Full wwPDB X-ray Structure Validation Report

Feb 1, 2016 – 05:55 PM GMT

PDB ID	:	4JYW
Title	:	X-ray structure of human glutamate carboxypeptidase II (GCPII) in complex with CTT1057
Authors	:	Barinka, C.
Deposited on	:	2013-04-01
Resolution	:	1.73 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 (i) symbol.

The following versions of software and data (see references (1)) were used in the production of this report:

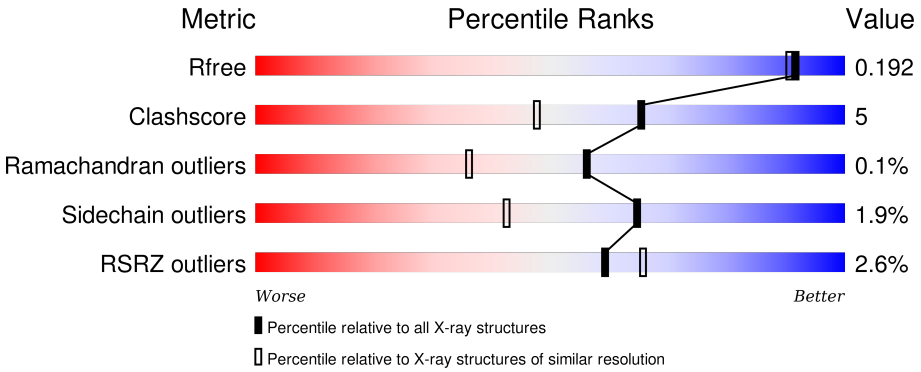
MolProbity	:	4.02b-467
Mogul	:	1.7 (RC4), CSD as536be (2015)
Xtriage (Phenix)	:	1.9-1692
EDS	:	rb-20026688
Percentile statistics	:	20151230.v01 (using entries in the PDB archive December 30th 2015)
Refmac	:	5.8.0135
CCP4	:	6.5.0
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	trunk26865

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.73 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	2417 (1.76-1.72)
Clashscore	102246	2570 (1.76-1.72)
Ramachandran outliers	100387	2544 (1.76-1.72)
Sidechain outliers	100360	2544 (1.76-1.72)
RSRZ outliers	91569	2420 (1.76-1.72)

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 <=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	3% 87% 10%

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
5	NAG	A	806	-	-	-	X

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Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	NAG	A	807	-	-	-	X
6	NAG	A	809	-	-	-	X
8	NAG	A	814	-	-	-	X
9	NAG	A	817	-	-	-	X
9	MAN	A	820	-	-	-	X

2 Entry composition

There are 11 unique types of molecules in this entry. The entry contains 6772 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	58	0
			5804	3729	968	1085	22			

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

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

- Molecule 3 is CALCIUM ION (three-letter code: CA) (formula: Ca).

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

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

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

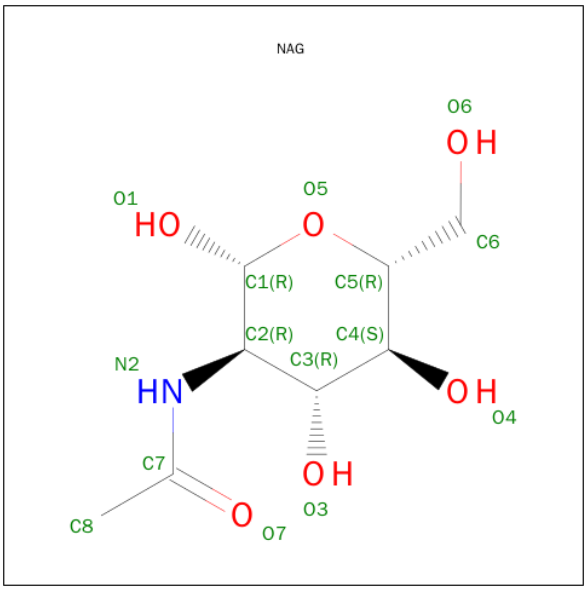
- Molecule 5 is a polymer of unknown type called SUGAR (2-MER).

