



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 4, 2024 – 11:59 AM EST

PDB ID : 3BJM  
Title : Crystal structure of human DPP-IV in complex with (1S,3S, 5S)-2-[(2S)-2-AMINO-2-(3-HYDROXYTRICYCLO[3.3.1.1<sup>3,7</sup>]DEC-1- YL)ACETYL]-2-AZABICYCLO[3.1.0]HEXANE-3-CARBONITRILE (CAS), (1S,3S,5S)-2-((2S)-2-AMINO-2-(3-HYDROXYADAMANTAN-1- YL)ACETYL)-2-AZABICYCLO[3.1.0]HEXANE-3-CARBONITRILE (IUPAC), OR BMS-477118  
Authors : Klei, H.E.  
Deposited on : 2007-12-04  
Resolution : 2.35 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](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.

The types of validation reports are described at

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

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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 : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 3.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)

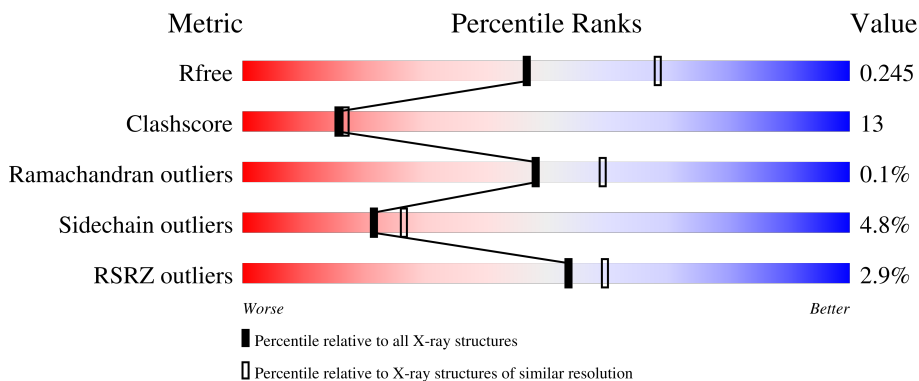
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.35 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))
$R_{free}$	164625	1460 (2.36-2.36)
Clashscore	180529	1571 (2.36-2.36)
Ramachandran outliers	177936	1559 (2.36-2.36)
Sidechain outliers	177891	1559 (2.36-2.36)
RSRZ outliers	164620	1460 (2.36-2.36)

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  $\geq 3$ , 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	728	
1	B	728	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

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	NAG	A	768	-	-	X	-
2	NAG	B	768	-	-	X	-

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 12238 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 Dipeptidyl peptidase 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	728	Total 5963	C 3827	N 982	O 1128	S 26	0	0	0
1	B	728	Total 5963	C 3827	N 982	O 1128	S 26	0	0	0

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).



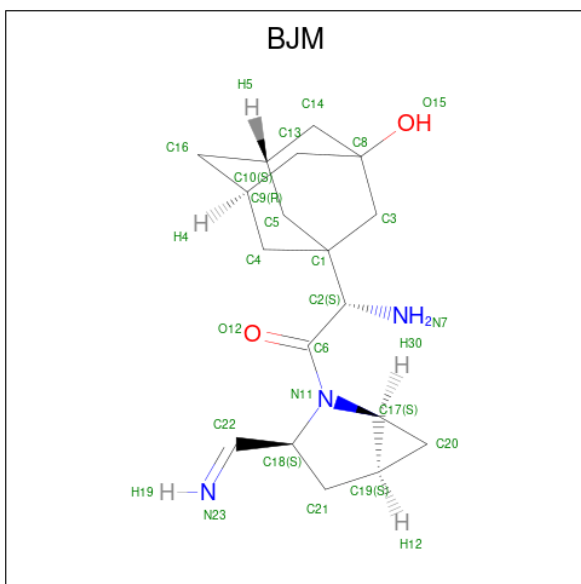
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0
2	A	1	Total 14	C 8	N 1	O 5	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		
2	B	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 3 is (2 {S})-2-azanyl-1-[(1 {S},3 {S},5 {S})-3-(iminomethyl)-2-azabicyclo[3.1.0]hexan-2-yl]-2-[(5 {R},7 {S})-3-oxidanyl-1-adamantyl]ethanone (three-letter code: BJM) (formula: C<sub>18</sub>H<sub>27</sub>N<sub>3</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			23	18	3	2		
3	B	1	Total	C	N	O	0	0
			23	18	3	2		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	62	Total	O	0	0
			62	62		
4	B	92	Total	O	0	0
			92	92		

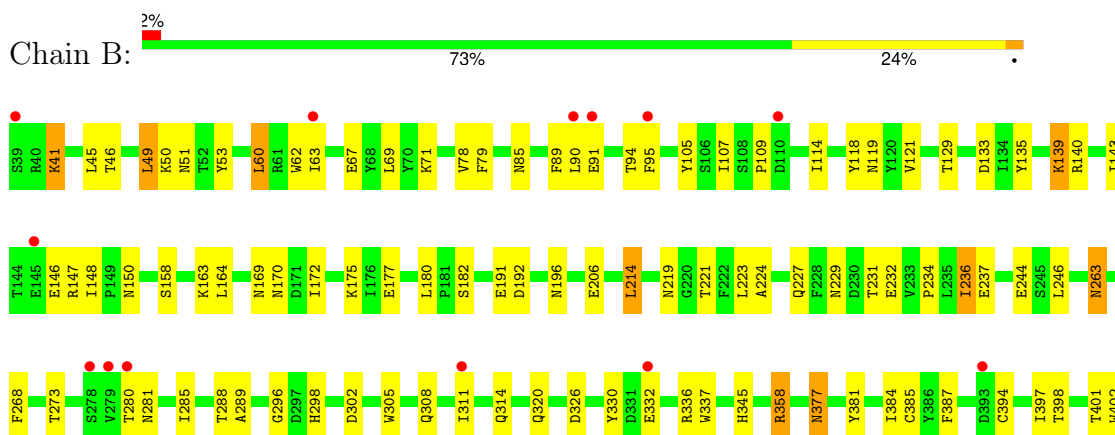
### 3 Residue-property plots i

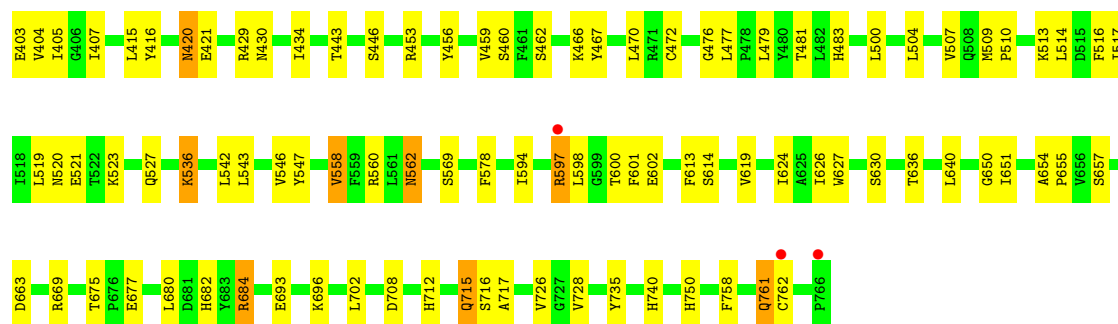
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

- Molecule 1: Dipeptidyl peptidase 4



- Molecule 1: Dipeptidyl peptidase 4





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	65.28Å 67.95Å 423.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.96 – 2.35 45.96 – 2.35	Depositor EDS
% Data completeness (in resolution range)	98.2 (45.96-2.35) 98.3 (45.96-2.35)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.73 (at 2.34Å)	Xtrriage
Refinement program	CNS, CNX 2005	Depositor
R, $R_{free}$	0.213 , 0.253 0.203 , 0.245	Depositor DCC
$R_{free}$ test set	1576 reflections (2.00%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	41.0	Xtrriage
Anisotropy	0.483	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 23.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	0.029 for k,h,-l	Xtrriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	12238	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.91% 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: NAG, BJM

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	0.32	0/6135	0.50	0/8344
1	B	0.33	0/6135	0.52	0/8344
All	All	0.33	0/12270	0.51	0/16688

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 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	5963	0	5684	144	0
1	B	5963	0	5684	168	0
2	A	70	0	65	18	0
2	B	42	0	39	14	0
3	A	23	0	25	0	0
3	B	23	0	25	0	0
4	A	62	0	0	1	0
4	B	92	0	0	8	0
All	All	12238	0	11522	308	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 13.

