



# Full wwPDB X-ray Structure Validation Report ⓘ

May 14, 2020 – 04:20 am BST

PDB ID : 1B9C  
Title : Green Fluorescent Protein Mutant F99S, M153T and V163A  
Authors : Battistutta, R.; Negro, A.; Zanotti, G.  
Deposited on : 1999-02-09  
Resolution : 2.40 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

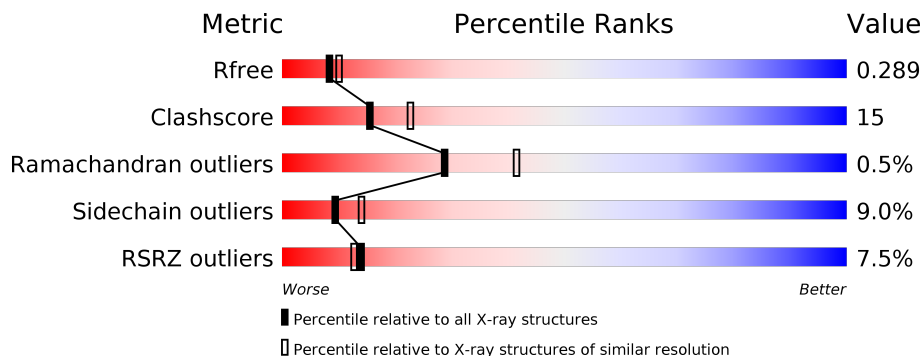
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.40 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	3907 (2.40-2.40)
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	236	<div style="display: flex; align-items: center;"> <div style="width: 11%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 57%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 32%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey;"></div> </div>
1	B	236	<div style="display: flex; align-items: center;"> <div style="width: 12%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 59%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 33%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey; position: relative;"> <span style="position: absolute; top: -5px; left: 50%; transform: translate(-50%, 0); font-size: 8px;">• 5%</span> </div> </div>
1	C	236	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 58%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 31%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 6%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey; position: relative;"> <span style="position: absolute; top: -5px; left: 50%; transform: translate(-50%, 0); font-size: 8px;">• 5%</span> </div> </div>
1	D	236	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 58%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 33%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 5%; height: 10px; background-color: grey; position: relative;"> <span style="position: absolute; top: -5px; left: 50%; transform: translate(-50%, 0); font-size: 8px;">• 5%</span> </div> </div>

## 2 Entry composition [i](#)

There are 2 unique types of molecules in this entry. The entry contains 7466 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 PROTEIN (GREEN FLUORESCENT PROTEIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	225	1795	1139	303	348	5	0	0	0
1	B	225	1795	1139	303	348	5	0	0	0
1	C	225	1795	1139	303	348	5	0	0	0
1	D	225	1795	1139	303	348	5	0	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	66	CRO	SER	CHROMOPHORE	UNP P42212
A	66	CRO	TYR	CHROMOPHORE	UNP P42212
A	66	CRO	GLY	CHROMOPHORE	UNP P42212
A	1	ALA	MET	ENGINEERED MUTATION	UNP P42212
A	99	SER	PHE	ENGINEERED MUTATION	UNP P42212
A	153	THR	MET	ENGINEERED MUTATION	UNP P42212
A	163	ALA	VAL	ENGINEERED MUTATION	UNP P42212
B	66	CRO	SER	CHROMOPHORE	UNP P42212
B	66	CRO	TYR	CHROMOPHORE	UNP P42212
B	66	CRO	GLY	CHROMOPHORE	UNP P42212
B	1	ALA	MET	ENGINEERED MUTATION	UNP P42212
B	99	SER	PHE	ENGINEERED MUTATION	UNP P42212
B	153	THR	MET	ENGINEERED MUTATION	UNP P42212
B	163	ALA	VAL	ENGINEERED MUTATION	UNP P42212
C	66	CRO	SER	CHROMOPHORE	UNP P42212
C	66	CRO	TYR	CHROMOPHORE	UNP P42212
C	66	CRO	GLY	CHROMOPHORE	UNP P42212
C	1	ALA	MET	ENGINEERED MUTATION	UNP P42212
C	99	SER	PHE	ENGINEERED MUTATION	UNP P42212
C	153	THR	MET	ENGINEERED MUTATION	UNP P42212
C	163	ALA	VAL	ENGINEERED MUTATION	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
D	66	CRO	SER	CHROMOPHORE	UNP P42212
D	66	CRO	TYR	CHROMOPHORE	UNP P42212
D	66	CRO	GLY	CHROMOPHORE	UNP P42212
D	1	ALA	MET	ENGINEERED MUTATION	UNP P42212
D	99	SER	PHE	ENGINEERED MUTATION	UNP P42212
D	153	THR	MET	ENGINEERED MUTATION	UNP P42212
D	163	ALA	VAL	ENGINEERED MUTATION	UNP P42212

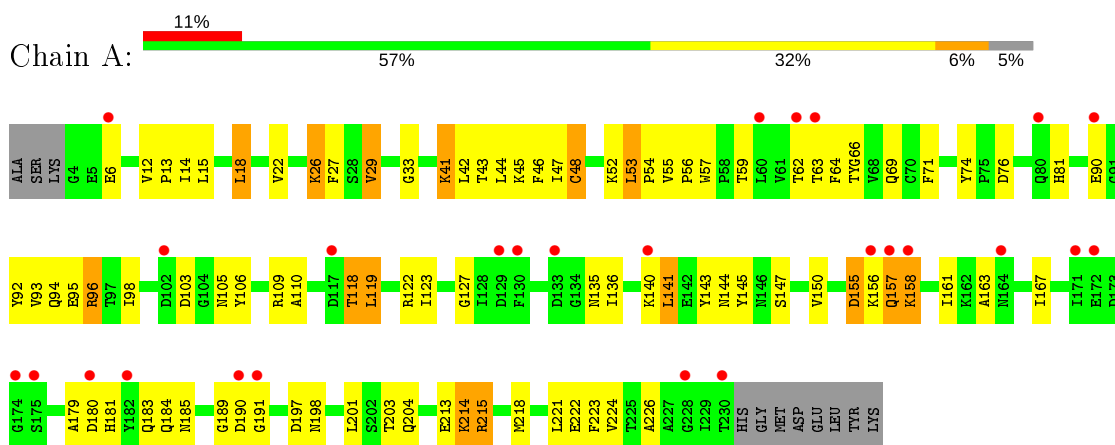
- Molecule 2 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	39	Total O 39 39	0	0
2	B	41	Total O 41 41	0	0
2	C	110	Total O 110 110	0	0
2	D	96	Total O 96 96	0	0

