Full wwPDB X-ray Structure Validation Report ⓘ

May 5, 2026 – 06:12 PM EDT

PDB ID	:	9P3J / pdb_00009p3j
Title	:	Crystal Structure of Xyloglucan Xylosyltransferase 2 and Xyloglucan Xylosyltransferase 5 Heterodimer
Authors	:	Julian, J.D.; Stewart Jr, S.E.; Culbertson, A.T.; Zabotina, O.A.
Deposited on	:	2025-06-14
Resolution	:	3.20 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:

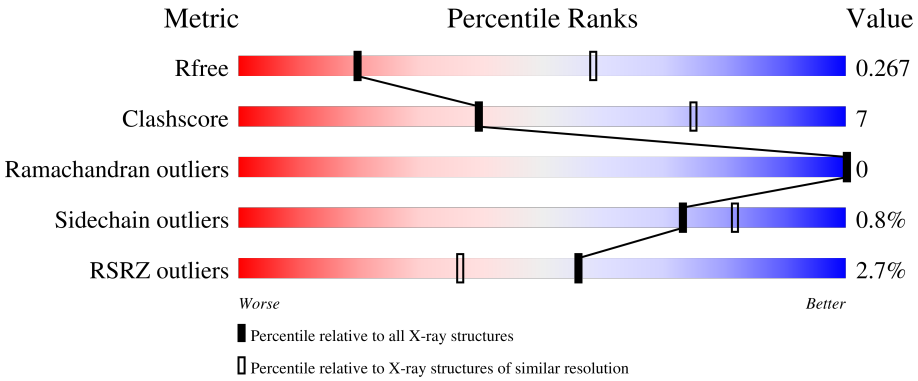
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 3.20 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}	180053	1466 (3.20-3.20)
Clashscore	190562	1573 (3.20-3.20)
Ramachandran outliers	187476	1548 (3.20-3.20)
Sidechain outliers	187428	1547 (3.20-3.20)
RSRZ outliers	180081	1466 (3.20-3.20)

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% 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	420	4% 73% 12% 15%
1	C	420	2% 70% 14% 16%
1	E	420	% 68% 17% • 14%
1	G	420	3% 75% 11% 14%
2	B	387	2% 71% 15% 14%

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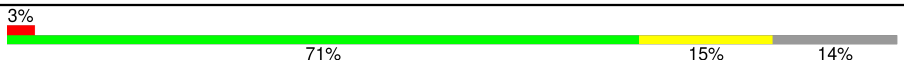
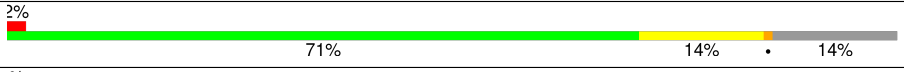
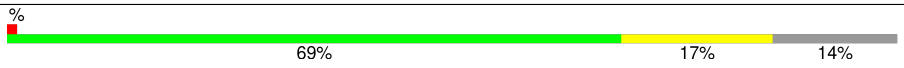
Mol	Chain	Length	Quality of chain
2	D	387	
2	F	387	
2	H	387	

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 44816 atoms, of which 22157 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.

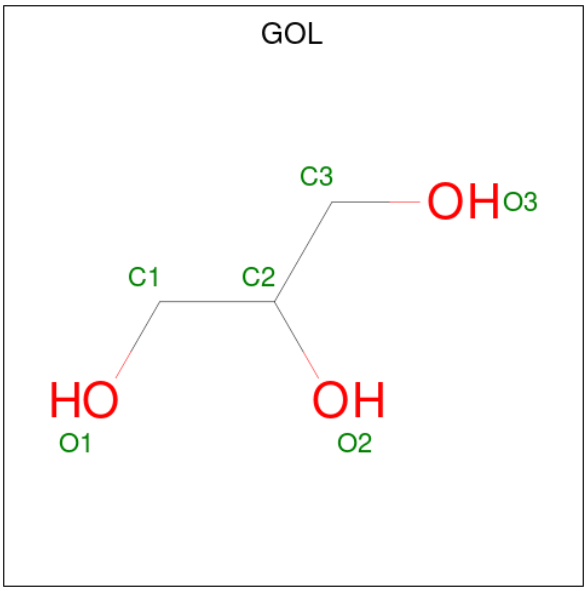
- Molecule 1 is a protein called Xyloglucan 6-xylosyltransferase 2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	358	Total	C	H	N	O	S	0	0	0
			5790	1899	2854	497	523	17			
1	C	352	Total	C	H	N	O	S	0	0	0
			5689	1863	2803	490	516	17			
1	E	360	Total	C	H	N	O	S	0	0	0
			5818	1905	2866	501	529	17			
1	G	361	Total	C	H	N	O	S	0	0	0
			5835	1910	2876	502	530	17			

- Molecule 2 is a protein called Xyloglucan 6-xylosyltransferase 5.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	331	Total	C	H	N	O	S	0	0	0
			5411	1770	2687	463	477	14			
2	D	331	Total	C	H	N	O	S	0	0	0
			5410	1770	2686	463	477	14			
2	F	331	Total	C	H	N	O	S	0	0	0
			5410	1770	2686	463	477	14			
2	H	331	Total	C	H	N	O	S	0	0	0
			5410	1770	2686	463	477	14			

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C H O 12 3 6 3	0	0
3	E	1	Total C H O 13 3 7 3	0	0

- Molecule 4 is MANGANESE (II) ION (CCD ID: MN) (formula: Mn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Mn 1 1	0	0
4	B	1	Total Mn 1 1	0	0
4	C	1	Total Mn 1 1	0	0
4	D	1	Total Mn 1 1	0	0
4	E	1	Total Mn 1 1	0	0
4	F	1	Total Mn 1 1	0	0
4	G	1	Total Mn 1 1	0	0
4	H	1	Total Mn 1 1	0	0

- Molecule 5 is water.

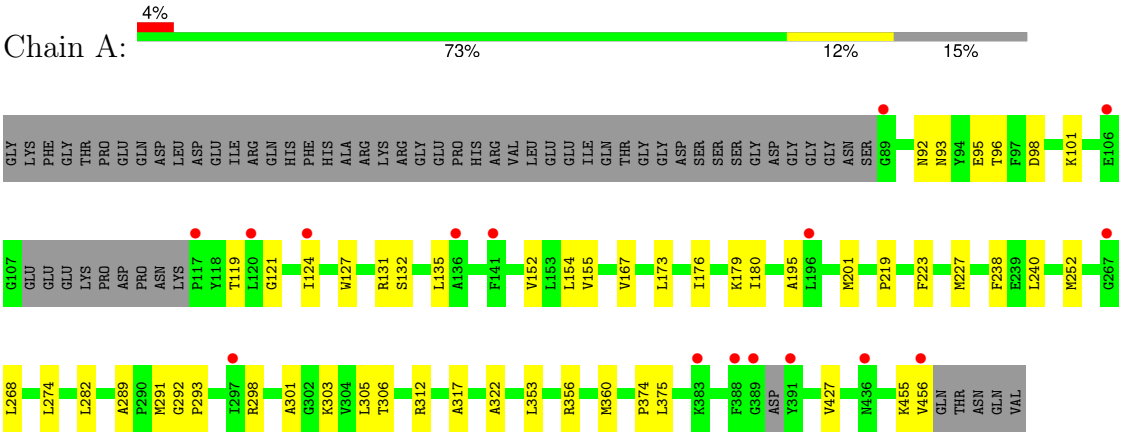
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	2	Total O 2 2	0	0
5	C	3	Total O 3 3	0	0
5	D	1	Total O 1 1	0	0
5	F	3	Total O 3 3	0	0
5	H	1	Total O 1 1	0	0

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.