All (308) 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:229:ASN:HD21	2:A:769:NAG:C1	1.52	1.22
1:B:85:ASN:HD21	2:B:767:NAG:C1	1.61	1.11
1:B:600:THR:HG23	1:B:601:PHE:H	1.09	1.11
1:A:85:ASN:HD21	2:A:767:NAG:C1	1.66	1.07
1:B:177:GLU:HB2	1:B:180:LEU:HD23	1.38	1.05
1:B:229:ASN:HD21	2:B:769:NAG:C1	1.71	1.03
1:B:600:THR:HB	4:B:790:HOH:O	1.57	1.01
1:B:716:SER:HB2	4:B:796:HOH:O	1.66	0.94
1:A:150:ASN:HD21	2:A:768:NAG:C1	1.82	0.92
1:A:229:ASN:ND2	2:A:769:NAG:C1	2.34	0.90
1:B:358:ARG:HB3	1:B:358:ARG:HH21	1.36	0.90
1:B:229:ASN:ND2	2:B:769:NAG:C1	2.35	0.90
1:A:85:ASN:ND2	2:A:767:NAG:C1	2.36	0.87
1:B:600:THR:HG23	1:B:601:PHE:N	1.88	0.86
1:A:147:ARG:HH11	2:A:768:NAG:H83	1.39	0.86
1:B:85:ASN:ND2	2:B:767:NAG:C1	2.38	0.86
1:A:281:ASN:HD21	2:A:770:NAG:C1	1.89	0.85
1:A:657:SER:H	1:A:715:GLN:NE2	1.76	0.84
1:B:597:ARG:O	1:B:600:THR:HG22	1.78	0.83
1:B:716:SER:CB	4:B:796:HOH:O	2.26	0.82
1:A:319:ILE:HD12	1:A:319:ILE:H	1.42	0.82
1:A:736:THR:HG21	1:B:717:ALA:O	1.81	0.81
1:B:600:THR:CG2	1:B:601:PHE:H	1.93	0.79
1:B:320:GLN:OE1	1:B:669:ARG:HD3	1.86	0.76
1:B:219:ASN:HB2	1:B:308:GLN:OE1	1.85	0.76
1:A:85:ASN:HD21	2:A:767:NAG:C2	1.98	0.75
1:B:403:GLU:H	1:B:420:ASN:HD21	1.33	0.75
1:A:358:ARG:HB3	1:A:358:ARG:HH11	1.53	0.74
1:A:764:SER:O	1:A:766:PRO:HD3	1.88	0.74
1:A:403:GLU:H	1:A:420:ASN:HD21	1.37	0.72
1:B:85:ASN:HD21	2:B:767:NAG:C2	2.01	0.72
1:B:377:ASN:C	1:B:377:ASN:HD22	1.93	0.72
1:B:726:VAL:HG13	1:B:728:VAL:HG23	1.72	0.72
1:A:236:ILE:HD13	1:A:237:GLU:H	1.55	0.70
1:A:693:GLU:O	1:A:696:LYS:HG3	1.91	0.70
1:A:431:LEU:HD13	1:A:445:LEU:HD12	1.74	0.70
1:B:46:THR:HG23	1:B:50:LYS:HD3	1.74	0.70
1:B:657:SER:H	1:B:715:GLN:NE2	1.90	0.70
1:B:640:LEU:HD11	1:B:650:GLY:HA3	1.74	0.69
1:B:358:ARG:HB3	1:B:358:ARG:NH2	2.08	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:655:PRO:HD2	4:B:796:HOH:O	1.93	0.67
1:A:377:ASN:C	1:A:377:ASN:HD22	1.97	0.67
1:B:693:GLU:O	1:B:696:LYS:HG2	1.94	0.67
1:B:735:TYR:OH	1:B:750:HIS:HD2	1.78	0.67
1:A:514:LEU:HD12	1:A:557:THR:HG22	1.75	0.66
1:A:358:ARG:HB3	1:A:358:ARG:NH1	2.11	0.65
1:B:150:ASN:ND2	2:B:768:NAG:H2	2.11	0.65
1:A:150:ASN:HD21	2:A:768:NAG:C2	2.10	0.65
1:A:236:ILE:HD13	1:A:237:GLU:N	2.12	0.65
1:B:91:GLU:CD	1:B:91:GLU:H	2.00	0.65
1:B:597:ARG:NH1	1:B:682:HIS:HB2	2.11	0.65
1:B:481:THR:OG1	1:B:483:HIS:HE1	1.80	0.65
1:B:598:LEU:O	1:B:682:HIS:HE1	1.79	0.64
1:A:696:LYS:HD2	1:A:697:GLN:HG3	1.79	0.64
1:A:281:ASN:ND2	2:A:770:NAG:C1	2.60	0.64
1:B:221:THR:O	1:B:273:THR:HG22	1.98	0.64
1:A:150:ASN:ND2	2:A:768:NAG:C1	2.60	0.63
1:A:508:GLN:HE21	1:A:533:HIS:CE1	2.17	0.62
1:A:501:ASP:O	1:A:505:GLN:HG3	2.00	0.62
1:B:46:THR:CG2	1:B:50:LYS:HD3	2.30	0.62
1:A:657:SER:H	1:A:715:GLN:HE21	1.44	0.62
1:A:60:LEU:HD13	1:A:60:LEU:H	1.66	0.60
1:B:536:LYS:H	1:B:536:LYS:HD3	1.65	0.60
1:B:236:ILE:HD13	1:B:237:GLU:N	2.17	0.60
1:B:613:PHE:O	1:B:619:VAL:HG21	2.02	0.59
1:B:229:ASN:HD21	2:B:769:NAG:C2	2.14	0.59
1:B:60:LEU:HD23	1:B:60:LEU:O	2.02	0.59
1:B:78:VAL:HG23	1:B:89:PHE:HB2	1.83	0.59
1:A:750:HIS:HE1	1:B:728:VAL:O	1.85	0.59
1:B:345:HIS:HD2	4:B:810:HOH:O	1.85	0.59
1:B:150:ASN:HD21	2:B:768:NAG:C1	2.15	0.59
1:B:509:MET:HE3	1:B:510:PRO:HD2	1.83	0.59
1:B:41:LYS:HE3	1:B:53:TYR:OH	2.03	0.59
1:B:129:THR:HG23	4:B:787:HOH:O	2.01	0.59
1:B:150:ASN:HD21	2:B:768:NAG:H2	1.67	0.59
1:B:236:ILE:HG13	1:B:712:HIS:CE1	2.38	0.58
1:A:735:TYR:OH	1:A:750:HIS:HD2	1.85	0.58
1:A:520:ASN:HD21	2:A:771:NAG:C1	2.16	0.58
1:A:726:VAL:HG12	1:A:728:VAL:HG23	1.85	0.58
1:A:39:SER:HB2	1:A:508:GLN:HG3	1.85	0.58
1:A:69:LEU:CD1	1:A:107:ILE:HD12	2.34	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:758:PHE:O	1:A:761:GLN:HG3	2.04	0.57
1:A:377:ASN:ND2	1:A:379:GLU:H	2.03	0.57
1:A:39:SER:O	1:A:40:ARG:HB3	2.02	0.57
1:A:98:PHE:HE2	1:A:100:HIS:HB2	1.69	0.57
1:B:89:PHE:CE2	1:B:107:ILE:HD13	2.40	0.57
1:A:69:LEU:HD13	1:A:107:ILE:HD12	1.87	0.57
1:B:150:ASN:OD1	2:B:768:NAG:C1	2.53	0.56
1:A:55:LEU:HD23	1:A:500:LEU:HD12	1.87	0.56
1:A:147:ARG:HH11	2:A:768:NAG:C8	2.15	0.56
1:A:105:TYR:HB2	1:A:114:ILE:HD11	1.86	0.56
1:B:231:THR:HG22	1:B:232:GLU:HG3	1.86	0.56
1:A:150:ASN:HD21	2:A:768:NAG:H2	1.70	0.56
1:A:689:MET:HE3	1:B:244:GLU:HG3	1.87	0.56
1:B:377:ASN:C	1:B:377:ASN:ND2	2.59	0.56
1:A:510:PRO:HD3	1:A:569:SER:HB2	1.88	0.55
1:A:597:ARG:HA	1:A:682:HIS:CD2	2.41	0.55
1:A:219:ASN:HB2	1:A:308:GLN:OE1	2.07	0.55
1:A:98:PHE:CE2	1:A:100:HIS:HB2	2.41	0.55
1:A:229:ASN:HD21	2:A:769:NAG:C2	2.18	0.55
1:B:45:LEU:HG	1:B:49:LEU:HD22	1.89	0.55
1:A:320:GLN:OE1	1:A:669:ARG:HD3	2.07	0.55
1:B:150:ASN:HD21	2:B:768:NAG:C2	2.20	0.55
1:A:190:LYS:HE3	1:A:193:ILE:HD12	1.89	0.54