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

- Molecule 6 is a polymer of unknown type called SUGAR (3-MER).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	3	Total C N O 38 22 2 14	0	0

- Molecule 7 is SUGAR (N-ACETYL-D-GLUCOSAMINE) (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).



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

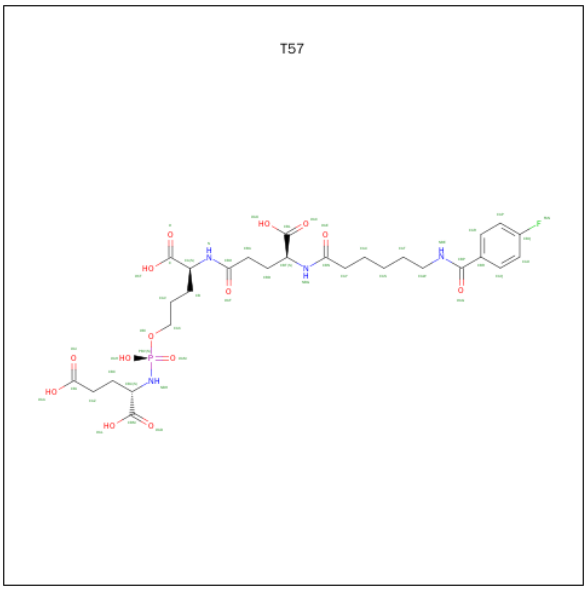
- Molecule 8 is a polymer of unknown type called SUGAR (3-MER).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	3	Total C N O 39 22 2 15	0	0

- Molecule 9 is a polymer of unknown type called SUGAR (5-MER).

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

- Molecule 10 is N-{6-[(4-FLUOROBENZOYL)AMINO]HEXANOYL}-L-GAMMA-GLUTAMYL-5-{[(S)-{[(1S)-1,3-DICARBOXYPROPYL]AMINO}(HYDROXY)PHOSPHORYL]OXY}-L-NORVALINE (three-letter code: T57) (formula: $C_{28}H_{40}FN_4O_{14}P$).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
10	A	1	Total	C	F	N	O	P	0	1
			96	56	2	8	28	2		

- Molecule 11 is water.

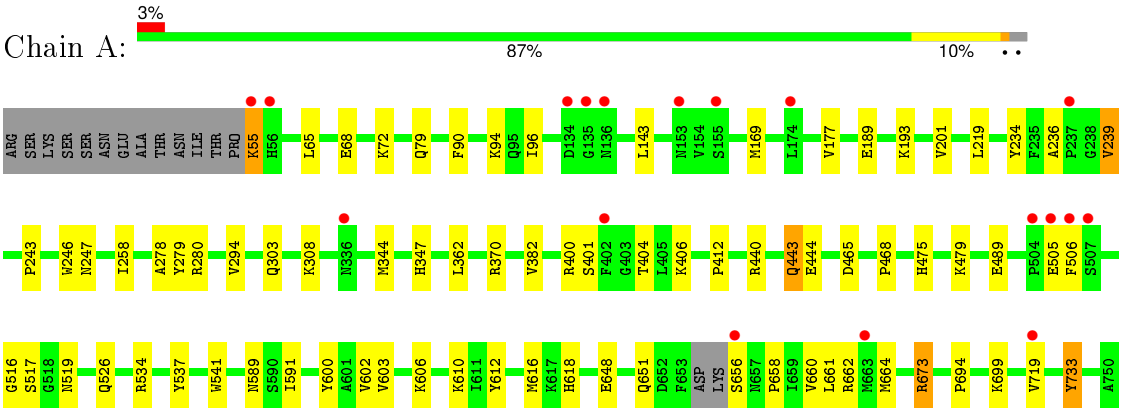
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	646	Total	O	0	0
			646	646		