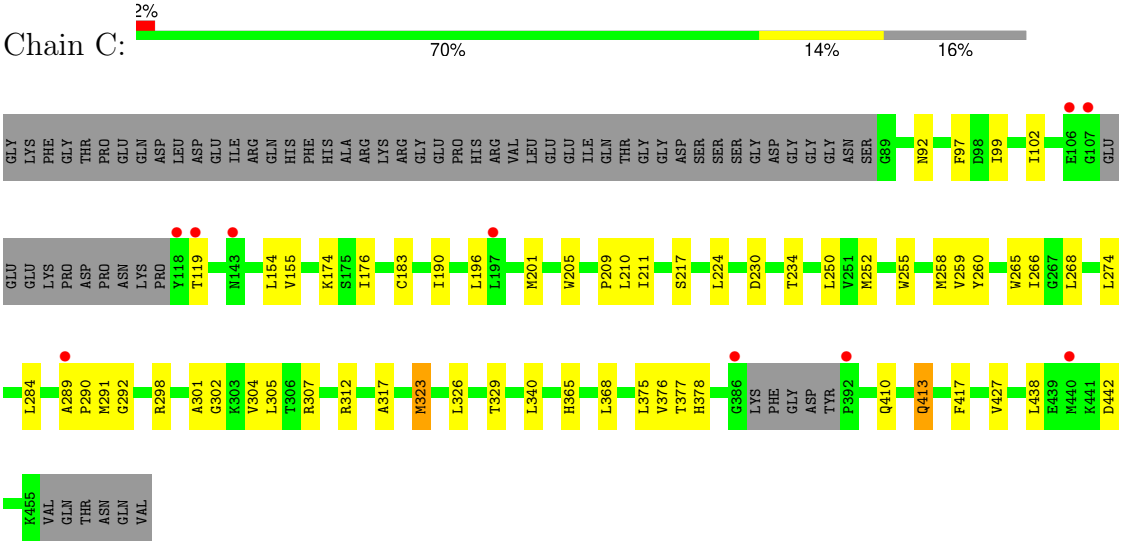
• Molecule 1: Xyloglucan 6-xylosyltransferase 2

Chain A:



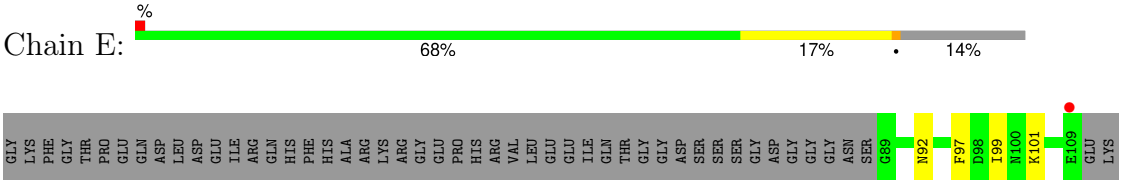
• Molecule 1: Xyloglucan 6-xylosyltransferase 2

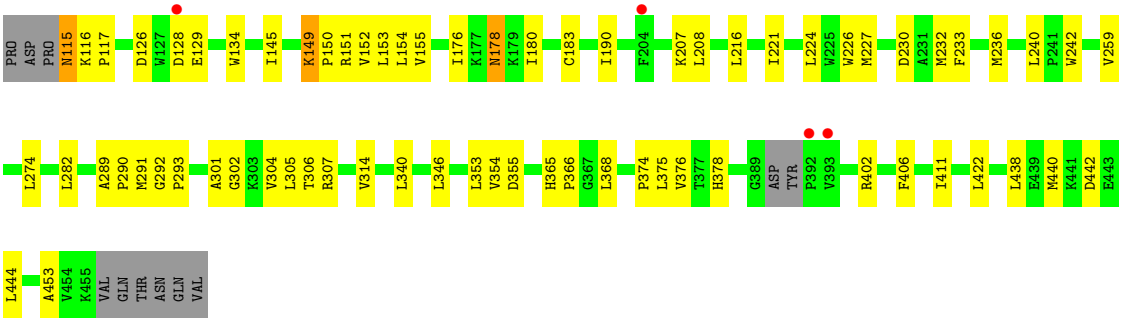
Chain C:



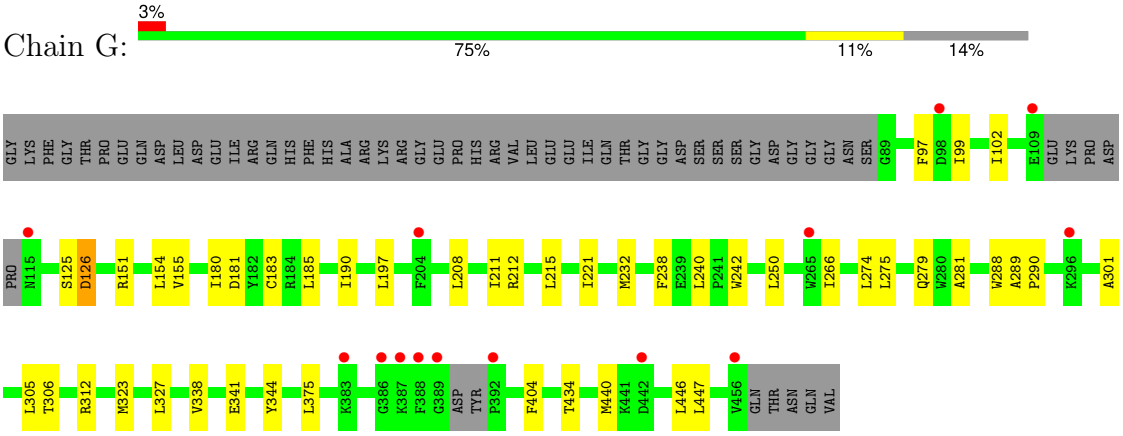
• Molecule 1: Xyloglucan 6-xylosyltransferase 2

Chain E:

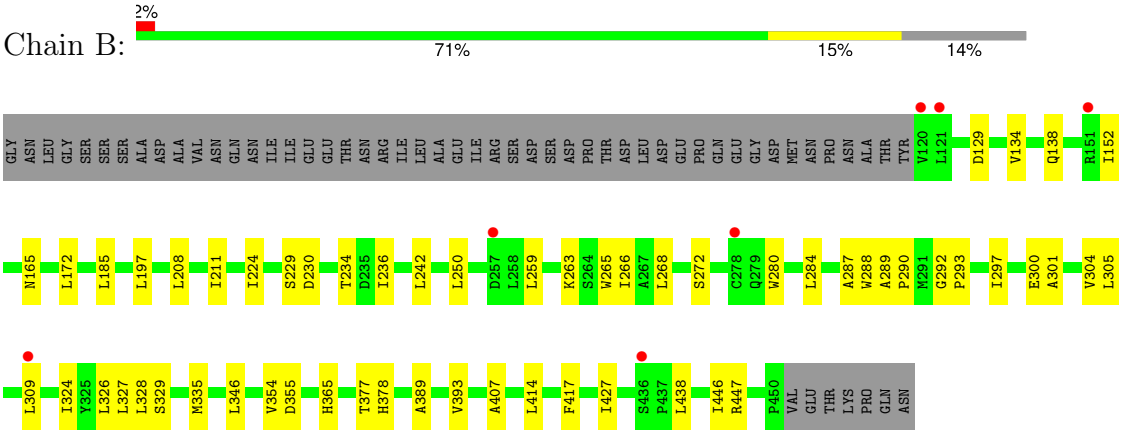




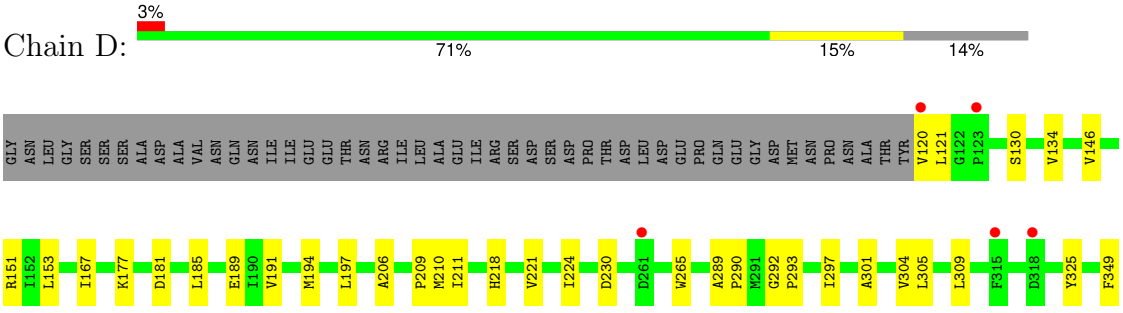
• Molecule 1: Xyloglucan 6-xylosyltransferase 2

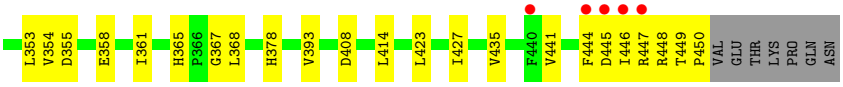


• Molecule 2: Xyloglucan 6-xylosyltransferase 5



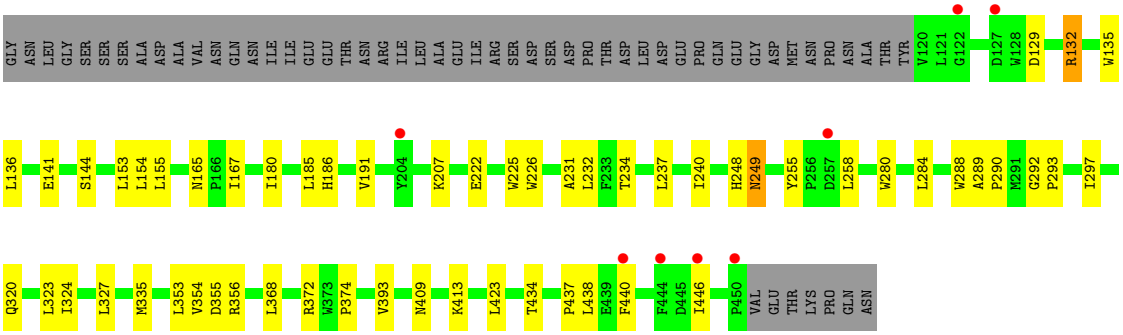
• Molecule 2: Xyloglucan 6-xylosyltransferase 5





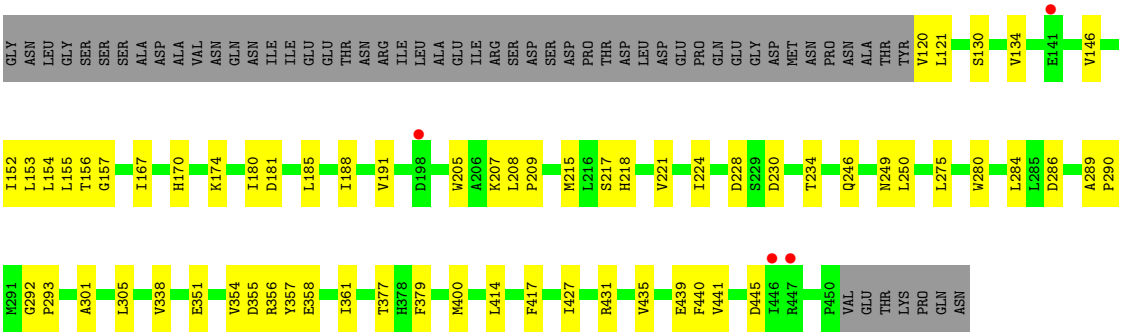
• Molecule 2: Xyloglucan 6-xylosyltransferase 5

Chain F:



• Molecule 2: Xyloglucan 6-xylosyltransferase 5

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	80.49Å 112.86Å 116.61Å 84.00° 69.81° 79.20°	Depositor
Resolution (Å)	49.08 – 3.20 49.08 – 3.20	Depositor EDS
% Data completeness (in resolution range)	99.5 (49.08-3.20) 90.4 (49.08-3.20)	Depositor EDS
R_{merge}	0.35	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.05 (at 3.19Å)	Xtriage
Refinement program	PHENIX 1.21.2_5419	Depositor
R, R_{free}	0.220 , 0.267 0.220 , 0.267	Depositor DCC
R_{free} test set	3050 reflections (4.89%)	wwPDB-VP
Wilson B-factor (Å^2)	44.6	Xtriage
Anisotropy	0.896	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.39 , 57.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.45$, $< L^2 > = 0.28$	Xtriage
Estimated twinning fraction	0.036 for -h,-k,-h+l	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	44816	wwPDB-VP
Average B, all atoms (Å^2)	66.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.77% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ 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: GOL, MN