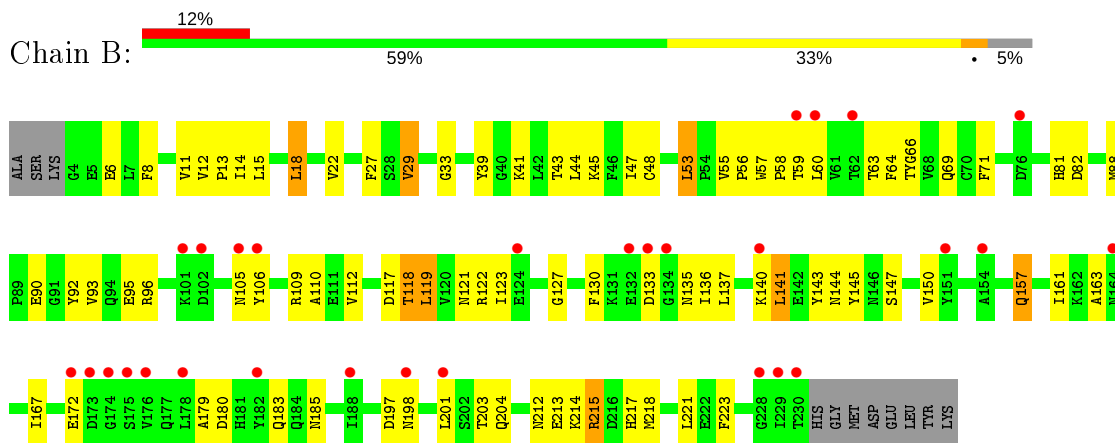
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

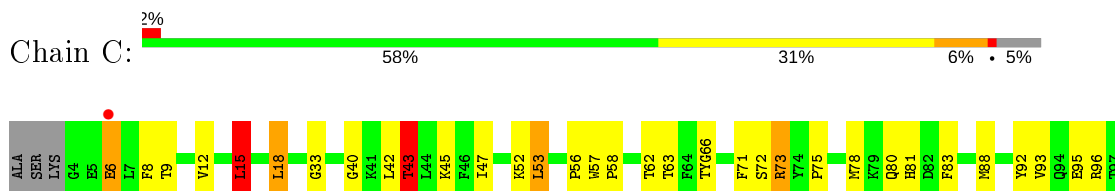
- Molecule 1: PROTEIN (GREEN FLUORESCENT PROTEIN)

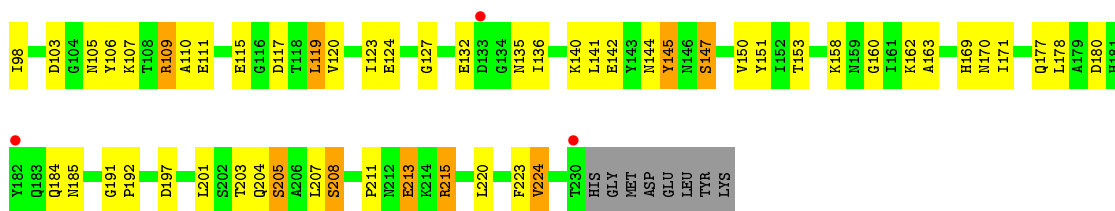


- Molecule 1: PROTEIN (GREEN FLUORESCENT PROTEIN)

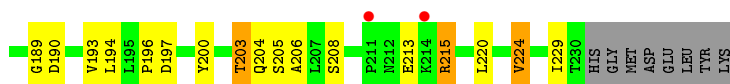
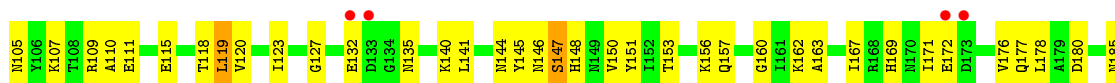
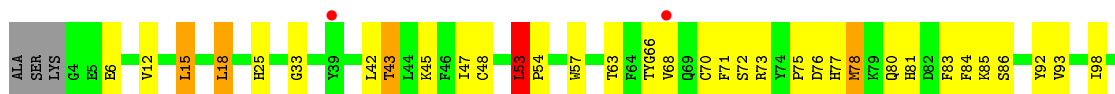


- Molecule 1: PROTEIN (GREEN FLUORESCENT PROTEIN)





• Molecule 1: PROTEIN (GREEN FLUORESCENT PROTEIN)



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	83.48Å 85.37Å 140.06Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.40 23.31 – 2.45	Depositor EDS
% Data completeness (in resolution range)	89.9 (30.00-2.40) 94.8 (23.31-2.45)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	16.35 (at 2.44Å)	Xtrriage
Refinement program	X-PLOR 3.8.5	Depositor
R, $R_{free}$	0.204 , 0.280 0.221 , 0.289	Depositor DCC
$R_{free}$ test set	3663 reflections (9.98%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	29.8	Xtrriage
Anisotropy	0.750	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 47.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.023 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	7466	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	31.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.31% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup> Intensities estimated from amplitudes.

