



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 15, 2023 – 11:16 AM JST

PDB ID : 6J71
Title : HuA21-scFv in complex with the extracellular domain(ECD) of HER2
Authors : Wang, Z.; Guo, G.; Cheng, B.; Zhu, Z.; Niu, L.; Zhang, H.
Deposited on : 2019-01-16
Resolution : 2.92 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

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

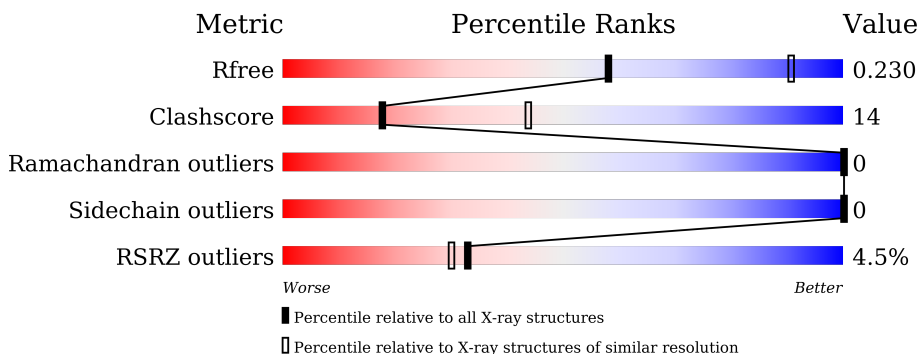
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.92 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}	130704	2307 (2.94-2.90)
Clashscore	141614	2531 (2.94-2.90)
Ramachandran outliers	138981	2462 (2.94-2.90)
Sidechain outliers	138945	2464 (2.94-2.90)
RSRZ outliers	127900	2248 (2.94-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	618	 6% 77% 23%
2	B	254	 74% 18% 8%
3	C	2	 50% 50%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 6601 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 Receptor tyrosine-protein kinase erbB-2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	618	4751	2951	847	898	55	0	0	0

- Molecule 2 is a protein called anti-HER2 humanized antibody HuA21.

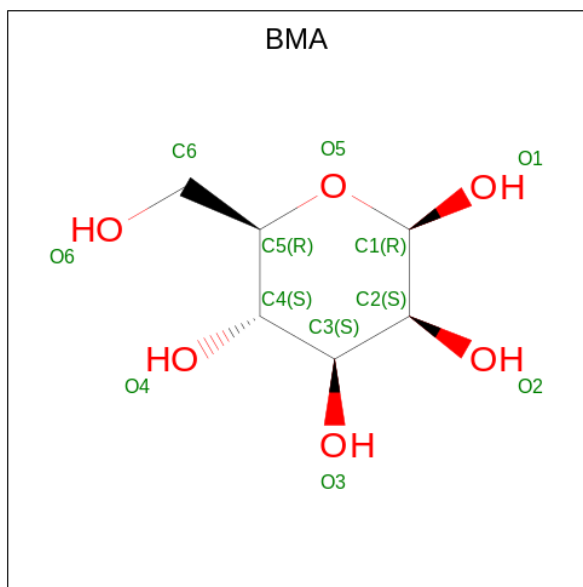
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	233	1814	1150	297	361	6	0	0	0

- Molecule 3 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
3	C	2	25	14	1	10	0	0	0

- Molecule 4 is beta-D-mannopyranose (three-letter code: BMA) (formula: C₆H₁₂O₆).

