



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 22, 2023 – 04:17 PM EDT

PDB ID : 2Z4E
Title : Crystal Structure of D-Dimer from Human Fibrin Complexed with Gly-His-A
rg-Pro-Tyr-amide
Authors : Doolittle, R.F.; Pandi, L.
Deposited on : 2007-06-16
Resolution : 2.70 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

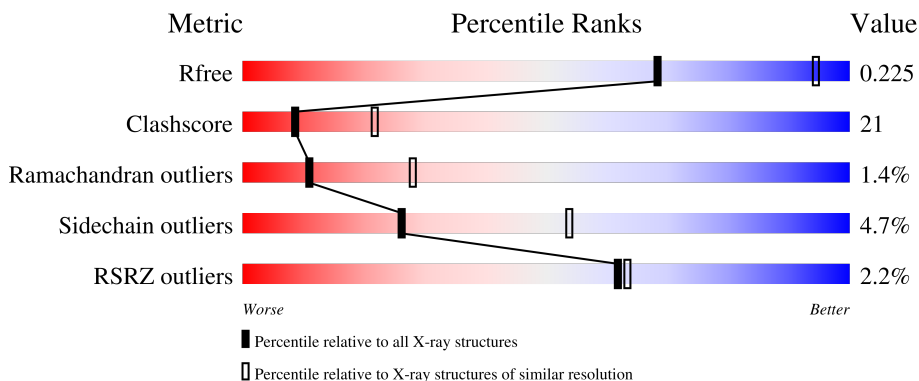
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.70 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	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)

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

Mol	Chain	Length	Quality of chain
1	A	87	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 31%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 43%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 23%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 31% 43% 23%</p>
1	D	87	<div style="display: flex; align-items: center;"> <div style="width: 5%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 26%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 33%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 38%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="font-size: small; margin-top: 5px;">5% 26% 33% 38%</p>
2	B	326	<div style="display: flex; align-items: center;"> <div style="width: 2%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 61%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 27%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 7%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="font-size: small; margin-top: 5px;">2% 61% 27% 7%</p>
2	E	326	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 58%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 29%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 58% 29% 9%</p>
3	C	324	<div style="display: flex; align-items: center;"> <div style="width: 0%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 61%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 27%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: grey; margin-right: 5px;"></div> </div> <p style="font-size: small; margin-top: 5px;">% 61% 27% 10%</p>

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Mol	Chain	Length	Quality of chain
3	F	324	 % 58% 28% 12%
4	S	4	 75% 25%
4	T	4	 75% 25%
5	I	5	 100%
5	J	5	 60% 40%
6	G	2	 50% 50%

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
6	NAG	G	2	-	-	-	X

2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 10646 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 Fibrinogen alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	67	547	337	103	104	3	0	0	0
1	D	54	441	269	84	85	3	0	0	0

- Molecule 2 is a protein called Fibrinogen beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	303	2429	1515	429	463	22	0	0	0
2	E	296	2378	1484	420	452	22	0	0	0

- Molecule 3 is a protein called Fibrinogen, gamma polypeptide.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	C	292	2343	1485	396	451	11	0	0	0
3	F	285	2287	1453	384	439	11	0	0	0

- Molecule 4 is a protein called Fibrin B knob (tetrapeptide).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
4	S	4	33	19	9	5	0	0	0
4	T	4	33	19	9	5	0	0	0

- Molecule 5 is a protein called Fibrin B knob (pentapeptide).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
5	I	5	Total	C	N	O	0	0	0
			45	28	10	7			
5	J	5	Total	C	N	O	0	0	0
			45	28	10	7			

- Molecule 6 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
6	G	2	Total	C	N	O	0	0	0
			28	16	2	10			

- Molecule 7 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	B	2	Total	Ca	0	0
			2	2		
7	C	2	Total	Ca	0	0
			2	2		
7	E	2	Total	Ca	0	0
			2	2		
7	F	2	Total	Ca	0	0
			2	2		

- Molecule 8 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C₈H₁₅NO₆).

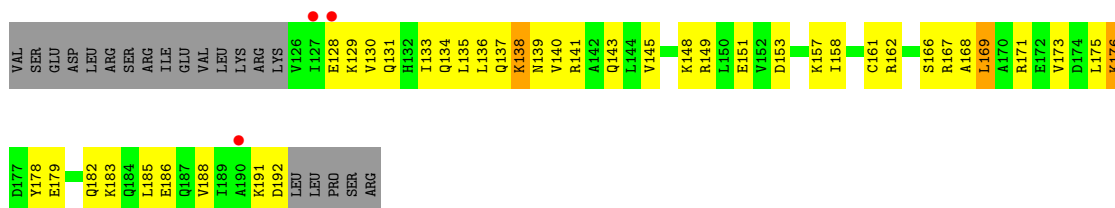


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
8	E	1	14	8	1	5	0	0
8	J	1	15	8	1	6	0	0

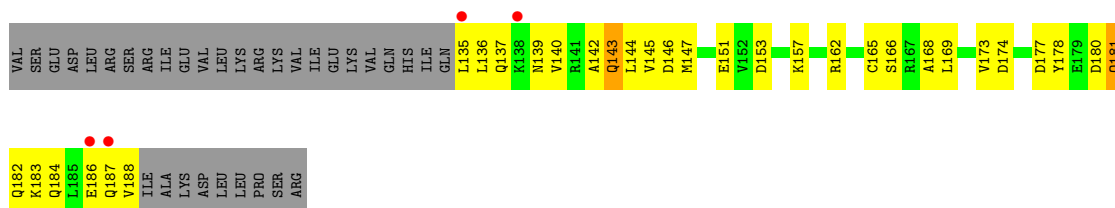
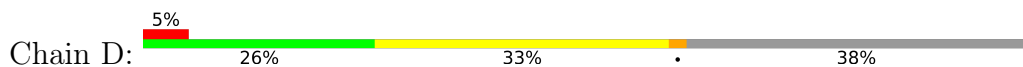
3 Residue-property plots [i](#)

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 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.

