



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 04:58 AM UTC

PDB ID : 4IME / pdb_00004ime
Title : Crystal Structure of Pasteurella multocida N-Acetyl-D-Neuraminic acid lyase K164A Mutant
Authors : Fisher, A.J.; Huynh, N.
Deposited on : 2013-01-02
Resolution : 1.75 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

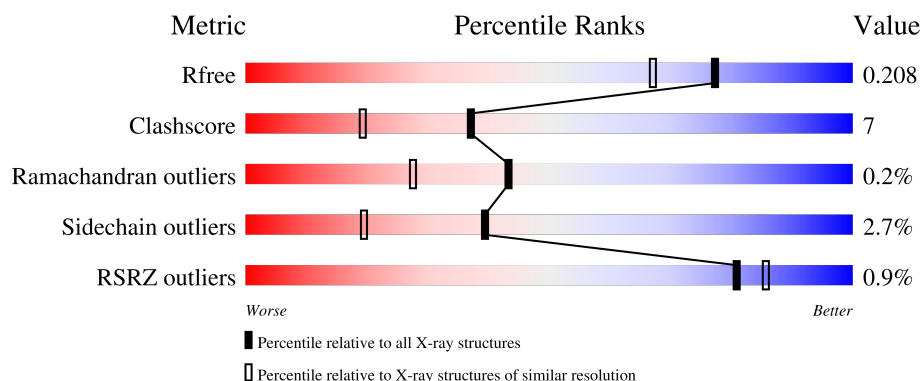
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.75 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	3183 (1.76-1.76)
Clashscore	190562	3299 (1.76-1.76)
Ramachandran outliers	187476	3274 (1.76-1.76)
Sidechain outliers	187428	3274 (1.76-1.76)
RSRZ outliers	180081	3183 (1.76-1.76)

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

Mol	Chain	Length	Quality of chain
1	A	293	86% 12% .
1	B	293	89% 10% .
1	C	293	87% 13% .
1	D	293	89% 10% .
1	E	293	89% 10% .

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Mol	Chain	Length	Quality of chain
1	F	293	 89% 10% ..
1	G	293	 88% 10% •
1	H	293	 91% 8% •

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	ME2	B	302	-	-	X	-
2	ME2	C	5001	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 21389 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 N-acetylneuraminate lyase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	293	Total	C	N	O	S	0	2	0
			2311	1495	370	438	8			
1	B	293	Total	C	N	O	S	0	0	0
			2295	1485	367	435	8			
1	C	293	Total	C	N	O	S	0	3	0
			2322	1504	371	439	8			
1	D	293	Total	C	N	O	S	0	3	0
			2322	1504	371	439	8			
1	E	293	Total	C	N	O	S	0	3	0
			2322	1504	371	439	8			
1	F	293	Total	C	N	O	S	0	2	0
			2314	1500	369	437	8			
1	G	293	Total	C	N	O	S	0	2	0
			2311	1495	370	438	8			
1	H	293	Total	C	N	O	S	0	3	0
			2319	1503	370	438	8			

There are 16 discrepancies between the modelled and reference sequences:

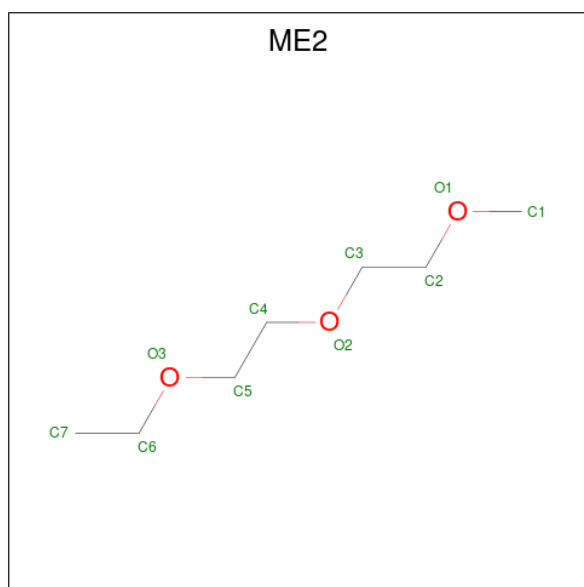
Chain	Residue	Modelled	Actual	Comment	Reference
A	164	ALA	LYS	engineered mutation	UNP Q9CKB0
A	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
B	164	ALA	LYS	engineered mutation	UNP Q9CKB0
B	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
C	164	ALA	LYS	engineered mutation	UNP Q9CKB0
C	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
D	164	ALA	LYS	engineered mutation	UNP Q9CKB0
D	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
E	164	ALA	LYS	engineered mutation	UNP Q9CKB0
E	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
F	164	ALA	LYS	engineered mutation	UNP Q9CKB0
F	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
G	164	ALA	LYS	engineered mutation	UNP Q9CKB0

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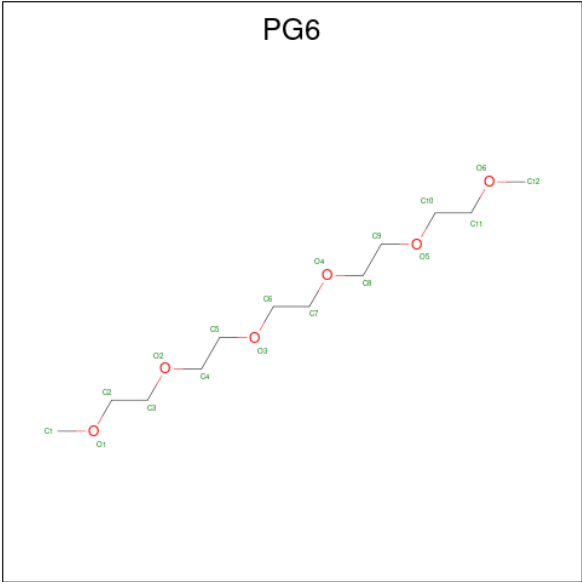
Chain	Residue	Modelled	Actual	Comment	Reference
G	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0
H	164	ALA	LYS	engineered mutation	UNP Q9CKB0
H	278	SER	PRO	SEE REMARK 999	UNP Q9CKB0

- Molecule 2 is 1-ETHOXY-2-(2-METHOXYETHOXY)ETHANE (CCD ID: ME2) (formula: $C_7H_{16}O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	B	1	Total C O 10 7 3	0	0
2	B	1	Total C O 10 7 3	0	0
2	C	1	Total C O 10 7 3	0	0
2	D	1	Total C O 10 7 3	0	0
2	E	1	Total C O 10 7 3	0	0
2	E	1	Total C O 10 7 3	0	0
2	G	1	Total C O 10 7 3	0	0

- Molecule 3 is 1-(2-METHOXY-ETHOXY)-2-{2-[2-(2-METHOXY-ETHOXY)-ETHOXY]-ETHANE (CCD ID: PG6) (formula: $C_{12}H_{26}O_6$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	G	1	Total	C	O	0	0
			18	12	6		