1:A:142:LEU:HD12	1:A:142:LEU:H	1.73	0.54
1:A:305:TRP:CZ3	1:A:311:ILE:HG12	2.43	0.54
1:B:520:ASN:O	1:B:521:GLU:HB3	2.07	0.54
1:A:281:ASN:HD21	2:A:770:NAG:C2	2.19	0.54
1:B:614:SER:HA	1:B:619:VAL:HG21	1.89	0.54
1:B:726:VAL:HG22	1:B:726:VAL:O	2.07	0.54
1:A:325:MET:CE	1:A:327:ILE:HD11	2.38	0.54
1:B:459:VAL:HG22	1:B:460:SER:N	2.23	0.54
1:B:500:LEU:HD11	1:B:504:LEU:HD11	1.90	0.54
1:B:285:ILE:HD12	1:B:285:ILE:N	2.22	0.54
1:A:169:ASN:O	1:A:170:ASN:HB2	2.08	0.53
1:A:147:ARG:HD3	2:A:768:NAG:H83	1.88	0.53
1:A:325:MET:HE2	1:A:327:ILE:HD11	1.91	0.53
1:A:163:LYS:HZ3	1:A:273:THR:HG22	1.74	0.53
1:A:314:GLN:NE2	1:A:362:PRO:HD3	2.23	0.53
1:B:384:ILE:HG13	1:B:404:VAL:HG21	1.90	0.53
1:A:72:GLN:O	1:A:73:GLU:HB2	2.08	0.53
1:A:420:ASN:C	1:A:420:ASN:HD22	2.12	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:175:LYS:HG3	1:B:182:SER:HB3	1.91	0.53
1:B:387:PHE:CD2	1:B:394:CYS:HB3	2.44	0.53
1:A:163:LYS:NZ	1:A:273:THR:HG22	2.24	0.52
1:A:751:ILE:O	1:A:755:MET:HG3	2.09	0.52
1:B:60:LEU:HD23	1:B:60:LEU:C	2.29	0.52
1:A:60:LEU:HD11	1:A:469:GLN:NE2	2.25	0.52
1:A:471:ARG:HG3	1:A:480:TYR:CE2	2.45	0.51
1:A:508:GLN:HE21	1:A:533:HIS:HE1	1.56	0.51
1:B:53:TYR:HB3	1:B:500:LEU:HD21	1.93	0.51
1:B:401:THR:HG22	1:B:401:THR:O	2.10	0.51
1:A:221:THR:O	1:A:273:THR:HB	2.11	0.51
1:B:175:LYS:NZ	1:B:180:LEU:O	2.42	0.51
1:B:377:ASN:ND2	1:B:381:TYR:H	2.09	0.51
1:B:562:ASN:C	1:B:562:ASN:HD22	2.14	0.51
1:A:236:ILE:HG13	1:A:712:HIS:CE1	2.45	0.51
1:A:626:ILE:O	1:A:650:GLY:HA2	2.11	0.51
1:A:674:PRO:O	1:A:680:LEU:HD13	2.12	0.50
1:A:377:ASN:C	1:A:377:ASN:ND2	2.64	0.50
1:A:451:PRO:HG2	1:A:452:GLU:OE2	2.11	0.50
1:A:543:LEU:HD12	1:A:567:LEU:HD13	1.94	0.50
1:A:60:LEU:HD13	1:A:60:LEU:N	2.26	0.49
1:B:405:ILE:HG13	1:B:429:ARG:HD3	1.93	0.49
1:A:179:ASN:OD1	1:A:180:LEU:HD13	2.13	0.49
1:B:172:ILE:HD13	1:B:214:LEU:HD11	1.94	0.49
1:A:481:THR:OG1	1:A:483:HIS:HE1	1.95	0.49
1:A:742:ILE:HG22	1:A:742:ILE:O	2.13	0.49
1:A:230:ASP:OD1	1:A:264:PRO:HB3	2.13	0.49
1:A:310:ARG:NH2	1:A:343:ARG:HH22	2.10	0.48
1:A:55:LEU:HD23	1:A:500:LEU:CD1	2.43	0.48
1:B:196:ASN:OD1	1:B:227:GLN:HG3	2.13	0.48
1:B:415:LEU:C	1:B:415:LEU:HD23	2.33	0.48
1:B:597:ARG:HG3	1:B:600:THR:HG21	1.96	0.48
1:A:311:ILE:HG13	1:A:337:TRP:CZ3	2.48	0.48
1:A:500:LEU:HD22	1:A:504:LEU:HG	1.96	0.48
1:B:169:ASN:O	1:B:170:ASN:HB2	2.13	0.48
1:A:109:PRO:HD2	1:A:161:GLY:O	2.13	0.48
1:A:602:GLU:HG2	1:A:603:VAL:N	2.29	0.48
1:A:401:THR:O	1:A:401:THR:HG22	2.12	0.48
1:A:508:GLN:NE2	1:A:533:HIS:HE1	2.11	0.48
1:B:140:ARG:N	1:B:140:ARG:HD2	2.29	0.47
1:B:657:SER:H	1:B:715:GLN:HE21	1.60	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:470:LEU:HD12	1:B:483:HIS:CE1	2.50	0.47
1:A:142:LEU:HD12	1:A:142:LEU:N	2.29	0.47
1:B:148:ILE:HD11	1:B:164:LEU:HD13	1.96	0.47
1:B:558:VAL:HG22	1:B:560:ARG:NH1	2.29	0.47
1:B:105:TYR:HB2	1:B:114:ILE:HD11	1.96	0.47
1:A:58:TYR:HD1	1:A:60:LEU:HD12	1.79	0.46
1:B:654:ALA:N	1:B:655:PRO:HD3	2.29	0.46
1:B:288:THR:HG22	1:B:289:ALA:O	2.15	0.46
1:B:594:ILE:HG23	1:B:594:ILE:O	2.16	0.46
1:B:121:VAL:HB	1:B:129:THR:HG22	1.98	0.46
1:B:69:LEU:HD23	1:B:78:VAL:HG22	1.98	0.46
1:A:214:LEU:HD23	1:A:225:TYR:HB3	1.96	0.46
1:A:369:ASN:C	1:A:389:ILE:HG12	2.36	0.46
1:A:492:ARG:HD2	4:A:802:HOH:O	2.16	0.46
1:B:517:ILE:HD11	1:B:578:PHE:CE1	2.51	0.46
1:B:60:LEU:HD22	4:B:798:HOH:O	2.16	0.46
1:B:597:ARG:HD3	1:B:597:ARG:HA	1.77	0.46
1:B:191:GLU:O	1:B:192:ASP:HB2	2.15	0.46
1:B:500:LEU:HD13	1:B:504:LEU:HG	1.98	0.46
1:B:626:ILE:O	1:B:650:GLY:HA2	2.16	0.46
1:B:675:THR:C	1:B:680:LEU:HB2	2.36	0.46
1:A:417:TYR:HE1	1:A:434:ILE:HG13	1.82	0.45
1:B:163:LYS:HZ2	1:B:273:THR:CG2	2.29	0.45
1:B:397:ILE:HG22	1:B:398:THR:HG23	1.97	0.45
1:B:598:LEU:O	1:B:682:HIS:CE1	2.66	0.45
1:B:680:LEU:HD21	1:B:684:ARG:NE	2.32	0.45
1:B:109:PRO:HG2	1:B:158:SER:O	2.16	0.45
1:B:680:LEU:HD13	1:B:680:LEU:C	2.37	0.45
1:A:229:ASN:HB3	1:A:265:THR:OG1	2.16	0.45
1:A:425:MET:CE	1:A:514:LEU:HD13	2.47	0.45
1:A:459:VAL:HG22	1:A:460:SER:N	2.32	0.45
1:A:105:TYR:HA	1:A:115:LEU:O	2.16	0.45
1:B:305:TRP:CZ3	1:B:311:ILE:HG12	2.52	0.45
1:A:60:LEU:CD1	1:A:469:GLN:NE2	2.80	0.45
1:A:658:ARG:HG3	1:A:687:THR:HG22	1.97	0.45
1:B:118:TYR:O	1:B:119:ASN:HB2	2.17	0.45
1:B:206:GLU:OE2	1:B:663:ASP:OD2	2.34	0.45
1:B:163:LYS:NZ	1:B:273:THR:HG23	2.32	0.45
1:B:305:TRP:CH2	1:B:311:ILE:HD11	2.51	0.45
1:B:517:ILE:HD12	1:B:519:LEU:HD11	1.99	0.44
1:A:312:SER:O	1:A:313:LEU:HD23	2.18	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:594:ILE:HD12	1:A:594:ILE:HA	1.86	0.44
1:B:63:ILE:HD11	1:B:109:PRO:O	2.17	0.44
1:A:594:ILE:HD11	1:A:602:GLU:OE1	2.18	0.44