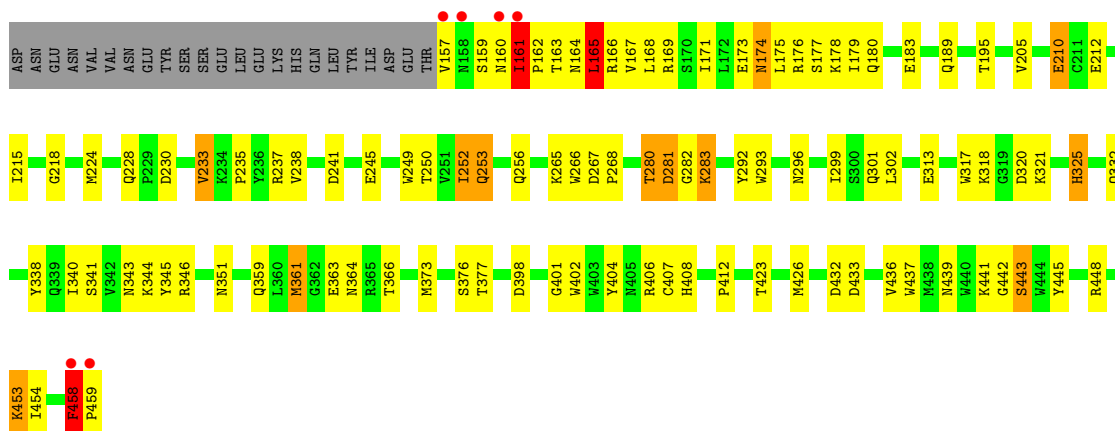
- Molecule 1: Fibrinogen alpha chain



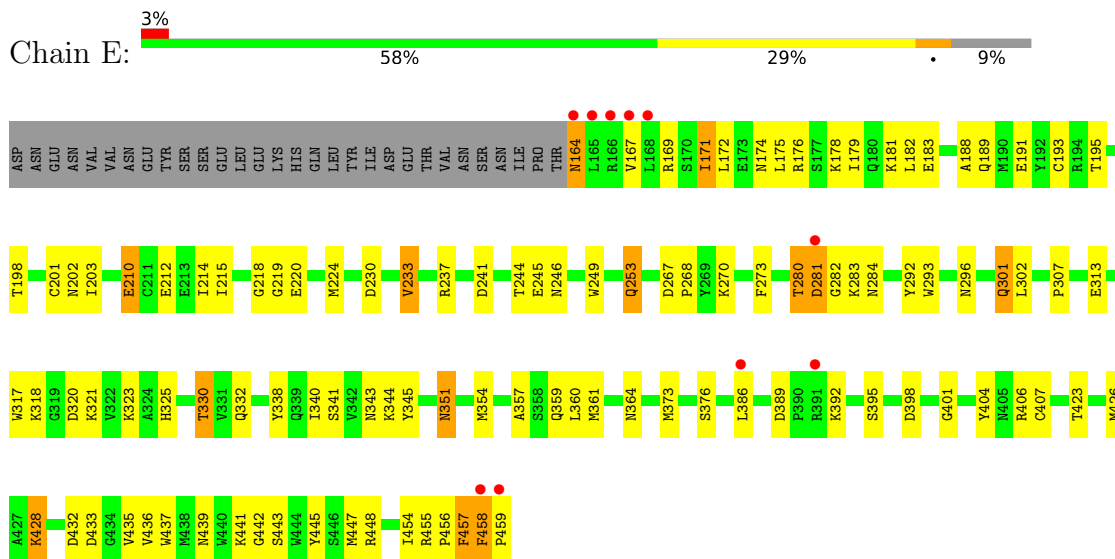
- Molecule 1: Fibrinogen alpha chain



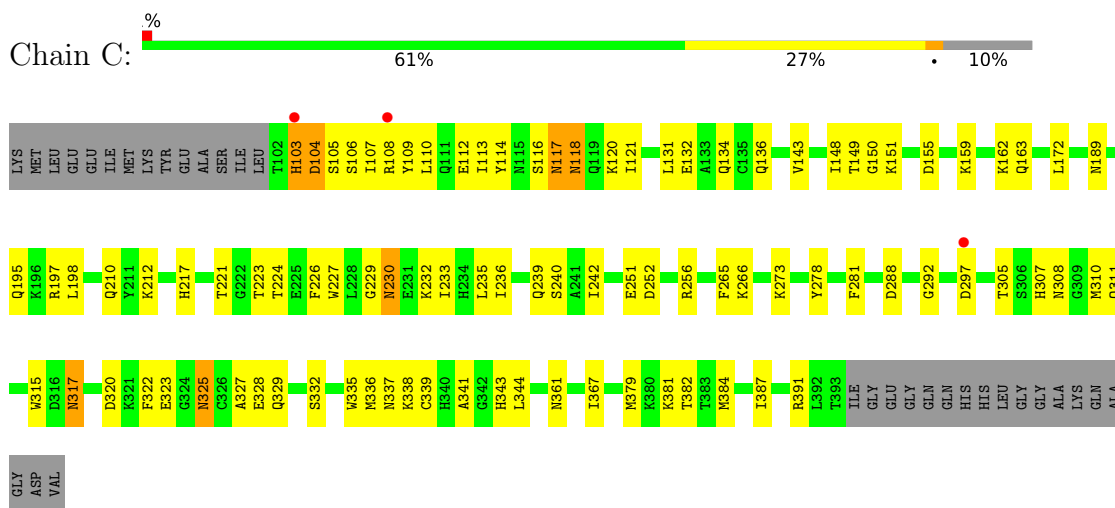
- Molecule 2: Fibrinogen beta chain



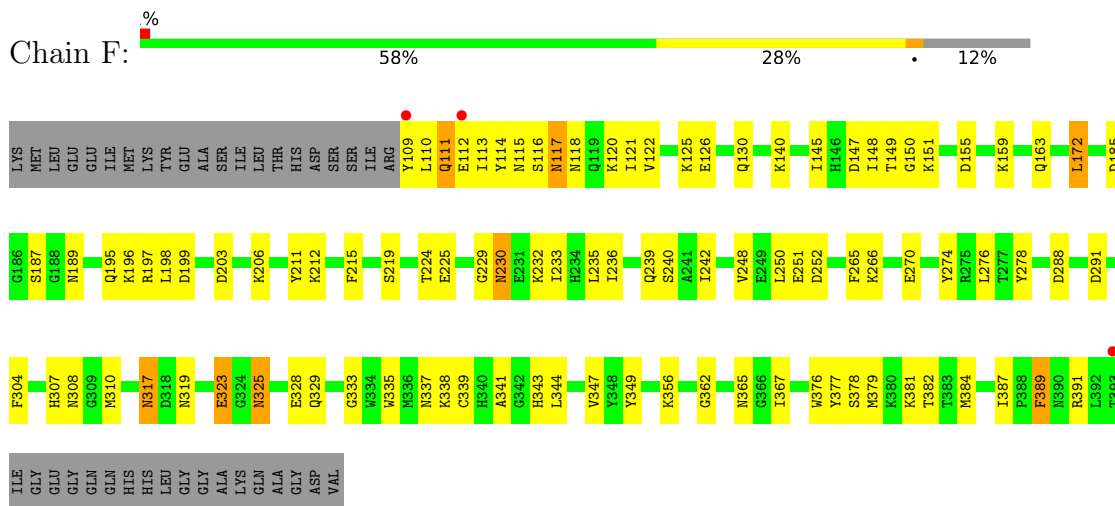
● Molecule 2: Fibrinogen beta chain



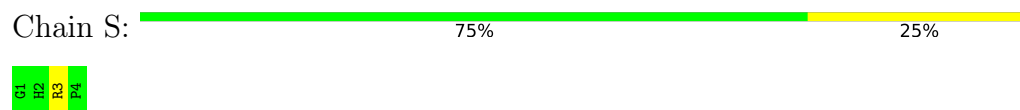
● Molecule 3: Fibrinogen, gamma polypeptide



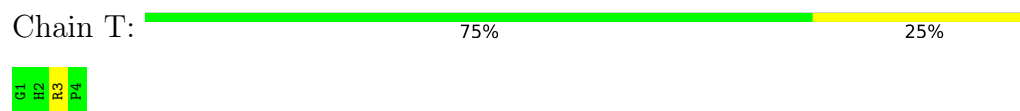
● Molecule 3: Fibrinogen, gamma polypeptide



- Molecule 4: Fibrin B knob (tetrapeptide)



- Molecule 4: Fibrin B knob (tetrapeptide)



- Molecule 5: Fibrin B knob (pentapeptide)



There are no outlier residues recorded for this chain.

- Molecule 5: Fibrin B knob (pentapeptide)



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	54.63Å 148.69Å 232.68Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.70 19.95 – 2.70	Depositor EDS
% Data completeness (in resolution range)	96.9 (30.00-2.70) 96.9 (19.95-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	6.41 (at 2.71Å)	Xtrriage
Refinement program	CNS	Depositor
R, R_{free}	0.216 , 0.275 0.220 , 0.225	Depositor DCC
R_{free} test set	2555 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	40.4	Xtrriage
Anisotropy	0.059	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 47.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	10646	wwPDB-VP
Average B, all atoms (Å ²)	40.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.04% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, CA

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	0.37	0/548	0.57	0/731
1	D	0.35	0/441	0.57	0/587
2	B	0.40	0/2491	0.67	0/3364
2	E	0.39	0/2439	0.65	0/3291
3	C	0.41	0/2408	0.64	0/3257
3	F	0.41	0/2351	0.64	0/3180
4	S	0.54	0/34	0.56	0/43
4	T	0.60	0/34	0.55	0/43
5	I	0.58	0/47	0.51	0/61
5	J	0.48	0/47	0.50	0/61
All	All	0.40	0/10840	0.64	0/14618

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	547	0	573	55	0
1	D	441	0	458	43	0
2	B	2429	0	2295	85	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	E	2378	0	2244	97	0
3	C	2343	0	2188	102	0
3	F	2287	0	2136	89	0
4	S	33	0	32	6	0
4	T	33	0	32	4	0
5	I	45	0	41	0	0
5	J	45	0	41	2	0
6	G	28	0	25	0	0
7	B	2	0	0	0	0
7	C	2	0	0	0	0
7	E	2	0	0	0	0
7	F	2	0	0	0	0
8	E	14	0	13	1	0
8	J	15	0	15	1	0
All	All	10646	0	10093	428	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 21.

