



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 23, 2023 – 03:36 PM EDT

PDB ID : 5KQV
Title : Insulin receptor ectodomain construct comprising domains L1,CR,L2, FnIII-1 and alphaCT peptide in complex with bovine insulin and FAB 83-14 (REVISED STRUCTURE)
Authors : Lawrence, M.C.; Smith, B.J.; Croll, T.I.
Deposited on : 2016-07-06
Resolution : 4.40 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)
Xtrriage (Phenix) : 1.13
EDS : 2.35.1
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) : 2.35.1

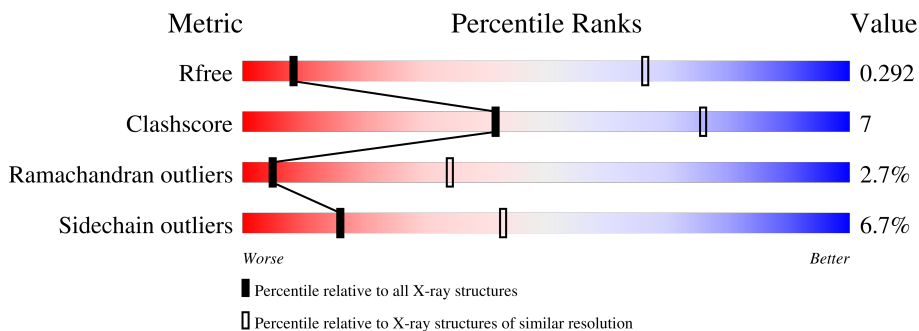
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 4.40 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	1043 (5.00-3.80)
Clashscore	141614	1111 (5.00-3.80)
Ramachandran outliers	138981	1059 (5.00-3.80)
Sidechain outliers	138945	1041 (5.00-3.80)

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 $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	21	48% (green), 43% (yellow), 10% (orange)
1	I	21	48% (green), 33% (yellow), 19% (orange)
2	B	30	43% (green), 13% (yellow), 43% (grey)
2	J	30	27% (green), 23% (yellow), 7% (orange), 43% (grey)
3	C	220	75% (green), 18% (yellow), 7% (orange), 0% (red), 0% (grey)
3	P	220	75% (green), 21% (yellow), 4% (orange), 0% (red), 0% (grey)
4	D	214	86% (green), 12% (yellow), 2% (orange), 0% (red), 0% (grey)

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Mol	Chain	Length	Quality of chain
4	Q	214	 86% 12% .
5	E	609	 78% 17% . .
5	F	609	 78% 17% . .
6	G	2	 50% 50%
6	H	2	 50% 50%
7	K	3	 33% 67%

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 16735 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 Insulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	21	159	97	25	33	4	0	0	0
1	I	21	159	97	25	33	4	0	0	0

- Molecule 2 is a protein called Insulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	17	127	81	21	23	2	0	0	0
2	J	17	127	81	21	23	2	0	0	0

- Molecule 3 is a protein called MONOCLONAL ANTIBODY FAB 83-14 - HEAVY CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	211	1589	1014	260	309	6	0	0	0
3	P	220	1662	1060	273	322	7	0	0	0

- Molecule 4 is a protein called MONOCLONAL ANTIBODY FAB 83-14 - LIGHT CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	D	214	1650	1022	277	344	7	0	0	0
4	Q	214	1650	1022	277	344	7	0	0	0

- Molecule 5 is a protein called Insulin receptor,Insulin receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	E	593	Total	C	N	O	S	0	0	0
			4760	3015	824	879	42			
5	F	592	Total	C	N	O	S	0	0	0
			4766	3023	821	880	42			

There are 2 discrepancies between the modelled and reference sequences:

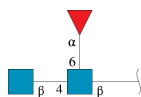
Chain	Residue	Modelled	Actual	Comment	Reference
E	144	HIS	TYR	variant	UNP P06213
F	144	HIS	TYR	variant	UNP P06213

- Molecule 6 is an oligosaccharide called alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
6	G	2	Total	C	N	O	0	0	0
			24	14	1	9			
6	H	2	Total	C	N	O	0	0	0
			24	14	1	9			

- Molecule 7 is an oligosaccharide called 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
7	K	3	Total	C	N	O	0	0	0
			38	22	2	14			

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.

- Molecule 1: Insulin

Chain A:  48% 43% 10%



- Molecule 1: Insulin

Chain I:  48% 33% 19%




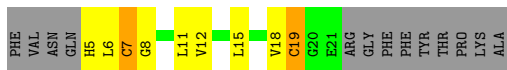
- Molecule 2: Insulin

Chain B:  43% 13% 43%



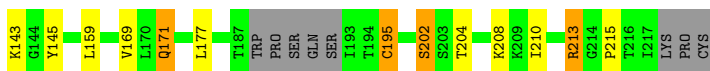
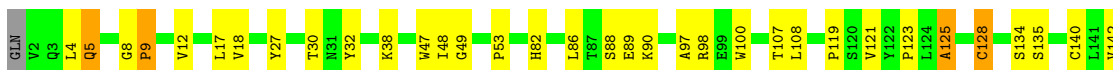
- Molecule 2: Insulin

Chain J:  27% 23% 7% 43%



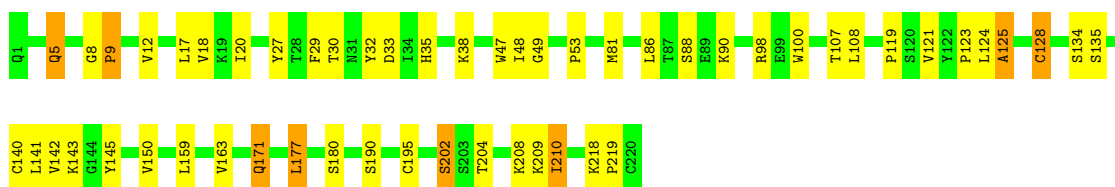
- Molecule 3: MONOCLONAL ANTIBODY FAB 83-14 - HEAVY CHAIN

Chain C:  75% 18% 7%



- Molecule 3: MONOCLONAL ANTIBODY FAB 83-14 - HEAVY CHAIN

Chain P: 75% 21%



• Molecule 4: MONOCLONAL ANTIBODY FAB 83-14 - LIGHT CHAIN

Chain D: 86% 12%



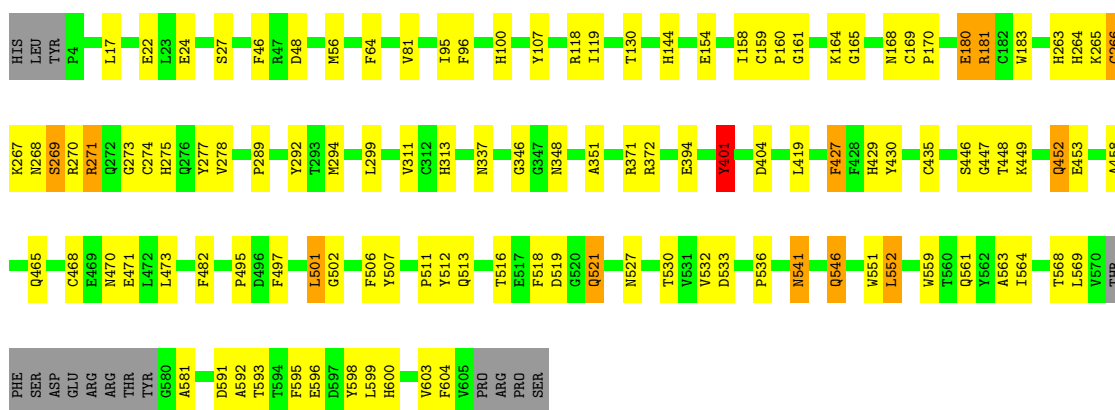
• Molecule 4: MONOCLONAL ANTIBODY FAB 83-14 - LIGHT CHAIN

