



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 14, 2017 – 12:46 am GMT

PDB ID : 4NGM
Title : Crystal Structure of Glutamate Carboxypeptidase II in a complex with urea-based inhibitor
Authors : Tykvart, J.; Pachl, P.
Deposited on : 2013-11-02
Resolution : 1.84 Å(reported)

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

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

A user guide is available at

<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 : trunk28620
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) : recalc28949

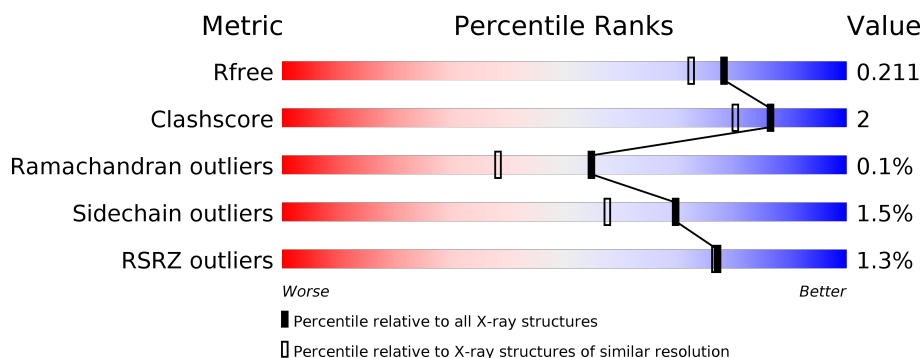
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.84 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	2964 (1.86-1.82)
Clashscore	112137	3197 (1.86-1.82)
Ramachandran outliers	110173	3164 (1.86-1.82)
Sidechain outliers	110143	3165 (1.86-1.82)
RSRZ outliers	101464	2973 (1.86-1.82)

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 ≥ 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	739	<div> <div style="width: 100%; height: 10px; position: relative;"> <div style="position: absolute; left: 0; top: -5px;">%</div> <div style="position: absolute; left: 0; width: 86%; height: 10px; background-color: green;"></div> <div style="position: absolute; left: 86%; width: 8%; height: 10px; background-color: yellow;"></div> <div style="position: absolute; left: 94%; width: 6%; height: 10px; background-color: grey;"></div> <div style="position: absolute; left: 0; width: 100%; height: 10px; background-color: red;"></div> <div style="position: absolute; left: 50%; top: -5px;">86%</div> <div style="position: absolute; left: 86%; top: -5px;">8%</div> <div style="position: absolute; left: 94%; top: -5px;">6%</div> </div> </div>

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
4	NAG	A	812	-	-	-	X

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 6417 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 Glutamate carboxypeptidase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	696	5567	3587	928	1033	19	0	10	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	12	ARG	-	EXPRESSION TAG	UNP Q04609
A	13	SER	-	EXPRESSION TAG	UNP Q04609
A	14	GLY	-	EXPRESSION TAG	UNP Q04609
A	15	LEU	-	EXPRESSION TAG	UNP Q04609
A	16	ASN	-	EXPRESSION TAG	UNP Q04609
A	17	ASP	-	EXPRESSION TAG	UNP Q04609
A	18	ILE	-	EXPRESSION TAG	UNP Q04609
A	19	PHE	-	EXPRESSION TAG	UNP Q04609
A	20	GLU	-	EXPRESSION TAG	UNP Q04609
A	21	ALA	-	EXPRESSION TAG	UNP Q04609
A	22	GLN	-	EXPRESSION TAG	UNP Q04609
A	23	LYS	-	EXPRESSION TAG	UNP Q04609
A	24	ILE	-	EXPRESSION TAG	UNP Q04609
A	25	GLU	-	EXPRESSION TAG	UNP Q04609
A	26	TRP	-	EXPRESSION TAG	UNP Q04609
A	27	HIS	-	EXPRESSION TAG	UNP Q04609
A	28	GLU	-	EXPRESSION TAG	UNP Q04609
A	29	GLY	-	EXPRESSION TAG	UNP Q04609
A	30	SER	-	EXPRESSION TAG	UNP Q04609
A	31	GLY	-	EXPRESSION TAG	UNP Q04609
A	32	SER	-	EXPRESSION TAG	UNP Q04609
A	33	GLY	-	EXPRESSION TAG	UNP Q04609
A	34	SER	-	EXPRESSION TAG	UNP Q04609
A	35	GLU	-	EXPRESSION TAG	UNP Q04609
A	36	ASN	-	EXPRESSION TAG	UNP Q04609
A	37	LEU	-	EXPRESSION TAG	UNP Q04609
A	38	TYR	-	EXPRESSION TAG	UNP Q04609

