7669	4888	1311	1424	46			
3	F	989	Total	C	N	O	S	0	0	0
			7631	4862	1306	1418	45			

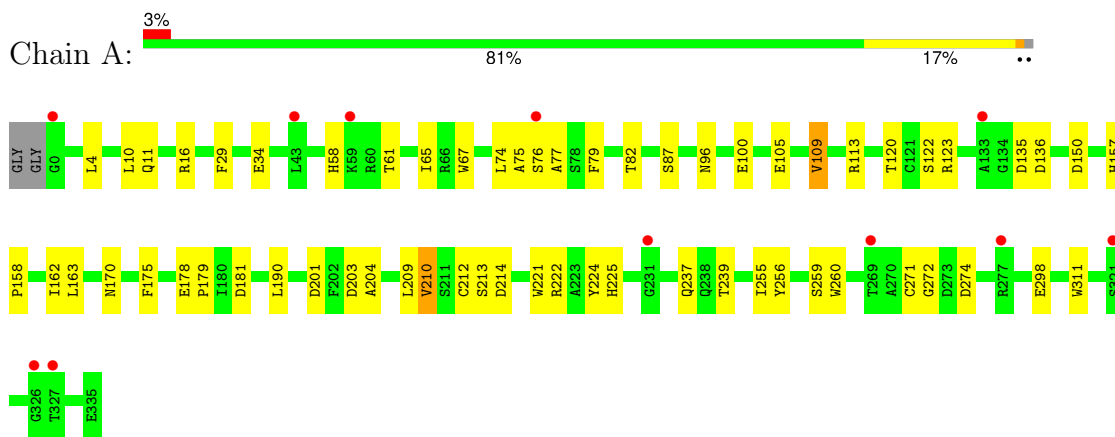
There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP Q9D071
C	-2	GLY	-	expression tag	UNP Q9D071
C	-1	GLY	-	expression tag	UNP Q9D071
C	0	ARG	-	expression tag	UNP Q9D071
F	-3	GLY	-	expression tag	UNP Q9D071
F	-2	GLY	-	expression tag	UNP Q9D071
F	-1	GLY	-	expression tag	UNP Q9D071
F	0	ARG	-	expression tag	UNP Q9D071

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: Probable cytosolic iron-sulfur protein assembly protein Ciaol

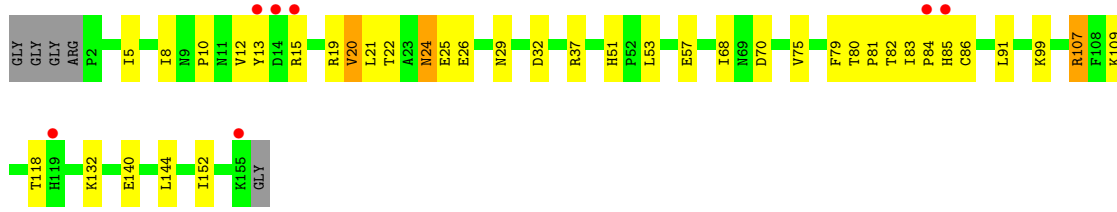


- Molecule 1: Probable cytosolic iron-sulfur protein assembly protein Ciaol

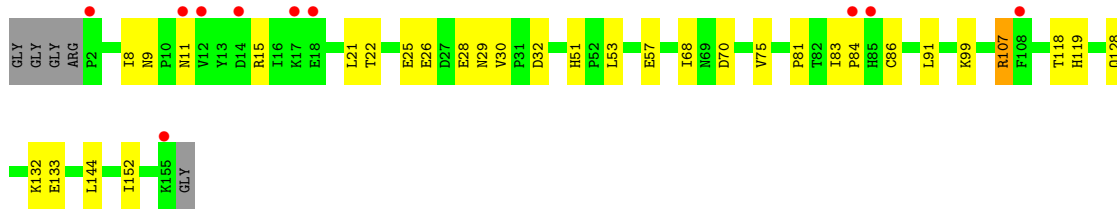
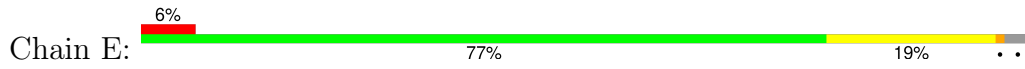


