Full wwPDB X-ray Structure Validation Report (i)

Feb 18, 2024 – 04:21 PM EST

PDB ID	:	4FNU
Title	:	Crystal structure of GH36 alpha-galactosidase AgaA A355E D478A from Geobacillus stearothermophilus in complex with stachyose
Authors	:	Merceron, R.; Foucault, M.; Haser, R.; Mattes, R.; Watzlawick, H.; Gouet, P.
Deposited on	:	2012-06-20
Resolution	:	3.60 Å(reported)

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

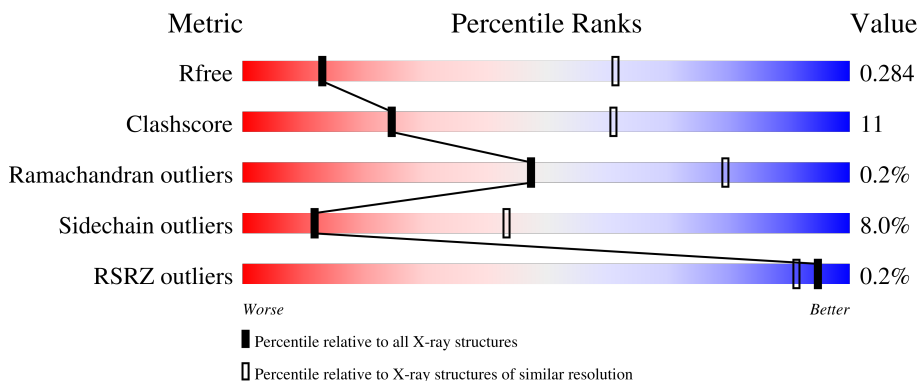|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry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

1　Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.60 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.
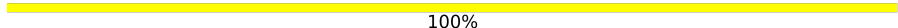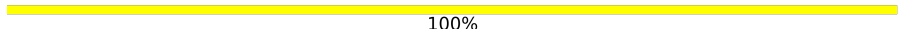
Metric	Percentile Ranks	Value
Rfree		0.284
Clashscore		11
Ramachandran outliers		0.2%
Sidechain outliers		8.0%
RSRZ outliers		0.2%

Worse ← → *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1257 (3.70-3.50)
Clashscore	141614	1353 (3.70-3.50)
Ramachandran outliers	138981	1307 (3.70-3.50)
Sidechain outliers	138945	1307 (3.70-3.50)
RSRZ outliers	127900	1161 (3.70-3.50)

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	729	66% / 28% ・ ・
1	B	729	69% / 26% ・ ・
1	C	729	69% / 27% ・ ・
1	D	729	71% / 26% ・ ・
2	E	4	50% / 50%

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Mol	Chain	Length	Quality of chain
2	F	4	100%
2	G	4	50%　　　　50%
2	H	4	100%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	FRU	E	4	-	-	-	X
2	GLC	G	3	-	-	-	X
2	FRU	G	4	-	-	-	X

2 Entry composition ⓘ

There are 2 unique types of molecules in this entry. The entry contains 23332 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 Alpha-galactosidase AgaA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	718	Total	C	N	O	S	0	0	0
			5788	3675	1020	1070	23			
1	B	718	Total	C	N	O	S	0	0	0
			5788	3675	1020	1070	23			
1	C	718	Total	C	N	O	S	0	0	0
			5788	3675	1020	1070	23			
1	D	718	Total	C	N	O	S	0	0	0
			5788	3675	1020	1070	23			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	355	GLU	ALA	engineered mutation	UNP Q9ALJ4
A	478	ALA	ASP	engineered mutation	UNP Q9ALJ4
B	355	GLU	ALA	engineered mutation	UNP Q9ALJ4
B	478	ALA	ASP	engineered mutation	UNP Q9ALJ4
C	355	GLU	ALA	engineered mutation	UNP Q9ALJ4
C	478	ALA	ASP	engineered mutation	UNP Q9ALJ4
D	355	GLU	ALA	engineered mutation	UNP Q9ALJ4
D	478	ALA	ASP	engineered mutation	UNP Q9ALJ4

- Molecule 2 is an oligosaccharide called beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose-(1-6)-alpha-D-galactopyranose-(1-6)-alpha-D-galactopyranose.
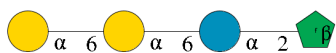
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	E	4	Total	C	O	0	0	0
			45	24	21			

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace
2	F	4	Total 45	C 24	O 21	0	0	0
2	G	4	Total 45	C 24	O 21	0	0	0
2	H	4	Total 45	C 24	O 21	0	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Alpha-galactosidase AgaA

Chain A:

- Molecule 1: Alpha-galactosidase AgaA

Chain B:

R377 R378 S379 L380 G381 D382 V385 K389 L394 V401 L406 L410 W411 V412 V417 S418 S421 E422 L423 Y424 R425 P428 C431 V434 R437 P438 R439 S440 E441 G442 R443 N444 Q445 L448 D449 Y450 S451 R452 V455 C456 I460 E461 N465

T473 K476 R481 H482 A490 Q496 R497 Y503 M504 L507 I514 T515 S516 R517 L522 F523 E524 S525 R532 F533 Q543 T544 T550 D551 A552 V553 S554 R555 I558 Q559 T562 S569 A573 S576 A577 V578 V583 G584 R585 V586 A587 S588

L589 K590 T591 R592 G593 H594 V595 E604 L605 D606 K609 L610 T611 E612 T613 E614 K615 M618 K626 D627 V628 R629 R639 N647 R667 V668 L669 N673 Y678 L679 R680 L681 K682 G683 L684 D685 S686 D689 I692 D701 E702 L703 M704 Y705 A709 L710

R713 F717 I718 M721 L724 V727 GLN GLN

• Molecule 1: Alpha-galactosidase AgaA

Chain C: 69%   27%   • •

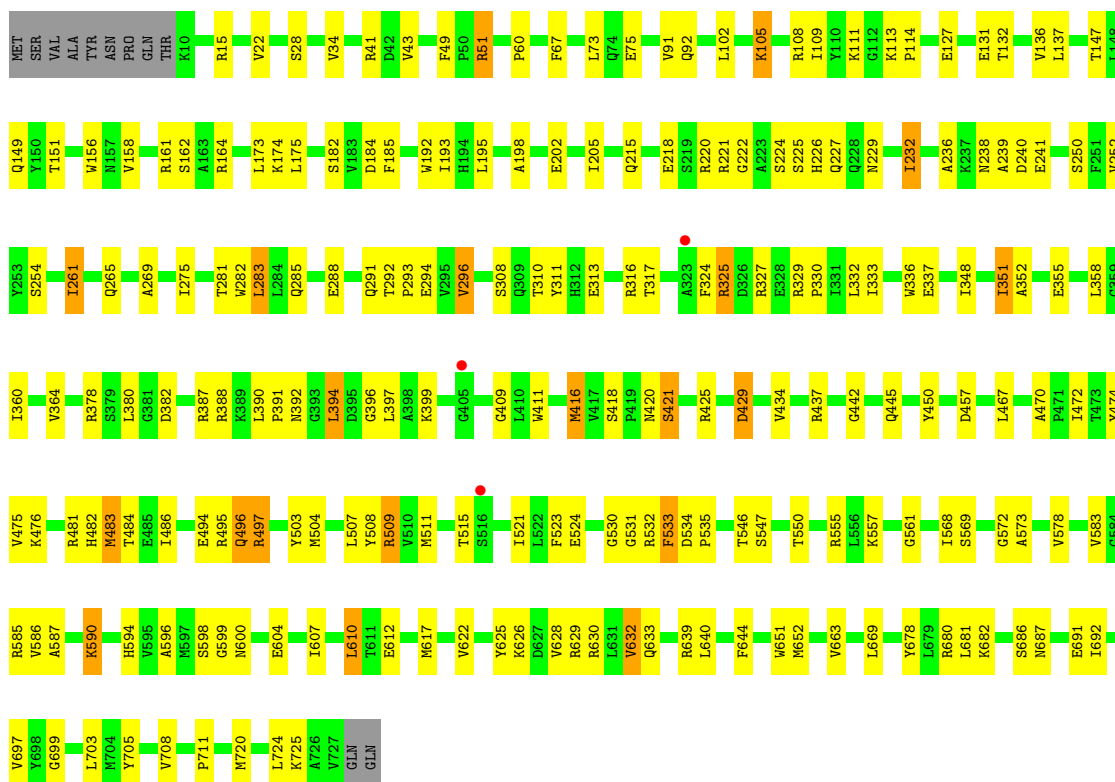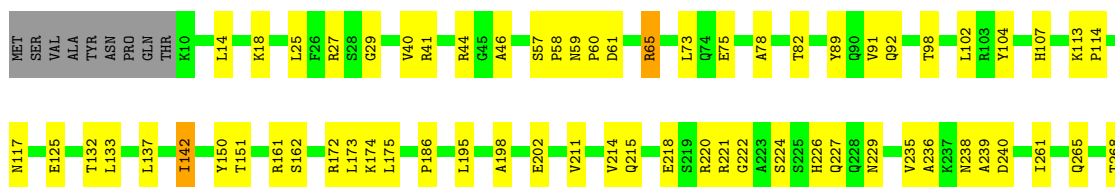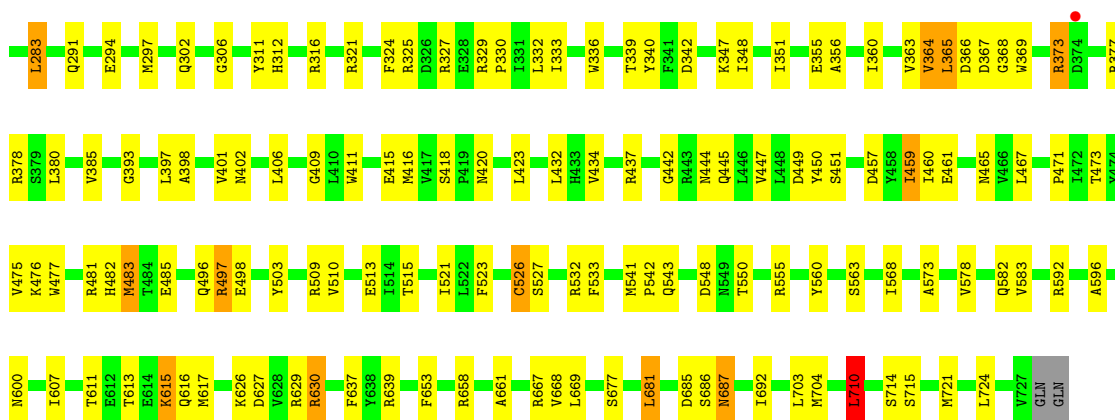MET SER VAL ALA TYR ASN PRO GLN THR K10 R15 V22 S28 V34 R41 D42 V43 F49 P50 R51 P60 F67 L73 Q74 E75 V91 Q92 L102 K105 R108 I109 Y110 K111 G112 K113 P114 E127 E131 T132 V136 L137 T147 L148

Q149 Y150 T151 W156 N157 V158 R161 S162 A163 R164 L173 K174 L175 S182 V183 D184 F185 W192 I193 H194 L195 A198 E202 I205 Q215 E218 S219 R220 R221 G222 A223 S224 S225 H226 Q227 Q228 N229 I232 A236 K237 N238 A239 D240 E241 S250 F251 V252

Y253 S254 I261 Q265 A269 I275 T281 W282 L283 I284 Q285 E288 Q291 T292 P293 E294 V295 V296 S308 Q309 T310 Y311 H312 E313 R316 T317 A323 F324 R325 D326 R327 E328 R329 P330 I331 L332 I333 W336 E337 I348 I351 A352 E355 L358 G359

I360 V364 R378 S379 L380 G381 D382 R387 R388 K389 L390 P391 N392 G393 D395 G396 L397 A398 K399 G405 G409 L410 W411 M416 V417 S418 P419 N420 S421 R425 V434 R437 G442 Q445 Y450 D457 L467 A470 P471 I472 T473 Y474

V475 K476 R481 H482 M483 T484 E485 I486 E494 R495 Q496 R497 Y503 M504 L507 Y508 R509 V510 M511 T515 S516 I521 L522 F523 E524 G530 G531 R532 F533 D534 P535 T546 S547 T550 R555 L556 K557 G561 I568 S569 G572 A573 V578 V583 G584

R585 V586 A587 K590 H594 V595 M597 S598 G599 N600 E604 I607 L610 T611 E612 M617 V622 Y625 K626 D627 V628 R629 R630 L631 V632 Q633 R639 L640 F644 W651 M652 V663 L669 Y678 L679 R680 L681 K682 S686 N687 E691 I692

