



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 07:30 PM GMT

PDB ID : 4P4I
Title : X-ray structure of human glutamate carboxypeptidase II (GCP II) in complex with a phosphoramidate inhibitor T33
Authors : Barinka, C.
Deposited on : 2014-03-12
Resolution : 1.87 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 (RC4), CSD as536be (2015)
Xtriage (Phenix) : 1.9-1692
EDS : rb-20026688
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)
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) : trunk26865

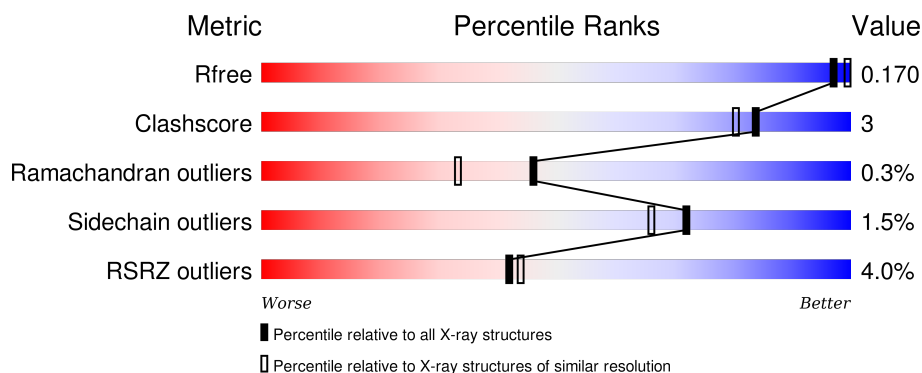
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

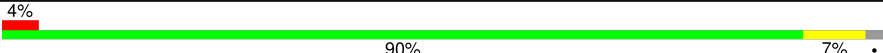
The reported resolution of this entry is 1.87 Å.

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}	91344	6965 (1.90-1.86)
Clashscore	102246	7778 (1.90-1.86)
Ramachandran outliers	100387	7691 (1.90-1.86)
Sidechain outliers	100360	7692 (1.90-1.86)
RSRZ outliers	91569	6979 (1.90-1.86)

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	707	

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	NAG	A	802	-	-	-	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	NAG	A	803	-	-	-	X
4	MAN	A	813	-	-	-	X

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 6548 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
1	A	692	Total	C	N	O	S	0	46	0
			5796	3715	974	1086	21			

- Molecule 2 is N-ACETYL-D-GLUCOSAMINE (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



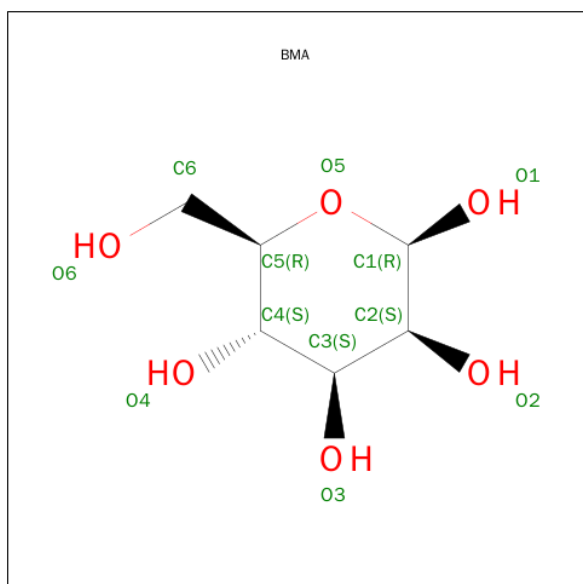
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		
2	A	1	Total	C	N	O	0	0
			14	8	1	5		

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

- Molecule 3 is BETA-D-MANNOSE (three-letter code: BMA) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			11	6	5		

- Molecule 4 is ALPHA-D-MANNOSE (three-letter code: MAN) (formula: $C_6H_{12}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			11	6	5		