<sup>2</sup> Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality i

### 5.1 Standard geometry i

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

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	0.78	0/1814	1.43	19/2453 (0.8%)
1	B	0.82	0/1814	1.45	13/2453 (0.5%)
1	C	0.95	2/1814 (0.1%)	1.71	23/2453 (0.9%)
1	D	0.94	1/1814 (0.1%)	1.66	21/2453 (0.9%)
All	All	0.87	3/7256 (0.0%)	1.57	76/9812 (0.8%)

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	A	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	208	SER	CA-CB	-6.19	1.43	1.52
1	D	57	TRP	CG-CD2	-5.18	1.34	1.43
1	C	213	GLU	CD-OE2	-5.16	1.20	1.25

All (76) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	215	ARG	NE-CZ-NH1	20.16	130.38	120.30
1	C	215	ARG	NE-CZ-NH2	-18.59	111.00	120.30
1	D	215	ARG	NE-CZ-NH1	17.26	128.93	120.30
1	D	215	ARG	NE-CZ-NH2	-16.78	111.91	120.30
1	C	215	ARG	CD-NE-CZ	13.17	142.04	123.60
1	B	215	ARG	NE-CZ-NH1	12.35	126.47	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	215	ARG	CD-NE-CZ	11.93	140.30	123.60
1	C	57	TRP	CD1-CG-CD2	10.23	114.48	106.30
1	A	57	TRP	CD1-CG-CD2	9.88	114.20	106.30
1	D	57	TRP	CD1-CG-CD2	9.85	114.18	106.30
1	D	109	ARG	NE-CZ-NH2	-9.79	115.41	120.30
1	C	57	TRP	CE2-CD2-CG	-9.04	100.07	107.30
1	C	109	ARG	NE-CZ-NH2	-8.96	115.82	120.30
1	B	57	TRP	CD1-CG-CD2	8.58	113.16	106.30
1	A	215	ARG	NE-CZ-NH1	8.50	124.55	120.30
1	B	57	TRP	CE2-CD2-CG	-8.39	100.59	107.30
1	D	57	TRP	CE2-CD2-CG	-8.35	100.62	107.30
1	C	96	ARG	NE-CZ-NH1	8.35	124.47	120.30
1	A	57	TRP	CE2-CD2-CG	-8.21	100.73	107.30
1	C	43	THR	CA-CB-CG2	7.99	123.58	112.40
1	D	18	LEU	CA-CB-CG	7.61	132.80	115.30
1	A	184	GLN	CA-CB-CG	7.51	129.93	113.40
1	A	122	ARG	NE-CZ-NH1	7.35	123.98	120.30
1	A	106	TYR	CB-CG-CD2	-7.28	116.63	121.00
1	C	43	THR	CA-CB-OG1	-7.25	93.78	109.00
1	D	78	MET	CA-CB-CG	7.11	125.39	113.30
1	B	106	TYR	CB-CG-CD2	-7.00	116.80	121.00
1	C	117	ASP	CA-CB-CG	6.71	128.16	113.40
1	C	208	SER	N-CA-CB	-6.60	100.61	110.50
1	B	39	TYR	CB-CG-CD1	-6.58	117.05	121.00
1	C	96	ARG	NE-CZ-NH2	-6.57	117.02	120.30
1	C	107	LYS	N-CA-C	-6.48	93.51	111.00
1	C	18	LEU	CA-CB-CG	6.45	130.14	115.30
1	B	145	TYR	CB-CG-CD1	-6.35	117.19	121.00
1	D	109	ARG	N-CA-C	-6.27	94.07	111.00
1	B	57	TRP	CG-CD2-CE3	6.21	139.49	133.90
1	D	43	THR	CA-CB-CG2	6.18	121.05	112.40
1	A	122	ARG	NE-CZ-NH2	-6.15	117.22	120.30
1	D	68	VAL	CA-CB-CG1	-6.09	101.76	110.90
1	C	109	ARG	N-CA-C	-6.08	94.58	111.00
1	C	57	TRP	CG-CD1-NE1	-6.07	104.03	110.10
1	D	53	LEU	CA-CB-CG	6.06	129.23	115.30
1	C	73	ARG	NE-CZ-NH2	-5.90	117.35	120.30
1	C	53	LEU	CA-CB-CG	5.88	128.83	115.30
1	B	18	LEU	CA-CB-CG	5.85	128.75	115.30
1	A	96	ARG	NE-CZ-NH1	5.79	123.20	120.30
1	D	107	LYS	N-CA-C	-5.78	95.40	111.00
1	A	18	LEU	CA-CB-CG	5.76	128.54	115.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	145	TYR	CB-CG-CD1	-5.62	117.62	121.00
1	A	189	GLY	CA-C-N	-5.60	104.88	117.20
1	A	57	TRP	CG-CD1-NE1	-5.60	104.50	110.10
1	D	43	THR	CA-CB-OG1	-5.60	97.25	109.00
1	B	57	TRP	CB-CG-CD1	-5.57	119.75	127.00
1	A	141	LEU	CA-CB-CG	5.56	128.08	115.30
1	B	141	LEU	CA-CB-CG	5.53	128.02	115.30
1	C	57	TRP	CG-CD2-CE3	5.53	138.87	133.90
1	A	48	CYS	CA-CB-SG	-5.49	104.12	114.00
1	B	96	ARG	NE-CZ-NH1	5.46	123.03	120.30
1	D	176	VAL	CG1-CB-CG2	-5.38	102.29	110.90
1	D	57	TRP	CG-CD2-CE3	5.38	138.74	133.90
1	A	57	TRP	CG-CD2-CE3	5.36	138.72	133.90
1	D	57	TRP	CB-CG-CD1	-5.32	120.09	127.00
1	C	103	ASP	CB-CG-OD2	5.30	123.08	118.30
1	D	193	VAL	CG1-CB-CG2	-5.28	102.45	110.90
1	B	122	ARG	NE-CZ-NH1	5.27	122.93	120.30
1	B	82	ASP	CB-CG-OD1	5.25	123.03	118.30
1	C	115	GLU	N-CA-C	-5.21	96.93	111.00
1	D	73	ARG	NE-CZ-NH2	-5.20	117.70	120.30
1	A	158	LYS	CA-CB-CG	5.14	124.71	113.40
1	A	41	LYS	CA-C-N	-5.13	105.91	117.20
1	D	115	GLU	N-CA-C	-5.12	97.17	111.00
1	C	15	LEU	N-CA-C	-5.12	97.19	111.00
1	A	155	ASP	CA-C-N	-5.08	106.02	117.20
1	C	124	GLU	N-CA-C	-5.06	97.33	111.00
1	D	57	TRP	CG-CD1-NE1	-5.06	105.04	110.10
1	A	57	TRP	CB-CG-CD1	-5.05	120.43	127.00

