



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 02:06 PM UTC

PDB ID : 4PGC / pdb_00004pgc
Title : MHC Class I in complex with modified Sendai virus nucleoprotein peptide F APGN(3,5-diiodotyrosine)PAL
Authors : Celie, P.; Joosten, R.P.; Perrakis, A.; Neefjes, J.
Deposited on : 2014-05-01
Resolution : 2.30 Å (reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

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

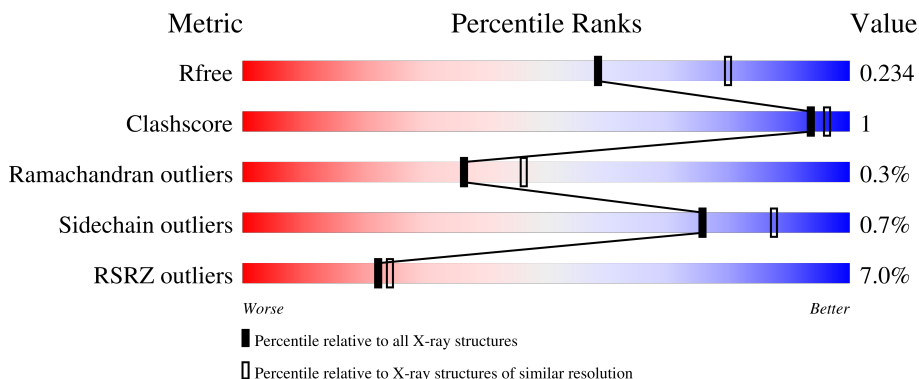
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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.



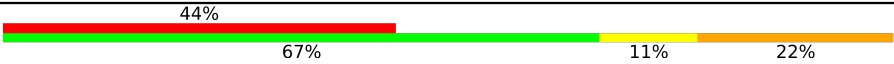
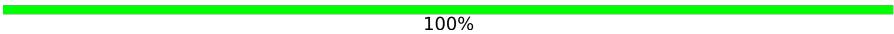
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	6319 (2.30-2.30)
Clashscore	190562	6919 (2.30-2.30)
Ramachandran outliers	187476	6854 (2.30-2.30)
Sidechain outliers	187428	6854 (2.30-2.30)
RSRZ outliers	180081	6325 (2.30-2.30)

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	304	 8% 88% 9%
1	D	304	 6% 87% 9% 5%
2	B	100	 % 96% 9% 5%
2	E	100	 2% 96% 9% 5%
3	C	9	 56% 67% 22% 11%

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Mol	Chain	Length	Quality of chain
3	F	9	 <p>44% 67% 11% 22%</p>
4	H	13	 <p>100%</p>

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 6481 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 H-2 class I histocompatibility antigen, K-B alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	278	Total	C	N	O	S	0	1	0
			2269	1433	399	428	9			
1	D	278	Total	C	N	O	S	0	0	0
			2262	1428	397	428	9			

There are 52 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-25	MET	-	initiating methionine	UNP P01901
A	-24	GLY	-	expression tag	UNP P01901
A	-23	SER	-	expression tag	UNP P01901
A	-22	SER	-	expression tag	UNP P01901
A	-21	HIS	-	expression tag	UNP P01901
A	-20	HIS	-	expression tag	UNP P01901
A	-19	HIS	-	expression tag	UNP P01901
A	-18	HIS	-	expression tag	UNP P01901
A	-17	HIS	-	expression tag	UNP P01901
A	-16	HIS	-	expression tag	UNP P01901
A	-15	SER	-	expression tag	UNP P01901
A	-14	SER	-	expression tag	UNP P01901
A	-13	GLY	-	expression tag	UNP P01901
A	-12	LEU	-	expression tag	UNP P01901
A	-11	VAL	-	expression tag	UNP P01901
A	-10	PRO	-	expression tag	UNP P01901
A	-9	ARG	-	expression tag	UNP P01901
A	-8	GLY	-	expression tag	UNP P01901
A	-7	SER	-	expression tag	UNP P01901
A	-6	HIS	-	expression tag	UNP P01901
A	-5	MET	-	expression tag	UNP P01901
A	-4	LEU	-	expression tag	UNP P01901
A	-3	GLU	-	expression tag	UNP P01901
A	-2	ASP	-	expression tag	UNP P01901
A	-1	PRO	-	expression tag	UNP P01901

