



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 22, 2020 – 11:27 AM BST

PDB ID : 2F83
Title : Crystal structure at 2.9 Angstroms resolution of human plasma coagulation factor XI zymogen
Authors : Papagrigoriou, E.; McEwan, P.A.; Walsh, P.N.; Emsley, J.
Deposited on : 2005-12-01
Resolution : 2.87 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

<https://www.wwpdb.org/validation/2017/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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.13.1
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) : 2.13.1

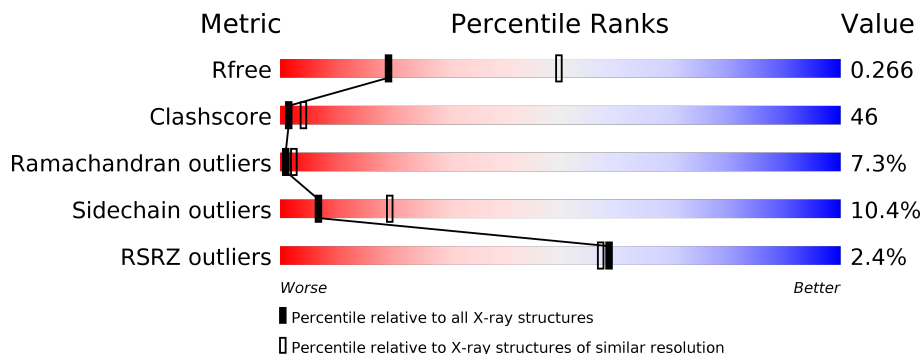
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.87 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}	130704	2691 (2.90-2.86)
Clashscore	141614	2947 (2.90-2.86)
Ramachandran outliers	138981	2868 (2.90-2.86)
Sidechain outliers	138945	2871 (2.90-2.86)
RSRZ outliers	127900	2629 (2.90-2.86)

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 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	625	
2	B	2	

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	B	1	-	-	X	X
2	NAG	B	2	-	-	-	X

2 Entry composition [i](#)

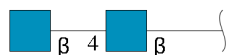
There are 5 unique types of molecules in this entry. The entry contains 4685 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Coagulation factor XI.

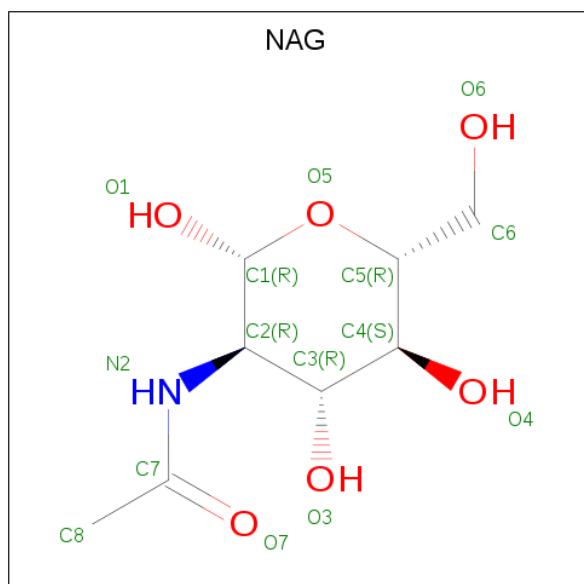
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	583	4574	2883	794	858	39	65	0	0

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



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

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (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		

- Molecule 4 is PLATINUM (II) ION (three-letter code: PT) (formula: Pt).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Pt	0	0
			2	2		

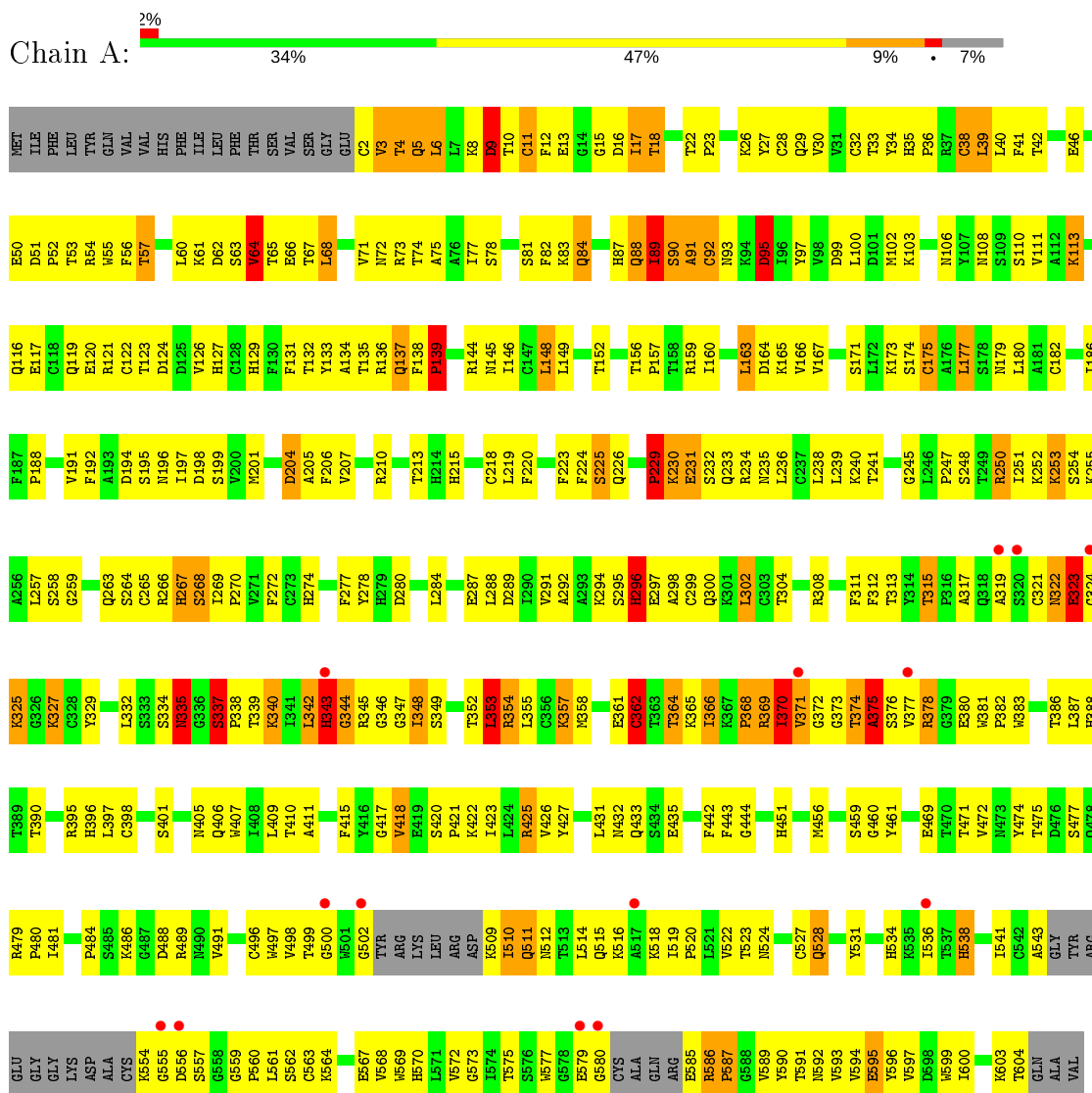
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	53	Total	O	0	0
			53	53		

