



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 13, 2017 – 11:26 pm GMT

PDB ID : 4OC1
Title : X-ray structure of of human glutamate carboxypeptidase II (GCPII) in a complex with COIBzL, a urea-based inhibitor (2S)-2-[(1S)-1-carboxy-2-[(2S)-oxiran-2-yl]ethyl}carbamoyl)amino]-6-[(4-iodobenzoyl)amino]hexanoic acid
Authors : Pavlicek, J.; Ptacek, J.; Cerny, J.; Byun, Y.; Skultetyova, L.; Pomper, M.; Lubkowski, J.; Barinka, C.
Deposited on : 2014-01-08
Resolution : 1.75 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

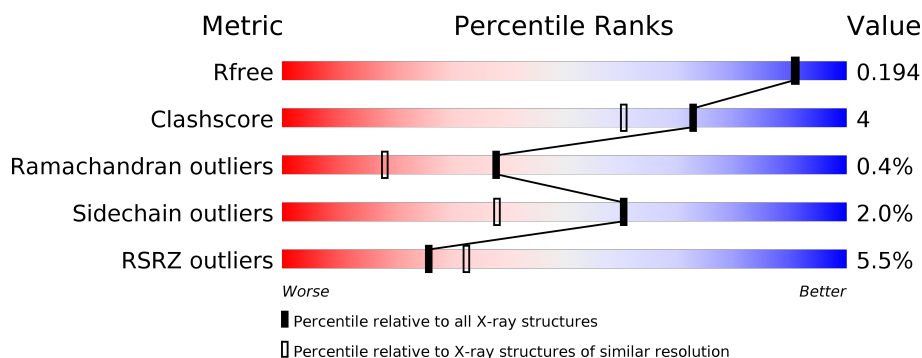
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.75 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	1762 (1.76-1.76)
Clashscore	112137	1889 (1.76-1.76)
Ramachandran outliers	110173	1868 (1.76-1.76)
Sidechain outliers	110143	1868 (1.76-1.76)
RSRZ outliers	101464	1770 (1.76-1.76)

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	709	<div> <div>5%</div> <div>89%</div> <div>8%</div> <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
2	NAG	A	808	-	-	-	X
3	NAG	A	807	-	-	-	X

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 6447 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	694	Total	C	N	O	S	0	31	0
			5678	3657	948	1053	20			

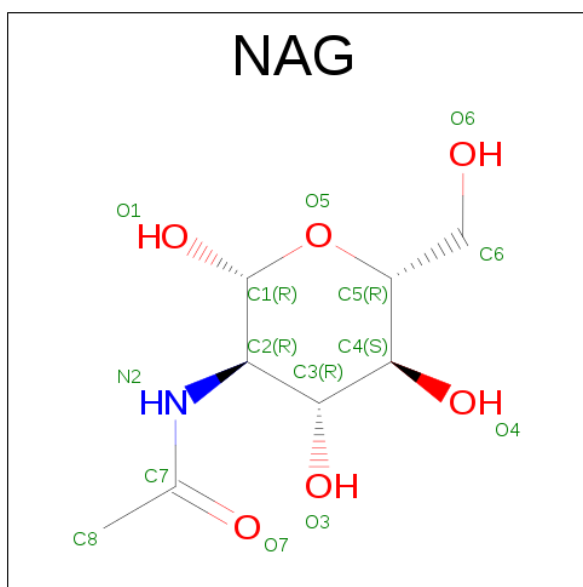
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
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		

- Molecule 3 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: C₈H₁₅NO₆).



