



# wwPDB X-ray Structure Validation Summary Report ⓘ

Nov 15, 2017 – 04:28 PM EST

PDB ID : 5SXU  
Title : X-ray structure of 2-bromoethanol bound to a pentameric ligand gated ion channel (ELIC) in a desensitized state  
Authors : Chen, Q.; Kinde, M.; Cohen, A.; Xu, Y.; Tang, P.  
Deposited on : unknown  
Resolution : 3.10 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

---

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

MolProbity : 4.02b-467  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20030345  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20030345

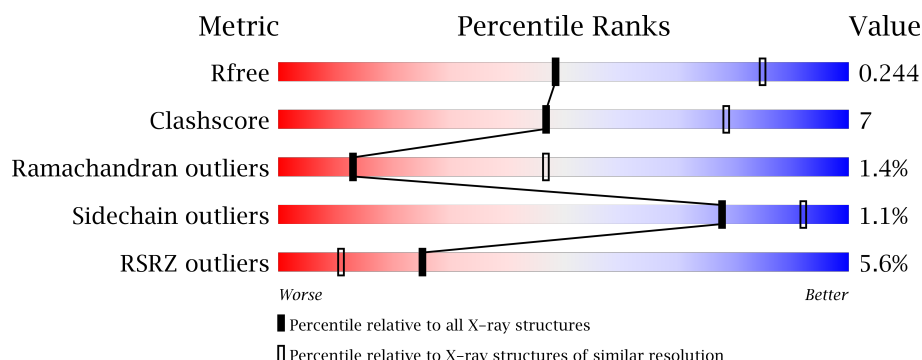
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.10 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))
$R_{free}$	100719	1001 (3.12-3.08)
Clashscore	112137	1099 (3.12-3.08)
Ramachandran outliers	110173	1057 (3.12-3.08)
Sidechain outliers	110143	1057 (3.12-3.08)
RSRZ outliers	101464	1006 (3.12-3.08)

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. 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	322	<div> <div>7%</div> <div> <div></div> <div>84%</div> <div>11%</div> <div>..</div> </div> </div>
1	B	322	<div> <div>4%</div> <div> <div></div> <div>77%</div> <div>18%</div> <div>..</div> </div> </div>
1	C	322	<div> <div>4%</div> <div> <div></div> <div>81%</div> <div>14%</div> <div>..</div> </div> </div>
1	D	322	<div> <div>5%</div> <div> <div></div> <div>77%</div> <div>17%</div> <div>..</div> </div> </div>
1	E	322	<div> <div>6%</div> <div> <div></div> <div>77%</div> <div>18%</div> <div>..</div> </div> </div>

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Length	Quality of chain
1	F	322	
1	G	322	
1	H	322	
1	I	322	
1	J	322	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	BRJ	A	401	-	-	X	X
2	BRJ	A	402	-	-	-	X
2	BRJ	A	403	-	-	-	X
2	BRJ	A	404	-	-	-	X
2	BRJ	B	401	-	-	-	X
2	BRJ	B	402	-	-	-	X
2	BRJ	B	403	-	-	-	X
2	BRJ	C	401	-	-	X	X
2	BRJ	C	402	-	-	-	X
2	BRJ	C	403	-	-	-	X
2	BRJ	D	401	-	-	-	X
2	BRJ	D	402	-	-	-	X
2	BRJ	D	403	-	-	-	X
2	BRJ	E	502	-	-	-	X
2	BRJ	E	503	-	-	-	X
2	BRJ	E	504	-	-	-	X
2	BRJ	F	401	-	-	X	X
2	BRJ	F	402	-	-	-	X
2	BRJ	F	403	-	-	-	X
2	BRJ	F	404	-	-	-	X
2	BRJ	G	401	-	-	-	X
2	BRJ	G	402	-	-	-	X
2	BRJ	H	401	-	-	X	X
2	BRJ	H	402	-	-	-	X
2	BRJ	H	403	-	-	-	X
2	BRJ	I	401	-	-	-	X
2	BRJ	I	402	-	-	-	X
2	BRJ	I	403	-	-	X	X

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	BRJ	J	502	-	-	-	X
2	BRJ	J	503	-	-	-	X
2	BRJ	J	504	-	-	-	X
3	3CN	G	404	-	-	-	X

## 2 Entry composition

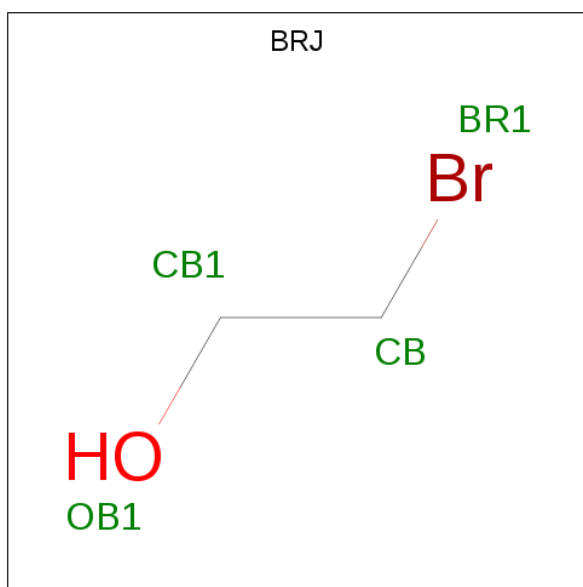
There are 6 unique types of molecules in this entry. The entry contains 25453 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Gamma-aminobutyric-acid receptor subunit beta-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	B	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	C	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	D	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	E	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	F	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	G	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	H	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	I	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			
1	J	308	Total	C	N	O	S	0	0	0
			2516	1639	420	451	6			

- Molecule 2 is 2-BROMOETHANOL (three-letter code: BRJ) (formula: C<sub>2</sub>H<sub>5</sub>BrO).