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	0.12	0/3024	0.31	0/4095
1	C	0.12	0/2971	0.29	0/4023
1	E	0.13	0/3039	0.31	0/4113
1	G	0.13	0/3046	0.30	0/4123
2	B	0.13	0/2808	0.30	0/3812
2	D	0.15	0/2808	0.30	0/3812
2	F	0.12	0/2808	0.30	0/3812
2	H	0.12	0/2808	0.29	0/3812
All	All	0.13	0/23312	0.30	0/31602

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	D	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	D	447	ARG	Sidechain
2	D	448	ARG	Sidechain

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	2936	2854	2853	36	0
1	C	2886	2803	2803	46	0
1	E	2952	2866	2866	53	0
1	G	2959	2876	2875	34	0
2	B	2724	2687	2686	43	0
2	D	2724	2686	2686	40	0
2	F	2724	2686	2686	34	0
2	H	2724	2686	2686	40	0
3	A	6	6	8	0	0
3	E	6	7	8	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
4	G	1	0	0	0	0
4	H	1	0	0	0	0
5	A	2	0	0	0	0
5	C	3	0	0	0	0
5	D	1	0	0	0	0
5	F	3	0	0	0	0
5	H	1	0	0	0	0
All	All	22659	22157	22157	301	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 (301) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:275:LEU:HD21	1:G:281:ALA:HB1	1.63	0.79
1:C:252:MET:HE2	1:C:268:LEU:HD13	1.63	0.79
1:C:291:MET:HE2	1:C:301:ALA:HB1	1.63	0.78
1:C:427:VAL:HG21	2:D:197:LEU:HD23	1.65	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:375:LEU:HD13	1:E:376:VAL:HG23	1.68	0.76
2:D:120:VAL:HG12	2:D:121:LEU:H	1.56	0.71
1:E:216:LEU:HD21	1:E:282:LEU:HD21	1.73	0.70
1:A:132:SER:HA	1:A:135:LEU:HD12	1.72	0.70
1:E:236:MET:HE2	1:E:411:ILE:HD11	1.74	0.69
1:E:291:MET:HE1	1:E:305:LEU:HD11	1.76	0.67
2:B:208:LEU:HD21	2:B:288:TRP:CG	2.30	0.66
2:D:218:HIS:O	2:D:221:VAL:HG12	1.96	0.66
1:C:230:ASP:OD2	1:C:378:HIS:CD2	2.49	0.65
2:D:206:ALA:HB1	2:D:210:MET:HE3	1.79	0.65
1:A:353:LEU:HD22	1:A:374:PRO:HG3	1.78	0.65
2:H:249:ASN:O	2:H:275:LEU:HD12	1.96	0.65
1:C:99:ILE:HD12	2:D:167:ILE:HD13	1.80	0.64
1:G:434:THR:HG21	1:G:440:MET:HG3	1.78	0.64
1:E:154:LEU:HD11	1:E:227:MET:HE3	1.80	0.64
1:G:99:ILE:HG21	2:H:167:ILE:HD13	1.79	0.63
2:B:301:ALA:O	2:B:305:LEU:HD23	1.97	0.63
2:H:301:ALA:O	2:H:305:LEU:HD23	1.99	0.63
1:E:145:ILE:HD11	1:E:149:LYS:CD	2.29	0.62
2:F:185:LEU:O	2:F:446:ILE:HD11	2.00	0.62
1:E:92:ASN:HA	2:F:393:VAL:HG13	1.83	0.60
1:E:453:ALA:HB1	2:F:141:GLU:HB2	1.83	0.60
1:C:375:LEU:HD13	1:C:376:VAL:HG23	1.84	0.60
2:B:208:LEU:HD21	2:B:288:TRP:CD2	2.37	0.59
2:D:301:ALA:O	2:D:305:LEU:HD23	2.02	0.59
1:C:291:MET:HE2	1:C:301:ALA:CB	2.32	0.59
2:B:284:LEU:HD23	2:B:284:LEU:C	2.27	0.58
1:E:353:LEU:HD22	1:E:374:PRO:HG3	1.85	0.58
1:C:365:HIS:CE1	1:C:368:LEU:HD21	2.39	0.58
1:E:302:GLY:O	1:E:306:THR:HG23	2.04	0.57
2:F:225:TRP:CH2	2:F:240:ILE:HD11	2.40	0.57
1:E:306:THR:HG21	1:E:314:VAL:HA	1.85	0.57
2:H:120:VAL:HG13	2:H:121:LEU:N	2.18	0.57
1:E:180:ILE:HD11	2:F:180:ILE:HD11	1.85	0.57
1:C:259:VAL:HG11	1:C:340:LEU:HD11	1.86	0.56
1:E:366:PRO:HG2	1:E:444:LEU:HD22	1.87	0.56
1:E:154:LEU:HD11	1:E:227:MET:CE	2.36	0.56
1:A:219:PRO:HG3	2:B:438:LEU:HD21	1.87	0.56
2:F:249:ASN:N	2:F:249:ASN:HD22	2.04	0.56
1:G:238:PHE:HB3	1:G:375:LEU:HD13	1.87	0.56
2:B:230:ASP:OD1	2:B:378:HIS:CD2	2.59	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:130:SER:O	2:D:134:VAL:HG23	2.06	0.55
1:C:259:VAL:HG11	1:C:340:LEU:CD1	2.36	0.55
2:B:172:LEU:HD22	2:B:229:SER:HB2	1.89	0.55
1:G:151:ARG:HG2	1:G:221:ILE:HD13	1.86	0.55
1:A:173:LEU:O	1:A:176:ILE:HG22	2.06	0.55
1:C:154:LEU:HD23	1:C:155:VAL:N	2.22	0.55
1:E:230:ASP:OD1	1:E:378:HIS:CD2	2.59	0.55
2:F:167:ILE:HD12	2:F:167:ILE:H	1.71	0.55
2:D:367:GLY:C	2:D:368:LEU:HD12	2.33	0.54
1:G:183:CYS:HB2	1:G:190:ILE:HD11	1.89	0.54
1:A:201:MET:HE1	1:A:289:ALA:HB1	1.90	0.54
2:H:207:LYS:HG3	2:H:208:LEU:HD12	1.89	0.54
1:C:301:ALA:O	1:C:305:LEU:HD13	2.08	0.53
2:B:152:ILE:HD11	2:B:242:LEU:HD21	1.88	0.53
2:D:365:HIS:O	2:D:368:LEU:HD13	2.08	0.53
2:F:446:ILE:C	2:F:446:ILE:HD12	2.33	0.53