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 (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

Chain A:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	I 2 2 2	Depositor
Cell constants a, b, c, α, β, γ	102.62Å 130.33Å 158.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	19.71 – 1.73 19.71 – 1.73	Depositor EDS
% Data completeness (in resolution range)	100.0 (19.71-1.73) 99.3 (19.71-1.73)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.54 (at 1.72Å)	Xtriage
Refinement program	REFMAC 5.5.0109	Depositor
R, R_{free}	0.158 , 0.181 0.172 , 0.192	Depositor DCC
R_{free} test set	5505 reflections (5.26%)	DCC
Wilson B-factor (Å^2)	17.8	Xtriage
Anisotropy	0.556	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 43.5	EDS
Estimated twinning fraction	No twinning to report.	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Outliers	0 of 110214 reflections	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	6772	wwPDB-VP
Average B, all atoms (Å^2)	22.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.11% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.375 respectively for untwinned datasets, and 0.333, 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: ZN, BMA, NAG, CL, CA, T57, FUC, 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	2/6136 (0.0%)	0.80	6/8305 (0.1%)

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	234	TYR	CD1-CE1	5.09	1.47	1.39
1	A	733	TYR	CD1-CE1	5.05	1.47	1.39

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	662[A]	ARG	NE-CZ-NH2	-6.03	117.28	120.30
1	A	662[B]	ARG	NE-CZ-NH2	-6.03	117.28	120.30
1	A	465	ASP	CB-CG-OD1	6.01	123.71	118.30
1	A	440	ARG	NE-CZ-NH2	-5.71	117.44	120.30
1	A	370	ARG	NE-CZ-NH1	5.20	122.90	120.30
1	A	673	ARG	NE-CZ-NH1	5.08	122.84	120.30

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	5804	0	5670	53	2
2	A	2	0	0	0	0
3	A	1	0	0	0	0
4	A	1	0	0	0	0
5	A	56	0	50	4	0
6	A	38	0	34	1	0
7	A	28	0	26	1	0
8	A	39	0	34	2	0
9	A	61	0	52	0	0
10	A	96	0	70	4	0
11	A	646	0	0	15	4
All	All	6772	0	5936	61	4

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 5.