All (428) 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:151:LYS:HB3	3:C:239:GLN:HE22	1.21	1.01
3:F:151:LYS:HB3	3:F:239:GLN:HE22	1.32	0.95
3:F:310:MET:SD	3:F:337:ASN:HB2	2.12	0.90
3:C:148:ILE:H	3:C:148:ILE:HD12	1.37	0.89
3:C:105:SER:HA	3:C:108:ARG:CZ	2.02	0.89
2:E:179:ILE:O	2:E:183:GLU:HG3	1.73	0.88
3:C:338:LYS:N	3:C:339:CYS:HA	1.91	0.85
3:F:329:GLN:HE21	4:T:3:ARG:HH11	1.24	0.85
2:B:174:ASN:C	2:B:174:ASN:HD22	1.79	0.84
1:D:151:GLU:HG2	1:D:173:VAL:HG13	1.60	0.84
3:C:162:LYS:HA	3:C:162:LYS:HE2	1.60	0.83
3:F:148:ILE:HD12	3:F:148:ILE:H	1.43	0.82
1:A:138:LYS:HE3	1:A:138:LYS:HA	1.61	0.81
3:C:104:ASP:HA	3:C:107:ILE:HD13	1.62	0.81
3:F:329:GLN:HE22	4:T:3:ARG:HE	1.24	0.81
1:A:169:LEU:H	2:B:189:GLN:HE22	1.29	0.81
3:C:307:HIS:HE1	3:C:341:ALA:H	1.29	0.80
1:A:179:GLU:O	1:A:183:LYS:HB2	1.83	0.79
1:A:188:VAL:O	1:A:191:LYS:HG2	1.82	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:161:ILE:HD13	2:B:161:ILE:H	1.45	0.79
3:F:307:HIS:HE1	3:F:341:ALA:H	1.31	0.78
2:E:458:PHE:H	2:E:459:PRO:HD2	1.49	0.78
1:A:148:LYS:HD2	1:A:182:GLN:HE22	1.50	0.77
2:E:302:LEU:HD13	2:E:454:ILE:HD11	1.64	0.77
2:E:224:MET:HE2	2:E:237:ARG:HD3	1.65	0.76
3:C:273:LYS:NZ	3:C:317:ASN:HD21	1.83	0.76
1:A:169:LEU:H	2:B:189:GLN:NE2	1.84	0.75
1:A:137:GLN:OE1	2:B:165:LEU:HD21	1.87	0.74
1:A:143:GLN:HE21	3:C:118:ASN:ND2	1.85	0.74
2:B:458:PHE:H	2:B:459:PRO:HD2	1.51	0.73
2:B:210:GLU:OE2	2:B:212:GLU:HB3	1.88	0.73
3:C:329:GLN:NE2	4:S:3:ARG:HH11	1.86	0.73
2:B:179:ILE:HD12	3:C:117:ASN:HB2	1.68	0.73
5:J:2:HIS:NE2	5:J:4:PRO:HG3	2.03	0.72
3:F:338:LYS:N	3:F:339:CYS:HA	2.04	0.72
3:C:117:ASN:HA	3:C:120:LYS:HB2	1.71	0.71
1:A:162:ARG:HG2	1:A:168:ALA:HB2	1.71	0.71
3:C:232:LYS:O	3:C:236:ILE:HG13	1.91	0.71
2:E:281:ASP:OD1	2:E:282:GLY:N	2.24	0.71
1:D:140:VAL:C	1:D:142:ALA:H	1.93	0.71
1:D:183:LYS:O	1:D:187:GLN:HG3	1.90	0.70
3:F:172:LEU:HD13	3:F:239:GLN:HE21	1.56	0.70
3:C:104:ASP:C	3:C:106:SER:H	1.95	0.70
1:D:162:ARG:HG2	1:D:162:ARG:HH11	1.56	0.70
1:A:162:ARG:HG2	1:A:168:ALA:CB	2.22	0.70
2:E:172:LEU:HD12	3:F:113:ILE:HG22	1.74	0.69
3:C:163:GLN:CD	3:C:163:GLN:H	1.95	0.69
1:A:129:LYS:N	1:A:131:GLN:HE22	1.92	0.68
2:B:332:GLN:O	2:B:338:TYR:HA	1.91	0.68
2:E:212:GLU:O	2:E:215:ILE:HG22	1.94	0.68
2:E:423:THR:N	2:E:426:MET:HE3	2.08	0.68
2:B:283:LYS:H	2:B:283:LYS:HD2	1.58	0.67
1:D:166:SER:HB3	2:E:195:THR:HG23	1.74	0.67
2:E:267:ASP:HB3	2:E:268:PRO:HD3	1.76	0.67
1:A:166:SER:OG	2:B:195:THR:HG23	1.95	0.67
3:F:172:LEU:HD13	3:F:239:GLN:NE2	2.10	0.67
2:E:171:ILE:O	2:E:175:LEU:HG	1.95	0.66
1:D:143:GLN:O	1:D:143:GLN:HG3	1.93	0.66
3:C:148:ILE:HD12	3:C:148:ILE:N	2.11	0.65
3:C:106:SER:O	3:C:109:TYR:HB2	1.97	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:235:LEU:O	3:F:239:GLN:HB3	1.96	0.65
2:E:179:ILE:HD12	3:F:117:ASN:HB2	1.79	0.65
1:A:128:GLU:C	1:A:131:GLN:HE22	2.00	0.64
2:B:161:ILE:HD13	2:B:161:ILE:N	2.13	0.64
2:E:361:MET:O	2:E:364:ASN:HB2	1.97	0.64
3:F:337:ASN:CG	3:F:337:ASN:O	2.37	0.64
3:F:329:GLN:NE2	4:T:3:ARG:HH11	1.94	0.63
1:D:182:GLN:O	1:D:186:GLU:HB2	1.99	0.63
2:E:218:GLY:O	2:E:220:GLU:HG3	1.98	0.63
2:E:432:ASP:OD1	2:E:443:SER:HB2	1.99	0.63
2:B:174:ASN:C	2:B:174:ASN:ND2	2.52	0.63
2:E:436:VAL:HG12	2:E:437:TRP:N	2.12	0.63
1:A:143:GLN:HE21	3:C:118:ASN:HD22	1.45	0.63
1:D:147:MET:CE	2:E:179:ILE:HG12	2.29	0.62
2:B:252:ILE:HD13	2:B:454:ILE:HG12	1.81	0.62
2:B:161:ILE:N	2:B:162:PRO:CD	2.63	0.62
2:B:176:ARG:O	2:B:180:GLN:HG2	2.00	0.62
1:A:151:GLU:HG3	1:A:173:VAL:HG13	1.80	0.62
2:B:281:ASP:OD1	2:B:282:GLY:N	2.31	0.62
2:B:165:LEU:HD23	2:B:165:LEU:O	2.00	0.62
3:C:307:HIS:CE1	3:C:341:ALA:H	2.16	0.62
1:D:181:GLN:HG3	2:E:171:ILE:HG12	1.80	0.62
2:E:178:LYS:O	2:E:181:LYS:HB3	2.00	0.62
2:E:307:PRO:HG2	2:E:459:PRO:HG2	1.82	0.61
3:F:323:GLU:H	3:F:323:GLU:CD	2.04	0.61
3:F:344:LEU:HA	3:F:367:ILE:HG23	1.81	0.61
3:C:104:ASP:CA	3:C:107:ILE:HD13	2.28	0.61
3:C:278:TYR:CE2	3:C:308:ASN:HB2	2.35	0.61
3:C:212:LYS:HA	3:C:230:ASN:HB2	1.82	0.61
3:C:217:HIS:O	3:C:224:THR:HG23	2.00	0.61
3:F:111:GLN:O	3:F:115:ASN:ND2	2.34	0.61
3:F:219:SER:OG	3:F:224:THR:HG22	2.01	0.61
2:E:317:TRP:CE3	2:E:448:ARG:HD3	2.36	0.60
3:F:356:LYS:HB3	3:F:376:TRP:CH2	2.35	0.60
3:C:109:TYR:O	3:C:112:GLU:HB2	2.02	0.60
3:C:104:ASP:C	3:C:106:SER:N	2.55	0.60
3:C:325:ASN:CG	3:C:328:GLU:HB2	2.22	0.60
1:D:135:LEU:HA	1:D:137:GLN:OE1	2.02	0.60
1:D:162:ARG:HG2	1:D:162:ARG:NH1	2.16	0.59
1:D:180:ASP:HA	1:D:183:LYS:HG3	1.83	0.59
2:E:167:VAL:C	2:E:169:ARG:H	2.06	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:230:ASP:HB3	2:B:233:VAL:CG1	2.33	0.59
1:A:137:GLN:HA	1:A:140:VAL:HG22	1.85	0.58
3:C:273:LYS:HZ2	3:C:317:ASN:HD21	1.48	0.58
2:E:224:MET:CE	2:E:237:ARG:HD3	2.31	0.58
1:A:139:ASN:HB3	3:C:114:TYR:CE2	2.39	0.58
2:E:439:ASN:HD22	2:E:439:ASN:H	1.50	0.58
3:F:329:GLN:NE2	4:T:3:ARG:HE	1.99	0.58
3:F:185:ASP:OD1	3:F:187:SER:HB2	2.03	0.58
3:C:105:SER:HA	3:C:108:ARG:NH2	2.18	0.58
3:C:195:GLN:OE1	3:C:382:THR:HG22	2.03	0.58
1:A:169:LEU:N	2:B:189:GLN:HE22	1.98	0.57
3:C:338:LYS:O	3:C:338:LYS:HG2	2.03	0.57
2:E:210:GLU:O	2:E:214:ILE:HG13	2.05	0.57
2:B:318:LYS:HE3	2:B:320:ASP:OD1	2.03	0.57
1:D:180:ASP:HA	1:D:183:LYS:CG	2.34	0.57
2:E:436:VAL:CG1	2:E:437:TRP:N	2.67	0.57
3:F:212:LYS:HA	3:F:230:ASN:HB2	1.86	0.57
1:A:153:ASP:O	1:A:157:LYS:HG2	2.05	0.57
2:B:313:GLU:OE1	2:B:453:LYS:HE2	2.04	0.57
3:F:109:TYR:HB3	3:F:112:GLU:OE2	2.04	0.57
2:B:359:GLN:NE2	2:B:442:GLY:HA2	2.19	0.57
1:D:169:LEU:H	2:E:189:GLN:HE22	1.53	0.57
2:B:266:TRP:HA	2:B:377:THR:HG21	1.86	0.57
2:E:441:LYS:HD3	2:E:445:TYR:CD1	2.39	0.57
3:C:148:ILE:H	3:C:148:ILE:CD1	2.14	0.57
1:A:145:VAL:HG12	1:A:149:ARG:NH1	2.20	0.56
1:D:147:MET:SD	3:F:121:ILE:HD11	2.45	0.56
1:A:169:LEU:HD23	1:A:171:ARG:HD2	1.86	0.56
1:A:135:LEU:HD13	1:A:139:ASN:ND2	2.20	0.56
3:C:265:PHE:O	3:C:266:LYS:HG3	2.05	0.56
2:E:323:LYS:NZ	2:E:325:HIS:HD2	2.03	0.56
2:B:252:ILE:CD1	2:B:454:ILE:HG12	2.36	0.56
1:D:139:ASN:HB2	3:F:114:TYR:OH	2.04	0.56
1:A:158:ILE:O	1:A:161:CYS:HB2	2.06	0.56
2:B:165:LEU:O	2:B:168:LEU:HD13	2.05	0.56
3:C:151:LYS:HB3	3:C:239:GLN:NE2	2.04	0.56
3:F:151:LYS:HB3	3:F:239:GLN:NE2	2.13	0.56
1:A:167:ARG:HG2	1:A:167:ARG:HH11	1.71	0.55
2:E:332:GLN:O	2:E:338:TYR:HA	2.06	0.55
1:A:148:LYS:HZ2	1:A:179:GLU:HG2	1.72	0.55
2:E:398:ASP:HA	2:E:433:ASP:HB3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:406:ARG:O	2:E:406:ARG:HG2	2.07	0.55
1:A:138:LYS:HE2	1:A:141:ARG:HD3	1.89	0.55
3:C:315:TRP:HB2	3:C:328:GLU:HG2	1.87	0.55