Chain Q: 86% 12%



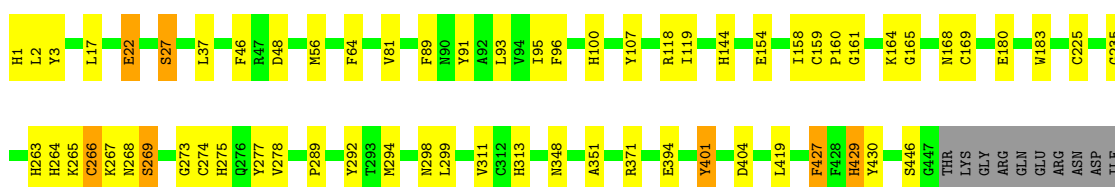
• Molecule 5: Insulin receptor, Insulin receptor

Chain E: 78% 17%



• Molecule 5: Insulin receptor, Insulin receptor

Chain F: 78% 17%





- Molecule 6: alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 6: alpha-L-fucopyranose-(1-6)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics i

Property	Value	Source
Space group	I 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	118.15Å 140.10Å 190.02Å 90.00° 95.04° 90.00°	Depositor
Resolution (Å)	42.49 – 4.40 39.95 – 4.40	Depositor EDS
% Data completeness (in resolution range)	88.1 (42.49-4.40) 88.1 (39.95-4.40)	Depositor EDS
R_{merge}	0.21	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.23 (at 4.44Å)	Xtrriage
Refinement program	BUSTER 2.10.2	Depositor
R, R_{free}	0.229 , 0.266 0.255 , 0.292	Depositor DCC
R_{free} test set	886 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	172.2	Xtrriage
Anisotropy	0.161	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.23 , 220.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.39$, $\langle L^2 \rangle = 0.22$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.88	EDS
Total number of atoms	16735	wwPDB-VP
Average B, all atoms (Å ²)	247.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.37% 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, FUC

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	0.72	0/160	1.03	0/216
1	I	0.83	0/160	1.12	0/216
2	B	0.72	0/129	0.98	0/174
2	J	0.54	0/129	1.00	0/174
3	C	0.54	0/1631	0.93	1/2227 (0.0%)
3	P	0.58	0/1709	0.95	0/2336
4	D	0.43	0/1685	0.73	1/2284 (0.0%)
4	Q	0.44	0/1685	0.73	2/2284 (0.1%)
5	E	0.50	0/4874	0.82	10/6605 (0.2%)
5	F	0.50	0/4884	0.80	5/6623 (0.1%)
All	All	0.51	0/17046	0.83	19/23139 (0.1%)

There are no bond length outliers.

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	264	HIS	C-N-CA	7.59	140.68	121.70
5	F	264	HIS	C-N-CA	7.06	139.36	121.70
5	F	264	HIS	CA-C-N	-5.95	104.10	117.20
5	F	502	GLY	N-CA-C	5.92	127.89	113.10
5	E	468	CYS	C-N-CA	5.82	136.26	121.70
5	E	448	THR	C-N-CA	5.74	136.04	121.70
5	F	266	CYS	C-N-CA	5.71	135.97	121.70
5	E	264	HIS	CA-C-N	-5.65	104.77	117.20
5	E	266	CYS	C-N-CA	5.44	135.30	121.70
4	Q	93	SER	C-N-CA	5.38	135.15	121.70
5	E	512	TYR	C-N-CA	5.37	135.12	121.70
4	D	93	SER	C-N-CA	5.28	134.89	121.70
5	E	502	GLY	N-CA-C	5.25	126.24	113.10
4	Q	108	ARG	CB-CA-C	-5.23	99.93	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	E	180	GLU	CA-C-N	5.17	128.57	117.20
5	F	268	ASN	C-N-CA	5.16	134.59	121.70
5	E	268	ASN	C-N-CA	5.13	134.53	121.70
5	E	401	TYR	CA-CB-CG	5.10	123.10	113.40
3	C	89	GLU	C-N-CA	5.02	134.25	121.70

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	159	0	145	3	0
1	I	159	0	145	7	0
2	B	127	0	120	0	0
2	J	127	0	120	7	0
3	C	1589	0	1568	25	0
3	P	1662	0	1640	29	0
4	D	1650	0	1572	19	0
4	Q	1650	0	1572	16	0
5	E	4760	0	4626	75	0
5	F	4766	0	4614	85	0
6	G	24	0	22	1	0
6	H	24	0	22	2	0
7	K	38	0	34	1	0
All	All	16735	0	16200	232	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 7.

All (232) 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)
5:E:372:ARG:HH21	5:F:533:ASP:CB	1.66	1.08
5:E:372:ARG:NH2	5:F:533:ASP:CB	2.20	1.03

