



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 05:28 PM UTC

PDB ID : 4YO5 / pdb_00004yo5
Title : EAEC T6SS TssA-Cterminus
Authors : Durand, E.; Zoued, A.; Spinelli, S.; Douzi, B.; Brunet, Y.R.; Bebeacua, C.;
Legrand, P.; Journet, L.; Mignot, T.; Cambillau, C.; Cascales, E.
Deposited on : 2015-03-11
Resolution : 3.35 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

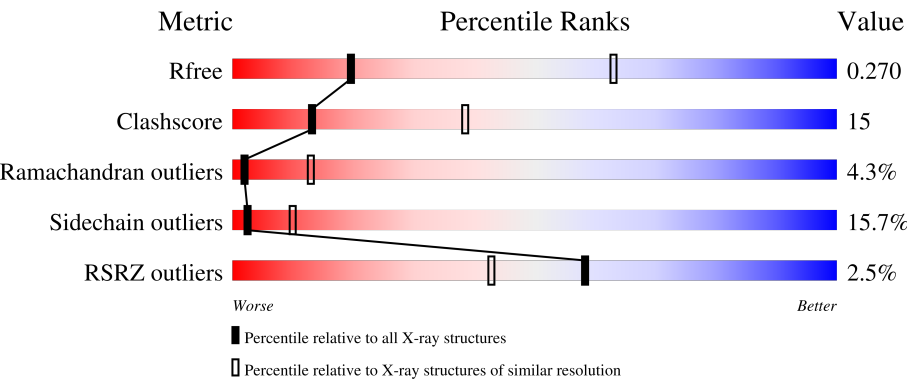
MolProbity : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (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 3.35 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	1099 (3.40-3.32)
Clashscore	190562	1116 (3.40-3.32)
Ramachandran outliers	187476	1101 (3.40-3.32)
Sidechain outliers	187428	1101 (3.40-3.32)
RSRZ outliers	180081	1099 (3.40-3.32)

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	131	2% 75% 21% • •
1	B	131	2% 66% 24% 6% •
1	C	131	5% 56% 30% 10% 5%
1	D	131	2% 73% 24% •
1	E	131	% 75% 20% 5% •

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Mol	Chain	Length	Quality of chain
1	F	131	2% 76% 21%
1	G	131	2% 77% 19%
1	H	131	3% 72% 22% 5%
1	I	131	4% 73% 23%
1	J	131	3% 63% 24% 9%
1	K	131	2% 70% 25%
1	L	131	% 64% 27% 5%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 12255 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 TssA.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	131	Total	C	N	O	S	Se	0	0	0
			1016	634	188	190	1	3			
1	B	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	C	131	Total	C	N	O	S	Se	0	0	0
			995	625	178	188	1	3			
1	D	131	Total	C	N	O	S	Se	0	0	0
			1007	629	184	190	1	3			
1	E	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	F	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	G	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	H	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	I	131	Total	C	N	O	S	Se	0	0	0
			1011	632	185	190	1	3			
1	J	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	K	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			
1	L	131	Total	C	N	O	S	Se	0	0	0
			1010	631	185	190	1	3			

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	399	ALA	-	expression tag	UNP B7LFT5
A	400	ALA	-	expression tag	UNP B7LFT5
B	399	ALA	-	expression tag	UNP B7LFT5
B	400	ALA	-	expression tag	UNP B7LFT5
C	399	ALA	-	expression tag	UNP B7LFT5

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Chain	Residue	Modelled	Actual	Comment	Reference
C	400	ALA	-	expression tag	UNP B7LFT5
D	399	ALA	-	expression tag	UNP B7LFT5
D	400	ALA	-	expression tag	UNP B7LFT5
E	399	ALA	-	expression tag	UNP B7LFT5
E	400	ALA	-	expression tag	UNP B7LFT5
F	399	ALA	-	expression tag	UNP B7LFT5
F	400	ALA	-	expression tag	UNP B7LFT5
G	399	ALA	-	expression tag	UNP B7LFT5
G	400	ALA	-	expression tag	UNP B7LFT5
H	399	ALA	-	expression tag	UNP B7LFT5
H	400	ALA	-	expression tag	UNP B7LFT5
I	399	ALA	-	expression tag	UNP B7LFT5
I	400	ALA	-	expression tag	UNP B7LFT5
J	399	ALA	-	expression tag	UNP B7LFT5
J	400	ALA	-	expression tag	UNP B7LFT5
K	399	ALA	-	expression tag	UNP B7LFT5
K	400	ALA	-	expression tag	UNP B7LFT5
L	399	ALA	-	expression tag	UNP B7LFT5
L	400	ALA	-	expression tag	UNP B7LFT5

- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	11	Total O 11 11	0	0
2	B	14	Total O 14 14	0	0
2	C	11	Total O 11 11	0	0
2	D	9	Total O 9 9	0	0
2	E	14	Total O 14 14	0	0
2	F	5	Total O 5 5	0	0
2	G	12	Total O 12 12	0	0
2	H	11	Total O 11 11	0	0
2	I	27	Total O 27 27	0	0
2	J	15	Total O 15 15	0	0

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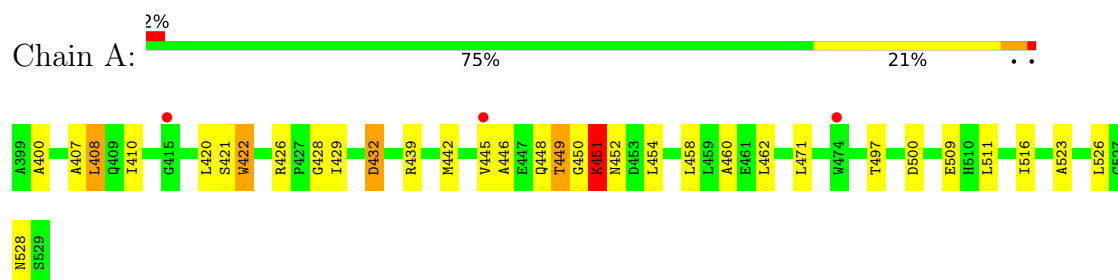
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	K	10	Total	O	0	0
			10	10		
2	L	7	Total	O	0	0
			7	7		

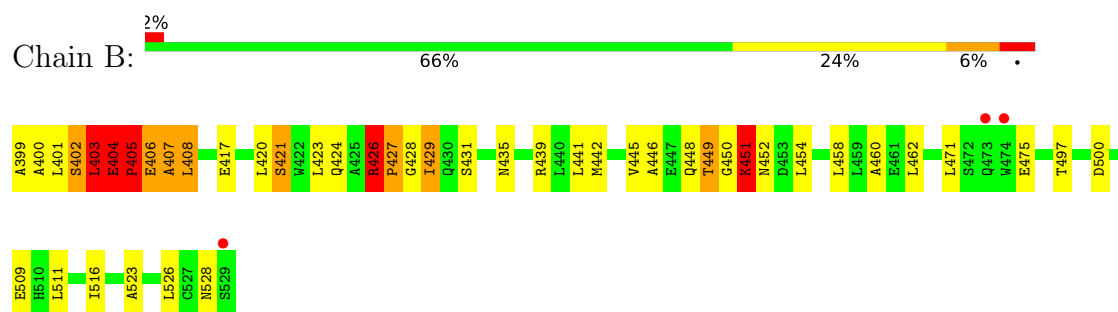
3 Residue-property plots

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.

