Full wwPDB X-ray Structure Validation Report (i)

Nov 2, 2024 – 08:30 pm GMT

PDB ID	:	4AP6
Title	:	Crystal structure of human POFUT2 E54A mutant in complex with GDP-fucose
Authors	:	Chen, C.; Keusch, J.J.; Klein, D.; Hess, D.; Hofsteenge, J.; Gut, H.
Deposited on	:	2012-03-30
Resolution	:	3.40 Å(reported)

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

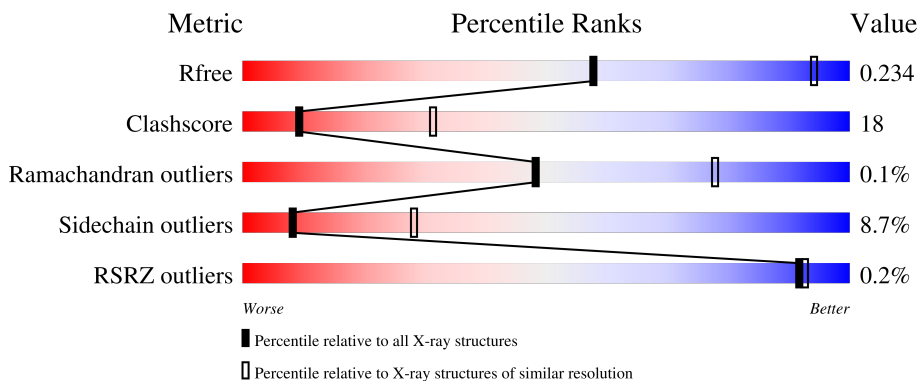|		
MolProbity	:	4.02b-467
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 3.40 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.234
Clashscore		18
Ramachandran outliers		0.1%
Sidechain outliers		8.7%
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}	164625	1140 (3.46-3.34)
Clashscore	180529	1172 (3.46-3.34)
Ramachandran outliers	177936	1172 (3.46-3.34)
Sidechain outliers	177891	1172 (3.46-3.34)
RSRZ outliers	164620	1140 (3.46-3.34)

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	422	56% 32% • 8%
1	B	422	54% 33% 5% 8%
1	C	422	58% 30% 5% 8%
1	D	422	55% 33% 5% 8%

WORLDWIDE PDB
PROTEIN DATA BANK

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 13222 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 GDP-FUCOSE PROTEIN O-FUCOSYLTRANSFERASE 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	389	Total 3247	C 2082	N 571	O 583	S 11	0	0	0
1	B	389	Total 3247	C 2082	N 571	O 583	S 11	0	0	0
1	C	388	Total 3233	C 2071	N 569	O 582	S 11	0	0	0
1	D	389	Total 3247	C 2082	N 571	O 583	S 11	0	0	0

There are 120 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	8	SER	-	expression tag	UNP Q9Y2G5
A	9	MET	-	expression tag	UNP Q9Y2G5
A	10	ALA	-	expression tag	UNP Q9Y2G5
A	11	SER	-	expression tag	UNP Q9Y2G5
A	12	HIS	-	expression tag	UNP Q9Y2G5
A	13	HIS	-	expression tag	UNP Q9Y2G5
A	14	HIS	-	expression tag	UNP Q9Y2G5
A	15	HIS	-	expression tag	UNP Q9Y2G5
A	16	HIS	-	expression tag	UNP Q9Y2G5
A	17	HIS	-	expression tag	UNP Q9Y2G5
A	18	SER	-	expression tag	UNP Q9Y2G5
A	19	SER	-	expression tag	UNP Q9Y2G5
A	20	GLY	-	expression tag	UNP Q9Y2G5
A	21	ASP	-	expression tag	UNP Q9Y2G5
A	22	TYR	-	expression tag	UNP Q9Y2G5
A	23	LYS	-	expression tag	UNP Q9Y2G5
A	24	ASP	-	expression tag	UNP Q9Y2G5
A	25	ASP	-	expression tag	UNP Q9Y2G5
A	26	ASP	-	expression tag	UNP Q9Y2G5
A	27	ASP	-	expression tag	UNP Q9Y2G5
A	28	LYS	-	expression tag	UNP Q9Y2G5

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Chain	Residue	Modelled	Actual	Comment	Reference
A	29	LEU	-	expression tag	UNP Q9Y2G5
A	30	GLU	-	expression tag	UNP Q9Y2G5
A	31	VAL	-	expression tag	UNP Q9Y2G5
A	32	LEU	-	expression tag	UNP Q9Y2G5
A	33	PHE	-	expression tag	UNP Q9Y2G5
A	34	GLN	-	expression tag	UNP Q9Y2G5
A	35	GLY	-	expression tag	UNP Q9Y2G5
A	36	PRO	-	expression tag	UNP Q9Y2G5
A	54	ALA	GLU	engineered mutation	UNP Q9Y2G5
B	8	SER	-	expression tag	UNP Q9Y2G5
B	9	MET	-	expression tag	UNP Q9Y2G5
B	10	ALA	-	expression tag	UNP Q9Y2G5
B	11	SER	-	expression tag	UNP Q9Y2G5
B	12	HIS	-	expression tag	UNP Q9Y2G5
B	13	HIS	-	expression tag	UNP Q9Y2G5
B	14	HIS	-	expression tag	UNP Q9Y2G5
B	15	HIS	-	expression tag	UNP Q9Y2G5
B	16	HIS	-	expression tag	UNP Q9Y2G5
B	17	HIS	-	expression tag	UNP Q9Y2G5
B	18	SER	-	expression tag	UNP Q9Y2G5
B	19	SER	-	expression tag	UNP Q9Y2G5
B	20	GLY	-	expression tag	UNP Q9Y2G5
B	21	ASP	-	expression tag	UNP Q9Y2G5
B	22	TYR	-	expression tag	UNP Q9Y2G5
B	23	LYS	-	expression tag	UNP Q9Y2G5
B	24	ASP	-	expression tag	UNP Q9Y2G5
B	25	ASP	-	expression tag	UNP Q9Y2G5
B	26	ASP	-	expression tag	UNP Q9Y2G5
B	27	ASP	-	expression tag	UNP Q9Y2G5
B	28	LYS	-	expression tag	UNP Q9Y2G5
B	29	LEU	-	expression tag	UNP Q9Y2G5
B	30	GLU	-	expression tag	UNP Q9Y2G5
B	31	VAL	-	expression tag	UNP Q9Y2G5
B	32	LEU	-	expression tag	UNP Q9Y2G5
B	33	PHE	-	expression tag	UNP Q9Y2G5
B	34	GLN	-	expression tag	UNP Q9Y2G5
B	35	GLY	-	expression tag	UNP Q9Y2G5
B	36	PRO	-	expression tag	UNP Q9Y2G5
B	54	ALA	GLU	engineered mutation	UNP Q9Y2G5
C	8	SER	-	expression tag	UNP Q9Y2G5
C	9	MET	-	expression tag	UNP Q9Y2G5
C	10	ALA	-	expression tag	UNP Q9Y2G5

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Chain	Residue	Modelled	Actual	Comment	Reference
C	11	SER	-	expression tag	UNP Q9Y2G5
C	12	HIS	-	expression tag	UNP Q9Y2G5
C	13	HIS	-	expression tag	UNP Q9Y2G5
C	14	HIS	-	expression tag	UNP Q9Y2G5
C	15	HIS	-	expression tag	UNP Q9Y2G5
C	16	HIS	-	expression tag	UNP Q9Y2G5
C	17	HIS	-	expression tag	UNP Q9Y2G5
C	18	SER	-	expression tag	UNP Q9Y2G5
C	19	SER	-	expression tag	UNP Q9Y2G5
C	20	GLY	-	expression tag	UNP Q9Y2G5
C	21	ASP	-	expression tag	UNP Q9Y2G5
C	22	TYR	-	expression tag	UNP Q9Y2G5
C	23	LYS	-	expression tag	UNP Q9Y2G5
C	24	ASP	-	expression tag	UNP Q9Y2G5
C	25	ASP	-	expression tag	UNP Q9Y2G5
C	26	ASP	-	expression tag	UNP Q9Y2G5
C	27	ASP	-	expression tag	UNP Q9Y2G5
C	28	LYS	-	expression tag	UNP Q9Y2G5
C	29	LEU	-	expression tag	UNP Q9Y2G5
C	30	GLU	-	expression tag	UNP Q9Y2G5
C	31	VAL	-	expression tag	UNP Q9Y2G5
C	32	LEU	-	expression tag	UNP Q9Y2G5
C	33	PHE	-	expression tag	UNP Q9Y2G5
C	34	GLN	-	expression tag	UNP Q9Y2G5
C	35	GLY	-	expression tag	UNP Q9Y2G5
C	36	PRO	-	expression tag	UNP Q9Y2G5
C	54	ALA	GLU	engineered mutation	UNP Q9Y2G5
D	8	SER	-	expression tag	UNP Q9Y2G5
D	9	MET	-	expression tag	UNP Q9Y2G5
D	10	ALA	-	expression tag	UNP Q9Y2G5
D	11	SER	-	expression tag	UNP Q9Y2G5
D	12	HIS	-	expression tag	UNP Q9Y2G5
D	13	HIS	-	expression tag	UNP Q9Y2G5
D	14	HIS	-	expression tag	UNP Q9Y2G5
D	15	HIS	-	expression tag	UNP Q9Y2G5
D	16	HIS	-	expression tag	UNP Q9Y2G5
D	17	HIS	-	expression tag	UNP Q9Y2G5
D	18	SER	-	expression tag	UNP Q9Y2G5
D	19	SER	-	expression tag	UNP Q9Y2G5
D	20	GLY	-	expression tag	UNP Q9Y2G5
D	21	ASP	-	expression tag	UNP Q9Y2G5
D	22	TYR	-	expression tag	UNP Q9Y2G5

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Chain	Residue	Modelled	Actual	Comment	Reference
D	23	LYS	-	expression tag	UNP Q9Y2G5
D	24	ASP	-	expression tag	UNP Q9Y2G5
D	25	ASP	-	expression tag	UNP Q9Y2G5
D	26	ASP	-	expression tag	UNP Q9Y2G5
D	27	ASP	-	expression tag	UNP Q9Y2G5
D	28	LYS	-	expression tag	UNP Q9Y2G5
D	29	LEU	-	expression tag	UNP Q9Y2G5
D	30	GLU	-	expression tag	UNP Q9Y2G5
D	31	VAL	-	expression tag	UNP Q9Y2G5
D	32	LEU	-	expression tag	UNP Q9Y2G5
D	33	PHE	-	expression tag	UNP Q9Y2G5
D	34	GLN	-	expression tag	UNP Q9Y2G5
D	35	GLY	-	expression tag	UNP Q9Y2G5
D	36	PRO	-	expression tag	UNP Q9Y2G5
D	54	ALA	GLU	engineered mutation	UNP Q9Y2G5

- Molecule 2 is GUANOSINE-5'-DIPHOSPHATE-BETA-L-FUCOPYRANOSE (three-letter code: GFB) (formula: $C_{16}H_{25}N_5O_{15}P_2$).
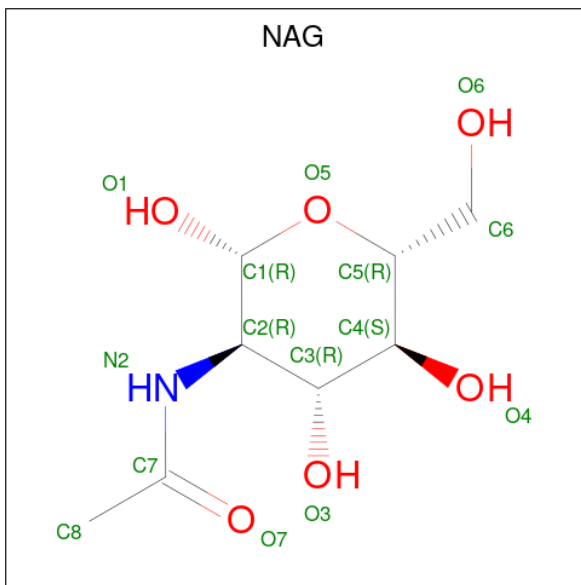

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			38	16	5	15	2		
2	B	1	Total	C	N	O	P	0	0
			38	16	5	15	2		
2	C	1	Total	C	N	O	P	0	0
			38	16	5	15	2		