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Chain	Residue	Modelled	Actual	Comment	Reference
A	0	MET	-	expression tag	UNP P01901
D	-25	MET	-	initiating methionine	UNP P01901
D	-24	GLY	-	expression tag	UNP P01901
D	-23	SER	-	expression tag	UNP P01901
D	-22	SER	-	expression tag	UNP P01901
D	-21	HIS	-	expression tag	UNP P01901
D	-20	HIS	-	expression tag	UNP P01901
D	-19	HIS	-	expression tag	UNP P01901
D	-18	HIS	-	expression tag	UNP P01901
D	-17	HIS	-	expression tag	UNP P01901
D	-16	HIS	-	expression tag	UNP P01901
D	-15	SER	-	expression tag	UNP P01901
D	-14	SER	-	expression tag	UNP P01901
D	-13	GLY	-	expression tag	UNP P01901
D	-12	LEU	-	expression tag	UNP P01901
D	-11	VAL	-	expression tag	UNP P01901
D	-10	PRO	-	expression tag	UNP P01901
D	-9	ARG	-	expression tag	UNP P01901
D	-8	GLY	-	expression tag	UNP P01901
D	-7	SER	-	expression tag	UNP P01901
D	-6	HIS	-	expression tag	UNP P01901
D	-5	MET	-	expression tag	UNP P01901
D	-4	LEU	-	expression tag	UNP P01901
D	-3	GLU	-	expression tag	UNP P01901
D	-2	ASP	-	expression tag	UNP P01901
D	-1	PRO	-	expression tag	UNP P01901
D	0	MET	-	expression tag	UNP P01901

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	99	821	524	138	152	7	0	0	0
2	E	99	821	524	138	152	7	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	0	MET	-	initiating methionine	UNP P01887
B	85	ASP	ALA	variant	UNP P01887
E	0	MET	-	initiating methionine	UNP P01887

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Chain	Residue	Modelled	Actual	Comment	Reference
E	85	ASP	ALA	variant	UNP P01887

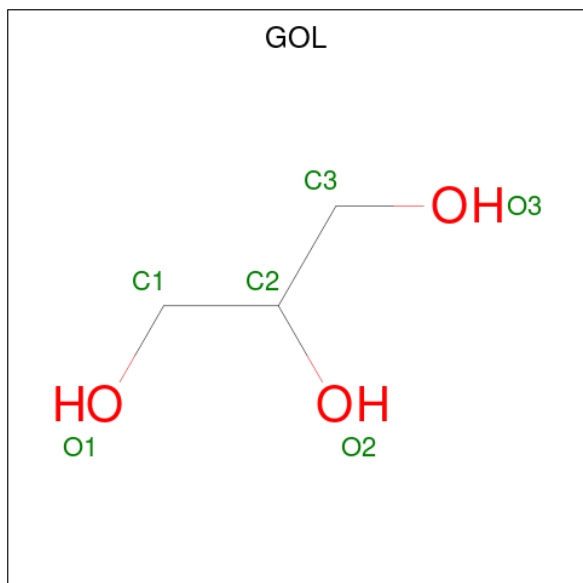
- Molecule 3 is a protein called Sendai virus nucleoprotein.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace	
3	C	9	Total	C	I	N	O	0	0	0
			70	46	2	10	12			
3	F	9	Total	C	I	N	O	0	0	0
			70	46	2	10	12			

- Molecule 4 is a protein called Unknown helical fragment.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf	Trace	
4	H	13	Total	C	N	O	0	0	0
			75	46	14	15			

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf	
5	A	1	Total	C	O	0	0
			6	3	3		
5	B	1	Total	C	O	0	0
			6	3	3		
5	B	1	Total	C	O	0	0
			6	3	3		