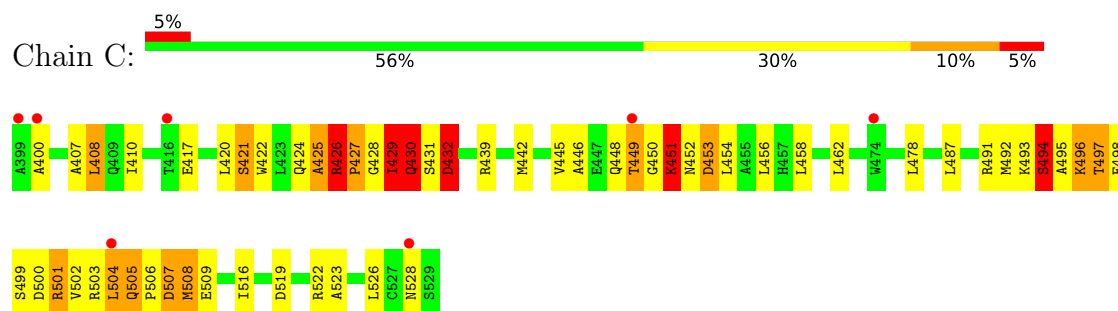
• Molecule 1: TssA



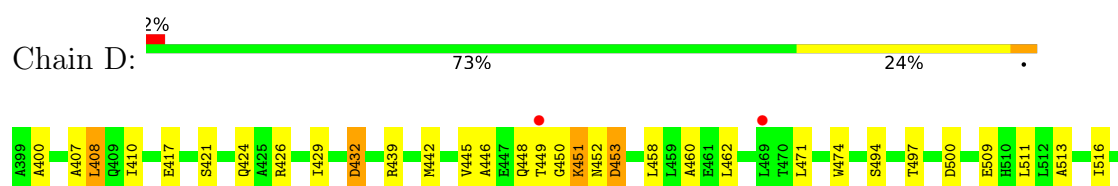
• Molecule 1: TssA



• Molecule 1: TssA

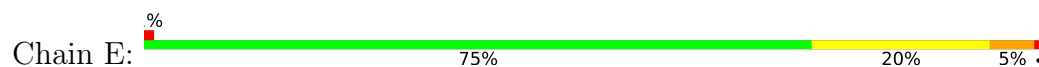


• Molecule 1: TssA

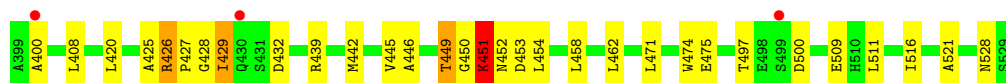
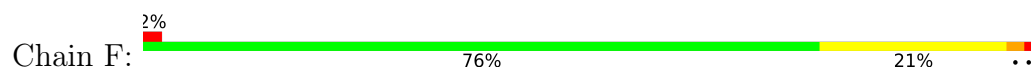




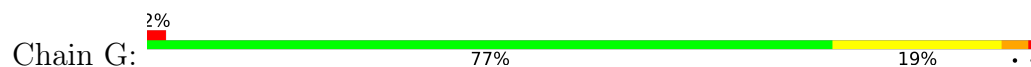
- Molecule 1: TssA



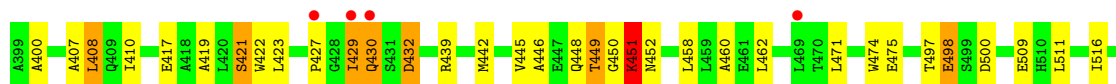
- Molecule 1: TssA



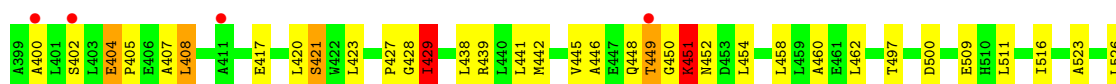
- Molecule 1: TssA



- Molecule 1: TssA

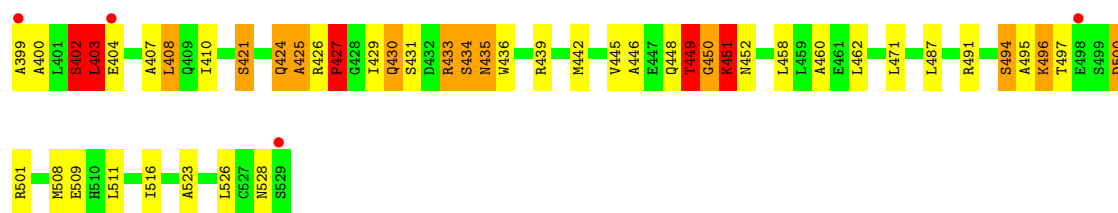


- Molecule 1: TssA

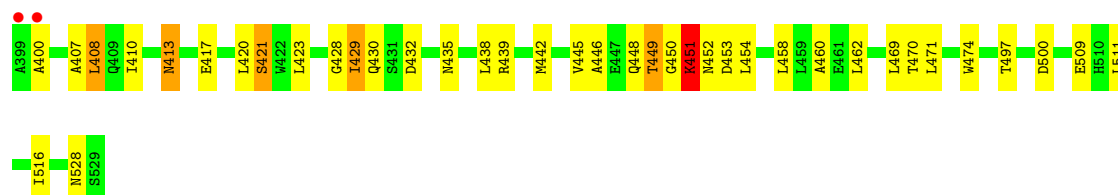


- Molecule 1: TssA

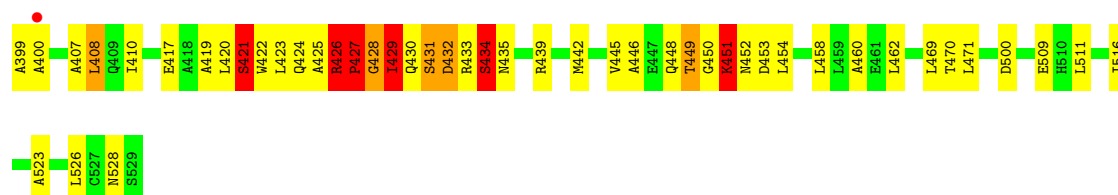




● Molecule 1: TssA



● Molecule 1: TssA



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	112.28Å 90.63Å 120.09Å 90.00° 101.96° 90.00°	Depositor
Resolution (Å)	46.20 – 3.35 46.20 – 3.35	Depositor EDS
% Data completeness (in resolution range)	99.3 (46.20-3.35) 99.3 (46.20-3.35)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.87 (at 3.32Å)	Xtriage
Refinement program	BUSTER 2.10.1	Depositor
R, R_{free}	0.225 , 0.260 0.239 , 0.270	Depositor DCC
R_{free} test set	1698 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	99.4	Xtriage
Anisotropy	0.159	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 82.6	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	0.93	EDS
Total number of atoms	12255	wwPDB-VP
Average B, all atoms (Å ²)	105.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.37% 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

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	0.81	0/1025	1.48	4/1382 (0.3%)
1	B	0.89	2/1019 (0.2%)	1.54	9/1375 (0.7%)
1	C	0.93	0/1004	1.61	13/1357 (1.0%)
1	D	0.84	0/1016	1.54	9/1372 (0.7%)
1	E	0.85	0/1019	1.53	4/1375 (0.3%)
1	F	0.82	1/1019 (0.1%)	1.47	0/1375
1	G	0.84	0/1019	1.51	4/1375 (0.3%)
1	H	0.85	0/1019	1.51	5/1374 (0.4%)
1	I	0.93	2/1020 (0.2%)	1.54	4/1376 (0.3%)
1	J	0.94	0/1019	1.56	16/1375 (1.2%)
1	K	0.80	0/1019	1.48	3/1375 (0.2%)
1	L	0.87	0/1019	1.45	8/1375 (0.6%)
All	All	0.86	5/12217 (0.0%)	1.52	79/16486 (0.5%)

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	B	0	3
1	C	0	6
1	J	0	2
1	L	0	5
All	All	0	16

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	404	GLU	CA-C	6.90	1.60	1.52
1	I	404	GLU	C-N	6.45	1.38	1.33
1	B	426	ARG	C-N	6.17	1.41	1.33
1	F	426	ARG	CA-C	5.70	1.60	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	427	PRO	N-CD	5.30	1.55	1.47