- 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		

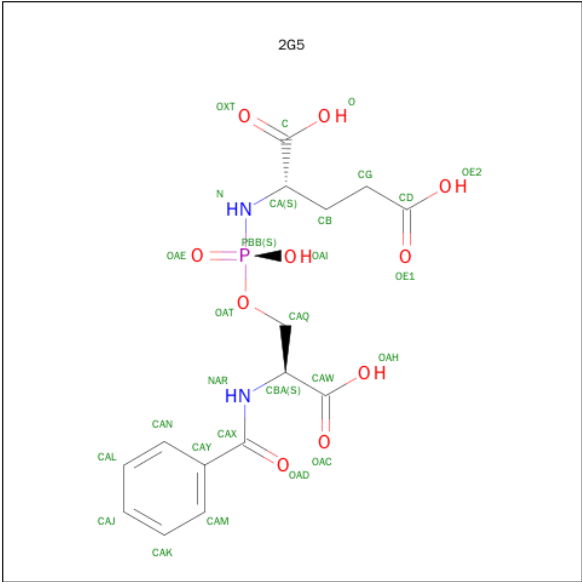
- Molecule 6 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 7 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

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

- Molecule 8 is N-[(S)-[(2S)-2-(benzoylamino)-2-carboxyethoxy](hydroxy)phosphoryl]-L-glutamic acid (three-letter code: 2G5) (formula: C₁₅H₁₉N₂O₁₀P).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
8	A	1	Total	C	N	O	P	0	0
			28	15	2	10	1		

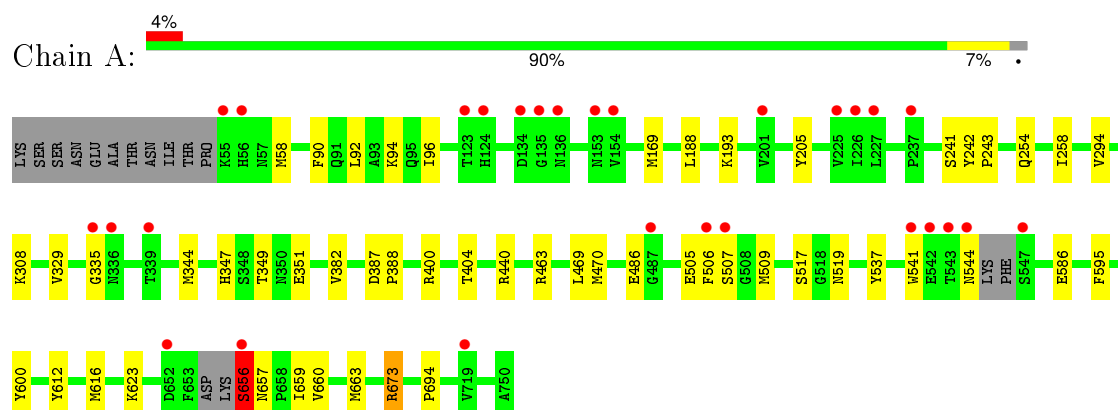
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	544	Total	O	0	0
			544	544		

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 errors 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 ($\text{RSRZ} > 2$). 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	102.31Å 130.46Å 159.66Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.69 – 1.87 29.69 – 1.86	Depositor EDS
% Data completeness (in resolution range)	99.1 (29.69-1.87) 99.1 (29.69-1.86)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.11 (at 1.87Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.152 , 0.170 0.152 , 0.170	Depositor DCC
R_{free} test set	1297 reflections (1.50%)	DCC
Wilson B-factor (Å ²)	25.8	Xtriage
Anisotropy	0.014	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 57.1	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	0 of 88549 reflections	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	6548	wwPDB-VP
Average B, all atoms (Å ²)	30.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.07% 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, 0.375 respectively for untwinned datasets, and 0.333, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, BMA, 2G5, 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	0.92	0/6016	0.75	2/8145 (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	A	0	2

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	673	ARG	NE-CZ-NH1	5.48	123.04	120.30
1	A	440	ARG	NE-CZ-NH2	-5.22	117.69	120.30

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	656	SER	Mainchain

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5796	0	5643	30	0
2	A	154	0	138	6	0
3	A	11	0	9	0	0
4	A	11	0	10	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	28	0	15	0	0
9	A	544	0	0	12	0
All	All	6548	0	5815	36	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 3.

