



wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 3, 2023 – 11:39 AM EDT

PDB ID : 3T4A
Title : Structure of a truncated form of Staphylococcal Complement Inhibitor B bound to human C3c at 3.4 Angstrom resolution
Authors : Garcia, B.L.; Geisbrecht, B.V.; Summers, B.J.
Deposited on : 2011-07-25
Resolution : 3.40 Å(reported)

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

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

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) : 1.13
EDS : 2.35
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) : 2.35

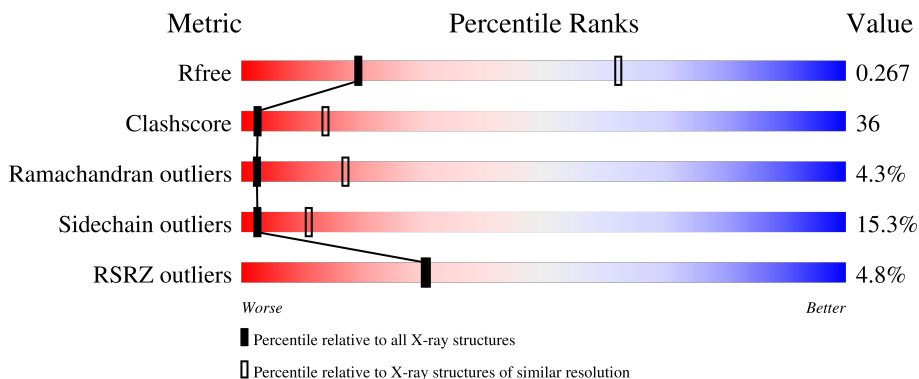
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.40 Å.

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



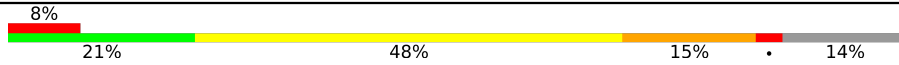


Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RSRZ outliers	127900	2173 (3.50-3.30)

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	645	 2% (red), 53% (green), 36% (yellow), 10% (orange), . (grey)
1	D	645	 % (red), 53% (green), 36% (yellow), 9% (orange), . (grey)
2	B	206	 49% (green), 33% (yellow), 7% (orange), 11% (grey)
2	E	206	 % (red), 52% (green), 30% (yellow), 6% (orange), 11% (grey)
3	C	343	 19% (red), 21% (green), 50% (yellow), 13% (orange), . (grey), 14% (grey)

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Mol	Chain	Length	Quality of chain
3	F	343	
4	G	73	
4	H	73	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 18730 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 Complement C3 beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	633	4931	3141	833	942	15	0	0	0
1	D	633	4931	3141	833	942	15	0	0	0

- Molecule 2 is a protein called Complement C3c alpha' chain fragment 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	183	1480	950	249	276	5	0	0	0
2	E	183	1480	950	249	276	5	0	0	0

- Molecule 3 is a protein called Complement C3c alpha' chain fragment 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	296	2407	1517	395	475	20	0	0	0
3	F	296	2407	1517	395	475	20	0	0	0

- Molecule 4 is a protein called Fibrinogen-binding protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	G	68	547	348	94	102	3	0	0	0
4	H	68	547	348	94	102	3	0	0	0

