Full wwPDB X-ray Structure Validation Report ⓘ

Oct 12, 2024 – 09:33 PM EDT

PDB ID	:	1LGB
Title	:	INTERACTION OF A LEGUME LECTIN WITH THE N2 FRAGMENT OF HUMAN LACTOTRANSFERRIN OR WITH THE ISOLATED BIANTENNARY GLYCOPEPTIDE: ROLE OF THE FUCOSE MOIETY
Authors	:	Bourne, Y.; Cambillau, C.
Deposited on	:	1994-01-07
Resolution	:	3.30 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:

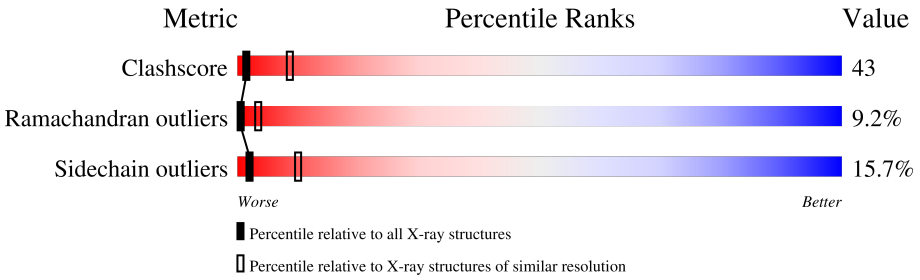
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	NOT EXECUTED
EDS	:	NOT EXECUTED
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.30 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))
Clashscore	180529	1128 (3.32-3.28)
Ramachandran outliers	177936	1125 (3.32-3.28)
Sidechain outliers	177891	1124 (3.32-3.28)

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 <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	181	28% 52% 18%
2	B	53	42% 42% 11%
3	C	159	36% 48% 14%
4	D	9	33% 56% 11%

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 3119 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 LEGUME ISOLECTIN II (ALPHA CHAIN).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
1	A	181	1403	893	231	279	0	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	16	PRO	GLN	conflict	UNP P04122
A	153	ALA	LYS	conflict	UNP P04122
A	168	GLY	ALA	conflict	UNP P04122

- Molecule 2 is a protein called LEGUME ISOLECTIN II (BETA CHAIN).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	B	47	371	244	57	70	0	0	1

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	47	ALA	SER	conflict	UNP P12307

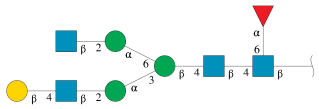
- Molecule 3 is a protein called LACTOTRANSFERRIN (N2 FRAGMENT).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	159	1233	779	214	232	8	0	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	200	LYS	ARG	conflict	UNP P02788

- Molecule 4 is an oligosaccharide called beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
4	D	9	Total	C	N	O	0	0	0
			110	62	4	44			

- Molecule 5 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	1	Total	Mn	0	0
			1	1		

- 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		

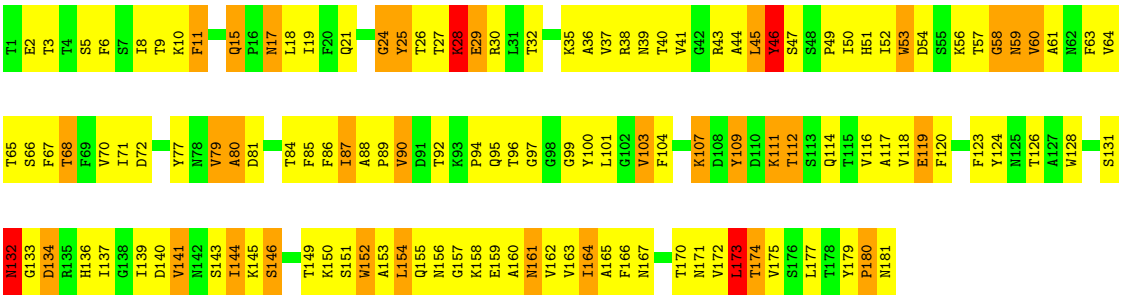
3 Residue-property plots (i)

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. 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. 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.

Note EDS was not executed.

• Molecule 1: LEGUME ISOLECTIN II (ALPHA CHAIN)

Chain A:

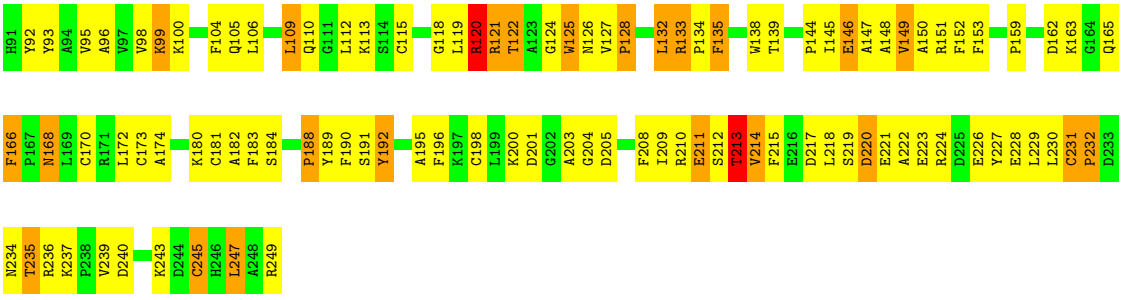


• Molecule 2: LEGUME ISOLECTIN II (BETA CHAIN)

