WORLDWIDE wwPDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 6, 2023 – 09:59 AM EDT

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PDB ID	:	4DWS
Title	:	Crystal Structure of a chitinase from the Yersinia entomophaga toxin complex
Authors	:	Busby, J.N.; Hurst, M.R.H.; Lott, J.S.
Deposited on	:	2012-02-26
Resolution	:	1.80 Å(reported)

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 1.80 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.
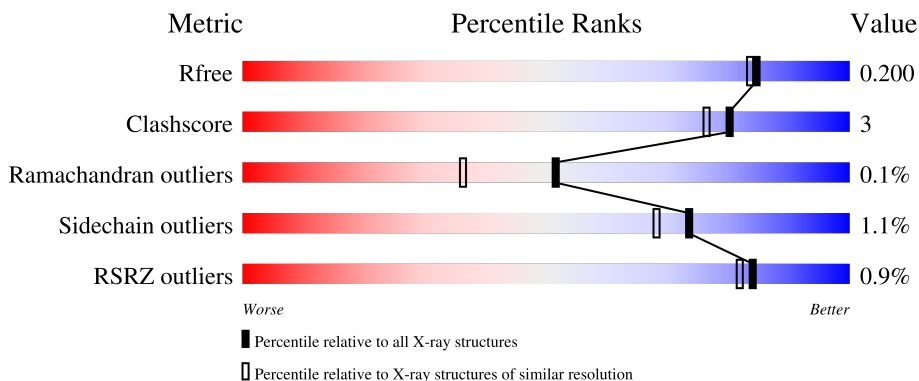
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	546	90% 8% •
2	B	546	.% 92% 5% ••
3	C	546	.% 87% 10% ••
4	D	546	.% 90% 8% ••

2 Entry composition ⓘ

There are 6 unique types of molecules in this entry. The entry contains 17938 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 Chi2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	540	Total	C	N	O	S	0	4	0
			4191	2670	697	807	17			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	88	GLY	-	expression tag	UNP B6A879
A	89	SER	-	expression tag	UNP B6A879
A	90	GLY	-	expression tag	UNP B6A879
A	91	ALA	-	expression tag	UNP B6A879

- Molecule 2 is a protein called Chi2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	538	Total	C	N	O	S	0	3	0
			4122	2628	681	795	18			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	88	GLY	-	expression tag	UNP B6A879
B	89	SER	-	expression tag	UNP B6A879
B	90	GLY	-	expression tag	UNP B6A879
B	91	ALA	-	expression tag	UNP B6A879

- Molecule 3 is a protein called Chi2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	539	Total	C	N	O	S	0	7	0
			4201	2674	694	815	18			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	88	GLY	-	expression tag	UNP B6A879
C	89	SER	-	expression tag	UNP B6A879
C	90	GLY	-	expression tag	UNP B6A879
C	91	ALA	-	expression tag	UNP B6A879

- Molecule 4 is a protein called Chi2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	D	539	Total 4194	C 2662	N 702	O 812	S 18	0	9	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	88	GLY	-	expression tag	UNP B6A879
D	89	SER	-	expression tag	UNP B6A879
D	90	GLY	-	expression tag	UNP B6A879
D	91	ALA	-	expression tag	UNP B6A879

- Molecule 5 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).
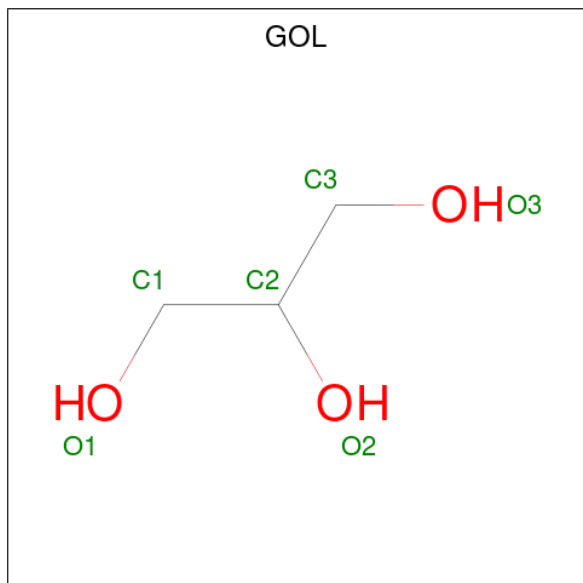
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 6	C 3	O 3	0	0
5	B	1	Total 6	C 3	O 3	0	0