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: Coagulation factor XI



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

Chain B: 

MAC1
MAC2

4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	80.67Å 80.67Å 254.35Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.87 49.94 – 2.87	Depositor EDS
% Data completeness (in resolution range)	(Not available) (50.00-2.87) 89.7 (49.94-2.87)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.91 (at 2.86Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.235 , 0.281 0.248 , 0.266	Depositor DCC
R_{free} test set	931 reflections (5.14%)	wwPDB-VP
Wilson B-factor (Å ²)	67.2	Xtrriage
Anisotropy	0.243	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 57.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	4685	wwPDB-VP
Average B, all atoms (Å ²)	61.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.06% 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: NAG, PT

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	0.43	0/4680	0.76	7/6338 (0.1%)

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 (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	375	ALA	N-CA-C	-7.87	89.74	111.00
1	A	344	GLY	N-CA-C	-6.29	97.38	113.10
1	A	64	VAL	N-CA-C	-5.92	95.00	111.00
1	A	362	CYS	N-CA-C	-5.82	95.30	111.00
1	A	9	ASP	CB-CG-OD2	5.43	123.19	118.30
1	A	89	ILE	N-CA-C	5.18	125.00	111.00
1	A	337	SER	N-CA-C	5.17	124.96	111.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	8	LYS	Peptide
1	A	9	ASP	Peptide

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	4574	0	4462	406	1
2	B	28	0	25	8	0
3	A	28	0	26	2	0
4	A	2	0	0	0	0
5	A	53	0	0	8	0
All	All	4685	0	4513	413	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 46.

All (413) 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)
2:B:1:NAG:H62	2:B:2:NAG:N2	1.50	1.27
2:B:1:NAG:H62	2:B:2:NAG:HN2	1.22	1.03
1:A:371:VAL:HG22	1:A:372:GLY:H	1.20	1.01
1:A:277:PHE:HB3	1:A:348:ILE:HD11	1.42	1.01
1:A:196:ASN:HD21	1:A:238:LEU:HD13	1.27	0.98
1:A:89:ILE:HG23	1:A:358:MET:SD	2.08	0.93
1:A:34:TYR:OH	1:A:89:ILE:HG21	1.70	0.90
1:A:284:LEU:O	1:A:338:PRO:HD2	1.70	0.89
1:A:163:LEU:HD13	1:A:166:VAL:HG21	1.54	0.89
1:A:196:ASN:ND2	1:A:238:LEU:HD13	1.90	0.85
1:A:382:PRO:HB2	1:A:479:ARG:H	1.40	0.85
1:A:592:ASN:ND2	1:A:595:GLU:HG2	1.91	0.84
1:A:93:ASN:HD22	1:A:95:ASP:HB2	1.43	0.83
1:A:10:THR:O	1:A:78:SER:OG	1.95	0.83
2:B:1:NAG:H62	2:B:2:NAG:C7	2.07	0.83
1:A:92:CYS:HB2	1:A:174:SER:OG	1.78	0.83
1:A:250:ARG:HE	1:A:250:ARG:H	1.27	0.82
1:A:592:ASN:HD22	1:A:595:GLU:HG2	1.42	0.82
1:A:509:LYS:HG3	1:A:510:ILE:H	1.45	0.81
1:A:528:GLN:HE21	1:A:528:GLN:HA	1.46	0.81
1:A:510:ILE:HG23	1:A:511:GLN:H	1.45	0.80
1:A:502:GLY:HA2	1:A:555:GLY:HA3	1.61	0.80