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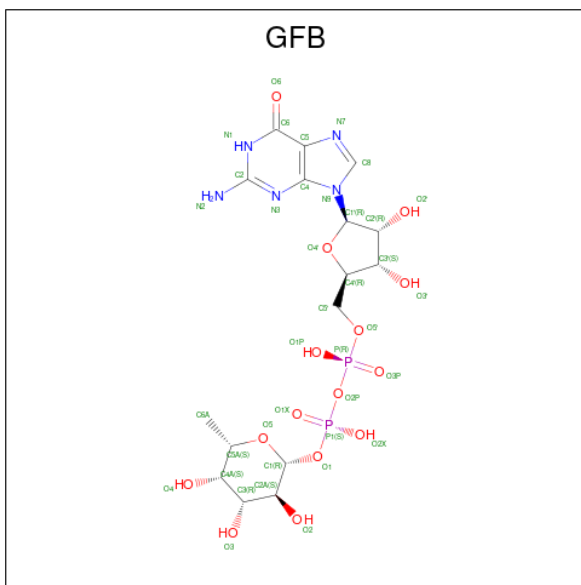
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	P		
2	D	1	38	16	5	15	2	0	0

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			14	8	1	5		
3	B	1	Total	C	N	O	0	0
			14	8	1	5		
3	B	1	Total	C	N	O	0	0
			14	8	1	5		
3	B	1	Total	C	N	O	0	0
			14	8	1	5		
3	C	1	Total	C	N	O	0	0
			14	8	1	5		
3	C	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Cl	0	0
			1	1		
4	B	1	Total	Cl	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	C	1	Total 1	Cl 1	0	0
4	D	1	Total 1	Cl 1	0	0

• Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	6	Total 6	O 6	0	0
5	B	2	Total 2	O 2	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.
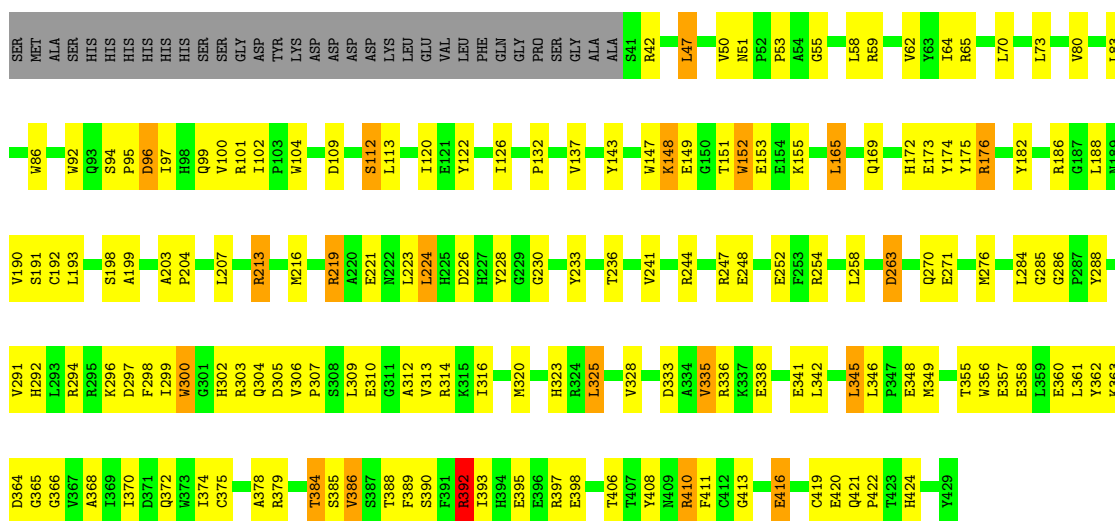
• Molecule 1: GDP-FUCOSE PROTEIN O-FUCOSYLTRANSFERASE 2
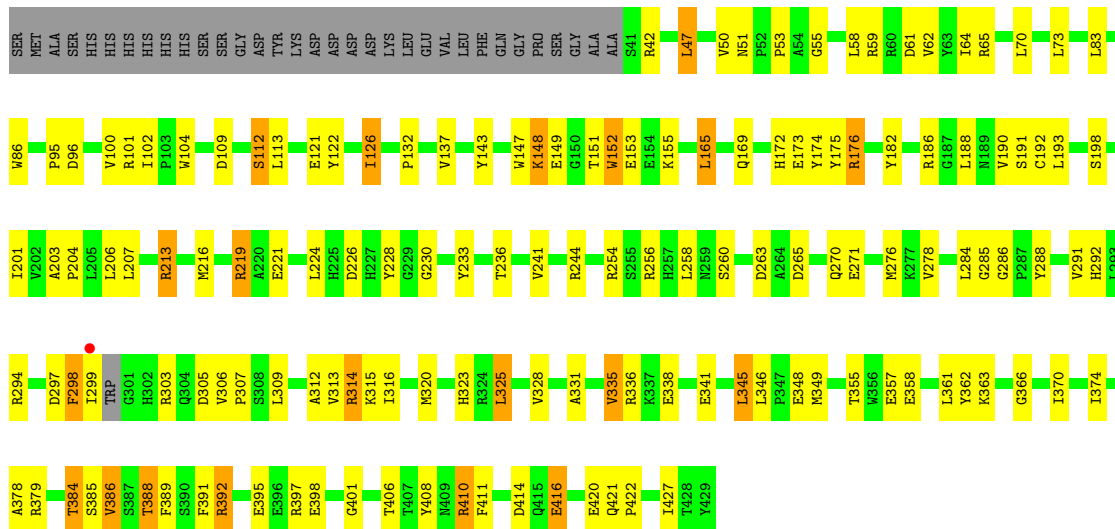
Chain A:
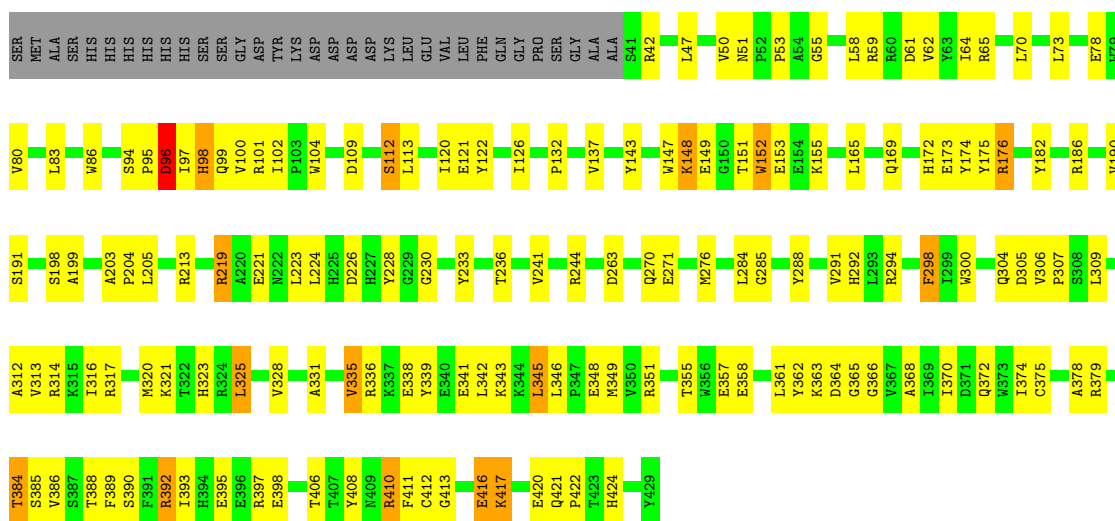
• Molecule 1: GDP-FUCOSE PROTEIN O-FUCOSYLTRANSFERASE 2
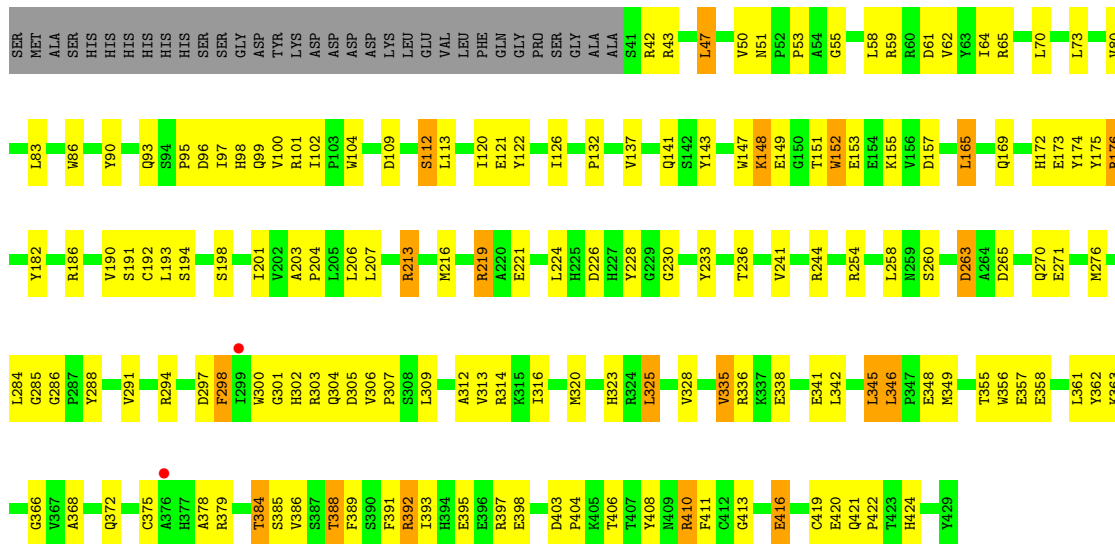
Chain B:

• Molecule 1: GDP-FUCOSE PROTEIN O-FUCOSYLTRANSFERASE 2

Chain C:

• Molecule 1: GDP-FUCOSE PROTEIN O-FUCOSYLTRANSFERASE 2

Chain D:

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α, β, γ	153.01Å 153.01Å 185.68Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	39.69 – 3.40 39.69 – 3.40	Depositor EDS
% Data completeness (in resolution range)	93.5 (39.69-3.40) 93.4 (39.69-3.40)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.04 (at 3.40Å)	Xtriage
Refinement program	PHENIX (PHENIX.REFINE: 1.7.1_743)	Depositor
R, R_{free}	0.192 , 0.238 0.190 , 0.234	Depositor DCC
R_{free} test set	1623 reflections (4.96%)	wwPDB-VP
Wilson B-factor (Å^2)	77.7	Xtriage
Anisotropy	0.177	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 92.9	EDS
L-test for twinning[2]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	0.039 for -h,-k,l	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	13222	wwPDB-VP
Average B, all atoms (Å^2)	104.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.40% 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: CL, NAG, GFB

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	0.53	0/3340	0.65	0/4523
1	B	0.61	0/3340	0.70	2/4523 (0.0%)
1	C	0.53	0/3323	0.65	0/4497
1	D	0.39	0/3340	0.60	0/4523
All	All	0.52	0/13343	0.65	2/18066 (0.0%)

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
1	A	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	224	LEU	CB-CG-CD2	-5.50	101.66	111.00
1	B	392	ARG	NE-CZ-NH1	-5.24	117.68	120.30

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	96	ASP	Peptide

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	3247	0	3162	106	0
1	B	3247	0	3160	125	0
1	C	3233	0	3150	110	0
1	D	3247	0	3163	122	0
2	A	38	0	23	5	0
2	B	38	0	23	4	0
2	C	38	0	23	4	0
2	D	38	0	23	5	0
3	A	14	0	13	0	0
3	B	42	0	39	1	0
3	C	28	0	26	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
5	A	6	0	0	0	0
5	B	2	0	0	0	0
All	All	13222	0	12805	464	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 18.