1:G:185:LEU:HD23	1:G:446:LEU:HB3	1.91	0.53
1:A:292:GLY:N	1:A:293:PRO:CD	2.71	0.53
2:B:185:LEU:O	2:B:446:ILE:HD11	2.09	0.53
1:C:417:PHE:CG	2:D:197:LEU:HD22	2.44	0.53
1:A:238:PHE:HB3	1:A:375:LEU:HD13	1.90	0.53
1:A:252:MET:HE1	1:A:268:LEU:HD22	1.91	0.52
2:B:287:ALA:HB1	2:B:326:LEU:HD11	1.91	0.52
2:D:146:VAL:HG21	2:D:151:ARG:HE	1.74	0.52
1:A:95:GLU:HG2	2:B:165:ASN:HD21	1.74	0.52
1:G:250:LEU:HD21	1:G:323:MET:HE2	1.90	0.52
1:A:92:ASN:HA	2:B:393:VAL:HG13	1.92	0.52
1:A:152:VAL:HG22	1:A:223:PHE:HB2	1.90	0.52
1:E:292:GLY:N	1:E:293:PRO:CD	2.73	0.52
1:E:97:PHE:HE1	1:E:101:LYS:HD3	1.73	0.52
2:H:120:VAL:HG11	2:H:286:ASP:OD2	2.10	0.52
1:A:154:LEU:HD23	1:A:155:VAL:N	2.24	0.51
2:B:289:ALA:N	2:B:290:PRO:CD	2.73	0.51
1:G:97:PHE:HE2	1:G:102:ILE:HD11	1.74	0.51
2:B:300:GLU:O	2:B:304:VAL:HG23	2.11	0.51
1:C:266:ILE:O	1:C:266:ILE:HG22	2.11	0.51
1:E:289:ALA:N	1:E:290:PRO:CD	2.73	0.51
1:E:99:ILE:HG12	2:F:167:ILE:HG12	1.93	0.51
2:H:120:VAL:HG22	2:H:121:LEU:H	1.76	0.50
2:B:354:VAL:HG23	2:B:355:ASP:N	2.27	0.50
1:C:438:LEU:HD23	1:C:438:LEU:H	1.75	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:292:GLY:N	2:F:293:PRO:CD	2.73	0.50
2:F:327:LEU:HD23	2:F:335:MET:HE3	1.94	0.50
1:C:217:SER:HB3	2:D:414:LEU:HD21	1.93	0.50
1:E:150:PRO:O	1:E:152:VAL:HG23	2.12	0.50
2:F:153:LEU:HD11	2:F:191:VAL:HG23	1.94	0.50
2:H:289:ALA:N	2:H:290:PRO:CD	2.74	0.50
1:E:301:ALA:O	1:E:305:LEU:HD13	2.12	0.50
2:B:293:PRO:HB2	2:B:297:ILE:HD13	1.94	0.50
1:C:298:ARG:HG2	1:C:317:ALA:HB3	1.93	0.50
2:F:248:HIS:C	2:F:249:ASN:HD22	2.20	0.50
1:G:306:THR:HG23	1:G:312:ARG:O	2.12	0.50
1:C:284:LEU:HD21	1:C:323:MET:HE1	1.93	0.50
1:E:183:CYS:HB2	1:E:190:ILE:HD11	1.94	0.50
1:E:438:LEU:HD13	2:F:135:TRP:HB2	1.93	0.50
1:C:183:CYS:HB2	1:C:190:ILE:HD11	1.94	0.50
1:A:98:ASP:O	1:A:101:LYS:HG2	2.11	0.49
2:D:289:ALA:N	2:D:290:PRO:CD	2.75	0.49
1:G:99:ILE:CG2	2:H:167:ILE:HD13	2.43	0.49
2:H:152:ILE:O	2:H:188:ILE:HG23	2.12	0.49
1:E:176:ILE:O	1:E:180:ILE:HG12	2.11	0.49
2:F:320:GLN:O	2:F:324:ILE:HG13	2.13	0.49
1:C:265:TRP:CE2	1:C:266:ILE:HD11	2.47	0.49
1:E:151:ARG:HG2	1:E:221:ILE:HD13	1.95	0.49
2:H:153:LEU:HD11	2:H:191:VAL:HG23	1.94	0.49
1:C:234:THR:HG21	1:C:377:THR:OG1	2.13	0.49
1:C:289:ALA:N	1:C:290:PRO:CD	2.75	0.49
1:E:365:HIS:CE1	1:E:368:LEU:HD21	2.48	0.49
2:H:218:HIS:O	2:H:221:VAL:HG12	2.13	0.49
1:E:115:ASN:N	1:E:115:ASN:HD22	2.11	0.49
1:C:298:ARG:CG	1:C:317:ALA:HB3	2.42	0.49
1:G:274:LEU:N	1:G:274:LEU:HD12	2.27	0.49
2:F:186:HIS:CE1	2:F:446:ILE:HD13	2.48	0.48
2:D:146:VAL:HG21	2:D:151:ARG:NE	2.28	0.48
1:G:185:LEU:HD23	1:G:446:LEU:HD22	1.94	0.48
2:H:280:TRP:CH2	2:H:284:LEU:HD22	2.48	0.48
1:G:208:LEU:HD21	1:G:288:TRP:CD2	2.49	0.48
1:A:356:ARG:O	1:A:360:MET:HG3	2.14	0.48
2:B:289:ALA:N	2:B:290:PRO:HD3	2.29	0.48
2:D:368:LEU:HD12	2:D:368:LEU:N	2.28	0.48
1:E:240:LEU:HD12	1:E:242:TRP:CH2	2.49	0.47
1:G:289:ALA:N	1:G:290:PRO:CD	2.77	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:292:GLY:N	2:D:293:PRO:CD	2.77	0.47
2:F:409:ASN:O	2:F:413:LYS:HG3	2.14	0.47
1:C:410:GLN:O	1:C:413:GLN:HG3	2.14	0.47
2:D:354:VAL:HG23	2:D:355:ASP:N	2.29	0.47
2:F:289:ALA:N	2:F:290:PRO:CD	2.78	0.47
2:B:250:LEU:HD23	2:B:250:LEU:C	2.39	0.47
2:B:280:TRP:CH2	2:B:284:LEU:HD12	2.49	0.47
1:C:92:ASN:HA	2:D:393:VAL:HG13	1.97	0.47
1:E:440:MET:HE3	1:E:440:MET:HA	1.96	0.47
2:B:417:PHE:CD2	2:B:427:ILE:HD12	2.50	0.47
2:D:121:LEU:HD11	2:D:209:PRO:HB3	1.97	0.47
2:H:146:VAL:HG23	2:H:146:VAL:O	2.15	0.47
1:A:195:ALA:HB1	2:B:427:ILE:HD13	1.97	0.47
2:D:153:LEU:HD12	2:D:189:GLU:O	2.14	0.47
1:E:116:LYS:HB3	1:E:117:PRO:HD2	1.95	0.47
1:A:124:ILE:HG12	1:A:282:LEU:HD13	1.97	0.47
1:C:301:ALA:HB3	1:C:317:ALA:HB2	1.97	0.47
2:H:417:PHE:CD2	2:H:427:ILE:HD12	2.50	0.47
1:A:92:ASN:HB2	2:B:389:ALA:O	2.14	0.46
1:A:131:ARG:NH1	1:A:135:LEU:HD21	2.30	0.46
1:G:240:LEU:HD13	1:G:274:LEU:HD21	1.97	0.46