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:284:LEU:HD12	1:A:339:THR:CG2	2.12	0.79
1:A:451:HIS:CD2	1:A:461:TYR:HD2	2.02	0.78
1:A:72:ASN:ND2	3:A:901:NAG:H83	1.99	0.78
1:A:594:VAL:O	1:A:597:VAL:HG23	1.84	0.78
1:A:374:THR:HG21	1:A:515:GLN:OE1	1.83	0.77
1:A:226:GLN:CG	1:A:342:LEU:HD13	2.16	0.76
1:A:132:THR:O	1:A:148:LEU:HD23	1.86	0.75
1:A:315:THR:HG22	1:A:327:LYS:HB2	1.67	0.75
1:A:335:ASN:N	1:A:335:ASN:HD22	1.82	0.75
1:A:64:VAL:C	1:A:66:GLU:H	1.90	0.75
1:A:39:LEU:HD23	1:A:40:LEU:N	2.01	0.75
1:A:9:ASP:OD1	1:A:74:THR:HA	1.87	0.75
1:A:124:ASP:OD2	1:A:179:ASN:HB2	1.87	0.75
1:A:374:THR:HA	1:A:516:LYS:HG2	1.68	0.75
1:A:377:VAL:HG13	1:A:380:GLU:HB2	1.67	0.75
1:A:388:HIS:CD2	1:A:396:HIS:HA	2.22	0.75
1:A:110:SER:HB2	1:A:121:ARG:NH1	2.02	0.74
1:A:509:LYS:HG3	1:A:510:ILE:N	2.01	0.73
1:A:165:LYS:N	1:A:165:LYS:HD2	2.01	0.73
1:A:474:TYR:CE1	1:A:480:PRO:HD3	2.24	0.73
1:A:451:HIS:HD2	1:A:461:TYR:HD2	1.36	0.73
1:A:17:ILE:HG23	1:A:60:LEU:O	1.89	0.73
1:A:406:GLN:HG3	1:A:471:THR:HG22	1.70	0.72
1:A:201:MET:HG3	1:A:338:PRO:O	1.89	0.72
2:B:1:NAG:C6	2:B:2:NAG:N2	2.43	0.72
1:A:510:ILE:O	1:A:511:GLN:HG2	1.89	0.72
1:A:267:HIS:O	1:A:268:SER:HB2	1.90	0.71
1:A:226:GLN:HG3	1:A:342:LEU:HD13	1.73	0.71
1:A:564:LYS:HE2	1:A:567:GLU:HA	1.73	0.71
1:A:93:ASN:ND2	1:A:95:ASP:HB2	2.05	0.71
1:A:223:PHE:HB3	5:A:1000:HOH:O	1.89	0.70
1:A:22:THR:HG21	1:A:28:CYS:HA	1.72	0.70
1:A:352:THR:O	1:A:354:ARG:N	2.21	0.69
1:A:263:GLN:O	1:A:266:ARG:HG3	1.93	0.69
1:A:510:ILE:HG23	1:A:511:GLN:N	2.07	0.69
2:B:1:NAG:C6	2:B:2:NAG:C7	2.70	0.69
1:A:502:GLY:HA2	1:A:554:LYS:O	1.93	0.69
1:A:257:LEU:HB3	5:A:1000:HOH:O	1.92	0.68
1:A:269:ILE:HD12	1:A:270:PRO:HD2	1.75	0.68
1:A:72:ASN:HD21	3:A:901:NAG:H83	1.58	0.67
1:A:129:HIS:HD2	1:A:152:THR:H	1.42	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:528:GLN:HE22	1:A:536:ILE:HG12	1.60	0.66
1:A:500:GLY:HA3	1:A:556:ASP:OD1	1.95	0.66
1:A:371:VAL:HG22	1:A:372:GLY:N	2.02	0.66
1:A:298:ALA:O	1:A:302:LEU:HD23	1.96	0.66
1:A:89:ILE:HG12	1:A:358:MET:HA	1.78	0.65
1:A:46:GLU:HG3	1:A:55:TRP:CH2	2.31	0.65
1:A:34:TYR:OH	1:A:91:ALA:HB2	1.95	0.65
1:A:257:LEU:HD13	1:A:258:SER:N	2.11	0.65
1:A:4:THR:O	1:A:5:GLN:HG2	1.96	0.65
1:A:288:LEU:HD11	5:A:1032:HOH:O	1.96	0.65
1:A:313:THR:HG23	1:A:349:SER:OG	1.97	0.64
1:A:528:GLN:NE2	1:A:536:ILE:HG12	2.12	0.64
1:A:374:THR:O	1:A:375:ALA:CB	2.45	0.64
1:A:11:CYS:SG	1:A:13:GLU:OE1	2.55	0.64
1:A:374:THR:H	1:A:516:LYS:HE2	1.60	0.64
1:A:40:LEU:O	1:A:41:PHE:HB3	1.97	0.64
1:A:54:ARG:O	1:A:57:THR:HB	1.97	0.64
1:A:382:PRO:HB2	1:A:479:ARG:N	2.13	0.64
1:A:226:GLN:CD	1:A:342:LEU:HD13	2.19	0.63
1:A:366:ILE:N	1:A:366:ILE:HD12	2.14	0.63
1:A:502:GLY:CA	1:A:555:GLY:HA3	2.28	0.63
1:A:219:LEU:HD23	1:A:245:GLY:HA2	1.79	0.63
1:A:425:ARG:HD2	1:A:442:PHE:CZ	2.34	0.63
1:A:33:THR:HA	1:A:81:SER:HB2	1.80	0.62
1:A:39:LEU:C	1:A:39:LEU:HD23	2.20	0.62
1:A:427:TYR:CE2	1:A:442:PHE:HB3	2.33	0.62
1:A:344:GLY:C	1:A:346:GLY:H	2.01	0.62
1:A:6:LEU:HD23	1:A:77:ILE:HG21	1.81	0.62
1:A:192:PHE:CE2	1:A:258:SER:HB3	2.35	0.62
1:A:210:ARG:O	1:A:213:THR:HB	1.99	0.62
1:A:296:HIS:O	1:A:298:ALA:N	2.32	0.62
1:A:56:PHE:HB3	1:A:160:ILE:HD12	1.80	0.62
1:A:269:ILE:CD1	1:A:270:PRO:HD2	2.30	0.62
1:A:251:ILE:HD12	1:A:251:ILE:N	2.15	0.61
1:A:376:SER:OG	1:A:516:LYS:HB3	2.01	0.61
1:A:39:LEU:H	1:A:83:LYS:NZ	1.98	0.61
1:A:380:GLU:HG2	1:A:381:TRP:CE2	2.35	0.61
1:A:380:GLU:HG2	1:A:381:TRP:NE1	2.17	0.60
1:A:113:LYS:HG3	1:A:117:GLU:OE2	2.01	0.60
1:A:311:PHE:CE2	1:A:337:SER:N	2.70	0.60
1:A:348:ILE:HD13	1:A:348:ILE:C	2.21	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:510:ILE:HG12	1:A:511:GLN:N	2.17	0.60
1:A:395:ARG:HD3	5:A:1043:HOH:O	2.01	0.59
1:A:97:TYR:O	1:A:167:VAL:HG23	2.02	0.59
1:A:401:SER:OG	1:A:560:PRO:HB3	2.02	0.59
1:A:64:VAL:O	1:A:66:GLU:N	2.33	0.59
1:A:84:GLN:CD	1:A:84:GLN:H	2.04	0.59
1:A:204:ASP:HB3	1:A:207:VAL:H	1.67	0.59
1:A:62:ASP:OD2	1:A:63:SER:N	2.35	0.59
1:A:304:THR:HA	1:A:352:THR:O	2.01	0.59
1:A:370:ILE:HD13	1:A:370:ILE:H	1.68	0.59
1:A:432:ASN:HA	1:A:512:ASN:O	2.03	0.59
1:A:308:ARG:HH11	1:A:308:ARG:HG3	1.68	0.59
1:A:35:HIS:CG	1:A:36:PRO:HD2	2.37	0.59
1:A:556:ASP:O	1:A:575:THR:HB	2.03	0.58
1:A:186:ILE:HD13	1:A:188:PRO:HD3	1.84	0.58
1:A:479:ARG:HG3	1:A:479:ARG:HH11	1.69	0.58