Chain B:

• Molecule 3: LACTOTRANSFERRIN (N2 FRAGMENT)

Chain C:



• Molecule 4: beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:

4 Data and refinement statistics (i)

Xtriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	63.50Å 63.50Å 251.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	6.00 – 3.30	Depositor
% Data completeness (in resolution range)	(Not available) (6.00-3.30)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR	Depositor
R, R_{free}	0.210 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	3119	wwPDB-VP
Average B, all atoms (Å^2)	42.0	wwPDB-VP

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: FUC, MAN, NAG, BMA, CA, MN, GAL

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	0.49	0/1438	0.82	2/1963 (0.1%)
2	B	0.53	0/383	0.77	0/525
3	C	0.57	1/1265 (0.1%)	0.82	3/1710 (0.2%)
All	All	0.53	1/3086 (0.0%)	0.81	5/4198 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	121	ARG	C-N	-6.13	1.20	1.34

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	121	ARG	O-C-N	-10.44	106.00	122.70
3	C	121	ARG	CA-C-O	6.47	133.68	120.10
3	C	201	ASP	C-N-CA	5.39	133.62	122.30
1	A	145	LYS	N-CA-C	-5.36	96.54	111.00
1	A	173	LEU	CA-CB-CG	5.09	127.01	115.30

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	1403	0	1349	154	0
2	B	371	0	347	45	0
3	C	1233	0	1173	100	0
4	D	110	0	94	3	0
5	A	1	0	0	0	0
6	A	1	0	0	0	0
All	All	3119	0	2963	262	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 43.