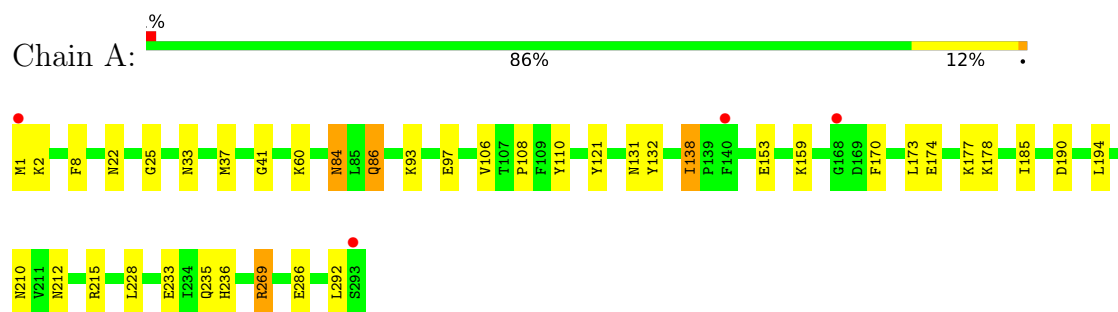
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	305	Total	O	0	0
			305	305		
4	B	383	Total	O	0	0
			383	383		
4	C	358	Total	O	0	0
			358	358		
4	D	369	Total	O	0	0
			369	369		
4	E	316	Total	O	0	0
			316	316		
4	F	366	Total	O	0	0
			366	366		
4	G	313	Total	O	0	0
			313	313		
4	H	375	Total	O	0	0
			375	375		

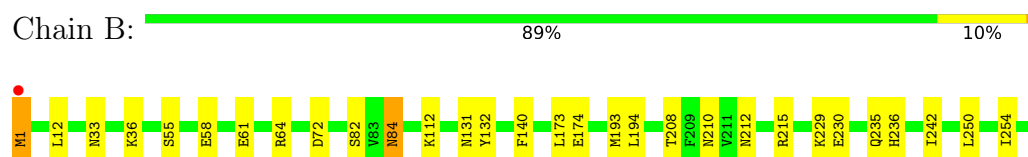
3 Residue-property plots [i](#)

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

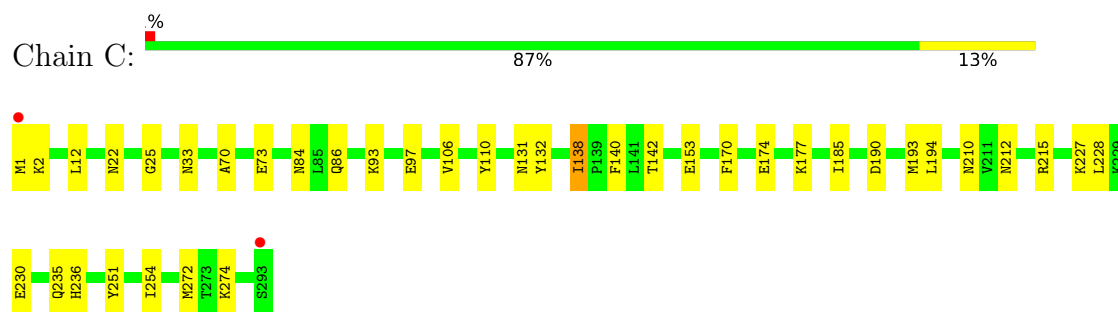
- Molecule 1: N-acetylneuraminate lyase



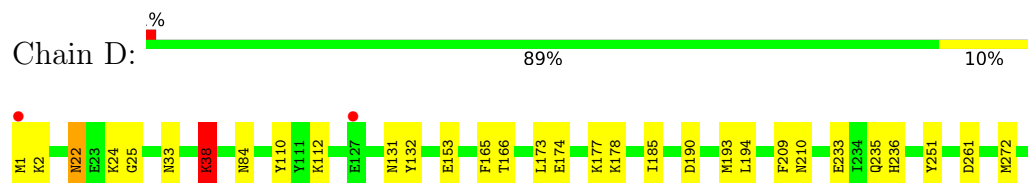
- Molecule 1: N-acetylneuraminate lyase



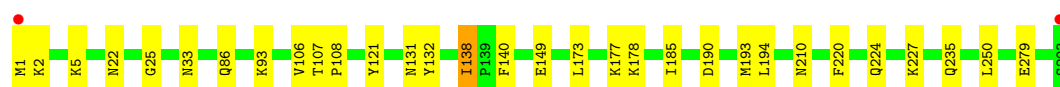
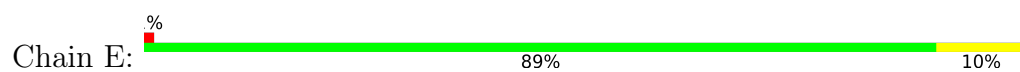
- Molecule 1: N-acetylneuraminate lyase



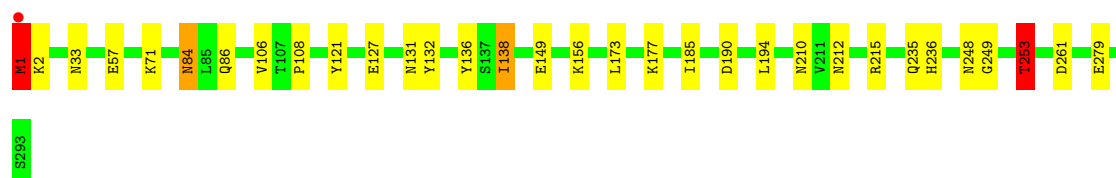
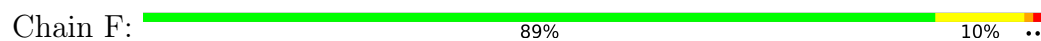
- Molecule 1: N-acetylneuraminate lyase



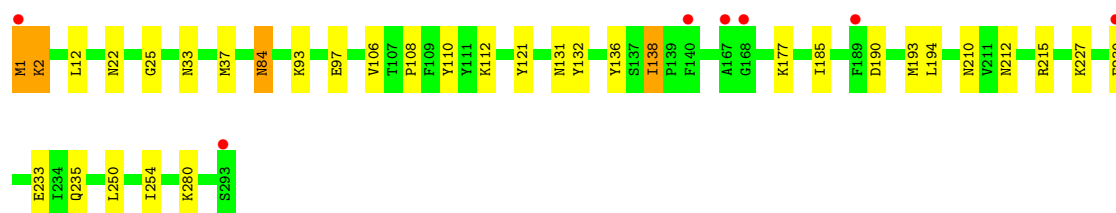
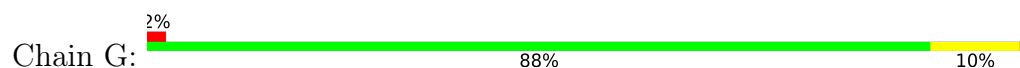
- Molecule 1: N-acetylneuraminate lyase