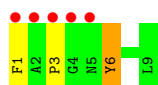
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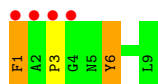
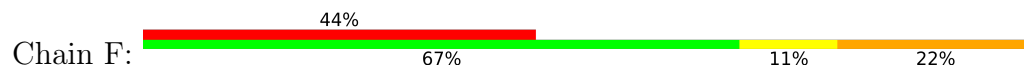
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	B	1	Total	C	O	0	0
			6	3	3		
5	D	1	Total	C	O	0	0
			6	3	3		
5	E	1	Total	C	O	0	0
			6	3	3		

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	19	Total	O	0	0
			19	19		
6	B	12	Total	O	0	0
			12	12		
6	C	1	Total	O	0	0
			1	1		
6	D	18	Total	O	0	0
			18	18		
6	E	6	Total	O	0	0
			6	6		
6	H	1	Total	O	0	0
			1	1		



- Molecule 3: Sendai virus nucleoprotein



- Molecule 4: Unknown helical fragment



There are no outlier residues recorded for this chain.

4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	66.18Å 90.30Å 89.37Å 90.00° 111.58° 90.00°	Depositor
Resolution (Å)	83.11 – 2.30 83.11 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.5 (83.11-2.30) 99.4 (83.11-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.38 (at 2.29Å)	Xtrriage
Refinement program	REFMAC refmac_5.8.0071	Depositor
R, R_{free}	0.212 , 0.243 (Not available) , 0.234	Depositor DCC
R_{free} test set	2178 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å ²)	34.5	Xtrriage
Anisotropy	0.815	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.37 , 35.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.023 for h,-k,-h-l	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6481	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 39.43 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 3.1756e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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: TYI, GOL

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	0.50	0/2337	0.69	0/3176
1	D	0.49	0/2326	0.68	0/3161
2	B	0.48	0/847	0.68	0/1148
2	E	0.48	0/847	0.68	0/1148
3	C	0.54	0/57	0.80	0/74
3	F	0.60	0/57	0.99	0/74
4	H	0.32	0/26	0.44	0/28
All	All	0.49	0/6497	0.69	0/8809

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2269	0	2157	7	0
1	D	2262	0	2150	9	0
2	B	821	0	796	2	0
2	E	821	0	796	2	0
3	C	70	0	62	4	0
3	F	70	0	62	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	H	75	0	47	0	0
5	A	6	0	8	0	0
5	B	18	0	24	0	0
5	D	6	0	8	0	0
5	E	6	0	8	0	0
6	A	19	0	0	0	0
6	B	12	0	0	0	0
6	C	1	0	0	0	0
6	D	18	0	0	0	0
6	E	6	0	0	0	0
6	H	1	0	0	0	0
All	All	6481	0	6118	18	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 1.

All (18) 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:D:9:VAL:HG22	1:D:24:GLU:HG2	1.83	0.61
1:A:9:VAL:HG22	1:A:24:GLU:HG2	1.84	0.59
1:A:9:VAL:HG21	3:C:6:TYI:I2	2.74	0.58
1:D:9:VAL:HG21	3:F:6:TYI:I2	2.80	0.52
3:C:3:PRO:HD2	3:C:6:TYI:I1	2.81	0.50
3:C:3:PRO:CD	3:C:6:TYI:I1	3.30	0.49
1:D:159:TYR:CE1	3:F:3:PRO:HG3	2.50	0.47
1:A:81:LEU:HD23	1:A:118:TYR:CD1	2.50	0.46
1:D:81:LEU:HD23	1:D:118:TYR:CD1	2.50	0.46
2:E:37:ILE:HB	2:E:51:MET:HE1	1.98	0.46
1:A:167:TRP:CD1	3:C:1:PHE:HB2	2.52	0.44
2:B:37:ILE:HB	2:B:51:MET:HE1	1.98	0.44
1:A:106:ASP:O	1:D:262:TYR:HB3	2.17	0.44
1:A:264:GLN:HA	1:D:105:SER:O	2.18	0.44
1:D:167:TRP:CE2	3:F:1:PHE:CD1	3.06	0.43
1:D:172:LEU:O	1:D:176:ASN:HB2	2.19	0.42
1:A:117:ALA:HB2	2:B:60:TRP:CE2	2.54	0.41
1:D:117:ALA:HB2	2:E:60:TRP:CE2	2.56	0.41