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:E:372:ARG:NH2	5:F:533:ASP:HB3	1.78	0.98
5:E:559:TRP:CE3	5:E:592:ALA:HB2	2.05	0.92
1:I:5:GLN:HE21	1:I:15:GLN:HE21	1.18	0.91
3:C:100:TRP:HB2	4:D:34:TYR:HE2	1.33	0.90
5:E:372:ARG:CZ	5:F:533:ASP:HB3	2.04	0.87
5:E:372:ARG:NH2	5:F:533:ASP:HB2	1.91	0.86
5:E:351:ALA:HB2	5:E:521:GLN:HB2	1.57	0.84
3:P:100:TRP:HB2	4:Q:34:TYR:HE2	1.42	0.83
5:E:372:ARG:HH21	5:F:533:ASP:HB2	1.42	0.82
5:E:95:ILE:HD13	5:E:119:ILE:HG12	1.61	0.81
5:E:169:CYS:HB2	5:E:180:GLU:HG2	1.62	0.81
1:A:5:GLN:HE21	1:A:15:GLN:HE21	1.26	0.81
5:F:559:TRP:CE3	5:F:592:ALA:HB2	2.16	0.80
5:F:95:ILE:HD13	5:F:119:ILE:HG12	1.65	0.78
5:F:570:VAL:HA	5:F:579:TYR:HB2	1.65	0.78
3:C:100:TRP:CB	4:D:34:TYR:HE2	1.98	0.76
3:C:100:TRP:HB2	4:D:34:TYR:CE2	2.19	0.76
5:E:449:LYS:HB3	5:E:452:GLN:NE2	2.00	0.75
5:F:573:SER:HB3	5:F:577:ARG:HA	1.68	0.74
5:F:169:CYS:HB2	5:F:180:GLU:HG2	1.70	0.74
5:E:552:LEU:H	5:E:552:LEU:HD12	1.53	0.74
5:E:130:THR:O	5:E:181:ARG:HA	1.89	0.73
3:P:121:VAL:HG22	3:P:142:VAL:HG13	1.71	0.73
5:F:552:LEU:HD12	5:F:552:LEU:H	1.54	0.73
3:P:35:HIS:HD1	3:P:47:TRP:HE1	1.38	0.71
5:E:271:ARG:HH11	5:E:313:HIS:HB3	1.55	0.70
5:E:559:TRP:CD2	5:E:592:ALA:HB2	2.26	0.70
5:E:471:GLU:HB2	5:E:581:ALA:HB2	1.74	0.69
5:F:516:THR:O	5:F:519:ASP:HB2	1.92	0.68
4:Q:132:VAL:HG13	4:Q:179:LEU:HB3	1.75	0.68
5:F:467:SER:HB2	5:F:579:TYR:HD1	1.59	0.68
5:E:427:PHE:HE1	5:E:429:HIS:HB2	1.58	0.68
1:I:16:LEU:HD11	2:J:6:LEU:HD21	1.77	0.66
5:E:559:TRP:CE3	5:E:592:ALA:CB	2.79	0.66
5:F:471:GLU:HB2	5:F:581:ALA:HB2	1.76	0.65
3:P:171:GLN:HG3	4:Q:160:LEU:HD21	1.79	0.65
4:D:132:VAL:HG13	4:D:179:LEU:HB3	1.77	0.65
5:F:501:LEU:HA	5:F:536:PRO:HG3	1.79	0.64
5:F:427:PHE:HE1	5:F:429:HIS:HB2	1.61	0.64
5:F:467:SER:HB2	5:F:579:TYR:CD1	2.33	0.64
5:F:351:ALA:HB2	5:F:521:GLN:HB2	1.79	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:11:LEU:O	2:J:15:LEU:HD12	1.98	0.64
3:P:100:TRP:HB2	4:Q:34:TYR:CE2	2.30	0.63
3:P:100:TRP:CB	4:Q:34:TYR:HE2	2.12	0.63
5:E:372:ARG:NE	5:F:533:ASP:HB3	2.14	0.62
5:F:56:MET:HG3	5:F:81:VAL:HB	1.82	0.61
5:E:516:THR:O	5:E:519:ASP:HB2	2.00	0.61
4:Q:132:VAL:CG1	4:Q:179:LEU:HB3	2.31	0.61
3:C:100:TRP:CB	4:D:34:TYR:CE2	2.83	0.61
5:E:372:ARG:HD3	5:F:504:MET:CE	2.31	0.60
5:F:546:GLN:HG2	5:F:546:GLN:O	2.01	0.60
5:F:160:PRO:HB3	5:F:164:LYS:HA	1.83	0.59
3:P:8:GLY:HA3	3:P:107:THR:HG23	1.84	0.59
5:E:270:ARG:HD3	5:E:337:ASN:ND2	2.18	0.59
5:E:346:GLY:HA3	5:F:525:GLY:N	2.17	0.59
3:C:8:GLY:HA3	3:C:107:THR:HG23	1.85	0.59
5:E:160:PRO:HB3	5:E:164:LYS:HA	1.83	0.59
5:F:559:TRP:CE3	5:F:592:ALA:CB	2.85	0.58
3:C:202:SER:HB2	3:C:204:THR:OG1	2.05	0.57
5:E:546:GLN:O	5:E:546:GLN:HG2	2.04	0.57
3:C:171:GLN:HG3	4:D:160:LEU:HD11	1.87	0.57
5:E:56:MET:HG3	5:E:81:VAL:HB	1.87	0.57
3:P:125:ALA:HB2	3:P:210:ILE:HG12	1.87	0.57
5:E:170:PRO:O	5:E:180:GLU:O	2.22	0.56
4:D:150:ILE:HD11	4:D:179:LEU:HD21	1.87	0.56
5:F:289:PRO:HG2	5:F:292:TYR:CD2	2.40	0.56
5:F:559:TRP:CD2	5:F:592:ALA:HB2	2.39	0.56
5:E:372:ARG:HD3	5:F:504:MET:HE3	1.87	0.56
5:E:372:ARG:HH21	5:F:533:ASP:CG	2.07	0.55
5:E:429:HIS:CD2	5:E:458:ALA:HB2	2.41	0.55
5:E:501:LEU:HA	5:E:536:PRO:HG3	1.86	0.55
5:E:394:GLU:HG2	5:E:401:TYR:CD2	2.42	0.55
3:P:119:PRO:HB3	3:P:145:TYR:HB3	1.89	0.55
3:C:195:CYS:HB3	3:C:210:ILE:HD11	1.88	0.54
5:E:159:CYS:HB2	5:E:160:PRO:HD3	1.90	0.54
3:P:202:SER:HB2	3:P:204:THR:OG1	2.08	0.54
4:Q:21:LEU:HD12	4:Q:21:LEU:N	2.23	0.54
5:F:467:SER:CB	5:F:579:TYR:HD1	2.21	0.54
4:Q:150:ILE:HD11	4:Q:179:LEU:HD21	1.88	0.54
3:C:119:PRO:HB3	3:C:145:TYR:HB3	1.89	0.54
5:F:278:VAL:HG12	5:F:294:MET:HG3	1.90	0.53
4:D:132:VAL:CG1	4:D:179:LEU:HB3	2.39	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:7:CYS:C	1:A:9:SER:H	2.12	0.53
5:F:3:TYR:HB3	5:F:27:SER:HB3	1.91	0.53
5:E:165:GLY:H	5:E:168:ASN:HD21	1.58	0.52
5:E:569:LEU:HD11	5:F:404:ASP:OD1	2.10	0.52
5:E:289:PRO:HG2	5:E:292:TYR:CD2	2.45	0.52
4:Q:195:GLU:HG2	4:Q:206:VAL:HG22	1.91	0.52
3:C:121:VAL:HG22	3:C:142:VAL:HG13	1.91	0.52
4:D:195:GLU:HG2	4:D:206:VAL:HG22	1.91	0.52
5:E:449:LYS:HB3	5:E:452:GLN:HE21	1.70	0.52
5:E:160:PRO:HB3	5:E:165:GLY:H	1.75	0.51
3:P:5:GLN:HE21	3:P:5:GLN:HA	1.75	0.51
5:E:64:PHE:CD1	5:E:96:PHE:HD2	2.28	0.51
5:E:270:ARG:HH11	5:E:271:ARG:NH1	2.09	0.51
5:E:430:TYR:OH	5:F:571:THR:HG23	2.10	0.51
3:C:210:ILE:H	3:C:210:ILE:HD12	1.76	0.50
5:F:469:GLU:HG3	5:F:582:LYS:HD3	1.93	0.50
5:E:278:VAL:HG12	5:E:294:MET:HG3	1.93	0.50
7:K:1:NAG:H61	7:K:2:NAG:C7	2.41	0.50
5:F:95:ILE:N	5:F:95:ILE:HD12	2.27	0.50
5:F:467:SER:HB2	5:F:579:TYR:HB3	1.94	0.50
5:E:263:HIS:HD2	5:E:277:TYR:O	1.95	0.49
3:C:171:GLN:CG	4:D:160:LEU:HD11	2.42	0.49
1:I:17:GLU:HG2	2:J:18:VAL:HG13	1.92	0.49
5:E:24:GLU:OE2	6:G:1:NAG:H3	2.13	0.49
5:F:311:VAL:HG12	5:F:313:HIS:CD2	2.47	0.49
4:D:108:ARG:HG3	4:D:171:SER:HB2	1.95	0.49
5:F:278:VAL:CG1	5:F:294:MET:HG3	2.43	0.49
5:E:404:ASP:OD1	5:F:569:LEU:HD11	2.13	0.49
5:F:160:PRO:HB3	5:F:165:GLY:H	1.78	0.49
1:A:12:SER:HB3	1:A:15:GLN:OE1	2.13	0.49
3:P:171:GLN:CG	4:Q:160:LEU:HD11	2.42	0.49
5:E:552:LEU:HD12	5:E:552:LEU:N	2.26	0.49
5:F:394:GLU:HG2	5:F:401:TYR:CD2	2.47	0.49