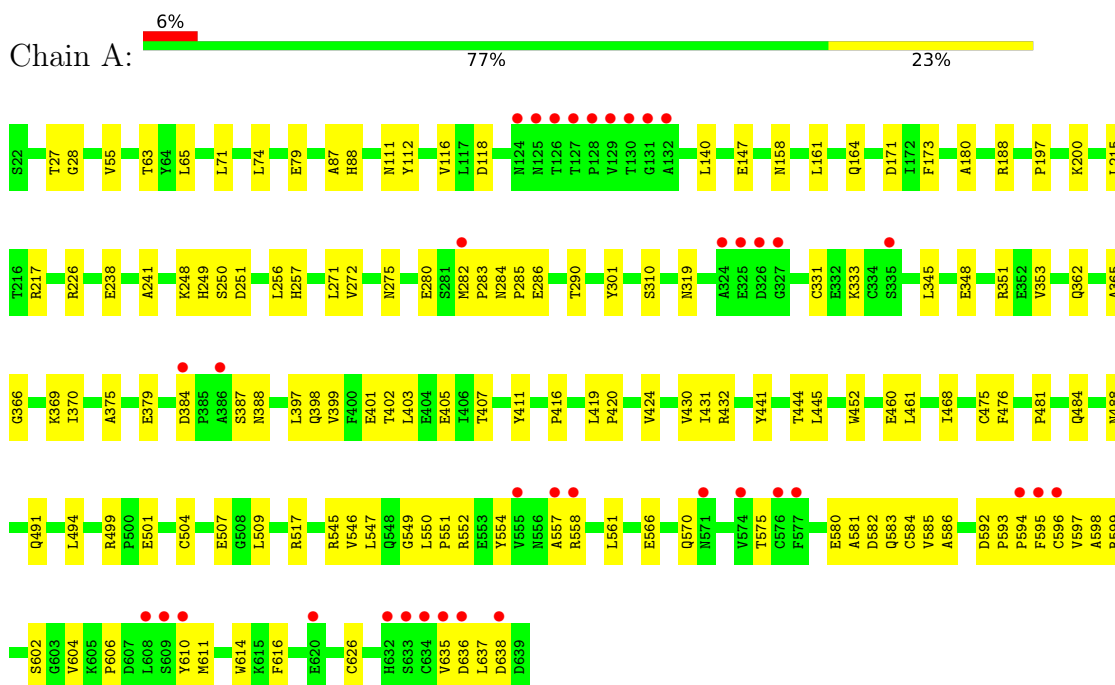


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			11	6	5		

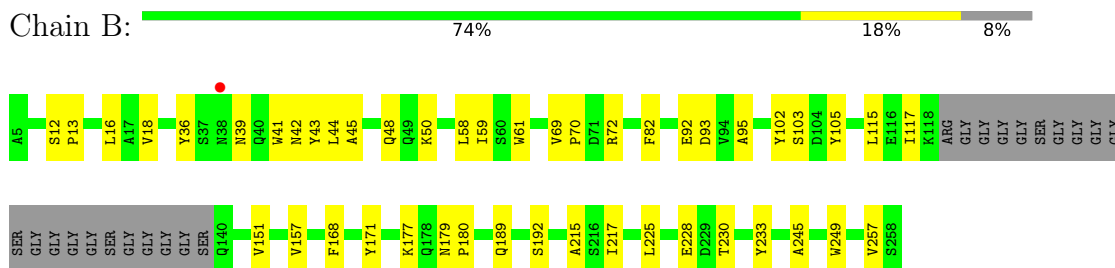
3 Residue-property plots

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

- Molecule 1: Receptor tyrosine-protein kinase erbB-2



- Molecule 2: anti-HER2 humanized antibody HuA21



- Molecule 3: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	146.99Å 78.07Å 125.77Å 90.00° 107.47° 90.00°	Depositor
Resolution (Å)	40.02 – 2.92 48.71 – 2.92	Depositor EDS
% Data completeness (in resolution range)	96.3 (40.02-2.92) 96.4 (48.71-2.92)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.23 (at 2.91Å)	Xtrriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.208 , 0.267 0.220 , 0.230	Depositor DCC
R_{free} test set	1474 reflections (5.13%)	wwPDB-VP
Wilson B-factor (Å ²)	67.2	Xtrriage
Anisotropy	0.699	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.26 , 51.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6601	wwPDB-VP
Average B, all atoms (Å ²)	82.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% 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: NAG, BMA

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	0.56	0/4866	0.77	0/6629
2	B	0.57	0/1857	0.74	0/2525
All	All	0.56	0/6723	0.76	0/9154

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	4751	0	4533	141	0
2	B	1814	0	1742	35	0
3	C	25	0	22	0	0
4	A	11	0	10	0	0
All	All	6601	0	6307	176	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 14.