All (61) 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:660[A]:VAL:O	1:A:664[A]:MET:HG2	1.29	1.27
1:A:658[A]:PRO:HB3	11:A:1255:HOH:O	1.63	0.97
1:A:412:PRO:HA	1:A:589[B]:ASN:HD21	1.32	0.95
1:A:189[B]:GLU:OE1	11:A:1484:HOH:O	1.98	0.81
1:A:505:GLU:HG3	1:A:606[B]:LYS:HZ1	1.45	0.80
1:A:90[B]:PHE:CE2	1:A:94:LYS:HE2	2.20	0.77
1:A:612:TYR:CZ	1:A:616:MET:HG3	2.20	0.77
1:A:400:ARG:O	1:A:404[B]:THR:HG23	1.89	0.72
1:A:733:TYR:HE2	11:A:1276:HOH:O	1.72	0.70
5:A:806:NAG:H81	11:A:1148:HOH:O	1.92	0.69
1:A:412:PRO:HA	1:A:589[B]:ASN:ND2	2.09	0.66
1:A:143:LEU:HD11	6:A:811:FUC:H62	1.78	0.65
1:A:505:GLU:HG3	1:A:606[B]:LYS:NZ	2.14	0.61
5:A:806:NAG:H83	11:A:1419:HOH:O	2.03	0.57
1:A:308:LYS:HB2	11:A:1237:HOH:O	2.05	0.57
1:A:516:GLY:O	1:A:526[B]:GLN:NE2	2.37	0.56
1:A:505:GLU:OE1	1:A:606[B]:LYS:HD2	2.05	0.56
5:A:807:NAG:H83	11:A:1110:HOH:O	2.06	0.55
1:A:177:VAL:HG13	1:A:201[B]:VAL:HG22	1.89	0.55
1:A:90[B]:PHE:CE2	1:A:94:LYS:CE	2.88	0.54
1:A:506:PHE:HE1	1:A:602:VAL:CG1	2.21	0.54
1:A:177:VAL:CG1	1:A:201[B]:VAL:HG22	2.39	0.53
1:A:362:LEU:CD1	1:A:406:LYS:HD2	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:169:MET:HA	1:A:344:MET:O	2.10	0.52
1:A:526[B]:GLN:HG2	1:A:694:PRO:HD3	1.93	0.51
1:A:239[A]:VAL:HG22	1:A:247:ASN:ND2	2.29	0.47
1:A:347:HIS:HE1	11:A:1239:HOH:O	1.97	0.46
1:A:177:VAL:HG11	1:A:201[B]:VAL:CG2	2.46	0.46
1:A:79[B]:GLN:CD	5:A:805:NAG:H81	2.36	0.46
8:A:815:NAG:H83	11:A:1111:HOH:O	2.14	0.46
1:A:618:HIS:HE1	11:A:1044:HOH:O	1.99	0.46
1:A:90[B]:PHE:HE2	1:A:94:LYS:HZ3	1.63	0.45
1:A:90[B]:PHE:CZ	1:A:94:LYS:HE2	2.51	0.45
1:A:591[B]:ILE:HG23	1:A:661[B]:LEU:HD21	1.99	0.45
10:A:822[A]:T57:H11	10:A:822[A]:T57:OAL	2.17	0.45
1:A:506:PHE:CE1	1:A:602:VAL:CG1	2.99	0.45
1:A:96[B]:ILE:HD13	11:A:984:HOH:O	2.17	0.45
1:A:648:GLU:O	1:A:651[B]:GLN:HG2	2.16	0.44
10:A:822[B]:T57:OAL	10:A:822[B]:T57:H11	2.17	0.44
1:A:236:ALA:O	1:A:239[A]:VAL:HG13	2.18	0.44
1:A:610:LYS:HE2	11:A:1078:HOH:O	2.17	0.44
1:A:475:HIS:O	1:A:479:LYS:HG3	2.18	0.43
1:A:258:ILE:HD13	1:A:294:VAL:HB	2.00	0.43
8:A:815:NAG:C8	11:A:1111:HOH:O	2.66	0.43
1:A:517:SER:HB3	1:A:699:LYS:HG3	2.00	0.43
1:A:177:VAL:HG11	1:A:201[B]:VAL:HG21	2.01	0.43
1:A:278:ALA:HB3	1:A:280[A]:ARG:NH1	2.34	0.42
1:A:506:PHE:CE1	1:A:602:VAL:HG12	2.55	0.42
1:A:246:TRP:CD1	7:A:813:NAG:H83	2.55	0.41
1:A:489:GLU:H	1:A:489:GLU:CD	2.24	0.41
1:A:243:PRO:HD3	11:A:1475:HOH:O	2.21	0.41
1:A:90[B]:PHE:CE2	1:A:94:LYS:NZ	2.89	0.41
1:A:541:TRP:HB2	10:A:822[B]:T57:CBR	2.50	0.41
1:A:65:LEU:HD23	1:A:401[B]:SER:OG	2.20	0.41
1:A:68[A]:GLU:HG3	1:A:72[A]:LYS:HE3	2.02	0.41
10:A:822[A]:T57:OXT	10:A:822[A]:T57:H13	2.21	0.41
1:A:443[B]:GLN:HG3	1:A:444:GLU:CD	2.42	0.41
1:A:55:LYS:HE2	1:A:55:LYS:HB3	1.92	0.40
1:A:219:LEU:HD12	11:A:1409:HOH:O	2.20	0.40
1:A:468:PRO:CG	1:A:603[A]:VAL:HG21	2.52	0.40