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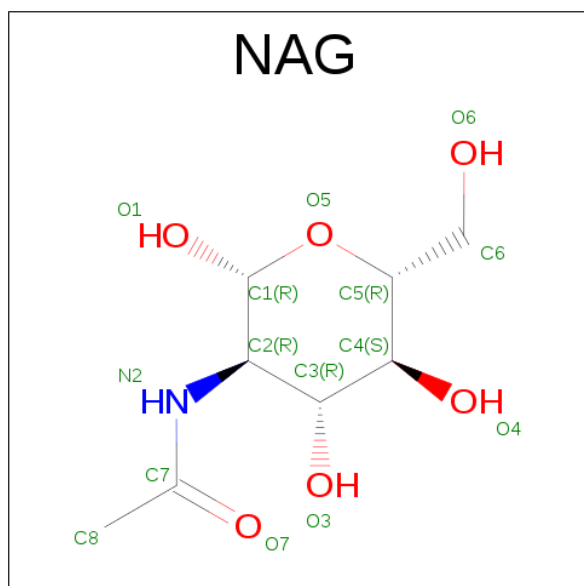
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Chain	Residue	Modelled	Actual	Comment	Reference
A	39	PHE	-	EXPRESSION TAG	UNP Q04609
A	40	GLN	-	EXPRESSION TAG	UNP Q04609
A	41	GLY	-	EXPRESSION TAG	UNP Q04609
A	42	ARG	-	EXPRESSION TAG	UNP Q04609
A	43	SER	-	EXPRESSION TAG	UNP Q04609

- Molecule 2 is a polymer of unknown type called SUGAR (2-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	2	Total	C	N	O	0	0
			28	16	2	10		
2	A	2	Total	C	N	O	0	0
			28	16	2	10		
2	A	2	Total	C	N	O	0	0
			28	16	2	10		
2	A	2	Total	C	N	O	0	0
			28	16	2	10		
2	A	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 3 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

- Molecule 4 is a polymer of unknown type called SUGAR (5-MER).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 5 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	2	Total	Zn	0	0
			2	2		

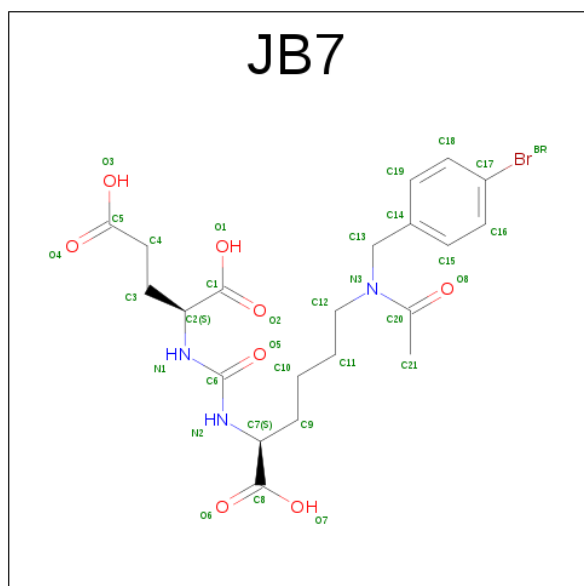
- Molecule 6 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	1	Total	Cl	0	0
			1	1		

- Molecule 7 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	1	Total	Ca	0	0
			1	1		

- Molecule 8 is N-((1S)-5-[ACETYL(4-BROMOBENZYL)AMINO]-1-CARBOXYPENTYL} CARBAMOYL)-L-GLUTAMIC ACID (three-letter code: JB7) (formula: C₂₁H₂₈BrN₃O₈).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
8	A	1	Total	Br	C	N	O	0	0
			33	1	21	3	8		