1:B:415:LEU:HD23	1:B:416:TYR:N	2.33	0.44
1:A:60:LEU:HD11	1:A:469:GLN:CD	2.37	0.44
1:B:708:ASP:OD1	1:B:740:HIS:HB2	2.18	0.44
1:B:477:LEU:HD22	1:B:500:LEU:HD12	1.99	0.44
1:B:677:GLU:CD	1:B:677:GLU:H	2.21	0.44
1:B:49:LEU:HD12	1:B:49:LEU:HA	1.83	0.44
1:A:596:ARG:NH2	1:A:678:ASP:OD1	2.50	0.44
1:B:150:ASN:ND2	2:B:768:NAG:C1	2.79	0.44
1:B:654:ALA:N	1:B:655:PRO:CD	2.80	0.44
1:B:758:PHE:O	1:B:761:GLN:HG3	2.18	0.44
1:A:177:GLU:HB2	1:A:180:LEU:HD22	2.00	0.43
1:A:369:ASN:O	1:A:389:ILE:HG12	2.18	0.43
1:A:403:GLU:H	1:A:420:ASN:ND2	2.11	0.43
1:B:263:ASN:HD22	1:B:263:ASN:HA	1.62	0.43
1:B:453:ARG:HG3	1:B:476:GLY:HA3	2.00	0.43
1:B:619:VAL:HG23	1:B:619:VAL:O	2.17	0.43
1:A:726:VAL:O	1:A:726:VAL:CG1	2.65	0.43
1:B:516:PHE:CZ	1:B:523:LYS:HE2	2.53	0.43
1:B:627:TRP:HB2	1:B:651:ILE:HB	1.99	0.43
1:A:39:SER:HB2	1:A:508:GLN:CG	2.48	0.43
1:A:508:GLN:NE2	1:A:533:HIS:CE1	2.83	0.43
1:B:715:GLN:HE21	1:B:715:GLN:HB3	1.61	0.43
1:B:302:ASP:HB3	1:B:314:GLN:HB2	2.01	0.43
1:B:507:VAL:HG23	1:B:509:MET:HG2	1.99	0.43
1:A:398:THR:CG2	1:A:434:ILE:HD11	2.49	0.43
1:B:387:PHE:CE2	1:B:394:CYS:HB3	2.54	0.43
1:B:630:SER:HA	1:B:654:ALA:O	2.18	0.43
1:A:519:LEU:HD23	1:A:519:LEU:HA	1.67	0.43
1:B:594:ILE:CD1	1:B:601:PHE:HB2	2.49	0.43
1:A:246:LEU:HD13	1:A:248:TYR:O	2.18	0.42
1:B:296:GLY:O	1:B:298:HIS:HD2	2.02	0.42
1:B:402:TRP:CD1	1:B:421:GLU:HG3	2.53	0.42
1:B:558:VAL:CG2	1:B:560:ARG:CZ	2.96	0.42
1:B:602:GLU:OE1	1:B:602:GLU:N	2.47	0.42
1:A:41:LYS:HB2	1:A:41:LYS:HE2	1.78	0.42
1:A:263:ASN:HD22	1:A:263:ASN:HA	1.64	0.42
1:A:512:LYS:HE3	1:A:527:GLN:OE1	2.19	0.42
1:A:571:GLU:CD	1:A:760:LYS:HD3	2.40	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:510:PRO:HD3	1:B:569:SER:HB2	2.00	0.42
1:B:305:TRP:CE3	1:B:311:ILE:HG12	2.54	0.42
1:A:199:THR:OG1	1:A:204:GLU:HB2	2.19	0.42
1:A:728:VAL:O	1:B:750:HIS:HE1	2.01	0.42
1:A:640:LEU:HD11	1:A:650:GLY:HA3	2.02	0.42
1:A:248:TYR:CZ	1:B:234:PRO:HB2	2.55	0.42
1:A:296:GLY:O	1:A:298:HIS:HD2	2.02	0.42
1:B:94:THR:O	1:B:95:PHE:HB2	2.20	0.42
1:B:546:VAL:HG22	1:B:547:TYR:N	2.34	0.42
1:A:54:ARG:O	1:A:500:LEU:HG	2.20	0.42
1:A:542:LEU:HD23	1:A:624:ILE:HG23	2.00	0.42
1:B:330:TYR:CE2	1:B:332:GLU:HA	2.55	0.42
1:B:626:ILE:HG23	1:B:636:THR:HG23	2.02	0.42
1:A:502:LYS:HA	1:A:505:GLN:HE21	1.83	0.42
1:B:150:ASN:ND2	2:B:768:NAG:C2	2.79	0.42
1:A:280:THR:HG22	1:A:281:ASN:N	2.35	0.42
1:A:294:LEU:HD12	1:A:294:LEU:HA	1.80	0.42
1:A:73:GLU:HB3	1:A:74:ASN:H	1.58	0.41
1:A:512:LYS:HE3	1:A:527:GLN:CD	2.40	0.41
1:B:89:PHE:HE2	1:B:107:ILE:HD13	1.83	0.41
1:B:139:LYS:C	1:B:140:ARG:HD2	2.41	0.41
1:B:403:GLU:H	1:B:420:ASN:ND2	2.10	0.41
1:B:466:LYS:HG2	1:B:467:TYR:CE1	2.55	0.41
1:B:761:GLN:HG3	1:B:762:CYS:N	2.35	0.41
1:A:615:LYS:O	1:A:616:MET:C	2.58	0.41
1:A:741:GLY:O	1:A:742:ILE:C	2.58	0.41
1:B:62:TRP:CG	1:B:462:SER:HA	2.55	0.41
1:B:398:THR:CG2	1:B:434:ILE:HD11	2.49	0.41
1:A:159:PRO:HD3	1:A:216:TRP:HB3	2.02	0.41
1:A:517:ILE:HD12	1:A:612:GLN:HG3	2.03	0.41
1:B:702:LEU:HD11	4:B:796:HOH:O	2.20	0.41
1:B:330:TYR:HB2	1:B:337:TRP:CH2	2.56	0.41
1:A:111:GLY:O	1:A:137:LEU:HD12	2.21	0.41
2:A:771:NAG:O7	2:A:771:NAG:H3	2.20	0.41
1:B:146:GLU:HB3	1:B:175:LYS:HZ1	1.85	0.41
1:B:513:LYS:O	1:B:527:GLN:HA	2.21	0.41
1:A:351:THR:OG1	1:A:592:HIS:HD2	2.02	0.41
1:A:627:TRP:HB2	1:A:651:ILE:HB	2.02	0.41
1:A:58:TYR:CD1	1:A:60:LEU:HD12	2.56	0.41
1:B:177:GLU:CB	1:B:180:LEU:HD23	2.27	0.41
1:B:280:THR:HG22	1:B:281:ASN:O	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:542:LEU:HB3	1:B:624:ILE:HD13	2.02	0.41
1:A:664:SER:HB2	1:A:668:GLU:OE2	2.20	0.41
1:B:114:ILE:CG2	1:B:135:TYR:HB3	2.51	0.41
1:B:456:TYR:CG	1:B:558:VAL:HG12	2.55	0.41
1:A:77:LEU:HD23	1:A:88:VAL:HA	2.02	0.41
1:B:67:GLU:HA	1:B:79:PHE:O	2.21	0.41
1:B:224:ALA:HB1	1:B:268:PHE:CZ	2.56	0.41
1:B:377:ASN:HD21	1:B:381:TYR:H	1.69	0.41
1:B:420:ASN:C	1:B:420:ASN:HD22	2.24	0.41
1:A:74:ASN:HB2	1:A:92:ASN:HB2	2.03	0.40
1:B:63:ILE:O	1:B:63:ILE:HD12	2.21	0.40
1:B:521:GLU:HG2	1:B:521:GLU:O	2.21	0.40
1:A:123:GLN:HB3	1:A:124:TRP:H	1.76	0.40
1:B:150:ASN:ND2	2:B:768:NAG:O5	2.48	0.40
1:B:407:ILE:HG23	1:B:415:LEU:HD21	2.02	0.40
1:B:430:ASN:OD1	1:B:446:SER:OG	2.32	0.40
1:B:594:ILE:HD12	1:B:594:ILE:HA	1.86	0.40
1:A:140:ARG:HE	1:A:140:ARG:HB2	1.81	0.40
1:A:544:LEU:HD13	1:A:546:VAL:CG2	2.52	0.40
1:B:133:ASP:OD1	1:B:147:ARG:NH1	2.55	0.40
1:B:143:ILE:O	1:B:143:ILE:HG13	2.21	0.40
1:B:519:LEU:O	1:B:520:ASN:C	2.59	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	726/728 (100%)	690 (95%)	35 (5%)	1 (0%)	48 59
1	B	726/728 (100%)	696 (96%)	29 (4%)	1 (0%)	48 59
All	All	1452/1456 (100%)	1386 (96%)	64 (4%)	2 (0%)	48 59