2:E:245:GLU:O	2:E:246:ASN:HB2	2.07	0.55
2:B:179:ILE:O	2:B:183:GLU:HG3	2.06	0.55
3:C:172:LEU:HD13	3:C:239:GLN:HE21	1.72	0.55
2:B:164:ASN:C	2:B:166:ARG:H	2.08	0.55
3:C:292:GLY:HA2	3:C:305:THR:O	2.07	0.55
3:F:155:ASP:O	3:F:159:LYS:HG3	2.07	0.55
3:C:151:LYS:HE3	3:C:172:LEU:HD11	1.89	0.55
3:C:195:GLN:HB3	3:C:384:MET:HB2	1.89	0.55
2:E:176:ARG:HG3	3:F:120:LYS:HZ3	1.72	0.55
3:F:199:ASP:O	3:F:225:GLU:OE2	2.24	0.55
3:F:211:TYR:CE1	3:F:333:GLY:HA3	2.41	0.55
2:B:359:GLN:HE22	2:B:442:GLY:HA2	1.72	0.54
3:F:121:ILE:O	3:F:125:LYS:HG2	2.07	0.54
1:D:169:LEU:H	2:E:189:GLN:NE2	2.04	0.54
3:C:117:ASN:O	3:C:121:ILE:HG13	2.07	0.54
3:F:195:GLN:HB3	3:F:384:MET:HB2	1.89	0.54
3:F:251:GLU:HB3	3:F:381:LYS:HB2	1.90	0.54
1:A:188:VAL:HG13	2:B:165:LEU:HG	1.90	0.54
2:E:359:GLN:NE2	2:E:442:GLY:HA2	2.23	0.54
2:B:280:THR:O	2:B:281:ASP:C	2.45	0.54
1:D:147:MET:HE1	2:E:179:ILE:HG12	1.89	0.54
3:F:265:PHE:O	3:F:266:LYS:HG3	2.08	0.54
2:B:159:SER:HA	2:B:162:PRO:HG3	1.89	0.54
2:E:230:ASP:HB3	2:E:233:VAL:CG1	2.38	0.54
3:F:307:HIS:CE1	3:F:341:ALA:H	2.18	0.53
2:B:171:ILE:O	2:B:175:LEU:HG	2.08	0.53
2:B:363:GLU:HA	2:B:366:THR:OG1	2.08	0.53
3:F:117:ASN:C	3:F:117:ASN:HD22	2.10	0.53
3:F:196:LYS:O	3:F:197:ARG:HD2	2.07	0.53
3:F:189:ASN:OD1	3:F:391:ARG:HG3	2.08	0.53
1:A:179:GLU:HA	1:A:182:GLN:HG2	1.91	0.53
3:C:104:ASP:CB	3:C:107:ILE:HD13	2.38	0.53
2:E:340:ILE:HG12	2:E:341:SER:N	2.23	0.53
3:C:149:THR:HG22	3:C:150:GLY:N	2.23	0.53
3:C:240:SER:OG	3:C:242:ILE:HG12	2.09	0.53
3:F:113:ILE:HA	3:F:116:SER:OG	2.09	0.53
3:F:197:ARG:HB2	3:F:382:THR:HB	1.90	0.53
2:B:283:LYS:H	2:B:283:LYS:CD	2.20	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:423:THR:HG23	2:B:426:MET:HE3	1.91	0.53
1:D:140:VAL:C	1:D:142:ALA:N	2.62	0.53
2:B:169:ARG:O	2:B:173:GLU:HG3	2.10	0.52
2:B:406:ARG:O	2:B:406:ARG:HG2	2.08	0.52
2:E:389:ASP:OD1	2:E:392:LYS:HE2	2.09	0.52
3:F:122:VAL:O	3:F:126:GLU:HG3	2.09	0.52
3:F:307:HIS:HD2	3:F:335:TRP:O	1.92	0.52
2:B:212:GLU:O	2:B:215:ILE:HG22	2.10	0.52
2:E:359:GLN:HE22	2:E:442:GLY:HA2	1.75	0.52
1:D:177:ASP:O	1:D:181:GLN:HB2	2.10	0.52
2:E:455:ARG:HG3	2:E:456:PRO:HD2	1.93	0.51
3:F:172:LEU:CD2	3:F:240:SER:HB3	2.40	0.51
3:F:232:LYS:O	3:F:236:ILE:HG13	2.08	0.51
3:C:310:MET:SD	3:C:337:ASN:HB2	2.49	0.51
3:C:344:LEU:HA	3:C:367:ILE:HG23	1.93	0.51
3:C:189:ASN:OD1	3:C:391:ARG:HG3	2.10	0.51
3:C:197:ARG:HB2	3:C:382:THR:HB	1.92	0.51
1:D:142:ALA:HA	1:D:145:VAL:HG12	1.91	0.51
2:E:351:ASN:ND2	2:E:354:MET:H	2.09	0.51
3:F:278:TYR:CE2	3:F:308:ASN:HB2	2.45	0.51
1:A:133:ILE:HD11	3:C:107:ILE:HG12	1.93	0.51
3:C:329:GLN:HE21	4:S:3:ARG:HH11	1.56	0.51
2:E:198:THR:HG22	3:F:140:LYS:HB3	1.93	0.51
3:F:387:ILE:HD11	3:F:391:ARG:HG2	1.93	0.51
3:C:387:ILE:HD11	3:C:391:ARG:HG2	1.93	0.51
1:D:166:SER:CB	2:E:195:THR:HG23	2.41	0.51
1:A:179:GLU:O	1:A:183:LYS:HE3	2.10	0.51
2:B:224:MET:HE2	2:B:237:ARG:HD3	1.93	0.51
2:E:343:ASN:OD1	2:E:344:LYS:HG3	2.11	0.51
3:F:148:ILE:H	3:F:148:ILE:CD1	2.19	0.51
3:C:337:ASN:O	3:C:337:ASN:CG	2.50	0.50
2:E:230:ASP:HB3	2:E:233:VAL:HG12	1.92	0.50
3:F:242:ILE:O	3:F:242:ILE:HG13	2.11	0.50
2:B:432:ASP:CB	2:B:443:SER:HB2	2.41	0.50
3:C:113:ILE:HA	3:C:116:SER:HB3	1.92	0.50
3:C:310:MET:HG3	3:C:337:ASN:HB2	1.93	0.50
3:C:278:TYR:CZ	3:C:308:ASN:HB2	2.47	0.50
2:E:176:ARG:HG3	3:F:120:LYS:NZ	2.26	0.50
1:D:140:VAL:N	3:F:114:TYR:OH	2.45	0.50
3:C:251:GLU:HB3	3:C:381:LYS:HB2	1.94	0.49
2:E:373:MET:HE2	2:E:404:TYR:O	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:181:GLN:NE2	2:E:174:ASN:ND2	2.60	0.49
2:B:210:GLU:OE2	2:B:212:GLU:N	2.46	0.49
1:D:140:VAL:HG13	3:F:114:TYR:OH	2.11	0.49
2:E:210:GLU:OE2	2:E:212:GLU:HB3	2.12	0.49
3:C:221:THR:O	3:C:223:THR:HG23	2.13	0.49
2:E:357:ALA:HB3	2:E:360:LEU:HD12	1.93	0.49
1:D:139:ASN:C	3:F:114:TYR:OH	2.51	0.49
1:D:165:CYS:HB3	2:E:193:CYS:HA	1.94	0.49
2:B:317:TRP:CE3	2:B:448:ARG:HD3	2.47	0.49
3:F:163:GLN:CD	3:F:163:GLN:H	2.16	0.49
1:D:147:MET:HE2	2:E:179:ILE:HG12	1.91	0.49
3:C:227:TRP:HZ2	3:C:230:ASN:HD21	1.59	0.49
2:E:351:ASN:C	2:E:351:ASN:HD22	2.15	0.49
2:E:423:THR:H	2:E:426:MET:HE3	1.77	0.49
8:E:501:NAG:O4	8:J:101:NAG:H82	2.12	0.49
3:F:250:LEU:HD22	3:F:379:MET:HG3	1.95	0.49
3:F:325:ASN:OD1	3:F:328:GLU:HB2	2.12	0.49
2:B:218:GLY:HA3	3:C:210:GLN:HG2	1.95	0.48
2:B:325:HIS:O	2:B:345:TYR:HA	2.13	0.48
2:B:157:VAL:HG22	2:B:157:VAL:O	2.13	0.48
1:A:140:VAL:HG23	1:A:141:ARG:N	2.28	0.48
3:C:281:PHE:CD2	3:C:288:ASP:HB2	2.49	0.48
2:E:340:ILE:CG1	2:E:341:SER:N	2.76	0.48
3:F:149:THR:HG22	3:F:150:GLY:N	2.29	0.48
1:A:151:GLU:CG	1:A:173:VAL:HG13	2.43	0.48
2:B:169:ARG:HG2	2:B:173:GLU:OE1	2.14	0.48
2:B:441:LYS:HD3	2:B:445:TYR:CD1	2.49	0.48
3:C:105:SER:HA	3:C:108:ARG:NE	2.28	0.48
3:C:307:HIS:HD2	3:C:335:TRP:O	1.96	0.48
3:C:338:LYS:HE2	4:S:3:ARG:O	2.14	0.48
2:E:188:ALA:O	2:E:191:GLU:HB3	2.13	0.48
2:E:457:PHE:HD2	2:E:459:PRO:CD	2.27	0.48
3:F:151:LYS:HD3	3:F:172:LEU:HD11	1.95	0.48
1:A:148:LYS:CD	1:A:182:GLN:HE22	2.25	0.48
3:F:195:GLN:OE1	3:F:382:THR:HG22	2.14	0.48
3:C:104:ASP:OD1	3:C:108:ARG:NH2	2.47	0.48
3:C:367:ILE:O	3:C:379:MET:HG2	2.14	0.48
1:D:151:GLU:OE1	2:E:182:LEU:HD21	2.14	0.48
2:E:457:PHE:HD2	2:E:459:PRO:HD2	1.79	0.48
3:F:116:SER:O	3:F:120:LYS:HG3	2.13	0.48
1:D:153:ASP:O	1:D:157:LYS:HG2	2.14	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:111:GLN:CD	3:F:111:GLN:H	2.17	0.47
2:B:398:ASP:HA	2:B:433:ASP:HB3	1.95	0.47
2:B:161:ILE:N	2:B:162:PRO:HD2	2.30	0.47
2:B:224:MET:CE	2:B:237:ARG:HD3	2.43	0.47
1:A:140:VAL:HG23	1:A:185:LEU:HD21	1.96	0.47
2:B:343:ASN:OD1	2:B:344:LYS:HG3	2.15	0.47
1:D:142:ALA:O	1:D:145:VAL:HG12	2.14	0.47
2:B:302:LEU:HD13	2:B:454:ILE:HD11	1.95	0.47
3:F:252:ASP:HB2	3:F:377:TYR:OH	2.13	0.47
3:C:327:ALA:HB1	3:C:332:SER:O	2.15	0.47
2:E:230:ASP:O	2:E:233:VAL:HG13	2.14	0.47
3:F:288:ASP:OD2	3:F:291:ASP:HB2	2.14	0.47
2:B:174:ASN:ND2	2:B:178:LYS:HG2	2.30	0.47
3:F:248:VAL:HG13	3:F:344:LEU:HD11	1.97	0.47
3:F:338:LYS:O	3:F:338:LYS:HG2	2.15	0.47
2:E:171:ILE:O	2:E:171:ILE:HD13	2.14	0.46
2:E:174:ASN:O	2:E:178:LYS:HG2	2.15	0.46
1:A:175:LEU:O	1:A:179:GLU:HG3	2.15	0.46
3:F:349:TYR:HB2	3:F:378:SER:HB3	1.98	0.46
1:A:138:LYS:HA	1:A:138:LYS:CE	2.40	0.46
3:C:217:HIS:O	3:C:224:THR:CG2	2.63	0.46
3:C:242:ILE:HG13	3:C:242:ILE:O	2.16	0.46
2:E:280:THR:O	2:E:281:ASP:C	2.54	0.46
3:F:203:ASP:O	3:F:206:LYS:HE2	2.15	0.46
2:B:406:ARG:N	2:B:407:CYS:HA	2.31	0.46
2:E:241:ASP:HB3	2:E:249:TRP:HB2	1.96	0.46
3:C:108:ARG:HG2	3:C:109:TYR:N	2.31	0.46