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

- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	305	Total 305	O 305	0	0
6	B	203	Total 203	O 203	0	0
6	C	394	Total 394	O 394	0	0
6	D	304	Total 304	O 304	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: Chi2

Chain A:

- Molecule 2: Chi2

Chain B:

- Molecule 3: Chi2

Chain C:

- Molecule 4: Chi2

Chain D:
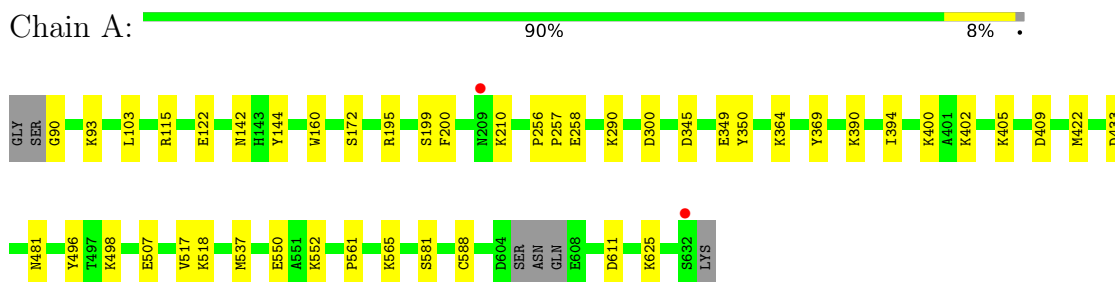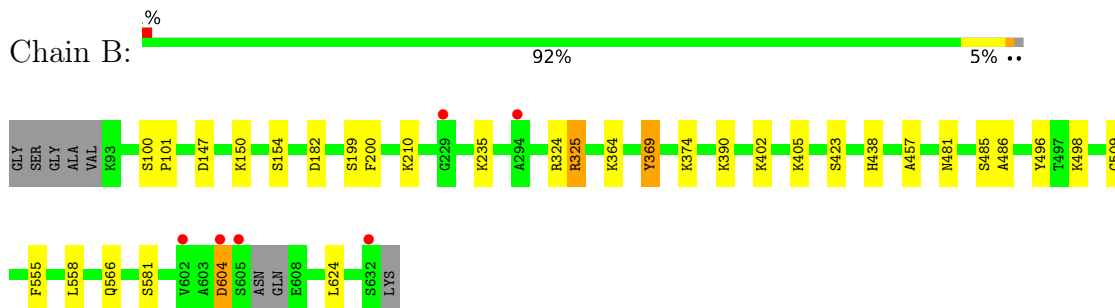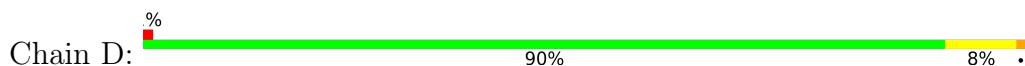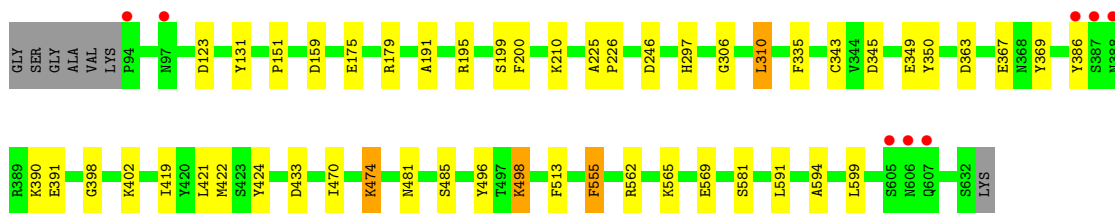
4 Data and refinement statistics ⓘ