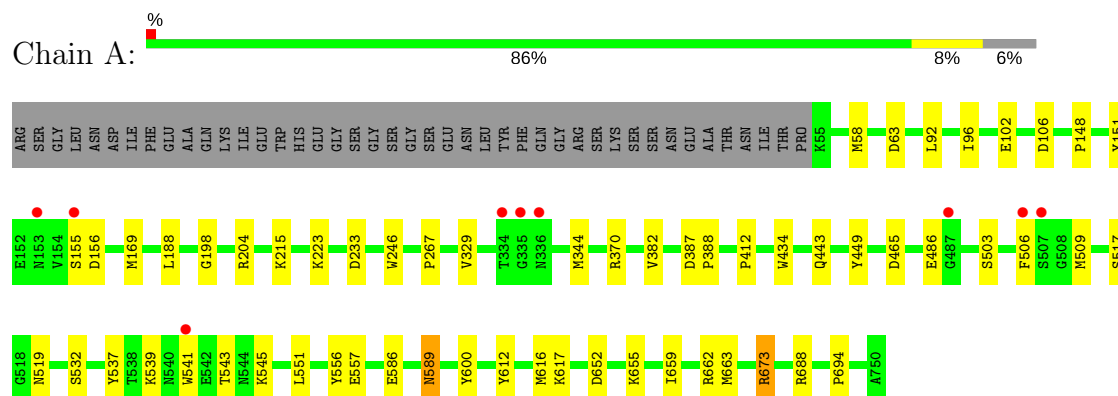
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	598	Total	O	0	1
			598	598		

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: Glutamate carboxypeptidase 2



4 Data and refinement statistics

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α , β , γ	101.30Å 130.19Å 158.79Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.03 – 1.84 46.91 – 1.84	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.03-1.84) 99.7 (46.91-1.84)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.18 (at 1.84Å)	Xtriage
Refinement program	REFMAC 5.7.0032	Depositor
R, R_{free}	0.170 , 0.206 0.177 , 0.211	Depositor DCC
R_{free} test set	4537 reflections (5.26%)	DCC
Wilson B-factor (Å ²)	23.4	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 50.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	6417	wwPDB-VP
Average B, all atoms (Å ²)	27.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.45% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: JB7, ZN, BMA, NAG, CL, CA, MAN

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	1.02	4/5756 (0.1%)	0.97	11/7808 (0.1%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	557	GLU	CD-OE2	-6.38	1.18	1.25
1	A	434	TRP	CE3-CZ3	5.44	1.47	1.38
1	A	267	PRO	N-CA	-5.37	1.38	1.47
1	A	102	GLU	CG-CD	5.03	1.59	1.51

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	673	ARG	NE-CZ-NH1	8.55	124.58	120.30
1	A	370	ARG	NE-CZ-NH1	8.51	124.56	120.30
1	A	673	ARG	NE-CZ-NH2	-6.81	116.89	120.30
1	A	662	ARG	NE-CZ-NH2	-6.32	117.14	120.30
1	A	204	ARG	NE-CZ-NH2	-5.97	117.32	120.30
1	A	465	ASP	CB-CG-OD1	5.94	123.65	118.30
1	A	233	ASP	CB-CG-OD2	5.74	123.47	118.30
1	A	63	ASP	CB-CG-OD1	5.71	123.44	118.30
1	A	662	ARG	NE-CZ-NH1	5.17	122.89	120.30
1	A	652	ASP	CB-CA-C	-5.08	100.24	110.40
1	A	106	ASP	CB-CG-OD2	5.08	122.87	118.30

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	5567	0	5393	26	0
2	A	140	0	125	3	0
3	A	14	0	13	0	0
4	A	61	0	52	0	0
5	A	2	0	0	0	0
6	A	1	0	0	0	0
7	A	1	0	0	0	0
8	A	33	0	25	0	0
9	A	598	0	0	6	0
All	All	6417	0	5608	28	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 2.