V697 Y698 G699 L703 M704 Y705 V708 P711 M720 L724 K725 A726 V727 GLN GLN

• Molecule 1: Alpha-galactosidase AgaA

Chain D: 71%   26%   • •

MET SER VAL ALA TYR ASN PRO GLN THR K10 L14 K18 L25 F26 R27 S28 G29 V40 R41 R44 G45 A46 S57 P58 N59 P60 D61 R65 L73 Q74 E75 A78 T82 Y89 Q90 V91 Q92 T98 L102 R103 Y104 H107 K113 P114

N117 E125 T132 L133 L137 I142 Y150 T151 R161 S162 R172 L173 K174 L175 P186 L195 A198 E202 V211 V214 Q215 E218 S219 R220 R221 G222 A223 S224 S225 H226 Q227 Q228 N229 V235 A236 K237 N238 A239 D240 I261 Q265 T268

L283 Q291 E294 M297 Q302 G306 Y311 H312 R316 R321 F324 R325 D326 R327 E328 R329 P330 I331 L332 I333 W336 T339 Y340 F341 D342 K347 I348 I351 E355 A356 I360 V363 V364 L365 D366 D367 G368 W369 R373 D374 R377

R378 S379 L380 V385 G393 L397 A398 V401 N402 L406 G409 L410 W411 E415 M416 V417 S418 P419 N420 L423 L432 H433 V434 R437 G442 R443 Q445 N444 L446 L447 L448 D449 Y450 S451 D457 Y458 I459 I460 E461 N465 V466 L467 P471 I472 T473 Y474

V475 K476 W477 R481 H482 M483 T484 E485 Q496 R497 E498 Y503 R509 V510 E513 I514 T515 I521 L522 F523 C526 S527 R532 F533 M541 P542 Q543 D548 N549 T550 R555 Y560 Y578 S563 I568 A573 V578 Q582 V583 R592 A596

N600 I607 T611 E612 T613 E614 K615 Q616 M617 K626 D627 V628 R629 R630 F637 Y638 R639 F653 R658 A661 R667 V668 L669 S677 L681 D685 S686 N687 I692 L703 M704 L710 S714 S715 M721 L724 V727 GLN GLN
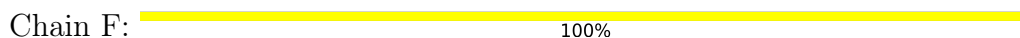
• Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose-(1-6)-alpha-D-galactopyranose-(1-6)-alpha-D-galactopyranose

Chain E:

• Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose-(1-6)-alpha-D-galactopyranose-(1-6)-alpha-D-galactopyranose

Chain F:

• Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose-(1-6)-alpha-D-galactopyranose-(1-6)-alpha-D-galactopyranose

Chain G:

• Molecule 2: beta-D-fructofuranose-(2-1)-alpha-D-glucopyranose-(1-6)-alpha-D-galactopyranose-(1-6)-alpha-D-galactopyranose

Chain H:

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	154.07Å　154.07Å　238.02Å 90.00°　　90.00°　　120.00°	Depositor
Resolution (Å)	19.92　–　3.60 19.92　–　3.60	Depositor EDS
% Data completeness (in resolution range)	99.7 (19.92-3.60) 99.7 (19.92-3.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.09	Depositor
$< I/\sigma(I) >$ [1]	3.07 (at 3.62Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.8_1069)	Depositor
R, R_{free}	0.238　,　0.282 0.238　,　0.284	Depositor DCC
R_{free} test set	1906 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	93.0	Xtriage
Anisotropy	0.223	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.23 , 19.4	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.024 for -h,-k,l	Xtriage
F_o,F_c correlation	0.90	EDS
Total number of atoms	23332	wwPDB-VP
Average B, all atoms (Å^2)	101.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.35% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: FRU, GLA, GLC

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	0.22	0/5935	0.42	0/8046
1	B	0.22	0/5935	0.40	0/8046
1	C	0.22	0/5935	0.41	0/8046
1	D	0.22	0/5935	0.42	1/8046 (0.0%)
All	All	0.22	0/23740	0.41	1/32184 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	710	LEU	CA-CB-CG	5.87	128.81	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5788	0	5621	147	0
1	B	5788	0	5621	130	0
1	C	5788	0	5621	139	0
1	D	5788	0	5621	124	0
2	E	45	0	39	4	0
2	F	45	0	39	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	G	45	0	39	2	0
2	H	45	0	39	0	0
All	All	23332	0	22640	501	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 11.