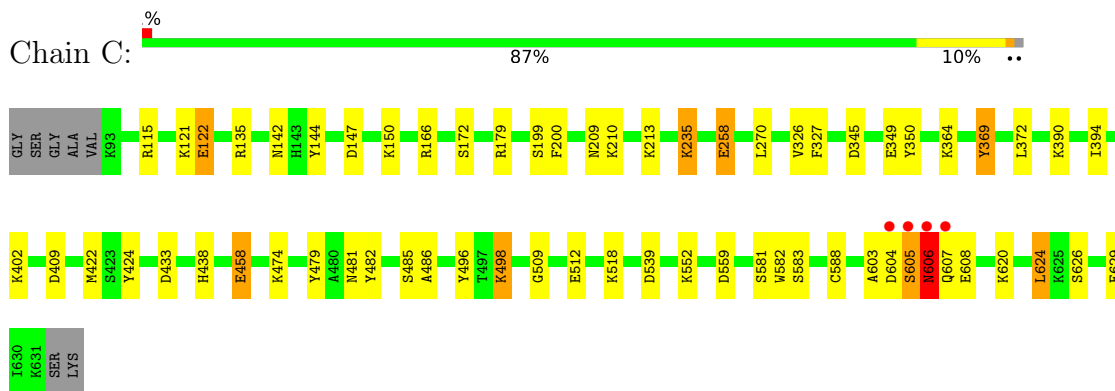| Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	60.51Å 210.56Å 92.58Å 90.00° 95.27° 90.00°	Depositor
Resolution (Å)	105.28 – 1.80 19.90 – 1.80	Depositor EDS
% Data completeness (in resolution range)	99.9 (105.28-1.80) 100.0 (19.90-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.12	Depositor
$< I/\sigma(I) >$ [1]	3.43 (at 1.80Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.160 , 0.199 0.160 , 0.200	Depositor DCC
R_{free} test set	10651 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	13.5	Xtriage
Anisotropy	0.026	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 47.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.48, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	17938	wwPDB-VP
Average B, all atoms (Å^2)	14.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.01% 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: MLY, MLZ, M3L, 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	1.14	3/4143 (0.1%)	0.99	4/5619 (0.1%)
2	B	1.05	1/4105 (0.0%)	0.95	4/5579 (0.1%)
3	C	1.22	9/4174 (0.2%)	1.04	11/5665 (0.2%)
4	D	1.15	8/4220 (0.2%)	0.99	5/5721 (0.1%)
All	All	1.14	21/16642 (0.1%)	0.99	24/22584 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
2	B	0	1
3	C	0	2
All	All	0	3

The worst 5 of 21 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	588	CYS	CB-SG	-7.37	1.69	1.82
4	D	367	GLU	CG-CD	6.74	1.62	1.51
4	D	513	PHE	CE1-CZ	6.61	1.50	1.37
4	D	555	PHE	CE1-CZ	6.57	1.49	1.37
3	C	512	GLU	CB-CG	6.42	1.64	1.52

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	537	MET	CG-SD-CE	-8.73	86.23	100.20
2	B	324	ARG	NE-CZ-NH1	-7.68	116.46	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	606	ASN	CB-CA-C	7.04	124.49	110.40
3	C	166	ARG	NE-CZ-NH2	-6.82	116.89	120.30
3	C	235	LYS	CD-CE-NZ	-6.68	96.34	111.70

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	604	ASP	Peptide
3	C	603	ALA	Peptide
3	C	605	SER	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	4191	0	4019	20	0
2	B	4122	0	3894	14	0
3	C	4201	0	4014	30	0
4	D	4194	0	3987	21	0
5	A	6	0	8	1	0
5	B	6	0	8	0	0
5	D	12	0	16	2	0
6	A	305	0	0	1	0
6	B	203	0	0	3	0
6	C	394	0	0	4	0
6	D	304	0	0	3	0
All	All	17938	0	15946	87	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 3.