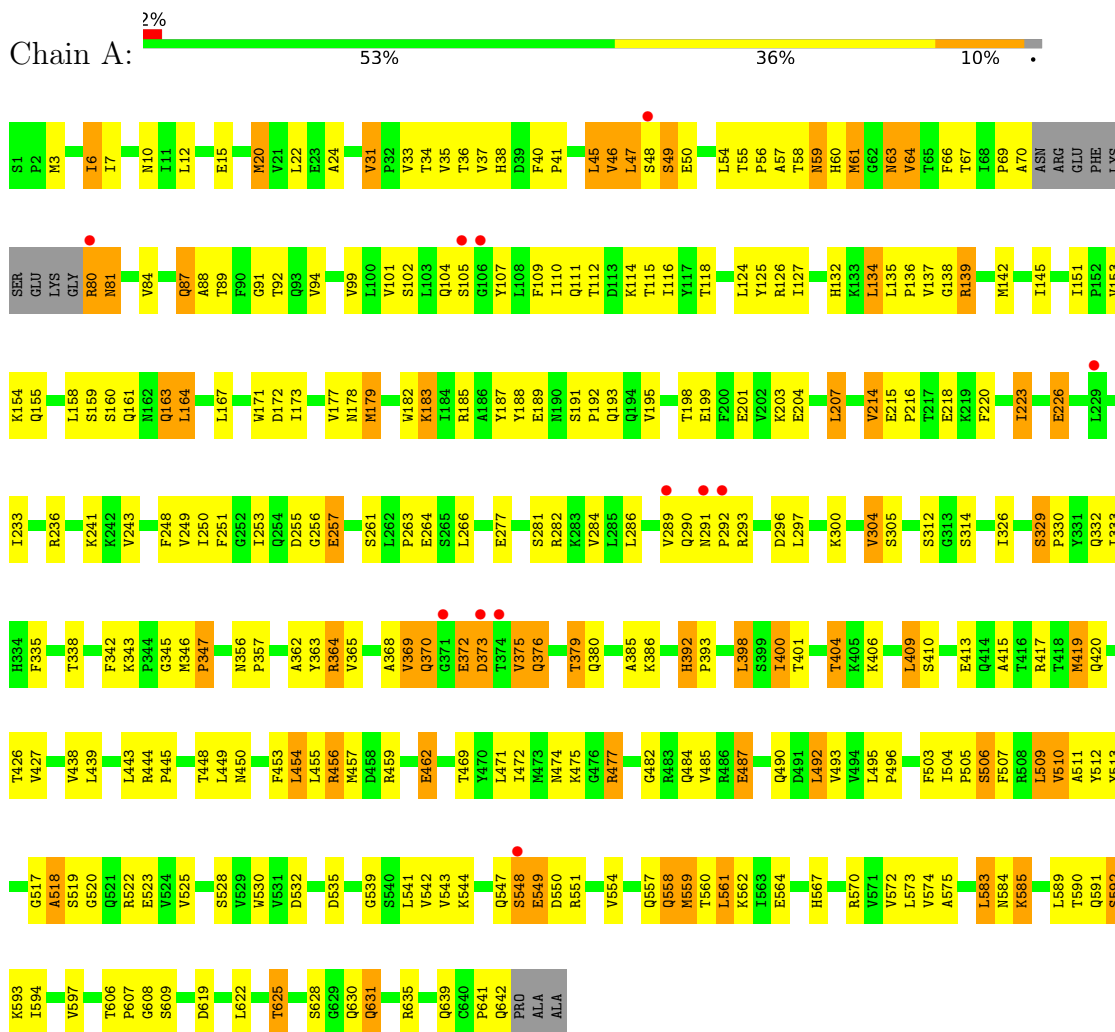
There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	13	GLY	-	expression tag	UNP Q99UU9
G	14	SER	-	expression tag	UNP Q99UU9
G	15	THR	-	expression tag	UNP Q99UU9
G	16	GLY	-	expression tag	UNP Q99UU9
G	17	SER	-	expression tag	UNP Q99UU9
H	13	GLY	-	expression tag	UNP Q99UU9
H	14	SER	-	expression tag	UNP Q99UU9
H	15	THR	-	expression tag	UNP Q99UU9
H	16	GLY	-	expression tag	UNP Q99UU9
H	17	SER	-	expression tag	UNP Q99UU9