All (176) 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:348:GLU:O	1:A:351:ARG:HG3	1.29	1.26
1:A:164:GLN:CD	1:A:188:ARG:HH21	1.49	1.16
1:A:557:ALA:O	1:A:558:ARG:HG2	1.47	1.15
1:A:164:GLN:OE1	1:A:188:ARG:NH2	1.83	1.10
1:A:164:GLN:CD	1:A:188:ARG:NH2	2.06	1.07
1:A:557:ALA:O	1:A:558:ARG:CG	2.08	1.01
1:A:161:LEU:O	1:A:188:ARG:NE	1.94	1.01
1:A:111:ASN:O	1:A:112:TYR:CD1	2.18	0.97
1:A:550:LEU:HB2	1:A:551:PRO:CD	1.98	0.94
1:A:552:ARG:NH2	1:A:575:THR:OG1	2.00	0.94
1:A:550:LEU:CB	1:A:551:PRO:HD3	2.02	0.89
1:A:581:ALA:HB3	1:A:595:PHE:HB2	1.55	0.88
1:A:475:CYS:SG	1:A:499:ARG:HD3	2.14	0.88
1:A:550:LEU:CB	1:A:551:PRO:CD	2.54	0.85
1:A:550:LEU:HB2	1:A:551:PRO:HD3	1.58	0.83
1:A:116:VAL:HG12	1:A:158:ASN:HD21	1.41	0.83
1:A:604:VAL:O	1:A:606:PRO:HD3	1.78	0.82
2:B:72:ARG:NE	2:B:93:ASP:OD2	2.15	0.80
1:A:348:GLU:O	1:A:351:ARG:CG	2.24	0.75
1:A:319:ASN:OD1	1:A:333:LYS:HA	1.87	0.75
1:A:550:LEU:HB2	1:A:551:PRO:HD2	1.69	0.73
1:A:552:ARG:HG3	1:A:575:THR:HG21	1.70	0.73
2:B:179:ASN:HB2	2:B:180:PRO:HD2	1.69	0.73
2:B:72:ARG:NH2	2:B:93:ASP:OD1	2.21	0.73
1:A:348:GLU:C	1:A:351:ARG:HG3	2.10	0.71
2:B:151:VAL:HG11	2:B:225:LEU:HD13	1.73	0.71
1:A:592:ASP:C	1:A:594:PRO:HD2	2.11	0.71
1:A:398:GLN:OE1	1:A:401:GLU:HB3	1.91	0.70
1:A:301:TYR:OH	1:A:460:GLU:OE1	2.08	0.69
1:A:545:ARG:NE	1:A:551:PRO:HD2	2.08	0.69
2:B:171:TYR:O	2:B:192:SER:OG	2.09	0.68
1:A:599:ARG:NH2	1:A:602:SER:OG	2.27	0.68
2:B:16:LEU:HB2	2:B:115:LEU:HD12	1.74	0.68
2:B:39:ASN:HB2	2:B:41:TRP:HD1	1.59	0.68
1:A:557:ALA:C	1:A:558:ARG:HG2	2.14	0.68
1:A:366:GLY:HA2	1:A:402:THR:HG21	1.77	0.67
1:A:161:LEU:O	1:A:188:ARG:CD	2.42	0.66
1:A:581:ALA:CB	1:A:595:PHE:HB2	2.26	0.65
1:A:552:ARG:NH2	1:A:570:GLN:H	1.95	0.65
1:A:545:ARG:HB3	1:A:549:GLY:HA3	1.80	0.64
2:B:157:VAL:HG12	2:B:225:LEU:HD11	1.80	0.63
1:A:635:VAL:HB	1:A:638:ASP:HB3	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:545:ARG:HH21	1:A:551:PRO:HG2	1.65	0.61
1:A:283:PRO:O	1:A:286:GLU:N	2.29	0.61