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	191	GLY	Peptide

## 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	1795	0	1730	60	0
1	B	1795	0	1730	49	0
1	C	1795	0	1730	60	0
1	D	1795	0	1730	51	0
2	A	39	0	0	3	0
2	B	41	0	0	0	0
2	C	110	0	0	8	0
2	D	96	0	0	6	0
All	All	7466	0	6920	208	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 (208) 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:A:203:THR:HG22	1:A:224:VAL:HG13	1.47	0.95
1:D:171:ILE:HD11	1:D:177:GLN:HB2	1.58	0.84
1:D:81:HIS:CD2	1:D:197:ASP:H	2.05	0.75
1:D:81:HIS:HD2	1:D:197:ASP:H	1.33	0.74
1:C:171:ILE:HD11	1:C:177:GLN:HB2	1.70	0.72
1:C:81:HIS:HD2	1:C:197:ASP:H	1.40	0.70
1:C:81:HIS:CD2	1:C:197:ASP:H	2.10	0.69
1:A:42:LEU:HD13	1:A:66:CRO:OG1	1.98	0.63
1:C:171:ILE:HD11	1:C:177:GLN:CB	2.29	0.63
1:C:93:VAL:HG22	1:C:111:GLU:HG2	1.81	0.63
1:D:93:VAL:HG22	1:D:111:GLU:HG2	1.80	0.62
1:C:95:GLU:HG2	1:C:109:ARG:HG3	1.81	0.62
1:D:45:LYS:HE2	1:D:47:ILE:HD11	1.82	0.62
1:C:75:PRO:HG2	1:C:78:MET:CG	2.30	0.62
1:C:204:GLN:OE1	1:D:144:ASN:HA	2.01	0.61
1:C:110:ALA:HB2	1:C:123:ILE:HG23	1.83	0.61
1:C:75:PRO:HG2	1:C:78:MET:HG2	1.83	0.60
1:D:71:PHE:HE2	1:D:119:LEU:HD22	1.67	0.59
1:C:71:PHE:HE2	1:C:119:LEU:HD22	1.66	0.59
1:C:66:CRO:CE1	1:C:203:THR:HG21	2.32	0.59
1:C:45:LYS:HE2	1:C:47:ILE:HD11	1.85	0.58
1:D:135:ASN:HA	1:D:140:LYS:HB2	1.85	0.58
1:A:214:LYS:HB2	2:A:242:HOH:O	2.03	0.58
1:C:72:SER:HA	1:C:224:VAL:HB	1.84	0.58
1:A:33:GLY:HA3	1:A:44:LEU:HD23	1.86	0.57
1:A:13:PRO:HB2	1:A:118:THR:HB	1.86	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:161:ILE:HG13	1:B:185:ASN:HB2	1.87	0.57
1:B:59:THR:HG23	1:B:141:LEU:HD11	1.87	0.57
1:D:72:SER:HA	1:D:224:VAL:HB	1.87	0.57
1:B:95:GLU:HG2	1:B:109:ARG:HG3	1.87	0.56
1:D:110:ALA:HB2	1:D:123:ILE:HG23	1.87	0.56
1:B:71:PHE:CE2	1:B:119:LEU:HD22	2.40	0.56
1:B:11:VAL:HB	1:D:157:GLN:HG3	1.89	0.55
1:C:135:ASN:HA	1:C:140:LYS:HB2	1.89	0.55
1:D:213:GLU:OE2	1:D:215:ARG:HB2	2.06	0.55
1:D:203:THR:HG23	1:D:224:VAL:HG13	1.88	0.55
1:C:141:LEU:HB3	2:C:328:HOH:O	2.07	0.55
1:C:205:SER:HB3	1:C:220:LEU:HD11	1.87	0.55
1:D:205:SER:HB3	1:D:220:LEU:HD11	1.88	0.55
1:A:71:PHE:CE2	1:A:119:LEU:HD22	2.42	0.55
1:A:59:THR:HG23	1:A:141:LEU:HD11	1.88	0.55
1:C:169:HIS:HB2	1:C:177:GLN:O	2.06	0.55
1:B:13:PRO:HB2	1:B:118:THR:HB	1.88	0.54
1:B:71:PHE:HE2	1:B:119:LEU:HD22	1.73	0.54
1:A:144:ASN:HB2	1:B:147:SER:OG	2.08	0.53
1:B:45:LYS:HE2	1:B:47:ILE:HD11	1.91	0.53
1:A:150:VAL:HB	1:A:201:LEU:HB2	1.91	0.53
1:B:29:VAL:HG21	1:B:64:PHE:CZ	2.44	0.52
1:A:71:PHE:HE2	1:A:119:LEU:HD22	1.73	0.52
1:C:66:CRO:OH	1:C:203:THR:HB	2.10	0.52
1:C:66:CRO:CZ	1:C:203:THR:HB	2.40	0.52
1:D:86:SER:HB3	1:D:194:LEU:HD12	1.91	0.52
1:A:59:THR:CG2	1:A:141:LEU:HD11	2.40	0.52
1:A:147:SER:OG	1:A:204:GLN:HG2	2.11	0.51
1:C:211:PRO:HD3	2:C:296:HOH:O	2.09	0.51
1:C:158:LYS:HD2	2:C:284:HOH:O	2.11	0.51
1:A:12:VAL:HB	1:A:71:PHE:CE1	2.46	0.51
1:D:42:LEU:HD13	1:D:66:CRO:OG1	2.11	0.51
1:A:12:VAL:HB	1:A:71:PHE:HE1	1.76	0.51
1:C:33:GLY:HA3	1:C:43:THR:O	2.12	0.50
1:B:213:GLU:OE1	1:B:215:ARG:HD3	2.11	0.50
1:C:213:GLU:OE2	1:C:215:ARG:HB2	2.12	0.50
1:A:92:TYR:CE1	1:A:185:ASN:ND2	2.80	0.50