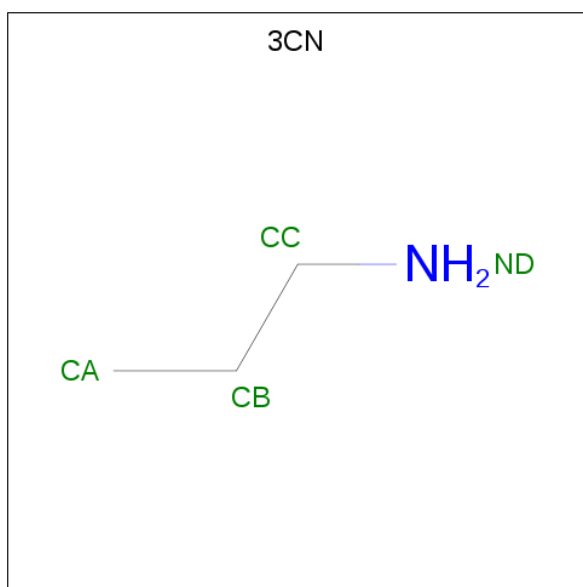
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	Br	C	O	0	0
			4	1	2	1		
2	A	1	Total	Br	C	O	0	0
			4	1	2	1		
2	A	1	Total	Br	C	O	0	0
			4	1	2	1		
2	A	1	Total	Br	C	O	0	0
			4	1	2	1		
2	B	1	Total	Br	C	O	0	0
			4	1	2	1		
2	B	1	Total	Br	C	O	0	0
			4	1	2	1		
2	B	1	Total	Br	C	O	0	0
			4	1	2	1		
2	C	1	Total	Br	C	O	0	0
			4	1	2	1		
2	C	1	Total	Br	C	O	0	0
			4	1	2	1		
2	C	1	Total	Br	C	O	0	0
			4	1	2	1		
2	D	1	Total	Br	C	O	0	0
			4	1	2	1		
2	D	1	Total	Br	C	O	0	0
			4	1	2	1		
2	D	1	Total	Br	C	O	0	0
			4	1	2	1		
2	E	1	Total	Br	C	O	0	0
			4	1	2	1		

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	E	1	Total 4	Br 1	C 2	O 1	0	0
2	E	1	Total 4	Br 1	C 2	O 1	0	0
2	F	1	Total 4	Br 1	C 2	O 1	0	0
2	F	1	Total 4	Br 1	C 2	O 1	0	0
2	F	1	Total 4	Br 1	C 2	O 1	0	0
2	F	1	Total 4	Br 1	C 2	O 1	0	0
2	G	1	Total 4	Br 1	C 2	O 1	0	0
2	G	1	Total 4	Br 1	C 2	O 1	0	0
2	G	1	Total 4	Br 1	C 2	O 1	0	0
2	H	1	Total 4	Br 1	C 2	O 1	0	0
2	H	1	Total 4	Br 1	C 2	O 1	0	0
2	H	1	Total 4	Br 1	C 2	O 1	0	0
2	I	1	Total 4	Br 1	C 2	O 1	0	0
2	I	1	Total 4	Br 1	C 2	O 1	0	0
2	I	1	Total 4	Br 1	C 2	O 1	0	0
2	J	1	Total 4	Br 1	C 2	O 1	0	0
2	J	1	Total 4	Br 1	C 2	O 1	0	0
2	J	1	Total 4	Br 1	C 2	O 1	0	0

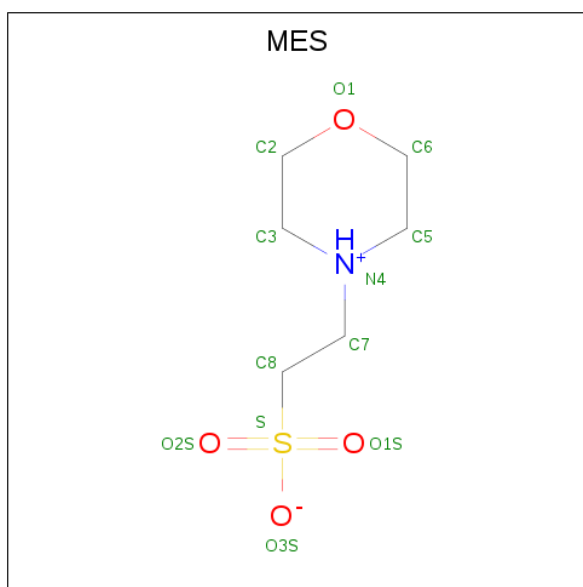
- Molecule 3 is 3-AMINOPROPANE (three-letter code: 3CN) (formula: C<sub>3</sub>H<sub>9</sub>N).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	N	0	0
			4	3	1		
3	B	1	Total	C	N	0	0
			4	3	1		
3	C	1	Total	C	N	0	0
			4	3	1		
3	D	1	Total	C	N	0	0
			4	3	1		
3	E	1	Total	C	N	0	0
			4	3	1		
3	F	1	Total	C	N	0	0
			4	3	1		
3	G	1	Total	C	N	0	0
			4	3	1		
3	H	1	Total	C	N	0	0
			4	3	1		
3	I	1	Total	C	N	0	0
			4	3	1		
3	J	1	Total	C	N	0	0
			4	3	1		

- Molecule 4 is 2-(N-MORPHOLINO)-ETHANESULFONIC ACID (three-letter code: MES) (formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S).





Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	B	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	C	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	D	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	E	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	F	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	G	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	H	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	I	1	Total	C	N	O	S	0	0
			12	6	1	4	1		
4	J	1	Total	C	N	O	S	0	0
			12	6	1	4	1		

- Molecule 5 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	J	1	Total	Cl	0	0
			1	1		
5	C	1	Total	Cl	0	0
			1	1		

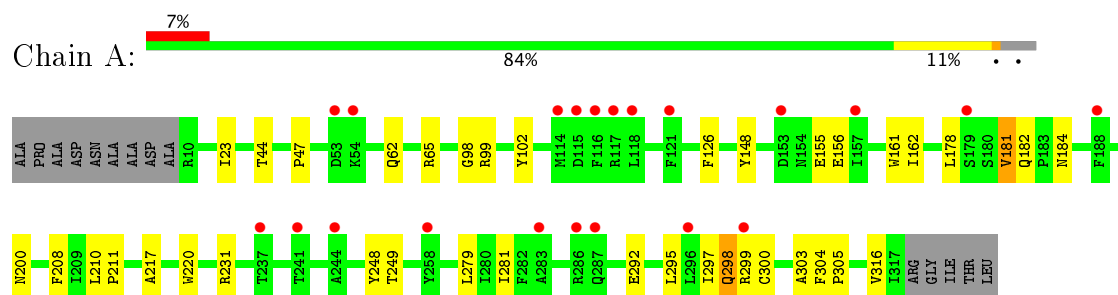
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	C	1	Total 1	O 1	0	0
6	I	1	Total 1	O 1	0	0
6	J	1	Total 1	O 1	0	0

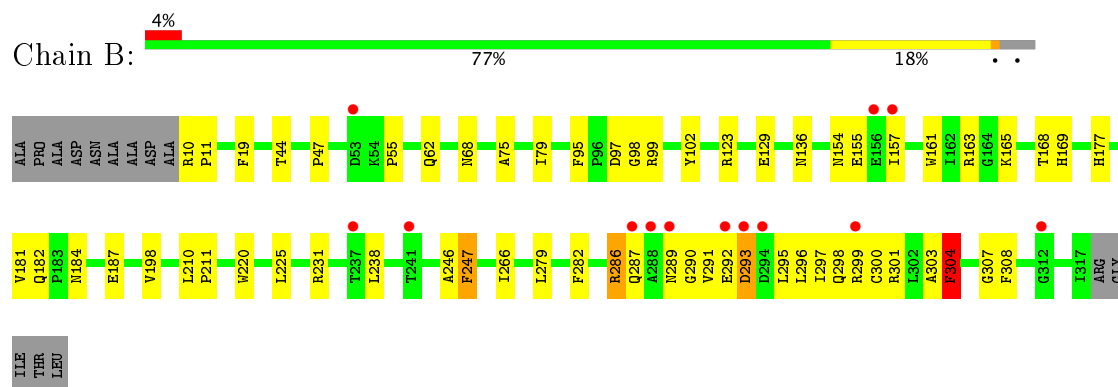
### 3 Residue-property plots [i](#)

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.

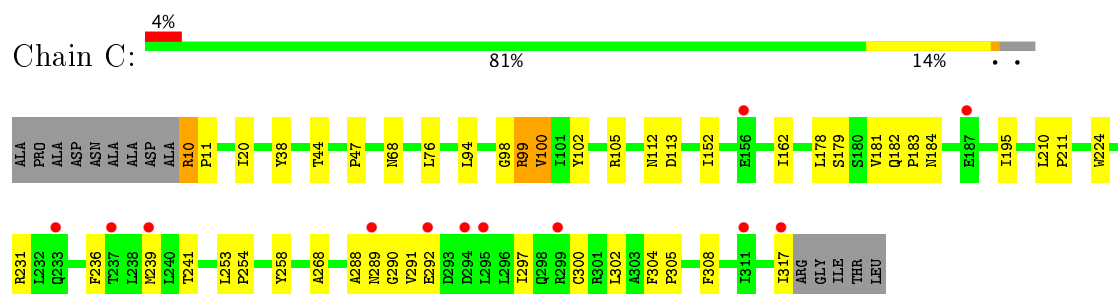
- Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1



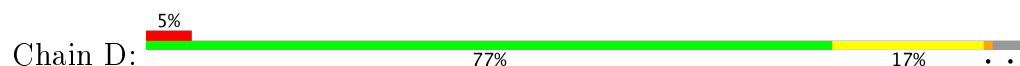
- Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1