The worst 5 of 87 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:A:433:ASP:OD1	1:A:498:M3L:CM1	2.06	1.04

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:433:ASP:OD1	1:A:498:M3L:HM11	1.58	1.02
4:D:433:ASP:OD1	4:D:498:M3L:HM33	1.64	0.97
3:C:433:ASP:OD1	3:C:498:M3L:CM2	2.17	0.93
3:C:433:ASP:OD1	3:C:498:M3L:HM23	1.72	0.86

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	526/546 (96%)	513 (98%)	13 (2%)	0	100	100
2	B	526/546 (96%)	510 (97%)	16 (3%)	0	100	100
3	C	531/546 (97%)	513 (97%)	16 (3%)	2 (0%)	34	21
4	D	539/546 (99%)	525 (97%)	12 (2%)	2 (0%)	34	21
All	All	2122/2184 (97%)	2061 (97%)	57 (3%)	4 (0%)	51	33

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
3	C	606	ASN
3	C	607	GLN
4	D	386[A]	TYR
4	D	386[B]	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	414/432 (96%)	410 (99%)	4 (1%)	76	71
2	B	404/435 (93%)	400 (99%)	4 (1%)	76	71
3	C	419/433 (97%)	412 (98%)	7 (2%)	60	51
4	D	422/439 (96%)	419 (99%)	3 (1%)	84	81
All	All	1659/1739 (95%)	1641 (99%)	18 (1%)	73	68

5 of 18 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	C	559	ASP
4	D	369	TYR
4	D	363	ASP
3	C	122	GLU
3	C	438	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	189	ASN
3	C	606	ASN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