1:A:65:LEU:HD23	1:A:71:LEU:HD21	1.82	0.60
1:A:158:ASN:HD22	1:A:161:LEU:HD22	1.68	0.58
1:A:592:ASP:OD1	1:A:593:PRO:HD2	2.03	0.58
2:B:36:TYR:HB3	2:B:39:ASN:OD1	2.03	0.57
1:A:550:LEU:HB3	1:A:551:PRO:HD3	1.85	0.57
1:A:248:LYS:O	1:A:251:ASP:HB2	2.03	0.57
1:A:545:ARG:HE	1:A:551:PRO:HG2	1.70	0.57
1:A:606:PRO:HB2	1:A:610:TYR:CD2	2.39	0.56
1:A:430:VAL:HG23	1:A:460:GLU:HG3	1.87	0.56
1:A:636:ASP:O	1:A:637:LEU:HB2	2.04	0.56
2:B:44:LEU:HD23	2:B:45:ALA:N	2.21	0.56
1:A:581:ALA:HB3	1:A:595:PHE:CD2	2.43	0.54
1:A:557:ALA:O	1:A:558:ARG:HG3	2.03	0.54
1:A:217:ARG:HB2	1:A:226:ARG:NH1	2.23	0.53
1:A:370:ILE:HG12	1:A:403:LEU:HD11	1.89	0.53
1:A:345:LEU:HD22	1:A:353:VAL:HG23	1.89	0.53
1:A:581:ALA:HB3	1:A:595:PHE:CB	2.34	0.53
1:A:444:THR:O	1:A:445:LEU:HD23	2.09	0.52
1:A:507:GLU:OE1	1:A:509:LEU:HG	2.09	0.52
1:A:552:ARG:HH21	1:A:575:THR:HG1	1.55	0.52
1:A:610:TYR:CD2	1:A:611:MET:O	2.63	0.52
2:B:48:GLN:HB2	2:B:58:LEU:HD11	1.90	0.52
2:B:230:THR:HG22	2:B:257:VAL:H	1.75	0.52
1:A:238:GLU:O	1:A:238:GLU:HG3	2.09	0.52
2:B:105:TYR:OH	2:B:189:GLN:OE1	2.24	0.52
2:B:151:VAL:HG11	2:B:225:LEU:CD1	2.38	0.52
1:A:606:PRO:HG2	1:A:610:TYR:CD2	2.46	0.51
1:A:290:THR:OG1	1:A:310:SER:HA	2.10	0.51
1:A:416:PRO:HB2	1:A:419:LEU:HG	1.93	0.51
2:B:230:THR:HG23	2:B:257:VAL:HG22	1.92	0.51
1:A:545:ARG:HH21	1:A:551:PRO:CG	2.24	0.51
1:A:602:SER:HB3	1:A:614:TRP:CZ3	2.46	0.51
1:A:566:GLU:OE2	1:A:598:ALA:HB2	2.11	0.51
2:B:228:GLU:N	2:B:228:GLU:OE1	2.44	0.50
1:A:552:ARG:HH12	1:A:570:GLN:C	2.15	0.50
1:A:197:PRO:O	1:A:200:LYS:NZ	2.40	0.50
1:A:272:VAL:O	1:A:272:VAL:HG23	2.11	0.50
1:A:582:ASP:HB3	1:A:594:PRO:O	2.12	0.50
1:A:566:GLU:HB3	1:A:596:CYS:HB3	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:570:GLN:HG3	1:A:575:THR:HA	1.94	0.50
1:A:63:THR:HA	1:A:87:ALA:O	2.11	0.49
1:A:545:ARG:HD2	1:A:550:LEU:H	1.76	0.49
2:B:102:TYR:CZ	2:B:245:ALA:HB2	2.46	0.49
1:A:282:MET:CB	1:A:284:ASN:HB2	2.42	0.49
1:A:384:ASP:O	1:A:387:SER:OG	2.28	0.49