All (36) 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:541:TRP:HA	1:A:544:ASN:ND2	2.03	0.73
1:A:90:PHE:CE2	1:A:94:LYS:HE2	2.23	0.73
1:A:656:SER:HB3	9:A:901:HOH:O	1.88	0.72
2:A:802:NAG:H81	9:A:1201:HOH:O	1.96	0.65
1:A:58:MET:CE	1:A:586:GLU:HG2	2.27	0.65
1:A:623:LYS:NZ	9:A:904:HOH:O	2.30	0.65
2:A:802:NAG:H83	9:A:1380:HOH:O	2.05	0.57
1:A:58:MET:HE1	1:A:586:GLU:HG2	1.86	0.57
1:A:656:SER:O	9:A:901:HOH:O	2.18	0.56
2:A:803:NAG:H83	9:A:1172:HOH:O	2.06	0.54
1:A:657[B]:ASN:HB3	1:A:660[B]:VAL:HB	1.88	0.54
1:A:349[B]:THR:HG23	1:A:351[B]:GLU:HG3	1.92	0.52
1:A:612:TYR:CZ	1:A:616:MET:HG3	2.46	0.50
1:A:90:PHE:CZ	1:A:94:LYS:HE2	2.46	0.50
1:A:659[B]:ILE:O	1:A:663[B]:MET:HG3	2.13	0.49
2:A:809:NAG:H83	9:A:1173:HOH:O	2.13	0.48
1:A:92:LEU:O	1:A:96[A]:ILE:HG12	2.14	0.47
1:A:347:HIS:HE1	9:A:1264:HOH:O	1.99	0.45
2:A:802:NAG:C8	9:A:1201:HOH:O	2.60	0.45
1:A:169:MET:HA	1:A:344:MET:O	2.17	0.45
1:A:486[B]:GLU:H	1:A:486[B]:GLU:HG2	1.57	0.45
1:A:400:ARG:O	1:A:404[B]:THR:HG23	2.16	0.45
1:A:517:SER:HB2	1:A:694:PRO:HG3	1.99	0.45
1:A:463[A]:ARG:NH1	9:A:1436:HOH:O	2.50	0.45
1:A:58:MET:HE2	1:A:586:GLU:HG2	1.98	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:659[B]:ILE:HD13	1:A:659[B]:ILE:HA	1.72	0.44
1:A:308:LYS:HB2	9:A:1429:HOH:O	2.19	0.42
1:A:469:LEU:O	1:A:595:PHE:HA	2.19	0.42
1:A:188:LEU:HD21	1:A:329[A]:VAL:HG11	2.01	0.42
1:A:258:ILE:HD13	1:A:294:VAL:HB	2.02	0.42
1:A:387:ASP:HA	1:A:388:PRO:HA	1.92	0.42
1:A:205:TYR:CE1	1:A:254:GLN:HB3	2.54	0.41
1:A:470[B]:MET:HB2	1:A:470[B]:MET:HE3	1.96	0.41
2:A:808:NAG:H83	9:A:1202:HOH:O	2.21	0.41
1:A:506:PHE:HB2	1:A:509:MET:HG3	2.03	0.40
1:A:242:TYR:CG	1:A:243:PRO:HA	2.57	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	731/707 (103%)	716 (98%)	13 (2%)	2 (0%)	46 33

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	335	GLY
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	634/603 (105%)	625 (99%)	9 (1%)	74 69

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	193	LYS
1	A	241	SER
1	A	505	GLU
1	A	507	SER
1	A	519	ASN
1	A	537	TYR
1	A	600	TYR
1	A	656	SER
1	A	673	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	303	GLN
1	A	544	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	NAG	A	801	1,2	14,14,15	0.62	0	15,19,21	1.16	1 (6%)