● Molecule 1: N-acetylneuraminate lyase



● Molecule 1: N-acetylneuraminate lyase



● Molecule 1: N-acetylneuraminate lyase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	90.14Å 147.71Å 111.98Å 90.00° 98.51° 90.00°	Depositor
Resolution (Å)	39.26 – 1.75 39.26 – 1.75	Depositor EDS
% Data completeness (in resolution range)	99.1 (39.26-1.75) 99.1 (39.26-1.75)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.91 (at 1.75Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.175 , 0.208 0.175 , 0.208	Depositor DCC
R_{free} test set	14540 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	14.4	Xtriage
Anisotropy	0.365	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 45.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	21389	wwPDB-VP
Average B, all atoms (Å ²)	17.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 14.07% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ME2, PG6

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	0.89	0/2353	0.99	7/3171 (0.2%)
1	B	0.99	0/2337	0.99	0/3148
1	C	0.92	0/2365	0.93	0/3187
1	D	1.00	1/2365 (0.0%)	0.97	1/3186 (0.0%)
1	E	0.86	0/2365	0.92	2/3187 (0.1%)
1	F	0.98	0/2357	1.02	1/3176 (0.0%)
1	G	0.90	0/2353	0.94	0/3171
1	H	0.96	0/2365	0.96	0/3187
All	All	0.94	1/18860 (0.0%)	0.97	11/25413 (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	F	0	1

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	166	THR	CA-C	-5.47	1.47	1.53