2:B:361:MET:O	2:B:364:ASN:HB2	2.15	0.46
2:E:201:CYS:CB	2:E:224:MET:HE3	2.46	0.46
3:C:103:HIS:ND1	3:C:103:HIS:C	2.69	0.46
2:B:179:ILE:CD1	3:C:117:ASN:HB2	2.42	0.45
2:E:293:TRP:HZ2	2:E:296:ASN:HD21	1.63	0.45
2:B:238:VAL:HG21	2:B:250:THR:CG2	2.46	0.45
2:E:351:ASN:HD21	2:E:354:MET:H	1.65	0.45
2:E:395:SER:HA	2:E:404:TYR:CE2	2.51	0.45
3:C:117:ASN:HD22	3:C:118:ASN:N	2.13	0.45
3:C:325:ASN:OD1	3:C:328:GLU:HB2	2.16	0.45
1:D:174:ASP:O	1:D:178:TYR:HD1	1.99	0.45
2:E:458:PHE:H	2:E:459:PRO:CD	2.23	0.45
1:A:129:LYS:O	1:A:133:ILE:HD13	2.16	0.45
3:C:108:ARG:HG2	3:C:109:TYR:H	1.82	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:282:GLY:O	2:B:283:LYS:O	2.35	0.45
1:D:147:MET:HB3	1:D:178:TYR:HE2	1.82	0.45
1:A:143:GLN:NE2	3:C:118:ASN:HD22	2.12	0.45
2:B:345:TYR:CG	2:B:346:ARG:N	2.84	0.45
3:F:230:ASN:HD22	3:F:230:ASN:HA	1.63	0.45
3:C:252:ASP:OD2	3:C:256:ARG:HB2	2.17	0.44
3:C:329:GLN:NE2	4:S:3:ARG:NH1	2.62	0.44
3:F:163:GLN:H	3:F:163:GLN:NE2	2.15	0.44
1:A:141:ARG:HB3	1:A:185:LEU:CD2	2.46	0.44
1:A:186:GLU:HA	1:A:186:GLU:OE2	2.16	0.44
3:C:273:LYS:HB2	3:C:311:GLN:HB3	2.00	0.44
1:D:168:ALA:HA	2:E:189:GLN:HE22	1.81	0.44
3:F:304:PHE:O	3:F:337:ASN:O	2.34	0.44
1:D:181:GLN:CG	2:E:171:ILE:HG12	2.46	0.44
3:F:349:TYR:HB2	3:F:378:SER:CB	2.47	0.44
5:J:2:HIS:CD2	5:J:4:PRO:HG3	2.52	0.44
3:C:329:GLN:HE21	4:S:3:ARG:NH1	2.15	0.44
1:D:181:GLN:HE22	2:E:174:ASN:ND2	2.15	0.44
3:F:356:LYS:HE2	3:F:362:GLY:O	2.17	0.44
2:B:340:ILE:HG12	2:B:341:SER:N	2.32	0.44
1:A:129:LYS:CA	1:A:131:GLN:HE22	2.31	0.43
2:B:253:GLN:HA	2:B:292:TYR:O	2.18	0.43
3:C:227:TRP:HZ2	3:C:230:ASN:ND2	2.15	0.43
3:F:270:GLU:HB2	3:F:274:TYR:CZ	2.53	0.43
3:C:151:LYS:CE	3:C:172:LEU:HD11	2.48	0.43
3:C:329:GLN:O	3:C:361:ASN:ND2	2.52	0.43
2:E:175:LEU:O	2:E:179:ILE:HG13	2.18	0.43
1:A:178:TYR:O	1:A:182:GLN:HG2	2.18	0.43
3:C:197:ARG:O	3:C:381:LYS:HA	2.18	0.43
2:E:406:ARG:N	2:E:407:CYS:HA	2.32	0.43
1:A:143:GLN:HE22	3:C:117:ASN:HD21	1.66	0.43
3:C:108:ARG:O	3:C:112:GLU:HG3	2.19	0.43
3:C:155:ASP:O	3:C:159:LYS:HG3	2.18	0.43
3:C:229:GLY:O	3:C:233:ILE:HG13	2.19	0.43
3:C:162:LYS:HE2	3:C:162:LYS:CA	2.37	0.43
1:A:135:LEU:O	1:A:138:LYS:HB3	2.19	0.43
2:B:174:ASN:O	2:B:177:SER:HB3	2.18	0.43
2:B:436:VAL:CG1	2:B:437:TRP:N	2.82	0.43
1:A:143:GLN:NE2	3:C:117:ASN:ND2	2.67	0.43
2:E:164:ASN:C	2:E:164:ASN:HD22	2.21	0.43
2:B:267:ASP:HB3	2:B:268:PRO:HD3	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:373:MET:HE2	2:B:404:TYR:O	2.18	0.43
3:F:113:ILE:O	3:F:117:ASN:ND2	2.52	0.43
3:C:117:ASN:HD22	3:C:117:ASN:C	2.21	0.42
3:C:273:LYS:HZ3	3:C:317:ASN:HD21	1.61	0.42
2:E:203:ILE:CD1	3:F:145:ILE:HD11	2.49	0.42
2:E:330:THR:CG2	2:E:332:GLN:NE2	2.82	0.42
1:A:143:GLN:HE22	3:C:117:ASN:ND2	2.16	0.42
2:B:161:ILE:N	2:B:161:ILE:CD1	2.81	0.42
2:B:230:ASP:HB3	2:B:233:VAL:HG12	2.00	0.42
2:B:252:ILE:HG13	2:B:299:ILE:HG12	2.01	0.42
2:E:244:THR:HG21	2:E:313:GLU:OE1	2.18	0.42
2:E:273:PHE:O	2:E:292:TYR:HB2	2.19	0.42
3:F:391:ARG:HA	3:F:391:ARG:HD2	1.82	0.42
1:A:128:GLU:C	1:A:131:GLN:NE2	2.71	0.42
2:B:162:PRO:C	2:B:164:ASN:N	2.73	0.42
2:B:458:PHE:H	2:B:459:PRO:CD	2.24	0.42
3:F:163:GLN:CD	3:F:163:GLN:N	2.72	0.42
3:F:343:HIS:O	3:F:367:ILE:HA	2.20	0.42
3:C:235:LEU:O	3:C:239:GLN:HB3	2.19	0.42
1:A:188:VAL:HG21	2:B:167:VAL:HG11	2.01	0.42
3:C:281:PHE:CG	3:C:288:ASP:HB2	2.54	0.42
3:C:343:HIS:O	3:C:367:ILE:HA	2.20	0.42
2:E:439:ASN:H	2:E:439:ASN:ND2	2.15	0.42
1:A:141:ARG:HB3	1:A:185:LEU:HD21	2.00	0.42
2:B:241:ASP:HB3	2:B:249:TRP:HB2	2.01	0.42
3:C:103:HIS:HE1	3:C:106:SER:OG	2.03	0.42
1:D:136:LEU:HA	1:D:139:ASN:HD22	1.84	0.42
2:E:376:SER:O	2:E:401:GLY:HA2	2.20	0.42
3:F:317:ASN:ND2	3:F:319:ASN:OD1	2.53	0.42
3:C:131:LEU:O	3:C:134:GLN:HB2	2.19	0.42
2:E:202:ASN:ND2	2:E:284:ASN:O	2.52	0.42
3:F:126:GLU:O	3:F:130:GLN:HG3	2.20	0.42
2:B:205:VAL:HG21	3:C:226:PHE:HB2	2.02	0.42
2:B:402:TRP:CZ2	2:B:412:PRO:HD2	2.54	0.42
3:C:322:PHE:CZ	4:S:3:ARG:HG2	2.55	0.42
2:E:302:LEU:CD1	2:E:454:ILE:HD11	2.42	0.41
1:A:137:GLN:O	1:A:140:VAL:HG22	2.20	0.41
2:B:439:ASN:H	2:B:439:ASN:HD22	1.66	0.41
3:C:132:GLU:O	3:C:136:GLN:HG2	2.19	0.41
1:D:139:ASN:CB	3:F:114:TYR:OH	2.68	0.41
1:D:143:GLN:HE21	1:D:143:GLN:HB2	1.62	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:253:GLN:HA	2:E:292:TYR:O	2.20	0.41
2:E:318:LYS:CE	2:E:320:ASP:OD1	2.68	0.41
2:E:428:LYS:HB2	2:E:428:LYS:NZ	2.34	0.41
3:F:185:ASP:C	3:F:185:ASP:OD2	2.58	0.41
3:F:265:PHE:HE1	3:F:276:LEU:CD1	2.33	0.41
1:A:130:VAL:O	1:A:134:GLN:HG2	2.20	0.41
2:B:458:PHE:N	2:B:459:PRO:HD2	2.25	0.41
3:C:104:ASP:HB2	3:C:107:ILE:HD13	2.03	0.41
3:C:320:ASP:HB3	3:C:336:MET:HB2	2.02	0.41
1:D:144:LEU:HD22	1:D:182:GLN:OE1	2.21	0.41
1:D:184:GLN:O	1:D:188:VAL:HG23	2.21	0.41
3:C:110:LEU:HD12	3:C:110:LEU:N	2.35	0.41
1:A:129:LYS:N	1:A:131:GLN:NE2	2.65	0.41
2:B:376:SER:O	2:B:401:GLY:HA2	2.21	0.41
1:D:142:ALA:O	1:D:146:ASP:N	2.41	0.41
2:E:325:HIS:O	2:E:345:TYR:HA	2.21	0.41
3:F:229:GLY:O	3:F:233:ILE:HG13	2.21	0.41
1:D:147:MET:HE2	2:E:179:ILE:CG1	2.51	0.41
1:A:145:VAL:CG1	1:A:149:ARG:NH1	2.84	0.41
2:B:161:ILE:O	2:B:165:LEU:N	2.52	0.41
2:E:164:ASN:C	2:E:164:ASN:ND2	2.74	0.41
2:E:171:ILE:HD13	2:E:175:LEU:HG	2.02	0.41
2:E:435:VAL:O	2:E:447:MET:HG2	2.21	0.41
3:F:206:LYS:HG3	3:F:215:PHE:CE2	2.56	0.41
3:F:347:VAL:HG21	3:F:365:ASN:ND2	2.36	0.41
3:F:389:PHE:C	3:F:391:ARG:H	2.24	0.41
3:F:323:GLU:CD	3:F:323:GLU:N	2.73	0.41
2:E:301:GLN:HE21	2:E:301:GLN:HB3	1.75	0.40
2:E:343:ASN:OD1	2:E:343:ASN:C	2.60	0.40
2:E:171:ILE:HG23	2:E:172:LEU:HD22	2.03	0.40
1:A:131:GLN:H	1:A:131:GLN:CD	2.24	0.40
1:A:176:LYS:HB2	1:A:176:LYS:NZ	2.37	0.40
2:B:164:ASN:C	2:B:166:ARG:N	2.75	0.40
2:B:293:TRP:HE1	2:B:296:ASN:ND2	2.20	0.40
2:E:267:ASP:O	2:E:270:LYS:HB3	2.21	0.40
2:B:228:GLN:CD	2:B:235:PRO:HG3	2.42	0.40
2:B:265:LYS:C	2:B:268:PRO:HD2	2.42	0.40
2:B:281:ASP:OD1	2:B:283:LYS:HD3	2.22	0.40
2:B:408:HIS:CD2	2:B:408:HIS:C	2.95	0.40
3:F:117:ASN:HD22	3:F:118:ASN:N	2.19	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	65/87 (75%)	59 (91%)	6 (9%)	0	100	100
1	D	52/87 (60%)	47 (90%)	5 (10%)	0	100	100
2	B	301/326 (92%)	270 (90%)	24 (8%)	7 (2%)	6	16
2	E	294/326 (90%)	267 (91%)	21 (7%)	6 (2%)	7	19
3	C	290/324 (90%)	267 (92%)	20 (7%)	3 (1%)	15	37
3	F	283/324 (87%)	255 (90%)	26 (9%)	2 (1%)	22	46
4	S	2/4 (50%)	2 (100%)	0	0	100	100
4	T	2/4 (50%)	2 (100%)	0	0	100	100
5	I	3/5 (60%)	3 (100%)	0	0	100	100
5	J	3/5 (60%)	3 (100%)	0	0	100	100
All	All	1295/1492 (87%)	1175 (91%)	102 (8%)	18 (1%)	11	28