- Molecule 2: MIP18 family protein galla-2

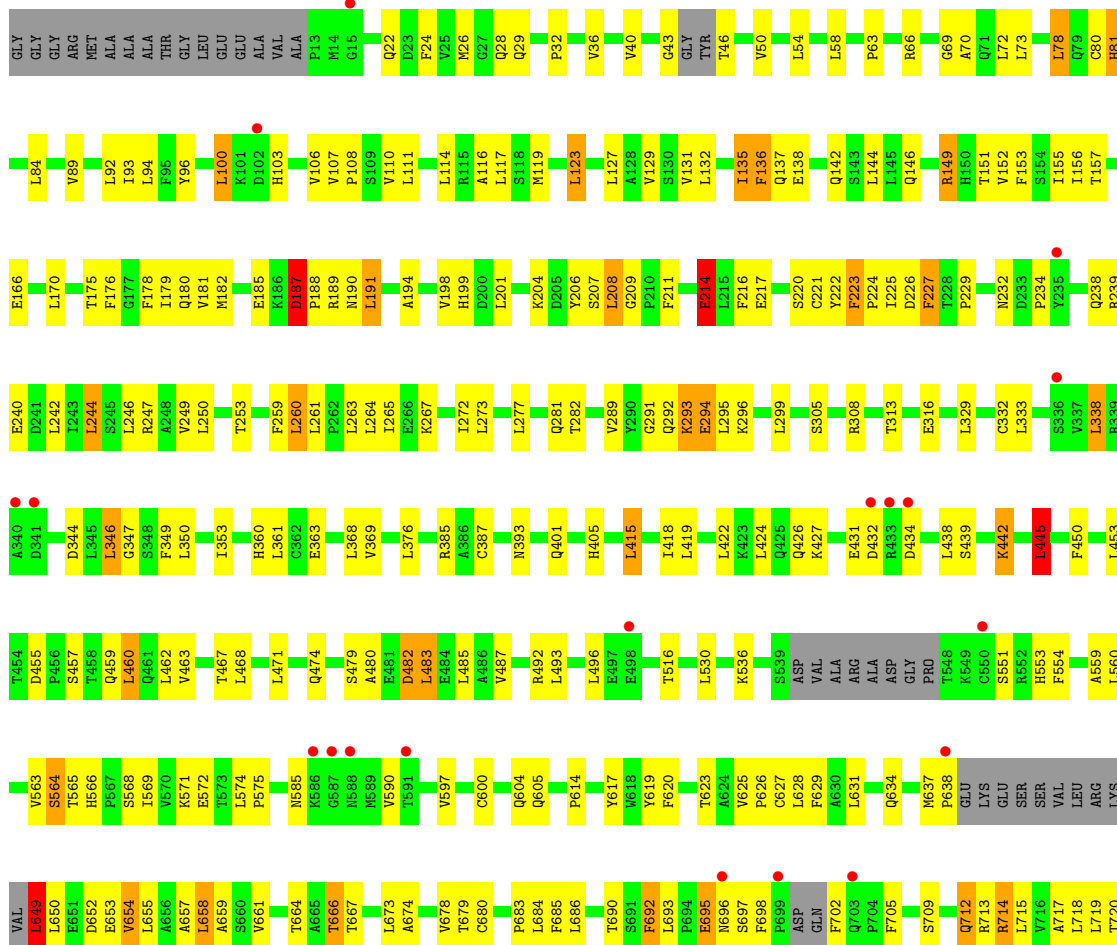


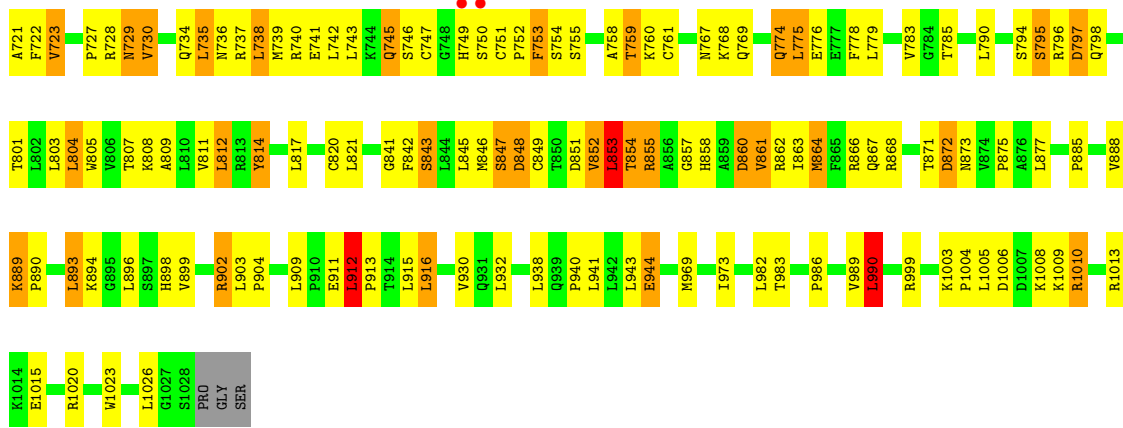


• Molecule 2: MIP18 family protein galla-2

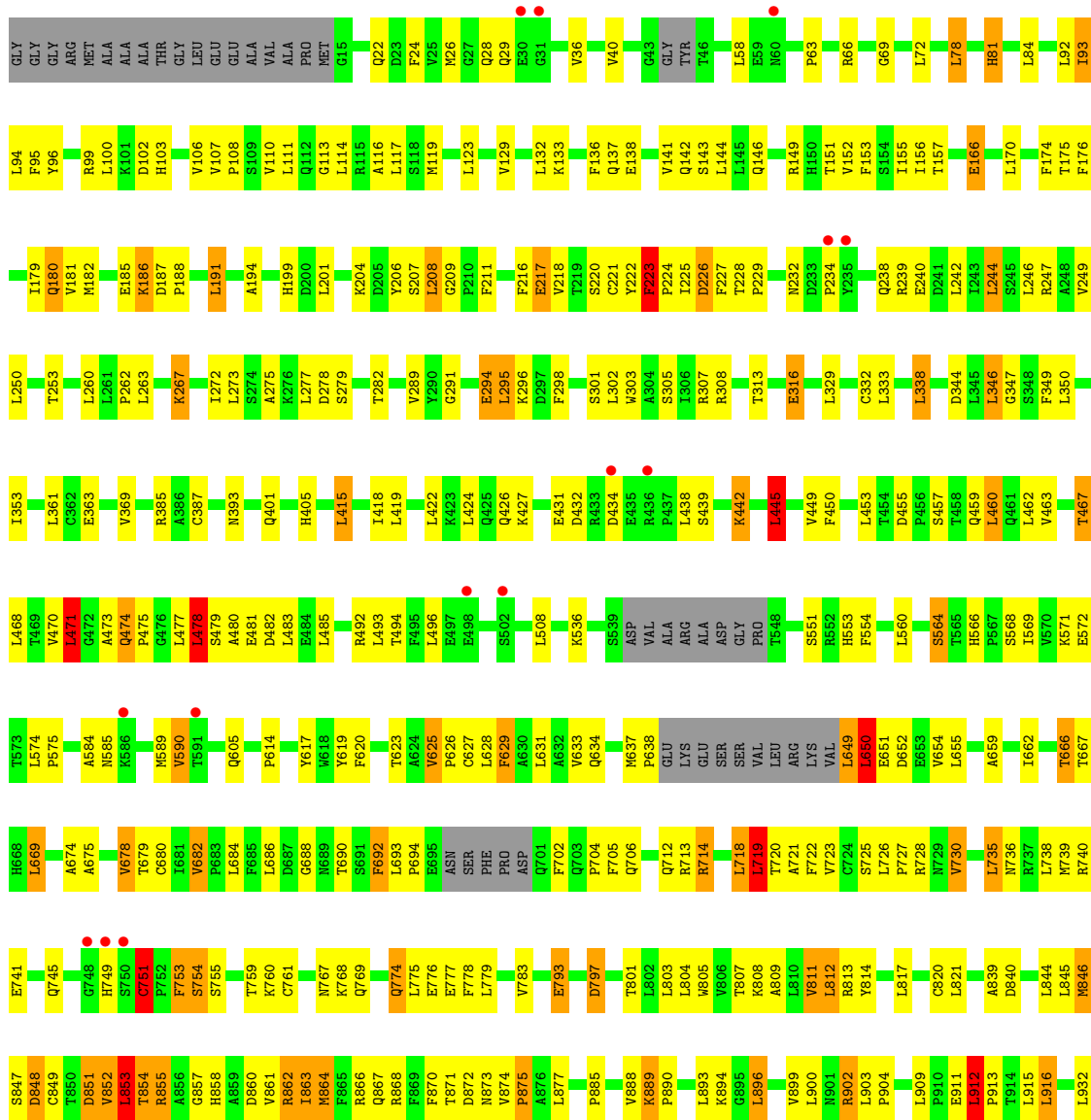


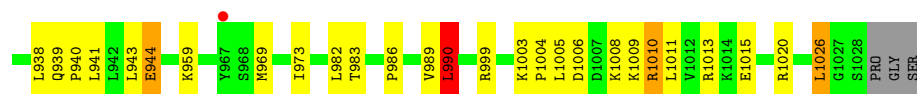
• Molecule 3: MMS19 nucleotide excision repair protein homolog





● Molecule 3: MMS19 nucleotide excision repair protein homolog





4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	107.40Å 140.70Å 327.33Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 3.60 20.00 – 3.60	Depositor EDS
% Data completeness (in resolution range)	100.0 (20.00-3.60) 100.0 (20.00-3.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.45 (at 3.62Å)	Xtrriage
Refinement program	CNS, PHENIX 1.16_3549	Depositor
R, R_{free}	0.258 , 0.277 0.278 , 0.294	Depositor DCC
R_{free} test set	2900 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	175.8	Xtrriage
Anisotropy	0.105	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.24 , 108.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.40$, $\langle L^2 \rangle = 0.23$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	22972	wwPDB-VP
Average B, all atoms (Å ²)	211.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.63% 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 i