1:A:204:ASP:HB2	1:A:207:VAL:HG23	1.84	0.58
1:A:215:HIS:HB3	1:A:218:CYS:H	1.68	0.58
1:A:323:GLU:OE2	1:A:325:LYS:HB2	2.03	0.58
1:A:191:VAL:HG23	1:A:251:ILE:HB	1.86	0.58
1:A:191:VAL:CG2	1:A:251:ILE:HB	2.34	0.57
1:A:361:GLU:HB2	1:A:479:ARG:NH2	2.19	0.57
1:A:267:HIS:O	1:A:268:SER:CB	2.52	0.57
1:A:311:PHE:HE2	1:A:337:SER:H	1.51	0.57
1:A:371:VAL:CG2	1:A:372:GLY:H	2.02	0.57
1:A:361:GLU:HB2	1:A:479:ARG:HH21	1.70	0.57
1:A:284:LEU:HD12	1:A:339:THR:HG22	1.83	0.57
1:A:519:ILE:HG23	1:A:520:PRO:HD2	1.85	0.57
1:A:38:CYS:SG	1:A:40:LEU:O	2.63	0.56
1:A:573:GLY:HA2	1:A:593:VAL:HG23	1.87	0.56
1:A:137:GLN:O	1:A:137:GLN:HG3	2.06	0.56
1:A:67:THR:O	1:A:68:LEU:HD13	2.04	0.56
1:A:192:PHE:O	1:A:240:LYS:HE2	2.05	0.56
1:A:361:GLU:O	1:A:362:CYS:HB3	2.05	0.56
1:A:444:GLY:O	1:A:469:GLU:HG2	2.06	0.56
1:A:335:ASN:N	1:A:335:ASN:ND2	2.50	0.56
1:A:277:PHE:CB	1:A:348:ILE:HD11	2.28	0.56
1:A:34:TYR:CZ	1:A:89:ILE:HG21	2.40	0.56
1:A:110:SER:HB2	1:A:121:ARG:HH11	1.71	0.55
1:A:377:VAL:CG1	1:A:380:GLU:HB2	2.35	0.55
1:A:124:ASP:O	1:A:180:LEU:HD21	2.06	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:592:ASN:HD22	1:A:595:GLU:CG	2.18	0.55
1:A:197:ILE:HD12	1:A:198:ASP:N	2.21	0.55
1:A:522:VAL:CG2	1:A:522:VAL:O	2.54	0.55
1:A:116:GLN:O	1:A:120:GLU:HG3	2.07	0.55
1:A:126:VAL:HG13	1:A:127:HIS:ND1	2.21	0.55
1:A:175:CYS:HB3	1:A:177:LEU:HD22	1.88	0.55
1:A:250:ARG:NE	1:A:250:ARG:H	2.01	0.55
1:A:250:ARG:O	1:A:250:ARG:HG2	2.06	0.55
1:A:29:GLN:HG3	1:A:41:PHE:HE2	1.72	0.55
1:A:352:THR:C	1:A:354:ARG:H	2.09	0.55
1:A:108:ASN:ND2	2:B:1:NAG:O7	2.38	0.55
1:A:266:ARG:HH11	1:A:272:PHE:HE1	1.53	0.54
1:A:386:THR:CG2	1:A:427:TYR:HB2	2.37	0.54
1:A:55:TRP:O	1:A:56:PHE:HB2	2.07	0.54
1:A:420:SER:O	1:A:423:ILE:HG12	2.08	0.54
1:A:528:GLN:HA	1:A:528:GLN:NE2	2.21	0.54
1:A:353:LEU:C	1:A:355:LEU:H	2.09	0.53
1:A:97:TYR:HB3	1:A:100:LEU:HD22	1.90	0.53
1:A:324:GLY:O	1:A:325:LYS:C	2.46	0.53
1:A:88:GLN:HG2	1:A:357:LYS:HE3	1.90	0.53
1:A:596:TYR:O	1:A:600:ILE:HG13	2.08	0.53
1:A:569:TRP:C	1:A:570:HIS:HD2	2.12	0.53
1:A:4:THR:OG1	1:A:5:GLN:N	2.40	0.53
1:A:197:ILE:HG13	1:A:239:LEU:O	2.09	0.53
1:A:510:ILE:HG12	1:A:511:GLN:H	1.74	0.53
1:A:564:LYS:CE	1:A:567:GLU:HA	2.38	0.53
1:A:443:PHE:CZ	1:A:472:VAL:HG22	2.43	0.52
1:A:4:THR:HG23	1:A:5:GLN:OE1	2.09	0.52
1:A:6:LEU:HD23	1:A:77:ILE:CG2	2.39	0.52
1:A:348:ILE:HD13	1:A:349:SER:N	2.23	0.52
1:A:29:GLN:NE2	1:A:82:PHE:CZ	2.76	0.52
1:A:129:HIS:CD2	1:A:152:THR:H	2.25	0.52
1:A:353:LEU:C	1:A:355:LEU:N	2.63	0.52
1:A:421:PRO:HG2	1:A:422:LYS:HE3	1.92	0.52
1:A:561:LEU:O	1:A:572:VAL:HG22	2.09	0.52
1:A:300:GLN:NE2	1:A:353:LEU:HD13	2.25	0.52
1:A:300:GLN:NE2	1:A:353:LEU:HD22	2.25	0.52
1:A:272:PHE:O	1:A:355:LEU:HB3	2.10	0.52
1:A:238:LEU:HD12	1:A:240:LYS:HZ1	1.75	0.52
1:A:210:ARG:HE	1:A:274:HIS:CE1	2.28	0.52
1:A:278:TYR:O	1:A:348:ILE:HA	2.10	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:366:ILE:H	1:A:366:ILE:HD12	1.75	0.52
1:A:89:ILE:CG1	1:A:358:MET:HA	2.39	0.52
1:A:344:GLY:O	1:A:345:ARG:HB2	2.10	0.52
1:A:338:PRO:HG2	5:A:1013:HOH:O	2.10	0.52
1:A:415:PHE:CD1	1:A:415:PHE:N	2.77	0.52
1:A:39:LEU:HD23	1:A:40:LEU:HB2	1.91	0.51
1:A:479:ARG:CZ	1:A:479:ARG:HB3	2.40	0.51
1:A:522:VAL:HG23	1:A:522:VAL:O	2.10	0.51
1:A:148:LEU:HD23	1:A:148:LEU:H	1.76	0.51
1:A:219:LEU:CD2	1:A:245:GLY:HA2	2.41	0.51
1:A:137:GLN:O	1:A:165:LYS:HG2	2.09	0.51
1:A:204:ASP:OD2	1:A:206:PHE:HB2	2.10	0.51
1:A:230:LYS:O	1:A:232:SER:N	2.44	0.51
1:A:64:VAL:C	1:A:66:GLU:N	2.59	0.51
1:A:378:ARG:HA	1:A:431:LEU:HD22	1.92	0.51
1:A:488:ASP:HB3	1:A:491:VAL:HG21	1.92	0.51
1:A:496:CYS:HA	1:A:563:CYS:HA	1.93	0.51
1:A:126:VAL:HG22	1:A:219:LEU:HD11	1.91	0.51
1:A:252:LYS:O	1:A:253:LYS:HB2	2.11	0.51
1:A:528:GLN:HE21	1:A:528:GLN:CA	2.14	0.50
1:A:297:GLU:HA	1:A:300:GLN:HB3	1.93	0.50
1:A:361:GLU:O	1:A:362:CYS:CB	2.59	0.50
1:A:432:ASN:O	1:A:435:GLU:HG3	2.11	0.50
1:A:500:GLY:O	1:A:514:LEU:HD12	2.11	0.50
1:A:12:PHE:CE1	1:A:40:LEU:HD22	2.46	0.50
1:A:564:LYS:HB2	1:A:569:TRP:CZ2	2.45	0.50
1:A:39:LEU:HD22	1:A:62:ASP:HA	1.94	0.50
1:A:111:VAL:HA	1:A:146:ILE:HA	1.92	0.50
1:A:196:ASN:HD22	1:A:238:LEU:HD22	1.77	0.50
1:A:390:THR:HG23	1:A:423:ILE:O	2.12	0.50
1:A:50:GLU:OE2	1:A:54:ARG:HD2	2.12	0.50
1:A:541:ILE:HG23	1:A:541:ILE:O	2.12	0.50