All (79) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	I	407	ALA	N-CA-C	-9.89	100.58	111.36
1	C	426	ARG	C-N-CD	9.47	141.44	120.60
1	J	500	ASP	CA-CB-CG	7.37	119.97	112.60
1	E	428	GLY	CA-C-N	6.87	129.97	120.49
1	E	428	GLY	C-N-CA	6.87	129.97	120.49
1	D	500	ASP	CA-CB-CG	6.54	119.14	112.60
1	C	494	SER	N-CA-C	-6.36	102.59	110.41
1	C	426	ARG	CA-C-N	-6.31	111.85	127.00
1	C	426	ARG	C-N-CA	-6.31	111.85	127.00
1	B	404	GLU	CA-C-N	-6.13	112.18	119.84
1	B	404	GLU	C-N-CA	-6.13	112.18	119.84
1	L	500	ASP	CA-CB-CG	6.11	118.71	112.60
1	I	405	PRO	N-CA-C	-6.03	107.74	114.92
1	J	496	LYS	N-CA-C	-5.89	104.85	111.28
1	C	487	LEU	CA-C-N	5.88	128.48	120.54
1	C	487	LEU	C-N-CA	5.88	128.48	120.54
1	H	460	ALA	CA-C-N	5.80	127.98	120.44
1	H	460	ALA	C-N-CA	5.80	127.98	120.44
1	J	424	GLN	N-CA-C	-5.79	104.97	111.28
1	C	505	GLN	CA-C-N	-5.75	112.67	119.05
1	C	505	GLN	C-N-CA	-5.75	112.67	119.05
1	B	407	ALA	N-CA-C	-5.72	105.12	111.36
1	L	427	PRO	CA-N-CD	-5.70	104.02	112.00
1	B	426	ARG	CA-C-N	-5.62	114.47	120.03
1	B	426	ARG	C-N-CA	-5.62	114.47	120.03
1	H	498	GLU	CB-CG-CD	5.58	122.08	112.60
1	L	460	ALA	CA-C-N	5.52	127.62	120.44
1	L	460	ALA	C-N-CA	5.52	127.62	120.44
1	G	460	ALA	CA-C-N	5.50	127.59	120.44
1	G	460	ALA	C-N-CA	5.50	127.59	120.44
1	D	460	ALA	CA-C-N	5.50	127.58	120.44
1	D	460	ALA	C-N-CA	5.50	127.58	120.44
1	J	495	ALA	CA-C-N	5.48	127.62	120.28
1	J	495	ALA	C-N-CA	5.48	127.62	120.28
1	B	423	LEU	N-CA-C	-5.46	105.33	111.28
1	L	426	ARG	CA-C-N	-5.46	113.02	119.84
1	L	426	ARG	C-N-CA	-5.46	113.02	119.84

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	413	ASN	CA-CB-CG	5.41	118.00	112.60
1	A	460	ALA	CA-C-N	5.37	127.41	120.44
1	A	460	ALA	C-N-CA	5.37	127.41	120.44
1	J	435	ASN	CA-C-N	5.35	127.45	120.28
1	J	435	ASN	C-N-CA	5.35	127.45	120.28
1	C	432	ASP	CA-C-N	5.30	127.65	120.65
1	C	432	ASP	C-N-CA	5.30	127.65	120.65
1	C	507	ASP	N-CA-C	-5.30	105.50	111.28
1	G	432	ASP	CA-C-N	5.30	127.64	120.65
1	G	432	ASP	C-N-CA	5.30	127.64	120.65
1	L	434	SER	N-CA-C	-5.25	105.56	111.28
1	D	432	ASP	CA-C-N	5.24	127.57	120.65
1	D	432	ASP	C-N-CA	5.24	127.57	120.65
1	D	453	ASP	CA-C-N	5.23	127.55	120.65
1	D	453	ASP	C-N-CA	5.23	127.55	120.65
1	L	421	SER	N-CA-C	-5.23	105.58	111.28
1	J	449	THR	CB-CA-C	5.22	120.81	110.42
1	I	460	ALA	CA-C-N	5.22	127.23	120.44
1	I	460	ALA	C-N-CA	5.22	127.23	120.44
1	J	460	ALA	CA-C-N	5.22	127.23	120.44
1	J	460	ALA	C-N-CA	5.22	127.23	120.44
1	E	460	ALA	CA-C-N	5.21	127.21	120.44
1	E	460	ALA	C-N-CA	5.21	127.21	120.44
1	K	460	ALA	CA-C-N	5.20	127.20	120.44
1	K	460	ALA	C-N-CA	5.20	127.20	120.44
1	J	402	SER	N-CA-C	-5.19	105.62	111.28
1	J	450	GLY	CA-C-N	5.17	131.42	121.54
1	J	450	GLY	C-N-CA	5.17	131.42	121.54
1	J	426	ARG	CA-C-N	-5.16	113.39	119.84
1	J	426	ARG	C-N-CA	-5.16	113.39	119.84
1	A	432	ASP	CA-C-N	5.11	127.39	120.65
1	A	432	ASP	C-N-CA	5.11	127.39	120.65
1	H	432	ASP	CA-C-N	5.10	127.38	120.65
1	H	432	ASP	C-N-CA	5.10	127.38	120.65
1	D	513	ALA	CA-C-N	5.07	125.58	120.00
1	D	513	ALA	C-N-CA	5.07	125.58	120.00
1	J	427	PRO	CA-N-CD	-5.06	104.92	112.00
1	B	405	PRO	CA-N-CD	-5.05	104.93	112.00
1	B	460	ALA	CA-C-N	5.03	126.98	120.44
1	B	460	ALA	C-N-CA	5.03	126.98	120.44
1	C	501	ARG	N-CA-C	-5.01	105.82	111.28
1	C	424	GLN	N-CA-C	-5.01	105.82	111.28

There are no chirality outliers.

All (16) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	403	LEU	Peptide
1	B	404	GLU	Peptide
1	B	426	ARG	Peptide
1	C	425	ALA	Peptide
1	C	426	ARG	Peptide
1	C	427	PRO	Peptide
1	C	429	ILE	Peptide
1	C	430	GLN	Peptide
1	C	504	LEU	Peptide
1	J	425	ALA	Peptide
1	J	427	PRO	Peptide
1	L	426	ARG	Peptide
1	L	427	PRO	Peptide
1	L	428	GLY	Peptide
1	L	429	ILE	Peptide
1	L	432	ASP	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	1016	0	1038	19	0
1	B	1010	0	1027	53	0
1	C	995	0	999	71	0
1	D	1007	0	1018	8	0
1	E	1010	0	1027	18	0
1	F	1010	0	1027	18	0
1	G	1010	0	1027	17	0
1	H	1010	0	1025	27	0
1	I	1011	0	1029	29	0
1	J	1010	0	1027	60	0
1	K	1010	0	1027	26	0
1	L	1010	0	1027	53	0
2	A	11	0	0	0	0
2	B	14	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	11	0	0	0	0
2	D	9	0	0	0	0
2	E	14	0	0	0	0
2	F	5	0	0	0	0
2	G	12	0	0	1	0
2	H	11	0	0	0	0
2	I	27	0	0	0	0
2	J	15	0	0	0	0
2	K	10	0	0	0	0
2	L	7	0	0	0	0
All	All	12255	0	12298	363	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.

All (363) 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:B:429:ILE:HD13	1:H:430:GLN:NE2	1.22	1.49
1:I:429:ILE:CD1	1:L:430:GLN:HE22	1.23	1.48
1:J:429:ILE:HD11	1:J:434:SER:C	1.43	1.44
1:I:429:ILE:CD1	1:L:430:GLN:NE2	1.86	1.37
1:J:429:ILE:CD1	1:J:434:SER:C	2.01	1.33
1:J:429:ILE:CD1	1:J:435:ASN:N	1.98	1.27
1:C:491:ARG:CG	1:C:508:MSE:HE3	1.72	1.20
1:I:429:ILE:HD13	1:L:430:GLN:NE2	1.58	1.18
1:J:403:LEU:O	1:J:404:GLU:HG3	1.43	1.18
1:B:429:ILE:CD1	1:H:430:GLN:NE2	2.07	1.16
1:I:429:ILE:HD12	1:L:430:GLN:NE2	1.47	1.16
1:J:429:ILE:HD13	1:J:435:ASN:N	1.60	1.13
1:C:491:ARG:HG2	1:C:508:MSE:HE3	1.22	1.11
1:C:427:PRO:HB2	1:C:429:ILE:H	1.17	1.08
1:I:429:ILE:HD13	1:L:430:GLN:CD	1.78	1.07
1:L:431:SER:OG	1:L:434:SER:N	1.88	1.06
1:B:399:ALA:N	1:B:402:SER:OG	1.88	1.06
1:B:405:PRO:O	1:B:407:ALA:N	1.87	1.06
1:C:491:ARG:HG2	1:C:508:MSE:CE	1.89	1.03
1:J:429:ILE:HD11	1:J:434:SER:CA	1.90	1.02
1:J:449:THR:HG22	1:J:451:LYS:HE3	1.41	1.02
1:L:417:GLU:O	1:L:421:SER:OG	1.79	1.00
1:E:449:THR:HG22	1:E:451:LYS:HE3	1.44	1.00