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

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

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	4	Total	C	N	O	0	0
			50	28	2	20		

- 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		

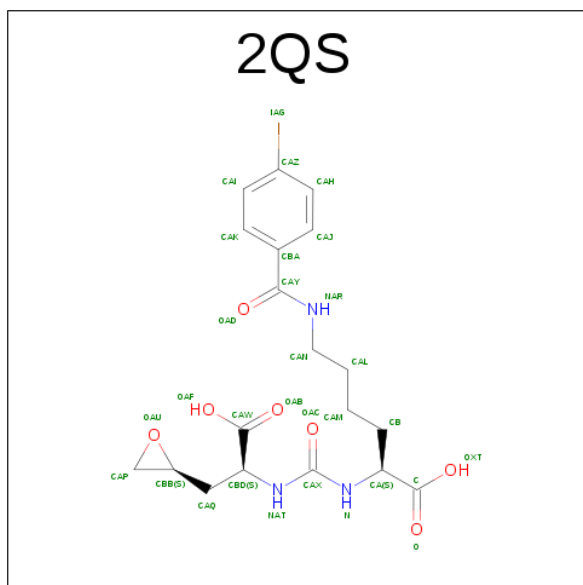
- Molecule 6 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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 1 1	0	0

- Molecule 8 is (2S)-2-[(1S)-1-CARBOXY-2-[(2S)-OXIRAN-2-YL]ETHYL}CARBAMOYL) AMINO]-6-[(4-IODOBENZOYL)AMINO]HEXANOIC ACID (NON-PREFERRED NAME) (three-letter code: 2QS) (formula: C₁₉H₂₄IN₃O₇).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	1	Total C I N O 60 38 2 6 14	0	1

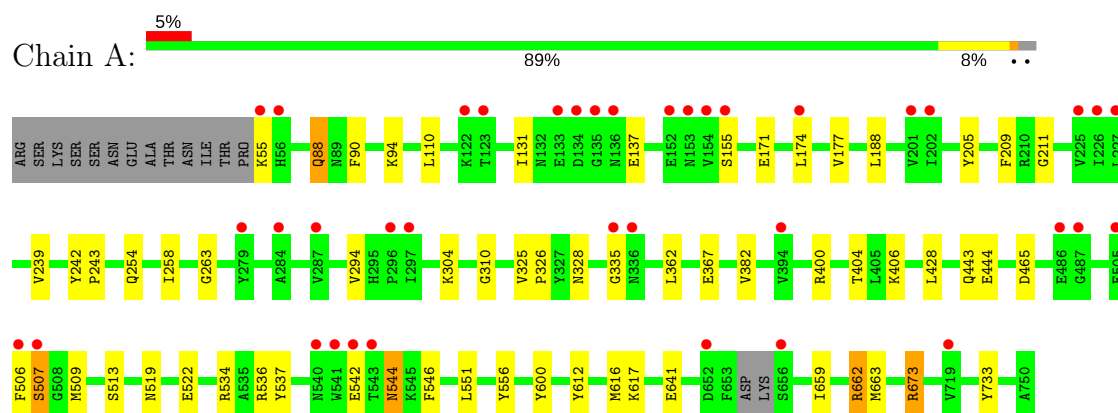
- Molecule 9 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
9	A	529	Total O 529 529	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: 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	101.40Å 130.35Å 158.94Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.48 – 1.75 29.48 – 1.75	Depositor EDS
% Data completeness (in resolution range)	99.6 (29.48-1.75) 99.6 (29.48-1.75)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.36 (at 1.75Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.168 , 0.193 0.168 , 0.194	Depositor DCC
R_{free} test set	1053 reflections (1.01%)	DCC
Wilson B-factor (Å ²)	23.6	Xtriage
Anisotropy	0.065	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 51.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	6447	wwPDB-VP
Average B, all atoms (Å ²)	28.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.91% 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 [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, BMA, NAG, CL, CA, 2QS, 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	0.89	0/5914	0.82	4/8012 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	673	ARG	NE-CZ-NH1	6.92	123.76	120.30
1	A	673	ARG	NE-CZ-NH2	-6.12	117.24	120.30
1	A	174[A]	LEU	CA-CB-CG	6.03	129.16	115.30
1	A	174[B]	LEU	CA-CB-CG	6.03	129.16	115.30

There are no chirality outliers.