All (464) 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:C:314:ARG:NH1	1:D:358:GLU:OE1	1.69	1.23
2:A:1430:GFB:H8	2:A:1430:GFB:H5'	1.44	0.96
2:C:1430:GFB:H5'	2:C:1430:GFB:H8	1.47	0.95
2:B:1430:GFB:H5'	2:B:1430:GFB:H8	1.50	0.93
1:C:244:ARG:NH2	1:C:271:GLU:OE1	2.02	0.93
1:C:379:ARG:HG3	1:C:379:ARG:HH11	1.30	0.92
1:D:379:ARG:HH11	1:D:379:ARG:HG3	1.33	0.92
1:A:379:ARG:HG3	1:A:379:ARG:HH11	1.36	0.91
2:D:1430:GFB:H5'	2:D:1430:GFB:H8	1.52	0.91
1:B:378:ALA:O	1:B:397:ARG:NH2	2.05	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:244:ARG:NH2	1:A:271:GLU:OE1	2.06	0.88
1:B:244:ARG:NH2	1:B:271:GLU:OE1	2.06	0.87
1:B:379:ARG:HG3	1:B:379:ARG:HH11	1.40	0.87
1:D:244:ARG:NH2	1:D:271:GLU:OE1	2.07	0.87
1:C:315:LYS:HD3	1:D:357:GLU:OE2	1.75	0.86
1:A:378:ALA:O	1:A:397:ARG:NH2	2.10	0.85
1:C:378:ALA:O	1:C:397:ARG:NH2	2.09	0.84
1:C:389:PHE:HB2	2:C:1430:GFB:O1P	1.79	0.83
1:D:378:ALA:O	1:D:397:ARG:NH2	2.12	0.83
1:A:292:HIS:HD1	1:A:390:SER:HG	1.27	0.81
1:C:314:ARG:HD2	1:D:358:GLU:OE2	1.83	0.79
2:A:1430:GFB:H8	2:A:1430:GFB:C5'	2.13	0.78
1:D:97:ILE:HG22	1:D:99:GLN:HG3	1.66	0.76
2:C:1430:GFB:H8	2:C:1430:GFB:C5'	2.16	0.74
1:D:90:TYR:HB2	1:D:93:GLN:HG3	1.69	0.74
1:D:99:GLN:HB3	1:D:102:ILE:HD11	1.71	0.73
2:D:1430:GFB:H8	2:D:1430:GFB:C5'	2.18	0.73
2:B:1430:GFB:H8	2:B:1430:GFB:C5'	2.18	0.72
1:A:94:SER:OG	1:A:96:ASP:OD1	2.08	0.71
1:A:313:VAL:HG22	1:A:346:LEU:HD13	1.71	0.71
1:B:313:VAL:HG22	1:B:346:LEU:HD13	1.72	0.70
1:D:313:VAL:HG22	1:D:346:LEU:HD13	1.74	0.70
1:A:312:ALA:O	1:A:316:ILE:HG12	1.92	0.69
1:A:96:ASP:OD1	1:A:364:ASP:HB2	1.91	0.69
1:A:96:ASP:OD2	1:A:99:GLN:HB2	1.93	0.68
1:C:312:ALA:O	1:C:316:ILE:HG12	1.93	0.68
1:C:313:VAL:HG22	1:C:346:LEU:HD13	1.74	0.68
1:B:312:ALA:O	1:B:316:ILE:HG12	1.92	0.67
1:B:389:PHE:HB2	2:B:1430:GFB:O1P	1.94	0.67
1:C:122:TYR:CE2	1:C:126:ILE:HD11	2.30	0.67
1:B:42:ARG:HB3	1:B:213:ARG:HH21	1.60	0.67
1:D:297:ASP:OD2	1:D:303:ARG:NH1	2.28	0.66
1:D:312:ALA:O	1:D:316:ILE:HG12	1.95	0.66
1:A:362:TYR:O	1:A:366:GLY:HA3	1.96	0.66
1:A:408:TYR:HB3	1:A:422:PRO:HG2	1.76	0.66
1:B:408:TYR:HB3	1:B:422:PRO:HG2	1.76	0.66
1:D:408:TYR:HB3	1:D:422:PRO:HG2	1.78	0.66
1:C:379:ARG:HG3	1:C:379:ARG:NH1	2.09	0.65
1:B:297:ASP:OD1	1:B:298:PHE:N	2.30	0.64
1:C:414:ASP:O	1:D:356:TRP:HB2	1.97	0.64
1:D:389:PHE:HB2	2:D:1430:GFB:O1P	1.97	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:314:ARG:HH12	1:D:355:THR:HG23	1.63	0.63
1:C:408:TYR:HB3	1:C:422:PRO:HG2	1.80	0.63
1:B:97:ILE:HD11	1:B:99:GLN:CG	2.28	0.63
1:A:385:SER:HB2	1:A:410:ARG:HD2	1.79	0.63
1:C:47:LEU:N	1:C:47:LEU:HD12	2.13	0.63
1:B:298:PHE:HB2	1:B:300:TRP:O	1.99	0.62
1:C:362:TYR:O	1:C:366:GLY:HA3	1.99	0.62
1:D:122:TYR:CE2	1:D:126:ILE:HD11	2.35	0.61
1:D:294:ARG:HB3	1:D:384:THR:HG21	1.81	0.61
1:A:323:HIS:HB2	1:A:325:LEU:HD23	1.81	0.61
1:D:335:VAL:HG23	1:D:338:GLU:HB2	1.82	0.61
1:A:309:LEU:HD11	1:A:338:GLU:HG2	1.81	0.61
1:A:174:TYR:HB3	1:A:186:ARG:HB3	1.81	0.61
1:D:385:SER:HB2	1:D:410:ARG:HD2	1.82	0.61
1:D:379:ARG:HG3	1:D:379:ARG:NH1	2.11	0.61
1:A:122:TYR:CE2	1:A:126:ILE:HD11	2.36	0.61
1:A:335:VAL:HG23	1:A:338:GLU:HB2	1.84	0.60
1:C:385:SER:HB2	1:C:410:ARG:HD2	1.82	0.60
1:B:122:TYR:CE2	1:B:126:ILE:HD11	2.37	0.60
1:B:362:TYR:O	1:B:366:GLY:HA3	2.01	0.60
1:D:379:ARG:HH11	1:D:379:ARG:CG	2.12	0.60
1:A:288:TYR:CE2	1:A:378:ALA:HB2	2.36	0.60
1:A:83:LEU:HB3	1:A:104:TRP:CD1	2.37	0.60
3:B:1431:NAG:O6	3:B:1431:NAG:O4	2.17	0.60
1:C:83:LEU:HB3	1:C:104:TRP:CD1	2.36	0.60
1:C:174:TYR:HB3	1:C:186:ARG:HB3	1.84	0.60
1:B:385:SER:HB2	1:B:410:ARG:HD2	1.82	0.59
1:B:97:ILE:CD1	1:B:99:GLN:HG3	2.32	0.59
2:A:1430:GFB:H5'	2:A:1430:GFB:C8	2.25	0.59
1:A:379:ARG:HG3	1:A:379:ARG:NH1	2.15	0.59
1:B:294:ARG:HB3	1:B:384:THR:HG21	1.84	0.59
1:B:174:TYR:HB3	1:B:186:ARG:HB3	1.85	0.59
1:C:323:HIS:HB2	1:C:325:LEU:HD23	1.83	0.59
1:D:83:LEU:HB3	1:D:104:TRP:CD1	2.38	0.59
1:C:335:VAL:HG23	1:C:338:GLU:HB2	1.84	0.59
1:A:294:ARG:HB3	1:A:384:THR:HG21	1.83	0.58
1:A:389:PHE:HB2	2:A:1430:GFB:O1P	2.03	0.58
1:D:361:LEU:O	1:D:363:LYS:HE3	2.04	0.58
1:D:323:HIS:HB2	1:D:325:LEU:HD23	1.86	0.58
1:A:198:SER:HB3	1:A:226:ASP:HA	1.86	0.58
1:B:392:ARG:HD3	1:B:395:GLU:OE1	2.03	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:203:ALA:N	1:C:204:PRO:HD2	2.19	0.58
1:B:323:HIS:HB2	1:B:325:LEU:HD23	1.84	0.58
1:D:198:SER:HB3	1:D:226:ASP:HA	1.85	0.58
1:D:362:TYR:O	1:D:366:GLY:HA3	2.03	0.58
1:C:198:SER:HB3	1:C:226:ASP:HA	1.85	0.57
1:C:379:ARG:HH11	1:C:379:ARG:CG	2.10	0.57
2:C:1430:GFB:H5'	2:C:1430:GFB:C8	2.30	0.57
1:A:152:TRP:HE3	1:A:153:GLU:N	2.02	0.57
1:A:99:GLN:HA	1:A:99:GLN:OE1	2.04	0.57
1:B:169:GLN:HG3	1:B:175:TYR:CE1	2.39	0.57
1:D:147:TRP:HB2	1:D:151:THR:HB	1.87	0.57
1:B:198:SER:HB3	1:B:226:ASP:HA	1.85	0.57
1:B:309:LEU:HD11	1:B:338:GLU:HG2	1.87	0.57
1:C:152:TRP:HE3	1:C:153:GLU:N	2.03	0.57
1:A:417:LYS:HA	1:B:356:TRP:CD1	2.39	0.57
1:D:174:TYR:HB3	1:D:186:ARG:HB3	1.87	0.57
1:D:47:LEU:HD12	1:D:47:LEU:N	2.20	0.57
1:D:300:TRP:HZ3	1:D:303:ARG:HD2	1.70	0.57
1:A:147:TRP:HB2	1:A:151:THR:HB	1.88	0.56
1:D:300:TRP:CZ3	1:D:303:ARG:HD2	2.40	0.56
1:D:284:LEU:HG	1:D:379:ARG:NH1	2.19	0.56
1:B:83:LEU:HB3	1:B:104:TRP:CD1	2.41	0.56
2:B:1430:GFB:H5'	2:B:1430:GFB:C8	2.31	0.56
1:C:361:LEU:O	1:C:363:LYS:HE3	2.05	0.56
1:D:143:TYR:CZ	1:D:155:LYS:HE3	2.41	0.56
1:C:309:LEU:HD11	1:C:338:GLU:HG2	1.88	0.56
1:C:284:LEU:HG	1:C:379:ARG:NH1	2.20	0.56
1:A:143:TYR:CZ	1:A:155:LYS:HE3	2.41	0.56
1:B:335:VAL:HG23	1:B:338:GLU:HB2	1.87	0.55
1:C:147:TRP:HB2	1:C:151:THR:HB	1.87	0.55
1:B:152:TRP:HE3	1:B:153:GLU:N	2.05	0.55
1:B:147:TRP:HB2	1:B:151:THR:HB	1.88	0.55
1:C:294:ARG:HB3	1:C:384:THR:HG21	1.88	0.55
1:A:97:ILE:N	1:A:97:ILE:HD12	2.22	0.55
1:D:309:LEU:HD11	1:D:338:GLU:HG2	1.89	0.55
1:C:61:ASP:OD2	1:C:65:ARG:NH1	2.40	0.55
1:D:172:HIS:O	1:D:173:GLU:HB2	2.07	0.55
1:A:109:ASP:HB3	1:A:241:VAL:HG22	1.89	0.55
1:B:379:ARG:HH11	1:B:379:ARG:CG	2.17	0.55
1:D:152:TRP:HE3	1:D:153:GLU:N	2.05	0.54
1:D:42:ARG:HB3	1:D:213:ARG:HH21	1.72	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:368:ALA:HA	2:D:1430:GFB:N2	2.22	0.54
1:C:172:HIS:O	1:C:173:GLU:HB2	2.08	0.54
1:D:368:ALA:O	1:D:372:GLN:HG3	2.07	0.54
1:A:62:VAL:HA	1:A:65:ARG:HD3	1.89	0.54
1:D:109:ASP:HB3	1:D:241:VAL:HG22	1.90	0.54
1:D:302:HIS:O	1:D:302:HIS:ND1	2.40	0.54
1:A:143:TYR:CE2	1:A:155:LYS:HE3	2.43	0.54
1:B:47:LEU:HD12	1:B:47:LEU:N	2.22	0.54
1:B:203:ALA:N	1:B:204:PRO:HD2	2.22	0.54
1:C:104:TRP:N	1:C:121:GLU:OE2	2.31	0.54
1:C:47:LEU:O	1:C:216:MET:HA	2.07	0.54
1:C:392:ARG:HD3	1:C:395:GLU:OE1	2.07	0.54
1:A:284:LEU:HG	1:A:379:ARG:NH1	2.23	0.54
1:D:42:ARG:NH1	1:D:42:ARG:HA	2.23	0.54
1:D:95:PRO:CB	1:D:96:ASP:HA	2.38	0.54
1:B:296:LYS:NZ	1:B:333:ASP:O	2.38	0.53
1:A:368:ALA:O	1:A:372:GLN:HG3	2.08	0.53
1:C:42:ARG:HA	1:C:42:ARG:NH1	2.22	0.53
1:A:379:ARG:HH11	1:A:379:ARG:CG	2.14	0.53
1:A:416:GLU:O	1:A:416:GLU:HG3	2.09	0.53
1:A:385:SER:CB	1:A:410:ARG:HD2	2.38	0.53
1:A:392:ARG:HD3	1:A:395:GLU:OE1	2.09	0.53