5:F:22:GLU:O	6:H:1:NAG:H83	2.12	0.49
5:E:118:ARG:HD2	5:E:144:HIS:HB3	1.95	0.49
3:P:123:PRO:HG3	3:P:208:LYS:HB3	1.94	0.49
5:F:532:VAL:HG11	5:F:551:TRP:CE2	2.48	0.49
5:E:429:HIS:NE2	5:E:458:ALA:HB2	2.28	0.48
3:C:125:ALA:HB2	3:C:210:ILE:HG22	1.94	0.48
4:D:21:LEU:N	4:D:21:LEU:HD12	2.28	0.48
3:C:8:GLY:HA2	3:C:9:PRO:O	2.11	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:47:TRP:CZ2	3:C:49:GLY:HA2	2.48	0.48
4:D:61:ARG:CZ	4:D:79:GLU:HG3	2.43	0.48
5:F:159:CYS:HB2	5:F:160:PRO:HD3	1.95	0.48
3:P:119:PRO:HB2	3:P:142:VAL:HG12	1.96	0.48
3:C:123:PRO:HG3	3:C:208:LYS:HB3	1.96	0.48
5:E:532:VAL:HG11	5:E:551:TRP:CE2	2.49	0.48
5:E:596:GLU:O	5:E:599:LEU:HB3	2.14	0.48
1:I:7:CYS:C	1:I:9:SER:H	2.15	0.48
5:F:2:LEU:HD22	5:F:225:CYS:O	2.14	0.47
5:E:64:PHE:HD1	5:E:96:PHE:HD2	1.62	0.47
5:F:289:PRO:HG2	5:F:292:TYR:HD2	1.79	0.47
5:F:17:LEU:HD11	5:F:46:PHE:CE1	2.50	0.47
5:F:165:GLY:H	5:F:168:ASN:HD21	1.62	0.47
3:C:5:GLN:HE21	3:C:5:GLN:HA	1.80	0.47
3:C:213:ARG:HB3	4:D:214:CYS:HB3	1.97	0.47
5:E:507:TYR:HA	5:E:563:ALA:O	2.15	0.47
3:P:12:VAL:HG11	3:P:18:VAL:HB	1.97	0.47
5:E:269:SER:O	5:E:274:CYS:HB2	2.15	0.46
3:P:47:TRP:CZ2	3:P:49:GLY:HA2	2.50	0.46
4:Q:21:LEU:HD13	4:Q:73:LEU:HB3	1.97	0.46
5:F:427:PHE:CD1	5:F:427:PHE:C	2.89	0.46
5:F:507:TYR:HA	5:F:563:ALA:O	2.15	0.46
3:C:12:VAL:HG11	3:C:18:VAL:HB	1.96	0.46
5:F:1:HIS:H3	5:F:235:GLY:HA3	1.81	0.46
5:E:419:LEU:O	5:E:446:SER:HA	2.16	0.46
1:I:10:VAL:HG13	2:J:5:HIS:CD2	2.50	0.46
4:D:149:LYS:HB2	4:D:193:THR:HB	1.98	0.46
5:E:394:GLU:HG2	5:E:401:TYR:HD2	1.80	0.46
5:F:263:HIS:HD2	5:F:277:TYR:O	1.98	0.45
5:F:269:SER:O	5:F:274:CYS:HB2	2.16	0.45
5:F:275:HIS:HD2	5:F:277:TYR:CE1	2.34	0.45
5:F:118:ARG:HD2	5:F:144:HIS:HB3	1.97	0.45
3:C:38:LYS:HB2	3:C:48:ILE:HD11	1.97	0.45
3:C:27:TYR:CE2	3:C:98:ARG:HD2	2.52	0.45
5:F:559:TRP:HB2	5:F:592:ALA:HB2	1.98	0.45
5:E:600:HIS:HA	5:E:604:PHE:CE2	2.52	0.45
3:P:8:GLY:HA2	3:P:9:PRO:O	2.17	0.45
3:P:12:VAL:HG21	3:P:86:LEU:HD13	1.97	0.45
5:E:278:VAL:CG1	5:E:294:MET:HG3	2.47	0.45
5:F:552:LEU:HD12	5:F:552:LEU:N	2.27	0.45
5:F:294:MET:SD	5:F:299:LEU:HA	2.57	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:427:PHE:C	5:F:427:PHE:HD1	2.21	0.45
5:E:595:PHE:CD2	5:E:595:PHE:C	2.89	0.44
5:F:1:HIS:N	5:F:235:GLY:CA	2.80	0.44
5:F:522:ASP:HB3	5:F:527:ASN:HD21	1.82	0.44
3:P:27:TYR:CE2	3:P:98:ARG:HD2	2.51	0.44
5:E:17:LEU:HD11	5:E:46:PHE:CE1	2.52	0.44
5:E:506:PHE:O	5:E:564:ILE:HA	2.18	0.44
5:F:482:PHE:HA	5:F:591:ASP:HB2	1.98	0.44
5:E:311:VAL:HG12	5:E:313:HIS:CD2	2.52	0.44
5:E:482:PHE:HA	5:E:591:ASP:HB2	1.99	0.44
3:P:32:TYR:O	3:P:53:PRO:HD2	2.17	0.44
4:D:62:PHE:CE1	4:D:75:ILE:HG12	2.52	0.44
5:F:22:GLU:O	6:H:1:NAG:C8	2.65	0.44
3:C:12:VAL:HG21	3:C:86:LEU:HD13	2.00	0.44
4:D:103:LYS:HE2	4:D:104:LEU:O	2.18	0.44
3:P:100:TRP:CB	4:Q:34:TYR:CE2	2.97	0.44
3:C:169:VAL:HG11	4:D:160:LEU:HD22	2.00	0.43
4:Q:61:ARG:CZ	4:Q:79:GLU:HG3	2.47	0.43
5:E:473:LEU:HD11	5:E:568:THR:HG23	2.00	0.43
5:F:419:LEU:O	5:F:446:SER:HA	2.18	0.43
4:Q:149:LYS:HB2	4:Q:193:THR:HB	1.99	0.43
5:F:64:PHE:HD1	5:F:96:PHE:HD2	1.66	0.43
5:F:479:ARG:HD3	3:P:33:ASP:OD2	2.18	0.43
3:P:29:PHE:CE2	3:P:53:PRO:HB3	2.53	0.43
5:F:1:HIS:H3	5:F:235:GLY:CA	2.32	0.43
1:I:17:GLU:HA	2:J:18:VAL:HG11	2.00	0.43
3:P:150:VAL:HG21	3:P:177:LEU:HD22	2.01	0.43
5:F:64:PHE:CD1	5:F:96:PHE:HD2	2.36	0.43
3:P:20:ILE:HD11	3:P:81:MET:HE1	2.01	0.43
4:Q:108:ARG:HH12	4:Q:111:ALA:HB2	1.84	0.43
5:E:447:GLY:C	5:E:449:LYS:H	2.22	0.42
5:E:603:VAL:HG12	5:E:604:PHE:CE1	2.54	0.42
5:F:577:ARG:H	5:F:577:ARG:HG2	1.57	0.42
4:Q:103:LYS:HE2	4:Q:104:LEU:O	2.19	0.42
4:D:123:GLU:H	4:D:123:GLU:HG3	1.69	0.42
5:E:270:ARG:HH11	5:E:271:ARG:HH12	1.68	0.42
3:P:124:LEU:HD11	3:P:141:LEU:HB2	2.01	0.42
5:F:548:HIS:HA	5:F:549:PRO:HD2	1.88	0.42
5:F:160:PRO:HB2	5:F:164:LYS:HD3	2.01	0.42
5:E:427:PHE:CE1	5:E:429:HIS:HB2	2.46	0.42
3:P:38:LYS:HB2	3:P:48:ILE:HD11	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:37:LEU:HD21	5:F:64:PHE:HE2	1.84	0.41
3:C:32:TYR:O	3:C:53:PRO:HD2	2.20	0.41
5:E:294:MET:SD	5:E:299:LEU:HA	2.60	0.41
5:E:372:ARG:HD3	5:F:504:MET:HE2	2.02	0.41
5:F:93:LEU:HG	5:F:95:ILE:HD11	2.01	0.41
1:I:16:LEU:HD11	2:J:6:LEU:CD2	2.48	0.41
5:F:89:PHE:O	5:F:91:TYR:CD2	2.74	0.41
3:C:4:LEU:CD1	3:C:97:ALA:HA	2.50	0.41
5:E:427:PHE:C	5:E:427:PHE:CD1	2.93	0.41
5:F:506:PHE:O	5:F:564:ILE:HA	2.20	0.41
5:F:93:LEU:HG	5:F:95:ILE:CD1	2.51	0.41
5:E:107:TYR:HA	5:E:183:TRP:CD1	2.56	0.41
5:E:275:HIS:CD2	5:E:277:TYR:CE1	3.09	0.41
5:F:107:TYR:HA	5:F:183:TRP:CD1	2.55	0.41
5:F:596:GLU:O	5:F:599:LEU:HB3	2.21	0.41
5:F:275:HIS:CD2	5:F:277:TYR:CE1	3.09	0.41
5:F:404:ASP:HA	5:F:430:TYR:O	2.20	0.41
5:F:571:THR:H	5:F:579:TYR:HA	1.85	0.41
5:F:427:PHE:CE1	5:F:429:HIS:HB2	2.48	0.40
3:P:20:ILE:HD11	3:P:81:MET:CE	2.51	0.40
5:E:452:GLN:HB3	5:E:453:GLU:H	1.67	0.40
5:E:275:HIS:HD2	5:E:277:TYR:CE1	2.38	0.40
2:J:7:CYS:O	2:J:11:LEU:HG	2.22	0.40
3:P:163:VAL:HA	3:P:180:SER:O	2.22	0.40
5:E:289:PRO:HG2	5:E:292:TYR:HD2	1.84	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	19/21 (90%)	13 (68%)	4 (21%)	2 (10%)	0 8