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	269	ARG	NE-CZ-NH2	-8.51	111.54	119.20
1	A	269	ARG	NE-CZ-NH1	7.88	129.38	121.50
1	A	269	ARG	CD-NE-CZ	7.32	134.65	124.40
1	A	269	ARG	CB-CG-CD	6.33	125.86	111.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	269	ARG	CA-CB-CG	6.28	126.67	114.10
1	F	253	THR	OG1-CB-CG2	5.97	121.25	109.30
1	E	107	THR	CA-C-N	-5.73	113.88	119.78
1	E	107	THR	C-N-CA	-5.73	113.88	119.78
1	D	38	LYS	CB-CA-C	-5.63	103.89	111.89
1	A	292	LEU	CA-C-N	5.58	131.74	121.70
1	A	292	LEU	C-N-CA	5.58	131.74	121.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	1	MET	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	2311	0	2339	40	0
1	B	2295	0	2323	34	0
1	C	2322	0	2347	45	0
1	D	2322	0	2346	35	0
1	E	2322	0	2347	25	0
1	F	2314	0	2342	29	0
1	G	2311	0	2339	30	0
1	H	2319	0	2348	23	0
2	B	20	0	32	13	0
2	C	10	0	16	13	0
2	D	10	0	16	4	0
2	E	20	0	32	9	0
2	G	10	0	16	5	0
3	G	18	0	26	2	0
4	A	305	0	0	5	0
4	B	383	0	0	9	0
4	C	358	0	0	6	0
4	D	369	0	0	12	0
4	E	316	0	0	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	F	366	0	0	6	0
4	G	313	0	0	6	0
4	H	375	0	0	4	0
All	All	21389	0	18869	267	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (267) 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:58:GLU:OE2	2:B:302:ME2:H31	1.46	1.14
1:C:140[B]:PHE:CE1	2:C:5001:ME2:H11	1.88	1.09
2:C:5001:ME2:H71	4:D:756:HOH:O	1.56	1.05
1:C:106:VAL:HG23	1:C:138[A]:ILE:HD11	1.40	1.04
1:B:58:GLU:OE2	2:B:302:ME2:C3	2.12	0.97
2:E:301:ME2:H21	4:E:712:HOH:O	1.64	0.96
1:F:248:ASN:HB3	1:F:253:THR:HG21	1.44	0.95
2:B:302:ME2:H21	4:B:666:HOH:O	1.69	0.91
1:F:1:MET:HA	4:F:651:HOH:O	1.70	0.91
1:D:153:GLU:HG2	4:D:723:HOH:O	1.72	0.89
1:C:153:GLU:HG2	4:C:5448:HOH:O	1.72	0.88
1:F:249:GLY:O	1:F:253:THR:HG23	1.74	0.86
1:B:230:GLU:HG3	4:B:579:HOH:O	1.74	0.85
1:E:131:ASN:HD22	1:E:132:TYR:H	1.28	0.82
1:C:131:ASN:HD22	1:C:132:TYR:H	1.26	0.82
1:F:131:ASN:HD22	1:F:132:TYR:H	1.30	0.79
1:B:82:SER:HB2	4:B:564:HOH:O	1.83	0.79
1:C:138[A]:ILE:HD12	1:C:138[A]:ILE:N	1.98	0.79
1:C:138[A]:ILE:HD12	1:C:138[A]:ILE:H	1.48	0.79
1:A:22[A]:ASN:HD22	1:A:25:GLY:H	1.30	0.78
1:B:174:GLU:OE1	1:D:236:HIS:HD2	1.67	0.77
1:E:279:GLU:HG3	4:E:713:HOH:O	1.83	0.77
2:E:302:ME2:H21	4:H:395:HOH:O	1.86	0.75
1:C:22[A]:ASN:HD22	1:C:25:GLY:H	1.34	0.74
1:C:140[A]:PHE:O	2:C:5001:ME2:H13	1.87	0.74
2:D:301:ME2:H41	4:D:767:HOH:O	1.88	0.73
1:B:82:SER:CB	4:B:564:HOH:O	2.36	0.73
1:G:22[A]:ASN:HD22	1:G:25:GLY:H	1.35	0.72
1:C:140[B]:PHE:CD1	2:C:5001:ME2:H11	2.24	0.71
1:H:236:HIS:HE1	4:H:535:HOH:O	1.72	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:93:LYS:O	1:C:97:GLU:HG2	1.89	0.71
1:G:1:MET:SD	4:G:664:HOH:O	2.48	0.71
1:A:86:GLN:HG2	2:B:302:ME2:H22	1.73	0.71
1:A:22[B]:ASN:C	1:A:22[B]:ASN:HD22	1.96	0.71
1:A:236:HIS:HE1	4:A:430:HOH:O	1.73	0.71
1:E:93:LYS:NZ	2:E:302:ME2:H42	2.05	0.71
1:A:131:ASN:HD22	1:A:132:TYR:H	1.36	0.70
1:B:236:HIS:HD2	1:D:174:GLU:OE1	1.74	0.70
1:E:106:VAL:HG23	1:E:138[A]:ILE:HD11	1.73	0.70
1:G:131:ASN:HD22	1:G:132:TYR:H	1.38	0.70
2:D:301:ME2:H32	4:D:769:HOH:O	1.91	0.70
1:H:131:ASN:HD22	1:H:132:TYR:H	1.40	0.69
1:B:131:ASN:HD22	1:B:132:TYR:H	1.39	0.69
1:G:112:LYS:HZ1	2:G:301:ME2:H61	1.56	0.69
1:F:106:VAL:HG23	1:F:138[A]:ILE:HD11	1.74	0.69
1:B:236:HIS:HE1	4:D:556:HOH:O	1.74	0.68
1:A:106:VAL:HG23	1:A:138[A]:ILE:HD11	1.74	0.68
1:C:140[B]:PHE:CZ	2:C:5001:ME2:H11	2.28	0.68
1:A:153:GLU:HG3	4:A:599:HOH:O	1.92	0.68
1:C:236:HIS:HE1	4:C:5317:HOH:O	1.76	0.67
1:B:140:PHE:O	2:B:301:ME2:H73	1.94	0.67
2:C:5001:ME2:H62	4:C:5384:HOH:O	1.95	0.66
1:E:22[A]:ASN:HD22	1:E:25:GLY:H	1.43	0.66
1:A:174:GLU:OE1	1:C:236:HIS:HD2	1.79	0.65
1:D:22[A]:ASN:C	1:D:22[A]:ASN:HD22	2.04	0.65
2:C:5001:ME2:H41	4:D:673:HOH:O	1.97	0.64
1:F:279:GLU:H	1:F:279:GLU:CD	2.06	0.64
1:C:22[B]:ASN:C	1:C:22[B]:ASN:HD22	2.05	0.63
1:E:140[B]:PHE:O	2:E:301:ME2:H72	2.00	0.62
1:C:22[A]:ASN:ND2	1:C:25:GLY:H	1.98	0.62
4:B:609:HOH:O	1:D:236:HIS:HE1	1.82	0.62
1:B:229:LYS:HE2	4:D:618:HOH:O	1.98	0.62
1:D:131:ASN:HD22	1:D:132:TYR:H	1.47	0.62
1:H:22[A]:ASN:HD22	1:H:22[A]:ASN:C	2.08	0.61
1:G:93:LYS:O	1:G:97:GLU:HG3	2.00	0.61
1:G:138[A]:ILE:N	1:G:138[A]:ILE:HD12	2.16	0.61
1:G:22[B]:ASN:C	1:G:22[B]:ASN:HD22	2.05	0.61
1:E:33:ASN:HD21	1:E:210:ASN:HA	1.64	0.61
1:E:93:LYS:HD3	2:E:302:ME2:H41	1.83	0.60
1:B:193:MET:HB3	1:B:235:GLN:HE22	1.67	0.60
1:D:22[B]:ASN:HD22	1:D:25:GLY:H	1.50	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:236:HIS:HE1	4:F:588:HOH:O	1.84	0.60
1:H:212:ASN:HD21	1:H:215:ARG:HD2	1.66	0.60