1:B:307:PRO:HG3	1:B:411:PHE:HB3	1.91	0.53
1:A:203:ALA:N	1:A:204:PRO:HD2	2.24	0.53
1:A:51:ASN:ND2	1:A:53:PRO:HD2	2.24	0.53
1:D:288:TYR:CE2	1:D:378:ALA:HB2	2.43	0.53
1:B:361:LEU:O	1:B:363:LYS:HE3	2.08	0.52
1:D:148:LYS:CD	1:D:149:GLU:H	2.23	0.52
1:B:172:HIS:O	1:B:173:GLU:HB2	2.08	0.52
2:D:1430:GFB:H5'	2:D:1430:GFB:C8	2.32	0.52
1:B:99:GLN:HB3	1:B:102:ILE:HD11	1.92	0.52
1:C:109:ASP:HB3	1:C:241:VAL:HG22	1.91	0.52
1:A:412:CYS:SG	1:B:357:GLU:OE1	2.68	0.52
1:C:346:LEU:HD23	1:C:349:MET:HB2	1.91	0.52
1:D:392:ARG:HD3	1:D:395:GLU:OE1	2.09	0.52
1:D:410:ARG:NH2	1:D:419:CYS:SG	2.81	0.52
1:A:361:LEU:O	1:A:363:LYS:HE3	2.10	0.52
1:B:47:LEU:O	1:B:216:MET:HA	2.10	0.52
1:D:143:TYR:CE2	1:D:155:LYS:HE3	2.45	0.52
1:B:109:ASP:HB3	1:B:241:VAL:HG22	1.92	0.52
1:B:99:GLN:OE1	1:B:364:ASP:HB2	2.11	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:305:ASP:HA	1:B:416:GLU:OE1	2.11	0.51
1:C:101:ARG:HG2	1:C:182:TYR:CE1	2.46	0.51
1:B:284:LEU:HG	1:B:379:ARG:NH1	2.25	0.51
1:D:148:LYS:HD2	1:D:149:GLU:H	1.76	0.51
1:C:55:GLY:O	1:C:59:ARG:HG3	2.11	0.51
1:D:285:GLY:HA3	1:D:379:ARG:HA	1.93	0.51
1:C:288:TYR:CE2	1:C:378:ALA:HB2	2.46	0.51
1:A:148:LYS:CD	1:A:149:GLU:H	2.23	0.51
1:A:285:GLY:HA3	1:A:379:ARG:HA	1.92	0.51
1:B:148:LYS:CD	1:B:149:GLU:H	2.24	0.51
1:C:148:LYS:HD2	1:C:149:GLU:H	1.75	0.51
1:A:323:HIS:HB2	1:A:325:LEU:CD2	2.41	0.51
1:D:169:GLN:HG3	1:D:175:TYR:CE1	2.46	0.51
1:D:385:SER:CB	1:D:410:ARG:HD2	2.40	0.51
1:B:285:GLY:HA3	1:B:379:ARG:HA	1.92	0.50
1:A:147:TRP:O	1:A:147:TRP:CD1	2.64	0.50
1:A:219:ARG:NH1	1:A:221:GLU:OE2	2.44	0.50
1:B:368:ALA:O	1:B:372:GLN:HG3	2.10	0.50
1:A:95:PRO:HG2	1:A:96:ASP:H	1.76	0.50
1:A:152:TRP:CE3	1:A:153:GLU:N	2.79	0.50
1:A:346:LEU:HD23	1:A:349:MET:HB2	1.94	0.50
1:D:61:ASP:OD2	1:D:65:ARG:NH1	2.43	0.50
1:A:47:LEU:N	1:A:47:LEU:HD12	2.26	0.50
1:A:172:HIS:O	1:A:173:GLU:HB2	2.10	0.50
1:C:143:TYR:CZ	1:C:155:LYS:HE3	2.47	0.50
1:D:305:ASP:HA	1:D:416:GLU:OE1	2.11	0.50
1:D:421:GLN:HB3	1:D:422:PRO:HD2	1.94	0.50
1:B:152:TRP:CE3	1:B:153:GLU:N	2.80	0.50
1:B:421:GLN:HB3	1:B:422:PRO:HD2	1.94	0.50
1:B:375:CYS:HB2	1:B:393:ILE:HD13	1.93	0.50
1:A:55:GLY:O	1:A:59:ARG:HG3	2.12	0.50
1:C:285:GLY:HA3	1:C:379:ARG:HA	1.94	0.50
1:B:95:PRO:HB2	1:B:96:ASP:OD1	2.12	0.49
1:A:148:LYS:HD2	1:A:149:GLU:H	1.77	0.49
1:C:421:GLN:HB3	1:C:422:PRO:HD2	1.94	0.49
1:D:307:PRO:HG3	1:D:411:PHE:HB3	1.95	0.49
1:A:421:GLN:HB3	1:A:422:PRO:HD2	1.94	0.49
1:B:379:ARG:HG3	1:B:379:ARG:NH1	2.18	0.49
1:C:152:TRP:CE3	1:C:153:GLU:N	2.80	0.49
1:C:298:PHE:HD1	1:C:299:ILE:H	1.55	0.49
1:B:228:TYR:C	1:B:230:GLY:H	2.16	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:385:SER:CB	1:B:410:ARG:HD2	2.42	0.49
1:C:42:ARG:HB3	1:C:213:ARG:HH21	1.78	0.49
1:C:169:GLN:HG3	1:C:175:TYR:CE1	2.47	0.49
1:A:95:PRO:HD2	1:A:364:ASP:OD2	2.12	0.49
1:A:270:GLN:HB3	1:A:276:MET:HB2	1.95	0.49
1:B:416:GLU:O	1:B:416:GLU:HG3	2.11	0.49
1:C:323:HIS:HB2	1:C:325:LEU:CD2	2.43	0.49
1:D:203:ALA:N	1:D:204:PRO:HD2	2.27	0.49
1:A:176:ARG:NH2	1:A:186:ARG:HE	2.11	0.49
1:D:51:ASN:ND2	1:D:53:PRO:HD2	2.28	0.49
1:B:323:HIS:O	1:B:325:LEU:HD22	2.13	0.48
1:B:348:GLU:CD	1:B:348:GLU:H	2.16	0.48
1:C:228:TYR:C	1:C:230:GLY:H	2.16	0.48
1:B:357:GLU:O	1:B:361:LEU:HB2	2.14	0.48
1:D:270:GLN:HB3	1:D:276:MET:HB2	1.94	0.48
1:D:323:HIS:HB2	1:D:325:LEU:CD2	2.44	0.48
1:D:47:LEU:O	1:D:216:MET:HA	2.14	0.48
1:C:95:PRO:HB2	1:C:96:ASP:HA	1.96	0.48
1:C:316:ILE:O	1:C:320:MET:HG3	2.13	0.48
1:C:314:ARG:NH1	1:D:355:THR:HG23	2.28	0.48
1:D:303:ARG:HG2	1:D:305:ASP:OD1	2.13	0.48
1:B:70:LEU:HA	1:B:73:LEU:HD12	1.96	0.48
1:B:316:ILE:O	1:B:320:MET:HG3	2.12	0.48
1:B:346:LEU:HD23	1:B:349:MET:HB2	1.94	0.48
1:C:148:LYS:CD	1:C:149:GLU:H	2.26	0.48
1:A:316:ILE:O	1:A:320:MET:HG3	2.14	0.48
1:C:270:GLN:HB3	1:C:276:MET:HB2	1.94	0.48
1:A:104:TRP:N	1:A:121:GLU:OE2	2.36	0.48
1:B:410:ARG:NH2	1:B:419:CYS:SG	2.87	0.48
1:D:152:TRP:CE3	1:D:153:GLU:N	2.82	0.48
1:A:101:ARG:HG2	1:A:182:TYR:CE1	2.49	0.47
1:B:303:ARG:HG2	1:B:305:ASP:OD1	2.14	0.47
1:C:385:SER:CB	1:C:410:ARG:HD2	2.43	0.47
1:A:58:LEU:O	1:A:58:LEU:HD23	2.14	0.47
1:B:55:GLY:O	1:B:59:ARG:HG3	2.13	0.47
1:A:61:ASP:OD2	1:A:65:ARG:NH1	2.45	0.47
1:A:307:PRO:HG3	1:A:411:PHE:HB3	1.96	0.47
1:B:148:LYS:HD2	1:B:149:GLU:H	1.78	0.47
1:C:112:SER:HB3	1:C:241:VAL:HG13	1.96	0.47
1:B:112:SER:HB3	1:B:241:VAL:HG13	1.95	0.47
1:B:147:TRP:CD1	1:B:147:TRP:O	2.67	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:298:PHE:CD1	1:C:299:ILE:N	2.80	0.47
1:B:97:ILE:HG13	1:B:99:GLN:HE21	1.79	0.47
1:C:379:ARG:NH1	1:C:379:ARG:CG	2.74	0.47
1:B:64:ILE:HG21	1:B:233:TYR:CD1	2.50	0.47
1:D:101:ARG:HG2	1:D:182:TYR:CE1	2.50	0.47
1:D:316:ILE:O	1:D:320:MET:HG3	2.14	0.47
1:A:305:ASP:HA	1:A:416:GLU:OE1	2.15	0.47
1:C:147:TRP:O	1:C:147:TRP:CD1	2.67	0.47
1:C:192:CYS:O	1:C:193:LEU:HD23	2.15	0.47
1:C:307:PRO:HG3	1:C:411:PHE:HB3	1.97	0.47
1:D:42:ARG:HA	1:D:42:ARG:CZ	2.45	0.47
1:A:97:ILE:O	1:A:98:HIS:C	2.52	0.47
1:A:228:TYR:C	1:A:230:GLY:H	2.17	0.47
1:B:62:VAL:HA	1:B:65:ARG:HD3	1.97	0.47
1:C:224:LEU:HD23	1:C:224:LEU:HA	1.64	0.47
1:D:219:ARG:NH1	1:D:221:GLU:OE2	2.48	0.47
1:D:228:TYR:C	1:D:230:GLY:H	2.17	0.47
1:A:169:GLN:HG3	1:A:175:TYR:CE1	2.50	0.47
1:B:288:TYR:CE2	1:B:378:ALA:HB2	2.49	0.47
1:D:102:ILE:HD13	1:D:363:LYS:HG3	1.97	0.47
1:B:51:ASN:ND2	1:B:53:PRO:HD2	2.30	0.47
1:D:58:LEU:HD23	1:D:58:LEU:O	2.14	0.47
1:D:176:ARG:NH2	1:D:186:ARG:HE	2.13	0.47
1:A:100:VAL:HG22	1:A:101:ARG:HG3	1.97	0.46
1:A:323:HIS:O	1:A:325:LEU:HD22	2.16	0.46
1:B:101:ARG:HG2	1:B:182:TYR:CE1	2.50	0.46
1:B:398:GLU:OE2	1:B:424:HIS:HE1	1.98	0.46
1:B:224:LEU:HA	1:B:224:LEU:HD23	1.60	0.46
1:C:176:ARG:NH2	1:C:186:ARG:HE	2.14	0.46
1:D:357:GLU:O	1:D:361:LEU:HB2	2.16	0.46
1:B:199:ALA:HA	1:B:223:LEU:HD22	1.96	0.46
1:C:102:ILE:HD13	1:C:363:LYS:HG3	1.97	0.46
1:D:70:LEU:HA	1:D:73:LEU:HD12	1.97	0.46
1:D:83:LEU:HD13	1:D:104:TRP:CG	2.50	0.46
1:D:147:TRP:O	1:D:147:TRP:CD1	2.68	0.46
1:D:224:LEU:HD23	1:D:224:LEU:HA	1.78	0.46
1:A:70:LEU:HA	1:A:73:LEU:HD12	1.98	0.46
1:D:348:GLU:H	1:D:348:GLU:CD	2.19	0.46
1:B:300:TRP:CD2	1:B:302:HIS:HB2	2.50	0.46
1:C:341:GLU:O	1:C:345:LEU:HD12	2.16	0.46
1:A:348:GLU:H	1:A:348:GLU:CD	2.19	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:64:ILE:HG21	1:D:233:TYR:CD1	2.50	0.46
1:D:112:SER:HB3	1:D:241:VAL:HG13	1.98	0.46
1:A:298:PHE:C	1:A:300:TRP:N	2.69	0.46
1:B:122:TYR:O	1:B:126:ILE:HG12	2.16	0.46
1:B:270:GLN:HB3	1:B:276:MET:HB2	1.98	0.46
1:D:260:SER:OG	1:D:265:ASP:OD2	2.28	0.46
1:B:126:ILE:HD12	1:B:132:PRO:HB3	1.98	0.46
1:B:298:PHE:HA	1:B:300:TRP:CD1	2.50	0.46
1:C:70:LEU:HA	1:C:73:LEU:HD12	1.98	0.46
1:D:379:ARG:NH1	1:D:379:ARG:CG	2.76	0.46
1:D:90:TYR:CB	1:D:93:GLN:HG3	2.44	0.45
1:D:346:LEU:HD23	1:D:349:MET:HB2	1.97	0.45
1:A:112:SER:HB3	1:A:241:VAL:HG13	1.99	0.45
1:A:341:GLU:O	1:A:345:LEU:HD12	2.16	0.45
1:A:357:GLU:O	1:A:361:LEU:HB2	2.16	0.45
1:B:143:TYR:CZ	1:B:155:LYS:HE3	2.51	0.45