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	I	19/21 (90%)	13 (68%)	4 (21%)	2 (10%)	0	8
2	B	15/30 (50%)	12 (80%)	2 (13%)	1 (7%)	1	18
2	J	15/30 (50%)	12 (80%)	1 (7%)	2 (13%)	0	4
3	C	207/220 (94%)	184 (89%)	15 (7%)	8 (4%)	3	26
3	P	218/220 (99%)	189 (87%)	21 (10%)	8 (4%)	3	28
4	D	212/214 (99%)	204 (96%)	6 (3%)	2 (1%)	17	56
4	Q	212/214 (99%)	204 (96%)	6 (3%)	2 (1%)	17	56
5	E	589/609 (97%)	533 (90%)	42 (7%)	14 (2%)	6	36
5	F	588/609 (97%)	536 (91%)	37 (6%)	15 (3%)	5	35
All	All	2094/2188 (96%)	1900 (91%)	138 (7%)	56 (3%)	5	34

All (56) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	18	ASN
3	C	9	PRO
3	C	159	LEU
4	D	94	SER
5	E	267	LYS
5	E	269	SER
5	E	513	GLN
5	E	521	GLN
5	F	267	LYS
5	F	269	SER
5	F	513	GLN
5	F	521	GLN
5	F	570	VAL
1	I	18	ASN
3	P	9	PRO
3	P	88	SER
3	P	159	LEU
4	Q	94	SER
3	C	88	SER
5	E	100	HIS
5	E	511	PRO
5	E	541	ASN
5	F	100	HIS
5	F	511	PRO
5	F	541	ASN

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Mol	Chain	Res	Type
2	J	8	GLY
3	C	90	LYS
3	C	215	PRO
5	E	273	GLY
5	E	470	ASN
5	F	265	LYS
5	F	273	GLY
5	F	523	ALA
1	I	17	GLU
3	P	135	SER
3	C	135	SER
4	D	150	ILE
5	E	161	GLY
5	E	265	LYS
5	F	161	GLY
2	J	19	CYS
3	P	90	LYS
4	Q	150	ILE
1	A	17	GLU
3	C	125	ALA
5	E	181	ARG
5	E	452	GLN
5	F	470	ASN
5	F	575	GLU
3	P	125	ALA
3	P	128	CYS
2	B	8	GLY
3	C	128	CYS
3	P	219	PRO
5	E	495	PRO
5	F	495	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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	19/19 (100%)	13 (68%)	6 (32%)	0	2
1	I	19/19 (100%)	13 (68%)	6 (32%)	0	2
2	B	14/25 (56%)	11 (79%)	3 (21%)	1	7
2	J	14/25 (56%)	11 (79%)	3 (21%)	1	7
3	C	178/187 (95%)	164 (92%)	14 (8%)	12	38
3	P	187/187 (100%)	171 (91%)	16 (9%)	10	35
4	D	190/190 (100%)	177 (93%)	13 (7%)	16	43
4	Q	190/190 (100%)	178 (94%)	12 (6%)	18	44
5	E	537/553 (97%)	512 (95%)	25 (5%)	26	53
5	F	538/553 (97%)	510 (95%)	28 (5%)	23	50
All	All	1886/1948 (97%)	1760 (93%)	126 (7%)	16	43

All (126) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	ILE
1	A	7	CYS
1	A	10	VAL
1	A	12	SER
1	A	16	LEU
1	A	20	CYS
2	B	7	CYS
2	B	12	VAL
2	B	19	CYS
3	C	5	GLN
3	C	17	LEU
3	C	30	THR
3	C	82	HIS
3	C	108	LEU
3	C	128	CYS
3	C	134	SER
3	C	140	CYS
3	C	143	LYS
3	C	171	GLN
3	C	177	LEU
3	C	195	CYS
3	C	202	SER

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Mol	Chain	Res	Type
3	C	213	ARG
4	D	3	GLN
4	D	12	SER
4	D	21	LEU
4	D	44	ILE
4	D	67	SER
4	D	89	LEU
4	D	104	LEU
4	D	108	ARG
4	D	121	SER
4	D	156	GLN
4	D	167	ASP
4	D	201	SER
4	D	214	CYS
5	E	22	GLU
5	E	27	SER
5	E	48	ASP
5	E	154	GLU
5	E	158	ILE
5	E	266	CYS
5	E	271	ARG
5	E	348	ASN
5	E	371	ARG
5	E	401	TYR
5	E	427	PHE
5	E	435	CYS
5	E	465	GLN
5	E	497	PHE
5	E	501	LEU
5	E	518	PHE
5	E	527	ASN
5	E	530	THR
5	E	533	ASP
5	E	541	ASN
5	E	546	GLN
5	E	552	LEU
5	E	561	GLN
5	E	593	THR
5	E	598	TYR
5	F	22	GLU
5	F	27	SER
5	F	48	ASP