All (28) 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:506:PHE:HB2	1:A:509:MET:HG3	1.66	0.78
1:A:659:ILE:O	1:A:663[B]:MET:HG3	1.88	0.72
1:A:486:GLU:CG	9:A:1232:HOH:O	2.50	0.58
1:A:688[B]:ARG:NH1	9:A:1021:HOH:O	2.37	0.57
1:A:617:LYS:NZ	9:A:1456:HOH:O	2.33	0.57
2:A:808:NAG:O3	9:A:1435:HOH:O	2.17	0.57
1:A:155:SER:O	1:A:156:ASP:HB2	2.06	0.56
1:A:215:LYS:HE2	9:A:1030:HOH:O	2.07	0.54
2:A:808:NAG:O4	2:A:809:NAG:H83	2.08	0.54
1:A:655:LYS:HD2	1:A:655:LYS:N	2.23	0.52
1:A:612:TYR:CZ	1:A:616:MET:HG3	2.44	0.52
1:A:58:MET:CE	1:A:586:GLU:HG2	2.40	0.50
1:A:198:GLY:O	1:A:223:LYS:HE2	2.12	0.50
1:A:188:LEU:HD11	1:A:329:VAL:HG11	1.94	0.50
1:A:443[A]:GLN:NE2	9:A:1204:HOH:O	2.44	0.50
1:A:543:THR:HG22	1:A:543:THR:O	2.12	0.50
1:A:58:MET:HE1	1:A:586:GLU:HG2	1.94	0.49
1:A:169:MET:HA	1:A:344:MET:O	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:188:LEU:HD11	1:A:329:VAL:CG1	2.42	0.48
1:A:246:TRP:CD1	2:A:808:NAG:H83	2.50	0.46
1:A:387:ASP:HA	1:A:388:PRO:HA	1.76	0.46
1:A:412:PRO:HA	1:A:589:ASN:OD1	2.15	0.45
1:A:551:LEU:HD22	1:A:556:TYR:HB2	1.98	0.45
1:A:517:SER:HB2	1:A:694:PRO:HG3	2.00	0.43
1:A:148:PRO:HG2	1:A:151:TYR:CD1	2.54	0.42
1:A:659:ILE:HG22	1:A:663[B]:MET:SD	2.58	0.42
1:A:92:LEU:O	1:A:96:ILE:HG12	2.21	0.41
1:A:449:TYR:O	1:A:532:SER:HA	2.20	0.41

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	704/739 (95%)	685 (97%)	18 (3%)	1 (0%)	55 38

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	382	VAL

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	592/629 (94%)	582 (98%)	10 (2%)	66 52

All (10) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	503	SER
1	A	519	ASN
1	A	537	TYR
1	A	539	LYS
1	A	541[A]	TRP
1	A	541[B]	TRP
1	A	545	LYS
1	A	589	ASN
1	A	600	TYR
1	A	673	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 ⓘ

15 carbohydrates 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	$\# Z > 2$
2	NAG	A	801	1,2	14,14,15	1.16	1 (7%)	15,19,21	1.72	5 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	A	802	2	14,14,15	0.65	0	15,19,21	1.72	2 (13%)
2	NAG	A	803	1,2	14,14,15	0.90	0	15,19,21	1.59	3 (20%)
2	NAG	A	804	2	14,14,15	0.58	0	15,19,21	2.57	5 (33%)
2	NAG	A	805	1,2	14,14,15	0.97	2 (14%)	15,19,21	1.31	2 (13%)
2	NAG	A	806	2	14,14,15	0.46	0	15,19,21	1.53	3 (20%)
2	NAG	A	808	1,2	14,14,15	0.60	0	15,19,21	2.30	5 (33%)
2	NAG	A	809	2	14,14,15	0.85	1 (7%)	15,19,21	2.05	5 (33%)
2	NAG	A	810	1,2	14,14,15	1.10	1 (7%)	15,19,21	1.47	2 (13%)
2	NAG	A	811	2	14,14,15	0.76	0	15,19,21	1.96	5 (33%)
4	NAG	A	812	1,4	14,14,15	0.87	0	15,19,21	1.31	1 (6%)
4	NAG	A	813	4	14,14,15	0.95	1 (7%)	15,19,21	1.19	2 (13%)
4	BMA	A	814	4	11,11,12	0.43	0	13,15,17	1.01	0
4	MAN	A	815	4	11,11,12	0.85	0	13,15,17	1.58	3 (23%)
4	MAN	A	816	4	11,11,12	0.61	0	13,15,17	1.41	2 (15%)