All (501) 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:B:681:LEU:HD11	1:B:703:LEU:HB3	1.61	0.81
1:B:684:LEU:H	1:B:704:MET:HE3	1.45	0.81
1:B:113:LYS:HD2	1:B:151:THR:HG21	1.66	0.78
1:A:113:LYS:HD2	1:A:151:THR:HG21	1.66	0.77
1:C:348:ILE:HD11	1:C:397:LEU:HD11	1.65	0.76
1:D:667:ARG:NH2	1:D:715:SER:O	2.20	0.75
1:A:317:THR:O	1:A:325:ARG:NH1	2.20	0.75
1:D:568:ILE:HD11	1:D:637:PHE:HB2	1.69	0.75
1:C:51:ARG:HH21	1:C:67:PHE:HA	1.51	0.73
1:A:281:THR:HG22	1:A:497:ARG:HB2	1.69	0.73
1:D:548:ASP:O	1:D:582:GLN:NE2	2.21	0.73
1:C:92:GLN:HB3	1:C:174:LYS:HB3	1.70	0.73
1:C:317:THR:O	1:C:325:ARG:NH1	2.22	0.72
1:A:686:SER:O	1:B:41:ARG:NH1	2.23	0.72
1:D:327:ARG:O	1:D:329:ARG:NH1	2.23	0.71
1:A:113:LYS:NZ	1:A:122:THR:O	2.22	0.71
1:B:75:GLU:OE1	1:B:161:ARG:NH1	2.24	0.71
1:C:681:LEU:HD12	1:C:703:LEU:HD13	1.73	0.71
1:C:351:ILE:HD11	1:C:607:ILE:HB	1.72	0.70
1:B:328:GLU:HB3	1:B:629:ARG:HD2	1.72	0.70
1:C:41:ARG:NH2	1:D:686:SER:O	2.24	0.70
1:D:27:ARG:NH2	1:D:61:ASP:OD2	2.25	0.70
1:B:232:ILE:HG12	1:B:259:ALA:HB1	1.73	0.69
1:B:368:GLY:HA2	1:B:373:ARG:HB3	1.73	0.69
1:D:368:GLY:HA2	1:D:373:ARG:HB3	1.74	0.69
1:C:316:ARG:HG3	1:C:317:THR:HG23	1.73	0.69
1:B:86:ALA:O	1:B:270:ARG:NH1	2.26	0.69
1:B:431:CYS:HA	1:B:448:LEU:HA	1.75	0.68
1:A:533:PHE:HE1	1:A:546:THR:HG22	1.58	0.68
1:D:380:LEU:HB2	1:D:418:SER:HB2	1.75	0.68
1:C:691:GLU:HA	1:C:697:VAL:HA	1.77	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:457:ASP:OD1	1:C:509:ARG:NH2	2.27	0.66
1:A:211:VAL:H	1:A:215:GLN:HE21	1.44	0.66
1:A:555:ARG:HH11	1:A:555:ARG:HG3	1.61	0.65
1:D:365:LEU:HD11	1:D:369:TRP:HB3	1.78	0.65
1:D:578:VAL:HG13	1:D:592:ARG:HH11	1.62	0.65
1:C:333:ILE:HG22	1:C:360:ILE:HG21	1.78	0.64
1:B:27:ARG:NH2	1:B:64:ASP:OD2	2.31	0.64
1:B:211:VAL:H	1:B:215:GLN:HE21	1.44	0.64
1:D:401:VAL:HG12	1:D:406:LEU:HB2	1.78	0.64
1:A:70:ASP:O	1:A:85:ARG:NH1	2.30	0.64
1:D:142:ILE:HG13	1:D:173:LEU:HD11	1.79	0.64
1:C:281:THR:HG22	1:C:497:ARG:HB2	1.80	0.64
1:C:625:TYR:OH	1:C:633:GLN:NE2	2.30	0.63
1:D:398:ALA:O	1:D:402:ASN:ND2	2.30	0.63
1:A:497:ARG:NH1	1:D:98:THR:OG1	2.31	0.63
1:A:440:SER:HB3	1:D:60:PRO:HA	1.79	0.63
1:A:41:ARG:NH2	1:B:689:ASP:OD1	2.32	0.62
1:B:440:SER:HB3	1:C:60:PRO:HA	1.80	0.62
1:C:652:MET:HE1	1:C:682:LYS:H	1.64	0.62
1:C:680:ARG:HH21	1:C:705:TYR:HA	1.64	0.62
1:C:442:GLY:H	1:C:481:ARG:HE	1.47	0.62
1:A:364:VAL:HG22	1:A:409:GLY:HA3	1.82	0.61
1:C:283:LEU:HD22	1:C:494:GLU:HG3	1.82	0.61
1:C:250:SER:HB3	1:C:296:VAL:HG13	1.82	0.61
1:D:218:GLU:OE2	1:D:220:ARG:NH2	2.33	0.61
1:C:390:LEU:HD11	1:C:397:LEU:HB2	1.81	0.61
1:A:301:ASP:N	1:A:301:ASP:OD1	2.33	0.61
1:A:546:THR:OG1	1:A:555:ARG:NH2	2.33	0.61
1:A:172:ARG:HH22	1:A:174:LYS:HE2	1.65	0.61
1:A:65:ARG:NH2	1:D:444:ASN:OD1	2.32	0.60
1:C:583:VAL:HG23	1:C:585:ARG:H	1.65	0.60
1:A:431:CYS:HA	1:A:448:LEU:HA	1.83	0.60
1:D:457:ASP:OD1	1:D:509:ARG:NH2	2.32	0.60
1:A:252:VAL:HG12	1:A:535:PRO:HB2	1.83	0.60
1:C:429:ASP:OD1	1:C:429:ASP:N	2.34	0.60
1:C:474:TYR:OH	1:C:524:GLU:OE2	2.20	0.59
1:C:590:LYS:O	1:C:594:HIS:ND1	2.35	0.59
1:D:174:LYS:HB3	1:D:283:LEU:HD12	1.82	0.59
1:C:102:LEU:HD21	1:C:137:LEU:HD13	1.84	0.59
1:B:411:TRP:HD1	1:B:476:LYS:HE2	1.67	0.59
1:B:594:HIS:ND1	1:B:721:MET:SD	2.73	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:378:ARG:HG2	1:D:420:ASN:HB3	1.84	0.59
1:D:461:GLU:O	1:D:465:ASN:ND2	2.34	0.59
1:D:59:ASN:OD1	1:D:65:ARG:NH1	2.35	0.59
1:C:114:PRO:HD3	1:C:132:THR:HG21	1.85	0.59
1:C:193:ILE:HD11	1:C:205:ILE:HB	1.85	0.59
1:C:355:GLU:HA	1:C:358:LEU:HD12	1.85	0.59
1:B:445:GLN:O	1:B:481:ARG:NH1	2.36	0.58
1:B:610:LEU:HD23	1:B:614:GLU:HB3	1.85	0.58
1:B:235:VAL:HG12	1:B:246:VAL:HG13	1.85	0.58
1:C:699:GLY:H	1:D:44:ARG:HG3	1.68	0.58
1:A:461:GLU:O	1:A:465:ASN:ND2	2.36	0.58
1:C:185:PHE:HB2	1:C:269:ALA:HB3	1.84	0.58
1:D:467:LEU:HD21	1:D:475:VAL:HG21	1.86	0.58
1:C:238:ASN:ND2	1:D:240:ASP:OD2	2.37	0.58
1:A:681:LEU:HD13	1:A:703:LEU:HB3	1.86	0.57
1:D:117:ASN:HB3	1:D:291:GLN:HG3	1.87	0.57
1:C:316:ARG:NH1	1:C:633:GLN:O	2.38	0.57
1:D:434:VAL:HG22	1:D:485:GLU:HB3	1.86	0.57
1:A:452:ARG:HB2	1:A:455:VAL:HG23	1.86	0.57
1:A:595:VAL:O	1:A:598:SER:OG	2.22	0.57
1:A:335:ASN:ND2	1:A:366:ASP:OD2	2.38	0.57
1:A:54:ARG:NH1	1:B:673:ASN:OD1	2.35	0.56
1:D:125:GLU:OE2	1:D:325:ARG:NH2	2.39	0.56
1:B:201:ARG:HA	1:B:558:ILE:HD11	1.86	0.56
1:C:252:VAL:HG12	1:C:535:PRO:HB2	1.87	0.56
1:C:205:ILE:H	1:C:644:PHE:HE2	1.51	0.56
1:C:364:VAL:HG12	1:C:409:GLY:HA3	1.87	0.56
1:A:86:ALA:O	1:A:270:ARG:NH1	2.39	0.56
1:B:377:ARG:NH1	1:B:444:ASN:OD1	2.39	0.56
1:B:175:LEU:HB2	1:B:282:TRP:HB3	1.86	0.56
1:A:434:VAL:HG23	1:A:437:ARG:HB2	1.89	0.55
1:A:497:ARG:HE	1:A:497:ARG:HA	1.71	0.55
1:B:241:GLU:OE2	1:B:639:ARG:NH1	2.39	0.55
1:B:583:VAL:O	1:D:714:SER:OG	2.24	0.55
1:C:75:GLU:OE1	1:C:161:ARG:NH1	2.39	0.55
1:D:339:THR:OG1	1:D:342:ASP:O	2.24	0.55
1:A:27:ARG:NH2	1:A:64:ASP:OD2	2.39	0.55
1:D:447:VAL:HG13	1:D:481:ARG:HD3	1.87	0.55
1:A:85:ARG:HE	1:A:270:ARG:NH2	2.04	0.55
1:C:252:VAL:HG22	1:C:294:GLU:O	2.07	0.55
1:C:380:LEU:HB2	1:C:418:SER:HB2	1.89	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:102:LEU:HD22	1:A:137:LEU:HB3	1.88	0.54
1:B:195:LEU:HB2	1:B:229:ASN:HB3	1.90	0.54
1:A:587:ALA:O	1:A:592:ARG:NH2	2.39	0.54
1:C:195:LEU:HB2	1:C:229:ASN:HB3	1.89	0.54
1:B:203:ARG:NE	1:B:562:THR:OG1	2.34	0.54
1:A:663:VAL:HG21	1:A:681:LEU:HD21	1.90	0.54
1:D:411:TRP:HD1	1:D:476:LYS:HE2	1.73	0.54
1:A:10:LYS:HB3	1:A:25:LEU:HB2	1.90	0.54
1:A:612:GLU:HA	1:A:615:LYS:HE3	1.90	0.54
1:A:680:ARG:NH2	1:B:245:GLU:OE2	2.39	0.54
1:A:250:SER:HB3	1:A:296:VAL:HG13	1.89	0.53
1:C:158:VAL:HG13	1:C:296:VAL:HG23	1.91	0.53
1:A:158:VAL:HG13	1:A:296:VAL:HG23	1.90	0.53
1:D:373:ARG:NH1	1:D:378:ARG:O	2.42	0.53
1:C:149:GLN:HE22	1:C:164:ARG:HB2	1.74	0.53
1:C:434:VAL:HG23	1:C:437:ARG:HB2	1.91	0.53
1:A:198:ALA:HB2	1:D:265:GLN:HB2	1.91	0.53
1:C:175:LEU:HB2	1:C:282:TRP:HB3	1.90	0.53
1:A:705:TYR:CD1	1:B:38:LYS:HE3	2.43	0.53
1:B:450:TYR:HE2	1:B:507:LEU:HD13	1.73	0.53
1:A:714:SER:OG	1:C:583:VAL:O	2.27	0.52
1:C:313:GLU:HA	1:C:316:ARG:HG2	1.91	0.52
1:C:687:ASN:HA	1:D:41:ARG:HH22	1.74	0.52
1:B:452:ARG:HE	1:B:490:ALA:HB2	1.74	0.52
1:C:467:LEU:HG	1:C:472:ILE:HG21	1.91	0.52
1:C:507:LEU:HD21	1:C:532:ARG:HH12	1.74	0.52
1:B:198:ALA:HB2	1:C:265:GLN:HB2	1.91	0.52
1:A:227:GLN:HG3	1:D:265:GLN:HB3	1.92	0.52
1:A:555:ARG:HD2	1:A:559:GLN:HG3	1.90	0.52
1:B:265:GLN:HB2	1:C:198:ALA:HB2	1.91	0.52
1:C:22:VAL:HG21	1:C:43:VAL:HG21	1.92	0.52
1:C:475:VAL:HG23	1:C:521:ILE:HD11	1.90	0.52
1:A:203:ARG:HE	1:A:562:THR:HB	1.74	0.52
1:A:232:ILE:HG12	1:A:259:ALA:HB1	1.91	0.52
1:A:591:THR:HG21	1:A:717:PHE:O	2.10	0.52
1:B:373:ARG:NH1	1:B:378:ARG:O	2.43	0.52
1:B:578:VAL:HG11	1:B:587:ALA:H	1.75	0.52
1:D:329:ARG:O	1:D:629:ARG:NH2	2.43	0.51
1:D:385:VAL:HG21	1:D:393:GLY:HA2	1.93	0.51
1:D:481:ARG:NH1	1:D:482:HIS:O	2.43	0.51
1:C:392:ASN:HB3	1:C:396:GLY:HA3	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:133:LEU:HB3	1:D:150:TYR:HB2	1.92	0.51
1:D:211:VAL:HG13	1:D:215:GLN:NE2	2.25	0.51
1:A:162:SER:HB3	1:A:294:GLU:HA	1.92	0.51
1:C:337:GLU:HB2	1:C:604:GLU:HG2	1.92	0.51
1:C:218:GLU:OE2	1:C:220:ARG:NH2	2.44	0.51
1:B:555:ARG:HD2	1:B:559:GLN:HG3	1.93	0.51
1:C:275:ILE:HD11	1:C:293:PRO:HD2	1.92	0.51
1:D:333:ILE:HG22	1:D:360:ILE:HG21	1.93	0.51
1:D:543:GLN:OE1	1:D:600:ASN:ND2	2.44	0.51
1:A:530:GLY:N	1:A:546:THR:O	2.44	0.51
1:A:211:VAL:HG22	1:A:215:GLN:HG3	1.92	0.51
1:A:725:LYS:NZ	1:A:726:ALA:O	2.31	0.51
1:C:546:THR:OG1	1:C:555:ARG:NH1	2.40	0.51
1:B:434:VAL:HG23	1:B:437:ARG:HB2	1.93	0.51
1:C:324:PHE:HA	1:C:327:ARG:HG3	1.92	0.51
1:B:626:LYS:HB3	1:B:629:ARG:HH21	1.75	0.51
1:B:504:MET:HE3	1:B:507:LEU:HD23	1.92	0.50
1:A:215:GLN:OE1	1:A:215:GLN:N	2.42	0.50
1:C:573:ALA:HB1	1:C:596:ALA:HA	1.93	0.50
1:B:116:LEU:HD12	1:B:121:ALA:HB2	1.93	0.50
1:B:441:GLU:HA	1:B:481:ARG:HH12	1.77	0.50
1:C:202:GLU:HG3	1:C:226:HIS:HB3	1.94	0.50
1:C:411:TRP:HD1	1:C:476:LYS:HE3	1.74	0.50
1:D:75:GLU:OE1	1:D:161:ARG:NH1	2.44	0.50
1:A:447:VAL:HG23	1:A:481:ARG:HD3	1.94	0.50
1:C:483:MET:HB2	1:C:486:ILE:HD11	1.93	0.50
1:B:552:ALA:HB2	1:B:592:ARG:HA	1.93	0.50
1:A:22:VAL:HG21	1:A:43:VAL:HG21	1.94	0.49
1:A:252:VAL:HG22	1:A:294:GLU:O	2.12	0.49
1:A:41:ARG:NH1	1:B:686:SER:O	2.43	0.49
1:B:496:GLN:NE2	1:B:497:ARG:HG2	2.27	0.49
1:D:363:VAL:HG23	1:D:406:LEU:HD22	1.94	0.49
1:D:661:ALA:HB3	1:D:724:LEU:HB2	1.93	0.49
1:B:70:ASP:OD2	1:C:221:ARG:NH2	2.40	0.49
1:C:240:ASP:OD1	1:D:238:ASN:ND2	2.38	0.49
1:D:195:LEU:HB2	1:D:229:ASN:HB3	1.95	0.49
1:A:161:ARG:HE	1:A:181:MET:HB2	1.77	0.49
1:A:442:GLY:O	1:A:445:GLN:HG2	2.11	0.49
1:B:92:GLN:HB2	1:B:176:LEU:HD11	1.94	0.49
1:C:192:TRP:HZ3	1:C:232:ILE:HD11	1.77	0.49
1:D:202:GLU:HG3	1:D:226:HIS:HB3	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:578:VAL:HG21	1:C:587:ALA:H	1.77	0.49
1:C:691:GLU:HG3	1:C:725:LYS:HG3	1.95	0.49
1:D:113:LYS:HD3	1:D:151:THR:HG21	1.95	0.49
1:B:380:LEU:HB2	1:B:418:SER:HB2	1.95	0.49
1:B:576:SER:O	1:B:592:ARG:NH1	2.45	0.49
1:B:460:ILE:HA	1:B:514:ILE:HD11	1.94	0.48
1:C:622:VAL:HG12	1:C:626:LYS:HE3	1.95	0.48
1:D:611:THR:O	1:D:615:LYS:HG2	2.13	0.48
1:B:51:ARG:HD2	1:B:51:ARG:HA	1.56	0.48
1:B:411:TRP:CD1	1:B:476:LYS:HE2	2.48	0.48
1:D:92:GLN:HB3	1:D:174:LYS:HG3	1.95	0.48
1:D:555:ARG:HH22	1:D:573:ALA:HA	1.78	0.48
1:C:496:GLN:NE2	1:C:497:ARG:HG2	2.28	0.48
1:B:428:PRO:O	1:B:439:ARG:NH1	2.46	0.48
1:D:509:ARG:NH1	1:D:513:GLU:OE2	2.46	0.48
1:D:582:GLN:N	1:D:582:GLN:OE1	2.46	0.48
1:A:161:ARG:HH21	1:A:182:SER:H	1.61	0.48
1:B:551:ASP:OD2	1:B:585:ARG:NH1	2.44	0.48
1:A:38:LYS:HB3	1:B:705:TYR:CG	2.49	0.48
1:A:184:ASP:OD1	1:A:270:ARG:NE	2.30	0.48
1:A:440:SER:OG	1:A:485:GLU:OE2	2.31	0.48
1:A:709:ALA:HB3	1:B:48:ALA:HB3	1.96	0.48
1:B:606:ASP:OD2	1:B:609:LYS:NZ	2.30	0.48
1:C:697:VAL:HG22	1:D:44:ARG:HH21	1.78	0.48
1:A:669:LEU:HD21	1:C:669:LEU:HD21	1.96	0.48
1:D:460:ILE:HD11	1:D:510:VAL:HA	1.95	0.48
1:D:560:TYR:CZ	1:D:639:ARG:HD2	2.49	0.48
1:C:113:LYS:HD2	1:C:151:THR:HG21	1.96	0.47
1:C:568:ILE:HD11	1:C:599:GLY:HA2	1.96	0.47
1:A:459:ILE:O	1:A:463:ILE:HG12	2.14	0.47
1:C:51:ARG:HD2	1:C:51:ARG:HA	1.56	0.47
1:C:111:LYS:NZ	1:C:131:GLU:HB3	2.29	0.47
1:A:99:VAL:HG21	1:D:485:GLU:HA	1.95	0.47
1:A:147:THR:HB	1:A:164:ARG:HB3	1.97	0.47
1:A:382:ASP:OD1	1:A:382:ASP:N	2.46	0.47
1:B:22:VAL:HG21	1:B:43:VAL:HG21	1.96	0.47
1:B:496:GLN:HE22	1:B:497:ARG:HG2	1.78	0.47
1:C:442:GLY:N	1:C:481:ARG:HE	2.12	0.47
1:A:175:LEU:HB2	1:A:282:TRP:HB3	1.96	0.47
1:A:705:TYR:HB3	1:B:38:LYS:HB3	1.96	0.47
1:B:85:ARG:HE	1:B:270:ARG:NH2	2.12	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:525:SER:OG	1:B:544:THR:HG23	2.15	0.47
1:B:680:ARG:HH21	1:B:705:TYR:HA	1.79	0.47
1:C:394:LEU:HB3	1:C:470:ALA:HB2	1.96	0.47
1:D:235:VAL:HG13	1:D:239:ALA:HB3	1.96	0.47
1:A:53:ASP:OD1	1:A:65:ARG:HD2	2.15	0.47
1:D:356:ALA:HB2	1:D:406:LEU:HD11	1.96	0.47
1:A:265:GLN:HB2	1:D:198:ALA:HB2	1.96	0.47
1:B:377:ARG:HH11	1:B:377:ARG:HG2	1.80	0.47
1:C:73:LEU:HD22	1:C:184:ASP:HB3	1.96	0.47
1:C:388:ARG:HA	1:C:388:ARG:HD3	1.70	0.47
1:C:215:GLN:HG2	1:C:261:ILE:HG23	1.97	0.46
1:C:533:PHE:HE1	1:C:546:THR:HG22	1.80	0.46
1:D:366:ASP:OD1	1:D:367:ASP:N	2.43	0.46
1:D:677:SER:HB2	1:D:710:LEU:HD11	1.97	0.46
1:B:329:ARG:HA	1:B:330:PRO:HD3	1.82	0.46
1:D:161:ARG:HD3	1:D:297:MET:HE1	1.97	0.46