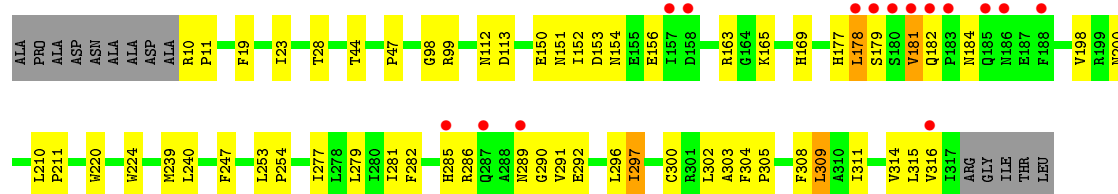


- Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1

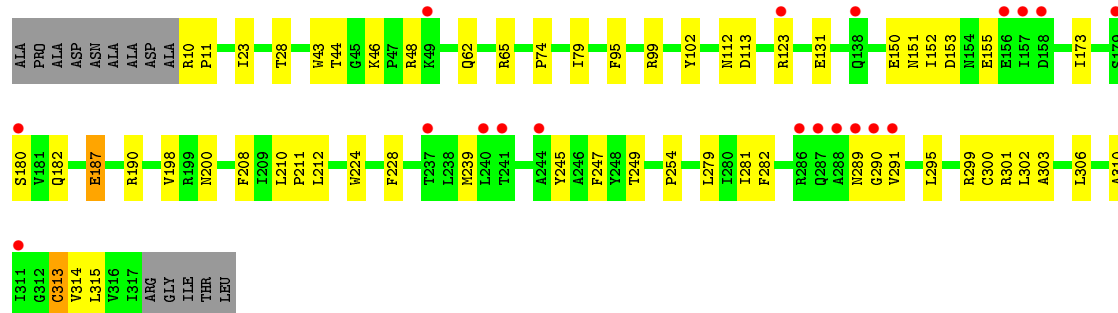
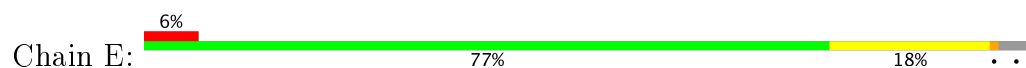


- Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1

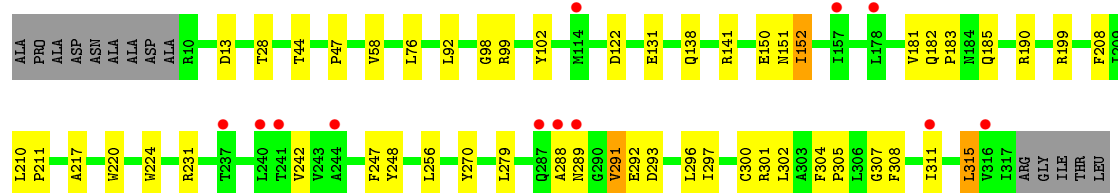
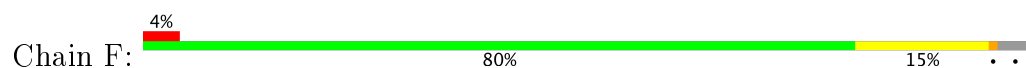




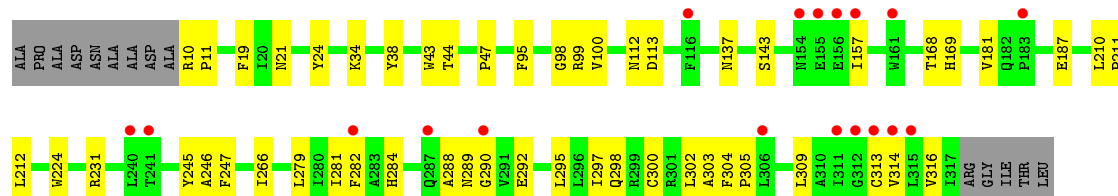
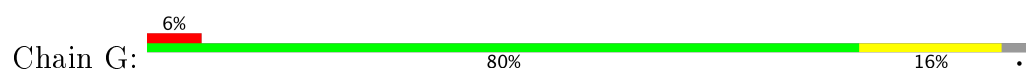
• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1



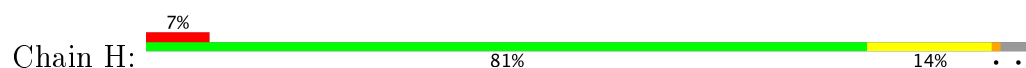
• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1



• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1

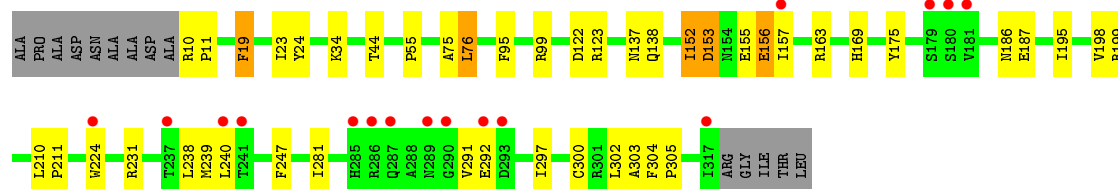
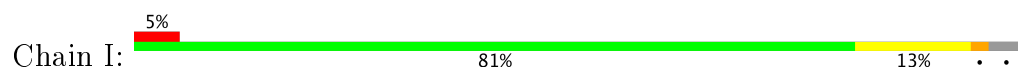


• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1

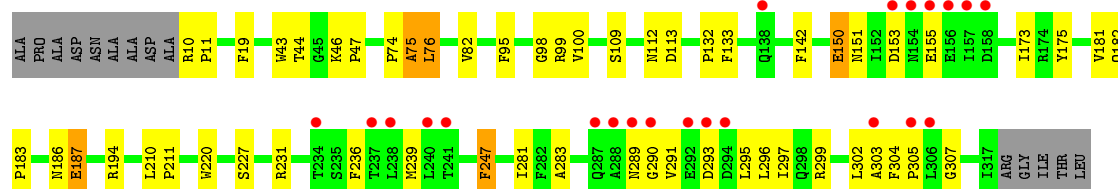
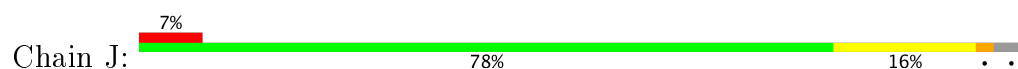




• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1



• Molecule 1: Gamma-aminobutyric-acid receptor subunit beta-1



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	105.90Å 266.79Å 111.11Å 90.00° 107.13° 90.00°	Depositor
Resolution (Å)	29.93 – 3.10 39.61 – 3.10	Depositor EDS
% Data completeness (in resolution range)	99.8 (29.93-3.10) 99.9 (39.61-3.10)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.34 (at 3.12Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, $R_{free}$	0.200 , 0.239 0.207 , 0.244	Depositor DCC
$R_{free}$ test set	5197 reflections (4.90%)	DCC
Wilson B-factor (Å <sup>2</sup> )	108.7	Xtriage
Anisotropy	0.344	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.29 , 81.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	0.022 for l,-k,h	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	25453	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	118.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.22% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: 3CN, BRJ, MES, CL

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	0.31	0/2584	0.60	1/3522 (0.0%)
1	B	0.32	0/2584	0.66	2/3522 (0.1%)
1	C	0.33	0/2584	0.61	0/3522
1	D	0.35	0/2584	0.66	1/3522 (0.0%)
1	E	0.31	0/2584	0.62	0/3522
1	F	0.35	0/2584	0.63	0/3522
1	G	0.32	0/2584	0.61	0/3522
1	H	0.32	0/2584	0.62	1/3522 (0.0%)
1	I	0.31	0/2584	0.63	0/3522
1	J	0.34	0/2584	0.64	0/3522
All	All	0.33	0/25840	0.63	5/35220 (0.0%)

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	1

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	304	PHE	CB-CG-CD1	6.58	125.41	120.80
1	A	178	LEU	CA-CB-CG	6.10	129.33	115.30
1	B	304	PHE	CB-CG-CD2	-5.78	116.75	120.80
1	D	309	LEU	CA-CB-CG	5.58	128.14	115.30
1	H	178	LEU	CA-CB-CG	5.45	127.82	115.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	304	PHE	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	2516	0	2490	28	0
1	B	2516	0	2490	45	0
1	C	2516	0	2490	33	0
1	D	2516	0	2490	51	0
1	E	2516	0	2490	38	0
1	F	2516	0	2490	38	0
1	G	2516	0	2490	35	0
1	H	2516	0	2490	37	0
1	I	2516	0	2490	45	0
1	J	2516	0	2490	41	0
2	A	16	0	12	3	0
2	B	12	0	9	1	0
2	C	12	0	9	3	0
2	D	12	0	9	1	0
2	E	12	0	9	2	0
2	F	16	0	12	2	0
2	G	12	0	9	1	0
2	H	12	0	9	2	0
2	I	12	0	9	4	0
2	J	12	0	9	1	0
3	A	4	0	9	0	0
3	B	4	0	9	0	0
3	C	4	0	9	0	0
3	D	4	0	9	0	0
3	E	4	0	9	0	0
3	F	4	0	9	0	0
3	G	4	0	9	0	0
3	H	4	0	9	1	0
3	I	4	0	9	0	0

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	J	4	0	9	0	0
4	A	12	0	13	0	0
4	B	12	0	13	0	0
4	C	12	0	13	0	0
4	D	12	0	12	0	0
4	E	12	0	13	0	0
4	F	12	0	12	0	0
4	G	12	0	13	0	0
4	H	12	0	13	0	0
4	I	12	0	13	0	0
4	J	12	0	13	0	0
5	C	1	0	0	0	0
5	J	1	0	0	0	0
6	C	1	0	0	0	0
6	I	1	0	0	0	0
6	J	1	0	0	0	0
All	All	25453	0	25214	359	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 7.

The worst 5 of 359 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:231:ARG:NH2	1:C:292:GLU:OE2	2.12	0.82
1:F:138:GLN:OE1	1:F:185:GLN:NE2	2.15	0.80
1:B:168:THR:O	1:B:169:HIS:ND1	2.15	0.78
1:B:168:THR:C	1:B:169:HIS:HD1	1.88	0.75
1:D:112:ASN:OD1	1:D:113:ASP:N	2.20	0.74

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	306/322 (95%)	278 (91%)	25 (8%)	3 (1%)	18	57
1	B	306/322 (95%)	270 (88%)	28 (9%)	8 (3%)	6	31
1	C	306/322 (95%)	274 (90%)	27 (9%)	5 (2%)	11	43
1	D	306/322 (95%)	274 (90%)	28 (9%)	4 (1%)	14	48
1	E	306/322 (95%)	275 (90%)	26 (8%)	5 (2%)	11	43
1	F	306/322 (95%)	278 (91%)	26 (8%)	2 (1%)	25	64
1	G	306/322 (95%)	273 (89%)	30 (10%)	3 (1%)	18	57
1	H	306/322 (95%)	273 (89%)	30 (10%)	3 (1%)	18	57
1	I	306/322 (95%)	274 (90%)	28 (9%)	4 (1%)	14	48
1	J	306/322 (95%)	273 (89%)	27 (9%)	6 (2%)	9	37
All	All	3060/3220 (95%)	2742 (90%)	275 (9%)	43 (1%)	13	47

5 of 43 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	181	VAL
1	B	181	VAL
1	B	286	ARG
1	B	292	GLU
1	C	99	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	276/284 (97%)	276 (100%)	0	100	100
1	B	276/284 (97%)	273 (99%)	3 (1%)	78	92
1	C	276/284 (97%)	272 (99%)	4 (1%)	71	90
1	D	276/284 (97%)	273 (99%)	3 (1%)	78	92