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:400:ALA:HB1	1:J:403:LEU:HD12	1.44	1.00
1:B:399:ALA:N	1:B:402:SER:HG	1.60	1.00
1:C:449:THR:HG22	1:C:451:LYS:HE3	1.42	0.99
1:H:449:THR:HG22	1:H:451:LYS:HE3	1.43	0.99
1:F:449:THR:HG22	1:F:451:LYS:HE3	1.44	0.99
1:I:449:THR:HG22	1:I:451:LYS:HE3	1.42	0.98
1:C:427:PRO:HD2	1:C:428:GLY:HA2	1.44	0.98
1:J:429:ILE:HD11	1:J:434:SER:CB	1.93	0.98
1:B:449:THR:HG22	1:B:451:LYS:HE3	1.44	0.97
1:G:449:THR:HG22	1:G:451:LYS:HE3	1.47	0.97
1:A:449:THR:HG22	1:A:451:LYS:HE3	1.44	0.97
1:K:449:THR:HG22	1:K:451:LYS:HE3	1.47	0.97
1:J:429:ILE:HD11	1:J:435:ASN:N	1.72	0.96
1:I:429:ILE:HG21	1:L:430:GLN:NE2	1.80	0.95
1:B:405:PRO:O	1:B:408:LEU:N	1.98	0.95
1:J:429:ILE:HD13	1:J:435:ASN:CA	1.97	0.94
1:L:449:THR:HG22	1:L:451:LYS:HE3	1.45	0.94
1:B:429:ILE:HD13	1:H:430:GLN:HE21	1.16	0.94
1:B:405:PRO:HD2	1:B:406:GLU:H	1.30	0.93
1:C:429:ILE:HD13	1:C:430:GLN:HA	1.48	0.93
1:C:427:PRO:HB2	1:C:429:ILE:N	1.83	0.93
1:C:491:ARG:HG3	1:C:508:MSE:HE3	1.55	0.88
1:I:429:ILE:HD12	1:L:430:GLN:HE22	0.73	0.88
1:C:427:PRO:CD	1:C:428:GLY:HA2	2.03	0.87
1:K:474:TRP:CZ3	1:L:433:ARG:NE	2.42	0.86
1:B:426:ARG:CB	1:B:427:PRO:HA	2.06	0.86
1:C:427:PRO:HB3	1:C:429:ILE:HG22	1.58	0.85
1:A:410:ILE:HD13	1:A:422:TRP:HD1	1.41	0.85
1:B:399:ALA:N	1:B:402:SER:H	1.75	0.85
1:B:449:THR:H	1:B:451:LYS:NZ	1.75	0.85
1:C:449:THR:H	1:C:451:LYS:NZ	1.75	0.84
1:F:449:THR:H	1:F:451:LYS:NZ	1.76	0.84
1:J:449:THR:H	1:J:451:LYS:HZ2	1.22	0.83
1:G:449:THR:H	1:G:451:LYS:NZ	1.76	0.83
1:E:449:THR:H	1:E:451:LYS:NZ	1.75	0.83
1:L:449:THR:H	1:L:451:LYS:NZ	1.76	0.83
1:I:449:THR:H	1:I:451:LYS:NZ	1.76	0.83
1:J:403:LEU:O	1:J:404:GLU:CG	2.25	0.83
1:A:449:THR:H	1:A:451:LYS:NZ	1.76	0.83
1:J:400:ALA:CB	1:J:403:LEU:HD12	2.08	0.83
1:I:429:ILE:HG21	1:L:430:GLN:HE21	1.39	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:405:PRO:CD	1:B:406:GLU:H	1.92	0.82
1:H:449:THR:H	1:H:451:LYS:NZ	1.78	0.81
1:C:429:ILE:HD13	1:C:430:GLN:CA	2.10	0.81
1:K:449:THR:H	1:K:451:LYS:NZ	1.78	0.81
1:L:429:ILE:HD12	1:L:434:SER:HB2	1.60	0.81
1:G:427:PRO:HB2	1:G:428:GLY:HA2	1.63	0.81
1:A:410:ILE:HD13	1:A:422:TRP:CD1	2.16	0.80
1:A:410:ILE:CD1	1:A:422:TRP:HD1	1.94	0.80
1:L:419:ALA:O	1:L:423:LEU:HD12	1.82	0.79
1:J:408:LEU:HD21	1:J:448:GLN:HG2	1.65	0.79
1:F:428:GLY:HA2	1:K:428:GLY:HA3	1.63	0.79
1:B:405:PRO:O	1:B:406:GLU:C	2.20	0.78
1:C:427:PRO:CB	1:C:429:ILE:H	1.96	0.78
1:B:429:ILE:HD13	1:H:430:GLN:CD	2.08	0.78
1:B:449:THR:H	1:B:451:LYS:HZ2	1.33	0.76
1:E:408:LEU:HD21	1:E:448:GLN:HG2	1.67	0.76
1:B:426:ARG:CB	1:B:429:ILE:HG22	2.15	0.76
1:I:429:ILE:HD13	1:L:430:GLN:OE1	1.84	0.75
1:C:504:LEU:C	1:C:506:PRO:HD2	2.12	0.75
1:I:449:THR:H	1:I:451:LYS:HZ1	1.33	0.75
1:J:429:ILE:HD12	1:J:434:SER:C	2.11	0.75
1:G:449:THR:H	1:G:451:LYS:HZ2	1.35	0.74
1:I:408:LEU:HD21	1:I:448:GLN:HG2	1.67	0.74
1:B:405:PRO:C	1:B:407:ALA:N	2.44	0.74
1:H:449:THR:H	1:H:451:LYS:HZ1	1.32	0.74
1:L:429:ILE:HD11	1:L:434:SER:OG	1.88	0.72
1:J:449:THR:H	1:J:451:LYS:NZ	1.85	0.72
1:L:429:ILE:CD1	1:L:434:SER:OG	2.38	0.72
1:C:429:ILE:HD13	1:C:429:ILE:C	2.16	0.71
1:B:405:PRO:CD	1:B:406:GLU:N	2.53	0.71
1:J:400:ALA:CA	1:J:403:LEU:HD12	2.21	0.71
1:C:427:PRO:CB	1:C:428:GLY:HA2	2.21	0.71
1:F:449:THR:H	1:F:451:LYS:HZ1	1.39	0.70
1:L:449:THR:H	1:L:451:LYS:HZ1	1.39	0.70
1:J:449:THR:HG22	1:J:451:LYS:CE	2.21	0.69
1:L:408:LEU:HD21	1:L:448:GLN:HG2	1.74	0.69
1:C:426:ARG:N	1:C:427:PRO:HA	2.06	0.69
1:J:433:ARG:HG2	1:J:434:SER:N	2.07	0.69
1:C:427:PRO:HB2	1:C:428:GLY:HA2	1.75	0.68
1:C:449:THR:H	1:C:451:LYS:HZ2	1.40	0.68
1:A:410:ILE:CD1	1:A:422:TRP:CD1	2.73	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:427:PRO:HB2	1:C:428:GLY:CA	2.24	0.68
1:A:449:THR:H	1:A:451:LYS:HZ1	1.43	0.67
1:J:400:ALA:HB1	1:J:403:LEU:CD1	2.24	0.67
1:L:431:SER:OG	1:L:432:ASP:N	2.25	0.67
1:F:428:GLY:CA	1:K:428:GLY:HA3	2.25	0.66
1:B:400:ALA:O	1:B:403:LEU:HD12	1.95	0.66
1:E:449:THR:H	1:E:451:LYS:HZ1	1.43	0.66
1:C:427:PRO:CB	1:C:429:ILE:HG22	2.24	0.66
1:I:429:ILE:CG2	1:L:430:GLN:NE2	2.57	0.65
1:J:429:ILE:HD13	1:J:435:ASN:HA	1.77	0.65
1:G:408:LEU:HD21	1:G:448:GLN:HG2	1.78	0.65
1:C:429:ILE:HD11	1:C:430:GLN:O	1.97	0.65
1:B:424:GLN:NE2	1:F:521:ALA:H	1.93	0.65
1:J:429:ILE:CD1	1:J:434:SER:CB	2.72	0.65
1:C:500:ASP:OD1	1:C:501:ARG:N	2.30	0.65
1:E:449:THR:H	1:E:451:LYS:HZ2	1.46	0.64
1:I:446:ALA:HA	1:I:451:LYS:HD2	1.80	0.64
1:L:431:SER:HG	1:L:434:SER:CB	2.10	0.64
1:L:429:ILE:CD1	1:L:434:SER:CB	2.76	0.63
1:B:405:PRO:C	1:B:407:ALA:H	2.06	0.63
1:B:408:LEU:HD21	1:B:448:GLN:HG2	1.79	0.63
1:K:449:THR:H	1:K:451:LYS:HZ2	1.46	0.63
1:C:500:ASP:O	1:C:504:LEU:N	2.31	0.63
1:K:470:THR:HG23	1:L:469:LEU:HG	1.80	0.63
1:B:429:ILE:CD1	1:H:430:GLN:HE22	2.08	0.62
1:E:449:THR:HG22	1:E:451:LYS:CE	2.26	0.62
1:B:400:ALA:HB1	1:B:403:LEU:HD11	1.82	0.62
1:L:429:ILE:CD1	1:L:434:SER:HB2	2.28	0.62
1:C:430:GLN:NE2	1:E:429:ILE:HG23	2.14	0.62
1:G:449:THR:HG22	1:G:451:LYS:CE	2.28	0.62
1:K:449:THR:H	1:K:451:LYS:HZ1	1.48	0.62
1:C:408:LEU:HD21	1:C:448:GLN:HG2	1.81	0.61
1:F:449:THR:HG22	1:F:451:LYS:CE	2.25	0.61
1:J:491:ARG:HG2	1:J:508:MSE:HE3	1.82	0.61
1:B:446:ALA:HA	1:B:451:LYS:HD2	1.82	0.61