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	139	LYS
1	A	402	TRP

### 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	653/653 (100%)	619 (95%)	34 (5%)	19	23
1	B	653/653 (100%)	624 (96%)	29 (4%)	24	30
All	All	1306/1306 (100%)	1243 (95%)	63 (5%)	21	26

All (63) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	40	ARG
1	A	60	LEU
1	A	73	GLU
1	A	90	LEU
1	A	147	ARG
1	A	223	LEU
1	A	236	ILE
1	A	246	LEU
1	A	263	ASN
1	A	294	LEU
1	A	300	LEU
1	A	316	LEU
1	A	343	ARG
1	A	358	ARG
1	A	366	LEU
1	A	377	ASN
1	A	385	CYS
1	A	399	LYS
1	A	412	SER
1	A	420	ASN
1	A	431	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	472	CYS
1	A	479	LEU
1	A	482	LEU
1	A	500	LEU
1	A	513	LYS
1	A	514	LEU
1	A	542	LEU
1	A	543	LEU
1	A	544	LEU
1	A	677	GLU
1	A	696	LYS
1	A	715	GLN
1	A	736	THR
1	B	41	LYS
1	B	49	LEU
1	B	51	ASN
1	B	60	LEU
1	B	71	LYS
1	B	90	LEU
1	B	214	LEU
1	B	223	LEU
1	B	236	ILE
1	B	246	LEU
1	B	263	ASN
1	B	326	ASP
1	B	336	ARG
1	B	358	ARG
1	B	377	ASN
1	B	385	CYS
1	B	420	ASN
1	B	443	THR
1	B	472	CYS
1	B	479	LEU
1	B	514	LEU
1	B	536	LYS
1	B	543	LEU
1	B	558	VAL
1	B	562	ASN
1	B	597	ARG
1	B	684	ARG
1	B	715	GLN
1	B	761	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (41) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	85	ASN
1	A	123	GLN
1	A	141	GLN
1	A	150	ASN
1	A	169	ASN
1	A	229	ASN
1	A	247	GLN
1	A	263	ASN
1	A	281	ASN
1	A	298	HIS
1	A	314	GLN
1	A	377	ASN
1	A	420	ASN
1	A	483	HIS
1	A	505	GLN
1	A	520	ASN
1	A	533	HIS
1	A	592	HIS
1	A	612	GLN
1	A	679	ASN
1	A	715	GLN
1	A	750	HIS
1	B	51	ASN
1	B	85	ASN
1	B	169	ASN
1	B	229	ASN
1	B	263	ASN
1	B	298	HIS
1	B	377	ASN
1	B	383	HIS
1	B	420	ASN
1	B	430	ASN
1	B	435	GLN
1	B	483	HIS
1	B	562	ASN
1	B	586	GLN
1	B	679	ASN
1	B	682	HIS
1	B	715	GLN
1	B	750	HIS
1	B	757	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