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Mol	Chain	Res	Type
5	F	154	GLU
5	F	158	ILE
5	F	266	CYS
5	F	298	ASN
5	F	348	ASN
5	F	371	ARG
5	F	401	TYR
5	F	427	PHE
5	F	429	HIS
5	F	465	GLN
5	F	497	PHE
5	F	501	LEU
5	F	518	PHE
5	F	527	ASN
5	F	530	THR
5	F	533	ASP
5	F	541	ASN
5	F	546	GLN
5	F	552	LEU
5	F	561	GLN
5	F	572	PHE
5	F	576	ARG
5	F	577	ARG
5	F	593	THR
5	F	598	TYR
1	I	2	ILE
1	I	7	CYS
1	I	10	VAL
1	I	12	SER
1	I	16	LEU
1	I	20	CYS
2	J	7	CYS
2	J	12	VAL
2	J	19	CYS
3	P	5	GLN
3	P	17	LEU
3	P	30	THR
3	P	108	LEU
3	P	128	CYS
3	P	134	SER
3	P	140	CYS
3	P	143	LYS

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Mol	Chain	Res	Type
3	P	171	GLN
3	P	177	LEU
3	P	190	SER
3	P	195	CYS
3	P	202	SER
3	P	209	LYS
3	P	210	ILE
3	P	218	LYS
4	Q	3	GLN
4	Q	12	SER
4	Q	21	LEU
4	Q	44	ILE
4	Q	67	SER
4	Q	89	LEU
4	Q	108	ARG
4	Q	121	SER
4	Q	142	LYS
4	Q	167	ASP
4	Q	201	SER
4	Q	214	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (26) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	5	GLN
3	C	5	GLN
5	E	32	HIS
5	E	34	GLN
5	E	168	ASN
5	E	218	GLN
5	E	275	HIS
5	E	313	HIS
5	E	328	GLN
5	E	349	ASN
5	E	452	GLN
5	E	561	GLN
5	E	600	HIS
5	F	32	HIS
5	F	34	GLN
5	F	168	ASN
5	F	264	HIS
5	F	275	HIS

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Mol	Chain	Res	Type
5	F	313	HIS
5	F	328	GLN
5	F	349	ASN
5	F	546	GLN
5	F	561	GLN
5	F	600	HIS
1	I	5	GLN
3	P	5	GLN

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](#)

7 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	$\# Z > 2$
6	NAG	G	1	5,6	14,14,15	0.40	0	17,19,21	1.16	2 (11%)
6	FUC	G	2	6	10,10,11	0.54	0	14,14,16	0.90	1 (7%)
6	NAG	H	1	5,6	14,14,15	0.41	0	17,19,21	2.06	3 (17%)
6	FUC	H	2	6	10,10,11	0.59	0	14,14,16	1.30	1 (7%)
7	NAG	K	1	5,7	14,14,15	0.43	0	17,19,21	2.02	1 (5%)
7	NAG	K	2	7	14,14,15	0.37	0	17,19,21	1.12	1 (5%)
7	FUC	K	3	7	10,10,11	0.57	0	14,14,16	0.99	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
6	NAG	G	1	5,6	-	5/6/23/26	0/1/1/1
6	FUC	G	2	6	-	-	0/1/1/1
6	NAG	H	1	5,6	-	2/6/23/26	0/1/1/1
6	FUC	H	2	6	-	-	0/1/1/1
7	NAG	K	1	5,7	-	2/6/23/26	0/1/1/1
7	NAG	K	2	7	-	1/6/23/26	0/1/1/1
7	FUC	K	3	7	-	-	0/1/1/1

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	K	1	NAG	O5-C1-C2	-7.79	98.99	111.29
6	H	1	NAG	O5-C1-C2	-6.60	100.87	111.29
6	H	1	NAG	C1-O5-C5	4.58	118.40	112.19
7	K	2	NAG	C1-O5-C5	4.29	118.01	112.19
6	H	2	FUC	C1-C2-C3	3.67	114.17	109.67
6	G	1	NAG	O5-C1-C2	-3.03	106.51	111.29
6	G	1	NAG	C1-C2-N2	-2.74	105.81	110.49
7	K	3	FUC	C1-O5-C5	2.39	118.20	112.78
6	G	2	FUC	C1-C2-C3	2.37	112.57	109.67
6	H	1	NAG	C3-C4-C5	2.05	113.90	110.24

There are no chirality outliers.

All (10) torsion outliers are listed below:

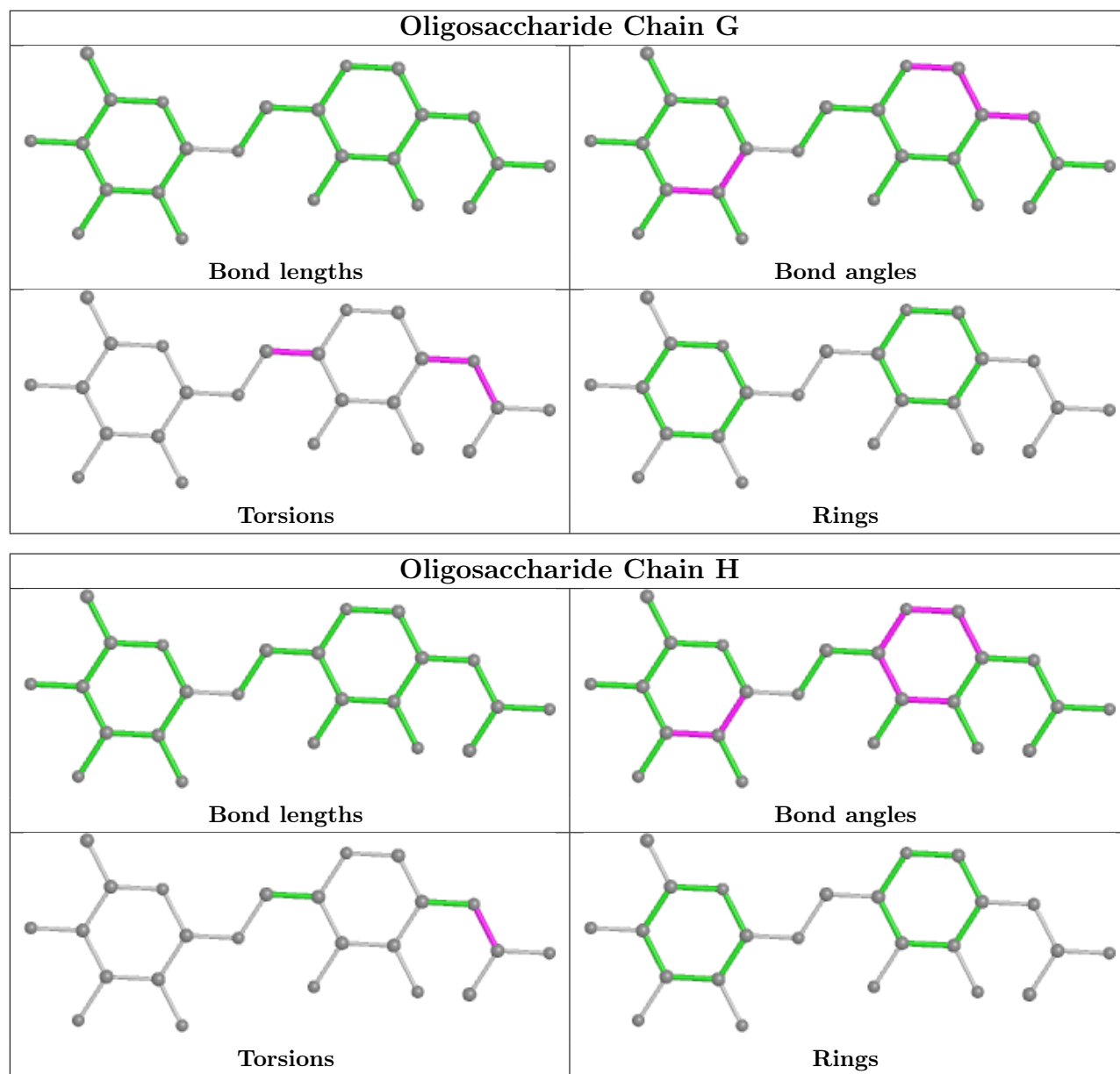
Mol	Chain	Res	Type	Atoms
6	G	1	NAG	C8-C7-N2-C2
6	G	1	NAG	O7-C7-N2-C2
6	H	1	NAG	C8-C7-N2-C2
6	H	1	NAG	O7-C7-N2-C2
7	K	1	NAG	O5-C5-C6-O6
6	G	1	NAG	C4-C5-C6-O6
6	G	1	NAG	O5-C5-C6-O6
7	K	1	NAG	C4-C5-C6-O6
7	K	2	NAG	O5-C5-C6-O6
6	G	1	NAG	C1-C2-N2-C7