2:D:297:ILE:HD12	2:D:297:ILE:H	1.79	0.46
1:E:274:LEU:CD1	1:E:346:LEU:HD21	2.45	0.46
1:A:240:LEU:HD13	1:A:274:LEU:HD11	1.96	0.46
2:F:280:TRP:CH2	2:F:284:LEU:HD13	2.51	0.46
2:H:156:THR:HG22	2:H:157:GLY:N	2.30	0.46
2:H:234:THR:HG21	2:H:377:THR:OG1	2.15	0.46
2:B:292:GLY:N	2:B:293:PRO:CD	2.79	0.46
1:C:252:MET:CE	1:C:268:LEU:HD13	2.42	0.46
2:D:230:ASP:OD1	2:D:378:HIS:CD2	2.69	0.46
1:G:125:SER:O	1:G:126:ASP:OD1	2.34	0.46
1:G:266:ILE:O	1:G:266:ILE:CG2	2.64	0.46
2:F:237:LEU:HD23	2:F:237:LEU:O	2.16	0.46
1:E:304:VAL:O	1:E:307:ARG:HG2	2.16	0.45
1:E:152:VAL:HG21	1:E:242:TRP:CH2	2.51	0.45
1:E:354:VAL:HG23	1:E:355:ASP:N	2.31	0.45
2:F:354:VAL:HG23	2:F:355:ASP:N	2.31	0.45
2:B:284:LEU:HD23	2:B:284:LEU:O	2.15	0.45
2:D:304:VAL:HG12	2:D:325:TYR:HE2	1.82	0.45
1:E:145:ILE:HD11	1:E:149:LYS:HD2	1.98	0.45
2:D:177:LYS:NZ	2:D:408:ASP:OD1	2.49	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:455:LYS:O	1:A:455:LYS:HG3	2.16	0.45
1:G:185:LEU:CD2	1:G:446:LEU:HD22	2.46	0.45
1:G:232:MET:HE1	1:G:404:PHE:HA	1.99	0.45
1:A:303:LYS:HA	1:A:306:THR:HG22	1.98	0.45
1:C:102:ILE:O	2:D:423:LEU:HD12	2.17	0.45
1:C:174:LYS:HA	2:D:194:MET:HE1	1.99	0.45
1:G:301:ALA:O	1:G:305:LEU:HD13	2.17	0.45
2:H:121:LEU:HD11	2:H:209:PRO:HG3	1.99	0.45
2:H:354:VAL:HG23	2:H:355:ASP:N	2.31	0.45
1:C:97:PHE:HE2	1:C:102:ILE:HG12	1.81	0.45
2:H:435:VAL:HG12	2:H:435:VAL:O	2.16	0.45
2:B:259:LEU:O	2:B:328:LEU:HD21	2.17	0.44
1:E:145:ILE:HD11	1:E:149:LYS:HD3	1.98	0.44
2:F:132:ARG:NH2	2:F:222:GLU:OE1	2.51	0.44
1:C:304:VAL:O	1:C:307:ARG:HG2	2.18	0.44
2:H:154:LEU:HD23	2:H:155:LEU:N	2.33	0.44
1:E:402:ARG:O	1:E:422:LEU:HD22	2.16	0.44
2:F:136:LEU:HD13	2:F:144:SER:OG	2.18	0.44
1:C:211:ILE:HG23	1:C:224:LEU:HD13	1.99	0.44
2:H:379:PHE:CZ	2:H:400:MET:HA	2.52	0.44
1:C:205:TRP:CD2	1:C:292:GLY:HA2	2.53	0.44
1:G:180:ILE:HD11	2:H:180:ILE:HD11	1.99	0.44
1:C:250:LEU:HD12	1:C:274:LEU:O	2.17	0.44
1:G:97:PHE:CE2	1:G:102:ILE:HD11	2.52	0.44
2:H:414:LEU:O	2:H:431:ARG:NH2	2.51	0.44
2:H:441:VAL:O	2:H:445:ASP:HB3	2.18	0.44
2:B:236:ILE:HD11	2:B:407:ALA:HB1	2.00	0.44
2:H:358:GLU:O	2:H:361:ILE:HG12	2.17	0.44
1:C:155:VAL:CG2	1:C:224:LEU:HD21	2.48	0.44
2:D:446:ILE:N	2:D:446:ILE:HD12	2.32	0.44
2:B:134:VAL:HG13	2:B:138:GLN:OE1	2.18	0.43
2:B:263:LYS:O	2:B:309:LEU:HD23	2.18	0.43
1:G:181:ASP:O	1:G:185:LEU:HD12	2.18	0.43
1:G:215:LEU:HD11	1:G:275:LEU:CD2	2.48	0.43
1:E:178:ASN:OD1	1:E:233:PHE:HB2	2.17	0.43
2:B:346:LEU:O	2:B:346:LEU:HD23	2.17	0.43
1:C:255:TRP:CE3	1:C:258:MET:HE2	2.53	0.43
1:E:134:TRP:HB2	2:F:438:LEU:HD13	1.99	0.43
1:E:126:ASP:OD1	1:E:129:GLU:HB2	2.18	0.43
2:F:154:LEU:HD23	2:F:155:LEU:N	2.34	0.43
1:A:305:LEU:HD21	1:A:322:ALA:HA	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:449:THR:O	2:D:450:PRO:C	2.61	0.43
1:E:227:MET:HE1	1:E:233:PHE:CZ	2.54	0.43
2:H:156:THR:HG22	2:H:157:GLY:H	1.84	0.43
2:B:234:THR:HG21	2:B:377:THR:OG1	2.18	0.43
1:A:127:TRP:CD1	1:A:282:LEU:HD11	2.53	0.43
1:A:179:LYS:O	1:A:180:ILE:C	2.62	0.43
2:H:215:MET:HG3	2:H:224:ILE:HD12	2.01	0.43
1:A:93:ASN:ND2	1:A:96:THR:HG23	2.34	0.43
1:A:292:GLY:N	1:A:293:PRO:HD3	2.34	0.43
2:F:293:PRO:HB2	2:F:297:ILE:HD13	2.01	0.43
1:G:197:LEU:H	1:G:197:LEU:HD12	1.84	0.43
1:G:240:LEU:HD12	1:G:242:TRP:CZ2	2.53	0.43
1:C:97:PHE:CE2	1:C:102:ILE:HG12	2.53	0.42
1:C:176:ILE:HD12	1:C:176:ILE:HA	1.93	0.42
1:A:298:ARG:HG3	1:A:317:ALA:HB3	2.01	0.42
2:B:327:LEU:HD23	2:B:335:MET:SD	2.59	0.42
1:C:119:THR:HB	1:C:201:MET:HE3	2.01	0.42
1:E:442:ASP:N	1:E:442:ASP:OD1	2.49	0.42
2:H:292:GLY:N	2:H:293:PRO:CD	2.82	0.42
2:D:446:ILE:HD12	2:D:446:ILE:H	1.84	0.42
1:E:274:LEU:HD12	1:E:274:LEU:N	2.34	0.42
1:E:128:ASP:OD1	1:E:128:ASP:N	2.53	0.42
2:F:207:LYS:HE3	2:F:226:TRP:CE2	2.55	0.42
2:B:290:PRO:O	2:B:293:PRO:HD2	2.19	0.42
1:C:196:LEU:O	2:D:427:ILE:HD11	2.19	0.42
2:B:326:LEU:O	2:B:329:SER:O	2.36	0.42