1:A:39:LEU:HA	1:A:81:SER:OG	2.12	0.50
1:A:197:ILE:O	1:A:198:ASP:HB2	2.10	0.50
1:A:267:HIS:N	1:A:267:HIS:ND1	2.59	0.50
1:A:17:ILE:O	1:A:18:THR:HB	2.11	0.49
1:A:234:ARG:O	1:A:235:ASN:HB2	2.12	0.49
1:A:26:LYS:HB2	1:A:26:LYS:NZ	2.27	0.49
1:A:474:TYR:CD1	1:A:480:PRO:HD3	2.47	0.49
1:A:538:HIS:CD2	1:A:538:HIS:H	2.31	0.49
1:A:89:ILE:HG12	1:A:358:MET:CA	2.43	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:38:CYS:O	1:A:61:LYS:O	2.30	0.49
1:A:197:ILE:C	1:A:197:ILE:HD12	2.33	0.49
1:A:410:THR:HG23	1:A:411:ALA:N	2.27	0.49
1:A:407:TRP:CZ2	1:A:604:THR:HG22	2.48	0.49
1:A:280:ASP:N	1:A:347:GLY:O	2.46	0.49
1:A:417:GLY:O	1:A:418:VAL:C	2.49	0.49
1:A:225:SER:OG	1:A:255:LYS:HB3	2.13	0.49
1:A:299:CYS:O	1:A:302:LEU:HB2	2.13	0.49
1:A:280:ASP:OD2	1:A:346:GLY:HA2	2.13	0.48
1:A:524:ASN:HA	1:A:527:CYS:HB2	1.95	0.48
1:A:388:HIS:HD2	1:A:396:HIS:HA	1.74	0.48
1:A:99:ASP:OD1	1:A:164:ASP:HA	2.12	0.48
1:A:188:PRO:HA	1:A:257:LEU:HD22	1.94	0.48
1:A:378:ARG:CA	1:A:431:LEU:HD22	2.44	0.48
1:A:432:ASN:HB2	1:A:435:GLU:HG3	1.94	0.48
1:A:496:CYS:C	1:A:497:TRP:CD1	2.87	0.48
1:A:63:SER:C	1:A:64:VAL:O	2.47	0.48
1:A:134:ALA:O	1:A:145:ASN:HA	2.14	0.48
1:A:317:ALA:HB1	1:A:322:ASN:HB3	1.95	0.48
1:A:88:GLN:HE21	1:A:357:LYS:NZ	2.10	0.48
1:A:397:LEU:O	1:A:398:CYS:SG	2.72	0.48
1:A:344:GLY:C	1:A:346:GLY:N	2.66	0.48
1:A:186:ILE:O	1:A:186:ILE:HD12	2.13	0.48
1:A:579:GLU:HG2	1:A:580:GLY:N	2.29	0.48
1:A:103:LYS:HE2	1:A:159:ARG:HH11	1.79	0.47
1:A:528:GLN:HE22	1:A:536:ILE:H	1.62	0.47
1:A:342:LEU:O	1:A:343:HIS:O	2.32	0.47
1:A:522:VAL:O	1:A:523:THR:C	2.53	0.47
1:A:106:ASN:HD22	1:A:148:LEU:HD12	1.78	0.47
1:A:195:SER:HB2	1:A:241:THR:HG23	1.96	0.47
1:A:296:HIS:CD2	1:A:296:HIS:N	2.80	0.47
1:A:188:PRO:CA	1:A:257:LEU:HD22	2.45	0.47
1:A:41:PHE:C	1:A:41:PHE:CD1	2.88	0.47
1:A:568:VAL:HG12	1:A:570:HIS:CD2	2.50	0.47
1:A:163:LEU:O	1:A:166:VAL:HB	2.15	0.47
1:A:201:MET:HB3	1:A:340:LYS:HE2	1.97	0.47
1:A:479:ARG:HH11	1:A:479:ARG:CG	2.27	0.47
1:A:11:CYS:O	1:A:71:VAL:HG12	2.15	0.46
1:A:136:ARG:O	1:A:137:GLN:HG2	2.14	0.46
1:A:6:LEU:CD1	1:A:6:LEU:H	2.28	0.46
1:A:89:ILE:HG12	1:A:358:MET:CG	2.45	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:57:THR:O	1:A:57:THR:HG22	2.16	0.46
1:A:315:THR:O	1:A:315:THR:CG2	2.64	0.46
1:A:308:ARG:NH1	1:A:308:ARG:HG3	2.30	0.46
1:A:332:LEU:O	1:A:332:LEU:HD12	2.16	0.46
1:A:46:GLU:HA	1:A:55:TRP:CE2	2.51	0.46
1:A:171:SER:OG	1:A:173:LYS:HG3	2.15	0.46
1:A:386:THR:HG23	1:A:427:TYR:HB2	1.96	0.46
1:A:296:HIS:CD2	1:A:296:HIS:H	2.32	0.46
1:A:113:LYS:N	1:A:117:GLU:OE2	2.46	0.46
1:A:288:LEU:O	1:A:289:ASP:HB2	2.15	0.46
1:A:38:CYS:O	1:A:39:LEU:HD22	2.16	0.46
1:A:198:ASP:OD1	1:A:199:SER:N	2.49	0.45
1:A:27:TYR:O	1:A:30:VAL:N	2.49	0.45
1:A:116:GLN:HB2	5:A:1016:HOH:O	2.14	0.45
1:A:342:LEU:O	1:A:343:HIS:C	2.53	0.45
1:A:409:LEU:HA	1:A:409:LEU:HD12	1.79	0.45
1:A:40:LEU:CD1	1:A:68:LEU:HD22	2.46	0.45
1:A:194:ASP:OD2	1:A:248:SER:HB3	2.16	0.45
1:A:280:ASP:CG	1:A:343:HIS:HA	2.37	0.45
1:A:315:THR:O	1:A:315:THR:HG22	2.16	0.45
1:A:368:PRO:O	1:A:369:ARG:HB3	2.16	0.45
1:A:488:ASP:HB3	1:A:491:VAL:CG2	2.47	0.45
1:A:126:VAL:O	1:A:126:VAL:HG22	2.17	0.45
1:A:254:SER:HB3	1:A:255:LYS:HD3	1.98	0.45
1:A:265:CYS:O	1:A:266:ARG:C	2.54	0.45
1:A:89:ILE:CG2	1:A:358:MET:SD	2.95	0.45
1:A:557:SER:C	1:A:559:GLY:H	2.20	0.45
1:A:300:GLN:HB2	1:A:312:PHE:CZ	2.52	0.45
1:A:205:ALA:HB1	5:A:1000:HOH:O	2.17	0.45
1:A:451:HIS:HD2	1:A:461:TYR:CD2	2.25	0.45
1:A:475:THR:C	1:A:477:SER:N	2.69	0.45
1:A:460:GLY:O	1:A:461:TYR:HB2	2.16	0.45
1:A:474:TYR:HB3	1:A:479:ARG:HD2	1.98	0.45
1:A:10:THR:HA	1:A:71:VAL:O	2.16	0.45
1:A:17:ILE:O	1:A:17:ILE:HD12	2.17	0.45
1:A:186:ILE:C	1:A:186:ILE:HD12	2.37	0.45
1:A:197:ILE:HG23	1:A:241:THR:HG22	1.99	0.45
1:A:269:ILE:CG1	1:A:270:PRO:HD2	2.47	0.45
1:A:23:PRO:HB3	1:A:102:MET:HE1	1.99	0.44
1:A:192:PHE:CE1	1:A:247:PRO:HG3	2.52	0.44
1:A:498:VAL:HG23	1:A:498:VAL:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:89:ILE:HB	1:A:90:SER:H	1.09	0.44
1:A:102:MET:HB3	1:A:157:PRO:HB3	2.00	0.44
1:A:238:LEU:CD1	1:A:240:LYS:HZ1	2.30	0.44
1:A:383:TRP:O	1:A:401:SER:HA	2.17	0.44
1:A:46:GLU:HG3	1:A:55:TRP:CZ3	2.53	0.44
1:A:456:MET:HB3	1:A:459:SER:OG	2.18	0.44
1:A:562:SER:HB3	1:A:569:TRP:CE3	2.53	0.44