1:A:204:GLN:OE1	1:B:144:ASN:HA	2.12	0.50
1:B:12:VAL:HB	1:B:71:PHE:HE1	1.77	0.50
1:B:135:ASN:HA	1:B:140:LYS:HB2	1.92	0.50
1:C:144:ASN:HA	1:D:204:GLN:OE1	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:GLU:HG2	1:A:109:ARG:HG3	1.92	0.49
1:D:33:GLY:HA3	1:D:43:THR:O	2.11	0.49
1:B:147:SER:OG	1:B:204:GLN:HG2	2.11	0.49
1:D:12:VAL:HB	1:D:71:PHE:HE1	1.78	0.49
1:A:33:GLY:HA3	1:A:43:THR:O	2.11	0.49
1:A:105:ASN:O	1:A:127:GLY:HA2	2.13	0.48
1:A:155:ASP:OD2	1:A:158:LYS:HD3	2.13	0.48
1:B:12:VAL:HB	1:B:71:PHE:CE1	2.47	0.48
1:A:53:LEU:HD13	1:A:55:VAL:HG23	1.95	0.48
1:A:29:VAL:HG21	1:A:64:PHE:CE1	2.49	0.48
1:C:92:TYR:CD2	1:C:185:ASN:ND2	2.78	0.48
1:C:105:ASN:O	1:C:127:GLY:HA2	2.14	0.48
1:A:135:ASN:HA	1:A:140:LYS:HB2	1.96	0.48
1:B:33:GLY:HA3	1:B:43:THR:O	2.14	0.47
1:B:167:ILE:HB	1:B:179:ALA:HB3	1.96	0.47
1:B:41:LYS:HB3	1:B:223:PHE:CE1	2.49	0.47
1:C:144:ASN:HB2	1:D:147:SER:OG	2.14	0.47
1:B:157:GLN:HA	1:B:157:GLN:HE21	1.80	0.47
1:B:33:GLY:HA3	1:B:44:LEU:HD23	1.96	0.47
1:C:169:HIS:HE1	2:C:346:HOH:O	1.96	0.47
1:A:81:HIS:CD2	1:A:197:ASP:H	2.33	0.47
1:A:147:SER:OG	1:B:144:ASN:HB2	2.15	0.47
1:C:56:PRO:HD3	1:C:136:ILE:O	2.14	0.47
1:A:223:PHE:HB3	2:A:258:HOH:O	2.14	0.47
1:A:41:LYS:HB3	1:A:223:PHE:CE1	2.49	0.47
1:B:69:GLN:NE2	1:B:150:VAL:HG11	2.29	0.47
1:B:48:CYS:SG	1:B:53:LEU:HD23	2.55	0.46
1:D:171:ILE:HG22	1:D:172:GLU:N	2.30	0.46
1:A:63:THR:HG23	1:A:123:ILE:HG21	1.98	0.46
1:D:169:HIS:HD2	2:D:256:HOH:O	1.97	0.46
1:A:94:GLN:HE21	1:A:96:ARG:NH1	2.14	0.46
1:C:184:GLN:HG3	2:C:253:HOH:O	2.14	0.46
1:A:161:ILE:HG13	1:A:185:ASN:HB2	1.97	0.46
1:A:98:ILE:HG23	1:A:181:HIS:CE1	2.51	0.46
1:D:141:LEU:HB3	2:D:264:HOH:O	2.16	0.46
1:A:22:VAL:HG21	1:A:55:VAL:HG11	1.98	0.46
1:A:46:PHE:CZ	1:A:64:PHE:HB3	2.52	0.45
1:B:92:TYR:CE1	1:B:185:ASN:ND2	2.84	0.45
1:C:153:THR:HG22	1:C:162:LYS:HB2	1.99	0.45
1:D:171:ILE:HG22	1:D:172:GLU:HG2	1.97	0.45
1:D:169:HIS:HB2	1:D:177:GLN:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:92:TYR:CD2	1:D:185:ASN:ND2	2.81	0.45
1:A:48:CYS:SG	1:A:53:LEU:HD23	2.57	0.45
1:B:56:PRO:HD3	1:B:136:ILE:O	2.16	0.45
1:D:151:TYR:O	1:D:163:ALA:HA	2.17	0.45
1:D:148:HIS:CG	1:D:167:ILE:HD13	2.52	0.45
1:D:92:TYR:CE2	1:D:185:ASN:ND2	2.85	0.45
1:A:155:ASP:OD2	1:A:158:LYS:HB2	2.16	0.45
1:C:142:GLU:HG3	1:C:170:ASN:O	2.17	0.45
1:D:12:VAL:HB	1:D:71:PHE:CE1	2.52	0.45
1:A:163:ALA:HB3	1:A:183:GLN:HB3	1.98	0.45
1:B:63:THR:HG23	1:B:123:ILE:HG21	1.98	0.45
1:B:59:THR:CG2	1:B:141:LEU:HD11	2.47	0.45
1:C:169:HIS:HD2	2:C:330:HOH:O	1.99	0.45
1:B:18:LEU:HD23	1:B:123:ILE:HB	1.98	0.44
1:D:105:ASN:O	1:D:127:GLY:HA2	2.17	0.44
1:B:112:VAL:HG22	1:B:121:ASN:OD1	2.18	0.44
1:A:81:HIS:HD2	1:A:197:ASP:H	1.65	0.44
1:B:163:ALA:HB3	1:B:183:GLN:HB3	1.99	0.44
1:B:81:HIS:CD2	1:B:197:ASP:H	2.35	0.44
1:A:45:LYS:HE2	1:A:47:ILE:HD11	1.98	0.44
1:B:143:TYR:OH	1:B:218:MET:HA	2.18	0.44
1:D:83:PHE:CE1	1:D:160:GLY:HA2	2.53	0.44
1:A:18:LEU:HD23	1:A:123:ILE:HB	2.00	0.44
1:D:15:LEU:O	1:D:120:VAL:HA	2.17	0.44
1:B:13:PRO:HB3	1:D:162:LYS:NZ	2.33	0.44
1:D:25:HIS:HE1	2:D:285:HOH:O	2.00	0.44
1:C:15:LEU:O	1:C:120:VAL:HA	2.18	0.44