1:D:341:GLU:O	1:D:345:LEU:HD12	2.17	0.45
1:A:199:ALA:HA	1:A:223:LEU:HD22	1.97	0.45
1:B:323:HIS:HB2	1:B:325:LEU:CD2	2.45	0.45
1:C:348:GLU:CD	1:C:348:GLU:H	2.19	0.45
1:B:176:ARG:NH2	1:B:186:ARG:HE	2.14	0.45
1:B:192:CYS:O	1:B:193:LEU:HD23	2.17	0.45
1:D:62:VAL:HA	1:D:65:ARG:HD3	1.98	0.45
1:D:104:TRP:N	1:D:121:GLU:OE2	2.40	0.45
1:D:416:GLU:O	1:D:416:GLU:HG3	2.15	0.45
1:A:80:VAL:HG21	1:A:120:ILE:HG23	1.99	0.45
1:B:92:TRP:O	1:B:95:PRO:HD3	2.16	0.45
1:C:143:TYR:CE2	1:C:155:LYS:HE3	2.51	0.45
1:A:294:ARG:NH1	1:A:294:ARG:HG3	2.32	0.45
1:B:342:LEU:HD12	1:B:342:LEU:HA	1.69	0.45
1:C:303:ARG:HG2	1:C:305:ASP:OD1	2.16	0.45
1:B:97:ILE:HD13	1:B:360:GLU:HA	1.99	0.45
1:C:62:VAL:HA	1:C:65:ARG:HD3	1.97	0.45
1:C:113:LEU:HD23	1:C:113:LEU:HA	1.77	0.45
1:D:298:PHE:HE1	1:D:301:GLY:HA2	1.80	0.45
1:C:416:GLU:O	1:C:416:GLU:HG3	2.15	0.45
1:A:368:ALA:HA	2:A:1430:GFB:N2	2.32	0.45
1:C:392:ARG:HD3	1:C:392:ARG:HA	1.57	0.45
1:D:294:ARG:HG3	1:D:294:ARG:NH1	2.32	0.45
1:D:298:PHE:CE1	1:D:301:GLY:HA2	2.52	0.45
1:A:304:GLN:O	1:A:413:GLY:HA3	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:292:HIS:ND1	1:B:390:SER:OG	2.49	0.45
1:C:325:LEU:HD13	1:C:325:LEU:HA	1.68	0.45
1:A:126:ILE:HD12	1:A:132:PRO:HB3	1.99	0.44
1:C:355:THR:OG1	1:C:358:GLU:HB2	2.16	0.44
1:D:113:LEU:HD23	1:D:113:LEU:HA	1.81	0.44
1:C:357:GLU:O	1:C:361:LEU:HB2	2.17	0.44
1:A:294:ARG:HG3	1:A:294:ARG:HH11	1.83	0.44
1:B:86:TRP:HB2	1:B:102:ILE:HB	1.99	0.44
1:A:224:LEU:HD23	1:A:224:LEU:HA	1.70	0.44
1:C:83:LEU:HD13	1:C:104:TRP:CG	2.52	0.44
1:D:263:ASP:N	1:D:263:ASP:OD1	2.51	0.44
1:A:342:LEU:HD12	1:A:342:LEU:HA	1.76	0.44
1:B:207:LEU:HD23	1:B:207:LEU:HA	1.82	0.44
1:A:416:GLU:O	1:A:416:GLU:CG	2.65	0.44
1:B:254:ARG:HA	1:B:258:LEU:HB2	2.00	0.44
1:C:64:ILE:HG21	1:C:233:TYR:CD1	2.53	0.44
1:C:314:ARG:CZ	1:D:358:GLU:OE1	2.56	0.44
1:B:97:ILE:HG13	1:B:99:GLN:HG3	1.99	0.44
1:B:263:ASP:OD1	1:B:263:ASP:N	2.51	0.44
1:C:206:LEU:HD23	1:C:206:LEU:HA	1.79	0.44
1:C:219:ARG:NH1	1:C:221:GLU:OE2	2.50	0.44
1:B:310:GLU:HG2	1:C:256:ARG:HH12	1.83	0.44
1:B:143:TYR:CE2	1:B:155:LYS:HE3	2.53	0.43
1:C:305:ASP:HA	1:C:416:GLU:OE1	2.18	0.43
1:D:137:VAL:HB	1:D:190:VAL:HG22	1.99	0.43
1:A:317:ARG:HG3	1:B:252:GLU:OE2	2.19	0.43
1:B:294:ARG:HG3	1:B:294:ARG:NH1	2.34	0.43
1:D:294:ARG:HG3	1:D:294:ARG:HH11	1.82	0.43
1:B:165:LEU:HD12	1:B:165:LEU:HA	1.71	0.43
1:C:100:VAL:HG22	1:C:101:ARG:HG3	2.01	0.43
1:D:388:THR:HA	1:D:391:PHE:CD2	2.53	0.43
1:A:42:ARG:HG3	1:A:78:GLU:HG2	2.01	0.43
1:B:392:ARG:HD3	1:B:392:ARG:HA	1.59	0.43
1:C:165:LEU:HD12	1:C:165:LEU:HA	1.76	0.43
1:A:86:TRP:HB2	1:A:102:ILE:HB	2.01	0.43
1:D:141:GLN:O	1:D:194:SER:HA	2.19	0.43
1:B:100:VAL:HG22	1:B:101:ARG:HG3	2.01	0.43
1:B:219:ARG:NH1	1:B:221:GLU:OE2	2.52	0.43
1:B:325:LEU:HA	1:B:325:LEU:HD13	1.72	0.43
1:B:385:SER:C	1:B:386:VAL:HG23	2.39	0.43
1:C:51:ASN:ND2	1:C:53:PRO:HD2	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:86:TRP:HB2	1:C:102:ILE:HB	2.00	0.43
1:C:388:THR:HA	1:C:391:PHE:CD2	2.53	0.43
1:D:206:LEU:HD23	1:D:206:LEU:HA	1.83	0.43
1:A:64:ILE:HA	1:A:236:THR:HG21	2.01	0.42
1:C:203:ALA:N	1:C:204:PRO:CD	2.81	0.42
1:C:385:SER:OG	1:C:386:VAL:HG23	2.18	0.42
1:B:355:THR:OG1	1:B:358:GLU:HB2	2.19	0.42
1:C:64:ILE:HA	1:C:236:THR:HG21	2.01	0.42
1:D:55:GLY:O	1:D:59:ARG:HG3	2.18	0.42
1:D:86:TRP:HB2	1:D:102:ILE:HB	2.00	0.42
1:D:143:TYR:OH	1:D:157:ASP:OD2	2.24	0.42
1:A:355:THR:OG1	1:A:358:GLU:HB2	2.20	0.42
1:B:247:ARG:HH11	1:B:247:ARG:HD2	1.69	0.42
1:B:370:ILE:O	1:B:374:ILE:HG13	2.20	0.42
1:C:292:HIS:HA	1:C:331:ALA:O	2.20	0.42
1:A:321:LYS:HD3	1:B:248:GLU:HB3	2.00	0.42
1:B:113:LEU:HD23	1:B:113:LEU:HA	1.70	0.42
1:D:126:ILE:HD12	1:D:132:PRO:HB3	2.02	0.42
1:A:137:VAL:HB	1:A:190:VAL:HG22	2.01	0.42
1:A:205:LEU:HD23	1:A:205:LEU:C	2.40	0.42
1:A:375:CYS:HB2	1:A:393:ILE:HD13	2.00	0.42
1:A:113:LEU:HD23	1:A:113:LEU:HA	1.76	0.42
1:C:201:ILE:HD12	1:C:201:ILE:HA	1.92	0.42
1:C:385:SER:C	1:C:386:VAL:HG23	2.40	0.42
1:D:80:VAL:HG21	1:D:120:ILE:HG23	2.02	0.42
1:A:365:GLY:HA2	1:A:368:ALA:HB3	2.01	0.42
1:B:80:VAL:HG21	1:B:120:ILE:HG23	2.02	0.42
1:B:365:GLY:HA2	1:B:368:ALA:HB3	2.02	0.41
1:B:96:ASP:HB2	1:B:356:TRP:HH2	1.84	0.41
1:D:201:ILE:HD12	1:D:201:ILE:HA	1.91	0.41
1:D:392:ARG:HD3	1:D:392:ARG:HA	1.58	0.41
1:A:343:LYS:HD2	1:A:343:LYS:HA	1.86	0.41
1:C:278:VAL:HG11	1:C:401:GLY:HA3	2.02	0.41
1:D:192:CYS:O	1:D:193:LEU:HD23	2.20	0.41
1:D:398:GLU:OE2	1:D:424:HIS:HE1	2.03	0.41
1:B:58:LEU:HD23	1:B:58:LEU:O	2.21	0.41
1:C:286:GLY:O	1:C:379:ARG:HB2	2.20	0.41
1:B:97:ILE:CG1	1:B:99:GLN:HE21	2.34	0.41
1:B:286:GLY:O	1:B:379:ARG:HB2	2.20	0.41
1:D:254:ARG:HA	1:D:258:LEU:HB2	2.01	0.41
1:A:292:HIS:HA	1:A:331:ALA:O	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:370:ILE:O	1:A:374:ILE:HG13	2.21	0.41
1:B:64:ILE:HA	1:B:236:THR:HG21	2.02	0.41
1:B:341:GLU:O	1:B:345:LEU:HD12	2.20	0.41
1:C:42:ARG:HA	1:C:42:ARG:CZ	2.51	0.41
1:C:260:SER:OG	1:C:265:ASP:OD2	2.31	0.41
1:D:43:ARG:HD2	1:D:80:VAL:CG1	2.51	0.41
1:D:385:SER:HB2	1:D:410:ARG:HH11	1.86	0.41
1:B:294:ARG:HG3	1:B:294:ARG:HH11	1.85	0.41
1:C:254:ARG:HA	1:C:258:LEU:HB2	2.03	0.41
1:D:64:ILE:HA	1:D:236:THR:HG21	2.01	0.41
1:A:379:ARG:NH1	1:A:379:ARG:CG	2.77	0.41
1:B:58:LEU:HD23	1:B:58:LEU:C	2.41	0.41
1:B:416:GLU:O	1:B:416:GLU:CG	2.69	0.41
1:C:323:HIS:O	1:C:325:LEU:HD22	2.20	0.41
1:A:64:ILE:HG21	1:A:233:TYR:CD1	2.56	0.41
1:B:188:LEU:HA	1:B:188:LEU:HD23	1.80	0.41
1:B:379:ARG:CG	1:B:379:ARG:NH1	2.81	0.41
1:C:385:SER:HB2	1:C:410:ARG:HH11	1.86	0.41
1:D:342:LEU:HA	1:D:342:LEU:HD12	1.71	0.41
1:D:375:CYS:HB2	1:D:393:ILE:HD13	2.02	0.41
1:B:304:GLN:O	1:B:413:GLY:HA3	2.21	0.40
1:C:58:LEU:O	1:C:58:LEU:HD23	2.21	0.40
1:C:137:VAL:HB	1:C:190:VAL:HG22	2.03	0.40
1:C:370:ILE:O	1:C:374:ILE:HG13	2.21	0.40
1:D:258:LEU:HA	1:D:258:LEU:HD23	1.90	0.40
1:D:286:GLY:O	1:D:379:ARG:HB2	2.21	0.40
1:D:304:GLN:O	1:D:413:GLY:HA3	2.21	0.40
1:D:403:ASP:HA	1:D:404:PRO:HD3	1.84	0.40
1:A:126:ILE:H	1:A:126:ILE:HG12	1.64	0.40
1:B:126:ILE:HG12	1:B:126:ILE:H	1.62	0.40
1:B:176:ARG:CZ	1:B:186:ARG:HE	2.34	0.40
1:C:188:LEU:HA	1:C:188:LEU:HD23	1.76	0.40
1:C:398:GLU:HG3	1:C:427:ILE:HG13	2.02	0.40
1:D:100:VAL:HG22	1:D:101:ARG:HG3	2.03	0.40
1:A:143:TYR:OH	1:A:155:LYS:HG3	2.22	0.40
1:A:339:TYR:CZ	1:A:351:ARG:HD2	2.55	0.40
1:A:398:GLU:OE2	1:A:424:HIS:HE1	2.05	0.40
1:C:126:ILE:HD12	1:C:132:PRO:HB3	2.02	0.40
1:B:137:VAL:HB	1:B:190:VAL:HG22	2.03	0.40
1:B:203:ALA:N	1:B:204:PRO:CD	2.85	0.40
1:B:97:ILE:CD1	1:B:99:GLN:CG	2.92	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:207:LEU:HD23	1:C:207:LEU:HA	1.88	0.40
1:D:165:LEU:HA	1:D:165:LEU:HD12	1.74	0.40
1:D:393:ILE:O	1:D:397:ARG:HG3	2.21	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	387/422 (92%)	372 (96%)	14 (4%)	1 (0%)	37	66
1	B	387/422 (92%)	376 (97%)	11 (3%)	0	100	100
1	C	384/422 (91%)	372 (97%)	12 (3%)	0	100	100
1	D	387/422 (92%)	372 (96%)	15 (4%)	0	100	100
All	All	1545/1688 (92%)	1492 (97%)	52 (3%)	1 (0%)	48	78