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	0.67	0	15,19,21	1.42	1 (6%)
2	NAG	A	803	1	14,14,15	0.74	0	15,19,21	1.45	3 (20%)
2	NAG	A	804	1,2	14,14,15	0.63	0	15,19,21	1.50	2 (13%)
2	NAG	A	805	2	14,14,15	0.61	0	15,19,21	1.01	1 (6%)
2	NAG	A	806	1	14,14,15	0.45	0	15,19,21	2.40	2 (13%)
2	NAG	A	807	1	14,14,15	0.68	0	15,19,21	1.32	3 (20%)
2	NAG	A	808	1,2	14,14,15	0.74	1 (7%)	15,19,21	0.92	0
2	NAG	A	809	2	14,14,15	0.53	0	15,19,21	1.15	2 (13%)
2	NAG	A	810	1,2	14,14,15	0.72	0	15,19,21	1.28	2 (13%)
2	NAG	A	811	3,2	14,14,15	0.63	0	15,19,21	1.36	1 (6%)
4	MAN	A	813	3	11,11,12	0.66	0	14,15,17	1.30	1 (7%)

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	-	0/6/23/26	0/1/1/1
2	NAG	A	804	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	805	2	-	0/6/23/26	0/1/1/1
2	NAG	A	806	1	-	0/6/23/26	0/1/1/1
2	NAG	A	807	1	-	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	3,2	-	0/6/23/26	0/1/1/1
4	MAN	A	813	3	-	0/2/19/22	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	808	NAG	O7-C7	2.02	1.27	1.23

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	811	NAG	C3-C4-C5	-3.71	103.73	110.20
2	A	807	NAG	O3-C3-C4	-2.42	104.90	110.34
2	A	809	NAG	O7-C7-C8	-2.30	117.84	122.06
2	A	810	NAG	O4-C4-C5	-2.23	103.32	109.24
2	A	804	NAG	O4-C4-C3	-2.23	105.31	110.34
2	A	806	NAG	C6-C5-C4	-2.15	107.72	113.02
2	A	803	NAG	O3-C3-C2	-2.06	105.03	109.11
2	A	803	NAG	C2-N2-C7	-2.03	120.43	123.04
2	A	805	NAG	O4-C4-C5	2.04	114.64	109.24
2	A	807	NAG	O5-C5-C6	2.06	111.80	107.35
2	A	801	NAG	C4-C3-C2	2.06	114.43	111.23
2	A	809	NAG	C8-C7-N2	2.68	121.23	116.11
2	A	803	NAG	O5-C5-C6	2.78	113.37	107.35
4	A	813	MAN	O5-C5-C6	2.81	113.43	107.35
2	A	807	NAG	C1-O5-C5	3.42	116.59	112.25
2	A	810	NAG	C1-O5-C5	3.48	116.66	112.25
2	A	802	NAG	C2-N2-C7	3.53	127.57	123.04
2	A	804	NAG	C1-O5-C5	3.58	116.79	112.25
2	A	806	NAG	C1-O5-C5	8.39	122.90	112.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	802	NAG	3	0
2	A	803	NAG	1	0
2	A	808	NAG	1	0
2	A	809	NAG	1	0