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	E	276/284 (97%)	273 (99%)	3 (1%)	78	92
1	F	276/284 (97%)	274 (99%)	2 (1%)	87	95
1	G	276/284 (97%)	274 (99%)	2 (1%)	87	95
1	H	276/284 (97%)	274 (99%)	2 (1%)	87	95
1	I	276/284 (97%)	272 (99%)	4 (1%)	71	90
1	J	276/284 (97%)	270 (98%)	6 (2%)	57	85
All	All	2760/2840 (97%)	2731 (99%)	29 (1%)	78	92

5 of 29 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	F	291	VAL
1	G	143	SER
1	J	239	MET
1	F	315	LEU
1	H	19	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	ASN
1	A	177	HIS
1	D	233	GLN
1	F	185	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

Of 54 ligands modelled in this entry, 2 are monoatomic - leaving 52 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
2	BRJ	A	401	-	3,3,3	0.48	0	2,2,2	1.00	0
2	BRJ	A	402	-	3,3,3	0.37	0	2,2,2	1.92	1 (50%)
2	BRJ	A	403	-	3,3,3	0.43	0	2,2,2	0.46	0
2	BRJ	A	404	-	3,3,3	0.42	0	2,2,2	0.59	0
3	3CN	A	405	-	3,3,3	0.81	0	2,2,2	0.31	0
4	MES	A	406	-	12,12,12	2.08	1 (8%)	14,16,16	1.95	4 (28%)
2	BRJ	B	401	-	3,3,3	0.37	0	2,2,2	0.65	0
2	BRJ	B	402	-	3,3,3	0.39	0	2,2,2	0.43	0
2	BRJ	B	403	-	3,3,3	0.46	0	2,2,2	0.13	0
3	3CN	B	404	-	3,3,3	0.74	0	2,2,2	0.28	0
4	MES	B	405	-	12,12,12	2.11	1 (8%)	14,16,16	1.82	4 (28%)
2	BRJ	C	401	-	3,3,3	0.46	0	2,2,2	0.53	0
2	BRJ	C	402	-	3,3,3	0.45	0	2,2,2	0.18	0
2	BRJ	C	403	-	3,3,3	0.41	0	2,2,2	0.61	0
3	3CN	C	404	-	3,3,3	0.76	0	2,2,2	0.23	0
4	MES	C	405	-	12,12,12	2.04	1 (8%)	14,16,16	2.36	5 (35%)
2	BRJ	D	401	-	3,3,3	0.44	0	2,2,2	0.49	0
2	BRJ	D	402	-	3,3,3	0.39	0	2,2,2	0.58	0
2	BRJ	D	403	-	3,3,3	0.46	0	2,2,2	0.26	0
3	3CN	D	404	-	3,3,3	0.75	0	2,2,2	0.23	0
4	MES	D	405	-	12,12,12	2.11	1 (8%)	14,16,16	1.93	5 (35%)
3	3CN	E	501	-	3,3,3	0.75	0	2,2,2	0.21	0
2	BRJ	E	502	-	3,3,3	0.45	0	2,2,2	0.61	0
2	BRJ	E	503	-	3,3,3	0.41	0	2,2,2	0.58	0
2	BRJ	E	504	-	3,3,3	0.44	0	2,2,2	0.28	0
4	MES	E	505	-	12,12,12	2.15	1 (8%)	14,16,16	1.86	5 (35%)
2	BRJ	F	401	-	3,3,3	0.39	0	2,2,2	0.38	0
2	BRJ	F	402	-	3,3,3	0.41	0	2,2,2	0.55	0
2	BRJ	F	403	-	3,3,3	0.42	0	2,2,2	0.85	0
2	BRJ	F	404	-	3,3,3	0.40	0	2,2,2	0.81	0
3	3CN	F	405	-	3,3,3	0.77	0	2,2,2	0.26	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	MES	F	406	-	12,12,12	2.07	1 (8%)	14,16,16	1.94	4 (28%)
2	BRJ	G	401	-	3,3,3	0.44	0	2,2,2	0.43	0
2	BRJ	G	402	-	3,3,3	0.31	0	2,2,2	1.61	1 (50%)
2	BRJ	G	403	-	3,3,3	0.39	0	2,2,2	0.87	0
3	3CN	G	404	-	3,3,3	0.92	0	2,2,2	0.10	0
4	MES	G	405	-	12,12,12	2.09	1 (8%)	14,16,16	2.08	6 (42%)
2	BRJ	H	401	-	3,3,3	0.41	0	2,2,2	1.07	0
2	BRJ	H	402	-	3,3,3	0.37	0	2,2,2	0.85	0
2	BRJ	H	403	-	3,3,3	0.41	0	2,2,2	0.42	0
3	3CN	H	404	-	3,3,3	0.89	0	2,2,2	0.14	0
4	MES	H	405	-	12,12,12	2.12	1 (8%)	14,16,16	1.86	4 (28%)
2	BRJ	I	401	-	3,3,3	0.45	0	2,2,2	0.46	0
2	BRJ	I	402	-	3,3,3	0.40	0	2,2,2	0.59	0
2	BRJ	I	403	-	3,3,3	0.42	0	2,2,2	0.64	0
3	3CN	I	404	-	3,3,3	0.79	0	2,2,2	0.21	0
4	MES	I	405	-	12,12,12	2.15	1 (8%)	14,16,16	1.72	4 (28%)
3	3CN	J	501	-	3,3,3	0.87	0	2,2,2	0.17	0
2	BRJ	J	502	-	3,3,3	0.36	0	2,2,2	0.93	0
2	BRJ	J	503	-	3,3,3	0.41	0	2,2,2	0.48	0
2	BRJ	J	504	-	3,3,3	0.33	0	2,2,2	1.99	1 (50%)
4	MES	J	505	-	12,12,12	2.08	1 (8%)	14,16,16	2.12	3 (21%)

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
2	BRJ	A	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	A	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	A	403	-	-	0/1/1/1	0/0/0/0
2	BRJ	A	404	-	-	0/1/1/1	0/0/0/0
3	3CN	A	405	-	-	0/1/1/1	0/0/0/0
4	MES	A	406	-	-	0/6/14/14	0/1/1/1
2	BRJ	B	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	B	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	B	403	-	-	0/1/1/1	0/0/0/0
3	3CN	B	404	-	-	0/1/1/1	0/0/0/0
4	MES	B	405	-	-	0/6/14/14	0/1/1/1
2	BRJ	C	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	C	402	-	-	0/1/1/1	0/0/0/0

Continued on next page...