1:C:92:TYR:CE2	1:C:185:ASN:ND2	2.86	0.44
1:A:42:LEU:HD13	1:A:66:CRO:HOG1	1.82	0.43
1:C:40:GLY:HA3	1:C:73:ARG:HB2	2.00	0.43
1:C:147:SER:OG	1:C:204:GLN:HG2	2.18	0.43
1:C:147:SER:HB2	1:D:146:ASN:OD1	2.18	0.43
1:A:144:ASN:HA	1:B:204:GLN:OE1	2.19	0.43
1:B:47:ILE:HD13	1:B:217:HIS:HB3	2.00	0.43
1:C:12:VAL:HB	1:C:71:PHE:HE1	1.82	0.43
1:C:78:MET:O	1:C:81:HIS:HB2	2.19	0.43
1:C:8:PHE:CE2	1:C:88:MET:HG3	2.54	0.43
1:D:169:HIS:HE1	2:D:246:HOH:O	2.02	0.43
1:B:22:VAL:HG23	1:B:27:PHE:HE1	1.82	0.43
1:C:160:GLY:HA3	1:C:185:ASN:O	2.18	0.43
1:A:143:TYR:OH	1:A:218:MET:HA	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:105:ASN:O	1:B:127:GLY:HA2	2.19	0.43
1:B:93:VAL:HA	1:B:110:ALA:O	2.19	0.43
1:C:62:THR:HG23	1:C:145:TYR:OH	2.17	0.43
1:C:42:LEU:HD13	1:C:66:CRO:OG1	2.18	0.43
1:D:77:HIS:NE2	1:D:229:ILE:O	2.42	0.43
1:D:63:THR:CG2	1:D:123:ILE:HG21	2.49	0.43
1:D:75:PRO:HG2	1:D:78:MET:HG2	2.01	0.43
1:A:157:GLN:HA	2:A:241:HOH:O	2.18	0.42
1:C:151:TYR:O	1:C:163:ALA:HA	2.19	0.42
1:D:150:VAL:O	1:D:200:TYR:HA	2.18	0.42
1:A:22:VAL:HG23	1:A:27:PHE:HE1	1.84	0.42
1:B:69:GLN:HE22	1:B:150:VAL:HG11	1.83	0.42
1:C:45:LYS:HD3	2:C:303:HOH:O	2.20	0.42
1:A:56:PRO:HG2	1:A:141:LEU:HG	2.01	0.42
1:A:93:VAL:O	1:A:185:ASN:HA	2.19	0.42
1:B:150:VAL:HB	1:B:201:LEU:HB2	2.01	0.42
1:C:58:PRO:HG3	1:C:207:LEU:CD1	2.49	0.42
1:A:14:ILE:HB	1:A:44:LEU:HD21	2.02	0.42
1:D:48:CYS:SG	1:D:53:LEU:HD23	2.59	0.42
1:A:53:LEU:HA	1:A:54:PRO:HD2	1.93	0.42
1:C:150:VAL:HB	1:C:201:LEU:HB2	2.01	0.42
1:D:153:THR:HG22	1:D:162:LYS:HB2	2.01	0.42
1:D:85:LYS:NZ	2:D:297:HOH:O	2.52	0.42
1:D:98:ILE:HD11	2:D:317:HOH:O	2.19	0.42
1:A:66:CRO:N2	1:A:66:CRO:HD1	2.35	0.42
1:B:8:PHE:CE2	1:B:88:MET:HG3	2.55	0.42
1:C:93:VAL:O	1:C:185:ASN:HA	2.20	0.42
1:A:69:GLN:HE22	1:A:150:VAL:HG11	1.85	0.41
1:B:14:ILE:HB	1:B:44:LEU:HD21	2.02	0.41
1:B:53:LEU:HD13	1:B:55:VAL:HG23	2.01	0.41
1:A:26:LYS:HG3	1:A:26:LYS:H	1.65	0.41
1:A:46:PHE:CE1	1:A:64:PHE:HB3	2.56	0.41
1:C:63:THR:HA	2:C:246:HOH:O	2.20	0.41
1:C:153:THR:CG2	1:C:162:LYS:HB2	2.51	0.41
1:C:83:PHE:CE1	1:C:160:GLY:HA2	2.56	0.41
1:C:98:ILE:HB	1:C:106:TYR:HB2	2.02	0.41
1:D:70:CYS:HB3	1:D:84:PHE:HB3	2.03	0.41
1:A:62:THR:HA	1:A:66:CRO:CA2	2.51	0.41
1:D:171:ILE:HD11	1:D:177:GLN:CB	2.40	0.41
1:A:213:GLU:OE1	1:A:215:ARG:HD3	2.20	0.41
1:C:223:PHE:HD2	1:D:206:ALA:HB1	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:53:LEU:HA	1:D:54:PRO:HD2	1.88	0.41
1:A:167:ILE:HB	1:A:179:ALA:HB3	2.03	0.41
1:B:22:VAL:HG21	1:B:55:VAL:HG11	2.03	0.41
1:B:93:VAL:O	1:B:185:ASN:HA	2.21	0.41
1:A:56:PRO:HD3	1:A:136:ILE:O	2.20	0.41
1:B:53:LEU:HD11	1:B:60:LEU:CD1	2.51	0.41
1:B:66:CRO:HD1	1:B:66:CRO:N2	2.36	0.41
1:B:130:PHE:HB3	1:B:137:LEU:HD23	2.04	0.40
1:C:135:ASN:HD22	1:C:140:LYS:CD	2.34	0.40
1:C:135:ASN:HD22	1:C:140:LYS:HD2	1.85	0.40
1:A:93:VAL:HA	1:A:110:ALA:O	2.21	0.40
1:A:42:LEU:HB2	1:A:222:GLU:HB3	2.03	0.40
1:A:74:TYR:HA	1:A:226:ALA:HB3	2.02	0.40
1:C:12:VAL:HB	1:C:71:PHE:CE1	2.56	0.40
1:C:207:LEU:O	1:D:204:GLN:NE2	2.50	0.40
1:A:69:GLN:NE2	1:A:150:VAL:HG11	2.35	0.40
1:C:6:GLU:HA	1:C:9:THR:HG23	2.03	0.40
1:D:78:MET:O	1:D:81:HIS:HB2	2.22	0.40