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	96	ASP

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	347/374 (93%)	318 (92%)	29 (8%)	9	29
1	B	347/374 (93%)	316 (91%)	31 (9%)	8	27
1	C	346/374 (92%)	316 (91%)	30 (9%)	8	28
1	D	347/374 (93%)	316 (91%)	31 (9%)	8	27
All	All	1387/1496 (93%)	1266 (91%)	121 (9%)	8	28

All (121) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	50	VAL
1	A	98	HIS
1	A	112	SER
1	A	148	LYS
1	A	152	TRP
1	A	165	LEU
1	A	176	ARG
1	A	191	SER
1	A	213	ARG
1	A	219	ARG
1	A	263	ASP
1	A	291	VAL
1	A	298	PHE
1	A	306	VAL
1	A	314	ARG
1	A	325	LEU
1	A	328	VAL
1	A	335	VAL
1	A	336	ARG
1	A	345	LEU
1	A	384	THR
1	A	386	VAL
1	A	388	THR
1	A	392	ARG
1	A	406	THR
1	A	410	ARG
1	A	416	GLU
1	A	417	LYS
1	A	420	GLU
1	B	47	LEU
1	B	50	VAL
1	B	94	SER
1	B	96	ASP

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Mol	Chain	Res	Type
1	B	112	SER
1	B	148	LYS
1	B	152	TRP
1	B	165	LEU
1	B	176	ARG
1	B	191	SER
1	B	213	ARG
1	B	219	ARG
1	B	263	ASP
1	B	291	VAL
1	B	299	ILE
1	B	300	TRP
1	B	306	VAL
1	B	314	ARG
1	B	325	LEU
1	B	328	VAL
1	B	335	VAL
1	B	336	ARG
1	B	345	LEU
1	B	384	THR
1	B	386	VAL
1	B	388	THR
1	B	392	ARG
1	B	406	THR
1	B	410	ARG
1	B	416	GLU
1	B	420	GLU
1	C	47	LEU
1	C	50	VAL
1	C	112	SER
1	C	126	ILE
1	C	148	LYS
1	C	152	TRP
1	C	165	LEU
1	C	176	ARG
1	C	191	SER
1	C	213	ARG
1	C	219	ARG
1	C	263	ASP
1	C	291	VAL
1	C	297	ASP
1	C	298	PHE

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Mol	Chain	Res	Type
1	C	306	VAL
1	C	314	ARG
1	C	325	LEU
1	C	328	VAL
1	C	335	VAL
1	C	336	ARG
1	C	345	LEU
1	C	384	THR
1	C	386	VAL
1	C	388	THR
1	C	392	ARG
1	C	406	THR
1	C	410	ARG
1	C	416	GLU
1	C	420	GLU
1	D	47	LEU
1	D	50	VAL
1	D	98	HIS
1	D	112	SER
1	D	148	LYS
1	D	152	TRP
1	D	165	LEU
1	D	176	ARG
1	D	191	SER
1	D	207	LEU
1	D	213	ARG
1	D	219	ARG
1	D	263	ASP
1	D	291	VAL
1	D	298	PHE
1	D	306	VAL
1	D	314	ARG
1	D	325	LEU
1	D	328	VAL
1	D	335	VAL
1	D	336	ARG
1	D	345	LEU
1	D	346	LEU
1	D	384	THR
1	D	386	VAL
1	D	388	THR
1	D	392	ARG

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Mol	Chain	Res	Type
1	D	406	THR
1	D	410	ARG
1	D	416	GLU
1	D	420	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 ⓘ

There are no oligosaccharides in this entry.

5.6   Ligand geometry ⓘ

Of 14 ligands modelled in this entry, 4 are monoatomic - leaving 10 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 Counts	Bond lengths RMSZ	Bond lengths #$|Z| > 2$	Bond angles Counts	Bond angles RMSZ	Bond angles #$|Z| > 2$
3	NAG	A	1431	1	14,14,15	0.51	0	17,19,21	0.97	1 (5%)
3	NAG	B	1431	1	14,14,15	0.51	0	17,19,21	1.22	3 (17%)
3	NAG	B	1432	1	14,14,15	0.66	0	17,19,21	0.53	0
3	NAG	C	1432	1	14,14,15	0.63	0	17,19,21	0.59	0
3	NAG	C	1431	1	14,14,15	0.52	0	17,19,21	1.11	1 (5%)
2	GFB	C	1430	-	34,41,41	0.96	1 (2%)	45,64,64	1.61	7 (15%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	NAG	B	1433	1	14,14,15	0.51	0	17,19,21	0.79	0
2	GFB	A	1430	-	34,41,41	0.96	1 (2%)	45,64,64	1.60	7 (15%)
2	GFB	B	1430	-	34,41,41	0.99	1 (2%)	45,64,64	1.57	7 (15%)
2	GFB	D	1430	-	34,41,41	0.98	1 (2%)	45,64,64	1.57	7 (15%)

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	NAG	A	1431	1	-	2/6/23/26	0/1/1/1
3	NAG	B	1431	1	-	1/6/23/26	0/1/1/1
3	NAG	B	1432	1	-	2/6/23/26	0/1/1/1
3	NAG	C	1432	1	-	2/6/23/26	0/1/1/1
3	NAG	C	1431	1	-	1/6/23/26	0/1/1/1
2	GFB	C	1430	-	-	9/17/57/57	0/4/4/4
3	NAG	B	1433	1	-	2/6/23/26	0/1/1/1
2	GFB	A	1430	-	-	9/17/57/57	0/4/4/4
2	GFB	B	1430	-	-	9/17/57/57	0/4/4/4
2	GFB	D	1430	-	-	9/17/57/57	0/4/4/4

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	1430	GFB	C5-C6	-3.95	1.39	1.47
2	B	1430	GFB	C5-C6	-3.88	1.39	1.47
2	C	1430	GFB	C5-C6	-3.73	1.39	1.47
2	A	1430	GFB	C5-C6	-3.59	1.40	1.47

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	1430	GFB	O5-C1-O1	-6.05	103.45	111.36
2	B	1430	GFB	O5-C1-O1	-6.05	103.46	111.36
2	D	1430	GFB	O5-C1-O1	-5.99	103.53	111.36
2	A	1430	GFB	O5-C1-O1	-5.90	103.65	111.36
3	C	1431	NAG	C1-O5-C5	3.58	117.04	112.19
3	B	1431	NAG	C1-O5-C5	3.34	116.72	112.19

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PROTEIN DATA BANK

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1430	GFB	N2-C2-N1	3.27	123.68	116.71
2	A	1430	GFB	C5-C6-N1	3.20	119.60	113.95
2	C	1430	GFB	C5-C6-N1	3.16	119.53	113.95
2	C	1430	GFB	N2-C2-N1	3.15	123.42	116.71
2	C	1430	GFB	O6-C6-C5	-3.13	118.26	124.37
2	A	1430	GFB	N2-C2-N1	3.08	123.27	116.71
2	D	1430	GFB	N2-C2-N1	3.01	123.12	116.71
2	A	1430	GFB	O6-C6-C5	-3.01	118.49	124.37
2	D	1430	GFB	C5-C6-N1	2.95	119.17	113.95
3	A	1431	NAG	O5-C5-C6	2.78	111.57	107.20
2	D	1430	GFB	O6-C6-C5	-2.74	119.02	124.37
2	B	1430	GFB	O6-C6-C5	-2.73	119.04	124.37
2	A	1430	GFB	C8-N7-C5	2.66	108.06	102.99
2	B	1430	GFB	C5-C6-N1	2.63	118.60	113.95
2	C	1430	GFB	C8-N7-C5	2.61	107.97	102.99
2	A	1430	GFB	C3-C4A-C5A	2.48	113.63	109.77
2	C	1430	GFB	C3-C4A-C5A	2.46	113.61	109.77
2	D	1430	GFB	C3-C4A-C5A	2.46	113.60	109.77
2	B	1430	GFB	C3-C4A-C5A	2.44	113.57	109.77
2	D	1430	GFB	C8-N7-C5	2.42	107.59	102.99
2	B	1430	GFB	C8-N7-C5	2.28	107.34	102.99
2	D	1430	GFB	C2-N1-C6	-2.27	120.92	125.10
3	B	1431	NAG	C6-C5-C4	-2.26	107.71	113.00
3	B	1431	NAG	O5-C5-C6	2.24	110.71	107.20
2	A	1430	GFB	C2-N1-C6	-2.21	121.03	125.10
2	B	1430	GFB	N2-C2-N3	-2.15	115.54	119.74
2	C	1430	GFB	C2-N1-C6	-2.11	121.21	125.10

There are no chirality outliers.

All (46) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1430	GFB	C5'-O5'-P-O1P
2	A	1430	GFB	P-O2P-P1-O1
2	A	1430	GFB	O5-C1-O1-P1
2	B	1430	GFB	C5'-O5'-P-O1P
2	B	1430	GFB	C5'-O5'-P-O3P
2	B	1430	GFB	P-O2P-P1-O1
2	B	1430	GFB	O5-C1-O1-P1
2	C	1430	GFB	C5'-O5'-P-O1P
2	C	1430	GFB	C5'-O5'-P-O3P
2	C	1430	GFB	O5-C1-O1-P1

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Mol	Chain	Res	Type	Atoms
2	D	1430	GFB	C5'-O5'-P-O1P
2	D	1430	GFB	C5'-O5'-P-O3P
2	D	1430	GFB	P-O2P-P1-O1
2	D	1430	GFB	O5-C1-O1-P1
3	B	1433	NAG	O5-C5-C6-O6
3	C	1432	NAG	O5-C5-C6-O6
3	C	1432	NAG	C4-C5-C6-O6
3	B	1433	NAG	C4-C5-C6-O6
3	B	1431	NAG	O5-C5-C6-O6
3	B	1432	NAG	O5-C5-C6-O6
2	C	1430	GFB	O4'-C4'-C5'-O5'
2	A	1430	GFB	O4'-C4'-C5'-O5'
2	B	1430	GFB	O4'-C4'-C5'-O5'
2	D	1430	GFB	O4'-C4'-C5'-O5'
2	A	1430	GFB	C4'-C5'-O5'-P
2	B	1430	GFB	C4'-C5'-O5'-P
2	C	1430	GFB	C4'-C5'-O5'-P
2	D	1430	GFB	C4'-C5'-O5'-P
2	A	1430	GFB	P1-O2P-P-O5'
2	B	1430	GFB	P1-O2P-P-O5'
2	C	1430	GFB	P1-O2P-P-O5'
2	C	1430	GFB	P-O2P-P1-O1
2	D	1430	GFB	P1-O2P-P-O5'
2	A	1430	GFB	C5'-O5'-P-O2P
2	A	1430	GFB	C5'-O5'-P-O3P
3	A	1431	NAG	C4-C5-C6-O6
3	C	1431	NAG	O5-C5-C6-O6
2	C	1430	GFB	C3'-C4'-C5'-O5'
3	B	1432	NAG	C4-C5-C6-O6
3	A	1431	NAG	O5-C5-C6-O6
2	A	1430	GFB	C3'-C4'-C5'-O5'
2	B	1430	GFB	C3'-C4'-C5'-O5'
2	D	1430	GFB	C3'-C4'-C5'-O5'
2	B	1430	GFB	C5'-O5'-P-O2P
2	C	1430	GFB	C5'-O5'-P-O2P
2	D	1430	GFB	C5'-O5'-P-O2P

There are no ring outliers.