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	NAG	A	801	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	802	2	-	0/6/23/26	0/1/1/1
2	NAG	A	803	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	804	2	-	0/6/23/26	0/1/1/1
2	NAG	A	805	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	806	2	-	0/6/23/26	0/1/1/1
2	NAG	A	808	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	809	2	-	0/6/23/26	0/1/1/1
2	NAG	A	810	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	811	2	-	0/6/23/26	0/1/1/1
4	NAG	A	812	1,4	-	0/6/23/26	0/1/1/1
4	NAG	A	813	4	-	0/6/23/26	0/1/1/1
4	BMA	A	814	4	-	0/2/19/22	0/1/1/1
4	MAN	A	815	4	-	0/2/19/22	0/1/1/1
4	MAN	A	816	4	-	0/2/19/22	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	NAG	O5-C1	-2.85	1.39	1.43
4	A	813	NAG	O5-C1	-2.61	1.39	1.43
2	A	809	NAG	O5-C1	-2.02	1.40	1.43
2	A	810	NAG	C1-C2	2.00	1.55	1.52
2	A	805	NAG	C4-C5	2.29	1.57	1.53
2	A	805	NAG	C1-C2	2.34	1.55	1.52

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	802	NAG	O5-C1-C2	-4.44	105.29	111.47
2	A	810	NAG	O5-C1-C2	-4.28	105.52	111.47
2	A	809	NAG	O5-C1-C2	-4.26	105.54	111.47
2	A	811	NAG	C3-C4-C5	-3.97	103.22	110.22
2	A	808	NAG	O5-C1-C2	-3.92	106.01	111.47
2	A	808	NAG	O7-C7-C8	-3.81	115.12	122.06
2	A	811	NAG	C2-N2-C7	-3.27	118.17	122.94
2	A	801	NAG	O4-C4-C3	-3.14	103.52	110.36
2	A	809	NAG	O3-C3-C4	-2.97	103.90	110.36
2	A	804	NAG	C6-C5-C4	-2.88	106.25	113.00
4	A	812	NAG	O5-C1-C2	-2.83	107.54	111.47
4	A	815	MAN	O4-C4-C3	-2.79	104.29	110.36
2	A	803	NAG	C1-C2-N2	-2.78	105.75	110.49
2	A	809	NAG	O7-C7-C8	-2.73	117.09	122.06
2	A	808	NAG	O3-C3-C4	-2.69	104.51	110.36
2	A	801	NAG	O5-C1-C2	-2.66	107.77	111.47
4	A	816	MAN	O5-C1-C2	-2.64	106.65	110.79
2	A	801	NAG	O3-C3-C4	-2.40	105.14	110.36
2	A	801	NAG	O7-C7-C8	-2.39	117.70	122.06
2	A	801	NAG	C1-C2-N2	-2.35	106.47	110.49
2	A	811	NAG	O6-C6-C5	-2.27	103.70	111.34
4	A	813	NAG	O5-C1-C2	-2.23	108.37	111.47
2	A	806	NAG	O7-C7-C8	-2.19	118.07	122.06
2	A	809	NAG	C6-C5-C4	-2.19	107.87	113.00
2	A	805	NAG	O4-C4-C3	-2.15	105.67	110.36
2	A	805	NAG	O3-C3-C4	-2.14	105.71	110.36
4	A	815	MAN	O4-C4-C5	2.03	114.40	109.28
4	A	816	MAN	O4-C4-C5	2.10	114.58	109.28
2	A	802	NAG	O4-C4-C5	2.17	114.76	109.28
2	A	810	NAG	C8-C7-N2	2.25	120.17	116.11
2	A	803	NAG	C4-C3-C2	2.25	114.32	111.02
2	A	804	NAG	O5-C1-C2	2.27	114.63	111.47
4	A	813	NAG	O3-C3-C4	2.32	115.41	110.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	811	NAG	C8-C7-N2	2.35	120.35	116.11
4	A	815	MAN	O3-C3-C2	2.36	114.32	110.02
2	A	806	NAG	C1-O5-C5	2.41	115.49	112.17
2	A	804	NAG	O3-C3-C2	2.52	114.79	109.39
2	A	811	NAG	O4-C4-C5	2.81	116.36	109.28
2	A	808	NAG	C8-C7-N2	3.09	121.69	116.11
2	A	806	NAG	O4-C4-C5	3.13	117.18	109.28
2	A	804	NAG	C3-C4-C5	3.44	116.28	110.22
2	A	809	NAG	C8-C7-N2	3.45	122.33	116.11
2	A	803	NAG	O6-C6-C5	3.53	123.23	111.34
2	A	808	NAG	C1-O5-C5	4.63	118.55	112.17
2	A	804	NAG	C1-O5-C5	7.77	122.87	112.17