All (262) 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)
3:C:229:LEU:HD22	3:C:245:CYS:SG	2.14	0.87
1:A:43:ARG:HB3	2:B:25:SER:HB2	1.58	0.83
3:C:122:THR:HA	3:C:126:ASN:HB2	1.65	0.79
1:A:6:PHE:CE1	2:B:42:PHE:HB3	2.20	0.77
3:C:221:GLU:HA	3:C:224:ARG:HE	1.49	0.76
3:C:95:VAL:HB	3:C:229:LEU:HD21	1.68	0.76
3:C:105:GLN:HB3	3:C:234:ASN:OD1	1.87	0.74
3:C:119:LEU:HB3	3:C:120:ARG:HD2	1.70	0.74
1:A:21:GLN:HE21	1:A:43:ARG:HE	1.35	0.74
1:A:70:VAL:HG12	1:A:159:GLU:HA	1.70	0.73
1:A:43:ARG:HD3	1:A:94:PRO:HG3	1.71	0.72
1:A:28:LYS:HD2	1:A:28:LYS:O	1.89	0.72
1:A:104:PHE:CE2	1:A:140:ASP:HB3	2.27	0.69
1:A:150:LYS:NZ	2:B:4:TYR:HD2	1.91	0.69
3:C:121:ARG:O	3:C:122:THR:C	2.29	0.69
3:C:93:TYR:CE1	3:C:249:ARG:HG3	2.27	0.68
1:A:118:VAL:HG21	1:A:175:VAL:HG11	1.74	0.68
1:A:152:TRP:HB2	2:B:4:TYR:CD2	2.29	0.68
1:A:46:TYR:HD1	1:A:47:SER:N	1.92	0.67
1:A:160:ALA:HB2	1:A:179:TYR:CE1	2.29	0.67
1:A:11:PHE:HB3	1:A:26:THR:HG22	1.77	0.67
1:A:155:GLN:HB3	1:A:158:LYS:HD3	1.77	0.66
3:C:110:GLN:HA	3:C:152:PHE:CE1	2.30	0.66
3:C:109:LEU:HD13	3:C:132:LEU:HD21	1.77	0.66
1:A:136:HIS:HD2	1:A:149:THR:HB	1.61	0.66
1:A:111:LYS:HD2	1:A:112:THR:H	1.61	0.65
1:A:132:ASN:ND2	1:A:134:ASP:HB2	2.11	0.65
1:A:101:LEU:CD1	1:A:119:GLU:HG3	2.27	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:99:LYS:HA	3:C:227:TYR:CD1	2.32	0.64
1:A:107:LYS:HA	1:A:144:ILE:HG22	1.80	0.64
1:A:104:PHE:HE2	1:A:140:ASP:HB3	1.62	0.64
1:A:8:ILE:HD11	1:A:17:ASN:HD21	1.61	0.63
1:A:88:ALA:HB1	1:A:89:PRO:HD2	1.79	0.63
3:C:220:ASP:O	3:C:224:ARG:HG3	1.98	0.63
1:A:136:HIS:HB3	1:A:151:SER:HA	1.79	0.63
1:A:139:ILE:HG21	1:A:173:LEU:HD11	1.80	0.63
3:C:231:CYS:SG	3:C:237:LYS:HD2	2.39	0.63
3:C:99:LYS:HG2	3:C:100:LYS:H	1.63	0.63
1:A:50:ILE:HD13	2:B:42:PHE:CZ	2.33	0.63
1:A:68:THR:HA	1:A:160:ALA:O	1.98	0.63
3:C:159:PRO:HB3	3:C:182:ALA:O	2.00	0.62
1:A:2:GLU:HG3	1:A:51:HIS:NE2	2.15	0.62
1:A:101:LEU:HD11	1:A:119:GLU:HG3	1.81	0.62
3:C:135:PHE:N	3:C:135:PHE:HD1	1.97	0.62
3:C:192:TYR:CD1	3:C:210:ARG:HG2	2.35	0.62
3:C:135:PHE:N	3:C:135:PHE:CD1	2.68	0.61
3:C:149:VAL:HG23	3:C:153:PHE:CD2	2.35	0.61
1:A:60:VAL:CG1	2:B:13:LYS:HB2	2.31	0.61
3:C:218:LEU:HB3	3:C:223:GLU:HG3	1.82	0.61
1:A:120:PHE:CD1	1:A:137:ILE:HG23	2.36	0.61
1:A:15:GLN:HA	1:A:15:GLN:OE1	2.01	0.61
3:C:118:GLY:HA2	3:C:159:PRO:HD2	1.82	0.60
3:C:93:TYR:CD1	3:C:249:ARG:HG3	2.35	0.60
1:A:28:LYS:NZ	1:A:28:LYS:HB3	2.17	0.60
1:A:90:VAL:O	2:B:21:ARG:HD2	2.01	0.60
1:A:170:THR:HB	1:A:172:VAL:HG12	1.82	0.60
1:A:50:ILE:HD13	2:B:42:PHE:HZ	1.66	0.60
1:A:66:SER:HB2	1:A:163:VAL:HG23	1.84	0.60
3:C:231:CYS:SG	3:C:237:LYS:HB2	2.42	0.60
3:C:149:VAL:HG23	3:C:153:PHE:HD2	1.67	0.59
3:C:229:LEU:O	3:C:245:CYS:SG	2.60	0.59
1:A:166:PHE:CZ	1:A:171:ASN:HA	2.36	0.59
3:C:218:LEU:HD12	3:C:227:TYR:HE2	1.67	0.59
1:A:150:LYS:HZ2	2:B:4:TYR:HD2	1.50	0.59
1:A:17:ASN:HD22	1:A:18:LEU:HD12	1.67	0.59