1:A:452:TRP:HB3	1:A:476:PHE:CD2	2.48	0.49
2:B:39:ASN:ND2	2:B:43:TYR:OH	2.38	0.49
1:A:111:ASN:O	1:A:112:TYR:CG	2.64	0.48
1:A:375:ALA:HA	1:A:411:TYR:O	2.13	0.48
1:A:545:ARG:NH2	1:A:551:PRO:HG2	2.28	0.48
2:B:168:PHE:CE2	2:B:192:SER:HB2	2.49	0.48
1:A:407:THR:O	1:A:432:ARG:HB2	2.13	0.48
1:A:88:HIS:HA	1:A:118:ASP:O	2.13	0.48
1:A:226:ARG:HD2	1:A:241:ALA:O	2.13	0.48
1:A:581:ALA:HB1	1:A:596:CYS:HB2	1.96	0.48
1:A:271:LEU:HA	1:A:283:PRO:HD2	1.96	0.48
1:A:348:GLU:N	1:A:351:ARG:CG	2.77	0.47
1:A:517:ARG:N	1:A:517:ARG:HD3	2.30	0.47
1:A:546:VAL:HG12	1:A:547:LEU:HD22	1.96	0.47
2:B:44:LEU:HD13	2:B:82:PHE:CG	2.49	0.47
1:A:370:ILE:HG12	1:A:403:LEU:CD1	2.44	0.47
1:A:545:ARG:NH2	1:A:551:PRO:CG	2.78	0.47
2:B:12:SER:HB3	2:B:13:PRO:HD3	1.97	0.47
1:A:348:GLU:N	1:A:351:ARG:HG2	2.29	0.47
1:A:147:GLU:OE1	1:A:241:ALA:O	2.32	0.47
1:A:365:ALA:HA	1:A:399:VAL:HG13	1.97	0.47
1:A:606:PRO:HB2	1:A:610:TYR:HD2	1.79	0.46
1:A:606:PRO:HG2	1:A:610:TYR:HD2	1.79	0.46
1:A:362:GLN:OE1	1:A:362:GLN:N	2.45	0.46
1:A:452:TRP:HB3	1:A:476:PHE:HD2	1.79	0.46
2:B:16:LEU:HB2	2:B:115:LEU:CD1	2.44	0.46
2:B:50:LYS:HE3	2:B:92:GLU:O	2.15	0.46
2:B:177:LYS:HE3	2:B:233:TYR:OH	2.16	0.46
1:A:282:MET:C	1:A:284:ASN:N	2.69	0.45
1:A:488:ASN:OD1	1:A:491:GLN:HG3	2.17	0.45
2:B:43:TYR:HB2	2:B:103:SER:HB2	1.98	0.45
1:A:348:GLU:CA	1:A:351:ARG:HG3	2.47	0.45
1:A:431:ILE:HB	1:A:461:LEU:HD23	1.99	0.45
1:A:411:TYR:CD1	1:A:444:THR:HB	2.52	0.44
1:A:171:ASP:OD2	1:A:215:LEU:HG	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:582:ASP:OD1	1:A:583:GLN:N	2.50	0.44
2:B:39:ASN:HB2	2:B:41:TRP:CD1	2.46	0.44
1:A:379:GLU:HB2	1:A:384:ASP:OD2	2.18	0.44
1:A:481:PRO:HB2	1:A:484:GLN:HG2	1.98	0.43
2:B:42:ASN:O	2:B:61:TRP:HA	2.18	0.43
1:A:282:MET:C	1:A:284:ASN:H	2.20	0.43
1:A:441:TYR:HE1	1:A:494:LEU:HD12	1.82	0.43
1:A:545:ARG:NE	1:A:551:PRO:HG2	2.33	0.43
1:A:582:ASP:OD1	1:A:583:GLN:HG2	2.18	0.43
1:A:197:PRO:O	1:A:200:LYS:CE	2.66	0.43
2:B:18:VAL:O	2:B:117:ILE:HA	2.18	0.43