1:A:106:VAL:HG23	1:A:138[A]:ILE:CD1	2.31	0.60
1:B:33:ASN:HD21	1:B:210:ASN:HA	1.67	0.59
1:C:140[B]:PHE:O	2:C:5001:ME2:H13	2.00	0.59
1:E:131:ASN:HD22	1:E:132:TYR:N	1.98	0.59
1:A:236:HIS:HD2	1:C:174:GLU:OE1	1.85	0.59
1:A:60:LYS:NZ	4:A:516:HOH:O	2.35	0.59
1:D:38:LYS:NZ	1:D:38:LYS:HB3	2.18	0.59
1:A:233:GLU:HG3	4:A:601:HOH:O	2.03	0.59
1:F:212:ASN:HD21	1:F:215:ARG:HH11	1.50	0.59
1:E:173:LEU:HD11	1:E:185:ILE:HG21	1.85	0.58
1:G:138[A]:ILE:HD12	1:G:138[A]:ILE:H	1.68	0.58
1:A:84:ASN:OD1	2:B:302:ME2:H11	2.03	0.58
2:C:5001:ME2:H12	1:D:112:LYS:HE3	1.86	0.58
1:F:33:ASN:HD21	1:F:210:ASN:HA	1.69	0.58
1:E:194:LEU:H	1:E:235:GLN:NE2	2.02	0.57
1:A:22[A]:ASN:ND2	1:A:25:GLY:H	2.00	0.57
2:E:301:ME2:C2	4:E:712:HOH:O	2.36	0.57
1:C:84:ASN:C	1:C:84:ASN:HD22	2.13	0.57
1:G:22[A]:ASN:ND2	1:G:25:GLY:H	2.03	0.57
1:E:140[A]:PHE:O	2:E:301:ME2:H72	2.04	0.57
1:E:194:LEU:C	1:E:194:LEU:HD23	2.30	0.57
1:B:230:GLU:CG	4:B:579:HOH:O	2.43	0.57
1:C:131:ASN:HD22	1:C:132:TYR:N	2.00	0.57
1:F:106:VAL:HG23	1:F:138[A]:ILE:CD1	2.34	0.57
1:D:38:LYS:CA	1:D:38:LYS:HE2	2.35	0.56
2:G:301:ME2:H72	1:H:140:PHE:O	2.06	0.56
1:D:33:ASN:HD21	1:D:210:ASN:HA	1.71	0.56
1:H:178:LYS:NZ	4:H:584:HOH:O	2.35	0.56
3:G:302:PG6:H21	4:G:571:HOH:O	2.04	0.56
1:H:33:ASN:HD21	1:H:210:ASN:HA	1.71	0.55
1:C:138[A]:ILE:HD13	1:C:142:THR:HG23	1.89	0.55
1:F:84:ASN:C	1:F:84:ASN:HD22	2.13	0.55
1:E:93:LYS:HZ1	2:E:302:ME2:H42	1.70	0.55
1:B:84:ASN:C	1:B:84:ASN:HD22	2.15	0.55
1:C:106:VAL:CG2	1:C:138[A]:ILE:HD11	2.26	0.55
1:G:106:VAL:HG23	1:G:138[A]:ILE:HD11	1.89	0.55
1:B:61:GLU:CD	1:B:64:ARG:HH21	2.15	0.54
1:F:131:ASN:ND2	1:F:132:TYR:H	2.01	0.54
1:H:84:ASN:C	1:H:84:ASN:HD22	2.13	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:58:GLU:OE2	2:B:302:ME2:H32	2.05	0.54
1:F:86:GLN:NE2	4:F:653:HOH:O	2.40	0.54
1:D:38:LYS:HE2	1:D:38:LYS:HA	1.90	0.54
1:F:248:ASN:HD22	1:F:253:THR:CG2	2.20	0.54
2:G:301:ME2:H41	4:H:615:HOH:O	2.07	0.54
1:G:233:GLU:HG2	4:G:668:HOH:O	2.08	0.54
2:D:301:ME2:H11	4:D:755:HOH:O	2.07	0.53
1:E:106:VAL:HG23	1:E:138[A]:ILE:CD1	2.38	0.53
1:D:84:ASN:C	1:D:84:ASN:HD22	2.15	0.53
1:C:140[B]:PHE:CZ	2:C:5001:ME2:C1	2.91	0.53
1:B:194:LEU:HD23	1:B:194:LEU:C	2.33	0.53
1:F:212:ASN:ND2	1:F:215:ARG:HH11	2.06	0.53
1:F:1:MET:HG2	1:F:2:LYS:H	1.73	0.53
1:H:194:LEU:C	1:H:194:LEU:HD23	2.34	0.52
1:F:138[A]:ILE:HD12	1:F:138[A]:ILE:N	2.23	0.52
1:A:177:LYS:HG2	1:A:185:ILE:HD12	1.91	0.52
1:B:212:ASN:HD21	1:B:215:ARG:HH11	1.56	0.52
1:E:93:LYS:HG2	2:E:302:ME2:H73	1.91	0.52
1:G:136:TYR:CE2	1:G:138[A]:ILE:HG13	2.45	0.52
1:G:177:LYS:HG2	1:G:185:ILE:HD12	1.92	0.52
1:A:22[B]:ASN:C	1:A:22[B]:ASN:ND2	2.67	0.52
1:A:228:LEU:HD11	1:C:228:LEU:HD21	1.92	0.52
1:G:84:ASN:C	1:G:84:ASN:HD22	2.18	0.51
1:G:194:LEU:HD23	1:G:194:LEU:C	2.34	0.51
1:E:5:LYS:NZ	4:E:588:HOH:O	2.34	0.51
1:F:248:ASN:HD22	1:F:253:THR:HG21	1.76	0.51
1:H:251:TYR:HE2	1:H:272:MET:HE1	1.75	0.51
1:A:84:ASN:C	1:A:84:ASN:HD22	2.17	0.51
1:C:86:GLN:NE2	4:C:5367:HOH:O	2.42	0.51
1:A:286:GLU:HG2	4:A:564:HOH:O	2.11	0.51
1:D:22[B]:ASN:ND2	1:D:25:GLY:H	2.08	0.51
1:H:138[A]:ILE:HG23	1:H:166:THR:HB	1.91	0.51
1:G:2:LYS:HG2	4:G:604:HOH:O	2.10	0.51
1:G:106:VAL:HG23	1:G:138[A]:ILE:CD1	2.41	0.51
1:G:212:ASN:HD21	1:G:215:ARG:HH11	1.59	0.51
1:G:131:ASN:HD22	1:G:132:TYR:N	2.08	0.50
1:C:12:LEU:HD11	1:C:254:ILE:HG21	1.94	0.50
1:C:177:LYS:HG2	1:C:185:ILE:HD12	1.94	0.50
1:E:22[A]:ASN:ND2	1:E:25:GLY:H	2.09	0.50
1:A:212:ASN:HD21	1:A:215:ARG:HH11	1.58	0.50
1:C:140[B]:PHE:CE1	2:C:5001:ME2:C1	2.79	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:131:ASN:HD22	1:F:132:TYR:N	2.04	0.50
1:G:33:ASN:HD21	1:G:210:ASN:HA	1.76	0.50
1:C:2:LYS:HD2	4:C:5260:HOH:O	2.11	0.50
1:H:131:ASN:ND2	1:H:132:TYR:H	2.09	0.50
1:E:22[B]:ASN:HD22	1:E:22[B]:ASN:C	2.20	0.50
1:H:194:LEU:H	1:H:235:GLN:NE2	2.08	0.50
1:F:127:GLU:HG2	4:F:665:HOH:O	2.11	0.49
1:F:248:ASN:CB	1:F:253:THR:HG21	2.31	0.49
1:H:138[A]:ILE:HG23	1:H:166:THR:CG2	2.43	0.49
1:D:173[B]:LEU:O	1:D:173[B]:LEU:HD13	2.13	0.49
1:G:112:LYS:NZ	2:G:301:ME2:H61	2.26	0.49
1:B:55:SER:HB3	2:B:302:ME2:C1	2.42	0.49
1:A:86:GLN:HB3	2:B:302:ME2:H13	1.95	0.48
1:C:274:LYS:HG2	4:C:5275:HOH:O	2.13	0.48
1:H:106:VAL:HG23	1:H:138[A]:ILE:HD11	1.94	0.48
1:D:193:MET:HE1	1:D:209:PHE:CZ	2.49	0.48
1:D:165:PHE:CD2	1:D:173[B]:LEU:HD23	2.50	0.47
1:A:93:LYS:O	1:A:97:GLU:HG2	2.13	0.47
2:C:5001:ME2:H22	1:D:112:LYS:NZ	2.28	0.47
1:D:2:LYS:HD2	4:D:718:HOH:O	2.14	0.47
1:F:138[A]:ILE:HD12	1:F:138[A]:ILE:H	1.79	0.47
1:H:193:MET:HB3	1:H:235:GLN:HE22	1.79	0.47
1:F:177:LYS:HG2	1:F:185:ILE:HD12	1.97	0.47