1:B:265:GLN:HB3	1:C:227:GLN:HG3	1.96	0.46
1:C:628:VAL:O	1:C:632:VAL:HG13	2.15	0.46
1:D:397:LEU:O	1:D:401:VAL:HG23	2.16	0.46
2:G:2:GLA:O2	2:G:4:FRU:H4	2.15	0.46
1:A:149:GLN:HE21	1:A:149:GLN:HB2	1.53	0.46
1:A:236:ALA:HB3	1:A:239:ALA:HB2	1.98	0.46
1:B:23:MET:HE3	1:B:75:GLU:HG3	1.97	0.46
1:D:14:LEU:HD11	1:D:150:TYR:HB3	1.97	0.46
1:D:58:PRO:HB2	1:D:82:THR:HG22	1.97	0.46
1:D:221:ARG:HD3	1:D:482:HIS:CE1	2.50	0.46
1:A:415:GLU:HA	1:A:450:TYR:HE2	1.80	0.46
1:A:535:PRO:HD3	1:A:566:TYR:HE1	1.81	0.46
1:A:555:ARG:HG3	1:A:555:ARG:NH1	2.27	0.46
1:A:227:GLN:OE1	1:A:227:GLN:N	2.48	0.46
1:A:375:ASP:OD1	1:A:375:ASP:N	2.47	0.46
1:B:227:GLN:OE1	1:B:227:GLN:N	2.47	0.46
1:B:93:LEU:HD13	1:B:142:ILE:HD11	1.96	0.46
1:C:222:GLY:HA3	1:C:483:MET:SD	2.56	0.46
1:D:227:GLN:OE1	1:D:227:GLN:N	2.47	0.46
1:D:432:LEU:HB2	1:D:447:VAL:HG23	1.97	0.46
1:D:236:ALA:HB3	1:D:239:ALA:HB2	1.98	0.46
1:D:283:LEU:N	1:D:498:GLU:OE2	2.43	0.46
1:D:442:GLY:O	1:D:445:GLN:HG2	2.15	0.46
1:A:394:LEU:HD12	1:A:395:ASP:N	2.32	0.46
1:B:385:VAL:HG12	1:B:394:LEU:HD13	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:415:GLU:OE2	1:D:477:TRP:NE1	2.48	0.46
1:A:417:VAL:HG23	1:A:448:LEU:HD22	1.97	0.45
1:C:91:VAL:HG11	1:C:173:LEU:HD23	1.97	0.45
1:C:147:THR:HB	1:C:164:ARG:HB3	1.98	0.45
1:C:472:ILE:HG23	1:C:521:ILE:HD12	1.97	0.45
1:C:640:LEU:HD12	1:C:640:LEU:HA	1.81	0.45
1:D:102:LEU:HD22	1:D:137:LEU:HB3	1.99	0.45
1:A:640:LEU:HD13	1:A:679:LEU:HD11	1.97	0.45
1:B:337:GLU:HB2	1:B:604:GLU:HG2	1.98	0.45
1:B:460:ILE:HG13	1:B:461:GLU:N	2.31	0.45
1:A:324:PHE:CD2	1:A:522:LEU:HD12	2.51	0.45
1:B:38:LYS:HE2	1:B:38:LYS:HB2	1.84	0.45
1:C:416:MET:HE2	1:C:445:GLN:HE21	1.82	0.45
1:A:336:TRP:CE3	2:E:1:GLA:H62	2.52	0.45
1:B:532:ARG:HE	1:B:532:ARG:HB3	1.54	0.45
1:D:687:ASN:O	1:D:687:ASN:ND2	2.43	0.45
1:A:526:CYS:SG	2:E:1:GLA:H2	2.56	0.45
1:A:262:GLU:HB3	1:A:270:ARG:HB3	1.98	0.45
1:C:105:LYS:HA	1:C:105:LYS:HD2	1.76	0.45
1:C:227:GLN:OE1	1:C:227:GLN:N	2.49	0.45
1:C:351:ILE:HG12	1:C:607:ILE:HD13	1.99	0.45
1:C:598:SER:OG	1:C:651:TRP:NE1	2.50	0.45
1:B:167:ASN:ND2	1:B:173:LEU:HD13	2.31	0.45
1:B:373:ARG:HD2	1:B:373:ARG:HA	1.54	0.45
1:A:559:GLN:HA	1:A:562:THR:HG22	1.98	0.45
1:A:663:VAL:HB	1:A:722:TRP:HB2	1.99	0.45
1:B:180:SER:H	1:B:274:GLY:HA3	1.82	0.45
1:B:221:ARG:HD3	1:B:482:HIS:ND1	2.32	0.45
1:C:421:SER:O	1:C:425:ARG:HG3	2.17	0.45
1:C:467:LEU:HD21	1:C:475:VAL:HG21	1.99	0.45
1:D:162:SER:HB3	1:D:294:GLU:HA	1.98	0.45
1:A:502:ARG:HA	1:A:505:LEU:HB2	1.99	0.44
1:B:58:PRO:HB2	1:B:82:THR:HG22	1.99	0.44
1:B:355:GLU:HB3	1:B:360:ILE:HD12	1.98	0.44
1:B:583:VAL:HG23	1:B:585:ARG:H	1.81	0.44
1:B:442:GLY:H	1:B:481:ARG:NH1	2.15	0.44
1:B:450:TYR:HB2	1:B:503:TYR:CD1	2.52	0.44
1:D:91:VAL:HG13	1:D:175:LEU:HD23	2.00	0.44
1:D:475:VAL:HG23	1:D:521:ILE:HD11	1.97	0.44
1:D:541:MET:HA	1:D:542:PRO:HD3	1.82	0.44
1:C:261:ILE:HD11	1:C:269:ALA:HB1	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:714:SER:OG	1:A:715:SER:N	2.51	0.44
1:B:554:SER:O	1:B:558:ILE:HG12	2.17	0.44
1:D:351:ILE:O	1:D:355:GLU:HG3	2.16	0.44
1:A:572:GLY:HA2	1:A:600:ASN:OD1	2.18	0.44
1:C:205:ILE:HG23	1:C:561:GLY:HA2	1.99	0.44
1:A:172:ARG:HG3	1:A:172:ARG:HH11	1.82	0.44
1:A:541:MET:HA	1:A:542:PRO:HD3	1.85	0.44
1:A:677:SER:HB2	1:A:710:LEU:HD22	2.00	0.44
1:B:194:HIS:CD2	1:B:196:PRO:HD3	2.53	0.44
1:C:652:MET:HG2	1:C:663:VAL:HA	1.98	0.44
1:D:73:LEU:HD12	1:D:73:LEU:H	1.82	0.44
1:D:398:ALA:HB3	1:D:471:PRO:HD2	1.99	0.44
1:A:92:GLN:HB2	1:A:176:LEU:HD11	1.99	0.44
1:A:354:THR:O	1:A:358:LEU:HD13	2.17	0.44
1:A:551:ASP:O	1:A:555:ARG:HB2	2.18	0.44
1:C:225:SER:N	1:C:531:GLY:O	2.50	0.44
1:D:450:TYR:HB2	1:D:503:TYR:CD1	2.53	0.44
1:D:568:ILE:HD13	1:D:653:PHE:HE1	1.83	0.44
1:C:352:ALA:HA	1:C:355:GLU:HG2	1.99	0.44
1:C:387:ARG:NH2	1:C:391:PRO:O	2.51	0.44
1:D:434:VAL:HG23	1:D:437:ARG:HB2	1.99	0.44
1:A:551:ASP:OD1	1:A:585:ARG:HB3	2.18	0.44
1:B:158:VAL:HG13	1:B:296:VAL:HG13	2.00	0.43
1:A:223:ALA:HA	1:A:254:SER:O	2.18	0.43
1:B:51:ARG:HH21	1:B:67:PHE:HA	1.82	0.43
1:B:465:ASN:OD1	1:B:465:ASN:N	2.50	0.43
1:B:692:ILE:HG13	1:B:724:LEU:HG	2.00	0.43
1:C:156:TRP:NE1	1:C:313:GLU:OE2	2.50	0.43
1:A:168:LYS:HE3	1:A:168:LYS:HB3	1.79	0.43
1:D:104:TYR:OH	1:D:107:HIS:ND1	2.28	0.43
1:A:385:VAL:HG11	1:A:393:GLY:HA2	1.99	0.43
1:C:236:ALA:HB3	1:C:239:ALA:HB2	1.99	0.43
1:C:275:ILE:HD12	1:C:275:ILE:H	1.84	0.43
1:C:316:ARG:HH12	1:C:569:SER:HB3	1.83	0.43
1:D:523:PHE:HB3	1:D:541:MET:HG2	2.01	0.43
1:A:254:SER:HA	1:A:534:ASP:OD2	2.18	0.43
1:A:430:TRP:CE3	1:A:455:VAL:HG13	2.54	0.43
1:C:450:TYR:HB2	1:C:503:TYR:CD1	2.54	0.43
1:A:667:ARG:HH11	1:A:667:ARG:HG2	1.83	0.43
1:B:18:LYS:HG2	1:B:157:ASN:HD21	1.83	0.43
1:C:202:GLU:OE1	1:C:202:GLU:N	2.46	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:224:SER:HB2	1:C:532:ARG:HA	2.00	0.43
1:C:504:MET:HG3	1:C:508:TYR:CE2	2.54	0.43
1:D:222:GLY:HA3	1:D:483:MET:SD	2.58	0.43
1:D:312:HIS:NE2	1:D:563:SER:O	2.41	0.43
1:B:686:SER:HB2	1:B:701:ASP:HB3	2.01	0.43
1:C:162:SER:HB3	1:C:294:GLU:HA	2.00	0.43
1:C:308:SER:OG	1:C:639:ARG:NH2	2.37	0.43
1:A:18:LYS:HE3	1:A:38:LYS:HD2	2.01	0.43
1:B:421:SER:O	1:B:425:ARG:HG3	2.19	0.43
1:C:607:ILE:HA	1:C:610:LEU:HD21	1.99	0.43
1:D:373:ARG:NH1	1:D:378:ARG:H	2.16	0.43
1:A:454:ASP:OD2	1:A:454:ASP:N	2.52	0.43
1:C:285:GLN:N	1:C:288:GLU:OE2	2.46	0.43
1:A:218:GLU:OE2	1:A:220:ARG:NH2	2.52	0.43
1:A:652:MET:SD	1:A:681:LEU:HD23	2.59	0.43
1:B:332:LEU:HB3	1:B:362:LEU:HD23	2.01	0.43
1:C:333:ILE:HD11	1:C:607:ILE:HD11	2.01	0.43
1:C:578:VAL:HG11	1:C:586:VAL:HG13	2.01	0.43
1:B:401:VAL:HG13	1:B:406:LEU:HB2	2.01	0.42
1:D:613:THR:O	1:D:616:GLN:HG2	2.18	0.42
1:A:473:THR:O	1:A:473:THR:OG1	2.36	0.42
1:C:49:PHE:CZ	1:C:51:ARG:HD3	2.54	0.42
1:D:211:VAL:HG13	1:D:215:GLN:HE21	1.84	0.42
1:A:449:ASP:OD2	1:A:451:SER:OG	2.25	0.42
1:D:25:LEU:HD11	1:D:29:GLY:HA2	2.01	0.42
1:D:626:LYS:HA	1:D:629:ARG:HD2	2.00	0.42
1:A:78:ALA:HB2	1:A:89:TYR:CE2	2.55	0.42
1:A:163:ALA:H	1:A:292:THR:HG22	1.83	0.42
1:B:555:ARG:HH12	1:B:573:ALA:HA	1.83	0.42
1:C:530:GLY:N	1:C:546:THR:O	2.53	0.42
1:D:459:ILE:HD13	1:D:459:ILE:HA	1.86	0.42
1:A:194:HIS:CD2	1:A:196:PRO:HD3	2.54	0.42
1:A:525:SER:HB2	1:A:544:THR:HG23	2.01	0.42
1:C:511:MET:HE3	1:C:511:MET:HB2	1.87	0.42
1:A:179:LEU:HD13	1:A:272:SER:HB2	2.01	0.42
1:A:573:ALA:HB1	1:A:596:ALA:HA	2.01	0.42
1:D:364:VAL:HG13	1:D:409:GLY:HA3	2.01	0.42
1:A:251:PHE:CE1	1:A:293:PRO:HB2	2.55	0.42
1:A:527:SER:OG	1:A:532:ARG:HD2	2.20	0.42
1:B:236:ALA:HB3	1:B:239:ALA:HB2	2.02	0.42
1:C:515:THR:HG22	1:C:523:PHE:CD2	2.55	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:557:LYS:HB3	1:C:644:PHE:HE1	1.85	0.42
1:D:302:GLN:HB3	1:D:306:GLY:HA3	2.02	0.42
1:A:96:GLY:O	1:D:497:ARG:HD2	2.19	0.42
1:A:319:LEU:HD23	1:A:538:LEU:HD23	2.01	0.42
1:B:417:VAL:HG13	1:B:423:LEU:HD21	2.01	0.42
1:B:461:GLU:OE2	1:B:517:ARG:NH2	2.52	0.42
1:C:692:ILE:HG12	1:C:724:LEU:HG	2.01	0.42
1:D:347:LYS:HD3	1:D:347:LYS:HA	1.76	0.42
1:A:480:ASN:ND2	2:E:2:GLA:O4	2.53	0.42
1:A:524:GLU:OE1	1:A:543:GLN:NE2	2.49	0.42
1:B:49:PHE:CZ	1:B:51:ARG:HD3	2.54	0.42
1:B:251:PHE:CE1	1:B:293:PRO:HB2	2.55	0.42
1:C:252:VAL:O	1:C:252:VAL:HG23	2.20	0.42
1:A:180:SER:HA	1:A:292:THR:HG21	2.02	0.42
1:A:196:PRO:HB3	1:A:228:GLN:HE22	1.83	0.42
1:A:264:ASP:OD1	1:A:268:THR:HG23	2.19	0.42
1:B:151:THR:O	1:B:159:ILE:HA	2.20	0.42
1:B:481:ARG:HG2	1:B:482:HIS:N	2.35	0.42
1:B:524:GLU:OE1	1:B:543:GLN:NE2	2.52	0.42
1:C:161:ARG:NH2	1:C:182:SER:H	2.18	0.42
1:C:711:PRO:HG2	1:C:720:MET:HE1	2.02	0.42
1:D:78:ALA:HB2	1:D:89:TYR:CE2	2.54	0.42
1:D:329:ARG:HA	1:D:330:PRO:HD3	1.86	0.42
1:A:222:GLY:HA3	1:A:483:MET:SD	2.60	0.41
1:A:284:LEU:HD23	1:A:288:GLU:HG3	2.01	0.41
1:B:76:TYR:HB2	1:B:148:LEU:HD21	2.01	0.41
1:B:229:ASN:O	1:B:231:PHE:N	2.52	0.41
1:C:254:SER:OG	1:C:534:ASP:OD2	2.25	0.41
1:C:625:TYR:CE2	1:C:629:ARG:HB2	2.55	0.41
1:A:109:ILE:HG12	1:A:133:LEU:HD13	2.01	0.41
1:B:449:ASP:O	1:B:455:VAL:HG21	2.19	0.41
1:D:373:ARG:HD2	1:D:373:ARG:HA	1.61	0.41
1:A:18:LYS:HG2	1:A:157:ASN:HD21	1.84	0.41
1:A:625:TYR:OH	1:A:633:GLN:NE2	2.41	0.41
1:B:113:LYS:HA	1:B:114:PRO:HD3	1.94	0.41
1:B:196:PRO:HD2	1:B:204:TRP:O	2.20	0.41
1:D:316:ARG:O	1:D:325:ARG:HG3	2.20	0.41
1:A:504:MET:HE3	1:A:507:LEU:HD23	2.03	0.41
1:D:18:LYS:HD2	1:D:18:LYS:HA	1.82	0.41
1:D:336:TRP:O	1:D:340:TYR:HD1	2.04	0.41
1:D:692:ILE:HG13	1:D:724:LEU:HG	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:456:CYS:O	1:B:460:ILE:HG12	2.21	0.41
1:B:701:ASP:OD1	1:B:701:ASP:N	2.53	0.41
1:A:275:ILE:HD11	1:A:293:PRO:HD2	2.02	0.41
1:A:395:ASP:OD1	1:A:396:GLY:N	2.53	0.41
1:A:484:THR:HG23	1:D:82:THR:H	1.86	0.41
1:A:495:ARG:O	1:A:497:ARG:N	2.54	0.41
1:B:515:THR:HG22	1:B:523:PHE:CD2	2.56	0.41
1:B:681:LEU:HD13	1:B:684:LEU:HD12	2.02	0.41
1:A:197:GLY:O	1:A:227:GLN:HA	2.20	0.41
1:A:480:ASN:HB3	2:E:2:GLA:O4	2.21	0.41
1:C:678:TYR:CE2	1:D:186:PRO:HB2	2.55	0.41
1:D:113:LYS:HA	1:D:114:PRO:HD3	1.89	0.41
1:B:551:ASP:O	1:B:555:ARG:HB2	2.20	0.41
1:B:669:LEU:HD21	1:D:669:LEU:HD21	2.01	0.41
1:C:329:ARG:HA	1:C:330:PRO:HD3	1.80	0.41
1:C:467:LEU:HD11	1:C:475:VAL:HG21	2.03	0.41
1:A:94:GLU:OE2	1:A:171:GLU:HG2	2.21	0.41
1:A:258:LEU:O	1:A:273:MET:HA	2.21	0.41
1:B:78:ALA:HB2	1:B:89:TYR:CE2	2.56	0.41
1:B:82:THR:H	1:C:484:THR:HG23	1.86	0.41
1:B:196:PRO:HB3	1:B:228:GLN:HE22	1.86	0.41
1:B:678:TYR:HA	1:B:709:ALA:HA	2.03	0.41
1:C:285:GLN:O	1:C:288:GLU:HG2	2.21	0.41
1:C:336:TRP:HB3	1:C:604:GLU:OE2	2.21	0.41
1:C:495:ARG:O	1:C:497:ARG:N	2.54	0.41
1:C:572:GLY:HA2	1:C:600:ASN:HB3	2.03	0.41
1:C:708:VAL:HA	1:D:46:ALA:O	2.21	0.41
1:D:324:PHE:HA	1:D:327:ARG:HB2	2.03	0.41
1:D:526:CYS:SG	1:D:527:SER:N	2.94	0.41
1:D:573:ALA:HB1	1:D:596:ALA:HA	2.03	0.41
1:A:328:GLU:OE1	1:A:630:ARG:HG2	2.21	0.41
1:B:227:GLN:HG3	1:C:265:GLN:HB3	2.02	0.41
1:C:607:ILE:O	1:C:610:LEU:HG	2.21	0.41
1:D:630:ARG:HD3	1:D:630:ARG:HA	1.63	0.41
1:A:70:ASP:HB2	1:A:82:THR:O	2.20	0.40
1:A:202:GLU:OE2	1:A:226:HIS:HD2	2.03	0.40
1:C:221:ARG:HD3	1:C:482:HIS:ND1	2.36	0.40
1:D:449:ASP:OD1	1:D:451:SER:OG	2.23	0.40
1:A:443:ARG:H	1:D:65:ARG:NH1	2.20	0.40
1:B:27:ARG:HB3	1:B:28:SER:H	1.59	0.40
1:B:53:ASP:OD2	2:G:4:FRU:O4	2.25	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:591:THR:HG21	1:B:717:PHE:O	2.21	0.40
1:B:647:ASN:OD1	1:B:668:VAL:HG13	2.20	0.40
1:A:460:ILE:HG13	1:A:461:GLU:N	2.35	0.40
1:B:161:ARG:NH2	1:B:182:SER:H	2.19	0.40
1:B:612:GLU:OE2	1:B:615:LYS:NZ	2.54	0.40
1:B:626:LYS:HB3	1:B:629:ARG:NH2	2.36	0.40
1:D:57:SER:HA	1:D:58:PRO:HD3	1.94	0.40
1:D:172:ARG:HH11	1:D:172:ARG:HG2	1.86	0.40
1:D:515:THR:HG22	1:D:523:PHE:CD2	2.57	0.40
1:D:681:LEU:CD1	1:D:703:LEU:HB2	2.50	0.40
1:A:38:LYS:HG2	1:B:705:TYR:CE2	2.57	0.40
1:A:418:SER:O	1:A:421:SER:OG	2.33	0.40
1:A:600:ASN:HA	1:A:625:TYR:OH	2.21	0.40
1:B:713:ARG:HB2	1:B:718:ILE:HD13	2.03	0.40
1:C:547:SER:O	1:C:555:ARG:NH2	2.54	0.40
1:A:47:ARG:HH21	1:B:678:TYR:HE1	1.69	0.40
1:B:344:ASN:HA	1:B:389:LYS:HB2	2.03	0.40
1:B:351:ILE:O	1:B:355:GLU:HG3	2.21	0.40
1:D:658:ARG:HB3	1:D:685:ASP:HB2	2.04	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	716/729 (98%)	683 (95%)	32 (4%)	1 (0%)	51	83
1	B	716/729 (98%)	685 (96%)	30 (4%)	1 (0%)	51	83
1	C	716/729 (98%)	683 (95%)	32 (4%)	1 (0%)	51	83
1	D	716/729 (98%)	682 (95%)	32 (4%)	2 (0%)	41	75
All	All	2864/2916 (98%)	2733 (95%)	126 (4%)	5 (0%)	47	79