1:A:449:THR:HG22	1:A:451:LYS:CE	2.26	0.61
1:G:446:ALA:HA	1:G:451:LYS:HD2	1.83	0.61
1:A:408:LEU:HD21	1:A:448:GLN:HG2	1.83	0.60
1:B:449:THR:HG22	1:B:451:LYS:CE	2.25	0.60
1:E:446:ALA:HA	1:E:451:LYS:HD2	1.82	0.60
1:K:446:ALA:HA	1:K:451:LYS:HD2	1.83	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:449:THR:H	1:A:451:LYS:HZ2	1.47	0.60
1:H:449:THR:HG22	1:H:451:LYS:CE	2.25	0.60
1:F:446:ALA:HA	1:F:451:LYS:HD2	1.84	0.60
1:B:424:GLN:HE22	1:F:521:ALA:H	1.49	0.60
1:F:429:ILE:HD12	1:K:430:GLN:HE22	1.66	0.60
1:J:446:ALA:HA	1:J:451:LYS:HD2	1.83	0.60
1:L:449:THR:HG22	1:L:451:LYS:CE	2.26	0.60
1:C:449:THR:H	1:C:451:LYS:HZ1	1.48	0.60
1:H:446:ALA:HA	1:H:451:LYS:HD2	1.83	0.60
1:L:446:ALA:HA	1:L:451:LYS:HD2	1.83	0.60
1:A:446:ALA:HA	1:A:451:LYS:HD2	1.83	0.59
1:J:400:ALA:O	1:J:403:LEU:HD12	2.01	0.59
1:K:408:LEU:HD21	1:K:448:GLN:HG2	1.83	0.59
1:C:499:SER:O	1:C:502:VAL:HG12	2.02	0.59
1:B:429:ILE:HG21	1:H:430:GLN:HG2	1.83	0.59
1:L:429:ILE:HG13	1:L:434:SER:OG	2.03	0.59
1:I:449:THR:HG22	1:I:451:LYS:CE	2.25	0.59
1:K:407:ALA:HA	1:K:410:ILE:HD12	1.85	0.58
1:H:408:LEU:HD21	1:H:448:GLN:HG2	1.85	0.58
1:C:446:ALA:HA	1:C:451:LYS:HD2	1.84	0.58
1:J:494:SER:HB2	1:J:501:ARG:HA	1.85	0.58
1:C:505:GLN:N	1:C:506:PRO:HD2	2.19	0.58
1:E:407:ALA:HA	1:E:410:ILE:HD12	1.86	0.57
1:L:449:THR:H	1:L:451:LYS:HZ2	1.52	0.57
1:B:404:GLU:N	1:B:404:GLU:OE1	2.38	0.57
1:H:427:PRO:HA	1:H:429:ILE:H	1.69	0.57
1:B:449:THR:N	1:B:451:LYS:HZ2	2.00	0.57
1:K:449:THR:HG22	1:K:451:LYS:CE	2.28	0.57
1:E:426:ARG:CB	1:E:427:PRO:HD3	2.35	0.57
1:G:407:ALA:HA	1:G:410:ILE:HD12	1.87	0.57
1:K:474:TRP:HZ3	1:L:433:ARG:HH21	1.53	0.56
1:C:497:THR:O	1:C:499:SER:N	2.36	0.56
1:J:429:ILE:CG1	1:J:434:SER:OG	2.54	0.56
1:C:494:SER:O	1:C:495:ALA:HB3	2.06	0.56
1:F:449:THR:H	1:F:451:LYS:HZ2	1.51	0.55
1:K:429:ILE:HD11	1:K:435:ASN:HB2	1.86	0.55
1:B:399:ALA:CB	2:B:603:HOH:O	2.55	0.55
1:G:429:ILE:HG23	1:J:430:GLN:HG3	1.88	0.55
1:J:429:ILE:HD11	1:J:434:SER:OG	2.06	0.55
1:B:449:THR:CG2	1:B:451:LYS:HE3	2.30	0.55
1:C:449:THR:HG22	1:C:451:LYS:CE	2.26	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:449:THR:N	1:C:451:LYS:HZ2	2.05	0.55
1:J:429:ILE:HD12	1:J:434:SER:O	2.07	0.55
1:D:408:LEU:HD21	1:D:448:GLN:HG2	1.89	0.54
1:L:426:ARG:CB	1:L:427:PRO:CA	2.85	0.54
1:L:429:ILE:CG1	1:L:434:SER:OG	2.56	0.54
1:G:449:THR:N	1:G:451:LYS:HZ2	2.01	0.54
1:C:499:SER:O	1:C:502:VAL:CG1	2.56	0.54
1:B:405:PRO:HD2	1:B:406:GLU:N	2.10	0.54
1:J:429:ILE:CD1	1:J:435:ASN:CA	2.72	0.54
1:F:474:TRP:CZ3	1:H:475:GLU:HG3	2.43	0.53
1:L:430:GLN:O	1:L:432:ASP:N	2.41	0.53
1:C:498:GLU:HB3	1:C:501:ARG:HG2	1.89	0.53
1:C:427:PRO:HD2	1:C:428:GLY:CA	2.28	0.53
1:C:427:PRO:CB	1:C:428:GLY:CA	2.85	0.53
1:K:429:ILE:HG21	1:K:438:LEU:HD22	1.91	0.53
1:H:449:THR:CG2	1:H:451:LYS:HE3	2.30	0.52
1:I:428:GLY:HA2	1:L:428:GLY:HA2	1.90	0.52
1:C:427:PRO:HB2	1:C:428:GLY:C	2.33	0.52
1:C:426:ARG:N	1:C:427:PRO:CA	2.72	0.52
1:C:505:GLN:N	1:C:506:PRO:CD	2.73	0.52
1:D:446:ALA:O	1:D:451:LYS:HB2	2.09	0.52
1:B:426:ARG:CB	1:B:429:ILE:H	2.23	0.52
1:E:439:ARG:HG3	1:E:442:MSE:HE2	1.92	0.52
1:B:420:LEU:O	1:B:424:GLN:HG3	2.10	0.51
1:C:429:ILE:CD1	1:C:430:GLN:CA	2.86	0.51
1:J:446:ALA:O	1:J:451:LYS:HB2	2.09	0.51
1:J:439:ARG:HG3	1:J:442:MSE:HE2	1.92	0.51
1:H:407:ALA:HA	1:H:410:ILE:HD12	1.92	0.51
1:B:399:ALA:N	1:B:400:ALA:CA	2.73	0.51
1:G:449:THR:H	1:G:451:LYS:HZ1	1.56	0.51
1:C:500:ASP:OD1	1:C:503:ARG:CD	2.56	0.51
1:L:431:SER:CB	1:L:434:SER:HG	2.14	0.51
1:J:400:ALA:CA	1:J:403:LEU:CD1	2.89	0.51
1:A:439:ARG:HG3	1:A:442:MSE:HE2	1.92	0.50
1:B:439:ARG:HG3	1:B:442:MSE:HE2	1.93	0.50
1:C:491:ARG:CG	1:C:508:MSE:CE	2.61	0.50
1:J:399:ALA:N	1:J:400:ALA:CA	2.74	0.50
1:J:487:LEU:HD12	1:J:508:MSE:HG2	1.94	0.50
1:D:407:ALA:HA	1:D:410:ILE:HD12	1.94	0.50
1:L:399:ALA:HB1	1:L:433:ARG:NH1	2.27	0.50
1:A:407:ALA:HA	1:A:410:ILE:HD12	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:407:ALA:HA	1:C:410:ILE:HD12	1.93	0.50
1:G:439:ARG:HG3	1:G:442:MSE:HE2	1.94	0.50
1:J:400:ALA:CB	1:J:403:LEU:CD1	2.86	0.50
1:L:439:ARG:HG3	1:L:442:MSE:HE2	1.94	0.50
1:B:405:PRO:CG	1:B:406:GLU:N	2.75	0.50
1:C:498:GLU:HA	1:C:501:ARG:HB3	1.93	0.50
1:B:399:ALA:N	1:B:401:LEU:N	2.60	0.49
1:B:449:THR:H	1:B:451:LYS:HZ1	1.55	0.49
1:C:446:ALA:O	1:C:451:LYS:HB2	2.11	0.49
1:J:407:ALA:HA	1:J:410:ILE:HD12	1.93	0.49
1:C:501:ARG:C	1:C:501:ARG:CD	2.85	0.49
1:B:402:SER:O	1:B:441:LEU:HD21	2.13	0.49
1:J:400:ALA:HA	1:J:403:LEU:CD1	2.42	0.49
1:L:407:ALA:HA	1:L:410:ILE:HD12	1.95	0.49
1:G:446:ALA:O	1:G:451:LYS:HB2	2.13	0.49
1:I:446:ALA:O	1:I:451:LYS:HB2	2.12	0.49
1:J:429:ILE:CD1	1:J:434:SER:HB2	2.43	0.49
1:J:433:ARG:CG	1:J:434:SER:N	2.75	0.49
1:K:423:LEU:HD13	1:K:442:MSE:HG2	1.95	0.49
1:E:439:ARG:HB3	1:E:462:LEU:HD21	1.95	0.48
1:C:439:ARG:HG3	1:C:442:MSE:HE2	1.96	0.48
1:I:449:THR:H	1:I:451:LYS:HZ2	1.57	0.48
1:K:439:ARG:HG3	1:K:442:MSE:HE2	1.96	0.48
1:B:475:GLU:HG3	1:D:474:TRP:CZ3	2.49	0.48
1:D:439:ARG:HB3	1:D:462:LEU:HD21	1.96	0.48
1:J:433:ARG:HG2	1:J:434:SER:H	1.78	0.48
1:D:439:ARG:HG3	1:D:442:MSE:HE2	1.95	0.48
1:F:439:ARG:HG3	1:F:442:MSE:HE2	1.95	0.48
1:K:469:LEU:HG	1:L:470:THR:HG23	1.95	0.47
1:B:429:ILE:CG2	1:H:430:GLN:HG2	2.44	0.47