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	277/304 (91%)	271 (98%)	5 (2%)	1 (0%)	30	38
1	D	276/304 (91%)	270 (98%)	5 (2%)	1 (0%)	30	38
2	B	97/100 (97%)	95 (98%)	2 (2%)	0	100	100
2	E	97/100 (97%)	95 (98%)	2 (2%)	0	100	100
3	C	6/9 (67%)	5 (83%)	1 (17%)	0	100	100
3	F	6/9 (67%)	5 (83%)	1 (17%)	0	100	100
4	H	3/13 (23%)	3 (100%)	0	0	100	100
All	All	762/839 (91%)	744 (98%)	16 (2%)	2 (0%)	36	46

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	195	PRO
1	D	195	PRO

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	237/259 (92%)	235 (99%)	2 (1%)	73	86
1	D	236/259 (91%)	234 (99%)	2 (1%)	73	86
2	B	94/95 (99%)	94 (100%)	0	100	100
2	E	94/95 (99%)	94 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	C	5/5 (100%)	5 (100%)	0	100	100
3	F	5/5 (100%)	4 (80%)	1 (20%)	1	1
4	H	4/4 (100%)	4 (100%)	0	100	100
All	All	675/722 (94%)	670 (99%)	5 (1%)	76	87

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	TYR
1	A	173	LYS
1	D	45	TYR
1	D	173	LYS
3	F	1	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	42	ASN
2	B	13	HIS
1	D	42	ASN
1	D	218	GLN
1	D	260	HIS
2	E	13	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues 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
3	TYI	C	6	3	13,14,15	0.68	0	14,19,21	1.56	5 (35%)
3	TYI	F	6	3	13,14,15	0.68	0	14,19,21	1.42	2 (14%)

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	TYI	C	6	3	-	2/5/6/8	0/1/1/1
3	TYI	F	6	3	-	2/5/6/8	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	6	TYI	CD1-CE1-I1	2.90	123.91	118.46
3	F	6	TYI	CB-CG-CD2	-2.57	116.01	120.43
3	C	6	TYI	CB-CG-CD2	-2.45	116.22	120.43
3	F	6	TYI	CD1-CE1-I1	2.36	122.88	118.46
3	C	6	TYI	CZ-CE2-I2	-2.25	116.08	119.35
3	C	6	TYI	CZ-CE1-I1	-2.13	116.26	119.35
3	C	6	TYI	CB-CG-CD1	2.06	123.97	120.43

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	F	6	TYI	CA-CB-CG-CD2
3	F	6	TYI	CA-CB-CG-CD1
3	C	6	TYI	CA-CB-CG-CD2
3	C	6	TYI	CA-CB-CG-CD1

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	6	TYI	3	0
3	F	6	TYI	1	0

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

6 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
5	GOL	D	301	-	5,5,5	0.36	0	5,5,5	0.30	0
5	GOL	E	101	-	5,5,5	0.47	0	5,5,5	0.68	0
5	GOL	B	103	-	5,5,5	0.31	0	5,5,5	0.16	0
5	GOL	B	102	-	5,5,5	0.37	0	5,5,5	0.28	0
5	GOL	A	301	-	5,5,5	0.30	0	5,5,5	0.23	0
5	GOL	B	101	-	5,5,5	0.50	0	5,5,5	0.37	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
5	GOL	D	301	-	-	4/4/4/4	-
5	GOL	E	101	-	-	4/4/4/4	-
5	GOL	B	103	-	-	2/4/4/4	-
5	GOL	B	102	-	-	2/4/4/4	-
5	GOL	A	301	-	-	3/4/4/4	-
5	GOL	B	101	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	B	101	GOL	O1-C1-C2-C3
5	B	102	GOL	O1-C1-C2-O2
5	B	102	GOL	O1-C1-C2-C3
5	B	103	GOL	O1-C1-C2-C3
5	D	301	GOL	C1-C2-C3-O3
5	E	101	GOL	C1-C2-C3-O3
5	E	101	GOL	O2-C2-C3-O3
5	D	301	GOL	O2-C2-C3-O3
5	D	301	GOL	O1-C1-C2-C3
5	E	101	GOL	O1-C1-C2-C3
5	B	101	GOL	O1-C1-C2-O2
5	B	103	GOL	O1-C1-C2-O2
5	D	301	GOL	O1-C1-C2-O2
5	A	301	GOL	O1-C1-C2-O2
5	A	301	GOL	C1-C2-C3-O3
5	E	101	GOL	O1-C1-C2-O2
5	A	301	GOL	O2-C2-C3-O3

There are no ring outliers.