5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

5.6 Ligand geometry [i](#)

Of 18 ligands modelled in this entry, 4 are monoatomic - leaving 14 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	NAG	A	801	1,2	14,14,15	0.62	0	15,19,21	1.16	1 (6%)
2	NAG	A	802	2	14,14,15	0.67	0	15,19,21	1.42	1 (6%)
2	NAG	A	803	1	14,14,15	0.74	0	15,19,21	1.45	3 (20%)
2	NAG	A	804	1,2	14,14,15	0.63	0	15,19,21	1.50	2 (13%)
2	NAG	A	805	2	14,14,15	0.61	0	15,19,21	1.01	1 (6%)
2	NAG	A	806	1	14,14,15	0.45	0	15,19,21	2.40	2 (13%)
2	NAG	A	807	1	14,14,15	0.68	0	15,19,21	1.32	3 (20%)
2	NAG	A	808	1,2	14,14,15	0.74	1 (7%)	15,19,21	0.92	0
2	NAG	A	809	2	14,14,15	0.53	0	15,19,21	1.15	2 (13%)
2	NAG	A	810	1,2	14,14,15	0.72	0	15,19,21	1.28	2 (13%)
2	NAG	A	811	3,2	14,14,15	0.63	0	15,19,21	1.36	1 (6%)
3	BMA	A	812	2,4	11,11,12	0.61	0	14,15,17	1.19	2 (14%)
4	MAN	A	813	3	11,11,12	0.66	0	14,15,17	1.30	1 (7%)
8	2G5	A	818	5	17,28,28	2.38	5 (29%)	21,38,38	1.10	2 (9%)

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	-	0/6/23/26	0/1/1/1
2	NAG	A	804	1,2	-	0/6/23/26	0/1/1/1
2	NAG	A	805	2	-	0/6/23/26	0/1/1/1
2	NAG	A	806	1	-	0/6/23/26	0/1/1/1
2	NAG	A	807	1	-	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	3,2	-	0/6/23/26	0/1/1/1
3	BMA	A	812	2,4	-	0/2/19/22	0/1/1/1
4	MAN	A	813	3	-	0/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	2G5	A	818	5	-	0/21/32/32	0/1/1/1

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	818	2G5	PBB-OAI	-2.13	1.50	1.56
2	A	808	NAG	O7-C7	2.02	1.27	1.23
8	A	818	2G5	CBA-NAR	2.05	1.49	1.46
8	A	818	2G5	CB-CA	4.42	1.59	1.53
8	A	818	2G5	PBB-N	4.48	1.66	1.61
8	A	818	2G5	PBB-OAE	6.25	1.53	1.46

All (23) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	811	NAG	C3-C4-C5	-3.71	103.73	110.20
2	A	807	NAG	O3-C3-C4	-2.42	104.90	110.34
2	A	809	NAG	O7-C7-C8	-2.30	117.84	122.06
2	A	810	NAG	O4-C4-C5	-2.23	103.32	109.24
2	A	804	NAG	O4-C4-C3	-2.23	105.31	110.34
8	A	818	2G5	OAE-PBB-N	-2.17	109.19	113.08
2	A	806	NAG	C6-C5-C4	-2.15	107.72	113.02
3	A	812	BMA	O3-C3-C2	-2.13	106.16	110.00
2	A	803	NAG	O3-C3-C2	-2.06	105.03	109.11
2	A	803	NAG	C2-N2-C7	-2.03	120.43	123.04
2	A	805	NAG	O4-C4-C5	2.04	114.64	109.24
2	A	807	NAG	O5-C5-C6	2.06	111.80	107.35
2	A	801	NAG	C4-C3-C2	2.06	114.43	111.23
3	A	812	BMA	C1-C2-C3	2.13	112.06	109.54
2	A	809	NAG	C8-C7-N2	2.68	121.23	116.11
2	A	803	NAG	O5-C5-C6	2.78	113.37	107.35
4	A	813	MAN	O5-C5-C6	2.81	113.43	107.35
8	A	818	2G5	OAI-PBB-OAE	2.84	115.93	110.00
2	A	807	NAG	C1-O5-C5	3.42	116.59	112.25
2	A	810	NAG	C1-O5-C5	3.48	116.66	112.25
2	A	802	NAG	C2-N2-C7	3.53	127.57	123.04
2	A	804	NAG	C1-O5-C5	3.58	116.79	112.25
2	A	806	NAG	C1-O5-C5	8.39	122.90	112.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	802	NAG	3	0
2	A	803	NAG	1	0
2	A	808	NAG	1	0
2	A	809	NAG	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, 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	692/707 (97%)	-0.18	28 (4%) 42 44	15, 27, 48, 77	0