1:A:89:ILE:H	1:A:89:ILE:HG13	1.23	0.44
1:A:510:ILE:CG2	1:A:511:GLN:N	2.75	0.44
1:A:53:THR:O	1:A:54:ARG:HB3	2.17	0.44
1:A:599:TRP:O	1:A:603:LYS:HG2	2.18	0.44
1:A:90:SER:C	1:A:92:CYS:H	2.21	0.44
1:A:255:LYS:CD	1:A:255:LYS:N	2.80	0.43
1:A:277:PHE:HD2	1:A:348:ILE:CD1	2.31	0.43
1:A:113:LYS:HG3	1:A:113:LYS:H	1.57	0.43
1:A:134:ALA:O	1:A:145:ASN:N	2.50	0.43
1:A:231:GLU:C	1:A:231:GLU:OE2	2.56	0.43
1:A:89:ILE:HG12	1:A:358:MET:HG3	2.01	0.43
1:A:74:THR:O	1:A:75:ALA:HB3	2.19	0.43
1:A:224:PHE:CD1	1:A:236:LEU:HD23	2.53	0.43
1:A:32:CYS:O	1:A:38:CYS:HB3	2.19	0.43
1:A:426:VAL:HB	1:A:443:PHE:HB2	2.00	0.43
2:B:1:NAG:C1	2:B:1:NAG:O7	2.66	0.43
1:A:334:SER:C	1:A:335:ASN:ND2	2.71	0.43
1:A:486:LYS:O	1:A:489:ARG:HG3	2.18	0.43
1:A:577:TRP:CZ2	1:A:589:VAL:HG21	2.53	0.43
1:A:594:VAL:C	1:A:596:TYR:H	2.21	0.43
1:A:238:LEU:HB3	1:A:240:LYS:HZ2	1.83	0.43
1:A:374:THR:O	1:A:375:ALA:HB2	2.19	0.43
1:A:296:HIS:CD2	1:A:297:GLU:HG3	2.54	0.43
1:A:366:ILE:N	1:A:366:ILE:CD1	2.79	0.43
1:A:67:THR:O	1:A:68:LEU:CD1	2.66	0.43
1:A:198:ASP:HB3	1:A:239:LEU:HD12	2.00	0.43
1:A:250:ARG:HE	1:A:250:ARG:N	2.06	0.43
1:A:357:LYS:HZ2	1:A:357:LYS:HA	1.84	0.43
1:A:531:TYR:HE1	1:A:587:PRO:HG2	1.84	0.43
1:A:64:VAL:HG12	5:A:1005:HOH:O	2.19	0.43
1:A:2:CYS:O	1:A:2:CYS:SG	2.77	0.42
1:A:39:LEU:H	1:A:83:LYS:HZ2	1.64	0.42
1:A:15:GLY:HA3	1:A:68:LEU:HD21	2.01	0.42
1:A:369:ARG:O	1:A:370:ILE:O	2.36	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:122:CYS:HB2	1:A:149:LEU:HD22	2.00	0.42
1:A:220:PHE:HB2	1:A:259:GLY:O	2.19	0.42
1:A:39:LEU:N	1:A:83:LYS:NZ	2.66	0.42
1:A:133:TYR:CE2	1:A:135:THR:HA	2.54	0.42
1:A:300:GLN:CD	1:A:353:LEU:HD22	2.40	0.42
1:A:371:VAL:HG13	1:A:372:GLY:N	2.34	0.42
1:A:51:ASP:HB2	1:A:52:PRO:CD	2.50	0.42
1:A:68:LEU:HA	1:A:68:LEU:HD12	1.79	0.42
1:A:353:LEU:HA	1:A:353:LEU:HD12	1.86	0.42
1:A:509:LYS:CG	1:A:510:ILE:N	2.76	0.42
1:A:585:GLU:O	1:A:586:ARG:NE	2.52	0.42
1:A:291:VAL:HG22	1:A:292:ALA:N	2.34	0.42
1:A:348:ILE:CD1	1:A:348:ILE:C	2.86	0.42
1:A:38:CYS:O	1:A:39:LEU:CD2	2.68	0.42
1:A:64:VAL:C	1:A:65:THR:HG23	2.39	0.42
1:A:315:THR:CG2	1:A:327:LYS:HB2	2.44	0.42
1:A:51:ASP:HB2	1:A:52:PRO:HD2	2.02	0.42
1:A:136:ARG:HA	1:A:144:ARG:CG	2.50	0.41
1:A:251:ILE:CD1	1:A:251:ILE:N	2.82	0.41
1:A:322:ASN:O	1:A:323:GLU:O	2.37	0.41
1:A:165:LYS:HD2	1:A:165:LYS:H	1.80	0.41
1:A:296:HIS:O	1:A:297:GLU:CB	2.67	0.41
1:A:337:SER:HA	1:A:338:PRO:HD3	1.76	0.41
1:A:405:ASN:HB3	1:A:471:THR:HB	2.02	0.41
1:A:383:TRP:CG	1:A:481:ILE:HB	2.56	0.41
1:A:510:ILE:CG2	1:A:511:GLN:H	2.14	0.41
1:A:296:HIS:O	1:A:297:GLU:HB2	2.20	0.41
1:A:299:CYS:SG	1:A:312:PHE:CD1	3.14	0.41
1:A:300:GLN:HE22	1:A:353:LEU:HD13	1.84	0.41
1:A:577:TRP:CH2	1:A:589:VAL:HG21	2.55	0.41
1:A:137:GLN:HG3	1:A:165:LYS:CG	2.51	0.41
1:A:137:GLN:HG3	1:A:165:LYS:HG2	2.02	0.41
1:A:197:ILE:HD12	1:A:198:ASP:CB	2.51	0.41
1:A:522:VAL:HG13	1:A:543:ALA:HA	2.02	0.41
1:A:22:THR:HG21	1:A:28:CYS:CA	2.47	0.41
1:A:230:LYS:HB2	1:A:233:GLN:HE21	1.86	0.41
2:B:1:NAG:C6	2:B:2:NAG:HN2	2.11	0.41
1:A:197:ILE:HD11	1:A:239:LEU:HB3	2.02	0.41
1:A:364:THR:HG23	1:A:479:ARG:HH22	1.85	0.41
1:A:496:CYS:HA	1:A:562:SER:O	2.20	0.41
1:A:509:LYS:CG	1:A:510:ILE:H	2.24	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:42:THR:HA	1:A:78:SER:HA	2.01	0.41
1:A:138:PHE:CD2	1:A:139:PRO:HD2	2.56	0.41
1:A:229:PRO:O	1:A:231:GLU:N	2.53	0.41
1:A:541:ILE:O	1:A:590:TYR:HB2	2.20	0.41
1:A:569:TRP:C	1:A:570:HIS:CD2	2.93	0.41
1:A:88:GLN:HG2	1:A:357:LYS:CE	2.51	0.41
1:A:194:ASP:O	1:A:195:SER:C	2.58	0.40
1:A:5:GLN:HG2	1:A:5:GLN:O	2.21	0.40
1:A:6:LEU:CD1	1:A:6:LEU:N	2.84	0.40
1:A:319:ALA:HB3	1:A:321:CYS:SG	2.61	0.40
1:A:327:LYS:HB3	1:A:329:TYR:HE1	1.85	0.40
1:A:502:GLY:HA2	1:A:555:GLY:CA	2.43	0.40
1:A:119:GLN:HB2	1:A:131:PHE:CZ	2.56	0.40
1:A:370:ILE:O	1:A:371:VAL:HG12	2.22	0.40
1:A:519:ILE:HG23	1:A:520:PRO:CD	2.51	0.40
1:A:589:VAL:HG12	1:A:590:TYR:N	2.36	0.40
1:A:484:PRO:HB2	1:A:594:VAL:HG22	2.03	0.40
1:A:182:CYS:SG	1:A:264:SER:HB3	2.62	0.40
1:A:17:ILE:HG13	1:A:18:THR:HG22	2.04	0.40
1:A:2:CYS:O	1:A:3:VAL:C	2.60	0.40
1:A:380:GLU:HG2	1:A:381:TRP:CD1	2.57	0.40
1:A:396:HIS:HB2	1:A:433:GLN:NE2	2.37	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)
1:A:287:GLU:OE2	1:A:287:GLU:OE2[7_556]	2.10	0.10