1:A:43:ARG:HB3	2:B:25:SER:CB	2.33	0.59
1:A:46:TYR:HD1	1:A:47:SER:H	1.51	0.58
1:A:81:ASP:OD1	1:A:99:GLY:HA2	2.04	0.58
3:C:220:ASP:HB3	3:C:223:GLU:OE2	2.04	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:35:LYS:O	1:A:37:VAL:N	2.36	0.58
3:C:127:VAL:HB	3:C:128:PRO:HD3	1.84	0.58
3:C:195:ALA:O	3:C:198:CYS:HB3	2.03	0.58
3:C:124:GLY:HA2	3:C:208:PHE:HB2	1.84	0.57
1:A:171:ASN:OD1	2:B:11:PRO:HA	2.04	0.57
3:C:166:PHE:HD1	3:C:166:PHE:N	2.03	0.57
1:A:51:HIS:HB3	2:B:19:TRP:CD2	2.40	0.57
3:C:209:ILE:HD13	3:C:213:THR:HB	1.85	0.57
3:C:138:TRP:CE3	3:C:145:ILE:HD13	2.40	0.57
3:C:231:CYS:HB3	3:C:245:CYS:HA	1.86	0.56
1:A:41:VAL:HG11	1:A:94:PRO:HB3	1.87	0.56
1:A:107:LYS:NZ	1:A:107:LYS:H	2.03	0.56
3:C:220:ASP:O	3:C:223:GLU:HG2	2.05	0.56
3:C:163:LYS:NZ	3:C:180:LYS:HB3	2.20	0.56
3:C:229:LEU:HB3	3:C:237:LYS:O	2.06	0.56
3:C:174:ALA:HB2	3:C:189:TYR:CE2	2.41	0.56
3:C:173:CYS:SG	3:C:181:CYS:HA	2.45	0.56
3:C:115:CYS:SG	3:C:204:GLY:HA3	2.46	0.56
1:A:132:ASN:HD21	1:A:134:ASP:HB2	1.71	0.55
1:A:70:VAL:CG1	1:A:159:GLU:HA	2.36	0.55
1:A:51:HIS:CE1	2:B:46:LEU:HD23	2.41	0.55
1:A:52:ILE:O	2:B:46:LEU:HD13	2.06	0.55
1:A:174:THR:HA	2:B:6:LEU:O	2.07	0.55
1:A:96:THR:HB	1:A:100:TYR:CD2	2.42	0.54
1:A:8:ILE:HD11	1:A:17:ASN:ND2	2.23	0.54
3:C:196:PHE:CE1	3:C:214:VAL:HB	2.41	0.54
3:C:222:ALA:O	3:C:226:GLU:HG3	2.07	0.54
1:A:162:VAL:HG12	1:A:177:LEU:HA	1.89	0.54
1:A:27:THR:HG23	1:A:28:LYS:N	2.23	0.54
3:C:99:LYS:HG3	3:C:227:TYR:HE1	1.72	0.54
1:A:96:THR:O	1:A:100:TYR:HB2	2.06	0.54
3:C:172:LEU:HD22	3:C:203:ALA:HB1	1.89	0.54
3:C:146:GLU:HB2	3:C:166:PHE:HE2	1.72	0.54
1:A:68:THR:O	2:B:38:LEU:HB2	2.08	0.54
3:C:166:PHE:N	3:C:166:PHE:CD1	2.74	0.54
1:A:5:SER:HA	2:B:42:PHE:O	2.07	0.53
1:A:19:ILE:HB	1:A:45:LEU:HD12	1.90	0.53
1:A:25:TYR:N	1:A:25:TYR:CD1	2.76	0.53
1:A:39:ASN:HA	2:B:28:THR:O	2.08	0.53
1:A:107:LYS:HA	1:A:144:ILE:CG2	2.39	0.53
1:A:101:LEU:N	1:A:101:LEU:HD23	2.23	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:46:TYR:CD1	1:A:47:SER:N	2.77	0.53
1:A:118:VAL:CG2	1:A:175:VAL:HG11	2.37	0.52
1:A:2:GLU:HG3	1:A:51:HIS:CE1	2.44	0.52
1:A:56:LYS:O	1:A:57:THR:HG23	2.09	0.52
1:A:153:ALA:HB3	2:B:4:TYR:OH	2.10	0.52
1:A:85:PHE:HB3	1:A:118:VAL:HG13	1.90	0.52
1:A:21:GLN:NE2	1:A:45:LEU:HD21	2.25	0.52
1:A:79:VAL:O	1:A:80:ALA:HB2	2.09	0.52
1:A:45:LEU:HD23	1:A:86:PHE:HZ	1.74	0.52
1:A:21:GLN:HG3	1:A:43:ARG:HG3	1.92	0.52
3:C:218:LEU:HD12	3:C:227:TYR:CE2	2.42	0.52
1:A:6:PHE:CG	1:A:46:TYR:CE2	2.98	0.52
3:C:231:CYS:SG	3:C:235:THR:O	2.68	0.51
1:A:84:THR:OG1	1:A:119:GLU:HB2	2.11	0.51
1:A:52:ILE:O	1:A:61:ALA:HB2	2.11	0.51
3:C:119:LEU:O	3:C:121:ARG:N	2.44	0.51
1:A:87:ILE:HG23	2:B:22:ILE:HG22	1.93	0.51
3:C:128:PRO:HG3	3:C:208:PHE:CD2	2.45	0.51
3:C:145:ILE:O	3:C:149:VAL:HG12	2.10	0.51
2:B:30:ALA:O	2:B:31:GLU:HG3	2.12	0.50
1:A:63:PHE:O	1:A:165:ALA:HA	2.12	0.50
1:A:111:LYS:HD2	1:A:112:THR:N	2.25	0.50
3:C:147:ALA:O	3:C:150:ALA:HB3	2.12	0.50