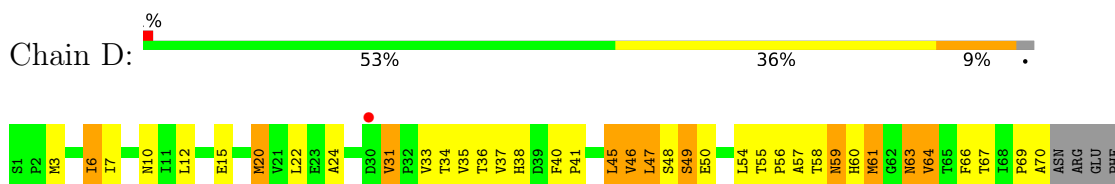
3 Residue-property plots

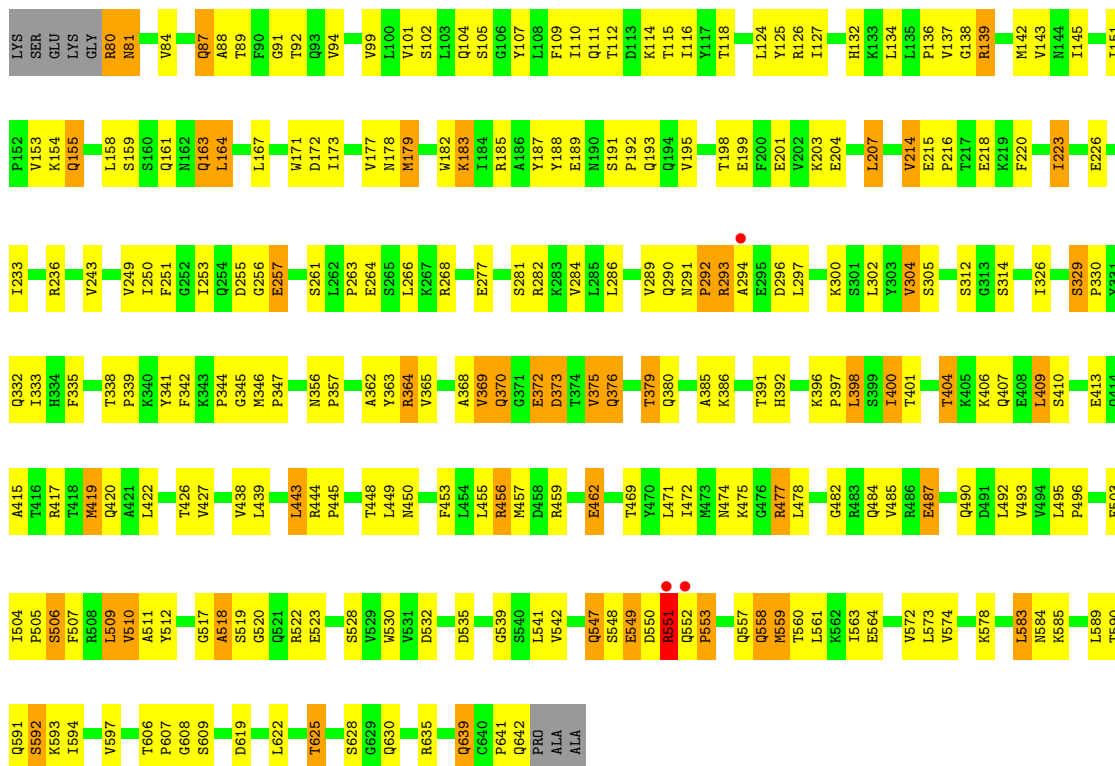
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Complement C3 beta chain



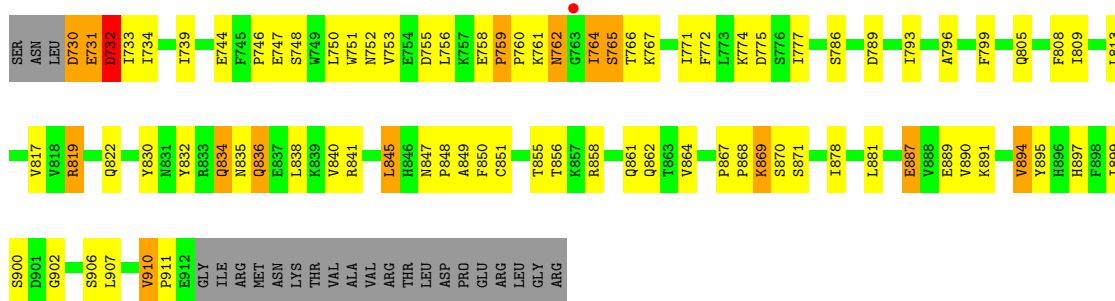
- Molecule 1: Complement C3 beta chain





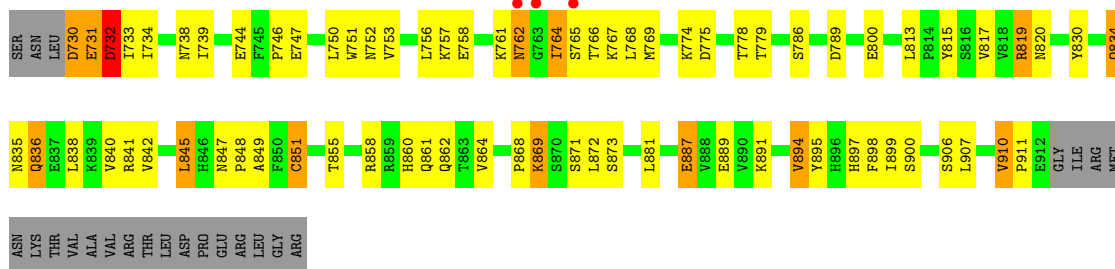
• Molecule 2: Complement C3c alpha' chain fragment 1