There are no planarity outliers.

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	5678	0	5567	44	0
2	A	84	0	75	1	0
3	A	42	0	39	0	0
4	A	50	0	43	0	0
5	A	2	0	0	0	0
6	A	1	0	0	0	0
7	A	1	0	0	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
8	A	60	0	44	8	0
9	A	529	0	0	6	1
All	All	6447	0	5768	46	1

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 4.

All (46) 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:659[A]:ILE:HG22	1:A:663[A]:MET:CE	1.92	0.99
1:A:88:GLN:HE21	1:A:88:GLN:H	1.13	0.91
1:A:733:TYR:HE1	9:A:1422:HOH:O	1.63	0.80
1:A:659[A]:ILE:HG22	1:A:663[A]:MET:HE2	1.69	0.73
1:A:641:GLU:HG3	9:A:1257:HOH:O	1.88	0.72
1:A:428:LEU:HG	8:A:818[A]:2QS:H1	1.72	0.71
1:A:90:PHE:CE2	1:A:94[A]:LYS:HE2	2.26	0.70
1:A:94[B]:LYS:HD3	1:A:110:LEU:HD11	1.76	0.67
1:A:177:VAL:HG12	1:A:188:LEU:HD11	1.78	0.66
1:A:400:ARG:O	1:A:404[B]:THR:HG23	1.98	0.63
1:A:534:ARG:HG3	8:A:818[A]:2QS:IAG	2.69	0.63
1:A:659[A]:ILE:O	1:A:663[A]:MET:HG3	1.98	0.63
1:A:131[A]:ILE:HD11	1:A:171:GLU:HG3	1.84	0.59
1:A:659[A]:ILE:HG22	1:A:663[A]:MET:HE1	1.83	0.59
1:A:659[A]:ILE:HG22	1:A:663[A]:MET:SD	2.45	0.57
1:A:536:ARG:CZ	8:A:818[A]:2QS:H23	2.35	0.55
1:A:659[A]:ILE:CG2	1:A:663[A]:MET:CE	2.79	0.55
1:A:733:TYR:CE1	9:A:1422:HOH:O	2.47	0.55
1:A:465:ASP:OD1	1:A:513:SER:HB2	2.09	0.53
1:A:362:LEU:CD1	1:A:406:LYS:HD2	2.38	0.53
1:A:536:ARG:HG2	8:A:818[A]:2QS:IAG	2.79	0.53
2:A:802:NAG:H81	9:A:1141:HOH:O	2.11	0.51
1:A:367:GLU:OE1	1:A:662[A]:ARG:NH1	2.42	0.50
1:A:551:LEU:HD22	1:A:556:TYR:HB2	1.95	0.48
1:A:506:PHE:O	1:A:507:SER:O	2.32	0.48
1:A:536:ARG:NE	8:A:818[A]:2QS:H23	2.29	0.48
1:A:55:LYS:HA	1:A:55:LYS:HE2	1.96	0.48
1:A:659[A]:ILE:CG2	1:A:663[A]:MET:HE1	2.43	0.47
1:A:258:ILE:HD13	1:A:294:VAL:HB	1.95	0.47
1:A:325:VAL:HB	1:A:326:PRO:HD2	1.96	0.47
1:A:546:PHE:HA	8:A:818[A]:2QS:H19	1.97	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:544:ASN:ND2	9:A:1128:HOH:O	2.49	0.46
1:A:362:LEU:HD11	1:A:406:LYS:HD2	1.99	0.45
1:A:94[B]:LYS:HA	1:A:94[B]:LYS:HD2	1.72	0.44
1:A:209:PHE:CE2	1:A:211:GLY:HA3	2.52	0.44
1:A:131[A]:ILE:CG2	1:A:137:GLU:HG2	2.48	0.44
1:A:88:GLN:NE2	1:A:88:GLN:H	1.96	0.44
1:A:534:ARG:HG3	8:A:818[C]:2QS:IAG	2.89	0.42
1:A:304:LYS:HE2	9:A:1133:HOH:O	2.19	0.42
1:A:612:TYR:CZ	1:A:616:MET:HG3	2.54	0.42
1:A:263:GLY:HA2	1:A:522:GLU:OE2	2.20	0.42
1:A:310:GLY:O	1:A:328:ASN:HB3	2.21	0.41
1:A:242:TYR:CG	1:A:243:PRO:HA	2.56	0.41
1:A:443[B]:GLN:HG3	1:A:444:GLU:CD	2.41	0.41
8:A:818[C]:2QS:OAC	8:A:818[C]:2QS:CAW	2.69	0.40
1:A:205:TYR:CE1	1:A:254:GLN:HB3	2.55	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
9:A:1154:HOH:O	9:A:1259:HOH:O[2_565]	2.07	0.13