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

45 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
2	MLZ	B	405	2	8,9,10	1.29	1 (12%)	4,9,11	0.77	0
1	M3L	A	364	1	10,11,12	0.70	0	9,14,16	0.73	0
1	MLY	A	552	1	9,10,11	1.39	1 (11%)	6,11,13	2.38	2 (33%)
2	MLY	B	364	2	9,10,11	0.66	0	6,11,13	2.10	2 (33%)
2	MLY	B	498	2	9,10,11	0.77	0	6,11,13	2.19	2 (33%)
3	MLY	C	210	3	9,10,11	1.04	1 (11%)	6,11,13	2.21	2 (33%)
4	MLZ	D	235	4	8,9,10	0.82	0	4,9,11	1.24	0
2	M3L	B	474	2	10,11,12	0.80	0	9,14,16	1.10	0
3	M3L	C	400	3	10,11,12	0.97	0	9,14,16	0.82	0
1	MLY	A	290	1	9,10,11	0.94	0	6,11,13	2.32	2 (33%)
1	MLZ	A	518	1	8,9,10	0.72	0	4,9,11	1.62	1 (25%)
1	MLY	A	565	1	9,10,11	0.51	0	6,11,13	2.23	2 (33%)
2	M3L	B	150	2	10,11,12	0.66	0	9,14,16	0.71	0
4	MLY	D	402	4	9,10,11	0.60	0	6,11,13	2.21	2 (33%)
1	MLY	A	210	1	9,9,11	0.73	0	10,10,13	1.67	3 (30%)
2	MLY	B	235	2	9,10,11	0.93	1 (11%)	6,11,13	2.54	3 (50%)
1	MLY	A	400	1	9,10,11	0.79	0	6,11,13	2.26	2 (33%)
3	MLY	C	213	3	9,10,11	1.09	1 (11%)	6,11,13	2.20	2 (33%)
1	M3L	A	498	1	10,11,12	0.81	0	9,14,16	0.71	0
1	MLZ	A	625	1	8,9,10	0.82	0	4,9,11	1.87	1 (25%)
1	M3L	A	390	1	10,11,12	0.42	0	9,14,16	4.60	6 (66%)
4	MLY	D	390	4	9,10,11	0.92	0	6,11,13	2.69	2 (33%)
2	MLY	B	390	2	9,10,11	0.82	0	6,11,13	2.23	2 (33%)
3	MLY	C	121	3	9,10,11	0.75	0	6,11,13	2.53	3 (50%)
3	MLY	C	552	3	9,10,11	0.63	0	6,11,13	2.08	2 (33%)
2	MLY	B	402	2	9,10,11	0.86	0	6,11,13	2.35	3 (50%)
2	M3L	B	400	2	10,11,12	0.79	0	9,14,16	0.70	0
2	MLY	B	210	2	9,10,11	1.31	1 (11%)	6,11,13	2.07	2 (33%)
3	MLZ	C	620	3	8,9,10	0.77	0	4,9,11	1.58	1 (25%)
1	MLY	A	93	1	9,10,11	0.54	0	6,11,13	2.36	2 (33%)
4	M3L	D	474	4	10,11,12	0.79	0	9,14,16	1.06	1 (11%)
3	MLY	C	390	3	9,10,11	0.85	0	6,11,13	2.86	2 (33%)
3	MLY	C	518	3	9,10,11	0.79	0	6,11,13	2.17	2 (33%)
3	MLY	C	402	3	9,10,11	0.91	0	6,11,13	1.99	2 (33%)
2	MLY	B	374	2	9,10,11	0.67	0	6,11,13	2.00	3 (50%)
3	MLY	C	364	3	9,10,11	0.77	0	6,11,13	2.17	2 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
1	MLY	A	402	1	9,10,11	0.70	0	6,11,13	2.18	2 (33%)
3	M3L	C	498	3	10,11,12	0.80	0	9,14,16	1.12	1 (11%)
4	MLY	D	210	4	9,10,11	0.86	0	6,11,13	2.22	2 (33%)
4	M3L	D	498	4	10,11,12	1.16	1 (10%)	9,14,16	1.37	3 (33%)
4	M3L	D	400	4	10,11,12	0.65	0	9,14,16	0.89	0
1	MLZ	A	405	1	8,9,10	0.50	0	4,9,11	1.58	1 (25%)
3	M3L	C	474	3	10,11,12	0.46	0	9,14,16	0.96	0
3	MLZ	C	150	3	8,9,10	0.82	0	4,9,11	1.46	1 (25%)
1	M3L	A	620	1	10,11,12	0.70	0	9,14,16	0.74	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	MLZ	B	405	2	-	0/7/8/10	-
1	M3L	A	364	1	-	4/9/10/12	-
1	MLY	A	552	1	-	3/8/9/11	-
2	MLY	B	364	2	-	1/8/9/11	-
2	MLY	B	498	2	-	2/8/9/11	-
3	MLY	C	210	3	-	2/8/9/11	-
4	MLZ	D	235	4	-	1/7/8/10	-
2	M3L	B	474	2	-	0/9/10/12	-
3	M3L	C	400	3	-	0/9/10/12	-
1	MLY	A	290	1	-	2/8/9/11	-
1	MLZ	A	518	1	-	2/7/8/10	-
1	MLY	A	565	1	-	3/8/9/11	-
2	M3L	B	150	2	-	2/9/10/12	-
4	MLY	D	402	4	-	1/8/9/11	-
1	MLY	A	210	1	-	2/7/7/11	-
2	MLY	B	235	2	-	2/8/9/11	-
1	MLY	A	400	1	-	1/8/9/11	-
3	MLY	C	213	3	-	2/8/9/11	-
1	M3L	A	498	1	-	2/9/10/12	-
1	MLZ	A	625	1	-	1/7/8/10	-
1	M3L	A	390	1	-	3/9/10/12	-
4	MLY	D	390	4	-	3/8/9/11	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	MLY	B	390	2	-	2/8/9/11	-
3	MLY	C	121	3	-	2/8/9/11	-
3	MLY	C	552	3	-	2/8/9/11	-
2	MLY	B	402	2	-	1/8/9/11	-
2	M3L	B	400	2	-	0/9/10/12	-
2	MLY	B	210	2	-	2/8/9/11	-
3	MLZ	C	620	3	-	0/7/8/10	-
1	MLY	A	93	1	-	2/8/9/11	-
4	M3L	D	474	4	-	1/9/10/12	-
3	MLY	C	390	3	-	3/8/9/11	-
3	MLY	C	518	3	-	2/8/9/11	-
3	MLY	C	402	3	-	1/8/9/11	-
2	MLY	B	374	2	-	1/8/9/11	-
3	MLY	C	364	3	-	1/8/9/11	-
1	MLY	A	402	1	-	1/8/9/11	-
3	M3L	C	498	3	-	2/9/10/12	-
4	MLY	D	210	4	-	2/8/9/11	-
4	M3L	D	498	4	-	4/9/10/12	-
4	M3L	D	400	4	-	0/9/10/12	-
1	MLZ	A	405	1	-	0/7/8/10	-
3	M3L	C	474	3	-	1/9/10/12	-
3	MLZ	C	150	3	-	1/7/8/10	-
1	M3L	A	620	1	-	0/9/10/12	-