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	220/236 (93%)	214 (97%)	5 (2%)	1 (0%)	29	41
1	B	220/236 (93%)	215 (98%)	4 (2%)	1 (0%)	29	41
1	C	220/236 (93%)	203 (92%)	16 (7%)	1 (0%)	29	41
1	D	220/236 (93%)	204 (93%)	15 (7%)	1 (0%)	29	41
All	All	880/944 (93%)	836 (95%)	40 (4%)	4 (0%)	29	41

All (4) Ramachandran outliers are listed below:



Mol	Chain	Res	Type
1	C	191	GLY
1	D	189	GLY
1	A	198	ASN
1	B	198	ASN

### 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	195/204 (96%)	178 (91%)	17 (9%)	10	15
1	B	195/204 (96%)	178 (91%)	17 (9%)	10	15
1	C	195/204 (96%)	178 (91%)	17 (9%)	10	15
1	D	195/204 (96%)	176 (90%)	19 (10%)	8	12
All	All	780/816 (96%)	710 (91%)	70 (9%)	9	14

All (70) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	GLU
1	A	15	LEU
1	A	26	LYS
1	A	29	VAL
1	A	52	LYS
1	A	53	LEU
1	A	76	ASP
1	A	90	GLU
1	A	103	ASP
1	A	118	THR
1	A	119	LEU
1	A	156	LYS
1	A	157	GLN
1	A	180	ASP
1	A	190	ASP
1	A	214	LYS
1	A	221	LEU
1	B	6	GLU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	B	15	LEU
1	B	29	VAL
1	B	53	LEU
1	B	58	PRO
1	B	90	GLU
1	B	117	ASP
1	B	118	THR
1	B	119	LEU
1	B	133	ASP
1	B	157	GLN
1	B	172	GLU
1	B	180	ASP
1	B	203	THR
1	B	212	ASN
1	B	214	LYS
1	B	221	LEU
1	C	6	GLU
1	C	15	LEU
1	C	18	LEU
1	C	43	THR
1	C	52	LYS
1	C	53	LEU
1	C	80	GLN
1	C	119	LEU
1	C	132	GLU
1	C	145	TYR
1	C	147	SER
1	C	178	LEU
1	C	180	ASP
1	C	192	PRO
1	C	205	SER
1	C	208	SER
1	C	224	VAL
1	D	6	GLU
1	D	15	LEU
1	D	18	LEU
1	D	53	LEU
1	D	76	ASP
1	D	80	GLN
1	D	118	THR
1	D	119	LEU
1	D	132	GLU

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Mol	Chain	Res	Type
1	D	145	TYR
1	D	147	SER
1	D	156	LYS
1	D	178	LEU
1	D	180	ASP
1	D	190	ASP
1	D	196	PRO
1	D	203	THR
1	D	208	SER
1	D	224	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	135	ASN
1	A	149	ASN
1	A	157	GLN
1	A	169	HIS
1	A	170	ASN
1	A	212	ASN
1	B	149	ASN
1	B	157	GLN
1	B	212	ASN
1	C	81	HIS
1	C	135	ASN
1	C	157	GLN
1	C	169	HIS
1	C	212	ASN
1	D	25	HIS
1	D	81	HIS
1	D	135	ASN
1	D	157	GLN
1	D	169	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](#)

4 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
1	CRO	C	66	1	22,22,24	2.53	7 (31%)	27,30,34	3.38	15 (55%)
1	CRO	D	66	1	22,22,24	1.85	6 (27%)	27,30,34	3.24	12 (44%)
1	CRO	A	66	1	22,22,24	2.02	7 (31%)	27,30,34	2.53	9 (33%)
1	CRO	B	66	1	22,22,24	2.03	6 (27%)	27,30,34	2.62	8 (29%)

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
1	CRO	C	66	1	-	2/9/29/32	0/2/2/2
1	CRO	D	66	1	-	2/9/29/32	0/2/2/2
1	CRO	A	66	1	-	2/9/29/32	0/2/2/2
1	CRO	B	66	1	-	0/9/29/32	0/2/2/2

All (26) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	66	CRO	CB2-CA2	6.27	1.40	1.35
1	C	66	CRO	CG2-CB2	-4.98	1.37	1.46
1	A	66	CRO	CG2-CB2	-4.93	1.37	1.46
1	B	66	CRO	CB2-CA2	4.87	1.39	1.35
1	C	66	CRO	CA2-N2	4.63	1.48	1.38
1	D	66	CRO	CB2-CA2	4.28	1.38	1.35
1	D	66	CRO	CG2-CB2	-4.07	1.39	1.46
1	B	66	CRO	CG2-CB2	-3.84	1.39	1.46
1	C	66	CRO	CA2-C2	3.61	1.52	1.48
1	B	66	CRO	CA2-N2	3.51	1.46	1.38
1	A	66	CRO	CA2-N2	3.46	1.45	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	66	CRO	C1-N2	3.40	1.37	1.32
1	C	66	CRO	C1-N2	3.38	1.37	1.32
1	A	66	CRO	C2-N3	-3.36	1.31	1.39
1	A	66	CRO	C1-N2	3.33	1.37	1.32
1	B	66	CRO	C2-N3	-3.31	1.32	1.39
1	C	66	CRO	C2-N3	-3.21	1.32	1.39
1	A	66	CRO	CB2-CA2	3.09	1.37	1.35
1	D	66	CRO	C2-N3	-3.04	1.32	1.39
1	C	66	CRO	CA1-C1	2.97	1.56	1.51
1	D	66	CRO	CA2-N2	2.93	1.44	1.38
1	A	66	CRO	CA3-N3	-2.66	1.42	1.47
1	D	66	CRO	C1-N2	2.52	1.35	1.32
1	B	66	CRO	CA2-C2	2.42	1.51	1.48
1	D	66	CRO	CA3-N3	-2.18	1.43	1.47
1	A	66	CRO	CA2-C2	2.07	1.50	1.48