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	719/709 (101%)	700 (97%)	16 (2%)	3 (0%)	38 18

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	507	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	382	VAL
1	A	335	GLY

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	621/605 (103%)	607 (98%)	14 (2%)	56 31

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	88	GLN
1	A	155	SER
1	A	239[A]	VAL
1	A	239[B]	VAL
1	A	509	MET
1	A	519	ASN
1	A	537	TYR
1	A	542	GLU
1	A	544	ASN
1	A	600	TYR
1	A	617	LYS
1	A	662[A]	ARG
1	A	662[B]	ARG
1	A	673	ARG

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	88	GLN
1	A	89	ASN
1	A	544	ASN
1	A	618	HIS

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 ⓘ

10 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	0.49	0	15,19,21	1.32	3 (20%)
2	NAG	A	802	2	14,14,15	0.61	0	15,19,21	1.23	2 (13%)
2	NAG	A	804	1,2	14,14,15	0.77	1 (7%)	15,19,21	0.96	1 (6%)
2	NAG	A	805	2	14,14,15	0.40	0	15,19,21	0.93	0
2	NAG	A	808	1,2	14,14,15	0.96	1 (7%)	15,19,21	1.11	2 (13%)
2	NAG	A	809	2	14,14,15	0.55	0	15,19,21	1.29	3 (20%)
4	NAG	A	810	1,4	14,14,15	0.68	0	15,19,21	1.21	2 (13%)
4	NAG	A	811	4	14,14,15	0.74	1 (7%)	15,19,21	1.70	4 (26%)
4	BMA	A	812	4	11,11,12	0.57	0	13,15,17	1.06	1 (7%)
4	MAN	A	813	4	11,11,12	0.57	0	13,15,17	0.90	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	804	1,2	-	0/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAG	A	805	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
4	NAG	A	810	1,4	-	0/6/23/26	0/1/1/1
4	NAG	A	811	4	-	0/6/23/26	0/1/1/1
4	BMA	A	812	4	-	0/2/19/22	0/1/1/1
4	MAN	A	813	4	-	0/2/19/22	0/1/1/1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	811	NAG	O5-C1	-2.09	1.40	1.43
2	A	804	NAG	C1-C2	2.06	1.55	1.52
2	A	808	NAG	O7-C7	2.29	1.28	1.23

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	810	NAG	O5-C1-C2	-3.06	107.22	111.47
4	A	811	NAG	O5-C1-C2	-2.87	107.47	111.47
2	A	801	NAG	O5-C1-C2	-2.84	107.52	111.47
2	A	809	NAG	O7-C7-C8	-2.66	117.22	122.06
2	A	804	NAG	O5-C1-C2	-2.44	108.08	111.47
4	A	811	NAG	C3-C4-C5	-2.41	105.97	110.22
2	A	808	NAG	O4-C4-C3	-2.35	105.25	110.36
2	A	808	NAG	O5-C1-C2	-2.33	108.23	111.47
4	A	810	NAG	O4-C4-C5	-2.31	103.45	109.28
2	A	801	NAG	O3-C3-C4	-2.23	105.50	110.36
2	A	801	NAG	C2-N2-C7	-2.16	119.79	122.94
4	A	812	BMA	O3-C3-C2	-2.13	106.16	110.02
4	A	811	NAG	C4-C3-C2	-2.07	107.98	111.02
2	A	802	NAG	C1-O5-C5	2.10	115.06	112.17
4	A	813	MAN	O3-C3-C2	2.25	114.12	110.02
2	A	809	NAG	C1-O5-C5	2.42	115.50	112.17
2	A	809	NAG	C8-C7-N2	2.95	121.43	116.11
4	A	811	NAG	C8-C7-N2	2.95	121.44	116.11
2	A	802	NAG	C2-N2-C7	2.99	127.30	122.94