1:E:207:LYS:CG	1:E:208:LEU:HD12	2.49	0.42
2:D:435:VAL:HG22	2:D:435:VAL:O	2.20	0.42
1:G:154:LEU:HD23	1:G:155:VAL:N	2.34	0.42
1:G:211:ILE:O	1:G:212:ARG:C	2.63	0.42
1:C:209:PRO:O	1:C:210:LEU:C	2.62	0.42
2:B:365:HIS:ND1	2:B:365:HIS:N	2.68	0.42
2:D:358:GLU:O	2:D:361:ILE:HG12	2.19	0.42
1:E:291:MET:HE1	1:E:305:LEU:HD21	2.01	0.42
1:E:115:ASN:CG	1:E:116:LYS:H	2.28	0.42
1:E:259:VAL:HG21	1:E:340:LEU:HD21	2.02	0.42
1:G:341:GLU:HG2	1:G:344:TYR:CE2	2.55	0.42
2:H:292:GLY:O	2:H:293:PRO:C	2.63	0.42
2:H:439:GLU:CG	2:H:440:PHE:N	2.83	0.42
2:H:181:ASP:O	2:H:185:LEU:HD13	2.20	0.41
2:B:268:LEU:H	2:B:324:ILE:HD11	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:272:SER:O	2:B:346:LEU:HD22	2.19	0.41
2:H:228:ASP:HB3	2:H:230:ASP:OD1	2.19	0.41
1:A:238:PHE:CD1	1:A:375:LEU:HD22	2.55	0.41
1:E:216:LEU:HD22	2:F:437:PRO:HG2	2.02	0.41
2:F:288:TRP:CE3	2:F:323:LEU:HD13	2.55	0.41
2:H:130:SER:O	2:H:134:VAL:HG23	2.20	0.41
2:B:265:TRP:CD1	2:B:266:ILE:HG23	2.56	0.41
2:D:181:ASP:O	2:D:185:LEU:HD13	2.20	0.41
1:G:181:ASP:O	1:G:185:LEU:CD1	2.67	0.41
2:H:205:TRP:CE2	2:H:292:GLY:HA2	2.55	0.41
2:B:211:ILE:HG23	2:B:224:ILE:HG21	2.03	0.41
2:D:153:LEU:HD11	2:D:191:VAL:HG23	2.03	0.41
1:E:155:VAL:HG12	1:E:226:TRP:CZ3	2.55	0.41
2:B:446:ILE:HD12	2:B:447:ARG:N	2.35	0.41
2:F:255:TYR:HB2	2:F:258:LEU:HD13	2.02	0.41
1:A:291:MET:CG	1:A:301:ALA:HB1	2.50	0.41
1:C:326:LEU:O	1:C:329:THR:O	2.38	0.41
1:A:306:THR:HB	1:A:312:ARG:HH11	1.85	0.41
1:C:259:VAL:HG13	1:C:260:TYR:CD2	2.56	0.41
2:D:211:ILE:HG23	2:D:224:ILE:HG21	2.03	0.41
1:A:427:VAL:HG21	2:B:197:LEU:HD23	2.03	0.41
1:A:455:LYS:O	1:A:456:VAL:HG23	2.20	0.41
2:B:134:VAL:CG1	2:B:138:GLN:OE1	2.69	0.41
2:D:441:VAL:O	2:D:445:ASP:CG	2.64	0.41
1:E:224:LEU:C	1:E:224:LEU:HD23	2.45	0.41
2:F:353:LEU:HD22	2:F:374:PRO:HG3	2.03	0.41
2:F:368:LEU:HD13	2:F:372:ARG:CZ	2.50	0.41
1:E:406:PHE:HA	1:E:422:LEU:HD21	2.04	0.40
1:G:327:LEU:HD21	1:G:338:VAL:HG21	2.03	0.40
2:H:228:ASP:CB	2:H:230:ASP:OD1	2.70	0.40
1:A:119:THR:CG2	1:A:121:GLY:O	2.70	0.40
1:A:124:ILE:CG1	1:A:282:LEU:HD13	2.51	0.40
1:C:302:GLY:HA2	1:C:312:ARG:NH2	2.37	0.40
1:G:154:LEU:HD23	1:G:154:LEU:C	2.46	0.40
1:G:447:LEU:HD22	2:H:217:SER:O	2.21	0.40
1:A:154:LEU:HD21	1:A:227:MET:HB3	2.03	0.40
2:B:297:ILE:H	2:B:297:ILE:HD12	1.86	0.40
2:B:414:LEU:HD23	2:B:414:LEU:C	2.47	0.40
1:C:375:LEU:CD1	1:C:376:VAL:HG23	2.50	0.40
2:D:349:PHE:O	2:D:353:LEU:HD12	2.22	0.40
2:F:434:THR:HG22	2:F:440:PHE:CE2	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:170:HIS:NE2	2:H:174:LYS:HE3	2.36	0.40
2:H:356:ARG:O	2:H:357:TYR:C	2.64	0.40
1:A:167:VAL:O	1:A:167:VAL:HG22	2.21	0.40
1:C:291:MET:HE1	1:C:305:LEU:CD1	2.51	0.40
2:D:365:HIS:CD2	2:D:368:LEU:HD11	2.55	0.40
1:E:153:LEU:HB2	1:E:221:ILE:HD12	2.03	0.40
2:D:265:TRP:HA	2:D:309:LEU:HD23	2.02	0.40
2:D:444:PHE:O	2:D:445:ASP:C	2.63	0.40
2:F:231:ALA:C	2:F:232:LEU:HD12	2.47	0.40
2:H:250:LEU:HD23	2:H:338:VAL:HG13	2.03	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	352/420 (84%)	338 (96%)	14 (4%)	0	100	100
1	C	346/420 (82%)	336 (97%)	10 (3%)	0	100	100
1	E	354/420 (84%)	348 (98%)	6 (2%)	0	100	100
1	G	355/420 (84%)	348 (98%)	7 (2%)	0	100	100
2	B	329/387 (85%)	319 (97%)	10 (3%)	0	100	100
2	D	329/387 (85%)	318 (97%)	11 (3%)	0	100	100
2	F	329/387 (85%)	318 (97%)	11 (3%)	0	100	100
2	H	329/387 (85%)	321 (98%)	8 (2%)	0	100	100
All	All	2723/3228 (84%)	2646 (97%)	77 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	312/364 (86%)	312 (100%)	0	100	100
1	C	307/364 (84%)	304 (99%)	3 (1%)	68	80
1	E	314/364 (86%)	310 (99%)	4 (1%)	61	78
1	G	315/364 (86%)	313 (99%)	2 (1%)	78	84
2	B	293/342 (86%)	292 (100%)	1 (0%)	86	88
2	D	293/342 (86%)	293 (100%)	0	100	100
2	F	293/342 (86%)	286 (98%)	7 (2%)	43	70
2	H	293/342 (86%)	291 (99%)	2 (1%)	76	83
All	All	2420/2824 (86%)	2401 (99%)	19 (1%)	73	82