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	552	MLY	CB-CA	3.71	1.58	1.53
2	B	405	MLZ	CB-CA	2.98	1.57	1.53
2	B	210	MLY	CB-CA	2.79	1.57	1.53
3	C	213	MLY	CB-CA	2.66	1.57	1.53
3	C	210	MLY	CB-CA	2.26	1.56	1.53

The worst 5 of 71 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(º)	Ideal(º)
1	A	390	M3L	CM3-NZ-CM1	-7.95	88.53	108.97
1	A	390	M3L	CM3-NZ-CM2	-7.16	90.55	108.97
1	A	390	M3L	CM3-NZ-CE	-6.81	82.05	109.92
3	C	390	MLY	CH2-NZ-CH1	5.53	124.03	109.73

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	390	MLY	CH2-NZ-CH1	5.10	122.91	109.73

There are no chirality outliers.

5 of 70 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	518	MLZ	CD-CE-NZ-CM
2	B	210	MLY	O-C-CA-CB
3	C	210	MLY	O-C-CA-CB
4	D	210	MLY	O-C-CA-CB
4	D	474	M3L	CG-CD-CE-NZ

There are no ring outliers.

7 monomers are involved in 22 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	364	M3L	1	0
2	B	150	M3L	2	0
1	A	498	M3L	6	0
4	D	474	M3L	3	0
3	C	498	M3L	5	0
4	D	498	M3L	3	0
3	C	474	M3L	2	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 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	701	-	5,5,5	0.21	0	5,5,5	0.76	0
5	GOL	B	701	-	5,5,5	0.36	0	5,5,5	0.64	0
5	GOL	A	701	-	5,5,5	0.36	0	5,5,5	0.51	0
5	GOL	D	702	-	5,5,5	0.50	0	5,5,5	1.20	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	701	-	-	2/4/4/4	-
5	GOL	B	701	-	-	2/4/4/4	-
5	GOL	A	701	-	-	0/4/4/4	-
5	GOL	D	702	-	-	3/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

5 of 7 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	D	702	GOL	O2-C2-C3-O3
5	D	702	GOL	O1-C1-C2-C3
5	D	702	GOL	C1-C2-C3-O3
5	B	701	GOL	O1-C1-C2-O2
5	D	701	GOL	O2-C2-C3-O3

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	701	GOL	1	0
5	D	702	GOL	2	0

5.7 Other polymers ⓘ

There are no such residues in this entry.

W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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(Å²)	Q<0.9
1	A	526/546 (96%)	-0.50	2 (0%)	92	90	5, 12, 23, 39	0
2	B	527/546 (96%)	-0.23	6 (1%)	80	78	8, 18, 30, 43	0
3	C	526/546 (96%)	-0.58	4 (0%)	86	84	4, 9, 21, 46	0
4	D	532/546 (97%)	-0.45	8 (1%)	73	70	5, 13, 24, 48	0
All	All	2111/2184 (96%)	-0.44	20 (0%)	84	82	4, 13, 27, 48	0

The worst 5 of 20 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
4	D	605	SER	6.6
4	D	386[A]	TYR	5.3
3	C	605	SER	4.9
3	C	604	ASP	4.4
3	C	607	GLN	3.7