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	802	NAG	1	0

5.6 Ligand geometry

Of 9 ligands modelled in this entry, 4 are monoatomic - leaving 5 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	803	1	14,14,15	0.60	0	15,19,21	1.41	1 (6%)
3	NAG	A	806	1	14,14,15	0.48	0	15,19,21	1.29	1 (6%)
3	NAG	A	807	1	14,14,15	0.75	0	15,19,21	1.75	3 (20%)
8	2QS	A	818[A]	-	25,31,31	1.38	2 (8%)	28,41,41	1.47	4 (14%)
8	2QS	A	818[C]	5	25,31,31	2.58	9 (36%)	28,41,41	3.12	11 (39%)

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	803	1	-	0/6/23/26	0/1/1/1
3	NAG	A	806	1	-	0/6/23/26	0/1/1/1
3	NAG	A	807	1	-	0/6/23/26	0/1/1/1
8	2QS	A	818[A]	-	-	0/24/34/34	0/1/2/2
8	2QS	A	818[C]	5	-	0/24/34/34	0/1/2/2

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	818[C]	2QS	CAI-CAZ	2.10	1.43	1.38
8	A	818[C]	2QS	CAJ-CBA	2.25	1.43	1.39
8	A	818[C]	2QS	CAH-CAZ	2.30	1.43	1.38

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	818[C]	2QS	CB-CA	3.10	1.57	1.53
8	A	818[A]	2QS	CAQ-CBB	3.11	1.59	1.52
8	A	818[C]	2QS	CAH-CAJ	3.25	1.44	1.38
8	A	818[C]	2QS	CAI-CAK	3.33	1.44	1.38
8	A	818[C]	2QS	CAQ-CBD	3.58	1.57	1.53
8	A	818[A]	2QS	CAQ-CBD	4.74	1.58	1.53
8	A	818[C]	2QS	CBA-CAY	5.16	1.61	1.50
8	A	818[C]	2QS	CAZ-IAG	7.55	2.29	2.10

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	A	818[C]	2QS	CAH-CAZ-CAI	-9.70	106.94	120.66
8	A	818[C]	2QS	CAJ-CBA-CAK	-4.29	112.64	118.58
3	A	807	NAG	O5-C1-C2	-4.20	105.63	111.47
8	A	818[A]	2QS	CAQ-CBB-CAP	-4.01	106.41	120.92
8	A	818[C]	2QS	CAQ-CBB-CAP	-3.20	109.33	120.92
3	A	803	NAG	C1-C2-N2	-3.12	105.17	110.49
3	A	807	NAG	O7-C7-C8	-3.03	116.53	122.06
8	A	818[A]	2QS	CB-CA-C	-2.88	108.10	112.28
8	A	818[C]	2QS	CB-CA-N	-2.59	106.29	110.22
8	A	818[A]	2QS	CAI-CAZ-IAG	-2.35	116.14	119.67
8	A	818[C]	2QS	OAC-CAX-NAT	-2.19	118.41	122.61
8	A	818[A]	2QS	OAU-CBB-CAP	-2.00	55.84	60.01
3	A	807	NAG	C8-C7-N2	2.04	119.80	116.11
8	A	818[C]	2QS	CAI-CAK-CBA	2.12	123.17	120.79
8	A	818[C]	2QS	N-CAX-NAT	2.89	119.39	115.14
3	A	806	NAG	C1-O5-C5	3.59	117.11	112.17
8	A	818[C]	2QS	CAI-CAZ-IAG	3.88	125.50	119.67
8	A	818[C]	2QS	CAH-CAZ-IAG	5.25	127.55	119.67
8	A	818[C]	2QS	CAK-CAI-CAZ	5.78	127.37	119.54
8	A	818[C]	2QS	CAJ-CAH-CAZ	6.13	127.85	119.54