1:C:453:ASP:OD1	1:C:493:LYS:NZ	2.47	0.47
1:K:446:ALA:O	1:K:451:LYS:HB2	2.14	0.47
1:B:429:ILE:HD11	1:B:435:ASN:HB2	1.96	0.47
1:C:430:GLN:HE22	1:E:429:ILE:HG23	1.77	0.47
1:L:446:ALA:O	1:L:451:LYS:HB2	2.13	0.47
1:C:429:ILE:HD13	1:C:430:GLN:N	2.29	0.47
1:F:475:GLU:HG3	1:H:474:TRP:CZ3	2.49	0.47
1:I:449:THR:CG2	1:I:451:LYS:HE3	2.31	0.47
1:K:449:THR:CG2	1:K:451:LYS:HE3	2.33	0.47
1:I:423:LEU:O	1:I:438:LEU:HD21	2.13	0.47
1:J:399:ALA:N	1:J:400:ALA:C	2.73	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:399:ALA:N	1:B:400:ALA:C	2.73	0.47
1:C:504:LEU:C	1:C:506:PRO:CD	2.85	0.47
1:F:449:THR:CG2	1:F:451:LYS:HE3	2.30	0.47
1:E:446:ALA:O	1:E:451:LYS:HB2	2.14	0.47
1:J:449:THR:CG2	1:J:451:LYS:HE3	2.30	0.47
1:F:446:ALA:O	1:F:451:LYS:HB2	2.14	0.47
1:K:449:THR:N	1:K:451:LYS:HZ2	2.13	0.47
1:J:421:SER:O	1:J:425:ALA:HB2	2.15	0.47
1:F:439:ARG:HB3	1:F:462:LEU:HD21	1.97	0.46
1:L:439:ARG:HB3	1:L:462:LEU:HD21	1.96	0.46
1:A:446:ALA:O	1:A:451:LYS:HB2	2.15	0.46
1:C:429:ILE:CD1	1:C:430:GLN:HA	2.33	0.46
1:C:503:ARG:HG2	1:C:504:LEU:N	2.30	0.46
1:J:400:ALA:C	1:J:403:LEU:HD12	2.40	0.46
1:B:427:PRO:HA	1:B:428:GLY:HA2	1.70	0.46
1:C:449:THR:CG2	1:C:451:LYS:HE3	2.31	0.46
1:E:420:LEU:HD11	1:E:454:LEU:HD21	1.98	0.46
1:K:439:ARG:HB3	1:K:462:LEU:HD21	1.97	0.46
1:I:439:ARG:HG3	1:I:442:MSE:HE2	1.97	0.46
1:I:439:ARG:HB3	1:I:462:LEU:HD21	1.96	0.46
1:J:400:ALA:O	1:J:403:LEU:HB2	2.16	0.46
1:L:420:LEU:O	1:L:424:GLN:HG3	2.15	0.46
1:C:422:TRP:O	1:C:425:ALA:HB3	2.16	0.46
1:I:404:GLU:HB2	1:I:441:LEU:HD13	1.97	0.46
1:C:494:SER:HA	1:C:501:ARG:HB2	1.98	0.45
1:H:439:ARG:HB3	1:H:462:LEU:HD21	1.99	0.45
1:H:446:ALA:O	1:H:451:LYS:HB2	2.15	0.45
1:A:439:ARG:HB3	1:A:462:LEU:HD21	1.98	0.45
1:G:528:ASN:HB2	2:G:601:HOH:O	2.16	0.45
1:E:449:THR:N	1:E:451:LYS:HZ2	2.11	0.45
1:J:449:THR:N	1:J:451:LYS:NZ	2.61	0.45
1:J:439:ARG:HB3	1:J:462:LEU:HD21	1.97	0.45
1:K:420:LEU:HD11	1:K:454:LEU:HD21	1.98	0.45
1:B:446:ALA:O	1:B:451:LYS:HB2	2.17	0.45
1:C:506:PRO:HG2	1:C:507:ASP:H	1.82	0.45
1:H:439:ARG:HG3	1:H:442:MSE:HE2	1.97	0.45
1:B:429:ILE:CD1	1:H:430:GLN:HE21	1.97	0.44
1:C:494:SER:C	1:C:496:LYS:H	2.25	0.44
1:K:474:TRP:CD2	1:L:433:ARG:HG3	2.52	0.44
1:A:420:LEU:HD11	1:A:454:LEU:HD21	1.98	0.44
1:C:523:ALA:HA	1:C:526:LEU:HD12	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:523:ALA:HA	1:I:526:LEU:HD12	1.99	0.44
1:J:403:LEU:H	1:J:403:LEU:HG	1.54	0.44
1:B:439:ARG:HB3	1:B:462:LEU:HD21	2.00	0.44
1:L:429:ILE:HG12	1:L:430:GLN:C	2.43	0.44
1:F:420:LEU:HD11	1:F:454:LEU:HD21	1.99	0.44
1:L:422:TRP:O	1:L:425:ALA:HB3	2.17	0.44
1:H:427:PRO:HA	1:H:429:ILE:N	2.31	0.44
1:B:523:ALA:HA	1:B:526:LEU:HD12	1.99	0.43
1:C:499:SER:OG	1:C:500:ASP:N	2.50	0.43
1:A:449:THR:N	1:A:451:LYS:HZ2	2.14	0.43
1:G:439:ARG:HB3	1:G:462:LEU:HD21	1.99	0.43
1:J:421:SER:O	1:J:425:ALA:N	2.49	0.43
1:J:431:SER:HB3	1:J:434:SER:OG	2.18	0.43
1:L:420:LEU:HD11	1:L:454:LEU:HD21	2.00	0.43
1:J:402:SER:O	1:J:404:GLU:N	2.51	0.43
1:H:419:ALA:O	1:H:422:TRP:HB3	2.17	0.43
1:J:429:ILE:HD11	1:J:434:SER:HB2	1.90	0.43
1:K:417:GLU:O	1:K:421:SER:HB2	2.19	0.43
1:I:427:PRO:HB3	1:L:428:GLY:HA3	2.00	0.42
1:L:435:ASN:O	1:L:439:ARG:HB2	2.19	0.42
1:C:453:ASP:HA	1:C:456:LEU:HD12	2.01	0.42
1:H:417:GLU:O	1:H:421:SER:HB2	2.19	0.42
1:J:429:ILE:CD1	1:J:434:SER:O	2.50	0.42
1:C:431:SER:O	1:C:432:ASP:C	2.59	0.42
1:I:417:GLU:O	1:I:421:SER:HB2	2.19	0.42
1:I:420:LEU:HD11	1:I:454:LEU:HD21	2.01	0.42
1:E:417:GLU:O	1:E:421:SER:HB2	2.19	0.42
1:J:399:ALA:N	1:J:402:SER:OG	2.53	0.42
1:J:429:ILE:CD1	1:J:434:SER:OG	2.68	0.42
1:H:523:ALA:HA	1:H:526:LEU:HD12	2.01	0.42
1:L:410:ILE:CD1	1:L:422:TRP:CD1	3.03	0.42
1:D:523:ALA:HA	1:D:526:LEU:HD12	2.01	0.42
1:G:449:THR:CG2	1:G:451:LYS:HE3	2.34	0.42
1:C:506:PRO:HG2	1:C:507:ASP:N	2.35	0.42
1:B:417:GLU:O	1:B:421:SER:HB2	2.20	0.42
1:C:429:ILE:CD1	1:C:430:GLN:C	2.93	0.41
1:C:439:ARG:HB3	1:C:462:LEU:HD21	2.00	0.41
1:A:449:THR:CG2	1:A:451:LYS:HE3	2.31	0.41
1:A:523:ALA:HA	1:A:526:LEU:HD12	2.03	0.41
1:C:417:GLU:O	1:C:421:SER:HB2	2.19	0.41
1:G:420:LEU:HD11	1:G:454:LEU:HD21	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:449:THR:N	1:L:451:LYS:HZ2	2.18	0.41
1:J:433:ARG:O	1:J:436:TRP:N	2.53	0.41
1:B:420:LEU:HD11	1:B:454:LEU:HD21	2.02	0.41
1:J:523:ALA:HA	1:J:526:LEU:HD12	2.03	0.41
1:L:410:ILE:HD13	1:L:422:TRP:CD1	2.56	0.41
1:C:519:ASP:HB3	1:C:522:ARG:HB2	2.02	0.41
1:E:423:LEU:HD13	1:E:442:MSE:HG2	2.03	0.41
1:H:449:THR:H	1:H:451:LYS:HZ2	1.62	0.41
1:L:523:ALA:HA	1:L:526:LEU:HD12	2.02	0.41
1:I:427:PRO:HB2	1:I:428:GLY:HA2	2.03	0.40
1:C:420:LEU:HD11	1:C:454:LEU:HD21	2.03	0.40
1:D:417:GLU:O	1:D:421:SER:HB2	2.22	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	129/131 (98%)	117 (91%)	7 (5%)	5 (4%)	2	14
1	B	129/131 (98%)	118 (92%)	5 (4%)	6 (5%)	2	11
1	C	129/131 (98%)	114 (88%)	10 (8%)	5 (4%)	2	14
1	D	129/131 (98%)	117 (91%)	7 (5%)	5 (4%)	2	14
1	E	129/131 (98%)	115 (89%)	8 (6%)	6 (5%)	2	11
1	F	129/131 (98%)	116 (90%)	6 (5%)	7 (5%)	1	9
1	G	129/131 (98%)	114 (88%)	10 (8%)	5 (4%)	2	14
1	H	129/131 (98%)	114 (88%)	11 (8%)	4 (3%)	3	17
1	I	129/131 (98%)	114 (88%)	10 (8%)	5 (4%)	2	14
1	J	129/131 (98%)	115 (89%)	7 (5%)	7 (5%)	1	9