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(Å²)	Q<0.9
1	MLY	A	210	10/12	0.92	0.10	10,13,17,18	0
2	M3L	B	474	12/13	0.92	0.15	13,19,31,35	0
2	MLY	B	374	11/12	0.93	0.15	14,15,34,35	0
1	M3L	A	364	12/13	0.93	0.18	15,24,43,45	0
3	MLZ	C	150	10/11	0.93	0.10	12,17,28,29	0
1	M3L	A	390	12/13	0.94	0.10	10,12,24,26	0
2	M3L	B	400	12/13	0.94	0.10	13,16,26,32	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	MLZ	C	620	10/11	0.94	0.12	12,15,36,37	0
4	MLZ	D	235	10/11	0.94	0.09	13,14,26,29	0
4	M3L	D	400	12/13	0.94	0.09	9,16,26,31	0
4	M3L	D	474	12/13	0.94	0.12	11,15,24,29	0
4	M3L	D	498	12/13	0.94	0.11	11,14,29,30	0
2	MLY	B	498	11/12	0.95	0.11	19,20,27,32	0
3	MLY	C	121	11/12	0.95	0.11	7,10,28,32	0
2	MLY	B	210	11/12	0.95	0.09	9,11,16,18	0
3	MLY	C	390	11/12	0.95	0.09	7,10,20,21	0
2	MLY	B	235	11/12	0.95	0.11	13,16,31,33	0
1	MLZ	A	405	10/11	0.95	0.09	13,14,27,29	0
1	MLZ	A	625	10/11	0.95	0.11	12,14,34,35	0
4	MLY	D	402	11/12	0.95	0.08	9,12,21,22	0
2	MLZ	B	405	10/11	0.95	0.14	13,15,34,36	0
2	M3L	B	150	12/13	0.95	0.10	17,23,31,32	0
3	MLY	C	213	11/12	0.96	0.11	7,10,32,34	0
2	MLY	B	390	11/12	0.96	0.08	15,16,17,18	0
3	M3L	C	400	12/13	0.96	0.10	9,12,19,25	0
3	M3L	C	474	12/13	0.96	0.09	8,12,24,31	0
3	M3L	C	498	12/13	0.96	0.10	8,11,25,26	0
1	MLY	A	290	11/12	0.96	0.11	12,14,24,28	0
4	MLY	D	210	11/12	0.96	0.07	12,14,15,16	0
1	MLY	A	400	11/12	0.96	0.09	12,15,20,21	0
1	MLY	A	402	11/12	0.96	0.09	10,14,22,28	0
1	MLY	A	93	11/12	0.96	0.09	13,15,28,29	0
2	MLY	B	364	11/12	0.96	0.12	12,14,29,34	0
1	M3L	A	498	12/13	0.96	0.11	10,11,23,26	0
3	MLY	C	210	11/12	0.97	0.07	5,7,10,12	0
1	MLZ	A	518	10/11	0.97	0.08	7,8,23,25	0
3	MLY	C	364	11/12	0.97	0.07	7,9,25,26	0
4	MLY	D	390	11/12	0.97	0.08	14,14,17,19	0
1	MLY	A	552	11/12	0.97	0.09	5,7,10,11	0
1	MLY	A	565	11/12	0.97	0.09	8,10,32,32	0
1	M3L	A	620	12/13	0.97	0.09	8,13,33,34	0
2	MLY	B	402	11/12	0.97	0.07	13,14,24,26	0
3	MLY	C	402	11/12	0.98	0.07	6,8,18,19	0
3	MLY	C	552	11/12	0.98	0.08	5,7,10,10	0
3	MLY	C	518	11/12	0.99	0.08	6,8,17,18	0

6.3 Carbohydrates (i)

There are no monosaccharides 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	D	702	6/6	0.79	0.15	31,39,40,43	0
5	GOL	A	701	6/6	0.86	0.16	24,35,37,38	0
5	GOL	B	701	6/6	0.90	0.16	38,39,39,40	0
5	GOL	D	701	6/6	0.93	0.12	33,35,37,40	0

6.5 Other polymers (i)

There are no such residues in this entry.