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	281	ASP
2	B	283	LYS
2	B	458	PHE
3	C	104	ASP
3	C	297	ASP
2	E	283	LYS
2	E	458	PHE
3	F	110	LEU
2	E	219	GLY
2	E	281	ASP
2	B	165	LEU
2	B	256	GLN
2	E	386	LEU
2	E	457	PHE

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Mol	Chain	Res	Type
3	F	111	GLN
2	B	245	GLU
3	C	103	HIS
2	B	161	ILE

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	62/82 (76%)	57 (92%)	5 (8%)	11	27
1	D	50/82 (61%)	48 (96%)	2 (4%)	31	60
2	B	261/284 (92%)	243 (93%)	18 (7%)	15	35
2	E	254/284 (89%)	243 (96%)	11 (4%)	29	57
3	C	246/270 (91%)	238 (97%)	8 (3%)	38	67
3	F	239/270 (88%)	230 (96%)	9 (4%)	33	62
4	S	3/3 (100%)	3 (100%)	0	100	100
4	T	3/3 (100%)	3 (100%)	0	100	100
5	I	4/4 (100%)	4 (100%)	0	100	100
5	J	4/4 (100%)	4 (100%)	0	100	100
All	All	1126/1286 (88%)	1073 (95%)	53 (5%)	26	54