No monomer is involved in short contacts.

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	278/304 (91%)	0.34	24 (8%) 16 17	20, 36, 66, 108	1 (0%)
1	D	278/304 (91%)	0.36	18 (6%) 25 27	21, 37, 62, 90	0
2	B	99/100 (99%)	-0.12	1 (1%) 79 80	21, 32, 53, 66	0
2	E	99/100 (99%)	0.11	2 (2%) 65 66	23, 37, 57, 75	0
3	C	8/9 (88%)	3.10	5 (62%) 0 0	32, 71, 113, 114	0
3	F	8/9 (88%)	2.84	4 (50%) 0 0	31, 54, 84, 92	0
4	H	4/13 (30%)	1.34	0 100 100	48, 50, 77, 78	0
All	All	774/839 (92%)	0.32	54 (6%) 22 24	20, 36, 64, 114	1 (0%)

All (54) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	1	PHE	8.3
3	C	2	ALA	6.5
3	F	2	ALA	6.4
3	F	3	PRO	6.0
1	A	278	PRO	5.1
2	B	1	ILE	5.1
3	F	1	PHE	5.1
2	E	1	ILE	4.9
1	D	278	PRO	4.6
1	A	195	PRO	4.4
3	C	3	PRO	4.4
1	D	225	ILE	4.2
1	D	177	ALA	4.2
1	A	194	ARG	4.0
3	F	4	GLY	4.0
1	A	277	PRO	3.9
1	A	1	GLY	3.8

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Mol	Chain	Res	Type	RSRZ
1	A	225	ILE	3.7
3	C	4	GLY	3.5
1	A	2	PRO	3.3
1	D	194	ARG	3.3
1	D	176	ASN	3.0
1	D	181	ARG	2.8
1	D	183	ASP	2.7
1	D	220	ASN	2.7
1	A	173	LYS	2.7
1	A	193	SER	2.7
1	A	65	GLN	2.6
1	D	156	LEU	2.5
1	D	138	MET	2.5
1	A	62	ARG	2.5
2	E	2	GLN	2.5
1	A	220	ASN	2.5
1	D	221	GLY	2.5
1	D	277	PRO	2.4
1	A	221	GLY	2.4
1	A	105	SER	2.4
1	D	179	LEU	2.4
1	D	1	GLY	2.4
1	A	113	TYR	2.3
1	A	109	LEU	2.2
1	A	174	ASN	2.2
1	A	17	LEU	2.2
1	A	228	MET	2.2
1	A	53	GLU	2.2
1	A	176	ASN	2.2
1	D	222	GLU	2.2
1	D	44	ARG	2.1
1	A	276	PRO	2.1
1	A	226	GLN	2.1
1	A	222	GLU	2.1
1	D	180	LEU	2.1
1	D	173	LYS	2.0
3	C	5	ASN	2.0

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

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	TYI	C	6	14/15	0.98	0.12	39,53,61,62	0
3	TYI	F	6	14/15	0.99	0.09	35,41,50,55	0

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(Å ²)	Q<0.9
5	GOL	B	101	6/6	0.82	0.20	39,49,50,51	0
5	GOL	B	103	6/6	0.83	0.13	47,50,54,63	0
5	GOL	E	101	6/6	0.83	0.17	45,49,53,54	0
5	GOL	D	301	6/6	0.87	0.15	37,44,48,57	0
5	GOL	A	301	6/6	0.89	0.14	39,49,53,56	0
5	GOL	B	102	6/6	0.91	0.17	50,53,56,65	0

6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.