2:B:69:VAL:HA	2:B:70:PRO:HD3	1.92	0.43
1:A:580:GLU:HB2	1:A:583:GLN:CG	2.48	0.43
1:A:616:PHE:CE1	1:A:626:CYS:HB3	2.54	0.43
2:B:151:VAL:O	2:B:257:VAL:HA	2.18	0.43
1:A:570:GLN:OE1	1:A:585:VAL:HG21	2.19	0.43
1:A:256:LEU:HD22	1:A:257:HIS:NE2	2.34	0.42
1:A:249:HIS:O	1:A:250:SER:CB	2.67	0.42
1:A:161:LEU:O	1:A:188:ARG:HD3	2.19	0.42
1:A:595:PHE:O	1:A:597:VAL:HG23	2.19	0.42
1:A:606:PRO:CG	1:A:610:TYR:HD2	2.32	0.42
1:A:387:SER:O	1:A:388:ASN:HB3	2.19	0.42
1:A:397:LEU:HB3	1:A:424:VAL:HG11	2.00	0.42
2:B:50:LYS:HG2	2:B:95:ALA:HB2	2.02	0.42
1:A:55:VAL:HG13	1:A:79:GLU:HB2	2.02	0.42
1:A:606:PRO:CB	1:A:610:TYR:CD2	3.03	0.42
2:B:249:TRP:CD1	2:B:249:TRP:N	2.88	0.42
1:A:71:LEU:HB3	1:A:74:LEU:CD1	2.50	0.41
1:A:173:PHE:CD2	1:A:180:ALA:HB1	2.55	0.41
1:A:575:THR:HG22	1:A:575:THR:O	2.20	0.41
1:A:593:PRO:N	1:A:594:PRO:HD2	2.35	0.41
1:A:597:VAL:HG12	1:A:599:ARG:H	1.85	0.41
1:A:63:THR:O	1:A:65:LEU:HD12	2.21	0.41
1:A:164:GLN:NE2	1:A:188:ARG:NH2	2.65	0.41
1:A:282:MET:HB2	1:A:284:ASN:HB2	2.02	0.41
1:A:545:ARG:NE	1:A:551:PRO:CD	2.82	0.41
1:A:275:ASN:HB2	1:A:280:GLU:CD	2.41	0.41
1:A:369:LYS:HG3	1:A:405:GLU:HG2	2.02	0.41
1:A:554:TYR:CE1	1:A:561:LEU:HB2	2.56	0.41
2:B:45:ALA:HA	2:B:59:ILE:O	2.21	0.41
2:B:92:GLU:H	2:B:92:GLU:CD	2.23	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:419:LEU:HA	1:A:420:PRO:HD3	1.93	0.40
1:A:445:LEU:HD12	1:A:468:ILE:CD1	2.52	0.40
1:A:585:VAL:HG13	1:A:586:ALA:N	2.36	0.40
2:B:215:ALA:O	2:B:217:ILE:HD12	2.20	0.40
1:A:319:ASN:HD22	1:A:331:CYS:HB3	1.86	0.40
1:A:584:CYS:HB2	1:A:596:CYS:SG	2.61	0.40
1:A:614:TRP:CE3	1:A:635:VAL:HG22	2.56	0.40
1:A:140:LEU:HD23	1:A:140:LEU:HA	1.94	0.40
1:A:27:THR:HG23	1:A:28:GLY:O	2.22	0.40
1:A:284:ASN:N	1:A:285:PRO:CD	2.84	0.40
1:A:501:GLU:O	1:A:504:CYS:HB2	2.21	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	616/618 (100%)	550 (89%)	66 (11%)	0	100	100
2	B	229/254 (90%)	214 (93%)	15 (7%)	0	100	100
All	All	845/872 (97%)	764 (90%)	81 (10%)	0	100	100