Chain B: 49% 33% 7% 11%

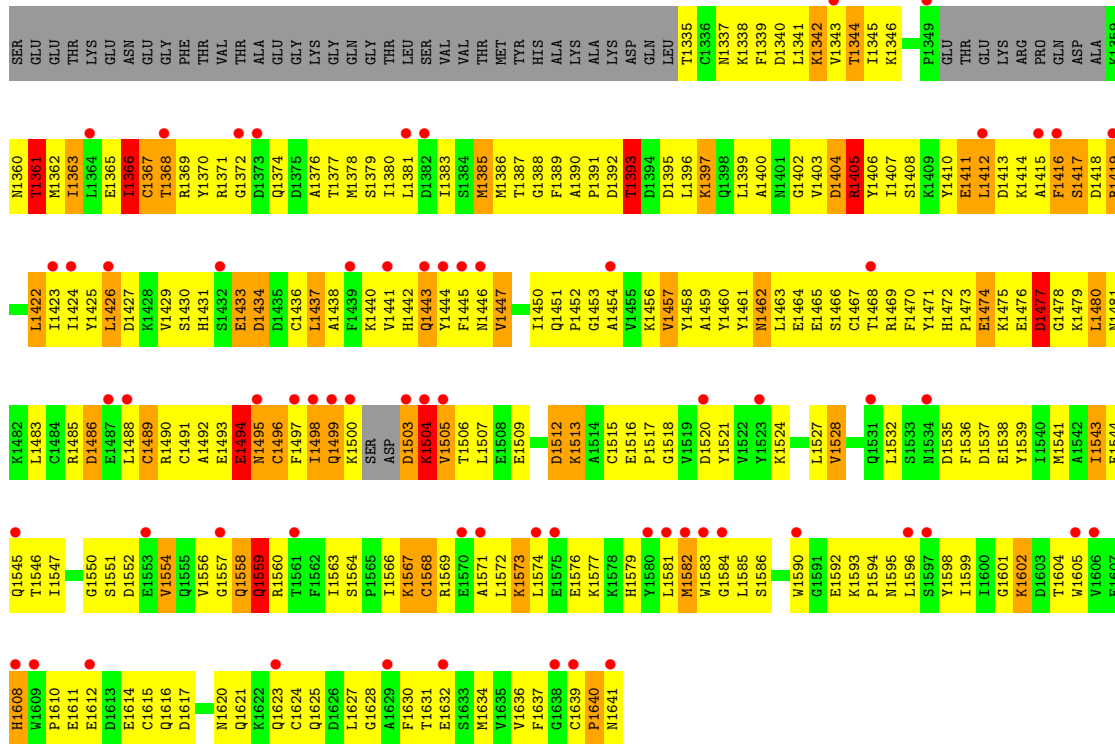
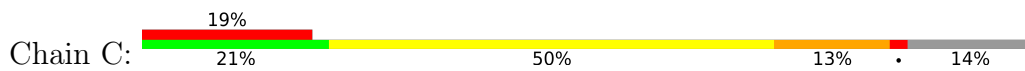