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	129	ASP
1	C	323	MET
1	C	413	GLN
1	C	442	ASP
1	E	115	ASN
1	E	149	LYS
1	E	178	ASN
1	E	232	MET
2	F	129	ASP
2	F	132	ARG
2	F	165	ASN
2	F	234	THR
2	F	249	ASN
2	F	356	ARG
2	F	423	LEU
1	G	126	ASP
1	G	279	GLN
2	H	246	GLN
2	H	351	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	170	HIS
1	A	336	ASN
2	B	137	ASN
2	B	165	ASN
1	E	130	GLN
2	F	262	GLN
1	G	170	HIS
1	G	193	ASN
1	G	269	ASN
1	G	336	ASN
2	H	131	GLN
2	H	139	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

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	$\#\|Z\| > 2$
3	GOL	E	501	-	5,5,5	0.35	0	5,5,5	0.52	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	GOL	A	501	-	5,5,5	0.37	0	5,5,5	0.48	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	GOL	E	501	-	-	0/4/4/4	-
3	GOL	A	501	-	-	0/4/4/4	-

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

There are no such residues in this entry.

5.8 Polymer linkage issues

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, 95^{th} 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	358/420 (85%)	0.60	16 (4%)	38	24	33, 67, 108, 142	0
1	C	352/420 (83%)	0.59	10 (2%)	55	35	40, 70, 108, 124	0
1	E	360/420 (85%)	0.42	5 (1%)	73	54	36, 61, 95, 146	0
1	G	361/420 (85%)	0.50	14 (3%)	43	27	31, 60, 98, 152	0
2	B	331/387 (85%)	0.47	7 (2%)	63	43	40, 67, 99, 160	0
2	D	331/387 (85%)	0.44	10 (3%)	52	33	35, 61, 106, 149	0
2	F	331/387 (85%)	0.37	8 (2%)	59	40	36, 59, 87, 154	0
2	H	331/387 (85%)	0.46	4 (1%)	76	58	39, 64, 96, 150	0
All	All	2755/3228 (85%)	0.48	74 (2%)	56	36	31, 63, 101, 160	0

All (74) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	444	PHE	5.0
2	H	446	ILE	4.1
1	G	388	PHE	4.1
1	A	89	GLY	3.9
2	D	315	PHE	3.8
1	E	204	PHE	3.8
1	E	392	PRO	3.6
2	D	446	ILE	3.6
1	C	392	PRO	3.5
2	H	447	ARG	3.5
1	G	389	GLY	3.4
1	A	388	PHE	3.4
2	F	450	PRO	3.4
1	G	98	ASP	3.3
2	F	204	TYR	3.3
2	F	127	ASP	3.2

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Mol	Chain	Res	Type	RSRZ
2	F	446	ILE	3.2
1	A	391	TYR	3.2
2	B	257	ASP	3.1
1	A	141	PHE	3.0
2	B	151	ARG	3.0
1	A	456	VAL	2.8
2	D	261	ASP	2.7
2	H	141	GLU	2.7
1	C	118	TYR	2.7
2	D	120	VAL	2.7
1	C	106	GLU	2.6
1	E	393	VAL	2.6
1	G	456	VAL	2.6
1	C	119	THR	2.6
1	G	204	PHE	2.6
2	F	444	PHE	2.6
1	C	107	GLY	2.6
1	G	386	GLY	2.5
2	B	309	LEU	2.5
1	G	109	GLU	2.5
1	G	387	LYS	2.5
2	F	257	ASP	2.5
2	D	123	PRO	2.5
1	C	440	MET	2.4
1	C	197	LEU	2.4
1	A	297	ILE	2.4
2	B	278	CYS	2.4
1	G	296	LYS	2.4
1	A	196	LEU	2.4
1	A	389	GLY	2.3
1	A	120	LEU	2.3
1	C	143	ASN	2.3
2	D	318	ASP	2.3
1	A	136	ALA	2.3
1	C	289	ALA	2.2
1	G	265	TRP	2.2
1	A	383	LYS	2.2
1	E	128	ASP	2.2
2	B	121	LEU	2.2
1	C	386	GLY	2.2
1	A	106	GLU	2.1
1	E	109	GLU	2.1

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Mol	Chain	Res	Type	RSRZ
2	F	122	GLY	2.1
1	A	436	ASN	2.1
1	G	383	LYS	2.1
2	D	440	PHE	2.1
2	F	440	PHE	2.1
1	G	392	PRO	2.1
2	B	120	VAL	2.1
2	D	447	ARG	2.1
1	G	442	ASP	2.1
1	A	117	PRO	2.1
2	B	436	SER	2.0
1	A	124	ILE	2.0
1	G	115	ASN	2.0
2	D	445	ASP	2.0
2	H	198	ASP	2.0
1	A	267	GLY	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

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, 95^{th} 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
4	MN	B	501	1/1	0.78	0.28	145,145,145,145	0
3	GOL	A	501	6/6	0.80	0.16	52,62,75,75	0
3	GOL	E	501	6/6	0.89	0.14	46,58,71,72	0
4	MN	G	501	1/1	0.92	0.07	66,66,66,66	0
4	MN	E	502	1/1	0.94	0.14	68,68,68,68	0
4	MN	A	502	1/1	0.94	0.07	73,73,73,73	0
4	MN	F	501	1/1	0.95	0.11	71,71,71,71	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	MN	H	501	1/1	0.95	0.17	75,75,75,75	0
4	MN	C	501	1/1	0.97	0.05	57,57,57,57	0
4	MN	D	501	1/1	0.99	0.04	44,44,44,44	0

6.5 Other polymers (i)

There are no such residues in this entry.