5 monomers are involved in 19 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1431	NAG	1	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	1430	GFB	4	0
2	A	1430	GFB	5	0
2	B	1430	GFB	4	0
2	D	1430	GFB	5	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand GFB C 1430

Bond lengths

Bond angles

Torsions

Rings

Ligand GFB A 1430

Bond lengths

Bond angles

Torsions

Rings

Ligand GFB B 1430

Bond lengths

Bond angles

Torsions

Rings

Ligand GFB D 1430

Bond lengths

Bond angles

Torsions

Rings
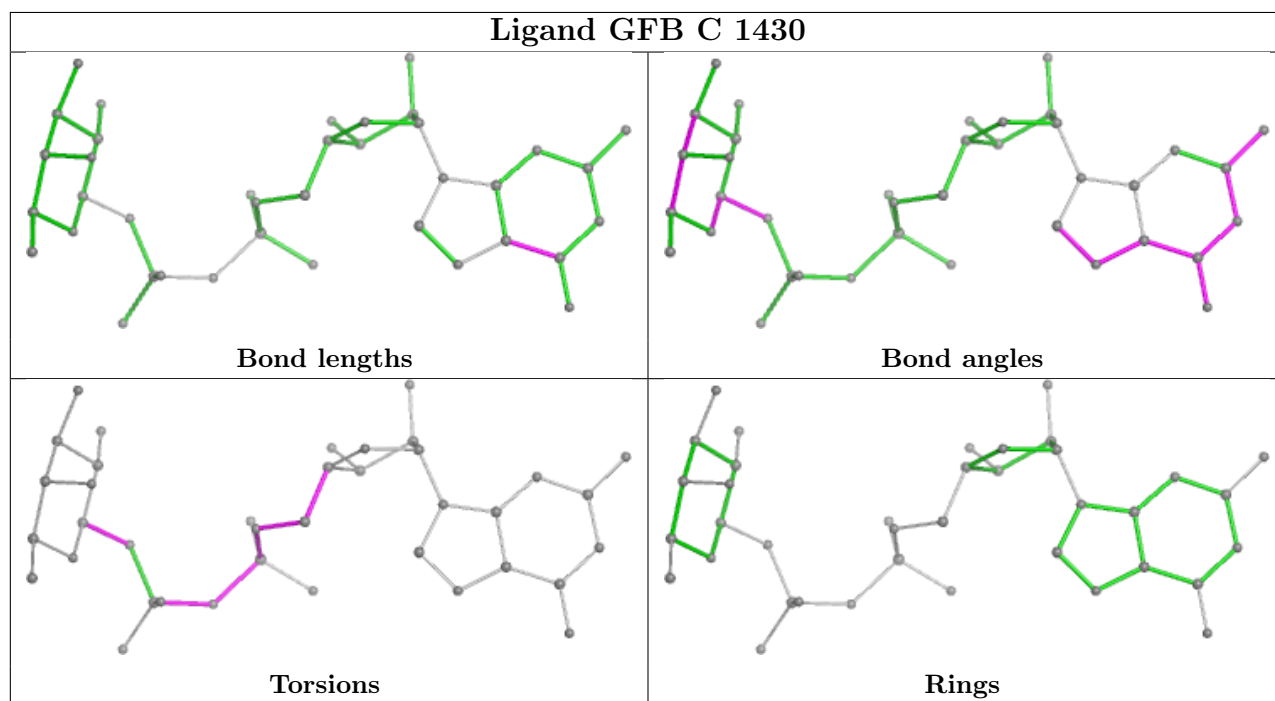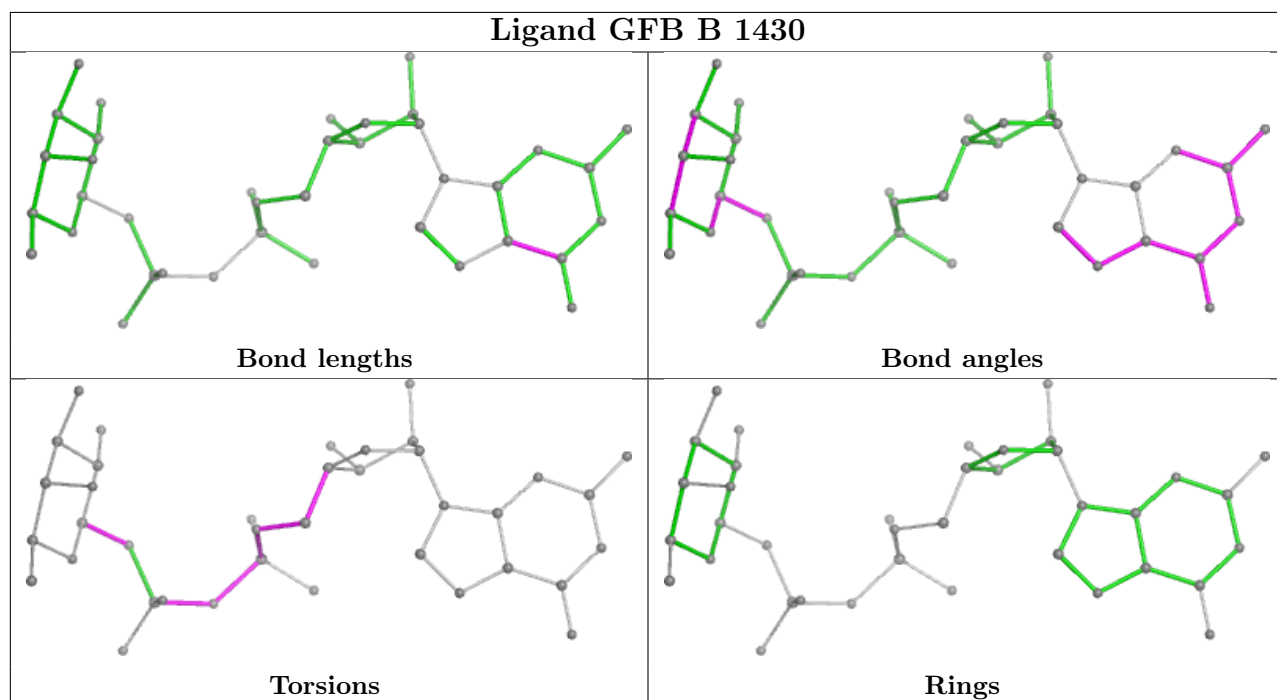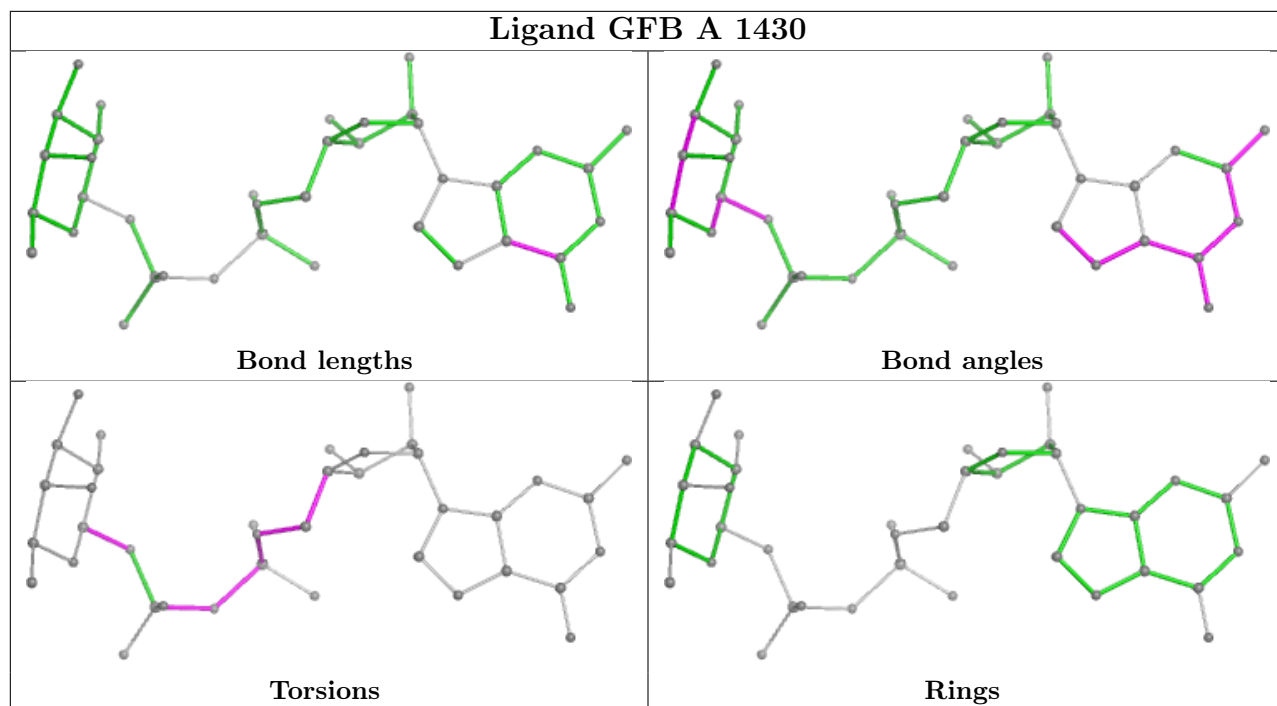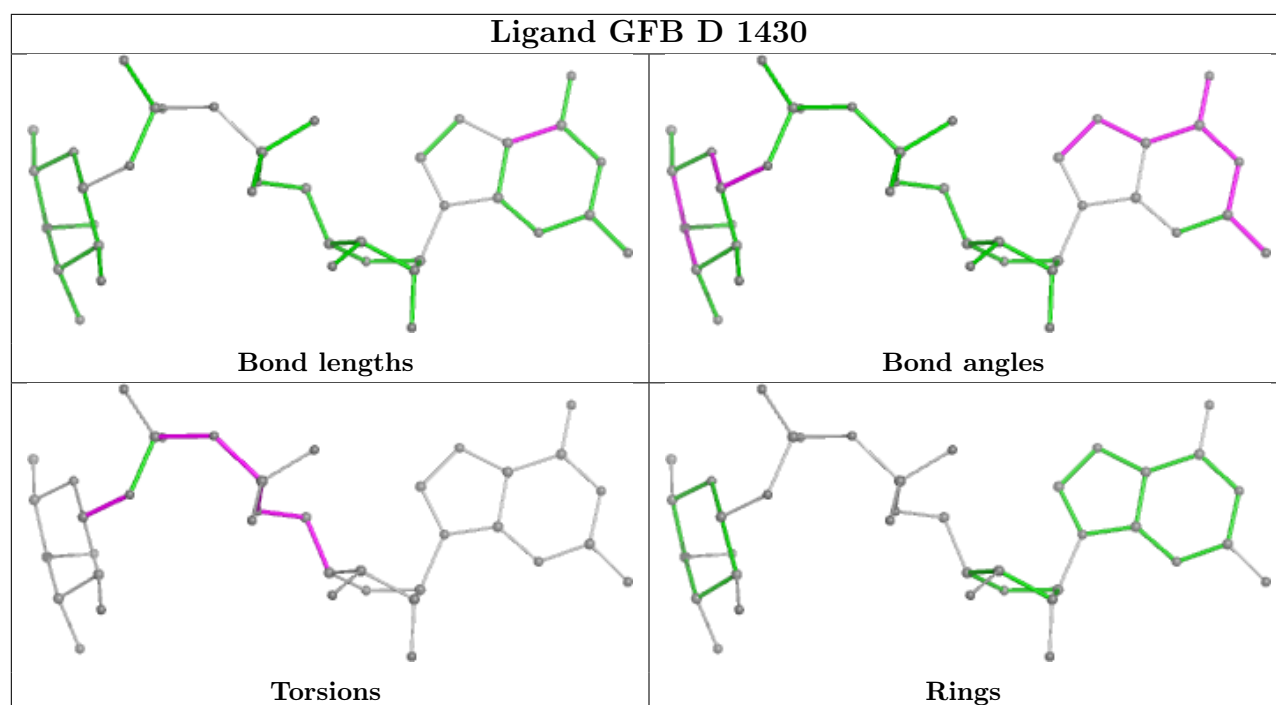
5.7 Other polymers ⓘ