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	K	129/131 (98%)	117 (91%)	8 (6%)	4 (3%)	3	17
1	L	129/131 (98%)	114 (88%)	8 (6%)	7 (5%)	1	9
All	All	1548/1572 (98%)	1385 (90%)	97 (6%)	66 (4%)	2	13

All (66) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	451	LYS
1	A	452	ASN
1	B	406	GLU
1	B	426	ARG
1	B	451	LYS
1	B	452	ASN
1	C	451	LYS
1	C	452	ASN
1	D	426	ARG
1	D	451	LYS
1	D	452	ASN
1	E	426	ARG
1	E	451	LYS
1	E	452	ASN
1	F	451	LYS
1	F	452	ASN
1	G	451	LYS
1	G	452	ASN
1	H	451	LYS
1	H	452	ASN
1	I	451	LYS
1	I	452	ASN
1	J	403	LEU
1	J	451	LYS
1	J	452	ASN
1	K	451	LYS
1	K	452	ASN
1	L	426	ARG
1	L	431	SER
1	L	451	LYS
1	L	452	ASN
1	A	428	GLY
1	A	450	GLY
1	B	405	PRO

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Mol	Chain	Res	Type
1	B	450	GLY
1	C	450	GLY
1	C	496	LYS
1	D	450	GLY
1	E	400	ALA
1	E	450	GLY
1	F	426	ARG
1	F	450	GLY
1	G	450	GLY
1	H	450	GLY
1	I	400	ALA
1	I	450	GLY
1	J	450	GLY
1	K	450	GLY
1	L	427	PRO
1	L	450	GLY
1	A	400	ALA
1	C	400	ALA
1	F	400	ALA
1	F	425	ALA
1	F	427	PRO
1	G	400	ALA
1	H	400	ALA
1	I	429	ILE
1	J	434	SER
1	K	400	ALA
1	L	400	ALA
1	D	400	ALA
1	E	427	PRO
1	J	433	ARG
1	J	427	PRO
1	G	426	ARG

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	104/104 (100%)	87 (84%)	17 (16%)	2	10
1	B	103/104 (99%)	86 (84%)	17 (16%)	2	9
1	C	99/104 (95%)	81 (82%)	18 (18%)	2	7
1	D	102/104 (98%)	87 (85%)	15 (15%)	3	12
1	E	103/104 (99%)	88 (85%)	15 (15%)	3	12
1	F	103/104 (99%)	88 (85%)	15 (15%)	3	12
1	G	103/104 (99%)	90 (87%)	13 (13%)	4	17
1	H	103/104 (99%)	85 (82%)	18 (18%)	2	8
1	I	103/104 (99%)	89 (86%)	14 (14%)	3	15
1	J	103/104 (99%)	83 (81%)	20 (19%)	1	5
1	K	103/104 (99%)	86 (84%)	17 (16%)	2	9
1	L	103/104 (99%)	89 (86%)	14 (14%)	3	15
All	All	1232/1248 (99%)	1039 (84%)	193 (16%)	2	10