There are no Ramachandran outliers to report.

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	534/534 (100%)	534 (100%)	0	100	100
2	B	199/204 (98%)	199 (100%)	0	100	100
All	All	733/738 (99%)	733 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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

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](#)

2 monosaccharides are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
3	NAG	C	1	1,3	14,14,15	0.83	0	17,19,21	1.19	1 (5%)
3	BMA	C	2	3	11,11,12	0.23	0	15,15,17	0.66	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
3	NAG	C	1	1,3	-	6/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	BMA	C	2	3	-	0/2/19/22	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1	NAG	C4-C3-C2	2.25	114.32	111.02

There are no chirality outliers.

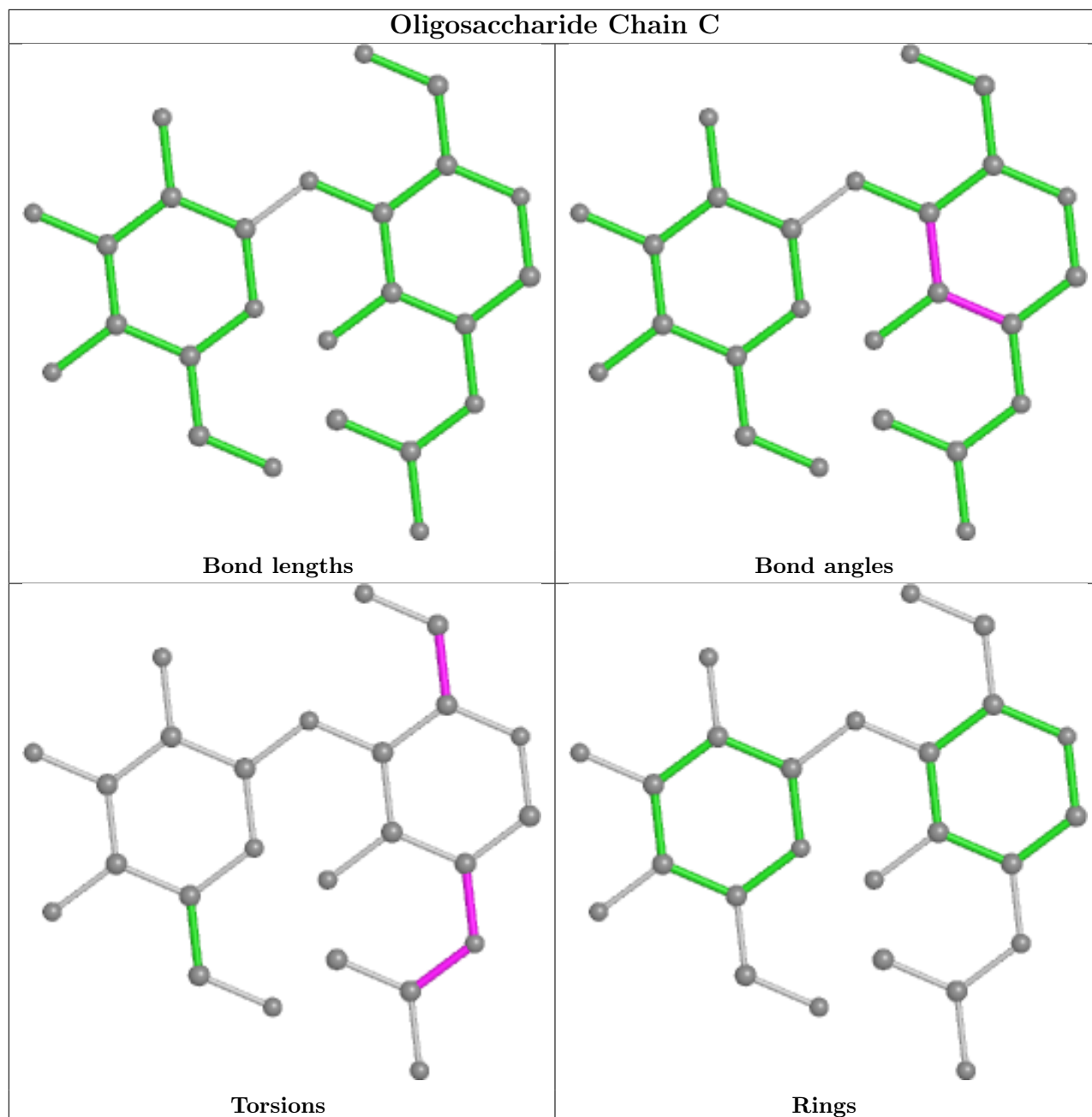
All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	1	NAG	C3-C2-N2-C7
3	C	1	NAG	O5-C5-C6-O6
3	C	1	NAG	C4-C5-C6-O6
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2
3	C	1	NAG	C1-C2-N2-C7

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



5.6 Ligand geometry [i](#)

1 ligand is 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
4	BMA	A	1001	1	11,11,12	0.27	0	15,15,17	0.64	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
4	BMA	A	1001	1	-	2/2/19/22	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	1001	BMA	O5-C5-C6-O6
4	A	1001	BMA	C4-C5-C6-O6

There are no ring outliers.

No monomer is involved in short contacts.

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	618/618 (100%)	0.11	37 (5%) 21 18	44, 80, 135, 171	60 (9%)
2	B	233/254 (91%)	-0.31	1 (0%) 92 92	54, 76, 106, 142	2 (0%)
All	All	851/872 (97%)	-0.00	38 (4%) 33 30	44, 78, 130, 171	62 (7%)

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	594	PRO	11.2
1	A	126	THR	11.1
1	A	130	THR	8.4
1	A	129	VAL	7.9
1	A	127	THR	7.8
1	A	608	LEU	7.2
1	A	325	GLU	7.2
1	A	128	PRO	6.7
1	A	124	ASN	6.6
1	A	609	SER	6.1
1	A	125	ASN	5.3
1	A	132	ALA	5.3
1	A	595	PHE	5.0
1	A	326	ASP	4.5
2	B	38	ASN	4.4
1	A	634	CYS	4.3
1	A	571	ASN	3.9
1	A	386	ALA	3.7
1	A	610	TYR	3.7
1	A	282	MET	3.3
1	A	577	PHE	3.3
1	A	596	CYS	3.3
1	A	384	ASP	3.1
1	A	558	ARG	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	576	CYS	3.1
1	A	635	VAL	3.0
1	A	638	ASP	2.9
1	A	636	ASP	2.8
1	A	327	GLY	2.8
1	A	574	VAL	2.7
1	A	620	GLU	2.5
1	A	557	ALA	2.4
1	A	555	VAL	2.4
1	A	131	GLY	2.3
1	A	335	SER	2.3
1	A	632	HIS	2.2
1	A	633	SER	2.2
1	A	324	ALA	2.0