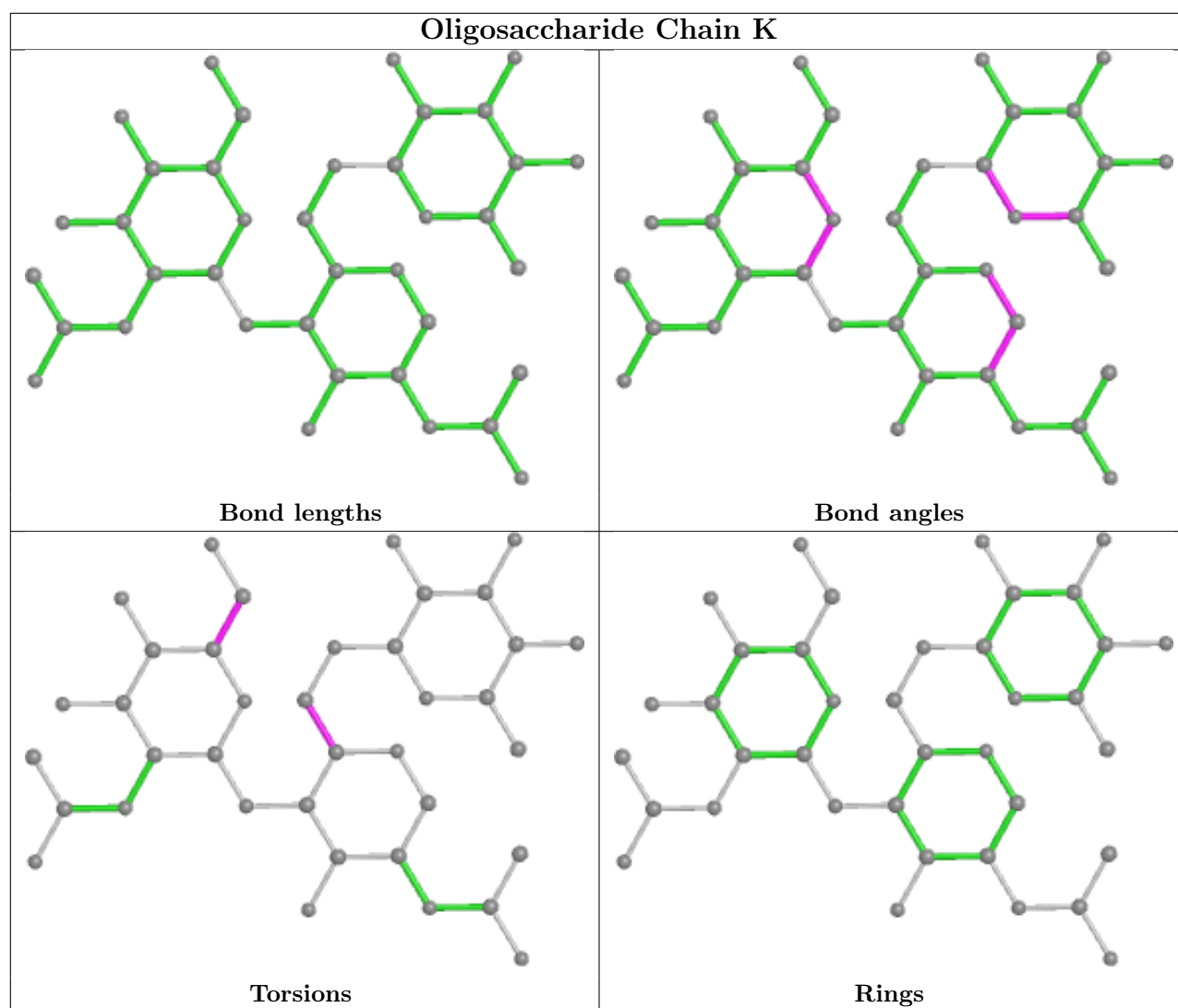
There are no ring outliers.

4 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	G	1	NAG	1	0
7	K	2	NAG	1	0
6	H	1	NAG	2	0
7	K	1	NAG	1	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](#)

There are no ligands in this entry.

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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

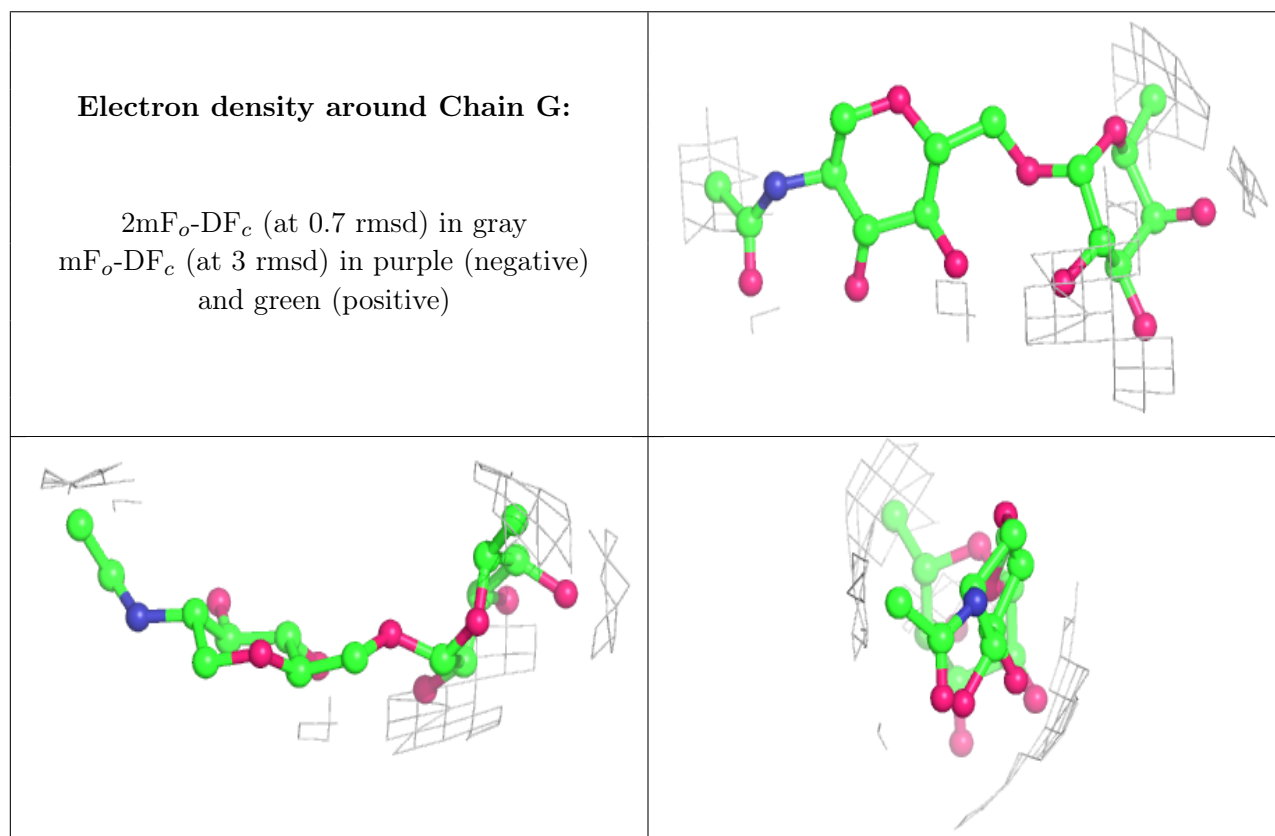
6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates [i](#)