3:C:232:PRO:HG3	3:C:247:LEU:HA	1.93	0.50
1:A:71:ILE:HA	2:B:34:ALA:O	2.11	0.50
1:A:85:PHE:HB3	1:A:118:VAL:CG1	2.42	0.50
1:A:19:ILE:O	1:A:44:ALA:HA	2.11	0.50
1:A:51:HIS:HB3	2:B:19:TRP:CE3	2.47	0.50
2:B:22:ILE:HD13	2:B:42:PHE:CZ	2.47	0.49
3:C:166:PHE:O	3:C:168:ASN:N	2.45	0.49
1:A:6:PHE:HE1	2:B:42:PHE:HB3	1.71	0.49
1:A:21:GLN:NE2	1:A:43:ARG:HE	2.05	0.49
3:C:174:ALA:HB3	3:C:188:PRO:HG2	1.94	0.49
3:C:98:VAL:HG12	3:C:205:ASP:O	2.13	0.49
1:A:27:THR:O	1:A:29:GLU:N	2.45	0.49
3:C:106:LEU:O	3:C:109:LEU:HD12	2.13	0.49
4:D:8:NAG:O7	4:D:8:NAG:H3	2.12	0.49
1:A:35:LYS:O	1:A:37:VAL:HG22	2.13	0.48
1:A:87:ILE:HG13	1:A:116:VAL:O	2.13	0.48
3:C:99:LYS:HG2	3:C:100:LYS:N	2.26	0.48
1:A:51:HIS:HA	2:B:18:GLU:O	2.13	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:64:VAL:O	2:B:42:PHE:HA	2.14	0.48
3:C:92:TYR:CZ	3:C:210:ARG:NH2	2.82	0.48
3:C:99:LYS:CG	3:C:100:LYS:H	2.20	0.48
3:C:133:ARG:HB3	3:C:134:PRO:HD3	1.95	0.48
3:C:247:LEU:N	3:C:247:LEU:HD23	2.27	0.48
1:A:45:LEU:HD12	1:A:45:LEU:O	2.13	0.48
1:A:77:TYR:O	1:A:77:TYR:CD1	2.66	0.48
1:A:72:ASP:HB3	1:A:157:GLY:HA2	1.96	0.48
3:C:183:PHE:O	3:C:190:PHE:CZ	2.67	0.48
1:A:152:TRP:NE1	1:A:177:LEU:HD22	2.29	0.47
1:A:160:ALA:HB2	1:A:179:TYR:HE1	1.78	0.47
3:C:96:ALA:HB3	3:C:230:LEU:HB2	1.96	0.47
3:C:98:VAL:HG23	3:C:228:GLU:HB2	1.95	0.47
1:A:24:GLY:HA2	1:A:32:THR:O	2.12	0.47
1:A:67:PHE:CE2	2:B:24:PHE:HE1	2.31	0.47
3:C:109:LEU:HD13	3:C:132:LEU:CD2	2.43	0.47
1:A:27:THR:HG22	1:A:30:ARG:O	2.14	0.47
1:A:51:HIS:HB3	2:B:19:TRP:CE2	2.50	0.47
3:C:218:LEU:CD1	3:C:227:TYR:HE2	2.27	0.47
1:A:117:ALA:O	1:A:140:ASP:N	2.47	0.47
1:A:139:ILE:CG2	1:A:173:LEU:HD11	2.44	0.47
3:C:100:LYS:HG3	3:C:228:GLU:HG3	1.97	0.47
2:B:5:THR:HG22	2:B:6:LEU:N	2.30	0.47
3:C:100:LYS:HD2	3:C:226:GLU:HA	1.96	0.47
3:C:200:LYS:NZ	3:C:218:LEU:HD21	2.30	0.47
1:A:95:GLN:HG3	1:A:103:VAL:O	2.14	0.47
1:A:72:ASP:HA	1:A:156:ASN:OD1	2.15	0.46
1:A:109:TYR:HE1	1:A:111:LYS:HA	1.80	0.46
1:A:114:GLN:HB3	2:B:17:PRO:HD3	1.96	0.46
1:A:6:PHE:CD1	1:A:46:TYR:CE2	3.03	0.46
1:A:107:LYS:H	1:A:107:LYS:HZ2	1.62	0.46
1:A:136:HIS:CD2	1:A:149:THR:HB	2.46	0.46
1:A:146:SER:HB2	1:A:149:THR:HG23	1.97	0.46
3:C:93:TYR:HE1	3:C:249:ARG:HG3	1.80	0.46
3:C:146:GLU:HB2	3:C:166:PHE:CE2	2.49	0.46
1:A:49:PRO:HB3	1:A:90:VAL:HG22	1.98	0.46
3:C:146:GLU:O	3:C:149:VAL:HG13	2.16	0.46
3:C:170:CYS:HB3	3:C:181:CYS:HB2	1.84	0.46
1:A:81:ASP:CG	1:A:99:GLY:HA2	2.35	0.46
1:A:167:ASN:O	1:A:171:ASN:N	2.49	0.45
1:A:65:THR:O	1:A:163:VAL:HA	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:123:PHE:CE2	4:D:4:MAN:H62	2.51	0.45
1:A:152:TRP:CD1	1:A:177:LEU:HD22	2.51	0.45
3:C:163:LYS:HZ1	3:C:180:LYS:HB3	1.81	0.45
3:C:232:PRO:CG	3:C:247:LEU:HA	2.46	0.45
3:C:99:LYS:HA	3:C:227:TYR:HD1	1.78	0.45
2:B:5:THR:C	2:B:6:LEU:HD12	2.37	0.45
3:C:228:GLU:HB3	3:C:236:ARG:HG2	1.98	0.45
3:C:93:TYR:CE2	3:C:243:LYS:HE3	2.51	0.45