5.1 Standard geometry i

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	0.38	0/2679	0.62	0/3649
1	D	0.42	0/2679	0.65	0/3649
2	B	0.54	0/1244	0.79	4/1694 (0.2%)
2	E	0.46	0/1244	0.80	5/1694 (0.3%)
3	C	0.45	2/7816 (0.0%)	0.74	15/10614 (0.1%)
3	F	0.45	2/7775 (0.0%)	0.74	18/10558 (0.2%)
All	All	0.45	4/23437 (0.0%)	0.72	42/31858 (0.1%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	187	ASP	CB-CG	-6.12	1.38	1.51
3	F	751	CYS	CB-SG	-6.12	1.71	1.82
3	F	217	GLU	CB-CG	-5.33	1.42	1.52
3	C	214	GLU	CB-CG	-5.18	1.42	1.52

The worst 5 of 42 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	735	LEU	CB-CG-CD2	-11.56	91.34	111.00
3	C	804	LEU	CB-CG-CD1	-10.07	93.89	111.00
3	C	208	LEU	CA-CB-CG	9.09	136.20	115.30
3	F	208	LEU	CA-CB-CG	8.94	135.86	115.30
3	F	718	LEU	CB-CG-CD1	-8.65	96.29	111.00

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	2613	0	2480	38	0
1	D	2613	0	2480	32	0
2	B	1223	0	1230	52	0
2	E	1223	0	1230	39	0
3	C	7669	0	7810	296	0
3	F	7631	0	7774	300	0
All	All	22972	0	23004	706	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 15.

The worst 5 of 706 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)
3:F:226:ASP:HB3	3:F:239:ARG:HD3	1.20	1.19
3:C:226:ASP:HB2	3:C:239:ARG:HD2	1.21	1.12
3:F:751:CYS:SG	3:F:754:SER:N	2.26	1.09
3:F:769:GLN:O	3:F:813:ARG:NH2	1.83	1.09
3:F:474:GLN:OE1	3:F:474:GLN:N	1.93	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	334/338 (99%)	320 (96%)	14 (4%)	0	100	100
1	D	334/338 (99%)	322 (96%)	12 (4%)	0	100	100
2	B	152/159 (96%)	148 (97%)	4 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	E	152/159 (96%)	148 (97%)	4 (3%)	0	100	100
3	C	984/1035 (95%)	936 (95%)	47 (5%)	1 (0%)	51	83
3	F	979/1035 (95%)	930 (95%)	48 (5%)	1 (0%)	51	83
All	All	2935/3064 (96%)	2804 (96%)	129 (4%)	2 (0%)	51	83

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	223	PHE
3	F	223	PHE

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	284/284 (100%)	280 (99%)	4 (1%)	67	85
1	D	284/284 (100%)	280 (99%)	4 (1%)	67	85
2	B	141/142 (99%)	139 (99%)	2 (1%)	67	85
2	E	141/142 (99%)	141 (100%)	0	100	100
3	C	859/887 (97%)	734 (85%)	125 (15%)	3	20
3	F	854/887 (96%)	717 (84%)	137 (16%)	2	16
All	All	2563/2626 (98%)	2291 (89%)	272 (11%)	6	32

5 of 272 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	F	723	VAL
3	F	793	GLU
3	F	896	LEU
3	C	795	SER
3	C	774	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 35 such sidechains are listed below:

Mol	Chain	Res	Type
3	F	461	GLN
3	F	489	HIS
3	F	769	GLN
3	C	566	HIS
3	C	489	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

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	336/338 (99%)	-0.07	11 (3%) 46 31	148, 195, 264, 303	0
1	D	336/338 (99%)	1.30	91 (27%) 0 0	314, 381, 426, 449	0
2	B	154/159 (96%)	-0.17	7 (4%) 33 21	164, 192, 281, 306	0
2	E	154/159 (96%)	0.02	10 (6%) 18 11	220, 249, 307, 323	0
3	C	994/1035 (96%)	-0.42	21 (2%) 63 48	118, 184, 263, 377	0
3	F	989/1035 (95%)	-0.46	15 (1%) 73 60	111, 167, 234, 375	0
All	All	2963/3064 (96%)	-0.16	155 (5%) 27 17	111, 189, 385, 449	0

The worst 5 of 155 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	31	SER	8.4
1	D	28	VAL	8.1
1	D	223	ALA	7.5
1	D	90	SER	6.8
1	D	91	GLY	6.7

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 monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.