1:F:57:GLU:HG2	4:F:648:HOH:O	2.14	0.47
1:F:136:TYR:CE2	1:F:138[A]:ILE:HG13	2.50	0.47
1:F:108:PRO:HD3	1:F:121:TYR:CE2	2.51	0.46
1:C:33:ASN:HD21	1:C:210:ASN:HA	1.80	0.46
1:D:173[A]:LEU:CD1	1:D:185:ILE:HD13	2.45	0.46
1:E:220:PHE:O	1:E:224:GLN:HG3	2.15	0.46
1:C:212:ASN:HD21	1:C:215:ARG:HH11	1.62	0.46
1:D:22[A]:ASN:ND2	1:D:25:GLY:H	2.14	0.46
1:D:177:LYS:HG2	1:D:185:ILE:HD12	1.98	0.46
1:B:1:MET:HE2	4:B:650:HOH:O	2.16	0.46
1:B:293:SER:OXT	1:B:293:SER:OG	2.34	0.46
1:D:173[B]:LEU:HD13	1:D:173[B]:LEU:C	2.41	0.46
1:G:108:PRO:HD3	1:G:121:TYR:CE2	2.51	0.46
1:G:97:GLU:HG2	4:G:619:HOH:O	2.16	0.45
2:D:301:ME2:C4	4:D:767:HOH:O	2.56	0.45
1:G:12:LEU:HD11	1:G:254:ILE:HG21	1.99	0.45
1:A:132:TYR:CD2	1:A:159:LYS:HE2	2.52	0.45
1:D:22[A]:ASN:C	1:D:22[A]:ASN:ND2	2.74	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:173:LEU:HD11	1:F:185:ILE:HG21	1.97	0.45
1:A:86:GLN:CG	2:B:302:ME2:H22	2.42	0.45
1:C:70:ALA:O	1:C:73:GLU:HG2	2.16	0.45
1:C:251:TYR:HE2	1:C:272:MET:HE1	1.81	0.45
1:A:194:LEU:H	1:A:235:GLN:NE2	2.14	0.45
1:C:193:MET:HB3	1:C:235:GLN:HE22	1.82	0.45
1:D:251:TYR:HE2	1:D:272:MET:HE1	1.82	0.45
1:A:108:PRO:HD3	1:A:121:TYR:CE2	2.52	0.45
1:G:193:MET:HB3	1:G:235:GLN:HE22	1.82	0.45
1:F:194:LEU:H	1:F:235:GLN:NE2	2.14	0.44
1:D:193:MET:CE	1:D:209:PHE:CZ	3.00	0.44
1:A:194:LEU:C	1:A:194:LEU:HD23	2.42	0.44
1:E:2:LYS:HD2	4:E:631:HOH:O	2.17	0.44
1:A:131:ASN:HD22	1:A:132:TYR:N	2.09	0.44
1:B:194:LEU:H	1:B:235:GLN:NE2	2.15	0.44
1:G:37:MET:HA	1:G:37:MET:HE2	1.99	0.44
1:A:33:ASN:HD21	1:A:210:ASN:HA	1.82	0.44
1:B:274:LYS:HE3	4:B:667:HOH:O	2.17	0.44
1:C:194:LEU:H	1:C:235:GLN:NE2	2.15	0.44
1:D:173[B]:LEU:HD21	1:D:185:ILE:HG21	1.99	0.44
1:A:170:PHE:CD1	1:C:170:PHE:CD1	3.06	0.43
1:A:173:LEU:HD11	1:A:185:ILE:HG21	1.99	0.43
1:D:194:LEU:H	1:D:235:GLN:NE2	2.17	0.43
1:A:8:PHE:CE2	1:A:41:GLY:HA3	2.54	0.43
1:B:212:ASN:ND2	1:B:215:ARG:HH11	2.17	0.43
1:C:131:ASN:ND2	1:C:132:TYR:H	2.06	0.43
1:F:71:LYS:HE2	4:F:497:HOH:O	2.18	0.43
1:E:177:LYS:HG2	1:E:185:ILE:HD12	1.99	0.43
1:G:194:LEU:H	1:G:235:GLN:NE2	2.17	0.43
1:D:22[B]:ASN:HD22	1:D:22[B]:ASN:C	2.26	0.43
1:A:212:ASN:HD21	1:A:215:ARG:HD2	1.83	0.43
1:A:131:ASN:ND2	1:A:132:TYR:H	2.11	0.42
1:A:194:LEU:HB2	1:A:235:GLN:HE21	1.85	0.42
1:A:228:LEU:HD21	1:C:228:LEU:HD11	2.00	0.42
1:B:173:LEU:HD23	1:B:173:LEU:C	2.44	0.42
1:D:1:MET:HE3	4:D:715:HOH:O	2.18	0.42
1:B:131:ASN:ND2	1:B:132:TYR:H	2.10	0.42
1:D:173[B]:LEU:C	1:D:173[B]:LEU:CD1	2.92	0.42
1:H:22[A]:ASN:C	1:H:22[A]:ASN:ND2	2.77	0.42
1:E:108:PRO:HD3	1:E:121:TYR:CE2	2.55	0.42
1:G:22[B]:ASN:C	1:G:22[B]:ASN:ND2	2.73	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:212:ASN:ND2	1:A:215:ARG:HH11	2.17	0.42
1:C:194:LEU:C	1:C:194:LEU:HD23	2.44	0.42
1:D:290:LYS:HG3	4:D:726:HOH:O	2.20	0.42
1:C:212:ASN:ND2	1:C:215:ARG:HH11	2.17	0.42
1:H:194:LEU:HB2	1:H:235:GLN:HE21	1.84	0.42
1:B:82:SER:HB3	4:B:564:HOH:O	2.12	0.42
1:B:208:THR:HG21	1:B:242:ILE:HG12	2.01	0.42
1:E:193:MET:HB3	1:E:235:GLN:HE22	1.84	0.42
1:A:37:MET:HE2	1:A:37:MET:HA	2.02	0.41
1:B:72:ASP:OD2	1:H:97:GLU:HB2	2.19	0.41
1:D:165:PHE:CE2	1:D:173[B]:LEU:HD23	2.55	0.41
1:H:173:LEU:C	1:H:173:LEU:HD23	2.45	0.41
1:A:138[B]:ILE:HG23	1:A:138[B]:ILE:O	2.20	0.41
1:H:177:LYS:HG2	1:H:185:ILE:HD12	2.01	0.41
1:D:194:LEU:HB2	1:D:235:GLN:HE21	1.85	0.41
1:G:280:LYS:HE2	3:G:302:PG6:H82	2.01	0.41
1:B:12:LEU:HD11	1:B:254:ILE:HG21	2.02	0.41
1:H:138[B]:ILE:HG23	1:H:138[B]:ILE:O	2.20	0.41
1:C:22[B]:ASN:ND2	1:C:25:GLY:H	2.18	0.41
1:B:112:LYS:NZ	2:B:301:ME2:H22	2.36	0.41
1:C:138[A]:ILE:HD13	1:C:142:THR:CG2	2.51	0.41
1:D:131:ASN:HD22	1:D:132:TYR:N	2.15	0.41
1:G:12:LEU:HD11	1:G:254:ILE:CG2	2.51	0.41
1:C:106:VAL:HG23	1:C:138[A]:ILE:CD1	2.29	0.41
1:A:86:GLN:CB	2:B:302:ME2:H22	2.51	0.40
1:B:194:LEU:HB2	1:B:235:GLN:HE21	1.87	0.40
1:C:138[B]:ILE:O	1:C:138[B]:ILE:HG23	2.22	0.40
1:C:140[B]:PHE:CD1	2:C:5001:ME2:C1	2.98	0.40
1:B:55:SER:HB3	2:B:302:ME2:H12	2.03	0.40
1:E:173:LEU:HD12	1:E:185:ILE:HD13	2.03	0.40
2:G:301:ME2:H22	4:G:662:HOH:O	2.21	0.40
1:H:1:MET:HB2	1:H:2:LYS:H	1.70	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	293/293 (100%)	291 (99%)	1 (0%)	1 (0%)	36	21
1	B	291/293 (99%)	287 (99%)	4 (1%)	0	100	100
1	C	294/293 (100%)	292 (99%)	1 (0%)	1 (0%)	36	21
1	D	294/293 (100%)	291 (99%)	2 (1%)	1 (0%)	36	21
1	E	294/293 (100%)	292 (99%)	2 (1%)	0	100	100
1	F	293/293 (100%)	290 (99%)	3 (1%)	0	100	100
1	G	293/293 (100%)	291 (99%)	1 (0%)	1 (0%)	36	21
1	H	294/293 (100%)	292 (99%)	2 (1%)	0	100	100
All	All	2346/2344 (100%)	2326 (99%)	16 (1%)	4 (0%)	43	27