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	496	GLN
1	B	496	GLN
1	C	496	GLN
1	D	496	GLN
1	D	526	CYS

5.3.2 Protein sidechains ⓘ

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	608/618 (98%)	545 (90%)	63 (10%)	7	33
1	B	608/618 (98%)	555 (91%)	53 (9%)	10	41
1	C	608/618 (98%)	567 (93%)	41 (7%)	16	50
1	D	608/618 (98%)	570 (94%)	38 (6%)	18	53
All	All	2432/2472 (98%)	2237 (92%)	195 (8%)	12	43

All (195) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	10	LYS
1	A	15	ARG
1	A	38	LYS
1	A	43	VAL
1	A	51	ARG
1	A	72	LEU
1	A	90	GLN
1	A	94	GLU
1	A	108	ARG
1	A	115	ARG
1	A	124	VAL
1	A	136	VAL
1	A	149	GLN
1	A	154	GLU
1	A	155	LYS

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Mol	Chain	Res	Type
1	A	215	GLN
1	A	224	SER
1	A	232	ILE
1	A	268	THR
1	A	296	VAL
1	A	301	ASP
1	A	302	GLN
1	A	311	TYR
1	A	325	ARG
1	A	349	VAL
1	A	357	GLU
1	A	365	LEU
1	A	375	ASP
1	A	377	ARG
1	A	382	ASP
1	A	389	LYS
1	A	394	LEU
1	A	404	LEU
1	A	410	LEU
1	A	412	VAL
1	A	420	ASN
1	A	423	LEU
1	A	440	SER
1	A	448	LEU
1	A	455	VAL
1	A	463	ILE
1	A	473	THR
1	A	497	ARG
1	A	514	ILE
1	A	522	LEU
1	A	527	SER
1	A	533	PHE
1	A	550	THR
1	A	555	ARG
1	A	575	VAL
1	A	589	LEU
1	A	590	LYS
1	A	598	SER
1	A	607	ILE
1	A	618	MET
1	A	652	MET
1	A	676	LEU

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Mol	Chain	Res	Type
1	A	681	LEU
1	A	682	LYS
1	A	692	ILE
1	A	703	LEU
1	A	710	LEU
1	A	725	LYS
1	B	10	LYS
1	B	40	VAL
1	B	90	GLN
1	B	91	VAL
1	B	126	HIS
1	B	129	GLU
1	B	132	THR
1	B	142	ILE
1	B	155	LYS
1	B	215	GLN
1	B	232	ILE
1	B	263	VAL
1	B	310	THR
1	B	311	TYR
1	B	321	ARG
1	B	325	ARG
1	B	348	ILE
1	B	351	ILE
1	B	354	THR
1	B	364	VAL
1	B	373	ARG
1	B	382	ASP
1	B	394	LEU
1	B	410	LEU
1	B	412	VAL
1	B	440	SER
1	B	448	LEU
1	B	465	ASN
1	B	473	THR
1	B	497	ARG
1	B	522	LEU
1	B	532	ARG
1	B	533	PHE
1	B	544	THR
1	B	550	THR
1	B	555	ARG