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	389/422 (92%)	-0.62	0	100	100	51, 81, 147, 212	0
1	B	389/422 (92%)	-0.79	0	100	100	37, 64, 127, 204	0
1	C	388/422 (91%)	-0.58	1 (0%)	90	89	50, 84, 145, 215	0
1	D	389/422 (92%)	-0.18	2 (0%)	87	83	91, 163, 222, 326	0
All	All	1555/1688 (92%)	-0.54	3 (0%)	92	92	37, 89, 195, 326	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	299	ILE	3.1
1	D	376	ALA	2.6
1	C	299	ILE	2.0

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

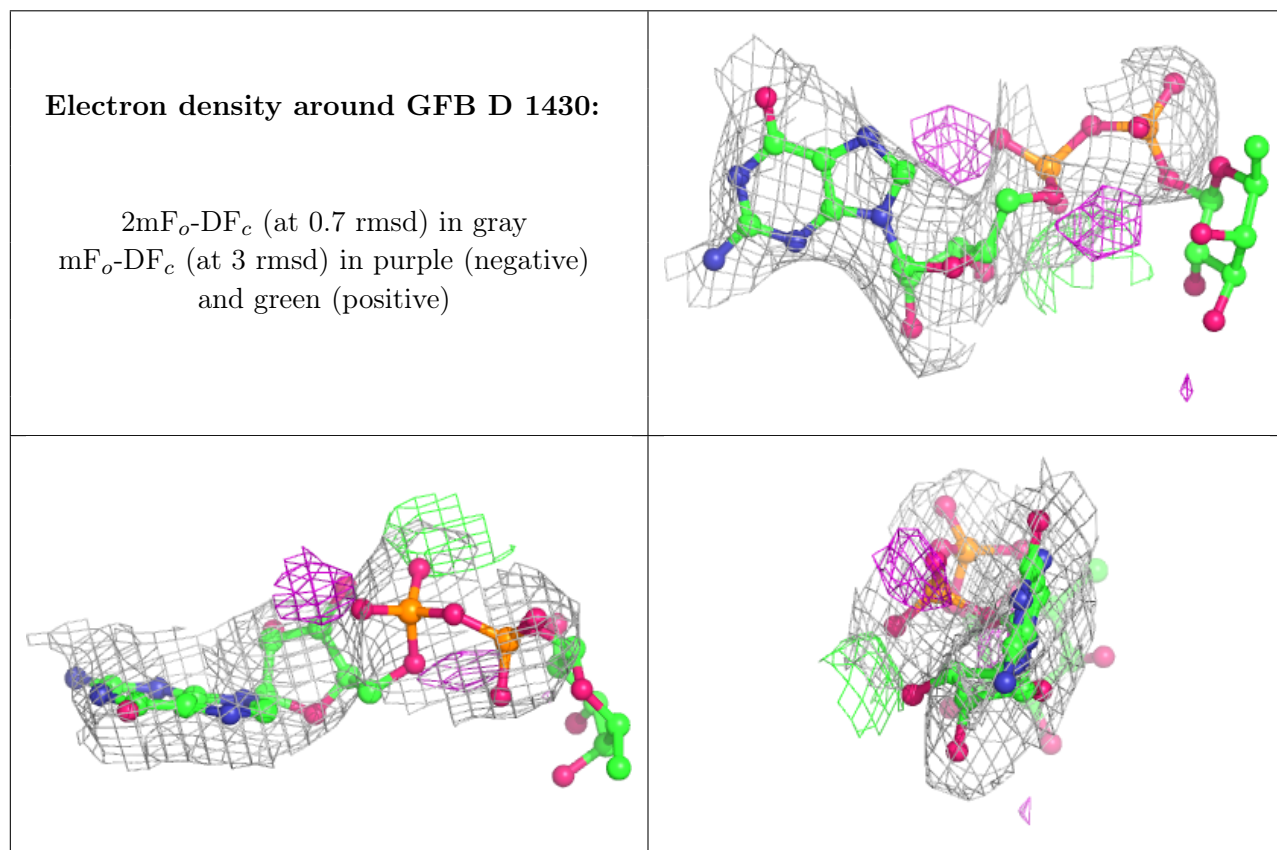There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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
3	NAG	C	1432	14/15	0.57	0.15	190,203,209,213	0
3	NAG	B	1433	14/15	0.59	0.13	185,198,204,208	0
3	NAG	A	1431	14/15	0.65	0.14	193,207,212,217	0
3	NAG	B	1431	14/15	0.70	0.13	180,193,198,203	0
3	NAG	B	1432	14/15	0.71	0.16	195,209,214,219	0
3	NAG	C	1431	14/15	0.74	0.13	214,228,233,238	0
2	GFB	D	1430	38/38	0.83	0.14	104,126,205,206	0
4	CL	D	1431	1/1	0.90	0.09	85,85,85,85	0
2	GFB	C	1430	38/38	0.93	0.11	71,89,176,177	0
2	GFB	A	1430	38/38	0.94	0.12	56,80,174,175	0
4	CL	C	1433	1/1	0.95	0.06	61,61,61,61	0
4	CL	A	1432	1/1	0.95	0.08	75,75,75,75	0
2	GFB	B	1430	38/38	0.96	0.09	42,62,155,155	0
4	CL	B	1434	1/1	0.98	0.06	55,55,55,55	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.
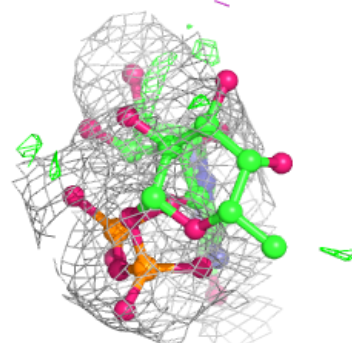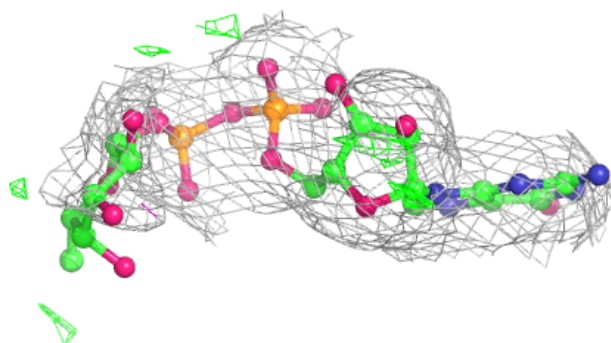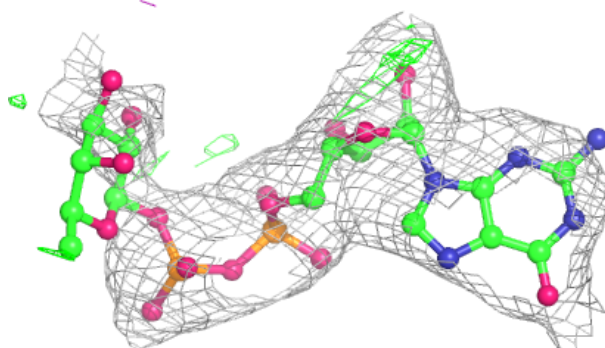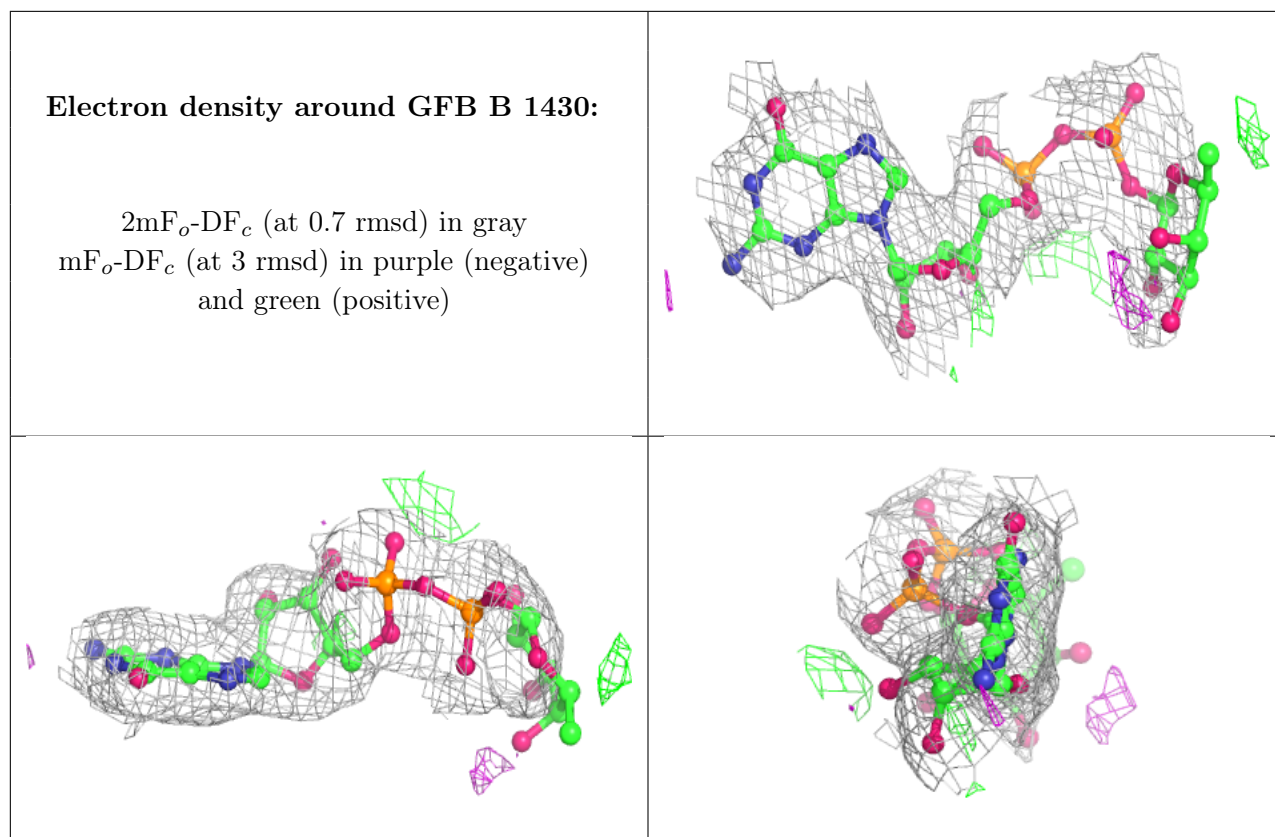
Electron density around GFB D 1430:

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

Electron density around GFB C 1430:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
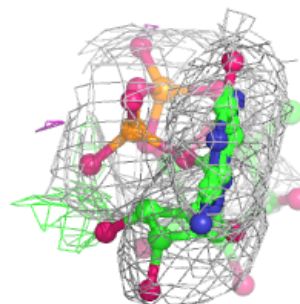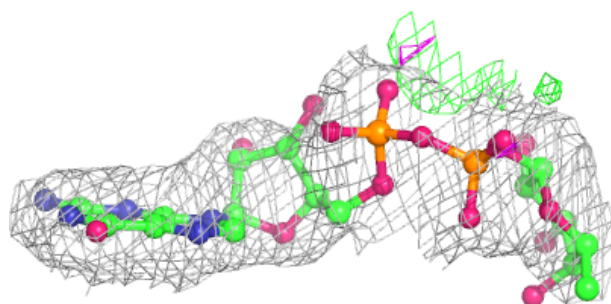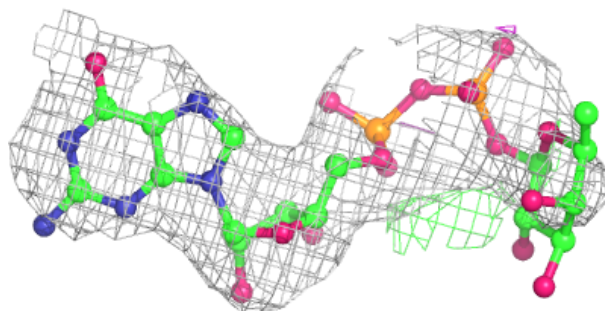
Electron density around GFB A 1430:

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

Electron density around GFB B 1430:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.