10 ligands 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
3	BJM	B	2	1	23,27,27	1.22	2 (8%)	40,45,45	2.51	7 (17%)
2	NAG	A	768	-	14,14,15	0.49	0	17,19,21	0.80	1 (5%)
2	NAG	A	769	-	14,14,15	0.46	0	17,19,21	0.73	1 (5%)
3	BJM	A	1	1	23,27,27	1.49	5 (21%)	40,45,45	1.99	9 (22%)
2	NAG	A	771	-	14,14,15	0.66	0	17,19,21	0.74	0
2	NAG	B	769	-	14,14,15	0.55	0	17,19,21	0.72	1 (5%)
2	NAG	B	767	-	14,14,15	0.47	0	17,19,21	0.70	0
2	NAG	A	767	-	14,14,15	0.48	0	17,19,21	0.92	0
2	NAG	A	770	-	14,14,15	0.51	0	17,19,21	0.94	1 (5%)
2	NAG	B	768	-	14,14,15	0.57	0	17,19,21	1.06	1 (5%)

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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	BJM	B	2	1	-	0/14/63/63	0/6/5/5
2	NAG	A	768	-	-	2/6/23/26	0/1/1/1
2	NAG	A	769	-	-	2/6/23/26	0/1/1/1
3	BJM	A	1	1	-	0/14/63/63	0/6/5/5
2	NAG	A	771	-	-	6/6/23/26	0/1/1/1
2	NAG	B	769	-	-	2/6/23/26	0/1/1/1
2	NAG	B	767	-	-	2/6/23/26	0/1/1/1
2	NAG	A	767	-	-	0/6/23/26	0/1/1/1
2	NAG	A	770	-	-	3/6/23/26	0/1/1/1
2	NAG	B	768	-	-	2/6/23/26	0/1/1/1

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1	BJM	C21-C18	-3.13	1.48	1.54
3	A	1	BJM	C17-N11	2.47	1.51	1.47
3	B	2	BJM	C17-N11	2.43	1.51	1.47
3	B	2	BJM	C18-N11	2.31	1.50	1.47
3	A	1	BJM	C3-C1	2.22	1.56	1.54
3	A	1	BJM	C14-C8	2.21	1.58	1.52
3	A	1	BJM	C16-C9	2.18	1.58	1.52

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	2	BJM	C20-C17-N11	-10.75	92.68	115.11
3	A	1	BJM	C21-C18-N11	6.08	109.19	101.92
3	B	2	BJM	C18-N11-C17	-6.05	102.85	112.17
3	B	2	BJM	C21-C18-N11	5.87	108.94	101.92
3	A	1	BJM	C20-C17-N11	-4.72	105.25	115.11
3	A	1	BJM	C4-C9-C13	-4.61	103.92	109.41
3	A	1	BJM	O15-C8-C14	3.96	119.55	109.33
3	B	2	BJM	C20-C19-C21	3.69	125.58	118.34
3	B	2	BJM	C21-C18-C22	-3.39	107.46	113.02
3	A	1	BJM	C18-N11-C17	-2.65	108.09	112.17
3	A	1	BJM	C5-C1-C2	2.64	117.01	110.41
2	A	770	NAG	C2-N2-C7	-2.60	119.42	122.90
3	A	1	BJM	O15-C8-C13	-2.44	103.03	109.33
2	B	768	NAG	C2-N2-C7	-2.28	119.85	122.90
2	A	768	NAG	C2-N2-C7	-2.26	119.87	122.90
3	B	2	BJM	C16-C9-C4	2.20	113.88	109.05

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	2	BJM	C21-C19-C17	-2.19	102.65	108.77
3	A	1	BJM	C20-C19-C21	2.16	122.57	118.34
2	A	769	NAG	C2-N2-C7	-2.13	120.04	122.90
3	A	1	BJM	C3-C8-C14	-2.02	107.04	109.31
2	B	769	NAG	C2-N2-C7	-2.02	120.20	122.90

There are no chirality outliers.

All (19) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	770	NAG	O7-C7-N2-C2
2	A	771	NAG	C1-C2-N2-C7
2	A	770	NAG	C8-C7-N2-C2
2	A	769	NAG	O5-C5-C6-O6
2	B	769	NAG	O5-C5-C6-O6
2	A	769	NAG	C4-C5-C6-O6
2	B	769	NAG	C4-C5-C6-O6
2	A	768	NAG	C8-C7-N2-C2
2	A	771	NAG	C8-C7-N2-C2
2	A	768	NAG	O7-C7-N2-C2
2	A	771	NAG	O7-C7-N2-C2
2	B	767	NAG	C4-C5-C6-O6
2	A	770	NAG	O5-C5-C6-O6
2	B	767	NAG	O5-C5-C6-O6
2	A	771	NAG	C4-C5-C6-O6
2	A	771	NAG	O5-C5-C6-O6
2	B	768	NAG	C4-C5-C6-O6
2	A	771	NAG	C3-C2-N2-C7
2	B	768	NAG	O5-C5-C6-O6

There are no ring outliers.

8 monomers are involved in 32 short contacts:

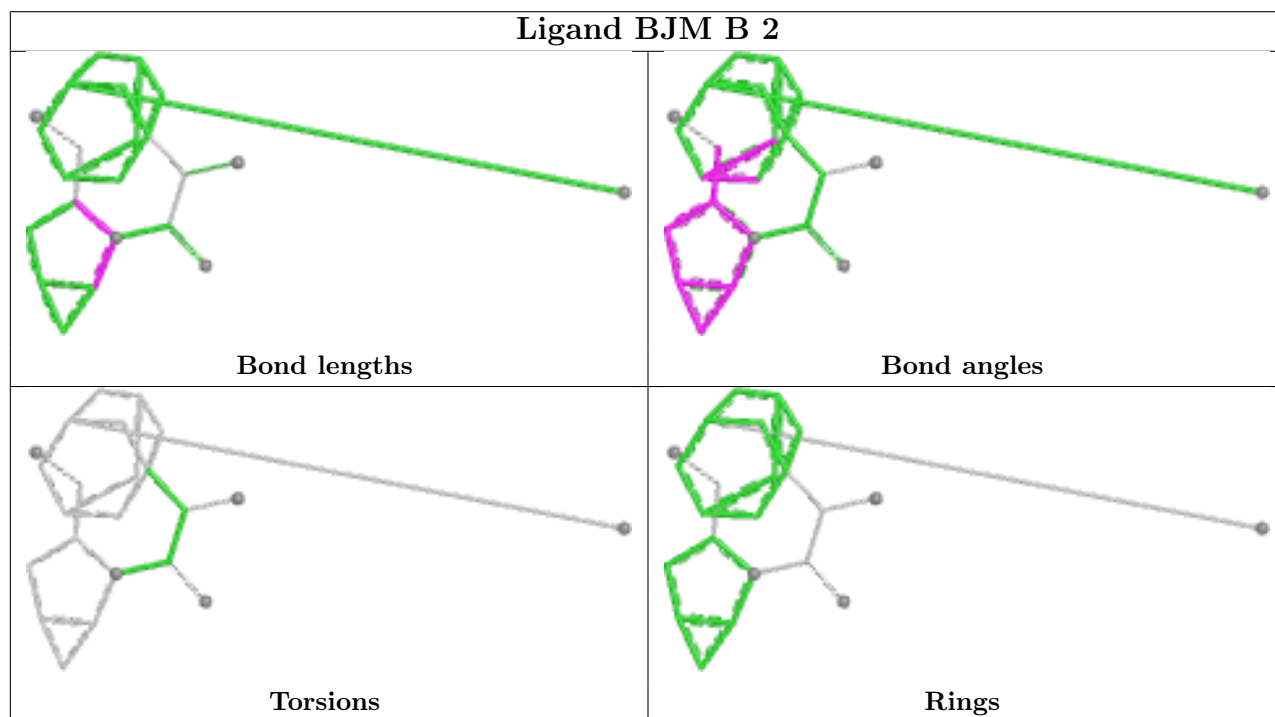
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	768	NAG	7	0
2	A	769	NAG	3	0
2	A	771	NAG	2	0
2	B	769	NAG	3	0
2	B	767	NAG	3	0
2	A	767	NAG	3	0
2	A	770	NAG	3	0