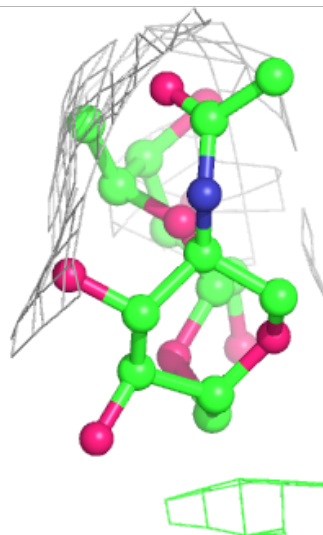
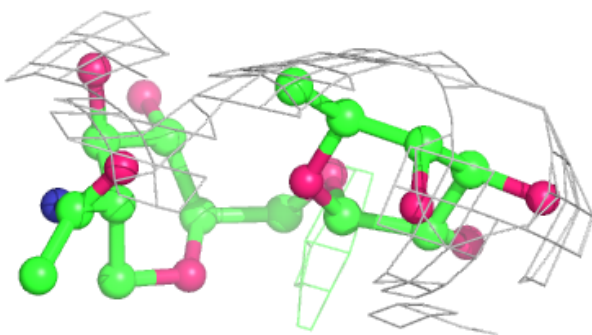
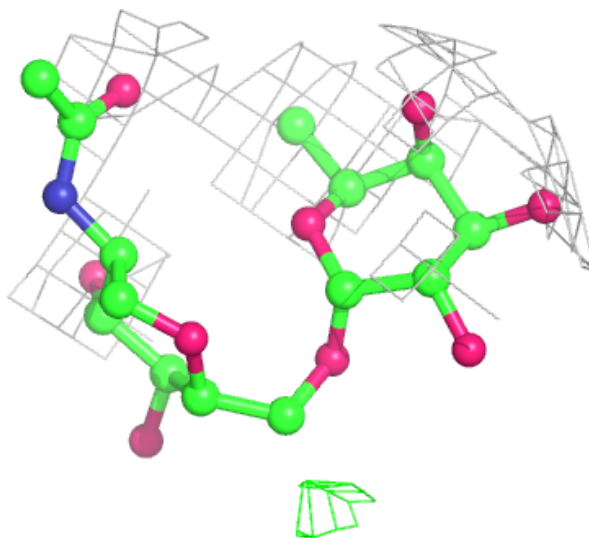
Unable to reproduce the depositors R factor - this section is therefore empty.

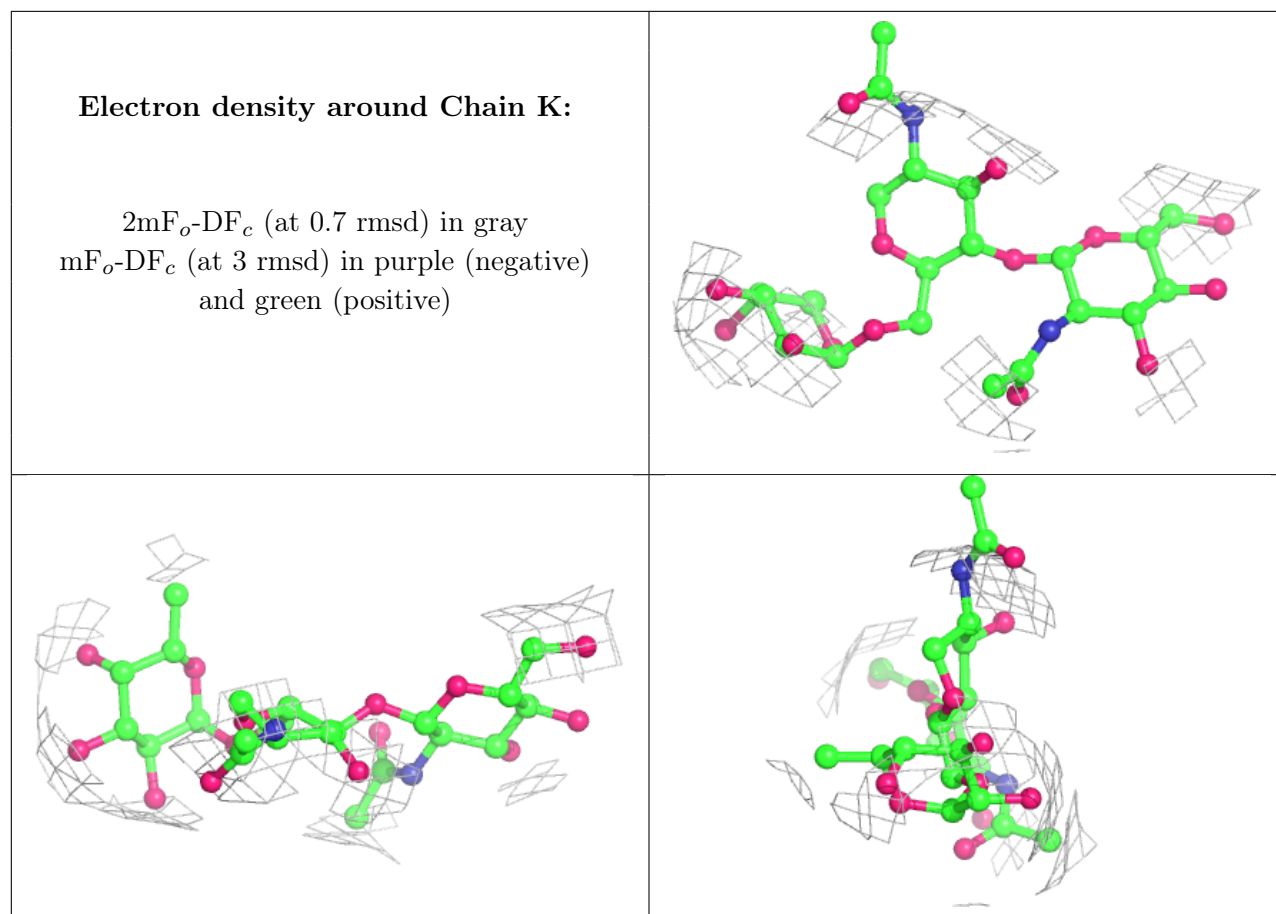
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.



Electron density around Chain H:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.4 Ligands [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.

6.5 Other polymers [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.