All (4) 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)
11:A:1116:HOH:O	11:A:1477:HOH:O[2_565]	1.74	0.46
1:A:656[B]:SER:O	11:A:1255:HOH:O[4_566]	1.87	0.33
11:A:1162:HOH:O	11:A:1290:HOH:O[2_565]	1.90	0.30
1:A:656[B]:SER:OG	11:A:1255:HOH:O[4_566]	2.19	0.01

5.3 Torsion angles

5.3.1 Protein backbone

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	746/709 (105%)	728 (98%)	17 (2%)	1 (0%)	56 36

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	382	VAL

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	648/605 (107%)	635 (98%)	13 (2%)	63 39

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	55	LYS
1	A	193	LYS

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Mol	Chain	Res	Type
1	A	239[A]	VAL
1	A	239[B]	VAL
1	A	303	GLN
1	A	443[A]	GLN
1	A	443[B]	GLN
1	A	519	ASN
1	A	534	ARG
1	A	537	TYR
1	A	600	TYR
1	A	673	ARG
1	A	719	VAL

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	124	HIS
1	A	136	ASN
1	A	303	GLN
1	A	347	HIS
1	A	618	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)

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	$\#\|Z\|>2$
5	NAG	A	805	1,5	14,14,15	0.64	0	15,19,21	1.21	1 (6%)
5	NAG	A	806	5	14,14,15	0.68	0	15,19,21	1.04	0
5	NAG	A	807	1,5	14,14,15	0.69	0	15,19,21	1.13	1 (6%)
5	NAG	A	808	5	14,14,15	0.56	0	15,19,21	1.10	1 (6%)
6	NAG	A	809	1,6	14,14,15	0.52	0	15,19,21	1.26	2 (13%)
6	NAG	A	810	6	14,14,15	0.49	0	15,19,21	1.16	3 (20%)
6	FUC	A	811	6	10,10,11	0.62	0	14,14,16	1.24	1 (7%)
8	NAG	A	814	1,8	14,14,15	0.71	0	15,19,21	0.93	1 (6%)
8	NAG	A	815	8	14,14,15	0.59	0	15,19,21	1.55	3 (20%)
8	BMA	A	816	8	11,11,12	0.74	0	14,15,17	1.14	1 (7%)
9	NAG	A	817	9,1	14,14,15	0.80	1 (7%)	15,19,21	0.98	0
9	NAG	A	818	9	14,14,15	0.65	0	15,19,21	1.61	2 (13%)
9	BMA	A	819	9	11,11,12	0.46	0	14,15,17	0.92	0
9	MAN	A	820	9	11,11,12	0.64	0	14,15,17	1.21	2 (14%)
9	MAN	A	821	9	11,11,12	0.54	0	14,15,17	1.08	0

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
5	NAG	A	805	1,5	-	0/6/23/26	0/1/1/1
5	NAG	A	806	5	-	0/6/23/26	0/1/1/1
5	NAG	A	807	1,5	-	0/6/23/26	0/1/1/1
5	NAG	A	808	5	-	0/6/23/26	0/1/1/1
6	NAG	A	809	1,6	-	0/6/23/26	0/1/1/1
6	NAG	A	810	6	-	0/6/23/26	0/1/1/1
6	FUC	A	811	6	-	0/0/17/20	0/1/1/1
8	NAG	A	814	1,8	-	0/6/23/26	0/1/1/1
8	NAG	A	815	8	-	0/6/23/26	0/1/1/1
8	BMA	A	816	8	-	0/2/19/22	0/1/1/1
9	NAG	A	817	9,1	-	0/6/23/26	0/1/1/1
9	NAG	A	818	9	-	0/6/23/26	0/1/1/1
9	BMA	A	819	9	-	0/2/19/22	0/1/1/1
9	MAN	A	820	9	-	0/2/19/22	0/1/1/1
9	MAN	A	821	9	-	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)
9	A	817	NAG	C1-C2	2.11	1.55	1.52