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	G	110	TYR
1	A	110	TYR
1	C	110	TYR
1	D	110	TYR

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	244/242 (101%)	235 (96%)	9 (4%)	30	11
1	B	242/242 (100%)	238 (98%)	4 (2%)	53	36
1	C	245/242 (101%)	239 (98%)	6 (2%)	43	23
1	D	245/242 (101%)	237 (97%)	8 (3%)	33	13
1	E	245/242 (101%)	236 (96%)	9 (4%)	30	11
1	F	244/242 (101%)	235 (96%)	9 (4%)	30	11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	G	244/242 (101%)	235 (96%)	9 (4%)	30	11
1	H	245/242 (101%)	238 (97%)	7 (3%)	37	17
All	All	1954/1936 (101%)	1893 (97%)	61 (3%)	39	15

All (61) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	2	LYS
1	A	84	ASN
1	A	86	GLN
1	A	138[A]	ILE
1	A	138[B]	ILE
1	A	178	LYS
1	A	190	ASP
1	A	269	ARG
1	B	1	MET
1	B	36	LYS
1	B	84	ASN
1	B	250	LEU
1	C	1	MET
1	C	138[A]	ILE
1	C	138[B]	ILE
1	C	190	ASP
1	C	227	LYS
1	C	230	GLU
1	D	22[A]	ASN
1	D	22[B]	ASN
1	D	24	LYS
1	D	38	LYS
1	D	178	LYS
1	D	190	ASP
1	D	233	GLU
1	D	261	ASP
1	E	1	MET
1	E	86	GLN
1	E	138[A]	ILE
1	E	138[B]	ILE
1	E	149	GLU
1	E	178	LYS
1	E	190	ASP

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Mol	Chain	Res	Type
1	E	227	LYS
1	E	250	LEU
1	F	1	MET
1	F	84	ASN
1	F	138[A]	ILE
1	F	138[B]	ILE
1	F	149	GLU
1	F	156	LYS
1	F	190	ASP
1	F	253	THR
1	F	261	ASP
1	G	1	MET
1	G	2	LYS
1	G	84	ASN
1	G	138[A]	ILE
1	G	138[B]	ILE
1	G	190	ASP
1	G	227	LYS
1	G	230	GLU
1	G	250	LEU
1	H	1	MET
1	H	22[A]	ASN
1	H	22[B]	ASN
1	H	84	ASN
1	H	138[A]	ILE
1	H	138[B]	ILE
1	H	190	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (63) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	33	ASN
1	A	131	ASN
1	A	145	ASN
1	A	212	ASN
1	A	235	GLN
1	A	236	HIS
1	A	248	ASN
1	B	33	ASN
1	B	84	ASN
1	B	86	GLN
1	B	131	ASN

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Mol	Chain	Res	Type
1	B	145	ASN
1	B	212	ASN
1	B	235	GLN
1	B	236	HIS
1	B	248	ASN
1	C	33	ASN
1	C	84	ASN
1	C	131	ASN
1	C	212	ASN
1	C	235	GLN
1	C	236	HIS
1	C	248	ASN
1	D	33	ASN
1	D	84	ASN
1	D	120	HIS
1	D	131	ASN
1	D	145	ASN
1	D	224	GLN
1	D	235	GLN
1	D	236	HIS
1	D	248	ASN
1	E	33	ASN
1	E	86	GLN
1	E	131	ASN
1	E	212	ASN
1	E	235	GLN
1	E	236	HIS
1	E	248	ASN
1	F	16	ASN
1	F	33	ASN
1	F	84	ASN
1	F	86	GLN
1	F	120	HIS
1	F	131	ASN
1	F	212	ASN
1	F	235	GLN
1	F	236	HIS
1	F	248	ASN
1	G	33	ASN
1	G	84	ASN
1	G	131	ASN
1	G	212	ASN

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Mol	Chain	Res	Type
1	G	224	GLN
1	G	235	GLN
1	H	33	ASN
1	H	84	ASN
1	H	131	ASN
1	H	145	ASN
1	H	212	ASN
1	H	235	GLN
1	H	236	HIS
1	H	248	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

8 ligands 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	ME2	B	302	-	9,9,9	0.66	0	8,8,8	0.64	0
2	ME2	B	301	-	9,9,9	0.64	0	8,8,8	0.73	0
2	ME2	E	302	-	9,9,9	0.74	0	8,8,8	1.76	3 (37%)
2	ME2	C	5001	-	9,9,9	0.54	0	8,8,8	0.50	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ME2	G	301	-	9,9,9	0.44	0	8,8,8	0.44	0
3	PG6	G	302	-	17,17,17	1.00	0	16,16,16	1.14	3 (18%)
2	ME2	E	301	-	9,9,9	0.49	0	8,8,8	0.76	0
2	ME2	D	301	-	9,9,9	1.01	0	8,8,8	1.05	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ME2	B	302	-	-	3/7/7/7	-
2	ME2	B	301	-	-	3/7/7/7	-
2	ME2	E	302	-	-	4/7/7/7	-
2	ME2	C	5001	-	-	4/7/7/7	-
2	ME2	G	301	-	-	5/7/7/7	-
3	PG6	G	302	-	-	5/15/15/15	-
2	ME2	E	301	-	-	6/7/7/7	-
2	ME2	D	301	-	-	6/7/7/7	-

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	302	ME2	O3-C5-C4	-2.95	96.91	110.35
2	E	302	ME2	O2-C4-C5	2.69	122.62	110.35
2	E	302	ME2	C6-O3-C5	2.65	122.36	113.06
3	G	302	PG6	O4-C8-C9	2.33	120.96	110.35
3	G	302	PG6	O5-C9-C8	2.14	120.09	110.35
3	G	302	PG6	O4-C7-C6	2.08	119.83	110.35

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	302	ME2	O1-C2-C3-O2
2	C	5001	ME2	O1-C2-C3-O2
2	E	301	ME2	O1-C2-C3-O2
2	G	301	ME2	O2-C4-C5-O3

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Mol	Chain	Res	Type	Atoms
2	D	301	ME2	O1-C2-C3-O2
2	D	301	ME2	C5-C4-O2-C3
2	E	301	ME2	C3-C2-O1-C1
2	D	301	ME2	O2-C4-C5-O3
2	E	301	ME2	C2-C3-O2-C4
2	C	5001	ME2	O2-C4-C5-O3
2	E	301	ME2	O2-C4-C5-O3
3	G	302	PG6	O2-C4-C5-O3
2	E	302	ME2	O1-C2-C3-O2
2	E	302	ME2	O2-C4-C5-O3
2	G	301	ME2	C7-C6-O3-C5
2	E	301	ME2	C7-C6-O3-C5
2	D	301	ME2	C7-C6-O3-C5
3	G	302	PG6	C3-C2-O1-C1
2	B	302	ME2	C5-C4-O2-C3
2	B	301	ME2	C3-C2-O1-C1
2	C	5001	ME2	C3-C2-O1-C1
2	E	302	ME2	C2-C3-O2-C4
2	E	302	ME2	C5-C4-O2-C3
2	E	301	ME2	C4-C5-O3-C6
2	G	301	ME2	C4-C5-O3-C6
2	C	5001	ME2	C2-C3-O2-C4
2	D	301	ME2	C4-C5-O3-C6
2	G	301	ME2	C3-C2-O1-C1
2	B	301	ME2	C7-C6-O3-C5
2	B	302	ME2	C7-C6-O3-C5
3	G	302	PG6	C6-C7-O4-C8
2	B	301	ME2	C2-C3-O2-C4
2	D	301	ME2	C3-C2-O1-C1
3	G	302	PG6	C11-C10-O5-C9
3	G	302	PG6	O4-C8-C9-O5
2	G	301	ME2	O1-C2-C3-O2

There are no ring outliers.