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

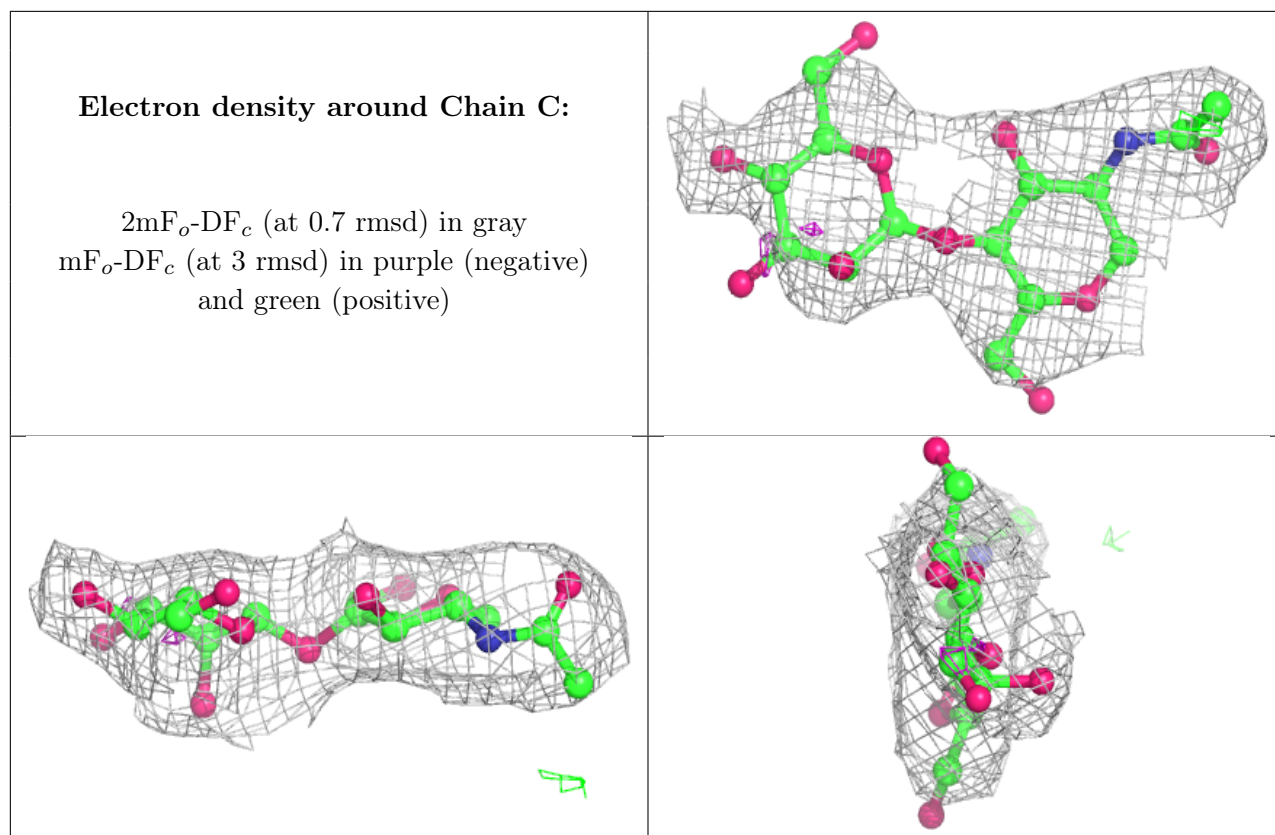
There are no non-standard protein/DNA/RNA residues in this entry.

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. 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	B-factors(Å ²)	Q<0.9
3	BMA	C	2	11/12	0.86	0.31	106,123,139,150	0
3	NAG	C	1	14/15	0.95	0.16	71,98,122,123	0

The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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	B-factors(\AA^2)	Q<0.9
4	BMA	A	1001	11/12	0.61	0.24	49,79,88,93	11

6.5 Other polymers [i](#)

There are no such residues in this entry.