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	136	LEU
1	A	138	LYS
1	A	169	LEU
1	A	176	LYS
1	A	192	ASP
2	B	160	ASN
2	B	161	ILE
2	B	163	THR
2	B	165	LEU

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Mol	Chain	Res	Type
2	B	174	ASN
2	B	210	GLU
2	B	233	VAL
2	B	252	ILE
2	B	253	GLN
2	B	280	THR
2	B	301	GLN
2	B	321	LYS
2	B	325	HIS
2	B	351	ASN
2	B	361	MET
2	B	443	SER
2	B	453	LYS
2	B	458	PHE
3	C	117	ASN
3	C	118	ASN
3	C	143	VAL
3	C	198	LEU
3	C	230	ASN
3	C	317	ASN
3	C	323	GLU
3	C	325	ASN
1	D	143	GLN
1	D	181	GLN
2	E	164	ASN
2	E	171	ILE
2	E	210	GLU
2	E	233	VAL
2	E	253	GLN
2	E	280	THR
2	E	301	GLN
2	E	321	LYS
2	E	330	THR
2	E	351	ASN
2	E	428	LYS
3	F	117	ASN
3	F	147	ASP
3	F	172	LEU
3	F	198	LEU
3	F	230	ASN
3	F	317	ASN
3	F	323	GLU

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Mol	Chain	Res	Type
3	F	325	ASN
3	F	389	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (64) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	131	GLN
1	A	132	HIS
1	A	134	GLN
1	A	139	ASN
1	A	181	GLN
1	A	182	GLN
1	A	184	GLN
2	B	174	ASN
2	B	189	GLN
2	B	253	GLN
2	B	256	GLN
2	B	296	ASN
2	B	301	GLN
2	B	339	GLN
2	B	351	ASN
2	B	408	HIS
2	B	439	ASN
3	C	103	HIS
3	C	111	GLN
3	C	117	ASN
3	C	118	ASN
3	C	123	ASN
3	C	130	GLN
3	C	136	GLN
3	C	177	GLN
3	C	230	ASN
3	C	239	GLN
3	C	307	HIS
3	C	317	ASN
3	C	319	ASN
3	C	325	ASN
3	C	329	GLN
3	C	337	ASN
3	C	350	GLN
1	D	139	ASN
1	D	143	GLN

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Mol	Chain	Res	Type
1	D	181	GLN
1	D	184	GLN
2	E	164	ASN
2	E	189	GLN
2	E	253	GLN
2	E	256	GLN
2	E	296	ASN
2	E	301	GLN
2	E	325	HIS
2	E	332	GLN
2	E	339	GLN
2	E	351	ASN
2	E	408	HIS
2	E	439	ASN
3	F	115	ASN
3	F	117	ASN
3	F	118	ASN
3	F	130	GLN
3	F	136	GLN
3	F	163	GLN
3	F	177	GLN
3	F	230	ASN
3	F	239	GLN
3	F	307	HIS
3	F	317	ASN
3	F	319	ASN
3	F	325	ASN
3	F	329	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](#)

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
6	NAG	G	1	6,2	14,14,15	0.77	0	17,19,21	1.33	3 (17%)
6	NAG	G	2	6	14,14,15	0.60	0	17,19,21	0.66	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	NAG	G	1	6,2	-	4/6/23/26	0/1/1/1
6	NAG	G	2	6	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	G	1	NAG	C4-C3-C2	3.27	115.81	111.02
6	G	1	NAG	C3-C4-C5	2.23	114.21	110.24
6	G	1	NAG	O4-C4-C3	-2.14	105.39	110.35

There are no chirality outliers.

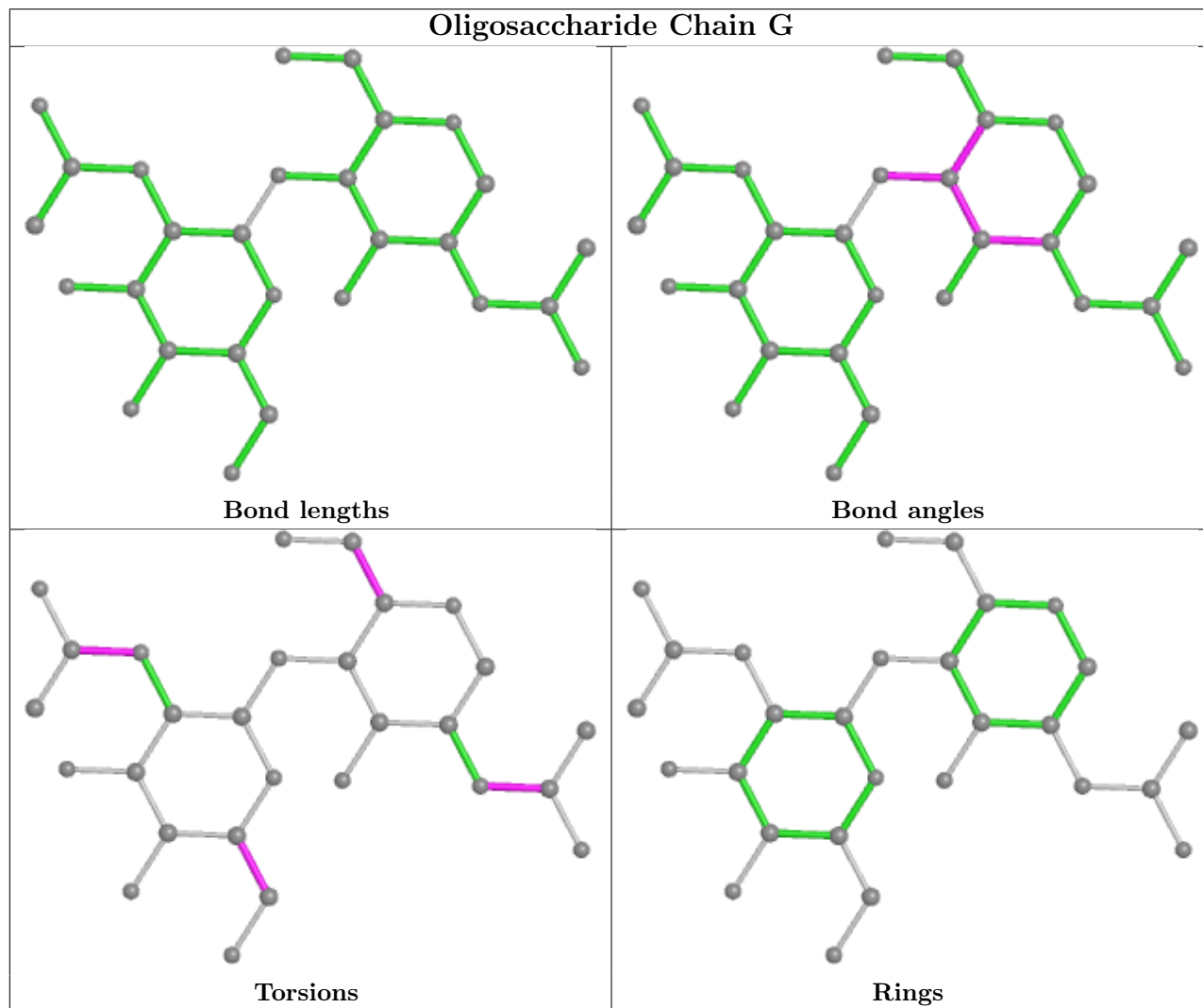
All (7) torsion outliers are listed below:

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

There are no ring outliers.