1:A:80:ALA:HA	1:A:81:ASP:HA	1.69	0.44
1:A:104:PHE:CZ	1:A:140:ASP:HB3	2.52	0.44
1:A:53:TRP:HA	1:A:59:ASN:O	2.17	0.44
1:A:9:THR:HG22	1:A:10:LYS:HG3	1.98	0.44
3:C:163:LYS:O	3:C:163:LYS:HG2	2.16	0.44
3:C:104:PHE:H	3:C:236:ARG:NH1	2.15	0.44
1:A:43:ARG:CD	1:A:94:PRO:HG3	2.43	0.44
1:A:164:ILE:HB	1:A:175:VAL:HG12	1.99	0.44
1:A:54:ASP:O	1:A:58:GLY:N	2.51	0.44
3:C:148:ALA:O	3:C:151:ARG:HG2	2.18	0.44
3:C:196:PHE:CZ	3:C:214:VAL:HG23	2.52	0.44
1:A:177:LEU:O	1:A:177:LEU:HD23	2.18	0.44
1:A:124:TYR:CD1	1:A:133:GLY:HA2	2.53	0.43
1:A:61:ALA:HB2	2:B:46:LEU:HD13	2.00	0.43
1:A:143:SER:O	1:A:144:ILE:HB	2.19	0.43
3:C:92:TYR:CD2	3:C:210:ARG:HB2	2.54	0.43
1:A:17:ASN:O	1:A:18:LEU:HD12	2.18	0.42
3:C:125:TRP:C	3:C:128:PRO:HD2	2.39	0.42
2:B:16:VAL:HG23	2:B:20:VAL:HG11	2.00	0.42
3:C:113:LYS:HB3	3:C:172:LEU:HD11	2.00	0.42
3:C:220:ASP:HB3	3:C:223:GLU:CD	2.39	0.42
3:C:231:CYS:SG	3:C:237:LYS:CB	3.07	0.42
1:A:67:PHE:O	1:A:162:VAL:HG22	2.19	0.42
1:A:116:VAL:HG22	1:A:141:VAL:HG23	2.02	0.42
2:B:29:GLY:C	2:B:31:GLU:H	2.22	0.42
1:A:39:ASN:ND2	2:B:29:GLY:HA2	2.35	0.42
1:A:43:ARG:HH12	1:A:103:VAL:CG1	2.32	0.42
3:C:184:SER:O	3:C:190:PHE:CD2	2.72	0.42
1:A:67:PHE:CE2	2:B:24:PHE:CE1	3.08	0.42
1:A:53:TRP:CE3	2:B:13:LYS:HG3	2.55	0.42
3:C:163:LYS:HZ3	3:C:180:LYS:HD3	1.85	0.41
1:A:101:LEU:HD23	1:A:101:LEU:H	1.85	0.41
1:A:136:HIS:ND1	1:A:136:HIS:N	2.69	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:175:VAL:CG2	2:B:6:LEU:HB2	2.50	0.41
1:A:38:ARG:HG3	2:B:32:PHE:CE2	2.55	0.41
1:A:150:LYS:NZ	2:B:4:TYR:CD2	2.81	0.41
1:A:167:ASN:ND2	1:A:170:THR:OG1	2.53	0.41
3:C:231:CYS:SG	3:C:237:LYS:CD	3.08	0.41
1:A:57:THR:O	1:A:59:ASN:N	2.53	0.41
2:B:29:GLY:HA3	4:D:4:MAN:H61	2.01	0.41
3:C:125:TRP:O	3:C:128:PRO:HD2	2.21	0.41
3:C:144:PRO:O	3:C:147:ALA:N	2.53	0.41
3:C:229:LEU:HD12	3:C:239:VAL:HA	2.02	0.41
1:A:150:LYS:HD3	1:A:151:SER:O	2.21	0.41
3:C:119:LEU:HD12	3:C:120:ARG:CZ	2.51	0.41
3:C:135:PHE:HB3	3:C:152:PHE:HE2	1.86	0.41
3:C:230:LEU:N	3:C:230:LEU:HD22	2.35	0.41
1:A:3:THR:OG1	2:B:45:GLU:HG2	2.21	0.41
1:A:68:THR:CG2	1:A:161:ASN:HB3	2.51	0.41
1:A:79:VAL:HG11	1:A:154:LEU:HD11	2.03	0.41
1:A:152:TRP:HD1	2:B:4:TYR:CD1	2.38	0.41
1:A:50:ILE:CD1	2:B:42:PHE:HZ	2.32	0.40
1:A:89:PRO:O	1:A:92:THR:HB	2.21	0.40
1:A:144:ILE:HD12	1:A:144:ILE:HA	1.93	0.40
1:A:43:ARG:HD3	1:A:94:PRO:CG	2.47	0.40
1:A:100:TYR:CE1	1:A:128:TRP:CH2	3.08	0.40
1:A:6:PHE:CD1	1:A:46:TYR:HE2	2.39	0.40
3:C:92:TYR:HD2	3:C:210:ARG:HB2	1.87	0.40
1:A:136:HIS:CB	1:A:151:SER:HA	2.50	0.40
3:C:165:GLN:C	3:C:166:PHE:HD1	2.23	0.40
3:C:200:LYS:HE2	3:C:200:LYS:HB3	1.87	0.40
1:A:124:TYR:CZ	1:A:126:THR:HA	2.56	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	179/181 (99%)	137 (76%)	26 (14%)	16 (9%)	0 4
2	B	45/53 (85%)	38 (84%)	6 (13%)	1 (2%)	5 26
3	C	157/159 (99%)	119 (76%)	20 (13%)	18 (12%)	0 2
All	All	381/393 (97%)	294 (77%)	52 (14%)	35 (9%)	0 3