• Molecule 2: Complement C3c alpha' chain fragment 1

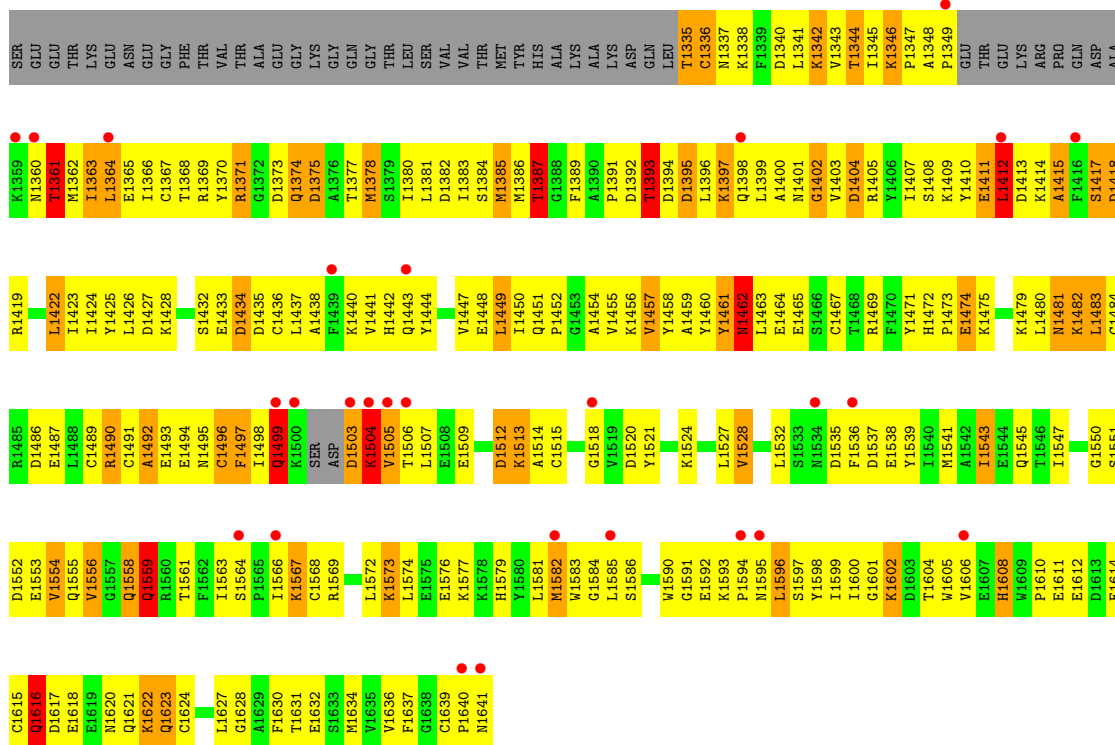
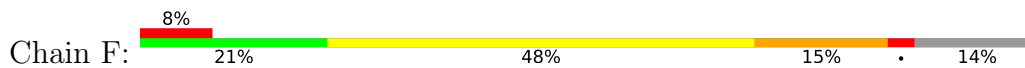
Chain E: % 52% 30% 6% 11%



• Molecule 3: Complement C3c alpha' chain fragment 2



• Molecule 3: Complement C3c alpha' chain fragment 2



- Molecule 4: Fibrinogen-binding protein



- Molecule 4: Fibrinogen-binding protein



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	103.30Å 165.44Å 203.12Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.71 – 3.40 50.06 – 3.40	Depositor EDS
% Data completeness (in resolution range)	92.6 (32.71-3.40) 91.6 (50.06-3.40)	Depositor EDS
R_{merge}	0.16	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.25 (at 3.40Å)	Xtrriage
Refinement program	PHENIX 1.7_650	Depositor
R, R_{free}	0.229 , 0.270 0.224 , 0.267	Depositor DCC
R_{free} test set	2000 reflections (4.27%)	wwPDB-VP
Wilson B-factor (Å ²)	59.0	Xtrriage
Anisotropy	0.158	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 39.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.89	EDS
Total number of atoms	18730	wwPDB-VP
Average B, all atoms (Å ²)	67.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.69% 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	0.52	1/5030 (0.0%)	0.69	0/6837
1	D	0.51	0/5030	0.68	0/6837
2	B	0.50	0/1512	0.65	0/2055
2	E	0.52	0/1512	0.67	0/2055
3	C	0.53	1/2453 (0.0%)	0.72	4/3305 (0.1%)
3	F	0.65	1/2453 (0.0%)	0.78	0/3305
4	G	0.53	0/553	0.65	0/741
4	H	0.52	0/553	0.64	0/741
All	All	0.54	3/19096 (0.0%)	0.70	4/25876 (0.0%)

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	1623	GLN	C-N	-5.78	1.20	1.34
3	C	1391	PRO	C-N	-5.63	1.21	1.34
1	A	631	GLN	C-N	-5.54	1.21	1.34

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1419	ARG	CB-CA-C	-5.99	98.41	110.40
3	C	1447	VAL	N-CA-CB	5.88	124.42	111.50
3	C	1405	ARG	N-CA-CB	5.21	119.99	110.60
3	C	1498	ILE	CB-CA-C	5.06	121.72	111.60

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	4931	0	4993	292	0
1	D	4931	0	4993	275	0
2	B	1480	0	1501	98	0
2	E	1480	0	1501	89	0
3	C	2407	0	2316	350	0
3	F	2407	0	2315	287	0
4	G	547	0	568	19	0
4	H	547	0	568	30	0
All	All	18730	0	18755	1362	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 36.