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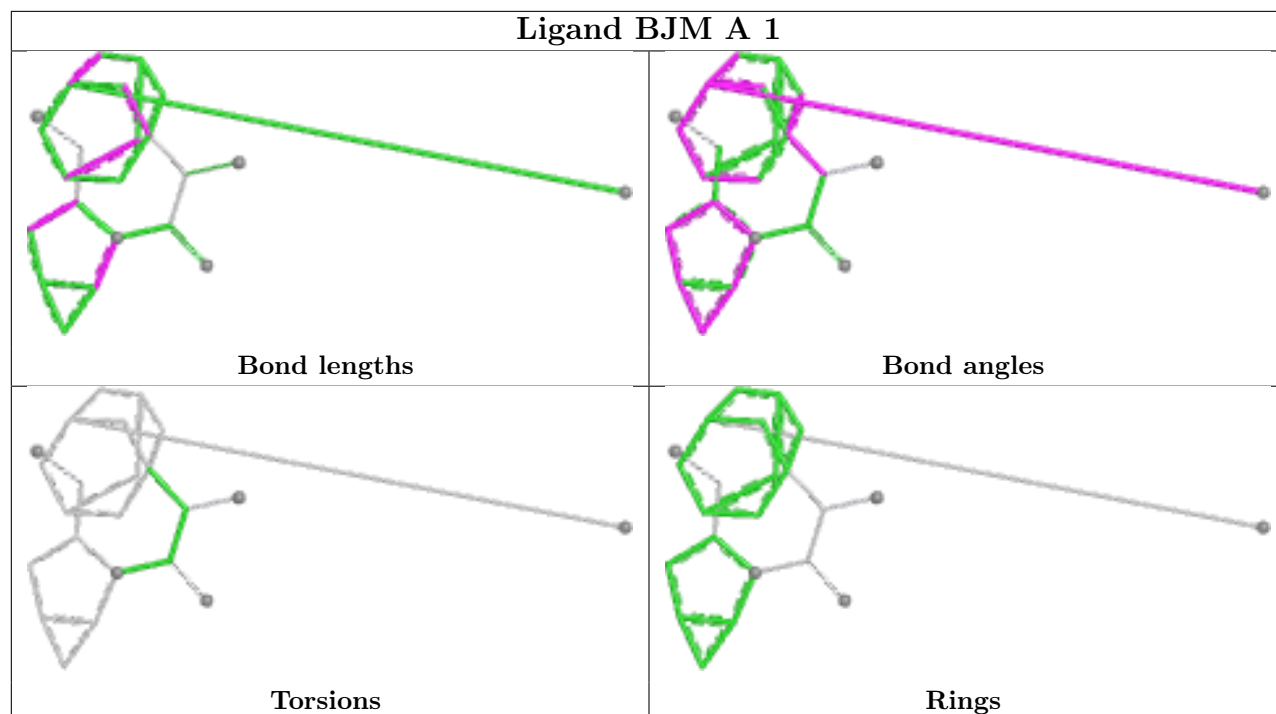
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	768	NAG	8	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







## 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	728/728 (100%)	0.06	26 (3%) 46 53	25, 39, 60, 70	0
1	B	728/728 (100%)	0.03	16 (2%) 62 67	23, 37, 59, 70	0
All	All	1456/1456 (100%)	0.05	42 (2%) 54 60	23, 38, 60, 70	0

All (42) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	766	PRO	5.3
1	B	279	VAL	4.4
1	A	342	ALA	3.9
1	B	766	PRO	3.8
1	A	39	SER	3.6
1	B	110	ASP	3.4
1	A	765	LEU	3.4
1	B	332	GLU	3.3
1	A	677	GLU	3.1
1	B	63	ILE	3.1
1	A	682	HIS	3.1
1	A	340	LEU	3.0
1	B	39	SER	2.9
1	A	452	GLU	2.8
1	A	521	GLU	2.7
1	B	762	CYS	2.7
1	A	390	ASP	2.6
1	B	91	GLU	2.6
1	A	506	ASN	2.5
1	A	279	VAL	2.5
1	A	142	LEU	2.5
1	A	519	LEU	2.5
1	B	278	SER	2.4
1	B	90	LEU	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	311	ILE	2.3
1	B	597	ARG	2.3
1	A	502	LYS	2.3
1	A	341	VAL	2.2
1	A	339	CYS	2.2
1	B	145	GLU	2.2
1	A	762	CYS	2.2
1	B	280	THR	2.2
1	A	98	PHE	2.2
1	B	95	PHE	2.2
1	A	393	ASP	2.2
1	A	392	LYS	2.2
1	A	73	GLU	2.1
1	A	345	HIS	2.1
1	B	393	ASP	2.1
1	B	311	ILE	2.0
1	A	145	GLU	2.0
1	A	243	ASP	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 monosaccharides in this entry.