All (193) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	408	LEU
1	A	421	SER
1	A	422	TRP
1	A	426	ARG
1	A	429	ILE
1	A	432	ASP
1	A	445	VAL
1	A	449	THR
1	A	451	LYS
1	A	458	LEU
1	A	471	LEU
1	A	497	THR
1	A	500	ASP
1	A	509	GLU
1	A	511	LEU
1	A	516	ILE
1	A	528	ASN
1	B	402	SER
1	B	403	LEU
1	B	408	LEU
1	B	421	SER
1	B	429	ILE

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Mol	Chain	Res	Type
1	B	431	SER
1	B	445	VAL
1	B	449	THR
1	B	451	LYS
1	B	458	LEU
1	B	471	LEU
1	B	497	THR
1	B	500	ASP
1	B	509	GLU
1	B	511	LEU
1	B	516	ILE
1	B	528	ASN
1	C	408	LEU
1	C	421	SER
1	C	429	ILE
1	C	430	GLN
1	C	432	ASP
1	C	445	VAL
1	C	449	THR
1	C	451	LYS
1	C	453	ASP
1	C	458	LEU
1	C	478	LEU
1	C	492	MSE
1	C	494	SER
1	C	497	THR
1	C	508	MSE
1	C	509	GLU
1	C	516	ILE
1	C	528	ASN
1	D	408	LEU
1	D	424	GLN
1	D	429	ILE
1	D	432	ASP
1	D	445	VAL
1	D	449	THR
1	D	453	ASP
1	D	458	LEU
1	D	471	LEU
1	D	494	SER
1	D	497	THR
1	D	509	GLU

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Mol	Chain	Res	Type
1	D	511	LEU
1	D	516	ILE
1	D	528	ASN
1	E	408	LEU
1	E	421	SER
1	E	429	ILE
1	E	445	VAL
1	E	449	THR
1	E	451	LYS
1	E	453	ASP
1	E	458	LEU
1	E	471	LEU
1	E	497	THR
1	E	500	ASP
1	E	509	GLU
1	E	511	LEU
1	E	516	ILE
1	E	528	ASN
1	F	408	LEU
1	F	429	ILE
1	F	432	ASP
1	F	445	VAL
1	F	449	THR
1	F	451	LYS
1	F	453	ASP
1	F	458	LEU
1	F	471	LEU
1	F	497	THR
1	F	500	ASP
1	F	509	GLU
1	F	511	LEU
1	F	516	ILE
1	F	528	ASN
1	G	408	LEU
1	G	429	ILE
1	G	432	ASP
1	G	445	VAL
1	G	449	THR
1	G	451	LYS
1	G	458	LEU
1	G	471	LEU
1	G	497	THR

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Mol	Chain	Res	Type
1	G	500	ASP
1	G	509	GLU
1	G	511	LEU
1	G	516	ILE
1	H	408	LEU
1	H	421	SER
1	H	423	LEU
1	H	429	ILE
1	H	430	GLN
1	H	432	ASP
1	H	445	VAL
1	H	449	THR
1	H	451	LYS
1	H	458	LEU
1	H	471	LEU
1	H	497	THR
1	H	498	GLU
1	H	500	ASP
1	H	509	GLU
1	H	511	LEU
1	H	516	ILE
1	H	528	ASN
1	I	402	SER
1	I	408	LEU
1	I	421	SER
1	I	429	ILE
1	I	445	VAL
1	I	449	THR
1	I	451	LYS
1	I	458	LEU
1	I	497	THR
1	I	500	ASP
1	I	509	GLU
1	I	511	LEU
1	I	516	ILE
1	I	528	ASN
1	J	402	SER
1	J	403	LEU
1	J	408	LEU
1	J	421	SER
1	J	424	GLN
1	J	427	PRO

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Mol	Chain	Res	Type
1	J	430	GLN
1	J	445	VAL
1	J	449	THR
1	J	451	LYS
1	J	458	LEU
1	J	471	LEU
1	J	494	SER
1	J	496	LYS
1	J	497	THR
1	J	500	ASP
1	J	509	GLU
1	J	511	LEU
1	J	516	ILE
1	J	528	ASN
1	K	408	LEU
1	K	413	ASN
1	K	421	SER
1	K	429	ILE
1	K	432	ASP
1	K	445	VAL
1	K	449	THR
1	K	451	LYS
1	K	453	ASP
1	K	458	LEU
1	K	471	LEU
1	K	497	THR
1	K	500	ASP
1	K	509	GLU
1	K	511	LEU
1	K	516	ILE
1	K	528	ASN
1	L	408	LEU
1	L	421	SER
1	L	429	ILE
1	L	434	SER
1	L	445	VAL
1	L	449	THR
1	L	451	LYS
1	L	453	ASP
1	L	458	LEU
1	L	471	LEU
1	L	509	GLU

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Mol	Chain	Res	Type
1	L	511	LEU
1	L	516	ILE
1	L	528	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	424	GLN
1	A	435	ASN
1	A	457	HIS
1	B	424	GLN
1	B	435	ASN
1	C	424	GLN
1	C	435	ASN
1	D	430	GLN
1	D	435	ASN
1	E	435	ASN
1	F	424	GLN
1	F	435	ASN
1	G	435	ASN
1	G	457	HIS
1	H	430	GLN
1	H	435	ASN
1	I	424	GLN
1	I	435	ASN
1	I	448	GLN
1	J	435	ASN
1	J	448	GLN
1	K	430	GLN
1	K	435	ASN
1	L	430	GLN
1	L	448	GLN
1	L	457	HIS

5.3.3 RNA ⓘ

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](#)

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

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, 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	128/131 (97%)	0.09	3 (2%) 61 45	77, 113, 148, 160	0
1	B	128/131 (97%)	0.20	3 (2%) 61 45	70, 100, 141, 179	0
1	C	128/131 (97%)	0.24	7 (5%) 30 22	70, 111, 150, 160	0
1	D	128/131 (97%)	0.14	2 (1%) 70 55	69, 109, 149, 162	0
1	E	128/131 (97%)	0.13	1 (0%) 82 71	63, 99, 142, 174	0
1	F	128/131 (97%)	0.16	3 (2%) 61 45	70, 111, 158, 164	0
1	G	128/131 (97%)	0.08	3 (2%) 61 45	62, 101, 144, 175	0
1	H	128/131 (97%)	0.29	4 (3%) 51 38	78, 115, 155, 176	0
1	I	128/131 (97%)	0.21	5 (3%) 43 30	54, 82, 124, 162	0
1	J	128/131 (97%)	0.18	4 (3%) 51 38	51, 90, 134, 147	0
1	K	128/131 (97%)	0.28	2 (1%) 70 55	63, 109, 153, 161	0
1	L	128/131 (97%)	0.14	1 (0%) 82 71	65, 101, 152, 171	0
All	All	1536/1572 (97%)	0.18	38 (2%) 58 43	51, 103, 149, 179	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	529	SER	3.3
1	C	474	TRP	2.9
1	B	474	TRP	2.8
1	J	529	SER	2.8
1	K	400	ALA	2.8
1	L	400	ALA	2.8
1	H	469	LEU	2.7
1	I	449	THR	2.7
1	I	400	ALA	2.7
1	C	416	THR	2.7
1	K	399	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	F	430	GLN	2.6
1	C	400	ALA	2.6
1	D	449	THR	2.5
1	B	473	GLN	2.5
1	C	399	ALA	2.5
1	A	415	GLY	2.5
1	I	529	SER	2.4
1	J	404	GLU	2.4
1	F	400	ALA	2.3
1	I	411	ALA	2.3
1	G	469	LEU	2.3
1	H	429	ILE	2.2
1	E	469	LEU	2.2
1	C	449	THR	2.2
1	F	499	SER	2.2
1	A	474	TRP	2.2
1	I	402	SER	2.2
1	J	498	GLU	2.2
1	H	427	PRO	2.2
1	D	469	LEU	2.1
1	H	430	GLN	2.1
1	J	399	ALA	2.1
1	C	528	ASN	2.1
1	A	445	VAL	2.1
1	G	400	ALA	2.1
1	G	529	SER	2.0
1	C	504	LEU	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 oligosaccharides 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.