The worst 5 of 1362 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:C:1389:PHE:CD2	3:C:1443:GLN:HB2	1.46	1.50
3:C:1381:LEU:HD13	3:C:1383:ILE:CG1	1.38	1.47
3:C:1381:LEU:CD1	3:C:1383:ILE:HG13	1.47	1.41
1:A:346:MET:HE3	1:A:456:ARG:CB	1.54	1.36
3:C:1379:SER:C	3:C:1380:ILE:HD12	1.44	1.36

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	629/645 (98%)	553 (88%)	57 (9%)	19 (3%)	4 23
1	D	629/645 (98%)	548 (87%)	62 (10%)	19 (3%)	4 23

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	181/206 (88%)	157 (87%)	18 (10%)	6 (3%)	4	22
2	E	181/206 (88%)	157 (87%)	19 (10%)	5 (3%)	5	24
3	C	290/343 (84%)	226 (78%)	42 (14%)	22 (8%)	1	6
3	F	290/343 (84%)	213 (73%)	48 (17%)	29 (10%)	0	4
4	G	66/73 (90%)	56 (85%)	10 (15%)	0	100	100
4	H	66/73 (90%)	55 (83%)	11 (17%)	0	100	100
All	All	2332/2534 (92%)	1965 (84%)	267 (11%)	100 (4%)	2	17

5 of 100 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	49	SER
1	A	347	PRO
1	A	392	HIS
1	A	518	ALA
1	A	549	GLU

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	558/567 (98%)	476 (85%)	82 (15%)	3	12
1	D	558/567 (98%)	474 (85%)	84 (15%)	3	12
2	B	171/191 (90%)	155 (91%)	16 (9%)	8	30
2	E	171/191 (90%)	154 (90%)	17 (10%)	8	27
3	C	270/309 (87%)	218 (81%)	52 (19%)	1	4
3	F	270/309 (87%)	204 (76%)	66 (24%)	0	2
4	G	57/60 (95%)	54 (95%)	3 (5%)	22	52
4	H	57/60 (95%)	53 (93%)	4 (7%)	15	44
All	All	2112/2254 (94%)	1788 (85%)	324 (15%)	2	11

5 of 324 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	609	SER
3	F	1469	ARG
2	E	764	ILE
3	F	1373	ASP
3	F	1543	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 63 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	10	ASN
3	F	1337	ASN
1	D	181	GLN
2	E	897	HIS
3	F	1559	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 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

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	633/645 (98%)	0.05	12 (1%) 66 65	25, 50, 86, 148	0
1	D	633/645 (98%)	0.00	4 (0%) 89 89	21, 53, 85, 141	0
2	B	183/206 (88%)	-0.16	1 (0%) 91 90	27, 54, 93, 121	0
2	E	183/206 (88%)	-0.22	3 (1%) 72 70	26, 48, 76, 126	0
3	C	296/343 (86%)	1.32	65 (21%) 0 1	24, 116, 155, 187	0
3	F	296/343 (86%)	0.73	27 (9%) 9 10	26, 90, 126, 147	0
4	G	68/73 (93%)	0.06	1 (1%) 73 72	35, 59, 106, 115	0
4	H	68/73 (93%)	-0.20	0 100 100	36, 47, 67, 79	0
All	All	2360/2534 (93%)	0.24	113 (4%) 30 31	21, 59, 127, 187	0

The worst 5 of 113 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	1500	LYS	7.2
3	F	1641	ASN	6.9
3	C	1503	ASP	6.4
3	C	1415	ALA	5.5
3	C	1606	VAL	4.8

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 monosaccharides in this entry.

6.4 Ligands [i](#)

There are no ligands in this entry.

6.5 Other polymers [i](#)

There are no such residues in this entry.