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
9	A	818	NAG	C3-C4-C5	-3.53	104.04	110.20
8	A	815	NAG	O7-C7-C8	-2.69	117.13	122.06
6	A	809	NAG	C3-C2-N2	-2.26	105.15	110.56
6	A	810	NAG	C2-N2-C7	-2.22	120.19	123.04
5	A	807	NAG	O3-C3-C2	-2.21	104.74	109.11
8	A	814	NAG	C3-C4-C5	-2.19	106.38	110.20
8	A	815	NAG	C1-O5-C5	-2.11	109.57	112.25
6	A	810	NAG	C3-C4-C5	-2.05	106.62	110.20
9	A	820	MAN	O3-C3-C2	2.23	114.02	110.00
6	A	810	NAG	O4-C4-C5	2.29	115.30	109.24
9	A	818	NAG	C8-C7-N2	2.63	121.14	116.11
9	A	820	MAN	C1-O5-C5	2.69	115.66	112.25
6	A	809	NAG	C1-O5-C5	2.73	115.72	112.25
8	A	816	BMA	C3-C4-C5	3.10	115.59	110.20
5	A	805	NAG	C1-O5-C5	3.12	116.20	112.25
5	A	808	NAG	C1-O5-C5	3.24	116.36	112.25
8	A	815	NAG	C8-C7-N2	3.61	123.01	116.11
6	A	811	FUC	C1-O5-C5	3.83	118.29	112.38

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

5 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	805	NAG	1	0
5	A	806	NAG	2	0
5	A	807	NAG	1	0
6	A	811	FUC	1	0
8	A	815	NAG	2	0

5.6 Ligand geometry (i)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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	$\#\|Z\| > 2$
7	NAG	A	812	1	14,14,15	0.47	0	15,19,21	2.21	3 (20%)
7	NAG	A	813	1	14,14,15	0.72	0	15,19,21	0.84	0
10	T57	A	822[A]	2	35,48,48	2.86	7 (20%)	38,63,63	1.33	3 (7%)
10	T57	A	822[B]	2	35,48,48	2.83	7 (20%)	38,63,63	1.38	5 (13%)

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
7	NAG	A	812	1	-	0/6/23/26	0/1/1/1
7	NAG	A	813	1	-	0/6/23/26	0/1/1/1
10	T57	A	822[A]	2	-	0/41/56/56	0/1/1/1
10	T57	A	822[B]	2	-	0/41/56/56	0/1/1/1

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	A	822[A]	T57	CBR-CBP	-4.48	1.40	1.50
10	A	822[B]	T57	CBR-CBP	-4.39	1.40	1.50
10	A	822[B]	T57	PBV-OAH	-2.88	1.48	1.56
10	A	822[A]	T57	PBV-OAH	-2.86	1.48	1.56
10	A	822[B]	T57	CAY-CBN	2.09	1.55	1.51
10	A	822[A]	T57	CAY-CBN	2.25	1.55	1.51
10	A	822[A]	T57	CBC-CBU	2.65	1.57	1.53
10	A	822[B]	T57	CBC-CBU	2.71	1.57	1.53
10	A	822[B]	T57	FAN-CBQ	3.01	1.43	1.36
10	A	822[A]	T57	FAN-CBQ	4.50	1.46	1.36
10	A	822[A]	T57	PBV-OAM	9.89	1.57	1.46
10	A	822[B]	T57	PBV-OAM	10.06	1.57	1.46
10	A	822[A]	T57	PBV-NBH	10.40	1.72	1.61
10	A	822[B]	T57	PBV-NBH	10.71	1.72	1.61