All (35) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	24	GLY
1	A	28	LYS
1	A	36	ALA
1	A	132	ASN
1	A	144	ILE
1	A	180	PRO
2	B	17	PRO
3	C	120	ARG
3	C	122	THR
3	C	192	TYR
1	A	11	PHE
1	A	58	GLY
1	A	90	VAL
1	A	134	ASP
1	A	141	VAL
3	C	132	LEU
3	C	162	ASP
3	C	168	ASN
1	A	80	ALA
3	C	99	LYS
3	C	191	SER
3	C	213	THR
3	C	217	ASP
1	A	131	SER
1	A	146	SER
3	C	125	TRP
3	C	139	THR
3	C	212	SER
3	C	214	VAL
3	C	245	CYS
3	C	247	LEU
3	C	211	GLU
1	A	46	TYR
1	A	97	GLY

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Mol	Chain	Res	Type
3	C	188	PRO

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	155/155 (100%)	126 (81%)	29 (19%)	1 6
2	B	39/46 (85%)	35 (90%)	4 (10%)	6 22
3	C	130/130 (100%)	112 (86%)	18 (14%)	3 13
All	All	324/331 (98%)	273 (84%)	51 (16%)	2 10

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	15	GLN
1	A	17	ASN
1	A	25	TYR
1	A	28	LYS
1	A	29	GLU
1	A	40	THR
1	A	45	LEU
1	A	46	TYR
1	A	53	TRP
1	A	59	ASN
1	A	60	VAL
1	A	68	THR
1	A	79	VAL
1	A	87	ILE
1	A	103	VAL
1	A	107	LYS
1	A	109	TYR
1	A	111	LYS
1	A	112	THR
1	A	119	GLU
1	A	132	ASN

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Mol	Chain	Res	Type
1	A	152	TRP
1	A	154	LEU
1	A	161	ASN
1	A	164	ILE
1	A	173	LEU
1	A	174	THR
1	A	180	PRO
1	A	181	ASN
2	B	12	LEU
2	B	16	VAL
2	B	17	PRO
2	B	28	THR
3	C	109	LEU
3	C	112	LEU
3	C	120	ARG
3	C	128	PRO
3	C	133	ARG
3	C	135	PHE
3	C	146	GLU
3	C	149	VAL
3	C	166	PHE
3	C	211	GLU
3	C	213	THR
3	C	215	PHE
3	C	219	SER
3	C	220	ASP
3	C	231	CYS
3	C	232	PRO
3	C	235	THR
3	C	240	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (7) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	17	ASN
1	A	21	GLN
1	A	39	ASN
1	A	59	ASN
1	A	132	ASN
2	B	35	HIS
3	C	110	GLN

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

9 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	$\#\|Z\| > 2$
4	NAG	D	1	3,4	14,14,15	0.70	0	17,19,21	1.33	2 (11%)
4	NAG	D	2	4	14,14,15	0.55	0	17,19,21	0.82	1 (5%)
4	BMA	D	3	4	11,11,12	0.53	0	15,15,17	0.71	0
4	MAN	D	4	4	11,11,12	0.53	0	15,15,17	0.93	1 (6%)
4	NAG	D	5	4	14,14,15	0.57	0	17,19,21	0.87	0
4	GAL	D	6	4	11,11,12	0.48	0	15,15,17	0.46	0
4	MAN	D	7	4	11,11,12	0.57	0	15,15,17	0.76	1 (6%)
4	NAG	D	8	4	14,14,15	0.52	0	17,19,21	0.55	0
4	FUC	D	9	4	10,10,11	0.73	0	14,14,16	1.04	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
4	NAG	D	1	3,4	-	1/6/23/26	0/1/1/1
4	NAG	D	2	4	-	0/6/23/26	0/1/1/1
4	BMA	D	3	4	-	0/2/19/22	0/1/1/1
4	MAN	D	4	4	-	0/2/19/22	0/1/1/1
4	NAG	D	5	4	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GAL	D	6	4	-	1/2/19/22	0/1/1/1
4	MAN	D	7	4	-	0/2/19/22	0/1/1/1
4	NAG	D	8	4	-	1/6/23/26	0/1/1/1
4	FUC	D	9	4	-	-	0/1/1/1

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	1	NAG	C4-C3-C2	-3.58	105.77	111.02
4	D	1	NAG	C1-C2-N2	3.09	115.31	110.43
4	D	2	NAG	C2-N2-C7	-2.86	119.06	122.90
4	D	4	MAN	C3-C4-C5	2.30	114.40	110.23
4	D	9	FUC	C1-C2-C3	2.16	112.78	109.64
4	D	7	MAN	C1-O5-C5	2.15	115.07	112.19

There are no chirality outliers.