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Mol	Chain	Res	Type
1	B	562	THR
1	B	569	SER
1	B	589	LEU
1	B	592	ARG
1	B	595	VAL
1	B	610	LEU
1	B	612	GLU
1	B	615	LYS
1	B	618	MET
1	B	627	ASP
1	B	667	ARG
1	B	668	VAL
1	B	678	TYR
1	B	681	LEU
1	B	682	LYS
1	B	710	LEU
1	B	721	MET
1	C	15	ARG
1	C	28	SER
1	C	34	VAL
1	C	51	ARG
1	C	105	LYS
1	C	108	ARG
1	C	109	ILE
1	C	127	GLU
1	C	136	VAL
1	C	232	ILE
1	C	241	GLU
1	C	261	ILE
1	C	283	LEU
1	C	291	GLN
1	C	292	THR
1	C	296	VAL
1	C	310	THR
1	C	311	TYR
1	C	325	ARG
1	C	332	LEU
1	C	351	ILE
1	C	378	ARG
1	C	382	ASP
1	C	394	LEU
1	C	399	LYS

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Mol	Chain	Res	Type
1	C	416	MET
1	C	420	ASN
1	C	421	SER
1	C	429	ASP
1	C	483	MET
1	C	497	ARG
1	C	509	ARG
1	C	533	PHE
1	C	550	THR
1	C	590	LYS
1	C	610	LEU
1	C	612	GLU
1	C	617	MET
1	C	630	ARG
1	C	632	VAL
1	C	686	SER
1	D	40	VAL
1	D	65	ARG
1	D	132	THR
1	D	142	ILE
1	D	214	VAL
1	D	224	SER
1	D	261	ILE
1	D	268	THR
1	D	283	LEU
1	D	311	TYR
1	D	321	ARG
1	D	332	LEU
1	D	348	ILE
1	D	364	VAL
1	D	365	LEU
1	D	373	ARG
1	D	377	ARG
1	D	416	MET
1	D	423	LEU
1	D	459	ILE
1	D	473	THR
1	D	483	MET
1	D	497	ARG
1	D	532	ARG
1	D	533	PHE
1	D	550	THR

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Mol	Chain	Res	Type
1	D	583	VAL
1	D	607	ILE
1	D	615	LYS
1	D	617	MET
1	D	627	ASP
1	D	630	ARG
1	D	668	VAL
1	D	681	LEU
1	D	687	ASN
1	D	704	MET
1	D	710	LEU
1	D	721	MET

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

Mol	Chain	Res	Type
1	A	149	GLN
1	A	291	GLN
1	A	302	GLN
1	C	291	GLN
1	C	445	GLN
1	C	621	GLN
1	D	580	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

16 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond

length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
2	GLA	E	1	2	11,11,12	2.57	2 (18%)	15,15,17	0.94	0
2	GLA	E	2	2	11,11,12	2.51	2 (18%)	15,15,17	1.73	2 (13%)
2	GLC	E	3	2	11,11,12	2.38	2 (18%)	15,15,17	1.34	1 (6%)
2	FRU	E	4	2	11,12,12	1.69	4 (36%)	10,18,18	1.65	2 (20%)
2	GLA	F	1	2	11,11,12	2.63	2 (18%)	15,15,17	1.15	1 (6%)
2	GLA	F	2	2	11,11,12	2.46	3 (27%)	15,15,17	2.43	7 (46%)
2	GLC	F	3	2	11,11,12	2.60	4 (36%)	15,15,17	1.58	4 (26%)
2	FRU	F	4	2	11,12,12	1.70	4 (36%)	10,18,18	1.96	4 (40%)
2	GLA	G	1	2	11,11,12	2.62	2 (18%)	15,15,17	1.30	1 (6%)
2	GLA	G	2	2	11,11,12	2.47	2 (18%)	15,15,17	2.24	5 (33%)
2	GLC	G	3	2	11,11,12	2.33	2 (18%)	15,15,17	2.14	7 (46%)
2	FRU	G	4	2	11,12,12	1.67	2 (18%)	10,18,18	1.89	4 (40%)
2	GLA	H	1	2	11,11,12	2.56	3 (27%)	15,15,17	1.29	1 (6%)
2	GLA	H	2	2	11,11,12	2.38	3 (27%)	15,15,17	2.28	6 (40%)
2	GLC	H	3	2	11,11,12	2.43	3 (27%)	15,15,17	1.77	5 (33%)
2	FRU	H	4	2	11,12,12	1.70	3 (27%)	10,18,18	2.03	4 (40%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	GLA	E	1	2	-	1/2/19/22	0/1/1/1
2	GLA	E	2	2	-	2/2/19/22	0/1/1/1
2	GLC	E	3	2	-	2/2/19/22	0/1/1/1
2	FRU	E	4	2	-	3/5/24/24	0/1/1/1
2	GLA	F	1	2	-	1/2/19/22	0/1/1/1
2	GLA	F	2	2	-	2/2/19/22	0/1/1/1
2	GLC	F	3	2	-	2/2/19/22	0/1/1/1
2	FRU	F	4	2	-	3/5/24/24	0/1/1/1
2	GLA	G	1	2	-	0/2/19/22	0/1/1/1
2	GLA	G	2	2	-	0/2/19/22	0/1/1/1
2	GLC	G	3	2	-	1/2/19/22	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FRU	G	4	2	-	5/5/24/24	0/1/1/1
2	GLA	H	1	2	-	1/2/19/22	0/1/1/1
2	GLA	H	2	2	-	1/2/19/22	0/1/1/1
2	GLC	H	3	2	-	0/2/19/22	0/1/1/1
2	FRU	H	4	2	-	5/5/24/24	0/1/1/1

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	1	GLA	C2-C3	-7.38	1.41	1.52
2	F	1	GLA	C2-C3	-7.35	1.41	1.52
2	E	1	GLA	C2-C3	-7.27	1.41	1.52
2	E	2	GLA	C2-C3	-7.14	1.42	1.52
2	H	1	GLA	C2-C3	-7.04	1.42	1.52
2	F	2	GLA	C2-C3	-6.94	1.42	1.52
2	G	2	GLA	C2-C3	-6.88	1.42	1.52
2	F	3	GLC	C2-C3	-6.52	1.42	1.52
2	H	2	GLA	C2-C3	-6.46	1.43	1.52
2	H	3	GLC	C2-C3	-6.39	1.43	1.52
2	E	3	GLC	C2-C3	-6.32	1.43	1.52
2	G	3	GLC	C2-C3	-5.82	1.43	1.52
2	F	3	GLC	O5-C1	4.12	1.50	1.43
2	G	3	GLC	O5-C1	3.79	1.49	1.43
2	H	1	GLA	O5-C1	3.52	1.49	1.43
2	G	1	GLA	O5-C1	3.49	1.49	1.43
2	H	3	GLC	O5-C1	3.40	1.49	1.43
2	F	1	GLA	O5-C1	3.31	1.49	1.43
2	E	1	GLA	O5-C1	3.29	1.49	1.43
2	E	3	GLC	O5-C1	3.26	1.48	1.43
2	G	4	FRU	C4-C5	-2.96	1.45	1.53
2	H	4	FRU	C4-C5	-2.84	1.45	1.53
2	F	4	FRU	C4-C5	-2.80	1.45	1.53
2	E	4	FRU	C4-C5	-2.68	1.46	1.53
2	H	4	FRU	O3-C3	-2.59	1.37	1.42
2	H	2	GLA	O5-C1	2.57	1.47	1.43
2	E	4	FRU	O5-C2	-2.56	1.39	1.43
2	G	4	FRU	O3-C3	-2.43	1.37	1.42
2	G	2	GLA	O5-C1	2.43	1.47	1.43
2	F	4	FRU	O3-C3	-2.43	1.37	1.42
2	E	4	FRU	O3-C3	-2.40	1.38	1.42
2	F	2	GLA	O5-C1	2.39	1.47	1.43
2	E	2	GLA	O5-C1	2.23	1.47	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	3	GLC	O2-C2	-2.19	1.38	1.43
2	H	2	GLA	C4-C3	-2.17	1.46	1.52
2	F	3	GLC	C4-C3	-2.16	1.46	1.52
2	F	4	FRU	O2-C2	2.14	1.44	1.40
2	F	2	GLA	C4-C3	-2.14	1.46	1.52
2	E	4	FRU	O2-C2	2.12	1.44	1.40
2	F	4	FRU	O5-C2	-2.10	1.40	1.43
2	H	3	GLC	O2-C2	-2.06	1.39	1.43
2	H	4	FRU	O5-C2	-2.03	1.40	1.43
2	H	1	GLA	O5-C5	-2.02	1.39	1.43

All (54) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	3	GLC	C1-C2-C3	5.17	116.02	109.67
2	G	2	GLA	O5-C5-C6	4.97	114.99	107.20
2	F	2	GLA	C1-C2-C3	4.87	115.65	109.67
2	H	2	GLA	O5-C5-C6	4.54	114.33	107.20
2	F	2	GLA	O5-C5-C6	4.40	114.11	107.20
2	G	2	GLA	C1-C2-C3	4.31	114.97	109.67
2	H	4	FRU	O1-C1-C2	4.03	120.43	111.86
2	F	4	FRU	O1-C1-C2	3.96	120.28	111.86
2	H	2	GLA	C1-O5-C5	3.91	117.50	112.19
2	E	2	GLA	O5-C5-C6	3.86	113.26	107.20
2	H	2	GLA	C1-C2-C3	3.72	114.24	109.67
2	E	2	GLA	C3-C4-C5	3.71	116.85	110.24
2	G	4	FRU	O1-C1-C2	3.62	119.56	111.86
2	F	3	GLC	C1-C2-C3	3.56	114.04	109.67
2	E	4	FRU	O1-C1-C2	3.45	119.20	111.86
2	F	2	GLA	C2-C3-C4	3.31	116.62	110.89
2	H	3	GLC	C3-C4-C5	3.26	116.06	110.24
2	G	3	GLC	C2-C3-C4	3.22	116.47	110.89
2	F	2	GLA	C3-C4-C5	3.01	115.60	110.24
2	H	1	GLA	C1-C2-C3	2.98	113.33	109.67
2	E	3	GLC	C1-C2-C3	2.89	113.22	109.67
2	H	3	GLC	O5-C1-C2	-2.87	106.34	110.77
2	G	1	GLA	C1-C2-C3	2.80	113.11	109.67
2	G	4	FRU	O5-C5-C6	2.72	116.43	108.85
2	H	4	FRU	C6-C5-C4	-2.70	108.58	115.09
2	G	3	GLC	O5-C5-C6	2.68	111.41	107.20
2	G	2	GLA	C2-C3-C4	2.67	115.52	110.89
2	H	2	GLA	O3-C3-C4	-2.67	104.17	110.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	G	2	GLA	C3-C4-C5	2.60	114.87	110.24
2	F	2	GLA	O2-C2-C3	-2.58	104.97	110.14
2	F	3	GLC	O5-C5-C6	2.58	111.25	107.20
2	G	3	GLC	C3-C4-C5	2.51	114.72	110.24
2	H	4	FRU	O5-C5-C6	2.49	115.77	108.85
2	H	3	GLC	O4-C4-C3	-2.48	104.61	110.35
2	H	3	GLC	O5-C5-C6	2.44	111.03	107.20
2	F	4	FRU	O5-C5-C6	2.43	115.63	108.85
2	G	4	FRU	O6-C6-C5	2.41	119.56	111.29
2	G	4	FRU	C6-C5-C4	-2.40	109.31	115.09
2	E	4	FRU	O5-C5-C6	2.37	115.45	108.85
2	F	3	GLC	O2-C2-C3	-2.35	105.44	110.14
2	F	4	FRU	C6-C5-C4	-2.23	109.71	115.09
2	F	2	GLA	O3-C3-C4	-2.22	105.22	110.35
2	G	3	GLC	O2-C2-C3	-2.21	105.71	110.14
2	H	4	FRU	O6-C6-C5	2.20	118.83	111.29
2	F	3	GLC	O4-C4-C3	-2.18	105.31	110.35
2	G	3	GLC	O6-C6-C5	2.15	118.67	111.29
2	F	4	FRU	O6-C6-C5	2.13	118.58	111.29
2	H	2	GLA	C2-C3-C4	2.12	114.57	110.89
2	G	2	GLA	O6-C6-C5	2.10	118.50	111.29
2	F	2	GLA	C1-O5-C5	2.07	115.00	112.19
2	H	3	GLC	C2-C3-C4	2.07	114.48	110.89
2	G	3	GLC	O4-C4-C3	-2.07	105.56	110.35
2	H	2	GLA	O6-C6-C5	2.02	118.21	111.29
2	F	1	GLA	C1-C2-C3	2.01	112.14	109.67

There are no chirality outliers.