All (28) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	541	TRP	6.8
1	A	543	THR	5.5
1	A	544	ASN	4.1
1	A	55	LYS	3.8
1	A	542	GLU	3.8
1	A	656	SER	3.3
1	A	153	ASN	3.3
1	A	227	LEU	3.0
1	A	652	ASP	3.0
1	A	134	ASP	2.9
1	A	226	ILE	2.9
1	A	123	THR	2.8
1	A	507	SER	2.7
1	A	547	SER	2.7
1	A	335	GLY	2.6
1	A	237	PRO	2.6
1	A	336	ASN	2.5
1	A	136	ASN	2.4
1	A	339	THR	2.4
1	A	719	VAL	2.4
1	A	124	HIS	2.4
1	A	487	GLY	2.4
1	A	225	VAL	2.3
1	A	56	HIS	2.3
1	A	506	PHE	2.2
1	A	154	VAL	2.2
1	A	201	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	135	GLY	2.1

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

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. 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
2	NAG	A	802	14/15	0.80	0.26	4.94	43,50,56,56	0
4	MAN	A	813	11/12	0.92	0.18	2.44	48,50,53,55	0
2	NAG	A	803	14/15	0.82	0.28	2.23	44,51,58,61	0
2	NAG	A	808	14/15	0.96	0.09	1.15	29,33,39,40	0
2	NAG	A	810	14/15	0.94	0.08	0.51	22,29,39,46	0
2	NAG	A	807	14/15	0.87	0.16	-	32,50,54,55	0
2	NAG	A	804	14/15	0.90	0.16	-	46,50,55,66	0
2	NAG	A	805	14/15	0.83	0.33	-	54,59,63,64	0
2	NAG	A	806	14/15	0.86	0.17	-	65,71,75,76	0
2	NAG	A	801	14/15	0.96	0.10	-	36,42,47,50	0
2	NAG	A	809	14/15	0.90	0.17	-	40,44,52,53	0
2	NAG	A	811	14/15	0.90	0.22	-	39,43,51,53	0

6.3 Carbohydrates [i](#)

There are no carbohydrates 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. 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
2	NAG	A	802	14/15	0.80	0.26	4.94	43,50,56,56	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	LLDF	B-factors(\AA^2)	Q<0.9
4	MAN	A	813	11/12	0.92	0.18	2.44	48,50,53,55	0
2	NAG	A	803	14/15	0.82	0.28	2.23	44,51,58,61	0
6	CA	A	816	1/1	1.00	0.08	1.52	17,17,17,17	0
2	NAG	A	808	14/15	0.96	0.09	1.15	29,33,39,40	0
2	NAG	A	810	14/15	0.94	0.08	0.51	22,29,39,46	0
8	2G5	A	818	28/28	0.97	0.10	-0.24	18,21,44,46	0
7	CL	A	817	1/1	1.00	0.09	-0.76	25,25,25,25	0
5	ZN	A	815	1/1	1.00	0.07	-1.77	20,20,20,20	0
5	ZN	A	814	1/1	1.00	0.06	-4.73	20,20,20,20	0
2	NAG	A	804	14/15	0.90	0.16	-	46,50,55,66	0
2	NAG	A	807	14/15	0.87	0.16	-	32,50,54,55	0
2	NAG	A	805	14/15	0.83	0.33	-	54,59,63,64	0
3	BMA	A	812	11/12	0.89	0.14	-	43,45,47,47	0
2	NAG	A	806	14/15	0.86	0.17	-	65,71,75,76	0
2	NAG	A	801	14/15	0.96	0.10	-	36,42,47,50	0
2	NAG	A	809	14/15	0.90	0.17	-	40,44,52,53	0
2	NAG	A	811	14/15	0.90	0.22	-	39,43,51,53	0

6.5 Other polymers [i](#)

There are no such residues in this entry.