All (3) torsion outliers are listed below:

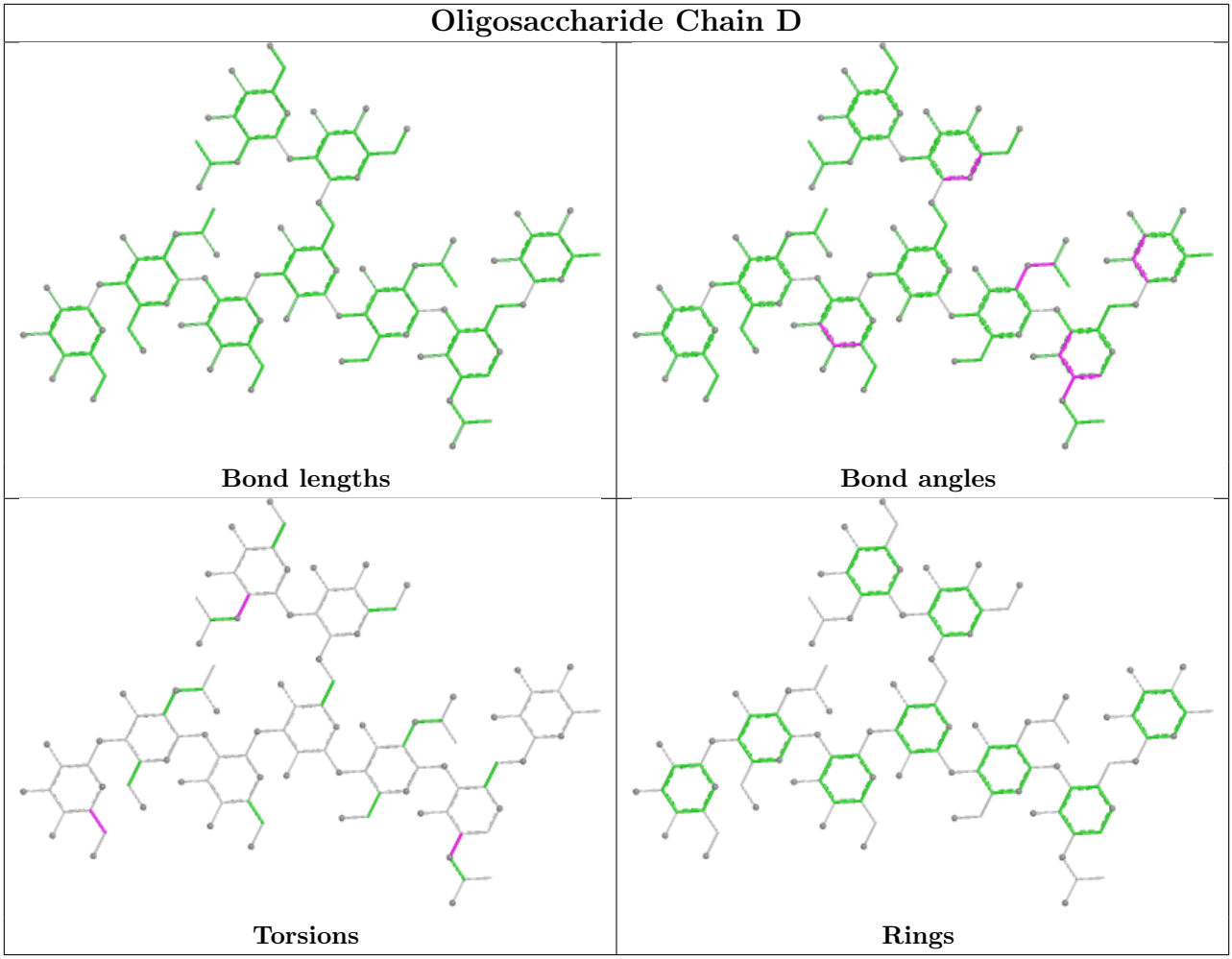
Mol	Chain	Res	Type	Atoms
4	D	1	NAG	C1-C2-N2-C7
4	D	6	GAL	O5-C5-C6-O6
4	D	8	NAG	C3-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	D	8	NAG	1	0
4	D	4	MAN	2	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 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

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)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	C	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	C	121:ARG	C	122:THR	N	1.19

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.