All (29) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	4	FRU	O1-C1-C2-C3
2	E	4	FRU	O1-C1-C2-O2
2	E	4	FRU	O1-C1-C2-O5
2	G	4	FRU	O1-C1-C2-C3
2	G	4	FRU	O1-C1-C2-O2
2	G	4	FRU	O1-C1-C2-O5
2	G	4	FRU	O5-C5-C6-O6
2	G	4	FRU	C4-C5-C6-O6
2	H	4	FRU	O5-C5-C6-O6
2	H	4	FRU	C4-C5-C6-O6
2	F	3	GLC	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
2	F	2	GLA	C4-C5-C6-O6
2	E	3	GLC	O5-C5-C6-O6
2	E	2	GLA	C4-C5-C6-O6
2	F	3	GLC	C4-C5-C6-O6
2	F	2	GLA	O5-C5-C6-O6
2	E	2	GLA	O5-C5-C6-O6
2	F	4	FRU	O1-C1-C2-O5
2	E	1	GLA	O5-C5-C6-O6
2	G	3	GLC	O5-C5-C6-O6
2	H	2	GLA	C4-C5-C6-O6
2	E	3	GLC	C4-C5-C6-O6
2	F	4	FRU	O1-C1-C2-C3
2	H	4	FRU	O1-C1-C2-O5
2	F	4	FRU	O1-C1-C2-O2
2	H	4	FRU	O1-C1-C2-O2
2	F	1	GLA	O5-C5-C6-O6
2	H	4	FRU	O1-C1-C2-C3
2	H	1	GLA	O5-C5-C6-O6

There are no ring outliers.

4 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	G	2	GLA	1	0
2	E	1	GLA	2	0
2	E	2	GLA	2	0
2	G	4	FRU	2	0

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

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain F

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain H

Bond lengths

Bond angles

Torsions

Rings
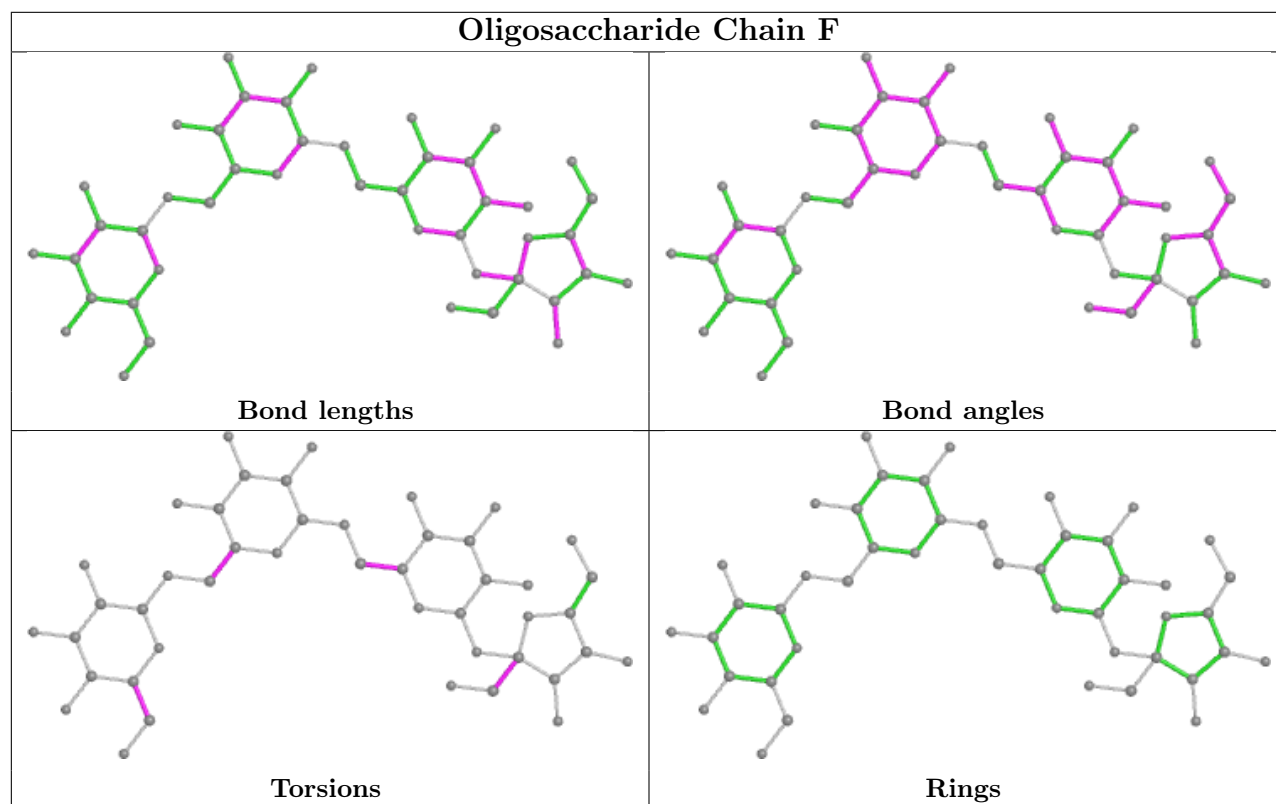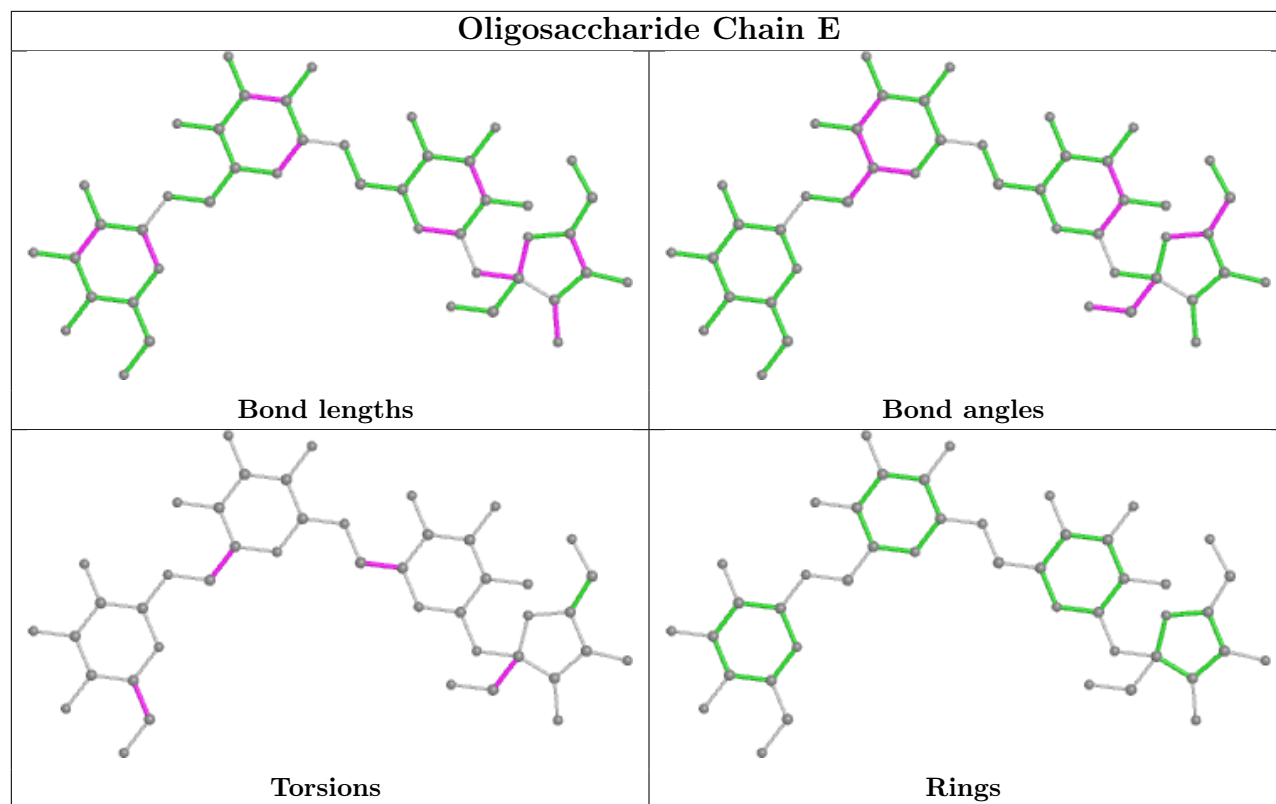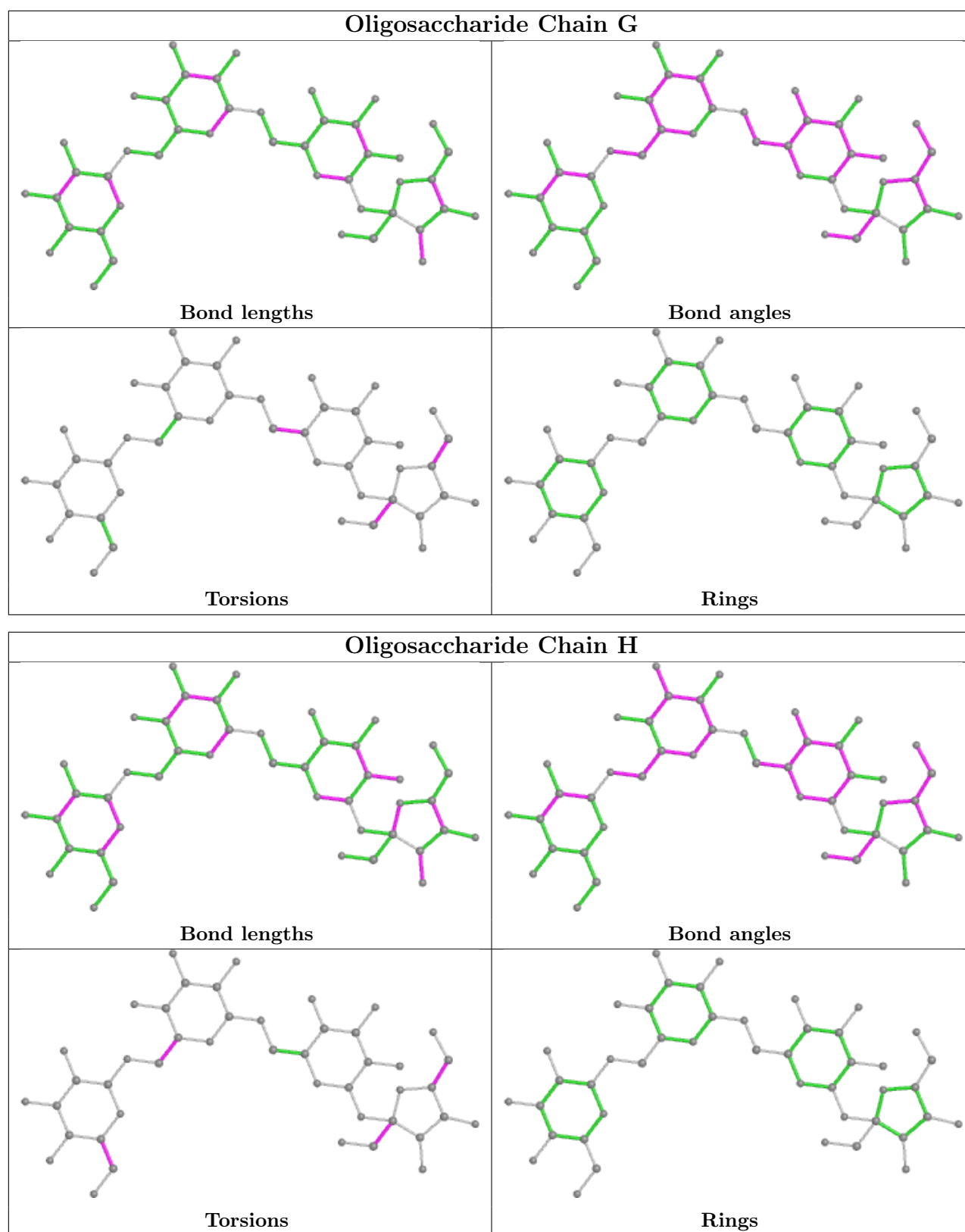
5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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, 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(Å²)	Q<0.9
1	A	718/729 (98%)	-0.36	2 (0%)	94	88	61, 101, 145, 173	0
1	B	718/729 (98%)	-0.51	0	100	100	56, 90, 127, 144	0
1	C	718/729 (98%)	-0.31	3 (0%)	92	86	71, 113, 139, 163	0
1	D	718/729 (98%)	-0.45	1 (0%)	95	93	62, 93, 126, 151	0
All	All	2872/2916 (98%)	-0.41	6 (0%)	95	91	56, 100, 136, 173	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	516	SER	2.7
1	C	323	ALA	2.6
1	A	376	ASP	2.5
1	A	374	ASP	2.1
1	C	405	GLY	2.1
1	D	374	ASP	2.1