*Continued from previous page...*

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	BRJ	C	403	-	-	0/1/1/1	0/0/0/0
3	3CN	C	404	-	-	0/1/1/1	0/0/0/0
4	MES	C	405	-	-	0/6/14/14	0/1/1/1
2	BRJ	D	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	D	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	D	403	-	-	0/1/1/1	0/0/0/0
3	3CN	D	404	-	-	0/1/1/1	0/0/0/0
4	MES	D	405	-	-	0/6/14/14	0/1/1/1
3	3CN	E	501	-	-	0/1/1/1	0/0/0/0
2	BRJ	E	502	-	-	0/1/1/1	0/0/0/0
2	BRJ	E	503	-	-	0/1/1/1	0/0/0/0
2	BRJ	E	504	-	-	0/1/1/1	0/0/0/0
4	MES	E	505	-	-	0/6/14/14	0/1/1/1
2	BRJ	F	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	F	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	F	403	-	-	0/1/1/1	0/0/0/0
2	BRJ	F	404	-	-	0/1/1/1	0/0/0/0
3	3CN	F	405	-	-	0/1/1/1	0/0/0/0
4	MES	F	406	-	-	0/6/14/14	0/1/1/1
2	BRJ	G	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	G	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	G	403	-	-	0/1/1/1	0/0/0/0
3	3CN	G	404	-	-	0/1/1/1	0/0/0/0
4	MES	G	405	-	-	0/6/14/14	0/1/1/1
2	BRJ	H	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	H	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	H	403	-	-	0/1/1/1	0/0/0/0
3	3CN	H	404	-	-	0/1/1/1	0/0/0/0
4	MES	H	405	-	-	0/6/14/14	0/1/1/1
2	BRJ	I	401	-	-	0/1/1/1	0/0/0/0
2	BRJ	I	402	-	-	0/1/1/1	0/0/0/0
2	BRJ	I	403	-	-	0/1/1/1	0/0/0/0
3	3CN	I	404	-	-	0/1/1/1	0/0/0/0
4	MES	I	405	-	-	0/6/14/14	0/1/1/1
3	3CN	J	501	-	-	0/1/1/1	0/0/0/0
2	BRJ	J	502	-	-	0/1/1/1	0/0/0/0
2	BRJ	J	503	-	-	0/1/1/1	0/0/0/0
2	BRJ	J	504	-	-	0/1/1/1	0/0/0/0
4	MES	J	505	-	-	0/6/14/14	0/1/1/1

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	I	405	MES	C8-S	-7.19	1.66	1.77
4	E	505	MES	C8-S	-7.16	1.66	1.77
4	D	405	MES	C8-S	-7.06	1.66	1.77
4	H	405	MES	C8-S	-7.05	1.66	1.77
4	B	405	MES	C8-S	-7.03	1.67	1.77

The worst 5 of 47 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	405	MES	C6-C5-N4	-3.28	105.51	110.11
2	J	504	BRJ	BR1-CB-CB1	-2.64	104.27	111.50
2	A	402	BRJ	BR1-CB-CB1	-2.63	104.29	111.50
4	G	405	MES	C6-C5-N4	-2.51	106.60	110.11
4	G	405	MES	C2-C3-N4	-2.28	106.91	110.11

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

17 monomers are involved in 21 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	401	BRJ	2	0
2	A	402	BRJ	1	0
2	A	403	BRJ	1	0
2	B	401	BRJ	1	0
2	C	401	BRJ	2	0
2	C	403	BRJ	1	0
2	D	403	BRJ	1	0
2	E	502	BRJ	1	0
2	E	504	BRJ	1	0
2	F	401	BRJ	2	0
2	G	401	BRJ	1	0
2	G	402	BRJ	1	0
2	H	401	BRJ	2	0
3	H	404	3CN	1	0
2	I	401	BRJ	1	0
2	I	403	BRJ	3	0
2	J	502	BRJ	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



## 6 Fit of model and data ⓘ

### 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	308/322 (95%)	0.10	21 (6%) 18 7	72, 115, 167, 209	0
1	B	308/322 (95%)	0.00	13 (4%) 37 18	69, 107, 178, 227	0
1	C	308/322 (95%)	0.04	12 (3%) 40 19	71, 110, 181, 204	0
1	D	308/322 (95%)	0.06	15 (4%) 30 14	63, 102, 174, 222	0
1	E	308/322 (95%)	0.18	19 (6%) 21 8	73, 113, 168, 198	0
1	F	308/322 (95%)	0.01	12 (3%) 40 19	71, 121, 177, 209	0
1	G	308/322 (95%)	0.04	18 (5%) 24 10	57, 106, 163, 204	0
1	H	308/322 (95%)	0.18	23 (7%) 15 5	70, 113, 185, 215	0
1	I	308/322 (95%)	0.03	16 (5%) 28 12	70, 110, 173, 210	0
1	J	308/322 (95%)	0.19	22 (7%) 17 6	84, 123, 187, 207	0
All	All	3080/3220 (95%)	0.08	171 (5%) 25 11	57, 112, 177, 227	0