No monomer is involved in short contacts.

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



5.6 Ligand geometry [i](#)

Of 10 ligands modelled in this entry, 8 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
8	NAG	E	501	2	14,14,15	0.51	0	17,19,21	0.52	0
8	NAG	J	101	-	15,15,15	0.68	0	21,21,21	0.96	1 (4%)

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
8	NAG	E	501	2	-	5/6/23/26	0/1/1/1
8	NAG	J	101	-	-	4/6/26/26	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	J	101	NAG	O5-C1-C2	3.02	112.55	109.52

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	E	501	NAG	C3-C2-N2-C7
8	E	501	NAG	C8-C7-N2-C2
8	E	501	NAG	O7-C7-N2-C2
8	J	101	NAG	C8-C7-N2-C2
8	J	101	NAG	O7-C7-N2-C2
8	J	101	NAG	C4-C5-C6-O6
8	E	501	NAG	O5-C5-C6-O6
8	J	101	NAG	O5-C5-C6-O6
8	E	501	NAG	C4-C5-C6-O6

There are no ring outliers.

2 monomers are involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	E	501	NAG	1	0
8	J	101	NAG	1	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	67/87 (77%)	0.03	3 (4%) 33 31	26, 50, 84, 119	0
1	D	54/87 (62%)	0.28	4 (7%) 14 12	28, 57, 98, 143	0
2	B	303/326 (92%)	-0.42	6 (1%) 65 67	17, 32, 66, 123	0
2	E	296/326 (90%)	-0.32	10 (3%) 45 45	18, 35, 76, 119	0
3	C	292/324 (90%)	-0.40	3 (1%) 82 83	18, 34, 72, 102	0
3	F	285/324 (87%)	-0.34	3 (1%) 80 82	23, 37, 65, 92	0
4	S	4/4 (100%)	0.16	0 100 100	39, 43, 61, 64	0
4	T	4/4 (100%)	0.22	0 100 100	38, 40, 44, 50	0
5	I	5/5 (100%)	0.17	0 100 100	31, 34, 38, 47	0
5	J	5/5 (100%)	0.50	0 100 100	43, 59, 72, 83	0
All	All	1315/1492 (88%)	-0.32	29 (2%) 62 63	17, 35, 77, 143	0

All (29) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	459	PRO	6.7
3	C	297	ASP	6.0
2	B	459	PRO	5.5
1	D	186	GLU	4.4
2	B	157	VAL	4.3
2	B	158	ASN	4.1
2	E	458	PHE	4.0
2	E	165	LEU	3.5
2	B	458	PHE	3.4
1	D	135	LEU	3.3
2	E	164	ASN	3.2
1	A	127	ILE	3.2
3	F	109	TYR	3.2

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Mol	Chain	Res	Type	RSRZ
2	E	167	VAL	3.1
2	B	160	ASN	3.1
1	D	138	LYS	3.0
1	A	128	GLU	3.0
3	F	393	THR	2.6
2	E	391	ARG	2.6
2	E	168	LEU	2.5
2	E	166	ARG	2.4
2	E	281	ASP	2.4
3	C	108	ARG	2.3
3	C	103	HIS	2.3
2	E	386	LEU	2.3
3	F	112	GLU	2.2
1	D	187	GLN	2.1
2	B	161	ILE	2.1
1	A	190	ALA	2.1

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

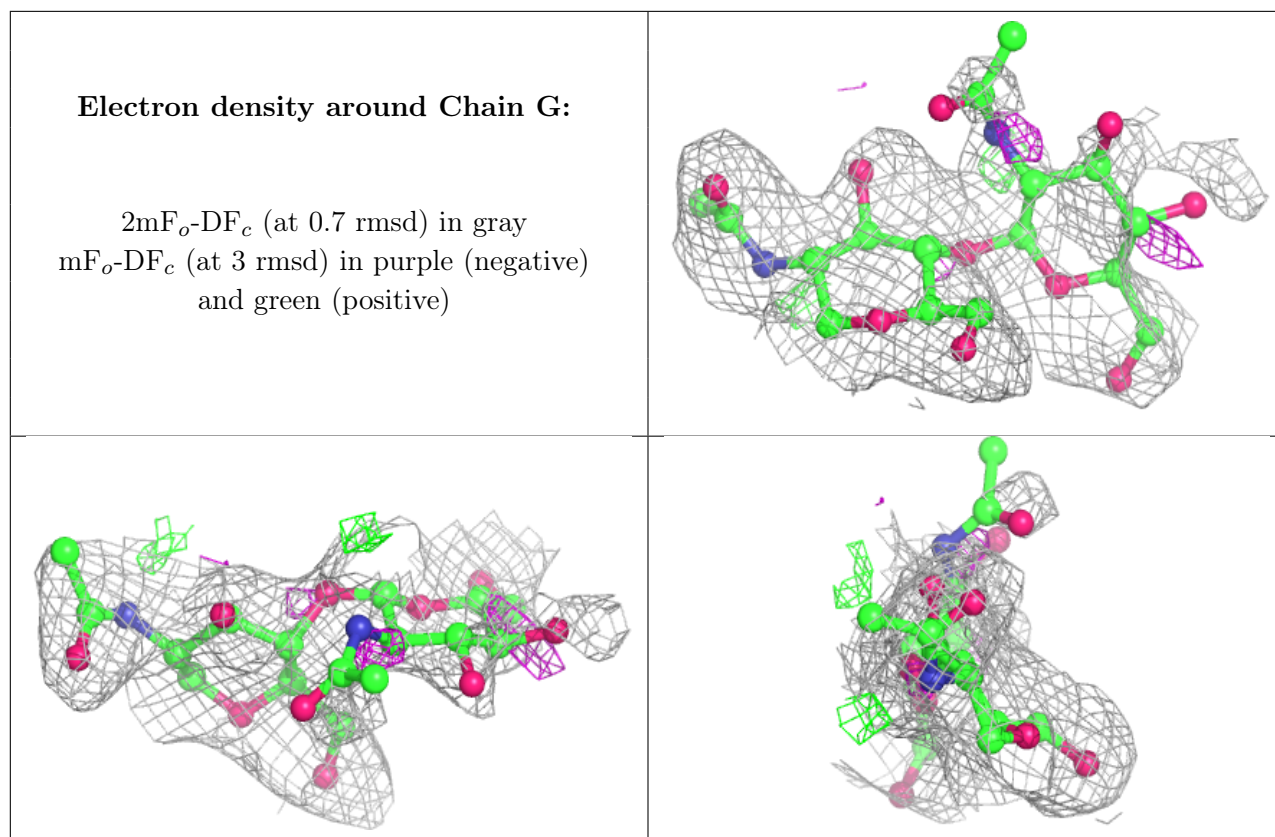
There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	NAG	G	2	14/15	0.58	0.44	97,97,97,97	0
6	NAG	G	1	14/15	0.78	0.23	51,51,51,51	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(Å ²)	Q<0.9
8	NAG	J	101	15/15	0.78	0.38	75,75,75,75	0
8	NAG	E	501	14/15	0.81	0.24	74,74,74,74	0
7	CA	E	502	1/1	0.86	0.07	34,34,34,34	0
7	CA	F	502	1/1	0.89	0.52	34,34,34,34	0
7	CA	C	501	1/1	0.90	0.09	34,34,34,34	0
7	CA	F	501	1/1	0.92	0.09	34,34,34,34	0
7	CA	B	501	1/1	0.94	0.08	34,34,34,34	0
7	CA	E	503	1/1	0.94	0.08	34,34,34,34	0
7	CA	B	502	1/1	0.95	0.29	34,34,34,34	0
7	CA	C	502	1/1	0.96	0.09	34,34,34,34	0

6.5 Other polymers [i](#)

There are no such residues in this entry.