All (44) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	66	CRO	O2-C2-CA2	-10.14	125.27	130.96
1	C	66	CRO	O2-C2-CA2	-9.97	125.36	130.96
1	D	66	CRO	N3-C1-N2	7.04	116.33	111.45
1	B	66	CRO	N3-C1-N2	6.88	116.22	111.45
1	B	66	CRO	CA2-N2-C1	-6.78	100.78	105.77
1	A	66	CRO	CA2-N2-C1	-6.61	100.91	105.77
1	D	66	CRO	CA2-N2-C1	-6.21	101.20	105.77
1	C	66	CRO	N3-C1-N2	6.13	115.70	111.45
1	A	66	CRO	N3-C1-N2	6.09	115.67	111.45
1	C	66	CRO	CA2-N2-C1	-5.79	101.51	105.77
1	C	66	CRO	C2-N3-C1	4.96	110.47	107.97
1	A	66	CRO	C2-N3-C1	4.58	110.28	107.97
1	C	66	CRO	CA2-C2-N3	4.53	105.51	103.37
1	C	66	CRO	CB2-CA2-C2	4.41	127.55	122.28
1	B	66	CRO	O2-C2-CA2	-4.36	128.51	130.96
1	B	66	CRO	CA2-C2-N3	4.14	105.33	103.37
1	A	66	CRO	O3-C3-CA3	-3.90	114.61	126.39
1	A	66	CRO	O2-C2-CA2	-3.62	128.93	130.96
1	D	66	CRO	CA1-C1-N2	-3.59	116.31	123.56
1	D	66	CRO	CB2-CA2-C2	3.55	126.52	122.28
1	D	66	CRO	CA2-C2-N3	3.41	104.98	103.37
1	B	66	CRO	C2-N3-C1	3.38	109.68	107.97
1	A	66	CRO	CA2-C2-N3	3.20	104.88	103.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	66	CRO	CD2-CG2-CB2	-3.08	110.72	121.22
1	C	66	CRO	C2-CA2-N2	-3.08	106.78	108.93
1	B	66	CRO	CB2-CA2-C2	3.05	125.92	122.28
1	A	66	CRO	CB2-CA2-C2	2.92	125.76	122.28
1	B	66	CRO	CA1-C1-N3	-2.72	121.30	124.85
1	D	66	CRO	O2-C2-N3	2.72	129.75	124.35
1	D	66	CRO	C2-N3-C1	2.67	109.32	107.97
1	B	66	CRO	OG1-CB1-CA1	2.66	117.89	110.85
1	C	66	CRO	CD1-CG2-CB2	2.65	130.24	121.22
1	C	66	CRO	CA3-N3-C1	-2.64	124.00	127.16
1	C	66	CRO	O3-C3-CA3	-2.59	118.57	126.39
1	D	66	CRO	CB2-CA2-N2	-2.52	125.33	128.83
1	C	66	CRO	CA1-C1-N2	-2.51	118.50	123.56
1	A	66	CRO	OG1-CB1-CA1	-2.46	104.33	110.85
1	C	66	CRO	OG1-CB1-CA1	-2.41	104.48	110.85
1	D	66	CRO	O3-C3-CA3	-2.39	119.18	126.39
1	C	66	CRO	O2-C2-N3	2.39	129.09	124.35
1	D	66	CRO	CD2-CG2-CB2	-2.32	113.33	121.22
1	C	66	CRO	CB2-CA2-N2	-2.27	125.68	128.83
1	D	66	CRO	CE1-CD1-CG2	-2.14	118.46	121.25
1	A	66	CRO	CB2-CA2-N2	-2.05	125.99	128.83

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	C	66	CRO	N1-CA1-CB1-OG1
1	C	66	CRO	C1-CA1-CB1-OG1
1	D	66	CRO	N1-CA1-CB1-OG1
1	D	66	CRO	C1-CA1-CB1-OG1
1	A	66	CRO	N1-CA1-CB1-OG1
1	A	66	CRO	C1-CA1-CB1-OG1

There are no ring outliers.

4 monomers are involved in 10 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	C	66	CRO	4	0
1	D	66	CRO	1	0
1	A	66	CRO	4	0
1	B	66	CRO	1	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates 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, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	224/236 (94%)	0.78	26 (11%) 4 4	18, 38, 61, 77	0
1	B	224/236 (94%)	0.81	29 (12%) 3 3	14, 40, 61, 72	0
1	C	224/236 (94%)	0.09	4 (1%) 68 66	10, 21, 36, 57	0
1	D	224/236 (94%)	0.15	8 (3%) 42 42	5, 21, 43, 57	0
All	All	896/944 (94%)	0.46	67 (7%) 14 13	5, 30, 58, 77	0

All (67) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	182	TYR	6.9
1	A	133	ASP	5.1
1	B	134	GLY	4.3
1	A	228	GLY	4.1
1	B	230	THR	4.0
1	B	133	ASP	3.9
1	A	6	GLU	3.7
1	A	182	TYR	3.7
1	B	228	GLY	3.6
1	B	174	GLY	3.5
1	A	191	GLY	3.4
1	D	173	ASP	3.4
1	C	6	GLU	3.4
1	A	62	THR	3.3
1	D	133	ASP	3.3
1	A	164	ASN	3.2
1	B	172	GLU	3.1
1	D	39	TYR	2.9
1	A	171	ILE	2.9
1	D	172	GLU	2.9
1	C	230	THR	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	182	TYR	2.8
1	B	140	LYS	2.8
1	A	63	THR	2.7
1	A	157	GLN	2.7
1	D	68	VAL	2.7
1	A	102	ASP	2.7
1	B	164	ASN	2.7
1	C	133	ASP	2.7
1	B	198	ASN	2.6
1	A	190	ASP	2.6
1	B	176	VAL	2.6
1	B	229	ILE	2.6
1	A	140	LYS	2.5
1	A	129	ASP	2.5
1	B	124	GLU	2.5
1	B	102	ASP	2.5
1	A	80	GLN	2.4
1	B	106	TYR	2.4
1	B	132	GLU	2.3
1	B	62	THR	2.3
1	D	132	GLU	2.3
1	A	180	ASP	2.3
1	A	156	LYS	2.3
1	B	101	LYS	2.3
1	A	60	LEU	2.3
1	B	105	ASN	2.3
1	A	174	GLY	2.3
1	D	211	PRO	2.2
1	B	188	ILE	2.2
1	A	175	SER	2.2
1	D	214	LYS	2.2
1	B	175	SER	2.2
1	B	151	TYR	2.2
1	B	173	ASP	2.2
1	A	158	LYS	2.1
1	A	172	GLU	2.1
1	B	201	LEU	2.1
1	A	117	ASP	2.1
1	A	130	PHE	2.1
1	B	60	LEU	2.1
1	B	76	ASP	2.1
1	A	230	THR	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	59	THR	2.1
1	B	178	LEU	2.1
1	B	154	ALA	2.0
1	A	90	GLU	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
1	CRO	C	66	21/23	0.84	0.34	8,22,29,46	0
1	CRO	B	66	21/23	0.88	0.31	22,28,43,51	0
1	CRO	A	66	21/23	0.90	0.29	18,30,48,55	0
1	CRO	D	66	21/23	0.93	0.26	2,16,21,36	0

## 6.3 Carbohydrates [i](#)

There are no carbohydrates 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.