The worst 5 of 171 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	289	ASN	15.2
1	D	179	SER	7.7
1	H	289	ASN	7.1
1	H	288	ALA	6.3
1	J	287	GLN	6.2

### 6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 6.3 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 6.4 Ligands ⓘ

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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
2	BRJ	G	401	4/4	0.58	1.02	39.27	111,117,133,164	0
2	BRJ	H	401	4/4	0.62	0.99	21.37	98,101,128,154	0
2	BRJ	B	401	4/4	0.43	1.25	18.43	106,132,136,192	0
2	BRJ	I	401	4/4	0.32	0.84	16.75	103,131,137,169	0
2	BRJ	D	401	4/4	0.58	0.68	16.24	94,127,129,141	0
2	BRJ	G	402	4/4	0.87	0.84	14.30	122,125,135,135	0
2	BRJ	I	402	4/4	0.55	0.72	12.85	98,114,121,125	0
2	BRJ	C	401	4/4	0.47	0.60	12.84	86,91,113,146	0
2	BRJ	J	503	4/4	0.79	0.99	12.74	131,142,143,153	0
2	BRJ	D	402	4/4	0.71	0.58	12.56	112,112,120,122	0
2	BRJ	A	401	4/4	0.53	0.92	11.93	124,131,154,183	0
2	BRJ	B	402	4/4	0.83	0.82	11.71	125,130,137,151	0
2	BRJ	J	502	4/4	0.60	0.89	11.30	109,116,118,139	0
2	BRJ	E	502	4/4	0.50	0.72	10.61	102,126,131,160	0
2	BRJ	H	403	4/4	0.57	0.66	10.15	142,145,149,152	0
2	BRJ	E	504	4/4	0.50	0.73	9.38	118,126,142,147	0
2	BRJ	I	403	4/4	0.32	0.65	8.59	95,99,111,142	0
2	BRJ	H	402	4/4	0.78	0.63	8.32	93,117,125,131	0
2	BRJ	F	401	4/4	0.65	0.46	7.88	99,117,132,135	0
2	BRJ	E	503	4/4	0.84	0.54	7.28	130,130,148,165	0
2	BRJ	F	402	4/4	0.64	0.45	7.05	101,108,121,128	0
2	BRJ	D	403	4/4	0.24	0.57	6.45	93,99,105,145	0
2	BRJ	J	504	4/4	0.74	0.56	6.27	145,148,153,158	0
2	BRJ	A	402	4/4	0.89	0.70	5.98	102,110,127,154	0
2	BRJ	C	402	4/4	0.55	0.42	5.80	104,106,110,139	0
2	BRJ	A	404	4/4	0.88	0.68	5.27	137,154,169,175	0
2	BRJ	C	403	4/4	0.65	0.45	5.16	121,147,151,177	0
2	BRJ	B	403	4/4	0.58	0.48	4.39	118,141,150,163	0
2	BRJ	F	403	4/4	0.69	0.57	4.19	118,146,156,160	0

*Continued on next page...*

*Continued from previous page...*

Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors( $\text{\AA}^2$ )	Q<0.9
2	BRJ	F	404	4/4	0.81	0.81	3.65	149,152,155,157	0
2	BRJ	A	403	4/4	0.60	0.50	3.34	125,129,136,146	0
3	3CN	G	404	4/4	0.92	0.34	2.13	85,87,97,99	0
2	BRJ	G	403	4/4	0.87	0.33	1.67	105,115,119,129	0
3	3CN	F	405	4/4	0.84	0.37	1.34	91,93,98,112	0
3	3CN	J	501	4/4	0.89	0.22	-0.41	97,121,130,132	0
4	MES	E	505	12/12	0.88	0.13	-0.82	136,156,168,171	0
3	3CN	D	404	4/4	0.88	0.33	-	96,102,109,113	0
5	CL	C	406	1/1	0.96	0.24	-	107,107,107,107	0
4	MES	F	406	12/12	0.93	0.15	-	131,155,168,187	0
4	MES	C	405	12/12	0.90	0.19	-	115,134,160,166	0
3	3CN	H	404	4/4	0.73	0.52	-	83,94,100,122	0
4	MES	A	406	12/12	0.85	0.18	-	132,154,185,186	0
3	3CN	I	404	4/4	0.91	0.38	-	96,98,103,109	0
3	3CN	E	501	4/4	0.94	0.28	-	91,95,102,114	0
4	MES	J	505	12/12	0.88	0.16	-	158,170,183,184	0
4	MES	G	405	12/12	0.92	0.18	-	128,151,170,173	0
4	MES	H	405	12/12	0.92	0.14	-	113,135,158,179	0
4	MES	B	405	12/12	0.89	0.11	-	129,148,167,179	0
3	3CN	A	405	4/4	0.69	0.42	-	86,98,102,115	0
5	CL	J	506	1/1	0.77	0.35	-	166,166,166,166	0
4	MES	I	405	12/12	0.85	0.30	-	141,175,183,195	0
4	MES	D	405	12/12	0.80	0.18	-	126,147,174,178	0
3	3CN	B	404	4/4	0.89	0.35	-	79,96,99,105	0
3	3CN	C	404	4/4	0.84	0.35	-	84,92,119,127	0

## 6.5 Other polymers ⓘ

There are no such residues in this entry.