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

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

6.3 Carbohydrates ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.
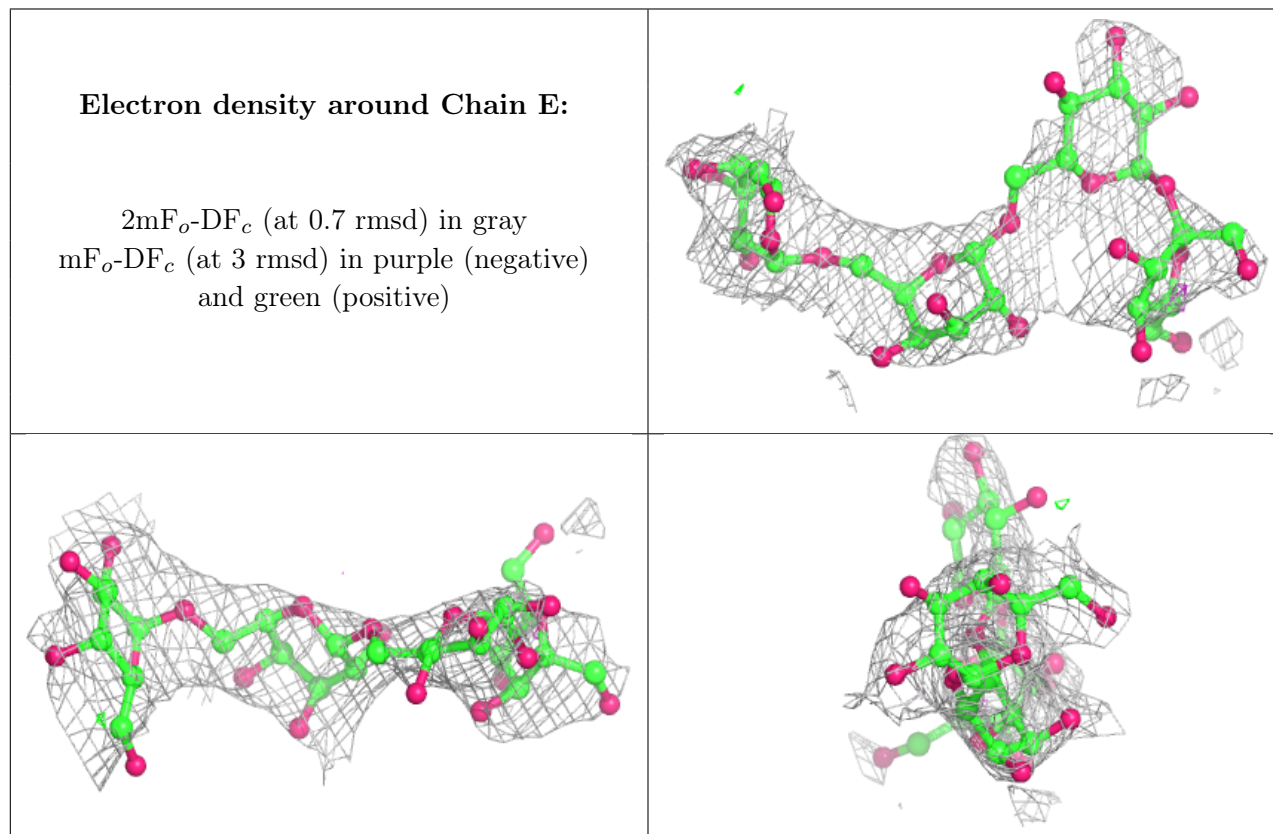
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
2	FRU	G	4	12/12	0.68	0.52	99,131,142,146	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	FRU	E	4	12/12	0.70	0.50	117,138,149,157	0
2	GLC	G	3	11/12	0.73	0.63	124,139,148,150	0
2	GLC	H	3	11/12	0.73	0.34	109,129,137,138	0
2	FRU	F	4	12/12	0.81	0.38	104,131,137,140	0
2	GLA	E	2	11/12	0.81	0.30	106,116,119,121	0
2	GLC	E	3	11/12	0.82	0.45	125,141,146,151	0
2	GLA	G	1	11/12	0.85	0.25	114,119,123,125	0
2	GLA	F	2	11/12	0.87	0.28	104,109,124,127	0
2	GLA	E	1	11/12	0.87	0.26	105,123,130,131	0
2	FRU	H	4	12/12	0.87	0.30	102,121,135,143	0
2	GLC	F	3	11/12	0.88	0.39	122,129,136,138	0
2	GLA	G	2	11/12	0.88	0.27	99,110,115,119	0
2	GLA	F	1	11/12	0.89	0.23	95,103,109,110	0
2	GLA	H	2	11/12	0.91	0.18	94,102,110,110	0
2	GLA	H	1	11/12	0.93	0.19	87,98,102,103	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.


Electron density around Chain E:

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

Electron density around Chain F:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)
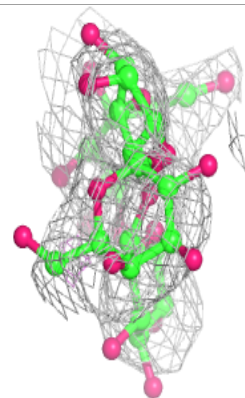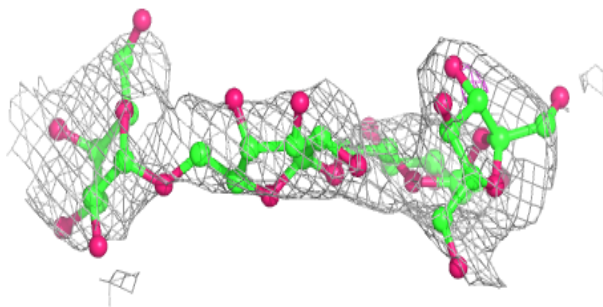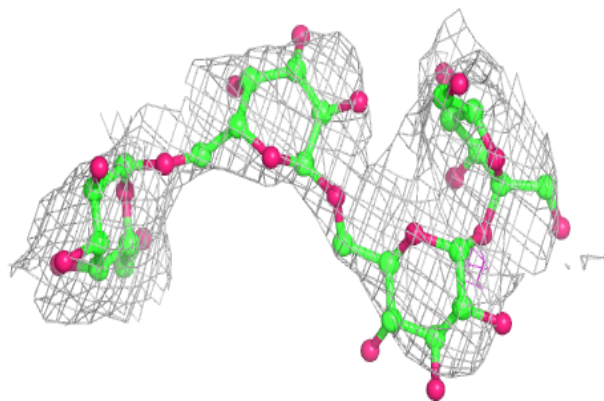
Electron density around Chain G:

2mF$_o$-DF$_c$ (at 0.7 rmsd) in gray
mF$_o$-DF$_c$ (at 3 rmsd) in purple (negative)
and green (positive)

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)
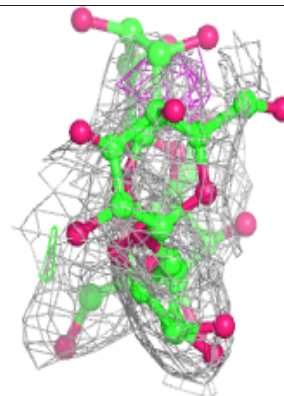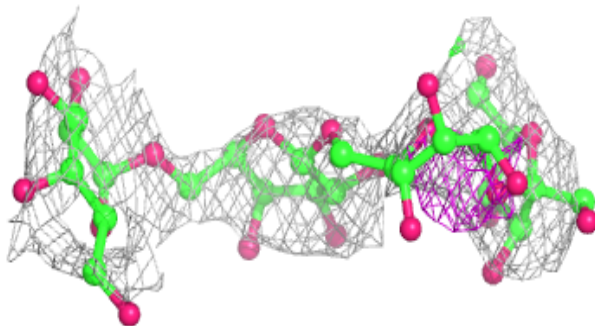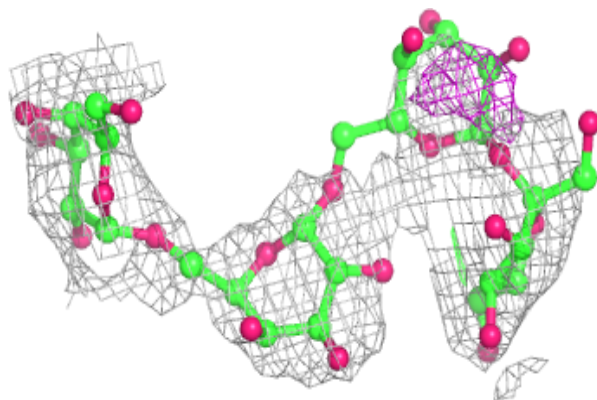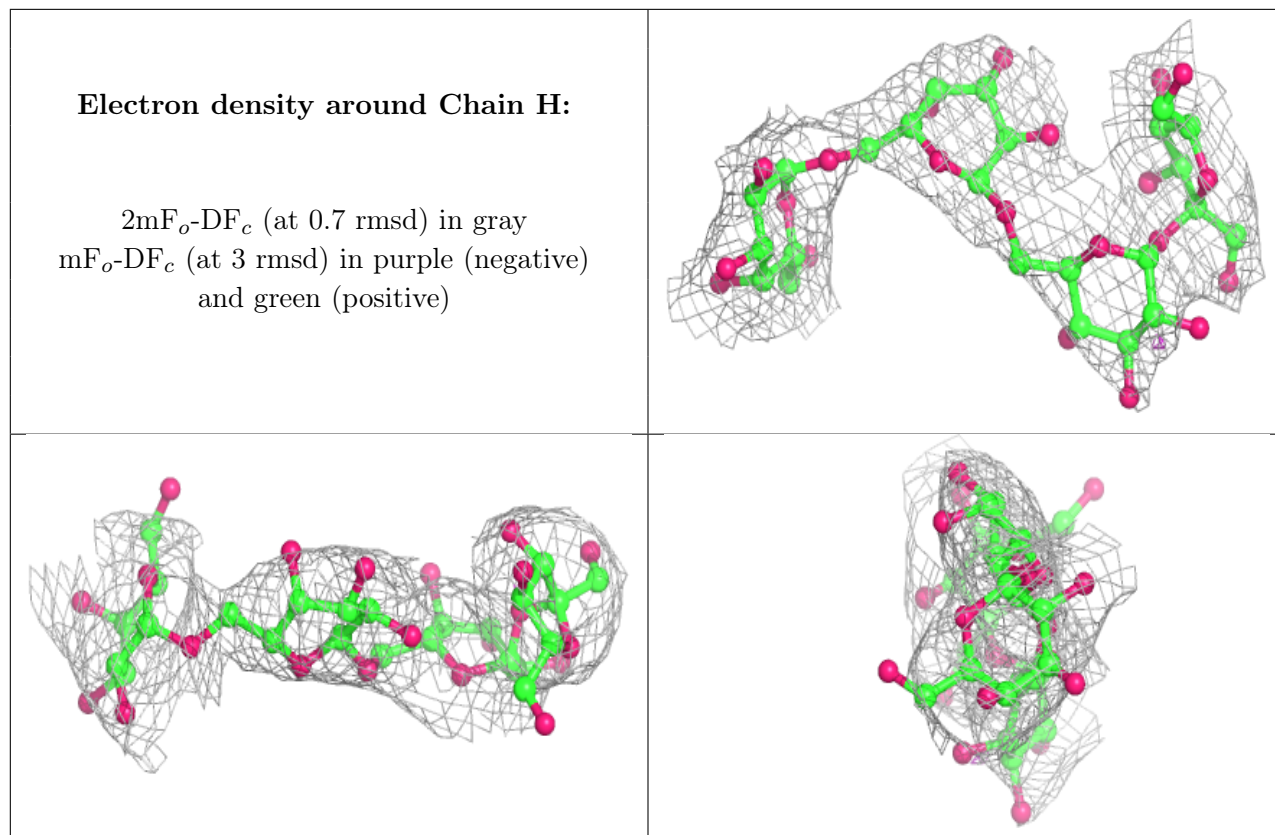
6.4 Ligands ⓘ

There are no ligands in this entry.

6.5 Other polymers ⓘ

There are no such residues in this entry.