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	808	NAG	3	0
2	A	809	NAG	1	0

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 4 are monoatomic - leaving 2 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
3	NAG	A	807	1	14,14,15	0.76	0	15,19,21	2.61	5 (33%)
8	JB7	A	821	5	24,33,33	1.14	2 (8%)	29,43,43	1.74	9 (31%)

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
3	NAG	A	807	1	-	0/6/23/26	0/1/1/1
8	JB7	A	821	5	-	0/26/36/36	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	821	JB7	C2-N1	-3.07	1.42	1.46
8	A	821	JB7	C7-N2	-2.97	1.42	1.46

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	A	821	JB7	C3-C2-C1	-4.36	105.95	112.28
3	A	807	NAG	O3-C3-C2	-4.02	100.78	109.39
8	A	821	JB7	BR-C17-C16	-3.06	114.75	119.30
3	A	807	NAG	C6-C5-C4	-2.75	106.57	113.00
8	A	821	JB7	O5-C6-N1	-2.36	118.10	122.61
8	A	821	JB7	C13-N3-C12	-2.16	111.35	116.57
8	A	821	JB7	C18-C19-C14	-2.08	118.14	121.02
8	A	821	JB7	O8-C20-N3	-2.01	118.34	121.02
8	A	821	JB7	BR-C17-C18	2.15	122.50	119.30
8	A	821	JB7	C15-C14-C19	2.42	122.00	118.16
3	A	807	NAG	O6-C6-C5	2.76	120.63	111.34
8	A	821	JB7	C21-C20-N3	3.08	122.17	118.30
3	A	807	NAG	C1-C2-N2	3.72	116.84	110.49
3	A	807	NAG	C1-O5-C5	6.64	121.32	112.17

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	696/739 (94%)	-0.27	9 (1%) 77 76	13, 23, 43, 68	0

All (9) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	335	GLY	4.3
1	A	541[A]	TRP	3.5
1	A	155	SER	2.9
1	A	506	PHE	2.7
1	A	507	SER	2.7
1	A	153	ASN	2.5
1	A	336	ASN	2.5
1	A	334	THR	2.3
1	A	487	GLY	2.1

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](#)

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, 95th 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 ²)	Q<0.9
4	NAG	A	812	14/15	0.94	0.08	2.53	18,27,36,46	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	NAG	A	803	14/15	0.78	0.22	1.83	41,51,68,77	0
2	NAG	A	810	14/15	0.95	0.09	0.68	26,28,30,37	0
2	NAG	A	805	14/15	0.88	0.11	0.20	34,38,45,46	0
4	MAN	A	815	11/12	0.90	0.10	0.17	46,51,55,56	0
2	NAG	A	808	14/15	0.91	0.10	-	30,43,56,59	0
2	NAG	A	806	14/15	0.89	0.23	-	49,54,58,64	0
4	BMA	A	814	11/12	0.93	0.10	-	42,48,52,52	0
2	NAG	A	802	14/15	0.80	0.27	-	37,47,57,58	0
2	NAG	A	809	14/15	0.78	0.29	-	58,65,72,78	0
4	NAG	A	813	14/15	0.92	0.13	-	34,40,52,56	0
2	NAG	A	801	14/15	0.94	0.13	-	29,37,45,49	0
2	NAG	A	811	14/15	0.94	0.12	-	32,39,46,49	0
4	MAN	A	816	11/12	0.81	0.23	-	53,60,66,68	0
2	NAG	A	804	14/15	0.78	0.35	-	64,74,80,92	0

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. 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, 95th 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(\AA^2)	Q<0.9
8	JB7	A	821	33/33	0.94	0.14	0.62	14,18,34,46	0
6	CL	A	819	1/1	0.99	0.11	-0.53	18,18,18,18	0
7	CA	A	820	1/1	1.00	0.07	-0.80	14,14,14,14	0
5	ZN	A	818	1/1	1.00	0.09	-1.16	17,17,17,17	0
5	ZN	A	817	1/1	1.00	0.07	-2.44	16,16,16,16	0
3	NAG	A	807	14/15	0.80	0.18	-	58,64,70,76	0

6.5 Other polymers [i](#)

There are no such residues in this entry.