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
10	A	822[A]	T57	OAM-PBV-NBH	-4.24	105.49	113.08
10	A	822[B]	T57	OAM-PBV-NBH	-4.20	105.56	113.08
7	A	812	NAG	C4-C3-C2	-2.78	106.90	111.23
10	A	822[A]	T57	CAP-CBQ-CAO	-2.48	119.30	122.87
10	A	822[B]	T57	CAP-CBQ-CAO	-2.39	119.44	122.87
7	A	812	NAG	C6-C5-C4	-2.35	107.23	113.02
10	A	822[B]	T57	OAH-PBV-OBI	2.18	112.97	106.60
10	A	822[B]	T57	CAR-CAP-CBQ	2.38	120.92	118.35
10	A	822[A]	T57	OAH-PBV-OBI	2.39	113.58	106.60
10	A	822[B]	T57	FAN-CBQ-CAP	2.53	122.74	118.52
7	A	812	NAG	C1-O5-C5	7.25	121.45	112.25

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	A	813	NAG	1	0
10	A	822[A]	T57	2	0
10	A	822[B]	T57	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, 95^{th} 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%)	-0.13	18 (2%) 59 66	11, 20, 38, 58	1 (0%)

All (18) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	506	PHE	4.1
1	A	55	LYS	3.6
1	A	336	ASN	3.4
1	A	134	ASP	3.1
1	A	656[A]	SER	2.9
1	A	402	PHE	2.6
1	A	505	GLU	2.6
1	A	237	PRO	2.5
1	A	174[A]	LEU	2.4
1	A	507	SER	2.3
1	A	719	VAL	2.2
1	A	135	GLY	2.2
1	A	136	ASN	2.1
1	A	56	HIS	2.1
1	A	663[A]	MET	2.1
1	A	153	ASN	2.1
1	A	155[A]	SER	2.0
1	A	504	PRO	2.0

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

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

6.3 Carbohydrates (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, 95^{th} 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
5	NAG	A	806	14/15	0.80	0.31	13.29	23,30,35,35	0
9	NAG	A	817	14/15	0.92	0.15	9.08	9,15,20,27	0
6	NAG	A	809	14/15	0.87	0.21	9.01	22,24,27,30	0
8	NAG	A	814	14/15	0.90	0.19	8.45	10,16,22,26	0
5	NAG	A	807	14/15	0.74	0.29	4.75	29,36,38,43	0
9	MAN	A	820	11/12	0.92	0.24	3.37	24,26,29,29	0
6	FUC	A	811	10/11	0.82	0.40	-	34,37,39,43	0
5	NAG	A	805	14/15	0.92	0.16	-	19,24,30,32	0
8	BMA	A	816	11/12	0.68	0.41	-	47,51,53,54	0
9	MAN	A	821	11/12	0.80	0.33	-	43,48,50,51	0
9	NAG	A	818	14/15	0.90	0.26	-	21,23,33,36	0
5	NAG	A	808	14/15	0.71	0.42	-	47,49,52,52	0
8	NAG	A	815	14/15	0.87	0.24	-	25,30,38,41	0
9	BMA	A	819	11/12	0.94	0.17	-	19,22,31,34	0
6	NAG	A	810	14/15	0.76	0.36	-	30,36,40,40	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, 95^{th} 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
10	T57	A	822[B]	48/48	0.97	0.09	0.32	12,22,28,30	48
10	T57	A	822[A]	48/48	0.97	0.09	0.26	12,22,31,34	48
4	CL	A	804	1/1	1.00	0.02	-2.92	15,15,15,15	0
3	CA	A	803	1/1	1.00	0.02	-4.96	10,10,10,10	0
2	ZN	A	801	1/1	1.00	0.02	-5.00	10,10,10,10	0
2	ZN	A	802	1/1	1.00	0.02	-5.18	10,10,10,10	0
7	NAG	A	813	14/15	0.92	0.17	-	11,24,27,28	0
7	NAG	A	812	14/15	0.78	0.28	-	44,49,51,51	0

6.5 Other polymers (i)

There are no such residues in this entry.