## 6.4 Ligands [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.

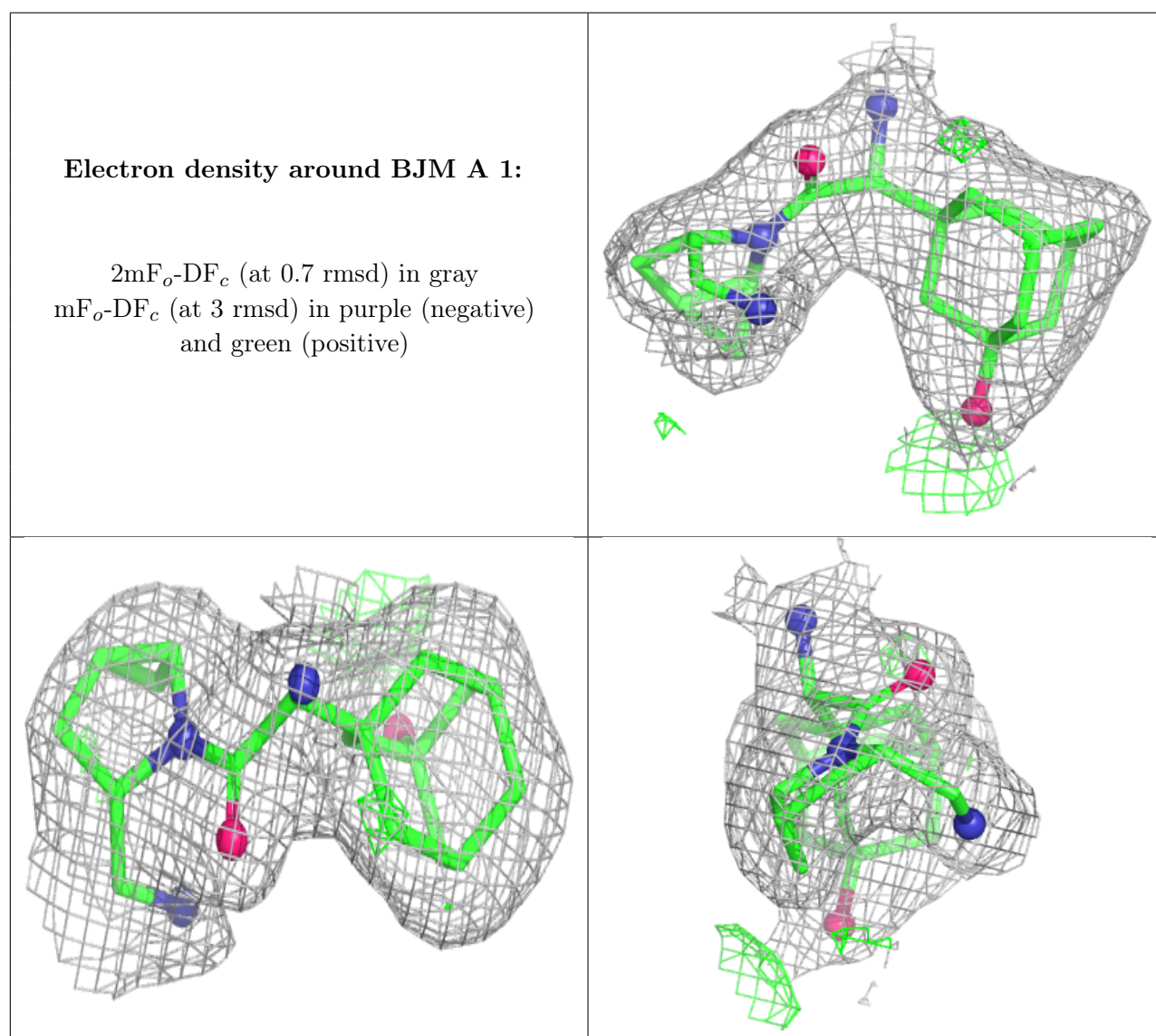
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
2	NAG	A	771	14/15	0.54	0.18	63,65,66,66	0
2	NAG	B	768	14/15	0.62	0.22	62,64,64,64	0
2	NAG	A	768	14/15	0.75	0.16	70,73,77,78	0
2	NAG	A	770	14/15	0.77	0.12	64,65,66,67	0
2	NAG	A	769	14/15	0.81	0.15	50,52,55,59	0

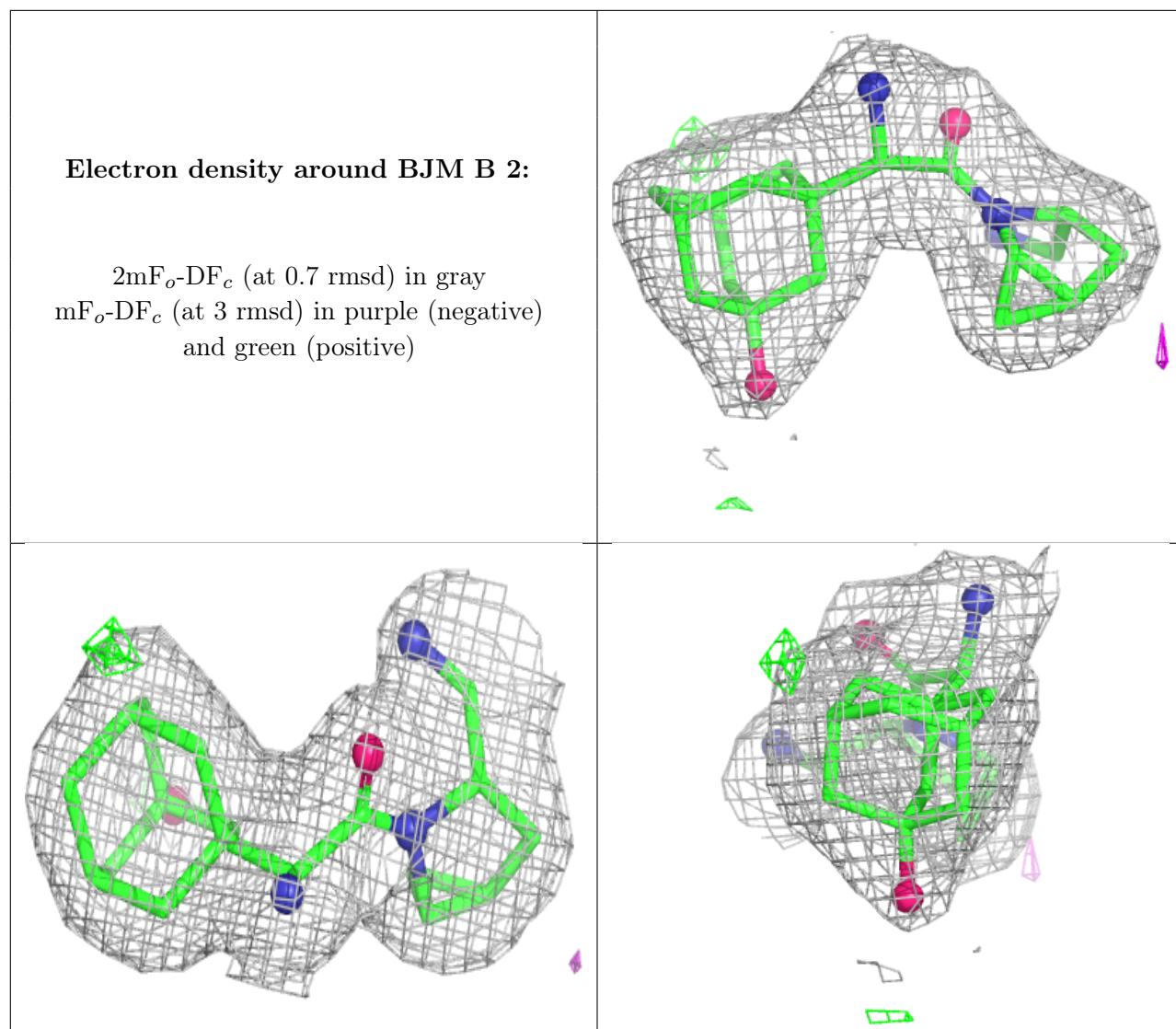
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	NAG	B	769	14/15	0.84	0.11	39,40,44,48	0
2	NAG	A	767	14/15	0.86	0.19	59,60,62,64	0
2	NAG	B	767	14/15	0.90	0.20	68,69,71,72	0
3	BJM	A	1	23/23	0.94	0.08	28,30,35,35	0
3	BJM	B	2	23/23	0.94	0.09	21,29,33,36	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.





## 6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.