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

2 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	818[A]	2QS	6	0
8	A	818[C]	2QS	2	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	694/709 (97%)	0.06	38 (5%)	26 32	15, 25, 44, 60	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	541	TRP	5.0
1	A	153	ASN	4.5
1	A	506	PHE	4.5
1	A	55	LYS	4.4
1	A	123	THR	3.8
1	A	719	VAL	3.7
1	A	335	GLY	3.7
1	A	505	GLU	3.6
1	A	652	ASP	3.5
1	A	656[A]	SER	3.4
1	A	287	VAL	3.4
1	A	134	ASP	3.2
1	A	201[A]	VAL	3.0
1	A	122	LYS	3.0
1	A	133	GLU	2.9
1	A	56	HIS	2.8
1	A	507	SER	2.8
1	A	227	LEU	2.8
1	A	394	VAL	2.8
1	A	155	SER	2.7
1	A	135	GLY	2.6
1	A	543	THR	2.6
1	A	487	GLY	2.6
1	A	486	GLU	2.6
1	A	152	GLU	2.5
1	A	136	ASN	2.5
1	A	540	ASN	2.3

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	284	ALA	2.3
1	A	174[A]	LEU	2.3
1	A	225	VAL	2.2
1	A	154	VAL	2.2
1	A	202	ILE	2.2
1	A	226	ILE	2.2
1	A	297	ILE	2.2
1	A	336	ASN	2.1
1	A	542	GLU	2.1
1	A	296	PRO	2.1
1	A	279[A]	TYR	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](#)

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	808	14/15	0.90	0.11	2.42	27,29,36,39	0
4	NAG	A	810	14/15	0.90	0.09	1.30	23,26,35,41	0
4	MAN	A	813	11/12	0.92	0.14	1.01	41,42,47,47	0
2	NAG	A	801	14/15	0.94	0.09	-	31,39,45,48	0
2	NAG	A	805	14/15	0.76	0.28	-	55,58,63,63	0
2	NAG	A	802	14/15	0.70	0.25	-	39,52,55,56	0
2	NAG	A	804	14/15	0.88	0.16	-	36,41,46,51	0
4	NAG	A	811	14/15	0.91	0.19	-	34,38,48,49	0
4	BMA	A	812	11/12	0.93	0.15	-	37,38,39,39	0
2	NAG	A	809	14/15	0.90	0.19	-	34,39,44,48	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(Å ²)	Q<0.9
3	NAG	A	807	14/15	0.82	0.15	2.73	30,46,52,54	0
6	CA	A	816	1/1	1.00	0.06	1.19	16,16,16,16	0
8	2QS	A	818[A]	30/30	0.98	0.10	0.11	7,21,36,37	30
8	2QS	A	818[C]	30/30	0.98	0.10	0.08	13,20,28,30	30
7	CL	A	817	1/1	0.99	0.10	-0.44	24,24,24,24	0
5	ZN	A	815	1/1	1.00	0.06	-2.17	18,18,18,18	0
5	ZN	A	814	1/1	1.00	0.07	-9.85	19,19,19,19	0
3	NAG	A	803	14/15	0.72	0.27	-	44,50,54,59	0
3	NAG	A	806	14/15	0.81	0.20	-	56,63,65,67	0

6.5 Other polymers [i](#)

There are no such residues in this entry.