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	575/625 (92%)	458 (80%)	75 (13%)	42 (7%)	1 2

All (42) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	3	VAL
1	A	6	LEU
1	A	87	HIS
1	A	88	GLN
1	A	89	ILE
1	A	90	SER
1	A	139	PRO
1	A	229	PRO
1	A	268	SER
1	A	323	GLU
1	A	325	LYS
1	A	335	ASN
1	A	362	CYS
1	A	369	ARG
1	A	370	ILE
1	A	371	VAL
1	A	375	ALA
1	A	510	ILE
1	A	5	GLN
1	A	9	ASP
1	A	230	LYS
1	A	231	GLU
1	A	343	HIS
1	A	353	LEU
1	A	511	GLN
1	A	587	PRO
1	A	595	GLU
1	A	38	CYS
1	A	95	ASP
1	A	295	SER
1	A	296	HIS
1	A	337	SER
1	A	368	PRO
1	A	91	ALA
1	A	342	LEU
1	A	374	THR
1	A	18	THR
1	A	225	SER

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Mol	Chain	Res	Type
1	A	253	LYS
1	A	418	VAL
1	A	64	VAL
1	A	373	GLY

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	517/552 (94%)	463 (90%)	54 (10%)	7 19

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	4	THR
1	A	9	ASP
1	A	11	CYS
1	A	16	ASP
1	A	17	ILE
1	A	39	LEU
1	A	57	THR
1	A	68	LEU
1	A	73	ARG
1	A	84	GLN
1	A	89	ILE
1	A	92	CYS
1	A	95	ASP
1	A	113	LYS
1	A	123	THR
1	A	137	GLN
1	A	139	PRO
1	A	148	LEU
1	A	156	THR
1	A	163	LEU
1	A	175	CYS
1	A	177	LEU

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Mol	Chain	Res	Type
1	A	204	ASP
1	A	229	PRO
1	A	250	ARG
1	A	267	HIS
1	A	294	LYS
1	A	296	HIS
1	A	302	LEU
1	A	315	THR
1	A	322	ASN
1	A	323	GLU
1	A	327	LYS
1	A	335	ASN
1	A	340	LYS
1	A	343	HIS
1	A	348	ILE
1	A	353	LEU
1	A	354	ARG
1	A	357	LYS
1	A	364	THR
1	A	365	LYS
1	A	366	ILE
1	A	370	ILE
1	A	378	ARG
1	A	387	LEU
1	A	425	ARG
1	A	499	THR
1	A	518	LYS
1	A	528	GLN
1	A	534	HIS
1	A	538	HIS
1	A	586	ARG
1	A	591	THR

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	29	GLN
1	A	72	ASN
1	A	88	GLN
1	A	93	ASN
1	A	129	HIS
1	A	189	ASN

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Mol	Chain	Res	Type
1	A	196	ASN
1	A	226	GLN
1	A	233	GLN
1	A	263	GLN
1	A	300	GLN
1	A	310	GLN
1	A	322	ASN
1	A	335	ASN
1	A	343	HIS
1	A	388	HIS
1	A	394	GLN
1	A	478	GLN
1	A	528	GLN
1	A	538	HIS
1	A	566	ASN
1	A	570	HIS
1	A	592	ASN

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
2	NAG	B	1	2	14,14,15	1.29	3 (21%)	17,19,21	1.22	1 (5%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	NAG	B	2	2	14,14,15	1.17	2 (14%)	17,19,21	1.83	5 (29%)

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	B	1	2	-	5/6/23/26	0/1/1/1
2	NAG	B	2	2	-	4/6/23/26	0/1/1/1

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	2	NAG	O5-C5	3.19	1.49	1.43
2	B	1	NAG	C3-C2	2.61	1.58	1.52
2	B	1	NAG	O4-C4	2.42	1.48	1.43
2	B	1	NAG	C4-C5	2.22	1.57	1.53
2	B	2	NAG	C4-C5	2.03	1.57	1.53

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	2	NAG	C4-C3-C2	-4.04	105.10	111.02
2	B	2	NAG	O5-C1-C2	-3.46	105.82	111.29
2	B	2	NAG	C2-N2-C7	-3.25	118.27	122.90
2	B	1	NAG	C2-N2-C7	-3.01	118.61	122.90
2	B	2	NAG	C6-C5-C4	-2.23	107.78	113.00
2	B	2	NAG	C1-C2-N2	2.16	114.18	110.49

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2	NAG	C8-C7-N2-C2
2	B	2	NAG	O7-C7-N2-C2
2	B	1	NAG	C3-C2-N2-C7
2	B	1	NAG	C8-C7-N2-C2
2	B	1	NAG	O7-C7-N2-C2
2	B	2	NAG	C4-C5-C6-O6

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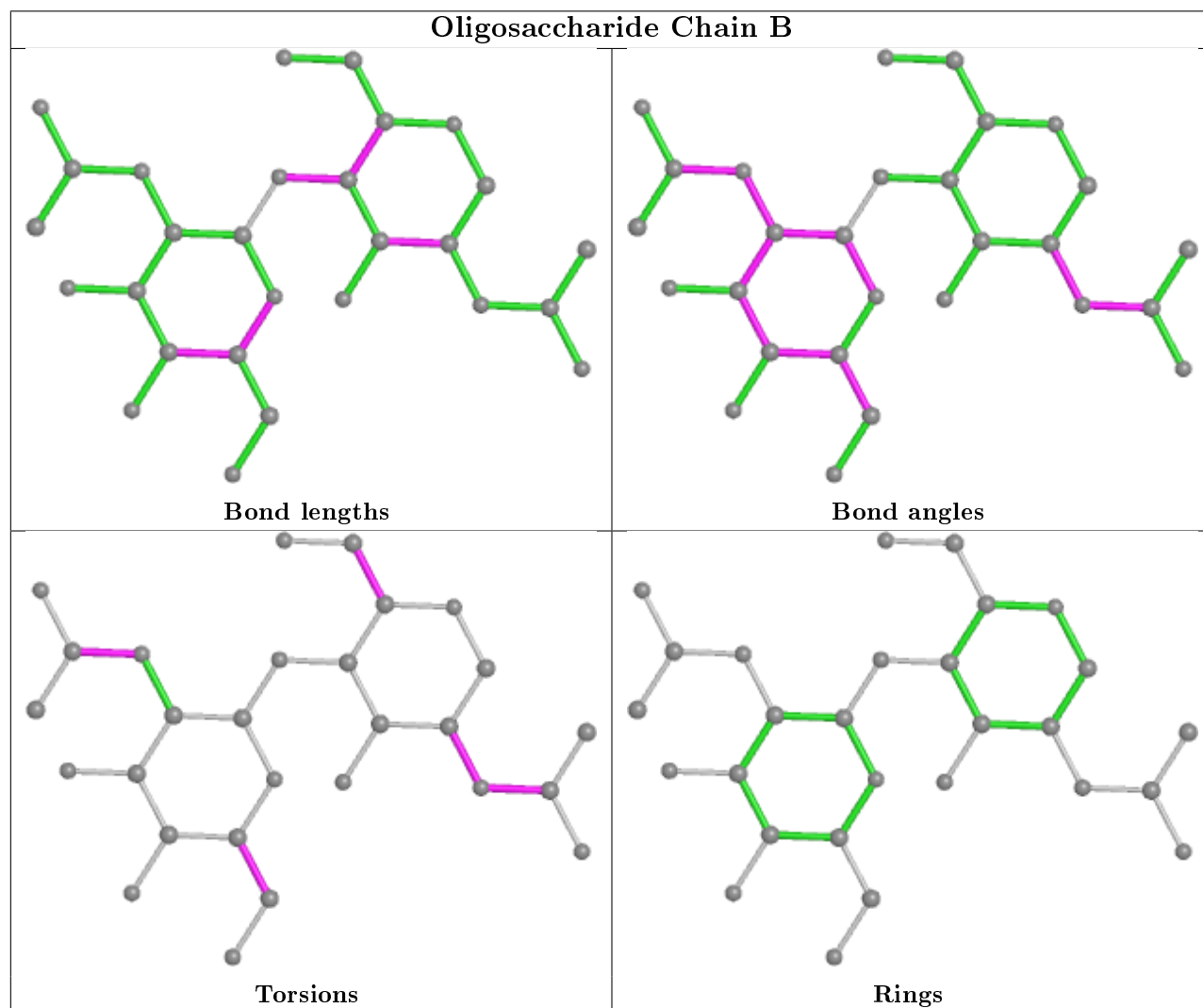
Mol	Chain	Res	Type	Atoms
2	B	2	NAG	O5-C5-C6-O6
2	B	1	NAG	C1-C2-N2-C7
2	B	1	NAG	C4-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	2	NAG	6	0
2	B	1	NAG	8	0