8 monomers are involved in 46 short contacts:

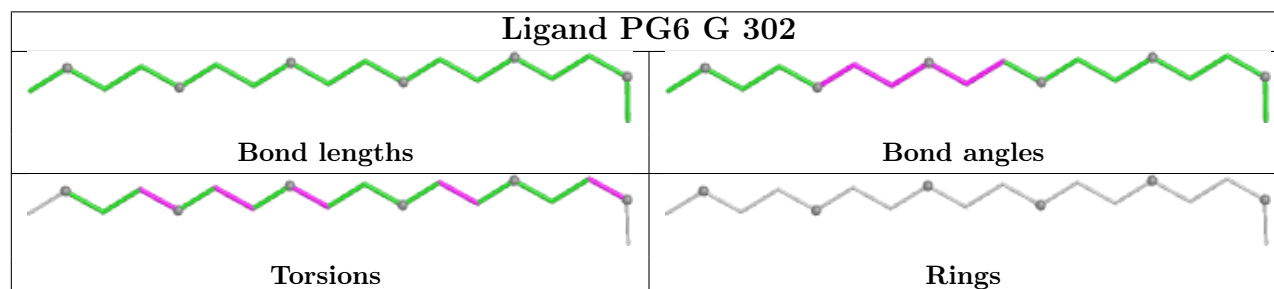
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	302	ME2	11	0
2	B	301	ME2	2	0
2	E	302	ME2	5	0
2	C	5001	ME2	13	0
2	G	301	ME2	5	0

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Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	G	302	PG6	2	0
2	E	301	ME2	4	0
2	D	301	ME2	4	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 than 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.



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	293/293 (100%)	-0.20	4 (1%) 73 80	6, 16, 26, 57	2 (0%)
1	B	293/293 (100%)	-0.34	1 (0%) 90 92	8, 12, 22, 63	0
1	C	293/293 (100%)	-0.27	2 (0%) 84 88	6, 14, 26, 54	3 (1%)
1	D	293/293 (100%)	-0.32	2 (0%) 84 88	5, 12, 21, 50	3 (1%)
1	E	293/293 (100%)	-0.16	2 (0%) 84 88	6, 17, 29, 60	3 (1%)
1	F	293/293 (100%)	-0.31	1 (0%) 90 92	5, 13, 22, 50	2 (0%)
1	G	293/293 (100%)	-0.17	7 (2%) 59 66	6, 15, 27, 62	2 (0%)
1	H	293/293 (100%)	-0.35	1 (0%) 90 92	5, 13, 23, 50	3 (1%)
All	All	2344/2344 (100%)	-0.27	20 (0%) 81 86	5, 14, 25, 63	18 (0%)

All (20) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	1	MET	6.1
1	B	1	MET	5.0
1	G	1	MET	4.9
1	A	1	MET	4.6
1	F	1	MET	4.6
1	E	1	MET	4.0
1	E	293	SER	3.8
1	C	1	MET	3.8
1	A	293	SER	3.2
1	G	189	PHE	3.1
1	G	167	ALA	3.1
1	H	1	MET	2.8
1	A	140	PHE	2.7
1	G	140	PHE	2.6
1	D	127	GLU	2.3
1	G	293	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	G	168	GLY	2.1
1	G	230	GLU	2.1
1	C	293	SER	2.1
1	A	168	GLY	2.0

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

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

6.3 Carbohydrates [i](#)

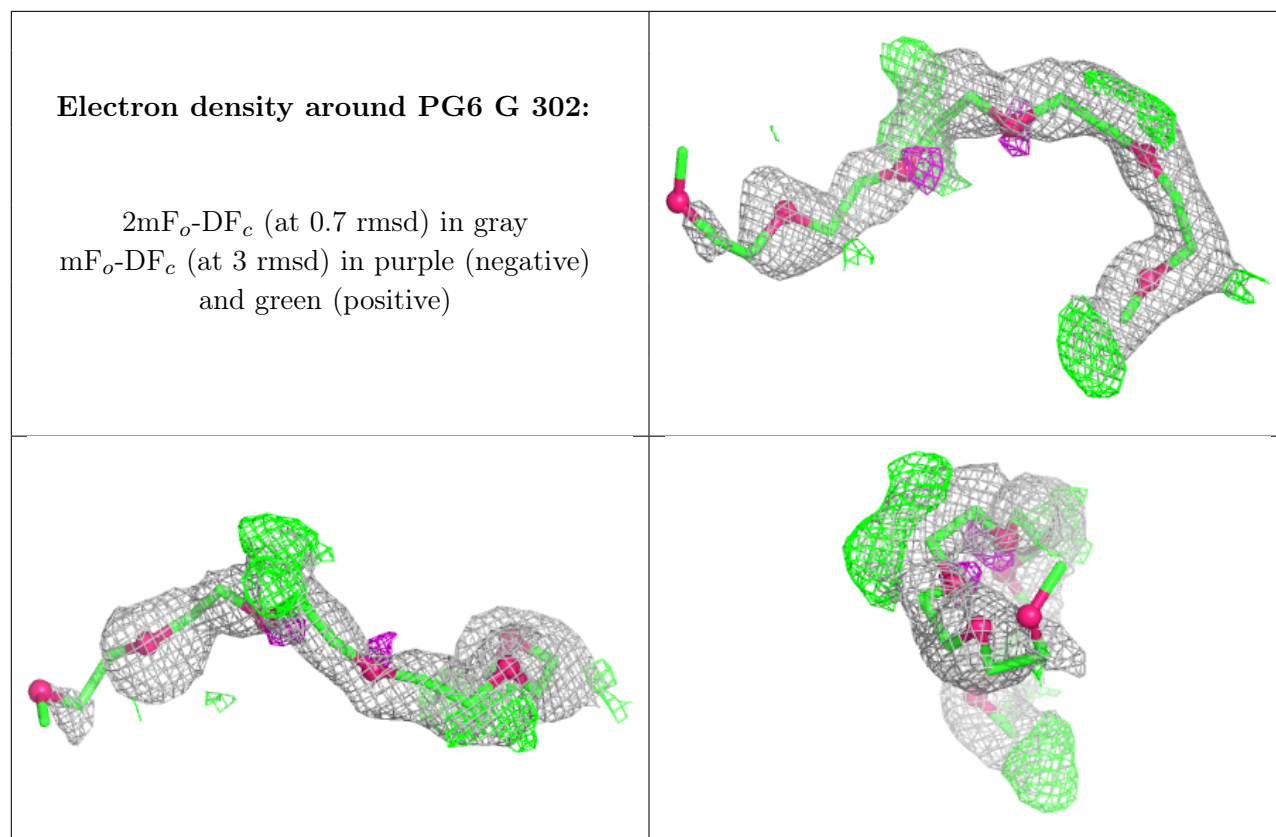
There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 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($\text{\AA}^2$)	Q<0.9
2	ME2	D	301	10/10	0.64	0.21	25,34,37,38	0
3	PG6	G	302	18/18	0.67	0.21	33,38,46,48	0
2	ME2	E	302	10/10	0.76	0.16	27,29,32,32	0
2	ME2	C	5001	10/10	0.78	0.16	22,30,31,35	0
2	ME2	B	302	10/10	0.79	0.14	22,27,28,32	0
2	ME2	B	301	10/10	0.83	0.15	28,31,33,35	0
2	ME2	G	301	10/10	0.84	0.15	30,31,34,36	0
2	ME2	E	301	10/10	0.84	0.14	28,31,34,37	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.