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](#)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	NAG	A	920	1	14,14,15	0.85	1 (7%)	17,19,21	1.00	1 (5%)
3	NAG	A	901	-	14,14,15	0.78	0	17,19,21	0.65	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	A	920	1	-	3/6/23/26	0/1/1/1
3	NAG	A	901	-	-	5/6/23/26	0/1/1/1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	920	NAG	O5-C5	2.11	1.47	1.43

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	920	NAG	C2-N2-C7	-2.00	120.05	122.90

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	920	NAG	C8-C7-N2-C2
3	A	920	NAG	O7-C7-N2-C2
3	A	901	NAG	C8-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
3	A	901	NAG	O7-C7-N2-C2
3	A	901	NAG	O5-C5-C6-O6
3	A	901	NAG	C4-C5-C6-O6
3	A	901	NAG	C1-C2-N2-C7
3	A	920	NAG	O5-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	901	NAG	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	583/625 (93%)	0.10	14 (2%) 59 57	30, 56, 102, 127	15 (2%)

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	371	VAL	5.1
1	A	343	HIS	4.3
1	A	536	ILE	3.6
1	A	517	ALA	3.4
1	A	579	GLU	3.4
1	A	324	GLY	2.7
1	A	556	ASP	2.7
1	A	320	SER	2.7
1	A	500	GLY	2.7
1	A	319	ALA	2.5
1	A	555	GLY	2.5
1	A	377	VAL	2.3
1	A	580	GLY	2.3
1	A	502	GLY	2.2

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

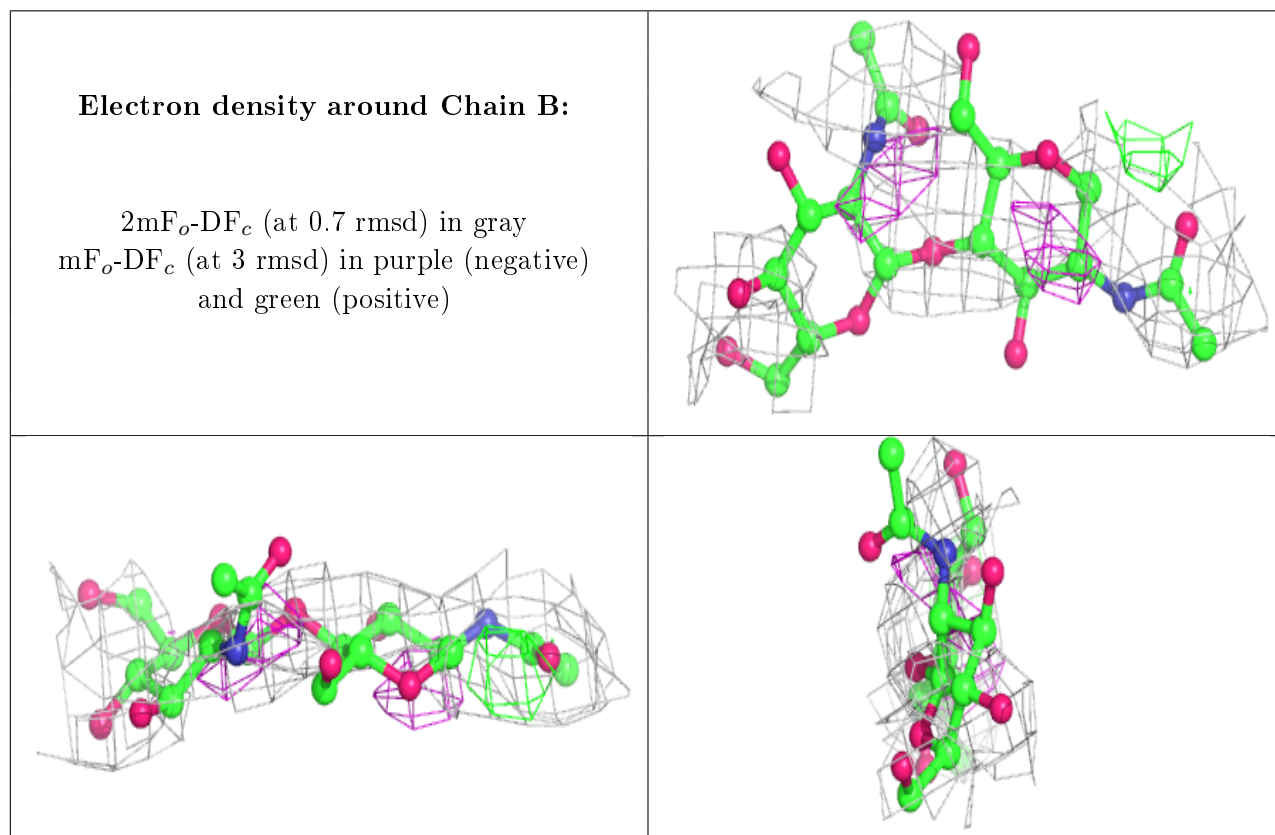
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates

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
2	NAG	B	2	14/15	0.42	0.51	131,133,135,135	0
2	NAG	B	1	14/15	0.45	0.43	119,125,127,130	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
3	NAG	A	920	14/15	0.70	0.33	93,96,98,100	0
4	PT	A	999	1/1	0.73	0.06	201,201,201,201	0
3	NAG	A	901	14/15	0.78	0.21	114,118,118,119	0
4	PT	A	998	1/1	0.99	0.19	110,110,110,110	0

6.5 Other polymers

There are no such residues in this entry.